S5. GSEA analysis using the oncogenic, KEGG, and GOBP gene sets.

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NAME	SIZE	ES		NES	p-val I	FDR q-value
PIGF_UP.V1_UP		184	0.37999806	2.1691117	0	7.66E-05
ERBB2_UP.V1_DN		190	0.35316053	2.0094836	; O	0.001074609
TBK1.DF_DN		280	0.28347325	1.7019244	. 0	0.015042434
VEGF_A_UP.V1_DN		185	0.29627037	1.6866676	; O	0.013255387
RB_P107_DN.V1_DN		120	0.3023082	1.613606	8.74E-04	0.02098995
RB_P130_DN.V1_DN		126	0.2854445	1.5376194	0.003938731	0.036148705

GSEA table for Oncogenic up-regulated gene sets (FDR < 0.05)

GSEA table for Oncogenie	c down-regulated gene sets ((FDR < 0.05)
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NAME	SIZE	E	S	1	VES	p-val	FDR q-value
KRAS.PROSTATE_UP.V1_UP		98	-0.	5134683	-2.299555		0 0
KRAS.600.LUNG.BREAST_UP.V1_UP		176	-0.4	4695035	-2.2835803	(0 0
KRAS.BREAST UP.V1 UP		89	-0.4	4960229	-2.1829803		0 0
KRAS.LUNG.BREAST_UP.V1_UP		93	-0.4	4846052	-2.1521356		0 0
KRAS.LUNG_UP.V1_UP		94	-0.4	4757321	-2.1105325		6.28E-05
CAHOY_NEURONAL		62	-0.4	4963074	-2.051618		7.63E-05
P53_DN.V2_UP		96	-0.4	4545239	-2.037276		9.39E-05
RELA DN.V1 DN		97	-0.4	4399677	-1.9602392		5.10E-04
IL15_UP.V1_DN		126	-0.4	4122638	-1.920542		7.79E-04
JAK2 DN.V1 UP		108	-0.4	4216185	-1.9118984	1.32E-04	7.64E-04
RPS14 DN.V1 UP		169	-0.3	3853375	-1.8674365		0.00126314
LEF1 UP.V1 UP		172	-0.3	3777391	-1.8274897		0.00204783
IL21_UP.V1_UP		145	-0.3	3804847	-1.8082885	1.27E-04	0.00239922
PTEN_DN.V1_DN		121	-0.3	3888049	-1.7984138	1.30E-04	0.00248792
BRCA1_DN.V1_UP		82	-0.4	4115107	-1.7910712	4.09E-04	0.00261858
ATF2_UP.V1_UP		126	-0.3	3837714	-1.7843652		0.00265331
IL2 UP.V1 UP		159	-0.3	3689195	-1.7741044	1.26E-04	0.00290406
KRAS.KIDNEY_UP.V1_DN		88		3982481	-1.749471	0.0014947	
DCA_UP.V1_UP		126		3741754	-1.7391055	7.67E-04	
KRAS.600 UP.V1 UP		203		3503501	-1.7383595		0.00403845
KRAS.300 UP.V1 UP		107		3753077	-1.7025163	6.58E-04	
P53_DN.V1_DN		173		3507869	-1.6983001	2.48E-04	
KRAS.50 UP.V1 UP		38		4575638	-1.6971632	0.0062761	
RB P107 DN.V1 UP		125		3657492	-1.6965069	5.15E-04	
SRC_UP.V1_UP		124		3638451	-1.691479	5.16E-04	
IL15 UP.V1 UP		161		3499104	-1.6811961	6.25E-04	
PIGF UP.V1 DN		148		3472409	-1.6576235	7.57E-04	
KRAS.BREAST UP.V1 DN		103		3665667	-1.6526378	0.0019757	
E2F3_UP.V1_UP		168		3394752	-1.6401621	4.95E-04	
JNK_DN.V1_DN		146		3449201	-1.6313322	3.82E-04	
CAMP UP.V1 DN		186		3264933	-1.6034255	7.39E-04	
PTEN_DN.V1_UP		135		3399975	-1.5964662	0.0025448	
ALK DN.V1 UP		100		3515601	-1.5770893	0.0043668	
CAHOY_ASTROGLIAL		88		3584442	-1.5765339	0.0056987	
VEGF A UP.V1 UP		158		3253332	-1.5661472	0.0016313	
CYCLIN_D1_UP.V1_UP		154		3264754	-1.5609566	0.0030207	
PRC1 BMI UP.V1 UP		141		3300336	-1.5605282	0.0029273	
PDGF_UP.V1_DN		94		3529673	-1.5599719	0.0072086	
PRC2_SUZ12_UP.V1_UP		141		.325922	-1.5430727	0.00457724	
RB P130 DN.V1 UP		109		3356836	-1.5277474	0.0083476	
KRAS.AMP.LUNG_UP.V1_DN		105		3370817	-1.5270163	0.0086252	
KRAS.PROSTATE_UP.V1_DN		94		3437824	-1.5264548	0.0111424	
KRAS.600.LUNG.BREAST UP.V1 DN		198		3088274	-1.5213447	0.0030273	
IL2 UP.V1 DN		143		3190751	-1.5122533	0.0069629	
ATF2 S UP.V1 UP		145		3157506	-1.5024015	0.0049789	
PKCA_DN.V1_DN		140		3231099	-1.4912496	0.009812	
JNK DN.V1 UP		142		3151889	-1.4871517	0.0081812	
SNF5 DN.V1 UP		142		3081793	-1.4846565	0.0073264	
SNF5_DN.V1_DN		133		3155903	-1.4754627	0.0121071	
YAP1 UP		43		3830668	-1.4662932	0.0377833	
BMI1_DN_MEL18_DN.V1_UP		129		3098199	-1.4555154	0.0144702	
01111_011_01010_011.V1_01		123	-0	2020122	-1.4000104	0.01447020	0.04002070

GSEA table for KEGG up-regulated gene sets (FDR < 0.05)

NAME	SIZE	ES	NES	p-val f	FDR q-value
KEGG_PROTEIN_EXPORT	23	0.631071	2.3141265	; 0	9.33E-04
KEGG_OXIDATIVE_PHOSPHORYLATION	121	0.42155826	2.2039602	2 0	0.002276881
KEGG_PARKINSONS_DISEASE	117	0.3875401	2.0368695	; 0	0.0068126
KEGG_CITRATE_CYCLE_TCA_CYCLE	29	0.527474	2.056116	; 0	0.007522518

GSEA table for KEGG down-regulated gene sets (FDR < 0.05)

NAME	SIZE	ES		NES	p-val	FDR q-value
KEGG_GRAFT_VERSUS_HOST_DISEASE		26	-0.84030366	-2.51570	4 0	0
KEGG_AUTOIMMUNE_THYROID_DISEASE		25	-0.8427207	-2.513141	6 0	0
KEGG_INTESTINAL_IMMUNE_NETWORK_FOR_IGA_PRODUCTION		32	-0.80258304	-2.508346	8 0	0
KEGG_HEMATOPOIETIC_CELL_LINEAGE		62	-0.71402407	-2.495267	4 0	0
KEGG_ALLOGRAFT_REJECTION		26	-0.82865447	-2.493551	5 0	0
KEGG_ASTHMA		17	-0.9046613	-2.457777	3 0	0
KEGG_PRIMARY_IMMUNODEFICIENCY		26	-0.75680894	-2.267379	8 0	0
KEGG_CYTOKINE_CYTOKINE_RECEPTOR_INTERACTION	:	159	-0.585377	-2.264232	6 0	0
KEGG_TYPE_I_DIABETES_MELLITUS		31	-0.7248778	-2.258077	9 0	0
KEGG_LEISHMANIA_INFECTION		61	-0.6452481	-2.244185	7 0	0
KEGG_CELL_ADHESION_MOLECULES_CAMS	:	112	-0.5878192	-2.203468	6 0	0
KEGG_VIRAL_MYOCARDITIS		60	-0.6162249	-2.135445	4 0	0
KEGG_ECM_RECEPTOR_INTERACTION		81	-0.56642216	-2.0531	3 0	5.46E-05
KEGG_NEUROACTIVE_LIGAND_RECEPTOR_INTERACTION	:	147	-0.5096956	-1.956969	5 0	2.93E-04
KEGG_SYSTEMIC_LUPUS_ERYTHEMATOSUS	:	103	-0.50952756	-1.89813	1 0	8.67E-04
KEGG_CALCIUM_SIGNALING_PATHWAY	:	143	-0.48741472	-1.867538	8 0	0.001418914
KEGG_ANTIGEN_PROCESSING_AND_PRESENTATION		54	-0.5400128	-1.855054	4 0	0.001746663
KEGG_CHEMOKINE_SIGNALING_PATHWAY	:	142	-0.45718867	-1.756327	2 0	0.006958953
KEGG_NATURAL_KILLER_CELL_MEDIATED_CYTOTOXICITY		93	-0.46455982	-1.71764	6 1.07E-04	0.011132123
KEGG_DRUG_METABOLISM_CYTOCHROME_P450		31	-0.54923296	-1.707842	5 0.003699593	0.01209183
KEGG_DILATED_CARDIOMYOPATHY		74	-0.46650556	-1.677574	4 8.86E-04	0.01647371
KEGG_FOCAL_ADHESION	:	190	-0.42584896	-1.665713	3 0	0.018245969
KEGG_ABC_TRANSPORTERS		39	-0.5074533	-1.648791	9 0.005799503	0.021292005
KEGG_LEUKOCYTE_TRANSENDOTHELIAL_MIGRATION		97	-0.44282904	-1.639767	4 0.001071467	0.022794547
KEGG_HYPERTROPHIC_CARDIOMYOPATHY_HCM		67	-0.46614856	-1.639393	7 0.002217541	0.021970354
KEGG_T_CELL_RECEPTOR_SIGNALING_PATHWAY		93	-0.44438422	-1.634263	9 0.001503114	0.022440786
KEGG_B_CELL_RECEPTOR_SIGNALING_PATHWAY		71	-0.45687383	-1.630641	8 0.001659476	0.022519669
KEGG_JAK_STAT_SIGNALING_PATHWAY		99	-0.43428278	-1.610450	9 0.001070893	0.027168183
KEGG_COMPLEMENT_AND_COAGULATION_CASCADES		51	-0.4630738	-1.576062	2 0.009388039	0.037909135

GSEA table for GOBP up-regulated gene sets (FDR < 0.05)

NAME	SIZE	ES			p-val F	DR q-value
GOBP_MITOCHONDRIAL_TRANSLATIONAL_TERMINATION		89	0.5148428	2.5802567	0	7.97E-04
GOBP_ER_NUCLEUS_SIGNALING_PATHWAY		52	0.55574876	2.5132298	0	7.99E-04
GOBP_ATP_SYNTHESIS_COUPLED_ELECTRON_TRANSPORT		93	0.47469223	2.4081469	0	0.00300918
GOBP_REGULATION_OF_TRANSCRIPTION_FROM_RNA_POLYMERASE_II_PROMOTER_IN_RESPONSE_TO_HYP						
AIXO		74	0.48969692	2.375456	0	0.00391304
GOBP_TRANSLATIONAL_TERMINATION		104	0.44788104	2.320398	0	0.00644285
GOBP_OXIDATIVE_PHOSPHORYLATION		135	0.42839652	2.2987373	0	0.00667296
GOBP_REGULATION_OF_DNA_TEMPLATED_TRANSCRIPTION_IN_RESPONSE_TO_STRESS		109	0.42872593	2.2605312	0	0.00908123
GOBP_VIRION_ASSEMBLY		40	0.5290905	2.2503767	0	0.00885648
GOBP AEROBIC RESPIRATION		81	0.44912013	2.2193592	0	0.01118527
GOBP_CELLULAR_RESPONSE_TO_TOPOLOGICALLY_INCORRECT_PROTEIN		156	0.39882573	2.21625	0	0.01042456
GOBP_MITOCHONDRIAL_ELECTRON_TRANSPORT_CYTOCHROME_C_TO_OXYGEN		18	0.65130705	2.215675	0	0.00958378
GOBP_RESPIRATORY_ELECTRON_TRANSPORT_CHAIN		108	0.42451945	2.2020218	0	0.01069079
GOBP MITOCHONDRIAL TRANSLATION		134	0.40634346			0.01220119
GOBP_POSITIVE_REGULATION_OF_DNA_TEMPLATED_TRANSCRIPTION_ELONGATION		25		2.1814685		0.01154373
GOBP_REGULATION_OF_NUCLEOBASE_CONTAINING_COMPOUND_TRANSPORT		15	0.6850738			0.0108532
GOBP_ENDOPLASMIC_RETICULUM_MANNOSE_TRIMMING		16		2.1683912		0.01178939
GOBP_GOLGI_ORGANIZATION		127		2.1625478		0.01179032
GOBP_REGULATION_OF_ENDOPLASMIC_RETICULUM_UNFOLDED_PROTEIN_RESPONSE		28	0.54766536			0.01662011
GOB_TRANSCRIPTION_ELONGATION_FROM_RNA_POLYMERASE_II_PROMOTER		81	0.42699003		4.550-04	0.01002011
GOBP_ANAPHASE_PROMOTING_COMPLEX_DEPENDENT_CATABOLIC_PROCESS		78		2.1052907		0.013327
GOBP_COPIL_COATED_VESICLE_BUDDING		71	0.43600196		-	0.01860879
		20	0.5994502			0.01880875
GOBP_VESICLE_CARGO_LOADING		191				
GOBP_RESPONSE_TO_TOPOLOGICALLY_INCORRECT_PROTEIN		191	0.37317285	2.0983012	0	0.01785151
GOBP_UBIQUITIN_DEPENDENT_PROTEIN_CATABOLIC_PROCESS_VIA_THE_MULTIVESICULAR_BODY_SORTING	3		0.55453045			
PATHWAY		23	0.56153846		-	0.02233192
		117		2.0703301		0.02149398
GOBP_MITOCHONDRIAL_GENE_EXPRESSION		165	0.37187043		-	0.02093118
GOBP_INTRA_GOLGI_VESICLE_MEDIATED_TRANSPORT		30	0.52455705		0.00105152	
GOBP_INTEGRATED_STRESS_RESPONSE_SIGNALING		26		2.0619016		0.02084304
GOBP_POSITIVE_REGULATION_OF_HISTONE_DEACETYLATION		17			0.00118017	
GOBP_RNA_CAPPING		33	0.50926226			0.02004727
GOBP_ENDOPLASMIC_RETICULUM_TO_GOLGI_VESICLE_MEDIATED_TRANSPORT		189	0.36615774			0.02038059
GOBP_CELLULAR_RESPONSE_TO_STEROL_DEPLETION		16			0.00113982	
GOBP_TRANSLATIONAL_ELONGATION		131	0.37939736			0.02055887
GOBP_RNA_EXPORT_FROM_NUCLEUS		130		2.0451307		0.02003722
GOBP_STEROL_BIOSYNTHETIC_PROCESS		66		2.0429168		0.0198856
GOBP_VESICLE_BUDDING_FROM_MEMBRANE		107	0.3941925		-	0.01934462
GOBP_PROTEIN_QUALITY_CONTROL_FOR_MISFOLDED_OR_INCOMPLETELY_SYNTHESIZED_PROTEINS		28		2.0413876		0.01907022
GOBP_VESICLE_TARGETING_TO_FROM_OR_WITHIN_GOLGI		72		2.0374014		0.0192738
GOBP_MRNA_EXPORT_FROM_NUCLEUS		105	0.39030963		-	0.02098905
GOBP_POSITIVE_REGULATION_OF_PROTEIN_DEACETYLATION		21	0.56271714	2.0165682	0.00173989	0.02218876
GOBP_DNA_TEMPLATED_TRANSCRIPTION_ELONGATION		110	0.38521206	2.009029	0.0018018	0.02305034
GOBP_POSITIVE_REGULATION_OF_CHROMOSOME_SEPARATION		17	0.59824973	2.0012763	0.00119379	0.0239352
GOBP_RETROGRADE_VESICLE_MEDIATED_TRANSPORT_GOLGI_TO_ENDOPLASMIC_RETICULUM		83	0.40226033	2.001097	0	0.02341957
GOBP_REGULATION_OF_CHOLESTEROL_BIOSYNTHETIC_PROCESS		42	0.46410406	2.0006864	6.29E-04	0.02294799
GOBP_UBIQUITIN_DEPENDENT_ERAD_PATHWAY		76	0.40638992	1.9988033	0	0.02279347
GOBP_MITOCHONDRIAL_ELECTRON_TRANSPORT_NADH_TO_UBIQUINONE		52	0.440862	1.9870356	0	0.02451197
GOBP_TRICARBOXYLIC_ACID_CYCLE		33	0.48046908	1.9466982	0.00164294	0.03401632
GOBP_CHAPERONE_MEDIATED_AUTOPHAGY		16	0.5866304	1.9298283	0.00195389	0.03828349
GOBP_NEGATIVE_REGULATION_OF_MACROAUTOPHAGY		35	0.47340983	1.9274449	5.67E-04	0.03824441
GOBP_INNER_MITOCHONDRIAL_MEMBRANE_ORGANIZATION		56	0.41934046	1.9268379	0	0.03772754
GOBP PHOSPHATIDYLCHOLINE BIOSYNTHETIC PROCESS		35	0.46212283	1.8968313	0.00235849	0.04686664

GSEA table for GOBP down-regulated gene sets (FDR < 0.05)

NAME	SIZE ES	NES		p-val FD	R a-value
GOBP B CELL RECEPTOR SIGNALING PATHWAY	64	-0.7669317	-2.6880314	p-vai PD	0
GOBP_ADAPTIVE_IMMUNE_RESPONSE	342	-0.6237414	-2.5076084	ő	0
GOBP_ALPHA_BETA_T_CELL_ACTIVATION	121	-0.6303483	-2.387556	ő	ő
GOBP POSITIVE REGULATION OF CELL ACTIVATION	289	-0.596866	-2.3836842	ő	0
GOBP POSITIVE REGULATION OF T CELL PROLIFERATION	77	-0.6579624	-2.375067	0	0
GOBP POSITIVE REGULATION OF LEUKOCYTE PROLIFERATION	117	-0.6276081	-2.360609	ő	0
GOBP B CELL ACTIVATION	219	-0.5969783	-2.3569849	ő	ő
GOBP POSITIVE REGULATION OF LEUKOCYTE CELL CELL ADHESION	196	-0.6006042	-2.3548284	ő	ő
GOBP_REGULATION_OF_B_CELL_ACTIVATION	115	-0.6243017	-2.3476071	ő	0
GOBP ALPHA BETA T CELL DIFFERENTIATION	89	-0.6387314	-2.3447883	ő	0
GOBP_POSITIVE_REGULATION_OF_B_CELL_ACTIVATION	77	-0.6481271	-2.3360827	0	0
GOBP B CELL PROLIFERATION	67	-0.6596063	-2.3290925	ő	0
GOBP_B_CELE_FROLIPERATION	123	-0.6105623	-2.3230525	0	0
GOBP_REGULATION_OF_LEUKOCYTE_PROLIFERATION	125	-0.5929681	-2.319425	ő	0
GOBP T CELL DIFFERENTIATION	205	-0.5874825	-2.3170707	0	0
GOBP_I_CELL_DIFFERENTIATION	148	-0.5985021	-2.311673	0	0
GOBP_REGORATION_OF_EINFRACTINE_DIFFERENTIATION	38	-0.7124783	-2.3060017	0	0
GOBP_CELLOLAK_DEPENSE_RESPONSE GOBP_REGULATION_OF_LYMPHOCYTE_ACTIVATION	370	-0.5709478	-2.3055615	0	0
GOBP_LYMPHOCYTE_MIGRATION	80	-0.6339475	-2.3033013	0	0
GOBP_T_CELL_SELECTION	38	-0.7085554	-2.297034	0	0
	238		-2.237034	0	0
GOBP_LEUKOCYTE_PROLIFERATION	238	-0.5752217	-2.28417	0	0
GOBP_ANTIGEN_RECEPTOR_MEDIATED_SIGNALING_PATHWAY		-0.5761899		0	0
GOBP_REGULATION_OF_T_CELL_ACTIVATION	265 80	-0.5705994	-2.2735913	0	0
GOBP_REGULATION_OF_ALPHA_BETA_T_CELL_ACTIVATION	230	-0.6269385 -0.5724195	-2.271247 -2.26788	0	0
GOBP_POSITIVE_REGULATION_OF_CELL_CELL_ADHESION GOBP_T_CELL_MIGRATION	53	-0.6656491	-2.2654603	0	0
	29	-0.7378844	-2.2573328	0	0
GOBP_INTERLEUKIN_4_PRODUCTION	29	-0./5/0044	-2.25/5520	0	0
GOBP_ADAPTIVE_IMMUNE_RESPONSE_BASED_ON_SOMATIC_RECOMBINATION_OF_IMMUNE_RECEP TORS_BUILT_FROM_IMMUNOGLOBULIN_SUPERFAMILY_DOMAINS	234	-0.5687107	-2.2492518	0	2.98E-06
GOBP_REGULATION_OF_CELL_ACTIVATION	468	-0.5520781	-2.2452518	0	2.88E-06
GOBP_NEGODATION_OF_CELL_ACTIVATION	336	-0.5564137	-2.2389948	0	2.78E-06
GOBP_MONONGCLEAR_CELL_DIFFERENTIATION GOBP POSITIVE REGULATION OF ALPHA BETA T CELL ACTIVATION	55	-0.6518996	-2.2303540	0	2.69E-06
GOBP_HUMORAL_IMMUNE_RESPONSE_MEDIATED_BY_CIRCULATING_IMMUNOGLOBULIN	56	-0.6452255	-2.2216325	0	2.61E-06
GOBP_LYMPHOCYTE_MEDIATED_IMMUNITY	213	-0.5613896	-2.2210323	0	7.56E-06
GOBP_LINITIOCTIC_MEDIATED_INITIONT	86	-0.6052293	-2.2098887	0	7.34E-06
GOBP_POSITIVE_REGULATION_OF_LYMPHOCYTE_DIFFERENTIATION	88	-0.601038	-2.2056887	0	1.43E-05
GOBP_POSITIVE_REGULATION_OF_INTERLEUKIN_6_PRODUCTION	36	-0.6867633	-2.1974807	0	1.85E-05
GOBP_T_CELL_PROLIFERATION	152	-0.5719871	-2.1970255	0	1.80E-05
GOBP T CELL ACTIVATION	380	-0.5405189	-2.183739	0	1.97E-05
GOBP_REGULATION_OF_ANTIGEN_RECEPTOR_MEDIATED_SIGNALING_PATHWAY	58	-0.6304706	-2.183733	0	1.92E-05
GOBP_RESPONSE TO CHEMOKINE	57	-0.6328475	-2.1828885	0	1.87E-05
GOBP_NESFONSE_TO_CHEMONINE GOBP_INTERLEUKIN 10 PRODUCTION	45	-0.6526682	-2.1020005	0	2.03E-05
GOBP_INTERLEGININ_IC_FRODUCTION	52	-0.6369289	-2.174941	0	1.98E-05
GOBP_REGULATION_OF_B_CELL_PROLIFERATION	291	-0.5428124	-2.174079	0	1.94E-05
	231	-0.744792	-2.172444	0	2.08E-05
GOBP_REGULATION_OF_B_CELL_RECEPTOR_SIGNALING_PATHWAY	66	-0.6157419	-2.1699202	0	2.08E-05
GOBP_CD4_POSITIVE_ALPHA_BETA_T_CELL_DIFFERENTIATION	55			-	2.04E-05 2.17E-05
GOBP_INTERLEUKIN_2_PRODUCTION	21	-0.632943 -0.7550752	-2.167681	0	2.17E-05 2.13E-05
GOBP_POSITIVE_REGULATION_OF_ANTIGEN_RECEPTOR_MEDIATED_SIGNALING_PATHWAY	140	-0.5624852	-2.15527915	0	2.13E-05 2.43E-05
GOBP_MONONUCLEAR_CELL_MIGRATION GOBP LEUKOCYTE TETHERING OR ROLLING	25	-0.7235997	-2.152/915	0	2.43E-05 2.72E-05
	25	-0.7255557	-2.1505452	0	2.720-05