

PANOPLY  
**Precision Cancer Genomic Report: Single Sample Inventory**  
Patient TCGA-AR-A1AR

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## 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-AR-A1AR has the following clinical features:

- Clinical Molecular Subtype: Triple Negative
- Age-Group:
- T-stage: 3
- N-stage: N2
- Vital Status: Dead
- Number of Days: 524
- Num 1st degree affected relatives:
- Estimated Tumor Cellularity Percent: 0.3

Matched controls (Alive and Tumor Free for >1000 days) were matched on tumor stage ( $\geq 0$ ) and Age (between 50 and 80). 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.	NA
TCGA-AR-A1AR	Triple Negative	Dead	524	50-59		3 N2	0.30
TCGA-AO-A0JL	Triple Negative	Alive	1683	50-59		3 N2	0.30
TCGA-AR-A0U0	Triple Negative	Alive	1988	70+		2 N1	0.30
TCGA-BH-A0B3	Triple Negative	Alive	1203	50-59		2 N1	0.30
TCGA-E2-A1LI	Triple Negative	Alive	3121	50-59		2 N1	0.30
TCGA-E9-A1ND	Triple Negative	Alive	1266	70+		2 N1	0.30

Matched controls (Alive for >1000 days) were matched to have the same clinical molecular subtype. As the number of matched controls allowed<sup>3</sup> they were also matched based on age (>age50) and N stage (>N0).

### 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:

- Somatic mutations predicted as non-synonymous
- Copy number gain or loss in germline or tumor
- RNA gene with over- or under-expression

#### 3.1 Somatic Variants

Somatic mutations: The variant table also includes all non-synonymous, high-confidence mutations (singular nucleotide variants and insertions and deletions) unique to the non-responder . These somatic mutations must also only be found in the non-responders tumor, and not in her blood. The variant location (CHROM, POS, REF, ALT), Effect, AA.Change, and AD fields described above are also included. The number of times a particular somatic mutation is observed in other responders is represented in the *Count.Matched* column, which are most likely zero.

#### 3.2 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

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
2260	8	38389449	38445293	FGFR1	0/5	AMP	1.624
51552	9	122980237	123003913	RAB14	0/5	AMP	0.383
6418	9	130491682	130498488	SET	0/5	AMP	0.383
8021	9	132990802	133098912	NUP214	0/5	AMP	0.382
7248	9	134756557	134809841	TSC1	0/5	AMP	0.382
2044	4	65872241	66218104	EPHA5	0/5	AMP	0.374
25	9	132579089	132752883	ABL1	0/5	AMP	0.205
1399	22	19601714	19637890	CRKL	0/5	DEL	-0.240
613	22	21852552	21988144	BCR	0/5	DEL	-0.240
6598	22	22459150	22506705	SMARCB1	0/5	DEL	-0.240
2952	22	22706141	22714231	GSTT1	0/5	DEL	-0.240
11200	22	27413731	27467822	CHEK2	0/5	DEL	-0.240
2903	16	9762923	10184112	GRIN2A	0/5	DEL	-0.244
8651	16	11255775	11257540	SOCS1	0/5	DEL	-0.244
2072	16	13921524	13949705	ERCC4	0/5	DEL	-0.244
4629	16	15704495	15858369	MYH11	0/5	DEL	-0.244
7249	16	2038600	2078713	TSC2	0/5	DEL	-0.245
23764	22	36927944	36942460	MAFF	0/5	DEL	-0.246
5155	22	37949665	37970936	PDGFB	0/5	DEL	-0.246
2033	22	39818553	39906024	EP300	0/5	DEL	-0.246
1869	20	31727150	31737854	E2F1	0/5	DEL	-0.252
5933	20	35059592	35157824	RBL1	0/5	DEL	-0.252
6714	20	35406502	35467235	SRC	0/5	DEL	-0.252
4605	20	41729123	41778536	MYBL2	0/5	DEL	-0.252
2778	20	56848190	56919642	GNAS	0/5	DEL	-0.252
1398	17	1272190	1306294	CRK	0/5	DEL	-0.254
1801	17	1880156	1893469	DPH1	0/5	DEL	-0.254

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
7157	17	7512464	7531642	<a href="#">TP53</a>	0/5	DEL	-0.254
9212	17	8048782	8054604	<a href="#">AURKB</a>	0/5	DEL	-0.254
6416	17	11864860	11987776	<a href="#">MAP2K4</a>	0/5	DEL	-0.254
6774	17	37718869	37794039	<a href="#">STAT3</a>	0/5	DEL	-0.254
8678	17	38215678	38229807	<a href="#">BECN1</a>	0/5	DEL	-0.254
672	17	38449840	38530994	<a href="#">BRCA1</a>	0/5	DEL	-0.254
2261	4	1765421	1780396	<a href="#">FGFR3</a>	0/5	DEL	-0.280
7015	5	1306282	1348159	<a href="#">TERT</a>	0/5	DEL	-0.290
2956	2	47863790	47887596	<a href="#">MSH6</a>	0/5	DEL	-0.306
5336	16	80362768	80549399	<a href="#">PLCG2</a>	0/5	DEL	-0.317
2175	16	88331460	88410566	<a href="#">FANCA</a>	0/5	DEL	-0.317
1540	16	49333486	49390029	<a href="#">CYLD</a>	0/5	DEL	-0.323
5934	16	52025901	52083061	<a href="#">RBL2</a>	0/5	DEL	-0.323
9688	16	55339647	55436178	<a href="#">NUP93</a>	0/5	DEL	-0.323
999	16	67328696	67426945	<a href="#">CDH1</a>	0/5	DEL	-0.323
10000	1	241718158	242073176	<a href="#">AKT3</a>	0/5	DEL	-0.360
55294	4	153461860	153675622	<a href="#">FBXW7</a>	0/5	DEL	-0.369
3248	4	175647955	175680186	<a href="#">HPGD</a>	0/5	DEL	-0.369
3660	4	185545909	185632697	<a href="#">IRF2</a>	0/5	DEL	-0.369
1387	16	3716568	3870712	<a href="#">CREBBP</a>	0/5	DEL	-0.607
7516	7	151974516	152004183	<a href="#">XRCC2</a>	0/5	DEL	-0.754
3845	12	25249447	25295121	<a href="#">KRAS</a>	1/5	AMP	0.455
7307	21	43386135	43400757	<a href="#">U2AF1</a>	1/5	AMP	0.446
7074	21	31414352	31853161	<a href="#">TIAM1</a>	1/5	AMP	0.418
2114	21	39099719	39118749	<a href="#">ETS2</a>	1/5	AMP	0.411
5156	4	54790204	54859169	<a href="#">PDGFRA</a>	1/5	AMP	0.374
3815	4	55218918	55301612	<a href="#">KIT</a>	1/5	AMP	0.374

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
3791	4	55639406	55686519	<a href="#">KDR</a>	1/5	AMP	0.374
3490	4	57592001	57671296	<a href="#">IGFBP7</a>	1/5	AMP	0.374
5395	7	5979396	6015232	<a href="#">PMS2</a>	1/5	AMP	0.296
5879	7	6380651	6410123	<a href="#">RAC1</a>	1/5	AMP	0.296
6608	7	128615949	128640622	<a href="#">SMO</a>	1/5	AMP	0.289
673	7	140080746	140271033	<a href="#">BRAF</a>	1/5	AMP	0.289
5644	7	142136904	142140495	<a href="#">PRSS1</a>	1/5	AMP	0.289
3792	7	142348323	142369625	<a href="#">KEL</a>	1/5	AMP	0.289
2146	7	148135408	148212347	<a href="#">EZH2</a>	1/5	AMP	0.289
861	21	35081968	35343465	<a href="#">RUNX1</a>	1/5	AMP	0.244
4097	17	77469438	77478879	<a href="#">MAFG</a>	1/5	DEL	-0.254
4763	17	26446243	26725590	<a href="#">NF1</a>	1/5	DEL	-0.254
23512	17	27288185	27352162	<a href="#">SUZ12</a>	1/5	DEL	-0.254
7703	17	34143676	34158084	<a href="#">PCGF2</a>	1/5	DEL	-0.254
2064	17	35097919	35138441	<a href="#">ERBB2</a>	1/5	DEL	-0.254
7153	17	35798321	35827695	<a href="#">TOP2A</a>	1/5	DEL	-0.254
2695	17	44390917	44400954	<a href="#">GIP</a>	1/5	DEL	-0.254
4804	17	44927666	44947360	<a href="#">NGFR</a>	1/5	DEL	-0.254
8405	17	45031245	45110524	<a href="#">SPOP</a>	1/5	DEL	-0.254
4830	17	46585919	46594449	<a href="#">NME1</a>	1/5	DEL	-0.254
974	17	59359832	59363446	<a href="#">CD79B</a>	1/5	DEL	-0.261
10672	17	60437295	60483216	<a href="#">GNA13</a>	1/5	DEL	-0.261
8313	17	60955143	60988227	<a href="#">AXIN2</a>	1/5	DEL	-0.261
5578	17	61729388	62237324	<a href="#">PRKCA</a>	1/5	DEL	-0.261
54894	17	53786036	53849893	<a href="#">RNF43</a>	1/5	DEL	-0.264
5889	17	54124962	54166691	<a href="#">RAD51C</a>	1/5	DEL	-0.264
83990	17	57114767	57295537	<a href="#">BRIP1</a>	1/5	DEL	-0.264

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
26127	12	26982583	27010129	FGFR1OP2	1/5	DEL	-0.267
894	12	4253199	4284777	CCND2	1/5	DEL	-0.270
8074	12	4347654	4359155	FGF23	1/5	DEL	-0.270
2251	12	4413569	4425041	FGF6	1/5	DEL	-0.270
1108	12	6549509	6586812	CHD4	1/5	DEL	-0.270
51147	12	6629707	6642565	ING4	1/5	DEL	-0.270
6229	10	79463580	79470480	RPS24	1/5	DEL	-0.271
657	10	88506376	88674925	BMPR1A	1/5	DEL	-0.271
4791	10	104145453	104152264	NFKB2	1/5	DEL	-0.271
51684	10	104253754	104383199	SUFU	1/5	DEL	-0.271
1586	10	104580282	104587168	CYP17A1	1/5	DEL	-0.271
2263	10	123227845	123347907	FGFR2	1/5	DEL	-0.271
5287	1	202658384	202726097	PIK3C2B	2/5	AMP	0.404
9641	1	204710419	204736845	IKBKE	2/5	AMP	0.404
84433	7	2912308	3050004	CARD11	2/5	AMP	0.296
3624	7	41695126	41709231	INHBA	2/5	AMP	0.296
7975	7	1536894	1547436	MAFK	2/5	AMP	0.296
54556	7	120378053	120402947	ING3	2/5	AMP	0.289
701	15	38240530	38300629	BUB1B	2/5	DEL	-0.260
5888	15	38774661	38811646	RAD51	2/5	DEL	-0.260
5873	15	53283084	53369293	RAB27A	2/5	DEL	-0.260
8125	15	66859259	66900277	ANP32A	2/5	DEL	-0.260
1027	12	12761576	12766570	CDKN1B	2/5	DEL	-0.270
355	10	90740268	90765522	FAS	2/5	DEL	-0.271
2626	8	11599162	11654918	GATA4	2/5	DEL	-0.276
10395	8	12985243	13416766	DLC1	2/5	DEL	-0.276
196528	12	44409887	44588086	ARID2	2/5	DEL	-0.280

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
466	12	49444128	49500328	ATF1	2/5	DEL	-0.280
91	12	50631753	50677127	ACVR1B	2/5	DEL	-0.280
2065	12	54760159	54783395	ERBB3	2/5	DEL	-0.280
2735	12	56140201	56152312	GLI1	2/5	DEL	-0.280
1649	12	56196638	56200567	DDIT3	2/5	DEL	-0.280
1019	12	56428270	56432431	CDK4	2/5	DEL	-0.280
8091	12	64504507	64646338	HMGA2	2/5	DEL	-0.280
5908	12	67290919	67340641	RAP1B	2/5	DEL	-0.280
4193	12	67488247	67520481	MDM2	2/5	DEL	-0.280
9353	4	19864333	20229886	SLIT2	2/5	DEL	-0.280
8100	13	20039208	20163503	IFT88	2/5	DEL	-0.281
26524	13	20446577	20533654	LATS2	2/5	DEL	-0.281
1024	13	25726756	25876569	CDK8	2/5	DEL	-0.281
1045	13	27434278	27441317	CDX2	2/5	DEL	-0.281
675	13	31787617	31871805	BRCA2	2/5	DEL	-0.281
9365	13	32488571	32538279	KL	2/5	DEL	-0.281
90627	13	32575307	32757892	STARD13	2/5	DEL	-0.281
5925	13	47775912	47954023	RB1	2/5	DEL	-0.281
8660	13	109204185	109236915	IRS2	2/5	DEL	-0.289
3575	5	35892748	35912681	IL7R	2/5	DEL	-0.290
253260	5	38973779	39110260	RICTOR	2/5	DEL	-0.290
2255	5	44340854	44424541	FGF10	2/5	DEL	-0.290
324	5	112101483	112209835	APC	2/5	DEL	-0.290
4015	5	121429918	121441853	LOX	2/5	DEL	-0.290
26277	14	23778693	23781640	TINF2	2/5	DEL	-0.352
4792	14	34940468	34943695	NFKBIA	2/5	DEL	-0.352
57697	14	44674886	44739840	FANCM	2/5	DEL	-0.352

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Table 2: Targetable CNA Regions of Visit 1 Tumor Sample

geneid	CHROM	START	STOP	Gene.Symbol	Count.Matched	Signal	TCGA-AR-A1AR
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### 3.3 RNA Gene Count Outliers

To find RNA gene counts in targetable genes that may be out of range, we use the normalized gene count 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 gene count 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
<a href="#">EEF1A1</a>	17.15	15.44	16.47	15.86	+/+	UP
<a href="#">FN1</a>	17.08	13.71	18.42	16.16	+	UP
<a href="#">ACTB</a>	16.73	16.44	17.95	17.36	-	UP
<a href="#">COL1A1</a>	16.44	13.69	16.74	15.63	+	UP
<a href="#">COL3A1</a>	16.43	13.57	16.00	15.01	+/+	UP
<a href="#">COL1A2</a>	16.18	13.29	16.13	15.08	+/+	UP
<a href="#">B2M</a>	16.09	14.64	17.23	15.99	+	UP
<a href="#">FTH1</a>	15.62	14.90	16.32	15.69	-	UP
<a href="#">PABPC1</a>	15.52	14.85	15.93	15.48	+	UP
<a href="#">HSP90AA1</a>	15.51	14.19	15.29	14.83	+/+	UP
<a href="#">HSPA8</a>	15.49	12.14	15.00	14.27	+/+	UP
<a href="#">ACTG1</a>	15.46	15.24	17.21	16.08	-	UP
<a href="#">PSAP</a>	15.37	14.40	15.15	14.83	+/+	UP
<a href="#">CD74</a>	15.28	13.88	17.05	15.57	-	UP
<a href="#">EEF2</a>	15.25	14.72	15.73	15.13	+	UP
<a href="#">RPS6</a>	15.22	13.82	16.62	14.87	+	UP
<a href="#">CTSB</a>	15.19	13.43	15.07	14.13	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
HSP90AB1	15.08	14.12	16.35	15.31	-	UP
CYP1B1	15.03	8.54	15.29	11.65	+	UP
ENO1	15.02	13.34	15.78	14.92	+	UP
RPS18	14.98	14.36	16.21	15.12	-	UP
HSPA5	14.94	13.75	14.73	14.21	+/+	UP
GAPDH	14.88	15.12	16.73	16.22	-/-	UP
EEF1G	14.77	12.78	14.50	13.82	+/+	UP
APP	14.75	13.84	15.33	14.68	+	UP
UBC	14.72	14.85	15.22	15.03	-/-	UP
YWHAZ	14.70	14.12	15.99	15.32	-	UP
RPLP0	14.67	13.86	14.54	14.28	+/+	UP
CD59	14.62	13.16	14.27	13.63	+/+	UP
IGFBP3	14.61	10.75	14.53	12.82	+/+	UP
LUM	14.58	11.15	13.52	12.43	+/+	UP
VIM	14.55	13.31	15.55	14.59	-	UP
HLA-DRA	14.50	11.95	15.51	14.14	+	UP
RPL15	14.50	13.17	15.06	13.88	+	UP
C3	14.50	9.68	15.84	13.17	+	UP
RPL7A	14.49	12.48	14.33	13.46	+/+	UP
RPS12	14.49	13.20	14.22	13.76	+/+	UP
COL6A3	14.48	11.85	14.39	13.30	+/+	UP
RPS3	14.43	12.71	14.22	13.85	+/+	UP
LDHA	14.39	12.69	14.62	13.87	+	UP
RPL4	14.38	13.80	15.14	14.27	+	UP
SOD2	14.32	11.43	15.15	13.33	+	UP
TPM4	14.30	12.88	14.73	13.92	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
RPL3	14.25	13.67	14.97	14.29	-	UP
RPL11	14.25	13.12	14.33	13.64	+	UP
SPP1	14.23	10.72	15.47	12.71	+	UP
HSP90B1	14.19	14.08	14.94	14.40	-	UP
GNB2L1	14.14	13.61	14.21	13.96	+	UP
HLA-A	14.14	14.39	16.18	15.46	-/-	UP
RPL13A	14.10	12.48	13.90	13.26	+/+	UP
CALR	14.08	14.67	15.31	14.96	-/-	UP
ANXA2	14.03	12.74	15.38	13.90	+	UP
DYNC1H1	13.99	12.66	13.85	13.16	+/+	UP
RPS20	13.99	13.55	17.14	14.78	-	UP
RHOA	13.97	12.86	13.98	13.55	+	UP
RPL30	13.94	13.11	16.05	14.48	-	UP
ADAR	13.93	12.27	14.70	13.78	+	UP
SET	13.91	12.08	13.19	12.79	+/+	UP
ATP1A1	13.91	12.52	14.65	14.10	-	UP
PPP1CB	13.91	13.16	14.32	13.56	+	UP
RPL8	13.91	13.72	16.94	14.98	-	UP
RPS24	13.88	12.98	15.64	14.11	-	UP
MYH9	13.87	14.05	15.88	14.67	-/-	UP
ITGB1	13.86	12.68	14.38	13.65	+	UP
ACTR2	13.80	12.28	13.51	12.97	+/+	UP
CTNNB1	13.79	11.93	14.04	13.36	+	UP
NRP1	13.79	9.78	11.80	11.30	+/+	UP
RPL10	13.78	12.81	14.05	13.48	+	UP
ALDOA	13.78	13.62	15.25	14.54	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
THBS1	13.78	11.61	13.83	12.61	+	UP
BGN	13.75	12.83	14.63	13.50	+	UP
CTSD	13.75	13.21	14.96	14.40	-	UP
HSPD1	13.75	12.42	13.79	13.18	+	UP
RPS19	13.75	13.76	15.07	14.14	-/-	UP
PRKDC	13.75	12.29	14.32	13.29	+	UP
RPS27A	13.74	12.66	13.57	13.16	+/+	UP
RPL35A	13.74	12.39	13.71	13.11	+/+	UP
DCN	13.69	10.91	13.06	11.82	+/+	UP
GNAS	13.67	14.42	18.06	15.35	-/-	UP
DSG1	13.66	2.04	9.37	6.13	+/+	UP
ATP2B4	13.65	10.76	11.85	11.38	+/+	UP
ZFP36L1	13.64	12.34	13.46	12.82	+/+	UP
TPM3	13.61	13.10	14.76	13.78	-	UP
SEC31A	13.60	11.98	12.90	12.43	+/+	UP
RPL27A	13.59	12.93	14.73	13.43	+	UP
CCND1	13.58	8.87	12.81	11.16	+/+	UP
PGK1	13.57	11.55	14.60	13.31	+	UP
YWHAQ	13.57	12.71	13.88	13.28	+	UP
VCAN	13.56	10.65	13.10	11.93	+/+	UP
A2M	13.53	12.67	16.38	13.89	-	UP
SDC1	13.53	12.33	14.32	13.06	+	UP
RPL41	13.52	12.65	13.42	13.16	+/+	UP
COPA	13.51	12.68	14.18	13.42	+	UP
RPL10A	13.50	12.56	13.42	12.91	+/+	UP
RPS13	13.45	12.13	12.95	12.39	+/+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
PRDX1	13.45	13.40	13.79	13.55	-	UP
CTNND1	13.45	11.97	15.33	12.92	+	UP
RPLP2	13.44	12.74	14.84	13.32	+	UP
NOTCH3	13.43	10.90	12.59	11.96	+/+	UP
RPL14	13.42	12.52	14.79	13.21	+	UP
YWHAE	13.39	13.24	13.95	13.59	-	UP
RPL26	13.39	12.40	13.93	13.11	+	UP
ANXA1	13.39	11.12	12.92	12.15	+/+	UP
IQGAP1	13.35	11.53	13.20	12.41	+/+	UP
RPS16	13.33	13.18	14.29	13.62	-	UP
RPS15A	13.32	12.26	14.37	13.30	+	UP
TLN1	13.30	12.60	13.18	12.99	+/+	UP
UBA52	13.30	12.67	14.10	13.12	+	UP
P4HB	13.27	13.72	15.76	14.58	-/-	UP
EIF4G1	13.27	12.04	13.90	13.08	+	UP
COL6A1	13.25	12.44	13.94	13.16	+	UP
IFI16	13.24	9.94	12.68	11.56	+/+	UP
RPS2	13.22	13.16	15.48	13.98	-	UP
RPL23	13.21	12.30	16.18	13.41	-	UP
RPL29	13.21	12.03	14.89	13.16	+	UP
CDC42	13.21	12.17	12.75	12.48	+/+	UP
NOTCH2	13.20	11.34	13.20	12.30	+	UP
TPR	13.19	11.98	12.90	12.33	+/+	UP
RPL19	13.19	13.45	17.40	14.51	-/-	UP
YWHAG	13.19	12.12	13.25	12.59	+	UP
MYL12A	13.19	12.32	13.82	13.23	-	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
RAC1	13.18	12.26	13.29	12.76	+	UP
RPS5	13.18	12.32	13.06	12.64	+/+	UP
ACTR3	13.17	12.08	13.24	12.75	+	UP
HDGF	13.17	13.35	14.81	13.97	-/-	UP
RPL22	13.16	12.06	13.06	12.62	+/+	UP
SPTAN1	13.16	11.47	12.75	12.20	+/+	UP
RPL18	13.16	12.49	15.01	13.52	-	UP
LRPPRC	13.15	11.04	13.20	12.07	+	UP
ARF1	13.15	13.05	15.05	14.05	-	UP
KIF5B	13.14	11.47	13.77	12.39	+	UP
DSG2	13.14	11.95	13.22	12.63	+	UP
EIF3E	13.13	12.06	14.05	13.23	-	UP
STAT1	13.13	10.24	15.19	13.61	-	UP
XPO1	13.13	11.56	12.63	12.09	+/+	UP
UBE2D3	13.12	11.76	12.55	12.08	+/+	UP
NCKAP1	13.11	11.73	12.87	12.47	+/+	UP
HMOX1	13.11	9.30	11.32	10.62	+/+	UP
RAD21	13.11	11.74	14.64	13.53	-	UP
PAICS	13.11	11.33	12.39	11.88	+/+	UP
RPS14	13.09	12.53	14.23	13.18	-	UP
RPS17	13.09	11.94	14.04	13.05	+	UP
MMP2	13.08	10.97	13.73	12.18	+	UP
HLA-DPA1	13.08	10.92	14.66	12.86	+	UP
EIF4A2	13.08	12.08	12.69	12.29	+/+	UP
LGR4	13.07	7.91	9.40	8.76	+/+	UP
KPNA2	13.07	11.39	13.05	12.27	+/+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
SMARCC1	13.07	11.70	12.91	12.18	+/+	UP
RPL27	13.07	11.87	12.98	12.50	+/+	UP
RPL24	13.04	12.17	14.28	13.16	-	UP
CCT8	13.03	11.65	13.18	12.37	+	UP
RPL6	13.03	11.88	13.97	12.84	+	UP
RPL37	13.01	11.66	15.79	13.09	-	UP
H3F3A	12.99	11.30	15.13	12.88	+	UP
ITGAV	12.97	10.65	11.52	10.94	+/+	UP
PARP1	12.96	11.66	13.06	12.45	+	UP
KDM5B	12.94	11.16	12.32	11.62	+/+	UP
COL6A2	12.94	12.61	14.79	13.62	-	UP
PPIA	12.94	12.45	13.58	12.89	+	UP
CALM1	12.94	12.31	13.53	12.87	+	UP
C1S	12.94	10.42	13.98	12.88	+	UP
RPS29	12.93	11.73	12.31	12.06	+/+	UP
DDB1	12.93	11.62	12.83	12.35	+/+	UP
RPS10	12.89	12.11	13.45	12.87	+	UP
RPL13	12.88	12.69	16.05	13.93	-	UP
MYL6	12.88	12.96	14.59	13.89	-/-	UP
BSG	12.87	12.08	14.80	13.41	-	UP
RPS9	12.86	12.38	13.80	12.96	-	UP
IARS	12.85	10.32	12.46	11.58	+/+	UP
UBB	12.85	13.42	14.42	13.91	-/-	UP
RPL35	12.85	11.48	14.33	12.63	+	UP
SPTBN1	12.83	11.53	12.94	12.25	+	UP
MARCKS	12.82	11.90	12.56	12.06	+/+	UP

(cont'd next page)



Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
UBR4	12.82	10.29	12.61	11.70	+/+	UP
TIMP2	12.79	11.89	13.82	12.66	+	UP
CCT4	12.79	10.74	12.58	12.08	+/+	UP
RAB14	12.78	10.49	11.62	11.08	+/+	UP
RPSA	12.75	12.15	13.11	12.53	+	UP
YWHAB	12.75	12.78	13.21	13.00	-/-	UP
PTGES3	12.75	11.72	12.73	12.39	+/+	UP
CD44	12.73	11.53	13.45	12.82	-	UP
CHD4	12.73	12.08	12.63	12.41	+/+	UP
EIF4B	12.72	11.65	12.52	11.93	+/+	UP
SMC4	12.71	10.73	12.35	11.50	+/+	UP
HMGN1	12.70	11.50	12.74	12.03	+	UP
HLA-DQA1	12.70	7.38	13.30	11.11	+	UP
IFNGR1	12.69	10.41	12.00	11.06	+/+	UP
B4GALT1	12.69	11.46	13.44	12.55	+	UP
TOP2A	12.68	11.59	13.53	12.51	+	UP
CTSK	12.67	9.79	12.44	11.05	+/+	UP
AP2M1	12.66	11.98	13.44	12.55	+	UP
MAGED1	12.66	10.34	13.03	12.16	+	UP
TNFSF10	12.66	8.59	12.89	11.14	+	UP
H2AFZ	12.64	11.79	13.68	12.50	+	UP
JAK1	12.64	10.93	12.51	11.86	+/+	UP
RPS3A	12.63	10.45	12.50	11.68	+/+	UP
RBBP4	12.62	11.16	12.88	11.94	+	UP
GNAI2	12.61	11.72	12.85	12.43	+	UP
YAP1	12.61	10.61	12.27	11.32	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
GSTP1	12.60	10.72	13.54	12.40	+	UP
STAT3	12.58	10.77	13.25	12.49	+	UP
NUP210	12.57	9.72	12.39	11.51	+/+	UP
BHLHE40	12.57	10.26	12.88	11.77	+	UP
PIK3R3	12.52	10.62	12.56	11.65	+	UP
KPNB1	12.52	11.96	12.89	12.66	-	UP
HLA-DRB1	12.52	8.71	14.43	12.41	+	UP
WASF2	12.51	11.24	12.23	11.75	+/+	UP
MMP9	12.50	9.24	13.22	11.22	+	UP
IFNGR2	12.48	10.53	11.63	11.05	+/+	UP
HSPA9	12.48	12.03	14.17	12.63	-	UP
TPP1	12.47	10.95	12.15	11.49	+/+	UP
SAT1	12.47	11.82	12.78	12.19	+	UP
ARHGEF12	12.47	11.41	12.34	11.88	+/+	UP
TNPO1	12.46	10.48	11.39	10.84	+/+	UP
VAV3	12.45	8.13	11.40	10.19	+/+	UP
CYCS	12.44	10.91	12.89	11.76	+	UP
PSMD1	12.43	11.05	11.74	11.42	+/+	UP
FKBP1A	12.42	12.28	12.69	12.44	-	UP
HSPA1A	12.42	13.03	14.67	13.49	-/-	UP
HIF1A	12.42	11.15	12.83	11.82	+	UP
SQSTM1	12.41	12.42	13.28	12.88	-/-	UP
IGFBP4	12.41	11.05	13.42	12.33	+	UP
MMP14	12.40	11.76	14.26	12.65	-	UP
RAB10	12.39	11.65	12.95	12.18	+	UP
HMGB1	12.38	12.23	13.35	12.61	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
TPM1	12.38	12.17	13.80	12.81	-	UP
GSN	12.37	12.16	13.28	12.85	-	UP
C1R	12.37	10.97	13.57	12.54	-	UP
RPL36	12.35	12.59	14.46	13.12	-/-	UP
CALD1	12.35	11.59	12.96	12.45	-	UP
DDX6	12.35	11.49	12.10	11.84	+/+	UP
NUP98	12.34	10.52	11.49	11.15	+/+	UP
KIT	12.33	4.61	13.24	8.34	+	UP
ETS1	12.33	10.88	12.08	11.43	+/+	UP
DTX3L	12.33	9.30	11.82	11.18	+/+	UP
RANBP2	12.32	11.06	11.73	11.52	+/+	UP
HSPG2	12.31	11.25	12.71	11.91	+	UP
RAB6A	12.31	11.57	12.33	12.00	+	UP
TUBA1A	12.30	10.97	12.79	12.14	+	UP
CD36	12.30	7.15	11.21	8.68	+/+	UP
CSNK1A1	12.27	11.96	13.14	12.37	-	UP
ASH2L	12.27	9.38	10.59	9.89	+/+	UP
SUMO3	12.27	11.26	12.28	11.80	+	UP
ADAM15	12.27	12.08	13.43	12.73	-	UP
PAK2	12.26	10.88	11.93	11.42	+/+	UP
CTSS	12.26	9.27	12.42	11.50	+	UP
SMARCA5	12.25	10.07	11.43	11.02	+/+	UP
FABP4	12.25	-0.17	8.37	4.42	+/+	UP
GARS	12.25	11.29	12.99	12.18	+	UP
ASPH	12.25	11.88	12.57	12.18	+	UP
EGR1	12.24	9.63	11.01	10.24	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
BAZ1B	12.24	10.85	12.54	11.82	+	UP
YES1	12.23	10.69	12.22	11.58	+/+	UP
HDAC2	12.23	10.91	12.28	11.51	+	UP
CDK6	12.23	7.97	11.20	9.80	+/+	UP
GNAI3	12.22	10.30	12.16	11.48	+/+	UP
EIF5A	12.21	12.87	14.08	13.34	-/-	UP
SLC34A2	12.21	6.02	14.30	11.10	+	UP
CDH1	12.19	11.89	13.15	12.66	-	UP
ADAM9	12.18	10.33	11.86	10.89	+/+	UP
MAT2A	12.17	11.45	12.41	11.81	+	UP
VDAC1	12.17	11.39	12.38	12.07	+	UP
ANTXR1	12.16	9.83	13.24	11.21	+	UP
HLA-E	12.13	11.97	14.37	13.56	-	UP
CCT5	12.13	11.98	13.89	12.80	-	UP
RAN	12.13	11.70	12.70	12.17	-	UP
CTGF	12.13	11.08	13.33	11.86	+	UP
NME2	12.13	12.24	13.85	13.04	-/-	UP
FOS	12.12	9.12	10.09	9.67	+/+	UP
COL4A2	12.12	12.61	14.00	13.35	-/-	UP
CAPN1	12.12	10.87	12.94	12.17	-	UP
VCL	12.12	11.36	13.00	12.10	+	UP
ARID1A	12.11	10.94	11.48	11.32	+/+	UP
AP2B1	12.11	11.51	12.56	11.95	+	UP
SKP1	12.11	10.65	11.90	11.53	+/+	UP
STAG2	12.10	10.80	11.62	11.03	+/+	UP
TXN	12.10	11.18	12.36	11.81	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
GABARAP	12.09	12.53	13.44	12.79	-/-	UP
ARPC1B	12.07	10.76	13.15	12.08	-	UP
PPP2R1A	12.06	12.18	13.17	12.57	-/-	UP
SMC1A	12.06	10.56	11.74	11.38	+/+	UP
CD47	12.06	10.72	13.09	11.82	+	UP
BMPR2	12.05	10.36	11.18	10.74	+/+	UP
JUP	12.05	11.86	13.64	12.98	-	UP
ADAM12	12.05	8.71	11.46	9.79	+/+	UP
RPL38	12.04	11.41	13.85	12.41	-	UP
OGT	12.04	10.71	12.42	11.51	+	UP
MAPKAPK2	12.03	11.10	12.49	11.94	+	UP
PSMA2	12.03	10.88	11.86	11.48	+/+	UP
CD9	12.02	11.50	12.76	12.28	-	UP
PDGFRA	12.02	8.77	10.49	9.55	+/+	UP
MAP4K4	12.01	11.48	12.15	11.87	+	UP
ACP5	12.01	8.49	10.70	9.78	+/+	UP
MYC	12.00	10.29	11.40	10.94	+/+	UP
POLR2A	11.98	10.52	12.51	11.95	+	UP
PDS5A	11.97	11.17	12.19	11.76	+	UP
IMPDH2	11.93	11.46	11.88	11.64	+/+	UP
SMG1	11.93	11.26	11.88	11.54	+/+	UP
GLO1	11.93	11.39	13.18	11.96	-	UP
ELAVL1	11.92	10.93	11.48	11.31	+/+	UP
TBL1XR1	11.92	11.18	12.83	12.03	-	UP
GNG12	11.92	9.95	11.60	11.08	+/+	UP
HYOU1	11.90	11.70	13.31	12.32	-	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
EZR	11.90	11.44	12.95	12.36	-	UP
CPT1A	11.89	8.89	11.24	9.64	+/+	UP
TRRAP	11.89	10.90	12.09	11.46	+	UP
NFIX	11.88	10.23	12.94	12.08	-	UP
NRAS	11.88	8.86	11.94	10.31	+	UP
NFIB	11.88	11.61	13.78	12.50	-	UP
ANPEP	11.87	8.20	12.34	10.00	+	UP
PPP2R5C	11.87	10.83	11.52	11.15	+/+	UP
MCM4	11.87	9.95	13.56	11.86	+	UP
INSR	11.86	9.58	11.59	10.31	+/+	UP
SOD1	11.85	11.16	12.98	12.08	-	UP
NAMPT	11.85	10.69	13.50	11.70	+	UP
DNAJB1	11.84	11.11	12.19	11.69	+	UP
APPL1	11.84	9.97	11.27	10.65	+/+	UP
EPHA4	11.83	6.44	9.60	7.75	+/+	UP
EPAS1	11.83	10.63	11.71	11.18	+/+	UP
CXCL12	11.83	9.31	10.16	9.82	+/+	UP
PTPN11	11.82	11.02	11.83	11.52	+	UP
DYRK1A	11.82	10.23	10.96	10.52	+/+	UP
PEBP1	11.82	12.20	13.57	12.79	-/-	UP
YWHAH	11.81	11.28	12.88	12.11	-	UP
PTPRC	11.81	7.63	11.21	9.86	+/+	UP
TAB2	11.81	9.97	11.80	11.08	+/+	UP
SERPINE1	11.80	8.20	10.64	9.53	+/+	UP
PBRM1	11.80	9.93	10.93	10.55	+/+	UP
ITGA5	11.79	10.48	12.15	11.32	+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
SP1	11.79	10.44	11.60	11.07	+/+	UP
LARS	11.79	10.61	12.63	11.35	+	UP
MCM6	11.79	10.00	11.57	10.86	+/+	UP
CD4	11.78	8.78	12.10	10.57	+	UP
MAPK1	11.78	10.90	11.97	11.46	+	UP
KRAS	11.78	9.71	10.62	10.16	+/+	UP
NUP153	11.78	10.16	11.98	11.11	+	UP
IFNAR1	11.77	9.89	11.58	10.58	+/+	UP
IGFBP5	11.76	11.06	14.99	12.45	-	UP
MYO6	11.76	10.70	11.85	11.31	+	UP
SCD	11.75	10.09	13.94	12.74	-	UP
TALDO1	11.74	11.78	12.24	12.10	-/-	UP
PPP6C	11.73	10.05	10.79	10.47	+/+	UP
MCM7	11.73	11.36	12.58	12.15	-	UP
SUMO1	11.72	10.02	12.22	11.10	+	UP
S100A10	11.72	10.50	13.99	12.55	-	UP
OPTN	11.72	9.75	12.79	11.71	+	UP
CCT2	11.71	10.65	12.27	11.52	+	UP
GRB10	11.70	10.05	11.69	10.71	+/+	UP
GNB4	11.70	10.09	11.63	10.83	+/+	UP
HLA-DQB1	11.69	9.51	13.49	11.71	-	UP
PPP1CC	11.69	11.52	11.66	11.56	+/+	UP
TGFBR2	11.69	9.32	12.25	10.48	+	UP
GORASP2	11.68	11.11	12.08	11.70	-	UP
SEL1L	11.68	10.46	11.63	11.11	+/+	UP
ABCA1	11.68	8.54	10.41	9.13	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
ICAM1	11.67	8.50	12.73	11.12	+	UP
HLA-DPB1	11.65	10.09	13.08	11.97	-	UP
PLOD2	11.65	10.14	11.86	10.90	+	UP
DLD	11.64	9.75	11.41	10.83	+/+	UP
KHSRP	11.64	11.31	11.73	11.54	+	UP
BCAP31	11.64	12.03	13.52	12.62	-/-	UP
XPOT	11.64	11.06	12.32	11.59	+	UP
NCBP2	11.63	10.63	11.07	10.87	+/+	UP
SHC1	11.62	11.42	12.46	11.94	-	UP
VWF	11.62	10.30	11.39	11.01	+/+	UP
EPS15	11.61	10.09	11.09	10.69	+/+	UP
HK1	11.60	11.44	12.17	11.94	-	UP
WTAP	11.58	10.06	11.77	10.90	+	UP
PLAU	11.58	9.84	11.96	10.64	+	UP
EXT2	11.58	10.23	11.75	10.75	+	UP
RHEB	11.58	10.59	11.23	10.84	+/+	UP
ACSL3	11.57	11.20	11.82	11.40	+	UP
RAF1	11.57	9.92	11.53	11.08	+/+	UP
PTK2	11.57	10.84	12.39	11.79	-	UP
B4GALT5	11.56	10.02	11.56	11.07	+/+	UP
ATF4	11.56	12.43	13.49	12.76	-/-	UP
PRLR	11.55	8.90	10.28	9.93	+/+	UP
SRRM1	11.55	10.51	11.50	10.93	+/+	UP
PTPRK	11.54	10.68	12.24	11.61	-	UP
EIF2S1	11.54	9.84	11.27	10.83	+/+	UP
PRKACB	11.53	8.58	9.74	9.07	+/+	UP

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Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
GNA13	11.53	10.43	11.00	10.83	+/+	UP
SMARCA4	11.52	11.64	12.46	11.88	-/-	UP
RPL18A	11.51	10.23	11.90	11.10	+	UP
BUB1	11.51	9.42	10.88	10.25	+/+	UP
ABL1	11.51	9.83	11.49	10.59	+/+	UP
MYD88	11.51	9.97	12.47	11.36	+	UP
RALGDS	11.50	10.16	10.75	10.51	+/+	UP
ADD1	11.50	11.33	11.98	11.61	-	UP
USP7	11.50	11.33	12.12	11.67	-	UP
BIRC2	11.50	9.61	11.29	10.46	+/+	UP
SUMO2	11.50	11.50	12.31	11.90	-/-	UP
ECT2	11.49	9.04	11.17	10.15	+/+	UP
NUP214	11.49	9.96	10.77	10.48	+/+	UP
SEC62	11.49	11.00	11.88	11.40	+	UP
SMARCA2	11.48	10.84	11.74	11.26	+	UP
AHCY	11.48	11.32	12.15	11.93	-	UP
ITGB5	11.48	9.59	11.78	10.42	+	UP
PPP2CA	11.48	10.55	11.65	11.21	+	UP
FCGR3A	11.47	9.78	12.90	11.21	+	UP
LSM1	11.47	8.88	9.79	9.22	+/+	UP
RBBP7	11.46	10.87	12.27	11.64	-	UP
VCAM1	11.46	8.42	10.60	9.57	+/+	UP
CASP2	11.46	10.25	10.99	10.60	+/+	UP
STEAP3	11.45	10.40	11.79	11.05	+	UP
EXOC4	11.45	9.75	11.00	10.35	+/+	UP
IRS1	11.45	7.07	8.93	8.06	+/+	UP

(cont'd next page)

Table 3: Targetable Expressed Genes with Matched Patient Comparison

gene	gcount	match.min	match.max	match.mean	Compare	UPDOWN
<a href="#">CUL4B</a>	11.45	10.48	11.04	10.74	+/+	UP
<a href="#">RRM2</a>	11.45	9.32	11.74	10.95	+	UP
<a href="#">SMAD2</a>	11.44	10.65	11.37	11.10	+/+	UP
<a href="#">NFKB1</a>	11.44	9.35	10.55	10.13	+/+	UP
<a href="#">MCM3</a>	11.44	10.70	13.03	12.22	-	UP
<a href="#">HEXB</a>	11.44	10.10	11.28	10.88	+/+	UP
<a href="#">PRKACA</a>	11.44	10.88	11.76	11.28	+	UP
<a href="#">MSH2</a>	11.43	9.01	11.14	10.33	+/+	UP
<a href="#">SKI</a>	11.43	10.53	11.21	10.93	+/+	UP
<a href="#">NNMT</a>	11.42	10.35	11.71	11.10	+	UP
<a href="#">MAPKAP1</a>	11.42	10.12	11.06	10.57	+/+	UP
<a href="#">PRPF19</a>	11.42	10.88	11.99	11.45	-	UP
<a href="#">CDK1</a>	11.42	10.02	11.54	10.54	+	UP

## 4 Single Gene Targets

Of the single gene events indicated above, we show a table of which ones have a drug that argets 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	Variant	CN	Expr	type	Source
<a href="#">A2M</a>	-	-	UP	-	-
<a href="#">ABCA1</a>	-	-	UP	-	-
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	n/a	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	n/a	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank
<a href="#">ABL1</a>	-	Amp	UP	n/a	DrugBank
<a href="#">ABL1</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">ACP5</a>	-	-	UP	-	-
<a href="#">ACSL3</a>	-	-	UP	-	-
<a href="#">ACTB</a>	-	-	UP	-	-
<a href="#">ACTG1</a>	-	-	UP	-	-
<a href="#">ACTR2</a>	-	-	UP	-	-
<a href="#">ACTR3</a>	-	-	UP	-	-
<a href="#">ACVR1B</a>	-	Del	-	-	-
<a href="#">ADAM12</a>	-	-	UP	-	-
<a href="#">ADAM15</a>	-	-	UP	-	-
<a href="#">ADAM9</a>	-	-	UP	-	-
<a href="#">ADAR</a>	-	-	UP	-	-
<a href="#">ADD1</a>	-	-	UP	-	-
<a href="#">AHCY</a>	-	-	UP	-	-
<a href="#">AKT3</a>	-	Del	-	n/a	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
AKT3	-	Del	-	n/a	DGIdb
AKT3	-	Del	-	n/a	DGIdb
AKT3	-	Del	-	inhibitor	DGIdb
AKT3	-	Del	-	n/a	DGIdb
AKT3	-	Del	-	inhibitor	DGIdb
AKT3	-	Del	-	inhibitor	DGIdb
AKT3	-	Del	-	n/a	DGIdb
AKT3	-	Del	-	n/a	DGIdb
ALDOA	-	-	UP	-	-
ANP32A	-	Del	-	-	-
ANPEP	-	-	UP	-	-
ANTXR1	-	-	UP	-	-
ANXA1	-	-	UP	-	-
ANXA2	-	-	UP	-	-
AP2B1	-	-	UP	-	-
AP2M1	-	-	UP	-	-
APC	-	Del	-	-	-
APP	-	-	UP	-	-
APPL1	-	-	UP	-	-
ARF1	-	-	UP	-	-
ARHGEF12	-	-	UP	-	-
ARID1A	-	-	UP	-	-
ARID2	-	Del	-	-	-
ARPC1B	-	-	UP	-	-
ASH2L	-	-	UP	-	-
ASPH	-	-	UP	-	-
ATF1	-	Del	-	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">ATF4</a>	-	-	UP	-	-
<a href="#">ATP1A1</a>	-	-	UP	-	-
<a href="#">ATP2B4</a>	-	-	UP	-	-
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AURKB</a>	-	Del	-	n/a	DGIdb
<a href="#">AURKB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">AXIN2</a>	-	Del	-	-	-
<a href="#">B2M</a>	-	-	UP	-	-
<a href="#">B4GALT1</a>	-	-	UP	-	-
<a href="#">B4GALT5</a>	-	-	UP	-	-
<a href="#">BAZ1B</a>	-	-	UP	-	-
<a href="#">BCAP31</a>	-	-	UP	-	-
<a href="#">BCR</a>	-	Del	-	inhibitor	DGIdb
<a href="#">BCR</a>	-	Del	-	n/a	DrugBank
<a href="#">BCR</a>	-	Del	-	n/a	DrugBank
<a href="#">BCR</a>	-	Del	-	inhibitor	DGIdb
<a href="#">BCR</a>	-	Del	-	inhibitor	DGIdb
<a href="#">BCR</a>	-	Del	-	inhibitor	DGIdb
<a href="#">BECN1</a>	-	Del	-	-	-
<a href="#">BGN</a>	-	-	UP	-	-
<a href="#">BHLHE40</a>	-	-	UP	-	-
<a href="#">BIRC2</a>	-	-	UP	antagonist	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
BIRC2	-	-	UP	n/a	DGIdb
BIRC2	-	-	UP	antagonist	DGIdb
BMPR1A	-	Del	-	-	-
BMPR2	-	-	UP	-	-
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	n/a	DGIdb
BRAF	-	Amp	-	n/a	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	n/a	DrugBank
BRAF	-	Amp	-	n/a	DrugBank
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	n/a	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	n/a	DrugBank
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	n/a	DGIdb
BRAF	-	Amp	-	n/a	DrugBank
BRAF	-	Amp	-	inhibitor	DGIdb
BRAF	-	Amp	-	inhibitor	DGIdb
BRCA1	-	Del	-	n/a	DGIdb
BRCA1	-	Del	-	n/a	DGIdb
BRCA1	-	Del	-	n/a	DGIdb
BRCA1	-	Del	-	n/a	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
BRCA1	-	Del	-	n/a	DGIdb
BRCA2	-	Del	-	n/a	DGIdb
BRCA2	-	Del	-	n/a	DGIdb
BRCA2	-	Del	-	n/a	DGIdb
BRCA2	-	Del	-	n/a	DGIdb
BRIP1	-	Del	-	-	-
BSG	-	-	UP	-	-
BUB1	-	-	UP	-	-
BUB1B	-	Del	-	-	-
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1R	-	-	UP	n/a	DrugBank
C1S	-	-	UP	n/a	DrugBank
C1S	-	-	UP	n/a	DrugBank
C1S	-	-	UP	n/a	DrugBank
C1S	-	-	UP	n/a	DrugBank
C1S	-	-	UP	n/a	DrugBank
C3	-	-	UP	-	-
CALD1	-	-	UP	-	-
CALM1	-	-	UP	-	-
CALR	-	-	UP	-	-
CAPN1	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">CARD11</a>	-	Amp	-	-	-
<a href="#">CASP2</a>	-	-	UP	-	-
<a href="#">CCND1</a>	-	-	UP	n/a	DrugBank
<a href="#">CCND1</a>	-	-	UP	n/a	DGIdb
<a href="#">CCND1</a>	-	-	UP	n/a	DGIdb
<a href="#">CCND2</a>	-	Del	-	n/a	DGIdb
<a href="#">CCND2</a>	-	Del	-	n/a	DGIdb
<a href="#">CCT2</a>	-	-	UP	-	-
<a href="#">CCT4</a>	-	-	UP	-	-
<a href="#">CCT5</a>	-	-	UP	-	-
<a href="#">CCT8</a>	-	-	UP	-	-
<a href="#">CD36</a>	-	-	UP	n/a	DGIdb
<a href="#">CD4</a>	-	-	UP	n/a	DailyMed
<a href="#">CD44</a>	-	-	UP	-	-
<a href="#">CD47</a>	-	-	UP	n/a	DGIdb
<a href="#">CD59</a>	-	-	UP	-	-
<a href="#">CD74</a>	-	-	UP	-	-
<a href="#">CD79B</a>	-	Del	-	-	-
<a href="#">CD9</a>	-	-	UP	-	-
<a href="#">CDC42</a>	-	-	UP	-	-
<a href="#">CDH1</a>	-	Del	UP	-	-
<a href="#">CDK1</a>	-	-	UP	inhibitor	DGIdb
<a href="#">CDK1</a>	-	-	UP	inhibitor	DGIdb
<a href="#">CDK4</a>	-	Del	-	n/a	DGIdb
<a href="#">CDK4</a>	-	Del	-	inhibitor	DGIdb
<a href="#">CDK4</a>	-	Del	-	n/a	DrugBank
<a href="#">CDK4</a>	-	Del	-	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
CDK4	-	Del	-	n/a	DGIdb
CDK4	-	Del	-	inhibitor	DGIdb
CDK6	-	-	UP	n/a	DrugBank
CDK6	-	-	UP	inhibitor	DGIdb
CDK6	-	-	UP	inhibitor	DGIdb
CDK6	-	-	UP	n/a	DGIdb
CDK6	-	-	UP	inhibitor	DGIdb
CDK6	-	-	UP	n/a	DGIdb
CDK8	-	Del	-	-	-
CDKN1B	-	Del	-	-	-
CDX2	-	Del	-	-	-
CHD4	-	Del	UP	-	-
CHEK2	-	Del	-	inhibitor	DGIdb
COL1A1	-	-	UP	-	-
COL1A2	-	-	UP	-	-
COL3A1	-	-	UP	-	-
COL4A2	-	-	UP	-	-
COL6A1	-	-	UP	-	-
COL6A2	-	-	UP	-	-
COL6A3	-	-	UP	-	-
COPA	-	-	UP	-	-
CPT1A	-	-	UP	-	-
CREBBP	-	Del	-	-	-
CRK	-	Del	-	-	-
CRKL	-	Del	-	-	-
CSNK1A1	-	-	UP	-	-
CTGF	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">CTNNB1</a>	-	-	UP	-	-
<a href="#">CTNND1</a>	-	-	UP	-	-
<a href="#">CTSB</a>	-	-	UP	-	-
<a href="#">CTSD</a>	-	-	UP	-	-
<a href="#">CTSK</a>	-	-	UP	-	-
<a href="#">CTSS</a>	-	-	UP	-	-
<a href="#">CUL4B</a>	-	-	UP	-	-
<a href="#">CXCL12</a>	-	-	UP	-	-
<a href="#">CYCS</a>	-	-	UP	-	-
<a href="#">CYLD</a>	-	Del	-	-	-
<a href="#">CYP17A1</a>	-	Del	-	n/a	DrugBank
<a href="#">CYP17A1</a>	-	Del	-	n/a	DGIdb
<a href="#">CYP17A1</a>	-	Del	-	n/a	DGIdb
<a href="#">CYP17A1</a>	-	Del	-	inhibitor	DGIdb
<a href="#">CYP17A1</a>	-	Del	-	inhibitor	DGIdb
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DGIdb
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank
<a href="#">CYP1B1</a>	-	-	UP	n/a	DrugBank

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
CYP1B1	-	-	UP	n/a	DrugBank
CYP1B1	-	-	UP	n/a	DrugBank
DCN	-	-	UP	-	-
DDB1	-	-	UP	-	-
DDIT3	-	Del	-	-	-
DDX6	-	-	UP	-	-
DLC1	-	Del	-	-	-
DLD	-	-	UP	-	-
DNAJB1	-	-	UP	-	-
DPH1	-	Del	-	-	-
DSG1	-	-	UP	-	-
DSG2	-	-	UP	-	-
DTX3L	-	-	UP	-	-
DYNC1H1	-	-	UP	-	-
DYRK1A	-	-	UP	-	-
E2F1	-	Del	-	-	-
ECT2	-	-	UP	-	-
EEF1A1	-	-	UP	-	-
EEF1G	-	-	UP	-	-
EEF2	-	-	UP	-	-
EGR1	-	-	UP	-	-
EIF2S1	-	-	UP	-	-
EIF3E	-	-	UP	-	-
EIF4A2	-	-	UP	-	-
EIF4B	-	-	UP	-	-
EIF4G1	-	-	UP	-	-
EIF5A	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">ELAVL1</a>	-	-	UP	-	-
<a href="#">ENO1</a>	-	-	UP	-	-
<a href="#">EP300</a>	-	Del	-	-	-
<a href="#">EPAS1</a>	-	-	UP	-	-
<a href="#">EPHA4</a>	-	-	UP	-	-
<a href="#">EPHA5</a>	-	Amp	-	-	-
<a href="#">EPS15</a>	-	-	UP	-	-
<a href="#">ERBB2</a>	-	Del	-	n/a	DGIdb
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DGIdb
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB2</a>	-	Del	-	n/a	DrugBank
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">ERBB2</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB3</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB3</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB3</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB3</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERBB3</a>	-	Del	-	inhibitor	DGIdb
<a href="#">ERCC4</a>	-	Del	-	-	-
<a href="#">ETS1</a>	-	-	UP	-	-
<a href="#">ETS2</a>	-	Amp	-	-	-
<a href="#">EXOC4</a>	-	-	UP	-	-
<a href="#">EXT2</a>	-	-	UP	-	-
<a href="#">EZH2</a>	-	Amp	-	-	-
<a href="#">EZR</a>	-	-	UP	-	-
<a href="#">FABP4</a>	-	-	UP	-	-
<a href="#">FANCA</a>	-	Del	-	-	-
<a href="#">FANCM</a>	-	Del	-	-	-
<a href="#">FAS</a>	-	Del	-	-	-
<a href="#">FBXW7</a>	-	Del	-	-	-
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FCGR3A</a>	-	-	UP	n/a	DrugBank
<a href="#">FGF10</a>	-	Del	-	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
FGF23	-	Del	-	-	-
FGF6	-	Del	-	-	-
FGFR1	-	Amp	-	n/a	DrugBank
FGFR1	-	Amp	-	n/a	DrugBank
FGFR1	-	Amp	-	n/a	DrugBank
FGFR1	-	Amp	-	n/a	DrugBank
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	n/a	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	n/a	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	inhibitor	DGIdb
FGFR1	-	Amp	-	n/a	DrugBank
FGFR1OP2	-	Del	-	-	-
FGFR2	-	Del	-	inhibitor	DGIdb
FGFR2	-	Del	-	inhibitor	DGIdb
FGFR2	-	Del	-	n/a	DrugBank
FGFR2	-	Del	-	inhibitor	DGIdb
FGFR2	-	Del	-	n/a	DrugBank
FGFR2	-	Del	-	inhibitor	DGIdb
FGFR2	-	Del	-	n/a	DrugBank
FGFR2	-	Del	-	n/a	DrugBank
FGFR2	-	Del	-	n/a	DrugBank

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
FGFR2	-	Del	-	n/a	DGIdb
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	-	inhibitor	DGIdb
FGFR3	-	Del	-	n/a	DrugBank
FGFR3	-	Del	-	n/a	DrugBank
FGFR3	-	Del	-	inhibitor	DGIdb
FGFR3	-	Del	-	n/a	DrugBank
FGFR3	-	Del	-	inhibitor	DGIdb
FGFR3	-	Del	-	n/a	DGIdb
FGFR3	-	Del	-	inhibitor	DGIdb
FGFR3	-	Del	-	n/a	DrugBank
FKBP1A	-	-	UP	other/unknown	DGIdb
FN1	-	-	UP	-	-
FOS	-	-	UP	-	-
FTH1	-	-	UP	-	-
GABARAP	-	-	UP	-	-
GAPDH	-	-	UP	-	-
GARS	-	-	UP	-	-
GATA4	-	Del	-	-	-
GIP	-	Del	-	-	-
GLI1	-	Del	-	-	-
GLO1	-	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
GNAI3	-	Del	UP	-	-
GNAI2	-	-	UP	-	-
GNAI3	-	-	UP	-	-
GNAS	-	Del	UP	-	-
GNB2L1	-	-	UP	-	-
GNB4	-	-	UP	-	-
GNG12	-	-	UP	-	-
GORASP2	-	-	UP	-	-
GRB10	-	-	UP	-	-
GRIN2A	-	Del	-	-	-
GSN	-	-	UP	-	-
GSTP1	-	-	UP	n/a	DrugBank
GSTP1	-	-	UP	n/a	DrugBank
GSTP1	-	-	UP	n/a	DrugBank
GSTP1	-	-	UP	n/a	DrugBank
GSTP1	-	-	UP	n/a	DrugBank
GSTP1	-	-	UP	n/a	DrugBank
GSTT1	-	Del	-	n/a	DrugBank
GSTT1	-	Del	-	n/a	DrugBank
GSTT1	-	Del	-	n/a	DrugBank
GSTT1	-	Del	-	n/a	DrugBank
H2AFZ	-	-	UP	-	-
H3F3A	-	-	UP	-	-
HDAC2	-	-	UP	n/a	DrugBank
HDGF	-	-	UP	-	-
HEXB	-	-	UP	-	-
HIF1A	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
HK1	-	-	UP	-	-
HLA-A	-	-	UP	-	-
HLA-DPA1	-	-	UP	-	-
HLA-DPB1	-	-	UP	-	-
HLA-DQA1	-	-	UP	-	-
HLA-DQB1	-	-	UP	-	-
HLA-DRA	-	-	UP	-	-
HLA-DRB1	-	-	UP	-	-
HLA-E	-	-	UP	-	-
HMGA2	-	Del	-	-	-
HMGB1	-	-	UP	-	-
HMGNI	-	-	UP	-	-
HMOX1	-	-	UP	-	-
HPGD	-	Del	-	-	-
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AA1	-	-	UP	inhibitor	DGIdb
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AA1	-	-	UP	inhibitor	DGIdb
HSP90AA1	-	-	UP	inhibitor	DGIdb
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AA1	-	-	UP	n/a	DGIdb
HSP90AB1	-	-	UP	-	-
HSP90B1	-	-	UP	-	-
HSPA1A	-	-	UP	-	-
HSPA5	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">HSPA8</a>	-	-	UP	-	-
<a href="#">HSPA9</a>	-	-	UP	-	-
<a href="#">HSPD1</a>	-	-	UP	-	-
<a href="#">HSPG2</a>	-	-	UP	n/a	DrugBank
<a href="#">HYOU1</a>	-	-	UP	-	-
<a href="#">IARS</a>	-	-	UP	-	-
<a href="#">ICAM1</a>	-	-	UP	-	-
<a href="#">IFI16</a>	-	-	UP	-	-
<a href="#">IFNAR1</a>	-	-	UP	n/a	DrugBank
<a href="#">IFNAR1</a>	-	-	UP	n/a	DrugBank
<a href="#">IFNGR1</a>	-	-	UP	n/a	DrugBank
<a href="#">IFNGR2</a>	-	-	UP	n/a	DrugBank
<a href="#">IFT88</a>	-	Del	-	-	-
<a href="#">IGFBP3</a>	-	-	UP	-	-
<a href="#">IGFBP4</a>	-	-	UP	-	-
<a href="#">IGFBP5</a>	-	-	UP	-	-
<a href="#">IGFBP7</a>	-	Amp	-	-	-
<a href="#">IKBKE</a>	-	Amp	-	-	-
<a href="#">IL7R</a>	-	Del	-	-	-
<a href="#">IMPDH2</a>	-	-	UP	n/a	DrugBank
<a href="#">ING3</a>	-	Amp	-	-	-
<a href="#">ING4</a>	-	Del	-	-	-
<a href="#">INHBA</a>	-	Amp	-	-	-
<a href="#">INSR</a>	-	-	UP	-	-
<a href="#">IQGAP1</a>	-	-	UP	-	-
<a href="#">IRF2</a>	-	Del	-	-	-
<a href="#">IRS1</a>	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">IRS2</a>	-	Del	-	-	-
<a href="#">ITGA5</a>	-	-	UP	n/a	DGIdb
<a href="#">ITGAV</a>	-	-	UP	n/a	DGIdb
<a href="#">ITGB1</a>	-	-	UP	-	-
<a href="#">ITGB5</a>	-	-	UP	n/a	DGIdb
<a href="#">JAK1</a>	-	-	UP	inhibitor	DGIdb
<a href="#">JAK1</a>	-	-	UP	inhibitor	DGIdb
<a href="#">JAK1</a>	-	-	UP	n/a	DrugBank
<a href="#">JUP</a>	-	-	UP	-	-
<a href="#">KDM5B</a>	-	-	UP	-	-
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	n/a	DailyMed
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	n/a	DGIdb
<a href="#">KDR</a>	-	Amp	-	n/a	DrugBank
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	n/a	DrugBank
<a href="#">KDR</a>	-	Amp	-	n/a	DrugBank
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">KDR</a>	-	Amp	-	n/a	DrugBank
<a href="#">KDR</a>	-	Amp	-	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
KDR	-	Amp	-	antagonist	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	n/a	DrugBank
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	n/a	DGIdb
KDR	-	Amp	-	n/a	DrugBank
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	n/a	DrugBank
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	inhibitor	DGIdb
KDR	-	Amp	-	n/a	DrugBank
KDR	-	Amp	-	n/a	DGIdb
KEL	-	Amp	-	-	-
KHSRP	-	-	UP	-	-
KIF5B	-	-	UP	-	-
KIT	-	Amp	UP	n/a	DrugBank
KIT	-	Amp	UP	inhibitor	DGIdb
KIT	-	Amp	UP	n/a	DrugBank

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">KIT</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	n/a	DrugBank
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">KIT</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KL</a>	-	Del	-	-	-
<a href="#">KPNA2</a>	-	-	UP	-	-
<a href="#">KPNB1</a>	-	-	UP	-	-
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	n/a	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">KRAS</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">LARS</a>	-	-	UP	-	-
<a href="#">LATS2</a>	-	Del	-	-	-
<a href="#">LDHA</a>	-	-	UP	-	-
<a href="#">LGR4</a>	-	-	UP	-	-
<a href="#">LOX</a>	-	Del	-	-	-
<a href="#">LRPPRC</a>	-	-	UP	-	-
<a href="#">LSM1</a>	-	-	UP	-	-
<a href="#">LUM</a>	-	-	UP	-	-
<a href="#">MAFF</a>	-	Del	-	-	-
<a href="#">MAFG</a>	-	Del	-	-	-
<a href="#">MAFK</a>	-	Amp	-	-	-
<a href="#">MAGED1</a>	-	-	UP	-	-
<a href="#">MAP2K4</a>	-	Del	-	inhibitor	DGIdb
<a href="#">MAP2K4</a>	-	Del	-	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">MAP2K4</a>	-	Del	-	inhibitor	DGIdb
<a href="#">MAP4K4</a>	-	-	UP	-	-
<a href="#">MAPK1</a>	-	-	UP	n/a	DrugBank
<a href="#">MAPKAP1</a>	-	-	UP	-	-
<a href="#">MAPKAPK2</a>	-	-	UP	-	-
<a href="#">MARCKS</a>	-	-	UP	-	-
<a href="#">MAT2A</a>	-	-	UP	-	-
<a href="#">MCM3</a>	-	-	UP	-	-
<a href="#">MCM4</a>	-	-	UP	-	-
<a href="#">MCM6</a>	-	-	UP	-	-
<a href="#">MCM7</a>	-	-	UP	-	-
<a href="#">MDM2</a>	-	Del	-	-	-
<a href="#">MMP14</a>	-	-	UP	-	-
<a href="#">MMP2</a>	-	-	UP	-	-
<a href="#">MMP9</a>	-	-	UP	n/a	DGIdb
<a href="#">MSH2</a>	-	-	UP	-	-
<a href="#">MSH6</a>	-	Del	-	-	-
<a href="#">MYBL2</a>	-	Del	-	-	-
<a href="#">MYC</a>	-	-	UP	n/a	DGIdb
<a href="#">MYC</a>	-	-	UP	n/a	DGIdb
<a href="#">MYD88</a>	-	-	UP	-	-
<a href="#">MYH11</a>	-	Del	-	-	-
<a href="#">MYH9</a>	-	-	UP	-	-
<a href="#">MYL12A</a>	-	-	UP	-	-
<a href="#">MYL6</a>	-	-	UP	-	-
<a href="#">MYO6</a>	-	-	UP	-	-
<a href="#">NAMPT</a>	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">NCBP2</a>	-	-	UP	-	-
<a href="#">NCKAP1</a>	-	-	UP	-	-
<a href="#">NF1</a>	-	Del	-	n/a	DGIdb
<a href="#">NF1</a>	-	Del	-	n/a	DGIdb
<a href="#">NF1</a>	-	Del	-	n/a	DGIdb
<a href="#">NFIB</a>	-	-	UP	-	-
<a href="#">NFIX</a>	-	-	UP	-	-
<a href="#">NFKB1</a>	-	-	UP	n/a	DrugBank
<a href="#">NFKB1</a>	-	-	UP	n/a	DGIdb
<a href="#">NFKB1</a>	-	-	UP	n/a	DGIdb
<a href="#">NFKB1</a>	-	-	UP	n/a	DGIdb
<a href="#">NFKB2</a>	-	Del	-	-	-
<a href="#">NFKBIA</a>	-	Del	-	-	-
<a href="#">NGFR</a>	-	Del	-	-	-
<a href="#">NME1</a>	-	Del	-	-	-
<a href="#">NME2</a>	-	-	UP	-	-
<a href="#">NNMT</a>	-	-	UP	-	-
<a href="#">NOTCH2</a>	-	-	UP	other/unknown	DGIdb
<a href="#">NOTCH3</a>	-	-	UP	other/unknown	DGIdb
<a href="#">NRAS</a>	-	-	UP	-	-
<a href="#">NRP1</a>	-	-	UP	n/a	DrugBank
<a href="#">NUP153</a>	-	-	UP	-	-
<a href="#">NUP210</a>	-	-	UP	-	-
<a href="#">NUP214</a>	-	Amp	UP	-	-
<a href="#">NUP93</a>	-	Del	-	-	-
<a href="#">NUP98</a>	-	-	UP	-	-
<a href="#">OGT</a>	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">OPTN</a>	-	-	UP	-	-
<a href="#">P4HB</a>	-	-	UP	-	-
<a href="#">PABPC1</a>	-	-	UP	-	-
<a href="#">PAICS</a>	-	-	UP	-	-
<a href="#">PAK2</a>	-	-	UP	-	-
<a href="#">PARP1</a>	-	-	UP	n/a	Therapeutic.Target.Database
<a href="#">PBRM1</a>	-	-	UP	-	-
<a href="#">PCGF2</a>	-	Del	-	-	-
<a href="#">PDGFB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">PDGFB</a>	-	Del	-	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DrugBank
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DrugBank
<a href="#">PDGFRA</a>	-	Amp	UP	antagonist	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DrugBank
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DrugBank
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DGIdb
<a href="#">PDGFRA</a>	-	Amp	UP	n/a	DrugBank
<a href="#">PDGFRA</a>	-	Amp	UP	inhibitor	DGIdb
<a href="#">PDS5A</a>	-	-	UP	-	-
<a href="#">PEBP1</a>	-	-	UP	-	-
<a href="#">PGK1</a>	-	-	UP	-	-
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3C2B</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	n/a	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb
<a href="#">PIK3R3</a>	-	-	UP	inhibitor	DGIdb

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
PIK3R3	-	-	UP	inhibitor	DGIdb
PLAU	-	-	UP	-	-
PLCG2	-	Del	-	-	-
PLOD2	-	-	UP	-	-
PMS2	-	Amp	-	-	-
POLR2A	-	-	UP	-	-
PPIA	-	-	UP	-	-
PPP1CB	-	-	UP	-	-
PPP1CC	-	-	UP	-	-
PPP2CA	-	-	UP	-	-
PPP2R1A	-	-	UP	-	-
PPP2R5C	-	-	UP	-	-
PPP6C	-	-	UP	-	-
PRDX1	-	-	UP	-	-
PRKACA	-	-	UP	-	-
PRKACB	-	-	UP	-	-
PRKCA	-	Del	-	n/a	DrugBank
PRKCA	-	Del	-	inhibitor,competitive	DGIdb
PRKCA	-	Del	-	n/a	DGIdb
PRKCA	-	Del	-	antisense oligonucleotide	DGIdb
PRKCA	-	Del	-	n/a	DGIdb
PRKCA	-	Del	-	inhibitor	DGIdb
PRKCA	-	Del	-	inhibitor	DGIdb
PRKCA	-	Del	-	inhibitor	DGIdb
PRKCA	-	Del	-	inhibitor	DGIdb
PRKDC	-	-	UP	n/a	DGIdb
PRLR	-	-	UP	n/a	DrugBank
PRPF19	-	-	UP	-	-

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
PRSS1	-	Amp	-	-	-
PSAP	-	-	UP	-	-
PSMA2	-	-	UP	other/unknown	DGIdb
PSMA2	-	-	UP	other/unknown	DGIdb
PSMD1	-	-	UP	other/unknown	DGIdb
PSMD1	-	-	UP	other/unknown	DGIdb
PSMD1	-	-	UP	n/a	DGIdb
PSMD1	-	-	UP	n/a	DrugBank
PTGES3	-	-	UP	-	-
PTK2	-	-	UP	n/a	DGIdb
PTK2	-	-	UP	inhibitor	DGIdb
PTPN11	-	-	UP	-	-
PTPRC	-	-	UP	-	-
PTPRK	-	-	UP	-	-
RAB10	-	-	UP	-	-
RAB14	-	Amp	UP	-	-
RAB27A	-	Del	-	-	-
RAB6A	-	-	UP	-	-
RAC1	-	Amp	UP	-	-
RAD21	-	-	UP	-	-
RAD51	-	Del	-	n/a	DGIdb
RAD51C	-	Del	-	-	-
RAF1	-	-	UP	n/a	DrugBank
RAF1	-	-	UP	inhibitor	DGIdb
RAF1	-	-	UP	inhibitor	DGIdb
RAF1	-	-	UP	antisense oligonucleotide	DGIdb
RAF1	-	-	UP	inhibitor	DGIdb

(cont'd next page)

Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
RAF1	-	-	UP	n/a	DrugBank
RAF1	-	-	UP	inhibitor	DGIdb
RAF1	-	-	UP	n/a	DrugBank
RALGDS	-	-	UP	-	-
RAN	-	-	UP	-	-
RANBP2	-	-	UP	-	-
RAP1B	-	Del	-	-	-
RB1	-	Del	-	-	-
RBBP4	-	-	UP	-	-
RBBP7	-	-	UP	-	-
RBL1	-	Del	-	-	-
RBL2	-	Del	-	-	-
RHEB	-	-	UP	-	-
RHOA	-	-	UP	-	-
RICTOR	-	Del	-	inhibitor	DGIdb
RICTOR	-	Del	-	inhibitor	DGIdb
RNF43	-	Del	-	-	-
RPL10	-	-	UP	-	-
RPL10A	-	-	UP	-	-
RPL11	-	-	UP	-	-
RPL13	-	-	UP	-	-
RPL13A	-	-	UP	-	-
RPL14	-	-	UP	-	-
RPL15	-	-	UP	-	-
RPL18	-	-	UP	-	-
RPL18A	-	-	UP	-	-
RPL19	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
RPL22	-	-	UP	-	-
RPL23	-	-	UP	-	-
RPL24	-	-	UP	-	-
RPL26	-	-	UP	-	-
RPL27	-	-	UP	-	-
RPL27A	-	-	UP	-	-
RPL29	-	-	UP	-	-
RPL3	-	-	UP	n/a	DrugBank
RPL3	-	-	UP	antagonist	DGIdb
RPL30	-	-	UP	-	-
RPL35	-	-	UP	-	-
RPL35A	-	-	UP	-	-
RPL36	-	-	UP	-	-
RPL37	-	-	UP	-	-
RPL38	-	-	UP	-	-
RPL4	-	-	UP	-	-
RPL41	-	-	UP	-	-
RPL6	-	-	UP	-	-
RPL7A	-	-	UP	-	-
RPL8	-	-	UP	-	-
RPLP0	-	-	UP	-	-
RPLP2	-	-	UP	-	-
RPS10	-	-	UP	-	-
RPS12	-	-	UP	-	-
RPS13	-	-	UP	-	-
RPS14	-	-	UP	-	-
RPS15A	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
RPS16	-	-	UP	-	-
RPS17	-	-	UP	-	-
RPS18	-	-	UP	-	-
RPS19	-	-	UP	-	-
RPS2	-	-	UP	-	-
RPS20	-	-	UP	-	-
RPS24	-	Del	UP	-	-
RPS27A	-	-	UP	-	-
RPS29	-	-	UP	-	-
RPS3	-	-	UP	-	-
RPS3A	-	-	UP	-	-
RPS5	-	-	UP	-	-
RPS6	-	-	UP	-	-
RPS9	-	-	UP	-	-
RPSA	-	-	UP	-	-
RRM2	-	-	UP	n/a	DGIdb
RRM2	-	-	UP	inhibitor	DGIdb
RRM2	-	-	UP	n/a	DGIdb
RRM2	-	-	UP	n/a	DGIdb
RRM2	-	-	UP	n/a	DrugBank
RUNX1	-	Amp	-	-	-
S100A10	-	-	UP	-	-
SAT1	-	-	UP	-	-
SCD	-	-	UP	-	-
SDC1	-	-	UP	-	-
SEC31A	-	-	UP	-	-
SEC62	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">SEL1L</a>	-	-	UP	-	-
<a href="#">SERPINE1</a>	-	-	UP	-	-
<a href="#">SET</a>	-	Amp	UP	-	-
<a href="#">SHC1</a>	-	-	UP	-	-
<a href="#">SKI</a>	-	-	UP	-	-
<a href="#">SKP1</a>	-	-	UP	-	-
<a href="#">SLC34A2</a>	-	-	UP	-	-
<a href="#">SLIT2</a>	-	Del	-	-	-
<a href="#">SMAD2</a>	-	-	UP	-	-
<a href="#">SMARCA2</a>	-	-	UP	-	-
<a href="#">SMARCA4</a>	-	-	UP	-	-
<a href="#">SMARCA5</a>	-	-	UP	-	-
<a href="#">SMARCB1</a>	-	Del	-	-	-
<a href="#">SMARCC1</a>	-	-	UP	-	-
<a href="#">SMC1A</a>	-	-	UP	-	-
<a href="#">SMC4</a>	-	-	UP	-	-
<a href="#">SMG1</a>	-	-	UP	-	-
<a href="#">SMO</a>	-	Amp	-	n/a	DrugBank
<a href="#">SMO</a>	-	Amp	-	inhibitor	DGIdb
<a href="#">SMO</a>	-	Amp	-	antagonist	DGIdb
<a href="#">SMO</a>	-	Amp	-	other/unknown	DGIdb
<a href="#">SOCS1</a>	-	Del	-	-	-
<a href="#">SOD1</a>	-	-	UP	n/a	DrugBank
<a href="#">SOD1</a>	-	-	UP	n/a	DrugBank
<a href="#">SOD1</a>	-	-	UP	n/a	DrugBank
<a href="#">SOD2</a>	-	-	UP	-	-
<a href="#">SP1</a>	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
SPOP	-	Del	-	-	-
SPP1	-	-	UP	-	-
SPTAN1	-	-	UP	-	-
SPTBN1	-	-	UP	-	-
SQSTM1	-	-	UP	-	-
SRC	-	Del	-	n/a	DrugBank
SRC	-	Del	-	n/a	DrugBank
SRC	-	Del	-	n/a	DGIdb
SRC	-	Del	-	n/a	DGIdb
SRC	-	Del	-	n/a	DGIdb
SRC	-	Del	-	n/a	DGIdb
SRC	-	Del	-	n/a	DGIdb
SRC	-	Del	-	inhibitor	DGIdb
SRC	-	Del	-	n/a	DrugBank
SRRM1	-	-	UP	-	-
STAG2	-	-	UP	-	-
STARD13	-	Del	-	-	-
STAT1	-	-	UP	-	-
STAT3	-	Del	UP	-	-
STEAP3	-	-	UP	-	-
SUFU	-	Del	-	-	-
SUMO1	-	-	UP	-	-
SUMO2	-	-	UP	-	-
SUMO3	-	-	UP	-	-
SUZ12	-	Del	-	-	-
TAB2	-	-	UP	-	-
TALDO1	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
<a href="#">TBL1XR1</a>	-	-	UP	-	-
<a href="#">TERT</a>	-	Del	-	n/a	DGIdb
<a href="#">TGFBR2</a>	-	-	UP	-	-
<a href="#">THBS1</a>	-	-	UP	-	-
<a href="#">TIAM1</a>	-	Amp	-	-	-
<a href="#">TIMP2</a>	-	-	UP	-	-
<a href="#">TNF2</a>	-	Del	-	-	-
<a href="#">TLN1</a>	-	-	UP	-	-
<a href="#">TNFSF10</a>	-	-	UP	-	-
<a href="#">TNPO1</a>	-	-	UP	-	-
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	n/a	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	n/a	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	inhibitor	DGIdb
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank
<a href="#">TOP2A</a>	-	Del	UP	n/a	DrugBank

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	inhibitor	DGIdb
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	n/a	DrugBank
TOP2A	-	Del	UP	n/a	DrugBank
TOP2A	-	Del	UP	n/a	DGIdb
TOP2A	-	Del	UP	n/a	DGIdb
TP53	S	Del	-	-	-
TPM1	-	-	UP	-	-
TPM3	-	-	UP	-	-
TPM4	-	-	UP	-	-
TPP1	-	-	UP	-	-
TPR	-	-	UP	-	-
TRRAP	-	-	UP	-	-
TSC1	-	Amp	-	-	-
TSC2	-	Del	-	-	-
TUBA1A	-	-	UP	n/a	DrugBank
TXN	-	-	UP	-	-
U2AF1	-	Amp	-	-	-
UBA52	-	-	UP	-	-
UBB	-	-	UP	-	-
UBC	-	-	UP	-	-
UBE2D3	-	-	UP	-	-
UBR4	-	-	UP	-	-

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Table 4: Single-Gene Event Drug Targets

Gene	Variant	CN	Expr	type	Source
USP7	-	-	UP	-	-
VAV3	-	-	UP	-	-
VCAM1	-	-	UP	-	-
VCAN	-	-	UP	-	-
VCL	-	-	UP	-	-
VDAC1	-	-	UP	-	-
VIM	-	-	UP	-	-
VWF	-	-	UP	-	-
WASF2	-	-	UP	-	-
WTAP	-	-	UP	-	-
XPO1	-	-	UP	-	-
XPOT	-	-	UP	-	-
XRCC2	-	Del	-	-	-
YAP1	-	-	UP	-	-
YES1	-	-	UP	n/a	DGIdb
YES1	-	-	UP	inhibitor	DGIdb
YES1	-	-	UP	n/a	DrugBank
YES1	-	-	UP	n/a	DGIdb
YWHAB	-	-	UP	-	-
YWHAE	-	-	UP	-	-
YWHAG	-	-	UP	-	-
YWHAH	-	-	UP	-	-
YWHAQ	-	-	UP	-	-
YWHAZ	-	-	UP	-	-
ZFP36L1	-	-	UP	-	-

## 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 667 given to random forest, and we select 260 genes to help make sense of druggable gene networks.

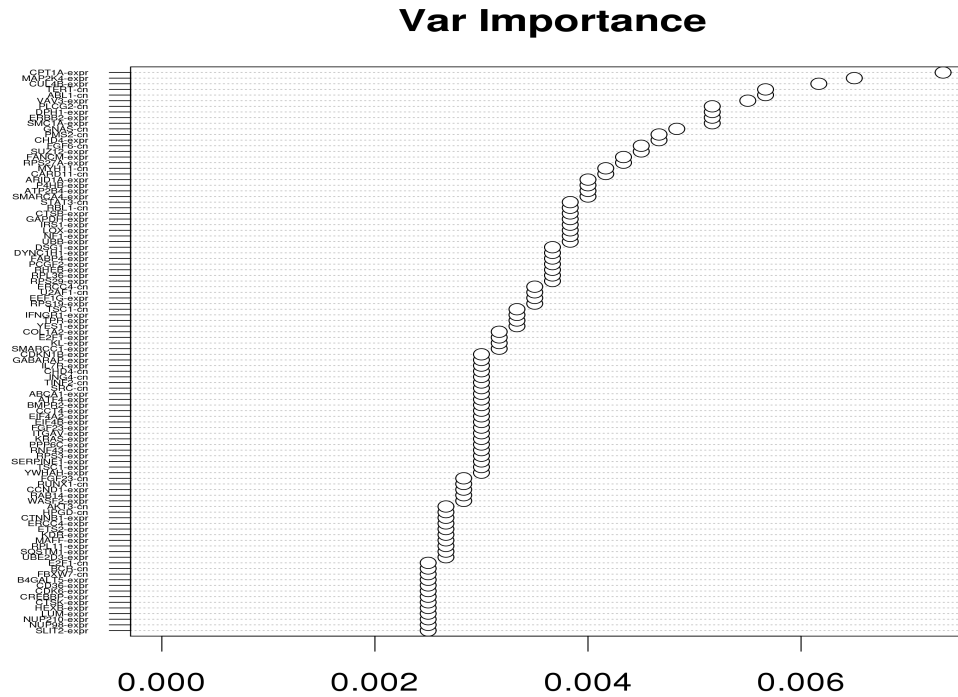


Figure 1: Random Forest Variable Importance

	Gene	Drug	type	Source
1	PRKCA	ELLAGIC ACID	inhibitor,competitive	DGIdb
2	PRKCA	BRYOSTATIN-1	n/a	DGIdb
3	PRKCA	SOPHORETIN	inhibitor	DGIdb
4	PRKCA	ENZASTAURIN	inhibitor	DGIdb
5	PRKCA	MIDOSTAURIN	inhibitor	DGIdb
6	PRKCA	AFFINITAC	antisense oligonucleotide	DGIdb
7	PRKCA	TAMOXIFEN	n/a	DGIdb
8	NOTCH1	RO4929097	inhibitor	DGIdb
10	APH1A	UNII-DRL23N424R	n/a	DGIdb
11	APH1B	UNII-DRL23N424R	n/a	DGIdb

Table 5: Drug Database File Format

## Gene-Network Targets

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

Table 6: Curated Cancer Networks

Cancer.Driver.Gene	Network	Network.pval	Total.Druggable	RF.match	RF.druggable
<a href="#">ETS2</a>	29	0.02	4	4	1
<a href="#">PTPN11</a>	99	0.03	4	6	0
<a href="#">KIT</a>	39	0.04	4	5	1
<a href="#">NFKB2</a>	25	0.04	2	3	1
<a href="#">SOCS1</a>	26	0.05	2	5	2
<a href="#">NGFR</a>	38	0.05	2	5	0
<a href="#">PDGFRA</a>	32	0.07	6	4	2
<a href="#">JAK1</a>	67	0.08	7	6	3
<a href="#">ETS1</a>	85	0.08	7	8	1
<a href="#">PLCG2</a>	40	0.10	1	3	1

PIK3C2B	3	0.11	1	0	0
CRK	23	0.12	2	4	2
CRKL	21	0.12	2	3	2
KDR	50	0.12	5	7	2
BMPRI1A	19	0.12	1	1	0
NFKB1	174	0.13	9	11	3
KITLG	34	0.14	3	5	1
PTEN	15	0.15	3	0	0
FGF10	40	0.15	3	5	1
IRS2	12	0.16	2	2	1
PIK3CG	41	0.16	2	3	0
FOS	114	0.17	8	12	2
FGFR2	39	0.17	2	3	0
INSR	38	0.18	1	2	0
PIK3R1	68	0.18	4	7	1
STAT3	140	0.18	5	13	4
FGFR3	35	0.18	2	1	0
RAP1B	42	0.19	3	7	0
RICTOR	6	0.19	1	0	0
FGF6	34	0.20	3	5	1
E2F1	91	0.20	4	10	2
BRCA2	4	0.21	1	0	0
TGFBR2	28	0.21	1	6	0
FGFR1	49	0.22	3	3	0
FGF23	26	0.22	3	5	1
EGFR	79	0.23	7	11	3
MET	38	0.24	5	6	1
RPS19	46	0.24	1	12	0
ATF1	40	0.24	3	2	0

KL	17	0.25	1	5	1
CDK6	13	0.25	3	2	2
BUB1B	8	0.26	1	2	0
BRCA1	55	0.26	1	8	0
SPTA1	4	0.27	1	2	1
EP300	387	0.28	16	41	6
KRAS	51	0.28	4	9	1
NRAS	51	0.28	2	9	0
EGR1	108	0.28	6	9	3
MAFK	34	0.29	2	3	2
ERBB3	40	0.29	4	6	2
RPL35A	55	0.30	1	15	0
NFKBIA	3	0.31	1	0	0
YES1	56	0.32	5	9	3
NOTCH3	7	0.32	2	0	0
CCND1	14	0.32	3	2	2
EPHA5	8	0.32	1	4	2
RPS17	58	0.32	1	15	0
RAN	17	0.34	1	3	0
NUP214	45	0.34	1	6	0
SMARCA2	6	0.35	1	1	1
SRC	161	0.36	12	15	5
NOTCH2	7	0.37	2	0	0
SMO	11	0.37	1	0	0
RBL1	6	0.38	1	1	1
HSP90AA1	24	0.38	4	7	2
SMAD3	44	0.39	1	6	0
NF1	17	0.39	1	0	0



Single Gene Driver Events in those genes or variants.

Table 7: DNA Driver Events

CHROM	Gene.Symbol	Case.Type	Control.Count	Expressed
1	JAK1			+
1	NOTCH2			+
1	NRAS			+
1	PIK3C2B	CN:Amp	2	+
1	SPTA1	CN:Amp	3	
10	BMPR1A	CN:Del	2	
10	FGFR2	CN:Del	1	
10	NFKB2	CN:Del	1	
10	PTEN	CN:Del	4	+
11	CCND1			+
11	ETS1			+
12	ATF1	CN:Del	2	+
12	ERBB3	CN:Del	2	
12	FGF23	CN:Del	2	+
12	FGF6	CN:Del	2	
12	KITLG	CN:Del	3	+
12	KRAS	CN:Amp	2	+
12	PTPN11	CN:Del	3	+
12	RAN	CN:Del	3	
12	RAP1B	CN:Del	2	+
13	BRCA2	CN:Del	2	+
13	IRS2	CN:Del	3	
13	KL	CN:Del	2	+
14	FOS			+
14	HSP90AA1			+

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Table 7: DNA Driver Events

CHROM	Gene.Symbol	Case.Type	Control.Count	Expressed
14	<a href="#">NFKBIA</a>	CN:Del	2	
15	<a href="#">BUB1B</a>	CN:Del	3	
15	<a href="#">RPS17</a>	CN:Del	3	
15	<a href="#">SMAD3</a>	CN:Del	3	+
16	<a href="#">PLCG2</a>	CN:Del	1	
16	<a href="#">SOCS1</a>	CN:Del	1	
17	<a href="#">BRCA1</a>	CN:Del	1	+
17	<a href="#">CRK</a>	CN:Del	0	+
17	<a href="#">NF1</a>	CN:Del	2	+
17	<a href="#">NGFR</a>	CN:Del	1	
17	<a href="#">STAT3</a>	CN:Del	1	
18	<a href="#">YES1</a>			+
19	<a href="#">INSR</a>	CN:Amp	3	+
19	<a href="#">NOTCH3</a>			+
20	<a href="#">E2F1</a>	CN:Del	1	
20	<a href="#">RBL1</a>	CN:Del	1	
20	<a href="#">SRC</a>	CN:Del	1	
21	<a href="#">ETS2</a>	CN:Amp	1	+
22	<a href="#">CRKL</a>	CN:Del	0	+
22	<a href="#">EP300</a>	CN:Del	1	+
3	<a href="#">RPL35A</a>			+
3	<a href="#">TGFB2</a>			+
4	<a href="#">EPHA5</a>	CN:Amp	0	
4	<a href="#">FGFR3</a>	CN:Del	0	
4	<a href="#">KDR</a>	CN:Amp	1	+
4	<a href="#">KIT</a>	CN:Amp	1	+
4	<a href="#">NFKB1</a>			+

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Table 7: DNA Driver Events

CHROM	Gene.Symbol	Case.Type	Control.Count	Expressed
4	<a href="#">PDGFRA</a>	CN:Amp	1	+
5	<a href="#">EGR1</a>			+
5	<a href="#">FGF10</a>	CN:Del	3	+
5	<a href="#">PIK3R1</a>	CN:Del	4	
5	<a href="#">RICTOR</a>	CN:Del	3	+
7	<a href="#">CDK6</a>	CN:Amp	4	+
7	<a href="#">EGFR</a>	CN:Amp	3	+
7	<a href="#">MAFK</a>	CN:Amp	2	
7	<a href="#">MET</a>	CN:Amp	3	
7	<a href="#">PIK3CG</a>	CN:Amp	3	+
7	<a href="#">SMO</a>	CN:Amp	1	
8	<a href="#">FGFR1</a>	CN:Amp	2	+
9	<a href="#">NUP214</a>	CN:Amp	3	+
9	<a href="#">SMARCA2</a>			+

## 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 8: Cancer Drug Table

Drug	Cancer.Driver.Genes	Network.Genes	N.Pathways	DNT.pval	DMT.pval	PScore	RF.Score
MIDOSTAURIN	KIT,PDGFRA,KDR,PRKCA	KIT,PDGFRA	11	0.0042	0.0000	5.6734	0.0010
VANDETANIB	KDR,PTEN,EGFR,KRAS	KRAS	22	0.1837	0.0000	4.0370	0.0010
GEFITINIB	PTEN,EGFR,KRAS,ERBB3	KRAS	25	0.2635	0.0000	3.8802	0.0010
AFATINIB	EGFR,ERBB2		15	0.3530	0.0000	3.7532	0.0013
MOTESANIB	KIT,PDGFRA,KDR	KIT,PDGFRA	4	0.0100	0.0200	3.6972	0.0010
TELATINIB	KIT,PDGFRA,KDR	KIT,PDGFRA	4	0.0100	0.0200	3.6972	0.0010
VATALANIB	KIT,PDGFRA,KDR	KIT,PDGFRA	4	0.0100	0.0200	3.6972	0.0010
AXITINIB	KIT,PDGFRA,KDR,PDGFB	KIT,PDGFRA	4	0.0177	0.0120	3.6735	0.0010
BMS-599626	EGFR,ERBB2		15	0.4319	0.0000	3.6656	0.0017
PELITINIB	EGFR,ERBB2		15	0.4319	0.0000	3.6656	0.0017
ENMD-2076	KIT,PDGFRA,KDR,FGFR2	KIT,PDGFRA,PTK2,ABL1	54	0.4575	0.0000	3.6406	0.0014
DACOMITINIB	EGFR,ERBB3,ERBB2		16	0.5062	0.0000	3.5967	0.0013
POZIOTINIB	EGFR,ERBB3,ERBB2		16	0.5062	0.0000	3.5967	0.0013
AEE 788	KDR,EGFR,ERBB2		17	0.5393	0.0000	3.5692	0.0031
BMS-690514	KDR,EGFR,ERBB2		17	0.5393	0.0000	3.5692	0.0031
LAPATINIB	EGFR,ERBB2		15	0.6046	0.0000	3.5196	0.0013
LAPATINIB DITOSY	EGFR,ERBB2		15	0.6633	0.0000	3.4793	0.0026
NERATINIB	EGFR,ERBB2		15	0.6633	0.0000	3.4793	0.0026
AZD8931	EGFR,ERBB3,ERBB2		16	0.7031	0.0000	3.4540	0.0017
MOMELOTINIB	EGFR,ERBB3,ERBB2		16	0.7031	0.0000	3.4540	0.0017
REGORAFENIB	KIT,PDGFRA,KDR,FGFR2	KIT,KRAS,PDGFRA,ABL1	58	0.0622	0.0060	3.4283	0.0010
NILOTINIB	KIT,PDGFRA,ABL1	KIT,PDGFRA,ABL1	3	0.0243	0.0270	3.1837	0.0012
BMN673	BRCA2,BRCA1		4	0.0393	0.0170	3.1755	0.0010
RUCAPARIB	BRCA2,BRCA1		4	0.0393	0.0170	3.1755	0.0010

VELIPARIB	BRCA2,BRCA1		4	0.0393	0.0170	3.1755	0.0010
IMATINIB	KIT,PDGFRA,NTRK1,BCR	KIT,PDGFRA,ABL1	5	0.0320	0.0290	3.0325	0.0011
CEDIRANIB	KIT,KDR	KIT	4	0.0346	0.0280	3.0136	0.0013
LINIFANIB	KIT,KDR	KIT	4	0.0346	0.0280	3.0136	0.0013
SUNITINIB	KIT,PDGFRA,KDR,PDGFB	KIT,PDGFRA	4	0.1195	0.0100	2.9226	0.0010
PROCARBAZINE		CYP1B1	2	0.0173	0.1210	2.6784	0.0017
BRIVANIB	KDR,FGFR2		8	0.7090	0.0030	2.6722	0.0020
APATINIB	KDR,EGFR,ERBB2		17	0.3355	0.0070	2.6293	0.0040
OSI-930	KDR		2	0.3355	0.0070	2.6293	0.0040
RAMUCIRUMAB	KDR		2	0.3355	0.0070	2.6293	0.0040
TIVOZANIB	KDR		2	0.3355	0.0070	2.6293	0.0040
DASATINIB	KIT,YES1,SRC,BCR,BRA	KIT,ABL1,CYP1B1,YES1	31	0.1093	0.0400	2.3592	0.0015
PONATINIB	KIT,PDGFRA,KDR,FGFR2	KIT,PDGFRA,ABL1	48	0.3692	0.0140	2.2866	0.0014
I058137-23-7	KDR,FGFR1		6	0.2494	0.0210	2.2808	0.0027
OXALIPLATIN		GSTP1,SOD1,CYP1B1	3	0.2050	0.0290	2.2259	0.0012
INTERFERON GAMMA		IFNGR2,IFNGR1	1	0.0949	0.0660	2.2032	0.0017
FORETINIB	KDR,MET		7	0.7161	0.0090	2.1908	0.0020
PIMASERTIB	KRAS,NF1,MAP2K1,BRAF	KRAS	30	0.3376	0.0210	2.1494	0.0019
ABT-510		CD36,CD47	5	0.0488	0.1550	2.1209	0.0013
CUDC-101	EGFR,ERBB2		15	0.6337	0.0130	2.0842	0.0017
CARBOPLATIN	BRCA1	GSTP1,SOD1	1	0.4626	0.0230	1.9731	0.0011
TSU-68	KDR,FGFR2		8	0.6485	0.0230	1.8263	0.0013
SELUMETINIB	KRAS,NF1,MAP2K1,MAP2	KRAS	32	0.3377	0.0530	1.7472	0.0023
ALVESPIMYCIN	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
AT13387	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
CNF1010	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
GANETESPIB	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
IPI-504	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
MPC-3100	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022

<a href="#">RETASPIMYCIN</a>	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
<a href="#">SNX-5422</a>	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
<a href="#">TANESPIMYCIN</a>	HSP90AA1	HSP90AA1	10	0.3451	0.0540	1.7296	0.0022
<a href="#">AT9283</a>	YES1,AURKB,ABL1	ABL1,YES1	4	0.4012	0.0510	1.6891	0.0018
<a href="#">TRAMETINIB</a>	KRAS,NF1,MAP2K1,MAP2	KRAS	32	0.4000	0.0530	1.6736	0.0020
<a href="#">SORAFENIB TOSYLA</a>	PDGFRA,KDR,BRAF,RAF1	PDGFRA,RAF1	14	0.2537	0.0980	1.6045	0.0009

## 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.

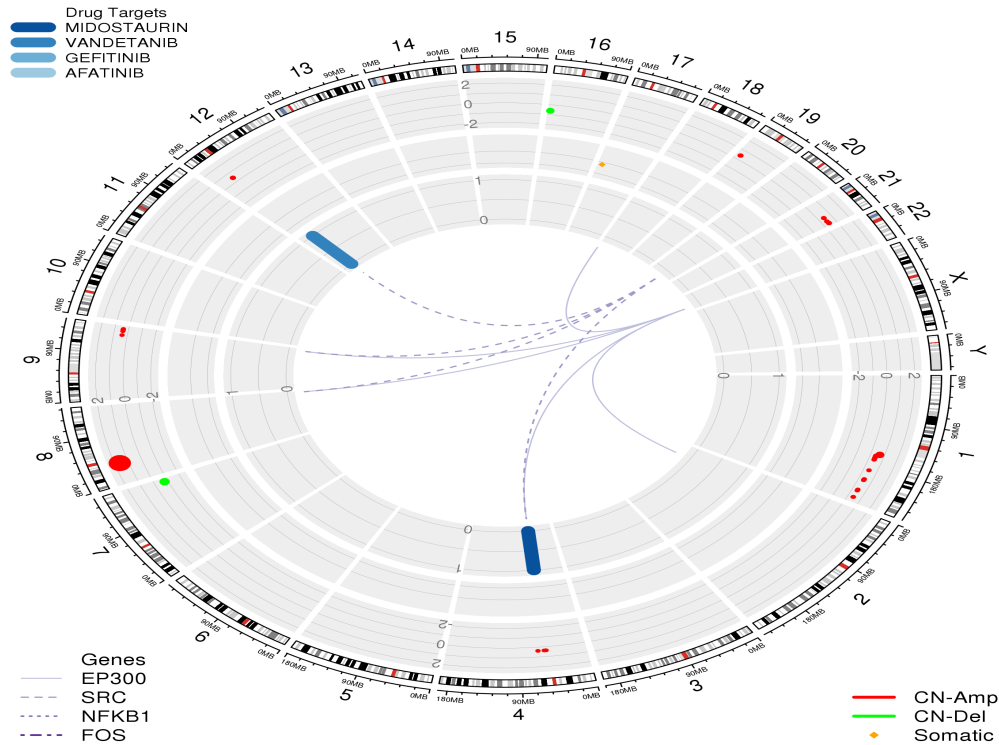


Figure 2: Key driver genomic events connected to gene expression events

