Full wwPDB X-ray Structure Validation Report (i)

May 29, 2020 – 09:17 am BST

PDB ID	:	1NF2
Title	:	X-ray crystal structure of TM0651 from Thermotoga maritima
Authors	:	Shin, D.H.; Berkeley Structural Genomics Center (BSGC)
Deposited on	:	2002-12-12
Resolution	:	2.20 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 following versions of software and data (see references (i)) were used in the production of this report:

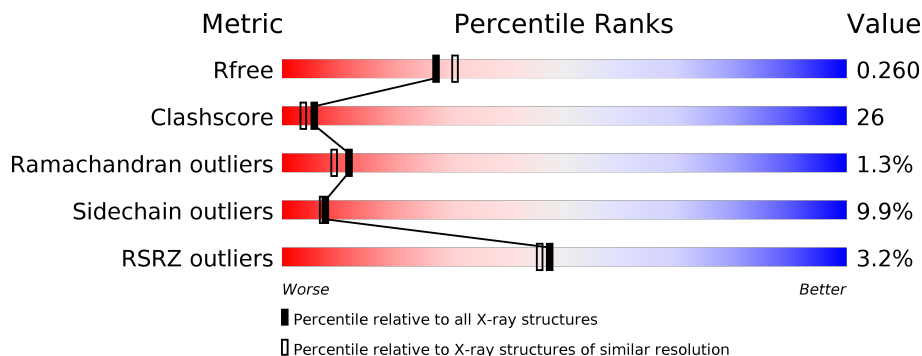|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	Percentile Ranks	Value
Rfree		0.260
Clashscore		26
Ramachandran outliers		1.3%
Sidechain outliers		9.9%
RSRZ outliers		3.2%

Worse   Better

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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 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	268	3%; 57% 36% 6% •
1	B	268	4%; 59% 32% 7% •
1	C	268	2%; 58% 36% 6%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 7085 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 phosphatase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	267	Total	C	N	O	S	0	0	0
			2186	1399	360	419	8			
1	B	267	Total	C	N	O	S	0	0	0
			2186	1399	360	419	8			
1	C	267	Total	C	N	O	S	0	0	0
			2186	1399	360	419	8			

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).
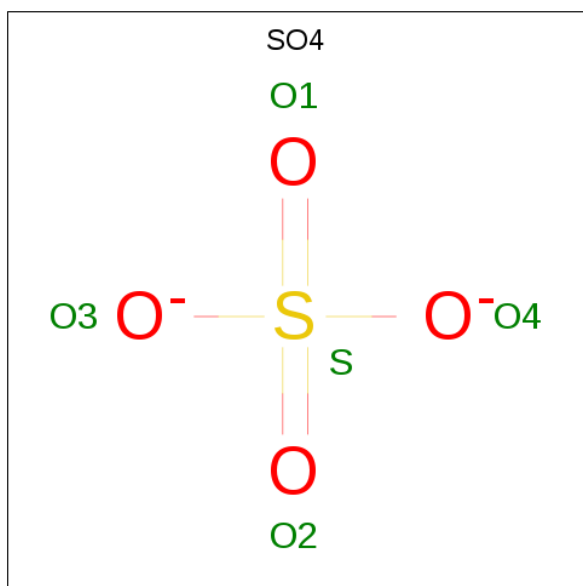
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total 5	O 4	S 1	0	0
2	C	1	Total 5	O 4	S 1	0	0
2	C	1	Total 5	O 4	S 1	0	0

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total 1	Mg 1	0	0
3	A	1	Total 1	Mg 1	0	0
3	C	1	Total 1	Mg 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	157	Total 157	O 157	0	0
4	B	168	Total 168	O 168	0	0
4	C	169	Total 169	O 169	0	0

3 Residue-property plots ⓘ

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: phosphatase
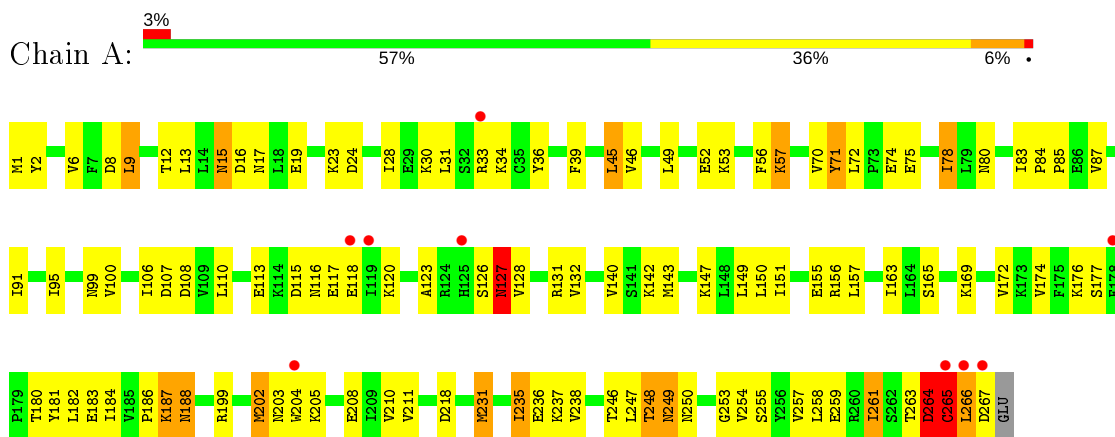
- Molecule 1: phosphatase
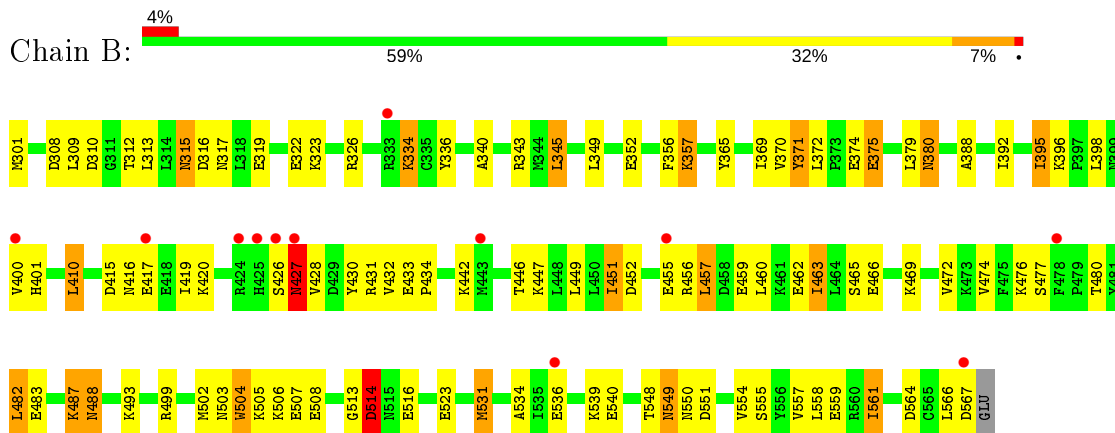
- Molecule 1: phosphatase
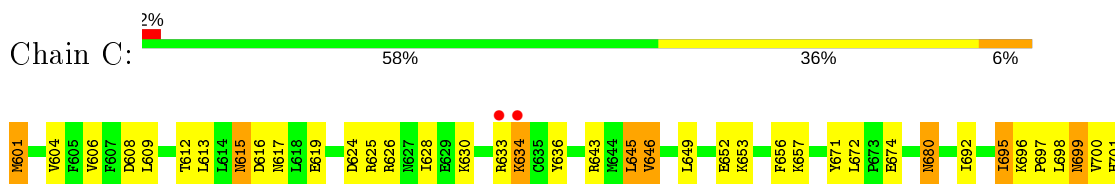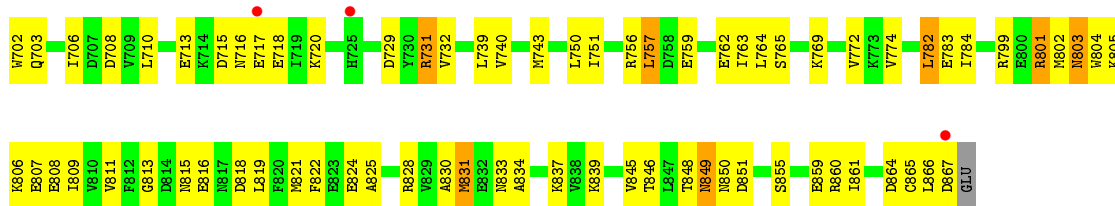
4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	158.41Å 93.88Å 98.42Å 90.00° 127.91° 90.00°	Depositor
Resolution (Å)	19.95 – 2.20 49.21 – 2.20	Depositor EDS
% Data completeness (in resolution range)	97.2 (19.95-2.20) 96.8 (49.21-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	3.24 (at 2.20Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.217 , 0.263 0.216 , 0.260	Depositor DCC
R_{free} test set	5886 reflections (10.19%)	wwPDB-VP
Wilson B-factor (Å^2)	25.8	Xtriage
Anisotropy	0.113	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 66.1	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.017 for -h+k-l,-l,-k 0.000 for -h-k-l,l,k 0.022 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	7085	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.57% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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)

Bond lengths and bond angles in the following residue types are not validated in this section: MG, SO4

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	1/2224 (0.0%)	0.64	0/3002
1	B	0.39	1/2224 (0.0%)	0.63	1/3002 (0.0%)
1	C	0.42	2/2224 (0.1%)	0.66	2/3002 (0.1%)
All	All	0.39	4/6672 (0.1%)	0.64	3/9006 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	831	MET	CG-SD	-7.51	1.61	1.81
1	A	231	MET	SD-CE	-6.33	1.42	1.77
1	B	531	MET	SD-CE	-6.21	1.43	1.77
1	C	821	MET	SD-CE	-5.22	1.48	1.77

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	831	MET	CA-CB-CG	-6.82	101.71	113.30
1	B	551	ASP	N-CA-C	-5.59	95.90	111.00
1	C	851	ASP	N-CA-C	-5.11	97.19	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2186	0	2207	118	0
1	B	2186	0	2204	105	0
1	C	2186	0	2204	114	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	1	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
4	A	157	0	0	8	0
4	B	168	0	0	9	0
4	C	169	0	0	8	1
All	All	7085	0	6615	337	1

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 26.

All (337) 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:C:706:ILE:HG21	1:C:743:MET:HE3	1.20	1.15
1:C:805:LYS:HE3	1:C:807:GLU:HB3	1.27	1.14
1:C:848:THR:HG22	1:C:850:ASN:H	1.02	1.11
1:B:548:THR:HG22	1:B:550:ASN:H	1.11	1.06
1:C:801:ARG:HD2	1:C:802:MET:HE2	1.38	1.05
1:B:499:ARG:HG3	1:B:504:TRP:HB2	1.37	1.04
1:A:95:ILE:HD11	1:A:150:LEU:HD21	1.41	1.00
1:C:833:ASN:HB3	4:C:1289:HOH:O	1.61	0.98
1:A:199:ARG:HG3	1:A:204:TRP:HB2	1.48	0.94
1:C:716:ASN:HD21	1:C:718:GLU:HB2	1.36	0.90
1:A:248:THR:HG23	1:A:250:ASN:H	1.36	0.90
1:C:848:THR:HG22	1:C:850:ASN:N	1.88	0.88
1:A:157:LEU:HD23	1:A:176:LYS:HE3	1.57	0.86
1:B:401:HIS:HD2	1:B:416:ASN:HD21	1.21	0.86
1:A:115:ASP:HB2	1:A:132:VAL:HG11	1.59	0.85
1:B:392:ILE:O	1:B:396:LYS:HG3	1.80	0.81
1:B:400:VAL:HG12	1:B:456:ARG:NH2	1.97	0.80
1:A:57:LYS:HE3	1:A:57:LYS:H	1.47	0.79
1:B:401:HIS:CD2	1:B:416:ASN:HD21	1.99	0.79
1:A:34:LYS:HD2	1:A:265:CYS:HA	1.65	0.78
1:A:46:VAL:HG13	1:A:108:ASP:OD2	1.84	0.77
1:B:549:ASN:H	1:B:549:ASN:HD22	1.30	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:646:VAL:HG22	1:C:708:ASP:OD2	1.86	0.76
1:A:31:LEU:HD11	1:A:258:LEU:HD11	1.69	0.75
1:A:126:SER:C	1:A:127:ASN:HD22	1.91	0.75
1:C:801:ARG:HD2	1:C:802:MET:CE	2.17	0.74
1:C:695:ILE:CD1	1:C:750:LEU:HD21	2.17	0.74
1:C:716:ASN:ND2	1:C:718:GLU:H	1.84	0.74
1:C:706:ILE:CG2	1:C:743:MET:HE3	2.11	0.74
1:A:16:ASP:H	1:A:250:ASN:ND2	1.86	0.73
1:C:813:GLY:O	4:C:1414:HOH:O	2.06	0.73
1:B:426:SER:C	1:B:427:ASN:HD22	1.92	0.73
1:C:849:ASN:HD22	1:C:849:ASN:H	1.34	0.73
1:B:316:ASP:H	1:B:550:ASN:HD21	1.35	0.73
1:A:116:ASN:ND2	1:A:118:GLU:HB2	2.04	0.72
1:B:365:TYR:CD2	1:B:369:ILE:HD13	2.24	0.72
1:A:188:ASN:H	1:A:188:ASN:ND2	1.88	0.72
1:B:415:ASP:HB2	1:B:432:VAL:HG11	1.73	0.71
1:B:400:VAL:HG12	1:B:456:ARG:HH22	1.56	0.71
1:A:127:ASN:N	1:A:127:ASN:HD22	1.85	0.71
1:B:505:LYS:HG2	1:B:508:GLU:HG2	1.71	0.71
1:A:248:THR:CG2	1:A:250:ASN:H	2.03	0.71
1:C:831:MET:HG2	1:C:846:THR:CG2	2.20	0.70
1:A:70:VAL:HG12	1:A:78:ILE:HD11	1.71	0.70
1:A:235:ILE:HD11	1:A:238:VAL:HG23	1.72	0.70
1:A:199:ARG:CG	1:A:204:TRP:HB2	2.22	0.70
1:A:165:SER:O	1:A:169:LYS:HB2	1.92	0.69
1:B:465:SER:O	1:B:469:LYS:HB2	1.93	0.69
1:C:695:ILE:HD11	1:C:750:LEU:HD21	1.73	0.68
1:B:548:THR:HG22	1:B:550:ASN:N	1.97	0.68
1:C:822:PHE:HB3	1:C:828:ARG:HD3	1.73	0.68
1:A:15:ASN:HD21	1:A:19:GLU:HG2	1.57	0.68
1:A:15:ASN:C	1:A:15:ASN:HD22	1.97	0.68
1:A:15:ASN:ND2	1:A:17:ASN:H	1.91	0.68
1:A:127:ASN:HB2	4:A:1426:HOH:O	1.93	0.67
1:A:16:ASP:H	1:A:250:ASN:HD21	1.41	0.67
1:C:604:VAL:HB	1:C:809:ILE:HD13	1.77	0.67
1:C:830:ALA:O	1:C:845:VAL:HA	1.95	0.67
1:B:566:LEU:O	1:B:567:ASP:HB2	1.92	0.67
1:C:757:LEU:HG	1:C:782:LEU:HB2	1.77	0.67
1:C:765:SER:O	1:C:769:LYS:HB2	1.95	0.67
1:C:692:ILE:O	1:C:696:LYS:HG3	1.95	0.67
1:A:106:ILE:HD11	1:A:140:VAL:HG22	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:316:ASP:H	1:B:550:ASN:ND2	1.92	0.66
1:A:249:ASN:HD22	1:A:249:ASN:H	1.42	0.66
1:B:372:LEU:HD12	1:B:375:GLU:HG3	1.77	0.66
1:B:548:THR:HG21	4:B:1095:HOH:O	1.94	0.66
1:A:188:ASN:HD22	1:A:188:ASN:H	1.41	0.66
1:A:205:LYS:HG2	1:A:208:GLU:HG2	1.77	0.66
1:C:799:ARG:HG2	1:C:804:TRP:HB2	1.78	0.66
1:A:45:LEU:HD22	1:A:49:LEU:HG	1.79	0.65
1:B:315:ASN:C	1:B:315:ASN:HD22	2.00	0.65
1:C:713:GLU:HB2	4:C:1166:HOH:O	1.97	0.65
1:A:236:GLU:H	1:A:236:GLU:CD	2.00	0.65
1:B:452:ASP:HB3	1:B:457:LEU:HD13	1.79	0.65
1:A:127:ASN:ND2	1:A:127:ASN:N	2.45	0.65
1:A:188:ASN:HD22	1:A:188:ASN:N	1.95	0.64
1:B:315:ASN:ND2	1:B:317:ASN:H	1.95	0.64
1:B:455:GLU:HB2	4:B:1034:HOH:O	1.98	0.64
1:C:715:ASP:HB2	1:C:732:VAL:HG11	1.81	0.63
1:C:804:TRP:HB3	1:C:809:ILE:HD11	1.80	0.63
1:B:426:SER:O	1:B:428:VAL:HG13	1.99	0.62
1:C:802:MET:O	1:C:803:ASN:HB3	1.99	0.62
1:A:236:GLU:HG2	4:A:1418:HOH:O	2.00	0.62
1:A:235:ILE:HD13	1:A:235:ILE:H	1.63	0.62
1:A:210:VAL:HG21	1:A:261:ILE:CD1	2.29	0.62
1:A:6:VAL:HB	1:A:211:VAL:HG12	1.82	0.61
1:A:15:ASN:ND2	1:A:19:GLU:HG2	2.15	0.61
1:A:12:THR:HA	1:A:231:MET:HE2	1.81	0.61
1:A:247:LEU:HB2	1:A:253:GLY:HA2	1.82	0.61
1:A:24:ASP:O	1:A:28:ILE:HG12	2.00	0.61
1:B:536:GLU:O	1:B:540:GLU:HG3	2.01	0.61
1:C:763:ILE:HG13	1:C:764:LEU:N	2.15	0.61
1:C:615:ASN:HD21	1:C:619:GLU:HG2	1.66	0.61
1:C:695:ILE:HD11	1:C:764:LEU:HD11	1.82	0.61
1:A:116:ASN:HD21	1:A:118:GLU:HB2	1.66	0.60
1:A:264:ASP:O	1:A:265:CYS:O	2.18	0.60
1:A:53:LYS:HA	1:A:56:PHE:O	2.01	0.60
1:A:118:GLU:HA	4:A:1360:HOH:O	2.01	0.60
1:A:78:ILE:H	1:A:78:ILE:HD13	1.66	0.60
1:C:799:ARG:HH12	1:C:806:LYS:NZ	1.99	0.60
1:C:616:ASP:H	1:C:850:ASN:ND2	1.99	0.59
1:C:624:ASP:O	1:C:628:ILE:HD13	2.02	0.59
1:C:633:ARG:O	1:C:634:LYS:HB3	2.01	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:417:GLU:H	1:B:417:GLU:CD	2.05	0.59
1:A:33:ARG:O	1:A:34:LYS:HB3	2.01	0.59
1:C:866:LEU:O	1:C:867:ASP:HB2	2.02	0.59
1:A:123:ALA:O	1:A:127:ASN:HA	2.02	0.59
1:A:95:ILE:HD11	1:A:150:LEU:CD2	2.26	0.59
1:C:615:ASN:ND2	1:C:619:GLU:H	2.01	0.59
1:B:451:ILE:HD12	1:B:452:ASP:N	2.18	0.59
1:B:431:ARG:HH11	1:B:431:ARG:HG3	1.67	0.59
1:B:555:SER:O	1:B:559:GLU:HG3	2.03	0.58
1:C:645:LEU:HD22	1:C:649:LEU:HG	1.84	0.58
1:B:301:MET:HE3	1:B:564:ASP:HB2	1.85	0.58
1:B:315:ASN:HD22	1:B:317:ASN:H	1.52	0.58
1:C:739:LEU:HG	1:C:743:MET:HE2	1.83	0.58
1:A:255:SER:O	1:A:259:GLU:HG3	2.04	0.57
1:B:312:THR:HG23	1:B:531:MET:CE	2.34	0.57
1:C:822:PHE:O	1:C:828:ARG:NH1	2.37	0.57
1:A:208:GLU:HB3	4:A:1331:HOH:O	2.05	0.57
1:B:513:GLY:O	1:B:531:MET:HG2	2.05	0.56
1:B:457:LEU:HG	1:B:482:LEU:HB2	1.87	0.56
1:A:235:ILE:HD11	1:A:238:VAL:CG2	2.35	0.56
1:B:301:MET:CE	1:B:564:ASP:HB2	2.34	0.56
1:B:352:GLU:O	1:B:356:PHE:O	2.23	0.56
1:B:374:GLU:HG2	1:B:375:GLU:H	1.71	0.56
1:B:312:THR:HG23	1:B:531:MET:HE2	1.88	0.56
1:B:374:GLU:HG2	1:B:375:GLU:N	2.22	0.55
1:A:165:SER:HA	1:A:174:VAL:HG21	1.89	0.55
1:A:265:CYS:C	1:A:267:ASP:H	2.11	0.55
1:A:177:SER:HB3	1:A:183:GLU:OE2	2.07	0.54
1:A:30:LYS:HB3	1:A:266:LEU:HD21	1.89	0.54
1:C:716:ASN:ND2	1:C:718:GLU:OE1	2.40	0.54
1:C:848:THR:CG2	1:C:849:ASN:N	2.70	0.54
1:B:462:GLU:O	1:B:466:GLU:HG2	2.07	0.54
1:C:653:LYS:HA	1:C:656:PHE:O	2.08	0.54
1:B:505:LYS:CG	1:B:508:GLU:HG2	2.36	0.54
1:C:615:ASN:HD22	1:C:615:ASN:C	2.11	0.53
1:B:536:GLU:CD	1:B:536:GLU:H	2.10	0.53
1:B:457:LEU:HD23	1:B:476:LYS:HE3	1.90	0.53
1:A:12:THR:HG23	1:A:231:MET:CE	2.38	0.53
1:B:312:THR:HA	1:B:531:MET:HE2	1.90	0.53
1:A:100:VAL:HG12	1:A:156:ARG:HH22	1.73	0.53
1:C:855:SER:O	1:C:859:GLU:HG3	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:695:ILE:HD13	1:C:750:LEU:HD21	1.91	0.53
1:C:701:HIS:ND1	1:C:751:ILE:HG22	2.24	0.52
1:A:34:LYS:CD	1:A:265:CYS:HA	2.38	0.52
1:B:410:LEU:HD13	1:B:430:TYR:HB3	1.91	0.52
1:B:310:ASP:OD2	1:B:343:ARG:NH1	2.43	0.52
1:B:549:ASN:N	1:B:549:ASN:HD22	2.05	0.52
1:C:799:ARG:HH12	1:C:806:LYS:HZ1	1.58	0.52
1:A:74:GLU:HG2	1:A:75:GLU:N	2.24	0.52
1:C:860:ARG:HD3	4:C:1142:HOH:O	2.08	0.52
1:A:74:GLU:HG2	1:A:75:GLU:HG2	1.92	0.51
1:B:380:ASN:ND2	4:B:1008:HOH:O	2.41	0.51
1:C:606:VAL:HB	1:C:811:VAL:HG12	1.93	0.51
1:A:9:LEU:HD11	1:A:39:PHE:HD2	1.75	0.51
1:B:474:VAL:O	1:B:474:VAL:HG23	2.11	0.51
1:C:616:ASP:H	1:C:850:ASN:HD21	1.58	0.51
1:A:52:GLU:O	1:A:56:PHE:O	2.29	0.51
1:C:803:ASN:O	1:C:803:ASN:CG	2.48	0.51
1:A:210:VAL:HG21	1:A:261:ILE:HD12	1.91	0.50
1:C:700:VAL:HG12	1:C:756:ARG:NH2	2.27	0.50
1:B:374:GLU:N	1:B:374:GLU:OE2	2.39	0.50
1:A:265:CYS:C	1:A:267:ASP:N	2.65	0.50
1:B:400:VAL:HG11	1:B:460:LEU:HD11	1.93	0.50
1:A:70:VAL:O	1:A:78:ILE:HD13	2.11	0.50
1:C:626:ARG:CB	1:C:626:ARG:HH11	2.24	0.50
1:C:848:THR:HG22	1:C:849:ASN:N	2.26	0.50
1:C:718:GLU:HG2	1:C:751:ILE:HG23	1.93	0.49
1:C:831:MET:HG2	1:C:846:THR:HG22	1.92	0.49
1:B:506:LYS:HD2	4:B:1231:HOH:O	2.11	0.49
1:A:205:LYS:CG	1:A:208:GLU:HG2	2.41	0.49
1:A:95:ILE:CD1	1:A:150:LEU:HD21	2.28	0.49
1:B:345:LEU:HD22	1:B:349:LEU:HG	1.94	0.49
1:C:636:TYR:CD2	1:C:804:TRP:CH2	3.00	0.49
1:A:30:LYS:HB3	1:A:266:LEU:CD2	2.43	0.49
1:B:315:ASN:ND2	1:B:319:GLU:H	2.11	0.49
1:C:672:LEU:HD11	1:C:802:MET:CE	2.43	0.49
1:B:548:THR:CG2	1:B:549:ASN:N	2.76	0.48
1:C:849:ASN:N	1:C:849:ASN:HD22	2.05	0.48
1:B:469:LYS:O	1:B:487:LYS:HE2	2.13	0.48
1:B:548:THR:HG22	1:B:549:ASN:N	2.28	0.48
1:C:716:ASN:HD21	1:C:718:GLU:CB	2.18	0.48
1:C:803:ASN:O	1:C:803:ASN:OD1	2.32	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:848:THR:HG23	1:C:849:ASN:HD22	1.78	0.48
1:C:680:ASN:ND2	4:C:1029:HOH:O	2.45	0.48
1:A:131:ARG:HH11	1:A:131:ARG:HG3	1.78	0.48
1:B:343:ARG:HG3	1:B:343:ARG:HH11	1.77	0.48
1:B:557:VAL:O	1:B:561:ILE:HG23	2.14	0.48
1:C:698:LEU:N	1:C:698:LEU:HD12	2.29	0.48
1:C:731:ARG:HH11	1:C:731:ARG:HG3	1.78	0.47
1:A:15:ASN:HB2	1:A:250:ASN:HD22	1.77	0.47
1:B:395:ILE:HD12	1:B:400:VAL:CG2	2.43	0.47
1:B:395:ILE:HD12	1:B:400:VAL:HG21	1.97	0.47
1:A:151:ILE:HD12	1:A:180:THR:O	2.14	0.47
1:C:608:ASP:OD1	1:C:818:ASP:OD1	2.33	0.47
1:A:100:VAL:HG12	1:A:156:ARG:NH2	2.29	0.47
1:A:249:ASN:HD22	1:A:249:ASN:N	2.11	0.47
1:B:370:VAL:HB	1:B:379:LEU:HB3	1.96	0.47
1:B:419:ILE:HG23	1:B:420:LYS:N	2.29	0.47
1:B:549:ASN:H	1:B:549:ASN:ND2	2.06	0.47
1:A:117:GLU:H	1:A:117:GLU:CD	2.18	0.47
1:C:634:LYS:HB2	1:C:634:LYS:NZ	2.29	0.47
1:C:696:LYS:HB2	1:C:697:PRO:HD3	1.97	0.47
1:C:652:GLU:O	1:C:656:PHE:O	2.33	0.47
1:A:8:ASP:OD1	1:A:218:ASP:OD1	2.32	0.47
1:A:174:VAL:HG23	1:A:174:VAL:O	2.15	0.46
1:B:505:LYS:HE3	1:B:507:GLU:HB3	1.97	0.46
1:A:15:ASN:C	1:A:15:ASN:ND2	2.68	0.46
1:B:365:TYR:HD2	1:B:369:ILE:HD13	1.77	0.46
1:A:100:VAL:HB	4:A:1267:HOH:O	2.14	0.46
1:C:811:VAL:HG13	1:C:825:ALA:HB2	1.97	0.46
1:A:149:LEU:C	1:A:149:LEU:HD23	2.36	0.46
1:A:15:ASN:ND2	1:A:19:GLU:H	2.13	0.46
1:A:202:MET:HG2	1:A:204:TRP:CZ2	2.50	0.46
1:A:23:LYS:NZ	1:A:23:LYS:HB2	2.31	0.46
1:A:116:ASN:O	1:A:120:LYS:HG3	2.15	0.46
1:B:334:LYS:HG3	1:B:334:LYS:O	2.15	0.46
1:B:516:GLU:HB2	4:B:1304:HOH:O	2.14	0.46
1:C:805:LYS:CE	1:C:807:GLU:HB3	2.20	0.46
1:A:106:ILE:HD11	1:A:140:VAL:CG2	2.44	0.46
1:A:118:GLU:HB3	1:A:151:ILE:HG12	1.96	0.46
1:B:323:LYS:HE2	4:B:1425:HOH:O	2.16	0.46
1:B:417:GLU:CD	1:B:417:GLU:N	2.70	0.45
1:C:695:ILE:CD1	1:C:764:LEU:HD11	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:626:ARG:HB2	1:C:626:ARG:NH1	2.31	0.45
1:A:265:CYS:O	1:A:267:ASP:N	2.50	0.45
1:A:87:VAL:O	1:A:91:ILE:HG13	2.17	0.45
1:C:706:ILE:HG21	1:C:743:MET:CE	2.14	0.45
1:C:698:LEU:N	1:C:698:LEU:CD1	2.79	0.45
1:C:626:ARG:HB2	1:C:626:ARG:HH11	1.81	0.45
1:C:692:ILE:HD13	1:C:702:TRP:CH2	2.51	0.45
1:B:388:ALA:O	1:B:392:ILE:HD13	2.17	0.45
1:A:2:TYR:HB2	1:A:261:ILE:HD11	1.98	0.45
1:A:57:LYS:HE3	1:A:57:LYS:N	2.25	0.45
1:B:343:ARG:CG	1:B:343:ARG:HH11	2.30	0.44
1:B:427:ASN:N	1:B:427:ASN:HD22	2.15	0.44
1:B:401:HIS:ND1	1:B:451:ILE:HG23	2.32	0.44
1:C:739:LEU:HG	1:C:743:MET:CE	2.47	0.44
1:A:131:ARG:NE	4:A:1019:HOH:O	2.49	0.44
1:C:716:ASN:ND2	1:C:718:GLU:N	2.61	0.44
1:A:1:MET:HE2	1:A:263:THR:C	2.38	0.44
1:B:416:ASN:O	1:B:420:LYS:HG3	2.18	0.44
1:A:184:ILE:HD12	1:A:184:ILE:N	2.32	0.44
1:B:426:SER:O	1:B:427:ASN:C	2.56	0.44
1:A:248:THR:CG2	1:A:250:ASN:HB2	2.48	0.44
1:B:427:ASN:HB2	4:B:1192:HOH:O	2.17	0.44
1:C:615:ASN:HB2	1:C:850:ASN:HD22	1.82	0.44
1:C:646:VAL:CG2	1:C:708:ASP:OD2	2.62	0.44
1:A:12:THR:HG23	1:A:231:MET:HE1	1.99	0.44
1:C:604:VAL:HB	1:C:809:ILE:CD1	2.47	0.44
1:C:608:ASP:O	1:C:612:THR:HB	2.18	0.43
1:B:415:ASP:O	1:B:420:LYS:HE2	2.18	0.43
1:B:442:LYS:O	1:B:442:LYS:HG3	2.17	0.43
1:B:506:LYS:NZ	1:B:523:GLU:O	2.51	0.43
1:C:701:HIS:ND1	1:C:751:ILE:CG2	2.81	0.43
1:C:716:ASN:O	1:C:720:LYS:HG3	2.18	0.43
1:C:866:LEU:N	1:C:866:LEU:HD22	2.33	0.43
1:A:264:ASP:C	1:A:265:CYS:O	2.56	0.43
1:A:84:PRO:HA	1:A:85:PRO:HD3	1.95	0.43
1:B:308:ASP:HA	1:B:340:ALA:O	2.18	0.43
1:C:643:ARG:NH2	4:C:1270:HOH:O	2.51	0.43
1:C:784:ILE:HD12	1:C:784:ILE:N	2.33	0.43
1:A:165:SER:CA	1:A:174:VAL:HG21	2.47	0.43
1:C:717:GLU:CD	1:C:717:GLU:H	2.20	0.43
1:C:732:VAL:HG23	1:C:732:VAL:O	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:334:LYS:HB2	1:B:334:LYS:NZ	2.33	0.43
1:C:816:GLU:OE2	1:C:837:LYS:HD3	2.18	0.43
1:C:831:MET:HG2	1:C:846:THR:HG23	2.01	0.43
1:A:57:LYS:N	1:A:57:LYS:CD	2.82	0.43
1:A:57:LYS:H	1:A:57:LYS:CE	2.26	0.43
1:B:554:VAL:HG12	1:B:558:LEU:HD22	1.99	0.43
1:C:865:CYS:O	1:C:866:LEU:HB2	2.19	0.43
1:B:315:ASN:HB2	1:B:550:ASN:HD22	1.83	0.42
1:B:566:LEU:O	1:B:567:ASP:CB	2.62	0.42
1:C:625:ARG:NH1	4:C:1038:HOH:O	2.49	0.42
1:C:601:MET:HG2	1:C:864:ASP:N	2.34	0.42
1:B:488:ASN:HB2	1:B:493:LYS:HE2	2.01	0.42
1:A:155:GLU:OE2	1:A:155:GLU:HA	2.19	0.42
1:C:806:LYS:HE3	1:C:824:GLU:HA	2.01	0.42
1:B:326:ARG:HD3	4:B:1107:HOH:O	2.20	0.42
1:A:254:VAL:HG23	4:A:1025:HOH:O	2.20	0.42
1:C:626:ARG:O	1:C:630:LYS:HG3	2.19	0.42
1:C:799:ARG:NH1	1:C:824:GLU:OE1	2.53	0.42
1:C:849:ASN:ND2	1:C:849:ASN:H	2.10	0.42
1:C:765:SER:HB2	1:C:774:VAL:CG2	2.50	0.42
1:A:126:SER:O	1:A:128:VAL:HG13	2.19	0.42
1:A:36:TYR:CD2	1:A:204:TRP:CH2	3.08	0.42
1:C:615:ASN:ND2	1:C:617:ASN:H	2.17	0.42
1:C:819:LEU:HD12	1:C:819:LEU:HA	1.93	0.42
1:B:375:GLU:HG2	1:B:375:GLU:H	1.55	0.42
1:C:706:ILE:HD11	1:C:740:VAL:HG22	2.02	0.42
1:A:237:LYS:HE2	4:A:1433:HOH:O	2.20	0.42
1:A:72:LEU:HD12	1:A:75:GLU:HG3	2.00	0.42
1:B:505:LYS:HG2	1:B:508:GLU:CG	2.44	0.42
1:C:626:ARG:NH1	2:C:881:SO4:O1	2.52	0.42
1:B:315:ASN:ND2	1:B:315:ASN:C	2.72	0.41
1:C:626:ARG:NE	4:C:1023:HOH:O	2.48	0.41
1:C:674:GLU:OE2	1:C:674:GLU:N	2.40	0.41
1:A:2:TYR:CB	1:A:261:ILE:HD11	2.51	0.41
1:B:477:SER:HB3	1:B:483:GLU:OE2	2.19	0.41
1:B:451:ILE:CD1	1:B:480:THR:HB	2.50	0.41
1:A:78:ILE:N	1:A:78:ILE:HD13	2.34	0.41
1:B:371:TYR:CD1	1:B:371:TYR:C	2.93	0.41
1:B:449:LEU:HD23	1:B:449:LEU:C	2.41	0.41
1:C:701:HIS:HE1	1:C:703:GLN:OE1	2.03	0.41
1:A:177:SER:OG	1:A:181:TYR:HB2	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:357:LYS:N	1:B:357:LYS:HD3	2.36	0.41
1:B:514:ASP:HA	1:B:534:ALA:HB2	2.02	0.41
1:B:558:LEU:HA	1:B:561:ILE:HD12	2.02	0.41
1:A:264:ASP:HB3	1:A:265:CYS:H	1.76	0.41
1:B:459:GLU:O	1:B:463:ILE:HG23	2.21	0.41
1:C:750:LEU:HD22	1:C:782:LEU:HD13	2.03	0.41
1:A:142:LYS:O	1:A:142:LYS:CG	2.69	0.41
1:A:74:GLU:N	1:A:74:GLU:OE2	2.47	0.41
1:B:322:GLU:O	1:B:326:ARG:HG3	2.21	0.41
1:B:374:GLU:H	1:B:374:GLU:CD	2.22	0.41
1:C:783:GLU:C	1:C:784:ILE:HD12	2.41	0.41
1:C:859:GLU:O	1:C:860:ARG:HD2	2.21	0.41
1:A:57:LYS:N	1:A:57:LYS:HD3	2.36	0.41
1:C:699:ASN:O	1:C:756:ARG:NH2	2.54	0.41
1:A:186:PRO:O	1:A:187:LYS:O	2.38	0.41
1:A:246:THR:HB	1:A:257:VAL:CG2	2.51	0.41
1:A:71:TYR:CD1	1:A:71:TYR:C	2.95	0.41
1:A:83:ILE:CD1	1:A:147:LYS:HA	2.51	0.40
1:A:248:THR:HG23	1:A:249:ASN:N	2.36	0.40
1:B:336:TYR:CD2	1:B:504:TRP:CH2	3.09	0.40
1:B:433:GLU:HA	1:B:434:PRO:HD2	1.95	0.40
1:B:536:GLU:HG2	4:B:1277:HOH:O	2.21	0.40
1:C:834:ALA:O	1:C:839:LYS:HD2	2.21	0.40
1:A:266:LEU:O	1:A:267:ASP:HB2	2.21	0.40
1:B:308:ASP:O	1:B:312:THR:HB	2.21	0.40
1:C:759:GLU:O	1:C:762:GLU:HB3	2.21	0.40
1:C:805:LYS:O	1:C:808:GLU:HG2	2.21	0.40
1:B:446:THR:O	1:B:447:LYS:HB3	2.21	0.40

All (1) 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)
4:C:1457:HOH:O	4:C:1457:HOH:O[2_656]	2.07	0.13

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	265/268 (99%)	244 (92%)	15 (6%)	6 (2%)	6	3
1	B	265/268 (99%)	243 (92%)	19 (7%)	3 (1%)	14	12
1	C	265/268 (99%)	253 (96%)	11 (4%)	1 (0%)	34	37
All	All	795/804 (99%)	740 (93%)	45 (6%)	10 (1%)	12	9

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	187	LYS
1	A	265	CYS
1	A	127	ASN
1	B	427	ASN
1	B	487	LYS
1	B	514	ASP
1	A	99	ASN
1	A	264	ASP
1	A	266	LEU
1	C	699	ASN

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	247/248 (100%)	222 (90%)	25 (10%)	7	7
1	B	247/248 (100%)	221 (90%)	26 (10%)	7	6

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	247/248 (100%)	225 (91%)	22 (9%)	9	9
All	All	741/744 (100%)	668 (90%)	73 (10%)	8	7

All (73) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	9	LEU
1	A	13	LEU
1	A	15	ASN
1	A	45	LEU
1	A	57	LYS
1	A	71	TYR
1	A	78	ILE
1	A	80	ASN
1	A	107	ASP
1	A	110	LEU
1	A	113	GLU
1	A	127	ASN
1	A	143	MET
1	A	163	ILE
1	A	172	VAL
1	A	182	LEU
1	A	188	ASN
1	A	202	MET
1	A	203	ASN
1	A	235	ILE
1	A	248	THR
1	A	249	ASN
1	A	261	ILE
1	A	264	ASP
1	A	265	CYS
1	B	309	LEU
1	B	313	LEU
1	B	315	ASN
1	B	334	LYS
1	B	345	LEU
1	B	357	LYS
1	B	371	TYR
1	B	375	GLU
1	B	380	ASN
1	B	395	ILE
1	B	398	LEU

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Mol	Chain	Res	Type
1	B	410	LEU
1	B	427	ASN
1	B	451	ILE
1	B	457	LEU
1	B	463	ILE
1	B	472	VAL
1	B	482	LEU
1	B	488	ASN
1	B	502	MET
1	B	503	ASN
1	B	504	TRP
1	B	514	ASP
1	B	539	LYS
1	B	549	ASN
1	B	561	ILE
1	C	601	MET
1	C	609	LEU
1	C	613	LEU
1	C	615	ASN
1	C	634	LYS
1	C	645	LEU
1	C	646	VAL
1	C	657	LYS
1	C	671	TYR
1	C	680	ASN
1	C	695	ILE
1	C	710	LEU
1	C	729	ASP
1	C	731	ARG
1	C	757	LEU
1	C	772	VAL
1	C	782	LEU
1	C	801	ARG
1	C	803	ASN
1	C	815	ASN
1	C	849	ASN
1	C	861	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	15	ASN

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Mol	Chain	Res	Type
1	A	80	ASN
1	A	127	ASN
1	A	188	ASN
1	A	203	ASN
1	A	215	ASN
1	A	217	ASN
1	A	249	ASN
1	A	250	ASN
1	B	315	ASN
1	B	380	ASN
1	B	401	HIS
1	B	427	ASN
1	B	488	ASN
1	B	503	ASN
1	B	515	ASN
1	B	517	ASN
1	B	549	ASN
1	B	550	ASN
1	C	615	ASN
1	C	680	ASN
1	C	701	HIS
1	C	716	ASN
1	C	815	ASN
1	C	817	ASN
1	C	849	ASN
1	C	850	ASN

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 carbohydrates in this entry.

5.6 Ligand geometry (i)

Of 9 ligands modelled in this entry, 3 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
2	SO4	A	281	-	4,4,4	0.26	0	6,6,6	0.06	0
2	SO4	B	580	3	4,4,4	0.26	0	6,6,6	0.09	0
2	SO4	C	881	-	4,4,4	0.27	0	6,6,6	0.14	0
2	SO4	A	280	3	4,4,4	0.13	0	6,6,6	0.25	0
2	SO4	C	880	3	4,4,4	0.23	0	6,6,6	0.12	0
2	SO4	B	581	-	4,4,4	0.29	0	6,6,6	0.09	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	881	SO4	1	0

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(Å²)	Q<0.9
1	A	267/268 (99%)	0.12	9 (3%)	45	43	13, 32, 68, 107	0
1	B	267/268 (99%)	0.03	12 (4%)	33	32	17, 33, 65, 87	0
1	C	267/268 (99%)	-0.06	5 (1%)	66	65	15, 29, 60, 94	0
All	All	801/804 (99%)	0.03	26 (3%)	47	45	13, 31, 65, 107	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	266	LEU	4.7
1	A	265	CYS	4.3
1	A	267	ASP	4.0
1	B	478	PHE	3.5
1	B	455	GLU	3.4
1	A	33	ARG	3.3
1	C	867	ASP	3.2
1	B	567	ASP	3.2
1	B	425	HIS	2.9
1	A	178	PHE	2.8
1	B	333	ARG	2.6
1	C	633	ARG	2.6
1	B	426	SER	2.6
1	B	427	ASN	2.5
1	C	634	LYS	2.5
1	B	417	GLU	2.5
1	C	725	HIS	2.4
1	B	400	VAL	2.4
1	A	204	TRP	2.3
1	B	424	ARG	2.3
1	C	717	GLU	2.3
1	A	125	HIS	2.3
1	B	443	MET	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	536	GLU	2.1
1	A	118	GLU	2.0
1	A	119	ILE	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 ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	MG	A	282	1/1	0.86	0.12	44,44,44,44	0
2	SO4	C	881	5/5	0.95	0.17	36,37,38,41	2
3	MG	B	582	1/1	0.95	0.08	39,39,39,39	0
2	SO4	B	581	5/5	0.96	0.14	46,46,46,48	2
2	SO4	A	281	5/5	0.98	0.11	37,37,38,39	2
3	MG	C	882	1/1	0.98	0.07	34,34,34,34	0
2	SO4	B	580	5/5	0.98	0.11	29,31,32,33	2
2	SO4	C	880	5/5	0.99	0.13	24,25,25,28	2
2	SO4	A	280	5/5	0.99	0.15	23,23,26,26	2

6.5 Other polymers ⓘ

There are no such residues in this entry.