



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 10, 2020 – 02:23 PM BST

PDB ID : 4IID
Title : Crystal structure of beta-glucosidase 1 from *Aspergillus aculeatus* in complex with 1-deoxynojirimycin
Authors : Suzuki, K.; Sumitani, J.; Kawaguchi, T.; Fushinobu, S.
Deposited on : 2012-12-20
Resolution : 2.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
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) : 2.13.1

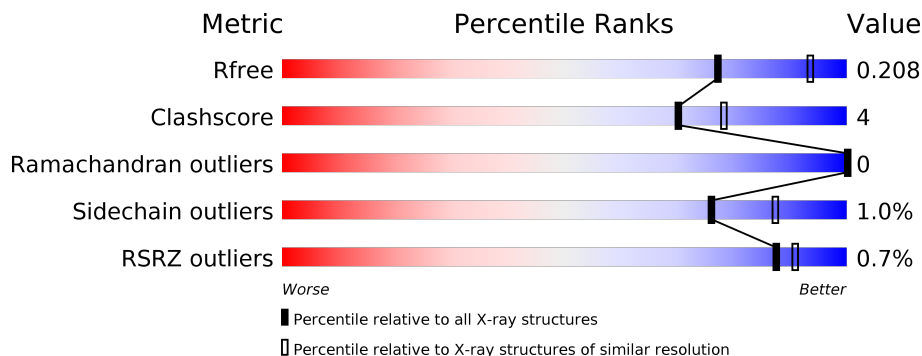
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

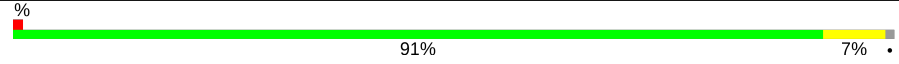

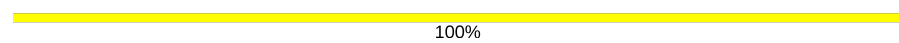

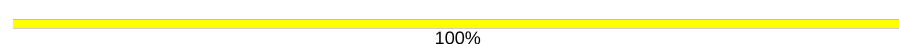
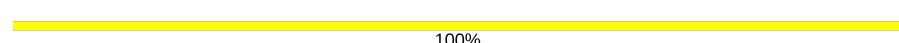
The reported resolution of this entry is 2.30 Å.

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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	841	
1	B	841	
2	C	4	
3	D	3	
3	L	3	
3	N	3	

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Mol	Chain	Length	Quality of chain
4	E	2	 100%
4	G	2	 100%
5	F	10	 100%
5	M	10	 30% 70%
6	H	7	 29% 57% 14%
6	O	7	 14% 57% 29%
7	I	7	 100%
8	J	7	 86% 14%
9	K	5	 100%
10	P	8	 100%

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
12	MRD	A	939	-	-	X	-

2 Entry composition [i](#)

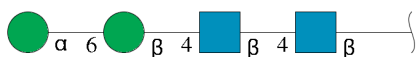
There are 15 unique types of molecules in this entry. The entry contains 14782 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Beta-glucosidase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	834	6387	4031	1097	1241	18	0	0	0
1	B	832	6375	4023	1095	1239	18	0	0	0

- Molecule 2 is an oligosaccharide called 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			
2	C	4	50	28	2	20	0	0	0

- Molecule 3 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.



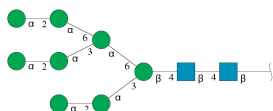
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	D	3	39	22	2	15	0	0	0
3	L	3	39	22	2	15	0	0	0
3	N	3	39	22	2	15	0	0	0

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



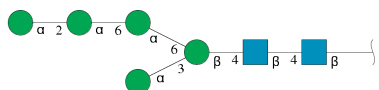
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	E	2	28	16	2	10	0	0	0
4	G	2	28	16	2	10	0	0	0

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-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.



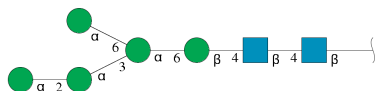
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	F	10	116	64	2	50	0	0	0
5	M	10	116	64	2	50	0	0	0

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-[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.



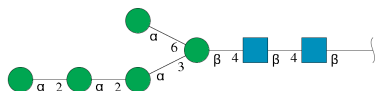
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	H	7	83	46	2	35	0	0	0
6	O	7	83	46	2	35	0	0	0

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]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.



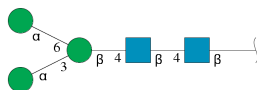
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
7	I	7	83	46	2	35	0	0	0

- Molecule 8 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



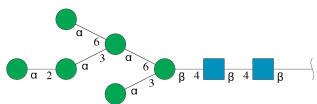
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
8	J	7	83	46	2	35	0	0	0

- Molecule 9 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.



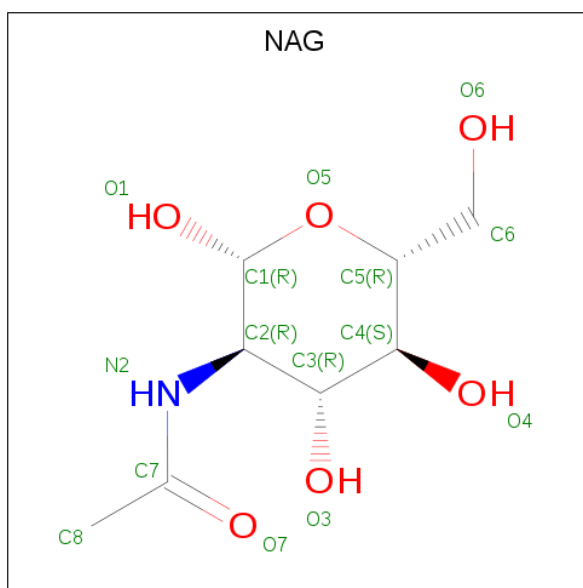
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
9	K	5	61	34	2	25	0	0	0

- Molecule 10 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[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.



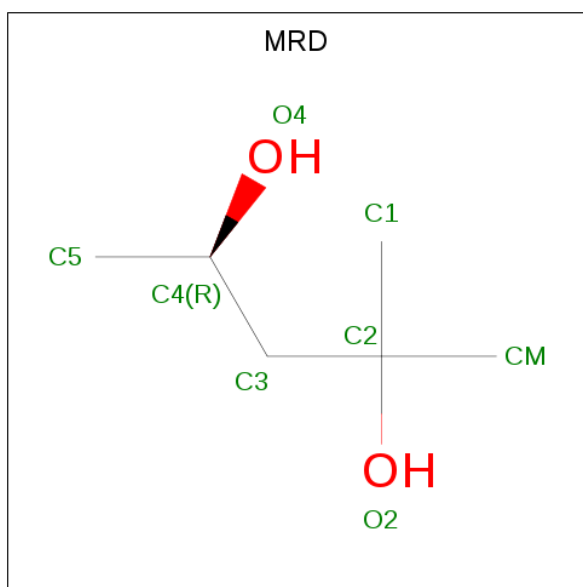
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
10	P	8	94	52	2	40	0	0	0

- Molecule 11 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



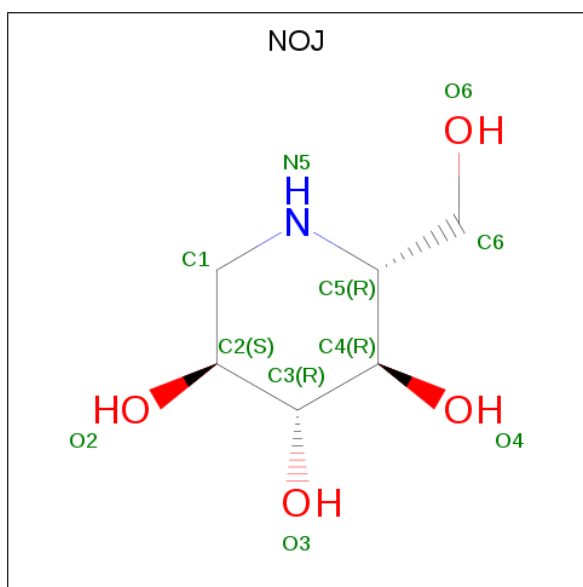
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
11	A	1	14	8	1	5	0	0
11	A	1	14	8	1	5	0	0
11	B	1	14	8	1	5	0	0
11	B	1	14	8	1	5	0	0
11	B	1	14	8	1	5	0	0

- Molecule 12 is (4R)-2-METHYLPENTANE-2,4-DIOL (three-letter code: MRD) (formula: C₆H₁₄O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	A	1	Total	C	O	0	0
			8	6	2		
12	A	1	Total	C	O	0	0
			8	6	2		
12	B	1	Total	C	O	0	0
			8	6	2		

- Molecule 13 is 1-DEOXYNOJIRIMYCIN (three-letter code: NOJ) (formula: $C_6H_{13}NO_4$).



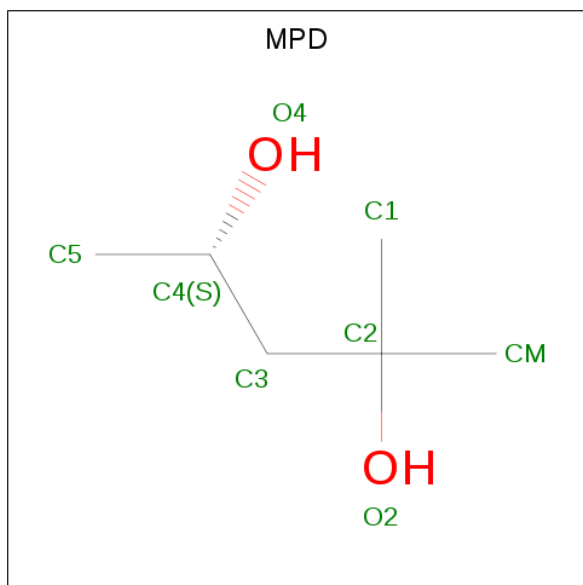
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
13	A	1	Total	C	N	O	0	0
			11	6	1	4		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
13	B	1	11	6	1	4	0	0

- Molecule 14 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: $C_6H_{14}O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
14	B	1	8	6	2	0	0

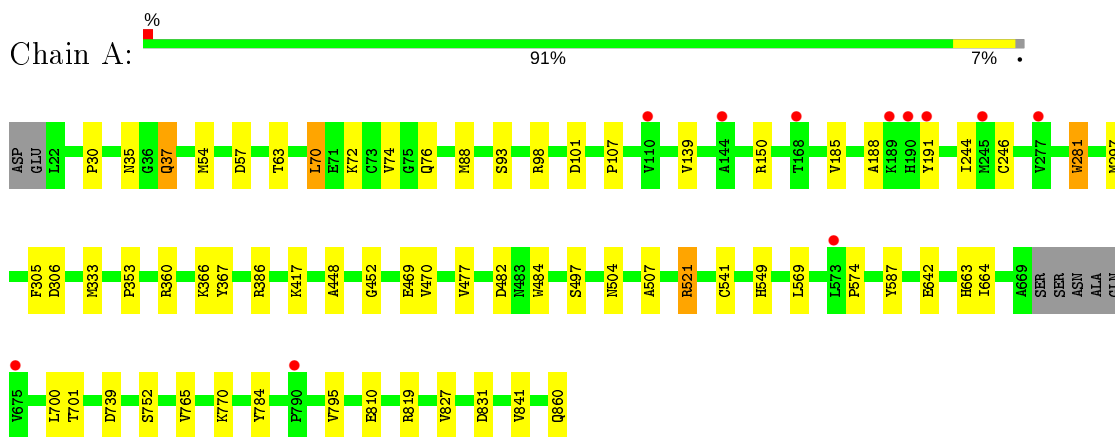
- Molecule 15 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
15	A	450	450	450	0	0
15	B	504	504	504	0	0

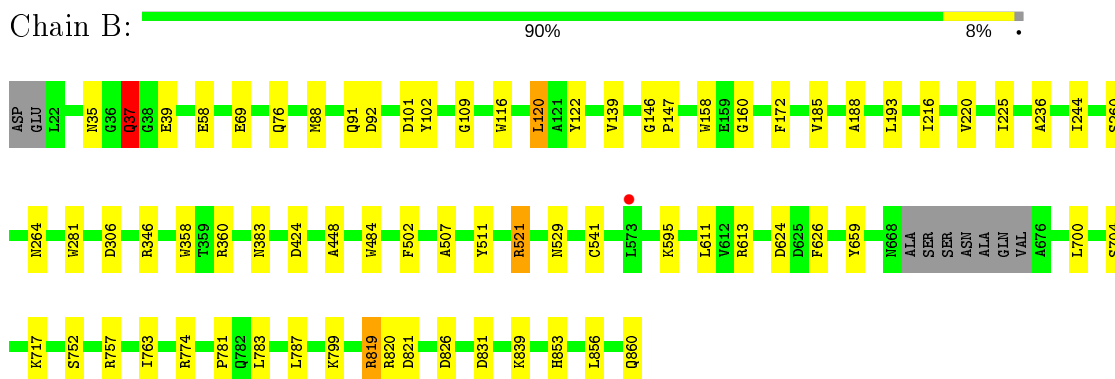
3 Residue-property plots [i](#)

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.

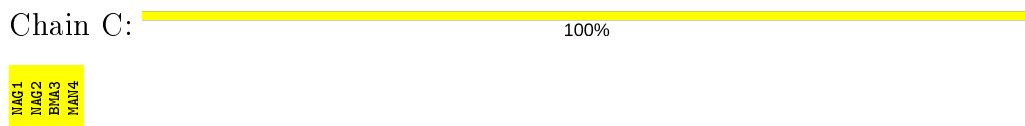
- Molecule 1: Beta-glucosidase 1



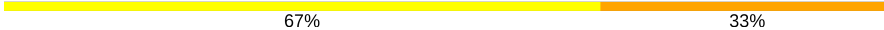
- Molecule 1: Beta-glucosidase 1



- Molecule 2: 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

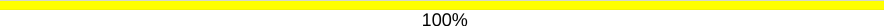


- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:  67% 33%

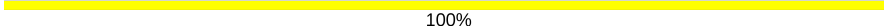
MAG1
MAG2
BOL3

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

Chain L:  100%

MAG1
MAG2
BOL3

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

Chain N:  100%

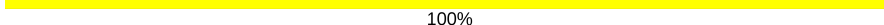
MAG1
MAG2
BOL3

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

Chain E:  100%

MAG1
MAG2

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

Chain G:  100%

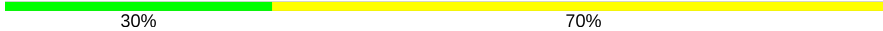
MAG1
MAG2

- Molecule 5: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-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 F:  100%

MAG1
MAG2
BOL3
MAN4
MAN5
MAN6
MAN7
MAN8
MAN9
MANTO

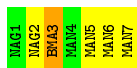
- Molecule 5: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain M:  30% 70%

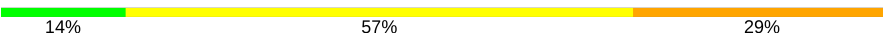


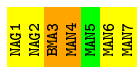
- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain H:  29% 57% 14%



- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-[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 O:  14% 57% 29%

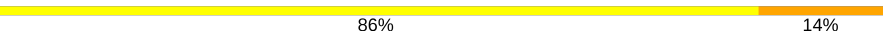


- Molecule 7: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  100%



- Molecule 8: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:  86% 14%



- Molecule 9: 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 K:  100%



- Molecule 10: α -D-mannopyranose-(1-2)- α -D-mannopyranose-(1-3)-[α -D-mannopyranose-(1-6)] α -D-mannopyranose-(1-6)-[α -D-mannopyranose-(1-3)] β -D-mannopyranose-(1-4)-2-acetamido-2-deoxy- β -D-glucopyranose-(1-4)-2-acetamido-2-deoxy- β -D-glucopyranose

Chain P:

100%

MAG1
MAG2
BMA3
MAN4
MAN5
MAN6
MAN7
MAN8

4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	82.45Å 121.60Å 221.81Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	39.07 – 2.30 39.07 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.4 (39.07-2.30) 99.5 (39.07-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.44 (at 2.29Å)	Xtrriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.155 , 0.207 0.157 , 0.208	Depositor DCC
R_{free} test set	4949 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	21.1	Xtrriage
Anisotropy	0.048	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 34.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14782	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.04% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.94	1/6550 (0.0%)	0.93	11/8930 (0.1%)
1	B	1.01	5/6538 (0.1%)	0.94	13/8913 (0.1%)
All	All	0.97	6/13088 (0.0%)	0.94	24/17843 (0.1%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	541	CYS	CA-CB	6.87	1.69	1.53
1	A	541	CYS	CA-CB	6.63	1.68	1.53
1	B	820	ARG	CZ-NH2	6.09	1.41	1.33
1	B	511	TYR	CE1-CZ	5.67	1.46	1.38
1	B	541	CYS	CB-SG	5.49	1.91	1.82
1	B	122	TYR	CE1-CZ	5.46	1.45	1.38

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	521	ARG	NE-CZ-NH2	-16.07	112.27	120.30
1	A	521	ARG	NE-CZ-NH2	-15.81	112.39	120.30
1	A	521	ARG	NE-CZ-NH1	13.38	126.99	120.30
1	B	521	ARG	NE-CZ-NH1	12.77	126.69	120.30
1	A	70	LEU	CA-CB-CG	-8.84	94.98	115.30
1	B	820	ARG	NE-CZ-NH1	-7.97	116.32	120.30
1	B	541	CYS	N-CA-CB	7.90	124.82	110.60
1	B	360	ARG	NE-CZ-NH2	7.81	124.20	120.30
1	B	819	ARG	NE-CZ-NH2	-7.72	116.44	120.30
1	A	101	ASP	CB-CG-OD1	6.97	124.57	118.30
1	A	541	CYS	N-CA-CB	6.71	122.67	110.60
1	A	98	ARG	NE-CZ-NH1	-6.29	117.16	120.30
1	B	120	LEU	CB-CG-CD1	6.22	121.57	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	774	ARG	NE-CZ-NH2	-6.01	117.29	120.30
1	B	704	SER	N-CA-CB	-5.99	101.52	110.50
1	B	37	GLN	CA-CB-CG	5.71	125.96	113.40
1	A	482	ASP	CB-CG-OD1	5.48	123.23	118.30
1	A	386	ARG	NE-CZ-NH1	5.40	123.00	120.30
1	B	831	ASP	CB-CG-OD1	5.36	123.13	118.30
1	B	826	ASP	CB-CG-OD1	5.31	123.08	118.30
1	B	101	ASP	CB-CG-OD1	5.29	123.06	118.30
1	A	54	MET	CG-SD-CE	-5.16	91.95	100.20
1	A	831	ASP	CB-CG-OD1	5.15	122.94	118.30
1	A	150	ARG	NE-CZ-NH2	-5.05	117.77	120.30

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	6387	0	6096	51	0
1	B	6375	0	6082	34	0
2	C	50	0	43	0	0
3	D	39	0	34	1	0
3	L	39	0	34	0	0
3	N	39	0	34	0	0
4	E	28	0	25	1	0
4	G	28	0	25	0	0
5	F	116	0	97	0	0
5	M	116	0	97	0	0
6	H	83	0	70	3	0
6	O	83	0	70	2	0
7	I	83	0	70	0	0
8	J	83	0	70	1	0
9	K	61	0	52	0	0
10	P	94	0	79	0	0
11	A	28	0	26	0	0
11	B	42	0	39	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	A	16	0	28	11	0
12	B	8	0	14	2	0
13	A	11	0	13	0	0
13	B	11	0	13	0	0
14	B	8	0	14	4	0
15	A	450	0	0	0	0
15	B	504	0	0	5	0
All	All	14782	0	13125	98	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 4.

All (98) 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)
14:B:947:MPD:C5	14:B:947:MPD:HM1	1.66	1.16
14:B:947:MPD:H53	14:B:947:MPD:CM	1.79	1.11
1:A:63:THR:HG21	1:A:333:MET:CE	1.83	1.08
1:A:63:THR:HG21	1:A:333:MET:HE2	1.33	1.06
1:A:63:THR:CG2	1:A:333:MET:CE	2.39	1.01
12:A:939:MRD:HMC2	15:B:1083:HOH:O	1.61	0.99
14:B:947:MPD:C5	14:B:947:MPD:CM	2.42	0.95
1:A:63:THR:CG2	1:A:333:MET:HE2	2.02	0.89
14:B:947:MPD:H53	14:B:947:MPD:HM1	0.90	0.88
1:A:360:ARG:HH21	12:A:939:MRD:HMC3	1.49	0.78
6:O:3:BMA:H62	6:O:4:MAN:H5	1.68	0.75
1:B:260:SER:O	1:B:264:ASN:HB2	1.89	0.72
1:A:63:THR:HG21	1:A:333:MET:HE1	1.74	0.67
12:A:938:MRD:O2	12:A:938:MRD:H5C3	1.94	0.66
1:B:717:LYS:HE3	15:B:1158:HOH:O	1.95	0.66
1:A:360:ARG:HH21	12:A:939:MRD:CM	2.08	0.66
1:A:35:ASN:OD1	1:A:37:GLN:HB3	1.96	0.65
1:A:360:ARG:HG2	12:A:939:MRD:HMC1	1.78	0.65
1:B:188:ALA:HB3	1:B:244:ILE:HD13	1.78	0.64
1:A:819:ARG:HH12	1:A:860:GLN:C	1.99	0.64
1:A:360:ARG:CG	12:A:939:MRD:HMC1	2.32	0.60
1:A:484:TRP:CZ2	6:H:3:BMA:H62	2.37	0.60
1:A:63:THR:CG2	1:A:333:MET:HE1	2.30	0.60
1:A:507:ALA:HB2	1:A:521:ARG:HG3	1.83	0.59
1:B:146:GLY:HA2	1:B:147:PRO:C	2.23	0.59
1:B:763:ILE:HD13	1:B:856:LEU:HD22	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:611:LEU:HD12	1:B:613:ARG:NH2	2.18	0.58
6:O:3:BMA:H62	6:O:4:MAN:C5	2.34	0.58
1:A:827:VAL:HG11	3:D:2:NAG:O3	2.04	0.58
1:A:819:ARG:NH1	1:A:860:GLN:O	2.28	0.57
1:A:188:ALA:HB3	1:A:244:ILE:HD13	1.87	0.56
1:A:63:THR:HG22	1:A:333:MET:CE	2.33	0.56
1:B:424:ASP:HB3	1:B:502:PHE:HB3	1.88	0.56
1:A:784:TYR:HB3	1:A:795:VAL:HB	1.88	0.55
12:B:948:MRD:O2	12:B:948:MRD:C5	2.55	0.54
1:B:193:LEU:HD11	1:B:225:ILE:HD12	1.90	0.54
1:A:819:ARG:NH1	1:A:860:GLN:C	2.63	0.52
1:B:819:ARG:HH22	1:B:860:GLN:C	2.12	0.51
1:A:191:TYR:O	1:A:246:CYS:HA	2.10	0.51
1:B:507:ALA:HB2	1:B:521:ARG:HG3	1.93	0.51
1:B:787:LEU:HA	1:B:839:LYS:HG2	1.93	0.51
1:A:448:ALA:HB1	1:A:507:ALA:O	2.10	0.50
1:B:76:GLN:HA	1:B:88:MET:O	2.12	0.50
1:A:360:ARG:HD2	12:A:939:MRD:CM	2.42	0.50
1:A:107:PRO:HG3	1:A:574:PRO:O	2.11	0.50
1:A:484:TRP:CE2	6:H:3:BMA:H62	2.47	0.49
1:B:109:GLY:HA3	1:B:160:GLY:O	2.12	0.49
1:A:664:ILE:HD12	1:A:765:VAL:HG22	1.95	0.48
1:A:484:TRP:CE2	6:H:3:BMA:C6	2.97	0.48
1:A:93:SER:HB2	1:A:452:GLY:HA2	1.96	0.48
1:B:783:LEU:HD23	1:B:783:LEU:C	2.33	0.48
1:A:664:ILE:HD11	1:A:841:VAL:HG11	1.94	0.48
1:A:360:ARG:CG	12:A:939:MRD:CM	2.91	0.48
1:B:611:LEU:HD12	1:B:613:ARG:CZ	2.43	0.47
1:A:37:GLN:OE1	1:A:752:SER:HB2	2.14	0.47
1:A:770:LYS:HG3	1:A:810:GLU:HG2	1.97	0.47
1:A:470:VAL:HG11	1:A:477:VAL:HB	1.97	0.47
12:A:938:MRD:O2	12:A:938:MRD:C5	2.63	0.46
1:A:63:THR:O	1:A:297:MET:HA	2.16	0.46
1:A:360:ARG:HD2	12:A:939:MRD:HMC3	1.97	0.46
1:B:158:TRP:CE2	1:B:448:ALA:HB3	2.51	0.45
1:B:139:VAL:HG22	1:B:185:VAL:HB	1.99	0.45
1:B:35:ASN:OD1	1:B:37:GLN:HB3	2.17	0.45
1:B:484:TRP:CZ2	1:B:529:ASN:HB2	2.52	0.45
1:B:172:PHE:CE2	1:B:236:ALA:HB2	2.52	0.45
1:B:613:ARG:NH1	15:B:1147:HOH:O	2.31	0.45
1:A:504:ASN:HA	1:A:549:HIS:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:63:THR:HB	1:A:333:MET:HE1	1.98	0.44
1:A:30:PRO:HG3	1:A:739:ASP:O	2.18	0.44
1:A:469:GLU:HG2	1:A:587:TYR:CE2	2.52	0.44
1:A:63:THR:CB	1:A:333:MET:HE1	2.47	0.44
1:B:220:VAL:HG22	1:B:626:PHE:CG	2.52	0.43
1:A:663:HIS:O	1:A:664:ILE:HD13	2.18	0.43
4:E:1:NAG:HO3	4:E:2:NAG:C1	2.31	0.43
1:A:139:VAL:HG22	1:A:185:VAL:HB	2.00	0.43
1:B:116:TRP:NE1	1:B:595:LYS:HB2	2.34	0.43
1:A:569:LEU:HD12	1:A:569:LEU:N	2.34	0.42
1:A:366:LYS:HE2	1:A:367:TYR:OH	2.19	0.42
1:B:346:ARG:HA	1:B:346:ARG:HD2	1.84	0.42
1:B:39:GLU:HG2	15:B:1350:HOH:O	2.19	0.42
1:B:102:TYR:HB3	1:B:383:ASN:HA	2.02	0.42
1:A:333:MET:HB3	1:A:333:MET:HE3	1.83	0.42
1:A:305:PHE:O	1:A:306:ASP:HB2	2.20	0.42
12:A:939:MRD:HMC1	12:A:939:MRD:H5C3	2.03	0.41
1:A:72:LYS:HG3	1:A:353:PRO:HG2	2.02	0.41
1:A:281:TRP:HE3	1:A:281:TRP:N	2.18	0.41
1:B:799:LYS:NZ	1:B:821:ASP:OD2	2.43	0.41
12:B:948:MRD:O2	12:B:948:MRD:H5C3	2.21	0.41
1:A:76:GLN:HA	1:A:88:MET:O	2.20	0.41
1:B:37:GLN:OE1	1:B:752:SER:HB2	2.21	0.41
1:A:417:LYS:HE2	1:A:417:LYS:HB2	1.83	0.41
1:B:69:GLU:HG2	1:B:358:TRP:CE3	2.56	0.41
1:B:306:ASP:HA	15:B:1075:HOH:O	2.20	0.40
1:B:91:GLN:HG3	1:B:92:ASP:O	2.21	0.40
1:B:58:GLU:HG3	8:J:1:NAG:H81	2.02	0.40
1:A:57:ASP:N	1:A:57:ASP:OD1	2.54	0.40
1:B:659:TYR:HE1	1:B:781:PRO:HB3	1.87	0.40
1:B:216:ILE:HD11	1:B:624:ASP:HB2	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	830/841 (99%)	795 (96%)	35 (4%)	0	100	100
1	B	828/841 (98%)	799 (96%)	29 (4%)	0	100	100
All	All	1658/1682 (99%)	1594 (96%)	64 (4%)	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	671/677 (99%)	663 (99%)	8 (1%)	71	84
1	B	670/677 (99%)	664 (99%)	6 (1%)	78	89
All	All	1341/1354 (99%)	1327 (99%)	14 (1%)	76	87

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	37	GLN
1	A	70	LEU
1	A	74	VAL
1	A	281	TRP
1	A	497	SER
1	A	642	GLU
1	A	700	LEU
1	A	701	THR
1	B	37	GLN
1	B	120	LEU
1	B	281	TRP
1	B	700	LEU
1	B	757	ARG
1	B	853	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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](#)

78 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	C	1	1,2	14,14,15	0.98	1 (7%)	17,19,21	1.53	3 (17%)
2	NAG	C	2	2	14,14,15	0.95	1 (7%)	17,19,21	1.70	5 (29%)
2	BMA	C	3	2	11,11,12	1.30	1 (9%)	15,15,17	1.88	3 (20%)
2	MAN	C	4	2	11,11,12	1.04	0	15,15,17	2.29	4 (26%)
3	NAG	D	1	1,3	14,14,15	1.05	1 (7%)	17,19,21	1.43	2 (11%)
3	NAG	D	2	3	14,14,15	0.83	0	17,19,21	1.51	3 (17%)
3	BMA	D	3	3	11,11,12	1.10	0	15,15,17	2.83	7 (46%)
4	NAG	E	1	1,4	14,14,15	0.61	0	17,19,21	1.42	2 (11%)
4	NAG	E	2	4	14,14,15	0.59	0	17,19,21	1.81	3 (17%)
5	NAG	F	1	1,5	14,14,15	1.25	1 (7%)	17,19,21	0.71	0
5	MAN	F	10	5	11,11,12	1.15	2 (18%)	15,15,17	2.02	5 (33%)
5	NAG	F	2	5	14,14,15	0.78	0	17,19,21	1.30	2 (11%)
5	BMA	F	3	5	11,11,12	0.92	0	15,15,17	1.80	4 (26%)
5	MAN	F	4	5	11,11,12	0.66	0	15,15,17	1.75	3 (20%)
5	MAN	F	5	5	11,11,12	0.98	0	15,15,17	1.99	5 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	MAN	F	6	5	11,11,12	0.95	1 (9%)	15,15,17	1.58	3 (20%)
5	MAN	F	7	5	11,11,12	0.66	0	15,15,17	1.51	3 (20%)
5	MAN	F	8	5	11,11,12	0.62	0	15,15,17	1.57	4 (26%)
5	MAN	F	9	5	11,11,12	0.79	0	15,15,17	1.21	3 (20%)
4	NAG	G	1	1,4	14,14,15	0.81	0	17,19,21	1.52	2 (11%)
4	NAG	G	2	4	14,14,15	0.90	1 (7%)	17,19,21	1.41	3 (17%)
6	NAG	H	1	1,6	14,14,15	0.68	0	17,19,21	0.83	0
6	NAG	H	2	6	14,14,15	0.92	0	17,19,21	2.00	5 (29%)
6	BMA	H	3	6	11,11,12	0.84	0	15,15,17	1.18	1 (6%)
6	MAN	H	4	6	11,11,12	0.80	0	15,15,17	1.05	0
6	MAN	H	5	6	11,11,12	0.85	0	15,15,17	1.92	5 (33%)
6	MAN	H	6	6	11,11,12	0.64	0	15,15,17	1.64	4 (26%)
6	MAN	H	7	6	11,11,12	0.72	0	15,15,17	1.87	2 (13%)
7	NAG	I	1	1,7	14,14,15	1.01	1 (7%)	17,19,21	1.95	6 (35%)
7	NAG	I	2	7	14,14,15	0.83	1 (7%)	17,19,21	1.34	2 (11%)
7	BMA	I	3	7	11,11,12	1.13	1 (9%)	15,15,17	1.86	4 (26%)
7	MAN	I	4	7	11,11,12	0.95	0	15,15,17	1.56	2 (13%)
7	MAN	I	5	7	11,11,12	0.93	0	15,15,17	1.60	3 (20%)
7	MAN	I	6	7	11,11,12	0.60	0	15,15,17	2.07	5 (33%)
7	MAN	I	7	7	11,11,12	1.16	2 (18%)	15,15,17	3.74	7 (46%)
8	NAG	J	1	1,8	14,14,15	1.19	1 (7%)	17,19,21	1.51	4 (23%)
8	NAG	J	2	8	14,14,15	0.69	0	17,19,21	1.73	4 (23%)
8	BMA	J	3	8	11,11,12	0.96	0	15,15,17	1.69	2 (13%)
8	MAN	J	4	8	11,11,12	0.56	0	15,15,17	1.76	2 (13%)
8	MAN	J	5	8	11,11,12	0.91	0	15,15,17	1.29	2 (13%)
8	MAN	J	6	8	11,11,12	0.86	0	15,15,17	1.62	3 (20%)
8	MAN	J	7	8	11,11,12	1.02	0	15,15,17	2.49	8 (53%)
9	NAG	K	1	1,9	14,14,15	1.11	0	17,19,21	1.57	4 (23%)
9	NAG	K	2	9	14,14,15	0.84	0	17,19,21	1.54	5 (29%)
9	BMA	K	3	9	11,11,12	0.58	0	15,15,17	1.67	1 (6%)
9	MAN	K	4	9	11,11,12	1.11	1 (9%)	15,15,17	1.64	4 (26%)
9	MAN	K	5	9	11,11,12	0.95	0	15,15,17	1.77	3 (20%)
3	NAG	L	1	1,3	14,14,15	0.79	0	17,19,21	1.77	3 (17%)
3	NAG	L	2	3	14,14,15	0.74	0	17,19,21	1.66	4 (23%)
3	BMA	L	3	3	11,11,12	0.83	0	15,15,17	1.76	4 (26%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	M	1	1,5	14,14,15	1.17	2 (14%)	17,19,21	1.84	6 (35%)
5	MAN	M	10	5	11,11,12	1.30	2 (18%)	15,15,17	2.06	7 (46%)
5	NAG	M	2	5	14,14,15	1.05	0	17,19,21	1.53	2 (11%)
5	BMA	M	3	5	11,11,12	0.79	0	15,15,17	1.15	0
5	MAN	M	4	5	11,11,12	0.82	0	15,15,17	2.24	6 (40%)
5	MAN	M	5	5	11,11,12	0.59	0	15,15,17	2.45	6 (40%)
5	MAN	M	6	5	11,11,12	0.70	0	15,15,17	1.17	0
5	MAN	M	7	5	11,11,12	0.99	0	15,15,17	1.41	1 (6%)
5	MAN	M	8	5	11,11,12	1.47	2 (18%)	15,15,17	2.05	4 (26%)
5	MAN	M	9	5	11,11,12	0.87	0	15,15,17	0.76	0
3	NAG	N	1	1,3	14,14,15	0.78	0	17,19,21	1.35	1 (5%)
3	NAG	N	2	3	14,14,15	0.96	0	17,19,21	1.48	3 (17%)
3	BMA	N	3	3	11,11,12	0.91	0	15,15,17	2.32	4 (26%)
6	NAG	O	1	1,6	14,14,15	0.88	0	17,19,21	1.71	6 (35%)
6	NAG	O	2	6	14,14,15	1.18	1 (7%)	17,19,21	2.07	8 (47%)
6	BMA	O	3	6	11,11,12	0.60	0	15,15,17	3.07	4 (26%)
6	MAN	O	4	6	11,11,12	1.39	2 (18%)	15,15,17	2.24	4 (26%)
6	MAN	O	5	6	11,11,12	0.62	0	15,15,17	1.16	0
6	MAN	O	6	6	11,11,12	0.94	0	15,15,17	1.32	2 (13%)
6	MAN	O	7	6	11,11,12	1.04	1 (9%)	15,15,17	1.93	4 (26%)
10	NAG	P	1	1,10	14,14,15	0.74	0	17,19,21	1.98	4 (23%)
10	NAG	P	2	10	14,14,15	0.91	1 (7%)	17,19,21	1.45	1 (5%)
10	BMA	P	3	10	11,11,12	1.07	0	15,15,17	1.44	3 (20%)
10	MAN	P	4	10	11,11,12	0.73	0	15,15,17	1.42	2 (13%)
10	MAN	P	5	10	11,11,12	0.74	0	15,15,17	2.17	4 (26%)
10	MAN	P	6	10	11,11,12	0.72	0	15,15,17	1.94	5 (33%)
10	MAN	P	7	10	11,11,12	1.04	1 (9%)	15,15,17	1.77	6 (40%)
10	MAN	P	8	10	11,11,12	1.00	1 (9%)	15,15,17	1.73	3 (20%)

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

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

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	BMA	C	3	2	-	0/2/19/22	0/1/1/1
2	MAN	C	4	2	-	0/2/19/22	0/1/1/1
3	NAG	D	1	1,3	-	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	-	2/2/19/22	0/1/1/1
4	NAG	E	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	E	2	4	-	3/6/23/26	0/1/1/1
5	NAG	F	1	1,5	-	0/6/23/26	0/1/1/1
5	MAN	F	10	5	-	2/2/19/22	0/1/1/1
5	NAG	F	2	5	-	0/6/23/26	0/1/1/1
5	BMA	F	3	5	-	0/2/19/22	0/1/1/1
5	MAN	F	4	5	-	0/2/19/22	0/1/1/1
5	MAN	F	5	5	-	1/2/19/22	0/1/1/1
5	MAN	F	6	5	-	0/2/19/22	0/1/1/1
5	MAN	F	7	5	-	0/2/19/22	0/1/1/1
5	MAN	F	8	5	-	0/2/19/22	0/1/1/1
5	MAN	F	9	5	-	0/2/19/22	0/1/1/1
4	NAG	G	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	G	2	4	-	2/6/23/26	0/1/1/1
6	NAG	H	1	1,6	-	0/6/23/26	0/1/1/1
6	NAG	H	2	6	-	0/6/23/26	0/1/1/1
6	BMA	H	3	6	-	0/2/19/22	0/1/1/1
6	MAN	H	4	6	-	0/2/19/22	0/1/1/1
6	MAN	H	5	6	-	0/2/19/22	0/1/1/1
6	MAN	H	6	6	-	0/2/19/22	0/1/1/1
6	MAN	H	7	6	-	2/2/19/22	0/1/1/1
7	NAG	I	1	1,7	-	1/6/23/26	0/1/1/1
7	NAG	I	2	7	-	0/6/23/26	0/1/1/1
7	BMA	I	3	7	-	0/2/19/22	0/1/1/1
7	MAN	I	4	7	-	2/2/19/22	0/1/1/1
7	MAN	I	5	7	-	0/2/19/22	0/1/1/1
7	MAN	I	6	7	-	2/2/19/22	0/1/1/1
7	MAN	I	7	7	-	2/2/19/22	0/1/1/1
8	NAG	J	1	1,8	-	0/6/23/26	0/1/1/1
8	NAG	J	2	8	-	2/6/23/26	0/1/1/1
8	BMA	J	3	8	-	0/2/19/22	0/1/1/1
8	MAN	J	4	8	-	0/2/19/22	0/1/1/1
8	MAN	J	5	8	-	1/2/19/22	0/1/1/1
8	MAN	J	6	8	-	2/2/19/22	0/1/1/1
8	MAN	J	7	8	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	NAG	K	1	1,9	-	0/6/23/26	0/1/1/1
9	NAG	K	2	9	-	0/6/23/26	0/1/1/1
9	BMA	K	3	9	-	0/2/19/22	0/1/1/1
9	MAN	K	4	9	-	2/2/19/22	0/1/1/1
9	MAN	K	5	9	-	1/2/19/22	0/1/1/1
3	NAG	L	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	L	2	3	-	1/6/23/26	0/1/1/1
3	BMA	L	3	3	-	2/2/19/22	0/1/1/1
5	NAG	M	1	1,5	-	0/6/23/26	0/1/1/1
5	MAN	M	10	5	-	0/2/19/22	0/1/1/1
5	NAG	M	2	5	-	0/6/23/26	0/1/1/1
5	BMA	M	3	5	-	0/2/19/22	0/1/1/1
5	MAN	M	4	5	-	0/2/19/22	0/1/1/1
5	MAN	M	5	5	-	0/2/19/22	0/1/1/1
5	MAN	M	6	5	-	0/2/19/22	0/1/1/1
5	MAN	M	7	5	-	0/2/19/22	0/1/1/1
5	MAN	M	8	5	-	0/2/19/22	0/1/1/1
5	MAN	M	9	5	-	0/2/19/22	0/1/1/1
3	NAG	N	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	N	2	3	-	2/6/23/26	0/1/1/1
3	BMA	N	3	3	-	1/2/19/22	0/1/1/1
6	NAG	O	1	1,6	-	0/6/23/26	0/1/1/1
6	NAG	O	2	6	-	0/6/23/26	0/1/1/1
6	BMA	O	3	6	-	0/2/19/22	0/1/1/1
6	MAN	O	4	6	-	0/2/19/22	0/1/1/1
6	MAN	O	5	6	-	1/2/19/22	0/1/1/1
6	MAN	O	6	6	-	1/2/19/22	0/1/1/1
6	MAN	O	7	6	-	1/2/19/22	0/1/1/1
10	NAG	P	1	1,10	-	1/6/23/26	0/1/1/1
10	NAG	P	2	10	-	0/6/23/26	0/1/1/1
10	BMA	P	3	10	-	0/2/19/22	0/1/1/1
10	MAN	P	4	10	-	1/2/19/22	0/1/1/1
10	MAN	P	5	10	-	0/2/19/22	0/1/1/1
10	MAN	P	6	10	-	2/2/19/22	0/1/1/1
10	MAN	P	7	10	-	0/2/19/22	0/1/1/1
10	MAN	P	8	10	-	2/2/19/22	0/1/1/1

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	O	4	MAN	O5-C1	-3.50	1.38	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	8	MAN	C2-C3	3.18	1.57	1.52
5	F	1	NAG	O5-C1	-3.15	1.38	1.43
7	I	1	NAG	C2-N2	-2.99	1.41	1.46
9	K	4	MAN	C2-C3	2.87	1.56	1.52
6	O	7	MAN	C2-C3	2.86	1.56	1.52
5	M	8	MAN	O5-C1	-2.76	1.39	1.43
5	M	10	MAN	C2-C3	2.71	1.56	1.52
5	M	10	MAN	O5-C1	-2.69	1.39	1.43
10	P	7	MAN	C2-C3	2.68	1.56	1.52
7	I	7	MAN	C2-C3	2.62	1.56	1.52
6	O	2	NAG	O5-C1	-2.47	1.39	1.43
10	P	8	MAN	C2-C3	2.45	1.56	1.52
5	M	1	NAG	C2-N2	-2.41	1.42	1.46
5	F	6	MAN	C2-C3	2.33	1.55	1.52
2	C	2	NAG	O5-C1	-2.31	1.40	1.43
10	P	2	NAG	O5-C1	-2.28	1.40	1.43
2	C	1	NAG	C1-C2	2.27	1.55	1.52
4	G	2	NAG	O5-C1	-2.26	1.40	1.43
3	D	1	NAG	O5-C1	-2.21	1.40	1.43
5	F	10	MAN	C2-C3	2.19	1.55	1.52
5	F	10	MAN	O3-C3	-2.15	1.37	1.43
2	C	3	BMA	C2-C3	2.14	1.55	1.52
7	I	7	MAN	O5-C1	2.13	1.47	1.43
7	I	2	NAG	O3-C3	-2.11	1.38	1.43
6	O	4	MAN	O4-C4	-2.08	1.38	1.43
5	M	1	NAG	C1-C2	2.04	1.55	1.52
8	J	1	NAG	C1-C2	2.02	1.55	1.52
7	I	3	BMA	O5-C1	-2.01	1.40	1.43

All (264) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	O	3	BMA	C6-C5-C4	-9.66	90.39	113.00
7	I	7	MAN	C1-O5-C5	8.05	123.11	112.19
7	I	7	MAN	C1-C2-C3	-6.89	101.20	109.67
10	P	5	MAN	C1-O5-C5	6.17	120.56	112.19
10	P	1	NAG	C1-O5-C5	5.93	120.23	112.19
3	D	3	BMA	C1-O5-C5	5.60	119.78	112.19
7	I	7	MAN	O5-C5-C6	5.47	115.78	107.20
9	K	3	BMA	C1-O5-C5	5.46	119.59	112.19
4	E	2	NAG	O5-C5-C6	5.46	115.76	107.20
5	M	4	MAN	C1-O5-C5	5.41	119.52	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	5	MAN	O6-C6-C5	-5.36	92.91	111.29
2	C	4	MAN	C1-O5-C5	5.21	119.25	112.19
6	H	2	NAG	O5-C1-C2	-5.19	103.09	111.29
5	M	8	MAN	C1-O5-C5	5.17	119.19	112.19
6	H	7	MAN	O5-C1-C2	-5.15	102.83	110.77
7	I	7	MAN	O2-C2-C3	5.08	120.31	110.14
2	C	4	MAN	O5-C5-C6	5.06	115.14	107.20
8	J	2	NAG	C1-O5-C5	4.98	118.94	112.19
7	I	1	NAG	C1-O5-C5	4.95	118.89	112.19
3	N	3	BMA	C1-O5-C5	4.89	118.82	112.19
2	C	3	BMA	C1-C2-C3	4.79	115.56	109.67
7	I	6	MAN	C1-O5-C5	4.77	118.66	112.19
5	M	5	MAN	C1-O5-C5	4.75	118.63	112.19
5	F	10	MAN	O2-C2-C3	4.74	119.63	110.14
6	O	4	MAN	C1-C2-C3	4.62	115.35	109.67
6	O	4	MAN	C1-O5-C5	4.55	118.36	112.19
3	N	1	NAG	C1-O5-C5	4.49	118.28	112.19
6	O	3	BMA	C1-O5-C5	4.44	118.21	112.19
10	P	6	MAN	O5-C5-C6	4.43	114.15	107.20
10	P	2	NAG	C1-O5-C5	4.38	118.13	112.19
8	J	7	MAN	O5-C5-C6	4.28	113.92	107.20
4	G	1	NAG	C1-O5-C5	4.24	117.93	112.19
6	O	2	NAG	O7-C7-N2	-4.24	114.17	121.95
3	L	1	NAG	O4-C4-C5	-4.20	98.88	109.30
5	F	3	BMA	O2-C2-C3	-4.07	101.97	110.14
3	D	3	BMA	O3-C3-C2	-4.07	102.19	109.99
8	J	4	MAN	O5-C5-C6	4.07	113.58	107.20
3	N	3	BMA	C1-C2-C3	4.06	114.66	109.67
5	M	2	NAG	C1-C2-N2	-4.02	103.62	110.49
3	D	3	BMA	C1-C2-C3	4.02	114.61	109.67
8	J	7	MAN	O6-C6-C5	3.99	124.98	111.29
9	K	5	MAN	O3-C3-C4	3.95	119.48	110.35
6	H	6	MAN	C1-O5-C5	3.93	117.51	112.19
6	O	7	MAN	O2-C2-C1	-3.92	101.14	109.15
3	L	2	NAG	C2-N2-C7	3.91	128.47	122.90
7	I	3	BMA	C1-O5-C5	3.89	117.46	112.19
3	D	3	BMA	O5-C5-C6	3.88	113.29	107.20
7	I	3	BMA	O3-C3-C4	3.88	119.32	110.35
8	J	3	BMA	C1-O5-C5	3.87	117.44	112.19
7	I	4	MAN	O5-C5-C6	3.84	113.23	107.20
7	I	7	MAN	C3-C4-C5	-3.82	103.42	110.24
5	F	5	MAN	C1-O5-C5	3.82	117.37	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	K	4	MAN	O5-C5-C6	3.77	113.12	107.20
3	D	3	BMA	C3-C4-C5	3.76	116.94	110.24
3	N	3	BMA	O5-C5-C6	3.76	113.09	107.20
8	J	4	MAN	O2-C2-C3	-3.74	102.64	110.14
6	H	2	NAG	C2-N2-C7	-3.73	117.59	122.90
6	O	4	MAN	O5-C1-C2	3.67	116.43	110.77
3	L	3	BMA	C1-O5-C5	3.66	117.15	112.19
4	E	1	NAG	O5-C5-C6	3.66	112.94	107.20
5	F	4	MAN	O6-C6-C5	-3.63	98.82	111.29
5	F	6	MAN	O5-C5-C6	3.63	112.90	107.20
5	F	5	MAN	O6-C6-C5	-3.63	98.83	111.29
3	D	1	NAG	C1-C2-N2	3.63	116.69	110.49
5	M	1	NAG	O4-C4-C5	-3.60	100.36	109.30
6	O	7	MAN	O5-C1-C2	-3.59	105.23	110.77
3	N	3	BMA	C3-C4-C5	3.50	116.49	110.24
5	F	4	MAN	O3-C3-C4	-3.49	102.27	110.35
5	M	7	MAN	O2-C2-C3	-3.48	103.17	110.14
5	F	6	MAN	C1-O5-C5	3.44	116.85	112.19
10	P	8	MAN	C2-C3-C4	3.44	116.84	110.89
3	L	2	NAG	C3-C4-C5	-3.43	104.12	110.24
5	M	10	MAN	O3-C3-C2	3.42	116.55	109.99
6	O	3	BMA	C3-C4-C5	3.42	116.34	110.24
5	F	3	BMA	C1-O5-C5	3.42	116.83	112.19
8	J	5	MAN	O6-C6-C5	-3.41	99.60	111.29
7	I	6	MAN	O5-C5-C6	-3.38	101.91	107.20
3	D	3	BMA	O6-C6-C5	3.38	122.87	111.29
6	H	5	MAN	C3-C4-C5	-3.37	104.22	110.24
10	P	7	MAN	C1-C2-C3	-3.36	105.53	109.67
8	J	6	MAN	O5-C5-C6	3.33	112.43	107.20
5	M	10	MAN	O2-C2-C3	3.32	116.80	110.14
9	K	1	NAG	C4-C3-C2	-3.31	106.16	111.02
6	O	6	MAN	C1-O5-C5	3.31	116.68	112.19
7	I	7	MAN	O3-C3-C2	3.30	116.32	109.99
2	C	2	NAG	C2-N2-C7	3.25	127.54	122.90
6	H	5	MAN	O2-C2-C3	-3.25	103.62	110.14
4	E	1	NAG	C2-N2-C7	3.22	127.49	122.90
4	G	2	NAG	C4-C3-C2	3.22	115.73	111.02
2	C	1	NAG	C2-N2-C7	-3.20	118.34	122.90
10	P	8	MAN	C1-C2-C3	3.19	113.59	109.67
7	I	6	MAN	O2-C2-C1	3.19	115.69	109.15
6	H	2	NAG	O6-C6-C5	-3.18	100.38	111.29
5	M	2	NAG	O5-C5-C6	-3.17	102.24	107.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	3	BMA	O3-C3-C4	3.16	117.66	110.35
10	P	3	BMA	O5-C5-C6	-3.15	102.26	107.20
6	O	2	NAG	C8-C7-N2	3.14	121.42	116.10
9	K	5	MAN	O5-C5-C6	3.14	112.12	107.20
8	J	7	MAN	C1-C2-C3	3.12	113.50	109.67
8	J	7	MAN	O4-C4-C3	-3.12	103.14	110.35
7	I	6	MAN	O3-C3-C4	3.11	117.54	110.35
2	C	4	MAN	O6-C6-C5	3.09	121.91	111.29
6	O	1	NAG	O5-C1-C2	-3.05	106.47	111.29
9	K	5	MAN	C6-C5-C4	3.02	120.08	113.00
8	J	7	MAN	C6-C5-C4	3.01	120.06	113.00
5	F	2	NAG	C1-O5-C5	3.01	116.27	112.19
6	O	2	NAG	O5-C1-C2	-2.98	106.58	111.29
5	F	3	BMA	C1-C2-C3	2.98	113.33	109.67
8	J	2	NAG	O6-C6-C5	-2.98	101.07	111.29
7	I	1	NAG	C1-C2-N2	-2.97	105.41	110.49
10	P	6	MAN	C1-O5-C5	2.97	116.21	112.19
2	C	2	NAG	O7-C7-C8	-2.97	116.55	122.06
3	D	2	NAG	C2-N2-C7	-2.96	118.69	122.90
3	D	2	NAG	O5-C5-C6	2.95	111.83	107.20
5	M	5	MAN	O2-C2-C1	2.95	115.18	109.15
3	L	3	BMA	O4-C4-C5	2.94	116.60	109.30
8	J	7	MAN	O3-C3-C4	2.94	117.15	110.35
10	P	5	MAN	O2-C2-C3	-2.92	104.29	110.14
5	F	7	MAN	O2-C2-C3	-2.92	104.30	110.14
10	P	4	MAN	O5-C1-C2	-2.91	106.28	110.77
5	M	4	MAN	O5-C1-C2	-2.91	106.28	110.77
5	F	2	NAG	O4-C4-C3	-2.91	103.63	110.35
3	N	2	NAG	O5-C5-C6	-2.90	102.66	107.20
5	F	8	MAN	O3-C3-C2	-2.90	104.44	109.99
5	F	10	MAN	C2-C3-C4	2.90	115.91	110.89
5	M	10	MAN	O2-C2-C1	2.90	115.08	109.15
10	P	6	MAN	O3-C3-C4	2.89	117.04	110.35
7	I	5	MAN	C6-C5-C4	2.89	119.78	113.00
8	J	7	MAN	C1-O5-C5	2.87	116.08	112.19
5	M	10	MAN	C6-C5-C4	-2.85	106.32	113.00
6	H	5	MAN	O5-C5-C6	2.83	111.64	107.20
5	M	8	MAN	O5-C1-C2	-2.83	106.41	110.77
2	C	1	NAG	C1-O5-C5	2.83	116.02	112.19
5	M	5	MAN	O5-C1-C2	2.82	115.13	110.77
4	E	2	NAG	C3-C4-C5	-2.82	105.21	110.24
8	J	1	NAG	C1-O5-C5	2.81	116.01	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	F	10	MAN	O2-C2-C1	2.80	114.88	109.15
3	N	2	NAG	C2-N2-C7	2.80	126.89	122.90
6	H	7	MAN	C1-C2-C3	-2.79	106.24	109.67
7	I	4	MAN	C1-O5-C5	2.78	115.96	112.19
9	K	1	NAG	C1-O5-C5	2.78	115.96	112.19
5	M	8	MAN	O4-C4-C3	2.78	116.77	110.35
5	F	8	MAN	C1-O5-C5	2.77	115.95	112.19
5	M	4	MAN	O2-C2-C3	2.76	115.67	110.14
5	M	1	NAG	C3-C4-C5	-2.76	105.32	110.24
3	D	3	BMA	O3-C3-C4	2.75	116.71	110.35
8	J	1	NAG	C2-N2-C7	-2.74	119.00	122.90
9	K	2	NAG	C1-C2-N2	2.74	115.16	110.49
5	M	1	NAG	C8-C7-N2	2.74	120.73	116.10
5	M	5	MAN	C6-C5-C4	-2.73	106.62	113.00
10	P	4	MAN	O3-C3-C2	-2.71	104.80	109.99
6	O	7	MAN	O3-C3-C2	2.71	115.18	109.99
2	C	1	NAG	O5-C1-C2	2.70	115.55	111.29
10	P	8	MAN	C3-C4-C5	2.70	115.05	110.24
9	K	2	NAG	C1-O5-C5	-2.68	108.56	112.19
3	L	1	NAG	C1-O5-C5	2.67	115.81	112.19
9	K	4	MAN	O2-C2-C3	2.66	115.47	110.14
6	O	4	MAN	O3-C3-C4	2.65	116.47	110.35
5	M	4	MAN	O6-C6-C5	-2.65	102.21	111.29
3	N	2	NAG	O7-C7-N2	2.64	126.81	121.95
6	O	1	NAG	C1-C2-N2	-2.63	105.99	110.49
6	H	6	MAN	C3-C4-C5	2.63	114.93	110.24
5	F	6	MAN	O3-C3-C2	2.61	114.99	109.99
7	I	5	MAN	O2-C2-C3	-2.60	104.92	110.14
5	F	5	MAN	C6-C5-C4	-2.59	106.93	113.00
7	I	2	NAG	C1-O5-C5	2.59	115.69	112.19
6	H	6	MAN	O5-C5-C6	2.56	111.22	107.20
5	F	10	MAN	C1-O5-C5	2.56	115.66	112.19
6	H	5	MAN	C6-C5-C4	2.55	118.99	113.00
10	P	7	MAN	O5-C5-C6	2.55	111.20	107.20
6	O	7	MAN	O2-C2-C3	2.55	115.24	110.14
10	P	1	NAG	O6-C6-C5	-2.54	102.58	111.29
3	D	2	NAG	C1-O5-C5	-2.52	108.78	112.19
5	M	4	MAN	O3-C3-C4	-2.52	104.53	110.35
5	M	8	MAN	C1-C2-C3	2.51	112.75	109.67
10	P	7	MAN	O2-C2-C3	2.51	115.16	110.14
4	G	1	NAG	O3-C3-C2	-2.51	104.28	109.47
5	F	3	BMA	O3-C3-C2	-2.50	105.20	109.99

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	I	1	NAG	O5-C5-C6	2.50	111.13	107.20
7	I	3	BMA	O2-C2-C3	2.45	115.05	110.14
2	C	3	BMA	O3-C3-C2	2.45	114.69	109.99
5	M	1	NAG	O5-C1-C2	-2.44	107.44	111.29
10	P	3	BMA	O5-C5-C4	-2.43	104.90	110.83
5	M	10	MAN	O6-C6-C5	-2.43	102.96	111.29
10	P	6	MAN	C3-C4-C5	-2.42	105.92	110.24
8	J	6	MAN	C3-C4-C5	-2.42	105.93	110.24
5	M	1	NAG	C4-C3-C2	2.42	114.56	111.02
3	L	2	NAG	C1-O5-C5	2.41	115.46	112.19
5	F	10	MAN	O4-C4-C3	-2.41	104.78	110.35
7	I	5	MAN	O4-C4-C3	-2.41	104.78	110.35
10	P	1	NAG	O5-C5-C6	2.40	110.97	107.20
2	C	2	NAG	O5-C5-C4	-2.39	105.00	110.83
3	L	3	BMA	O5-C5-C6	2.38	110.93	107.20
8	J	6	MAN	O3-C3-C4	-2.37	104.88	110.35
5	M	10	MAN	O5-C5-C6	2.36	110.91	107.20
3	L	3	BMA	C1-C2-C3	2.36	112.57	109.67
7	I	6	MAN	O6-C6-C5	-2.36	103.19	111.29
5	M	5	MAN	O2-C2-C3	-2.36	105.41	110.14
10	P	6	MAN	O2-C2-C3	2.34	114.83	110.14
6	H	6	MAN	C6-C5-C4	-2.33	107.55	113.00
10	P	7	MAN	C3-C4-C5	2.33	114.39	110.24
9	K	4	MAN	C2-C3-C4	2.33	114.92	110.89
7	I	1	NAG	O5-C1-C2	-2.31	107.64	111.29
7	I	2	NAG	C2-N2-C7	-2.31	119.61	122.90
6	O	1	NAG	O4-C4-C3	-2.31	105.01	110.35
8	J	2	NAG	O4-C4-C5	-2.31	103.57	109.30
3	D	1	NAG	O5-C5-C4	-2.29	105.25	110.83
6	O	1	NAG	C2-N2-C7	-2.28	119.66	122.90
5	F	8	MAN	O3-C3-C4	-2.28	105.08	110.35
4	G	2	NAG	C1-C2-N2	-2.28	106.60	110.49
6	O	6	MAN	O4-C4-C3	-2.28	105.08	110.35
8	J	3	BMA	O2-C2-C1	-2.27	104.50	109.15
3	L	2	NAG	O6-C6-C5	-2.27	103.51	111.29
4	G	2	NAG	C2-N2-C7	-2.26	119.68	122.90
10	P	5	MAN	O6-C6-C5	-2.25	103.57	111.29
9	K	2	NAG	O6-C6-C5	-2.25	103.57	111.29
6	H	2	NAG	C3-C4-C5	-2.22	106.27	110.24
5	F	9	MAN	O4-C4-C3	-2.22	105.21	110.35
6	O	2	NAG	O4-C4-C5	2.22	114.81	109.30
10	P	5	MAN	O5-C5-C4	2.21	116.22	110.83

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	O	2	NAG	C1-C2-N2	-2.19	106.75	110.49
6	O	2	NAG	C6-C5-C4	2.18	118.12	113.00
5	F	9	MAN	O2-C2-C3	-2.18	105.77	110.14
9	K	4	MAN	O3-C3-C2	2.18	114.17	109.99
5	F	5	MAN	O5-C1-C2	2.18	114.14	110.77
7	I	7	MAN	O4-C4-C3	2.18	115.38	110.35
6	O	3	BMA	O3-C3-C4	-2.18	105.32	110.35
9	K	2	NAG	O5-C5-C4	-2.17	105.54	110.83
8	J	1	NAG	O7-C7-C8	-2.17	118.03	122.06
10	P	7	MAN	O3-C3-C2	2.16	114.14	109.99
10	P	3	BMA	O6-C6-C5	-2.16	103.87	111.29
2	C	2	NAG	C4-C3-C2	2.15	114.17	111.02
6	H	5	MAN	C2-C3-C4	-2.15	107.17	110.89
5	M	10	MAN	C1-O5-C5	2.14	115.10	112.19
7	I	1	NAG	O6-C6-C5	-2.14	103.94	111.29
6	H	2	NAG	O4-C4-C3	-2.14	105.40	110.35
5	F	9	MAN	O5-C5-C6	2.14	110.55	107.20
6	O	2	NAG	O5-C5-C4	-2.13	105.63	110.83
6	O	1	NAG	O3-C3-C2	-2.13	105.06	109.47
10	P	1	NAG	O4-C4-C5	-2.13	104.01	109.30
5	F	8	MAN	O4-C4-C5	2.13	114.58	109.30
9	K	1	NAG	O7-C7-N2	2.13	125.86	121.95
5	F	4	MAN	O3-C3-C2	2.11	114.04	109.99
9	K	1	NAG	O4-C4-C3	-2.11	105.47	110.35
2	C	2	NAG	O6-C6-C5	-2.11	104.05	111.29
4	E	2	NAG	O7-C7-C8	-2.10	118.16	122.06
8	J	2	NAG	O7-C7-C8	-2.09	118.17	122.06
8	J	7	MAN	C3-C4-C5	2.09	113.96	110.24
6	H	3	BMA	O2-C2-C1	-2.08	104.89	109.15
8	J	5	MAN	O2-C2-C1	-2.08	104.89	109.15
6	O	1	NAG	C4-C3-C2	2.08	114.07	111.02
8	J	1	NAG	C4-C3-C2	2.08	114.06	111.02
5	F	5	MAN	O5-C5-C4	2.07	115.87	110.83
2	C	4	MAN	C1-C2-C3	2.07	112.21	109.67
7	I	3	BMA	C6-C5-C4	2.06	117.84	113.00
5	F	7	MAN	O3-C3-C2	-2.06	106.05	109.99
5	M	1	NAG	C1-C2-N2	-2.05	106.98	110.49
9	K	2	NAG	C6-C5-C4	2.05	117.80	113.00
5	M	4	MAN	C3-C4-C5	-2.05	106.59	110.24
7	I	1	NAG	C6-C5-C4	-2.04	108.23	113.00
5	F	7	MAN	O3-C3-C4	-2.04	105.64	110.35
10	P	7	MAN	C6-C5-C4	-2.03	108.25	113.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	L	1	NAG	O5-C1-C2	-2.01	108.12	111.29
6	O	2	NAG	O4-C4-C3	-2.00	105.72	110.35

There are no chirality outliers.

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	I	4	MAN	O5-C5-C6-O6
7	I	6	MAN	O5-C5-C6-O6
3	L	3	BMA	O5-C5-C6-O6
5	F	10	MAN	O5-C5-C6-O6
7	I	7	MAN	O5-C5-C6-O6
7	I	4	MAN	C4-C5-C6-O6
9	K	4	MAN	O5-C5-C6-O6
10	P	6	MAN	O5-C5-C6-O6
8	J	6	MAN	O5-C5-C6-O6
7	I	6	MAN	C4-C5-C6-O6
9	K	4	MAN	C4-C5-C6-O6
4	G	2	NAG	C4-C5-C6-O6
5	F	10	MAN	C4-C5-C6-O6
10	P	6	MAN	C4-C5-C6-O6
7	I	7	MAN	C4-C5-C6-O6
6	H	7	MAN	O5-C5-C6-O6
3	N	2	NAG	C4-C5-C6-O6
10	P	8	MAN	O5-C5-C6-O6
3	L	3	BMA	C4-C5-C6-O6
8	J	6	MAN	C4-C5-C6-O6
3	D	3	BMA	O5-C5-C6-O6
4	G	2	NAG	O5-C5-C6-O6
8	J	5	MAN	O5-C5-C6-O6
3	N	2	NAG	O5-C5-C6-O6
4	E	2	NAG	C4-C5-C6-O6
4	E	2	NAG	O5-C5-C6-O6
6	H	7	MAN	C4-C5-C6-O6
10	P	1	NAG	C4-C5-C6-O6
8	J	2	NAG	C4-C5-C6-O6
6	O	5	MAN	O5-C5-C6-O6
10	P	4	MAN	C4-C5-C6-O6
3	N	3	BMA	O5-C5-C6-O6
3	L	2	NAG	C3-C2-N2-C7
4	E	2	NAG	C3-C2-N2-C7
10	P	8	MAN	C4-C5-C6-O6

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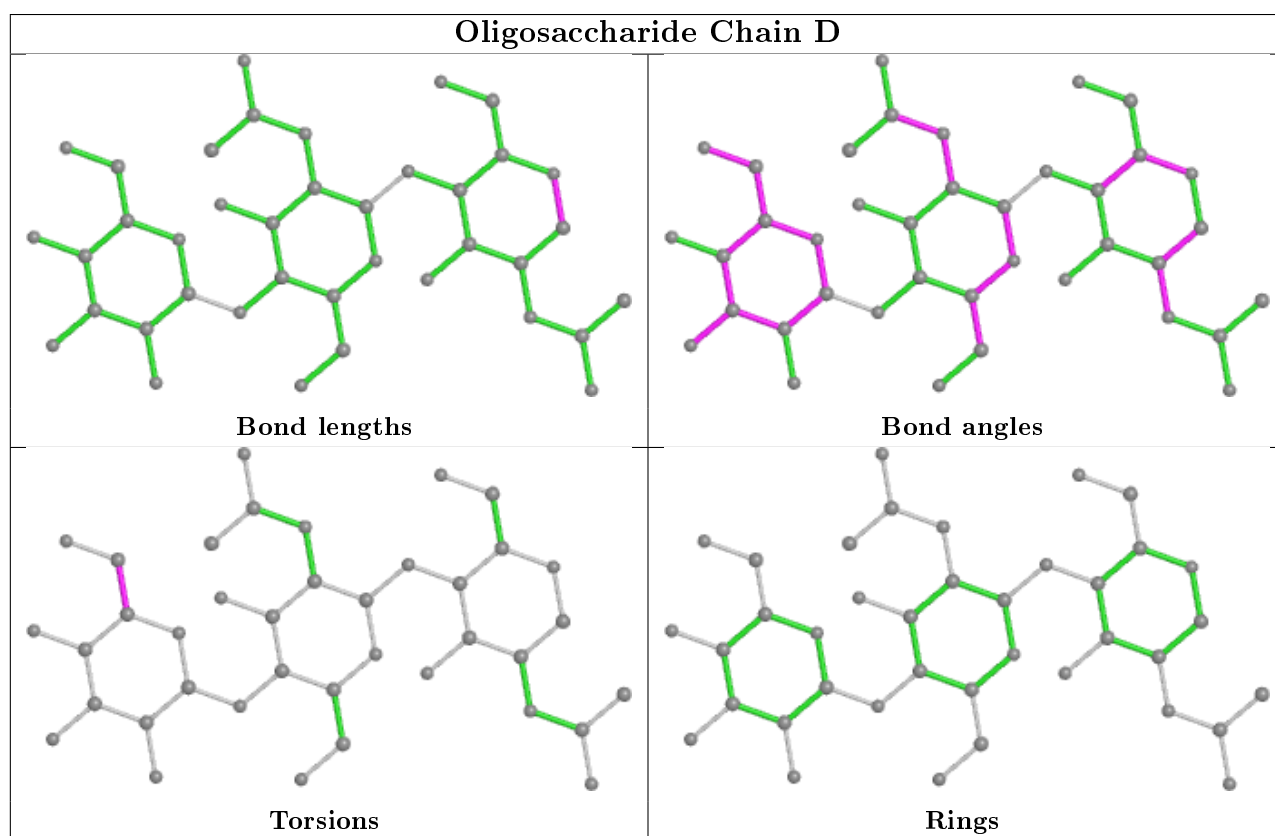
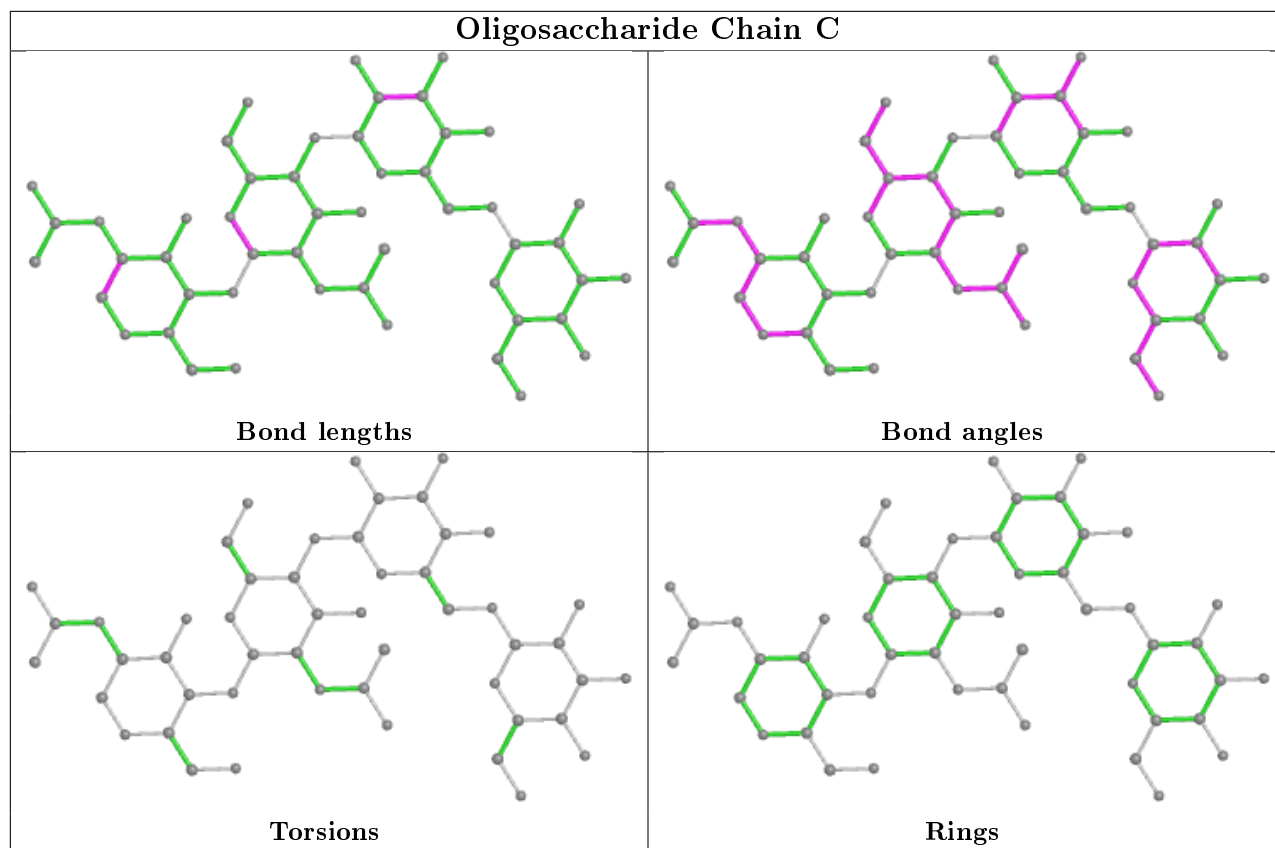
Mol	Chain	Res	Type	Atoms
9	K	5	MAN	O5-C5-C6-O6
3	D	3	BMA	C4-C5-C6-O6
8	J	2	NAG	O5-C5-C6-O6
6	O	6	MAN	O5-C5-C6-O6
6	O	7	MAN	C4-C5-C6-O6
7	I	1	NAG	C4-C5-C6-O6
5	F	5	MAN	C4-C5-C6-O6

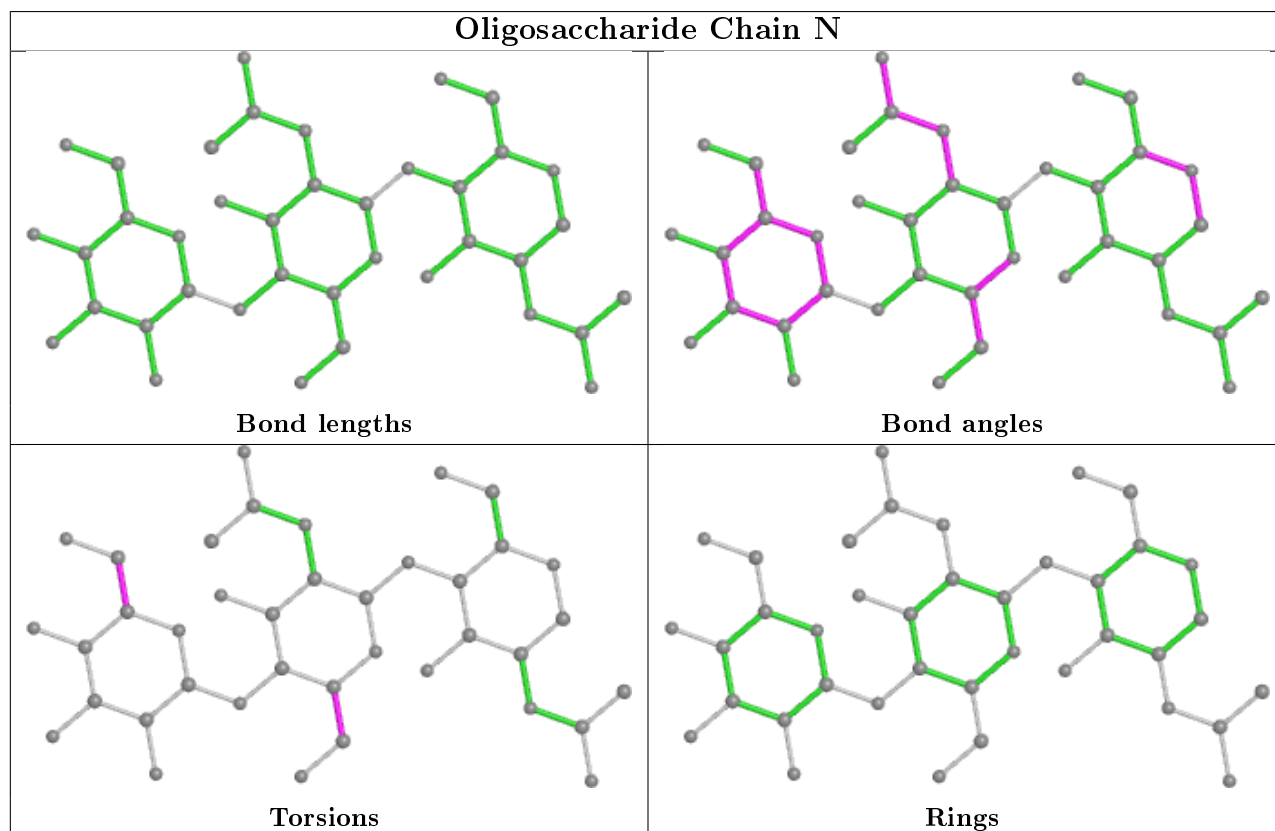
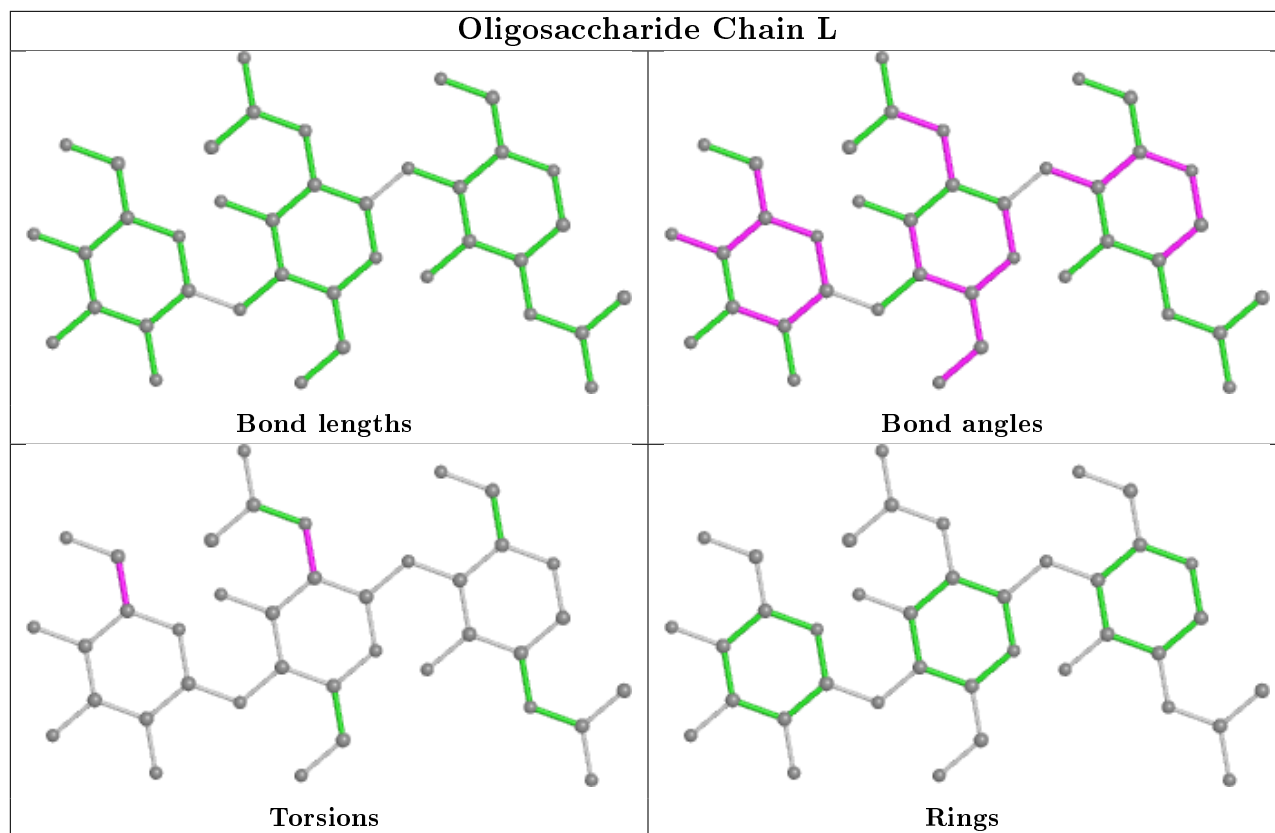
There are no ring outliers.

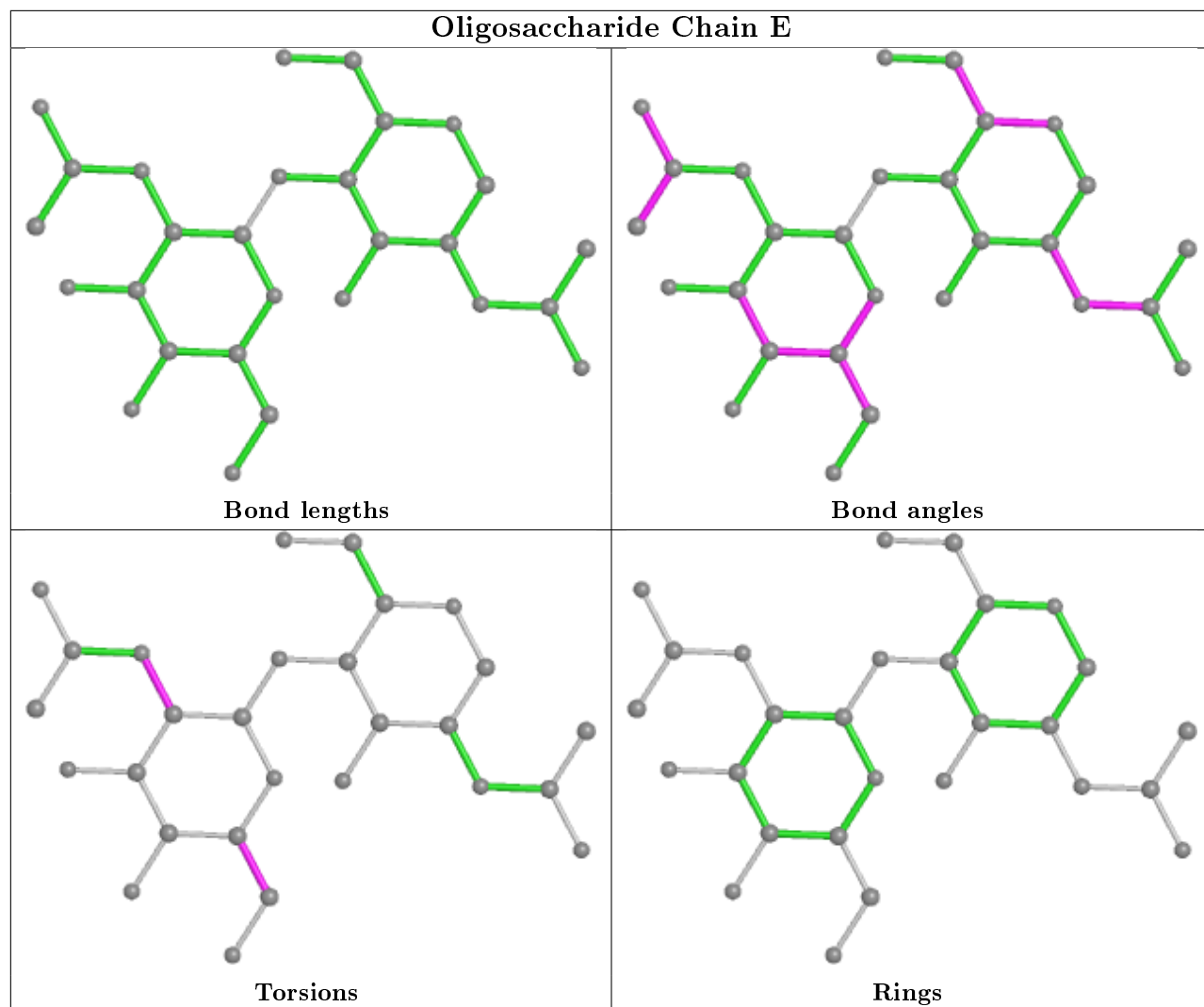
7 monomers are involved in 8 short contacts:

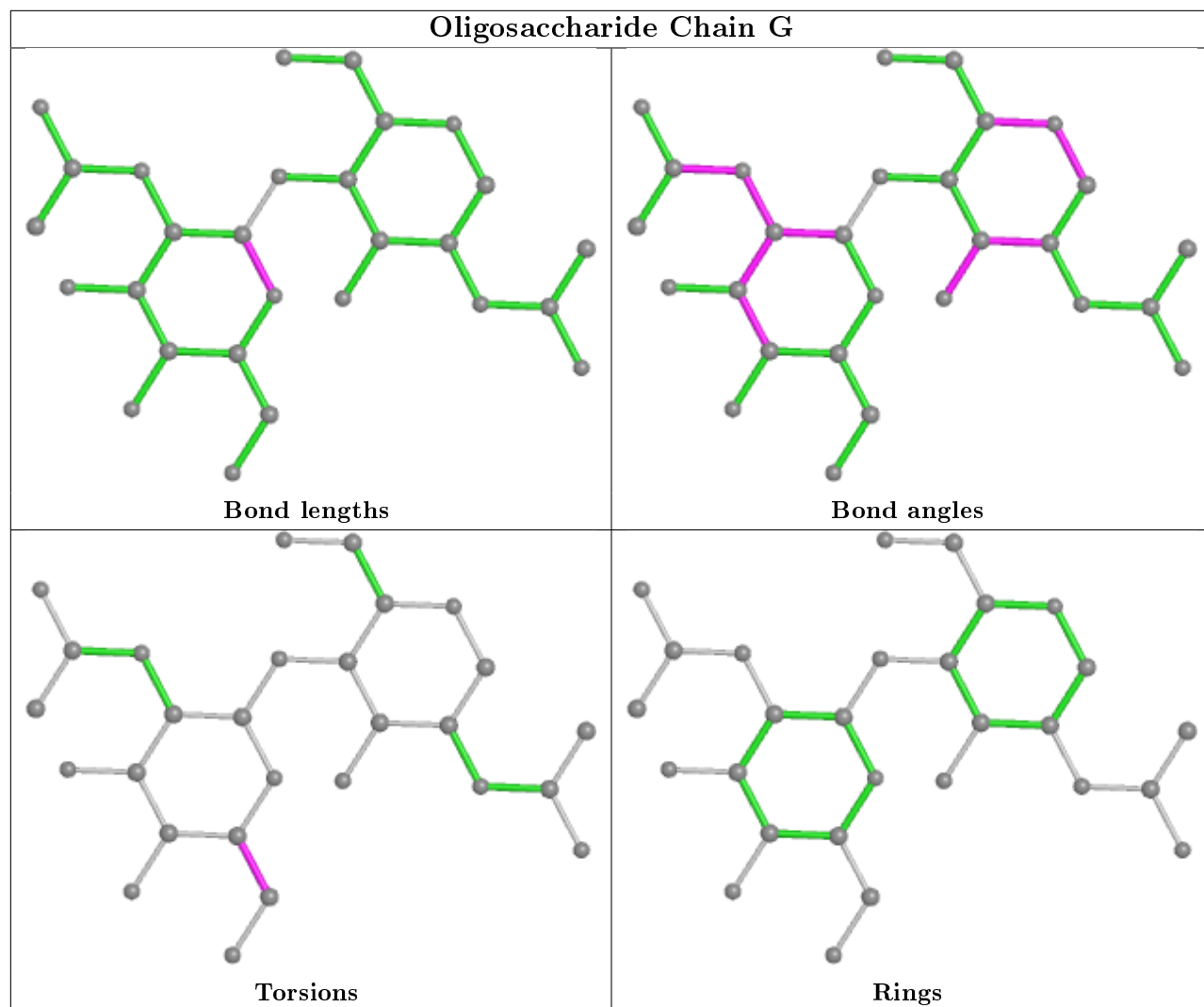
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	1	NAG	1	0
8	J	1	NAG	1	0
6	O	4	MAN	2	0
6	O	3	BMA	2	0
6	H	3	BMA	3	0
3	D	2	NAG	1	0
4	E	2	NAG	1	0

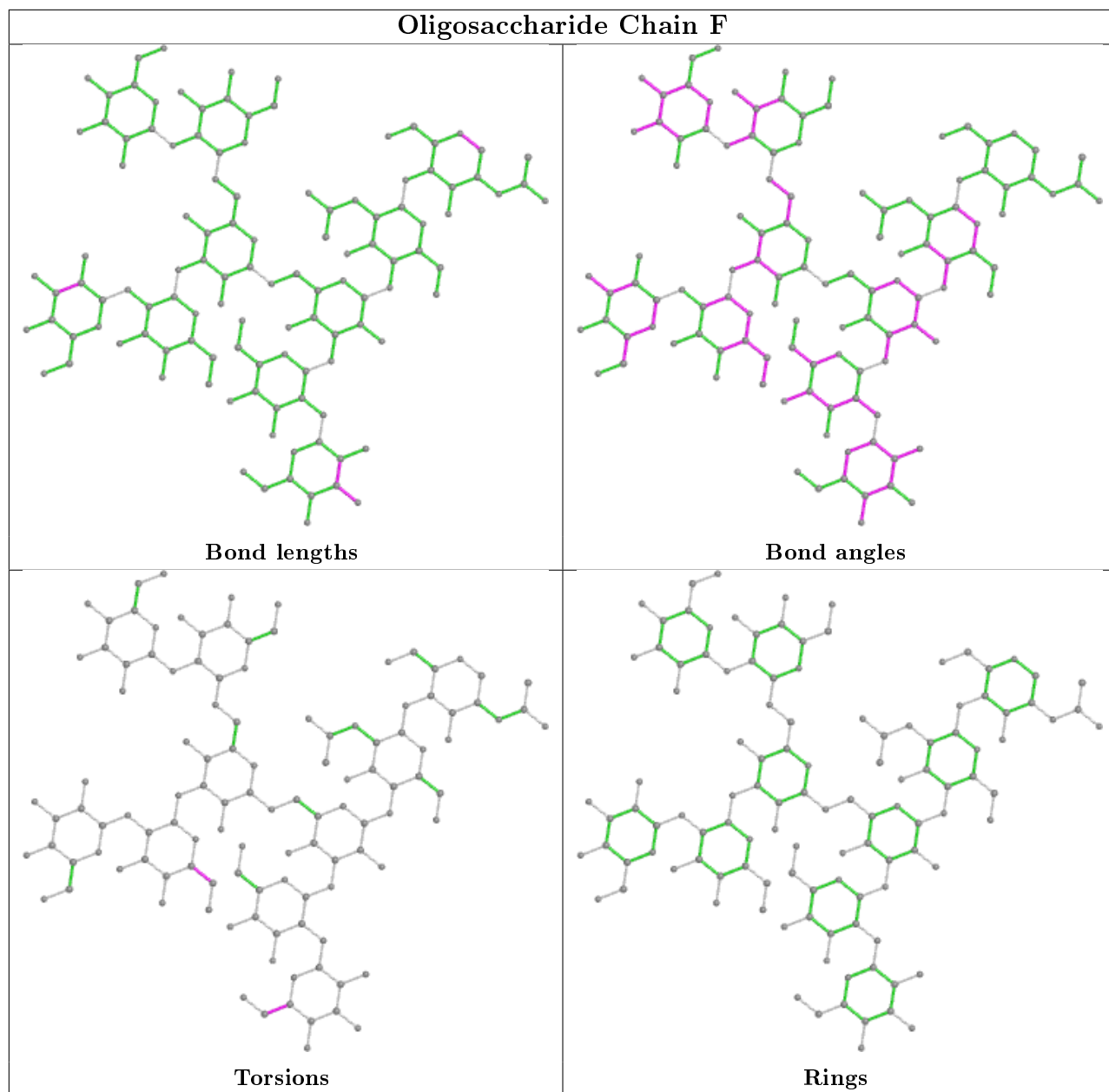
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

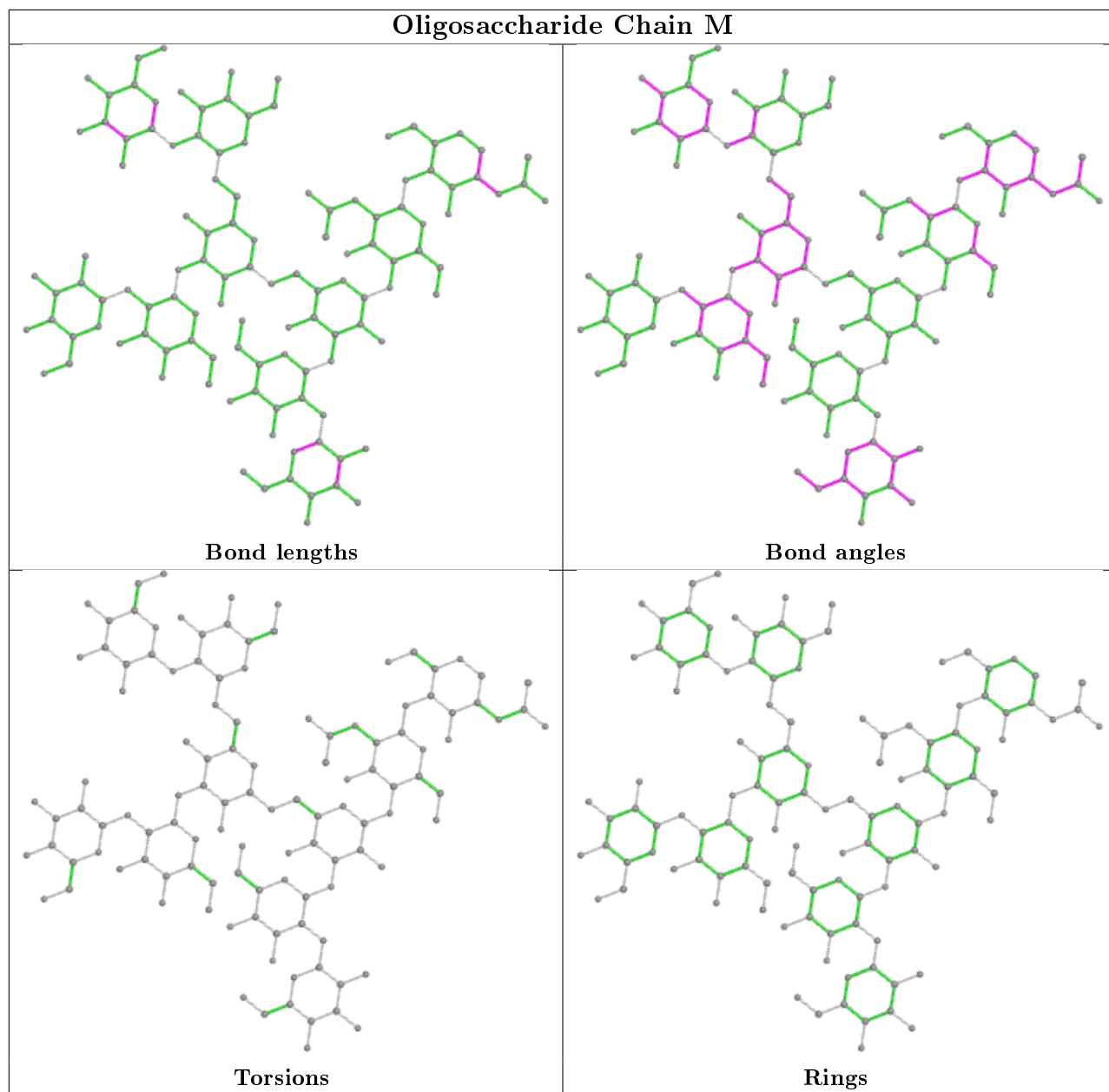


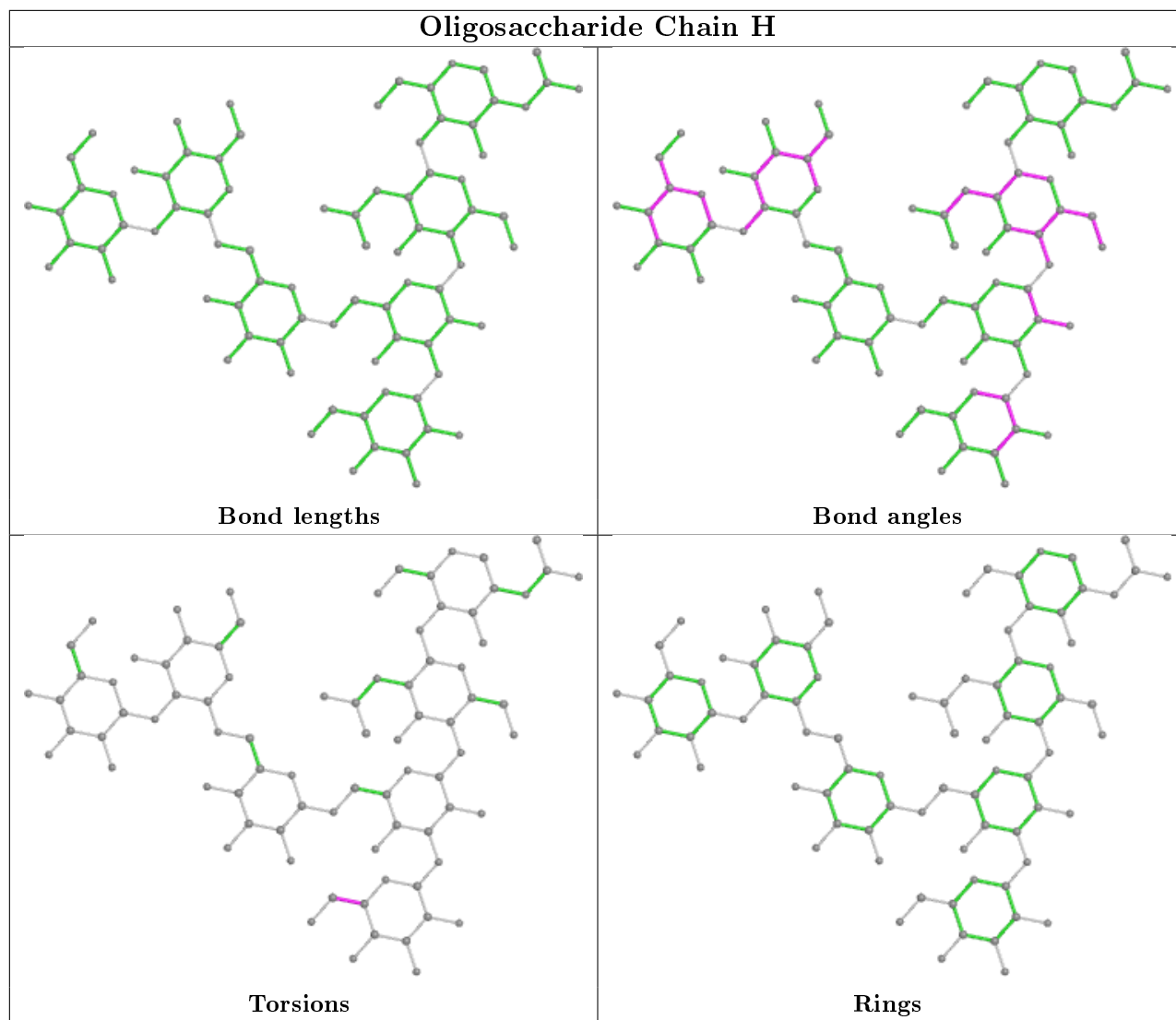


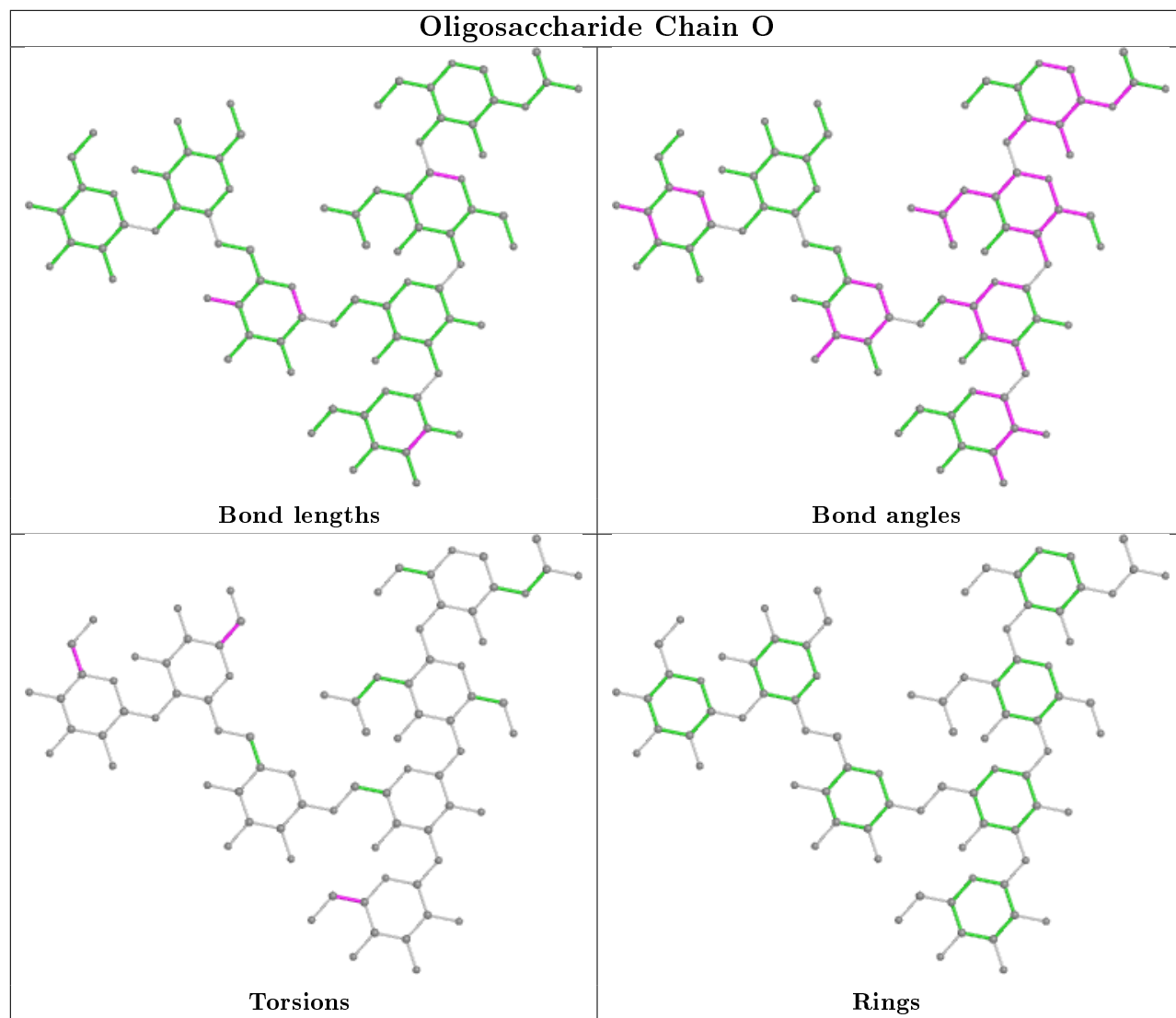


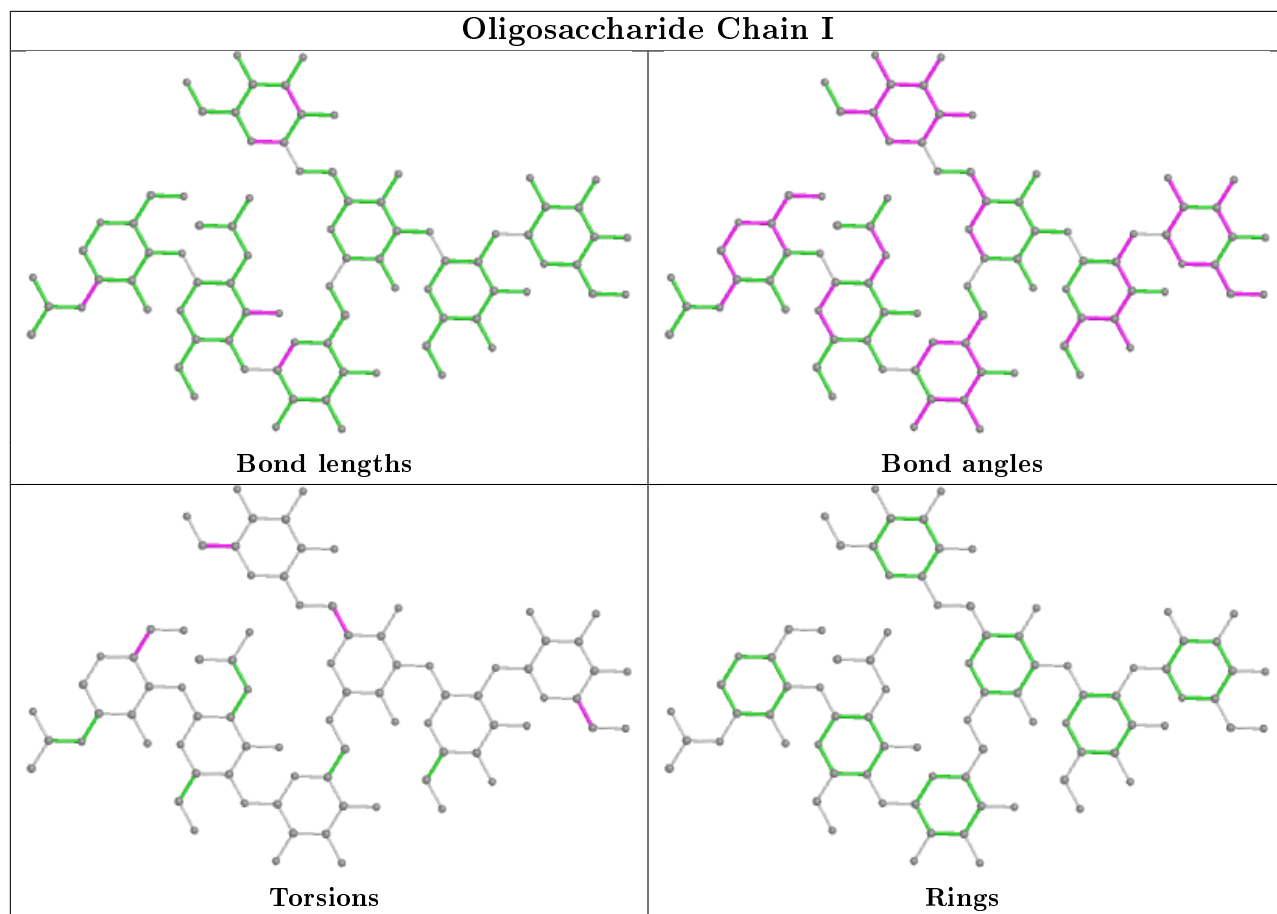


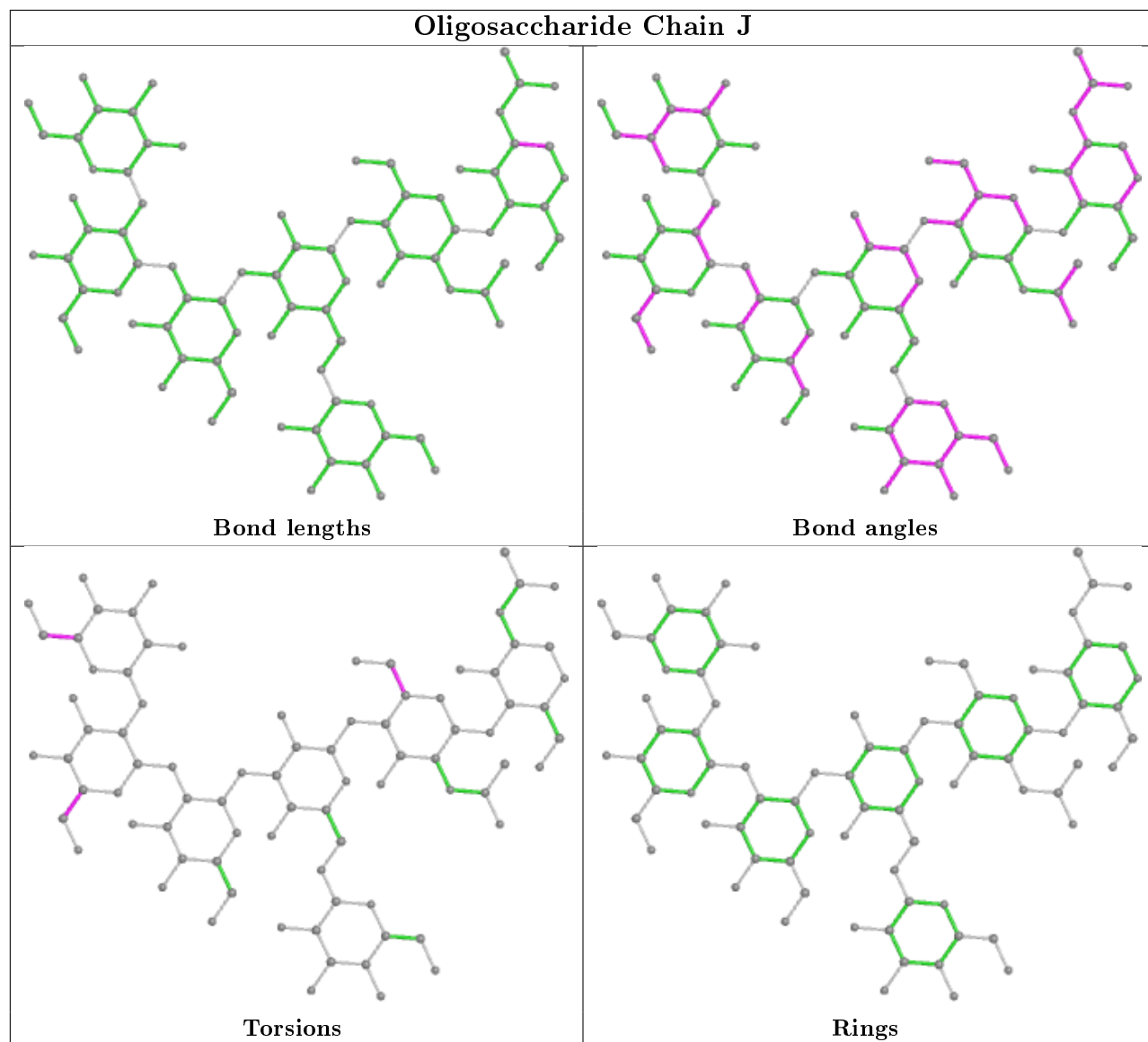


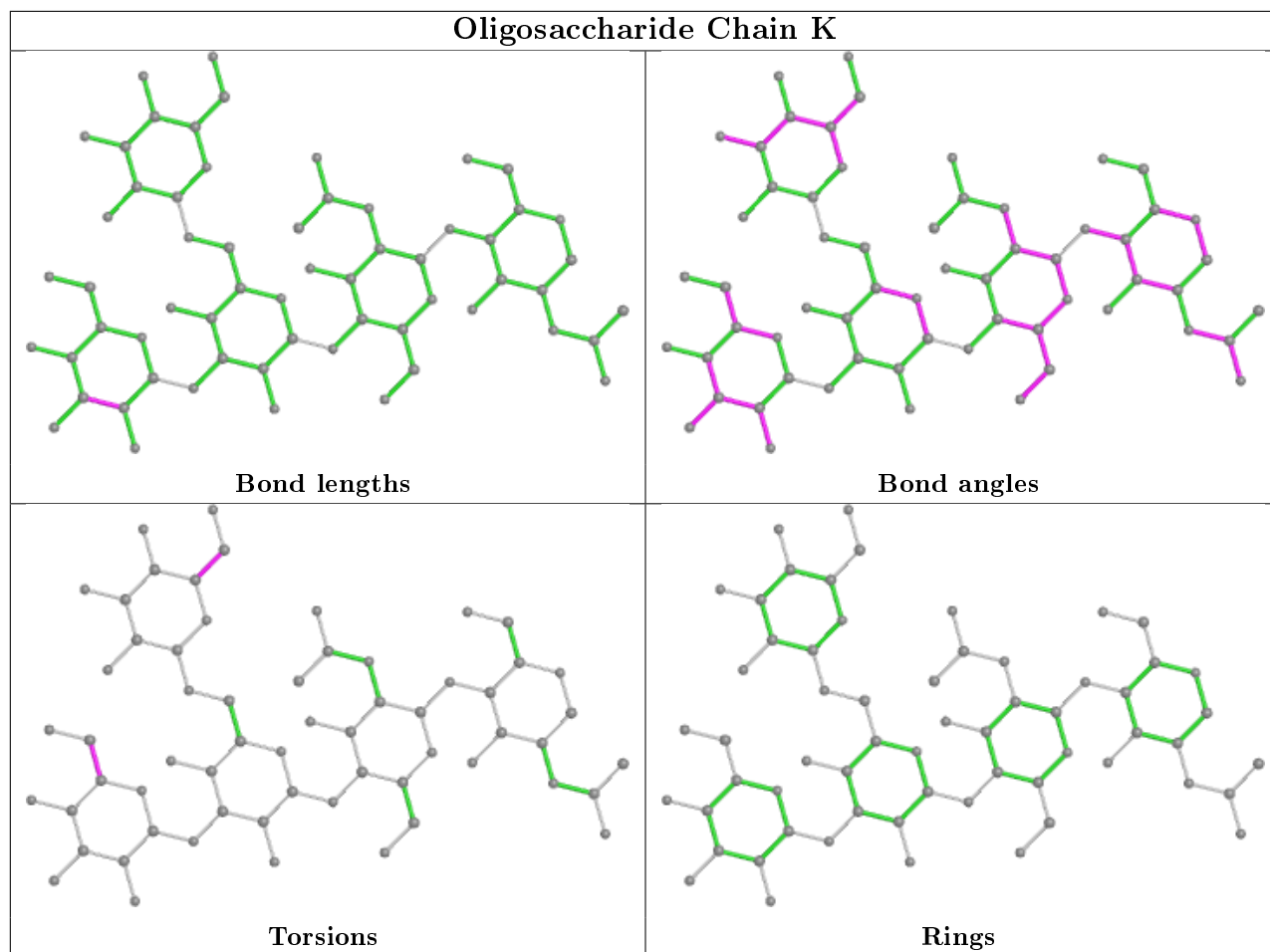


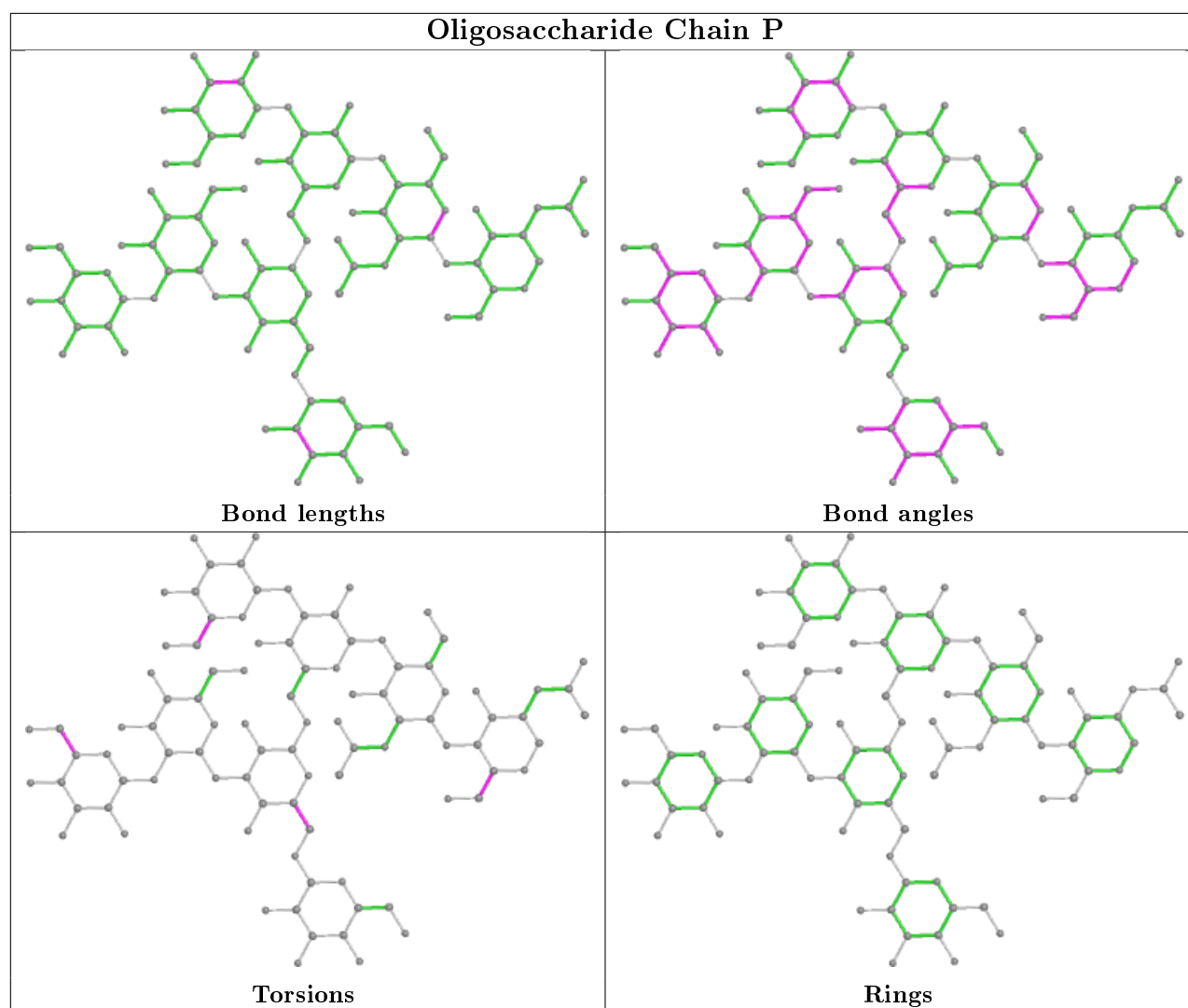












5.6 Ligand geometry [i](#)

11 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	$\# Z > 2$
11	NAG	B	946	1	14,14,15	0.70	0	17,19,21	1.15	1 (5%)
13	NOJ	A	940	-	11,11,11	0.47	0	13,15,15	1.22	2 (15%)
11	NAG	A	937	1	14,14,15	0.58	0	17,19,21	1.94	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
12	MRD	B	948	-	7,7,7	0.91	0	9,10,10	0.44	0
11	NAG	A	905	1	14,14,15	0.92	0	17,19,21	1.58	3 (17%)
11	NAG	B	908	1	14,14,15	0.82	0	17,19,21	1.26	2 (11%)
14	MPD	B	947	-	7,7,7	0.51	0	9,10,10	1.51	1 (11%)
11	NAG	B	945	1	14,14,15	0.59	0	17,19,21	1.42	2 (11%)
12	MRD	A	939	-	7,7,7	0.71	0	9,10,10	0.82	0
13	NOJ	B	949	-	11,11,11	1.44	2 (18%)	13,15,15	1.83	4 (30%)
12	MRD	A	938	-	7,7,7	0.63	0	9,10,10	0.62	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
11	NAG	B	946	1	-	2/6/23/26	0/1/1/1
13	NOJ	A	940	-	-	0/2/19/19	0/1/1/1
11	NAG	A	937	1	-	2/6/23/26	0/1/1/1
12	MRD	B	948	-	-	2/5/5/5	-
11	NAG	A	905	1	-	0/6/23/26	0/1/1/1
11	NAG	B	908	1	-	4/6/23/26	0/1/1/1
14	MPD	B	947	-	-	1/5/5/5	-
11	NAG	B	945	1	-	1/6/23/26	0/1/1/1
12	MRD	A	939	-	-	4/5/5/5	-
13	NOJ	B	949	-	-	0/2/19/19	0/1/1/1
12	MRD	A	938	-	-	1/5/5/5	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
13	B	949	NOJ	C1-C2	2.97	1.55	1.52
13	B	949	NOJ	C2-C3	2.48	1.56	1.52

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	A	937	NAG	O5-C5-C6	4.81	114.75	107.20
11	A	905	NAG	C1-C2-N2	3.76	116.91	110.49
11	B	945	NAG	O5-C1-C2	-3.58	105.64	111.29
11	A	937	NAG	C3-C4-C5	-3.57	103.87	110.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
13	B	949	NOJ	C1-N5-C5	3.50	117.18	109.61
11	A	937	NAG	C4-C3-C2	-3.08	106.50	111.02
11	B	945	NAG	C4-C3-C2	3.08	115.53	111.02
13	B	949	NOJ	O2-C2-C1	-3.07	103.61	109.61
11	A	905	NAG	O7-C7-C8	-2.83	116.79	122.06
14	B	947	MPD	O2-C2-C1	-2.76	99.21	108.08
11	A	905	NAG	C1-O5-C5	2.58	115.69	112.19
13	B	949	NOJ	O4-C4-C5	2.32	114.27	109.47
11	B	908	NAG	C2-N2-C7	2.27	126.14	122.90
13	A	940	NOJ	C1-N5-C5	2.18	114.32	109.61
13	B	949	NOJ	O2-C2-C3	-2.09	105.96	110.14
11	B	946	NAG	O5-C5-C6	2.08	110.46	107.20
13	A	940	NOJ	C1-C2-C3	2.04	112.72	110.33
11	B	908	NAG	O4-C4-C3	-2.02	105.67	110.35

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
12	B	948	MRD	C2-C3-C4-O4
12	B	948	MRD	C2-C3-C4-C5
12	A	939	MRD	C2-C3-C4-O4
11	B	946	NAG	O5-C5-C6-O6
11	A	937	NAG	O5-C5-C6-O6
11	B	946	NAG	C4-C5-C6-O6
11	A	937	NAG	C4-C5-C6-O6
11	B	908	NAG	O5-C5-C6-O6
11	B	908	NAG	C4-C5-C6-O6
12	A	938	MRD	C2-C3-C4-C5
12	A	939	MRD	C1-C2-C3-C4
12	A	939	MRD	CM-C2-C3-C4
11	B	945	NAG	C4-C5-C6-O6
11	B	908	NAG	C3-C2-N2-C7
12	A	939	MRD	O2-C2-C3-C4
11	B	908	NAG	C1-C2-N2-C7
14	B	947	MPD	C2-C3-C4-C5

There are no ring outliers.

4 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
12	B	948	MRD	2	0
14	B	947	MPD	4	0
12	A	939	MRD	9	0
12	A	938	MRD	2	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	834/841 (99%)	-0.37	11 (1%) 77 81	11, 21, 36, 74	0
1	B	832/841 (98%)	-0.52	1 (0%) 95 97	11, 18, 32, 56	0
All	All	1666/1682 (99%)	-0.44	12 (0%) 87 91	11, 20, 34, 74	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	245	MET	3.0
1	A	144	ALA	2.8
1	A	675	VAL	2.7
1	A	277	VAL	2.6
1	A	189	LYS	2.2
1	B	573	LEU	2.2
1	A	190	HIS	2.1
1	A	110	VAL	2.1
1	A	168	THR	2.1
1	A	790	PRO	2.1
1	A	573	LEU	2.0
1	A	191	TYR	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, 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(\AA^2)	Q<0.9
9	MAN	K	4	11/12	0.68	0.25	71,78,86,88	0
9	MAN	K	5	11/12	0.74	0.28	56,66,70,73	0
6	MAN	O	7	11/12	0.76	0.29	71,76,79,85	0
10	MAN	P	7	11/12	0.78	0.23	45,61,66,70	0
3	BMA	L	3	11/12	0.80	0.28	57,75,80,91	0
6	MAN	H	7	11/12	0.81	0.34	66,68,75,77	0
10	MAN	P	8	11/12	0.82	0.22	62,72,77,79	0
7	MAN	I	7	11/12	0.83	0.23	51,57,67,69	0
3	BMA	N	3	11/12	0.85	0.26	56,65,69,69	0
2	MAN	C	4	11/12	0.87	0.17	42,50,53,58	0
4	NAG	G	2	14/15	0.88	0.21	49,56,64,65	0
7	MAN	I	6	11/12	0.89	0.19	50,56,59,62	0
10	MAN	P	6	11/12	0.90	0.23	51,58,63,67	0
5	MAN	M	10	11/12	0.91	0.12	32,38,45,48	0
2	BMA	C	3	11/12	0.91	0.09	32,39,46,47	0
6	BMA	H	3	11/12	0.91	0.19	32,35,43,53	0
6	MAN	O	4	11/12	0.92	0.17	30,35,41,41	0
3	BMA	D	3	11/12	0.92	0.25	38,43,52,56	0
9	BMA	K	3	11/12	0.92	0.17	47,53,62,78	0
6	NAG	O	2	14/15	0.92	0.18	23,28,38,38	0
6	BMA	O	3	11/12	0.92	0.17	34,39,47,54	0
10	BMA	P	3	11/12	0.93	0.15	37,44,55,66	0
8	MAN	J	7	11/12	0.93	0.12	34,38,42,44	0
6	NAG	H	2	14/15	0.93	0.15	18,26,37,39	0
10	NAG	P	2	14/15	0.93	0.13	25,35,42,44	0
5	MAN	M	6	11/12	0.93	0.13	29,37,42,43	0
7	BMA	I	3	11/12	0.93	0.13	38,43,49,53	0
6	MAN	H	4	11/12	0.94	0.17	30,36,41,46	0
5	MAN	F	10	11/12	0.94	0.17	35,45,55,58	0
3	NAG	N	2	14/15	0.94	0.18	39,42,50,57	0
8	MAN	J	5	11/12	0.94	0.19	33,37,46,61	0
3	NAG	D	2	14/15	0.94	0.12	24,31,38,39	0
3	NAG	L	2	14/15	0.94	0.14	20,32,45,51	0
5	MAN	F	6	11/12	0.94	0.17	33,38,43,43	0
4	NAG	G	1	14/15	0.95	0.10	29,36,44,47	0
7	NAG	I	2	14/15	0.95	0.13	26,32,42,45	0
6	NAG	H	1	14/15	0.95	0.14	18,26,39,42	0
8	BMA	J	3	11/12	0.95	0.09	26,28,32,32	0
7	MAN	I	4	11/12	0.95	0.10	27,34,41,52	0
6	NAG	O	1	14/15	0.95	0.11	16,24,41,41	0
10	MAN	P	5	11/12	0.96	0.13	26,33,38,48	0
6	MAN	O	6	11/12	0.96	0.13	26,31,37,39	0
9	NAG	K	2	14/15	0.96	0.13	27,29,35,42	0

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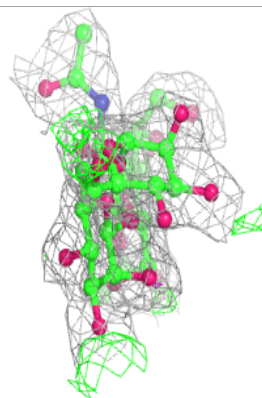
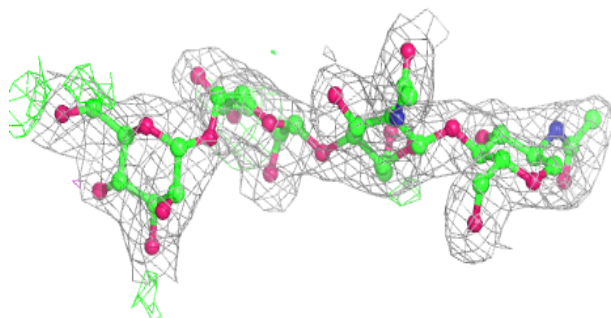
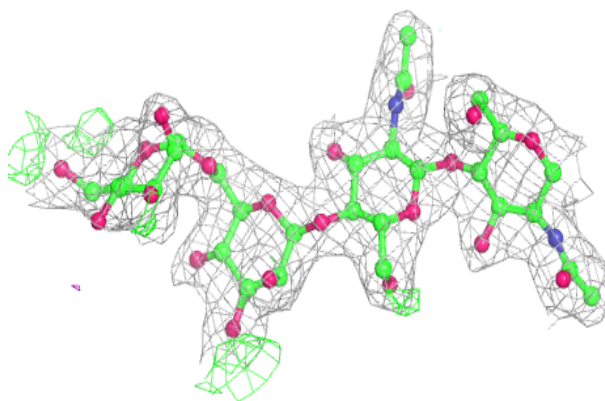
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	NAG	D	1	14/15	0.96	0.08	19,25,30,34	0
5	MAN	F	7	11/12	0.96	0.09	23,25,27,27	0
2	NAG	C	2	14/15	0.96	0.09	27,31,36,39	0
8	NAG	J	1	14/15	0.96	0.09	14,17,20,21	0
5	NAG	M	2	14/15	0.96	0.09	18,20,27,30	0
8	MAN	J	6	11/12	0.96	0.14	28,31,36,40	0
5	MAN	F	5	11/12	0.96	0.13	24,28,35,39	0
4	NAG	E	1	14/15	0.96	0.08	18,24,27,29	0
10	MAN	P	4	11/12	0.96	0.16	27,35,47,52	0
8	MAN	J	4	11/12	0.96	0.16	28,34,39,41	0
4	NAG	E	2	14/15	0.96	0.13	32,37,42,47	0
10	NAG	P	1	14/15	0.96	0.08	19,23,26,27	0
5	NAG	M	1	14/15	0.97	0.08	17,20,23,25	0
7	MAN	I	5	11/12	0.97	0.11	28,35,45,49	0
5	NAG	F	1	14/15	0.97	0.12	24,28,31,31	0
7	NAG	I	1	14/15	0.97	0.08	21,24,26,31	0
3	NAG	N	1	14/15	0.97	0.08	26,33,46,54	0
9	NAG	K	1	14/15	0.97	0.09	21,24,27,28	0
5	MAN	F	8	11/12	0.97	0.13	21,22,26,27	0
8	NAG	J	2	14/15	0.97	0.08	16,21,25,31	0
5	MAN	F	9	11/12	0.97	0.13	30,34,38,41	0
5	MAN	M	8	11/12	0.97	0.08	18,20,20,25	0
6	MAN	H	6	11/12	0.97	0.17	29,31,40,49	0
2	NAG	C	1	14/15	0.97	0.09	19,25,26,27	0
5	NAG	F	2	14/15	0.97	0.10	26,27,31,31	0
5	BMA	M	3	11/12	0.97	0.07	20,22,25,26	0
6	MAN	O	5	11/12	0.98	0.14	27,30,34,40	0
5	MAN	M	9	11/12	0.98	0.07	19,22,24,31	0
3	NAG	L	1	14/15	0.98	0.07	15,19,22,23	0
5	MAN	M	7	11/12	0.98	0.07	15,17,20,24	0
6	MAN	H	5	11/12	0.98	0.15	25,27,28,32	0
5	MAN	M	4	11/12	0.98	0.08	17,19,20,21	0
5	MAN	M	5	11/12	0.98	0.08	21,23,30,32	0
5	BMA	F	3	11/12	0.98	0.09	24,26,29,31	0
5	MAN	F	4	11/12	0.98	0.08	17,20,23,23	0

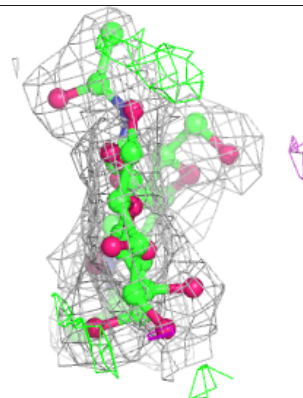
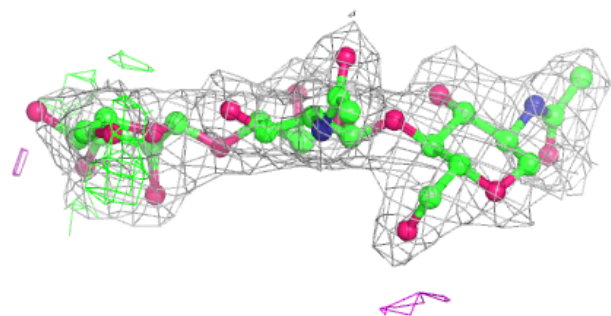
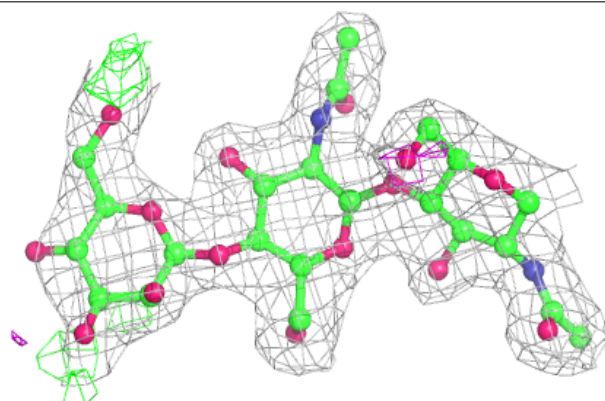
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain C:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

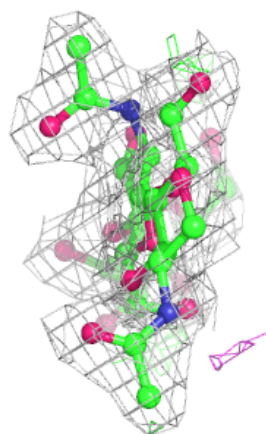
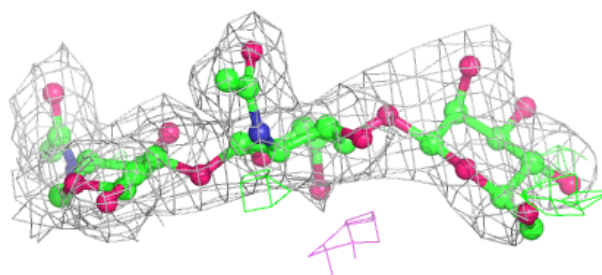
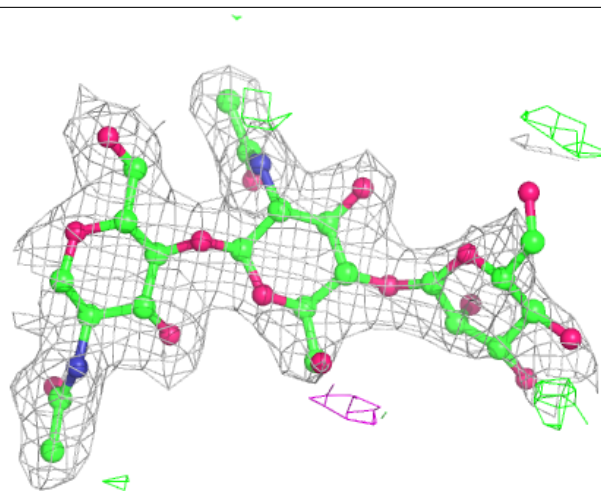
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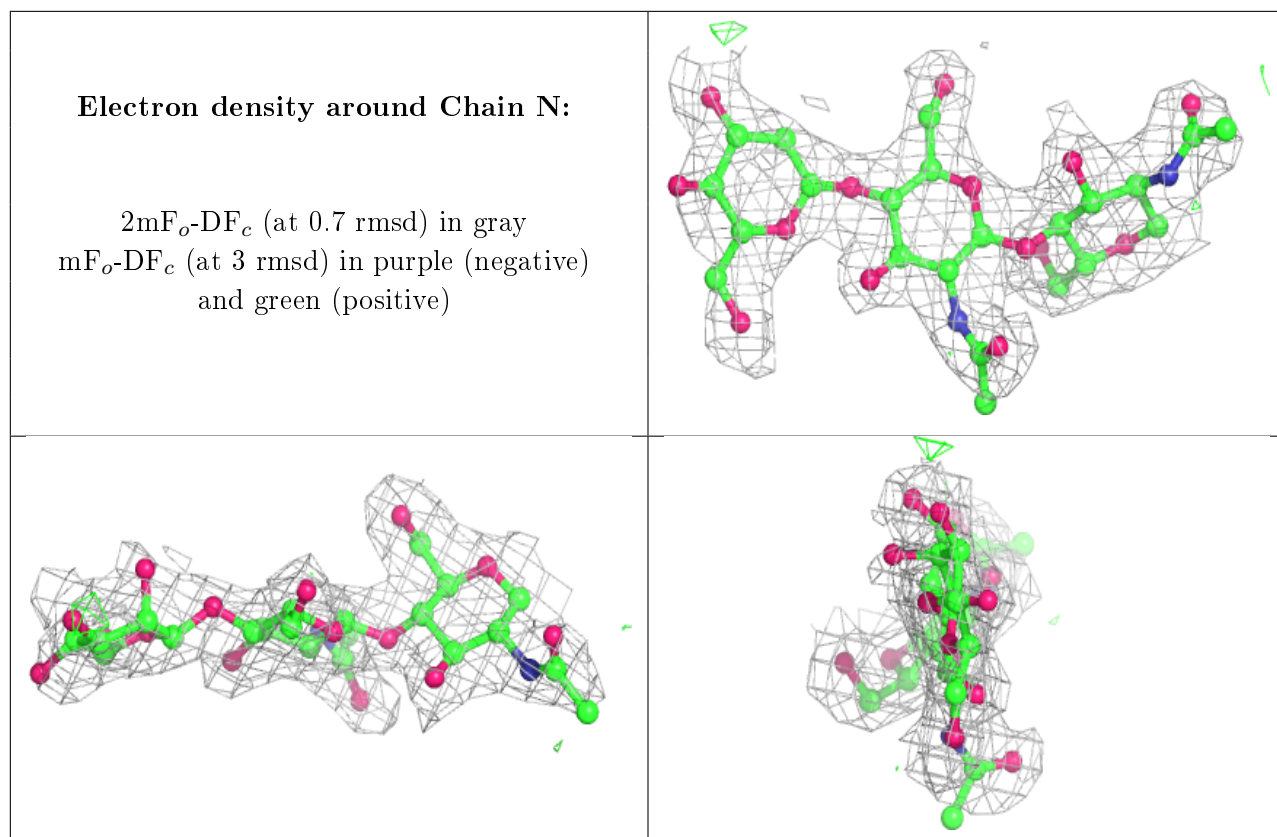
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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain L:

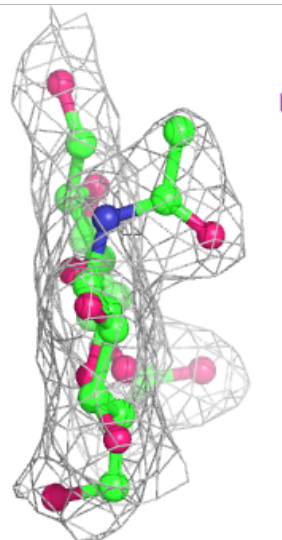
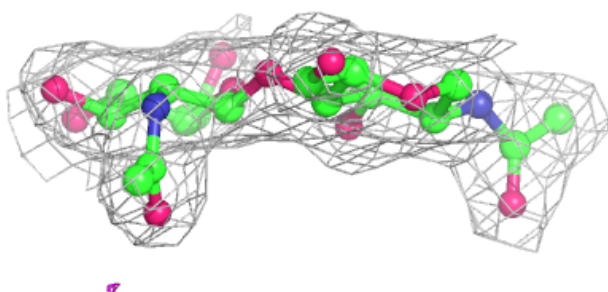
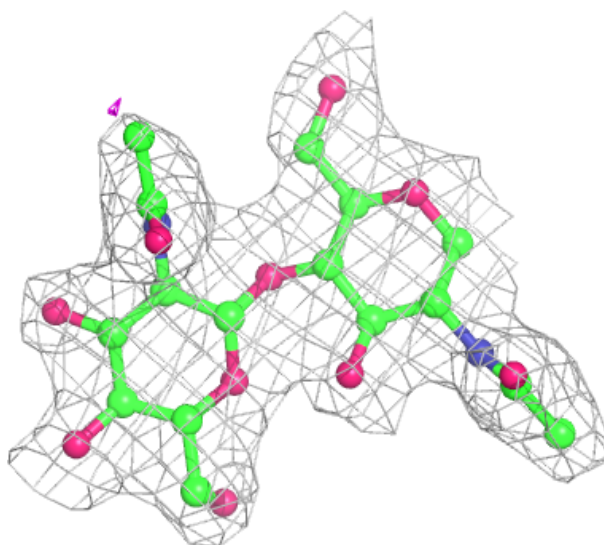
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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





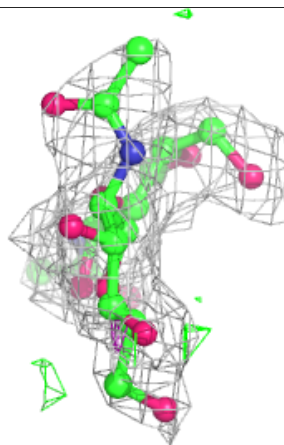
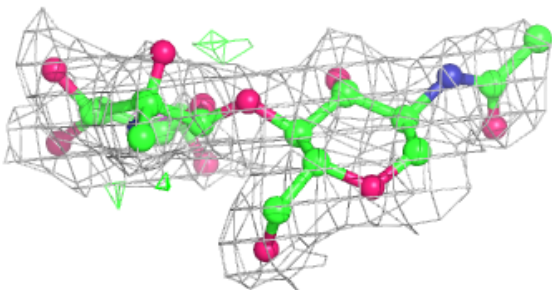
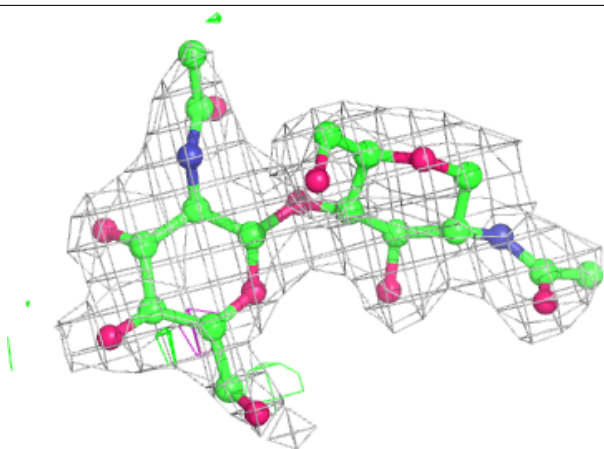
Electron density around Chain E:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



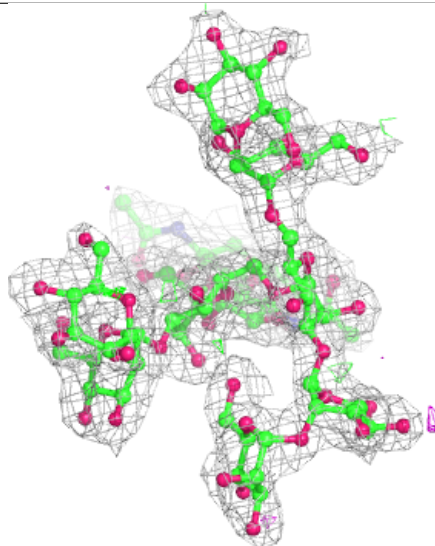
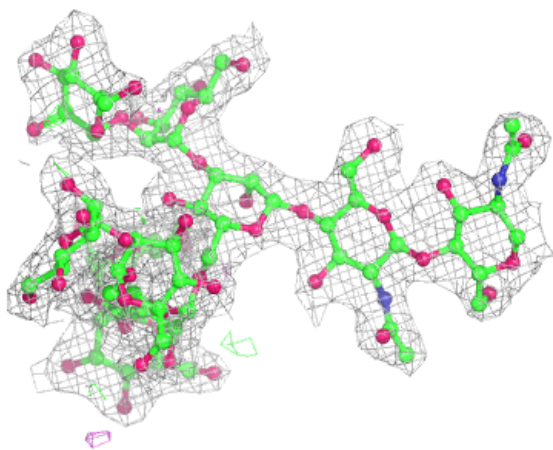
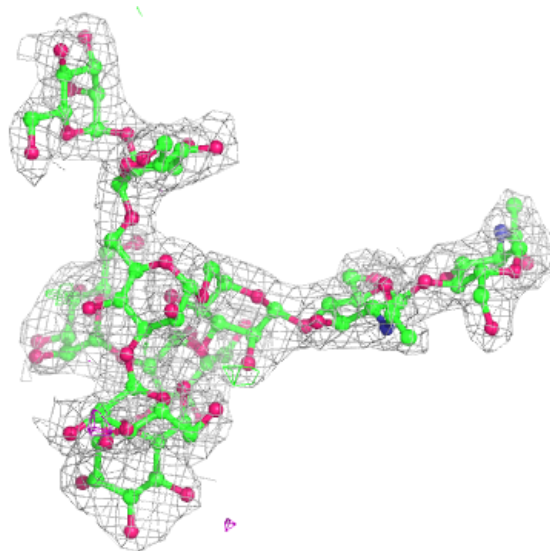
Electron density around Chain G:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



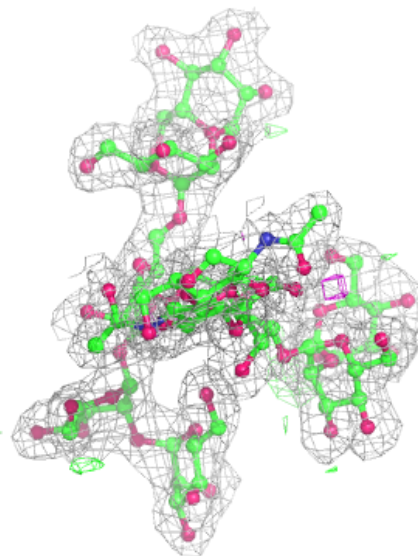
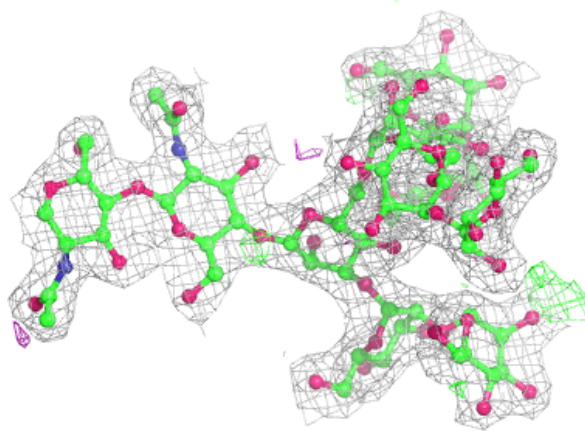
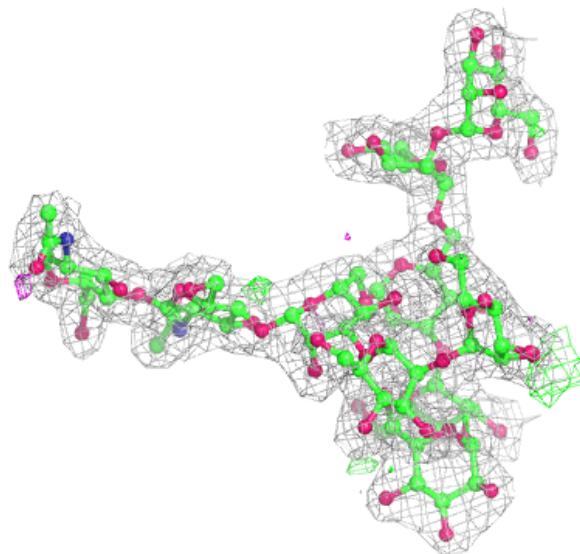
Electron density around Chain F:

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and green (positive)



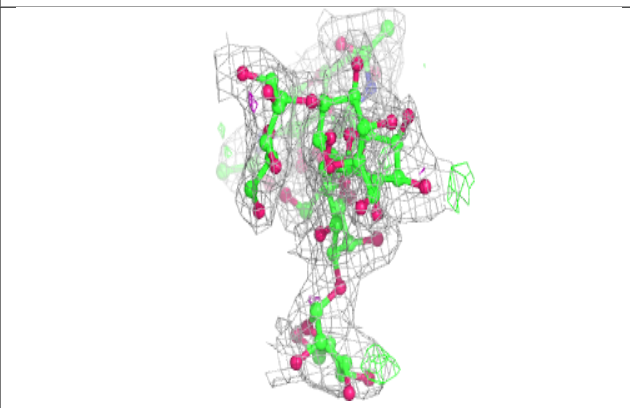
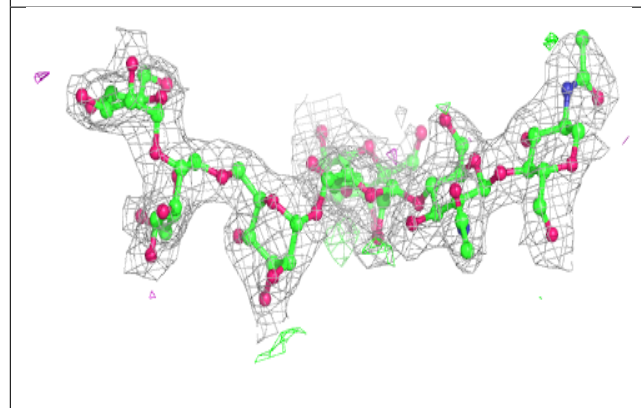
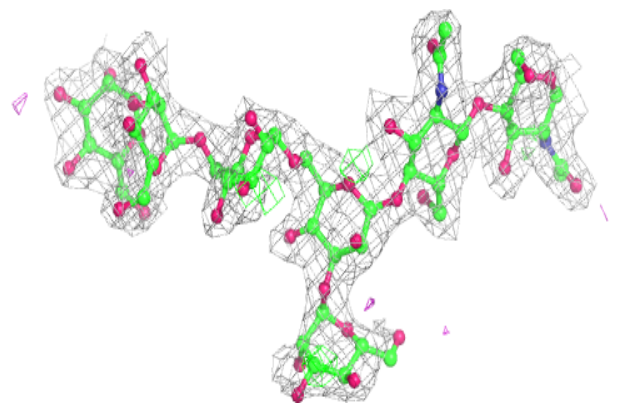
Electron density around Chain M:

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and green (positive)

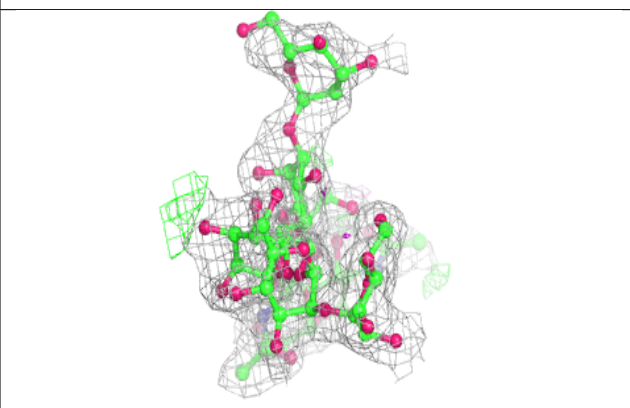
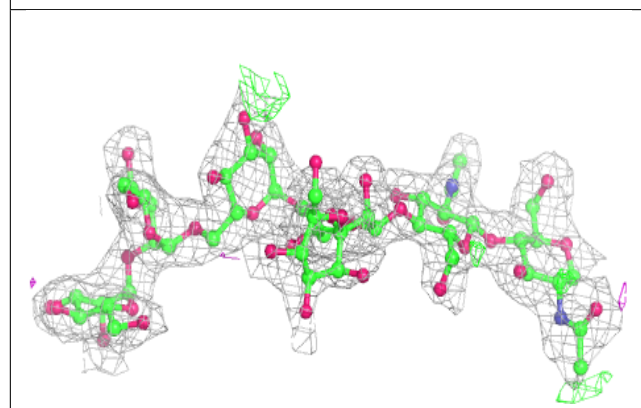
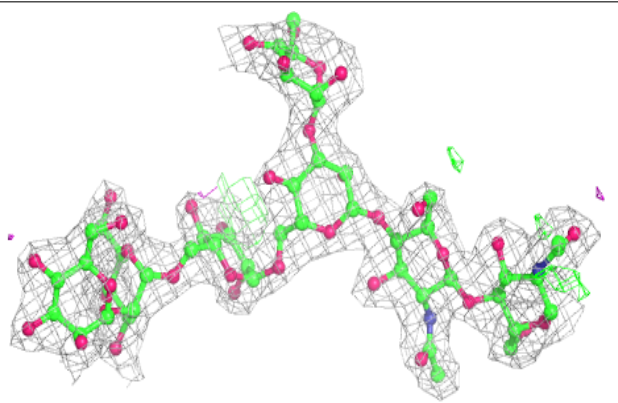


Electron density around Chain H:

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and green (positive)

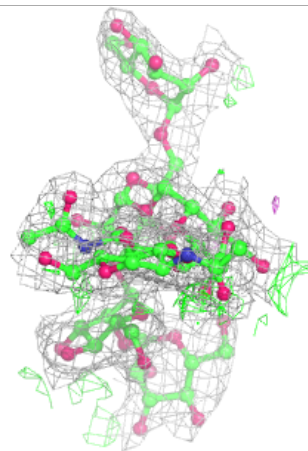
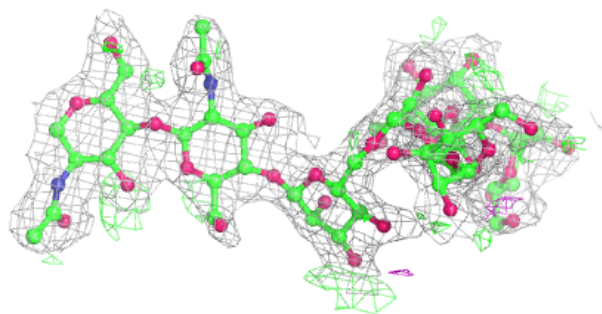
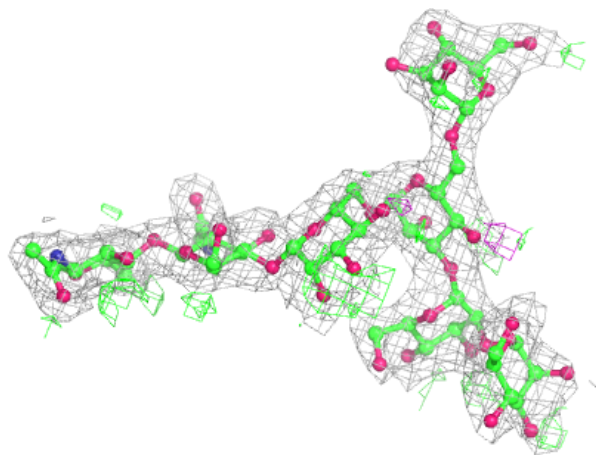
**Electron density around Chain O:**

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



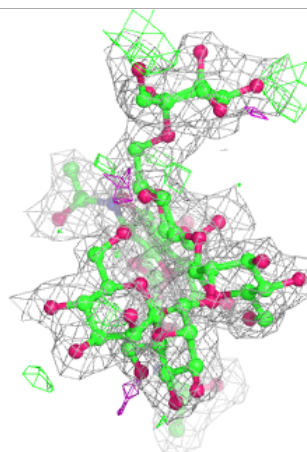
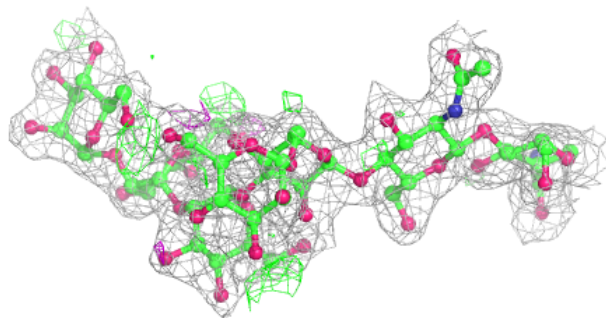
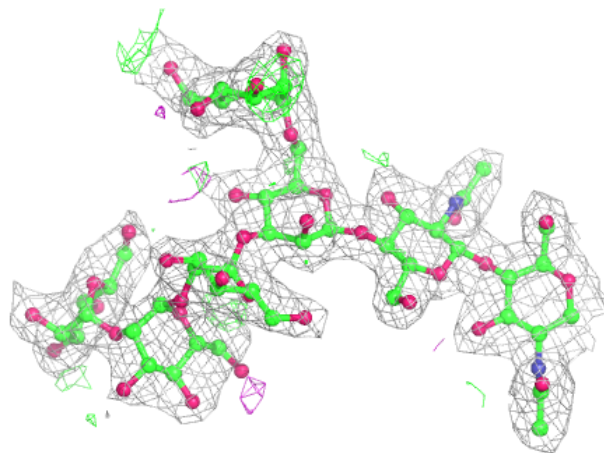
Electron density around Chain I:

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



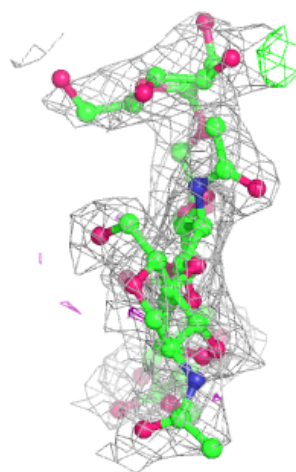
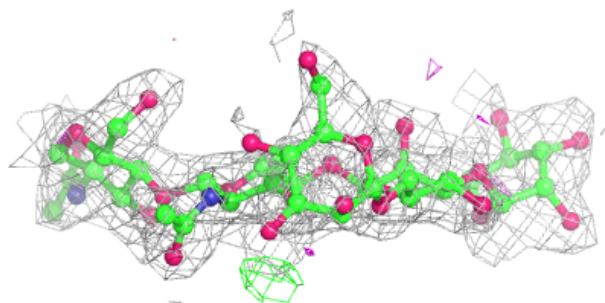
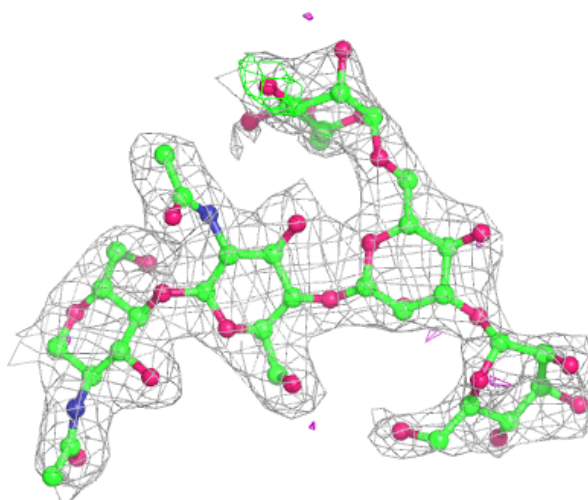
Electron density around Chain J:

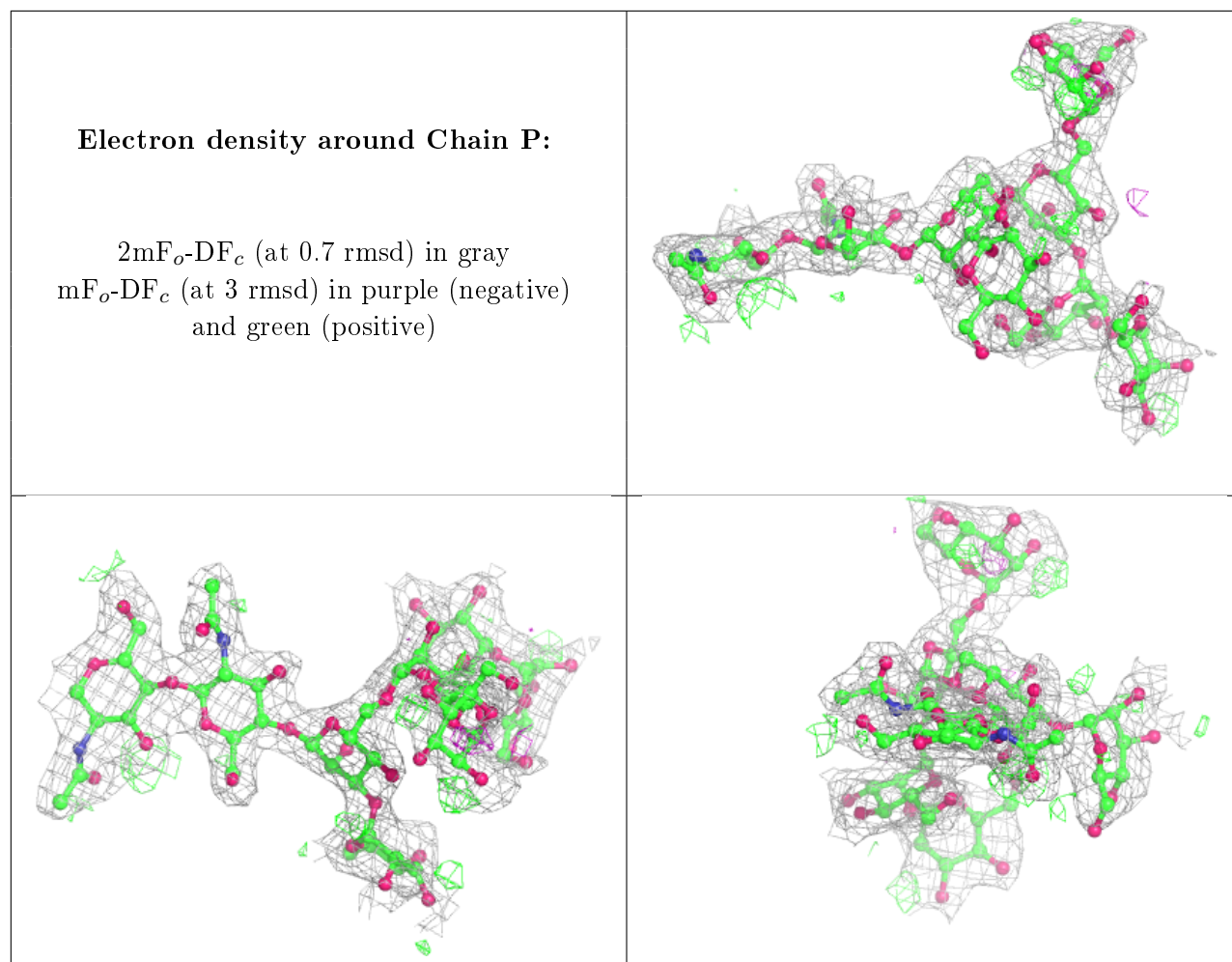
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain K:

$2mF_o-DF_c$ (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
11	NAG	A	905	14/15	0.83	0.32	49,63,72,73	0
11	NAG	B	908	14/15	0.90	0.28	44,58,67,69	0
11	NAG	B	945	14/15	0.91	0.24	45,60,67,70	0
14	MPD	B	947	8/8	0.93	0.14	26,32,40,44	0
12	MRD	A	939	8/8	0.93	0.14	24,28,37,37	0
12	MRD	B	948	8/8	0.95	0.16	38,45,48,52	0
11	NAG	A	937	14/15	0.96	0.14	39,45,50,52	0
12	MRD	A	938	8/8	0.96	0.11	36,38,40,41	0
11	NAG	B	946	14/15	0.97	0.22	29,35,40,43	0
13	NOJ	B	949	11/11	0.98	0.17	14,15,17,18	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
13	NOJ	A	940	11/11	0.99	0.23	17,21,22,24	0

6.5 Other polymers [i](#)

There are no such residues in this entry.