



# wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 20, 2017 – 05:58 PM EDT

PDB ID : 1DWF  
Title : Study on radiation damage on a cryocooled crystal. Part 2: Structure after irradiation with  $9.1 \times 10^{15}$  photons/mm<sup>2</sup>  
Authors : Burmeister, W.P.  
Deposited on : 1999-12-05  
Resolution : 2.00 Å(reported)

This is a wwPDB X-ray Structure 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/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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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 : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20029077  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
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) : rb-20029077

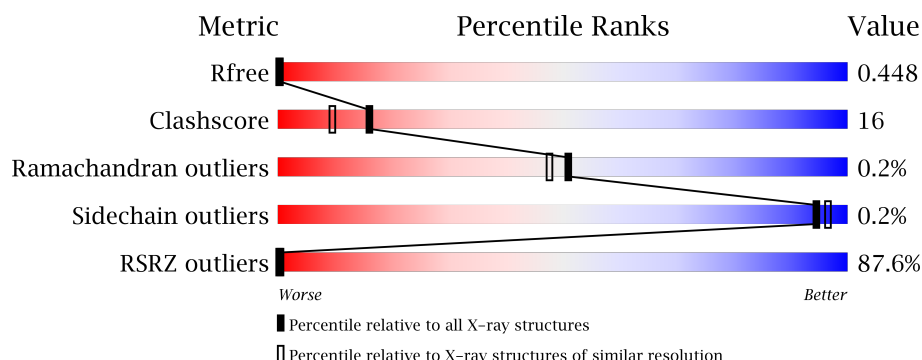
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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))
$R_{free}$	100719	6609 (2.00-2.00)
Clashscore	112137	7775 (2.00-2.00)
Ramachandran outliers	110173	7679 (2.00-2.00)
Sidechain outliers	110143	7678 (2.00-2.00)
RSRZ outliers	101464	6696 (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. 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	M	499	<div> <div>88%</div> <div>82%16%</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
2	NAG	M	1505	-	-	-	X
2	NAG	M	1506	-	-	X	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	NAG	M	1519	X	-	-	X
4	BMA	M	1515	-	-	X	-
6	MAN	M	1518	X	-	X	-
8	SO4	M	1526	-	-	X	-
8	SO4	M	1527	-	-	X	-
8	SO4	M	1529	-	X	-	-
8	SO4	M	1532	-	X	X	X
9	GOL	M	1533	-	-	X	X
9	GOL	M	1534	-	-	-	X

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 5220 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.

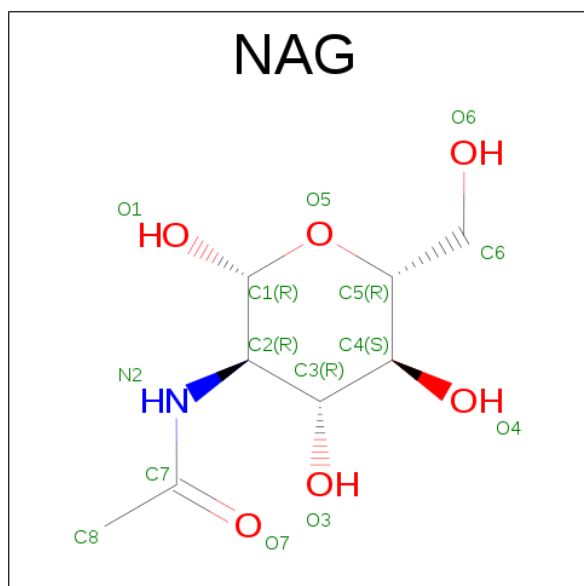
- Molecule 1 is a protein called MYROSINASE MA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	M	499	Total	C	N	O	S	0	21	0
			4083	2619	660	788	16			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	497	THR	SER	SEE REMARK 999	UNP P29736

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



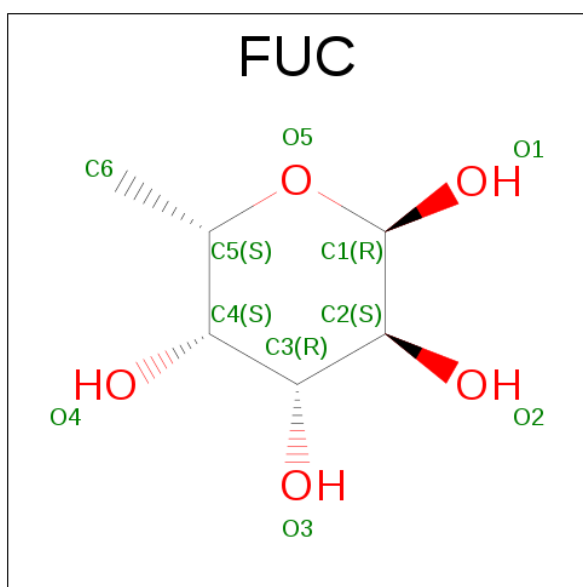
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		

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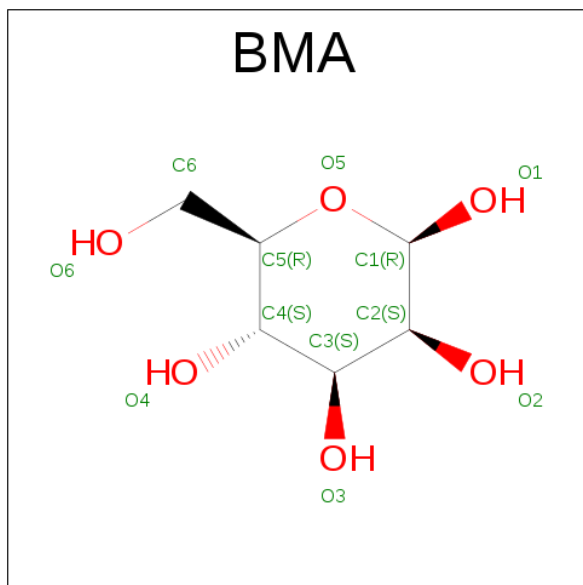
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1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

- Molecule 3 is ALPHA-L-FUCOSE (three-letter code: FUC) (formula:  $C_6H_{12}O_5$ ).



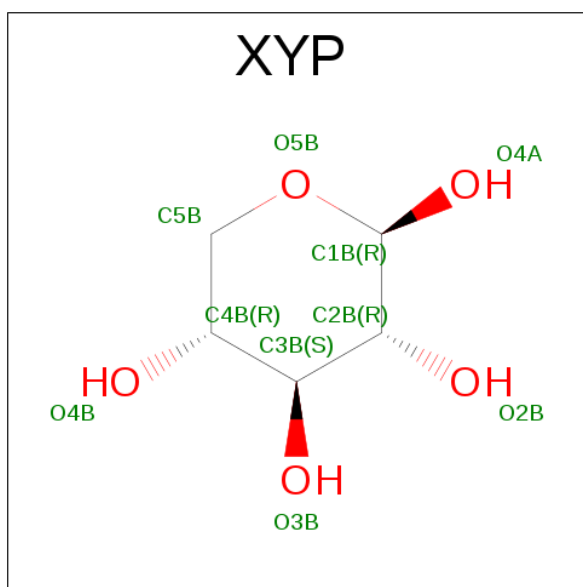
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	M	1	Total	C	O	0	0
			10	6	4		
3	M	1	Total	C	O	0	0
			10	6	4		

- Molecule 4 is BETA-D-MANNOSE (three-letter code: BMA) (formula:  $C_6H_{12}O_6$ ).



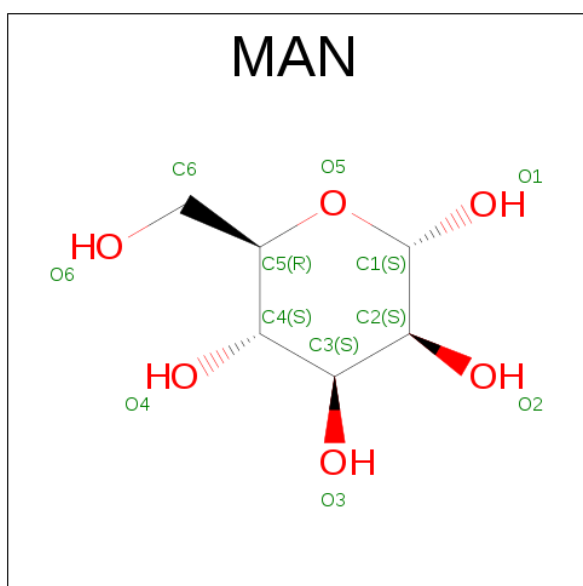
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	M	1	Total	C	O	0	0
			11	6	5		
4	M	1	Total	C	O	0	0
			11	6	5		

- Molecule 5 is BETA-D-XYLOPYRANOSE (three-letter code: XYP) (formula:  $C_5H_{10}O_5$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	M	1	Total	C	O	0	0
			9	5	4		
5	M	1	Total	C	O	0	0
			9	5	4		

- Molecule 6 is ALPHA-D-MANNOSE (three-letter code: MAN) (formula:  $C_6H_{12}O_6$ ).

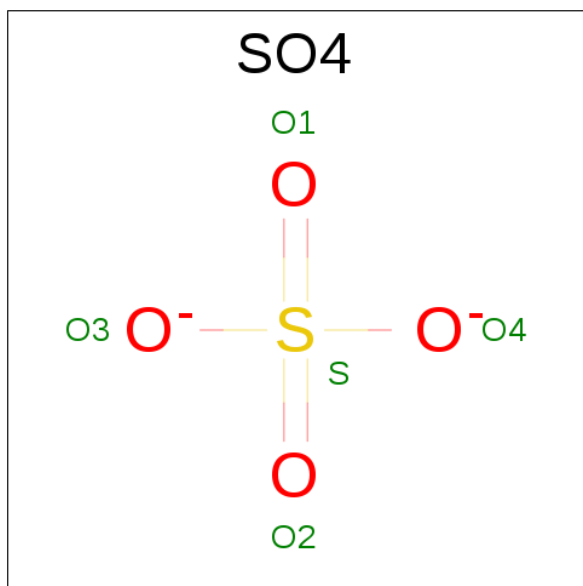


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	M	1	Total	C	O	0	0
			11	6	5		
6	M	1	Total	C	O	0	0
			11	6	5		

- 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		

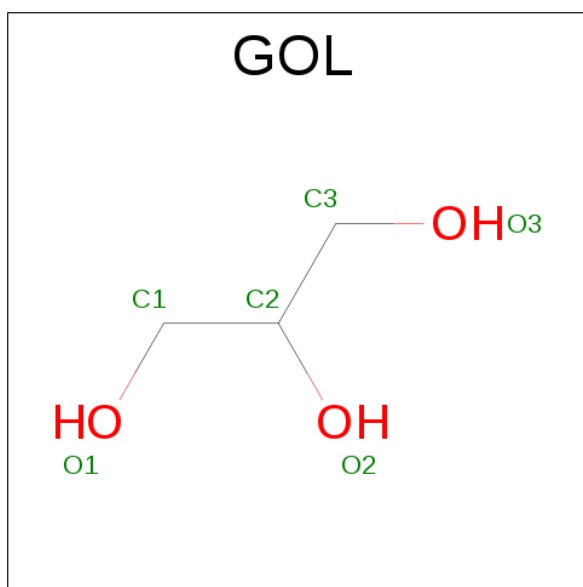
- Molecule 8 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



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		
8	M	1	Total	O	S	0	0
			5	4	1		

- Molecule 9 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
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		
9	M	1	Total	C	O	0	0
			6	3	3		

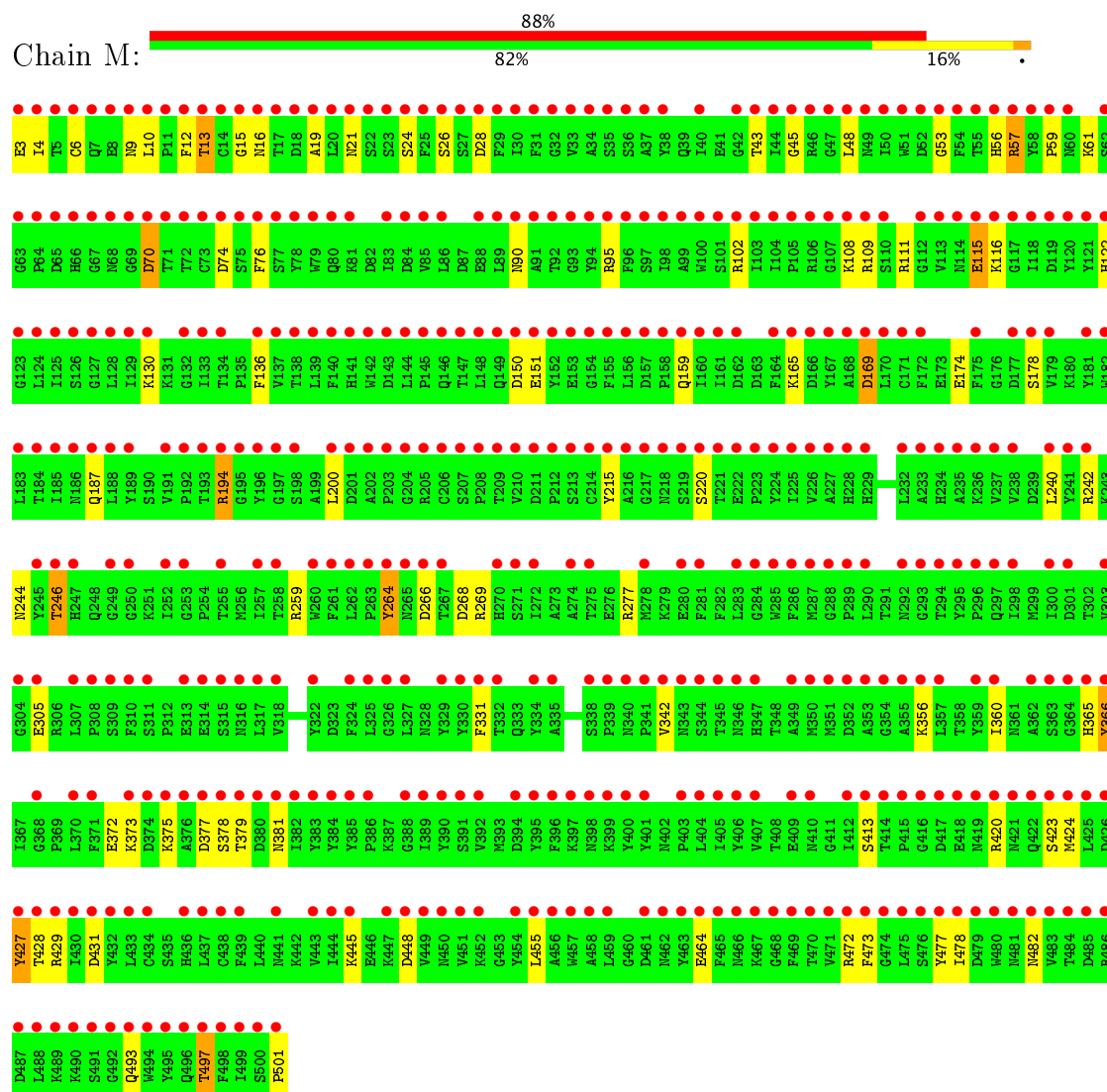
- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	M	788	Total	O	0	0
			788	788		

### 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 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: MYROSINASE MA1



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	134.30 Å   136.40 Å   80.30 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	17.40 – 2.00 9.94 – 1.99	Depositor EDS
% Data completeness (in resolution range)	99.8 (17.40-2.00) 98.7 (9.94-1.99)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	6.70 (at 1.99 Å)	Xtriage
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.169 , 0.180 0.435 , 0.448	Depositor DCC
$R_{free}$ test set	2440 reflections (4.87%)	DCC
Wilson B-factor (Å <sup>2</sup> )	16.8	Xtriage
Anisotropy	0.048	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.44 , 58.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.018 for -k,-h,-l	Xtriage
$F_o, F_c$ correlation	0.66	EDS
Total number of atoms	5220	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.67% 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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 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: XYP, GOL, ZN, BMA, NAG, 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	1.15	18/4291 (0.4%)	1.32	41/5835 (0.7%)

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	1

The worst 5 of 18 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	264	TYR	CE1-CZ	-21.78	1.10	1.38
1	M	264	TYR	CZ-OH	20.20	1.72	1.37
1	M	16	ASN	CG-ND2	12.66	1.64	1.32
1	M	356	LYS	CE-NZ	-11.08	1.21	1.49
1	M	423	SER	CB-OG	9.83	1.55	1.42

The worst 5 of 41 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	448	ASP	CB-CG-OD2	-18.65	101.51	118.30
1	M	115	GLU	OE1-CD-OE2	-15.25	105.00	123.30
1	M	264	TYR	CZ-CE2-CD2	-12.25	108.77	119.80
1	M	264	TYR	CE1-CZ-CE2	11.60	138.36	119.80
1	M	109	ARG	NE-CZ-NH1	-11.36	114.62	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	M	13	THR	Mainchain

## 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	M	4083	0	3835	104	4
2	M	196	0	172	22	0
3	M	20	0	20	0	0
4	M	22	0	15	7	0
5	M	18	0	16	0	0
6	M	22	0	19	8	0
7	M	1	0	0	0	1
8	M	40	0	0	9	0
9	M	30	0	39	4	0
10	M	788	0	0	77	17
All	All	5220	0	4116	134	21

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 16.

The worst 5 of 134 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:M:244:ASN:HD21	2:M:1506:NAG:C1	0.96	1.56
1:M:21:ASN:HD21	2:M:1502:NAG:C1	0.90	1.52
1:M:264:TYR:OH	1:M:264:TYR:CZ	1.72	1.42
1:M:360[B]:ILE:HD11	1:M:366[B]:TYR:CZ	1.57	1.37
9:M:1533:GOL:C1	10:M:3026:HOH:O	1.71	1.34

The worst 5 of 21 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	Interatomic distance (Å)	Clash overlap (Å)
7:M:1524:ZN:ZN	7:M:1524:ZN:ZN[3_656]	1.10	1.10
10:M:2279:HOH:O	10:M:2279:HOH:O[3_656]	1.10	1.10

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:M:2009:HOH:O	10:M:2520:HOH:O[4_576]	1.36	0.84
10:M:2248:HOH:O	10:M:2534:HOH:O[4_576]	1.37	0.83
10:M:2247:HOH:O	10:M:2247:HOH:O[4_576]	1.42	0.78

## 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	M	518/499 (104%)	504 (97%)	13 (2%)	1 (0%)	51 48

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	M	187	GLN

### 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	M	456/435 (105%)	455 (100%)	1 (0%)	94 96

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	3	GLU

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

Mol	Chain	Res	Type
1	M	244	ASN
1	M	365	HIS

### 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 ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

Of 36 ligands modelled in this entry, 1 is monoatomic - leaving 35 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	M	1502	1	14,14,15	1.18	1 (7%)	15,19,21	1.97	3 (20%)
2	NAG	M	1503	1	14,14,15	1.63	2 (14%)	15,19,21	2.08	2 (13%)
2	NAG	M	1504	1,2	14,14,15	6.16	7 (50%)	15,19,21	3.51	8 (53%)
2	NAG	M	1505	2	14,14,15	2.86	3 (21%)	15,19,21	3.90	7 (46%)
2	NAG	M	1506	1	14,14,15	1.98	5 (35%)	15,19,21	8.50	11 (73%)
2	NAG	M	1507	1,3,2	14,14,15	0.56	0	15,19,21	2.03	5 (33%)
3	FUC	M	1508	2	9,10,11	1.65	2 (22%)	13,14,16	2.26	4 (30%)
2	NAG	M	1509	2,4	14,14,15	1.03	1 (7%)	15,19,21	1.38	3 (20%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	BMA	M	1510	2,5	11,11,12	1.92	2 (18%)	13,15,17	1.61	4 (30%)
5	XYP	M	1511	4	9,9,10	1.37	2 (22%)	10,12,14	2.80	4 (40%)
2	NAG	M	1512	1,3,2	14,14,15	1.91	3 (21%)	15,19,21	2.52	2 (13%)
3	FUC	M	1513	2	9,10,11	3.07	5 (55%)	13,14,16	1.93	2 (15%)
2	NAG	M	1514	2,4	14,14,15	1.47	3 (21%)	15,19,21	1.71	3 (20%)
4	BMA	M	1515	2,5,6	11,11,12	2.64	3 (27%)	13,15,17	4.43	7 (53%)
5	XYP	M	1516	4	9,9,10	1.95	3 (33%)	10,12,14	2.32	4 (40%)
6	MAN	M	1517	4	11,11,12	1.90	2 (18%)	13,15,17	2.69	7 (53%)
6	MAN	M	1518	4	11,11,12	3.06	7 (63%)	13,15,17	7.12	10 (76%)
2	NAG	M	1519	1	14,14,15	1.34	2 (14%)	15,19,21	2.91	4 (26%)
2	NAG	M	1520	1	14,14,15	1.30	1 (7%)	15,19,21	2.49	6 (40%)
2	NAG	M	1521	1,2	14,14,15	2.34	4 (28%)	15,19,21	2.51	3 (20%)
2	NAG	M	1522	2	14,14,15	1.42	2 (14%)	15,19,21	2.67	9 (60%)
2	NAG	M	1523	1	14,14,15	1.22	1 (7%)	15,19,21	1.99	4 (26%)
8	SO4	M	1525	-	4,4,4	0.82	0	6,6,6	1.34	1 (16%)
8	SO4	M	1526	-	4,4,4	0.57	0	6,6,6	0.50	0
8	SO4	M	1527	8	4,4,4	1.44	1 (25%)	6,6,6	1.46	1 (16%)
8	SO4	M	1528	-	4,4,4	0.20	0	6,6,6	0.35	0
8	SO4	M	1529	-	4,4,4	1.97	1 (25%)	6,6,6	2.43	3 (50%)
8	SO4	M	1530	-	4,4,4	1.14	0	6,6,6	1.34	1 (16%)
8	SO4	M	1531	-	4,4,4	0.83	0	6,6,6	0.34	0
8	SO4	M	1532	8	4,4,4	1.55	1 (25%)	6,6,6	2.88	5 (83%)
9	GOL	M	1533	-	5,5,5	0.69	0	5,5,5	1.11	1 (20%)
9	GOL	M	1534	-	5,5,5	1.29	1 (20%)	5,5,5	1.00	0
9	GOL	M	1535	-	5,5,5	0.93	0	5,5,5	1.07	0
9	GOL	M	1536	-	5,5,5	0.64	0	5,5,5	1.05	0
9	GOL	M	1537	-	5,5,5	0.82	0	5,5,5	1.20	1 (20%)

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	M	1502	1	-	0/6/23/26	0/1/1/1
2	NAG	M	1503	1	-	0/6/23/26	0/1/1/1
2	NAG	M	1504	1,2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	M	1505	2	-	0/6/23/26	0/1/1/1
2	NAG	M	1506	1	-	0/6/23/26	0/1/1/1
2	NAG	M	1507	1,3,2	-	0/6/23/26	0/1/1/1
3	FUC	M	1508	2	-	0/0/17/20	0/1/1/1
2	NAG	M	1509	2,4	-	0/6/23/26	0/1/1/1
4	BMA	M	1510	2,5	-	0/2/19/22	0/1/1/1
5	XYP	M	1511	4	-	0/0/14/17	0/1/1/1
2	NAG	M	1512	1,3,2	-	0/6/23/26	0/1/1/1
3	FUC	M	1513	2	-	0/0/17/20	0/1/1/1
2	NAG	M	1514	2,4	-	0/6/23/26	0/1/1/1
4	BMA	M	1515	2,5,6	-	0/2/19/22	0/1/1/1
5	XYP	M	1516	4	-	0/0/14/17	0/1/1/1
6	MAN	M	1517	4	-	0/2/19/22	0/1/1/1
6	MAN	M	1518	4	1/1/4/5	0/2/19/22	0/1/1/1
2	NAG	M	1519	1	1/1/5/7	0/6/23/26	0/1/1/1
2	NAG	M	1520	1	-	0/6/23/26	0/1/1/1
2	NAG	M	1521	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	1522	2	-	0/6/23/26	0/1/1/1
2	NAG	M	1523	1	-	0/6/23/26	0/1/1/1
8	SO4	M	1525	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1526	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1527	8	-	0/0/0/0	0/0/0/0
8	SO4	M	1528	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1529	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1530	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1531	-	-	0/0/0/0	0/0/0/0
8	SO4	M	1532	8	-	0/0/0/0	0/0/0/0
9	GOL	M	1533	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1534	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1535	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1536	-	-	0/4/4/4	0/0/0/0
9	GOL	M	1537	-	-	0/4/4/4	0/0/0/0

The worst 5 of 65 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	M	1515	BMA	C2-C3	-7.27	1.42	1.52
2	M	1521	NAG	O7-C7	-6.30	1.08	1.23
2	M	1505	NAG	C6-C5	-6.06	1.31	1.51
2	M	1512	NAG	C1-C2	-5.26	1.45	1.52
2	M	1505	NAG	C4-C5	-4.53	1.43	1.53

The worst 5 of 125 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	M	1518	MAN	C1-O5-C5	-15.59	90.67	112.17
2	M	1506	NAG	O7-C7-N2	-7.97	106.58	121.92
2	M	1505	NAG	C1-O5-C5	-7.55	101.75	112.17
2	M	1504	NAG	O3-C3-C2	-7.34	93.66	109.39
2	M	1520	NAG	O5-C1-C2	-6.84	101.95	111.47

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	M	1518	MAN	C5
2	M	1519	NAG	C1

There are no torsion outliers.

There are no ring outliers.

12 monomers are involved in 44 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	M	1502	NAG	5	0
2	M	1503	NAG	3	0
2	M	1504	NAG	3	0
2	M	1506	NAG	8	0
4	M	1515	BMA	7	0
6	M	1518	MAN	8	0
2	M	1519	NAG	2	0
2	M	1522	NAG	1	0
8	M	1526	SO4	2	0
8	M	1527	SO4	5	0
8	M	1532	SO4	7	0
9	M	1533	GOL	4	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 [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<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	499/499 (100%)	3.17	437 (87%) <b>0</b> <b>0</b>	9, 13, 27, 54	3 (0%)

The worst 5 of 437 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	212	PRO	8.3
1	M	23	SER	7.2
1	M	376	ALA	7.1
1	M	378	SER	6.9
1	M	345	THR	6.7

### 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](#)

There are no carbohydrates in this entry.

### 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. 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	SO4	M	1532	5/5	0.52	0.58	<b>10.36</b>	36,38,44,57	1

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
9	GOL	M	1533	6/6	0.47	0.52	9.74	34,40,42,49	6
2	NAG	M	1506	14/15	0.63	0.43	4.89	33,40,46,47	0
2	NAG	M	1519	14/15	0.57	0.64	4.79	41,48,60,66	0
9	GOL	M	1534	6/6	0.53	0.42	3.10	3,12,16,16	1
8	SO4	M	1525	5/5	0.81	0.38	1.19	24,27,30,35	5
2	NAG	M	1502	14/15	0.47	0.40	0.35	23,32,44,46	0
2	NAG	M	1505	14/15	0.49	0.46	0.33	35,43,55,57	0
2	NAG	M	1507	14/15	0.64	0.34	0.18	13,20,25,25	0
2	NAG	M	1521	14/15	0.65	0.31	-0.11	7,14,19,21	0
8	SO4	M	1527	5/5	0.77	0.27	-0.17	12,26,28,32	5
2	NAG	M	1504	14/15	0.63	0.31	-0.23	17,21,30,35	0
9	GOL	M	1537	6/6	0.65	0.28	-0.68	13,14,20,20	0
9	GOL	M	1535	6/6	0.74	0.23	-1.34	9,19,24,29	6
7	ZN	M	1524	1/1	0.84	0.19	-	34,34,34,34	0
2	NAG	M	1520	14/15	0.57	0.40	-	54,62,68,68	0
4	BMA	M	1515	11/12	0.53	0.27	-	23,28,33,45	0
8	SO4	M	1530	5/5	0.76	0.34	-	11,31,32,35	5
5	XYP	M	1516	9/10	0.48	0.42	-	30,36,41,61	0
8	SO4	M	1528	5/5	0.72	0.31	-	15,19,24,27	0
8	SO4	M	1531	5/5	0.74	0.33	-	31,33,36,37	5
6	MAN	M	1518	11/12	0.54	0.56	-	31,41,52,53	0
3	FUC	M	1508	10/11	0.59	0.38	-	22,30,37,46	0
2	NAG	M	1522	14/15	0.57	0.36	-	24,29,47,54	0
2	NAG	M	1503	14/15	0.64	0.31	-	22,25,34,43	0
8	SO4	M	1529	5/5	0.78	0.49	-	24,28,32,33	5
2	NAG	M	1512	14/15	0.75	0.27	-	15,18,24,27	0
6	MAN	M	1517	11/12	0.42	0.47	-	23,37,49,54	0
3	FUC	M	1513	10/11	0.64	0.30	-	17,19,31,31	0
2	NAG	M	1509	14/15	0.71	0.30	-	19,25,31,36	0
2	NAG	M	1514	14/15	0.79	0.24	-	18,21,26,30	0
9	GOL	M	1536	6/6	0.52	0.57	-	29,29,41,43	6
8	SO4	M	1526	5/5	0.60	0.53	-	23,26,33,34	5
5	XYP	M	1511	9/10	0.54	0.34	-	39,46,50,52	0
2	NAG	M	1523	14/15	0.35	0.66	-	32,38,51,54	0
4	BMA	M	1510	11/12	0.34	0.51	-	36,41,46,51	0

## 6.5 Other polymers

There are no such residues in this entry.