



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 06:07 AM UTC

PDB ID : 4FQI / pdb_00004fqi
Title : Crystal Structure of Fab CR9114 in Complex with a H5N1 influenza virus hemagglutinin
Authors : Dreyfus, C.; Wilson, I.A.
Deposited on : 2012-06-25
Resolution : 1.71 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

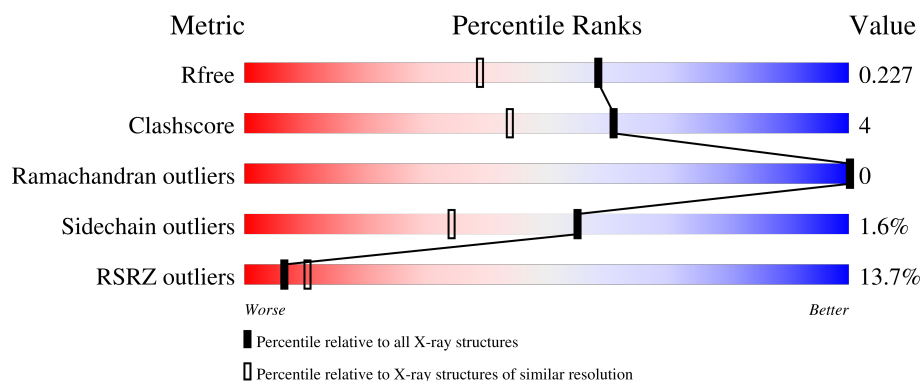
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.71 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	1039 (1.72-1.72)
Clashscore	190562	1049 (1.72-1.72)
Ramachandran outliers	187476	1041 (1.72-1.72)
Sidechain outliers	187428	1041 (1.72-1.72)
RSRZ outliers	180081	1039 (1.72-1.72)

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	334	4% 87% 10% .
2	B	177	3% 90% 9% .
3	H	230	17% 88% 5% 7% .
4	L	216	33% 86% 11% ..
5	C	2	50% 50%

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
6	EDO	A	404	-	-	X	-

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 8532 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 HA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	324	Total	C	N	O	S	0	12	0
			2658	1677	462	504	15			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	ALA	-	expression tag	UNP Q6DQ33
A	8	ASP	-	expression tag	UNP Q6DQ33
A	9	PRO	-	expression tag	UNP Q6DQ33
A	10	GLY	-	expression tag	UNP Q6DQ33

- Molecule 2 is a protein called Hemagglutinin HA2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	176	Total	C	N	O	S	0	9	0
			1487	925	255	298	9			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	175	SER	-	expression tag	UNP Q6DQ33
B	176	GLY	-	expression tag	UNP Q6DQ33
B	177	ARG	-	expression tag	UNP Q6DQ33

- Molecule 3 is a protein called antibody CR9114 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	H	215	Total	C	N	O	S	0	2	0
			1608	1013	268	320	7			

- Molecule 4 is a protein called antibody CR9114 light chain.

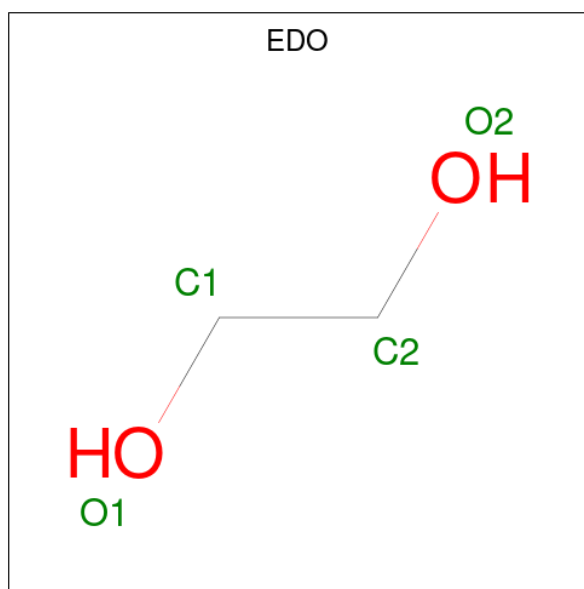
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	L	211	Total	C	N	O	S	0	0	0
			1568	978	266	320	4			

- Molecule 5 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
5	C	2	Total	C	N	O		0	0	0
			28	16	2	10				

- Molecule 6 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



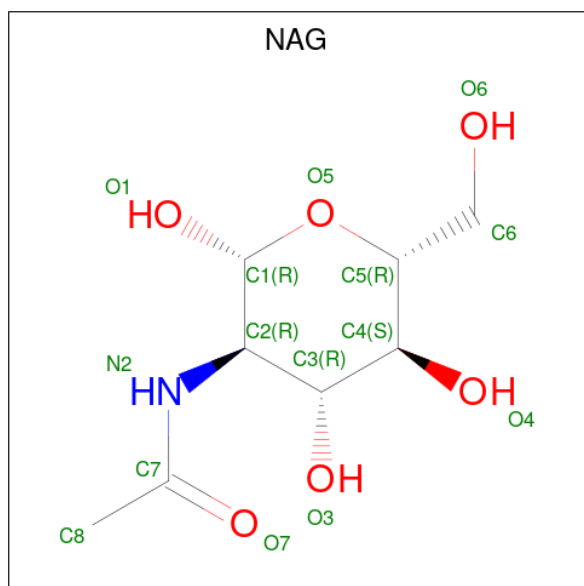
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		
6	A	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	B	1	Total	C	O	0	0
			4	2	2		
6	H	1	Total	C	O	0	0
			4	2	2		

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



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

- Molecule 8 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



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

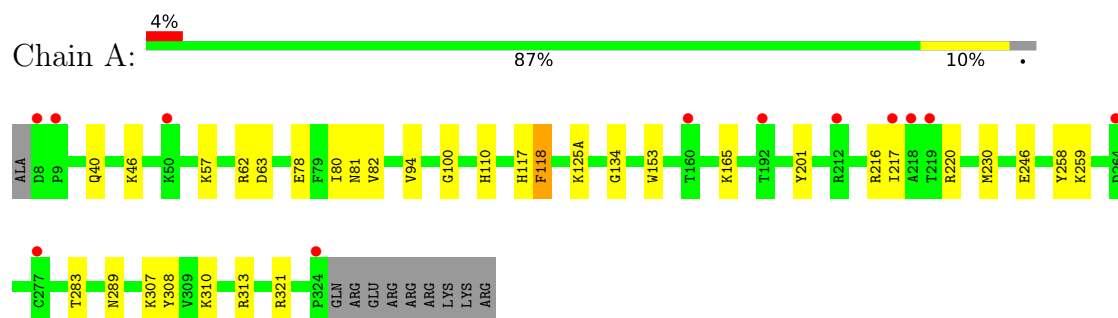
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	474	Total	O	0	0
			474	474		
9	B	242	Total	O	0	0
			242	242		
9	H	239	Total	O	0	0
			239	239		
9	L	136	Total	O	0	0
			136	136		

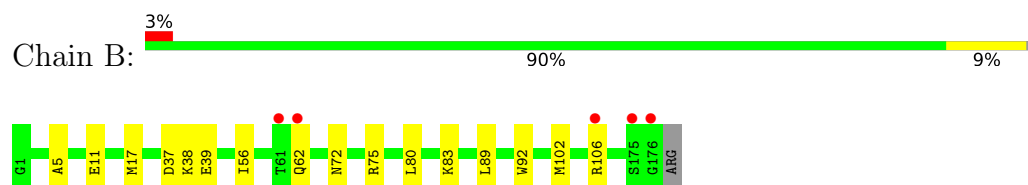
3 Residue-property plots [i](#)

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.

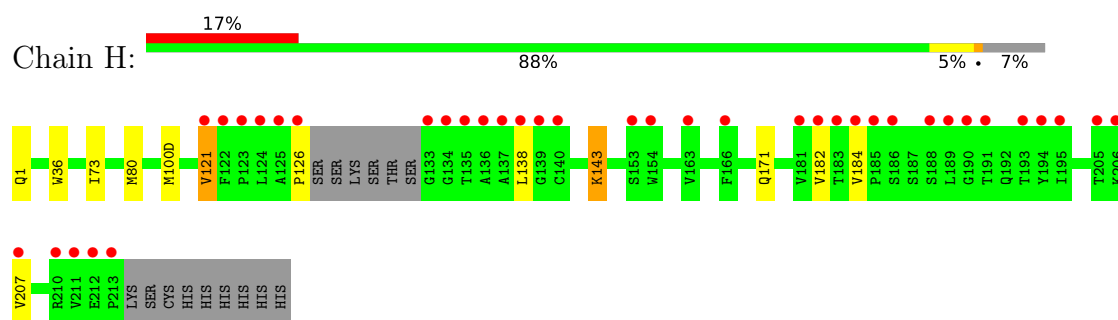
• Molecule 1: Hemagglutinin HA1



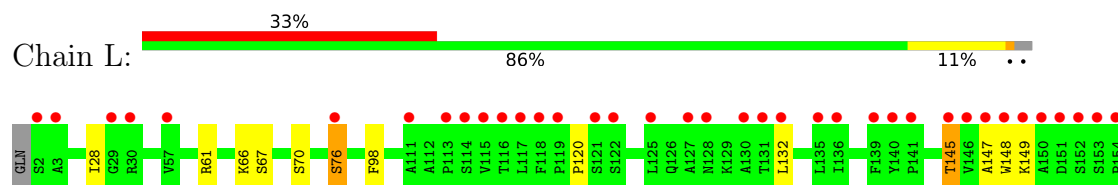
• Molecule 2: Hemagglutinin HA2

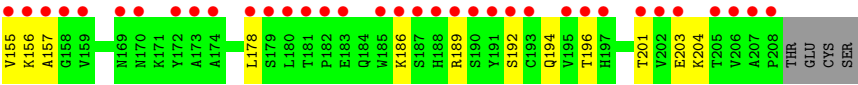


• Molecule 3: antibody CR9114 heavy chain



• Molecule 4: antibody CR9114 light chain





- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α , β , γ	141.64Å 141.64Å 382.92Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	36.55 – 1.71 36.55 – 1.71	Depositor EDS
% Data completeness (in resolution range)	98.9 (36.55-1.71) 86.9 (36.55-1.71)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.17 (at 1.71Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.7.2_869)	Depositor
R, R_{free}	0.198 , 0.232 0.195 , 0.227	Depositor DCC
R_{free} test set	7944 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	24.9	Xtriage
Anisotropy	0.018	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 43.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	8532	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.62% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, EDO, GOL

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	1.08	1/2740 (0.0%)	1.04	2/3719 (0.1%)
2	B	1.07	1/1526 (0.1%)	1.06	0/2048
3	H	0.95	0/1647	1.03	1/2245 (0.0%)
4	L	0.79	0/1606	0.91	1/2193 (0.0%)
All	All	1.00	2/7519 (0.0%)	1.02	4/10205 (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
1	A	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	117	HIS	C-N	19.25	1.60	1.33
2	B	5	ALA	CA-CB	5.86	1.60	1.53

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	117	HIS	CA-C-N	-5.21	113.66	122.67
1	A	117	HIS	C-N-CA	-5.21	113.66	122.67
4	L	76	SER	N-CA-C	-5.09	102.95	110.48
3	H	143	LYS	N-CA-C	5.04	118.02	109.76

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	118	PHE	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	2658	0	2599	29	0
2	B	1487	0	1395	12	0
3	H	1608	0	1556	12	0
4	L	1568	0	1517	15	0
5	C	28	0	25	0	0
6	A	20	0	30	7	0
6	B	20	0	30	3	0
6	H	4	0	6	0	0
7	A	28	0	26	0	0
7	B	14	0	13	0	0
8	B	6	0	8	0	0
9	A	474	0	0	10	0
9	B	242	0	0	0	0
9	H	239	0	0	2	0
9	L	136	0	0	1	0
All	All	8532	0	7205	62	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (62) 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:A:82:VAL:H	6:A:404:EDO:H22	1.31	0.92
2:B:38[B]:LYS:HG2	6:B:206:EDO:H11	1.62	0.81
1:A:258:TYR:HE2	6:A:404:EDO:H12	1.43	0.80
1:A:82:VAL:N	6:A:404:EDO:H22	1.99	0.77
1:A:118:PHE:CD1	1:A:258:TYR:HB3	2.21	0.75
2:B:38[A]:LYS:HG2	6:B:206:EDO:H11	1.68	0.74
3:H:126:PRO:HG3	3:H:138:LEU:HB3	1.77	0.66
4:L:132:LEU:HB2	4:L:178:LEU:HB3	1.76	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:307:LYS:HD2	2:B:62:GLN:HG2	1.76	0.65
2:B:102:MET:HE3	2:B:106:ARG:NH2	2.12	0.64
4:L:149:LYS:HB2	4:L:192:SER:HB2	1.79	0.62
4:L:66:LYS:NZ	9:L:422:HOH:O	2.32	0.61
4:L:145:THR:HG22	4:L:196:THR:OG1	2.00	0.60
1:A:289[A]:ASN:ND2	9:A:662:HOH:O	2.27	0.60
2:B:72:ASN:OD1	2:B:75:ARG:NH2	2.35	0.60
3:H:121:VAL:HG11	3:H:207:VAL:HG11	1.84	0.58
2:B:37:ASP:HA	6:B:206:EDO:H21	1.87	0.57
1:A:259:LYS:NZ	9:A:731:HOH:O	2.40	0.54
1:A:110:HIS:ND1	9:A:771:HOH:O	2.34	0.54
3:H:121:VAL:CG1	3:H:207:VAL:HG11	2.38	0.54
3:H:143:LYS:NZ	9:H:627:HOH:O	2.45	0.50
1:A:201:TYR:OH	1:A:246:GLU:OE1	2.23	0.50
4:L:148:TRP:HB2	4:L:155:VAL:CG1	2.42	0.50
1:A:40[A]:GLN:HG2	3:H:73:ILE:HD11	1.95	0.49
4:L:61:ARG:HB2	4:L:76:SER:O	2.13	0.49
2:B:62:GLN:HB2	2:B:92:TRP:CD2	2.48	0.48
1:A:134:GLY:HA3	1:A:153:TRP:HB3	1.96	0.48
1:A:57:LYS:NZ	9:A:521:HOH:O	2.47	0.48
3:H:171:GLN:NE2	9:H:552:HOH:O	2.47	0.48
1:A:80:ILE:O	6:A:404:EDO:H11	2.13	0.47
4:L:155:VAL:HG22	4:L:157:ALA:H	1.78	0.47
1:A:216:ARG:O	1:A:220:ARG:NH2	2.48	0.47
3:H:1:GLN:OE1	3:H:1:GLN:N	2.42	0.46
3:H:100(D):MET:HE1	4:L:98:PHE:HZ	1.80	0.45
2:B:106:ARG:HG3	2:B:106:ARG:HH11	1.82	0.45
3:H:36:TRP:CE2	3:H:80:MET:HB2	2.51	0.45
1:A:321[A]:ARG:HG2	9:A:675:HOH:O	2.16	0.45
4:L:28:ILE:O	4:L:66:LYS:HE3	2.17	0.45
4:L:203:GLU:O	4:L:204:LYS:HG2	2.18	0.44
1:A:63:ASP:HB3	1:A:94:VAL:HG22	2.00	0.44
1:A:82:VAL:HG22	6:A:404:EDO:H21	1.99	0.44
1:A:308:TYR:HE2	2:B:89[A]:LEU:HD21	1.83	0.44
1:A:258:TYR:CE2	6:A:404:EDO:H12	2.35	0.44
4:L:148:TRP:HB2	4:L:155:VAL:HG11	2.00	0.44
1:A:46:LYS:NZ	9:A:714:HOH:O	2.51	0.44
1:A:81:ASN:HA	6:A:404:EDO:H11	2.01	0.43
1:A:62:ARG:HD3	1:A:78:GLU:OE2	2.19	0.43
1:A:100:GLY:HA3	1:A:230:MET:O	2.19	0.43
3:H:80:MET:HE3	3:H:80:MET:HB3	1.99	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:121:VAL:HG11	3:H:207:VAL:CG1	2.49	0.42
2:B:80:LEU:C	2:B:80:LEU:HD23	2.45	0.42
4:L:196:THR:HG22	4:L:201:THR:OG1	2.18	0.42
1:A:310:LYS:HE3	2:B:89[A]:LEU:HG	2.01	0.42
1:A:125(A):LYS:NZ	9:A:845:HOH:O	2.53	0.42
1:A:310:LYS:HE3	2:B:89[A]:LEU:CD2	2.50	0.41
1:A:165:LYS:NZ	9:A:940:HOH:O	2.54	0.41
4:L:147:ALA:HB3	4:L:194:GLN:HB2	2.03	0.41
1:A:321[D]:ARG:HD3	9:A:846:HOH:O	2.21	0.40
1:A:313:ARG:NH2	9:A:762:HOH:O	2.55	0.40
3:H:182:VAL:HG22	3:H:184:VAL:HG13	2.03	0.40
4:L:120:PRO:HD3	4:L:132:LEU:HG	2.03	0.40
4:L:156:LYS:HE3	4:L:156:LYS:HB2	1.72	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	334/334 (100%)	325 (97%)	9 (3%)	0	100	100
2	B	183/177 (103%)	180 (98%)	3 (2%)	0	100	100
3	H	213/230 (93%)	211 (99%)	2 (1%)	0	100	100
4	L	209/216 (97%)	204 (98%)	5 (2%)	0	100	100
All	All	939/957 (98%)	920 (98%)	19 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	303/300 (101%)	301 (99%)	2 (1%)	76	64
2	B	159/151 (105%)	153 (96%)	6 (4%)	29	8
3	H	180/193 (93%)	179 (99%)	1 (1%)	78	68
4	L	175/180 (97%)	170 (97%)	5 (3%)	37	14
All	All	817/824 (99%)	803 (98%)	14 (2%)	55	31

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

Mol	Chain	Res	Type
1	A	217	ILE
1	A	283	THR
2	B	11	GLU
2	B	17	MET
2	B	39[A]	GLU
2	B	39[B]	GLU
2	B	56	ILE
2	B	83	LYS
3	H	121	VAL
4	L	67	SER
4	L	70	SER
4	L	145	THR
4	L	186	LYS
4	L	189	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	122	GLN
1	A	150	ASN
3	H	192	GLN
4	L	108	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 ⓘ

2 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	$\# Z > 2$
5	NAG	C	1	5,1	14,14,15	0.68	0	17,19,21	1.75	3 (17%)
5	NAG	C	2	5	14,14,15	0.48	0	17,19,21	0.89	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	1	5,1	-	1/6/23/26	0/1/1/1
5	NAG	C	2	5	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	1	NAG	C1-O5-C5	5.83	120.00	112.19
5	C	1	NAG	C6-C5-C4	-2.28	107.43	113.02
5	C	1	NAG	C1-C2-N2	2.01	113.60	110.43

There are no chirality outliers.

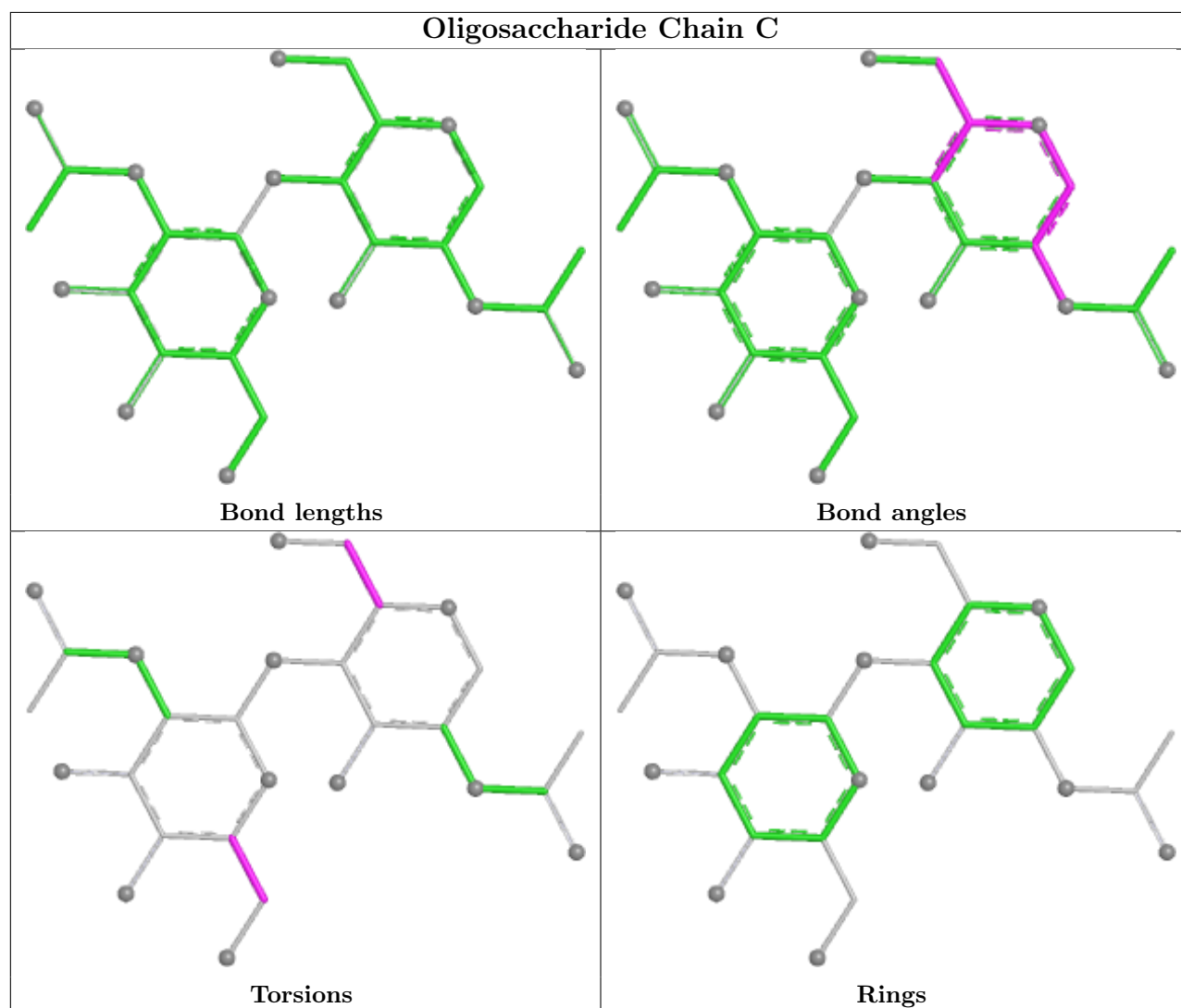
All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	2	NAG	C4-C5-C6-O6
5	C	2	NAG	O5-C5-C6-O6
5	C	1	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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](#)

15 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	EDO	A	401	-	3,3,3	0.46	0	2,2,2	0.29	0
6	EDO	H	301	-	3,3,3	0.86	0	2,2,2	0.64	0
6	EDO	B	204	-	3,3,3	0.48	0	2,2,2	0.63	0
8	GOL	B	201	-	5,5,5	0.21	0	5,5,5	0.77	0
6	EDO	B	205	-	3,3,3	0.56	0	2,2,2	0.60	0
6	EDO	B	206	-	3,3,3	0.78	0	2,2,2	0.78	0
6	EDO	B	203	-	3,3,3	0.47	0	2,2,2	0.43	0
7	NAG	B	207	2	14,14,15	0.87	1 (7%)	17,19,21	1.80	3 (17%)
6	EDO	A	404	-	3,3,3	0.44	0	2,2,2	0.59	0
6	EDO	B	202	-	3,3,3	0.34	0	2,2,2	0.77	0
7	NAG	A	409	1	14,14,15	0.56	0	17,19,21	1.20	3 (17%)
6	EDO	A	403	-	3,3,3	0.34	0	2,2,2	0.56	0
7	NAG	A	405	1	14,14,15	0.47	0	17,19,21	0.88	1 (5%)
6	EDO	A	402	-	3,3,3	0.72	0	2,2,2	0.65	0
6	EDO	A	406	-	3,3,3	0.45	0	2,2,2	0.64	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	EDO	A	401	-	-	0/1/1/1	-
6	EDO	H	301	-	-	1/1/1/1	-
6	EDO	B	204	-	-	1/1/1/1	-
8	GOL	B	201	-	-	2/4/4/4	-
6	EDO	B	205	-	-	0/1/1/1	-
6	EDO	B	206	-	-	1/1/1/1	-
6	EDO	B	203	-	-	0/1/1/1	-
7	NAG	B	207	2	-	2/6/23/26	0/1/1/1
6	EDO	A	404	-	-	1/1/1/1	-
6	EDO	B	202	-	-	1/1/1/1	-
7	NAG	A	409	1	-	0/6/23/26	0/1/1/1
6	EDO	A	403	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	NAG	A	405	1	-	1/6/23/26	0/1/1/1
6	EDO	A	402	-	-	1/1/1/1	-
6	EDO	A	406	-	-	1/1/1/1	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	B	207	NAG	O5-C1	-2.07	1.40	1.43

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	207	NAG	C1-O5-C5	5.63	119.73	112.19
7	A	409	NAG	C1-O5-C5	2.58	115.64	112.19
7	A	405	NAG	C2-N2-C7	-2.52	119.52	122.90
7	A	409	NAG	C6-C5-C4	-2.13	107.80	113.02
7	B	207	NAG	C2-N2-C7	2.08	125.69	122.90
7	A	409	NAG	O5-C5-C6	2.07	111.70	107.66
7	B	207	NAG	C6-C5-C4	-2.07	107.94	113.02

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	B	207	NAG	O5-C5-C6-O6
7	B	207	NAG	C4-C5-C6-O6
8	B	201	GOL	O1-C1-C2-C3
6	A	403	EDO	O1-C1-C2-O2
6	B	206	EDO	O1-C1-C2-O2
8	B	201	GOL	O1-C1-C2-O2
6	A	406	EDO	O1-C1-C2-O2
7	A	405	NAG	C4-C5-C6-O6
6	A	404	EDO	O1-C1-C2-O2
6	B	202	EDO	O1-C1-C2-O2
6	B	204	EDO	O1-C1-C2-O2
6	A	402	EDO	O1-C1-C2-O2
6	H	301	EDO	O1-C1-C2-O2

There are no ring outliers.

2 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	206	EDO	3	0
6	A	404	EDO	7	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

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	324/334 (97%)	0.14	12 (3%) 45 53	10, 28, 45, 83	12 (3%)
2	B	176/177 (99%)	-0.02	5 (2%) 55 63	12, 25, 44, 60	9 (5%)
3	H	215/230 (93%)	0.67	38 (17%) 4 6	11, 29, 80, 100	2 (0%)
4	L	211/216 (97%)	1.47	72 (34%) 1 2	20, 46, 93, 101	0
All	All	926/957 (96%)	0.54	127 (13%) 6 10	10, 30, 75, 101	23 (2%)

All (127) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	H	195	ILE	6.6
3	H	133	GLY	5.9
3	H	137	ALA	5.7
3	H	136	ALA	5.3
1	A	218	ALA	5.3
4	L	180	LEU	4.7
4	L	208	PRO	4.5
4	L	193	CYS	4.5
4	L	182	PRO	4.5
4	L	155	VAL	4.4
3	H	134	GLY	4.4
3	H	206	LYS	4.4
4	L	154	PRO	4.3
3	H	188	SER	4.3
4	L	130	ALA	4.2
4	L	185	TRP	4.2
3	H	138	LEU	4.2
4	L	186	LYS	4.1
4	L	150	ALA	4.0
4	L	157	ALA	4.0
4	L	188	HIS	4.0

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Mol	Chain	Res	Type	RSRZ
3	H	189	LEU	4.0
4	L	206	VAL	3.8
1	A	217	ILE	3.8
3	H	184	VAL	3.7
4	L	178	LEU	3.7
4	L	2	SER	3.7
4	L	115	VAL	3.6
4	L	148	TRP	3.6
3	H	211	VAL	3.5
4	L	153	SER	3.4
4	L	149	LYS	3.4
4	L	207	ALA	3.4
4	L	145	THR	3.4
3	H	125	ALA	3.4
2	B	176	GLY	3.4
4	L	125	LEU	3.3
4	L	181	THR	3.3
3	H	213	PRO	3.3
3	H	121	VAL	3.3
3	H	190	GLY	3.2
3	H	194	TYR	3.2
3	H	191	THR	3.2
3	H	126	PRO	3.2
4	L	132	LEU	3.2
3	H	185	PRO	3.2
1	A	324	PRO	3.2
2	B	61	THR	3.2
4	L	191	TYR	3.1
3	H	122	PHE	3.1
3	H	124	LEU	3.1
1	A	277	CYS	3.1
4	L	187	SER	3.1
4	L	119	PRO	3.0
4	L	202	VAL	3.0
3	H	193	THR	3.0
4	L	172	TYR	3.0
4	L	117	LEU	3.0
4	L	201	THR	2.9
4	L	158	GLY	2.9
4	L	151	ASP	2.9
4	L	139	PHE	2.9
4	L	116	THR	2.9

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Mol	Chain	Res	Type	RSRZ
4	L	159	VAL	2.9
4	L	174	ALA	2.9
4	L	179	SER	2.9
3	H	135	THR	2.8
3	H	207	VAL	2.8
4	L	195	VAL	2.8
3	H	140	CYS	2.7
4	L	156	LYS	2.7
4	L	190	SER	2.7
4	L	203	GLU	2.7
3	H	166	PHE	2.7
4	L	127	ALA	2.7
4	L	147	ALA	2.7
3	H	181	VAL	2.6
4	L	196	THR	2.6
4	L	146	VAL	2.6
3	H	186	SER	2.6
4	L	118	PHE	2.5
3	H	123	PRO	2.5
1	A	8	ASP	2.5
1	A	160	THR	2.5
1	A	219	THR	2.5
4	L	192	SER	2.5
2	B	106	ARG	2.5
4	L	152	SER	2.4
4	L	170	ASN	2.4
4	L	114	SER	2.4
4	L	131	THR	2.4
4	L	140	TYR	2.4
3	H	163	VAL	2.4
1	A	9	PRO	2.4
2	B	62	GLN	2.4
4	L	111	ALA	2.4
3	H	183	THR	2.4
4	L	136	ILE	2.3
4	L	121	SER	2.3
4	L	183	GLU	2.3
3	H	154	TRP	2.3
3	H	182	VAL	2.3
4	L	30	ARG	2.3
3	H	139	GLY	2.3
1	A	264	ASP	2.3

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Mol	Chain	Res	Type	RSRZ
4	L	3	ALA	2.3
4	L	173	ALA	2.3
4	L	197	HIS	2.3
3	H	212	GLU	2.3
4	L	122	SER	2.3
4	L	189	ARG	2.3
4	L	205	THR	2.2
3	H	210	ARG	2.2
4	L	141	PRO	2.2
4	L	29	GLY	2.2
4	L	169	ASN	2.1
4	L	76	SER	2.1
4	L	135	LEU	2.1
3	H	205	THR	2.1
1	A	50	LYS	2.1
4	L	128	ASN	2.0
1	A	212[A]	ARG	2.0
2	B	175	SER	2.0
1	A	192	THR	2.0
4	L	113	PRO	2.0
3	H	153	SER	2.0
4	L	57	VAL	2.0

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

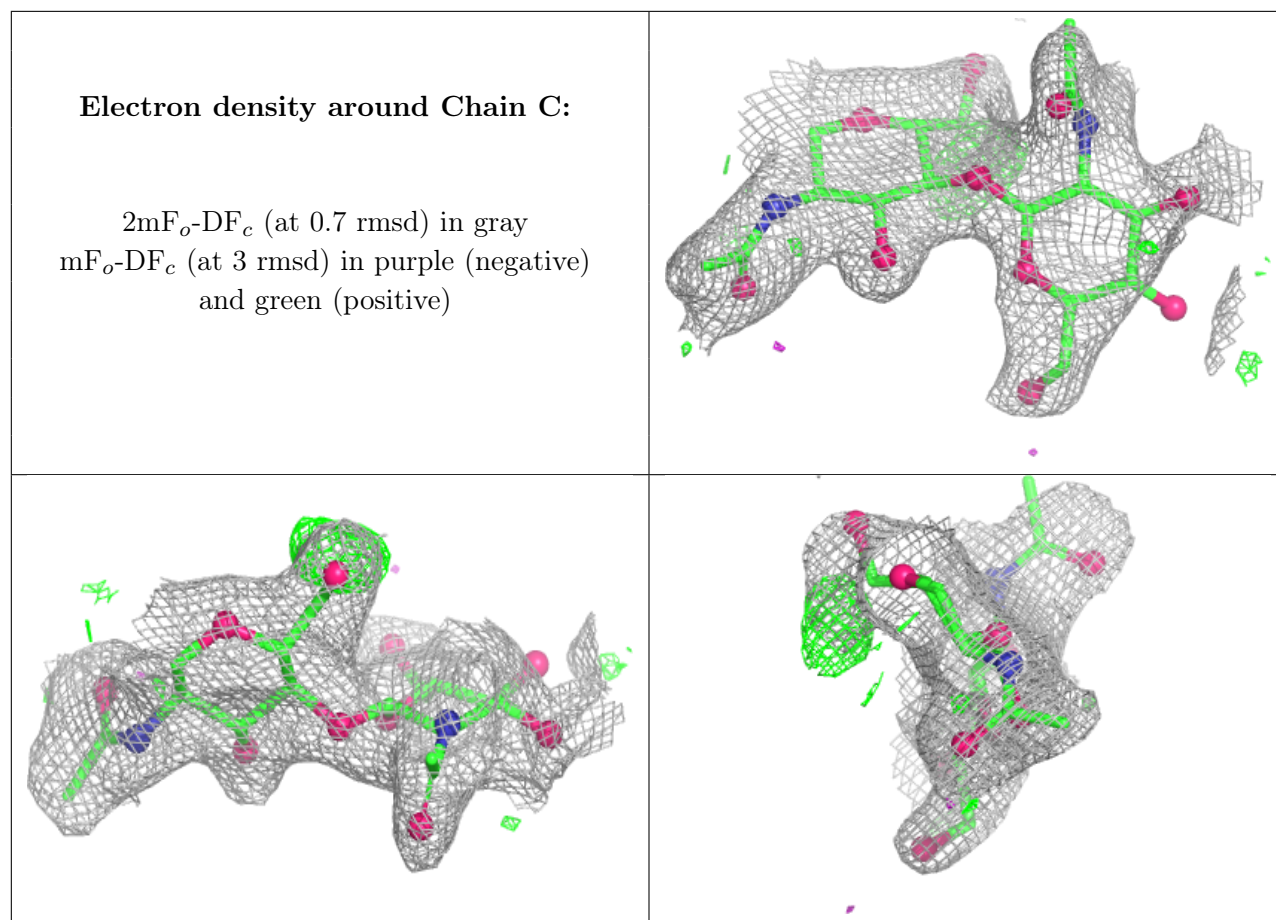
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	NAG	C	1	14/15	-	-	33,43,60,72	0
5	NAG	C	2	14/15	-	-	67,74,83,93	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.



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
6	EDO	B	203	4/4	0.43	0.21	70,89,100,101	0
7	NAG	A	409	14/15	0.75	0.15	54,66,79,84	0
7	NAG	A	405	14/15	0.76	0.15	41,63,82,86	0
7	NAG	B	207	14/15	0.81	0.12	40,58,66,67	0
6	EDO	A	404	4/4	0.86	0.29	33,36,42,43	0
6	EDO	B	202	4/4	0.86	0.17	46,46,54,69	0
8	GOL	B	201	6/6	0.86	0.12	53,60,64,67	0
6	EDO	B	206	4/4	0.88	0.20	33,38,44,47	0
6	EDO	H	301	4/4	0.88	0.16	29,31,32,42	0
6	EDO	A	402	4/4	0.91	0.12	39,40,41,45	0
6	EDO	A	403	4/4	0.93	0.15	20,37,38,45	0
6	EDO	B	204	4/4	0.93	0.10	35,36,36,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
6	EDO	A	406	4/4	0.94	0.15	28,36,38,42	0
6	EDO	B	205	4/4	0.95	0.08	36,37,38,43	0
6	EDO	A	401	4/4	0.99	0.03	19,20,23,25	0

6.5 Other polymers [i](#)

There are no such residues in this entry.