



wwPDB X-ray Structure Validation Summary Report ⓘ

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PDB ID : 1KTC
Title : The Structure of alpha-N-Acetylgalactosaminidase
Authors : Garman, S.C.; Hannick, L.; Zhu, A.; Garboczi, D.N.
Deposited on : 2002-01-15
Resolution : 2.40 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.13.1

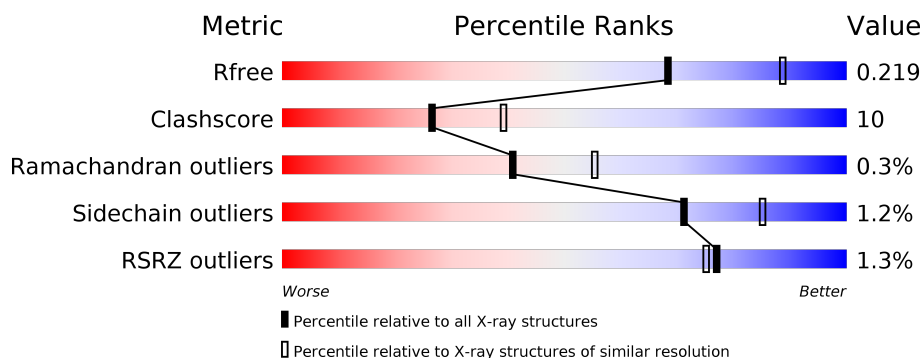
1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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 on 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	405	<div> <div></div> <div>81%</div> <div>14%</div> <div>• •</div> </div>
2	B	2	<div> <div>100%</div> </div>

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	B	2	-	-	-	X
3	NAG	A	869	-	-	-	X
4	NGA	A	870	X	-	-	-
6	GOL	A	1102	-	-	-	X
6	GOL	A	1104	-	-	X	-
6	GOL	A	1105	-	-	-	X
6	GOL	A	1107	-	-	X	X
6	GOL	A	1109	-	-	X	X
6	GOL	A	1110	-	-	X	X
7	ACY	A	3101	-	-	X	-

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 3544 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 alpha-N-acetylgalactosaminidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	388	Total	C	N	O	S	0	0	0
			3075	1958	532	562	23			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	101	GLY	ASP	conflict	PIR S43413

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



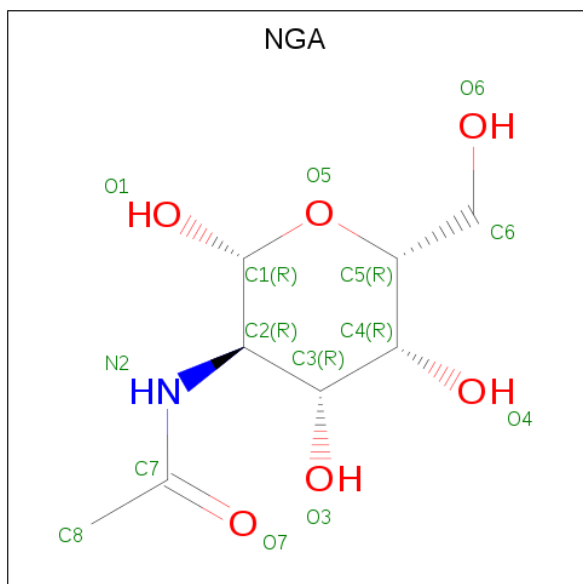
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



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

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-galactopyranose (three-letter code: NGA) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			15	8	1	6		

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



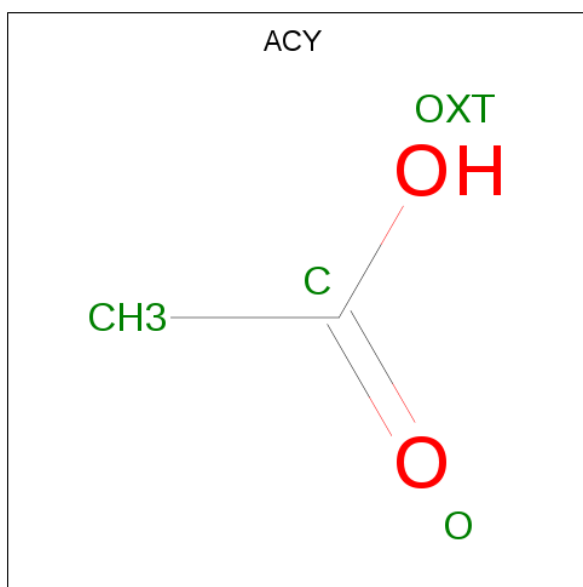
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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	A	1	Total	C	O	0	0
			6	3	3		
6	A	1	Total	C	O	0	0
			6	3	3		

- Molecule 7 is ACETIC ACID (three-letter code: ACY) (formula: C₂H₄O₂).



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

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	305	Total	O	0	0
			305	305		

4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	72.93 Å 72.93 Å 176.41 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.99 – 2.40 30.99 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.6 (30.99-2.40) 99.6 (30.99-2.40)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.23 (at 2.39 Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.216 , 0.231 0.205 , 0.219	Depositor DCC
R_{free} test set	868 reflections (4.49%)	wwPDB-VP
Wilson B-factor (Å ²)	31.4	Xtriage
Anisotropy	0.092	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 41.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	3544	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% 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, ACY, NAG, NGA, SO4

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	0.36	0/3154	0.69	3/4280 (0.1%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	108	ARG	NE-CZ-NH2	7.44	124.02	120.30
1	A	251	ARG	NE-CZ-NH2	6.38	123.49	120.30
1	A	16	TRP	N-CA-C	5.55	125.99	111.00

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	3075	0	3006	60	0
2	B	28	0	25	1	0
3	A	28	0	26	0	0
4	A	15	0	15	0	0
5	A	25	0	0	1	0
6	A	60	0	80	30	1
7	A	8	0	6	3	0
8	A	305	0	0	7	2

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	3544	0	3158	66	2

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 10.

The worst 5 of 66 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)
7:A:3101:ACY:H3	8:A:3342:HOH:O	1.36	1.25
1:A:299:ARG:HH11	6:A:1104:GOL:H12	1.01	1.17
1:A:299:ARG:NH1	6:A:1104:GOL:H12	1.63	1.13
1:A:317:GLN:H	6:A:1107:GOL:H31	1.14	1.11
1:A:299:ARG:HH11	6:A:1104:GOL:C1	1.81	0.94

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:1104:GOL:O1	8:A:3242:HOH:O[4_565]	2.07	0.13
8:A:3200:HOH:O	8:A:3276:HOH:O[4_565]	2.11	0.09

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	386/405 (95%)	371 (96%)	14 (4%)	1 (0%)	41 55

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	236	ASP

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	A	325/339 (96%)	321 (99%)	4 (1%)	71 85

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	ARG
1	A	198	ASN
1	A	257	TRP
1	A	307	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	HIS
1	A	231	HIS
1	A	317	GLN

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](#)

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	$\# Z > 2$
2	NAG	B	1	1,2	14,14,15	0.54	0	17,19,21	0.65	0
2	NAG	B	2	2	14,14,15	0.49	0	17,19,21	0.60	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	B	1	1,2	-	1/6/23/26	0/1/1/1
2	NAG	B	2	2	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

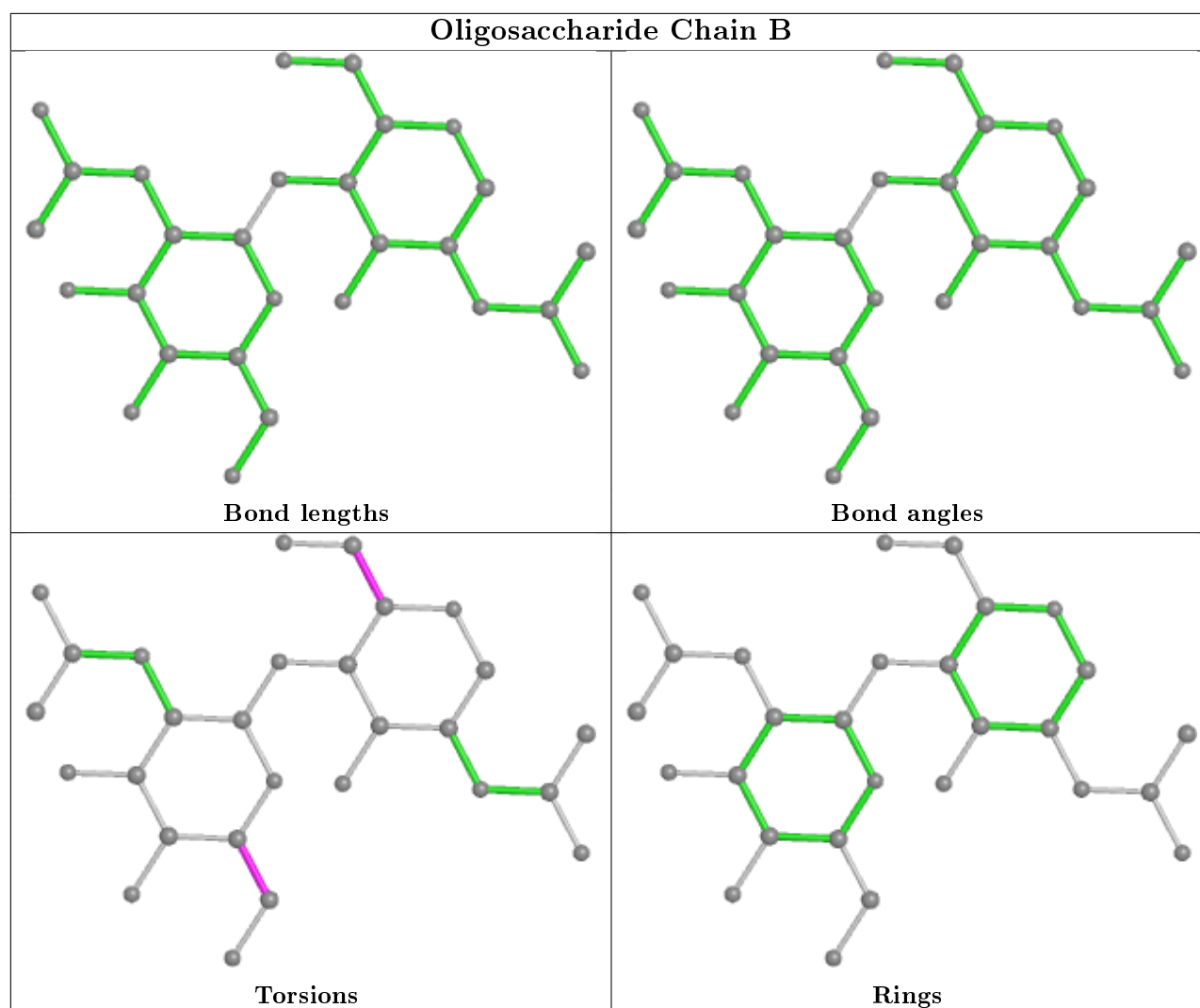
Mol	Chain	Res	Type	Atoms
2	B	2	NAG	O5-C5-C6-O6
2	B	2	NAG	C4-C5-C6-O6
2	B	1	NAG	O5-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2	NAG	1	0
2	B	1	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](#)

20 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	SO4	A	2103	-	4,4,4	0.26	0	6,6,6	0.07	0
7	ACY	A	3102	-	1,3,3	2.73	1 (100%)	0,3,3	0.00	-
6	GOL	A	1103	-	5,5,5	0.91	0	5,5,5	0.93	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
6	GOL	A	1107	-	5,5,5	1.03	0	5,5,5	0.83	0
3	NAG	A	869	1	14,14,15	0.54	0	17,19,21	0.68	1 (5%)
6	GOL	A	1109	-	5,5,5	1.01	0	5,5,5	0.82	0
6	GOL	A	1104	-	5,5,5	1.15	0	5,5,5	0.72	0
6	GOL	A	1110	-	5,5,5	1.18	0	5,5,5	0.72	0
7	ACY	A	3101	-	1,3,3	5.93	1 (100%)	0,3,3	0.00	-
5	SO4	A	2105	-	4,4,4	0.24	0	6,6,6	0.07	0
5	SO4	A	2101	-	4,4,4	0.27	0	6,6,6	0.20	0
3	NAG	A	685	1	14,14,15	0.49	0	17,19,21	0.66	0
6	GOL	A	1101	-	5,5,5	0.93	0	5,5,5	0.90	0
4	NGA	A	870	-	15,15,15	1.01	1 (6%)	21,21,21	1.56	3 (14%)
5	SO4	A	2102	-	4,4,4	0.22	0	6,6,6	0.08	0
6	GOL	A	1105	-	5,5,5	0.98	0	5,5,5	0.83	0
6	GOL	A	1102	-	5,5,5	1.08	0	5,5,5	0.82	0
6	GOL	A	1106	-	5,5,5	1.14	0	5,5,5	0.72	0
5	SO4	A	2104	-	4,4,4	0.23	0	6,6,6	0.05	0
6	GOL	A	1108	-	5,5,5	1.11	0	5,5,5	0.92	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	1103	-	-	3/4/4/4	-
6	GOL	A	1110	-	-	2/4/4/4	-
3	NAG	A	869	1	-	2/6/23/26	0/1/1/1
6	GOL	A	1109	-	-	4/4/4/4	-
6	GOL	A	1104	-	-	4/4/4/4	-
6	GOL	A	1107	-	-	2/4/4/4	-
3	NAG	A	685	1	-	0/6/23/26	0/1/1/1
6	GOL	A	1101	-	-	2/4/4/4	-
4	NGA	A	870	-	1/1/6/7	0/6/26/26	0/1/1/1
6	GOL	A	1105	-	-	4/4/4/4	-
6	GOL	A	1102	-	-	4/4/4/4	-
6	GOL	A	1106	-	-	1/4/4/4	-
6	GOL	A	1108	-	-	2/4/4/4	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	A	3101	ACY	CH3-C	5.93	1.56	1.48
4	A	870	NGA	C1-C2	2.87	1.56	1.52
7	A	3102	ACY	CH3-C	2.73	1.52	1.48

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	870	NGA	C1-C2-N2	-3.79	106.33	110.73
4	A	870	NGA	O7-C7-C8	3.02	127.67	122.06
4	A	870	NGA	C3-C2-N2	2.69	115.69	110.62
3	A	869	NAG	C2-N2-C7	-2.01	120.04	122.90

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	A	870	NGA	C1

5 of 30 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	1103	GOL	O1-C1-C2-O2
6	A	1103	GOL	O1-C1-C2-C3
6	A	1107	GOL	O1-C1-C2-C3
6	A	1104	GOL	O1-C1-C2-C3
6	A	1104	GOL	C1-C2-C3-O3

There are no ring outliers.

11 monomers are involved in 35 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	3102	ACY	1	0
6	A	1103	GOL	1	0
6	A	1107	GOL	6	0
6	A	1109	GOL	4	0
6	A	1104	GOL	7	1
6	A	1110	GOL	5	0
7	A	3101	ACY	2	0
5	A	2105	SO4	1	0
6	A	1101	GOL	2	0
6	A	1102	GOL	3	0
6	A	1106	GOL	2	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	388/405 (95%)	-0.10	5 (1%) 77 75	20, 30, 47, 72	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	26	ARG	3.3
1	A	74	ARG	3.1
1	A	388	ALA	2.5
1	A	80	GLU	2.2
1	A	166	PRO	2.0

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

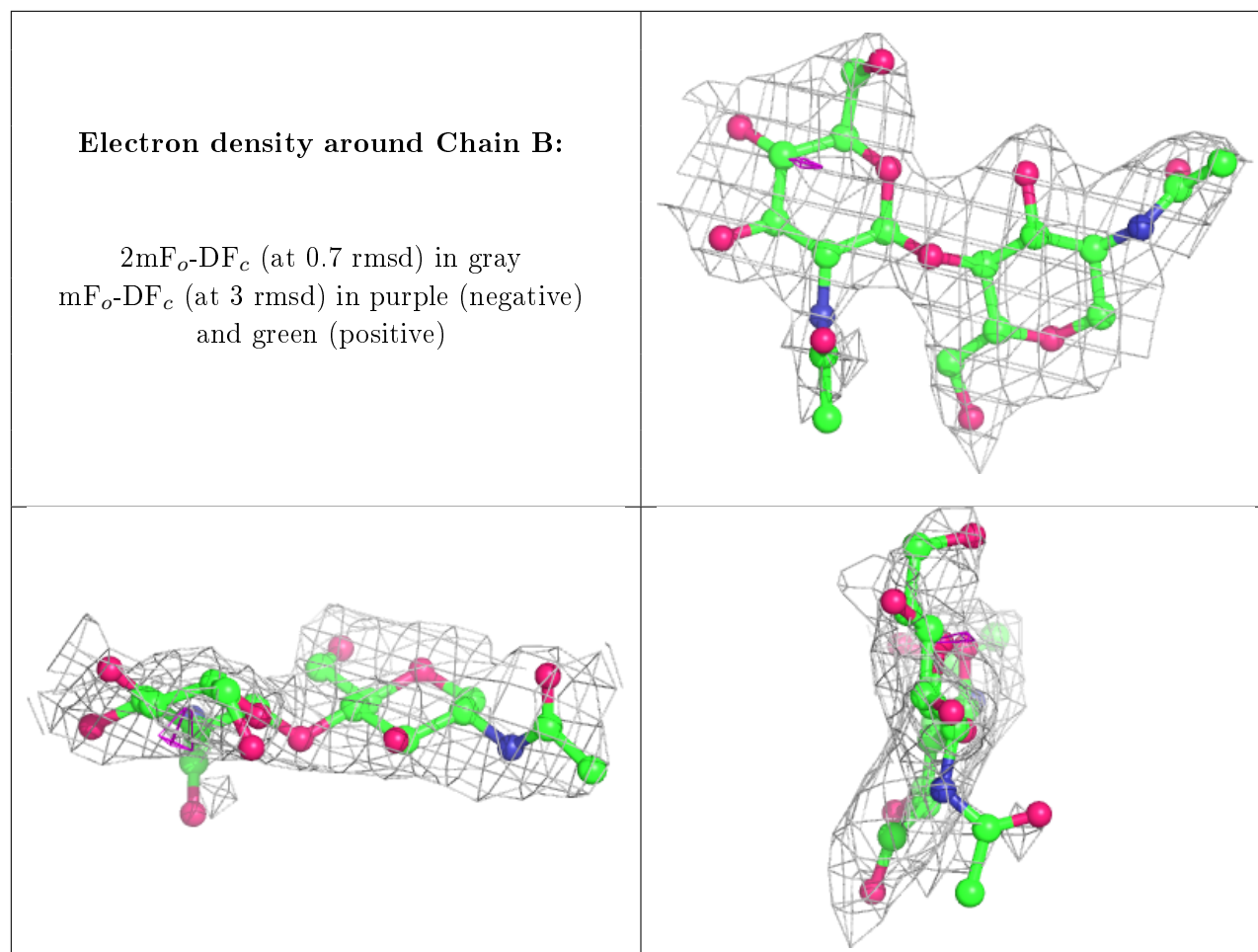
There are no non-standard protein/DNA/RNA residues in this entry.

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
2	NAG	B	2	14/15	0.67	0.46	74,81,83,84	0
2	NAG	B	1	14/15	0.90	0.17	49,53,58,67	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.



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(\AA^2)	Q<0.9
3	NAG	A	869	14/15	0.44	0.47	79,90,93,94	0
6	GOL	A	1106	6/6	0.66	0.28	57,58,58,58	0
6	GOL	A	1107	6/6	0.67	0.40	60,61,62,64	0
6	GOL	A	1110	6/6	0.69	0.40	47,48,49,53	0
6	GOL	A	1104	6/6	0.72	0.36	55,57,58,59	0
6	GOL	A	1109	6/6	0.73	0.57	51,52,52,56	0
6	GOL	A	1102	6/6	0.77	0.54	58,59,60,60	0
6	GOL	A	1105	6/6	0.77	0.52	50,53,54,57	0
7	ACY	A	3101	4/4	0.83	0.28	52,52,53,54	0
6	GOL	A	1101	6/6	0.84	0.23	47,51,52,52	0
5	SO4	A	2105	5/5	0.85	0.46	81,81,82,82	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
6	GOL	A	1108	6/6	0.85	0.21	49,49,50,52	0
3	NAG	A	685	14/15	0.88	0.26	47,51,52,53	0
6	GOL	A	1103	6/6	0.88	0.38	42,48,50,52	0
7	ACY	A	3102	4/4	0.92	0.08	61,62,62,62	0
5	SO4	A	2103	5/5	0.94	0.32	75,75,76,77	0
4	NGA	A	870	15/15	0.96	0.13	18,19,22,22	0
5	SO4	A	2104	5/5	0.96	0.31	69,69,70,71	0
5	SO4	A	2102	5/5	0.96	0.18	65,65,67,67	0
5	SO4	A	2101	5/5	0.98	0.14	32,32,37,37	0

6.5 Other polymers [i](#)

There are no such residues in this entry.