

## Supplement Tables

**Table 1. Alterations of gene expression induced by two weeks of copanlisib and copanlisib plus anti-PD1 antibody treatment.**

Gene	baseMean	log2FoldCh	lfcSE	stat	pvalue	padj	abslfc	Higher in
<b>Gene expression changed between control and copanlisib-sensitive tumors</b>								
Gjc3	132.6215	-8.48926	1.563346	-5.43019	5.63E-08	0.000387	8.489262	PI3K-S
Col2a1	454.0513	-7.85618	1.461866	-5.37408	7.70E-08	0.000387	7.856182	PI3K-S
Crym	41.64041	-6.54136	1.177698	-5.55436	2.79E-08	0.000387	6.541362	PI3K-S
Smim5	15.35714	-4.16352	0.834767	-4.98765	6.11E-07	0.001537	4.163524	PI3K-S
ErbB3	129.4868	-3.45934	0.698463	-4.95279	7.32E-07	0.001542	3.459338	PI3K-S
Galnt16	167.069	-2.04891	0.432688	-4.73531	2.19E-06	0.003666	2.04891	PI3K-S
Adam23	62.04836	-2.24923	0.492087	-4.57079	4.86E-06	0.005638	2.249229	PI3K-S
Efs	75.72357	-2.12561	0.464738	-4.57379	4.79E-06	0.005638	2.125615	PI3K-S
Actg2	1092.824	2.885284	0.628986	4.587202	4.49E-06	0.005638	2.885284	Ctrl
Chl1	89.24415	-3.147	0.693698	-4.53656	5.72E-06	0.006161	3.147003	PI3K-S
Adgre4	7.575093	-3.0563	0.697995	-4.37869	1.19E-05	0.011137	3.056305	PI3K-S
Pax3	7.624794	-5.7339	1.325264	-4.32661	1.51E-05	0.012023	5.733902	PI3K-S
Sox10	123.6069	-4.18557	1.007116	-4.156	3.24E-05	0.018582	4.185573	PI3K-S
Gpr3711	28.92131	-4.15525	1.001281	-4.14994	3.33E-05	0.018582	4.155253	PI3K-S
Myl9	2842.189	2.13725	0.523258	4.084508	4.42E-05	0.023036	2.13725	Ctrl
Nectin4	182.6351	-2.57178	0.638891	-4.02538	5.69E-05	0.025239	2.571782	PI3K-S
P2rx3	22.70719	-4.0319	1.010112	-3.99154	6.56E-05	0.025393	4.031899	PI3K-S
Plp1	210.3077	-2.7834	0.696473	-3.99641	6.43E-05	0.025393	2.783397	PI3K-S
Vsig4	8.660657	-4.47774	1.136579	-3.93967	8.16E-05	0.029767	4.477742	PI3K-S
Tac1	36.3329	-4.43188	1.126006	-3.93593	8.29E-05	0.029767	4.431884	PI3K-S
Rnf39	28.86999	-3.86423	0.998302	-3.87081	0.000108	0.036366	3.864233	PI3K-S
Adrb1	11.15421	-3.22746	0.842051	-3.83285	0.000127	0.041541	3.227459	PI3K-S
Plxnb3	38.66988	-2.97602	0.780855	-3.81122	0.000138	0.04346	2.976015	PI3K-S
Pitx2	59.73652	2.981889	0.784672	3.800175	0.000145	0.043905	2.981889	Ctrl
<b>Gene expression changed between control and tumors sensitive to the copanlisib plus anti-PD1 combination</b>								
Casp12	2883.932	-1.84825	0.387153	-4.77395	1.81E-06	0.005375	1.84825	Combo-S
Col1a1	331235.9	1.162073	0.240083	4.840297	1.30E-06	0.004822	1.162073	Ctrl
Epcam	172.4899	-4.64942	0.905082	-5.13701	2.79E-07	0.001384	4.649418	Combo-S
Hbb-bs	675.6181	-2.0765	0.468827	-4.42914	9.46E-06	0.023458	2.076503	Combo-S
Lep	26.24531	-8.04194	1.836087	-4.37993	1.19E-05	0.02523	8.04194	Combo-S
Mpp7	397.6571	-1.46078	0.284091	-5.14196	2.72E-07	0.001384	1.460784	Combo-S
Orm1	88.24069	-4.73051	1.118564	-4.22909	2.35E-05	0.043634	4.730509	Combo-S

## Supplement Tables

**Table 2. Alterations of gene expression induced by two weeks of anti-PD1 antibody treatment.**

**Gene expression changed between control and tumors sensitive to anti-PD1 therapy**

Gene	baseMean	log2FoldChange	lfcSE	stat	pvalue	padj	abslfc	Higher in
Casp12	3170.591236	-1.547412825	0.393514746	-3.93228676	8.41E-05	0.015615	1.547413	aPD1-S
Orm1	94.45683487	-3.992071945	1.134432658	-3.51900302	0.000433	0.039691	3.992072	aPD1-S
9330182L0	129.452188	-1.707890003	0.352042777	-4.85137067	1.23E-06	0.000856	1.70789	aPD1-S
Ackr4	117.800632	-3.079631454	0.699797935	-4.40074385	1.08E-05	0.004162	3.079631	aPD1-S
Adra2a	1532.085784	-1.169396248	0.226366033	-5.16595283	2.39E-07	0.000263	1.169396	aPD1-S
Amot	748.1716834	1.056434328	0.26544985	3.979788762	6.90E-05	0.013438	1.056434	Ctrl
Ap1m2	71.94948627	-6.699979545	1.414467924	-4.73674902	2.17E-06	0.001327	6.69998	aPD1-S
Arc	162.294655	-1.294449579	0.373084063	-3.46959226	0.000521	0.04443	1.29445	aPD1-S
Arg2	39.55462754	-3.007603656	0.783775684	-3.83732708	0.000124	0.020722	3.007604	aPD1-S
Armh4	174.1923012	2.329048168	0.546021498	4.265488041	1.99E-05	0.005606	2.329048	Ctrl
Atp6v0a4	110.4758461	-2.646242413	0.720512052	-3.6727247	0.00024	0.029566	2.646242	aPD1-S
Barx2	96.35334303	-4.63130998	0.981898912	-4.71668715	2.40E-06	0.001352	4.63131	aPD1-S
Bcas1	42.31580238	3.791779361	1.08872384	3.482774254	0.000496	0.043216	3.791779	Ctrl
Bicdl2	36.52106668	-6.681756291	1.808886949	-3.69384958	0.000221	0.028914	6.681756	aPD1-S
C4b	2621.035605	1.565226572	0.450716708	3.472750276	0.000515	0.044268	1.565227	Ctrl
Cd109	717.7927006	-1.711164876	0.416556715	-4.10787971	3.99E-05	0.009292	1.711165	aPD1-S
Cd72	677.998319	1.032051142	0.257847495	4.002564163	6.27E-05	0.013124	1.032051	Ctrl
Cdh11	2094.061004	1.561322404	0.423116225	3.690055623	0.000224	0.028942	1.561322	Ctrl
Cdh13	3566.583128	-1.114257366	0.223301771	-4.98991729	6.04E-07	0.000521	1.114257	aPD1-S
Cdh15	120.2892218	2.184226248	0.589083498	3.707838115	0.000209	0.027861	2.184226	Ctrl
Cdh2	572.0096568	1.452821166	0.407975772	3.561047655	0.000369	0.03684	1.452821	Ctrl
Cela1	577.5746875	-1.160415054	0.303720611	-3.82066613	0.000133	0.02122	1.160415	aPD1-S
Chac1	437.7814582	1.40783112	0.330968425	4.253671989	2.10E-05	0.005709	1.407831	Ctrl
Chdh	37.72553842	-3.512041433	0.809531774	-4.33836144	1.44E-05	0.004816	3.512041	aPD1-S
Chga	37.62301274	2.61607385	0.7122311	3.673068827	0.00024	0.029566	2.616074	Ctrl
Chil1	224.4861565	-5.325904087	1.406297545	-3.78718153	0.000152	0.022117	5.325904	aPD1-S
Ckmt2	7.47028757	6.394061281	1.718902181	3.719851746	0.000199	0.027313	6.394061	Ctrl
Clca3a1	83.98701916	2.934228881	0.825108598	3.556172953	0.000376	0.037226	2.934229	Ctrl
Cldn1	322.5839977	-2.24847564	0.655191856	-3.43178203	0.0006	0.049113	2.248476	aPD1-S
Clec4d	309.8838743	-1.456468219	0.355507464	-4.096871	4.19E-05	0.009446	1.456468	aPD1-S
Cmpk2	482.1808583	1.68607727	0.464048623	3.63340647	0.00028	0.031303	1.686077	Ctrl
Cnmd	45.51788888	4.249429791	1.166809811	3.641921546	0.000271	0.03124	4.24943	Ctrl
Col20a1	97.77796788	3.822617446	0.923564353	4.138983314	3.49E-05	0.008384	3.822617	Ctrl
Col4a6	247.27159	3.044123544	0.562715457	5.409703084	6.31E-08	0.000103	3.044124	Ctrl
Col9a1	172.9438819	3.635233213	0.624572208	5.820356982	5.87E-09	1.65E-05	3.635233	Ctrl
Col9a2	81.92719982	2.163928257	0.516752834	4.187549856	2.82E-05	0.007253	2.163928	Ctrl
Cox6a2	35.59029105	2.590579083	0.736876626	3.515621191	0.000439	0.039691	2.590579	Ctrl
Crb3	37.18472422	-4.933727087	1.357537118	-3.63432206	0.000279	0.031303	4.933727	aPD1-S
Crym	91.59209644	4.085691168	0.938121503	4.355183368	1.33E-05	0.004797	4.085691	Ctrl
Cxcl9	630.5928764	1.875736513	0.487017116	3.85147965	0.000117	0.019785	1.875737	Ctrl
Cyp4f18	283.3561697	1.083155289	0.296410633	3.654238985	0.000258	0.03124	1.083155	Ctrl
Dapk2	92.80058063	-1.997092367	0.495568857	-4.02989885	5.58E-05	0.012031	1.997092	aPD1-S
Ddx60	258.8042999	1.449945283	0.420407348	3.44890566	0.000563	0.046964	1.449945	Ctrl
Dhx58	337.9102482	1.362702945	0.361008422	3.774712337	0.00016	0.022672	1.362703	Ctrl
Dio2	185.0635534	-2.394832612	0.448612535	-5.33830962	9.38E-08	0.000138	2.394833	aPD1-S
Elf5	10.83004028	-6.825266412	1.863445636	-3.66271292	0.00025	0.03049	6.825266	aPD1-S
Emcn	427.9286641	-1.129815606	0.278033828	-4.06359044	4.83E-05	0.010574	1.129816	aPD1-S
Esrp1	224.1671425	-7.887558482	2.184384027	-3.61088453	0.000305	0.032656	7.887558	aPD1-S
Fam167a	1102.898062	-1.093479707	0.249553819	-4.38173902	1.18E-05	0.004426	1.09348	aPD1-S
Fermt1	49.60885424	-6.15462352	1.170533162	-5.25796596	1.46E-07	0.000178	6.154624	aPD1-S

Fkbp6	12.17962209	7.102888811	1.82038961	3.901850885	9.55E-05	0.016862	7.102889	Ctrl
Foxp2	1500.984574	8.047460467	1.727849775	4.657500079	3.20E-06	0.001738	8.04746	Ctrl
Gad2	40.74549851	5.287915314	1.543597331	3.425709028	0.000613	0.049669	5.287915	Ctrl
Gad1	129.0275531	-3.353705491	0.878902414	-3.81578823	0.000136	0.021333	3.353705	aPD1-S
Gfap	295.0508459	6.094011388	1.228354	4.96111983	7.01E-07	0.000571	6.094011	Ctrl
Gfra2	2195.748815	1.164229329	0.304353105	3.825258591	0.000131	0.02122	1.164229	Ctrl
Gjc3	294.2830545	5.663173464	1.444978524	3.919209434	8.88E-05	0.01591	5.663173	Ctrl
Gm21188	141.4498356	1.71234093	0.474860415	3.60598794	0.000311	0.033037	1.712341	Ctrl
Gnai1	423.9487451	-2.06885842	0.469621449	-4.40537463	1.06E-05	0.004162	2.068858	aPD1-S
Gpihbp1	736.9435316	-1.603294988	0.268429377	-5.97287452	2.33E-09	8.54E-06	1.603295	aPD1-S
Gpr37l1	61.01773486	3.986031389	0.939329128	4.243487474	2.20E-05	0.005866	3.986031	Ctrl
Gpr87	67.59884075	-8.501311788	2.193678967	-3.87536732	0.000106	0.018363	8.501312	aPD1-S
Grb7	38.39488818	-5.42217727	1.490091841	-3.63882086	0.000274	0.031303	5.422177	aPD1-S
Grem1	7904.017579	-1.311802376	0.272704344	-4.81034647	1.51E-06	0.001004	1.311802	aPD1-S
H2-Q6	388.7173701	1.12607598	0.294684365	3.821295308	0.000133	0.02122	1.126076	Ctrl
Helz2	681.5196156	1.384248684	0.335631755	4.124307853	3.72E-05	0.008793	1.384249	Ctrl
Ifi206	194.785173	2.165472837	0.575731083	3.761257472	0.000169	0.023606	2.165473	Ctrl
Ifi213	204.7661467	1.488555381	0.423723277	3.5130366	0.000443	0.039691	1.488555	Ctrl
Ifih1	721.6262411	1.184821391	0.337320314	3.512451941	0.000444	0.039691	1.184821	Ctrl
Ifit1	1367.723136	1.468687073	0.41097415	3.573672631	0.000352	0.03592	1.468687	Ctrl
Ifit2	1244.326793	1.313136664	0.368572939	3.562759296	0.000367	0.03684	1.313137	Ctrl
Ifit3	2062.288401	1.32422227	0.374258203	3.538258505	0.000403	0.038595	1.324222	Ctrl
Ifit3b	569.0354115	1.53286313	0.43696845	3.507949216	0.000452	0.039893	1.532863	Ctrl
Igfbp3	26851.44871	-1.525445595	0.432653465	-3.52579077	0.000422	0.039428	1.525446	aPD1-S
Igtp	751.9124007	1.376724605	0.364814579	3.773765311	0.000161	0.022672	1.376725	Ctrl
Il1r1	2200.127261	-1.439678539	0.413493544	-3.48174369	0.000498	0.043216	1.439679	aPD1-S
Insc	60.33326734	1.942403228	0.514716981	3.773730615	0.000161	0.022672	1.942403	Ctrl
Irf7	1805.982079	1.690263625	0.334160849	5.05823357	4.23E-07	0.000388	1.690264	Ctrl
Isg15	1413.933779	1.464864154	0.330267891	4.435381688	9.19E-06	0.003905	1.464864	Ctrl
Kcnj2	142.1122844	-1.326748322	0.368926018	-3.59624493	0.000323	0.033809	1.326748	aPD1-S
Kcnj8	280.7749773	-1.750639868	0.405433632	-4.31794436	1.57E-05	0.005008	1.75064	aPD1-S
Ly6d	1996.914649	-8.640870299	1.914632188	-4.51307063	6.39E-06	0.003022	8.64087	aPD1-S
Map1b	2411.122061	1.061394085	0.305688354	3.472144333	0.000516	0.044268	1.061394	Ctrl
Map7	54.49495257	-3.642600898	1.008331151	-3.61250458	0.000303	0.032656	3.642601	aPD1-S
Mgst1	1004.785361	-1.939019307	0.42491252	-4.56333767	5.03E-06	0.002636	1.939019	aPD1-S
Mmp12	1118.584488	-2.550851645	0.520748353	-4.89843439	9.66E-07	0.000745	2.550852	aPD1-S
Mmp3	26288.63071	-2.768579962	0.784086076	-3.53096433	0.000414	0.038913	2.76858	aPD1-S
Mpzl2	34.89932082	-3.603108218	0.944984256	-3.81287645	0.000137	0.021333	3.603108	aPD1-S
Ms4a4c	556.2850848	2.203949538	0.416135601	5.296229238	1.18E-07	0.000158	2.20395	Ctrl
Mx1	392.3457944	1.735980854	0.367172876	4.727965949	2.27E-06	0.00133	1.735981	Ctrl
Myzap	231.6894908	-1.383055834	0.347126621	-3.9842978	6.77E-05	0.013438	1.383056	aPD1-S
Nkx6-1	10.87545755	6.939145623	1.971062558	3.520510089	0.000431	0.039691	6.939146	Ctrl
Nrcam	39.30642886	2.40733058	0.679431834	3.543152468	0.000395	0.038388	2.407331	Ctrl
Oas1a	445.2051771	1.348291761	0.366517284	3.67865806	0.000234	0.02938	1.348292	Ctrl
Oas1g	168.9545671	1.779436913	0.345044226	5.15712705	2.51E-07	0.000263	1.779437	Ctrl
Oas2	211.7757462	1.515222211	0.411197437	3.684901886	0.000229	0.028942	1.515222	Ctrl
Oas3	322.355604	1.86734069	0.5145608	3.628999117	0.000285	0.031579	1.867341	Ctrl
Oasl1	487.4242764	2.308874959	0.407531776	5.665509037	1.47E-08	3.07E-05	2.308875	Ctrl
Oasl2	1653.436486	1.422752924	0.373926099	3.804904033	0.000142	0.021333	1.422753	Ctrl
Odaph	869.0449731	-1.866958856	0.207814617	-8.98377063	2.62E-19	1.92E-15	1.866959	aPD1-S
Padi2	365.108504	1.992161519	0.471118888	4.228574927	2.35E-05	0.006157	1.992162	Ctrl
Panx2	28.92236237	-3.456724539	0.803885293	-4.30002212	1.71E-05	0.005008	3.456725	aPD1-S

Parm1	226.4385497	-2.082914308	0.369125548	-5.64283432	1.67E-08	3.07E-05	2.082914	aPD1-S
Phf11a	63.73204364	2.324767507	0.535989428	4.337338359	1.44E-05	0.004816	2.324768	Ctrl
Phf11b	316.9944906	1.748505392	0.461262619	3.790693895	0.00015	0.022025	1.748505	Ctrl
Pi15	907.7103034	-1.501630409	0.346643817	-4.3319117	1.48E-05	0.004816	1.50163	aPD1-S
Pitpnm3	58.06134762	-1.928874256	0.539068643	-3.57816074	0.000346	0.035725	1.928874	aPD1-S
Plet1	87.49010734	-4.456283484	1.074808931	-4.14611691	3.38E-05	0.008263	4.456283	aPD1-S
Plxnb3	76.28178835	3.384500004	0.815938254	4.14798545	3.35E-05	0.008263	3.3845	Ctrl
Prom2	133.8294186	-9.488076598	2.603865843	-3.64384234	0.000269	0.03124	9.488077	aPD1-S
Prss8	25.32947163	-6.222853334	1.761535668	-3.53262977	0.000411	0.038913	6.222853	aPD1-S
Prune2	1293.165982	1.12046139	0.260845309	4.295501395	1.74E-05	0.005011	1.120461	Ctrl
Ptges	1337.587373	-1.268926629	0.348196922	-3.64427871	0.000268	0.03124	1.268927	aPD1-S
Ptpn5	23.65928732	-2.863853123	0.77723315	-3.68467701	0.000229	0.028942	2.863853	aPD1-S
Ramp3	271.6544135	-1.220639228	0.281762937	-4.33214972	1.48E-05	0.004816	1.220639	aPD1-S
Rasd1	49.83374015	-2.837703237	0.624751065	-4.5421343	5.57E-06	0.002815	2.837703	aPD1-S
Rcan1	2086.681886	-1.337975455	0.222454397	-6.01460558	1.80E-09	8.54E-06	1.337975	aPD1-S
Rnf208	25.80950488	-4.539334537	1.282336275	-3.53989404	0.0004	0.038595	4.539335	aPD1-S
Rnf213	2488.118964	1.461714358	0.335775855	4.353244399	1.34E-05	0.004797	1.461714	Ctrl
Rsad2	842.2007842	2.020202677	0.52189603	3.87089106	0.000108	0.018486	2.020203	Ctrl
S100g	650.3595025	-4.320967592	0.338181716	-12.7770586	2.20E-37	3.23E-33	4.320968	aPD1-S
Saa3	3776.93904	-5.508206782	1.244434285	-4.42627373	9.59E-06	0.003905	5.508207	aPD1-S
Siglec1	854.2841059	2.311759664	0.51168355	4.51794799	6.24E-06	0.003022	2.31176	Ctrl
Slc39a4	120.5790354	-1.26312772	0.324171258	-3.89648277	9.76E-05	0.017035	1.263128	aPD1-S
Slnf1	278.0225528	1.404598057	0.369279464	3.803618111	0.000143	0.021333	1.404598	Ctrl
Slnf8	494.0361287	1.551921519	0.389444145	3.984965598	6.75E-05	0.013438	1.551922	Ctrl
Slnf9	948.4372214	1.055350352	0.268034261	3.937371101	8.24E-05	0.015484	1.05535	Ctrl
Steap4	779.0695899	-2.591182628	0.544811838	-4.75610559	1.97E-06	0.001258	2.591183	aPD1-S
Stk32a	24.76315027	3.112078592	0.723167536	4.303399196	1.68E-05	0.005008	3.112079	Ctrl
Syt1l	88.03467451	-5.035045482	1.181398794	-4.26193552	2.03E-05	0.005606	5.035045	aPD1-S
Tap1	1269.094424	1.124630022	0.274266298	4.100503895	4.12E-05	0.009444	1.12463	Ctrl
Tek	172.1907625	-1.055956763	0.264695925	-3.98932007	6.63E-05	0.013438	1.055957	aPD1-S
Themis2	471.9008929	1.182822334	0.337189859	3.507882287	0.000452	0.039893	1.182822	Ctrl
Tmem56	118.7683657	-2.85620277	0.747591895	-3.82053736	0.000133	0.02122	2.856203	aPD1-S
Tprg	99.72273836	-2.912496055	0.655329498	-4.44432314	8.82E-06	0.003905	2.912496	aPD1-S
Ttc22	32.72496648	-7.451919022	1.874471612	-3.97547713	7.02E-05	0.013438	7.451919	aPD1-S
Ttc9	408.9816048	-1.304269946	0.224991169	-5.79698284	6.75E-09	1.65E-05	1.30427	aPD1-S
Usp18	506.0658601	1.735797928	0.468973536	3.70127053	0.000215	0.028334	1.735798	Ctrl
Wif1	37.28777014	-2.547322297	0.592303512	-4.30070436	1.70E-05	0.005008	2.547322	aPD1-S
Znfx1	1507.973883	1.017409858	0.284290784	3.578764822	0.000345	0.035725	1.01741	Ctrl

**Legends for the column heads:**

**basemean:** baseline mean expression in the control tumors

**Log2FoldChange:** Log2 fold change of expression

**LfcSE:** Log2 fold change standard error

**Stat:**

**p value:** unadjusted p values

**padj:** Corrected/adjusted p value

**abslfc:** absolute Log2 fold changes

## Supplement Tables

**Table 3. GSEA of hallmark gene sets between control and copanlisib-sensitive tumors.**

NES>0 means up in PI3KS; NES<0 means up in Ctrl

GS follow link to MSigDB	GS DETAILS	SIZ E	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">HALLMARK_TGF_BETA_SIGNALING</a>	<a href="#">Details ...</a>	53	-0.5	-1.7	0	0.001	0.004	2153	tags=34%, list=12%, signal=39%
<a href="#">HALLMARK_UV_RESPONSE_DN</a>	<a href="#">Details ...</a>	143	-0.4	-1.6	0	0.015	0.073	5989	tags=52%, list=34%, signal=79%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_EARLY</a>	<a href="#">Details ...</a>	198	-0.4	-1.5	0	0.022	0.132	5204	tags=49%, list=30%, signal=69%
<a href="#">HALLMARK_MITOTIC_SPINDLE</a>	<a href="#">Details ...</a>	199	-0.4	-1.4	0	0.06	0.376	3923	tags=37%, list=23%, signal=47%
<a href="#">HALLMARK_INFLAMMATORY_RESPONSE</a>	<a href="#">Details ...</a>	197	-0.4	-1.4	0.001	0.059	0.42	4930	tags=39%, list=28%, signal=53%
<a href="#">HALLMARK_KRAS_SIGNALING_UP</a>	<a href="#">Details ...</a>	199	-0.4	-1.4	0.003	0.064	0.493	5153	tags=42%, list=30%, signal=59%
<a href="#">HALLMARK_APICAL_SURFACE</a>	<a href="#">Details ...</a>	44	-0.4	-1.4	0.068	0.062	0.52	5655	tags=43%, list=32%, signal=64%
<a href="#">HALLMARK_HEDGEHOG_SIGNALING</a>	<a href="#">Details ...</a>	36	-0.4	-1.3	0.085	0.092	0.715	4884	tags=50%, list=28%, signal=69%
<a href="#">HALLMARK_PROTEIN_SECRETION</a>	<a href="#">Details ...</a>	96	-0.4	-1.3	0.032	0.095	0.756	4359	tags=38%, list=25%, signal=50%
<a href="#">HALLMARK_APICAL_JUNCTION</a>	<a href="#">Details ...</a>	198	-0.4	-1.3	0.008	0.094	0.771	6146	tags=46%, list=35%, signal=71%
<a href="#">HALLMARK_KRAS_SIGNALING_DN</a>	<a href="#">Details ...</a>	198	-0.4	-1.3	0.01	0.088	0.779	5093	tags=37%, list=29%, signal=52%
<a href="#">HALLMARK_WNT_BETA_CATENIN_SIGNALING</a>	<a href="#">Details ...</a>	41	-0.4	-1.3	0.085	0.089	0.802	2489	tags=32%, list=14%, signal=37%
<a href="#">HALLMARK_HEME_METABOLISM</a>	<a href="#">Details ...</a>	190	-0.4	-1.3	0.016	0.136	0.941	5276	tags=41%, list=30%, signal=58%
<a href="#">HALLMARK_ANDROGEN_RESPONSE</a>	<a href="#">Details ...</a>	98	-0.4	-1.3	0.078	0.154	0.965	5855	tags=43%, list=34%, signal=64%
<a href="#">HALLMARK_BILE_ACID_METABOLISM</a>	<a href="#">Details ...</a>	111	-0.4	-1.3	0.079	0.157	0.975	6248	tags=46%, list=36%, signal=71%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_LATE</a>	<a href="#">Details ...</a>	198	-0.3	-1.2	0.123	0.352	1	5859	tags=43%, list=34%, signal=64%
<a href="#">HALLMARK_TNFA_SIGNALING_VIA_NFKB</a>	<a href="#">Details ...</a>	197	-0.3	-1.1	0.156	0.394	1	7119	tags=46%, list=41%, signal=76%
<a href="#">HALLMARK_IL6_JAK_STAT3_SIGNALING</a>	<a href="#">Details ...</a>	85	-0.3	-1.1	0.25	0.383	1	7332	tags=53%, list=42%, signal=91%
<a href="#">HALLMARK_IL2_STATS_SIGNALING</a>	<a href="#">Details ...</a>	199	-0.3	-1.1	0.187	0.425	1	3323	tags=27%, list=19%, signal=33%
<a href="#">HALLMARK_ALLOGRAFT_REJECTION</a>	<a href="#">Details ...</a>	195	-0.3	-1	0.428	0.759	1	3970	tags=28%, list=23%, signal=36%
<a href="#">HALLMARK_NOTCH_SIGNALING</a>		32	-0.4	-1	0.46	0.766	1	7603	tags=63%, list=44%, signal=111%
<a href="#">HALLMARK_COAGULATION</a>		138	-0.3	-1	0.484	0.781	1	6529	tags=43%, list=37%, signal=68%
<a href="#">HALLMARK_CHOLESTEROL_HOMEOSTASIS</a>		72	-0.3	-1	0.522	0.813	1	4693	tags=29%, list=27%, signal=40%
<a href="#">HALLMARK_P53_PATHWAY</a>		198	-0.3	-1	0.62	0.898	1	5990	tags=39%, list=34%, signal=59%
<a href="#">HALLMARK_PEROXISOME</a>		102	-0.3	-1	0.621	0.906	1	6229	tags=36%, list=36%, signal=56%
<a href="#">HALLMARK_ANGIOGENESIS</a>		36	-0.3	-0.9	0.564	0.884	1	5271	tags=42%, list=30%, signal=60%
<a href="#">HALLMARK_PI3K_AKT_MTOR_SIGNALING</a>		105	-0.3	-0.9	0.616	0.862	1	4930	tags=35%, list=28%, signal=49%
<a href="#">HALLMARK_COMPLEMENT</a>		191	-0.3	-0.9	0.737	0.918	1	6408	tags=41%, list=37%, signal=64%
<a href="#">HALLMARK_EPITHELIAL_MESENCHYMAL_TRANSITION</a>		196	-0.3	-0.9	0.798	0.961	1	5795	tags=34%, list=33%, signal=51%
<a href="#">HALLMARK_APOPTOSIS</a>		161	-0.2	-0.8	0.838	1	1	7918	tags=48%, list=45%, signal=87%
<a href="#">HALLMARK_ADIPOGENESIS</a>		199	-0.2	-0.8	0.872	0.991	1	6070	tags=36%, list=35%, signal=55%
<a href="#">HALLMARK_MYOGENESIS</a>		200	-0.2	-0.8	0.894	0.97	1	3234	tags=20%, list=19%, signal=24%
<a href="#">HALLMARK_XENOBIOTIC_METABOLISM</a>		196	-0.2	-0.8	0.902	0.975	1	6322	tags=37%, list=36%, signal=58%
<a href="#">HALLMARK_INTERFERON_GAMMA_RESPONSE</a>		192	-0.2	-0.7	0.956	1	1	7458	tags=47%, list=43%, signal=82%



HALLMARK_G2M_CHECKPOINT		196	-0.2	-0.7	0.979	0.998	1	2059	tags=13%, list=12%, signal=14%
HALLMARK_FATTY_ACID_METABOLISM		156	-0.2	-0.7	0.959	0.976	1	6082	tags=32%, list=35%, signal=49%
HALLMARK_HYPOXIA		198	-0.2	-0.7	0.974	0.952	1	2089	tags=12%, list=12%, signal=13%
HALLMARK_SPERMATOGENESIS		134	-0.2	-0.7	0.961	0.941	1	6625	tags=33%, list=38%, signal=53%
HALLMARK_UV_RESPONSE_UP		156	-0.2	-0.5	1	0.949	1	5980	tags=29%, list=34%, signal=45%
<a href="#">HALLMARK_OXIDATIVE_PHOSPHORYLATION</a>	<a href="#">Details ...</a>	196	0.41	2.55	0	0	0	3290	tags=52%, list=19%, signal=63%
<a href="#">HALLMARK_DNA_REPAIR</a>	<a href="#">Details ...</a>	148	0.35	1.84	0	0.009	0.001	3274	tags=41%, list=19%, signal=50%
<a href="#">HALLMARK_E2F_TARGETS</a>	<a href="#">Details ...</a>	200	0.29	1.84	0	0.006	0.001	3693	tags=42%, list=21%, signal=53%
<a href="#">HALLMARK_PANCREAS_BETA_CELLS</a>	<a href="#">Details ...</a>	40	0.33	1.5	0.02	0.035	0.008	2172	tags=25%, list=12%, signal=28%
<a href="#">HALLMARK_MYC_TARGETS_V2</a>	<a href="#">Details ...</a>	57	0.29	1.43	0	0.043	0.013	3694	tags=44%, list=21%, signal=55%
<a href="#">HALLMARK_REACTIVE_OXYGEN_SPECIES_PATHWAY</a>	<a href="#">Details ...</a>	49	0.22	1.02	0.417	0.602	0.236	2619	tags=35%, list=15%, signal=41%
<a href="#">HALLMARK_UNFOLDED_PROTEIN_RESPONSE</a>	<a href="#">Details ...</a>	112	0.19	1	0.4	0.597	0.263	3151	tags=33%, list=18%, signal=40%
<a href="#">HALLMARK_INTERFERON_ALPHA_RESPONSE</a>	<a href="#">Details ...</a>	93	0.17	0.97	0.579	0.606	0.299	2908	tags=29%, list=17%, signal=35%
<a href="#">HALLMARK_GLYCOLYSIS</a>	<a href="#">Details ...</a>	200	0.15	0.87	1	0.796	0.415	1611	tags=15%, list=9%, signal=16%
<a href="#">HALLMARK_MTORC1_SIGNALING</a>	<a href="#">Details ...</a>	197	0.14			1	0	3780	tags=35%, list=22%, signal=44%
<a href="#">HALLMARK_MYC_TARGETS_V1</a>	<a href="#">Details ...</a>	200	0.39			1	0	3504	tags=51%, list=20%, signal=63%

## Supplement Tables

**Table 4. GSEA of hallmark gene sets between control and anti-PD1-sensitive tumors.**

NES>0 means up in aPD1S; NES<0 means up in Ctrl

GS follow link to MSigDB	GS DETAILS	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">HALLMARK_INTERFERON_ALPHA_RESPONSE</a>	<a href="#">Details ...</a>	93	0.72	3.45	0	0	0	1719	tags=60%, list=10%, signal=66%
<a href="#">HALLMARK_INTERFERON_GAMMA_RESPONSE</a>	<a href="#">Details ...</a>	192	0.57	2.93	0	0	0	1919	tags=45%, list=11%, signal=50%
<a href="#">HALLMARK_MITOTIC_SPINDLE</a>	<a href="#">Details ...</a>	199	0.46	2.49	0	0	0	3287	tags=44%, list=19%, signal=54%
<a href="#">HALLMARK_G2M_CHECKPOINT</a>	<a href="#">Details ...</a>	196	0.42	2.21	0	0	0	4710	tags=58%, list=27%, signal=78%
<a href="#">HALLMARK_E2F_TARGETS</a>	<a href="#">Details ...</a>	200	0.39	2.02	0	0	0	4508	tags=50%, list=26%, signal=66%
<a href="#">HALLMARK_ALLOGRAFT_REJECTION</a>	<a href="#">Details ...</a>	195	0.36	1.82	0	0.002	0.002	2585	tags=35%, list=15%, signal=40%
<a href="#">HALLMARK_PANCREAS_BETA_CELLS</a>	<a href="#">Details ...</a>	40	0.46	1.81	0.005	0.002	0.002	2391	tags=35%, list=14%, signal=40%
<a href="#">HALLMARK_HEDGEHOG_SIGNALING</a>	<a href="#">Details ...</a>	36	0.39	1.56	0.011	0.006	0.019	2537	tags=39%, list=15%, signal=45%
<a href="#">HALLMARK_IL6_JAK_STAT3_SIGNALING</a>	<a href="#">Details ...</a>	85	0.23	1.09	0.257	0.241	0.599	1326	tags=19%, list=8%, signal=20%
<a href="#">HALLMARK_OXIDATIVE_PHOSPHORYLATION</a>	<a href="#">Details ...</a>	196	-0.6	-2.2	0	0	0	4903	tags=63%, list=28%, signal=86%
<a href="#">HALLMARK_ADIPOGENESIS</a>	<a href="#">Details ...</a>	199	-0.5	-1.9	0	0	0	4903	tags=48%, list=28%, signal=66%
<a href="#">HALLMARK_REACTIVE_OXYGEN_SPECIES_PATHWAY</a>	<a href="#">Details ...</a>	49	-0.5	-1.6	0.002	0.015	0.05	4297	tags=49%, list=25%, signal=65%
<a href="#">HALLMARK_XENOBIOTIC_METABOLISM</a>	<a href="#">Details ...</a>	196	-0.4	-1.6	0	0.013	0.056	4488	tags=41%, list=26%, signal=55%
<a href="#">HALLMARK_PEROXISOME</a>	<a href="#">Details ...</a>	102	-0.4	-1.6	0.002	0.01	0.056	4757	tags=41%, list=27%, signal=56%
<a href="#">HALLMARK_FATTY_ACID_METABOLISM</a>	<a href="#">Details ...</a>	156	-0.4	-1.6	0	0.01	0.067	6193	tags=57%, list=36%, signal=88%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_EARLY</a>	<a href="#">Details ...</a>	198	-0.4	-1.5	0.001	0.046	0.304	4912	tags=42%, list=28%, signal=58%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_LATE</a>	<a href="#">Details ...</a>	198	-0.4	-1.4	0.009	0.113	0.644	4898	tags=42%, list=28%, signal=58%
<a href="#">HALLMARK_P53_PATHWAY</a>	<a href="#">Details ...</a>	198	-0.3	-1.4	0.014	0.144	0.772	6012	tags=46%, list=35%, signal=69%
<a href="#">HALLMARK_HEME_METABOLISM</a>	<a href="#">Details ...</a>	190	-0.3	-1.2	0.093	0.445	0.993	5177	tags=37%, list=30%, signal=53%
<a href="#">HALLMARK_ANGIOGENESIS</a>	<a href="#">Details ...</a>	36	-0.4	-1.2	0.198	0.406	0.993	6337	tags=50%, list=36%, signal=78%
<a href="#">HALLMARK_UV_RESPONSE_UP</a>	<a href="#">Details ...</a>	156	-0.3	-1.2	0.117	0.43	0.998	5755	tags=42%, list=25%, signal=62%
<a href="#">HALLMARK_EPITHELIAL_MESENCHYMAL_TRANSITION</a>	<a href="#">Details ...</a>	196	-0.3	-1.2	0.095	0.403	0.998	4911	tags=34%, list=28%, signal=46%
<a href="#">HALLMARK_BILE_ACID_METABOLISM</a>	<a href="#">Details ...</a>	111	-0.3	-1.2	0.153	0.377	0.998	5194	tags=41%, list=30%, signal=57%
<a href="#">HALLMARK_DNA_REPAIR</a>	<a href="#">Details ...</a>	148	-0.3	-1.2	0.18	0.459	1	4871	tags=33%, list=28%, signal=46%
<a href="#">HALLMARK_COAGULATION</a>	<a href="#">Details ...</a>	138	-0.3	-1.2	0.19	0.468	1	4255	tags=31%, list=24%, signal=41%
<a href="#">HALLMARK_ANDROGEN_RESPONSE</a>	<a href="#">Details ...</a>	98	-0.3	-1.2	0.221	0.507	1	2316	tags=20%, list=13%, signal=23%
<a href="#">HALLMARK_TNFA_SIGNALING_VIA_NFKB</a>	<a href="#">Details ...</a>	197	-0.3	-1.1	0.199	0.486	1	5839	tags=43%, list=34%, signal=63%
<a href="#">HALLMARK_KRAS_SIGNALING_UP</a>	<a href="#">Details ...</a>	199	-0.3	-1.1	0.225	0.511	1	4006	tags=33%, list=23%, signal=42%
<a href="#">HALLMARK_PROTEIN_SECRETION</a>	<a href="#">Details ...</a>	96	-0.3	-1.1	0.291	0.569	1	7516	tags=54%, list=43%, signal=95%
<a href="#">HALLMARK_MYC_TARGETS_V1</a>		200	-0.3	-1.1	0.286	0.595	1	6482	tags=40%, list=37%, signal=63%
<a href="#">HALLMARK_TGF_BETA_SIGNALING</a>		53	-0.3	-1.1	0.34	0.583	1	8621	signal=130%
<a href="#">HALLMARK_CHOLESTEROL_HOMEOSTASIS</a>		72	-0.3	-1.1	0.333	0.574	1	6726	tags=53%, list=39%, signal=86%
<a href="#">HALLMARK_HYPOXIA</a>		198	-0.3	-1.1	0.365	0.623	1	4063	tags=27%, list=23%, signal=35%
<a href="#">HALLMARK_KRAS_SIGNALING_DN</a>		198	-0.3	-1.1	0.35	0.603	1	3975	tags=30%, list=23%, signal=38%
<a href="#">HALLMARK_MYOGENESIS</a>		200	-0.2	-1	0.573	0.895	1	2198	tags=17%, list=13%, signal=19%
<a href="#">HALLMARK_GLYCOLYSIS</a>		200	-0.2	-0.9	0.686	1	1	6730	tags=41%, list=39%, signal=66%
<a href="#">HALLMARK_APICAL_SURFACE</a>		44	-0.3	-0.9	0.633	0.999	1	4922	tags=34%, list=28%, signal=47%
<a href="#">HALLMARK_APOPTOSIS</a>		161	-0.2	-0.9	0.747	1	1	4582	tags=28%, list=26%, signal=38%
<a href="#">HALLMARK_WNT_BETA_CATENIN_SIGNALING</a>		41	-0.3	-0.9	0.675	1	1	2874	tags=17%, list=17%, signal=20%
<a href="#">HALLMARK_IL2_STAT5_SIGNALING</a>		199	-0.2	-0.9	0.773	0.999	1	4885	tags=31%, list=28%, signal=43%
<a href="#">HALLMARK_UV_RESPONSE_DN</a>		143	-0.2	-0.9	0.785	1	1	3676	tags=21%, list=21%, signal=26%
<a href="#">HALLMARK_MTORC1_SIGNALING</a>		197	-0.2	-0.9	0.827	0.985	1	6433	tags=39%, list=37%, signal=61%
<a href="#">HALLMARK_APICAL_JUNCTION</a>		198	-0.2	-0.8	0.847	0.981	1	4783	tags=29%, list=27%, signal=39%
<a href="#">HALLMARK_NOTCH_SIGNALING</a>		32	-0.3	-0.8	0.778	1	1	5860	tags=38%, list=34%, signal=56%
<a href="#">HALLMARK_SPERMATOGENESIS</a>		134	-0.2	-0.7	0.919	1	1	5793	tags=31%, list=33%, signal=47%
<a href="#">HALLMARK_COMPLEMENT</a>		191	-0.2	-0.7	0.956	1	1	3461	tags=20%, list=20%, signal=25%
<a href="#">HALLMARK_INFLAMMATORY_RESPONSE</a>		197	-0.2	-0.7	0.962	1	1	3506	tags=23%, list=20%, signal=29%
<a href="#">HALLMARK_UNFOLDED_PROTEIN_RESPONSE</a>		112	-0.2	-0.7	0.971	1	1	6191	tags=37%, list=36%, signal=56%
<a href="#">HALLMARK_PI3K_AKT_MTOR_SIGNALING</a>		105	-0.2	-0.6	0.997	1	1	6433	tags=33%, list=37%, signal=53%
<a href="#">HALLMARK_MYC_TARGETS_V2</a>		57	-0.1	-0.4	1	1	1	5967	tags=25%, list=34%, signal=37%

## Supplement Tables

**Table 5. GSEA of hallmark gene sets between control and combination-sensitive tumors.**

NES>0 means up in ComboS; NES<0 means up in Ctrl

GS follow link to MSigDB	GS DETAILS	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">HALLMARK_MYOGENESIS</a>	<a href="#">Details ...</a>	200	0.51	2.61	0	0	0	1140	tags=33%, list=7%, signal=34%
<a href="#">HALLMARK_EPITHELIAL_MESENCHYMAL_TRANSITION</a>	<a href="#">Details ...</a>	196	0.32	1.62	0	0.038	0.011	2286	tags=33%, list=13%, signal=37%
<a href="#">HALLMARK_PANCREAS_BETA_CELLS</a>	<a href="#">Details ...</a>	40	0.39	1.58	0.008	0.033	0.014	1767	tags=23%, list=10%, signal=25%
<a href="#">HALLMARK_INTERFERON_ALPHA_RESPONSE</a>	<a href="#">Details ...</a>	93	0.33	1.56	0	0.027	0.016	3860	tags=46%, list=22%, signal=59%
<a href="#">HALLMARK_INTERFERON_GAMMA_RESPONSE</a>	<a href="#">Details ...</a>	192	0.23	1.29	0	0.147	0.114	3870	tags=38%, list=22%, signal=48%
<a href="#">HALLMARK_APICAL_JUNCTION</a>	<a href="#">Details ...</a>	198	0.21	1.04	0.231	0.609	0.487	2275	tags=23%, list=13%, signal=26%
<a href="#">HALLMARK_WNT_BETA_CATENIN_SIGNALING</a>	<a href="#">Details ...</a>	41	0.26	1.02	0.409	0.622	0.545	2367	tags=27%, list=14%, signal=31%
<a href="#">HALLMARK_ALLOGRAFT_REJECTION</a>	<a href="#">Details ...</a>	195	0.19	1	0.333	0.607	0.577	1556	tags=14%, list=9%, signal=15%
<a href="#">HALLMARK_UNFOLDED_PROTEIN_RESPONSE</a>	<a href="#">Details ...</a>	112	0.19	0.93	0.645	0.774	0.717	2251	tags=21%, list=13%, signal=24%
<a href="#">HALLMARK_HEDGEHOG_SIGNALING</a>	<a href="#">Details ...</a>	36	0.23	0.86	0.703	0.885	0.796	1241	tags=17%, list=7%, signal=18%
<a href="#">HALLMARK_MYC_TARGETS_V2</a>	<a href="#">Details ...</a>	57	0.15	0.61	1	0.996	0.869	2763	tags=21%, list=16%, signal=25%
<a href="#">HALLMARK_E2F_TARGETS</a>	<a href="#">Details ...</a>	200	-0.5	-1.7	0	0.004	0.005	6565	tags=62%, list=38%, signal=98%
<a href="#">HALLMARK_G2M_CHECKPOINT</a>	<a href="#">Details ...</a>	196	-0.5	-1.6	0	0.009	0.02	5980	tags=56%, list=34%, signal=84%
<a href="#">HALLMARK_OXIDATIVE_PHOSPHORYLATION</a>	<a href="#">Details ...</a>	196	-0.4	-1.4	0	0.116	0.357	8205	tags=61%, list=47%, signal=114%
<a href="#">HALLMARK_ADIPOGENESIS</a>	<a href="#">Details ...</a>	199	-0.4	-1.4	0.003	0.092	0.373	7289	tags=60%, list=42%, signal=102%
<a href="#">HALLMARK_CHOLESTEROL_HOMEOSTASIS</a>	<a href="#">Details ...</a>	72	-0.4	-1.4	0.011	0.078	0.389	4051	tags=39%, list=23%, signal=50%
<a href="#">HALLMARK_HEME_METABOLISM</a>	<a href="#">Details ...</a>	190	-0.4	-1.4	0.001	0.073	0.42	5513	tags=44%, list=32%, signal=63%
<a href="#">HALLMARK_BILE_ACID_METABOLISM</a>	<a href="#">Details ...</a>	111	-0.4	-1.4	0.019	0.075	0.485	5140	tags=44%, list=30%, signal=62%
<a href="#">HALLMARK_KRAS_SIGNALING_DN</a>	<a href="#">Details ...</a>	198	-0.4	-1.4	0.008	0.096	0.626	2913	tags=27%, list=17%, signal=32%
<a href="#">HALLMARK_PEROXISOME</a>	<a href="#">Details ...</a>	102	-0.4	-1.4	0.025	0.088	0.637	6763	tags=55%, list=39%, signal=89%
<a href="#">HALLMARK_ANDROGEN_RESPONSE</a>	<a href="#">Details ...</a>	98	-0.4	-1.3	0.044	0.127	0.797	6524	tags=51%, list=37%, signal=81%
<a href="#">HALLMARK_FATTY_ACID_METABOLISM</a>	<a href="#">Details ...</a>	156	-0.4	-1.3	0.031	0.158	0.892	5936	tags=47%, list=34%, signal=71%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_LATE</a>	<a href="#">Details ...</a>	198	-0.4	-1.3	0.048	0.209	0.964	5977	tags=44%, list=34%, signal=67%
<a href="#">HALLMARK_PROTEIN_SECRETION</a>	<a href="#">Details ...</a>	96	-0.4	-1.3	0.082	0.197	0.966	7320	tags=55%, list=42%, signal=95%
<a href="#">HALLMARK_ESTROGEN_RESPONSE_EARLY</a>	<a href="#">Details ...</a>	198	-0.4	-1.2	0.057	0.238	0.992	6402	tags=47%, list=37%, signal=73%
<a href="#">HALLMARK_MYC_TARGETS_V1</a>	<a href="#">Details ...</a>	200	-0.3	-1.2	0.061	0.234	0.992	7732	tags=52%, list=44%, signal=92%
<a href="#">HALLMARK_P53_PATHWAY</a>	<a href="#">Details ...</a>	198	-0.3	-1.2	0.11	0.344	0.999	6513	tags=46%, list=37%, signal=73%
<a href="#">HALLMARK_SPERMATOGENESIS</a>	<a href="#">Details ...</a>	134	-0.3	-1.2	0.202	0.438	1	5884	tags=37%, list=34%, signal=55%
<a href="#">HALLMARK_MITOTIC_SPINDLE</a>	<a href="#">Details ...</a>	199	-0.3	-1.1	0.264	0.591	1	5720	tags=39%, list=33%, signal=58%
<a href="#">HALLMARK_KRAS_SIGNALING_UP</a>	<a href="#">Details ...</a>	199	-0.3	-1.1	0.253	0.565	1	5519	tags=36%, list=32%, signal=52%
<a href="#">HALLMARK_MTORC1_SIGNALING</a>	<a href="#">Details ...</a>	197	-0.3	-1.1	0.251	0.541	1	6500	tags=44%, list=37%, signal=69%
<a href="#">HALLMARK_APICAL_SURFACE</a>		44	-0.4	-1.1	0.376	0.6	1	4799	tags=39%, list=28%, signal=53%
<a href="#">HALLMARK_INFLAMMATORY_RESPONSE</a>		197	-0.3	-1	0.437	0.779	1	6614	tags=40%, list=38%, signal=64%
<a href="#">HALLMARK_TNFA_SIGNALING_VIA_NFKB</a>		197	-0.3	-1	0.472	0.803	1	7273	tags=48%, list=42%, signal=82%
<a href="#">HALLMARK_IL2_STAT5_SIGNALING</a>		199	-0.3	-1	0.503	0.821	1	4067	tags=25%, list=23%, signal=32%

HALLMARK_UV_RESPONSE_DN		143	-0.3	-1	0.598	0.92	1	3080	tags=22%, list=18%, signal=27%
HALLMARK_APOPTOSIS		161	-0.3	-1	0.599	0.887	1	6896	tags=42%, list=40%, signal=68%
HALLMARK_HYPOXIA		198	-0.3	-0.9	0.653	0.908	1	2895	tags=22%, list=17%, signal=26%
HALLMARK_ANGIOGENESIS		36	-0.3	-0.9	0.57	0.887	1	6093	tags=42%, list=35%, signal=64%
HALLMARK_DNA_REPAIR		148	-0.3	-0.9	0.76	1	1	5563	tags=31%, list=32%, signal=45%
HALLMARK_PI3K_AKT_MTOR_SIGNALING		105	-0.3	-0.9	0.776	1	1	8514	tags=59%, list=49%, signal=115%
HALLMARK_XENOBIOTIC_METABOLISM		196	-0.2	-0.8	0.844	1	1	7172	tags=42%, list=41%, signal=70%
HALLMARK_REACTIVE_OXYGEN_SPECIES_PATHWAY		49	-0.3	-0.8	0.747	0.999	1	1518	tags=12%, list=9%, signal=13%
HALLMARK_GLYCOLYSIS		200	-0.2	-0.8	0.893	1	1	3849	tags=22%, list=22%, signal=28%
HALLMARK_UV_RESPONSE_UP		156	-0.2	-0.8	0.933	1	1	6656	tags=39%, list=38%, signal=63%
HALLMARK_TGF_BETA_SIGNALING		53	-0.2	-0.7	0.884	1	1	7583	tags=53%, list=44%, signal=93%
HALLMARK_COAGULATION		138	-0.2	-0.7	0.957	1	1	4867	tags=29%, list=28%, signal=40%
HALLMARK_IL6_JAK_STAT3_SIGNALING		85	-0.2	-0.6	0.987	1	1	5894	tags=29%, list=34%, signal=44%
HALLMARK_NOTCH_SIGNALING		32	-0.2	-0.6	0.947	1	1	1730	tags=13%, list=10%, signal=14%
HALLMARK_COMPLEMENT		191	-0.2	-0.6	1	0.997	1	6000	tags=30%, list=34%, signal=45%

## Supplement Tables

**Table 6. GSEA of oncogenic gene sets between copanlisib-sensitive and copanlisib-resistant tumors.**

SI Table 6. NES&gt;0 means up in PI3KR; NES&lt;0 means up in PI3KS

GS follow link to MSigDB	GS DETAILS	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">SINGH KRAS DEPENDENCY SIGNATURE</a>	<a href="#">Details ...</a>	19	0.86	2.06	0	0	0	1495	tags=74%, list=9%, signal=81%
<a href="#">KRAS.LUNG_UP.V1_DN</a>	<a href="#">Details ...</a>	127	0.68	1.96	0	0	0	3241	tags=49%, list=19%, signal=60%
<a href="#">AKT_UP.V1_UP</a>	<a href="#">Details ...</a>	164	0.56	1.61	0	0.015	0.043	4000	tags=44%, list=23%, signal=56%
<a href="#">MTOR_UP.V1_UP</a>	<a href="#">Details ...</a>	165	0.55	1.6	0	0.012	0.046	4892	tags=46%, list=28%, signal=63%
<a href="#">KRAS.600_UP.V1_DN</a>	<a href="#">Details ...</a>	248	0.54	1.59	0	0.013	0.062	2894	tags=32%, list=17%, signal=38%
<a href="#">KRAS.LUNG.BREAST_UP.V1_DN</a>	<a href="#">Details ...</a>	129	0.55	1.59	0	0.011	0.062	3160	tags=35%, list=18%, signal=42%
<a href="#">KRAS.50_UP.V1_DN</a>	<a href="#">Details ...</a>	39	0.6	1.58	0.007	0.01	0.068	3045	tags=36%, list=17%, signal=43%
<a href="#">NRL_DN.V1_UP</a>	<a href="#">Details ...</a>	136	0.54	1.54	0	0.015	0.112	3296	tags=33%, list=19%, signal=40%
<a href="#">MEK_UP.V1_UP</a>	<a href="#">Details ...</a>	189	0.53	1.53	0	0.016	0.129	4283	tags=42%, list=25%, signal=56%
<a href="#">KRAS.600.LUNG.BREAST_UP.V1_DN</a>	<a href="#">Details ...</a>	252	0.51	1.51	0	0.021	0.191	3216	tags=32%, list=18%, signal=38%
<a href="#">RPS14_DN.V1_UP</a>	<a href="#">Details ...</a>	172	0.52	1.5	0	0.021	0.207	4436	tags=44%, list=25%, signal=58%
<a href="#">WNT_UP.V1_UP</a>	<a href="#">Details ...</a>	172	0.52	1.5	0	0.02	0.217	3633	tags=38%, list=21%, signal=47%
<a href="#">E2F3_UP.V1_DN</a>	<a href="#">Details ...</a>	123	0.52	1.49	0	0.022	0.251	5442	tags=51%, list=31%, signal=74%
<a href="#">KRAS.300_UP.V1_DN</a>	<a href="#">Details ...</a>	125	0.52	1.49	0	0.021	0.266	3160	tags=34%, list=18%, signal=41%
<a href="#">AKT_UP_MTOR_DN.V1_UP</a>	<a href="#">Details ...</a>	173	0.51	1.48	0	0.023	0.295	4700	tags=46%, list=27%, signal=63%
<a href="#">PKCA_DN.V1_UP</a>	<a href="#">Details ...</a>	152	0.51	1.48	0	0.022	0.303	2742	tags=29%, list=16%, signal=34%
<a href="#">CRX_NRL_DN.V1_UP</a>	<a href="#">Details ...</a>	136	0.51	1.47	0	0.022	0.321	4010	tags=37%, list=23%, signal=47%
<a href="#">PRC1_BMI_UP.V1_UP</a>	<a href="#">Details ...</a>	160	0.5	1.46	0	0.024	0.36	4265	tags=39%, list=24%, signal=51%
<a href="#">ALK_DN.V1_DN</a>	<a href="#">Details ...</a>	124	0.5	1.45	0	0.024	0.373	4449	tags=42%, list=26%, signal=56%
<a href="#">DCA_UP.V1_UP</a>	<a href="#">Details ...</a>	157	0.5	1.45	0	0.025	0.396	3757	tags=32%, list=22%, signal=41%
<a href="#">STK33_NOMO_DN</a>		256	0.5	1.45	0	0.024	0.405	3685	tags=34%, list=21%, signal=42%
<a href="#">P53_DN.V1_UP</a>		180	0.5	1.45	0.001	0.023	0.414	2676	tags=28%, list=15%, signal=32%
<a href="#">LEF1_UP.V1_DN</a>		176	0.49	1.44	0	0.024	0.431	4030	tags=42%, list=23%, signal=54%
<a href="#">PKCA_DN.V1_DN</a>		149	0.5	1.43	0.001	0.025	0.465	3391	tags=31%, list=19%, signal=38%
<a href="#">ERBB2_UP.V1_UP</a>		181	0.49	1.43	0.001	0.026	0.484	4240	tags=39%, list=24%, signal=51%
<a href="#">RB_P130_DN.V1_DN</a>		131	0.49	1.43	0.003	0.025	0.486	3973	tags=35%, list=23%, signal=45%
<a href="#">STK33_DN</a>		261	0.48	1.43	0	0.025	0.494	4440	tags=39%, list=25%, signal=52%
<a href="#">PTEN_DN.V2_UP</a>		124	0.49	1.42	0.004	0.029	0.569	3835	tags=35%, list=22%, signal=44%
<a href="#">ATF2_S_UP.V1_UP</a>		178	0.48	1.41	0.001	0.03	0.6	3158	tags=29%, list=18%, signal=35%
<a href="#">KRAS.DF.V1_DN</a>		180	0.48	1.4	0	0.034	0.65	3391	tags=30%, list=19%, signal=37%
<a href="#">EGFR_UP.V1_UP</a>		185	0.48	1.39	0.003	0.034	0.664	4332	tags=39%, list=25%, signal=52%
<a href="#">KRAS.BREAST_UP.V1_UP</a>		121	0.48	1.39	0.006	0.035	0.686	2145	tags=24%, list=12%, signal=27%
<a href="#">JAK2_DN.V1_UP</a>		156	0.48	1.39	0.001	0.034	0.687	3272	tags=28%, list=19%, signal=34%
<a href="#">PRC2_SUZ12_UP.V1_UP</a>		165	0.47	1.37	0.003	0.042	0.77	5060	tags=45%, list=29%, signal=63%
<a href="#">LTE2_UP.V1_UP</a>		182	0.47	1.37	0.001	0.042	0.785	4343	tags=36%, list=25%, signal=47%
<a href="#">KRAS.PROSTATE_UP.V1_DN</a>		126	0.48	1.37	0.004	0.042	0.789	4347	tags=44%, list=25%, signal=58%



RB_P107_DN.V1_DN		123	0.48	1.37	0.002	0.041	0.792	5436	tags=48%, list=31%, signal=69%
CYCLIN_D1_KE_V1_DN		180	0.47	1.36	0.001	0.047	0.837	5116	tags=42%, list=29%, signal=58%
ESC_J1_UP_EARLY.V1_UP		177	0.46	1.36	0.002	0.047	0.846	4097	tags=32%, list=24%, signal=41%
PRC1_BMI_UP.V1_DN		166	0.46	1.35	0.006	0.049	0.868	3666	tags=30%, list=21%, signal=37%
P53_DN.V2_DN		137	0.47	1.35	0.004	0.051	0.884	3470	tags=32%, list=20%, signal=40%
STK33_SKM_DN		252	0.46	1.35	0	0.051	0.891	4440	tags=38%, list=25%, signal=50%
NOTCH_DN.V1_UP		167	0.46	1.33	0.003	0.058	0.927	4577	tags=39%, list=26%, signal=52%
ATF2_UP.V1_UP		177	0.45	1.32	0.006	0.069	0.958	4514	tags=34%, list=26%, signal=45%
KRAS.50_UP.V1_UP		44	0.49	1.32	0.068	0.068	0.958	4213	tags=41%, list=24%, signal=54%
PRC2_SUZ12_UP.V1_DN		172	0.45	1.32	0.007	0.069	0.961	4767	tags=37%, list=27%, signal=50%
KRAS.KIDNEY_UP.V1_DN		118	0.46	1.31	0.02	0.073	0.968	3860	tags=32%, list=22%, signal=41%
SIRNA_EIF4GI_UP		91	0.46	1.31	0.042	0.074	0.97	4908	tags=37%, list=28%, signal=52%
NOTCH_DN.V1_DN		160	0.45	1.31	0.013	0.074	0.971	3856	tags=34%, list=22%, signal=43%
SNF5_DN.V1_DN		151	0.45	1.3	0.01	0.08	0.977	3774	tags=32%, list=22%, signal=41%
ATF2_S_UP.V1_DN		179	0.44	1.3	0.01	0.085	0.981	3458	tags=30%, list=20%, signal=37%
IL15_UP.V1_DN		165	0.44	1.29	0.02	0.093	0.992	2983	tags=25%, list=17%, signal=30%
RELA_DN.V1_DN		128	0.45	1.29	0.022	0.092	0.992	3564	tags=32%, list=20%, signal=40%
ESC_V6.5_UP_EARLY.V1_DN		159	0.44	1.29	0.016	0.094	0.994	2979	tags=23%, list=17%, signal=28%
ESC_V6.5_UP_EARLY.V1_UP		162	0.44	1.28	0.015	0.106	0.997	4316	tags=40%, list=25%, signal=53%
IL2_UP.V1_UP		174	0.44	1.28	0.021	0.105	0.997	4999	tags=40%, list=29%, signal=55%
KRAS.PROSTATE_UP.V1_UP		123	0.44	1.28	0.034	0.103	0.997	3735	tags=28%, list=21%, signal=35%
PRC2_EED_UP.V1_DN		187	0.44	1.28	0.014	0.102	0.997	5812	tags=47%, list=33%, signal=69%
CTIP_DN.V1_DN		118	0.45	1.27	0.044	0.101	0.997	4642	tags=34%, list=27%, signal=46%
PIGF_UP.V1_DN		173	0.44	1.27	0.017	0.104	0.998	3990	tags=32%, list=23%, signal=41%
BRCA1_DN.V1_DN		119	0.44	1.27	0.045	0.104	0.998	3794	tags=30%, list=22%, signal=38%
IL21_UP.V1_DN		166	0.44	1.27	0.021	0.104	0.998	4672	tags=34%, list=27%, signal=46%
RAF_UP.V1_UP		187	0.43	1.26	0.018	0.111	0.999	4480	tags=36%, list=26%, signal=48%
E2F1_UP.V1_DN		180	0.43	1.26	0.012	0.111	0.999	5256	tags=44%, list=30%, signal=63%
BMI1_DN.V1_UP		144	0.43	1.26	0.038	0.11	0.999	4245	tags=35%, list=24%, signal=46%
KRAS.AMP.LUNG_UP.V1_DN		124	0.44	1.26	0.04	0.111	0.999	3703	tags=29%, list=21%, signal=37%
WNT_UP.V1_DN		167	0.43	1.26	0.031	0.115	1	3774	tags=33%, list=22%, signal=42%
ATF2_UP.V1_DN		168	0.43	1.25	0.029	0.12	1	3062	tags=29%, list=18%, signal=34%
CAHOY_ASTROCYTIC		97	0.44	1.25	0.063	0.121	1	1864	tags=19%, list=11%, signal=21%
CRX_DN.V1_DN		132	0.43	1.25	0.049	0.122	1	4260	tags=33%, list=24%, signal=44%
KRAS.BREAST_UP.V1_DN		127	0.43	1.25	0.057	0.122	1	3289	tags=30%, list=19%, signal=37%
EIF4E_DN		97	0.44	1.25	0.088	0.122	1	5962	tags=51%, list=34%, signal=76%
KRAS.LUNG_UP.V1_UP		118	0.43	1.25	0.057	0.121	1	4279	tags=36%, list=25%, signal=47%
ESC_V6.5_UP_LATE.V1_DN		177	0.42	1.23	0.047	0.149	1	2979	tags=25%, list=17%, signal=30%
ATM_DN.V1_DN		128	0.43	1.23	0.064	0.151	1	3564	tags=27%, list=20%, signal=34%

PDGF_UP.V1_DN		108	0.43	1.22	0.099	0.162	1	5359	tags=44%, list=31%, signal=62%
BCAT_GDS748_UP		45	0.45	1.21	0.168	0.182	1	4655	tags=38%, list=27%, signal=51%
RB_DN.V1_DN		120	0.42	1.21	0.094	0.184	1	4777	tags=34%, list=27%, signal=47%
KRAS.LUNG.BREAST_UP.V1_UP		124	0.42	1.21	0.102	0.189	1	4439	tags=38%, list=25%, signal=51%
IL15_UP.V1_UP		170	0.42	1.21	0.059	0.19	1	5243	tags=39%, list=30%, signal=56%
BCAT_BILD_ET_AL_UP		43	0.45	1.21	0.206	0.189	1	5106	tags=49%, list=29%, signal=69%
MEL18_DN.V1_UP		137	0.41	1.2	0.093	0.193	1	4439	tags=36%, list=25%, signal=48%
CRX_DN.V1_UP		131	0.42	1.2	0.095	0.198	1	3956	tags=34%, list=23%, signal=43%
RB_DN.V1_UP		115	0.42	1.2	0.098	0.203	1	3897	tags=28%, list=22%, signal=36%
IL2_UP.V1_DN		173	0.41	1.2	0.07	0.204	1	3246	tags=26%, list=19%, signal=32%
NFE2L2.V2		403	0.4	1.2	0.01	0.203	1	3914	tags=28%, list=22%, signal=35%
KRAS.DF.V1_UP		181	0.41	1.19	0.069	0.204	1	3113	tags=28%, list=18%, signal=34%
BMI1_DN_MEL18_DN.V1_DN		135	0.41	1.19	0.109	0.202	1	3418	tags=31%, list=20%, signal=38%
LEF1_UP.V1_UP		183	0.41	1.19	0.063	0.2	1	2384	tags=22%, list=14%, signal=26%
ESC_J1_UP_LATE.V1_UP		183	0.41	1.19	0.076	0.206	1	5319	tags=41%, list=31%, signal=58%
JNK_DN.V1_UP		168	0.41	1.19	0.077	0.205	1	5064	tags=38%, list=29%, signal=53%
SRC_UP.V1_UP		152	0.41	1.19	0.1	0.21	1	3314	tags=23%, list=19%, signal=28%
GCNP_SHH_UP_LATE.V1_DN		172	0.41	1.19	0.091	0.211	1	4900	tags=37%, list=28%, signal=51%
RAF_UP.V1_DN		189	0.41	1.18	0.074	0.212	1	4245	tags=34%, list=24%, signal=44%
KRAS.AMP.LUNG_UP.V1_UP		112	0.41	1.18	0.141	0.213	1	4882	tags=35%, list=28%, signal=48%
ESC_J1_UP_EARLY.V1_DN		168	0.41	1.18	0.109	0.229	1	4276	tags=31%, list=25%, signal=41%
MEK_UP.V1_DN		175	0.4	1.17	0.111	0.246	1	5754	tags=46%, list=33%, signal=68%
CTIP_DN.V1_UP		116	0.41	1.17	0.148	0.244	1	2770	tags=24%, list=16%, signal=29%
IL21_UP.V1_UP		173	0.4	1.17	0.092	0.241	1	2671	tags=23%, list=15%, signal=26%
PTEN_DN.V1_DN		154	0.4	1.16	0.122	0.255	1	3964	tags=29%, list=23%, signal=37%
KRAS.300_UP.V1_UP		127	0.4	1.16	0.168	0.272	1	3157	tags=27%, list=18%, signal=32%
TGFB_UP.V1_DN		178	0.4	1.16	0.115	0.27	1	4514	tags=32%, list=26%, signal=43%
BCAT_GDS748_DN		40	0.44	1.15	0.262	0.274	1	2301	tags=25%, list=13%, signal=29%
BMI1_DN_MEL18_DN.V1_UP		140	0.4	1.15	0.163	0.278	1	4553	tags=34%, list=26%, signal=45%
LTE2_UP.V1_DN		180	0.39	1.14	0.147	0.297	1	3976	tags=33%, list=23%, signal=42%
CAHOY_ASTROGLIAL		100	0.4	1.14	0.222	0.302	1	4198	tags=30%, list=24%, signal=39%
TBK1.DF_UP		273	0.39	1.14	0.1	0.31	1	5270	tags=36%, list=30%, signal=50%
P53_DN.V2_UP		129	0.39	1.13	0.184	0.32	1	3719	tags=31%, list=21%, signal=39%
MYC_UP.V1_UP		166	0.39	1.13	0.157	0.318	1	5204	tags=40%, list=30%, signal=57%
CYCLIN_D1_UP.V1_DN		177	0.39	1.13	0.166	0.317	1	4944	tags=35%, list=28%, signal=48%
VEGF_A_UP.V1_UP		185	0.38	1.13	0.186	0.329	1	4032	tags=26%, list=23%, signal=33%
RAPA_EARLY_UP.V1_DN		170	0.39	1.13	0.19	0.332	1	5864	tags=43%, list=34%, signal=64%
ESC_J1_UP_LATE.V1_DN		167	0.39	1.13	0.175	0.331	1	4871	tags=36%, list=28%, signal=49%
MEL18_DN.V1_DN		140	0.39	1.12	0.198	0.33	1	2162	tags=19%, list=12%, signal=22%

ALK_DN.V1_UP		126	0.39	1.12	0.221	0.334	1	3317	tags=26%, list=19%, signal=32%
CYCLIN_D1_KE_V1_UP		185	0.38	1.12	0.184	0.331	1	4914	tags=33%, list=28%, signal=45%
PRC2_EZH2_UP.V1_UP		182	0.38	1.12	0.194	0.337	1	4219	tags=30%, list=24%, signal=39%
PTEN_DN.V1_UP		163	0.39	1.12	0.195	0.338	1	3863	tags=29%, list=22%, signal=37%
E2F1_UP.V1_UP		187	0.38	1.12	0.182	0.347	1	5718	tags=40%, list=33%, signal=58%
HOXA9_DN.V1_UP		176	0.39	1.11	0.212	0.345	1	4420	tags=31%, list=25%, signal=41%
MYC_UP.V1_DN		150	0.39	1.11	0.222	0.345	1	4292	tags=31%, list=25%, signal=40%
TBK1_DF_DN		279	0.37	1.1	0.181	0.373	1	6624	tags=48%, list=38%, signal=77%
PRC2_EZH2_UP.V1_DN		181	0.38	1.1	0.254	0.383	1	5505	tags=38%, list=32%, signal=55%
CAHOY_OLIGODENDROCTIC		99	0.38	1.09	0.334	0.422	1	6166	tags=43%, list=35%, signal=67%
CAHOY_NEURONAL		100	0.38	1.08	0.32	0.434	1	2114	tags=16%, list=12%, signal=18%
KRAS.KIDNEY_UP.V1_UP		138	0.37	1.07	0.318	0.483	1	3811	tags=26%, list=22%, signal=33%
BRCA1_DN.V1_UP		114	0.37	1.06	0.359	0.496	1	5510	tags=35%, list=32%, signal=51%
ATM_DN.V1_UP		133	0.37	1.06	0.364	0.507	1	3552	tags=26%, list=20%, signal=33%
P53_DN.V1_DN		189	0.36	1.06	0.358	0.52	1	5479	tags=40%, list=31%, signal=57%
SRC_UP.V1_DN		147	0.37	1.06	0.366	0.517	1	3489	tags=24%, list=20%, signal=30%
PTEN_DN.V2_DN		132	0.37	1.05	0.376	0.526	1	3472	tags=23%, list=20%, signal=28%
KRAS.600.LUNG.BREAST_UP.V1_UP		238	0.36	1.05	0.339	0.523	1	4560	tags=31%, list=26%, signal=41%
BMI1_DN.V1_DN		129	0.37	1.05	0.384	0.526	1	4010	tags=31%, list=23%, signal=40%
AKT_UP.V1_DN		184	0.36	1.05	0.362	0.528	1	2581	tags=19%, list=15%, signal=22%
DCA_UP.V1_DN		167	0.36	1.04	0.385	0.546	1	4707	tags=32%, list=27%, signal=43%
GLI1_UP.V1_DN		17	0.44	1.04	0.441	0.551	1	7906	tags=59%, list=45%, signal=108%
EGFR_UP.V1_DN		179	0.36	1.04	0.391	0.553	1	5836	tags=41%, list=34%, signal=61%
HOXA9_DN.V1_DN		180	0.36	1.04	0.403	0.551	1	5156	tags=38%, list=30%, signal=53%
TGFB_UP.V1_UP		182	0.35	1.03	0.425	0.57	1	3394	tags=25%, list=19%, signal=30%
RAPA_EARLY_UP.V1_UP		156	0.36	1.03	0.417	0.574	1	5654	tags=38%, list=32%, signal=56%
BCAT.100_UP.V1_UP		48	0.38	1.01	0.486	0.621	1	4471	tags=31%, list=26%, signal=42%
CAMP_UP.V1_DN		192	0.34	1.01	0.489	0.645	1	6075	tags=40%, list=35%, signal=61%
GCNP_SHH_UP_LATE.V1_UP		177	0.35	1.01	0.487	0.641	1	7013	tags=48%, list=40%, signal=80%
CYCLIN_D1_UP.V1_UP		179	0.35	1.01	0.493	0.639	1	4913	tags=31%, list=28%, signal=43%
CSR_LATE_UP.V1_DN		139	0.35	1	0.513	0.646	1	5804	tags=41%, list=33%, signal=61%
SNF5_DN.V1_UP		170	0.34	1	0.5	0.643	1	4659	tags=34%, list=27%, signal=46%
RPS14_DN.V1_DN		177	0.34	1	0.51	0.651	1	6280	tags=40%, list=36%, signal=62%
BCAT_BILD_ET_AL_DN		41	0.37	0.99	0.516	0.682	1	7739	tags=63%, list=44%, signal=114%
CAMP_UP.V1_UP		189	0.34	0.99	0.548	0.68	1	4469	tags=31%, list=26%, signal=41%
AKT_UP_MTOR_DN.V1_DN		182	0.34	0.98	0.543	0.687	1	3739	tags=26%, list=21%, signal=33%
PDGF_ERK_DN.V1_DN		142	0.34	0.98	0.54	0.685	1	5659	tags=39%, list=32%, signal=57%
YAP1_DN		43	0.37	0.98	0.556	0.695	1	2840	tags=16%, list=16%, signal=19%
KRAS.600_UP.V1_UP		251	0.33	0.96	0.611	0.733	1	3157	tags=22%, list=18%, signal=26%

CRX_NRL_DN.V1_DN		125	0.33	0.94	0.643	0.799	1	4832	tags=28%, list=28%, signal=38%
STK33_NOMO_UP		271	0.32	0.93	0.722	0.814	1	4469	tags=28%, list=26%, signal=37%
MTOR_UP.V1_DN		178	0.32	0.93	0.71	0.826	1	5159	tags=31%, list=30%, signal=43%
GCNP_SHH_UP_EARLY.V1_DN		163	0.31	0.91	0.731	0.863	1	3955	tags=26%, list=23%, signal=34%
NRL_DN.V1_DN		130	0.31	0.9	0.721	0.888	1	4431	tags=24%, list=25%, signal=32%
STK33_SKM_UP		235	0.3	0.89	0.827	0.907	1	2852	tags=17%, list=16%, signal=20%
MTOR_UP.N4.V1_UP		191	0.31	0.89	0.814	0.907	1	5241	tags=32%, list=30%, signal=46%
ESC_V6.5_UP_LATE.V1_UP		180	0.3	0.88	0.827	0.922	1	5017	tags=33%, list=29%, signal=46%
JNK_DN.V1_DN		176	0.3	0.87	0.841	0.925	1	3297	tags=17%, list=19%, signal=21%
CSR_EARLY_UP.V1_UP		152	0.3	0.85	0.846	0.957	1	3506	tags=21%, list=20%, signal=26%
BCAT.100_UP.V1_DN		35	0.32	0.84	0.744	0.973	1	4711	tags=31%, list=27%, signal=43%
RB_P130_DN.V1_UP		129	0.29	0.84	0.854	0.971	1	4343	tags=26%, list=25%, signal=35%
PDGF_ERK_DN.V1_UP		133	0.29	0.83	0.87	0.97	1	6267	tags=37%, list=36%, signal=57%
PRC2_EED_UP.V1_UP		175	0.28	0.83	0.899	0.974	1	3962	tags=24%, list=23%, signal=31%
STK33_UP		258	0.28	0.82	0.955	0.979	1	4469	tags=24%, list=26%, signal=32%
PDGF_UP.V1_UP		136	0.28	0.81	0.885	0.984	1	6692	tags=42%, list=38%, signal=68%
RB_P107_DN.V1_UP		129	0.28	0.8	0.898	0.991	1	4949	tags=30%, list=28%, signal=42%
GCNP_SHH_UP_EARLY.V1_UP		166	0.27	0.79	0.937	0.995	1	7255	tags=43%, list=42%, signal=74%
RELA_DN.V1_UP		139	0.27	0.78	0.921	0.995	1	4373	tags=27%, list=25%, signal=36%
CSR_EARLY_UP.V1_DN		115	0.27	0.76	0.925	1	1	4245	tags=23%, list=24%, signal=30%
E2F3_UP.V1_UP		185	0.26	0.75	0.962	1	1	4688	tags=27%, list=27%, signal=37%
ERBB2_UP.V1_DN		187	0.24	0.72	0.979	1	1	5719	tags=34%, list=33%, signal=50%
VEGF_A_UP.V1_DN		187	0.23	0.67	0.99	1	1	6875	tags=39%, list=39%, signal=63%
JAK2_DN.V1_DN		116	0.23	0.67	0.973	1	1	6458	tags=31%, list=37%, signal=49%
TBK1.DN.48HRS_UP		49	0.24	0.67	0.929	1	1	4515	tags=29%, list=26%, signal=38%
CSR_LATE_UP.V1_UP		158	0.23	0.66	0.986	1	1	4417	tags=23%, list=25%, signal=31%
CORDENONSI_YAP_CONSERVED_SIG NATURE		57	0.24	0.65	0.94	1	1	5168	tags=28%, list=30%, signal=40%
GLI1_UP.V1_UP		24	0.26	0.65	0.917	1	1	4485	tags=42%, list=26%, signal=56%
PIGF_UP.V1_UP		181	0.21	0.62	0.995	1	1	6642	tags=36%, list=38%, signal=57%
SIRNA_EIF4GI_DN		88	0.21	0.58	0.985	1	1	4136	tags=23%, list=24%, signal=30%
TBK1.DN.48HRS_DN		48	0.19	0.52	0.991	1	1	1212	tags=6%, list=7%, signal=7%
YAP1_UP		45	0.2	0.52	0.988	1	1	8553	tags=53%, list=49%, signal=105%
MTOR_UP.N4.V1_DN		153	0.17	0.48	1	0.999	1	5343	tags=25%, list=31%, signal=36%
<a href="#">EIF4E_UP</a>	<a href="#">Details ...</a>	97	-0.3	-1.3	0	0.066	0.059	3202	tags=35%, list=18%, signal=43%

## Supplement Tables

**Table 7. GSEA of oncogenic gene sets between anti-PD1-sensitive and anti-PD1-resistant tumors.**

SI Table 7. NES>0 means up in aPD1R; NES<0 means up in aPD1S

GS follow link to MSigDB	GS DETAILS	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">SINGH KRAS DEPENDENCY SIGNATURE</a>	<a href="#">Details ...</a>	19	0.67	1.9	0	0.001	0.001	2434	tags=63%, list=14%, signal=73%
<a href="#">BCAT_BILD_ET_AL_UP</a>	<a href="#">Details ...</a>	43	0.51	1.72	0	0.012	0.027	5555	tags=63%, list=32%, signal=92%
<a href="#">RB_P107_DN.V1_DN</a>	<a href="#">Details ...</a>	123	0.44	1.7	0	0.011	0.037	5648	tags=54%, list=32%, signal=80%
<a href="#">KRAS.50_UP.V1_DN</a>	<a href="#">Details ...</a>	39	0.51	1.68	0.001	0.01	0.047	3663	tags=44%, list=21%, signal=55%
<a href="#">AKT_UP.V1_UP</a>	<a href="#">Details ...</a>	164	0.41	1.6	0	0.024	0.126	4990	tags=46%, list=29%, signal=63%
<a href="#">EIF4E_UP</a>	<a href="#">Details ...</a>	97	0.43	1.59	0	0.02	0.13	4612	tags=49%, list=26%, signal=67%
<a href="#">SIRNA_EIF4GI_UP</a>	<a href="#">Details ...</a>	91	0.42	1.57	0.002	0.025	0.188	4156	tags=42%, list=24%, signal=55%
<a href="#">CAMP_UP.V1_UP</a>	<a href="#">Details ...</a>	189	0.4	1.56	0	0.025	0.206	6229	tags=55%, list=36%, signal=85%
<a href="#">GCNP_SHH_UP_LATE.V1_DN</a>	<a href="#">Details ...</a>	172	0.39	1.56	0	0.022	0.208	4961	tags=44%, list=28%, signal=61%
<a href="#">AKT_UP_MTOR_DN.V1_UP</a>	<a href="#">Details ...</a>	173	0.4	1.56	0.001	0.02	0.212	4990	tags=46%, list=29%, signal=64%
<a href="#">KRAS.300_UP.V1_DN</a>	<a href="#">Details ...</a>	125	0.4	1.55	0	0.021	0.241	2950	tags=31%, list=17%, signal=37%
<a href="#">MYC_UP.V1_UP</a>	<a href="#">Details ...</a>	166	0.39	1.52	0	0.03	0.342	6850	tags=53%, list=39%, signal=87%
<a href="#">KRAS.LUNG_UP.V1_DN</a>	<a href="#">Details ...</a>	127	0.39	1.48	0.007	0.05	0.544	3015	tags=34%, list=17%, signal=41%
<a href="#">KRAS.LUNG.BREAST_UP.V1_DN</a>	<a href="#">Details ...</a>	129	0.38	1.46	0.004	0.056	0.592	2916	tags=30%, list=17%, signal=36%
<a href="#">KRAS.600_UP.V1_DN</a>	<a href="#">Details ...</a>	248	0.36	1.45	0.001	0.064	0.668	2950	tags=29%, list=17%, signal=34%
<a href="#">RB_DN.V1_UP</a>	<a href="#">Details ...</a>	115	0.38	1.45	0.01	0.06	0.668	6785	tags=56%, list=39%, signal=91%
<a href="#">ESC_J1_UP_EARLY.V1_DN</a>	<a href="#">Details ...</a>	168	0.37	1.43	0.002	0.074	0.771	6877	tags=54%, list=39%, signal=89%
<a href="#">SNF5_DN.V1_DN</a>	<a href="#">Details ...</a>	151	0.37	1.42	0.008	0.08	0.816	5108	tags=41%, list=29%, signal=58%
<a href="#">CRX_NRL_DN.V1_UP</a>	<a href="#">Details ...</a>	136	0.36	1.41	0.008	0.083	0.85	3524	tags=35%, list=20%, signal=43%
<a href="#">KRAS.DF.V1_UP</a>	<a href="#">Details ...</a>	181	0.36	1.41	0.007	0.081	0.853	5057	tags=40%, list=29%, signal=56%
<a href="#">CYCLIN_D1_UP.V1_UP</a>		179	0.36	1.4	0.005	0.088	0.891	6476	tags=47%, list=37%, signal=74%
<a href="#">WNT_UP.V1_UP</a>		172	0.36	1.39	0.008	0.099	0.924	6865	tags=51%, list=39%, signal=83%
<a href="#">MTOR_UP.V1_UP</a>		165	0.36	1.38	0.008	0.105	0.944	5402	tags=42%, list=31%, signal=60%
<a href="#">E2F3_UP.V1_DN</a>		123	0.36	1.37	0.021	0.112	0.958	4474	tags=36%, list=26%, signal=48%
<a href="#">P53_DN.V1_UP</a>		180	0.35	1.37	0.009	0.111	0.963	5142	tags=40%, list=30%, signal=56%
<a href="#">NRL_DN.V1_UP</a>		136	0.36	1.37	0.014	0.112	0.969	3744	tags=33%, list=21%, signal=42%
<a href="#">LEF1_UP.V1_DN</a>		176	0.35	1.36	0.008	0.11	0.972	4577	tags=41%, list=26%, signal=55%
<a href="#">RB_DN.V1_DN</a>		120	0.35	1.35	0.03	0.125	0.988	6462	tags=48%, list=37%, signal=76%
<a href="#">CYCLIN_D1_KE_.V1_UP</a>		185	0.34	1.35	0.006	0.128	0.994	6714	tags=48%, list=39%, signal=77%
<a href="#">MEK_UP.V1_UP</a>		189	0.34	1.34	0.017	0.141	0.995	4639	tags=40%, list=27%, signal=54%
<a href="#">PDGF_ERK_DN.V1_DN</a>		142	0.35	1.33	0.026	0.14	0.997	6284	tags=48%, list=36%, signal=74%
<a href="#">RAPA_EARLY_UP.V1_DN</a>		170	0.34	1.33	0.019	0.148	0.998	6045	tags=46%, list=35%, signal=70%
<a href="#">ERBB2_UP.V1_UP</a>		181	0.34	1.33	0.022	0.145	0.998	4939	tags=43%, list=28%, signal=59%
<a href="#">PRC2_EED_UP.V1_DN</a>		187	0.34	1.32	0.016	0.156	0.999	5374	tags=42%, list=31%, signal=60%
<a href="#">RB_P130_DN.V1_UP</a>		129	0.34	1.31	0.044	0.167	0.999	7078	tags=58%, list=41%, signal=97%
<a href="#">ESC_V6.5_UP_LATE.V1_DN</a>		177	0.33	1.31	0.026	0.165	0.999	5265	tags=40%, list=30%, signal=56%
<a href="#">KRAS.600.LUNG.BREAST_UP.V1_DN</a>		252	0.33	1.3	0.016	0.185	0.999	3899	tags=32%, list=22%, signal=41%

IL2_UP.V1_UP		174	0.33	1.29	0.03	0.188	0.999	5847	tags=43%, list=34%, signal=64%
KRAS.PROSTATE_UP.V1_DN		126	0.34	1.29	0.055	0.199	0.999	4180	tags=35%, list=24%, signal=46%
SRC_UP.V1_UP		152	0.33	1.28	0.047	0.215	0.999	7063	tags=51%, list=41%, signal=86%
ESC_J1_UP_LATE.V1_DN		167	0.32	1.26	0.064	0.244	1	6285	tags=44%, list=36%, signal=68%
IL15_UP.V1_UP		170	0.32	1.25	0.069	0.291	1	5925	tags=44%, list=34%, signal=65%
ESC_J1_UP_EARLY.V1_UP		177	0.32	1.24	0.074	0.289	1	5928	tags=41%, list=34%, signal=61%
PRC2_SUZ12_UP.V1_DN		172	0.32	1.24	0.065	0.299	1	5095	tags=38%, list=29%, signal=54%
CRX_DN.V1_UP		131	0.32	1.22	0.11	0.358	1	3128	tags=27%, list=18%, signal=32%
ESC_J1_UP_LATE.V1_UP		183	0.31	1.21	0.099	0.374	1	7231	tags=46%, list=42%, signal=78%
KRAS.BREAST_UP.V1_UP		121	0.32	1.2	0.12	0.394	1	4809	tags=34%, list=28%, signal=46%
RB_P107_DN.V1_UP		129	0.31	1.2	0.126	0.414	1	7724	tags=53%, list=44%, signal=95%
VEGF_A_UP.V1_UP		185	0.3	1.19	0.105	0.416	1	6935	tags=46%, list=40%, signal=76%
RB_P130_DN.V1_DN		131	0.31	1.19	0.172	0.441	1	3821	tags=30%, list=22%, signal=38%
KRAS.LUNG.BREAST_UP.V1_UP		124	0.31	1.18	0.167	0.47	1	4763	tags=35%, list=27%, signal=48%
EGFR_UP.V1_UP		185	0.3	1.17	0.145	0.485	1	4763	tags=35%, list=27%, signal=47%
MTOR_UP.N4.V1_UP		191	0.29	1.15	0.16	0.551	1	5151	tags=36%, list=30%, signal=51%
E2F1_UP.V1_UP		187	0.29	1.15	0.161	0.56	1	5545	tags=38%, list=32%, signal=55%
CSR_LATE_UP.V1_UP		158	0.3	1.15	0.188	0.551	1	5754	tags=41%, list=33%, signal=61%
PIGF_UP.V1_DN		173	0.29	1.15	0.192	0.559	1	6578	tags=44%, list=38%, signal=70%
DCA_UP.V1_UP		157	0.29	1.13	0.234	0.63	1	5476	tags=32%, list=31%, signal=46%
BMI1_DN.V1_UP		144	0.29	1.13	0.223	0.629	1	4751	tags=33%, list=27%, signal=45%
TBK1.DN.48HRS_DN		48	0.33	1.12	0.285	0.629	1	5777	tags=44%, list=33%, signal=65%
MTOR_UP.V1_DN		178	0.28	1.12	0.222	0.651	1	6004	tags=39%, list=34%, signal=59%
RPS14_DN.V1_DN		177	0.28	1.1	0.263	0.706	1	5726	tags=39%, list=33%, signal=57%
MEL18_DN.V1_UP		137	0.29	1.1	0.28	0.708	1	5547	tags=38%, list=32%, signal=55%
PRC1_BMI_UP.V1_DN		166	0.29	1.1	0.26	0.702	1	5838	tags=38%, list=34%, signal=57%
LTE2_UP.V1_UP		182	0.28	1.1	0.27	0.695	1	5567	tags=39%, list=32%, signal=57%
BCAT_GDS748_UP		45	0.32	1.09	0.36	0.723	1	2124	tags=24%, list=12%, signal=28%
NFE2L2.V2		403	0.26	1.06	0.296	0.853	1	5095	tags=31%, list=29%, signal=42%
BMI1_DN.V1_DN		129	0.27	1.05	0.388	0.882	1	5120	tags=36%, list=29%, signal=50%
ESC_V6.5_UP_EARLY.V1_DN		159	0.27	1.05	0.402	0.883	1	4113	tags=28%, list=24%, signal=37%
E2F1_UP.V1_DN		180	0.27	1.04	0.393	0.904	1	5169	tags=35%, list=30%, signal=49%
PDGF_UP.V1_UP		136	0.27	1.04	0.409	0.897	1	6692	tags=42%, list=38%, signal=68%
NOTCH_DN.V1_UP		167	0.26	1.03	0.435	0.972	1	6235	tags=38%, list=36%, signal=58%
RELA_DN.V1_DN		128	0.27	1.02	0.449	0.964	1	5440	tags=33%, list=31%, signal=47%
AKT_UP_MTOR_DN.V1_DN		182	0.26	1.02	0.435	0.956	1	5521	tags=37%, list=32%, signal=54%
STK33_NOMO_DN		256	0.25	1.01	0.456	0.992	1	5196	tags=35%, list=30%, signal=49%
ESC_V6.5_UP_LATE.V1_UP		180	0.26	1.01	0.471	0.988	1	5746	tags=33%, list=33%, signal=49%
PTEN_DN.V2_UP		124	0.27	1.01	0.476	0.978	1	4007	tags=29%, list=23%, signal=37%

MYC_UP.V1_DN		150	0.26	1.01	0.489	0.99	1	4081	tags=27%, list=23%, signal=35%
BRCA1_DN.V1_DN		119	0.26	1	0.48	0.988	1	5682	tags=34%, list=33%, signal=50%
KRAS.DF.V1_DN		180	0.25	1	0.497	0.988	1	6203	tags=36%, list=36%, signal=55%
CYCLIN_D1_UP.V1_DN		177	0.26	1	0.508	0.988	1	6163	tags=36%, list=35%, signal=55%
ESC_V6.5_UP_EARLY.V1_UP		162	0.25	1	0.513	0.986	1	5849	tags=35%, list=34%, signal=52%
IL21_UP.V1_UP		173	0.25	0.99	0.527	0.984	1	3214	tags=24%, list=18%, signal=29%
PDGF_UP.V1_DN		108	0.26	0.99	0.514	0.989	1	2641	tags=21%, list=15%, signal=25%
BMI1_DN_MEL18_DN.V1_DN		135	0.26	0.99	0.515	0.988	1	4763	tags=31%, list=27%, signal=42%
CAHOY_OLIGODENDROCYTIC		99	0.27	0.99	0.513	0.976	1	2581	tags=21%, list=15%, signal=25%
WNT_UP.V1_DN		167	0.25	0.99	0.539	0.966	1	5488	tags=35%, list=32%, signal=51%
ALK_DN.V1_DN		124	0.26	0.99	0.544	0.962	1	4797	tags=27%, list=28%, signal=36%
PKCA_DN.V1_UP		152	0.25	0.98	0.537	0.955	1	4043	tags=29%, list=23%, signal=37%
CSR_EARLY_UP.V1_UP		152	0.25	0.98	0.54	0.952	1	6428	tags=41%, list=37%, signal=64%
STK33_DN		261	0.25	0.98	0.568	0.952	1	7279	tags=46%, list=42%, signal=77%
KRAS.BREAST_UP.V1_DN		127	0.26	0.98	0.554	0.946	1	6919	tags=46%, list=40%, signal=75%
KRAS.KIDNEY_UP.V1_DN		118	0.26	0.98	0.555	0.949	1	6787	tags=46%, list=39%, signal=74%
AKT_UP.V1_DN		184	0.25	0.97	0.576	0.947	1	5827	tags=38%, list=33%, signal=56%
ATF2_S_UP.V1_UP		178	0.25	0.97	0.565	0.939	1	4849	tags=31%, list=28%, signal=43%
PDGF_ERK_DN.V1_UP		133	0.25	0.97	0.579	0.938	1	4298	tags=29%, list=25%, signal=39%
PTEN_DN.V2_DN		132	0.25	0.97	0.566	0.936	1	7312	tags=45%, list=42%, signal=76%
TGFB_UP.V1_DN		178	0.25	0.97	0.603	0.928	1	5991	tags=39%, list=34%, signal=58%
STK33_SKM_DN		252	0.24	0.96	0.595	0.929	1	6447	tags=38%, list=37%, signal=59%
BMI1_DN_MEL18_DN.V1_UP		140	0.25	0.96	0.578	0.933	1	4751	tags=30%, list=27%, signal=41%
KRAS.600.LUNG.BREAST_UP.V1_UP		238	0.24	0.96	0.596	0.925	1	4763	tags=30%, list=27%, signal=41%
CAHOY_NEURONAL		100	0.25	0.96	0.581	0.918	1	1266	tags=12%, list=7%, signal=13%
CYCLIN_D1_KE_V1_DN		180	0.25	0.96	0.613	0.911	1	6163	tags=37%, list=35%, signal=56%
BCAT.100_UP.V1_DN		35	0.29	0.96	0.545	0.904	1	5251	tags=37%, list=30%, signal=53%
CAHOY_ASTROCYTIC		97	0.25	0.95	0.581	0.917	1	5406	tags=34%, list=31%, signal=49%
CRX_DN.V1_DN		132	0.25	0.95	0.62	0.928	1	6159	tags=41%, list=35%, signal=63%
PKCA_DN.V1_DN		149	0.24	0.95	0.629	0.921	1	6862	tags=41%, list=39%, signal=67%
TBK1_DF_UP		273	0.24	0.95	0.679	0.916	1	6360	tags=36%, list=37%, signal=56%
TBK1.DN.48HRS_UP		49	0.27	0.94	0.569	0.912	1	5930	tags=37%, list=34%, signal=56%
DCA_UP.V1_DN		167	0.24	0.94	0.638	0.905	1	4498	tags=31%, list=26%, signal=41%
CSR_EARLY_UP.V1_DN		115	0.25	0.94	0.628	0.918	1	4891	tags=30%, list=28%, signal=41%
IL15_UP.V1_DN		165	0.24	0.93	0.66	0.931	1	1678	tags=17%, list=10%, signal=19%
PRC2_SUZ12_UP.V1_UP		165	0.24	0.93	0.667	0.924	1	3383	tags=22%, list=19%, signal=28%
PRC1_BMI_UP.V1_UP		160	0.24	0.92	0.668	0.936	1	4024	tags=24%, list=23%, signal=31%
MEL18_DN.V1_DN		140	0.24	0.92	0.686	0.933	1	2012	tags=19%, list=12%, signal=22%
CAHOY_ASTROGLIAL		100	0.25	0.92	0.66	0.927	1	4830	tags=33%, list=28%, signal=45%



GCNP_SHH_UP_LATE.V1_UP		177	0.23	0.91	0.715	0.95	1	3883	tags=25%, list=22%, signal=32%
ATF2_UP.V1_UP		177	0.23	0.91	0.71	0.943	1	5797	tags=35%, list=33%, signal=52%
IL2_UP.V1_DN		173	0.23	0.9	0.717	0.945	1	2672	tags=18%, list=15%, signal=22%
KRAS.LUNG_UP.V1_UP		118	0.24	0.9	0.693	0.937	1	6829	tags=43%, list=39%, signal=71%
HOXA9_DN.V1_DN		180	0.23	0.9	0.752	0.939	1	5644	tags=33%, list=32%, signal=49%
NOTCH_DN.V1_DN		160	0.23	0.89	0.744	0.945	1	5679	tags=37%, list=33%, signal=54%
ALK_DN.V1_UP		126	0.23	0.89	0.718	0.951	1	6240	tags=37%, list=36%, signal=58%
RAF_UP.V1_UP		187	0.23	0.89	0.752	0.943	1	4758	tags=30%, list=27%, signal=41%
RAPA_EARLY_UP.V1_UP		156	0.23	0.87	0.765	0.97	1	5411	tags=33%, list=31%, signal=47%
CRX_NRL_DN.V1_DN		125	0.22	0.85	0.795	1	1	5387	tags=32%, list=31%, signal=46%
YAP1_DN		43	0.25	0.85	0.709	1	1	6587	tags=37%, list=38%, signal=60%
BCAT_GDS748_DN		40	0.25	0.85	0.718	0.995	1	3915	tags=33%, list=22%, signal=42%
PRC2_EZH2_UP.V1_DN		181	0.22	0.85	0.835	0.99	1	5392	tags=31%, list=31%, signal=45%
SRC_UP.V1_DN		147	0.22	0.84	0.825	0.99	1	5151	tags=31%, list=30%, signal=43%
CTIP_DN.V1_DN		118	0.22	0.84	0.797	0.986	1	7347	tags=44%, list=42%, signal=76%
P53_DN.V2_UP		129	0.22	0.83	0.825	1	1	5679	tags=33%, list=33%, signal=48%
LEF1_UP.V1_UP		183	0.21	0.82	0.863	1	1	7265	tags=43%, list=42%, signal=73%
TGFB_UP.V1_UP		182	0.21	0.81	0.878	1	1	3980	tags=25%, list=23%, signal=32%
PRC2_EZH2_UP.V1_UP		182	0.2	0.8	0.892	1	1	4934	tags=28%, list=28%, signal=39%
ATM_DN.V1_DN		128	0.21	0.79	0.876	1	1	4024	tags=25%, list=23%, signal=32%
P53_DN.V2_DN		137	0.2	0.77	0.907	1	1	4855	tags=26%, list=28%, signal=35%
KRAS.50_UP.V1_UP		44	0.23	0.76	0.834	1	1	6291	tags=34%, list=36%, signal=53%
PTEN_DN.V1_UP		163	0.19	0.75	0.945	1	1	2878	tags=18%, list=17%, signal=22%
ATM_DN.V1_UP		133	0.19	0.74	0.934	1	1	7228	tags=39%, list=42%, signal=66%
IL21_UP.V1_DN		166	0.19	0.74	0.939	1	1	2060	tags=14%, list=12%, signal=16%
RAF_UP.V1_DN		189	0.19	0.73	0.956	1	1	3640	tags=20%, list=21%, signal=25%
JNK_DN.V1_DN		176	0.18	0.72	0.965	1	1	5701	tags=27%, list=33%, signal=40%
ATF2_S_UP.V1_DN		179	0.18	0.71	0.957	1	1	6424	tags=37%, list=37%, signal=58%
JAK2_DN.V1_UP		156	0.18	0.71	0.95	1	1	6022	tags=32%, list=35%, signal=49%
GCNP_SHH_UP_EARLY.V1_DN		163	0.18	0.71	0.953	1	1	5601	tags=29%, list=32%, signal=42%
JNK_DN.V1_UP		168	0.18	0.7	0.964	1	1	5347	tags=29%, list=31%, signal=42%
NRL_DN.V1_DN		130	0.18	0.67	0.974	1	1	5387	tags=28%, list=31%, signal=41%
CSR_LATE_UP.V1_DN		139	0.17	0.67	0.973	1	1	6462	tags=37%, list=37%, signal=58%
EGFR_UP.V1_DN		179	0.17	0.66	0.982	1	1	1604	tags=12%, list=9%, signal=13%
GLI1_UP.V1_UP		24	0.21	0.66	0.919	1	1	6397	tags=42%, list=37%, signal=66%
KRAS.AMP.LUNG_UP.V1_DN		124	0.17	0.65	0.977	1	1	5774	tags=28%, list=33%, signal=42%
P53_DN.V1_DN		189	0.16	0.62	0.991	1	1	5695	tags=28%, list=33%, signal=41%
GCNP_SHH_UP_EARLY.V1_UP		166	0.16	0.62	0.997	1	1	5000	tags=23%, list=29%, signal=32%
EIF4E_DN		97	0.16	0.61	0.983	1	1	6237	tags=32%, list=36%, signal=50%

RELA_DN.V1_UP		139	0.16	0.6	0.993	1	1	5990	tags=30%, list=34%, signal=46%
HOXA9_DN.V1_UP		176	0.13	0.52	1	1	1	6667	tags=32%, list=38%, signal=52%
GLI1_UP.V1_DN		17	0.17	0.48	0.991	1	1	3538	tags=18%, list=20%, signal=22%
<a href="#">STK33_UP</a>	<a href="#">Details ...</a>	258	-0.2			1	0	3208	tags=31%, list=18%, signal=38%
<a href="#">PIGF_UP.V1_UP</a>	<a href="#">Details ...</a>	181	-0.3	-1.9	0	0.013	0.004	4311	tags=51%, list=25%, signal=67%
<a href="#">KRAS.KIDNEY_UP.V1_UP</a>	<a href="#">Details ...</a>	138	-0.3	-1.7	0	0.017	0.008	3091	tags=36%, list=18%, signal=43%
<a href="#">CORDENONSI_YAP_CONSERVED_SIGNAL_URE</a>	<a href="#">Details ...</a>	57	-0.3	-1.6	0.026	0.044	0.025	3104	tags=44%, list=18%, signal=53%
<a href="#">ERBB2_UP.V1_DN</a>	<a href="#">Details ...</a>	187	-0.3	-1.6	0	0.035	0.025	3990	tags=43%, list=23%, signal=55%
<a href="#">STK33_SKM_UP</a>	<a href="#">Details ...</a>	235	-0.2	-1.6	0	0.03	0.026	4005	tags=41%, list=23%, signal=52%
<a href="#">CTIP_DN.V1_UP</a>	<a href="#">Details ...</a>	116	-0.3	-1.4	0	0.108	0.106	1093	tags=17%, list=6%, signal=18%
<a href="#">LTE2_UP.V1_DN</a>	<a href="#">Details ...</a>	180	-0.2	-1.3	0	0.172	0.19	2274	tags=26%, list=13%, signal=30%
<a href="#">SNF5_DN.V1_UP</a>	<a href="#">Details ...</a>	170	-0.2	-1.3	0	0.159	0.196	2667	tags=26%, list=15%, signal=30%
<a href="#">KRAS.300_UP.V1_UP</a>	<a href="#">Details ...</a>	127	-0.2	-1.2	0.045	0.22	0.281	2251	tags=24%, list=13%, signal=27%
<a href="#">CAMP_UP.V1_DN</a>	<a href="#">Details ...</a>	192	-0.2	-1.2	0	0.213	0.296	3488	tags=34%, list=20%, signal=43%
<a href="#">SIRNA_EIF4GI_DN</a>	<a href="#">Details ...</a>	88	-0.2	-1.2	0.109	0.204	0.308	2829	tags=31%, list=16%, signal=36%
<a href="#">E2F3_UP.V1_UP</a>	<a href="#">Details ...</a>	185	-0.2	-1.2	0	0.227	0.355	2575	tags=24%, list=15%, signal=28%
<a href="#">KRAS.600_UP.V1_UP</a>	<a href="#">Details ...</a>	251	-0.2	-1.2	0	0.22	0.367	2884	tags=24%, list=17%, signal=29%
<a href="#">MTOR_UP.N4.V1_DN</a>	<a href="#">Details ...</a>	153	-0.2	-1.2	0.111	0.226	0.397	3025	tags=31%, list=17%, signal=37%
<a href="#">YAP1_UP</a>	<a href="#">Details ...</a>	45	-0.3	-1.2	0.157	0.236	0.429	2760	tags=33%, list=16%, signal=40%
<a href="#">JAK2_DN.V1_DN</a>	<a href="#">Details ...</a>	116	-0.2	-1.2	0	0.224	0.43	3535	tags=34%, list=20%, signal=43%
<a href="#">BRCA1_DN.V1_UP</a>	<a href="#">Details ...</a>	114	-0.2	-1.2	0.154	0.232	0.464	2534	tags=22%, list=15%, signal=25%
<a href="#">KRAS.PROSTATE_UP.V1_UP</a>	<a href="#">Details ...</a>	123	-0.2	-1.1	0.211	0.248	0.499	1685	tags=21%, list=10%, signal=23%
<a href="#">STK33_NOMO_UP</a>	<a href="#">Details ...</a>	271	-0.2	-1.1	0	0.3	0.585	4005	tags=36%, list=23%, signal=46%
RPS14_DN.V1_UP		172	-0.2	-1.1	0.167	0.351	0.657	1530	tags=19%, list=9%, signal=20%
VEGF_A_UP.V1_DN		187	-0.2	-1.1	0.167	0.412	0.725	3968	tags=35%, list=23%, signal=45%
MEK_UP.V1_DN		175	-0.2	-1	0.375	0.465	0.791	3585	tags=31%, list=21%, signal=39%
ATF2_UP.V1_DN		168	-0.2	-1	0.25	0.466	0.803	1254	tags=16%, list=7%, signal=17%
BCAT.100_UP.V1_UP		48	-0.2	-1	0.495	0.567	0.871	3009	tags=31%, list=17%, signal=38%
KRAS.AMP.LUNG_UP.V1_UP		112	-0.2	-1	0.542	0.663	0.921	941	tags=13%, list=5%, signal=13%
PTEN_DN.V1_DN		154	-0.2	-0.9	0.737	0.689	0.939	2580	tags=21%, list=15%, signal=24%
PRC2_EED_UP.V1_UP		175	-0.2	-0.8	1	0.932	0.979	4203	tags=34%, list=24%, signal=45%
TBK1_DF_DN		279	-0.2	-0.8	1	0.916	0.981	4122	tags=36%, list=24%, signal=47%
BCAT_BILD_ET_AL_DN		41	-0.2	-0.8	0.881	0.893	0.982	3662	tags=37%, list=21%, signal=46%

## Supplement Tables

**Table 8. GSEA of oncogenic gene sets between combination-sensitive and combination-resistant tumors.**

SI Table 8. NES&gt;0 means up in ComboR; NES&lt;0 means up in ComboS

GS follow link to MSigDB	GS DETAILS	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
<a href="#">KRAS.LUNG_UP.V1_DN</a>	<a href="#">Details ...</a>	127	0.45	2.04	0	0	0	3740	tags=47%, list=21%, signal=60%
<a href="#">MTOR_UP.V1_UP</a>	<a href="#">Details ...</a>	165	0.4	1.96	0	0.002	0.003	4962	tags=52%, list=28%, signal=71%
<a href="#">SINGH_KRAS_DEPENDENCY_SIGNATURE</a>	<a href="#">Details ...</a>	19	0.66	1.96	0	0.002	0.003	2655	tags=63%, list=15%, signal=74%
<a href="#">AKT_UP.V1_UP</a>	<a href="#">Details ...</a>	164	0.41	1.95	0	0.001	0.003	3310	tags=37%, list=19%, signal=45%
<a href="#">WNT_UP.V1_UP</a>	<a href="#">Details ...</a>	172	0.37	1.79	0	0.005	0.016	2655	tags=29%, list=15%, signal=34%
<a href="#">MYC_UP.V1_UP</a>	<a href="#">Details ...</a>	166	0.37	1.78	0	0.006	0.021	4112	tags=36%, list=24%, signal=47%
<a href="#">RB_DN.V1_UP</a>	<a href="#">Details ...</a>	115	0.37	1.68	0	0.012	0.053	5567	tags=57%, list=32%, signal=83%
<a href="#">LEF1_UP.V1_DN</a>	<a href="#">Details ...</a>	176	0.34	1.65	0	0.014	0.07	2627	tags=33%, list=15%, signal=38%
<a href="#">AKT_UP_MTOR_DN.V1_UP</a>	<a href="#">Details ...</a>	173	0.34	1.63	0	0.018	0.1	3182	tags=29%, list=18%, signal=35%
<a href="#">ALK_DN.V1_UP</a>	<a href="#">Details ...</a>	126	0.35	1.62	0	0.019	0.114	4453	tags=39%, list=26%, signal=52%
<a href="#">RB_P130_DN.V1_UP</a>	<a href="#">Details ...</a>	129	0.35	1.61	0.002	0.02	0.13	2542	tags=30%, list=15%, signal=35%
<a href="#">KRAS.600_UP.V1_DN</a>	<a href="#">Details ...</a>	248	0.32	1.59	0	0.021	0.148	4109	tags=39%, list=24%, signal=50%
<a href="#">KRAS.KIDNEY_UP.V1_DN</a>	<a href="#">Details ...</a>	118	0.35	1.59	0.003	0.019	0.149	4360	tags=36%, list=25%, signal=47%
<a href="#">SRC_UP.V1_UP</a>	<a href="#">Details ...</a>	152	0.32	1.52	0.003	0.038	0.286	3375	tags=26%, list=19%, signal=32%
<a href="#">P53_DN.V1_UP</a>	<a href="#">Details ...</a>	180	0.31	1.5	0.003	0.046	0.354	3473	tags=36%, list=20%, signal=45%
<a href="#">KRAS.PROSTATE_UP.V1_DN</a>	<a href="#">Details ...</a>	126	0.33	1.49	0.003	0.047	0.378	4551	tags=40%, list=26%, signal=53%
<a href="#">PKCA_DN.V1_UP</a>	<a href="#">Details ...</a>	152	0.32	1.47	0.005	0.053	0.426	2763	tags=28%, list=16%, signal=33%
<a href="#">EIF4E_UP</a>	<a href="#">Details ...</a>	97	0.33	1.47	0.015	0.052	0.439	5785	tags=48%, list=33%, signal=72%
<a href="#">PRC1_BMI_UP.V1_DN</a>	<a href="#">Details ...</a>	166	0.3	1.46	0.003	0.053	0.463	3254	tags=28%, list=19%, signal=34%
<a href="#">STK33_NOMO_DN</a>	<a href="#">Details ...</a>	256	0.28	1.44	0.003	0.065	0.546	3630	tags=33%, list=21%, signal=41%
<a href="#">BMI1_DN_MEL18_DN.V1_DN</a>		135	0.3	1.41	0.005	0.08	0.629	2919	tags=28%, list=17%, signal=34%
<a href="#">RB_P107_DN.V1_UP</a>		129	0.3	1.4	0.021	0.082	0.66	3805	tags=40%, list=22%, signal=51%
<a href="#">CSR_LATE_UP.V1_UP</a>		158	0.29	1.4	0.005	0.084	0.684	5176	tags=42%, list=30%, signal=60%
<a href="#">KRAS.300_UP.V1_DN</a>		125	0.3	1.37	0.02	0.103	0.791	3658	tags=35%, list=21%, signal=44%
<a href="#">STK33_DN</a>		261	0.27	1.37	0.012	0.102	0.803	3589	tags=29%, list=21%, signal=36%
<a href="#">BCAT_BILD_ET_AL_UP</a>		43	0.36	1.37	0.055	0.1	0.812	2716	tags=30%, list=16%, signal=36%
<a href="#">IL15_UP.V1_UP</a>		170	0.28	1.34	0.013	0.125	0.881	2920	tags=25%, list=17%, signal=30%
<a href="#">RAPA_EARLY_UP.V1_DN</a>		170	0.28	1.32	0.015	0.138	0.912	3813	tags=29%, list=22%, signal=37%
<a href="#">RB_P107_DN.V1_DN</a>		123	0.29	1.32	0.037	0.136	0.916	4693	tags=39%, list=27%, signal=53%
<a href="#">NFE2L2.V2</a>		403	0.25	1.32	0.012	0.133	0.919	3595	tags=27%, list=21%, signal=33%
<a href="#">PRC2_EZH2_UP.V1_DN</a>		181	0.27	1.32	0.014	0.132	0.922	2878	tags=26%, list=17%, signal=31%
<a href="#">WNT_UP.V1_DN</a>		167	0.28	1.31	0.027	0.141	0.938	3138	tags=25%, list=18%, signal=30%
<a href="#">ESC_J1_UP_EARLY.V1_DN</a>		168	0.27	1.31	0.021	0.139	0.941	2108	tags=18%, list=12%, signal=21%
<a href="#">STK33_SKM_DN</a>		252	0.26	1.3	0.03	0.14	0.948	3572	tags=28%, list=21%, signal=34%
<a href="#">RPS14_DN.V1_DN</a>		177	0.28	1.3	0.045	0.136	0.948	2537	tags=24%, list=15%, signal=28%
<a href="#">PRC2_SUZ12_UP.V1_DN</a>		172	0.27	1.29	0.017	0.143	0.96	2377	tags=22%, list=14%, signal=25%

BMI1_DN.V1_DN		129	0.28	1.28	0.072	0.164	0.976	2779	tags=24%, list=16%, signal=28%
P53_DN.V2_DN		137	0.27	1.26	0.072	0.18	0.986	2918	tags=27%, list=17%, signal=32%
KRAS.600.LUNG.BREAST_UP.V1_UP		238	0.25	1.26	0.037	0.18	0.986	2893	tags=21%, list=17%, signal=25%
ESC_J1_UP_LATE.V1_DN		167	0.26	1.26	0.065	0.176	0.986	3874	tags=30%, list=22%, signal=38%
KRAS.LUNG.BREAST_UP.V1_UP		124	0.28	1.25	0.076	0.185	0.991	2893	tags=23%, list=17%, signal=28%
BCAT.100_UP.V1_DN		35	0.35	1.25	0.142	0.188	0.992	2905	tags=34%, list=17%, signal=41%
KRAS.DF.V1_UP		181	0.26	1.24	0.043	0.198	0.993	2481	tags=23%, list=14%, signal=26%
TBK1.DN.48HRS_DN		48	0.33	1.24	0.145	0.197	0.995	3478	tags=31%, list=20%, signal=39%
ESC_V6.5_UP_LATE.V1_DN		177	0.26	1.24	0.061	0.193	0.995	2409	tags=20%, list=14%, signal=23%
RELA_DN.V1_DN		128	0.27	1.24	0.087	0.189	0.995	2659	tags=23%, list=15%, signal=27%
IL2_UP.V1_UP		174	0.26	1.23	0.068	0.209	0.997	3341	tags=28%, list=19%, signal=34%
ESC_V6.5_UP_EARLY.V1_UP		162	0.26	1.22	0.081	0.206	0.997	2970	tags=26%, list=17%, signal=31%
E2F3_UP.V1_DN		123	0.27	1.22	0.1	0.206	0.997	4180	tags=31%, list=24%, signal=40%
SNF5_DN.V1_DN		151	0.26	1.21	0.077	0.217	0.999	2824	tags=26%, list=16%, signal=31%
IL21_UP.V1_DN		166	0.26	1.21	0.109	0.216	0.999	2584	tags=20%, list=15%, signal=24%
KRAS.600.LUNG.BREAST_UP.V1_DN		252	0.24	1.21	0.062	0.218	0.999	3947	tags=31%, list=23%, signal=39%
ATF2_S_UP.V1_UP		178	0.25	1.2	0.078	0.224	0.999	2641	tags=21%, list=15%, signal=25%
ATF2_UP.V1_UP		177	0.25	1.2	0.083	0.23	0.999	4109	tags=32%, list=24%, signal=42%
KRAS.BREAST_UP.V1_UP		121	0.26	1.19	0.114	0.236	0.999	2843	tags=23%, list=16%, signal=27%
IL21_UP.V1_UP		173	0.25	1.19	0.115	0.236	1	2082	tags=18%, list=12%, signal=21%
KRAS.LUNG_UP.V1_UP		118	0.27	1.19	0.112	0.233	1	2016	tags=20%, list=12%, signal=23%
KRAS.LUNG.BREAST_UP.V1_DN		129	0.26	1.18	0.125	0.235	1	4252	tags=37%, list=24%, signal=49%
GCPNP_SHH_UP_EARLY.V1_DN		163	0.25	1.17	0.094	0.254	1	1604	tags=16%, list=9%, signal=17%
CTIP_DN.V1_DN		118	0.26	1.17	0.139	0.256	1	1554	tags=15%, list=9%, signal=17%
CRX_DN.V1_UP		131	0.26	1.17	0.142	0.253	1	3468	tags=25%, list=20%, signal=31%
BCAT_GDS748_UP		45	0.31	1.17	0.186	0.256	1	2544	tags=29%, list=15%, signal=34%
RPS14_DN.V1_UP		172	0.25	1.16	0.134	0.26	1	4047	tags=31%, list=23%, signal=40%
ERBB2_UP.V1_UP		181	0.24	1.16	0.15	0.264	1	3842	tags=33%, list=22%, signal=42%
KRAS.50_UP.V1_DN		39	0.32	1.16	0.214	0.261	1	4543	tags=49%, list=26%, signal=66%
NOTCH_DN.V1_UP		167	0.24	1.16	0.155	0.263	1	2594	tags=20%, list=15%, signal=24%
ALK_DN.V1_DN		124	0.25	1.15	0.177	0.27	1	2724	tags=20%, list=16%, signal=24%
PTEN_DN.V1_DN		154	0.24	1.15	0.181	0.272	1	4018	tags=30%, list=23%, signal=38%
ESC_J1_UP_EARLY.V1_UP		177	0.24	1.15	0.162	0.27	1	3089	tags=25%, list=18%, signal=30%
MEL18_DN.V1_DN		140	0.25	1.14	0.172	0.272	1	2559	tags=24%, list=15%, signal=28%
NOTCH_DN.V1_DN		160	0.24	1.14	0.155	0.269	1	2537	tags=21%, list=15%, signal=24%
PRC1_BMI_UP.V1_UP		160	0.24	1.12	0.19	0.305	1	2402	tags=18%, list=14%, signal=21%
SIRNA_EIF4GI_UP		91	0.26	1.12	0.234	0.307	1	4709	tags=38%, list=27%, signal=52%
PIGF_UP.V1_DN		173	0.23	1.12	0.193	0.31	1	3825	tags=30%, list=22%, signal=38%
CYCLIN_D1_KE_V1_UP		185	0.23	1.1	0.214	0.347	1	3317	tags=25%, list=19%, signal=31%

DCA_UP.V1_UP		157	0.23	1.1	0.234	0.345	1	2169	tags=19%, list=12%, signal=22%
AKT_UP_MTOR_DN.V1_DN		182	0.23	1.1	0.186	0.345	1	3151	tags=25%, list=18%, signal=30%
LTE2_UP.V1_UP		182	0.22	1.08	0.26	0.397	1	2279	tags=24%, list=13%, signal=28%
LEF1_UP.V1_UP		183	0.22	1.08	0.254	0.399	1	3331	tags=26%, list=19%, signal=31%
SNF5_DN.V1_UP		170	0.22	1.07	0.298	0.408	1	2646	tags=18%, list=15%, signal=21%
PDGF_UP.V1_DN		108	0.24	1.07	0.284	0.406	1	3412	tags=29%, list=20%, signal=35%
RB_DN.V1_DN		120	0.24	1.07	0.271	0.406	1	2764	tags=23%, list=16%, signal=28%
PRC2_SUZ12_UP.V1_UP		165	0.23	1.07	0.287	0.402	1	3906	tags=28%, list=22%, signal=36%
CYCLIN_D1_UP.V1_UP		179	0.22	1.06	0.303	0.418	1	4145	tags=31%, list=24%, signal=40%
ATM_DN.V1_UP		133	0.23	1.05	0.311	0.439	1	4162	tags=28%, list=24%, signal=36%
P53_DN.V2_UP		129	0.23	1.04	0.346	0.468	1	4050	tags=28%, list=23%, signal=36%
GCNP_SHH_UP_LATE.V1_DN		172	0.22	1.04	0.361	0.465	1	2982	tags=25%, list=17%, signal=30%
EGFR_UP.V1_UP		185	0.21	1.04	0.35	0.46	1	3734	tags=30%, list=21%, signal=37%
MTOR_UP.N4.V1_UP		191	0.21	1.03	0.358	0.47	1	4140	tags=32%, list=24%, signal=42%
ATM_DN.V1_DN		128	0.22	1.03	0.38	0.473	1	4360	tags=31%, list=25%, signal=41%
PRC2_EED_UP.V1_DN		187	0.21	1.01	0.409	0.513	1	2124	tags=19%, list=12%, signal=21%
PDGF_ERK_DN.V1_DN		142	0.22	1.01	0.42	0.517	1	3080	tags=21%, list=18%, signal=25%
CAMP_UP.V1_UP		189	0.21	1.01	0.42	0.513	1	4883	tags=34%, list=28%, signal=47%
SRC_UP.V1_DN		147	0.22	1	0.441	0.551	1	2817	tags=23%, list=16%, signal=27%
E2F1_UP.V1_UP		187	0.2	0.99	0.477	0.585	1	3525	tags=28%, list=20%, signal=34%
VEGF_A_UP.V1_UP		185	0.2	0.98	0.533	0.596	1	3719	tags=25%, list=21%, signal=31%
HOXA9_DN.V1_DN		180	0.2	0.97	0.541	0.618	1	3315	tags=26%, list=19%, signal=31%
BRCA1_DN.V1_DN		119	0.21	0.97	0.527	0.615	1	3783	tags=26%, list=22%, signal=33%
IL15_UP.V1_DN		165	0.2	0.96	0.556	0.632	1	3087	tags=24%, list=18%, signal=29%
RAF_UP.V1_UP		187	0.2	0.96	0.549	0.628	1	2523	tags=19%, list=14%, signal=22%
CRX_NRL_DN.V1_UP		136	0.21	0.96	0.532	0.633	1	2735	tags=20%, list=16%, signal=23%
GCNP_SHH_UP_LATE.V1_UP		177	0.2	0.96	0.573	0.63	1	3879	tags=29%, list=22%, signal=37%
CRX_DN.V1_DN		132	0.2	0.91	0.679	0.766	1	2722	tags=20%, list=16%, signal=24%
KRAS.PROSTATE_UP.V1_UP		123	0.2	0.91	0.706	0.768	1	2122	tags=19%, list=12%, signal=21%
PTEN_DN.V2_UP		124	0.2	0.91	0.695	0.765	1	2781	tags=19%, list=16%, signal=22%
ESC_J1_UP_LATE.V1_UP		183	0.19	0.9	0.785	0.779	1	2095	tags=16%, list=12%, signal=18%
BRCA1_DN.V1_UP		114	0.2	0.9	0.714	0.778	1	4818	tags=32%, list=28%, signal=43%
GLI1_UP.V1_DN		17	0.3	0.87	0.651	0.852	1	1603	tags=18%, list=9%, signal=19%
CAHOY_ASTROCYTIC		97	0.2	0.86	0.787	0.859	1	4006	tags=29%, list=23%, signal=37%
KRAS.BREAST_UP.V1_DN		127	0.18	0.83	0.903	0.918	1	4903	tags=33%, list=28%, signal=46%
PTEN_DN.V2_DN		132	0.18	0.82	0.913	0.925	1	3842	tags=27%, list=22%, signal=34%
KRAS.AMP.LUNG_UP.V1_DN		124	0.17	0.77	0.964	0.98	1	3248	tags=19%, list=19%, signal=23%
KRAS.AMP.LUNG_UP.V1_UP		112	0.17	0.76	0.958	0.975	1	4405	tags=28%, list=25%, signal=37%
KRAS.50_UP.V1_UP		44	0.18	0.68	0.962	0.993	1	5434	tags=34%, list=31%, signal=49%

<a href="#">PIGF_UP.V1_UP</a>	<a href="#">Details ...</a>	181	-0.5	-2.1	0	0.001	0.001	4028	tags=49%, list=23%, signal=63%
<a href="#">CAMP_UP.V1_DN</a>	<a href="#">Details ...</a>	192	-0.4	-1.9	0	0.001	0.003	4121	tags=43%, list=24%, signal=55%
<a href="#">JAK2_DN.V1_DN</a>	<a href="#">Details ...</a>	116	-0.5	-1.9	0	0.001	0.004	3614	tags=38%, list=21%, signal=48%
<a href="#">ERBB2_UP.V1_DN</a>	<a href="#">Details ...</a>	187	-0.4	-1.8	0	0.002	0.014	4195	tags=40%, list=24%, signal=52%
<a href="#">SIRNA_EIF4GI_DN</a>	<a href="#">Details ...</a>	88	-0.5	-1.8	0	0.003	0.023	3699	tags=39%, list=21%, signal=49%
<a href="#">EIF4E_DN</a>	<a href="#">Details ...</a>	97	-0.4	-1.8	0	0.005	0.04	4114	tags=46%, list=24%, signal=60%
<a href="#">STK33_NOMO_UP</a>	<a href="#">Details ...</a>	271	-0.4	-1.7	0	0.011	0.108	4018	tags=40%, list=23%, signal=51%
<a href="#">TBK1_DF_DN</a>	<a href="#">Details ...</a>	279	-0.4	-1.7	0	0.01	0.11	4208	tags=39%, list=24%, signal=51%
<a href="#">MEL18_DN.V1_UP</a>	<a href="#">Details ...</a>	137	-0.4	-1.7	0.002	0.01	0.133	4028	tags=41%, list=23%, signal=53%
<a href="#">STK33_UP</a>	<a href="#">Details ...</a>	258	-0.3	-1.6	0	0.013	0.182	3847	tags=36%, list=22%, signal=46%
<a href="#">CORDENONSI_YAP_CONSERVED_SIGNAL_URE</a>	<a href="#">Details ...</a>	57	-0.4	-1.6	0.011	0.022	0.327	4025	tags=47%, list=23%, signal=61%
<a href="#">E2F3_UP.V1_UP</a>	<a href="#">Details ...</a>	185	-0.3	-1.6	0	0.021	0.327	3546	tags=30%, list=20%, signal=37%
<a href="#">RAF_UP.V1_DN</a>	<a href="#">Details ...</a>	189	-0.3	-1.6	0.002	0.019	0.329	3448	tags=35%, list=20%, signal=44%
<a href="#">MTOR_UP.N4.V1_DN</a>	<a href="#">Details ...</a>	153	-0.4	-1.6	0.002	0.02	0.356	4855	tags=43%, list=28%, signal=59%
<a href="#">BCAT_BILD_ET_AL_DN</a>	<a href="#">Details ...</a>	41	-0.4	-1.5	0.026	0.02	0.374	1851	tags=27%, list=11%, signal=30%
<a href="#">KRAS.KIDNEY_UP.V1_UP</a>	<a href="#">Details ...</a>	138	-0.4	-1.5	0.008	0.02	0.39	3060	tags=28%, list=18%, signal=34%
<a href="#">TGFB_UP.V1_UP</a>	<a href="#">Details ...</a>	182	-0.3	-1.5	0.003	0.021	0.435	4187	tags=39%, list=24%, signal=51%
<a href="#">STK33_SKM_UP</a>	<a href="#">Details ...</a>	235	-0.3	-1.5	0.002	0.029	0.564	3521	tags=31%, list=20%, signal=39%
<a href="#">CSR_EARLY_UP.V1_UP</a>	<a href="#">Details ...</a>	152	-0.3	-1.4	0.02	0.046	0.755	4187	tags=35%, list=24%, signal=46%
<a href="#">BMI1_DN.V1_UP</a>	<a href="#">Details ...</a>	144	-0.3	-1.4	0.011	0.059	0.853	3391	tags=33%, list=19%, signal=41%
<a href="#">YAP1_UP</a>		45	-0.4	-1.4	0.068	0.074	0.923	3161	tags=33%, list=18%, signal=41%
<a href="#">VEGF_A_UP.V1_DN</a>		187	-0.3	-1.4	0.019	0.093	0.971	2939	tags=29%, list=17%, signal=34%
<a href="#">LTE2_UP.V1_DN</a>		180	-0.3	-1.4	0.019	0.092	0.972	3804	tags=33%, list=22%, signal=42%
<a href="#">BMI1_DN_MEL18_DN.V1_UP</a>		140	-0.3	-1.4	0.025	0.09	0.974	4120	tags=37%, list=24%, signal=48%
<a href="#">PRC2_EED_UP.V1_UP</a>		175	-0.3	-1.3	0.022	0.101	0.981	3985	tags=33%, list=23%, signal=42%
<a href="#">MTOR_UP.V1_DN</a>		178	-0.3	-1.3	0.024	0.097	0.981	3611	tags=30%, list=21%, signal=37%
<a href="#">TBK1_DF_UP</a>		273	-0.3	-1.3	0.016	0.1	0.986	3536	tags=28%, list=20%, signal=35%
<a href="#">JNK_DN.V1_DN</a>		176	-0.3	-1.3	0.022	0.101	0.987	3735	tags=32%, list=21%, signal=40%
<a href="#">GCNP_SHH_UP_EARLY.V1_UP</a>		166	-0.3	-1.3	0.072	0.181	1	3204	tags=29%, list=18%, signal=35%
<a href="#">ESC_V6.5_UP_LATE.V1_UP</a>		180	-0.3	-1.3	0.068	0.183	1	4412	tags=38%, list=25%, signal=51%
<a href="#">E2F1_UP.V1_DN</a>		180	-0.3	-1.3	0.065	0.186	1	3700	tags=34%, list=21%, signal=43%
<a href="#">MEK_UP.V1_DN</a>		175	-0.3	-1.2	0.082	0.207	1	3589	tags=31%, list=21%, signal=38%
<a href="#">ESC_V6.5_UP_EARLY.V1_DN</a>		159	-0.3	-1.2	0.102	0.202	1	3170	tags=29%, list=18%, signal=35%
<a href="#">ATF2_UP.V1_DN</a>		168	-0.3	-1.2	0.089	0.208	1	3574	tags=32%, list=21%, signal=39%
<a href="#">CSR_EARLY_UP.V1_DN</a>		115	-0.3	-1.2	0.112	0.206	1	2046	tags=21%, list=12%, signal=23%
<a href="#">KRAS.600_UP.V1_UP</a>		251	-0.3	-1.2	0.081	0.222	1	4819	tags=35%, list=28%, signal=48%
<a href="#">BCAT_GDS748_DN</a>		40	-0.4	-1.2	0.176	0.219	1	2904	tags=30%, list=17%, signal=36%
<a href="#">PDGF_UP.V1_UP</a>		136	-0.3	-1.2	0.112	0.242	1	3517	tags=28%, list=20%, signal=35%

EGFR_UP.V1_DN		179	-0.3	-1.2	0.121	0.237	1	3744	tags=31%, list=21%, signal=39%
PRC2_EZH2_UP.V1_UP		182	-0.3	-1.2	0.135	0.246	1	3904	tags=29%, list=22%, signal=37%
DCA_UP.V1_DN		167	-0.3	-1.2	0.117	0.272	1	4012	tags=29%, list=23%, signal=37%
MEK_UP.V1_UP		189	-0.3	-1.2	0.143	0.274	1	3423	tags=30%, list=20%, signal=36%
YAP1_DN		43	-0.3	-1.2	0.22	0.283	1	4609	tags=33%, list=26%, signal=44%
TBK1.DN.48HRS_UP		49	-0.3	-1.2	0.217	0.286	1	5385	tags=49%, list=31%, signal=71%
RAPA_EARLY_UP.V1_UP		156	-0.3	-1.2	0.178	0.29	1	3657	tags=25%, list=21%, signal=31%
PTEN_DN.V1_UP		163	-0.3	-1.2	0.166	0.292	1	4715	tags=34%, list=27%, signal=46%
JNK_DN.V1_UP		168	-0.3	-1.1	0.174	0.293	1	3726	tags=29%, list=21%, signal=36%
AKT_UP.V1_DN		184	-0.3	-1.1	0.166	0.288	1	4515	tags=34%, list=26%, signal=45%
CAHOY_ASTROGLIAL		100	-0.3	-1.1	0.232	0.308	1	3804	tags=31%, list=22%, signal=39%
KRAS.DF.V1_DN		180	-0.3	-1.1	0.197	0.322	1	3399	tags=25%, list=20%, signal=31%
CSR_LATE_UP.V1_DN		139	-0.3	-1.1	0.244	0.347	1	3629	tags=27%, list=21%, signal=34%
HOXA9_DN.V1_UP		176	-0.2	-1.1	0.246	0.371	1	3942	tags=32%, list=23%, signal=41%
PKCA_DN.V1_DN		149	-0.2	-1.1	0.321	0.448	1	2968	tags=23%, list=17%, signal=27%
CAHOY_NEURONAL		100	-0.3	-1.1	0.346	0.449	1	4846	tags=39%, list=28%, signal=54%
NRL_DN.V1_UP		136	-0.2	-1	0.359	0.472	1	1417	tags=13%, list=8%, signal=14%
NRL_DN.V1_DN		130	-0.2	-1	0.37	0.496	1	3111	tags=24%, list=18%, signal=29%
JAK2_DN.V1_UP		156	-0.2	-1	0.384	0.515	1	1921	tags=15%, list=11%, signal=17%
MYC_UP.V1_DN		150	-0.2	-1	0.411	0.53	1	2322	tags=20%, list=13%, signal=23%
P53_DN.V1_DN		189	-0.2	-1	0.462	0.584	1	1860	tags=16%, list=11%, signal=18%
KRAS.300_UP.V1_UP		127	-0.2	-1	0.529	0.651	1	4773	tags=32%, list=27%, signal=44%
RELA_DN.V1_UP		139	-0.2	-0.9	0.621	0.756	1	4555	tags=30%, list=26%, signal=41%
CTIP_DN.V1_UP		116	-0.2	-0.9	0.629	0.747	1	1608	tags=14%, list=9%, signal=15%
RB_P130_DN.V1_DN		131	-0.2	-0.9	0.639	0.753	1	2410	tags=19%, list=14%, signal=22%
IL2_UP.V1_DN		173	-0.2	-0.9	0.677	0.78	1	1621	tags=15%, list=9%, signal=16%
PDGF_ERK_DN.V1_UP		133	-0.2	-0.9	0.67	0.779	1	2816	tags=20%, list=16%, signal=23%
CRX_NRL_DN.V1_DN		125	-0.2	-0.9	0.701	0.778	1	4081	tags=29%, list=23%, signal=37%
ATF2_S_UP.V1_DN		179	-0.2	-0.9	0.731	0.77	1	3301	tags=22%, list=19%, signal=27%
GLI1_UP.V1_UP		24	-0.3	-0.9	0.63	0.768	1	4330	tags=29%, list=25%, signal=39%
BCAT.100_UP.V1_UP		48	-0.2	-0.9	0.699	0.819	1	4877	tags=38%, list=28%, signal=52%
CYCLIN_D1_KE_V1_DN		180	-0.2	-0.9	0.809	0.822	1	3109	tags=22%, list=18%, signal=26%
TGFB_UP.V1_DN		178	-0.2	-0.8	0.921	0.936	1	4088	tags=26%, list=23%, signal=33%
CYCLIN_D1_UP.V1_DN		177	-0.2	-0.8	0.948	0.946	1	5185	tags=34%, list=30%, signal=48%
CAHOY_OLIGODENDROCYTIC		99	-0.2	-0.8	0.931	0.945	1	3935	tags=25%, list=23%, signal=32%