wwPDB X-ray Structure Validation Summary Report (i)

Sep 29, 2026 – 02:05 PM EDT

PDB ID	:	37NT / pdb_000037nt
Title	:	Crystal structure of the extracellular region of the human receptor tyrosine kinase MERTK
Authors	:	Zuo, Y.; Starbird, C.A.; Ferguson, K.M.
Deposited on	:	2026-07-29
Resolution	:	3.41 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:

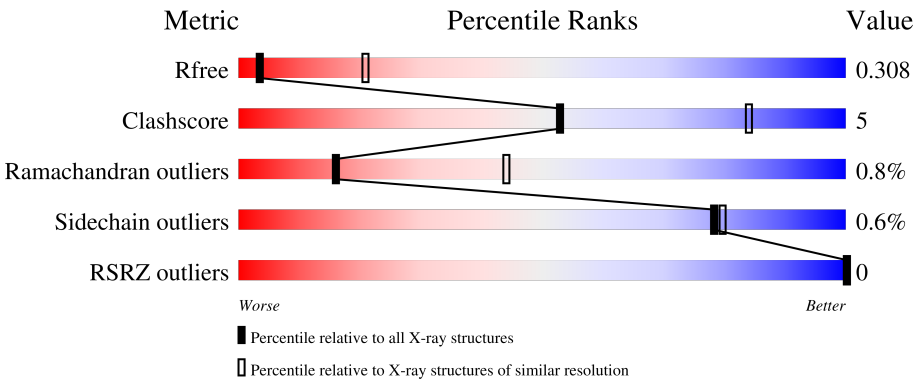
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 3.41 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	1210 (3.48-3.36)
Clashscore	190562	1234 (3.48-3.36)
Ramachandran outliers	187476	1222 (3.48-3.36)
Sidechain outliers	187428	1222 (3.48-3.36)
RSRZ outliers	180081	1210 (3.48-3.36)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	490	67% 13% 20%
2	B	3	100%
2	C	3	100%
2	E	3	33% 67%
3	D	5	100%

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Mol	Chain	Length	Quality of chain
3	F	5	100%
3	G	5	20% 80%
4	H	2	50% 50%
4	I	2	50% 50%
5	J	4	100%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 3435 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.

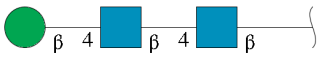
- Molecule 1 is a protein called Tyrosine-protein kinase Mer.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	392	3015	1911	517	574	13	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

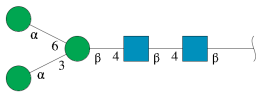
Chain	Residue	Modelled	Actual	Comment	Reference
A	485	HIS	-	expression tag	UNP Q12866
A	486	HIS	-	expression tag	UNP Q12866
A	487	HIS	-	expression tag	UNP Q12866
A	488	HIS	-	expression tag	UNP Q12866
A	489	HIS	-	expression tag	UNP Q12866
A	490	HIS	-	expression tag	UNP Q12866

- Molecule 2 is an oligosaccharide called beta-D-mannopyranose-(1-4)-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	B	3	39	22	2	15	0	0	0
2	C	3	39	22	2	15	0	0	0
2	E	3	39	22	2	15	0	0	0

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-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			
3	D	5	61	34	2	25	0	0	0
3	F	5	61	34	2	25	0	0	0
3	G	5	61	34	2	25	0	0	0

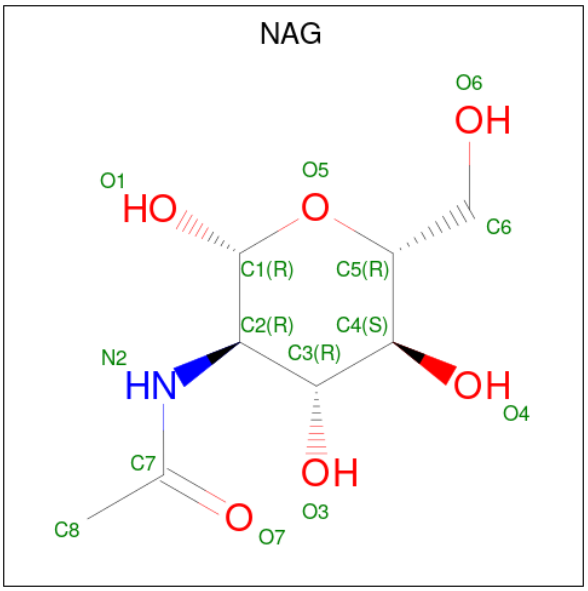
- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

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

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-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			
5	J	4	50	28	2	20	0	0	0

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
6	A	1	14	8	1	5	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: Tyrosine-protein kinase Mer

Chain A: 67% 13% 20%

MET GLY PRO ALA PRO LEU PRO LEU LEU LEU GLY LEU PHE LEU PRO ALA LEU TRP ARG ARG ALA ILE THR GLU ALA ARG GLU GLU ALA LYS PRO TYR PRO LEU PHE PRO GLY PRO PHE PRO GLY SER LEU GLN THR ASP HIS THR PRO LEU LEU SER LEU PRO HIS ALA SER GLY TYR GLN

PRO ALA LEU MET PHE SER PRO THR GLN PRO GLY ARG PRO HIS THR GLY ASN VAL ALA ILE PRO GLN VAL THR SER VAL GLU SER LYS PRO LEU PRO P93 L105 V111 N114 N121 Q124 W131 K132 T154 I162 R167 S168 D169 N170 I174 Q194

H198 E240 Q241 A258 E263 A264 H265 L270 I278 P284 S285 P286 P287 S291 I292 R293 N294 S295 T296 S299 I300 L301 I302 S303 D309 S312 I319 K322 G330 T337 S338 A339 L340 L343 V359 M362 W367 S368 A369 P383 S384

V385 N389 N400 N406 P409 L417 H424 S428 I431 S432 K433 E437 R447 A455 T458 V459 R460 T465 P481 G484 HIS HIS HIS HIS HIS HIS

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

Chain B: 100%

NAG1 NAG2 BMA3

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

Chain C: 100%

NAG1 NAG2 BMA3

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

Chain E: 33% 67%

NAG1 NAG2 BMA3

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

Chain D: 100%

NAG1 NAG2 BMA3 MAN4 MAN5

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

Chain F: 100%

NAG1 NAG2 BMA3 MAN4 MAN5

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

Chain G: 20% 80%

NAG1 NAG2 BMA3 MAN4 MAN5

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

Chain H: 50% 50%

NAG1 NAG2

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

Chain I: 50% 50%

NAG1 NAG2

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

Chain J: 100%

NAG1 NAG2 BMA3 MAN4

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	40.50Å 133.51Å 163.81Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	42.95 – 3.41 42.95 – 3.41	Depositor EDS
% Data completeness (in resolution range)	98.6 (42.95-3.41) 98.6 (42.95-3.41)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.05 (at 3.40Å)	Xtriage
Refinement program	PHENIX 1.21rc1_5127	Depositor
R, R_{free}	0.256 , 0.307 0.256 , 0.308	Depositor DCC
R_{free} test set	618 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å^2)	136.4	Xtriage
Anisotropy	0.063	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 109.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.40$, $< L^2 > = 0.23$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	3435	wwPDB-VP
Average B, all atoms (Å^2)	155.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.55% 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: BMA, MAN, NAG

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	0.11	0/3091	0.32	0/4218

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	3015	0	2962	34	0
2	B	39	0	34	0	0
2	C	39	0	34	0	0
2	E	39	0	34	0	0
3	D	61	0	52	0	0
3	F	61	0	52	0	0
3	G	61	0	52	0	0
4	H	28	0	25	1	0
4	I	28	0	25	0	0
5	J	50	0	43	0	0
6	A	14	0	13	1	0
All	All	3435	0	3326	34	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 5.

The worst 5 of 34 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:428:SER:HB2	1:A:455:ALA:HB2	1.76	0.66
1:A:132:LYS:NZ	1:A:168:SER:O	2.25	0.64
1:A:296:THR:HG1	1:A:299:SER:HG	1.45	0.62
1:A:258:ALA:HB3	1:A:278:ILE:HB	1.81	0.61
1:A:339:ALA:H	4:H:1:NAG:H82	1.65	0.60

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	A	390/490 (80%)	367 (94%)	20 (5%)	3 (1%)	16 44

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	481	PRO
1	A	295	SER
1	A	389	ASN

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	342/425 (80%)	340 (99%)	2 (1%)	78 80

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

Mol	Chain	Res	Type
1	A	114	ASN
1	A	170	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	219	GLN
1	A	453	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

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

5.5 Carbohydrates (i)

32 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	B	1	1,2	14,14,15	0.73	0	17,19,21	1.05	1 (5%)
2	NAG	B	2	2	14,14,15	0.80	0	17,19,21	1.68	3 (17%)
2	BMA	B	3	2	11,11,12	0.79	0	15,15,17	1.71	1 (6%)
2	NAG	C	1	1,2	14,14,15	0.68	0	17,19,21	1.24	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	NAG	C	2	2	14,14,15	0.69	0	17,19,21	0.96	1 (5%)
2	BMA	C	3	2	11,11,12	0.79	0	15,15,17	1.82	1 (6%)
3	NAG	D	1	3,1	14,14,15	0.70	0	17,19,21	0.97	1 (5%)
3	NAG	D	2	3	14,14,15	0.71	0	17,19,21	1.36	3 (17%)
3	BMA	D	3	3	11,11,12	0.71	0	15,15,17	2.35	4 (26%)
3	MAN	D	4	3	11,11,12	0.65	0	15,15,17	1.79	1 (6%)
3	MAN	D	5	3	11,11,12	0.70	0	15,15,17	1.21	1 (6%)
2	NAG	E	1	1,2	14,14,15	0.68	0	17,19,21	0.87	0
2	NAG	E	2	2	14,14,15	0.69	0	17,19,21	0.93	1 (5%)
2	BMA	E	3	2	11,11,12	0.81	0	15,15,17	1.78	1 (6%)
3	NAG	F	1	3,1	14,14,15	0.68	0	17,19,21	0.97	1 (5%)
3	NAG	F	2	3	14,14,15	0.67	0	17,19,21	1.05	1 (5%)
3	BMA	F	3	3	11,11,12	0.83	0	15,15,17	1.98	3 (20%)
3	MAN	F	4	3	11,11,12	0.63	0	15,15,17	1.94	2 (13%)
3	MAN	F	5	3	11,11,12	0.65	0	15,15,17	1.68	1 (6%)
3	NAG	G	1	3,1	14,14,15	0.75	0	17,19,21	0.82	0
3	NAG	G	2	3	14,14,15	0.75	0	17,19,21	1.29	2 (11%)
3	BMA	G	3	3	11,11,12	0.75	0	15,15,17	1.63	2 (13%)
3	MAN	G	4	3	11,11,12	0.65	0	15,15,17	1.64	1 (6%)
3	MAN	G	5	3	11,11,12	0.64	0	15,15,17	1.99	1 (6%)
4	NAG	H	1	4,1	14,14,15	0.69	0	17,19,21	1.13	2 (11%)
4	NAG	H	2	4	14,14,15	0.67	0	17,19,21	0.96	1 (5%)
4	NAG	I	1	4,1	14,14,15	0.74	0	17,19,21	1.23	2 (11%)
4	NAG	I	2	4	14,14,15	0.72	0	17,19,21	0.84	0
5	NAG	J	1	5,1	14,14,15	0.76	0	17,19,21	1.00	1 (5%)
5	NAG	J	2	5	14,14,15	0.70	0	17,19,21	1.00	1 (5%)
5	BMA	J	3	5	11,11,12	0.77	0	15,15,17	1.96	1 (6%)
5	MAN	J	4	5	11,11,12	0.64	0	15,15,17	1.89	1 (6%)

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	B	1	1,2	-	3/6/23/26	0/1/1/1

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

There are no bond length outliers.

The worst 5 of 44 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	3	BMA	C1-O5-C5	7.63	122.41	112.19
3	G	5	MAN	C1-O5-C5	6.63	121.07	112.19
5	J	3	BMA	C1-O5-C5	6.55	120.97	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	4	MAN	C1-O5-C5	6.41	120.78	112.19
5	J	4	MAN	C1-O5-C5	6.39	120.75	112.19

There are no chirality outliers.

5 of 36 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	3	BMA	O5-C5-C6-O6
3	F	3	BMA	C4-C5-C6-O6
2	B	1	NAG	C8-C7-N2-C2
2	B	1	NAG	O7-C7-N2-C2
2	C	2	NAG	C8-C7-N2-C2

5 of 7 ring outliers are listed below:

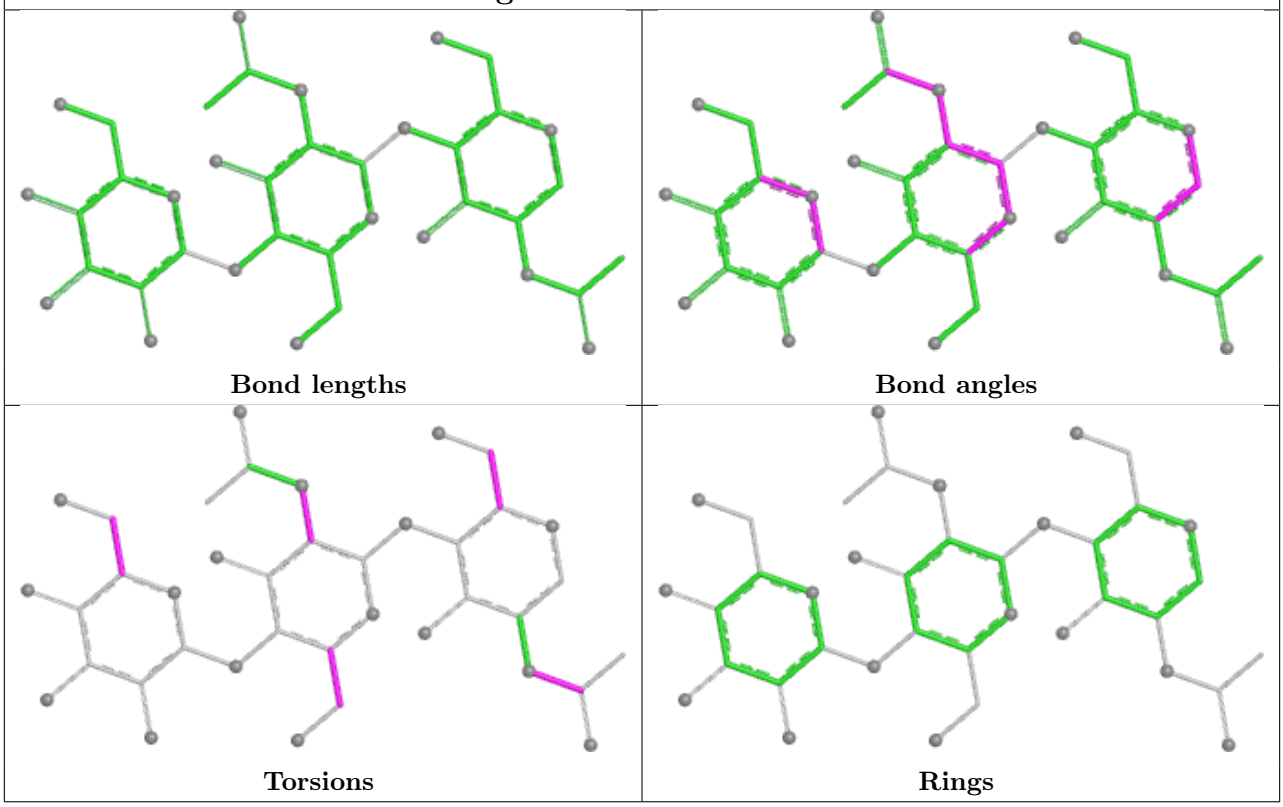
Mol	Chain	Res	Type	Atoms
3	G	5	MAN	C1-C2-C3-C4-C5-O5
3	F	4	MAN	C1-C2-C3-C4-C5-O5
3	D	4	MAN	C1-C2-C3-C4-C5-O5
5	J	4	MAN	C1-C2-C3-C4-C5-O5
3	D	5	MAN	C1-C2-C3-C4-C5-O5

1 monomer is involved in 1 short contact:

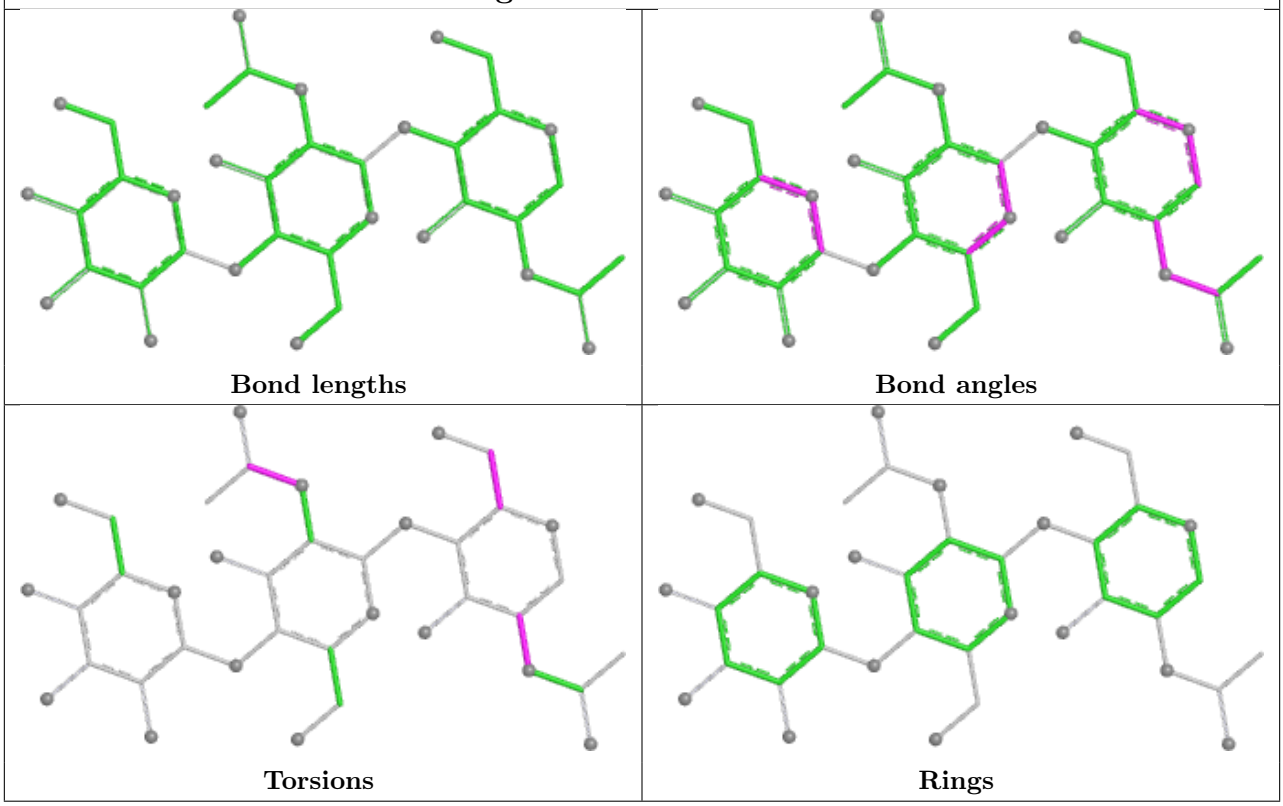
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	H	1	NAG	1	0

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

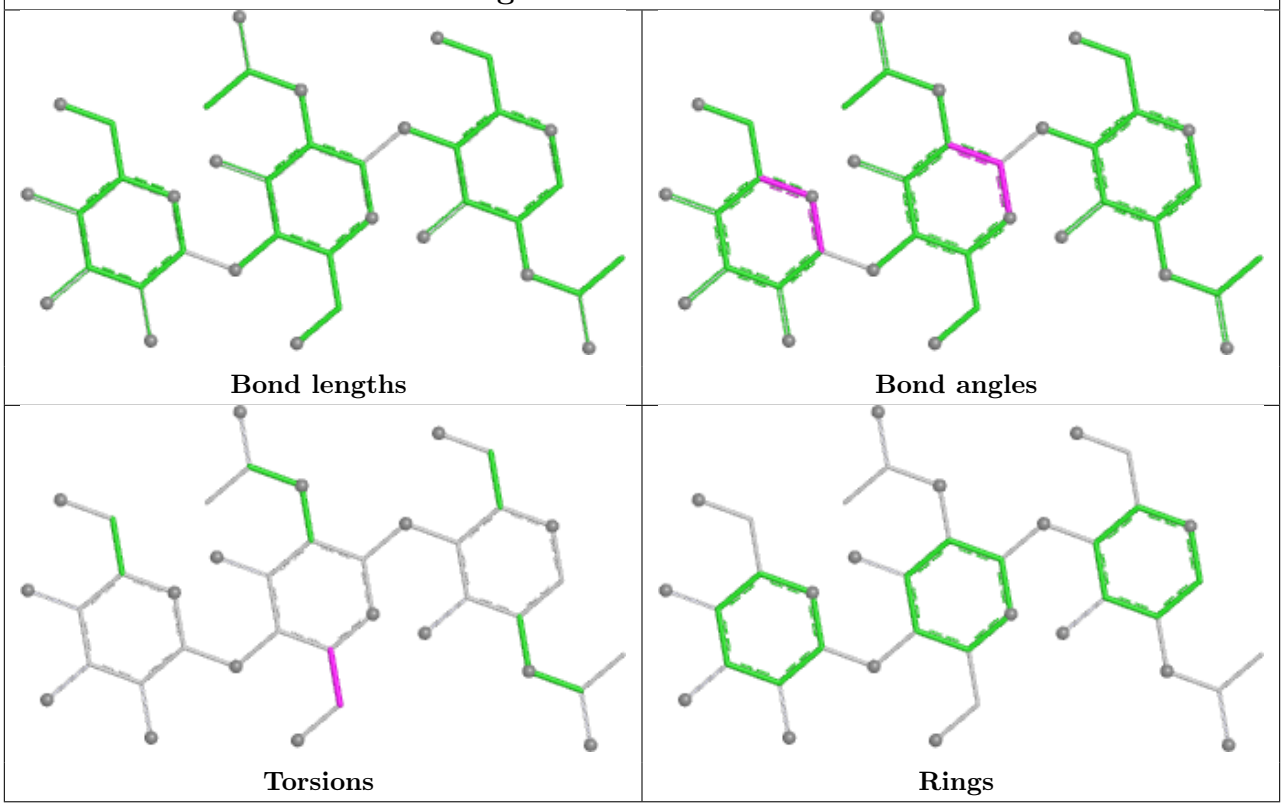
Oligosaccharide Chain B



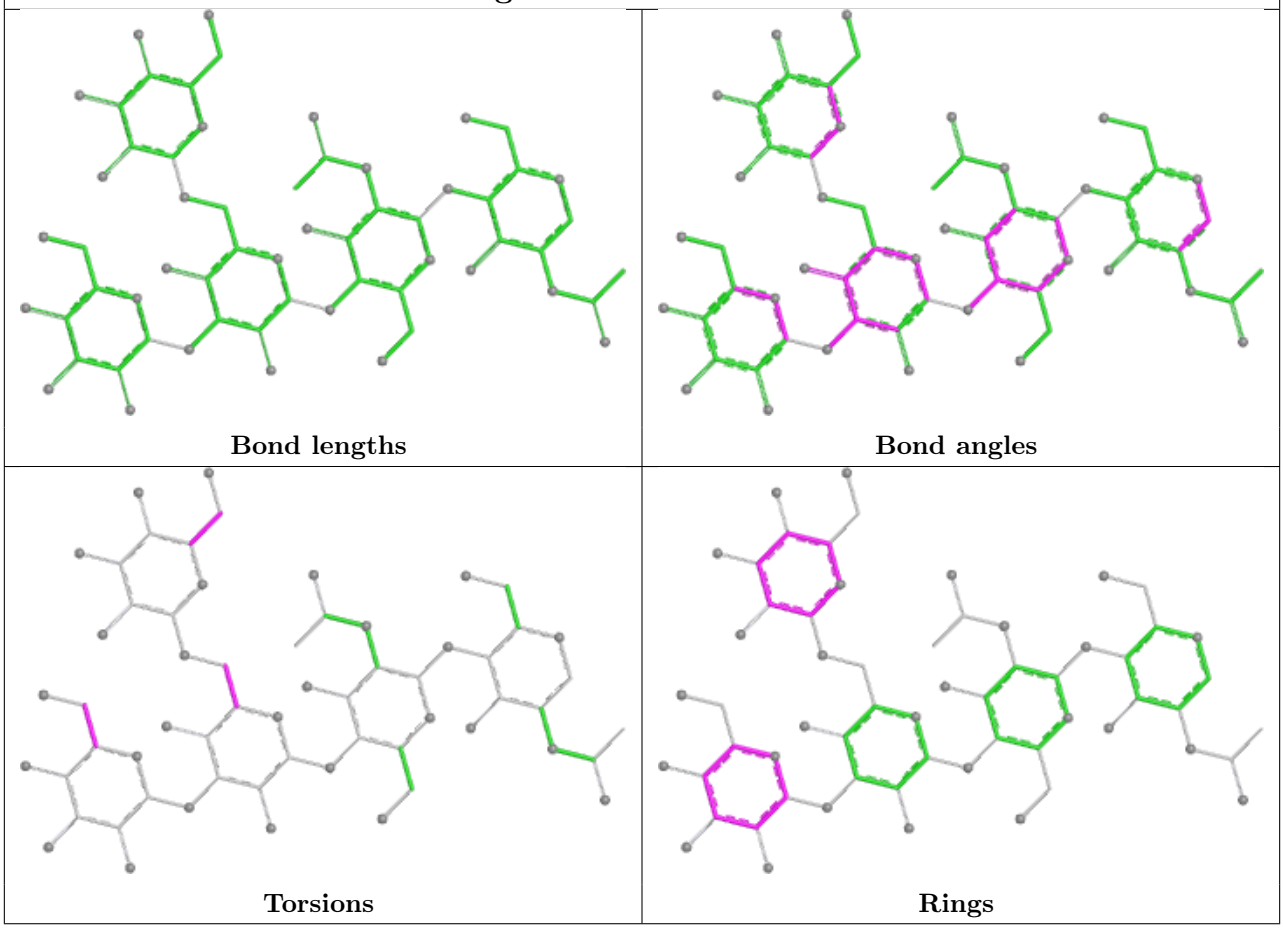
Oligosaccharide Chain C



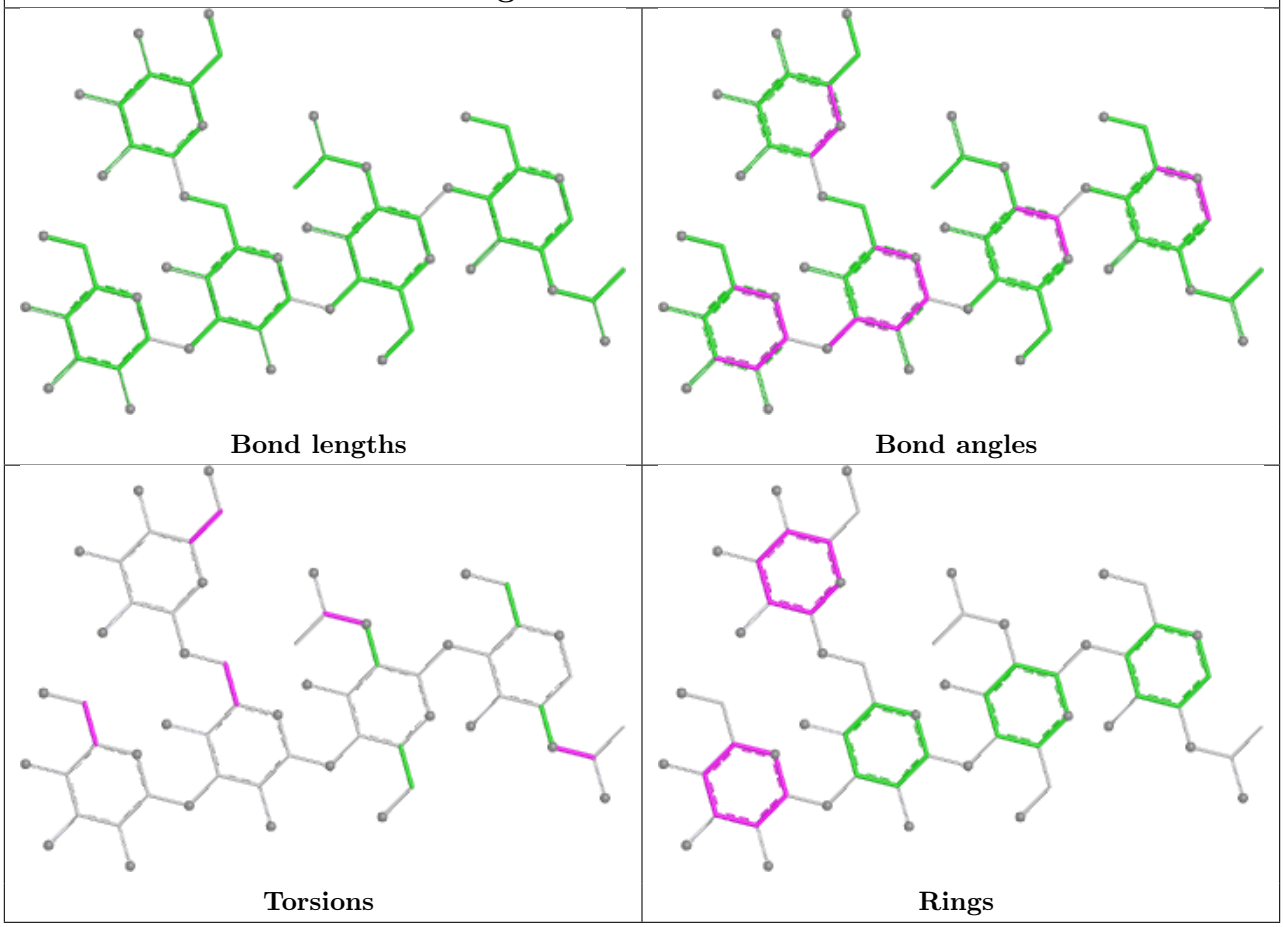
Oligosaccharide Chain E



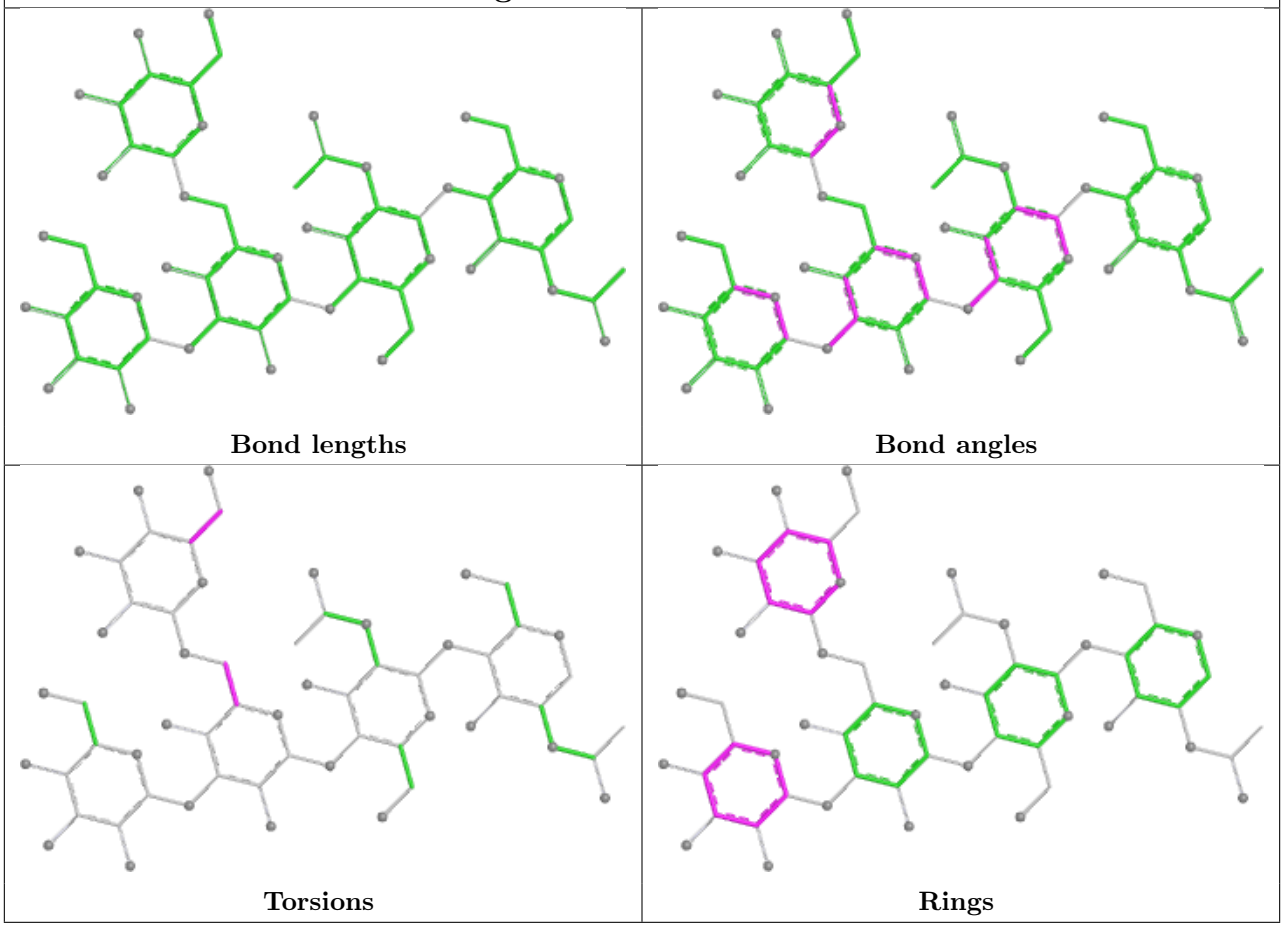
Oligosaccharide Chain D



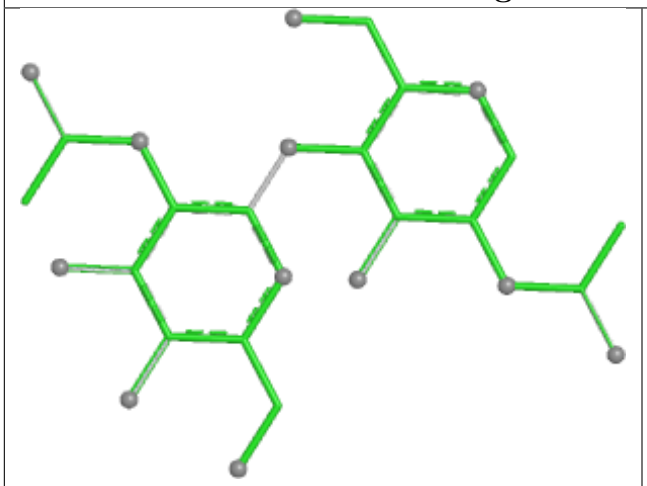
Oligosaccharide Chain F



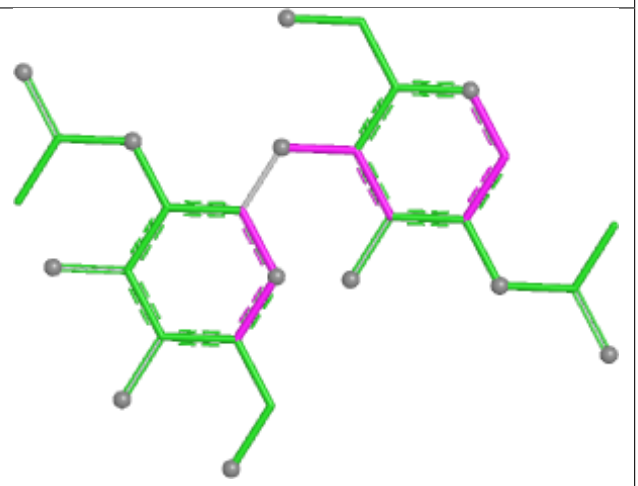
Oligosaccharide Chain G



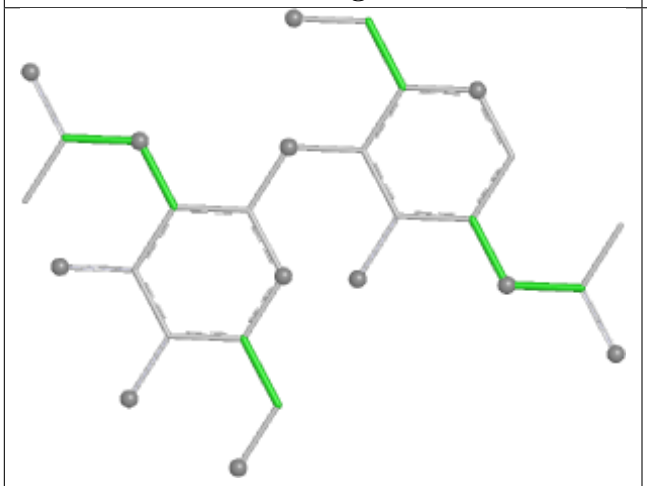
Oligosaccharide Chain H



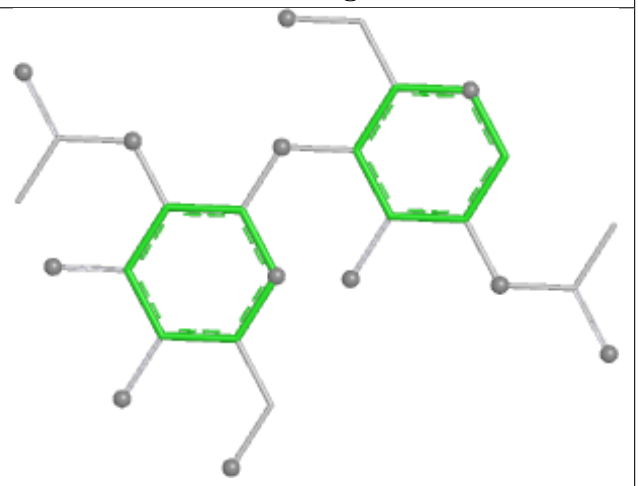
Bond lengths



Bond angles

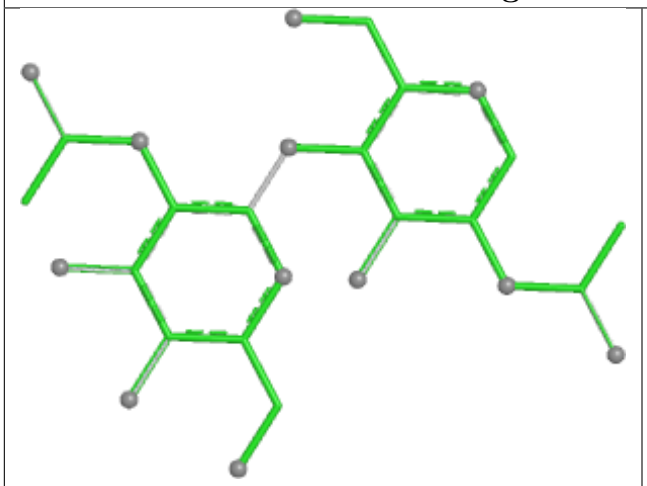


Torsions

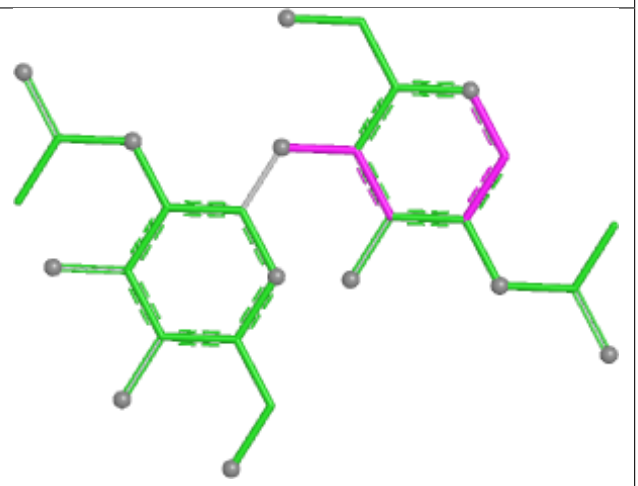


Rings

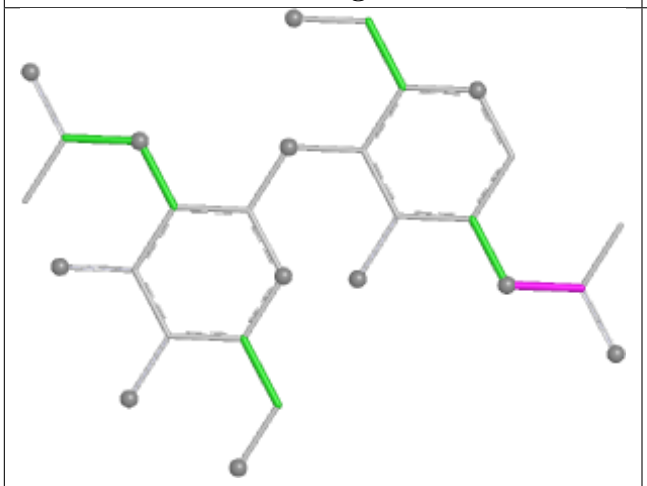
Oligosaccharide Chain I



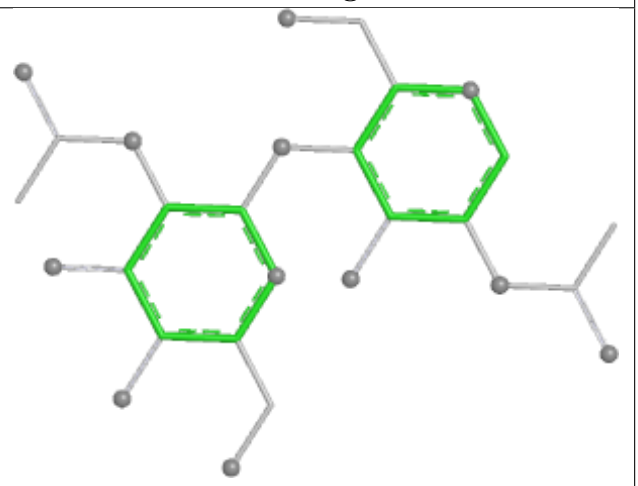
Bond lengths



Bond angles

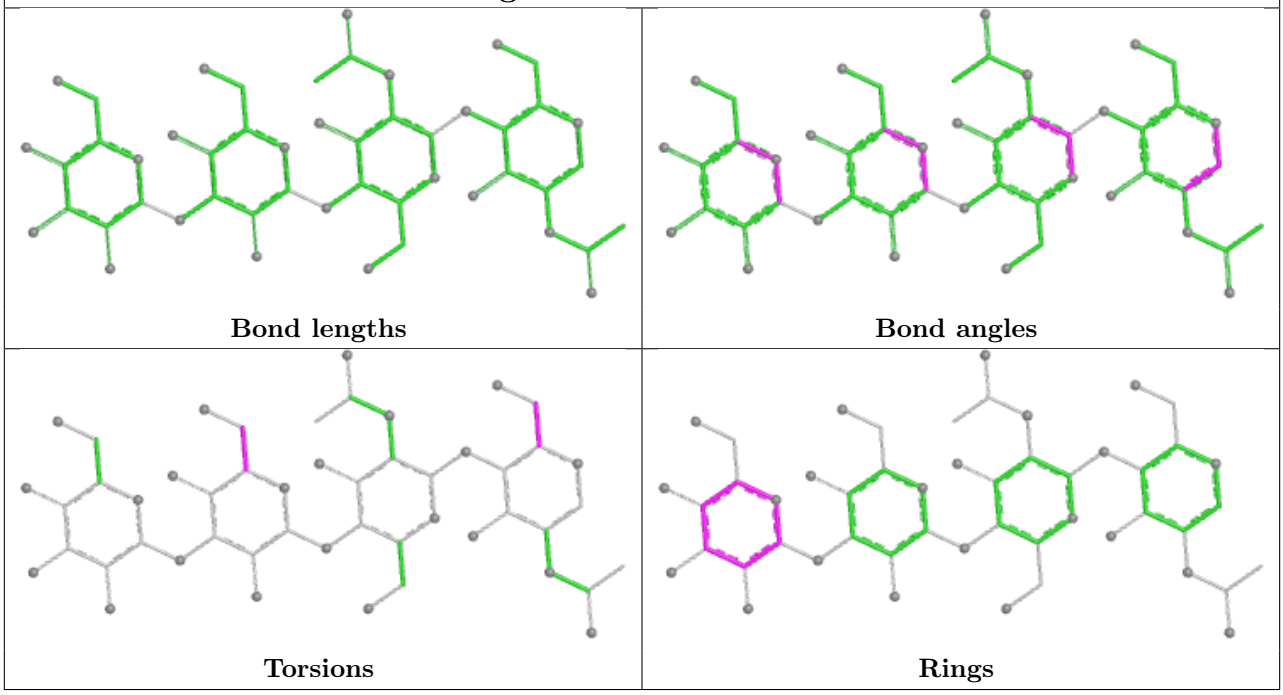


Torsions



Rings

Oligosaccharide Chain J



5.6 Ligand geometry (i)

1 ligand is 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	A	601	1	14,14,15	0.68	0	17,19,21	0.95	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
6	NAG	A	601	1	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	601	NAG	O5-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	601	NAG	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	392/490 (80%)	-0.38	0 100 100	100, 145, 185, 231	0

There are no RSRZ outliers to report.

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
3	MAN	D	4	11/12	0.23	0.10	191,248,258,261	0
3	MAN	G	5	11/12	0.31	0.09	220,255,262,266	0
3	BMA	G	3	11/12	0.45	0.10	245,257,275,289	0
3	MAN	F	4	11/12	0.45	0.10	150,215,249,251	0
5	BMA	J	3	11/12	0.51	0.09	205,228,249,256	0
5	MAN	J	4	11/12	0.52	0.13	198,207,233,236	0
3	MAN	F	5	11/12	0.53	0.09	265,278,294,294	0
2	NAG	B	2	14/15	0.55	0.09	209,241,272,279	0
4	NAG	I	2	14/15	0.56	0.09	163,211,238,240	0
3	MAN	D	5	11/12	0.58	0.09	196,241,259,268	0
3	NAG	G	2	14/15	0.60	0.09	172,211,235,237	0
2	BMA	C	3	11/12	0.60	0.07	177,221,250,251	0
2	BMA	E	3	11/12	0.61	0.07	183,206,235,241	0
4	NAG	H	2	14/15	0.63	0.09	197,239,250,254	0

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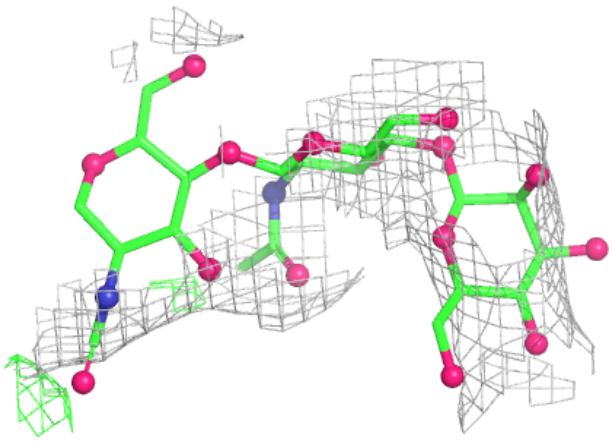
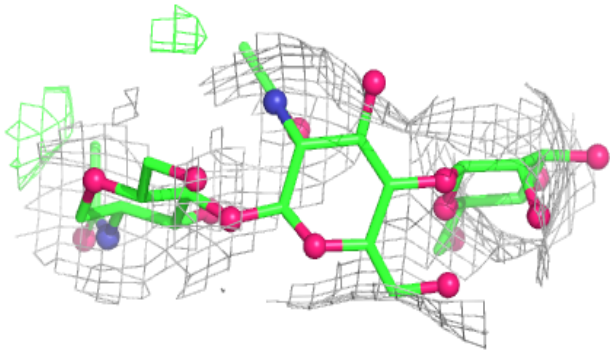
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	NAG	B	1	14/15	0.65	0.11	175,202,235,242	0
3	MAN	G	4	11/12	0.66	0.09	195,225,248,253	0
2	BMA	B	3	11/12	0.66	0.08	243,262,282,283	0
3	BMA	F	3	11/12	0.66	0.08	239,247,263,270	0
2	NAG	E	2	14/15	0.68	0.11	181,212,237,253	0
2	NAG	C	1	14/15	0.73	0.10	135,184,209,218	0
3	BMA	D	3	11/12	0.76	0.06	217,238,247,253	0
2	NAG	C	2	14/15	0.76	0.10	171,216,246,253	0
3	NAG	G	1	14/15	0.77	0.10	135,186,201,205	0
3	NAG	D	2	14/15	0.79	0.10	157,192,236,242	0
3	NAG	F	2	14/15	0.80	0.08	160,194,251,252	0
5	NAG	J	2	14/15	0.80	0.08	201,220,251,270	0
4	NAG	H	1	14/15	0.82	0.07	161,205,231,238	0
2	NAG	E	1	14/15	0.85	0.09	83,153,196,198	0
4	NAG	I	1	14/15	0.85	0.07	157,180,207,210	0
3	NAG	F	1	14/15	0.85	0.07	107,142,175,175	0
5	NAG	J	1	14/15	0.87	0.07	172,189,229,242	0
3	NAG	D	1	14/15	0.92	0.07	121,158,184,193	0

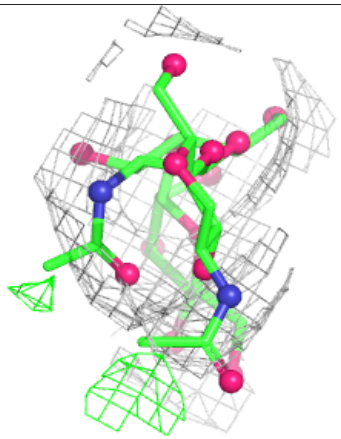
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

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)

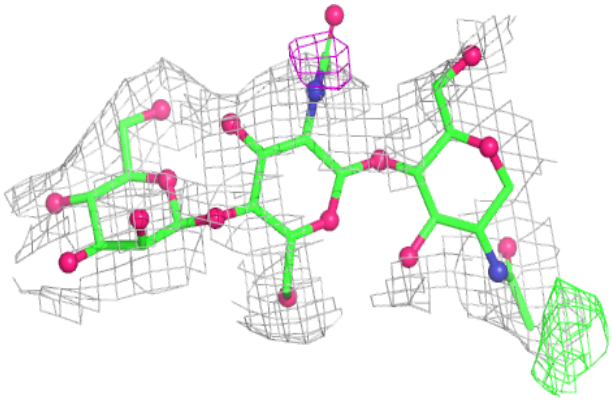


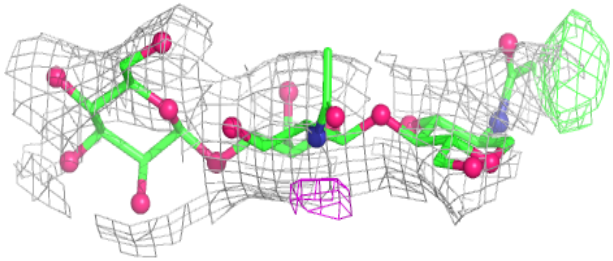


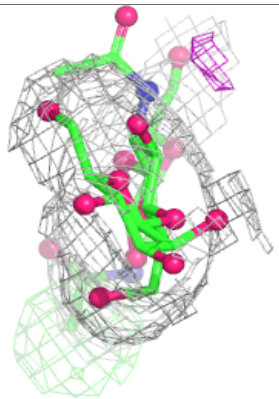


Electron density around Chain C:

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

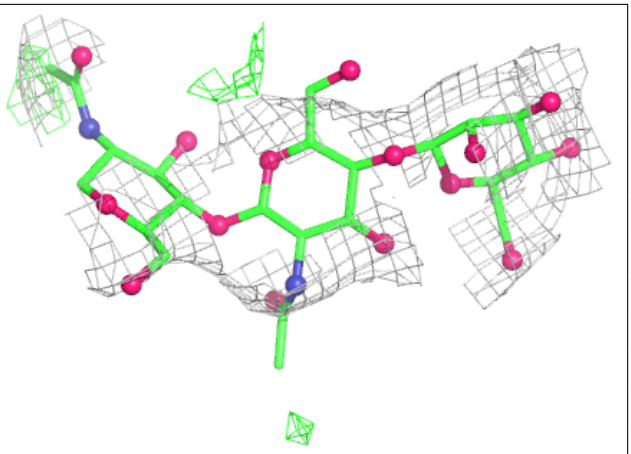


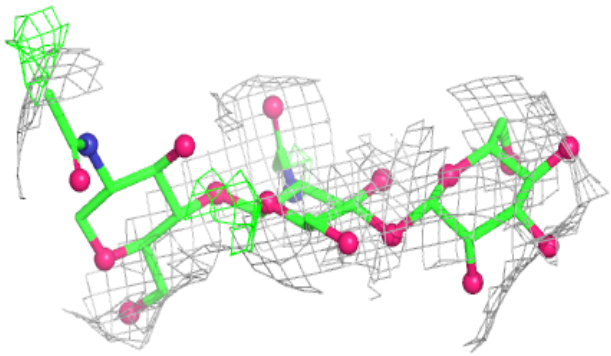


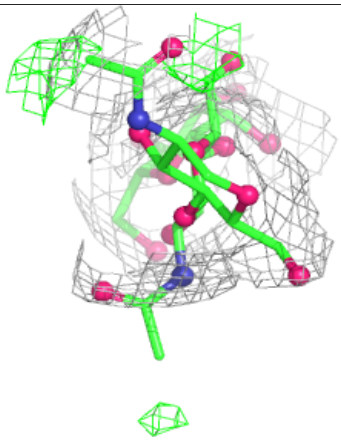


Electron density around Chain E:

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

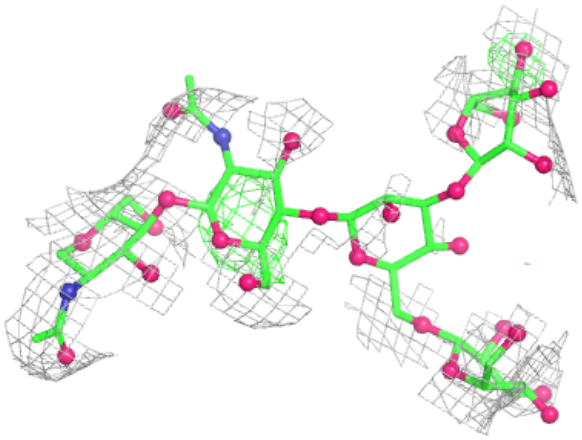


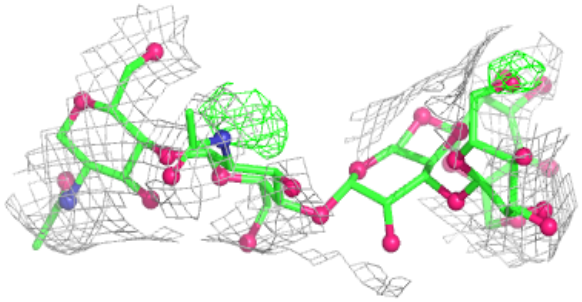


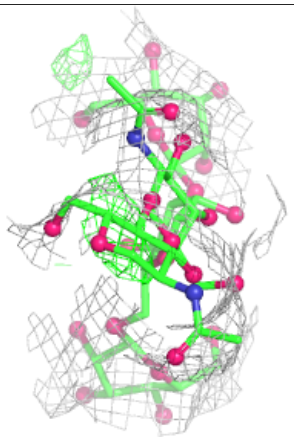


Electron density around Chain D:

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

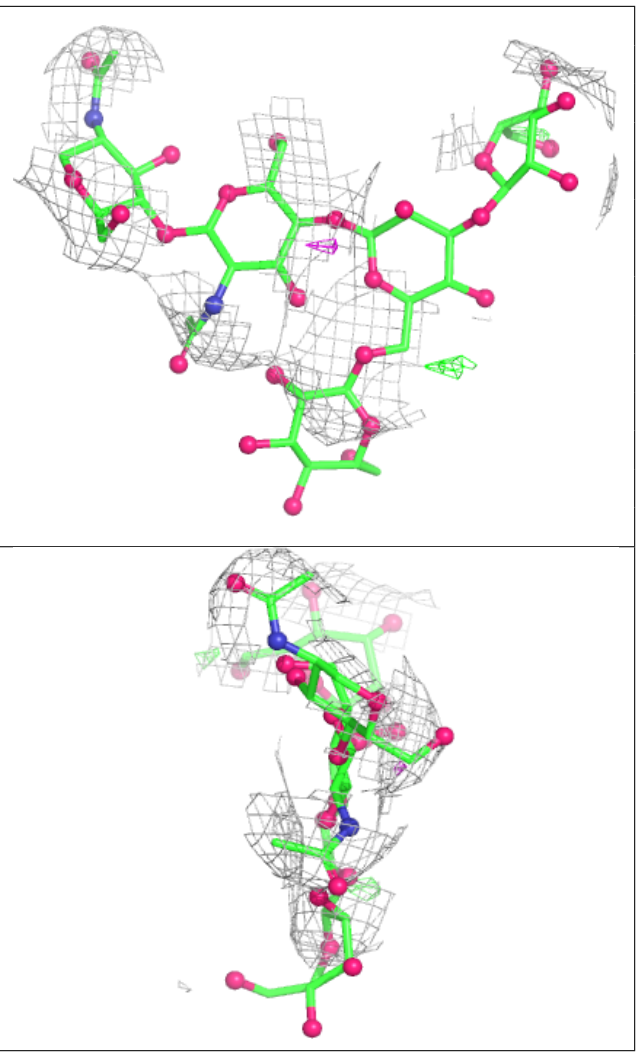






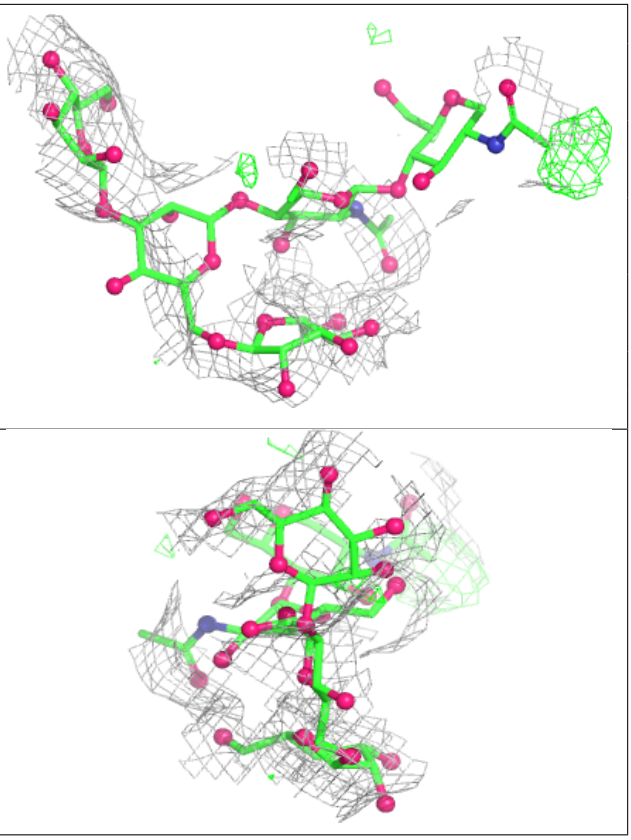
Electron density around Chain F:

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



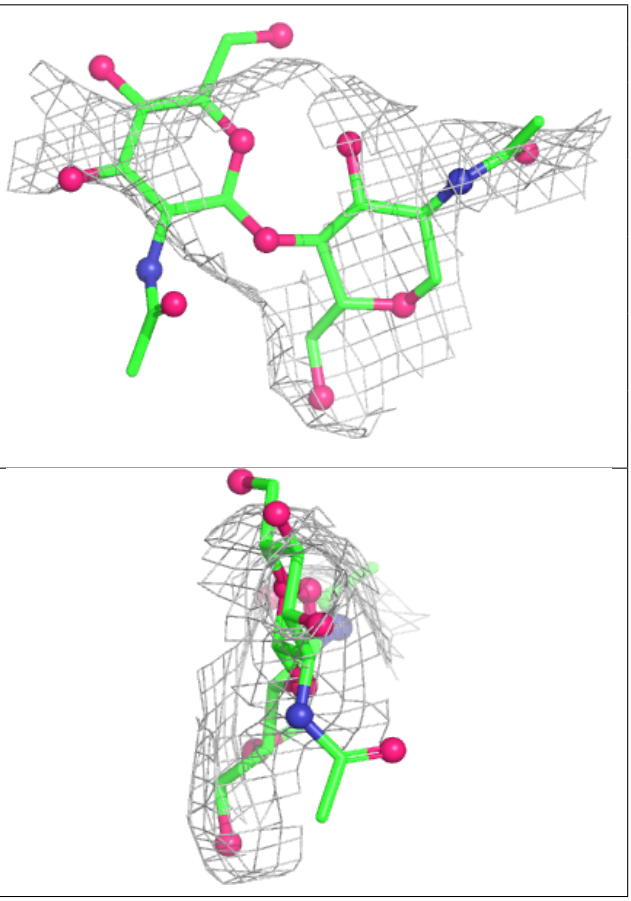
Electron density around Chain G:

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



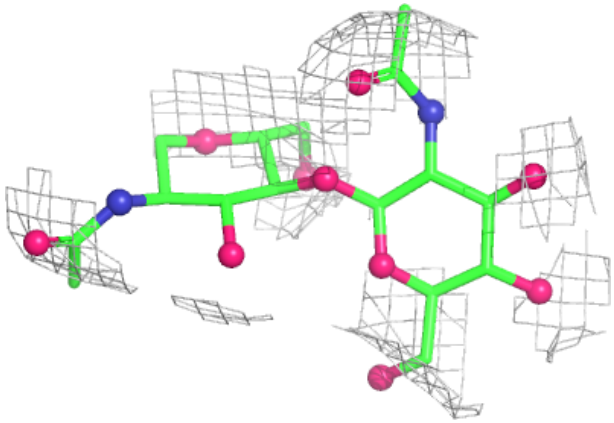
Electron density around Chain H:

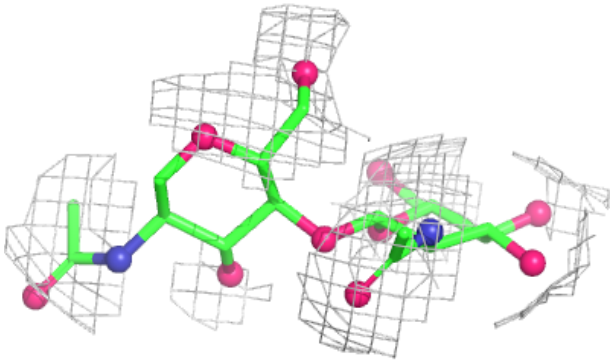
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

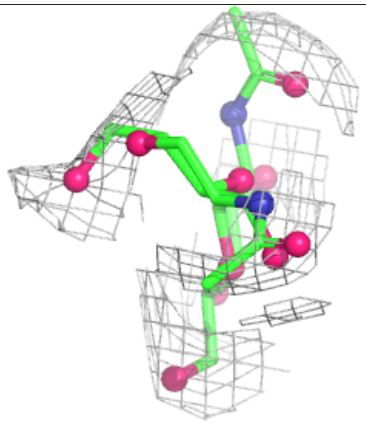


Electron density around Chain I:

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

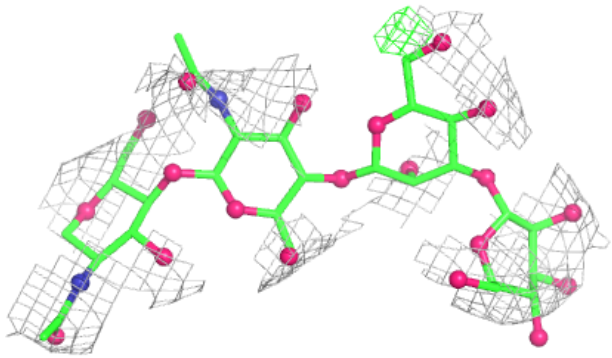


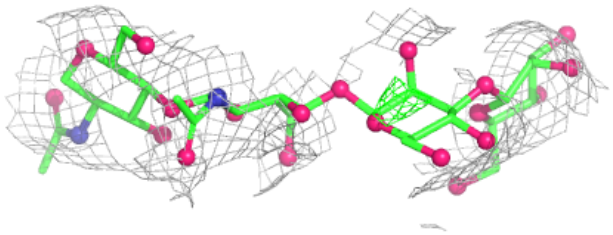


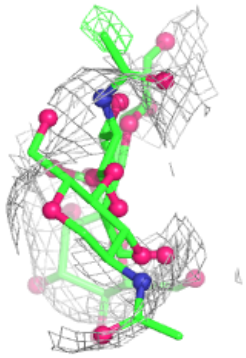


Electron density around Chain J:

$2mF_o$-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
6	NAG	A	601	14/15	0.58	0.09	193,229,253,259	0

6.5 Other polymers (i)

There are no such residues in this entry.