



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 21, 2020 – 04:48 PM BST

PDB ID : 1R7Y
Title : Glycosyltransferase A in complex with 3-amino-acceptor analog inhibitor and uridine diphosphate
Authors : Nguyen, H.P.; Seto, N.O.L.; Cai, Y.; Leinala, E.K.; Borisova, S.N.; Palcic, M.M.; Evans, S.V.
Deposited on : 2003-10-22
Resolution : 1.75 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 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 : **FAILED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.14.6

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 2356 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 Glycoprotein-fucosylgalactoside alpha-N-acetylgalactosaminyl transferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	264	2158	1405	367	376	10	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	63	MET	-	initiating MET	UNP P16442

- Molecule 2 is an oligosaccharide called alpha-L-fucopyranose-(1-2)-hexyl 3-amino-3-deoxy-beta-D-galactopyranoside.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	B	2	28	18	1	9	0	0	0

- Molecule 3 is MERCURY (II) ION (three-letter code: HG) (formula: Hg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total	Hg	0	0
			5	5		

- Molecule 4 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Mn	0	0
			1	1		

- Molecule 5 is URIDINE-5'-DIPHOSPHATE (three-letter code: UDP) (formula: C₉H₁₄N₂O₁₂P₂).

3 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	52.50Å 149.40Å 79.40Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	36.13 – 1.75	Depositor
% Data completeness (in resolution range)	98.2 (36.13-1.75)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	8.65 (at 1.75Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.208 , 0.216	Depositor
Wilson B-factor (Å ²)	20.6	Xtriage
Anisotropy	0.043	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	2356	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.51% of the height of the origin peak. No significant pseudotranslation is detected.*

¹ Intensities estimated from amplitudes.

² Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality [i](#)

4.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: UDP, MN, FUC, AIG, HG

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	0.32	0/2220	0.62	0/3017

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

4.2 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	2158	0	2140	41	0
2	B	28	0	34	6	0
3	A	5	0	0	0	0
4	A	1	0	0	0	0
5	A	25	0	11	0	0
6	A	139	0	0	2	0
All	All	2356	0	2185	44	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 10.

All (44) 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:198:ARG:H	1:A:198:ARG:HD2	1.22	1.02
1:A:125:LYS:HD3	1:A:125:LYS:H	1.28	0.98
1:A:233:HIS:HD2	1:A:235:GLY:H	1.24	0.85
1:A:198:ARG:N	1:A:198:ARG:HD2	1.90	0.83
2:B:1:AIG:H6'3	2:B:2:FUC:H62	1.69	0.72
1:A:251:GLN:NE2	1:A:251:GLN:H	1.88	0.71
1:A:233:HIS:HA	1:A:266:LEU:HG	1.74	0.70
1:A:80:CYS:SG	1:A:99:THR:HA	2.33	0.68
1:A:75:LYS:HB2	1:A:78:THR:HB	1.74	0.67
1:A:226:THR:HG21	1:A:317:LYS:HB2	1.76	0.67
1:A:123:ILE:HG22	1:A:124:LYS:HG3	1.77	0.67
1:A:196:CYS:SG	1:A:198:ARG:HD3	2.35	0.66
1:A:195:PHE:CE1	1:A:199:ARG:HD3	2.30	0.66
1:A:80:CYS:SG	1:A:99:THR:HG22	2.36	0.66
1:A:266:LEU:HD13	1:A:324:LEU:HD13	1.81	0.61
1:A:233:HIS:CD2	1:A:235:GLY:H	2.14	0.58
1:A:234:PRO:HD2	1:A:266:LEU:HD21	1.86	0.57
1:A:329:LEU:HD23	2:B:1:AIG:H4'1	1.87	0.56
1:A:199:ARG:HE	1:A:203:GLU:CD	2.10	0.54
1:A:226:THR:HB	1:A:317:LYS:HD2	1.92	0.51
1:A:241:ARG:HA	1:A:244:PHE:CD1	2.45	0.51
1:A:106:ASN:OD1	1:A:145:HIS:HE1	1.93	0.50
1:A:197:GLU:HG3	6:A:610:HOH:O	2.12	0.49
1:A:123:ILE:CG2	1:A:124:LYS:HG3	2.42	0.48
1:A:274:VAL:O	1:A:278:GLN:HG3	2.12	0.48
1:A:124:LYS:HB3	1:A:125:LYS:HD3	1.96	0.48
1:A:173:LEU:HD22	1:A:173:LEU:N	2.29	0.48
1:A:131:LYS:O	1:A:135:GLU:HG3	2.15	0.47
1:A:280:LEU:HD23	1:A:280:LEU:C	2.35	0.47
1:A:110:ARG:HA	1:A:110:ARG:HD2	1.83	0.46
1:A:323:TYR:O	1:A:341:PHE:HB3	2.16	0.45
1:A:120:VAL:HG11	1:A:133:PHE:CZ	2.51	0.45
1:A:330:LEU:HD11	2:B:1:AIG:H5'1	1.98	0.45
1:A:279:ARG:HG3	6:A:558:HOH:O	2.17	0.45
1:A:285:HIS:O	1:A:289:MET:HG3	2.18	0.44
1:A:199:ARG:O	1:A:203:GLU:HG3	2.17	0.44
1:A:269:PHE:HB2	1:A:324:LEU:HD12	2.00	0.44
2:B:1:AIG:C6'	2:B:2:FUC:H62	2.42	0.43
1:A:233:HIS:HE1	2:B:1:AIG:O4	2.02	0.42
1:A:123:ILE:HD12	1:A:123:ILE:N	2.35	0.41
1:A:125:LYS:HD3	1:A:125:LYS:N	2.13	0.41
1:A:233:HIS:HD2	1:A:235:GLY:N	2.05	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:120:VAL:HG11	1:A:133:PHE:CE2	2.56	0.41
2:B:1:AIG:H6'2	2:B:2:FUC:H4	2.03	0.40

There are no symmetry-related clashes.

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

4.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

4.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

4.5 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	AIG	B	1	2	18,18,18	1.16	3 (16%)	22,23,23	0.82	1 (4%)

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	AIG	B	1	2	-	1/9/29/29	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1	AIG	O1-C1	2.39	1.44	1.40
2	B	1	AIG	C6'-C5'	-2.05	1.33	1.49
2	B	1	AIG	C4'-C3'	2.00	1.62	1.51

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1	AIG	O1-C1'-C2'	-2.22	101.78	109.56

There are no chirality outliers.

All (1) torsion outliers are listed below:

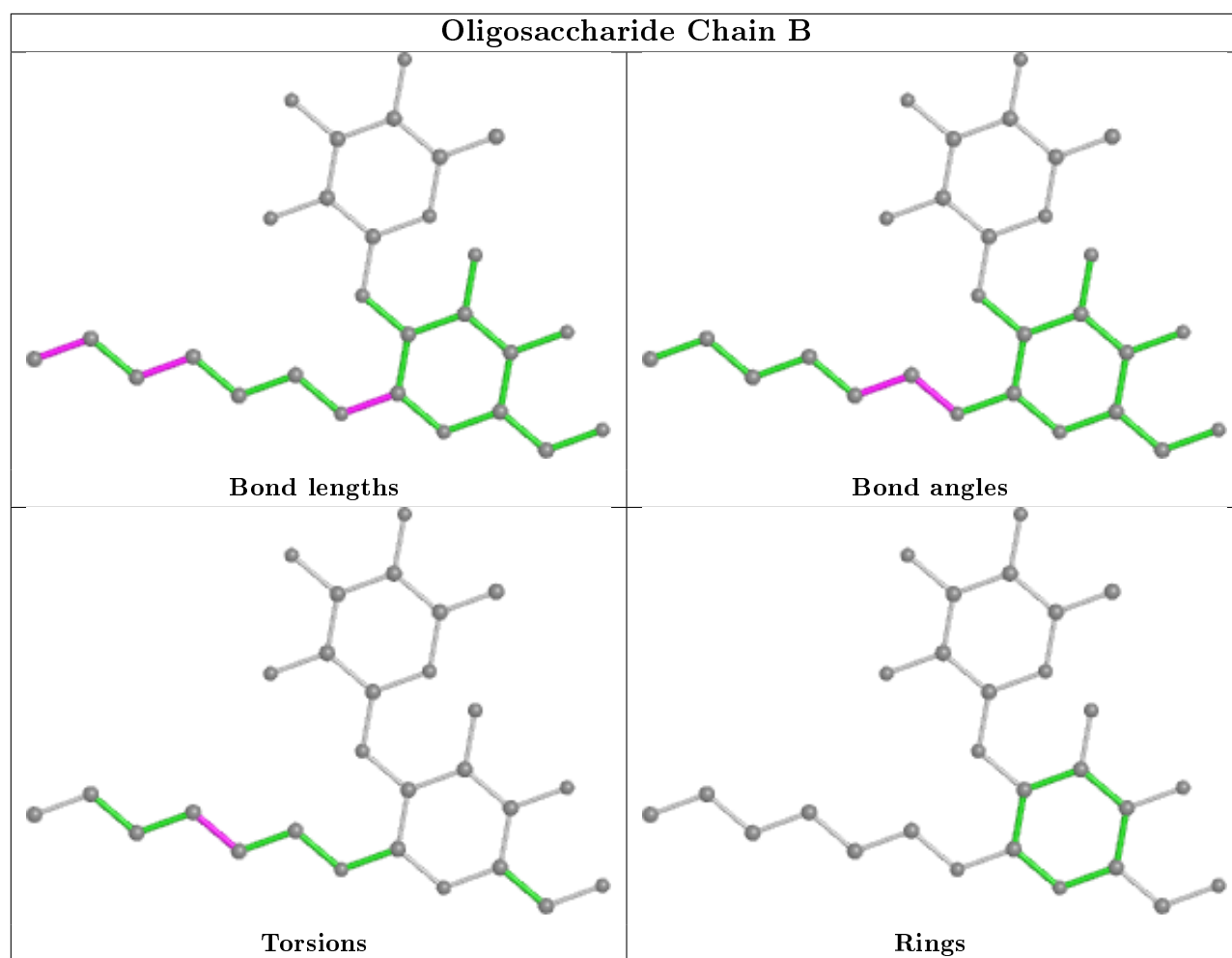
Mol	Chain	Res	Type	Atoms
2	B	1	AIG	C1'-C2'-C3'-C4'

There are no ring outliers.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1	AIG	6	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.



4.6 Ligand geometry [i](#)

Of 7 ligands modelled in this entry, 6 are monoatomic - leaving 1 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

4.7 Other polymers [i](#)

There are no such residues in this entry.

4.8 Polymer linkage issues

There are no chain breaks in this entry.

5 Fit of model and data [i](#)

5.1 Protein, DNA and RNA chains [i](#)

EDS failed to run properly - this section is therefore empty.

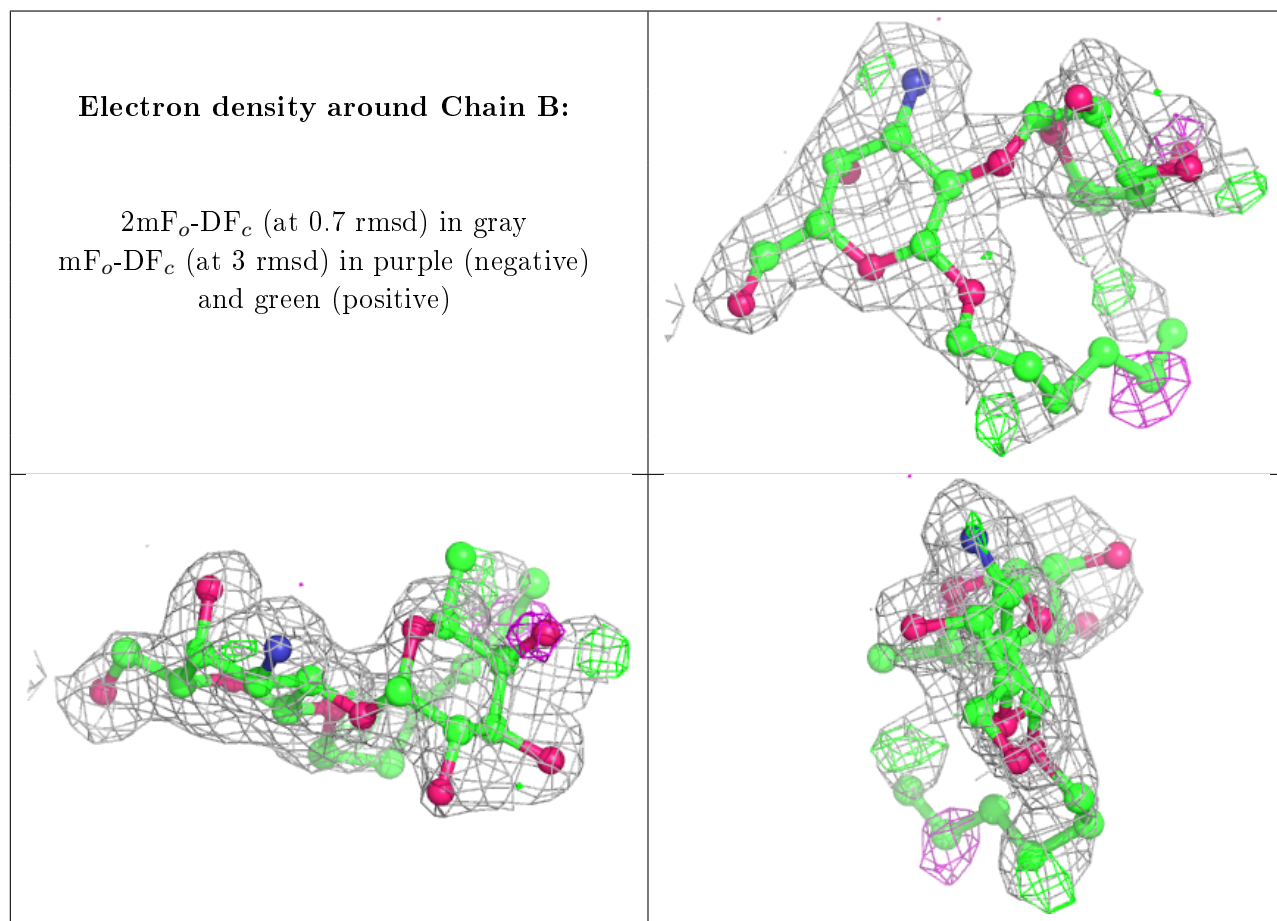
5.2 Non-standard residues in protein, DNA, RNA chains [i](#)

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates [i](#)

EDS failed to run properly - this section is therefore empty.

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.



5.4 Ligands [i](#)

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers

EDS failed to run properly - this section is therefore empty.