Supporting Information

Identification of the first inhibitor of the GBP1:PIM1 interaction. Implications for the development of a new class of anticancer agents against paclitaxel resistant cancer cells.

Mirko Andreoli,[†,//] *Marco Persico,*[‡,//] *Ajay Kumar,*[±,//] *Nausicaa Orteca,*[‡] *Vineet Kumar,*[#] *Antonella Pepe,*[#] *Sakkarapalayam Mahalingam,*[$] *Antonio E. Alegria,*[€] *Lella Petrella,*[§] *Laima Sevciunaite,*[§] *Alessia Camperchioli,*[§] *Marisa Mariani,*[†] *Antonio Di Dato,*[‡] *Ettore Novellino,*[‡] *Giovanni Scambia,*[¥] *Sanjay V. Malhotra,*[*,#] *Cristiano Ferlini,*[*,†] *Caterina Fattorusso*[*,‡]

TOC:

l) **Table 2SI.** Protein functional motifs indentified by the ELM software in the binding sites of etoposide, podophyllotoxin and NSC756093;

m) Ramachandran plots, Chi1-Chi2 plots, Main Chain parameters, Side Chain parameters of:
   i) Human GBP1 X-ray structure (PDB ID: 1DG3);
   ii) Structure of NSC756093/GBP1 docked complex.

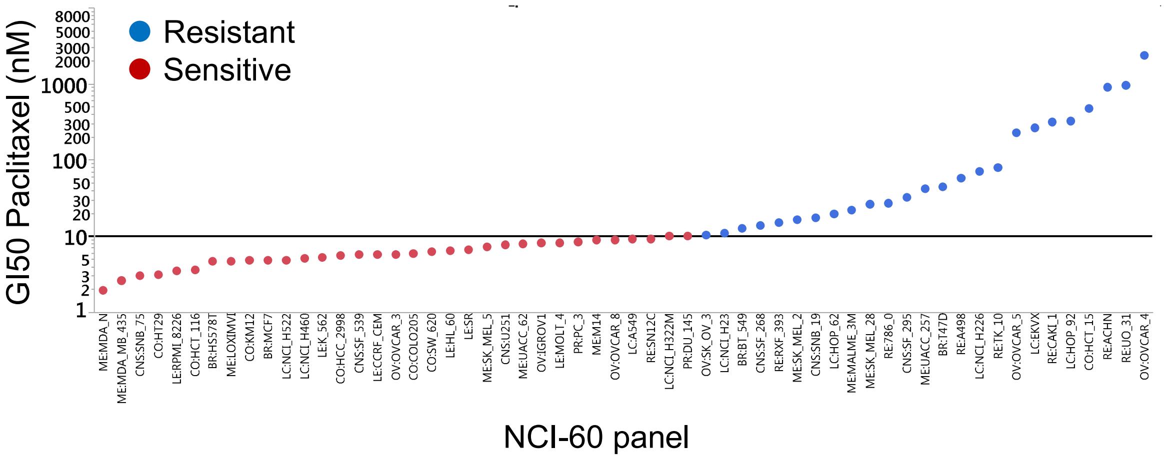
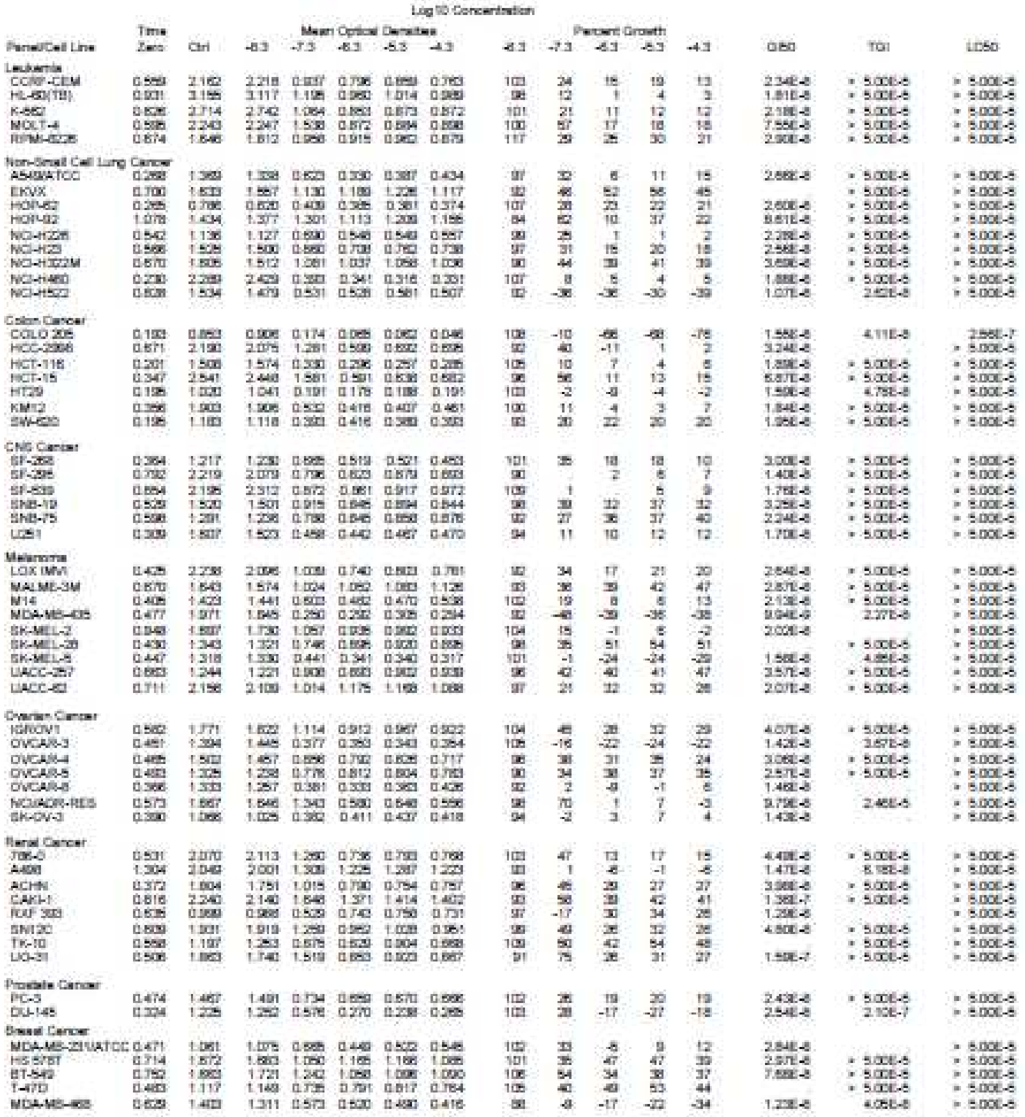


Figure 1SI. Dot chart showing the sensitivity to paclitaxel in the NCI-60 panel. Cells were grouped as sensitive (red dot) or resistant (blue dot) if the GI_{50} value was lower or higher than 10 nM, respectively. As reported in the chart paclitaxel-resistant cell lines are the following: SK-OV-3, NCI-H23, BT-549, SF-268, RXF-393, SK-MEL-2, SNB-19, HOP-62, MALME-3M, SK-MEL-28, 786-0, SF-295, UACC-257, T47D, A498, NCI-H226, TK-10, OVACAR-5, EKVX, CAKI-1, HOP-92, HCT-15, ACHN, UO-31, OVCAR-4.



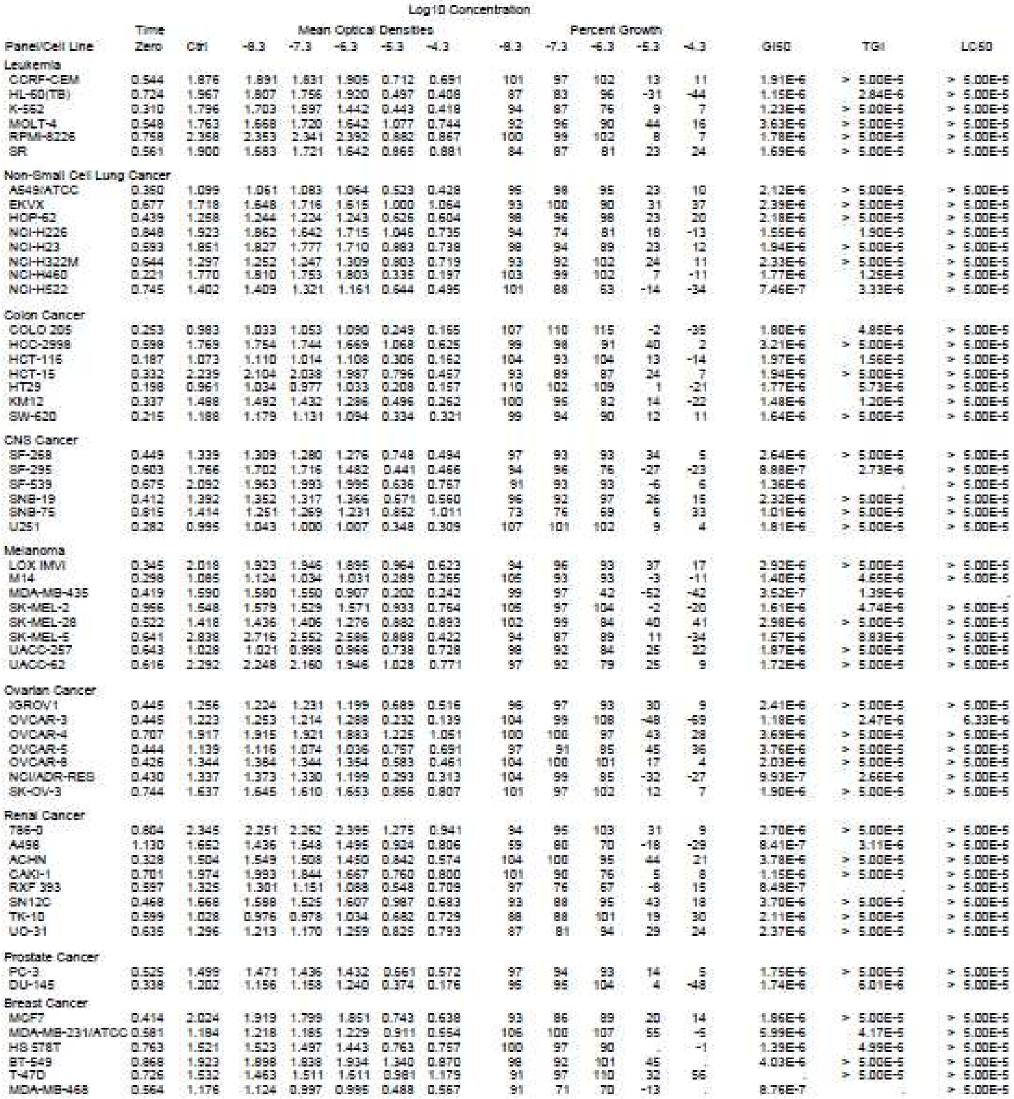
Log10 Concentration

Panel/Cell Line	Time Zero	Ctrl	Mean Optical Densities					Percent Growth					GI50	TGI	LC50
			-8.3	-7.3	-6.3	-5.3	-4.3	-8.3	-7.3	-6.3	-5.3	-4.3			
Leukemia															
CCRF-CEM	0.559	2.162	2.218	0.937	0.796	0.858	0.763	103	24	15	19	13	2.34E-8	> 5.00E-5	> 5.00E-5
HL-60(TB)	0.931	3.155	3.117	1.195	0.960	1.014	0.989	98	12	1	4	3	1.81E-8	> 5.00E-5	> 5.00E-5
K-562	0.626	2.714	2.742	1.064	0.860	0.873	0.872	101	21	11	12	12	2.18E-8	> 5.00E-5	> 5.00E-5
MOLT-4	0.595	2.243	2.247	1.538	0.872	0.884	0.898	100	57	17	18	18	7.55E-8	> 5.00E-5	> 5.00E-5
RPMI-8226	0.674	1.646	1.812	0.958	0.915	0.962	0.879	117	29	25	30	21	2.90E-8	> 5.00E-5	> 5.00E-5
Non-Small Cell Lung Cancer															
A549/ATCC	0.268	1.369	1.338	0.623	0.330	0.387	0.434	97	32	6	11	15	2.88E-8	> 5.00E-5	> 5.00E-5
EKVX	0.700	1.633	1.557	1.130	1.189	1.226	1.117	92	46	52	56	45		> 5.00E-5	> 5.00E-5
HOP-62	0.265	0.786	0.820	0.409	0.385	0.381	0.374	107	28	23	22	21	2.60E-8	> 5.00E-5	> 5.00E-5
HOP-92	1.078	1.434	1.377	1.301	1.113	1.209	1.156	84	62	10	37	22	8.61E-8	> 5.00E-5	> 5.00E-5
NCI-H226	0.542	1.136	1.127	0.690	0.548	0.549	0.557	98	25	1	1	2	2.28E-8	> 5.00E-5	> 5.00E-5
NCI-H23	0.566	1.526	1.500	0.860	0.708	0.762	0.738	97	31	15	20	18	2.56E-8	> 5.00E-5	> 5.00E-5
NCI-H322M	0.670	1.606	1.512	1.081	1.037	1.058	1.036	90	44	39	41	39	3.69E-8	> 5.00E-5	> 5.00E-5
NCI-H460	0.230	2.288	2.429	0.393	0.341	0.316	0.331	107	8	5	4	5	1.88E-8	> 5.00E-5	> 5.00E-5
NCI-H522	0.828	1.534	1.479	0.531	0.528	0.581	0.507	92	-36	-36	-30	-39	1.07E-8	2.62E-8	> 5.00E-5
Colon Cancer															
COLO 205	0.193	0.853	0.906	0.174	0.065	0.062	0.046	108	-10	-66	-68	-76	1.55E-8	4.11E-8	2.86E-7
HCC-2998	0.671	2.190	2.075	1.281	0.599	0.692	0.695	92	40	-11	1	2	3.24E-8		> 5.00E-5
HCT-116	0.201	1.506	1.574	0.330	0.296	0.257	0.285	105	10	7	4	6	1.89E-8	> 5.00E-5	> 5.00E-5
HCT-15	0.347	2.541	2.448	1.581	0.591	0.636	0.682	96	56	11	13	15	6.87E-8	> 5.00E-5	> 5.00E-5
HT29	0.195	1.020	1.041	0.191	0.178	0.188	0.191	103	-2	-9	-4	-2	1.59E-8	4.75E-8	> 5.00E-5
KM12	0.366	1.903	1.906	0.532	0.416	0.407	0.461	100	11	4	3	7	1.84E-8	> 5.00E-5	> 5.00E-5
SW-620	0.195	1.183	1.118	0.393	0.416	0.389	0.393	93	20	22	20	20	1.95E-8	> 5.00E-5	> 5.00E-5
CNS Cancer															
SF-268	0.364	1.217	1.230	0.665	0.519	0.521	0.453	101	35	18	18	10	3.00E-8	> 5.00E-5	> 5.00E-5
SF-295	0.792	2.219	2.079	0.796	0.823	0.879	0.893	90		2	6	7	1.40E-8	> 5.00E-5	> 5.00E-5
SF-539	0.854	2.196	2.312	0.872	0.861	0.917	0.972	109	1		5	9	1.76E-8	> 5.00E-5	> 5.00E-5
SNB-19	0.529	1.520	1.501	0.915	0.846	0.894	0.844	98	39	32	37	32	3.25E-8	> 5.00E-5	> 5.00E-5
SNB-75	0.598	1.281	1.236	0.786	0.846	0.850	0.876	92	27	36	37	40	2.24E-8	> 5.00E-5	> 5.00E-5
U251	0.309	1.607	1.523	0.458	0.442	0.467	0.470	94	11	10	12	12	1.70E-8	> 5.00E-5	> 5.00E-5
Melanoma															
LOX IMVI	0.425	2.236	2.096	1.038	0.740	0.803	0.781	92	34	17	21	20	2.64E-8	> 5.00E-5	> 5.00E-5
MALME-3M	0.670	1.643	1.574	1.024	1.052	1.083	1.126	93	36	39	42	47	2.87E-8	> 5.00E-5	> 5.00E-5
M14	0.405	1.423	1.441	0.603	0.462	0.470	0.538	102	19	6	6	13	2.13E-8	> 5.00E-5	> 5.00E-5
MDA-MB-435	0.477	1.971	1.845	0.250	0.292	0.305	0.294	92	-48	-39	-36	-38	9.94E-9	2.27E-8	> 5.00E-5
SK-MEL-2	0.948	1.697	1.730	1.057	0.936	0.992	0.933	104	15	-1	6	-2	2.02E-8		> 5.00E-5
SK-MEL-28	0.430	1.343	1.321	0.746	0.895	0.920	0.895	98	35	51	54	51		> 5.00E-5	> 5.00E-5
SK-MEL-5	0.447	1.318	1.330	0.441	0.341	0.340	0.317	101	-1	-24	-24	-29	1.56E-8	4.85E-8	> 5.00E-5
UACC-257	0.663	1.244	1.221	0.908	0.893	0.902	0.938	96	42	40	41	47	3.57E-8	> 5.00E-5	> 5.00E-5
UACC-62	0.711	2.156	2.103	1.014	1.175	1.168	1.088	97	21	32	32	26	2.07E-8	> 5.00E-5	> 5.00E-5
Ovarian Cancer															
IGROV1	0.582	1.771	1.822	1.114	0.912	0.967	0.922	104	45	28	32	29	4.07E-8	> 5.00E-5	> 5.00E-5
OVCAR-3	0.451	1.394	1.445	0.377	0.353	0.343	0.354	105	-16	-22	-24	-22	1.42E-8	3.67E-8	> 5.00E-5
OVCAR-4	0.465	1.502	1.457	0.856	0.792	0.828	0.717	96	38	31	35	24	3.06E-8	> 5.00E-5	> 5.00E-5
OVCAR-5	0.483	1.326	1.238	0.776	0.812	0.804	0.783	90	34	39	37	35	2.57E-8	> 5.00E-5	> 5.00E-5
OVCAR-8	0.366	1.333	1.257	0.381	0.333	0.363	0.426	92	2	-9	-1	6	1.46E-8		> 5.00E-5
NCI/ADR-RES	0.573	1.667	1.646	1.343	0.580	0.648	0.556	98	70	1	7	-3	9.79E-8	2.46E-5	> 5.00E-5
SK-OV-3	0.390	1.066	1.025	0.382	0.411	0.437	0.418	94	-2	3	7	4	1.43E-8		> 5.00E-5
Renal Cancer															
786-0	0.531	2.070	2.113	1.260	0.736	0.793	0.768	103	47	13	17	15	4.49E-8	> 5.00E-5	> 5.00E-5
A498	1.304	2.049	2.001	1.308	1.225	1.287	1.223	93	1	-6	-1	-6	1.47E-8	8.15E-8	> 5.00E-5
ACHN	0.372	1.804	1.751	1.015	0.780	0.754	0.757	96	45	28	27	27	3.88E-8	> 5.00E-5	> 5.00E-5
CAKI-1	0.818	2.240	2.140	1.646	1.371	1.414	1.402	93	58	39	42	41	1.38E-7	> 5.00E-5	> 5.00E-5
RXF 393	0.636	0.989	0.988	0.529	0.743	0.750	0.731	97	-17	30	34	26	1.29E-8		> 5.00E-5
SN12C	0.609	1.931	1.919	1.259	0.952	1.028	0.951	99	49	26	32	26	4.80E-8	> 5.00E-5	> 5.00E-5
TK-10	0.559	1.197	1.253	0.875	0.829	0.904	0.868	109	50	42	54	48		> 5.00E-5	> 5.00E-5
UO-31	0.506	1.863	1.740	1.519	0.853	0.923	0.867	91	75	26	31	27	1.59E-7	> 5.00E-5	> 5.00E-5
Prostate Cancer															
PC-3	0.474	1.467	1.491	0.734	0.659	0.670	0.666	102	26	19	20	19	2.43E-8	> 5.00E-5	> 5.00E-5
DU-145	0.324	1.226	1.252	0.576	0.270	0.238	0.265	103	28	-17	-27	-18	2.54E-8	2.10E-7	> 5.00E-5
Breast Cancer															
MDA-MB-231/ATCC	0.471	1.061	1.075	0.665	0.449	0.522	0.546	102	33	-5	9	12	2.84E-8		> 5.00E-5
HS 578T	0.714	1.672	1.683	1.050	1.165	1.166	1.086	101	35	47	47	39	2.57E-8	> 5.00E-5	> 5.00E-5
BT-549	0.752	1.663	1.721	1.242	1.058	1.098	1.090	106	54	34	38	37	7.69E-8	> 5.00E-5	> 5.00E-5
T-47D	0.483	1.117	1.149	0.735	0.791	0.817	0.764	105	40	49	53	44		> 5.00E-5	> 5.00E-5
MDA-MB-468	0.628	1.403	1.311	0.573	0.520	0.490	0.416	88	-9	-17	-22	-34	1.23E-8	4.05E-8	> 5.00E-5

Figure 2SI. Five dose data for NSC756090.

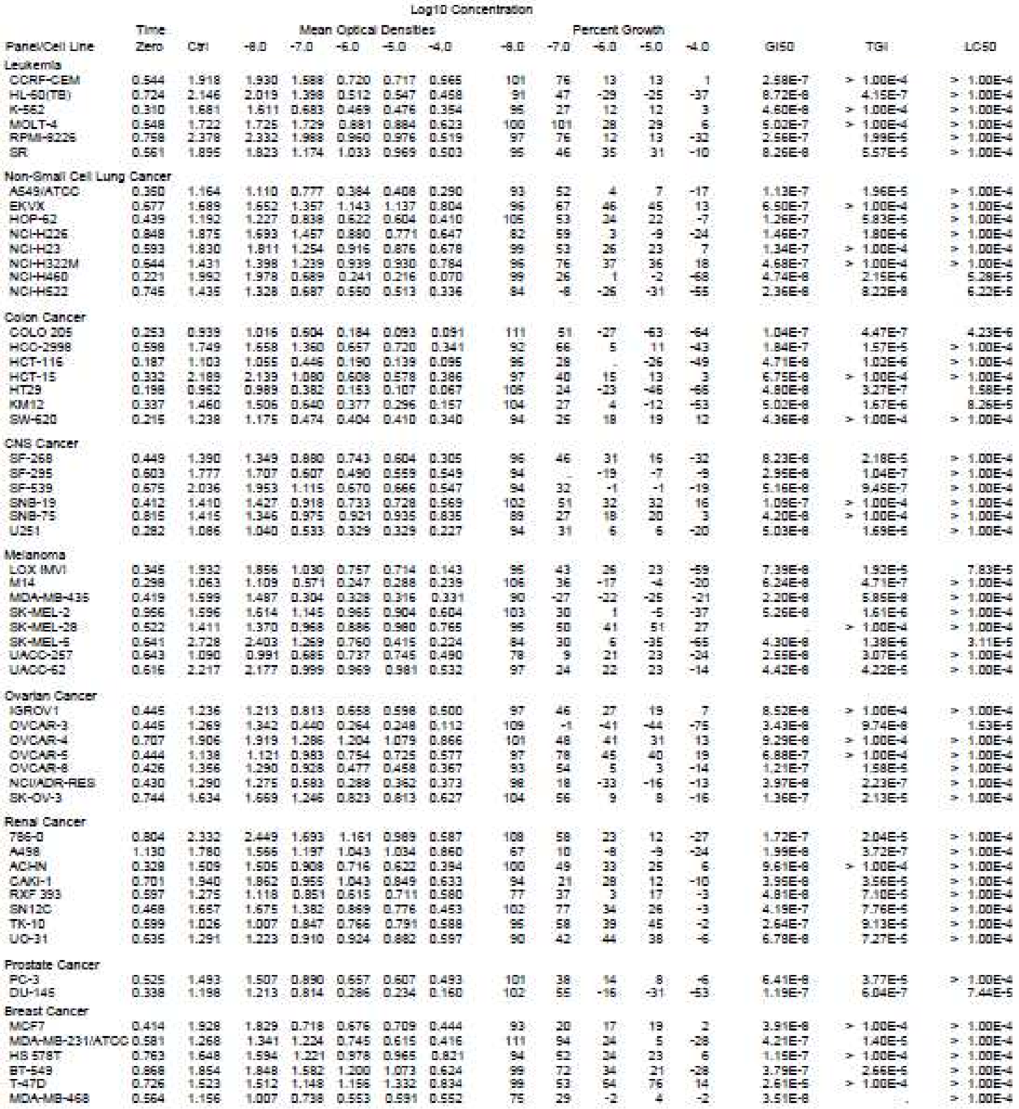
						Log10 Concentration									
	Time			Mean Optical Densities						Percent Growth					
Panel/Cell Line	Zero	Ctrl	-8.0	-7.0	-6.0	-5.0	-4.0	-8.0	-7.0	-6.0	-5.0	-4.0	GI50	TGI	LC50
Leukemia															
CCRF-CEM	0.544	2.032	2.020	1.325	0.696	0.668	0.712	99	52	10	8	11	1.14E-7	> 1.00E-4	> 1.00E-4
K-562	0.310	1.807	1.606	0.604	0.462	0.386	0.436	87	20	10	5	8	3.52E-8	> 1.00E-4	> 1.00E-4
MOLT-4	0.548	1.753	1.664	1.402	0.841	0.770	0.801	93	71	24	18	21	2.80E-7	> 1.00E-4	> 1.00E-4
RPMI-8226	0.758	2.412	2.336	1.818	0.946	0.916	0.949	95	64	11	10	12	1.85E-7	> 1.00E-4	> 1.00E-4
SR	0.561	1.942	1.634	1.082	1.046	0.826	0.831	78	38	35	19	20	4.93E-8	> 1.00E-4	> 1.00E-4
Non-Small Cell Lung Cancer															
A549/ATCC	0.350	1.244	1.189	0.705	0.412	0.391	0.388	94	40	7	5	4	6.45E-8	> 1.00E-4	> 1.00E-4
EKVX	0.677	1.812	1.732	1.534	1.239	1.162	1.256	93	76	50	43	51	.	> 1.00E-4	> 1.00E-4
HOP-62	0.439	1.255	1.233	0.769	0.702	0.613	0.586	97	40	32	21	18	6.78E-8	> 1.00E-4	> 1.00E-4
NCI-H226	0.848	1.913	1.858	1.327	0.984	0.696	0.704	95	45	13	-18	-17	7.92E-8	2.61E-6	> 1.00E-4
NCI-H23	0.593	1.865	1.816	1.218	0.875	0.719	0.720	96	49	22	10	10	9.58E-8	> 1.00E-4	> 1.00E-4
NCI-H322M	0.644	1.301	1.252	1.047	0.881	0.697	0.711	93	61	36	8	10	2.81E-7	> 1.00E-4	> 1.00E-4
NCI-H460	0.221	1.815	1.813	0.466	0.296	0.182	0.155	100	15	5	-18	-30	3.89E-8	1.62E-6	> 1.00E-4
NCI-H522	0.745	1.426	1.287	0.603	0.548	0.388	0.475	79	-19	-27	-48	-36	1.99E-8	6.40E-8	> 1.00E-4
Colon Cancer															
COLO 205	0.253	1.062	1.084	0.539	0.277	0.118	0.082	103	35	3	-53	-68	6.06E-8	1.13E-6	8.72E-6
HCC-2998	0.598	1.816	1.781	1.301	0.614	0.673	0.637	97	58	1	6	3	1.37E-7	> 1.00E-4	> 1.00E-4
HCT-116	0.187	1.089	1.117	0.422	0.266	0.146	0.138	103	26	9	-22	-26	4.89E-8	1.92E-6	> 1.00E-4
HCT-15	0.332	2.325	2.186	1.192	0.572	0.530	0.448	93	43	12	10	6	7.28E-8	> 1.00E-4	> 1.00E-4
HT29	0.198	1.059	1.051	0.247	0.169	0.100	0.117	99	6	-15	-50	-41	3.35E-8	1.90E-7	> 1.00E-4
KM12	0.337	1.483	1.426	0.557	0.427	0.252	0.242	95	19	8	-25	-28	3.92E-8	1.73E-6	> 1.00E-4
SW-620	0.215	1.249	1.174	0.390	0.401	0.376	0.352	93	17	18	16	13	3.67E-8	> 1.00E-4	> 1.00E-4
CNS Cancer															
SF-268	0.449	1.341	1.294	0.793	0.742	0.545	0.520	95	39	33	11	8	6.25E-8	> 1.00E-4	> 1.00E-4
SF-295	0.603	2.047	1.932	0.705	0.604	0.824	0.915	92	7	.	15	22	3.12E-8	> 1.00E-4	> 1.00E-4
SF-539	0.675	1.996	1.947	0.897	0.639	0.595	0.670	96	17	-5	-12	-1	3.82E-8	5.74E-7	> 1.00E-4
SNB-19	0.412	1.395	1.347	0.860	0.713	0.605	0.604	95	46	31	20	19	8.15E-8	> 1.00E-4	> 1.00E-4
SNB-75	0.815	1.401	1.251	0.843	0.867	0.919	0.920	74	5	9	18	18	2.24E-8	> 1.00E-4	> 1.00E-4
U251	0.282	1.172	1.105	0.511	0.351	0.332	0.333	92	26	8	6	6	4.32E-8	> 1.00E-4	> 1.00E-4
Melanoma															
LOX IMVI	0.345	1.960	1.911	1.010	0.939	0.634	0.629	97	41	37	18	18	6.94E-8	> 1.00E-4	> 1.00E-4
M14	0.298	1.126	1.094	0.543	0.318	0.285	0.339	96	30	2	-4	5	4.93E-8	.	> 1.00E-4
MDA-MB-435	0.419	1.758	1.652	0.323	0.251	0.262	0.250	92	-23	-40	-38	-40	2.32E-8	6.31E-8	> 1.00E-4
SK-MEL-2	0.956	1.592	1.524	0.851	0.824	0.750	0.745	89	-11	-14	-22	-22	2.46E-8	7.76E-8	> 1.00E-4
SK-MEL-28	0.522	1.411	1.378	0.982	0.858	0.856	0.872	96	52	38	38	39	1.33E-7	> 1.00E-4	> 1.00E-4
SK-MEL-5	0.641	2.840	2.714	1.152	1.066	0.356	0.377	94	23	19	-44	-41	4.20E-8	2.01E-6	> 1.00E-4
UACC-257	0.643	1.124	1.088	0.721	0.792	0.747	0.788	92	16	31	22	30	3.60E-8	> 1.00E-4	> 1.00E-4
UACC-62	0.616	2.352	2.191	0.995	1.058	0.947	0.875	91	22	25	19	15	3.90E-8	> 1.00E-4	> 1.00E-4
Ovarian Cancer															
IGROV1	0.445	1.236	1.241	0.844	0.684	0.536	0.493	101	50	30	11	6	1.04E-7	> 1.00E-4	> 1.00E-4
OVCAR-3	0.445	1.255	1.250	0.334	0.214	0.181	0.181	99	-25	-52	-59	-59	2.50E-8	6.30E-8	8.50E-7
OVCAR-4	0.707	1.942	1.885	1.307	1.230	1.023	1.019	95	49	42	26	25	9.34E-8	> 1.00E-4	> 1.00E-4
OVCAR-5	0.444	1.139	1.093	0.909	0.730	0.600	0.650	93	67	41	22	30	4.51E-7	> 1.00E-4	> 1.00E-4
OVCAR-8	0.426	1.504	1.528	0.999	0.578	0.444	0.461	102	53	14	2	3	1.20E-7	> 1.00E-4	> 1.00E-4
NCI/ADR-RES	0.430	1.351	1.350	0.657	0.282	0.281	0.335	100	25	-35	-35	-22	4.60E-8	2.61E-7	> 1.00E-4
SK-OV-3	0.744	1.670	1.633	1.127	0.947	0.803	0.747	96	41	22	6	.	6.95E-8	> 1.00E-4	> 1.00E-4
Renal Cancer															
786-0	0.804	2.342	2.262	1.357	1.178	0.792	0.772	95	36	24	-1	-4	5.77E-8	8.75E-6	> 1.00E-4
A498	1.130	1.649	1.456	1.160	0.973	0.865	0.865	63	6	-14	-23	-23	1.67E-8	1.95E-7	> 1.00E-4
ACHN	0.328	1.503	1.478	0.854	0.773	0.564	0.562	98	45	38	20	20	7.96E-8	> 1.00E-4	> 1.00E-4
CAKI-1	0.701	2.017	1.908	1.031	0.991	0.788	0.778	92	25	22	7	6	4.23E-8	> 1.00E-4	> 1.00E-4
RXF 393	0.597	1.281	1.212	0.730	0.562	0.616	0.726	90	19	-6	3	19	3.68E-8	.	> 1.00E-4
SN12C	0.468	1.732	1.697	1.193	1.000	0.739	0.675	97	57	42	21	16	3.02E-7	> 1.00E-4	> 1.00E-4
TK-10	0.599	1.062	1.004	0.816	0.774	0.718	0.742	87	47	38	26	31	8.31E-8	> 1.00E-4	> 1.00E-4
UO-31	0.636	1.314	1.203	0.894	0.919	0.784	0.759	84	38	42	22	18	5.49E-8	> 1.00E-4	> 1.00E-4
Prostate Cancer															
PC-3	0.525	1.515	1.503	0.778	0.696	0.601	0.623	99	26	17	8	10	4.64E-8	> 1.00E-4	> 1.00E-4
DU-145	0.338	1.201	1.159	0.653	0.360	0.188	0.205	95	37	2	-45	-39	5.88E-8	1.13E-6	> 1.00E-4
Breast Cancer															
MCF7	0.414	2.011	1.856	0.668	0.709	0.647	0.552	90	16	18	15	9	3.48E-8	> 1.00E-4	> 1.00E-4
MDA-MB-231/ATCC	0.581	1.171	1.173	1.027	0.729	0.504	0.506	100	76	25	-13	-13	3.21E-7	4.51E-6	> 1.00E-4
HS 578T	0.763	1.498	1.466	0.928	0.780	0.814	0.751	96	22	2	7	-2	4.20E-8	6.54E-5	> 1.00E-4
BT-549	0.868	1.804	1.781	1.316	1.265	0.832	0.719	97	48	42	-4	-17	9.03E-8	8.15E-6	> 1.00E-4
T-47D	0.726	1.618	1.577	1.065	1.239	1.240	1.200	95	38	58	58	53	.	> 1.00E-4	> 1.00E-4
MDA-MB-468	0.564	1.175	1.117	0.624	0.584	0.495	0.543	90	10	3	-12	-4	3.18E-8	1.61E-6	> 1.00E-4

Figure 3SI. Five dose data for NSC756092.



			Log10 Concentration												
	Time		Mean Optical Densities					Percent Growth							
Panel/Cell Line	Zero	Ctrl	-8.3	-7.3	-6.3	-5.3	-4.3	-8.3	-7.3	-6.3	-5.3	-4.3	GI50	TGI	LC50
Leukemia															
CCRF-CEM	0.544	1.876	1.891	1.831	1.905	0.712	0.691	101	97	102	13	11	1.91E-6	> 5.00E-5	> 5.00E-5
HL-60(TB)	0.724	1.967	1.807	1.756	1.920	0.497	0.408	87	83	96	-31	-44	1.15E-6	2.84E-6	> 5.00E-5
K-562	0.310	1.796	1.703	1.597	1.442	0.443	0.418	94	87	76	9	7	1.23E-6	> 5.00E-5	> 5.00E-5
MOLT-4	0.548	1.763	1.668	1.720	1.642	1.077	0.744	92	96	90	44	16	3.63E-6	> 5.00E-5	> 5.00E-5
RPMI-8226	0.758	2.358	2.353	2.341	2.392	0.882	0.867	100	99	102	8	7	1.78E-6	> 5.00E-5	> 5.00E-5
SR	0.561	1.900	1.683	1.721	1.642	0.865	0.881	84	87	81	23	24	1.69E-6	> 5.00E-5	> 5.00E-5
Non-Small Cell Lung Cancer															
A549/ATCC	0.360	1.099	1.061	1.083	1.064	0.523	0.428	95	98	95	23	10	2.12E-6	> 5.00E-5	> 5.00E-5
EKVX	0.677	1.718	1.648	1.716	1.615	1.000	1.064	93	100	90	31	37	2.39E-6	> 5.00E-5	> 5.00E-5
HOP-62	0.439	1.258	1.244	1.224	1.243	0.626	0.604	98	96	98	23	20	2.18E-6	> 5.00E-5	> 5.00E-5
NCI-H226	0.848	1.923	1.862	1.642	1.715	1.046	0.735	94	74	81	18	-13	1.55E-6	1.90E-5	> 5.00E-5
NCI-H23	0.593	1.851	1.827	1.777	1.710	0.883	0.738	98	94	89	23	12	1.94E-6	> 5.00E-5	> 5.00E-5
NCI-H322M	0.644	1.297	1.252	1.247	1.309	0.803	0.719	93	92	102	24	11	2.33E-6	> 5.00E-5	> 5.00E-5
NCI-H460	0.221	1.770	1.810	1.753	1.803	0.335	0.197	103	99	102	7	-11	1.77E-6	1.25E-5	> 5.00E-5
NCI-H522	0.745	1.402	1.409	1.321	1.161	0.644	0.495	101	88	63	-14	-34	7.46E-7	3.33E-6	> 5.00E-5
Colon Cancer															
COLO 205	0.253	0.983	1.033	1.053	1.090	0.249	0.165	107	110	115	-2	-35	1.80E-6	4.85E-6	> 5.00E-5
HCC-2998	0.598	1.769	1.754	1.744	1.669	1.068	0.625	99	98	91	40	2	3.21E-6	> 5.00E-5	> 5.00E-5
HCT-116	0.187	1.073	1.110	1.014	1.108	0.306	0.162	104	93	104	13	-14	1.97E-6	1.56E-5	> 5.00E-5
HCT-15	0.332	2.239	2.104	2.038	1.987	0.796	0.457	93	89	87	24	7	1.94E-6	> 5.00E-5	> 5.00E-5
HT29	0.198	0.961	1.034	0.977	1.033	0.208	0.157	110	102	109	1	-21	1.77E-6	5.73E-6	> 5.00E-5
KM12	0.337	1.488	1.492	1.432	1.286	0.496	0.262	100	95	82	14	-22	1.48E-6	1.20E-5	> 5.00E-5
SW-620	0.215	1.188	1.179	1.131	1.094	0.334	0.321	99	94	90	12	11	1.64E-6	> 5.00E-5	> 5.00E-5
CNS Cancer															
SF-268	0.449	1.339	1.309	1.280	1.276	0.748	0.494	97	93	93	34	5	2.64E-6	> 5.00E-5	> 5.00E-5
SF-295	0.603	1.766	1.702	1.716	1.482	0.441	0.466	94	96	76	-27	-23	8.88E-7	2.73E-6	> 5.00E-5
SF-539	0.675	2.092	1.963	1.993	1.995	0.636	0.767	91	93	93	-6	6	1.36E-6	.	> 5.00E-5
SNB-19	0.412	1.392	1.352	1.317	1.366	0.671	0.560	96	92	97	26	15	2.32E-6	> 5.00E-5	> 5.00E-5
SNB-75	0.815	1.414	1.251	1.269	1.231	0.852	1.011	73	76	69	6	33	1.01E-6	> 5.00E-5	> 5.00E-5
U251	0.282	0.995	1.043	1.000	1.007	0.348	0.309	107	101	102	9	4	1.81E-6	> 5.00E-5	> 5.00E-5
Melanoma															
LOX IMVI	0.345	2.018	1.923	1.946	1.895	0.964	0.623	94	96	93	37	17	2.92E-6	> 5.00E-5	> 5.00E-5
M14	0.298	1.085	1.124	1.034	1.031	0.289	0.265	105	93	93	-3	-11	1.40E-6	4.65E-6	> 5.00E-5
MDA-MB-435	0.419	1.590	1.590	1.550	0.907	0.202	0.242	99	97	42	-52	-42	3.52E-7	1.39E-6	.
SK-MEL-2	0.956	1.548	1.579	1.529	1.571	0.933	0.764	105	97	104	-2	-20	1.61E-6	4.74E-6	> 5.00E-5
SK-MEL-28	0.522	1.418	1.436	1.406	1.276	0.882	0.893	102	99	84	40	41	2.98E-6	> 5.00E-5	> 5.00E-5
SK-MEL-5	0.641	2.838	2.716	2.552	2.586	0.888	0.422	94	87	89	11	-34	1.57E-6	8.83E-6	> 5.00E-5
UACC-257	0.643	1.028	1.021	0.998	0.966	0.738	0.728	98	92	84	25	22	1.87E-6	> 5.00E-5	> 5.00E-5
UACC-62	0.616	2.292	2.248	2.160	1.946	1.028	0.771	97	92	79	25	9	1.72E-6	> 5.00E-5	> 5.00E-5
Ovarian Cancer															
IGROV1	0.445	1.256	1.224	1.231	1.199	0.689	0.516	96	97	93	30	9	2.41E-6	> 5.00E-5	> 5.00E-5
OVCAR-3	0.445	1.223	1.253	1.214	1.288	0.232	0.139	104	99	108	-48	-69	1.18E-6	2.47E-6	6.33E-6
OVCAR-4	0.707	1.917	1.915	1.921	1.883	1.225	1.051	100	100	97	43	28	3.69E-6	> 5.00E-5	> 5.00E-5
OVCAR-5	0.444	1.139	1.116	1.074	1.036	0.757	0.691	97	91	85	45	36	3.76E-6	> 5.00E-5	> 5.00E-5
OVCAR-8	0.426	1.344	1.384	1.344	1.354	0.583	0.461	104	100	101	17	4	2.03E-6	> 5.00E-5	> 5.00E-5
NCI/ADR-RES	0.430	1.337	1.373	1.330	1.199	0.293	0.313	104	99	85	-32	-27	9.93E-7	2.66E-6	> 5.00E-5
SK-OV-3	0.744	1.637	1.645	1.610	1.653	0.856	0.807	101	97	102	12	7	1.90E-6	> 5.00E-5	> 5.00E-5
Renal Cancer															
786-0	0.804	2.345	2.251	2.262	2.395	1.275	0.941	94	95	103	31	9	2.70E-6	> 5.00E-5	> 5.00E-5
A498	1.130	1.652	1.436	1.548	1.495	0.924	0.806	59	80	70	-18	-29	8.41E-7	3.11E-6	> 5.00E-5
ACHN	0.328	1.504	1.549	1.508	1.450	0.842	0.574	104	100	95	44	21	3.78E-6	> 5.00E-5	> 5.00E-5
CAKI-1	0.701	1.974	1.993	1.844	1.667	0.760	0.800	101	90	76	5	8	1.15E-6	> 5.00E-5	> 5.00E-5
RXF 393	0.597	1.325	1.301	1.151	1.088	0.548	0.709	97	76	67	-8	15	8.49E-7	.	> 5.00E-5
SN12C	0.468	1.668	1.598	1.525	1.607	0.987	0.683	93	88	95	43	18	3.70E-6	> 5.00E-5	> 5.00E-5
TK-10	0.599	1.028	0.976	0.978	1.034	0.682	0.729	88	88	101	19	30	2.11E-6	> 5.00E-5	> 5.00E-5
UO-31	0.635	1.296	1.213	1.170	1.259	0.825	0.793	87	81	94	29	24	2.37E-6	> 5.00E-5	> 5.00E-5
Prostate Cancer															
PC-3	0.525	1.499	1.471	1.436	1.432	0.661	0.572	97	94	93	14	5	1.75E-6	> 5.00E-5	> 5.00E-5
DU-145	0.338	1.202	1.156	1.158	1.240	0.374	0.176	95	95	104	4	-48	1.74E-6	6.01E-6	> 5.00E-5
Breast Cancer															
MCF7	0.414	2.024	1.919	1.799	1.851	0.743	0.638	93	86	89	20	14	1.86E-6	> 5.00E-5	> 5.00E-5
MDA-MB-231/ATCC	0.581	1.184	1.218	1.185	1.229	0.911	0.554	106	100	107	55	-5	5.99E-6	4.17E-5	> 5.00E-5
HS 578T	0.763	1.521	1.523	1.497	1.443	0.763	0.757	100	97	90	.	-1	1.39E-6	4.99E-6	> 5.00E-5
BT-549	0.868	1.923	1.898	1.838	1.934	1.340	0.870	98	92	101	45	.	4.03E-6	> 5.00E-5	> 5.00E-5
T-47D	0.726	1.532	1.463	1.511	1.611	0.981	1.179	91	97	110	32	56	.	> 5.00E-5	> 5.00E-5
MDA-MB-468	0.564	1.176	1.124	0.997	0.995	0.488	0.567	91	71	70	-13	.	8.76E-7	.	> 5.00E-5

Figure 4SI. Five dose data for NSC756093.



			Log10 Concentration												
	Time		Mean Optical Densities					Percent Growth							
Panel/Cell Line	Zero	Ctrl	-8.0	-7.0	-6.0	-5.0	-4.0	-8.0	-7.0	-6.0	-5.0	-4.0	GI50	TGI	LC50
Leukemia															
CCRF-CEM	0.544	1.918	1.930	1.588	0.720	0.717	0.565	101	76	13	13	1	2.58E-7	> 1.00E-4	> 1.00E-4
HL-60(TB)	0.724	2.146	2.019	1.398	0.512	0.547	0.458	91	47	-29	-25	-37	8.72E-8	4.15E-7	> 1.00E-4
K-562	0.310	1.681	1.611	0.683	0.469	0.476	0.354	95	27	12	12	3	4.60E-8	> 1.00E-4	> 1.00E-4
MOLT-4	0.548	1.722	1.725	1.729	0.881	0.884	0.623	100	101	28	29	6	5.02E-7	> 1.00E-4	> 1.00E-4
RPMI-8226	0.758	2.378	2.332	1.988	0.960	0.976	0.519	97	76	12	13	-32	2.56E-7	1.99E-5	> 1.00E-4
SR	0.561	1.895	1.823	1.174	1.033	0.969	0.503	95	46	35	31	-10	8.26E-8	5.57E-5	> 1.00E-4
Non-Small Cell Lung Cancer															
A549/ATCC	0.350	1.164	1.110	0.777	0.384	0.408	0.290	93	52	4	7	-17	1.13E-7	1.96E-5	> 1.00E-4
EKVX	0.677	1.689	1.652	1.357	1.143	1.137	0.804	96	67	46	45	13	6.50E-7	> 1.00E-4	> 1.00E-4
HOP-62	0.439	1.192	1.227	0.838	0.622	0.604	0.410	105	53	24	22	-7	1.26E-7	5.83E-5	> 1.00E-4
NCI-H226	0.848	1.875	1.693	1.457	0.880	0.771	0.647	82	59	3	-9	-24	1.46E-7	1.80E-6	> 1.00E-4
NCI-H23	0.593	1.830	1.811	1.254	0.916	0.876	0.678	98	53	26	23	7	1.34E-7	> 1.00E-4	> 1.00E-4
NCI-H322M	0.644	1.431	1.398	1.239	0.939	0.930	0.784	96	76	37	36	18	4.68E-7	> 1.00E-4	> 1.00E-4
NCI-H460	0.221	1.992	1.978	0.689	0.241	0.216	0.070	99	26	1	-2	-68	4.74E-8	2.15E-6	5.28E-5
NCI-H522	0.745	1.435	1.328	0.687	0.550	0.513	0.336	84	-8	-26	-31	-55	2.36E-8	8.22E-8	6.22E-5
Colon Cancer															
COLO 205	0.253	0.939	1.016	0.504	0.184	0.093	0.091	111	51	-27	-63	-64	1.04E-7	4.47E-7	4.23E-6
HCC-2998	0.598	1.749	1.658	1.360	0.657	0.720	0.341	92	66	5	11	-43	1.84E-7	1.57E-5	> 1.00E-4
HCT-116	0.187	1.103	1.055	0.446	0.190	0.139	0.095	95	28	.	-26	-49	4.71E-8	1.02E-6	> 1.00E-4
HCT-15	0.332	2.189	2.139	1.080	0.608	0.578	0.386	97	40	15	13	3	6.75E-8	> 1.00E-4	> 1.00E-4
HT29	0.198	0.952	0.989	0.382	0.153	0.107	0.067	105	24	-23	-46	-66	4.80E-8	3.27E-7	1.58E-5
KM12	0.337	1.460	1.506	0.640	0.377	0.296	0.157	104	27	4	-12	-53	5.02E-8	1.67E-6	8.26E-5
SW-620	0.215	1.238	1.175	0.474	0.404	0.410	0.340	94	25	18	19	12	4.36E-8	> 1.00E-4	> 1.00E-4
CNS Cancer															
SF-268	0.449	1.390	1.349	0.880	0.743	0.604	0.305	96	46	31	16	-32	8.23E-8	2.18E-5	> 1.00E-4
SF-295	0.603	1.777	1.707	0.607	0.490	0.559	0.549	94	.	-19	-7	-9	2.95E-8	1.04E-7	> 1.00E-4
SF-539	0.675	2.036	1.953	1.115	0.670	0.666	0.547	94	32	-1	-1	-19	5.16E-8	9.45E-7	> 1.00E-4
SNB-19	0.412	1.410	1.427	0.918	0.733	0.728	0.569	102	51	32	32	16	1.09E-7	> 1.00E-4	> 1.00E-4
SNB-75	0.815	1.415	1.346	0.975	0.921	0.935	0.835	89	27	18	20	3	4.20E-8	> 1.00E-4	> 1.00E-4
U251	0.282	1.086	1.040	0.533	0.329	0.329	0.227	94	31	6	6	-20	5.03E-8	1.69E-5	> 1.00E-4
Melanoma															
LOX IMVI	0.345	1.932	1.856	1.030	0.757	0.714	0.143	95	43	26	23	-59	7.39E-8	1.92E-5	7.83E-5
M14	0.298	1.063	1.109	0.571	0.247	0.288	0.239	106	36	-17	-4	-20	6.24E-8	4.71E-7	> 1.00E-4
MDA-MB-435	0.419	1.599	1.487	0.304	0.328	0.316	0.331	90	-27	-22	-25	-21	2.20E-8	5.85E-8	> 1.00E-4
SK-MEL-2	0.956	1.596	1.614	1.145	0.965	0.904	0.604	103	30	1	-5	-37	5.26E-8	1.61E-6	> 1.00E-4
SK-MEL-28	0.522	1.411	1.370	0.968	0.886	0.980	0.765	95	50	41	51	27	.	> 1.00E-4	> 1.00E-4
SK-MEL-5	0.641	2.728	2.403	1.269	0.760	0.415	0.224	84	30	6	-35	-65	4.30E-8	1.38E-6	3.11E-5
UACC-257	0.643	1.090	0.991	0.685	0.737	0.745	0.490	78	9	21	23	-24	2.55E-8	3.07E-5	> 1.00E-4
UACC-62	0.616	2.217	2.177	0.999	0.969	0.981	0.532	97	24	22	23	-14	4.42E-8	4.22E-5	> 1.00E-4
Ovarian Cancer															
IGROV1	0.445	1.236	1.213	0.813	0.658	0.598	0.500	97	46	27	19	7	8.52E-8	> 1.00E-4	> 1.00E-4
OVCAR-3	0.445	1.269	1.342	0.440	0.264	0.248	0.112	109	-1	-41	-44	-75	3.43E-8	9.74E-8	1.53E-5
OVCAR-4	0.707	1.906	1.919	1.286	1.204	1.079	0.866	101	48	41	31	13	9.29E-8	> 1.00E-4	> 1.00E-4
OVCAR-5	0.444	1.138	1.121	0.983	0.754	0.725	0.577	97	78	45	40	19	6.88E-7	> 1.00E-4	> 1.00E-4
OVCAR-8	0.426	1.356	1.290	0.928	0.477	0.458	0.367	93	54	5	3	-14	1.21E-7	1.58E-5	> 1.00E-4
NCI/ADR-RES	0.430	1.290	1.275	0.583	0.288	0.362	0.373	98	18	-33	-16	-13	3.97E-8	2.23E-7	> 1.00E-4
SK-OV-3	0.744	1.634	1.669	1.246	0.823	0.813	0.627	104	56	9	8	-16	1.36E-7	2.13E-5	> 1.00E-4
Renal Cancer															
786-0	0.804	2.332	2.449	1.693	1.161	0.989	0.587	108	58	23	12	-27	1.72E-7	2.04E-5	> 1.00E-4
A498	1.130	1.780	1.566	1.197	1.043	1.034	0.860	67	10	-8	-9	-24	1.99E-8	3.72E-7	> 1.00E-4
ACHN	0.328	1.509	1.505	0.908	0.716	0.622	0.394	100	49	33	25	6	9.61E-8	> 1.00E-4	> 1.00E-4
CAKI-1	0.701	1.940	1.862	0.955	1.043	0.849	0.633	94	21	28	12	-10	3.95E-8	3.56E-5	> 1.00E-4
RXF 393	0.597	1.275	1.118	0.851	0.615	0.711	0.580	77	37	3	17	-3	4.81E-8	7.10E-5	> 1.00E-4
SN12C	0.468	1.657	1.675	1.382	0.869	0.776	0.453	102	77	34	26	-3	4.19E-7	7.76E-5	> 1.00E-4
TK-10	0.599	1.026	1.007	0.847	0.766	0.791	0.588	96	58	39	45	-2	2.64E-7	9.13E-5	> 1.00E-4
UO-31	0.635	1.291	1.223	0.910	0.924	0.882	0.597	90	42	44	38	-6	6.78E-8	7.27E-5	> 1.00E-4
Prostate Cancer															
PC-3	0.525	1.493	1.507	0.890	0.657	0.607	0.493	101	38	14	8	-6	6.41E-8	3.77E-5	> 1.00E-4
DU-145	0.338	1.198	1.213	0.814	0.286	0.234	0.160	102	55	-16	-31	-53	1.19E-7	6.04E-7	7.44E-5
Breast Cancer															
MCF7	0.414	1.928	1.829	0.718	0.676	0.709	0.444	93	20	17	19	2	3.91E-8	> 1.00E-4	> 1.00E-4
MDA-MB-231/ATCC	0.581	1.268	1.341	1.224	0.745	0.615	0.416	111	94	24	5	-28	4.21E-7	1.40E-5	> 1.00E-4
HS 578T	0.763	1.648	1.594	1.221	0.978	0.965	0.821	94	52	24	23	6	1.15E-7	> 1.00E-4	> 1.00E-4
BT-549	0.868	1.854	1.848	1.582	1.200	1.073	0.624	99	72	34	21	-28	3.79E-7	2.66E-5	> 1.00E-4
T-47D	0.726	1.523	1.512	1.148	1.156	1.332	0.834	99	53	54	76	14	2.61E-6	> 1.00E-4	> 1.00E-4
MDA-MB-468	0.564	1.156	1.007	0.738	0.553	0.591	0.552	75	29	-2	4	-2	3.51E-8	.	> 1.00E-4

Figure 5SI. Five dose data for NSC756095.

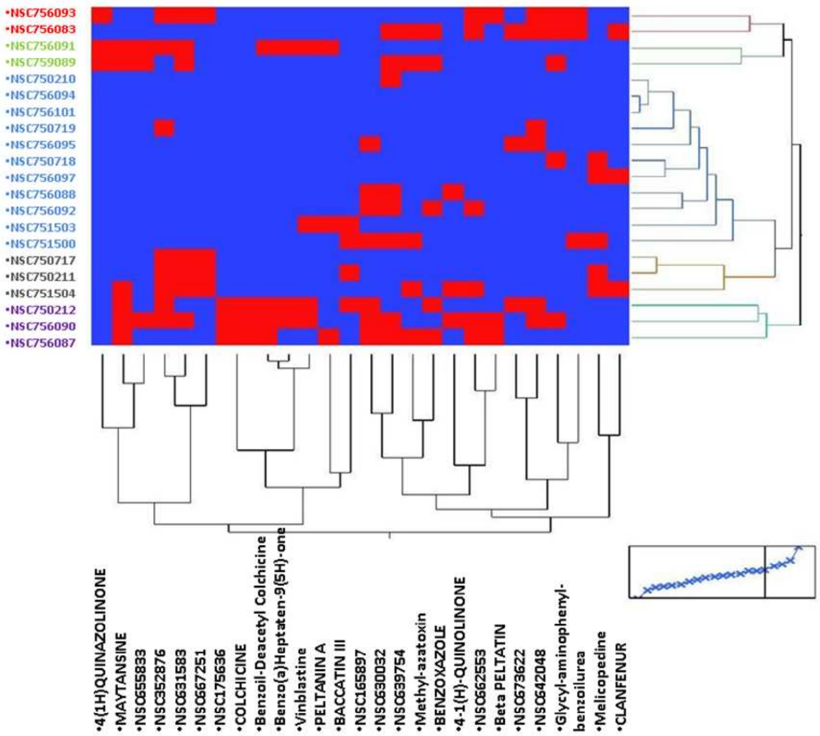


Figure 6SI. Heat-Map showing the results of two-way hierarchical clustering of the COMPARE analysis for the most active twenty-one 4-APTs with the reference mechanistic set (red = correlation; blu = no correlation). On the vertical axis, with different colors are represented the five different 4-APTs clusters. The first cluster (NSC756093 and NSC756083) show the highest divergence in terms of homology of mechanism as compared with the fifth cluster (NSC752012, NSC756090, NSC756087).

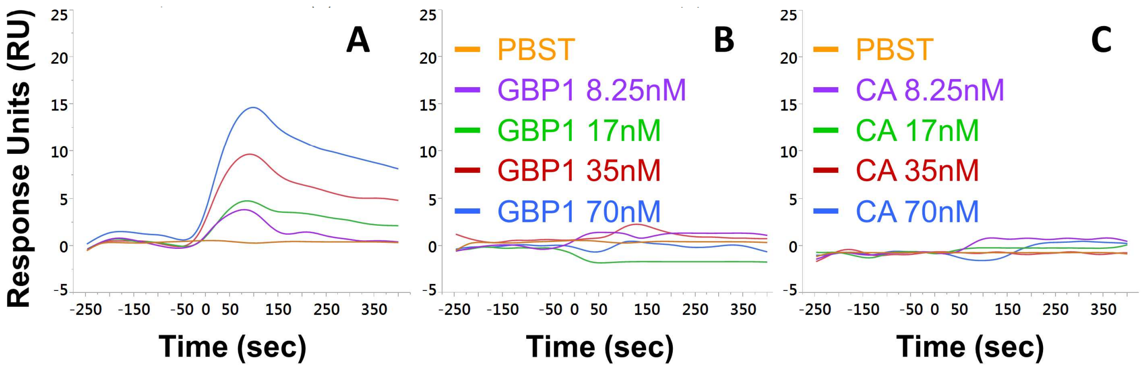


Figure 7SI. Representative biosensograms for controls of binding specificity for the interaction GBP1:PIM1. A: Positive dose-dependent control interaction between GBP1:PIM1. PIM1 was the analyte and [GBP1] were 8.25nM (purple line), 17nM (green line), 35nM (red line) and 70nM (blue line). Reference channel was kept in PBST (yellow line). B: Negative dose-dependent control. In the parallel line, CA was spotted and no signal was detectable in the same concentration range. These experiments demonstrate that GBP1 interact with PIM1 in a dose dependent manner, but not with CA. C: Negative dose dependent control of the interaction of CA with PIM1. CA was unable to interact with PIM1, used as a ligand in the same channel used for A. [CA] were 8.25nM (purple line), 17nM (green line), 35nM (red line) and 70nM (blue line). Reference channel was kept in PBST (yellow line).

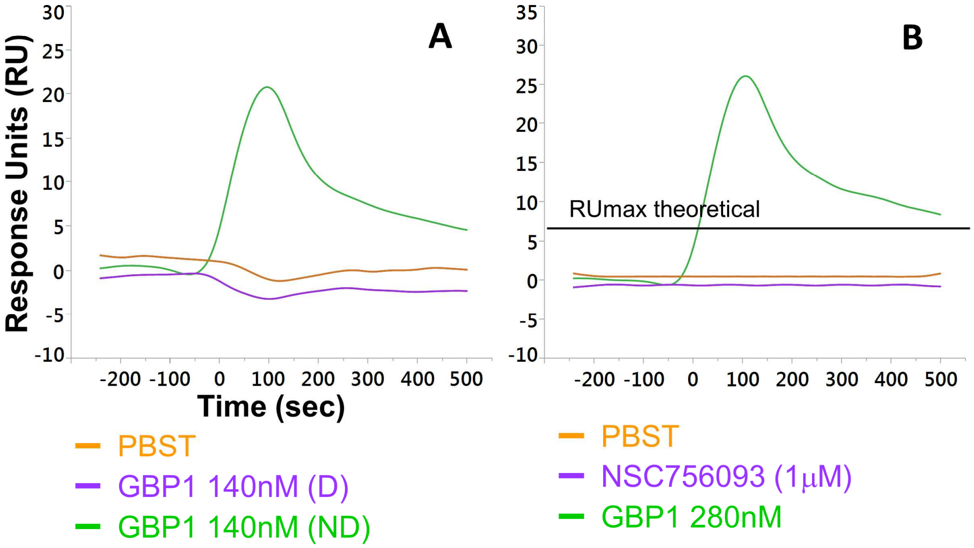


Figure 8SI. Representative biosensograms for the negative controls of binding of GBP1 and for the absence of binding of NSC756093 to PIM1 as ligand. A: GBP1 is capable to interact with PIM1 when the protein is purified in native conditions (green line) but not when the protein is heat-inactivated (purple line). Reference channel was kept in PBST (yellow line). B: NSC756093 is unable to bind to PIM1. PIM1 was used as ligand and was functional for its capability to bind GBP1 (green line). NSC756093 at a dose of 1 μM was estimated to produce a maximum signal (RU_{max}) in case of binding of 6.8 RU (continuous black line). We calculated the theoretical RU_{max} using the formula RU_{max} = MWA/MWL x RL x SM, where MWA is the molecular weight of the analyte PIM1, MWL is the molecular weight of NSC756093, RL is the immobilization level in RU of PIM1 in this experiment and SM is the molar stoichiometry (=1μM). No binding was noticed (purple line), thus suggesting no interaction of NSC756093 with PIM1. Reference channel was kept in PBST (yellow line).

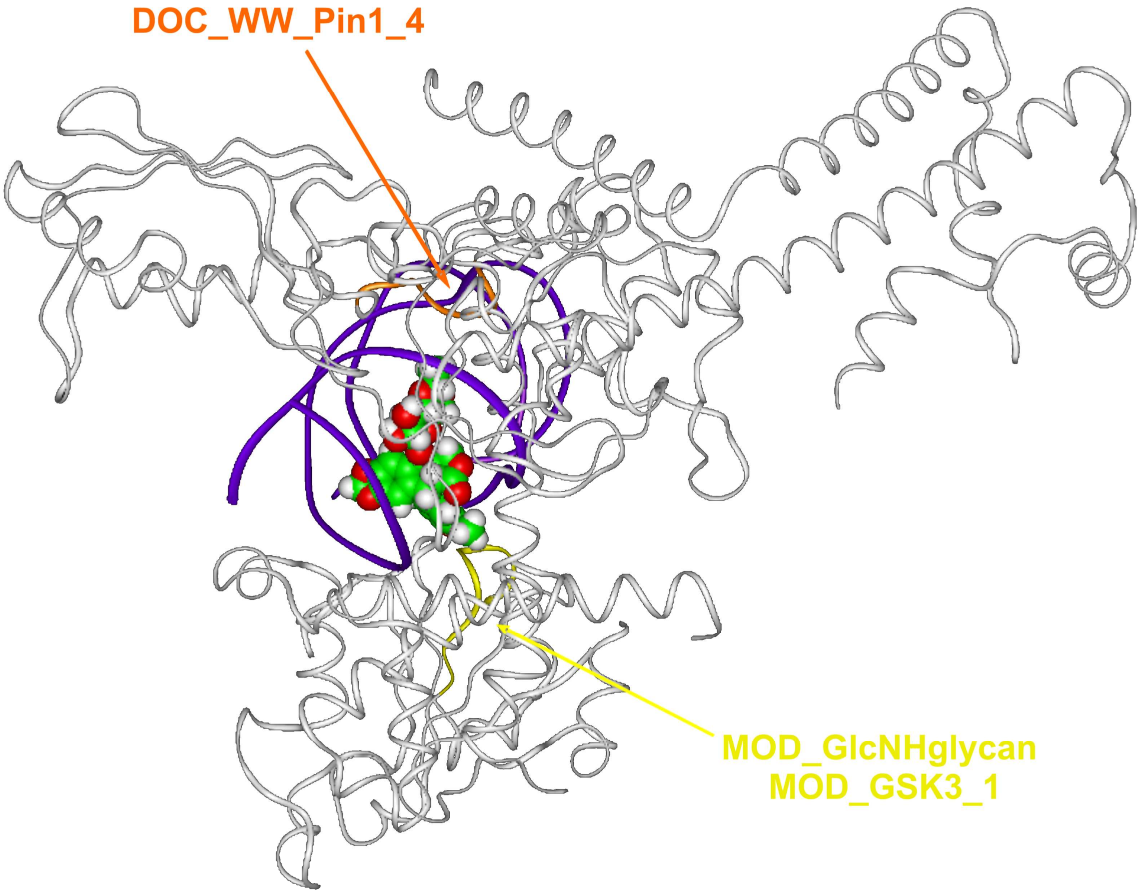


Figure 9SI. Overall view of the human TopoIIβ/DNA complex stabilized by the anticancer drug etoposide (PDB ID: 3QX3). TopoIIβ (white) and DNA (violet) are displayed as ribbons. Etoposide is displayed as CPK and colored by atom type (C = green, O = red, H = white). Protein motifs involved in binding site are displayed as ribbons and colored: DOC_WW_Pin1_4 motif (orange); MOD_GlcNHglycan and MOD_GSK3_1 motifs (yellow).

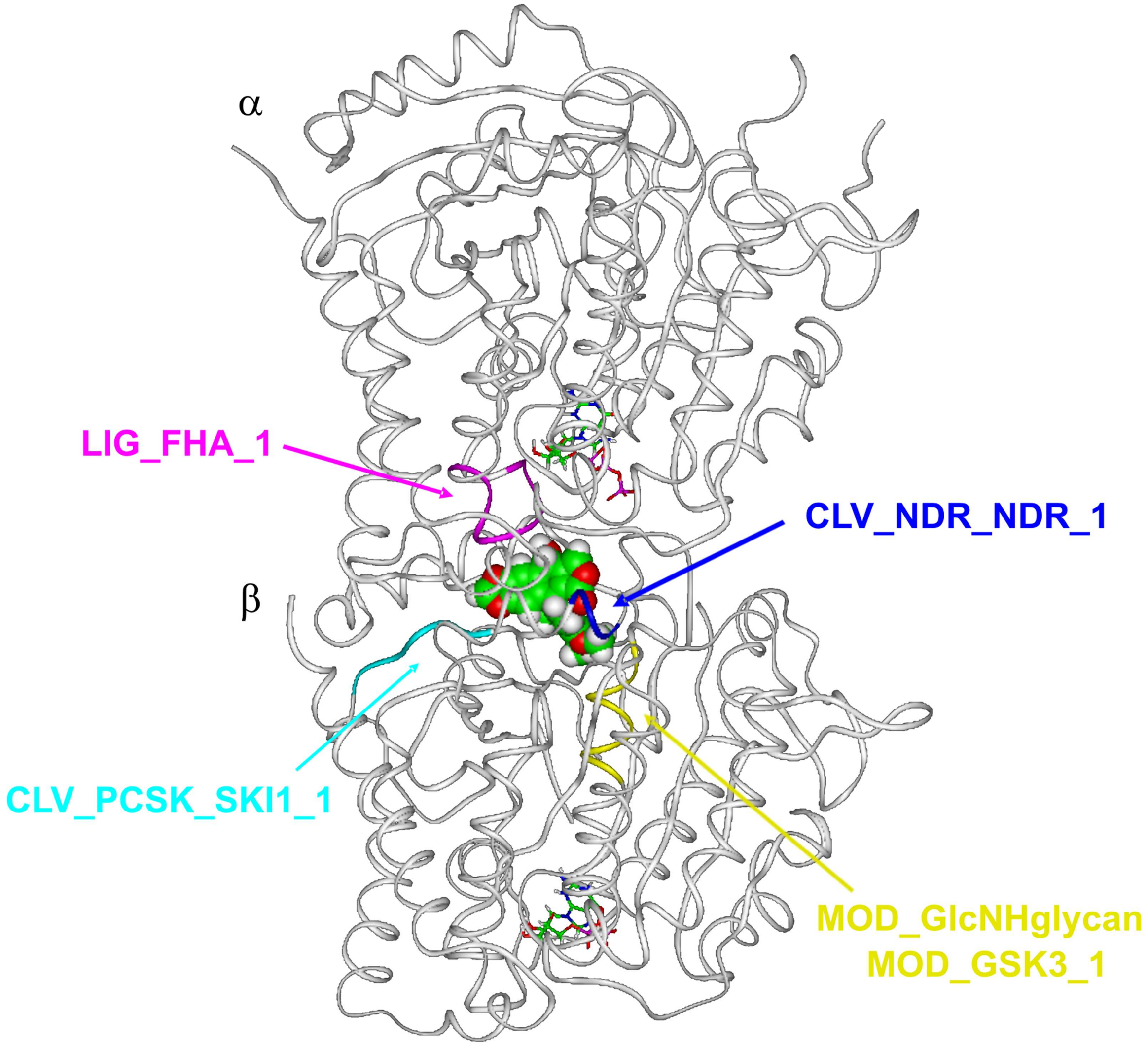


Figure 10SI. Overall view of X-ray structure of the human tubulin/podophyllotoxin complex (PDB ID: 1SA1). αβ-Tubulin (white) is displayed as ribbons. Podophyllotoxin is displayed as CPK and colored by atom type (C = green, O = red, H = white). Protein motifs involved in binding site are displayed as ribbons and colored: LIG_FHA_1 motif (magenta); CLV_NDR_NDR_1 motif (blue); CLV_PCSK_SKI1_1 motif (cyan); MOD_GlcNHglycan and MOD_GSK3_1 motifs (yellow).

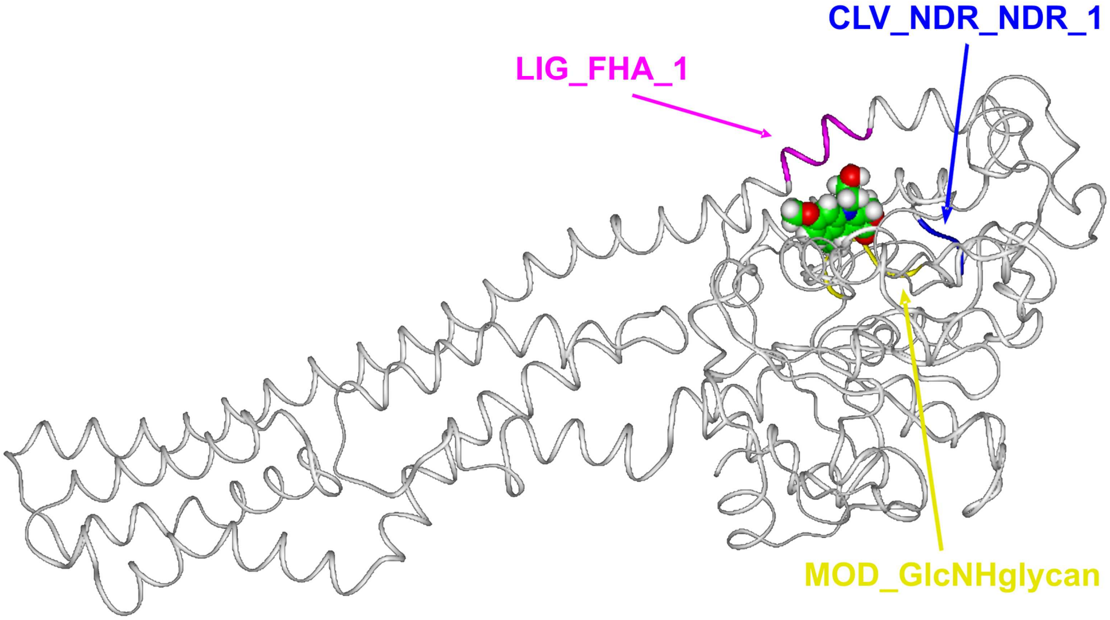


Figure 11SI. Overall view of NSC756093/GBP1 complex resulting from docking calculations. GBP1 (white) is displayed as ribbons. NSC756093 is displayed as CPK and colored by atom type (C = green, O = red, N = blue, H = white). Protein motifs involved in binding site are displayed as ribbons and colored: LIG_FHA_1 motif (magenta); CLV_NDR_NDR_1 motif (blue); MOD_GlcNHglycan motif (yellow).

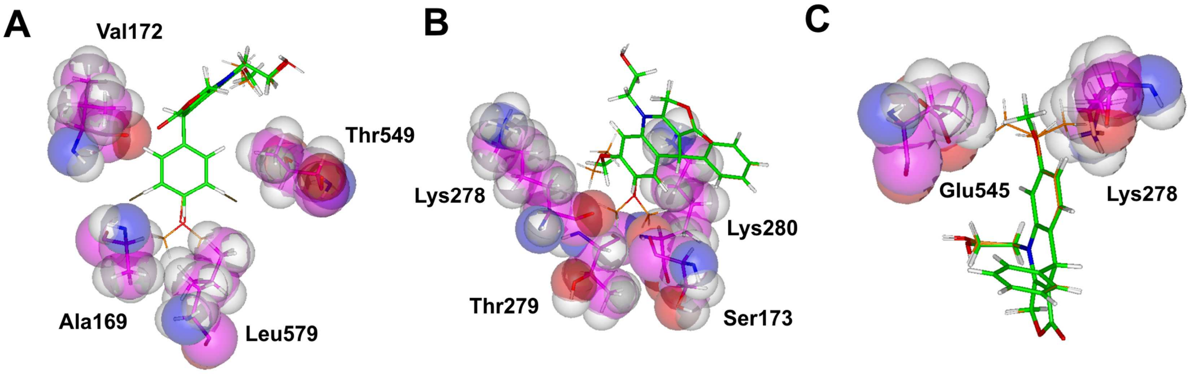


Figure 12SI. Superimposition of (A) NSC756095 and NSC756094, (B) NSC756100 and (C) NSC756108 PM7 conformers (carbons in orange) on the bioactive conformation of NSC756093 (carbons in green). Bioactive conformation of NSC756093 is displayed in sticks while conformers are displayed as lines. GBP1 amino acids (carbons in magenta) involved in steric clashes are labeled and displayed as CPK (transparency = 50 %). Heteroatoms are colored by atom type (O = red, N = blue, H = white).

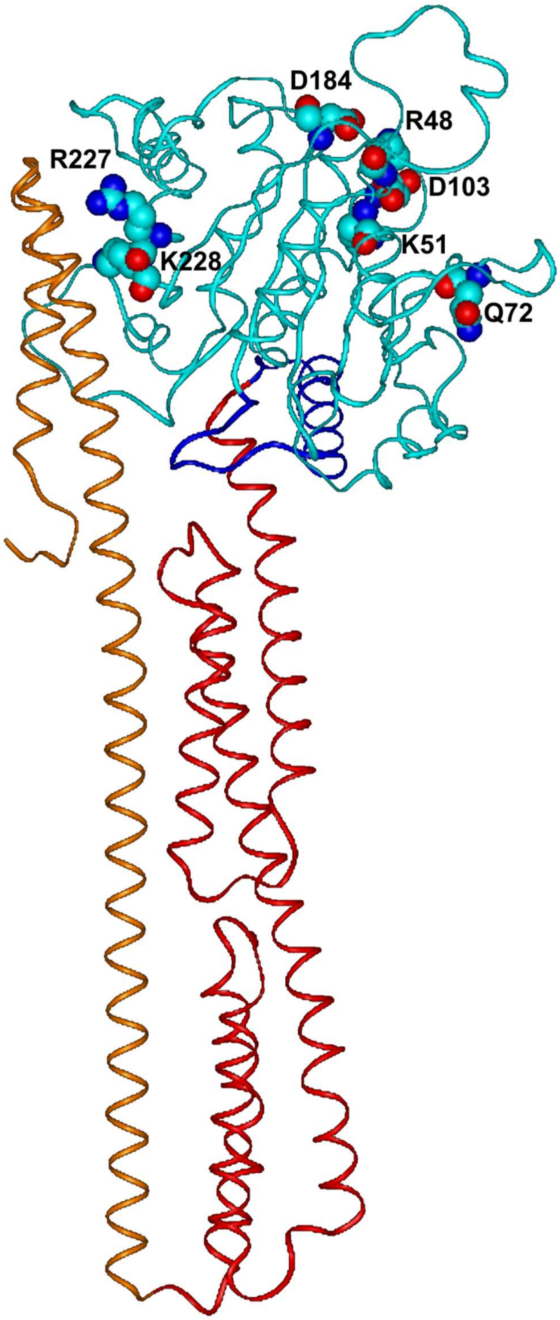


Figure 13SI. Mutated residues in GBP1 structure are displayed as CPK, colored by atom type (C = cyan, O = red, N = blue, H = white) and labeled. Hydrogens are omitted for clarity. GBP1 is displayed as ribbons, where the LG-domain is in cyan, the connecting region in blue, the helical domain in red and α12/α13 in orange.

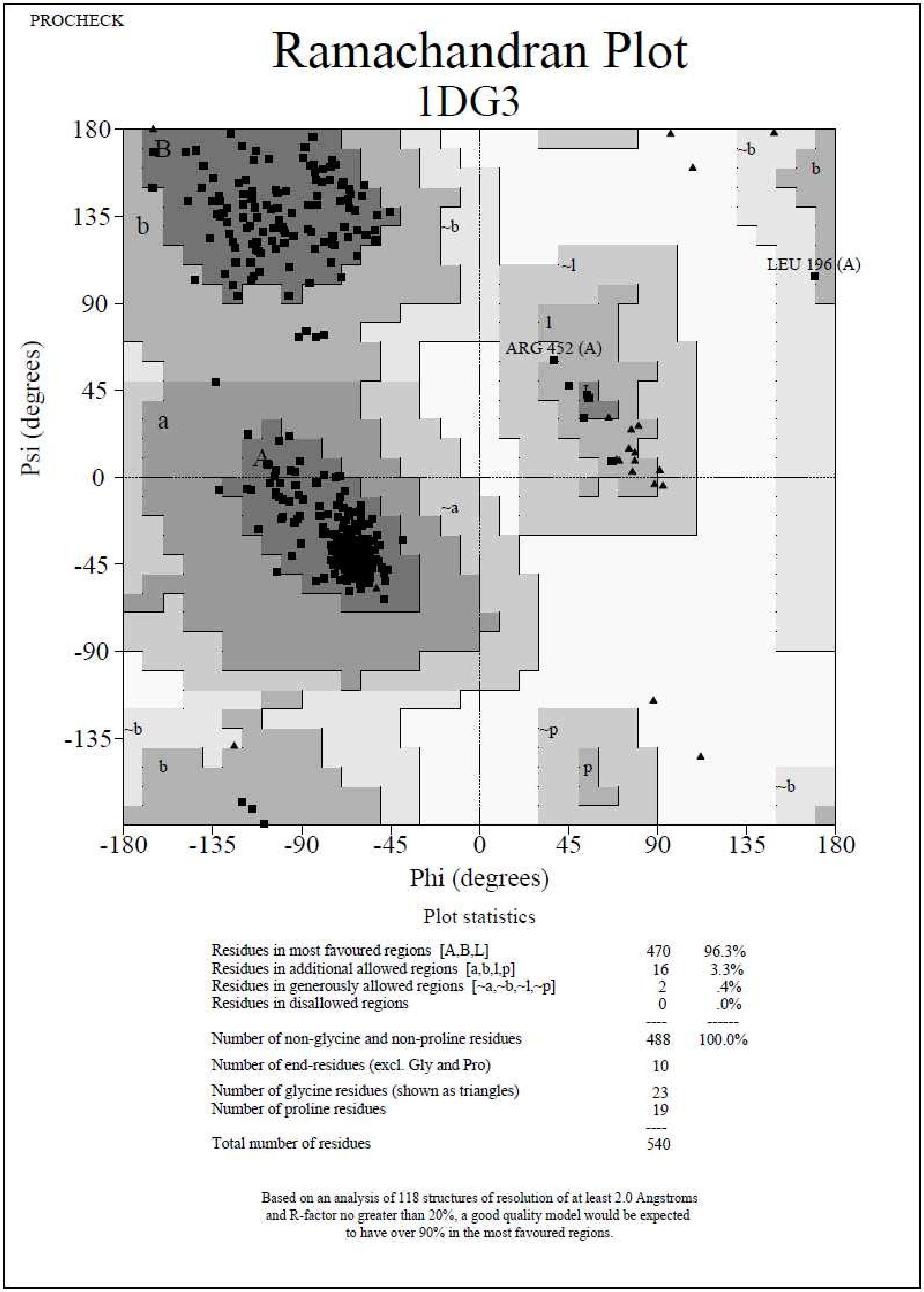
Table 1SI. Energy values of the NSC756093/GBP1 complexes obtained by docking studies.

Frame	**Complex Energy (kcal/mol)**	**Set**	**Frame**	**Complex Energy (kcal/mol)**	**Set**
1	-4274.32	I	11	-3685.40	II
2	-4039.88	I	12	-3683.72	II
3	-3918.33	II	13	-3659.74	III
4	-3916.03	II	14	-3644.31	II
5	-3880.23	I	15	-3614.31	II
6	-3818.93	II	16	-3608.95	II
7	-3793.41	II	17	-3598.23	II
8	-3756.90	III	18	-3413.74	II
9	-3736.54	II	19	-3411.68	II
10	-3707.18	II	20	-3192.69	III

Table 2SI. Protein functional motifs indentified by the ELM software in the binding sites of etoposide, podophyllotoxin, and NSC756093.

Motif Name	**Functional site class**	**Description**	**Consensus Sequence**[a]
LIG_FHA_1	FHA phosphopeptide ligands	Phosphothreonine motif binding a subset of FHA domains that show a preference for a large aliphatic amino acid at the pT+3 position.	..(T)..[ILV].
DOC_WW_Pin1_4	WW domain ligands	The Class IV WW domain interaction motif is recognised primarily by the Pin1 phosphorylation-dependent prolyl isomerase.	...([ST])P.
CLV_NDR_NDR_1	NDR cleavage site	N-Arg dibasic convertase (nardilysin) cleavage site	(.RK)|(RR[^KR])
CLV_PCSK_SKI1_1	PCSK cleavage site	Subtilisin/kexin isozyme-1 (SKI1) cleavage site	[RK].[AILMFV][LTKF].
MOD_GlcNHglycan	Glycosaminoglycan attachment site	The glycosaminoglycan attachment site is an exposed serine which accepts transfer of xylose from UDP-xylose to the hydroxyl group by protein xylosyl transferase	[ED]{0,3}.(S)[GA].
MOD_GSK3_1	GSK3 phosphorylation site	GSK3 phosphorylation recognition site	..([ST])...[ST]

[a] . any amino acid allowed; [...]amino acids listed are allowed; [^...]amino acids listed are not allowed; {*min, max*} *min* required, *max* allowed; | matches either expression it separates; (...)positions of specific interest.



Ramachandran Plot

1DG3

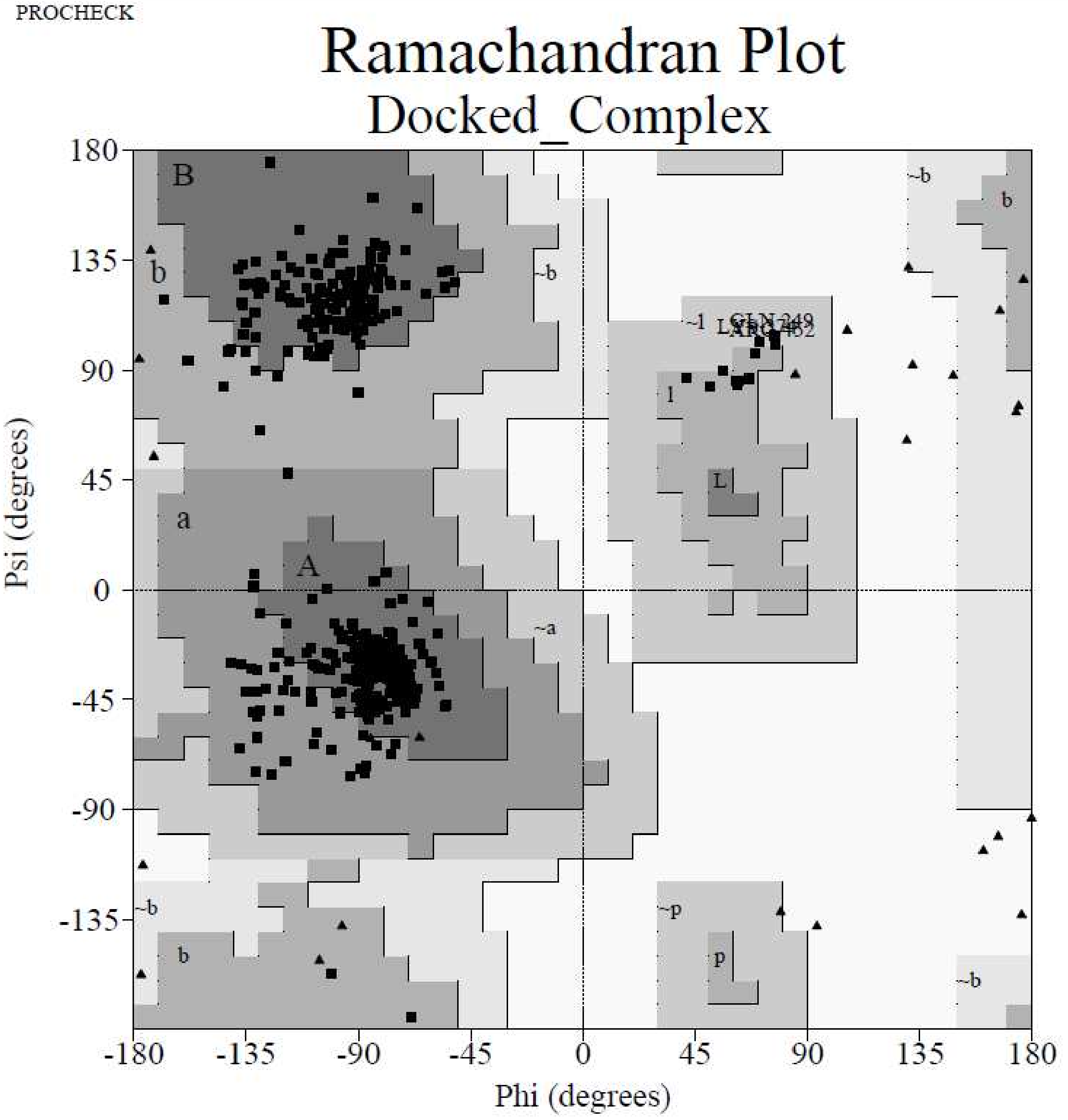
Plot statistics

```
Residues in most favoured regions  [A,B,L]                 470      96.3%
Residues in additional allowed regions  [a,b,l,p]           16       3.3%
Residues in generously allowed regions  [~a,~b,~l,~p]        2        .4%
Residues in disallowed regions                               0        .0%
                                                           ----     ------
Number of non-glycine and non-proline residues             488     100.0%

Number of end-residues (excl. Gly and Pro)                  10

Number of glycine residues (shown as triangles)             23
Number of proline residues                                  19
                                                           ----
Total number of residues                                   540
```

Based on an analysis of 118 structures of resolution of at least 2.0 Angstroms
and R-factor no greater than 20%, a good quality model would be expected
to have over 90% in the most favoured regions.



Plot statistics

Residues in most favoured regions [A,B,L]	477	87.7%
Residues in additional allowed regions [a,b,l,p]	64	11.8%
Residues in generously allowed regions [~a,~b,~l,~p]	3	.6%
Residues in disallowed regions	0	.0%
	----	------
Number of non-glycine and non-proline residues	544	100.0%
Number of end-residues (excl. Gly and Pro)	2	
Number of glycine residues (shown as triangles)	26	
Number of proline residues	20	

Total number of residues	592	

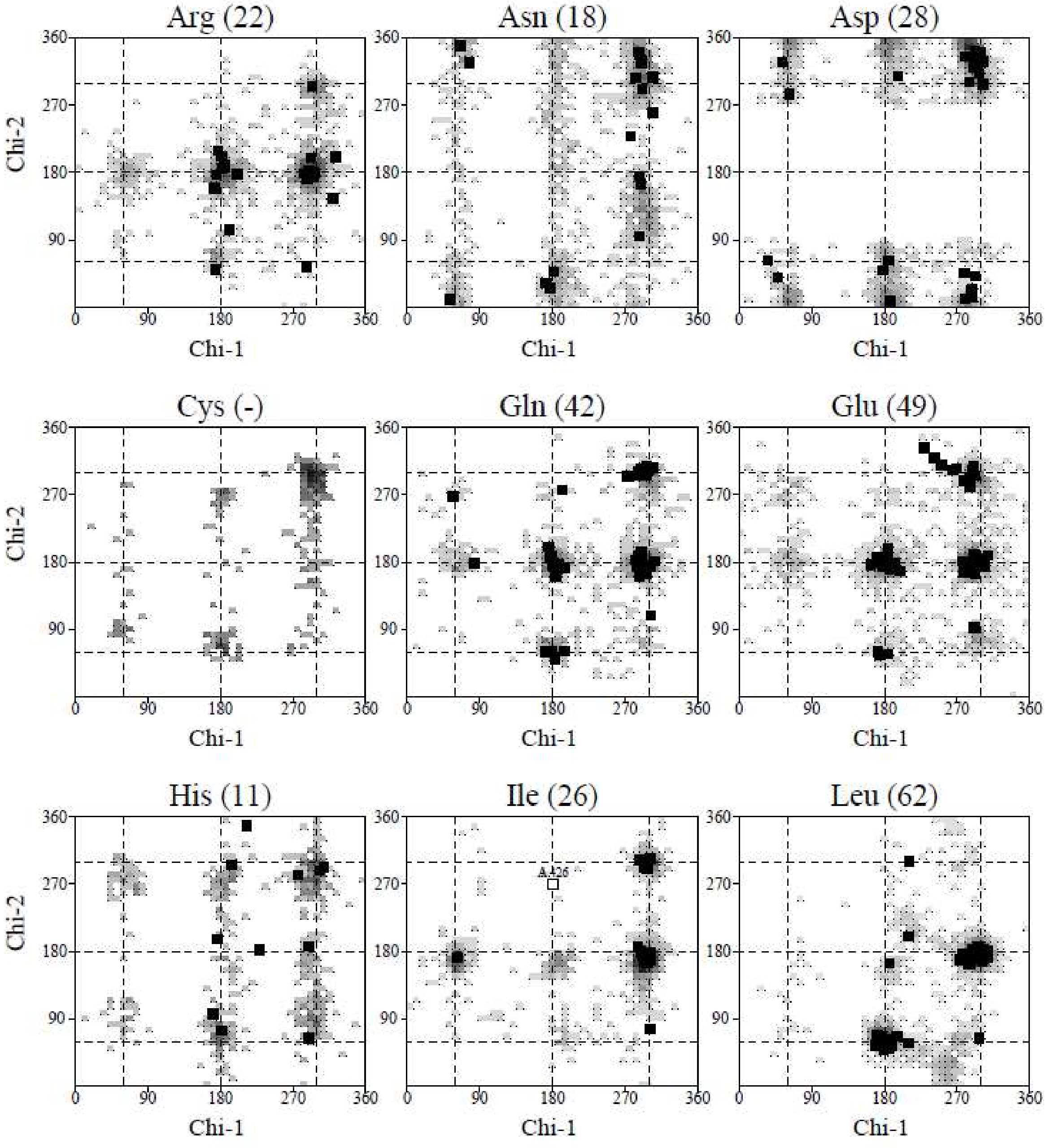
Based on an analysis of 118 structures of resolution of at least 2.0 Angstroms and R-factor no greater than 20%, a good quality model would be expected to have over 90% in the most favoured regions.

PROCHECK

Page 1

Chi1-Chi2 plots

1DG3

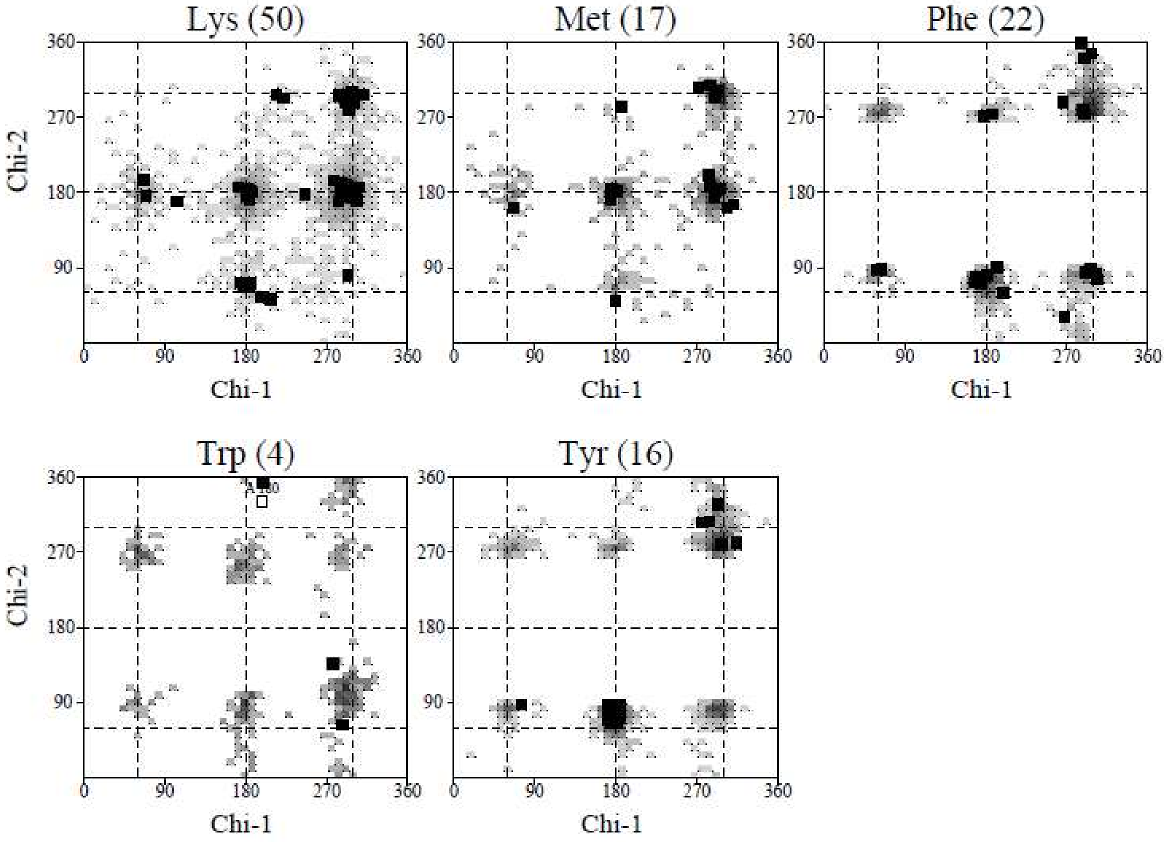


Numbers of residues are shown in brackets. Those in unfavourable conformations (score < -3.00) are labelled.
Shading shows favourable conformations as obtained from an analysis of 163 structures at resolution 2.0A or better.

PROCHECK

Chi1-Chi2 plots

1DG3

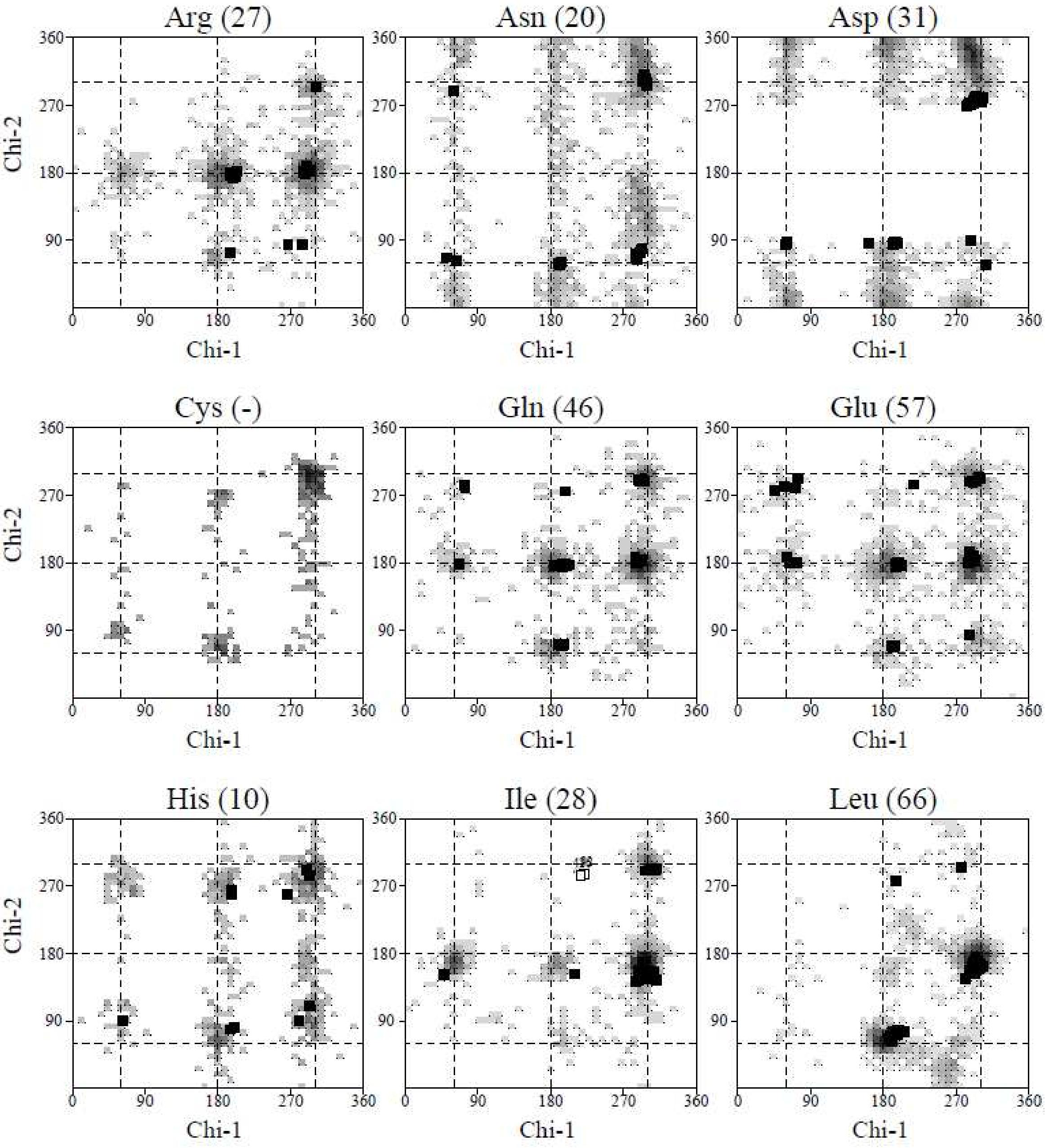


Numbers of residues are shown in brackets. Those in unfavourable conformations (score < -3.00) are labelled.
Shading shows favourable conformations as obtained from an analysis of 163 structures at resolution 2.0A or better.

PROCHECK

Chi1-Chi2 plots

Docked_Complex



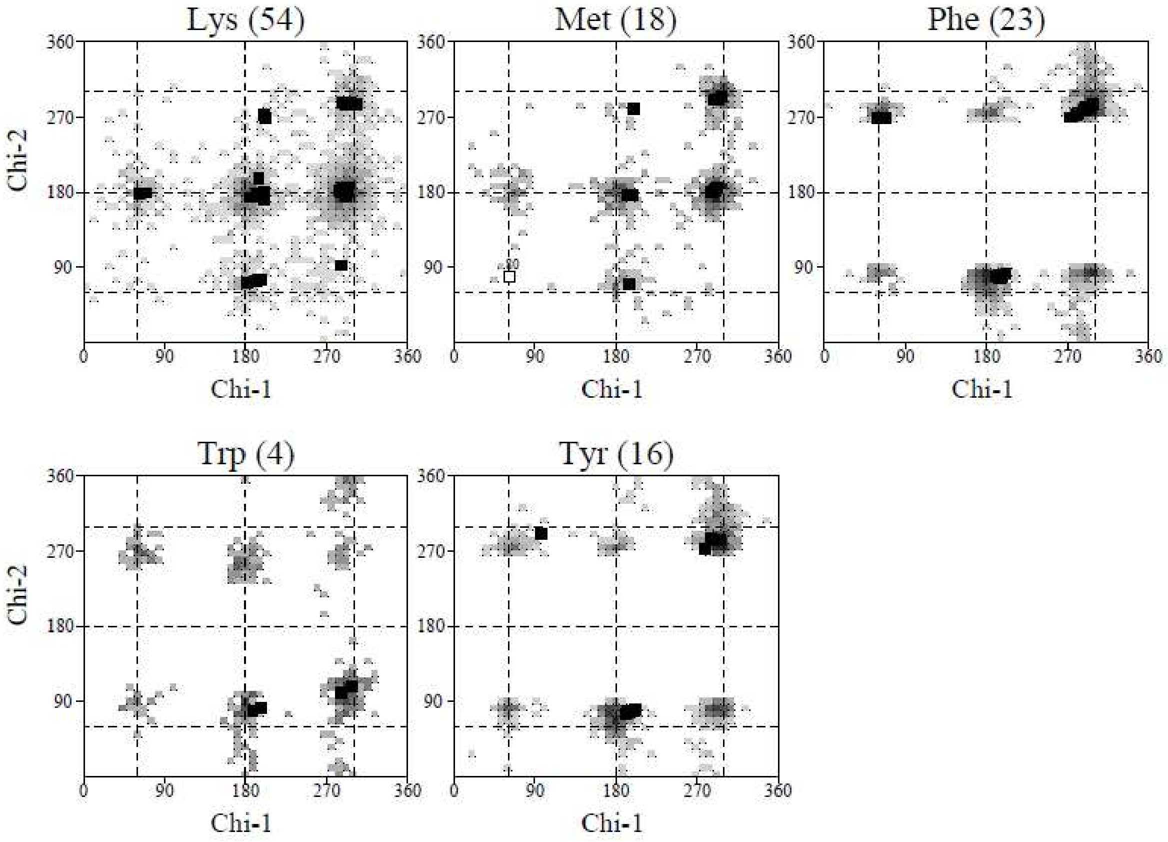
Numbers of residues are shown in brackets. Those in unfavourable conformations (score < -3.00) are labelled.
Shading shows favourable conformations as obtained from an analysis of 163 structures at resolution 2.0A or better.

PROCHECK

Page 2

Chi1-Chi2 plots

Docked_Complex

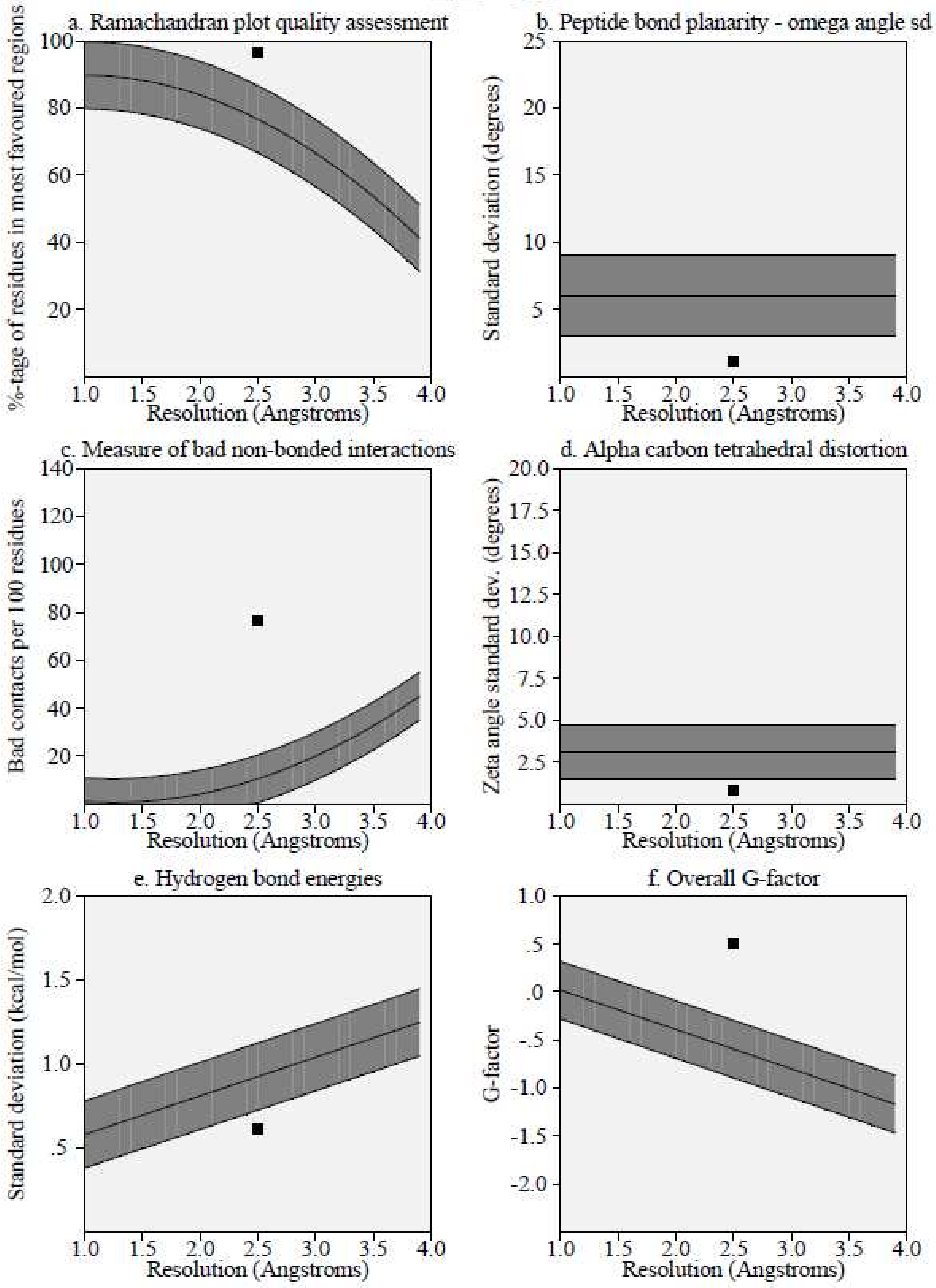


Numbers of residues are shown in brackets. Those in unfavourable conformations (score < -3.00) are labelled.
Shading shows favourable conformations as obtained from an analysis of 163 structures at resolution 2.0A or better.

PROCHECK

Main-chain parameters

1DG3



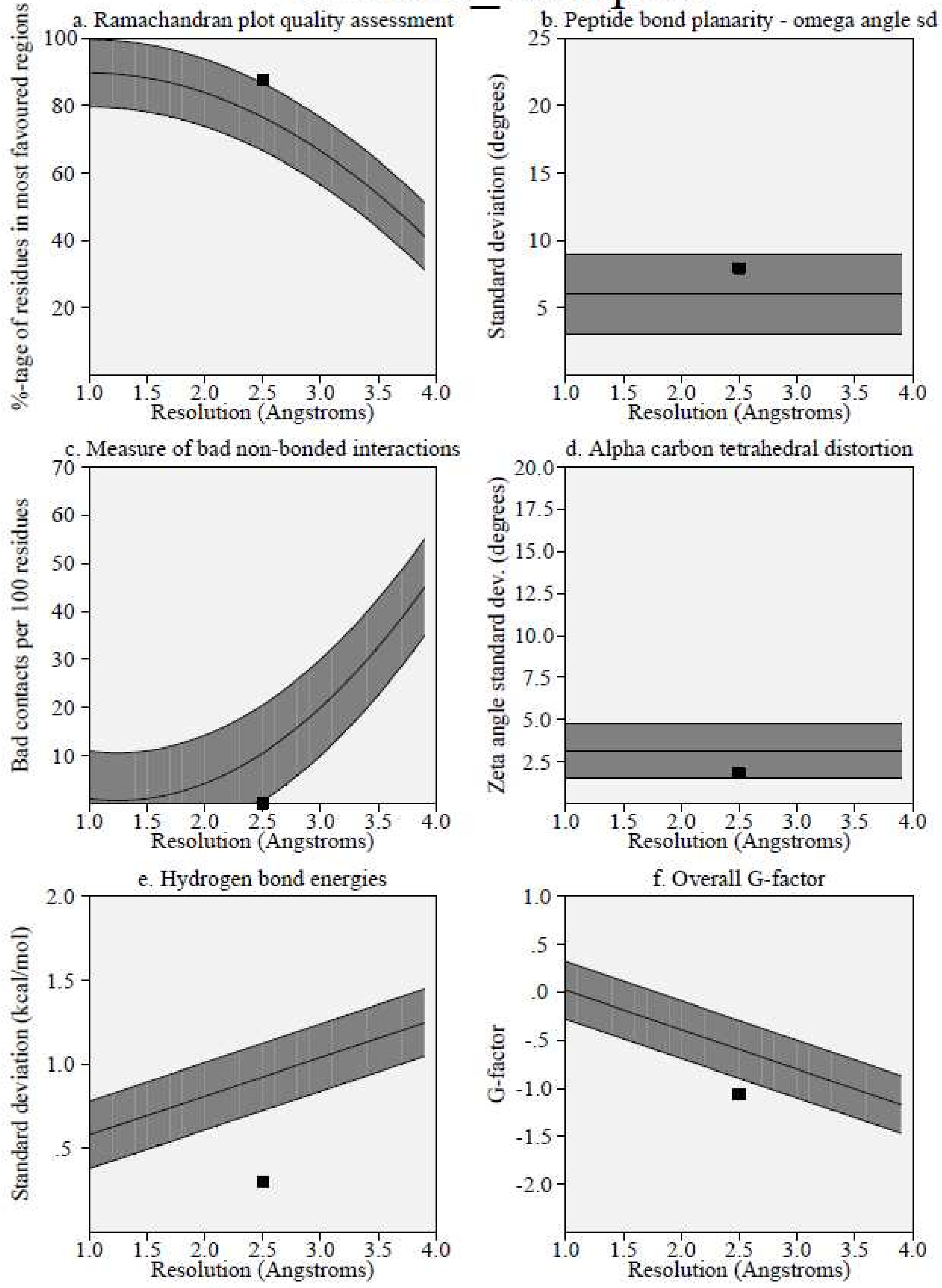
Plot statistics

Stereochemical parameter	No. of data pts	Parameter value	Comparison values Typical value	Band width	No. of band widths from mean	
a. %-tage residues in A, B, L	488	96.3	76.6	10.0	2.0	BETTER
b. Omega angle st dev	534	1.2	6.0	3.0	-1.6	BETTER
c. Bad contacts / 100 residues	413	76.5	10.5	10.0	6.6	WORSE
d. Zeta angle st dev	517	.8	3.1	1.6	-1.4	BETTER
e. H-bond energy st dev	402	.6	.9	.2	-1.6	BETTER
f. Overall G-factor	540	.5	-.6	.3	3.6	BETTER

PROCHECK

Main-chain parameters

Docked_Complex



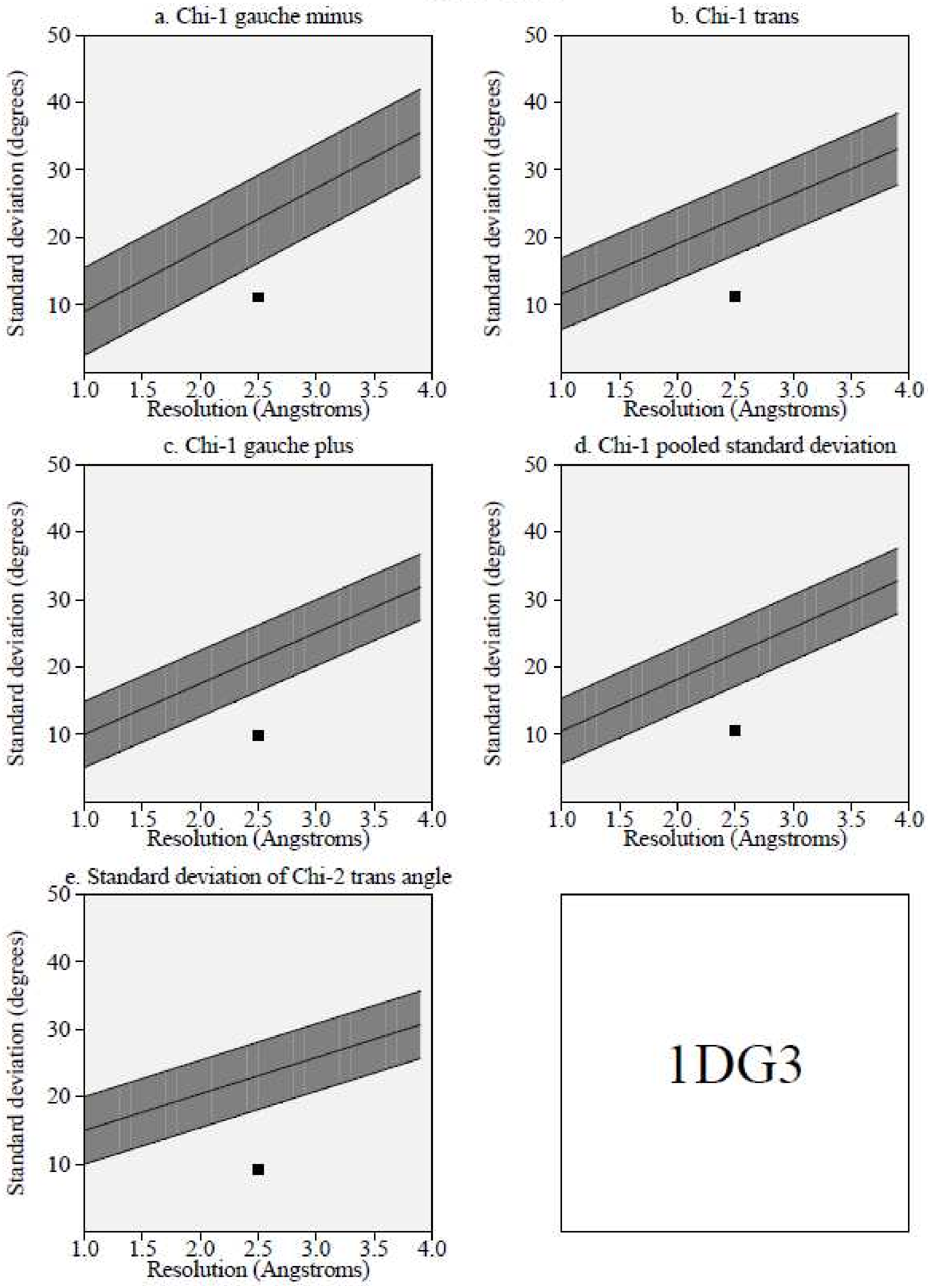
Plot statistics

Stereochemical parameter	No. of data pts	Parameter value	Comparison values Typical value	Band width	No. of band widths from mean	
a. %-tage residues in A, B, L	544	87.7	76.6	10.0	1.1	BETTER
b. Omega angle st dev	590	7.9	6.0	3.0	.6	Inside
c. Bad contacts / 100 residues	0	.0	10.5	10.0	-1.1	BETTER
d. Zeta angle st dev	566	1.8	3.1	1.6	-.8	Inside
e. H-bond energy st dev	311	.3	.9	.2	-3.1	BETTER
f. Overall G-factor	592	-1.1	-.6	.3	-1.6	WORSE

PROCHECK

Side-chain parameters

1DG3



a. Chi-1 gauche minus

b. Chi-1 trans

c. Chi-1 gauche plus

d. Chi-1 pooled standard deviation

e. Standard deviation of Chi-2 trans angle

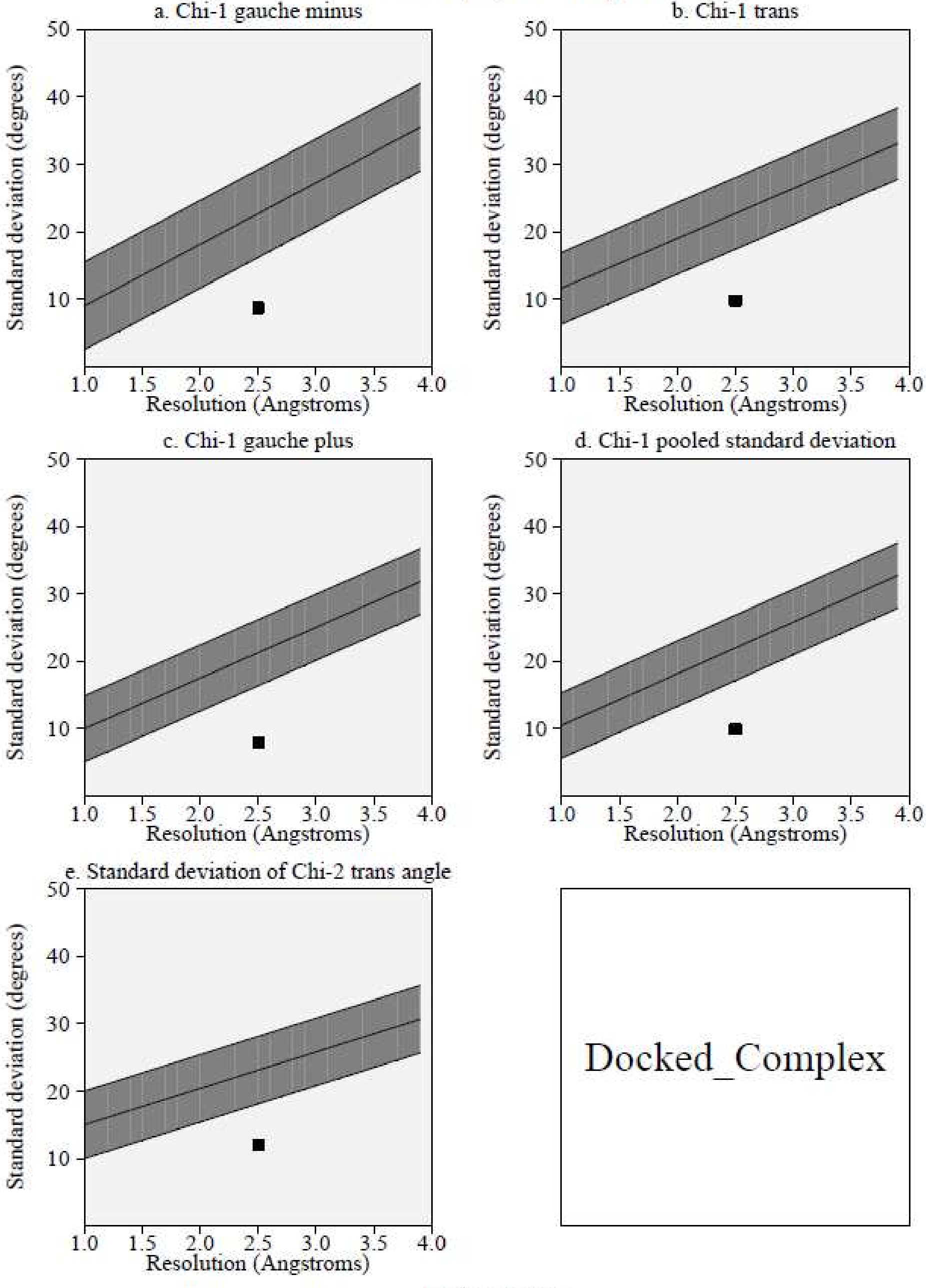
Plot statistics

Stereochemical parameter	No. of data pts	Parameter value	Comparison values Typical value	Band width	No. of band widths from mean	
a. Chi-1 gauche minus st dev	44	11.1	22.7	6.5	-1.8	BETTER
b. Chi-1 trans st dev	161	11.3	22.7	5.3	-2.2	BETTER
c. Chi-1 gauche plus st dev	263	9.9	21.3	4.9	-2.3	BETTER
d. Chi-1 pooled st dev	468	10.5	22.0	4.8	-2.4	BETTER
e. Chi-2 trans st dev	178	9.1	23.1	5.0	-2.8	BETTER

PROCHECK

Side-chain parameters

Docked_Complex



Plot statistics

Stereochemical parameter	No. of data pts	Parameter value	Comparison values Typical value	Band width	No. of band widths from mean	
a. Chi-1 gauche minus st dev	57	8.7	22.7	6.5	-2.1	BETTER
b. Chi-1 trans st dev	179	9.8	22.7	5.3	-2.4	BETTER
c. Chi-1 gauche plus st dev	276	8.0	21.3	4.9	-2.7	BETTER
d. Chi-1 pooled st dev	512	9.9	22.0	4.8	-2.5	BETTER
e. Chi-2 trans st dev	200	12.0	23.1	5.0	-2.2	BETTER