Full wwPDB X-ray Structure Validation Report (i)

Sep 22, 2022 – 04:24 am BST

PDB ID	:	7Q3P
Title	:	Crystal structure of IgG1-Fc-MST-HN (efgartigimod)
Authors	:	Pannecoucke, E.; Savvides, S.N.
Deposited on	:	2021-10-28
Resolution	:	2.10 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 (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 (1)) were used in the production of this report:

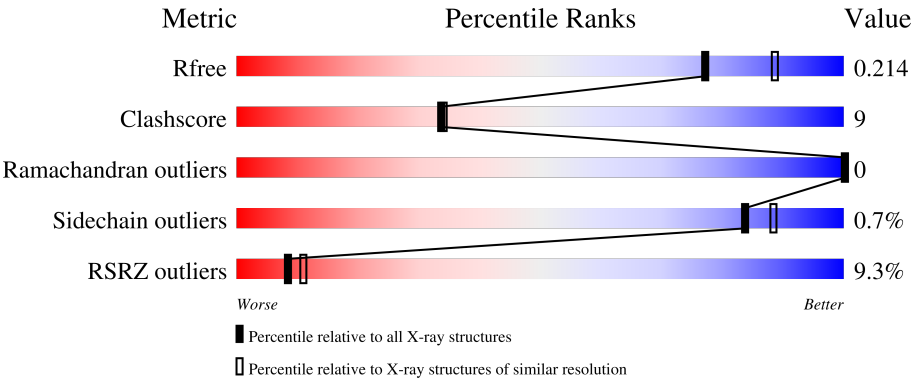
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.30
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.30

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 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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	A	225	4% 82% 10% • 7%
1	B	225	17% 73% 18% • 8%
1	C	225	5% 83% 9% • 8%
2	D	2	100%
2	G	2	50% 50%

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Mol	Chain	Length	Quality of chain
3	E	4	75% 25%
4	F	2	50% 50%
4	I	2	50% 50%
5	H	4	25% 50% 25%

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	NAG	F	2	-	-	-	X

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 5730 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.

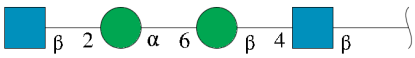
- Molecule 1 is a protein called IgG1-Fc-MST-HN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	210	Total	C	N	O	S	0	2	0
			1679	1076	279	319	5			
1	B	208	Total	C	N	O	S	0	1	0
			1623	1040	269	309	5			
1	C	208	Total	C	N	O	S	0	1	0
			1673	1069	279	320	5			

- Molecule 2 is an oligosaccharide called alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose.

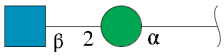
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	D	2	Total	C	N	O	0	0	0
			24	14	1	9			
2	G	2	Total	C	N	O	0	0	0
			24	14	1	9			

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



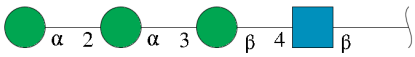
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	E	4	Total	C	N	O	0	0	0
			50	28	2	20			

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



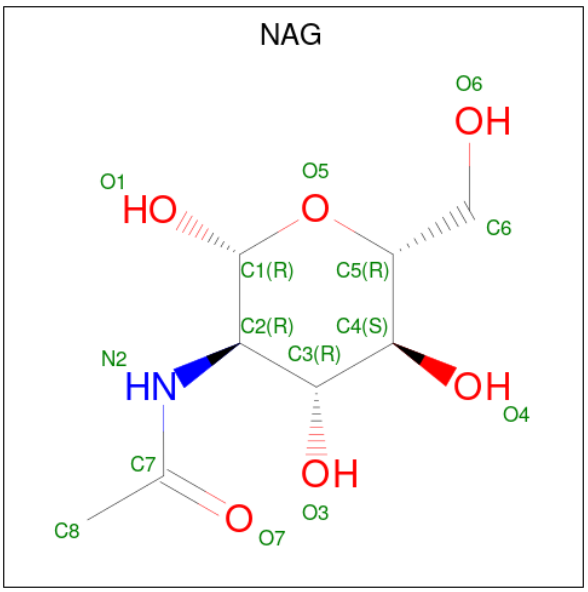
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	F	2	Total	C	N	O	0	0	0
			25	14	1	10			
4	I	2	Total	C	N	O	0	0	0
			25	14	1	10			

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



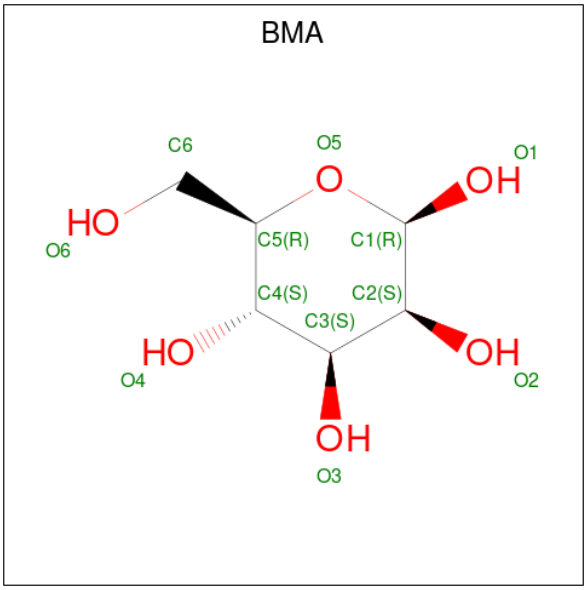
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	H	4	Total	C	N	O	0	0	0
			47	26	1	20			

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



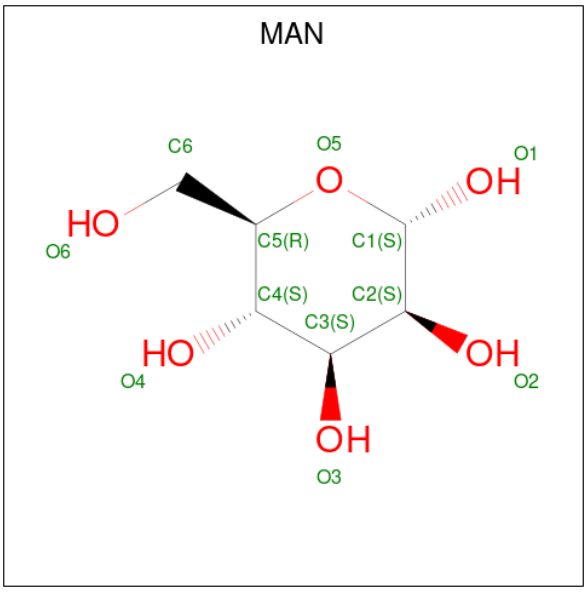
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	B	1	Total C N O 14 8 1 5	0	0
6	B	1	Total C N O 14 8 1 5	0	0
6	B	1	Total C N O 14 8 1 5	0	0
6	B	1	Total C N O 14 8 1 5	0	0

- Molecule 7 is beta-D-mannopyranose (three-letter code: BMA) (formula: $C_6H_{12}O_6$).



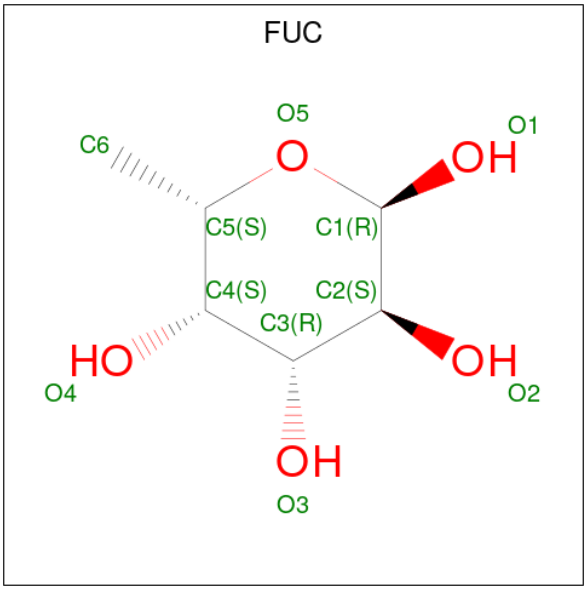
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total C O 11 6 5	0	0

- Molecule 8 is alpha-D-mannopyranose (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C O 11 6 5	0	0
8	B	1	Total C O 11 6 5	0	0

- Molecule 9 is alpha-L-fucopyranose (three-letter code: FUC) (formula: $C_6H_{12}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total C O 10 6 4	0	0

- Molecule 10 is water.

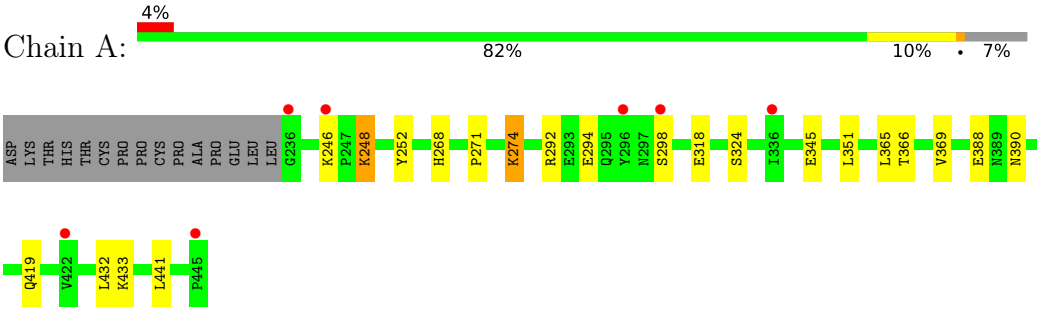
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	A	173	Total O 173 173	0	0
10	B	101	Total O 101 101	0	0
10	C	187	Total O 187 187	0	0

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.

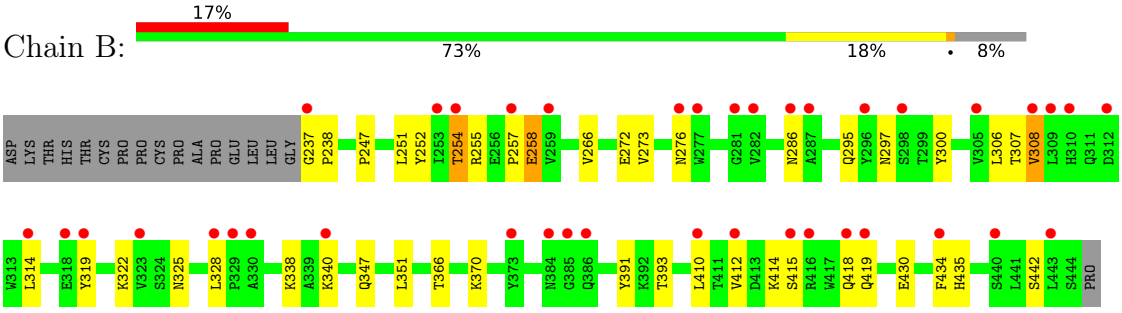
• Molecule 1: IgG1-Fc-MST-HN

Chain A:



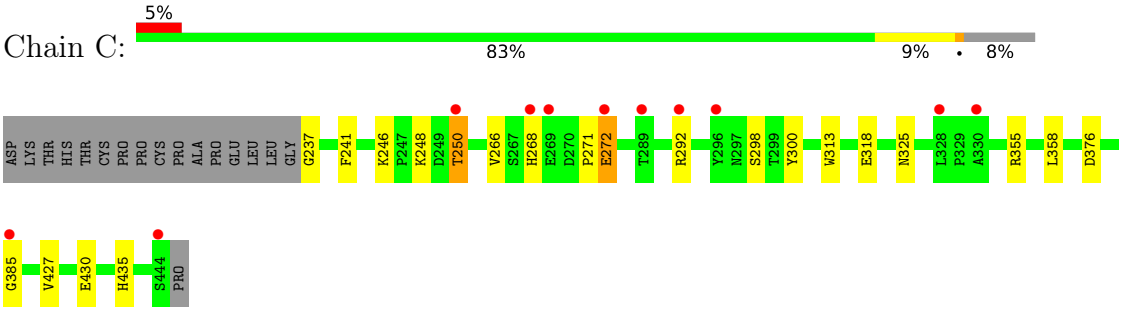
• Molecule 1: IgG1-Fc-MST-HN

Chain B:



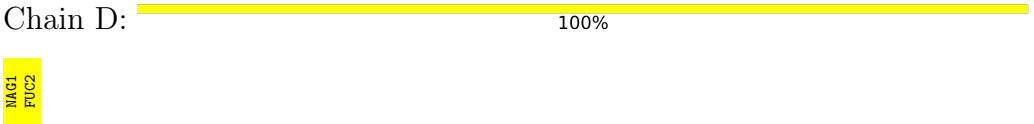
• Molecule 1: IgG1-Fc-MST-HN

Chain C:



• Molecule 2: alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:



• Molecule 2: alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E:

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

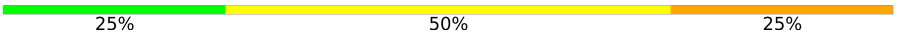
Chain F:

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

Chain I:

• Molecule 5: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	96.41Å 87.94Å 106.09Å 90.00° 114.04° 90.00°	Depositor
Resolution (Å)	48.14 – 2.10 60.93 – 2.10	Depositor EDS
% Data completeness (in resolution range)	98.8 (48.14-2.10) 88.6 (60.93-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.83 (at 2.10Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.189 , 0.214 0.189 , 0.214	Depositor DCC
R_{free} test set	2344 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	35.3	Xtriage
Anisotropy	0.240	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.019 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	5730	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.61% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, MAN, BMA, FUC

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.52	2/1730 (0.1%)	0.70	5/2360 (0.2%)
1	B	0.53	3/1670 (0.2%)	0.77	8/2287 (0.3%)
1	C	0.41	0/1720	0.64	4/2345 (0.2%)
All	All	0.49	5/5120 (0.1%)	0.70	17/6992 (0.2%)

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	C	1	1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	258	GLU	CD-OE2	13.76	1.40	1.25
1	A	388	GLU	CD-OE2	11.84	1.38	1.25
1	A	248	LYS	CE-NZ	9.51	1.72	1.49
1	B	258	GLU	CG-CD	5.70	1.60	1.51
1	B	258	GLU	CD-OE1	5.68	1.31	1.25

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	340	LYS	CD-CE-NZ	-12.92	81.98	111.70
1	A	248	LYS	CD-CE-NZ	-12.35	83.29	111.70
1	B	340	LYS	CA-CB-CG	-11.08	89.02	113.40
1	B	273	VAL	CG1-CB-CG2	-8.94	96.60	110.90
1	C	246	LYS	CB-CG-CD	-7.94	90.95	111.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	254	THR	CA-CB-CG2	-7.12	102.43	112.40
1	A	406	LEU	CA-CB-CG	7.04	131.49	115.30
1	B	308	VAL	CG1-CB-CG2	6.93	121.98	110.90
1	B	340	LYS	CG-CD-CE	6.56	131.58	111.90
1	B	254	THR	OG1-CB-CG2	-6.50	95.05	110.00
1	C	246	LYS	N-CA-CB	-6.43	99.02	110.60
1	A	248	LYS	CA-CB-CG	6.40	127.48	113.40
1	A	274	LYS	CB-CG-CD	-5.57	97.12	111.60
1	C	246	LYS	CA-CB-CG	5.53	125.57	113.40
1	C	250	THR	OG1-CB-CG2	5.50	122.64	110.00
1	B	308	VAL	CA-CB-CG2	5.34	118.92	110.90
1	A	248	LYS	N-CA-CB	5.01	119.62	110.60

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	C	250	THR	CB

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	272	GLU	Sidechain

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	A	1679	0	1631	22	0
1	B	1623	0	1537	42	0
1	C	1673	0	1630	19	0
2	D	24	0	22	0	0
2	G	24	0	22	0	0
3	E	50	0	43	2	0
4	F	25	0	22	2	0
4	I	25	0	22	0	0
5	H	47	0	40	1	0
6	B	56	0	50	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	11	0	9	1	0
8	B	22	0	18	1	0
9	B	10	0	10	2	0
10	A	173	0	0	8	0
10	B	101	0	0	10	1
10	C	187	0	0	7	0
All	All	5730	0	5056	88	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 9.

All (88) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:248:LYS:CE	1:A:248:LYS:NZ	1.72	1.51
1:A:248:LYS:NZ	1:A:248:LYS:CD	2.17	1.07
1:A:271:PRO:HB2	1:A:292[B]:ARG:HH12	1.10	1.06
1:B:297:ASN:ND2	10:B:601:HOH:O	1.94	0.97
1:A:271:PRO:HB2	1:A:292[B]:ARG:NH1	1.82	0.94
1:B:258:GLU:HA	1:B:308:VAL:HG22	1.50	0.94
1:B:258:GLU:HA	1:B:308:VAL:CG2	1.99	0.92
1:C:248:LYS:NZ	10:C:501:HOH:O	1.93	0.91
1:C:237:GLY:N	10:C:502:HOH:O	2.05	0.88
1:A:298:SER:O	10:A:501:HOH:O	1.89	0.88
10:B:618:HOH:O	4:F:1:MAN:O4	1.92	0.86
1:A:248:LYS:NZ	1:A:248:LYS:HD3	1.91	0.84
1:A:433:LYS:NZ	10:A:503:HOH:O	2.10	0.84
1:B:319:TYR:OH	10:B:602:HOH:O	1.97	0.83
1:B:442:SER:O	10:B:603:HOH:O	1.97	0.82
1:B:391:TYR:HB3	1:B:410:LEU:HD23	1.62	0.81
1:A:246:LYS:NZ	3:E:4:NAG:O4	2.15	0.79
1:B:308:VAL:HG13	1:B:319:TYR:CZ	2.17	0.79
1:B:295:GLN:NE2	10:B:606:HOH:O	2.16	0.77
1:A:248:LYS:CD	1:A:248:LYS:HZ3	1.99	0.74
1:A:416[B]:ARG:NH1	10:A:504:HOH:O	2.19	0.74
1:B:308:VAL:CG1	1:B:319:TYR:CZ	2.72	0.72
1:A:248:LYS:HD3	1:A:248:LYS:HZ3	1.52	0.72
1:B:258:GLU:HB3	1:B:307:THR:HA	1.71	0.72
1:C:318:GLU:OE2	10:C:503:HOH:O	2.08	0.70
1:B:276:ASN:HB2	1:B:322:LYS:HE2	1.75	0.69
1:A:271:PRO:CB	1:A:292[B]:ARG:HH12	1.97	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:418:GLN:NE2	10:B:608:HOH:O	2.25	0.69
1:C:430:GLU:OE2	10:C:504:HOH:O	2.09	0.68
10:A:514:HOH:O	1:B:370:LYS:HE3	1.96	0.66
1:B:322:LYS:HE3	10:B:625:HOH:O	1.97	0.64
1:C:268:HIS:NE2	1:C:298:SER:O	2.31	0.62
1:C:271:PRO:HB2	1:C:292:ARG:NH1	2.14	0.61
1:C:355:ARG:HA	1:C:358:LEU:CD2	2.32	0.59
1:B:308:VAL:CG1	1:B:319:TYR:OH	2.49	0.59
6:B:501:NAG:H61	9:B:508:FUC:O5	2.02	0.59
1:C:355:ARG:HA	1:C:358:LEU:HD23	1.83	0.59
1:B:258:GLU:OE2	1:B:307:THR:OG1	2.17	0.58
3:E:2:BMA:O3	4:F:1:MAN:H3	2.04	0.58
1:B:258:GLU:HA	1:B:308:VAL:HG23	1.85	0.57
1:C:250:THR:HG21	1:C:313:TRP:CD1	2.41	0.56
1:A:318:GLU:CD	10:A:505:HOH:O	2.44	0.55
1:C:266:VAL:HB	1:C:300:TYR:HB2	1.89	0.54
1:A:390:ASN:ND2	10:A:502:HOH:O	1.93	0.54
1:B:414:LYS:HG2	1:B:418:GLN:NE2	2.23	0.54
1:B:266:VAL:HB	1:B:300:TYR:HB2	1.89	0.53
1:B:308:VAL:HG12	1:B:319:TYR:OH	2.08	0.53
1:A:274:LYS:HD3	1:A:324:SER:HB2	1.89	0.53
1:B:308:VAL:HG13	1:B:319:TYR:CE1	2.45	0.52
1:C:250:THR:HG21	1:C:313:TRP:HD1	1.73	0.51
1:B:442:SER:N	10:B:603:HOH:O	2.26	0.50
1:B:258:GLU:CA	1:B:308:VAL:CG2	2.83	0.49
1:B:415:SER:O	1:B:419:GLN:HG2	2.13	0.49
1:B:276:ASN:CB	1:B:322:LYS:HE2	2.43	0.49
1:B:347:GLN:NE2	10:B:605:HOH:O	2.16	0.48
1:C:272:GLU:O	1:C:325:ASN:ND2	2.44	0.48
1:B:414:LYS:O	1:B:418:GLN:HG2	2.14	0.48
1:B:430:GLU:HA	1:B:435:HIS:CD2	2.49	0.48
6:B:501:NAG:H61	9:B:508:FUC:C5	2.44	0.48
1:B:252:TYR:C	1:B:254:THR:H	2.19	0.47
1:B:258:GLU:CB	1:B:307:THR:HA	2.44	0.46
7:B:503:BMA:H61	8:B:505:MAN:C1	2.46	0.46
1:B:257:PRO:C	1:B:308:VAL:HG23	2.37	0.45
1:B:434:PHE:N	10:B:607:HOH:O	2.18	0.45
1:A:268:HIS:NE2	1:A:294:GLU:OE2	2.48	0.45
1:B:254:THR:OG1	1:B:255:ARG:HG3	2.18	0.44
1:C:268:HIS:CE1	1:C:298:SER:HB3	2.53	0.44
1:A:369:VAL:HB	1:A:406:LEU:HD22	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:318:GLU:CG	10:A:505:HOH:O	2.64	0.44
1:A:345:GLU:HG3	1:A:432:LEU:HD23	2.00	0.44
1:B:237:GLY:HA2	1:B:238:PRO:C	2.38	0.43
1:A:365:LEU:HD13	1:A:441:LEU:HD23	1.99	0.43
1:B:314:LEU:HA	1:B:338:LYS:HD3	2.00	0.43
1:C:271:PRO:HB2	1:C:292:ARG:HH12	1.83	0.43
1:B:238:PRO:HG2	1:B:328:LEU:HD21	2.02	0.42
1:C:376:ASP:OD1	10:C:507:HOH:O	2.22	0.42
1:C:385:GLY:N	10:C:505:HOH:O	2.11	0.42
1:B:276:ASN:HB2	1:B:322:LYS:CE	2.48	0.42
1:A:351:LEU:HB2	1:A:366:THR:HB	2.02	0.41
1:C:248:LYS:CE	10:C:501:HOH:O	2.59	0.41
1:B:410:LEU:CD1	1:B:412:VAL:HG13	2.50	0.41
1:B:272:GLU:O	1:B:325:ASN:ND2	2.50	0.41
1:B:247:PRO:O	1:B:251:LEU:HG	2.20	0.41
1:A:415:SER:O	1:A:419:GLN:HG3	2.21	0.41
1:B:351:LEU:HB2	1:B:366:THR:HB	2.02	0.41
1:C:241:PHE:CZ	5:H:1:NAG:H61	2.57	0.40
1:B:286:ASN:OD1	1:B:306:LEU:HD11	2.21	0.40
10:A:581:HOH:O	1:C:435:HIS:HD2	2.04	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:B:616:HOH:O	10:B:685:HOH:O[4_445]	2.12	0.08

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	A	210/225 (93%)	209 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	207/225 (92%)	204 (99%)	3 (1%)	0	100	100
1	C	207/225 (92%)	206 (100%)	1 (0%)	0	100	100
All	All	624/675 (92%)	619 (99%)	5 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	A	191/209 (91%)	189 (99%)	2 (1%)	76	82
1	B	180/209 (86%)	179 (99%)	1 (1%)	86	90
1	C	193/209 (92%)	192 (100%)	1 (0%)	88	92
All	All	564/627 (90%)	560 (99%)	4 (1%)	84	88

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	252	TYR
1	A	406	LEU
1	B	393	THR
1	C	427	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	342	GLN

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)

16 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	D	1	1,2	14,14,15	0.23	0	17,19,21	0.75	1 (5%)
2	FUC	D	2	2	10,10,11	0.88	0	14,14,16	1.12	1 (7%)
3	NAG	E	1	3	14,14,15	1.24	1 (7%)	17,19,21	0.77	0
3	BMA	E	2	3	11,11,12	0.72	0	15,15,17	0.84	1 (6%)
3	MAN	E	3	3	11,11,12	1.26	2 (18%)	15,15,17	1.37	1 (6%)
3	NAG	E	4	3	14,14,15	0.14	0	17,19,21	0.57	0
4	MAN	F	1	4	11,11,12	1.50	1 (9%)	15,15,17	1.72	2 (13%)
4	NAG	F	2	4	14,14,15	0.40	0	17,19,21	1.44	2 (11%)
2	NAG	G	1	1,2	14,14,15	0.22	0	17,19,21	0.83	0
2	FUC	G	2	2	10,10,11	0.83	0	14,14,16	0.99	1 (7%)
5	NAG	H	1	5	14,14,15	0.99	1 (7%)	17,19,21	0.74	0
5	BMA	H	2	5	11,11,12	0.65	0	15,15,17	0.98	0
5	MAN	H	3	5	11,11,12	1.04	1 (9%)	15,15,17	1.16	1 (6%)
5	MAN	H	4	5	11,11,12	1.09	1 (9%)	15,15,17	1.71	2 (13%)
4	MAN	I	1	4	11,11,12	1.10	1 (9%)	15,15,17	1.15	2 (13%)
4	NAG	I	2	4	14,14,15	0.38	0	17,19,21	0.50	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	D	1	1,2	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FUC	D	2	2	-	-	0/1/1/1
3	NAG	E	1	3	-	0/6/23/26	0/1/1/1
3	BMA	E	2	3	-	0/2/19/22	0/1/1/1
3	MAN	E	3	3	-	2/2/19/22	0/1/1/1
3	NAG	E	4	3	-	2/6/23/26	0/1/1/1
4	MAN	F	1	4	-	0/2/19/22	0/1/1/1
4	NAG	F	2	4	-	2/6/23/26	0/1/1/1
2	NAG	G	1	1,2	-	0/6/23/26	0/1/1/1
2	FUC	G	2	2	-	-	0/1/1/1
5	NAG	H	1	5	-	1/6/23/26	0/1/1/1
5	BMA	H	2	5	-	2/2/19/22	0/1/1/1
5	MAN	H	3	5	-	2/2/19/22	0/1/1/1
5	MAN	H	4	5	-	1/2/19/22	1/1/1/1
4	MAN	I	1	4	-	1/2/19/22	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	1	NAG	O5-C1	-4.29	1.36	1.43
5	H	1	NAG	O5-C1	-3.15	1.38	1.43
4	F	1	MAN	C2-C3	3.11	1.57	1.52
5	H	3	MAN	O5-C1	-2.78	1.39	1.43
3	E	3	MAN	O5-C1	-2.67	1.39	1.43
5	H	4	MAN	O5-C5	2.42	1.48	1.43
3	E	3	MAN	C1-C2	2.10	1.57	1.52
4	I	1	MAN	C1-C2	-2.09	1.47	1.52

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	H	4	MAN	C1-O5-C5	5.06	119.05	112.19
4	F	1	MAN	O2-C2-C1	4.73	118.82	109.15
4	F	2	NAG	C2-N2-C7	4.20	128.88	122.90
3	E	3	MAN	O2-C2-C3	-4.08	101.97	110.14
4	F	1	MAN	O2-C2-C3	3.12	116.39	110.14
4	F	2	NAG	C1-C2-N2	3.07	115.73	110.49
4	I	1	MAN	C1-O5-C5	2.59	115.69	112.19
5	H	3	MAN	C1-C2-C3	-2.46	106.65	109.67
5	H	4	MAN	O2-C2-C3	-2.41	105.30	110.14
2	D	2	FUC	C1-O5-C5	2.41	118.25	112.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	2	BMA	O2-C2-C3	-2.22	105.69	110.14
4	I	1	MAN	C1-C2-C3	-2.20	106.97	109.67
2	D	1	NAG	O4-C4-C5	-2.16	103.93	109.30
2	G	2	FUC	O2-C2-C1	2.12	113.50	109.15

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	F	2	NAG	C1-C2-N2-C7
2	D	1	NAG	C4-C5-C6-O6
2	D	1	NAG	O5-C5-C6-O6
3	E	3	MAN	C4-C5-C6-O6
5	H	2	BMA	O5-C5-C6-O6
5	H	3	MAN	C4-C5-C6-O6
3	E	3	MAN	O5-C5-C6-O6
5	H	2	BMA	C4-C5-C6-O6
3	E	4	NAG	O5-C5-C6-O6
5	H	3	MAN	O5-C5-C6-O6
5	H	1	NAG	O5-C5-C6-O6
4	I	1	MAN	O5-C5-C6-O6
3	E	4	NAG	C4-C5-C6-O6
5	H	4	MAN	O5-C5-C6-O6
4	F	2	NAG	O5-C5-C6-O6

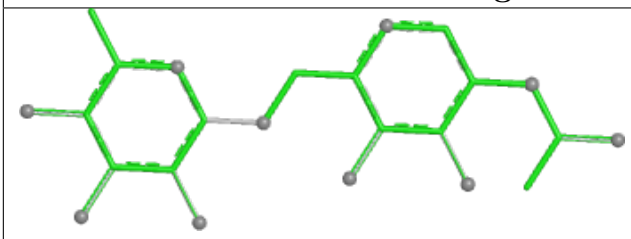
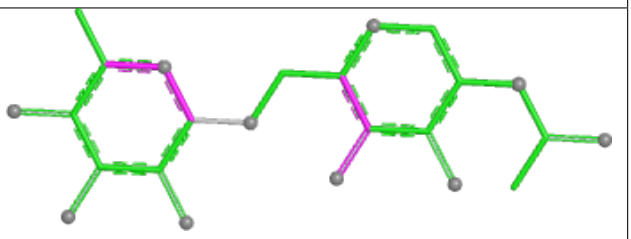
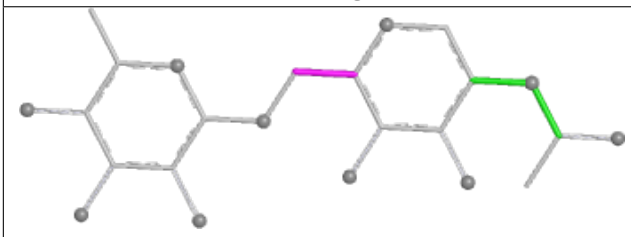
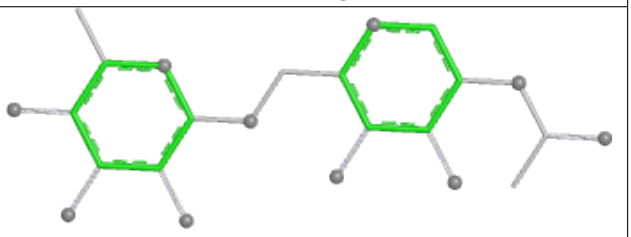
All (1) ring outliers are listed below:

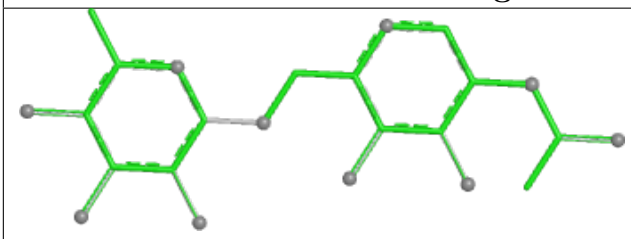
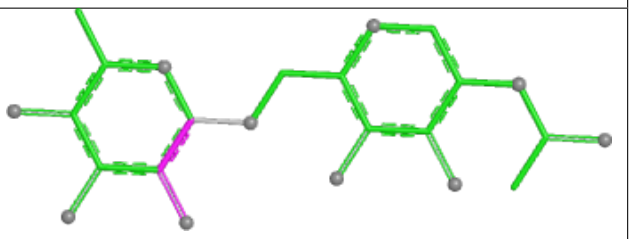
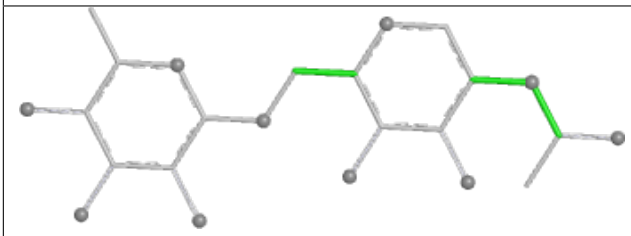
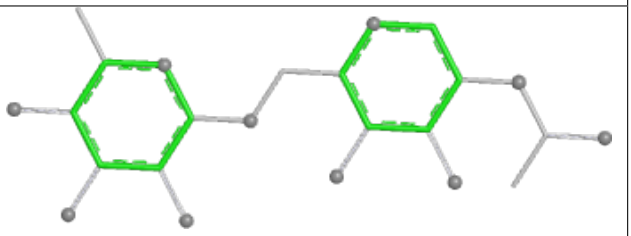
Mol	Chain	Res	Type	Atoms
5	H	4	MAN	C1-C2-C3-C4-C5-O5

4 monomers are involved in 4 short contacts:

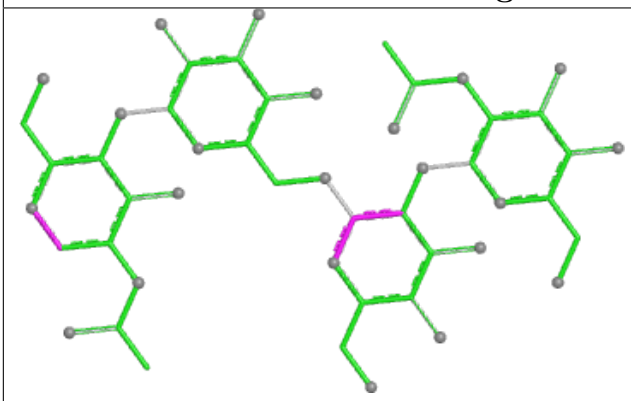
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	4	NAG	1	0
3	E	2	BMA	1	0
5	H	1	NAG	1	0
4	F	1	MAN	2	0

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

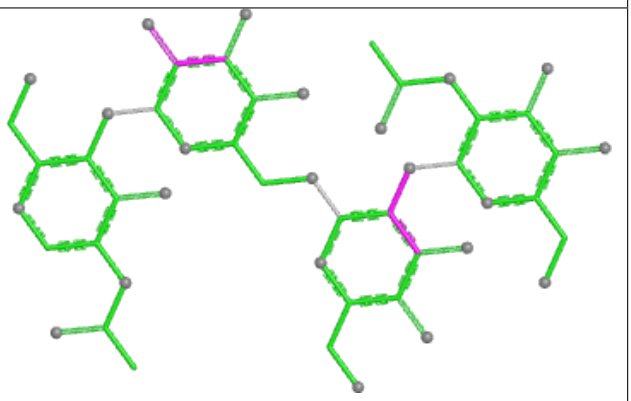
Oligosaccharide Chain D	
 Bond lengths	 Bond angles
 Torsions	 Rings

Oligosaccharide Chain G	
 Bond lengths	 Bond angles
 Torsions	 Rings

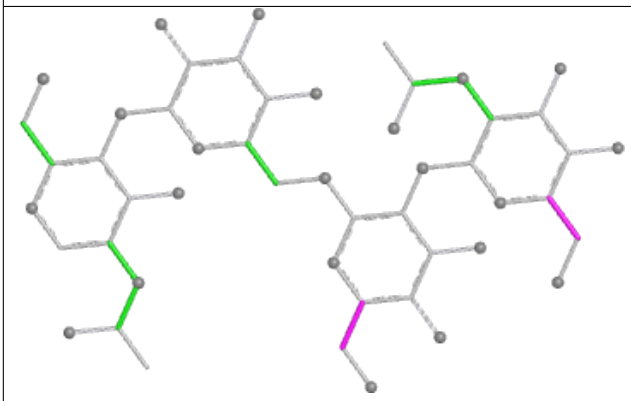
Oligosaccharide Chain E



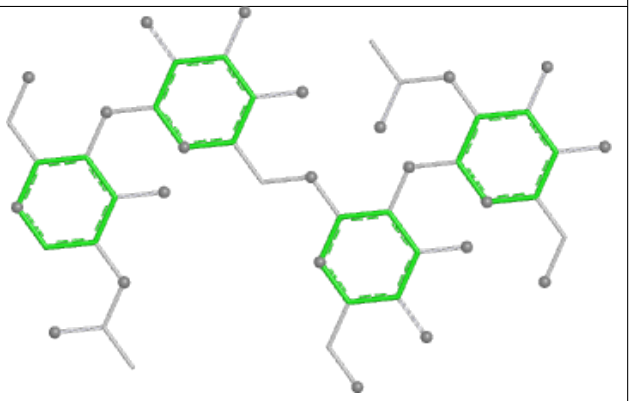
Bond lengths



Bond angles

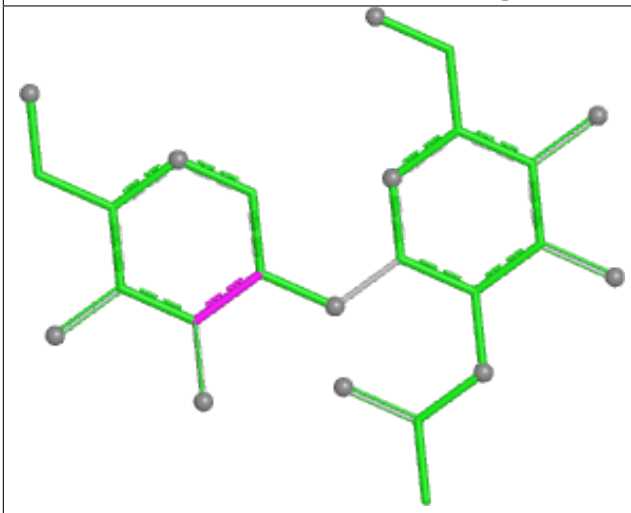


Torsions

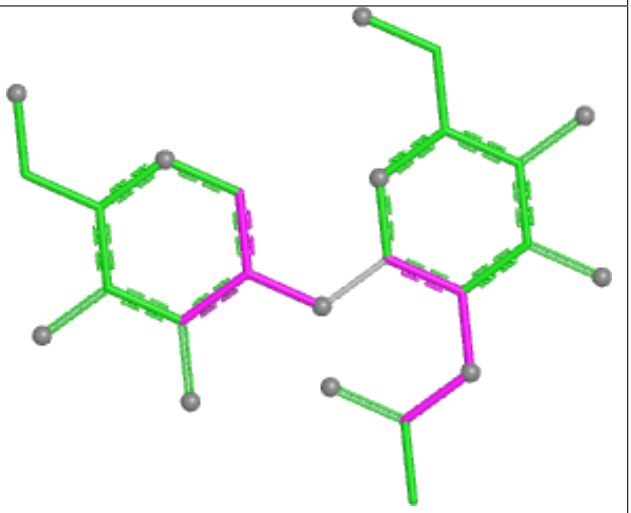


Rings

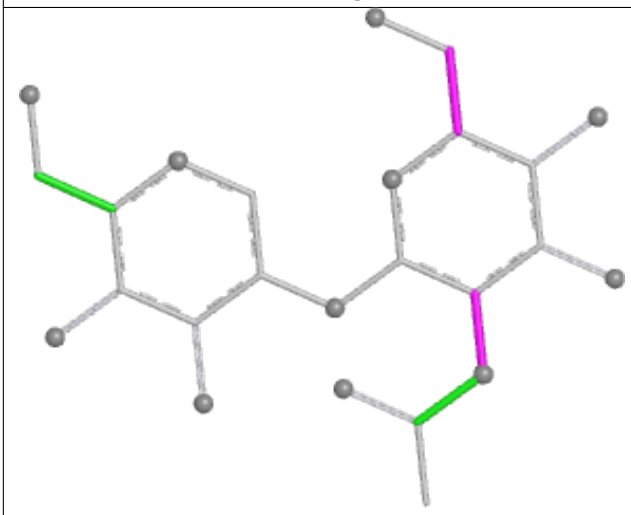
Oligosaccharide Chain F



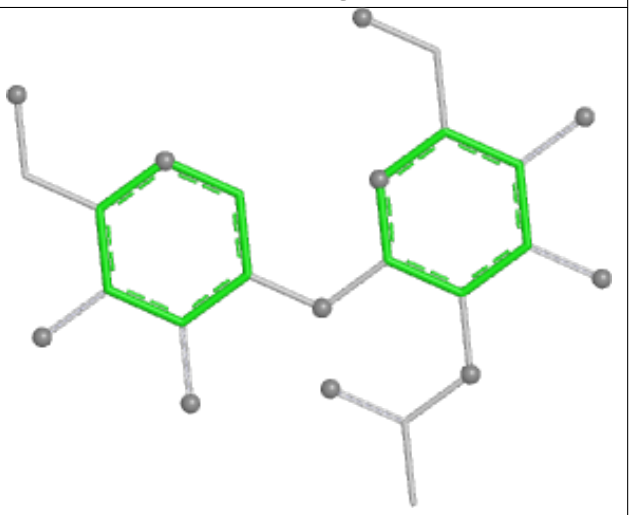
Bond lengths



Bond angles

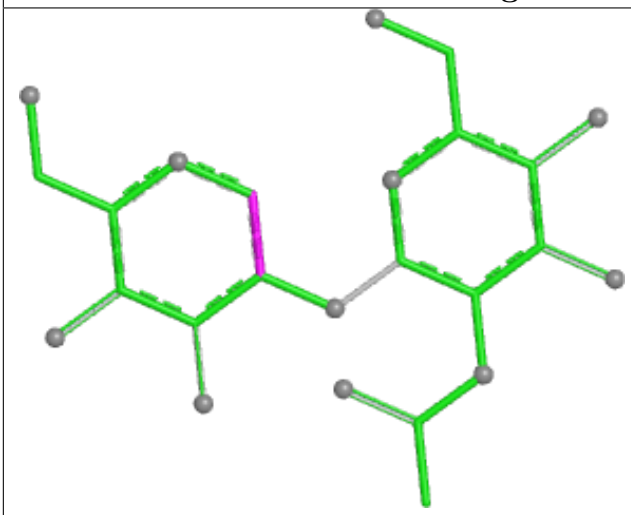


Torsions

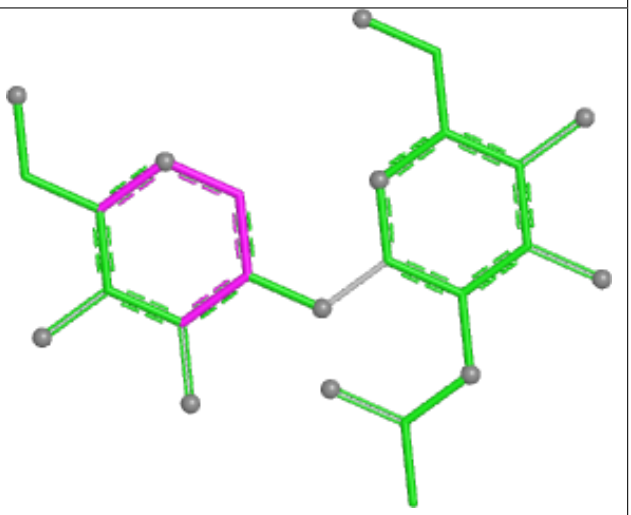


Rings

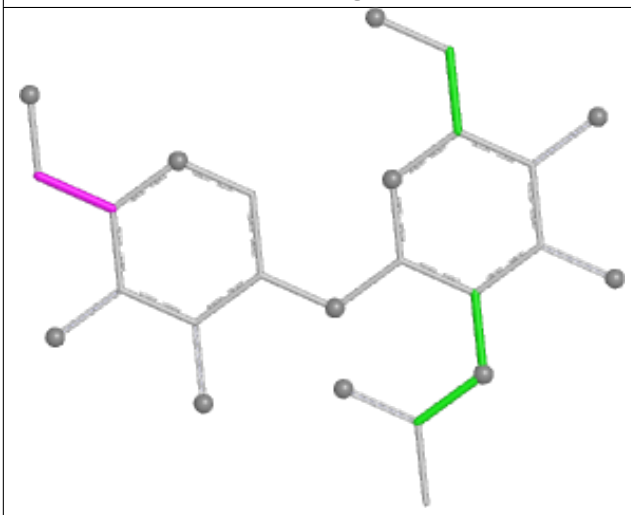
Oligosaccharide Chain I



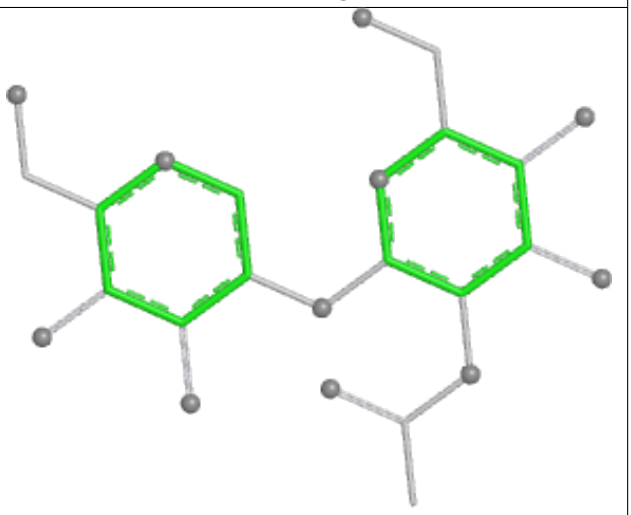
Bond lengths



Bond angles

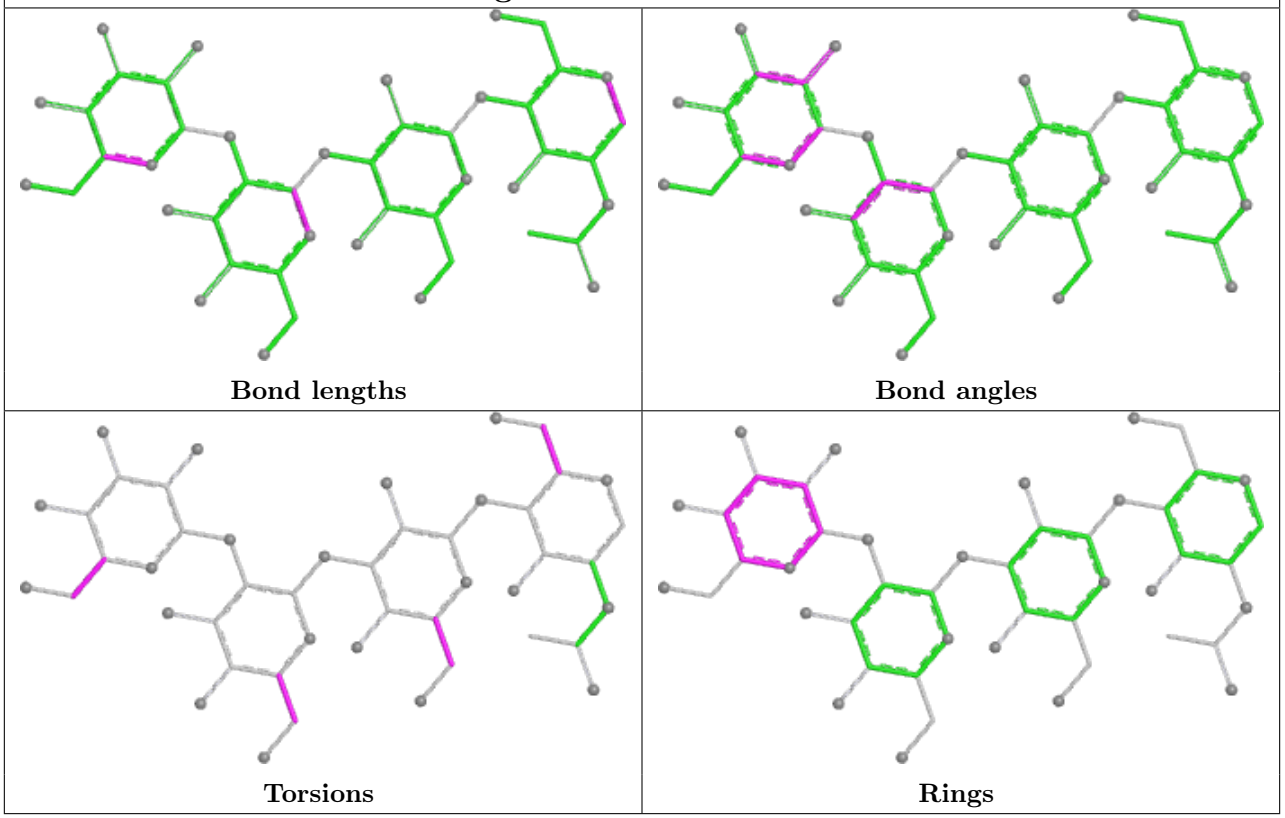


Torsions



Rings

Oligosaccharide Chain H



5.6 Ligand geometry (i)

8 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
6	NAG	B	501	6,1	14,14,15	0.37	0	17,19,21	0.76	0
7	BMA	B	503	8,6	11,11,12	1.80	2 (18%)	15,15,17	2.02	3 (20%)
9	FUC	B	508	-	10,10,11	1.36	2 (20%)	14,14,16	2.03	4 (28%)
6	NAG	B	502	7,6	14,14,15	0.91	1 (7%)	17,19,21	0.60	0
6	NAG	B	507	8	14,14,15	0.23	0	17,19,21	0.56	0
8	MAN	B	505	6	11,11,12	1.31	3 (27%)	15,15,17	1.25	2 (13%)
6	NAG	B	506	8	14,14,15	0.75	1 (7%)	17,19,21	0.61	1 (5%)
8	MAN	B	504	7,6	11,11,12	0.91	0	15,15,17	1.02	2 (13%)

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
6	NAG	B	501	6,1	-	2/6/23/26	0/1/1/1
7	BMA	B	503	8,6	-	2/2/19/22	0/1/1/1
9	FUC	B	508	-	-	-	0/1/1/1
6	NAG	B	502	7,6	-	0/6/23/26	0/1/1/1
6	NAG	B	507	8	-	2/6/23/26	0/1/1/1
8	MAN	B	505	6	-	2/2/19/22	0/1/1/1
6	NAG	B	506	8	-	2/6/23/26	0/1/1/1
8	MAN	B	504	7,6	-	0/2/19/22	0/1/1/1

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	B	503	BMA	O5-C1	-4.72	1.36	1.43
6	B	502	NAG	O5-C1	-3.23	1.38	1.43
7	B	503	BMA	C6-C5	-2.72	1.42	1.51
9	B	508	FUC	C1-C2	2.66	1.58	1.52
6	B	506	NAG	O5-C1	-2.66	1.39	1.43
8	B	505	MAN	O5-C1	-2.59	1.39	1.43
8	B	505	MAN	C1-C2	-2.39	1.46	1.52
9	B	508	FUC	O5-C5	2.01	1.47	1.43
8	B	505	MAN	O2-C2	-2.00	1.39	1.43

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	B	503	BMA	C1-O5-C5	4.82	118.72	112.19
9	B	508	FUC	O5-C1-C2	4.10	117.10	110.77
9	B	508	FUC	C1-C2-C3	3.93	114.49	109.67
7	B	503	BMA	O5-C5-C6	-3.92	101.05	107.20
9	B	508	FUC	C1-O5-C5	3.61	120.97	112.78
7	B	503	BMA	C6-C5-C4	-3.42	105.00	113.00
8	B	505	MAN	O2-C2-C3	-2.23	105.68	110.14
8	B	504	MAN	O2-C2-C3	-2.21	105.72	110.14
9	B	508	FUC	O2-C2-C1	2.20	113.66	109.15
8	B	504	MAN	C1-O5-C5	2.14	115.09	112.19
8	B	505	MAN	O2-C2-C1	-2.10	104.85	109.15
6	B	506	NAG	C1-O5-C5	2.00	114.91	112.19

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	B	506	NAG	C4-C5-C6-O6
8	B	505	MAN	O5-C5-C6-O6
6	B	501	NAG	O5-C5-C6-O6
6	B	506	NAG	O5-C5-C6-O6
8	B	505	MAN	C4-C5-C6-O6
6	B	507	NAG	C8-C7-N2-C2
6	B	507	NAG	O7-C7-N2-C2
6	B	501	NAG	C4-C5-C6-O6
7	B	503	BMA	O5-C5-C6-O6
7	B	503	BMA	C4-C5-C6-O6

There are no ring outliers.

4 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	501	NAG	2	0
7	B	503	BMA	1	0
9	B	508	FUC	2	0
8	B	505	MAN	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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	210/225 (93%)	0.82	8 (3%) 40 46	30, 44, 66, 91	0
1	B	208/225 (92%)	1.21	39 (18%) 1 1	37, 59, 80, 91	0
1	C	208/225 (92%)	0.87	11 (5%) 26 32	27, 40, 67, 84	0
All	All	626/675 (92%)	0.97	58 (9%) 8 11	27, 47, 75, 91	0

All (58) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	236	GLY	7.4
1	C	268	HIS	6.6
1	B	282	VAL	6.0
1	C	296	TYR	5.5
1	B	237	GLY	5.3
1	B	418	GLN	5.1
1	B	254	THR	5.0
1	A	296	TYR	5.0
1	B	329	PRO	5.0
1	C	272	GLU	4.3
1	B	318	GLU	4.2
1	B	296	TYR	3.7
1	A	445	PRO	3.7
1	B	309	LEU	3.6
1	B	419	GLN	3.6
1	B	276	ASN	3.5
1	B	340	LYS	3.5
1	B	412	VAL	3.3
1	C	292	ARG	3.2
1	B	281	GLY	3.0
1	B	310	HIS	3.0
1	A	246	LYS	3.0
1	B	384	ASN	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	444	SER	2.9
1	B	443	LEU	2.9
1	B	308	VAL	2.8
1	B	277	TRP	2.8
1	B	253	ILE	2.8
1	B	385	GLY	2.7
1	C	269	GLU	2.6
1	B	416	ARG	2.5
1	A	336	ILE	2.5
1	B	440	SER	2.5
1	B	298	SER	2.5
1	B	415	SER	2.5
1	B	330	ALA	2.4
1	B	314	LEU	2.4
1	C	250	THR	2.4
1	C	385	GLY	2.4
1	B	328	LEU	2.3
1	B	259	VAL	2.3
1	C	289	THR	2.2
1	A	416[A]	ARG	2.2
1	B	312	ASP	2.2
1	A	422	VAL	2.2
1	B	319	TYR	2.2
1	B	434	PHE	2.1
1	A	298	SER	2.1
1	B	257	PRO	2.1
1	B	286	ASN	2.1
1	C	328	LEU	2.1
1	B	410	LEU	2.1
1	B	305	VAL	2.1
1	B	323	VAL	2.1
1	C	330	ALA	2.1
1	B	373	TYR	2.1
1	B	386	GLN	2.0
1	B	287	ALA	2.0

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)

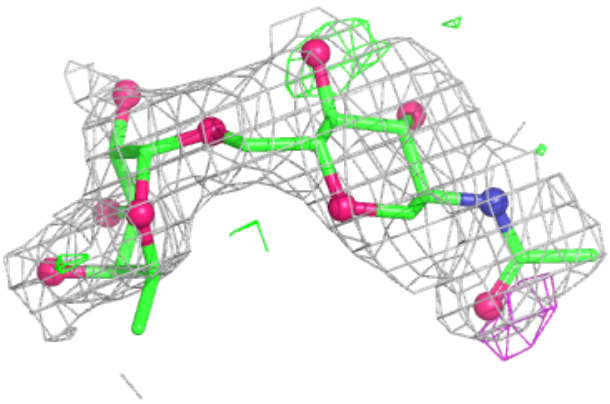
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

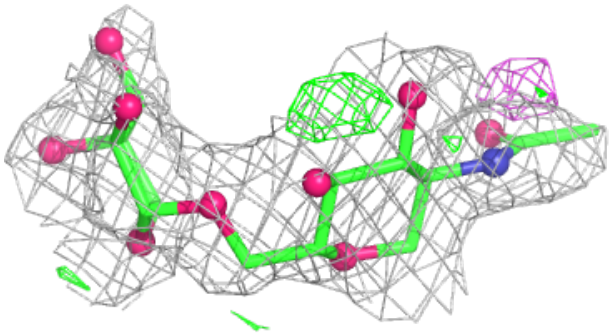
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MAN	F	1	11/12	0.09	0.35	89,96,99,101	0
4	NAG	F	2	14/15	0.48	0.40	98,103,106,109	0
2	FUC	G	2	10/11	0.56	0.28	62,68,73,77	0
3	NAG	E	4	14/15	0.60	0.21	64,65,68,69	0
5	MAN	H	4	11/12	0.63	0.32	88,91,98,99	0
3	MAN	E	3	11/12	0.65	0.23	63,65,70,72	0
5	MAN	H	3	11/12	0.71	0.27	71,79,88,88	0
2	FUC	D	2	10/11	0.73	0.40	75,79,83,85	0
4	MAN	I	1	11/12	0.75	0.20	52,57,66,70	0
4	NAG	I	2	14/15	0.76	0.20	48,52,57,57	0
3	NAG	E	1	14/15	0.78	0.23	50,53,57,58	0
3	BMA	E	2	11/12	0.79	0.16	50,57,63,69	0
2	NAG	G	1	14/15	0.81	0.15	46,53,61,64	0
2	NAG	D	1	14/15	0.81	0.19	49,61,68,69	0
5	NAG	H	1	14/15	0.86	0.18	43,49,63,68	0
5	BMA	H	2	11/12	0.88	0.22	51,58,67,71	0

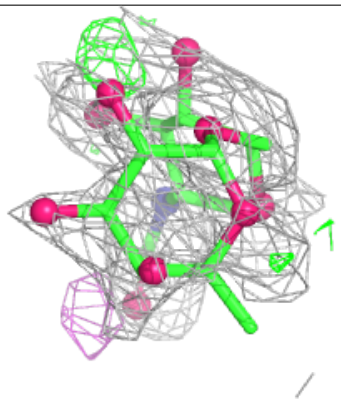
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain D:

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

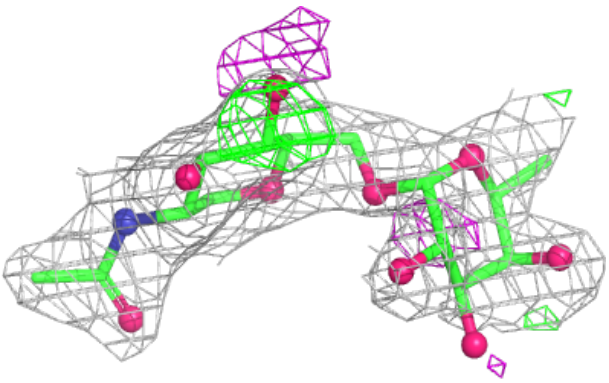


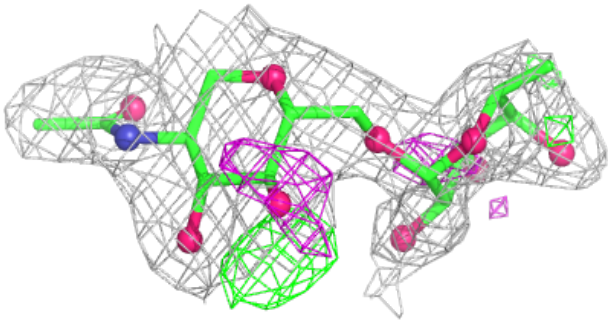


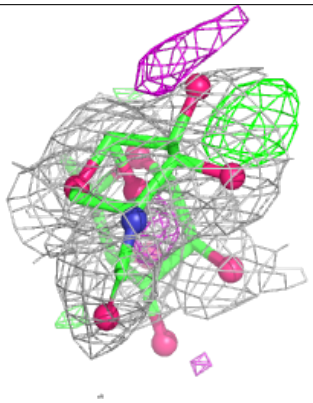


Electron density around Chain G:

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

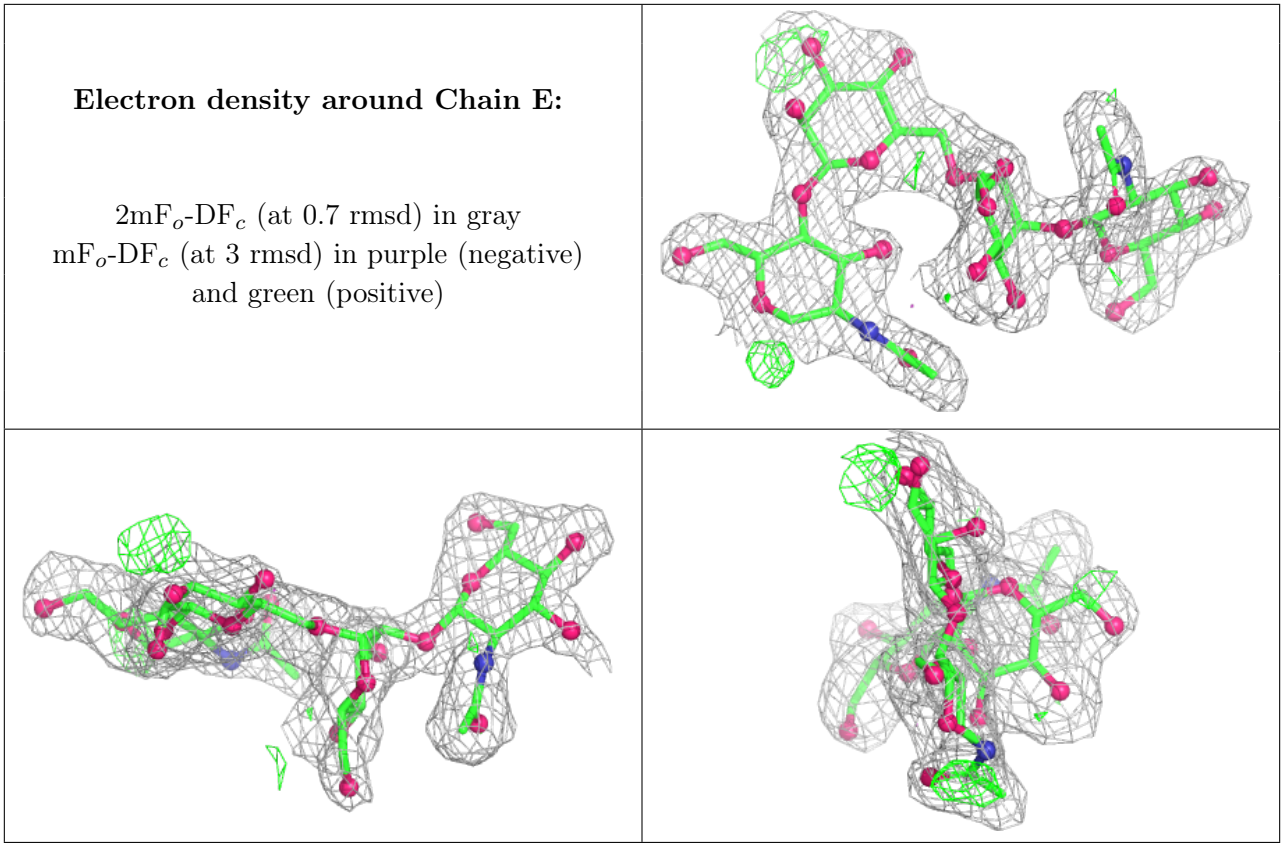






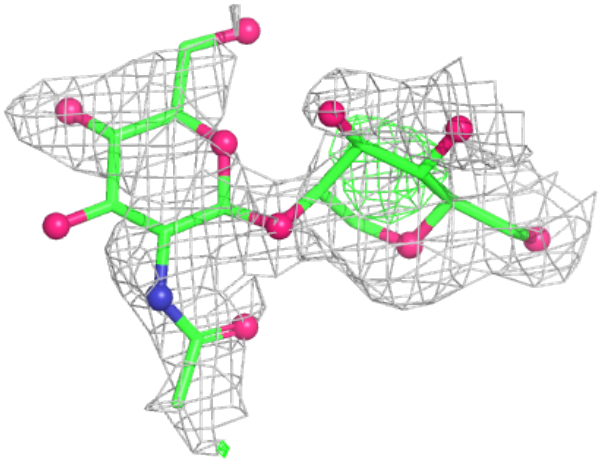
Electron density around Chain E:

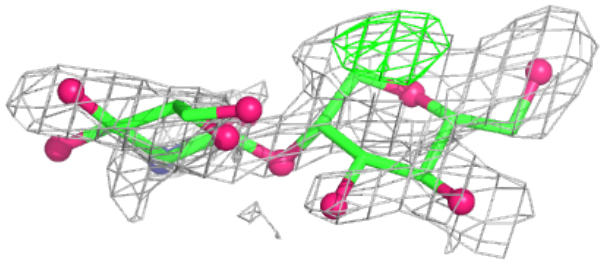
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

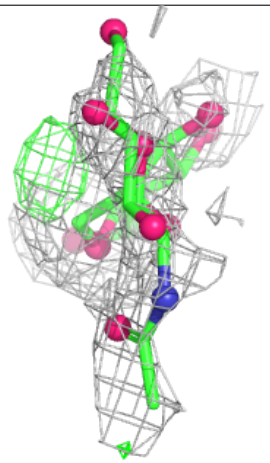


Electron density around Chain F:

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

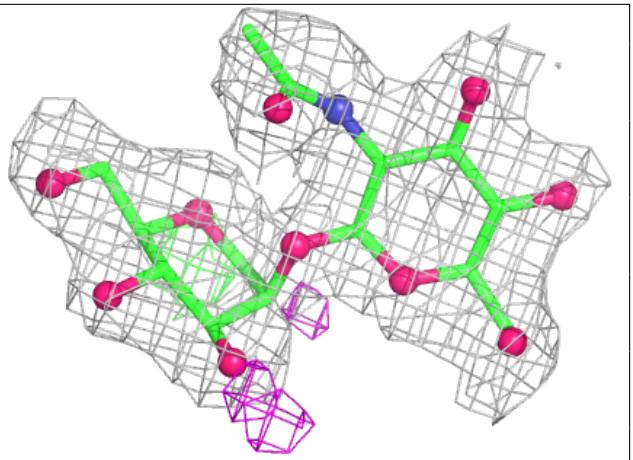


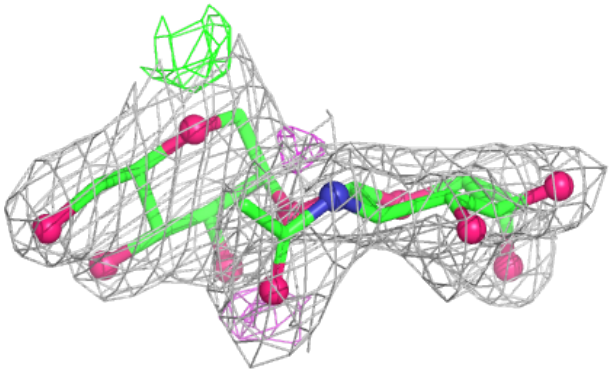


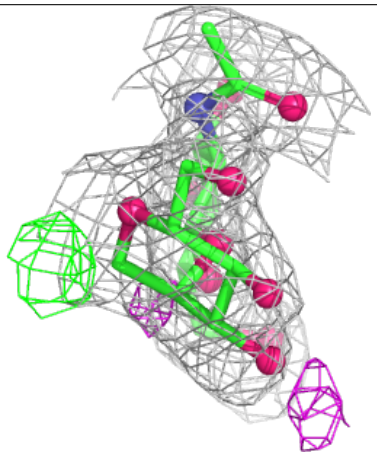


Electron density around Chain I:

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

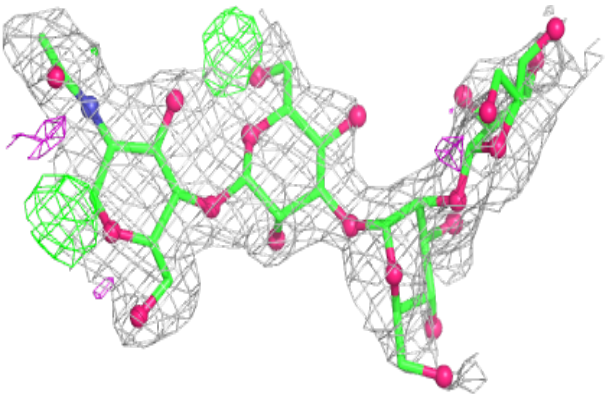


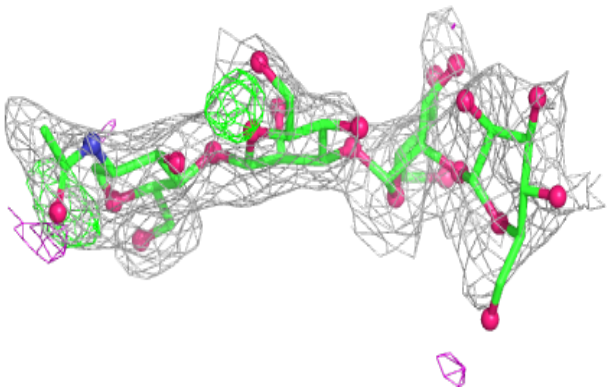


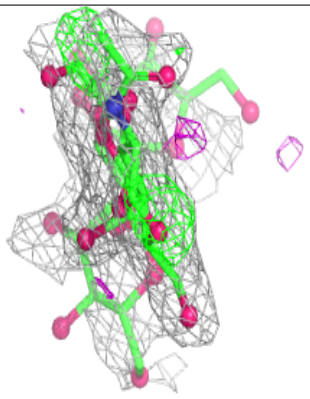


Electron density around Chain H:

$2mF_o$-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, 95^{th} 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	FUC	B	508	10/11	0.32	0.38	84,87,90,92	0
8	MAN	B	504	11/12	0.58	0.30	70,72,76,76	0
8	MAN	B	505	11/12	0.59	0.22	60,64,67,70	0
6	NAG	B	506	14/15	0.64	0.34	60,67,70,77	0
6	NAG	B	502	14/15	0.74	0.22	49,59,64,66	0
6	NAG	B	501	14/15	0.75	0.19	55,64,71,72	0
6	NAG	B	507	14/15	0.76	0.26	82,87,92,92	0
7	BMA	B	503	11/12	0.81	0.23	49,59,67,76	0

6.5 Other polymers (i)

There are no such residues in this entry.