



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 15, 2020 – 04:00 am BST

PDB ID : 3SLA
Title : X-ray structure of first four repeats of human beta-catenin
Authors : Gupta, D.; Bienz, M.
Deposited on : 2011-06-24
Resolution : 2.50 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 : 2.11
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

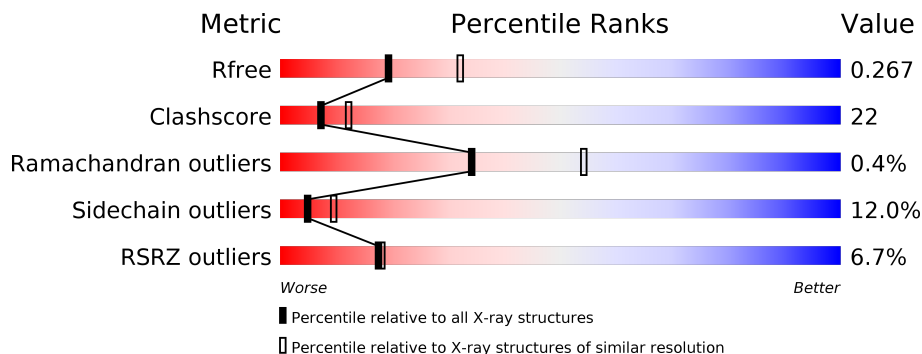
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	168	 % 74% 20% . .
1	B	168	 2% 69% 21% 7%
1	C	168	 29% 29% 46% 14% 9%
1	D	168	 % 71% 21% 5% .
1	E	168	 % 74% 19% . .

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	7	-	-	-	X

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6074 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 Catenin beta-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	166	1256	790	226	231	9	0	0	0
1	B	156	1166	734	213	210	9	0	0	0
1	C	153	1061	667	193	194	7	0	0	0
1	D	164	1236	778	221	228	9	0	0	0
1	E	162	1219	768	222	220	9	0	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	139	GLY	-	EXPRESSION TAG	UNP P35222
A	140	SER	-	EXPRESSION TAG	UNP P35222
B	139	GLY	-	EXPRESSION TAG	UNP P35222
B	140	SER	-	EXPRESSION TAG	UNP P35222
C	139	GLY	-	EXPRESSION TAG	UNP P35222
C	140	SER	-	EXPRESSION TAG	UNP P35222
D	139	GLY	-	EXPRESSION TAG	UNP P35222
D	140	SER	-	EXPRESSION TAG	UNP P35222
E	139	GLY	-	EXPRESSION TAG	UNP P35222
E	140	SER	-	EXPRESSION TAG	UNP P35222

- Molecule 2 is GLYCEROL (three-letter code: 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		
2	A	1	Total	C	O	0	0
			6	3	3		
2	A	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		
2	D	1	Total	C	O	0	0
			6	3	3		
2	E	1	Total	C	O	0	0
			6	3	3		
2	E	1	Total	C	O	0	0
			6	3	3		

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	E	2	Total	Na	0	0
			2	2		

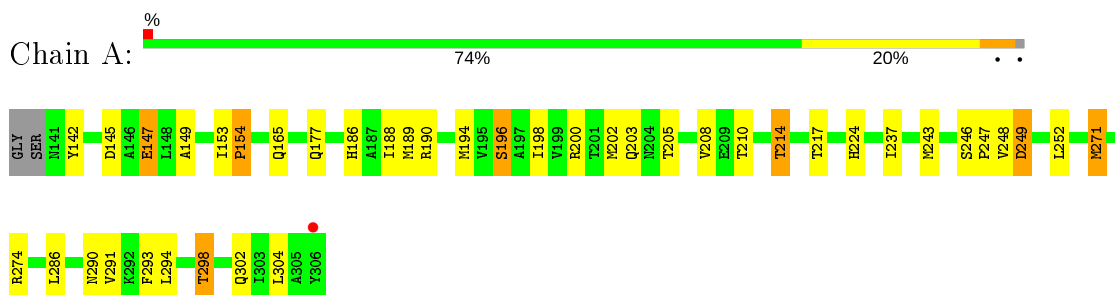
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	18	Total 18	O 18	0	0
4	B	17	Total 17	O 17	0	0
4	C	2	Total 2	O 2	0	0
4	D	21	Total 21	O 21	0	0
4	E	28	Total 28	O 28	0	0

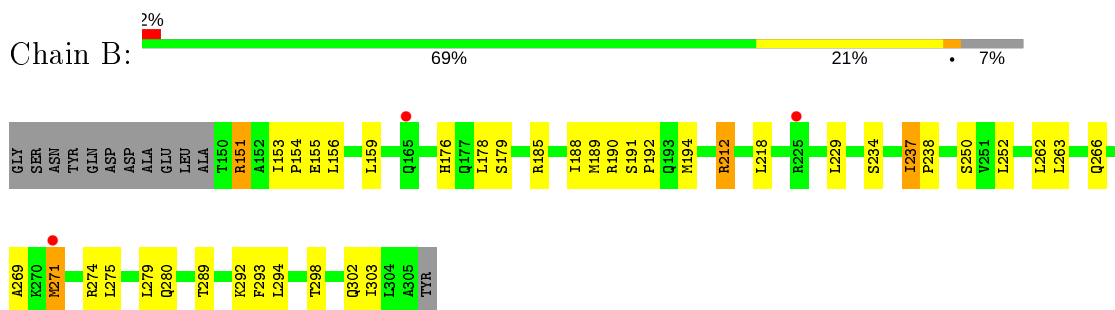
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

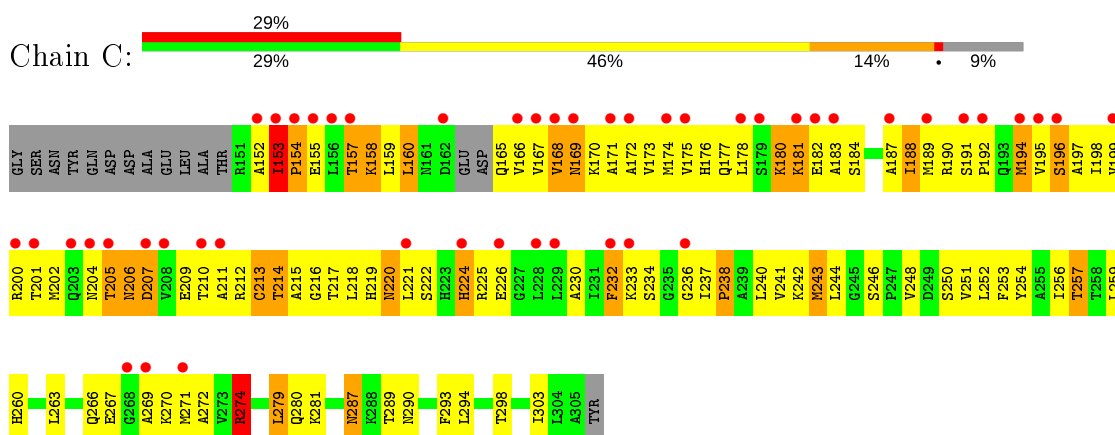
- Molecule 1: Catenin beta-1



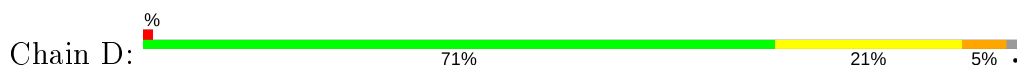
- Molecule 1: Catenin beta-1

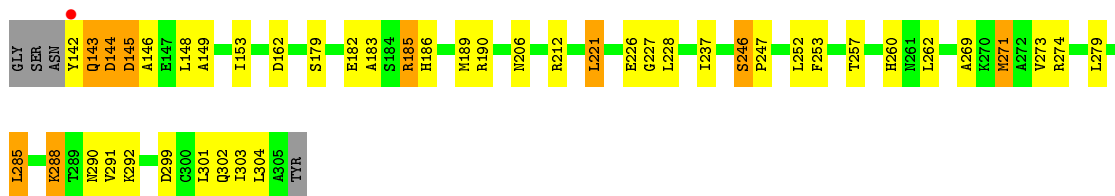


- Molecule 1: Catenin beta-1

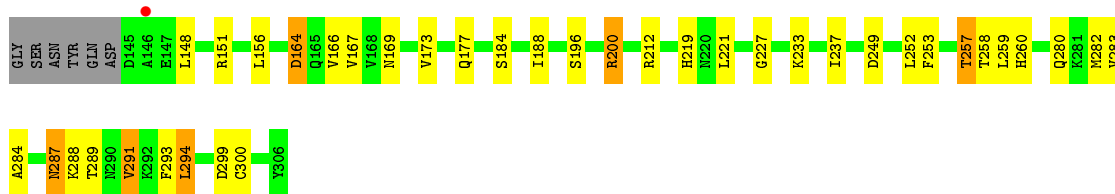
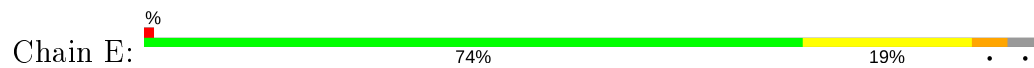


- Molecule 1: Catenin beta-1





- Molecule 1: Catenin beta-1



4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α , β , γ	90.79Å 90.79Å 364.34Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.71 – 2.50 40.71 – 2.50	Depositor EDS
% Data completeness (in resolution range)	99.0 (40.71-2.50) 99.0 (40.71-2.50)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.86 (at 2.51Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.218 , 0.277 0.212 , 0.267	Depositor DCC
R_{free} test set	2719 reflections (5.08%)	wwPDB-VP
Wilson B-factor (Å ²)	57.4	Xtrriage
Anisotropy	0.001	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 52.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6074	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.82% of the height of the origin peak. No significant pseudotranslation is detected.*

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: GOL, NA

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	0.95	1/1271 (0.1%)	0.95	1/1720 (0.1%)
1	B	0.85	0/1180	0.89	1/1600 (0.1%)
1	C	1.02	2/1072 (0.2%)	0.89	2/1456 (0.1%)
1	D	0.89	0/1251	0.91	2/1695 (0.1%)
1	E	0.94	1/1233 (0.1%)	0.94	1/1668 (0.1%)
All	All	0.93	4/6007 (0.1%)	0.92	7/8139 (0.1%)

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	C	0	1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	154	PRO	N-CD	10.55	1.62	1.47
1	C	207	ASP	CA-CB	6.42	1.68	1.53
1	E	291	VAL	CB-CG1	-5.88	1.40	1.52
1	A	147	GLU	CG-CD	5.03	1.59	1.51

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	212	ARG	NE-CZ-NH2	-7.10	116.75	120.30
1	E	164	ASP	CB-CG-OD2	5.62	123.36	118.30
1	D	185	ARG	NE-CZ-NH2	-5.45	117.57	120.30
1	D	221	LEU	CB-CG-CD1	-5.33	101.94	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	249	ASP	CB-CG-OD2	-5.23	113.59	118.30
1	C	274	ARG	NE-CZ-NH1	5.21	122.91	120.30
1	C	154	PRO	N-CD-CG	-5.11	95.53	103.20

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	159	LEU	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	1256	0	1305	34	0
1	B	1166	0	1214	29	0
1	C	1061	0	1029	156	0
1	D	1236	0	1281	37	0
1	E	1219	0	1282	23	0
2	A	24	0	32	7	0
2	D	12	0	16	2	0
2	E	12	0	16	1	0
3	E	2	0	0	0	0
4	A	18	0	0	1	0
4	B	17	0	0	1	0
4	C	2	0	0	0	0
4	D	21	0	0	3	0
4	E	28	0	0	2	0
All	All	6074	0	6175	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 22.

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:C:154:PRO:HB2	1:C:157:THR:OG1	1.41	1.19
1:C:197:ALA:O	1:C:201:THR:HG23	1.44	1.18
1:C:160:LEU:CB	1:C:168:VAL:HA	1.73	1.16
1:C:152:ALA:C	1:C:154:PRO:HD3	1.73	1.10
1:C:219:HIS:O	1:C:222:SER:HB3	1.55	1.05
1:C:212:ARG:CG	1:C:254:TYR:HE2	1.72	1.03
1:C:207:ASP:O	1:C:210:THR:HG22	1.63	0.98
1:C:220:ASN:HD22	1:C:220:ASN:H	0.99	0.98
1:C:212:ARG:HG2	1:C:254:TYR:HE2	1.26	0.97
1:C:158:LYS:HE2	1:C:194:MET:HG2	1.46	0.97
1:C:207:ASP:H	1:C:210:THR:HG21	1.28	0.96
1:C:214:THR:O	1:C:218:LEU:HD12	1.66	0.96
1:C:207:ASP:H	1:C:210:THR:CG2	1.78	0.95
1:C:213:CYS:O	1:C:217:THR:HG23	1.69	0.93
1:A:294:LEU:O	1:A:298:THR:HG23	1.69	0.92
1:C:216:GLY:O	1:C:220:ASN:ND2	2.04	0.91
1:C:212:ARG:HG2	1:C:254:TYR:CE2	2.07	0.89
1:C:195:VAL:HG12	1:C:234:SER:CB	2.02	0.89
1:C:201:THR:O	1:C:205:THR:HG22	1.72	0.87
1:C:263:LEU:HB3	1:C:303:ILE:HG21	1.56	0.86
1:C:195:VAL:HG21	1:C:230:ALA:HB1	1.58	0.85
1:C:220:ASN:HD22	1:C:220:ASN:N	1.75	0.84
1:A:302:GLN:HE22	1:C:287:ASN:HB2	1.43	0.83
1:C:220:ASN:ND2	1:C:220:ASN:H	1.75	0.83
1:C:289:THR:OG1	1:C:293:PHE:HB2	1.80	0.81
1:A:153:ILE:HB	1:A:154:PRO:HD3	1.62	0.80
1:B:263:LEU:HB3	1:B:303:ILE:HG21	1.61	0.80
1:A:246:SER:HB2	2:A:2:GOL:H32	1.64	0.79
1:C:274:ARG:HH11	1:C:274:ARG:HG3	1.46	0.79
1:C:207:ASP:N	1:C:210:THR:CG2	2.45	0.79
1:A:252:LEU:HD11	1:A:293:PHE:CD2	2.18	0.79
1:C:154:PRO:HB2	1:C:157:THR:HG1	1.44	0.79
1:D:146:ALA:HB2	1:D:183:ALA:HB1	1.65	0.79
1:D:253:PHE:O	1:D:257:THR:HG23	1.84	0.77
1:B:237:ILE:HB	1:B:238:PRO:HD3	1.65	0.77
1:C:252:LEU:O	1:C:256:ILE:HG22	1.84	0.77
1:D:288:LYS:HG3	1:D:288:LYS:O	1.83	0.76
1:D:288:LYS:HB3	4:D:9:HOH:O	1.85	0.75
1:D:206:ASN:HD21	2:D:3:GOL:H11	1.50	0.75
1:C:259:LEU:O	1:C:263:LEU:HD13	1.86	0.74
1:C:237:ILE:HB	1:C:238:PRO:HD3	1.69	0.74
1:C:188:ILE:HG22	1:C:194:MET:HB3	1.68	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:209:GLU:O	1:C:213:CYS:SG	2.45	0.74
1:B:271:MET:SD	1:B:271:MET:N	2.56	0.73
1:C:160:LEU:O	1:C:167:VAL:HG13	1.89	0.73
1:C:246:SER:CB	1:C:251:VAL:HG21	2.18	0.73
1:A:246:SER:HB2	2:A:2:GOL:C3	2.18	0.73
1:C:207:ASP:N	1:C:210:THR:HG22	2.03	0.72
1:C:176:HIS:HA	1:C:217:THR:HG22	1.70	0.72
1:C:214:THR:O	1:C:218:LEU:CD1	2.37	0.72
1:C:212:ARG:CG	1:C:254:TYR:CE2	2.64	0.72
1:C:196:SER:O	1:C:200:ARG:HG2	1.90	0.72
1:C:270:LYS:HG3	1:C:271:MET:N	2.05	0.71
1:C:216:GLY:O	1:C:219:HIS:HB3	1.91	0.70
1:B:289:THR:OG1	1:B:293:PHE:HB2	1.91	0.70
1:C:240:LEU:O	1:C:243:MET:HB2	1.91	0.70
1:A:145:ASP:OD2	1:A:147:GLU:HB3	1.92	0.70
1:C:279:LEU:HD23	1:C:279:LEU:C	2.12	0.69
1:C:237:ILE:HD12	1:C:272:ALA:CB	2.22	0.69
1:C:210:THR:HG23	1:C:211:ALA:N	2.08	0.69
1:D:212:ARG:HD3	4:D:17:HOH:O	1.92	0.68
1:C:207:ASP:CA	1:C:210:THR:HG22	2.25	0.67
1:C:195:VAL:HG12	1:C:234:SER:HB3	1.78	0.65
1:C:207:ASP:N	1:C:210:THR:HG21	2.08	0.65
1:C:246:SER:CB	1:C:251:VAL:CG2	2.73	0.65
1:A:252:LEU:HD11	1:A:293:PHE:CE2	2.32	0.65
1:C:207:ASP:C	1:C:210:THR:HG22	2.16	0.65
1:C:237:ILE:HD12	1:C:272:ALA:HB3	1.78	0.65
1:C:177:GLN:HA	1:C:177:GLN:NE2	2.12	0.64
1:C:158:LYS:O	1:C:158:LYS:CD	2.46	0.64
1:C:178:LEU:O	1:C:184:SER:HB3	1.97	0.64
1:E:291:VAL:HA	1:E:294:LEU:HD22	1.80	0.64
1:C:158:LYS:CE	1:C:194:MET:HG2	2.25	0.64
1:C:294:LEU:O	1:C:298:THR:HG23	1.98	0.64
1:C:174:MET:HA	1:C:177:GLN:HG2	1.78	0.63
1:A:302:GLN:NE2	1:C:287:ASN:HB2	2.11	0.63
1:C:202:MET:HA	1:C:205:THR:CG2	2.28	0.63
1:B:179:SER:O	1:B:185:ARG:NH1	2.32	0.63
1:C:274:ARG:HG3	1:C:274:ARG:NH1	2.14	0.62
1:C:220:ASN:ND2	1:C:220:ASN:N	2.36	0.62
1:C:184:SER:O	1:C:187:ALA:HB3	1.99	0.62
1:C:253:PHE:O	1:C:257:THR:OG1	2.18	0.62
1:C:197:ALA:O	1:C:201:THR:CG2	2.35	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:237:ILE:HD11	1:B:262:LEU:HD13	1.80	0.62
1:C:182:GLU:OE1	1:C:224:HIS:HE1	1.83	0.61
1:D:142:TYR:CD2	1:D:144:ASP:OD2	2.54	0.61
1:D:271:MET:HE1	4:E:83:HOH:O	2.00	0.61
1:B:176:HIS:HE1	4:B:56:HOH:O	1.83	0.61
1:D:145:ASP:OD2	1:D:145:ASP:C	2.38	0.61
1:A:149:ALA:O	1:A:153:ILE:HG12	2.00	0.61
1:C:153:ILE:N	1:C:154:PRO:HD3	2.16	0.61
1:A:274:ARG:HH12	2:A:7:GOL:H12	1.66	0.60
1:C:169:ASN:HD22	1:C:169:ASN:H	1.48	0.60
1:C:212:ARG:HG3	1:C:254:TYR:HE2	1.65	0.60
1:D:182:GLU:CG	1:D:185:ARG:HH21	2.15	0.60
1:C:207:ASP:O	1:C:210:THR:CG2	2.45	0.59
1:C:176:HIS:CA	1:C:217:THR:HG22	2.31	0.59
1:C:153:ILE:O	1:C:153:ILE:HG12	2.02	0.59
1:C:153:ILE:O	1:C:153:ILE:CG1	2.51	0.59
1:D:288:LYS:HD2	1:D:290:ASN:O	2.02	0.58
1:C:166:VAL:O	1:C:169:ASN:ND2	2.36	0.58
1:C:197:ALA:HA	1:C:200:ARG:HH11	1.68	0.58
1:C:177:GLN:HA	1:C:177:GLN:HE21	1.69	0.58
1:C:152:ALA:CB	1:C:154:PRO:HD3	2.34	0.57
1:D:274:ARG:NH1	1:D:304:LEU:O	2.30	0.57
1:C:169:ASN:O	1:C:173:VAL:HG13	2.04	0.57
1:A:210:THR:O	1:A:214:THR:HB	2.03	0.57
1:A:271:MET:HB2	2:A:7:GOL:C3	2.35	0.57
1:C:153:ILE:C	1:C:153:ILE:HD13	2.25	0.57
1:B:153:ILE:HB	1:B:154:PRO:HD3	1.85	0.57
1:C:195:VAL:HG12	1:C:234:SER:HB2	1.87	0.57
1:C:195:VAL:CG1	1:C:234:SER:CB	2.82	0.56
1:D:162:ASP:OD1	2:D:5:GOL:H31	2.06	0.56
1:E:284:ALA:O	1:E:288:LYS:HG3	2.05	0.56
1:C:210:THR:CG2	1:C:211:ALA:N	2.69	0.56
1:E:164:ASP:HB3	1:E:167:VAL:HG13	1.88	0.56
1:C:189:MET:CB	1:C:226:GLU:OE2	2.54	0.55
1:C:180:LYS:HG2	1:C:181:LYS:NZ	2.20	0.55
1:C:248:VAL:O	1:C:251:VAL:HG22	2.07	0.55
1:D:252:LEU:HD11	1:D:285:LEU:HD11	1.89	0.55
1:C:240:LEU:O	1:C:243:MET:N	2.39	0.55
1:C:182:GLU:OE1	1:C:224:HIS:CE1	2.60	0.55
1:C:160:LEU:CB	1:C:168:VAL:CA	2.67	0.55
1:C:180:LYS:HD2	1:C:180:LYS:H	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:253:PHE:O	1:E:257:THR:OG1	2.25	0.55
1:E:221:LEU:O	1:E:227:GLY:HA3	2.07	0.54
1:B:237:ILE:CD1	1:B:262:LEU:HD13	2.37	0.54
1:C:155:GLU:HA	1:C:155:GLU:OE1	2.08	0.54
1:B:294:LEU:O	1:B:298:THR:HG23	2.08	0.53
1:C:178:LEU:O	1:C:184:SER:CB	2.56	0.53
1:B:298:THR:OG1	1:E:287:ASN:ND2	2.42	0.53
1:C:224:HIS:ND1	1:C:224:HIS:N	2.56	0.53
1:C:241:VAL:O	1:C:242:LYS:C	2.45	0.53
1:C:237:ILE:HD12	1:C:272:ALA:HB1	1.91	0.53
1:C:232:PHE:HD2	1:C:266:GLN:CD	2.12	0.53
1:A:294:LEU:O	1:A:298:THR:CG2	2.49	0.52
1:C:240:LEU:O	1:C:243:MET:CB	2.56	0.52
1:D:142:TYR:HE1	4:D:68:HOH:O	1.93	0.52
1:A:202:MET:HA	1:A:214:THR:HG21	1.92	0.52
1:C:160:LEU:O	1:C:168:VAL:HG22	2.09	0.52
1:B:289:THR:OG1	1:B:293:PHE:CB	2.58	0.52
1:C:237:ILE:HB	1:C:238:PRO:CD	2.38	0.51
1:D:221:LEU:O	1:D:227:GLY:HA3	2.10	0.51
1:C:266:GLN:HG3	1:C:269:ALA:HB2	1.92	0.51
1:C:181:LYS:H	1:C:181:LYS:HD2	1.75	0.51
1:C:152:ALA:CA	1:C:154:PRO:HD3	2.42	0.50
1:C:188:ILE:HG22	1:C:194:MET:CB	2.38	0.50
1:E:260:HIS:HE1	1:E:299:ASP:OD2	1.95	0.50
1:A:286:LEU:HD11	1:A:298:THR:HG22	1.92	0.50
1:A:198:ILE:HD13	1:A:217:THR:HG21	1.93	0.50
1:C:241:VAL:O	1:C:243:MET:N	2.44	0.50
1:C:195:VAL:CG1	1:C:234:SER:HB2	2.42	0.50
1:C:237:ILE:CB	1:C:238:PRO:HD3	2.40	0.50
1:A:186:HIS:HA	1:A:189:MET:HG2	1.92	0.49
1:A:177:GLN:OE1	2:A:4:GOL:H12	2.13	0.49
1:C:190:ARG:O	1:C:192:PRO:HD3	2.12	0.49
1:C:210:THR:O	1:C:214:THR:OG1	2.30	0.49
1:C:152:ALA:HB1	1:C:154:PRO:CD	2.42	0.49
1:C:152:ALA:O	1:C:154:PRO:HD3	2.10	0.48
1:C:152:ALA:HB1	1:C:154:PRO:HD3	1.95	0.48
1:D:143:GLN:HG3	1:D:143:GLN:O	2.11	0.48
1:D:288:LYS:CG	1:D:288:LYS:O	2.58	0.48
1:B:151:ARG:N	1:B:151:ARG:HD2	2.28	0.48
1:A:196:SER:HB2	1:A:200:ARG:NH2	2.28	0.48
1:C:232:PHE:CD2	1:C:266:GLN:CD	2.87	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:153:ILE:N	1:C:154:PRO:CD	2.76	0.48
1:C:241:VAL:C	1:C:243:MET:N	2.67	0.48
1:D:186:HIS:HA	1:D:189:MET:HE2	1.95	0.48
1:C:152:ALA:C	1:C:154:PRO:CD	2.64	0.47
1:C:174:MET:O	1:C:177:GLN:HB2	2.14	0.47
1:C:181:LYS:HG2	1:C:184:SER:HB2	1.95	0.47
1:B:252:LEU:HD23	1:B:293:PHE:CE1	2.49	0.47
1:C:153:ILE:O	1:C:153:ILE:HD13	2.14	0.47
1:D:182:GLU:HG3	1:D:185:ARG:HH21	1.79	0.47
1:A:203:GLN:HA	1:A:243:MET:HE1	1.97	0.47
1:C:221:LEU:H	1:C:221:LEU:HD12	1.79	0.47
1:C:177:GLN:O	1:C:180:LYS:HD2	2.14	0.47
1:C:181:LYS:O	1:C:184:SER:N	2.47	0.47
1:A:208:VAL:HG13	1:A:248:VAL:HG21	1.97	0.47
1:D:301:LEU:HA	1:D:301:LEU:HD23	1.55	0.47
1:D:269:ALA:O	1:D:273:VAL:HG23	2.15	0.47
1:C:218:LEU:H	1:C:218:LEU:HD12	1.80	0.46
1:A:274:ARG:HH12	2:A:7:GOL:C1	2.28	0.46
1:B:237:ILE:CB	1:B:238:PRO:HD3	2.42	0.46
1:C:165:GLN:N	1:C:167:VAL:HG12	2.31	0.46
1:B:302:GLN:HA	1:E:283:VAL:HG11	1.97	0.46
1:C:196:SER:HA	1:C:234:SER:OG	2.16	0.46
1:C:169:ASN:ND2	1:C:169:ASN:H	2.14	0.46
1:C:172:ALA:O	1:C:173:VAL:C	2.54	0.46
1:C:195:VAL:HG11	1:C:230:ALA:O	2.16	0.46
1:D:279:LEU:HD12	1:D:304:LEU:HD13	1.98	0.45
1:D:285:LEU:HA	1:D:285:LEU:HD23	1.71	0.45
1:A:202:MET:HB2	1:A:214:THR:HG23	1.99	0.45
1:B:185:ARG:HD2	1:B:189:MET:CE	2.47	0.45
1:B:190:ARG:O	1:B:192:PRO:HD3	2.16	0.45
1:B:191:SER:O	1:B:194:MET:HB3	2.16	0.45
1:C:294:LEU:HD22	1:E:291:VAL:CG1	2.46	0.45
1:C:152:ALA:CB	1:C:154:PRO:CD	2.95	0.45
1:D:149:ALA:O	1:D:153:ILE:HG12	2.17	0.44
1:B:155:GLU:O	1:B:159:LEU:HD12	2.16	0.44
1:A:202:MET:HG3	1:A:214:THR:CG2	2.48	0.44
1:C:279:LEU:HD23	1:C:280:GLN:N	2.31	0.44
1:C:180:LYS:HG2	1:C:181:LYS:HZ2	1.82	0.44
1:B:252:LEU:HD23	1:B:293:PHE:CD1	2.53	0.44
1:D:285:LEU:O	1:D:288:LYS:HG2	2.18	0.44
1:C:169:ASN:O	1:C:173:VAL:CG1	2.65	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:270:LYS:HG3	1:C:271:MET:H	1.83	0.44
1:D:145:ASP:OD2	1:D:146:ALA:N	2.50	0.44
1:D:189:MET:HG3	1:D:221:LEU:HD22	1.98	0.44
1:A:246:SER:HA	1:A:247:PRO:HD2	1.79	0.44
1:C:153:ILE:O	1:C:153:ILE:CD1	2.66	0.44
1:C:251:VAL:CG2	1:C:252:LEU:N	2.81	0.43
1:B:156:LEU:HA	1:B:159:LEU:HD12	2.00	0.43
1:B:266:GLN:O	1:B:269:ALA:HB2	2.18	0.43
1:D:190:ARG:HG2	1:D:226:GLU:OE2	2.19	0.43
1:E:151:ARG:NH1	4:E:24:HOH:O	2.51	0.43
1:A:224:HIS:HB3	4:A:51:HOH:O	2.18	0.43
1:B:188:ILE:HG23	1:B:194:MET:HG2	2.00	0.43
1:B:237:ILE:CD1	1:B:237:ILE:N	2.82	0.43
1:C:215:ALA:HA	1:C:218:LEU:HD13	2.00	0.43
1:C:205:THR:C	1:C:206:ASN:OD1	2.56	0.43
1:D:143:GLN:C	1:D:145:ASP:H	2.21	0.43
1:D:182:GLU:HG2	1:D:185:ARG:HH21	1.82	0.43
1:D:246:SER:HA	1:D:247:PRO:HD3	1.81	0.43
1:D:260:HIS:HE1	1:D:299:ASP:OD2	2.01	0.43
1:C:212:ARG:HG3	1:C:254:TYR:CE2	2.48	0.42
1:C:244:LEU:HB2	1:C:281:LYS:HD2	2.00	0.42
1:D:228:LEU:HD22	1:D:262:LEU:HD23	2.00	0.42
1:E:212:ARG:HH11	1:E:212:ARG:HG2	1.85	0.42
1:C:177:GLN:NE2	1:C:177:GLN:CA	2.78	0.42
1:D:186:HIS:O	1:D:190:ARG:HG3	2.19	0.42
1:E:184:SER:O	1:E:188:ILE:HG13	2.20	0.42
1:A:246:SER:HB2	2:A:2:GOL:H31	2.01	0.42
1:C:199:VAL:CG1	1:C:236:GLY:HA2	2.50	0.42
1:E:282:MET:SD	1:E:300:CYS:HB3	2.59	0.42
1:A:186:HIS:O	1:A:190:ARG:HG3	2.20	0.42
1:C:290:ASN:C	1:C:290:ASN:OD1	2.58	0.42
1:E:287:ASN:HD22	1:E:287:ASN:HA	1.66	0.42
1:C:218:LEU:HA	1:C:221:LEU:HD13	2.02	0.42
1:E:233:LYS:HE3	2:E:8:GOL:O3	2.20	0.42
1:D:142:TYR:CG	1:D:144:ASP:OD2	2.73	0.41
1:C:158:LYS:HD2	1:C:158:LYS:O	2.18	0.41
1:E:200:ARG:HB2	1:E:200:ARG:HE	1.52	0.41
1:A:188:ILE:HG23	1:A:194:MET:HG2	2.01	0.41
1:E:252:LEU:HD21	1:E:289:THR:HG21	2.01	0.41
1:C:293:PHE:N	1:C:293:PHE:CD1	2.89	0.41
1:E:259:LEU:HD23	1:E:259:LEU:HA	1.75	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:252:LEU:HD23	1:E:293:PHE:CD2	2.55	0.41
1:C:158:LYS:HD3	1:C:158:LYS:O	2.21	0.41
1:C:171:ALA:O	1:C:175:VAL:N	2.46	0.41
1:C:279:LEU:CD2	1:C:279:LEU:C	2.86	0.41
1:C:257:THR:O	1:C:260:HIS:HB3	2.21	0.41
1:E:169:ASN:O	1:E:173:VAL:HG23	2.21	0.41
1:B:237:ILE:HD13	1:B:237:ILE:H	1.84	0.41
1:C:205:THR:OG1	1:C:210:THR:HG21	2.21	0.41
1:D:303:ILE:O	1:D:303:ILE:HG22	2.21	0.41
1:E:294:LEU:HA	1:E:294:LEU:HD12	1.92	0.41
1:A:203:GLN:HA	1:A:243:MET:CE	2.51	0.41
1:C:198:ILE:HA	1:C:201:THR:OG1	2.21	0.41
1:C:289:THR:HG1	1:C:293:PHE:HB2	1.83	0.41
1:C:180:LYS:HB3	1:C:180:LYS:HE2	1.95	0.40
1:A:290:ASN:C	1:A:290:ASN:OD1	2.60	0.40
1:A:304:LEU:HA	1:A:304:LEU:HD23	1.72	0.40
1:C:246:SER:CB	1:C:251:VAL:HG23	2.51	0.40
1:C:237:ILE:CD1	1:C:272:ALA:HB3	2.50	0.40
1:B:237:ILE:HD13	1:B:237:ILE:N	2.36	0.40
1:C:181:LYS:O	1:C:183:ALA:N	2.54	0.40
1:C:199:VAL:HG13	1:C:236:GLY:HA2	2.04	0.40
1:E:219:HIS:HA	1:E:258:THR:OG1	2.21	0.40
1:B:178:LEU:HD23	1:B:178:LEU:HA	1.82	0.40
1:B:212:ARG:HG3	1:B:250:SER:OG	2.21	0.40
1:C:270:LYS:CG	1:C:271:MET:N	2.81	0.40
1:A:291:VAL:CG2	1:E:294:LEU:HB3	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	164/168 (98%)	161 (98%)	3 (2%)	0	100	100
1	B	154/168 (92%)	150 (97%)	4 (3%)	0	100	100
1	C	149/168 (89%)	126 (85%)	20 (13%)	3 (2%)	7	12
1	D	162/168 (96%)	161 (99%)	1 (1%)	0	100	100
1	E	160/168 (95%)	158 (99%)	2 (1%)	0	100	100
All	All	789/840 (94%)	756 (96%)	30 (4%)	3 (0%)	34	54

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	153	ILE
1	C	160	LEU
1	C	225	ARG

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	136/140 (97%)	126 (93%)	10 (7%)	13	27
1	B	126/140 (90%)	115 (91%)	11 (9%)	10	20
1	C	99/140 (71%)	70 (71%)	29 (29%)	0	0
1	D	134/140 (96%)	121 (90%)	13 (10%)	8	16
1	E	132/140 (94%)	120 (91%)	12 (9%)	9	18
All	All	627/700 (90%)	552 (88%)	75 (12%)	5	9

All (75) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	142	TYR
1	A	154	PRO
1	A	165	GLN
1	A	196	SER
1	A	205	THR

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Mol	Chain	Res	Type
1	A	214	THR
1	A	237	ILE
1	A	249	ASP
1	A	271	MET
1	A	298	THR
1	B	151	ARG
1	B	218	LEU
1	B	229	LEU
1	B	234	SER
1	B	237	ILE
1	B	271	MET
1	B	274	ARG
1	B	275	LEU
1	B	279	LEU
1	B	280	GLN
1	B	292	LYS
1	C	153	ILE
1	C	157	THR
1	C	158	LYS
1	C	168	VAL
1	C	169	ASN
1	C	170	LYS
1	C	180	LYS
1	C	181	LYS
1	C	188	ILE
1	C	191	SER
1	C	194	MET
1	C	196	SER
1	C	204	ASN
1	C	205	THR
1	C	206	ASN
1	C	213	CYS
1	C	214	THR
1	C	220	ASN
1	C	224	HIS
1	C	232	PHE
1	C	233	LYS
1	C	238	PRO
1	C	243	MET
1	C	250	SER
1	C	257	THR
1	C	267	GLU

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Mol	Chain	Res	Type
1	C	274	ARG
1	C	279	LEU
1	C	287	ASN
1	D	143	GLN
1	D	144	ASP
1	D	145	ASP
1	D	148	LEU
1	D	179	SER
1	D	237	ILE
1	D	246	SER
1	D	271	MET
1	D	285	LEU
1	D	288	LYS
1	D	291	VAL
1	D	292	LYS
1	D	302	GLN
1	E	148	LEU
1	E	156	LEU
1	E	166	VAL
1	E	177	GLN
1	E	196	SER
1	E	200	ARG
1	E	237	ILE
1	E	249	ASP
1	E	257	THR
1	E	280	GLN
1	E	287	ASN
1	E	294	LEU

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

Mol	Chain	Res	Type
1	A	169	ASN
1	A	186	HIS
1	A	287	ASN
1	A	302	GLN
1	B	161	ASN
1	C	177	GLN
1	C	220	ASN
1	C	223	HIS
1	C	224	HIS
1	C	260	HIS

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Mol	Chain	Res	Type
1	C	261	ASN
1	C	266	GLN
1	C	287	ASN
1	D	206	ASN
1	D	287	ASN
1	E	204	ASN
1	E	260	HIS
1	E	280	GLN
1	E	287	ASN
1	E	290	ASN
1	E	302	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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 2 are monoatomic - leaving 8 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	GOL	A	4	-	5,5,5	0.54	0	5,5,5	0.68	0
2	GOL	A	7	-	5,5,5	0.48	0	5,5,5	1.14	1 (20%)
2	GOL	D	3	-	5,5,5	0.37	0	5,5,5	0.37	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	GOL	E	6	-	5,5,5	0.36	0	5,5,5	0.43	0
2	GOL	E	8	-	5,5,5	0.66	0	5,5,5	0.76	0
2	GOL	A	1	-	5,5,5	0.54	0	5,5,5	0.54	0
2	GOL	A	2	-	5,5,5	0.50	0	5,5,5	0.81	0
2	GOL	D	5	-	5,5,5	0.32	0	5,5,5	0.61	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	4	-	-	3/4/4/4	-
2	GOL	A	7	-	-	2/4/4/4	-
2	GOL	D	3	-	-	2/4/4/4	-
2	GOL	E	6	-	-	2/4/4/4	-
2	GOL	E	8	-	-	2/4/4/4	-
2	GOL	A	1	-	-	2/4/4/4	-
2	GOL	A	2	-	-	2/4/4/4	-
2	GOL	D	5	-	-	4/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	7	GOL	O3-C3-C2	2.09	120.20	110.20

There are no chirality outliers.

All (19) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	4	GOL	O1-C1-C2-C3
2	A	7	GOL	C1-C2-C3-O3
2	E	6	GOL	C1-C2-C3-O3
2	D	5	GOL	O1-C1-C2-C3
2	E	6	GOL	O2-C2-C3-O3
2	E	8	GOL	O2-C2-C3-O3
2	A	4	GOL	C1-C2-C3-O3
2	D	3	GOL	O1-C1-C2-C3

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Mol	Chain	Res	Type	Atoms
2	D	3	GOL	C1-C2-C3-O3
2	E	8	GOL	C1-C2-C3-O3
2	A	1	GOL	C1-C2-C3-O3
2	A	4	GOL	O1-C1-C2-O2
2	A	7	GOL	O2-C2-C3-O3
2	D	5	GOL	O1-C1-C2-O2
2	A	2	GOL	O1-C1-C2-O2
2	A	1	GOL	O2-C2-C3-O3
2	D	5	GOL	O2-C2-C3-O3
2	D	5	GOL	C1-C2-C3-O3
2	A	2	GOL	O1-C1-C2-C3

There are no ring outliers.

6 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	4	GOL	1	0
2	A	7	GOL	3	0
2	D	3	GOL	1	0
2	E	8	GOL	1	0
2	A	2	GOL	3	0
2	D	5	GOL	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	166/168 (98%)	-0.07	1 (0%) 89 90	33, 48, 77, 122	0
1	B	156/168 (92%)	0.09	3 (1%) 66 69	39, 57, 83, 95	0
1	C	153/168 (91%)	1.39	48 (31%) 0 0	40, 95, 127, 137	0
1	D	164/168 (97%)	-0.02	1 (0%) 89 90	34, 50, 85, 121	0
1	E	162/168 (96%)	0.01	1 (0%) 89 90	32, 44, 74, 107	0
All	All	801/840 (95%)	0.27	54 (6%) 17 18	32, 54, 111, 137	0

All (54) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	192	PRO	7.3
1	C	152	ALA	5.5
1	C	168	VAL	5.0
1	C	157	THR	4.9
1	C	233	LYS	4.8
1	C	208	VAL	4.8
1	C	167	VAL	4.7
1	C	156	LEU	4.7
1	A	306	TYR	4.4
1	C	175	VAL	4.3
1	C	183	ALA	4.2
1	C	178	LEU	4.1
1	C	229	LEU	4.0
1	C	174	MET	3.7
1	C	269	ALA	3.4
1	C	228	LEU	3.3
1	C	169	ASN	3.3
1	C	162	ASP	3.2
1	C	205	THR	3.1
1	C	224	HIS	3.1

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Mol	Chain	Res	Type	RSRZ
1	C	171	ALA	3.0
1	C	203	GLN	3.0
1	C	172	ALA	3.0
1	C	195	VAL	3.0
1	C	189	MET	3.0
1	C	268	GLY	2.9
1	C	179	SER	2.9
1	C	221	LEU	2.9
1	C	199	VAL	2.9
1	C	226	GLU	2.8
1	C	153	ILE	2.7
1	D	142	TYR	2.7
1	C	200	ARG	2.6
1	C	196	SER	2.6
1	B	271	MET	2.5
1	C	187	ALA	2.5
1	C	236	GLY	2.5
1	C	182	GLU	2.4
1	C	194	MET	2.4
1	B	225	ARG	2.4
1	C	181	LYS	2.3
1	C	154	PRO	2.3
1	C	191	SER	2.3
1	E	146	ALA	2.3
1	C	211	ALA	2.3
1	C	232	PHE	2.2
1	C	210	THR	2.2
1	C	207	ASP	2.1
1	C	271	MET	2.1
1	C	166	VAL	2.1
1	C	155	GLU	2.1
1	C	204	ASN	2.1
1	C	201	THR	2.1
1	B	165	GLN	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 carbohydrates 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	A	7	6/6	0.73	0.43	69,77,80,98	0
2	GOL	A	2	6/6	0.73	0.19	74,87,90,90	0
2	GOL	D	3	6/6	0.75	0.18	93,103,107,108	0
2	GOL	A	1	6/6	0.80	0.19	72,74,76,81	0
2	GOL	D	5	6/6	0.80	0.34	77,83,88,89	0
2	GOL	A	4	6/6	0.84	0.24	67,72,77,79	0
2	GOL	E	8	6/6	0.85	0.44	62,69,72,73	0
2	GOL	E	6	6/6	0.90	0.20	85,92,98,103	0
3	NA	E	2	1/1	0.94	0.16	68,68,68,68	0
3	NA	E	1	1/1	0.94	0.14	54,54,54,54	0

6.5 Other polymers [i](#)

There are no such residues in this entry.