



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 06:51 PM UTC

PDB ID : 2C10 / pdb_00002c10
Title : The structure of a truncated, soluble version of semicarbazide- sensitive amine oxidase
Authors : Jakobsson, E.; Kleywegt, G.J.
Deposited on : 2005-09-09
Resolution : 2.50 Å(reported)

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

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A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

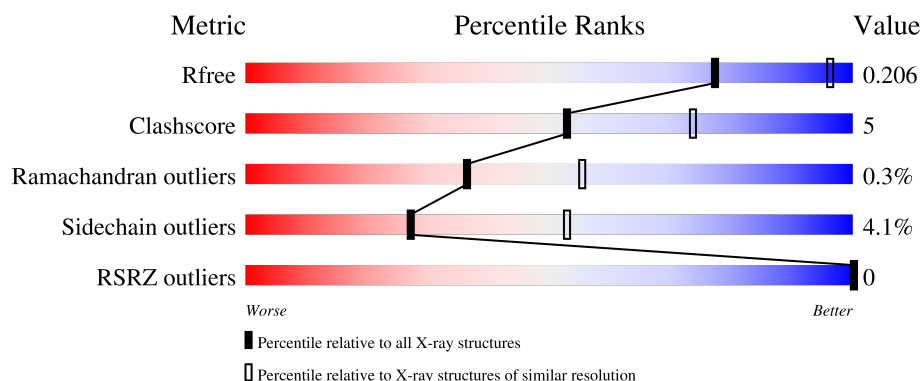
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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

Mol	Chain	Length	Quality of chain
1	A	735	 80% 15% . .
1	B	735	 83% 12% . .
1	C	735	 83% 12% . .
1	D	735	 84% 11% . .
2	E	3	 100%

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Mol	Chain	Length	Quality of chain
2	H	3	 33% 67%
2	K	3	 100%
3	F	3	 100%
3	L	3	 33% 67%
4	G	2	 100%
4	J	2	 100%
4	M	2	 100%
4	P	2	 100%
5	I	5	 80% 20%
5	O	5	 100%
6	N	4	 25% 75%

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
3	NAG	F	1	X	-	-	-
3	FUC	F	3	X	-	-	-
3	NAG	L	1	X	-	-	-
3	FUC	L	3	X	-	-	-
5	NAG	I	1	X	-	-	-
5	FUC	I	5	X	-	-	-
5	NAG	O	1	X	-	-	-
5	FUC	O	5	X	-	-	-

2 Entry composition [i](#)

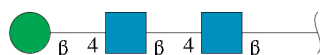
There are 11 unique types of molecules in this entry. The entry contains 23470 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 MEMBRANE COPPER AMINE OXIDASE.

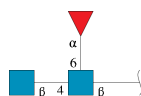
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	706	Total	C	N	O	S	0	0	1
			5563	3571	960	1011	21			
1	B	709	Total	C	N	O	S	0	0	1
			5587	3587	965	1014	21			
1	C	706	Total	C	N	O	S	0	0	1
			5563	3571	960	1011	21			
1	D	709	Total	C	N	O	S	0	0	1
			5587	3587	965	1014	21			

- 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
2	E	3	Total	C	N	O	0	0	0
			39	22	2	15			
2	H	3	Total	C	N	O	0	0	0
			39	22	2	15			
2	K	3	Total	C	N	O	0	0	0
			39	22	2	15			

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



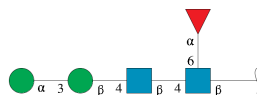
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	F	3	Total	C	N	O	0	0	0
			38	22	2	14			
3	L	3	Total	C	N	O	0	0	0
			38	22	2	14			

- 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
4	G	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	J	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	M	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	P	2	Total	C	N	O	0	0	0
			28	16	2	10			

- 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)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	I	5	Total	C	N	O	0	0	0
			60	34	2	24			
5	O	5	Total	C	N	O	0	0	0
			60	34	2	24			

- Molecule 6 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
6	N	4	Total	C	N	O	0	0	0
			50	28	2	20			

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 8 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	2	Total 2	Ca 2	0	0
8	B	2	Total 2	Ca 2	0	0
8	C	2	Total 2	Ca 2	0	0
8	D	2	Total 2	Ca 2	0	0

- Molecule 9 is COPPER (II) ION (CCD ID: CU) (formula: Cu).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total 1	Cu 1	0	0
9	B	1	Total 1	Cu 1	0	0
9	C	1	Total 1	Cu 1	0	0
9	D	1	Total 1	Cu 1	0	0

- Molecule 10 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	2	Total 2	Cl 2	0	0
10	B	2	Total 2	Cl 2	0	0
10	C	2	Total 2	Cl 2	0	0
10	D	2	Total 2	Cl 2	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	141	Total 141	O 141	0	0
11	B	139	Total 139	O 139	0	0
11	C	141	Total 141	O 141	0	0

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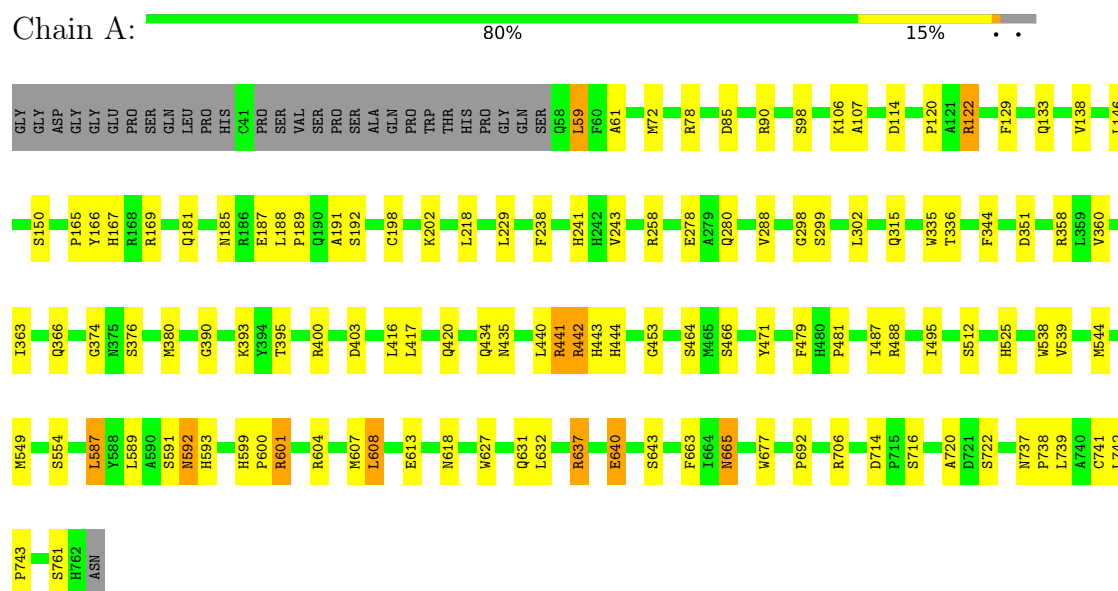
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	D	142	Total 142	O 142	0	0

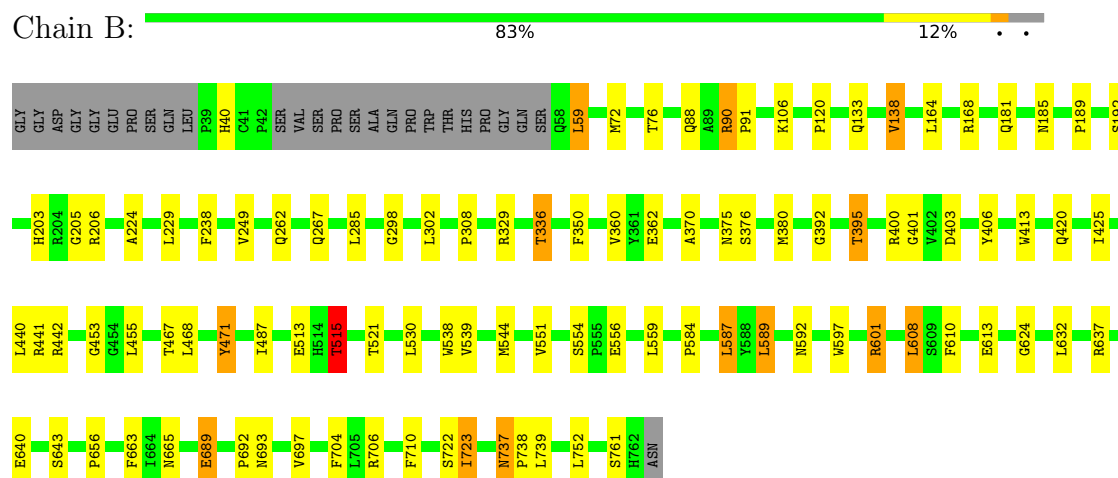
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

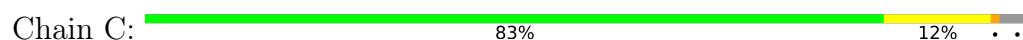
• Molecule 1: MEMBRANE COPPER AMINE OXIDASE

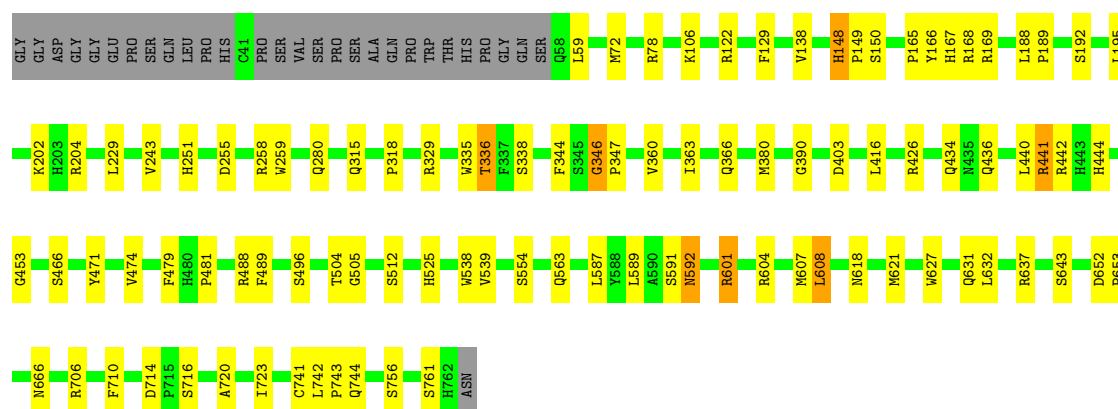


• Molecule 1: MEMBRANE COPPER AMINE OXIDASE



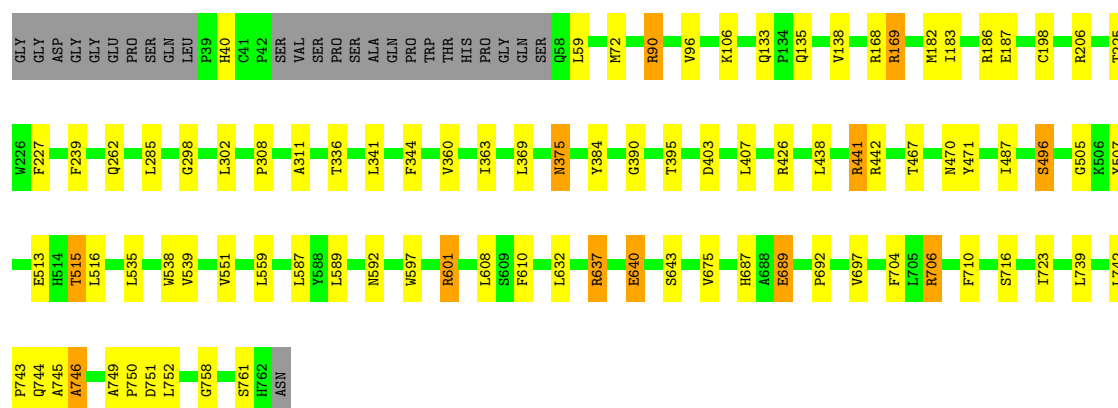
• Molecule 1: MEMBRANE COPPER AMINE OXIDASE





• Molecule 1: MEMBRANE COPPER AMINE OXIDASE

Chain D: 84% 11% . .



• 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: 100%



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

Chain H: 33% 67%



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

Chain K: 100%

MAG1
MAG2
BMA3

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

Chain F:  100%


MAG1
MAG2
FUC3

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

Chain L:  33%  67%

MAG1
MAG2
FUC3

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

Chain G:  100%

MAG1
MAG2

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

Chain J:  100%

MAG1
MAG2

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

Chain M:  100%

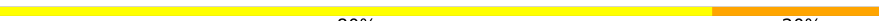
MAG1
MAG2

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

Chain P:  100%

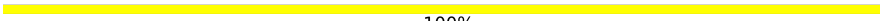
MAG1
MAG2

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

Chain I:  80% 20%

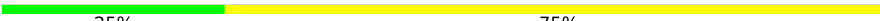
NAG1
NAG2
BMA3
MAN4
FUC5

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

Chain O:  100%

NAG1
NAG2
BMA3
MAN4
FUC5

- Molecule 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 N:  25% 75%

NAG1
NAG2
BMA3
MAN4

4 Data and refinement statistics

Property	Value	Source
Space group	P 43	Depositor
Cell constants a, b, c, α , β , γ	130.24Å 130.24Å 221.53Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.50 20.00 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.2 (20.00-2.50) 98.2 (20.00-2.50)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.67 (at 2.50Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, R_{free}	0.204 , 0.252 0.204 , 0.206	Depositor DCC
R_{free} test set	6351 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	34.6	Xtriage
Anisotropy	0.645	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 4.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	0.448 for h,-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	23470	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.91% 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: CA, CU, CL, FUC, MAN, TPQ, NAG, BMA

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.60	1/5724 (0.0%)	0.84	6/7804 (0.1%)
1	B	0.60	1/5751 (0.0%)	0.85	6/7842 (0.1%)
1	C	0.60	1/5724 (0.0%)	0.85	9/7804 (0.1%)
1	D	0.59	1/5751 (0.0%)	0.84	1/7842 (0.0%)
All	All	0.60	4/22950 (0.0%)	0.85	22/31292 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	761	SER	C-N	-6.74	1.24	1.33
1	A	761	SER	C-N	-6.57	1.24	1.33
1	B	761	SER	C-N	-6.56	1.24	1.33
1	C	761	SER	C-N	-6.42	1.24	1.33

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	554	SER	CA-C-N	8.40	128.06	119.82
1	C	554	SER	C-N-CA	8.40	128.06	119.82
1	A	592	ASN	N-CA-C	-6.82	105.09	113.41
1	C	346	GLY	CA-C-N	6.22	126.25	119.90
1	C	346	GLY	C-N-CA	6.22	126.25	119.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	133	GLN	N-CA-C	6.20	113.80	108.22
1	B	554	SER	CA-C-N	6.08	125.76	119.56
1	B	554	SER	C-N-CA	6.08	125.76	119.56
1	B	133	GLN	N-CA-C	5.96	113.58	108.22
1	A	592	ASN	N-CA-CB	-5.91	101.84	110.47
1	B	515	THR	N-CA-C	5.79	118.33	108.90
1	A	374	GLY	N-CA-C	5.79	119.02	110.63
1	C	592	ASN	N-CA-CB	-5.60	101.60	110.28
1	C	148	HIS	CA-C-N	5.54	125.49	119.78
1	C	148	HIS	C-N-CA	5.54	125.49	119.78
1	C	255	ASP	CA-C-N	5.45	125.80	119.47
1	C	255	ASP	C-N-CA	5.45	125.80	119.47
1	B	737	ASN	CA-C-N	5.29	124.96	119.56
1	B	737	ASN	C-N-CA	5.29	124.96	119.56
1	A	133	GLN	N-CA-C	5.29	112.89	108.13
1	A	554	SER	CA-C-N	5.22	124.94	119.82
1	A	554	SER	C-N-CA	5.22	124.94	119.82

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	198	CYS	Peptide

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5563	0	5311	78	0
1	B	5587	0	5333	54	0
1	C	5563	0	5311	52	0
1	D	5587	0	5332	59	0
2	E	39	0	34	0	0
2	H	39	0	34	1	0
2	K	39	0	34	0	0
3	F	38	0	34	0	0
3	L	38	0	34	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	G	28	0	25	0	0
4	J	28	0	25	0	0
4	M	28	0	25	0	0
4	P	28	0	25	0	0
5	I	60	0	52	2	0
5	O	60	0	52	0	0
6	N	50	0	43	0	0
7	A	14	0	13	1	0
7	B	42	0	39	1	0
7	C	14	0	13	0	0
7	D	42	0	39	1	0
8	A	2	0	0	0	0
8	B	2	0	0	0	0
8	C	2	0	0	0	0
8	D	2	0	0	0	0
9	A	1	0	0	0	0
9	B	1	0	0	0	0
9	C	1	0	0	0	0
9	D	1	0	0	0	0
10	A	2	0	0	0	0
10	B	2	0	0	0	0
10	C	2	0	0	0	0
10	D	2	0	0	0	0
11	A	141	0	0	9	0
11	B	139	0	0	4	0
11	C	141	0	0	5	0
11	D	142	0	0	5	0
All	All	23470	0	21808	224	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.

All (224) 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:D:360:VAL:HG11	1:D:363:ILE:HG13	1.38	1.04
1:A:360:VAL:HG11	1:A:363:ILE:HG13	1.56	0.85
1:D:426:ARG:HE	1:D:758:GLY:HA3	1.49	0.78
1:A:538:TRP:CZ3	1:A:592:ASN:HB2	2.19	0.77
1:A:488:ARG:HH12	1:A:608:LEU:CD1	1.98	0.77
1:C:488:ARG:HH22	1:C:608:LEU:HD13	1.48	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:360:VAL:HG11	1:C:363:ILE:HG13	1.69	0.74
1:A:488:ARG:HH12	1:A:608:LEU:HD13	1.52	0.74
1:A:166:TYR:O	1:A:169:ARG:HG3	1.88	0.74
1:B:106:LYS:HB2	1:B:637:ARG:NH2	2.04	0.72
1:A:403:ASP:OD1	1:B:442:ARG:HG3	1.89	0.72
1:D:587:LEU:HD22	1:D:632:LEU:HD21	1.70	0.71
1:C:166:TYR:O	1:C:169:ARG:HG3	1.92	0.70
1:A:453:GLY:HA3	1:B:302:LEU:HD13	1.77	0.67
1:A:706:ARG:CZ	11:A:2137:HOH:O	2.44	0.66
1:A:706:ARG:NE	11:A:2137:HOH:O	2.28	0.66
1:C:403:ASP:OD1	1:D:442:ARG:HG3	1.95	0.66
1:A:587:LEU:HD22	1:A:632:LEU:HD21	1.78	0.66
1:A:315:GLN:HE22	1:A:434:GLN:HA	1.61	0.65
1:A:539:VAL:HG22	1:A:589:LEU:HD22	1.77	0.65
1:A:640:GLU:CD	1:A:640:GLU:H	2.05	0.64
1:D:407:LEU:HD21	1:D:752:LEU:HD23	1.79	0.64
1:C:538:TRP:CZ3	1:C:592:ASN:HB2	2.34	0.63
1:B:587:LEU:HD22	1:B:632:LEU:HD21	1.80	0.63
1:B:285:LEU:HG	1:B:285:LEU:O	1.99	0.63
1:B:72:MET:HE3	1:B:420:GLN:HA	1.80	0.62
1:B:539:VAL:HG22	1:B:589:LEU:HD22	1.81	0.62
7:D:1774:NAG:O4	11:D:2142:HOH:O	2.13	0.62
1:D:106:LYS:HB2	1:D:637:ARG:NH2	2.14	0.62
1:C:488:ARG:HH12	1:C:608:LEU:CD1	2.11	0.62
1:B:468:LEU:HB2	1:B:471:TPQ:O5	2.00	0.62
1:D:344:PHE:HA	1:D:390:GLY:HA2	1.80	0.62
1:A:441:ARG:NH2	11:A:2084:HOH:O	2.34	0.61
1:C:329:ARG:HH21	1:C:336:THR:HG23	1.66	0.60
5:I:2:NAG:H5	5:I:5:FUC:H61	1.84	0.60
1:A:315:GLN:NE2	1:A:434:GLN:HA	2.16	0.59
1:A:98:SER:HB2	1:A:417:LEU:HD23	1.84	0.59
1:B:723:ILE:HD13	1:B:739:LEU:HD22	1.84	0.59
1:A:129:PHE:CZ	1:A:169:ARG:HB2	2.37	0.59
1:C:587:LEU:HD22	1:C:632:LEU:HD21	1.83	0.59
1:C:380:MET:HE3	1:D:559:LEU:HD21	1.84	0.59
1:A:344:PHE:HA	1:A:390:GLY:HA2	1.85	0.59
1:D:169:ARG:HD2	11:D:2018:HOH:O	2.03	0.59
1:A:302:LEU:HD13	1:B:453:GLY:HA3	1.85	0.58
1:A:608:LEU:HD23	1:B:610:PHE:HZ	1.68	0.58
1:A:706:ARG:NH2	11:A:2137:HOH:O	2.37	0.58
7:B:1773:NAG:H2	5:I:2:NAG:O3	2.04	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:607:MET:HE1	1:A:631:GLN:HB3	1.86	0.57
1:C:315:GLN:HE22	1:C:434:GLN:HA	1.70	0.57
1:D:742:LEU:O	1:D:746:ALA:HB3	2.05	0.57
1:A:591:SER:OG	1:A:592:ASN:N	2.32	0.57
1:C:442:ARG:HG3	1:D:403:ASP:OD1	2.04	0.57
1:A:366:GLN:OE1	1:A:643:SER:HA	2.06	0.56
1:C:714:ASP:HB2	1:D:689:GLU:O	2.06	0.56
1:D:539:VAL:HG22	1:D:589:LEU:HD22	1.88	0.56
1:A:742:LEU:N	1:A:743:PRO:HD2	2.22	0.55
1:C:436:GLN:HA	1:C:436:GLN:OE1	2.05	0.55
1:D:587:LEU:CD2	1:D:632:LEU:HD21	2.35	0.55
1:C:607:MET:HE1	1:C:631:GLN:HB3	1.88	0.54
1:D:640:GLU:CD	1:D:640:GLU:H	2.15	0.54
1:C:539:VAL:HG22	1:C:589:LEU:HD22	1.89	0.54
1:D:360:VAL:HG11	1:D:363:ILE:CG1	2.25	0.54
1:D:587:LEU:HD22	1:D:632:LEU:CD2	2.35	0.54
1:B:440:LEU:HD23	1:B:455:LEU:HD23	1.88	0.54
1:B:538:TRP:CZ3	1:B:592:ASN:HB2	2.42	0.54
1:C:453:GLY:HA3	1:D:302:LEU:HD13	1.89	0.54
1:C:188:LEU:HD22	1:C:195:LEU:HD11	1.90	0.54
1:A:85:ASP:CG	1:A:420:GLN:HG2	2.33	0.54
1:D:608:LEU:HD11	1:D:704:PHE:CD2	2.42	0.54
1:D:723:ILE:HD13	1:D:739:LEU:HD22	1.89	0.54
1:A:488:ARG:HH22	1:A:608:LEU:HD13	1.73	0.53
1:B:513:GLU:O	1:B:515:THR:HG22	2.07	0.53
1:B:90:ARG:HG3	1:B:91:PRO:HD2	1.91	0.53
1:B:392:GLY:O	1:B:395:THR:HB	2.09	0.53
1:D:298:GLY:O	1:D:692:PRO:HB3	2.09	0.53
1:C:706:ARG:NE	11:C:2128:HOH:O	2.41	0.53
1:D:285:LEU:O	1:D:285:LEU:HG	2.09	0.53
1:A:315:GLN:NE2	1:A:435:ASN:H	2.07	0.52
1:C:441:ARG:NH2	11:C:2072:HOH:O	2.41	0.52
1:B:168:ARG:HD3	11:B:2124:HOH:O	2.09	0.52
1:B:643:SER:HB3	11:B:2053:HOH:O	2.09	0.52
1:C:440:LEU:HD22	1:C:481:PRO:HG2	1.91	0.51
1:B:400:ARG:HD3	1:B:406:TYR:CE2	2.45	0.51
1:A:441:ARG:HD3	1:A:716:SER:OG	2.10	0.51
1:A:376:SER:O	1:A:380:MET:HB2	2.11	0.51
1:B:329:ARG:HH21	1:B:336:THR:HG23	1.76	0.51
1:B:413:TRP:HE3	1:B:425:ILE:HD12	1.76	0.51
1:D:441:ARG:HD3	1:D:716:SER:OG	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:78:ARG:HH11	1:A:78:ARG:HB3	1.75	0.50
1:D:687:HIS:HD1	1:D:689:GLU:HG2	1.76	0.50
1:A:72:MET:HE2	1:A:416:LEU:HD21	1.93	0.50
1:C:344:PHE:HA	1:C:390:GLY:HA2	1.92	0.50
1:D:608:LEU:HD11	1:D:704:PHE:CE2	2.47	0.50
1:A:188:LEU:N	1:A:189:PRO:HD2	2.26	0.49
1:C:621:MET:HB2	1:C:653:PRO:HB2	1.93	0.49
1:C:608:LEU:HD23	1:D:610:PHE:HZ	1.77	0.49
1:A:720:ALA:O	1:B:308:PRO:HA	2.13	0.49
1:C:129:PHE:CZ	1:C:169:ARG:HB2	2.48	0.48
1:C:563:GLN:HG2	1:D:507:TYR:CE1	2.48	0.48
3:L:1:NAG:H61	3:L:2:NAG:C1	2.44	0.48
1:B:601:ARG:HB3	1:B:710:PHE:HA	1.96	0.48
1:B:59:LEU:HD11	1:B:120:PRO:HD2	1.95	0.48
1:D:106:LYS:HE2	1:D:535:LEU:HD21	1.96	0.48
1:A:444:HIS:O	1:B:467:THR:HG21	2.13	0.48
1:C:441:ARG:HD3	1:C:716:SER:OG	2.14	0.48
1:A:613:GLU:HB3	1:B:544:MET:HE2	1.95	0.48
1:C:318:PRO:HG2	1:D:311:ALA:HB3	1.96	0.47
1:A:714:ASP:HB2	1:B:689:GLU:O	2.12	0.47
1:C:601:ARG:HB3	1:C:710:PHE:HA	1.96	0.47
1:D:496:SER:HB3	11:D:2084:HOH:O	2.15	0.47
1:A:743:PRO:HA	1:B:752:LEU:HD13	1.96	0.47
1:D:637:ARG:HG3	1:D:637:ARG:HH11	1.79	0.47
1:A:98:SER:HB2	1:A:417:LEU:CD2	2.45	0.47
1:B:181:GLN:NE2	1:B:185:ASN:OD1	2.47	0.47
1:B:298:GLY:O	1:B:692:PRO:HB3	2.15	0.47
1:C:488:ARG:HH12	1:C:608:LEU:HD12	1.80	0.47
1:D:168:ARG:HD3	11:D:2118:HOH:O	2.15	0.47
1:D:687:HIS:ND1	1:D:689:GLU:HG2	2.29	0.46
1:C:504:THR:HG22	1:C:505:GLY:H	1.80	0.46
1:A:106:LYS:HB2	1:A:637:ARG:NH1	2.31	0.46
1:B:203:HIS:H	1:B:203:HIS:CD2	2.33	0.46
1:C:720:ALA:O	1:D:308:PRO:HA	2.15	0.46
1:A:442:ARG:HG2	1:A:443:HIS:N	2.25	0.45
1:A:488:ARG:NH1	1:A:608:LEU:HD13	2.24	0.45
1:B:329:ARG:HH21	1:B:336:THR:CG2	2.29	0.45
1:D:513:GLU:O	1:D:515:THR:HG23	2.16	0.45
1:D:262:GLN:HG2	11:D:2034:HOH:O	2.16	0.45
1:A:440:LEU:HD22	1:A:481:PRO:HG2	1.98	0.45
1:C:488:ARG:NH2	1:C:608:LEU:HD13	2.25	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:551:VAL:HG22	1:D:559:LEU:HD23	1.97	0.45
1:C:366:GLN:OE1	1:C:643:SER:HA	2.17	0.45
1:D:239:PHE:CD2	1:D:470:ASN:HB3	2.52	0.45
1:A:544:MET:HE2	1:B:613:GLU:HB3	1.99	0.45
1:D:375:ASN:HD22	1:D:375:ASN:HA	1.55	0.45
1:A:593:HIS:O	1:A:601:ARG:HG2	2.17	0.45
1:D:183:ILE:HA	1:D:187:GLU:HB2	1.99	0.45
1:B:551:VAL:HG22	1:B:559:LEU:HD23	1.99	0.45
2:H:2:NAG:H4	2:H:3:BMA:O2	2.17	0.44
1:D:704:PHE:HB3	1:D:706:ARG:HD3	1.99	0.44
1:A:238:PHE:CD1	1:A:238:PHE:C	2.94	0.44
1:B:224:ALA:HA	1:B:249:VAL:O	2.17	0.44
1:C:72:MET:HE2	1:C:416:LEU:HD21	1.99	0.44
1:C:706:ARG:CZ	11:C:2128:HOH:O	2.65	0.44
1:C:525:HIS:HB2	1:C:627:TRP:CE3	2.53	0.44
1:A:187:GLU:C	1:A:189:PRO:HD2	2.43	0.44
1:A:640:GLU:CD	1:A:640:GLU:N	2.75	0.44
1:D:538:TRP:CZ3	1:D:592:ASN:HB2	2.53	0.44
1:D:601:ARG:CB	1:D:710:PHE:HA	2.47	0.44
1:A:122:ARG:HB3	1:A:146:LEU:HB2	2.00	0.43
1:B:238:PHE:CD1	1:B:238:PHE:C	2.96	0.43
1:A:59:LEU:HD11	1:A:120:PRO:HD2	2.00	0.43
1:B:267:GLN:NE2	11:B:2035:HOH:O	2.42	0.43
1:D:225:THR:HB	1:D:227:PHE:CE1	2.53	0.43
1:D:745:ALA:O	1:D:746:ALA:HB2	2.18	0.43
1:A:335:TRP:CE2	1:A:479:PHE:HB3	2.54	0.43
1:A:393:LYS:HG3	1:A:417:LEU:HD13	2.00	0.43
1:A:604:ARG:HD3	11:A:2136:HOH:O	2.18	0.43
1:A:739:LEU:HD21	1:B:401:GLY:HA3	2.01	0.43
1:C:168:ARG:HG2	1:C:652:ASP:HB2	2.00	0.43
1:A:90:ARG:NH2	11:A:2007:HOH:O	2.49	0.43
1:B:189:PRO:O	1:B:192:SER:HB2	2.19	0.43
1:B:350:PHE:CE2	1:B:362:GLU:HG3	2.53	0.43
1:D:369:LEU:HD12	1:D:384:TYR:O	2.19	0.43
1:A:114:ASP:OD2	1:A:358:ARG:NH2	2.48	0.43
1:A:400:ARG:HH21	1:A:400:ARG:HB2	1.84	0.42
1:A:512:SER:HA	1:B:597:TRP:CZ2	2.55	0.42
1:B:608:LEU:HD11	1:B:704:PHE:CD2	2.54	0.42
1:C:165:PRO:HB2	1:C:167:HIS:CE1	2.53	0.42
1:A:61:ALA:O	1:A:122:ARG:NH2	2.53	0.42
1:A:191:ALA:HA	1:A:278:GLU:HB2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:262:GLN:HG2	11:B:2033:HOH:O	2.18	0.42
1:B:584:PRO:HG2	1:B:587:LEU:HD12	2.01	0.42
1:A:241:HIS:NE2	1:A:299:SER:O	2.52	0.42
1:A:298:GLY:O	1:A:692:PRO:HB3	2.19	0.42
1:A:525:HIS:HB2	1:A:627:TRP:CE3	2.53	0.42
1:C:335:TRP:CE2	1:C:479:PHE:HB3	2.54	0.42
1:A:495:ILE:HG12	11:A:2094:HOH:O	2.19	0.42
1:A:737:ASN:C	1:A:739:LEU:H	2.28	0.42
1:B:692:PRO:C	1:B:693:ASN:HD22	2.28	0.42
1:D:40:HIS:ND1	1:D:751:ASP:HB3	2.35	0.42
1:B:360:VAL:HG22	1:B:530:LEU:HD23	2.02	0.42
1:C:742:LEU:N	1:C:743:PRO:HD2	2.35	0.42
1:D:341:LEU:HD21	1:D:395:THR:OG1	2.19	0.42
1:A:360:VAL:HG11	1:A:363:ILE:CG1	2.39	0.42
1:C:706:ARG:NH2	11:C:2128:HOH:O	2.52	0.42
1:A:107:ALA:HB3	11:A:2013:HOH:O	2.19	0.42
1:A:181:GLN:O	1:A:185:ASN:HB2	2.19	0.42
1:D:90:ARG:HA	1:D:90:ARG:HD3	1.61	0.42
1:A:442:ARG:HE	1:B:403:ASP:CG	2.28	0.42
1:C:189:PRO:O	1:C:192:SER:HB2	2.20	0.42
1:C:346:GLY:HA3	1:C:347:PRO:HD2	1.90	0.42
1:C:512:SER:HA	1:D:597:TRP:CZ2	2.55	0.42
1:A:78:ARG:HB3	1:A:78:ARG:NH1	2.34	0.41
1:A:198:CYS:HB3	1:A:288:VAL:HG11	2.01	0.41
1:A:665:ASN:OD1	1:A:665:ASN:N	2.54	0.41
1:A:351:ASP:OD2	1:A:358:ARG:HD3	2.20	0.41
1:A:599:HIS:HA	1:A:600:PRO:HD3	1.97	0.41
1:B:370:ALA:HA	1:B:521:THR:O	2.20	0.41
1:A:165:PRO:HB2	1:A:167:HIS:CE1	2.55	0.41
1:D:535:LEU:HD23	1:D:535:LEU:HA	1.80	0.41
1:D:742:LEU:HB3	1:D:743:PRO:HD3	2.01	0.41
1:C:106:LYS:HB2	1:C:637:ARG:NH1	2.36	0.41
1:D:687:HIS:CE1	1:D:689:GLU:HG2	2.55	0.41
1:B:138:VAL:O	1:B:164:LEU:HB2	2.20	0.41
1:C:444:HIS:O	1:D:467:THR:HG21	2.21	0.41
1:C:474:VAL:O	1:C:489:PHE:HA	2.21	0.41
1:C:251:HIS:HA	1:C:259:TRP:CD1	2.56	0.41
1:D:72:MET:HE1	1:D:96:VAL:HG11	2.03	0.41
7:A:1768:NAG:H61	11:A:2141:HOH:O	2.20	0.40
1:B:737:ASN:HA	1:B:738:PRO:HD2	1.81	0.40
1:C:148:HIS:HA	1:C:149:PRO:HD3	1.80	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:749:ALA:HA	1:D:750:PRO:HD2	1.83	0.40
1:A:663:PHE:N	1:A:663:PHE:CD1	2.90	0.40
1:C:604:ARG:HD3	11:C:2109:HOH:O	2.20	0.40
1:C:743:PRO:HA	1:D:752:LEU:HD12	2.02	0.40
1:D:182:MET:HG3	1:D:186:ARG:NH2	2.35	0.40
1:B:624:GLY:HA2	1:B:656:PRO:HB3	2.03	0.40
1:C:591:SER:OG	1:C:592:ASN:N	2.55	0.40
1:D:601:ARG:HB2	1:D:710:PHE:HA	2.02	0.40
1:A:189:PRO:O	1:A:192:SER:HB2	2.21	0.40
1:A:525:HIS:CE1	1:A:677:TRP:HB3	2.57	0.40
1:B:90:ARG:HD3	1:B:90:ARG:HA	1.90	0.40
1:B:376:SER:O	1:B:380:MET:HB2	2.22	0.40
1:B:663:PHE:N	1:B:663:PHE:CD1	2.89	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	702/735 (96%)	671 (96%)	30 (4%)	1 (0%)	48	68
1	B	704/735 (96%)	675 (96%)	27 (4%)	2 (0%)	36	55
1	C	702/735 (96%)	668 (95%)	32 (5%)	2 (0%)	36	55
1	D	704/735 (96%)	675 (96%)	26 (4%)	3 (0%)	30	49
All	All	2812/2940 (96%)	2689 (96%)	115 (4%)	8 (0%)	36	55

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	746	ALA
1	C	744	GLN

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Mol	Chain	Res	Type
1	B	59	LEU
1	C	204	ARG
1	B	205	GLY
1	D	744	GLN
1	A	738	PRO
1	D	505	GLY

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	585/609 (96%)	558 (95%)	27 (5%)	24	48
1	B	588/609 (97%)	563 (96%)	25 (4%)	26	51
1	C	585/609 (96%)	562 (96%)	23 (4%)	28	55
1	D	588/609 (97%)	566 (96%)	22 (4%)	30	57
All	All	2346/2436 (96%)	2249 (96%)	97 (4%)	27	53

All (97) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	LEU
1	A	122	ARG
1	A	138	VAL
1	A	150	SER
1	A	202	LYS
1	A	218	LEU
1	A	229	LEU
1	A	243	VAL
1	A	258	ARG
1	A	280	GLN
1	A	336	THR
1	A	395	THR
1	A	441	ARG
1	A	442	ARG
1	A	464	SER

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Mol	Chain	Res	Type
1	A	466	SER
1	A	487	ILE
1	A	549	MET
1	A	587	LEU
1	A	601	ARG
1	A	608	LEU
1	A	618	ASN
1	A	637	ARG
1	A	640	GLU
1	A	665	ASN
1	A	722	SER
1	A	741	CYS
1	B	40	HIS
1	B	76	THR
1	B	88	GLN
1	B	90	ARG
1	B	138	VAL
1	B	206	ARG
1	B	229	LEU
1	B	336	THR
1	B	375	ASN
1	B	395	THR
1	B	441	ARG
1	B	487	ILE
1	B	515	THR
1	B	556	GLU
1	B	587	LEU
1	B	589	LEU
1	B	601	ARG
1	B	608	LEU
1	B	640	GLU
1	B	665	ASN
1	B	689	GLU
1	B	697	VAL
1	B	706	ARG
1	B	722	SER
1	B	723	ILE
1	C	59	LEU
1	C	78	ARG
1	C	122	ARG
1	C	138	VAL
1	C	150	SER

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Mol	Chain	Res	Type
1	C	202	LYS
1	C	229	LEU
1	C	243	VAL
1	C	258	ARG
1	C	280	GLN
1	C	336	THR
1	C	338	SER
1	C	426	ARG
1	C	441	ARG
1	C	466	SER
1	C	496	SER
1	C	601	ARG
1	C	608	LEU
1	C	618	ASN
1	C	666	ASN
1	C	723	ILE
1	C	741	CYS
1	C	756	SER
1	D	59	LEU
1	D	90	ARG
1	D	135	GLN
1	D	138	VAL
1	D	169	ARG
1	D	206	ARG
1	D	336	THR
1	D	375	ASN
1	D	438	LEU
1	D	441	ARG
1	D	487	ILE
1	D	496	SER
1	D	515	THR
1	D	516	LEU
1	D	601	ARG
1	D	637	ARG
1	D	640	GLU
1	D	643	SER
1	D	675	VAL
1	D	689	GLU
1	D	697	VAL
1	D	706	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	185	ASN
1	A	242	HIS
1	A	262	GLN
1	A	319	GLN
1	A	666	ASN
1	A	737	ASN
1	B	40	HIS
1	B	181	GLN
1	B	203	HIS
1	B	241	HIS
1	B	375	ASN
1	B	560	GLN
1	B	574	GLN
1	B	618	ASN
1	B	757	HIS
1	C	185	ASN
1	C	241	HIS
1	C	315	GLN
1	C	560	GLN
1	C	593	HIS
1	C	729	GLN
1	D	190	GLN
1	D	207	ASN
1	D	262	GLN
1	D	375	ASN
1	D	420	GLN
1	D	574	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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
1	TPQ	D	471	1	13,14,15	2.22	2 (15%)	13,19,21	1.50	3 (23%)
1	TPQ	A	471	1	13,14,15	2.16	3 (23%)	13,19,21	1.57	4 (30%)
1	TPQ	C	471	1	13,14,15	2.19	2 (15%)	13,19,21	1.48	3 (23%)
1	TPQ	B	471	1	13,14,15	2.21	3 (23%)	13,19,21	1.64	3 (23%)

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
1	TPQ	D	471	1	-	4/5/22/24	0/1/1/1
1	TPQ	A	471	1	-	4/5/22/24	0/1/1/1
1	TPQ	C	471	1	-	4/5/22/24	0/1/1/1
1	TPQ	B	471	1	-	4/5/22/24	0/1/1/1

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	471	TPQ	O5-C5	4.88	1.37	1.24
1	C	471	TPQ	O5-C5	4.88	1.37	1.24
1	B	471	TPQ	O5-C5	4.80	1.37	1.24
1	A	471	TPQ	O5-C5	4.61	1.36	1.24
1	C	471	TPQ	O2-C2	4.54	1.36	1.24
1	A	471	TPQ	O2-C2	4.48	1.36	1.24
1	D	471	TPQ	O2-C2	4.47	1.36	1.24
1	B	471	TPQ	O2-C2	4.47	1.36	1.24
1	B	471	TPQ	C3-C4	2.17	1.40	1.36
1	A	471	TPQ	C3-C4	2.04	1.39	1.36

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	471	TPQ	C6-C1-C2	3.19	120.92	118.66
1	C	471	TPQ	C6-C1-C2	3.05	120.83	118.66
1	D	471	TPQ	C6-C5-C4	2.74	121.59	116.80
1	A	471	TPQ	C1-C6-C5	-2.65	118.13	122.59
1	A	471	TPQ	C6-C5-C4	2.64	121.43	116.80
1	B	471	TPQ	C6-C5-C4	2.56	121.28	116.80
1	B	471	TPQ	C1-C6-C5	-2.48	118.41	122.59

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	471	TPQ	C1-C6-C5	-2.43	118.50	122.59
1	D	471	TPQ	O2-C2-C3	-2.35	116.48	121.83
1	C	471	TPQ	C6-C5-C4	2.21	120.67	116.80
1	D	471	TPQ	C1-C6-C5	-2.11	119.04	122.59
1	A	471	TPQ	C6-C1-C2	2.04	120.11	118.66
1	A	471	TPQ	C4-C3-C2	-2.00	118.14	120.30

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	471	TPQ	C-CA-CB-C1
1	A	471	TPQ	C2-C1-CB-CA
1	B	471	TPQ	C-CA-CB-C1
1	B	471	TPQ	C2-C1-CB-CA
1	B	471	TPQ	C6-C1-CB-CA
1	C	471	TPQ	C-CA-CB-C1
1	D	471	TPQ	C-CA-CB-C1
1	D	471	TPQ	C2-C1-CB-CA
1	C	471	TPQ	N-CA-CB-C1
1	C	471	TPQ	C2-C1-CB-CA
1	A	471	TPQ	C6-C1-CB-CA
1	D	471	TPQ	C6-C1-CB-CA
1	B	471	TPQ	N-CA-CB-C1
1	A	471	TPQ	N-CA-CB-C1
1	D	471	TPQ	N-CA-CB-C1
1	C	471	TPQ	C6-C1-CB-CA

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	B	471	TPQ	1	0

5.5 Carbohydrates

37 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	E	1	1,2	14,14,15	0.61	0	17,19,21	1.34	2 (11%)
2	NAG	E	2	2	14,14,15	0.65	0	17,19,21	1.18	1 (5%)
2	BMA	E	3	2	11,11,12	0.49	0	15,15,17	1.18	1 (6%)
3	NAG	F	1	3,1	14,14,15	0.67	0	17,19,21	1.74	3 (17%)
3	NAG	F	2	3	14,14,15	0.66	0	17,19,21	1.82	4 (23%)
3	FUC	F	3	3	10,10,11	0.68	0	14,14,16	1.50	2 (14%)
4	NAG	G	1	4,1	14,14,15	0.58	0	17,19,21	1.05	2 (11%)
4	NAG	G	2	4	14,14,15	0.63	0	17,19,21	1.43	2 (11%)
2	NAG	H	1	1,2	14,14,15	0.67	0	17,19,21	1.26	2 (11%)
2	NAG	H	2	2	14,14,15	0.50	0	17,19,21	1.16	1 (5%)
2	BMA	H	3	2	11,11,12	0.73	0	15,15,17	0.91	1 (6%)
5	NAG	I	1	1,5	14,14,15	0.60	0	17,19,21	1.79	2 (11%)
5	NAG	I	2	5	14,14,15	0.52	0	17,19,21	1.02	1 (5%)
5	BMA	I	3	5	11,11,12	0.69	0	15,15,17	1.74	3 (20%)
5	MAN	I	4	5	11,11,12	0.55	0	15,15,17	1.13	1 (6%)
5	FUC	I	5	5	10,10,11	0.71	0	14,14,16	0.89	0
4	NAG	J	1	4,1	14,14,15	0.65	0	17,19,21	0.99	1 (5%)
4	NAG	J	2	4	14,14,15	0.61	0	17,19,21	1.58	2 (11%)
2	NAG	K	1	1,2	14,14,15	0.56	0	17,19,21	0.96	1 (5%)
2	NAG	K	2	2	14,14,15	0.53	0	17,19,21	1.04	1 (5%)
2	BMA	K	3	2	11,11,12	0.60	0	15,15,17	0.85	1 (6%)
3	NAG	L	1	3,1	14,14,15	0.63	0	17,19,21	2.05	4 (23%)
3	NAG	L	2	3	14,14,15	0.55	0	17,19,21	1.42	4 (23%)
3	FUC	L	3	3	10,10,11	0.79	0	14,14,16	1.39	3 (21%)
4	NAG	M	1	4,1	14,14,15	0.54	0	17,19,21	1.54	3 (17%)
4	NAG	M	2	4	14,14,15	0.65	0	17,19,21	1.69	1 (5%)
6	NAG	N	1	6,1	14,14,15	0.56	0	17,19,21	1.01	0
6	NAG	N	2	6	14,14,15	0.56	0	17,19,21	2.00	8 (47%)
6	BMA	N	3	6	11,11,12	0.57	0	15,15,17	1.12	1 (6%)
6	MAN	N	4	6	11,11,12	0.60	0	15,15,17	1.38	2 (13%)
5	NAG	O	1	1,5	14,14,15	0.51	0	17,19,21	2.33	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	O	2	5	14,14,15	0.49	0	17,19,21	1.93	3 (17%)
5	BMA	O	3	5	11,11,12	0.88	0	15,15,17	1.94	3 (20%)
5	MAN	O	4	5	11,11,12	0.60	0	15,15,17	2.52	3 (20%)
5	FUC	O	5	5	10,10,11	0.76	0	14,14,16	1.36	3 (21%)
4	NAG	P	1	4,1	14,14,15	0.58	0	17,19,21	0.95	2 (11%)
4	NAG	P	2	4	14,14,15	0.65	0	17,19,21	1.12	1 (5%)

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	E	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	E	2	2	-	4/6/23/26	0/1/1/1
2	BMA	E	3	2	-	2/2/19/22	0/1/1/1
3	NAG	F	1	3,1	1/1/5/7	0/6/23/26	0/1/1/1
3	NAG	F	2	3	-	2/6/23/26	0/1/1/1
3	FUC	F	3	3	1/1/4/5	-	0/1/1/1
4	NAG	G	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	G	2	4	-	0/6/23/26	0/1/1/1
2	NAG	H	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	H	2	2	-	4/6/23/26	0/1/1/1
2	BMA	H	3	2	-	0/2/19/22	0/1/1/1
5	NAG	I	1	1,5	1/1/5/7	2/6/23/26	0/1/1/1
5	NAG	I	2	5	-	2/6/23/26	0/1/1/1
5	BMA	I	3	5	-	0/2/19/22	0/1/1/1
5	MAN	I	4	5	-	1/2/19/22	0/1/1/1
5	FUC	I	5	5	1/1/4/5	-	0/1/1/1
4	NAG	J	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	J	2	4	-	1/6/23/26	0/1/1/1
2	NAG	K	1	1,2	-	2/6/23/26	0/1/1/1
2	NAG	K	2	2	-	2/6/23/26	0/1/1/1
2	BMA	K	3	2	-	2/2/19/22	0/1/1/1
3	NAG	L	1	3,1	1/1/5/7	2/6/23/26	0/1/1/1
3	NAG	L	2	3	-	3/6/23/26	0/1/1/1
3	FUC	L	3	3	1/1/4/5	-	0/1/1/1
4	NAG	M	1	4,1	-	4/6/23/26	0/1/1/1

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

There are no bond length outliers.

All (78) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	O	4	MAN	C1-O5-C5	8.39	123.42	112.19
5	O	2	NAG	C1-O5-C5	5.99	120.22	112.19
5	O	1	NAG	C1-O5-C5	5.84	120.02	112.19
5	O	1	NAG	O5-C1-C2	5.83	120.32	111.29
5	O	3	BMA	C1-C2-C3	5.74	118.00	109.64
4	M	2	NAG	C1-O5-C5	5.55	119.62	112.19
3	L	1	NAG	C1-O5-C5	5.07	118.98	112.19
4	J	2	NAG	C1-O5-C5	4.72	118.51	112.19
5	I	3	BMA	C1-C2-C3	4.67	116.45	109.64
3	L	1	NAG	O5-C1-C2	4.49	118.24	111.29
5	I	1	NAG	O5-C1-C2	4.41	118.11	111.29
3	F	1	NAG	C1-O5-C5	4.32	117.97	112.19
5	I	1	NAG	C1-O5-C5	4.30	117.95	112.19
6	N	2	NAG	C1-O5-C5	4.00	117.55	112.19
2	E	3	BMA	C1-O5-C5	3.98	117.52	112.19
3	F	2	NAG	O5-C1-C2	3.81	117.18	111.29
5	I	4	MAN	C1-O5-C5	3.80	117.28	112.19
3	F	2	NAG	C1-O5-C5	3.80	117.28	112.19
4	G	2	NAG	C1-O5-C5	3.72	117.17	112.19
2	E	2	NAG	C2-N2-C7	-3.72	117.92	122.90
6	N	4	MAN	C1-O5-C5	3.71	117.16	112.19
6	N	3	BMA	C1-O5-C5	3.70	117.14	112.19
3	F	3	FUC	C1-O5-C5	3.67	121.63	112.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	M	1	NAG	C2-N2-C7	3.39	127.45	122.90
4	J	1	NAG	C4-C3-C2	3.39	115.99	111.02
5	O	3	BMA	C2-C3-C4	3.37	116.78	110.86
3	F	1	NAG	O5-C1-C2	3.36	116.49	111.29
3	F	2	NAG	C4-C3-C2	3.36	115.94	111.02
2	E	1	NAG	C1-O5-C5	3.26	116.56	112.19
6	N	2	NAG	C8-C7-N2	3.18	121.39	116.12
5	I	3	BMA	C2-C3-C4	3.11	116.33	110.86
4	P	2	NAG	C1-O5-C5	3.07	116.30	112.19
3	L	3	FUC	C1-C2-C3	2.81	113.73	109.64
3	F	2	NAG	O5-C5-C6	2.79	113.10	107.66
5	O	2	NAG	C2-N2-C7	2.75	126.59	122.90
2	H	1	NAG	C1-O5-C5	2.67	115.77	112.19
5	O	1	NAG	O7-C7-C8	-2.67	117.29	122.05
3	F	3	FUC	C1-C2-C3	2.67	113.53	109.64
3	L	2	NAG	O5-C5-C6	2.66	112.83	107.66
5	O	4	MAN	O5-C1-C2	2.63	117.06	110.79
2	H	2	NAG	C4-C3-C2	2.59	114.81	111.02
6	N	2	NAG	C3-C4-C5	2.54	114.84	110.23
6	N	2	NAG	O7-C7-C8	-2.52	117.57	122.05
5	I	2	NAG	C1-O5-C5	2.52	115.56	112.19
3	F	1	NAG	O5-C5-C6	-2.50	102.79	107.66
4	G	2	NAG	O5-C1-C2	2.49	115.15	111.29
5	O	2	NAG	C1-C2-N2	2.45	114.29	110.43
3	L	2	NAG	C4-C3-C2	2.44	114.59	111.02
6	N	2	NAG	C6-C5-C4	-2.43	107.06	113.02
3	L	1	NAG	O6-C6-C5	-2.42	103.08	111.33
6	N	2	NAG	C2-N2-C7	2.38	126.09	122.90
2	K	1	NAG	O4-C4-C3	-2.37	104.80	110.38
3	L	3	FUC	C1-O5-C5	2.35	118.52	112.97
4	M	1	NAG	C1-O5-C5	2.35	115.33	112.19
4	M	1	NAG	O5-C1-C2	-2.35	107.66	111.29
5	O	3	BMA	C3-C4-C5	2.33	114.46	110.23
6	N	4	MAN	C1-C2-C3	2.32	113.03	109.64
2	E	1	NAG	O4-C4-C3	-2.27	105.02	110.38
3	L	1	NAG	O5-C5-C6	-2.25	103.28	107.66
6	N	2	NAG	O5-C5-C4	2.22	116.24	110.83
5	O	4	MAN	C2-C3-C4	-2.22	106.95	110.86
5	O	5	FUC	C1-O5-C5	2.22	118.19	112.97
5	O	5	FUC	O5-C5-C6	2.21	112.20	107.40
5	I	3	BMA	C1-O5-C5	2.21	115.15	112.19
2	K	2	NAG	C4-C3-C2	-2.19	107.81	111.02

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	3	BMA	O5-C5-C6	2.16	111.87	107.66
3	L	3	FUC	O5-C5-C4	2.16	113.44	109.55
4	J	2	NAG	C4-C3-C2	-2.14	107.88	111.02
2	H	1	NAG	O4-C4-C3	-2.12	105.38	110.38
4	G	1	NAG	O4-C4-C3	-2.11	105.39	110.38
4	P	1	NAG	C4-C3-C2	2.08	114.07	111.02
2	K	3	BMA	C1-O5-C5	2.05	114.94	112.19
3	L	2	NAG	O5-C5-C4	-2.04	105.87	110.83
6	N	2	NAG	O5-C1-C2	-2.04	108.14	111.29
4	G	1	NAG	C4-C3-C2	2.03	113.99	111.02
4	P	1	NAG	C1-O5-C5	2.03	114.90	112.19
3	L	2	NAG	C1-C2-N2	-2.02	107.24	110.43
5	O	5	FUC	C2-C3-C4	-2.00	107.34	110.86

All (8) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	F	1	NAG	C1
3	F	3	FUC	C1
3	L	1	NAG	C1
3	L	3	FUC	C1
5	I	1	NAG	C1
5	I	5	FUC	C1
5	O	1	NAG	C1
5	O	5	FUC	C1

All (63) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	2	NAG	C8-C7-N2-C2
2	E	2	NAG	O7-C7-N2-C2
2	H	2	NAG	C8-C7-N2-C2
2	H	2	NAG	O7-C7-N2-C2
2	K	2	NAG	C8-C7-N2-C2
2	K	2	NAG	O7-C7-N2-C2
3	L	2	NAG	C8-C7-N2-C2
3	L	2	NAG	O7-C7-N2-C2
4	G	1	NAG	C8-C7-N2-C2
4	G	1	NAG	O7-C7-N2-C2
4	P	1	NAG	C8-C7-N2-C2
4	P	1	NAG	O7-C7-N2-C2
5	O	2	NAG	C1-C2-N2-C7

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Mol	Chain	Res	Type	Atoms
5	O	2	NAG	C8-C7-N2-C2
5	O	2	NAG	O7-C7-N2-C2
6	N	2	NAG	C8-C7-N2-C2
6	N	2	NAG	O7-C7-N2-C2
5	I	1	NAG	O5-C5-C6-O6
2	E	3	BMA	O5-C5-C6-O6
5	I	2	NAG	O5-C5-C6-O6
2	K	3	BMA	O5-C5-C6-O6
4	M	1	NAG	C4-C5-C6-O6
3	L	1	NAG	O5-C5-C6-O6
2	E	2	NAG	C4-C5-C6-O6
5	I	1	NAG	C4-C5-C6-O6
5	O	4	MAN	O5-C5-C6-O6
2	E	3	BMA	C4-C5-C6-O6
2	K	1	NAG	C8-C7-N2-C2
2	K	1	NAG	O7-C7-N2-C2
4	M	1	NAG	O5-C5-C6-O6
6	N	4	MAN	C4-C5-C6-O6
2	E	2	NAG	O5-C5-C6-O6
5	O	3	BMA	O5-C5-C6-O6
6	N	3	BMA	O5-C5-C6-O6
6	N	3	BMA	C4-C5-C6-O6
2	E	1	NAG	C8-C7-N2-C2
3	L	1	NAG	C4-C5-C6-O6
2	K	3	BMA	C4-C5-C6-O6
5	I	2	NAG	C4-C5-C6-O6
6	N	4	MAN	O5-C5-C6-O6
2	E	1	NAG	O7-C7-N2-C2
2	H	2	NAG	C4-C5-C6-O6
4	J	1	NAG	C4-C5-C6-O6
4	P	2	NAG	C8-C7-N2-C2
3	F	2	NAG	C4-C5-C6-O6
5	I	4	MAN	O5-C5-C6-O6
4	P	2	NAG	O7-C7-N2-C2
5	O	3	BMA	C4-C5-C6-O6
2	H	2	NAG	O5-C5-C6-O6
5	O	4	MAN	C4-C5-C6-O6
4	J	1	NAG	O5-C5-C6-O6
4	M	1	NAG	C3-C2-N2-C7
4	M	2	NAG	C4-C5-C6-O6
5	O	2	NAG	C4-C5-C6-O6
6	N	1	NAG	C8-C7-N2-C2

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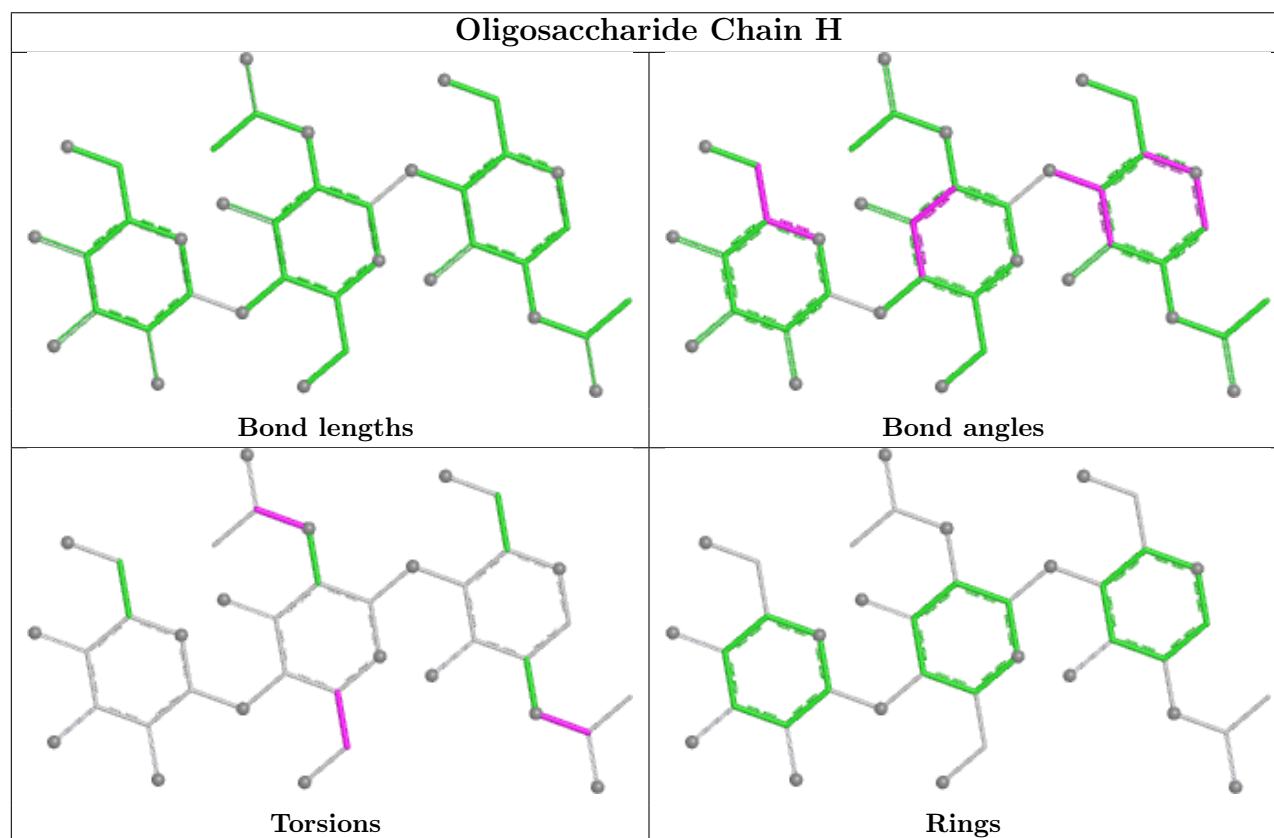
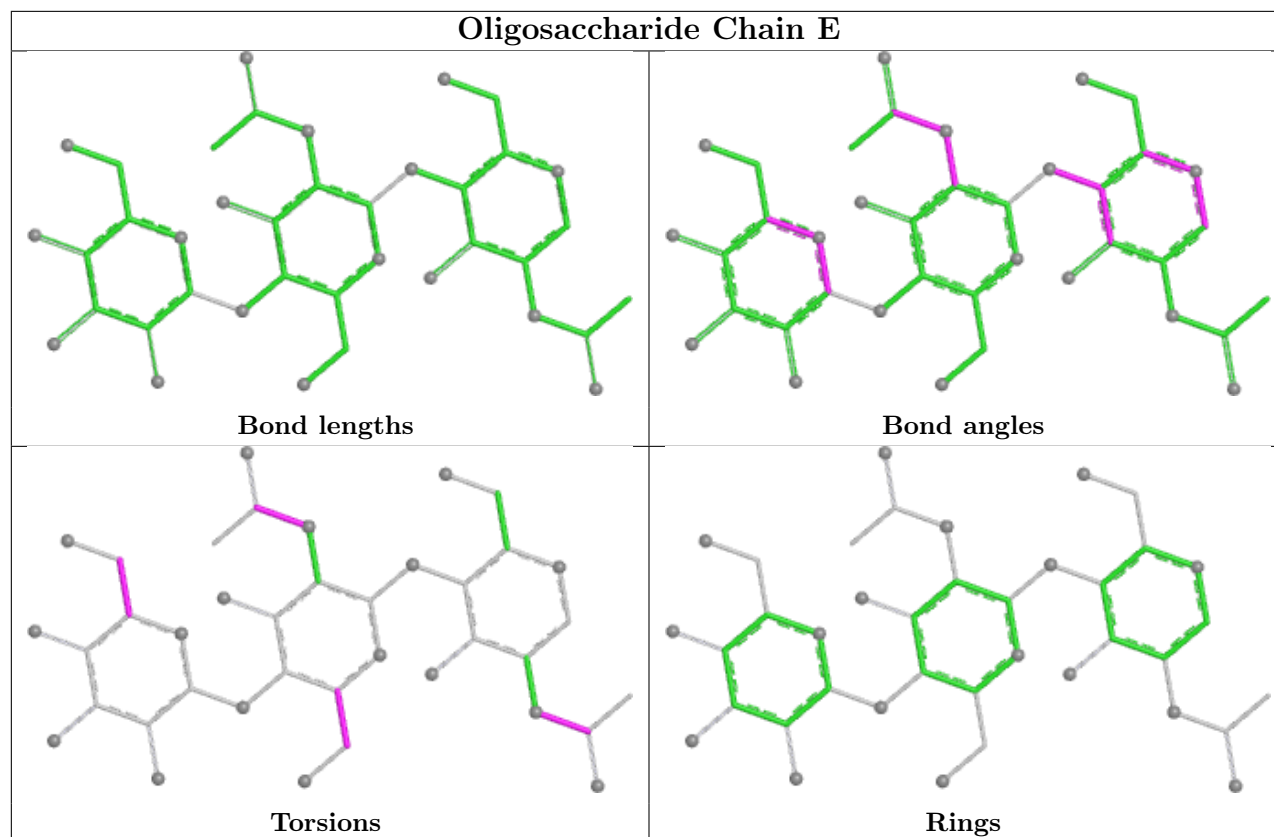
Mol	Chain	Res	Type	Atoms
2	H	1	NAG	C8-C7-N2-C2
6	N	1	NAG	O7-C7-N2-C2
4	M	1	NAG	C1-C2-N2-C7
4	P	2	NAG	C4-C5-C6-O6
2	H	1	NAG	O7-C7-N2-C2
4	J	2	NAG	C4-C5-C6-O6
3	L	2	NAG	C4-C5-C6-O6
3	F	2	NAG	O5-C5-C6-O6

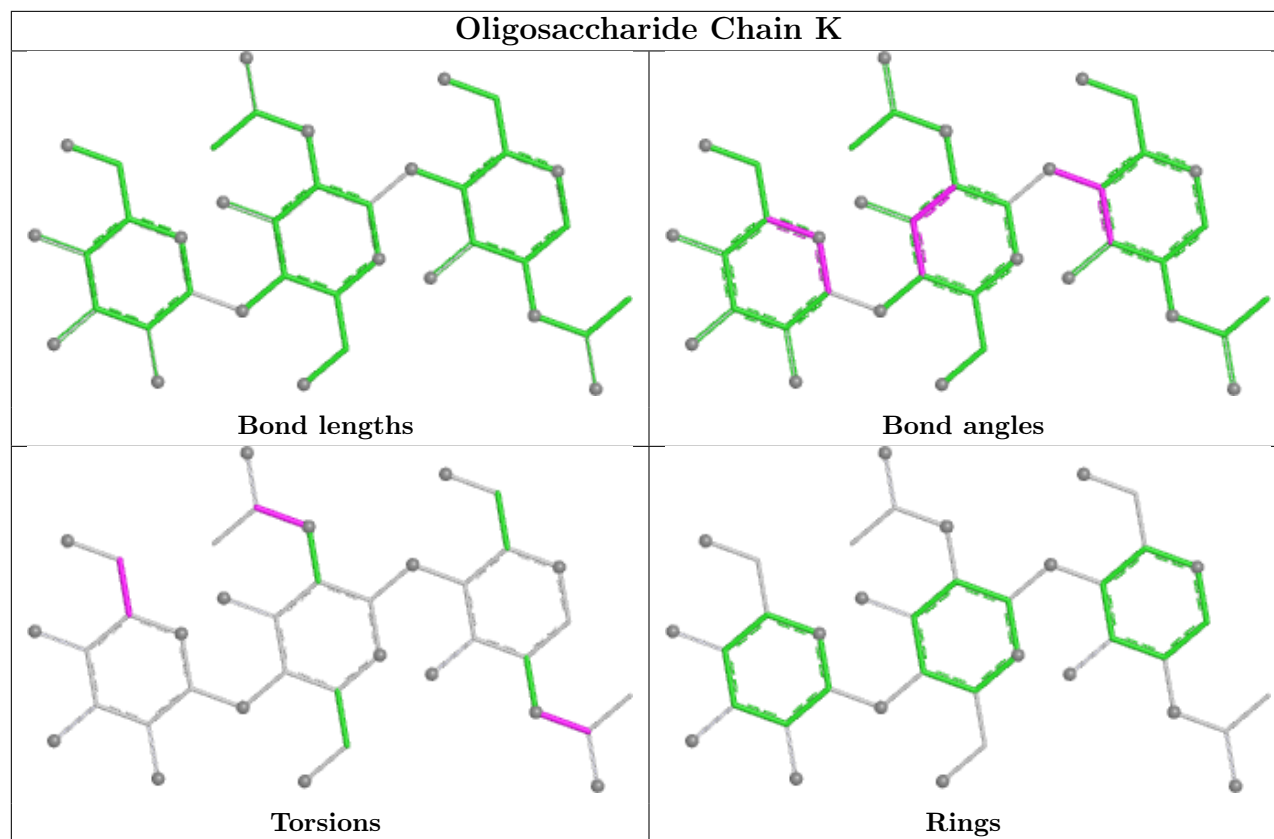
There are no ring outliers.

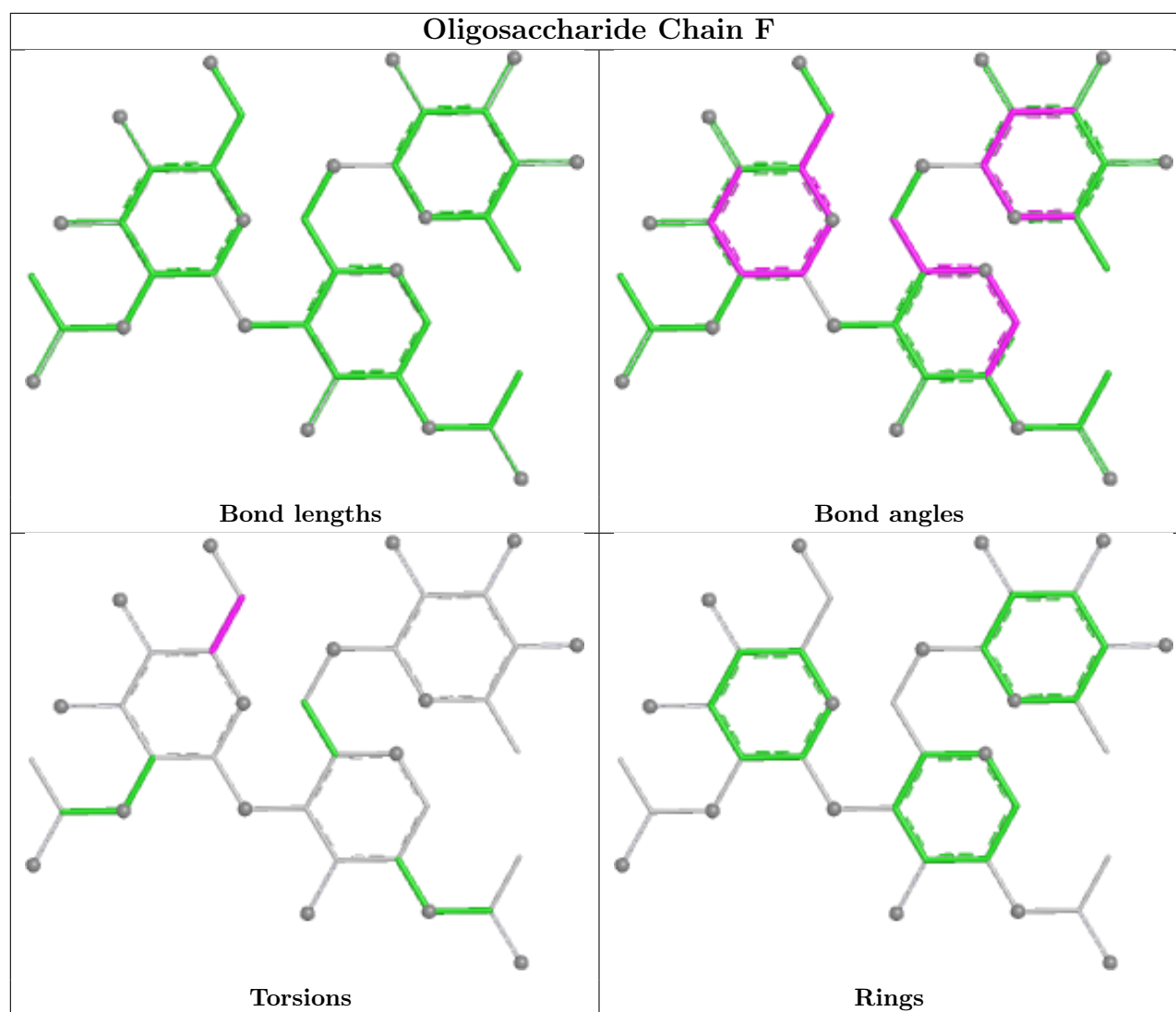
6 monomers are involved in 4 short contacts:

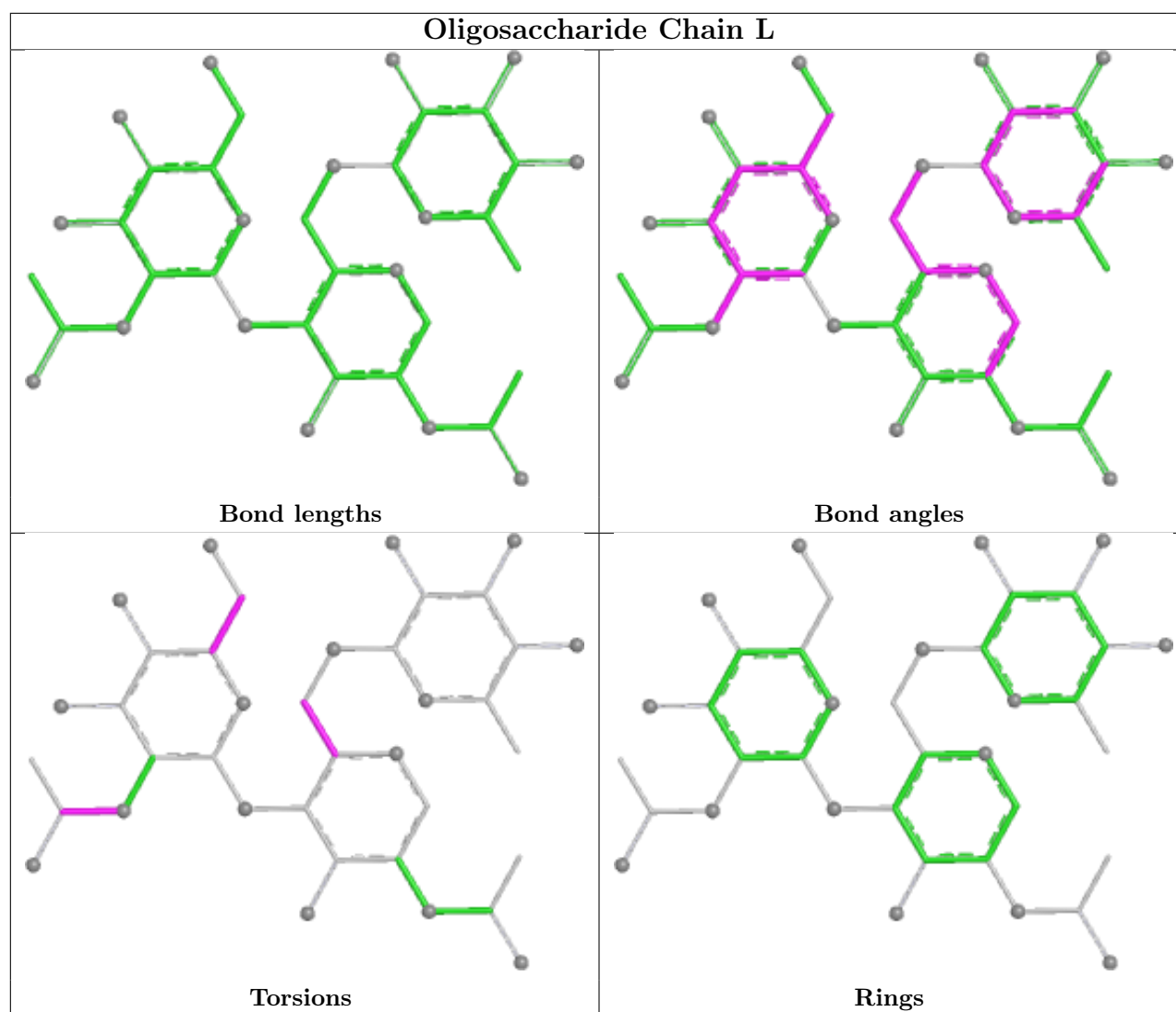
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	2	NAG	1	0
5	I	2	NAG	2	0
3	L	1	NAG	1	0
2	H	3	BMA	1	0
5	I	5	FUC	1	0
3	L	2	NAG	1	0

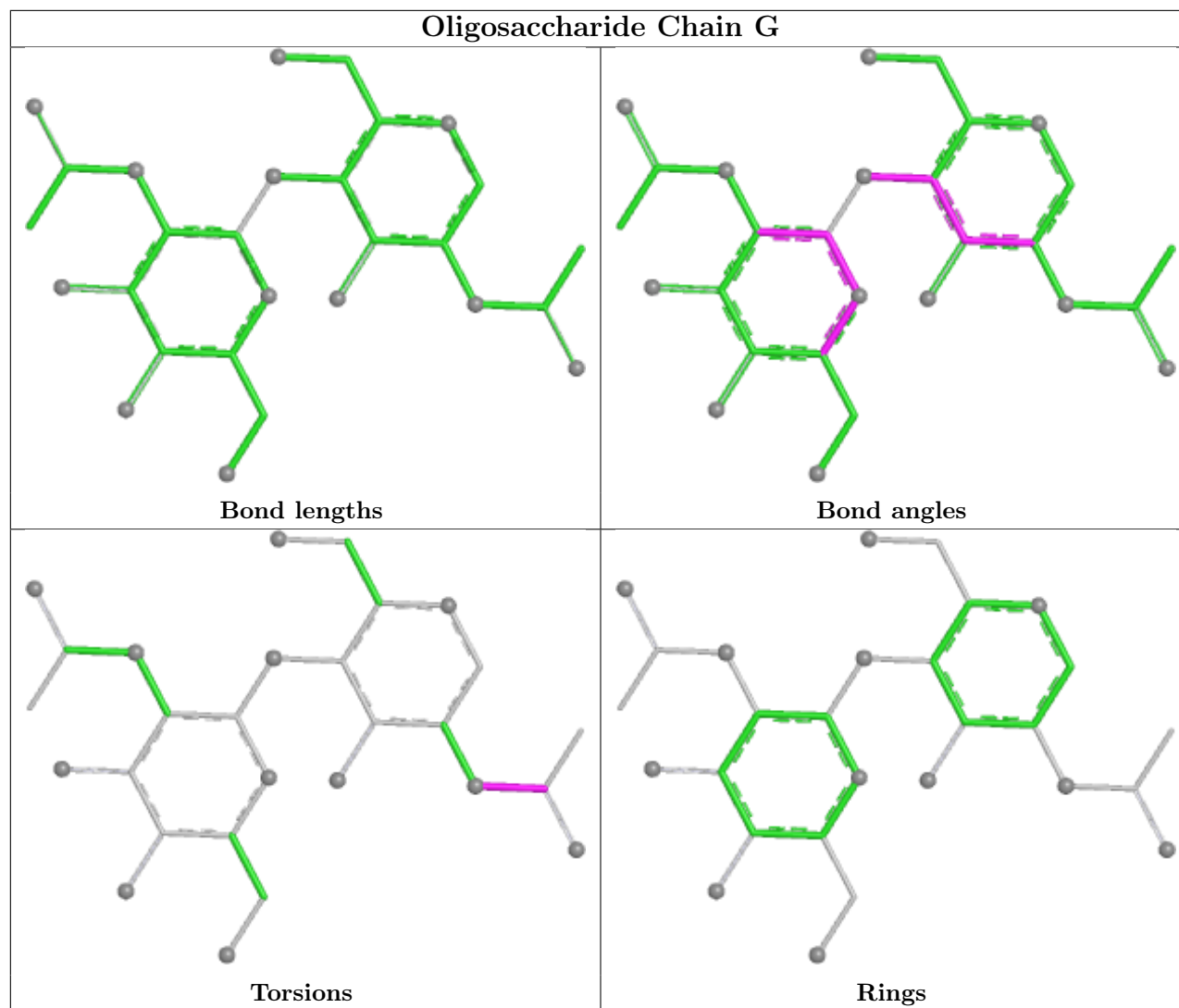
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

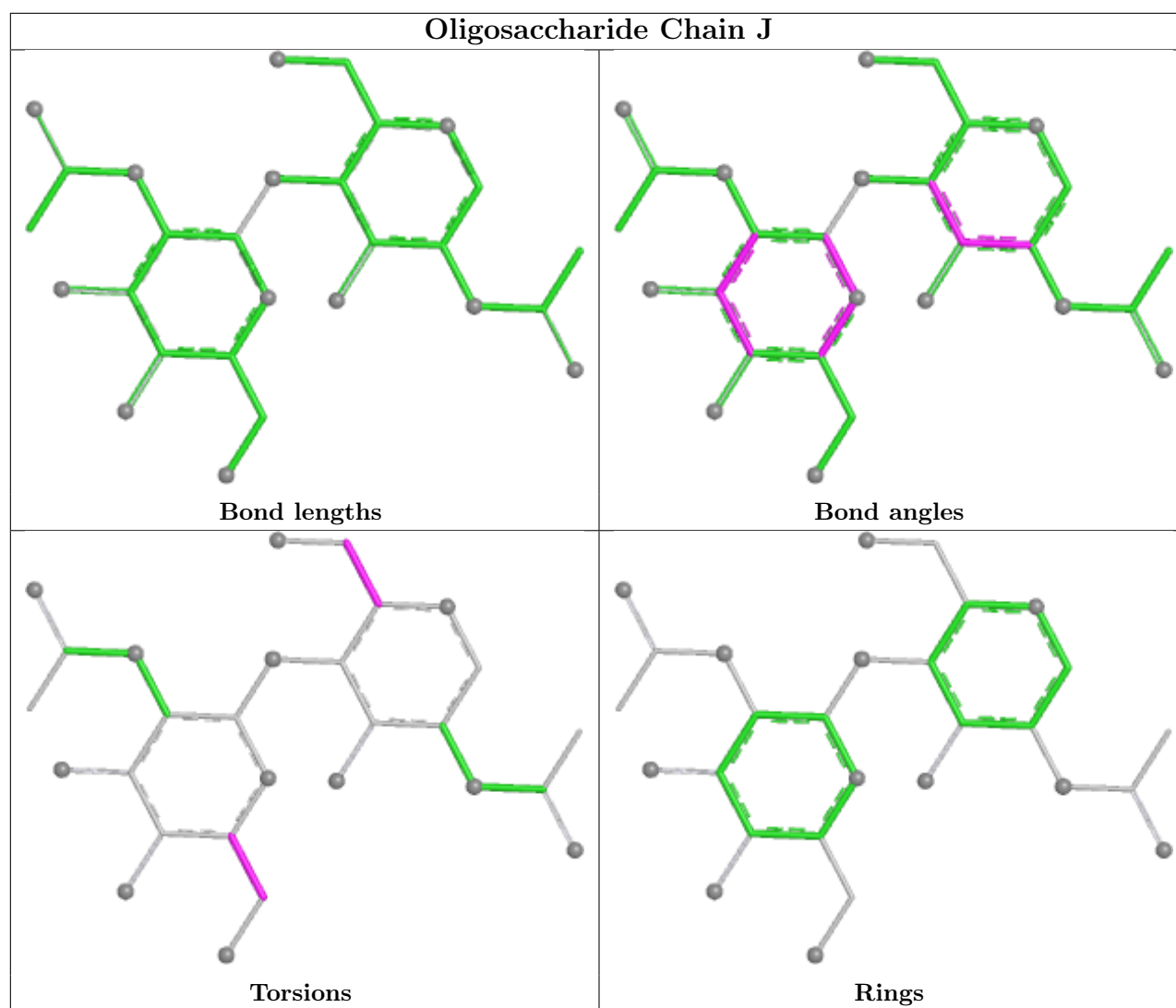


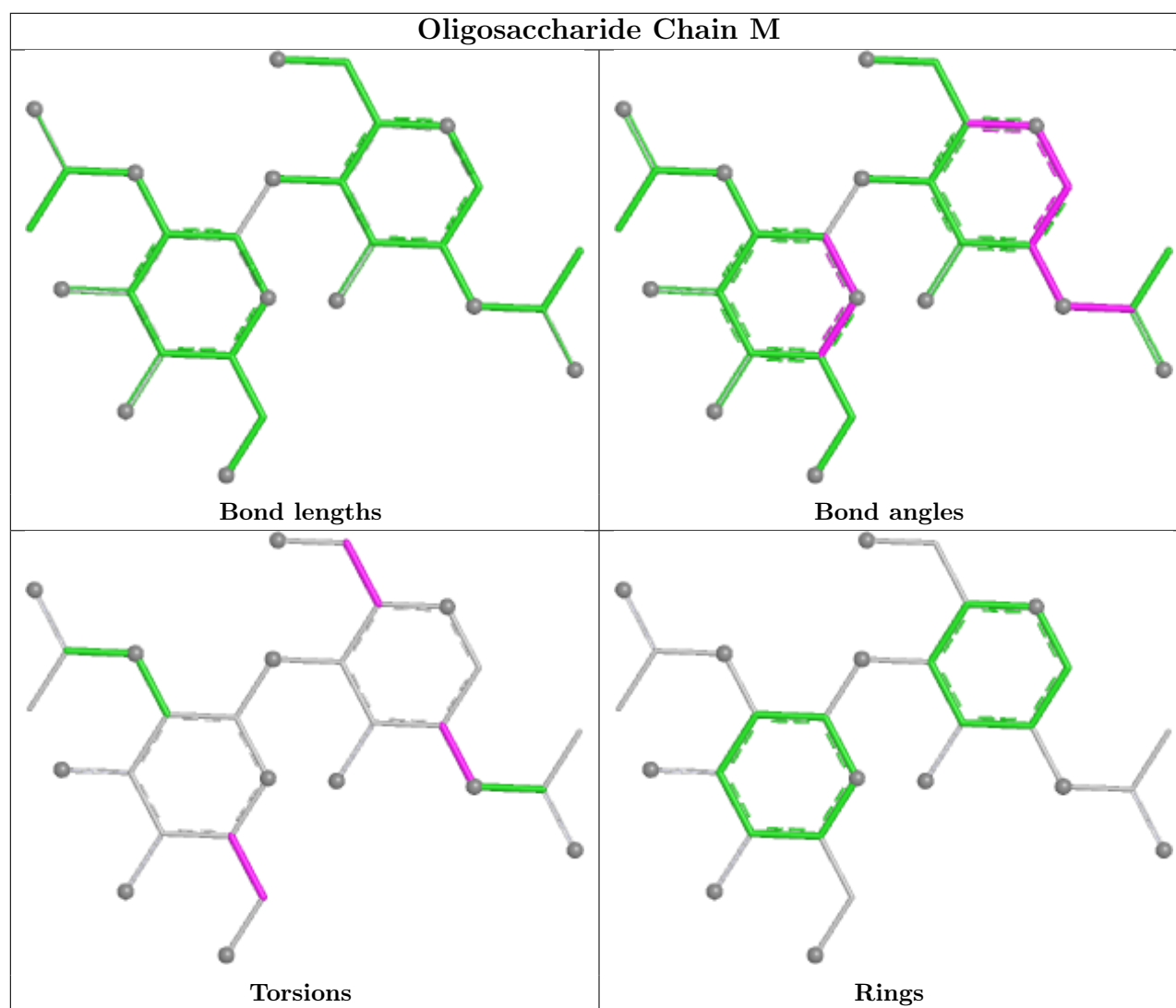


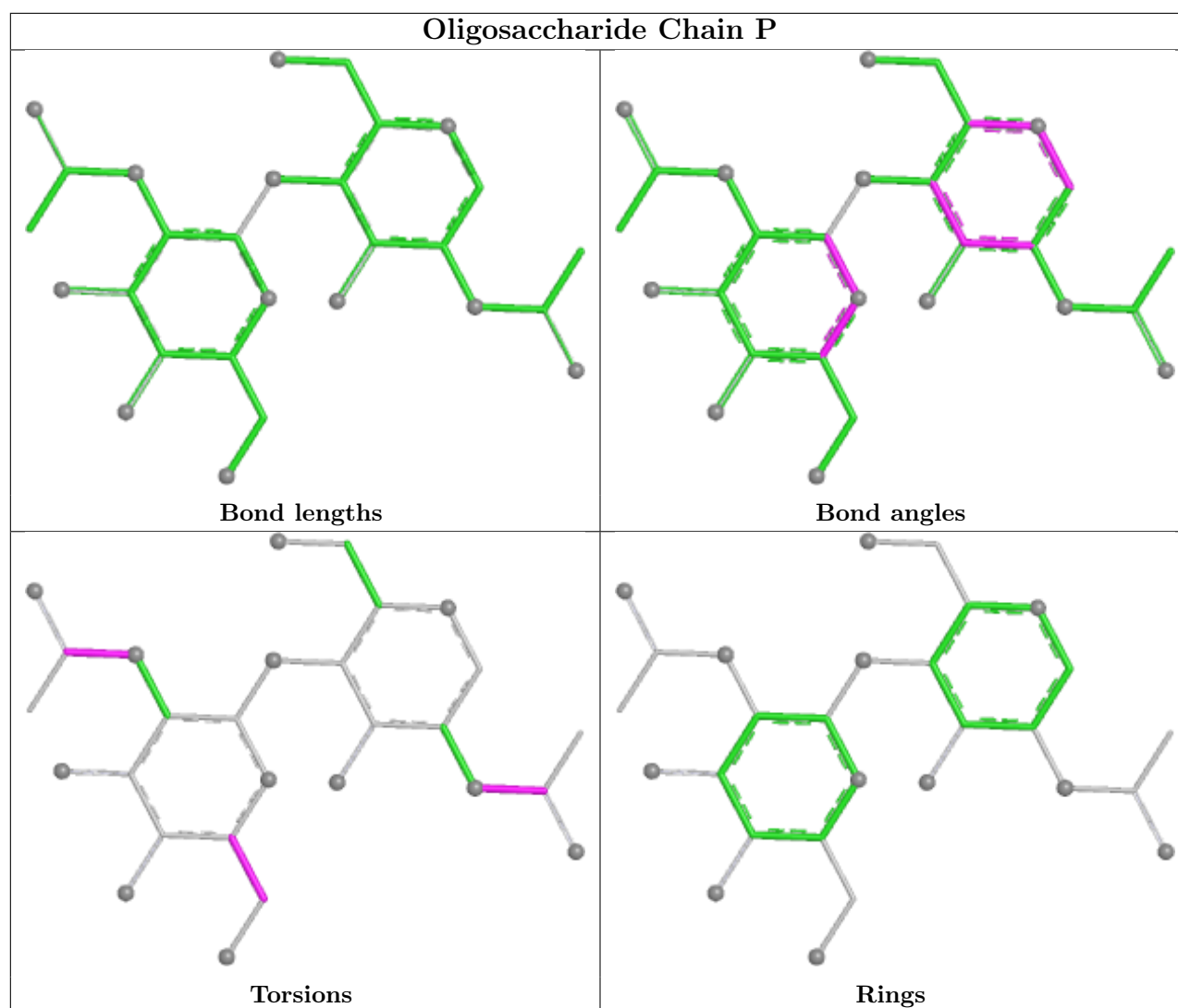


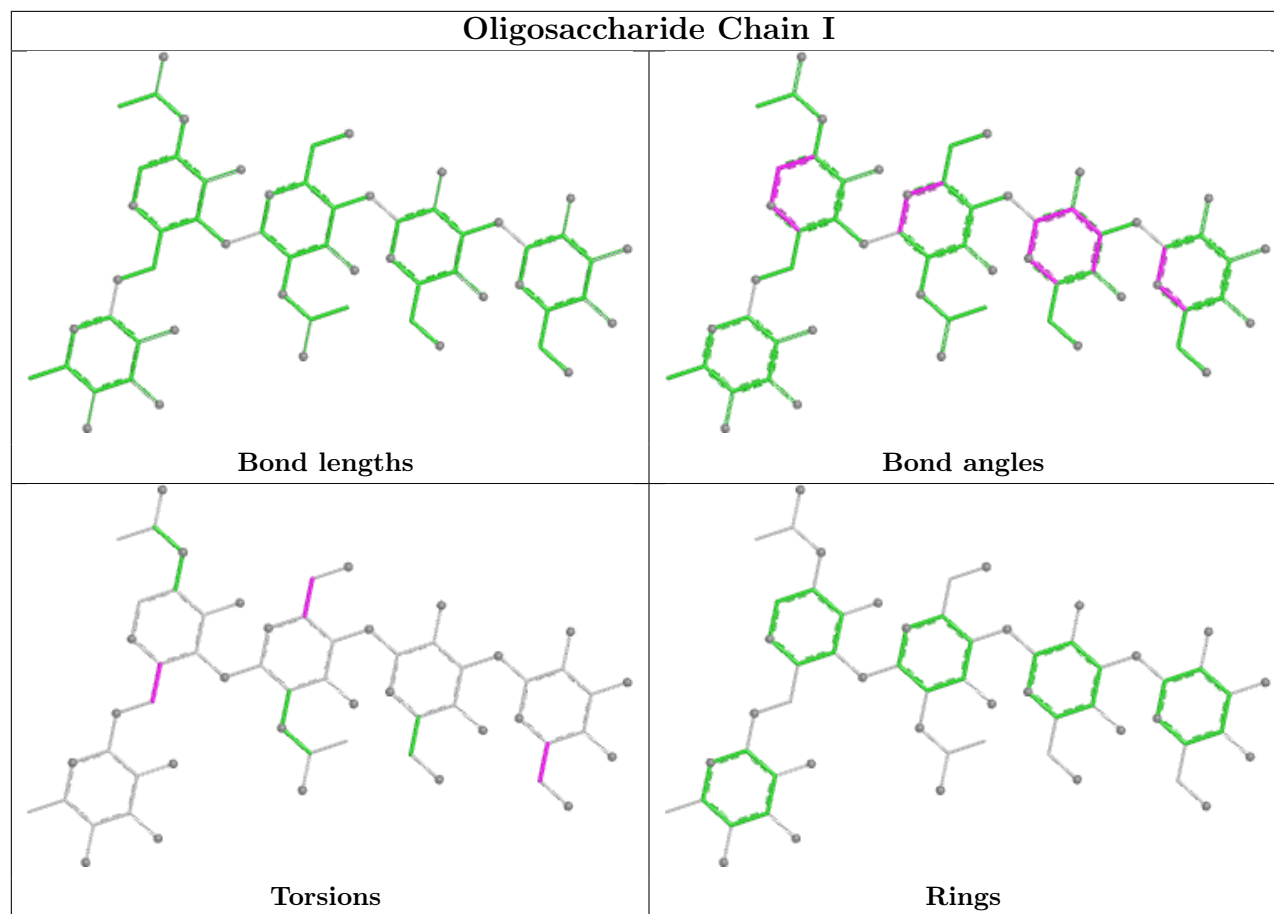


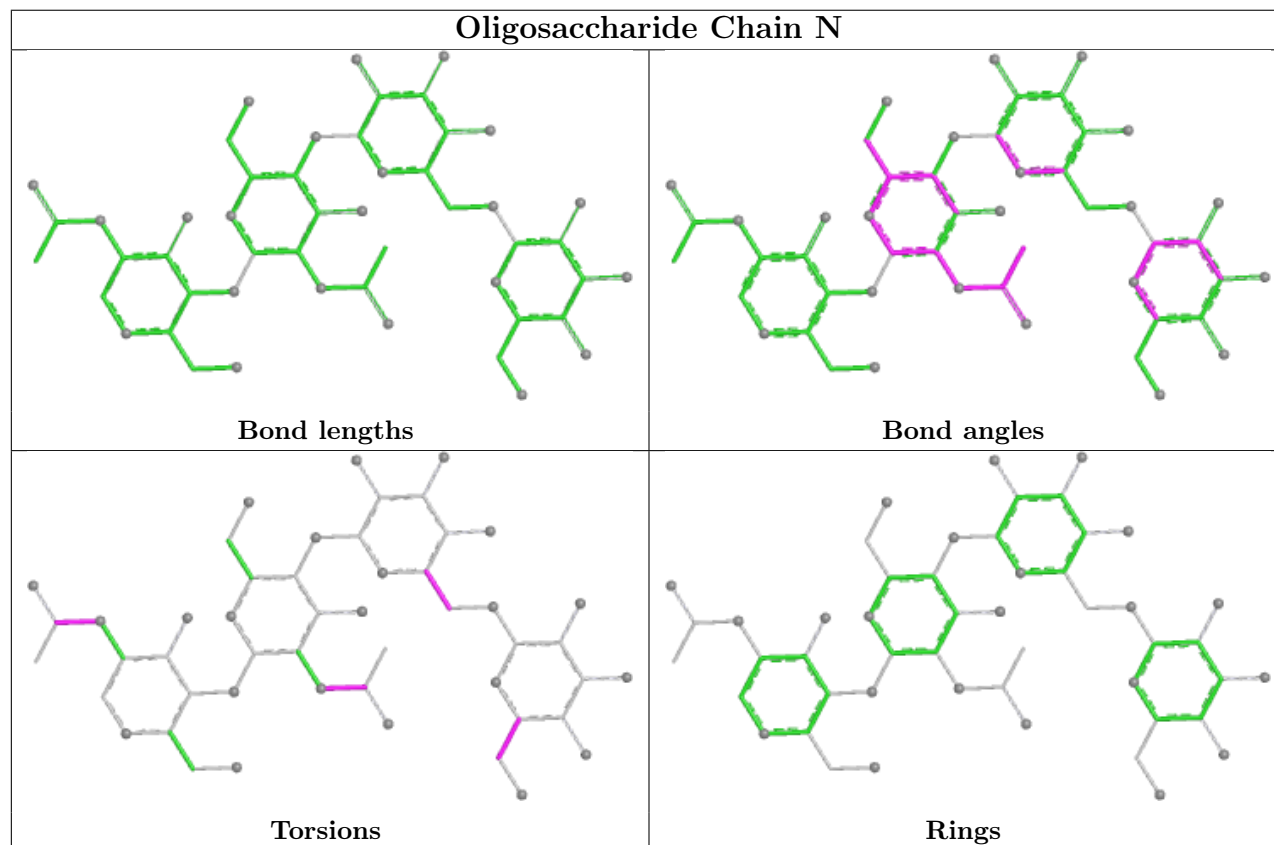
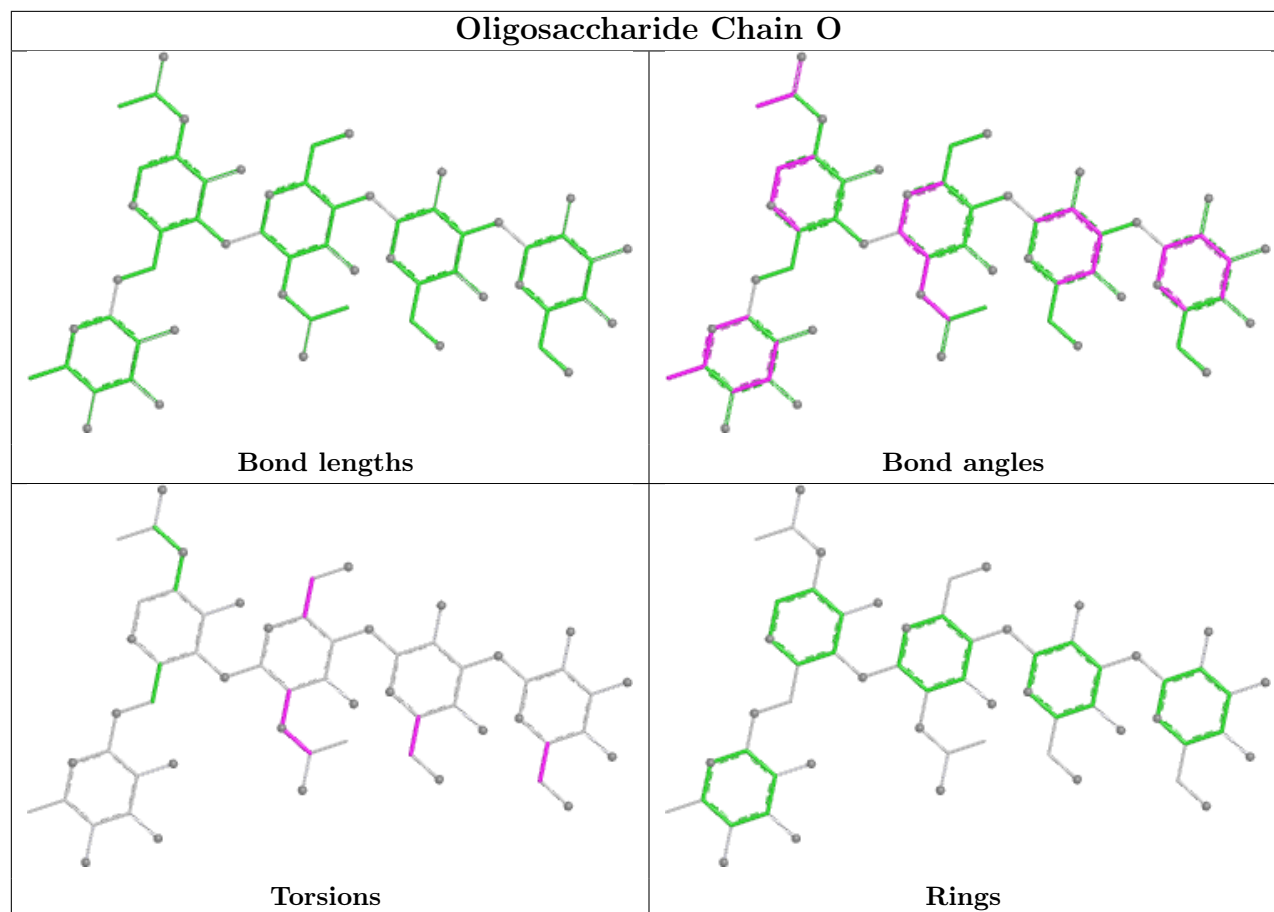












5.6 Ligand geometry

Of 28 ligands modelled in this entry, 20 are monoatomic - leaving 8 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
7	NAG	C	1768	1	14,14,15	0.62	0	17,19,21	0.78	0
7	NAG	D	1770	1	14,14,15	0.68	0	17,19,21	1.29	2 (11%)
7	NAG	B	1770	1	14,14,15	0.65	0	17,19,21	2.74	6 (35%)
7	NAG	D	1774	-	14,14,15	0.64	0	17,19,21	1.59	3 (17%)
7	NAG	D	1768	1	14,14,15	0.59	0	17,19,21	1.55	3 (17%)
7	NAG	B	1773	-	14,14,15	0.62	0	17,19,21	1.90	4 (23%)
7	NAG	A	1768	1	14,14,15	0.54	0	17,19,21	0.98	1 (5%)
7	NAG	B	1768	1	14,14,15	0.55	0	17,19,21	1.51	1 (5%)

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
7	NAG	C	1768	1	-	2/6/23/26	0/1/1/1
7	NAG	D	1770	1	-	2/6/23/26	0/1/1/1
7	NAG	B	1770	1	-	2/6/23/26	0/1/1/1
7	NAG	D	1774	-	-	3/6/23/26	0/1/1/1
7	NAG	D	1768	1	-	2/6/23/26	0/1/1/1
7	NAG	B	1773	-	-	4/6/23/26	0/1/1/1
7	NAG	A	1768	1	-	2/6/23/26	0/1/1/1
7	NAG	B	1768	1	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1770	NAG	C1-O5-C5	8.34	123.36	112.19
7	B	1768	NAG	C1-O5-C5	5.35	119.35	112.19
7	B	1773	NAG	C2-N2-C7	5.03	129.64	122.90
7	D	1774	NAG	C2-N2-C7	4.21	128.54	122.90
7	B	1770	NAG	C4-C3-C2	4.03	116.92	111.02
7	D	1770	NAG	C4-C3-C2	3.90	116.73	111.02
7	D	1768	NAG	C1-O5-C5	3.64	117.06	112.19
7	B	1770	NAG	C3-C4-C5	3.60	116.75	110.23
7	B	1773	NAG	C1-C2-N2	3.35	115.72	110.43
7	B	1773	NAG	C1-O5-C5	3.32	116.63	112.19
7	D	1774	NAG	C1-O5-C5	3.26	116.55	112.19
7	D	1768	NAG	O5-C1-C2	3.01	115.95	111.29
7	A	1768	NAG	C1-O5-C5	2.82	115.96	112.19
7	B	1770	NAG	C6-C5-C4	-2.75	106.26	113.02
7	B	1770	NAG	O5-C1-C2	2.73	115.51	111.29
7	D	1768	NAG	C4-C3-C2	2.58	114.79	111.02
7	B	1770	NAG	O5-C5-C4	2.33	116.49	110.83
7	D	1770	NAG	C3-C4-C5	2.13	114.10	110.23
7	B	1773	NAG	O5-C1-C2	-2.11	108.03	111.29
7	D	1774	NAG	C1-C2-N2	2.07	113.70	110.43

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	B	1768	NAG	C8-C7-N2-C2
7	B	1768	NAG	O7-C7-N2-C2
7	B	1773	NAG	C1-C2-N2-C7
7	D	1774	NAG	C3-C2-N2-C7
7	D	1774	NAG	C8-C7-N2-C2
7	D	1774	NAG	O7-C7-N2-C2
7	D	1768	NAG	C8-C7-N2-C2
7	D	1768	NAG	O7-C7-N2-C2
7	C	1768	NAG	C4-C5-C6-O6
7	A	1768	NAG	C8-C7-N2-C2
7	D	1770	NAG	C8-C7-N2-C2
7	D	1770	NAG	O7-C7-N2-C2
7	C	1768	NAG	O5-C5-C6-O6
7	A	1768	NAG	O7-C7-N2-C2
7	B	1768	NAG	C4-C5-C6-O6
7	B	1770	NAG	C4-C5-C6-O6
7	B	1773	NAG	C8-C7-N2-C2
7	B	1773	NAG	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
7	B	1773	NAG	C4-C5-C6-O6
7	B	1768	NAG	O5-C5-C6-O6
7	B	1770	NAG	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	D	1774	NAG	1	0
7	B	1773	NAG	1	0
7	A	1768	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	705/735 (95%)	-1.49	0 100 100	26, 34, 64, 88	0
1	B	708/735 (96%)	-1.50	0 100 100	24, 34, 67, 99	0
1	C	705/735 (95%)	-1.49	0 100 100	25, 35, 64, 84	0
1	D	708/735 (96%)	-1.49	0 100 100	24, 34, 68, 101	0
All	All	2826/2940 (96%)	-1.50	0 100 100	24, 34, 67, 101	0

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	TPQ	A	471	14/15	0.99	0.04	40,48,51,52	0
1	TPQ	B	471	14/15	0.99	0.05	39,47,49,50	0
1	TPQ	C	471	14/15	0.99	0.04	38,46,49,49	0
1	TPQ	D	471	14/15	0.99	0.05	38,46,49,49	0

6.3 Carbohydrates [i](#)

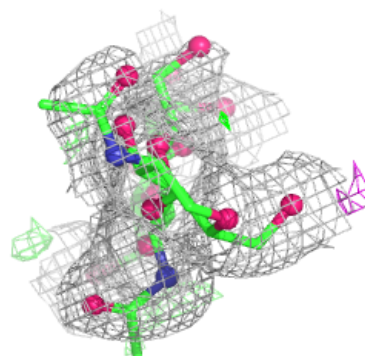
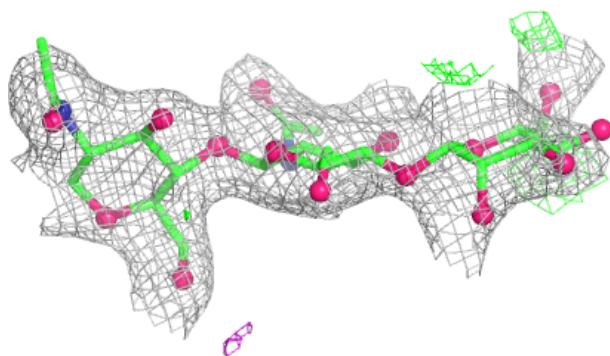
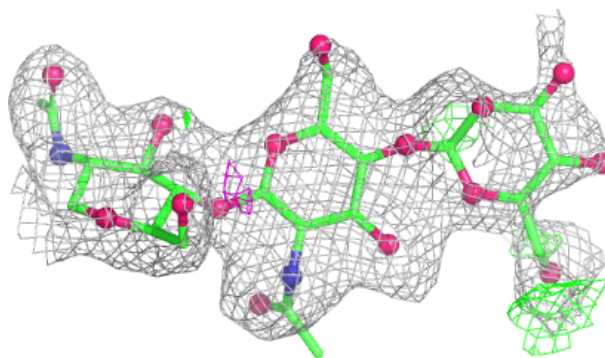
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	BMA	K	3	11/12	0.94	0.05	73,75,75,76	0
2	BMA	H	3	11/12	0.95	0.05	79,82,82,82	0
2	BMA	E	3	11/12	0.95	0.06	72,74,75,75	0
3	NAG	L	2	14/15	0.95	0.07	62,65,69,69	0
4	NAG	M	2	14/15	0.95	0.06	76,79,80,81	0
6	BMA	N	3	11/12	0.95	0.04	79,82,86,88	0
5	BMA	I	3	11/12	0.96	0.05	69,70,72,75	0
5	MAN	O	4	11/12	0.96	0.06	79,81,82,82	0
4	NAG	G	2	14/15	0.96	0.07	77,81,81,82	0
6	MAN	N	4	11/12	0.96	0.05	89,90,91,91	0
5	MAN	I	4	11/12	0.97	0.05	78,79,80,81	0
5	BMA	O	3	11/12	0.97	0.04	67,70,72,76	0
3	NAG	F	2	14/15	0.97	0.05	57,61,62,62	0
4	NAG	P	2	14/15	0.97	0.05	74,75,77,77	0
4	NAG	J	2	14/15	0.97	0.05	71,73,73,74	0
4	NAG	P	1	14/15	0.98	0.04	59,66,68,71	0
3	NAG	L	1	14/15	0.98	0.03	42,48,53,58	0
5	NAG	I	2	14/15	0.98	0.04	54,61,67,68	0
2	NAG	K	1	14/15	0.98	0.04	43,49,51,55	0
2	NAG	K	2	14/15	0.98	0.04	59,61,66,70	0
5	FUC	I	5	10/11	0.98	0.05	53,55,56,57	0
5	NAG	O	2	14/15	0.98	0.04	55,59,62,66	0
4	NAG	J	1	14/15	0.98	0.04	58,63,65,68	0
2	NAG	H	2	14/15	0.98	0.04	62,66,70,75	0
5	FUC	O	5	10/11	0.98	0.05	52,55,57,58	0
6	NAG	N	2	14/15	0.98	0.04	61,64,68,74	0
4	NAG	M	1	14/15	0.98	0.04	58,64,66,72	0
2	NAG	E	2	14/15	0.98	0.04	59,63,65,69	0
5	NAG	O	1	14/15	0.99	0.03	34,43,52,52	0
4	NAG	G	1	14/15	0.99	0.04	58,64,67,73	0
2	NAG	H	1	14/15	0.99	0.03	39,43,48,55	0
5	NAG	I	1	14/15	0.99	0.03	39,45,51,54	0
3	FUC	F	3	10/11	0.99	0.04	50,51,52,52	0
6	NAG	N	1	14/15	0.99	0.04	40,44,49,55	0
2	NAG	E	1	14/15	0.99	0.04	43,46,49,55	0
3	NAG	F	1	14/15	0.99	0.02	39,44,48,53	0
3	FUC	L	3	10/11	0.99	0.04	47,50,52,53	0

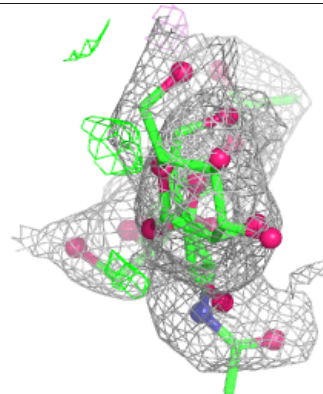
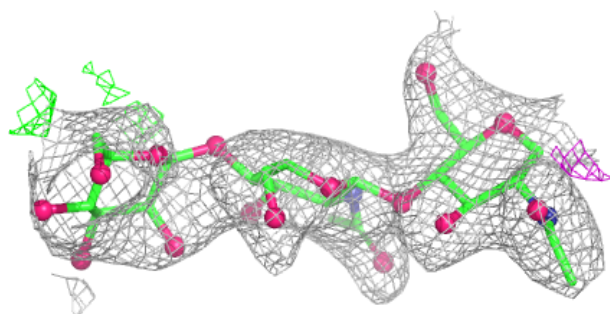
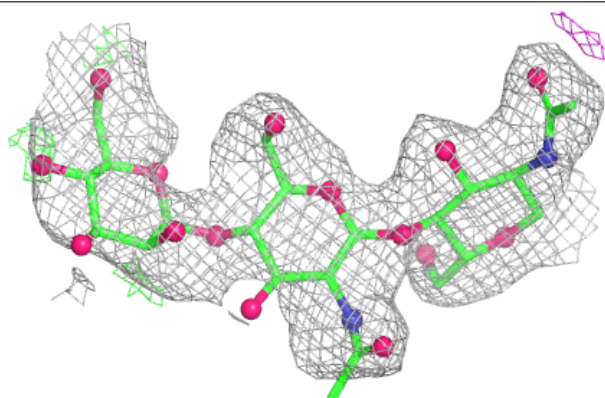
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain E:

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

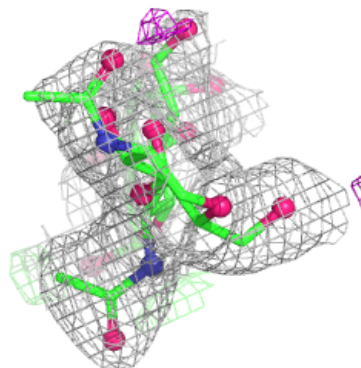
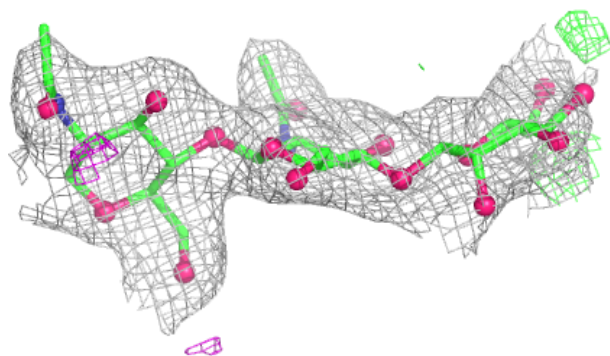
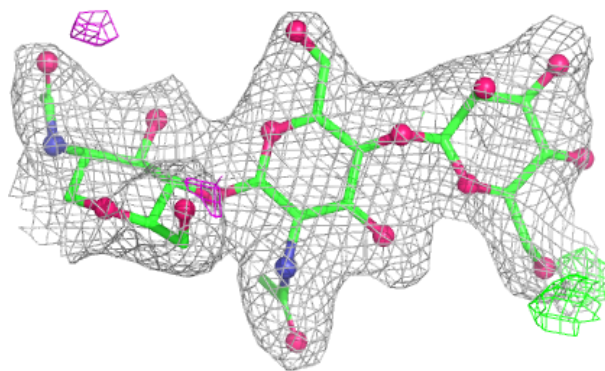
**Electron density around Chain H:**

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



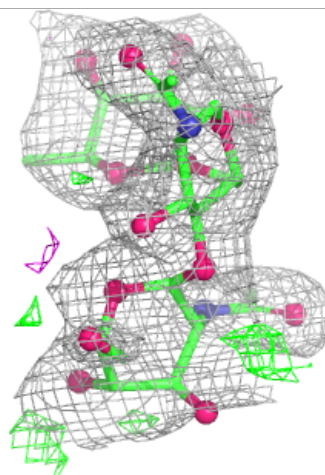
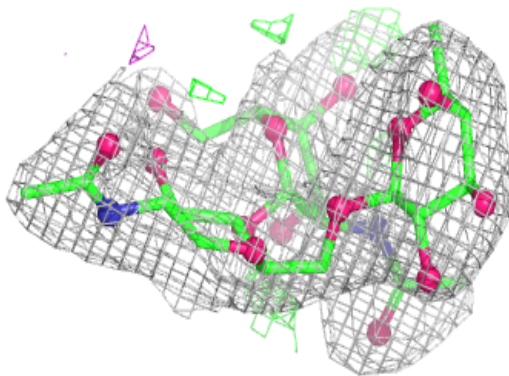
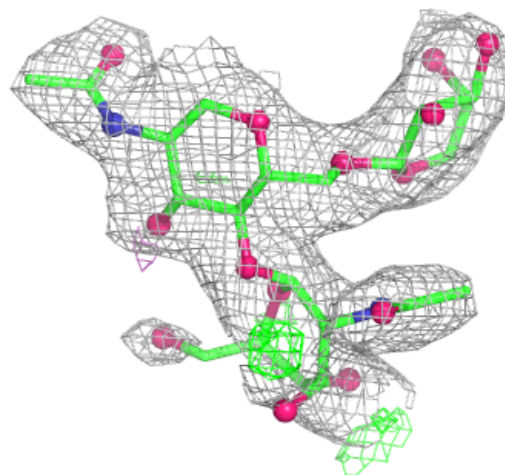
Electron density around Chain K:

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



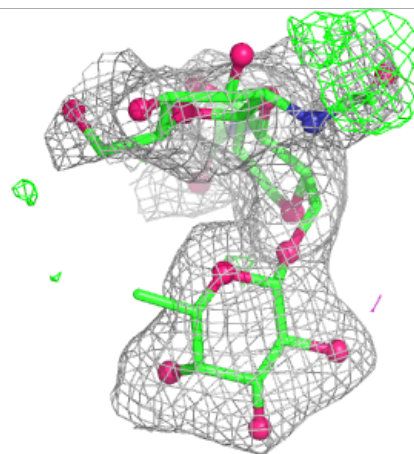
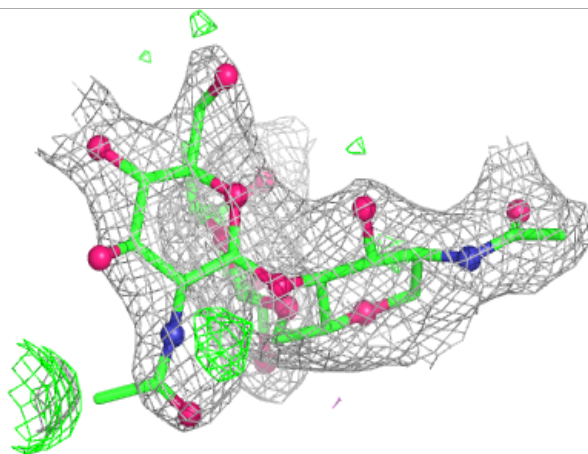
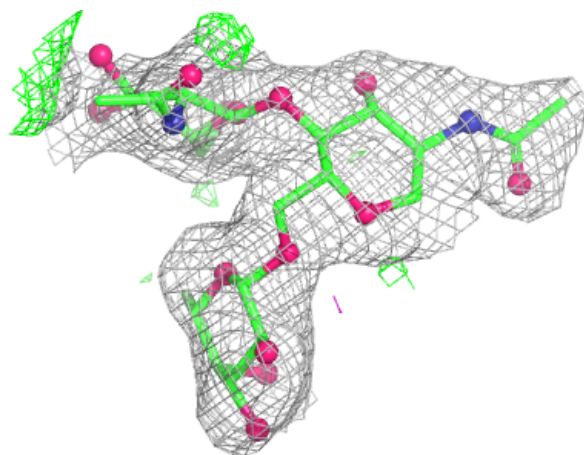
Electron density around Chain F:

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



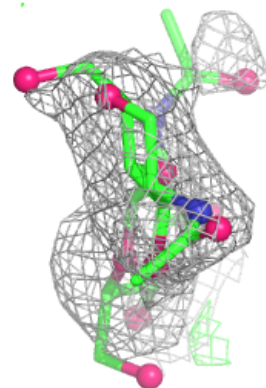
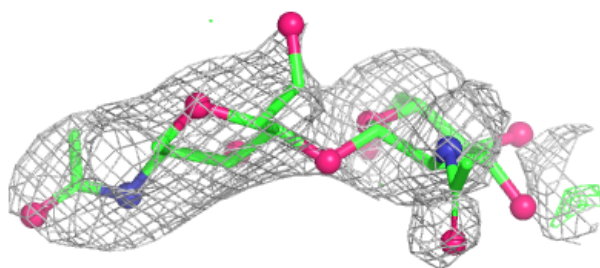
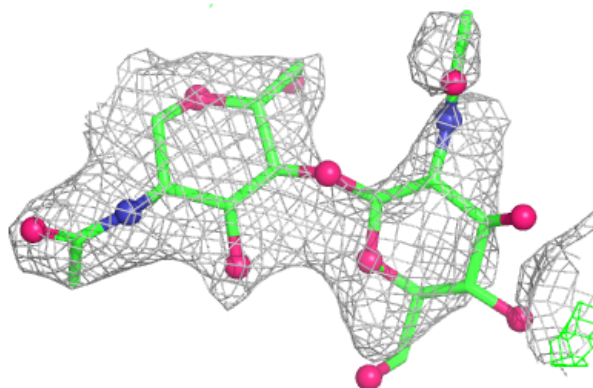
Electron density around Chain L:

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



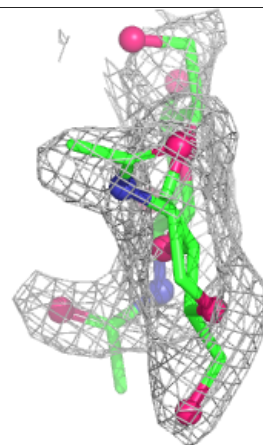
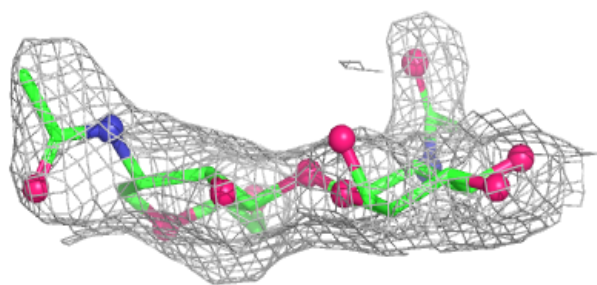
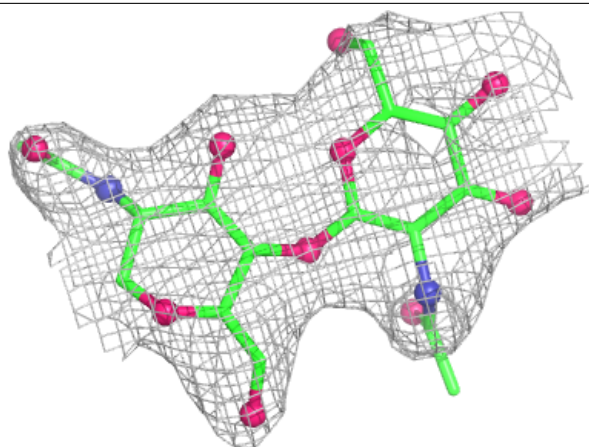
Electron density around Chain G:

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

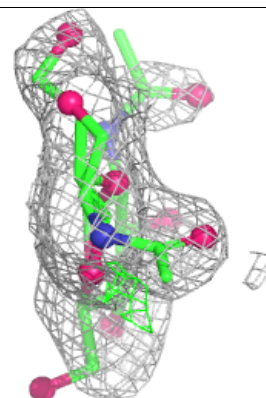
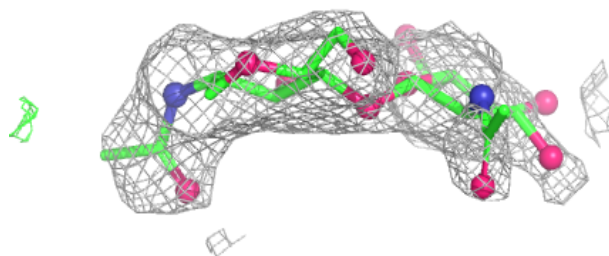
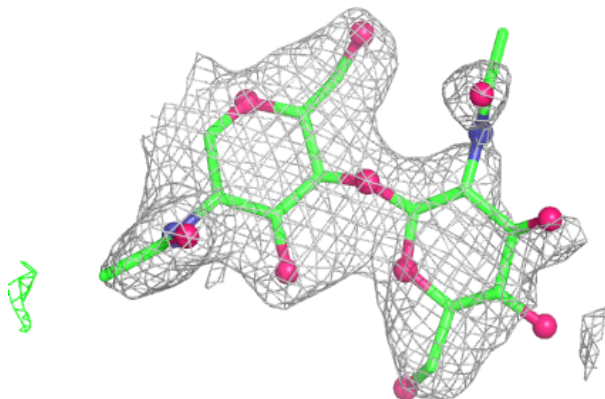


Electron density around Chain J:

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

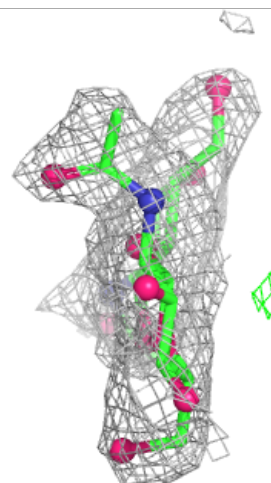
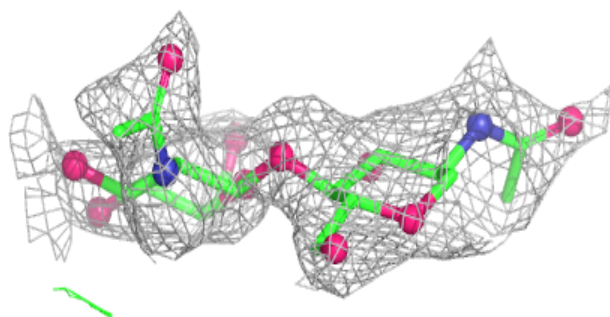
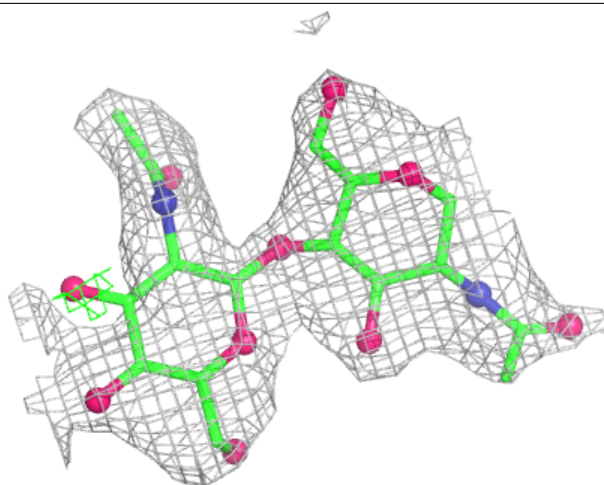
**Electron density around Chain M:**

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



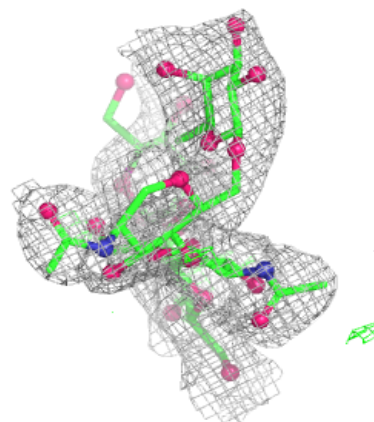
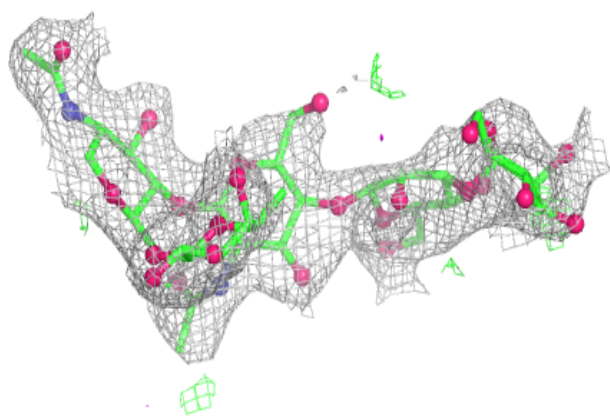
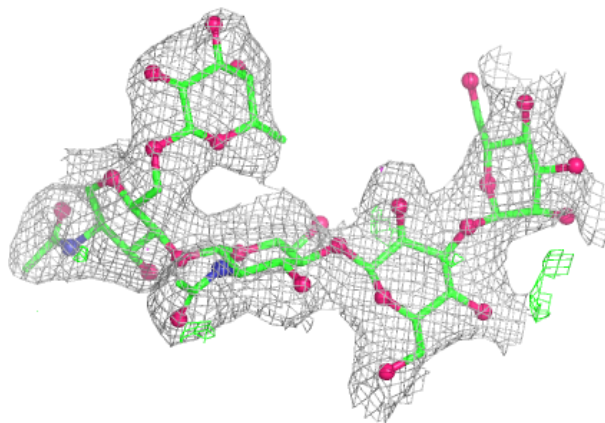
Electron density around Chain P:

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



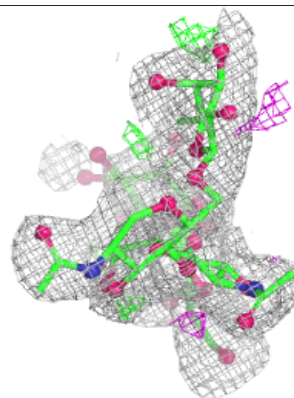
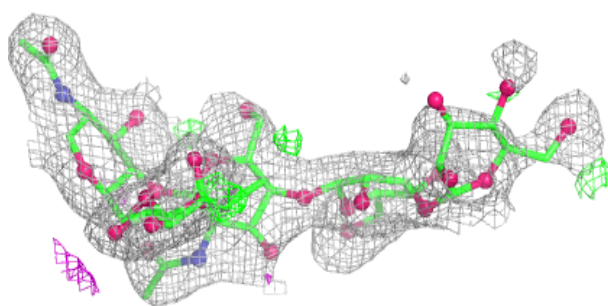
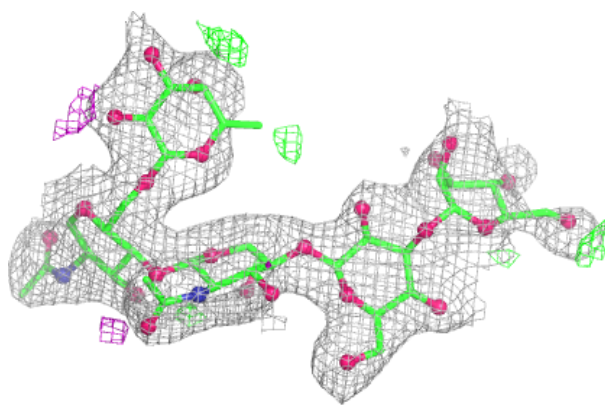
Electron density around Chain I:

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

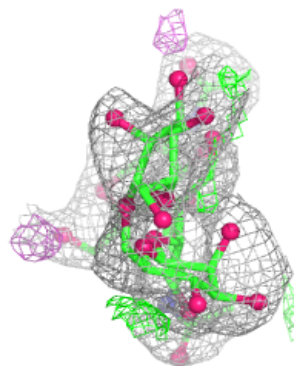
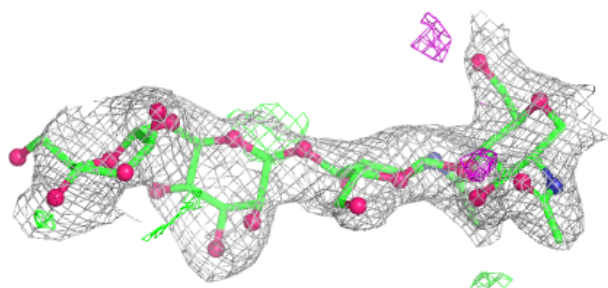
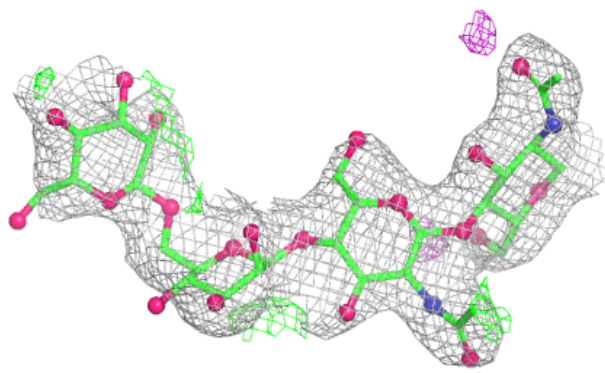


Electron density around Chain O:

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

**Electron density around Chain N:**

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



6.4 Ligands

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
7	NAG	A	1768	14/15	0.95	0.05	64,69,70,70	0
7	NAG	B	1770	14/15	0.95	0.04	60,65,66,66	0
7	NAG	D	1768	14/15	0.95	0.04	62,66,69,70	0
7	NAG	C	1768	14/15	0.96	0.04	61,66,66,68	0
7	NAG	B	1768	14/15	0.96	0.04	62,67,70,71	0
7	NAG	D	1774	14/15	0.96	0.05	83,86,87,87	0
7	NAG	D	1770	14/15	0.97	0.04	60,65,67,67	0
7	NAG	B	1773	14/15	0.97	0.04	77,78,78,79	0
8	CA	A	1773	1/1	0.99	0.01	40,40,40,40	0
8	CA	C	1773	1/1	0.99	0.02	42,42,42,42	0
10	CL	C	1775	1/1	0.99	0.05	24,24,24,24	1
10	CL	D	1780	1/1	0.99	0.03	21,21,21,21	1
8	CA	C	1771	1/1	1.00	0.02	28,28,28,28	0
8	CA	A	1771	1/1	1.00	0.03	29,29,29,29	0
8	CA	D	1776	1/1	1.00	0.02	25,25,25,25	0
8	CA	D	1778	1/1	1.00	0.02	29,29,29,29	0
9	CU	A	1772	1/1	1.00	0.01	33,33,33,33	0
9	CU	B	1776	1/1	1.00	0.01	35,35,35,35	0
9	CU	C	1772	1/1	1.00	0.02	36,36,36,36	0
9	CU	D	1777	1/1	1.00	0.01	35,35,35,35	0
10	CL	A	1774	1/1	1.00	0.01	19,19,19,19	0
10	CL	A	1775	1/1	1.00	0.03	24,24,24,24	1
10	CL	B	1778	1/1	1.00	0.02	18,18,18,18	0
10	CL	B	1779	1/1	1.00	0.02	18,18,18,18	1
10	CL	C	1774	1/1	1.00	0.01	15,15,15,15	0
8	CA	B	1775	1/1	1.00	0.03	27,27,27,27	0
10	CL	D	1779	1/1	1.00	0.01	16,16,16,16	0
8	CA	B	1777	1/1	1.00	0.01	31,31,31,31	0

6.5 Other polymers

There are no such residues in this entry.