Full wwPDB X-ray Structure Validation Report ⓘ

Nov 13, 2023 – 11:22 PM JST

PDB ID	:	5YGJ
Title	:	Crystal structure of a synthase from Streptomyces sp. CL190
Authors	:	Gao, J.; Liu, W.D.; Chen, C.C.; Guo, R.T.
Deposited on	:	2017-09-23
Resolution	:	2.65 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

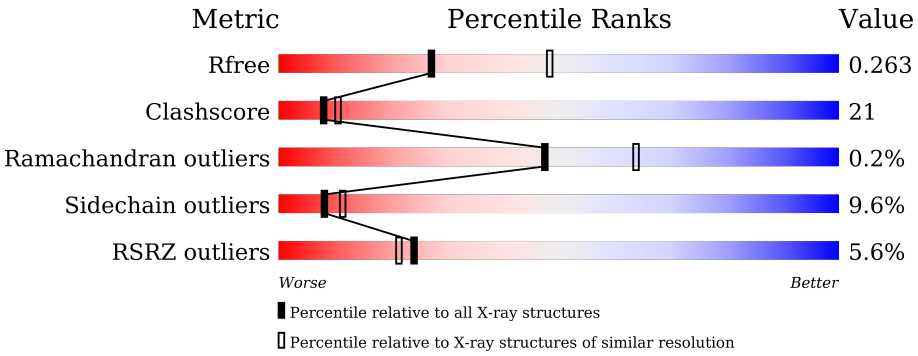
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.65 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	1426 (2.66-2.62)
Clashscore	141614	1472 (2.66-2.62)
Ramachandran outliers	138981	1446 (2.66-2.62)
Sidechain outliers	138945	1446 (2.66-2.62)
RSRZ outliers	127900	1408 (2.66-2.62)

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	217	63% 29% • 6%
1	B	217	5% 66% 26% • 5%
1	C	217	5% 62% 29% 5% 5%
1	D	217	10% 44% 41% 9% 6%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 6512 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 Cyclolavandulyl diphosphate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	204	Total	C	N	O	S	0	0	0
			1603	1021	260	312	10			
1	B	207	Total	C	N	O	S	0	0	0
			1630	1036	269	315	10			
1	C	207	Total	C	N	O	S	0	0	0
			1630	1036	269	315	10			
1	D	205	Total	C	N	O	S	0	0	0
			1614	1027	264	313	10			

- Molecule 2 is water.

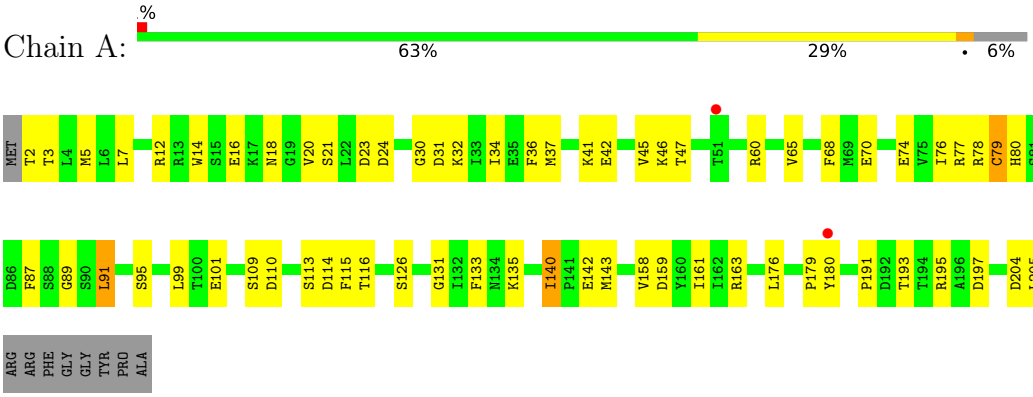
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	12	Total	O	0	0
			12	12		
2	B	9	Total	O	0	0
			9	9		
2	C	10	Total	O	0	0
			10	10		
2	D	4	Total	O	0	0
			4	4		

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.

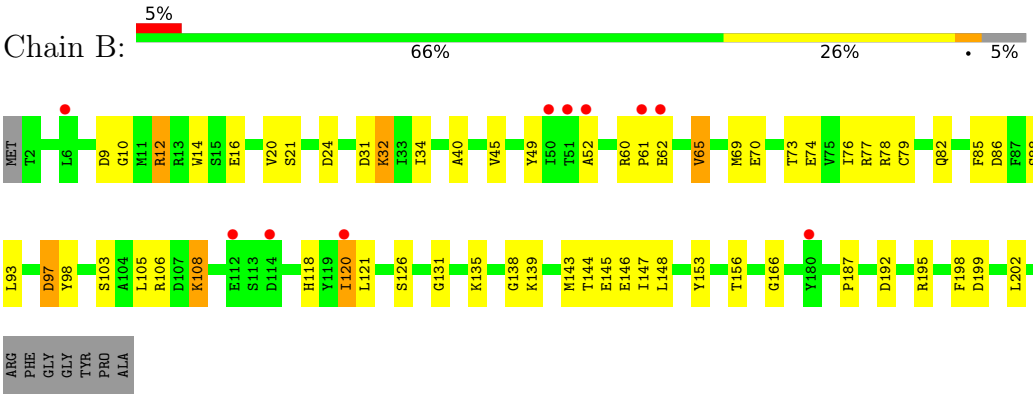
• Molecule 1: Cyclolavandulyl diphosphate synthase

Chain A:



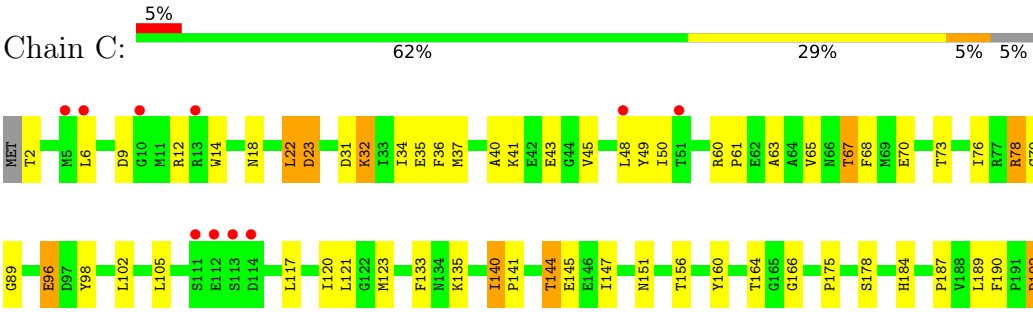
• Molecule 1: Cyclolavandulyl diphosphate synthase

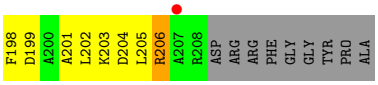
Chain B:



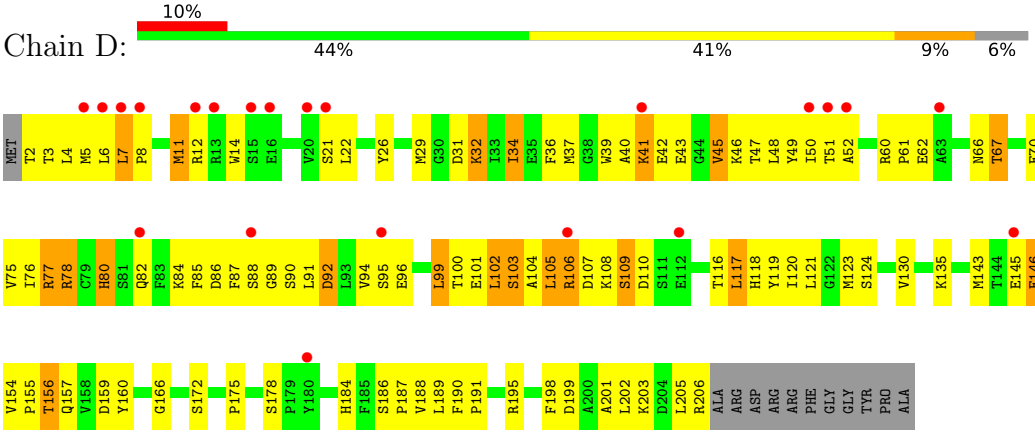
• Molecule 1: Cyclolavandulyl diphosphate synthase

Chain C:





• Molecule 1: Cyclolavandulyl diphosphate synthase



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	92.53Å 118.44Å 88.87Å 90.00° 116.35° 90.00°	Depositor
Resolution (Å)	24.91 – 2.65 24.91 – 2.65	Depositor EDS
% Data completeness (in resolution range)	99.0 (24.91-2.65) 92.7 (24.91-2.65)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.87 (at 2.64Å)	Xtriage
Refinement program	PHENIX (1.10_2155: ???)	Depositor
R, R_{free}	0.209 , 0.269 0.213 , 0.263	Depositor DCC
R_{free} test set	1261 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å^2)	58.7	Xtriage
Anisotropy	0.894	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 52.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	6512	wwPDB-VP
Average B, all atoms (Å^2)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.90% 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	0.62	0/1639	0.73	0/2217
1	B	0.72	0/1666	0.75	0/2252
1	C	0.70	0/1666	0.77	0/2252
1	D	0.70	0/1650	0.77	0/2231
All	All	0.69	0/6621	0.75	0/8952

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	1603	0	1554	45	0
1	B	1630	0	1585	46	0
1	C	1630	0	1585	72	0
1	D	1614	0	1565	116	0
2	A	12	0	0	0	0
2	B	9	0	0	0	0
2	C	10	0	0	0	0
2	D	4	0	0	0	0
All	All	6512	0	6289	273	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 21.

All (273) 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:70:GLU:OE1	1:A:77:ARG:NH2	1.77	1.17
1:D:49:TYR:OH	1:D:156:THR:OG1	1.66	1.11
1:D:42:GLU:OE1	1:D:195:ARG:NH1	1.82	1.11
1:D:31:ASP:OD1	1:D:78:ARG:NH2	1.85	1.08
1:C:70:GLU:OE1	1:C:98:TYR:OH	1.76	1.02
1:D:48:LEU:HD12	1:D:117:LEU:HD22	1.50	0.93
1:C:63:ALA:O	1:C:67:THR:HG23	1.68	0.93
1:D:32:LYS:HD2	1:D:32:LYS:N	1.86	0.90
1:D:103:SER:O	1:D:106:ARG:HB3	1.72	0.90
1:B:70:GLU:HG2	1:B:98:TYR:OH	1.72	0.89
1:B:34:ILE:HG12	1:B:79:CYS:SG	2.12	0.89
1:D:184:HIS:HB2	1:D:205:LEU:HD11	1.54	0.87
1:B:76:ILE:HD13	1:B:85:PHE:CZ	2.10	0.87
1:C:76:ILE:HG22	1:C:105:LEU:HD13	1.57	0.87
1:C:14:TRP:CD1	1:C:192:ASP:OD2	2.29	0.85
1:B:20:VAL:HG12	1:B:21:SER:H	1.42	0.84
1:B:60:ARG:HB3	1:B:61:PRO:HD2	1.59	0.82
1:D:135:LYS:NZ	1:D:151:ASN:OD1	2.11	0.81
1:A:133:PHE:CZ	1:C:140:ILE:HD11	2.16	0.80
1:D:92:ASP:OD1	1:D:92:ASP:N	2.14	0.80
1:C:32:LYS:HD2	1:C:35:GLU:OE2	1.80	0.80
1:D:106:ARG:O	1:D:109:SER:OG	1.98	0.80
1:C:201:ALA:O	1:C:205:LEU:HD12	1.81	0.80
1:D:42:GLU:OE1	1:D:195:ARG:CZ	2.29	0.79
1:C:184:HIS:HB2	1:C:205:LEU:HD11	1.65	0.78
1:D:4:LEU:HD13	1:D:160:TYR:HB2	1.66	0.78
1:D:42:GLU:OE1	1:D:195:ARG:NH2	2.17	0.78
1:C:76:ILE:CG2	1:C:105:LEU:HD13	2.13	0.78
1:A:12:ARG:HH22	1:A:60:ARG:HH12	1.29	0.78
1:C:12:ARG:HD3	1:C:22:LEU:HD21	1.67	0.76
1:C:49:TYR:OH	1:C:156:THR:HG22	1.84	0.76
1:A:31:ASP:OD2	1:B:108:LYS:NZ	2.18	0.76
1:C:14:TRP:NE1	1:C:192:ASP:OD1	2.18	0.76
1:D:74:GLU:HA	1:D:77:ARG:HG3	1.68	0.76
1:D:62:GLU:HG2	1:D:66:ASN:OD1	1.86	0.75
1:C:63:ALA:O	1:C:67:THR:CG2	2.35	0.75
1:C:160:TYR:HB3	1:C:205:LEU:HD22	1.67	0.75
1:C:14:TRP:HD1	1:C:192:ASP:OD2	1.67	0.75
1:A:18:ASN:O	1:A:20:VAL:HG23	1.87	0.74
1:D:48:LEU:HD11	1:D:50:ILE:HD11	1.71	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:144:THR:HG23	1:C:147:ILE:H	1.54	0.71
1:A:140:ILE:HD11	1:C:133:PHE:CZ	2.25	0.71
1:D:52:ALA:HB3	1:D:121:LEU:HD23	1.71	0.71
1:D:5:MET:HE2	1:D:51:THR:CG2	2.20	0.70
1:D:89:GLY:H	1:D:91:LEU:HD21	1.55	0.70
1:D:60:ARG:HB3	1:D:61:PRO:HD2	1.72	0.70
1:D:199:ASP:O	1:D:203:LYS:HG2	1.91	0.69
1:D:90:SER:CB	1:D:153:TYR:OH	2.40	0.69
1:C:50:ILE:CD1	1:C:117:LEU:HD11	2.23	0.69
1:D:96:GLU:OE2	1:D:96:GLU:N	2.23	0.69
1:C:201:ALA:O	1:C:205:LEU:CD1	2.41	0.68
1:C:135:LYS:NZ	1:C:151:ASN:OD1	2.26	0.68
1:C:203:LYS:NZ	1:C:206:ARG:HD3	2.09	0.68
1:D:90:SER:HB3	1:D:153:TYR:OH	1.94	0.67
1:A:42:GLU:OE1	1:A:195:ARG:NH2	2.28	0.66
1:D:85:PHE:CZ	1:D:102:LEU:HD23	2.30	0.66
1:C:96:GLU:CD	1:C:96:GLU:H	1.97	0.66
1:A:179:PRO:HG2	1:A:180:TYR:CD1	2.31	0.66
1:D:145:GLU:OE2	1:D:145:GLU:N	2.29	0.66
1:C:189:LEU:HD12	1:C:189:LEU:H	1.61	0.65
1:C:184:HIS:CB	1:C:205:LEU:HD11	2.25	0.65
1:C:144:THR:HG22	1:C:147:ILE:HD12	1.79	0.65
1:D:48:LEU:HD12	1:D:117:LEU:CD2	2.27	0.64
1:C:23:ASP:N	1:C:23:ASP:OD1	2.31	0.64
1:D:80:HIS:CD2	1:D:108:LYS:O	2.51	0.64
1:C:14:TRP:HE1	1:C:192:ASP:CG	2.03	0.62
1:D:198:PHE:CZ	1:D:202:LEU:HD11	2.35	0.62
1:D:201:ALA:O	1:D:205:LEU:HD13	1.98	0.62
1:D:186:SER:OG	1:D:188:VAL:HG12	2.00	0.62
1:D:3:THR:HG23	1:D:47:THR:HB	1.81	0.61
1:D:4:LEU:HD12	1:D:160:TYR:O	1.99	0.61
1:D:36:PHE:HA	1:D:39:TRP:CE3	2.35	0.61
1:B:49:TYR:OH	1:B:156:THR:HG22	1.99	0.61
1:D:11:MET:SD	1:D:29:MET:HB2	2.41	0.61
1:A:20:VAL:HG12	1:A:24:ASP:HB2	1.82	0.61
1:B:20:VAL:HG12	1:B:21:SER:N	2.12	0.60
1:C:50:ILE:HD12	1:C:117:LEU:HD11	1.83	0.60
1:D:72:PHE:HB3	1:D:119:TYR:HE2	1.66	0.60
1:D:105:LEU:O	1:D:105:LEU:HD12	2.01	0.60
1:D:72:PHE:HB3	1:D:119:TYR:CE2	2.37	0.60
1:D:106:ARG:HD3	1:D:107:ASP:N	2.16	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:12:ARG:O	1:A:16:GLU:HG3	2.01	0.60
1:C:12:ARG:HD3	1:C:22:LEU:CD2	2.32	0.60
1:C:203:LYS:HA	1:C:206:ARG:HG2	1.82	0.60
1:D:85:PHE:HZ	1:D:102:LEU:CD2	2.15	0.60
1:D:6:LEU:HD22	1:D:50:ILE:HG12	1.83	0.59
1:D:91:LEU:N	1:D:91:LEU:HD23	2.18	0.59
1:C:40:ALA:HB1	1:C:45:VAL:CG2	2.32	0.59
1:C:120:ILE:HG21	1:C:123:MET:CE	2.32	0.58
1:C:203:LYS:HZ3	1:C:206:ARG:HD3	1.68	0.58
1:C:40:ALA:HB1	1:C:45:VAL:HG21	1.83	0.58
1:D:48:LEU:CD1	1:D:117:LEU:HD22	2.27	0.58
1:B:166:GLY:HA2	1:B:187:PRO:HA	1.85	0.58
1:C:41:LYS:NZ	1:C:82:GLN:O	2.37	0.58
1:D:101:GLU:O	1:D:105:LEU:HB2	2.04	0.58
1:D:90:SER:O	1:D:90:SER:OG	2.13	0.58
1:D:85:PHE:HZ	1:D:102:LEU:HD23	1.67	0.58
1:D:124:SER:HA	1:D:172:SER:HB2	1.85	0.58
1:C:202:LEU:O	1:C:206:ARG:HG2	2.04	0.58
1:D:11:MET:SD	1:D:29:MET:SD	3.02	0.57
1:A:45:VAL:HG12	1:A:115:PHE:HE1	1.70	0.57
1:C:78:ARG:O	1:C:78:ARG:HG3	2.04	0.57
1:B:76:ILE:CD1	1:B:85:PHE:CZ	2.88	0.56
1:D:184:HIS:CB	1:D:205:LEU:HD11	2.30	0.56
1:B:20:VAL:HG12	1:B:24:ASP:HB2	1.86	0.56
1:D:7:LEU:HD13	1:D:51:THR:OG1	2.05	0.56
1:B:32:LYS:HG3	1:B:32:LYS:O	2.05	0.56
1:A:32:LYS:O	1:A:36:PHE:N	2.25	0.56
1:C:203:LYS:O	1:C:206:ARG:N	2.37	0.56
1:D:43:GLU:HG2	1:D:202:LEU:HD22	1.86	0.55
1:C:166:GLY:HA2	1:C:187:PRO:HA	1.88	0.55
1:A:20:VAL:HG12	1:A:21:SER:N	2.22	0.54
1:B:52:ALA:HB3	1:B:121:LEU:HD23	1.89	0.54
1:C:12:ARG:CD	1:C:22:LEU:HD21	2.36	0.54
1:C:203:LYS:O	1:C:204:ASP:C	2.44	0.54
1:A:133:PHE:CE1	1:C:140:ILE:HD11	2.42	0.53
1:D:102:LEU:O	1:D:106:ARG:HB2	2.08	0.53
1:B:195:ARG:HG3	1:B:199:ASP:OD2	2.09	0.53
1:D:45:VAL:O	1:D:46:LYS:HD3	2.07	0.53
1:D:5:MET:CE	1:D:51:THR:CG2	2.87	0.53
1:C:43:GLU:HG3	1:C:198:PHE:HE2	1.73	0.53
1:A:80:HIS:O	1:A:109:SER:HB2	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:198:PHE:O	1:D:202:LEU:HD12	2.08	0.53
1:A:46:LYS:NZ	1:A:114:ASP:OD2	2.42	0.53
1:C:43:GLU:OE2	1:C:43:GLU:HA	2.08	0.53
1:D:198:PHE:CE1	1:D:202:LEU:HD11	2.44	0.52
1:B:198:PHE:CZ	1:B:202:LEU:HD11	2.44	0.52
1:D:86:ASP:O	1:D:118:HIS:HA	2.09	0.52
1:D:103:SER:C	1:D:106:ARG:HB3	2.29	0.52
1:B:20:VAL:CG1	1:B:21:SER:H	2.18	0.52
1:D:32:LYS:HD2	1:D:32:LYS:H	1.70	0.51
1:D:40:ALA:HB1	1:D:45:VAL:HG11	1.91	0.51
1:C:14:TRP:NE1	1:C:192:ASP:CG	2.63	0.51
1:B:166:GLY:CA	1:B:187:PRO:HA	2.39	0.51
1:D:5:MET:HE2	1:D:51:THR:HG23	1.93	0.51
1:D:12:ARG:HG3	1:D:12:ARG:HH11	1.75	0.51
1:D:37:MET:SD	1:D:41:LYS:HD2	2.51	0.51
1:A:80:HIS:O	1:A:109:SER:CB	2.59	0.51
1:D:103:SER:HA	1:D:106:ARG:HB3	1.92	0.51
1:D:60:ARG:HB3	1:D:61:PRO:CD	2.38	0.51
1:B:34:ILE:HG12	1:B:79:CYS:HG	1.74	0.51
1:C:65:VAL:HA	1:C:68:PHE:CE2	2.46	0.50
1:D:22:LEU:HD12	1:D:26:TYR:HE2	1.76	0.50
1:B:31:ASP:OD1	1:B:78:ARG:NH2	2.33	0.50
1:B:97:ASP:OD1	1:B:97:ASP:N	2.41	0.50
1:A:14:TRP:CD1	1:A:191:PRO:HB2	2.47	0.50
1:C:32:LYS:CD	1:C:35:GLU:OE2	2.56	0.50
1:C:83:PHE:C	1:C:83:PHE:CD1	2.86	0.49
1:B:131:GLY:O	1:B:135:LYS:HG3	2.11	0.49
1:D:31:ASP:HA	1:D:34:ILE:HG13	1.95	0.49
1:D:66:ASN:O	1:D:70:GLU:HG2	2.13	0.49
1:D:120:ILE:HG22	1:D:123:MET:HB2	1.94	0.49
1:B:90:SER:HB3	1:B:153:TYR:OH	2.12	0.49
1:A:20:VAL:CG1	1:A:24:ASP:HB2	2.43	0.49
1:A:85:PHE:CD1	1:A:85:PHE:C	2.87	0.48
1:A:204:ASP:O	1:A:205:LEU:HD13	2.13	0.48
1:B:70:GLU:CG	1:B:98:TYR:OH	2.55	0.48
1:B:76:ILE:HG22	1:B:105:LEU:HD22	1.95	0.48
1:B:62:GLU:HA	1:B:65:VAL:HG13	1.96	0.48
1:D:39:TRP:CD1	1:D:195:ARG:CZ	2.96	0.48
1:D:102:LEU:O	1:D:106:ARG:CB	2.61	0.48
1:B:9:ASP:OD1	1:B:10:GLY:N	2.46	0.48
1:A:5:MET:HB3	1:A:161:ILE:HG12	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:195:ARG:O	1:C:195:ARG:HG3	2.14	0.48
1:A:74:GLU:O	1:A:78:ARG:HG3	2.14	0.47
1:B:14:TRP:NE1	1:B:192:ASP:OD1	2.39	0.47
1:D:90:SER:HB2	1:D:153:TYR:OH	2.13	0.47
1:D:48:LEU:HD11	1:D:50:ILE:CD1	2.42	0.47
1:A:95:SER:O	1:A:99:LEU:HD12	2.14	0.47
1:A:131:GLY:O	1:A:135:LYS:HG3	2.14	0.47
1:B:76:ILE:HD13	1:B:85:PHE:CE1	2.48	0.47
1:D:189:LEU:HD22	1:D:189:LEU:H	1.79	0.47
1:D:5:MET:HE2	1:D:51:THR:HG22	1.97	0.47
1:A:20:VAL:HG12	1:A:21:SER:H	1.80	0.47
1:C:2:THR:OG1	1:C:45:VAL:HG12	2.15	0.47
1:D:96:GLU:H	1:D:96:GLU:CD	2.14	0.47
1:D:37:MET:O	1:D:40:ALA:HB3	2.15	0.47
1:D:62:GLU:O	1:D:66:ASN:N	2.38	0.47
1:A:3:THR:HG22	1:A:47:THR:HB	1.97	0.46
1:D:6:LEU:HD23	1:D:8:PRO:HD3	1.96	0.46
1:D:6:LEU:HD22	1:D:50:ILE:CG1	2.45	0.46
1:B:60:ARG:HB3	1:B:61:PRO:CD	2.37	0.46
1:D:49:TYR:CD1	1:D:118:HIS:HB3	2.51	0.46
1:A:110:ASP:OD1	1:A:113:SER:N	2.49	0.46
1:B:195:ARG:HG3	1:B:195:ARG:O	2.15	0.46
1:A:34:ILE:HG12	1:A:79:CYS:SG	2.56	0.46
1:A:140:ILE:HD11	1:C:133:PHE:CE1	2.51	0.46
1:B:138:GLY:O	1:B:139:LYS:HE2	2.16	0.46
1:D:103:SER:CA	1:D:106:ARG:HB3	2.45	0.46
1:A:79:CYS:HB3	1:A:82:GLN:NE2	2.31	0.46
1:B:12:ARG:H	1:B:12:ARG:HD2	1.81	0.46
1:C:32:LYS:HA	1:C:32:LYS:HD3	1.55	0.45
1:C:48:LEU:HD22	1:C:117:LEU:HD12	1.97	0.45
1:D:6:LEU:HD21	1:D:8:PRO:HB3	1.97	0.45
1:B:20:VAL:CG1	1:B:24:ASP:HB2	2.46	0.45
1:D:5:MET:HA	1:D:49:TYR:HB2	1.97	0.45
1:B:76:ILE:CD1	1:B:85:PHE:CE1	3.00	0.45
1:B:88:SER:O	1:B:120:ILE:HA	2.16	0.45
1:D:5:MET:CE	1:D:51:THR:HG22	2.47	0.45
1:D:117:LEU:CD1	1:D:117:LEU:C	2.86	0.45
1:B:86:ASP:O	1:B:118:HIS:HA	2.16	0.45
1:A:7:LEU:HB2	1:A:163:ARG:HA	1.99	0.45
1:A:14:TRP:NE1	1:A:191:PRO:HB2	2.32	0.45
1:C:166:GLY:CA	1:C:187:PRO:HA	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:203:LYS:O	1:C:205:LEU:N	2.49	0.45
1:D:103:SER:O	1:D:104:ALA:C	2.56	0.45
1:D:195:ARG:HG2	1:D:199:ASP:OD1	2.17	0.45
1:A:2:THR:HA	1:A:159:ASP:OD2	2.17	0.44
1:B:92:ASP:OD1	1:B:92:ASP:N	2.51	0.44
1:D:14:TRP:CD1	1:D:191:PRO:HB2	2.53	0.44
1:B:12:ARG:O	1:B:16:GLU:HG3	2.16	0.44
1:B:144:THR:HG23	1:B:146:GLU:HB2	1.97	0.44
1:D:80:HIS:ND1	1:D:80:HIS:N	2.63	0.44
1:A:30:GLY:O	1:A:34:ILE:HD12	2.16	0.44
1:D:12:ARG:HG3	1:D:12:ARG:NH1	2.32	0.44
1:A:77:ARG:NH1	1:A:101:GLU:OE2	2.50	0.44
1:D:7:LEU:HD13	1:D:7:LEU:HA	1.49	0.44
1:D:67:THR:HA	1:D:70:GLU:HG3	2.00	0.44
1:D:175:PRO:HG2	1:D:178:SER:HB2	1.99	0.44
1:A:5:MET:HE3	1:A:158:VAL:HG21	1.99	0.43
1:C:34:ILE:HG23	1:C:79:CYS:SG	2.57	0.43
1:D:3:THR:O	1:D:159:ASP:HB2	2.18	0.43
1:A:91:LEU:HB3	1:A:99:LEU:HD21	2.01	0.43
1:B:92:ASP:OD1	1:B:93:LEU:HD12	2.17	0.43
1:C:9:ASP:HB3	1:C:164:THR:O	2.18	0.43
1:C:60:ARG:HB3	1:C:61:PRO:CD	2.48	0.43
1:D:87:PHE:O	1:D:87:PHE:CG	2.70	0.43
1:C:12:ARG:CD	1:C:22:LEU:CD2	2.96	0.43
1:D:105:LEU:HD12	1:D:105:LEU:C	2.39	0.43
1:C:14:TRP:CD1	1:C:192:ASP:CG	2.91	0.43
1:C:89:GLY:HA3	1:C:121:LEU:O	2.17	0.43
1:D:7:LEU:CD1	1:D:51:THR:OG1	2.66	0.43
1:C:203:LYS:HZ2	1:C:206:ARG:NE	2.16	0.43
1:C:203:LYS:HA	1:C:206:ARG:CG	2.48	0.43
1:B:40:ALA:HB1	1:B:45:VAL:CG1	2.49	0.43
1:C:73:THR:HG22	1:C:102:LEU:HD21	2.00	0.42
1:D:48:LEU:C	1:D:48:LEU:HD13	2.40	0.42
1:D:85:PHE:CD1	1:D:85:PHE:C	2.91	0.42
1:D:94:VAL:HB	1:D:99:LEU:CD1	2.49	0.42
1:D:96:GLU:N	1:D:96:GLU:CD	2.73	0.42
1:A:32:LYS:HD3	1:A:193:THR:O	2.20	0.42
1:D:2:THR:HB	1:D:159:ASP:OD2	2.19	0.42
1:D:120:ILE:HG21	1:D:123:MET:SD	2.60	0.42
1:A:37:MET:O	1:A:41:LYS:HG3	2.20	0.42
1:B:143:MET:HG3	1:D:130:VAL:HG22	2.00	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:6:LEU:HD12	1:D:36:PHE:CZ	2.54	0.42
1:D:190:PHE:HB3	1:D:191:PRO:HD3	2.02	0.42
1:B:69:MET:HE3	1:B:69:MET:HA	2.01	0.42
1:B:148:LEU:HD12	1:B:148:LEU:O	2.20	0.42
1:D:102:LEU:O	1:D:106:ARG:N	2.46	0.42
1:D:48:LEU:CD1	1:D:50:ILE:CD1	2.97	0.41
1:D:75:VAL:HG12	1:D:76:ILE:HD13	2.02	0.41
1:A:89:GLY:O	1:A:91:LEU:HD22	2.21	0.41
1:B:144:THR:OG1	1:B:145:GLU:N	2.54	0.41
1:C:190:PHE:O	1:C:193:THR:OG1	2.38	0.41
1:D:146:GLU:H	1:D:146:GLU:HG3	1.51	0.41
1:B:70:GLU:OE2	1:B:77:ARG:NH2	2.44	0.41
1:C:50:ILE:HD11	1:C:117:LEU:HD11	2.02	0.41
1:A:65:VAL:HA	1:A:68:PHE:CE2	2.55	0.41
1:C:40:ALA:O	1:C:45:VAL:HG22	2.21	0.41
1:C:36:PHE:CD1	1:C:36:PHE:C	2.94	0.41
1:A:76:ILE:O	1:A:80:HIS:HB3	2.20	0.41
1:A:84:LYS:HB3	1:A:116:THR:HG22	2.03	0.41
1:C:6:LEU:HD11	1:C:190:PHE:HE1	1.86	0.40
1:C:164:THR:OG1	1:C:190:PHE:HB2	2.21	0.40
1:C:175:PRO:HG2	1:C:178:SER:HB2	2.03	0.40
1:D:84:LYS:O	1:D:116:THR:HA	2.21	0.40
1:C:18:ASN:OD1	1:C:18:ASN:N	2.52	0.40
1:A:77:ARG:HH11	1:A:101:GLU:CD	2.24	0.40
1:D:91:LEU:HA	1:D:94:VAL:HG23	2.03	0.40
1:D:154:VAL:HA	1:D:155:PRO:HD3	1.85	0.40
1:D:11:MET:SD	1:D:29:MET:CB	3.08	0.40
1:D:166:GLY:CA	1:D:187:PRO:HA	2.51	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	202/217 (93%)	190 (94%)	12 (6%)	0	100	100
1	B	205/217 (94%)	200 (98%)	5 (2%)	0	100	100
1	C	205/217 (94%)	196 (96%)	8 (4%)	1 (0%)	29	43
1	D	203/217 (94%)	190 (94%)	12 (6%)	1 (0%)	29	43
All	All	815/868 (94%)	776 (95%)	37 (4%)	2 (0%)	47	64

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	141	PRO
1	D	110	ASP

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	174/183 (95%)	163 (94%)	11 (6%)	18	27
1	B	176/183 (96%)	163 (93%)	13 (7%)	13	21
1	C	176/183 (96%)	161 (92%)	15 (8%)	10	15
1	D	175/183 (96%)	147 (84%)	28 (16%)	2	2
All	All	701/732 (96%)	634 (90%)	67 (10%)	8	11

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	ASP
1	A	79	CYS
1	A	85	PHE
1	A	87	PHE
1	A	91	LEU
1	A	126	SER
1	A	140	ILE
1	A	142	GLU
1	A	143	MET

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Mol	Chain	Res	Type
1	A	176	LEU
1	A	197	ASP
1	B	12	ARG
1	B	32	LYS
1	B	65	VAL
1	B	73	THR
1	B	74	GLU
1	B	82	GLN
1	B	97	ASP
1	B	103	SER
1	B	106	ARG
1	B	108	LYS
1	B	120	ILE
1	B	126	SER
1	B	147	ILE
1	C	22	LEU
1	C	23	ASP
1	C	31	ASP
1	C	32	LYS
1	C	37	MET
1	C	67	THR
1	C	78	ARG
1	C	96	GLU
1	C	140	ILE
1	C	144	THR
1	C	145	GLU
1	C	192	ASP
1	C	194	THR
1	C	199	ASP
1	C	206	ARG
1	D	7	LEU
1	D	11	MET
1	D	21	SER
1	D	32	LYS
1	D	34	ILE
1	D	41	LYS
1	D	45	VAL
1	D	67	THR
1	D	77	ARG
1	D	78	ARG
1	D	80	HIS
1	D	82	GLN

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Mol	Chain	Res	Type
1	D	88	SER
1	D	92	ASP
1	D	95	SER
1	D	99	LEU
1	D	100	THR
1	D	102	LEU
1	D	103	SER
1	D	105	LEU
1	D	106	ARG
1	D	109	SER
1	D	117	LEU
1	D	143	MET
1	D	146	GLU
1	D	156	THR
1	D	157	GLN
1	D	206	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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

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	204/217 (94%)	0.04	2 (0%) 82 81	51, 68, 96, 115	0
1	B	207/217 (95%)	-0.01	11 (5%) 26 23	52, 69, 90, 109	0
1	C	207/217 (95%)	0.06	11 (5%) 26 23	50, 71, 99, 117	0
1	D	205/217 (94%)	0.49	22 (10%) 6 4	56, 90, 119, 145	0
All	All	823/868 (94%)	0.15	46 (5%) 24 21	50, 72, 108, 145	0

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	51	THR	4.8
1	A	180	TYR	4.6
1	D	112	GLU	4.5
1	D	106	ARG	4.3
1	D	50	ILE	4.2
1	C	13	ARG	4.2
1	D	7	LEU	3.9
1	B	207	ALA	3.8
1	D	6	LEU	3.6
1	B	114	ASP	3.5
1	B	180	TYR	3.4
1	D	180	TYR	3.3
1	B	62	GLU	3.3
1	B	6	LEU	2.9
1	B	51	THR	2.9
1	C	6	LEU	2.9
1	D	8	PRO	2.9
1	C	112	GLU	2.9
1	D	88	SER	2.9
1	D	16	GLU	2.8
1	D	63	ALA	2.8

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Mol	Chain	Res	Type	RSRZ
1	D	13	ARG	2.7
1	B	50	ILE	2.7
1	D	20	VAL	2.7
1	D	95	SER	2.7
1	B	61	PRO	2.6
1	D	5	MET	2.6
1	D	15	SER	2.5
1	C	48	LEU	2.5
1	C	114	ASP	2.4
1	C	111	SER	2.4
1	C	5	MET	2.3
1	D	82	GLN	2.3
1	B	120	ILE	2.3
1	C	113	SER	2.3
1	B	112	GLU	2.3
1	C	10	GLY	2.3
1	D	41	LYS	2.2
1	C	207	ALA	2.2
1	D	145	GLU	2.2
1	A	51	THR	2.2
1	D	21	SER	2.1
1	B	52	ALA	2.1
1	D	12	ARG	2.1
1	D	52	ALA	2.1
1	C	51	THR	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.