



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 06:43 PM GMT

PDB ID : 4MJ2  
Title : Crystal structure of apo-iduronidase in the R3 form  
Authors : Bie, H.; Yin, J.; He, X.; Kermode, A.R.; Goddard-Borger, E.D.; Withers, S.G.; James, M.N.G.  
Deposited on : 2013-09-03  
Resolution : 2.10 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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/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 : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

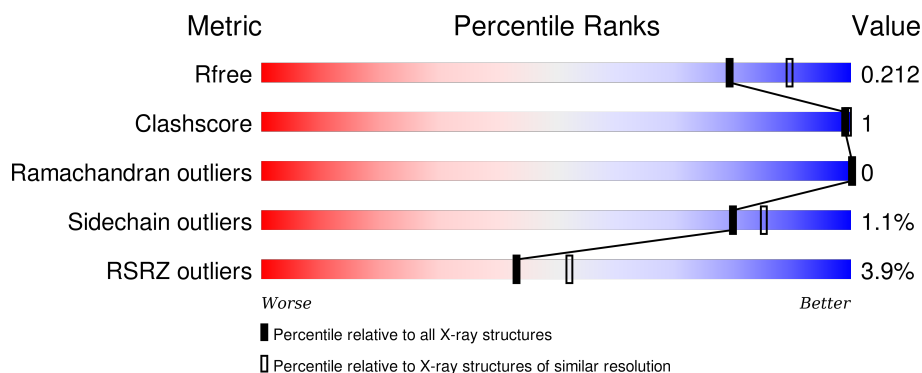
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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))
$R_{free}$	91344	3939 (2.10-2.10)
Clashscore	102246	4460 (2.10-2.10)
Ramachandran outliers	100387	4413 (2.10-2.10)
Sidechain outliers	100360	4414 (2.10-2.10)
RSRZ outliers	91569	3948 (2.10-2.10)

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. 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	653	<div> <div>5%</div> <div>89%</div> <div>9%</div> </div>
1	B	653	<div> <div>3%</div> <div>90%</div> <div>7%</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
10	SRT	B	918	-	-	-	X
5	GOL	A	909	-	-	-	X
5	GOL	B	912	-	-	-	X
5	GOL	B	915	-	-	-	X

## 2 Entry composition [i](#)

There are 11 unique types of molecules in this entry. The entry contains 10336 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.

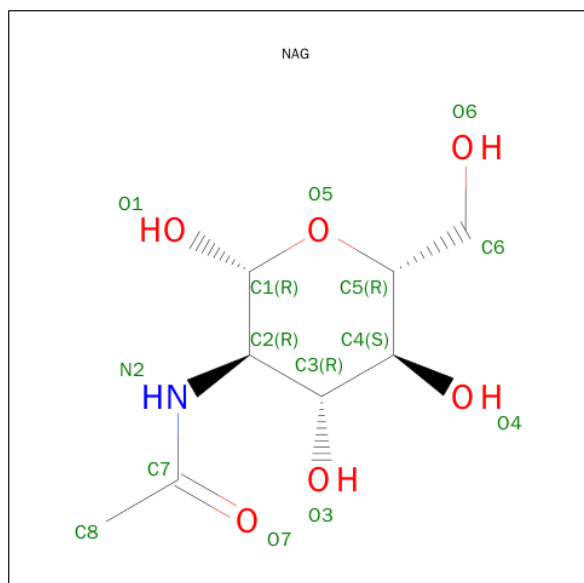
- Molecule 1 is a protein called Alpha-L-iduronidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	595	Total	C	N	O	S	0	1	0
			4745	3036	856	841	12			
1	B	607	Total	C	N	O	S	0	4	0
			4851	3099	878	860	14			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	33	GLN	HIS	SEE REMARK 999	UNP P35475
A	63	PRO	GLN	SEE REMARK 999	UNP P35475
A	105	GLN	ARG	SEE REMARK 999	UNP P35475
B	33	GLN	HIS	SEE REMARK 999	UNP P35475
B	63	PRO	GLN	SEE REMARK 999	UNP P35475
B	105	GLN	ARG	SEE REMARK 999	UNP P35475

- Molecule 2 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



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

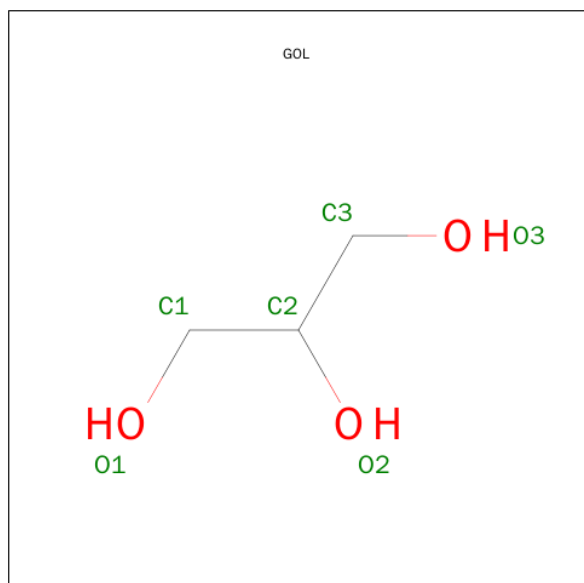
- Molecule 3 is a polymer of unknown type called SUGAR (2-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 4 is a polymer of unknown type called SUGAR (5-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



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

*Continued on next page...*

*Continued from previous page...*

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

- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	1	Total	Cl	0	0
			1	1		
6	A	1	Total	Cl	0	0
			1	1		

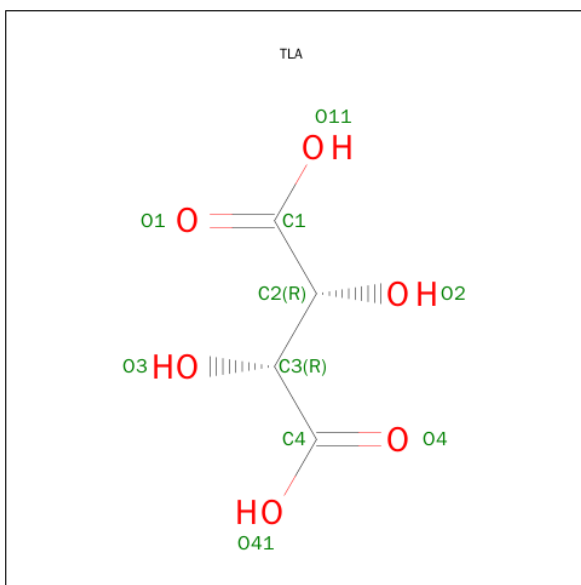
- Molecule 7 is a polymer of unknown type called SUGAR (3-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	B	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 8 is a polymer of unknown type called SUGAR (7-MER).

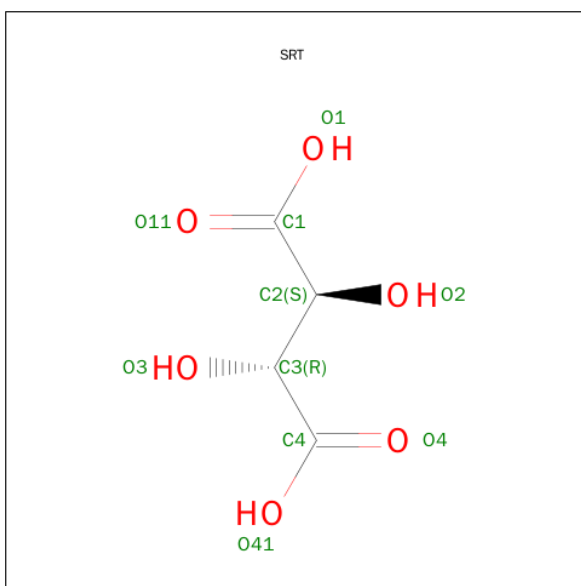
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	B	7	Total	C	N	O	0	0
			83	46	2	35		

- Molecule 9 is L(+)-TARTARIC ACID (three-letter code: TLA) (formula: C<sub>4</sub>H<sub>6</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	C	O	0	0
			10	4	6		
9	B	1	Total	C	O	0	0
			10	4	6		

- Molecule 10 is S,R MESO-TARTARIC ACID (three-letter code: SRT) (formula: C<sub>4</sub>H<sub>6</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	B	1	Total	C	O	0	0
			10	4	6		

- Molecule 11 is water.

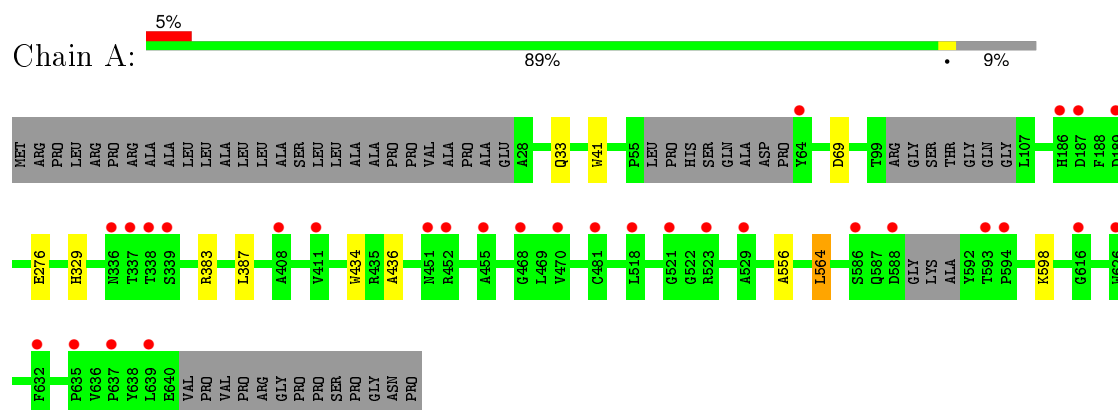
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	168	Total 168	O 168	0	0
11	B	265	Total 265	O 265	0	0



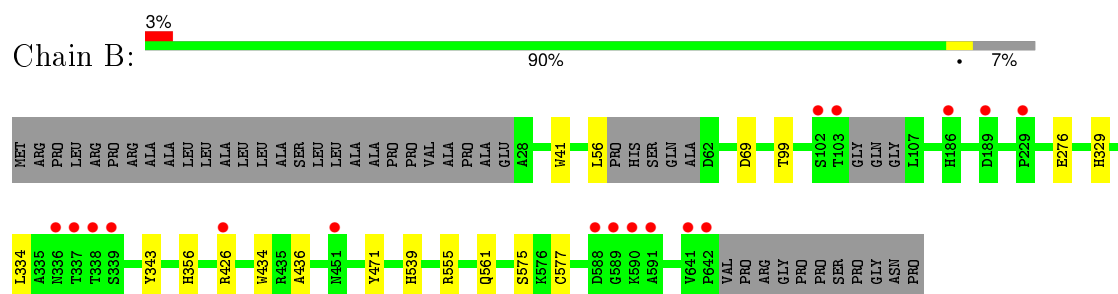
### 3 Residue-property plots [i](#)

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 ( $\text{RSRZ} > 2$ ). 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-L-iduronidase



#### • Molecule 1: Alpha-L-iduronidase



## 4 Data and refinement statistics

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	259.36 Å   259.36 Å   71.81 Å 90.00°   90.00°   120.00°	Depositor
Resolution (Å)	49.01 – 2.10 49.01 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.5 (49.01-2.10) 99.5 (49.01-2.10)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.14	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.70 (at 2.10 Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, $R_{free}$	0.191 , 0.206 0.196 , 0.212	Depositor DCC
$R_{free}$ test set	5233 reflections (5.26%)	DCC
Wilson B-factor (Å <sup>2</sup> )	29.3	Xtriage
Anisotropy	0.656	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 43.9	EDS
Estimated twinning fraction	0.037 for h,-h-k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtriage
Outliers	0 of 104643 reflections	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	10336	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.61% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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: GOL, BMA, NAG, CL, TLA, SRT, 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	0.28	0/4890	0.51	0/6680
1	B	0.29	0/4999	0.53	0/6829
All	All	0.29	0/9889	0.52	0/13509

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	4745	0	4644	5	0
1	B	4851	0	4753	9	0
2	A	14	0	13	0	0
2	B	14	0	13	0	0
3	A	28	0	25	0	0
4	A	61	0	52	0	0
5	A	6	0	8	0	0
5	B	30	0	40	2	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
7	B	39	0	34	0	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	B	83	0	70	1	0
9	B	20	0	8	0	0
10	B	10	0	4	0	0
11	A	168	0	0	0	0
11	B	265	0	0	0	0
All	All	10336	0	9664	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 distance (Å)	Clash overlap (Å)
1:B:575:SER:HG	1:B:577[A]:CYS:HG	1.19	0.89
1:B:575:SER:OG	1:B:577[A]:CYS:SG	2.48	0.56
1:A:434:TRP:CH2	1:A:436:ALA:HB2	2.45	0.52
1:B:434:TRP:CH2	1:B:436:ALA:HB2	2.51	0.46
1:A:383:ARG:CG	1:A:387:LEU:HD23	2.48	0.43
1:B:276:GLU:OE1	1:B:329:HIS:NE2	2.44	0.43
1:B:56:LEU:CD1	8:B:909:MAN:H3	2.49	0.42
1:B:334:LEU:HD21	1:B:343:TYR:HB3	2.02	0.41
1:A:383:ARG:HG2	1:A:387:LEU:HD23	2.01	0.41
1:B:356:HIS:HB2	5:B:913:GOL:H32	2.02	0.41
1:B:471:TYR:HA	1:B:539:HIS:O	2.20	0.41
1:A:556:ALA:HB1	1:A:564:LEU:HD11	2.02	0.41
1:A:276:GLU:OE1	1:A:329:HIS:NE2	2.47	0.40
1:B:356:HIS:HB2	5:B:913:GOL:C3	2.51	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	588/653 (90%)	569 (97%)	19 (3%)	0	100	100
1	B	605/653 (93%)	586 (97%)	19 (3%)	0	100	100
All	All	1193/1306 (91%)	1155 (97%)	38 (3%)	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	504/545 (92%)	499 (99%)	5 (1%)	82	87
1	B	516/545 (95%)	510 (99%)	6 (1%)	78	84
All	All	1020/1090 (94%)	1009 (99%)	11 (1%)	80	85

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	33	GLN
1	A	41	TRP
1	A	69	ASP
1	A	564	LEU
1	A	598	LYS
1	B	41	TRP
1	B	69	ASP
1	B	99	THR
1	B	426	ARG
1	B	555	ARG
1	B	561	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	33	GLN
1	B	603	ASN

### 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 ⓘ

17 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	$\# Z  > 2$
3	NAG	A	902	1,3	14,14,15	0.51	0	15,19,21	0.84	1 (6%)
3	NAG	A	903	3	14,14,15	0.51	0	15,19,21	0.78	0
4	NAG	A	904	1,4	14,14,15	0.52	0	15,19,21	0.75	0
4	NAG	A	905	4	14,14,15	0.53	0	15,19,21	1.10	1 (6%)
4	BMA	A	906	4	11,11,12	0.29	0	14,15,17	0.80	0
4	MAN	A	907	4	11,11,12	0.55	0	14,15,17	0.77	1 (7%)
4	MAN	A	908	4	11,11,12	0.58	0	14,15,17	0.64	0
7	NAG	B	902	1,7	14,14,15	0.48	0	15,19,21	1.05	1 (6%)
7	NAG	B	903	7	14,14,15	0.53	0	15,19,21	0.77	0
7	BMA	B	904	7	11,11,12	0.27	0	14,15,17	0.61	0
8	NAG	B	905	1,8	14,14,15	0.53	0	15,19,21	0.86	0
8	NAG	B	906	8	14,14,15	0.62	0	15,19,21	0.89	1 (6%)
8	BMA	B	907	8	11,11,12	0.36	0	14,15,17	0.76	0
8	MAN	B	908	8	11,11,12	0.60	0	14,15,17	0.67	0
8	MAN	B	909	8	11,11,12	0.59	0	14,15,17	1.26	2 (14%)
8	MAN	B	910	8	11,11,12	0.55	0	14,15,17	0.87	1 (7%)
8	MAN	B	911	8	11,11,12	0.70	0	14,15,17	1.19	1 (7%)

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	A	902	1,3	-	0/6/23/26	0/1/1/1
3	NAG	A	903	3	-	0/6/23/26	0/1/1/1
4	NAG	A	904	1,4	-	0/6/23/26	0/1/1/1
4	NAG	A	905	4	-	0/6/23/26	0/1/1/1
4	BMA	A	906	4	-	0/2/19/22	0/1/1/1
4	MAN	A	907	4	-	0/2/19/22	0/1/1/1
4	MAN	A	908	4	-	0/2/19/22	0/1/1/1
7	NAG	B	902	1,7	-	0/6/23/26	0/1/1/1
7	NAG	B	903	7	-	0/6/23/26	0/1/1/1
7	BMA	B	904	7	-	0/2/19/22	0/1/1/1
8	NAG	B	905	1,8	-	0/6/23/26	0/1/1/1
8	NAG	B	906	8	-	0/6/23/26	0/1/1/1
8	BMA	B	907	8	-	0/2/19/22	0/1/1/1
8	MAN	B	908	8	-	0/2/19/22	0/1/1/1
8	MAN	B	909	8	-	0/2/19/22	0/1/1/1
8	MAN	B	910	8	-	0/2/19/22	0/1/1/1
8	MAN	B	911	8	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	907	MAN	C1-O5-C5	2.03	114.82	112.25
8	B	906	NAG	C1-O5-C5	2.18	115.02	112.25
8	B	910	MAN	C1-O5-C5	2.34	115.22	112.25
3	A	902	NAG	C1-O5-C5	2.41	115.30	112.25
8	B	909	MAN	C1-O5-C5	2.42	115.32	112.25
7	B	902	NAG	C1-O5-C5	3.15	116.25	112.25
8	B	909	MAN	C1-C2-C3	3.32	113.47	109.54
4	A	905	NAG	C1-O5-C5	3.46	116.64	112.25
8	B	911	MAN	C1-C2-C3	3.55	113.74	109.54

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	B	909	MAN	1	0

## 5.6 Ligand geometry

Of 13 ligands modelled in this entry, 2 are monoatomic - leaving 11 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	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	NAG	A	901	1	14,14,15	0.56	0	15,19,21	0.97	1 (6%)
5	GOL	A	909	-	5,5,5	0.21	0	5,5,5	0.18	0
2	NAG	B	901	1	14,14,15	0.48	0	15,19,21	0.78	0
5	GOL	B	912	-	5,5,5	0.32	0	5,5,5	0.21	0
5	GOL	B	913	-	5,5,5	0.29	0	5,5,5	0.35	0
5	GOL	B	914	-	5,5,5	0.23	0	5,5,5	0.36	0
5	GOL	B	915	-	5,5,5	0.26	0	5,5,5	0.20	0
5	GOL	B	916	-	5,5,5	0.20	0	5,5,5	0.45	0
9	TLA	B	917	-	3,9,9	0.43	0	6,12,12	1.11	0
10	SRT	B	918	-	3,9,9	0.42	0	6,12,12	0.87	0
9	TLA	B	919	-	3,9,9	0.49	0	6,12,12	0.84	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	901	1	-	0/6/23/26	0/1/1/1
5	GOL	A	909	-	-	0/4/4/4	0/0/0/0
2	NAG	B	901	1	-	0/6/23/26	0/1/1/1
5	GOL	B	912	-	-	0/4/4/4	0/0/0/0
5	GOL	B	913	-	-	0/4/4/4	0/0/0/0
5	GOL	B	914	-	-	0/4/4/4	0/0/0/0
5	GOL	B	915	-	-	0/4/4/4	0/0/0/0
5	GOL	B	916	-	-	0/4/4/4	0/0/0/0
9	TLA	B	917	-	-	0/4/12/12	0/0/0/0
10	SRT	B	918	-	-	0/4/12/12	0/0/0/0
9	TLA	B	919	-	-	0/4/12/12	0/0/0/0

There are no bond length outliers.



All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
2	A	901	NAG	C4-C3-C2	2.34	114.86	111.23

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	913	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 ⓘ

### 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	595/653 (91%)	0.04	30 (5%)	32 41	22, 36, 64, 86	0
1	B	607/653 (92%)	-0.07	17 (2%)	56 64	20, 30, 50, 68	0
All	All	1202/1306 (92%)	-0.01	47 (3%)	43 52	20, 33, 61, 86	0

All (47) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	336	ASN	5.1
1	A	639	LEU	4.9
1	A	588	ASP	4.5
1	B	588	ASP	4.4
1	A	616	GLY	4.2
1	B	336	ASN	4.1
1	B	338	THR	4.1
1	B	589	GLY	4.0
1	A	529	ALA	3.9
1	B	590	LYS	3.8
1	A	338	THR	3.7
1	B	641	VAL	3.6
1	B	642	PRO	3.5
1	B	229	PRO	3.4
1	A	594	PRO	3.3
1	A	468	GLY	3.2
1	A	593	THR	3.2
1	A	521	GLY	3.1
1	B	186	HIS	3.1
1	B	426	ARG	3.0
1	A	408	ALA	2.9
1	B	189	ASP	2.8
1	A	451	ASN	2.8
1	A	626	TRP	2.8

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	RSRZ
1	B	103	THR	2.8
1	A	452	ARG	2.7
1	A	189	ASP	2.7
1	A	586	SER	2.7
1	A	481	CYS	2.5
1	A	64	TYR	2.5
1	A	470	VAL	2.5
1	A	523	ARG	2.5
1	B	591	ALA	2.5
1	A	632	PHE	2.4
1	A	635	PRO	2.4
1	A	339	SER	2.4
1	B	337	THR	2.4
1	A	455	ALA	2.3
1	A	186	HIS	2.3
1	A	637	PRO	2.3
1	B	451	ASN	2.3
1	A	411	VAL	2.2
1	A	337	THR	2.2
1	B	339	SER	2.2
1	A	518	LEU	2.1
1	B	102	SER	2.1
1	A	187	ASP	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. 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	RSCC	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
8	NAG	B	905	14/15	0.96	0.13	0.85	27,30,32,32	0
8	NAG	B	906	14/15	0.94	0.13	0.71	33,35,38,40	0
4	MAN	A	908	11/12	0.73	0.34	-	80,84,86,87	0

*Continued on next page...*

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
8	MAN	B	908	11/12	0.87	0.13	-	58,61,66,72	0
4	BMA	A	906	11/12	0.85	0.12	-	60,65,70,74	0
8	MAN	B	910	11/12	0.88	0.12	-	57,58,61,66	0
7	NAG	B	903	14/15	0.78	0.40	-	68,74,76,81	0
7	NAG	B	902	14/15	0.89	0.23	-	43,48,55,62	0
3	NAG	A	902	14/15	0.92	0.16	-	44,47,53,59	0
4	NAG	A	905	14/15	0.93	0.12	-	47,48,55,55	0
7	BMA	B	904	11/12	0.66	0.40	-	85,86,87,88	0
4	NAG	A	904	14/15	0.94	0.11	-	37,41,44,44	0
8	BMA	B	907	11/12	0.91	0.12	-	42,46,51,53	0
8	MAN	B	911	11/12	0.71	0.23	-	72,74,77,79	0
8	MAN	B	909	11/12	0.59	0.26	-	75,77,79,80	0
3	NAG	A	903	14/15	0.81	0.37	-	66,72,73,74	0
4	MAN	A	907	11/12	0.80	0.25	-	73,73,74,75	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	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
5	GOL	A	909	6/6	0.77	0.22	3.32	46,48,49,52	0
10	SRT	B	918	10/10	0.86	0.23	3.30	50,53,53,54	0
5	GOL	B	912	6/6	0.82	0.19	3.25	42,43,43,43	0
5	GOL	B	915	6/6	0.88	0.15	2.83	48,50,53,54	0
6	CL	A	910	1/1	0.99	0.10	1.84	31,31,31,31	0
5	GOL	B	913	6/6	0.89	0.13	1.47	39,40,41,41	0
5	GOL	B	914	6/6	0.92	0.14	1.45	37,38,38,38	0
9	TLA	B	919	10/10	0.77	0.19	1.26	66,68,71,71	0
5	GOL	B	916	6/6	0.94	0.09	-0.66	31,32,33,34	0
6	CL	B	920	1/1	0.99	0.06	-1.55	29,29,29,29	0
9	TLA	B	917	10/10	0.93	0.11	-1.66	37,39,40,42	0
2	NAG	B	901	14/15	0.94	0.13	-	35,40,43,43	0
2	NAG	A	901	14/15	0.89	0.21	-	51,57,60,60	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.