



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 6, 2024 – 11:24 PM EDT

PDB ID : 3OKW
Title : Mouse Semaphorin 6A, extracellular domains 1-2
Authors : Janssen, B.J.C.; Robinson, R.A.; Bell, C.H.; Siebold, C.; Jones, E.Y.
Deposited on : 2010-08-25
Resolution : 2.30 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ 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 : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.003 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

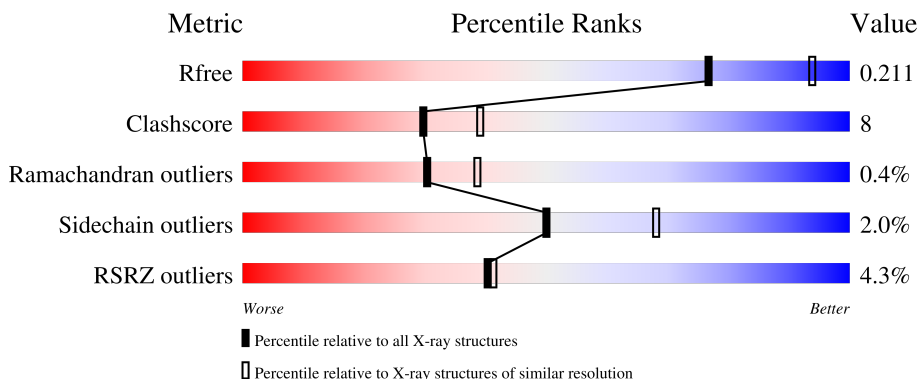
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




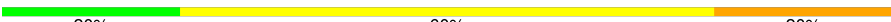
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	5963 (2.30-2.30)
Clashscore	180529	6698 (2.30-2.30)
Ramachandran outliers	177936	6640 (2.30-2.30)
Sidechain outliers	177891	6640 (2.30-2.30)
RSRZ outliers	164620	5963 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	565	<div> <div>3%</div> <div> <div></div> <div>81%</div> <div>14%</div> <div>• •</div> </div> </div>
1	B	565	<div> <div>5%</div> <div> <div></div> <div>73%</div> <div>19%</div> <div>8%</div> </div> </div>
2	C	2	<div> <div></div> <div>100%</div> </div>
2	D	2	<div> <div></div> <div>50%</div> <div>50%</div> </div>
2	E	2	<div> <div></div> <div>100%</div> </div>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	F	2	 100%
3	G	5	 20% 60% 20%

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
2	NAG	E	1	X	-	-	-

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 8995 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 Semaphorin-6A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	540	Total	C	N	O	S	0	0	0
			4295	2718	747	799	31			
1	B	522	Total	C	N	O	S	0	0	0
			4148	2629	713	775	31			

There are 24 discrepancies between the modelled and reference sequences:

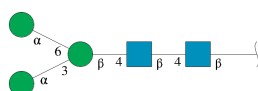
Chain	Residue	Modelled	Actual	Comment	Reference
A	16	GLU	-	expression tag	UNP O35464
A	17	THR	-	expression tag	UNP O35464
A	18	GLY	-	expression tag	UNP O35464
A	572	GLY	-	expression tag	UNP O35464
A	573	THR	-	expression tag	UNP O35464
A	574	LYS	-	expression tag	UNP O35464
A	575	HIS	-	expression tag	UNP O35464
A	576	HIS	-	expression tag	UNP O35464
A	577	HIS	-	expression tag	UNP O35464
A	578	HIS	-	expression tag	UNP O35464
A	579	HIS	-	expression tag	UNP O35464
A	580	HIS	-	expression tag	UNP O35464
B	16	GLU	-	expression tag	UNP O35464
B	17	THR	-	expression tag	UNP O35464
B	18	GLY	-	expression tag	UNP O35464
B	572	GLY	-	expression tag	UNP O35464
B	573	THR	-	expression tag	UNP O35464
B	574	LYS	-	expression tag	UNP O35464
B	575	HIS	-	expression tag	UNP O35464
B	576	HIS	-	expression tag	UNP O35464
B	577	HIS	-	expression tag	UNP O35464
B	578	HIS	-	expression tag	UNP O35464
B	579	HIS	-	expression tag	UNP O35464
B	580	HIS	-	expression tag	UNP O35464

- Molecule 2 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
2	C	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	D	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	E	2	Total	C	N	O	0	0	0
			28	16	2	10			
2	F	2	Total	C	N	O	0	0	0
			28	16	2	10			

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



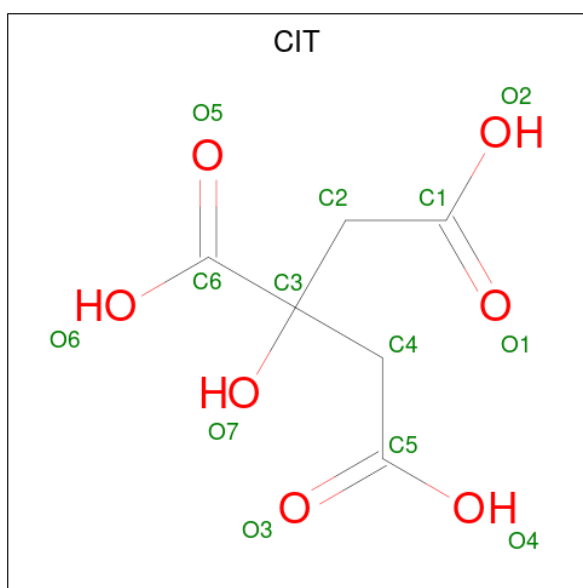
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	G	5	Total	C	N	O	0	0	0
			61	34	2	25			

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



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

- Molecule 5 is CITRIC ACID (three-letter code: CIT) (formula: $C_6H_8O_7$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			13	6	7		

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		
6	B	1	Total	C	O	0	0
			6	3	3		

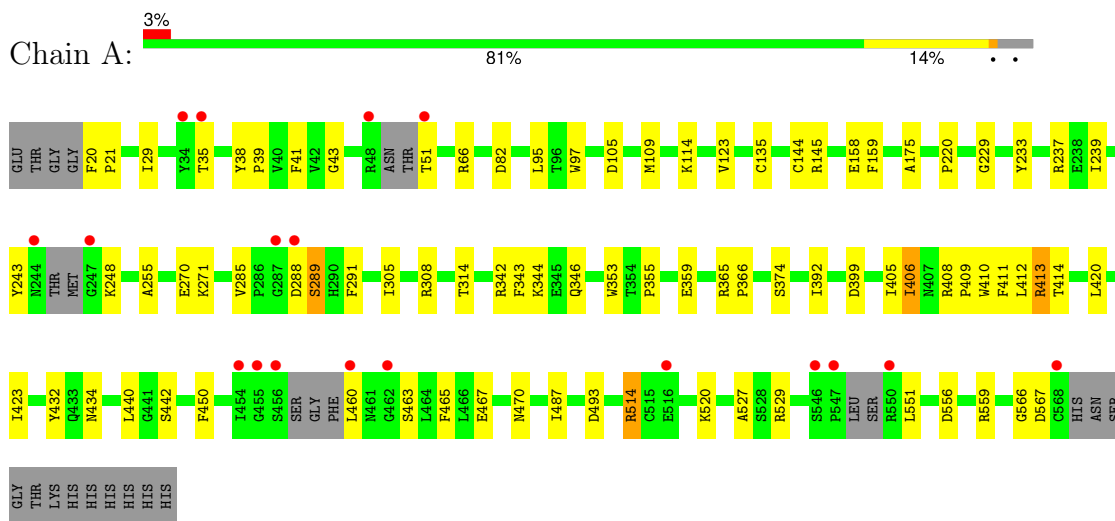
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	189	Total	O	0	0
			189	189		
7	B	89	Total	O	0	0
			89	89		

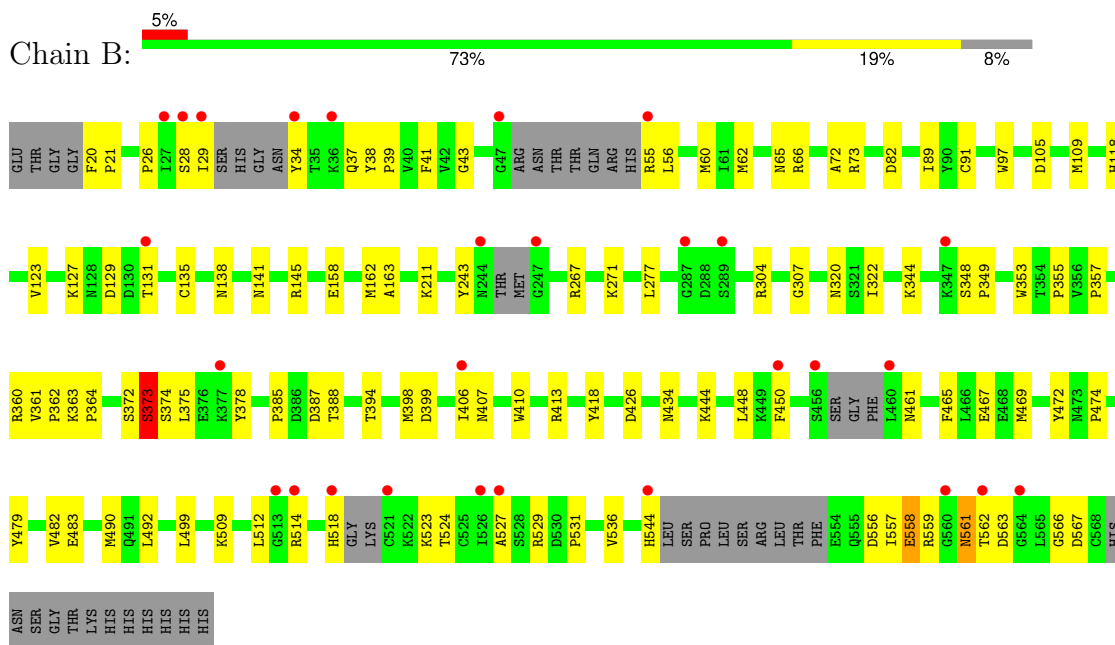
3 Residue-property plots [i](#)

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: Semaphorin-6A



• Molecule 1: Semaphorin-6A




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

Chain C:  100%

MAG1
MAG2

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

Chain D:  50% 50%

MAG1
MAG2

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

Chain E:  100%


MAG1
MAG2

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

Chain F:  100%

MAG1
MAG2

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

Chain G:  20% 60% 20%

MAG1
MAG2
BMA3
MAN4
MAN5

4 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α , β , γ	97.04Å 97.04Å 153.06Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	32.43 – 2.30 32.43 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.5 (32.43-2.30) 99.6 (32.43-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.71 (at 2.29Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.2_432)	Depositor
R, R_{free}	0.184 , 0.219 0.175 , 0.211	Depositor DCC
R_{free} test set	3609 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	44.8	Xtriage
Anisotropy	0.113	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 49.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.008 for -h,-k,l 0.029 for h,-h-k,-l 0.018 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	8995	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.82% 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: GOL, MAN, BMA, NAG, CIT

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	0.43	0/4395	0.56	0/5944
1	B	0.38	0/4242	0.54	0/5736
All	All	0.40	0/8637	0.55	0/11680

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4295	0	4187	65	0
1	B	4148	0	4036	78	0
2	C	28	0	25	0	0
2	D	28	0	25	3	0
2	E	28	0	25	2	0
2	F	28	0	25	2	0
3	G	61	0	52	1	0
4	A	14	0	13	0	0
4	B	14	0	13	1	0
5	A	13	0	5	1	0
6	A	36	0	48	2	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	B	24	0	32	0	0
7	A	189	0	0	0	0
7	B	89	0	0	0	0
All	All	8995	0	8486	144	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 8.

The worst 5 of 144 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:B:65:ASN:HA	2:E:1:NAG:H83	1.56	0.87
1:A:229:GLY:H	6:A:2005:GOL:H11	1.36	0.86
1:B:277:LEU:HD22	1:B:398:MET:HE1	1.65	0.78
1:A:20:PHE:CE1	1:A:414:THR:HG21	2.19	0.77
1:A:20:PHE:HE1	1:A:414:THR:HG21	1.50	0.77

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	530/565 (94%)	512 (97%)	16 (3%)	2 (0%)	30	39
1	B	508/565 (90%)	486 (96%)	20 (4%)	2 (0%)	30	39
All	All	1038/1130 (92%)	998 (96%)	36 (4%)	4 (0%)	30	39

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	289	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	406	ILE
1	B	373	SER
1	B	561	ASN

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	474/495 (96%)	467 (98%)	7 (2%)	60	76
1	B	458/495 (92%)	446 (97%)	12 (3%)	41	58
All	All	932/990 (94%)	913 (98%)	19 (2%)	50	68

5 of 19 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	413	ARG
1	B	558	GLU
1	B	563	ASP
1	B	536	VAL
1	B	62	MET

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

Mol	Chain	Res	Type
1	B	555	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

13 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	NAG	C	1	1,2	14,14,15	0.49	0	17,19,21	1.03	1 (5%)
2	NAG	C	2	2	14,14,15	0.51	0	17,19,21	2.12	4 (23%)
2	NAG	D	1	1,2	14,14,15	0.72	0	17,19,21	1.38	2 (11%)
2	NAG	D	2	2	14,14,15	0.54	0	17,19,21	0.88	0
2	NAG	E	1	1,2	14,14,15	0.42	0	17,19,21	1.25	2 (11%)
2	NAG	E	2	2	14,14,15	0.63	0	17,19,21	1.35	1 (5%)
2	NAG	F	1	1,2	14,14,15	0.55	0	17,19,21	1.11	1 (5%)
2	NAG	F	2	2	14,14,15	0.51	0	17,19,21	1.45	1 (5%)
3	NAG	G	1	3,1	14,14,15	0.39	0	17,19,21	1.35	2 (11%)
3	NAG	G	2	3	14,14,15	0.47	0	17,19,21	1.18	1 (5%)
3	BMA	G	3	3	11,11,12	0.64	0	15,15,17	1.35	2 (13%)
3	MAN	G	4	3	11,11,12	0.58	0	15,15,17	0.91	1 (6%)
3	MAN	G	5	3	11,11,12	0.54	0	15,15,17	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
2	NAG	C	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	C	2	2	-	4/6/23/26	0/1/1/1
2	NAG	D	1	1,2	-	4/6/23/26	0/1/1/1
2	NAG	D	2	2	-	2/6/23/26	0/1/1/1
2	NAG	E	1	1,2	1/1/5/7	5/6/23/26	0/1/1/1
2	NAG	E	2	2	-	3/6/23/26	0/1/1/1
2	NAG	F	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	F	2	2	-	3/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

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

There are no bond length outliers.

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	2	NAG	C1-O5-C5	4.78	118.59	112.19
2	E	2	NAG	C1-O5-C5	4.78	118.59	112.19
2	F	2	NAG	C1-O5-C5	4.76	118.56	112.19
2	C	2	NAG	C4-C3-C2	-4.07	105.06	111.02
2	C	2	NAG	C2-N2-C7	3.81	128.00	122.90

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	E	1	NAG	C1

5 of 32 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	2	NAG	C3-C2-N2-C7
2	D	2	NAG	C8-C7-N2-C2
2	D	2	NAG	O7-C7-N2-C2
2	E	1	NAG	C1-C2-N2-C7
2	E	2	NAG	C3-C2-N2-C7

There are no ring outliers.

7 monomers are involved in 8 short contacts:

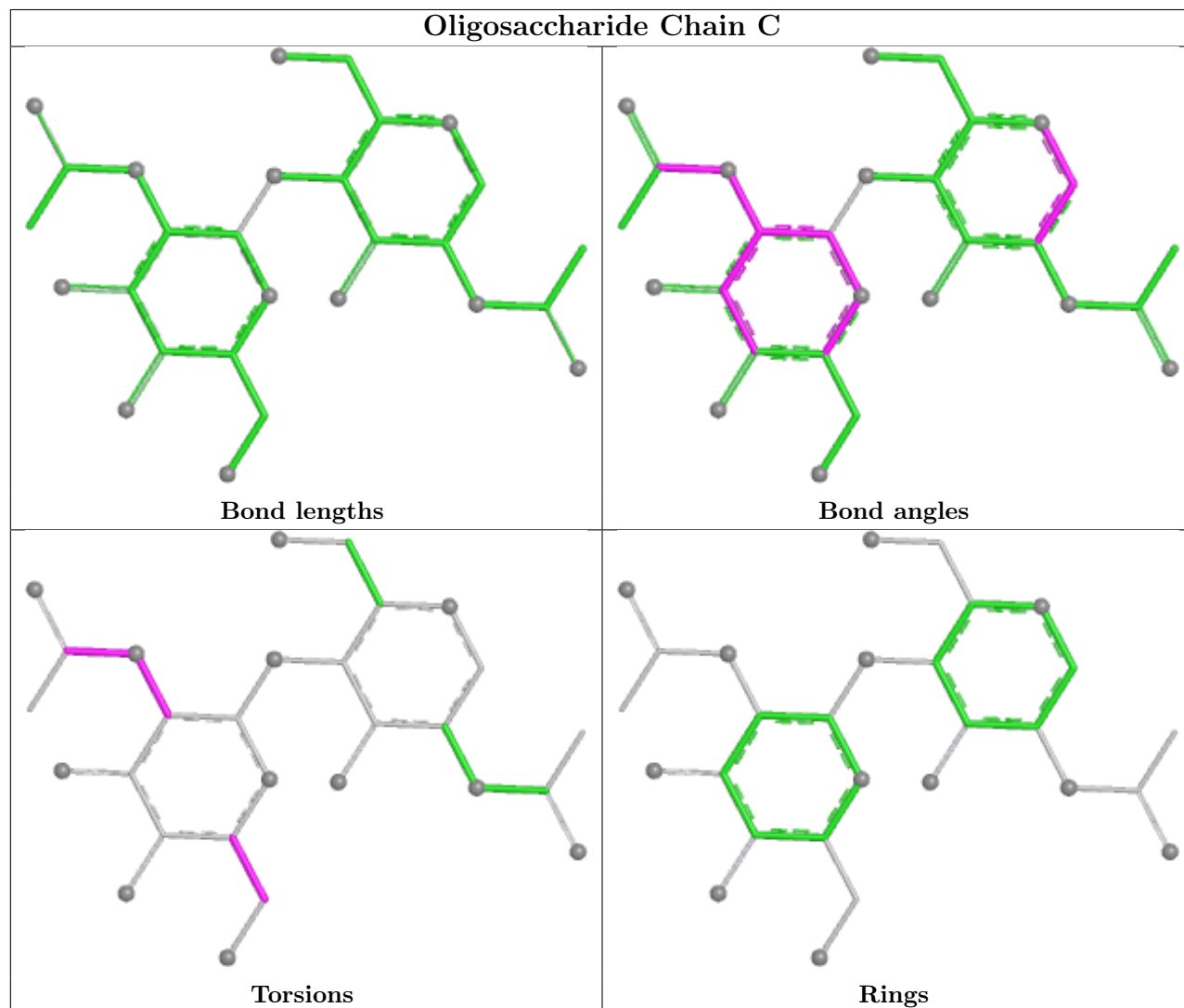
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	1	NAG	1	0
2	E	2	NAG	1	0
2	F	1	NAG	2	0
2	D	1	NAG	2	0
2	D	2	NAG	1	0
2	F	2	NAG	1	0

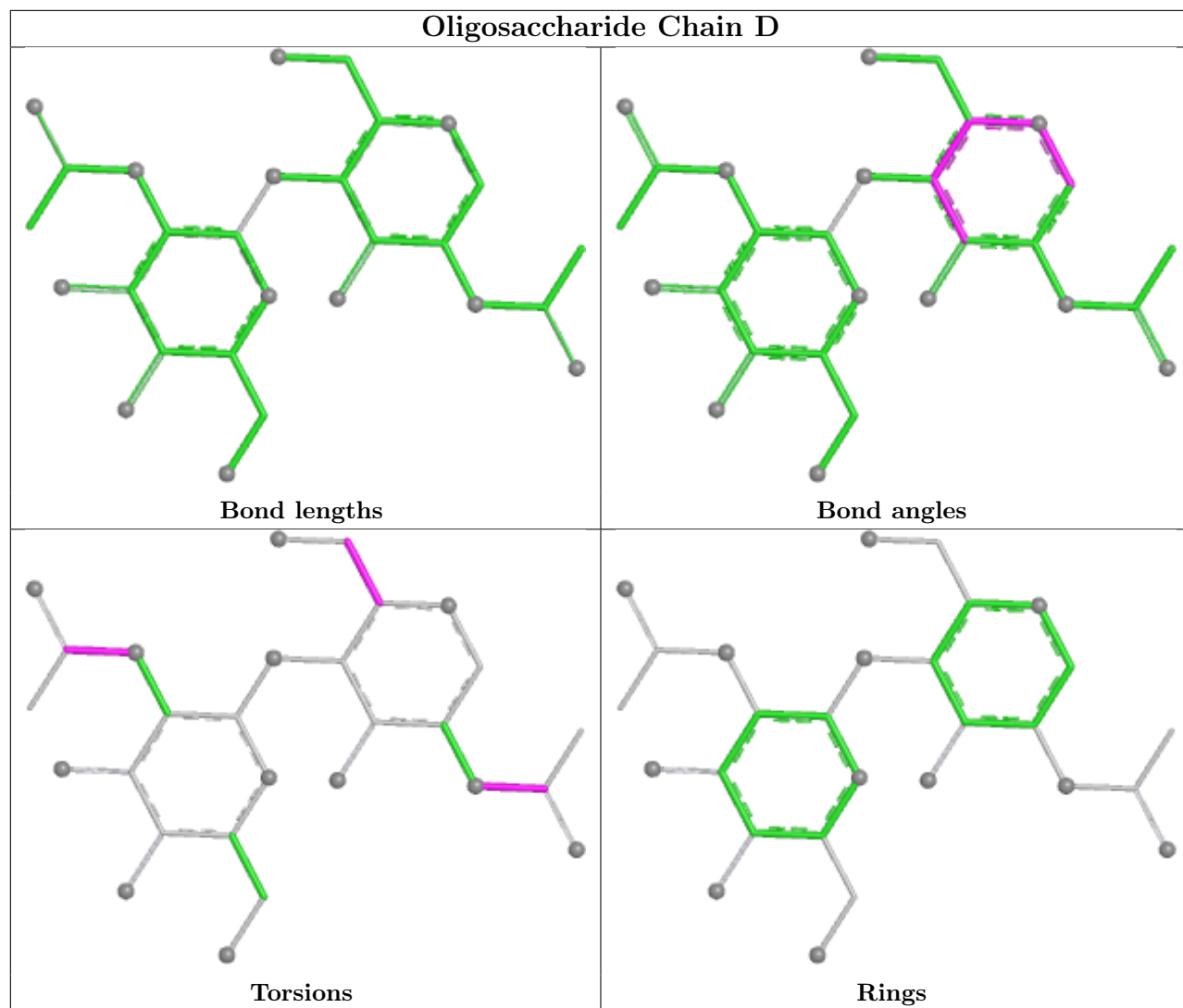
Continued on next page...

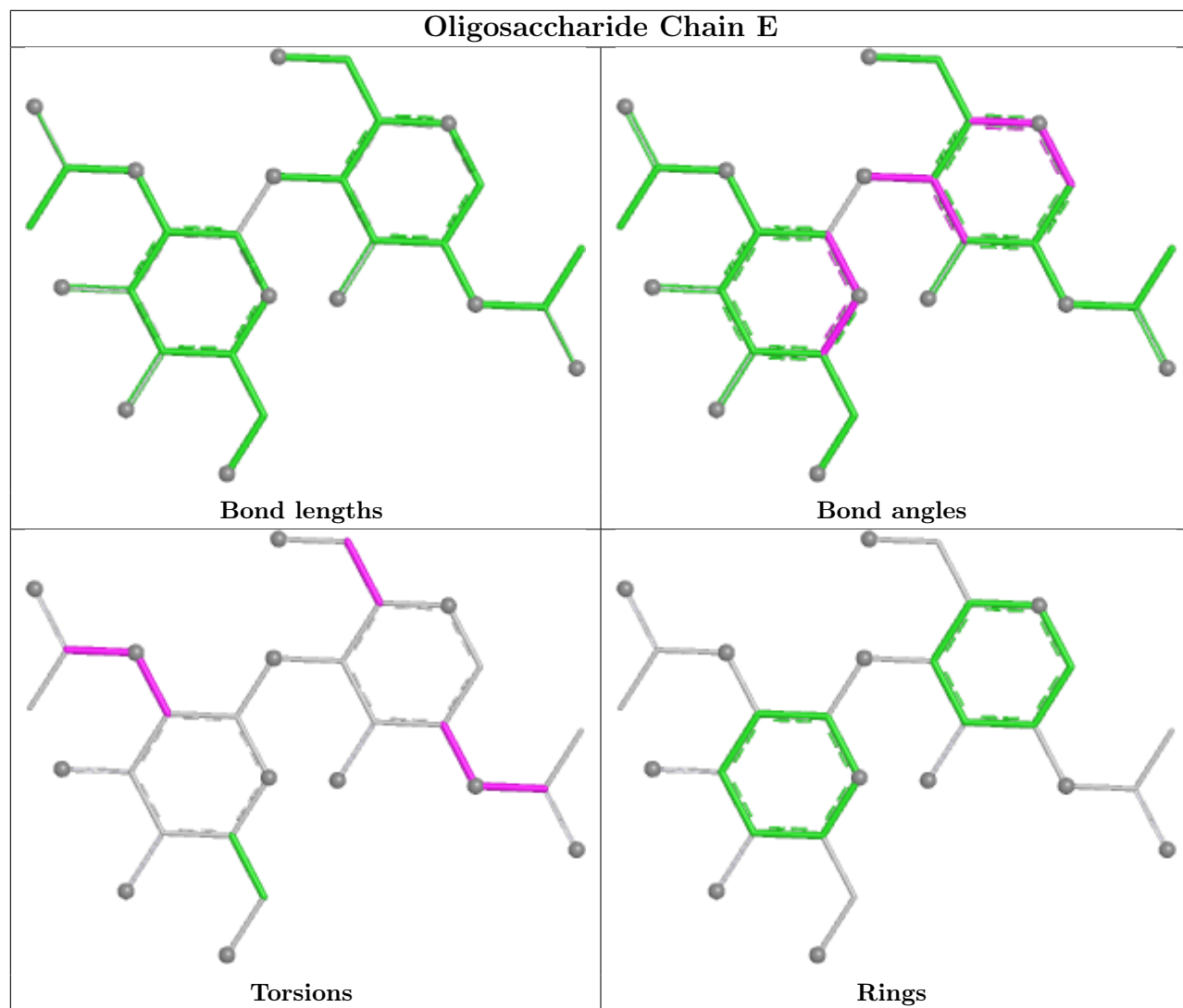
Continued from previous page...

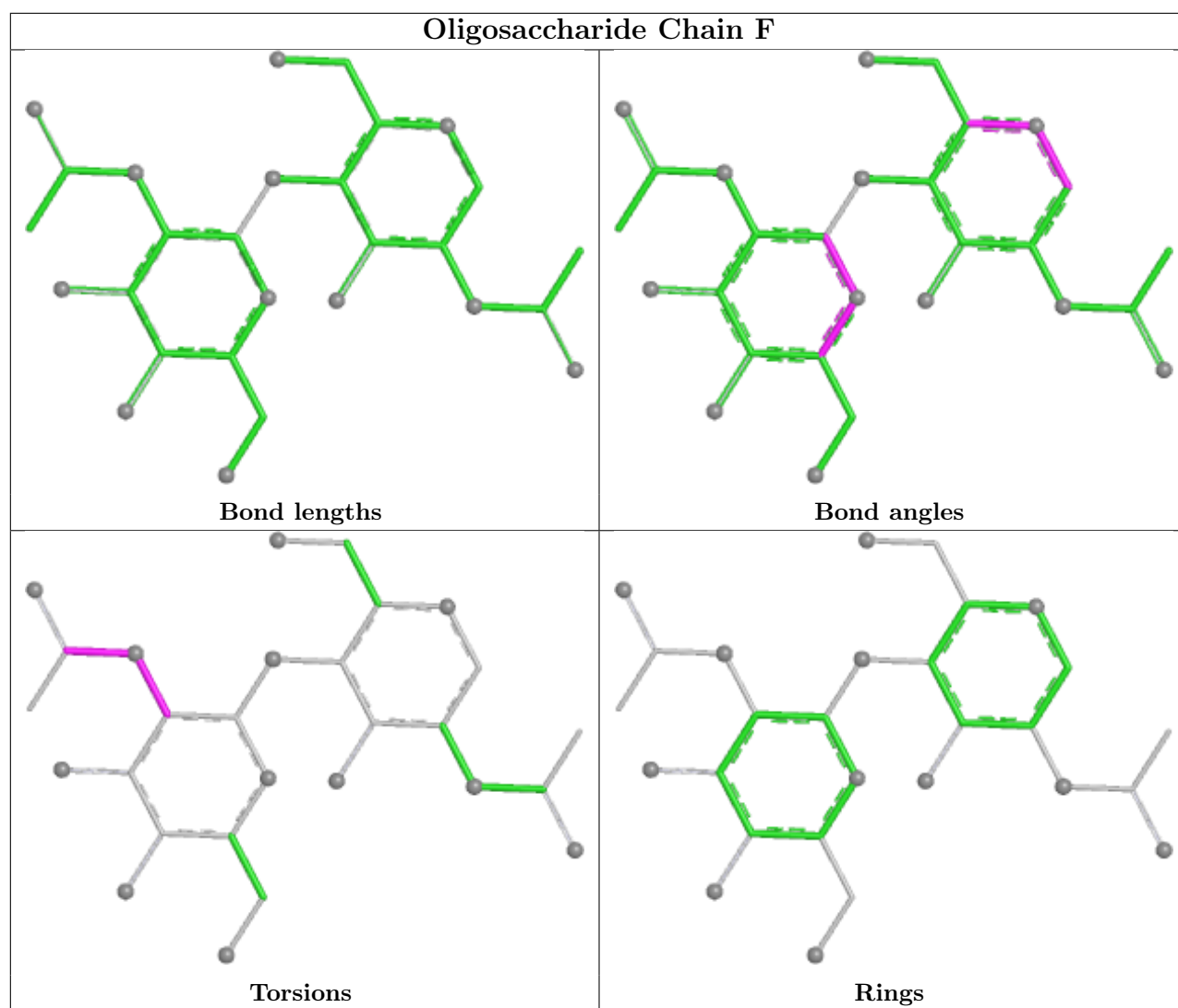
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	1	NAG	2	0

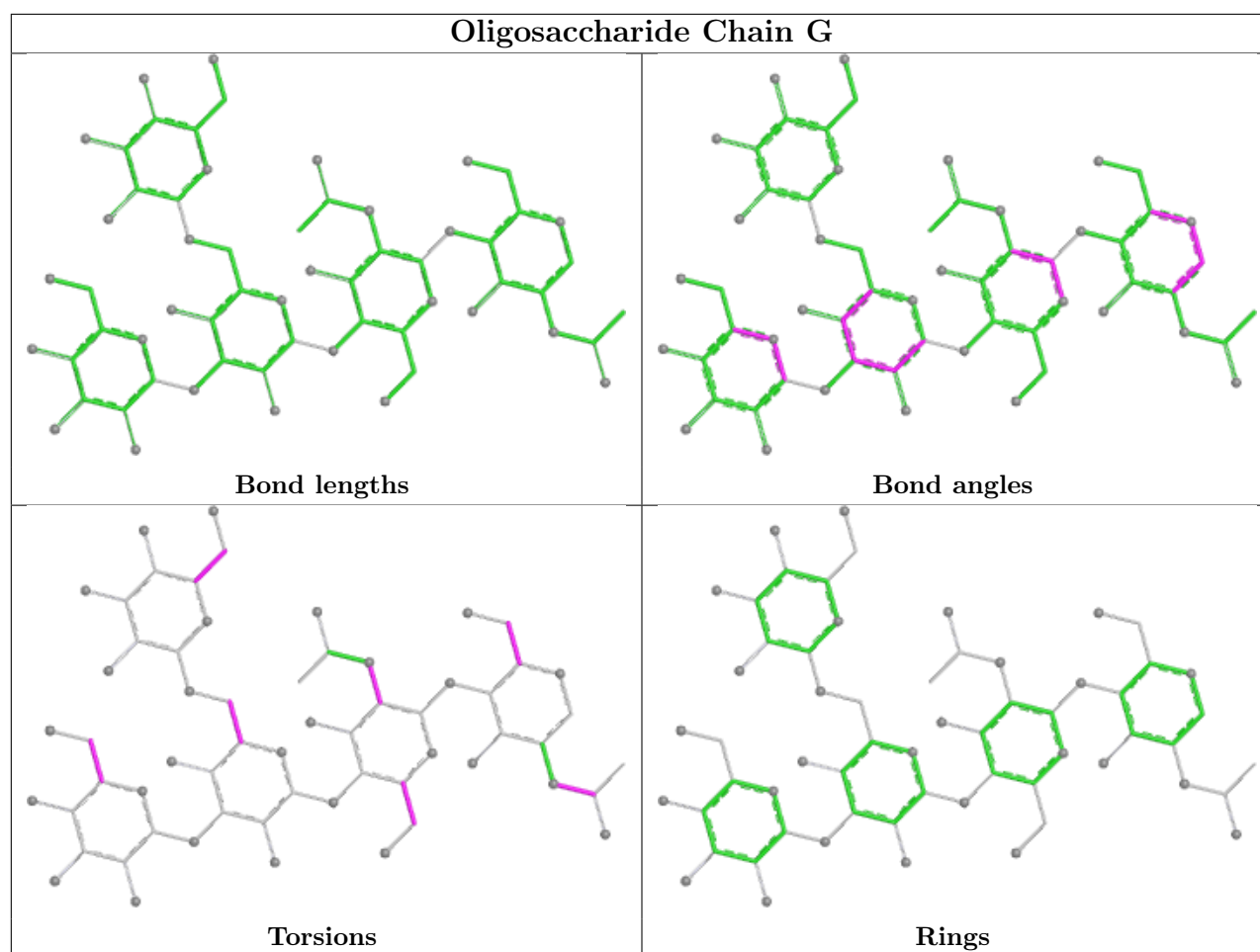
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











5.6 Ligand geometry [i](#)

13 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
6	GOL	A	2006	-	5,5,5	0.39	0	5,5,5	0.27	0
6	GOL	B	2017	-	5,5,5	0.29	0	5,5,5	0.61	0
5	CIT	A	2001	-	12,12,12	1.07	0	17,17,17	1.59	1 (5%)
6	GOL	A	2003	-	5,5,5	0.36	0	5,5,5	0.60	0
6	GOL	A	2005	-	5,5,5	0.33	0	5,5,5	0.31	0
4	NAG	A	1065	1	14,14,15	0.51	0	17,19,21	0.68	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	B	1434	1	14,14,15	0.46	0	17,19,21	0.98	1 (5%)
6	GOL	B	2018	-	5,5,5	0.46	0	5,5,5	0.45	0
6	GOL	B	2019	-	5,5,5	0.34	0	5,5,5	0.37	0
6	GOL	A	2002	-	5,5,5	0.33	0	5,5,5	0.34	0
6	GOL	A	2004	-	5,5,5	0.38	0	5,5,5	0.58	0
6	GOL	A	2007	-	5,5,5	0.32	0	5,5,5	0.57	0
6	GOL	B	2016	-	5,5,5	0.52	0	5,5,5	0.27	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GOL	A	2006	-	-	3/4/4/4	-
6	GOL	B	2017	-	-	2/4/4/4	-
5	CIT	A	2001	-	-	3/16/16/16	-
6	GOL	A	2003	-	-	1/4/4/4	-
6	GOL	A	2005	-	-	2/4/4/4	-
4	NAG	A	1065	1	-	4/6/23/26	0/1/1/1
4	NAG	B	1434	1	-	4/6/23/26	0/1/1/1
6	GOL	B	2018	-	-	2/4/4/4	-
6	GOL	B	2019	-	-	2/4/4/4	-
6	GOL	A	2002	-	-	2/4/4/4	-
6	GOL	A	2004	-	-	4/4/4/4	-
6	GOL	A	2007	-	-	2/4/4/4	-
6	GOL	B	2016	-	-	0/4/4/4	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	2001	CIT	O6-C6-C3	4.28	121.36	113.14
4	B	1434	NAG	C1-O5-C5	2.19	115.12	112.19

There are no chirality outliers.

5 of 31 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1065	NAG	C8-C7-N2-C2
4	A	1065	NAG	O7-C7-N2-C2
6	A	2002	GOL	O1-C1-C2-C3
6	A	2004	GOL	O1-C1-C2-C3
6	A	2004	GOL	C1-C2-C3-O3

There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	2001	CIT	1	0
6	A	2003	GOL	1	0
6	A	2005	GOL	1	0
4	B	1434	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	540/565 (95%)	-0.31	18 (3%) 49 51	24, 43, 88, 145	0
1	B	522/565 (92%)	0.09	28 (5%) 32 34	26, 60, 115, 150	0
All	All	1062/1130 (93%)	-0.12	46 (4%) 40 41	24, 50, 107, 150	0

The worst 5 of 46 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	547	PRO	5.6
1	A	247	GLY	5.2
1	A	568	CYS	5.1
1	A	454	ILE	4.7
1	B	47	GLY	4.4

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

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

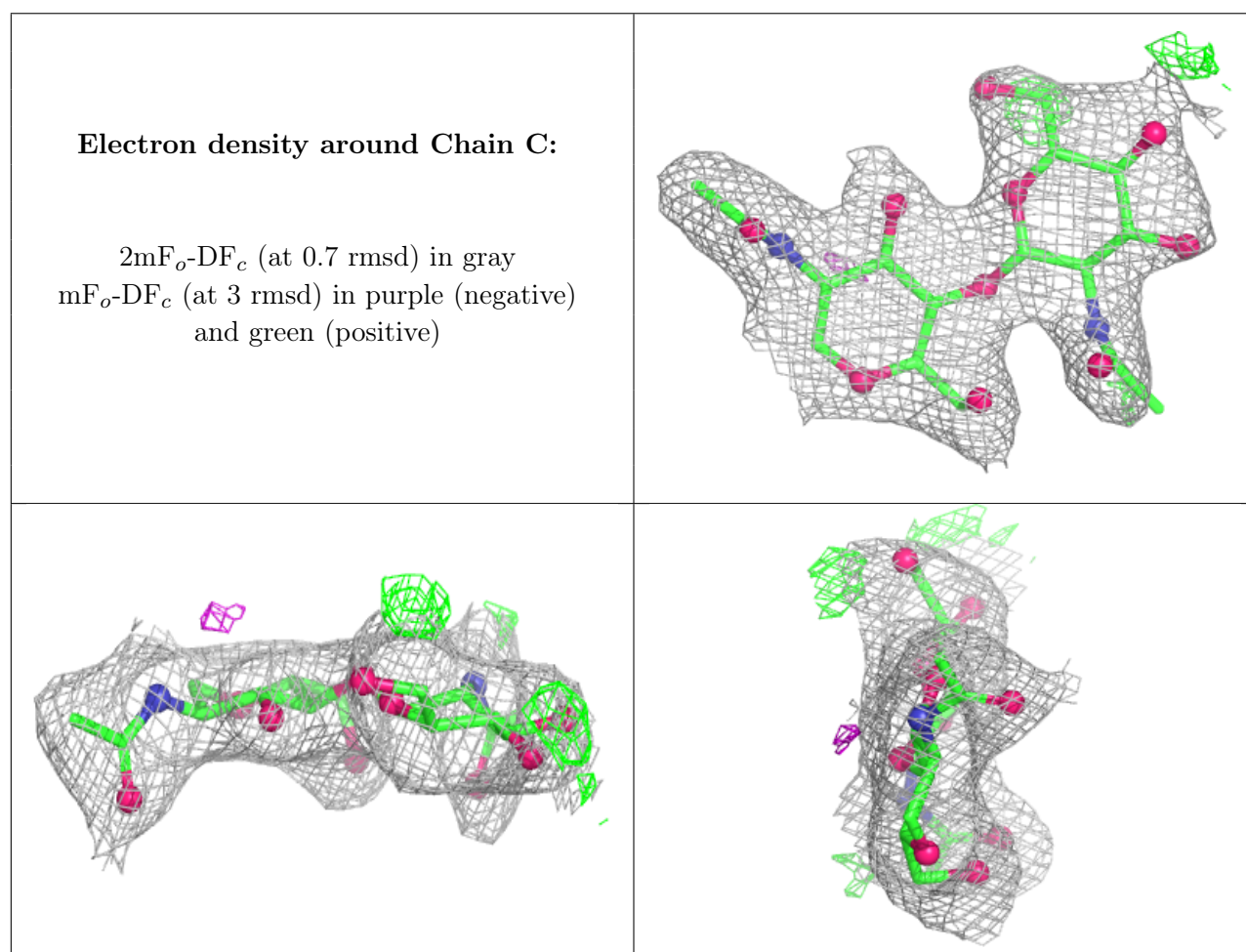
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MAN	G	5	11/12	0.19	0.23	130,156,159,162	0
3	MAN	G	4	11/12	0.51	0.19	147,151,160,160	0
2	NAG	E	2	14/15	0.56	0.16	123,131,133,135	0
2	NAG	D	2	14/15	0.67	0.16	98,112,114,116	0
3	NAG	G	1	14/15	0.70	0.14	117,126,128,130	0

Continued on next page...

Continued from previous page...

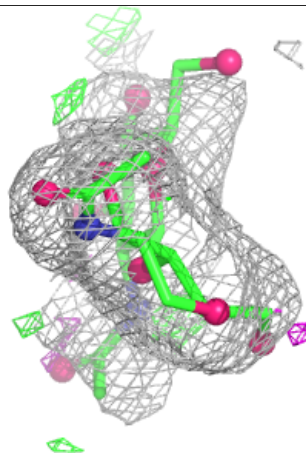
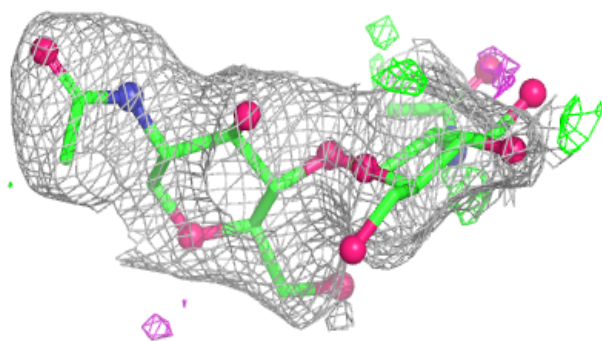
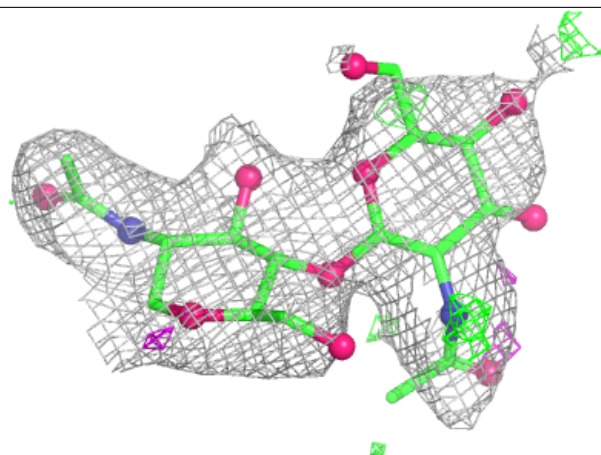
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	NAG	F	2	14/15	0.71	0.14	66,84,91,94	0
2	NAG	E	1	14/15	0.74	0.18	132,136,149,151	0
3	BMA	G	3	11/12	0.75	0.14	116,129,140,145	0
3	NAG	G	2	14/15	0.79	0.13	124,130,132,133	0
2	NAG	C	2	14/15	0.84	0.14	72,84,96,101	0
2	NAG	D	1	14/15	0.87	0.10	57,70,93,97	0
2	NAG	C	1	14/15	0.96	0.07	41,49,63,65	0
2	NAG	F	1	14/15	0.96	0.06	50,56,66,67	0

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



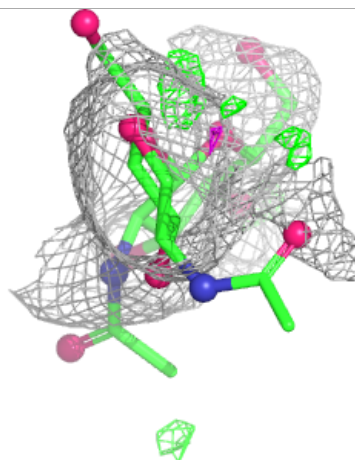
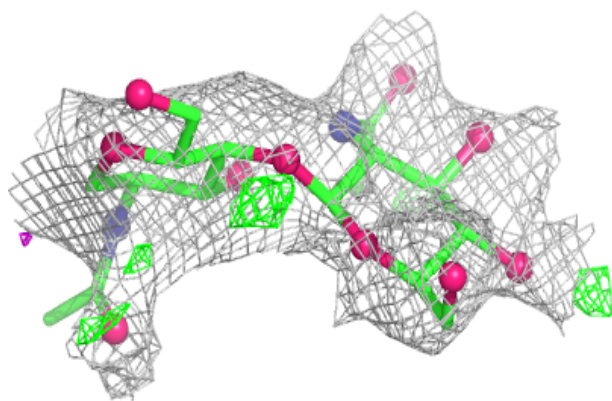
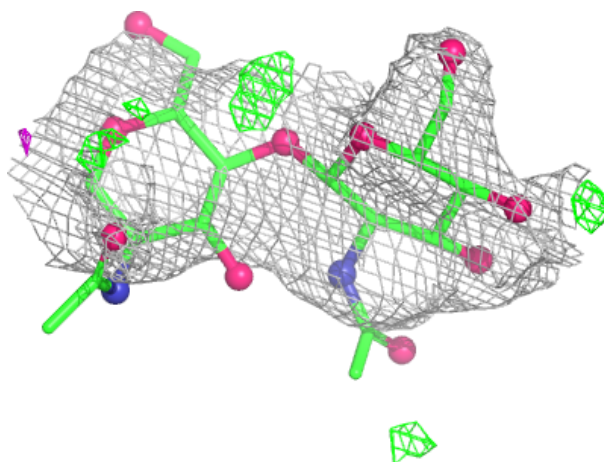
Electron density around Chain D:

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



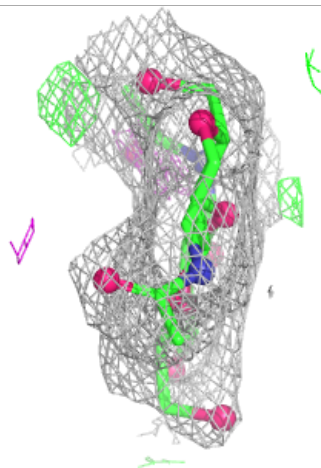
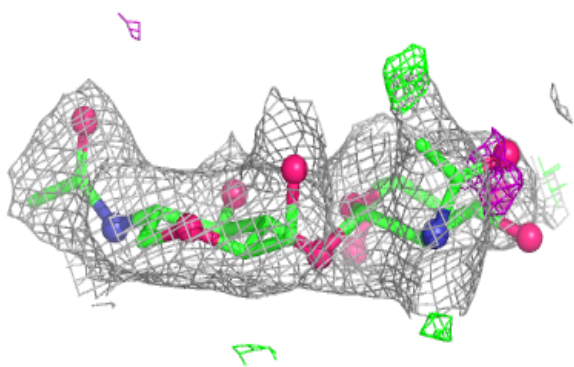
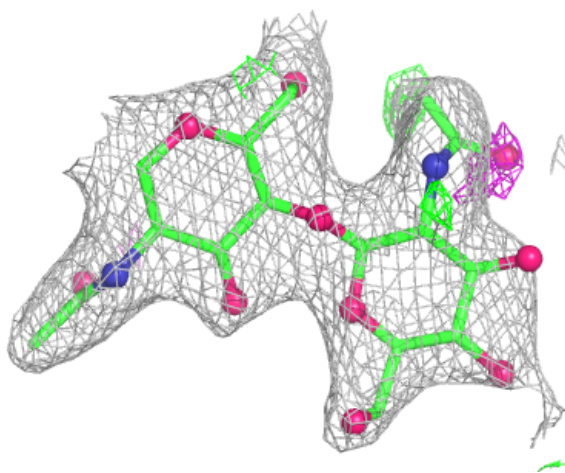
Electron density around Chain E:

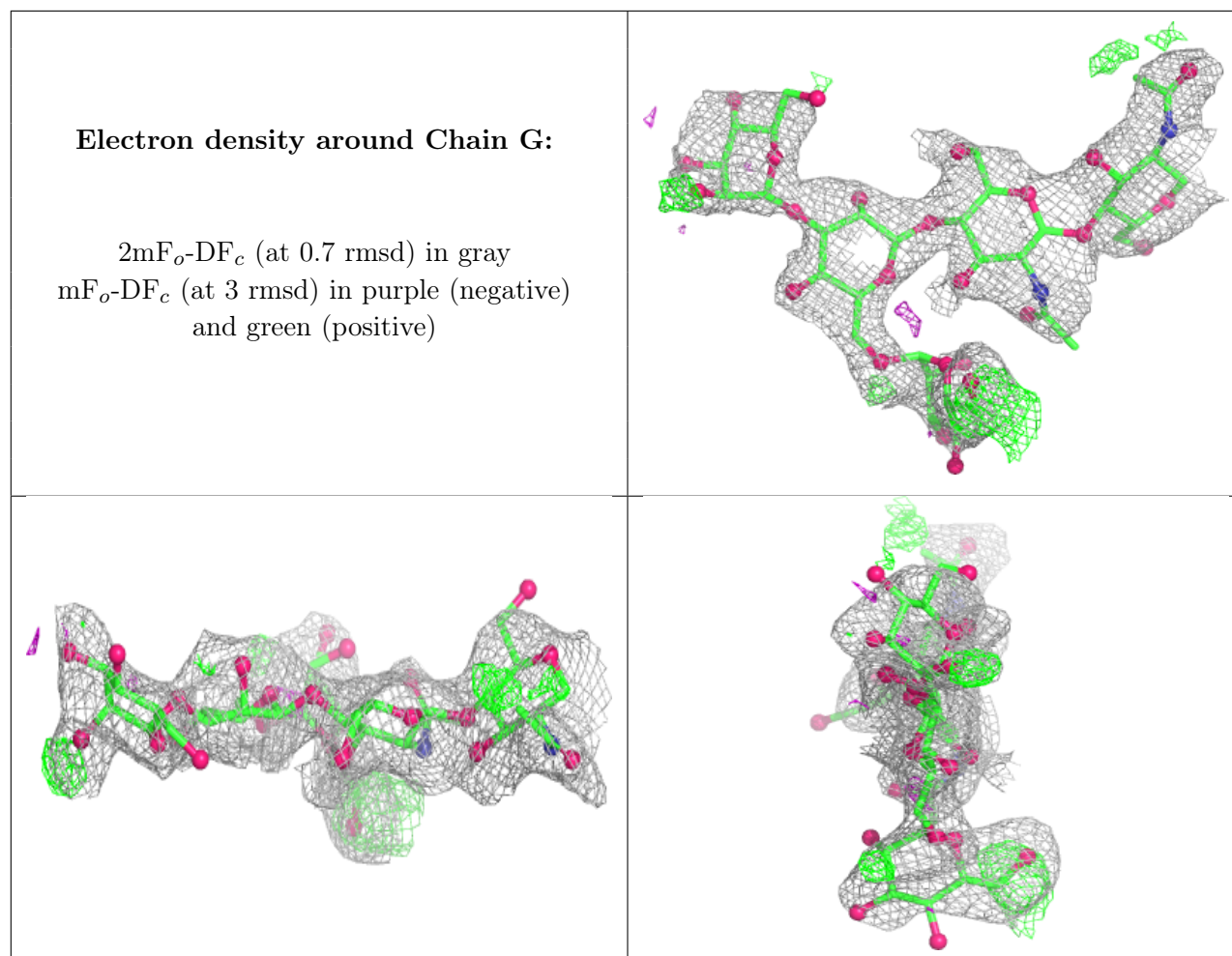
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain F:

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





6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
4	NAG	B	1434	14/15	0.67	0.13	102,110,119,129	0
4	NAG	A	1065	14/15	0.68	0.16	93,100,110,112	0
6	GOL	A	2005	6/6	0.83	0.14	75,78,82,84	0
6	GOL	B	2017	6/6	0.83	0.18	54,64,70,76	0
5	CIT	A	2001	13/13	0.85	0.14	55,68,73,74	0
6	GOL	B	2019	6/6	0.85	0.19	44,60,67,71	0
6	GOL	B	2016	6/6	0.86	0.16	43,58,60,64	0
6	GOL	A	2007	6/6	0.87	0.15	51,67,70,73	0
6	GOL	A	2004	6/6	0.87	0.16	57,66,67,67	0
6	GOL	B	2018	6/6	0.89	0.16	51,62,73,73	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
6	GOL	A	2006	6/6	0.89	0.12	73,83,83,84	0
6	GOL	A	2002	6/6	0.90	0.13	77,80,83,85	0
6	GOL	A	2003	6/6	0.96	0.07	40,56,62,65	0

6.5 Other polymers [i](#)

There are no such residues in this entry.