



# wwPDB X-ray Structure Validation Summary Report i

Feb 27, 2014 – 09:02 AM GMT

PDB ID : 3S5Z  
Title : Pharmacological Chaperoning in Human alpha-Galactosidase  
Authors : Guce, A.I.; Clark, N.E.; Garman, S.C.  
Deposited on : 2011-05-23  
Resolution : 2.00 Å(reported)

This is a wwPDB validation summary report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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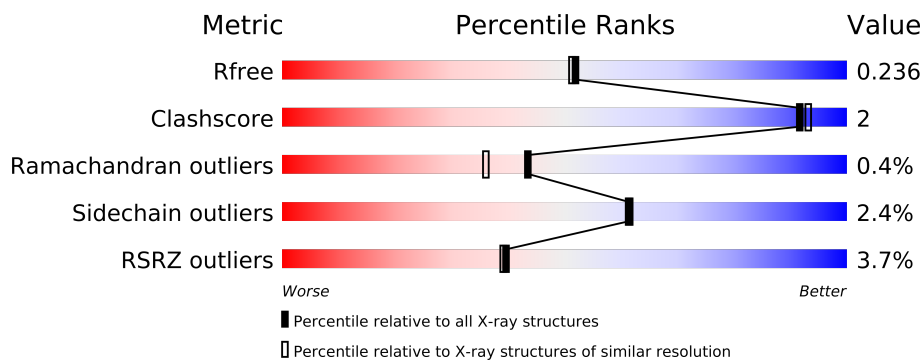
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

# 1 Overall quality at a glance



The reported resolution of this entry is 2.00 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))
$R_{free}$	66092	4888 (2.00-2.00)
Clashscore	79885	6188 (2.00-2.00)
Ramachandran outliers	78287	6102 (2.00-2.00)
Sidechain outliers	78261	6100 (2.00-2.00)
RSRZ outliers	66119	4890 (2.00-2.00)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	398	
1	B	398	

## 2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 6930 atoms, of which 0 are hydrogen and 0 are deuterium.

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-galactosidase A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	390	Total	C	N	O	S	0	5	0
			3143	2000	536	578	29			
1	B	390	Total	C	N	O	S	0	6	0
			3157	2008	540	579	30			

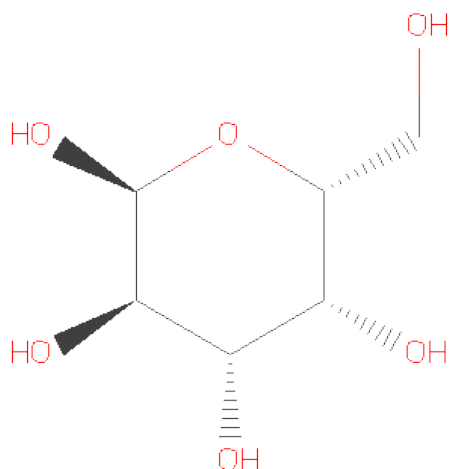
- Molecule 2 is a polymer of unknown type called SUGAR (7-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	7	Total	C	N	O	0	0
			80	45	2	33		

- Molecule 3 is a polymer of unknown type called SUGAR (3-MER).

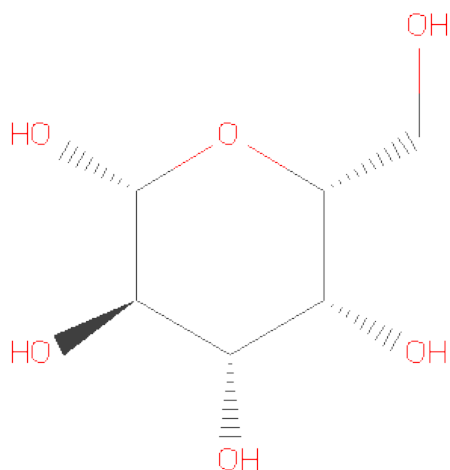
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	3	Total	C	N	O	0	0
			38	22	2	14		

- Molecule 4 is SUGAR (ALPHA D-GALACTOSE) (three-letter code: GLA) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



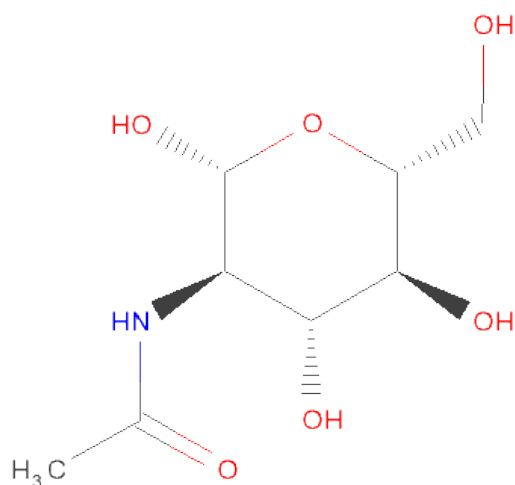
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			12	6	6		
4	B	1	Total	C	O	0	0
			12	6	6		

- Molecule 5 is SUGAR (BETA-D-GALACTOSE) (three-letter code: GAL) (formula:  $C_6H_{12}O_6$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			12	6	6		
5	B	1	Total	C	O	0	0
			12	6	6		

- Molecule 6 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



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

- Molecule 7 is a polymer of unknown type called SUGAR (5-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	B	5	Total	C	N	O	0	0
			59	33	2	24		

- Molecule 8 is a polymer of unknown type called SUGAR (4-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	B	4	Total	C	N	O	0	0
			49	28	2	19		

- Molecule 9 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



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

- Molecule 10 is water.

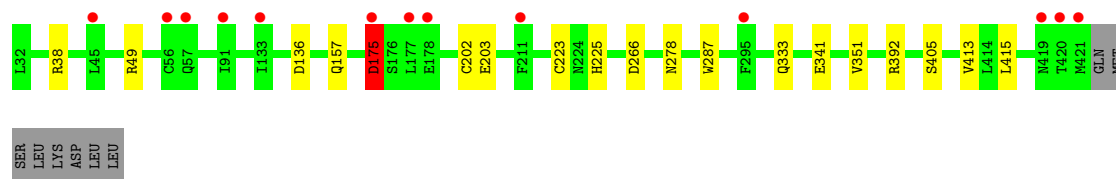
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	175	Total	O	0	0
			175	175		
10	B	161	Total	O	0	0
			161	161		

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

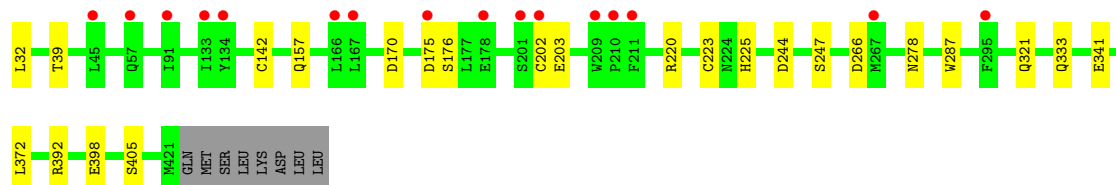
- Molecule 1: Alpha-galactosidase A

Chain A: 



- Molecule 1: Alpha-galactosidase A

Chain B: 



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	89.31Å 140.61Å 182.49Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.44 – 2.00 30.44 – 2.00	Depositor EDS
% Data completeness (in resolution range)	99.3 (30.44-2.00) 99.3 (30.44-2.00)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.36 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, $R_{free}$	0.210 , 0.234 0.214 , 0.236	Depositor DCC
$R_{free}$ test set	3867 reflections (5.29%)	DCC
Wilson B-factor (Å <sup>2</sup> )	30.4	Xtriage
Anisotropy	0.361	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 36.3	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtriage
Outliers	2 of 77025 reflections (0.003%)	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	6930	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.46% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.



## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: XYP, GOL, BMA, NAG, GLA, GAL, FUC, MAN

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	0.49	3/3243 (0.1%)	0.62	3/4403 (0.1%)
1	B	0.46	3/3255 (0.1%)	0.60	2/4418 (0.0%)
All	All	0.47	6/6498 (0.1%)	0.61	5/8821 (0.1%)

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	A	3	0
7	B	3	0
All	All	6	0

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	341	GLU	CD-OE2	-5.71	1.19	1.25
1	B	341	GLU	CD-OE1	-5.65	1.19	1.25
1	A	341	GLU	CD-OE1	-5.25	1.19	1.25
1	A	203	GLU	CD-OE2	-5.23	1.19	1.25
1	B	203	GLU	CD-OE2	-5.12	1.20	1.25

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	341	GLU	OE1-CD-OE2	-7.69	114.07	123.30
1	A	203	GLU	OE1-CD-OE2	-6.76	115.19	123.30
1	A	341	GLU	OE1-CD-OE2	-6.64	115.33	123.30
1	B	203	GLU	OE1-CD-OE2	-6.08	116.00	123.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	136	ASP	CB-CG-OD2	5.22	123.00	118.30

5 of 6 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	698	XYP	C4B,C2B,C3B
7	B	698	XYP	C4B,C2B,C3B

There are no planarity outliers.

## 5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3143	0	0	7	0
1	B	3157	0	0	6	2
2	A	80	0	67	0	0
3	A	38	0	34	0	0
4	A	12	0	12	0	0
4	B	12	0	12	0	0
5	A	12	0	12	0	0
5	B	12	0	12	0	0
6	B	14	0	13	0	0
7	B	59	0	49	0	0
8	B	49	0	43	0	0
9	B	6	0	8	0	0
10	A	175	0	0	4	0
10	B	161	0	0	1	2
All	All	6930	0	262	13	2

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 2.

The worst 5 of 13 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:413:VAL:CG1	10:A:454:HOH:O	2.25	0.84
1:A:278:ASN:ND2	10:A:561:HOH:O	2.30	0.64
1:B:39:THR:OG1	1:B:321:GLN:NE2	2.40	0.54
1:A:49:ARG:NE	10:A:303(D):HOH:O	2.44	0.51
1:A:202[B]:CYS:SG	1:A:223:CYS:SG	3.12	0.46

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	Distance(Å)	Clash(Å)
1:B:247:SER:N	10:B:507:HOH:O[3_655]	1.93	0.27
1:B:244:ASP:O	10:B:507:HOH:O[3_655]	1.96	0.24

## 5.3 Torsion angles

### 5.3.1 Protein backbone ⓘ

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	393/398 (99%)	380 (97%)	11 (3%)	2 (0%)	38	29
1	B	394/398 (99%)	381 (97%)	12 (3%)	1 (0%)	50	44
All	All	787/796 (99%)	761 (97%)	23 (3%)	3 (0%)	43	36

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	266	ASP
1	B	266	ASP
1	A	175	ASP

### 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	336/339 (99%)	329 (98%)	7 (2%)	66	67
1	B	337/339 (99%)	328 (97%)	9 (3%)	57	56
All	All	673/678 (99%)	657 (98%)	16 (2%)	61	61

5 of 16 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	157	GLN
1	B	176	SER
1	B	372	LEU
1	A	405	SER
1	B	392	ARG

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

### 5.3.3 RNA ⓘ

There are no RNA chains 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 ⓘ

19 carbohydrates 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	A	692	1,2	12,14,15	0.67	1 (8%)	15,19,21	0.96	0
2	NAG	A	693	2	12,14,15	0.74	1 (8%)	15,19,21	1.03	1 (6%)
2	BMA	A	694	2	10,11,12	0.48	0	11,15,17	1.38	2 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	MAN	A	695	2	10,11,12	0.72	0	11,15,17	0.68	0
2	MAN	A	696	2	10,11,12	0.80	0	11,15,17	0.78	0
2	FUC	A	697	2	9,10,11	0.81	0	10,14,16	0.43	0
2	XYP	A	698	2	8,9,10	1.34	1 (12%)	8,12,14	0.48	0
3	NAG	A	715	1,3	12,14,15	0.68	1 (8%)	15,19,21	0.79	0
3	NAG	A	716	3	12,14,15	0.64	0	15,19,21	1.14	1 (6%)
3	FUC	A	720	3	9,10,11	0.79	0	10,14,16	0.52	0
7	NAG	B	692	1,7	12,14,15	0.54	0	15,19,21	1.09	1 (6%)
7	NAG	B	693	7	12,14,15	0.68	0	15,19,21	0.77	0
7	BMA	B	694	7	10,11,12	0.59	0	11,15,17	1.75	2 (18%)
7	MAN	B	695	7	10,11,12	0.68	0	11,15,17	0.95	0
7	XYP	B	698	7	8,9,10	1.33	1 (12%)	8,12,14	0.52	0
8	NAG	B	715	1,8	12,14,15	0.67	1 (8%)	15,19,21	1.18	2 (13%)
8	NAG	B	716	8	12,14,15	0.79	1 (8%)	15,19,21	0.81	0
8	BMA	B	717	8	10,11,12	0.48	0	11,15,17	0.73	0
8	FUC	B	720	8	9,10,11	0.73	0	10,14,16	0.93	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	A	692	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	693	2	-	0/6/23/26	0/1/1/1
2	BMA	A	694	2	-	0/2/19/22	0/1/1/1
2	MAN	A	695	2	-	0/2/19/22	0/1/1/1
2	MAN	A	696	2	-	0/2/19/22	0/1/1/1
2	FUC	A	697	2	-	0/0/17/20	0/1/1/1
2	XYP	A	698	2	3/3/3/4	0/0/14/17	0/1/1/1
3	NAG	A	715	1,3	-	0/6/23/26	0/1/1/1
3	NAG	A	716	3	-	0/6/23/26	0/1/1/1
3	FUC	A	720	3	-	0/0/17/20	0/1/1/1
7	NAG	B	692	1,7	-	0/6/23/26	0/1/1/1
7	NAG	B	693	7	-	0/6/23/26	0/1/1/1
7	BMA	B	694	7	-	0/2/19/22	0/1/1/1
7	MAN	B	695	7	-	0/2/19/22	0/1/1/1
7	XYP	B	698	7	3/3/3/4	0/0/14/17	0/1/1/1
8	NAG	B	715	1,8	-	0/6/23/26	0/1/1/1
8	NAG	B	716	8	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	BMA	B	717	8	-	0/2/19/22	0/1/1/1
8	FUC	B	720	8	-	0/0/17/20	0/1/1/1

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	698	XYP	O5B-C5B	-3.37	1.36	1.43
7	B	698	XYP	O5B-C5B	-3.29	1.36	1.43
2	A	693	NAG	O5-C5	-2.37	1.41	1.45
8	B	716	NAG	O5-C5	-2.36	1.41	1.45
3	A	715	NAG	O5-C5	-2.18	1.41	1.45

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	694	BMA	O5-C5-C4	3.92	115.63	110.65
7	B	694	BMA	C3-C4-C5	3.24	115.99	110.20
2	A	694	BMA	O5-C5-C4	3.07	114.55	110.65
3	A	716	NAG	O5-C5-C6	2.93	110.06	106.98
7	B	692	NAG	C6-C5-C4	-2.36	107.30	113.00

5 of 6 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	698	XYP	C4B
2	A	698	XYP	C2B
2	A	698	XYP	C3B
7	B	698	XYP	C4B
7	B	698	XYP	C2B

There are no torsion outliers.

There are no ring outliers.

## 5.6 Ligand geometry ⓘ

6 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	GLA	A	801	-	12,12,12	0.47	0	17,17,17	0.95	1 (5%)
5	GAL	A	804	-	12,12,12	0.47	0	17,17,17	0.54	0
9	GOL	B	1001	-	5,5,5	0.32	0	5,5,5	0.34	0
6	NAG	B	639	1	12,14,15	0.61	0	15,19,21	1.42	2 (13%)
4	GLA	B	802	-	12,12,12	0.50	0	17,17,17	0.94	1 (5%)
5	GAL	B	803	-	12,12,12	0.42	0	17,17,17	0.62	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	GLA	A	801	-	-	0/2/22/22	0/1/1/1
5	GAL	A	804	-	-	0/2/22/22	0/1/1/1
9	GOL	B	1001	-	-	0/4/4/4	0/0/0/0
6	NAG	B	639	1	-	0/6/23/26	0/1/1/1
4	GLA	B	802	-	-	0/2/22/22	0/1/1/1
5	GAL	B	803	-	-	0/2/22/22	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	639	NAG	O5-C5-C6	4.30	111.49	106.98
6	B	639	NAG	O5-C5-C4	-2.28	107.76	110.65
4	A	801	GLA	C1-O5-C5	2.20	117.34	113.40
4	B	802	GLA	C1-O5-C5	2.07	117.11	113.40

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	390/398 (97%)	0.08	13 (3%) 44 44	17, 36, 63, 105	0
1	B	390/398 (97%)	0.12	16 (4%) 35 35	23, 36, 60, 88	0
All	All	780/796 (97%)	0.10	29 (3%) 39 39	17, 36, 62, 105	0

The worst 5 of 29 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	209	TRP	5.4
1	A	211	PHE	4.7
1	B	211	PHE	4.5
1	B	295	PHE	4.0
1	B	210	PRO	4.0

### 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

### 6.3 Carbohydrates ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
7	BMA	B	694	11/12	0.31	-	90,97,101,107	0
3	NAG	A	715	14/15	0.27	-	68,78,93,95	0
7	MAN	B	695	11/12	0.32	-	80,91,94,95	0

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
3	FUC	A	720	10/11	0.39	-	90,94,96,97	0
2	XYP	A	698	9/10	0.28	-	64,81,86,87	0
2	NAG	A	692	14/15	0.13	-	36,44,56,60	0
7	XYP	B	698	9/10	0.34	-	95,98,101,104	0
2	MAN	A	695	11/12	0.30	-	81,89,92,95	0
2	MAN	A	696	11/12	0.38	-	96,101,107,107	0
8	NAG	B	715	14/15	0.13	-	28,39,50,51	0
7	NAG	B	693	14/15	0.24	-	55,69,78,85	0
8	FUC	B	720	10/11	0.17	-	37,40,47,47	0
8	BMA	B	717	11/12	0.25	-	82,87,91,92	0
3	NAG	A	716	14/15	0.32	-	81,93,96,99	0
8	NAG	B	716	14/15	0.19	-	40,49,67,75	0
2	FUC	A	697	10/11	0.54	-	82,90,93,94	0
2	BMA	A	694	11/12	0.26	-	78,88,99,103	0
7	NAG	B	692	14/15	0.15	-	39,47,54,64	0
2	NAG	A	693	14/15	0.17	-	47,60,71,73	0

## 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
9	GOL	B	1001	6/6	0.16	-	69,78,78,82	0
5	GAL	B	803	12/12	0.16	-	59,66,73,76	0
4	GLA	A	801	12/12	0.12	-	29,34,39,46	0
6	NAG	B	639	14/15	0.40	-	76,83,92,94	0
5	GAL	A	804	12/12	0.21	-	56,60,65,69	0
4	GLA	B	802	12/12	0.11	-	18,26,31,37	0

## 6.5 Other polymers

There are no such residues in this entry.