



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 11:54 AM UTC

PDB ID : 6PD5 / pdb_00006pd5
Title : Crystal Structure of a H5N1 influenza virus hemagglutinin at pH 6.5
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Deposited on : 2019-06-18
Resolution : 2.39 Å(reported)

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

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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

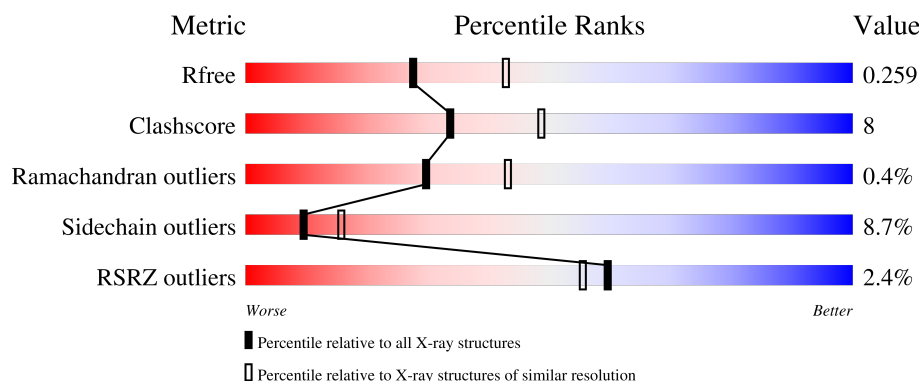
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.39 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	4912 (2.40-2.40)
Clashscore	190562	5391 (2.40-2.40)
Ramachandran outliers	187476	5320 (2.40-2.40)
Sidechain outliers	187428	5321 (2.40-2.40)
RSRZ outliers	180081	4916 (2.40-2.40)

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	527	

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	SO4	A	1111	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 4178 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 Hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	491	Total	C	N	O	S	0	2	0
			3944	2476	683	761	24			

There are 22 discrepancies between the modelled and reference sequences:

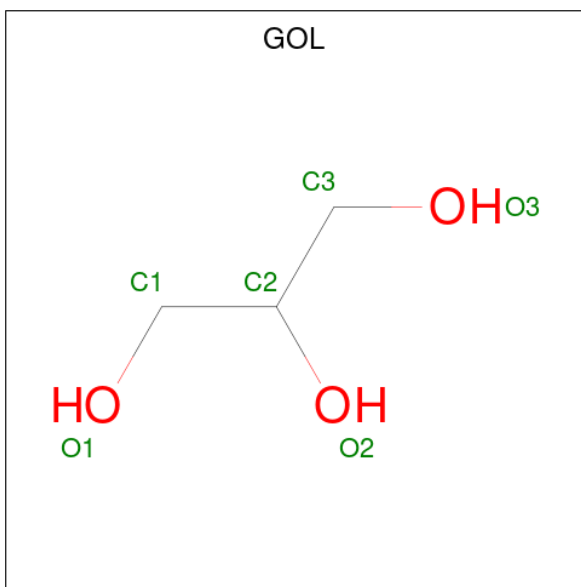
Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	LEU	-	expression tag	UNP Q1KHJ8
A	-3	LEU	-	expression tag	UNP Q1KHJ8
A	-2	ALA	-	expression tag	UNP Q1KHJ8
A	-1	ALA	-	expression tag	UNP Q1KHJ8
A	0	ALA	-	expression tag	UNP Q1KHJ8
A	1	ALA	-	expression tag	UNP Q1KHJ8
A	2	HIS	-	expression tag	UNP Q1KHJ8
A	3	SER	-	expression tag	UNP Q1KHJ8
A	4	ALA	-	expression tag	UNP Q1KHJ8
A	5	PHE	-	expression tag	UNP Q1KHJ8
A	6	ALA	-	expression tag	UNP Q1KHJ8
A	7	ALA	-	expression tag	UNP Q1KHJ8
A	8	ASP	-	expression tag	UNP Q1KHJ8
A	9	PRO	-	expression tag	UNP Q1KHJ8
A	10	GLY	-	expression tag	UNP Q1KHJ8
A	1043	SER	-	expression tag	UNP Q1KHJ8
A	1044	ARG	-	expression tag	UNP Q1KHJ8
A	1045	LEU	-	expression tag	UNP Q1KHJ8
A	1046	VAL	-	expression tag	UNP Q1KHJ8
A	1047	PRO	-	expression tag	UNP Q1KHJ8
A	1048	ARG	-	expression tag	UNP Q1KHJ8
A	1049	GLY	-	expression tag	UNP Q1KHJ8

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



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

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).

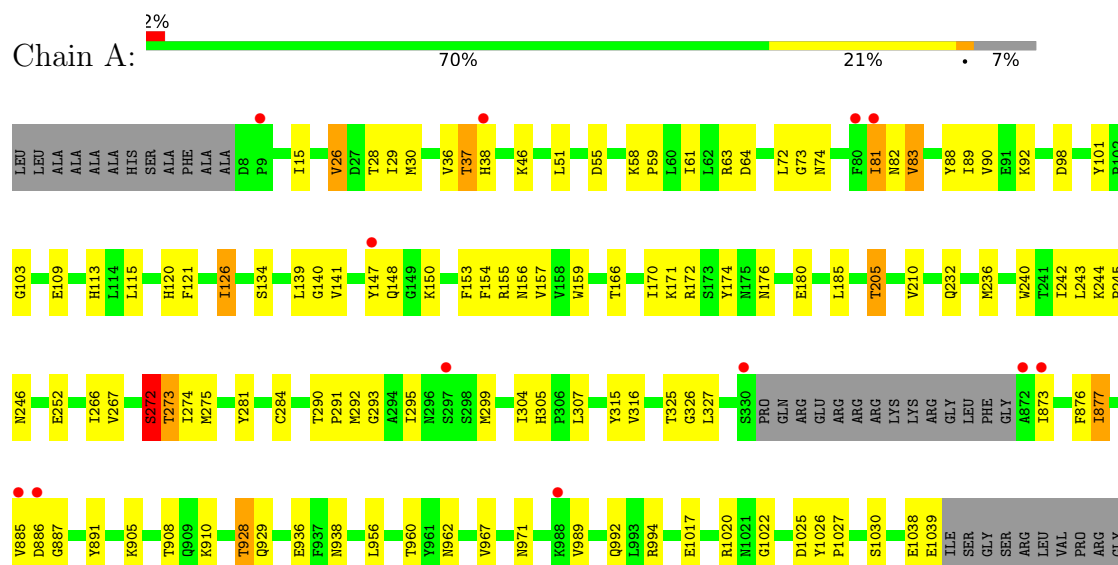


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	A	1	Total	C	N	O	0	0
			14	8	1	5		
4	A	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	105	Total	O	0	0
			105	105		

- Molecule 1: Hemagglutinin



4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α , β , γ	108.06Å 108.06Å 419.82Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	29.35 – 2.39 29.35 – 2.39	Depositor EDS
% Data completeness (in resolution range)	98.2 (29.35-2.39) 98.2 (29.35-2.39)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.57 (at 2.39Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.213 , 0.261 0.217 , 0.259	Depositor DCC
R_{free} test set	1828 reflections (4.81%)	wwPDB-VP
Wilson B-factor (Å ²)	49.9	Xtriage
Anisotropy	0.073	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 26.4	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	0.96	EDS
Total number of atoms	4178	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.35% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, NAG, 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	1.01	0/4039	1.42	7/5465 (0.1%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	205	THR	CA-CB-OG1	-5.81	100.89	109.60
1	A	281	TYR	CA-C-O	-5.54	115.45	121.44
1	A	139	LEU	N-CA-C	-5.36	106.91	113.50
1	A	1025	ASP	CA-C-N	5.32	126.38	119.78
1	A	1025	ASP	C-N-CA	5.32	126.38	119.78
1	A	928	THR	CB-CA-C	5.13	119.08	111.17
1	A	126	ILE	N-CA-C	-5.07	107.89	112.96

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	3944	0	3788	59	0
2	A	55	0	0	2	0
3	A	18	0	24	2	0
4	A	56	0	52	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	105	0	0	1	0
All	All	4178	0	3864	61	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 (61) 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:290:THR:HG22	1:A:292:MET:H	1.27	0.97
1:A:98:ASP:OD2	3:A:1114:GOL:H11	1.69	0.92
1:A:290:THR:HB	1:A:293:GLY:O	1.84	0.78
1:A:59:PRO:HG2	1:A:61:ILE:HD11	1.65	0.77
1:A:295:ILE:HD11	1:A:304:ILE:HD12	1.73	0.70
1:A:103:GLY:HA3	1:A:236:MET:O	1.96	0.65
1:A:38[B]:HIS:HE1	5:A:1231:HOH:O	1.81	0.64
1:A:63:ARG:O	1:A:92:LYS:HD3	1.98	0.63
1:A:299:MET:HA	1:A:299:MET:HE2	1.82	0.61
1:A:171:LYS:O	1:A:172:ARG:HD3	2.02	0.60
1:A:992:GLN:OE1	1:A:1022:GLY:HA2	2.04	0.57
1:A:37:THR:HB	1:A:327:LEU:H	1.70	0.56
1:A:272:SER:OG	1:A:273:THR:N	2.35	0.55
1:A:295:ILE:HD11	1:A:304:ILE:CD1	2.36	0.55
1:A:74:ASN:OD1	1:A:74:ASN:C	2.50	0.54
1:A:26:VAL:HG13	1:A:971:ASN:ND2	2.23	0.54
1:A:176:ASN:ND2	1:A:245:PRO:HA	2.23	0.54
1:A:876:PHE:CE1	1:A:877:ILE:HG13	2.43	0.53
1:A:290:THR:HG23	1:A:305:HIS:HB3	1.90	0.52
1:A:153:PHE:CZ	1:A:236:MET:HE3	2.44	0.52
1:A:315:TYR:CD2	1:A:956:LEU:HD13	2.45	0.51
1:A:325:THR:HG21	3:A:1112:GOL:H32	1.93	0.51
1:A:176:ASN:HB2	1:A:243:LEU:HD23	1.94	0.50
1:A:185:LEU:HD23	1:A:240:TRP:HB3	1.94	0.49
1:A:101:TYR:CE2	1:A:232:GLN:HG3	2.47	0.49
1:A:51:LEU:HD13	1:A:90:VAL:HG21	1.95	0.48
1:A:120:HIS:HB3	1:A:267:VAL:HG23	1.95	0.48
1:A:147:TYR:CD2	1:A:155:ARG:NH2	2.82	0.48
1:A:170:ILE:O	1:A:252:GLU:HA	2.14	0.48
1:A:37:THR:HG22	1:A:326:GLY:HA3	1.95	0.48
1:A:59:PRO:HB3	1:A:88:TYR:CZ	2.48	0.48
1:A:126:ILE:HG22	1:A:174:TYR:CZ	2.49	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:121:PHE:HD1	1:A:266:ILE:HG22	1.79	0.47
1:A:89:ILE:HD11	1:A:115:LEU:O	2.15	0.47
1:A:153:PHE:CE1	1:A:236:MET:HE3	2.50	0.46
1:A:291:PRO:HD3	1:A:307:LEU:O	2.15	0.45
1:A:140:GLY:HA3	1:A:159:TRP:HB3	1.98	0.45
2:A:1111:SO4:O2	4:A:1116:NAG:O4	2.29	0.45
1:A:887:GLY:HA2	1:A:908:THR:HG21	1.97	0.45
1:A:891:TYR:CD2	1:A:1020:ARG:HD3	2.52	0.45
1:A:15:ILE:HD11	1:A:989:VAL:HG21	1.99	0.45
1:A:37:THR:HG22	1:A:38[B]:HIS:CD2	2.52	0.45
1:A:275:MET:HE3	1:A:291:PRO:HA	1.99	0.43
1:A:113:HIS:ND1	1:A:936:GLU:OE1	2.41	0.43
1:A:73:GLY:O	1:A:74:ASN:C	2.62	0.43
1:A:205:THR:O	1:A:205:THR:HG22	2.18	0.42
1:A:29:ILE:HG23	1:A:30:MET:HG3	2.00	0.42
1:A:155:ARG:HD3	1:A:155:ARG:HA	1.80	0.42
1:A:153:PHE:O	1:A:154:PHE:C	2.63	0.42
1:A:1038:GLU:O	1:A:1039:GLU:CB	2.68	0.42
2:A:1111:SO4:S	4:A:1116:NAG:O4	2.76	0.41
1:A:273:THR:HG23	1:A:274:ILE:N	2.35	0.41
1:A:140:GLY:HA3	1:A:159:TRP:O	2.21	0.41
1:A:244:LYS:HB3	1:A:245:PRO:HD2	2.02	0.41
1:A:59:PRO:HB3	1:A:88:TYR:CE1	2.56	0.41
1:A:81:ILE:HD12	1:A:82:ASN:N	2.36	0.41
1:A:176:ASN:O	1:A:245:PRO:O	2.38	0.41
1:A:109:GLU:OE2	1:A:938:ASN:HB3	2.21	0.40
1:A:1026:TYR:HB3	1:A:1027:PRO:HD3	2.03	0.40
1:A:15:ILE:N	1:A:15:ILE:HD12	2.37	0.40
1:A:72:LEU:O	1:A:156:ASN:HB2	2.21	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	489/527 (93%)	461 (94%)	26 (5%)	2 (0%)	30	43

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	272	SER
1	A	83	VAL

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	437/460 (95%)	399 (91%)	38 (9%)	9	16

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

Mol	Chain	Res	Type
1	A	26	VAL
1	A	28	THR
1	A	36	VAL
1	A	37	THR
1	A	46	LYS
1	A	55	ASP
1	A	58	LYS
1	A	64	ASP
1	A	81	ILE
1	A	83	VAL
1	A	134	SER
1	A	141	VAL
1	A	148	GLN
1	A	150	LYS
1	A	157	VAL
1	A	166	THR
1	A	180	GLU
1	A	210	VAL
1	A	242	ILE

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Mol	Chain	Res	Type
1	A	246	ASN
1	A	272	SER
1	A	273	THR
1	A	284	CYS
1	A	316	VAL
1	A	873	ILE
1	A	877	ILE
1	A	885	VAL
1	A	886	ASP
1	A	905	LYS
1	A	910	LYS
1	A	928	THR
1	A	929	GLN
1	A	960	THR
1	A	962	ASN
1	A	967	VAL
1	A	994	ARG
1	A	1017	GLU
1	A	1030	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	156	ASN
1	A	178	ASN
1	A	254	ASN
1	A	895	ASN
1	A	946	ASN
1	A	948	ASN
1	A	1013	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](#)

18 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	SO4	A	1105	-	4,4,4	0.32	0	6,6,6	0.13	0
4	NAG	A	1115	1	14,14,15	1.01	0	17,19,21	2.41	5 (29%)
2	SO4	A	1102	-	4,4,4	0.30	0	6,6,6	0.07	0
2	SO4	A	1107	-	4,4,4	0.31	0	6,6,6	0.13	0
2	SO4	A	1111	-	4,4,4	0.32	0	6,6,6	0.05	0
3	GOL	A	1113	-	5,5,5	0.15	0	5,5,5	0.38	0
3	GOL	A	1114	-	5,5,5	0.11	0	5,5,5	0.36	0
2	SO4	A	1103	-	4,4,4	0.31	0	6,6,6	0.23	0
4	NAG	A	1118	1	14,14,15	1.47	2 (14%)	17,19,21	3.08	5 (29%)
4	NAG	A	1117	1	14,14,15	0.65	1 (7%)	17,19,21	1.64	4 (23%)
2	SO4	A	1110	-	4,4,4	0.29	0	6,6,6	0.12	0
2	SO4	A	1108	-	4,4,4	0.29	0	6,6,6	0.08	0
2	SO4	A	1106	-	4,4,4	0.32	0	6,6,6	0.11	0
3	GOL	A	1112	-	5,5,5	0.14	0	5,5,5	0.50	0
2	SO4	A	1109	-	4,4,4	0.32	0	6,6,6	0.07	0
2	SO4	A	1101	-	4,4,4	0.26	0	6,6,6	0.16	0
4	NAG	A	1116	1	14,14,15	0.47	0	17,19,21	1.29	4 (23%)
2	SO4	A	1104	-	4,4,4	0.30	0	6,6,6	0.11	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
4	NAG	A	1115	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	A	1114	-	-	2/4/4/4	-
4	NAG	A	1118	1	-	0/6/23/26	0/1/1/1
4	NAG	A	1117	1	-	0/6/23/26	0/1/1/1
3	GOL	A	1112	-	-	2/4/4/4	-
3	GOL	A	1113	-	-	0/4/4/4	-
4	NAG	A	1116	1	-	3/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	1118	NAG	C1-C2	3.80	1.57	1.52
4	A	1118	NAG	C2-N2	2.49	1.50	1.46
4	A	1117	NAG	C1-C2	2.10	1.55	1.52

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	1118	NAG	C1-C2-N2	7.42	122.12	110.43
4	A	1115	NAG	C1-O5-C5	6.59	121.02	112.19
4	A	1118	NAG	C1-O5-C5	6.57	120.99	112.19
4	A	1118	NAG	O5-C5-C6	5.08	117.55	107.66
4	A	1118	NAG	C2-N2-C7	4.66	129.14	122.90
4	A	1117	NAG	C1-O5-C5	4.33	117.98	112.19
4	A	1115	NAG	C2-N2-C7	3.92	128.16	122.90
4	A	1115	NAG	O5-C1-C2	-2.95	106.73	111.29
4	A	1116	NAG	C1-C2-N2	2.89	114.98	110.43
4	A	1118	NAG	O7-C7-N2	2.53	126.45	121.98
4	A	1116	NAG	C3-C4-C5	-2.22	106.20	110.23
4	A	1117	NAG	O4-C4-C3	-2.18	105.24	110.38
4	A	1115	NAG	O3-C3-C4	-2.16	105.28	110.38
4	A	1115	NAG	C1-C2-N2	2.13	113.80	110.43
4	A	1117	NAG	C2-N2-C7	-2.11	120.07	122.90
4	A	1117	NAG	O5-C1-C2	2.09	114.53	111.29
4	A	1116	NAG	C4-C3-C2	-2.03	108.05	111.02
4	A	1116	NAG	O5-C5-C6	2.02	111.60	107.66

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1112	GOL	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
3	A	1112	GOL	O1-C1-C2-C3
3	A	1114	GOL	O1-C1-C2-O2
3	A	1114	GOL	O1-C1-C2-C3
4	A	1115	NAG	C3-C2-N2-C7
4	A	1116	NAG	C4-C5-C6-O6
4	A	1115	NAG	C4-C5-C6-O6
4	A	1116	NAG	O5-C5-C6-O6
4	A	1116	NAG	C8-C7-N2-C2

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1111	SO4	2	0
3	A	1114	GOL	1	0
3	A	1112	GOL	1	0
4	A	1116	NAG	2	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	491/527 (93%)	0.05	12 (2%) 59 55	32, 59, 95, 136	2 (0%)

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	81	ILE	4.7
1	A	873	ILE	4.4
1	A	872	ALA	3.8
1	A	9	PRO	3.1
1	A	330	SER	2.7
1	A	38[A]	HIS	2.6
1	A	988	LYS	2.5
1	A	297	SER	2.5
1	A	885	VAL	2.4
1	A	886	ASP	2.3
1	A	147	TYR	2.3
1	A	80	PHE	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	SO4	A	1101	5/5	0.67	0.18	126,133,154,154	0
2	SO4	A	1110	5/5	0.67	0.11	125,139,151,154	0
4	NAG	A	1118	14/15	0.67	0.17	85,148,164,169	0
2	SO4	A	1111	5/5	0.73	0.08	128,129,151,166	0
2	SO4	A	1109	5/5	0.77	0.15	174,174,177,180	5
3	GOL	A	1112	6/6	0.78	0.32	109,119,120,121	0
4	NAG	A	1115	14/15	0.81	0.14	82,119,130,132	0
2	SO4	A	1106	5/5	0.81	0.20	141,144,169,192	0
2	SO4	A	1105	5/5	0.83	0.08	118,119,131,143	0
2	SO4	A	1107	5/5	0.86	0.13	120,134,145,170	0
4	NAG	A	1117	14/15	0.87	0.10	85,101,117,121	0
2	SO4	A	1102	5/5	0.87	0.07	94,97,110,110	0
2	SO4	A	1104	5/5	0.88	0.10	111,112,123,124	0
3	GOL	A	1114	6/6	0.89	0.14	90,104,113,114	0
3	GOL	A	1113	6/6	0.90	0.13	91,108,117,135	0
2	SO4	A	1108	5/5	0.91	0.08	93,93,107,107	5
2	SO4	A	1103	5/5	0.94	0.09	57,58,80,103	0
4	NAG	A	1116	14/15	0.96	0.06	59,66,74,83	0

6.5 Other polymers [i](#)

There are no such residues in this entry.