



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 4, 2025 – 09:01 AM EST

PDB ID : 1E6S
Title : MYROSINASE FROM SINAPIS ALBA with bound gluco-hydroximolactam and sulfate
Authors : Burmeister, W.P.
Deposited on : 2000-08-23
Resolution : 1.35 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) : 2.40

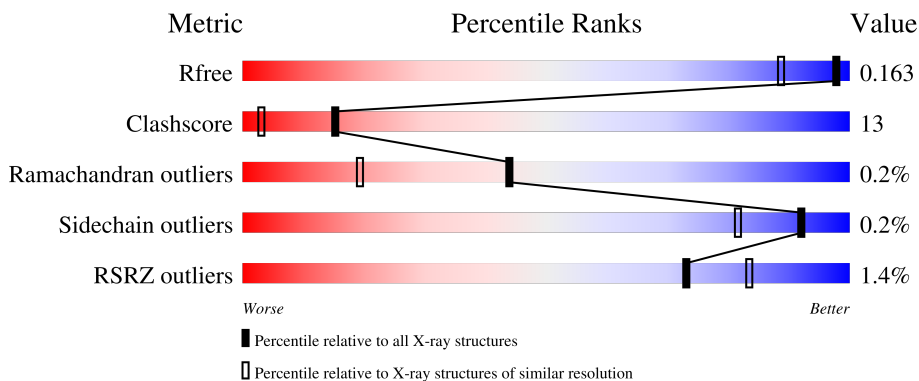
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.35 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	1089 (1.36-1.36)
Clashscore	180529	1157 (1.36-1.36)
Ramachandran outliers	177936	1146 (1.36-1.36)
Sidechain outliers	177891	1146 (1.36-1.36)
RSRZ outliers	164620	1088 (1.36-1.36)

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	M	501	
2	A	2	
3	B	5	
4	C	7	

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
4	BMA	C	3	-	-	X	-
4	MAN	C	6	X	-	X	-
5	NAG	M	905	-	-	X	-
8	SO4	M	925[A]	-	X	-	-
8	SO4	M	925[B]	-	-	X	-
8	SO4	M	927	-	X	-	-

2 Entry composition [i](#)

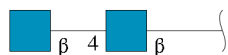
There are 10 unique types of molecules in this entry. The entry contains 5207 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MYROSINASE MA1.

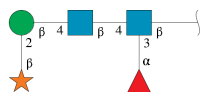
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	M	499	4082	2618	660	788	16	0	21	0

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



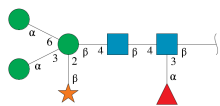
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	A	2	28	16	2	10	0	0	0

- Molecule 3 is an oligosaccharide called beta-D-xylopyranose-(1-2)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-3)]2-acetamido-2-deoxy-beta-D-glucopyranose.



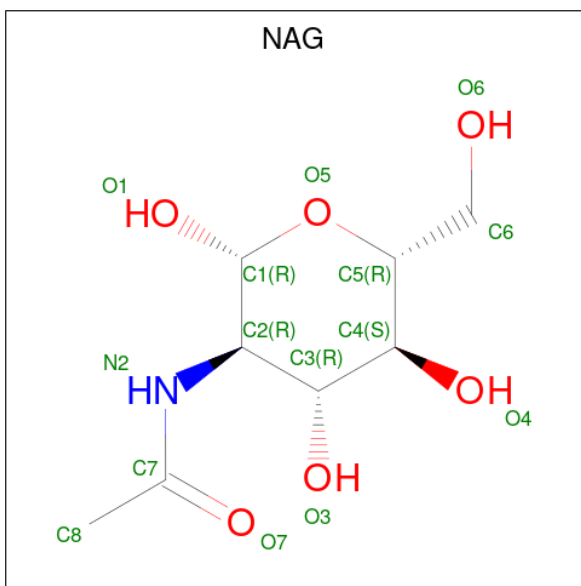
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	B	5	58	33	2	23	0	0	0

- Molecule 4 is an oligosaccharide called beta-D-xylopyranose-(1-2)-[alpha-D-mannopyranose-(1-3)][alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-3)]2-acetamido-2-deoxy-beta-D-glucopyranose.



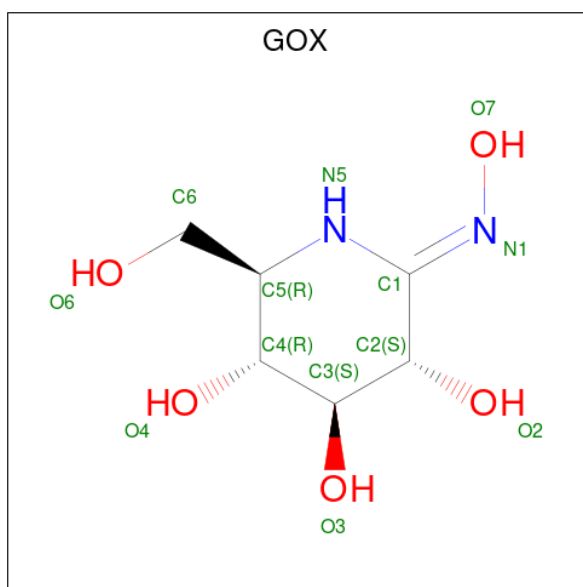
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	C	7	80	45	2	33	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 6 is (2S,3S,4R,5R)-6-(HYDROXYAMINO)-2-(HYDROXYMETHYL)-2,3,4,5-TE TRAHYDROPYRIDINE-3,4,5-TRIOL (three-letter code: GOX) (formula: $C_6H_{12}N_2O_5$).

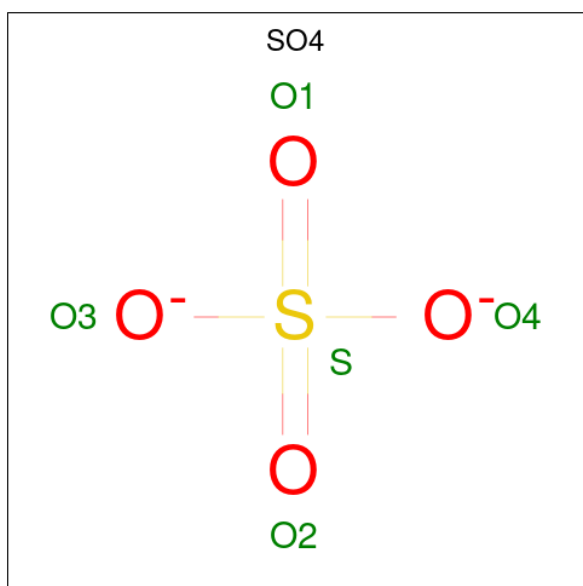


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
6	M	1	13	6	2	5	0	0

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

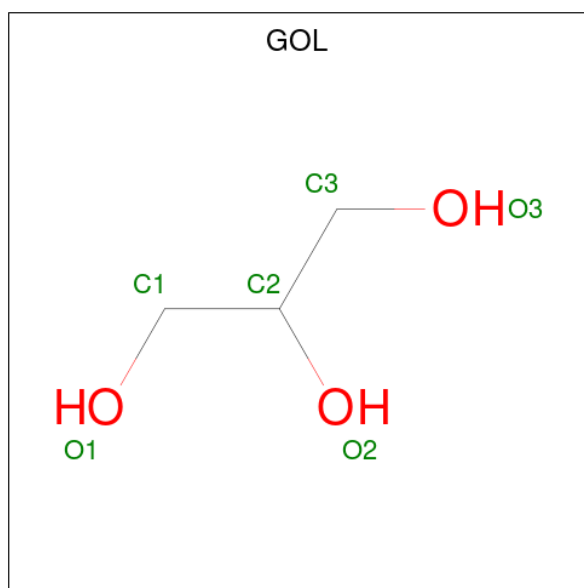
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
7	M	1	1	1	0	0

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



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 10 8 2	0	1
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 5 4 1	0	0
8	M	1	Total O S 5 4 1	0	0

- 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 7 3 4	0	1
9	M	1	Total C O 6 3 3	0	0
9	M	1	Total C O 6 3 3	0	0
9	M	1	Total C O 6 3 3	0	0

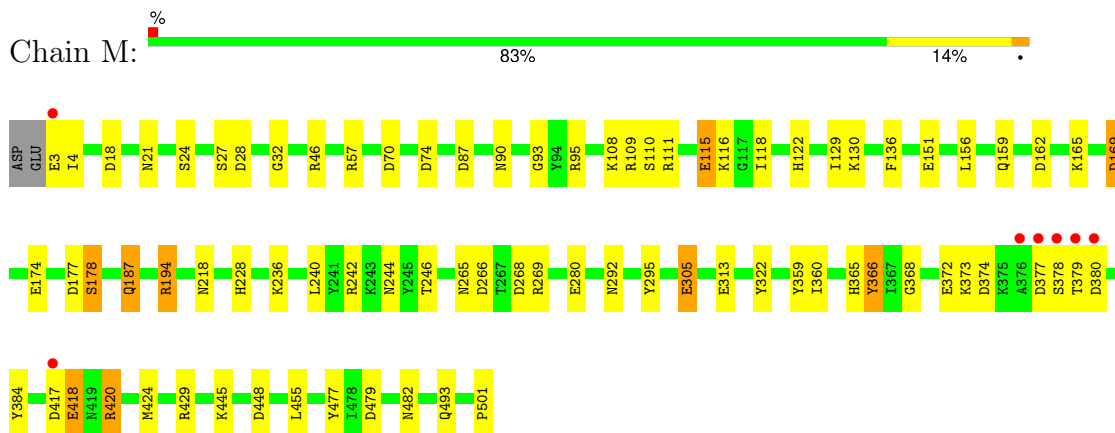
- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	M	791	Total O 791 791	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.

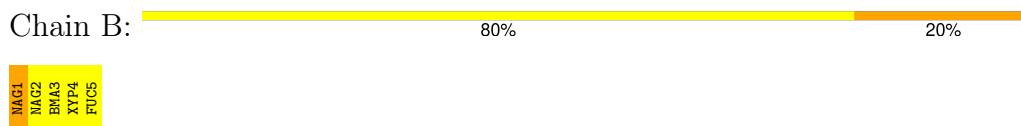
- Molecule 1: MYROSINASE MA1



- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 3: beta-D-xylopyranose-(1-2)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-3)]2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 4: beta-D-xylopyranose-(1-2)-[alpha-D-mannopyranose-(1-3)][alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-3)]2-acetamido-2-deoxy-beta-D-glucopyranose



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 – 1.35 10.00 – 1.35	Depositor EDS
% Data completeness (in resolution range)	82.1 (10.00-1.35) 81.5 (10.00-1.35)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.55 (at 1.35Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.120 , 0.152 0.137 , 0.163	Depositor DCC
R_{free} test set	6736 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	10.9	Xtrriage
Anisotropy	0.269	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.47 , 58.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.014 for -k,-h,-l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	5207	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.88% 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, XYP, FUC, ZN, MAN, GOX, SO4, NAG, BMA

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	0.98	5/4290 (0.1%)	1.50	56/5833 (1.0%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	24	SER	CB-OG	7.01	1.51	1.42
1	M	178	SER	CB-OG	6.19	1.50	1.42
1	M	151	GLU	CD-OE2	-5.99	1.19	1.25
1	M	115	GLU	CD-OE2	5.23	1.31	1.25
1	M	501	PRO	N-CD	5.02	1.54	1.47

All (56) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	109	ARG	NE-CZ-NH2	-18.31	111.14	120.30
1	M	269	ARG	NE-CZ-NH2	-13.15	113.73	120.30
1	M	115	GLU	OE1-CD-OE2	-13.02	107.67	123.30
1	M	109	ARG	NH1-CZ-NH2	10.98	131.48	119.40
1	M	57	ARG	NE-CZ-NH2	-9.36	115.62	120.30
1	M	242	ARG	NE-CZ-NH2	-8.87	115.87	120.30
1	M	479	ASP	CB-CG-OD1	8.62	126.06	118.30
1	M	269	ARG	NE-CZ-NH1	8.21	124.41	120.30
1	M	377	ASP	CB-CG-OD1	7.91	125.42	118.30
1	M	169[A]	ASP	CB-CG-OD2	-7.68	111.39	118.30
1	M	169[B]	ASP	CB-CG-OD2	-7.68	111.39	118.30
1	M	380	ASP	CB-CG-OD1	7.57	125.11	118.30
1	M	266	ASP	CB-CG-OD2	-7.43	111.61	118.30
1	M	377	ASP	CB-CG-OD2	-7.27	111.75	118.30
1	M	162	ASP	CB-CG-OD2	-7.24	111.79	118.30
1	M	359	TYR	CB-CG-CD1	-7.24	116.66	121.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	266	ASP	CB-CG-OD1	7.11	124.70	118.30
1	M	417	ASP	CB-CG-OD1	7.05	124.64	118.30
1	M	482	ASN	CB-CG-OD1	6.99	135.57	121.60
1	M	70	ASP	CB-CG-OD2	-6.87	112.12	118.30
1	M	448	ASP	CB-CG-OD1	6.87	124.48	118.30
1	M	322	TYR	CB-CG-CD1	-6.58	117.05	121.00
1	M	109	ARG	NE-CZ-NH1	-6.37	117.11	120.30
1	M	295	TYR	CB-CG-CD1	-6.23	117.26	121.00
1	M	268	ASP	CB-CG-OD1	6.05	123.75	118.30
1	M	366[A]	TYR	CB-CG-CD1	6.04	124.62	121.00
1	M	366[B]	TYR	CB-CG-CD1	6.04	124.62	121.00
1	M	87	ASP	CB-CG-OD2	-5.81	113.07	118.30
1	M	194	ARG	NE-CZ-NH1	-5.72	117.44	120.30
1	M	429	ARG	CD-NE-CZ	5.71	131.60	123.60
1	M	177	ASP	CB-CG-OD1	5.71	123.44	118.30
1	M	482	ASN	CA-CB-CG	-5.71	100.83	113.40
1	M	313	GLU	OE1-CD-OE2	5.67	130.11	123.30
1	M	280	GLU	OE1-CD-OE2	-5.59	116.59	123.30
1	M	379	THR	O-C-N	-5.52	113.87	122.70
1	M	74	ASP	CB-CG-OD2	-5.44	113.40	118.30
1	M	477	TYR	CG-CD1-CE1	5.43	125.64	121.30
1	M	417	ASP	CB-CG-OD2	-5.43	113.42	118.30
1	M	359	TYR	CB-CG-CD2	5.42	124.25	121.00
1	M	372	GLU	OE1-CD-OE2	-5.35	116.88	123.30
1	M	359	TYR	CZ-CE2-CD2	-5.30	115.03	119.80
1	M	18	ASP	CB-CG-OD2	-5.28	113.54	118.30
1	M	418	GLU	CG-CD-OE2	-5.27	107.76	118.30
1	M	70	ASP	CB-CG-OD1	5.22	123.00	118.30
1	M	420	ARG	CD-NE-CZ	5.22	130.90	123.60
1	M	111	ARG	NE-CZ-NH2	-5.17	117.72	120.30
1	M	46	ARG	NE-CZ-NH2	-5.15	117.73	120.30
1	M	268	ASP	OD1-CG-OD2	-5.14	113.54	123.30
1	M	477	TYR	CD1-CE1-CZ	-5.13	115.18	119.80
1	M	169[A]	ASP	CB-CG-OD1	5.12	122.91	118.30
1	M	169[B]	ASP	CB-CG-OD1	5.12	122.91	118.30
1	M	380	ASP	CB-CG-OD2	-5.09	113.72	118.30
1	M	305[A]	GLU	OE1-CD-OE2	-5.04	117.25	123.30
1	M	305[B]	GLU	OE1-CD-OE2	-5.04	117.25	123.30
1	M	374	ASP	CB-CG-OD2	-5.01	113.79	118.30
1	M	482	ASN	OD1-CG-ND2	-5.00	110.39	121.90

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	M	4082	0	3835	97	0
2	A	28	0	25	6	0
3	B	58	0	42	6	0
4	C	80	0	58	18	0
5	M	84	0	77	22	0
6	M	13	0	12	1	0
7	M	1	0	0	0	0
8	M	45	0	0	5	0
9	M	25	0	29	1	0
10	M	791	0	0	33	1
All	All	5207	0	4078	114	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 13.

All (114) 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:M:21:ASN:HD21	5:M:901:NAG:C1	0.92	1.56
1:M:244:ASN:HD21	5:M:905:NAG:C1	0.96	1.54
1:M:90:ASN:HD21	5:M:902:NAG:C1	0.92	1.54
1:M:265:ASN:HD21	3:B:1:NAG:C1	0.88	1.51
1:M:218:ASN:HD21	2:A:1:NAG:C1	0.86	1.49
1:M:292:ASN:ND2	4:C:1:NAG:C1	1.71	1.49
1:M:21:ASN:ND2	5:M:901:NAG:C1	1.77	1.45
1:M:244:ASN:ND2	5:M:905:NAG:C1	1.78	1.43
1:M:218:ASN:ND2	2:A:1:NAG:C1	1.72	1.42
1:M:90:ASN:ND2	5:M:902:NAG:C1	1.77	1.40
1:M:265:ASN:ND2	3:B:1:NAG:C1	1.72	1.38
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CZ	1.59	1.36
1:M:418:GLU:HB2	10:M:1022:HOH:O	1.16	1.29
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CE1	2.18	1.26

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CZ	2.20	1.25
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:OH	1.38	1.22
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CE1	1.76	1.20
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CE1	2.31	1.10
10:M:1005:HOH:O	4:C:6:MAN:H61	1.50	1.09
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CD1	1.91	1.06
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CE1	1.87	1.04
4:C:3:BMA:H61	4:C:6:MAN:H61	1.39	1.01
4:C:3:BMA:C6	4:C:6:MAN:H61	1.95	0.97
1:M:165:LYS:NZ	5:M:905:NAG:H82	1.80	0.96
1:M:246:THR:HG22	10:M:1304:HOH:O	1.65	0.95
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:OH	2.12	0.95
1:M:265:ASN:HD21	3:B:1:NAG:C2	1.81	0.92
1:M:130:LYS:HB3	10:M:1576:HOH:O	1.69	0.92
4:C:3:BMA:H61	4:C:6:MAN:C6	1.98	0.92
1:M:165:LYS:HZ1	5:M:905:NAG:H82	1.36	0.84
1:M:130:LYS:HG3	10:M:1403:HOH:O	1.80	0.80
1:M:21:ASN:HD21	5:M:901:NAG:C2	1.92	0.78
1:M:28:ASP:HA	10:M:1004:HOH:O	1.85	0.77
4:C:3:BMA:C6	4:C:6:MAN:C6	2.58	0.77
1:M:373:LYS:NZ	1:M:378:SER:OG	2.16	0.77
1:M:360[B]:ILE:HG13	1:M:366[B]:TYR:CE1	2.17	0.76
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CD1	2.58	0.75
1:M:493:GLN:NE2	10:M:1001:HOH:O	2.18	0.75
1:M:4:ILE:HD11	1:M:445:LYS:HD2	1.70	0.74
1:M:244:ASN:HD21	5:M:905:NAG:C2	1.93	0.73
1:M:218:ASN:HD21	2:A:1:NAG:C2	1.95	0.73
1:M:115:GLU:HG3	10:M:1002:HOH:O	1.93	0.68
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CZ	2.69	0.68
1:M:265:ASN:CG	3:B:1:NAG:C1	2.61	0.68
1:M:169[B]:ASP:HB2	1:M:240:LEU:HD21	1.78	0.66
1:M:116:LYS:HG2	10:M:1492:HOH:O	1.96	0.66
1:M:130:LYS:HB3	10:M:1648:HOH:O	1.96	0.65
1:M:265:ASN:ND2	3:B:1:NAG:C2	2.51	0.65
1:M:218:ASN:ND2	2:A:1:NAG:C2	2.58	0.63
1:M:365:HIS:HE1	10:M:1246:HOH:O	1.80	0.63
10:M:1005:HOH:O	4:C:3:BMA:C4	2.46	0.62
4:C:3:BMA:H61	4:C:6:MAN:H62	1.82	0.62
1:M:365:HIS:HD2	10:M:1658:HOH:O	1.82	0.62
1:M:292:ASN:ND2	4:C:1:NAG:C2	2.59	0.60
1:M:90:ASN:ND2	5:M:902:NAG:C2	2.60	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:M:1011:HOH:O	4:C:6:MAN:C5	2.49	0.59
4:C:3:BMA:O6	4:C:6:MAN:C6	2.41	0.59
10:M:1020:HOH:O	4:C:6:MAN:H62	2.02	0.59
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CZ	2.34	0.57
1:M:108:LYS:HD2	10:M:1135:HOH:O	2.05	0.56
1:M:165:LYS:NZ	5:M:905:NAG:C8	2.63	0.56
1:M:244:ASN:ND2	5:M:905:NAG:O5	2.36	0.55
1:M:360[B]:ILE:HD13	1:M:366[B]:TYR:CZ	2.30	0.55
1:M:4:ILE:HD11	1:M:445:LYS:CD	2.36	0.54
1:M:21:ASN:CG	5:M:901:NAG:C1	2.71	0.54
1:M:218:ASN:CG	2:A:1:NAG:C1	2.70	0.53
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CG	2.42	0.53
1:M:265:ASN:ND2	3:B:1:NAG:O5	2.36	0.53
1:M:165:LYS:HD2	1:M:236:LYS:HG3	1.90	0.53
1:M:218:ASN:ND2	2:A:1:NAG:O5	2.37	0.52
1:M:194:ARG:NH1	8:M:925[B]:SO4:S	2.83	0.52
1:M:122:HIS:HE1	1:M:174:GLU:O	1.92	0.51
1:M:228:HIS:CD2	10:M:1019:HOH:O	2.62	0.51
1:M:424:MET:HE3	10:M:1001:HOH:O	2.08	0.51
1:M:194:ARG:NH1	8:M:925[B]:SO4:O4	2.44	0.51
1:M:360[A]:ILE:HG23	10:M:1597:HOH:O	2.09	0.51
10:M:1005:HOH:O	4:C:3:BMA:C5	2.58	0.51
1:M:240:LEU:HD13	5:M:905:NAG:H83	1.94	0.50
1:M:95:ARG:HA	1:M:136:PHE:O	2.12	0.50
10:M:1020:HOH:O	4:C:6:MAN:C6	2.59	0.50
1:M:118[B]:ILE:HD12	1:M:174:GLU:HG3	1.94	0.49
1:M:159:GLN:NE2	10:M:1021:HOH:O	2.45	0.49
1:M:21:ASN:ND2	5:M:901:NAG:C2	2.63	0.49
1:M:187:GLN:OE1	6:M:921:GOX:N1	2.46	0.49
1:M:156:LEU:HD21	10:M:1656:HOH:O	2.13	0.48
1:M:130:LYS:CB	10:M:1576:HOH:O	2.42	0.48
1:M:360[A]:ILE:CG2	10:M:1597:HOH:O	2.61	0.48
10:M:1006:HOH:O	4:C:6:MAN:C6	2.63	0.47
1:M:115:GLU:CD	10:M:1002:HOH:O	2.52	0.47
1:M:115:GLU:OE2	10:M:1002:HOH:O	2.20	0.47
1:M:90:ASN:ND2	5:M:902:NAG:O5	2.39	0.46
1:M:194:ARG:NH1	8:M:925[B]:SO4:O1	2.36	0.45
1:M:165:LYS:CE	5:M:905:NAG:H82	2.47	0.45
1:M:165:LYS:HZ2	5:M:905:NAG:H82	1.75	0.45
1:M:292:ASN:ND2	4:C:1:NAG:O5	2.39	0.45
1:M:240:LEU:CD1	5:M:905:NAG:H83	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:M:1005:HOH:O	4:C:3:BMA:C6	2.66	0.44
1:M:368:GLY:HA3	1:M:384:TYR:O	2.18	0.44
1:M:165:LYS:HZ2	5:M:905:NAG:C8	2.31	0.43
1:M:165:LYS:HD2	1:M:236:LYS:CG	2.48	0.43
1:M:95:ARG:HB2	1:M:455:LEU:HD13	2.01	0.43
1:M:108:LYS:HE3	1:M:110:SER:OG	2.19	0.42
1:M:115:GLU:CG	10:M:1002:HOH:O	2.61	0.42
8:M:925[B]:SO4:O1	10:M:1003:HOH:O	2.21	0.42
1:M:27:SER:O	10:M:1004:HOH:O	2.22	0.42
1:M:129:ILE:CD1	1:M:178:SER:HB3	2.50	0.42
1:M:32:GLY:HA3	1:M:93:GLY:O	2.20	0.41
4:C:3:BMA:O6	4:C:6:MAN:H61	2.08	0.41
1:M:420:ARG:O	1:M:424:MET:HG2	2.20	0.41
9:M:933:GOL:C2	10:M:1007:HOH:O	2.68	0.41
1:M:194:ARG:HD2	8:M:925[B]:SO4:O1	2.21	0.41
1:M:244:ASN:ND2	5:M:905:NAG:C2	2.68	0.40
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:HE1	1.67	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)
10:M:1004:HOH:O	10:M:1556:HOH:O[6_565]	1.95	0.25

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	M	518/501 (103%)	503 (97%)	14 (3%)	1 (0%)	44 19

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	M	187	GLN

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	M	456/437 (104%)	455 (100%)	1 (0%)	92 81

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	3	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) 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	365	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](#)

14 monosaccharides 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	NAG	A	1	2	14,14,15	2.62	7 (50%)	17,19,21	3.45	9 (52%)
2	NAG	A	2	2	14,14,15	2.34	4 (28%)	17,19,21	4.41	8 (47%)
3	NAG	B	1	3	14,14,15	1.07	1 (7%)	17,19,21	3.06	6 (35%)
3	NAG	B	2	3	14,14,15	1.47	1 (7%)	17,19,21	1.69	4 (23%)
3	BMA	B	3	3	11,11,12	1.97	3 (27%)	15,15,17	1.52	2 (13%)
3	XYP	B	4	3	9,9,10	1.27	1 (11%)	10,12,14	2.01	4 (40%)
3	FUC	B	5	3	10,10,11	2.04	4 (40%)	14,14,16	2.12	3 (21%)
4	NAG	C	1	4	14,14,15	1.65	2 (14%)	17,19,21	3.04	6 (35%)
4	NAG	C	2	4	14,14,15	1.51	2 (14%)	17,19,21	2.24	7 (41%)
4	BMA	C	3	4	11,11,12	2.37	3 (27%)	15,15,17	4.68	9 (60%)
4	XYP	C	4	4	9,9,10	2.07	2 (22%)	10,12,14	3.42	6 (60%)
4	MAN	C	5	4	11,11,12	1.59	3 (27%)	15,15,17	2.36	6 (40%)
4	MAN	C	6	4	11,11,12	2.86	5 (45%)	15,15,17	7.07	12 (80%)
4	FUC	C	7	4	10,10,11	2.13	5 (50%)	14,14,16	2.58	8 (57%)

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	NAG	A	1	2	-	0/6/23/26	0/1/1/1
2	NAG	A	2	2	-	1/6/23/26	0/1/1/1
3	NAG	B	1	3	-	0/6/23/26	0/1/1/1
3	NAG	B	2	3	-	0/6/23/26	0/1/1/1
3	BMA	B	3	3	-	0/2/19/22	0/1/1/1
3	XYP	B	4	3	-	-	0/1/1/1
3	FUC	B	5	3	-	-	0/1/1/1
4	NAG	C	1	4	-	0/6/23/26	0/1/1/1
4	NAG	C	2	4	-	0/6/23/26	0/1/1/1
4	BMA	C	3	4	-	0/2/19/22	0/1/1/1
4	XYP	C	4	4	-	-	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	MAN	C	5	4	-	0/2/19/22	0/1/1/1
4	MAN	C	6	4	1/1/4/5	1/2/19/22	0/1/1/1
4	FUC	C	7	4	-	-	0/1/1/1

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	6	MAN	O5-C5	6.78	1.56	1.43
2	A	2	NAG	C4-C5	6.58	1.67	1.53
4	C	3	BMA	C2-C3	-6.17	1.43	1.52
2	A	1	NAG	O7-C7	-5.07	1.11	1.23
4	C	4	XYP	C2-C3	4.65	1.59	1.52
3	B	5	FUC	C2-C3	4.36	1.59	1.52
4	C	1	NAG	C1-C2	-4.28	1.46	1.52
2	A	1	NAG	C4-C5	-4.24	1.44	1.53
3	B	3	BMA	C2-C3	-4.11	1.46	1.52
2	A	1	NAG	C8-C7	4.08	1.59	1.50
2	A	2	NAG	C6-C5	4.04	1.65	1.51
4	C	6	MAN	C1-C2	3.43	1.60	1.52
4	C	7	FUC	C4-C5	3.43	1.60	1.52
4	C	6	MAN	C2-C3	3.38	1.57	1.52
4	C	5	MAN	O5-C5	3.29	1.49	1.43
3	B	2	NAG	C1-C2	3.28	1.56	1.52
3	B	3	BMA	O5-C5	3.25	1.49	1.43
4	C	7	FUC	C2-C3	3.07	1.57	1.52
4	C	2	NAG	C1-C2	3.06	1.56	1.52
3	B	3	BMA	C4-C5	2.94	1.59	1.53
4	C	7	FUC	C6-C5	2.91	1.58	1.51
3	B	5	FUC	C6-C5	2.85	1.58	1.51
2	A	1	NAG	O5-C5	2.79	1.48	1.43
4	C	6	MAN	O4-C4	2.73	1.49	1.43
4	C	4	XYP	O5-C5	2.71	1.48	1.43
3	B	1	NAG	C3-C2	2.70	1.58	1.52
2	A	1	NAG	O4-C4	2.69	1.49	1.43
4	C	3	BMA	C4-C5	2.68	1.58	1.53
3	B	5	FUC	O5-C5	2.67	1.48	1.43
2	A	1	NAG	C6-C5	2.66	1.60	1.51
4	C	2	NAG	C3-C2	-2.64	1.47	1.52
4	C	3	BMA	O3-C3	2.60	1.49	1.43
4	C	1	NAG	O5-C5	2.59	1.48	1.43
4	C	6	MAN	O5-C1	2.54	1.48	1.43
2	A	2	NAG	C1-C2	2.42	1.55	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	5	MAN	C4-C5	2.36	1.58	1.53
4	C	7	FUC	O4-C4	2.22	1.48	1.43
4	C	7	FUC	C1-C2	2.21	1.57	1.52
2	A	1	NAG	C3-C2	2.19	1.57	1.52
3	B	4	XYP	O3-C3	2.18	1.48	1.43
2	A	2	NAG	C3-C2	-2.16	1.48	1.52
4	C	5	MAN	C4-C3	2.13	1.57	1.52
3	B	5	FUC	O2-C2	2.11	1.47	1.43

All (90) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	6	MAN	C6-C5-C4	14.56	148.77	113.02
2	A	2	NAG	C1-O5-C5	-14.05	93.36	112.19
4	C	6	MAN	C1-O5-C5	-13.53	94.05	112.19
4	C	3	BMA	O4-C4-C5	12.12	139.19	109.32
4	C	6	MAN	O5-C5-C6	-11.39	85.50	107.66
2	A	1	NAG	C1-O5-C5	-8.88	100.29	112.19
4	C	1	NAG	C1-O5-C5	-8.51	100.78	112.19
4	C	6	MAN	O4-C4-C5	8.40	130.02	109.32
3	B	1	NAG	C1-O5-C5	-6.72	103.18	112.19
4	C	3	BMA	C6-C5-C4	6.64	129.32	113.02
2	A	2	NAG	C6-C5-C4	-6.61	96.79	113.02
4	C	1	NAG	O5-C1-C2	6.47	121.30	111.29
3	B	1	NAG	C2-N2-C7	-6.41	114.31	122.90
4	C	3	BMA	O4-C4-C3	-6.25	95.64	110.38
4	C	3	BMA	O5-C5-C6	-6.24	95.52	107.66
2	A	2	NAG	O5-C5-C4	-6.19	95.76	110.83
4	C	6	MAN	O5-C5-C4	6.07	125.59	110.83
4	C	2	NAG	C2-N2-C7	-5.98	114.89	122.90
2	A	1	NAG	C2-N2-C7	-5.63	115.36	122.90
4	C	4	XYP	O2-C2-C3	-5.61	98.54	110.15
4	C	4	XYP	C5-C4-C3	-5.50	101.64	109.64
3	B	1	NAG	C8-C7-N2	-5.26	107.40	116.12
4	C	7	FUC	C6-C5-C4	-5.18	103.61	113.08
4	C	4	XYP	C4-C3-C2	-5.17	104.78	110.92
3	B	5	FUC	O2-C2-C3	-5.13	99.52	110.15
4	C	6	MAN	O5-C1-C2	-5.11	98.61	110.79
4	C	6	MAN	O4-C4-C3	-5.04	98.50	110.38
2	A	1	NAG	C8-C7-N2	-4.83	108.11	116.12
3	B	5	FUC	O3-C3-C2	-4.72	100.43	110.05
2	A	1	NAG	O7-C7-N2	4.47	129.87	121.98

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	7	FUC	C1-C2-C3	-4.43	103.19	109.64
4	C	6	MAN	C1-C2-C3	4.41	116.06	109.64
4	C	1	NAG	O5-C5-C6	-4.39	99.11	107.66
4	C	5	MAN	C2-C3-C4	-4.39	103.14	110.86
4	C	5	MAN	C1-C2-C3	4.34	115.97	109.64
3	B	3	BMA	C2-C3-C4	3.92	117.76	110.86
4	C	3	BMA	C3-C4-C5	3.89	117.28	110.23
4	C	7	FUC	O2-C2-C1	-3.78	100.58	109.22
4	C	3	BMA	O2-C2-C3	-3.62	102.65	110.15
2	A	1	NAG	O5-C5-C6	-3.59	100.67	107.66
2	A	2	NAG	O5-C5-C6	-3.58	100.69	107.66
4	C	6	MAN	C2-C3-C4	-3.54	104.64	110.86
4	C	6	MAN	O6-C6-C5	3.45	123.07	111.33
4	C	5	MAN	C3-C4-C5	-3.37	104.12	110.23
4	C	5	MAN	O5-C5-C6	-3.34	101.16	107.66
3	B	4	XYP	O2-C2-C3	-3.33	103.26	110.15
4	C	6	MAN	O2-C2-C1	-3.24	101.81	109.22
4	C	3	BMA	O5-C5-C4	-3.16	103.14	110.83
2	A	2	NAG	O4-C4-C3	-3.15	102.94	110.38
4	C	2	NAG	O5-C1-C2	-3.14	106.43	111.29
3	B	2	NAG	O3-C3-C2	-3.09	102.99	109.40
2	A	2	NAG	O4-C4-C5	-3.06	101.78	109.32
4	C	5	MAN	O3-C3-C4	-3.06	103.17	110.38
3	B	4	XYP	O3-C3-C2	-2.99	103.96	110.05
4	C	4	XYP	O4-C4-C3	-2.98	103.97	110.15
3	B	4	XYP	C4-C3-C2	-2.94	107.43	110.92
4	C	2	NAG	O4-C4-C3	-2.86	103.65	110.38
4	C	7	FUC	O2-C2-C3	-2.85	104.24	110.15
3	B	3	BMA	O5-C5-C4	-2.83	103.95	110.83
4	C	6	MAN	C3-C4-C5	-2.79	105.17	110.23
4	C	4	XYP	O3-C3-C4	2.78	115.74	110.05
4	C	7	FUC	C3-C4-C5	-2.78	105.58	109.81
4	C	3	BMA	C1-C2-C3	-2.75	105.64	109.64
3	B	1	NAG	O7-C7-N2	2.72	126.78	121.98
2	A	1	NAG	O4-C4-C3	-2.63	104.17	110.38
4	C	3	BMA	C1-O5-C5	-2.61	108.69	112.19
2	A	1	NAG	C1-C2-N2	-2.59	106.35	110.43
4	C	2	NAG	O5-C5-C4	-2.58	104.55	110.83
3	B	2	NAG	O7-C7-C8	-2.57	117.47	122.05
2	A	1	NAG	O3-C3-C2	-2.57	104.06	109.40
3	B	2	NAG	O4-C4-C3	-2.53	104.40	110.38
4	C	4	XYP	C5-O5-C1	2.49	115.44	111.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	2	NAG	O4-C4-C5	-2.37	103.48	109.32
3	B	2	NAG	O5-C5-C4	-2.37	105.06	110.83
2	A	1	NAG	O4-C4-C5	-2.33	103.59	109.32
3	B	5	FUC	C1-C2-C3	-2.26	106.36	109.64
4	C	2	NAG	O5-C5-C6	2.24	112.03	107.66
3	B	4	XYP	C5-C4-C3	-2.22	106.42	109.64
3	B	1	NAG	C3-C4-C5	-2.19	106.26	110.23
4	C	7	FUC	O5-C5-C4	-2.18	105.63	109.55
2	A	2	NAG	O5-C1-C2	2.16	114.64	111.29
2	A	2	NAG	C2-N2-C7	-2.15	120.03	122.90
4	C	7	FUC	O5-C1-C2	-2.13	105.70	110.79
3	B	1	NAG	O7-C7-C8	2.11	125.82	122.05
4	C	1	NAG	C6-C5-C4	-2.11	107.84	113.02
4	C	1	NAG	C8-C7-N2	-2.09	112.65	116.12
4	C	1	NAG	O7-C7-C8	2.05	125.71	122.05
4	C	5	MAN	O2-C2-C3	-2.03	105.95	110.15
4	C	2	NAG	O3-C3-C4	-2.02	105.61	110.38
4	C	7	FUC	O5-C5-C6	-2.01	103.05	107.40

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	C	6	MAN	C5

All (2) torsion outliers are listed below:

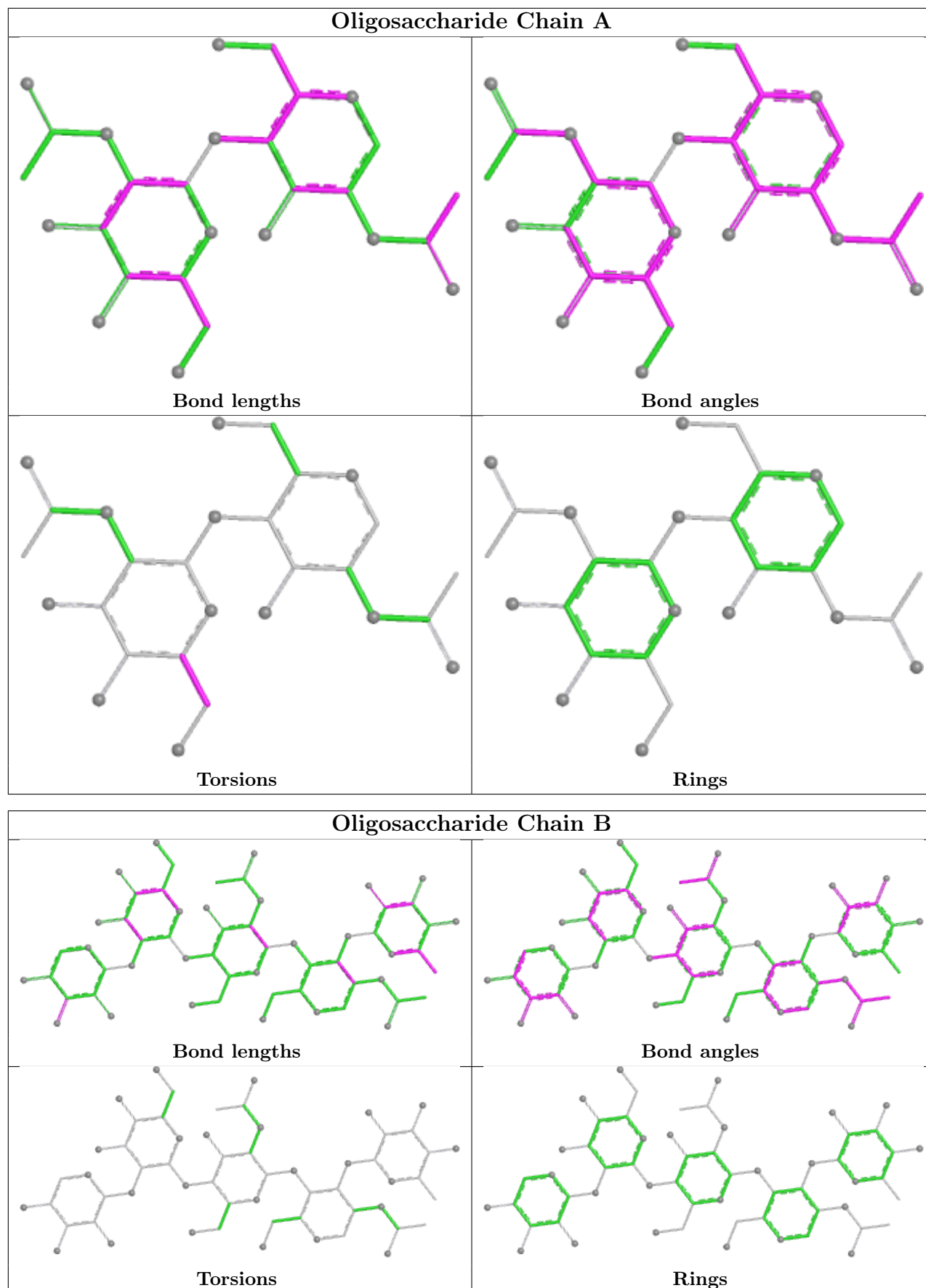
Mol	Chain	Res	Type	Atoms
4	C	6	MAN	O5-C5-C6-O6
2	A	2	NAG	O5-C5-C6-O6

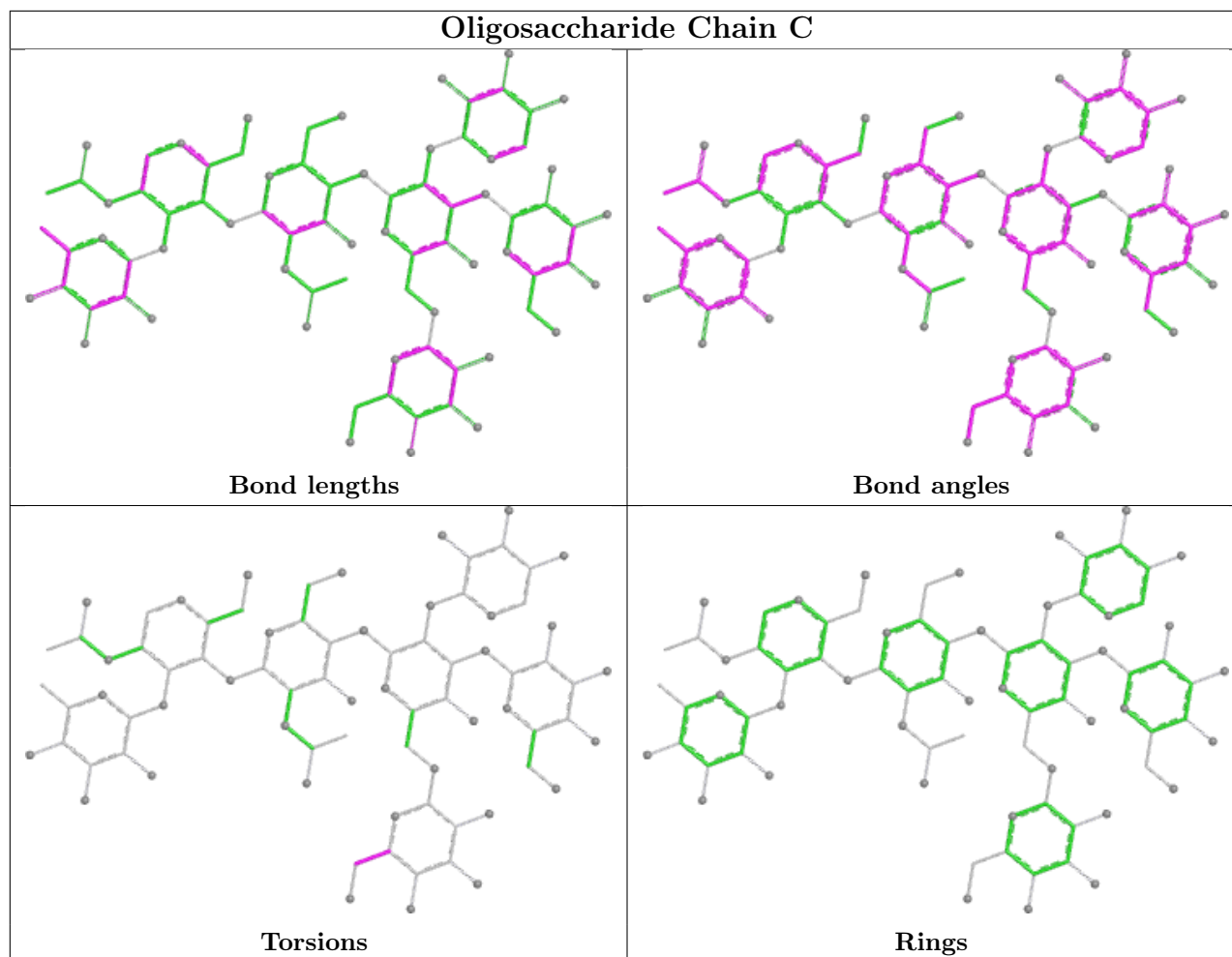
There are no ring outliers.

5 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1	NAG	3	0
4	C	6	MAN	12	0
2	A	1	NAG	6	0
3	B	1	NAG	6	0
4	C	3	BMA	10	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.





5.6 Ligand geometry [i](#)

Of 22 ligands modelled in this entry, 1 is monoatomic - leaving 21 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	925[B]	-	4,4,4	0.88	0	6,6,6	0.94	0
9	GOL	M	932	-	5,5,5	0.81	0	5,5,5	1.67	2 (40%)
5	NAG	M	901	-	14,14,15	1.24	2 (14%)	17,19,21	2.38	6 (35%)
8	SO4	M	926	-	4,4,4	0.52	0	6,6,6	0.26	0
8	SO4	M	929	-	4,4,4	0.81	0	6,6,6	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
8	SO4	M	925[A]	-	4,4,4	1.49	1 (25%)	6,6,6	2.55	4 (66%)
9	GOL	M	930[B]	-	5,5,5	0.98	0	5,5,5	2.98	2 (40%)
5	NAG	M	920	1	14,14,15	1.27	1 (7%)	17,19,21	2.34	5 (29%)
8	SO4	M	928	-	4,4,4	1.00	0	6,6,6	1.49	1 (16%)
5	NAG	M	919	1	14,14,15	1.30	1 (7%)	17,19,21	2.31	5 (29%)
9	GOL	M	931	-	5,5,5	0.92	0	5,5,5	1.13	0
6	GOX	M	921	-	12,13,13	1.26	2 (16%)	14,18,18	1.97	6 (42%)
9	GOL	M	930[A]	-	5,5,5	0.87	0	5,5,5	1.24	1 (20%)
5	NAG	M	905	-	14,14,15	1.75	3 (21%)	17,19,21	7.25	10 (58%)
5	NAG	M	902	-	14,14,15	1.50	2 (14%)	17,19,21	2.43	5 (29%)
8	SO4	M	923	-	4,4,4	0.78	0	6,6,6	1.27	1 (16%)
5	NAG	M	918	1	14,14,15	1.41	2 (14%)	17,19,21	2.48	6 (35%)
8	SO4	M	924	-	4,4,4	0.57	0	6,6,6	0.44	0
9	GOL	M	933	-	5,5,5	0.25	0	5,5,5	1.21	0
8	SO4	M	934	-	4,4,4	0.70	0	6,6,6	0.75	0
8	SO4	M	927	-	4,4,4	1.83	1 (25%)	6,6,6	2.33	4 (66%)

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
9	GOL	M	931	-	-	0/4/4/4	-
6	GOX	M	921	-	-	0/3/24/24	0/1/1/1
5	NAG	M	902	-	-	0/6/23/26	0/1/1/1
5	NAG	M	918	1	-	0/6/23/26	0/1/1/1
9	GOL	M	930[A]	-	-	0/4/4/4	-
9	GOL	M	932	-	-	0/4/4/4	-
9	GOL	M	930[B]	-	-	2/4/4/4	-
5	NAG	M	901	-	-	0/6/23/26	0/1/1/1
5	NAG	M	920	1	-	0/6/23/26	0/1/1/1
9	GOL	M	933	-	-	2/4/4/4	-
5	NAG	M	905	-	-	2/6/23/26	0/1/1/1
5	NAG	M	919	1	-	2/6/23/26	0/1/1/1

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	919	NAG	O7-C7	-4.22	1.13	1.23
5	M	902	NAG	O7-C7	-4.03	1.14	1.23
5	M	920	NAG	O7-C7	-3.86	1.14	1.23
5	M	918	NAG	O7-C7	-3.82	1.14	1.23
5	M	905	NAG	O7-C7	-3.54	1.15	1.23
8	M	927	SO4	O2-S	3.42	1.65	1.44
6	M	921	GOX	O7-N1	-2.92	1.31	1.40
5	M	905	NAG	C1-C2	-2.89	1.48	1.52
5	M	901	NAG	O7-C7	-2.49	1.17	1.23
5	M	902	NAG	C1-C2	2.47	1.55	1.52
6	M	921	GOX	C4-C5	2.41	1.57	1.52
8	M	925[A]	SO4	O1-S	2.41	1.59	1.44
5	M	918	NAG	C2-N2	2.14	1.49	1.46
5	M	905	NAG	C8-C7	-2.04	1.46	1.50
5	M	901	NAG	O5-C1	-2.04	1.40	1.43

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	905	NAG	C8-C7-N2	18.02	146.00	116.12
5	M	905	NAG	O5-C1-C2	11.63	129.28	111.29
5	M	905	NAG	O7-C7-N2	-11.42	101.80	121.98
5	M	905	NAG	C2-N2-C7	11.21	137.92	122.90
5	M	905	NAG	C1-O5-C5	-9.49	99.46	112.19
5	M	902	NAG	C1-O5-C5	-7.46	102.19	112.19
9	M	930[B]	GOL	O1-C1-C2	6.06	137.65	110.38
5	M	905	NAG	O7-C7-C8	-5.83	111.67	122.05
5	M	919	NAG	O5-C1-C2	-5.63	102.58	111.29
5	M	901	NAG	C1-O5-C5	-5.19	105.23	112.19
5	M	920	NAG	O3-C3-C2	-5.11	98.79	109.40
5	M	905	NAG	C4-C3-C2	-5.06	103.60	111.02
5	M	920	NAG	C4-C3-C2	-5.04	103.64	111.02
5	M	918	NAG	C1-C2-N2	-4.96	102.62	110.43
5	M	918	NAG	C1-O5-C5	4.67	118.45	112.19
5	M	919	NAG	O3-C3-C2	-4.61	99.83	109.40
5	M	901	NAG	O5-C1-C2	4.46	118.20	111.29
5	M	918	NAG	O3-C3-C2	-4.23	100.61	109.40
8	M	925[A]	SO4	O3-S-O2	4.10	131.01	109.56
5	M	920	NAG	C1-C2-N2	-4.03	104.09	110.43
5	M	901	NAG	O5-C5-C4	-3.60	102.08	110.83
5	M	919	NAG	O5-C5-C6	-3.52	100.82	107.66
5	M	918	NAG	O5-C1-C2	3.38	116.53	111.29
5	M	902	NAG	C4-C3-C2	-3.38	106.06	111.02

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	918	NAG	O4-C4-C5	-3.14	101.60	109.32
5	M	901	NAG	O4-C4-C5	-3.09	101.72	109.32
6	M	921	GOX	O2-C2-C1	3.07	115.75	109.31
8	M	927	SO4	O3-S-O2	-3.06	93.57	109.56
5	M	905	NAG	O4-C4-C5	-2.99	101.96	109.32
5	M	901	NAG	O3-C3-C2	-2.96	103.25	109.40
8	M	927	SO4	O2-S-O1	-2.95	88.27	109.06
6	M	921	GOX	C6-C5-N5	-2.90	103.86	109.56
6	M	921	GOX	C3-C4-C5	-2.88	106.79	111.02
8	M	925[A]	SO4	O3-S-O1	-2.88	94.51	109.56
5	M	919	NAG	O5-C5-C4	-2.86	103.86	110.83
5	M	902	NAG	O3-C3-C2	-2.81	103.57	109.40
5	M	918	NAG	O6-C6-C5	-2.79	101.84	111.33
6	M	921	GOX	C4-C5-N5	-2.74	105.79	110.47
5	M	902	NAG	O5-C5-C4	-2.64	104.41	110.83
5	M	920	NAG	C8-C7-N2	-2.55	111.89	116.12
8	M	928	SO4	O4-S-O1	2.53	122.81	109.56
9	M	930[A]	GOL	O2-C2-C1	2.44	119.27	109.18
9	M	930[B]	GOL	O2-C2-C1	2.44	119.27	109.18
5	M	901	NAG	C2-N2-C7	-2.33	119.78	122.90
8	M	927	SO4	O4-S-O1	2.26	121.38	109.56
8	M	925[A]	SO4	O4-S-O3	2.23	120.83	108.54
9	M	932	GOL	O2-C2-C3	-2.22	99.99	109.18
5	M	919	NAG	C2-N2-C7	2.21	125.86	122.90
5	M	902	NAG	O5-C5-C6	-2.21	103.37	107.66
6	M	921	GOX	O3-C3-C2	-2.14	105.41	109.64
8	M	923	SO4	O3-S-O2	2.12	120.64	109.56
5	M	920	NAG	O5-C5-C4	-2.12	105.67	110.83
5	M	905	NAG	O3-C3-C4	-2.10	105.42	110.38
8	M	927	SO4	O4-S-O3	2.10	120.09	108.54
8	M	925[A]	SO4	O4-S-O2	-2.08	98.69	109.56
5	M	905	NAG	C3-C4-C5	2.06	113.96	110.23
6	M	921	GOX	C4-C3-C2	-2.02	107.02	110.22
9	M	932	GOL	O3-C3-C2	-2.02	101.27	110.38

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	M	905	NAG	C8-C7-N2-C2
9	M	930[B]	GOL	O1-C1-C2-C3
9	M	933	GOL	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
5	M	919	NAG	O5-C5-C6-O6
5	M	905	NAG	O7-C7-N2-C2
5	M	919	NAG	C4-C5-C6-O6
9	M	933	GOL	O2-C2-C3-O3
9	M	930[B]	GOL	O1-C1-C2-O2

There are no ring outliers.

6 monomers are involved in 29 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	M	925[B]	SO4	5	0
5	M	901	NAG	5	0
6	M	921	GOX	1	0
5	M	905	NAG	13	0
5	M	902	NAG	4	0
9	M	933	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 [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	M	499/501 (99%)	-0.51	7 (1%) 73 83	7, 12, 23, 51	21 (4%)

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	376	ALA	5.1
1	M	380	ASP	4.4
1	M	379	THR	2.9
1	M	377	ASP	2.5
1	M	417	ASP	2.5
1	M	3	GLU	2.3
1	M	378	SER	2.3

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](#)

SUGAR-RSR INFOmissingINFO

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
9	GOL	M	933	6/6	0.58	0.24	37,39,41,44	6

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	NAG	M	919	14/15	0.69	0.16	53,61,64,66	0
8	SO4	M	928	5/5	0.70	0.19	21,28,30,31	5
5	NAG	M	918	14/15	0.75	0.14	28,35,43,45	0
5	NAG	M	905	14/15	0.76	0.15	31,40,45,47	0
9	GOL	M	932	6/6	0.78	0.14	28,29,30,33	6
5	NAG	M	920	14/15	0.79	0.12	30,35,44,46	0
8	SO4	M	925[B]	5/5	0.81	0.15	37,39,40,41	5
8	SO4	M	925[A]	5/5	0.81	0.15	23,27,27,27	5
5	NAG	M	901	14/15	0.83	0.13	27,30,35,38	0
5	NAG	M	902	14/15	0.89	0.09	22,24,28,28	0
8	SO4	M	929	5/5	0.90	0.14	34,36,37,37	5
8	SO4	M	927	5/5	0.91	0.10	25,25,29,30	5
9	GOL	M	930[B]	6/6	0.96	0.07	9,13,16,16	2
9	GOL	M	931	6/6	0.96	0.07	11,16,18,25	6
8	SO4	M	924	5/5	0.96	0.07	18,24,30,30	5
9	GOL	M	930[A]	6/6	0.96	0.07	9,13,15,16	2
6	GOX	M	921	13/13	0.97	0.05	11,12,15,19	0
8	SO4	M	923	5/5	0.98	0.06	19,20,26,27	5
8	SO4	M	934	5/5	0.99	0.09	16,20,23,25	0
8	SO4	M	926	5/5	0.99	0.06	14,14,22,24	0
7	ZN	M	922	1/1	1.00	0.01	9,9,9,9	1

6.5 Other polymers [i](#)

There are no such residues in this entry.