



Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 03:03 AM GMT

PDB ID : 1E70
Title : 2-F-GLUCOSYLATED MYROSINASE FROM SINAPIS ALBA
Authors : Burmeister, W.P.
Deposited on : 2000-08-23
Resolution : 1.65 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

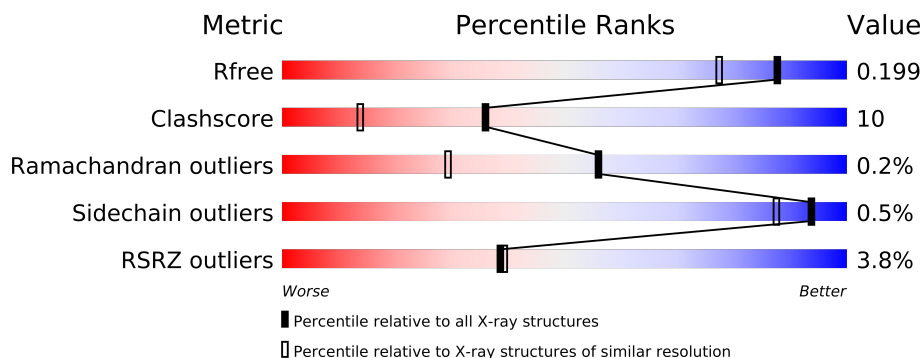
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

The reported resolution of this entry is 1.65 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}	66092	1404 (1.68-1.64)
Clashscore	79885	1001 (1.66-1.66)
Ramachandran outliers	78287	1581 (1.68-1.64)
Sidechain outliers	78261	1580 (1.68-1.64)
RSRZ outliers	66119	1404 (1.68-1.64)

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. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	M	501	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	NAG	M	901	-	X
2	NAG	M	911	-	X
2	NAG	M	931	-	X
2	NAG	M	961	-	X
2	NAG	M	971	-	X
2	NAG	M	991	-	X
8	SO4	M	1503	-	X

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Mol	Type	Chain	Res	Geometry	Electron density
8	SO4	M	1505	-	X
8	SO4	M	1506	-	X
8	SO4	M	1507	-	X
8	SO4	M	1508	-	X
8	SO4	M	1509	-	X
8	SO4	M	1510	-	X
9	GOL	M	1511	-	X
9	GOL	M	1512[A]	-	X
9	GOL	M	1512[B]	-	X
9	GOL	M	1513	X	X
9	GOL	M	1514	-	X

2 Entry composition i

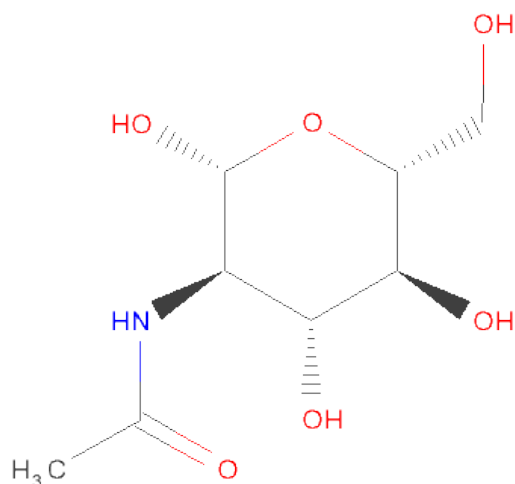
There are 10 unique types of molecules in this entry. The entry contains 5196 atoms, of which 0 are hydrogen and 0 are deuterium.

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 MYROSINASE MA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	M	499	Total	C	N	O	S	0	22	0
			4086	2622	660	788	16			

- Molecule 2 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	M	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is a polymer of unknown type called SUGAR (2-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	M	2	Total	C	N	O	0	0
			28	16	2	10		

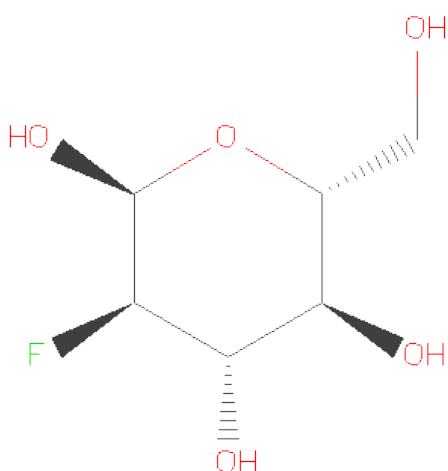
- Molecule 4 is a polymer of unknown type called SUGAR (5-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	M	5	Total	C	N	O	0	0
			58	33	2	23		

- Molecule 5 is a polymer of unknown type called SUGAR (6-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	M	6	Total	C	N	O	0	0
			69	39	2	28		

- Molecule 6 is SUGAR (2-DEOXY-2-FLUORO-ALPHA-D-GLUCOPYRANOSE) (three-letter code: G2F) (formula: C₆H₁₁FO₅).

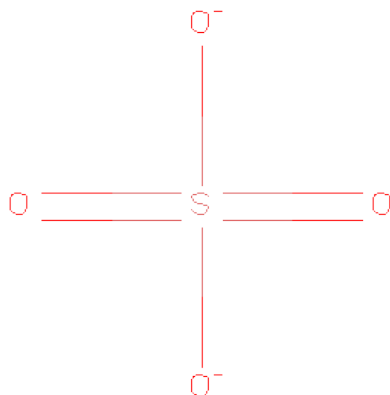


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	M	1	Total	C	F	O	0	0
			11	6	1	4		

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

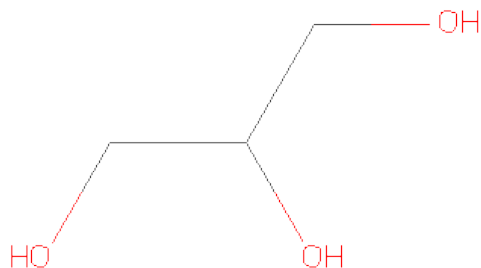
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	M	1	Total	Zn	0	0
			1	1		

- Molecule 8 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	M	1	Total	O	S	0	0
			5	4	1		
8	M	1	Total	O	S	0	0
			5	4	1		
8	M	1	Total	O	S	0	0
			5	4	1		
8	M	1	Total	O	S	0	0
			5	4	1		
8	M	1	Total	O	S	0	0
			5	4	1		
8	M	1	Total	O	S	0	0
			5	4	1		

- Molecule 9 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	1
			7	3	4		
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		

- Molecule 10 is water.

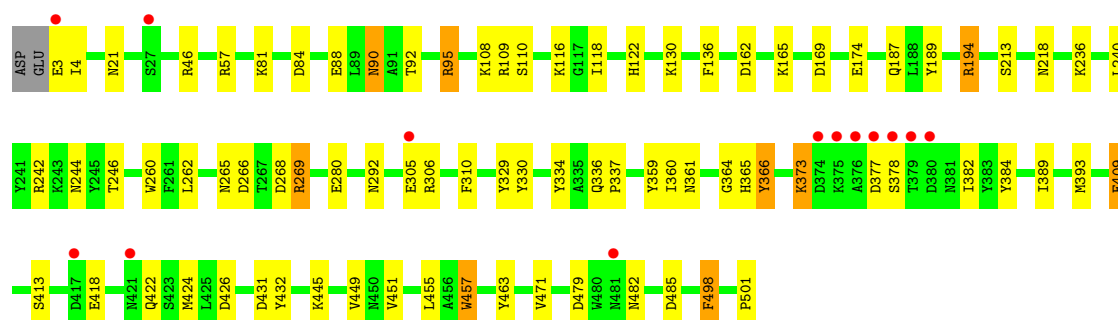
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	M	794	Total	O	0	0
			794	794		

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: MYROSINASE MA1

Chain M: 



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	135.30Å 137.20Å 80.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	10.00 – 1.65 9.99 – 1.65	Depositor EDS
% Data completeness (in resolution range)	82.3 (10.00-1.65) 82.3 (9.99-1.65)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	0.09	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.09 (at 1.65Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.169 , 0.195 0.180 , 0.199	Depositor DCC
R_{free} test set	3755 reflections (5.36%)	DCC
Wilson B-factor (Å ²)	23.2	Xtriage
Anisotropy	0.229	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.47 , 69.8	EDS
Estimated twinning fraction	0.017 for -k,-h,-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 73749 reflections	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	5196	wwPDB-VP
Average B, all atoms (Å ²)	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.75% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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: XYP, GOL, ZN, BMA, NAG, G2F, SO4, MAN, FUC

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	M	2.43	3/4299 (0.1%)	1.56	56/5845 (1.0%)

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	M	0	2
5	M	1	0
All	All	1	2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	409[A]	GLU	CD-OE1	107.27	2.43	1.25
1	M	409[B]	GLU	CD-OE1	107.27	2.43	1.25
1	M	501	PRO	N-CD	5.46	1.55	1.47

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	426	ASP	CB-CG-OD1	15.70	132.43	118.30
1	M	109	ARG	NE-CZ-NH2	-15.33	112.63	120.30
1	M	409[A]	GLU	CG-CD-OE1	-15.30	87.70	118.30
1	M	409[B]	GLU	CG-CD-OE1	-15.30	87.70	118.30
1	M	46	ARG	NE-CZ-NH2	-11.90	114.35	120.30
1	M	269	ARG	NE-CZ-NH1	10.43	125.51	120.30
1	M	109	ARG	NH1-CZ-NH2	9.84	130.22	119.40
1	M	431	ASP	CB-CG-OD2	-9.69	109.58	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	463	TYR	CB-CG-CD1	9.69	126.81	121.00
1	M	57	ARG	NE-CZ-NH1	-9.29	115.66	120.30
1	M	330	TYR	CB-CG-CD1	-8.96	115.62	121.00
1	M	409[A]	GLU	OE1-CD-OE2	8.34	133.31	123.30
1	M	409[B]	GLU	OE1-CD-OE2	8.34	133.31	123.30
1	M	330	TYR	CB-CG-CD2	8.23	125.94	121.00
1	M	194	ARG	NE-CZ-NH1	8.07	124.34	120.30
1	M	162	ASP	CB-CG-OD1	8.05	125.55	118.30
1	M	95	ARG	NE-CZ-NH1	7.95	124.28	120.30
1	M	90	ASN	CB-CG-OD1	7.80	137.20	121.60
1	M	268	ASP	CB-CG-OD2	7.79	125.31	118.30
1	M	482	ASN	CB-CG-OD1	7.79	137.18	121.60
1	M	426	ASP	CB-CG-OD2	-7.61	111.45	118.30
1	M	242	ARG	NE-CZ-NH2	-7.25	116.68	120.30
1	M	498	PHE	CB-CG-CD1	-6.93	115.95	120.80
1	M	457	TRP	O-C-N	-6.89	111.68	122.70
1	M	57	ARG	NH1-CZ-NH2	6.76	126.83	119.40
1	M	109	ARG	NE-CZ-NH1	-6.31	117.14	120.30
1	M	169[A]	ASP	CB-CG-OD2	-6.12	112.79	118.30
1	M	169[B]	ASP	CB-CG-OD2	-6.12	112.79	118.30
1	M	162	ASP	CB-CG-OD2	-6.07	112.84	118.30
1	M	280	GLU	O-C-N	-5.98	113.13	122.70
1	M	426	ASP	O-C-N	-5.91	113.24	122.70
1	M	457	TRP	CA-C-O	-5.83	107.86	120.10
1	M	306	ARG	CD-NE-CZ	5.82	131.75	123.60
1	M	169[A]	ASP	CB-CG-OD1	5.79	123.51	118.30
1	M	169[B]	ASP	CB-CG-OD1	5.79	123.51	118.30
1	M	46	ARG	NE-CZ-NH1	5.78	123.19	120.30
1	M	479	ASP	CB-CG-OD1	5.76	123.48	118.30
1	M	242	ARG	CD-NE-CZ	5.71	131.60	123.60
1	M	384	TYR	CB-CG-CD2	-5.67	117.60	121.00
1	M	57	ARG	NE-CZ-NH2	-5.60	117.50	120.30
1	M	213[A]	SER	CA-C-O	-5.60	108.34	120.10
1	M	213[B]	SER	CA-C-O	-5.60	108.34	120.10
1	M	329	TYR	CB-CG-CD2	-5.58	117.65	121.00
1	M	366[A]	TYR	CB-CG-CD2	-5.51	117.69	121.00
1	M	366[B]	TYR	CB-CG-CD2	-5.51	117.69	121.00
1	M	310	PHE	CB-CG-CD1	-5.47	116.97	120.80
1	M	485	ASP	CB-CG-OD1	5.45	123.20	118.30
1	M	432	TYR	CG-CD1-CE1	-5.37	117.00	121.30
1	M	457	TRP	N-CA-CB	5.37	120.27	110.60
1	M	189	TYR	CG-CD2-CE2	-5.35	117.02	121.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	92	THR	CA-CB-CG2	-5.29	104.99	112.40
1	M	463	TYR	CB-CG-CD2	-5.18	117.89	121.00
1	M	361	ASN	CB-CG-OD1	5.17	131.95	121.60
1	M	266	ASP	CB-CG-OD2	-5.11	113.70	118.30
1	M	457	TRP	CA-C-N	5.10	128.42	117.20
1	M	426	ASP	CA-C-O	5.06	130.72	120.10

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	M	954	MAN	C1

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	M	457	TRP	Mainchain,Peptide

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	M	4086	0	3841	73	0
2	M	84	0	77	9	0
3	M	28	0	25	4	0
4	M	58	0	50	4	0
5	M	69	0	57	6	0
6	M	11	0	9	2	0
7	M	1	0	0	0	0
8	M	40	0	0	3	0
9	M	25	0	30	2	0
10	M	794	0	0	18	0
All	All	5196	0	4089	83	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 10.

All (83) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CZ	1.24	1.70
1:M:21:ASN:HD21	2:M:901:NAG:C1	1.00	1.63
1:M:292:ASN:HD21	5:M:951:NAG:C1	1.00	1.62
1:M:265:ASN:HD21	4:M:941:NAG:C1	0.97	1.61
1:M:90:ASN:HD21	2:M:911:NAG:C1	0.97	1.58
1:M:218:ASN:HD21	3:M:921:NAG:C1	0.94	1.55
1:M:244:ASN:HD21	2:M:931:NAG:C1	1.00	1.52
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CZ	1.91	1.49
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CE1	1.54	1.39
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CE1	2.19	1.18
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CE1	2.30	1.14
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:OH	1.43	1.14
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CD1	1.88	1.07
1:M:360[B]:ILE:HD13	1:M:366[B]:TYR:CZ	1.98	0.94
1:M:246:THR:HG22	10:M:2392:HOH:O	1.69	0.90
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CE1	2.01	0.87
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:OH	2.10	0.83
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CD1	2.63	0.74
1:M:165:LYS:NZ	2:M:931:NAG:H82	2.02	0.74
1:M:130:LYS:HG3	10:M:2253:HOH:O	1.89	0.72
1:M:130:LYS:HB3	10:M:2264:HOH:O	1.92	0.69
5:M:954:MAN:C4	10:M:2741:HOH:O	2.43	0.66
5:M:954:MAN:C5	10:M:2741:HOH:O	2.42	0.66
1:M:409[B]:GLU:CD	6:M:999:G2F:C1	2.66	0.63
1:M:218:ASN:HD21	3:M:921:NAG:C2	2.00	0.63
1:M:95:ARG:HB2	1:M:455:LEU:HD13	1.83	0.61
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CG	2.36	0.61
1:M:118[B]:ILE:HD12	1:M:174:GLU:HG3	1.81	0.61
1:M:360[B]:ILE:HD13	1:M:366[B]:TYR:CE2	2.35	0.61
1:M:449[B]:VAL:HG23	1:M:451:VAL:HG23	1.84	0.60
5:M:954:MAN:C6	10:M:2741:HOH:O	2.50	0.60
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CE2	2.76	0.59
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:HH	1.63	0.58
1:M:108:LYS:HE3	1:M:110:SER:OG	2.04	0.57
1:M:4:ILE:HD11	1:M:445:LYS:HD2	1.87	0.56
1:M:165:LYS:HZ1	2:M:931:NAG:H82	1.67	0.56
1:M:360[B]:ILE:HG13	1:M:366[B]:TYR:CE1	2.35	0.55
1:M:365:HIS:HE1	10:M:2552:HOH:O	1.89	0.55
1:M:90:ASN:ND2	2:M:911:NAG:C2	2.66	0.54
1:M:194:ARG:HD2	8:M:1510:SO4:O1	2.10	0.52
1:M:218:ASN:ND2	3:M:921:NAG:C2	2.68	0.52
1:M:122:HIS:HE1	1:M:174:GLU:O	1.93	0.52

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
2:M:991:NAG:H61	10:M:2682:HOH:O	2.11	0.51
1:M:265:ASN:ND2	4:M:941:NAG:O5	2.41	0.51
1:M:360[A]:ILE:HD11	1:M:364:GLY:HA2	1.91	0.51
1:M:265:ASN:ND2	4:M:941:NAG:C2	2.69	0.50
1:M:409[A]:GLU:CD	6:M:999:G2F:C1	2.80	0.50
9:M:1511:GOL:H11	10:M:2786:HOH:O	2.13	0.48
5:M:956:MAN:H61	10:M:2453:HOH:O	2.14	0.48
8:M:1505:SO4:O2	8:M:1510:SO4:O2	2.30	0.48
1:M:165:LYS:HD2	1:M:236:LYS:HE3	1.94	0.48
1:M:240:LEU:HA	2:M:931:NAG:H83	1.97	0.47
1:M:373:LYS:NZ	1:M:378:SER:OG	2.42	0.47
1:M:218:ASN:ND2	3:M:921:NAG:O5	2.43	0.47
1:M:418:GLU:HB3	1:M:422:GLN:HB2	1.96	0.46
1:M:292:ASN:ND2	5:M:951:NAG:O5	2.38	0.46
1:M:365:HIS:HD2	10:M:2256:HOH:O	1.98	0.45
1:M:336:GLN:HB2	1:M:337:PRO:HD2	1.98	0.45
9:M:1511:GOL:H31	10:M:2427:HOH:O	2.16	0.45
1:M:424:MET:HE3	10:M:2695:HOH:O	2.16	0.45
1:M:359:TYR:CZ	1:M:382:ILE:HG23	2.52	0.45
1:M:165:LYS:HZ2	2:M:931:NAG:H82	1.79	0.45
1:M:95:ARG:HA	1:M:136:PHE:O	2.17	0.45
4:M:943:NAG:H82	10:M:2424:HOH:O	2.17	0.45
1:M:269:ARG:NH2	10:M:2426:HOH:O	2.51	0.43
1:M:262:LEU:O	1:M:334:TYR:HA	2.18	0.43
1:M:389:ILE:O	1:M:393:MET:HG2	2.19	0.42
1:M:116:LYS:HG2	10:M:2234:HOH:O	2.20	0.42
1:M:21:ASN:HA	1:M:498:PHE:CD2	2.55	0.42
1:M:413:SER:HB2	1:M:471:VAL:HB	2.01	0.42
1:M:4:ILE:CD1	1:M:445:LYS:HD2	2.50	0.41
1:M:260:TRP:HA	1:M:260:TRP:CE3	2.55	0.41
1:M:84:ASP:O	1:M:88[B]:GLU:HG3	2.20	0.41
8:M:1505:SO4:O1	8:M:1510:SO4:O3	2.38	0.41
1:M:377:ASP:HA	10:M:2568:HOH:O	2.20	0.41
1:M:81:LYS:HD2	10:M:2167:HOH:O	2.21	0.41

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	M	519/501 (104%)	503 (97%)	15 (3%)	1 (0%)	56 29

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	M	187	GLN

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	M	457/437 (105%)	455 (100%)	2 (0%)	95 91

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	3	GLU
1	M	373	LYS

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

Mol	Chain	Res	Type
1	M	90	ASN
1	M	122	HIS
1	M	218	ASN
1	M	244	ASN
1	M	265	ASN
1	M	292	ASN

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Mol	Chain	Res	Type
1	M	365	HIS

5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

13 carbohydrates 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$
3	NAG	M	921	1,3	12,14,15	1.64	5 (41%)	15,19,21	2.35	7 (46%)
3	NAG	M	923	3	12,14,15	1.07	1 (8%)	15,19,21	2.70	6 (40%)
4	NAG	M	941	1,4	12,14,15	1.11	1 (8%)	15,19,21	3.49	9 (60%)
4	FUC	M	942	4	9,10,11	1.21	0	10,14,16	2.41	6 (60%)
4	NAG	M	943	4	12,14,15	1.20	1 (8%)	15,19,21	1.77	3 (20%)
4	BMA	M	944	4	10,11,12	1.51	2 (20%)	11,15,17	1.33	2 (18%)
4	XYP	M	945	4	8,9,10	0.70	0	8,12,14	2.13	2 (25%)
5	NAG	M	951	1,5	12,14,15	1.11	0	15,19,21	2.04	5 (33%)
5	FUC	M	952	5	9,10,11	1.38	2 (22%)	10,14,16	2.16	5 (50%)
5	NAG	M	953	5	12,14,15	1.50	2 (16%)	15,19,21	2.81	7 (46%)
5	MAN	M	954	5	10,11,12	1.49	2 (20%)	11,15,17	7.47	8 (72%)
5	XYP	M	955	5	8,9,10	1.13	0	8,12,14	3.94	5 (62%)
5	MAN	M	956	5	10,11,12	1.04	1 (10%)	11,15,17	2.00	4 (36%)

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
3	NAG	M	921	1,3	-	0/6/23/26	0/1/1/1
3	NAG	M	923	3	-	0/6/23/26	0/1/1/1
4	NAG	M	941	1,4	-	0/6/23/26	0/1/1/1
4	FUC	M	942	4	-	0/0/17/20	0/1/1/1
4	NAG	M	943	4	-	0/6/23/26	0/1/1/1
4	BMA	M	944	4	-	0/2/19/22	0/1/1/1
4	XYP	M	945	4	-	0/0/14/17	0/1/1/1
5	NAG	M	951	1,5	-	0/6/23/26	0/1/1/1
5	FUC	M	952	5	-	0/0/17/20	0/1/1/1
5	NAG	M	953	5	-	0/6/23/26	0/1/1/1
5	MAN	M	954	5	1/1/4/5	0/2/19/22	0/1/1/1
5	XYP	M	955	5	-	0/0/14/17	0/1/1/1
5	MAN	M	956	5	-	0/2/19/22	0/1/1/1

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	954	MAN	C3-C2	-3.27	1.45	1.52
4	M	944	BMA	C4-C5	3.14	1.59	1.53
5	M	953	NAG	C3-C2	-3.06	1.46	1.52
4	M	941	NAG	C3-C2	3.05	1.58	1.52
4	M	944	BMA	C3-C2	-3.03	1.46	1.52
5	M	953	NAG	O5-C5	-2.85	1.40	1.45
5	M	954	MAN	O3-C3	2.63	1.49	1.43
4	M	943	NAG	O7-C7	2.56	1.28	1.23
3	M	921	NAG	C3-C2	2.55	1.57	1.52
3	M	921	NAG	C2-N2	-2.51	1.43	1.46
5	M	952	FUC	C3-C2	2.32	1.58	1.52
5	M	952	FUC	C6-C5	2.30	1.57	1.51
3	M	921	NAG	C8-C7	2.26	1.55	1.50
3	M	921	NAG	O7-C7	-2.15	1.18	1.23
3	M	921	NAG	O5-C5	2.13	1.49	1.45
5	M	956	MAN	C4-C3	2.08	1.57	1.52
3	M	923	NAG	C3-C2	-2.02	1.48	1.52

All (69) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	954	MAN	O5-C5-C6	-13.15	93.19	106.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	954	MAN	C6-C5-C4	12.70	143.68	113.00
5	M	954	MAN	O4-C4-C5	9.40	134.06	109.28
5	M	954	MAN	C3-C4-C5	8.39	125.19	110.20
3	M	923	NAG	O5-C5-C4	-7.29	101.40	110.65
5	M	955	XYP	O3B-C3B-C4B	7.27	123.16	110.03
5	M	954	MAN	C4-C3-C2	-7.03	101.07	110.50
4	M	941	NAG	C8-C7-N2	-6.72	102.97	116.11
5	M	954	MAN	O4-C4-C3	-5.94	97.03	110.35
4	M	941	NAG	O5-C5-C4	-5.89	103.18	110.65
4	M	941	NAG	C2-N2-C7	-5.68	113.55	123.09
5	M	953	NAG	O5-C5-C4	-5.35	103.86	110.65
5	M	955	XYP	C4B-C3B-C2B	-5.11	103.13	110.53
3	M	921	NAG	C8-C7-N2	-5.01	106.31	116.11
5	M	953	NAG	O4-C4-C3	-4.95	99.25	110.35
5	M	953	NAG	O4-C4-C5	-4.73	96.81	109.28
3	M	923	NAG	O5-C5-C6	-4.64	102.11	106.98
4	M	945	XYP	O2B-C2B-C3B	-4.63	100.19	110.18
4	M	941	NAG	O7-C7-N2	4.60	131.50	121.90
3	M	921	NAG	O7-C7-N2	4.33	130.94	121.90
5	M	954	MAN	O2-C2-C3	-4.21	101.09	110.18
5	M	951	NAG	O5-C5-C6	-4.20	102.57	106.98
5	M	952	FUC	C6-C5-C4	-4.17	106.28	113.06
5	M	955	XYP	O4B-C4B-C3B	4.10	118.19	110.23
4	M	941	NAG	C4-C3-C2	-3.88	101.83	111.32
5	M	955	XYP	O4B-C4B-C5B	3.84	117.08	109.14
5	M	953	NAG	O5-C5-C6	3.64	110.80	106.98
4	M	942	FUC	C6-C5-C4	-3.58	107.25	113.06
5	M	954	MAN	O3-C3-C2	-3.52	103.50	109.94
5	M	956	MAN	C4-C3-C2	-3.42	105.91	110.50
4	M	942	FUC	O5-C5-C6	-3.40	102.57	108.03
4	M	943	NAG	O5-C5-C6	-3.38	103.43	106.98
5	M	956	MAN	O2-C2-C3	-3.29	103.08	110.18
4	M	942	FUC	O3-C3-C2	-3.27	103.96	109.94
5	M	952	FUC	O3-C3-C2	-3.26	103.97	109.94
5	M	955	XYP	O2B-C2B-C3B	-3.23	103.21	110.18
5	M	951	NAG	C8-C7-N2	-3.17	109.91	116.11
5	M	951	NAG	O5-C5-C4	-3.05	106.79	110.65
5	M	953	NAG	C2-N2-C7	-3.02	118.01	123.09
5	M	956	MAN	O5-C5-C4	2.99	114.44	110.65
4	M	943	NAG	O7-C7-N2	-2.96	115.73	121.90
4	M	943	NAG	C3-C2-N2	-2.95	107.27	111.76
4	M	944	BMA	O5-C5-C4	-2.93	106.94	110.65

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	M	921	NAG	O4-C4-C3	-2.92	103.81	110.35
3	M	921	NAG	C2-N2-C7	-2.83	118.33	123.09
5	M	953	NAG	C3-C2-N2	-2.81	107.49	111.76
4	M	941	NAG	O3-C3-C2	-2.65	103.52	109.09
4	M	942	FUC	C4-C3-C2	2.61	114.00	110.50
4	M	945	XYP	O3B-C3B-C4B	2.58	114.69	110.03
5	M	951	NAG	C3-C4-C5	2.56	114.78	110.20
5	M	952	FUC	O3-C3-C4	-2.55	104.63	110.35
3	M	923	NAG	O3-C3-C2	-2.54	103.76	109.09
5	M	953	NAG	C8-C7-N2	-2.52	111.19	116.11
4	M	942	FUC	O2-C2-C3	-2.44	104.90	110.18
3	M	921	NAG	O3-C3-C2	-2.42	104.00	109.09
4	M	941	NAG	C6-C5-C4	2.40	118.79	113.00
4	M	944	BMA	O5-C5-C6	-2.38	104.49	106.98
3	M	923	NAG	C6-C5-C4	-2.37	107.28	113.00
3	M	921	NAG	O4-C4-C5	-2.37	103.04	109.28
5	M	951	NAG	C3-C2-N2	2.36	115.35	111.76
3	M	923	NAG	O6-C6-C5	-2.34	103.29	111.36
4	M	941	NAG	O4-C4-C3	-2.32	105.15	110.35
4	M	941	NAG	C3-C4-C5	2.24	114.20	110.20
4	M	942	FUC	O4-C4-C5	-2.20	104.68	109.78
3	M	923	NAG	C3-C2-N2	-2.19	108.42	111.76
5	M	952	FUC	C4-C3-C2	2.12	113.35	110.50
5	M	956	MAN	C3-C4-C5	-2.07	106.50	110.20
5	M	952	FUC	O2-C2-C3	-2.04	105.77	110.18
3	M	921	NAG	C4-C3-C2	-2.00	106.42	111.32

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	M	954	MAN	C1

There are no torsion outliers.

There are no ring outliers.

5.6 Ligand geometry ⓘ

Of 21 ligands modelled in this entry, 2 are modelled with single atom and 1 is monoatomic - leaving 18 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
8	SO4	M	1503	-	4,4,4	0.67	0	6,6,6	0.23	0
8	SO4	M	1504	-	4,4,4	0.99	0	6,6,6	0.23	0
8	SO4	M	1505	-	4,4,4	1.03	0	6,6,6	0.32	0
8	SO4	M	1506	-	4,4,4	1.12	0	6,6,6	1.76	2 (33%)
8	SO4	M	1507	-	4,4,4	1.25	0	6,6,6	0.99	0
8	SO4	M	1508	-	4,4,4	1.15	0	6,6,6	0.56	0
8	SO4	M	1509	-	4,4,4	1.01	0	6,6,6	0.17	0
8	SO4	M	1510	-	4,4,4	0.82	0	6,6,6	0.56	0
9	GOL	M	1511	-	5,5,5	0.28	0	5,5,5	0.62	0
9	GOL	M	1513	-	5,5,5	3.76	4 (80%)	5,5,5	2.40	3 (60%)
9	GOL	M	1514	-	5,5,5	0.26	0	5,5,5	0.87	0
2	NAG	M	901	1	12,14,15	1.12	1 (8%)	15,19,21	1.28	2 (13%)
2	NAG	M	911	1	12,14,15	1.28	1 (8%)	15,19,21	1.91	3 (20%)
2	NAG	M	931	1	12,14,15	1.95	2 (16%)	15,19,21	7.15	9 (60%)
2	NAG	M	961	1	12,14,15	1.90	3 (25%)	15,19,21	1.44	1 (6%)
2	NAG	M	971	1	12,14,15	1.50	2 (16%)	15,19,21	1.46	2 (13%)
2	NAG	M	991	1	12,14,15	1.59	3 (25%)	15,19,21	1.68	4 (26%)
6	G2F	M	999	-	9,11,12	2.43	1 (11%)	11,15,17	2.91	5 (45%)

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
8	SO4	M	1503	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1504	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1505	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1506	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1507	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1508	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1509	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1510	-	-	0/0/0/0	0/0/0/0
9	GOL	M	1511	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1513	-	-	0/4/4/4	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	GOL	M	1514	-	-	0/4/4/4	0/0/0/0
2	NAG	M	901	1	-	0/6/23/26	0/1/1/1
2	NAG	M	911	1	-	0/6/23/26	0/1/1/1
2	NAG	M	931	1	-	0/6/23/26	0/1/1/1
2	NAG	M	961	1	1/1/5/7	0/6/23/26	0/1/1/1
2	NAG	M	971	1	-	0/6/23/26	0/1/1/1
2	NAG	M	991	1	1/1/5/7	0/6/23/26	0/1/1/1
6	G2F	M	999	-	-	0/2/19/22	0/1/1/1

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	999	G2F	C2-C3	6.79	1.57	1.51
9	M	1513	GOL	O2-C2	5.99	1.62	1.43
2	M	931	NAG	O7-C7	-4.46	1.13	1.23
9	M	1513	GOL	O1-C1	4.11	1.60	1.42
2	M	971	NAG	O7-C7	-4.08	1.14	1.23
2	M	961	NAG	O7-C7	-4.00	1.14	1.23
2	M	931	NAG	C2-N2	-3.91	1.41	1.46
2	M	961	NAG	C2-N2	3.82	1.50	1.46
2	M	911	NAG	O7-C7	-3.82	1.14	1.23
2	M	991	NAG	O7-C7	-3.67	1.15	1.23
9	M	1513	GOL	C1-C2	3.27	1.65	1.52
2	M	901	NAG	O7-C7	-3.14	1.16	1.23
2	M	961	NAG	O5-C5	-2.83	1.40	1.45
2	M	991	NAG	C2-N2	2.73	1.49	1.46
9	M	1513	GOL	C3-C2	2.63	1.63	1.52
2	M	991	NAG	O5-C5	-2.33	1.41	1.45
2	M	971	NAG	O5-C5	-2.13	1.41	1.45

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	M	931	NAG	C2-N2-C7	24.44	164.12	123.09
2	M	931	NAG	C3-C2-N2	9.25	125.85	111.76
6	M	999	G2F	O5-C5-C6	-6.61	100.05	106.98
2	M	931	NAG	O7-C7-N2	-5.49	110.43	121.90
2	M	911	NAG	O5-C5-C4	-4.99	104.32	110.65
2	M	971	NAG	O5-C5-C4	-4.47	104.98	110.65
2	M	991	NAG	O5-C5-C4	-4.42	105.04	110.65
2	M	931	NAG	O5-C5-C4	-4.30	105.20	110.65
6	M	999	G2F	C2-C3-C4	-3.96	104.42	109.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	M	999	G2F	C3-C4-C5	-3.87	103.29	110.20
9	M	1513	GOL	O3-C3-C2	3.58	127.16	109.71
2	M	931	NAG	O7-C7-C8	3.42	128.72	122.04
2	M	961	NAG	C3-C2-N2	-3.40	106.59	111.76
6	M	999	G2F	O5-C5-C4	-3.25	106.52	110.65
8	M	1506	SO4	O4-S-O3	-3.21	95.51	109.08
2	M	911	NAG	C4-C3-C2	-3.07	103.81	111.32
2	M	901	NAG	O5-C5-C4	-2.81	107.09	110.65
9	M	1513	GOL	O1-C1-C2	2.66	122.67	109.71
2	M	991	NAG	C2-N2-C7	-2.59	118.73	123.09
2	M	911	NAG	O3-C3-C2	-2.59	103.66	109.09
8	M	1506	SO4	O2-S-O1	2.58	118.05	109.53
2	M	971	NAG	O5-C5-C6	-2.57	104.28	106.98
9	M	1513	GOL	C3-C2-C1	2.56	122.56	111.26
2	M	991	NAG	C4-C3-C2	-2.49	105.21	111.32
2	M	931	NAG	C8-C7-N2	2.42	120.85	116.11
2	M	931	NAG	C3-C4-C5	2.40	114.48	110.20
2	M	901	NAG	O3-C3-C4	2.28	115.46	110.35
2	M	931	NAG	C4-C3-C2	-2.19	105.95	111.32
2	M	931	NAG	O4-C4-C5	-2.19	103.52	109.28
6	M	999	G2F	C6-C5-C4	2.07	117.99	113.00
2	M	991	NAG	C6-C5-C4	-2.05	108.06	113.00

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	M	991	NAG	C1
2	M	961	NAG	C1

There are no torsion outliers.

There are no ring outliers.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues

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	M	499/501 (99%)	-0.26	13 (2%) 53 54	20, 25, 39, 66	1 (0%)

All (13) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	376	ALA	9.9
1	M	380	ASP	4.6
1	M	374	ASP	4.4
1	M	378	SER	4.3
1	M	375	LYS	4.0
1	M	417	ASP	3.9
1	M	377	ASP	3.8
1	M	3	GLU	3.2
1	M	379	THR	2.8
1	M	421	ASN	2.6
1	M	27	SER	2.5
1	M	481	ASN	2.1
1	M	305[A]	GLU	2.0

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

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

6.3 Carbohydrates ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	RSR	LLDF	B-factors(\AA^2)	Q<0.9
5	MAN	M	956	11/12	0.48	12.01	42,55,57,57	0
4	XYP	M	945	9/10	0.38	10.53	59,60,62,62	0
5	FUC	M	952	10/11	0.14	6.53	38,39,43,43	0
5	NAG	M	953	14/15	0.12	2.16	34,37,40,42	0
3	NAG	M	923	14/15	0.38	1.76	49,52,56,58	0
5	NAG	M	951	14/15	0.09	0.95	30,32,35,36	0
3	NAG	M	921	14/15	0.09	0.50	29,34,38,42	0
4	NAG	M	941	14/15	0.08	-0.17	30,33,36,36	0
4	NAG	M	943	14/15	0.12	-	39,43,48,49	0
5	MAN	M	954	11/12	0.17	-	44,48,52,54	0
4	FUC	M	942	10/11	0.23	-	41,43,47,49	0
5	XYP	M	955	9/10	0.42	-	56,59,60,62	0
4	BMA	M	944	11/12	0.33	-	53,57,59,59	0

6.4 Ligands

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	RSR	LLDF	B-factors(\AA^2)	Q<0.9
8	SO4	M	1507	5/5	0.44	31.01	50,52,53,54	5
8	SO4	M	1505	5/5	0.28	29.79	54,56,56,58	5
2	NAG	M	971	14/15	0.46	29.62	69,75,76,76	0
9	GOL	M	1514	6/6	0.30	23.12	57,59,59,60	6
2	NAG	M	961	14/15	0.52	22.52	59,63,66,67	0
2	NAG	M	991	14/15	0.64	17.56	57,58,63,64	0
2	NAG	M	911	14/15	0.19	13.49	36,40,41,45	0
8	SO4	M	1509	5/5	0.33	12.87	54,55,55,55	5
9	GOL	M	1511	6/6	0.34	12.29	55,56,56,56	6
9	GOL	M	1512[B]	1/6	0.13	11.84	29,29,29,29	1
9	GOL	M	1513	6/6	0.31	11.72	20,26,29,36	0
8	SO4	M	1510	5/5	0.38	11.60	62,62,63,64	1
8	SO4	M	1506	5/5	0.12	10.17	35,36,37,40	0
9	GOL	M	1512[A]	1/6	0.13	9.99	16,16,16,16	1
2	NAG	M	931	14/15	0.32	6.52	53,58,60,60	0
8	SO4	M	1508	5/5	0.30	4.81	42,46,47,47	5
8	SO4	M	1503	5/5	0.12	3.90	37,40,41,43	5
2	NAG	M	901	14/15	0.21	2.52	42,45,50,52	0

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(\AA^2)	Q<0.9
8	SO4	M	1504	5/5	0.15	1.70	36,39,41,41	5
6	G2F	M	999	11/12	0.09	0.19	27,32,35,37	0
7	ZN	M	1502	1/1	0.02	-3.65	21,21,21,21	1

6.5 Other polymers

There are no such residues in this entry.