



# wwPDB X-ray Structure Validation Summary Report

Feb 28, 2014 – 03:03 AM GMT

PDB ID : 1E70  
Title : 2-F-GLUCOSYLATED MYROSINASE FROM SINAPIS ALBA  
Authors : Burmeister, W.P.  
Deposited on : 2000-08-23  
Resolution : 1.65 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>

---

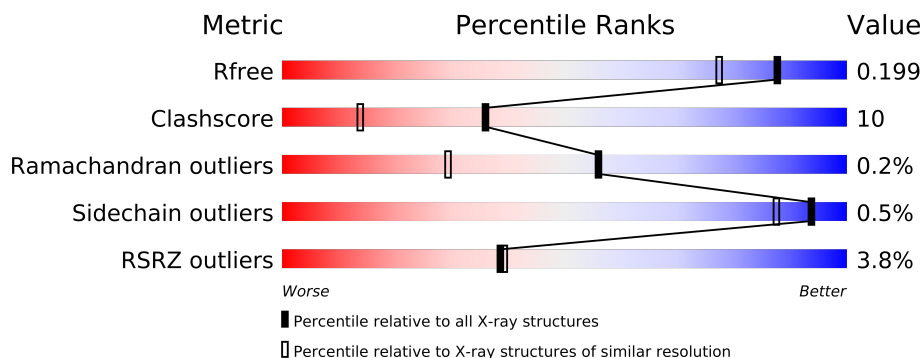
The following versions of software and data (see [references](#)) were used in the production of this report:

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 1.65 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	1404 (1.68-1.64)
Clashscore	79885	1001 (1.66-1.66)
Ramachandran outliers	78287	1581 (1.68-1.64)
Sidechain outliers	78261	1580 (1.68-1.64)
RSRZ outliers	66119	1404 (1.68-1.64)

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	M	501	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	NAG	M	901	-	X
2	NAG	M	911	-	X
2	NAG	M	931	-	X
2	NAG	M	961	-	X
2	NAG	M	971	-	X
2	NAG	M	991	-	X
8	SO4	M	1503	-	X

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Geometry	Electron density
8	SO4	M	1505	-	X
8	SO4	M	1506	-	X
8	SO4	M	1507	-	X
8	SO4	M	1508	-	X
8	SO4	M	1509	-	X
8	SO4	M	1510	-	X
9	GOL	M	1511	-	X
9	GOL	M	1512[A]	-	X
9	GOL	M	1512[B]	-	X
9	GOL	M	1513	X	X
9	GOL	M	1514	-	X

## 2 Entry composition i

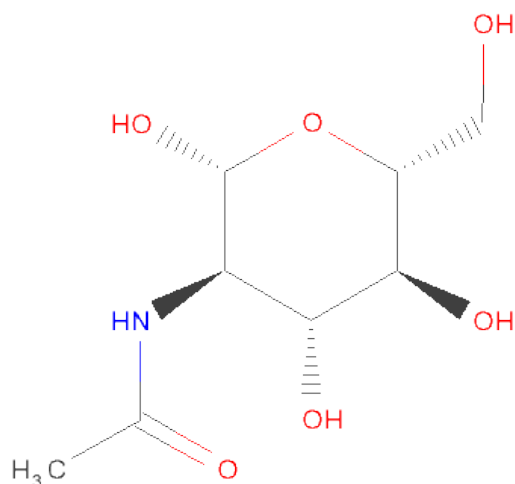
There are 10 unique types of molecules in this entry. The entry contains 5196 atoms, of which 0 are hydrogen and 0 are deuterium.

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 MYROSINASE MA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	M	499	Total	C	N	O	S	0	22	0
			4086	2622	660	788	16			

- 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	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		

*Continued on next page...*

*Continued from previous page...*

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

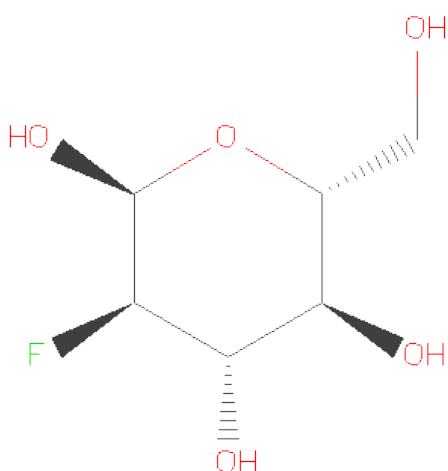
- Molecule 4 is a polymer of unknown type called SUGAR (5-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	M	5	Total	C	N	O	0	0
			58	33	2	23		

- Molecule 5 is a polymer of unknown type called SUGAR (6-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	M	6	Total	C	N	O	0	0
			69	39	2	28		

- Molecule 6 is SUGAR (2-DEOXY-2-FLUORO-ALPHA-D-GLUCOPYRANOSE) (three-letter code: G2F) (formula: C<sub>6</sub>H<sub>11</sub>FO<sub>5</sub>).

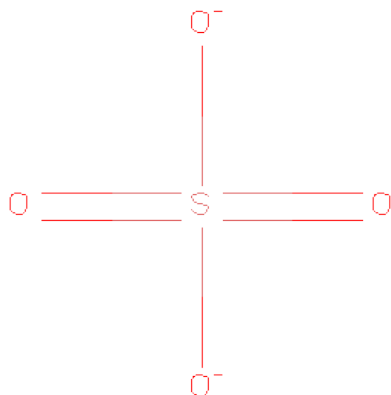


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	M	1	Total	C	F	O	0	0
			11	6	1	4		

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

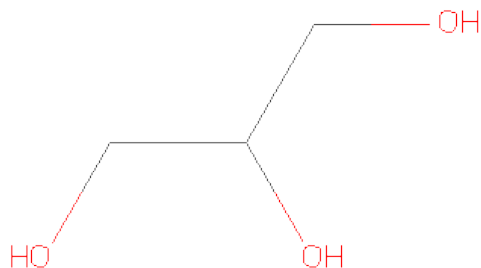
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	M	1	Total	Zn	0	0
			1	1		

- Molecule 8 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



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

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



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	1
			7	3	4		
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		

- Molecule 10 is water.

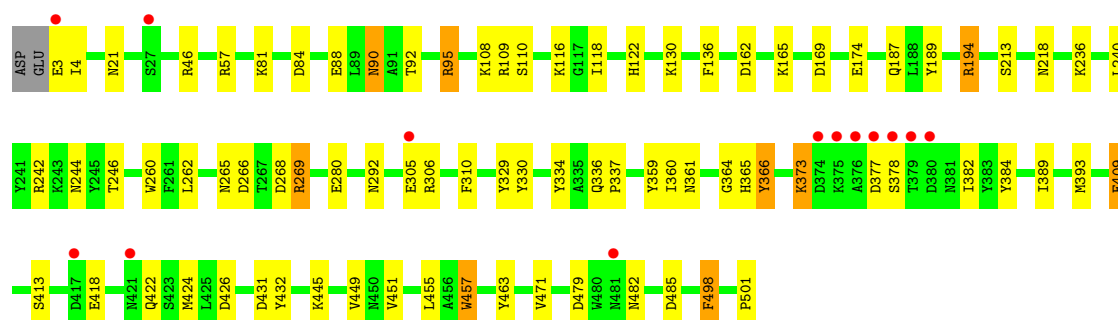
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	M	794	Total	O	0	0
			794	794		

### 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 ( $\text{RSRZ} > 2$ ). 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: MYROSINASE MA1

Chain M: 





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	135.30Å 137.20Å 80.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	10.00 – 1.65 9.99 – 1.65	Depositor EDS
% Data completeness (in resolution range)	82.3 (10.00-1.65) 82.3 (9.99-1.65)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.09 (at 1.65Å)	Xtriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.169 , 0.195 0.180 , 0.199	Depositor DCC
$R_{free}$ test set	3755 reflections (5.36%)	DCC
Wilson B-factor (Å <sup>2</sup> )	23.2	Xtriage
Anisotropy	0.229	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.47 , 69.8	EDS
Estimated twinning fraction	0.017 for -k,-h,-l	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 73749 reflections	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	5196	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 5.75% 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, ZN, BMA, NAG, G2F, SO4, MAN, FUC

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	M	2.43	3/4299 (0.1%)	1.56	56/5845 (1.0%)

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
1	M	0	2
5	M	1	0
All	All	1	2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	409[A]	GLU	CD-OE1	107.27	2.43	1.25
1	M	409[B]	GLU	CD-OE1	107.27	2.43	1.25
1	M	501	PRO	N-CD	5.46	1.55	1.47

The worst 5 of 56 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	426	ASP	CB-CG-OD1	15.70	132.43	118.30
1	M	109	ARG	NE-CZ-NH2	-15.33	112.63	120.30
1	M	409[A]	GLU	CG-CD-OE1	-15.30	87.70	118.30
1	M	409[B]	GLU	CG-CD-OE1	-15.30	87.70	118.30
1	M	46	ARG	NE-CZ-NH2	-11.90	114.35	120.30

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	M	954	MAN	C1

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	M	457	TRP	Mainchain,Peptide

## 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	M	4086	0	3841	73	0
2	M	84	0	77	9	0
3	M	28	0	25	4	0
4	M	58	0	50	4	0
5	M	69	0	57	6	0
6	M	11	0	9	2	0
7	M	1	0	0	0	0
8	M	40	0	0	3	0
9	M	25	0	30	2	0
10	M	794	0	0	18	0
All	All	5196	0	4089	83	0

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 10.

The worst 5 of 83 close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CZ	1.24	1.70
1:M:21:ASN:HD21	2:M:901:NAG:C1	1.00	1.63
1:M:292:ASN:HD21	5:M:951:NAG:C1	1.00	1.62
1:M:265:ASN:HD21	4:M:941:NAG:C1	0.97	1.61
1:M:90:ASN:HD21	2:M:911:NAG:C1	0.97	1.58

There are no symmetry-related clashes.

## 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	M	519/501 (104%)	503 (97%)	15 (3%)	1 (0%)	56 29

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	M	187	GLN

### 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	M	457/437 (105%)	455 (100%)	2 (0%)	95 91

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	3	GLU
1	M	373	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	M	244	ASN
1	M	365	HIS
1	M	265	ASN
1	M	122	HIS
1	M	292	ASN

### 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 ⓘ

13 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	M	921	1,3	12,14,15	1.64	5 (41%)	15,19,21	2.35	7 (46%)
3	NAG	M	923	3	12,14,15	1.07	1 (8%)	15,19,21	2.70	6 (40%)
4	NAG	M	941	1,4	12,14,15	1.11	1 (8%)	15,19,21	3.49	9 (60%)
4	FUC	M	942	4	9,10,11	1.21	0	10,14,16	2.41	6 (60%)
4	NAG	M	943	4	12,14,15	1.20	1 (8%)	15,19,21	1.77	3 (20%)
4	BMA	M	944	4	10,11,12	1.51	2 (20%)	11,15,17	1.33	2 (18%)
4	XYP	M	945	4	8,9,10	0.70	0	8,12,14	2.13	2 (25%)
5	NAG	M	951	1,5	12,14,15	1.11	0	15,19,21	2.04	5 (33%)
5	FUC	M	952	5	9,10,11	1.38	2 (22%)	10,14,16	2.16	5 (50%)
5	NAG	M	953	5	12,14,15	1.50	2 (16%)	15,19,21	2.81	7 (46%)
5	MAN	M	954	5	10,11,12	1.49	2 (20%)	11,15,17	7.47	8 (72%)
5	XYP	M	955	5	8,9,10	1.13	0	8,12,14	3.94	5 (62%)
5	MAN	M	956	5	10,11,12	1.04	1 (10%)	11,15,17	2.00	4 (36%)

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	M	921	1,3	-	0/6/23/26	0/1/1/1
3	NAG	M	923	3	-	0/6/23/26	0/1/1/1
4	NAG	M	941	1,4	-	0/6/23/26	0/1/1/1
4	FUC	M	942	4	-	0/0/17/20	0/1/1/1
4	NAG	M	943	4	-	0/6/23/26	0/1/1/1
4	BMA	M	944	4	-	0/2/19/22	0/1/1/1
4	XYP	M	945	4	-	0/0/14/17	0/1/1/1
5	NAG	M	951	1,5	-	0/6/23/26	0/1/1/1
5	FUC	M	952	5	-	0/0/17/20	0/1/1/1
5	NAG	M	953	5	-	0/6/23/26	0/1/1/1
5	MAN	M	954	5	1/1/4/5	0/2/19/22	0/1/1/1
5	XYP	M	955	5	-	0/0/14/17	0/1/1/1
5	MAN	M	956	5	-	0/2/19/22	0/1/1/1

The worst 5 of 17 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	M	954	MAN	C3-C2	-3.27	1.45	1.52
4	M	944	BMA	C4-C5	3.14	1.59	1.53
5	M	953	NAG	C3-C2	-3.06	1.46	1.52
4	M	941	NAG	C3-C2	3.05	1.58	1.52
4	M	944	BMA	C3-C2	-3.03	1.46	1.52

The worst 5 of 69 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	M	954	MAN	O5-C5-C6	-13.15	93.19	106.98
5	M	954	MAN	C6-C5-C4	12.70	143.68	113.00
5	M	954	MAN	O4-C4-C5	9.40	134.06	109.28
5	M	954	MAN	C3-C4-C5	8.39	125.19	110.20
3	M	923	NAG	O5-C5-C4	-7.29	101.40	110.65

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
5	M	954	MAN	C1

There are no torsion outliers.

There are no ring outliers.

## 5.6 Ligand geometry ⓘ

Of 21 ligands modelled in this entry, 2 are modelled with single atom and 1 is monoatomic - leaving 18 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$
8	SO4	M	1503	-	4,4,4	0.67	0	6,6,6	0.23	0
8	SO4	M	1504	-	4,4,4	0.99	0	6,6,6	0.23	0
8	SO4	M	1505	-	4,4,4	1.03	0	6,6,6	0.32	0
8	SO4	M	1506	-	4,4,4	1.12	0	6,6,6	1.76	2 (33%)
8	SO4	M	1507	-	4,4,4	1.25	0	6,6,6	0.99	0
8	SO4	M	1508	-	4,4,4	1.15	0	6,6,6	0.56	0
8	SO4	M	1509	-	4,4,4	1.01	0	6,6,6	0.17	0
8	SO4	M	1510	-	4,4,4	0.82	0	6,6,6	0.56	0
9	GOL	M	1511	-	5,5,5	0.28	0	5,5,5	0.62	0
9	GOL	M	1513	-	5,5,5	3.76	4 (80%)	5,5,5	2.40	3 (60%)
9	GOL	M	1514	-	5,5,5	0.26	0	5,5,5	0.87	0
2	NAG	M	901	1	12,14,15	1.12	1 (8%)	15,19,21	1.28	2 (13%)
2	NAG	M	911	1	12,14,15	1.28	1 (8%)	15,19,21	1.91	3 (20%)
2	NAG	M	931	1	12,14,15	1.95	2 (16%)	15,19,21	7.15	9 (60%)
2	NAG	M	961	1	12,14,15	1.90	3 (25%)	15,19,21	1.44	1 (6%)
2	NAG	M	971	1	12,14,15	1.50	2 (16%)	15,19,21	1.46	2 (13%)
2	NAG	M	991	1	12,14,15	1.59	3 (25%)	15,19,21	1.68	4 (26%)
6	G2F	M	999	-	9,11,12	2.43	1 (11%)	11,15,17	2.91	5 (45%)

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
8	SO4	M	1503	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1504	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1505	-	-	0/0/0/0	0/0/0/0

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	SO4	M	1506	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1507	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1508	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1509	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1510	-	-	0/0/0/0	0/0/0/0
9	GOL	M	1511	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1513	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1514	-	-	0/4/4/4	0/0/0/0
2	NAG	M	901	1	-	0/6/23/26	0/1/1/1
2	NAG	M	911	1	-	0/6/23/26	0/1/1/1
2	NAG	M	931	1	-	0/6/23/26	0/1/1/1
2	NAG	M	961	1	1/1/5/7	0/6/23/26	0/1/1/1
2	NAG	M	971	1	-	0/6/23/26	0/1/1/1
2	NAG	M	991	1	1/1/5/7	0/6/23/26	0/1/1/1
6	G2F	M	999	-	-	0/2/19/22	0/1/1/1

The worst 5 of 17 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	999	G2F	C2-C3	6.79	1.57	1.51
9	M	1513	GOL	O2-C2	5.99	1.62	1.43
2	M	931	NAG	O7-C7	-4.46	1.13	1.23
9	M	1513	GOL	O1-C1	4.11	1.60	1.42
2	M	971	NAG	O7-C7	-4.08	1.14	1.23

The worst 5 of 31 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	M	931	NAG	C2-N2-C7	24.44	164.12	123.09
2	M	931	NAG	C3-C2-N2	9.25	125.85	111.76
6	M	999	G2F	O5-C5-C6	-6.61	100.05	106.98
2	M	931	NAG	O7-C7-N2	-5.49	110.43	121.90
2	M	911	NAG	O5-C5-C4	-4.99	104.32	110.65

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	M	991	NAG	C1
2	M	961	NAG	C1

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	M	499/501 (99%)	-0.26	13 (2%) 53 54	20, 25, 39, 66	1 (0%)

The worst 5 of 13 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	376	ALA	9.9
1	M	380	ASP	4.6
1	M	374	ASP	4.4
1	M	378	SER	4.3
1	M	375	LYS	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
5	MAN	M	956	11/12	0.48	12.01	42,55,57,57	0
4	XYP	M	945	9/10	0.38	10.53	59,60,62,62	0
5	FUC	M	952	10/11	0.14	6.53	38,39,43,43	0
5	NAG	M	953	14/15	0.12	2.16	34,37,40,42	0
3	NAG	M	923	14/15	0.38	1.76	49,52,56,58	0

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
5	NAG	M	951	14/15	0.09	0.95	30,32,35,36	0
3	NAG	M	921	14/15	0.09	0.50	29,34,38,42	0
4	NAG	M	941	14/15	0.08	-0.17	30,33,36,36	0
4	NAG	M	943	14/15	0.12	-	39,43,48,49	0
5	MAN	M	954	11/12	0.17	-	44,48,52,54	0
4	FUC	M	942	10/11	0.23	-	41,43,47,49	0
5	XYP	M	955	9/10	0.42	-	56,59,60,62	0
4	BMA	M	944	11/12	0.33	-	53,57,59,59	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(Å <sup>2</sup> )	Q<0.9
8	SO4	M	1507	5/5	0.44	31.01	50,52,53,54	5
8	SO4	M	1505	5/5	0.28	29.79	54,56,56,58	5
2	NAG	M	971	14/15	0.46	29.62	69,75,76,76	0
9	GOL	M	1514	6/6	0.30	23.12	57,59,59,60	6
2	NAG	M	961	14/15	0.52	22.52	59,63,66,67	0
2	NAG	M	991	14/15	0.64	17.56	57,58,63,64	0
2	NAG	M	911	14/15	0.19	13.49	36,40,41,45	0
8	SO4	M	1509	5/5	0.33	12.87	54,55,55,55	5
9	GOL	M	1511	6/6	0.34	12.29	55,56,56,56	6
9	GOL	M	1512[B]	1/6	0.13	11.84	29,29,29,29	1
9	GOL	M	1513	6/6	0.31	11.72	20,26,29,36	0
8	SO4	M	1510	5/5	0.38	11.60	62,62,63,64	1
8	SO4	M	1506	5/5	0.12	10.17	35,36,37,40	0
9	GOL	M	1512[A]	1/6	0.13	9.99	16,16,16,16	1
2	NAG	M	931	14/15	0.32	6.52	53,58,60,60	0
8	SO4	M	1508	5/5	0.30	4.81	42,46,47,47	5
8	SO4	M	1503	5/5	0.12	3.90	37,40,41,43	5
2	NAG	M	901	14/15	0.21	2.52	42,45,50,52	0
8	SO4	M	1504	5/5	0.15	1.70	36,39,41,41	5
6	G2F	M	999	11/12	0.09	0.19	27,32,35,37	0
7	ZN	M	1502	1/1	0.02	-3.65	21,21,21,21	1

## 6.5 Other polymers ⓘ

There are no such residues in this entry.