



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 05:06 AM UTC

PDB ID : 5W6R / pdb_00005w6r
Title : Crystal structure of the A/Puerto Rico/8/1934 (H1N1) influenza virus hemagglutinin in complex with cyclic peptide CP141099 (P6)
Authors : Wilson, I.A.; Kadam, R.U.
Deposited on : 2017-06-16
Resolution : 2.73 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 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:

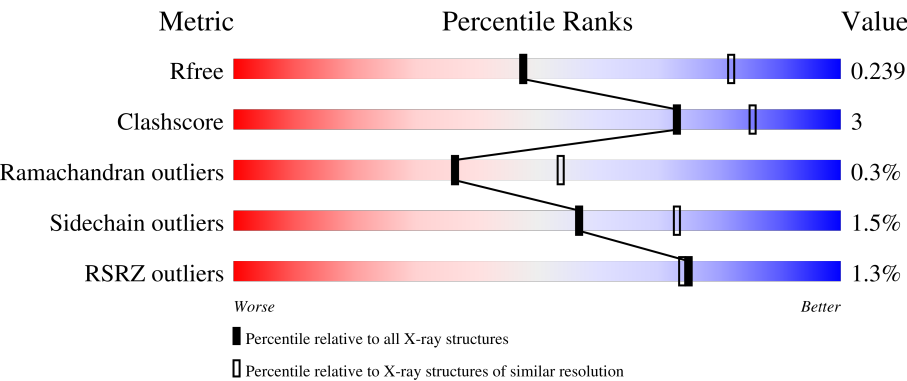
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.73 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	1819 (2.76-2.72)
Clashscore	190562	1866 (2.76-2.72)
Ramachandran outliers	187476	1830 (2.76-2.72)
Sidechain outliers	187428	1831 (2.76-2.72)
RSRZ outliers	180081	1819 (2.76-2.72)

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	326	% 90%8% .
1	C	326	% 88%10% ..
1	E	326	91%7% ..
1	G	326	% 87%11% ..
2	B	176	4% 90%7% .

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Mol	Chain	Length	Quality of chain
2	D	176	
2	F	176	
2	H	176	
3	M	12	
3	N	12	
3	O	12	
3	Q	12	
4	I	2	
4	J	2	
4	K	2	
4	L	2	
4	P	2	
4	R	2	
4	S	2	
4	T	2	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	NAG	C	405	X	-	-	-
5	NAG	G	405	X	-	-	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 16630 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 Hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	322	Total	C	N	O	S	0	0	0
			2542	1603	443	483	13			
1	C	322	Total	C	N	O	S	0	0	0
			2542	1603	443	483	13			
1	E	322	Total	C	N	O	S	0	0	0
			2542	1603	443	483	13			
1	G	322	Total	C	N	O	S	0	0	0
			2542	1603	443	483	13			

- Molecule 2 is a protein called Hemagglutinin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	171	Total	C	N	O	S	0	0	0
			1380	866	235	272	7			
2	D	171	Total	C	N	O	S	0	0	0
			1380	866	235	272	7			
2	F	171	Total	C	N	O	S	0	0	0
			1380	866	235	272	7			
2	H	171	Total	C	N	O	S	0	0	0
			1380	866	235	272	7			

- Molecule 3 is a protein called ACE-PH8-ORN-LEU-GLU-TYR-PHE-GLU-TRP-LEU-SER-9WV.

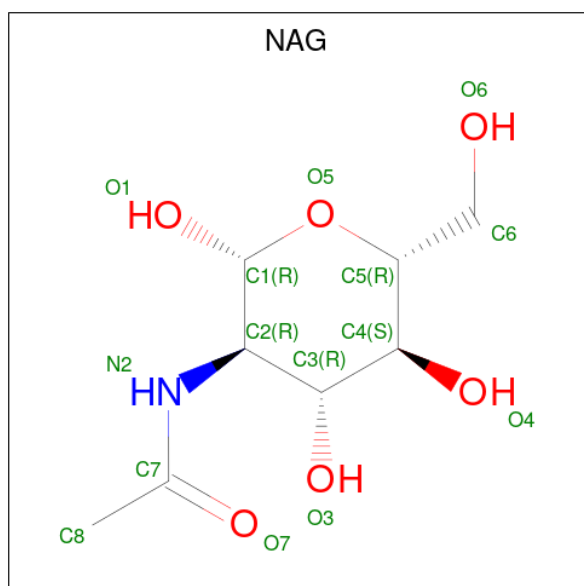
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	M	12	Total	C	N	O	0	0	0
			112	78	15	19			
3	O	12	Total	C	N	O	0	0	0
			112	78	15	19			
3	N	12	Total	C	N	O	0	0	0
			112	78	15	19			
3	Q	12	Total	C	N	O	0	0	0
			112	78	15	19			

- 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	I	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	K	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	L	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			
4	R	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	S	2	Total	C	N	O	0	0	0
			28	16	2	10			
4	T	2	Total	C	N	O	0	0	0
			28	16	2	10			

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



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

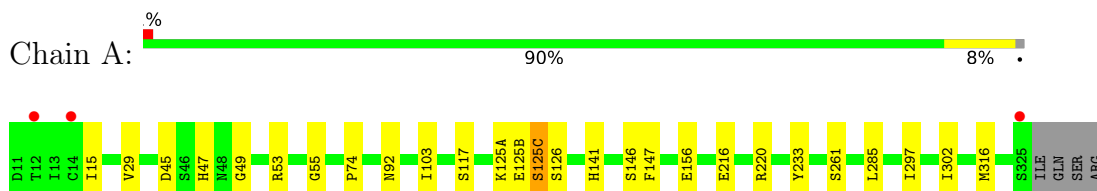
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	21	Total O 21 21	0	0
6	B	2	Total O 2 2	0	0
6	C	21	Total O 21 21	0	0
6	D	7	Total O 7 7	0	0
6	E	20	Total O 20 20	0	0
6	F	3	Total O 3 3	0	0
6	G	25	Total O 25 25	0	0
6	H	3	Total O 3 3	0	0

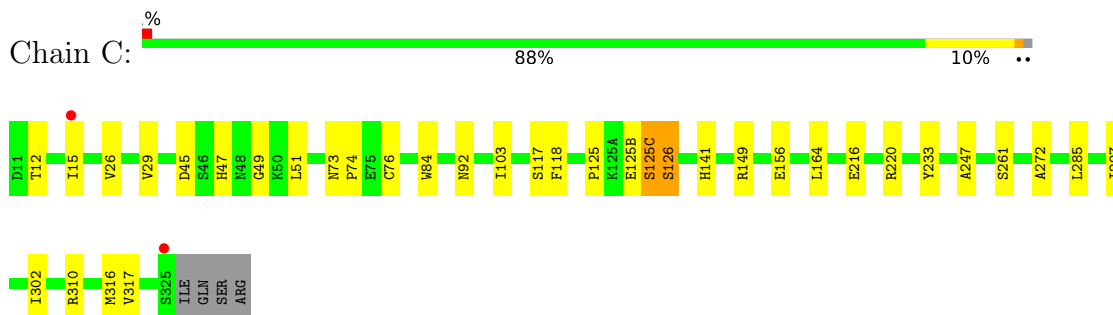
3 Residue-property plots [i](#)

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.

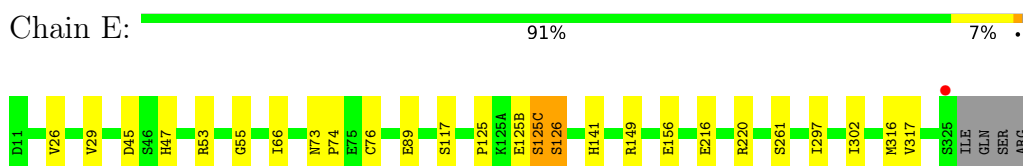
- Molecule 1: Hemagglutinin



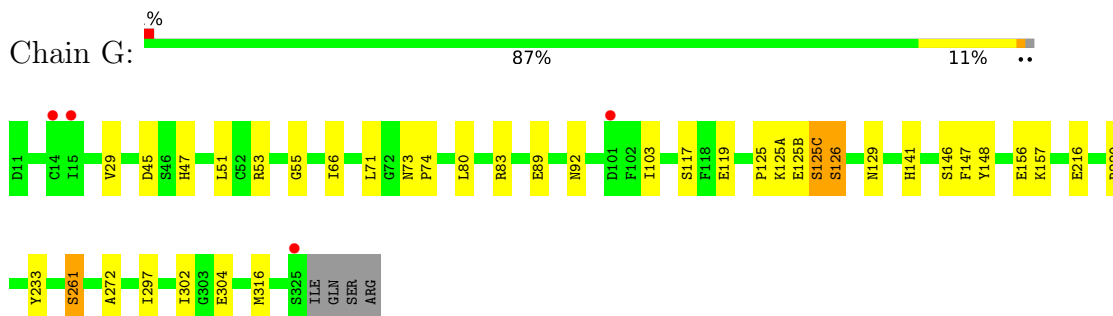
- Molecule 1: Hemagglutinin



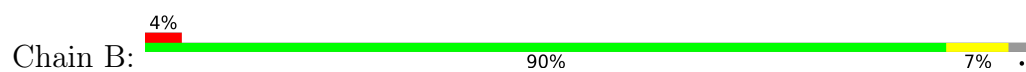
- Molecule 1: Hemagglutinin



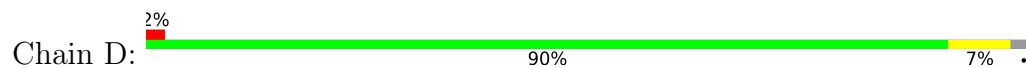
- Molecule 1: Hemagglutinin



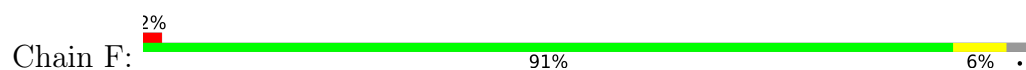
- Molecule 2: Hemagglutinin



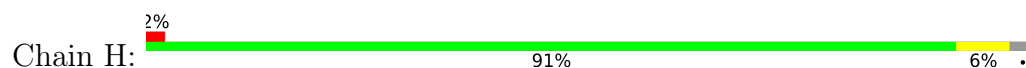
- Molecule 2: Hemagglutinin



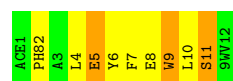
- Molecule 2: Hemagglutinin



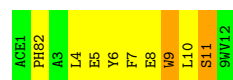
- Molecule 2: Hemagglutinin



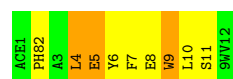
- Molecule 3: ACE-PH8-ORN-LEU-GLU-TYR-PHE-GLU-TRP-LEU-SER-9WV



- Molecule 3: ACE-PH8-ORN-LEU-GLU-TYR-PHE-GLU-TRP-LEU-SER-9WV

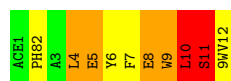


- Molecule 3: ACE-PH8-ORN-LEU-GLU-TYR-PHE-GLU-TRP-LEU-SER-9WV

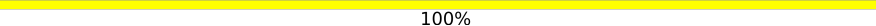


- Molecule 3: ACE-PH8-ORN-LEU-GLU-TYR-PHE-GLU-TRP-LEU-SER-9WV

Chain Q:  17% 33% 33% 17%



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

Chain I:  100%

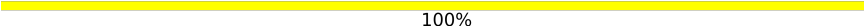


- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:  100%

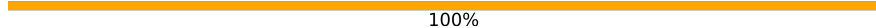


- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:  100%

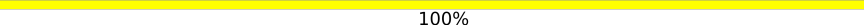


- Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain L:  100%



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

Chain P:  100%



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

Chain R:  100%

MAG1
MAG2

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

Chain S:  100%MAG1
MAG2

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

Chain T:  100%MAG1
MAG2

4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α , β , γ	234.46Å 234.46Å 144.56Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.34 – 2.73 44.34 – 2.73	Depositor EDS
% Data completeness (in resolution range)	96.8 (44.34-2.73) 96.7 (44.34-2.73)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.14 (at 2.73Å)	Xtriage
Refinement program	PHENIX 1.8.4_1496	Depositor
R, R_{free}	0.198 , 0.239 0.205 , 0.239	Depositor DCC
R_{free} test set	3816 reflections (4.85%)	wwPDB-VP
Wilson B-factor (Å ²)	73.9	Xtriage
Anisotropy	0.173	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 38.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.022 for $-1/3^*h+1/3^*k+4/3^*l, -k, 2/3^*h+1/3^*k+1/3^*l$ 0.024 for $-2/3^*h-1/3^*k-4/3^*l, -1/3^*h-2/3^*k+4/3^*l, -1/3^*h+1/3^*k+1/3^*l$ 0.022 for $-h, 1/3^*h-1/3^*k-4/3^*l, -1/3^*h-2/3^*k+1/3^*l$ 0.398 for $-1/3^*h-2/3^*k+4/3^*l, -2/3^*h-1/3^*k-4/3^*l, 1/3^*h-1/3^*k-1/3^*l$ 0.368 for $-h, 2/3^*h+1/3^*k+4/3^*l, 1/3^*h+2/3^*k-1/3^*l$ 0.379 for $1/3^*h+2/3^*k-4/3^*l, -k, -2/3^*h-1/3^*k-1/3^*l$ 0.026 for $h, -h-k, -l$	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	16630	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.76% of the height of the origin peak. No significant pseudotranslation is detected.*

¹ Intensities estimated from amplitudes.

² Theoretical 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, 9WV, ORN, PH8, ACE

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	0.33	0/2606	0.72	0/3544
1	C	0.34	0/2606	0.74	0/3544
1	E	0.34	0/2606	0.73	0/3544
1	G	0.34	0/2606	0.73	0/3544
2	B	0.34	0/1407	0.69	1/1891 (0.1%)
2	D	0.34	0/1407	0.71	1/1891 (0.1%)
2	F	0.35	0/1407	0.69	1/1891 (0.1%)
2	H	0.32	0/1407	0.69	1/1891 (0.1%)
3	M	3.59	13/80 (16.2%)	1.47	1/108 (0.9%)
3	N	3.58	12/80 (15.0%)	1.53	1/108 (0.9%)
3	O	3.61	15/80 (18.8%)	1.51	1/108 (0.9%)
3	Q	3.65	12/80 (15.0%)	1.48	1/108 (0.9%)
All	All	0.61	52/16372 (0.3%)	0.74	8/22172 (0.0%)

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
3	M	0	1
3	O	0	1
3	Q	0	1
All	All	0	3

All (52) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	N	8	GLU	CA-C	-11.43	1.39	1.52
3	M	5	GLU	CA-C	-11.42	1.39	1.53
3	Q	5	GLU	CA-C	-11.27	1.39	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	O	5	GLU	CA-C	-11.17	1.39	1.53
3	Q	10	LEU	CA-C	-11.12	1.37	1.53
3	N	5	GLU	CA-C	-10.74	1.40	1.53
3	Q	8	GLU	CA-C	-10.28	1.39	1.52
3	Q	9	TRP	CA-C	-10.24	1.39	1.52
3	M	7	PHE	CA-C	-10.23	1.40	1.52
3	O	8	GLU	CA-C	-10.00	1.39	1.52
3	Q	7	PHE	CA-C	-9.98	1.39	1.52
3	O	10	LEU	CA-C	-9.93	1.40	1.52
3	M	6	TYR	CA-C	-9.87	1.39	1.52
3	Q	6	TYR	CA-C	-9.84	1.39	1.52
3	O	6	TYR	CA-C	-9.70	1.39	1.52
3	N	7	PHE	CA-C	-9.60	1.40	1.52
3	M	10	LEU	CA-C	-9.59	1.40	1.52
3	N	6	TYR	CA-C	-9.52	1.39	1.52
3	O	7	PHE	CA-C	-9.51	1.40	1.52
3	N	9	TRP	CA-C	-9.48	1.39	1.52
3	M	8	GLU	CA-C	-9.43	1.39	1.52
3	O	9	TRP	CA-C	-9.23	1.40	1.52
3	N	10	LEU	CA-C	-9.16	1.40	1.52
3	M	9	TRP	CA-C	-9.01	1.40	1.52
3	Q	11	SER	CA-C	-6.76	1.38	1.52
3	O	11	SER	CA-C	-6.60	1.39	1.52
3	M	11	SER	CA-C	-6.53	1.39	1.52
3	N	11	SER	CA-C	-6.53	1.39	1.52
3	Q	4	LEU	CA-C	-6.47	1.39	1.52
3	M	4	LEU	CA-C	-6.38	1.39	1.52
3	O	4	LEU	CA-C	-6.28	1.39	1.52
3	N	4	LEU	CA-C	-6.18	1.40	1.52
3	O	9	TRP	C-N	6.15	1.42	1.33
3	N	9	TRP	CG-CD2	-6.04	1.32	1.43
3	O	9	TRP	CG-CD2	-5.96	1.33	1.43
3	M	9	TRP	CG-CD2	-5.95	1.33	1.43
3	Q	9	TRP	CG-CD2	-5.79	1.33	1.43
3	N	9	TRP	C-N	5.68	1.41	1.33
3	M	9	TRP	C-N	5.53	1.41	1.33
3	N	6	TYR	CB-CG	-5.40	1.39	1.51
3	M	10	LEU	C-N	5.34	1.40	1.33
3	O	6	TYR	CB-CG	-5.28	1.40	1.51
3	Q	4	LEU	C-N	5.28	1.40	1.33
3	Q	6	TYR	CB-CG	-5.27	1.40	1.51
3	O	4	LEU	C-N	5.24	1.40	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	M	6	TYR	CB-CG	-5.23	1.40	1.51
3	M	4	LEU	C-N	5.19	1.40	1.33
3	N	10	LEU	C-N	5.12	1.40	1.33
3	O	8	GLU	C-N	5.07	1.40	1.33
3	O	10	LEU	C-N	5.06	1.40	1.33
3	Q	7	PHE	C-N	5.04	1.40	1.33
3	O	7	PHE	C-N	5.03	1.40	1.33

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	Q	7	PHE	CA-CB-CG	-6.30	107.50	113.80
3	O	7	PHE	CA-CB-CG	-6.25	107.56	113.80
2	F	127	LYS	CB-CA-C	-5.70	110.02	116.63
2	B	127	LYS	CB-CA-C	-5.53	110.22	116.63
2	H	127	LYS	CB-CA-C	-5.22	110.57	116.63
3	N	7	PHE	CA-CB-CG	-5.19	108.61	113.80
2	D	127	LYS	CB-CA-C	-5.18	110.62	116.63
3	M	7	PHE	CA-CB-CG	-5.05	108.75	113.80

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	M	11	SER	Peptide
3	O	11	SER	Peptide
3	Q	11	SER	Peptide

5.2 Too-close contacts

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	2542	0	2470	16	0
1	C	2542	0	2469	23	0
1	E	2542	0	2470	14	0
1	G	2542	0	2469	21	0
2	B	1380	0	1309	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1380	0	1309	9	0
2	F	1380	0	1309	7	0
2	H	1380	0	1309	7	0
3	M	112	0	89	1	0
3	N	112	0	89	2	0
3	O	112	0	90	1	0
3	Q	112	0	89	3	0
4	I	28	0	25	0	0
4	J	28	0	25	1	0
4	K	28	0	25	0	0
4	L	28	0	25	1	0
4	P	28	0	25	0	0
4	R	28	0	25	1	0
4	S	28	0	25	0	0
4	T	28	0	25	1	0
5	A	42	0	39	0	0
5	C	42	0	39	0	0
5	E	42	0	39	0	0
5	G	42	0	39	0	0
6	A	21	0	0	0	0
6	B	2	0	0	0	0
6	C	21	0	0	0	0
6	D	7	0	0	0	0
6	E	20	0	0	0	0
6	F	3	0	0	0	0
6	G	25	0	0	1	0
6	H	3	0	0	0	0
All	All	16630	0	15827	103	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 3.

All (103) 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)
2:D:50:ASN:O	2:D:54:THR:HG23	1.63	0.97
1:A:117:SER:HB3	1:A:261:SER:OG	1.66	0.96
2:H:50:ASN:O	2:H:54:THR:HG23	1.67	0.93
1:C:117:SER:HB3	1:C:261:SER:OG	1.68	0.93
1:G:117:SER:HB3	1:G:261:SER:OG	1.77	0.83
1:E:117:SER:HB3	1:E:261:SER:OG	1.85	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:216:GLU:O	1:A:220:ARG:NH2	2.25	0.70
1:C:125(B):GLU:O	1:C:125(C):SER:HB3	1.91	0.70
1:G:125(B):GLU:O	1:G:125(C):SER:HB3	1.93	0.69
1:A:117:SER:HB3	1:A:261:SER:HG	1.58	0.68
1:C:125:PRO:O	1:C:126:SER:OG	2.11	0.67
1:C:117:SER:HB3	1:C:261:SER:HG	1.59	0.66
1:A:117:SER:CB	1:A:261:SER:OG	2.45	0.63
1:C:216:GLU:O	1:C:220:ARG:NH2	2.33	0.62
3:Q:9:TRP:CD1	3:Q:9:TRP:H	2.16	0.62
1:E:316:MET:HE1	2:F:55:VAL:HG21	1.83	0.60
4:T:1:NAG:O3	4:T:2:NAG:O5	2.19	0.60
4:R:1:NAG:O3	4:R:2:NAG:O5	2.19	0.59
1:C:117:SER:CB	1:C:261:SER:OG	2.48	0.59
1:G:316:MET:HE1	2:H:55:VAL:HG21	1.84	0.58
1:A:316:MET:HE1	2:B:55:VAL:HG21	1.85	0.58
4:L:1:NAG:O3	4:L:2:NAG:O5	2.19	0.57
4:J:1:NAG:O3	4:J:2:NAG:O5	2.19	0.57
3:Q:11:SER:O	3:Q:12:9WV:NDV	2.38	0.57
1:E:125:PRO:O	1:E:126:SER:OG	2.22	0.56
1:E:216:GLU:O	1:E:220:ARG:NH2	2.39	0.55
1:A:47:HIS:HB3	1:A:297:ILE:HD13	1.87	0.55
1:G:117:SER:CB	1:G:261:SER:OG	2.53	0.55
3:N:9:TRP:CD1	3:N:9:TRP:H	2.24	0.55
1:C:316:MET:HE1	2:D:55:VAL:HG21	1.87	0.54
1:A:53:ARG:NH1	1:A:55:GLY:O	2.42	0.53
1:C:47:HIS:HB3	1:C:297:ILE:HD13	1.90	0.52
1:G:216:GLU:O	1:G:220:ARG:NH2	2.42	0.52
2:F:2:LEU:O	2:H:113:SER:OG	2.28	0.51
1:G:125:PRO:O	1:G:126:SER:OG	2.26	0.51
3:M:9:TRP:CD1	3:M:9:TRP:H	2.29	0.49
1:E:47:HIS:HB3	1:E:297:ILE:HD13	1.95	0.48
2:F:76:ARG:HB2	6:G:507:HOH:O	2.12	0.48
1:G:47:HIS:HB3	1:G:297:ILE:HD13	1.95	0.48
1:G:51:LEU:HG	1:G:272:ALA:HB3	1.96	0.47
2:B:3:PHE:CE2	2:B:113:SER:HB2	2.49	0.47
1:G:74:PRO:HB2	1:G:141:HIS:HB2	1.95	0.47
1:E:66:ILE:HG12	1:E:89:GLU:OE1	2.15	0.47
1:A:53:ARG:NH2	1:G:119:GLU:OE1	2.39	0.46
2:B:132:GLU:HG2	2:B:138:PHE:CE1	2.50	0.46
1:C:45:ASP:N	1:C:45:ASP:OD1	2.49	0.46
1:C:125(B):GLU:OE1	1:C:125(B):GLU:HA	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:76:CYS:O	1:E:149:ARG:NH2	2.38	0.46
1:E:117:SER:HB3	1:E:261:SER:HG	1.80	0.46
1:E:45:ASP:N	1:E:45:ASP:OD1	2.49	0.46
1:A:15:ILE:HD11	2:B:122:VAL:HG21	1.98	0.45
1:G:146:SER:OG	1:G:147:PHE:N	2.47	0.45
1:G:103:ILE:HG13	1:G:233:TYR:CE2	2.51	0.45
1:C:103:ILE:HG13	1:C:233:TYR:CE2	2.51	0.45
1:C:310:ARG:NH1	2:D:90:ASP:OD1	2.38	0.45
1:G:45:ASP:OD1	1:G:45:ASP:N	2.49	0.45
1:G:80:LEU:HB2	1:G:83:ARG:HD3	1.98	0.45
1:C:51:LEU:HG	1:C:272:ALA:HB3	1.98	0.45
1:E:73:ASN:HA	1:E:74:PRO:HD3	1.81	0.45
1:A:45:ASP:N	1:A:45:ASP:OD1	2.50	0.45
2:H:159:TYR:HB3	2:H:160:PRO:HD3	1.99	0.45
3:O:9:TRP:H	3:O:9:TRP:CD1	2.33	0.45
1:G:92:ASN:OD1	1:G:92:ASN:N	2.49	0.44
2:B:159:TYR:HB3	2:B:160:PRO:HD3	1.99	0.44
2:H:3:PHE:CE2	2:H:113:SER:HB2	2.52	0.44
1:G:73:ASN:HA	1:G:74:PRO:HD3	1.82	0.44
1:C:15:ILE:HD11	2:D:122:VAL:HG21	2.00	0.43
2:F:3:PHE:CE2	2:F:113:SER:HB2	2.52	0.43
2:D:159:TYR:HB3	2:D:160:PRO:HD3	1.98	0.43
2:F:159:TYR:HB3	2:F:160:PRO:HD3	2.01	0.43
1:A:49:GLY:HA2	1:A:285:LEU:O	2.19	0.43
1:E:53:ARG:NH1	1:E:55:GLY:O	2.52	0.43
2:D:3:PHE:CE2	2:D:113:SER:HB2	2.53	0.43
1:E:26:VAL:HG21	1:E:317:VAL:HB	2.01	0.43
1:G:53:ARG:NH1	1:G:55:GLY:O	2.52	0.43
2:F:58:LYS:HD3	2:F:58:LYS:HA	1.84	0.43
1:E:74:PRO:HB2	1:E:141:HIS:HB2	2.01	0.43
1:C:12:THR:HG22	2:D:139:GLU:HA	2.01	0.42
1:C:74:PRO:HB2	1:C:141:HIS:HB2	2.01	0.42
2:D:158:ASP:OD1	2:D:160:PRO:HD2	2.18	0.42
2:D:113:SER:OG	2:H:2:LEU:O	2.37	0.42
1:A:146:SER:OG	1:A:147:PHE:N	2.48	0.42
2:B:132:GLU:HG2	2:B:138:PHE:HE1	1.83	0.42
1:G:304:GLU:HB3	2:H:61:ILE:HG21	2.02	0.42
1:A:74:PRO:HB2	1:A:141:HIS:HB2	2.01	0.42
1:C:26:VAL:HG21	1:C:317:VAL:HB	2.02	0.41
1:A:103:ILE:HG13	1:A:233:TYR:CE2	2.54	0.41
1:C:49:GLY:HA2	1:C:285:LEU:O	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:76:CYS:O	1:C:149:ARG:NH2	2.40	0.41
1:G:129:ASN:HA	1:G:157:LYS:HD3	2.02	0.41
2:B:149:MET:O	2:B:153:ARG:HG3	2.20	0.41
1:C:84:TRP:CZ3	1:C:118:PHE:HD2	2.39	0.41
1:C:92:ASN:OD1	1:C:92:ASN:N	2.48	0.41
1:G:71:LEU:O	1:G:148:TYR:HB3	2.21	0.41
3:N:4:LEU:HD23	3:N:4:LEU:HA	1.74	0.41
2:F:158:ASP:OD1	2:F:160:PRO:HD2	2.20	0.40
1:G:66:ILE:HG12	1:G:89:GLU:OE1	2.21	0.40
1:A:92:ASN:OD1	1:A:92:ASN:N	2.48	0.40
1:C:73:ASN:HA	1:C:74:PRO:HD3	1.83	0.40
3:Q:8:GLU:C	3:Q:10:LEU:H	2.29	0.40
1:A:125(B):GLU:O	1:A:125(C):SER:CB	2.69	0.40
1:C:164:LEU:HG	1:C:247:ALA:O	2.21	0.40
1:E:125(B):GLU:O	1:E:125(C):SER:CB	2.69	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	320/326 (98%)	308 (96%)	10 (3%)	2 (1%)	21	36
1	C	320/326 (98%)	308 (96%)	11 (3%)	1 (0%)	36	54
1	E	320/326 (98%)	307 (96%)	12 (4%)	1 (0%)	36	54
1	G	320/326 (98%)	308 (96%)	10 (3%)	2 (1%)	21	36
2	B	169/176 (96%)	164 (97%)	5 (3%)	0	100	100
2	D	169/176 (96%)	164 (97%)	5 (3%)	0	100	100
2	F	169/176 (96%)	164 (97%)	5 (3%)	0	100	100
2	H	169/176 (96%)	164 (97%)	5 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	M	8/12 (67%)	6 (75%)	2 (25%)	0	100	100
3	N	8/12 (67%)	5 (62%)	3 (38%)	0	100	100
3	O	8/12 (67%)	4 (50%)	4 (50%)	0	100	100
3	Q	8/12 (67%)	4 (50%)	4 (50%)	0	100	100
All	All	1988/2056 (97%)	1906 (96%)	76 (4%)	6 (0%)	36	54

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	125(A)	LYS
1	A	125(C)	SER
1	C	125(C)	SER
1	E	125(C)	SER
1	G	125(C)	SER
1	G	125(A)	LYS

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	285/289 (99%)	281 (99%)	4 (1%)	59	74
1	C	285/289 (99%)	281 (99%)	4 (1%)	59	74
1	E	285/289 (99%)	281 (99%)	4 (1%)	59	74
1	G	285/289 (99%)	280 (98%)	5 (2%)	51	69
2	B	147/151 (97%)	146 (99%)	1 (1%)	76	85
2	D	147/151 (97%)	146 (99%)	1 (1%)	76	85
2	F	147/151 (97%)	146 (99%)	1 (1%)	76	85
2	H	147/151 (97%)	146 (99%)	1 (1%)	76	85
3	M	8/8 (100%)	7 (88%)	1 (12%)	4	7
3	N	8/8 (100%)	7 (88%)	1 (12%)	4	7
3	O	8/8 (100%)	8 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	Q	8/8 (100%)	5 (62%)	3 (38%)	0	0
All	All	1760/1792 (98%)	1734 (98%)	26 (2%)	57	73

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	VAL
1	A	126	SER
1	A	156	GLU
1	A	302	ILE
2	B	98	LEU
1	C	29	VAL
1	C	126	SER
1	C	156	GLU
1	C	302	ILE
2	D	98	LEU
1	E	29	VAL
1	E	126	SER
1	E	156	GLU
1	E	302	ILE
2	F	98	LEU
1	G	29	VAL
1	G	126	SER
1	G	156	GLU
1	G	261	SER
1	G	302	ILE
2	H	98	LEU
3	M	5	GLU
3	N	5	GLU
3	Q	4	LEU
3	Q	5	GLU
3	Q	10	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	275	HIS
1	C	95	ASN
1	C	275	HIS
2	D	25	HIS
1	E	95	ASN

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Mol	Chain	Res	Type
1	E	275	HIS
2	H	25	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

12 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
3	PH8	Q	2	3	12,13,14	1.31	1 (8%)	10,15,17	0.73	0
3	PH8	N	2	3	12,13,14	1.34	1 (8%)	10,15,17	0.78	0
3	9WV	Q	12	3	9,10,11	0.58	0	8,11,13	0.99	0
3	9WV	N	12	3	9,10,11	0.66	0	8,11,13	0.79	0
3	ORN	N	3	3	6,7,8	0.61	0	2,7,9	0.74	0
3	PH8	O	2	3	12,13,14	1.31	1 (8%)	10,15,17	0.76	0
3	ORN	Q	3	3	6,7,8	0.47	0	2,7,9	0.42	0
3	9WV	M	12	3	9,10,11	0.63	0	8,11,13	0.95	0
3	ORN	M	3	3	6,7,8	0.43	0	2,7,9	0.48	0
3	9WV	O	12	3	9,10,11	0.65	0	8,11,13	0.74	0
3	PH8	M	2	3	12,13,14	1.29	1 (8%)	10,15,17	0.68	0
3	ORN	O	3	3	6,7,8	0.54	0	2,7,9	0.63	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
3	PH8	Q	2	3	-	3/7/8/10	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PH8	N	2	3	-	2/7/8/10	0/1/1/1
3	9WV	Q	12	3	-	4/10/11/13	-
3	9WV	N	12	3	-	4/10/11/13	-
3	ORN	N	3	3	-	0/5/6/8	-
3	PH8	O	2	3	-	1/7/8/10	0/1/1/1
3	ORN	Q	3	3	-	1/5/6/8	-
3	9WV	M	12	3	-	3/10/11/13	-
3	ORN	M	3	3	-	1/5/6/8	-
3	9WV	O	12	3	-	2/10/11/13	-
3	PH8	M	2	3	-	1/7/8/10	0/1/1/1
3	ORN	O	3	3	-	1/5/6/8	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	N	2	PH8	CJ-CG	-4.42	1.39	1.51
3	Q	2	PH8	CJ-CG	-4.32	1.39	1.51
3	O	2	PH8	CJ-CG	-4.30	1.39	1.51
3	M	2	PH8	CJ-CG	-4.25	1.39	1.51

There are no bond angle outliers.

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	N	2	PH8	O-C-CA-CB
3	M	3	ORN	O-C-CA-CB
3	M	12	9WV	CEG-CEH-CEI-NEJ
3	N	12	9WV	O-C-CA-CB
3	Q	12	9WV	O-C-CA-CB
3	M	12	9WV	CEH-CEG-NDV-CA
3	O	12	9WV	CEH-CEG-NDV-CA
3	N	12	9WV	CEH-CEG-NDV-CA
3	Q	12	9WV	CEH-CEG-NDV-CA
3	M	12	9WV	OEK-CEG-NDV-CA
3	O	12	9WV	OEK-CEG-NDV-CA
3	N	12	9WV	OEK-CEG-NDV-CA
3	Q	12	9WV	OEK-CEG-NDV-CA
3	N	2	PH8	CB-CI-CJ-CG
3	Q	2	PH8	CA-CB-CI-CJ

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Mol	Chain	Res	Type	Atoms
3	Q	2	PH8	CB-CI-CJ-CG
3	O	2	PH8	CA-CB-CI-CJ
3	M	2	PH8	CA-CB-CI-CJ
3	N	12	9WV	CEG-CEH-CEI-NEJ
3	Q	12	9WV	CEG-CEH-CEI-NEJ
3	O	3	ORN	CA-CB-CG-CD
3	Q	3	ORN	NE-CD-CG-CB
3	Q	2	PH8	N-CA-CB-CI

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	Q	12	9WV	1	0

5.5 Carbohydrates [i](#)

16 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
4	NAG	I	1	4,1	14,14,15	0.58	0	17,19,21	1.10	1 (5%)
4	NAG	I	2	4	14,14,15	1.19	2 (14%)	17,19,21	1.50	2 (11%)
4	NAG	J	1	4,2	14,14,15	0.64	0	17,19,21	1.57	3 (17%)
4	NAG	J	2	4	14,14,15	0.59	0	17,19,21	1.83	4 (23%)
4	NAG	K	1	4,1	14,14,15	0.57	0	17,19,21	1.11	1 (5%)
4	NAG	K	2	4	14,14,15	1.19	2 (14%)	17,19,21	1.50	2 (11%)
4	NAG	L	1	4,2	14,14,15	0.64	0	17,19,21	1.57	3 (17%)
4	NAG	L	2	4	14,14,15	0.59	0	17,19,21	1.84	4 (23%)
4	NAG	P	1	4,1	14,14,15	0.58	0	17,19,21	1.10	1 (5%)
4	NAG	P	2	4	14,14,15	1.19	2 (14%)	17,19,21	1.48	2 (11%)
4	NAG	R	1	4,2	14,14,15	0.64	0	17,19,21	1.56	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	R	2	4	14,14,15	0.57	0	17,19,21	1.83	4 (23%)
4	NAG	S	1	4,1	14,14,15	0.58	0	17,19,21	1.12	1 (5%)
4	NAG	S	2	4	14,14,15	1.19	2 (14%)	17,19,21	1.49	2 (11%)
4	NAG	T	1	4,2	14,14,15	0.65	0	17,19,21	1.56	3 (17%)
4	NAG	T	2	4	14,14,15	0.60	0	17,19,21	1.83	4 (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
4	NAG	I	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1
4	NAG	J	1	4,2	-	1/6/23/26	0/1/1/1
4	NAG	J	2	4	-	4/6/23/26	0/1/1/1
4	NAG	K	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	K	2	4	-	0/6/23/26	0/1/1/1
4	NAG	L	1	4,2	-	1/6/23/26	0/1/1/1
4	NAG	L	2	4	-	4/6/23/26	0/1/1/1
4	NAG	P	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	P	2	4	-	0/6/23/26	0/1/1/1
4	NAG	R	1	4,2	-	1/6/23/26	0/1/1/1
4	NAG	R	2	4	-	4/6/23/26	0/1/1/1
4	NAG	S	1	4,1	-	0/6/23/26	0/1/1/1
4	NAG	S	2	4	-	0/6/23/26	0/1/1/1
4	NAG	T	1	4,2	-	1/6/23/26	0/1/1/1
4	NAG	T	2	4	-	4/6/23/26	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	S	2	NAG	C2-N2	-2.24	1.42	1.46
4	P	2	NAG	C2-N2	-2.24	1.42	1.46
4	K	2	NAG	C2-N2	-2.21	1.42	1.46
4	I	2	NAG	C2-N2	-2.21	1.42	1.46
4	S	2	NAG	O5-C1	-2.20	1.40	1.43
4	I	2	NAG	O5-C1	-2.20	1.40	1.43
4	P	2	NAG	O5-C1	-2.17	1.40	1.43
4	K	2	NAG	O5-C1	-2.15	1.40	1.43

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	L	2	NAG	C2-N2-C7	-5.04	116.14	122.90
4	R	2	NAG	C2-N2-C7	-5.02	116.17	122.90
4	J	2	NAG	C2-N2-C7	-5.02	116.18	122.90
4	T	2	NAG	C2-N2-C7	-4.99	116.21	122.90
4	L	1	NAG	C6-C5-C4	-4.58	101.78	113.02
4	J	1	NAG	C6-C5-C4	-4.56	101.83	113.02
4	T	1	NAG	C6-C5-C4	-4.55	101.84	113.02
4	R	1	NAG	C6-C5-C4	-4.54	101.86	113.02
4	I	2	NAG	O5-C1-C2	-4.04	105.04	111.29
4	K	2	NAG	O5-C1-C2	-4.04	105.04	111.29
4	S	2	NAG	O5-C1-C2	-4.03	105.06	111.29
4	P	2	NAG	O5-C1-C2	-4.02	105.07	111.29
4	T	2	NAG	C4-C3-C2	-3.09	106.49	111.02
4	J	2	NAG	C4-C3-C2	-3.08	106.50	111.02
4	R	2	NAG	C4-C3-C2	-3.06	106.53	111.02
4	L	2	NAG	C4-C3-C2	-3.05	106.54	111.02
4	R	2	NAG	O5-C5-C6	2.62	112.76	107.66
4	T	2	NAG	O5-C5-C6	2.62	112.75	107.66
4	J	2	NAG	O5-C5-C6	2.61	112.75	107.66
4	L	2	NAG	O5-C5-C6	2.59	112.71	107.66
4	L	2	NAG	C3-C4-C5	-2.50	105.70	110.23
4	R	2	NAG	C3-C4-C5	-2.49	105.72	110.23
4	J	2	NAG	C3-C4-C5	-2.48	105.73	110.23
4	T	2	NAG	C3-C4-C5	-2.47	105.76	110.23
4	R	1	NAG	O5-C5-C4	-2.40	104.98	110.83
4	L	1	NAG	O5-C5-C4	-2.40	104.98	110.83
4	J	1	NAG	O5-C5-C4	-2.39	105.01	110.83
4	T	1	NAG	O5-C5-C4	-2.37	105.05	110.83
4	S	1	NAG	C2-N2-C7	-2.18	119.98	122.90
4	I	2	NAG	C1-O5-C5	2.16	115.08	112.19
4	K	2	NAG	C1-O5-C5	2.15	115.07	112.19
4	P	2	NAG	C1-O5-C5	2.14	115.05	112.19
4	K	1	NAG	C2-N2-C7	-2.14	120.04	122.90
4	I	1	NAG	C2-N2-C7	-2.12	120.05	122.90
4	P	1	NAG	C2-N2-C7	-2.12	120.06	122.90
4	S	2	NAG	C1-O5-C5	2.10	115.00	112.19
4	J	1	NAG	O5-C1-C2	-2.04	108.14	111.29
4	L	1	NAG	O5-C1-C2	-2.03	108.15	111.29
4	T	1	NAG	O5-C1-C2	-2.02	108.17	111.29
4	R	1	NAG	O5-C1-C2	-2.00	108.19	111.29

There are no chirality outliers.

All (20) torsion outliers are listed below:

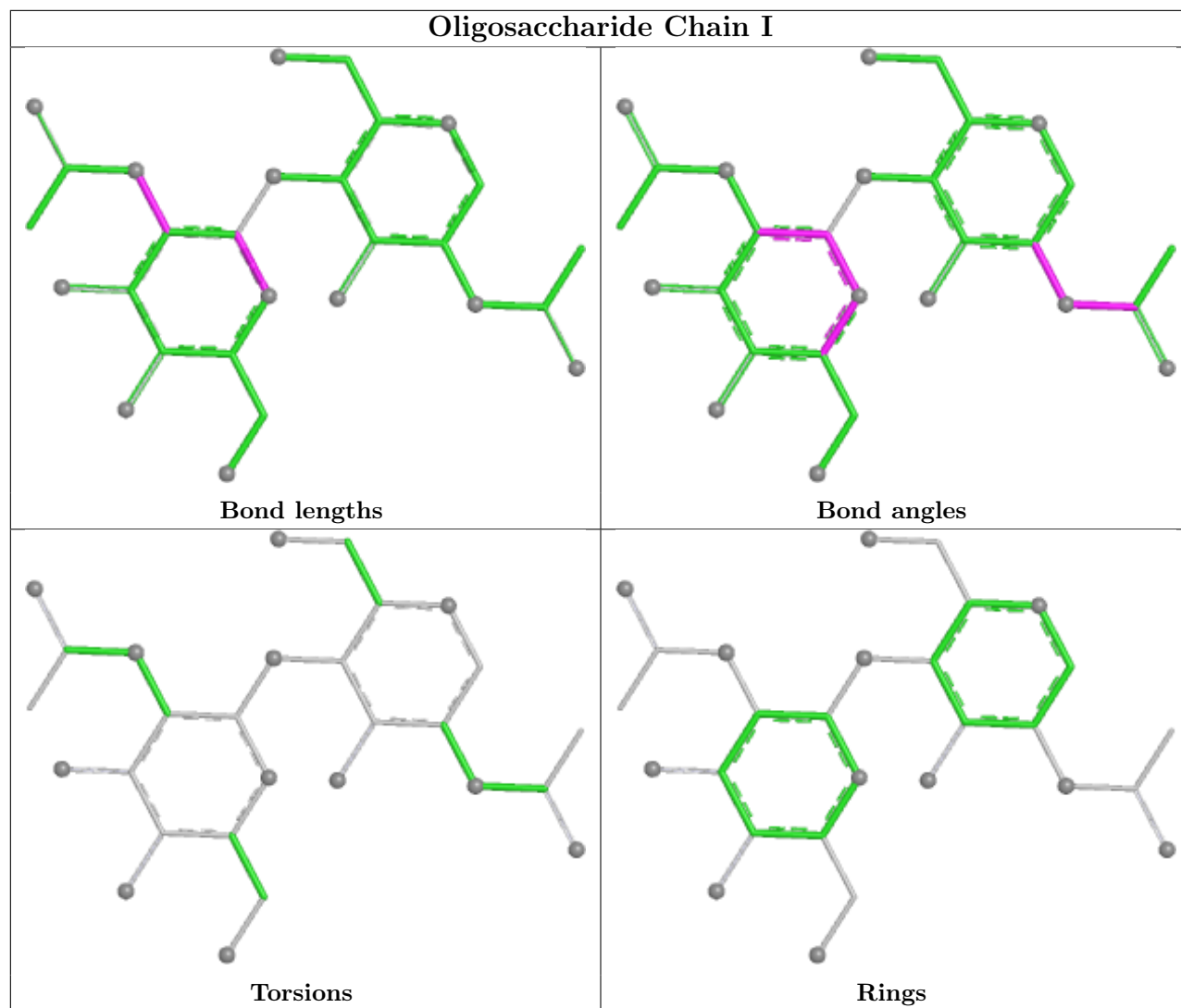
Mol	Chain	Res	Type	Atoms
4	J	1	NAG	C1-C2-N2-C7
4	L	1	NAG	C1-C2-N2-C7
4	R	1	NAG	C1-C2-N2-C7
4	T	1	NAG	C1-C2-N2-C7
4	J	2	NAG	O5-C5-C6-O6
4	L	2	NAG	O5-C5-C6-O6
4	R	2	NAG	O5-C5-C6-O6
4	T	2	NAG	O5-C5-C6-O6
4	J	2	NAG	C8-C7-N2-C2
4	J	2	NAG	O7-C7-N2-C2
4	L	2	NAG	C8-C7-N2-C2
4	L	2	NAG	O7-C7-N2-C2
4	R	2	NAG	C8-C7-N2-C2
4	R	2	NAG	O7-C7-N2-C2
4	T	2	NAG	C8-C7-N2-C2
4	T	2	NAG	O7-C7-N2-C2
4	J	2	NAG	C4-C5-C6-O6
4	L	2	NAG	C4-C5-C6-O6
4	R	2	NAG	C4-C5-C6-O6
4	T	2	NAG	C4-C5-C6-O6

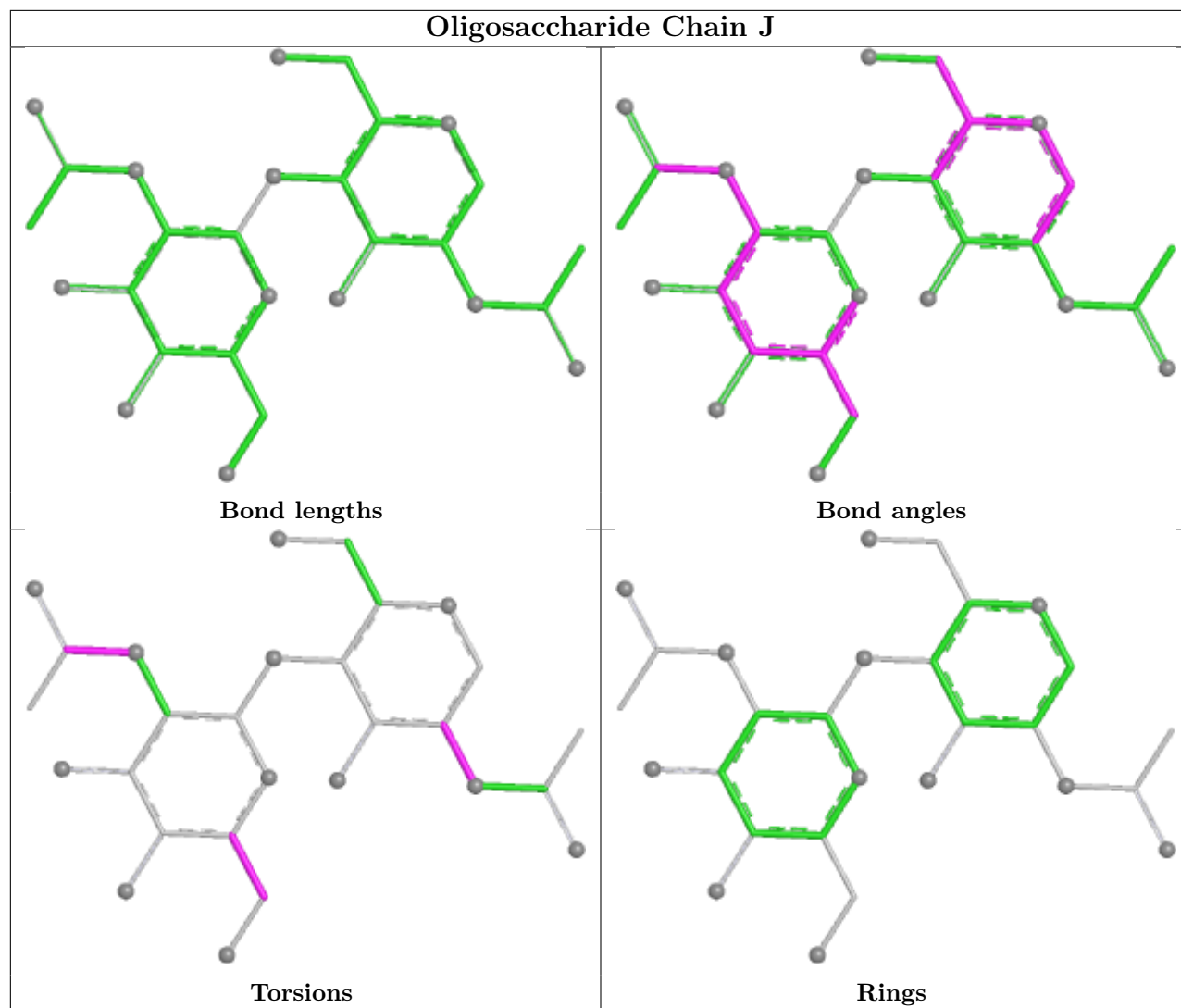
There are no ring outliers.

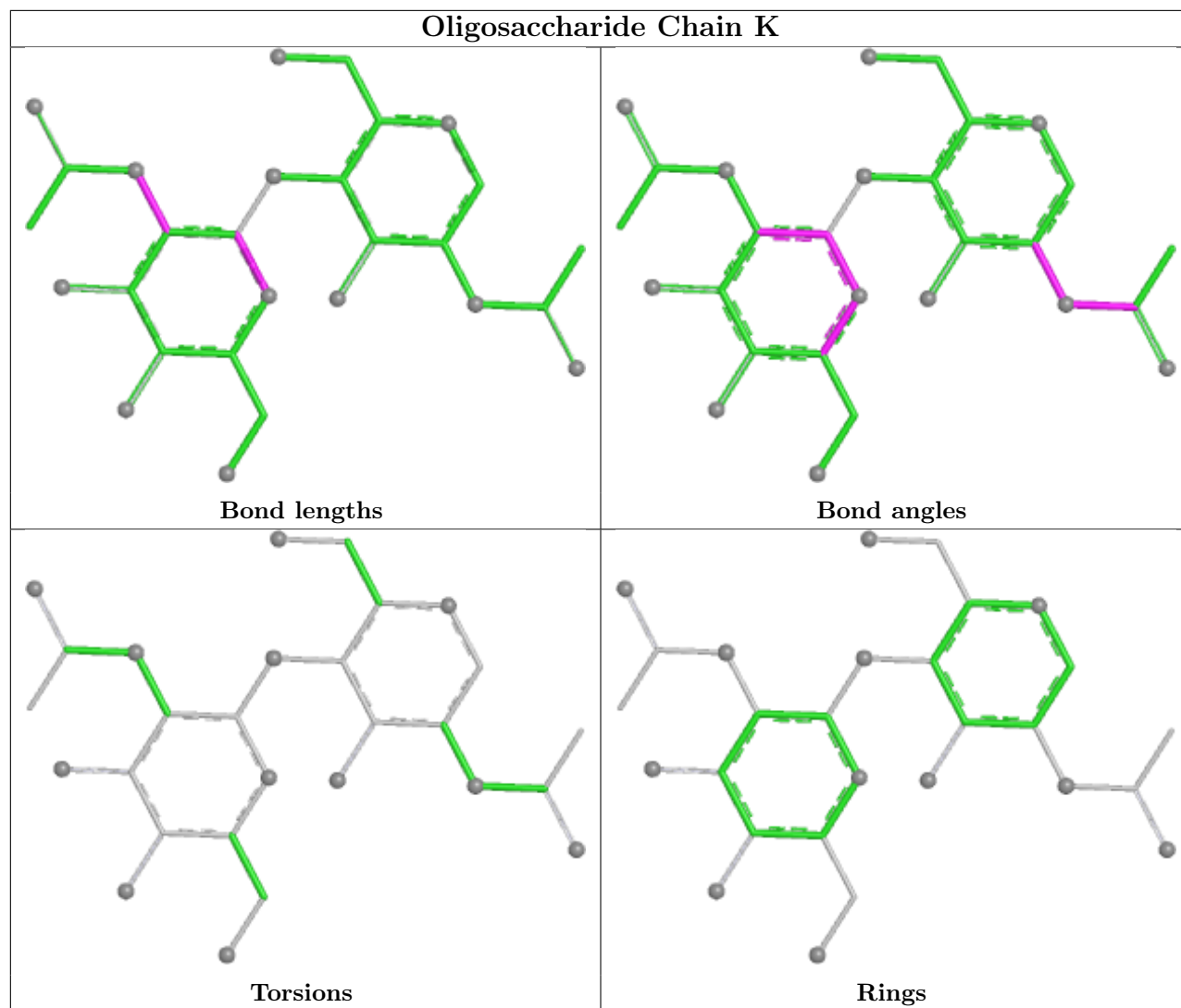
8 monomers are involved in 4 short contacts:

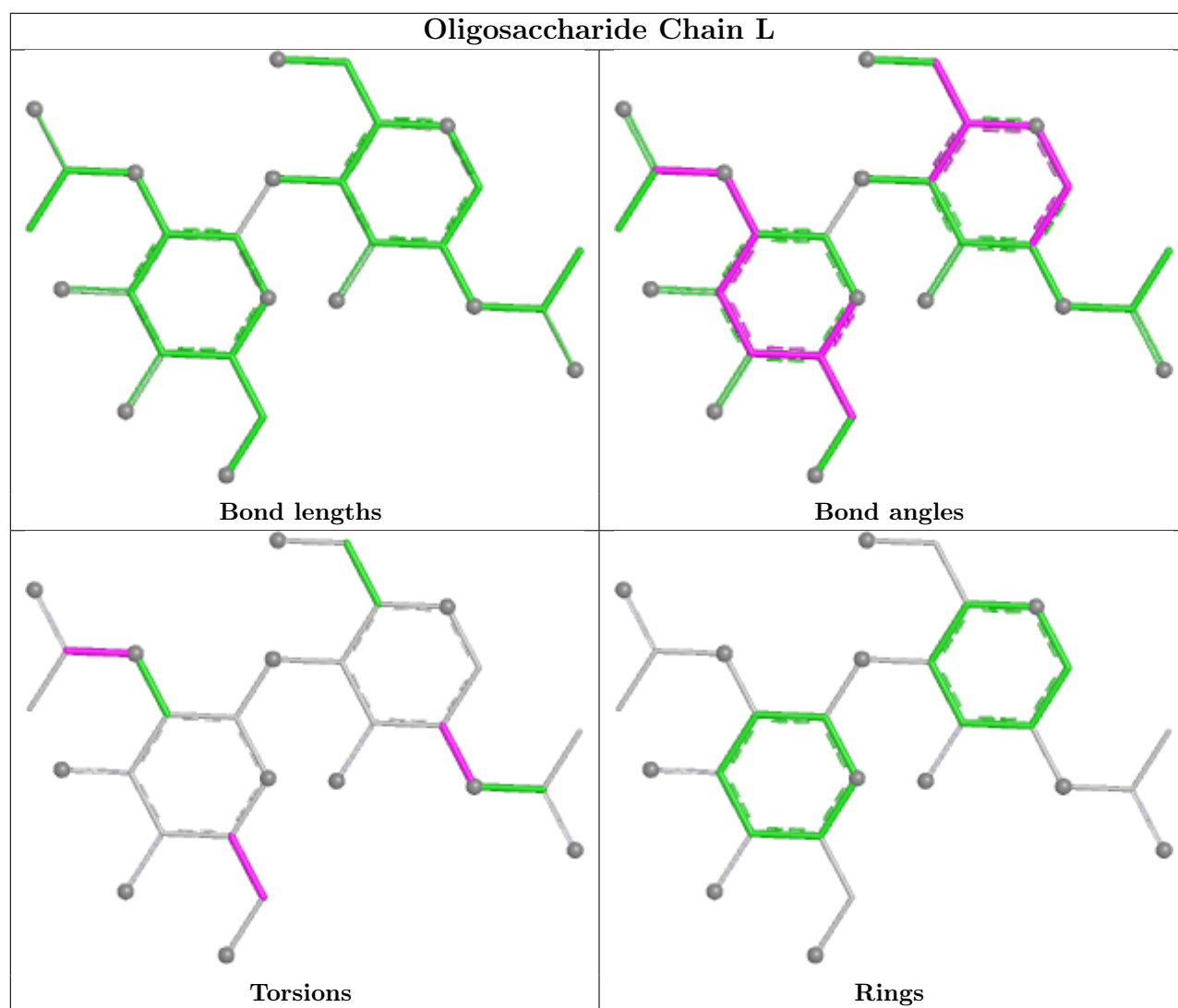
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	R	2	NAG	1	0
4	L	1	NAG	1	0
4	J	1	NAG	1	0
4	T	1	NAG	1	0
4	L	2	NAG	1	0
4	J	2	NAG	1	0
4	R	1	NAG	1	0
4	T	2	NAG	1	0

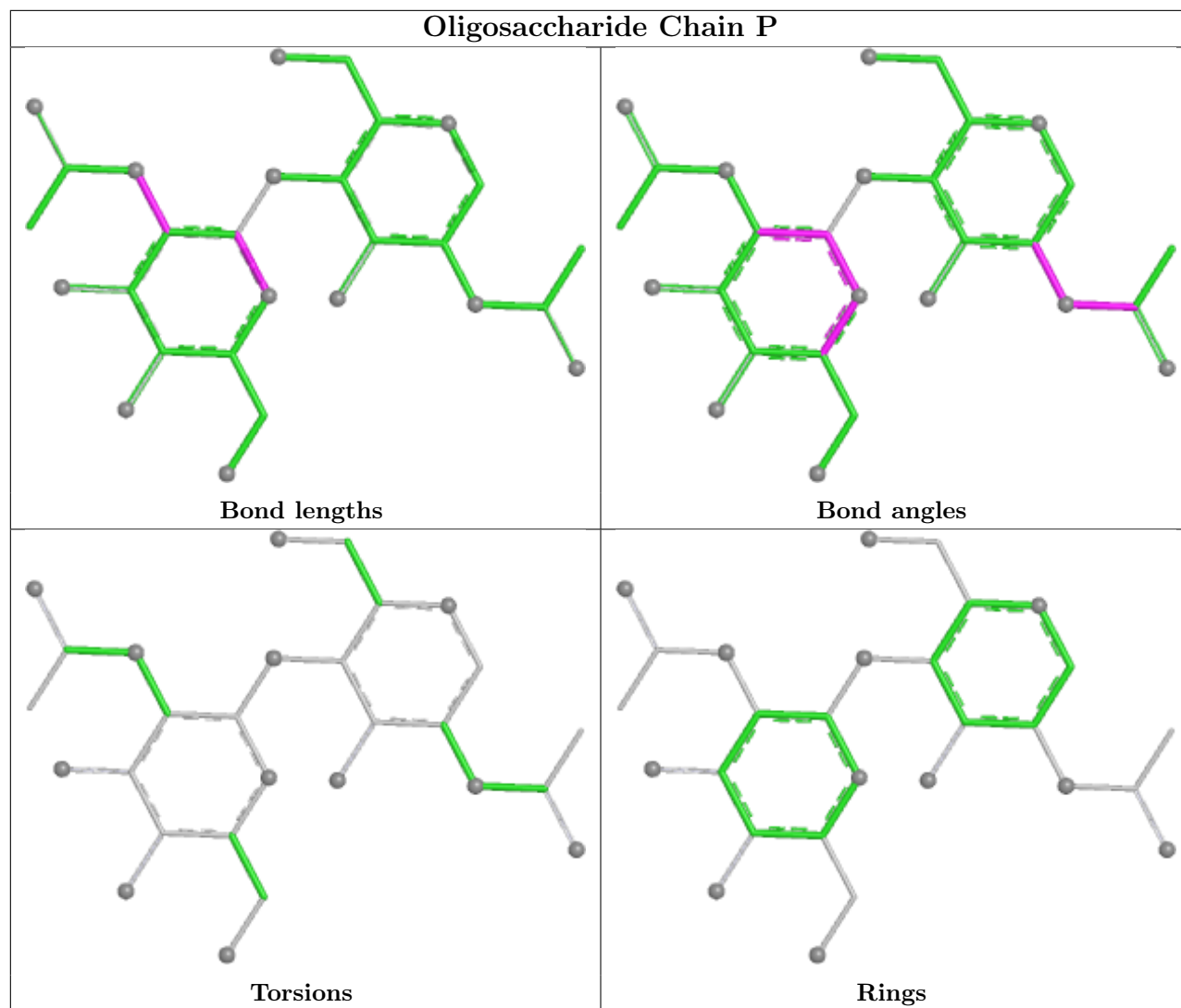
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

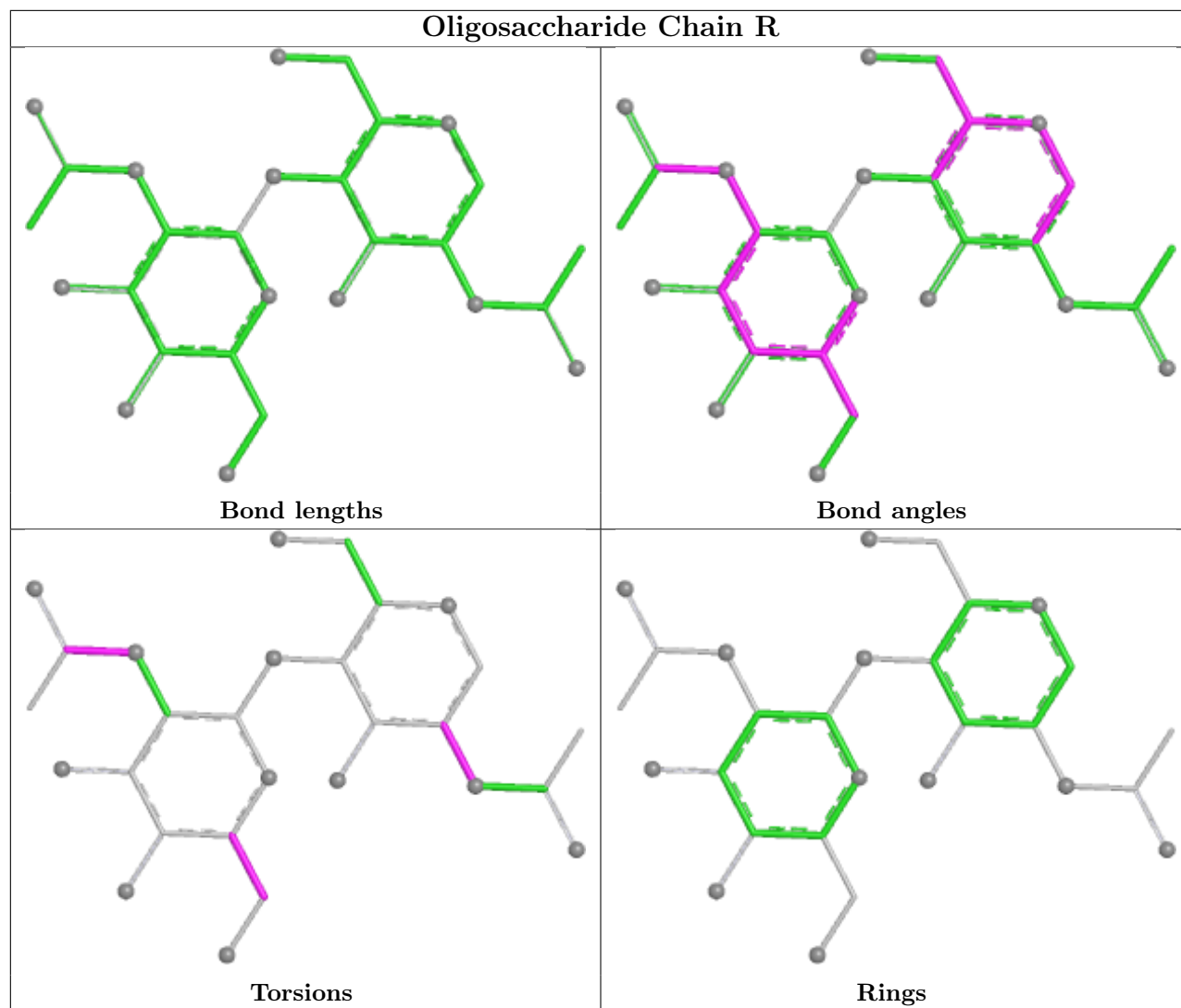


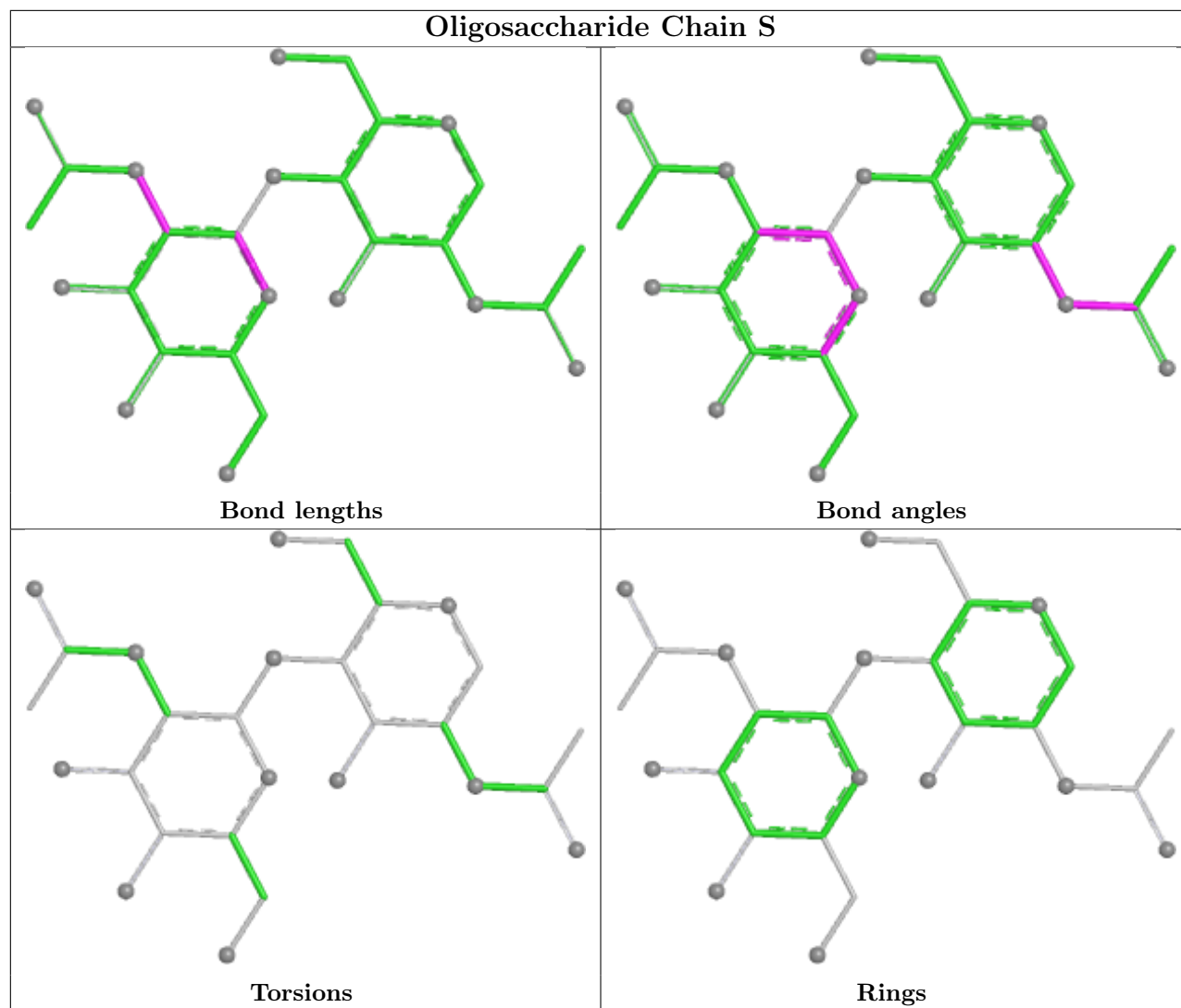


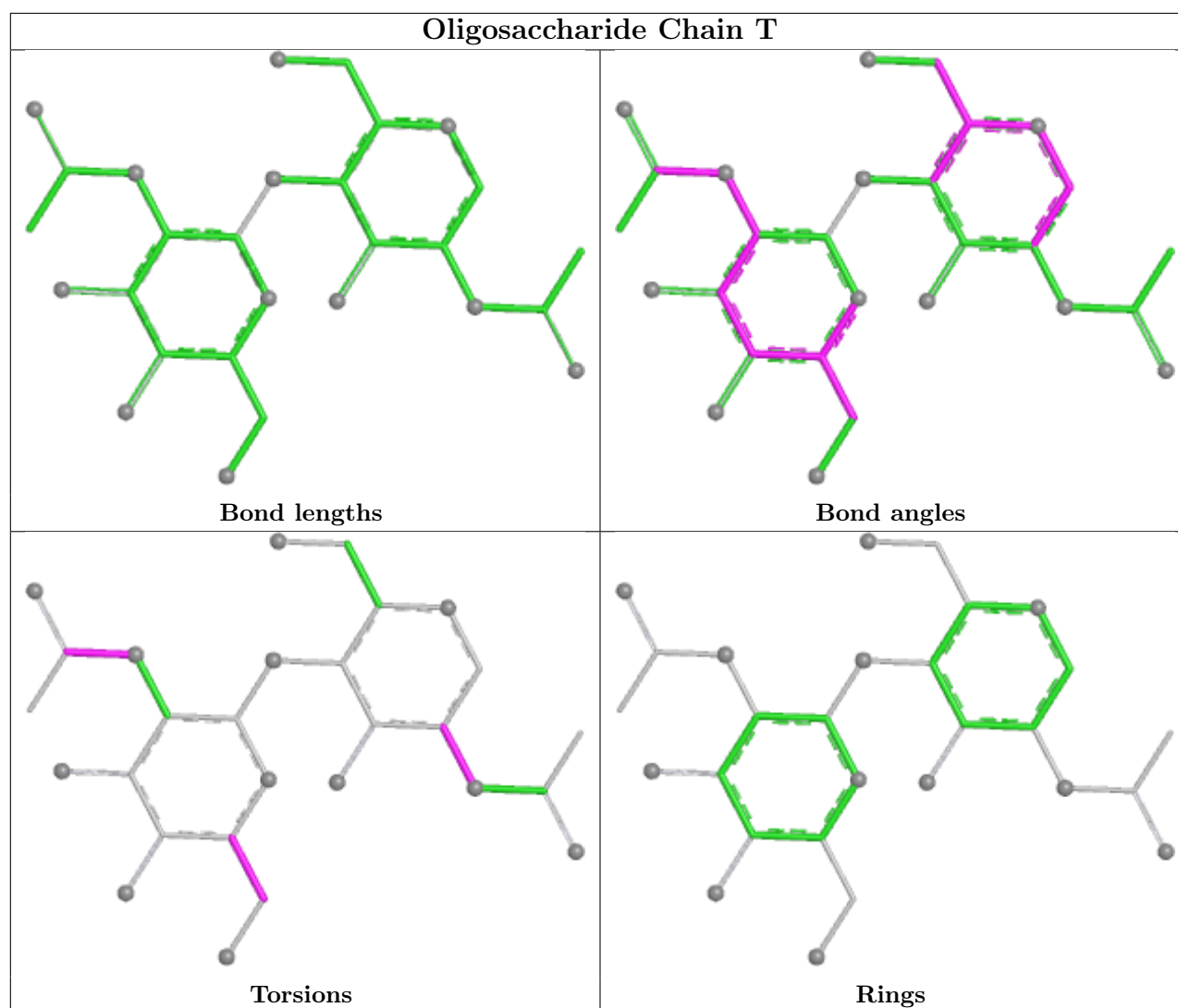












5.6 Ligand geometry [i](#)

12 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	$\# Z > 2$
5	NAG	C	405	1	14,14,15	1.07	1 (7%)	17,19,21	1.52	3 (17%)
5	NAG	E	405	1	14,14,15	1.08	1 (7%)	17,19,21	1.52	3 (17%)
5	NAG	E	404	1	14,14,15	0.25	0	17,19,21	0.59	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	A	401	1	14,14,15	1.07	1 (7%)	17,19,21	1.27	2 (11%)
5	NAG	C	401	1	14,14,15	1.07	1 (7%)	17,19,21	1.27	2 (11%)
5	NAG	G	401	1	14,14,15	1.07	1 (7%)	17,19,21	1.27	2 (11%)
5	NAG	A	405	1	14,14,15	1.08	1 (7%)	17,19,21	1.52	3 (17%)
5	NAG	E	401	1	14,14,15	1.06	1 (7%)	17,19,21	1.26	2 (11%)
5	NAG	G	404	1	14,14,15	0.26	0	17,19,21	0.58	0
5	NAG	A	404	1	14,14,15	0.27	0	17,19,21	0.58	0
5	NAG	G	405	1	14,14,15	1.09	1 (7%)	17,19,21	1.51	3 (17%)
5	NAG	C	404	1	14,14,15	0.27	0	17,19,21	0.59	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
5	NAG	C	405	1	1/1/5/7	0/6/23/26	0/1/1/1
5	NAG	E	405	1	-	0/6/23/26	0/1/1/1
5	NAG	E	404	1	-	1/6/23/26	0/1/1/1
5	NAG	A	401	1	-	2/6/23/26	0/1/1/1
5	NAG	C	401	1	-	2/6/23/26	0/1/1/1
5	NAG	G	401	1	-	2/6/23/26	0/1/1/1
5	NAG	A	405	1	-	0/6/23/26	0/1/1/1
5	NAG	E	401	1	-	2/6/23/26	0/1/1/1
5	NAG	G	404	1	-	1/6/23/26	0/1/1/1
5	NAG	A	404	1	-	1/6/23/26	0/1/1/1
5	NAG	G	405	1	1/1/5/7	0/6/23/26	0/1/1/1
5	NAG	C	404	1	-	1/6/23/26	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	G	405	NAG	C2-N2	-2.31	1.42	1.46
5	A	405	NAG	C2-N2	-2.27	1.42	1.46
5	C	405	NAG	C2-N2	-2.25	1.42	1.46
5	E	405	NAG	C2-N2	-2.24	1.42	1.46
5	C	401	NAG	C2-N2	-2.12	1.42	1.46
5	G	401	NAG	C2-N2	-2.10	1.42	1.46
5	E	401	NAG	C2-N2	-2.10	1.42	1.46
5	A	401	NAG	C2-N2	-2.09	1.42	1.46

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	405	NAG	C1-O5-C5	3.34	116.66	112.19
5	E	405	NAG	C1-O5-C5	3.33	116.65	112.19
5	A	405	NAG	C1-O5-C5	3.32	116.64	112.19
5	G	405	NAG	C1-O5-C5	3.32	116.63	112.19
5	C	401	NAG	C1-O5-C5	3.03	116.25	112.19
5	G	401	NAG	C1-O5-C5	3.02	116.24	112.19
5	A	401	NAG	C1-O5-C5	3.01	116.22	112.19
5	E	401	NAG	C1-O5-C5	2.98	116.17	112.19
5	A	405	NAG	C6-C5-C4	-2.75	106.26	113.02
5	E	405	NAG	C6-C5-C4	-2.74	106.28	113.02
5	C	405	NAG	C6-C5-C4	-2.74	106.28	113.02
5	G	405	NAG	C6-C5-C4	-2.73	106.31	113.02
5	C	405	NAG	O5-C1-C2	-2.34	107.67	111.29
5	E	405	NAG	O5-C1-C2	-2.29	107.74	111.29
5	A	405	NAG	O5-C1-C2	-2.28	107.77	111.29
5	G	405	NAG	O5-C1-C2	-2.26	107.80	111.29
5	C	401	NAG	O5-C1-C2	-2.21	107.87	111.29
5	G	401	NAG	O5-C1-C2	-2.21	107.88	111.29
5	A	401	NAG	O5-C1-C2	-2.20	107.89	111.29
5	E	401	NAG	O5-C1-C2	-2.20	107.89	111.29

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	C	405	NAG	C1
5	G	405	NAG	C1

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	401	NAG	C4-C5-C6-O6
5	C	401	NAG	C4-C5-C6-O6
5	E	401	NAG	C4-C5-C6-O6
5	G	401	NAG	C4-C5-C6-O6
5	A	401	NAG	O5-C5-C6-O6
5	E	401	NAG	O5-C5-C6-O6
5	G	401	NAG	O5-C5-C6-O6
5	C	401	NAG	O5-C5-C6-O6
5	A	404	NAG	C4-C5-C6-O6
5	C	404	NAG	C4-C5-C6-O6
5	E	404	NAG	C4-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	G	404	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	322/326 (98%)	-0.13	3 (0%) 81 81	51, 71, 104, 145	0
1	C	322/326 (98%)	-0.18	2 (0%) 85 85	49, 71, 102, 141	0
1	E	322/326 (98%)	-0.16	1 (0%) 90 91	51, 71, 104, 144	0
1	G	322/326 (98%)	-0.21	4 (1%) 76 75	51, 70, 101, 133	0
2	B	171/176 (97%)	0.33	7 (4%) 41 40	46, 100, 141, 153	0
2	D	171/176 (97%)	0.31	3 (1%) 67 64	44, 100, 143, 158	0
2	F	171/176 (97%)	0.28	4 (2%) 61 58	44, 98, 137, 153	0
2	H	171/176 (97%)	0.31	3 (1%) 67 64	44, 97, 140, 156	0
3	M	8/12 (66%)	0.20	0 100 100	85, 100, 109, 126	0
3	N	8/12 (66%)	0.19	0 100 100	93, 101, 109, 118	0
3	O	8/12 (66%)	0.08	0 100 100	88, 97, 106, 117	0
3	Q	8/12 (66%)	0.01	0 100 100	86, 99, 105, 111	0
All	All	2004/2056 (97%)	-0.00	27 (1%) 75 74	44, 78, 133, 158	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	325	SER	4.1
1	C	325	SER	4.0
1	G	325	SER	3.3
2	D	138	PHE	3.0
2	B	136	GLY	3.0
1	A	325	SER	2.9
2	D	9	PHE	2.7
2	B	9	PHE	2.7
2	F	136	GLY	2.6
2	H	137	CYS	2.6
2	F	138	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
2	B	65	ALA	2.5
2	D	65	ALA	2.4
1	A	14	CYS	2.4
2	B	137	CYS	2.3
2	B	60	ASN	2.3
2	H	8	GLY	2.3
1	C	15	ILE	2.2
2	H	9	PHE	2.2
2	F	35	ALA	2.2
1	G	14	CYS	2.2
2	B	138	PHE	2.2
1	G	101	ASP	2.1
2	F	9	PHE	2.1
1	G	15	ILE	2.1
1	A	12	THR	2.0
2	B	1	GLY	2.0

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
3	9WV	O	12	11/12	0.64	0.12	96,107,110,113	0
3	9WV	N	12	11/12	0.67	0.12	87,104,116,118	0
3	9WV	M	12	11/12	0.76	0.13	101,111,117,122	0
3	ORN	M	3	8/9	0.83	0.13	91,97,115,119	0
3	9WV	Q	12	11/12	0.84	0.11	98,105,112,115	0
3	ORN	O	3	8/9	0.87	0.10	86,88,99,104	0
3	ORN	N	3	8/9	0.87	0.10	93,97,110,118	0
3	ORN	Q	3	8/9	0.91	0.09	86,91,101,107	0
3	PH8	O	2	13/14	0.96	0.11	80,91,104,104	0
3	PH8	N	2	13/14	0.96	0.12	81,92,107,108	0
3	PH8	M	2	13/14	0.97	0.11	81,95,102,105	0
3	PH8	Q	2	13/14	0.97	0.13	83,97,104,105	0

6.3 Carbohydrates

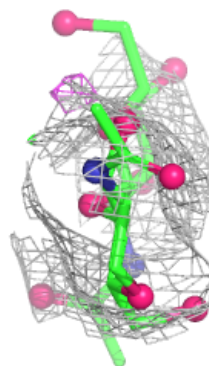
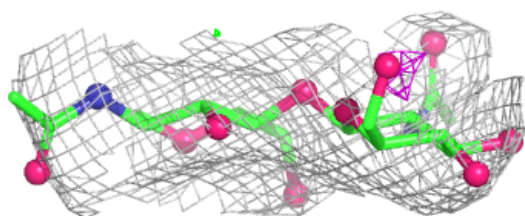
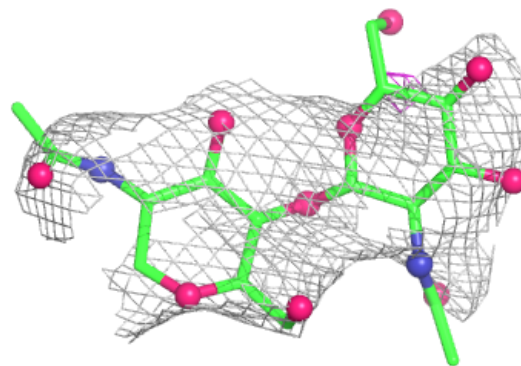
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	NAG	I	1	14/15	-	-	125,145,165,170	0
4	NAG	I	2	14/15	-	-	154,170,195,205	0
4	NAG	J	1	14/15	-	-	153,164,180,182	0
4	NAG	J	2	14/15	-	-	136,170,177,179	0
4	NAG	K	1	14/15	-	-	127,142,162,164	0
4	NAG	K	2	14/15	-	-	126,169,190,199	0
4	NAG	L	1	14/15	-	-	159,173,183,183	0
4	NAG	L	2	14/15	-	-	150,181,194,197	0
4	NAG	S	1	14/15	0.59	0.13	134,144,162,163	0
4	NAG	R	2	14/15	0.62	0.11	150,176,191,192	0
4	NAG	T	1	14/15	0.64	0.13	140,169,177,180	0
4	NAG	S	2	14/15	0.65	0.13	129,165,193,201	0
4	NAG	P	2	14/15	0.65	0.10	126,165,187,194	0
4	NAG	R	1	14/15	0.71	0.12	161,171,176,177	0
4	NAG	T	2	14/15	0.71	0.12	148,169,185,185	0
4	NAG	P	1	14/15	0.75	0.10	132,143,159,167	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.

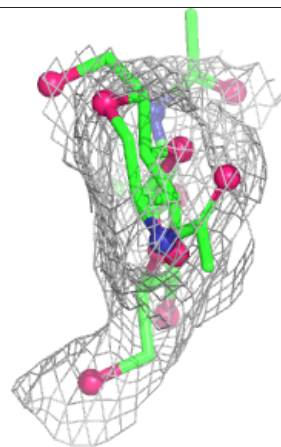
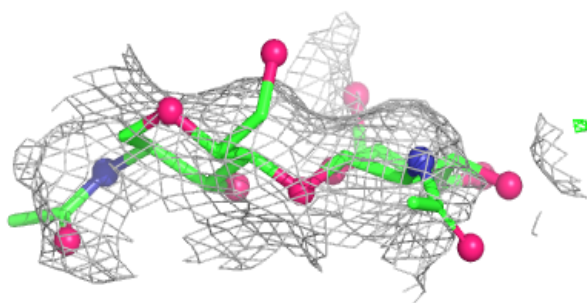
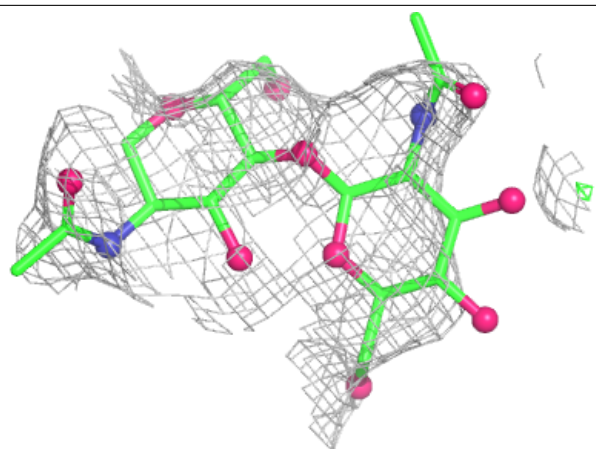
Electron density around Chain I:

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



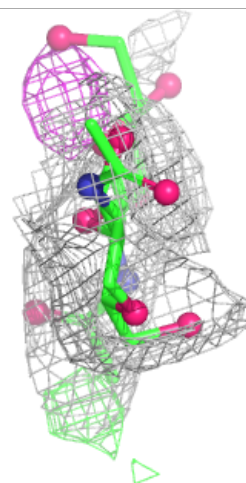
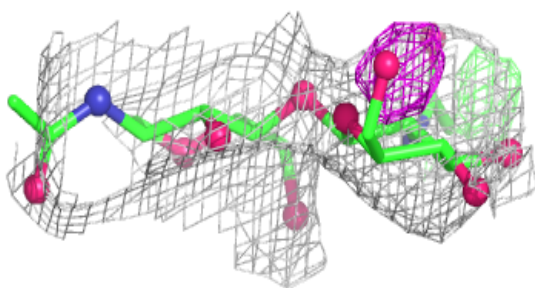
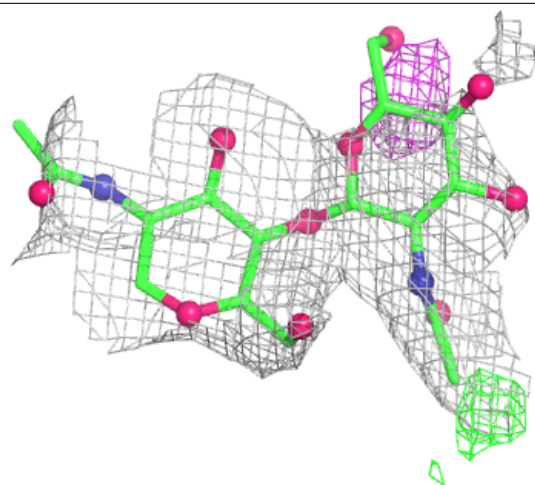
Electron density around Chain J:

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



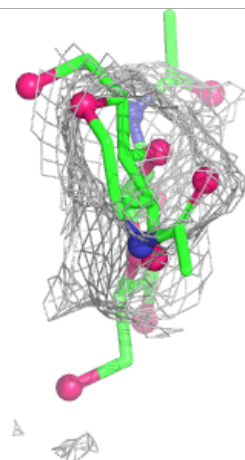
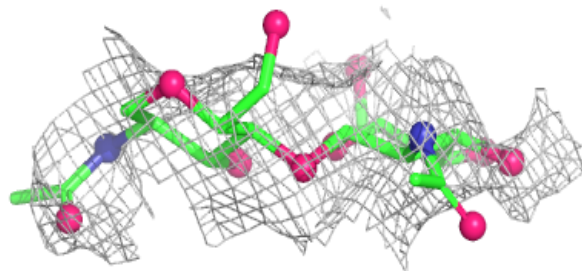
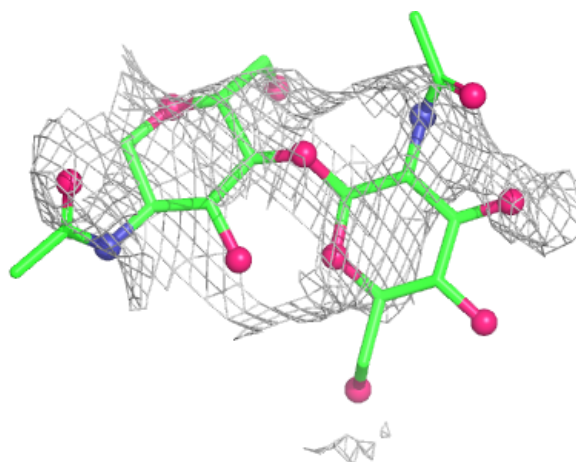
Electron density around Chain K:

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



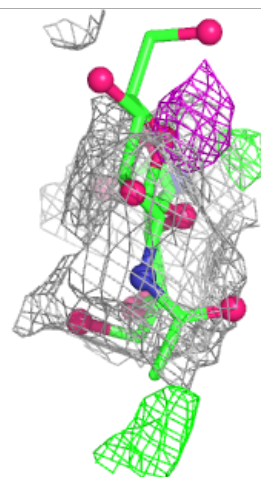
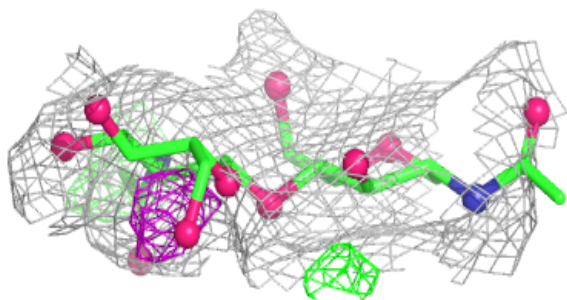
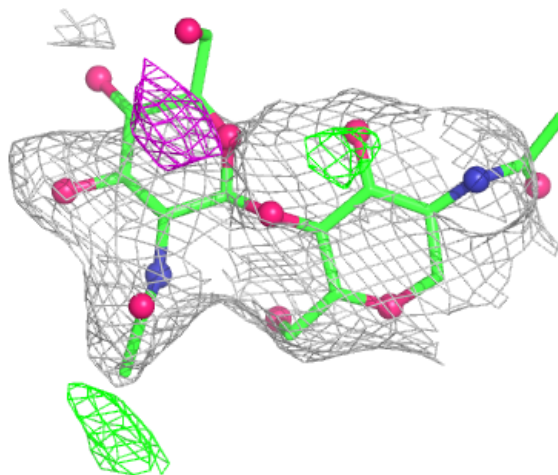
Electron density around Chain L:

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



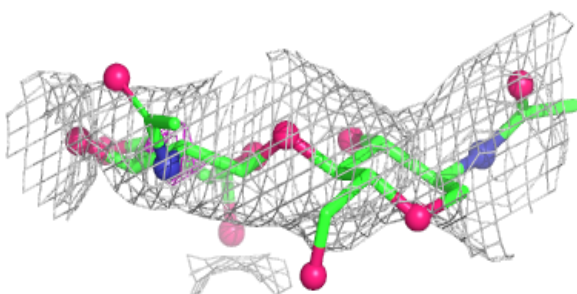
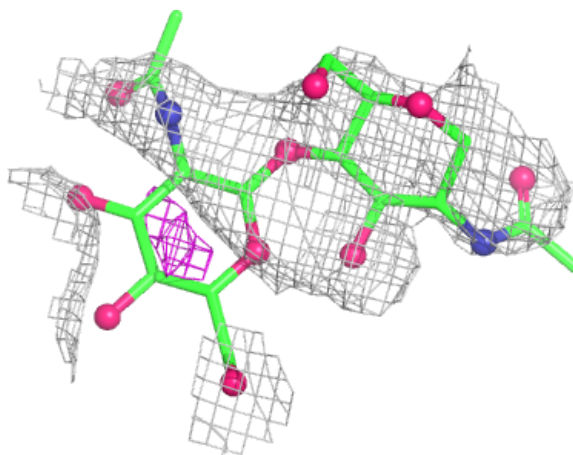
Electron density around Chain P:

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



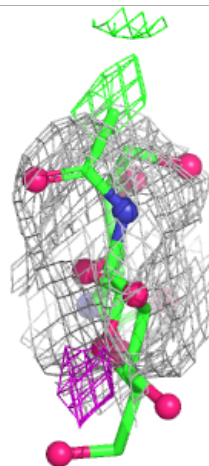
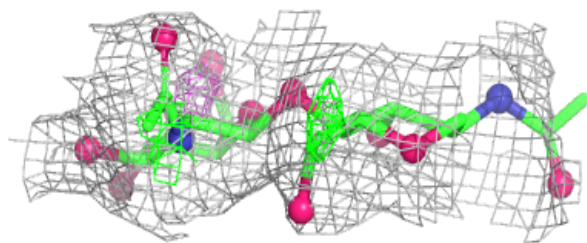
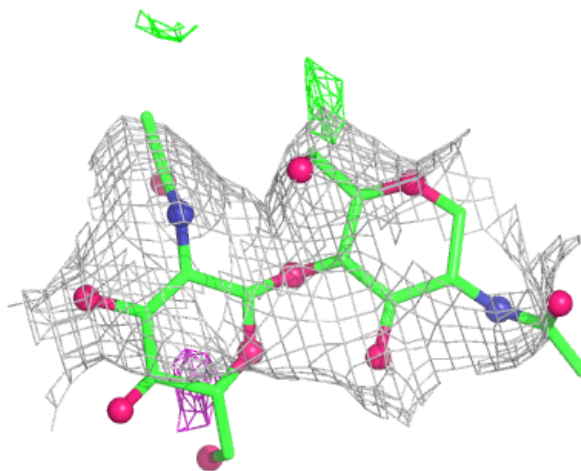
Electron density around Chain R:

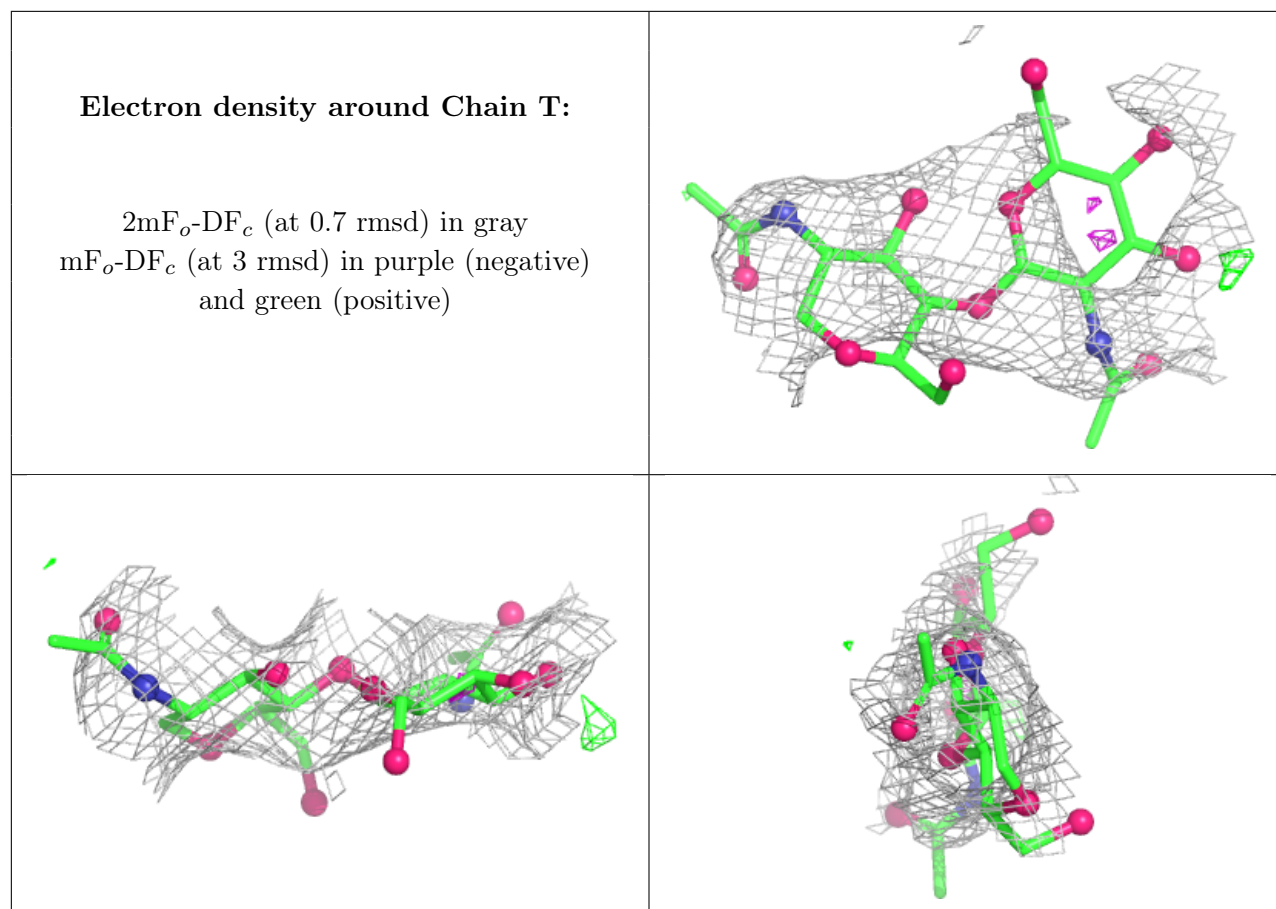
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain S:

$2mF_o-DF_c$ (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
5	NAG	G	405	14/15	0.47	0.13	120,137,147,149	0
5	NAG	C	405	14/15	0.48	0.12	109,132,142,146	0
5	NAG	A	401	14/15	0.55	0.12	115,154,165,165	0
5	NAG	E	404	14/15	0.61	0.11	132,145,151,155	0
5	NAG	G	401	14/15	0.62	0.14	125,154,164,166	0
5	NAG	E	405	14/15	0.62	0.12	122,138,145,146	0
5	NAG	A	405	14/15	0.65	0.11	126,142,155,158	0
5	NAG	C	401	14/15	0.66	0.13	150,167,175,179	0
5	NAG	G	404	14/15	0.67	0.12	134,141,149,150	0
5	NAG	E	401	14/15	0.69	0.11	124,160,175,181	0
5	NAG	A	404	14/15	0.69	0.14	126,142,155,157	0
5	NAG	C	404	14/15	0.71	0.12	135,147,153,154	0

6.5 Other polymers [i](#)

There are no such residues in this entry.