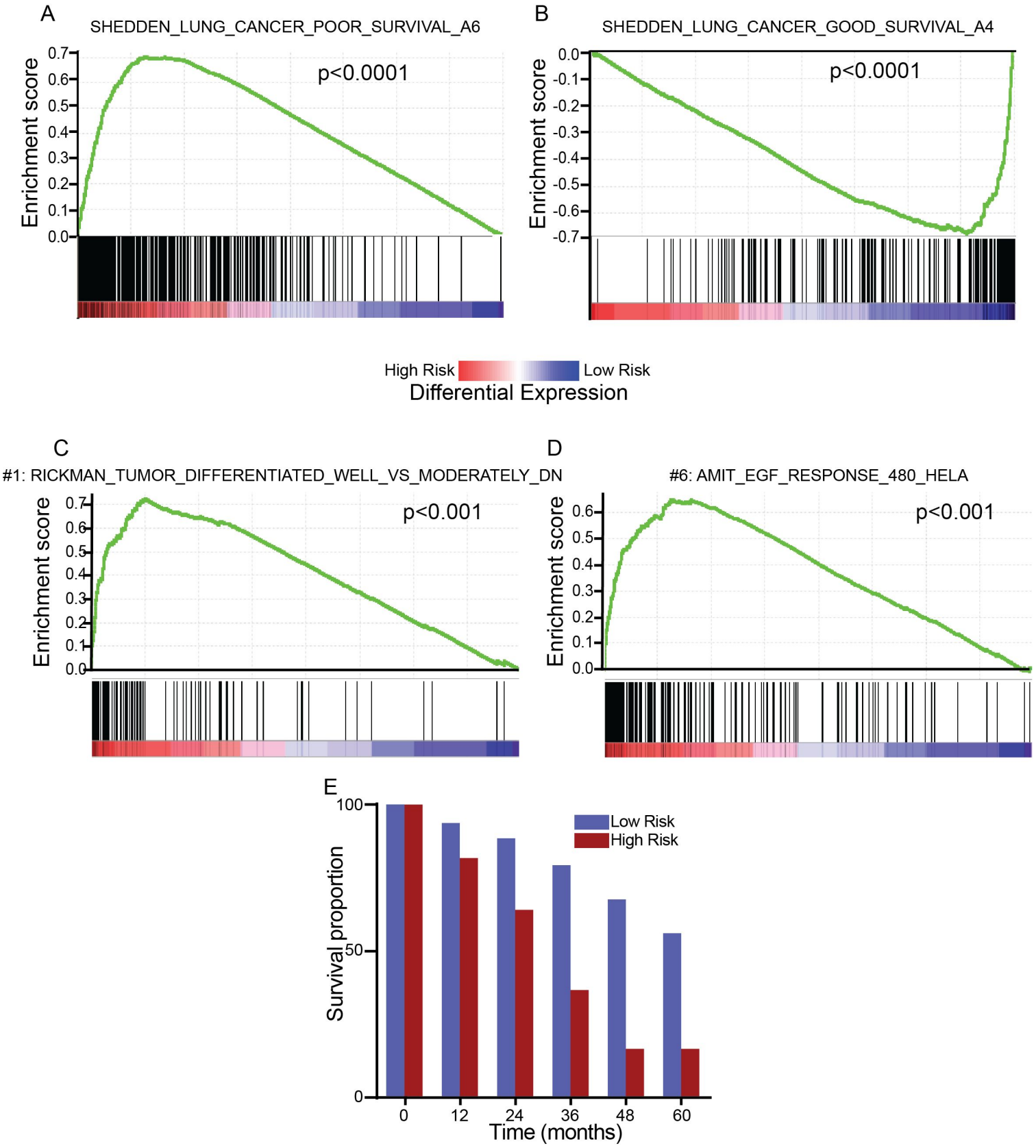
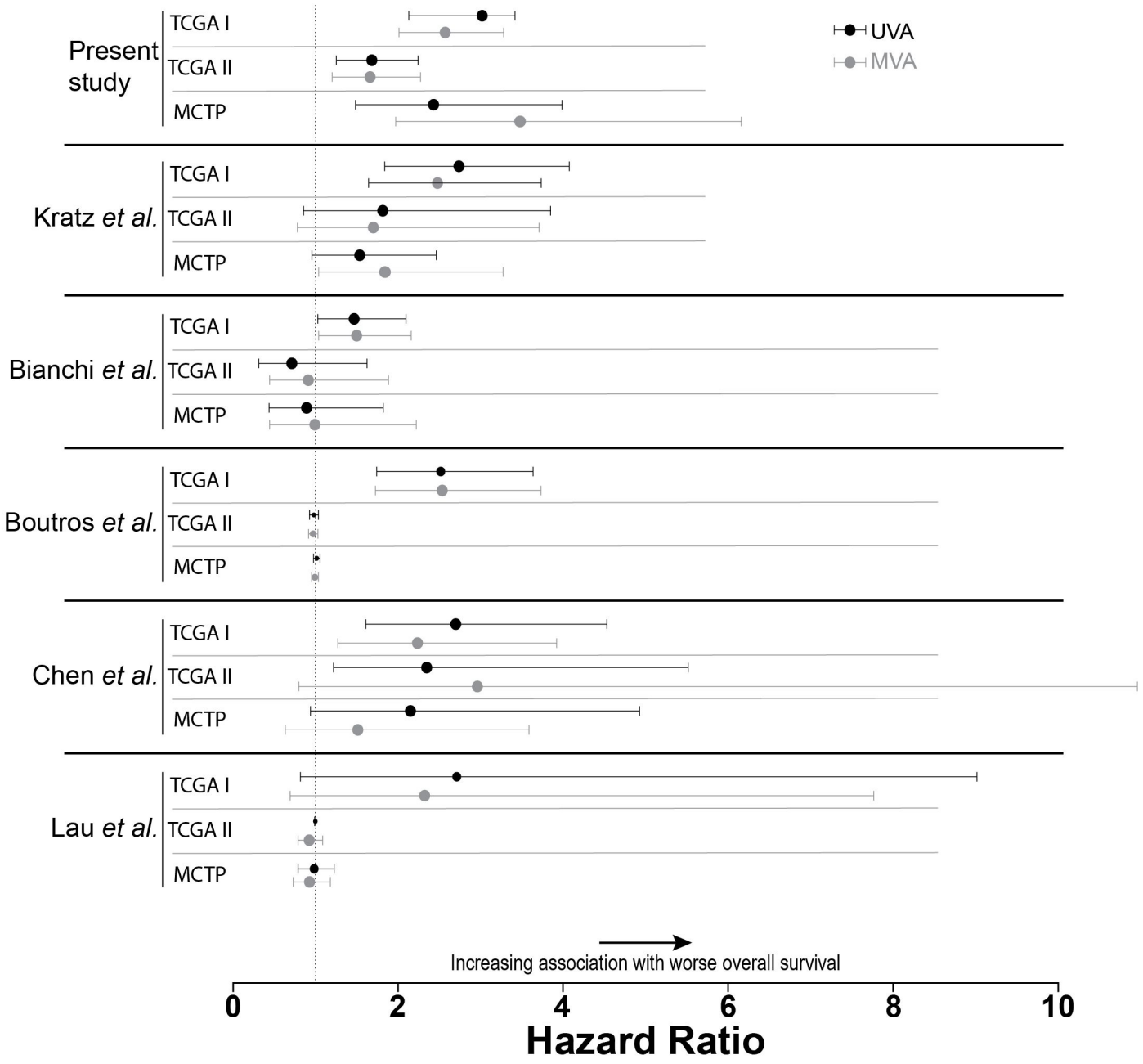
Suppl Fig 1



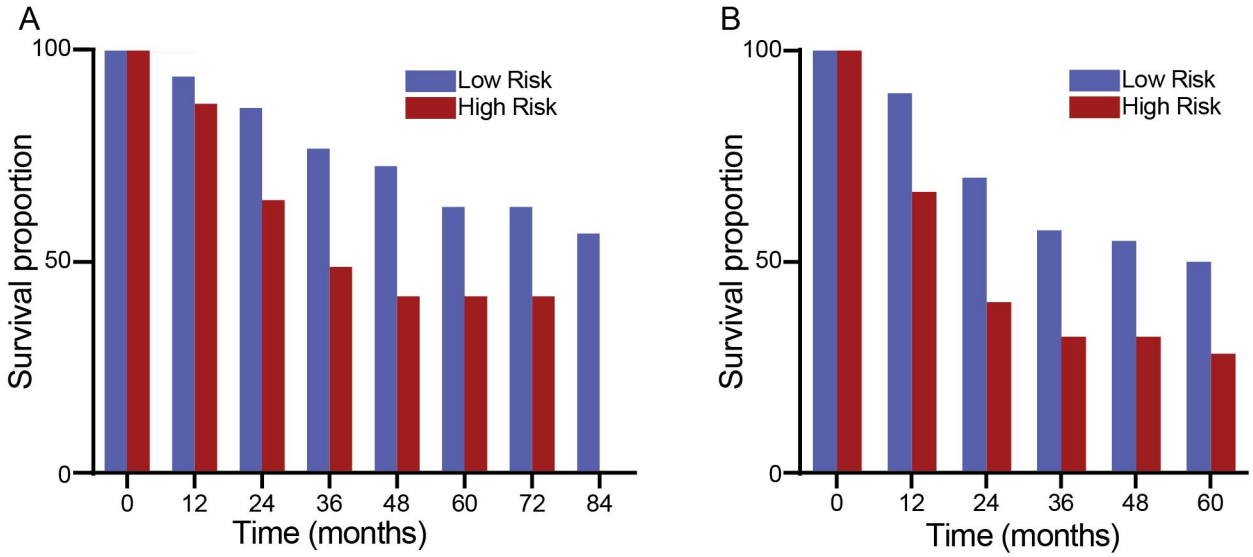
Supplemental Figure 1: GSEA results for High versus Low Risk differentially-expressed genes in TCGA Cohort I for lung cancer survival-related signatures SHEDDEN_LUNG_CANCER_POOR_SURVIVAL_A6 (A) and SHEDDEN_LUNG_CANCER_GOOD_SURVIVAL_A4 (B), as well as the top overall signature (RICKMAN_TUMOR_DIFFERENTIATED_WELL_VS_MODERATELY_DN) (C) and the top biological pathway signature (AMIT_EGF_RESPONSE_480_HELA) (D). Full results for all significant signatures can be found in supplemental table 8. Overall survival proportion time-course by 4-gene signature High and Low Risk in TCGA Cohort I (E).

Suppl Fig 2

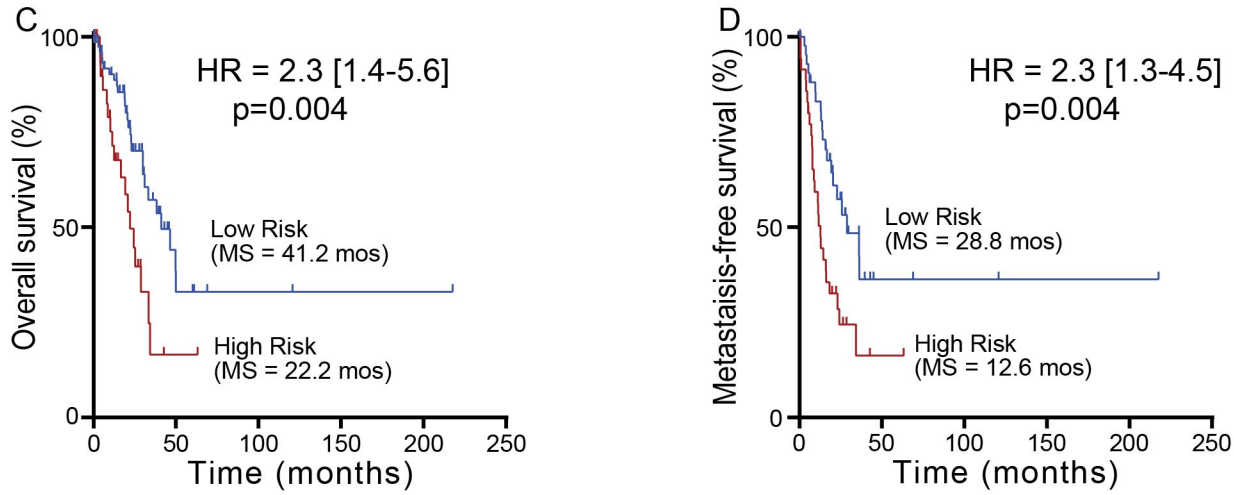


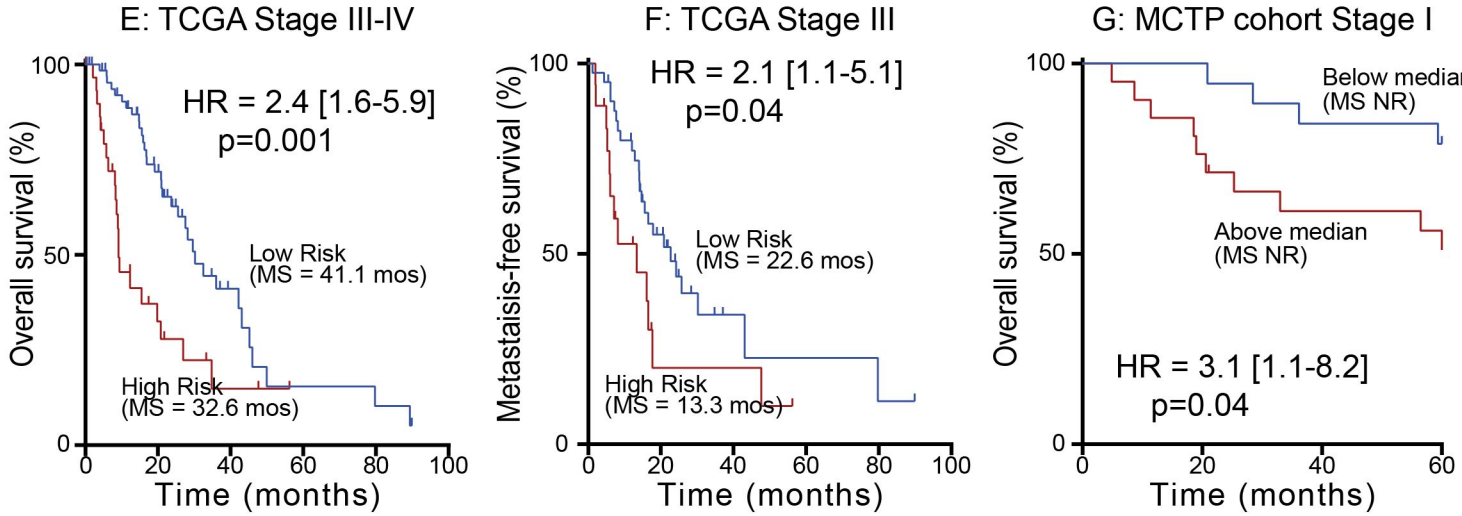
Supplemental Figure 2: Forest plot of Cox proportional hazards models of other published lung signatures in the RNA-seq datasets used in the present study. The signatures are noted at the far left, and divided by the 3 RNA-seq cohorts. For each of the other signatures, coefficients were derived from a multivariate Cox model in TCGA Cohort I, and used to generate a risk score, in the same manner as for the four-gene risk score. Within each cohort, the risk score for each of the other signatures was then evaluated by a univariate (UVA) Cox model, and a multivariate (MVA) Cox model also including the standard variables age, stage, and gender. Data is presented as the hazard ratio point estimate (circle), with 95% CIs (error bars). UVA=univariate Cox model results (black). MVA other=multivariate Cox model results. Point estimate circles were made smaller for visualization of narrow 95% CIs.

Suppl Fig 3



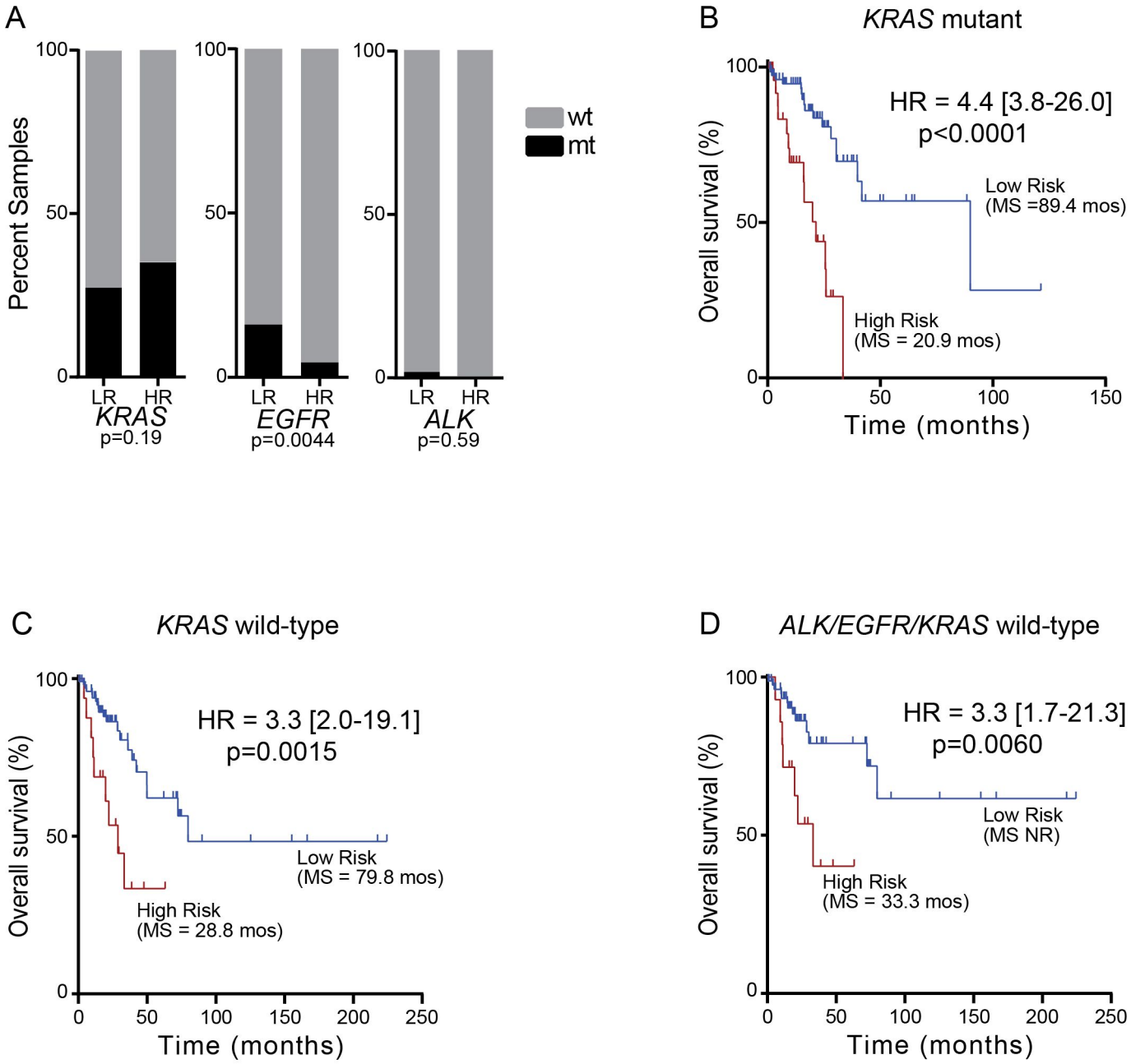
TCGA Stage II





Supplemental Figure 3: Overall survival proportion time-course by 4-gene signature High and Low Risk in the TCGA Cohort II (A) and MCTP Cohort (B). Kaplan-Meier curves with log-rank hazard ratio (HR), 95% CI, and p-value, and median survival for overall survival (C, E, G) and metastasis-free survival (D, F) in Stage II (C, D), Stage III-IV (E) and Stage III (F) cases from TCGA Cohort I. Kaplan-Meier curve of overall survival (G) in the Stage I cases in the MCTP Cohort stratified by the risk score median of the 4-gene signature.

Suppl Fig 4



Supplemental Figure 4: (A) *KRAS*, *EGFR*, and *ALK* wild-type (wt) and mutation (mt) proportions by 4-gene prognostic signature Low Risk (LR) or High Risk (HR) in the full TCGA cohort; p-value computed by Fisher's exact test. Kaplan-Meier curves with log-rank hazard ratio (HR), 95% CI, and p-value, and median survival for overall survival of *KRAS* mutant cases from the full TCGA cohort (B), and *KRAS* wild-type (C) and *ALK*, *EGFR*, and *KRAS* wild-type (D) cases from TCGA Cohort II stratified by 4-gene signature High and Low Risk. HR=hazard ratio. mos=months.

Supplemental Table 1: Clinical characteristics, follow-up data, and four-gene prognostic signature data in TCGA Cohort I

ID	Age (y)	Gender	Smoking History	Stage	ENSG00000104140 (RHOV)	ENSG00000156535 (CD109)	ENSG00000235884 (LINC00941)	ENSG00000156869 (FRRS1)	Four-gene Risk Score	Four-gene Risk Group
TCGA-50-6597	79	FEMALE	No	Stage IB	1.73	0.48	0.04	0.45	0.09	Low
TCGA-49-4486	72	MALE	Yes	Stage IA	1.92	0.14	0.13	0.56	0.09	Low
TCGA-64-1678	70	FEMALE	Yes	Stage IIA	1.38	0.58	0.16	0.23	0.10	Low
TCGA-53-7813	51	FEMALE	Yes	Stage IIIB	3.69	0.35	0.07	0.36	0.10	Low
TCGA-49-4514	79	FEMALE	Yes	Stage IA	7.25	0.38	0.08	0.35	0.14	Low
TCGA-78-7167	77	MALE	Yes	Stage IV	1.59	0.95	0.03	0.91	0.15	Low
TCGA-49-4510	51	FEMALE	Yes	Stage IIB	4.25	0.86	0.18	0.34	0.16	Low
TCGA-78-7152	65	MALE	Yes	Stage IB	5.50	0.60	0.02	0.74	0.16	Low
TCGA-78-7539	75	FEMALE	Yes	Stage IIA	0.72	1.09	0.03	1.10	0.16	Low
TCGA-55-7910	50	FEMALE	Yes	Stage IIA	3.57	0.30	0.17	1.11	0.17	Low
TCGA-95-7948	42	FEMALE	Yes	Stage IB	2.14	0.37	0.18	1.31	0.17	Low
TCGA-73-4662	65	FEMALE	Yes	Stage IA	0.37	0.99	0.19	0.98	0.17	Low
TCGA-78-7163	60	MALE	Yes	Stage IB	8.36	0.08	0.28	0.44	0.18	Low
TCGA-44-6776	60	FEMALE	Yes	Stage IA	2.12	0.46	0.11	1.56	0.18	Low
TCGA-44-2657	74	FEMALE	Yes	Stage IB	1.20	0.57	0.26	1.30	0.19	Low
TCGA-73-7498	58	FEMALE	Yes	Stage IA	2.34	1.01	0.22	0.87	0.19	Low
TCGA-67-3774	73	FEMALE	Yes	Stage IB	2.58	1.44	0.15	0.59	0.19	Low
TCGA-50-5935	86	FEMALE	Unknown	Stage IA	5.11	1.08	0.03	0.89	0.20	Low
TCGA-64-5778	60	MALE	Yes	Stage IB	7.02	0.98	0.08	0.60	0.20	Low
TCGA-78-7633	67	MALE	Yes	Stage IA	0.81	0.93	0.01	1.76	0.20	Low
TCGA-64-1677	77	FEMALE	Yes	Stage IIIA	4.43	0.97	0.21	0.71	0.20	Low
TCGA-69-8253	59	FEMALE	Yes	Stage IIA	5.96	1.24	0.11	0.53	0.20	Low
TCGA-64-1681	61	FEMALE	Yes	Stage IA	4.47	1.19	0.09	0.87	0.20	Low
TCGA-91-6849	75	FEMALE	Yes	Stage IIIA	2.57	1.24	0.05	1.34	0.21	Low
TCGA-73-7499	81	FEMALE	No	Stage IB	4.90	0.62	0.23	1.14	0.22	Low
TCGA-44-5645	61	FEMALE	Yes	Stage IA	1.13	0.68	0.07	2.06	0.22	Low
TCGA-78-7153	65	FEMALE	Yes	Stage IB	10.32	0.37	0.23	0.59	0.22	Low
TCGA-95-7567	61	MALE	Yes	Stage IIB	9.89	0.56	0.03	0.97	0.22	Low
TCGA-35-3615	57	MALE	No	Stage IB	4.51	0.43	0.11	1.77	0.22	Low
TCGA-64-5779	61	MALE	Yes	Stage IIIA	1.31	1.58	0.18	1.07	0.22	Low
TCGA-55-6968	61	MALE	Yes	Stage IV	1.50	0.77	0.06	2.13	0.23	Low
TCGA-78-7156	62	MALE	Yes	Stage IV	0.27	0.79	0.14	2.17	0.23	Low
TCGA-50-5932	75	MALE	Unknown	Stage IIB	4.48	1.55	0.07	1.07	0.24	Low
TCGA-64-5774	60	MALE	Yes	Stage IB	2.36	1.27	0.23	1.30	0.24	Low
TCGA-05-4432	66	MALE	Yes	Stage IIB	7.67	0.90	0.24	0.85	0.24	Low
TCGA-44-2661	69	FEMALE	No	Stage IA	1.08	1.10	0.19	1.82	0.25	Low
TCGA-67-3770	70	FEMALE	Yes	Stage IA	0.66	0.63	0.04	2.69	0.25	Low
TCGA-55-8206	56	MALE	No	Stage IA	1.24	1.25	0.06	2.06	0.25	Low

TCGA-55-7725	68	FEMALE	Yes	Stage IA	4.61	1.03	0.00	1.88	0.25	Low
TCGA-50-5055	79	FEMALE	Unknown	Stage IIA	3.35	1.71	0.16	1.12	0.26	Low
TCGA-67-6217	73	FEMALE	Yes	Stage IIA	0.95	0.59	0.09	2.71	0.26	Low
TCGA-86-8279	46	MALE	No	Stage IIA	5.99	1.00	0.09	1.64	0.26	Low
TCGA-49-4501	67	FEMALE	No	Stage IB	1.57	1.25	0.10	2.09	0.27	Low
TCGA-55-6969	52	MALE	Yes	Stage IB	0.64	1.34	0.30	1.70	0.27	Low
TCGA-78-7162	75	MALE	Yes	Stage IA	1.68	1.70	0.17	1.53	0.27	Low
TCGA-55-7281	70	FEMALE	Yes	Stage IA	2.78	1.76	0.24	1.14	0.27	Low
TCGA-55-8085	64	MALE	Yes	Stage IA	8.84	0.75	0.16	1.36	0.27	Low
TCGA-05-4417	51	FEMALE	Yes	Stage IB	1.02	1.61	0.34	1.39	0.27	Low
TCGA-97-8174	67	MALE	Yes	Stage IIA	0.27	1.48	0.19	1.96	0.27	Low
TCGA-67-3772	82	FEMALE	No	Stage IB	1.42	1.44	0.32	1.54	0.27	Low
TCGA-44-7659	70	MALE	Yes	Stage IA	7.13	0.73	0.14	1.75	0.27	Low
TCGA-50-5942	67	FEMALE	Yes	Stage IA	1.24	0.82	0.09	2.70	0.28	Low
TCGA-55-8301	58	MALE	Yes	Stage IB	2.72	1.74	0.22	1.40	0.28	Low
TCGA-91-6828	70	MALE	Yes	Stage IA	0.31	2.08	0.16	1.59	0.28	Low
TCGA-55-7911	70	FEMALE	Yes	Stage IA	6.99	1.73	0.07	1.11	0.28	Low
TCGA-73-4677	74	MALE	Yes	Stage IA	9.47	1.13	0.15	1.18	0.29	Low
TCGA-44-6148	60	MALE	Yes	Stage IA	4.71	0.84	0.16	2.16	0.29	Low
TCGA-05-5423	65	MALE	Yes	Stage IIB	1.83	1.37	0.05	2.35	0.29	Low
TCGA-73-4675	59	MALE	Yes	Stage IIIA	6.33	0.83	0.20	1.92	0.29	Low
TCGA-78-7537	72	MALE	Yes	Stage IB	4.33	0.70	0.20	2.36	0.30	Low
TCGA-44-2659	65	FEMALE	Yes	Stage IIB	0.62	1.10	0.09	2.83	0.30	Low
TCGA-50-5068	59	FEMALE	Unknown	Stage IIB	3.36	1.22	0.17	2.15	0.30	Low
TCGA-86-7701	66	MALE	No	Stage IV	3.53	1.02	0.67	1.19	0.30	Low
TCGA-44-2655	65	FEMALE	Yes	Stage IA	11.70	0.86	0.15	1.28	0.30	Low
TCGA-38-7271	72	FEMALE	Yes	Stage IA	9.79	1.62	0.16	0.87	0.30	Low
TCGA-05-4390	58	FEMALE	Yes	Stage IB	1.84	1.12	0.33	2.18	0.30	Low
TCGA-05-4420	41	MALE	Yes	Stage IB	6.22	0.47	0.31	2.17	0.31	Low
TCGA-55-7914	71	FEMALE	Yes	Stage IIA	4.70	0.41	0.25	2.72	0.31	Low
TCGA-55-6983	81	MALE	Yes	Stage IIB	14.55	0.74	0.27	0.89	0.32	Low
TCGA-86-8280	54	FEMALE	No	Stage IIA	6.40	1.32	0.22	1.71	0.32	Low
TCGA-44-7667	49	FEMALE	Yes	Stage IIB	3.71	1.73	0.59	0.90	0.32	Low
TCGA-55-6986	74	FEMALE	No	Stage IB	7.85	0.96	0.54	1.09	0.32	Low
TCGA-99-8028	50	FEMALE	Yes	Stage IA	9.92	1.41	0.30	0.93	0.32	Low
TCGA-50-5944	69	FEMALE	Unknown	Stage IA	1.09	1.55	0.05	2.73	0.32	Low
TCGA-97-7546	76	FEMALE	Yes	Stage IA	0.56	1.68	0.08	2.66	0.32	Low
TCGA-78-7143	62	FEMALE	No	Stage IB	2.95	2.27	0.11	1.68	0.32	Low
TCGA-64-1680	63	MALE	Yes	Stage IV	4.90	0.38	0.25	2.85	0.33	Low
TCGA-91-6840	59	FEMALE	Yes	Stage IA	3.37	0.82	0.79	1.48	0.33	Low
TCGA-78-7536	69	MALE	Yes	Stage IIIA	4.99	0.39	0.06	3.31	0.33	Low
TCGA-44-5644	51	FEMALE	Yes	Stage IB	2.50	1.82	0.93	0.41	0.33	Low
TCGA-50-6591	63	FEMALE	No	Stage IV	0.71	2.54	0.51	1.03	0.33	Low

TCGA-67-3773	84	FEMALE	Yes	Stage IB	2.47	0.51	0.27	3.17	0.33	Low
TCGA-05-4430	59	FEMALE	Yes	Stage IB	3.36	2.33	0.22	1.53	0.34	Low
TCGA-05-4405	74	FEMALE	Yes	Stage IB	5.03	2.25	0.06	1.80	0.34	Low
TCGA-91-7771	62	MALE	Yes	Stage IIB	2.27	1.73	0.16	2.46	0.34	Low
TCGA-64-1676	58	MALE	Yes	Stage IA	6.56	3.21	0.06	0.72	0.35	Low
TCGA-69-7973	42	FEMALE	Yes	Stage IB	5.99	1.03	0.64	1.51	0.35	Low
TCGA-91-6831	66	MALE	Yes	Stage IB	4.14	1.95	0.37	1.58	0.35	Low
TCGA-69-7764	75	MALE	Yes	Stage IA	1.89	1.97	0.30	2.11	0.35	Low
TCGA-93-7348	75	FEMALE	Yes	Stage IA	6.94	2.03	0.16	1.63	0.35	Low
TCGA-69-7763	69	MALE	Yes	Stage IA	11.24	1.99	0.28	0.78	0.36	Low
TCGA-55-7574	64	FEMALE	Yes	Stage IB	2.82	2.09	0.69	1.07	0.36	Low
TCGA-38-4630	75	FEMALE	No	Stage IB	3.10	1.28	0.31	2.76	0.37	Low
TCGA-86-8054	61	MALE	Yes	Stage IIB	2.03	1.23	0.69	2.17	0.37	Low
TCGA-73-4659	66	MALE	Yes	Stage IIIA	11.89	1.39	0.37	1.27	0.37	Low
TCGA-97-7547	67	FEMALE	Yes	Stage IB	1.96	3.21	0.23	1.44	0.37	Low
TCGA-38-4626	57	FEMALE	Yes	Stage IIA	0.93	2.65	0.38	1.81	0.38	Low
TCGA-78-7159	60	FEMALE	Yes	Stage IA	6.64	1.09	0.80	1.50	0.38	Low
TCGA-44-7671	64	MALE	Yes	Stage IB	6.08	2.07	0.09	2.30	0.38	Low
TCGA-78-7149	71	MALE	Yes	Stage IIIB	20.91	1.04	0.13	0.94	0.39	Low
TCGA-73-4658	80	FEMALE	Yes	Stage IB	3.40	3.56	0.17	1.31	0.39	Low
TCGA-44-6147	67	FEMALE	Yes	Stage IA	10.82	1.99	0.16	1.65	0.40	Low
TCGA-05-4249	67	MALE	Yes	Stage IB	4.43	3.07	0.07	1.96	0.40	Low
TCGA-99-8025	72	FEMALE	Yes	Stage IIIA	16.29	1.64	0.34	0.84	0.40	Low
TCGA-50-5049	70	MALE	Unknown	Stage IA	1.37	1.41	0.16	3.77	0.40	Low
TCGA-38-6178	70	FEMALE	No	Stage IIIA	1.38	2.47	0.16	2.79	0.41	Low
TCGA-49-6744	64	FEMALE	Yes	Stage IIA	2.56	3.23	0.18	1.88	0.41	Low
TCGA-69-7980	69	FEMALE	Yes	Stage I	0.76	4.25	0.25	1.11	0.41	Low
TCGA-53-7626	76	FEMALE	Yes	Stage IIA	7.94	2.07	0.19	2.17	0.41	Low
TCGA-97-8177	59	FEMALE	No	Stage IB	1.26	2.28	0.17	3.07	0.41	Low
TCGA-49-4505	61	FEMALE	Yes	Stage IIB	11.10	2.53	0.05	1.69	0.42	Low
TCGA-50-5941	55	FEMALE	Yes	Stage IIIA	12.09	2.14	0.17	1.66	0.42	Low
TCGA-86-7713	70	MALE	No	Stage IIA	11.57	0.94	0.18	2.84	0.42	Low
TCGA-55-6971	59	FEMALE	Yes	Stage IB	3.49	2.41	0.53	1.97	0.42	Low
TCGA-55-1595	74	FEMALE	Yes	Stage IA	13.10	2.20	0.25	1.33	0.43	Low
TCGA-97-7938	76	FEMALE	Yes	Stage IA	7.09	1.63	0.28	2.73	0.43	Low
TCGA-05-4389	70	MALE	Yes	Stage IA	3.19	2.51	0.17	2.80	0.43	Low
TCGA-67-3771	77	FEMALE	Yes	Stage IA	8.24	0.69	0.18	3.68	0.43	Low
TCGA-50-6593	49	FEMALE	Yes	Stage IIIA	12.72	3.13	0.02	1.17	0.43	Low
TCGA-55-6642	63	MALE	Yes	Stage IB	5.15	2.78	0.50	1.56	0.43	Low
TCGA-44-7660	72	MALE	Yes	Stage IB	10.60	0.76	0.28	3.14	0.44	Low
TCGA-44-3918	60	FEMALE	Yes	Stage IA	9.16	3.07	0.16	1.70	0.45	Low
TCGA-35-5375	61	MALE	Yes	Stage IIIA	3.39	1.28	0.21	4.11	0.45	Low
TCGA-55-7903	64	MALE	Yes	Stage IA	4.94	4.05	0.05	1.72	0.45	Low

TCGA-69-7760	73	MALE	No	Stage IIB	9.81	3.67	0.10	1.24	0.46	Low
TCGA-91-6836	52	FEMALE	Yes	Stage IB	1.57	5.32	0.08	1.05	0.46	Low
TCGA-78-7147	67	FEMALE	Yes	Stage IIB	1.45	1.89	0.05	4.27	0.46	Low
TCGA-55-7995	73	FEMALE	Yes	Stage IA	8.29	2.19	0.18	2.82	0.47	Low
TCGA-55-7815	76	MALE	No	Stage IB	1.50	2.26	0.11	3.98	0.47	Low
TCGA-55-8207	73	MALE	Yes	Stage IB	3.39	4.00	0.03	2.41	0.48	Low
TCGA-05-4424	70	MALE	Yes	Stage IIB	4.21	3.03	0.12	2.99	0.48	Low
TCGA-99-8032	61	MALE	Yes	Stage IA	9.36	1.58	1.25	0.96	0.48	Low
TCGA-55-1594	68	MALE	Yes	Stage IIIA	3.93	2.66	0.93	1.67	0.49	Low
TCGA-86-7953	69	FEMALE	No	Stage IA	2.69	2.62	0.45	3.03	0.49	Low
TCGA-55-1596	55	MALE	Yes	Stage IIB	13.65	0.81	0.15	3.75	0.50	Low
TCGA-86-8076	42	MALE	No	Stage IA	25.54	1.33	0.15	1.52	0.50	Low
TCGA-44-8120	58	MALE	Yes	Stage IB	7.31	3.39	0.05	2.74	0.51	Low
TCGA-49-6761	68	FEMALE	Yes	Stage IIIA	6.68	3.74	0.56	1.40	0.51	Low
TCGA-44-7669	59	MALE	Yes	Stage IIA	2.33	2.45	1.00	2.26	0.51	Low
TCGA-50-5066	72	MALE	No	Stage IB	0.29	3.37	1.19	1.31	0.51	Low
TCGA-05-5428	57	MALE	Yes	Stage IIA	7.75	3.04	0.20	2.76	0.52	Low
TCGA-55-8091	74	MALE	Yes	Stage IB	15.62	3.08	0.24	1.45	0.52	Low
TCGA-55-7227	77	MALE	Yes	Stage IIIA	21.97	2.39	0.16	1.33	0.52	Low
TCGA-44-3919	71	FEMALE	No	Stage IA	7.96	3.99	0.08	2.20	0.52	Low
TCGA-55-6982	79	FEMALE	No	Stage IIB	11.40	2.63	0.26	2.53	0.52	Low
TCGA-44-4112	60	FEMALE	Yes	Stage IB	3.70	4.24	0.50	1.70	0.52	Low
TCGA-38-4631	72	FEMALE	Yes	Stage IB	8.17	1.55	0.42	3.94	0.55	Low
TCGA-67-6216	57	FEMALE	No	Stage IA	23.57	1.14	0.32	2.26	0.55	Low
TCGA-69-7765	56	MALE	Yes	Stage IV	2.29	5.04	0.24	2.32	0.56	Low
TCGA-86-7714	61	FEMALE	Yes	Stage IIIA	13.84	2.27	0.21	3.32	0.57	Low
TCGA-50-5946	62	MALE	Yes	Stage IA	14.90	1.60	0.20	4.15	0.60	Low
TCGA-55-7907	77	MALE	Yes	Stage IIA	7.36	6.66	0.25	1.01	0.63	Low
TCGA-44-2656	59	MALE	Yes	Stage IB	5.47	5.98	0.20	2.16	0.64	Low
TCGA-97-7552	70	MALE	Yes	Stage IB	7.61	1.75	1.25	3.35	0.64	Low
TCGA-55-6980	56	MALE	No	Stage IA	7.77	6.38	0.06	1.92	0.65	Low
TCGA-55-5899	58	MALE	Yes	Stage IA	0.42	4.86	0.56	3.35	0.66	Low
TCGA-95-7947	67	MALE	Yes	Stage IA	26.64	1.89	0.09	3.13	0.66	Low
TCGA-05-4403	76	MALE	Yes	Stage IB	4.22	5.16	0.43	2.79	0.66	Low
TCGA-44-6774	56	FEMALE	Yes	Stage IIIA	2.24	5.86	0.74	1.75	0.66	Low
TCGA-55-7570	60	MALE	Yes	Stage IA	14.47	1.14	0.34	5.17	0.66	Low
TCGA-05-4384	66	MALE	Yes	Stage IIIA	21.16	4.17	0.10	1.97	0.67	Low
TCGA-55-6543	60	FEMALE	Yes	Stage IA	38.08	2.20	0.11	1.21	0.67	Low
TCGA-73-4668	66	FEMALE	Yes	Stage IIB	3.33	6.51	0.32	2.15	0.67	Low
TCGA-44-2666	43	MALE	Yes	Stage IB	12.32	3.60	0.82	2.32	0.67	Low
TCGA-55-6981	53	FEMALE	Yes	Stage IIIA	13.97	3.92	0.21	3.17	0.67	Low
TCGA-86-8075	66	FEMALE	No	Stage IB	1.45	4.22	0.31	4.58	0.68	Low
TCGA-78-7145	52	FEMALE	Yes	Stage IV	8.92	7.20	0.07	1.31	0.68	Low

TCGA-55-7994	81	MALE	Yes	Stage IIB	12.85	4.10	0.16	3.83	0.71	Low
TCGA-55-7727	70	MALE	Yes	Stage IIIA	9.93	7.45	0.03	1.84	0.74	Low
TCGA-55-7728	64	FEMALE	Yes	Stage IB	6.08	2.79	2.13	1.96	0.74	Low
TCGA-38-4632	42	MALE	Yes	Stage IV	7.85	8.46	0.11	1.09	0.74	Low
TCGA-05-4396	76	MALE	Yes	Stage IIIB	17.39	0.97	0.08	6.72	0.75	Low
TCGA-78-7535	45	MALE	Yes	Stage IB	53.86	1.26	0.05	1.06	0.76	Low
TCGA-05-5425	68	MALE	Yes	Stage IIB	13.85	2.24	0.06	6.58	0.78	Low
TCGA-78-7160	61	MALE	Yes	Stage IV	10.57	7.34	0.22	2.11	0.79	Low
TCGA-05-5420	67	MALE	Yes	Stage IIIA	14.49	2.10	0.29	6.19	0.79	Low
TCGA-69-7974	54	FEMALE	Yes	Stage IIIA	7.59	5.82	1.00	2.34	0.80	Low
TCGA-49-4488	74	FEMALE	Yes	Stage IA	15.92	8.34	0.10	0.89	0.81	Low
TCGA-91-6847	62	FEMALE	Yes	Stage IB	6.20	5.34	1.39	2.50	0.83	Low
TCGA-55-8090	80	MALE	Yes	Stage IA	21.36	6.48	0.70	1.03	0.85	Low
TCGA-55-1592	65	MALE	Yes	Stage IA	6.91	2.09	0.10	8.73	0.86	Low
TCGA-38-4627	64	FEMALE	Yes	Stage IIA	3.06	6.97	0.65	3.68	0.86	Low
TCGA-44-7672	52	FEMALE	Yes	Stage IA	4.28	11.49	0.22	0.74	0.90	Low
TCGA-35-4123	38	MALE	Yes	Stage IA	5.83	5.99	1.53	2.63	0.90	Low
TCGA-55-8096	67	FEMALE	Yes	Stage IB	3.63	5.26	0.25	6.56	0.90	Low
TCGA-44-8117	54	FEMALE	Yes	Stage IB	71.27	0.65	0.22	0.78	0.92	Low
TCGA-35-4122	69	MALE	Yes	Stage IA	1.91	5.42	2.42	2.27	0.94	Low
TCGA-44-3396	74	FEMALE	Yes	Stage IIIA	35.62	5.08	0.37	2.24	0.95	Low
TCGA-78-7540	66	FEMALE	No	Stage IB	8.38	1.47	2.70	4.64	0.96	Low
TCGA-05-4402	57	FEMALE	No	Stage IV	16.13	5.15	0.17	6.00	0.98	Low
TCGA-64-1679	58	FEMALE	Yes	Stage IIIA	6.85	9.96	0.39	2.63	0.99	High
TCGA-44-6777	85	FEMALE	Yes	Stage IB	2.06	7.19	0.20	6.48	1.00	High
TCGA-05-4426	71	MALE	Yes	Stage IB	20.09	7.87	0.29	3.02	1.00	High
TCGA-44-6146	64	MALE	Yes	Stage IIB	2.62	1.08	3.98	3.58	1.01	High
TCGA-55-8094	51	MALE	Yes	Stage IV	3.13	4.15	3.89	1.01	1.02	High
TCGA-44-7670	47	FEMALE	Yes	Stage IIA	6.94	2.53	2.93	4.41	1.04	High
TCGA-71-6725	48	FEMALE	Yes	Stage IB	89.36	0.59	0.03	0.65	1.07	High
TCGA-86-6562	52	MALE	No	Stage IIA	37.96	7.89	0.23	1.47	1.08	High
TCGA-55-6712	71	MALE	Yes	Stage IIA	3.53	0.01	4.95	3.59	1.10	High
TCGA-44-6775	72	FEMALE	Yes	Stage IB	1.88	10.12	0.48	4.76	1.11	High
TCGA-05-5715	69	FEMALE	No	Stage IB	50.23	5.36	0.04	2.88	1.12	High
TCGA-78-7148	71	MALE	Yes	Stage IIB	18.55	12.69	0.07	1.44	1.16	High
TCGA-50-6594	79	FEMALE	Yes	Stage IIIA	19.66	11.59	0.19	2.23	1.17	High
TCGA-97-7941	72	FEMALE	Yes	Stage IA	21.33	3.05	3.21	3.12	1.18	High
TCGA-91-6829	78	MALE	Yes	Stage IB	0.36	11.84	0.67	4.80	1.24	High
TCGA-05-4397	65	MALE	Yes	Stage IIB	4.15	7.50	0.20	9.42	1.25	High
TCGA-44-2665	55	FEMALE	No	Stage IIB	30.27	9.08	1.02	2.16	1.25	High
TCGA-69-7978	59	MALE	Yes	Stage IIB	20.36	9.41	1.11	3.23	1.26	High
TCGA-44-6145	62	FEMALE	Yes	Stage IA	40.35	8.68	0.16	3.17	1.27	High
TCGA-69-7761	84	MALE	Yes	Stage IB	12.00	3.05	2.11	8.35	1.28	High

TCGA-93-8067	77	MALE	Yes	Stage IB	7.59	16.43	0.22	1.26	1.29	High
TCGA-55-7284	74	MALE	Yes	Stage IIB	7.15	2.34	4.80	3.88	1.29	High
TCGA-49-6742	70	MALE	Yes	Stage IIB	94.05	1.49	0.04	4.31	1.45	High
TCGA-55-8205	76	FEMALE	Yes	Stage IIB	5.06	9.92	3.75	1.88	1.46	High
TCGA-49-4507	73	FEMALE	Yes	Stage IIIA	104.01	1.29	1.17	0.76	1.47	High
TCGA-55-6970	67	FEMALE	Yes	Stage IIIA	66.80	7.29	0.09	3.43	1.48	High
TCGA-91-6848	59	MALE	Yes	Stage IIIA	1.02	10.27	3.47	3.20	1.49	High
TCGA-50-6590	72	FEMALE	Yes	Stage IB	16.32	4.39	5.59	2.16	1.54	High
TCGA-44-7662	61	MALE	Yes	Stage IB	2.74	17.92	1.17	1.95	1.54	High
TCGA-55-7576	54	MALE	Yes	Stage IB	4.89	20.09	0.23	2.23	1.58	High
TCGA-64-5815	74	MALE	Yes	Stage IIB	25.29	14.33	1.30	2.19	1.59	High
TCGA-78-7220	53	FEMALE	Yes	Stage IIIA	94.29	1.26	1.78	3.86	1.69	High
TCGA-64-5781	55	FEMALE	Yes	Stage IB	67.58	4.33	2.68	3.89	1.75	High
TCGA-44-5643	53	MALE	Yes	Stage IIIA	68.52	6.24	1.35	5.29	1.77	High
TCGA-97-8175	55	FEMALE	Yes	Stage IB	31.01	12.48	2.53	3.36	1.82	High
TCGA-49-6743	81	FEMALE	Yes	Stage IIIA	52.09	15.51	0.19	3.28	1.86	High
TCGA-91-6830	65	FEMALE	Yes	Stage IIA	41.46	17.77	0.21	2.93	1.87	High
TCGA-73-4676	45	MALE	Yes	Stage IIA	8.17	22.76	0.20	3.67	1.89	High
TCGA-05-4250	79	FEMALE	Yes	Stage IIIA	14.34	13.63	4.76	2.21	1.99	High
TCGA-50-6592	71	FEMALE	Yes	Stage IB	9.76	1.21	6.84	9.94	2.02	High
TCGA-55-6978	81	MALE	No	Stage IIA	7.33	12.52	6.23	1.45	2.03	High
TCGA-05-4433	82	MALE	Yes	Stage IB	1.53	8.80	7.39	3.49	2.05	High
TCGA-49-6767	46	FEMALE	Yes	Stage IIB	12.27	14.88	4.91	2.25	2.08	High
TCGA-44-2668	51	MALE	Yes	Stage IB	10.16	12.77	5.98	2.17	2.09	High
TCGA-53-7624	40	FEMALE	Yes	Stage IV	114.02	6.72	0.10	5.78	2.13	High
TCGA-86-7711	70	MALE	Yes	Stage IIA	120.34	1.05	0.29	10.15	2.17	High
TCGA-49-6745	82	MALE	Yes	Stage IIIA	7.27	17.14	5.59	1.96	2.26	High
TCGA-55-7724	76	FEMALE	Yes	Stage IB	10.39	25.22	0.33	6.49	2.30	High
TCGA-50-5044	72	FEMALE	Unknown	Stage IIIB	3.14	8.96	10.47	0.38	2.36	High
TCGA-55-6984	71	FEMALE	Unknown	Stage IIB	21.07	3.06	10.18	4.36	2.41	High
TCGA-83-5908	59	FEMALE	Yes	Stage IA	21.39	22.83	3.15	2.58	2.44	High
TCGA-50-5936	58	MALE	Unknown	Stage IIIA	141.28	5.33	0.80	7.04	2.54	High
TCGA-44-6779	50	FEMALE	Yes	Stage IIB	27.41	16.91	5.71	5.97	2.78	High
TCGA-55-6975	61	MALE	Yes	Stage IIB	127.99	14.02	1.57	2.72	2.78	High
TCGA-50-6673	84	FEMALE	No	Stage I	7.55	33.13	2.70	2.45	2.89	High
TCGA-50-6595	74	FEMALE	Yes	Stage IIIA	5.92	26.06	7.05	2.52	3.12	High
TCGA-50-5939	85	MALE	Yes	Stage IB	20.03	14.92	8.25	8.04	3.13	High
TCGA-50-5072	74	MALE	Yes	Stage IIIA	194.86	4.82	0.75	7.98	3.16	High
TCGA-05-4418	69	MALE	Yes	Stage IIIA	214.46	4.89	1.41	4.56	3.24	High
TCGA-78-7166	84	MALE	Yes	Stage IIB	281.34	2.51	0.12	0.65	3.33	High
TCGA-73-4670	69	FEMALE	Yes	Stage IV	250.71	3.79	1.16	2.04	3.34	High
TCGA-64-5775	71	MALE	Yes	Stage IIIA	0.61	22.75	11.74	0.89	3.49	High
TCGA-05-5429	60	MALE	No	Stage IIIA	11.08	0.95	6.75	32.22	3.60	High

TCGA-55-7726	72	FEMALE	Yes	Stage IA	22.70	26.81	13.16	3.68	4.43	High
TCGA-05-4415	57	MALE	Yes	Stage IIIB	217.57	37.45	2.95	6.18	5.79	High

Supplemental Table 2: Clinical characteristics, follow-up data, and four-gene prognostic signature data in TCGA Cohort II

ID	Age (y)	Gender	SmokingHistory		ENSG00000104140 (RHOV)	ENSG00000156535 (CD109)	ENSG00000235884 (LINC00941)	ENSG00000156869 (FRRS1)	Four-gene Risk Score	Four-gene Risk Group
TCGA-55-A492	70	FEMALE	Yes	IA	3.36	0.41	0.01	0.16	0.08	Low
TCGA-MP-A5C7	76	FEMALE	Yes	IB	3.03	0.26	0.04	0.35	0.08	Low
TCGA-95-A4VP	66	FEMALE	Yes	IIIA	3.06	0.67	0.09	0.15	0.10	Low
TCGA-55-8097	60	FEMALE	Yes	IA	0.38	0.71	0.07	0.63	0.11	Low
TCGA-78-7155	68	MALE	Yes	IB	1.70	0.83	0.11	0.33	0.12	Low
TCGA-86-8669	64	MALE	Yes	IA	2.14	0.66	0.12	0.49	0.12	Low
TCGA-91-A4BC	59	MALE	Yes	IIA	1.09	0.55	0.24	0.51	0.13	Low
TCGA-MP-A4TH	70	FEMALE	Yes	IA	3.49	0.56	0.04	0.61	0.13	Low
TCGA-91-8497	75	FEMALE	No	IA	0.90	1.08	0.05	0.54	0.13	Low
TCGA-50-5051	42	FEMALE	Yes	IIIA	5.97	0.47	0.04	0.37	0.13	Low
TCGA-62-8397	70	FEMALE	No	IIB	0.79	0.59	0.09	1.00	0.13	Low
TCGA-49-AAR0	57	MALE	Yes	IA	6.27	0.54	0.04	0.37	0.14	Low
TCGA-97-A4M0	60	FEMALE	Yes	IB	3.49	0.59	0.02	0.79	0.14	Low
TCGA-L9-A7SV	69	MALE	Yes	IIA	0.60	0.98	0.03	0.90	0.14	Low
TCGA-J2-A4AG	66	FEMALE	Yes	IA	0.99	0.95	0.03	0.85	0.14	Low
TCGA-J2-A4AE	77	FEMALE	No	IA	2.63	0.69	0.01	0.97	0.15	Low
TCGA-97-A4M1	52	FEMALE	Yes	IA	1.20	1.18	0.03	0.71	0.15	Low
TCGA-55-8087	59	FEMALE	No	IB	4.50	0.82	0.01	0.60	0.15	Low
TCGA-86-A4D0	48	MALE	Yes	IIA	2.03	1.49	0.03	0.33	0.15	Low
TCGA-97-8172	75	FEMALE	Yes	IB	1.77	1.11	0.04	0.73	0.15	Low
TCGA-L9-A50W	75	MALE	Yes	IIA	6.56	0.59	0.04	0.48	0.15	Low
TCGA-50-8460	74	MALE	Unknown	IA	1.13	0.68	0.13	1.03	0.15	Low
TCGA-62-8395	80	FEMALE	No	IIB	2.13	0.99	0.09	0.86	0.17	Low
TCGA-62-8399	62	MALE	Yes	IIIA	3.27	1.17	0.07	0.57	0.17	Low
TCGA-44-A47B	79	MALE	Yes	IB	3.94	1.37	0.02	0.41	0.17	Low
TCGA-97-A4M3	69	FEMALE	Yes	IA	9.29	0.66	0.00	0.37	0.17	Low
TCGA-50-7109	60	MALE	Yes	IA	4.49	1.16	0.09	0.45	0.17	Low
TCGA-49-AARQ	41	FEMALE	Yes	I	10.46	0.33	0.10	0.35	0.18	Low
TCGA-50-8457	63	FEMALE	Yes	IA	1.07	1.44	0.04	0.91	0.18	Low
TCGA-97-8552	55	FEMALE	No	I	7.61	0.82	0.05	0.51	0.18	Low
TCGA-78-7161	69	FEMALE	Yes	IIB	4.31	0.59	0.48	0.26	0.18	Low
TCGA-86-A456	78	FEMALE	Yes	IA	1.41	1.86	0.02	0.59	0.18	Low
TCGA-91-A4BD	78	MALE	Yes	IIA	11.52	0.68	0.00	0.18	0.18	Low
TCGA-49-4512	69	FEMALE	No	IIIA	5.22	1.28	0.12	0.40	0.19	Low
TCGA-86-8668	61	FEMALE	No	IA	0.81	1.38	0.00	1.27	0.19	Low
TCGA-55-A48X	63	FEMALE	Yes	IIA	5.20	0.89	0.07	0.95	0.20	Low
TCGA-97-A4M7	74	MALE	Yes	IA	5.90	0.95	0.02	0.92	0.20	Low
TCGA-97-8171	81	MALE	Yes	IV	1.98	0.57	0.05	1.82	0.20	Low
TCGA-78-7158	59	FEMALE	Yes	IIIB	3.05	0.74	0.02	1.61	0.20	Low
TCGA-69-8255	71	MALE	Yes	IA	1.39	0.42	0.02	2.21	0.21	Low
TCGA-NJ-A4YG	65	MALE	Yes	IB	9.74	0.86	0.05	0.46	0.21	Low
TCGA-86-8671	72	FEMALE	No	IIB	2.08	1.82	0.07	0.73	0.21	Low
TCGA-86-8073	58	MALE	Yes	IB	2.82	1.12	0.05	1.32	0.21	Low
TCGA-97-A4M2	66	MALE	Yes	IA	4.96	1.60	0.04	0.58	0.21	Low
TCGA-91-8496	63	FEMALE	No	IB	0.82	1.56	0.00	1.45	0.22	Low
TCGA-97-8179	72	MALE	Yes	IA	3.28	1.91	0.10	0.53	0.22	Low
TCGA-86-7954	68	FEMALE	Yes	IB	5.96	1.03	0.15	0.83	0.22	Low
TCGA-4B-A93V	52	FEMALE	Yes	IA	13.93	0.13	0.22	0.28	0.22	Low
TCGA-62-8402	73	FEMALE	No	IIIA	10.48	0.64	0.12	0.60	0.22	Low
TCGA-49-AAR2	64	MALE	Yes	IB	12.77	0.37	0.08	0.64	0.22	Low
TCGA-93-7347	76	FEMALE	Yes	IA	2.16	1.76	0.11	0.92	0.22	Low

TCGA-44-A47A	78	FEMALE	Yes	IB	4.63	1.01	0.01	1.48	0.23	Low
TCGA-44-A479	73	FEMALE	Yes	IB	3.69	1.00	0.26	1.06	0.23	Low
TCGA-97-A4LX	81	MALE	Yes	IB	3.48	1.65	0.12	0.88	0.23	Low
TCGA-55-8092	75	MALE	Yes	IIB	4.06	0.50	0.12	1.94	0.24	Low
TCGA-97-A4M6	45	FEMALE	No	IA	13.87	0.73	0.04	0.42	0.24	Low
TCGA-86-A4P8	59	FEMALE	No	IIIA	0.43	2.10	0.02	1.27	0.24	Low
TCGA-J2-8194	69	FEMALE	Yes	IIB	2.29	2.36	0.12	0.54	0.24	Low
TCGA-62-A46V	78	FEMALE	Yes	IB	6.87	1.77	0.08	0.54	0.24	Low
TCGA-NJ-A7XG	49	MALE	Yes	IIIA	12.14	1.10	0.05	0.53	0.25	Low
TCGA-86-A4P7	63	FEMALE	No	IB	7.95	1.37	0.04	0.94	0.25	Low
TCGA-55-A57B	80	FEMALE	No	IA	1.74	1.16	0.06	2.09	0.26	Low
TCGA-NJ-A55R	67	MALE	Yes	IA	2.35	2.75	0.18	0.37	0.26	Low
TCGA-44-A4SU	67	FEMALE	Yes	IA	7.76	1.65	0.05	0.87	0.26	Low
TCGA-86-8673	61	MALE	Yes	IB	10.34	1.46	0.05	0.66	0.26	Low
TCGA-93-A4JN	71	MALE	Yes	IV	1.48	2.24	0.31	0.70	0.27	Low
TCGA-L4-A4E5	48	FEMALE	Yes	I	9.77	1.63	0.03	0.65	0.27	Low
TCGA-NJ-A55O	56	FEMALE	Yes	IIA	5.91	2.01	0.04	0.93	0.27	Low
TCGA-38-4628	65	FEMALE	No	IIB	4.92	1.53	0.02	1.65	0.28	Low
TCGA-44-6778	59	MALE	Yes	IA	0.61	1.96	0.03	2.12	0.29	Low
TCGA-97-7554	83	FEMALE	Yes	IIIA	2.59	2.68	0.08	1.08	0.30	Low
TCGA-55-A491	81	FEMALE	Yes	IA	8.06	1.32	0.08	1.50	0.30	Low
TCGA-55-A4DG	71	MALE	Yes	IA	0.61	3.52	0.04	0.80	0.30	Low
TCGA-MP-A4TE	56	MALE	Yes	IIA	16.96	1.49	0.08	0.11	0.31	Low
TCGA-55-8203	69	FEMALE	Yes	IB	18.48	0.82	0.17	0.33	0.31	Low
TCGA-97-A4M5	83	MALE	Yes	IA	10.05	2.24	0.03	0.71	0.31	Low
TCGA-55-8621	75	FEMALE	Yes	IA	4.62	2.34	0.11	1.29	0.32	Low
TCGA-55-A4DF	88	MALE	Yes	IA	8.99	2.16	0.02	1.13	0.33	Low
TCGA-55-A494	61	FEMALE	Yes	IB	9.82	1.34	0.76	0.20	0.33	Low
TCGA-49-AARR	68	MALE	Yes	IA	12.85	1.64	0.04	1.09	0.34	Low
TCGA-55-8510	55	FEMALE	Yes	IB	4.25	3.17	0.05	1.09	0.34	Low
TCGA-95-7562	71	MALE	Yes	IIA	17.17	1.44	0.02	0.84	0.35	Low
TCGA-99-AA5R	70	FEMALE	Yes	IA	3.87	3.54	0.04	0.92	0.35	Low
TCGA-86-8358	44	MALE	Yes	IB	1.28	2.84	0.06	1.96	0.35	Low
TCGA-L4-A4E6	67	MALE	Yes	IA	0.93	3.26	0.17	1.43	0.36	Low
TCGA-62-A472	70	MALE	Yes	IIB	10.06	2.60	0.28	0.52	0.37	Low
TCGA-91-6835	81	FEMALE	Yes	IA	2.04	3.29	0.02	1.75	0.37	Low
TCGA-MN-A4N1	60	MALE	Yes	IIA	4.03	3.73	0.34	0.36	0.37	Low
TCGA-62-A46U	71	FEMALE	No	IIB	12.67	1.91	0.07	1.38	0.38	Low
TCGA-55-A48Y	69	MALE	Yes	IIA	13.80	1.70	0.25	1.00	0.38	Low
TCGA-91-8499	76	FEMALE	Yes	IA	1.82	2.36	0.07	2.64	0.38	Low
TCGA-S2-AA1A	68	FEMALE	Yes	IA	4.37	0.52	1.39	0.97	0.38	Low
TCGA-86-6851	73	FEMALE	Yes	IIA	0.73	3.63	0.11	1.62	0.38	Low
TCGA-49-4490	45	FEMALE	Yes	IIIA	5.79	2.29	0.06	2.29	0.39	Low
TCGA-50-5045	57	FEMALE	Unknown	IA	6.29	3.18	0.33	0.83	0.39	Low
TCGA-95-A4VN	62	FEMALE	Yes	IIA	10.67	3.51	0.05	0.73	0.41	Low
TCGA-55-8208	73	FEMALE	Yes	IA	9.99	3.04	0.10	1.22	0.41	Low
TCGA-67-6215	52	FEMALE	No	IB	19.90	1.04	0.05	1.69	0.42	Low
TCGA-49-4487	72	FEMALE	Yes	IA	24.67	1.24	0.23	0.48	0.42	Low
TCGA-55-A48Z	60	FEMALE	Yes	IIIB	9.97	4.22	0.07	0.81	0.46	Low
TCGA-44-3917	33	FEMALE	Yes	IB	1.46	1.71	0.18	4.18	0.46	Low
TCGA-95-7043	63	FEMALE	Yes	IA	28.13	1.43	0.02	0.74	0.46	Low
TCGA-95-8039	72	MALE	No	IA	14.34	4.01	0.05	0.51	0.47	Low
TCGA-78-8640	59	MALE	Yes	IIA	12.63	0.74	0.03	3.88	0.47	Low
TCGA-49-AARO	39	FEMALE	Yes	IA	11.02	4.17	0.35	0.53	0.49	Low
TCGA-55-6987	77	MALE	Yes	IA	18.26	3.05	0.13	1.08	0.50	Low
TCGA-69-8254	85	MALE	Yes	Availa	10.32	4.20	0.02	1.50	0.50	Low
TCGA-93-A4JP	64	MALE	No	IV	6.73	5.40	0.01	1.02	0.50	Low
TCGA-86-A4JF	56	MALE	Yes	IIB	36.46	0.77	0.04	0.79	0.52	Low
TCGA-MN-A4N4	57	MALE	Yes	IA	15.96	4.35	0.17	0.42	0.52	Low

TCGA-97-8547	78	FEMALE	No	IIIA	19.42	3.85	0.14	0.49	0.53	Low
TCGA-93-A4JQ	49	MALE	Yes	IA	7.80	4.61	0.34	1.35	0.54	Low
TCGA-NJ-A4YF	50	FEMALE	Yes	IA	44.86	0.67	0.00	0.17	0.55	Low
TCGA-86-8056	63	FEMALE	Yes	IIIA	0.78	5.41	0.08	2.44	0.55	Low
TCGA-44-A47G	73	FEMALE	Yes	IA	3.38	7.21	0.07	0.63	0.57	Low
TCGA-05-4427	65	FEMALE	Yes	IIB	5.27	6.94	0.18	0.92	0.61	Low
TCGA-L9-A743	56	MALE	Yes	IIA	11.90	6.29	0.15	0.70	0.62	Low
TCGA-J2-A4AD	61	FEMALE	Yes	IA	13.43	5.35	0.04	1.78	0.64	Low
TCGA-50-5931	75	FEMALE	Yes	IB	14.47	5.15	0.18	1.53	0.64	Low
TCGA-44-A4SS	73	MALE	Yes	IA	9.84	1.99	0.60	4.34	0.65	Low
TCGA-97-8176	63	MALE	Yes	IIIA	43.36	1.33	0.04	1.21	0.66	Low
TCGA-95-7039	54	FEMALE	Yes	IIB	9.67	7.95	0.00	0.39	0.66	Low
TCGA-86-8672	59	MALE	No	IIB	28.18	1.09	1.23	1.41	0.68	Low
TCGA-L9-A8F4	64	FEMALE	Yes	IB	52.08	1.26	0.04	0.58	0.70	Low
TCGA-95-8494	67	MALE	Yes	IIA	15.05	7.18	0.04	0.99	0.72	Low
TCGA-99-7458	74	FEMALE	Yes	IIIA	4.01	8.52	0.01	2.10	0.76	Low
TCGA-J2-8192	65	FEMALE	No	IIA	18.16	5.74	0.20	2.12	0.76	Low
TCGA-73-4666	52	FEMALE	Yes	IV	10.27	5.88	0.93	2.38	0.82	Low
TCGA-86-8359	52	MALE	Yes	IIIA	55.82	2.26	0.28	0.57	0.85	Low
TCGA-49-4494	77	MALE	Yes	IIIA	38.14	2.65	1.13	1.10	0.86	Low
TCGA-95-7944	71	MALE	Yes	IA	5.72	2.95	3.31	0.88	0.86	Low
TCGA-MP-A4T9	54	FEMALE	Yes	IIIA	10.83	10.30	0.12	0.81	0.88	Low
TCGA-50-5933	72	MALE	Unknown	IIIB	3.38	11.31	0.07	2.02	0.94	Low
TCGA-44-2662	65	MALE	Yes	IB	0.44	8.55	0.63	3.84	0.95	Low
TCGA-55-8614	76	MALE	Yes	IB	24.01	5.54	1.20	2.30	0.99	High
TCGA-05-4398	47	FEMALE	Yes	IIIB	30.24	9.03	0.07	0.74	0.99	High
TCGA-69-8453	77	MALE	Yes	IIB	5.52	7.33	2.27	1.13	1.00	High
TCGA-95-A4VK	74	FEMALE	Yes	IIIA	82.59	1.83	0.11	0.91	1.11	High
TCGA-86-8055	79	MALE	Yes	IIA	3.58	12.72	0.25	3.43	1.17	High
TCGA-NJ-A4YP	52	MALE	Yes	IB	85.08	2.18	0.13	1.05	1.18	High
TCGA-73-A9RS	41	MALE	Yes	IIB	87.41	0.77	0.05	2.17	1.18	High
TCGA-MP-A4TK	56	FEMALE	Yes	IIB	3.37	14.52	1.08	0.56	1.21	High
TCGA-MN-A4N5	63	MALE	Yes	IA	64.24	4.54	0.98	0.65	1.21	High
TCGA-86-8674	50	MALE	Yes	IIA	105.23	0.18	0.07	1.32	1.28	High
TCGA-49-AAR3	69	MALE	Unknown	IIB	2.37	8.52	3.89	0.78	1.28	High
TCGA-86-8278	63	FEMALE	No	IIB	82.28	4.37	0.44	1.23	1.35	High
TCGA-50-5930	47	MALE	Unknown	IIIA	74.34	5.88	0.20	1.74	1.36	High
TCGA-44-3398	77	FEMALE	Yes	IA	36.65	10.58	1.16	2.64	1.48	High
TCGA-38-4629	68	MALE	Yes	IIB	8.01	12.03	2.61	2.99	1.52	High
TCGA-NJ-A4YQ	69	FEMALE	Yes	IA	82.52	7.91	0.02	2.39	1.61	High
TCGA-78-7146	71	FEMALE	Yes	IIIA	15.99	17.22	1.72	1.79	1.72	High
TCGA-78-7154	72	MALE	Yes	IIIA	3.16	11.50	4.81	7.03	2.08	High
TCGA-55-8299	61	FEMALE	Yes	IA	165.71	2.77	0.16	2.21	2.19	High
TCGA-78-7542	56	MALE	Yes	IB	15.49	24.15	3.64	2.68	2.55	High
TCGA-44-7661	69	FEMALE	Yes	IB	13.62	17.20	7.03	1.81	2.56	High
TCGA-78-7150	59	MALE	Yes	IIB	173.64	5.31	0.40	4.90	2.68	High
TCGA-49-4506	68	FEMALE	Yes	IIB	328.54	0.92	3.93	2.01	4.46	High

Supplemental Table 3: Clinical characteristics, follow-up data, and four-gene prognostic signature data in the MCTP Col

ID	Age (y)	Gender		ENSG00000104140 (RHOV)	ENSG00000156535 (CD109)	ENSG00000235884 (LINC00941)	ENSG00000156869 (FRRS1)	Four-gene Risk Score	Four-gene Risk Group
A67	62	FEMALE	I	0.74	0.21	0.02	0.11	0.03	Low
A49	65	MALE	I	2.76	0.13	0.03	0.30	0.06	Low
A07	65	FEMALE	I	4.13	0.14	0.00	0.34	0.08	Low
C052	68	FEMALE	I	0.09	0.66	0.03	0.65	0.10	Low
C004	72	MALE	III	0.92	0.25	0.18	0.62	0.10	Low
C084	55	FEMALE	II	1.07	0.54	0.18	0.52	0.11	Low
C016	80	FEMALE	I	3.57	0.42	0.14	0.54	0.13	Low
A75	85	FEMALE	I	4.38	0.48	0.12	0.44	0.13	Low
C056	69	FEMALE	I	0.41	0.89	0.02	0.94	0.13	Low
C026	77	MALE	I	1.93	0.71	0.26	0.51	0.15	Low
A65	69	MALE	III	4.98	0.64	0.05	0.72	0.16	Low
C051	64	MALE	I	0.71	1.09	0.21	0.75	0.17	Low
A34	78	FEMALE	III	4.27	0.59	0.29	0.50	0.17	Low
C045	79	FEMALE	I	2.10	0.76	0.16	1.03	0.17	Low
C030	60	MALE	I	10.50	0.38	0.08	0.27	0.17	Low
C062	60	FEMALE	III	0.30	1.24	0.28	0.65	0.18	Low
L63	39	FEMALE	III	4.02	1.00	0.22	0.57	0.19	Low
C041	81	MALE	I	0.52	0.50	0.14	1.76	0.19	Low
C002	72	MALE	I	1.22	1.47	0.14	0.79	0.19	Low
C111	77	FEMALE	II	2.06	1.10	0.18	1.11	0.20	Low
C042	78	MALE	I	10.70	0.23	0.07	0.88	0.21	Low
C116	59	FEMALE	I	3.84	1.29	0.01	1.08	0.21	Low
C038	62	FEMALE	II	1.31	1.13	0.38	0.80	0.21	Low
C017	76	MALE	II	0.94	0.92	0.00	2.04	0.22	Low
C023	78	MALE	I	0.09	1.32	0.30	1.16	0.22	Low
C089	75	MALE	I	2.65	1.94	0.26	0.35	0.23	Low
C046	73	FEMALE	I	12.69	0.22	0.17	0.78	0.24	Low
C040	71	FEMALE	I	5.41	1.22	0.40	0.65	0.25	Low
C028	76	MALE	I	2.52	2.26	0.19	0.93	0.27	Low
A63	40	FEMALE	I	5.04	1.13	0.54	0.83	0.28	Low
A41	63	FEMALE	I	6.38	2.86	0.14	0.41	0.31	Low
C037	73	MALE	I	3.73	3.82	0.11	0.86	0.37	Low
C031	85	FEMALE	II	3.67	2.34	0.42	1.54	0.37	Low
A85	68	MALE	II	13.14	1.69	0.06	1.57	0.38	Low
C011	73	MALE	I	12.46	1.38	0.56	1.28	0.41	Low
C055	63	FEMALE	III	18.63	0.94	0.31	1.53	0.43	Low
A17	61	FEMALE	I	9.53	3.00	0.05	1.70	0.43	Low
C117	83	MALE	I	12.08	1.75	0.82	0.80	0.44	Low
A29	74	FEMALE	III	30.89	0.58	0.15	0.94	0.47	Low
C071	63	FEMALE	I	4.50	2.19	1.24	1.09	0.47	Low
C103	71	FEMALE	II	23.44	1.70	0.38	0.66	0.48	Low
A28	63	MALE	III	2.78	3.74	0.34	2.33	0.50	Low
C115	52	MALE	I	3.34	4.33	0.87	0.55	0.50	Low
A52	72	MALE	I	2.65	3.17	1.36	0.67	0.51	Low
A39	73	MALE	I	1.54	0.96	1.87	1.98	0.53	Low
C059	74	FEMALE	II	5.13	4.14	0.52	1.67	0.53	Low
A47	62	MALE	III	3.81	6.61	0.32	0.39	0.56	Low
D1	31	FEMALE	I	45.10	0.22	0.11	0.59	0.57	Low
A76	60	FEMALE	II	25.59	1.69	0.12	2.21	0.57	Low
C020	73	MALE	I	0.79	5.07	0.24	2.86	0.59	Low
A70	77	MALE	III	6.04	6.52	0.16	1.49	0.63	Low

A25	72	FEMALE	III	45.12	0.65	0.48	0.70	0.67	Low
A35	81	MALE	I	5.50	1.61	1.24	4.20	0.67	Low
C033	85	MALE	I	4.10	3.38	2.33	1.48	0.75	Low
A93	54	MALE	II	57.72	1.23	0.12	2.01	0.88	Low
C074	58	FEMALE	II	46.52	3.48	0.92	1.04	0.97	Low
A21	60	FEMALE	I	90.94	0.35	0.08	0.41	1.07	High
C083	48	FEMALE	I	5.88	6.59	2.96	1.48	1.09	High
A06	59	FEMALE	I	2.99	2.32	4.72	3.28	1.19	High
A61	48	FEMALE	I	3.03	15.45	0.14	1.86	1.21	High
C010	76	MALE	III	80.08	3.40	1.08	2.51	1.46	High
A19	48	FEMALE	I	37.23	9.80	1.35	3.39	1.52	High
C081	64	MALE	II	61.21	6.45	3.15	2.57	1.80	High
C085	56	MALE	II	26.30	6.65	6.68	0.98	1.89	High
C057	73	MALE	III	165.07	0.98	0.23	2.85	2.12	High
C058	52	FEMALE	I	3.63	17.91	6.45	0.94	2.34	High
C047	80	FEMALE	III	18.34	3.74	12.80	3.91	2.82	High

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Supplemental Table 4: Individual gene univariate Cox proportional hazards models in TCGA Cohort I for genes with FDR ≤ 0.05

The top 13 genes that were used in stepwise regression are highlighted.

p-value	FDR	Hazard Ratio	Ensembl ID	Gene Symbol	Gene Type
< 1e-07	< 1e-07	1.012	ENSG00000104140	RHOV	protein_coding
< 1e-07	< 1e-07	1.001	ENSG00000134333	LDHA	protein_coding
< 1e-07	< 1e-07	1.106	ENSG00000156535	CD109	protein_coding
< 1e-07	< 1e-07	1.331	ENSG00000189362	TMEM194B	protein_coding
< 1e-07	0.000213	1.32	ENSG00000121621	KIF18A	protein_coding
< 1e-07	0.000213	1.123	ENSG00000088386	SLC15A1	protein_coding
< 1e-07	0.000213	1.255	ENSG00000235884	Linc00941 (RP11-	lincRNA
2E-07	0.000373	1.007	ENSG00000117394	SLC2A1	protein_coding
3E-07	0.000448	1.012	ENSG00000107984	DKK1	protein_coding
3E-07	0.000448	1.017	ENSG00000139725	RHOF	protein_coding
4E-07	0.000543	1.154	ENSG00000156687	UNC5D	protein_coding
5E-07	0.000622	1.047	ENSG00000163814	CDCP1	protein_coding
6E-07	0.000689	1.115	ENSG00000156869	FRRS1	protein_coding
1.2E-06	0.00112	1.086	ENSG00000152056	AP1S3	protein_coding
1.2E-06	0.00112	1.02	ENSG00000198517	MAFK	protein_coding
1.2E-06	0.00112	1.013	ENSG00000137767	SQRDL	protein_coding
1.5E-06	0.00132	1.122	ENSG00000196850	PPTC7	protein_coding
1.7E-06	0.00136	1.116	ENSG00000159217	IGF2BP1	protein_coding
1.8E-06	0.00136	1.003	ENSG00000150093	ITGB1	protein_coding
0.000002	0.00136	1.051	ENSG00000188735	TMEM120B	protein_coding
0.000002	0.00136	1.011	ENSG00000163735	CXCL5	protein_coding
2.1E-06	0.00136	1.197	ENSG00000229656	RP11-462L8.1	lincRNA
2.1E-06	0.00136	1.019	ENSG00000131746	TNS4	protein_coding
2.3E-06	0.00143	1.007	ENSG00000197930	ERO1L	protein_coding
2.8E-06	0.00165	1.068	ENSG00000091436	AC013461.1	protein_coding
0.000003	0.00165	1.031	ENSG00000011426	ANLN	protein_coding
0.000003	0.00165	1.007	ENSG00000075618	FSCN1	protein_coding
3.1E-06	0.00165	1.054	ENSG00000147408	CSGALNACT1	protein_coding
3.4E-06	0.00175	1.019	ENSG00000100558	PLEK2	protein_coding
3.6E-06	0.00178	1.042	ENSG00000029153	ARNTL2	protein_coding

3.7E-06	0.00178	1.051	ENSG00000198752	CDC42BPB	protein_coding
3.9E-06	0.00182	1.167	ENSG00000112186	CAP2	protein_coding
4.8E-06	0.00217	1.168	ENSG00000116641	DOCK7	protein_coding
5.7E-06	0.0025	1.131	ENSG00000151572	ANO4	protein_coding
5.9E-06	0.00252	1	ENSG00000111640	GAPDH	protein_coding
6.4E-06	0.00262	1.162	ENSG00000179241	LDLRAD3	protein_coding
6.5E-06	0.00262	1.039	ENSG00000125733	TRIP10	protein_coding
7.5E-06	0.00295	1.067	ENSG00000163364	AC017048.3	lincRNA
8.3E-06	0.00318	1.127	ENSG00000166206	GABRB3	protein_coding
1.02E-05	0.00381	1.022	ENSG00000143641	GALNT2	protein_coding
1.07E-05	0.0039	1.017	ENSG00000176014	TUBB6	protein_coding
1.27E-05	0.00452	1.039	ENSG00000153234	NR4A2	protein_coding
1.31E-05	0.00455	1.178	ENSG00000099139	PCSK5	protein_coding
1.39E-05	0.00472	1.157	ENSG00000157111	TMEM171	protein_coding
1.43E-05	0.00475	1.029	ENSG00000019549	SNAI2	protein_coding
1.69E-05	0.00549	1.061	ENSG00000132429	POPDC3	protein_coding
1.74E-05	0.00551	1.114	ENSG00000113249	HAVCR1	protein_coding
1.77E-05	0.00551	1.035	ENSG00000224407	RP5-956O18.3	antisense
1.83E-05	0.00558	1.005	ENSG00000115919	KYNU	protein_coding
1.99E-05	0.00595	1.053	ENSG00000213281	NRAS	protein_coding
2.41E-05	0.00688	1.021	ENSG00000100522	GNPNAT1	protein_coding
2.43E-05	0.00688	1.138	ENSG00000147509	RGS20	protein_coding
2.48E-05	0.00688	1.019	ENSG00000178209	PLEC	protein_coding
2.55E-05	0.00688	1.026	ENSG00000163110	PDLIM5	protein_coding
0.000026	0.00688	1.113	ENSG00000221988	PPT2	protein_coding
2.64E-05	0.00688	1.072	ENSG00000102743	SLC25A15	protein_coding
2.64E-05	0.00688	1.084	ENSG00000127666	TICAM1	protein_coding
2.67E-05	0.00688	1.04	ENSG00000152377	SPOCK1	protein_coding
2.82E-05	0.00714	1.021	ENSG00000163975	MFI2	protein_coding
2.96E-05	0.00737	1.134	ENSG00000095752	IL11	protein_coding
3.07E-05	0.00752	1.004	ENSG00000141526	SLC16A3	protein_coding
3.34E-05	0.00805	1.303	ENSG00000186073	C15orf41	protein_coding
3.57E-05	0.00834	1.032	ENSG00000155254	MARVELD1	protein_coding
0.000036	0.00834	1.402	ENSG00000165891	E2F7	protein_coding
3.63E-05	0.00834	1.188	ENSG00000237523	RP11-40F6.2	lincRNA
4.08E-05	0.00923	1.007	ENSG00000106366	SERPINE1	protein_coding

4.17E-05	0.0093	1.057	ENSG00000169174	PCSK9	protein_coding
4.31E-05	0.00947	1.117	ENSG00000121236	TRIM6	protein_coding
4.41E-05	0.00955	1.037	ENSG00000133466	C1QTNF6	protein_coding
4.59E-05	0.0098	1.167	ENSG00000173218	VANGL1	protein_coding
4.81E-05	0.01	1.193	ENSG00000151835	SACS	protein_coding
0.000049	0.01	1.276	ENSG00000196935	SRGAP1	protein_coding
4.91E-05	0.01	1.013	ENSG00000125753	VASP	protein_coding
5.33E-05	0.0106	1.015	ENSG00000091136	LAMB1	protein_coding
5.36E-05	0.0106	1.073	ENSG00000169299	PGM2	protein_coding
5.41E-05	0.0106	1.442	ENSG00000138685	FGF2	protein_coding
5.65E-05	0.011	1.011	ENSG00000142864	SERBP1	protein_coding
5.84E-05	0.0112	1.035	ENSG00000167601	AXL	protein_coding
0.000059	0.0112	1.008	ENSG00000165637	VDAC2	protein_coding
0.000063	0.0117	1.09	ENSG00000087053	MTMR2	protein_coding
6.34E-05	0.0117	1.071	ENSG00000165801	ARHGEF40	protein_coding
6.54E-05	0.0119	1	ENSG00000135480	KRT7	protein_coding
7.04E-05	0.0127	1.005	ENSG00000147689	FAM83A	protein_coding
7.15E-05	0.0127	1.019	ENSG00000089159	PXN	protein_coding
7.34E-05	0.0129	1.032	ENSG00000065882	TBC1D1	protein_coding
7.42E-05	0.0129	1.057	ENSG00000131459	GFPT2	protein_coding
7.52E-05	0.0129	1.02	ENSG00000170035	UBE2E3	protein_coding
7.58E-05	0.0129	1.001	ENSG00000067225	PKM	protein_coding
8.26E-05	0.0139	1.007	ENSG00000067057	PFKP	protein_coding
8.61E-05	0.0143	1.054	ENSG00000115365	LANCL1	protein_coding
9.07E-05	0.0149	1.142	ENSG00000157766	ACAN	protein_coding
0.000092	0.0149	1.049	ENSG00000205642	VCX3B	protein_coding
9.33E-05	0.0149	1.071	ENSG00000065613	SLK	protein_coding
9.36E-05	0.0149	1.093	ENSG00000093000	NUP50	protein_coding
9.68E-05	0.0152	1.039	ENSG00000150630	VEGFC	protein_coding
9.96E-05	0.0155	1.102	ENSG00000135074	ADAM19	protein_coding
0.000103	0.0157	1.007	ENSG00000232527	RP11-14N7.2	lincRNA
0.000103	0.0157	1.022	ENSG00000175592	FOSL1	protein_coding
0.00011	0.0166	388.099	ENSG00000230176	RP4-779E11.3	antisense
0.000112	0.0166	1.008	ENSG00000153048	CARHSP1	protein_coding
0.000114	0.0166	1.025	ENSG00000188910	GJB3	protein_coding
0.000114	0.0166	1.052	ENSG00000110841	PPFIBP1	protein_coding

0.000115	0.0166	1.084	ENSG00000140406	MESDC1	protein_coding
0.000117	0.0168	1.018	ENSG00000100504	PYGL	protein_coding
0.000118	0.0168	1.348	ENSG00000169509	CRCT1	protein_coding
0.000121	0.0171	1.001	ENSG00000111669	TPI1	protein_coding
0.000124	0.0173	1.028	ENSG00000121005	CRISPLD1	protein_coding
0.000128	0.0175	1.007	ENSG00000171314	PGAM1	protein_coding
0.000128	0.0175	1.055	ENSG00000134548	C12orf39	protein_coding
0.000134	0.0183	1.111	ENSG00000160208	RRP1B	protein_coding
0.000137	0.0184	1.209	ENSG00000134830	GPR77	protein_coding
0.000139	0.0184	1.003	ENSG00000137309	HMGA1	protein_coding
0.000139	0.0184	1.109	ENSG00000146054	TRIM7	protein_coding
0.000145	0.0191	1.275	ENSG00000164418	GRIK2	protein_coding
0.000148	0.0192	1.023	ENSG00000164251	F2RL1	protein_coding
0.000159	0.0204	1.014	ENSG00000167755	KLK6	protein_coding
0.000161	0.0204	1.053	ENSG00000120437	ACAT2	protein_coding
0.000162	0.0204	1.049	ENSG00000120254	MTHFD1L	protein_coding
0.000163	0.0204	1.041	ENSG00000137936	BCAR3	protein_coding
0.000164	0.0204	1.256	ENSG00000157680	DGKI	protein_coding
0.000165	0.0204	1.17	ENSG00000139734	DIAPH3	protein_coding
0.000168	0.0206	1.122	ENSG00000160193	WDR4	protein_coding
0.000172	0.0208	1.028	ENSG00000170485	NPAS2	protein_coding
0.000172	0.0208	1.04	ENSG00000100347	SAMM50	protein_coding
0.000177	0.0208	1.039	ENSG00000164466	SFXN1	protein_coding
0.000177	0.0208	1.108	ENSG00000018510	AGPS	protein_coding
0.000179	0.0208	1.013	ENSG00000213923	CSNK1E	protein_coding
0.000179	0.0208	1.037	ENSG00000112299	VNN1	protein_coding
0.000181	0.0208	1.063	ENSG00000104320	NBN	protein_coding
0.000182	0.0208	1.03	ENSG00000147394	ZNF185	protein_coding
0.000182	0.0208	1.028	ENSG00000035403	VCL	protein_coding
0.000184	0.0208	1.085	ENSG00000104142	VPS18	protein_coding
0.000187	0.0208	1.078	ENSG00000213694	S1PR3	protein_coding
0.000187	0.0208	1.005	ENSG00000134871	COL4A2	protein_coding
0.000193	0.0213	1.108	ENSG00000205809	KLRC2	protein_coding
0.000197	0.0216	1.05	ENSG00000197905	TEAD4	protein_coding
0.000198	0.0216	1.02	ENSG00000173744	AGFG1	protein_coding
0.000201	0.0217	1.081	ENSG00000196588	MKL1	protein_coding

0.00021	0.0225	1.059	ENSG00000094916	CBX5	protein_coding
0.000211	0.0225	1.045	ENSG00000176597	B3GNT5	protein_coding
0.000228	0.0241	1.012	ENSG00000102172	SMS	protein_coding
0.000229	0.0241	1.007	ENSG00000009307	CSDE1	protein_coding
0.000232	0.0242	1	ENSG00000170421	KRT8	protein_coding
0.000251	0.026	1.005	ENSG00000157227	MMP14	protein_coding
0.000256	0.0264	1.007	ENSG00000100380	ST13	protein_coding
0.00026	0.0266	1.009	ENSG00000185567	AHNAK2	protein_coding
0.000266	0.0271	1.095	ENSG00000143476	DTL	protein_coding
0.000273	0.0274	1.004	ENSG00000100342	APOL1	protein_coding
0.000274	0.0274	1.115	ENSG00000089902	RCOR1	protein_coding
0.00028	0.0279	1.02	ENSG00000079739	PGM1	protein_coding
0.000283	0.028	1.028	ENSG00000138594	TMOD3	protein_coding
0.000287	0.0282	1.134	ENSG00000057704	TMCC3	protein_coding
0.000292	0.0285	1.013	ENSG00000105355	PLIN3	protein_coding
0.000298	0.0288	1.402	ENSG00000141096	DPEP3	protein_coding
0.000299	0.0288	1.066	ENSG00000076067	RBMS2	protein_coding
0.000317	0.0304	1.146	ENSG00000105137	SYDE1	protein_coding
0.000333	0.0317	1.013	ENSG00000079246	XRCC5	protein_coding
0.000341	0.0321	1.009	ENSG00000148344	PTGES	protein_coding
0.000347	0.0321	1.124	ENSG00000040275	CCDC99	protein_coding
0.00035	0.0321	1.015	ENSG00000091409	ITGA6	protein_coding
0.000351	0.0321	1.006	ENSG00000213585	VDAC1	protein_coding
0.000353	0.0321	1.176	ENSG00000175874	CREG2	protein_coding
0.000353	0.0321	0.765	ENSG00000228340	RP5-1043L13.1	lincRNA
0.000354	0.0321	1.011	ENSG00000177426	TGIF1	protein_coding
0.000355	0.0321	1.047	ENSG00000160256	FAM207A	protein_coding
0.000361	0.0324	1.102	ENSG00000179431	FJX1	protein_coding
0.000367	0.0328	1.051	ENSG00000171862	PTEN	protein_coding
0.000369	0.0328	1.006	ENSG00000082153	BZW1	protein_coding
0.000387	0.0342	1.056	ENSG00000137996	RTCA	protein_coding
0.000399	0.035	1.03	ENSG00000075223	SEMA3C	protein_coding
0.000403	0.035	1.001	ENSG00000074800	ENO1	protein_coding
0.000403	0.035	1.036	ENSG00000083312	TNPO1	protein_coding
0.00041	0.0354	1.229	ENSG00000130363	RSPH3	protein_coding
0.000435	0.0372	1.086	ENSG00000162688	AGL	protein_coding

0.000437	0.0372	1.009	ENSG00000053747	LAMA3	protein_coding
0.000438	0.0372	1.048	ENSG00000205795	CYS1	protein_coding
0.000443	0.0374	1.02	ENSG00000233532	LINC00460	lincRNA
0.00046	0.0386	1.012	ENSG00000196923	PDLIM7	protein_coding
0.000462	0.0386	1.05	ENSG00000139926	FRMD6	protein_coding
0.000473	0.0392	1	ENSG00000111057	KRT18	protein_coding
0.000506	0.0418	1.04	ENSG00000125266	EFNB2	protein_coding
0.000537	0.0441	1.123	ENSG00000165118	C9orf64	protein_coding
0.000543	0.0443	1.001	ENSG00000125148	MT2A	protein_coding
0.000561	0.0455	1.084	ENSG00000163697	APBB2	protein_coding
0.000568	0.0456	1.062	ENSG00000198826	ARHGAP11A	protein_coding
0.000568	0.0456	1.024	ENSG00000206527	PTPLB	protein_coding
0.000574	0.0458	1.038	ENSG00000128591	FLNC	protein_coding
0.000588	0.0467	1.005	ENSG00000161203	AP2M1	protein_coding
0.000595	0.047	1.047	ENSG00000100003	SEC14L2	protein_coding
0.000599	0.0471	1.078	ENSG00000036549	ZZZ3	protein_coding
0.000603	0.0471	1.055	ENSG00000187079	TEAD1	protein_coding
0.000648	0.0503	1.036	ENSG00000165416	SUGT1	protein_coding
0.00065	0.0503	1.034	ENSG00000114279	FGF12	protein_coding
0.000659	0.0506	1.107	ENSG00000066084	DIP2B	protein_coding
0.00066	0.0506	1.006	ENSG00000187498	COL4A1	protein_coding
0.000675	0.0514	1.102	ENSG00000169410	PTPN9	protein_coding
0.000678	0.0514	1.165	ENSG00000163132	MSX1	protein_coding
0.00069	0.0519	1.051	ENSG00000174371	EXO1	protein_coding
0.000692	0.0519	1.09	ENSG00000134897	BIVM	protein_coding
0.000697	0.052	1.094	ENSG00000171262	FAM98B	protein_coding
0.000699	0.052	1.041	ENSG00000162607	USP1	protein_coding
0.000708	0.0523	1.018	ENSG00000087128	TMPRSS11E	protein_coding
0.000714	0.0523	1.05	ENSG00000109572	CLCN3	protein_coding
0.000714	0.0523	0.989	ENSG00000051108	HERPUD1	protein_coding
0.000722	0.0524	1.133	ENSG00000047932	GOPC	protein_coding
0.000727	0.0524	1.13	ENSG00000071205	ARHGAP10	protein_coding
0.000728	0.0524	0.898	ENSG00000130413	STK33	protein_coding
0.00073	0.0524	1.616	ENSG00000214107	MAGEB1	protein_coding
0.000746	0.0532	1.278	ENSG00000123360	PDE1B	protein_coding
0.000749	0.0532	1.054	ENSG00000066697	MSANTD3	protein_coding

0.000767	0.0543	1.043	ENSG00000123684	LPGAT1	protein_coding
0.000776	0.0547	1.027	ENSG00000145907	G3BP1	protein_coding
0.00078	0.0547	1.01	ENSG00000023445	BIRC3	protein_coding
0.000812	0.0567	1.052	ENSG00000160867	FGFR4	protein_coding
0.000819	0.0567	1.023	ENSG00000138166	DUSP5	protein_coding
0.000823	0.0567	1.081	ENSG00000090889	KIF4A	protein_coding
0.000829	0.0567	1.107	ENSG00000204949	RP11-539E17.4	antisense
0.000829	0.0567	1.057	ENSG00000145220	LYAR	protein_coding
0.000831	0.0567	1.002	ENSG00000198431	TXNRD1	protein_coding
0.000836	0.0567	1.025	ENSG00000070961	ATP2B1	protein_coding
0.000839	0.0567	0.973	ENSG00000021300	PLEKHB1	protein_coding
0.000848	0.0567	1.723	ENSG00000205683	DPF3	protein_coding
0.000849	0.0567	0.98	ENSG00000153066	TXNDC11	protein_coding
0.00085	0.0567	1.049	ENSG00000168917	SLC35G2	protein_coding
0.000868	0.0576	1.231	ENSG00000100578	KIAA0586	protein_coding
0.000877	0.058	1.011	ENSG00000157483	MYO1E	protein_coding
0.00089	0.058	1.024	ENSG00000166949	SMAD3	protein_coding
0.00089	0.058	1.021	ENSG00000061676	NCKAP1	protein_coding
0.000894	0.058	1.098	ENSG00000146409	SLC18B1	protein_coding
0.000896	0.058	1.141	ENSG00000141655	TNFRSF11A	protein_coding
0.000898	0.058	1.006	ENSG00000010438	PRSS3	protein_coding
0.000901	0.058	1.002	ENSG00000155366	RHOC	protein_coding
0.000909	0.0582	1.115	ENSG00000165480	SKA3	protein_coding
0.000914	0.0582	1.021	ENSG00000131941	RHPN2	protein_coding
0.000917	0.0582	1.014	ENSG00000149948	HMGA2	protein_coding
0.00092	0.0582	1.006	ENSG00000161091	MFSD12	protein_coding
0.000923	0.0582	1.051	ENSG00000074211	PPP2R2C	protein_coding
0.000931	0.0582	1.005	ENSG00000159166	LAD1	protein_coding
0.000933	0.0582	1.01	ENSG00000197614	MFAP5	protein_coding
0.000938	0.0582	1.035	ENSG00000101311	FERMT1	protein_coding
0.000941	0.0582	1.08	ENSG00000187720	THSD4	protein_coding
0.000946	0.0582	1.028	ENSG00000166851	PLK1	protein_coding
0.000947	0.0582	3.012	ENSG00000233997	AP000475.2	lincRNA
0.000998	0.0611	1.104	ENSG00000062650	WAPAL	protein_coding
0.001011	0.0614	1.004	ENSG00000105971	CAV2	protein_coding
0.001012	0.0614	1.152	ENSG00000135502	SLC26A10	protein_coding

0.001027	0.0619	1.028	ENSG00000068366	ACSL4	protein_coding
0.001027	0.0619	1.029	ENSG00000114270	COL7A1	protein_coding
0.001041	0.0624	1.037	ENSG00000023171	GRAMD1B	protein_coding
0.00105	0.0627	1.038	ENSG00000107566	ERLIN1	protein_coding
0.001058	0.063	1.195	ENSG00000113356	POLR3G	protein_coding
0.001076	0.0638	1.045	ENSG00000128298	BAIAP2L2	protein_coding
0.001093	0.0645	1.157	ENSG00000179546	HTR1D	protein_coding
0.0011	0.0645	1.1	ENSG00000153885	KCTD15	protein_coding
0.001102	0.0645	1.264	ENSG00000120868	APAF1	protein_coding
0.001107	0.0646	1.027	ENSG00000128335	APOL2	protein_coding
0.001117	0.0649	1.017	ENSG00000137710	RDX	protein_coding
0.001132	0.0654	1.61	ENSG00000123560	PLP1	protein_coding
0.001134	0.0654	0.982	ENSG00000008283	CYB561	protein_coding
0.001145	0.0658	1.21	ENSG00000164045	CDC25A	protein_coding
0.001151	0.0659	1.009	ENSG00000086696	HSD17B2	protein_coding
0.00116	0.0659	1.282	ENSG00000230387	RP4-737E23.2	lincRNA
0.001161	0.0659	1.369	ENSG00000074047	GLI2	protein_coding
0.001165	0.0659	0.94	ENSG00000177191	B3GNT8	protein_coding
0.001173	0.0661	1.079	ENSG00000128578	FAM40B	protein_coding
0.001183	0.0663	1.044	ENSG00000176170	SPHK1	protein_coding
0.001193	0.0663	1.07	ENSG00000164850	GPER	protein_coding
0.001194	0.0663	1.608	ENSG00000184258	CDR1	protein_coding
0.001194	0.0663	1.012	ENSG00000096060	FKBP5	protein_coding
0.001223	0.0677	1.167	ENSG00000186767	SPIN4	protein_coding
0.001253	0.069	1.041	ENSG00000140157	NIPA2	protein_coding
0.001297	0.0711	1.003	ENSG00000058085	LAMC2	protein_coding
0.001299	0.0711	1.165	ENSG00000248690	HAS2-AS1	antisense
0.001315	0.0717	1.05	ENSG00000228716	DHFR	protein_coding
0.001323	0.0719	1.062	ENSG00000170961	HAS2	protein_coding
0.001351	0.0731	1.024	ENSG00000102038	SMARCA1	protein_coding
0.001359	0.0733	1.062	ENSG00000149798	CDC42EP2	protein_coding
0.001372	0.0737	1.08	ENSG00000104756	KCTD9	protein_coding
0.001383	0.0741	1.002	ENSG00000188643	S100A16	protein_coding
0.00139	0.0741	1.006	ENSG00000160014	CALM3	protein_coding
0.001404	0.0746	1.043	ENSG00000140263	SORD	protein_coding
0.001417	0.075	1.044	ENSG00000160190	SLC37A1	protein_coding

0.001428	0.0752	1.049	ENSG00000116017	ARID3A	protein_coding
0.001435	0.0752	1.062	ENSG00000213918	DNASE1	protein_coding
0.001435	0.0752	1.004	ENSG00000198467	TPM2	protein_coding
0.001449	0.0757	1.025	ENSG00000172819	RARG	protein_coding
0.001457	0.0759	1.139	ENSG00000158402	CDC25C	protein_coding
0.001463	0.0759	1.041	ENSG00000065135	GNAI3	protein_coding
0.001474	0.0762	1.005	ENSG00000110958	PTGES3	protein_coding
0.001487	0.0766	1.026	ENSG00000145107	TM4SF19	protein_coding
0.001505	0.077	1.041	ENSG00000187288	CIDEC	protein_coding
0.001506	0.077	1.218	ENSG00000137812	CASC5	protein_coding
0.001512	0.0771	1.002	ENSG00000013588	GPRC5A	protein_coding
0.001533	0.0779	1.081	ENSG00000082805	ERC1	protein_coding
0.00154	0.078	1.169	ENSG00000184208	C22orf46	protein_coding
0.001555	0.0782	1.202	ENSG00000138134	STAMBPL1	protein_coding
0.001557	0.0782	1.029	ENSG00000153815	CMIP	protein_coding
0.001561	0.0782	1.062	ENSG00000077713	SLC25A43	protein_coding
0.00158	0.0788	1.001	ENSG00000102265	TIMP1	protein_coding
0.001584	0.0788	1.02	ENSG00000121774	KHDRBS1	protein_coding
0.0016	0.0794	1.032	ENSG00000224081	RP11-86H7.1	lincRNA
0.001629	0.0805	1.002	ENSG00000021826	CPS1	protein_coding
0.001632	0.0805	1.128	ENSG00000163535	SGOL2	protein_coding
0.00164	0.0806	1.088	ENSG00000140950	KIAA1609	protein_coding
0.001667	0.0815	1.015	ENSG00000138071	ACTR2	protein_coding
0.001673	0.0815	1.009	ENSG00000121316	PLBD1	protein_coding
0.001674	0.0815	1.033	ENSG00000111145	ELK3	protein_coding
0.00169	0.0818	1.37	ENSG00000203926	SPANXA2	protein_coding
0.001692	0.0818	1.078	ENSG00000204540	PSORS1C1	protein_coding
0.001701	0.082	1.048	ENSG00000068489	PRR11	protein_coding
0.001714	0.0823	1.015	ENSG00000101000	PROCR	protein_coding
0.001718	0.0823	1.025	ENSG00000079112	CDH17	protein_coding
0.001727	0.0824	1.368	ENSG00000198021	SPANXA1	protein_coding
0.001734	0.0825	1.002	ENSG00000112096	SOD2	protein_coding
0.00177	0.0839	1.022	ENSG00000175183	CSRP2	protein_coding
0.001789	0.0846	1.073	ENSG00000173210	ABLIM3	protein_coding
0.001807	0.0851	1.017	ENSG00000170248	PDCD6IP	protein_coding
0.001811	0.0851	1.004	ENSG00000175166	PSMD2	protein_coding

0.001819	0.0852	0.911	ENSG00000121104	FAM117A	protein_coding
0.00183	0.0854	1.017	ENSG00000155115	GTF3C6	protein_coding
0.001844	0.0855	1.394	ENSG00000119042	SATB2	protein_coding
0.001848	0.0855	1.046	ENSG00000170779	CDCA4	protein_coding
0.001849	0.0855	1.021	ENSG00000143179	UCK2	protein_coding
0.001863	0.0855	1.093	ENSG00000180263	FGD6	protein_coding
0.001865	0.0855	1.026	ENSG00000168175	MAPK1IP1L	protein_coding
0.001867	0.0855	0.977	ENSG00000245694	CRNDE	lincRNA
0.001885	0.0861	1.145	ENSG00000131969	ABHD12B	protein_coding
0.001892	0.0861	1.03	ENSG00000100714	MTHFD1	protein_coding
0.001902	0.0861	1.041	ENSG00000145386	CCNA2	protein_coding
0.001904	0.0861	1.011	ENSG00000103335	PIEZO1	protein_coding
0.001908	0.0861	1.006	ENSG00000152952	PLOD2	protein_coding
0.001958	0.0876	0.828	ENSG00000135951	TSGA10	protein_coding
0.001962	0.0876	1.072	ENSG00000180287	PLD5	protein_coding
0.001963	0.0876	1.006	ENSG00000196419	XRCC6	protein_coding
0.001964	0.0876	1.018	ENSG00000183386	FHL3	protein_coding
0.001981	0.088	1.042	ENSG00000185551	NR2F2	protein_coding
0.001994	0.0884	1.076	ENSG00000053524	MCF2L2	protein_coding
0.002029	0.0894	1.099	ENSG00000102786	INTS6	protein_coding
0.00203	0.0894	1.056	ENSG00000112984	KIF20A	protein_coding
0.002043	0.0895	1.142	ENSG00000012174	MBTPS2	protein_coding
0.002049	0.0895	1.024	ENSG00000100412	ACO2	protein_coding
0.00205	0.0895	1.108	ENSG00000171241	SHCBP1	protein_coding
0.002059	0.0896	1.122	ENSG00000132297	HHLA1	protein_coding
0.002067	0.0896	1.06	ENSG00000156273	BACH1	protein_coding
0.002081	0.0896	1.129	ENSG00000139132	FGD4	protein_coding
0.002087	0.0896	1.142	ENSG00000196406	SPANXD	protein_coding
0.002095	0.0896	1.029	ENSG00000104312	RIPK2	protein_coding
0.002098	0.0896	1.145	ENSG00000077092	RARB	protein_coding
0.002099	0.0896	1.018	ENSG00000101144	BMP7	protein_coding
0.002101	0.0896	1.069	ENSG00000169752	NRG4	protein_coding
0.002154	0.0917	1.065	ENSG00000187634	SAMD11	protein_coding
0.002177	0.0924	0.888	ENSG00000105516	DBP	protein_coding
0.002206	0.0932	1.055	ENSG00000087303	NID2	protein_coding
0.002208	0.0932	1.016	ENSG00000116489	CAPZA1	protein_coding

0.002223	0.0935	1.025	ENSG00000136231	IGF2BP3	protein_coding
0.002256	0.0941	1.042	ENSG00000057294	PKP2	protein_coding
0.002262	0.0941	1.015	ENSG00000163297	ANTXR2	protein_coding
0.002263	0.0941	1.04	ENSG00000152492	CCDC50	protein_coding
0.002264	0.0941	1.022	ENSG00000088002	SULT2B1	protein_coding
0.002268	0.0941	1.076	ENSG00000205726	ITSN1	protein_coding
0.002296	0.095	3.32	ENSG00000186297	GABRA5	protein_coding
0.002333	0.0963	1.048	ENSG00000165934	CPSF2	protein_coding
0.002348	0.0964	1.052	ENSG00000132388	UBE2G1	protein_coding
0.002349	0.0964	1.069	ENSG00000161813	LARP4	protein_coding
0.002362	0.0966	1.127	ENSG00000169946	ZFPM2	protein_coding
0.002368	0.0966	1.049	ENSG00000126787	DLGAP5	protein_coding
0.002383	0.0966	1.009	ENSG00000140350	ANP32A	protein_coding
0.002391	0.0966	1.233	ENSG00000145414	NAF1	protein_coding
0.002393	0.0966	1.037	ENSG00000004700	RECQL	protein_coding
0.002394	0.0966	1.018	ENSG00000198901	PRC1	protein_coding
0.002421	0.0974	1.007	ENSG00000083444	PLOD1	protein_coding
0.002429	0.0974	1.142	ENSG00000182885	GPR97	protein_coding
0.002431	0.0974	1.023	ENSG00000172380	GNG12	protein_coding
0.002439	0.0974	1.217	ENSG00000198797	FAM5B	protein_coding
0.002456	0.0978	1.042	ENSG00000136636	KCTD3	protein_coding
0.002468	0.0978	1.175	ENSG00000168143	FAM83B	protein_coding
0.002468	0.0978	1.02	ENSG00000077150	NFKB2	protein_coding
0.002475	0.0978	1.084	ENSG00000110756	HPS5	protein_coding
0.002533	0.0998	1.007	ENSG00000113296	THBS4	protein_coding
0.002552	0.1	1.199	ENSG00000143498	TAF1A	protein_coding
0.002585	0.101	1.081	ENSG00000164211	STARD4	protein_coding
0.002585	0.101	1.043	ENSG00000136045	PWP1	protein_coding
0.002599	0.101	1.142	ENSG00000162975	KCNF1	protein_coding
0.002605	0.101	1.013	ENSG00000104881	PPP1R13L	protein_coding
0.002607	0.101	1.019	ENSG00000164171	ITGA2	protein_coding
0.002608	0.101	1.035	ENSG00000148935	GAS2	protein_coding
0.002611	0.101	1.025	ENSG00000050820	BCAR1	protein_coding
0.002628	0.101	1.076	ENSG00000184992	BRI3BP	protein_coding
0.002631	0.101	1.021	ENSG00000136826	KLF4	protein_coding
0.002666	0.102	1.128	ENSG00000169258	GPRIN1	protein_coding

0.002667	0.102	1.059	ENSG00000226605	AC007098.1	antisense
0.002667	0.102	1.198	ENSG00000138182	KIF20B	protein_coding
0.002698	0.102	1.038	ENSG00000080986	NDC80	protein_coding
0.00271	0.102	1	ENSG00000163993	S100P	protein_coding
0.002719	0.102	0.94	ENSG00000176842	IRX5	protein_coding
0.002722	0.102	1.024	ENSG00000175029	CTBP2	protein_coding
0.002723	0.102	1.106	ENSG00000111087	GLI1	protein_coding
0.002729	0.102	1.215	ENSG00000234147	RP3-460G2.2	lincRNA
0.00273	0.102	1	ENSG00000182718	ANXA2	protein_coding
0.002737	0.102	1.01	ENSG00000134001	EIF2S1	protein_coding
0.002744	0.102	1.092	ENSG00000169857	AVEN	protein_coding
0.002763	0.103	1.052	ENSG00000135454	B4GALNT1	protein_coding
0.002799	0.104	1.021	ENSG00000114346	ECT2	protein_coding
0.002807	0.104	1.064	ENSG00000185340	GAS2L1	protein_coding
0.002838	0.105	1.041	ENSG00000080815	PSEN1	protein_coding
0.002871	0.106	1.093	ENSG00000150457	LATS2	protein_coding
0.002876	0.106	1.397	ENSG00000171451	DSEL	protein_coding
0.002884	0.106	1.064	ENSG00000137819	PAQR5	protein_coding
0.002903	0.106	1.029	ENSG00000165732	DDX21	protein_coding
0.002936	0.107	1.197	ENSG00000171914	TLN2	protein_coding
0.002946	0.107	1.218	ENSG00000250312	ZNF718	protein_coding
0.002949	0.107	1.072	ENSG00000233621	RP11-422J8.1	antisense
0.002984	0.108	1.116	ENSG00000224167	RP3-522D1.1	lincRNA
0.002996	0.108	1.006	ENSG00000072110	ACTN1	protein_coding
0.003029	0.109	1.043	ENSG00000072401	UBE2D1	protein_coding
0.003036	0.109	1.137	ENSG00000116704	SLC35D1	protein_coding
0.003036	0.109	1.011	ENSG00000162545	CAMK2N1	protein_coding
0.003048	0.109	1.109	ENSG00000186001	LRCH3	protein_coding
0.003058	0.109	1.008	ENSG00000159840	ZYX	protein_coding
0.003085	0.11	1.118	ENSG00000118007	STAG1	protein_coding
0.003104	0.11	1.114	ENSG00000024526	DEPDC1	protein_coding
0.003114	0.11	0.973	ENSG00000102409	BEX4	protein_coding
0.003194	0.113	1.026	ENSG00000115963	RND3	protein_coding
0.003214	0.113	1.082	ENSG00000137875	BCL2L10	protein_coding
0.003219	0.113	1.078	ENSG00000148634	HERC4	protein_coding
0.003241	0.114	1.059	ENSG00000232533	AC093673.5	antisense

0.003245	0.114	1.041	ENSG00000100722	ZC3H14	protein_coding
0.003258	0.114	1.008	ENSG00000086062	B4GALT1	protein_coding
0.003262	0.114	1.185	ENSG00000104321	TRPA1	protein_coding
0.003277	0.114	1.011	ENSG00000134686	PHC2	protein_coding
0.003296	0.114	1.012	ENSG00000146112	PPP1R18	protein_coding
0.003338	0.115	1.03	ENSG00000088826	SMOX	protein_coding
0.003345	0.115	1.022	ENSG00000153827	TRIP12	protein_coding
0.003356	0.115	1.068	ENSG00000119953	SMNDC1	protein_coding
0.00336	0.115	1.037	ENSG00000163874	ZC3H12A	protein_coding
0.0034	0.117	1.03	ENSG00000205213	LGR4	protein_coding
0.003412	0.117	1.021	ENSG00000171310	CHST11	protein_coding
0.003454	0.118	1.087	ENSG00000120647	CCDC77	protein_coding
0.003461	0.118	1.047	ENSG00000107897	ACBD5	protein_coding
0.003467	0.118	1.001	ENSG00000196230	TUBB	protein_coding
0.003474	0.118	1.006	ENSG00000054277	OPN3	protein_coding
0.003486	0.118	1.056	ENSG00000169255	B3GALNT1	protein_coding
0.003486	0.118	1.927	ENSG00000226792	LINC00371	lincRNA
0.0035	0.118	1.033	ENSG00000168487	BMP1	protein_coding
0.003528	0.118	1.018	ENSG00000155380	SLC16A1	protein_coding
0.003538	0.118	1.089	ENSG00000244649	CTD-2377D24.6	lincRNA
0.003554	0.118	1.181	ENSG00000233608	TWIST2	protein_coding
0.00356	0.118	1.007	ENSG00000185033	SEMA4B	protein_coding
0.003562	0.118	1.16	ENSG00000184661	CDCA2	protein_coding
0.003569	0.118	1.043	ENSG00000111737	RAB35	protein_coding
0.00359	0.119	1.532	ENSG00000106714	CNTNAP3	protein_coding
0.003601	0.119	1.022	ENSG00000087586	AURKA	protein_coding
0.003612	0.119	1.249	ENSG00000170537	TMC7	protein_coding
0.003614	0.119	1.079	ENSG00000138386	NAB1	protein_coding
0.003657	0.12	0.932	ENSG00000084764	MAPRE3	protein_coding
0.003671	0.12	1	ENSG00000197747	S100A10	protein_coding
0.003678	0.12	1.044	ENSG00000108064	TFAM	protein_coding
0.003696	0.12	1.04	ENSG00000136108	CKAP2	protein_coding
0.003698	0.12	1.015	ENSG00000151239	TWF1	protein_coding
0.003774	0.123	1.01	ENSG00000170515	PA2G4	protein_coding
0.003786	0.123	0.906	ENSG00000124215	CDH26	protein_coding
0.003806	0.123	1.001	ENSG00000172757	CFL1	protein_coding

0.003816	0.123	1.014	ENSG00000170323	FABP4	protein_coding
0.003825	0.123	1.007	ENSG00000067182	TNFRSF1A	protein_coding
0.003893	0.125	1.007	ENSG00000124762	CDKN1A	protein_coding
0.003921	0.126	1.05	ENSG00000100311	PDGFB	protein_coding
0.003924	0.126	1.028	ENSG00000135766	EGLN1	protein_coding
0.003938	0.126	1.092	ENSG00000100557	C14orf105	protein_coding
0.003951	0.126	0.915	ENSG00000180096	41883	protein_coding
0.003979	0.126	1.059	ENSG00000186432	KPNA4	protein_coding
0.003982	0.126	1.025	ENSG00000177706	FAM20C	protein_coding
0.003988	0.126	1.086	ENSG00000143493	INTS7	protein_coding
0.003989	0.126	1.001	ENSG00000120708	TGFBI	protein_coding
0.003996	0.126	0.829	ENSG00000232442	CTD-3184A7.4	antisense
0.004012	0.126	1.016	ENSG00000162745	OLFML2B	protein_coding
0.004012	0.126	1.019	ENSG00000213782	DDX47	protein_coding
0.004016	0.126	1.051	ENSG00000132906	CASP9	protein_coding
0.004054	0.127	0.9	ENSG00000172116	CD8B	protein_coding
0.004061	0.127	1.113	ENSG00000139350	NEDD1	protein_coding
0.004079	0.127	1.043	ENSG00000162302	RPS6KA4	protein_coding
0.004117	0.128	1.016	ENSG00000112972	HMGCS1	protein_coding
0.004133	0.128	1.182	ENSG00000198853	RUSC2	protein_coding
0.00417	0.129	1.032	ENSG00000146242	TPBG	protein_coding
0.004177	0.129	1.008	ENSG00000120438	TCP1	protein_coding
0.004208	0.13	1.011	ENSG00000171848	RRM2	protein_coding
0.004215	0.13	1.012	ENSG00000148926	ADM	protein_coding
0.004255	0.131	1.023	ENSG00000135316	SYNCRIP	protein_coding
0.004264	0.131	102.326	ENSG00000250600	ROPN1L-AS1	antisense
0.004318	0.132	1.005	ENSG00000140297	GCNT3	protein_coding
0.004319	0.132	1.152	ENSG00000107560	RAB11FIP2	protein_coding
0.004338	0.132	1.183	ENSG00000171320	ESCO2	protein_coding
0.004354	0.132	0.789	ENSG00000204950	LRRC10B	protein_coding
0.004397	0.133	1.113	ENSG00000152782	PANK1	protein_coding
0.00442	0.134	1.034	ENSG00000128944	C15orf23	protein_coding
0.004484	0.135	0.241	ENSG00000125409	TEKT3	protein_coding
0.004495	0.135	0.749	ENSG00000173875	ZNF791	protein_coding
0.004517	0.136	1.146	ENSG00000154127	UBASH3B	protein_coding
0.004524	0.136	1.212	ENSG00000137449	CPEB2	protein_coding

0.004533	0.136	1.047	ENSG00000123352	SPATS2	protein_coding
0.004547	0.136	1.054	ENSG00000103671	TRIP4	protein_coding
0.004554	0.136	1.04	ENSG00000066248	NGEF	protein_coding
0.004575	0.136	1.065	ENSG00000105991	HOXA1	protein_coding
0.00462	0.137	1.014	ENSG00000120802	TMPO	protein_coding
0.004624	0.137	1.027	ENSG00000180370	PAK2	protein_coding
0.004632	0.137	1.095	ENSG00000170677	SOCS6	protein_coding
0.004684	0.138	0.974	ENSG00000113621	TXNDC15	protein_coding
0.004724	0.139	1.001	ENSG00000123416	TUBA1B	protein_coding
0.004733	0.139	1.032	ENSG00000162433	AK4	protein_coding
0.004742	0.139	1.043	ENSG00000115504	EHBP1	protein_coding
0.00477	0.14	1.008	ENSG00000167900	TK1	protein_coding
0.00483	0.141	1.009	ENSG00000102572	STK24	protein_coding
0.004834	0.141	1.242	ENSG00000185046	ANKS1B	protein_coding
0.004872	0.142	0.911	ENSG00000115325	DOK1	protein_coding
0.004883	0.142	1.006	ENSG00000166532	RIMKLB	protein_coding
0.004942	0.143	1.068	ENSG00000114450	GNB4	protein_coding
0.004944	0.143	1.139	ENSG00000142623	PADI1	protein_coding
0.004955	0.143	1.047	ENSG00000133119	RFC3	protein_coding
0.004955	0.143	1.002	ENSG00000197111	PCBP2	protein_coding
0.004984	0.143	1.041	ENSG00000149554	CHEK1	protein_coding
0.004994	0.143	1.033	ENSG00000072518	MARK2	protein_coding
0.004995	0.143	1.028	ENSG00000100221	JOSD1	protein_coding
0.005012	0.143	1.01	ENSG00000070404	FSTL3	protein_coding
0.005027	0.144	1.068	ENSG00000137251	TINAG	protein_coding
0.00506	0.144	0.966	ENSG00000105552	BCAT2	protein_coding
0.005066	0.144	1.101	ENSG00000180611	MB21D2	protein_coding
0.005068	0.144	1.018	ENSG00000176890	TYMS	protein_coding
0.005079	0.144	1.099	ENSG00000066279	ASPM	protein_coding
0.0051	0.144	1.002	ENSG00000122862	SRGN	protein_coding
0.005136	0.145	1.001	ENSG00000110955	ATP5B	protein_coding
0.00515	0.145	1.176	ENSG00000131725	WDR44	protein_coding
0.005156	0.145	1.008	ENSG00000106682	EIF4H	protein_coding
0.005161	0.145	0.765	ENSG00000050438	SLC4A8	protein_coding
0.005166	0.145	1.202	ENSG00000164506	STXBP5	protein_coding
0.005196	0.145	1.163	ENSG00000113273	ARSB	protein_coding

0.005213	0.146	1.034	ENSG00000140525	FANCI	protein_coding
0.005255	0.146	1.064	ENSG00000171033	PKIA	protein_coding
0.005267	0.146	0.999	ENSG00000189377	CXCL17	protein_coding
0.005272	0.146	1.041	ENSG00000162627	SNX7	protein_coding
0.005284	0.146	1.059	ENSG00000065183	WDR3	protein_coding
0.005285	0.146	1.001	ENSG00000169908	TM4SF1	protein_coding
0.00533	0.147	1.002	ENSG00000198363	ASPH	protein_coding
0.005376	0.148	1.01	ENSG00000134057	CCNB1	protein_coding
0.005407	0.149	1.06	ENSG00000130270	ATP8B3	protein_coding
0.005408	0.149	0.989	ENSG00000159212	CLIC6	protein_coding
0.005426	0.149	1.009	ENSG00000162772	ATF3	protein_coding
0.005473	0.15	1.032	ENSG00000169032	MAP2K1	protein_coding
0.005489	0.15	1.009	ENSG00000135862	LAMC1	protein_coding
0.005626	0.153	1.425	ENSG00000189410	SH2D5	protein_coding
0.005645	0.153	1.111	ENSG00000138660	AP1AR	protein_coding
0.005649	0.153	1.009	ENSG00000139112	GABARAPL1	protein_coding
0.005656	0.153	1.033	ENSG00000114480	GBE1	protein_coding
0.005735	0.155	1.061	ENSG00000204531	POU5F1	protein_coding
0.005749	0.155	1.01	ENSG00000117399	CDC20	protein_coding
0.005815	0.157	1.109	ENSG00000198088	NUP62CL	protein_coding
0.00582	0.157	1.045	ENSG00000183864	TOB2	protein_coding
0.005826	0.157	1.017	ENSG00000206075	SERPINB5	protein_coding
0.005885	0.158	1.045	ENSG00000203668	CHML	protein_coding
0.005905	0.158	1.158	ENSG00000152104	PTPN14	protein_coding
0.005919	0.158	1.102	ENSG00000182963	GJC1	protein_coding
0.005936	0.158	1.112	ENSG00000162694	EXTL2	protein_coding
0.005977	0.159	0.988	ENSG00000134802	SLC43A3	protein_coding
0.005981	0.159	1.011	ENSG00000071054	MAP4K4	protein_coding
0.005987	0.159	1.1	ENSG00000185386	MAPK11	protein_coding
0.006121	0.162	1.027	ENSG00000136943	CTSL2	protein_coding
0.006133	0.162	0.897	ENSG00000136878	USP20	protein_coding
0.006137	0.162	0.71	ENSG00000176029	C11orf16	protein_coding
0.006146	0.162	1.041	ENSG00000100320	RBFOX2	protein_coding
0.006155	0.162	0.813	ENSG00000004660	CAMKK1	protein_coding
0.006272	0.165	1.01	ENSG00000196591	HDAC2	protein_coding
0.006321	0.166	1.058	ENSG00000185591	SP1	protein_coding

0.006352	0.166	1.013	ENSG00000134294	SLC38A2	protein_coding
0.006371	0.166	0.815	ENSG00000235280	MCF2L-AS1	antisense
0.006376	0.166	1.05	ENSG00000177119	ANO6	protein_coding
0.006392	0.166	1.056	ENSG00000163681	SLMAP	protein_coding
0.006432	0.167	1.061	ENSG00000156970	BUB1B	protein_coding
0.006441	0.167	1.024	ENSG00000174891	RSRC1	protein_coding
0.006455	0.167	1.397	ENSG00000113749	HRH2	protein_coding
0.006462	0.167	1.016	ENSG00000065150	IPO5	protein_coding
0.006483	0.167	1.42	ENSG00000155897	ADCY8	protein_coding
0.006487	0.167	1.005	ENSG00000004478	FKBP4	protein_coding
0.006504	0.167	1.157	ENSG00000130962	PRRG1	protein_coding
0.00655	0.167	1.022	ENSG00000120675	DNAJC15	protein_coding
0.006552	0.167	1.043	ENSG00000136603	SKIL	protein_coding
0.006564	0.167	1.054	ENSG00000138160	KIF11	protein_coding
0.006564	0.167	1.046	ENSG00000123485	HJURP	protein_coding
0.006571	0.167	1.022	ENSG00000165410	CFL2	protein_coding
0.006576	0.167	0.992	ENSG00000141934	PPAP2C	protein_coding
0.006577	0.167	1.027	ENSG00000197713	RPE	protein_coding
0.006594	0.167	1.013	ENSG00000023697	DERA	protein_coding
0.006615	0.167	1.281	ENSG00000137760	ALKBH8	protein_coding
0.006619	0.167	1.019	ENSG00000005020	SKAP2	protein_coding
0.006637	0.167	1.073	ENSG00000163069	SGCB	protein_coding
0.00668	0.168	1.048	ENSG00000142892	PIGK	protein_coding
0.006681	0.168	1.105	ENSG00000092853	CLSPN	protein_coding
0.006687	0.168	1.038	ENSG00000133961	NUMB	protein_coding
0.006696	0.168	1.05	ENSG00000166130	IKBIP	protein_coding
0.006754	0.169	0.999	ENSG00000180879	SSR4	protein_coding
0.006767	0.169	1.008	ENSG00000163898	LIPH	protein_coding
0.006783	0.169	1.028	ENSG00000078804	TP53INP2	protein_coding
0.006788	0.169	1.054	ENSG00000174804	FZD4	protein_coding
0.006793	0.169	1.046	ENSG00000183098	GPC6	protein_coding
0.006834	0.17	0.766	ENSG00000167487	KLHL26	protein_coding
0.006856	0.17	1.045	ENSG00000157890	MEGF11	protein_coding
0.006876	0.17	1.015	ENSG00000067082	KLF6	protein_coding
0.006888	0.17	1.025	ENSG00000181104	F2R	protein_coding
0.006905	0.17	0.836	ENSG00000225889	AC074289.1	antisense

0.00691	0.17	1.02	ENSG00000170955	PRKCDBP	protein_coding
0.006956	0.171	1.041	ENSG00000170542	SERPINB9	protein_coding
0.006968	0.171	0.988	ENSG00000091490	SEL1L3	protein_coding
0.006977	0.171	1.075	ENSG00000154229	PRKCA	protein_coding
0.007008	0.171	1.087	ENSG00000075218	GTSE1	protein_coding
0.007021	0.171	1.124	ENSG00000196747	HIST1H2AI	protein_coding
0.007026	0.171	0.938	ENSG00000141542	RAB40B	protein_coding
0.00709	0.172	1.031	ENSG00000106004	HOXA5	protein_coding
0.007115	0.173	1.075	ENSG00000166510	CCDC68	protein_coding
0.007128	0.173	1.071	ENSG00000054179	ENTPD2	protein_coding
0.007189	0.174	1.053	ENSG00000125744	RTN2	protein_coding
0.007191	0.174	1.042	ENSG00000023572	GLRX2	protein_coding
0.007218	0.174	1.014	ENSG00000111206	FOXM1	protein_coding
0.00727	0.175	1.081	ENSG00000198554	WDHD1	protein_coding
0.007334	0.176	0.878	ENSG00000204711	C9orf135	protein_coding
0.007346	0.176	1.029	ENSG00000116212	LRRC42	protein_coding
0.007391	0.177	1.102	ENSG00000118596	SLC16A7	protein_coding
0.007399	0.177	0.885	ENSG00000101844	ATG4A	protein_coding
0.007416	0.177	0.97	ENSG00000185909	KLHDC8B	protein_coding
0.007418	0.177	1.067	ENSG00000121481	RNF2	protein_coding
0.007453	0.178	1.018	ENSG00000064961	HMG20B	protein_coding
0.007539	0.179	1.041	ENSG00000166579	NDEL1	protein_coding
0.007557	0.179	1.032	ENSG00000170558	CDH2	protein_coding
0.007562	0.179	1.123	ENSG00000175048	ZDHHC14	protein_coding
0.007576	0.179	1.07	ENSG00000134371	CDC73	protein_coding
0.007589	0.179	1.108	ENSG00000125726	CD70	protein_coding
0.007599	0.179	1.015	ENSG00000141959	PFKL	protein_coding
0.007613	0.179	1.108	ENSG00000054690	PLEKHH1	protein_coding
0.007637	0.18	0.639	ENSG00000205038	PKHD1L1	protein_coding
0.007647	0.18	1.002	ENSG00000116285	ERRFI1	protein_coding
0.007667	0.18	1.069	ENSG00000168404	MLKL	protein_coding
0.007668	0.18	1.008	ENSG00000103257	SLC7A5	protein_coding
0.007687	0.18	1.076	ENSG00000204610	TRIM15	protein_coding
0.007711	0.18	1.06	ENSG00000149782	PLCB3	protein_coding
0.007717	0.18	4.516	ENSG00000228536	RP11-392O17.1	lincRNA
0.007733	0.18	1.131	ENSG00000139354	GAS2L3	protein_coding

0.007742	0.18	0.997	ENSG00000204257	HLA-DMA	protein_coding
0.007775	0.18	0.94	ENSG00000203880	PCMTD2	protein_coding
0.007826	0.181	1.033	ENSG00000153250	RBMS1	protein_coding
0.007831	0.181	0.838	ENSG00000122224	LY9	protein_coding
0.007837	0.181	0.915	ENSG00000009790	TRAF3IP3	protein_coding
0.00789	0.182	1.21	ENSG00000183798	EMILIN3	protein_coding
0.007898	0.182	1.126	ENSG00000248008	RP11-18C24.6	antisense
0.007923	0.182	1.503	ENSG00000186615	KTN1-AS1	antisense
0.007958	0.182	0.954	ENSG00000007944	MYLIP	protein_coding
0.007958	0.182	1.06	ENSG00000130720	FIBCD1	protein_coding
0.007992	0.183	1	ENSG00000019582	CD74	protein_coding
0.008041	0.183	1.063	ENSG00000114062	UBE3A	protein_coding
0.00805	0.183	1.266	ENSG00000101746	NOL4	protein_coding
0.008058	0.183	1.004	ENSG00000142156	COL6A1	protein_coding
0.008119	0.185	0.96	ENSG00000055163	CYFIP2	protein_coding
0.00816	0.185	1.065	ENSG00000185989	RASA3	protein_coding
0.008206	0.186	0.785	ENSG00000172345	STARD5	protein_coding
0.008213	0.186	0.941	ENSG00000185101	ANO9	protein_coding
0.008251	0.186	1.029	ENSG00000101557	USP14	protein_coding
0.008264	0.186	1.019	ENSG00000161714	PLCD3	protein_coding
0.008283	0.187	1.022	ENSG00000196428	TSC22D2	protein_coding
0.008301	0.187	1.032	ENSG00000100290	BIK	protein_coding
0.008324	0.187	0.77	ENSG00000142530	FAM71E1	protein_coding
0.008343	0.187	1.257	ENSG00000135702	CHST5	protein_coding
0.008351	0.187	1.004	ENSG00000105974	CAV1	protein_coding
0.008394	0.188	1.011	ENSG00000134363	FST	protein_coding
0.008452	0.189	1.042	ENSG00000072571	HMMR	protein_coding
0.008478	0.189	1.029	ENSG00000113070	HBEGF	protein_coding
0.008545	0.19	1.113	ENSG00000120322	PCDHB8	protein_coding
0.008549	0.19	1.05	ENSG00000142867	BCL10	protein_coding
0.008631	0.192	1.062	ENSG00000185347	C14orf80	protein_coding
0.008659	0.192	1.005	ENSG00000125740	FOSB	protein_coding
0.008694	0.192	1.058	ENSG00000105889	STEAP1B	protein_coding
0.008717	0.193	1.036	ENSG00000092969	TGFB2	protein_coding
0.00873	0.193	1.012	ENSG00000135919	SERPINE2	protein_coding
0.008745	0.193	1.029	ENSG00000148773	MKI67	protein_coding

0.008789	0.193	1.012	ENSG00000090006	LTBP4	protein_coding
0.008794	0.193	0.926	ENSG00000168421	RHOH	protein_coding
0.008822	0.193	0.872	ENSG00000198863	RUNDC1	protein_coding
0.008832	0.193	1.132	ENSG00000162723	SLAMF9	protein_coding
0.008857	0.194	1.121	ENSG00000151233	GXYLT1	protein_coding
0.00889	0.194	1.228	ENSG00000066382	MPPED2	protein_coding
0.008893	0.194	1.038	ENSG00000136425	CIB2	protein_coding
0.008917	0.194	1.029	ENSG00000122958	VPS26A	protein_coding
0.00896	0.195	1.014	ENSG00000168288	MMADHC	protein_coding
0.008962	0.195	1.037	ENSG00000176092	AIM1L	protein_coding
0.008974	0.195	1.34	ENSG00000173068	BNC2	protein_coding
0.009005	0.195	1.008	ENSG00000126458	RRAS	protein_coding
0.009007	0.195	1.01	ENSG00000170027	YWHAG	protein_coding
0.009011	0.195	1.069	ENSG00000104147	OIP5	protein_coding
0.009082	0.196	1.012	ENSG00000151491	EPS8	protein_coding
0.009116	0.196	1.037	ENSG00000116761	CTH	protein_coding
0.009124	0.196	1.106	ENSG00000136122	BORA	protein_coding
0.009125	0.196	1.196	ENSG00000183876	ARSI	protein_coding
0.009163	0.196	0.962	ENSG00000067836	ROGDI	protein_coding
0.009178	0.196	0.994	ENSG00000099622	CIRBP	protein_coding
0.009187	0.196	1.032	ENSG00000073712	FERMT2	protein_coding
0.0092	0.196	1.026	ENSG00000158615	PPP1R15B	protein_coding
0.009236	0.196	1.108	ENSG00000218336	ODZ3	protein_coding
0.009241	0.196	0.88	ENSG00000153093	ACOXL	protein_coding
0.009247	0.196	1.081	ENSG00000165983	PTER	protein_coding
0.009332	0.198	0.986	ENSG00000141556	TBCD	protein_coding
0.009332	0.198	0.983	ENSG00000090661	CERS4	protein_coding
0.009336	0.198	1.133	ENSG00000187951	ARHGAP11B	protein_coding
0.009351	0.198	1.057	ENSG00000242539	AC007620.3	antisense
0.009413	0.199	1.08	ENSG00000105245	NUMBL	protein_coding
0.009461	0.199	0.998	ENSG00000100219	XBP1	protein_coding
0.009495	0.199	1.011	ENSG00000115129	TP53I3	protein_coding
0.009506	0.199	1.276	ENSG00000154429	CCSAP	protein_coding
0.009527	0.199	1.007	ENSG00000168615	ADAM9	protein_coding
0.009534	0.199	1.081	ENSG00000115355	CCDC88A	protein_coding
0.009536	0.199	0.853	ENSG00000121807	CCR2	protein_coding

0.009551	0.199	1.074	ENSG00000144852	NR1I2	protein_coding
0.009551	0.199	1.13	ENSG00000104626	ERI1	protein_coding
0.009554	0.199	1.004	ENSG00000026297	RNASET2	protein_coding
0.009575	0.199	1.032	ENSG00000117650	NEK2	protein_coding
0.009622	0.2	0.948	ENSG00000181392	SYNE4	protein_coding
0.009686	0.201	1.093	ENSG00000136051	KIAA1033	protein_coding
0.009695	0.201	1.046	ENSG00000134901	KDELC1	protein_coding
0.009728	0.201	0.943	ENSG00000166971	AKTIP	protein_coding
0.009766	0.202	1.076	ENSG00000137261	KIAA0319	protein_coding
0.009767	0.202	1.023	ENSG00000223414	LINC00473	lincRNA
0.009786	0.202	1.05	ENSG00000158290	CUL4B	protein_coding
0.009794	0.202	1.009	ENSG00000156261	CCT8	protein_coding
0.009855	0.203	1.241	ENSG00000118655	DCLRE1B	protein_coding
0.009916	0.203	1.102	ENSG00000085840	ORC1	protein_coding
0.009923	0.203	1.108	ENSG00000137814	HAUS2	protein_coding
0.009953	0.203	1.113	ENSG00000170113	NIPA1	protein_coding
0.009956	0.203	1.007	ENSG00000174437	ATP2A2	protein_coding
0.009979	0.204	1.002	ENSG00000108518	PFN1	protein_coding
0.009992	0.204	1.016	ENSG00000065548	ZC3H15	protein_coding
0.010014	0.204	1.022	ENSG00000013563	DNASE1L1	protein_coding
0.010027	0.204	1.035	ENSG00000182544	MFSD5	protein_coding
0.010032	0.204	1.035	ENSG00000175602	CCDC85B	protein_coding
0.010053	0.204	1.012	ENSG00000113368	LMNB1	protein_coding
0.010139	0.205	1.029	ENSG00000072501	SMC1A	protein_coding
0.010139	0.205	1.012	ENSG00000176407	KCMF1	protein_coding
0.010159	0.205	1.14	ENSG00000151014	CCRN4L	protein_coding
0.010167	0.205	1.035	ENSG00000197191	C9orf169	protein_coding
0.010208	0.205	0.869	ENSG00000142920	ADC	protein_coding
0.01021	0.205	1.076	ENSG00000156162	DPY19L4	protein_coding
0.010213	0.205	1.043	ENSG00000197045	GMFB	protein_coding
0.010257	0.206	1.045	ENSG00000101986	ABCD1	protein_coding
0.010266	0.206	1.057	ENSG00000121931	LRIF1	protein_coding
0.010291	0.206	1.047	ENSG00000188488	SERPINA5	protein_coding
0.0103	0.206	1.021	ENSG00000137845	ADAM10	protein_coding
0.010351	0.206	1.035	ENSG00000117899	MESDC2	protein_coding
0.010355	0.206	1.016	ENSG00000113083	LOX	protein_coding

0.010361	0.206	1.038	ENSG00000119616	FCF1	protein_coding
0.010361	0.206	1.029	ENSG00000182247	UBE2E2	protein_coding
0.010414	0.206	1.072	ENSG00000243725	TTC4	protein_coding
0.010429	0.206	0.964	ENSG00000103510	KAT8	protein_coding
0.010435	0.206	1.22	ENSG00000043355	ZIC2	protein_coding
0.010456	0.206	1.068	ENSG00000181381	DDX60L	protein_coding
0.010462	0.206	1.177	ENSG00000120149	MSX2	protein_coding
0.01048	0.206	1.004	ENSG00000084733	RAB10	protein_coding
0.01049	0.206	1.122	ENSG00000070778	PTPN21	protein_coding
0.010492	0.206	0.915	ENSG00000171045	TSNARE1	protein_coding
0.010524	0.206	1.147	ENSG00000196196	HRCT1	protein_coding
0.010524	0.206	1.05	ENSG00000143702	CEP170	protein_coding
0.010546	0.206	1.033	ENSG00000096063	SRPK1	protein_coding
0.010579	0.207	1.047	ENSG00000113739	STC2	protein_coding
0.010609	0.207	1.166	ENSG00000102384	CENPI	protein_coding
0.010694	0.209	1.061	ENSG00000240137	RP11-103G8.2	antisense
0.010753	0.209	1.012	ENSG00000179820	MYADM	protein_coding
0.010763	0.209	1.084	ENSG00000118200	CAMSAP2	protein_coding
0.010776	0.209	1.078	ENSG00000115942	ORC2	protein_coding
0.010783	0.209	0.976	ENSG00000165905	GYLTL1B	protein_coding
0.010827	0.21	1.014	ENSG00000074410	CA12	protein_coding
0.010858	0.21	0.976	ENSG00000130222	GADD45G	protein_coding
0.01087	0.21	1.002	ENSG00000132470	ITGB4	protein_coding
0.010872	0.21	1.004	ENSG00000105048	TNNT1	protein_coding
0.010874	0.21	1.091	ENSG00000005981	ASB4	protein_coding
0.010886	0.21	1.059	ENSG00000110218	PANX1	protein_coding
0.010956	0.21	1.335	ENSG00000137878	GCOM1	protein_coding
0.010958	0.21	1.014	ENSG00000088325	TPX2	protein_coding
0.010975	0.21	1.015	ENSG00000049323	LTBP1	protein_coding
0.011021	0.211	0.761	ENSG00000156345	CDK20	protein_coding
0.011041	0.211	0.661	ENSG00000100628	ASB2	protein_coding
0.011054	0.211	0.886	ENSG00000090554	FLT3LG	protein_coding
0.011064	0.211	1.016	ENSG00000125944	HNRNPR	protein_coding
0.011126	0.212	1.005	ENSG00000127824	TUBA4A	protein_coding
0.011138	0.212	0.955	ENSG00000110900	TSPAN11	protein_coding
0.011189	0.212	1.055	ENSG00000164038	SLC9B2	protein_coding

0.011192	0.212	1.024	ENSG00000158195	WASF2	protein_coding
0.011213	0.213	1.031	ENSG00000161888	SPC24	protein_coding
0.011224	0.213	1.019	ENSG00000186591	UBE2H	protein_coding
0.011262	0.213	0.983	ENSG00000235098	ANKRD65	protein_coding
0.011296	0.213	0.982	ENSG00000063854	HAGH	protein_coding
0.011391	0.215	0.798	ENSG00000123411	IKZF4	protein_coding
0.011392	0.215	1.006	ENSG00000172115	CYCS	protein_coding
0.011482	0.216	1.262	ENSG00000132953	XPO4	protein_coding
0.011532	0.217	1.056	ENSG00000152253	SPC25	protein_coding
0.011549	0.217	1.12	ENSG00000179361	ARID3B	protein_coding
0.011557	0.217	1.189	ENSG00000183166	CALN1	protein_coding
0.011572	0.217	0.755	ENSG00000117090	SLAMF1	protein_coding
0.011694	0.218	1.181	ENSG00000133121	STARD13	protein_coding
0.011694	0.218	1.138	ENSG00000174327	SLC16A13	protein_coding
0.0117	0.218	1.013	ENSG00000163362	C1orf106	protein_coding
0.011753	0.219	1.009	ENSG00000142178	SIK1	protein_coding
0.011756	0.219	1.111	ENSG00000116874	WARS2	protein_coding
0.011807	0.219	1.033	ENSG00000100665	SERPINA4	protein_coding
0.01182	0.219	1.013	ENSG00000176871	WSB2	protein_coding
0.011822	0.219	1.026	ENSG00000140682	TGFB1I1	protein_coding
0.011918	0.22	1.065	ENSG00000104880	ARHGEF18	protein_coding
0.011926	0.22	1.122	ENSG00000072415	MPP5	protein_coding
0.011932	0.22	1.026	ENSG00000169851	PCDH7	protein_coding
0.011939	0.22	1.003	ENSG00000137331	IER3	protein_coding
0.011945	0.22	1.02	ENSG00000161800	RACGAP1	protein_coding
0.011947	0.22	1.004	ENSG00000109321	AREG	protein_coding
0.011974	0.22	1.015	ENSG00000126803	HSPA2	protein_coding
0.01204	0.221	1.013	ENSG00000133106	EPSTI1	protein_coding
0.012056	0.221	0.99	ENSG00000172057	ORMDL3	protein_coding
0.012099	0.221	1.018	ENSG00000097033	SH3GLB1	protein_coding
0.012121	0.222	0.93	ENSG00000204178	TMEM57	protein_coding
0.012172	0.222	1.091	ENSG00000121879	PIK3CA	protein_coding
0.012181	0.222	1.018	ENSG00000162613	FUBP1	protein_coding
0.012197	0.222	1.032	ENSG00000188060	RAB42	protein_coding
0.012198	0.222	1.084	ENSG00000112210	RAB23	protein_coding
0.012248	0.223	1.014	ENSG00000120756	PLS1	protein_coding

0.012282	0.223	1.022	ENSG00000130340	SNX9	protein_coding
0.012319	0.223	0.704	ENSG00000107614	TRDMT1	protein_coding
0.012335	0.223	1.019	ENSG00000170545	SMAGP	protein_coding
0.012338	0.223	1.06	ENSG00000060140	STYK1	protein_coding
0.012343	0.223	1.079	ENSG00000198774	RASSF9	protein_coding
0.012345	0.223	1.006	ENSG00000123999	INHA	protein_coding
0.012351	0.223	0.77	ENSG00000105662	CRTC1	protein_coding
0.012379	0.223	1.084	ENSG00000142207	URB1	protein_coding
0.012428	0.223	1.079	ENSG00000182916	TCEAL7	protein_coding
0.012496	0.224	1.014	ENSG00000142627	EPHA2	protein_coding
0.012526	0.225	1.006	ENSG00000143384	MCL1	protein_coding
0.012584	0.225	1.016	ENSG00000164294	GPX8	protein_coding
0.012589	0.225	1.025	ENSG00000102471	NDFIP2	protein_coding
0.012596	0.225	1.056	ENSG00000126391	FRMD8	protein_coding
0.01266	0.226	1.007	ENSG00000125775	SDCBP2	protein_coding
0.012697	0.226	0.992	ENSG00000070081	NUCB2	protein_coding
0.012702	0.226	0.96	ENSG00000160271	RALGDS	protein_coding
0.012826	0.228	1.036	ENSG00000149503	INCENP	protein_coding
0.012914	0.229	1.012	ENSG00000182197	EXT1	protein_coding
0.012988	0.23	1.071	ENSG00000139645	ANKRD52	protein_coding
0.012991	0.23	1.026	ENSG00000086544	ITPKC	protein_coding
0.013055	0.231	1.137	ENSG00000137960	GIPC2	protein_coding
0.013083	0.231	0.926	ENSG00000143772	ITPKB	protein_coding
0.01311	0.231	1.046	ENSG00000153207	AHCTF1	protein_coding
0.013223	0.233	1.096	ENSG00000154839	SKA1	protein_coding
0.013228	0.233	1.094	ENSG00000198252	STYX	protein_coding
0.013258	0.233	1.019	ENSG00000100439	ABHD4	protein_coding
0.013292	0.233	1.002	ENSG00000147381	MAGEA4	protein_coding
0.013308	0.233	1.402	ENSG00000196972	LINC00087	lincRNA
0.013312	0.233	1.232	ENSG00000249166	RP11-1C1.6	lincRNA
0.013342	0.234	1.01	ENSG00000198732	SMOC1	protein_coding
0.013351	0.234	1.055	ENSG00000151693	ASAP2	protein_coding
0.013372	0.234	1.019	ENSG00000111142	METAP2	protein_coding
0.013412	0.234	1.02	ENSG00000134755	DSC2	protein_coding
0.013413	0.234	1.085	ENSG00000124782	RREB1	protein_coding
0.013419	0.234	1.108	ENSG00000011114	BTBD7	protein_coding

0.013446	0.234	1.019	ENSG00000163655	GMPS	protein_coding
0.013448	0.234	0.979	ENSG00000092068	SLC7A8	protein_coding
0.01361	0.236	1.003	ENSG00000142173	COL6A2	protein_coding
0.01363	0.236	1.031	ENSG00000100603	SNW1	protein_coding
0.01363	0.236	1.025	ENSG00000114030	KPNA1	protein_coding
0.013691	0.237	0.977	ENSG00000141510	TP53	protein_coding
0.013709	0.237	0.79	ENSG00000185133	INPP5J	protein_coding
0.013711	0.237	1.022	ENSG00000135899	SP110	protein_coding
0.013748	0.237	1.019	ENSG00000114378	HYAL1	protein_coding
0.013788	0.237	0.97	ENSG00000147162	OGT	protein_coding
0.013852	0.238	1.078	ENSG00000119285	HEATR1	protein_coding
0.013859	0.238	1.043	ENSG00000155189	AGPAT5	protein_coding
0.013932	0.239	1.033	ENSG00000198829	SUCNR1	protein_coding
0.013947	0.239	1.019	ENSG00000137500	CCDC90B	protein_coding
0.014	0.24	1.035	ENSG00000112033	PPARD	protein_coding
0.014019	0.24	1.08	ENSG00000092470	WDR76	protein_coding
0.014059	0.24	1.007	ENSG00000179674	ARL14	protein_coding
0.014064	0.24	0.916	ENSG00000158717	RNF166	protein_coding
0.014154	0.241	1.025	ENSG00000146670	CDCA5	protein_coding
0.014178	0.241	1.081	ENSG00000249550	RP11-438N16.1	lincRNA
0.014181	0.241	1.008	ENSG00000164611	PTTG1	protein_coding
0.014209	0.241	1.177	ENSG00000184838	PRR16	protein_coding
0.014244	0.242	1	ENSG00000115414	FN1	protein_coding
0.01433	0.243	0.942	ENSG00000172071	EIF2AK3	protein_coding
0.014344	0.243	1.171	ENSG00000151090	THRB	protein_coding
0.014387	0.243	1.007	ENSG00000124466	LYPD3	protein_coding
0.014401	0.243	1.015	ENSG00000099942	CRKL	protein_coding
0.014402	0.243	0.996	ENSG00000242574	HLA-DMB	protein_coding
0.014474	0.244	1.158	ENSG00000060749	QSER1	protein_coding
0.014535	0.244	1.039	ENSG00000157600	TMEM164	protein_coding
0.014547	0.244	1.021	ENSG00000130779	CLIP1	protein_coding
0.014556	0.244	1.015	ENSG00000134668	SPOCD1	protein_coding
0.014596	0.245	1.039	ENSG00000197265	GTF2E2	protein_coding
0.014607	0.245	1.009	ENSG00000205364	MT1M	protein_coding
0.014621	0.245	1.193	ENSG00000134987	WDR36	protein_coding
0.014676	0.245	0.867	ENSG00000115085	ZAP70	protein_coding

0.014702	0.245	1.101	ENSG00000135341	MAP3K7	protein_coding
0.01472	0.245	1.025	ENSG00000117505	DR1	protein_coding
0.014724	0.245	1.041	ENSG00000043093	DCUN1D1	protein_coding
0.014827	0.246	0.923	ENSG00000242259	C22orf39	protein_coding
0.014833	0.246	0.928	ENSG00000238083	LRRC37A2	protein_coding
0.01487	0.247	1.147	ENSG00000111647	UHRF1BP1L	protein_coding
0.014888	0.247	0.956	ENSG00000182272	B4GALNT4	protein_coding
0.014899	0.247	1.097	ENSG00000176697	BDNF	protein_coding
0.014931	0.247	0.944	ENSG00000172349	IL16	protein_coding
0.01498	0.247	1.089	ENSG00000150990	DHX37	protein_coding
0.014983	0.247	1.016	ENSG00000073008	PVR	protein_coding
0.014986	0.247	1.016	ENSG00000100605	ITPK1	protein_coding
0.015013	0.247	1.155	ENSG00000005108	THSD7A	protein_coding
0.01511	0.248	1.01	ENSG00000119318	RAD23B	protein_coding
0.01512	0.248	1.027	ENSG00000109685	WHSC1	protein_coding
0.015172	0.249	0.928	ENSG00000215256	DHRS4-AS1	antisense
0.015182	0.249	0.97	ENSG00000111452	GPR133	protein_coding
0.015267	0.25	1.01	ENSG00000138119	MYOF	protein_coding
0.015269	0.25	1.039	ENSG00000177311	ZBTB38	protein_coding
0.015289	0.25	1.004	ENSG00000149100	EIF3M	protein_coding
0.015302	0.25	1.038	ENSG00000165304	MELK	protein_coding
0.015367	0.251	1.03	ENSG00000142945	KIF2C	protein_coding
0.01543	0.251	0.868	ENSG00000160654	CD3G	protein_coding
0.01546	0.251	1.125	ENSG00000129810	SGOL1	protein_coding
0.015468	0.251	1.013	ENSG00000188761	BCL2L15	protein_coding
0.01553	0.252	1.046	ENSG00000115368	WDR75	protein_coding
0.015535	0.252	0.787	ENSG00000144191	CNGA3	protein_coding
0.015552	0.252	1.018	ENSG00000099917	MED15	protein_coding
0.015557	0.252	1.042	ENSG00000153317	ASAP1	protein_coding
0.015599	0.252	1.006	ENSG00000078369	GNB1	protein_coding
0.015627	0.252	1.016	ENSG00000154473	BUB3	protein_coding
0.015646	0.252	1.103	ENSG00000136141	LRCH1	protein_coding
0.015651	0.252	1.019	ENSG00000127947	PTPN12	protein_coding
0.01568	0.252	0.966	ENSG00000116824	CD2	protein_coding
0.015687	0.252	1.092	ENSG00000083520	DIS3	protein_coding
0.015697	0.252	1.093	ENSG00000166341	DCHS1	protein_coding

0.015705	0.252	1.036	ENSG00000089060	SLC24A6	protein_coding
0.015724	0.252	0.872	ENSG00000110448	CD5	protein_coding
0.015757	0.252	1.113	ENSG00000106689	LHX2	protein_coding
0.015811	0.253	0.939	ENSG00000146555	SDK1	protein_coding
0.015872	0.254	1.112	ENSG00000129173	E2F8	protein_coding
0.015928	0.254	0.887	ENSG00000111796	KLRB1	protein_coding
0.016	0.255	0.982	ENSG00000233016	SNHG7	antisense
0.016013	0.255	1.095	ENSG00000169994	MYO7B	protein_coding
0.016016	0.255	1.019	ENSG00000125977	EIF2S2	protein_coding
0.016028	0.255	0.986	ENSG00000147535	PPAPDC1B	protein_coding
0.016153	0.256	1.113	ENSG00000234616	JRK	protein_coding
0.016181	0.257	1.057	ENSG00000136824	SMC2	protein_coding
0.016205	0.257	1.038	ENSG00000141644	MBD1	protein_coding
0.016217	0.257	1.027	ENSG00000030110	BAK1	protein_coding
0.016232	0.257	1.005	ENSG00000158825	CDA	protein_coding
0.016267	0.257	1.005	ENSG00000167772	ANGPTL4	protein_coding
0.016317	0.257	1.057	ENSG00000174899	C3orf55	protein_coding
0.016349	0.257	1.12	ENSG00000159267	HLCS	protein_coding
0.016353	0.257	1.048	ENSG00000101076	HNF4A	protein_coding
0.016421	0.258	1.04	ENSG00000168078	PBK	protein_coding
0.016431	0.258	1.025	ENSG00000117620	SLC35A3	protein_coding
0.016439	0.258	1.027	ENSG00000196781	TLE1	protein_coding
0.016502	0.259	0.993	ENSG00000177508	IRX3	protein_coding
0.016536	0.259	1.011	ENSG00000096746	HNRNPH3	protein_coding
0.016542	0.259	1.027	ENSG00000070214	SLC44A1	protein_coding
0.016555	0.259	1.011	ENSG00000116871	MAP7D1	protein_coding
0.016566	0.259	1.129	ENSG00000072041	SLC6A15	protein_coding
0.016625	0.259	0.952	ENSG00000115902	SLC1A4	protein_coding
0.016729	0.26	0.98	ENSG00000185187	SIGIRR	protein_coding
0.016736	0.26	1.168	ENSG00000183814	LIN9	protein_coding
0.016793	0.261	1.02	ENSG00000077380	DYNC1I2	protein_coding
0.016826	0.261	1.11	ENSG00000120688	WBP4	protein_coding
0.016845	0.261	1.071	ENSG00000119041	GTF3C3	protein_coding
0.01687	0.261	1.015	ENSG00000137959	IFI44L	protein_coding
0.016882	0.261	1.097	ENSG00000229967	RP11-366F6.2	antisense
0.016945	0.262	1.121	ENSG00000182585	EPGN	protein_coding

0.016952	0.262	1.004	ENSG00000184007	PTP4A2	protein_coding
0.016974	0.262	1.003	ENSG00000001084	GCLC	protein_coding
0.016993	0.262	1.028	ENSG00000160214	RRP1	protein_coding
0.017014	0.262	0.944	ENSG00000162755	KLHDC9	protein_coding
0.0171	0.263	1.011	ENSG00000173852	DPY19L1	protein_coding
0.017113	0.263	0.895	ENSG00000013725	CD6	protein_coding
0.01716	0.263	1.014	ENSG00000203760	CENPW	protein_coding
0.017179	0.263	1.081	ENSG00000165556	CDX2	protein_coding
0.017235	0.264	0.973	ENSG00000129158	SERGEF	protein_coding
0.017293	0.264	1.136	ENSG00000180488	FAM73A	protein_coding
0.017312	0.264	1.089	ENSG00000163507	KIAA1524	protein_coding
0.017358	0.264	1.008	ENSG00000135318	NT5E	protein_coding
0.017385	0.264	1.04	ENSG00000082701	GSK3B	protein_coding
0.017406	0.264	1.286	ENSG00000150672	DLG2	protein_coding
0.017409	0.264	1.049	ENSG00000153936	HS2ST1	protein_coding
0.017411	0.264	0.945	ENSG00000241106	HLA-DOB	protein_coding
0.017415	0.264	0.957	ENSG00000147364	FBXO25	protein_coding
0.017429	0.264	1.03	ENSG00000147854	UHRF2	protein_coding
0.017443	0.264	1.229	ENSG00000151422	FER	protein_coding
0.017454	0.264	1.075	ENSG00000169607	CKAP2L	protein_coding
0.017468	0.264	0.856	ENSG00000181896	ZNF101	protein_coding
0.017479	0.264	1.001	ENSG00000213719	CLIC1	protein_coding
0.017537	0.265	0.778	ENSG00000225742	RP11-513G11.4	lincRNA
0.017565	0.265	1.023	ENSG00000166503	RP11-382A20.3	protein_coding
0.017568	0.265	1.193	ENSG00000139618	BRCA2	protein_coding
0.017607	0.265	1.041	ENSG00000106078	COBL	protein_coding
0.017642	0.265	1.007	ENSG00000145920	CPLX2	protein_coding
0.017677	0.265	1.021	ENSG00000113575	PPP2CA	protein_coding
0.017717	0.265	0.935	ENSG00000139508	SLC46A3	protein_coding
0.017732	0.265	0.85	ENSG00000240005	RP11-293A21.1	antisense
0.017752	0.265	1.001	ENSG00000125730	C3	protein_coding
0.017767	0.265	1.06	ENSG00000248323	RP11-213H15.3	lincRNA
0.01779	0.265	1.167	ENSG00000177374	HIC1	protein_coding
0.017791	0.265	1.055	ENSG00000148841	ITPRIP	protein_coding
0.017791	0.265	1.008	ENSG00000168243	GNG4	protein_coding
0.01781	0.265	1.135	ENSG00000196639	HRH1	protein_coding

0.017818	0.265	1.097	ENSG00000138246	DNAJC13	protein_coding
0.017859	0.265	0.985	ENSG00000154589	LY96	protein_coding
0.017862	0.265	1.089	ENSG00000157350	ST3GAL2	protein_coding
0.017898	0.266	0.83	ENSG00000198208	RPS6KL1	protein_coding
0.017926	0.266	1.044	ENSG00000124789	NUP153	protein_coding
0.017928	0.266	0.962	ENSG00000119729	RHOQ	protein_coding
0.017949	0.266	1.026	ENSG00000163734	CXCL3	protein_coding
0.017995	0.266	1.082	ENSG00000162779	AXDND1	protein_coding
0.018058	0.267	0.934	ENSG00000106948	AKNA	protein_coding
0.018121	0.267	1.154	ENSG00000227053	RP11-395B7.4	antisense
0.018178	0.267	0.918	ENSG00000135063	FAM189A2	protein_coding
0.018183	0.267	0.857	ENSG00000187486	KCNJ11	protein_coding
0.018187	0.267	1.029	ENSG00000244509	APOBEC3C	protein_coding
0.018188	0.267	1.008	ENSG00000124942	AHNAK	protein_coding
0.018253	0.268	1.223	ENSG00000140534	TICRR	protein_coding
0.018329	0.269	0.919	ENSG00000183044	ABAT	protein_coding
0.018332	0.269	1.178	ENSG00000197565	COL4A6	protein_coding
0.01837	0.269	1.167	ENSG00000102349	KLF8	protein_coding
0.01846	0.27	1.027	ENSG00000110172	CHORDC1	protein_coding
0.018475	0.27	1.018	ENSG00000100304	TTLL12	protein_coding
0.018579	0.271	1.01	ENSG00000104738	MCM4	protein_coding
0.018642	0.271	1.001	ENSG00000167553	TUBA1C	protein_coding
0.018652	0.271	1.006	ENSG00000046604	DSG2	protein_coding
0.018662	0.271	1.578	ENSG00000225826	LINC00626	lincRNA
0.018665	0.271	0.954	ENSG00000179144	GIMAP7	protein_coding
0.018722	0.272	0.986	ENSG00000121073	SLC35B1	protein_coding
0.018756	0.272	1.049	ENSG00000146476	C6orf211	protein_coding
0.018791	0.273	0.969	ENSG00000205629	LCMT1	protein_coding
0.0189	0.274	1.088	ENSG00000113790	EHHADH	protein_coding
0.019	0.275	1.159	ENSG00000146263	MMS22L	protein_coding
0.019007	0.275	1.028	ENSG00000108039	XPNPEP1	protein_coding
0.019022	0.275	1.067	ENSG00000137770	CTDSPL2	protein_coding
0.019028	0.275	1.084	ENSG00000241697	TMEFF1	protein_coding
0.019054	0.275	1.011	ENSG00000197766	CFD	protein_coding
0.019141	0.276	1.065	ENSG00000110025	SNX15	protein_coding
0.019217	0.277	1.089	ENSG00000126970	ZC4H2	protein_coding

0.019244	0.277	1.02	ENSG00000023228	NDUFS1	protein_coding
0.019272	0.277	0.943	ENSG00000182134	TDRKH	protein_coding
0.019295	0.277	0.981	ENSG00000167861	C17orf28	protein_coding
0.019317	0.277	0.92	ENSG00000105607	GCDH	protein_coding
0.019363	0.277	1.006	ENSG00000213977	TAX1BP3	protein_coding
0.019375	0.277	1.075	ENSG00000162614	NEXN	protein_coding
0.01941	0.277	1.004	ENSG00000168528	SERINC2	protein_coding
0.019448	0.278	1.204	ENSG00000162419	GMEB1	protein_coding
0.019477	0.278	1.004	ENSG00000182240	BACE2	protein_coding
0.019517	0.278	1.011	ENSG00000232220	AC008440.5	antisense
0.019569	0.279	0.931	ENSG00000072818	ACAP1	protein_coding
0.019712	0.28	1.031	ENSG00000079950	STX7	protein_coding
0.019791	0.281	1.012	ENSG00000132170	PPARG	protein_coding
0.019805	0.281	0.947	ENSG00000015133	CCDC88C	protein_coding
0.019825	0.281	1.026	ENSG00000183963	SMTN	protein_coding
0.019875	0.282	1.023	ENSG00000144959	NCEH1	protein_coding
0.019888	0.282	1.04	ENSG00000100246	DNAL4	protein_coding
0.01992	0.282	1.021	ENSG00000143850	PLEKHA6	protein_coding
0.020013	0.283	0.966	ENSG00000136720	HS6ST1	protein_coding
0.020042	0.283	0.98	ENSG00000171307	ZDHHC16	protein_coding
0.020044	0.283	1.024	ENSG00000090924	PLEKHG2	protein_coding
0.020062	0.283	1.017	ENSG00000177879	AP3S1	protein_coding
0.020106	0.283	1.06	ENSG00000166477	LEO1	protein_coding
0.020147	0.283	1.017	ENSG00000138600	SPPL2A	protein_coding
0.020226	0.284	1.042	ENSG00000070367	EXOC5	protein_coding
0.02026	0.284	1.036	ENSG00000074356	C17orf85	protein_coding
0.020343	0.285	1.011	ENSG00000224063	AC007319.1	antisense
0.020386	0.286	1.088	ENSG00000183137	CEP57L1	protein_coding
0.020479	0.287	1.013	ENSG00000151914	DST	protein_coding
0.020535	0.287	0.807	ENSG00000174951	FUT1	protein_coding
0.020603	0.288	1.021	ENSG00000132031	MATN3	protein_coding
0.020644	0.288	1.034	ENSG00000119541	VPS4B	protein_coding
0.020652	0.288	0.996	ENSG00000161798	AQP5	protein_coding
0.020674	0.288	1.067	ENSG00000166073	GPR176	protein_coding
0.020715	0.288	1.004	ENSG00000114867	EIF4G1	protein_coding
0.020774	0.289	0.973	ENSG00000144749	LRIG1	protein_coding

0.02082	0.289	1.027	ENSG00000167196	FBXO22	protein_coding
0.020871	0.29	1.037	ENSG00000158315	RHBDL2	protein_coding
0.020923	0.29	1.029	ENSG00000167080	B4GALNT2	protein_coding
0.020923	0.29	1.036	ENSG00000174469	CNTNAP2	protein_coding
0.020964	0.29	1.026	ENSG00000137831	UACA	protein_coding
0.021069	0.291	1.06	ENSG00000129951	hsa-mir-3187	protein_coding
0.021076	0.291	0.878	ENSG00000180535	BHLHA15	protein_coding
0.021086	0.291	0.99	ENSG00000182551	ADI1	protein_coding
0.021102	0.291	1.174	ENSG00000205060	SLC35B4	protein_coding
0.021123	0.291	1.01	ENSG00000013810	TACC3	protein_coding
0.021204	0.292	1.074	ENSG00000033178	UBA6	protein_coding
0.021257	0.292	1.02	ENSG00000135127	CCDC64	protein_coding
0.021321	0.293	1.016	ENSG00000180628	PCGF5	protein_coding
0.02133	0.293	1.008	ENSG00000134240	HMGCS2	protein_coding
0.021381	0.293	1.003	ENSG00000115053	NCL	protein_coding
0.021418	0.293	0.977	ENSG00000121057	AKAP1	protein_coding
0.021427	0.293	0.84	ENSG00000181035	SLC25A42	protein_coding
0.021451	0.293	1.088	ENSG00000118263	KLF7	protein_coding
0.021496	0.294	1.01	ENSG00000100664	EIF5	protein_coding
0.021641	0.295	1.033	ENSG00000169679	BUB1	protein_coding
0.021656	0.295	1.04	ENSG00000163638	ADAMTS9	protein_coding
0.021676	0.295	1.107	ENSG00000080345	RIF1	protein_coding
0.02171	0.296	1.098	ENSG00000169641	LUZP1	protein_coding
0.021727	0.296	1.039	ENSG00000144824	PHLDB2	protein_coding
0.021782	0.296	1.022	ENSG00000178718	RPP25	protein_coding
0.021792	0.296	1.016	ENSG00000137804	NUSAP1	protein_coding
0.021809	0.296	1.016	ENSG00000100401	RANGAP1	protein_coding
0.021824	0.296	1.006	ENSG00000122176	FMOD	protein_coding
0.021857	0.296	0.916	ENSG00000181045	SLC26A11	protein_coding
0.021865	0.296	0.612	ENSG00000132932	ATP8A2	protein_coding
0.021923	0.296	0.927	ENSG00000167476	JSRP1	protein_coding
0.021961	0.296	1.024	ENSG00000100934	SEC23A	protein_coding
0.021969	0.296	0.918	ENSG00000124508	BTN2A2	protein_coding
0.022088	0.298	1.033	ENSG00000177425	PAWR	protein_coding
0.022126	0.298	0.905	ENSG00000204175	GPRIN2	protein_coding
0.022146	0.298	1.086	ENSG00000155099	TMEM55A	protein_coding

0.02218	0.298	0.857	ENSG00000135472	FAIM2	protein_coding
0.022187	0.298	0.96	ENSG00000088899	RP5-1187M17.10	protein_coding
0.022273	0.299	0.956	ENSG00000182108	DEXI	protein_coding
0.022339	0.3	1.06	ENSG00000125657	TNFSF9	protein_coding
0.022387	0.3	1.003	ENSG00000002586	CD99	protein_coding
0.022391	0.3	0.934	ENSG00000048462	TNFRSF17	protein_coding
0.022413	0.3	0.785	ENSG00000163599	CTLA4	protein_coding
0.02244	0.3	1.045	ENSG00000162702	ZNF281	protein_coding
0.022452	0.3	0.861	ENSG00000163644	PPM1K	protein_coding
0.02253	0.3	1.049	ENSG00000165650	PDZD8	protein_coding
0.022566	0.301	1.016	ENSG00000213625	LEPROT	protein_coding
0.022718	0.302	1.063	ENSG00000112742	TTK	protein_coding
0.022723	0.302	1	ENSG00000133636	NTS	protein_coding
0.02273	0.302	0.892	ENSG00000011132	APBA3	protein_coding
0.022758	0.302	1.146	ENSG00000147655	RSPO2	protein_coding
0.02277	0.302	1.029	ENSG00000133104	SPG20	protein_coding
0.022851	0.303	1.058	ENSG00000006555	TTC22	protein_coding
0.022911	0.303	1.013	ENSG00000001036	FUCA2	protein_coding
0.022929	0.303	0.533	ENSG00000162630	B3GALT2	protein_coding
0.023063	0.305	1.024	ENSG00000139163	ETNK1	protein_coding
0.023066	0.305	1.025	ENSG00000139726	DENR	protein_coding
0.023101	0.305	0.965	ENSG00000143390	RFX5	protein_coding
0.023118	0.305	1.077	ENSG00000120539	MASTL	protein_coding
0.023163	0.305	1.003	ENSG00000183255	PTTG1IP	protein_coding
0.023174	0.305	1.009	ENSG00000115339	GALNT3	protein_coding
0.023261	0.306	1.153	ENSG00000164520	RAET1E	protein_coding
0.023419	0.308	0.937	ENSG00000158050	DUSP2	protein_coding
0.023482	0.308	1.21	ENSG00000131650	KREMEN2	protein_coding
0.023518	0.308	1.025	ENSG00000122641	INHBA	protein_coding
0.023544	0.308	0.919	ENSG00000187325	TAF9B	protein_coding
0.023562	0.308	1.019	ENSG00000196504	PRPF40A	protein_coding
0.02359	0.308	1.045	ENSG00000139117	CPNE8	protein_coding
0.023599	0.308	0.964	ENSG00000163521	GLB1L	protein_coding
0.023607	0.308	1.228	ENSG00000234787	LINC00458	lincRNA
0.02364	0.308	1.001	ENSG00000146674	IGFBP3	protein_coding
0.023643	0.308	0.978	ENSG00000114737	CISH	protein_coding

0.02366	0.308	1.829	ENSG00000230648	RP3-406P24.3	antisense
0.023668	0.308	1.015	ENSG00000130309	GLT25D1	protein_coding
0.023678	0.308	1.018	ENSG00000198087	CD2AP	protein_coding
0.023685	0.308	1.026	ENSG00000196369	SRGAP2B	protein_coding
0.023729	0.308	1.02	ENSG00000145431	PDGFC	protein_coding
0.023745	0.308	0.937	ENSG00000183248	AC010336.1	protein_coding
0.023793	0.308	0.954	ENSG00000164929	BAALC	protein_coding
0.024029	0.311	0.972	ENSG00000128928	IVD	protein_coding
0.024088	0.312	1.133	ENSG00000118496	FBXO30	protein_coding
0.024111	0.312	1.023	ENSG00000101384	JAG1	protein_coding
0.024141	0.312	1.091	ENSG00000074603	DPP8	protein_coding
0.024291	0.313	1.035	ENSG00000085491	SLC25A24	protein_coding
0.024326	0.314	1.052	ENSG00000153086	ACMSD	protein_coding
0.024434	0.315	1.019	ENSG00000115602	IL1RL1	protein_coding
0.024473	0.315	0.919	ENSG00000213096	ZNF254	protein_coding
0.024503	0.315	1.134	ENSG00000169432	SCN9A	protein_coding
0.024507	0.315	1.01	ENSG00000162174	ASRGL1	protein_coding
0.024609	0.316	0.988	ENSG00000178927	C17orf62	protein_coding
0.024678	0.316	0.968	ENSG00000196189	SEMA4A	protein_coding
0.024698	0.316	1.002	ENSG00000123689	G0S2	protein_coding
0.02472	0.316	1.029	ENSG00000102753	KPNA3	protein_coding
0.02473	0.316	0.969	ENSG00000137266	SLC22A23	protein_coding
0.024781	0.317	1.041	ENSG00000073614	KDM5A	protein_coding
0.024808	0.317	0.983	ENSG00000163879	DNALI1	protein_coding
0.024853	0.317	1.082	ENSG00000204055	RP11-247A12.2	antisense
0.024855	0.317	1.017	ENSG00000151247	EIF4E	protein_coding
0.024878	0.317	1.017	ENSG00000136802	LRRC8A	protein_coding
0.024946	0.317	1	ENSG00000149925	ALDOA	protein_coding
0.024993	0.317	0.976	ENSG00000131370	SH3BP5	protein_coding
0.024995	0.317	0.89	ENSG00000128594	LRRC4	protein_coding
0.025002	0.317	1.041	ENSG00000173546	CSPG4	protein_coding
0.025014	0.317	0.965	ENSG00000088808	PPP1R13B	protein_coding
0.025049	0.317	1.095	ENSG00000196550	FAM72A	protein_coding
0.025082	0.318	0.858	ENSG00000186787	SPIN2B	protein_coding
0.025108	0.318	1.042	ENSG00000170385	SLC30A1	protein_coding
0.025127	0.318	0.856	ENSG00000136925	TSTD2	protein_coding

0.025169	0.318	1.001	ENSG00000140564	FURIN	protein_coding
0.025177	0.318	0.965	ENSG00000180448	HMHA1	protein_coding
0.025222	0.318	0.999	ENSG00000231389	HLA-DPA1	protein_coding
0.025271	0.318	1.025	ENSG00000165996	PTPLA	protein_coding
0.025304	0.318	1.032	ENSG00000188677	PARVB	protein_coding
0.025316	0.318	1.032	ENSG00000168884	TNIP2	protein_coding
0.025356	0.319	1.01	ENSG00000142327	RNPEPL1	protein_coding
0.025429	0.319	1.049	ENSG00000059728	MXD1	protein_coding
0.025434	0.319	0.961	ENSG00000121067	SPOP	protein_coding
0.02544	0.319	0.878	ENSG00000179023	KLHDC7A	protein_coding
0.025472	0.319	1.131	ENSG00000155330	C16orf87	protein_coding
0.025558	0.32	1.009	ENSG00000111802	TDP2	protein_coding
0.025605	0.32	0.992	ENSG00000099958	DERL3	protein_coding
0.025636	0.32	1.181	ENSG00000163590	PPM1L	protein_coding
0.025701	0.32	0.947	ENSG00000086619	ERO1LB	protein_coding
0.025707	0.32	1.074	ENSG00000112039	FANCE	protein_coding
0.025714	0.32	1.083	ENSG00000121964	GTDC1	protein_coding
0.025814	0.32	1.018	ENSG00000117724	CENPF	protein_coding
0.025815	0.32	1.018	ENSG00000163558	PRKCI	protein_coding
0.025831	0.32	1.027	ENSG00000041353	RAB27B	protein_coding
0.025834	0.32	0.972	ENSG00000110721	CHKA	protein_coding
0.025842	0.32	1.029	ENSG00000176105	YES1	protein_coding
0.025848	0.32	1.006	ENSG00000142634	EFHD2	protein_coding
0.025894	0.321	1.073	ENSG00000166170	BAG5	protein_coding
0.025947	0.321	1.131	ENSG00000111696	NT5DC3	protein_coding
0.025948	0.321	1.121	ENSG00000196505	GDAP2	protein_coding
0.025985	0.321	1.118	ENSG00000203943	SAMD13	protein_coding
0.026026	0.321	1.037	ENSG00000143167	GPA33	protein_coding
0.02605	0.321	1.023	ENSG00000165449	SLC16A9	protein_coding
0.02605	0.321	0.931	ENSG00000175463	TBC1D10C	protein_coding
0.026051	0.321	1.131	ENSG00000185761	ADAMTSL5	protein_coding
0.026091	0.321	1.016	ENSG00000006831	ADIPOR2	protein_coding
0.026112	0.321	0.886	ENSG00000185565	LSAMP	protein_coding
0.026129	0.321	1.057	ENSG00000124151	NCOA3	protein_coding
0.026208	0.321	1.185	ENSG00000198948	MFAP3L	protein_coding
0.026259	0.321	1.015	ENSG00000155506	LARP1	protein_coding

0.026282	0.321	0.955	ENSG00000123329	ARHGAP9	protein_coding
0.026306	0.321	1.046	ENSG00000136002	ARHGEF4	protein_coding
0.026308	0.321	1.106	ENSG00000008083	JARID2	protein_coding
0.026317	0.321	1.075	ENSG00000170775	GPR37	protein_coding
0.026319	0.321	0.972	ENSG00000145022	TCTA	protein_coding
0.026335	0.321	1.084	ENSG00000173705	SUSD5	protein_coding
0.026392	0.322	1.024	ENSG00000173482	PTPRM	protein_coding
0.026427	0.322	1.017	ENSG00000168575	SLC20A2	protein_coding
0.026462	0.322	1.064	ENSG00000042088	TDP1	protein_coding
0.026463	0.322	1.091	ENSG00000135220	UGT2A3	protein_coding
0.026491	0.322	0.985	ENSG00000151500	THYN1	protein_coding
0.026532	0.322	1.019	ENSG00000120211	INSL4	protein_coding
0.02668	0.324	1.012	ENSG00000111666	CHPT1	protein_coding
0.026782	0.324	0.999	ENSG00000223865	HLA-DPB1	protein_coding
0.026783	0.324	1.011	ENSG00000107581	EIF3A	protein_coding
0.026805	0.324	1.047	ENSG00000167721	TSR1	protein_coding
0.026861	0.324	1.002	ENSG00000167460	TPM4	protein_coding
0.026868	0.324	1.09	ENSG00000157470	FAM81A	protein_coding
0.026868	0.324	1.174	ENSG00000241852	C8orf58	protein_coding
0.02687	0.324	1.007	ENSG00000122884	P4HA1	protein_coding
0.026929	0.325	1.101	ENSG00000176678	FOXL1	protein_coding
0.026941	0.325	1.008	ENSG00000097021	ACOT7	protein_coding
0.026997	0.325	1.075	ENSG00000169876	MUC17	protein_coding
0.027188	0.327	0.914	ENSG00000139194	RBP5	protein_coding
0.027205	0.327	1.013	ENSG00000150722	PPP1R1C	protein_coding
0.027252	0.327	1.001	ENSG00000160213	CSTB	protein_coding
0.027281	0.327	1.07	ENSG00000241945	PWP2	protein_coding
0.027289	0.327	0.944	ENSG00000176476	CCDC101	protein_coding
0.027326	0.327	0.921	ENSG00000226777	KIAA0125	lincRNA
0.027458	0.329	1	ENSG00000171560	FGA	protein_coding
0.027506	0.329	1.013	ENSG00000236453	AC003092.1	lincRNA
0.027655	0.33	1.046	ENSG00000116199	FAM20B	protein_coding
0.027671	0.33	0.921	ENSG00000091592	NLRP1	protein_coding
0.027671	0.33	0.825	ENSG00000229124	RP11-124N14.4	antisense
0.027734	0.33	1.058	ENSG00000124216	SNAI1	protein_coding
0.027743	0.33	1.069	ENSG00000182749	PAQR7	protein_coding

0.027772	0.331	1.061	ENSG00000172548	NIPAL4	protein_coding
0.02784	0.331	1.021	ENSG00000080031	PTPRH	protein_coding
0.027927	0.332	0.98	ENSG00000196586	MYO6	protein_coding
0.027974	0.332	1.488	ENSG00000118520	ARG1	protein_coding
0.028	0.332	0.958	ENSG00000182208	MOB2	protein_coding
0.028025	0.332	0.786	ENSG00000083828	ZNF586	protein_coding
0.028026	0.332	1.001	ENSG00000204983	PRSS1	protein_coding
0.028057	0.332	0.855	ENSG00000063176	SPHK2	protein_coding
0.028182	0.333	1.043	ENSG00000188483	IER5L	protein_coding
0.028204	0.333	1.184	ENSG00000249590	RP4-539M6.19	protein_coding
0.028206	0.333	0.914	ENSG00000172215	CXCR6	protein_coding
0.028226	0.333	1.02	ENSG00000105887	MTPN	protein_coding
0.028264	0.333	1.085	ENSG00000196810	CTBP1-AS1	antisense
0.028283	0.333	0.979	ENSG00000167286	CD3D	protein_coding
0.028293	0.333	1.028	ENSG00000211455	STK38L	protein_coding
0.028311	0.333	1.038	ENSG00000236673	RP11-69I8.2	lincRNA
0.028374	0.333	1.033	ENSG00000164823	OSGIN2	protein_coding
0.028435	0.333	0.942	ENSG00000103274	NUBP1	protein_coding
0.028489	0.333	1.042	ENSG00000064726	BTBD1	protein_coding
0.028502	0.333	0.799	ENSG00000162148	PPP1R32	protein_coding
0.028519	0.333	1.013	ENSG00000155363	MOV10	protein_coding
0.028522	0.333	0.885	ENSG00000171533	MAP6	protein_coding
0.028586	0.333	1.003	ENSG00000178473	UCN3	protein_coding
0.02859	0.333	1.007	ENSG00000086061	DNAJA1	protein_coding
0.02859	0.333	1.041	ENSG00000143061	IGSF3	protein_coding
0.028646	0.333	1.079	ENSG00000134852	CLOCK	protein_coding
0.028651	0.333	0.781	ENSG00000137098	SPAG8	protein_coding
0.028675	0.333	1.004	ENSG00000094755	GABRP	protein_coding
0.028708	0.333	1.058	ENSG00000182552	RWDD4	protein_coding
0.028712	0.333	1.005	ENSG00000196141	SPATS2L	protein_coding
0.028717	0.333	1.011	ENSG00000147454	SLC25A37	protein_coding
0.02872	0.333	0.828	ENSG00000176542	KIAA2018	protein_coding
0.028722	0.333	1.032	ENSG00000009844	VTA1	protein_coding
0.028762	0.334	1.055	ENSG00000198768	APCDD1L	protein_coding
0.028821	0.334	0.989	ENSG00000171346	KRT15	protein_coding
0.028823	0.334	1.127	ENSG00000228318	AP001610.5	antisense

0.028928	0.335	0.906	ENSG00000137078	SIT1	protein_coding
0.028935	0.335	1.025	ENSG00000176903	PNMA1	protein_coding
0.028963	0.335	0.902	ENSG00000168297	PXK	protein_coding
0.028999	0.335	1.018	ENSG00000104131	EIF3J	protein_coding
0.029033	0.335	1.014	ENSG00000123374	CDK2	protein_coding
0.029059	0.335	1.105	ENSG00000005513	SOX8	protein_coding
0.029072	0.335	1.031	ENSG00000140044	JDP2	protein_coding
0.029099	0.335	1.009	ENSG00000203485	INF2	protein_coding
0.029214	0.336	1.187	ENSG00000128923	FAM63B	protein_coding
0.029279	0.336	1.044	ENSG00000121211	MND1	protein_coding
0.029283	0.336	0.972	ENSG00000166105	GLB1L3	protein_coding
0.029386	0.337	1.044	ENSG00000197498	RPF2	protein_coding
0.029397	0.337	1.073	ENSG00000198142	SOWAHC	protein_coding
0.029442	0.337	1.029	ENSG00000138180	CEP55	protein_coding
0.029503	0.337	1.096	ENSG00000146410	FAM54A	protein_coding
0.029508	0.337	1.037	ENSG00000168556	ING2	protein_coding
0.029558	0.337	0.894	ENSG00000103264	FBXO31	protein_coding
0.029565	0.337	0.607	ENSG00000151892	GFRA1	protein_coding
0.029571	0.337	1.037	ENSG00000097007	ABL1	protein_coding
0.029595	0.337	0.987	ENSG00000132581	SDF2	protein_coding
0.029638	0.338	1.019	ENSG00000006451	RALA	protein_coding
0.029703	0.338	1.099	ENSG00000198146	ZNF770	protein_coding
0.029746	0.338	0.913	ENSG00000169249	ZRSR2	protein_coding
0.029775	0.338	0.963	ENSG00000139193	CD27	protein_coding
0.029797	0.338	0.429	ENSG00000170324	FRMPD2	protein_coding
0.029841	0.339	0.98	ENSG00000128590	DNAJB9	protein_coding
0.029881	0.339	1.079	ENSG00000100335	SMCR7L	protein_coding
0.029897	0.339	1.027	ENSG00000058804	TMEM48	protein_coding
0.029914	0.339	1.143	ENSG00000110427	KIAA1549L	protein_coding
0.029954	0.339	1.085	ENSG00000097046	CDC7	protein_coding
0.030035	0.339	0.924	ENSG00000166669	ATF7IP2	protein_coding
0.030072	0.339	1.018	ENSG00000028203	VEZT	protein_coding
0.030094	0.339	1.022	ENSG00000144655	CSRNP1	protein_coding
0.030152	0.339	0.981	ENSG00000151498	ACAD8	protein_coding
0.030157	0.339	1.052	ENSG00000100599	RIN3	protein_coding
0.030167	0.339	1.064	ENSG00000112290	WASF1	protein_coding

0.030187	0.339	1.01	ENSG00000122952	ZWINT	protein_coding
0.030194	0.339	0.861	ENSG00000145362	ANK2	protein_coding
0.030201	0.339	1.013	ENSG00000104695	PPP2CB	protein_coding
0.030202	0.339	1.007	ENSG00000071127	WDR1	protein_coding
0.03021	0.339	0.947	ENSG00000141579	ZNF750	protein_coding
0.030218	0.339	1.017	ENSG00000173674	EIF1AX	protein_coding
0.030241	0.339	1.04	ENSG00000166889	PATL1	protein_coding
0.030254	0.339	1.115	ENSG00000151136	BTBD11	protein_coding
0.0303	0.339	1.012	ENSG00000215301	DDX3X	protein_coding
0.030382	0.34	1.011	ENSG00000131876	SNRPA1	protein_coding
0.030445	0.34	1.028	ENSG00000121152	NCAPH	protein_coding
0.030529	0.341	1.024	ENSG00000139722	VPS37B	protein_coding
0.030632	0.342	1.008	ENSG00000105401	CDC37	protein_coding
0.030685	0.342	1.047	ENSG00000157538	DSCR3	protein_coding
0.030745	0.342	1.008	ENSG00000099940	SNAP29	protein_coding
0.030761	0.342	1.041	ENSG00000137962	ARHGAP29	protein_coding
0.030827	0.343	1.041	ENSG00000198586	TLK1	protein_coding
0.030828	0.343	1.004	ENSG00000072274	TFRC	protein_coding
0.030858	0.343	0.994	ENSG00000136352	NKX2-1	protein_coding
0.030928	0.343	0.958	ENSG00000183508	FAM46C	protein_coding
0.030928	0.343	0.809	ENSG00000148832	PAOX	protein_coding
0.030933	0.343	1.107	ENSG00000198513	ATL1	protein_coding
0.030954	0.343	0.993	ENSG00000105519	CAPS	protein_coding
0.030974	0.343	1.039	ENSG00000139116	KIF21A	protein_coding
0.031085	0.344	0.968	ENSG00000181523	SGSH	protein_coding
0.031149	0.344	1.01	ENSG00000204267	TAP2	protein_coding
0.031164	0.344	1.701	ENSG00000148680	HTR7	protein_coding
0.03124	0.345	0.979	ENSG00000247774	PCED1B-AS1	processed_transcript
0.031271	0.345	0.995	ENSG00000108654	DDX5	protein_coding
0.031305	0.345	0.949	ENSG00000197165	SULT1A2	protein_coding
0.031366	0.345	0.94	ENSG00000076351	SLC46A1	protein_coding
0.031404	0.345	1.016	ENSG00000123064	DDX54	protein_coding
0.031437	0.346	0.912	ENSG00000137103	TMEM8B	protein_coding
0.031491	0.346	1.082	ENSG00000125741	OPA3	protein_coding
0.031501	0.346	1.009	ENSG00000076706	MCAM	protein_coding
0.031551	0.346	1.053	ENSG00000198498	TMA16	protein_coding

0.03159	0.346	1.015	ENSG00000106554	CHCHD3	protein_coding
0.03161	0.346	0.851	ENSG00000236859	AC018737.1	antisense
0.0318	0.348	1.048	ENSG00000162599	NFIA	protein_coding
0.031869	0.348	1.042	ENSG00000180745	CLRN3	protein_coding
0.031879	0.348	0.965	ENSG00000149582	TMEM25	protein_coding
0.031881	0.348	0.956	ENSG00000064545	TMEM161A	protein_coding
0.031915	0.348	1.16	ENSG00000189433	GJB4	protein_coding
0.031994	0.349	1.054	ENSG00000169436	COL22A1	protein_coding
0.032	0.349	0.114	ENSG00000112818	MEP1A	protein_coding
0.032139	0.35	1.016	ENSG00000075213	SEMA3A	protein_coding
0.032165	0.35	1.048	ENSG00000185009	AP3M1	protein_coding
0.032262	0.351	1.012	ENSG00000111335	OAS2	protein_coding
0.032268	0.351	1.016	ENSG00000248538	RP11-10A14.5	lincRNA
0.032296	0.351	0.882	ENSG00000214050	FBXO16	protein_coding
0.032374	0.351	0.91	ENSG00000178935	ZNF552	protein_coding
0.032394	0.351	0.89	ENSG00000145088	EAF2	protein_coding
0.032456	0.351	1.05	ENSG00000168502	SOGA2	protein_coding
0.032504	0.351	0.945	ENSG00000186104	CYP2R1	protein_coding
0.032515	0.351	1.127	ENSG00000151640	DPYSL4	protein_coding
0.032516	0.351	1.002	ENSG00000160789	LMNA	protein_coding
0.032522	0.351	1.008	ENSG00000099812	C19orf21	protein_coding
0.032547	0.351	0.849	ENSG00000124374	PAIP2B	protein_coding
0.032638	0.352	1.022	ENSG00000169855	ROBO1	protein_coding
0.032671	0.352	1.026	ENSG00000213949	ITGA1	protein_coding
0.03269	0.352	1.076	ENSG00000083642	PDS5B	protein_coding
0.032734	0.352	1.009	ENSG00000136295	TTYH3	protein_coding
0.032761	0.352	1.002	ENSG00000088986	DYNLL1	protein_coding
0.032859	0.353	1.005	ENSG00000188157	AGRN	protein_coding
0.032899	0.353	1.047	ENSG00000136143	SUCLA2	protein_coding
0.03291	0.353	1.061	ENSG00000187824	TMEM220	protein_coding
0.032936	0.353	1.03	ENSG00000106688	SLC1A1	protein_coding
0.032971	0.353	1.16	ENSG00000143322	ABL2	protein_coding
0.033004	0.353	0.96	ENSG00000101417	PXMP4	protein_coding
0.033021	0.353	1.035	ENSG00000198056	PRIM1	protein_coding
0.033033	0.353	0.958	ENSG00000122122	SASH3	protein_coding
0.033036	0.353	1.087	ENSG00000143147	GPR161	protein_coding

0.033048	0.353	1.012	ENSG00000111331	OAS3	protein_coding
0.033101	0.353	1.087	ENSG00000020922	MRE11A	protein_coding
0.033154	0.353	1.151	ENSG00000119906	FAM178A	protein_coding
0.033161	0.353	1.042	ENSG00000107862	GBF1	protein_coding
0.033197	0.353	1.042	ENSG00000213214	ARHGEF35	protein_coding
0.0332	0.353	1.072	ENSG00000129194	SOX15	protein_coding
0.033267	0.354	1.018	ENSG00000129667	RHBDF2	protein_coding
0.033284	0.354	1.03	ENSG00000158158	CNNM4	protein_coding
0.033303	0.354	1.005	ENSG00000128050	PAICS	protein_coding
0.033367	0.354	1.079	ENSG00000174791	RIN1	protein_coding
0.033382	0.354	1.013	ENSG00000105755	ETHE1	protein_coding
0.033399	0.354	0.834	ENSG00000203288	RP11-98D18.9	antisense
0.033471	0.354	1.004	ENSG00000103202	NME4	protein_coding
0.033474	0.354	0.905	ENSG00000160908	ZNF394	protein_coding
0.033486	0.354	1.148	ENSG00000168807	SNTB2	protein_coding
0.033561	0.355	0.97	ENSG00000103460	TOX3	protein_coding
0.033653	0.355	1.218	ENSG00000146858	ZC3HAV1L	protein_coding
0.033659	0.355	1.02	ENSG00000116237	ICMT	protein_coding
0.033745	0.356	1.004	ENSG00000166681	NGFRAP1	protein_coding
0.033762	0.356	1	ENSG00000204287	HLA-DRA	protein_coding
0.034041	0.358	1.033	ENSG00000067955	CBFB	protein_coding
0.034042	0.358	1.02	ENSG00000089472	HEPH	protein_coding
0.034043	0.358	1.023	ENSG00000166250	CLMP	protein_coding
0.034113	0.358	0.964	ENSG00000215915	ATAD3C	protein_coding
0.034122	0.358	1.003	ENSG00000107159	CA9	protein_coding
0.034124	0.358	1.049	ENSG00000132749	MTL5	protein_coding
0.034136	0.358	1.032	ENSG00000172845	SP3	protein_coding
0.034143	0.358	1.027	ENSG00000197170	PSMD12	protein_coding
0.034171	0.358	1.04	ENSG00000156787	WDR67	protein_coding
0.034202	0.358	1.103	ENSG00000239839	DEFA3	protein_coding
0.034292	0.358	0.889	ENSG00000118308	LRMP	protein_coding
0.034311	0.358	1.061	ENSG00000166881	TMEM194A	protein_coding
0.034322	0.358	0.835	ENSG00000185905	C16orf54	protein_coding
0.034372	0.358	0.762	ENSG00000169239	CA5B	protein_coding
0.034416	0.358	0.958	ENSG00000175575	PAAF1	protein_coding
0.034423	0.358	1.113	ENSG00000215712	TMEM242	protein_coding

0.034437	0.358	1.118	ENSG00000146276	GABRR1	protein_coding
0.034457	0.358	1.015	ENSG00000108219	TSPAN14	protein_coding
0.034511	0.359	1.006	ENSG00000109854	HTATIP2	protein_coding
0.034544	0.359	1.035	ENSG00000116750	UCHL5	protein_coding
0.034578	0.359	1.101	ENSG00000166822	TMEM170A	protein_coding
0.034581	0.359	1.042	ENSG00000134146	ATPBD4	protein_coding
0.034693	0.359	0.833	ENSG00000188687	SLC4A5	protein_coding
0.034706	0.359	0.958	ENSG00000189283	FHIT	protein_coding
0.03473	0.359	1.01	ENSG00000165102	HGSNAT	protein_coding
0.034741	0.359	0.929	ENSG00000125352	RNF113A	protein_coding
0.034753	0.359	0.992	ENSG00000184489	PTP4A3	protein_coding
0.034824	0.36	0.939	ENSG00000180730	SHISA2	protein_coding
0.034875	0.36	1.003	ENSG00000134827	TCN1	protein_coding
0.034885	0.36	1.057	ENSG00000174442	ZWILCH	protein_coding
0.034983	0.361	1.022	ENSG00000164683	HEY1	protein_coding
0.035072	0.361	1.016	ENSG00000142694	FAM176B	protein_coding
0.035086	0.361	1.112	ENSG00000163530	DPPA2	protein_coding
0.035126	0.361	0.765	ENSG00000139537	CCDC65	protein_coding
0.035176	0.361	0.824	ENSG00000179598	PLD6	protein_coding
0.035189	0.361	0.922	ENSG00000165548	TMEM63C	protein_coding
0.0352	0.361	1.007	ENSG00000184900	SUMO3	protein_coding
0.035203	0.361	0.961	ENSG00000122299	ZC3H7A	protein_coding
0.03528	0.362	1.011	ENSG00000099783	HNRNPM	protein_coding
0.035317	0.362	1.073	ENSG00000104722	NEFM	protein_coding
0.035347	0.362	0.997	ENSG00000123131	PRDX4	protein_coding
0.035381	0.362	0.677	ENSG00000136449	MYCBPAP	protein_coding
0.035382	0.362	1.039	ENSG00000138303	ASCC1	protein_coding
0.035512	0.363	0.916	ENSG00000141569	TRIM65	protein_coding
0.035633	0.364	0.993	ENSG00000165140	FBP1	protein_coding
0.035652	0.364	1.001	ENSG00000105825	TFPI2	protein_coding
0.035714	0.364	1.028	ENSG00000172137	CALB2	protein_coding
0.03572	0.364	1.002	ENSG00000105220	GPI	protein_coding
0.035723	0.364	1.026	ENSG00000141503	MINK1	protein_coding
0.035758	0.364	1.002	ENSG00000122566	HNRNPA2B1	protein_coding
0.035767	0.364	0.918	ENSG00000119866	BCL11A	protein_coding
0.035775	0.364	1.005	ENSG00000197324	LRP10	protein_coding

0.035849	0.364	0.976	ENSG00000126778	SIX1	protein_coding
0.035859	0.364	0.878	ENSG00000234753	RP11-328M4.2	antisense
0.035874	0.364	2.398	ENSG00000152086	TUBA3E	protein_coding
0.035981	0.364	1.159	ENSG00000010539	ZNF200	protein_coding
0.036015	0.364	1.046	ENSG00000011332	DPF1	protein_coding
0.036018	0.364	0.997	ENSG00000132386	SERPINF1	protein_coding
0.036029	0.364	1.017	ENSG00000136270	TBRG4	protein_coding
0.036032	0.364	1.02	ENSG00000071539	TRIP13	protein_coding
0.036126	0.364	0.991	ENSG00000113811	RP11-884K10.5	protein_coding
0.036159	0.364	0.989	ENSG00000173376	NDNF	protein_coding
0.036163	0.364	0.981	ENSG00000214046	C19orf42	protein_coding
0.036203	0.364	1.218	ENSG00000119509	INVS	protein_coding
0.03622	0.364	1.227	ENSG00000131096	PYY	protein_coding
0.03623	0.364	1.016	ENSG00000111665	CDCA3	protein_coding
0.036246	0.364	1.017	ENSG00000174564	IL20RB	protein_coding
0.036271	0.364	1.012	ENSG00000110047	EHD1	protein_coding
0.036278	0.364	1.009	ENSG00000164096	C4orf3	protein_coding
0.036324	0.364	0.987	ENSG00000108950	FAM20A	protein_coding
0.036334	0.364	0.866	ENSG00000250237	CTC-498J12.1	lincRNA
0.036368	0.364	0.814	ENSG00000204428	LY6G5C	protein_coding
0.036371	0.364	0.99	ENSG00000239779	WBP1	protein_coding
0.036373	0.364	0.995	ENSG00000104870	FCGRT	protein_coding
0.036451	0.365	0.845	ENSG00000233483	CTD-2020K17.4	antisense
0.036485	0.365	0.976	ENSG00000186907	RTN4RL2	protein_coding
0.036497	0.365	1.059	ENSG00000177335	C8orf31	processed_transcript
0.036595	0.365	1.078	ENSG00000151092	NGLY1	protein_coding
0.036701	0.366	1.053	ENSG00000107201	DDX58	protein_coding
0.036722	0.366	1.001	ENSG00000135047	CTSL1	protein_coding
0.036807	0.366	1.047	ENSG00000164128	NPY1R	protein_coding
0.036833	0.366	1.005	ENSG00000066322	ELOVL1	protein_coding
0.03687	0.366	1.039	ENSG00000158104	HPD	protein_coding
0.036871	0.366	1.002	ENSG00000196878	LAMB3	protein_coding
0.036875	0.366	1.012	ENSG00000136450	SRSF1	protein_coding
0.03697	0.367	0.925	ENSG00000196167	C11orf92	antisense
0.036976	0.367	0.992	ENSG00000184584	TMEM173	protein_coding
0.037011	0.367	0.796	ENSG00000163704	PRRT3	protein_coding

0.037023	0.367	0.952	ENSG00000173540	GMPPB	protein_coding
0.037135	0.368	1.051	ENSG00000189057	FAM111B	protein_coding
0.037143	0.368	1.037	ENSG00000109805	NCAPG	protein_coding
0.037241	0.368	0.941	ENSG00000162104	ADCY9	protein_coding
0.037281	0.369	1.134	ENSG00000146776	ATXN7L1	protein_coding
0.037377	0.369	0.966	ENSG00000167925	GHDC	protein_coding
0.037401	0.369	1.004	ENSG00000114638	UPK1B	protein_coding
0.037515	0.37	1.072	ENSG00000230733	AC092171.4	lincRNA
0.037613	0.371	1.023	ENSG00000110660	SLC35F2	protein_coding
0.03762	0.371	1.036	ENSG00000163166	IWS1	protein_coding
0.037682	0.371	0.891	ENSG00000172322	CLEC12A	protein_coding
0.037717	0.371	1.008	ENSG00000136271	DDX56	protein_coding
0.037729	0.371	1.021	ENSG00000134690	CDCA8	protein_coding
0.037788	0.371	0.715	ENSG00000179761	PIPOX	protein_coding
0.037851	0.372	0.989	ENSG00000105369	CD79A	protein_coding
0.037918	0.372	1.093	ENSG00000075391	RASAL2	protein_coding
0.03795	0.372	0.853	ENSG00000021645	NRXN3	protein_coding
0.038204	0.374	1.115	ENSG00000085185	BCORL1	protein_coding
0.038262	0.375	1.066	ENSG00000101945	SUV39H1	protein_coding
0.038282	0.375	1.005	ENSG00000168385	41884	protein_coding
0.03832	0.375	1.005	ENSG00000104687	GSR	protein_coding
0.038427	0.376	0.881	ENSG00000178796	RIIAD1	protein_coding
0.038571	0.377	1.027	ENSG00000179295	PTPN11	protein_coding
0.038633	0.377	0.777	ENSG00000135338	LCA5	protein_coding
0.038692	0.377	1.074	ENSG00000122592	HOXA7	protein_coding
0.038702	0.377	0.966	ENSG00000068903	SIRT2	protein_coding
0.038707	0.377	1.018	ENSG00000023839	ABCC2	protein_coding
0.038773	0.378	1.009	ENSG00000114416	FXR1	protein_coding
0.038842	0.378	1.03	ENSG00000128487	SPECC1	protein_coding
0.038896	0.378	1.014	ENSG00000166582	CENPV	protein_coding
0.038913	0.378	1.009	ENSG00000164880	INTS1	protein_coding
0.038915	0.378	1.006	ENSG00000171552	BCL2L1	protein_coding
0.038928	0.378	0.834	ENSG00000144182	LIPT1	protein_coding
0.03893	0.378	0.912	ENSG00000158220	ESYT3	protein_coding
0.038995	0.378	1.01	ENSG00000100764	PSMC1	protein_coding
0.039058	0.378	1.034	ENSG00000163661	PTX3	protein_coding

0.039122	0.379	1.03	ENSG00000236886	AC007563.5	antisense
0.039156	0.379	1.034	ENSG00000160294	MCM3AP	protein_coding
0.039208	0.379	1.04	ENSG00000085760	MTIF2	protein_coding
0.039258	0.379	1.007	ENSG00000169372	CRADD	protein_coding
0.039264	0.379	1.022	ENSG00000164308	ERAP2	protein_coding
0.039328	0.38	0.823	ENSG00000182162	P2RY8	protein_coding
0.039386	0.38	1.089	ENSG00000143479	DYRK3	protein_coding
0.039431	0.38	1.013	ENSG00000186174	BCL9L	protein_coding
0.039558	0.381	0.999	ENSG00000179344	HLA-DQB1	protein_coding
0.039634	0.381	1.004	ENSG00000111481	COPZ1	protein_coding
0.039659	0.381	1.036	ENSG00000146918	NCAPG2	protein_coding
0.039665	0.381	1.101	ENSG00000075702	WDR62	protein_coding
0.039669	0.381	1.026	ENSG00000050748	MAPK9	protein_coding
0.039729	0.381	1.072	ENSG00000153294	GPR115	protein_coding
0.039832	0.382	1.009	ENSG00000124795	DEK	protein_coding
0.039864	0.382	1.007	ENSG00000073921	PICALM	protein_coding
0.039904	0.382	1.016	ENSG00000106268	NUDT1	protein_coding
0.039947	0.383	1.27	ENSG00000174007	CEP19	protein_coding
0.040003	0.383	1.007	ENSG00000103855	CD276	protein_coding
0.040093	0.383	1.035	ENSG00000133997	MED6	protein_coding
0.040156	0.384	1.045	ENSG00000163249	CCNYL1	protein_coding
0.040168	0.384	1.03	ENSG00000157193	LRP8	protein_coding
0.040206	0.384	0.288	ENSG00000197993	KEL	protein_coding
0.040263	0.384	1.012	ENSG00000100554	ATP6V1D	protein_coding
0.040283	0.384	1.038	ENSG00000160145	KALRN	protein_coding
0.040343	0.384	1.05	ENSG00000054983	GALC	protein_coding
0.040355	0.384	0.974	ENSG00000214293	RSBN1L-AS1	lincRNA
0.040377	0.384	0.848	ENSG00000189431	RASSF10	protein_coding
0.040454	0.385	1.063	ENSG00000187097	ENTPD5	protein_coding
0.040523	0.385	1.018	ENSG00000154102	C16orf74	protein_coding
0.040559	0.385	0.864	ENSG00000138468	SENP7	protein_coding
0.04057	0.385	1.161	ENSG00000177888	ZBTB41	protein_coding
0.040588	0.385	0.946	ENSG00000112659	CUL9	protein_coding
0.040617	0.385	0.992	ENSG00000103316	CRYM	protein_coding
0.04062	0.385	1.011	ENSG00000144118	RALB	protein_coding
0.040703	0.385	1.012	ENSG00000110880	CORO1C	protein_coding

0.040788	0.386	1.036	ENSG00000099810	MTAP	protein_coding
0.040823	0.386	0.953	ENSG00000063180	CA11	protein_coding
0.040885	0.386	0.288	ENSG00000167094	TTC16	protein_coding
0.040938	0.387	1.002	ENSG00000092199	HNRNPC	protein_coding
0.041003	0.387	1.109	ENSG00000069943	PIGB	protein_coding
0.041017	0.387	1.005	ENSG00000102007	PLP2	protein_coding
0.041048	0.387	1.051	ENSG00000126773	PCNXL4	protein_coding
0.041065	0.387	0.69	ENSG00000172673	THEMIS	protein_coding
0.04108	0.387	0.983	ENSG00000137486	ARRB1	protein_coding
0.041117	0.387	1.012	ENSG00000128951	DUT	protein_coding
0.041161	0.387	1.105	ENSG00000173145	NOC3L	protein_coding
0.041179	0.387	1.007	ENSG00000138434	SSFA2	protein_coding
0.041185	0.387	1.021	ENSG00000232774	RP11-47I22.3	lincRNA
0.041349	0.387	1.006	ENSG00000135269	TES	protein_coding
0.041352	0.387	1.018	ENSG00000162434	JAK1	protein_coding
0.041354	0.387	1.121	ENSG00000183580	FBXL7	protein_coding
0.041361	0.387	1.011	ENSG00000137693	YAP1	protein_coding
0.041384	0.387	0.961	ENSG00000205744	DENND1C	protein_coding
0.041384	0.387	1.084	ENSG00000160447	PKN3	protein_coding
0.041413	0.387	1.014	ENSG00000135932	CAB39	protein_coding
0.041462	0.387	1.011	ENSG00000104067	TJP1	protein_coding
0.041499	0.387	1.012	ENSG00000116132	PRRX1	protein_coding
0.041553	0.388	1.026	ENSG00000119979	FAM45A	protein_coding
0.041591	0.388	1.03	ENSG00000231290	APCDD1L-AS1	processed_transcript
0.041642	0.388	1.096	ENSG00000075131	TIPIN	protein_coding
0.041682	0.388	1.012	ENSG00000136527	TRA2B	protein_coding
0.041714	0.388	1.005	ENSG00000165119	HNRNPK	protein_coding
0.041837	0.389	1.032	ENSG00000009335	UBE3C	protein_coding
0.041861	0.389	0.807	ENSG00000181754	AMIGO1	protein_coding
0.041882	0.389	1.042	ENSG00000101871	MID1	protein_coding
0.041927	0.389	1.039	ENSG00000198420	FAM115A	protein_coding
0.041953	0.389	1.056	ENSG00000159259	CHAF1B	protein_coding
0.042203	0.391	1.013	ENSG00000111726	CMAS	protein_coding
0.042245	0.391	1.037	ENSG00000005700	IBTK	protein_coding
0.042265	0.391	0.891	ENSG00000113578	FGF1	protein_coding
0.042277	0.391	0.981	ENSG00000153551	CMTM7	protein_coding

0.042287	0.391	1.019	ENSG00000014914	MTMR11	protein_coding
0.042289	0.391	1.035	ENSG00000184743	ATL3	protein_coding
0.042321	0.391	0.99	ENSG00000108465	CDK5RAP3	protein_coding
0.042325	0.391	1.134	ENSG00000198788	MUC2	processed_transcript
0.042349	0.391	1.026	ENSG00000105997	HOXA3	protein_coding
0.042373	0.391	0.942	ENSG00000235453	TOPORS-AS1	antisense
0.042465	0.391	1.062	ENSG00000196526	AFAP1	protein_coding
0.04256	0.392	1.033	ENSG00000095303	PTGS1	protein_coding
0.042609	0.392	1.013	ENSG00000111667	USP5	protein_coding
0.042619	0.392	1.076	ENSG00000213066	FGFR1OP	protein_coding
0.042649	0.392	1.062	ENSG00000112029	FBXO5	protein_coding
0.042669	0.392	0.963	ENSG00000118096	IFT46	protein_coding
0.042744	0.392	1.045	ENSG00000205413	SAMD9	protein_coding
0.04278	0.393	1.105	ENSG00000187642	C1orf170	protein_coding
0.042852	0.393	1.038	ENSG00000135636	DYSF	protein_coding
0.042887	0.393	1.012	ENSG00000067704	IARS2	protein_coding
0.042918	0.393	1.006	ENSG00000167767	KRT80	protein_coding
0.042964	0.393	0.997	ENSG00000106565	TMEM176B	protein_coding
0.043036	0.393	0.926	ENSG00000069493	CLEC2D	protein_coding
0.043047	0.393	1.478	ENSG00000204538	PSORS1C2	protein_coding
0.043071	0.393	1.022	ENSG00000012211	PRICKLE3	protein_coding
0.043075	0.393	1.017	ENSG00000176619	LMNB2	protein_coding
0.043158	0.394	1.028	ENSG00000123268	ATF1	protein_coding
0.043444	0.396	1.029	ENSG00000119977	TCTN3	protein_coding
0.043447	0.396	1.014	ENSG00000125746	EML2	protein_coding
0.043457	0.396	0.942	ENSG00000184515	BEX5	protein_coding
0.043511	0.396	0.817	ENSG00000184271	POU6F1	protein_coding
0.043745	0.398	1.029	ENSG00000014138	POLA2	protein_coding
0.043818	0.398	0.993	ENSG00000188706	ZDHHC9	protein_coding
0.043876	0.398	1.028	ENSG00000137411	VARS2	protein_coding
0.04388	0.398	0.998	ENSG00000115884	SDC1	protein_coding
0.043925	0.398	0.97	ENSG00000180354	C7orf41	protein_coding
0.043932	0.398	1	ENSG00000089356	FXYD3	protein_coding
0.043933	0.398	0.93	ENSG00000067191	CACNB1	protein_coding
0.043951	0.398	1.024	ENSG00000140835	CHST4	protein_coding
0.043988	0.398	0.936	ENSG00000118971	CCND2	protein_coding

0.044202	0.4	1.012	ENSG00000198805	PNP	protein_coding
0.044229	0.4	1.196	ENSG00000102098	SCML2	protein_coding
0.044377	0.401	0.995	ENSG00000169692	AGPAT2	protein_coding
0.044406	0.401	1.009	ENSG00000124260	MAGEA10	protein_coding
0.044423	0.401	1.031	ENSG00000117133	RPF1	protein_coding
0.044464	0.401	0.993	ENSG00000076864	RAP1GAP	protein_coding
0.044592	0.402	1.043	ENSG00000051382	PIK3CB	protein_coding
0.044597	0.402	1.016	ENSG00000183431	SF3A3	protein_coding
0.044626	0.402	0.964	ENSG00000135211	TMEM60	protein_coding
0.044743	0.402	1.043	ENSG00000095539	SEMA4G	protein_coding
0.044752	0.402	1.064	ENSG00000164134	NAA15	protein_coding
0.044787	0.402	0.98	ENSG00000124098	FAM210B	protein_coding
0.044791	0.402	0.971	ENSG00000184162	NR2C2AP	protein_coding
0.044793	0.402	0.768	ENSG00000187889	C1orf168	protein_coding
0.044861	0.402	0.936	ENSG00000126460	PRRG2	protein_coding
0.044876	0.402	0.992	ENSG00000204219	TCEA3	protein_coding
0.044928	0.403	1.047	ENSG00000106665	CLIP2	protein_coding
0.044974	0.403	0.979	ENSG00000186635	ARAP1	protein_coding
0.044982	0.403	0.825	ENSG00000177272	KCNA3	protein_coding
0.045074	0.403	0.967	ENSG00000119523	ALG2	protein_coding
0.045099	0.403	1.356	ENSG00000205293	RP11-1112C15.1	lincRNA
0.045138	0.403	1.009	ENSG00000113758	DBN1	protein_coding
0.045222	0.404	1.035	ENSG00000158234	FAIM	protein_coding
0.0453	0.404	0.905	ENSG00000184857	TMEM186	protein_coding
0.045304	0.404	1.087	ENSG00000151116	UEVLD	protein_coding
0.045315	0.404	1.01	ENSG00000170606	HSPA4	protein_coding
0.045343	0.404	0.853	ENSG00000227733	RP4-565E6.1	lincRNA
0.045384	0.404	1.003	ENSG00000115461	IGFBP5	protein_coding
0.04539	0.404	1.003	ENSG00000159131	GART	protein_coding
0.045421	0.404	0.966	ENSG00000183762	KREMEN1	protein_coding
0.045613	0.405	1.03	ENSG00000076382	SPAG5	protein_coding
0.045845	0.407	0.953	ENSG00000103160	HSDL1	protein_coding
0.045852	0.407	1.007	ENSG00000184113	CLDN5	protein_coding
0.045854	0.407	1.017	ENSG00000189223	AC016683.6	processed_transcript
0.046009	0.408	1.024	ENSG00000180776	ZDHHC20	protein_coding
0.046108	0.408	1.07	ENSG00000142731	PLK4	protein_coding

0.046132	0.408	0.93	ENSG00000010671	BTK	protein_coding
0.046215	0.409	0.956	ENSG00000179583	CIITA	protein_coding
0.046247	0.409	1.017	ENSG00000015676	NUDCD3	protein_coding
0.046254	0.409	0.977	ENSG00000103365	GGA2	protein_coding
0.046331	0.409	1.047	ENSG00000051180	RAD51	protein_coding
0.046383	0.409	0.929	ENSG00000228221	LINC00578	lincRNA
0.046418	0.409	1.021	ENSG00000109133	TMEM33	protein_coding
0.046458	0.409	0.998	ENSG00000166562	SEC11C	protein_coding
0.046472	0.409	1.004	ENSG00000188313	PLSCR1	protein_coding
0.046475	0.409	0.998	ENSG00000122133	PAEP	protein_coding
0.04656	0.41	1.085	ENSG00000165671	NSD1	protein_coding
0.046573	0.41	1.096	ENSG00000100815	TRIP11	protein_coding
0.046631	0.41	0.85	ENSG00000242732	RGAG4	protein_coding
0.046641	0.41	1.017	ENSG00000090776	EFNB1	protein_coding
0.046647	0.41	1.014	ENSG00000106049	HIBADH	protein_coding
0.046783	0.411	1	ENSG00000171557	FGG	protein_coding
0.046884	0.411	0.871	ENSG00000142621	FHAD1	protein_coding
0.046885	0.411	1.025	ENSG00000007168	PAFAH1B1	protein_coding
0.046948	0.411	1.132	ENSG00000162390	ACOT11	protein_coding
0.046995	0.411	1.001	ENSG00000196531	NACA	protein_coding
0.047023	0.411	1.002	ENSG00000164111	ANXA5	protein_coding
0.047088	0.412	1.065	ENSG00000053770	AP5M1	protein_coding
0.047147	0.412	1.006	ENSG00000106263	EIF3B	protein_coding
0.047183	0.412	0.848	ENSG00000159387	IRX6	protein_coding
0.047313	0.413	1.028	ENSG00000164163	ABCE1	protein_coding
0.047333	0.413	0.95	ENSG00000143373	ZNF687	protein_coding
0.047411	0.413	1.067	ENSG00000113838	TBCCD1	protein_coding
0.047611	0.414	1.012	ENSG00000221926	TRIM16	protein_coding
0.047664	0.414	1.014	ENSG00000181222	POLR2A	protein_coding
0.047673	0.414	1.029	ENSG00000111266	DUSP16	protein_coding
0.047683	0.414	1.015	ENSG00000185100	ADSSL1	protein_coding
0.047702	0.414	1.008	ENSG00000115590	IL1R2	protein_coding
0.047742	0.414	1.047	ENSG00000134775	FHOD3	protein_coding
0.047751	0.414	1.113	ENSG00000000460	C1orf112	protein_coding
0.047755	0.414	1.014	ENSG00000082898	XPO1	protein_coding
0.04777	0.414	1.006	ENSG00000116161	CACYBP	protein_coding

0.047775	0.414	0.959	ENSG00000141428	C18orf21	protein_coding
0.047852	0.414	0.864	ENSG00000183918	SH2D1A	protein_coding
0.047855	0.414	1.051	ENSG00000133056	PIK3C2B	protein_coding
0.04786	0.414	1.008	ENSG00000077147	TM9SF3	protein_coding
0.047881	0.414	1.086	ENSG00000223725	AC007879.5	antisense
0.047912	0.414	1.037	ENSG00000004961	HCCS	protein_coding
0.047927	0.414	1.12	ENSG00000112761	WISP3	protein_coding
0.04793	0.414	0.833	ENSG00000126218	F10	protein_coding
0.047957	0.414	1.058	ENSG00000109184	DCUN1D4	protein_coding
0.04814	0.415	1.155	ENSG00000172728	FUT10	protein_coding
0.048209	0.415	1.084	ENSG00000162623	TYW3	protein_coding
0.048212	0.415	1.005	ENSG00000115091	ACTR3	protein_coding
0.048218	0.415	0.968	ENSG00000119411	BSPRY	protein_coding
0.048237	0.415	1.002	ENSG00000150753	CCT5	protein_coding
0.048358	0.416	1.027	ENSG00000122547	EEPD1	protein_coding
0.04844	0.416	1.073	ENSG00000138092	CENPO	protein_coding
0.048452	0.416	0.913	ENSG00000177570	SAMD12	protein_coding
0.048458	0.416	1.006	ENSG00000069275	NUCKS1	protein_coding
0.048478	0.416	1.004	ENSG00000142227	EMP3	protein_coding
0.048505	0.416	0.989	ENSG00000102096	PIM2	protein_coding
0.048514	0.416	0.916	ENSG00000120616	EPC1	protein_coding
0.048572	0.416	1.02	ENSG00000137404	NRM	protein_coding
0.048785	0.418	1.01	ENSG00000188486	H2AFX	protein_coding
0.048803	0.418	1.072	ENSG00000214193	SH3D21	protein_coding
0.048868	0.418	0.943	ENSG00000169302	STK32A	protein_coding
0.048881	0.418	0.969	ENSG00000156873	PHKG2	protein_coding
0.048897	0.418	1.037	ENSG00000164253	WDR41	protein_coding
0.048956	0.418	0.981	ENSG00000132254	ARFIP2	protein_coding
0.048978	0.418	1.001	ENSG00000112378	PERP	protein_coding
0.048989	0.418	1.065	ENSG00000120334	CENPL	protein_coding
0.048999	0.418	0.95	ENSG00000214413	BBIP1	protein_coding
0.049053	0.418	0.942	ENSG00000197620	CXorf40A	protein_coding
0.049122	0.418	0.94	ENSG00000143297	FCRL5	protein_coding
0.049204	0.419	1.01	ENSG00000010292	NCAPD2	protein_coding
0.049405	0.419	1.062	ENSG00000124257	NEURL2	protein_coding
0.049415	0.419	1.025	ENSG00000089154	GCN1L1	protein_coding

0.049422	0.419	0.963	ENSG00000141627	DYM	protein_coding
0.049428	0.419	1.005	ENSG00000153187	HNRNPU	protein_coding
0.049446	0.419	0.951	ENSG00000182866	LCK	protein_coding
0.049468	0.419	1.013	ENSG00000117868	ESYT2	protein_coding
0.049489	0.419	0.977	ENSG00000143393	PI4KB	protein_coding
0.049593	0.419	1.039	ENSG00000087116	ADAMTS2	protein_coding
0.049593	0.419	1.007	ENSG00000011304	PTBP1	protein_coding
0.049624	0.419	1.023	ENSG00000242247	ARFGAP3	protein_coding
0.049632	0.419	0.901	ENSG00000124772	CPNE5	protein_coding
0.04964	0.419	0.895	ENSG00000094841	UPRT	protein_coding
0.049644	0.419	1.039	ENSG00000153214	TMEM87B	protein_coding
0.049671	0.419	1.04	ENSG00000054611	TBC1D22A	protein_coding
0.049716	0.419	0.483	ENSG00000243627	AP000322.53	protein_coding
0.049756	0.419	1.012	ENSG00000084463	WBP11	protein_coding
0.049794	0.42	0.901	ENSG00000106993	CDC37L1	protein_coding
0.049852	0.42	1.023	ENSG00000126746	ZNF384	protein_coding
0.049984	0.421	0.988	ENSG00000141504	SAT2	protein_coding
0.049998	0.421	0.909	ENSG00000143315	PIGM	protein_coding

Supplemental Table 5: Multivariate Cox proportional hazards model after forward selection stepwise regression in TCGA Cohort I

	Hazard Ratio (95% CI)	Likelihood ratio p-value
ENSG00000104140 (RHOV)	1.011 (1.006-1.016)	4.35E-06
ENSG00000156535 (CD109)	1.068 (1.028-1.109)	0.00069
ENSG00000235884 (LINC00941)	1.177 (1.063-1.304)	0.0018
ENSG00000156869 (FRRS1)	1.075 (1.015-1.139)	0.0142

Supplemental Table 6: Top 100 up-regulated and top 100 down-regulated genes in High Risk tumors

Name	Low Risk	High Risk	FC	FDR
KRT14	1.03	22.55	21.99	0.04
S100A7	1.39	15.82	11.37	0.03
KRT6B	1.22	13.54	11.10	0.01
ANXA8	0.97	9.63	9.89	0
DSC3	0.24	2.37	9.76	0.04
RP11-77I22.3	0.30	2.88	9.56	0
PI3	6.28	58.66	9.34	0
ANXA8L1	0.87	7.99	9.20	0
ANXA8L2	1.20	10.44	8.69	0
KRT16	3.60	31.27	8.68	0.01
IL1A	0.42	3.56	8.51	0.02
RP11-314P12.3	0.97	7.78	8.04	0
RSPO3	1.47	11.68	7.95	0
RHOV	7.11	45.63	6.41	0
KRT6A	20.59	130.62	6.34	0.02
LYPD3	4.94	31.24	6.33	0
DKK1	5.76	35.84	6.23	0
SERPINB5	2.77	17.20	6.20	0
TNS4	3.95	23.95	6.06	0
TFF1	81.08	480.22	5.92	0.03
KLK7	1.48	8.76	5.90	0.03
AL591684.1	0.41	2.34	5.72	0
AL603965.1	0.49	2.79	5.71	0
GJB3	3.30	18.20	5.52	0
RP11-10A14.5	0.90	4.95	5.52	0
DNER	1.28	7.03	5.49	0
IL20RB	2.14	11.34	5.31	0
TRIM29	8.03	40.70	5.07	0
KRT6C	0.70	3.52	5.05	0.03
GRAMD1B	1.37	6.87	5.01	0
S100A12	1.03	5.13	4.99	0.04
FOSL1	4.51	21.82	4.84	0
FAM83B	0.41	1.95	4.71	0
LINC00460	2.30	10.78	4.69	0.02
PTPRN	0.91	4.25	4.65	0.03
SERPINB3	3.78	17.41	4.60	0.05
CD109	2.28	10.51	4.60	0
GJB5	1.19	5.44	4.58	0
POPDC3	1.19	5.46	4.58	0
KLK6	3.76	17.16	4.56	0.02
CTD-2354A18.1	0.85	3.84	4.52	0.04
KYNU	11.95	53.10	4.44	0
ESRG	1.02	4.47	4.39	0.01
RP11-309L24.6	0.94	3.98	4.26	0.02
SPRR1B	11.45	48.69	4.25	0
NCCRP1	2.44	10.27	4.21	0.04
RP3-523K23.2	0.77	3.22	4.21	0
CYP24A1	24.12	100.91	4.18	0.03

AKAP12	4.56	19.06	4.18	0.02
FLNC	1.63	6.76	4.16	0.01
MFI2	4.40	18.30	4.16	0
ABCC2	1.97	8.18	4.16	0
LAMC2	33.85	139.49	4.12	0
KRT17	35.38	145.76	4.12	0
VNN1	1.74	7.15	4.10	0.02
FZD10	1.34	5.42	4.05	0.03
PTPRR	0.99	3.96	3.98	0.05
HMGA2	3.71	14.76	3.97	0.01
FAM25C	0.85	3.36	3.95	0
ELOVL3	0.55	2.16	3.93	0.01
GABRP	7.47	29.29	3.92	0.03
FIBCD1	0.92	3.54	3.85	0
VEGFC	2.70	10.35	3.83	0
FOXE1	0.64	2.45	3.83	0.02
PRSS3	6.14	23.49	3.82	0.04
LGALS4	35.75	136.24	3.81	0.04
CXCL5	5.85	22.02	3.76	0.05
SLC15A1	0.77	2.90	3.75	0.01
SPOCD1	2.24	8.41	3.75	0.01
ARNTL2	4.58	16.89	3.69	0
RP11-64D22.2	0.53	1.93	3.64	0
CREG2	0.57	2.04	3.61	0
S1PR5	0.33	1.18	3.61	0.02
TCN1	15.14	54.59	3.60	0.03
CDA	13.39	48.01	3.59	0
USH1C	2.41	8.37	3.47	0.05
SLC16A1	4.31	14.96	3.47	0
SERPINA3	36.41	125.34	3.44	0
AL391137.1	0.47	1.61	3.42	0.01
GPR115	1.11	3.76	3.40	0
LINC00313	0.73	2.46	3.38	0.01
CA12	6.43	21.49	3.34	0
TM4SF19	2.38	7.83	3.29	0
COL7A1	2.92	9.55	3.27	0
COL17A1	9.89	32.29	3.26	0.01
LETM2	3.57	11.64	3.26	0
CLMP	2.57	8.36	3.26	0
LAMA3	14.52	47.25	3.26	0
SPOCK1	2.35	7.66	3.25	0.02
PCSK9	1.86	6.02	3.24	0
SPRR2D	2.93	9.33	3.19	0.04
GPR1	0.30	0.94	3.18	0
ITGA5	21.50	68.21	3.17	0
GBP6	0.83	2.58	3.11	0.04
RP11-48O20.4	2.22	6.81	3.06	0.04
KLRC2	0.61	1.87	3.05	0.03
TMEM171	0.95	2.87	3.03	0
SERPINA5	1.54	4.63	3.01	0
TNFRSF6B	7.19	21.58	3.00	0.02
AP000695.4	0.55	1.65	2.98	0
PCSK2	68.01	1.01	0.01	0

KLK12	79.78	1.81	0.02	0
NNAT	9.84	0.34	0.03	0.03
TMEM59L	25.12	2.37	0.09	0
KLK13	8.50	0.89	0.11	0
THBS4	10.89	1.15	0.11	0
CHIA	19.16	2.05	0.11	0
KLK14	20.18	2.26	0.11	0
SCGB3A2	1553.96	177.60	0.11	0
GFRA3	12.60	1.46	0.12	0
WIF1	28.88	3.38	0.12	0
CHAD	3.50	0.43	0.12	0
CRLF1	111.10	13.63	0.12	0
RET	3.10	0.39	0.13	0
C16orf89	258.62	32.76	0.13	0
UCN3	10.28	1.34	0.13	0.01
NPTX1	7.28	0.97	0.13	0
NOTUM	12.72	1.72	0.14	0.01
HSD17B13	1.63	0.22	0.14	0
IGLV9-49	152.76	21.13	0.14	0.03
SCGB3A1	1083.87	151.91	0.14	0
GKN2	37.83	5.52	0.15	0
PCP4	54.30	7.96	0.15	0
BAI1	2.63	0.42	0.16	0
RP11-259K15.2	4.10	0.69	0.17	0
SHISA3	14.34	2.50	0.17	0
BRDT	3.99	0.70	0.17	0
RP11-279F6.1	11.23	2.00	0.18	0
TNNC2	17.30	3.15	0.18	0
RP11-318M2.3	2.89	0.53	0.18	0
BAALC	7.88	1.51	0.19	0
MTMR7	3.80	0.73	0.19	0.01
RP11-262H14.10	2.62	0.51	0.19	0
GGTLC1	24.62	4.78	0.19	0
CYP4B1	71.15	13.97	0.20	0
APOH	11.01	2.16	0.20	0
AC132217.4	33.79	6.91	0.20	0.01
AC010136.2	7.89	1.62	0.21	0
RP11-896J10.3	7.42	1.52	0.21	0
CACNA2D2	15.30	3.17	0.21	0
TSPAN11	7.55	1.57	0.21	0
AL359473.1	1119.89	233.00	0.21	0.01
LILRA2	7.52	1.63	0.22	0
RP5-1174J21.1	22.17	4.87	0.22	0.01
GSTA2	8.42	1.87	0.22	0.01
PITX2	5.50	1.22	0.22	0
SLC1A7	15.23	3.43	0.23	0
NKD1	3.10	0.71	0.23	0
IGLVI-70	6.78	1.59	0.23	0.01
CIT	37.59	8.84	0.24	0
CRYM	28.15	6.67	0.24	0
AC008537.2	54.98	13.06	0.24	0
HOXD1	7.79	1.87	0.24	0
AC026471.6	3.22	0.79	0.25	0

GPR98	4.52	1.14	0.25	0
PGC	603.11	153.22	0.25	0.02
PTCSC3	2.98	0.76	0.25	0
SLC46A2	4.49	1.16	0.26	0
DPP10	2.12	0.55	0.26	0
HOPX	501.48	130.02	0.26	0
AC131056.5	6.57	1.71	0.26	0
KHDRBS2	1.81	0.47	0.26	0
AC011293.1	75.19	19.85	0.26	0.04
ZNF385B	9.23	2.46	0.27	0
NGF	2.78	0.75	0.27	0
BMP3	6.88	1.85	0.27	0
PEBP4	46.98	12.70	0.27	0
NPAS3	1.97	0.54	0.27	0
PLA2G1B	10.73	2.96	0.28	0
SFTA3	171.20	47.27	0.28	0
Metazoa_SRP	10.36	2.88	0.28	0
IGFBP2	283.44	79.10	0.28	0
MST1P9	13.87	3.91	0.28	0
AC013718.1	3.92	1.11	0.28	0
CTD-2531D15.4	4.82	1.36	0.28	0
FAM182A	0.73	0.21	0.29	0
TMEM213	1.71	0.49	0.29	0
CUZD1	1.08	0.32	0.29	0
FGF18	1.62	0.48	0.30	0
C4BPA	150.02	44.40	0.30	0
AC008268.1	5.78	1.72	0.30	0
MYBPHL	5.33	1.60	0.30	0
SCUBE2	10.23	3.07	0.30	0
RNY3P8	27.37	8.24	0.30	0
FDCSP	14.79	4.48	0.30	0
TMEM108	7.44	2.26	0.30	0
GFRA1	0.90	0.28	0.31	0
ZDHHC11B	4.92	1.51	0.31	0
LRP2	4.53	1.41	0.31	0
NAPSA	1445.42	450.89	0.31	0
SCNN1G	5.78	1.81	0.31	0
ADH1C	23.08	7.25	0.31	0.04
SLC26A9	16.18	5.09	0.31	0
SFTA1P	33.14	10.43	0.31	0
SFTPD	193.60	61.13	0.32	0
ALOX15B	27.77	8.77	0.32	0
SYBU	21.04	6.66	0.32	0
MYOZ1	2.07	0.66	0.32	0
TDRD10	3.40	1.10	0.32	0
SCTR	14.03	4.55	0.32	0

Supplemental Table 7: PantherDB annotation analysis of genes differentially up-regulated in High Risk tumors

Analysis Type:	PANTHER Overrepresentation Test (release 20150430)
Annotation Version and Release Date:	PANTHER version 10.0 Released 2015-05-15
Analyzed List:	up regulated in high risk for PantherDB 07232015.csv (Homo sapiens)
Reference List:	Homo sapiens (all genes in database)
Bonferroni correction:	TRUE

	Homo sapiens - REFLIST (20814)	**up regulated in high risk for PantherDB 07232015.csv (257)**				
PANTHER GO-Slim Biological Process	**#**	**#**	**expected**	**over/under**	**fold Enrichment**	**P-value**
Unclassified	8629	79	106.55	-	0.74	0.00E+00
developmental process	2456	61	30.33	+	2.01	1.61E-05
immune system process	1391	38	17.18	+	2.21	8.74E-04
cell communication	3006	64	37.12	+	1.72	1.53E-03
macrophage activation	167	11	2.06	+	> 5	2.10E-03
system development	1271	33	15.69	+	2.1	1.09E-02
cellular process	6708	113	82.83	+	1.36	1.21E-02
mesoderm development	671	21	8.29	+	2.53	2.42E-02
angiogenesis	198	10	2.44	+	4.09	4.65E-02
ectoderm development	663	20	8.19	+	2.44	5.67E-02
response to stimulus	2170	45	26.79	+	1.68	8.58E-02
heart development	181	9	2.23	+	4.03	1.07E-01
immune response	518	16	6.4	+	2.5	1.83E-01
anatomical structure morphogenesis	596	17	7.36	+	2.31	2.98E-01
cell killing	8	2	0.1	+	> 5	1.00E+00
ferredoxin metabolic process	8	1	0.1	+	> 5	1.00E+00
behavior	20	2	0.25	+	> 5	1.00E+00
regulation of sequence-specific DNA binding transcription facto	15	1	0.19	+	> 5	1.00E+00
dorsal/ventral axis specification	32	2	0.4	+	> 5	1.00E+00
locomotion	65	4	0.8	+	4.98	1.00E+00
neuron-neuron synaptic transmission	52	3	0.64	+	4.67	1.00E+00
regulation of liquid surface tension	56	3	0.69	+	4.34	1.00E+00
cellular calcium ion homeostasis	38	2	0.47	+	4.26	1.00E+00
response to biotic stimulus	41	2	0.51	+	3.95	1.00E+00
cell proliferation	103	5	1.27	+	3.93	1.00E+00
synaptic vesicle exocytosis	71	3	0.88	+	3.42	1.00E+00
porphyrin-containing compound metabolic process	27	1	0.33	+	3	1.00E+00
blood coagulation	168	6	2.07	+	2.89	1.00E+00
B cell mediated immunity	141	5	1.74	+	2.87	1.00E+00

extracellular transport	113	4	1.4	+	2.87	1.00E+00
nuclear transport	85	3	1.05	+	2.86	1.00E+00
vitamin transport	59	2	0.73	+	2.75	1.00E+00
cell-matrix adhesion	89	3	1.1	+	2.73	1.00E+00
blood circulation	154	5	1.9	+	2.63	1.00E+00
respiratory electron transport chain	217	7	2.68	+	2.61	1.00E+00
DNA replication	161	5	1.99	+	2.52	1.00E+00
induction of apoptosis	129	4	1.59	+	2.51	1.00E+00
pattern specification process	196	6	2.42	+	2.48	1.00E+00
fatty acid metabolic process	202	6	2.49	+	2.41	1.00E+00
receptor-mediated endocytosis	205	6	2.53	+	2.37	1.00E+00
response to external stimulus	378	11	4.67	+	2.36	1.00E+00
anion transport	173	5	2.14	+	2.34	1.00E+00
cellular component movement	476	13	5.88	+	2.21	1.00E+00
embryo development	150	4	1.85	+	2.16	1.00E+00
response to interferon-gamma	39	1	0.48	+	2.08	1.00E+00
generation of precursor metabolites and energy	274	7	3.38	+	2.07	1.00E+00
cellular component morphogenesis	478	12	5.9	+	2.03	1.00E+00
cholesterol metabolic process	83	2	1.02	+	1.95	1.00E+00
homeostatic process	209	5	2.58	+	1.94	1.00E+00
biological adhesion	606	14	7.48	+	1.87	1.00E+00
cell-cell adhesion	391	9	4.83	+	1.86	1.00E+00
protein glycosylation	174	4	2.15	+	1.86	1.00E+00
glycogen metabolic process	87	2	1.07	+	1.86	1.00E+00
response to stress	659	15	8.14	+	1.84	1.00E+00
purine nucleobase metabolic process	88	2	1.09	+	1.84	1.00E+00
cell adhesion	579	13	7.15	+	1.82	1.00E+00
steroid metabolic process	179	4	2.21	+	1.81	1.00E+00
complement activation	45	1	0.56	+	1.8	1.00E+00
regulation of molecular function	1096	24	13.53	+	1.77	1.00E+00
nervous system development	823	18	10.16	+	1.77	1.00E+00
lipid transport	322	7	3.98	+	1.76	1.00E+00
sulfur compound metabolic process	92	2	1.14	+	1.76	1.00E+00
endocytosis	373	8	4.61	+	1.74	1.00E+00
synaptic transmission	331	7	4.09	+	1.71	1.00E+00
negative regulation of apoptotic process	95	2	1.17	+	1.71	1.00E+00
female gamete generation	96	2	1.19	+	1.69	1.00E+00
neurotransmitter secretion	145	3	1.79	+	1.68	1.00E+00
cell-cell signaling	633	13	7.82	+	1.66	1.00E+00
regulation of catalytic activity	1073	22	13.25	+	1.66	1.00E+00

vitamin metabolic process	49	1	0.61	+	1.65	1.00E+00
segment specification	148	3	1.83	+	1.64	1.00E+00
lipid metabolic process	880	17	10.87	+	1.56	1.00E+00
intracellular protein transport	1052	20	12.99	+	1.54	1.00E+00
single-multicellular organism process	1636	31	20.2	+	1.53	1.00E+00
multicellular organismal process	1640	31	20.25	+	1.53	1.00E+00
pyrimidine nucleobase metabolic process	54	1	0.67	+	1.5	1.00E+00
system process	1296	24	16	+	1.5	1.00E+00
protein transport	1082	20	13.36	+	1.5	1.00E+00
DNA metabolic process	379	7	4.68	+	1.5	1.00E+00
proteolysis	719	13	8.88	+	1.46	1.00E+00
protein targeting	112	2	1.38	+	1.45	1.00E+00
hemopoiesis	112	2	1.38	+	1.45	1.00E+00
response to toxic substance	56	1	0.69	+	1.45	1.00E+00
oxidative phosphorylation	56	1	0.69	+	1.45	1.00E+00
neurological system process	1064	19	13.14	+	1.45	1.00E+00
DNA repair	172	3	2.12	+	1.41	1.00E+00
spermatogenesis	172	3	2.12	+	1.41	1.00E+00
localization	2607	45	32.19	+	1.4	1.00E+00
skeletal system development	232	4	2.86	+	1.4	1.00E+00
gamete generation	351	6	4.33	+	1.38	1.00E+00
reproduction	410	7	5.06	+	1.38	1.00E+00
regulation of phosphate metabolic process	178	3	2.2	+	1.36	1.00E+00
transport	2473	41	30.54	+	1.34	1.00E+00
phospholipid metabolic process	182	3	2.25	+	1.33	1.00E+00
fertilization	61	1	0.75	+	1.33	1.00E+00
death	566	9	6.99	+	1.29	1.00E+00
vesicle-mediated transport	895	14	11.05	+	1.27	1.00E+00
polysaccharide metabolic process	192	3	2.37	+	1.27	1.00E+00
exocytosis	258	4	3.19	+	1.26	1.00E+00
RNA splicing, via transesterification reactions	132	2	1.63	+	1.23	1.00E+00
cellular component organization	1206	18	14.89	+	1.21	1.00E+00
RNA splicing	135	2	1.67	+	1.2	1.00E+00
biological regulation	3918	58	48.38	+	1.2	1.00E+00
sensory perception of sound	68	1	0.84	+	1.19	1.00E+00
apoptotic process	548	8	6.77	+	1.18	1.00E+00
cellular component organization or biogenesis	1316	19	16.25	+	1.17	1.00E+00
cell death	562	8	6.94	+	1.15	1.00E+00
regulation of biological process	2846	39	35.14	+	1.11	1.00E+00
cellular defense response	231	3	2.85	+	1.05	1.00E+00

protein folding	155	2	1.91	+	1.05	1.00E+00
metabolic process	8247	103	101.83	+	1.01	1.00E+00
cell differentiation	161	2	1.99	+	1.01	1.00E+00
cellular amino acid biosynthetic process	81	1	1	-	1	1.00E+00
protein metabolic process	2692	33	33.24	-	0.99	1.00E+00
tRNA metabolic process	82	1	1.01	-	0.99	1.00E+00
nitrogen compound metabolic process	1099	13	13.57	-	0.96	1.00E+00
cell cycle	1107	13	13.67	-	0.95	1.00E+00
primary metabolic process	6825	80	84.27	-	0.95	1.00E+00
cellular amino acid metabolic process	264	3	3.26	-	0.92	1.00E+00
mRNA splicing, via spliceosome	183	2	2.26	-	0.89	1.00E+00
regulation of transcription from RNA polymerase II promoter	1319	14	16.29	-	0.86	1.00E+00
regulation of nucleobase-containing compound metabolic proce	1700	18	20.99	-	0.86	1.00E+00
biosynthetic process	764	8	9.43	-	0.85	1.00E+00
muscle organ development	288	3	3.56	-	0.84	1.00E+00
natural killer cell activation	99	1	1.22	-	0.82	1.00E+00
cellular protein modification process	1317	13	16.26	-	0.8	1.00E+00
transcription, DNA-dependent	1941	19	23.97	-	0.79	1.00E+00
nucleobase-containing compound metabolic process	3467	33	42.81	-	0.77	1.00E+00
protein complex assembly	107	1	1.32	-	0.76	1.00E+00
transcription from RNA polymerase II promoter	1723	16	21.27	-	0.75	1.00E+00
protein complex biogenesis	108	1	1.33	-	0.75	1.00E+00
phosphate-containing compound metabolic process	910	8	11.24	-	0.71	1.00E+00
cytokinesis	114	1	1.41	-	0.71	1.00E+00
carbohydrate metabolic process	573	5	7.08	-	0.71	1.00E+00
protein localization	116	1	1.43	-	0.7	1.00E+00
nucleobase-containing compound transport	116	1	1.43	-	0.7	1.00E+00
RNA metabolic process	2360	20	29.14	-	0.69	1.00E+00
ion transport	714	6	8.82	-	0.68	1.00E+00
protein phosphorylation	603	5	7.45	-	0.67	1.00E+00
catabolic process	407	3	5.03	-	0.6	1.00E+00
mRNA processing	274	2	3.38	-	0.59	1.00E+00
cation transport	571	4	7.05	-	0.57	1.00E+00
muscle contraction	217	1	2.68	-	0.37	1.00E+00
translation	435	2	5.37	-	0.37	1.00E+00
visual perception	219	1	2.7	-	0.37	1.00E+00
sensory perception	455	2	5.62	-	0.36	1.00E+00
chromatin organization	250	1	3.09	-	0.32	1.00E+00
organelle organization	571	2	7.05	-	0.28	1.00E+00
cellular component biogenesis	310	1	3.83	-	0.26	1.00E+00

mitosis	367	1	4.53	-	0.22	1.00E+00
cytokine production	4	0	0.05	-	< 0.2	1.00E+00
regulation of cell cycle	26	0	0.32	-	< 0.2	1.00E+00
chromosome segregation	91	0	1.12	-	< 0.2	1.00E+00
phosphate ion transport	97	0	1.2	-	< 0.2	1.00E+00
multi-multicellular organism process	1	0	0.01	-	< 0.2	1.00E+00
regulation of translation	148	0	1.83	-	< 0.2	1.00E+00
mRNA transcription	57	0	0.7	-	< 0.2	1.00E+00
mRNA polyadenylation	20	0	0.25	-	< 0.2	1.00E+00
lysosomal transport	44	0	0.54	-	< 0.2	1.00E+00
nitric oxide biosynthetic process	6	0	0.07	-	< 0.2	1.00E+00
7-methylguanosine mRNA capping	3	0	0.04	-	< 0.2	1.00E+00
asymmetric protein localization	13	0	0.16	-	< 0.2	1.00E+00
RNA localization	83	0	1.02	-	< 0.2	1.00E+00
RNA catabolic process	56	0	0.69	-	< 0.2	1.00E+00
response to endogenous stimulus	57	0	0.7	-	< 0.2	1.00E+00
circadian rhythm	2	0	0.02	-	< 0.2	1.00E+00
pteridine-containing compound metabolic process	1	0	0.01	-	< 0.2	1.00E+00
carbohydrate transport	78	0	0.96	-	< 0.2	1.00E+00
vitamin catabolic process	1	0	0.01	-	< 0.2	1.00E+00
vitamin biosynthetic process	36	0	0.44	-	< 0.2	1.00E+00
response to pheromone	6	0	0.07	-	< 0.2	1.00E+00
sensory perception of pain	13	0	0.16	-	< 0.2	1.00E+00
peroxisomal transport	18	0	0.22	-	< 0.2	1.00E+00
defense response to bacterium	25	0	0.31	-	< 0.2	1.00E+00
cytoskeleton organization	78	0	0.96	-	< 0.2	1.00E+00
sensory perception of smell	30	0	0.37	-	< 0.2	1.00E+00
sensory perception of chemical stimulus	133	0	1.64	-	< 0.2	1.00E+00
rRNA metabolic process	115	0	1.42	-	< 0.2	1.00E+00
cellular amino acid catabolic process	53	0	0.65	-	< 0.2	1.00E+00
regulation of vasoconstriction	52	0	0.64	-	< 0.2	1.00E+00
cell recognition	1	0	0.01	-	< 0.2	1.00E+00
coenzyme metabolic process	103	0	1.27	-	< 0.2	1.00E+00
mammary gland development	15	0	0.19	-	< 0.2	1.00E+00
mitochondrion organization	40	0	0.49	-	< 0.2	1.00E+00
chromatin remodeling	7	0	0.09	-	< 0.2	1.00E+00
protein lipidation	31	0	0.38	-	< 0.2	1.00E+00
tricarboxylic acid cycle	20	0	0.25	-	< 0.2	1.00E+00
pentose-phosphate shunt	9	0	0.11	-	< 0.2	1.00E+00
glycolysis	25	0	0.31	-	< 0.2	1.00E+00

gluconeogenesis	14	0	0.17	-	< 0.2	1.00E+00
cellular glucose homeostasis	60	0	0.74	-	< 0.2	1.00E+00
chromatin assembly	24	0	0.3	-	< 0.2	1.00E+00
regulation of cellular amino acid metabolic process	11	0	0.14	-	< 0.2	1.00E+00
prosthetic group metabolic process	5	0	0.06	-	< 0.2	1.00E+00
cell growth	3	0	0.04	-	< 0.2	1.00E+00
protein methylation	14	0	0.17	-	< 0.2	1.00E+00
regulation of gene expression, epigenetic	8	0	0.1	-	< 0.2	1.00E+00
mRNA 3'-end processing	30	0	0.37	-	< 0.2	1.00E+00
protein acetylation	35	0	0.43	-	< 0.2	1.00E+00
DNA recombination	50	0	0.62	-	< 0.2	1.00E+00
phagocytosis	24	0	0.3	-	< 0.2	1.00E+00
protein ADP-ribosylation	8	0	0.1	-	< 0.2	1.00E+00
pinocytosis	1	0	0.01	-	< 0.2	1.00E+00
bile acid metabolic process	1	0	0.01	-	< 0.2	1.00E+00
response to abiotic stimulus	23	0	0.28	-	< 0.2	1.00E+00
amino acid transport	59	0	0.73	-	< 0.2	1.00E+00
sex determination	7	0	0.09	-	< 0.2	1.00E+00
endoderm development	12	0	0.15	-	< 0.2	1.00E+00
DNA catabolic process	4	0	0.05	-	< 0.2	1.00E+00
monosaccharide metabolic process	143	0	1.77	-	< 0.2	1.00E+00
secondary metabolic process	2	0	0.02	-	< 0.2	1.00E+00
regulation of carbohydrate metabolic process	21	0	0.26	-	< 0.2	1.00E+00
cyclic nucleotide metabolic process	80	0	0.99	-	< 0.2	1.00E+00
nitrogen utilization	2	0	0.02	-	< 0.2	1.00E+00
ovulation cycle process	1	0	0.01	-	< 0.2	1.00E+00
meiosis	29	0	0.36	-	< 0.2	1.00E+00
disaccharide metabolic process	1	0	0.01	-	< 0.2	1.00E+00
growth	5	0	0.06	-	< 0.2	1.00E+00
antigen processing and presentation of peptide or polysacchari	38	0	0.47	-	< 0.2	1.00E+00
neuromuscular synaptic transmission	6	0	0.07	-	< 0.2	1.00E+00
antigen processing and presentation	56	0	0.69	-	< 0.2	1.00E+00
mitochondrial transport	25	0	0.31	-	< 0.2	1.00E+00
digestive tract mesoderm development	48	0	0.59	-	< 0.2	1.00E+00
circadian behavior	2	0	0.02	-	< 0.2	1.00E+00
rhythmic process	4	0	0.05	-	< 0.2	1.00E+00
sensory perception of taste	12	0	0.15	-	< 0.2	1.00E+00
acyl-CoA metabolic process	33	0	0.41	-	< 0.2	1.00E+00
unsaturated fatty acid biosynthetic process	10	0	0.12	-	< 0.2	1.00E+00
polyphosphate catabolic process	3	0	0.04	-	< 0.2	1.00E+00

fatty acid beta-oxidation	33	0	0.41	-	< 0.2	1.00E+00
fatty acid biosynthetic process	42	0	0.52	-	< 0.2	1.00E+00
anterior/posterior axis specification	28	0	0.35	-	< 0.2	1.00E+00

Supplemental Table 8: Gene sets with FDR or FWER ≤ 0.05 from GSEA of TCGA Cohort I High Risk vs Low Risk

NAME	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX
RICKMAN_TUMOR_DIFFERENTIATED_WELL_VS_MODERATELY_DN	90	0.72	2.44	0	0.00191886	0.001	2518
RICKMAN_TUMOR_DIFFERENTIATED_WELL_VS_POORLY_DN	348	0.65	2.43	0	9.59E-04	0.001	3866
CHARAFE_BREAST_CANCER_LUMINAL_VS_BASAL_DN	429	0.62	2.31	0	0.006445217	0.008	4150
GRUETZMANN_PANCREATIC_CANCER_UP	350	0.55	2.30	0	0.005233529	0.009	3971
CROMER_METASTASIS_DN	80	0.67	2.29	0	0.005789975	0.013	2742
AMIT_EGF_RESPONSE_480_HELA	159	0.65	2.28	0.002178649	0.005545371	0.015	3135
HUANG_DASATINIB_RESISTANCE_UP	80	0.73	2.22	0	0.011273473	0.033	4023
RICKMAN_HEAD_AND_NECK_CANCER_C	71	0.60	2.21	0	0.011262935	0.036	4251
SENESE_HDAC2_TARGETS_UP	107	0.63	2.20	0	0.012978726	0.046	3777
CHARAFE_BREAST_CANCER_LUMINAL_VS_MESENCHYMAL_DN	446	0.63	2.19	0.002096436	0.013437703	0.054	4246
KOINUMA_TARGETS_OF_SMAD2_OR_SMAD3	796	0.50	2.18	0	0.013472037	0.059	3822
LEI_MYB_TARGETS	311	0.50	2.18	0	0.012489755	0.06	3794
PID_A6B1_A6B4_INTEGRIN_PATHWAY	46	0.64	2.18	0	0.011622255	0.061	2334
AMIT_EGF_RESPONSE_240_HELA	60	0.64	2.16	0.002118644	0.013259431	0.073	2942
RODRIGUES_THYROID_CARCINOMA_ANAPLASTIC_UP	684	0.62	2.16	0	0.013007506	0.075	3639
VANTVEER_BREAST_CANCER_ESR1_DN	225	0.58	2.16	0	0.01305657	0.08	4405
BROWNE_HCMV_INFECTION_2HR_DN	47	0.67	2.14	0	0.015072336	0.096	3701
SENESE_HDAC1_AND_HDAC2_TARGETS_UP	216	0.55	2.14	0	0.01675659	0.114	3827
SESTO_RESPONSE_TO_UV_C1	71	0.60	2.13	0	0.016908998	0.118	4592
WU_CELL_MIGRATION	181	0.55	2.13	0	0.016699651	0.124	3550
MURAKAMI_UV_RESPONSE_6HR_UP	33	0.62	2.12	0	0.019299705	0.14	3748
BRUECKNER_TARGETS_OF_MIRLET7A3_DN	73	0.63	2.11	0	0.020314626	0.148	3249
SENESE_HDAC1_TARGETS_UP	421	0.53	2.11	0	0.019877627	0.151	3777
PID_EPHB_FWD_PATHWAY	39	0.66	2.11	0	0.020174354	0.16	2433
HUMMERICH_SKIN_CANCER_PROGRESSION_UP	86	0.58	2.09	0	0.028862694	0.219	3607
DITTMER_PTHLH_TARGETS_DN	70	0.56	2.08	0	0.02822611	0.22	3041
TOOKER_GEMCITABINE_RESISTANCE_DN	122	0.53	2.07	0.002164502	0.03671076	0.276	3597
GHO_ATF5_TARGETS_DN	16	0.74	2.07	0.002070393	0.036220852	0.279	1994
CSR_EARLY_UP.V1_UP	154	0.55	2.06	0	0.03691489	0.289	3969
KIM_WT1_TARGETS_UP	207	0.56	2.06	0.002155172	0.036090765	0.292	3738
WINTER_HYPOXIA_UP	89	0.67	2.06	0.002155172	0.035097178	0.293	2546
NAKAMURA_TUMOR_ZONE_PERIPHERAL_VS_CENTRAL_UP	272	0.57	2.06	0	0.03422338	0.294	5198
BMI1_DN.V1_UP	138	0.57	2.06	0.002188184	0.03547121	0.306	3799
KIM_WT1_TARGETS_12HR_DN	199	0.48	2.05	0	0.035240397	0.31	3922
RICKMAN_METASTASIS_DN	245	0.56	2.05	0.00210084	0.035487063	0.317	4502
KRIEG_HYPOXIA_NOT_VIA_KDM3A	703	0.46	2.04	0	0.039526902	0.352	4277
BASAKI_YBX1_TARGETS_UP	279	0.64	2.04	0	0.038609874	0.354	3829
DAUER_STAT3_TARGETS_UP	46	0.65	2.04	0	0.041230842	0.371	2577
MCCABE_HOXC6_TARGETS_CANCER_DN	20	0.67	2.04	0	0.040580448	0.374	1163
WANG_METHYLATED_IN_BREAST_CANCER	34	0.69	2.04	0.002109705	0.039565936	0.374	2782

WINTER_HYPOXIA_METAGENE	221	0.49	2.04	0	0.039360963	0.378	3762
JACKSON_DNMT1_TARGETS_UP	73	0.53	2.03	0	0.04388277	0.404	4968
KAPOSI_LIVER_CANCER_MET_UP	17	0.77	2.02	0.002074689	0.04487527	0.415	3123
PEDERSEN_TARGETS_OF_611CTF_ISOFORM_OF_ERBB2	72	0.61	2.02	0.002262444	0.044234816	0.418	3587
KIM_WT1_TARGETS_8HR_UP	154	0.54	2.02	0.002057613	0.04348874	0.419	4698
STEIN_ESRRA_TARGETS_RESPONSIVE_TO_ESTROGEN_UP	30	0.62	2.02	0	0.045527227	0.434	4453
GU_PDEF_TARGETS_DN	33	0.63	2.01	0.002298851	0.046622626	0.442	4219
GOLDRATH_ANTIGEN_RESPONSE	333	0.54	2.01	0	0.048964106	0.461	3188
SIMBULAN_UV_RESPONSE_IMMORTALIZED_DN	31	0.69	2.01	0	0.04796484	0.461	4063
KARLSSON_TGFB1_TARGETS_UP	122	0.58	2.01	0	0.047683936	0.462	3745
BILD_HRAS_ONCOGENIC_SIGNATURE	249	0.50	2.01	0	0.047246817	0.465	3748
PHONG_TNF_RESPONSE_NOT_VIA_P38	333	0.48	2.01	0	0.046768207	0.467	3556
ALONSO_METASTASIS_EMT_UP	34	0.63	2.00	0.002096436	0.047593277	0.475	4112
KEGG_RENAL_CELL_CARCINOMA	68	0.55	2.00	0	0.047741115	0.482	4126
MEL18_DN.V1_UP	137	0.56	2.00	0.002178649	0.049314614	0.498	4019
DOANE_BREAST_CANCER_CLASSES_DN	33	0.65	2.00	0.002118644	0.049704615	0.505	1219
AMIT_SERUM_RESPONSE_240_MCF10A	55	0.59	2.00	0.004175365	0.04928575	0.505	3739
RUIZ_TNC_TARGETS_DN	139	0.67	2.00	0	0.048435997	0.505	3306
FOURNIER_ACINAR_DEVELOPMENT_LATE_2	274	0.61	2.00	0.00422833	0.04761505	0.505	3515
BERENJENO_TRANSFORMED_BY_RHOA_UP	521	0.57	2.00	0	0.048048902	0.515	4703
PEDERSEN_METASTASIS_BY_ERBB2_ISOFORM_7	375	0.43	1.99	0	0.048433755	0.525	3729
WHITFIELD_CELL_CYCLE_G2_M	208	0.55	1.99	0	0.048496753	0.529	3684
VEGF_A_UP.V1_DN	186	0.55	1.99	0	0.047904763	0.53	4857
KEGG_FOCAL_ADHESION	181	0.56	1.99	0	0.047487613	0.533	4041
AZARE_NEOPLASTIC_TRANSFORMATION_BY_STAT3_UP	111	0.55	1.99	0.002262444	0.047638763	0.536	5407
ZEMBUTSU_SENSITIVITY_TO_FLUOROURACIL	13	0.71	1.99	0.002136752	0.048174407	0.545	3082
REN_ALVEOLAR_RHABDOMYOSARCOMA_DN	404	0.56	1.99	0.002066116	0.04831323	0.551	4554
KEGG_ADHERENS_JUNCTION	69	0.58	1.99	0	0.04846249	0.555	4352
NUYTTEN_NIPP1_TARGETS_DN	812	0.44	1.99	0	0.04785798	0.555	4252
SESTO_RESPONSE_TO_UV_C5	46	0.65	1.98	0	0.047489785	0.556	5623
HERNANDEZ_MITOTIC_ARREST_BY_DOCETAXEL_2_UP	59	0.53	1.98	0.002415459	0.047107797	0.558	3964
PID_PI3KCI_AKT_PATHWAY	35	0.62	1.98	0	0.047431227	0.563	5071
SHEDDEN_LUNG_CANCER_POOR_SURVIVAL_A6	428	0.70	1.98	0.002114165	0.04875226	0.573	3219
FIGUEROA_AML_METHYLATION_CLUSTER_3_DN	34	0.58	1.98	0.002105263	0.049279183	0.578	4547
FURUKAWA_DUSP6_TARGETS_PCI35_DN	70	0.67	1.98	0.002173913	0.049279273	0.582	2438
CROMER_TUMORIGENESIS_UP	60	0.66	1.96	0.002197802	0.049876116	0.628	5113
SESTO_RESPONSE_TO_UV_C8	69	0.53	1.96	0.002061856	0.04937641	0.629	3122
ELVIDGE_HYPOXIA_BY_DMOG_UP	127	0.52	1.96	0.002164502	0.048827782	0.629	4616
REACTOME_SHC1_EVENTS_IN_ERBB4_SIGNALING	18	0.68	1.96	0	0.048752576	0.631	3985
OXFORD_RALA_OR_RALB_TARGETS_DN	23	0.67	1.96	0	0.049958814	0.637	3044
AMIT_EGF_RESPONSE_480_MCF10A	40	0.59	1.96	0	0.04958467	0.638	3395
KRIEG_HYPOXIA_VIA_KDM3A	51	0.59	1.96	0.004376368	0.04934461	0.638	4402
ONDER_CDH1_TARGETS_1_DN	159	0.53	1.96	0	0.048842892	0.638	5054
HIRSCH_CELLULAR_TRANSFORMATION_SIGNATURE_UP	236	0.48	1.96	0	0.04950745	0.644	3642

YAMASHITA_LIVER_CANCER_STEM_CELL_UP	44	0.57	1.96	0.002283105	0.049909994	0.647	3364
REACTOME_SIGNAL_TRANSDUCTION_BY_L1	33	0.60	1.95	0.002155172	0.049856707	0.653	2167
SARTIPY_NORMAL_AT_INSULIN_RESISTANCE_UP	34	0.63	1.95	0.002096436	0.049514458	0.654	4647
SARRIO_EPITHELIAL_MESENCHYMAL_TRANSITION_UP	170	0.65	1.95	0.006593407	0.049611337	0.655	3986
OSADA_ASCL1_TARGETS_DN	24	0.68	1.95	0.00456621	0.04983411	0.656	2250
BIOCARTA_IL4_PATHWAY	10	0.83	1.95	0.00407332	0.04940771	0.656	3082
APRELIKOVA_BRCA1_TARGETS	45	0.57	1.95	0	0.0490294	0.657	4526
REACTOME_CELL_CELL_COMMUNICATION	102	0.51	1.95	0.002217295	0.049413517	0.663	4157
REACTOME_SHC1_EVENTS_IN_EGFR_SIGNALING	15	0.72	1.95	0.002040816	0.04956859	0.668	2433
ONDER_CDH1_TARGETS_2_DN	437	0.47	1.95	0.002398082	0.049578033	0.673	4673
REACTOME_SHC_RELATED_EVENTS	16	0.70	1.94	0	0.049740963	0.674	2433
KEGG_REGULATION_OF_ACTIN_CYTOSKELETON	177	0.50	1.94	0.002123142	0.049667988	0.676	4352
WANG_BARRETTS_ESOPHAGUS_AND_ESOPHAGUS_CANCER_DN	31	0.62	1.94	0	0.04944742	0.677	2518
CHIANG_LIVER_CANCER_SUBCLASS_PROLIFERATION_UP	167	0.63	1.94	0.010460251	0.049087156	0.678	3070
SMID_BREAST_CANCER_RELAPSE_IN_LUNG_UP	17	0.72	1.94	0.004464286	0.04879417	0.678	1420
KEGG_DORSO_VENTRAL_AXIS_FORMATION	20	0.66	1.94	0	0.04900794	0.682	5331
RB_P130_DN.V1_DN	129	0.49	1.94	0.002123142	0.048910674	0.685	3247
SHEPARD_BMYB_TARGETS	58	0.63	1.94	0.002150538	0.04947987	0.69	2429
VERRECCHIA_RESPONSE_TO_TGFB1_C2	24	0.73	1.94	0.005964215	0.049108822	0.69	3474
KUROKAWA_LIVER_CANCER_CHEMOTHERAPY_DN	38	0.54	1.94	0	0.048802402	0.69	6192
GROSS_HYPOXIA_VIA_ELK3_ONLY_UP	33	0.59	1.94	0.004415011	0.048546128	0.692	4289
KIM_MYCL1_AMPLIFICATION_TARGETS_DN	19	0.68	1.94	0	0.048167676	0.692	2509
NAKAMURA_CANCER_MICROENVIRONMENT_DN	45	0.70	1.94	0	0.048005152	0.693	2350
XU_RESPONSE_TO_TRETINOIN_DN	13	0.71	1.94	0	0.048142172	0.698	1873
ACEVEDO_FGFR1_TARGETS_IN_PROSTATE_CANCER_MODEL_UP	253	0.45	1.94	0	0.04811718	0.7	4183
NAKAYAMA_SOFT_TISSUE_TUMORS_PCA2_UP	79	0.69	1.94	0.002212389	0.047984343	0.702	2853
LE_SKI_TARGETS_UP	15	0.71	1.93	0.008583691	0.049323667	0.715	862
SHEPARD_CRUSH_AND_BURN_MUTANT_DN	148	0.54	1.93	0.002155172	0.04918046	0.716	2857
ZHAN_MULTIPLE_MYELOMA_CD2_DN	46	0.54	1.93	0.002309469	0.048978806	0.716	2206
LIEN_BREAST_CARCINOMA_METAPLASTIC_VS_DUCTAL_UP	70	0.58	1.93	0.002304148	0.04870754	0.716	4895

Supplemental Table 9: Cox proportional hazards models in TCGA Cohort I

	univariate		**multivariate**	
	Hazard Ratio (95% CI)	Likelihood ratio test p-value	Hazard Ratio (95% CI)	Likelihood ratio test p-value
Stage	1.58 (1.29-1.93)	$7.45*10^{-6}$	1.58 (1.26-1.99)	$8.42*10^{-5}$
Gender	1.01 (0.64-1.59)	0.944	1.25 (0.78-1.99)	0.354
Age	1.02 (1.00-1.05)	0.0781	1.04 (1.01-1.06)	0.00267
Risk Score	3.03 (2.14-3.43)	$6.37*10^{-17}$	2.58 (2.02-3.29)	$2.96*10^{-14}$

Supplemental Table 10: Evaluation and comparison of prognostic performance of 5 published lung adenocarcinoma prognostic signatures

The gene lists from the published signatures was used re-derive coefficients in TCGA Cohort I using a multivariate Cox model, the same way that the 4-gene prognostic signature of the present study was derived. The resulting models were then tested for prognostic significance in all 3 cohorts using a univariate Cox model, as well as a multivariate Cox model with the present study 4-gene signature as the only other variable.

		Kratz *et al.*		**Bianchi *et al.***		**Boutros *et al.***		**Chen *et al.***		**Lau *et al.***	
		Hazard Ratio (95% CI)	Likelihood ratio p-value	Hazard Ratio (95% CI)	Likelihood ratio p-value	Hazard Ratio (95% CI)	Likelihood ratio p-value	Hazard Ratio (95% CI)	Likelihood ratio p-value	Hazard Ratio (95% CI)	Likelihood ratio p-value
TCGA Cohort I (training)	**Univariate**	2.74 (1.84-4.08)	<0.0001	1.47 (1.03-2.10)	0.035	2.52 (1.74-3.64)	<0.0001	2.70 (1.61-4.53)	0.00017	2.71 (0.82-9.02)	0.10
	Multivariate										
	other signature	1.42 (0.91-2.20)	0.12	0.85 (0.53-1.35)	0.49	1.31 (0.89-1.93)	0.17	1.51 (0.92-2.48)	0.10	1.93 (0.56-6.63)	0.30
	4-gene signature	2.44 (1.86-3.20)	<0.0001	2.88 (2.22-3.75)	<0.0001	2.48 (1.90-3.25)	<0.0001	2.55 (1.99-3.27)	<0.0001	2.67 (2.11-3.37)	<0.0001
TCGA Cohort II (validation)	**Univariate**	1.81 (0.86-3.85)	0.12	0.71 (0.31-1.62)	0.42	0.98 (0.93-1.03)	0.45	2.35 (1.22-5.51)	0.024	1.00 (0.99-1.00)	0.43
	Multivariate										
	other signature	1.28 (0.54-2.99)	0.57	0.51 (0.20-1.30)	0.16	1.03 (0.96-1.10)	0.45	1.23 (1.14-4.26)	0.020	1.00 (0.99-1.01)	0.68
	4-gene signature	1.64 (1.20-2.24)	0.0021	1.82 (1.33-2.49)	0.00018	1.86 (1.27-2.72)	0.0014	1.72 (1.28-2.32)	0.00035	1.67 (1.25-2.24)	0.00061
MCTP Cohort (validation)	**Univariate**	1.54 (0.96-2.46)	0.075	0.89 (0.44-1.82)	0.76	1.02 (0.98-1.06)	0.45	2.15 (0.94-4.93)	0.070	0.98 (0.79-1.22)	0.88
	Multivariate										
	other signature	1.27 (0.77-2.08)	0.35	0.77 (0.37-1.64)	0.50	1.04 (1.00-1.08)	0.037	1.72 (0.75-3.92)	0.20	1.27 (0.97-1.67)	0.079
	4-gene signature	2.29 (1.36-3.84)	0.0018	2.55 (1.52-4.28)	0.00041	3.35 (1.90-5.91)	<0.0001	2.26 (1.37-3.71)	0.0013	3.62 (1.93-6.81)	<0.0001

Supplemental Table 11: KRAS and EGFR mutation TCGA cases

Non-silent KRAS and EGFR mutations extracted from raw MAF files at the Broad GDAC FireHose (gdac.broadinstitute.org)

Hugo_Symbol	Variant_Classificatior	Variant_Type	Tumor_Sample_Barcode	Protein_Change	Patient Barcode
EGFR	Splice_Site	SNP	TCGA-05-4382-01A-01D-1931-08	p.E545_splice	TCGA-05-4382
EGFR	In_Frame_Del	DEL	TCGA-05-4402-01A-01D-1265-08	p.ATSPKANKE750del	TCGA-05-4402
EGFR	Missense_Mutation	SNP	TCGA-05-4410-01A-21D-1855-08	p.R377S	TCGA-05-4410
EGFR	Missense_Mutation	SNP	TCGA-05-5423-01A-01D-1625-08	p.L833F	TCGA-05-5423
EGFR	Missense_Mutation	SNP	TCGA-05-5423-01A-01D-1625-08	p.L861Q	TCGA-05-5423
EGFR	Missense_Mutation	SNP	TCGA-05-5425-01A-02D-1625-08	p.F856L	TCGA-05-5425
EGFR	Missense_Mutation	SNP	TCGA-17-Z002-01A-01W-0746-08	p.A1013V	TCGA-17-Z002
EGFR	Missense_Mutation	SNP	TCGA-17-Z026-01A-01W-0746-08	p.G721V	TCGA-17-Z026
EGFR	In_Frame_Del	DEL	TCGA-17-Z032-01A-01W-0746-08	p.KELREA745del	TCGA-17-Z032
EGFR	Missense_Mutation	SNP	TCGA-17-Z047-01A-01W-0747-08	p.L858R	TCGA-17-Z047
EGFR	In_Frame_Ins	INS	TCGA-17-Z048-01A-01W-0746-08	p.770_771EP>EG*P	TCGA-17-Z048
EGFR	Missense_Mutation	SNP	TCGA-38-4627-01A-01D-1553-08	p.L858R	TCGA-38-4627
EGFR	Missense_Mutation	SNP	TCGA-38-4627-01A-01D-1553-08	p.L62R	TCGA-38-4627
EGFR	In_Frame_Del	DEL	TCGA-38-4628-01A-01D-1265-08	p.KELREA745del	TCGA-38-4628
EGFR	Missense_Mutation	SNP	TCGA-38-4629-01A-02D-1265-08	p.G465R	TCGA-38-4629
EGFR	In_Frame_Del	DEL	TCGA-38-6178-01A-11D-1753-08	p.KELREA745del	TCGA-38-6178
EGFR	In_Frame_Del	DEL	TCGA-44-2661-01A-01D-1105-08	p.KELREA745del	TCGA-44-2661
EGFR	In_Frame_Del	DEL	TCGA-44-2661-01A-01D-1105-08	p.KELREA745del	TCGA-44-2661
EGFR	Missense_Mutation	SNP	TCGA-44-6147-01A-11D-1753-08	p.S768I	TCGA-44-6147
EGFR	Missense_Mutation	SNP	TCGA-44-6147-01A-11D-1753-08	p.V769L	TCGA-44-6147
EGFR	Missense_Mutation	SNP	TCGA-44-6147-01A-11D-1753-08	p.S768I	TCGA-44-6147
EGFR	Missense_Mutation	SNP	TCGA-44-6147-01A-11D-1753-08	p.V769L	TCGA-44-6147
EGFR	Missense_Mutation	SNP	TCGA-44-A4SU-01A-11D-A24P-08	p.S768I	TCGA-44-A4SU
EGFR	Missense_Mutation	SNP	TCGA-44-A4SU-01A-11D-A24P-08	p.G719C	TCGA-44-A4SU
EGFR	Missense_Mutation	SNP	TCGA-49-4490-01A-21D-1855-08	p.L858R	TCGA-49-4490
EGFR	Missense_Mutation	SNP	TCGA-49-4494-01A-01D-1265-08	p.L858R	TCGA-49-4494
EGFR	Missense_Mutation	SNP	TCGA-49-4494-01A-01D-1265-08	p.T790M	TCGA-49-4494
EGFR	In_Frame_Del	DEL	TCGA-49-4501-01A-01D-1265-08	p.ELREA746del	TCGA-49-4501
EGFR	Splice_Site	SNP	TCGA-50-5066-01A-01D-1625-08	p.L210_splice	TCGA-50-5066
EGFR	Splice_Site	SNP	TCGA-50-5066-02A-11D-2107-08	p.L210_splice	TCGA-50-5066
EGFR	Missense_Mutation	SNP	TCGA-50-5944-01A-11D-1753-08	p.L858R	TCGA-50-5944

EGFR	Missense_Mutation	SNP	TCGA-50-6591-01A-11D-1753-08	p.L833V	TCGA-50-6591
EGFR	In_Frame_Del	DEL	TCGA-50-6591-01A-11D-1753-08	p.KANKEI754del	TCGA-50-6591
EGFR	Missense_Mutation	SNP	TCGA-50-6595-01A-12D-1855-08	p.S768I	TCGA-50-6595
EGFR	Missense_Mutation	SNP	TCGA-50-6595-01A-12D-1855-08	p.G719A	TCGA-50-6595
EGFR	In_Frame_Ins	INS	TCGA-50-6673-01A-11D-1945-08	p.772_773insT	TCGA-50-6673
EGFR	Missense_Mutation	SNP	TCGA-55-6968-01A-11D-1945-08	p.E866K	TCGA-55-6968
EGFR	In_Frame_Del	DEL	TCGA-55-6980-01A-11D-1945-08	p.ET709del	TCGA-55-6980
EGFR	In_Frame_Del	DEL	TCGA-55-6981-01A-11D-1945-08	p.ELREAT746del	TCGA-55-6981
EGFR	Missense_Mutation	SNP	TCGA-55-7570-01A-11D-2036-08	p.V300M	TCGA-55-7570
EGFR	Missense_Mutation	SNP	TCGA-55-7570-01A-11D-2036-08	p.V300M	TCGA-55-7570
EGFR	Missense_Mutation	SNP	TCGA-55-7573-01A-11D-2036-08	p.K754E	TCGA-55-7573
EGFR	In_Frame_Del	DEL	TCGA-55-7573-01A-11D-2036-08	p.ELR746del	TCGA-55-7573
EGFR	Missense_Mutation	SNP	TCGA-55-8096-01A-11D-2238-08	p.L858R	TCGA-55-8096
EGFR	In_Frame_Del	DEL	TCGA-55-8206-01A-11D-2238-08	p.ELREA746del	TCGA-55-8206
EGFR	Missense_Mutation	SNP	TCGA-55-8506-01A-11D-2393-08	p.L858R	TCGA-55-8506
EGFR	Missense_Mutation	SNP	TCGA-55-A48Z-01A-12D-A24P-08	p.G719A	TCGA-55-A48Z
EGFR	Missense_Mutation	SNP	TCGA-62-8394-01A-11D-2323-08	p.L858R	TCGA-62-8394
EGFR	In_Frame_Del	DEL	TCGA-62-8402-01A-11D-2323-08	p.KELREA745del	TCGA-62-8402
EGFR	In_Frame_Del	DEL	TCGA-62-A46U-01A-11D-A24D-08	p.ELREA746del	TCGA-62-A46U
EGFR	Missense_Mutation	SNP	TCGA-64-1681-01A-11D-2063-08	p.L858R	TCGA-64-1681
EGFR	Missense_Mutation	SNP	TCGA-67-3770-01A-01W-0928-08	p.L858R	TCGA-67-3770
EGFR	Missense_Mutation	SNP	TCGA-67-3770-01A-01D-0969-08	p.L858R	TCGA-67-3770
EGFR	Missense_Mutation	SNP	TCGA-67-3770-01A-01W-0928-08	p.L858R	TCGA-67-3770
EGFR	Missense_Mutation	SNP	TCGA-67-3770-01A-01D-0969-08	p.L858R	TCGA-67-3770
EGFR	Missense_Mutation	SNP	TCGA-67-3772-01A-01W-0928-08	p.L858R	TCGA-67-3772
EGFR	Missense_Mutation	SNP	TCGA-67-6217-01A-11D-1753-08	p.L858R	TCGA-67-6217
EGFR	In_Frame_Del	DEL	TCGA-69-7760-01A-11D-2167-08	p.ET709del	TCGA-69-7760
EGFR	Nonsense_Mutation	SNP	TCGA-69-7765-01A-11D-2167-08	p.Q486*	TCGA-69-7765
EGFR	Missense_Mutation	SNP	TCGA-71-8520-01A-11D-2393-08	p.L858R	TCGA-71-8520
EGFR	Missense_Mutation	SNP	TCGA-71-8520-01A-11D-2393-08	p.L62R	TCGA-71-8520
EGFR	In_Frame_Del	DEL	TCGA-75-6207-01A-11D-1753-08	p.KELREA745del	TCGA-75-6207
EGFR	In_Frame_Del	DEL	TCGA-75-6212-01A-11D-1753-08	p.ELR746del	TCGA-75-6212
EGFR	In_Frame_Del	DEL	TCGA-75-7025-01A-12D-1945-08	p.KELREA745del	TCGA-75-7025
EGFR	Missense_Mutation	SNP	TCGA-78-7147-01A-11D-2036-08	p.L861Q	TCGA-78-7147
EGFR	Missense_Mutation	SNP	TCGA-78-7147-01A-11D-2036-08	p.L387M	TCGA-78-7147
EGFR	Frame_Shift_Del	DEL	TCGA-78-7147-01A-11D-2036-08	p.D1084fs	TCGA-78-7147

EGFR	Missense_Mutation	SNP	TCGA-78-7155-01A-11D-2036-08	p.Q432H	TCGA-78-7155
EGFR	Splice_Site	SNP	TCGA-78-7155-01A-11D-2036-08	p.G901_splice	TCGA-78-7155
EGFR	Missense_Mutation	SNP	TCGA-78-7155-01A-11D-2036-08	p.K754I	TCGA-78-7155
EGFR	Missense_Mutation	SNP	TCGA-78-7158-01A-11D-2036-08	p.L907M	TCGA-78-7158
EGFR	Missense_Mutation	SNP	TCGA-86-8055-01A-11D-2238-08	p.L858R	TCGA-86-8055
EGFR	In_Frame_Del	DEL	TCGA-86-8074-01A-11D-2238-08	p.KELREA745del	TCGA-86-8074
EGFR	Missense_Mutation	SNP	TCGA-86-8075-01A-11D-2238-08	p.L858R	TCGA-86-8075
EGFR	In_Frame_Del	DEL	TCGA-86-8280-01A-11D-2284-08	p.KELREA745del	TCGA-86-8280
EGFR	Missense_Mutation	SNP	TCGA-86-8668-01A-11D-2393-08	p.L858R	TCGA-86-8668
EGFR	Frame_Shift_Del	DEL	TCGA-86-A4JF-01A-11D-A24P-08	p.SE677fs	TCGA-86-A4JF
EGFR	In_Frame_Del	DEL	TCGA-86-A4P7-01A-11D-A24P-08	p.ET709del	TCGA-86-A4P7
EGFR	Missense_Mutation	SNP	TCGA-91-6835-01A-11D-1855-08	p.L858R	TCGA-91-6835
EGFR	Missense_Mutation	SNP	TCGA-93-A4JP-01A-11D-A24P-08	p.L861Q	TCGA-93-A4JP
EGFR	Missense_Mutation	SNP	TCGA-95-7039-01A-11D-1945-08	p.S921R	TCGA-95-7039
EGFR	Missense_Mutation	SNP	TCGA-95-7947-01A-11D-2184-08	p.I91V	TCGA-95-7947
EGFR	Missense_Mutation	SNP	TCGA-95-7947-01A-11D-2184-08	p.R1052I	TCGA-95-7947
EGFR	In_Frame_Del	DEL	TCGA-97-8171-01A-11D-2284-08	p.KELREA745del	TCGA-97-8171
EGFR	Splice_Site	SNP	TCGA-97-8172-01A-11D-2284-08	p.G627_splice	TCGA-97-8172
EGFR	Missense_Mutation	SNP	TCGA-97-8177-01A-11D-2284-08	p.L858R	TCGA-97-8177
EGFR	In_Frame_Del	DEL	TCGA-97-8547-01A-11D-2393-08	p.KELREA745del	TCGA-97-8547
EGFR	In_Frame_Del	DEL	TCGA-97-8552-01A-11D-2393-08	p.ELREA746del	TCGA-97-8552
EGFR	Missense_Mutation	SNP	TCGA-97-A4M1-01A-11D-A24P-08	p.L858R	TCGA-97-A4M1
EGFR	In_Frame_Del	DEL	TCGA-97-A4M6-01A-11D-A24P-08	p.KELREA745del	TCGA-97-A4M6
EGFR	Missense_Mutation	SNP	TCGA-97-A4M7-01A-11D-A24P-08	p.L858R	TCGA-97-A4M7
EGFR	In_Frame_Del	DEL	TCGA-J2-8192-01A-11D-2238-08	p.ELREA746del	TCGA-J2-8192
EGFR	Missense_Mutation	SNP	TCGA-MP-A4SW-01A-21D-A24P-08	p.L858R	TCGA-MP-A4SW
EGFR	In_Frame_Del	DEL	TCGA-MP-A4T6-01A-32D-A25L-08	p.ELR746del	TCGA-MP-A4T6
EGFR	Missense_Mutation	SNP	TCGA-MP-A4T9-01A-11D-A24P-08	p.L858R	TCGA-MP-A4T9
KRAS	Missense_Mutation	SNP	TCGA-05-4244-01A-01D-1105-08	p.G12C	TCGA-05-4244
KRAS	Missense_Mutation	SNP	TCGA-05-4249-01A-01D-1105-08	p.G12C	TCGA-05-4249
KRAS	Missense_Mutation	SNP	TCGA-05-4250-01A-01D-1105-08	p.G12C	TCGA-05-4250
KRAS	Missense_Mutation	SNP	TCGA-05-4390-01A-02D-1753-08	p.G12V	TCGA-05-4390
KRAS	Missense_Mutation	SNP	TCGA-05-4395-01A-01D-1265-08	p.G12V	TCGA-05-4395
KRAS	Missense_Mutation	SNP	TCGA-05-4403-01A-01D-1265-08	p.G12C	TCGA-05-4403
KRAS	Missense_Mutation	SNP	TCGA-05-4415-01A-22D-1855-08	p.G12C	TCGA-05-4415
KRAS	Missense_Mutation	SNP	TCGA-05-4417-01A-22D-1855-08	p.G12C	TCGA-05-4417

KRAS	Missense_Mutation	SNP	TCGA-05-4418-01A-01D-1265-08	p.G12C	TCGA-05-4418
KRAS	Missense_Mutation	SNP	TCGA-05-4427-01A-21D-1855-08	p.G12V	TCGA-05-4427
KRAS	Missense_Mutation	SNP	TCGA-05-4433-01A-22D-1855-08	p.G12V	TCGA-05-4433
KRAS	Missense_Mutation	SNP	TCGA-17-Z010-01A-01W-0746-08	p.G12V	TCGA-17-Z010
KRAS	Missense_Mutation	SNP	TCGA-17-Z014-01A-01W-0746-08	p.Q61L	TCGA-17-Z014
KRAS	Missense_Mutation	SNP	TCGA-17-Z017-01A-01W-0746-08	p.G13C	TCGA-17-Z017
KRAS	Missense_Mutation	SNP	TCGA-17-Z020-01A-01W-0746-08	p.G12V	TCGA-17-Z020
KRAS	Missense_Mutation	SNP	TCGA-17-Z022-01A-01W-0746-08	p.G12C	TCGA-17-Z022
KRAS	Missense_Mutation	SNP	TCGA-17-Z033-01A-01W-0746-08	p.G12V	TCGA-17-Z033
KRAS	Missense_Mutation	SNP	TCGA-17-Z036-01A-01W-0746-08	p.G12C	TCGA-17-Z036
KRAS	Missense_Mutation	SNP	TCGA-17-Z037-01A-01W-0746-08	p.G12A	TCGA-17-Z037
KRAS	Missense_Mutation	SNP	TCGA-17-Z042-01A-01W-0746-08	p.G12C	TCGA-17-Z042
KRAS	Missense_Mutation	SNP	TCGA-17-Z050-01A-01W-0747-08	p.G12V	TCGA-17-Z050
KRAS	Missense_Mutation	SNP	TCGA-17-Z060-01A-01W-0747-08	p.G12D	TCGA-17-Z060
KRAS	Missense_Mutation	SNP	TCGA-35-3615-01A-01W-0928-08	p.G12C	TCGA-35-3615
KRAS	Missense_Mutation	SNP	TCGA-35-3615-01A-01D-1040-01	p.G12C	TCGA-35-3615
KRAS	Missense_Mutation	SNP	TCGA-35-3615-01A-01W-0928-08	p.G12C	TCGA-35-3615
KRAS	Missense_Mutation	SNP	TCGA-35-3615-01A-01D-1040-01	p.G12C	TCGA-35-3615
KRAS	Missense_Mutation	SNP	TCGA-38-4626-01A-01D-1553-08	p.G12V	TCGA-38-4626
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01W-0928-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01D-0969-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01W-0928-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01D-0969-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01W-0928-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-2668-01A-01D-0969-08	p.G12C	TCGA-44-2668
KRAS	Missense_Mutation	SNP	TCGA-44-6145-01A-11D-1753-08	p.G12V	TCGA-44-6145
KRAS	Missense_Mutation	SNP	TCGA-44-6145-01A-11D-1753-08	p.G12V	TCGA-44-6145
KRAS	Missense_Mutation	SNP	TCGA-44-6146-01A-11D-1753-08	p.G12V	TCGA-44-6146
KRAS	Missense_Mutation	SNP	TCGA-44-6146-01A-11D-1753-08	p.G12V	TCGA-44-6146
KRAS	Missense_Mutation	SNP	TCGA-44-6776-01A-11D-1855-08	p.G12D	TCGA-44-6776
KRAS	Missense_Mutation	SNP	TCGA-44-6776-01A-11D-1855-08	p.G12D	TCGA-44-6776
KRAS	Missense_Mutation	SNP	TCGA-44-6777-01A-11D-1855-08	p.G12C	TCGA-44-6777
KRAS	Missense_Mutation	SNP	TCGA-44-6777-01A-11D-1855-08	p.G12C	TCGA-44-6777
KRAS	Missense_Mutation	SNP	TCGA-44-7659-01A-11D-2063-08	p.G12C	TCGA-44-7659
KRAS	Missense_Mutation	SNP	TCGA-44-7661-01A-11D-2063-08	p.G12V	TCGA-44-7661
KRAS	Missense_Mutation	SNP	TCGA-44-7661-01A-11D-2063-08	p.G12V	TCGA-44-7661

KRAS	Missense_Mutation	SNP	TCGA-44-7671-01A-11D-2063-08	p.G12C	TCGA-44-7671
KRAS	Missense_Mutation	SNP	TCGA-44-7671-01A-11D-2063-08	p.G12C	TCGA-44-7671
KRAS	Missense_Mutation	SNP	TCGA-44-7672-01A-11D-2063-08	p.G12A	TCGA-44-7672
KRAS	Missense_Mutation	SNP	TCGA-44-7672-01A-11D-2063-08	p.G12A	TCGA-44-7672
KRAS	Missense_Mutation	SNP	TCGA-44-8117-01A-11D-2238-08	p.L19F	TCGA-44-8117
KRAS	Missense_Mutation	SNP	TCGA-44-A47A-01A-21D-A24D-08	p.G12D	TCGA-44-A47A
KRAS	Missense_Mutation	SNP	TCGA-44-A47F-01A-11D-A24D-08	p.G12C	TCGA-44-A47F
KRAS	Missense_Mutation	SNP	TCGA-49-4505-01A-01D-1931-08	p.G12C	TCGA-49-4505
KRAS	Missense_Mutation	SNP	TCGA-49-4510-01A-01D-1265-08	p.G12D	TCGA-49-4510
KRAS	Missense_Mutation	SNP	TCGA-49-6761-01A-31D-1945-08	p.G12D	TCGA-49-6761
KRAS	Missense_Mutation	SNP	TCGA-50-5051-01A-21D-1855-08	p.G12C	TCGA-50-5051
KRAS	Missense_Mutation	SNP	TCGA-50-5932-01A-11D-1753-08	p.G12C	TCGA-50-5932
KRAS	Missense_Mutation	SNP	TCGA-50-5941-01A-11D-1753-08	p.G12A	TCGA-50-5941
KRAS	Missense_Mutation	SNP	TCGA-50-8457-01A-11D-2323-08	p.G12A	TCGA-50-8457
KRAS	Missense_Mutation	SNP	TCGA-50-8459-01A-11D-2323-08	p.G12C	TCGA-50-8459
KRAS	Missense_Mutation	SNP	TCGA-53-7813-01A-11D-2167-08	p.G12A	TCGA-53-7813
KRAS	Missense_Mutation	SNP	TCGA-55-1595-01A-01D-0969-08	p.G12C	TCGA-55-1595
KRAS	Missense_Mutation	SNP	TCGA-55-1595-01A-01D-0969-08	p.G12C	TCGA-55-1595
KRAS	Missense_Mutation	SNP	TCGA-55-6642-01A-11D-1855-08	p.G12V	TCGA-55-6642
KRAS	Missense_Mutation	SNP	TCGA-55-6970-01A-11D-1945-08	p.G12V	TCGA-55-6970
KRAS	Missense_Mutation	SNP	TCGA-55-6975-01A-11D-1945-08	p.G13C	TCGA-55-6975
KRAS	Missense_Mutation	SNP	TCGA-55-6983-01A-11D-1945-08	p.G12C	TCGA-55-6983
KRAS	Missense_Mutation	SNP	TCGA-55-6984-01A-11D-1945-08	p.G12A	TCGA-55-6984
KRAS	Missense_Mutation	SNP	TCGA-55-7281-01A-11D-2036-08	p.G12C	TCGA-55-7281
KRAS	Missense_Mutation	SNP	TCGA-55-7281-01A-11D-2036-08	p.G12C	TCGA-55-7281
KRAS	Missense_Mutation	SNP	TCGA-55-7283-01A-11D-2036-08	p.G12S	TCGA-55-7283
KRAS	Missense_Mutation	SNP	TCGA-55-7283-01A-11D-2036-08	p.G12S	TCGA-55-7283
KRAS	Missense_Mutation	SNP	TCGA-55-7284-01B-11D-2238-08	p.G12D	TCGA-55-7284
KRAS	Missense_Mutation	SNP	TCGA-55-7576-01A-11D-2063-08	p.G12S	TCGA-55-7576
KRAS	Missense_Mutation	SNP	TCGA-55-7576-01A-11D-2063-08	p.G12S	TCGA-55-7576
KRAS	Missense_Mutation	SNP	TCGA-55-7725-01A-11D-2167-08	p.G12V	TCGA-55-7725
KRAS	Missense_Mutation	SNP	TCGA-55-7726-01A-11D-2167-08	p.G12C	TCGA-55-7726
KRAS	Missense_Mutation	SNP	TCGA-55-7728-01A-11D-2184-08	p.G12V	TCGA-55-7728
KRAS	Missense_Mutation	SNP	TCGA-55-7815-01A-11D-2167-08	p.G12V	TCGA-55-7815
KRAS	Missense_Mutation	SNP	TCGA-55-7907-01A-11D-2167-08	p.G12C	TCGA-55-7907
KRAS	Missense_Mutation	SNP	TCGA-55-7910-01A-11D-2167-08	p.G13C	TCGA-55-7910

KRAS	Nonsense_Mutation	SNP	TCGA-55-7911-01A-11D-2167-08	p.K88*	TCGA-55-7911
KRAS	Missense_Mutation	SNP	TCGA-55-7911-01A-11D-2167-08	p.G12V	TCGA-55-7911
KRAS	Missense_Mutation	SNP	TCGA-55-7914-01A-11D-2167-08	p.G12C	TCGA-55-7914
KRAS	Missense_Mutation	SNP	TCGA-55-8090-01A-11D-2238-08	p.G12V	TCGA-55-8090
KRAS	Missense_Mutation	SNP	TCGA-55-8094-01A-11D-2238-08	p.G13C	TCGA-55-8094
KRAS	Missense_Mutation	SNP	TCGA-55-8097-01A-11D-2238-08	p.G12C	TCGA-55-8097
KRAS	Missense_Mutation	SNP	TCGA-55-8203-01A-11D-2238-08	p.G12C	TCGA-55-8203
KRAS	Missense_Mutation	SNP	TCGA-55-8207-01A-11D-2238-08	p.G12C	TCGA-55-8207
KRAS	Missense_Mutation	SNP	TCGA-55-8299-01A-11D-2284-08	p.G12C	TCGA-55-8299
KRAS	Missense_Mutation	SNP	TCGA-55-8299-01A-11D-2284-08	p.G12C	TCGA-55-8299
KRAS	Missense_Mutation	SNP	TCGA-55-8302-01A-11D-2323-08	p.G12C	TCGA-55-8302
KRAS	Missense_Mutation	SNP	TCGA-55-8508-01A-11D-2393-08	p.G12C	TCGA-55-8508
KRAS	Missense_Mutation	SNP	TCGA-55-8512-01A-11D-2393-08	p.G12V	TCGA-55-8512
KRAS	Missense_Mutation	SNP	TCGA-55-8514-01A-11D-2393-08	p.G12A	TCGA-55-8514
KRAS	Missense_Mutation	SNP	TCGA-55-8615-01A-11D-2393-08	p.G12C	TCGA-55-8615
KRAS	Missense_Mutation	SNP	TCGA-55-8616-01A-11D-2393-08	p.G12C	TCGA-55-8616
KRAS	Missense_Mutation	SNP	TCGA-55-A490-01A-11D-A24D-08	p.G12C	TCGA-55-A490
KRAS	Missense_Mutation	SNP	TCGA-55-A494-01A-11D-A24P-08	p.G12D	TCGA-55-A494
KRAS	Missense_Mutation	SNP	TCGA-62-8398-01A-11D-2323-08	p.G12D	TCGA-62-8398
KRAS	Missense_Mutation	SNP	TCGA-62-A46R-01A-11D-A24D-08	p.G12A	TCGA-62-A46R
KRAS	Missense_Mutation	SNP	TCGA-62-A46S-01A-11D-A24D-08	p.G13D	TCGA-62-A46S
KRAS	Missense_Mutation	SNP	TCGA-64-5774-01A-01D-1625-08	p.G12C	TCGA-64-5774
KRAS	Missense_Mutation	SNP	TCGA-64-5775-01A-01D-1625-08	p.Q61L	TCGA-64-5775
KRAS	Missense_Mutation	SNP	TCGA-64-5778-01A-01D-1625-08	p.G12C	TCGA-64-5778
KRAS	Missense_Mutation	SNP	TCGA-64-5815-01A-01D-1625-08	p.Q61L	TCGA-64-5815
KRAS	Missense_Mutation	SNP	TCGA-67-3773-01A-01D-1040-01	p.G12V	TCGA-67-3773
KRAS	Missense_Mutation	SNP	TCGA-67-3773-01A-01D-1040-01	p.G12V	TCGA-67-3773
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01W-0928-08	p.G12C	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01W-0928-08	p.G12V	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01D-1040-01	p.G12C	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01D-1040-01	p.G12V	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01W-0928-08	p.G12C	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01W-0928-08	p.G12V	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01D-1040-01	p.G12C	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-3774-01A-01D-1040-01	p.G12V	TCGA-67-3774
KRAS	Missense_Mutation	SNP	TCGA-67-4679-01B-01D-1753-08	p.G12A	TCGA-67-4679

KRAS	Missense_Mutation	SNP	TCGA-69-7973-01A-11D-2184-08	p.G12C	TCGA-69-7973
KRAS	Missense_Mutation	SNP	TCGA-69-7974-01A-11D-2184-08	p.Q61H	TCGA-69-7974
KRAS	Missense_Mutation	SNP	TCGA-69-7978-01A-11D-2184-08	p.G12C	TCGA-69-7978
KRAS	Missense_Mutation	SNP	TCGA-69-7980-01A-11D-2184-08	p.G12A	TCGA-69-7980
KRAS	Missense_Mutation	SNP	TCGA-69-8253-01A-11D-2284-08	p.G12D	TCGA-69-8253
KRAS	Missense_Mutation	SNP	TCGA-69-8254-01A-11D-2284-08	p.G12D	TCGA-69-8254
KRAS	Missense_Mutation	SNP	TCGA-73-4659-01A-01D-1265-08	p.G12V	TCGA-73-4659
KRAS	Missense_Mutation	SNP	TCGA-73-4662-01A-01D-1265-08	p.G12C	TCGA-73-4662
KRAS	Missense_Mutation	SNP	TCGA-73-4670-01A-01D-1265-08	p.A146P	TCGA-73-4670
KRAS	Missense_Mutation	SNP	TCGA-73-4677-01A-01D-1265-08	p.G12A	TCGA-73-4677
KRAS	Missense_Mutation	SNP	TCGA-73-7498-01A-12D-2184-08	p.G12C	TCGA-73-7498
KRAS	Missense_Mutation	SNP	TCGA-75-5126-01A-01D-1753-08	p.G12C	TCGA-75-5126
KRAS	Missense_Mutation	SNP	TCGA-75-6206-01A-11D-1753-08	p.G13D	TCGA-75-6206
KRAS	Missense_Mutation	SNP	TCGA-75-7027-01A-11D-1945-08	p.G12V	TCGA-75-7027
KRAS	Missense_Mutation	SNP	TCGA-75-7030-01A-11D-1945-08	p.G12D	TCGA-75-7030
KRAS	Missense_Mutation	SNP	TCGA-78-7145-01A-11D-2036-08	p.G12D	TCGA-78-7145
KRAS	Missense_Mutation	SNP	TCGA-78-7145-01A-11D-2036-08	p.G12C	TCGA-78-7145
KRAS	Missense_Mutation	SNP	TCGA-78-7148-01A-11D-2036-08	p.G12C	TCGA-78-7148
KRAS	Missense_Mutation	SNP	TCGA-78-7160-01A-11D-2036-08	p.G12D	TCGA-78-7160
KRAS	Missense_Mutation	SNP	TCGA-78-7161-01A-11D-2036-08	p.G12V	TCGA-78-7161
KRAS	Missense_Mutation	SNP	TCGA-78-7166-01A-12D-2063-08	p.G12C	TCGA-78-7166
KRAS	Missense_Mutation	SNP	TCGA-78-7167-01A-11D-2063-08	p.G12C	TCGA-78-7167
KRAS	Missense_Mutation	SNP	TCGA-78-7167-01A-11D-2063-08	p.G12V	TCGA-78-7167
KRAS	Missense_Mutation	SNP	TCGA-78-7539-01A-11D-2063-08	p.G12C	TCGA-78-7539
KRAS	Missense_Mutation	SNP	TCGA-78-7540-01A-11D-2063-08	p.G12V	TCGA-78-7540
KRAS	Missense_Mutation	SNP	TCGA-78-8655-01A-11D-2393-08	p.G12S	TCGA-78-8655
KRAS	Missense_Mutation	SNP	TCGA-80-5608-01A-31D-1945-08	p.G12A	TCGA-80-5608
KRAS	Missense_Mutation	SNP	TCGA-83-5908-01A-21D-2284-08	p.G12A	TCGA-83-5908
KRAS	Missense_Mutation	SNP	TCGA-86-7713-01A-11D-2063-08	p.G12C	TCGA-86-7713
KRAS	Missense_Mutation	SNP	TCGA-86-7713-01A-11D-2063-08	p.G12C	TCGA-86-7713
KRAS	Missense_Mutation	SNP	TCGA-86-7953-01A-11D-2184-08	p.G12D	TCGA-86-7953
KRAS	Missense_Mutation	SNP	TCGA-86-8054-01A-11D-2238-08	p.G12V	TCGA-86-8054
KRAS	Missense_Mutation	SNP	TCGA-86-8056-01A-11D-2238-08	p.G12D	TCGA-86-8056
KRAS	Missense_Mutation	SNP	TCGA-86-8076-01A-31D-2238-08	p.G12D	TCGA-86-8076
KRAS	Missense_Mutation	SNP	TCGA-86-8359-01A-11D-2323-08	p.G12A	TCGA-86-8359
KRAS	Missense_Mutation	SNP	TCGA-86-8674-01A-21D-2393-08	p.G13C	TCGA-86-8674

KRAS	Missense_Mutation	SNP	TCGA-86-A456-01A-11D-A24D-08	p.G12V	TCGA-86-A456
KRAS	Missense_Mutation	SNP	TCGA-86-A4JF-01A-11D-A24P-08	p.G12V	TCGA-86-A4JF
KRAS	Missense_Mutation	SNP	TCGA-91-6828-01A-11D-1855-08	p.G12V	TCGA-91-6828
KRAS	Missense_Mutation	SNP	TCGA-91-6828-01A-11D-1855-08	p.G12V	TCGA-91-6828
KRAS	Missense_Mutation	SNP	TCGA-91-6836-01A-21D-1855-08	p.G12A	TCGA-91-6836
KRAS	Missense_Mutation	SNP	TCGA-91-8497-01A-11D-2393-08	p.G12C	TCGA-91-8497
KRAS	Missense_Mutation	SNP	TCGA-93-7347-01A-11D-2184-08	p.G12C	TCGA-93-7347
KRAS	Missense_Mutation	SNP	TCGA-93-8067-01A-11D-2284-08	p.G12V	TCGA-93-8067
KRAS	Missense_Mutation	SNP	TCGA-93-A4JO-01A-21D-A24P-08	p.G12D	TCGA-93-A4JO
KRAS	Missense_Mutation	SNP	TCGA-95-7039-01A-11D-1945-08	p.D33E	TCGA-95-7039
KRAS	Missense_Mutation	SNP	TCGA-95-7562-01A-11D-2238-08	p.G12C	TCGA-95-7562
KRAS	Missense_Mutation	SNP	TCGA-95-7567-01A-11D-2063-08	p.G12V	TCGA-95-7567
KRAS	Missense_Mutation	SNP	TCGA-95-A4VK-01A-11D-A25L-08	p.G12V	TCGA-95-A4VK
KRAS	Missense_Mutation	SNP	TCGA-95-A4VN-01A-11D-A25L-08	p.G12V	TCGA-95-A4VN
KRAS	Missense_Mutation	SNP	TCGA-95-A4VP-01A-21D-A25L-08	p.G12V	TCGA-95-A4VP
KRAS	Missense_Mutation	SNP	TCGA-97-7554-01A-11D-2036-08	p.G12V	TCGA-97-7554
KRAS	Missense_Mutation	SNP	TCGA-97-7938-01A-11D-2167-08	p.G12C	TCGA-97-7938
KRAS	Missense_Mutation	SNP	TCGA-97-7941-01A-11D-2184-08	p.G12A	TCGA-97-7941
KRAS	Missense_Mutation	SNP	TCGA-97-8176-01A-11D-2393-08	p.G12S	TCGA-97-8176
KRAS	Missense_Mutation	SNP	TCGA-97-8179-01A-11D-2284-08	p.L19F	TCGA-97-8179
KRAS	Missense_Mutation	SNP	TCGA-97-A4M0-01A-11D-A24P-08	p.G12C	TCGA-97-A4M0
KRAS	Missense_Mutation	SNP	TCGA-97-A4M5-01A-11D-A24P-08	p.G12C	TCGA-97-A4M5
KRAS	Missense_Mutation	SNP	TCGA-99-7458-01A-11D-2036-08	p.G12R	TCGA-99-7458
KRAS	Missense_Mutation	SNP	TCGA-99-8025-01A-11D-2238-08	p.G13C	TCGA-99-8025
KRAS	Missense_Mutation	SNP	TCGA-99-8028-01A-11D-2238-08	p.G12C	TCGA-99-8028
KRAS	Missense_Mutation	SNP	TCGA-99-8032-01A-11D-2238-08	p.G12C	TCGA-99-8032
KRAS	Missense_Mutation	SNP	TCGA-99-8033-01A-11D-2238-08	p.G13C	TCGA-99-8033
KRAS	Missense_Mutation	SNP	TCGA-J2-8194-01A-11D-2238-08	p.G12C	TCGA-J2-8194
KRAS	Missense_Mutation	SNP	TCGA-J2-A4AG-01A-11D-A24D-08	p.G12D	TCGA-J2-A4AG
KRAS	Missense_Mutation	SNP	TCGA-L9-A443-01A-12D-A24D-08	p.G12V	TCGA-L9-A443
KRAS	Missense_Mutation	SNP	TCGA-MN-A4N5-01A-11D-A24P-08	p.G12C	TCGA-MN-A4N5
KRAS	Missense_Mutation	SNP	TCGA-MP-A4SY-01A-21D-A24P-08	p.G12D	TCGA-MP-A4SY
KRAS	Missense_Mutation	SNP	TCGA-MP-A4T4-01A-11D-A25L-08	p.G12V	TCGA-MP-A4T4
KRAS	Missense_Mutation	SNP	TCGA-MP-A4T7-01A-11D-A24P-08	p.G12V	TCGA-MP-A4T7
KRAS	Missense_Mutation	SNP	TCGA-MP-A4T8-01A-11D-A24P-08	p.G12D	TCGA-MP-A4T8
KRAS	Missense_Mutation	SNP	TCGA-MP-A4TD-01A-32D-A25L-08	p.G12C	TCGA-MP-A4TD

KRAS	Missense_Mutation	SNP	TCGA-MP-A4TE-01A-22D-A25L-08	p.G12C	TCGA-MP-A4TE
KRAS	Missense_Mutation	SNP	TCGA-MP-A4TF-01A-11D-A25L-08	p.G12C	TCGA-MP-A4TF
KRAS	Missense_Mutation	SNP	TCGA-MP-A4TI-01A-21D-A24P-08	p.G12C	TCGA-MP-A4TI
KRAS	Missense_Mutation	SNP	TCGA-MP-A4TK-01A-11D-A24P-08	p.G12V	TCGA-MP-A4TK
KRAS	Missense_Mutation	SNP	TCGA-NJ-A4YG-01A-22D-A25L-08	p.G12D	TCGA-NJ-A4YG
KRAS	Missense_Mutation	SNP	TCGA-NJ-A4YI-01A-11D-A25L-08	p.G12C	TCGA-NJ-A4YI
KRAS	Missense_Mutation	SNP	TCGA-NJ-A4YP-01A-11D-A25L-08	p.L19F	TCGA-NJ-A4YP
KRAS	Missense_Mutation	SNP	TCGA-NJ-A4YP-01A-11D-A25L-08	p.Q61E	TCGA-NJ-A4YP
KRAS	Missense_Mutation	SNP	TCGA-NJ-A55O-01A-11D-A25L-08	p.G12C	TCGA-NJ-A55O
KRAS	Missense_Mutation	SNP	TCGA-NJ-A55R-01A-11D-A25L-08	p.G12A	TCGA-NJ-A55R

Supplemental Table 12: ALK fusion TCGA cases from the TCGA Fusion Gene Databased (MDACC)

For details, please see http://54.84.12.177/PanCanFusV2/ or ref. 17

TCGA SampleId	FusionPair	E-value	Tier	Frame	5' Gene Junction	3' Gene Junction
TCGA-50-8460-01A	EML4__ALK	0.35	tier1	In-frame	Chr2:42492091/1	Chr2:29446394/-1
TCGA-67-6215-01A	EML4__ALK	0.35	tier1	In-frame	Chr2:42491871/1	Chr2:29446394/-1
TCGA-67-6216-01A	EML4__ALK	0.35	tier1	In-frame	Chr2:42492091/1	Chr2:29446394/-1
TCGA-78-7163-01A	EML4__ALK	0.35	tier1	In-frame	Chr2:42522656/1	Chr2:29446394/-1
TCGA-86-A4P8-01A	EML4__ALK	0.35	tier3	In-frame	Chr2:42552694/1	Chr2:29446394/-1

Supplemental Table 13: multivariate Cox proportional hazards model including EGFR, KRAS, and ALK alteration status in full TCGA cohort

	multivariate	
	Hazard Ratio (95% CI)	Likelihood ratio test p-value
Stage	1.43 (1.18-1.74)	0.00027
Age	1.01 (0.99-1.03)	0.19
Gender	0.91 (0.62-1.33)	0.61
Risk Score	2.13 (1.79-2.52)	<0.0001
EGFRmt	2.03 (1.26-3.62)	0.0049
KRASmt	1.53 (0.99-2.38)	0.058
ALK+	0.00 (-Inf-+Inf)*	0.96

* Inf=infinity.