

Supporting Information

DUD-Enhanced – Better Ligands and Decoys for Better Benchmarking

Michael M. Mysinger¹, Michael Carchia¹, John. J. Irwin^{1*}, Brian K. Shoichet^{1*}

¹*Department of Pharmaceutical Chemistry, University of California, San Francisco*

*Correspondence to: John J. Irwin or Brian K. Shoichet, Department of Pharmaceutical Chemistry, University of California San Francisco, 1700 4th Street Box 2550, San Francisco, CA 94158-2330.
Email: jjj@cgl.ucsf.edu or shoichet@cgl.ucsf.edu.

Table S1: Full Target List

Id	Class	Description	Total Ligands	Clustered Ligands	Experimental Decoys	Matched Decoys	PDB	Resolution (Å)	LogAUC (%)	ROC EF1	AUC (%)
aa2ar	GPCR	Adenosine A2a receptor	3057	482	192	31,550	3eml	2.60	28	22	83
abl1	Kinase	Tyrosine-protein kinase ABL	409	182	84	10,750	2hzi	1.70	26	19	81
ace	Protease	Angiotensin-converting enzyme	749	282	55	16,900	3bkl	2.18	22	20	72
aces	Other Enzymes	Acetylcholinesterase	1581	453	487	26,250	1e66	2.10	25	20	81
ada	Other Enzymes	Adenosine deaminase	98	93	42	5,450	2e1w	2.50	24	22	76
ada17	Protease	ADAM17	1341	532	31	35,900	2oi0	2.00	26	22	77
adrb1	GPCR	Beta-1 adrenergic receptor	648	247	69	15,850	2vt4	2.70	19	11	76
adrb2	GPCR	Beta-2 adrenergic receptor	602	231	118	15,000	3ny8	2.84	12	4	69
akt1	Kinase	Serine/threonine-protein kinase AKT	585	293	53	16,450	3cqw	2.00	27	29	72
akt2	Kinase	Serine/threonine-protein kinase AKT2	234	117	23	6,900	3d0e	2.00	16	8	77
aldr	Other Enzymes	Aldose reductase	604	159	78	9,000	2hv5	1.59	31	33	76
ampc	Other Enzymes	Beta-lactamase	48	48	84	2,850	1l2s	1.94	16	8	79
andr	Nuclear Receptor	Androgen Receptor	1046	269	19	14,350	2am9	1.64	5	6	51
aofb	Other Enzymes	Monoamine oxidase B	438	122	129	6,900	1s3b	1.65	17	8	75
bace1	Protease	Beta-secretase 1	595	283	41	18,100	3l5d	1.75	11	8	66
braf	Kinase	Serine/threonine-protein kinase B-raf	317	152	28	9,950	3d4q	2.80	22	11	83
cah2	Other Enzymes	Carbonic anhydrase II	1924	492	27	31,172	1bcd	1.90	12	3	73
casp3	Protease	Caspase-3	470	199	37	10,700	2cnk	1.75	16	12	72
cdk2	Kinase	Cyclin-dependent kinase 2	1310	474	136	27,850	1h00	1.60	21	14	79
comt	Other Enzymes	Catechol O-methyltransferase	41	41	1	3,850	3bwm	1.98	34	22	89
cp2c9	Cytochrome P450	Cytochrome P450 2C9	145	120	176	7,450	1r9o	2.00	7	3	60
cp3a4	Cytochrome P450	Cytochrome P450 3A4	302	170	267	11,800	3nxu	2.00	7	2	63
csf1r	Kinase	Macrophage colony stimulating factor receptor	385	166	5	12,150	3krj	2.10	32	25	86
cxcr4	GPCR	C-X-C chemokine receptor type 4	40	40	14	3,406	3odu	2.50	36	18	90
def	Other Enzymes	Peptide deformylase	171	102	8	5,700	1lru	2.10	23	22	69
dhi1	Other Enzymes	11-beta-hydroxysteroid dehydrogenase 1	836	387	29	19,350	3frj	2.30	11	6	68
dpp4	Protease	Dipeptidyl peptidase IV	1939	533	167	40,950	2i78	2.50	41	41	87
drd3	GPCR	Dopamine D3 receptor	2113	480	14	34,050	3pbl	2.89	13	4	69
dyr	Other Enzymes	Dihydrofolate reductase	1082	231	117	17,200	3nxo	1.35	43	44	87
egfr	Kinase	Epidermal growth factor receptor erbB1	1612	542	407	35,050	2rgp	2.00	29	22	84
esr1	Nuclear Receptor	Estrogen receptor alpha	1297	383	136	20,685	1sj0	1.90	18	15	67
esr2	Nuclear Receptor	Estrogen receptor beta	1343	367	126	20,199	2fsz	2.20	19	18	65
fa10	Protease	Coagulation factor X	3090	537	176	28,325	3kl6	1.45	39	36	87
fa7	Protease	Coagulation factor VII	303	114	39	6,250	1w7x	1.80	56	66	88

Id	Class	Description	Total Ligands	Clustered Ligands	Experimental Decoys	Matched Decoys	PDB	Resolution (Å)	LogAUC (%)	ROC EF1	AUC (%)
fabp4	Miscellaneous	Fatty acid binding protein adipocyte	47	47	16	2,750	2nnq	1.80	46	43	90
fak1	Kinase	Focal adhesion kinase 1	101	100	11	5,350	3bz3	2.20	24	20	75
fgfr1	Kinase	Fibroblast growth factor receptor 1	327	139	146	8,700	3c4f	2.07	18	13	73
fkbl1a	Other Enzymes	FK506-binding protein 1A	159	111	68	5,800	1j4h	1.80	16	9	75
fnta	Other Enzymes	Protein farnesyltransferase type I alpha subunit	1430	592	132	51,500	3e37	1.80	16	7	76
fpps	Other Enzymes	Farnesyl diphosphate synthase	85	85	27	8,850	1zw5	2.30	51	67	84
gcr	Nuclear Receptor	Glucocorticoid receptor	972	258	6	15,000	3bqd	2.50	4	9	44
glcm	Other Enzymes	Beta-glucocerebrosidase	54	54	27	3,800	2v3f	1.95	30	24	81
gria2	Ion Channel	Glutamate receptor ionotropic, AMPA 2	476	158	201	11,845	3kgc	1.55	23	23	71
grik1	Ion Channel	Glutamate receptor ionotropic kainate 1	136	101	235	6,550	1vso	1.85	35	27	86
hdac2	Other Enzymes	Histone deacetylase 2	407	185	62	10,300	3max	2.05	24	20	77
hdac8	Other Enzymes	Histone deacetylase 8	309	170	73	10,450	3f07	3.30	29	24	80
hivint	Other Enzymes	Human immunodeficiency virus type 1 integrase	167	100	268	6,650	3nf7	1.80	8	2	64
hivpr	Protease	Human immunodeficiency virus type 1 protease	1468	536	96	35,750	1xl2	1.50	7	5	60
hivrt	Other Enzymes	Human immunodeficiency virus type 1 reverse transcriptase	1178	338	258	18,891	3lan	2.55	11	7	64
hmdh	Other Enzymes	HMG-CoA reductase	527	170	8	8,750	3ccw	2.10	26	24	74
hs90a	Miscellaneous	Heat shock protein HSP 90-alpha	88	88	25	4,850	1uyg	2.00	15	3	69
hxx4	Other Enzymes	Hexokinase type IV	136	92	14	4,700	3f9m	1.50	25	17	80
igf1r	Kinase	Insulin-like growth factor I receptor	370	148	75	9,300	2oj9	2.00	18	5	79
inha	Other Enzymes	Enoyl-[acyl-carrier-protein] reductase	44	44	22	2,300	2h7l	1.73	19	2	85
ital	Miscellaneous	Leukocyte adhesion glycoprotein LFA-1 alpha	324	138	29	8,500	2ica	1.56	15	14	66
jak2	Kinase	Tyrosine-protein kinase JAK2	246	130	6	6,500	3lpb	2.00	29	23	82
kif11	Miscellaneous	Kinesin-like protein 1	272	116	29	6,850	3cjo	2.28	34	35	77
kit	Kinase	Stem cell growth factor receptor	378	166	8	10,450	3g0e	1.60	12	4	73
kith	Other Enzymes	Thymidine kinase	57	57	68	2,850	2b8t	2.00	15	0	80
kpcb	Kinase	Protein kinase C beta	331	135	153	8,700	2i0e	2.60	15	17	61
lck	Kinase	Tyrosine-protein kinase LCK	916	420	148	27,400	2of2	2.00	25	16	82
lkha4	Protease	Leukotriene A4 hydrolase	343	171	21	9,450	3chp	2.10	18	4	82
mapk2	Kinase	MAP kinase-activated protein kinase 2	184	101	81	6,150	3m2w	2.41	33	27	86
mcr	Nuclear Receptor	Mineralocorticoid receptor	201	94	2	5,150	2aa2	1.95	-4	2	36
met	Kinase	Hepatocyte growth factor receptor	333	166	17	11,250	3lq8	2.02	24	16	80

Id	Class	Description	Total Ligands	Clustered Ligands	Experimental Decoys	Matched Decoys	PDB	Resolution (Å)	LogAUC (%)	ROC EF1	AUC (%)
mk01	Kinase	MAP kinase ERK2	79	79	35	4,550	2ojg	2.00	19	9	79
mk10	Kinase	c-Jun N-terminal kinase 3	199	104	23	6,600	2zdt	2.00	24	11	82
mk14	Kinase	MAP kinase p38 alpha	2205	578	73	35,850	2qd9	1.70	17	10	74
mmp13	Protease	Matrix metalloproteinase 13	1632	572	26	37,200	830c	1.60	12	5	71
mp2k1	Kinase	Dual specificity mitogen-activated protein kinase kinase 1	308	121	12	8,150	3eqh	2.00	16	4	78
nos1	Other Enzymes	Nitric-oxide synthase, brain	311	100	73	8,050	1qw6	2.10	19	11	78
nam	Other Enzymes	Neuraminidase	200	98	21	6,200	1b9v	2.35	44	46	93
pa2ga	Other Enzymes	Phospholipase A2 group IIA	173	99	14	5,150	1kvo	2.00	26	29	72
parp1	Other Enzymes	Poly [ADP-ribose] polymerase-1	1031	508	12	30,050	3l3m	2.50	25	21	79
pde5a	Other Enzymes	Phosphodiesterase 5A	958	398	93	27,550	1udt	2.30	17	11	72
pgh1	Other Enzymes	Cyclooxygenase-1	534	195	1070	10,800	2oyu	2.70	3	5	53
pgh2	Other Enzymes	Cyclooxygenase-2	1707	435	444	23,150	3ln1	2.40	13	13	62
plk1	Kinase	Serine/threonine-protein kinase PLK1	227	107	46	6,800	2owb	2.10	28	19	84
pnph	Other Enzymes	Purine nucleoside phosphorylase	225	103	10	6,950	3bgs	2.10	39	42	81
ppara	Nuclear Receptor	Peroxisome proliferator-activated receptor alpha	1040	373	82	19,399	2p54	1.79	19	5	81
ppard	Nuclear Receptor	Peroxisome proliferator-activated receptor delta	699	240	79	12,250	2znp	3.00	32	20	89
pparg	Nuclear Receptor	Peroxisome proliferator-activated receptor gamma	1245	484	43	25,300	2gtk	2.10	21	12	80
prgr	Nuclear Receptor	Progesterone receptor	1114	293	1	15,650	3kba	2.00	8	8	56
ptn1	Other Enzymes	Protein-tyrosine phosphatase 1B	264	130	153	7,250	2azr	2.00	36	30	84
pur2	Other Enzymes	GAR transformylase	50	50	12	2,700	1njs	1.98	51	50	92
pygm	Other Enzymes	Muscle glycogen phosphorylase	77	77	7	3,950	1c8k	1.76	17	9	72
pyrd	Other Enzymes	Dihydroorotate dehydrogenase	226	111	88	6,450	1d3g	1.60	30	28	83
reni	Protease	Renin	391	104	46	6,958	3g6z	2.00	21	19	66
rock1	Kinase	Rho-associated protein kinase 1	216	100	15	6,300	2etr	2.60	17	10	74
rxra	Nuclear Receptor	Retinoid X receptor alpha	298	131	7	6,950	1mv9	1.90	25	24	71
sahh	Other Enzymes	Adenosylhomocysteine	63	63	5	3,450	1li4	2.01	39	33	85
src	Kinase	Tyrosine-protein kinase SRC	1269	524	287	34,500	3el8	2.30	18	9	77
tgfr1	Kinase	TGF-beta receptor type I	235	133	7	8,500	3hmm	1.70	36	28	88
thb	Nuclear Receptor	Thyroid hormone receptor beta-1	246	103	29	7,450	1q4x	2.80	36	38	79
thrb	Protease	Thrombin	2109	461	255	27,004	1ype	1.81	32	30	81
try1	Protease	Trypsin I	924	449	117	25,980	2ayw	0.97	57	62	93
tryb1	Protease	Tryptase beta-1	216	148	16	7,650	2zec	2.06	37	31	87
tysy	Other Enzymes	Thymidylate synthase	390	109	63	6,750	1syn	2.00	28	21	82

Id	Class	Description	Total Ligands	Clustered Ligands	Experimental Decoys	Matched Decoys	PDB	Resolution (Å)	LogAUC (%)	ROC EF1	AUC (%)
urok	Protease	Urokinase-type plasminogen activator	372	162	44	9,850	1sqt	1.90	65	72	95
vgfr2	Kinase	Vascular endothelial growth factor receptor 2	2320	409	142	24,950	2p2i	2.40	21	12	79
wee1	Kinase	Serine/threonine-protein kinase WEE1	221	102	15	6,150	3biz	2.20	52	55	91
xiap	Miscellaneous	Inhibitor of apoptosis protein 3	100	100	7	5,150	3hl5	1.80	52	55	88

Table S2: Effect of Clustering on Enrichment

Target	Raw Ligands	Clustered Ligands	Clustered Percentage	Raw LogAUC (%)	Clustered LogAUC (%)
tryb1	216	148	69	43	37
cp3a4	302	170	56	5	7
hdac8	309	170	55	25	29
...			...		
vgfr2	2320	409	18	16	21
fa10	3090	537	17	37	39
aa2ar	3057	482	16	24	28

Table S3: Ligand and Decoy Property Distribution

Average (Standard Deviation)	Molecular Weight [Daltons]		logP		Rotable Bonds		Hydrogen Bond Acceptors		Hydrogen Bond Donors		Net Charge	
Target	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys
aa2ar	409.8 (74.9)	401.9 (71.8)	2.4 (1.3)	2.4 (1.4)	5.1 (2.4)	5.4 (2.3)	8.8 (2.4)	7.8 (1.9)	2.9 (1.6)	2.5 (1.3)	0.4 (0.7)	0.3 (0.6)
abl1	465.9 (79.7)	446.8 (69.1)	4.3 (1.3)	4.0 (1.3)	5.8 (2.0)	5.9 (2.2)	7.2 (1.5)	6.6 (1.4)	2.6 (1.2)	2.3 (1.0)	0.5 (0.6)	0.5 (0.6)
ace	416.0 (80.7)	390.6 (77.8)	0.8 (1.5)	1.8 (1.6)	8.2 (2.9)	6.5 (2.6)	6.8 (1.8)	7.4 (1.8)	1.5 (1.3)	0.9 (1.0)	-1.2 (0.5)	-1.1 (0.5)
aces	443.8 (91.3)	415.8 (76.4)	4.5 (2.6)	3.9 (1.8)	8.5 (3.8)	7.0 (2.9)	5.4 (1.8)	5.4 (1.9)	2.4 (1.5)	2.0 (1.1)	1.2 (0.7)	0.9 (0.6)
ada	324.1 (74.6)	323.9 (72.1)	2.0 (1.4)	2.0 (1.3)	7.1 (2.5)	6.2 (2.1)	6.5 (1.4)	5.9 (1.4)	3.3 (1.1)	3.2 (0.9)	0.3 (0.5)	0.3 (0.5)
ada17	475.8 (62.8)	451.3 (52.5)	2.6 (1.2)	2.9 (1.4)	7.0 (1.9)	6.8 (2.0)	8.6 (1.6)	8.0 (1.5)	2.6 (1.2)	2.3 (1.1)	-0.0 (0.5)	-0.0 (0.6)
adrb1	443.4 (86.5)	417.1 (73.7)	3.4 (1.5)	3.2 (1.5)	9.6 (3.3)	7.9 (2.6)	6.6 (2.0)	6.6 (2.1)	3.9 (1.4)	3.2 (1.1)	0.6 (0.7)	0.5 (0.6)
adrb2	453.4 (98.4)	421.1 (79.6)	3.3 (1.5)	3.2 (1.6)	9.9 (3.5)	8.1 (2.8)	6.9 (2.3)	6.7 (2.2)	4.0 (1.6)	3.1 (1.2)	0.6 (0.6)	0.5 (0.6)
akt1	449.5 (71.6)	422.2 (67.1)	3.7 (1.5)	3.2 (1.6)	6.4 (1.8)	6.3 (2.1)	6.9 (1.9)	6.4 (1.8)	4.0 (1.4)	3.3 (1.2)	0.9 (0.6)	0.9 (0.6)
akt2	450.9 (88.8)	424.0 (81.9)	3.2 (1.9)	3.0 (1.9)	5.3 (1.9)	5.9 (2.1)	7.6 (1.9)	6.7 (1.8)	4.3 (1.7)	3.5 (1.4)	0.8 (0.5)	0.8 (0.5)
aldr	351.7 (65.9)	340.7 (65.1)	2.4 (1.5)	2.4 (1.5)	3.6 (2.2)	4.0 (1.9)	6.0 (1.9)	5.7 (1.6)	0.8 (1.2)	0.7 (1.1)	-0.8 (0.5)	-0.8 (0.5)
ampc	293.4 (63.7)	294.9 (65.3)	1.8 (1.4)	1.9 (1.4)	3.8 (1.4)	3.7 (1.6)	5.8 (1.4)	5.7 (1.4)	0.6 (0.7)	0.6 (0.6)	-1.5 (0.6)	-1.5 (0.5)
andr	368.1 (71.6)	358.1 (71.6)	3.8 (1.4)	3.8 (1.4)	3.0 (2.6)	3.4 (2.0)	4.2 (2.0)	4.1 (1.9)	0.9 (0.8)	0.9 (0.8)	0.0 (0.3)	0.0 (0.3)
aofb	278.4 (67.3)	277.2 (64.7)	2.9 (1.3)	2.9 (1.2)	3.6 (2.3)	3.3 (1.9)	3.7 (1.6)	3.7 (1.5)	1.2 (1.1)	1.2 (1.0)	0.3 (0.5)	0.3 (0.5)
bace1	508.9 (68.9)	466.6 (53.4)	4.0 (1.4)	3.9 (1.5)	8.6 (3.8)	7.4 (2.8)	7.1 (1.4)	6.9 (1.7)	3.8 (1.1)	2.9 (0.9)	0.7 (0.5)	0.6 (0.5)

Average (Standard Deviation)	Molecular Weight [Daltons]		logP		Rotable Bonds		Hydrogen Bond Acceptors		Hydrogen Bond Donors		Net Charge	
Target	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys
braf	456.6 (83.4)	439.0 (69.6)	4.0 (1.3)	3.8 (1.3)	5.8 (2.2)	5.8 (2.3)	7.2 (1.6)	6.6 (1.5)	2.7 (1.2)	2.4 (1.0)	0.4 (0.6)	0.4 (0.6)
cah2	406.6 (97.3)	382.0 (83.0)	0.9 (1.8)	1.5 (1.6)	6.0 (2.9)	5.6 (2.4)	8.1 (2.6)	7.4 (2.1)	3.5 (1.6)	2.8 (1.3)	-0.1 (0.8)	-0.0 (0.7)
casp3	461.8 (80.6)	437.3 (66.1)	1.9 (1.6)	2.5 (1.5)	9.1 (4.2)	7.7 (3.1)	9.1 (2.5)	8.2 (1.9)	1.9 (1.3)	1.4 (1.3)	-0.4 (0.8)	-0.2 (0.7)
cdk2	394.9 (74.0)	386.0 (72.1)	2.9 (1.2)	2.8 (1.3)	4.8 (2.0)	5.1 (2.1)	7.2 (1.8)	6.6 (1.7)	3.0 (1.4)	2.8 (1.2)	0.2 (0.6)	0.2 (0.6)
comt	291.8 (76.7)	300.0 (74.8)	2.3 (1.2)	2.1 (1.2)	4.1 (2.1)	3.8 (1.9)	7.0 (1.6)	6.2 (1.6)	1.8 (0.9)	1.6 (0.9)	-0.5 (0.6)	-0.5 (0.6)
cp2c9	422.5 (107.8)	406.9 (93.1)	4.1 (1.4)	4.0 (1.3)	6.0 (2.6)	5.6 (2.5)	5.7 (2.0)	5.6 (2.0)	1.5 (1.3)	1.4 (1.2)	-0.1 (0.7)	-0.1 (0.7)
cp3a4	449.7 (97.1)	428.6 (83.1)	4.0 (1.5)	3.9 (1.4)	6.6 (3.4)	6.2 (2.9)	6.5 (2.3)	6.1 (2.0)	2.0 (1.6)	1.7 (1.3)	0.4 (0.6)	0.4 (0.6)
csf1r	436.9 (66.6)	424.4 (59.5)	3.5 (1.1)	3.3 (1.2)	5.3 (2.0)	5.4 (2.2)	7.3 (1.8)	6.7 (1.6)	2.7 (1.4)	2.4 (1.1)	0.4 (0.7)	0.4 (0.7)
cxcr4	394.0 (65.2)	368.3 (58.6)	2.4 (1.4)	2.8 (1.3)	6.1 (1.5)	6.0 (1.9)	5.1 (1.2)	5.1 (1.6)	3.8 (1.9)	3.4 (1.3)	1.8 (0.9)	1.6 (0.6)
def	383.7 (83.9)	375.2 (76.6)	2.5 (1.2)	2.6 (1.2)	7.1 (3.3)	6.4 (2.9)	6.7 (1.4)	6.5 (1.4)	2.5 (0.9)	2.4 (0.8)	0.1 (0.4)	0.1 (0.4)
dhi1	392.8 (77.3)	384.3 (72.9)	3.8 (1.1)	3.9 (1.1)	4.6 (1.8)	4.4 (1.8)	4.8 (1.5)	4.8 (1.5)	1.0 (1.0)	0.9 (1.0)	0.0 (0.5)	0.0 (0.5)
dpp4	377.4 (63.5)	362.3 (65.9)	1.6 (1.4)	1.9 (1.4)	4.5 (1.8)	4.9 (1.9)	6.2 (1.5)	6.0 (1.6)	2.8 (1.0)	2.7 (0.9)	0.7 (0.6)	0.7 (0.6)
drd3	418.4 (73.9)	406.0 (71.5)	4.4 (1.2)	4.2 (1.2)	6.4 (2.4)	6.1 (2.4)	4.8 (1.5)	4.8 (1.6)	1.7 (0.9)	1.6 (0.9)	0.8 (0.5)	0.8 (0.5)
dyr	381.7 (82.7)	361.1 (81.8)	1.9 (2.1)	1.9 (1.7)	5.5 (3.1)	5.3 (2.3)	7.8 (2.8)	6.6 (2.5)	5.1 (1.2)	4.1 (1.1)	0.1 (1.1)	0.3 (0.8)
egfr	449.0 (82.6)	434.1 (71.2)	4.2 (1.2)	3.9 (1.2)	6.7 (2.6)	6.2 (2.5)	7.1 (1.9)	6.6 (1.7)	2.4 (1.2)	2.2 (1.1)	0.4 (0.6)	0.4 (0.6)
esr1	421.0 (93.2)	404.6 (84.5)	5.1 (1.4)	4.7 (1.3)	5.2 (3.4)	5.3 (2.8)	4.6 (1.8)	4.4 (1.8)	2.3 (1.0)	2.1 (0.9)	0.5 (0.6)	0.5 (0.6)
esr2	410.2 (95.3)	394.6 (86.8)	4.9 (1.5)	4.5 (1.4)	4.9 (3.3)	5.2 (2.8)	4.6 (1.9)	4.4 (1.9)	2.3 (1.0)	2.1 (0.8)	0.5 (0.6)	0.5 (0.6)
fa10	513.5 (48.8)	470.9 (48.4)	2.9 (1.6)	3.1 (1.8)	7.1 (2.1)	6.9 (2.2)	8.6 (1.9)	7.9 (1.9)	3.9 (2.3)	2.9 (1.6)	0.7 (0.7)	0.5 (0.7)
fa7	472.1 (66.8)	427.5 (67.7)	2.9 (1.8)	2.4 (2.0)	8.2 (2.5)	6.9 (2.5)	8.1 (1.9)	7.8 (2.3)	6.2 (1.6)	4.8 (1.3)	0.6 (0.8)	0.5 (0.8)
fabp4	390.7 (78.6)	393.8 (79.5)	5.5 (1.4)	5.1 (1.2)	6.3 (2.9)	5.7 (2.6)	4.1 (1.0)	4.4 (1.3)	0.5 (0.8)	0.5 (0.8)	-0.9 (0.4)	-0.8 (0.4)
fak1	438.1 (58.0)	433.1 (53.7)	3.4 (0.8)	3.3 (0.8)	7.0 (2.1)	6.6 (2.0)	8.3 (1.6)	7.7 (1.4)	2.4 (1.2)	2.2 (1.1)	0.2 (0.6)	0.2 (0.6)
fgfr1	448.7 (78.7)	430.0 (70.4)	3.7 (1.6)	3.4 (1.5)	5.7 (3.1)	5.9 (2.6)	7.7 (1.5)	6.8 (1.5)	3.2 (1.2)	2.8 (1.1)	0.5 (0.6)	0.5 (0.6)
fkf1a	440.4 (65.2)	429.7 (58.4)	4.0 (1.4)	4.0 (1.4)	8.4 (2.8)	7.7 (2.3)	6.2 (1.9)	6.0 (1.7)	0.2 (0.5)	0.3 (0.5)	-0.1 (0.2)	-0.1 (0.2)
fnta	480.8 (58.7)	454.5 (49.8)	3.5 (1.7)	3.8 (1.5)	7.0 (3.4)	6.6 (2.6)	6.6 (1.5)	6.6 (1.7)	1.5 (1.3)	1.3 (1.1)	0.3 (0.7)	0.3 (0.7)
fpps	292.0 (40.6)	311.2 (69.8)	-1.0 (1.7)	0.3 (2.1)	6.0 (3.1)	5.6 (2.5)	7.5 (0.8)	7.3 (1.6)	2.7 (1.2)	1.3 (1.3)	-2.1 (0.9)	-1.7 (0.6)
gcr	440.0 (65.5)	425.5 (60.8)	5.2 (1.2)	5.0 (1.2)	4.3 (2.2)	4.6 (2.0)	4.4 (1.6)	4.4 (1.7)	1.3 (0.9)	1.2 (0.8)	0.1 (0.5)	0.1 (0.5)
glcm	352.9 (93.4)	344.7 (93.6)	1.9 (2.2)	1.8 (1.9)	7.7 (4.8)	6.5 (3.3)	6.5 (1.9)	6.3 (2.2)	4.8 (2.1)	4.0 (1.5)	0.6 (0.6)	0.5 (0.6)
gria2	362.7 (89.6)	353.8 (81.3)	1.0 (2.1)	1.3 (2.0)	5.2 (4.4)	5.1 (2.9)	8.2 (2.4)	7.3 (2.0)	2.5 (2.2)	1.9 (1.6)	-0.3 (1.5)	-0.4 (1.2)
grik1	313.4 (94.5)	314.9 (81.3)	-0.6 (2.0)	-0.1 (1.8)	4.5 (2.4)	4.6 (2.0)	7.9 (2.3)	7.5 (1.7)	2.5 (1.1)	2.0 (1.1)	-0.8 (0.6)	-0.8 (0.6)
hdac2	390.2 (84.6)	381.9 (75.9)	3.3 (1.3)	3.2 (1.2)	7.9 (2.7)	6.9 (2.4)	6.3 (1.8)	6.0 (1.8)	3.1 (1.2)	2.8 (1.1)	0.2 (0.5)	0.2 (0.5)
hdac8	384.4 (80.1)	376.2 (71.6)	3.3 (1.3)	3.2 (1.3)	7.4 (2.4)	6.6 (2.2)	6.1 (1.8)	5.8 (1.7)	2.9 (1.1)	2.7 (1.0)	0.3 (0.6)	0.3 (0.6)
hivint	383.1 (78.0)	371.2 (69.8)	1.9 (1.4)	2.1 (1.3)	5.2 (2.5)	4.9 (2.0)	7.2 (2.3)	6.7 (2.0)	2.1 (1.9)	1.9 (1.6)	-0.6 (0.9)	-0.5 (0.7)

Average (Standard Deviation)	Molecular Weight [Daltons]		logP		Rotable Bonds		Hydrogen Bond Acceptors		Hydrogen Bond Donors		Net Charge	
Target	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys
hivpr	512.2 (75.6)	472.2 (57.8)	5.1 (1.5)	4.6 (1.5)	9.3 (3.2)	7.8 (2.7)	6.9 (2.2)	6.9 (2.1)	2.3 (1.8)	1.7 (1.4)	-0.3 (0.7)	-0.3 (0.7)
hivrt	357.9 (68.6)	352.4 (66.1)	3.2 (1.8)	3.2 (1.6)	4.3 (2.5)	4.2 (2.1)	5.5 (2.5)	5.2 (2.0)	1.5 (1.2)	1.4 (1.2)	-0.0 (0.7)	0.0 (0.5)
hmdh	471.8 (69.5)	446.3 (55.1)	4.3 (1.5)	4.2 (1.6)	9.0 (2.8)	7.6 (2.5)	6.1 (2.0)	6.5 (2.0)	2.0 (1.0)	1.3 (0.8)	-0.6 (0.5)	-0.6 (0.5)
hs90a	431.5 (76.7)	418.4 (63.0)	3.6 (1.3)	3.6 (1.1)	5.2 (1.9)	5.3 (2.0)	7.5 (1.8)	6.7 (1.8)	3.1 (1.2)	2.7 (0.9)	0.1 (0.4)	0.1 (0.4)
hxx4	419.7 (53.8)	417.0 (53.1)	3.3 (1.0)	3.3 (1.0)	6.2 (1.8)	5.7 (1.7)	7.1 (1.2)	6.9 (1.2)	1.4 (0.7)	1.4 (0.7)	-0.1 (0.4)	-0.1 (0.4)
igf1r	498.5 (62.9)	464.4 (52.0)	4.3 (1.4)	3.7 (1.5)	6.6 (1.9)	6.6 (2.2)	8.3 (1.8)	7.1 (1.7)	3.8 (1.4)	3.0 (1.1)	0.6 (0.6)	0.5 (0.6)
inha	344.4 (55.8)	347.6 (55.7)	5.1 (0.8)	4.8 (0.8)	6.1 (2.5)	5.2 (2.0)	4.0 (1.1)	3.6 (1.1)	1.2 (0.8)	1.1 (0.7)	-0.0 (0.4)	-0.0 (0.4)
ital	516.3 (57.4)	486.0 (46.9)	4.8 (1.5)	4.9 (1.4)	6.6 (2.0)	6.7 (2.1)	6.1 (1.9)	6.3 (1.8)	0.8 (0.9)	0.8 (0.8)	-0.1 (0.6)	-0.1 (0.6)
jak2	417.1 (81.5)	407.9 (75.2)	3.0 (1.1)	3.0 (1.2)	5.0 (2.2)	5.2 (2.0)	7.5 (1.8)	7.0 (1.6)	2.2 (1.2)	2.1 (1.1)	0.4 (0.7)	0.4 (0.7)
kif11	406.4 (68.3)	394.6 (67.0)	3.8 (0.9)	3.8 (1.0)	5.1 (2.3)	5.0 (2.1)	4.8 (1.4)	4.7 (1.5)	1.9 (1.3)	1.9 (1.2)	0.5 (0.6)	0.5 (0.6)
kit	459.9 (69.7)	440.5 (61.8)	3.9 (1.2)	3.6 (1.2)	6.1 (2.3)	6.1 (2.2)	7.7 (1.7)	6.8 (1.6)	3.3 (1.3)	2.8 (1.1)	0.5 (0.6)	0.5 (0.6)
kith	418.9 (91.1)	403.7 (82.1)	2.0 (1.7)	2.1 (1.6)	5.3 (2.0)	5.7 (1.9)	7.7 (1.3)	7.4 (1.4)	2.8 (0.6)	2.7 (0.7)	0.1 (0.3)	0.1 (0.3)
kpcb	466.6 (72.8)	437.7 (59.9)	3.9 (1.2)	3.6 (1.4)	4.7 (3.6)	5.2 (2.6)	7.5 (2.0)	6.6 (1.8)	2.8 (1.9)	2.2 (1.5)	0.3 (0.9)	0.3 (0.7)
lck	465.8 (80.6)	443.3 (65.9)	4.5 (1.4)	4.0 (1.4)	5.9 (2.3)	6.0 (2.3)	7.5 (1.8)	6.6 (1.6)	3.0 (1.4)	2.5 (1.1)	0.5 (0.7)	0.5 (0.6)
lkha4	372.8 (73.8)	370.9 (76.0)	4.0 (1.7)	3.9 (1.6)	7.5 (2.1)	6.5 (2.1)	4.9 (1.8)	4.8 (1.8)	1.7 (1.1)	1.6 (1.1)	0.4 (0.6)	0.4 (0.6)
mapk2	374.9 (74.1)	362.7 (73.2)	2.5 (1.8)	2.4 (1.7)	3.2 (1.8)	4.0 (1.8)	6.3 (1.5)	5.8 (1.6)	3.2 (1.3)	2.9 (1.1)	0.2 (0.6)	0.2 (0.6)
mcr	411.4 (46.3)	405.3 (49.4)	4.8 (1.3)	4.6 (1.2)	4.6 (2.4)	4.6 (1.9)	4.7 (1.5)	4.6 (1.5)	1.1 (1.0)	1.1 (1.0)	-0.2 (0.5)	-0.2 (0.5)
met	473.7 (77.9)	454.6 (67.6)	3.8 (1.3)	3.7 (1.3)	6.0 (2.2)	6.1 (2.3)	7.8 (1.7)	7.1 (1.6)	2.2 (1.3)	2.0 (1.2)	0.4 (0.6)	0.4 (0.6)
mk01	415.0 (73.5)	402.8 (74.1)	3.3 (1.8)	3.1 (1.7)	5.1 (2.6)	5.3 (2.3)	6.9 (1.6)	6.6 (1.6)	3.4 (1.1)	3.2 (1.1)	0.0 (0.4)	0.0 (0.4)
mk10	411.9 (71.2)	404.0 (66.5)	3.5 (1.4)	3.5 (1.3)	5.5 (2.0)	5.2 (1.9)	6.7 (1.6)	6.4 (1.5)	2.3 (1.2)	2.1 (1.1)	0.3 (0.6)	0.3 (0.6)
mk14	445.8 (71.5)	430.3 (62.9)	4.5 (1.4)	4.1 (1.3)	5.8 (2.0)	5.8 (2.2)	6.4 (1.9)	6.0 (1.7)	2.4 (1.2)	2.1 (1.0)	0.4 (0.6)	0.4 (0.6)
mmp13	473.5 (62.5)	449.8 (53.1)	2.6 (1.4)	2.8 (1.5)	7.5 (2.2)	7.0 (2.2)	8.6 (1.7)	8.0 (1.5)	2.0 (0.9)	1.8 (1.0)	-0.2 (0.6)	-0.2 (0.6)
mp2k1	454.5 (80.1)	436.6 (78.1)	4.1 (1.6)	3.9 (1.6)	6.8 (2.9)	6.6 (2.6)	6.8 (1.7)	6.5 (1.5)	2.8 (1.7)	2.5 (1.4)	0.4 (0.6)	0.4 (0.6)
nos1	308.2 (96.1)	304.5 (87.4)	2.7 (1.7)	2.5 (1.6)	4.4 (2.7)	4.3 (2.2)	4.1 (1.7)	4.0 (1.9)	3.8 (1.7)	3.3 (1.2)	1.1 (0.7)	1.1 (0.7)
nram	343.8 (51.2)	333.6 (61.6)	-0.3 (1.2)	0.2 (1.3)	6.3 (2.1)	5.4 (2.1)	7.5 (1.4)	7.5 (1.6)	4.3 (1.5)	3.9 (1.3)	-0.1 (0.5)	-0.1 (0.5)
pa2ga	444.7 (76.0)	431.2 (65.0)	3.9 (1.8)	3.7 (1.5)	9.7 (4.0)	8.2 (3.3)	6.7 (1.3)	6.7 (1.5)	1.6 (0.9)	1.5 (0.8)	-0.7 (0.6)	-0.6 (0.6)
parp1	361.3 (86.4)	350.9 (84.4)	2.3 (1.3)	2.3 (1.3)	3.6 (1.8)	4.1 (1.9)	5.9 (1.9)	5.6 (1.9)	2.4 (1.3)	2.4 (1.2)	0.4 (0.6)	0.4 (0.6)
pde5a	454.5 (82.4)	439.8 (68.8)	3.5 (1.2)	3.4 (1.2)	6.5 (2.8)	6.2 (2.5)	8.3 (2.1)	7.5 (1.8)	1.4 (1.0)	1.4 (1.0)	0.2 (0.7)	0.2 (0.7)
pgh1	341.8 (64.8)	340.9 (63.8)	4.3 (1.5)	4.0 (1.4)	3.6 (1.7)	3.6 (1.6)	4.1 (1.7)	4.0 (1.7)	1.1 (1.1)	1.0 (1.0)	-0.3 (0.5)	-0.2 (0.5)
pgh2	375.3 (68.7)	369.4 (67.8)	4.0 (1.4)	3.9 (1.4)	4.2 (1.8)	4.0 (1.7)	4.5 (1.6)	4.5 (1.6)	0.8 (0.9)	0.7 (0.9)	-0.2 (0.4)	-0.2 (0.4)
plk1	464.3 (73.6)	447.6 (61.2)	3.8 (1.4)	3.7 (1.4)	6.8 (1.9)	6.3 (1.9)	7.4 (1.6)	6.9 (1.4)	2.9 (1.2)	2.5 (0.9)	0.4 (0.7)	0.4 (0.7)
pnph	277.7 (44.9)	273.8 (50.9)	0.1 (1.7)	0.3 (1.7)	3.3 (1.9)	4.1 (1.8)	7.0 (1.8)	6.2 (1.6)	4.4 (1.7)	3.8 (1.6)	-0.2 (0.9)	-0.2 (0.9)

Average (Standard Deviation)	Molecular Weight [Daltons]		logP		Rotable Bonds		Hydrogen Bond Acceptors		Hydrogen Bond Donors		Net Charge	
Target	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys	Ligands	Decoys
ppara	472.4 (58.6)	460.9 (52.8)	5.6 (1.3)	5.0 (1.1)	10.2 (2.0)	8.4 (2.1)	6.1 (1.4)	6.5 (1.5)	0.3 (0.6)	0.5 (0.6)	-0.8 (0.4)	-0.8 (0.4)
ppard	484.5 (56.5)	463.2 (45.9)	5.8 (1.5)	5.1 (1.2)	9.9 (1.6)	8.1 (1.8)	5.8 (1.5)	6.4 (1.4)	0.2 (0.5)	0.4 (0.6)	-0.9 (0.3)	-0.9 (0.3)
pparg	463.4 (59.9)	451.8 (53.0)	5.4 (1.5)	4.8 (1.3)	9.5 (2.3)	7.9 (2.3)	6.1 (1.5)	6.4 (1.5)	0.4 (0.6)	0.6 (0.6)	-0.8 (0.5)	-0.7 (0.5)
prgr	368.7 (72.6)	360.8 (71.1)	4.8 (1.2)	4.6 (1.2)	2.9 (2.1)	3.5 (1.8)	3.6 (1.3)	3.6 (1.3)	1.0 (0.7)	0.9 (0.6)	0.0 (0.3)	0.0 (0.3)
ptn1	483.2 (86.9)	445.4 (67.2)	4.9 (2.6)	4.3 (2.1)	7.9 (3.3)	6.8 (2.8)	6.4 (2.3)	6.5 (2.1)	1.1 (1.0)	0.7 (0.9)	-1.2 (0.8)	-1.0 (0.7)
pur2	463.5 (27.4)	418.1 (50.5)	-1.1 (0.9)	0.7 (1.7)	10.2 (1.4)	7.2 (1.9)	11.3 (1.0)	9.6 (1.9)	5.4 (0.8)	3.5 (1.1)	-1.9 (0.3)	-0.9 (0.6)
pygm	412.2 (75.1)	397.9 (68.5)	3.3 (1.4)	3.1 (1.3)	5.4 (2.3)	5.2 (2.2)	7.1 (1.7)	6.9 (1.6)	1.6 (1.3)	1.5 (1.4)	-0.9 (1.1)	-0.9 (1.1)
pyrd	377.6 (60.1)	369.6 (60.9)	4.1 (1.2)	3.9 (1.1)	4.5 (1.6)	4.5 (1.6)	4.6 (1.3)	4.7 (1.3)	0.7 (0.7)	0.7 (0.7)	-0.7 (0.4)	-0.7 (0.4)
reni	534.3 (58.7)	480.5 (47.2)	4.3 (1.7)	4.0 (1.9)	13.6 (3.6)	10.8 (2.6)	8.1 (2.1)	7.7 (2.2)	4.1 (1.8)	2.6 (1.4)	0.5 (0.7)	0.3 (0.6)
rock1	360.6 (67.2)	353.3 (67.9)	2.6 (1.4)	2.5 (1.4)	4.4 (1.5)	4.8 (1.9)	6.6 (2.2)	5.9 (1.9)	3.4 (1.2)	3.1 (1.0)	0.8 (0.7)	0.8 (0.7)
rxra	407.8 (66.8)	412.4 (58.6)	6.4 (1.2)	5.5 (0.9)	5.4 (2.3)	5.0 (2.1)	3.7 (1.6)	4.7 (1.5)	0.2 (0.5)	0.4 (0.6)	-0.9 (0.4)	-0.8 (0.4)
sahh	270.6 (41.7)	275.4 (48.9)	-0.3 (0.9)	-0.0 (1.0)	2.5 (1.4)	3.5 (1.4)	7.9 (1.3)	6.9 (1.4)	3.9 (0.7)	3.6 (0.8)	-0.1 (0.4)	-0.1 (0.4)
src	482.3 (73.6)	457.8 (61.8)	4.7 (1.6)	4.3 (1.5)	6.5 (2.4)	6.3 (2.4)	7.6 (1.8)	6.7 (1.6)	2.4 (1.3)	2.0 (1.1)	0.4 (0.8)	0.4 (0.7)
tgfr1	379.0 (59.8)	374.8 (59.5)	3.2 (1.0)	3.2 (1.0)	4.2 (1.7)	4.1 (1.7)	6.1 (1.4)	5.8 (1.3)	1.5 (1.1)	1.5 (1.0)	0.2 (0.5)	0.2 (0.5)
thb	461.0 (69.5)	442.6 (58.3)	4.6 (1.2)	4.3 (1.2)	6.0 (2.2)	6.0 (2.1)	6.8 (2.5)	6.5 (2.1)	1.5 (0.9)	1.1 (0.9)	-0.5 (0.7)	-0.5 (0.7)
thrb	489.9 (58.2)	436.4 (53.4)	1.2 (1.7)	1.9 (1.8)	9.2 (2.7)	7.3 (2.4)	9.2 (1.8)	8.4 (2.0)	5.3 (1.9)	3.9 (1.4)	0.7 (0.7)	0.4 (0.7)
try1	481.5 (67.6)	423.8 (65.6)	1.6 (1.8)	1.8 (1.9)	8.6 (3.0)	6.9 (2.7)	8.9 (2.3)	8.1 (2.3)	6.1 (1.9)	4.5 (1.5)	1.1 (0.7)	0.6 (0.7)
tryb1	488.6 (62.7)	449.7 (56.7)	1.6 (2.1)	2.0 (1.8)	8.8 (3.3)	7.9 (2.6)	9.2 (2.0)	8.5 (2.0)	4.1 (2.2)	3.1 (1.8)	0.6 (0.8)	0.4 (0.7)
tysy	452.2 (93.4)	407.0 (79.6)	0.7 (2.3)	1.9 (1.9)	7.1 (3.3)	5.8 (2.5)	9.4 (3.0)	7.8 (2.4)	3.0 (1.4)	2.0 (1.5)	-1.0 (1.3)	-0.5 (0.9)
urok	403.6 (80.1)	375.0 (79.8)	2.8 (1.8)	2.2 (1.8)	5.8 (2.8)	5.5 (2.4)	6.5 (2.4)	6.4 (2.5)	5.5 (1.5)	4.4 (1.2)	0.8 (0.8)	0.6 (0.8)
vgfr2	449.9 (69.8)	432.0 (62.9)	4.0 (1.5)	3.6 (1.4)	5.9 (2.2)	6.0 (2.2)	7.3 (1.7)	6.6 (1.6)	2.7 (1.4)	2.3 (1.1)	0.5 (0.6)	0.5 (0.6)
wee1	474.6 (73.4)	453.8 (66.8)	4.1 (1.1)	4.0 (1.2)	5.1 (2.1)	5.7 (2.0)	7.3 (1.2)	6.6 (1.3)	2.6 (0.8)	2.4 (0.8)	0.2 (0.6)	0.2 (0.6)
xiap	484.1 (73.7)	440.9 (59.0)	1.6 (1.8)	2.2 (1.6)	8.5 (2.4)	7.4 (2.2)	8.0 (1.9)	7.9 (2.3)	5.1 (1.7)	4.0 (1.2)	0.8 (0.7)	0.6 (0.7)

Table S4: Per Target Docking Enrichments

Target	None	Full	SEV	Thin	Drug-like*
<i>Average</i>	<i>20.6</i>	<i>14.3</i>	<i>24.4</i>	<i>24.9</i>	<i>26.8</i>
aa2ar	20	25	28	3	25
abl1	27	13	26	23	27
ace	18	16	22	18	38
aces	18	15	25	23	27
ada	13	27	24	16	29
ada17	25	13	26	26	33
adrb1	23	3	19	12	20

Target	None	Full	SEV	Thin	Drug-like*
adrb2	19	1	12	11	13
akt1	27	6	27	27	36
akt2	21	4	16	20	24
aldr	30	18	31	31	34
ampc	20	6	16	17	26
andr	3	4	5	5	20
aofb	19	16	17	18	33
bace1	10	6	11	9	15
braf	22	11	22	22	25
cah2	12	7	12	9	15
casp3	11	5	16	16	19
cdk2	14	15	21	22	22
comt	19	30	34	31	38
cp2c9	6	6	7	8	9
cp3a4	6	8	7	7	4
csf1r	21	24	32	35	26
cxcr4	20	11	36	20	53
def	17	23	23	26	25
dhi1	8	10	11	12	22
dpp4	36	26	41	41	36
drd3	14	8	13	10	17
dyr	33	31	43	43	39
egfr	22	21	29	35	32
esr1	14	8	18	17	21
esr2	17	8	19	17	18
fa10	33	11	39	43	41
fa7	53	14	56	67	53
fabp4	44	33	46	46	56
fak1	9	16	24	25	25
fgfr1	24	9	18	16	18
fkbl1a	9	18	16	16	22
fnta	11	14	16	25	15
fpps	55	35	51	53	71
gcr	1	4	4	3	9
glcm	16	32	30	31	33
gria2	15	10	23	23	14
grik1	36	6	35	35	18
hdac2	20	16	24	25	19
hdac8	25	20	29	29	18
hivint	13	1	8	4	7
hivpr	4	5	7	8	7
hivrt	9	9	11	11	19
hmdh	17	35	26	25	34
hs90a	11	12	15	15	18
hvk4	21	16	25	27	30
igf1r	8	8	18	25	22
inha	12	18	19	20	19
ital	6	3	15	19	27
jak2	12	19	29	28	28

Target	None	Full	SEV	Thin	Drug-like*
kif11	25	17	34	40	34
kit	7	7	12	11	17
kith	12	10	15	20	20
kpcb	13	7	15	17	13
lck	18	14	25	22	28
lkha4	27	13	18	19	20
mapk2	15	19	33	43	30
mcr	-5	-4	-4	-4	0
met	30	8	24	24	27
mk01	21	20	19	24	32
mk10	14	21	24	27	25
mk14	10	12	17	17	20
mmp13	22	2	12	12	21
mp2k1	12	15	16	16	21
nos1	12	25	19	19	33
nam	46	10	44	45	41
pa2ga	16	21	26	28	37
parp1	22	17	25	37	21
pde5a	11	16	17	19	20
pgh1	7	2	3	3	11
pgh2	10	11	13	13	20
plk1	18	21	28	30	33
pnph	9	32	39	40	12
ppara	16	7	19	20	13
ppard	28	22	32	34	43
pparg	18	11	21	21	28
prgr	9	8	8	9	25
ptn1	30	25	36	35	44
pur2	54	-13	51	53	48
pygm	16	2	17	18	9
pyrd	29	14	30	30	33
reni	24	11	21	21	17
rock1	11	10	17	11	19
rxra	30	18	25	27	32
sahh	24	39	39	38	58
src	17	11	18	20	21
tgfr1	30	27	36	37	33
thb	33	38	36	37	37
thrb	31	5	32	34	27
try1	45	18	57	57	42
tryb1	43	5	37	37	29
tysy	31	7	28	27	21
urok	45	41	65	64	47
vgfr2	17	13	21	20	22
wee1	39	31	52	64	55
xiap	61	7	52	60	53

*Drug-like background made from all ChEMBL12 ligands with affinities below 10 μ M

Table S5: Comparison of DUD-E and DUD

Incremental Change		All Original	New Style Decoys	Switch Ligands	Switch Target Preparation
Decoys		DUD	DUD-E	DUD-E	DUD-E
Ligands		DUD	DUD	DUD-E	DUD-E
Receptor Preparation		DUD	DUD	DUD	DUD-E
LogAUC	Average	14.8	19.7	16.4	22.8
DUD-E target	DUD target				
ace	ace_auto	20	29	19	22
aces	ache_auto	2	3	9	25
ada	ada_semi	8	19	17	24
aldr	alr2_auto	24	24	14	31
ampc	ampc_auto	0	8	10	16
andr	ar_auto	19	3	3	5
cdk2	cdk2_semi	21	28	25	21
comt	comt_auto	31	27	33	34
dyr	dhfr_semi	13	30	19	43
egfr	egfr_semi	25	32	28	29
fa10	fxa_auto	13	28	25	39
fgfr1	fgfr1_auto	-10	-6	11	18
gcr	gr_auto	10	-3	-4	4
hivpr	hivpr_semi	7	12	-2	7
hivrt	hivrt_auto	6	8	8	11
hmdh	hmga_auto	20	14	16	26
hs90a	hsp90_semi	21	20	17	15
inha	inha_auto	10	24	11	19
kith	tk_auto	1	32	14	15
mcr	mr_auto	45	27	-4	-4
mk14	p38_semi	4	19	16	17
nram	neua_auto	14	14	32	44
parp1	parp_semi	15	35	33	25
pde5a	pde5_semi	18	18	17	17
pgh1	cox1_auto	8	15	-4	3
pgh2	cox2_auto	26	29	8	13
pnph	pnp_auto	15	14	12	39
pparg	ppar_auto	-4	2	15	21
prgr	pr_auto	4	-5	4	8
pur2	gart_semi	40	62	37	51
pygm	gpb_semi	17	13	2	17
rxra	rxr_auto	34	37	22	25
sahh	sahh_auto	26	26	31	39
src	src_semi	1	10	19	18
thrb	thrombin_auto	27	39	28	32
try1	trypsin_auto	15	31	53	57
vgfr2	vegfr2_semi	3	11	15	21