

# Full wwPDB X-ray Structure Validation Report (i)

Jan 3, 2024 – 03:31 pm GMT

PDB ID : 5IEF

Title : Murine endoplasmic reticulum alpha-glucosidase II with N-butyl-1-deoxynoji

rimycin

Authors: Caputo, A.T.; Roversi, P.; Alonzi, D.S.; Kiappes, J.L.; Zitzmann, N.

Deposited on : 2016-02-25

Resolution : 2.38 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.orgA user guide is available at

https://www.wwpdb.org/validation/2017/XrayValidationReportHelp with specific help available everywhere you see the (i) 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 (1)) were used in the production of this report:

MolProbity: 4.02b-467

Mogul : 1.8.4, CSD as541be (2020)

Xtriage (Phenix) : 1.13

EDS : 2.36

buster-report : 1.1.7 (2018)

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)

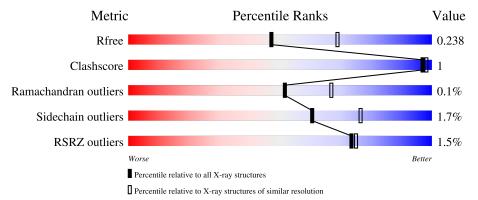
Validation Pipeline (wwPDB-VP) : 2.36

## 1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure: X- $RAY\ DIFFRACTION$ 

The reported resolution of this entry is 2.38 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	Similar resolution
Metric	$(\#  ext{Entries})$	$(\#  ext{Entries},  ext{ resolution range}( ext{Å}))$
$R_{free}$	130704	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

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 <=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 o	f chain
1	A	913	90%	• 6%
2	В	88	97%	
3	С	2	50%	50%



## 2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 8085 atoms, of which 84 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 Neutral alpha-glucosidase AB.

Mol	Chain	Residues			Ato	$\mathbf{m}\mathbf{s}$			ZeroOcc	AltConf	Trace
1	A	858	Total 6980	C 4461	H 17	N 1205	O 1267	S 30	0	10	0

There are 23 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	PHE	deletion	UNP Q8BHN3
A	?	-	SER	deletion	UNP Q8BHN3
A	?	-	ASP	deletion	UNP Q8BHN3
A	?	-	LYS	deletion	UNP Q8BHN3
A	?	-	VAL	deletion	UNP Q8BHN3
A	?	-	SER	deletion	UNP Q8BHN3
A	?	-	LEU	deletion	UNP Q8BHN3
A	?	-	ALA	deletion	UNP Q8BHN3
A	?	-	LEU	deletion	UNP Q8BHN3
A	?	-	GLY	deletion	UNP Q8BHN3
A	?	-	SER	deletion	UNP Q8BHN3
A	?	-	VAL	deletion	UNP Q8BHN3
A	?	-	TRP	deletion	UNP Q8BHN3
A	?	-	ASP	deletion	UNP Q8BHN3
A	?	-	LYS	deletion	UNP Q8BHN3
A	?	-	ILE	deletion	UNP Q8BHN3
A	?	-	LYS	deletion	UNP Q8BHN3
A	?	-	ASN	deletion	UNP Q8BHN3
A	?	-	LEU	deletion	UNP Q8BHN3
A	?	-	PHE	deletion	UNP Q8BHN3
A	?	-	SER	deletion	UNP Q8BHN3
A	?	-	ARG	deletion	UNP Q8BHN3
A	967	ALA	-	expression tag	UNP Q8BHN3

• Molecule 2 is a protein called Glucosidase 2 subunit beta.



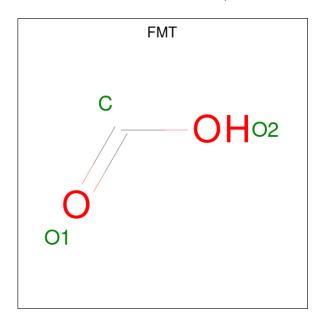
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	В	88	Total 663	C 399	N 106	O 148	S 10	0	0	0

• Molecule 3 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-a cetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	F	Aton	ns		ZeroOcc	AltConf	Trace
3	С	2	Total 28	C 16	N 2	O 10	0	0	0

• Molecule 4 is FORMIC ACID (three-letter code: FMT) (formula: CH<sub>2</sub>O<sub>2</sub>).



Mol	Chain	Residues	A	ton	ns		ZeroOcc	AltConf
4	A	1	Total 5	C 1	H 2	O 2	0	0

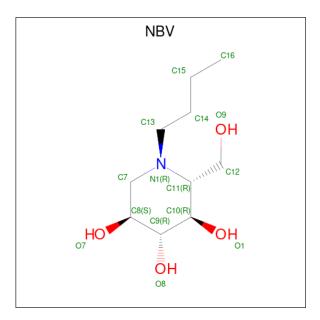
 $\bullet$  Molecule 5 is ACETATE ION (three-letter code: ACT) (formula:  $\mathrm{C_2H_3O_2}).$ 





Mol	Chain	Residues	A	Atoms				AltConf
5	A	1	Total 7	C 2	H 3	0	0	0

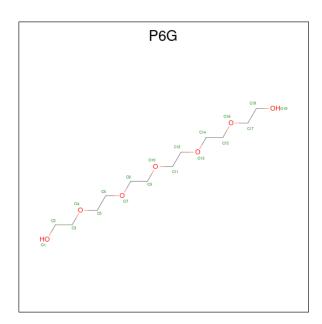
 $\bullet$  Molecule 6 is (2R,3R,4R,5S)-1-BUTYL-2-(HYDROXYMETHYL)PIPERIDINE-3,4,5-TRI OL (three-letter code: NBV) (formula:  $C_{10}H_{21}NO_4).$ 



Mol	Chain	Residues		Ato	oms			ZeroOcc	AltConf
6	A	1	Total	С	Н	N	O	0	0
	11	1	35	10	20	1	4		

 $\bullet$  Molecule 7 is HEXAETHYLENE GLYCOL (three-letter code: P6G) (formula:  $\mathrm{C_{12}H_{26}O_{7}}).$ 





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
7	Λ	1	Total	С	Н	О	0	0	
'	Α	1	30	9	16	5	0	U	
7	Λ	1	Total	С	Н	О	0	0	
'	A	1	45	12	26	7	0	U	

• Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	В	2	Total Ca 2 2	0	0

• Molecule 9 is water.

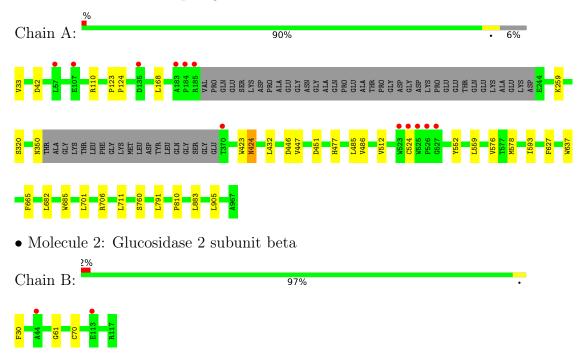
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	267	Total O 267 267	0	0
9	В	23	Total O 23 23	0	0



## 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: Neutral alpha-glucosidase AB



opyranose

• Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc





## 4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants	103.84Å 172.89Å 62.77Å	Donasiton
a, b, c, $\alpha$ , $\beta$ , $\gamma$	90.00° 90.00° 90.00°	Depositor
Resolution (Å)	53.72 - 2.38	Depositor
Resolution (A)	53.72 - 2.38	EDS
% Data completeness	95.5 (53.72-2.38)	Depositor
(in resolution range)	95.5 (53.72-2.38)	EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.38	Depositor
$< I/\sigma(I) > 1$	1.53 (at 2.37Å)	Xtriage
Refinement program	BUSTER 2.10.2	Depositor
D D.	0.186 , 0.218	Depositor
$R, R_{free}$	0.204 , 0.238	DCC
$R_{free}$ test set	2230 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	28.1	Xtriage
Anisotropy	0.022	Xtriage
Bulk solvent $k_{sol}(e/Å^3)$ , $B_{sol}(Å^2)$	0.36, 43.8	EDS
L-test for twinning <sup>2</sup>	$ < L > = 0.47, < L^2> = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	8085	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 3.44% of the height of the origin peak. No significant pseudotranslation is detected.

<sup>&</sup>lt;sup>2</sup>Theoretical values of <|L|>,  $<L^2>$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



<sup>&</sup>lt;sup>1</sup>Intensities estimated from amplitudes.

## 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: CA, P6G, FMT, NBV, NAG, ACT

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		Bo	${ m ond\ angles}$		
Moi Chai		RMSZ	# Z  > 5	RMSZ	# Z  > 5		
1	A	0.50	0/7203	0.69	1/9801 (0.0%)		
2	В	0.50	0/677	0.69	0/920		
All	All	0.50	0/7880	0.69	$1/10721 \ (0.0\%)$		

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Atoms Z Observed		$\operatorname{Ideal}({}^{o})$
1	A	168	LEU	CA-CB-CG	5.24	127.36	115.30

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	6963	17	6740	13	0
2	В	663	0	568	1	0
3	С	28	0	25	0	0
4	A	3	2	2	0	0
5	A	4	3	3	0	0
6	A	15	20	21	0	0
7	A	33	42	42	1	0
8	В	2	0	0	0	0



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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	A	267	0	0	0	0
9	В	23	0	0	0	0
All	All	8001	84	7401	14	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 1.

All (14) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic	Clash
Atom-1	Atom-2	${f distance}({ m \AA})$	overlap (Å)
1:A:485:LEU:HD22	1:A:559[B]:LEU:HD13	1.92	0.51
1:A:432:LEU:HD22	1:A:477[A]:HIS:CD2	2.48	0.48
1:A:760:SER:HB2	7:A:1007:P6G:H182	1.96	0.48
2:B:61:GLY:HA2	2:B:70:CYS:SG	2.54	0.47
1:A:424:ASN:OD1	1:A:451:ASP:HB3	2.15	0.46
1:A:320:SER:O	1:A:627:PHE:HA	2.15	0.46
1:A:512:VAL:HG11	1:A:578[B]:MET:SD	2.58	0.43
1:A:883:LEU:HG	1:A:905:LEU:HB3	2.02	0.42
1:A:423:TRP:O	1:A:701:LEU:HA	2.20	0.42
1:A:447:VAL:HG11	1:A:486:VAL:HG23	2.01	0.42
1:A:123:PRO:HA	1:A:124:PRO:HD3	2.00	0.41
1:A:791:LEU:O	1:A:810:PRO:HA	2.21	0.41
1:A:593:ILE:HD12	1:A:593:ILE:C	2.42	0.40
1:A:682:LEU:HD23	1:A:711:LEU:HD11	2.01	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	862/913 (94%)	834 (97%)	27 (3%)	1 (0%)	51 67



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Mol	Chain	Analysed Favoured Allowed		Outliers	Perce	entiles	
2	В	86/88 (98%)	84 (98%)	2 (2%)	0	100	100
All	All	948/1001 (95%)	918 (97%)	29 (3%)	1 (0%)	51	67

#### All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	576	VAL

#### 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	757/790 (96%)	744 (98%)	13 (2%)	60 76
2	В	77/77 (100%)	76 (99%)	1 (1%)	69 82
All	All	834/867 (96%)	820 (98%)	14 (2%)	60 76

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

Mol	Chain	Res	Type
1	A	33	VAL
1	A	42	ASP
1	A	110	ARG
1	A	259	LYS
1	A	350	ASN
1	A	424	ASN
1	A	446	ASP
1	A	524	CYS
1	A	552	TYR
1	A	637	TRP
1	A	665	PHE
1	A	685	TRP
1	A	706	ARG
2	В	30	PHE



Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

#### 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	Chain	Chain Ros	Link	Bo	ond leng	$ ag{ths}$	В	ond ang	eles						
MIOI	Туре	туре	туре	туре	Chain	res 1	nes	nes	main   nes	Lilik	Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	NAG	С	1	3,1	14,14,15	0.44	0	17,19,21	1.11	1 (5%)						
3	NAG	С	2	3	14,14,15	0.40	0	17,19,21	0.74	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
3	NAG	С	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	С	2	3	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

I	Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	$Observed(^o)$	$\operatorname{Ideal}(^{o})$
	3	С	1	NAG	C1-O5-C5	3.24	116.58	112.19



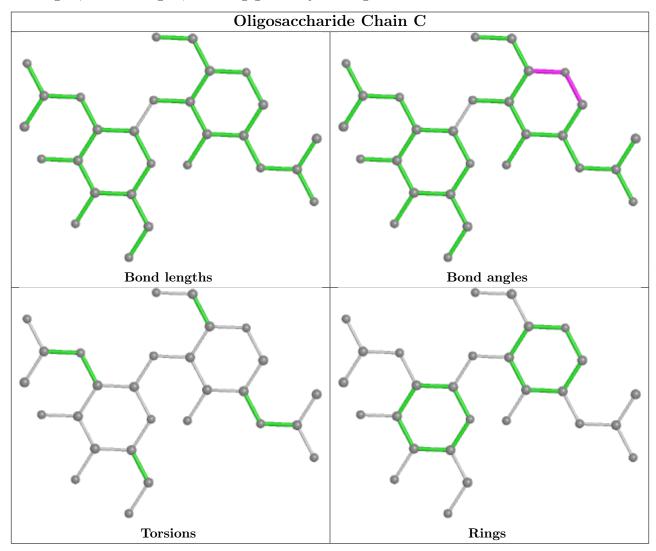
There are no chirality outliers.

There are no torsion outliers.

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)

Of 7 ligands modelled in this entry, 2 are monoatomic - leaving 5 for Mogul analysis.

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	Bo	Bond lengths Bo				ond angles		
MIOI	wor Type Chain In	nes	LIIIK	Counts	RMSZ	# Z  > 2	Counts	RMSZ	$\begin{array}{c cccc} MSZ & \# Z  > 2 \\ 62 & 0 \\ 03 & 0 \\ 26 & 0 \\ 45 & 1 & (33\%) \\ \end{array}$			
7	P6G	A	1007	-	18,18,18	0.32	0	17,17,17	0.62	0		
4	FMT	A	1003	-	2,2,2	1.16	0	1,1,1	1.03	0		
7	P6G	A	1006	-	13,13,18	0.19	0	12,12,17	0.26	0		
5	ACT	A	1004	-	3,3,3	0.93	0	3,3,3	1.45	1 (33%)		
6	NBV	A	1005	-	15,15,15	0.25	0	18,20,20	1.18	3 (16%)		

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
7	P6G	A	1007	-	-	7/16/16/16	-
6	NBV	A	1005	-	-	3/6/26/26	0/1/1/1
7	P6G	A	1006	-	-	3/11/11/16	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	$\mathbf{Z}$	$Observed(^o)$	$Ideal(^{o})$
6	A	1005	NBV	C7-N1-C11	2.95	116.53	109.69
6	A	1005	NBV	C8-C7-N1	2.60	115.17	110.54
6	A	1005	NBV	C12-C11-C10	-2.11	109.66	112.90
5	A	1004	ACT	O-C-CH3	-2.02	114.47	122.33

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	1005	NBV	C14-C13-N1-C11
7	A	1007	P6G	O13-C14-C15-O16
7	A	1007	P6G	C9-C8-O7-C6
7	A	1007	P6G	O10-C11-C12-O13
7	A	1007	P6G	O16-C17-C18-O19
7	A	1007	P6G	C8-C9-O10-C11
6	A	1005	NBV	C14-C13-N1-C7
7	A	1006	P6G	C15-C14-O13-C12



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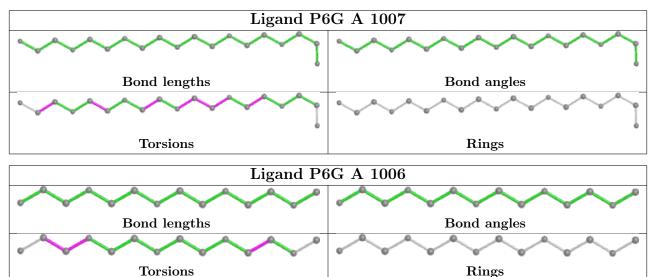
Mol	Chain	Res	Type	Atoms
7	A	1006	P6G	O4-C5-C6-O7
7	A	1006	P6G	O13-C14-C15-O16
6	A	1005	NBV	C13-C14-C15-C16
7	A	1007	P6G	O7-C8-C9-O10
7	A	1007	P6G	O4-C5-C6-O7

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	1007	P6G	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 all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 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,  $95^{th}$  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 $>$	$\# \mathrm{RSRZ}{>}2$	$OWAB(Å^2)$	Q<0.9
1	A	858/913 (93%)	-0.17	12 (1%) 75 77	14, 28, 50, 83	0
2	В	88/88 (100%)	0.07	2 (2%) 60 62	22, 34, 58, 80	0
All	All	946/1001 (94%)	-0.15	14 (1%) 73 75	14, 29, 52, 83	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	526	PRO	4.4
1	A	524	CYS	3.5
1	A	523	TRP	3.5
1	A	183	ALA	3.4
1	A	185	ARG	3.3
1	A	525	TRP	3.1
1	A	370	THR	2.8
1	A	184	PRO	2.7
1	A	527	GLY	2.6
2	В	113	GLU	2.4
1	A	135	ASP	2.3
1	A	57	LEU	2.2
2	В	44	ALA	2.1
1	A	107	GLU	2.1

## 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)

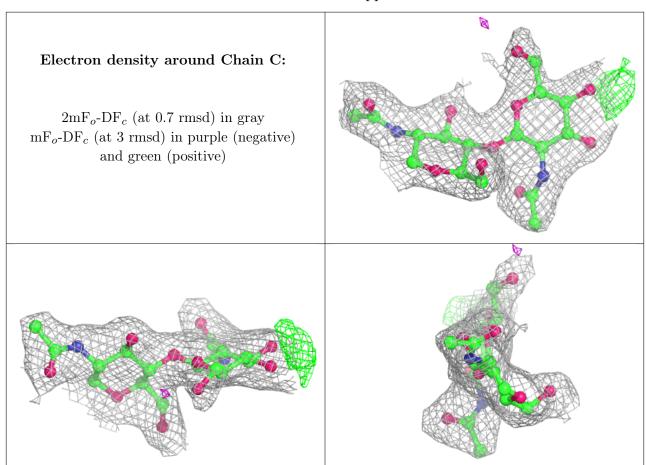
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,



median,  $95^{th}$  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	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q < 0.9
3	NAG	С	2	14/15	0.90	0.14	33,46,54,54	0
3	NAG	С	1	14/15	0.96	0.08	20,27,29,30	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 (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,  $95^{th}$  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.

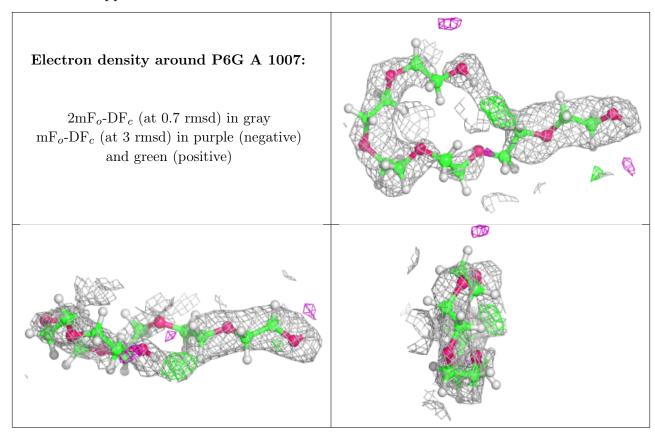
Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q<0.9
7	P6G	A	1007	19/19	0.79	0.21	49,77,84,84	0
7	P6G	A	1006	14/19	0.90	0.15	39,45,57,58	0
5	ACT	A	1004	4/4	0.91	0.32	35,35,38,40	0



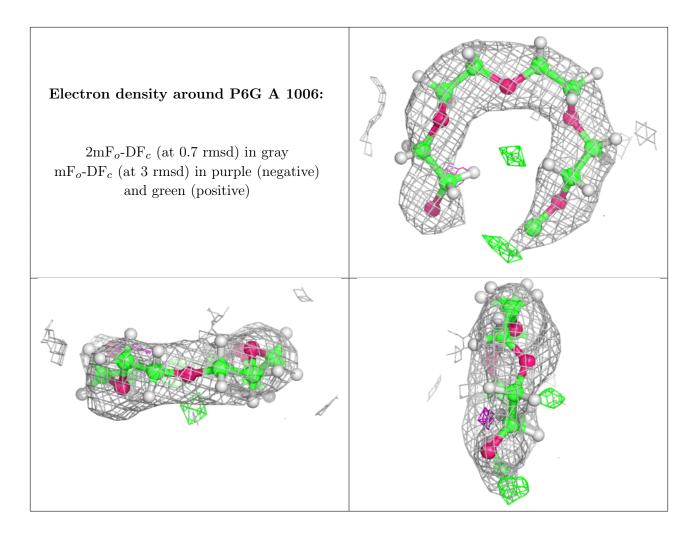
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	$\mathbf{B} ext{-}\mathbf{factors}(\mathbf{\mathring{A}}^2)$	Q<0.9
6	NBV	A	1005	15/15	0.93	0.18	32,39,45,46	0
4	FMT	A	1003	3/3	0.95	0.20	41,41,44,44	0
8	CA	В	201	1/1	0.99	0.08	23,23,23,23	0
8	CA	В	202	1/1	1.00	0.10	24,24,24,24	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.







## 6.5 Other polymers (i)

There are no such residues in this entry.

