Full wwPDB X-ray Structure Validation Report (i)

Jun 12, 2024 – 09:30 AM EDT

PDB ID	:	6O18
Title	:	Unliganded alpha-L-fucosidase AlfC from Lactobacillus casei
Authors	:	Klontz, E.H.; Sundberg, E.J.
Deposited on	:	2019-02-18
Resolution	:	2.55 Å(reported)

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

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

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

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

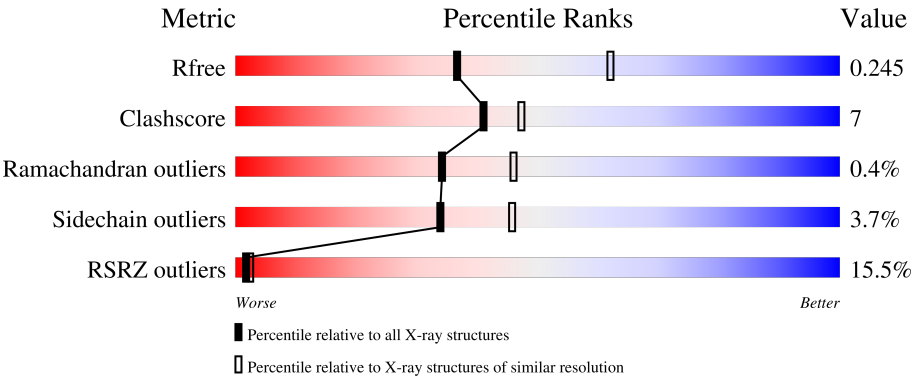
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance

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

The reported resolution of this entry is 2.55 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	1284 (2.56-2.52)
Clashscore	141614	1332 (2.56-2.52)
Ramachandran outliers	138981	1315 (2.56-2.52)
Sidechain outliers	138945	1315 (2.56-2.52)
RSRZ outliers	127900	1272 (2.56-2.52)

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	345	12% 81% 13% • 5%
1	B	345	14% 81% 12% • 6%
1	C	345	12% 79% 13% • 6%
1	D	345	19% 76% 15% • 7%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 10225 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 AlfC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	329	Total	C	N	O	S	0	0	0
			2593	1657	429	494	13			
1	B	323	Total	C	N	O	S	0	0	0
			2517	1609	412	484	12			
1	C	326	Total	C	N	O	S	0	0	0
			2561	1634	423	492	12			
1	D	322	Total	C	N	O	S	0	0	0
			2521	1608	414	487	12			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	345	LEU	-	expression tag	UNP K0NB39
B	345	LEU	-	expression tag	UNP K0NB39
C	345	LEU	-	expression tag	UNP K0NB39
D	345	LEU	-	expression tag	UNP K0NB39

- Molecule 2 is water.

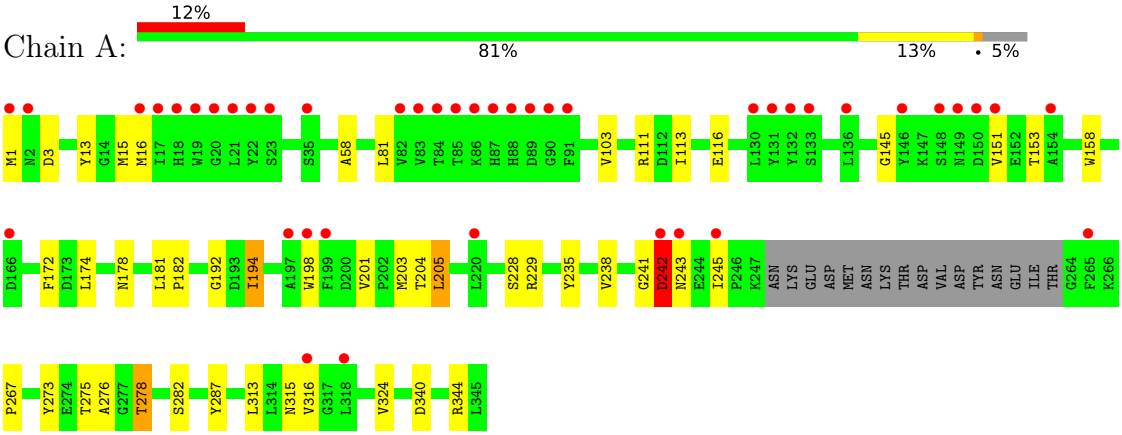
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	10	Total	O	0	0
			10	10		
2	B	8	Total	O	0	0
			8	8		
2	C	9	Total	O	0	0
			9	9		
2	D	6	Total	O	0	0
			6	6		

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.

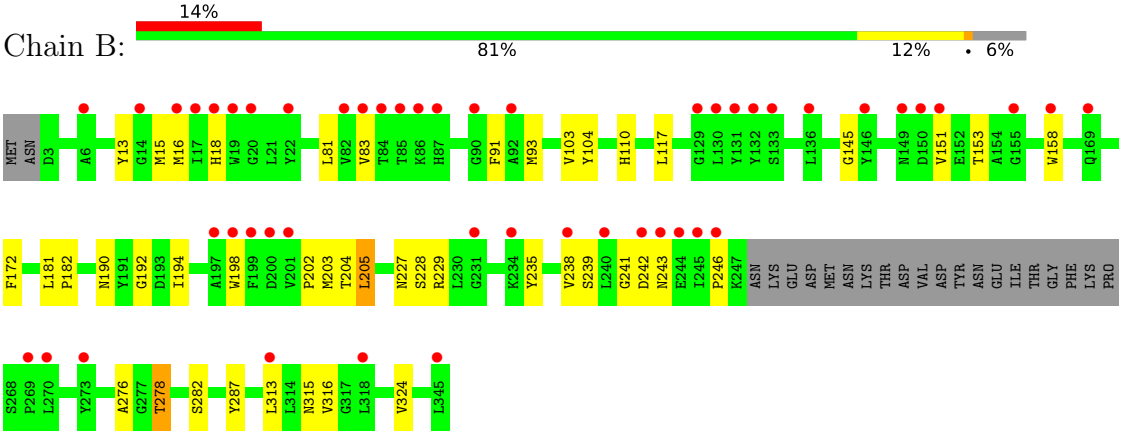
- Molecule 1: AlfC

Chain A:



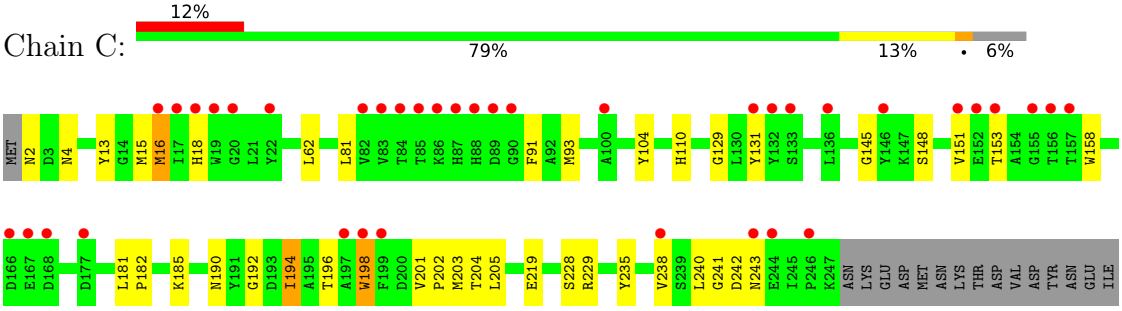
- Molecule 1: AlfC

Chain B:



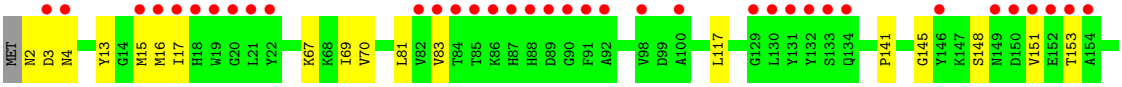
- Molecule 1: AlfC

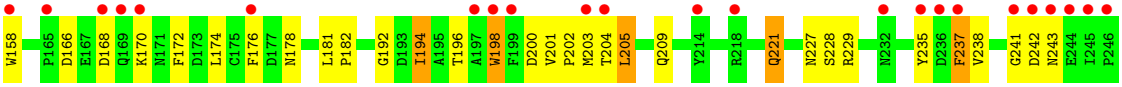
Chain C:

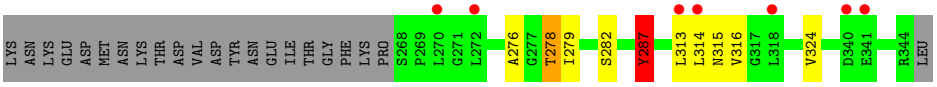


• Molecule 1: AlfC

Chain D:







4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	89.30Å 137.12Å 264.71Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.11 – 2.55 29.09 – 2.55	Depositor EDS
% Data completeness (in resolution range)	99.6 (29.11-2.55) 99.7 (29.09-2.55)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.44 (at 2.54Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.208 , 0.242 0.210 , 0.245	Depositor DCC
R_{free} test set	2621 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å^2)	79.7	Xtriage
Anisotropy	0.285	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 65.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	10225	wwPDB-VP
Average B, all atoms (Å^2)	101.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.94% 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	0.68	0/2667	0.77	0/3629
1	B	0.67	0/2589	0.76	1/3532 (0.0%)
1	C	0.67	0/2634	0.76	1/3589 (0.0%)
1	D	0.66	0/2593	0.78	2/3535 (0.1%)
All	All	0.67	0/10483	0.77	4/14285 (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	A	0	1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	198	TRP	CA-CB-CG	5.39	123.93	113.70
1	C	190	ASN	CB-CA-C	5.26	120.93	110.40
1	B	190	ASN	CB-CA-C	5.26	120.92	110.40
1	D	287	TYR	CB-CA-C	5.14	120.69	110.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1	MET	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	2593	0	2393	36	0
1	B	2517	0	2281	34	0
1	C	2561	0	2343	38	0
1	D	2521	0	2291	35	0
2	A	10	0	0	0	0
2	B	8	0	0	0	0
2	C	9	0	0	0	1
2	D	6	0	0	0	0
All	All	10225	0	9308	138	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 7.

All (138) 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:D:16:MET:HG3	1:D:315:ASN:HD22	1.30	0.97
1:B:16:MET:HG3	1:B:315:ASN:HD22	1.44	0.82
1:D:221:GLN:HE21	1:D:221:GLN:HA	1.47	0.79
1:A:278:THR:CG2	1:A:315:ASN:HD22	1.98	0.77
1:D:278:THR:HG21	1:D:282:SER:O	1.87	0.74
1:A:278:THR:HG21	1:A:282:SER:O	1.87	0.73
1:B:91:PHE:HD2	1:B:93:MET:CE	2.01	0.73
1:C:278:THR:HG21	1:C:282:SER:O	1.88	0.73
1:C:91:PHE:HD2	1:C:93:MET:CE	2.02	0.73
1:A:278:THR:HG22	1:A:315:ASN:HD22	1.52	0.72
1:A:145:GLY:HA2	1:A:203:MET:CE	2.19	0.72
1:B:91:PHE:CD2	1:B:93:MET:CE	2.74	0.71
1:B:278:THR:HG21	1:B:282:SER:O	1.90	0.70
1:D:145:GLY:HA2	1:D:203:MET:CE	2.20	0.70
1:C:91:PHE:CD2	1:C:93:MET:CE	2.74	0.70
1:B:192:GLY:O	1:B:194:ILE:HD13	1.94	0.68
1:D:192:GLY:O	1:D:194:ILE:HD13	1.95	0.67
1:A:192:GLY:O	1:A:194:ILE:HD13	1.95	0.67
1:C:192:GLY:O	1:C:194:ILE:HD13	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:58:ALA:HB2	1:C:62:LEU:CD2	2.27	0.65
1:A:103:VAL:HG21	1:A:113:ILE:HD12	1.77	0.64
1:C:278:THR:HG23	1:C:315:ASN:HB3	1.80	0.64
1:A:58:ALA:HB2	1:C:62:LEU:HD23	1.79	0.63
1:D:172:PHE:CE2	1:D:205:LEU:HD12	2.34	0.63
1:A:172:PHE:CE2	1:A:205:LEU:HD12	2.34	0.62
1:B:172:PHE:CE2	1:B:205:LEU:HD12	2.35	0.62
1:A:287:TYR:CD1	1:C:287:TYR:HB2	2.35	0.62
1:A:245:ILE:HD11	1:A:275:THR:OG1	2.00	0.61
1:B:278:THR:HG23	1:B:315:ASN:HB3	1.83	0.61
1:D:227:ASN:HA	1:D:237:PHE:CE1	2.36	0.61
1:B:145:GLY:H	1:B:204:THR:HG21	1.66	0.60
1:B:91:PHE:CD2	1:B:93:MET:HE2	2.37	0.60
1:C:235:TYR:OH	1:C:267:PRO:O	2.14	0.60
1:D:278:THR:HG23	1:D:315:ASN:HB3	1.84	0.60
1:D:221:GLN:HA	1:D:221:GLN:NE2	2.17	0.59
1:A:111:ARG:HD2	1:A:116:GLU:OE2	2.01	0.59
1:C:238:VAL:HG23	1:C:240:LEU:CD1	2.32	0.58
1:B:287:TYR:CD1	1:D:287:TYR:HB2	2.38	0.58
1:A:235:TYR:OH	1:A:267:PRO:O	2.15	0.58
1:A:145:GLY:H	1:A:204:THR:HG21	1.68	0.58
1:A:278:THR:HG23	1:A:315:ASN:HB3	1.86	0.58
1:D:145:GLY:H	1:D:204:THR:HG21	1.69	0.57
1:B:153:THR:HG22	1:B:158:TRP:CE2	2.40	0.57
1:D:153:THR:HG22	1:D:158:TRP:CE2	2.38	0.57
1:A:153:THR:HG22	1:A:158:TRP:CE2	2.39	0.57
1:C:153:THR:HG22	1:C:158:TRP:CE2	2.40	0.57
1:B:16:MET:CG	1:B:315:ASN:HD22	2.15	0.56
1:C:91:PHE:CD2	1:C:93:MET:HE2	2.40	0.56
1:B:228:SER:HA	1:B:235:TYR:CB	2.35	0.56
1:C:145:GLY:H	1:C:204:THR:HG21	1.70	0.56
1:A:145:GLY:HA2	1:A:203:MET:HE2	1.87	0.55
1:D:83:VAL:HG21	1:D:117:LEU:HD13	1.88	0.54
1:C:228:SER:HA	1:C:235:TYR:CB	2.37	0.54
1:D:228:SER:HA	1:D:235:TYR:CB	2.36	0.54
1:C:202:PRO:HB3	1:C:205:LEU:HG	1.90	0.54
1:D:241:GLY:O	1:D:243:ASN:N	2.42	0.53
1:B:83:VAL:HG21	1:B:117:LEU:HD13	1.90	0.53
1:A:103:VAL:HG21	1:A:113:ILE:CD1	2.39	0.53
1:A:278:THR:CG2	1:A:315:ASN:ND2	2.70	0.53
1:B:241:GLY:O	1:B:243:ASN:N	2.41	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2:ASN:OD1	1:C:4:ASN:HB2	2.08	0.52
1:C:241:GLY:O	1:C:243:ASN:N	2.41	0.52
1:A:228:SER:HA	1:A:235:TYR:CB	2.39	0.52
1:D:172:PHE:CZ	1:D:205:LEU:HD12	2.45	0.51
1:A:172:PHE:CZ	1:A:205:LEU:HD12	2.46	0.51
1:A:242:ASP:OD1	1:A:242:ASP:N	2.44	0.51
1:A:241:GLY:O	1:A:243:ASN:N	2.44	0.51
1:B:202:PRO:HB3	1:B:205:LEU:HB3	1.94	0.50
1:C:16:MET:HG2	1:C:313:LEU:HD21	1.94	0.50
1:C:201:VAL:HG23	1:C:229:ARG:HD3	1.94	0.50
1:B:172:PHE:CZ	1:B:205:LEU:HD12	2.47	0.49
1:D:67:LYS:O	1:D:70:VAL:HG12	2.11	0.49
1:D:145:GLY:HA2	1:D:203:MET:HE1	1.93	0.49
1:D:166:ASP:OD1	1:D:168:ASP:OD1	2.31	0.49
1:B:316:VAL:HG11	1:B:324:VAL:HG22	1.95	0.48
1:B:227:ASN:OD1	1:B:239:SER:OG	2.27	0.48
1:D:316:VAL:HG11	1:D:324:VAL:HG22	1.95	0.48
1:A:111:ARG:HH11	1:A:116:GLU:CD	2.17	0.47
1:A:340:ASP:HB3	1:A:344:ARG:NH1	2.30	0.47
1:C:266:LYS:HA	1:C:266:LYS:HE3	1.97	0.47
1:D:17:ILE:HD11	1:D:69:ILE:HG21	1.96	0.47
1:C:266:LYS:HA	1:C:266:LYS:CE	2.44	0.46
1:A:58:ALA:HB2	1:C:62:LEU:HD21	1.97	0.46
1:C:238:VAL:HG23	1:C:240:LEU:HD13	1.95	0.46
1:A:316:VAL:HG11	1:A:324:VAL:HG22	1.97	0.46
1:A:238:VAL:HG22	1:A:273:TYR:CD1	2.51	0.46
1:D:176:PHE:CE2	1:D:209:GLN:HB3	2.51	0.46
1:C:181:LEU:HG	1:C:185:LYS:HE3	1.98	0.45
1:B:91:PHE:HD2	1:B:93:MET:HE3	1.80	0.45
1:B:91:PHE:CE2	1:B:93:MET:HE2	2.52	0.45
1:B:276:ALA:HA	1:B:313:LEU:O	2.17	0.45
1:C:316:VAL:HG11	1:C:324:VAL:HG22	1.97	0.45
1:A:276:ALA:HA	1:A:313:LEU:O	2.17	0.45
1:C:276:ALA:HA	1:C:313:LEU:O	2.17	0.45
1:D:174:LEU:O	1:D:178:ASN:ND2	2.34	0.45
1:D:141:PRO:O	1:D:170:LYS:HE3	2.17	0.44
1:B:227:ASN:CG	1:B:239:SER:OG	2.55	0.44
1:B:16:MET:HB3	1:B:315:ASN:HA	1.99	0.44
1:C:91:PHE:CE2	1:C:93:MET:CE	3.01	0.44
1:D:201:VAL:HG13	1:D:229:ARG:HD3	1.99	0.44
1:B:91:PHE:CE2	1:B:93:MET:CE	3.01	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:16:MET:HB3	1:D:315:ASN:HA	1.99	0.44
1:B:181:LEU:N	1:B:182:PRO:CD	2.81	0.44
1:C:2:ASN:HB3	1:C:4:ASN:HB2	2.00	0.44
1:A:201:VAL:HG13	1:A:229:ARG:HD2	2.00	0.44
1:A:174:LEU:O	1:A:178:ASN:ND2	2.34	0.43
1:D:276:ALA:HA	1:D:313:LEU:O	2.18	0.43
1:D:202:PRO:HB3	1:D:205:LEU:HB3	1.99	0.43
1:B:104:TYR:O	1:B:110:HIS:HD2	2.02	0.43
1:A:16:MET:HB3	1:A:315:ASN:HA	2.00	0.43
1:A:111:ARG:NH1	1:A:116:GLU:OE1	2.52	0.43
1:C:181:LEU:N	1:C:182:PRO:CD	2.82	0.43
1:A:181:LEU:N	1:A:182:PRO:CD	2.82	0.42
1:C:129:GLY:HA3	1:C:196:THR:OG1	2.20	0.42
1:D:15:MET:O	1:D:81:LEU:HA	2.20	0.42
1:B:93:MET:HE2	1:B:103:VAL:HG13	2.01	0.42
1:B:228:SER:HB3	1:B:238:VAL:HA	2.01	0.42
1:C:15:MET:O	1:C:81:LEU:HA	2.20	0.42
1:C:104:TYR:O	1:C:110:HIS:HD2	2.03	0.41
1:C:228:SER:HB3	1:C:238:VAL:HA	2.02	0.41
1:C:228:SER:HA	1:C:235:TYR:CG	2.55	0.41
1:B:18:HIS:ND1	1:B:315:ASN:ND2	2.69	0.41
1:A:228:SER:HB3	1:A:238:VAL:HA	2.02	0.41
1:D:181:LEU:N	1:D:182:PRO:CD	2.82	0.41
1:D:279:ILE:HD13	1:D:314:LEU:HD11	2.02	0.41
1:B:15:MET:O	1:B:81:LEU:HA	2.20	0.41
1:B:278:THR:CG2	1:B:315:ASN:HB3	2.51	0.41
1:D:2:ASN:C	1:D:4:ASN:H	2.24	0.41
1:D:16:MET:CG	1:D:315:ASN:HD22	2.14	0.41
1:D:228:SER:HB3	1:D:238:VAL:HA	2.02	0.41
1:A:15:MET:O	1:A:81:LEU:HA	2.20	0.41
1:C:131:TYR:HD2	1:C:198:TRP:HE3	1.69	0.41
1:C:181:LEU:HB3	1:C:182:PRO:HD3	2.03	0.41
1:C:203:MET:HB2	1:C:204:THR:HG23	2.03	0.41
1:D:228:SER:HA	1:D:235:TYR:CG	2.55	0.41
1:B:203:MET:HB2	1:B:204:THR:HG23	2.03	0.41
1:B:227:ASN:ND2	1:B:239:SER:OG	2.54	0.40
1:C:18:HIS:ND1	1:C:315:ASN:ND2	2.69	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)
2:C:403:HOH:O	2:C:403:HOH:O[4_555]	1.79	0.41

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	325/345 (94%)	303 (93%)	21 (6%)	1 (0%)	41	51
1	B	319/345 (92%)	297 (93%)	20 (6%)	2 (1%)	25	34
1	C	322/345 (93%)	298 (92%)	23 (7%)	1 (0%)	41	51
1	D	318/345 (92%)	296 (93%)	21 (7%)	1 (0%)	41	51
All	All	1284/1380 (93%)	1194 (93%)	85 (7%)	5 (0%)	34	46

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	242	ASP
1	C	242	ASP
1	D	242	ASP
1	A	242	ASP
1	B	246	PRO

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	263/293 (90%)	255 (97%)	8 (3%)	41	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	251/293 (86%)	245 (98%)	6 (2%)	49 64
1	C	259/293 (88%)	248 (96%)	11 (4%)	30 40
1	D	254/293 (87%)	241 (95%)	13 (5%)	24 32
All	All	1027/1172 (88%)	989 (96%)	38 (4%)	34 46

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ASP
1	A	13	TYR
1	A	151	VAL
1	A	194	ILE
1	A	198	TRP
1	A	205	LEU
1	A	242	ASP
1	A	278	THR
1	B	13	TYR
1	B	151	VAL
1	B	198	TRP
1	B	205	LEU
1	B	229	ARG
1	B	278	THR
1	C	13	TYR
1	C	16	MET
1	C	148	SER
1	C	151	VAL
1	C	194	ILE
1	C	198	TRP
1	C	219	GLU
1	C	266	LYS
1	C	278	THR
1	C	287	TYR
1	C	344	ARG
1	D	3	ASP
1	D	13	TYR
1	D	148	SER
1	D	151	VAL
1	D	194	ILE
1	D	196	THR
1	D	198	TRP
1	D	200	ASP

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Mol	Chain	Res	Type
1	D	205	LEU
1	D	221	GLN
1	D	237	PHE
1	D	278	THR
1	D	287	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	190	ASN
1	A	288	HIS
1	B	110	HIS
1	B	142	ASN
1	B	190	ASN
1	B	288	HIS
1	B	306	ASN
1	B	315	ASN
1	B	331	ASN
1	C	110	HIS
1	C	169	GLN
1	C	183	GLN
1	C	315	ASN
1	D	102	ASN
1	D	190	ASN
1	D	221	GLN
1	D	223	ASN
1	D	290	GLN
1	D	315	ASN
1	D	331	ASN
1	D	343	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 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	329/345 (95%)	0.65	43 (13%)	3 4	56, 94, 135, 161	0
1	B	323/345 (93%)	0.75	49 (15%)	2 2	62, 95, 138, 160	0
1	C	326/345 (94%)	0.66	43 (13%)	3 4	68, 101, 137, 156	0
1	D	322/345 (93%)	0.85	66 (20%)	1 1	67, 110, 156, 173	0
All	All	1300/1380 (94%)	0.73	201 (15%)	2 2	56, 100, 145, 173	0

All (201) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	84	THR	7.5
1	D	151	VAL	7.2
1	C	198	TRP	6.9
1	B	84	THR	6.9
1	B	131	TYR	6.5
1	D	246	PRO	6.5
1	B	245	ILE	6.4
1	C	151	VAL	6.3
1	A	131	TYR	6.3
1	A	133	SER	6.2
1	B	198	TRP	6.1
1	D	131	TYR	5.9
1	A	198	TRP	5.8
1	B	151	VAL	5.7
1	C	84	THR	5.7
1	A	86	LYS	5.6
1	A	17	ILE	5.6
1	B	146	TYR	5.4
1	D	152	GLU	5.4
1	A	87	HIS	5.4
1	D	17	ILE	5.4

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Mol	Chain	Res	Type	RSRZ
1	D	198	TRP	5.3
1	B	132	TYR	5.2
1	A	84	THR	5.2
1	D	83	VAL	5.2
1	A	83	VAL	5.1
1	C	267	PRO	5.0
1	A	151	VAL	5.0
1	D	245	ILE	5.0
1	B	83	VAL	5.0
1	D	16	MET	4.9
1	D	153	THR	4.9
1	B	133	SER	4.8
1	C	131	TYR	4.8
1	B	345	LEU	4.8
1	D	87	HIS	4.8
1	C	87	HIS	4.7
1	D	146	TYR	4.7
1	D	133	SER	4.6
1	D	18	HIS	4.6
1	A	132	TYR	4.6
1	B	270	LEU	4.5
1	C	133	SER	4.5
1	D	82	VAL	4.4
1	D	270	LEU	4.4
1	B	130	LEU	4.3
1	A	150	ASP	4.3
1	B	86	LYS	4.3
1	C	82	VAL	4.1
1	D	85	THR	4.1
1	C	266	LYS	4.1
1	A	154	ALA	4.1
1	C	18	HIS	4.1
1	B	82	VAL	4.1
1	B	85	THR	4.1
1	C	272	LEU	4.0
1	B	231	GLY	4.0
1	D	20	GLY	4.0
1	C	83	VAL	4.0
1	A	22	TYR	4.0
1	B	87	HIS	4.0
1	C	85	THR	3.9
1	A	85	THR	3.8

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Mol	Chain	Res	Type	RSRZ
1	C	86	LYS	3.8
1	A	19	TRP	3.8
1	D	236	ASP	3.8
1	D	243	ASN	3.8
1	B	243	ASN	3.7
1	C	156	THR	3.7
1	A	82	VAL	3.7
1	B	199	PHE	3.7
1	D	244	GLU	3.7
1	A	130	LEU	3.7
1	B	240	LEU	3.6
1	D	168	ASP	3.6
1	B	197	ALA	3.6
1	C	268	SER	3.6
1	A	20	GLY	3.6
1	C	20	GLY	3.5
1	D	4	ASN	3.4
1	A	88	HIS	3.4
1	A	18	HIS	3.4
1	A	245	ILE	3.4
1	C	157	THR	3.4
1	A	16	MET	3.4
1	C	243	ASN	3.3
1	D	165	PRO	3.3
1	D	19	TRP	3.3
1	C	199	PHE	3.3
1	B	18	HIS	3.2
1	A	89	ASP	3.2
1	C	16	MET	3.2
1	B	238	VAL	3.2
1	C	155	GLY	3.2
1	D	86	LYS	3.2
1	B	17	ILE	3.1
1	B	244	GLU	3.1
1	B	201	VAL	3.1
1	A	23	SER	3.1
1	C	166	ASP	3.1
1	C	168	ASP	3.0
1	D	199	PHE	3.0
1	D	132	TYR	3.0
1	D	100	ALA	3.0
1	B	246	PRO	3.0

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Mol	Chain	Res	Type	RSRZ
1	D	203	MET	3.0
1	A	265	PHE	3.0
1	D	149	ASN	3.0
1	B	20	GLY	3.0
1	D	22	TYR	3.0
1	D	341	GLU	3.0
1	B	6	ALA	3.0
1	C	100	ALA	2.9
1	D	232	ASN	2.9
1	B	19	TRP	2.9
1	B	200	ASP	2.8
1	D	154	ALA	2.8
1	A	21	LEU	2.8
1	D	89	ASP	2.8
1	C	152	GLU	2.8
1	D	241	GLY	2.8
1	B	150	ASP	2.8
1	D	90	GLY	2.8
1	C	153	THR	2.7
1	B	16	MET	2.7
1	B	313	LEU	2.7
1	D	98	VAL	2.7
1	C	146	TYR	2.7
1	D	214	TYR	2.7
1	B	90	GLY	2.7
1	B	129	GLY	2.7
1	C	132	TYR	2.7
1	D	158	TRP	2.7
1	D	340	ASP	2.7
1	B	169	GLN	2.6
1	B	22	TYR	2.6
1	A	90	GLY	2.6
1	B	92	ALA	2.6
1	A	1	MET	2.6
1	C	167	GLU	2.6
1	C	17	ILE	2.6
1	B	149	ASN	2.6
1	C	244	GLU	2.6
1	A	149	ASN	2.6
1	D	129	GLY	2.6
1	D	218	ARG	2.5
1	D	92	ALA	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	220	LEU	2.5
1	C	19	TRP	2.5
1	C	273	TYR	2.5
1	A	91	PHE	2.5
1	D	15	MET	2.5
1	B	318	LEU	2.5
1	D	314	LEU	2.4
1	D	176	PHE	2.4
1	D	3	ASP	2.4
1	A	2	ASN	2.4
1	A	243	ASN	2.4
1	D	134	GLN	2.4
1	C	22	TYR	2.4
1	A	136	LEU	2.4
1	A	242	ASP	2.4
1	D	170	LYS	2.4
1	B	269	PRO	2.4
1	D	88	HIS	2.4
1	C	90	GLY	2.4
1	B	273	TYR	2.4
1	A	166	ASP	2.3
1	D	130	LEU	2.3
1	A	316	VAL	2.3
1	D	91	PHE	2.3
1	A	197	ALA	2.3
1	A	199	PHE	2.3
1	D	150	ASP	2.3
1	A	318	LEU	2.3
1	C	238	VAL	2.2
1	D	197	ALA	2.2
1	B	136	LEU	2.2
1	C	136	LEU	2.2
1	C	88	HIS	2.2
1	D	318	LEU	2.2
1	D	242	ASP	2.2
1	D	235	TYR	2.2
1	C	197	ALA	2.2
1	B	242	ASP	2.2
1	C	246	PRO	2.2
1	D	21	LEU	2.2
1	A	146	TYR	2.2
1	A	148	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	177	ASP	2.1
1	B	155	GLY	2.1
1	D	204	THR	2.1
1	C	89	ASP	2.1
1	D	272	LEU	2.1
1	D	313	LEU	2.1
1	B	158	TRP	2.1
1	D	237	PHE	2.0
1	D	169	GLN	2.0
1	B	234	LYS	2.0
1	B	14	GLY	2.0
1	A	35	SER	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.