

PANOPLY
Precision Cancer Genomic Report: Single Sample Inventory
Patient TCGA-AA-3488

Package Vignette
PANOPLY: COAD from TCGA

May 7, 2018

1 Objective

Identify the best drug targets based on the pre-drug tumor genomic sequencing data, using data from cancer patients. Tumor-specific drug targets for the patient can be found with the following steps:

1. Identify 4 or more reference samples that serve as matched controls. That is, they have similar phenotypic characteristics (subtype, age), but had pathological complete response, and did not recur.
2. Identify the single-gene genomic events in the major cancer genes for the patient and compare them to the genomic events for the matched controls. List drug targets for genes of interest for the patient.
3. Identify key pathway-based genomic features that are over or under-expressed in this patient versus normal tissue samples.
4. Identify key drugs that target the most over or under-expressed networks of genes linked by the genes the drugs target.
5. Plot and list pathways with possible drugs that target those pathways.

2 Clinical Data

Patient TCGA-AA-3488 has the following clinical features:

- Age: 58
- Vital Status: DECEASED
- Days of Follow up: 152
- Lymphatic Invasion:
- Tumor Stage: Stage IV
- Num 1st degree affected relatives: 0
- Loss Exp. Mismatch Repair IHC: NO

Matched controls (Alive and Tumor Free for >200 days) were matched on tumor stage (≥ 2).

The patients and the matched characteristics are shown in Table 1, where the first row is the patient for whom this report is generated.

Table 1: Patient and Matched Controls

Patient	Vital Status	Age	Days-Followup	Stage	Lymphatic Invasion	Num. 1st degree rel.
TCGA-AA-3488	DECEASED	58	152	Stage IV		0
TCGA-A6-3810	LIVING	62	246	Stage IIA	NO	0
TCGA-CM-4748	LIVING	53	214	Stage IIIB	YES	0
TCGA-CM-4747	LIVING	47	244	Stage IVA	YES	0
TCGA-AZ-4315	LIVING	61	1334	Stage IIA	NO	0
TCGA-A6-3808	LIVING	73	278	Stage IIA	NO	0

3 Single-Gene Events

The first focus is to assemble a list of genomic events in genes that are identified as possibly druggable targets. The events we report may be any of these for a gene in the list of targetable genes:

- Copy number gain or loss in germline or tumor
- RNA gene with over- or under-expression

3.1 Copy Number (CN) Events

In this section we report copy number events for any gene in the target list. This is limited to any copy event with $\log_2\text{ratio} > 0.2$ for copy gain, or $\log_2\text{ratio} < -0.23$ for copy loss. The ability to detect copy levels for the sample at this level depends on the tumor percentage, or tumor purity. These cutoffs for gain and loss correspond to tumor percentage 0.3. Most samples in this set meet or exceed that tumor percentage.

To help decipher the importance of the copy number events, the column named *Count.Matched* is the count of the number of times the matched controls have a gain in the same gene if the patient of interest has a gain, or likewise a loss. Since there are large number of copy number events for some subjects, and they are common across cancer samples, we limit the table below to just those that are in less than half the matched patients.

Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
11p15.5	11	532242	535550	HRAS	0/5	AMP	0.421
9p21.3	9	21967751	21994490	CDKN2A	0/5	AMP	0.402
9p13.2	9	36838531	37034476	PAX5	0/5	AMP	0.402
9p21.3	9	22002902	22009312	CDKN2B	0/5	AMP	0.402
9p13.3	9	36036910	36124452	RECK	0/5	AMP	0.402
9p13.3	9	35073835	35080013	FANCG	0/5	AMP	0.402
9p24.1	9	4985245	5128183	JAK2	0/5	AMP	0.401
9p24.3	9	2015342	2193624	SMARCA2	0/5	AMP	0.401
9p24.1	9	5510545	5571282	PDCD1LG2	0/5	AMP	0.401
9p24.1	9	5450503	5470567	CD274	0/5	AMP	0.401

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
11p14.3	11	22644079	22647387	FANCF	0/5	AMP	0.396
11p11.2	11	47236493	47260769	DDB2	0/5	AMP	0.396
11p15.2	11	14299466	14386052	RRAS2	0/5	AMP	0.396
11p15.4	11	2904448	2906995	CDKN1C	0/5	AMP	0.396
11p15.4	11	3696240	3819022	NUP98	0/5	AMP	0.396
11p15.5	11	2150347	2170833	IGF2	0/5	AMP	0.396
11p11.2	11	44117099	44266980	EXT2	0/5	AMP	0.396
11p15.1	11	18501858	18548503	TSG101	0/5	AMP	0.396
11p11.2	11	47376409	47400127	SPI1	0/5	AMP	0.396
11p13	11	32409321	32457081	WT1	0/5	AMP	0.396
9q33.2	9	123940415	123964365	RAB14	0/5	AMP	0.393
9q33.1	9	117904097	118164923	DEC1	0/5	AMP	0.393
9q34.13	9	134000981	134109091	NUP214	0/5	AMP	0.393
9q34.13	9	135766735	135820020	TSC1	0/5	AMP	0.393
9q34.12	9	133589268	133763062	ABL1	0/5	AMP	0.393
9q34.11	9	130577291	130617047	ENG	0/5	AMP	0.393
9q34.3	9	139388896	139440238	NOTCH1	0/5	AMP	0.393
9q31.2	9	110247133	110252047	KLF4	0/5	AMP	0.393
7q36.1	7	148504464	148581441	EZH2	0/5	AMP	0.390
9q22.32	9	97861336	98079991	FANCC	0/5	AMP	0.381
9q21.2	9	80335189	80646219	GNAQ	0/5	AMP	0.381
9q22.33	9	101569981	101612363	GALNT12	0/5	AMP	0.381
9q21.33	9	87283466	87638505	NTRK2	0/5	AMP	0.381
9q22.32	9	98205264	98279247	PTCH1	0/5	AMP	0.381
9q22.2	9	93564012	93660842	SYK	0/5	AMP	0.381
1p11.2	1	120454176	120612317	NOTCH2	0/5	DEL	-0.364
1p13.2	1	115247085	115259515	NRAS	0/5	DEL	-0.390

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
4q13.1	4	66185281	66535653	EPHA5	0/5	DEL	-0.393
4q12	4	55944426	55991762	KDR	0/5	DEL	-0.393
4q21.23	4	84382092	84406290	FAM175A	0/5	DEL	-0.393
4q12	4	55095264	55164412	PDGFRA	0/5	DEL	-0.393
4q25	4	110834040	110934118	EGF	0/5	DEL	-0.393
4q12	4	55524095	55606881	KIT	0/5	DEL	-0.393
3p22.1	3	41240942	41281939	CTNNB1	0/5	DEL	-0.395
1p32.1	1	59246463	59249785	JUN	0/5	DEL	-0.395
1p31.3	1	65298906	65432187	JAK1	0/5	DEL	-0.395
1p32.3	1	51434367	51440309	CDKN2C	0/5	DEL	-0.395
1p34.2	1	43803475	43820135	MPL	0/5	DEL	-0.397
1p33	1	47681963	47695443	TAL1	0/5	DEL	-0.397
21q22.11	21	32490736	32931290	TIAM1	0/5	DEL	-0.399
21q22.3	21	44513066	44527688	U2AF1	0/5	DEL	-0.399
21q22.12	21	36160098	36421595	RUNX1	0/5	DEL	-0.399
21q22.2	21	40177231	40196879	ETS2	0/5	DEL	-0.399
4p16.3	4	1795039	1810599	FGFR3	0/5	DEL	-0.401
1p13.2	1	112162405	112256101	RAP1A	0/5	DEL	-0.402
5q31.2	5	137801181	137805004	EGR1	0/5	DEL	-0.410
5q31.2	5	138089107	138270723	CTNNA1	0/5	DEL	-0.410
4q35.1	4	185308876	185395726	IRF2	0/5	DEL	-0.411
4q27	4	123372625	123377650	IL2	0/5	DEL	-0.411
4q31.3	4	153242410	153456393	FBXW7	0/5	DEL	-0.411
3p11.1	3	89156674	89531284	EPHA3	0/5	DEL	-0.411
3p13	3	69788586	70017488	MITF	0/5	DEL	-0.411
3p14.3	3	55499743	55521670	WNT5A	0/5	DEL	-0.443
5q35.3	5	180028506	180076624	FLT4	0/5	DEL	-0.488

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
5q35.3	5	177576464	177580961	NHP2	0/5	DEL	-0.488
5q32	5	149432854	149492935	CSF1R	0/5	DEL	-0.488
5q32	5	149493402	149535422	PDGFRB	0/5	DEL	-0.488
5q35.2	5	176513921	176525127	FGFR4	0/5	DEL	-0.488
8q21.3	8	92967195	93115454	RUNX1T1	1/5	AMP	0.786
8q24.3	8	144873090	144897549	SCRIB	1/5	AMP	0.786
8q12.1	8	57025501	57026541	MOS	1/5	AMP	0.786
8q24.21	8	128748315	128753680	MYC	1/5	AMP	0.786
8q24.3	8	144510230	144512602	MAFA	1/5	AMP	0.786
8q24.11	8	118811602	119124058	EXT1	1/5	AMP	0.786
8q13.2	8	68864603	69143897	PREX2	1/5	AMP	0.786
8q21.3	8	90945564	90996899	NBN	1/5	AMP	0.786
8q12.1	8	56792386	56925006	LYN	1/5	AMP	0.786
8q12.1	8	61429469	61536203	RAB2A	1/5	AMP	0.786
8q13.1	8	67474410	67525480	MYBL1	1/5	AMP	0.786
8q11.21	8	48685669	48872743	PRKDC	1/5	AMP	0.786
3q26.31	3	172468475	172539264	ECT2	1/5	AMP	0.416
3q26.2	3	170075473	170114637	SKIL	1/5	AMP	0.416
3q26.2	3	169940220	170023770	PRKCI	1/5	AMP	0.416
7q31.2	7	116312459	116438440	MET	1/5	AMP	0.415
7q32.1	7	128828713	128853386	SMO	1/5	AMP	0.415
7q31.2	7	116164839	116201239	CAV1	1/5	AMP	0.415
3q26.32	3	178866311	178952500	PIK3CA	1/5	AMP	0.414
3q26.33	3	181429712	181432224	SOX2	1/5	AMP	0.414
3q27.3	3	187439165	187463513	BCL6	1/5	AMP	0.414
3q29	3	196769431	197025447	DLG1	1/5	AMP	0.414
7q21.2	7	92234235	92465941	CDK6	1/5	AMP	0.413

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
7q22.1	7	100400187	100425143	EPHB4	1/5	AMP	0.413
7q22.3	7	106505924	106547592	PIK3CG	1/5	AMP	0.413
7q21.12	7	86273230	86494192	GRM3	1/5	AMP	0.413
7q21.11	7	81331444	81399452	HGF	1/5	AMP	0.413
7q22.3	7	107384279	107402083	CBL1	1/5	AMP	0.413
7q21.11	7	77646374	79082890	MAGI2	1/5	AMP	0.413
5p12	5	44305097	44388784	FGF10	1/5	AMP	0.402
5p13.1	5	38938022	39074501	RICTOR	1/5	AMP	0.397
5p13.2	5	35856977	35879705	IL7R	1/5	AMP	0.397
7q34	7	140433812	140624564	BRAF	1/5	AMP	0.390
7q34	7	142638201	142659503	KEL	1/5	AMP	0.390
7q34	7	142457319	142460927	PRSS1	1/5	AMP	0.390
5p15.33	5	1253282	1295162	TERT	1/5	AMP	0.370
4q24	4	103422486	103538459	NFKB1	1/5	DEL	-0.393
3p21.31	3	50367217	50378367	RASSF1	1/5	DEL	-0.395
3p21.31	3	50305040	50314573	SEMA3B	1/5	DEL	-0.395
3p21.31	3	45636323	45722755	LIMD1	1/5	DEL	-0.395
3p21.1	3	53195223	53226733	PRKCD	1/5	DEL	-0.395
3p24.2	3	25469754	25639423	RARB	1/5	DEL	-0.395
3p24.1	3	30647994	30735634	TGFBR2	1/5	DEL	-0.395
3p24.3	3	19988572	20026667	RAB5A	1/5	DEL	-0.395
3p22.2	3	37903669	38025960	CTDSPL	1/5	DEL	-0.395
3p25.3	3	10183319	10195354	VHL	1/5	DEL	-0.395
3p22.2	3	38179969	38184513	MYD88	1/5	DEL	-0.395
3p25.3	3	10068113	10143614	FANCD2	1/5	DEL	-0.395
3p25.2	3	12329349	12475855	PPARG	1/5	DEL	-0.395
3p22.2	3	37034841	37092337	MLH1	1/5	DEL	-0.395

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
3p25.2	3	12625100	12705700	RAF1	1/5	DEL	-0.395
3p25.1	3	14186647	14220172	XPC	1/5	DEL	-0.395
1p36.12	1	23037331	23241823	EPHB2	1/5	DEL	-0.397
1p36.32	1	3569129	3652765	TP73	1/5	DEL	-0.397
1p35.1	1	32716840	32751766	LCK	1/5	DEL	-0.397
1p36.11	1	27237975	27240567	NR0B2	1/5	DEL	-0.397
1p36.11	1	27938800	27961727	FGR	1/5	DEL	-0.397
1p36.22	1	11166588	11322608	MTOR	1/5	DEL	-0.397
1p36.12	1	21922708	21995856	RAP1GAP	1/5	DEL	-0.397
1p36.11	1	24018269	24022915	RPL11	1/5	DEL	-0.397
5q31.1	5	131817301	131826465	IRF1	1/5	DEL	-0.410
5q31.1	5	131892616	131980313	RAD50	1/5	DEL	-0.410
5q31.1	5	131396347	131398896	IL3	1/5	DEL	-0.410
10q26.13	10	123237844	123357972	FGFR2	1/5	DEL	-0.411
10q24.32	10	104263719	104393214	SUFU	1/5	DEL	-0.411
10q24.32	10	104153867	104162286	NFKB2	1/5	DEL	-0.411
10q25.2	10	111967363	112047123	MXI1	1/5	DEL	-0.411
4p15.31	4	20255235	20620788	SLIT2	1/5	DEL	-0.420
17p12	17	11924135	12047051	MAP2K4	1/5	DEL	-0.436
11q23.3	11	115044345	115375241	CADM1	1/5	DEL	-0.442
11q23.3	11	120207618	120360645	ARHGEF12	1/5	DEL	-0.442
11q24.2	11	125495031	125546150	CHEK1	1/5	DEL	-0.442
11q23.3	11	119288655	119294246	THY1	1/5	DEL	-0.442
11q22.3	11	108093559	108239826	ATM	1/5	DEL	-0.442
11q23.3	11	118618472	118661972	DDX6	1/5	DEL	-0.442
11q24.3	11	128556430	128683162	FLI1	1/5	DEL	-0.442
11q24.3	11	128328656	128457453	ETS1	1/5	DEL	-0.442

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
11q23.3	11	119076986	119178859	CBL	1/5	DEL	-0.442
8p11.21	8	41119476	41166990	SFRP1	1/5	DEL	-0.445
17p13.2	17	5031687	5078324	USP6	1/5	DEL	-0.449
17p13.1	17	7571720	7590868	TP53	1/5	DEL	-0.449
17p13.1	17	8108049	8113944	AURKB	1/5	DEL	-0.449
17p13.3	17	1324647	1359561	CRK	1/5	DEL	-0.449
17p13.3	17	1933431	1946725	DPH1	1/5	DEL	-0.449
8p11.23	8	38268656	38326352	FGFR1	1/5	DEL	-1.193
8p21.3	8	21766384	21771205	DOK2	1/5	DEL	-1.220
8p22	8	12940872	13372429	DLC1	1/5	DEL	-1.220
13q14.2	13	48877883	49056026	RB1	2/5	AMP	0.918
13q12.2	13	28874483	29069265	FLT1	2/5	AMP	0.856
13q13.2	13	33677272	34250932	STARD13	2/5	AMP	0.856
13q13.1	13	32889617	32973809	BRCA2	2/5	AMP	0.856
13q12.11	13	21141208	21265576	IFT88	2/5	AMP	0.856
13q12.2	13	28577411	28674729	FLT3	2/5	AMP	0.856
13q13.1	13	33590571	33640282	KL	2/5	AMP	0.856
13q12.13	13	26828756	26978569	CDK8	2/5	AMP	0.856
13q32.1	13	98086475	98120252	RAP2A	2/5	AMP	0.670
20q11.23	20	35626178	35724410	RBL1	2/5	AMP	0.663
20q11.21	20	30252261	30310656	BCL2L1	2/5	AMP	0.663
20q11.22	20	32263292	32274210	E2F1	2/5	AMP	0.663
20q11.23	20	35973088	36033821	SRC	2/5	AMP	0.663
13q34	13	110406184	110438914	IRS2	2/5	AMP	0.641
13q33.1	13	102373205	103054124	FGF14	2/5	AMP	0.641
20q13.12	20	42295709	42345122	MYBL2	2/5	AMP	0.632
20q13.32	20	57414795	57486250	GNAS	2/5	AMP	0.631

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
20q13.2	20	54944445	54967351	AURKA	2/5	AMP	0.631
7p22.1	7	6012870	6048737	PMS2	2/5	AMP	0.412
7p22.2	7	2945709	3083509	CARD11	2/5	AMP	0.412
7p22.3	7	1570368	1582679	MAFK	2/5	AMP	0.412
7p22.1	7	6414126	6443598	RAC1	2/5	AMP	0.412
7p11.2	7	55086725	55275031	EGFR	2/5	AMP	0.389
7p14.1	7	41728601	41742706	INHBA	2/5	AMP	0.389
7p14.1	7	39663152	39747723	RALA	2/5	AMP	0.389
1q23.1	1	156785542	156851642	NTRK1	2/5	AMP	0.383
1q21.3	1	153954127	153958806	RAB13	2/5	AMP	0.383
1q23.1	1	158580496	158656506	SPTA1	2/5	AMP	0.378
1q23.3	1	164528597	164821067	PBX1	2/5	AMP	0.378
1q25.2	1	179068462	179198819	ABL2	2/5	AMP	0.371
1q32.1	1	205577071	205602000	ELK4	2/5	AMP	0.371
1q42.12	1	226250408	226259703	H3F3A	2/5	AMP	0.371
1q31.1	1	186280784	186344457	TPR	2/5	AMP	0.371
1q32.1	1	206643586	206670223	IKBKE	2/5	AMP	0.371
1q32.1	1	206680879	206762616	RASSF5	2/5	AMP	0.371
1q32.1	1	203274664	203278730	BTG2	2/5	AMP	0.371
1q42.13	1	228270361	228286913	ARF1	2/5	AMP	0.371
1q32.1	1	207070788	207077484	IL24	2/5	AMP	0.371
1q32.1	1	204485507	204527248	MDM4	2/5	AMP	0.371
1q41	1	223967595	224033674	TP53BP2	2/5	AMP	0.371
1q32.1	1	204391758	204459474	PIK3C2B	2/5	AMP	0.371
1q44	1	243651535	244006886	AKT3	2/5	AMP	0.371
15q21.3	15	55495164	55582013	RAB27A	2/5	DEL	-0.396
15q15.1	15	40453210	40513337	BUB1B	2/5	DEL	-0.396

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
15q24.1	15	74287014	74340160	PML	2/5	DEL	-0.399
15q22.31	15	66161797	66184329	RAB11A	2/5	DEL	-0.399
15q22.33	15	67358195	67487533	SMAD3	2/5	DEL	-0.399
15q22.31	15	66679211	66783882	MAP2K1	2/5	DEL	-0.399
5q13.1	5	67511584	67597649	PIK3R1	2/5	DEL	-0.405
18q11.2	18	20513295	20606449	RBBP8	2/5	DEL	-0.406
5q23.1	5	121398890	121414055	LOX	2/5	DEL	-0.410
18q21.2	18	49866542	51062273	DCC	2/5	DEL	-0.414
18q21.2	18	48556583	48611412	SMAD4	2/5	DEL	-0.414
18q21.1	18	45359466	45457517	SMAD2	2/5	DEL	-0.414
18q21.33	18	60382672	60647676	PHLPP1	2/5	DEL	-0.414
18q21.33	18	60790579	60986613	BCL2	2/5	DEL	-0.414
14q21.2	14	45605136	45670093	FANCM	2/5	DEL	-0.416
14q13.2	14	35870716	35873960	NFKBIA	2/5	DEL	-0.416
14q24.3	14	75745481	75748937	FOS	2/5	DEL	-0.419
15q25.3	15	88419988	88799962	NTRK3	2/5	DEL	-0.419
15q26.1	15	91427665	91439006	FES	2/5	DEL	-0.419
15q26.3	15	99192761	99507759	IGF1R	2/5	DEL	-0.419
15q26.1	15	91260579	91358686	BLM	2/5	DEL	-0.419
15q26.1	15	93443551	93571237	CHD2	2/5	DEL	-0.419
15q26.1	15	89787194	89860362	FANCI	2/5	DEL	-0.419
18p11.32	18	721592	812327	YES1	2/5	DEL	-0.431
14q31.1	14	81421869	81612646	TSHR	2/5	DEL	-0.441
14q32.31	14	102547075	102606086	HSP90AA1	2/5	DEL	-0.441
14q32.33	14	105235686	105262080	AKT1	2/5	DEL	-0.441
14q32.13	14	96176304	96180533	TCL1A	2/5	DEL	-0.441
5q11.2	5	56110900	56191979	MAP3K1	2/5	DEL	-0.447

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

Cytoband	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AA-3488
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3.2 RNA Gene Count Outliers

To find RNA genecounts in targetable genes that may be out of range, we use the normalized genecount of the patient’s tumor sample gene expression.

To help determine the importance of the gene expression for the patient with recurrent tumor, we include the minimum, maximum, and mean gene count of the matched control normalized samples. In the output table, the *Compare* column will have two minus (“-/-”) signs if the recurrent patient’s sample is less than the minimum genecount of all matched controls, “-” if less than the mean of the matched controls, and similarly one and two plus (“+”) signs for being greater than the mean and maximum of the matched controls, respectively.

Since the number of outlying genes per patient is large, we limit the results printed below to only those with two minus (“-/-”), two plus (“+/+”), or are a driver gene of interest.

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
ADCY2	1.65	-0.90	3.46	0.75	+	UP
ADH7	1.65	1.58	3.64	2.49	-	UP
APOB	1.65	-0.22	1.43	0.54	+/+	UP
AQP2	1.65	-0.08	2.51	1.59	+	UP
AVP	1.65	1.43	3.53	2.26	-	UP
CACNA2D3	1.65	-0.85	0.81	0.06	+/+	UP
CACNG2	1.65	-0.08	2.51	1.71	-	UP
CAV3	1.65	-0.54	2.32	1.38	+	UP
CNTN1	1.65	-0.97	3.51	0.68	+	UP
CPB2	1.65	1.25	3.30	2.20	-	UP
CYP11A1	1.65	-0.27	2.29	0.69	+	UP
CYP7A1	1.65	1.58	3.43	2.42	-	UP
FCER2	1.65	-1.07	2.23	0.52	+	UP
FGF10	1.65	-0.92	3.53	1.59	+	UP
FGF16	1.65	1.58	3.46	2.43	-	UP
FGF4	1.65	1.25	3.33	2.24	-	UP
FGF6	1.65	-0.35	2.45	1.62	+	UP

(cont’d next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
G6PC	1.65	-0.18	2.23	1.06	+	UP
GCK	1.65	-0.43	2.32	0.66	+	UP
GH1	1.65	1.43	3.43	2.32	-	UP
GK2	1.65	1.25	2.80	2.01	-	UP
GNG13	1.65	-0.52	3.62	1.62	+	UP
GPR119	1.65	-0.11	2.45	1.71	-	UP
GRIN2A	1.65	-0.22	2.06	0.83	+	UP
HIST1H2AA	1.65	1.43	3.33	2.22	-	UP
IFNA13	1.65	-0.05	2.51	1.63	+	UP
IFNA21	1.65	1.55	3.64	2.27	-	UP
IFNA5	1.65	1.58	3.33	2.26	-	UP
IFNA8	1.65	1.43	3.62	2.38	-	UP
IFNG	1.65	-0.28	2.95	1.15	+	UP
IL5RA	1.65	-0.22	3.64	1.74	-	UP
INS	1.65	1.43	3.62	2.35	-	UP
KLK7	1.65	-0.12	1.13	0.39	+/+	UP
MBL2	1.65	1.43	3.51	2.39	-	UP
NOS1	1.65	-0.24	2.29	0.99	+	UP
NR1H4	1.65	-0.65	3.46	1.15	+	UP
NRG4	1.65	-0.86	3.43	1.52	+	UP
PCSK2	1.65	-0.93	1.55	0.53	+/+	UP
PDYN	1.65	-0.34	2.45	1.64	+	UP
PLA2G1B	1.65	0.58	3.30	2.12	-	UP
PRKACG	1.65	-0.40	2.45	1.49	+	UP
PRKAG3	1.65	1.58	3.55	2.46	-	UP
PRL	1.65	-0.74	3.62	1.72	-	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
RIMS1	1.65	-1.04	2.26	0.69	+	UP
SLC10A2	1.65	-0.05	2.51	1.47	+	UP
SLC34A2	1.65	-0.39	1.97	0.75	+	UP
SOST	1.65	-0.10	2.51	1.51	+	UP
TPO	1.65	-0.97	2.06	0.53	+	UP
TRPV5	1.65	0.58	3.62	2.27	-	UP
UNC5C	1.65	-0.86	3.53	1.03	+	UP
WNT1	1.65	-0.22	2.29	1.14	+	UP
WNT3A	1.65	0.58	3.64	2.11	-	UP
WNT8A	1.65	-0.26	2.51	1.53	+	UP
WNT9B	1.65	-0.35	2.18	1.35	+	UP
ADIPOQ	1.46	-0.34	1.97	0.47	+	UP
ATP1A2	1.46	-0.57	0.89	0.13	+/+	UP
CGA	1.46	1.09	3.55	1.94	-	UP
CLEC1B	1.46	1.25	3.38	2.12	-	UP
CYP11B1	1.46	-0.07	2.32	1.59	-	UP
CYP4A11	1.46	-0.46	2.32	0.88	+	UP
DCC	1.46	-0.36	2.12	0.83	+	UP
ELANE	1.46	-0.65	2.44	1.13	+	UP
EPHA5	1.46	0.98	3.53	1.90	-	UP
FGF17	1.46	-0.55	1.74	0.64	+	UP
FGF8	1.46	0.58	2.56	1.55	-	UP
G6PC2	1.46	-0.05	2.32	1.62	-	UP
GH2	1.46	-0.26	2.29	1.38	+	UP
GLYAT	1.46	-0.12	2.29	1.49	-	UP
IFNA1	1.46	1.16	2.80	1.75	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
IFNA10	1.46	1.20	2.91	1.96	-	UP
IFNA14	1.46	-0.45	2.29	1.40	+	UP
IFNA17	1.46	1.25	3.33	1.96	-	UP
IFNA7	1.46	1.25	3.38	2.00	-	UP
IL3	1.46	0.96	2.56	1.71	-	UP
INHA	1.46	-0.50	1.30	0.35	+/+	UP
KLK3	1.46	-1.10	2.29	0.79	+	UP
KLKB1	1.46	-0.73	2.18	0.55	+	UP
MUC7	1.46	-0.49	2.29	1.42	+	UP
NANOG	1.46	-0.52	2.23	1.09	+	UP
NKX2-5	1.46	-0.32	1.97	0.97	+	UP
NPPA	1.46	-0.73	1.55	0.76	+	UP
NRG2	1.46	-0.91	3.43	0.90	+	UP
PLCZ1	1.46	1.25	3.43	2.01	-	UP
PPFIA2	1.46	-0.73	3.58	0.92	+	UP
SLC25A21	1.46	0.86	3.55	1.93	-	UP
SLC5A5	1.46	-0.79	1.74	0.88	+	UP
SLC6A3	1.46	-0.33	1.80	0.72	+	UP
SPO11	1.46	1.43	3.55	2.31	-	UP
TSHB	1.46	1.13	3.43	2.16	-	UP
WNT16	1.46	-0.85	2.32	0.91	+	UP
CACNG3	1.19	-0.60	1.97	0.98	+	UP
CCNA1	1.19	-0.65	2.91	1.15	+	UP
ERBB4	1.19	-0.22	3.21	1.26	-	UP
FGG	1.19	0.57	2.99	1.68	-	UP
FOXD3	1.19	-1.01	1.02	0.23	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
GIP	1.19	0.96	3.21	1.78	-	UP
IFNB1	1.19	0.64	2.95	1.79	-	UP
MUC16	1.19	-0.97	1.97	0.20	+	UP
MYL7	1.19	1.25	3.21	1.85	-/-	UP
NKX6-1	1.19	-0.53	2.32	1.06	+	UP
PAK7	1.19	0.96	3.33	1.88	-	UP
PLA2G2E	1.19	1.25	3.33	2.06	-/-	UP
PRKCG	1.19	-1.03	1.80	0.32	+	UP
RAG2	1.19	-0.63	1.97	1.28	-	UP
RPE65	1.19	0.96	3.30	1.96	-	UP
SNAP25	1.19	-1.11	2.80	0.94	+	UP
SPTA1	1.19	-0.45	2.45	1.09	+	UP
TYR	1.19	-0.37	1.97	0.82	+	UP
WNT7A	1.19	-0.41	1.66	0.62	+	UP
MYO5A	1.16	-0.16	1.36	0.40	+	UP
EEF1A2	1.10	-0.81	1.31	0.25	+	UP
TAF1L	1.09	-0.65	1.49	0.34	+	UP
CD79B	1.09	-0.57	1.30	0.29	+	UP
JAK2	1.07	-0.38	1.31	0.26	+	UP
HIST1H2BO	1.06	-0.93	1.22	0.11	+	UP
IFIH1	1.06	-0.02	1.17	0.35	+	UP
SMAD9	1.05	-0.34	0.88	0.24	+/+	UP
DUSP4	1.04	-0.08	0.52	0.16	+/+	UP
EYA1	1.04	-0.85	1.29	0.14	+	UP
FBLN5	1.04	-0.16	1.13	0.28	+	UP
PDE5A	1.04	0.07	1.33	0.49	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
GNB4	1.01	-0.01	1.33	0.42	+	UP
HK3	1.00	-0.43	1.13	0.26	+	UP
FCGR1A	0.99	-0.33	1.08	0.21	+	UP
WNT2	0.99	-0.15	1.05	0.30	+	UP
TAOK1	0.99	-0.70	1.17	0.13	+	UP
CCL2	0.98	0.05	1.33	0.52	+	UP
ITGB3	0.98	-0.39	1.23	0.22	+	UP
F2RL3	0.98	-0.87	1.26	0.17	+	UP
AOC3	0.98	0.01	0.94	0.34	+/+	UP
DUOX1	0.98	-0.67	1.29	0.17	+	UP
GAS2	0.97	-0.92	1.10	0.12	+	UP
ALDH1A3	0.97	-0.17	0.97	0.24	+	UP
POLK	0.97	-0.32	1.17	0.19	+	UP
GTF2A1	0.96	-0.45	1.06	0.11	+	UP
APBB1IP	0.96	-0.38	1.17	0.27	+	UP
COL2A1	0.96	-0.56	1.30	0.22	+	UP
IRF4	0.96	-0.45	0.59	0.07	+/+	UP
INPP4B	0.96	-0.28	1.29	0.27	+	UP
ITPR1	0.96	-0.30	1.27	0.31	+	UP
POU5F1	0.96	-0.91	1.03	0.12	+	UP
SGOL1	0.96	-0.37	0.84	0.10	+/+	UP
HPSE	0.96	-0.54	1.27	0.25	+	UP
MMP10	0.95	-0.50	0.90	0.20	+/+	UP
PIK3CA	0.95	-0.52	1.32	0.20	+	UP
TRIM22	0.95	-0.01	1.23	0.36	+	UP
PTPRC	0.95	-0.27	1.25	0.22	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
CDK5R1	0.95	-0.78	1.08	0.02	+	UP
HLA-DQA2	0.95	-0.11	1.27	0.33	+	UP
RAPGEF3	0.94	-0.41	1.11	0.31	+	UP
NR6A1	0.94	-1.12	1.01	-0.01	+	UP
FAS	0.94	-0.13	1.40	0.36	+	UP
CDKN2B	0.94	-0.28	1.37	0.37	+	UP
IL1A	0.94	-0.51	0.88	0.06	+/+	UP
CSF2RA	0.93	-0.43	1.06	0.24	+	UP
GNA14	0.93	-0.42	1.25	0.30	+	UP
PPFIA4	0.92	-0.95	0.93	-0.02	+	UP
CCNT1	0.92	-0.68	1.13	0.10	+	UP
CRMP1	0.92	-0.67	1.17	0.07	+	UP
ABCA1	0.92	-0.07	0.97	0.29	+	UP
ANAPC10	0.92	-0.56	1.36	0.18	+	UP
LCK	0.92	-0.47	1.24	0.21	+	UP
ERCC4	0.92	-0.46	1.07	0.16	+	UP
KCNH2	0.91	-0.20	0.70	0.16	+/+	UP
PCK1	0.91	-0.31	0.86	0.18	+/+	UP
TIRAP	0.91	-0.47	1.19	0.19	+	UP
TCF7L1	0.91	-0.44	1.13	0.21	+	UP
CD36	0.91	-0.51	0.98	0.15	+	UP
BRAF	0.91	-0.81	1.13	0.02	+	UP
SUFU	0.90	-0.04	1.12	0.44	+	UP
HLA-DQB2	0.90	-0.35	1.05	0.17	+	UP
RYR2	0.90	-0.42	1.03	0.27	+	UP
LPL	0.90	-0.11	1.17	0.31	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
NTRK2	0.90	-0.34	1.22	0.23	+	UP
TREM2	0.90	-0.45	1.14	0.10	+	UP
CSF2RB	0.90	-0.45	1.18	0.20	+	UP
WRN	0.90	-0.56	1.24	0.10	+	UP
SYT1	0.89	-0.52	0.53	-0.05	+/+	UP
SLC11A1	0.89	-0.56	1.20	0.14	+	UP
TLR4	0.89	-0.03	0.81	0.28	+/+	UP
PRSS1	0.89	-1.01	1.08	0.20	+	UP
WNT10B	0.89	-0.22	2.56	1.14	-	UP
CACNA1C	0.89	-0.31	0.90	0.26	+	UP
ACHE	0.88	-0.88	1.43	0.20	+	UP
PIK3CD	0.88	-0.43	1.17	0.18	+	UP
CDC7	0.88	-0.59	0.98	-0.01	+	UP
MCF2	0.88	1.25	2.44	1.75	-/-	UP
SFTPD	0.88	-0.81	1.97	1.03	-	UP
BLNK	0.88	-0.37	0.92	0.11	+	UP
GRIA2	0.88	-0.61	1.97	1.04	-	UP
TNFSF11	0.88	-0.52	1.12	0.10	+	UP
PDE4D	0.88	-0.09	1.02	0.26	+	UP
GNG2	0.88	-0.26	0.89	0.17	+	UP
BRIP1	0.87	-0.79	0.95	0.01	+	UP
CIITA	0.87	-0.34	1.22	0.26	+	UP
TRIM10	0.87	-1.00	0.97	0.04	+	UP
KCNJ2	0.87	-0.27	1.06	0.33	+	UP
PRKAA2	0.87	-1.22	0.98	-0.10	+	UP
TBX5	0.87	-0.41	2.38	1.10	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
XRCC4	0.87	-0.44	0.87	0.12	+/+	UP
GPC3	0.87	-1.09	0.73	-0.19	+/+	UP
CYP11B2	0.87	-0.74	2.18	1.17	-	UP
TCN1	0.87	-0.22	0.69	0.22	+/+	UP
IFIT3	0.87	-0.30	1.17	0.23	+	UP
FGF21	0.87	-0.60	1.97	0.95	-	UP
FGF5	0.87	-1.06	1.13	0.05	+	UP
CPLX1	0.86	-0.86	0.94	0.12	+	UP
TEC	0.86	-0.94	1.25	-0.02	+	UP
MNAT1	0.86	-0.43	1.30	0.19	+	UP
SLC22A4	0.86	-1.17	1.19	-0.05	+	UP
F9	0.86	1.43	2.80	2.12	-/-	UP
CACNB1	0.86	-0.60	1.22	0.28	+	UP
FZD4	0.86	-0.27	1.04	0.22	+	UP
LAT	0.86	-0.61	1.25	0.16	+	UP
SYCP2	0.86	-0.92	2.91	0.77	+	UP
GPC2	0.86	-0.96	1.16	0.16	+	UP
WWTR1	0.86	-0.54	1.26	0.13	+	UP
CYP27B1	0.85	-0.82	1.20	0.03	+	UP
TRAF1	0.85	-0.29	1.19	0.33	+	UP
ATP1A4	0.85	-0.91	2.29	0.91	-	UP
CACNA2D1	0.85	-0.94	1.39	0.18	+	UP
FASLG	0.85	-0.83	3.64	0.94	-	UP
GFAP	0.85	-0.91	2.38	0.72	+	UP
GNG3	0.85	-0.38	3.58	1.39	-	UP
GRIA4	0.85	-0.40	2.29	0.93	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
HBD	0.85	0.58	3.43	1.52	-	UP
IL2	0.85	1.58	3.62	2.43	-/-	UP
KCNJ4	0.85	-0.49	2.32	0.84	+	UP
KEL	0.85	0.22	3.46	1.64	-	UP
NTRK1	0.85	-0.40	0.73	0.10	+/+	UP
TLR6	0.85	-1.07	1.55	0.20	+	UP
TRPV6	0.85	-1.03	2.32	0.65	+	UP
SOX2	0.85	-0.88	1.99	0.97	-	UP
FGF19	0.85	-0.43	1.55	0.52	+	UP
ARHGEF6	0.85	-0.53	1.05	0.12	+	UP
ACSBG1	0.85	-0.65	0.91	0.07	+	UP
CPS1	0.85	-0.29	1.06	0.22	+	UP
CASC5	0.85	-0.29	1.20	0.34	+	UP
UGCG	0.85	-0.14	1.43	0.38	+	UP
LTB	0.85	-0.46	1.12	0.13	+	UP
GGT5	0.84	-0.01	0.97	0.38	+	UP
SMO	0.84	-0.50	0.94	0.13	+	UP
ATF2	0.84	-0.11	1.45	0.42	+	UP
EPHB1	0.84	-0.90	0.99	-0.04	+	UP
WAS	0.84	-0.53	1.11	0.16	+	UP
BCHE	0.84	-0.45	2.66	0.67	+	UP
MUC15	0.84	-0.38	1.97	0.95	-	UP
NDC80	0.83	-0.29	1.26	0.23	+	UP
ATP1A3	0.83	-1.04	1.00	0.05	+	UP
FZD3	0.83	-0.53	1.09	0.12	+	UP
GHR	0.83	-0.76	0.60	-0.01	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
CHD9	0.83	-0.15	1.26	0.26	+	UP
MAFA	0.83	0.65	2.80	1.82	-	UP
COL7A1	0.83	-0.48	0.80	0.03	+/+	UP
CPT1B	0.83	-0.49	0.83	0.05	+	UP
RPS6KA5	0.83	-0.59	2.99	0.71	+	UP
XRCC2	0.82	-0.93	3.62	0.86	-	UP
IFNA4	0.82	-0.65	1.97	0.80	+	UP
CACNA2D2	0.82	-1.13	0.71	-0.13	+/+	UP
RBL1	0.82	-0.46	1.29	0.24	+	UP
IL18	0.82	-0.38	1.18	0.17	+	UP
PRKACB	0.82	0.01	1.19	0.33	+	UP
CD79A	0.82	-0.56	1.35	0.22	+	UP
SLC2A2	0.82	-0.81	1.55	0.87	-	UP
DBP	0.82	-0.47	0.86	0.15	+	UP
NFATC1	0.81	-0.34	1.06	0.23	+	UP
FGFR1OP	0.81	-0.36	1.28	0.20	+	UP
BZRAP1	0.81	-0.88	0.81	0.05	+/+	UP
SLC8A1	0.81	-0.32	1.01	0.19	+	UP
MSR1	0.81	-0.17	0.94	0.18	+	UP
ELMO1	0.81	-0.60	1.22	0.15	+	UP
PTAFR	0.81	-0.50	0.84	0.05	+	UP
IL7R	0.81	-0.81	3.33	0.78	+	UP
SH2D2A	0.81	-0.26	1.20	0.39	+	UP
ADCY8	0.81	-0.65	1.17	0.61	+	UP
SESN3	0.81	-1.05	3.09	0.68	+	UP
PTGS1	0.81	-0.28	1.28	0.30	+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
TRPV1	0.80	-1.15	1.15	0.01	+	UP
SYNJ1	0.80	-0.53	1.08	0.15	+	UP
CD247	0.80	-0.57	0.81	0.09	+	UP
DCT	0.80	-1.03	1.97	0.30	+	UP
ADH6	0.80	-0.38	0.98	0.16	+	UP
FRS2	0.80	-0.22	1.33	0.27	+	UP
LATS1	0.80	-0.34	1.13	0.23	+	UP
S100B	0.80	-0.49	0.66	-0.00	+/+	UP
RASA3	0.80	-0.25	0.75	0.12	+/+	UP
SMAD1	0.80	0.05	1.22	0.42	+	UP
WNT2B	0.79	-0.93	1.41	0.18	+	UP
ARSB	0.79	-0.30	1.26	0.31	+	UP
F2RL2	0.79	-0.53	1.02	0.15	+	UP
CBLB	0.79	-0.11	1.03	0.33	+	UP
FGFBP1	0.79	-0.09	1.26	0.32	+	UP
MEF2C	0.79	-0.45	1.00	0.13	+	UP
TEK	0.79	-0.53	1.19	0.17	+	UP
JAK3	0.79	-0.55	0.98	0.06	+	UP
IL3RA	0.79	-0.47	0.98	0.12	+	UP
RHOJ	0.79	-0.88	1.08	0.04	+	UP
TGFA	0.79	-0.09	1.16	0.28	+	UP
CDKN2A	0.79	-0.42	1.27	0.28	+	UP
NFATC2	0.78	-1.15	1.09	-0.08	+	UP
RAD52	0.78	-0.48	1.30	0.22	+	UP
IFNA6	0.78	0.66	1.52	1.09	-	UP
DNMT3B	0.78	-1.12	1.11	0.07	+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
SMARCD3	0.78	-0.60	1.18	0.12	+	UP
HEY1	0.78	-0.70	1.24	0.13	+	UP
ERCC8	0.77	-0.39	1.18	0.16	+	UP
SLC2A4	0.77	-0.56	0.76	-0.05	+/+	UP
E2F2	0.77	-0.12	1.43	0.46	+	UP
ADCY4	0.77	-0.59	1.01	0.10	+	UP
HBEGF	0.77	0.14	0.60	0.33	+/+	UP
RGS1	0.77	-0.17	1.09	0.18	+	UP
TPK1	0.77	-0.78	1.12	0.08	+	UP
PIAS2	0.76	-0.37	1.21	0.17	+	UP
PTGS2	0.76	-0.19	1.07	0.35	+	UP
PPARGC1A	0.76	-0.44	0.93	0.04	+	UP
IL7	0.76	-0.54	1.20	0.20	+	UP
PIWIL2	0.76	-1.00	0.70	-0.14	+/+	UP
TRIM33	0.76	0.02	1.25	0.39	+	UP
ARNTL	0.76	-0.57	1.12	0.08	+	UP
NR3C1	0.76	-0.46	1.02	0.05	+	UP
CYP3A4	0.76	-1.27	1.00	-0.09	+	UP
EPHA7	0.76	-0.74	1.43	0.38	+	UP
FGF9	0.76	-1.15	3.30	1.36	-	UP
KLRD1	0.76	-0.99	0.73	0.07	+/+	UP
PLIN1	0.76	-0.91	0.97	-0.05	+	UP
SERPINC1	0.76	1.25	2.80	1.86	-/-	UP
NFE2	0.76	-1.30	0.94	-0.15	+	UP
MAP3K1	0.76	-0.31	1.19	0.25	+	UP
ANKRD1	0.76	-1.15	1.52	0.38	+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
FGF3	0.76	0.43	1.59	0.92	-	UP
WNT5B	0.76	-0.65	0.97	0.21	+	UP
GNAL	0.75	-0.62	1.20	0.09	+	UP
ATM	0.75	-0.29	1.17	0.23	+	UP
WNT9A	0.75	-1.01	1.89	0.94	-	UP
TAF1B	0.75	-0.61	0.55	-0.01	+/+	UP
VCAM1	0.75	-0.40	1.23	0.14	+	UP
IL2RB	0.75	-0.56	1.24	0.13	+	UP
ARHGAP5	0.75	0.27	1.23	0.58	+	UP
TAF3	0.75	-0.68	0.90	-0.07	+	UP
MAPK12	0.75	-0.92	0.86	-0.06	+	UP
DLL1	0.74	-0.20	1.37	0.36	+	UP
DLC1	0.74	-0.24	1.13	0.17	+	UP
ERCC6	0.74	-0.50	1.26	0.20	+	UP
KCNJ14	0.74	-1.01	1.10	0.10	+	UP
ZFYVE16	0.74	-0.04	1.34	0.38	+	UP
INHBA	0.74	-0.60	1.16	0.13	+	UP
TFDP2	0.74	-0.32	1.22	0.23	+	UP
CACNA1D	0.74	-0.45	1.00	0.26	+	UP
MAP3K8	0.74	-0.65	1.26	0.15	+	UP
HIST1H1C	0.74	-0.65	0.56	-0.08	+/+	UP
ACSL6	0.74	-0.68	0.88	0.11	+	UP
MAML2	0.73	-0.47	0.87	0.13	+	UP
PRKCE	0.73	-0.40	1.05	0.19	+	UP
PTGDS	0.73	-0.33	1.09	0.13	+	UP
WASF3	0.73	-0.47	1.14	0.21	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
IFI16	0.73	-0.18	0.73	0.13	+	UP
CENPE	0.73	-0.44	0.91	0.06	+	UP
SLC2A5	0.73	-0.37	1.11	0.24	+	UP
CLOCK	0.73	-0.39	1.17	0.16	+	UP
TOP3A	0.73	-0.02	1.07	0.48	+	UP
RPS6KB1	0.73	-0.18	1.23	0.26	+	UP
RAB3A	0.73	-1.14	1.08	-0.08	+	UP
PLA2G10	0.73	-1.13	0.94	-0.08	+	UP
ZAP70	0.72	-0.83	1.05	-0.05	+	UP
PPP3CC	0.72	-0.63	1.17	0.02	+	UP
MAP3K3	0.72	-0.11	0.97	0.33	+	UP
ABCB4	0.72	-1.07	3.46	0.64	+	UP
TNFRSF10A	0.72	-0.48	0.89	0.08	+	UP
ACVR2A	0.72	-0.38	1.13	0.12	+	UP
CBL	0.72	-0.12	0.92	0.29	+	UP
NTN1	0.72	-0.97	1.14	-0.01	+	UP
LIPE	0.72	-0.51	0.53	0.03	+/+	UP
RHOF	0.72	-0.34	1.34	0.24	+	UP
RAD51AP1	0.72	-0.44	1.29	0.21	+	UP
GNAI1	0.72	-0.21	0.95	0.19	+	UP
DUSP5	0.72	-0.27	0.98	0.15	+	UP
SLCO1B1	0.72	-0.05	1.16	0.65	+	UP
TNNI3	0.72	-1.09	0.64	-0.09	+/+	UP
DDX4	0.72	0.65	1.13	0.81	-	UP
CLIP1	0.71	0.18	1.04	0.51	+	UP
MKNK1	0.71	-0.14	1.00	0.25	+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
PIAS3	0.71	-0.23	0.78	0.19	+	UP
PPP1R14A	0.71	-0.41	1.24	0.22	+	UP
DMD	0.71	-0.39	1.04	0.22	+	UP
GNB5	0.71	-0.45	0.96	0.03	+	UP
FCER1G	0.71	-0.28	1.15	0.22	+	UP
LAT2	0.71	-0.36	1.01	0.17	+	UP
APOC3	0.70	0.52	3.66	2.13	-	UP
SYN1	0.70	-0.93	0.79	-0.08	+	UP
RGL1	0.70	-0.45	0.95	0.16	+	UP
PDGFC	0.70	-0.12	1.29	0.34	+	UP
BIRC3	0.70	-0.09	1.32	0.32	+	UP
GABPB1	0.70	-0.12	1.38	0.35	+	UP
IL2RA	0.70	-0.79	0.43	-0.24	+/+	UP
TRAF6	0.70	-0.41	1.34	0.30	+	UP
PMAIP1	0.69	-0.42	1.27	0.13	+	UP
LNPEP	0.69	-0.83	0.71	-0.14	+	UP
ING3	0.69	-0.50	1.23	0.17	+	UP
LOX	0.69	-0.26	1.00	0.10	+	UP
HPGD	0.69	-0.18	1.09	0.27	+	UP
SPHK1	0.69	-0.43	1.01	0.04	+	UP
NCAPG	0.69	0.03	1.46	0.44	+	UP
ALOX5AP	0.69	-0.42	1.02	0.07	+	UP
PLCG2	0.69	-0.59	0.79	0.03	+	UP
TNIK	0.69	-0.22	1.11	0.25	+	UP
EIF2AK2	0.68	-0.35	1.01	0.15	+	UP
PLCD1	0.68	-0.34	0.88	0.22	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
SKIL	0.68	-0.26	1.06	0.18	+	UP
FZD1	0.68	-0.19	0.84	0.26	+	UP
DDX20	0.68	-0.28	1.12	0.24	+	UP
IL6R	0.68	-0.61	0.74	0.01	+	UP
PLK4	0.68	-0.47	1.12	0.17	+	UP
PLCB1	0.67	-0.36	1.15	0.19	+	UP
GNG11	0.67	-0.47	0.93	0.01	+	UP
CCNE2	0.67	-0.43	0.89	0.10	+	UP
ARNTL2	0.67	-0.51	1.44	0.30	+	UP
XPC	0.67	0.05	0.86	0.34	+	UP
ANAPC4	0.67	-0.22	1.06	0.20	+	UP
DLG4	0.67	-0.60	1.01	0.03	+	UP

4 Single Gene Targets

Of the single gene events indicated above, we show a table of which ones have a drug that targets them. We keep a tally of what kind of genomic events occur per patient (**S**=Somatic Variant, **CN** = Copy Number, **Expr**=Gene Expression) for the gene.

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
ABCA1	-	UP	-	-
ABCB4	-	UP	-	-
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	n/a	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	n/a	DGIdb
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	inhibitor	DGIdb
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	n/a	DrugBank
ABL1	Amp	-	inhibitor	DGIdb
ABL2	Amp	-	n/a	DrugBank
ACHE	-	UP	-	-
ACSBG1	-	UP	-	-
ACSL6	-	UP	-	-
ACVR2A	-	UP	-	-
ADCY2	-	UP	-	-
ADCY4	-	UP	-	-
ADCY8	-	UP	-	-
ADH6	-	UP	-	-
ADH7	-	UP	-	-
ADIPOQ	-	UP	-	-
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	n/a	DGIdb
AKT1	Del	-	n/a	DrugBank
AKT1	Del	-	inhibitor	DGIdb
AKT1	Del	-	n/a	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	inhibitor	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	inhibitor	DGIdb
AKT3	Amp	-	n/a	DGIdb
AKT3	Amp	-	inhibitor	DGIdb
ALDH1A3	-	UP	-	-
ALOX5AP	-	UP	-	-
ANAPC10	-	UP	-	-
ANAPC4	-	UP	-	-
ANKRD1	-	UP	-	-
AOC3	-	UP	-	-
APBB1IP	-	UP	-	-
APOB	-	UP	-	-
APOC3	-	UP	-	-
AQP2	-	UP	-	-
ARF1	Amp	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
ARHGAP5	-	UP	-	-
ARHGEF12	Del	-	-	-
ARHGEF6	-	UP	-	-
ARNTL	-	UP	-	-
ARNTL2	-	UP	-	-
ARSB	-	UP	-	-
ATF2	-	UP	-	-
ATM	Del	UP	n/a	DGIdb
ATM	Del	UP	n/a	DGIdb
ATM	Del	UP	n/a	DGIdb
ATM	Del	UP	n/a	DGIdb
ATP1A2	-	UP	-	-
ATP1A3	-	UP	-	-
ATP1A4	-	UP	-	-
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	n/a	DGIdb
AURKA	Amp	-	inhibitor	DGIdb
AURKA	Amp	-	n/a	DGIdb
AURKB	Del	-	inhibitor	DGIdb
AURKB	Del	-	n/a	DGIdb
AURKB	Del	-	inhibitor	DGIdb
AURKB	Del	-	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
AURKB	Del	-	inhibitor	DGIdb
AURKB	Del	-	inhibitor	DGIdb
AURKB	Del	-	inhibitor	DGIdb
AURKB	Del	-	inhibitor	DGIdb
AVP	-	UP	-	-
BCHE	-	UP	n/a	DrugBank
BCHE	-	UP	n/a	DrugBank
BCL2	Del	-	n/a	DrugBank
BCL2	Del	-	n/a	DrugBank
BCL2L1	Amp	-	-	-
BCL6	Amp	-	-	-
BIRC3	-	UP	antagonist	DGIdb
BIRC3	-	UP	antagonist	DGIdb
BLM	Del	-	-	-
BLNK	-	UP	-	-
BRAF	Amp	UP	n/a	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	n/a	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	n/a	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
BRAF	Amp	UP	n/a	DrugBank
BRAF	Amp	UP	n/a	DrugBank
BRAF	Amp	UP	n/a	DGIdb
BRAF	Amp	UP	n/a	DrugBank
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	inhibitor	DGIdb
BRAF	Amp	UP	n/a	DrugBank
BRCA2	Amp	-	n/a	DGIdb
BRCA2	Amp	-	n/a	DGIdb
BRCA2	Amp	-	n/a	DGIdb
BRCA2	Amp	-	n/a	DGIdb
BRIP1	-	UP	-	-
BTG2	Amp	-	-	-
BUB1B	Del	-	-	-
BZRAP1	-	UP	-	-
CACNA1C	-	UP	-	-
CACNA1D	-	UP	-	-
CACNA2D1	-	UP	-	-
CACNA2D2	-	UP	-	-
CACNA2D3	-	UP	-	-
CACNB1	-	UP	-	-
CACNG2	-	UP	-	-
CACNG3	-	UP	-	-
CADM1	Del	-	-	-
CARD11	Amp	-	-	-
CASC5	-	UP	-	-
CAV1	Amp	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
CAV3	-	UP	-	-
CBL	Del	UP	-	-
CBLB	-	UP	-	-
CBLL1	Amp	-	-	-
CCL2	-	UP	-	-
CCNA1	-	UP	-	-
CCNE2	-	UP	-	-
CCNT1	-	UP	-	-
CD247	-	UP	-	-
CD274	Amp	-	-	-
CD36	-	UP	n/a	DGIdb
CD79A	-	UP	-	-
CD79B	-	UP	-	-
CDC7	-	UP	-	-
CDK5R1	-	UP	-	-
CDK6	Amp	-	n/a	DGIdb
CDK6	Amp	-	inhibitor	DGIdb
CDK6	Amp	-	n/a	DGIdb
CDK6	Amp	-	inhibitor	DGIdb
CDK6	Amp	-	inhibitor	DGIdb
CDK6	Amp	-	n/a	DrugBank
CDK8	Amp	-	-	-
CDKN1C	Amp	-	-	-
CDKN2A	Amp	UP	n/a	DGIdb
CDKN2A	Amp	UP	n/a	DGIdb
CDKN2B	Amp	UP	-	-
CDKN2C	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
CENPE	-	UP	-	-
CGA	-	UP	-	-
CHD2	Del	-	-	-
CHD9	-	UP	-	-
CHEK1	Del	-	inhibitor	DGIdb
CHEK1	Del	-	inhibitor	DGIdb
CHEK1	Del	-	inhibitor	DGIdb
CIITA	-	UP	-	-
CLEC1B	-	UP	-	-
CLIP1	-	UP	-	-
CLOCK	-	UP	-	-
CNTN1	-	UP	-	-
COL2A1	-	UP	-	-
COL7A1	-	UP	-	-
CPB2	-	UP	-	-
CPLX1	-	UP	-	-
CPS1	-	UP	-	-
CPT1B	-	UP	-	-
CRK	Del	-	-	-
CRMP1	-	UP	-	-
CSF1R	Del	-	n/a	DrugBank
CSF1R	Del	-	n/a	DrugBank
CSF2RA	-	UP	-	-
CSF2RB	-	UP	-	-
CTDSPL	Del	-	-	-
CTNNA1	Del	-	-	-
CTNNB1	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
CYP11A1	-	UP	n/a	DrugBank
CYP11A1	-	UP	inhibitor	DGIdb
CYP11B1	-	UP	n/a	DrugBank
CYP11B1	-	UP	inducer	DGIdb
CYP11B1	-	UP	n/a	DrugBank
CYP11B2	-	UP	-	-
CYP27B1	-	UP	-	-
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP3A4	-	UP	n/a	DrugBank
CYP4A11	-	UP	n/a	DrugBank
CYP4A11	-	UP	n/a	DrugBank
CYP7A1	-	UP	-	-
DBP	-	UP	-	-
DCC	Del	UP	-	-
DCT	-	UP	-	-
DDB2	Amp	-	-	-
DDX20	-	UP	-	-
DDX4	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
DDX6	Del	-	-	-
DEC1	Amp	-	-	-
DLC1	Del	UP	-	-
DLG1	Amp	-	-	-
DLG4	-	UP	-	-
DLL1	-	UP	-	-
DMD	-	UP	-	-
DNMT3B	-	UP	-	-
DOK2	Del	-	-	-
DPH1	Del	-	-	-
DUOX1	-	UP	-	-
DUSP4	-	UP	-	-
DUSP5	-	UP	-	-
E2F1	Amp	-	-	-
E2F2	-	UP	-	-
ECT2	Amp	-	-	-
EEF1A2	-	UP	-	-
EGF	Del	-	-	-
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	n/a	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	n/a	DrugBank
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGFR	Amp	-	inhibitor	DGIdb
EGR1	Del	-	-	-
EIF2AK2	-	UP	-	-
ELANE	-	UP	-	-
ELK4	Amp	-	-	-
ELMO1	-	UP	-	-
ENG	Amp	-	-	-
EPHA3	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
EPHA5	Del	UP	-	-
EPHA7	-	UP	-	-
EPHB1	-	UP	-	-
EPHB2	Del	-	-	-
EPHB4	Amp	-	-	-
ERBB4	-	UP	inhibitor	DGIdb
ERBB4	-	UP	inhibitor	DGIdb
ERBB4	-	UP	inhibitor	DGIdb
ERBB4	-	UP	inhibitor	DGIdb
ERBB4	-	UP	inhibitor	DGIdb
ERBB4	-	UP	n/a	DrugBank
ERCC4	-	UP	-	-
ERCC6	-	UP	-	-
ERCC8	-	UP	-	-
ETS1	Del	-	-	-
ETS2	Del	-	-	-
EXT1	Amp	-	-	-
EXT2	Amp	-	-	-
EYA1	-	UP	-	-
EZH2	Amp	-	-	-
F2RL2	-	UP	-	-
F2RL3	-	UP	-	-
F9	-	UP	-	-
FAM175A	Del	-	-	-
FANCC	Amp	-	-	-
FANCD2	Del	-	-	-
FANCF	Amp	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
FANCG	Amp	-	-	-
FANCI	Del	-	-	-
FANCM	Del	-	-	-
FAS	-	UP	-	-
FASLG	-	UP	-	-
FBLN5	-	UP	-	-
FBXW7	Del	-	-	-
FCER1G	-	UP	-	-
FCER2	-	UP	-	-
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	antagonist	DGIdb
FCGR1A	-	UP	n/a	DrugBank
FCGR1A	-	UP	n/a	DrugBank
FES	Del	-	-	-
FGF10	Amp	UP	-	-
FGF14	Amp	-	-	-
FGF16	-	UP	-	-
FGF17	-	UP	-	-
FGF19	-	UP	-	-
FGF21	-	UP	-	-
FGF3	-	UP	-	-
FGF4	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
FGF5	-	UP	-	-
FGF6	-	UP	-	-
FGF8	-	UP	-	-
FGF9	-	UP	-	-
FGFBP1	-	UP	-	-
FGFR1	Del	-	n/a	DrugBank
FGFR1	Del	-	n/a	DrugBank
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	n/a	DGIdb
FGFR1	Del	-	n/a	DrugBank
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	n/a	DGIdb
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	n/a	DrugBank
FGFR1	Del	-	inhibitor	DGIdb
FGFR1	Del	-	n/a	DrugBank
FGFR1OP	-	UP	-	-
FGFR2	Del	-	n/a	DrugBank
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	n/a	DrugBank
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
FGFR2	Del	-	n/a	DrugBank
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	n/a	DGIdb
FGFR2	Del	-	n/a	DrugBank
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	inhibitor	DGIdb
FGFR2	Del	-	n/a	DGIdb
FGFR3	Del	-	n/a	DrugBank
FGFR3	Del	-	inhibitor	DGIdb
FGFR3	Del	-	n/a	DrugBank
FGFR3	Del	-	n/a	DrugBank
FGFR3	Del	-	n/a	DGIdb
FGFR3	Del	-	inhibitor	DGIdb
FGFR3	Del	-	n/a	DrugBank
FGFR3	Del	-	inhibitor	DGIdb
FGFR3	Del	-	inhibitor	DGIdb
FGFR4	Del	-	n/a	DrugBank
FGFR4	Del	-	n/a	DGIdb
FGFR4	Del	-	n/a	DrugBank
FGFR4	Del	-	n/a	DGIdb
FGFR4	Del	-	n/a	DGIdb
FGFR4	Del	-	n/a	DrugBank
FGG	-	UP	-	-
FGR	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
FLI1	Del	-	-	-
FLT1	Amp	-	n/a	DrugBank
FLT1	Amp	-	n/a	DrugBank
FLT1	Amp	-	n/a	DrugBank
FLT1	Amp	-	n/a	DrugBank
FLT1	Amp	-	n/a	DrugBank
FLT1	Amp	-	n/a	DrugBank
FLT3	Amp	-	n/a	DrugBank
FLT3	Amp	-	n/a	DrugBank
FLT3	Amp	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FLT4	Del	-	n/a	DrugBank
FOS	Del	-	-	-
FOXD3	-	UP	-	-
FRS2	-	UP	-	-
FZD1	-	UP	-	-
FZD3	-	UP	-	-
FZD4	-	UP	-	-
G6PC	-	UP	-	-
G6PC2	-	UP	-	-
GABPB1	-	UP	-	-
GALNT12	Amp	-	-	-
GAS2	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
GCK	-	UP	-	-
GFAP	-	UP	-	-
GGT5	-	UP	-	-
GH1	-	UP	-	-
GH2	-	UP	-	-
GHR	-	UP	-	-
GIP	-	UP	-	-
GK2	-	UP	-	-
GLYAT	-	UP	-	-
GNA14	-	UP	-	-
GNAI1	-	UP	-	-
GNAL	-	UP	-	-
GNAQ	Amp	-	-	-
GNAS	Amp	-	-	-
GNB4	-	UP	-	-
GNB5	-	UP	-	-
GNG11	-	UP	-	-
GNG13	-	UP	-	-
GNG2	-	UP	-	-
GNG3	-	UP	-	-
GPC2	-	UP	-	-
GPC3	-	UP	-	-
GPR119	-	UP	-	-
GRIA2	-	UP	n/a	DGIdb
GRIA4	-	UP	n/a	DGIdb
GRIN2A	-	UP	-	-
GRM3	Amp	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
GTF2A1	-	UP	-	-
H3F3A	Amp	-	-	-
HBD	-	UP	-	-
HBEGF	-	UP	-	-
HEY1	-	UP	-	-
HGF	Amp	-	-	-
HIST1H1C	-	UP	-	-
HIST1H2AA	-	UP	-	-
HIST1H2BO	-	UP	-	-
HK3	-	UP	-	-
HLA-DQA2	-	UP	-	-
HLA-DQB2	-	UP	-	-
HPGD	-	UP	-	-
HPSE	-	UP	-	-
HRAS	Amp	-	-	-
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	inhibitor	DGIdb
HSP90AA1	Del	-	inhibitor	DGIdb
HSP90AA1	Del	-	n/a	DGIdb
HSP90AA1	Del	-	inhibitor	DGIdb
IFI16	-	UP	-	-
IFIH1	-	UP	-	-
IFIT3	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
IFNA1	-	UP	-	-
IFNA10	-	UP	-	-
IFNA13	-	UP	-	-
IFNA14	-	UP	-	-
IFNA17	-	UP	-	-
IFNA21	-	UP	-	-
IFNA4	-	UP	-	-
IFNA5	-	UP	-	-
IFNA6	-	UP	-	-
IFNA7	-	UP	-	-
IFNA8	-	UP	-	-
IFNB1	-	UP	-	-
IFNG	-	UP	-	-
IFT88	Amp	-	-	-
IGF1R	Del	-	-	-
IGF2	Amp	-	-	-
IKBKE	Amp	-	-	-
IL18	-	UP	-	-
IL1A	-	UP	-	-
IL2	Del	UP	-	-
IL24	Amp	-	-	-
IL2RA	-	UP	n/a	DrugBank
IL2RA	-	UP	n/a	DrugBank
IL2RB	-	UP	n/a	DrugBank
IL2RB	-	UP	n/a	DrugBank
IL3	Del	UP	-	-
IL3RA	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
IL5RA	-	UP	-	-
IL6R	-	UP	-	-
IL7	-	UP	-	-
IL7R	Amp	UP	-	-
ING3	-	UP	-	-
INHA	-	UP	-	-
INHBA	Amp	UP	-	-
INPP4B	-	UP	-	-
INS	-	UP	-	-
IRF1	Del	-	-	-
IRF2	Del	-	-	-
IRF4	-	UP	-	-
IRS2	Amp	-	-	-
ITGB3	-	UP	n/a	DGIdb
ITPR1	-	UP	-	-
JAK1	Del	-	inhibitor	DGIdb
JAK1	Del	-	inhibitor	DGIdb
JAK1	Del	-	n/a	DrugBank
JAK2	Amp	UP	n/a	DrugBank
JAK2	Amp	UP	inhibitor	DGIdb
JAK2	Amp	UP	n/a	DGIdb
JAK2	Amp	UP	inhibitor	DGIdb
JAK2	Amp	UP	n/a	DGIdb
JAK2	Amp	UP	inhibitor	DGIdb
JAK2	Amp	UP	inhibitor	DGIdb
JAK2	Amp	UP	n/a	DGIdb
JAK3	-	UP	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
JAK3	-	UP	inhibitor	DGIdb
JUN	Del	-	n/a	DrugBank
JUN	Del	-	n/a	DrugBank
JUN	Del	-	other/unknown	DGIdb
KCNH2	-	UP	-	-
KCNJ14	-	UP	-	-
KCNJ2	-	UP	-	-
KCNJ4	-	UP	-	-
KDR	Del	-	n/a	DrugBank
KDR	Del	-	n/a	DrugBank
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DrugBank
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DailyMed
KDR	Del	-	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DGIdb
KDR	Del	-	n/a	DrugBank
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DrugBank
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DrugBank
KDR	Del	-	antagonist	DGIdb
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	n/a	DrugBank
KDR	Del	-	inhibitor	DGIdb
KDR	Del	-	inhibitor	DGIdb
KEL	Amp	UP	-	-
KIT	Del	-	n/a	DGIdb
KIT	Del	-	inhibitor	DGIdb
KIT	Del	-	inhibitor	DGIdb
KIT	Del	-	n/a	DrugBank
KIT	Del	-	inhibitor	DGIdb
KIT	Del	-	n/a	DrugBank
KIT	Del	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
KLK7	-	UP	-	-
KLKB1	-	UP	-	-
KLRD1	-	UP	-	-
LAT	-	UP	-	-
LAT2	-	UP	-	-
LATS1	-	UP	-	-
LCK	Del	UP	n/a	DGIdb
LCK	Del	UP	n/a	DrugBank
LCK	Del	UP	n/a	DGIdb
LCK	Del	UP	n/a	DrugBank
LIMD1	Del	-	-	-
LIPE	-	UP	-	-
LNPEP	-	UP	-	-
LOX	Del	UP	-	-
LPL	-	UP	-	-
LTB	-	UP	-	-
LYN	Amp	-	n/a	DrugBank
LYN	Amp	-	n/a	DrugBank
LYN	Amp	-	inhibitor	DGIdb
MAFA	Amp	UP	-	-
MAFK	Amp	-	-	-
MAGI2	Amp	-	-	-
MAML2	-	UP	-	-
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	n/a	DrugBank
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	inhibitor	DGIdb
MAP2K1	Del	-	n/a	DrugBank
MAP2K4	Del	-	inhibitor	DGIdb
MAP2K4	Del	-	inhibitor	DGIdb
MAP2K4	Del	-	inhibitor	DGIdb
MAP3K1	Del	UP	-	-
MAP3K3	-	UP	-	-
MAP3K8	-	UP	-	-
MAPK12	-	UP	-	-
MBL2	-	UP	-	-
MCF2	-	UP	-	-
MDM4	Amp	-	-	-
MEF2C	-	UP	-	-
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	n/a	DrugBank
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	n/a	DrugBank
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MET	Amp	-	inhibitor	DGIdb
MITF	Del	-	-	-
MKNK1	-	UP	-	-
MLH1	Del	-	-	-
MMP10	-	UP	-	-
MNAT1	-	UP	-	-
MOS	Amp	-	-	-
MPL	Del	-	n/a	DrugBank
MPL	Del	-	n/a	DrugBank
MSR1	-	UP	-	-
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	n/a	DGIdb
MTOR	Del	-	n/a	DrugBank
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	n/a	DGIdb
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	n/a	DrugBank
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	inhibitor	DGIdb
MTOR	Del	-	n/a	DGIdb
MTOR	Del	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
MTOR	Del	-	n/a	DGIdb
MTOR	Del	-	inhibitor	DGIdb
MUC15	-	UP	-	-
MUC16	-	UP	-	-
MUC7	-	UP	-	-
MXI1	Del	-	-	-
MYBL1	Amp	-	-	-
MYBL2	Amp	-	-	-
MYC	Amp	-	n/a	DGIdb
MYC	Amp	-	n/a	DGIdb
MYD88	Del	-	-	-
MYL7	-	UP	-	-
MYO5A	-	UP	-	-
NANOG	-	UP	-	-
NBN	Amp	-	-	-
NCAPG	-	UP	-	-
NDC80	-	UP	-	-
NFATC1	-	UP	-	-
NFATC2	-	UP	-	-
NFE2	-	UP	-	-
NFKB1	Del	-	n/a	DGIdb
NFKB1	Del	-	n/a	DGIdb
NFKB1	Del	-	n/a	DGIdb
NFKB1	Del	-	n/a	DrugBank
NFKB2	Del	-	-	-
NFKBIA	Del	-	-	-
NHP2	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
NKX2-5	-	UP	-	-
NKX6-1	-	UP	-	-
NOS1	-	UP	n/a	DrugBank
NOTCH1	Amp	-	inhibitor	DGIdb
NOTCH2	Del	-	other/unknown	DGIdb
NPPA	-	UP	-	-
NR0B2	Del	-	-	-
NR1H4	-	UP	-	-
NR3C1	-	UP	n/a	DrugBank
NR6A1	-	UP	-	-
NRAS	Del	-	-	-
NRG2	-	UP	-	-
NRG4	-	UP	-	-
NTN1	-	UP	-	-
NTRK1	Amp	UP	n/a	DGIdb
NTRK1	Amp	UP	n/a	DGIdb
NTRK1	Amp	UP	n/a	DrugBank
NTRK1	Amp	UP	n/a	DGIdb
NTRK1	Amp	UP	inhibitor	DGIdb
NTRK1	Amp	UP	n/a	DGIdb
NTRK1	Amp	UP	n/a	DrugBank
NTRK2	Amp	UP	n/a	DGIdb
NTRK3	Del	-	-	-
NUP214	Amp	-	-	-
NUP98	Amp	-	-	-
PAK7	-	UP	-	-
PAX5	Amp	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PBX1	Amp	-	-	-
PCK1	-	UP	-	-
PCSK2	-	UP	-	-
PDCD1LG2	Amp	-	-	-
PDE4D	-	UP	-	-
PDE5A	-	UP	-	-
PDGFC	-	UP	-	-
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	n/a	DrugBank
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	antagonist	DGIdb
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	n/a	DrugBank
PDGFRA	Del	-	n/a	DrugBank
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PDGFRA	Del	-	inhibitor	DGIdb
PDGFRA	Del	-	n/a	DrugBank
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	n/a	DGIdb
PDGFRA	Del	-	n/a	DrugBank
PDGFRB	Del	-	n/a	DrugBank
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	antagonist	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	antagonist	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DrugBank
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	n/a	DrugBank
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	inhibitor	DGIdb
PDGFRB	Del	-	n/a	DrugBank
PDGFRB	Del	-	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DGIdb
PDGFRB	Del	-	n/a	DrugBank
PDYN	-	UP	-	-
PHLPP1	Del	-	-	-
PIAS2	-	UP	-	-
PIAS3	-	UP	-	-
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3C2B	Amp	-	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	n/a	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	n/a	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PIK3CA	Amp	UP	n/a	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	n/a	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	inhibitor	DGIdb
PIK3CA	Amp	UP	n/a	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	n/a	DGIdb
PIK3CD	-	UP	n/a	DrugBank
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	n/a	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CD	-	UP	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	n/a	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3CG	Amp	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	n/a	DGIdb
PIK3R1	Del	-	n/a	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	n/a	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	inhibitor	DGIdb
PIK3R1	Del	-	n/a	DGIdb
PIWIL2	-	UP	-	-
PLA2G10	-	UP	-	-
PLA2G1B	-	UP	-	-
PLA2G2E	-	UP	-	-
PLCB1	-	UP	-	-
PLCD1	-	UP	-	-
PLCG2	-	UP	-	-
PLCZ1	-	UP	-	-
PLIN1	-	UP	-	-
PLK4	-	UP	-	-
PMAIP1	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PML	Del	-	-	-
PMS2	Amp	-	-	-
POLK	-	UP	-	-
POU5F1	-	UP	-	-
PPARG	Del	-	agonist	DGIdb
PPARGC1A	-	UP	-	-
PPFIA2	-	UP	-	-
PPFIA4	-	UP	-	-
PPP1R14A	-	UP	-	-
PPP3CC	-	UP	-	-
PREX2	Amp	-	-	-
PRKAA2	-	UP	n/a	DGIdb
PRKACB	-	UP	-	-
PRKACG	-	UP	-	-
PRKAG3	-	UP	-	-
PRKCD	Del	-	n/a	DrugBank
PRKCD	Del	-	inhibitor	DGIdb
PRKCD	Del	-	n/a	DGIdb
PRKCE	-	UP	inhibitor	DGIdb
PRKCE	-	UP	n/a	DGIdb
PRKCE	-	UP	inhibitor	DGIdb
PRKCE	-	UP	n/a	DrugBank
PRKCG	-	UP	n/a	DGIdb
PRKCG	-	UP	inhibitor	DGIdb
PRKCG	-	UP	n/a	DrugBank
PRKCG	-	UP	inhibitor	DGIdb
PRKCI	Amp	-	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
PRKDC	Amp	-	n/a	DGIdb
PRL	-	UP	-	-
PRSS1	Amp	UP	-	-
PTAFR	-	UP	-	-
PTCH1	Amp	-	other/unknown	DGIdb
PTGDS	-	UP	-	-
PTGS1	-	UP	n/a	DrugBank
PTGS1	-	UP	n/a	DrugBank
PTGS1	-	UP	n/a	DrugBank
PTGS1	-	UP	n/a	DrugBank
PTGS1	-	UP	n/a	DrugBank
PTGS1	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	negative modulator	DGIdb
PTGS2	-	UP	n/a	DGIdb
PTGS2	-	UP	inhibitor	DGIdb
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DrugBank
PTGS2	-	UP	n/a	DGIdb
PTGS2	-	UP	inhibitor	DGIdb
PTPRC	-	UP	-	-
RAB11A	Del	-	-	-
RAB13	Amp	-	-	-
RAB14	Amp	-	-	-
RAB27A	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
RAB2A	Amp	-	-	-
RAB3A	-	UP	-	-
RAB5A	Del	-	-	-
RAC1	Amp	-	-	-
RAD50	Del	-	-	-
RAD51AP1	-	UP	-	-
RAD52	-	UP	-	-
RAF1	Del	-	inhibitor	DGIdb
RAF1	Del	-	n/a	DrugBank
RAF1	Del	-	n/a	DrugBank
RAF1	Del	-	n/a	DrugBank
RAF1	Del	-	inhibitor	DGIdb
RAF1	Del	-	inhibitor	DGIdb
RAF1	Del	-	inhibitor	DGIdb
RAF1	Del	-	antisense oligonucleotide	DGIdb
RAG2	-	UP	-	-
RALA	Amp	-	-	-
RAP1A	Del	-	-	-
RAP1GAP	Del	-	-	-
RAP2A	Amp	-	-	-
RAPGEF3	-	UP	-	-
RARB	Del	-	-	-
RASA3	-	UP	-	-
RASSF1	Del	-	-	-
RASSF5	Amp	-	-	-
RB1	Amp	-	-	-
RBBP8	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
RBL1	Amp	UP	-	-
RECK	Amp	-	-	-
RGL1	-	UP	-	-
RGS1	-	UP	-	-
RHOF	-	UP	-	-
RHOJ	-	UP	-	-
RICTOR	Amp	-	inhibitor	DGIdb
RICTOR	Amp	-	inhibitor	DGIdb
RIMS1	-	UP	-	-
RPE65	-	UP	-	-
RPL11	Del	-	-	-
RPS6KA5	-	UP	-	-
RPS6KB1	-	UP	-	-
RRAS2	Amp	-	-	-
RUNX1	Del	-	-	-
RUNX1T1	Amp	-	-	-
RYR2	-	UP	-	-
S100B	-	UP	-	-
SCRIB	Amp	-	-	-
SEMA3B	Del	-	-	-
SERPINC1	-	UP	-	-
SESN3	-	UP	-	-
SFRP1	Del	-	-	-
SFTPD	-	UP	-	-
SGOL1	-	UP	-	-
SH2D2A	-	UP	-	-
SKIL	Amp	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
SLC10A2	-	UP	-	-
SLC11A1	-	UP	-	-
SLC22A4	-	UP	-	-
SLC25A21	-	UP	-	-
SLC2A2	-	UP	n/a	DGIdb
SLC2A2	-	UP	n/a	DrugBank
SLC2A4	-	UP	n/a	DGIdb
SLC2A5	-	UP	-	-
SLC34A2	-	UP	-	-
SLC5A5	-	UP	-	-
SLC6A3	-	UP	-	-
SLC8A1	-	UP	-	-
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLCO1B1	-	UP	n/a	DrugBank
SLIT2	Del	-	-	-
SMAD1	-	UP	-	-
SMAD2	Del	-	-	-
SMAD3	Del	-	-	-
SMAD4	Del	-	-	-
SMAD9	-	UP	-	-
SMARCA2	Amp	-	-	-
SMARCD3	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
SMO	Amp	UP	antagonist	DGIdb
SMO	Amp	UP	n/a	DrugBank
SMO	Amp	UP	other/unknown	DGIdb
SMO	Amp	UP	inhibitor	DGIdb
SNAP25	-	UP	-	-
SOST	-	UP	-	-
SOX2	Amp	UP	-	-
SPHK1	-	UP	n/a	DGIdb
SPHK1	-	UP	n/a	DGIdb
SPI1	Amp	-	-	-
SPO11	-	UP	-	-
SPTA1	Amp	UP	-	-
SRC	Amp	-	n/a	DGIdb
SRC	Amp	-	inhibitor	DGIdb
SRC	Amp	-	n/a	DGIdb
SRC	Amp	-	n/a	DrugBank
SRC	Amp	-	n/a	DrugBank
SRC	Amp	-	n/a	DGIdb
SRC	Amp	-	n/a	DGIdb
SRC	Amp	-	n/a	DGIdb
SRC	Amp	-	n/a	DrugBank
STARD13	Amp	-	-	-
SUFU	Del	UP	-	-
SYCP2	-	UP	-	-
SYK	Amp	-	inhibitor	DGIdb
SYK	Amp	-	inhibitor	DGIdb
SYN1	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
SYNJ1	-	UP	-	-
SYT1	-	UP	-	-
TAF1B	-	UP	-	-
TAF1L	-	UP	-	-
TAF3	-	UP	-	-
TAL1	Del	-	-	-
TAOK1	-	UP	-	-
TBX5	-	UP	-	-
TCF7L1	-	UP	-	-
TCL1A	Del	-	-	-
TCN1	-	UP	-	-
TEC	-	UP	-	-
TEK	-	UP	n/a	DrugBank
TEK	-	UP	n/a	DrugBank
TEK	-	UP	n/a	DrugBank
TERT	Amp	-	n/a	DGIdb
TFDP2	-	UP	-	-
TGFA	-	UP	-	-
TGFBR2	Del	-	-	-
THY1	Del	-	-	-
TIAM1	Del	-	-	-
TIRAP	-	UP	-	-
TLR4	-	UP	-	-
TLR6	-	UP	-	-
TNFRSF10A	-	UP	-	-
TNFSF11	-	UP	n/a	DrugBank
TNIK	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr	type	Source
TNNI3	-	UP	-	-
TOP3A	-	UP	-	-
TP53	Del	-	-	-
TP53BP2	Amp	-	-	-
TP73	Del	-	-	-
TPK1	-	UP	-	-
TPO	-	UP	-	-
TPR	Amp	-	-	-
TRAF1	-	UP	-	-
TRAF6	-	UP	-	-
TREM2	-	UP	-	-
TRIM10	-	UP	-	-
TRIM22	-	UP	-	-
TRIM33	-	UP	-	-
TRPV1	-	UP	-	-
TRPV5	-	UP	-	-
TRPV6	-	UP	-	-
TSC1	Amp	-	-	-
TSG101	Amp	-	-	-
TSHB	-	UP	-	-
TSHR	Del	-	-	-
TYR	-	UP	-	-
U2AF1	Del	-	-	-
UGCG	-	UP	-	-
UNC5C	-	UP	-	-
USP6	Del	-	-	-
VCAM1	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr type		Source
VHL	Del	-	-	-
WAS	-	UP	-	-
WASF3	-	UP	-	-
WNT1	-	UP	-	-
WNT10B	-	UP	-	-
WNT16	-	UP	-	-
WNT2	-	UP	-	-
WNT2B	-	UP	-	-
WNT3A	-	UP	-	-
WNT5A	Del	-	-	-
WNT5B	-	UP	-	-
WNT7A	-	UP	-	-
WNT8A	-	UP	-	-
WNT9A	-	UP	-	-
WNT9B	-	UP	-	-
WRN	-	UP	-	-
WT1	Amp	-	-	-
WWTR1	-	UP	-	-
XPC	Del	UP	-	-
XRCC2	-	UP	-	-
XRCC4	-	UP	-	-
YES1	Del	-	inhibitor	DGIdb
YES1	Del	-	n/a	DrugBank
YES1	Del	-	n/a	DGIdb
YES1	Del	-	n/a	DGIdb
ZAP70	-	UP	-	-
ZFYVE16	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	CN	Expr type	Source
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4.1 Random Forest on Genomic Events

Figure 1 below shows what random forest determines from all of the drivers and expressed genes below as key classifiers for the patient versus the matched controls. The plot shows variable importance, which will be used later to sift through the top gene networks. There were a total of 784 given to random forest, and we select 251 genes to help make sense of druggable gene networks.

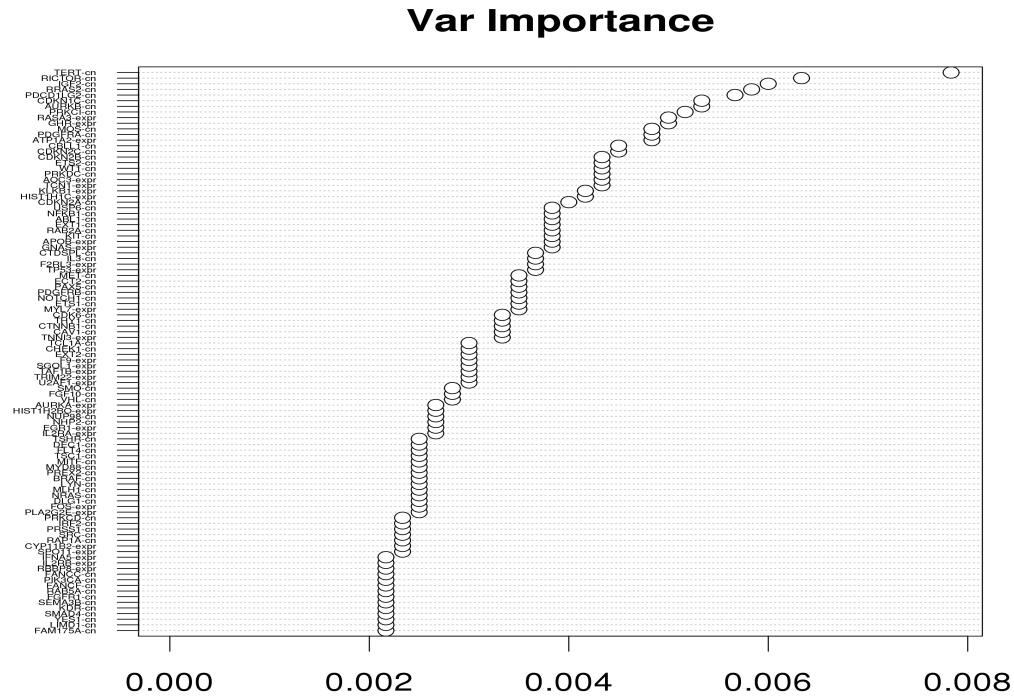


Figure 1: Random Forest Variable Importance

Gene-Network Targets

Genes with DNA Mutation events that are in gene-specific networks that are significantly altered compared to the matched controls.

Table 5: Curated Cancer Networks

Cancer.Driver.Gene	Network	Network.pval	Total.Druggable	RF.match	RF.druggable
IL24	17	0.02	2	3	2
PRL	23	0.02	4	4	3
GEN1	22	0.03	1	3	2
PPARG	43	0.04	3	3	0
IL3	34	0.04	5	6	4
BLM	21	0.04	1	3	2
FYN	120	0.04	5	4	1
ERCC4	30	0.05	1	3	2
LYN	96	0.05	7	4	1
FGR	47	0.05	3	2	1
RAP2A	1	0.09	1	1	1
RAP2B	1	0.09	1	1	1
RAP2C	1	0.09	1	1	1
SMAD4	43	0.09	1	5	0
RAB11B	1	0.09	1	1	1
CD79A	30	0.10	2	6	3
PDCD1LG2	17	0.10	1	0	0
KITLG	34	0.12	3	2	2
CD79B	29	0.12	2	5	3
IL2	52	0.12	6	8	5
SMO	11	0.13	2	1	1
PPP2R1A	56	0.14	2	6	1
SYK	50	0.14	4	2	1
CD274	18	0.15	1	0	0
ATM	37	0.17	2	3	2

RRAS2	20	0.17	3	3	2
RRAS	21	0.18	3	3	2
FES	14	0.18	1	1	1
SMAD3	44	0.19	1	6	0
FGF14	15	0.19	1	0	0
MRAS	19	0.19	3	3	2
LCK	115	0.20	7	6	3
NF1	17	0.20	3	2	1
SOCS1	26	0.20	4	4	2
ALK	6	0.22	3	1	1
ATR	49	0.22	2	2	2
KIT	39	0.23	4	2	2
PIK3CA	61	0.24	5	6	4
RICTOR	6	0.25	2	0	0
PIK3R1	68	0.25	2	6	2
BTK	26	0.25	1	1	0
PLCG2	40	0.25	2	2	1
PTPN11	99	0.25	6	8	4
PTEN	15	0.26	3	1	1
CBLB	22	0.26	2	1	0
PRKCI	13	0.27	2	1	1
RAB2A	2	0.27	1	1	1
CBLC	18	0.28	4	1	1
GSK3B	64	0.29	3	1	0
ERBB3	40	0.29	6	3	3
KRAS	51	0.29	4	3	2
JAK2	86	0.29	5	4	2
SRC	161	0.30	8	3	2

Single Gene Driver Events in those genes or variants.

Table 6: DNA Driver Events

CHROM	Gene.Symbol	Case.Type	Control.Count	Expressed
1	FGR	CN:Del	1	+
1	IL24	CN:Amp	2	
1	LCK	CN:Del	1	+
11	ATM	CN:Del	1	+
11	RRAS2	CN:Amp	1	
12	KITLG			+
12	KRAS			+
13	FGF14	CN:Amp	2	
13	RAP2A	CN:Amp	2	
15	BLM	CN:Del	2	+
15	FES	CN:Del	2	
15	SMAD3	CN:Del	2	+
16	ERCC4			+
16	PLCG2			+
17	CD79B			+
18	SMAD4	CN:Del	2	
19	CD79A			+
19	RRAS			+
2	GEN1			+
20	SRC	CN:Amp	2	
3	ATR			+
3	CBLB			+
3	PIK3CA	CN:Amp	1	+
3	PPARG	CN:Del	1	
3	PRKCI	CN:Amp	1	

(cont'd next page)

Table 6: DNA Driver Events

CHROM	Gene.Symbol	Case.Type	Control.Count	Expressed
4	IL2	CN:Del	0	
4	KIT	CN:Del	0	
5	IL3	CN:Del	2	
5	PIK3R1	CN:Del	2	+
5	RICTOR	CN:Amp	2	+
7	SMO	CN:Amp	1	+
8	LYN	CN:Amp	1	
8	RAB2A	CN:Amp	1	
9	CD274	CN:Amp	1	
9	JAK2	CN:Amp	1	+
9	PDCD1LG2	CN:Amp	1	
9	SYK	CN:Amp	2	

Cancer Drugs and Pathways

Drugs that target the cancer genes and their network genes ranked by the drugs that target the most in the remaining list of candidates.

Table 7: Cancer Drug Table

Drug	Cancer.Driver.Genes	Network.Genes	N.Pathways	DNT.pval	DMT.pval	PScore	RF.Score
LESTAURTINIB	JAK2,NTRK1,NTRK2	JAK2,NTRK1,NTRK2	7	0.0243	0.0000	4.9153	0.0014
LY2784544	JAK2	JAK2	6	0.1082	0.0000	4.2668	0.0017
XL019	JAK2	JAK2	6	0.1082	0.0000	4.2668	0.0017
GDC-0032	PIK3CA	PIK3CA	13	0.1497	0.0000	4.1257	0.0022
INK-1117	PIK3CA	PIK3CA	13	0.1497	0.0000	4.1257	0.0022
NVP-BGT226	PIK3CA,MTOR	PIK3CA	15	0.2131	0.0000	3.9725	0.0019
ARQ736	BRAF	BRAF	1	0.0889	0.0100	3.0511	0.0025
CHIR-265	BRAF	BRAF	1	0.0889	0.0100	3.0511	0.0025
REGORAFENIB	KIT,KRAS,FLT4,NTRK1,	BRAF,NTRK1,TEK,CYP3A	63	0.0558	0.0160	3.0493	0.0018
DASATINIB	FYN,LCK,KIT,SRC,YES1	LCK,BRAF,CYP3A4	49	0.2245	0.0050	2.9498	0.0016
DENILEUKIN DIFTI		IL2RA,IL2RB	0	0.0623	0.0310	2.7139	0.0016
RAF265	KDR,BRAF	BRAF	3	0.1095	0.0300	2.4833	0.0023
AT9283	JAK2,JAK3,YES1,AURKB	JAK2,JAK3	12	0.3361	0.0100	2.4736	0.0024
ENMD-2076	FYN,LCK,KIT,JAK2,SRC	JAK2,LCK,NTRK1	87	0.1214	0.0360	2.3593	0.0019
DEFOROLIMUS	MTOR		0	0.4650	0.0140	2.1864	0.0017
METFORMIN	MTOR		0	0.4650	0.0140	2.1864	0.0017
RIDAFOROLIMUS	MTOR		0	0.4650	0.0140	2.1864	0.0017
SORAFENIB	KIT,FLT4,VEGFA,KDR,F	BRAF,CYP3A4	33	0.0953	0.0770	2.1346	0.0021
SORAFENIB TOSYLA	VEGFA,KDR,PDGFRA,PDG	BRAF	17	0.2413	0.0310	2.1262	0.0024
ERISMODEGIB	SMO	SMO	1	0.1363	0.0800	1.9624	0.0028
LY2940680	SMO	SMO	1	0.1363	0.0800	1.9624	0.0028
AZD8055	RICTOR,MTOR,RPTOR		11	0.3947	0.0410	1.7909	0.0020
OSI-027	RICTOR,MTOR,RPTOR		11	0.3947	0.0410	1.7909	0.0020
LY2603618	CHEK1		1	0.4126	0.0550	1.6441	0.0030

SCH900776	CHEK1		1	0.4126	0.0550	1.6441	0.0030
AZD7762	CHEK2,CHEK1		2	0.4396	0.0780	1.4648	0.0015
NELFINAVIR	AKT1		12	0.6105	0.0650	1.4014	0.0017
AKOS004227608	EGFR		11	0.4664	0.0960	1.3489	0.0013
AP26113	EGFR		11	0.4664	0.0960	1.3489	0.0013
CO-1686	EGFR		11	0.4664	0.0960	1.3489	0.0013
ERLOTINIB HYDROC	EGFR		11	0.4664	0.0960	1.3489	0.0013
ICOTINIB	EGFR		11	0.4664	0.0960	1.3489	0.0013
PANITUMUMAB	EGFR		11	0.4664	0.0960	1.3489	0.0013
IMATINIB	KIT,NTRK1,PDGFRA,CSF	NTRK1,PTGS1,CYP3A4	7	0.1242	0.4040	1.2994	0.0022
DOVITINIB	KIT,NTRK1,KDR,PDGFRA	NTRK1	38	0.1066	0.7200	1.1148	0.0022
SUNITINIB	KIT,PDGFB,FLT4,KDR,F	CYP3A4	6	0.0932	0.8810	1.0855	0.0026
PONATINIB	LYN,LCK,KIT,SRC,KDR,	LCK,TEK,CYP3A4	70	0.1413	0.6190	1.0581	0.0016
PAZOPANIB	KIT,FLT4,KDR,FLT1,PD	CYP3A4,SLCO1B1	17	0.1126	0.8370	1.0259	0.0019
AXITINIB	KIT,PDGFB,FLT4,KDR,F	CYP3A4,SLCO1B1	8	0.1157	0.9430	0.9620	0.0024
NA							
NA							

Visualization

We show a circos plot of the driver gene events in outer bands, and gene expression events in the inner bands, colored blue if they are over- or under-expressed, and if one of the key drugs target them. Across the center circle, we show genes that are connected as the top cancer drivers connected to their druggable in-network genes.

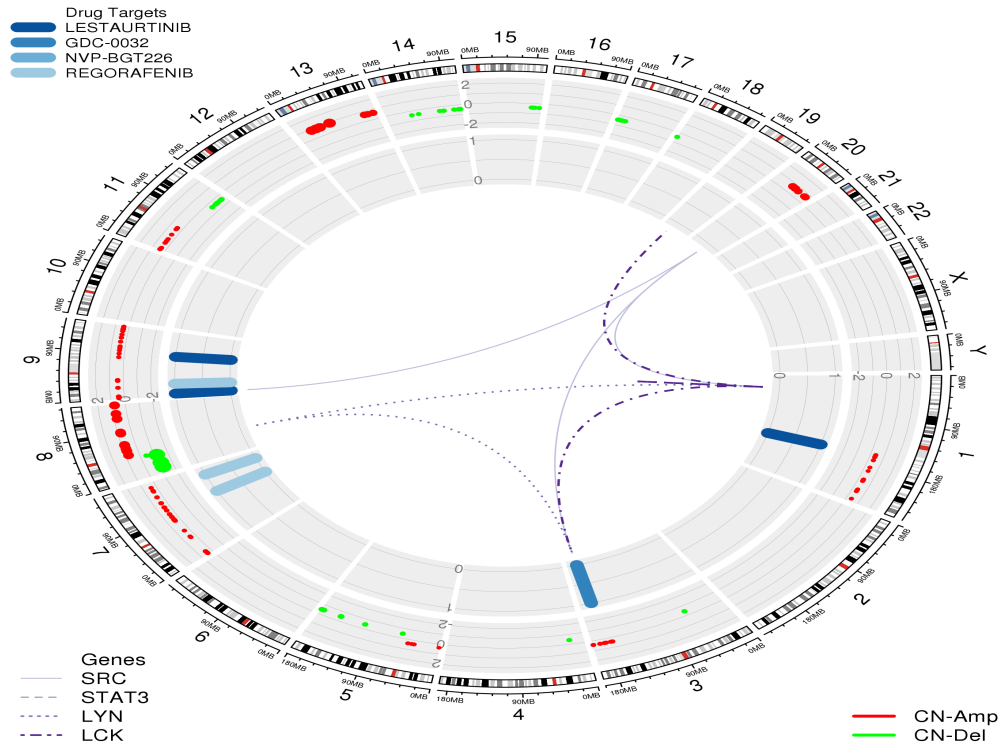


Figure 2: Key driver genomic events connected to gene expression events