



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 02:27 PM EDT

PDB ID : 3BCZ / pdb_00003bcz
Title : Crystal structure of Memo
Authors : Qiu, C.
Deposited on : 2007-11-13
Resolution : 2.10 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

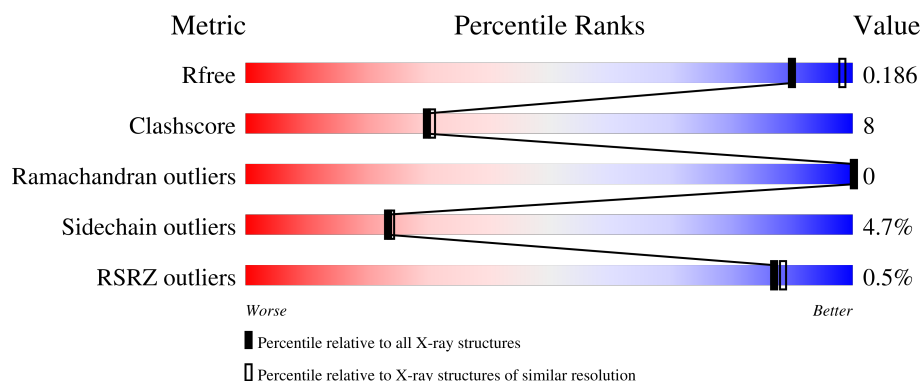
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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}	180053	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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 $\leq 5\%$. 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	293	 81% 17% .
1	B	293	 82% 16% .
1	C	293	 82% 16% .
1	D	293	 85% 14% .

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	GOL	A	302	-	-	X	-
2	GOL	A	303	-	-	X	-
2	GOL	B	304	-	-	X	-
2	GOL	D	301	-	-	X	-

2 Entry composition [i](#)

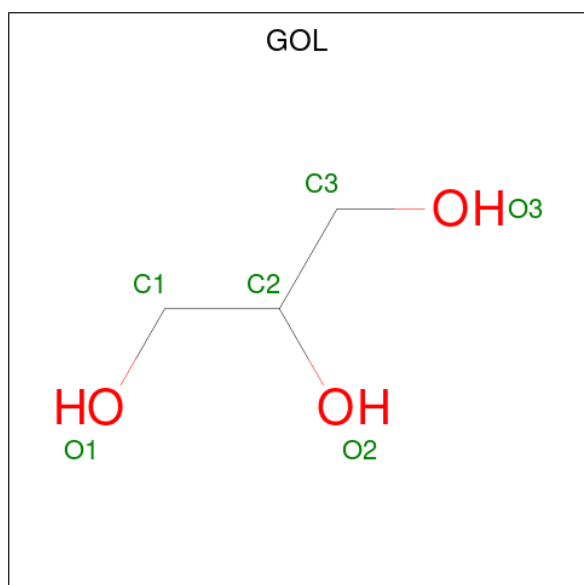
There are 3 unique types of molecules in this entry. The entry contains 9863 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Protein MEMO1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	293	Total	C	N	O	S	Se	0	2	0
			2346	1486	403	441	8	8			
1	B	293	Total	C	N	O	S	Se	0	0	0
			2340	1482	403	440	7	8			
1	C	292	Total	C	N	O	S	Se	0	0	0
			2333	1477	402	439	7	8			
1	D	293	Total	C	N	O	S	Se	0	2	0
			2351	1489	406	441	7	8			

- Molecule 2 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			6	3	3		
2	A	1	Total	C	O	0	0
			6	3	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			6	3	3		
2	C	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		

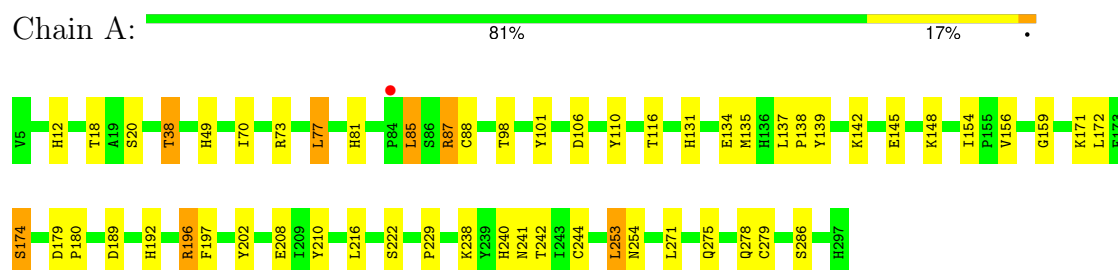
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	116	Total	O	0	0
			116	116		
3	B	135	Total	O	0	0
			135	135		
3	C	86	Total	O	0	0
			86	86		
3	D	126	Total	O	0	0
			126	126		

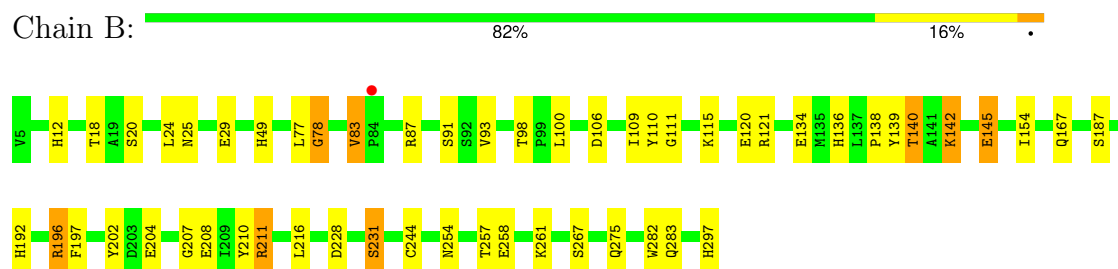
3 Residue-property plots [i](#)

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.

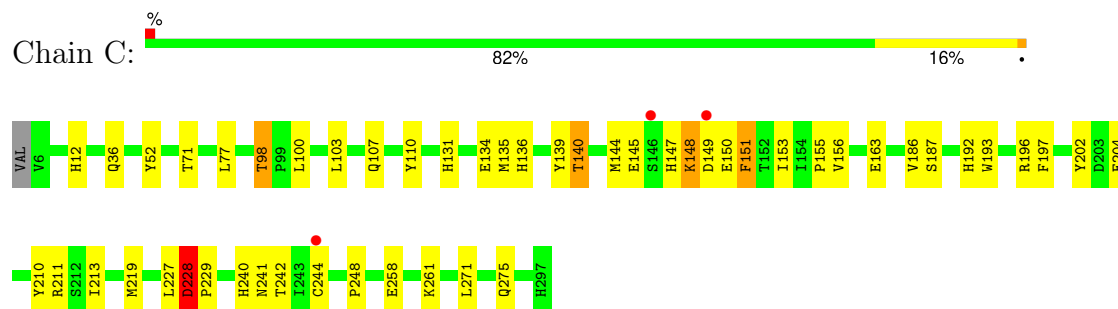
• Molecule 1: Protein MEMO1



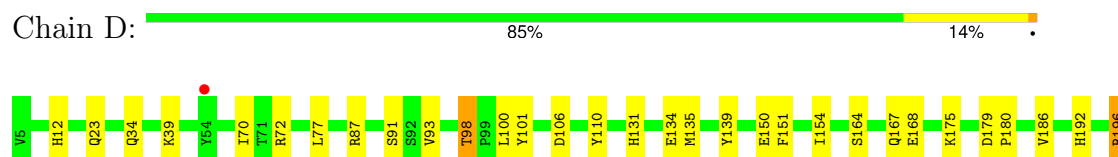
• Molecule 1: Protein MEMO1



• Molecule 1: Protein MEMO1



• Molecule 1: Protein MEMO1



F197	
L216	
P229	
N241	
T242	
P248	
V251	
N254	
M266	
S269	
P270	
L271	
V296	
H297	

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	139.83Å 88.85Å 98.09Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.97 – 2.10 29.97 – 2.10	Depositor EDS
% Data completeness (in resolution range)	98.9 (29.97-2.10) 98.9 (29.97-2.10)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.45 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.183 , 0.230 0.187 , 0.186	Depositor DCC
R_{free} test set	3603 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	22.7	Xtriage
Anisotropy	0.700	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 41.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9863	wwPDB-VP
Average B, all atoms (Å ²)	13.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 55.63 % 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 3.0778e-05. 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

5.1 Standard geometry

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

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	0.94	0/2406	0.99	0/3244
1	B	0.91	1/2394 (0.0%)	0.95	3/3228 (0.1%)
1	C	0.85	0/2387	1.00	7/3218 (0.2%)
1	D	0.93	1/2411 (0.0%)	0.96	2/3250 (0.1%)
All	All	0.91	2/9598 (0.0%)	0.98	12/12940 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	251	VAL	CA-CB	5.26	1.60	1.54
1	B	83	VAL	CA-CB	5.08	1.60	1.54

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	228	ASP	CA-C-N	9.00	129.04	119.05
1	C	228	ASP	C-N-CA	9.00	129.04	119.05
1	C	149	ASP	N-CA-C	-6.06	105.87	113.20
1	C	228	ASP	N-CA-C	5.70	121.03	108.73
1	D	179	ASP	CA-C-N	5.45	125.28	119.28
1	D	179	ASP	C-N-CA	5.45	125.28	119.28
1	B	145	GLU	N-CA-C	5.20	117.62	111.33
1	B	78	GLY	CA-C-N	5.13	125.03	119.85
1	B	78	GLY	C-N-CA	5.13	125.03	119.85
1	C	227	LEU	CA-C-N	-5.04	116.33	122.64
1	C	227	LEU	C-N-CA	-5.04	116.33	122.64
1	C	52	TYR	N-CA-C	5.02	117.48	111.71

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	2346	0	2265	48	0
1	B	2340	0	2255	41	0
1	C	2333	0	2246	36	0
1	D	2351	0	2273	38	0
2	A	12	0	16	11	0
2	B	6	0	8	4	0
2	C	6	0	8	1	0
2	D	6	0	8	7	0
3	A	116	0	0	3	0
3	B	135	0	0	4	0
3	C	86	0	0	4	0
3	D	126	0	0	5	0
All	All	9863	0	9079	157	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 8.

All (157) 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:49:HIS:HE1	1:A:244[A]:CYS:SG	1.65	1.18
1:A:49:HIS:CE1	1:A:244[A]:CYS:SG	2.45	1.08
1:A:254:ASN:HD21	2:A:303:GOL:H32	0.97	1.07
1:A:244[B]:CYS:SG	2:A:302:GOL:H12	2.00	1.00
1:A:254:ASN:ND2	2:A:303:GOL:H32	1.80	0.97
1:B:136:HIS:O	1:B:140:THR:HG23	1.66	0.95
1:B:98:THR:HG22	1:B:100:LEU:H	1.29	0.95
1:A:229:PRO:HB2	2:A:303:GOL:H11	1.52	0.92
1:A:254:ASN:HD21	2:A:303:GOL:C3	1.86	0.88
1:D:266:MSE:HG2	1:D:296:VAL:HG22	1.56	0.87
1:A:244[B]:CYS:SG	2:A:302:GOL:C1	2.64	0.85
1:C:150:GLU:HA	1:C:150:GLU:OE1	1.75	0.85
1:C:136:HIS:O	1:C:140:THR:HG23	1.77	0.83
1:A:81:HIS:NE2	2:A:302:GOL:H11	1.94	0.83
1:D:229:PRO:HB2	2:D:301:GOL:H12	1.61	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:106:ASP:HB3	1:A:154:ILE:HD11	1.64	0.78
1:D:98:THR:HG22	1:D:100:LEU:H	1.47	0.78
1:C:98:THR:HG22	1:C:100:LEU:H	1.47	0.78
1:A:208:GLU:OE1	1:A:210:TYR:HE2	1.67	0.78
1:D:23:GLN:HG2	3:D:824:HOH:O	1.85	0.76
1:B:98:THR:HG22	1:B:100:LEU:N	2.02	0.75
1:C:202:TYR:CE2	1:C:204:GLU:HG3	2.24	0.73
1:D:12:HIS:HD2	1:D:134:GLU:OE1	1.72	0.71
1:D:98:THR:HG22	1:D:100:LEU:N	2.06	0.71
1:A:12:HIS:HD2	1:A:134:GLU:OE1	1.73	0.70
1:A:131:HIS:HB2	1:A:135:MSE:HE3	1.73	0.70
1:B:167:GLN:CG	2:B:304:GOL:H11	2.22	0.70
1:A:38:THR:HG21	3:A:799:HOH:O	1.90	0.70
1:B:111:GLY:O	1:B:115:LYS:HG3	1.91	0.70
1:C:192:HIS:HE1	3:C:584:HOH:O	1.75	0.69
1:A:244[B]:CYS:SG	2:A:302:GOL:O1	2.49	0.68
1:C:147:HIS:O	1:C:150:GLU:HB2	1.94	0.68
1:A:202:TYR:O	1:C:240:HIS:HE1	1.76	0.67
1:D:254:ASN:OD1	2:D:301:GOL:H11	1.95	0.67
1:A:106:ASP:HB3	1:A:154:ILE:CD1	2.25	0.67
1:C:98:THR:HG22	1:C:100:LEU:N	2.10	0.66
1:B:49:HIS:CE1	1:B:244:CYS:SG	2.89	0.66
1:A:208:GLU:OE1	1:A:210:TYR:CE2	2.51	0.63
1:A:70:ILE:HD11	1:D:70:ILE:HG23	1.80	0.63
1:B:208:GLU:H	1:B:211:ARG:HH21	1.45	0.63
1:B:29:GLU:HG2	1:B:142:LYS:HE2	1.81	0.62
1:B:29:GLU:OE2	1:B:142:LYS:HE3	1.99	0.62
1:D:98:THR:CG2	1:D:100:LEU:H	2.12	0.62
1:B:106:ASP:HB3	1:B:154:ILE:CD1	2.31	0.61
1:B:87:ARG:HD2	1:B:120:GLU:HG3	1.81	0.60
1:B:210:TYR:HB2	1:B:275:GLN:HE22	1.65	0.60
1:D:131:HIS:HB2	1:D:135:MSE:HE3	1.83	0.60
1:B:49:HIS:HE1	1:B:244:CYS:SG	2.25	0.60
1:C:186:VAL:HG13	1:C:248:PRO:HB2	1.84	0.59
1:B:25:ASN:OD1	1:B:142:LYS:NZ	2.34	0.59
1:D:254:ASN:HD21	2:D:301:GOL:H11	1.68	0.59
1:C:98:THR:CG2	1:C:100:LEU:H	2.16	0.58
1:B:87:ARG:HH11	1:B:120:GLU:HG3	1.68	0.58
1:C:107:GLN:NE2	3:C:507:HOH:O	2.28	0.58
1:B:258:GLU:O	1:B:261:LYS:HB3	2.03	0.58
1:B:98:THR:CG2	1:B:100:LEU:H	2.09	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:164:SER:O	1:D:168:GLU:HG3	2.03	0.57
1:D:87:ARG:HG2	3:D:689:HOH:O	2.04	0.57
1:B:282:TRP:CD1	3:B:860:HOH:O	2.58	0.56
1:C:147:HIS:HB3	1:C:150:GLU:HB2	1.88	0.56
1:C:210:TYR:HB2	1:C:275:GLN:HE22	1.70	0.56
1:A:192:HIS:NE2	1:A:244[B]:CYS:SG	2.79	0.56
1:A:244[B]:CYS:HG	2:A:302:GOL:C1	2.06	0.56
1:C:71:THR:O	1:C:144:MSE:HE1	2.05	0.55
1:D:196:ARG:HD2	1:D:197:PHE:CZ	2.42	0.55
1:B:142:LYS:NZ	1:B:145:GLU:OE2	2.39	0.54
1:C:12:HIS:HD2	1:C:134:GLU:OE2	1.91	0.54
1:C:244:CYS:SG	3:C:762:HOH:O	2.24	0.53
1:D:254:ASN:ND2	2:D:301:GOL:H11	2.22	0.53
1:D:106:ASP:HB3	1:D:154:ILE:CD1	2.39	0.53
1:B:282:TRP:HD1	3:B:860:HOH:O	1.92	0.53
1:A:12:HIS:HB2	1:A:135:MSE:HE1	1.90	0.52
1:A:192:HIS:HE1	2:A:302:GOL:O2	1.93	0.52
1:C:77:LEU:HD22	1:C:156:VAL:HB	1.91	0.52
1:D:106:ASP:HB3	1:D:154:ILE:HD11	1.91	0.52
1:C:192:HIS:NE2	1:C:244:CYS:SG	2.82	0.52
1:B:87:ARG:NH1	1:B:120:GLU:HG3	2.26	0.51
1:B:207:GLY:HA3	1:B:211:ARG:HH21	1.74	0.51
1:D:72:ARG:HD2	1:D:150:GLU:O	2.11	0.51
1:C:229:PRO:HB2	2:C:305:GOL:H31	1.92	0.51
1:D:254:ASN:CG	2:D:301:GOL:H11	2.36	0.51
1:B:24:LEU:HD21	1:B:138:PRO:HB3	1.92	0.51
1:A:70:ILE:HD11	1:D:70:ILE:CG2	2.40	0.51
1:B:208:GLU:HG2	1:B:211:ARG:NH2	2.26	0.51
1:C:150:GLU:OE1	1:C:150:GLU:CA	2.50	0.50
1:C:153:ILE:HD12	1:C:155:PRO:HG3	1.93	0.50
1:A:189:ASP:H	1:A:244[A]:CYS:HG	1.58	0.50
1:C:148:LYS:C	1:C:150:GLU:H	2.19	0.50
1:B:167:GLN:HG3	2:B:304:GOL:H11	1.94	0.50
1:C:12:HIS:HE1	3:C:437:HOH:O	1.95	0.50
1:A:210:TYR:HB2	1:A:275:GLN:HE22	1.77	0.49
1:C:196:ARG:HD2	1:C:197:PHE:CE1	2.46	0.49
1:A:77:LEU:HD22	1:A:156:VAL:HB	1.94	0.49
1:D:266:MSE:CG	1:D:296:VAL:HG22	2.38	0.49
1:A:279:CYS:SG	1:A:286[B]:SER:HB2	2.53	0.49
1:D:241:ASN:HD22	1:D:242:THR:H	1.61	0.49
1:D:192:HIS:HE1	3:D:519:HOH:O	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:208:GLU:N	1:B:211:ARG:HH21	2.10	0.48
1:A:142:LYS:O	1:A:145:GLU:HB2	2.13	0.48
1:A:240:HIS:HE1	1:C:202:TYR:O	1.97	0.48
1:B:202:TYR:CE2	1:B:204:GLU:HG2	2.49	0.48
1:A:202:TYR:O	1:C:240:HIS:CE1	2.63	0.47
1:D:98:THR:HB	1:D:101:TYR:O	2.14	0.47
1:B:228:ASP:CG	1:B:231:SER:HB3	2.40	0.47
1:D:131:HIS:O	1:D:135:MSE:HG2	2.15	0.47
1:A:241:ASN:HD22	1:A:242:THR:H	1.63	0.46
1:A:18:THR:HG22	1:A:20:SER:H	1.80	0.46
1:A:180:PRO:HB2	1:D:180:PRO:HG2	1.98	0.46
1:C:144:MSE:O	1:C:145:GLU:C	2.60	0.45
1:D:12:HIS:HB2	1:D:135:MSE:HE1	1.97	0.45
1:D:91:SER:OG	1:D:93:VAL:HG22	2.15	0.45
1:B:91:SER:OG	1:B:93:VAL:HG22	2.17	0.45
1:C:136:HIS:HE1	1:C:187:SER:OG	1.98	0.45
1:B:192:HIS:HE1	3:B:758:HOH:O	1.98	0.45
1:A:101:TYR:CZ	1:A:148:LYS:HB2	2.51	0.45
1:A:229:PRO:HB3	1:A:253:LEU:HB3	1.99	0.45
1:A:275:GLN:NE2	3:A:483:HOH:O	2.49	0.45
1:A:196:ARG:HD2	1:A:197:PHE:CZ	2.52	0.45
1:C:151:PHE:CD1	1:C:151:PHE:C	2.95	0.45
1:A:116:THR:HG21	1:A:172:LEU:HD11	1.98	0.45
1:A:12:HIS:CD2	1:A:134:GLU:OE1	2.63	0.45
1:C:196:ARG:HD2	1:C:197:PHE:CZ	2.52	0.45
1:B:208:GLU:H	1:B:211:ARG:NH2	2.12	0.44
1:B:196:ARG:HD2	1:B:197:PHE:CZ	2.53	0.44
1:A:81:HIS:NE2	2:A:302:GOL:C1	2.74	0.44
1:D:34:GLN:NE2	3:D:752:HOH:O	2.50	0.44
1:B:267:SER:OG	1:B:297:HIS:HE1	2.01	0.44
1:D:39:LYS:HE3	1:D:269:SER:OG	2.17	0.44
1:D:167:GLN:HE21	2:D:301:GOL:H2	1.83	0.44
1:C:258:GLU:O	1:C:261:LYS:HB2	2.18	0.44
1:D:186:VAL:HG13	1:D:248:PRO:HB2	2.00	0.43
1:D:241:ASN:HD22	1:D:242:THR:N	2.16	0.43
1:D:196:ARG:HD2	1:D:197:PHE:CE1	2.53	0.43
1:A:85:LEU:HB3	1:A:159:GLY:HA3	1.99	0.43
1:B:12:HIS:HD2	1:B:134:GLU:OE1	2.01	0.43
1:C:193:TRP:CG	1:C:213:ILE:HD11	2.54	0.43
1:B:29:GLU:OE1	3:B:464:HOH:O	2.22	0.43
1:B:167:GLN:OE1	2:B:304:GOL:H11	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:87:ARG:HB2	1:A:88:CYS:H	1.63	0.42
1:D:72:ARG:O	1:D:151:PHE:HB2	2.19	0.42
1:B:142:LYS:HA	1:B:142:LYS:HD3	1.85	0.42
1:B:18:THR:HG22	1:B:20:SER:H	1.85	0.42
1:B:78:GLY:HA2	1:B:187:SER:HB3	2.02	0.41
1:A:278:GLN:HG2	3:A:483:HOH:O	2.20	0.41
1:A:49:HIS:CE1	1:A:244[A]:CYS:HG	2.32	0.41
1:B:254:ASN:HD21	2:B:304:GOL:H12	1.86	0.41
1:C:131:HIS:O	1:C:135:MSE:HG2	2.20	0.41
1:C:219:MSE:HE2	1:C:219:MSE:HB3	1.86	0.41
1:C:228:ASP:HA	1:C:229:PRO:HD2	1.56	0.41
1:C:241:ASN:HD22	1:C:242:THR:H	1.69	0.41
1:D:229:PRO:CB	2:D:301:GOL:H12	2.40	0.41
1:A:171:LYS:O	1:A:174:SER:HB2	2.21	0.41
1:B:87:ARG:NH1	1:B:120:GLU:CG	2.84	0.41
1:A:137:LEU:HB2	1:A:138:PRO:HD3	2.03	0.40
1:A:179:ASP:HA	1:A:180:PRO:HD3	1.88	0.40
1:D:12:HIS:CD2	1:D:134:GLU:OE1	2.63	0.40
1:D:175:LYS:HB3	3:D:700:HOH:O	2.20	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	293/293 (100%)	284 (97%)	9 (3%)	0	100	100
1	B	291/293 (99%)	286 (98%)	5 (2%)	0	100	100
1	C	290/293 (99%)	285 (98%)	5 (2%)	0	100	100
1	D	293/293 (100%)	287 (98%)	6 (2%)	0	100	100
All	All	1167/1172 (100%)	1142 (98%)	25 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	257/247 (104%)	242 (94%)	15 (6%)	18	16
1	B	255/247 (103%)	241 (94%)	14 (6%)	19	18
1	C	254/247 (103%)	242 (95%)	12 (5%)	23	24
1	D	257/247 (104%)	250 (97%)	7 (3%)	39	45
All	All	1023/988 (104%)	975 (95%)	48 (5%)	23	24

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	38	THR
1	A	73	ARG
1	A	77	LEU
1	A	85	LEU
1	A	87	ARG
1	A	98	THR
1	A	110	TYR
1	A	139	TYR
1	A	174	SER
1	A	196	ARG
1	A	216	LEU
1	A	222	SER
1	A	238	LYS
1	A	253	LEU
1	A	271	LEU
1	B	77	LEU
1	B	83	VAL
1	B	109	ILE
1	B	110	TYR
1	B	121	ARG
1	B	139	TYR
1	B	140	THR

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Mol	Chain	Res	Type
1	B	142	LYS
1	B	196	ARG
1	B	211	ARG
1	B	216	LEU
1	B	231	SER
1	B	257	THR
1	B	283	GLN
1	C	36	GLN
1	C	98	THR
1	C	103	LEU
1	C	110	TYR
1	C	139	TYR
1	C	140	THR
1	C	148	LYS
1	C	151	PHE
1	C	163	GLU
1	C	211	ARG
1	C	228	ASP
1	C	271	LEU
1	D	77	LEU
1	D	98	THR
1	D	110	TYR
1	D	139	TYR
1	D	196	ARG
1	D	216	LEU
1	D	271	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (44) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	12	HIS
1	A	49	HIS
1	A	125	GLN
1	A	147	HIS
1	A	167	GLN
1	A	234	ASN
1	A	241	ASN
1	A	254	ASN
1	A	265	ASN
1	A	275	GLN
1	A	297	HIS
1	B	12	HIS

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Mol	Chain	Res	Type
1	B	49	HIS
1	B	192	HIS
1	B	241	ASN
1	B	260	GLN
1	B	275	GLN
1	B	283	GLN
1	B	297	HIS
1	C	12	HIS
1	C	25	ASN
1	C	36	GLN
1	C	82	HIS
1	C	136	HIS
1	C	147	HIS
1	C	167	GLN
1	C	206	GLN
1	C	226	GLN
1	C	234	ASN
1	C	240	HIS
1	C	241	ASN
1	C	260	GLN
1	C	262	ASN
1	C	275	GLN
1	C	297	HIS
1	D	12	HIS
1	D	27	GLN
1	D	34	GLN
1	D	82	HIS
1	D	107	GLN
1	D	147	HIS
1	D	167	GLN
1	D	192	HIS
1	D	241	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

5 ligands are modelled in this entry.

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	GOL	A	303	-	5,5,5	0.54	0	5,5,5	1.21	0
2	GOL	D	301	-	5,5,5	0.76	0	5,5,5	0.94	0
2	GOL	B	304	-	5,5,5	0.47	0	5,5,5	1.80	2 (40%)
2	GOL	C	305	-	5,5,5	0.70	0	5,5,5	1.20	0
2	GOL	A	302	-	5,5,5	0.37	0	5,5,5	0.96	0

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	GOL	A	303	-	-	4/4/4/4	-
2	GOL	D	301	-	-	1/4/4/4	-
2	GOL	B	304	-	-	2/4/4/4	-
2	GOL	C	305	-	-	3/4/4/4	-
2	GOL	A	302	-	-	4/4/4/4	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	304	GOL	O1-C1-C2	2.54	121.81	110.38
2	B	304	GOL	O2-C2-C1	2.33	118.82	109.18

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	302	GOL	O1-C1-C2-C3
2	B	304	GOL	O1-C1-C2-C3
2	A	302	GOL	O1-C1-C2-O2
2	A	302	GOL	C1-C2-C3-O3
2	A	303	GOL	O1-C1-C2-C3
2	A	303	GOL	C1-C2-C3-O3
2	C	305	GOL	O1-C1-C2-C3
2	A	303	GOL	O1-C1-C2-O2
2	A	303	GOL	O2-C2-C3-O3
2	B	304	GOL	O1-C1-C2-O2
2	C	305	GOL	O2-C2-C3-O3
2	A	302	GOL	O2-C2-C3-O3
2	C	305	GOL	O1-C1-C2-O2
2	D	301	GOL	O1-C1-C2-O2

There are no ring outliers.

5 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	303	GOL	4	0
2	D	301	GOL	7	0
2	B	304	GOL	4	0
2	C	305	GOL	1	0
2	A	302	GOL	7	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(Å ²)	Q<0.9
1	A	285/293 (97%)	-0.39	1 (0%) 88 90	6, 11, 21, 27	2 (0%)
1	B	285/293 (97%)	-0.40	1 (0%) 88 90	7, 12, 20, 24	0
1	C	284/293 (96%)	-0.16	3 (1%) 78 80	7, 13, 21, 28	0
1	D	285/293 (97%)	-0.46	1 (0%) 88 90	6, 11, 21, 29	2 (0%)
All	All	1139/1172 (97%)	-0.35	6 (0%) 87 88	6, 12, 21, 29	4 (0%)

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	84	PRO	2.8
1	C	146	SER	2.4
1	C	149	ASP	2.3
1	C	244	CYS	2.3
1	D	54	TYR	2.2
1	A	84	PRO	2.1

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 oligosaccharides 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	GOL	C	305	6/6	0.80	0.15	23,34,36,39	0
2	GOL	A	302	6/6	0.83	0.12	32,34,35,36	0
2	GOL	B	304	6/6	0.86	0.14	24,34,37,39	0
2	GOL	A	303	6/6	0.89	0.15	24,34,35,37	0
2	GOL	D	301	6/6	0.91	0.14	28,30,32,33	0

6.5 Other polymers [i](#)

There are no such residues in this entry.