wwPDB X-ray Structure Validation Summary Report (i)

Nov 23, 2023 – 12:59 AM JST

PDB ID	:	8GSV
Title	:	Crystal structure of human BAK in complex with the Pxt1 BH3 domain
Authors	:	Lim, D.; Ku, B.
Deposited on	:	2022-09-07
Resolution	:	2.20 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:

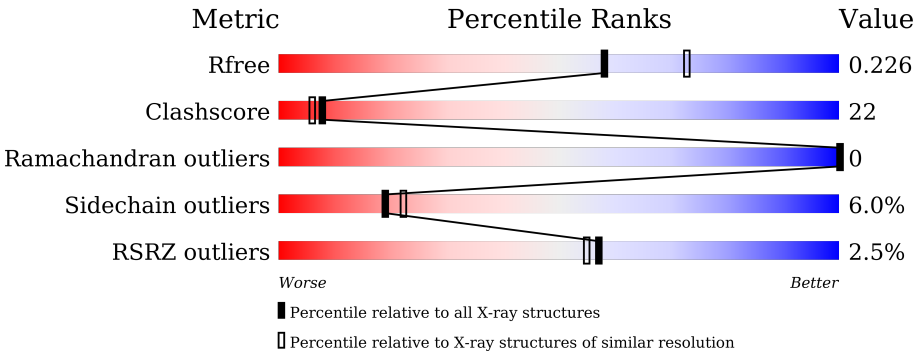
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	166	67% 22% • 7%
1	C	166	66% 25% • 7%
1	E	166	% 71% 20% • 7%
1	G	166	% 70% 21% • 7%
1	I	166	% 63% 26% • 7%
1	K	166	63% 28% • 7%

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Mol	Chain	Length	Quality of chain
1	M	166	3% 55% 34% 7%
1	O	166	4% 52% 36% 7%
1	Q	166	8% 51% 39% 8%
1	S	166	5% 49% 40% 7%
1	U	166	3% 47% 42% 8%
1	W	166	7% 44% 45% 7%
2	B	29	41% 31% 7% 21%
2	D	29	41% 31% 7% 21%
2	F	29	55% 17% 7% 21%
2	H	29	55% 24% 21%
2	J	29	52% 28% 21%
2	L	29	38% 38% 24%
2	N	29	24% 34% 38%
2	P	29	31% 31% 38%
2	R	29	45% 31% 21%
2	T	29	31% 45% 21%
2	V	29	48% 28% 24%
2	X	29	34% 41% 21%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 17258 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Bcl-2 homologous antagonist/killer.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	155	Total	C	N	O	S	0	0	0
			1253	798	219	231	5			
1	C	154	Total	C	N	O	S	0	0	0
			1242	792	215	230	5			
1	E	154	Total	C	N	O	S	0	0	0
			1235	789	214	227	5			
1	G	154	Total	C	N	O	S	0	0	0
			1242	792	215	230	5			
1	I	155	Total	C	N	O	S	0	0	0
			1249	796	219	229	5			
1	K	155	Total	C	N	O	S	0	0	0
			1253	798	219	231	5			
1	M	155	Total	C	N	O	S	0	0	0
			1256	801	219	231	5			
1	O	154	Total	C	N	O	S	0	0	0
			1235	789	215	226	5			
1	Q	152	Total	C	N	O	S	0	0	0
			1232	785	215	227	5			
1	S	154	Total	C	N	O	S	0	0	0
			1241	792	217	227	5			
1	U	152	Total	C	N	O	S	0	0	0
			1232	787	215	225	5			
1	W	154	Total	C	N	O	S	0	0	0
			1238	791	212	230	5			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	20	GLY	-	expression tag	UNP Q16611
A	21	HIS	-	expression tag	UNP Q16611
A	22	MET	-	expression tag	UNP Q16611
A	166	SER	CYS	engineered mutation	UNP Q16611
C	20	GLY	-	expression tag	UNP Q16611

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Chain	Residue	Modelled	Actual	Comment	Reference
C	21	HIS	-	expression tag	UNP Q16611
C	22	MET	-	expression tag	UNP Q16611
C	166	SER	CYS	engineered mutation	UNP Q16611
E	20	GLY	-	expression tag	UNP Q16611
E	21	HIS	-	expression tag	UNP Q16611
E	22	MET	-	expression tag	UNP Q16611
E	166	SER	CYS	engineered mutation	UNP Q16611
G	20	GLY	-	expression tag	UNP Q16611
G	21	HIS	-	expression tag	UNP Q16611
G	22	MET	-	expression tag	UNP Q16611
G	166	SER	CYS	engineered mutation	UNP Q16611
I	20	GLY	-	expression tag	UNP Q16611
I	21	HIS	-	expression tag	UNP Q16611
I	22	MET	-	expression tag	UNP Q16611
I	166	SER	CYS	engineered mutation	UNP Q16611
K	20	GLY	-	expression tag	UNP Q16611
K	21	HIS	-	expression tag	UNP Q16611
K	22	MET	-	expression tag	UNP Q16611
K	166	SER	CYS	engineered mutation	UNP Q16611
M	20	GLY	-	expression tag	UNP Q16611
M	21	HIS	-	expression tag	UNP Q16611
M	22	MET	-	expression tag	UNP Q16611
M	166	SER	CYS	engineered mutation	UNP Q16611
O	20	GLY	-	expression tag	UNP Q16611
O	21	HIS	-	expression tag	UNP Q16611
O	22	MET	-	expression tag	UNP Q16611
O	166	SER	CYS	engineered mutation	UNP Q16611
Q	20	GLY	-	expression tag	UNP Q16611
Q	21	HIS	-	expression tag	UNP Q16611
Q	22	MET	-	expression tag	UNP Q16611
Q	166	SER	CYS	engineered mutation	UNP Q16611
S	20	GLY	-	expression tag	UNP Q16611
S	21	HIS	-	expression tag	UNP Q16611
S	22	MET	-	expression tag	UNP Q16611
S	166	SER	CYS	engineered mutation	UNP Q16611
U	20	GLY	-	expression tag	UNP Q16611
U	21	HIS	-	expression tag	UNP Q16611
U	22	MET	-	expression tag	UNP Q16611
U	166	SER	CYS	engineered mutation	UNP Q16611
W	20	GLY	-	expression tag	UNP Q16611
W	21	HIS	-	expression tag	UNP Q16611
W	22	MET	-	expression tag	UNP Q16611

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Chain	Residue	Modelled	Actual	Comment	Reference
W	166	SER	CYS	engineered mutation	UNP Q16611

- Molecule 2 is a protein called Peroxisomal testis-specific protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	23	Total	C	N	O	S	0	0	0
			192	119	38	33	2			
2	D	23	Total	C	N	O	S	0	0	0
			188	116	37	33	2			
2	F	23	Total	C	N	O	S	0	0	0
			192	119	38	33	2			
2	H	23	Total	C	N	O	S	0	0	0
			185	115	37	31	2			
2	J	23	Total	C	N	O	S	0	0	0
			189	117	37	33	2			
2	L	22	Total	C	N	O	S	0	0	0
			180	112	34	32	2			
2	N	18	Total	C	N	O	S	0	0	0
			148	93	28	26	1			
2	P	18	Total	C	N	O	S	0	0	0
			144	90	27	26	1			
2	R	23	Total	C	N	O	S	0	0	0
			185	115	37	31	2			
2	T	23	Total	C	N	O	S	0	0	0
			192	119	38	33	2			
2	V	22	Total	C	N	O	S	0	0	0
			178	112	34	30	2			
2	X	23	Total	C	N	O	S	0	0	0
			171	107	32	31	1			

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	73	GLY	-	expression tag	UNP Q8NFP0
B	74	HIS	-	expression tag	UNP Q8NFP0
B	75	MET	-	expression tag	UNP Q8NFP0
D	73	GLY	-	expression tag	UNP Q8NFP0
D	74	HIS	-	expression tag	UNP Q8NFP0
D	75	MET	-	expression tag	UNP Q8NFP0
F	73	GLY	-	expression tag	UNP Q8NFP0
F	74	HIS	-	expression tag	UNP Q8NFP0
F	75	MET	-	expression tag	UNP Q8NFP0

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Chain	Residue	Modelled	Actual	Comment	Reference
H	73	GLY	-	expression tag	UNP Q8NFP0
H	74	HIS	-	expression tag	UNP Q8NFP0
H	75	MET	-	expression tag	UNP Q8NFP0
J	73	GLY	-	expression tag	UNP Q8NFP0
J	74	HIS	-	expression tag	UNP Q8NFP0
J	75	MET	-	expression tag	UNP Q8NFP0
L	73	GLY	-	expression tag	UNP Q8NFP0
L	74	HIS	-	expression tag	UNP Q8NFP0
L	75	MET	-	expression tag	UNP Q8NFP0
N	73	GLY	-	expression tag	UNP Q8NFP0
N	74	HIS	-	expression tag	UNP Q8NFP0
N	75	MET	-	expression tag	UNP Q8NFP0
P	73	GLY	-	expression tag	UNP Q8NFP0
P	74	HIS	-	expression tag	UNP Q8NFP0
P	75	MET	-	expression tag	UNP Q8NFP0
R	73	GLY	-	expression tag	UNP Q8NFP0
R	74	HIS	-	expression tag	UNP Q8NFP0
R	75	MET	-	expression tag	UNP Q8NFP0
T	73	GLY	-	expression tag	UNP Q8NFP0
T	74	HIS	-	expression tag	UNP Q8NFP0
T	75	MET	-	expression tag	UNP Q8NFP0
V	73	GLY	-	expression tag	UNP Q8NFP0
V	74	HIS	-	expression tag	UNP Q8NFP0
V	75	MET	-	expression tag	UNP Q8NFP0
X	73	GLY	-	expression tag	UNP Q8NFP0
X	74	HIS	-	expression tag	UNP Q8NFP0
X	75	MET	-	expression tag	UNP Q8NFP0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	24	Total O 24 24	0	0
3	B	3	Total O 3 3	0	0
3	C	20	Total O 20 20	0	0
3	D	4	Total O 4 4	0	0
3	E	21	Total O 21 21	0	0
3	F	3	Total O 3 3	0	0

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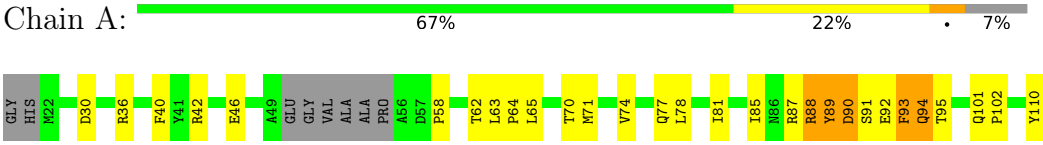
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	G	24	Total O 24 24	0	0
3	H	4	Total O 4 4	0	0
3	I	22	Total O 22 22	0	0
3	J	5	Total O 5 5	0	0
3	K	18	Total O 18 18	0	0
3	L	5	Total O 5 5	0	0
3	M	3	Total O 3 3	0	0
3	N	1	Total O 1 1	0	0
3	O	6	Total O 6 6	0	0
3	P	1	Total O 1 1	0	0
3	Q	12	Total O 12 12	0	0
3	R	4	Total O 4 4	0	0
3	S	8	Total O 8 8	0	0
3	T	1	Total O 1 1	0	0
3	U	7	Total O 7 7	0	0
3	V	3	Total O 3 3	0	0
3	W	6	Total O 6 6	0	0
3	X	1	Total O 1 1	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

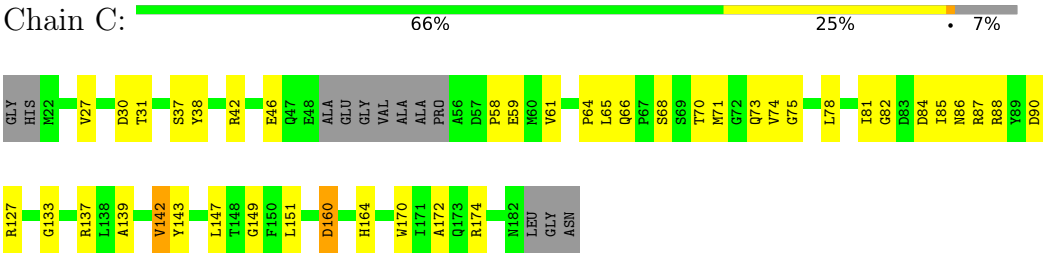
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain A:



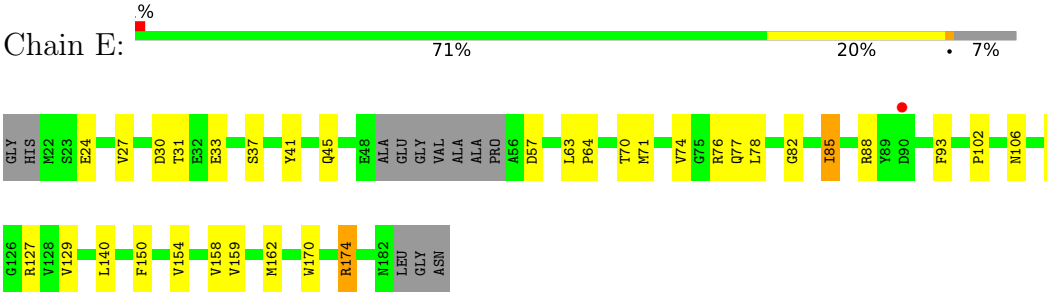
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain C:



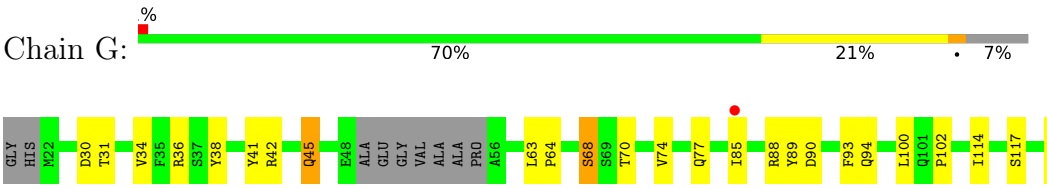
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain E:



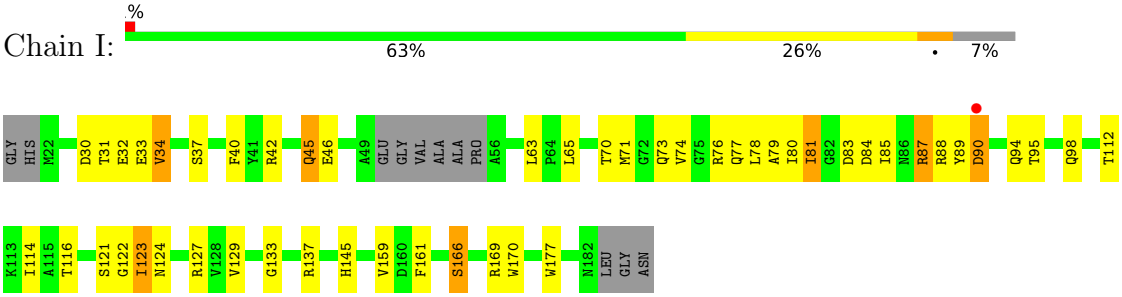
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain G:



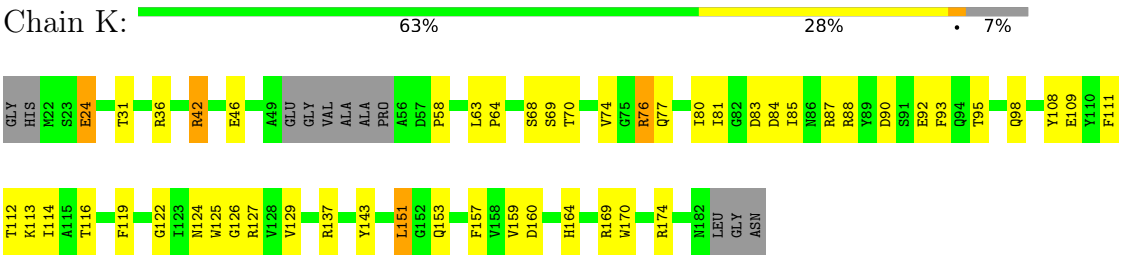
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain I:



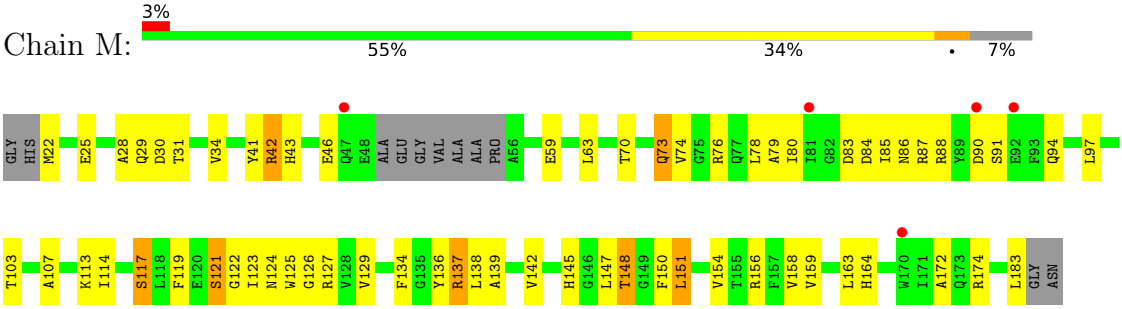
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain K:



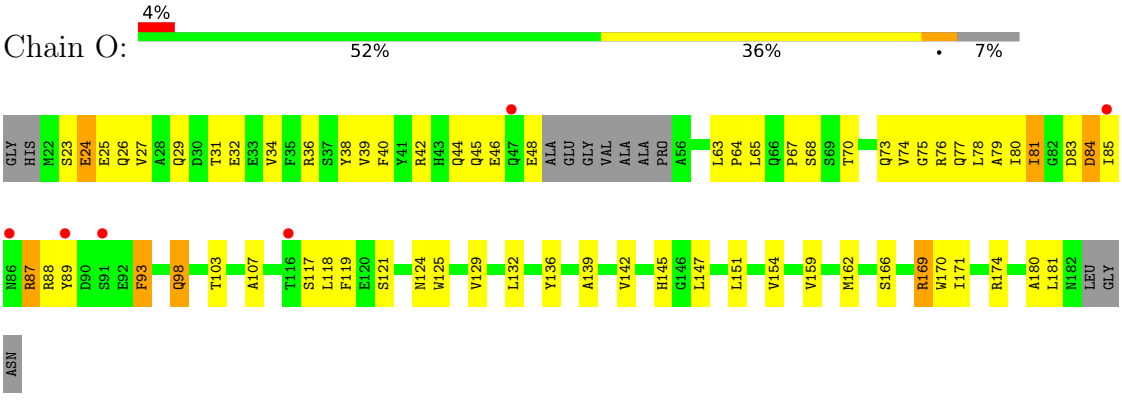
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain M:



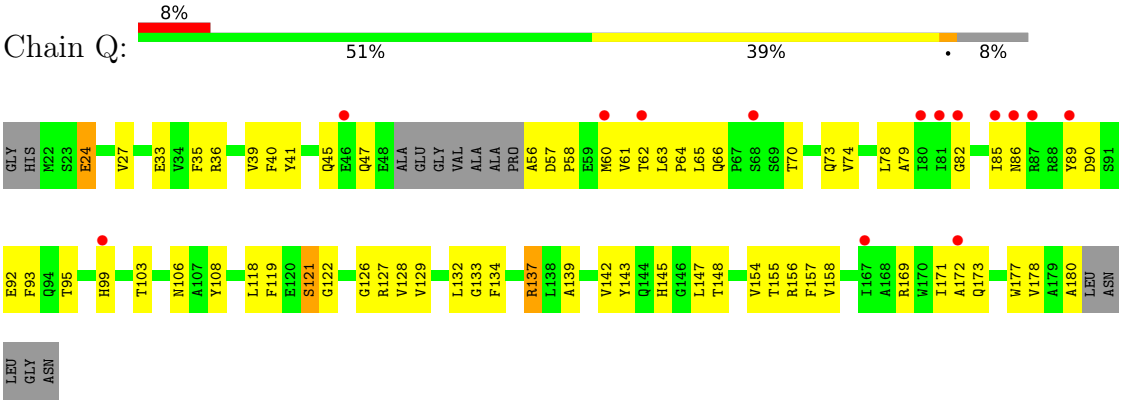
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain O:



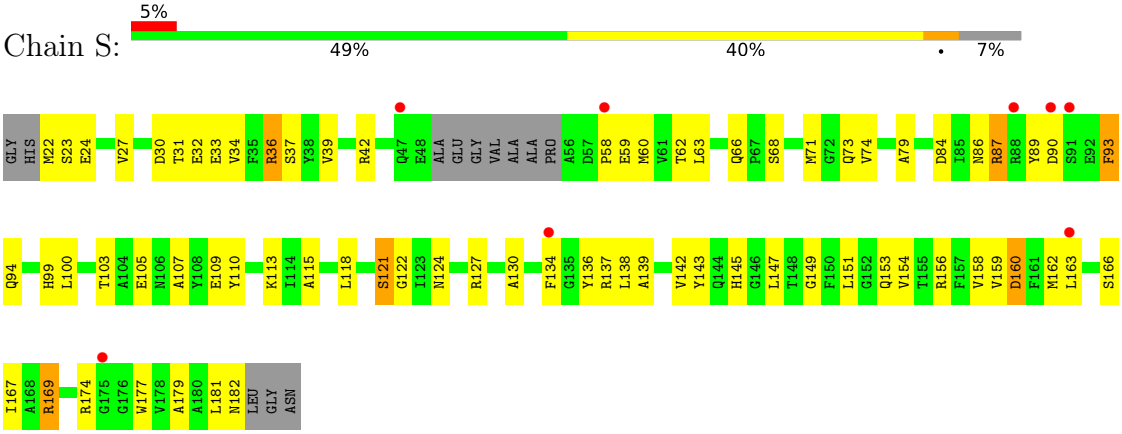
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain Q:



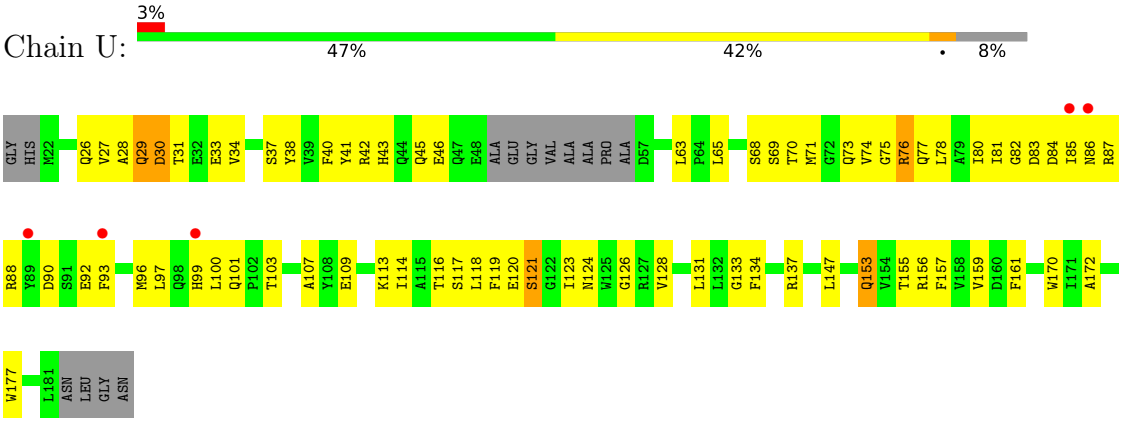
• Molecule 1: Bcl-2 homologous antagonist/killer

Chain S:



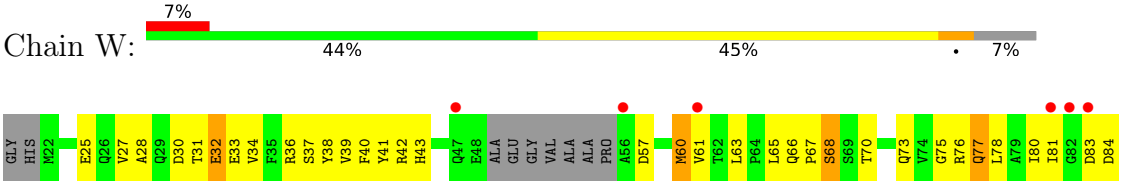
• Molecule 1: Bcl-2 homologous antagonist/killer

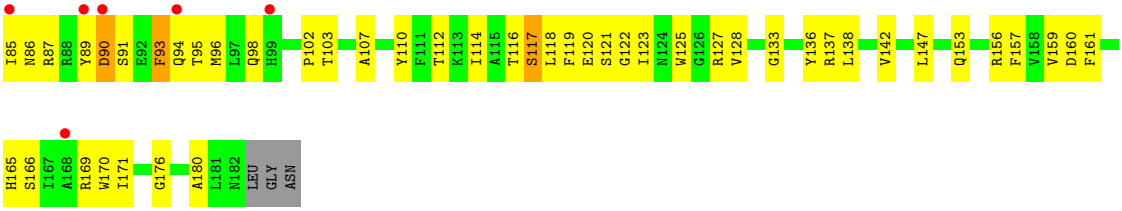
Chain U:



• Molecule 1: Bcl-2 homologous antagonist/killer

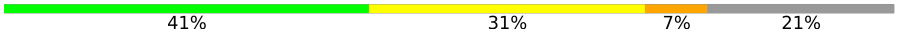
Chain W:

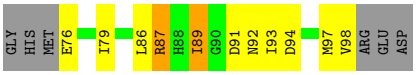




• Molecule 2: Peroxisomal testis-specific protein 1

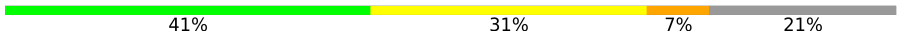
Chain B:





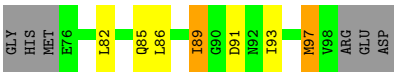
• Molecule 2: Peroxisomal testis-specific protein 1

Chain D:



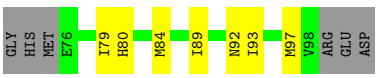
• Molecule 2: Peroxisomal testis-specific protein 1

Chain F:



• Molecule 2: Peroxisomal testis-specific protein 1

Chain H:



• Molecule 2: Peroxisomal testis-specific protein 1

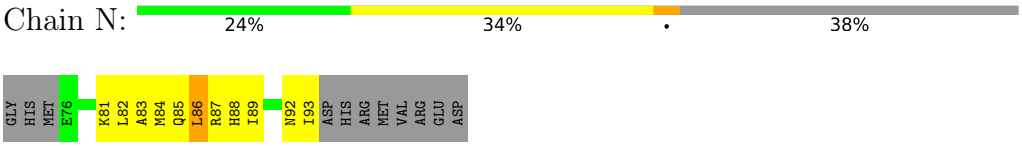
Chain J:

• Molecule 2: Peroxisomal testis-specific protein 1

Chain L:

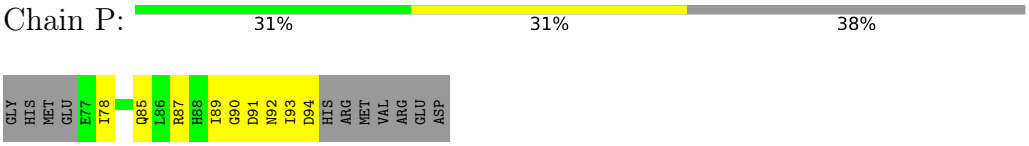
• Molecule 2: Peroxisomal testis-specific protein 1

Chain N:



• Molecule 2: Peroxisomal testis-specific protein 1

Chain P:

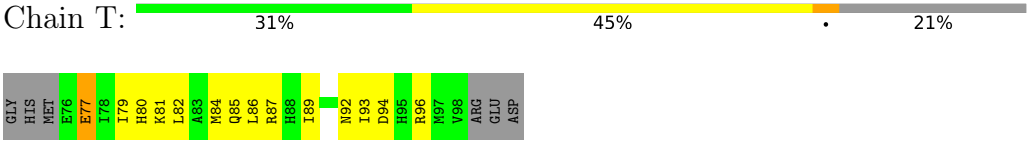


• Molecule 2: Peroxisomal testis-specific protein 1

Chain R:

• Molecule 2: Peroxisomal testis-specific protein 1

Chain T:

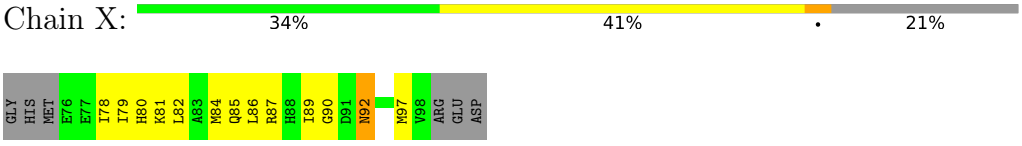


• Molecule 2: Peroxisomal testis-specific protein 1

Chain V:

• Molecule 2: Peroxisomal testis-specific protein 1

Chain X:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	70.00Å 108.36Å 108.42Å 120.03° 90.02° 89.98°	Depositor
Resolution (Å)	46.94 – 2.20 46.93 – 2.20	Depositor EDS
% Data completeness (in resolution range)	93.3 (46.94-2.20) 54.9 (46.93-2.20)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.64 (at 2.20Å)	Xtriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.211 , 0.266 0.174 , 0.226	Depositor DCC
R_{free} test set	1203 reflections (1.55%)	wwPDB-VP
Wilson B-factor (Å^2)	25.8	Xtriage
Anisotropy	0.057	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 13.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.40$, $< L^2 > = 0.22$	Xtriage
Estimated twinning fraction	0.376 for h,k+l,-k 0.376 for h,-l,k+l 0.369 for h,l,-k-l 0.369 for h,-k-l,k 0.447 for h,-k,-l 0.349 for -h,l,k 0.409 for -h,k,-k-l 0.360 for -h,-k-l,l 0.367 for -h,k+l,-l 0.367 for -h,-l,-k 0.417 for -h,-k,k+l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	17258	wwPDB-VP
Average B, all atoms (Å^2)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.03% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.61	0/1283	0.68	0/1738
1	C	0.64	0/1272	0.66	0/1724
1	E	0.59	0/1265	0.63	0/1715
1	G	0.59	0/1272	0.62	0/1724
1	I	0.63	0/1279	0.67	0/1733
1	K	0.62	0/1283	0.64	0/1738
1	M	0.48	0/1286	0.59	0/1742
1	O	0.53	0/1265	0.56	0/1715
1	Q	0.52	0/1262	0.59	0/1709
1	S	0.49	0/1271	0.60	0/1722
1	U	0.49	0/1262	0.56	0/1709
1	W	0.48	0/1268	0.57	0/1719
2	B	0.64	0/194	0.74	0/258
2	D	0.44	0/190	0.59	0/254
2	F	0.49	0/194	0.73	0/258
2	H	0.50	0/187	0.68	0/250
2	J	0.51	0/191	0.67	0/255
2	L	0.56	0/182	0.78	0/242
2	N	0.40	0/149	0.48	0/198
2	P	0.49	0/145	0.66	0/194
2	R	0.44	0/187	0.57	0/250
2	T	0.52	0/194	0.65	0/258
2	V	0.48	0/180	0.73	0/240
2	X	0.35	0/172	0.51	0/232
All	All	0.55	0/17433	0.62	0/23577

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1253	0	1199	53	0
1	C	1242	0	1183	39	0
1	E	1235	0	1175	34	0
1	G	1242	0	1183	32	0
1	I	1249	0	1195	55	0
1	K	1253	0	1199	38	0
1	M	1256	0	1205	78	0
1	O	1235	0	1173	79	0
1	Q	1232	0	1177	67	0
1	S	1241	0	1186	78	0
1	U	1232	0	1181	80	0
1	W	1238	0	1176	93	0
2	B	192	0	194	13	0
2	D	188	0	183	13	0
2	F	192	0	194	6	0
2	H	185	0	181	11	0
2	J	189	0	185	10	0
2	L	180	0	176	10	0
2	N	148	0	152	23	0
2	P	144	0	141	12	0
2	R	185	0	181	15	0
2	T	192	0	194	19	0
2	V	178	0	179	12	0
2	X	171	0	158	15	0
3	A	24	0	0	0	0
3	B	3	0	0	0	0
3	C	20	0	0	0	0
3	D	4	0	0	0	0
3	E	21	0	0	0	0
3	F	3	0	0	0	0
3	G	24	0	0	1	0
3	H	4	0	0	0	0
3	I	22	0	0	3	0
3	J	5	0	0	0	0
3	K	18	0	0	2	0
3	L	5	0	0	1	0
3	M	3	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	N	1	0	0	3	0
3	O	6	0	0	2	0
3	P	1	0	0	0	0
3	Q	12	0	0	1	0
3	R	4	0	0	1	0
3	S	8	0	0	1	0
3	T	1	0	0	0	0
3	U	7	0	0	0	0
3	V	3	0	0	0	0
3	W	6	0	0	1	0
3	X	1	0	0	0	0
All	All	17258	0	16350	724	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 22.

The worst 5 of 724 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:U:30:ASP:O	1:U:34:VAL:HG23	1.34	1.26
1:U:31:THR:CG2	1:U:159:VAL:HG22	1.76	1.15
1:U:31:THR:HG22	1:U:159:VAL:HG22	1.22	1.14
1:U:33:GLU:O	1:U:37:SER:HB3	1.49	1.11
1:S:166:SER:HA	1:S:169:ARG:CG	1.82	1.10

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	151/166 (91%)	146 (97%)	5 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	150/166 (90%)	147 (98%)	3 (2%)	0	100	100
1	E	150/166 (90%)	147 (98%)	3 (2%)	0	100	100
1	G	150/166 (90%)	144 (96%)	6 (4%)	0	100	100
1	I	151/166 (91%)	141 (93%)	10 (7%)	0	100	100
1	K	151/166 (91%)	144 (95%)	7 (5%)	0	100	100
1	M	151/166 (91%)	135 (89%)	16 (11%)	0	100	100
1	O	150/166 (90%)	138 (92%)	12 (8%)	0	100	100
1	Q	148/166 (89%)	137 (93%)	11 (7%)	0	100	100
1	S	150/166 (90%)	141 (94%)	9 (6%)	0	100	100
1	U	148/166 (89%)	135 (91%)	13 (9%)	0	100	100
1	W	150/166 (90%)	135 (90%)	15 (10%)	0	100	100
2	B	21/29 (72%)	21 (100%)	0	0	100	100
2	D	21/29 (72%)	21 (100%)	0	0	100	100
2	F	21/29 (72%)	20 (95%)	1 (5%)	0	100	100
2	H	21/29 (72%)	21 (100%)	0	0	100	100
2	J	21/29 (72%)	21 (100%)	0	0	100	100
2	L	20/29 (69%)	20 (100%)	0	0	100	100
2	N	16/29 (55%)	14 (88%)	2 (12%)	0	100	100
2	P	16/29 (55%)	13 (81%)	3 (19%)	0	100	100
2	R	21/29 (72%)	19 (90%)	2 (10%)	0	100	100
2	T	21/29 (72%)	19 (90%)	2 (10%)	0	100	100
2	V	20/29 (69%)	18 (90%)	2 (10%)	0	100	100
2	X	21/29 (72%)	21 (100%)	0	0	100	100
All	All	2040/2340 (87%)	1918 (94%)	122 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	130/136 (96%)	121 (93%)	9 (7%)	15 16
1	C	129/136 (95%)	124 (96%)	5 (4%)	32 41
1	E	127/136 (93%)	124 (98%)	3 (2%)	49 62
1	G	129/136 (95%)	123 (95%)	6 (5%)	26 33
1	I	129/136 (95%)	119 (92%)	10 (8%)	12 13
1	K	130/136 (96%)	123 (95%)	7 (5%)	22 26
1	M	131/136 (96%)	123 (94%)	8 (6%)	18 21
1	O	126/136 (93%)	117 (93%)	9 (7%)	14 16
1	Q	128/136 (94%)	123 (96%)	5 (4%)	32 41
1	S	128/136 (94%)	117 (91%)	11 (9%)	10 10
1	U	128/136 (94%)	118 (92%)	10 (8%)	12 13
1	W	128/136 (94%)	120 (94%)	8 (6%)	18 20
2	B	21/26 (81%)	18 (86%)	3 (14%)	3 2
2	D	20/26 (77%)	16 (80%)	4 (20%)	1 1
2	F	21/26 (81%)	19 (90%)	2 (10%)	8 8
2	H	19/26 (73%)	19 (100%)	0	100 100
2	J	20/26 (77%)	19 (95%)	1 (5%)	24 30
2	L	19/26 (73%)	19 (100%)	0	100 100
2	N	16/26 (62%)	14 (88%)	2 (12%)	4 4
2	P	15/26 (58%)	15 (100%)	0	100 100
2	R	19/26 (73%)	18 (95%)	1 (5%)	22 27
2	T	21/26 (81%)	20 (95%)	1 (5%)	25 32
2	V	19/26 (73%)	18 (95%)	1 (5%)	22 27
2	X	16/26 (62%)	15 (94%)	1 (6%)	18 20
All	All	1769/1944 (91%)	1662 (94%)	107 (6%)	19 22

5 of 107 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	151	LEU
1	Q	121	SER
1	W	60	MET
2	N	92	ASN
1	O	93	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 28 such sidechains are listed below:

Mol	Chain	Res	Type
1	Q	99	HIS
1	W	164	HIS
1	S	73	GLN
1	W	77	GLN
1	Q	173	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	155/166 (93%)	-0.39	0 100 100	9, 23, 61, 78	0
1	C	154/166 (92%)	-0.38	0 100 100	9, 22, 60, 69	0
1	E	154/166 (92%)	-0.44	1 (0%) 89 88	9, 20, 59, 75	0
1	G	154/166 (92%)	-0.41	1 (0%) 89 88	8, 21, 60, 69	0
1	I	155/166 (93%)	-0.40	1 (0%) 89 88	10, 22, 56, 70	0
1	K	155/166 (93%)	-0.43	0 100 100	12, 25, 59, 73	0
1	M	155/166 (93%)	0.35	5 (3%) 47 45	35, 58, 91, 99	0
1	O	154/166 (92%)	0.40	6 (3%) 39 37	32, 56, 89, 99	0
1	Q	152/166 (91%)	0.53	14 (9%) 9 7	34, 57, 89, 97	0
1	S	154/166 (92%)	0.36	8 (5%) 27 26	36, 59, 90, 99	0
1	U	152/166 (91%)	0.32	5 (3%) 46 44	37, 57, 88, 98	0
1	W	154/166 (92%)	0.39	12 (7%) 13 11	38, 56, 88, 106	0
2	B	23/29 (79%)	-0.67	0 100 100	12, 17, 24, 28	0
2	D	23/29 (79%)	-0.72	0 100 100	14, 20, 27, 32	0
2	F	23/29 (79%)	-0.75	0 100 100	12, 17, 26, 30	0
2	H	23/29 (79%)	-0.72	0 100 100	13, 17, 24, 28	0
2	J	23/29 (79%)	-0.51	0 100 100	15, 19, 28, 31	0
2	L	22/29 (75%)	-0.70	0 100 100	13, 18, 24, 27	0
2	N	18/29 (62%)	-0.46	0 100 100	29, 34, 41, 47	0
2	P	18/29 (62%)	-0.40	0 100 100	27, 35, 45, 48	0
2	R	23/29 (79%)	-0.58	0 100 100	23, 32, 37, 42	0
2	T	23/29 (79%)	-0.45	0 100 100	28, 32, 37, 39	0
2	V	22/29 (75%)	-0.28	0 100 100	28, 35, 40, 46	0
2	X	23/29 (79%)	-0.42	0 100 100	29, 35, 40, 42	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
All	All	2112/2340 (90%)	-0.08	53 (2%) 57 55	8, 39, 79, 106	0

The worst 5 of 53 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	S	58	PRO	4.7
1	W	47	GLN	4.5
1	S	90	ASP	4.4
1	W	89	TYR	4.4
1	M	47	GLN	4.2

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.