



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2022 – 01:16 pm BST

PDB ID : 7QRY
Title : Crystal structure of B30.2 PRYSPRY domain of MID1
Authors : Chaikuad, A.; Knapp, S.; Structural Genomics Consortium (SGC)
Deposited on : 2022-01-12
Resolution : 2.07 Å(reported)

This is a Full wwPDB X-ray Structure Validation 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 ⓘ symbol.

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

MolProbity : 4.02b-467
Xtrriage (Phenix) : 1.13
EDS : 2.28
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.28

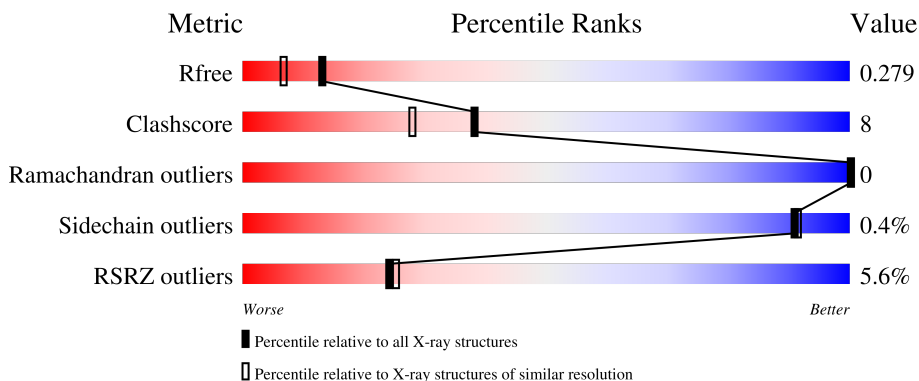
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.07 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	2684 (2.08-2.04)
Clashscore	141614	2801 (2.08-2.04)
Ramachandran outliers	138981	2768 (2.08-2.04)
Sidechain outliers	138945	2768 (2.08-2.04)
RSRZ outliers	127900	2646 (2.08-2.04)

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 $\leq 5\%$. 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	188	 4% 74% 13% 13%
1	B	188	 5% 78% 10% • 12%
1	C	188	 4% 76% 12% 13%
1	D	188	 6% 75% 13% • 12%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5376 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 E3 ubiquitin-protein ligase Midline-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	164	1308	841	229	234	4	0	0	0
1	B	166	1322	849	231	238	4	0	0	0
1	C	164	1308	841	229	234	4	0	0	0
1	D	166	1321	849	231	236	5	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	480	SER	-	expression tag	UNP O15344
A	481	MET	-	expression tag	UNP O15344
B	480	SER	-	expression tag	UNP O15344
B	481	MET	-	expression tag	UNP O15344
C	480	SER	-	expression tag	UNP O15344
C	481	MET	-	expression tag	UNP O15344
D	480	SER	-	expression tag	UNP O15344
D	481	MET	-	expression tag	UNP O15344

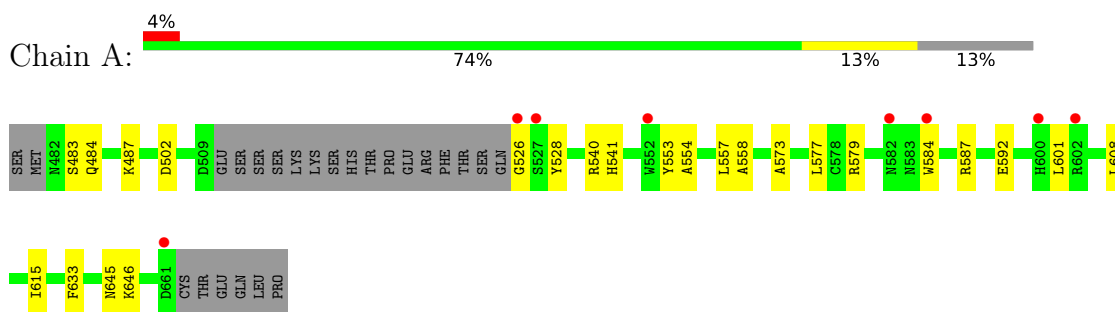
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	24	Total 24	O 24	0	0
2	B	35	Total 35	O 35	0	0
2	C	31	Total 31	O 31	0	0
2	D	27	Total 27	O 27	0	0

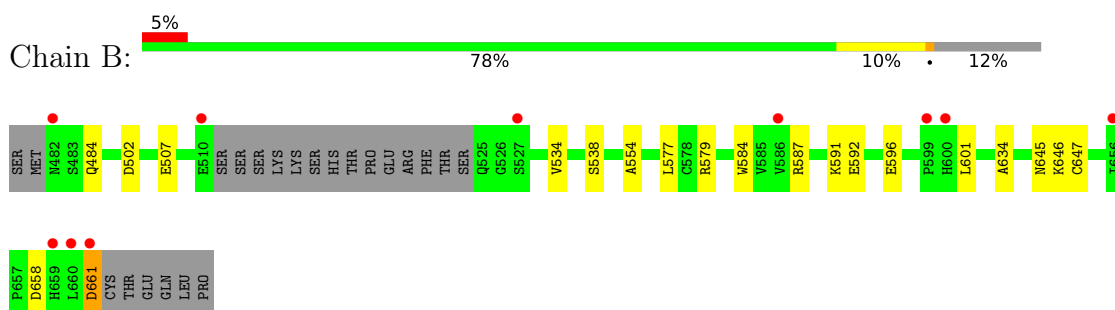
3 Residue-property plots [i](#)

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.

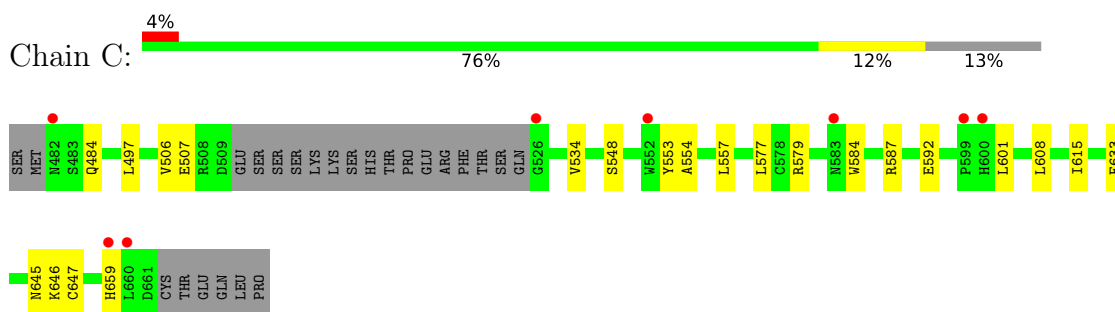
- Molecule 1: E3 ubiquitin-protein ligase Midline-1



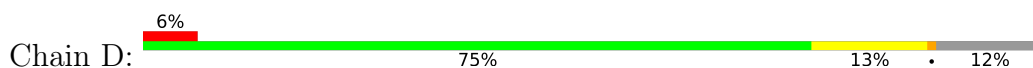
- Molecule 1: E3 ubiquitin-protein ligase Midline-1

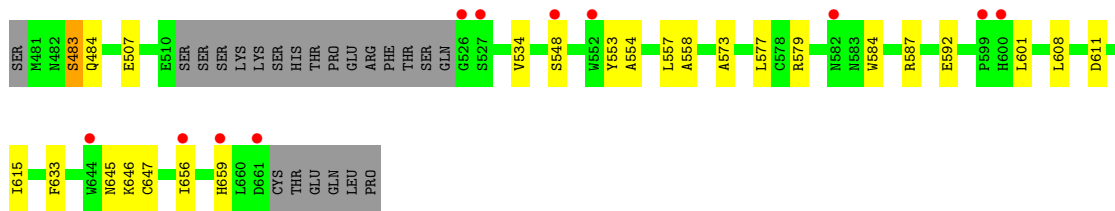


- Molecule 1: E3 ubiquitin-protein ligase Midline-1



- Molecule 1: E3 ubiquitin-protein ligase Midline-1





4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	38.86Å 51.76Å 80.38Å 103.76° 92.64° 94.33°	Depositor
Resolution (Å)	47.71 – 2.07 47.71 – 2.07	Depositor EDS
% Data completeness (in resolution range)	95.0 (47.71-2.07) 95.0 (47.71-2.07)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.29 (at 2.07Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, R_{free}	0.227 , 0.273 0.236 , 0.279	Depositor DCC
R_{free} test set	1721 reflections (4.91%)	wwPDB-VP
Wilson B-factor (Å ²)	42.3	Xtriage
Anisotropy	0.063	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5376	wwPDB-VP
Average B, all atoms (Å ²)	49.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.54% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.70	0/1349	0.75	0/1841
1	B	0.71	0/1363	0.78	0/1860
1	C	0.72	0/1349	0.75	0/1841
1	D	0.72	1/1362 (0.1%)	0.75	0/1858
All	All	0.72	1/5423 (0.0%)	0.75	0/7400

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	483	SER	CA-CB	-5.47	1.44	1.52

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	1308	0	1268	23	0
1	B	1322	0	1276	17	0
1	C	1308	0	1268	23	0
1	D	1321	0	1279	21	0
2	A	24	0	0	1	0
2	B	35	0	0	2	0
2	C	31	0	0	2	0
2	D	27	0	0	1	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	5376	0	5091	79	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 8.

All (79) 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:B:591:LYS:NZ	2:B:701:HOH:O	2.18	0.77
1:C:548:SER:HG	1:C:647:CYS:HG	1.29	0.71
1:A:557:LEU:HD13	1:A:615:ILE:HD12	1.72	0.69
1:D:579:ARG:HD2	1:D:584:TRP:CH2	2.28	0.69
1:B:579:ARG:HD2	1:B:584:TRP:CH2	2.28	0.69
1:A:579:ARG:HD2	1:A:584:TRP:CH2	2.28	0.68
1:A:557:LEU:CD1	1:A:615:ILE:HD12	2.25	0.67
1:D:557:LEU:CD1	1:D:615:ILE:HD12	2.25	0.67
1:C:579:ARG:HD2	1:C:584:TRP:CH2	2.29	0.67
1:C:557:LEU:CD1	1:C:615:ILE:HD12	2.27	0.65
1:C:557:LEU:HD13	1:C:615:ILE:HD12	1.80	0.62
1:D:557:LEU:HD13	1:D:615:ILE:HD12	1.81	0.62
1:D:484:GLN:HG2	1:D:534:VAL:HG21	1.82	0.61
1:D:587:ARG:HD3	1:D:592:GLU:HG2	1.83	0.61
1:A:483:SER:HB2	1:A:541:HIS:HA	1.83	0.60
1:A:483:SER:CB	1:A:541:HIS:HA	2.31	0.60
1:A:557:LEU:HD13	1:A:615:ILE:CD1	2.33	0.57
1:B:587:ARG:HD3	1:B:592:GLU:CG	2.35	0.57
1:A:587:ARG:HD3	1:A:592:GLU:CG	2.35	0.56
1:C:587:ARG:HD3	1:C:592:GLU:CG	2.35	0.56
1:B:502:ASP:HB3	1:C:659:HIS:CD2	2.40	0.56
1:B:484:GLN:HG2	1:B:534:VAL:HG21	1.88	0.55
1:A:526:GLY:HA2	1:A:528:TYR:CE1	2.42	0.55
1:B:507:GLU:OE2	2:B:702:HOH:O	2.18	0.54
1:D:587:ARG:HD3	1:D:592:GLU:CG	2.37	0.54
1:C:557:LEU:HD13	1:C:615:ILE:CD1	2.38	0.54
1:D:557:LEU:HD13	1:D:615:ILE:CD1	2.37	0.54
1:B:587:ARG:HD3	1:B:592:GLU:HG2	1.91	0.53
1:A:587:ARG:HD3	1:A:592:GLU:HG2	1.91	0.52
1:B:584:TRP:CZ3	1:B:601:LEU:HD23	2.43	0.52
1:D:553:TYR:HH	1:D:584:TRP:HZ3	1.57	0.52
1:A:608:LEU:HD13	1:A:615:ILE:CD1	2.39	0.52
1:D:584:TRP:CZ3	1:D:601:LEU:HD23	2.46	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:608:LEU:HD13	1:C:615:ILE:CD1	2.40	0.51
1:A:553:TYR:HH	1:A:584:TRP:HZ3	1.53	0.50
1:D:608:LEU:HD13	1:D:615:ILE:CD1	2.41	0.50
1:C:484:GLN:HG2	1:C:534:VAL:HG21	1.94	0.49
1:A:484:GLN:HA	1:B:634:ALA:O	2.13	0.49
1:C:553:TYR:HH	1:C:584:TRP:HZ3	1.55	0.49
1:A:553:TYR:OH	1:A:584:TRP:HZ3	1.96	0.49
1:C:587:ARG:HD3	1:C:592:GLU:HG2	1.94	0.49
1:A:487:LYS:HE3	1:B:538:SER:HB3	1.94	0.48
1:C:584:TRP:CZ3	1:C:601:LEU:HD23	2.49	0.48
1:C:553:TYR:OH	1:C:584:TRP:HZ3	1.97	0.48
1:C:584:TRP:HH2	2:C:710:HOH:O	1.95	0.48
1:C:507:GLU:HG2	1:C:647:CYS:HB3	1.95	0.47
1:D:615:ILE:HD11	1:D:633:PHE:HZ	1.79	0.47
1:A:584:TRP:CZ3	1:A:601:LEU:HD23	2.49	0.47
1:D:548:SER:OG	1:D:647:CYS:SG	2.51	0.46
1:C:548:SER:OG	1:C:647:CYS:SG	2.47	0.46
1:A:608:LEU:HD13	1:A:615:ILE:HD11	1.98	0.46
1:B:484:GLN:NE2	1:D:656:ILE:O	2.44	0.45
1:C:608:LEU:HD13	1:C:615:ILE:HD11	1.98	0.45
1:B:658:ASP:HA	1:B:661:ASP:OD2	2.16	0.45
1:C:615:ILE:HD11	1:C:633:PHE:HZ	1.80	0.45
1:B:507:GLU:HG2	1:B:647:CYS:HB3	1.99	0.44
1:B:645:ASN:ND2	1:B:646:LYS:HG2	2.33	0.44
1:D:553:TYR:OH	1:D:584:TRP:HZ3	1.99	0.44
1:B:554:ALA:HA	1:B:577:LEU:O	2.18	0.44
1:D:611:ASP:HB2	2:D:704:HOH:O	2.18	0.43
1:C:587:ARG:HD3	1:C:592:GLU:HG3	2.00	0.43
1:A:540:ARG:NH1	2:A:701:HOH:O	2.47	0.43
1:D:645:ASN:ND2	1:D:646:LYS:HG2	2.33	0.43
1:A:554:ALA:HA	1:A:577:LEU:O	2.19	0.43
1:A:645:ASN:ND2	1:A:646:LYS:HG2	2.34	0.43
1:C:507:GLU:HB3	2:C:718:HOH:O	2.19	0.42
1:C:645:ASN:ND2	1:C:646:LYS:HG2	2.34	0.42
1:C:554:ALA:HA	1:C:577:LEU:O	2.19	0.42
1:B:596:GLU:OE1	1:B:596:GLU:HA	2.18	0.42
1:A:615:ILE:HD11	1:A:633:PHE:HZ	1.84	0.41
1:A:558:ALA:HA	1:A:573:ALA:O	2.21	0.41
1:D:507:GLU:HG2	1:D:647:CYS:HB3	2.01	0.41
1:D:608:LEU:HD13	1:D:615:ILE:HD11	2.01	0.41
1:D:558:ALA:HA	1:D:573:ALA:O	2.21	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:554:ALA:HA	1:D:577:LEU:O	2.20	0.41
1:A:502:ASP:HB3	1:D:659:HIS:CD2	2.55	0.41
1:C:497:LEU:HD13	1:C:506:VAL:HG21	2.03	0.41
1:A:587:ARG:HD3	1:A:592:GLU:HG3	2.02	0.40
1:B:587:ARG:HD3	1:B:592:GLU:HG3	2.01	0.40

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	160/188 (85%)	150 (94%)	10 (6%)	0	100	100
1	B	162/188 (86%)	153 (94%)	9 (6%)	0	100	100
1	C	160/188 (85%)	150 (94%)	10 (6%)	0	100	100
1	D	162/188 (86%)	153 (94%)	9 (6%)	0	100	100
All	All	644/752 (86%)	606 (94%)	38 (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	142/166 (86%)	142 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	143/166 (86%)	142 (99%)	1 (1%)	84	84
1	C	142/166 (86%)	142 (100%)	0	100	100
1	D	143/166 (86%)	142 (99%)	1 (1%)	84	84
All	All	570/664 (86%)	568 (100%)	2 (0%)	91	91

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	661	ASP
1	D	483	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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, 95th 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	164/188 (87%)	0.54	8 (4%) 29 30	34, 47, 73, 104	0
1	B	166/188 (88%)	0.55	10 (6%) 21 22	31, 44, 75, 126	0
1	C	164/188 (87%)	0.54	8 (4%) 29 30	30, 45, 76, 107	0
1	D	166/188 (88%)	0.55	11 (6%) 18 18	31, 45, 75, 111	0
All	All	660/752 (87%)	0.55	37 (5%) 24 25	30, 45, 76, 126	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	526	GLY	5.3
1	D	582	ASN	5.0
1	A	602	ARG	5.0
1	B	659	HIS	4.6
1	C	659	HIS	4.6
1	D	552	TRP	4.3
1	D	526	GLY	4.2
1	B	660	LEU	3.9
1	C	600	HIS	3.9
1	D	600	HIS	3.6
1	D	527	SER	3.5
1	A	552	TRP	3.5
1	A	661	ASP	3.3
1	C	660	LEU	3.2
1	C	599	PRO	3.0
1	A	600	HIS	3.0
1	C	552	TRP	3.0
1	C	482	ASN	2.9
1	A	582	ASN	2.9
1	C	583	ASN	2.8
1	B	661	ASP	2.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	599	PRO	2.6
1	B	527	SER	2.5
1	B	586	VAL	2.5
1	B	599	PRO	2.4
1	D	644	TRP	2.3
1	A	584	TRP	2.3
1	D	661	ASP	2.3
1	B	510	GLU	2.2
1	D	659	HIS	2.2
1	B	482	ASN	2.1
1	B	656	ILE	2.1
1	D	656	ILE	2.1
1	C	526	GLY	2.1
1	D	548	SER	2.1
1	A	527	SER	2.0
1	B	600	HIS	2.0

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.