Full wwPDB X-ray Structure Validation Report (i)

Jun 18, 2024 – 01:39 AM EDT

PDB ID	:	3BU2
Title	:	Crystal structure of a tRNA-binding protein from Staphylococcus saprophyticus subsp. saprophyticus. Northeast Structural Genomics Consortium target SyR77
Authors	:	Seetharaman, J.; Su, M.; Forouhar, F.; Wang, D.; Fang, Y.; Cunningham, K.; Ma, L.-C.; Xia, R.; Liu, J.; Baran, M.C.; Acton, T.B.; Rost, B.; Montelione, G.T.; Hunt, J.F.; Tong, L.; Northeast Structural Genomics Consortium (NESG)
Deposited on	:	2007-12-31
Resolution	:	2.70 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:

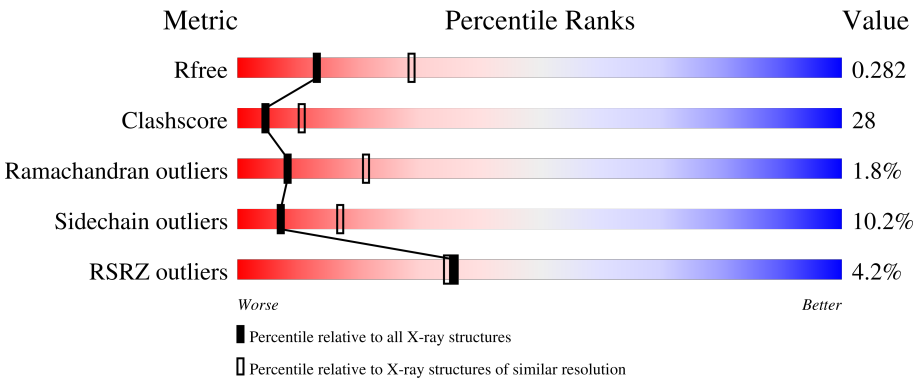
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)

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 2.70 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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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	199	3%; 58%; 34%; 6% • •
1	B	199	3%; 52%; 39%; 6% • •
1	C	199	6%; 52%; 40%; 5% • •

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Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

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Mol	Chain	Length	Quality of chain
1	D	199	5% 57% 35% 6%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 6099 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 Putative tRNA-binding protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	195	1477	940	236	293	2	6	0	0	0
1	B	195	1477	940	236	293	2	6	0	0	0
1	C	195	1477	940	236	293	2	6	0	0	0
1	D	195	1477	940	236	293	2	6	0	0	0

- Molecule 2 is water.

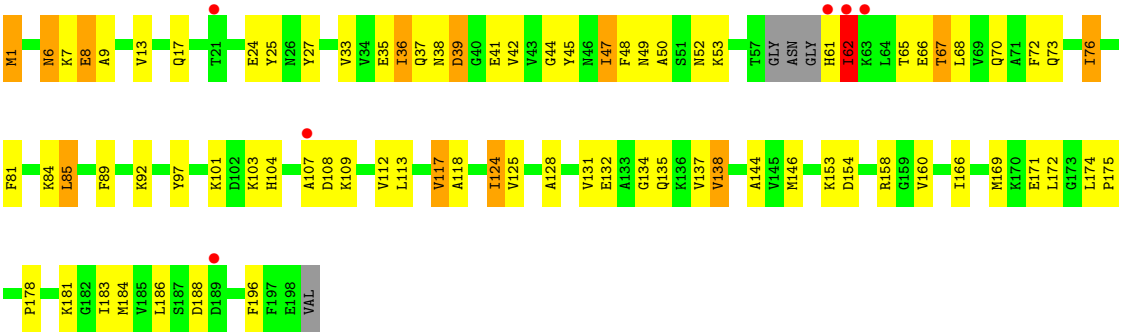
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
2	A	37	37	37	0	0
2	B	57	57	57	0	0
2	C	41	41	41	0	0
2	D	56	56	56	0	0

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.

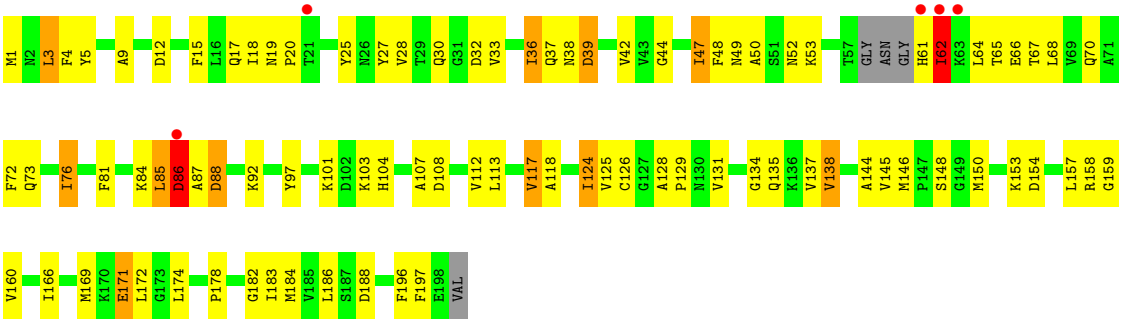
• Molecule 1: Putative tRNA-binding protein

Chain A:



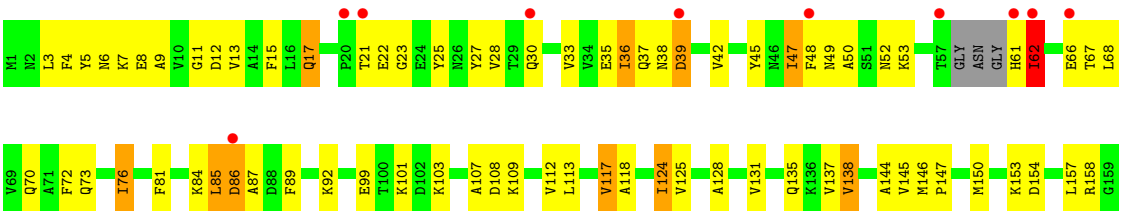
• Molecule 1: Putative tRNA-binding protein

Chain B:



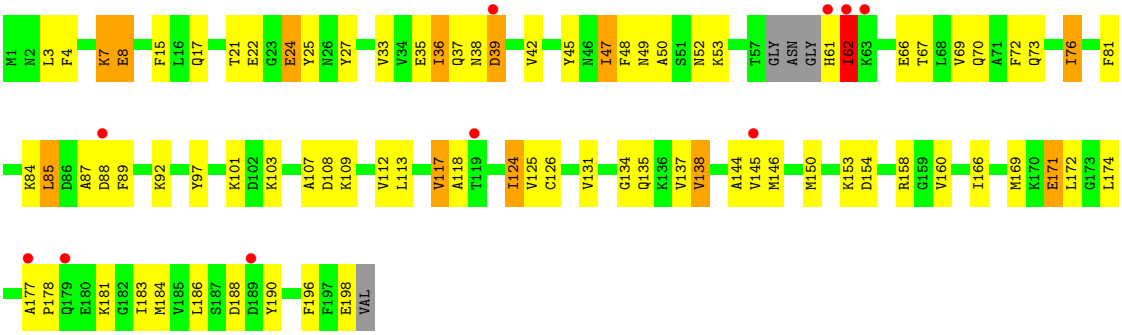
• Molecule 1: Putative tRNA-binding protein

Chain C:



- Molecule 1: Putative tRNA-binding protein

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	75.90Å 79.80Å 139.13Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.10 – 2.70 40.10 – 2.70	Depositor EDS
% Data completeness (in resolution range)	92.4 (40.10-2.70) 98.1 (40.10-2.70)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
$< I/\sigma(I) >$ [1]	7.54 (at 2.69Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.250 , 0.273 0.259 , 0.282	Depositor DCC
R_{free} test set	2100 reflections (4.70%)	wwPDB-VP
Wilson B-factor (Å^2)	26.9	Xtriage
Anisotropy	0.169	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 34.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.025 for k,h,-l	Xtriage
F_o,F_c correlation	0.85	EDS
Total number of atoms	6099	wwPDB-VP
Average B, all atoms (Å^2)	21.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.36% 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 (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	0.38	0/1495	0.62	0/2016
1	B	0.38	0/1495	0.64	2/2016 (0.1%)
1	C	0.41	0/1495	0.64	0/2016
1	D	0.39	0/1495	0.63	0/2016
All	All	0.39	0/5980	0.63	2/8064 (0.0%)

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	B	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	86	ASP	CB-CG-OD2	5.22	123.00	118.30
1	B	88	ASP	CB-CG-OD2	5.19	122.97	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	86	ASP	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	1477	0	1471	86	0
1	B	1477	0	1471	95	0
1	C	1477	0	1471	85	0
1	D	1477	0	1471	85	0
2	A	37	0	0	14	0
2	B	57	0	0	19	0
2	C	41	0	0	7	0
2	D	56	0	0	11	0
All	All	6099	0	5884	332	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 28.

All (332) 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:28:VAL:HG12	2:B:227:HOH:O	1.67	0.92
1:B:68:LEU:HD12	2:B:226:HOH:O	1.71	0.90
1:C:28:VAL:HG12	2:C:228:HOH:O	1.73	0.87
1:A:184:MSE:HE3	1:A:186:LEU:HD21	1.58	0.84
1:C:184:MSE:HE3	1:C:186:LEU:HD21	1.59	0.83
1:C:169:MSE:HE3	1:C:174:LEU:HD22	1.59	0.83
1:B:169:MSE:HE3	1:B:174:LEU:HD22	1.60	0.83
1:B:184:MSE:HE3	1:B:186:LEU:HD21	1.60	0.83
1:C:47:ILE:HD11	1:C:50:ALA:HA	1.62	0.82
1:D:184:MSE:HE3	1:D:186:LEU:HD21	1.60	0.82
1:A:169:MSE:HE3	1:A:174:LEU:HD22	1.61	0.82
1:D:169:MSE:HE3	1:D:174:LEU:HD22	1.60	0.82
1:B:47:ILE:HD11	1:B:50:ALA:HA	1.62	0.81
1:B:47:ILE:HD13	1:B:53:LYS:HD2	1.63	0.80
1:B:196:PHE:HZ	1:C:169:MSE:HE2	1.48	0.79
1:D:47:ILE:HD11	1:D:50:ALA:HA	1.63	0.79
1:A:47:ILE:HD11	1:A:50:ALA:HA	1.64	0.78
1:D:47:ILE:HD13	1:D:53:LYS:HD2	1.64	0.78
1:A:47:ILE:HD13	1:A:53:LYS:HD2	1.65	0.77
1:A:196:PHE:HZ	1:D:169:MSE:HE2	1.51	0.76
1:B:129:PRO:HD2	2:B:202:HOH:O	1.86	0.75
1:D:8:GLU:H	1:D:8:GLU:CD	1.88	0.75
1:C:47:ILE:HD13	1:C:53:LYS:HD2	1.67	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1:MSE:HB2	1:A:17:GLN:O	1.89	0.73
1:B:182:GLY:HA2	2:B:202:HOH:O	1.89	0.73
1:A:137:VAL:HG23	2:A:201:HOH:O	1.90	0.71
1:A:24:GLU:H	1:A:24:GLU:CD	1.94	0.70
1:A:50:ALA:HB3	2:A:237:HOH:O	1.91	0.70
1:C:48:PHE:CE2	1:D:158:ARG:HG3	2.25	0.70
1:D:72:PHE:O	1:D:76:ILE:HG23	1.92	0.70
1:D:47:ILE:CD1	1:D:53:LYS:HD2	2.23	0.69
1:B:30:GLN:HG3	2:B:227:HOH:O	1.92	0.69
1:D:38:ASN:O	1:D:39:ASP:HB2	1.92	0.69
1:A:169:MSE:HE2	1:D:196:PHE:HZ	1.58	0.68
1:A:9:ALA:O	1:A:128:ALA:HB2	1.93	0.68
1:C:73:GLN:HE22	1:C:84:LYS:HA	1.58	0.68
1:D:73:GLN:HE22	1:D:84:LYS:HA	1.58	0.68
1:B:38:ASN:O	1:B:39:ASP:HB2	1.95	0.67
1:C:38:ASN:O	1:C:39:ASP:HB2	1.94	0.67
1:B:15:PHE:HE1	1:B:157:LEU:HD11	1.58	0.67
1:B:47:ILE:CD1	1:B:53:LYS:HD2	2.23	0.67
1:B:73:GLN:HE22	1:B:85:LEU:H	1.39	0.67
1:A:38:ASN:O	1:A:39:ASP:HB2	1.95	0.67
1:A:47:ILE:CD1	1:A:53:LYS:HD2	2.24	0.67
1:A:158:ARG:HG3	1:B:48:PHE:CE2	2.30	0.67
1:B:72:PHE:O	1:B:76:ILE:HG23	1.94	0.66
1:A:137:VAL:HG21	1:A:166:ILE:CG2	2.26	0.66
1:A:72:PHE:O	1:A:76:ILE:HG23	1.94	0.66
1:C:30:GLN:HG3	2:C:228:HOH:O	1.94	0.65
1:B:73:GLN:HE22	1:B:84:LYS:HA	1.61	0.65
1:A:73:GLN:HE22	1:A:84:LYS:HA	1.60	0.65
1:C:137:VAL:HG21	1:C:166:ILE:CG2	2.25	0.65
1:D:73:GLN:HE22	1:D:85:LEU:H	1.43	0.65
1:C:72:PHE:O	1:C:76:ILE:HG23	1.97	0.65
1:A:137:VAL:CG2	2:A:201:HOH:O	2.45	0.64
1:C:73:GLN:HE22	1:C:85:LEU:H	1.44	0.64
1:B:73:GLN:NE2	1:B:85:LEU:H	1.96	0.64
1:B:137:VAL:HG21	1:B:166:ILE:CG2	2.28	0.64
1:B:159:GLY:HA3	2:B:242:HOH:O	1.97	0.63
1:C:47:ILE:CD1	1:C:53:LYS:HD2	2.27	0.63
1:C:15:PHE:HE1	1:C:157:LEU:HD11	1.64	0.63
1:A:52:ASN:HB2	2:A:202:HOH:O	1.98	0.63
1:A:73:GLN:HE22	1:A:85:LEU:H	1.44	0.63
1:B:137:VAL:CG2	2:B:203:HOH:O	2.46	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:137:VAL:HG23	2:B:203:HOH:O	1.99	0.62
1:B:62:ILE:HB	2:B:247:HOH:O	1.98	0.62
1:C:99:GLU:HB3	2:C:247:HOH:O	2.00	0.62
1:C:158:ARG:HG3	1:D:48:PHE:CE2	2.34	0.61
1:A:137:VAL:HG21	1:A:166:ILE:HG23	1.81	0.61
1:D:137:VAL:HG21	1:D:166:ILE:CG2	2.29	0.61
1:C:8:GLU:HG3	1:C:181:LYS:HB3	1.81	0.61
1:D:92:LYS:HB3	1:D:144:ALA:HB2	1.83	0.61
1:C:137:VAL:HG21	1:C:166:ILE:HG23	1.82	0.60
1:A:48:PHE:CE2	1:B:158:ARG:HG3	2.35	0.60
1:C:92:LYS:HB3	1:C:144:ALA:HB2	1.83	0.60
1:D:137:VAL:CG2	2:D:205:HOH:O	2.50	0.60
1:A:109:LYS:NZ	2:A:205:HOH:O	2.33	0.60
1:B:92:LYS:HB3	1:B:144:ALA:HB2	1.83	0.60
1:B:3:LEU:HD22	1:B:4:PHE:N	2.17	0.60
1:D:88:ASP:OD2	1:D:89:PHE:N	2.29	0.59
1:D:137:VAL:HG23	2:D:205:HOH:O	2.01	0.59
1:D:4:PHE:HB2	2:D:219:HOH:O	2.02	0.59
1:C:137:VAL:HG23	2:C:258:HOH:O	2.02	0.59
1:C:62:ILE:HD13	1:C:62:ILE:N	2.18	0.59
1:A:113:LEU:HG	2:A:234:HOH:O	2.01	0.58
1:D:137:VAL:HG21	1:D:166:ILE:HG23	1.83	0.58
1:C:17:GLN:NE2	1:C:150:MSE:HG3	2.18	0.58
1:C:73:GLN:HE22	1:C:85:LEU:N	2.02	0.58
1:B:73:GLN:HE22	1:B:85:LEU:N	2.01	0.58
1:D:73:GLN:HE22	1:D:85:LEU:N	2.01	0.58
1:D:117:VAL:O	1:D:117:VAL:HG13	2.03	0.58
1:B:62:ILE:N	1:B:62:ILE:HD13	2.19	0.58
1:B:137:VAL:HG21	1:B:166:ILE:HG23	1.85	0.58
1:D:69:VAL:HG11	1:D:87:ALA:HB2	1.86	0.57
1:A:92:LYS:HB3	1:A:144:ALA:HB2	1.85	0.57
1:D:73:GLN:NE2	1:D:85:LEU:H	2.02	0.57
1:A:117:VAL:HG13	1:A:117:VAL:O	2.03	0.57
1:D:88:ASP:CG	1:D:89:PHE:H	2.08	0.57
1:A:73:GLN:HE22	1:A:85:LEU:N	2.03	0.57
1:B:117:VAL:HG13	1:B:117:VAL:O	2.02	0.57
1:D:8:GLU:HG3	1:D:181:LYS:HB3	1.87	0.56
1:A:62:ILE:HD13	1:A:62:ILE:N	2.20	0.56
1:B:150:MSE:HB3	2:B:240:HOH:O	2.06	0.56
1:C:7:LYS:HA	1:C:11:GLY:O	2.04	0.56
1:C:73:GLN:NE2	1:C:85:LEU:H	2.02	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:137:VAL:HG22	1:A:138:VAL:N	2.19	0.56
1:A:158:ARG:NE	2:A:209:HOH:O	2.38	0.56
1:B:65:THR:N	2:B:226:HOH:O	2.38	0.56
1:A:73:GLN:NE2	1:A:85:LEU:H	2.04	0.56
1:D:169:MSE:HG2	2:D:243:HOH:O	2.06	0.55
1:C:137:VAL:HG22	1:C:138:VAL:N	2.21	0.55
1:B:15:PHE:CE1	1:B:157:LEU:HD11	2.41	0.55
1:B:137:VAL:HG22	1:B:138:VAL:N	2.20	0.55
1:C:169:MSE:HE3	1:C:174:LEU:CD2	2.35	0.55
1:B:84:LYS:HD2	2:B:209:HOH:O	2.06	0.55
1:A:1:MSE:HE2	1:A:1:MSE:N	2.22	0.55
1:D:137:VAL:HG22	1:D:138:VAL:N	2.21	0.55
1:C:109:LYS:HB2	2:C:254:HOH:O	2.07	0.54
1:C:117:VAL:O	1:C:117:VAL:HG13	2.07	0.54
1:B:62:ILE:HG12	1:B:62:ILE:O	2.07	0.54
1:C:15:PHE:CE1	1:C:157:LEU:HD11	2.43	0.54
1:D:62:ILE:HG12	1:D:62:ILE:O	2.07	0.54
1:D:109:LYS:HB2	2:D:226:HOH:O	2.07	0.53
1:C:62:ILE:HG12	1:C:62:ILE:O	2.07	0.53
1:B:47:ILE:HG13	1:B:47:ILE:O	2.07	0.53
1:D:62:ILE:N	1:D:62:ILE:HD13	2.23	0.53
1:C:27:TYR:CE1	1:C:36:ILE:HD12	2.44	0.53
1:A:47:ILE:HG13	1:A:47:ILE:O	2.09	0.53
1:B:33:VAL:HG22	1:B:81:PHE:CE2	2.44	0.53
1:B:27:TYR:CE1	1:B:36:ILE:HD12	2.44	0.52
1:A:103:LYS:NZ	1:A:103:LYS:HB3	2.25	0.52
1:C:147:PRO:HB2	2:C:234:HOH:O	2.09	0.52
1:A:27:TYR:CE1	1:A:36:ILE:HD12	2.44	0.52
1:D:88:ASP:O	1:D:89:PHE:HB2	2.10	0.52
1:A:181:LYS:HZ3	1:D:198:GLU:CD	2.13	0.52
1:C:33:VAL:HG22	1:C:81:PHE:CE2	2.45	0.52
1:D:169:MSE:HE3	1:D:174:LEU:CD2	2.38	0.51
1:C:153:LYS:HE3	1:C:154:ASP:H	1.75	0.51
1:B:103:LYS:NZ	1:B:103:LYS:HB3	2.25	0.51
1:A:62:ILE:HG12	1:A:62:ILE:O	2.09	0.51
1:C:47:ILE:HG13	1:C:47:ILE:O	2.10	0.51
1:B:104:HIS:HB3	2:B:212:HOH:O	2.10	0.51
1:D:145:VAL:HB	2:D:218:HOH:O	2.10	0.51
1:D:103:LYS:HB3	1:D:103:LYS:NZ	2.26	0.51
1:A:138:VAL:HG11	1:A:184:MSE:HE2	1.93	0.51
1:D:47:ILE:O	1:D:47:ILE:HG13	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:33:VAL:HG22	1:D:81:PHE:CE2	2.45	0.50
2:A:237:HOH:O	1:B:12:ASP:C	2.50	0.50
1:D:27:TYR:CE1	1:D:36:ILE:HD12	2.46	0.50
1:C:25:TYR:CE2	1:C:38:ASN:HB2	2.47	0.50
1:B:138:VAL:HG11	1:B:184:MSE:HE2	1.94	0.50
1:A:169:MSE:HB2	1:A:178:PRO:HG2	1.93	0.50
1:D:153:LYS:HE3	1:D:154:ASP:H	1.76	0.50
1:A:153:LYS:HE3	1:A:154:ASP:H	1.77	0.50
1:B:108:ASP:N	2:B:212:HOH:O	2.43	0.50
1:B:169:MSE:HB2	1:B:178:PRO:HG2	1.93	0.50
1:B:169:MSE:HE2	1:C:196:PHE:HZ	1.76	0.50
1:B:37:GLN:HB3	1:B:42:VAL:HA	1.94	0.50
1:B:25:TYR:CE2	1:B:38:ASN:HB2	2.47	0.50
1:B:124:ILE:HD12	1:B:125:VAL:N	2.27	0.50
1:C:3:LEU:HD12	1:C:4:PHE:H	1.77	0.50
1:C:12:ASP:OD2	1:D:49:ASN:HA	2.11	0.50
1:A:33:VAL:HG22	1:A:81:PHE:CE2	2.46	0.49
1:D:146:MSE:CE	1:D:171:GLU:HG3	2.41	0.49
1:A:25:TYR:CE2	1:A:38:ASN:HB2	2.48	0.49
1:B:153:LYS:HE3	1:B:154:ASP:H	1.76	0.49
1:C:37:GLN:HB3	1:C:42:VAL:HA	1.94	0.49
1:D:124:ILE:HD12	1:D:125:VAL:N	2.27	0.49
1:A:6:ASN:CG	1:A:9:ALA:HB3	2.32	0.49
1:B:86:ASP:OD2	1:B:87:ALA:N	2.41	0.49
1:D:4:PHE:HB3	1:D:15:PHE:HB2	1.93	0.49
1:D:62:ILE:HD12	2:D:244:HOH:O	2.13	0.49
1:C:9:ALA:O	1:C:128:ALA:HB2	2.11	0.49
1:C:138:VAL:HG11	1:C:184:MSE:HE2	1.93	0.49
1:D:169:MSE:HB2	1:D:178:PRO:HG2	1.94	0.49
1:A:169:MSE:HE3	1:A:174:LEU:CD2	2.37	0.49
1:D:25:TYR:CE2	1:D:38:ASN:HB2	2.48	0.48
1:C:66:GLU:O	1:C:70:GLN:HG3	2.14	0.48
1:C:103:LYS:NZ	1:C:103:LYS:HB3	2.29	0.48
1:D:138:VAL:HG11	1:D:184:MSE:HE2	1.95	0.48
1:A:1:MSE:HE2	1:A:1:MSE:H1	1.78	0.48
2:B:236:HOH:O	1:C:169:MSE:HG3	2.12	0.48
1:A:37:GLN:HB3	1:A:42:VAL:HA	1.95	0.48
1:C:169:MSE:HB2	1:C:178:PRO:HG2	1.96	0.48
1:B:1:MSE:HA	1:B:17:GLN:O	2.13	0.48
1:C:146:MSE:CE	1:C:171:GLU:HG3	2.43	0.48
1:C:47:ILE:HD11	1:C:50:ALA:CA	2.40	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:37:GLN:HB3	1:D:42:VAL:HA	1.96	0.47
1:A:8:GLU:CD	1:A:8:GLU:H	2.16	0.47
1:C:124:ILE:HD12	1:C:125:VAL:N	2.30	0.47
1:B:66:GLU:O	1:B:70:GLN:HG3	2.15	0.47
1:C:6:ASN:CG	1:C:9:ALA:HB3	2.35	0.47
1:C:107:ALA:O	1:C:108:ASP:HB3	2.15	0.47
1:B:1:MSE:HE2	1:B:18:ILE:HG12	1.96	0.47
1:D:8:GLU:CD	1:D:8:GLU:N	2.61	0.47
1:B:145:VAL:HG22	2:B:201:HOH:O	2.14	0.47
1:B:148:SER:HB2	2:B:219:HOH:O	2.15	0.47
1:C:138:VAL:CG1	1:C:184:MSE:HE2	2.45	0.47
1:D:101:LYS:HG3	1:D:113:LEU:CD2	2.45	0.47
2:A:237:HOH:O	1:B:5:TYR:HE1	1.97	0.47
1:B:107:ALA:O	1:B:108:ASP:HB3	2.15	0.47
1:A:1:MSE:HG2	1:B:64:LEU:HD11	1.97	0.46
1:A:107:ALA:O	1:A:108:ASP:HB3	2.16	0.46
1:A:117:VAL:O	1:A:118:ALA:HB3	2.15	0.46
1:B:169:MSE:HE3	1:B:174:LEU:CD2	2.37	0.46
1:B:9:ALA:O	1:B:128:ALA:HB2	2.15	0.46
1:A:8:GLU:HG3	1:A:181:LYS:HB3	1.98	0.46
1:B:86:ASP:CG	1:B:87:ALA:N	2.69	0.46
1:B:101:LYS:HG3	1:B:113:LEU:CD2	2.45	0.46
1:B:146:MSE:CE	1:B:171:GLU:HG3	2.45	0.46
1:C:5:TYR:OH	1:C:12:ASP:OD1	2.26	0.46
1:A:138:VAL:CG1	1:A:184:MSE:HE2	2.45	0.46
1:C:101:LYS:HG3	1:C:113:LEU:CD2	2.46	0.46
1:D:17:GLN:CD	1:D:150:MSE:HE3	2.36	0.46
1:A:124:ILE:HD12	1:A:125:VAL:N	2.31	0.46
1:A:174:LEU:HD23	1:A:178:PRO:HG3	1.98	0.46
1:D:107:ALA:O	1:D:108:ASP:HB3	2.16	0.46
1:A:8:GLU:HG3	1:A:181:LYS:CB	2.46	0.45
1:B:33:VAL:HG22	1:B:81:PHE:HE2	1.80	0.45
1:B:65:THR:HG23	2:B:226:HOH:O	2.15	0.45
1:D:174:LEU:HD23	1:D:178:PRO:HG3	1.98	0.45
1:B:138:VAL:CG1	1:B:184:MSE:HE2	2.46	0.45
1:C:47:ILE:C	1:C:47:ILE:HD12	2.37	0.45
1:D:183:ILE:HD12	1:D:183:ILE:C	2.37	0.45
1:B:124:ILE:HD12	1:B:125:VAL:O	2.16	0.45
1:C:174:LEU:HD23	1:C:178:PRO:HG3	1.99	0.45
1:A:183:ILE:C	1:A:183:ILE:HD12	2.37	0.44
1:D:88:ASP:CG	1:D:89:PHE:N	2.70	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:146:MSE:CE	1:A:171:GLU:HG3	2.47	0.44
1:C:117:VAL:O	1:C:118:ALA:HB3	2.17	0.44
1:C:146:MSE:HE2	1:C:165:MSE:SE	2.68	0.44
1:A:101:LYS:HG3	1:A:113:LEU:CD2	2.47	0.44
1:B:174:LEU:HD23	1:B:178:PRO:HG3	1.99	0.44
1:B:197:PHE:CE1	1:C:176:ASN:HB2	2.53	0.44
1:C:72:PHE:HE2	1:D:3:LEU:HD22	1.83	0.44
1:D:138:VAL:CG1	1:D:184:MSE:HE2	2.48	0.44
1:A:66:GLU:O	1:A:70:GLN:HG3	2.17	0.44
1:B:47:ILE:HD11	1:B:50:ALA:CA	2.42	0.44
1:C:103:LYS:HB3	1:C:103:LYS:HZ3	1.82	0.44
1:A:174:LEU:HA	1:A:175:PRO:HD3	1.86	0.43
1:D:118:ALA:HA	2:D:231:HOH:O	2.18	0.43
1:C:66:GLU:HA	1:C:89:PHE:HE1	1.83	0.43
1:D:35:GLU:HG3	1:D:45:TYR:CE1	2.53	0.43
1:D:66:GLU:O	1:D:70:GLN:HG3	2.19	0.43
1:D:33:VAL:HG22	1:D:81:PHE:HE2	1.83	0.43
1:A:50:ALA:N	2:A:237:HOH:O	2.48	0.43
1:B:39:ASP:HB3	2:B:248:HOH:O	2.18	0.43
1:B:117:VAL:O	1:B:118:ALA:HB3	2.18	0.43
1:D:97:TYR:OH	1:D:134:GLY:HA2	2.18	0.43
1:A:24:GLU:CD	1:A:24:GLU:N	2.68	0.43
1:B:124:ILE:HD12	1:B:125:VAL:C	2.38	0.43
1:A:41:GLU:HB3	1:B:20:PRO:HB3	2.01	0.43
1:C:8:GLU:HG3	1:C:181:LYS:CB	2.46	0.43
1:A:33:VAL:HG22	1:A:81:PHE:HE2	1.82	0.43
1:B:38:ASN:O	1:B:39:ASP:CB	2.66	0.43
1:B:61:HIS:O	1:B:62:ILE:C	2.57	0.43
1:C:33:VAL:HG22	1:C:81:PHE:HE2	1.82	0.43
1:A:68:LEU:HD23	1:A:68:LEU:HA	1.90	0.42
1:A:73:GLN:HE22	1:A:84:LYS:CA	2.30	0.42
1:B:131:VAL:HA	1:B:135:GLN:HE22	1.84	0.42
1:D:84:LYS:HG2	2:D:200:HOH:O	2.17	0.42
1:A:66:GLU:HA	1:A:89:PHE:CE1	2.54	0.42
1:B:36:ILE:HG23	1:B:44:GLY:C	2.40	0.42
1:D:49:ASN:O	1:D:52:ASN:OD1	2.37	0.42
1:D:61:HIS:N	2:D:228:HOH:O	2.52	0.42
1:C:138:VAL:HG11	1:C:184:MSE:CE	2.48	0.42
1:D:73:GLN:NE2	1:D:85:LEU:N	2.64	0.42
1:B:124:ILE:HD11	1:B:126:CYS:HB2	2.01	0.42
1:C:73:GLN:NE2	1:C:85:LEU:N	2.64	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:38:ASN:O	1:D:39:ASP:CB	2.65	0.42
1:C:68:LEU:HD23	1:C:68:LEU:HA	1.91	0.42
1:C:124:ILE:HD12	1:C:125:VAL:O	2.20	0.42
1:A:47:ILE:C	1:A:47:ILE:HD12	2.39	0.42
1:B:49:ASN:O	1:B:52:ASN:OD1	2.37	0.42
1:C:137:VAL:CG2	2:C:258:HOH:O	2.65	0.42
1:C:73:GLN:HE22	1:C:84:LYS:CA	2.29	0.42
1:A:132:GLU:H	1:A:135:GLN:NE2	2.18	0.42
1:C:146:MSE:HE3	1:C:171:GLU:HG3	2.01	0.42
1:A:73:GLN:NE2	1:A:85:LEU:N	2.67	0.42
1:B:183:ILE:HD12	1:B:183:ILE:C	2.41	0.42
1:A:13:VAL:HG22	1:B:48:PHE:CD2	2.54	0.41
1:B:104:HIS:HB3	1:B:107:ALA:HB3	2.02	0.41
1:B:47:ILE:HD12	1:B:47:ILE:C	2.40	0.41
1:C:183:ILE:C	1:C:183:ILE:HD12	2.39	0.41
1:A:7:LYS:N	2:A:235:HOH:O	2.52	0.41
1:A:67:THR:CG2	2:A:232:HOH:O	2.68	0.41
1:C:13:VAL:HG22	1:D:48:PHE:CD2	2.55	0.41
1:A:137:VAL:CG2	1:A:138:VAL:N	2.83	0.41
1:B:3:LEU:HD22	1:B:3:LEU:C	2.40	0.41
1:B:73:GLN:NE2	1:B:85:LEU:N	2.64	0.41
1:C:35:GLU:HG3	1:C:45:TYR:CE1	2.56	0.41
1:A:61:HIS:O	1:A:62:ILE:C	2.58	0.41
1:A:97:TYR:OH	1:A:134:GLY:HA2	2.20	0.41
1:A:131:VAL:HA	1:A:135:GLN:HE22	1.85	0.41
1:C:186:LEU:HB3	1:C:190:TYR:CD1	2.56	0.41
1:D:61:HIS:O	1:D:62:ILE:C	2.59	0.41
1:B:103:LYS:HB3	1:B:103:LYS:HZ3	1.86	0.41
1:B:196:PHE:CZ	1:C:169:MSE:HE2	2.40	0.41
1:D:117:VAL:O	1:D:118:ALA:HB3	2.21	0.41
1:D:177:ALA:HA	1:D:178:PRO:HD3	1.89	0.41
1:D:124:ILE:HD11	1:D:126:CYS:HB2	2.01	0.41
1:A:36:ILE:HG23	1:A:44:GLY:C	2.41	0.41
1:A:169:MSE:HE2	1:D:196:PHE:CZ	2.47	0.41
1:B:32:ASP:O	1:B:48:PHE:HD1	2.04	0.41
1:D:73:GLN:HE22	1:D:84:LYS:CA	2.28	0.41
1:A:35:GLU:HG3	1:A:45:TYR:CE1	2.55	0.41
1:A:38:ASN:O	1:A:39:ASP:CB	2.66	0.41
1:A:65:THR:HB	2:A:232:HOH:O	2.20	0.41
1:A:67:THR:HG22	2:A:232:HOH:O	2.20	0.41
1:B:25:TYR:CD1	1:B:36:ILE:HD11	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:73:GLN:HE22	1:B:84:LYS:CA	2.31	0.41
1:B:138:VAL:HG11	1:B:184:MSE:CE	2.50	0.41
1:C:6:ASN:ND2	1:C:171:GLU:OE2	2.53	0.41
1:C:49:ASN:O	1:C:52:ASN:OD1	2.38	0.41
1:C:61:HIS:O	1:C:62:ILE:C	2.58	0.41
1:C:137:VAL:CG2	1:C:138:VAL:N	2.84	0.41
1:D:25:TYR:CD1	1:D:36:ILE:HD11	2.56	0.41
1:D:124:ILE:HD12	1:D:125:VAL:C	2.41	0.41
1:D:158:ARG:NE	2:D:203:HOH:O	2.28	0.41
1:D:7:LYS:HB2	1:D:7:LYS:HE3	1.86	0.41
1:D:146:MSE:HE3	1:D:171:GLU:HG3	2.03	0.41
1:D:186:LEU:HB3	1:D:190:TYR:CD1	2.56	0.40
1:C:17:GLN:HE22	1:C:150:MSE:HG3	1.84	0.40
1:B:97:TYR:OH	1:B:134:GLY:HA2	2.21	0.40
1:C:131:VAL:HA	1:C:135:GLN:HE22	1.86	0.40
1:D:24:GLU:H	1:D:24:GLU:HG3	1.53	0.40
1:D:124:ILE:HD12	1:D:125:VAL:O	2.21	0.40
1:A:1:MSE:HG2	1:B:64:LEU:CD1	2.52	0.40
1:A:49:ASN:O	1:A:52:ASN:OD1	2.39	0.40
1:A:104:HIS:HB3	1:A:107:ALA:HB3	2.02	0.40
1:C:145:VAL:HG23	1:C:145:VAL:O	2.22	0.40
1:D:131:VAL:HA	1:D:135:GLN:HE22	1.85	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	191/199 (96%)	173 (91%)	16 (8%)	2 (1%)	15 37
1	B	191/199 (96%)	170 (89%)	18 (9%)	3 (2%)	9 24
1	C	191/199 (96%)	170 (89%)	15 (8%)	6 (3%)	4 9

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	D	191/199 (96%)	170 (89%)	18 (9%)	3 (2%)	9 24
All	All	764/796 (96%)	683 (89%)	67 (9%)	14 (2%)	8 21

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	62	ILE
1	B	62	ILE
1	B	88	ASP
1	C	62	ILE
1	D	62	ILE
1	C	21	THR
1	A	39	ASP
1	B	39	ASP
1	C	39	ASP
1	D	39	ASP
1	C	86	ASP
1	C	87	ALA
1	D	7	LYS
1	C	23	GLY

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	161/157 (102%)	145 (90%)	16 (10%)	8 18
1	B	161/157 (102%)	145 (90%)	16 (10%)	8 18
1	C	161/157 (102%)	145 (90%)	16 (10%)	8 18
1	D	161/157 (102%)	143 (89%)	18 (11%)	6 13
All	All	644/628 (102%)	578 (90%)	66 (10%)	7 17

All (66) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MSE
1	A	6	ASN
1	A	8	GLU
1	A	36	ILE
1	A	47	ILE
1	A	62	ILE
1	A	67	THR
1	A	76	ILE
1	A	85	LEU
1	A	112	VAL
1	A	117	VAL
1	A	124	ILE
1	A	138	VAL
1	A	160	VAL
1	A	172	LEU
1	A	188	ASP
1	B	3	LEU
1	B	19	ASN
1	B	36	ILE
1	B	47	ILE
1	B	62	ILE
1	B	67	THR
1	B	76	ILE
1	B	85	LEU
1	B	112	VAL
1	B	117	VAL
1	B	124	ILE
1	B	138	VAL
1	B	160	VAL
1	B	171	GLU
1	B	172	LEU
1	B	188	ASP
1	C	17	GLN
1	C	22	GLU
1	C	36	ILE
1	C	47	ILE
1	C	62	ILE
1	C	67	THR
1	C	76	ILE
1	C	85	LEU
1	C	86	ASP
1	C	112	VAL
1	C	117	VAL

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Mol	Chain	Res	Type
1	C	124	ILE
1	C	138	VAL
1	C	160	VAL
1	C	172	LEU
1	C	188	ASP
1	D	8	GLU
1	D	21	THR
1	D	22	GLU
1	D	24	GLU
1	D	36	ILE
1	D	47	ILE
1	D	62	ILE
1	D	67	THR
1	D	76	ILE
1	D	85	LEU
1	D	112	VAL
1	D	117	VAL
1	D	124	ILE
1	D	138	VAL
1	D	160	VAL
1	D	171	GLU
1	D	172	LEU
1	D	188	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	ASN
1	A	19	ASN
1	A	26	ASN
1	A	30	GLN
1	A	46	ASN
1	A	70	GLN
1	A	73	GLN
1	A	135	GLN
1	B	30	GLN
1	B	46	ASN
1	B	61	HIS
1	B	70	GLN
1	B	73	GLN
1	B	135	GLN
1	C	17	GLN

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Mol	Chain	Res	Type
1	C	30	GLN
1	C	38	ASN
1	C	46	ASN
1	C	70	GLN
1	C	73	GLN
1	C	123	GLN
1	C	135	GLN
1	D	30	GLN
1	D	46	ASN
1	D	73	GLN
1	D	135	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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	189/199 (94%)	0.25	6 (3%)	47	48	6, 20, 37, 51	0
1	B	189/199 (94%)	0.19	5 (2%)	56	57	4, 18, 36, 52	0
1	C	189/199 (94%)	0.33	11 (5%)	23	22	5, 18, 35, 52	0
1	D	189/199 (94%)	0.30	10 (5%)	26	25	5, 20, 36, 51	0
All	All	756/796 (94%)	0.27	32 (4%)	36	35	4, 19, 37, 52	0

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	61	HIS	5.6
1	C	61	HIS	5.5
1	A	61	HIS	5.3
1	D	61	HIS	5.3
1	D	62	ILE	4.5
1	C	21	THR	4.2
1	C	62	ILE	3.4
1	D	39	ASP	3.3
1	C	57	THR	3.3
1	C	39	ASP	3.2
1	B	86	ASP	3.2
1	B	62	ILE	3.1
1	A	62	ILE	3.0
1	A	21	THR	2.8
1	B	63	LYS	2.7
1	D	119	THR	2.6
1	D	88	ASP	2.5
1	A	63	LYS	2.5
1	C	48	PHE	2.4
1	C	86	ASP	2.4
1	C	66	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	21	THR	2.3
1	C	30	GLN	2.2
1	D	63	LYS	2.2
1	D	189	ASP	2.2
1	C	176	ASN	2.2
1	D	179	GLN	2.1
1	A	107	ALA	2.1
1	D	145	VAL	2.1
1	C	20	PRO	2.1
1	D	177	ALA	2.0
1	A	189	ASP	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.