wwPDB X-ray Structure Validation Summary Report (i)

Dec 8, 2023 – 02:37 am GMT

PDB ID	:	1E72
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 wwPDB X-ray Structure Validation Summary 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 (i) 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 (i)) were used in the production of this report:

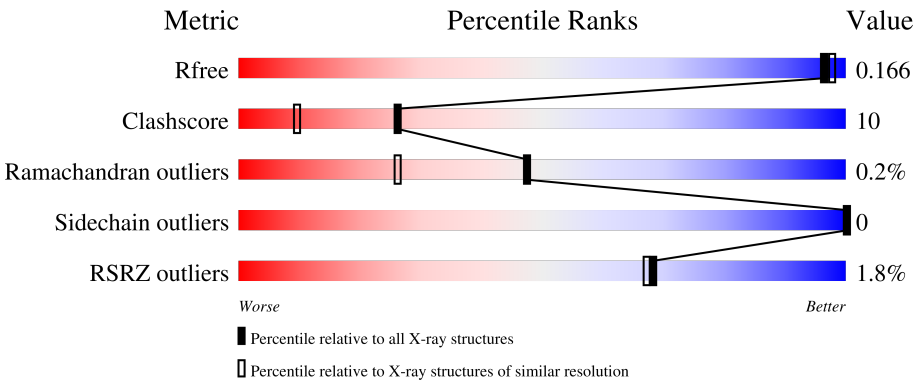
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 1.60 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}	130704	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (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 <=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%, 87%, 11%, •
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	-	-	X
5	NAG	M	971	-	-	-	X
5	NAG	M	991	X	-	-	X

2 Entry composition (i)

There are 11 unique types of molecules in this entry. The entry contains 5204 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.

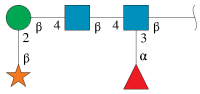
- Molecule 1 is a protein called MYROSINASE MA1.

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.

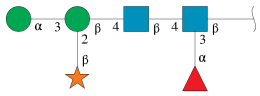
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	A	2	28	16	2	10	0	0	0

- 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.



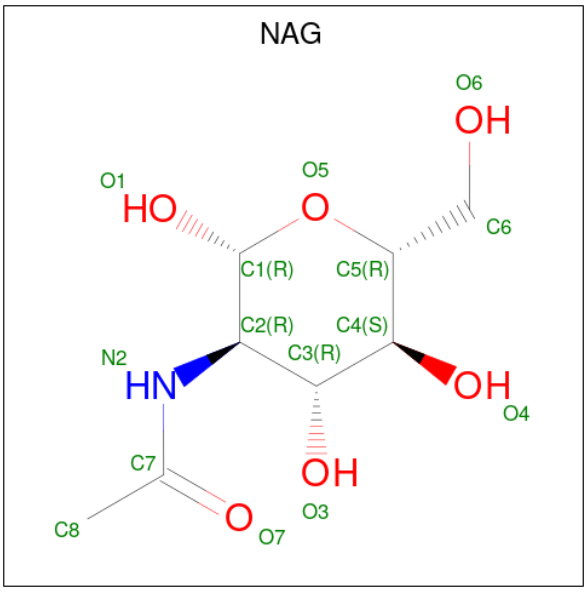
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	B	5	58	33	2	23	0	0	0

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



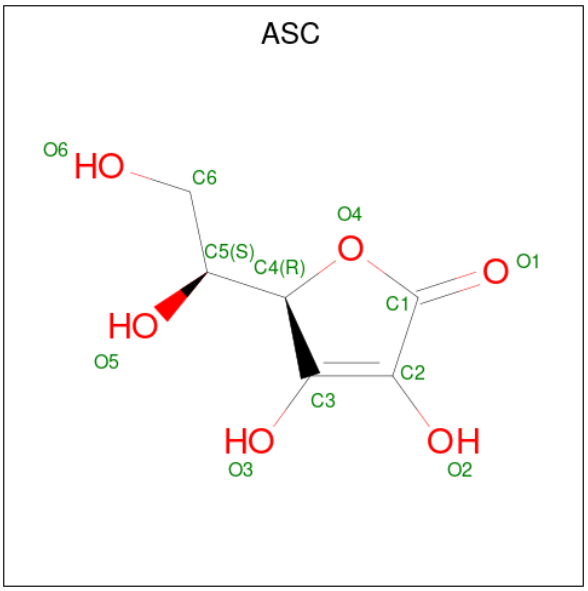
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	C	6	69	39	2	28	0	0	0

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



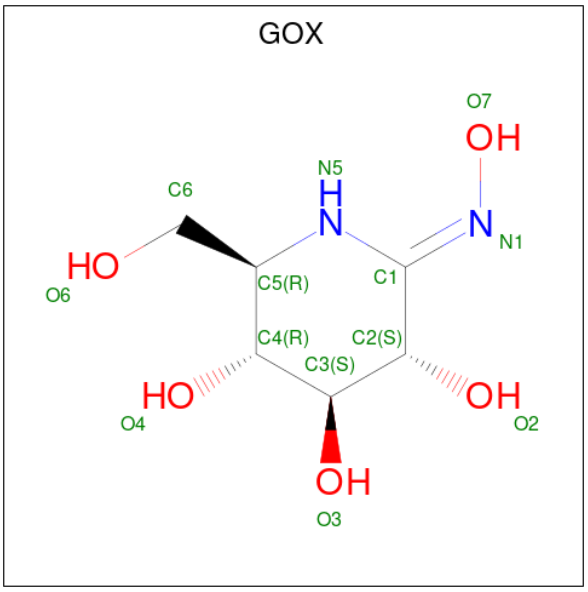
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
5	M	1	14	8	1	5	0	0
			Total	C	N	O		
5	M	1	14	8	1	5	0	0
			Total	C	N	O		
5	M	1	14	8	1	5	0	0
			Total	C	N	O		
5	M	1	14	8	1	5	0	0
			Total	C	N	O		
5	M	1	14	8	1	5	0	0
			Total	C	N	O		
5	M	1	14	8	1	5	0	0

- Molecule 6 is ASCORBIC ACID (three-letter code: ASC) (formula: $C_6H_8O_6$).



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

- Molecule 7 is (2S,3S,4R,5R)-6-(HYDROXYAMINO)-2-(HYDROXYMETHYL)-2,3,4,5-TETRAHYDROPYRIDINE-3,4,5-TRIOL (three-letter code: GOX) (formula: $C_6H_{12}N_2O_5$).

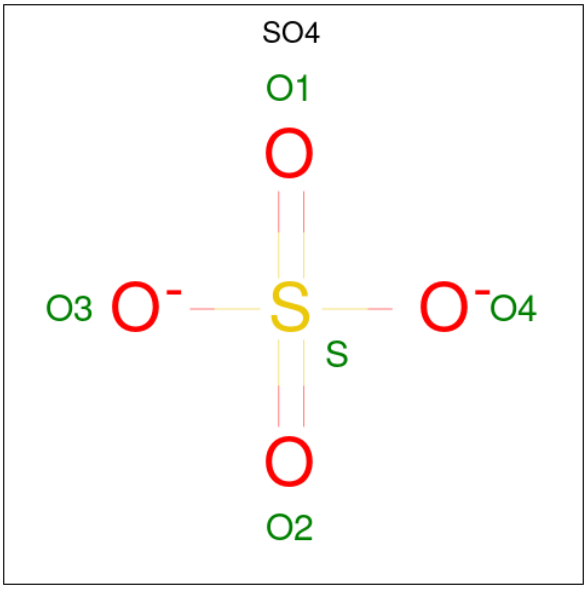


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	M	1	Total C N O 13 6 2 5	0	0

- Molecule 8 is ZINC ION (three-letter code: ZN) (formula: Zn).

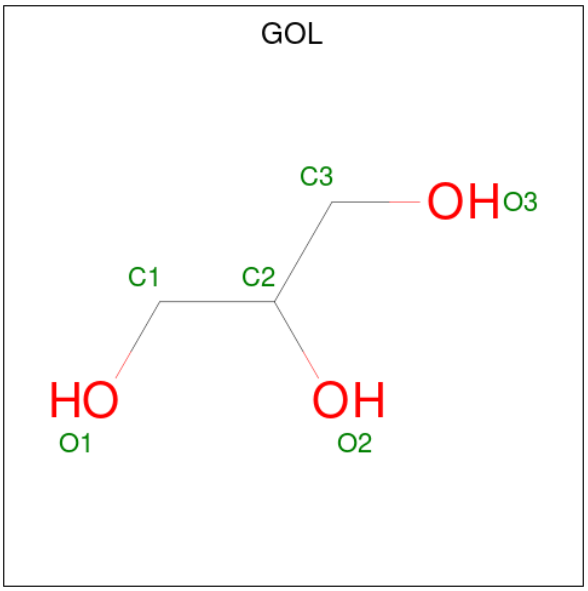
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
8	M	1	1	1	0	0

- Molecule 9 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



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

- Molecule 10 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 11 is water.

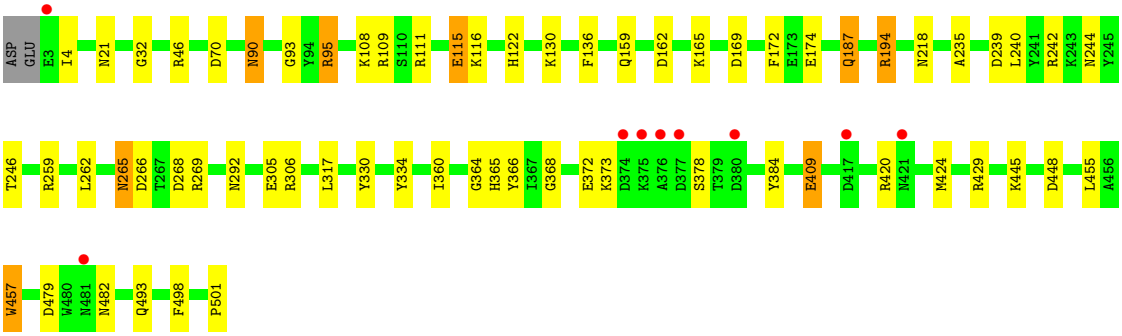
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
11	M	787	787	787	0	0

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

Chain M:

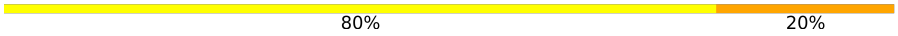


• Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain A:

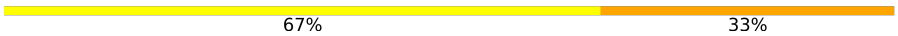
• Molecule 3: beta-D-xylopyranose-(1-2)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-3)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B:



• 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

Chain C:



4 Data and refinement statistics (i)

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 9.99 – 1.60	Depositor EDS
% Data completeness (in resolution range)	97.5 (10.00-1.60) 97.5 (9.99-1.60)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	2.66 (at 1.60Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.129 , 0.157 0.143 , 0.166	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)	0.49 , 62.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	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.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, ASC, FUC, GOX, NAG, ZN, GOL, MAN, XYP, 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	0.64	1/4290 (0.0%)	1.26	34/5833 (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 (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	501	PRO	N-CD	5.92	1.56	1.47

The worst 5 of 34 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	M	109	ARG	NE-CZ-NH2	-12.53	114.03	120.30
1	M	268	ASP	CB-CG-OD1	11.57	128.71	118.30
1	M	95	ARG	NE-CZ-NH2	-10.33	115.14	120.30
1	M	46	ARG	NE-CZ-NH2	-9.97	115.32	120.30
1	M	194	ARG	NE-CZ-NH2	9.32	124.96	120.30

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 (i)

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	82	0
2	A	28	0	25	5	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	21	0
All	All	5204	0	4078	89	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 10.

The worst 5 of 89 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

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%)	47 26

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%)	456 (100%)	0	100 100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 6 such sidechains are listed below:

Mol	Chain	Res	Type
1	M	265	ASN
1	M	292	ASN
1	M	365	HIS
1	M	218	ASN
1	M	90	ASN

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)

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	1.57	4 (28%)	17,19,21	2.82	8 (47%)
2	NAG	A	2	2	14,14,15	1.04	0	17,19,21	2.91	8 (47%)
3	NAG	B	1	3	14,14,15	1.03	1 (7%)	17,19,21	3.01	11 (64%)
3	NAG	B	2	3	14,14,15	1.14	1 (7%)	17,19,21	0.99	1 (5%)
3	BMA	B	3	3	11,11,12	1.90	2 (18%)	15,15,17	1.15	1 (6%)
3	XYP	B	4	3	9,9,10	0.91	0	10,12,14	1.98	3 (30%)
3	FUC	B	5	3	10,10,11	1.43	1 (10%)	14,14,16	1.88	3 (21%)
4	NAG	C	1	4	14,14,15	1.35	2 (14%)	17,19,21	2.76	7 (41%)
4	NAG	C	2	4	14,14,15	1.18	2 (14%)	17,19,21	1.97	5 (29%)
4	BMA	C	3	4	11,11,12	2.16	3 (27%)	15,15,17	5.44	13 (86%)
4	XYP	C	4	4	9,9,10	1.18	1 (11%)	10,12,14	2.20	4 (40%)
4	MAN	C	5	4	11,11,12	1.26	1 (9%)	15,15,17	1.81	3 (20%)
4	FUC	C	6	4	10,10,11	1.68	3 (30%)	14,14,16	2.45	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

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
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

The worst 5 of 21 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	3	BMA	C2-C3	-4.86	1.45	1.52
3	B	3	BMA	C2-C3	-4.79	1.45	1.52
4	C	3	BMA	C4-C5	3.40	1.60	1.53
3	B	3	BMA	C4-C5	2.79	1.58	1.53
2	A	1	NAG	O7-C7	-2.68	1.17	1.23

The worst 5 of 73 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	3	BMA	O5-C5-C6	-9.85	91.76	107.20
2	A	2	NAG	C1-O5-C5	-8.66	100.45	112.19
2	A	1	NAG	C1-O5-C5	-8.39	100.83	112.19
4	C	3	BMA	O4-C4-C3	-8.17	91.47	110.35
4	C	3	BMA	C1-O5-C5	-7.91	101.47	112.19

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

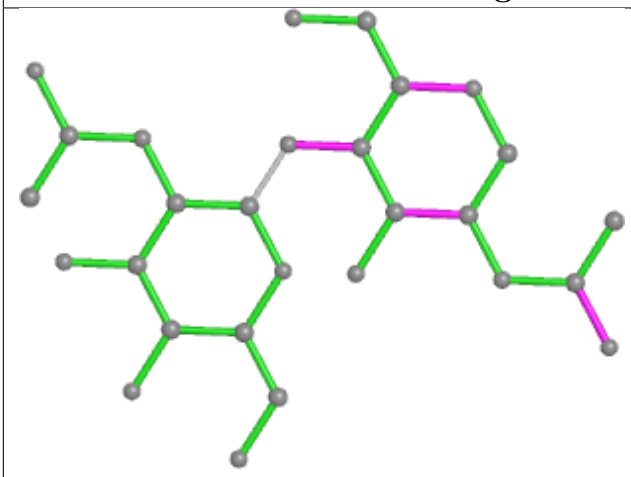
There are no ring outliers.

4 monomers are involved in 19 short contacts:

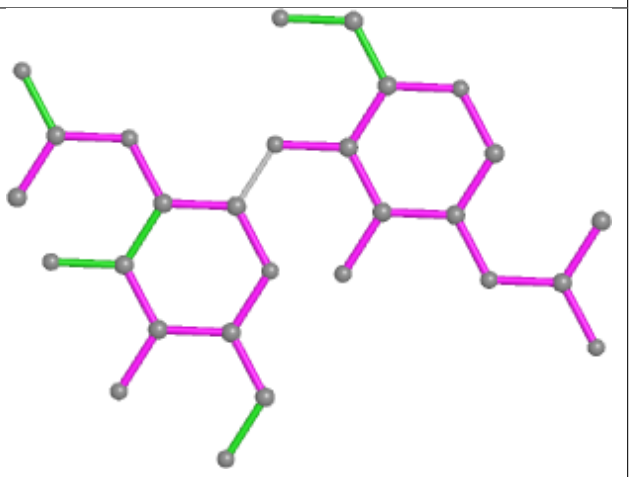
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	1	NAG	4	0
4	C	3	BMA	4	0
2	A	1	NAG	5	0
3	B	1	NAG	6	0

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

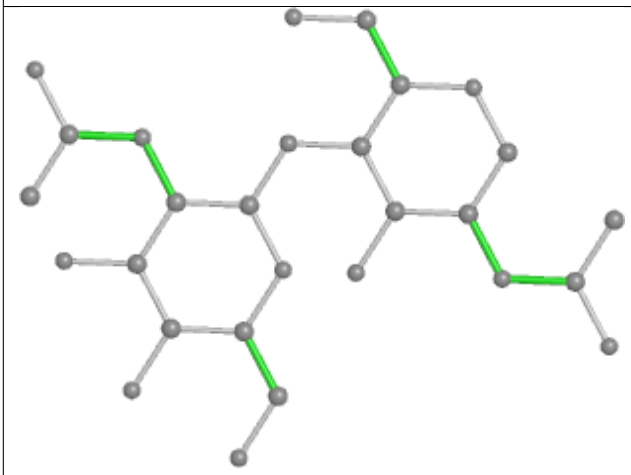
Oligosaccharide Chain A



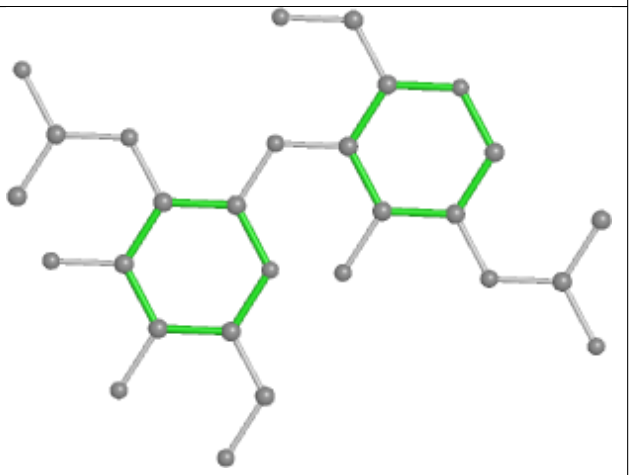
Bond lengths



Bond angles

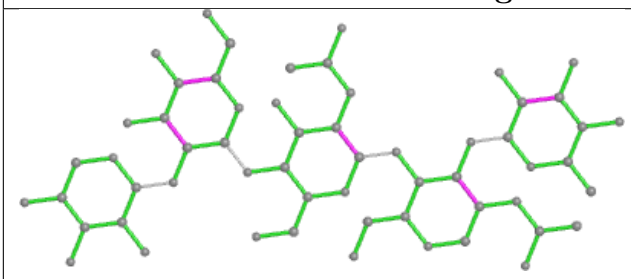


Torsions

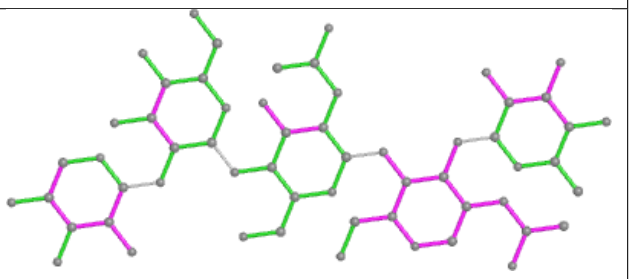


Rings

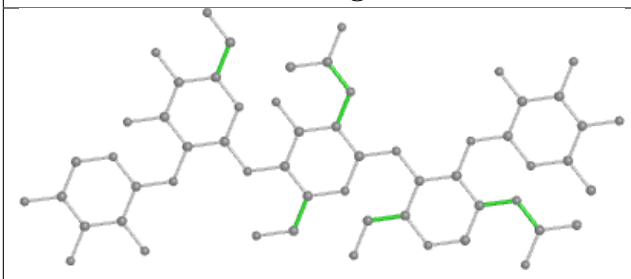
Oligosaccharide Chain B



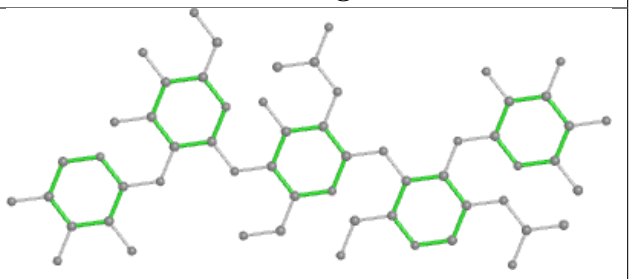
Bond lengths



Bond angles

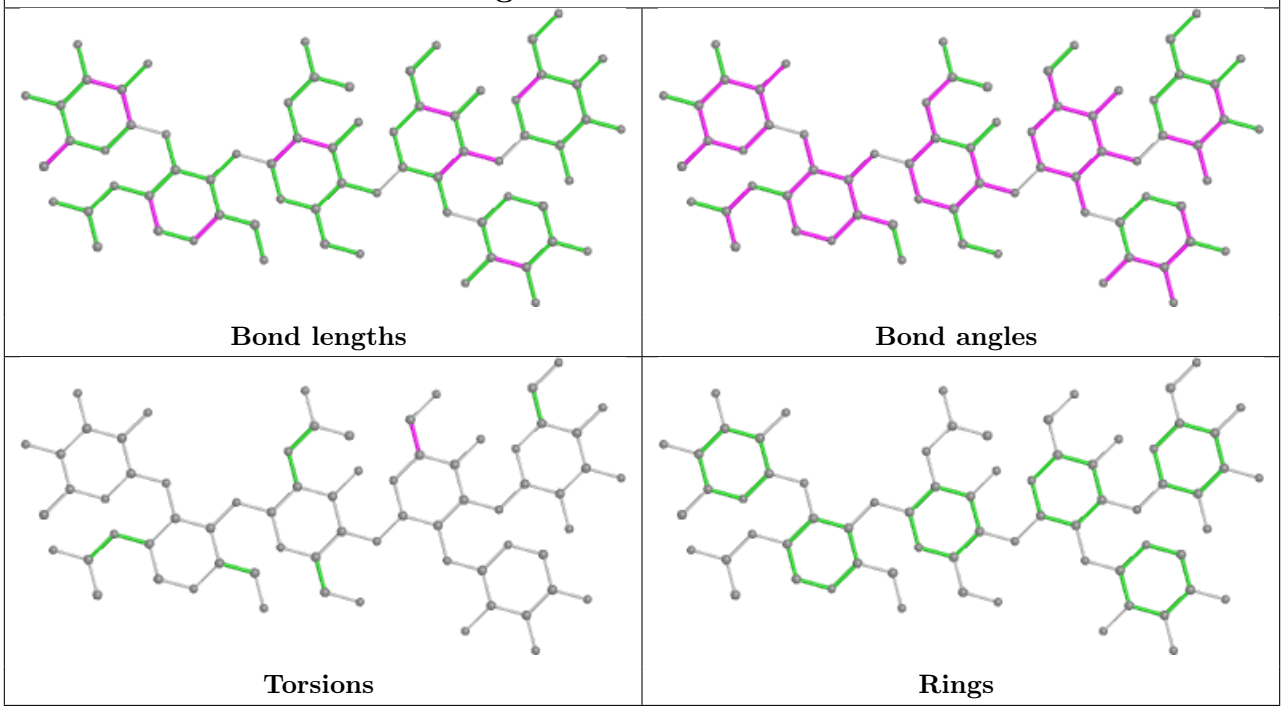


Torsions



Rings

Oligosaccharide Chain C



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	$\#\|Z\| > 2$
9	SO4	M	1508	-	4,4,4	0.81	0	6,6,6	0.92	0
9	SO4	M	1504	-	4,4,4	0.62	0	6,6,6	0.43	0
10	GOL	M	1512	-	5,5,5	0.31	0	5,5,5	0.80	0
5	NAG	M	971	1	14,14,15	1.28	1 (7%)	17,19,21	1.61	3 (17%)
9	SO4	M	1503	-	4,4,4	0.68	0	6,6,6	0.85	0
5	NAG	M	911	-	14,14,15	1.23	1 (7%)	17,19,21	1.96	4 (23%)
9	SO4	M	1513[B]	-	4,4,4	0.54	0	6,6,6	0.56	0
6	ASC	M	995[A]	-	12,12,12	4.70	8 (66%)	17,17,17	3.87	11 (64%)
9	SO4	M	1505[A]	-	4,4,4	0.88	0	6,6,6	1.31	1 (16%)
7	GOX	M	999	-	11,13,13	1.82	2 (18%)	14,18,18	5.15	9 (64%)
10	GOL	M	1510[A]	-	5,5,5	0.80	0	5,5,5	1.29	1 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
10	GOL	M	1511	-	5,5,5	0.53	0	5,5,5	0.97	0
9	SO4	M	1507	-	4,4,4	0.81	0	6,6,6	1.05	0
5	NAG	M	961	1	14,14,15	1.32	1 (7%)	17,19,21	2.26	4 (23%)
9	SO4	M	1506	-	4,4,4	0.43	0	6,6,6	0.47	0
5	NAG	M	931	-	14,14,15	1.66	3 (21%)	17,19,21	6.98	10 (58%)
5	NAG	M	991	1	14,14,15	1.40	1 (7%)	17,19,21	2.42	7 (41%)
9	SO4	M	1505[B]	-	4,4,4	0.69	0	6,6,6	0.55	0
10	GOL	M	1510[B]	-	5,5,5	0.81	0	5,5,5	1.80	2 (40%)
10	GOL	M	1514	-	5,5,5	0.28	0	5,5,5	0.62	0
9	SO4	M	1509	-	4,4,4	0.63	0	6,6,6	0.20	0
5	NAG	M	901	-	14,14,15	1.28	1 (7%)	17,19,21	2.21	5 (29%)

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
5	NAG	M	991	1	1/1/5/7	0/6/23/26	0/1/1/1
7	GOX	M	999	-	-	1/3/24/24	0/1/1/1
10	GOL	M	1510[A]	-	-	0/4/4/4	-
10	GOL	M	1511	-	-	0/4/4/4	-
10	GOL	M	1512	-	-	0/4/4/4	-
5	NAG	M	961	1	1/1/5/7	0/6/23/26	0/1/1/1
5	NAG	M	971	1	-	2/6/23/26	0/1/1/1
5	NAG	M	901	-	-	0/6/23/26	0/1/1/1
5	NAG	M	911	-	-	0/6/23/26	0/1/1/1
5	NAG	M	931	-	-	2/6/23/26	0/1/1/1
10	GOL	M	1514	-	-	4/4/4/4	-
6	ASC	M	995[A]	-	-	0/6/22/22	0/1/1/1
10	GOL	M	1510[B]	-	-	2/4/4/4	-

The worst 5 of 18 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	995[A]	ASC	C2-C1	9.44	1.67	1.45
6	M	995[A]	ASC	O1-C1	-8.80	1.03	1.21
6	M	995[A]	ASC	O4-C1	5.19	1.43	1.36
6	M	995[A]	ASC	C4-C3	4.83	1.57	1.50
7	M	999	GOX	C4-C5	4.55	1.62	1.52

The worst 5 of 57 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	M	931	NAG	C2-N2-C7	19.95	151.31	122.90
7	M	999	GOX	O7-N1-C1	15.14	124.40	110.18
5	M	931	NAG	C8-C7-N2	13.87	139.57	116.10
5	M	931	NAG	O7-C7-N2	-10.81	102.08	121.95
6	M	995[A]	ASC	O4-C1-C2	-7.85	102.88	109.86

All (2) chirality outliers are listed below:

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

5 of 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

There are no ring outliers.

7 monomers are involved in 24 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	M	911	NAG	4	0
6	M	995[A]	ASC	2	0
7	M	999	GOX	3	0
5	M	931	NAG	10	0
9	M	1505[B]	SO4	1	0
10	M	1514	GOL	1	0
5	M	901	NAG	4	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%)	-0.61	9 (1%) 68 67	11, 15, 27, 54	0

The worst 5 of 9 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	376	ALA	9.6
1	M	380	ASP	3.9
1	M	417	ASP	3.8
1	M	374	ASP	3.8
1	M	375	LYS	3.7

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
4	XYP	C	4	9/10	0.54	0.27	37,40,42,45	0
2	NAG	A	2	14/15	0.55	0.30	38,43,47,48	0
4	MAN	C	5	11/12	0.57	0.31	26,37,41,41	0
3	XYP	B	4	9/10	0.63	0.38	42,43,45,46	0
3	BMA	B	3	11/12	0.74	0.33	38,41,43,44	0
3	FUC	B	5	10/11	0.86	0.20	29,33,34,37	0
4	BMA	C	3	11/12	0.86	0.14	24,28,33,35	0

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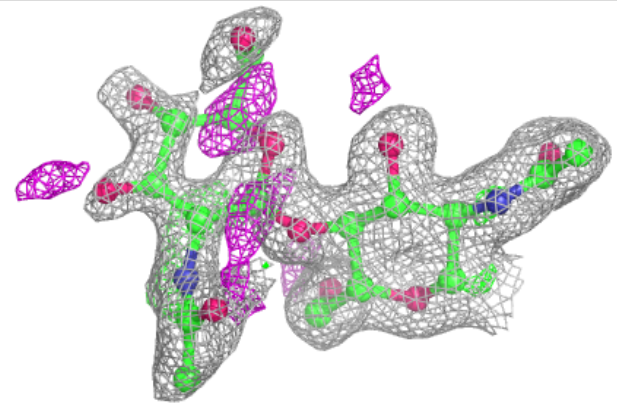
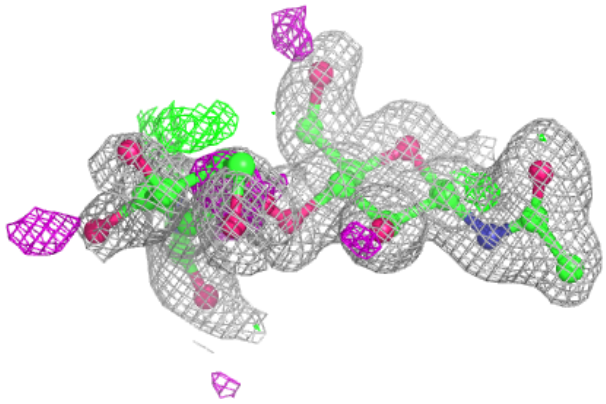
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	FUC	C	6	10/11	0.91	0.10	21,23,25,26	0
3	NAG	B	2	14/15	0.92	0.09	26,29,34,36	0
2	NAG	A	1	14/15	0.93	0.08	20,24,29,32	0
3	NAG	B	1	14/15	0.93	0.08	18,21,23,25	0
4	NAG	C	1	14/15	0.93	0.09	18,19,23,25	0
4	NAG	C	2	14/15	0.93	0.10	20,24,29,32	0

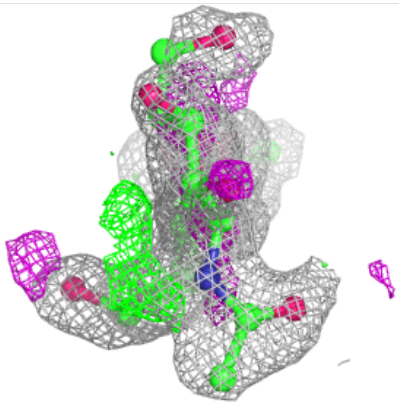
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain A:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

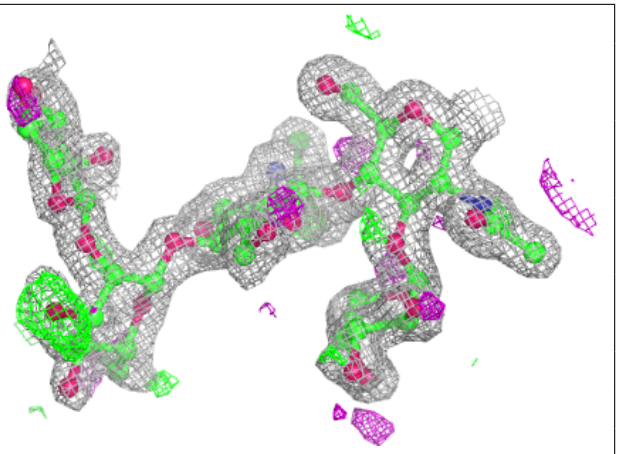


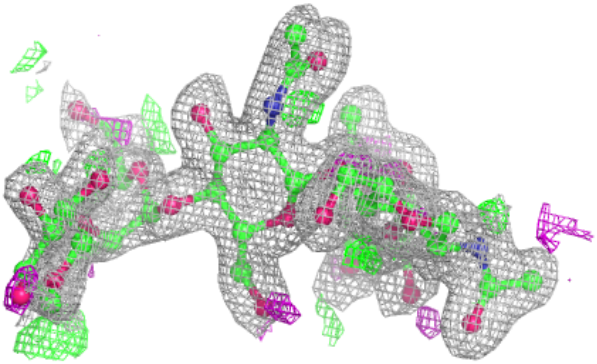


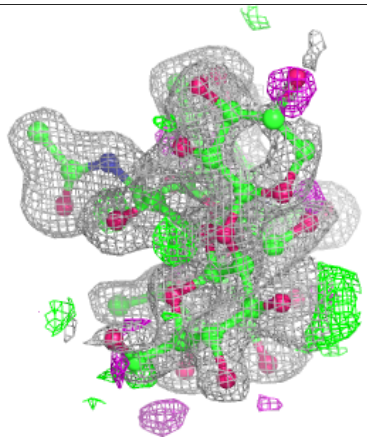


Electron density around Chain B:

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

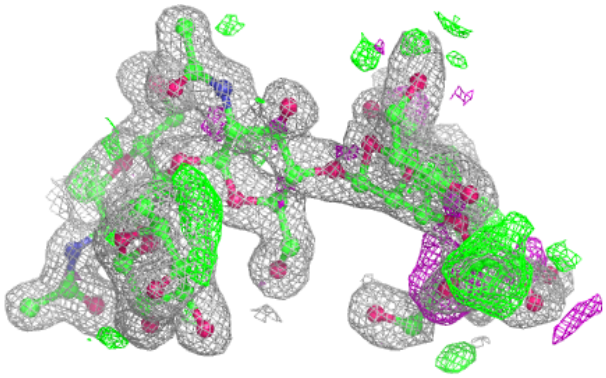


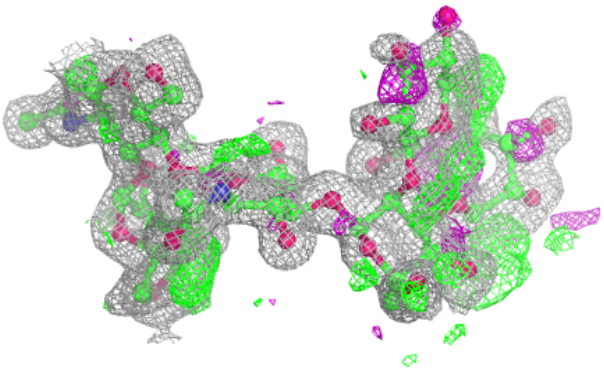


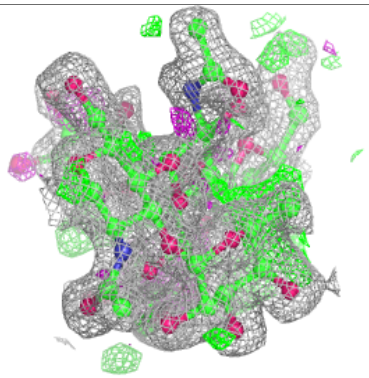


Electron density around Chain C:

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







6.4 Ligands (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
5	NAG	M	971	14/15	0.57	0.52	56,63,65,67	0
5	NAG	M	991	14/15	0.59	0.41	37,39,47,48	0
9	SO4	M	1508	5/5	0.60	0.27	29,32,34,35	5
5	NAG	M	961	14/15	0.61	0.45	36,40,46,47	0
5	NAG	M	931	14/15	0.65	0.29	36,42,45,47	0
5	NAG	M	901	14/15	0.72	0.18	31,34,38,39	0
10	GOL	M	1514	6/6	0.74	0.30	44,44,45,45	6
10	GOL	M	1512	6/6	0.75	0.21	34,34,35,37	6
9	SO4	M	1505[B]	5/5	0.77	0.28	43,44,44,44	5
9	SO4	M	1505[A]	5/5	0.77	0.28	31,33,33,33	5
9	SO4	M	1507	5/5	0.82	0.23	33,33,35,35	5
9	SO4	M	1509	5/5	0.82	0.24	41,41,41,42	5
7	GOX	M	999	13/13	0.84	0.17	17,20,27,30	0
5	NAG	M	911	14/15	0.86	0.20	25,28,30,32	0
10	GOL	M	1510[B]	6/6	0.88	0.13	15,18,20,20	2
6	ASC	M	995[A]	12/12	0.88	0.15	13,23,23,23	12
10	GOL	M	1510[A]	6/6	0.88	0.13	15,18,19,20	2
10	GOL	M	1511	6/6	0.93	0.10	15,19,22,28	6
9	SO4	M	1504	5/5	0.94	0.18	26,29,31,32	5
9	SO4	M	1513[B]	5/5	0.98	0.07	20,21,21,22	5
9	SO4	M	1503	5/5	0.98	0.13	24,26,28,30	5
9	SO4	M	1506	5/5	0.99	0.05	20,20,24,25	0
8	ZN	M	1502	1/1	1.00	0.02	12,12,12,12	1

6.5 Other polymers (i)

There are no such residues in this entry.