Full wwPDB X-ray Structure Validation Report ⓘ

Apr 15, 2024 – 04:12 PM JST

PDB ID	:	8J5B
Title	:	Crystal structure of P domain from norovirus GI.4 capsid protein.
Authors	:	Katsura, K.; Sakai, N.; Hasegawa, K.; Kimura-Someya, T.; Shirouzu, M.
Deposited on	:	2023-04-21
Resolution	:	1.89 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

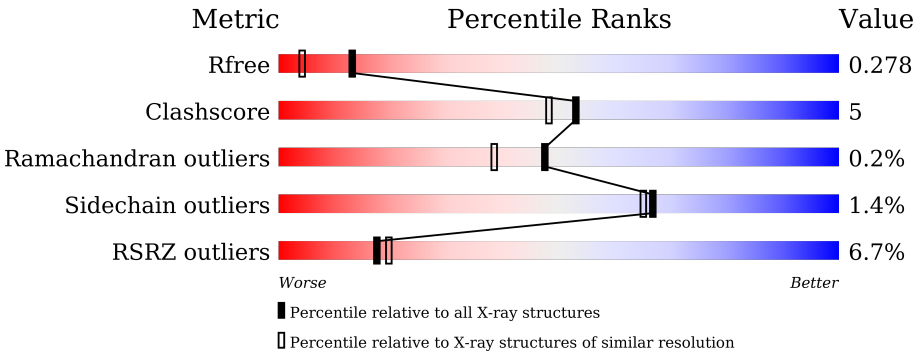
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation 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 1.89 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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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	314	6% 82% 13% 5%
2	B	303	6% 87% 11% ·
2	C	303	7% 88% 11% ••
3	D	308	7% 84% 14% ·

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 9579 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 Capsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	299	Total	C	N	O	S	0	0	0
			2280	1451	381	439	9			

- Molecule 2 is a protein called Capsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	297	Total	C	N	O	S	0	0	0
			2270	1445	379	437	9			
2	C	300	Total	C	N	O	S	0	0	0
			2290	1456	382	443	9			

- Molecule 3 is a protein called Capsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	302	Total	C	N	O	S	0	0	0
			2298	1462	384	443	9			

- Molecule 4 is water.

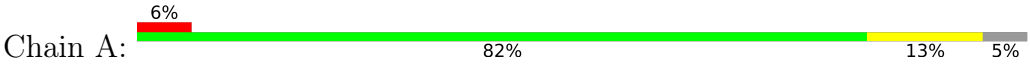
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	127	Total	O	0	0
			127	127		
4	B	102	Total	O	0	0
			102	102		
4	C	92	Total	O	0	0
			92	92		
4	D	120	Total	O	0	0
			120	120		

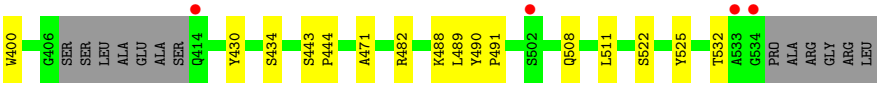
3 Residue-property plots (i)

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: Capsid protein

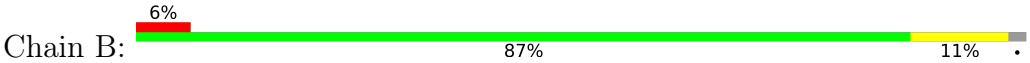
Chain A:

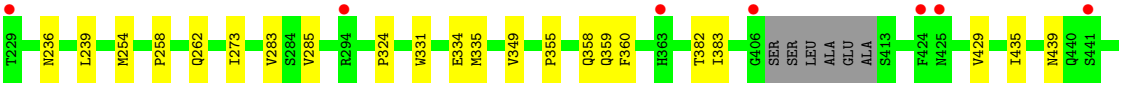


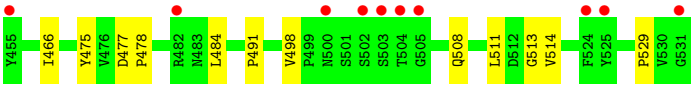


• Molecule 2: Capsid protein

Chain B:

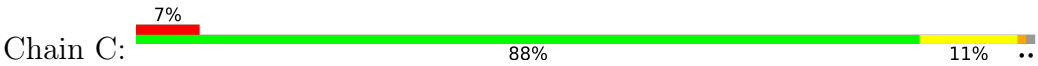


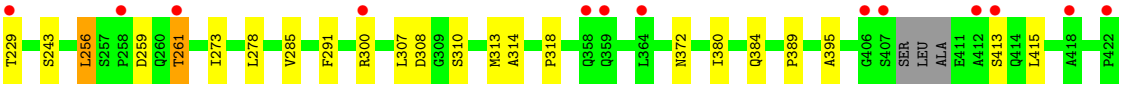


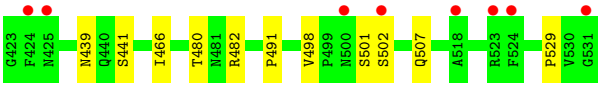


• Molecule 2: Capsid protein

Chain C:

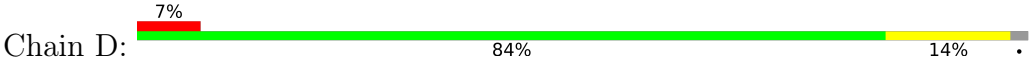


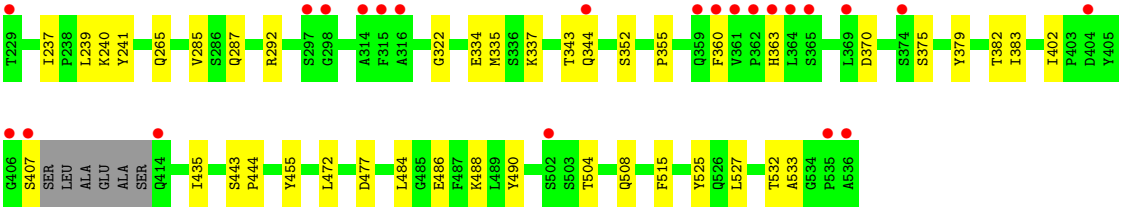




• Molecule 3: Capsid protein

Chain D:




T229
I237
P238
L239
K240
Y241
Q265
V285
S286
Q287
R292
S297
G298
A314
F315
A316
G322
E334
M335
S336
K337
T343
Q344
S352
P355
Q359
F360
V361
P362
H363
L364
S365
L369
D370
S374
S375
Y379
T382
I383
I402
P403
D404
Y405
G406
S407
SER
LEU
ALA
GLU
ALA
SER
Q414
I435
S443
P444
Y455
L472
D477
L484
G485
E486
F487
K488
L489
Y490
S502
S503
T504
Q508
F515
Y525
Q526
L527
T532
A533
G534
P535
A536

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	61.67Å 62.79Å 92.76Å 91.74° 97.71° 119.07°	Depositor
Resolution (Å)	49.80 – 1.89 49.75 – 1.89	Depositor EDS
% Data completeness (in resolution range)	96.2 (49.80-1.89) 96.2 (49.75-1.89)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	1.33 (at 1.90Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.232 , 0.275 0.236 , 0.278	Depositor DCC
R_{free} test set	4600 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	22.6	Xtriage
Anisotropy	0.108	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 34.7	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.019 for -h-k,k,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	9579	wwPDB-VP
Average B, all atoms (Å^2)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.69% 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	0.70	0/2349	0.84	0/3219
2	B	0.68	0/2339	0.83	0/3205
2	C	0.68	0/2359	0.83	0/3232
3	D	0.69	0/2368	0.83	0/3246
All	All	0.69	0/9415	0.83	0/12902

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

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	2280	0	2201	26	0
2	B	2270	0	2191	24	0
2	C	2290	0	2207	22	0
3	D	2298	0	2218	34	0
4	A	127	0	0	1	0
4	B	102	0	0	2	0
4	C	92	0	0	1	0
4	D	120	0	0	3	0
All	All	9579	0	8817	96	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 5.

All (96) 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:A:291:PHE:HE1	1:A:335:MET:HE3	1.45	0.82
2:C:466:ILE:HD13	2:C:491:PRO:HB3	1.73	0.69
3:D:472:LEU:HD11	3:D:486:GLU:HG2	1.76	0.68
3:D:508:GLN:OE1	4:D:601:HOH:O	2.12	0.67
2:B:273:ILE:HG12	2:B:491:PRO:HA	1.76	0.67
3:D:508:GLN:CD	4:D:601:HOH:O	2.34	0.65
2:B:335:MET:HG3	2:B:349:VAL:CG2	2.28	0.64
3:D:435:ILE:HA	4:D:615:HOH:O	1.98	0.64
3:D:337:LYS:NZ	3:D:375:SER:OG	2.30	0.63
2:B:466:ILE:HD13	2:B:491:PRO:HB3	1.80	0.63
2:C:300:ARG:HG3	2:C:372:ASN:OD1	1.99	0.61
1:A:354:LYS:HD3	1:A:390:SER:HB2	1.83	0.59
2:C:256:LEU:HD22	2:C:507:GLN:HE22	1.68	0.59
1:A:354:LYS:HB2	1:A:357:SER:HB3	1.85	0.58
2:C:291:PHE:O	2:C:380:ILE:HD12	2.04	0.58
2:C:413:SER:HB2	3:D:533:ALA:HB2	1.86	0.58
2:B:254:MET:HE2	2:B:429:VAL:HG11	1.85	0.57
3:D:504:THR:HG21	3:D:532:THR:O	2.04	0.57
1:A:334:GLU:OE1	2:C:384:GLN:NE2	2.32	0.57
2:C:318:PRO:HB3	2:C:415:LEU:HD12	1.86	0.56
1:A:355:PRO:HA	1:A:360:PHE:CG	2.43	0.54
1:A:315:PHE:CD2	1:A:315:PHE:O	2.61	0.54
3:D:335:MET:HG3	3:D:379:TYR:CD2	2.43	0.53
1:A:368:THR:HG23	4:A:655:HOH:O	2.09	0.53
2:C:273:ILE:HG12	2:C:491:PRO:HA	1.93	0.50
3:D:363:HIS:ND1	3:D:407:SER:CB	2.74	0.50
2:B:239:LEU:HD23	2:B:511:LEU:HD13	1.94	0.50
1:A:471:ALA:HB3	1:A:489:LEU:HB3	1.93	0.50
2:B:254:MET:CE	2:B:429:VAL:HG11	2.41	0.50
2:B:335:MET:HG3	2:B:349:VAL:HG22	1.93	0.49
2:B:358:GLN:HE21	2:B:359:GLN:NE2	2.10	0.49
2:B:382:THR:OG1	2:B:383:ILE:N	2.45	0.49
2:C:308:ASP:CG	2:C:310:SER:HG	2.15	0.49
2:C:259:ASP:OD2	2:C:261:THR:HG22	2.13	0.49
1:A:443:SER:HB2	1:A:444:PRO:HD2	1.95	0.48
3:D:355:PRO:HA	3:D:360:PHE:CG	2.49	0.48
3:D:335:MET:HE3	3:D:379:TYR:HB3	1.95	0.48
2:B:435:ILE:N	4:B:603:HOH:O	2.47	0.47
1:A:280:THR:HG23	1:A:318:PRO:HG2	1.96	0.47
1:A:335:MET:HB2	1:A:335:MET:HE2	1.75	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:443:SER:HB2	1:A:444:PRO:CD	2.45	0.47
2:B:236:ASN:ND2	4:B:601:HOH:O	2.26	0.47
3:D:287:GLN:O	3:D:322:GLY:HA3	2.14	0.47
3:D:335:MET:HG3	3:D:379:TYR:HD2	1.78	0.47
1:A:508:GLN:HE22	1:A:532:THR:CG2	2.28	0.46
2:B:334:GLU:OE2	3:D:334:GLU:OE2	2.34	0.46
2:B:355:PRO:HA	2:B:360:PHE:CD1	2.50	0.46
2:B:285:VAL:HB	3:D:285:VAL:HB	1.98	0.46
2:C:307:LEU:HD22	2:C:380:ILE:CD1	2.46	0.46
2:C:507:GLN:NE2	4:C:601:HOH:O	2.13	0.45
2:B:475:TYR:CZ	2:B:513:GLY:HA3	2.51	0.45
2:B:478:PRO:HG3	2:B:514:VAL:HG23	1.99	0.45
2:C:389:PRO:HD2	2:C:395:ALA:O	2.16	0.45
2:B:475:TYR:O	2:B:484:LEU:HB2	2.18	0.44
3:D:488:LYS:NZ	3:D:525:TYR:O	2.45	0.44
1:A:335:MET:CE	1:A:379:TYR:HB3	2.48	0.44
1:A:258:PRO:HD3	1:A:400:TRP:CE2	2.52	0.44
2:B:258:PRO:HD2	2:B:262:GLN:OE1	2.18	0.44
2:C:314:ALA:C	3:D:532:THR:HG22	2.38	0.44
1:A:488:LYS:CE	1:A:525:TYR:O	2.66	0.44
2:C:480:THR:OG1	2:C:482:ARG:HB3	2.17	0.44
1:A:508:GLN:HE22	1:A:532:THR:HB	1.82	0.44
3:D:352:SER:HB2	3:D:370:ASP:OD2	2.17	0.44
1:A:287:GLN:O	1:A:322:GLY:HA3	2.18	0.43
1:A:352:SER:HB3	1:A:370:ASP:OD2	2.18	0.43
1:A:359:GLN:HB2	1:A:368:THR:OG1	2.18	0.43
2:B:477:ASP:HB2	2:B:484:LEU:HD11	2.01	0.43
2:C:259:ASP:OD1	2:C:259:ASP:C	2.57	0.43
3:D:265:GLN:O	3:D:402:ILE:HD13	2.19	0.43
3:D:292:ARG:HA	3:D:379:TYR:O	2.19	0.43
3:D:335:MET:HE2	3:D:379:TYR:HB2	2.00	0.43
2:C:307:LEU:HD22	2:C:380:ILE:HD11	2.00	0.43
3:D:488:LYS:HG3	3:D:527:LEU:HD11	2.01	0.43
3:D:335:MET:CE	3:D:379:TYR:HB3	2.49	0.43
2:B:324:PRO:HB2	2:B:331:TRP:CH2	2.53	0.43
1:A:254:MET:HA	1:A:430:TYR:O	2.19	0.42
3:D:363:HIS:ND1	3:D:407:SER:HB2	2.34	0.42
3:D:335:MET:HE2	3:D:379:TYR:CB	2.49	0.42
3:D:455:TYR:OH	3:D:515:PHE:HB2	2.20	0.42
1:A:285:VAL:HB	2:C:285:VAL:HB	2.02	0.42
1:A:490:TYR:HA	1:A:491:PRO:HD3	1.96	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:286:SER:HB3	2:C:243:SER:HB2	2.03	0.41
3:D:382:THR:OG1	3:D:383:ILE:N	2.53	0.41
2:B:283:VAL:HG11	3:D:237:ILE:HG21	2.02	0.41
3:D:443:SER:HB2	3:D:444:PRO:CD	2.50	0.41
2:B:498:VAL:O	2:B:529:PRO:HA	2.21	0.41
3:D:477:ASP:HB2	3:D:484:LEU:HD11	2.03	0.41
2:C:308:ASP:OD1	2:C:310:SER:OG	2.39	0.41
3:D:239:LEU:HD12	3:D:239:LEU:HA	1.94	0.41
2:C:498:VAL:O	2:C:529:PRO:HA	2.21	0.40
3:D:240:LYS:HE3	3:D:241:TYR:CZ	2.56	0.40
2:B:358:GLN:HG2	2:B:359:GLN:NE2	2.36	0.40
2:B:439:ASN:O	3:D:343:THR:HA	2.21	0.40
1:A:343:THR:HA	2:C:439:ASN:O	2.20	0.40
3:D:488:LYS:CE	3:D:490:TYR:OH	2.69	0.40
1:A:295:ILE:HD12	1:A:301:VAL:O	2.21	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	295/314 (94%)	288 (98%)	6 (2%)	1 (0%)	41	31
2	B	293/303 (97%)	282 (96%)	11 (4%)	0	100	100
2	C	296/303 (98%)	284 (96%)	11 (4%)	1 (0%)	41	31
3	D	298/308 (97%)	291 (98%)	7 (2%)	0	100	100
All	All	1182/1228 (96%)	1145 (97%)	35 (3%)	2 (0%)	47	38

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	501	SER
1	A	365	SER

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	259/270 (96%)	253 (98%)	6 (2%)	50	45
2	B	259/263 (98%)	258 (100%)	1 (0%)	91	91
2	C	261/263 (99%)	254 (97%)	7 (3%)	44	38
3	D	261/265 (98%)	260 (100%)	1 (0%)	91	91
All	All	1040/1061 (98%)	1025 (99%)	15 (1%)	67	65

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	296	THR
1	A	365	SER
1	A	434	SER
1	A	482	ARG
1	A	511	LEU
1	A	522	SER
2	B	508	GLN
2	C	229	THR
2	C	256	LEU
2	C	261	THR
2	C	278	LEU
2	C	313	MET
2	C	441	SER
2	C	502	SER
3	D	344	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	500	ASN
2	B	249	ASN
2	B	359	GLN
2	C	481	ASN
3	D	260	GLN
3	D	299	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	299/314 (95%)	0.65	19 (6%)	19	22	15, 25, 48, 94	0
2	B	297/303 (98%)	0.68	17 (5%)	23	26	14, 26, 50, 69	0
2	C	300/303 (99%)	0.75	21 (7%)	16	18	15, 27, 55, 93	0
3	D	302/308 (98%)	0.69	23 (7%)	13	15	15, 25, 49, 79	0
All	All	1198/1228 (97%)	0.69	80 (6%)	17	20	14, 26, 50, 94	0

All (80) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	412	ALA	9.1
3	D	315	PHE	7.3
1	A	315	PHE	6.6
3	D	536	ALA	6.4
2	C	424	PHE	6.4
2	C	524	PHE	6.3
2	B	502	SER	5.6
3	D	360	PHE	5.5
3	D	229	THR	5.4
2	B	503	SER	5.1
3	D	359	GLN	4.8
3	D	316	ALA	4.7
1	A	362	PRO	4.7
2	C	407	SER	4.5
2	C	406	GLY	4.3
1	A	229	THR	4.3
1	A	295	ILE	4.3
1	A	317	ALA	4.2
3	D	535	PRO	4.0
2	C	502	SER	4.0
3	D	407	SER	4.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	316	ALA	4.0
2	B	531	GLY	3.9
2	B	500	ASN	3.8
1	A	363	HIS	3.5
1	A	358	GLN	3.5
2	B	229	THR	3.4
1	A	361	VAL	3.4
2	C	261	THR	3.4
3	D	362	PRO	3.4
2	C	258	PRO	3.3
3	D	404	ASP	3.3
3	D	369	LEU	3.3
2	B	424	PHE	3.3
1	A	360	PHE	3.2
2	B	524	PHE	3.2
1	A	414	GLN	3.0
2	C	359	GLN	3.0
3	D	406	GLY	2.9
3	D	361	VAL	2.9
1	A	313	MET	2.9
1	A	298	GLY	2.8
3	D	363	HIS	2.8
1	A	364	LEU	2.7
2	C	500	ASN	2.7
3	D	365	SER	2.7
2	C	229	THR	2.7
3	D	414	GLN	2.6
1	A	533	ALA	2.6
2	C	422	PRO	2.5
2	B	441	SER	2.5
1	A	534	GLY	2.5
2	B	505	GLY	2.5
2	B	363	HIS	2.4
3	D	364	LEU	2.4
2	B	525	TYR	2.4
3	D	502	SER	2.4
2	B	425	ASN	2.3
2	C	358	GLN	2.3
2	C	418	ALA	2.3
3	D	314	ALA	2.3
3	D	344	GLN	2.3
3	D	297	SER	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	D	298	GLY	2.2
3	D	374	SER	2.2
2	B	406	GLY	2.2
1	A	502	SER	2.2
2	B	482	ARG	2.2
2	B	504	THR	2.2
2	C	425	ASN	2.2
2	C	413	SER	2.2
2	B	294	ARG	2.2
2	C	518	ALA	2.2
2	C	300	ARG	2.1
2	C	364	LEU	2.1
1	A	314	ALA	2.1
1	A	359	GLN	2.1
2	B	455	TYR	2.1
2	C	523	ARG	2.0
2	C	531	GLY	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.