Full wwPDB X-ray Structure Validation Report (i)

Jun 13, 2024 – 08:43 AM EDT

PDB ID	:	4IDX
Title	:	hexameric crystal structure of Schmallenberg virus nucleoprotein
Authors	:	Dong, H.; Dong, C.
Deposited on	:	2012-12-13
Resolution	:	3.21 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 (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:

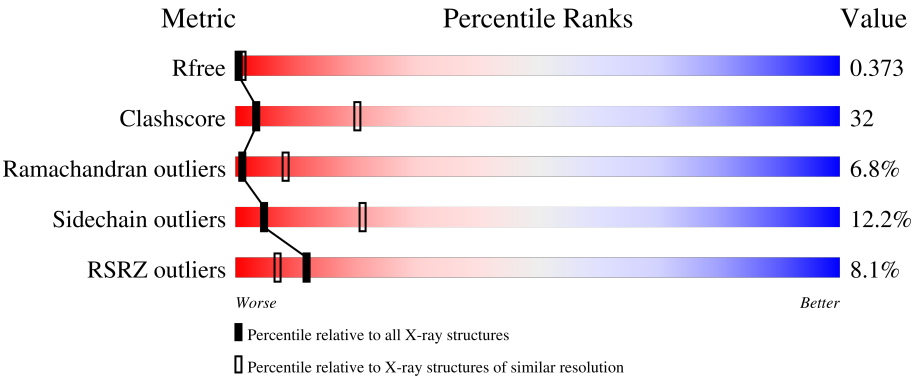
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.20.1
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 3.21 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	1335 (3.24-3.20)
Clashscore	141614	1460 (3.24-3.20)
Ramachandran outliers	138981	1437 (3.24-3.20)
Sidechain outliers	138945	1436 (3.24-3.20)
RSRZ outliers	127900	1291 (3.24-3.20)

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	233	10% 58% 28% 6% • 6%
1	B	233	3% 49% 29% 9% • 10%
1	C	233	10% 56% 24% 8% • 9%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 5072 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 Nucleocapsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	209	Total	C	N	O	S	0	0	0
			1651	1074	276	289	12			
1	A	218	Total	C	N	O	S	0	0	0
			1722	1116	292	302	12			
1	C	213	Total	C	N	O	S	0	0	0
			1682	1093	282	295	12			

- Molecule 2 is water.

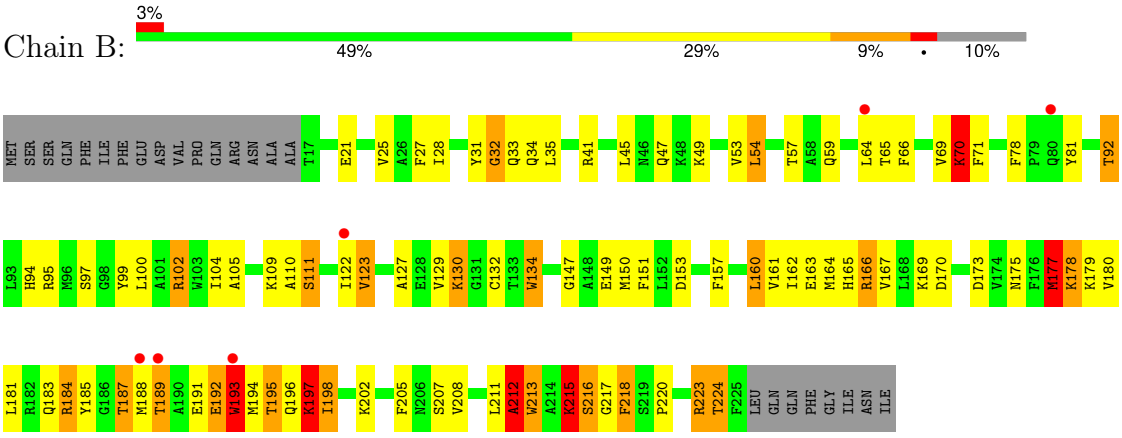
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	3	Total	O	0	0
			3	3		
2	A	7	Total	O	0	0
			7	7		
2	C	7	Total	O	0	0
			7	7		

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.

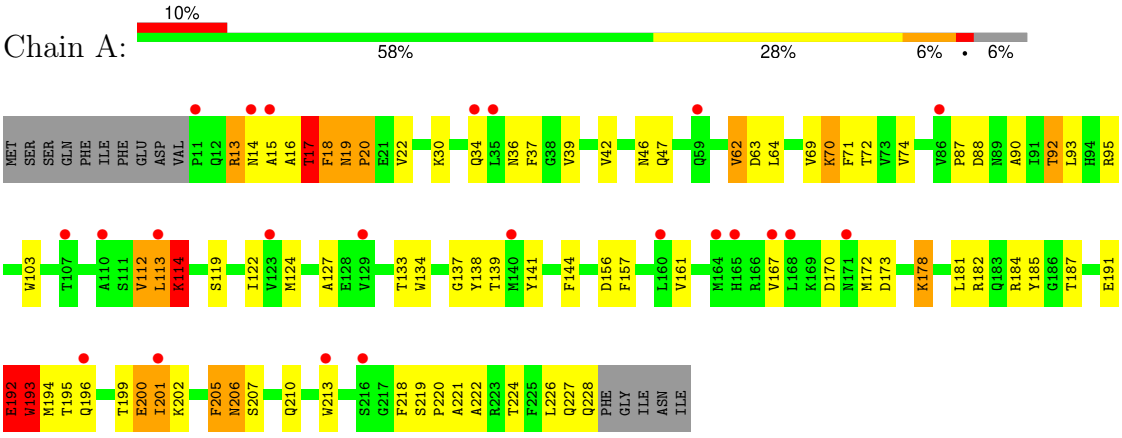
• Molecule 1: Nucleocapsid protein

Chain B:



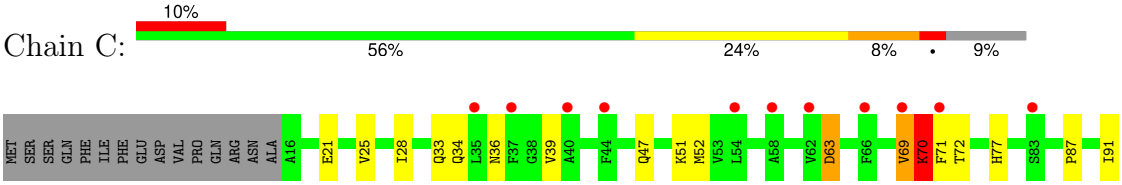
• Molecule 1: Nucleocapsid protein

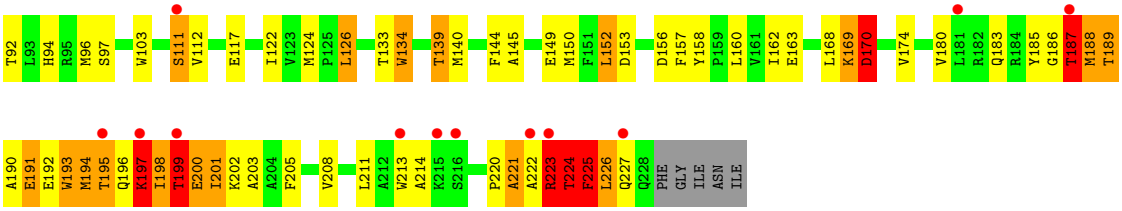
Chain A:



• Molecule 1: Nucleocapsid protein

Chain C:




T92 L93 H94 R95 M96 S97 W103 S111 V112 E117 I122 V123 M124 P125 L126 T133 W134 T139 M140 F144 A145 E149 M150 F151 L152 D153 D156 F157 Y158 P159 L160 V161 I162 E163 L168 K169 D170 V174 V180 L181 R182 Q183 R184 Y185 G186 T187 M188 T189
A190 E191 E192 W193 M194 T195 Q196 K197 I198 T199 E200 I201 K202 A203 A204 F205 V208 L211 A212 W213 A214 K215 S216 P220 A221 A222 R223 T224 P225 L226 Q227 Q228 PHE GLY ILE ASN ILE

4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 4 2 2	Depositor
Cell constants a, b, c, α, β, γ	159.20Å 159.20Å 157.80Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.94 – 3.21 49.94 – 3.21	Depositor EDS
% Data completeness (in resolution range)	99.8 (49.94-3.21) 100.0 (49.94-3.21)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	5.26 (at 3.19Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.321 , 0.374 0.319 , 0.373	Depositor DCC
R_{free} test set	853 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	94.5	Xtriage
Anisotropy	0.165	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 75.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.42$, $< L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.056 for l,-k,h 0.070 for -h,-l,-k	Xtriage
F_o,F_c correlation	0.83	EDS
Total number of atoms	5072	wwPDB-VP
Average B, all atoms (Å^2)	92.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.43% 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	0.53	2/1767 (0.1%)	0.82	6/2392 (0.3%)
1	B	0.51	2/1695 (0.1%)	0.75	7/2295 (0.3%)
1	C	0.52	2/1726 (0.1%)	0.81	11/2337 (0.5%)
All	All	0.52	6/5188 (0.1%)	0.79	24/7024 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	212	ALA	CA-CB	5.33	1.63	1.52
1	A	103	TRP	CD2-CE2	5.12	1.47	1.41
1	A	213	TRP	CD2-CE2	5.05	1.47	1.41
1	B	193	TRP	CD2-CE2	5.02	1.47	1.41
1	C	103	TRP	CD2-CE2	5.00	1.47	1.41
1	C	213	TRP	CD2-CE2	5.00	1.47	1.41

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	194	MET	CB-CA-C	-16.41	77.58	110.40
1	B	177	MET	N-CA-C	-13.97	73.28	111.00
1	A	193	TRP	N-CA-C	-13.29	75.12	111.00
1	C	186	GLY	N-CA-C	-12.30	82.36	113.10
1	A	194	MET	N-CA-C	10.95	140.56	111.00
1	B	178	LYS	N-CA-CB	10.43	129.37	110.60
1	A	114	LYS	N-CA-CB	9.52	127.74	110.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	170	ASP	CB-CA-C	9.40	129.21	110.40
1	C	111	SER	N-CA-C	9.07	135.50	111.00
1	B	212	ALA	CB-CA-C	8.25	122.48	110.10
1	A	192	GLU	CB-CA-C	8.19	126.78	110.40
1	B	110	ALA	N-CA-C	7.66	131.69	111.00
1	C	170	ASP	N-CA-C	-7.29	91.33	111.00
1	C	187	THR	N-CA-CB	-7.28	96.48	110.30
1	C	199	THR	N-CA-C	6.79	129.34	111.00
1	C	224	THR	CB-CA-C	6.34	128.71	111.60
1	B	110	ALA	CB-CA-C	-5.85	101.32	110.10
1	C	112	VAL	N-CA-CB	5.75	124.15	111.50
1	C	169	LYS	N-CA-C	-5.57	95.96	111.00
1	A	64	LEU	CA-CB-CG	-5.52	102.60	115.30
1	B	178	LYS	N-CA-C	-5.45	96.30	111.00
1	B	111	SER	N-CA-C	-5.32	96.63	111.00
1	C	225	PHE	N-CA-CB	-5.24	101.17	110.60
1	C	70	LYS	N-CA-C	5.02	124.56	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	197	LYS	Peptide

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	1722	0	1717	87	2
1	B	1651	0	1645	124	0
1	C	1682	0	1677	119	2
2	A	7	0	0	0	0
2	B	3	0	0	0	0
2	C	7	0	0	0	0
All	All	5072	0	5039	326	2

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 32.

All (326) 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:69:VAL:CG1	1:A:70:LYS:HB3	1.53	1.36
1:C:220:PRO:HA	1:C:221:ALA:CB	1.54	1.33
1:A:69:VAL:HA	1:A:70:LYS:CB	1.63	1.28
1:A:17:THR:CA	1:A:18:PHE:HB3	1.68	1.23
1:C:189:THR:HG23	1:C:190:ALA:N	1.49	1.20
1:A:17:THR:HA	1:A:18:PHE:CB	1.73	1.17
1:B:69:VAL:HA	1:B:70:LYS:HB2	1.16	1.15
1:C:189:THR:CG2	1:C:190:ALA:H	1.55	1.15
1:A:19:ASN:HB2	1:A:20:PRO:HD2	1.18	1.13
1:C:220:PRO:HA	1:C:221:ALA:HB3	1.21	1.13
1:C:191:GLU:CB	1:C:193:TRP:HB2	1.78	1.13
1:C:194:MET:HA	1:C:198:ILE:HB	1.30	1.12
1:A:69:VAL:CA	1:A:70:LYS:HB2	1.78	1.11
1:C:196:GLN:HA	1:C:197:LYS:HB3	1.30	1.11
1:B:69:VAL:HA	1:B:70:LYS:CB	1.80	1.11
1:B:69:VAL:HG13	1:B:70:LYS:HB3	1.14	1.10
1:C:194:MET:O	1:C:198:ILE:HA	1.52	1.10
1:A:220:PRO:HA	1:A:221:ALA:HB3	1.26	1.09
1:C:197:LYS:O	1:C:197:LYS:HG3	1.46	1.09
1:B:34:GLN:HE22	1:B:70:LYS:NZ	1.47	1.09
1:B:69:VAL:CG1	1:B:70:LYS:HB3	1.82	1.09
1:C:191:GLU:HA	1:C:192:GLU:CB	1.74	1.09
1:A:69:VAL:CA	1:A:70:LYS:CB	2.31	1.09
1:B:45:LEU:HD11	1:B:123:VAL:HG13	1.11	1.08
1:B:216:SER:HB2	1:B:217:GLY:HA3	1.31	1.08
1:A:69:VAL:HG12	1:A:70:LYS:HB3	1.24	1.06
1:C:69:VAL:HA	1:C:70:LYS:HB2	1.10	1.06
1:A:19:ASN:HB2	1:A:20:PRO:CD	1.86	1.05
1:A:201:ILE:HG23	1:A:202:LYS:H	0.91	1.05
1:A:201:ILE:HG23	1:A:202:LYS:N	1.70	1.04
1:C:188:MET:HA	1:C:189:THR:HB	1.40	1.04
1:C:157:PHE:CZ	1:C:185:TYR:HD2	1.77	1.02
1:B:45:LEU:HD11	1:B:123:VAL:CG1	1.89	1.01
1:C:220:PRO:HA	1:C:221:ALA:HB2	1.43	1.01
1:C:194:MET:HA	1:C:198:ILE:CB	1.89	1.00
1:C:191:GLU:HA	1:C:192:GLU:HB3	1.02	0.99
1:A:201:ILE:CG2	1:A:202:LYS:H	1.73	0.99
1:C:191:GLU:HB2	1:C:193:TRP:HB2	1.42	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:150:MET:HA	1:B:183:GLN:NE2	1.78	0.98
1:C:157:PHE:CZ	1:C:185:TYR:CD2	2.51	0.98
1:B:150:MET:HA	1:B:183:GLN:HE21	1.29	0.97
1:C:196:GLN:HA	1:C:197:LYS:CB	1.94	0.95
1:C:220:PRO:CA	1:C:221:ALA:CB	2.44	0.95
1:B:211:LEU:HD12	1:B:212:ALA:O	1.67	0.95
1:A:207:SER:HA	1:A:210:GLN:HG2	1.47	0.94
1:A:69:VAL:HG13	1:A:70:LYS:HB3	1.49	0.94
1:C:69:VAL:CA	1:C:70:LYS:HB2	1.99	0.93
1:B:34:GLN:HE22	1:B:70:LYS:HZ1	1.12	0.93
1:A:69:VAL:CG1	1:A:70:LYS:CB	2.47	0.92
1:A:205:PHE:CG	1:A:206:ASN:N	2.38	0.91
1:C:194:MET:HA	1:C:198:ILE:CG2	2.00	0.91
1:A:220:PRO:CA	1:A:221:ALA:HB3	2.01	0.90
1:B:216:SER:CB	1:B:217:GLY:HA3	1.97	0.90
1:A:157:PHE:O	1:A:161:VAL:HG23	1.71	0.88
1:B:223:ARG:O	1:B:224:THR:OG1	1.90	0.88
1:A:69:VAL:HA	1:A:70:LYS:HB2	0.88	0.88
1:B:69:VAL:CA	1:B:70:LYS:CB	2.52	0.87
1:C:162:ILE:HG13	1:C:163:GLU:N	1.89	0.87
1:C:69:VAL:HA	1:C:70:LYS:CB	2.00	0.87
1:B:215:LYS:O	1:B:216:SER:HB3	1.76	0.86
1:A:17:THR:HA	1:A:18:PHE:HB3	0.88	0.86
1:B:163:GLU:HA	1:B:166:ARG:HG3	1.56	0.86
1:C:199:THR:O	1:C:201:ILE:N	2.10	0.85
1:C:191:GLU:HB3	1:C:193:TRP:HB2	1.56	0.85
1:B:45:LEU:CD1	1:B:123:VAL:HG13	2.03	0.84
1:C:157:PHE:CE2	1:C:185:TYR:CE2	2.65	0.84
1:C:223:ARG:HA	1:C:224:THR:HB	1.59	0.84
1:C:162:ILE:HG13	1:C:163:GLU:H	1.45	0.81
1:C:201:ILE:HG22	1:C:202:LYS:N	1.96	0.80
1:C:194:MET:CA	1:C:198:ILE:HB	2.10	0.80
1:C:191:GLU:CA	1:C:192:GLU:HB3	1.99	0.80
1:A:69:VAL:HG13	1:A:70:LYS:HD3	1.61	0.80
1:C:187:THR:C	1:C:189:THR:HA	2.03	0.79
1:B:130:LYS:HA	1:B:213:TRP:CB	2.13	0.79
1:C:189:THR:CG2	1:C:190:ALA:N	2.24	0.79
1:A:47:GLN:HG3	1:A:93:LEU:HD21	1.65	0.78
1:C:189:THR:HG23	1:C:190:ALA:H	0.67	0.77
1:C:197:LYS:O	1:C:197:LYS:CG	2.32	0.77
1:C:199:THR:C	1:C:201:ILE:H	1.88	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:196:GLN:CA	1:C:197:LYS:HB3	2.10	0.77
1:B:149:GLU:O	1:B:183:GLN:HG3	1.83	0.77
1:B:217:GLY:O	1:B:218:PHE:HB3	1.84	0.76
1:B:215:LYS:O	1:B:216:SER:CB	2.33	0.76
1:C:188:MET:CA	1:C:189:THR:HB	2.16	0.76
1:A:17:THR:CA	1:A:18:PHE:CB	2.43	0.75
1:C:194:MET:O	1:C:198:ILE:CA	2.33	0.75
1:C:191:GLU:HB3	1:C:193:TRP:CB	2.16	0.75
1:A:71:PHE:CD2	1:A:71:PHE:N	2.56	0.74
1:A:69:VAL:CB	1:A:70:LYS:HB3	2.18	0.73
1:B:34:GLN:HE22	1:B:70:LYS:HZ2	1.33	0.73
1:B:129:VAL:O	1:B:130:LYS:HB2	1.89	0.73
1:A:202:LYS:HA	1:A:205:PHE:HD1	1.53	0.73
1:C:220:PRO:CA	1:C:221:ALA:HB3	2.10	0.72
1:C:225:PHE:O	1:C:226:LEU:HD12	1.90	0.72
1:B:175:ASN:O	1:B:177:MET:O	2.09	0.71
1:C:223:ARG:HA	1:C:224:THR:CB	2.20	0.71
1:B:78:PHE:HB3	1:B:81:TYR:CD2	2.26	0.70
1:B:69:VAL:CA	1:B:70:LYS:HB2	2.07	0.70
1:B:130:LYS:HA	1:B:213:TRP:HB3	1.72	0.70
1:C:191:GLU:CA	1:C:192:GLU:CB	2.60	0.70
1:C:91:ILE:HD11	1:C:96:MET:HB2	1.74	0.70
1:B:34:GLN:NE2	1:B:70:LYS:NZ	2.33	0.69
1:A:191:GLU:O	1:A:192:GLU:C	2.30	0.69
1:B:34:GLN:NE2	1:B:70:LYS:HZ1	1.90	0.69
1:C:157:PHE:CE2	1:C:185:TYR:CD2	2.80	0.69
1:C:201:ILE:HG22	1:C:202:LYS:H	1.58	0.69
1:C:139:THR:HG21	1:C:156:ASP:OD2	1.92	0.69
1:B:183:GLN:O	1:B:184:ARG:HB2	1.92	0.68
1:B:33:GLN:HE22	1:A:87:PRO:HB3	1.59	0.68
1:C:157:PHE:HZ	1:C:185:TYR:CD2	2.10	0.67
1:B:185:TYR:O	1:B:189:THR:HG23	1.93	0.67
1:A:74:VAL:HG21	1:A:90:ALA:HB1	1.75	0.67
1:B:177:MET:O	1:B:179:LYS:HG2	1.94	0.67
1:C:211:LEU:HD12	1:C:211:LEU:O	1.95	0.67
1:B:66:PHE:N	1:B:69:VAL:O	2.28	0.67
1:A:202:LYS:HA	1:A:205:PHE:CD1	2.29	0.67
1:B:163:GLU:HA	1:B:166:ARG:CG	2.26	0.66
1:B:216:SER:CB	1:B:217:GLY:CA	2.73	0.66
1:B:129:VAL:O	1:B:130:LYS:CB	2.44	0.66
1:C:157:PHE:CE2	1:C:185:TYR:HE2	2.11	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:63:ASP:HA	1:A:71:PHE:O	1.96	0.66
1:B:208:VAL:O	1:B:211:LEU:HG	1.96	0.66
1:A:195:THR:HG22	1:A:196:GLN:H	1.60	0.65
1:C:196:GLN:O	1:C:199:THR:HA	1.95	0.65
1:A:220:PRO:HA	1:A:221:ALA:CB	2.01	0.65
1:B:183:GLN:O	1:B:184:ARG:CB	2.45	0.65
1:C:194:MET:HA	1:C:198:ILE:HG22	1.79	0.65
1:B:130:LYS:O	1:B:213:TRP:HB3	1.95	0.65
1:B:162:ILE:O	1:B:166:ARG:HG2	1.96	0.64
1:C:201:ILE:CG2	1:C:202:LYS:N	2.60	0.64
1:B:92:THR:HG22	1:B:95:ARG:H	1.63	0.64
1:B:130:LYS:HA	1:B:213:TRP:HB2	1.79	0.64
1:A:63:ASP:OD1	1:A:63:ASP:O	2.14	0.64
1:C:201:ILE:CG2	1:C:202:LYS:H	2.12	0.63
1:C:220:PRO:CA	1:C:221:ALA:HB2	2.21	0.63
1:A:178:LYS:HE2	1:A:178:LYS:HA	1.80	0.62
1:B:122:ILE:HB	1:B:134:TRP:HH2	1.64	0.62
1:B:92:THR:HG23	1:B:94:HIS:H	1.63	0.62
1:C:124:MET:HE1	1:C:145:ALA:HB2	1.80	0.62
1:B:130:LYS:HD3	1:B:213:TRP:CD2	2.35	0.62
1:B:177:MET:C	1:B:179:LYS:H	2.01	0.62
1:B:205:PHE:O	1:B:208:VAL:HG22	2.00	0.61
1:B:216:SER:HB2	1:B:217:GLY:CA	2.21	0.61
1:C:157:PHE:HE2	1:C:185:TYR:CE2	2.18	0.61
1:A:200:GLU:O	1:A:201:ILE:C	2.39	0.61
1:B:69:VAL:CA	1:B:70:LYS:HB3	2.30	0.61
1:A:69:VAL:HG13	1:A:70:LYS:CB	2.22	0.60
1:A:69:VAL:CA	1:A:70:LYS:HB3	2.15	0.60
1:B:21:GLU:O	1:B:25:VAL:HG23	2.01	0.60
1:A:219:SER:OG	1:A:220:PRO:HD2	2.01	0.60
1:C:226:LEU:O	1:C:227:GLN:HB2	2.02	0.60
1:A:69:VAL:HB	1:A:71:PHE:CE2	2.36	0.60
1:C:195:THR:OG1	1:C:196:GLN:N	2.34	0.60
1:B:41:ARG:O	1:B:45:LEU:HD13	2.01	0.59
1:C:190:ALA:C	1:C:191:GLU:HG3	2.22	0.59
1:B:54:LEU:HA	1:B:57:THR:HG22	1.83	0.59
1:B:163:GLU:O	1:B:167:VAL:HG23	2.02	0.58
1:C:198:ILE:HG12	1:C:198:ILE:O	2.03	0.58
1:A:15:ALA:O	1:A:17:THR:N	2.32	0.58
1:C:197:LYS:N	1:C:199:THR:N	2.52	0.58
1:B:130:LYS:CA	1:B:213:TRP:HB3	2.33	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:124:MET:HB2	1:A:141:TYR:CE2	2.39	0.58
1:A:124:MET:HB3	1:A:127:ALA:HB3	1.86	0.57
1:A:112:VAL:O	1:A:113:LEU:C	2.42	0.57
1:B:94:HIS:CE1	1:B:147:GLY:HA2	2.39	0.57
1:B:69:VAL:HA	1:B:70:LYS:HE3	1.85	0.57
1:B:69:VAL:HA	1:B:70:LYS:HB3	1.83	0.56
1:B:28:ILE:HG13	1:B:32:GLY:HA3	1.88	0.56
1:A:17:THR:O	1:A:88:ASP:OD1	2.23	0.56
1:C:140:MET:SD	1:C:211:LEU:CD2	2.93	0.56
1:B:47:GLN:HE22	1:B:97:SER:HB2	1.70	0.56
1:A:69:VAL:HG13	1:A:70:LYS:CD	2.33	0.56
1:B:202:LYS:HE2	1:C:197:LYS:HD2	1.88	0.55
1:C:198:ILE:HD13	1:C:198:ILE:N	2.21	0.55
1:B:28:ILE:HG23	1:A:22:VAL:HG11	1.89	0.55
1:B:165:HIS:CE1	1:B:208:VAL:HG23	2.41	0.55
1:B:165:HIS:HB3	1:B:213:TRP:CH2	2.42	0.55
1:B:92:THR:CG2	1:B:95:ARG:H	2.21	0.54
1:B:160:LEU:HD23	1:B:160:LEU:O	2.06	0.54
1:C:188:MET:N	1:C:189:THR:HA	2.22	0.54
1:A:74:VAL:CG2	1:A:90:ALA:HB1	2.36	0.54
1:C:200:GLU:O	1:C:201:ILE:O	2.24	0.54
1:A:220:PRO:CA	1:A:221:ALA:CB	2.71	0.54
1:A:181:LEU:O	1:A:182:ARG:HB2	2.07	0.54
1:A:69:VAL:HB	1:A:71:PHE:HE2	1.72	0.54
1:A:184:ARG:HD3	1:A:187:THR:HA	1.90	0.53
1:A:191:GLU:O	1:A:193:TRP:O	2.26	0.53
1:B:122:ILE:HB	1:B:134:TRP:CH2	2.44	0.53
1:C:201:ILE:O	1:C:202:LYS:HB2	2.07	0.53
1:A:37:PHE:HD1	1:A:122:ILE:HD11	1.73	0.53
1:B:69:VAL:HG12	1:B:71:PHE:CD1	2.44	0.53
1:C:191:GLU:CB	1:C:193:TRP:CB	2.65	0.53
1:A:16:ALA:C	1:A:17:THR:HG22	2.27	0.53
1:B:32:GLY:HA2	1:B:35:LEU:HD12	1.91	0.53
1:B:165:HIS:HB3	1:B:213:TRP:CZ2	2.44	0.53
1:B:161:VAL:HG11	1:B:205:PHE:HA	1.91	0.53
1:C:200:GLU:C	1:C:201:ILE:O	2.47	0.52
1:C:169:LYS:O	1:C:170:ASP:HB3	2.09	0.52
1:B:161:VAL:CG1	1:B:205:PHE:HA	2.39	0.52
1:C:199:THR:C	1:C:201:ILE:N	2.55	0.52
1:A:127:ALA:HB2	1:A:144:PHE:HB2	1.92	0.52
1:B:122:ILE:O	1:B:134:TRP:HZ3	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:169:LYS:O	1:C:170:ASP:CB	2.58	0.52
1:C:51:LYS:HG3	1:C:77:HIS:ND1	2.24	0.52
1:C:160:LEU:HA	1:C:180:VAL:HG11	1.92	0.52
1:B:69:VAL:HG12	1:B:71:PHE:CE1	2.45	0.51
1:C:194:MET:O	1:C:195:THR:C	2.48	0.51
1:A:19:ASN:CB	1:A:20:PRO:CD	2.64	0.51
1:C:191:GLU:CB	1:C:193:TRP:N	2.74	0.51
1:A:113:LEU:O	1:A:113:LEU:HG	2.11	0.51
1:B:92:THR:HG23	1:B:94:HIS:N	2.25	0.51
1:A:42:VAL:O	1:A:46:ASN:HB2	2.10	0.51
1:B:223:ARG:O	1:B:224:THR:CB	2.59	0.51
1:C:222:ALA:O	1:C:223:ARG:O	2.29	0.51
1:B:70:LYS:O	1:B:70:LYS:HG3	2.10	0.50
1:C:194:MET:CA	1:C:198:ILE:HG22	2.42	0.50
1:B:169:LYS:HG3	1:B:213:TRP:CZ2	2.46	0.50
1:A:71:PHE:H	1:A:71:PHE:HD2	1.57	0.50
1:B:153:ASP:HA	1:B:185:TYR:HE1	1.77	0.50
1:B:69:VAL:CB	1:B:70:LYS:HB3	2.39	0.50
1:C:140:MET:SD	1:C:211:LEU:HD21	2.52	0.50
1:B:149:GLU:HB2	1:B:180:VAL:HG13	1.94	0.50
1:B:165:HIS:CE1	1:B:208:VAL:CG2	2.94	0.50
1:B:177:MET:C	1:B:179:LYS:N	2.65	0.49
1:A:205:PHE:CD2	1:A:206:ASN:N	2.80	0.49
1:B:31:TYR:O	1:B:33:GLN:N	2.35	0.49
1:B:127:ALA:HB1	1:B:132:CYS:HB3	1.95	0.49
1:C:198:ILE:CD1	1:C:198:ILE:H	2.25	0.49
1:A:167:VAL:HA	1:A:172:MET:HB3	1.95	0.49
1:B:157:PHE:HZ	1:B:196:GLN:HG2	1.78	0.48
1:A:47:GLN:CG	1:A:93:LEU:HD21	2.40	0.48
1:B:165:HIS:CD2	1:B:169:LYS:HE3	2.47	0.48
1:B:165:HIS:NE2	1:B:208:VAL:HG23	2.28	0.48
1:A:205:PHE:CD1	1:A:206:ASN:N	2.65	0.48
1:A:17:THR:N	1:A:18:PHE:HB3	2.25	0.48
1:C:188:MET:CA	1:C:189:THR:CB	2.85	0.48
1:B:193:TRP:O	1:B:196:GLN:O	2.32	0.48
1:C:91:ILE:HD11	1:C:96:MET:CB	2.42	0.48
1:B:196:GLN:O	1:B:197:LYS:C	2.52	0.47
1:C:201:ILE:O	1:C:203:ALA:N	2.44	0.47
1:A:36:ASN:O	1:A:39:VAL:HG22	2.14	0.47
1:B:105:ALA:O	1:B:109:LYS:HG2	2.15	0.47
1:C:193:TRP:C	1:C:194:MET:HG3	2.34	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:34:GLN:NE2	1:B:70:LYS:HZ2	2.05	0.47
1:B:102:ARG:HD2	1:B:151:PHE:CD1	2.50	0.47
1:A:227:GLN:HG2	1:A:228:GLN:HB2	1.97	0.47
1:C:158:TYR:O	1:C:162:ILE:HG23	2.15	0.46
1:C:183:GLN:O	1:C:192:GLU:OE1	2.33	0.46
1:C:188:MET:N	1:C:189:THR:CA	2.78	0.46
1:A:62:VAL:HG12	1:A:63:ASP:H	1.79	0.46
1:C:222:ALA:O	1:C:223:ARG:HG2	2.16	0.46
1:B:129:VAL:HG13	1:B:130:LYS:HG2	1.98	0.46
1:C:198:ILE:N	1:C:198:ILE:CD1	2.79	0.46
1:B:194:MET:O	1:B:195:THR:C	2.54	0.46
1:B:198:ILE:O	1:B:202:LYS:N	2.47	0.46
1:C:187:THR:O	1:C:188:MET:C	2.54	0.46
1:A:13:ARG:HA	1:A:14:ASN:HA	1.72	0.46
1:A:113:LEU:O	1:A:114:LYS:HG2	2.16	0.45
1:A:127:ALA:HB2	1:A:144:PHE:CB	2.46	0.45
1:C:21:GLU:O	1:C:25:VAL:HG22	2.16	0.45
1:C:223:ARG:CA	1:C:224:THR:CB	2.92	0.45
1:A:172:MET:HG2	1:A:173:ASP:N	2.32	0.45
1:C:196:GLN:C	1:C:199:THR:H	2.20	0.45
1:B:163:GLU:OE1	1:B:180:VAL:HG21	2.17	0.44
1:C:126:LEU:HB3	1:C:144:PHE:HB3	1.98	0.44
1:B:162:ILE:O	1:B:166:ARG:CG	2.62	0.44
1:A:139:THR:HG21	1:A:156:ASP:HB2	2.00	0.44
1:C:94:HIS:HE1	1:C:149:GLU:OE2	1.99	0.44
1:B:197:LYS:HE3	1:B:197:LYS:HA	1.98	0.44
1:B:31:TYR:CE1	1:B:71:PHE:HA	2.53	0.44
1:A:227:GLN:HA	1:A:228:GLN:HA	1.58	0.44
1:B:179:LYS:HG2	1:B:179:LYS:H	1.53	0.44
1:A:172:MET:HG2	1:A:173:ASP:H	1.83	0.44
1:C:33:GLN:H	1:C:33:GLN:HG3	1.60	0.44
1:C:47:GLN:HE22	1:C:97:SER:HB2	1.82	0.44
1:A:199:THR:O	1:A:201:ILE:N	2.51	0.44
1:C:188:MET:HA	1:C:189:THR:CB	2.27	0.44
1:B:192:GLU:HB2	1:B:195:THR:OG1	2.17	0.43
1:B:94:HIS:CE1	1:B:147:GLY:CA	3.00	0.43
1:C:36:ASN:O	1:C:39:VAL:HG22	2.18	0.43
1:B:169:LYS:HG3	1:B:213:TRP:HZ2	1.83	0.43
1:A:133:THR:HG22	1:A:134:TRP:H	1.83	0.43
1:C:189:THR:C	1:C:191:GLU:H	2.21	0.43
1:C:149:GLU:O	1:C:152:LEU:HG	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:THR:O	1:C:197:LYS:HA	2.19	0.43
1:A:18:PHE:HA	1:A:19:ASN:HA	1.57	0.42
1:B:215:LYS:HD3	1:B:215:LYS:HA	1.88	0.42
1:C:63:ASP:HA	1:C:72:THR:HA	2.01	0.42
1:C:157:PHE:HE1	1:C:192:GLU:CG	2.32	0.42
1:B:130:LYS:HD3	1:B:213:TRP:CG	2.55	0.42
1:C:168:LEU:HD23	1:C:169:LYS:HG3	2.01	0.42
1:B:69:VAL:CG1	1:B:71:PHE:CE1	3.03	0.42
1:B:92:THR:HG22	1:B:95:ARG:HB2	2.00	0.42
1:A:92:THR:O	1:A:95:ARG:N	2.52	0.42
1:C:122:ILE:O	1:C:134:TRP:CZ3	2.73	0.42
1:C:157:PHE:HE1	1:C:192:GLU:HG3	1.85	0.42
1:C:187:THR:C	1:C:189:THR:CA	2.84	0.42
1:B:21:GLU:CD	1:B:102:ARG:HH12	2.22	0.42
1:B:27:PHE:CD2	1:B:99:TYR:HB3	2.54	0.42
1:B:160:LEU:O	1:B:160:LEU:CD2	2.68	0.42
1:C:202:LYS:HA	1:C:205:PHE:HB3	2.02	0.42
1:B:130:LYS:C	1:B:213:TRP:HB3	2.40	0.42
1:C:198:ILE:HD13	1:C:198:ILE:H	1.83	0.42
1:B:70:LYS:HB2	1:B:70:LYS:HE3	1.32	0.41
1:B:166:ARG:HG2	1:B:166:ARG:H	1.36	0.41
1:B:181:LEU:HD12	1:B:181:LEU:HA	1.99	0.41
1:A:69:VAL:HG12	1:A:70:LYS:CB	2.17	0.41
1:B:215:LYS:HB3	1:B:216:SER:H	1.61	0.41
1:A:201:ILE:CG2	1:A:202:LYS:N	2.44	0.41
1:C:197:LYS:HA	1:C:198:ILE:HA	1.73	0.41
1:B:25:VAL:HG12	1:A:22:VAL:HG13	2.01	0.41
1:C:189:THR:C	1:C:191:GLU:N	2.74	0.41
1:B:49:LYS:O	1:B:53:VAL:HG23	2.21	0.41
1:B:104:ILE:HD13	1:B:122:ILE:HD13	2.03	0.41
1:A:92:THR:HG22	1:A:95:ARG:H	1.86	0.41
1:C:149:GLU:HG2	1:C:150:MET:N	2.35	0.41
1:C:208:VAL:HA	1:C:211:LEU:HG	2.03	0.41
1:B:65:THR:HA	1:B:70:LYS:H	1.86	0.41
1:B:166:ARG:O	1:B:170:ASP:HB2	2.21	0.41
1:A:219:SER:O	1:A:220:PRO:C	2.59	0.41
1:A:70:LYS:O	1:A:70:LYS:HG2	2.20	0.40
1:C:198:ILE:O	1:C:198:ILE:CG1	2.69	0.40
1:B:130:LYS:HD3	1:B:213:TRP:CE3	2.57	0.40
1:B:187:THR:HB	1:B:188:MET:H	1.63	0.40
1:A:157:PHE:CE2	1:A:185:TYR:CE1	3.09	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:191:GLU:HB3	1:C:193:TRP:N	2.36	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:220:PRO:O	1:C:193:TRP:CH2[11_444]	2.04	0.16
1:A:221:ALA:N	1:C:193:TRP:CH2[11_444]	2.16	0.04

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	216/233 (93%)	164 (76%)	37 (17%)	15 (7%)	1	8
1	B	207/233 (89%)	169 (82%)	24 (12%)	14 (7%)	1	8
1	C	211/233 (91%)	168 (80%)	29 (14%)	14 (7%)	1	9
All	All	634/699 (91%)	501 (79%)	90 (14%)	43 (7%)	1	8

All (43) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	70	LYS
1	B	215	LYS
1	B	216	SER
1	B	218	PHE
1	A	70	LYS
1	A	112	VAL
1	A	192	GLU
1	A	201	ILE
1	C	70	LYS
1	C	170	ASP

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Mol	Chain	Res	Type
1	C	189	THR
1	C	200	GLU
1	C	201	ILE
1	C	221	ALA
1	C	223	ARG
1	C	224	THR
1	B	191	GLU
1	B	192	GLU
1	A	17	THR
1	A	19	ASN
1	A	114	LYS
1	A	200	GLU
1	A	206	ASN
1	C	188	MET
1	C	214	ALA
1	C	225	PHE
1	B	32	GLY
1	B	184	ARG
1	B	212	ALA
1	C	195	THR
1	B	178	LYS
1	B	224	THR
1	A	222	ALA
1	C	111	SER
1	B	130	LYS
1	B	197	LYS
1	A	18	PHE
1	A	138	TYR
1	A	226	LEU
1	A	20	PRO
1	A	137	GLY
1	B	220	PRO
1	C	87	PRO

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	179/193 (93%)	164 (92%)	15 (8%)	11 38
1	B	172/193 (89%)	147 (86%)	25 (14%)	3 14
1	C	175/193 (91%)	151 (86%)	24 (14%)	3 16
All	All	526/579 (91%)	462 (88%)	64 (12%)	5 21

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	54	LEU
1	B	59	GLN
1	B	64	LEU
1	B	70	LYS
1	B	92	THR
1	B	100	LEU
1	B	102	ARG
1	B	111	SER
1	B	123	VAL
1	B	134	TRP
1	B	160	LEU
1	B	164	MET
1	B	166	ARG
1	B	173	ASP
1	B	177	MET
1	B	187	THR
1	B	189	THR
1	B	193	TRP
1	B	195	THR
1	B	197	LYS
1	B	198	ILE
1	B	207	SER
1	B	213	TRP
1	B	215	LYS
1	B	223	ARG
1	A	13	ARG
1	A	17	THR
1	A	30	LYS
1	A	34	GLN
1	A	62	VAL
1	A	72	THR
1	A	92	THR
1	A	113	LEU
1	A	119	SER

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Mol	Chain	Res	Type
1	A	170	ASP
1	A	178	LYS
1	A	193	TRP
1	A	205	PHE
1	A	218	PHE
1	A	224	THR
1	C	28	ILE
1	C	34	GLN
1	C	52	MET
1	C	63	ASP
1	C	69	VAL
1	C	71	PHE
1	C	92	THR
1	C	117	GLU
1	C	126	LEU
1	C	133	THR
1	C	134	TRP
1	C	139	THR
1	C	152	LEU
1	C	153	ASP
1	C	174	VAL
1	C	187	THR
1	C	191	GLU
1	C	193	TRP
1	C	194	MET
1	C	197	LYS
1	C	198	ILE
1	C	199	THR
1	C	223	ARG
1	C	226	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	33	GLN
1	B	34	GLN
1	B	47	GLN
1	B	55	HIS
1	B	94	HIS
1	B	165	HIS
1	B	183	GLN
1	C	34	GLN

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Mol	Chain	Res	Type
1	C	46	ASN
1	C	47	GLN
1	C	94	HIS

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	218/233 (93%)	0.77	23 (10%) 6 4	71, 101, 130, 137	0
1	B	209/233 (89%)	0.36	6 (2%) 51 37	55, 69, 94, 120	0
1	C	213/233 (91%)	0.70	23 (10%) 5 4	73, 98, 141, 172	0
All	All	640/699 (91%)	0.61	52 (8%) 12 7	55, 89, 131, 172	0

All (52) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	11	PRO	4.4
1	C	222	ALA	4.1
1	A	15	ALA	4.0
1	A	164	MET	3.8
1	A	34	GLN	3.8
1	C	195	THR	3.5
1	A	14	ASN	3.4
1	C	54	LEU	3.4
1	C	83	SER	3.4
1	C	44	PHE	3.4
1	A	129	VAL	3.4
1	A	213	TRP	3.3
1	C	197	LYS	3.2
1	C	199	THR	3.2
1	C	215	LYS	3.0
1	C	37	PHE	3.0
1	C	66	PHE	3.0
1	B	189	THR	2.8
1	A	201	ILE	2.7
1	B	193	TRP	2.7
1	C	213	TRP	2.7
1	A	140	MET	2.6
1	C	216	SER	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	35	LEU	2.5
1	C	71	PHE	2.5
1	A	165	HIS	2.5
1	C	187	THR	2.5
1	A	168	LEU	2.5
1	A	160	LEU	2.5
1	A	86	VAL	2.4
1	C	40	ALA	2.4
1	A	167	VAL	2.4
1	A	59	GLN	2.4
1	A	196	GLN	2.4
1	C	58	ALA	2.4
1	A	113	LEU	2.3
1	C	62	VAL	2.3
1	B	64	LEU	2.3
1	C	181	LEU	2.3
1	C	223	ARG	2.3
1	C	69	VAL	2.3
1	C	111	SER	2.3
1	A	123	VAL	2.3
1	A	171	ASN	2.2
1	C	227	GLN	2.2
1	A	107	THR	2.2
1	B	122	ILE	2.2
1	B	188	MET	2.1
1	B	80	GLN	2.1
1	C	35	LEU	2.1
1	A	216	SER	2.1
1	A	110	ALA	2.1

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.