Full wwPDB X-ray Structure Validation Report ⓘ

May 21, 2020 – 01:46 pm BST

PDB ID	:	2FZ1
Title	:	Structure of Empty Head Turnip Yellow Mosaic Virus (ATC) at 100 K
Authors	:	Larson, S.B.; Lucas, R.W.; McPherson, A.
Deposited on	:	2006-02-08
Resolution	:	2.90 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:

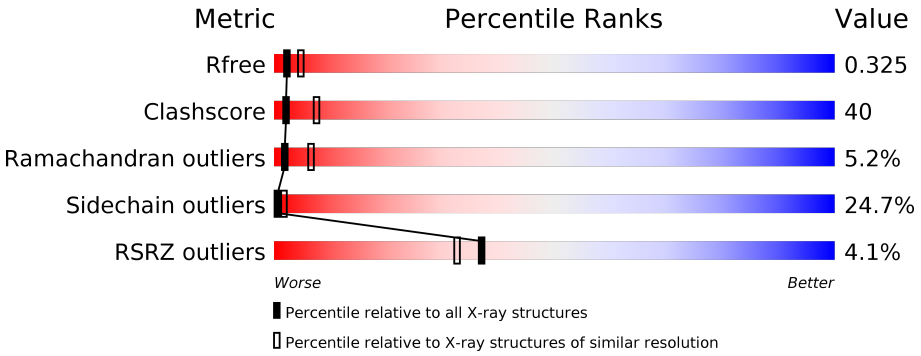
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 2.90 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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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 on 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	189	5% 30% 37% 19% • 14%
1	B	189	3% 40% 38% 21% •
1	C	189	3% 37% 55% 8% •

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 4058 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 Coat protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	163	Total	C	N	O	S	0	0	0
			1224	787	194	236	7			
1	B	189	Total	C	N	O	S	0	0	0
			1417	909	225	275	8			
1	C	189	Total	C	N	O	S	0	0	0
			1417	909	225	275	8			

There are 9 discrepancies between the modelled and reference sequences:

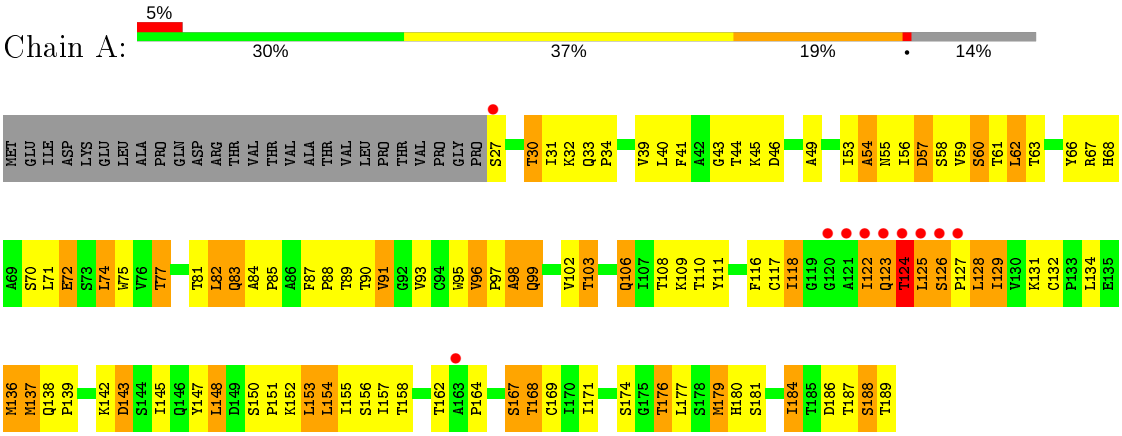
Chain	Residue	Modelled	Actual	Comment	Reference
A	99	GLN	ASN	VARIANT	UNP P20125
A	123	GLN	ASN	VARIANT	UNP P20125
A	138	GLN	ASN	VARIANT	UNP P20125
B	99	GLN	ASN	VARIANT	UNP P20125
B	123	GLN	ASN	VARIANT	UNP P20125
B	138	GLN	ASN	VARIANT	UNP P20125
C	99	GLN	ASN	VARIANT	UNP P20125
C	123	GLN	ASN	VARIANT	UNP P20125
C	138	GLN	ASN	VARIANT	UNP P20125

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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.

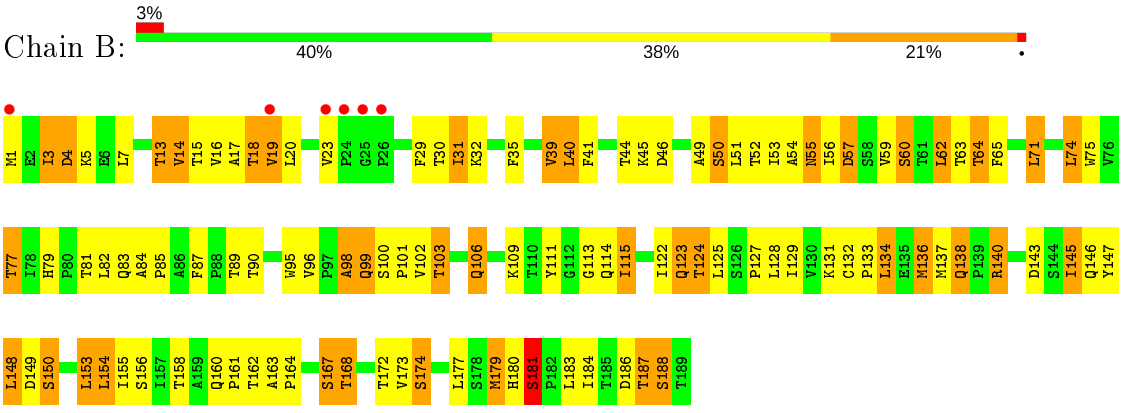
- Molecule 1: Coat protein

Chain A:



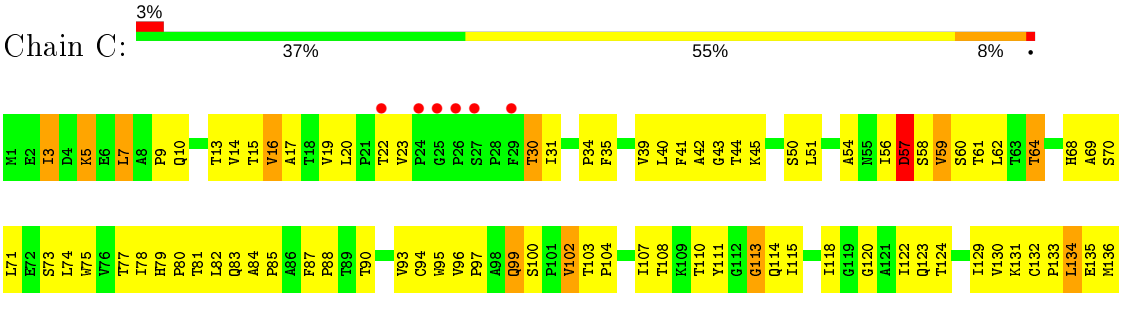
- Molecule 1: Coat protein

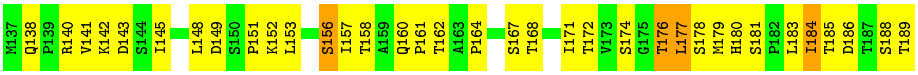
Chain B:



- Molecule 1: Coat protein

Chain C:




M137
Q138
F139
R140
V141
K142
D143
S144
I145
L148
D149
S150
P151
K152
L153
S156
I157
T158
A159
Q160
P161
T162
A163
P164
S167
T168
I171
T172
V173
S174
G175
T176
L177
S178
M179
H180
S181
P182
L183
I184
T185
D186
T187
S188
T189

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 64 2 2	Depositor
Cell constants a, b, c, α, β, γ	511.36Å 511.36Å 304.31Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.64 – 2.90 49.53 – 2.89	Depositor EDS
% Data completeness (in resolution range)	49.2 (48.64-2.90) 55.2 (49.53-2.89)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.12	Depositor
$< I/\sigma(I) >$ [1]	0.48 (at 2.91Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.309 , 0.315 0.321 , 0.325	Depositor DCC
R_{free} test set	14121 reflections (4.37%)	wwPDB-VP
Wilson B-factor (Å^2)	49.7	Xtriage
Anisotropy	0.267	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 47.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.78	EDS
Total number of atoms	4058	wwPDB-VP
Average B, all atoms (Å^2)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.83% 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	0.60	0/1255	0.82	0/1724
1	B	0.57	0/1452	0.84	0/1997
1	C	0.29	0/1452	0.60	0/1997
All	All	0.50	0/4159	0.76	0/5718

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	1224	0	1250	106	0
1	B	1417	0	1454	125	0
1	C	1417	0	1454	113	0
All	All	4058	0	4158	329	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 40.

All (329) 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:153:LEU:HD13	1:B:155:ILE:HD11	1.30	1.06

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:81:THR:HG23	1:B:83:GLN:H	1.20	1.05
1:A:30:THR:HG23	1:A:180:HIS:HB3	1.34	1.03
1:B:30:THR:HG22	1:B:180:HIS:HB3	1.42	1.01
1:C:184:ILE:HD12	1:C:184:ILE:H	1.23	0.99
1:A:136:MET:HG2	1:B:184:ILE:HD11	1.43	0.98
1:C:97:PRO:HB2	1:C:99:GLN:HE22	1.32	0.94
1:C:81:THR:HG23	1:C:83:GLN:H	1.29	0.94
1:C:134:LEU:HD22	1:C:134:LEU:H	1.38	0.88
1:A:118:ILE:HA	1:A:123:GLN:HG2	1.54	0.87
1:C:10:GLN:HE22	1:C:94:CYS:HA	1.38	0.87
1:A:184:ILE:HD12	1:A:184:ILE:H	1.38	0.87
1:A:102:VAL:HG13	1:A:106:GLN:HG3	1.57	0.86
1:A:59:VAL:O	1:A:63:THR:HG23	1.76	0.84
1:A:88:PRO:HA	1:A:118:ILE:O	1.78	0.84
1:C:5:LYS:HD3	1:C:129:ILE:HD11	1.61	0.83
1:B:153:LEU:CD1	1:B:155:ILE:HD11	2.09	0.83
1:C:56:ILE:HG12	1:C:59:VAL:HG12	1.62	0.82
1:B:71:LEU:HD13	1:B:177:LEU:HD23	1.59	0.82
1:A:77:THR:HB	1:A:129:ILE:HG22	1.62	0.81
1:A:81:THR:HG23	1:A:83:GLN:H	1.47	0.78
1:B:4:ASP:O	1:B:127:PRO:HD2	1.83	0.78
1:B:50:SER:C	1:B:51:LEU:HD12	2.04	0.78
1:B:19:VAL:HG23	1:C:23:VAL:HG12	1.65	0.78
1:A:67:ARG:HH12	1:C:17:ALA:HB2	1.50	0.76
1:B:99:GLN:HE22	1:B:149:ASP:HB3	1.50	0.76
1:B:71:LEU:HD13	1:B:177:LEU:CD2	2.17	0.75
1:A:126:SER:C	1:A:128:LEU:H	1.91	0.74
1:B:77:THR:HB	1:B:79:HIS:CE1	2.22	0.74
1:A:81:THR:HG22	1:A:168:THR:O	1.88	0.73
1:B:63:THR:HA	1:B:179:MET:HE2	1.70	0.73
1:B:115:ILE:HD13	1:B:115:ILE:O	1.89	0.72
1:A:90:THR:HB	1:A:158:THR:HB	1.72	0.72
1:A:125:LEU:C	1:A:127:PRO:HD2	2.09	0.71
1:B:148:LEU:H	1:B:148:LEU:HD12	1.56	0.71
1:B:153:LEU:HD13	1:B:155:ILE:CD1	2.16	0.71
1:A:81:THR:CG2	1:A:83:GLN:HB2	2.21	0.70
1:B:30:THR:HG22	1:B:180:HIS:CB	2.20	0.70
1:B:90:THR:HB	1:B:158:THR:HB	1.73	0.70
1:B:15:THR:HG22	1:B:136:MET:HG3	1.71	0.69
1:B:3:ILE:H	1:B:3:ILE:HD12	1.57	0.69
1:C:81:THR:HG21	1:C:167:SER:O	1.91	0.69

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:81:THR:HG22	1:A:168:THR:C	2.13	0.69
1:B:77:THR:HG23	1:B:129:ILE:HG12	1.74	0.69
1:C:97:PRO:CB	1:C:99:GLN:HE22	2.05	0.69
1:B:95:TRP:CE2	1:B:132:CYS:HB2	2.28	0.69
1:B:74:LEU:HD22	1:B:75:TRP:N	2.08	0.68
1:C:61:THR:HA	1:C:64:THR:HG23	1.76	0.68
1:B:154:LEU:C	1:B:155:ILE:HD12	2.14	0.68
1:A:123:GLN:HA	1:A:123:GLN:HE21	1.58	0.67
1:B:74:LEU:HD22	1:B:75:TRP:H	1.57	0.67
1:B:40:LEU:HD22	1:B:41:PHE:N	2.09	0.67
1:A:118:ILE:HA	1:A:123:GLN:CG	2.25	0.67
1:B:60:SER:O	1:B:64:THR:HG23	1.95	0.66
1:A:87:PHE:CD1	1:A:164:PRO:HB3	2.29	0.66
1:C:90:THR:HB	1:C:158:THR:HB	1.78	0.66
1:B:39:VAL:HG11	1:B:173:VAL:HG23	1.76	0.66
1:A:81:THR:HG21	1:A:167:SER:O	1.96	0.65
1:C:93:VAL:HG11	1:C:130:VAL:HG11	1.78	0.65
1:A:81:THR:HG23	1:A:83:GLN:HB2	1.78	0.65
1:B:32:LYS:HA	1:B:177:LEU:O	1.97	0.64
1:A:103:THR:O	1:A:106:GLN:HG2	1.98	0.64
1:A:39:VAL:HG22	1:A:171:ILE:O	1.98	0.64
1:B:81:THR:HG23	1:B:83:GLN:N	2.04	0.64
1:C:97:PRO:HB2	1:C:99:GLN:NE2	2.07	0.64
1:B:103:THR:HG23	1:B:106:GLN:CG	2.27	0.64
1:B:81:THR:HG22	1:B:168:THR:O	1.97	0.64
1:C:184:ILE:H	1:C:184:ILE:CD1	2.00	0.63
1:C:71:LEU:HD23	1:C:177:LEU:HB3	1.79	0.63
1:A:74:LEU:HG	1:A:75:TRP:N	2.13	0.63
1:B:102:VAL:HA	1:B:106:GLN:HE21	1.62	0.63
1:C:84:ALA:N	1:C:85:PRO:HD2	2.13	0.63
1:B:5:LYS:HD3	1:B:129:ILE:HD11	1.80	0.62
1:A:31:ILE:HD12	1:A:31:ILE:O	1.99	0.62
1:A:126:SER:N	1:A:127:PRO:HD2	2.15	0.62
1:A:98:ALA:HB3	1:A:148:LEU:O	2.00	0.61
1:A:123:GLN:O	1:A:124:THR:HG23	1.99	0.61
1:A:61:THR:HG22	1:A:62:LEU:N	2.14	0.61
1:C:88:PRO:HG3	1:C:120:GLY:HA3	1.82	0.61
1:A:125:LEU:HD13	1:A:127:PRO:HG3	1.82	0.61
1:B:160:GLN:HG3	1:B:161:PRO:HD2	1.83	0.61
1:C:56:ILE:HG12	1:C:59:VAL:CG1	2.31	0.60
1:B:19:VAL:HG11	1:B:140:ARG:CZ	2.31	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:126:SER:O	1:A:128:LEU:N	2.34	0.60
1:B:99:GLN:NE2	1:B:149:ASP:HB3	2.16	0.60
1:C:56:ILE:CG1	1:C:59:VAL:HG12	2.31	0.60
1:C:107:ILE:HD12	1:C:156:SER:HB3	1.84	0.60
1:A:30:THR:HG22	1:A:179:MET:O	2.01	0.60
1:C:122:ILE:O	1:C:124:THR:HG23	2.02	0.60
1:C:160:GLN:HG3	1:C:161:PRO:HD2	1.84	0.59
1:A:184:ILE:CD1	1:A:184:ILE:H	2.14	0.59
1:A:125:LEU:HB3	1:A:127:PRO:HD2	1.86	0.58
1:B:81:THR:HG21	1:B:167:SER:O	2.03	0.58
1:A:99:GLN:O	1:A:99:GLN:HG2	2.04	0.57
1:A:154:LEU:HD23	1:A:154:LEU:N	2.19	0.57
1:A:58:SER:O	1:A:62:LEU:HD12	2.05	0.57
1:B:146:GLN:O	1:C:145:ILE:HD13	2.04	0.57
1:A:136:MET:HG2	1:B:184:ILE:CD1	2.28	0.57
1:B:103:THR:HG23	1:B:106:GLN:CD	2.25	0.57
1:B:75:TRP:CB	1:B:131:LYS:HA	2.34	0.57
1:B:89:THR:OG1	1:B:168:THR:HG21	2.05	0.57
1:C:104:PRO:O	1:C:107:ILE:HG13	2.04	0.57
1:A:153:LEU:HD22	1:A:154:LEU:N	2.19	0.57
1:C:77:THR:HB	1:C:79:HIS:CE1	2.40	0.57
1:B:84:ALA:N	1:B:85:PRO:HD2	2.20	0.56
1:A:81:THR:HG23	1:A:83:GLN:N	2.20	0.56
1:B:87:PHE:CG	1:B:164:PRO:HB3	2.41	0.56
1:A:126:SER:C	1:A:128:LEU:N	2.59	0.56
1:B:83:GLN:NE2	1:B:83:GLN:HA	2.20	0.56
1:C:87:PHE:CG	1:C:164:PRO:HB3	2.40	0.56
1:B:17:ALA:HB1	1:B:138:GLN:HG2	1.88	0.56
1:C:77:THR:HG23	1:C:129:ILE:HG12	1.87	0.56
1:C:73:SER:OG	1:C:176:THR:HG23	2.06	0.56
1:C:3:ILE:H	1:C:3:ILE:HD12	1.71	0.55
1:B:31:ILE:H	1:B:31:ILE:HD12	1.71	0.55
1:A:126:SER:N	1:A:127:PRO:CD	2.70	0.55
1:C:171:ILE:N	1:C:171:ILE:HD12	2.21	0.55
1:B:17:ALA:O	1:C:23:VAL:HG13	2.06	0.55
1:C:75:TRP:CE2	1:C:174:SER:HB2	2.42	0.55
1:B:63:THR:HA	1:B:179:MET:CE	2.36	0.55
1:B:20:LEU:HD12	1:B:20:LEU:O	2.06	0.55
1:C:3:ILE:N	1:C:3:ILE:HD12	2.21	0.54
1:A:32:LYS:HA	1:A:177:LEU:O	2.07	0.54
1:C:88:PRO:HA	1:C:118:ILE:O	2.07	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:54:ALA:HA	1:C:141:VAL:HG13	1.87	0.54
1:A:122:ILE:O	1:A:122:ILE:HG12	2.07	0.54
1:A:95:TRP:CE2	1:A:132:CYS:HB2	2.43	0.54
1:A:89:THR:OG1	1:A:168:THR:HG21	2.08	0.54
1:A:49:ALA:HB3	1:A:155:ILE:HB	1.90	0.54
1:A:67:ARG:NH1	1:C:17:ALA:HB2	2.19	0.54
1:B:134:LEU:HD12	1:B:134:LEU:H	1.72	0.54
1:C:88:PRO:HG3	1:C:120:GLY:CA	2.37	0.54
1:B:40:LEU:HD22	1:B:41:PHE:H	1.72	0.54
1:A:84:ALA:HB3	1:A:85:PRO:HD3	1.88	0.54
1:C:15:THR:HG23	1:C:15:THR:O	2.08	0.54
1:B:19:VAL:CG2	1:C:23:VAL:HG12	2.36	0.54
1:B:81:THR:CG2	1:B:83:GLN:H	2.07	0.53
1:C:184:ILE:HD12	1:C:184:ILE:N	2.07	0.53
1:C:34:PRO:O	1:C:35:PHE:HB3	2.09	0.53
1:A:117:CYS:O	1:A:123:GLN:HG2	2.09	0.53
1:A:40:LEU:HD12	1:A:41:PHE:H	1.72	0.53
1:B:96:VAL:HG13	1:B:100:SER:HB3	1.90	0.53
1:B:96:VAL:CG1	1:B:100:SER:HB3	2.39	0.53
1:B:103:THR:H	1:B:106:GLN:HG3	1.74	0.53
1:B:63:THR:O	1:B:65:PHE:N	2.41	0.53
1:C:74:LEU:HD12	1:C:75:TRP:H	1.74	0.53
1:C:19:VAL:HB	1:C:140:ARG:HD2	1.91	0.53
1:C:59:VAL:HG13	1:C:60:SER:N	2.24	0.52
1:B:18:THR:HB	1:C:20:LEU:HB3	1.91	0.52
1:B:98:ALA:HB3	1:B:148:LEU:O	2.09	0.52
1:A:129:ILE:HD13	1:A:129:ILE:H	1.75	0.52
1:B:56:ILE:O	1:B:57:ASP:C	2.48	0.52
1:B:77:THR:HA	1:B:128:LEU:O	2.10	0.52
1:A:122:ILE:O	1:A:122:ILE:CG1	2.58	0.52
1:A:96:VAL:HG12	1:A:152:LYS:HB3	1.91	0.52
1:C:133:PRO:HA	1:C:135:GLU:OE2	2.10	0.51
1:C:130:VAL:HG13	1:C:130:VAL:O	2.09	0.51
1:A:68:HIS:HE1	1:C:16:VAL:O	1.93	0.51
1:C:31:ILE:O	1:C:31:ILE:HD12	2.10	0.51
1:C:7:LEU:CD2	1:C:9:PRO:HD3	2.40	0.51
1:B:7:LEU:O	1:B:7:LEU:HD12	2.10	0.51
1:A:87:PHE:CG	1:A:164:PRO:HB3	2.45	0.51
1:A:184:ILE:HD12	1:A:184:ILE:N	2.17	0.51
1:C:134:LEU:H	1:C:134:LEU:CD2	2.17	0.51
1:B:20:LEU:HD23	1:B:145:ILE:HD13	1.93	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:109:LYS:HB3	1:C:186:ASP:OD1	2.10	0.50
1:A:95:TRP:CZ3	1:A:153:LEU:HB2	2.46	0.50
1:B:40:LEU:CD2	1:B:41:PHE:H	2.23	0.50
1:B:40:LEU:CD2	1:B:41:PHE:N	2.75	0.50
1:B:51:LEU:CD1	1:B:51:LEU:N	2.74	0.50
1:C:10:GLN:NE2	1:C:94:CYS:HA	2.18	0.50
1:A:33:GLN:HE21	1:A:34:PRO:HD2	1.77	0.50
1:B:180:HIS:HD2	1:B:181:SER:HB2	1.76	0.50
1:B:51:LEU:HD12	1:B:51:LEU:N	2.23	0.50
1:C:161:PRO:HG2	1:C:162:THR:H	1.77	0.50
1:A:58:SER:O	1:A:61:THR:HB	2.12	0.50
1:A:103:THR:HG23	1:A:106:GLN:CD	2.32	0.50
1:B:161:PRO:HG2	1:B:162:THR:H	1.76	0.50
1:C:95:TRP:CE2	1:C:132:CYS:HB2	2.47	0.50
1:C:7:LEU:HD22	1:C:9:PRO:HD3	1.93	0.50
1:A:96:VAL:O	1:A:137:MET:HE1	2.12	0.49
1:A:81:THR:HG21	1:A:83:GLN:HB2	1.92	0.49
1:B:19:VAL:HG11	1:B:140:ARG:NE	2.26	0.49
1:B:99:GLN:OE1	1:B:99:GLN:N	2.45	0.49
1:C:138:GLN:O	1:C:151:PRO:HD3	2.12	0.49
1:B:87:PHE:CD1	1:B:164:PRO:HB3	2.47	0.49
1:A:43:GLY:HA3	1:A:168:THR:HB	1.95	0.49
1:C:75:TRP:CB	1:C:131:LYS:HA	2.42	0.49
1:A:102:VAL:HG12	1:A:103:THR:N	2.26	0.49
1:B:59:VAL:O	1:B:60:SER:C	2.48	0.49
1:C:7:LEU:C	1:C:7:LEU:HD22	2.33	0.49
1:C:177:LEU:HD12	1:C:177:LEU:O	2.13	0.49
1:B:18:THR:HG22	1:C:22:THR:HA	1.95	0.49
1:B:102:VAL:HG12	1:B:103:THR:N	2.28	0.49
1:B:62:LEU:HB3	1:B:179:MET:HE3	1.94	0.49
1:B:81:THR:CG2	1:B:168:THR:HA	2.43	0.49
1:B:3:ILE:N	1:B:3:ILE:HD12	2.27	0.48
1:A:93:VAL:HG12	1:A:155:ILE:HG12	1.93	0.48
1:B:82:LEU:HD23	1:B:82:LEU:N	2.28	0.48
1:A:84:ALA:HB1	1:A:118:ILE:HG22	1.95	0.48
1:B:103:THR:HG23	1:B:106:GLN:HG2	1.95	0.48
1:A:66:TYR:CD1	1:A:66:TYR:N	2.81	0.48
1:C:61:THR:HA	1:C:64:THR:CG2	2.43	0.48
1:C:40:LEU:HD12	1:C:41:PHE:H	1.78	0.48
1:C:74:LEU:HD12	1:C:75:TRP:N	2.28	0.48
1:B:13:THR:HG23	1:B:14:VAL:N	2.29	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:15:THR:CG2	1:C:136:MET:HB2	2.43	0.48
1:C:81:THR:HG22	1:C:168:THR:O	2.14	0.48
1:B:19:VAL:C	1:C:20:LEU:HD22	2.33	0.48
1:C:96:VAL:O	1:C:152:LYS:HB3	2.14	0.48
1:B:31:ILE:O	1:B:31:ILE:HD12	2.14	0.47
1:C:183:LEU:HD13	1:C:183:LEU:C	2.35	0.47
1:C:30:THR:HB	1:C:180:HIS:HB3	1.94	0.47
1:B:75:TRP:HB3	1:B:131:LYS:HA	1.95	0.47
1:A:125:LEU:HD22	1:A:127:PRO:CD	2.44	0.47
1:C:68:HIS:HA	1:C:142:LYS:O	2.15	0.47
1:C:81:THR:CG2	1:C:83:GLN:H	2.13	0.47
1:A:81:THR:CG2	1:A:168:THR:HA	2.44	0.47
1:C:81:THR:HG22	1:C:168:THR:HA	1.96	0.47
1:B:63:THR:C	1:B:65:PHE:H	2.18	0.47
1:B:81:THR:HG22	1:B:168:THR:C	2.35	0.47
1:B:155:ILE:N	1:B:155:ILE:HD12	2.29	0.47
1:C:59:VAL:HG13	1:C:60:SER:H	1.80	0.47
1:A:97:PRO:O	1:A:99:GLN:N	2.48	0.46
1:B:115:ILE:HD13	1:B:115:ILE:H	1.80	0.46
1:B:83:GLN:HA	1:B:83:GLN:HE21	1.80	0.46
1:A:125:LEU:CB	1:A:127:PRO:HD2	2.46	0.46
1:C:42:ALA:HB1	1:C:157:ILE:HG21	1.95	0.46
1:B:138:GLN:O	1:B:150:SER:HA	2.16	0.46
1:B:16:VAL:HG22	1:B:17:ALA:N	2.31	0.46
1:C:149:ASP:OD2	1:C:149:ASP:N	2.46	0.46
1:C:43:GLY:HA3	1:C:168:THR:H	1.81	0.46
1:A:98:ALA:HA	1:A:152:LYS:HB2	1.97	0.46
1:A:125:LEU:HD13	1:A:127:PRO:CG	2.45	0.46
1:B:7:LEU:C	1:B:7:LEU:HD12	2.36	0.46
1:B:124:THR:C	1:B:125:LEU:HD23	2.37	0.46
1:C:107:ILE:O	1:C:113:GLY:HA3	2.16	0.45
1:B:75:TRP:HB2	1:B:131:LYS:HA	1.98	0.45
1:C:15:THR:HG22	1:C:136:MET:HB2	1.97	0.45
1:A:102:VAL:CG1	1:A:103:THR:N	2.79	0.45
1:A:32:LYS:NZ	1:A:72:GLU:HG2	2.31	0.45
1:C:123:GLN:HG3	1:C:123:GLN:O	2.15	0.45
1:B:153:LEU:HD22	1:B:154:LEU:N	2.31	0.45
1:B:53:ILE:O	1:B:56:ILE:HG23	2.16	0.45
1:C:56:ILE:O	1:C:57:ASP:C	2.55	0.45
1:C:7:LEU:HB2	1:C:129:ILE:O	2.17	0.45
1:A:123:GLN:HA	1:A:123:GLN:NE2	2.27	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:59:VAL:O	1:A:60:SER:C	2.55	0.45
1:A:137:MET:CE	1:A:151:PRO:HA	2.46	0.45
1:A:153:LEU:C	1:A:154:LEU:HD23	2.36	0.45
1:B:81:THR:HG21	1:B:168:THR:HA	1.98	0.45
1:B:50:SER:O	1:B:51:LEU:HD12	2.17	0.45
1:B:123:GLN:HG3	1:B:124:THR:N	2.31	0.44
1:C:143:ASP:C	1:C:145:ILE:H	2.19	0.44
1:C:62:LEU:H	1:C:62:LEU:HD12	1.82	0.44
1:C:19:VAL:HG12	1:C:138:GLN:HE22	1.82	0.44
1:C:39:VAL:HB	1:C:171:ILE:O	2.18	0.44
1:C:114:GLN:O	1:C:115:ILE:HD12	2.17	0.44
1:C:39:VAL:HG23	1:C:172:THR:HA	2.00	0.44
1:C:102:VAL:HG11	1:C:110:THR:OG1	2.17	0.44
1:B:15:THR:HG21	1:C:184:ILE:HD11	1.99	0.44
1:C:51:LEU:N	1:C:51:LEU:HD23	2.33	0.44
1:C:60:SER:O	1:C:64:THR:HG23	2.18	0.44
1:A:116:PHE:CD1	1:A:116:PHE:N	2.85	0.43
1:A:168:THR:O	1:A:169:CYS:HB3	2.18	0.43
1:B:133:PRO:HB2	1:B:136:MET:HE3	2.00	0.43
1:A:68:HIS:O	1:A:179:MET:HA	2.18	0.43
1:A:109:LYS:HB3	1:B:186:ASP:OD1	2.18	0.43
1:B:49:ALA:HB1	1:B:51:LEU:HD11	2.00	0.43
1:B:53:ILE:O	1:B:55:ASN:N	2.51	0.43
1:B:81:THR:HG23	1:B:82:LEU:N	2.33	0.43
1:A:138:GLN:O	1:A:151:PRO:HD3	2.17	0.43
1:A:71:LEU:HD23	1:A:176:THR:O	2.19	0.43
1:B:35:PHE:O	1:B:174:SER:HA	2.18	0.43
1:C:99:GLN:NE2	1:C:99:GLN:N	2.66	0.43
1:A:62:LEU:H	1:A:62:LEU:HD12	1.83	0.43
1:C:138:GLN:HB3	1:C:149:ASP:C	2.38	0.43
1:B:79:HIS:HE1	1:B:172:THR:OG1	2.01	0.43
1:C:68:HIS:HB2	1:C:180:HIS:CE1	2.54	0.43
1:C:78:ILE:O	1:C:80:PRO:HD3	2.19	0.43
1:A:138:GLN:HA	1:A:139:PRO:HD3	1.82	0.43
1:A:106:GLN:H	1:A:106:GLN:HG2	1.73	0.42
1:A:118:ILE:HD13	1:A:123:GLN:HG3	2.00	0.42
1:A:143:ASP:HB2	1:A:147:TYR:HE1	1.84	0.42
1:B:149:ASP:OD2	1:B:149:ASP:N	2.45	0.42
1:B:95:TRP:CZ3	1:B:153:LEU:HG	2.54	0.42
1:B:20:LEU:HD12	1:B:20:LEU:C	2.40	0.42
1:C:132:CYS:O	1:C:134:LEU:HD22	2.19	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:51:LEU:H	1:C:51:LEU:HD23	1.83	0.42
1:B:184:ILE:N	1:B:184:ILE:HD12	2.34	0.42
1:B:153:LEU:HD22	1:B:155:ILE:CD1	2.49	0.42
1:A:33:GLN:NE2	1:A:34:PRO:HD2	2.34	0.42
1:C:51:LEU:HD21	1:C:153:LEU:HB3	2.02	0.42
1:C:99:GLN:NE2	1:C:99:GLN:H	2.17	0.42
1:A:59:VAL:HG12	1:A:60:SER:N	2.35	0.42
1:B:56:ILE:HG13	1:B:56:ILE:O	2.20	0.42
1:C:82:LEU:N	1:C:82:LEU:HD23	2.35	0.42
1:B:187:THR:O	1:B:188:SER:C	2.58	0.42
1:C:99:GLN:OE1	1:C:149:ASP:HB3	2.18	0.42
1:A:118:ILE:CA	1:A:123:GLN:HG2	2.36	0.42
1:B:125:LEU:HD23	1:B:125:LEU:N	2.34	0.41
1:A:74:LEU:HD23	1:A:132:CYS:CB	2.51	0.41
1:A:81:THR:HG21	1:A:168:THR:HA	2.03	0.41
1:B:99:GLN:CA	1:B:99:GLN:OE1	2.68	0.41
1:C:183:LEU:O	1:C:183:LEU:HD13	2.20	0.41
1:C:34:PRO:HA	1:C:176:THR:HA	2.02	0.41
1:B:115:ILE:CD1	1:B:115:ILE:O	2.66	0.41
1:B:163:ALA:HB1	1:B:164:PRO:HD2	2.01	0.41
1:C:69:ALA:HA	1:C:178:SER:O	2.21	0.41
1:A:125:LEU:HD22	1:A:127:PRO:HD3	2.01	0.41
1:A:68:HIS:HD2	1:A:143:ASP:OD1	2.04	0.41
1:A:99:GLN:N	1:A:99:GLN:OE1	2.54	0.41
1:B:3:ILE:N	1:B:3:ILE:CD1	2.84	0.41
1:A:56:ILE:O	1:A:57:ASP:C	2.59	0.41
1:C:87:PHE:CD1	1:C:164:PRO:HB3	2.56	0.41
1:B:19:VAL:HG12	1:B:147:TYR:OH	2.20	0.41
1:A:68:HIS:HA	1:A:142:LYS:O	2.21	0.41
1:A:82:LEU:O	1:A:85:PRO:HD2	2.21	0.41
1:C:99:GLN:HE21	1:C:100:SER:N	2.19	0.41
1:C:81:THR:HG22	1:C:168:THR:C	2.41	0.40
1:B:71:LEU:HD13	1:B:177:LEU:HD21	2.00	0.40
1:C:50:SER:HA	1:C:153:LEU:O	2.21	0.40
1:C:19:VAL:CG1	1:C:138:GLN:HE22	2.33	0.40
1:B:82:LEU:CD2	1:B:82:LEU:H	2.35	0.40
1:C:185:THR:OG1	1:C:186:ASP:N	2.54	0.40
1:A:91:VAL:HB	1:A:157:ILE:HD12	2.03	0.40
1:A:186:ASP:C	1:A:186:ASP:OD2	2.59	0.40
1:A:53:ILE:O	1:A:55:ASN:N	2.54	0.40
1:A:54:ALA:HA	1:A:59:VAL:HG11	2.02	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	161/189 (85%)	129 (80%)	23 (14%)	9 (6%)	2	5
1	B	187/189 (99%)	158 (84%)	19 (10%)	10 (5%)	2	6
1	C	187/189 (99%)	164 (88%)	14 (8%)	9 (5%)	2	8
All	All	535/567 (94%)	451 (84%)	56 (10%)	28 (5%)	2	6

All (28) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	98	ALA
1	B	64	THR
1	B	188	SER
1	B	54	ALA
1	B	111	TYR
1	C	5	LYS
1	C	58	SER
1	C	59	VAL
1	C	64	THR
1	C	188	SER
1	A	122	ILE
1	A	124	THR
1	B	57	ASP
1	C	57	ASP
1	A	54	ALA
1	A	111	TYR
1	B	4	ASP
1	B	98	ALA
1	A	181	SER
1	A	188	SER
1	B	181	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	111	TYR
1	C	113	GLY
1	C	181	SER
1	A	118	ILE
1	B	101	PRO
1	B	113	GLY
1	A	126	SER

5.3.2 Protein sidechains

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	144/167 (86%)	97 (67%)	47 (33%)	0 0
1	B	167/167 (100%)	118 (71%)	49 (29%)	0 1
1	C	167/167 (100%)	145 (87%)	22 (13%)	4 12
All	All	478/501 (95%)	360 (75%)	118 (25%)	0 2

All (118) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	SER
1	A	30	THR
1	A	44	THR
1	A	45	LYS
1	A	46	ASP
1	A	57	ASP
1	A	60	SER
1	A	62	LEU
1	A	70	SER
1	A	72	GLU
1	A	74	LEU
1	A	77	THR
1	A	82	LEU
1	A	83	GLN
1	A	91	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	96	VAL
1	A	99	GLN
1	A	103	THR
1	A	106	GLN
1	A	108	THR
1	A	110	THR
1	A	123	GLN
1	A	124	THR
1	A	125	LEU
1	A	128	LEU
1	A	129	ILE
1	A	131	LYS
1	A	134	LEU
1	A	136	MET
1	A	137	MET
1	A	143	ASP
1	A	145	ILE
1	A	148	LEU
1	A	150	SER
1	A	153	LEU
1	A	154	LEU
1	A	156	SER
1	A	162	THR
1	A	167	SER
1	A	168	THR
1	A	174	SER
1	A	176	THR
1	A	179	MET
1	A	184	ILE
1	A	187	THR
1	A	188	SER
1	A	189	THR
1	B	1	MET
1	B	3	ILE
1	B	13	THR
1	B	14	VAL
1	B	18	THR
1	B	19	VAL
1	B	23	VAL
1	B	29	PHE
1	B	31	ILE
1	B	39	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	40	LEU
1	B	44	THR
1	B	45	LYS
1	B	46	ASP
1	B	50	SER
1	B	52	THR
1	B	55	ASN
1	B	60	SER
1	B	62	LEU
1	B	71	LEU
1	B	74	LEU
1	B	77	THR
1	B	99	GLN
1	B	103	THR
1	B	106	GLN
1	B	114	GLN
1	B	115	ILE
1	B	122	ILE
1	B	123	GLN
1	B	124	THR
1	B	134	LEU
1	B	136	MET
1	B	137	MET
1	B	138	GLN
1	B	140	ARG
1	B	143	ASP
1	B	145	ILE
1	B	148	LEU
1	B	150	SER
1	B	153	LEU
1	B	154	LEU
1	B	156	SER
1	B	167	SER
1	B	168	THR
1	B	174	SER
1	B	179	MET
1	B	181	SER
1	B	183	LEU
1	B	187	THR
1	C	3	ILE
1	C	7	LEU
1	C	13	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C	14	VAL
1	C	16	VAL
1	C	30	THR
1	C	44	THR
1	C	45	LYS
1	C	57	ASP
1	C	70	SER
1	C	99	GLN
1	C	102	VAL
1	C	103	THR
1	C	108	THR
1	C	134	LEU
1	C	148	LEU
1	C	156	SER
1	C	176	THR
1	C	177	LEU
1	C	179	MET
1	C	184	ILE
1	C	189	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	33	GLN
1	A	55	ASN
1	A	68	HIS
1	A	114	GLN
1	A	123	GLN
1	A	180	HIS
1	B	36	GLN
1	B	68	HIS
1	B	79	HIS
1	B	83	GLN
1	B	106	GLN
1	B	180	HIS
1	C	10	GLN
1	C	33	GLN
1	C	55	ASN
1	C	99	GLN
1	C	106	GLN
1	C	123	GLN
1	C	138	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 carbohydrates 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	163/189 (86%)	0.22	10 (6%)	21 17	19, 37, 112, 177	0
1	B	189/189 (100%)	0.30	6 (3%)	47 43	20, 38, 89, 153	0
1	C	189/189 (100%)	0.27	6 (3%)	47 43	20, 38, 83, 109	0
All	All	541/567 (95%)	0.27	22 (4%)	37 32	19, 37, 96, 177	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	123	GLN	8.1
1	B	25	GLY	7.6
1	B	24	PRO	6.3
1	A	125	LEU	5.3
1	B	23	VAL	5.2
1	A	122	ILE	5.1
1	C	25	GLY	3.8
1	A	124	THR	3.5
1	B	26	PRO	3.3
1	A	126	SER	3.2
1	C	22	THR	3.1
1	A	163	ALA	2.8
1	A	120	GLY	2.7
1	A	127	PRO	2.7
1	B	19	VAL	2.5
1	C	24	PRO	2.4
1	A	27	SER	2.2
1	B	1	MET	2.2
1	C	27	SER	2.1
1	A	121	ALA	2.1
1	C	26	PRO	2.1
1	C	29	PHE	2.0

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

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

6.3 Carbohydrates

There are no carbohydrates in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.