



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 10:38 AM UTC

PDB ID : 4ONT / pdb_00004ont
Title : Ternary host recognition complex of complement factor H, C3d, and sialic acid
Authors : Blaum, B.S.; Stehle, T.S.
Deposited on : 2014-01-29
Resolution : 2.15 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 : 4-5-2 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

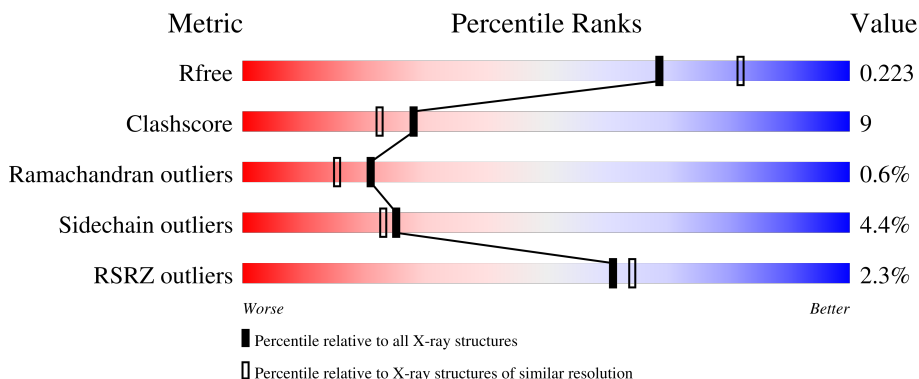
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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.




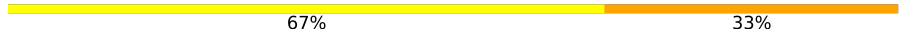

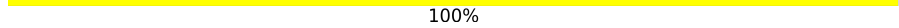
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2057 (2.16-2.16)
Clashscore	190562	2159 (2.16-2.16)
Ramachandran outliers	187476	2134 (2.16-2.16)
Sidechain outliers	187428	2133 (2.16-2.16)
RSRZ outliers	180081	2059 (2.16-2.16)

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	D	129	 78% 19% ..
1	E	129	 3% 82% 15% ..
1	F	129	 9% 54% 34% 7% ..
2	A	317	 % 79% 13% • 7%
2	B	317	 2% 74% 17% • 8%

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Mol	Chain	Length	Quality of chain
2	C	317	 <p>%</p> <p>72% 18% 8%</p>
3	G	3	 <p>67% 33%</p>
3	H	3	 <p>33% 67%</p>
3	I	3	 <p>100%</p>

2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 10510 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 Complement factor H.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	F	124	Total 944	C 595	N 164	O 176	S 9	0	0	0
1	D	126	Total 997	C 624	N 179	O 185	S 9	0	0	0
1	E	126	Total 1004	C 628	N 179	O 188	S 9	0	2	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	1103	GLU	-	expression tag	UNP P08603
D	1104	ALA	-	expression tag	UNP P08603
D	1105	GLU	-	expression tag	UNP P08603
D	1106	PHE	-	expression tag	UNP P08603
E	1103	GLU	-	expression tag	UNP P08603
E	1104	ALA	-	expression tag	UNP P08603
E	1105	GLU	-	expression tag	UNP P08603
E	1106	PHE	-	expression tag	UNP P08603
F	1103	GLU	-	expression tag	UNP P08603
F	1104	ALA	-	expression tag	UNP P08603
F	1105	GLU	-	expression tag	UNP P08603
F	1106	PHE	-	expression tag	UNP P08603

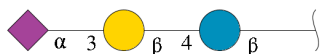
- Molecule 2 is a protein called Complement C3d fragment.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	295	Total 2356	C 1512	N 396	O 439	S 9	0	3	0
2	B	292	Total 2287	C 1468	N 380	O 430	S 9	0	0	0
2	C	292	Total 2262	C 1460	N 374	O 419	S 9	0	0	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	GLY	-	expression tag	UNP P01024
A	-5	PRO	-	expression tag	UNP P01024
A	-4	LEU	-	expression tag	UNP P01024
A	-3	GLY	-	expression tag	UNP P01024
A	-2	SER	-	expression tag	UNP P01024
A	-1	PRO	-	expression tag	UNP P01024
A	0	GLU	-	expression tag	UNP P01024
A	1	PHE	-	expression tag	UNP P01024
A	2	ARG	-	expression tag	UNP P01024
A	17	ALA	CYS	engineered mutation	UNP P01024
B	-6	GLY	-	expression tag	UNP P01024
B	-5	PRO	-	expression tag	UNP P01024
B	-4	LEU	-	expression tag	UNP P01024
B	-3	GLY	-	expression tag	UNP P01024
B	-2	SER	-	expression tag	UNP P01024
B	-1	PRO	-	expression tag	UNP P01024
B	0	GLU	-	expression tag	UNP P01024
B	1	PHE	-	expression tag	UNP P01024
B	2	ARG	-	expression tag	UNP P01024
B	17	ALA	CYS	engineered mutation	UNP P01024
C	-6	GLY	-	expression tag	UNP P01024
C	-5	PRO	-	expression tag	UNP P01024
C	-4	LEU	-	expression tag	UNP P01024
C	-3	GLY	-	expression tag	UNP P01024
C	-2	SER	-	expression tag	UNP P01024
C	-1	PRO	-	expression tag	UNP P01024
C	0	GLU	-	expression tag	UNP P01024
C	1	PHE	-	expression tag	UNP P01024
C	2	ARG	-	expression tag	UNP P01024
C	17	ALA	CYS	engineered mutation	UNP P01024

- Molecule 3 is an oligosaccharide called N-acetyl-alpha-neuraminic acid-(2-3)-beta-D-galactopyranose-(1-4)-beta-D-glucopyranose.



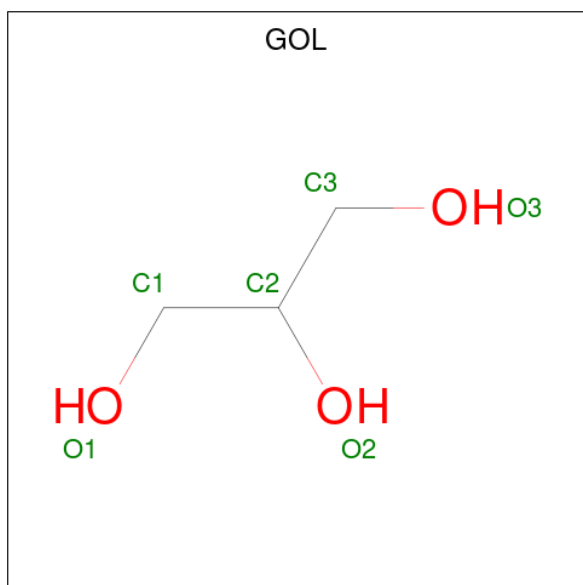
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
			Total	C	N				O
3	G	3	43	23	1	19	0	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
3	H	3	Total	C	N	O	0	0	0
			43	23	1	19			
3	I	3	Total	C	N	O	0	0	0
			43	23	1	19			

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	F	5	Total O 5 5	0	0
5	A	133	Total O 133 133	0	0
5	D	85	Total O 85 85	0	0
5	B	127	Total O 127 127	0	0
5	E	59	Total O 59 59	0	0
5	C	80	Total O 80 80	0	0

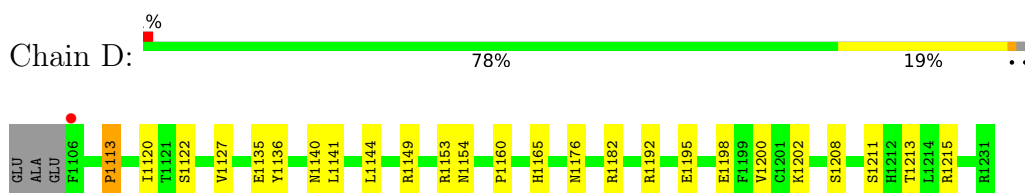
3 Residue-property plots [i](#)

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.

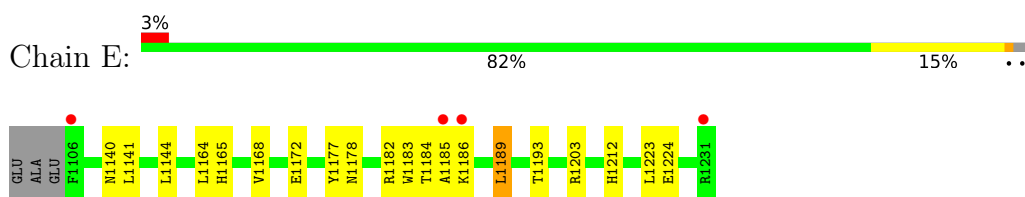
- Molecule 1: Complement factor H



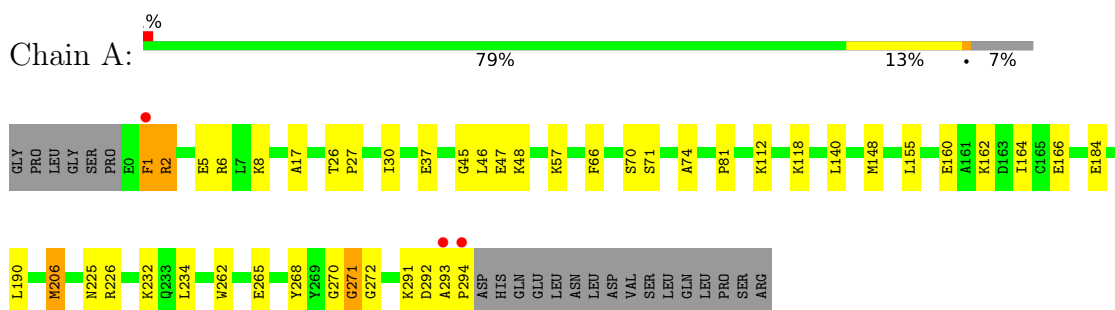
- Molecule 1: Complement factor H




- Molecule 1: Complement factor H



- Molecule 2: Complement C3d fragment



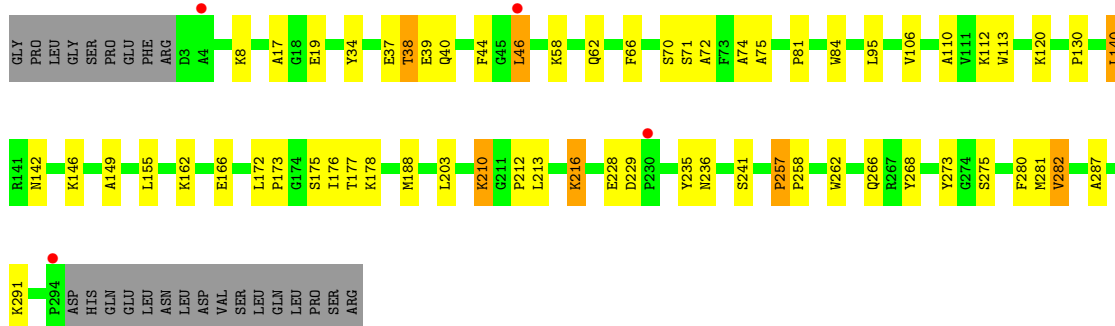
- Molecule 2: Complement C3d fragment

Chain B:  2% 74% 17% 8%

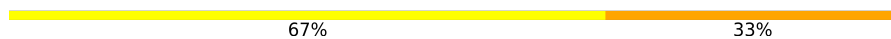


- Molecule 2: Complement C3d fragment

Chain C:  72% 18% 8%



- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-3)-beta-D-galactopyranose-(1-4)-beta-D-glucopyranose

Chain G:  67% 33%



- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-3)-beta-D-galactopyranose-(1-4)-beta-D-glucopyranose

Chain H:  33% 67%



- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-3)-beta-D-galactopyranose-(1-4)-beta-D-glucopyranose

Chain I:  100%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	75.46Å 82.54Å 85.75Å 112.50° 110.71° 99.98°	Depositor
Resolution (Å)	46.09 – 2.15 46.09 – 2.15	Depositor EDS
% Data completeness (in resolution range)	97.3 (46.09-2.15) 97.3 (46.09-2.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.45 (at 2.16Å)	Xtrriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.172 , 0.223 0.173 , 0.223	Depositor DCC
R_{free} test set	4408 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	40.2	Xtrriage
Anisotropy	0.399	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 42.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.013 for -h,-k,h+k+l	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	10510	wwPDB-VP
Average B, all atoms (Å ²)	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.56% 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: BGC, GOL, GAL, SIA

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	D	0.87	1/1023 (0.1%)	1.09	3/1388 (0.2%)
1	E	0.83	0/1030	0.98	0/1400
1	F	0.69	0/970	1.06	5/1325 (0.4%)
2	A	0.86	1/2406 (0.0%)	1.02	3/3259 (0.1%)
2	B	0.88	0/2333	1.02	6/3163 (0.2%)
2	C	0.73	0/2311	0.98	5/3138 (0.2%)
All	All	0.82	2/10073 (0.0%)	1.02	22/13673 (0.2%)

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
2	C	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	1113	PRO	CA-C	5.80	1.56	1.52
2	A	272	GLY	N-CA	5.54	1.51	1.45

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	15	SER	N-CA-C	9.88	122.12	111.36
1	F	1111	PRO	CA-C-N	9.44	126.55	119.66
1	F	1111	PRO	C-N-CA	9.44	126.55	119.66
2	C	172	LEU	CA-C-N	-8.12	111.36	119.56
2	C	172	LEU	C-N-CA	-8.12	111.36	119.56

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	229	ASP	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	D	997	0	961	15	0
1	E	1004	0	956	17	0
1	F	944	0	870	38	0
2	A	2356	0	2350	31	0
2	B	2287	0	2277	32	0
2	C	2262	0	2241	47	0
3	G	43	0	37	1	0
3	H	43	0	37	0	0
3	I	43	0	37	0	0
4	A	6	0	8	0	0
4	B	18	0	24	1	0
4	C	12	0	16	3	0
4	E	6	0	8	0	0
5	A	133	0	0	6	0
5	B	127	0	0	3	0
5	C	80	0	0	4	0
5	D	85	0	0	3	0
5	E	59	0	0	1	0
5	F	5	0	0	0	0
All	All	10510	0	9822	177	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 9.

The worst 5 of 177 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:E:1184:THR:HG22	1:E:1186:LYS:H	1.24	1.02

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:2:ARG:HG3	2:A:2:ARG:HH11	1.24	1.02
2:C:58:LYS:O	2:C:62:GLN:HG3	1.61	1.00
2:A:166[A]:GLU:HG3	5:A:570:HOH:O	1.73	0.86
2:A:155:LEU:HD21	2:A:206:MET:HE1	1.58	0.86

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	D	124/129 (96%)	121 (98%)	3 (2%)	0	100	100
1	E	126/129 (98%)	121 (96%)	5 (4%)	0	100	100
1	F	122/129 (95%)	107 (88%)	9 (7%)	6 (5%)	1	0
2	A	296/317 (93%)	288 (97%)	8 (3%)	0	100	100
2	B	286/317 (90%)	281 (98%)	5 (2%)	0	100	100
2	C	290/317 (92%)	272 (94%)	16 (6%)	2 (1%)	18	13
All	All	1244/1338 (93%)	1190 (96%)	46 (4%)	8 (1%)	21	15

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	1177	TYR
1	F	1212	HIS
1	F	1175	GLU
1	F	1202	LYS
1	F	1131	ALA

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	D	110/115 (96%)	108 (98%)	2 (2%)	51 58
1	E	110/115 (96%)	107 (97%)	3 (3%)	39 41
1	F	99/115 (86%)	85 (86%)	14 (14%)	3 1
2	A	247/264 (94%)	240 (97%)	7 (3%)	38 40
2	B	242/264 (92%)	232 (96%)	10 (4%)	27 26
2	C	232/264 (88%)	222 (96%)	10 (4%)	26 24
All	All	1040/1137 (92%)	994 (96%)	46 (4%)	25 23

5 of 46 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	222	LYS
1	E	1223	LEU
2	B	256	VAL
2	B	305	LEU
2	C	46	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	297	GLN
2	C	134	GLN
2	C	288	GLN
2	C	205	GLN
2	B	170	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

9 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
3	BGC	G	1	3	12,12,12	0.47	0	17,17,17	0.84	1 (5%)
3	GAL	G	2	3	11,11,12	0.56	0	15,15,17	1.12	1 (6%)
3	SIA	G	3	3	20,20,21	0.58	0	21,28,31	1.27	3 (14%)
3	BGC	H	1	3	12,12,12	0.52	0	17,17,17	0.50	0
3	GAL	H	2	3	11,11,12	0.52	0	15,15,17	1.37	4 (26%)
3	SIA	H	3	3	20,20,21	0.85	0	21,28,31	1.22	2 (9%)
3	BGC	I	1	3	12,12,12	0.57	0	17,17,17	0.97	2 (11%)
3	GAL	I	2	3	11,11,12	0.84	0	15,15,17	1.68	4 (26%)
3	SIA	I	3	3	20,20,21	0.70	0	21,28,31	1.13	2 (9%)

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	BGC	G	1	3	-	2/2/22/22	0/1/1/1
3	GAL	G	2	3	-	2/2/19/22	0/1/1/1
3	SIA	G	3	3	-	4/18/34/38	0/1/1/1
3	BGC	H	1	3	-	0/2/22/22	0/1/1/1
3	GAL	H	2	3	-	2/2/19/22	0/1/1/1
3	SIA	H	3	3	-	0/18/34/38	0/1/1/1
3	BGC	I	1	3	-	2/2/22/22	0/1/1/1
3	GAL	I	2	3	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	SIA	I	3	3	-	0/18/34/38	0/1/1/1

There are no bond length outliers.

The worst 5 of 19 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	I	2	GAL	O5-C5-C6	2.95	113.41	107.66
3	I	3	SIA	O6-C2-C3	-2.84	106.74	110.56
3	H	2	GAL	O5-C5-C6	2.80	113.10	107.66
3	G	2	GAL	C1-O5-C5	2.77	115.90	112.19
3	H	2	GAL	C2-C3-C4	2.77	115.73	110.86

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

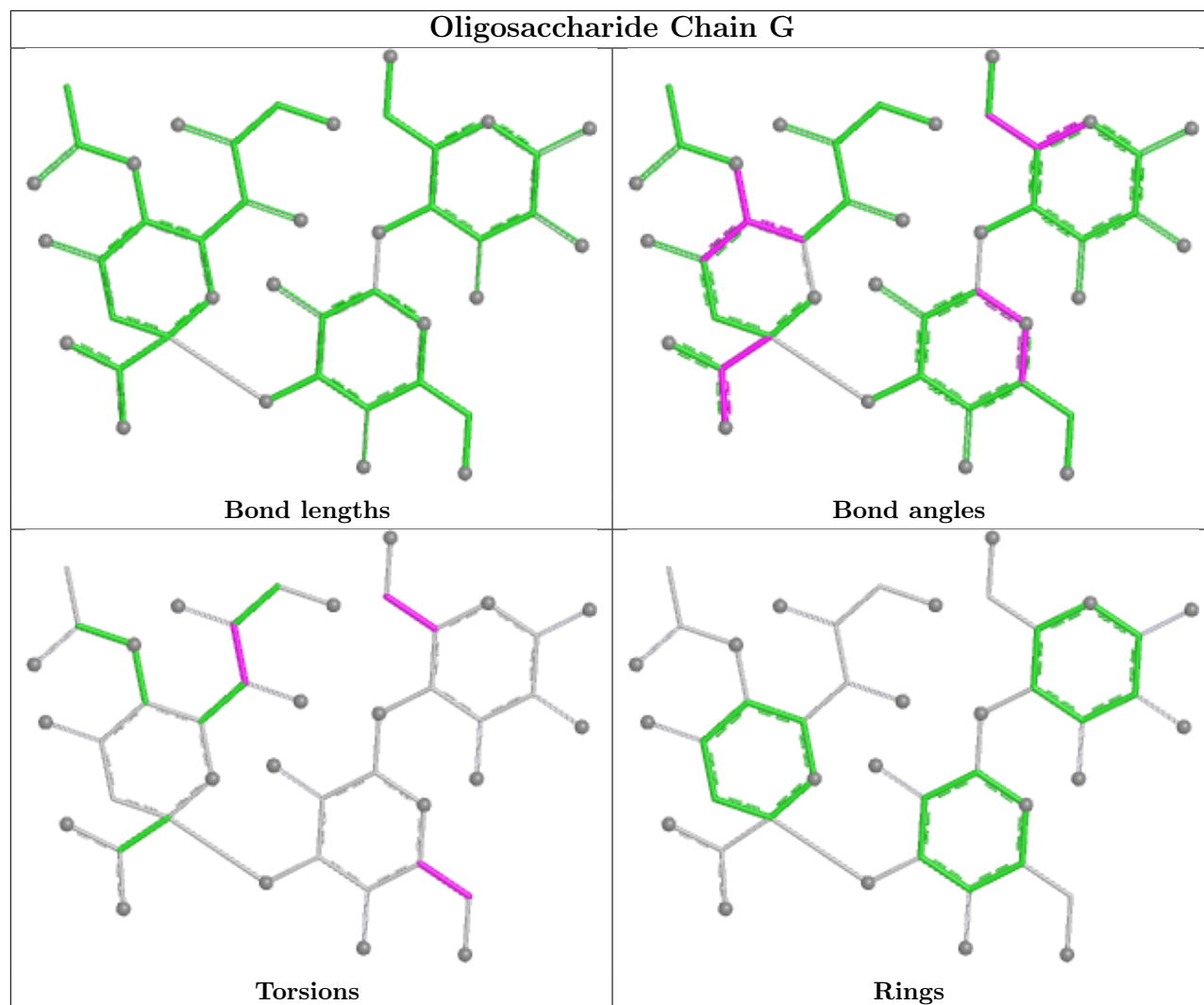
Mol	Chain	Res	Type	Atoms
3	H	2	GAL	O5-C5-C6-O6
3	G	1	BGC	O5-C5-C6-O6
3	H	2	GAL	C4-C5-C6-O6
3	G	2	GAL	C4-C5-C6-O6
3	G	1	BGC	C4-C5-C6-O6

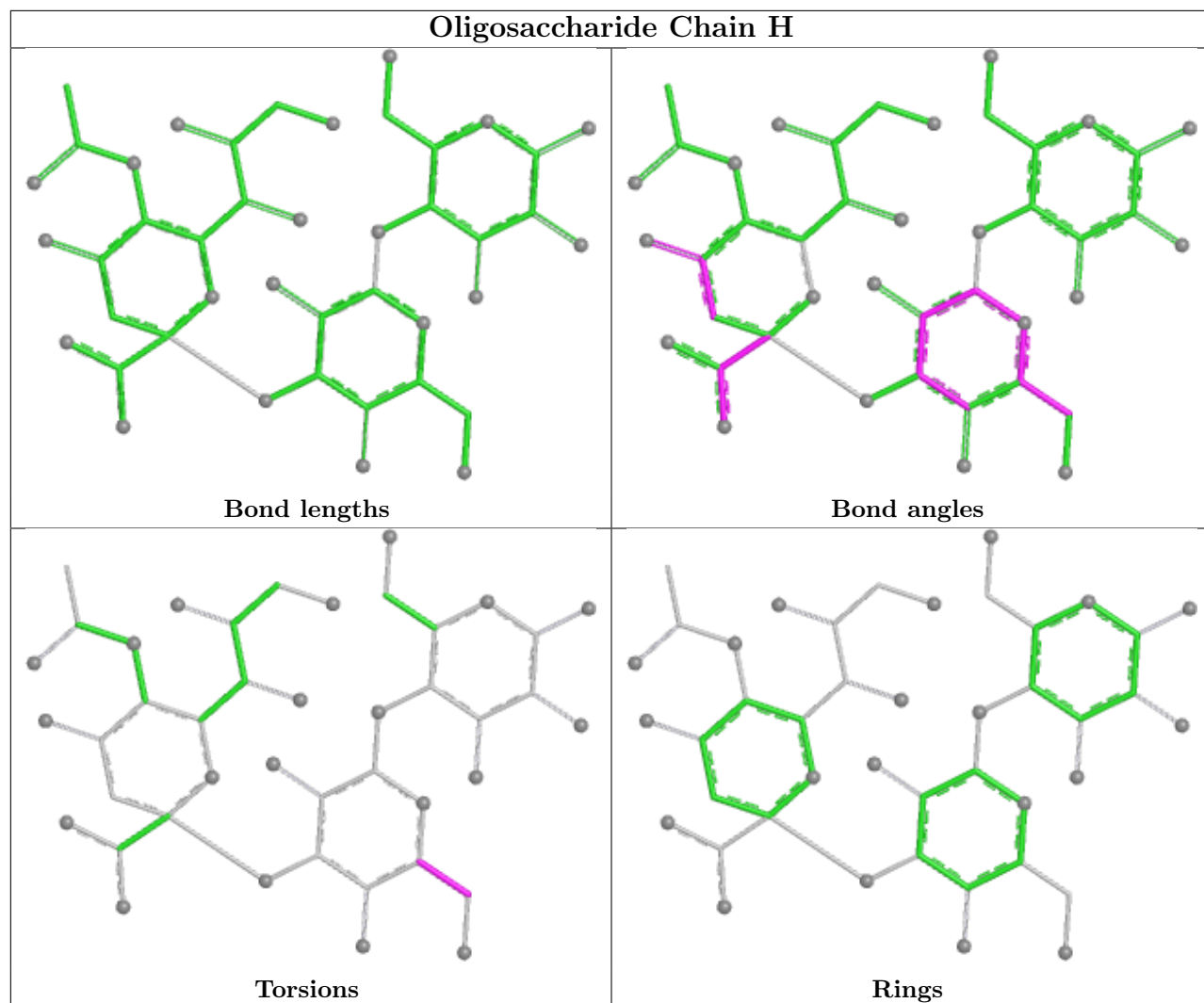
There are no ring outliers.

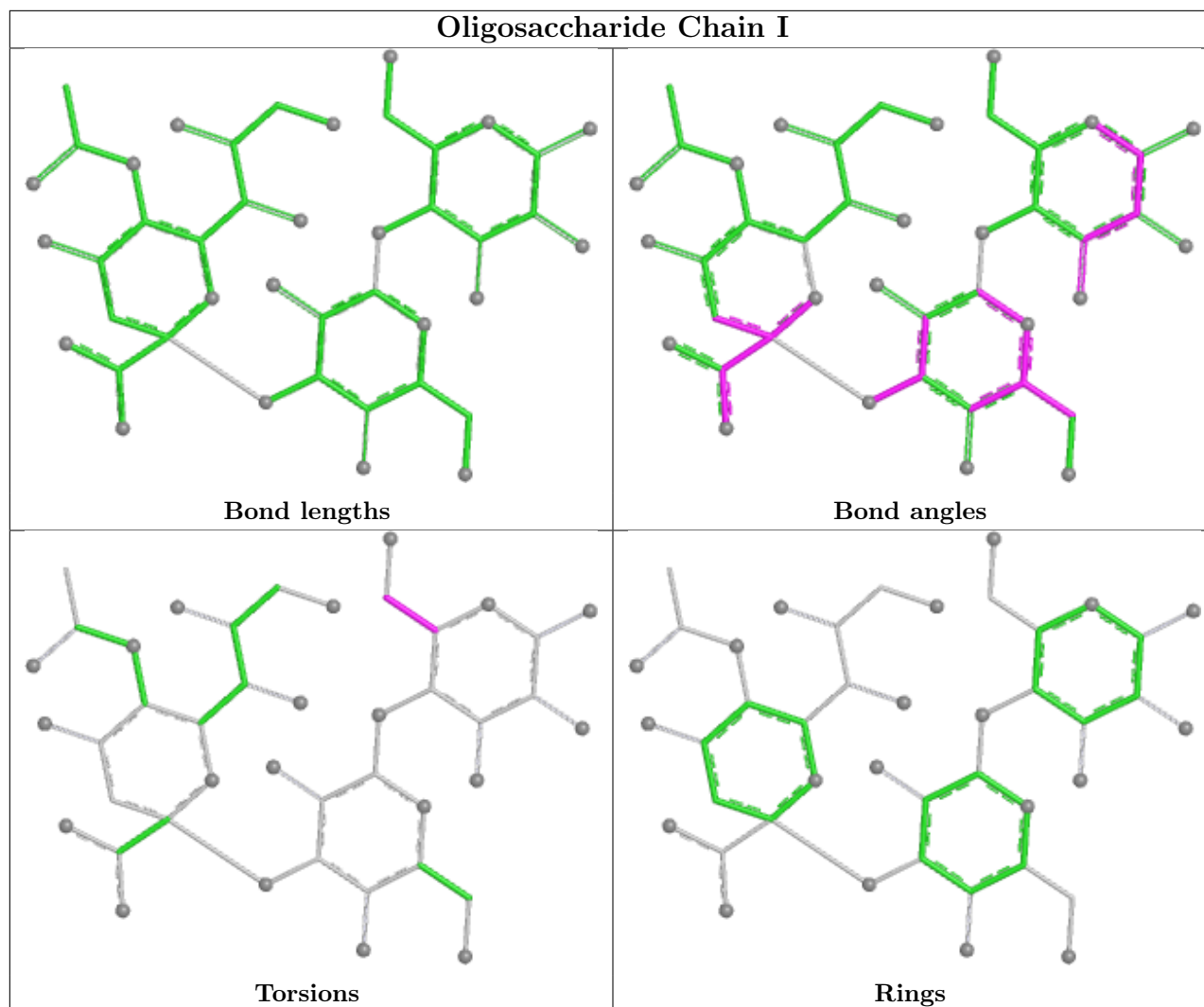
1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	3	SIA	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](#)

7 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$
4	GOL	B	402	-	5,5,5	0.56	0	5,5,5	0.46	0
4	GOL	A	401	-	5,5,5	0.87	0	5,5,5	2.18	1 (20%)
4	GOL	C	402	-	5,5,5	0.69	0	5,5,5	1.50	1 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	GOL	E	1304	-	5,5,5	0.40	0	5,5,5	0.33	0
4	GOL	B	401	-	5,5,5	0.41	0	5,5,5	1.05	0
4	GOL	C	401	-	5,5,5	0.32	0	5,5,5	0.33	0
4	GOL	B	403	-	5,5,5	0.32	0	5,5,5	0.51	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
4	GOL	B	402	-	-	2/4/4/4	-
4	GOL	A	401	-	-	2/4/4/4	-
4	GOL	C	402	-	-	2/4/4/4	-
4	GOL	E	1304	-	-	2/4/4/4	-
4	GOL	B	401	-	-	2/4/4/4	-
4	GOL	C	401	-	-	1/4/4/4	-
4	GOL	B	403	-	-	4/4/4/4	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	401	GOL	C3-C2-C1	-4.56	95.07	111.80
4	C	402	GOL	C3-C2-C1	-2.98	100.86	111.80

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	401	GOL	C1-C2-C3-O3
4	A	401	GOL	O2-C2-C3-O3
4	B	402	GOL	O1-C1-C2-C3
4	B	403	GOL	O1-C1-C2-C3
4	C	402	GOL	C1-C2-C3-O3

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	402	GOL	2	0
4	C	401	GOL	1	0
4	B	403	GOL	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	D	126/129 (97%)	-0.30	1 (0%) 82 84	34, 47, 78, 98	0
1	E	126/129 (97%)	-0.02	4 (3%) 50 54	23, 56, 92, 137	2 (1%)
1	F	124/129 (96%)	0.86	11 (8%) 15 17	46, 96, 133, 149	0
2	A	295/317 (93%)	-0.44	3 (1%) 79 82	21, 43, 72, 124	3 (1%)
2	B	292/317 (92%)	-0.32	6 (2%) 63 67	29, 48, 79, 112	0
2	C	292/317 (92%)	0.01	4 (1%) 73 77	37, 61, 106, 133	0
All	All	1255/1338 (93%)	-0.12	29 (2%) 61 64	21, 53, 107, 149	5 (0%)

The worst 5 of 29 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	301	LEU	4.1
1	E	1106	PHE	3.9
1	D	1106	PHE	3.8
2	A	294	PRO	3.8
1	F	1180	ALA	3.2

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

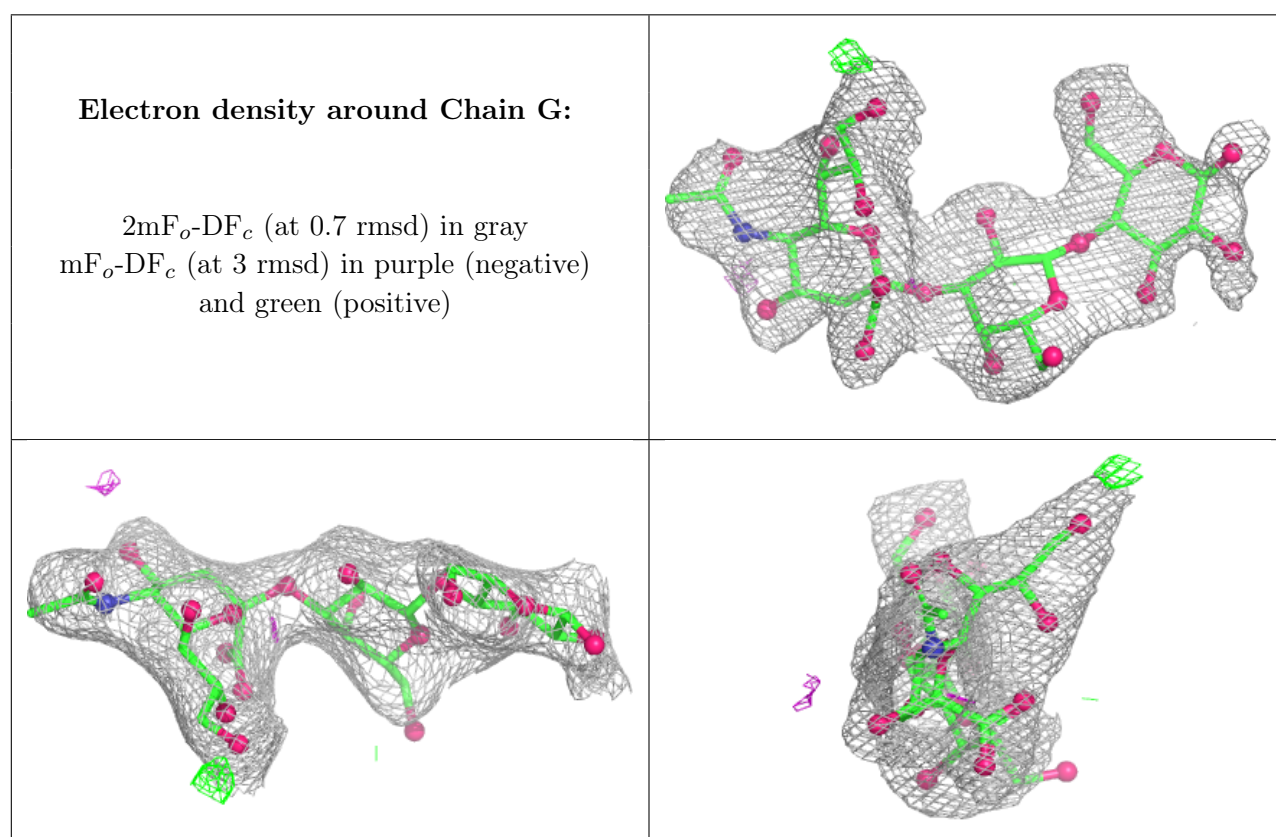
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

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

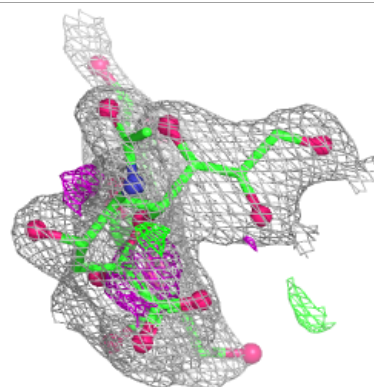
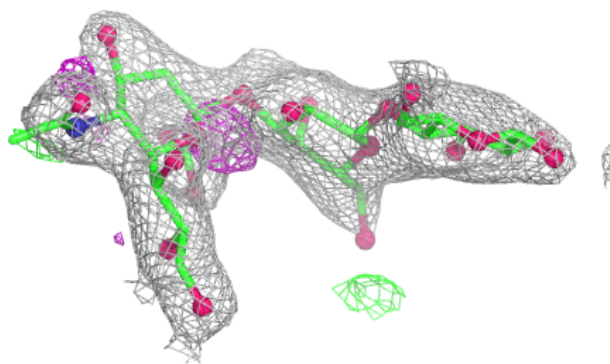
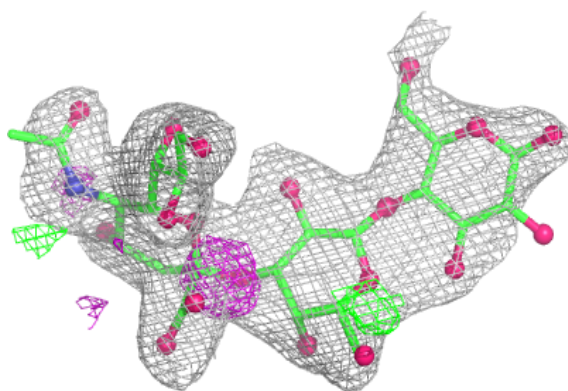
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	BGC	G	1	12/12	0.69	0.10	86,129,135,141	0
3	BGC	H	1	12/12	0.81	0.10	94,105,116,125	0
3	GAL	G	2	11/12	0.84	0.08	100,109,117,120	0
3	GAL	H	2	11/12	0.85	0.08	76,85,91,91	0
3	BGC	I	1	12/12	0.88	0.10	65,79,88,98	0
3	SIA	H	3	20/21	0.93	0.09	42,79,98,101	0
3	SIA	G	3	20/21	0.93	0.08	74,89,108,110	0
3	GAL	I	2	11/12	0.95	0.06	58,62,65,70	0
3	SIA	I	3	20/21	0.96	0.06	44,53,61,67	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.

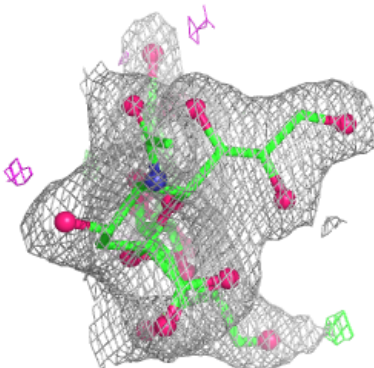
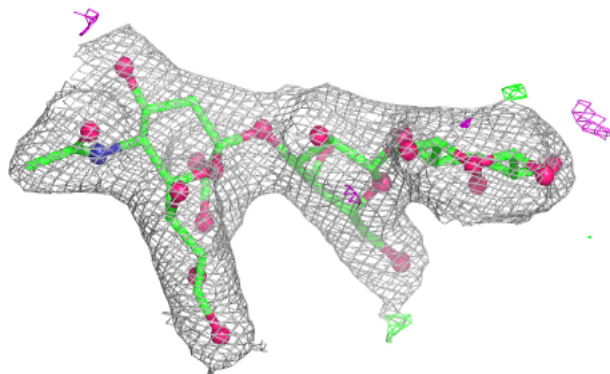
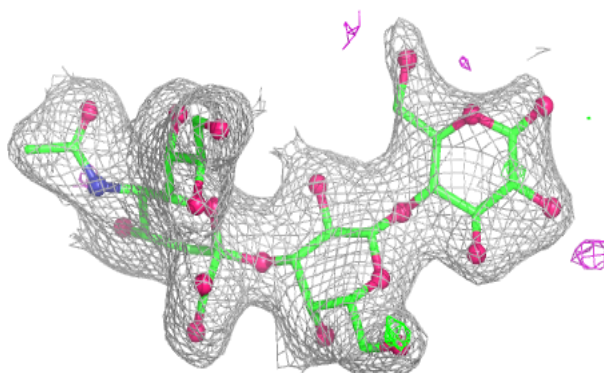


Electron density around Chain H:

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

**Electron density around Chain I:**

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



6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	GOL	B	401	6/6	0.88	0.15	67,75,80,81	0
4	GOL	B	402	6/6	0.90	0.14	64,70,79,90	0
4	GOL	E	1304	6/6	0.93	0.11	64,69,76,77	0
4	GOL	C	401	6/6	0.93	0.12	69,90,102,105	0
4	GOL	C	402	6/6	0.94	0.10	45,55,66,70	0
4	GOL	A	401	6/6	0.95	0.10	33,45,49,74	0
4	GOL	B	403	6/6	0.97	0.12	37,47,49,63	0

6.5 Other polymers [i](#)

There are no such residues in this entry.