



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 9, 2020 – 02:43 PM BST

PDB ID : 1IBQ
Title : ASPERGILLOPEPSIN FROM ASPERGILLUS PHOENICIS
Authors : Cho, S.W.; Shin, W.
Deposited on : 2001-03-28
Resolution : 2.14 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
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)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.13.1

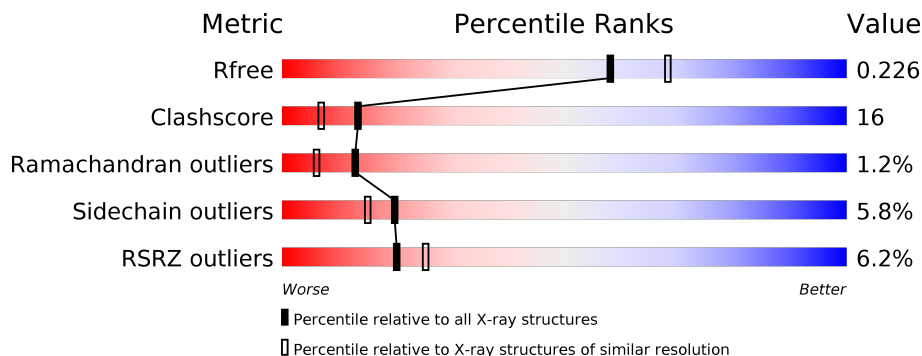
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.14 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	2523 (2.16-2.12)
Clashscore	141614	2653 (2.16-2.12)
Ramachandran outliers	138981	2618 (2.16-2.12)
Sidechain outliers	138945	2617 (2.16-2.12)
RSRZ outliers	127900	2485 (2.16-2.12)

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 $\leq 5\%$. 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	325	
1	B	325	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	MAN	A	460	-	-	-	X
2	MAN	B	960	-	-	X	X

2 Entry composition [i](#)

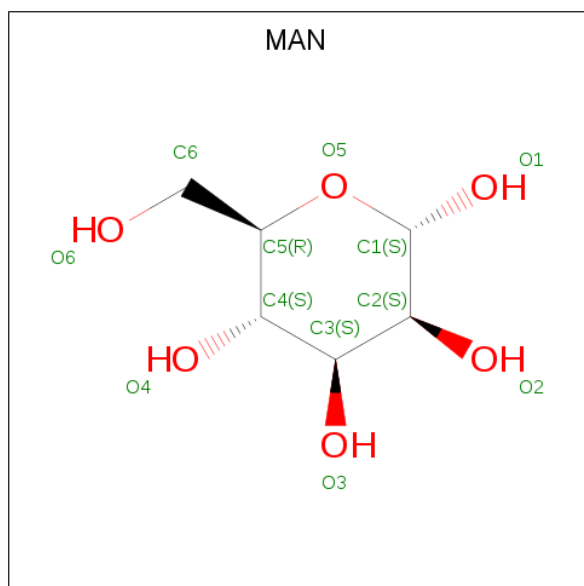
There are 4 unique types of molecules in this entry. The entry contains 5172 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 ASPERGILLOPEPSIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	325	Total	C	N	O	S	0	0	0
			2417	1518	372	525	2			
1	B	325	Total	C	N	O	S	0	0	0
			2417	1518	372	525	2			

- Molecule 2 is alpha-D-mannopyranose (three-letter code: MAN) (formula: C₆H₁₂O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	Total	C	O	0	0
			11	6	5		
2	A	1	Total	C	O	0	0
			11	6	5		
2	B	1	Total	C	O	0	0
			11	6	5		
2	B	1	Total	C	O	0	0
			11	6	5		

- Molecule 3 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	4	Total 4	Zn 4	0	0
3	A	4	Total 4	Zn 4	0	0

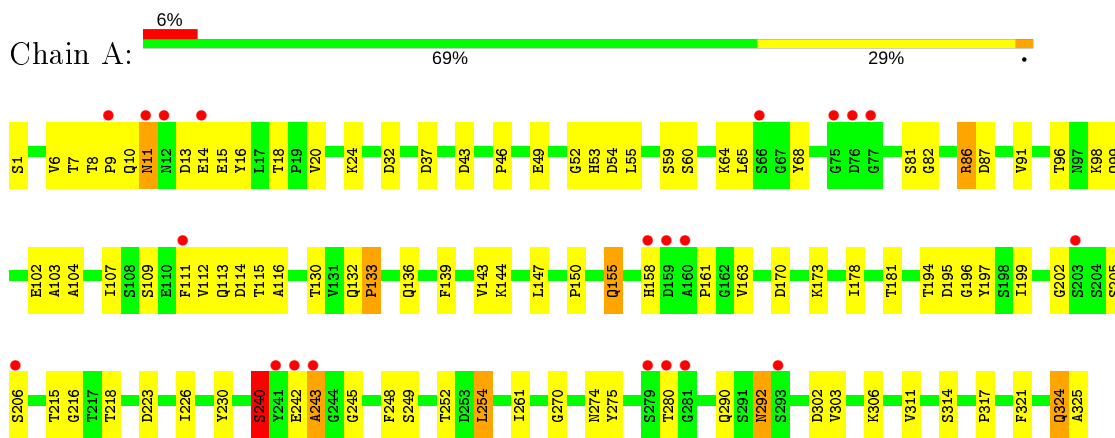
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	139	Total 139	O 139	0	0
4	B	147	Total 147	O 147	0	0

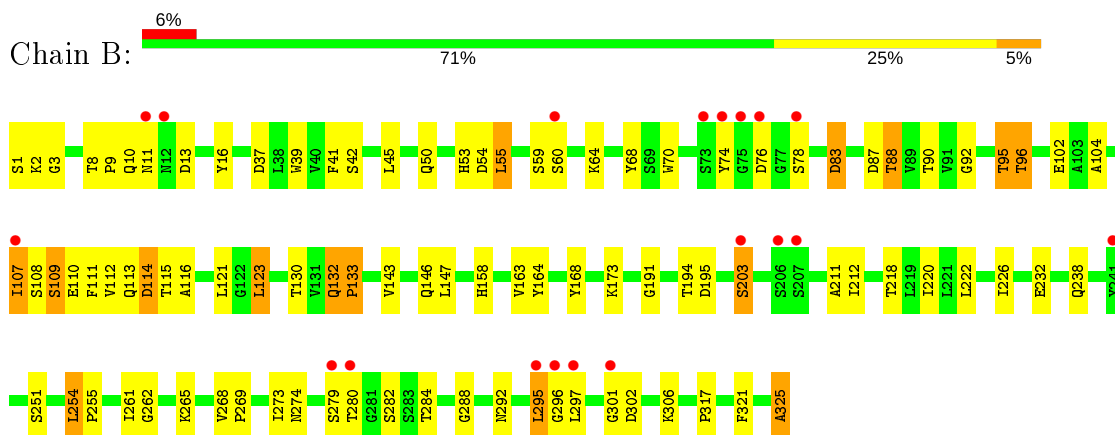
3 Residue-property plots [i](#)

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: ASPERGILLOPEPSIN



- Molecule 1: ASPERGILLOPEPSIN



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.19Å 36.62Å 104.94Å 90.00° 113.49° 90.00°	Depositor
Resolution (Å)	26.34 – 2.14 26.33 – 2.14	Depositor EDS
% Data completeness (in resolution range)	(Not available) (26.34-2.14) 77.7 (26.33-2.14)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.80 (at 2.13Å)	Xtrriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.221 , 0.269 0.206 , 0.226	Depositor DCC
R_{free} test set	1220 reflections (4.87%)	wwPDB-VP
Wilson B-factor (Å ²)	21.1	Xtrriage
Anisotropy	0.185	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 108.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.000 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5172	wwPDB-VP
Average B, all atoms (Å ²)	27.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 69.44 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.6979e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ 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: ZN, MAN

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	0.81	9/2471 (0.4%)	0.73	4/3368 (0.1%)
1	B	0.77	5/2471 (0.2%)	0.73	3/3368 (0.1%)
All	All	0.79	14/4942 (0.3%)	0.73	7/6736 (0.1%)

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	325	ALA	C-OXT	29.86	1.80	1.23
1	A	133	PRO	N-CD	21.29	1.77	1.47
1	A	133	PRO	CA-CB	14.07	1.81	1.53
1	A	325	ALA	C-OXT	12.26	1.46	1.23
1	A	242	GLU	CD-OE1	10.40	1.37	1.25
1	A	133	PRO	CA-C	-8.43	1.35	1.52
1	A	317	PRO	CG-CD	7.21	1.74	1.50
1	A	317	PRO	CB-CG	-7.13	1.14	1.50
1	A	133	PRO	C-O	7.12	1.37	1.23
1	B	133	PRO	CA-CB	6.09	1.65	1.53
1	B	317	PRO	CA-CB	-5.75	1.42	1.53
1	A	11	ASN	CG-ND2	5.54	1.46	1.32
1	B	133	PRO	N-CA	-5.51	1.37	1.47
1	B	203	SER	CB-OG	5.01	1.48	1.42

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	133	PRO	N-CA-CB	-7.42	94.39	103.30
1	B	133	PRO	N-CD-CG	-7.10	92.55	103.20
1	B	110	GLU	OE1-CD-OE2	-6.83	115.10	123.30
1	B	133	PRO	CA-CB-CG	-6.63	91.40	104.00
1	A	133	PRO	N-CD-CG	-5.95	94.27	103.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	133	PRO	CA-C-N	5.87	130.12	117.20
1	A	133	PRO	O-C-N	-5.27	114.27	122.70

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	2417	0	2248	81	0
1	B	2417	0	2248	74	0
2	A	22	0	20	1	0
2	B	22	0	20	6	0
3	A	4	0	0	0	0
3	B	4	0	0	0	0
4	A	139	0	0	8	0
4	B	147	0	0	7	0
All	All	5172	0	4536	152	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 16.

All (152) 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:133:PRO:CB	1:A:133:PRO:CA	1.81	1.54
1:A:133:PRO:CD	1:A:133:PRO:N	1.77	1.47
1:B:325:ALA:OXT	1:B:325:ALA:C	1.80	1.19
1:B:60:SER:H	2:B:960:MAN:H5	1.34	0.91
1:A:46:PRO:HG2	1:A:49:GLU:OE2	1.71	0.89
1:B:265:LYS:HE3	4:B:1218:HOH:O	1.75	0.85
1:A:52:GLY:HA2	1:B:284:THR:HG21	1.56	0.85
1:A:133:PRO:CB	1:A:133:PRO:N	2.39	0.83
1:A:133:PRO:CG	1:A:133:PRO:CA	2.57	0.83
1:A:1:SER:HB2	4:A:1281:HOH:O	1.79	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:133:PRO:CB	1:A:133:PRO:C	2.48	0.81
1:A:249:SER:HB3	1:A:252:THR:HG23	1.62	0.80
1:A:170:ASP:HB3	1:A:173:LYS:HD2	1.62	0.79
1:B:41:PHE:HB3	1:B:55:LEU:HD12	1.62	0.79
1:A:133:PRO:CG	1:A:133:PRO:N	2.46	0.77
1:B:2:LYS:HE2	4:B:1146:HOH:O	1.85	0.74
1:A:245:GLY:HA3	1:A:290:GLN:OE1	1.89	0.73
1:A:254:LEU:HD23	1:A:254:LEU:H	1.53	0.72
1:A:52:GLY:O	1:A:115:THR:HG23	1.91	0.71
1:B:107:ILE:HD12	1:B:108:SER:H	1.55	0.70
1:A:130:THR:HG22	4:A:1212:HOH:O	1.90	0.70
1:B:59:SER:HB2	2:B:960:MAN:H5	1.76	0.68
1:B:96:THR:HB	1:B:143:VAL:HG12	1.75	0.68
1:B:292:ASN:O	1:B:295:LEU:HD22	1.94	0.67
1:B:132:GLN:HE21	1:B:133:PRO:HA	1.61	0.64
1:B:146:GLN:HB3	4:B:1132:HOH:O	1.98	0.63
1:A:155:GLN:HB3	1:A:163:VAL:HG12	1.81	0.62
1:A:32:ASP:OD1	1:A:216:GLY:HA3	1.99	0.62
1:A:53:HIS:HE1	1:A:114:ASP:O	1.81	0.62
1:B:9:PRO:HG3	1:B:16:TYR:CE2	2.34	0.62
1:A:292:ASN:H	1:A:292:ASN:HD22	1.48	0.62
1:A:132:GLN:C	1:A:133:PRO:CD	2.66	0.62
1:B:173:LYS:HE2	4:B:1034:HOH:O	2.00	0.61
1:B:254:LEU:H	1:B:254:LEU:HD23	1.66	0.61
1:B:1:SER:O	1:B:147:LEU:HA	2.01	0.59
1:A:254:LEU:HD21	1:A:274:ASN:HB2	1.82	0.59
1:A:46:PRO:HB2	1:A:49:GLU:HG3	1.84	0.59
1:B:2:LYS:HD2	1:B:168:TYR:CD1	2.38	0.59
1:A:199:ILE:HD13	1:A:230:TYR:HA	1.83	0.58
1:A:20:VAL:HG13	1:A:91:VAL:HG22	1.84	0.58
1:B:59:SER:HB2	2:B:960:MAN:O4	2.03	0.58
1:B:302:ASP:O	1:B:306:LYS:HG3	2.04	0.57
1:B:107:ILE:HD11	1:B:111:PHE:CD2	2.39	0.56
1:B:222:LEU:HD13	1:B:226:ILE:HG21	1.87	0.56
1:B:13:ASP:OD2	1:B:306:LYS:NZ	2.38	0.56
1:B:45:LEU:CD1	1:B:50:GLN:HG2	2.35	0.56
1:A:8:THR:HG22	1:A:161:PRO:HB3	1.87	0.56
1:A:196:GLY:HA3	1:A:205:SER:O	2.07	0.55
1:A:292:ASN:N	1:A:292:ASN:HD22	2.04	0.55
1:A:155:GLN:HE21	1:A:163:VAL:HG12	1.72	0.55
1:A:197:TYR:CE1	1:A:226:ILE:HD12	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:254:LEU:H	1:B:254:LEU:CD2	2.20	0.55
1:B:39:TRP:HA	1:B:102:GLU:O	2.07	0.55
1:A:240:SER:O	1:A:243:ALA:HB3	2.07	0.54
1:A:150:PRO:HB2	1:A:314:SER:OG	2.07	0.54
1:A:68:TYR:HA	1:A:132:GLN:O	2.08	0.53
1:B:60:SER:N	2:B:960:MAN:H5	2.15	0.53
1:B:59:SER:HB2	2:B:960:MAN:C5	2.38	0.53
1:A:158:HIS:HB2	1:A:306:LYS:HE3	1.91	0.53
1:A:197:TYR:CZ	1:A:226:ILE:HD12	2.43	0.53
1:A:163:VAL:HG11	1:A:173:LYS:HE2	1.91	0.52
1:B:107:ILE:HD12	1:B:108:SER:N	2.23	0.52
1:A:52:GLY:CA	1:A:115:THR:HG23	2.39	0.52
1:A:99:GLN:OE1	1:A:139:PHE:HA	2.09	0.52
1:A:10:GLN:HG2	1:A:15:GLU:O	2.09	0.52
1:A:254:LEU:O	1:A:270:GLY:HA3	2.10	0.52
1:B:50:GLN:HE21	1:B:55:LEU:CD2	2.23	0.51
1:A:1:SER:O	1:A:147:LEU:HA	2.10	0.51
1:A:86:ARG:NH2	1:A:136:GLN:OE1	2.44	0.51
1:B:64:LYS:NZ	1:B:83:ASP:HB3	2.26	0.51
1:B:3:GLY:HA3	1:B:92:GLY:O	2.11	0.50
1:A:249:SER:HB3	1:A:252:THR:CG2	2.39	0.50
1:B:90:THR:OG1	1:B:95:THR:HB	2.12	0.50
1:A:107:ILE:HD12	1:A:111:PHE:HB2	1.94	0.50
1:A:52:GLY:CA	1:B:284:THR:HG21	2.37	0.50
1:B:60:SER:H	2:B:960:MAN:C5	2.14	0.50
1:A:248:PHE:CE1	1:A:254:LEU:HD22	2.47	0.49
1:B:218:THR:O	1:B:301:GLY:O	2.30	0.49
1:B:301:GLY:O	1:B:302:ASP:HB2	2.12	0.49
1:B:114:ASP:HB2	4:B:1099:HOH:O	2.12	0.49
1:B:130:THR:HG22	4:B:1092:HOH:O	2.11	0.49
1:A:170:ASP:OD2	1:A:173:LYS:HE3	2.13	0.48
1:B:55:LEU:N	1:B:55:LEU:HD22	2.28	0.48
1:A:37:ASP:OD2	1:A:102:GLU:OE1	2.31	0.48
1:A:7:THR:O	1:A:161:PRO:HA	2.13	0.48
1:A:292:ASN:H	1:A:292:ASN:ND2	2.10	0.48
1:A:215:THR:O	1:A:302:ASP:OD1	2.32	0.48
1:A:218:THR:O	1:A:303:VAL:HG23	2.13	0.48
1:A:54:ASP:HA	4:A:1131:HOH:O	2.14	0.48
1:B:295:LEU:HD13	1:B:295:LEU:N	2.29	0.47
1:A:178:ILE:HD13	1:A:311:VAL:HG21	1.96	0.47
1:A:109:SER:HA	4:A:1232:HOH:O	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:254:LEU:HD21	1:B:274:ASN:HB2	1.97	0.47
1:B:232:GLU:HG3	1:B:232:GLU:O	2.14	0.47
1:B:68:TYR:HA	1:B:132:GLN:O	2.15	0.47
1:B:191:GLY:HA2	1:B:212:ILE:HA	1.96	0.47
1:B:53:HIS:HE1	1:B:112:VAL:O	1.97	0.47
1:B:121:LEU:HD23	1:B:123:LEU:HD13	1.97	0.47
1:A:59:SER:HB2	1:A:87:ASP:OD1	2.14	0.47
1:B:113:GLN:O	1:B:115:THR:N	2.48	0.47
1:A:11:ASN:N	1:A:11:ASN:OD1	2.48	0.46
1:B:279:SER:OG	1:B:282:SER:HB2	2.15	0.46
1:B:76:ASP:HB2	4:B:1166:HOH:O	2.15	0.46
1:B:191:GLY:HA2	1:B:211:ALA:O	2.14	0.46
1:B:74:TYR:HD1	1:B:78:SER:O	1.99	0.46
1:B:87:ASP:OD1	1:B:88:THR:N	2.47	0.46
1:A:7:THR:O	1:A:7:THR:HG23	2.15	0.46
1:A:82:GLY:HA3	1:A:103:ALA:O	2.15	0.46
1:A:254:LEU:HD23	1:A:254:LEU:N	2.26	0.45
1:A:81:SER:O	1:A:104:ALA:HA	2.16	0.45
1:A:60:SER:H	2:A:460:MAN:C1	2.28	0.45
1:B:115:THR:O	1:B:116:ALA:HB3	2.16	0.45
1:A:64:LYS:NZ	4:A:1177:HOH:O	2.46	0.45
1:B:261:ILE:HD13	1:B:321:PHE:CD1	2.51	0.45
1:B:13:ASP:OD2	1:B:158:HIS:ND1	2.50	0.45
1:A:155:GLN:HG2	1:A:324:GLN:HE21	1.83	0.44
1:B:8:THR:HA	1:B:9:PRO:HD3	1.89	0.44
1:A:223:ASP:HA	1:A:292:ASN:HD21	1.82	0.44
1:B:109:SER:HA	1:B:112:VAL:CG2	2.48	0.44
1:B:295:LEU:O	1:B:297:LEU:N	2.51	0.44
1:A:226:ILE:HG12	4:A:1244:HOH:O	2.18	0.44
1:A:113:GLN:HA	1:B:238:GLN:NE2	2.33	0.44
1:B:64:LYS:HZ1	1:B:83:ASP:HB3	1.83	0.44
1:B:50:GLN:HB3	1:B:55:LEU:HD21	2.00	0.43
1:B:64:LYS:HZ1	1:B:83:ASP:CB	2.31	0.43
1:A:65:LEU:HD21	1:A:86:ARG:HG3	2.00	0.43
1:A:163:VAL:HG11	1:A:173:LYS:CE	2.49	0.43
1:B:42:SER:OG	1:B:104:ALA:O	2.29	0.43
1:B:195:ASP:OD2	1:B:262:GLY:N	2.47	0.42
1:B:325:ALA:OXT	1:B:325:ALA:CA	2.64	0.42
1:A:43:ASP:HB3	4:A:1037:HOH:O	2.19	0.42
1:A:96:THR:HB	1:A:143:VAL:HG12	2.01	0.42
1:A:7:THR:OG1	1:A:16:TYR:HB3	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:49:GLU:HA	1:A:112:VAL:HG13	2.02	0.42
1:A:6:VAL:O	1:A:18:THR:HG23	2.20	0.42
1:A:261:ILE:HD13	1:A:321:PHE:CD1	2.55	0.41
1:A:240:SER:O	1:A:240:SER:OG	2.36	0.41
1:A:9:PRO:HB2	1:A:13:ASP:HA	2.01	0.41
1:B:70:TRP:HZ2	1:B:104:ALA:HA	1.84	0.41
1:B:39:TRP:HB3	1:B:102:GLU:HB2	2.02	0.41
1:A:202:GLY:HA3	4:A:1059:HOH:O	2.20	0.41
1:A:195:ASP:O	1:A:206:SER:O	2.38	0.41
1:B:163:VAL:HG22	1:B:164:TYR:N	2.35	0.41
1:B:70:TRP:CE2	1:B:102:GLU:HB3	2.55	0.41
1:B:268:VAL:HA	1:B:269:PRO:HD3	1.89	0.41
1:B:254:LEU:HD11	1:B:273:ILE:HB	2.03	0.41
1:A:158:HIS:HB2	1:A:306:LYS:CE	2.51	0.41
1:A:155:GLN:HB3	1:A:155:GLN:HE21	1.53	0.40
1:B:220:ILE:HG22	1:B:222:LEU:HG	2.03	0.40
1:B:254:LEU:HB2	1:B:255:PRO:HD2	2.02	0.40
1:A:155:GLN:HG2	1:A:324:GLN:NE2	2.35	0.40
1:B:273:ILE:O	1:B:288:GLY:N	2.50	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	323/325 (99%)	299 (93%)	20 (6%)	4 (1%)	13	6
1	B	323/325 (99%)	303 (94%)	16 (5%)	4 (1%)	13	6
All	All	646/650 (99%)	602 (93%)	36 (6%)	8 (1%)	13	6

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	116	ALA
1	A	275	TYR
1	B	280	THR
1	B	296	GLY
1	B	109	SER
1	A	240	SER
1	A	243	ALA
1	B	114	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	267/267 (100%)	253 (95%)	14 (5%)	23	18
1	B	267/267 (100%)	250 (94%)	17 (6%)	17	12
All	All	534/534 (100%)	503 (94%)	31 (6%)	20	15

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLU
1	A	24	LYS
1	A	55	LEU
1	A	86	ARG
1	A	98	LYS
1	A	144	LYS
1	A	155	GLN
1	A	181	THR
1	A	194	THR
1	A	240	SER
1	A	254	LEU
1	A	280	THR
1	A	292	ASN
1	A	324	GLN
1	B	10	GLN
1	B	11	ASN

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Mol	Chain	Res	Type
1	B	37	ASP
1	B	54	ASP
1	B	55	LEU
1	B	83	ASP
1	B	88	THR
1	B	95	THR
1	B	96	THR
1	B	107	ILE
1	B	123	LEU
1	B	132	GLN
1	B	194	THR
1	B	203	SER
1	B	251	SER
1	B	254	LEU
1	B	295	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	113	GLN
1	A	155	GLN
1	A	187	GLN
1	A	292	ASN
1	B	50	GLN
1	B	53	HIS
1	B	132	GLN
1	B	238	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

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 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	MAN	B	960	1	11,11,12	0.66	0	15,15,17	1.15	2 (13%)
2	MAN	A	460	1	11,11,12	0.67	0	15,15,17	0.97	1 (6%)
2	MAN	A	435	1	11,11,12	0.73	0	15,15,17	0.57	0
2	MAN	B	935	1	11,11,12	0.68	0	15,15,17	0.92	1 (6%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MAN	B	960	1	-	2/2/19/22	0/1/1/1
2	MAN	A	460	1	-	0/2/19/22	0/1/1/1
2	MAN	A	435	1	-	2/2/19/22	0/1/1/1
2	MAN	B	935	1	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	960	MAN	O5-C1-C2	2.89	115.23	110.77
2	A	460	MAN	C1-O5-C5	2.80	115.98	112.19
2	B	960	MAN	C1-C2-C3	2.68	112.96	109.67
2	B	935	MAN	C1-O5-C5	2.11	115.06	112.19

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	960	MAN	C4-C5-C6-O6
2	A	435	MAN	O5-C5-C6-O6
2	B	935	MAN	O5-C5-C6-O6
2	B	960	MAN	O5-C5-C6-O6
2	A	435	MAN	C4-C5-C6-O6
2	B	935	MAN	C4-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	960	MAN	6	0
2	A	460	MAN	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

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, 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	325/325 (100%)	0.30	21 (6%) 18 23	4, 24, 62, 100	0
1	B	325/325 (100%)	0.23	19 (5%) 23 29	4, 22, 57, 78	0
All	All	650/650 (100%)	0.26	40 (6%) 20 25	4, 23, 60, 100	0

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	241	TYR	6.5
1	A	280	THR	5.2
1	B	296	GLY	4.6
1	B	75	GLY	4.5
1	A	206	SER	4.4
1	A	241	TYR	4.4
1	A	12	ASN	4.3
1	A	11	ASN	4.0
1	B	12	ASN	3.9
1	B	280	THR	3.6
1	B	76	ASP	3.6
1	B	11	ASN	3.4
1	A	77	GLY	3.4
1	B	74	TYR	3.3
1	A	281	GLY	3.3
1	A	75	GLY	3.1
1	A	279	SER	2.8
1	B	206	SER	2.8
1	A	293	SER	2.7
1	A	242	GLU	2.7
1	A	111	PHE	2.6
1	A	243	ALA	2.5
1	A	203	SER	2.5
1	B	279	SER	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	160	ALA	2.4
1	A	76	ASP	2.4
1	B	203	SER	2.4
1	B	60	SER	2.4
1	A	14	GLU	2.3
1	B	295	LEU	2.3
1	A	159	ASP	2.3
1	A	158	HIS	2.3
1	B	301	GLY	2.3
1	B	78	SER	2.2
1	B	73	SER	2.1
1	A	66	SER	2.1
1	B	297	LEU	2.1
1	A	9	PRO	2.1
1	B	207	SER	2.0
1	B	107	ILE	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](#)

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
2	MAN	B	960	11/12	0.45	0.49	56,64,70,77	0
2	MAN	A	460	11/12	0.53	0.50	47,59,75,86	0
2	MAN	B	935	11/12	0.64	0.20	38,52,57,61	0
2	MAN	A	435	11/12	0.88	0.19	37,49,53,61	0
3	ZN	A	1457	1/1	0.97	0.07	21,21,21,21	0
3	ZN	B	1456	1/1	0.98	0.06	24,24,24,24	0
3	ZN	B	1458	1/1	0.98	0.06	19,19,19,19	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	ZN	B	1452	1/1	0.99	0.06	19,19,19,19	0
3	ZN	A	1453	1/1	0.99	0.03	20,20,20,20	0
3	ZN	B	1454	1/1	0.99	0.03	18,18,18,18	0
3	ZN	A	1455	1/1	0.99	0.04	21,21,21,21	0
3	ZN	A	1451	1/1	0.99	0.09	22,22,22,22	0

6.5 Other polymers [i](#)

There are no such residues in this entry.