



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:48 PM UTC

PDB ID : 1E72 / pdb_00001e72
Title : Myrosinase from Sinapis alba with bound gluco-hydroximolactam and sulfate or ascorbate
Authors : Burmeister, W.P.
Deposited on : 2000-08-23
Resolution : 1.60 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 : 4-5-2 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

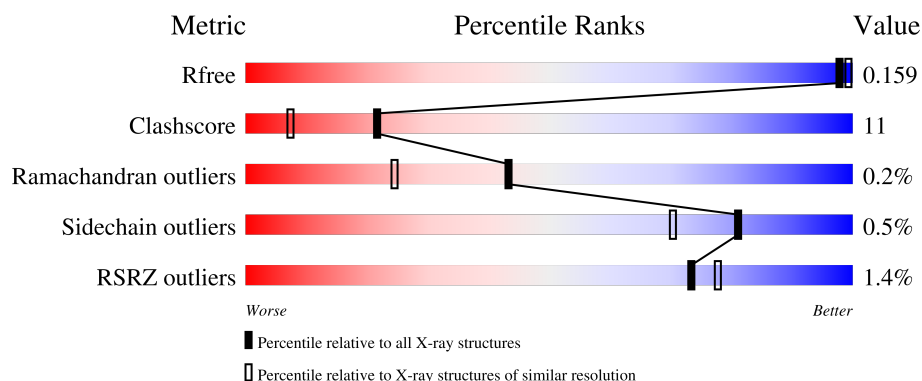
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	% 87% 10%
2	A	2	50% 50%
3	B	5	80% 20%
4	C	6	67% 33%

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
5	NAG	M	931	-	-	X	-
5	NAG	M	961	X	-	-	-
5	NAG	M	991	X	-	-	-

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.

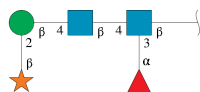
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	M	499	Total	C	N	O	S	0	21	0
			4082	2618	660	788	16			

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



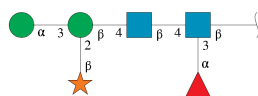
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	A	2	Total	C	N	O	0	0	0
			28	16	2	10			

- 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
3	B	5	Total	C	N	O	0	0	0
			58	33	2	23			

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



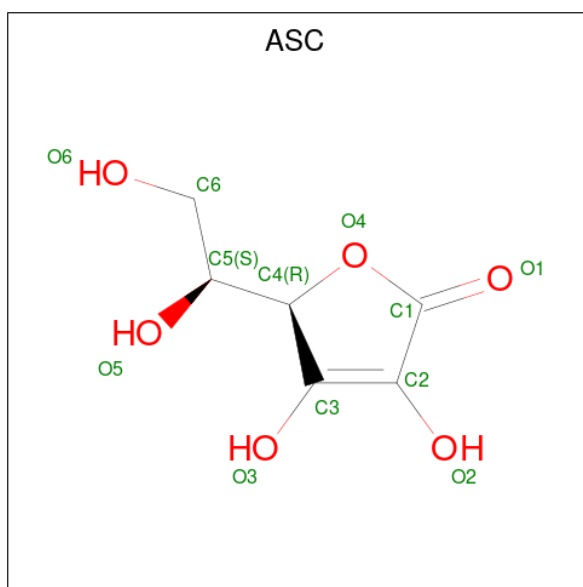
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	C	6	Total	C	N	O	0	0	0
			69	39	2	28			

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



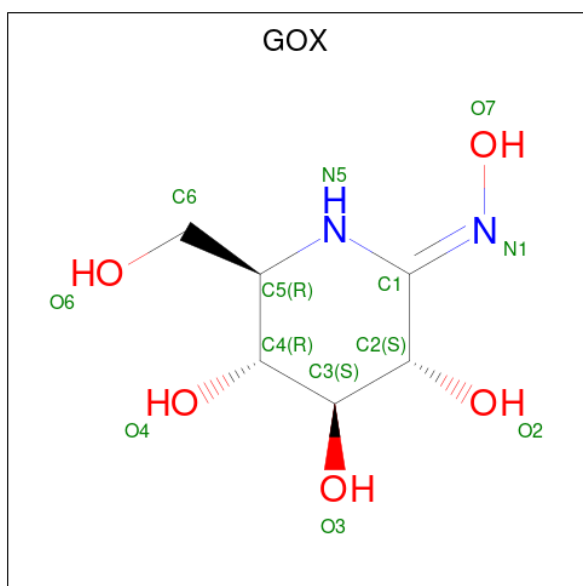
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	M	1	Total	C	N	O	0	0
			14	8	1	5		
5	M	1	Total	C	N	O	0	0
			14	8	1	5		
5	M	1	Total	C	N	O	0	0
			14	8	1	5		
5	M	1	Total	C	N	O	0	0
			14	8	1	5		
5	M	1	Total	C	N	O	0	0
			14	8	1	5		
5	M	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 6 is ASCORBIC ACID (CCD ID: ASC) (formula: $C_6H_8O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	M	1	Total	C	O	0	1
			12	6	6		

- Molecule 7 is (2S,3S,4R,5R)-6-(HYDROXYAMINO)-2-(HYDROXYMETHYL)-2,3,4,5-TE TRAHYDROPYRIDINE-3,4,5-TRIOL (CCD ID: GOX) (formula: $C_6H_{12}N_2O_5$).

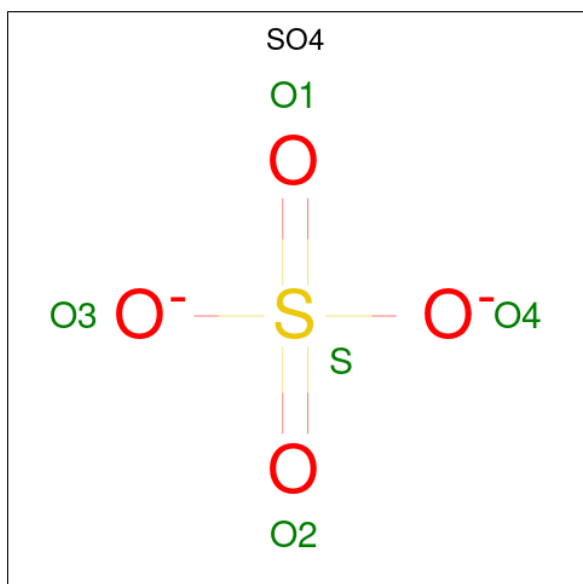


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	M	1	Total	C	N	O	0	0
			13	6	2	5		

- Molecule 8 is ZINC ION (CCD ID: ZN) (formula: Zn).

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

- Molecule 9 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



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

- Molecule 10 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



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

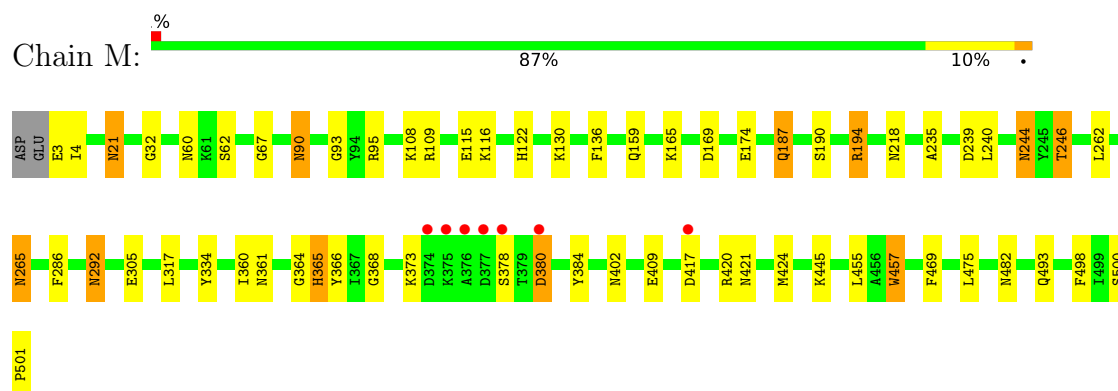
- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	M	787	Total	O	0	0
			787	787		

3 Residue-property plots

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.

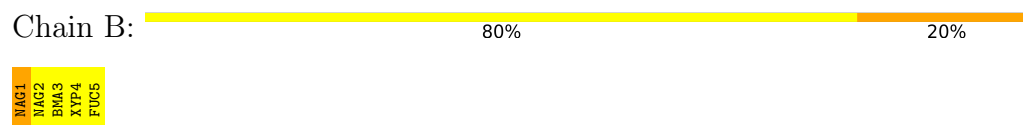
- Molecule 1: MYROSINASE MA1



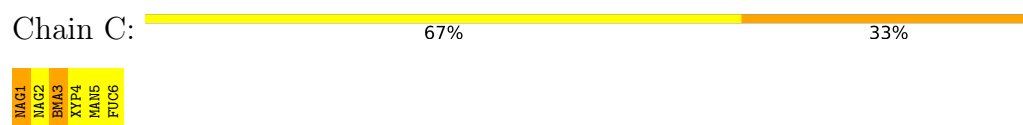
- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- 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)]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 – 1.60 10.00 – 1.60	Depositor EDS
% Data completeness (in resolution range)	97.5 (10.00-1.60) 97.0 (10.00-1.60)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.66 (at 1.60Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.129 , 0.157 (Not available) , 0.159	Depositor DCC
R_{free} test set	4890 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	14.2	Xtriage
Anisotropy	0.079	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.46 , 58.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.016 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	5204	wwPDB-VP
Average B, all atoms (Å ²)	20.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.94% 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: GOX, NAG, ASC, MAN, XYP, BMA, GOL, ZN, FUC, SO4

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	0.78	2/4290 (0.0%)	1.38	36/5833 (0.6%)

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

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	501	PRO	N-CD	5.99	1.56	1.47
1	M	500	SER	C-O	-5.62	1.17	1.24

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	482	ASN	CA-CB-CG	-11.00	101.60	112.60
1	M	482	ASN	OD1-CG-ND2	-9.78	112.82	122.60
1	M	457	TRP	O-C-N	-9.68	111.93	123.16
1	M	361	ASN	OD1-CG-ND2	-8.77	113.83	122.60
1	M	244	ASN	OD1-CG-ND2	-8.48	114.12	122.60
1	M	60	ASN	OD1-CG-ND2	-8.35	114.25	122.60
1	M	190	SER	N-CA-C	7.70	119.46	111.14
1	M	457	TRP	CA-C-O	-7.42	112.38	120.92
1	M	482	ASN	CB-CG-OD1	7.34	135.48	120.80
1	M	417	ASP	CA-CB-CG	7.33	119.93	112.60
1	M	109	ARG	NH1-CZ-NH2	6.96	128.35	119.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	265	ASN	CA-CB-CG	-6.75	105.85	112.60
1	M	421	ASN	O-C-N	6.64	128.91	122.07
1	M	421	ASN	CA-C-O	-6.63	113.86	120.82
1	M	292	ASN	CA-CB-CG	-6.60	106.00	112.60
1	M	21	ASN	CA-CB-CG	-6.45	106.15	112.60
1	M	194	ARG	NE-CZ-NH2	6.40	124.96	119.20
1	M	500	SER	CA-C-O	6.03	128.97	120.83
1	M	90	ASN	CB-CG-OD1	5.80	132.40	120.80
1	M	365	HIS	CB-CG-CD2	-5.76	123.72	131.20
1	M	109	ARG	NE-CZ-NH2	-5.74	114.03	119.20
1	M	457	TRP	N-CA-C	-5.73	100.33	109.96
1	M	90	ASN	CB-CG-ND2	-5.59	108.02	116.40
1	M	265	ASN	CB-CG-OD1	5.58	131.97	120.80
1	M	380	ASP	CA-C-O	5.50	125.99	119.56
1	M	402	ASN	N-CA-CB	-5.39	105.67	111.66
1	M	286	PHE	CA-CB-CG	-5.38	108.42	113.80
1	M	361	ASN	CB-CG-OD1	5.32	131.45	120.80
1	M	21	ASN	OD1-CG-ND2	-5.29	117.31	122.60
1	M	194	ARG	NH1-CZ-NH2	-5.27	112.44	119.30
1	M	90	ASN	CA-CB-CG	-5.26	107.34	112.60
1	M	21	ASN	CB-CG-OD1	5.10	131.00	120.80
1	M	246	THR	OG1-CB-CG2	-5.06	99.18	109.30
1	M	469	PHE	CA-CB-CG	-5.05	108.75	113.80
1	M	265	ASN	CB-CG-ND2	-5.02	108.88	116.40
1	M	475	LEU	N-CA-C	-5.01	107.17	113.28

There are no chirality outliers.

All (2) planarity outliers are listed below:

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

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	85	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	28	0	25	6	0
3	B	58	0	42	6	0
4	C	69	0	50	8	0
5	M	84	0	77	18	0
6	M	12	0	7	2	0
7	M	13	0	12	3	0
8	M	1	0	0	0	0
9	M	45	0	0	1	0
10	M	25	0	30	1	0
11	M	787	0	0	22	0
All	All	5204	0	4078	92	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 11.

All (92) 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:90:ASN:HD21	5:M:911:NAG:C1	0.95	1.59
1:M:21:ASN:HD21	5:M:901:NAG:C1	0.95	1.58
1:M:244:ASN:HD21	5:M:931:NAG:C1	0.96	1.58
1:M:292:ASN:HD21	4:C:1:NAG:C1	0.95	1.55
1:M:265:ASN:HD21	3:B:1:NAG:C1	0.92	1.54
1:M:218:ASN:HD21	2:A:1:NAG:C1	0.93	1.54
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CZ	1.45	1.50
1:M:244:ASN:ND2	5:M:931:NAG:C1	1.80	1.44
1:M:292:ASN:ND2	4:C:1:NAG:C1	1.77	1.44
1:M:90:ASN:ND2	5:M:911:NAG:C1	1.80	1.44
1:M:265:ASN:ND2	3:B:1:NAG:C1	1.78	1.43
1:M:218:ASN:ND2	2:A:1:NAG:C1	1.78	1.41
1:M:21:ASN:ND2	5:M:901:NAG:C1	1.80	1.38
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CZ	2.05	1.37
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CE1	1.68	1.28
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CE1	2.21	1.24
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:OH	1.39	1.17
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CE1	1.84	1.12
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:CE1	2.24	1.12
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CD1	1.83	1.12
1:M:360[B]:ILE:CD1	1:M:366[B]:TYR:OH	2.08	0.95
11:M:2739:HOH:O	4:C:3:BMA:C4	2.14	0.94
1:M:246:THR:HG22	11:M:2390:HOH:O	1.67	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:M:995[A]:ASC:H4	7:M:999:GOX:O7	1.72	0.89
1:M:165:LYS:NZ	5:M:931:NAG:H82	1.89	0.88
1:M:360[B]:ILE:HD13	1:M:366[B]:TYR:CZ	2.07	0.87
11:M:2739:HOH:O	4:C:3:BMA:C5	2.22	0.86
11:M:2739:HOH:O	4:C:3:BMA:O4	1.94	0.85
1:M:165:LYS:HZ1	5:M:931:NAG:H82	1.43	0.82
1:M:4:ILE:HD11	1:M:445:LYS:HD2	1.62	0.79
1:M:265:ASN:HD21	3:B:1:NAG:C2	1.97	0.73
1:M:130:LYS:HG3	11:M:2252:HOH:O	1.91	0.71
1:M:187:GLN:OE1	7:M:999:GOX:N1	2.24	0.68
1:M:218:ASN:HD21	2:A:1:NAG:C2	1.98	0.67
6:M:995[A]:ASC:H5	11:M:2755:HOH:O	1.96	0.66
11:M:2739:HOH:O	4:C:3:BMA:C6	2.44	0.66
1:M:116:LYS:HG2	11:M:2232:HOH:O	1.97	0.65
1:M:360[B]:ILE:HG13	1:M:366[B]:TYR:CE1	2.29	0.64
1:M:169[B]:ASP:HB2	1:M:240:LEU:HD21	1.80	0.63
1:M:130:LYS:HB3	11:M:2265:HOH:O	2.00	0.62
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CD1	2.62	0.60
1:M:360[B]:ILE:CG1	1:M:366[B]:TYR:CZ	2.71	0.60
1:M:365:HIS:HD2	11:M:2255:HOH:O	1.85	0.59
1:M:424:MET:HE3	11:M:2693:HOH:O	2.02	0.59
1:M:218:ASN:ND2	2:A:1:NAG:C2	2.64	0.58
1:M:21:ASN:HD21	5:M:901:NAG:C2	2.00	0.57
1:M:365:HIS:HE1	11:M:2550:HOH:O	1.86	0.57
1:M:108:LYS:HE2	11:M:2317:HOH:O	2.06	0.55
1:M:265:ASN:ND2	3:B:1:NAG:C2	2.64	0.55
1:M:244:ASN:ND2	5:M:931:NAG:O5	2.40	0.54
1:M:265:ASN:CG	3:B:1:NAG:C1	2.73	0.54
1:M:239:ASP:OD1	11:M:2385:HOH:O	2.19	0.53
1:M:90:ASN:ND2	5:M:911:NAG:C2	2.66	0.53
1:M:218:ASN:CG	2:A:1:NAG:C1	2.75	0.53
1:M:115:GLU:HG3	11:M:2229:HOH:O	2.09	0.52
1:M:240:LEU:HD13	5:M:931:NAG:H83	1.92	0.52
1:M:4:ILE:HD11	1:M:445:LYS:CD	2.36	0.52
1:M:265:ASN:ND2	3:B:1:NAG:O5	2.37	0.52
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CZ	2.42	0.50
1:M:240:LEU:CD1	5:M:931:NAG:H83	2.42	0.49
10:M:1514:GOL:H11	11:M:2785:HOH:O	2.11	0.49
1:M:4:ILE:CD1	1:M:445:LYS:HD2	2.36	0.49
1:M:409:GLU:OE1	7:M:999:GOX:C1	2.60	0.49
1:M:360[A]:ILE:HG23	11:M:2538:HOH:O	2.13	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:218:ASN:ND2	2:A:1:NAG:O5	2.43	0.47
1:M:95:ARG:HB2	1:M:455:LEU:HD13	1.97	0.47
1:M:493:GLN:NE2	11:M:2693:HOH:O	2.47	0.47
1:M:95:ARG:HA	1:M:136:PHE:O	2.15	0.47
1:M:360[A]:ILE:HD11	1:M:364:GLY:HA2	1.97	0.47
1:M:194:ARG:HD2	9:M:1505[B]:SO4:O1	2.15	0.46
1:M:360[B]:ILE:HG12	1:M:366[B]:TYR:CG	2.44	0.46
1:M:244:ASN:HD21	5:M:931:NAG:C2	2.01	0.46
1:M:292:ASN:ND2	4:C:1:NAG:C2	2.68	0.45
1:M:445:LYS:HE2	11:M:2641:HOH:O	2.15	0.45
1:M:165:LYS:CE	5:M:931:NAG:H82	2.46	0.44
1:M:420:ARG:O	1:M:424:MET:HG2	2.17	0.44
1:M:21:ASN:ND2	5:M:901:NAG:C2	2.71	0.42
1:M:62[B]:SER:OG	1:M:67:GLY:O	2.30	0.42
1:M:21:ASN:HA	1:M:498:PHE:CD2	2.55	0.42
1:M:159:GLN:NE2	11:M:2309:HOH:O	2.53	0.41
1:M:90:ASN:ND2	5:M:911:NAG:O5	2.45	0.41
1:M:373:LYS:NZ	1:M:378:SER:OG	2.44	0.41
1:M:115:GLU:CD	11:M:2229:HOH:O	2.63	0.41
1:M:122:HIS:HE1	1:M:174:GLU:O	2.02	0.41
1:M:235:ALA:HB1	1:M:317:LEU:HG	2.02	0.41
1:M:368:GLY:HA3	1:M:384:TYR:O	2.21	0.41
1:M:21:ASN:CG	5:M:901:NAG:C1	2.77	0.41
1:M:373:LYS:NZ	11:M:2559:HOH:O	2.52	0.41
1:M:32:GLY:HA3	1:M:93:GLY:O	2.21	0.41
1:M:262:LEU:O	1:M:334:TYR:HA	2.21	0.41
1:M:292:ASN:ND2	4:C:1:NAG:O5	2.42	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	M	518/501 (103%)	504 (97%)	13 (2%)	1 (0%)	43 24

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	456/437 (104%)	454 (100%)	2 (0%)	84 75

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

Mol	Chain	Res	Type
1	M	3	GLU
1	M	380	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	M	90	ASN
1	M	122	HIS
1	M	159	GLN
1	M	218	ASN
1	M	230	GLN
1	M	244	ASN
1	M	265	ASN
1	M	292	ASN
1	M	365	HIS
1	M	402	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 ⓘ

13 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	1.59	4 (28%)	17,19,21	2.86	8 (47%)
2	NAG	A	2	2	14,14,15	1.05	0	17,19,21	2.93	8 (47%)
3	NAG	B	1	3	14,14,15	1.04	1 (7%)	17,19,21	3.08	10 (58%)
3	NAG	B	2	3	14,14,15	1.17	1 (7%)	17,19,21	0.99	1 (5%)
3	BMA	B	3	3	11,11,12	1.85	2 (18%)	15,15,17	1.11	1 (6%)
3	XYP	B	4	3	9,9,10	0.88	0	10,12,14	1.78	2 (20%)
3	FUC	B	5	3	10,10,11	1.43	2 (20%)	14,14,16	1.80	3 (21%)
4	NAG	C	1	4	14,14,15	1.38	2 (14%)	17,19,21	2.79	7 (41%)
4	NAG	C	2	4	14,14,15	1.23	2 (14%)	17,19,21	2.00	5 (29%)
4	BMA	C	3	4	11,11,12	2.09	3 (27%)	15,15,17	5.15	11 (73%)
4	XYP	C	4	4	9,9,10	1.15	1 (11%)	10,12,14	2.04	4 (40%)
4	MAN	C	5	4	11,11,12	1.27	1 (9%)	15,15,17	1.69	3 (20%)
4	FUC	C	6	4	10,10,11	1.65	3 (30%)	14,14,16	2.27	6 (42%)

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	-	0/6/23/26	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	-	1/2/19/22	0/1/1/1
4	XYP	C	4	4	-	-	0/1/1/1
4	MAN	C	5	4	-	0/2/19/22	0/1/1/1
4	FUC	C	6	4	-	-	0/1/1/1

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	3	BMA	C2-C3	-4.65	1.45	1.52
3	B	3	BMA	C2-C3	-4.59	1.45	1.52
4	C	3	BMA	C4-C5	3.36	1.60	1.53
4	C	2	NAG	C1-C2	2.86	1.56	1.52
3	B	3	BMA	C4-C5	2.76	1.58	1.53
2	A	1	NAG	O7-C7	-2.71	1.17	1.23
4	C	5	MAN	O5-C5	2.71	1.48	1.43
3	B	2	NAG	C1-C2	2.66	1.56	1.52
3	B	5	FUC	C2-C3	2.57	1.56	1.52
2	A	1	NAG	O5-C5	2.54	1.48	1.43
4	C	1	NAG	C1-C2	-2.50	1.48	1.52
4	C	6	FUC	C6-C5	2.46	1.57	1.51
2	A	1	NAG	C3-C2	2.43	1.57	1.52
3	B	1	NAG	C3-C2	2.39	1.57	1.52
4	C	6	FUC	C2-C3	2.33	1.56	1.52
4	C	3	BMA	O3-C3	2.33	1.48	1.43
4	C	6	FUC	C1-C2	2.33	1.57	1.52
4	C	2	NAG	C3-C2	-2.26	1.47	1.52
4	C	4	XYP	C2-C3	2.22	1.55	1.52
2	A	1	NAG	O4-C4	2.19	1.48	1.43
4	C	1	NAG	O5-C5	2.17	1.47	1.43
3	B	5	FUC	O5-C5	2.05	1.47	1.43

All (69) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2	NAG	C1-O5-C5	-8.76	100.45	112.19
2	A	1	NAG	C1-O5-C5	-8.48	100.83	112.19
4	C	3	BMA	O5-C5-C6	-8.17	91.76	107.66
4	C	3	BMA	O4-C4-C3	-8.02	91.47	110.38
4	C	3	BMA	C1-O5-C5	-8.00	101.47	112.19
4	C	3	BMA	C6-C5-C4	7.36	131.09	113.02
4	C	3	BMA	O4-C4-C5	6.97	126.48	109.32
4	C	1	NAG	C1-O5-C5	-6.87	102.98	112.19
4	C	1	NAG	O5-C1-C2	6.55	121.42	111.29
4	C	3	BMA	C2-C3-C4	-6.50	99.43	110.86
3	B	1	NAG	C1-O5-C5	-6.06	104.07	112.19
3	B	1	NAG	C2-N2-C7	-5.58	115.42	122.90
3	B	1	NAG	C8-C7-N2	-4.89	108.01	116.12
4	C	6	FUC	C1-C2-C3	-4.87	102.55	109.64
4	C	3	BMA	C3-C4-C5	4.42	118.25	110.23
4	C	2	NAG	C2-N2-C7	-4.42	116.98	122.90
2	A	1	NAG	O4-C4-C5	-4.06	99.33	109.32
3	B	5	FUC	O3-C3-C2	-4.04	101.80	110.05
3	B	1	NAG	O7-C7-N2	3.86	128.81	121.98
4	C	2	NAG	O4-C4-C3	-3.77	101.50	110.38
4	C	4	XYP	C4-C3-C2	-3.56	106.70	110.92
3	B	4	XYP	O2-C2-C3	-3.54	102.81	110.15
4	C	3	BMA	O5-C5-C4	-3.53	102.23	110.83
3	B	4	XYP	C1-C2-C3	3.43	114.64	109.64
2	A	2	NAG	O5-C1-C2	3.38	116.52	111.29
3	B	1	NAG	C1-C2-N2	-3.37	105.12	110.43
4	C	2	NAG	O4-C4-C5	-3.33	101.12	109.32
2	A	1	NAG	C2-N2-C7	-3.26	118.53	122.90
3	B	1	NAG	C4-C3-C2	-3.21	106.32	111.02
4	C	4	XYP	C5-C4-C3	-3.17	105.02	109.64
3	B	1	NAG	O3-C3-C2	-3.15	102.86	109.40
4	C	5	MAN	C1-C2-C3	3.12	114.19	109.64
2	A	1	NAG	C1-C2-N2	-3.08	105.59	110.43
2	A	1	NAG	C8-C7-N2	-3.06	111.04	116.12
3	B	5	FUC	O2-C2-C3	-3.03	103.88	110.15
2	A	2	NAG	C8-C7-N2	-2.96	111.20	116.12
4	C	6	FUC	C6-C5-C4	-2.85	107.86	113.08
4	C	5	MAN	O2-C2-C3	-2.84	104.28	110.15
4	C	4	XYP	O2-C2-C3	-2.82	104.32	110.15
2	A	2	NAG	O5-C5-C4	-2.80	104.01	110.83
4	C	2	NAG	O5-C1-C2	-2.75	107.04	111.29
4	C	1	NAG	C8-C7-N2	-2.74	111.58	116.12
4	C	6	FUC	O5-C5-C6	-2.72	101.49	107.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2	NAG	O4-C4-C5	-2.72	102.62	109.32
2	A	2	NAG	C6-C5-C4	-2.68	106.43	113.02
4	C	3	BMA	C1-C2-C3	-2.68	105.75	109.64
4	C	6	FUC	C1-O5-C5	2.67	119.26	112.97
4	C	3	BMA	O2-C2-C3	-2.65	104.66	110.15
4	C	5	MAN	C2-C3-C4	-2.63	106.24	110.86
4	C	6	FUC	C3-C4-C5	-2.62	105.83	109.81
4	C	4	XYP	O3-C3-C4	2.62	115.39	110.05
2	A	2	NAG	C2-N2-C7	-2.59	119.43	122.90
3	B	5	FUC	O3-C3-C4	-2.58	104.29	110.38
4	C	2	NAG	O5-C5-C4	-2.56	104.60	110.83
4	C	6	FUC	O2-C2-C1	-2.55	103.38	109.22
2	A	1	NAG	O4-C4-C3	-2.47	104.56	110.38
4	C	1	NAG	O5-C5-C6	-2.35	103.10	107.66
2	A	2	NAG	O4-C4-C3	-2.31	104.92	110.38
4	C	1	NAG	C4-C3-C2	-2.31	107.63	111.02
4	C	1	NAG	O3-C3-C2	-2.29	104.65	109.40
2	A	1	NAG	O7-C7-N2	2.18	125.84	121.98
3	B	3	BMA	C2-C3-C4	2.17	114.68	110.86
3	B	1	NAG	O5-C5-C4	-2.17	105.54	110.83
3	B	1	NAG	O4-C4-C3	-2.14	105.33	110.38
2	A	1	NAG	O3-C3-C2	-2.13	104.98	109.40
3	B	2	NAG	O3-C3-C2	-2.12	104.99	109.40
4	C	3	BMA	O3-C3-C4	-2.08	105.46	110.38
4	C	1	NAG	O4-C4-C5	-2.05	104.27	109.32
3	B	1	NAG	O4-C4-C5	-2.03	104.31	109.32

There are no chirality outliers.

All (1) torsion outliers are listed below:

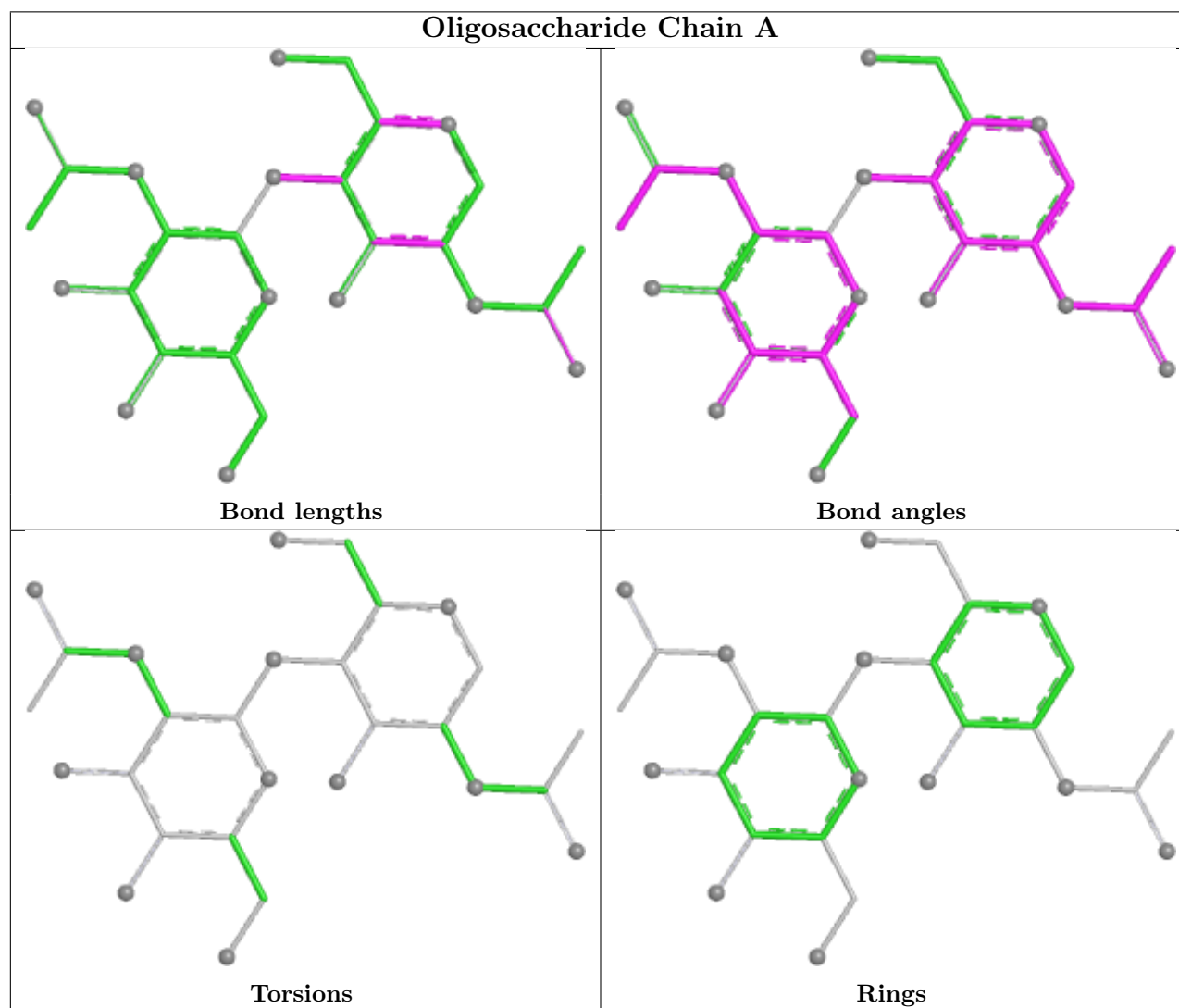
Mol	Chain	Res	Type	Atoms
4	C	3	BMA	C4-C5-C6-O6

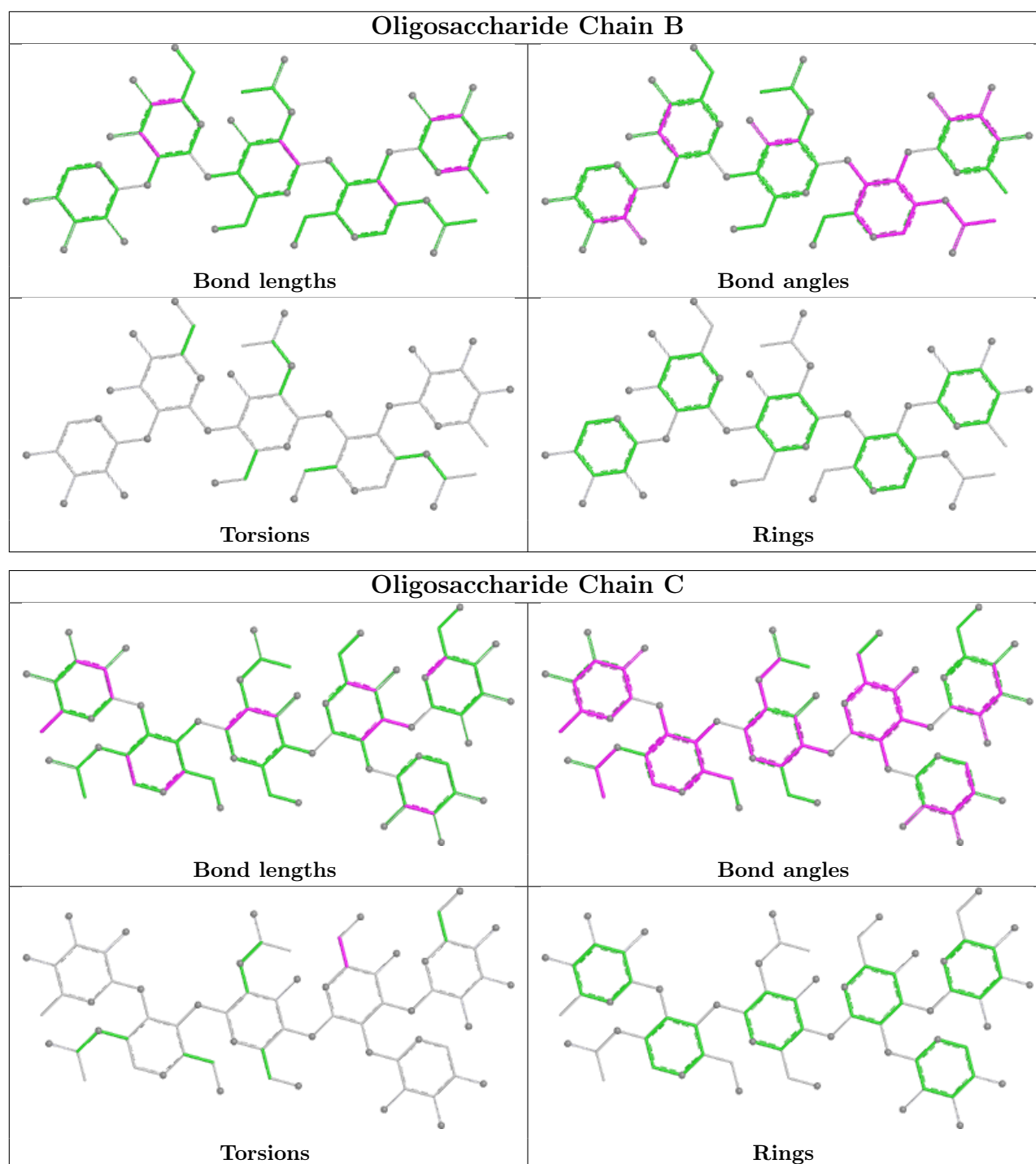
There are no ring outliers.

4 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	3	BMA	4	0
2	A	1	NAG	6	0
4	C	1	NAG	4	0
3	B	1	NAG	6	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 23 ligands modelled in this entry, 1 is monoatomic - leaving 22 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
5	NAG	M	931	-	14,14,15	1.68	3 (21%)	17,19,21	7.28	10 (58%)
6	ASC	M	995[A]	-	12,12,12	4.58	8 (66%)	17,17,17	3.93	11 (64%)
5	NAG	M	971	1	14,14,15	1.30	1 (7%)	17,19,21	1.60	3 (17%)
9	SO4	M	1509	-	4,4,4	0.70	0	6,6,6	0.20	0
10	GOL	M	1512	-	5,5,5	0.33	0	5,5,5	0.86	0
10	GOL	M	1510[B]	-	5,5,5	0.85	0	5,5,5	1.90	2 (40%)
9	SO4	M	1505[B]	-	4,4,4	0.76	0	6,6,6	0.50	0
5	NAG	M	961	1	14,14,15	1.35	1 (7%)	17,19,21	2.30	4 (23%)
9	SO4	M	1507	-	4,4,4	0.86	0	6,6,6	1.05	0
10	GOL	M	1510[A]	-	5,5,5	0.84	0	5,5,5	1.36	1 (20%)
9	SO4	M	1505[A]	-	4,4,4	0.93	0	6,6,6	1.29	1 (16%)
5	NAG	M	911	-	14,14,15	1.24	1 (7%)	17,19,21	1.97	4 (23%)
7	GOX	M	999	-	12,13,13	1.81	2 (16%)	14,18,18	3.26	9 (64%)
5	NAG	M	991	1	14,14,15	1.44	1 (7%)	17,19,21	2.43	7 (41%)
9	SO4	M	1504	-	4,4,4	0.69	0	6,6,6	0.43	0
9	SO4	M	1513[B]	-	4,4,4	0.62	0	6,6,6	0.51	0
10	GOL	M	1514	-	5,5,5	0.29	0	5,5,5	0.67	0
5	NAG	M	901	-	14,14,15	1.30	1 (7%)	17,19,21	2.24	5 (29%)
9	SO4	M	1506	-	4,4,4	0.50	0	6,6,6	0.48	0
9	SO4	M	1503	-	4,4,4	0.73	0	6,6,6	0.85	0
9	SO4	M	1508	-	4,4,4	0.87	0	6,6,6	0.88	0
10	GOL	M	1511	-	5,5,5	0.54	0	5,5,5	1.02	1 (20%)

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
10	GOL	M	1514	-	-	4/4/4/4	-
5	NAG	M	931	-	-	2/6/23/26	0/1/1/1
6	ASC	M	995[A]	-	-	0/6/22/22	0/1/1/1
5	NAG	M	911	-	-	0/6/23/26	0/1/1/1
5	NAG	M	971	1	-	2/6/23/26	0/1/1/1
7	GOX	M	999	-	-	1/3/24/24	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
10	GOL	M	1510[A]	-	-	0/4/4/4	-
5	NAG	M	901	-	-	0/6/23/26	0/1/1/1
10	GOL	M	1512	-	-	0/4/4/4	-
5	NAG	M	991	1	1/1/5/7	0/6/23/26	0/1/1/1
10	GOL	M	1510[B]	-	-	2/4/4/4	-
10	GOL	M	1511	-	-	0/4/4/4	-
5	NAG	M	961	1	1/1/5/7	0/6/23/26	0/1/1/1

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	995[A]	ASC	O1-C1	-9.08	1.03	1.21
6	M	995[A]	ASC	C2-C1	8.87	1.67	1.45
6	M	995[A]	ASC	O4-C1	4.83	1.43	1.36
7	M	999	GOX	C4-C5	4.61	1.62	1.52
6	M	995[A]	ASC	C4-C3	4.53	1.57	1.50
5	M	911	NAG	O7-C7	-4.09	1.14	1.23
5	M	971	NAG	O7-C7	-3.95	1.14	1.23
5	M	931	NAG	O7-C7	-3.85	1.14	1.23
5	M	991	NAG	O7-C7	-3.76	1.14	1.23
5	M	961	NAG	O7-C7	-3.69	1.15	1.23
6	M	995[A]	ASC	O3-C3	3.59	1.45	1.32
6	M	995[A]	ASC	C2-C3	3.54	1.44	1.35
5	M	901	NAG	O7-C7	-3.41	1.15	1.23
5	M	931	NAG	C2-N2	-3.33	1.40	1.46
6	M	995[A]	ASC	O4-C4	-3.03	1.40	1.45
6	M	995[A]	ASC	O2-C2	-2.79	1.24	1.33
7	M	999	GOX	O7-N1	-2.52	1.33	1.40
5	M	931	NAG	C8-C7	-2.31	1.45	1.50

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	931	NAG	C2-N2-C7	21.20	151.31	122.90
5	M	931	NAG	C8-C7-N2	14.14	139.57	116.12
5	M	931	NAG	O7-C7-N2	-11.26	102.08	121.98
6	M	995[A]	ASC	O1-C1-C2	7.94	141.23	129.33
6	M	995[A]	ASC	O4-C1-C2	-7.88	102.88	109.86
5	M	931	NAG	C1-O5-C5	-7.58	102.03	112.19
5	M	961	NAG	C1-O5-C5	7.03	121.61	112.19
5	M	901	NAG	O5-C1-C2	6.30	121.05	111.29
6	M	995[A]	ASC	O4-C4-C3	6.28	110.05	103.76

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	M	999	GOX	C4-C5-N5	-5.67	100.81	110.47
5	M	991	NAG	O5-C1-C2	5.64	120.01	111.29
5	M	931	NAG	O5-C1-C2	5.46	119.74	111.29
5	M	911	NAG	C1-O5-C5	-5.33	105.04	112.19
7	M	999	GOX	C3-C4-C5	-5.20	103.39	111.02
5	M	971	NAG	O5-C1-C2	-5.01	103.54	111.29
7	M	999	GOX	O2-C2-C3	4.91	120.75	110.53
7	M	999	GOX	O3-C3-C2	-4.74	100.25	109.64
5	M	991	NAG	C4-C3-C2	-4.32	104.68	111.02
6	M	995[A]	ASC	C6-C5-C4	4.30	119.11	111.86
5	M	901	NAG	C1-O5-C5	-4.17	106.59	112.19
6	M	995[A]	ASC	O4-C1-O1	-4.09	115.88	121.27
7	M	999	GOX	C3-C2-C1	-4.05	102.27	110.28
5	M	991	NAG	C1-O5-C5	3.88	117.39	112.19
6	M	995[A]	ASC	C4-O4-C1	3.70	113.33	109.27
5	M	961	NAG	O5-C1-C2	3.64	116.93	111.29
5	M	931	NAG	C4-C3-C2	-3.62	105.71	111.02
6	M	995[A]	ASC	O2-C2-C1	3.52	130.81	122.22
5	M	961	NAG	C1-C2-N2	-3.36	105.14	110.43
5	M	911	NAG	C4-C3-C2	-3.32	106.15	111.02
5	M	991	NAG	O3-C3-C2	-3.28	102.58	109.40
5	M	961	NAG	O3-C3-C2	-3.11	102.95	109.40
6	M	995[A]	ASC	O3-C3-C2	3.04	140.17	132.40
10	M	1510[B]	GOL	O1-C1-C2	3.04	124.04	110.38
6	M	995[A]	ASC	C4-C3-C2	-2.99	104.98	109.55
7	M	999	GOX	O2-C2-C1	-2.92	103.21	109.31
5	M	901	NAG	O5-C5-C4	-2.74	104.17	110.83
5	M	931	NAG	C3-C4-C5	2.67	115.08	110.23
10	M	1510[A]	GOL	O2-C2-C1	2.63	120.06	109.18
10	M	1510[B]	GOL	O2-C2-C1	2.63	120.06	109.18
6	M	995[A]	ASC	O2-C2-C3	-2.55	120.83	128.64
9	M	1505[A]	SO4	O3-S-O2	2.50	122.63	109.56
7	M	999	GOX	O4-C4-C5	-2.49	104.24	109.40
5	M	991	NAG	C2-N2-C7	-2.47	119.59	122.90
5	M	971	NAG	O5-C5-C6	-2.44	102.92	107.66
5	M	911	NAG	O3-C3-C2	-2.40	104.41	109.40
5	M	991	NAG	C6-C5-C4	-2.35	107.25	113.02
5	M	901	NAG	C4-C3-C2	-2.29	107.66	111.02
5	M	931	NAG	O5-C5-C4	-2.28	105.28	110.83
7	M	999	GOX	C6-C5-N5	-2.27	105.11	109.56
6	M	995[A]	ASC	C5-C4-C3	2.22	118.78	114.71
5	M	901	NAG	O3-C3-C2	-2.17	104.89	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	991	NAG	C8-C7-N2	-2.17	112.52	116.12
7	M	999	GOX	C6-C5-C4	2.13	119.71	112.03
5	M	931	NAG	O7-C7-C8	-2.09	118.33	122.05
5	M	931	NAG	O4-C4-C5	-2.09	104.17	109.32
10	M	1511	GOL	O2-C2-C3	2.07	117.75	109.18
5	M	971	NAG	O5-C5-C4	-2.05	105.83	110.83
5	M	911	NAG	O5-C5-C4	-2.04	105.87	110.83

All (2) chirality outliers are listed below:

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

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	M	999	GOX	N5-C1-N1-O7
10	M	1510[B]	GOL	O1-C1-C2-C3
10	M	1514	GOL	O1-C1-C2-C3
5	M	971	NAG	O5-C5-C6-O6
5	M	931	NAG	C8-C7-N2-C2
5	M	971	NAG	C4-C5-C6-O6
5	M	931	NAG	O7-C7-N2-C2
10	M	1514	GOL	C1-C2-C3-O3
10	M	1510[B]	GOL	O1-C1-C2-O2
10	M	1514	GOL	O2-C2-C3-O3
10	M	1514	GOL	O1-C1-C2-O2

There are no ring outliers.

7 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	M	931	NAG	9	0
6	M	995[A]	ASC	2	0
9	M	1505[B]	SO4	1	0
5	M	911	NAG	4	0
7	M	999	GOX	3	0
10	M	1514	GOL	1	0
5	M	901	NAG	5	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%)	-0.75	7 (1%) 73 78	9, 14, 28, 54	21 (4%)

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	376	ALA	6.1
1	M	374	ASP	3.8
1	M	380	ASP	3.8
1	M	417	ASP	3.2
1	M	377	ASP	3.1
1	M	378	SER	2.5
1	M	375	LYS	2.2

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](#)

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.

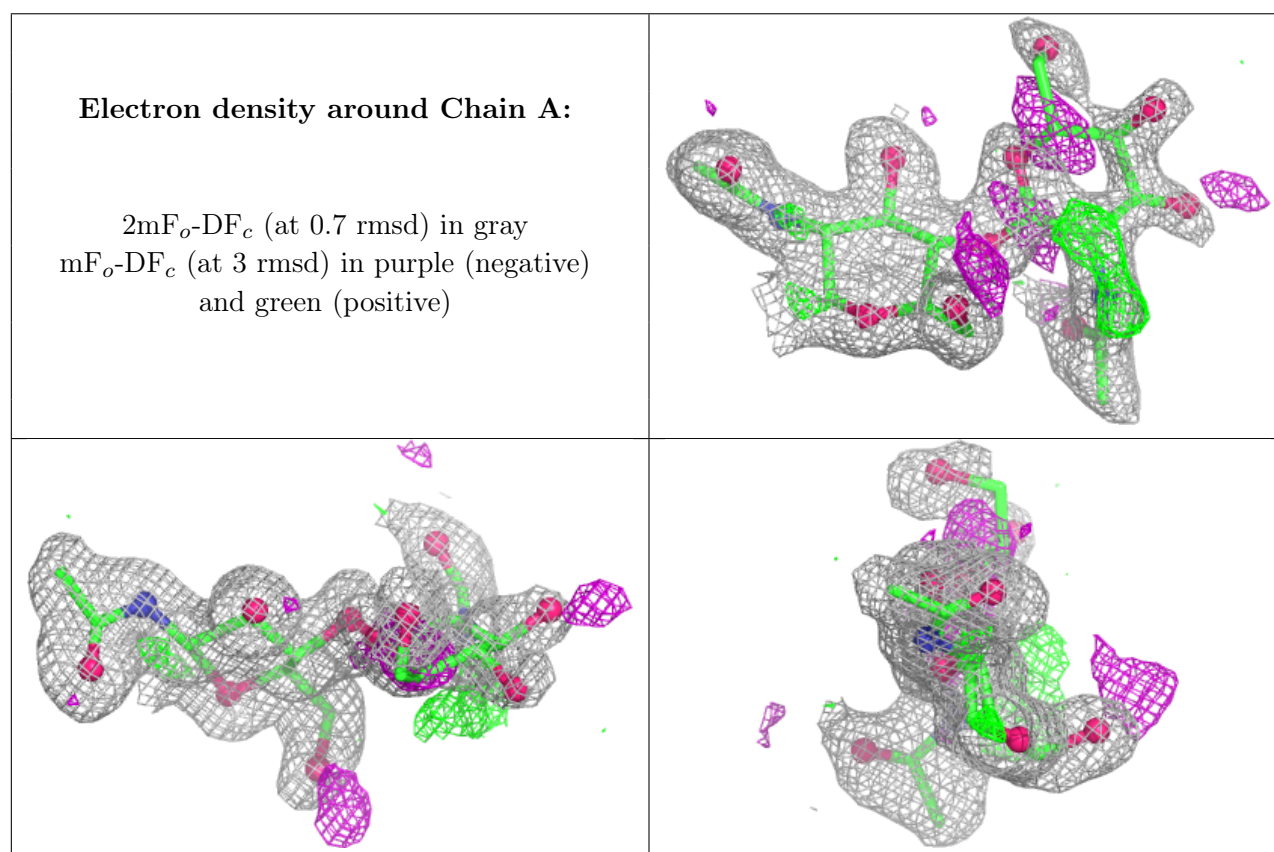
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	NAG	A	1	14/15	-	-	20,24,29,32	0
2	NAG	A	2	14/15	-	-	38,43,47,48	0
3	NAG	B	2	14/15	0.66	0.14	26,29,34,36	0
4	XYP	C	4	9/10	0.68	0.13	37,40,42,45	0
3	BMA	B	3	11/12	-	-	38,41,43,44	0

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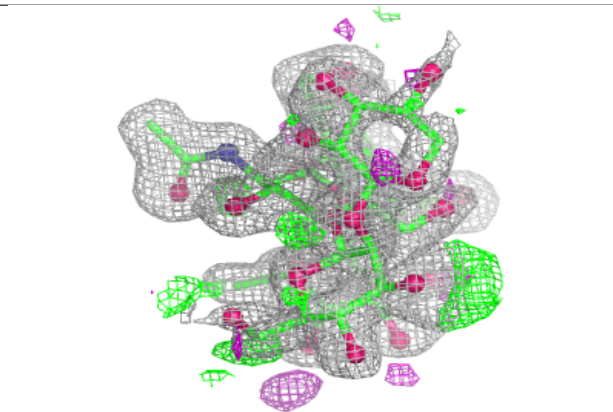
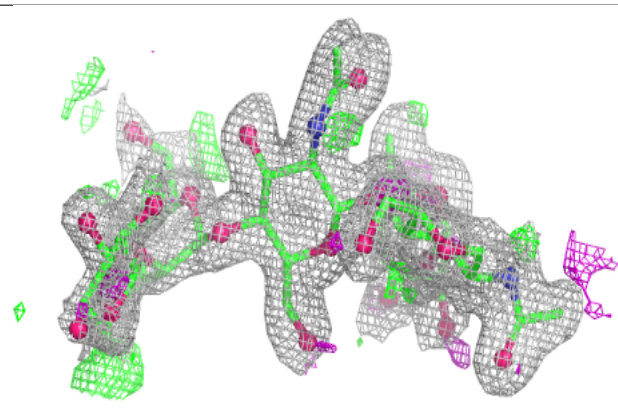
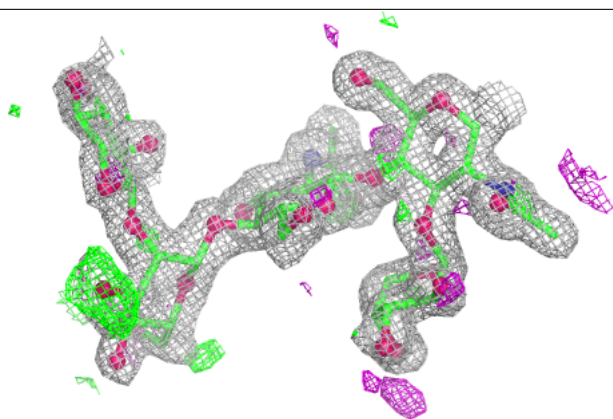
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	XYP	B	4	9/10	-	-	42,43,45,46	0
3	FUC	B	5	10/11	-	-	29,33,34,37	0
4	BMA	C	3	11/12	0.78	0.11	24,28,33,35	0
4	NAG	C	2	14/15	0.91	0.08	20,24,29,32	0
4	NAG	C	1	14/15	0.92	0.07	18,19,23,25	0
3	NAG	B	1	14/15	0.93	0.07	18,21,23,25	0
4	MAN	C	5	11/12	-	-	26,37,41,41	0
4	FUC	C	6	10/11	-	-	21,23,25,26	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

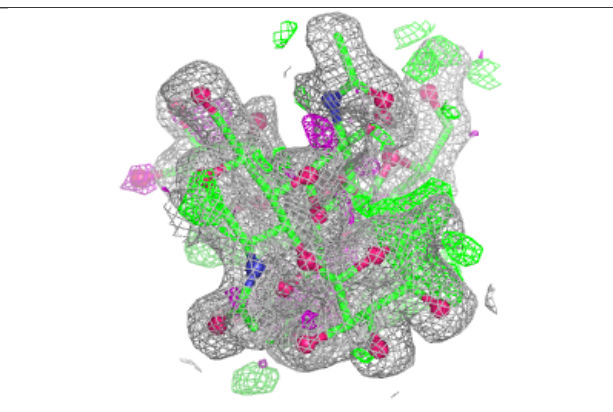
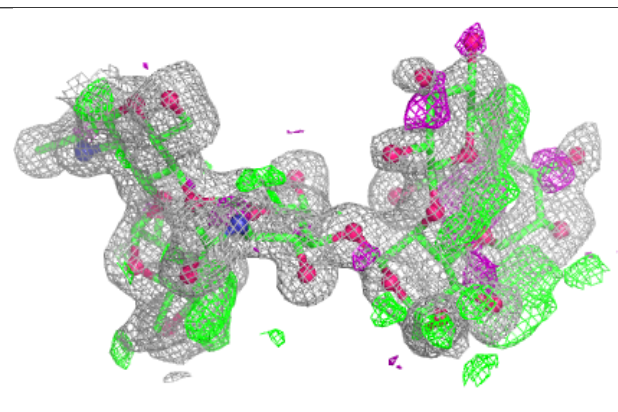
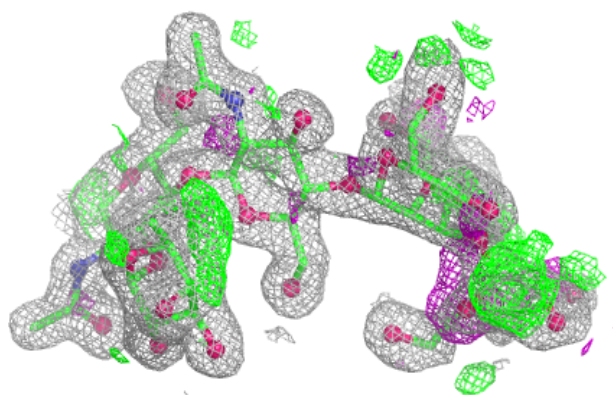


Electron density around Chain B:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around Chain C:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



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. 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($\text{\AA}^2$)	Q<0.9
5	NAG	M	971	14/15	0.54	0.16	56,63,65,67	0
9	SO4	M	1508	5/5	0.64	0.18	29,32,34,35	5
5	NAG	M	961	14/15	0.66	0.13	36,40,46,47	0
10	GOL	M	1514	6/6	0.68	0.25	44,44,45,45	6
5	NAG	M	931	14/15	0.72	0.12	36,42,45,47	0
5	NAG	M	991	14/15	0.72	0.13	37,39,47,48	0
9	SO4	M	1505[A]	5/5	0.73	0.17	31,33,33,33	5
10	GOL	M	1512	6/6	0.73	0.17	34,34,35,37	6
9	SO4	M	1505[B]	5/5	0.73	0.17	43,44,44,44	5
9	SO4	M	1509	5/5	0.80	0.16	41,41,41,42	5
6	ASC	M	995[A]	12/12	0.81	0.12	13,23,23,23	12
5	NAG	M	901	14/15	0.82	0.11	31,34,38,39	0
9	SO4	M	1507	5/5	0.86	0.13	33,33,35,35	5
7	GOX	M	999	13/13	0.87	0.09	17,20,27,30	0
10	GOL	M	1510[A]	6/6	0.89	0.09	15,18,19,20	2
10	GOL	M	1510[B]	6/6	0.89	0.09	15,18,20,20	2
5	NAG	M	911	14/15	0.90	0.08	25,28,30,32	0
10	GOL	M	1511	6/6	0.93	0.07	15,19,22,28	6
9	SO4	M	1504	5/5	0.95	0.09	26,29,31,32	5
9	SO4	M	1513[B]	5/5	0.97	0.06	20,21,21,22	5
9	SO4	M	1503	5/5	0.97	0.08	24,26,28,30	5
9	SO4	M	1506	5/5	0.99	0.04	20,20,24,25	0
8	ZN	M	1502	1/1	1.00	0.01	12,12,12,12	1

6.5 Other polymers

There are no such residues in this entry.