Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2025 – 10:19 AM EDT

PDB ID	:	9B15
Title	:	Superfamily 2 helicase Hel308 containing the beta-hairpin from DNA pol theta helicase-like domain
Authors	:	Eckenroth, B.E.; Doublie, S.
Deposited on	:	2024-03-13
Resolution	:	2.25 Å(reported)

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

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

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

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

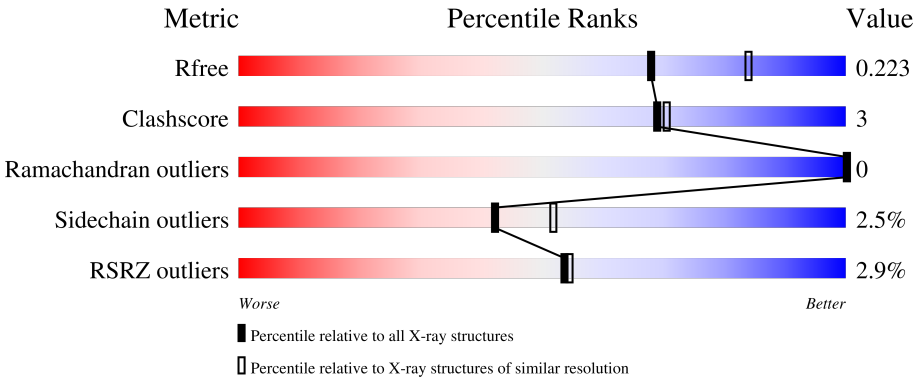
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41.4

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.25 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}	164625	1763 (2.26-2.26)
Clashscore	180529	1919 (2.26-2.26)
Ramachandran outliers	177936	1884 (2.26-2.26)
Sidechain outliers	177891	1885 (2.26-2.26)
RSRZ outliers	164620	1763 (2.26-2.26)

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	699	3% 88% 9% .
1	B	699	3% 87% 10% .

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 11057 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 ATP-dependent DNA helicase Hel308.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	682	Total	C	N	O	S	0	4	0
			5360	3396	936	1005	23			
1	B	680	Total	C	N	O	S	0	4	0
			5292	3353	920	997	22			

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	348	PRO	-	linker	UNP P0DMI1
A	349	ILE	-	linker	UNP P0DMI1
A	350	PHE	-	linker	UNP P0DMI1
A	351	GLY	-	linker	UNP P0DMI1
A	352	GLY	-	linker	UNP P0DMI1
A	353	ARG	-	linker	UNP P0DMI1
A	354	PRO	-	linker	UNP P0DMI1
A	689	ALA	-	expression tag	UNP P0DMI1
A	690	ALA	-	expression tag	UNP P0DMI1
A	691	ALA	-	expression tag	UNP P0DMI1
A	692	LEU	-	expression tag	UNP P0DMI1
A	693	GLU	-	expression tag	UNP P0DMI1
A	694	HIS	-	expression tag	UNP P0DMI1
A	695	HIS	-	expression tag	UNP P0DMI1
A	696	HIS	-	expression tag	UNP P0DMI1
A	697	HIS	-	expression tag	UNP P0DMI1
A	698	HIS	-	expression tag	UNP P0DMI1
A	699	HIS	-	expression tag	UNP P0DMI1
B	348	PRO	-	linker	UNP P0DMI1
B	349	ILE	-	linker	UNP P0DMI1
B	350	PHE	-	linker	UNP P0DMI1
B	351	GLY	-	linker	UNP P0DMI1
B	352	GLY	-	linker	UNP P0DMI1
B	353	ARG	-	linker	UNP P0DMI1
B	354	PRO	-	linker	UNP P0DMI1

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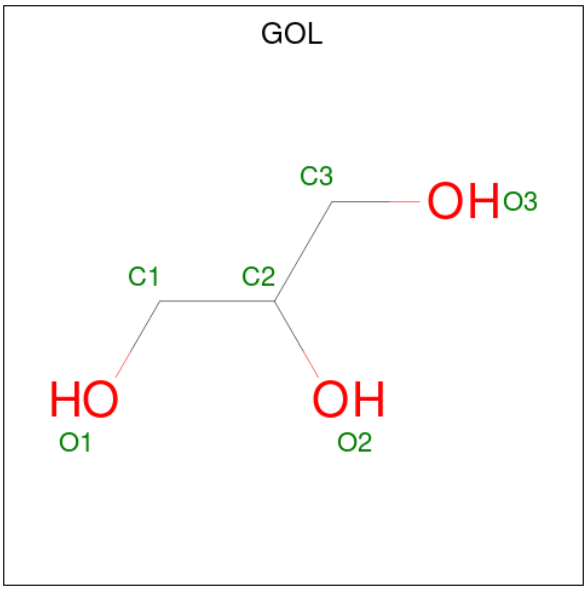
Chain	Residue	Modelled	Actual	Comment	Reference
B	689	ALA	-	expression tag	UNP P0DMI1
B	690	ALA	-	expression tag	UNP P0DMI1
B	691	ALA	-	expression tag	UNP P0DMI1
B	692	LEU	-	expression tag	UNP P0DMI1
B	693	GLU	-	expression tag	UNP P0DMI1
B	694	HIS	-	expression tag	UNP P0DMI1
B	695	HIS	-	expression tag	UNP P0DMI1
B	696	HIS	-	expression tag	UNP P0DMI1
B	697	HIS	-	expression tag	UNP P0DMI1
B	698	HIS	-	expression tag	UNP P0DMI1
B	699	HIS	-	expression tag	UNP P0DMI1

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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	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 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0
2	B	1	Total C O 6 3 3	0	0

- Molecule 3 is water.

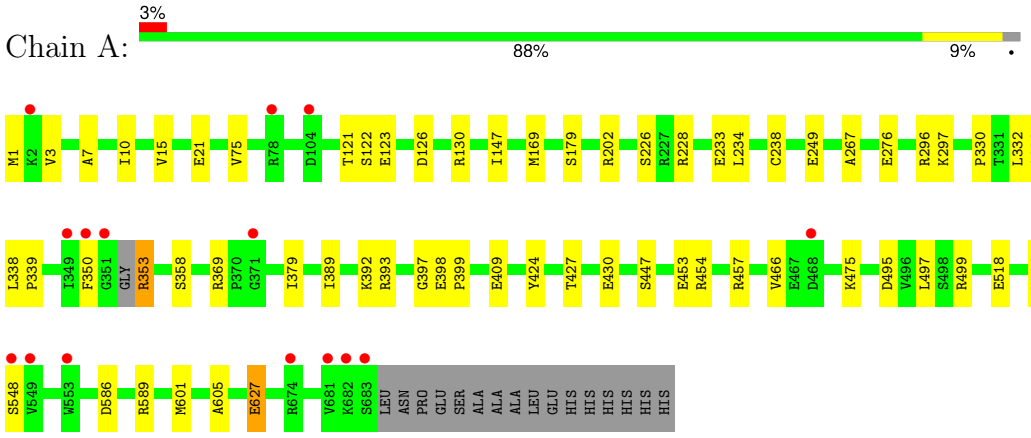
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	201	Total O 201 201	0	0
3	B	150	Total O 150 150	0	0

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.

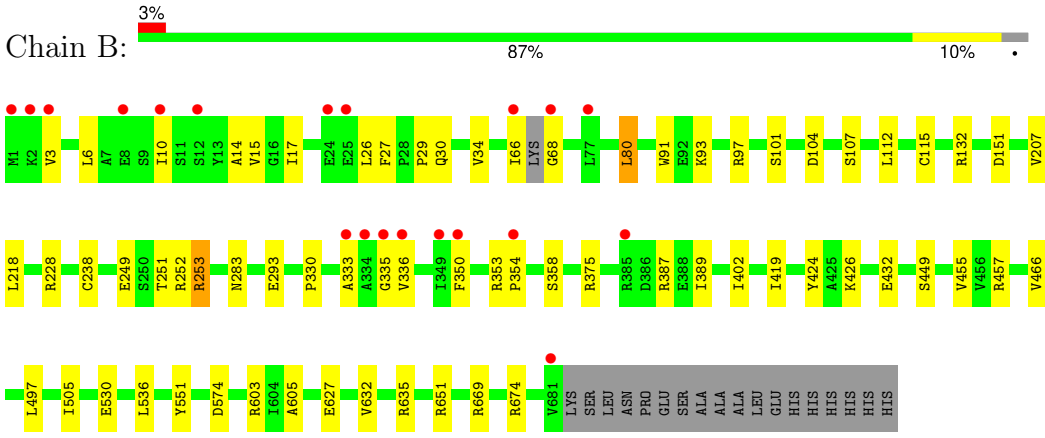
• Molecule 1: ATP-dependent DNA helicase Hel308

Chain A:



• Molecule 1: ATP-dependent DNA helicase Hel308

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	138.20Å 174.13Å 85.48Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.53 – 2.25 44.53 – 2.25	Depositor EDS
% Data completeness (in resolution range)	99.1 (44.53-2.25) 98.9 (44.53-2.25)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.72 (at 2.24Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.183 , 0.221 0.183 , 0.223	Depositor DCC
R_{free} test set	9938 reflections (10.12%)	wwPDB-VP
Wilson B-factor (Å^2)	46.4	Xtriage
Anisotropy	0.476	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 51.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	11057	wwPDB-VP
Average B, all atoms (Å^2)	60.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.11% 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

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	0.41	0/5458	0.60	0/7363
1	B	0.39	1/5389 (0.0%)	0.58	0/7281
All	All	0.40	1/10847 (0.0%)	0.59	0/14644

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	238	CYS	CB-SG	-5.78	1.72	1.81

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5360	0	5410	32	1
1	B	5292	0	5294	41	1
2	A	36	0	48	1	0
2	B	18	0	24	0	0
3	A	201	0	0	1	0
3	B	150	0	0	3	0
All	All	11057	0	10776	73	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 3.

All (73) 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:B:253:ARG:NH2	3:B:801:HOH:O	2.07	0.86
1:B:27:PHE:H	1:B:30:GLN:HE21	1.26	0.84
1:B:457:ARG:NH2	1:B:467:GLU:OE1	2.15	0.78
1:A:3:VAL:HG12	1:A:15:VAL:HG13	1.71	0.72
1:B:432[A]:GLU:OE1	1:B:449:SER:OG	2.08	0.70
1:A:169[A]:MET:SD	1:A:424:TYR:OH	2.49	0.67
1:A:398:GLU:HG2	1:A:399:PRO:HD2	1.77	0.67
1:B:217:GLU:OE1	1:B:387:ARG:NH2	2.28	0.64
1:A:495:ASP:OD2	1:A:499:ARG:NH1	2.31	0.64
1:B:80:LEU:HG	1:B:335:GLY:HA3	1.79	0.64
1:B:249:GLU:O	1:B:330:PRO:HD3	1.98	0.64
1:B:66:ILE:O	1:B:68:GLY:N	2.31	0.64
1:B:101:SER:HA	1:B:112:LEU:HD11	1.80	0.63
1:B:389:ILE:H	1:B:389:ILE:HD12	1.64	0.62
1:B:251:THR:HB	1:B:253:ARG:HE	1.65	0.61
1:B:17:ILE:HD11	1:B:93:LYS:HB2	1.83	0.61
1:A:202:ARG:O	2:A:702:GOL:H2	2.01	0.60
1:A:267:ALA:HB2	1:A:297:LYS:HD3	1.86	0.58
1:B:253:ARG:NH1	3:B:806:HOH:O	2.37	0.56
1:A:276:GLU:HB2	1:A:296:ARG:HB2	1.87	0.56
1:A:427:THR:CG2	1:A:430:GLU:H	2.18	0.55
1:A:249:GLU:O	1:A:330:PRO:HD3	2.07	0.55
1:B:104:ASP:HB2	1:B:107:SER:HB2	1.89	0.54
1:A:339:PRO:HB2	1:A:369:ARG:HG2	1.90	0.54
1:A:427:THR:HG22	1:A:430:GLU:HG3	1.90	0.53
1:B:333:ALA:HB3	1:B:336:VAL:HG23	1.92	0.52
1:B:215:THR:OG1	1:B:228:ARG:NH1	2.43	0.52
1:A:234:LEU:HD13	1:A:379:ILE:HD13	1.93	0.51
1:A:427:THR:HG23	1:A:430:GLU:H	1.75	0.51
1:B:283:ASN:ND2	1:B:574[A]:ASP:OD1	2.43	0.51
1:A:333:ALA:HB3	1:A:336:VAL:HG23	1.93	0.50
1:B:27:PHE:HB2	1:B:30:GLN:HG3	1.94	0.49
1:A:453:GLU:OE1	1:A:457:ARG:NH1	2.46	0.49
1:A:627[B]:GLU:CD	1:A:627[B]:GLU:H	2.15	0.49
1:B:353:ARG:HG3	1:B:354:PRO:O	2.13	0.48
1:A:350:PHE:O	1:A:353:ARG:HB3	2.13	0.48
1:A:389:ILE:H	1:A:389:ILE:HD12	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:3:VAL:HG22	1:B:15:VAL:HG13	1.95	0.47
1:B:530:GLU:HG3	1:B:551:TYR:OH	2.15	0.47
1:B:6:LEU:HB3	1:B:10:ILE:HD12	1.97	0.47
1:B:426:LYS:O	1:B:470:HIS:HB2	2.16	0.46
1:B:253:ARG:NE	1:B:253:ARG:H	2.13	0.46
1:B:635:ARG:HH12	1:B:674:ARG:HH22	1.64	0.46
1:B:505:ILE:HG12	1:B:536:LEU:HD13	1.99	0.45
1:A:409:GLU:OE2	1:A:454:ARG:NH1	2.51	0.44
1:B:27:PHE:H	1:B:30:GLN:NE2	2.04	0.44
1:B:358:SER:HB2	3:B:920:HOH:O	2.18	0.44
1:A:518:GLU:OE1	1:A:589:ARG:HD2	2.18	0.43
1:B:30:GLN:O	1:B:34:VAL:HG13	2.18	0.43
1:B:252:ARG:H	1:B:253:ARG:NH2	2.16	0.43
1:B:10:ILE:HG22	1:B:14:ALA:HB3	2.01	0.43
1:B:14:ALA:HB1	1:B:91:TRP:HZ3	1.84	0.43
1:A:123:GLU:HG3	3:A:926:HOH:O	2.18	0.42
1:A:586:ASP:OD1	1:A:589:ARG:NH2	2.38	0.42
1:B:27:PHE:HB3	1:B:29:PRO:HD2	2.01	0.42
1:B:151:ASP:HB2	1:B:402:ILE:HG23	2.01	0.42
1:A:233[B]:GLU:H	1:A:233[B]:GLU:HG3	1.61	0.42
1:B:603:ARG:HA	1:B:603:ARG:HD3	1.86	0.42
1:A:7:ALA:O	1:A:10:ILE:O	2.38	0.42
1:B:97:ARG:HB2	1:B:115:CYS:HA	2.00	0.42
1:A:75:VAL:O	1:A:121:THR:HA	2.19	0.42
1:A:393:ARG:O	1:A:397:GLY:HA3	2.20	0.42
1:A:126:ASP:O	1:A:130:ARG:HG3	2.20	0.41
1:A:497:LEU:HD11	1:A:601:MET:HG3	2.01	0.41
1:B:350:PHE:O	1:B:353:ARG:HG2	2.20	0.41
1:B:419:ILE:HG23	1:B:424:TYR:HB2	2.03	0.41
1:B:10:ILE:CG2	1:B:14:ALA:HB3	2.51	0.41
1:B:497:LEU:HD13	1:B:605:ALA:HB2	2.03	0.40
1:A:332:LEU:HD21	1:A:338:LEU:HD12	2.02	0.40
1:B:207:VAL:HG12	1:B:218:LEU:HD22	2.03	0.40
1:A:147:ILE:HG22	1:A:179:SER:HB2	2.03	0.40
1:A:497:LEU:HD13	1:A:605:ALA:HB2	2.03	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)
1:A:430:GLU:OE2	1:B:469:HIS:NE2[4_454]	2.11	0.09

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	682/699 (98%)	666 (98%)	16 (2%)	0	100	100
1	B	680/699 (97%)	668 (98%)	12 (2%)	0	100	100
All	All	1362/1398 (97%)	1334 (98%)	28 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	565/589 (96%)	548 (97%)	17 (3%)	36	44
1	B	552/589 (94%)	540 (98%)	12 (2%)	47	56
All	All	1117/1178 (95%)	1088 (97%)	29 (3%)	42	50

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	21	GLU
1	A	122	SER
1	A	226	SER
1	A	228	ARG
1	A	238	CYS
1	A	353	ARG
1	A	358	SER

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Mol	Chain	Res	Type
1	A	392	LYS
1	A	447	SER
1	A	466	VAL
1	A	475	LYS
1	A	524	LYS
1	A	545	SER
1	A	548	SER
1	A	627[A]	GLU
1	A	627[B]	GLU
1	B	26	LEU
1	B	80	LEU
1	B	132	ARG
1	B	253	ARG
1	B	293	GLU
1	B	375	ARG
1	B	455	VAL
1	B	466	VAL
1	B	627	GLU
1	B	632	VAL
1	B	651	ARG
1	B	669	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	470	HIS
1	B	30	GLN
1	B	636	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

9 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	704	-	5,5,5	1.01	0	5,5,5	1.20	0
2	GOL	A	706	-	5,5,5	1.09	0	5,5,5	0.91	0
2	GOL	B	703	-	5,5,5	0.98	0	5,5,5	1.04	0
2	GOL	A	705	-	5,5,5	0.91	0	5,5,5	1.08	0
2	GOL	A	701	-	5,5,5	0.76	0	5,5,5	1.17	0
2	GOL	B	702	-	5,5,5	0.93	0	5,5,5	1.22	1 (20%)
2	GOL	A	702	-	5,5,5	1.02	0	5,5,5	1.08	0
2	GOL	B	701	-	5,5,5	0.98	0	5,5,5	1.15	0
2	GOL	A	703	-	5,5,5	1.13	1 (20%)	5,5,5	0.93	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	704	-	-	0/4/4/4	-
2	GOL	A	706	-	-	2/4/4/4	-
2	GOL	B	703	-	-	0/4/4/4	-
2	GOL	A	705	-	-	3/4/4/4	-
2	GOL	A	701	-	-	0/4/4/4	-
2	GOL	B	702	-	-	0/4/4/4	-
2	GOL	A	702	-	-	0/4/4/4	-
2	GOL	B	701	-	-	2/4/4/4	-
2	GOL	A	703	-	-	0/4/4/4	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	703	GOL	O2-C2	-2.05	1.37	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	702	GOL	C3-C2-C1	-2.20	103.74	111.80

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	705	GOL	O1-C1-C2-C3
2	A	706	GOL	C1-C2-C3-O3
2	A	706	GOL	O2-C2-C3-O3
2	A	705	GOL	O1-C1-C2-O2
2	A	705	GOL	O2-C2-C3-O3
2	B	701	GOL	C1-C2-C3-O3
2	B	701	GOL	O2-C2-C3-O3

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	702	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, 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	682/699 (97%)	-0.29	19 (2%)	55	55	28, 54, 85, 140	6 (0%)
1	B	680/699 (97%)	-0.14	21 (3%)	51	52	27, 60, 97, 129	6 (0%)
All	All	1362/1398 (97%)	-0.21	40 (2%)	54	54	27, 56, 93, 140	12 (0%)

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	681	VAL	5.5
1	B	334	ALA	3.7
1	A	681	VAL	3.6
1	B	1	MET	3.5
1	A	335	GLY	3.5
1	A	351	GLY	3.4
1	B	335	GLY	3.2
1	A	674	ARG	3.1
1	A	553	TRP	3.1
1	A	334	ALA	3.0
1	B	468	ASP	3.0
1	B	10	ILE	2.9
1	A	683	SER	2.9
1	A	548	SER	2.8
1	B	2	LYS	2.8
1	B	8	GLU	2.7
1	B	333	ALA	2.7
1	A	546	ASP	2.7
1	A	549	VAL	2.6
1	B	349	ILE	2.6
1	B	68	GLY	2.5
1	A	349	ILE	2.4
1	A	547	PHE	2.4
1	B	336	VAL	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	682	LYS	2.4
1	B	25	GLU	2.4
1	B	3	VAL	2.3
1	A	2	LYS	2.3
1	B	350	PHE	2.3
1	B	66	ILE	2.2
1	B	24	GLU	2.2
1	A	104	ASP	2.2
1	B	385	ARG	2.1
1	B	77	LEU	2.1
1	B	12	SER	2.1
1	A	78	ARG	2.1
1	A	468	ASP	2.1
1	A	371	GLY	2.0
1	B	354	PRO	2.0
1	A	350	PHE	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, 95^{th} 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	B	703	6/6	0.72	0.20	86,88,91,91	0
2	GOL	A	705	6/6	0.76	0.16	92,95,100,103	0
2	GOL	A	702	6/6	0.77	0.20	68,76,84,89	0
2	GOL	B	701	6/6	0.79	0.18	85,93,97,104	0
2	GOL	A	706	6/6	0.84	0.17	59,70,78,84	0
2	GOL	A	703	6/6	0.85	0.16	71,73,87,90	0
2	GOL	A	704	6/6	0.85	0.18	74,81,84,85	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	GOL	B	702	6/6	0.89	0.13	73,78,82,90	0
2	GOL	A	701	6/6	0.90	0.17	74,77,81,83	0

6.5 Other polymers (i)

There are no such residues in this entry.