



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 06:23 AM GMT

PDB ID : 2WXD
Title : A MICROMOLAR O-SULFATED THIOHYDROXIMATE INHIBITOR
BOUND TO PLANT MYROSINASE
Authors : Besle, A.; Burmeister, W.P.
Deposited on : 2009-11-09
Resolution : 1.60 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
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

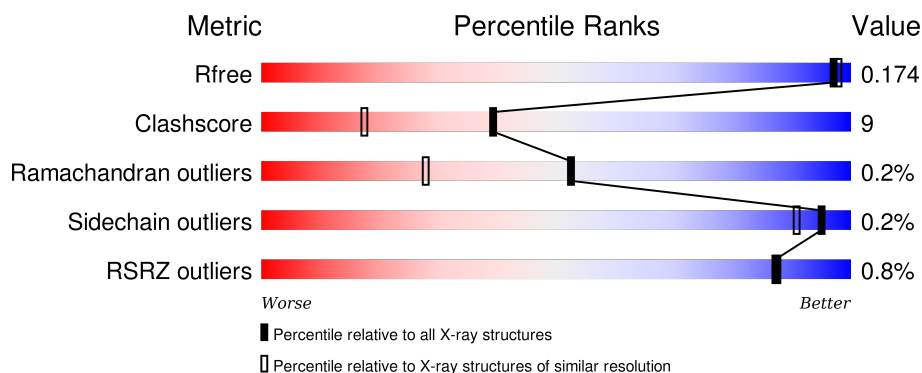
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 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	2475 (1.60-1.60)
Clashscore	102246	2732 (1.60-1.60)
Ramachandran outliers	100387	2654 (1.60-1.60)
Sidechain outliers	100360	2653 (1.60-1.60)
RSRZ outliers	91569	2479 (1.60-1.60)

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 ≥ 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	501	<div> <div style="width: 100%; height: 10px; position: relative;"> <div style="position: absolute; left: 0; top: -10px; width: 5px; height: 5px; background-color: red;"></div> <div style="position: absolute; left: 81%; top: -10px; width: 5px; height: 5px; background-color: yellow;"></div> <div style="position: absolute; left: 97%; top: -10px; width: 5px; height: 5px; background-color: green;"></div> </div> <div style="display: flex; justify-content: space-between; width: 100%;"> 81% 17% . </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	SO4	M	1503[A]	-	-	-	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
10	SO4	M	1503[B]	-	-	-	X
10	SO4	M	1504	-	-	-	X
11	GOL	M	2512[A]	-	-	-	X
11	GOL	M	2512[B]	-	-	-	X
11	GOL	M	2513	-	-	-	X
2	NAG	M	931	-	-	X	-
2	NAG	M	961	-	-	-	X
2	NAG	M	963	-	-	-	X
7	MAN	M	957	-	-	-	X
8	E18	M	1501	-	-	-	X

2 Entry composition [i](#)

There are 12 unique types of molecules in this entry. The entry contains 5238 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.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	M	499	Total	C	N	O	S	0	21	0
			4082	2617	663	786	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		

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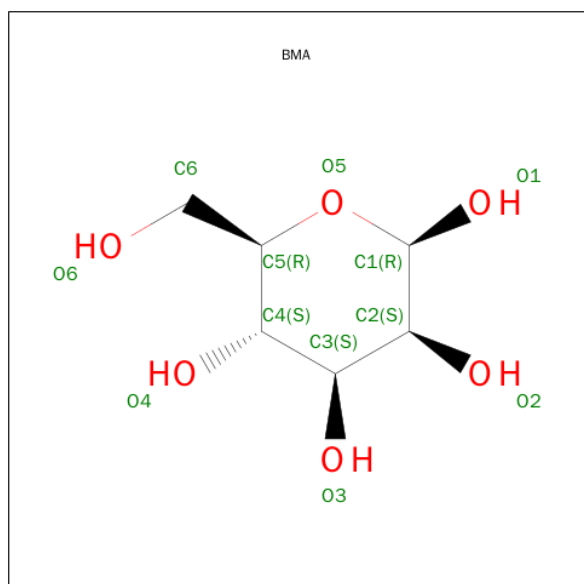
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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
			14	8	1	5		
2	M	1	Total	C	N	O	0	0
	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

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

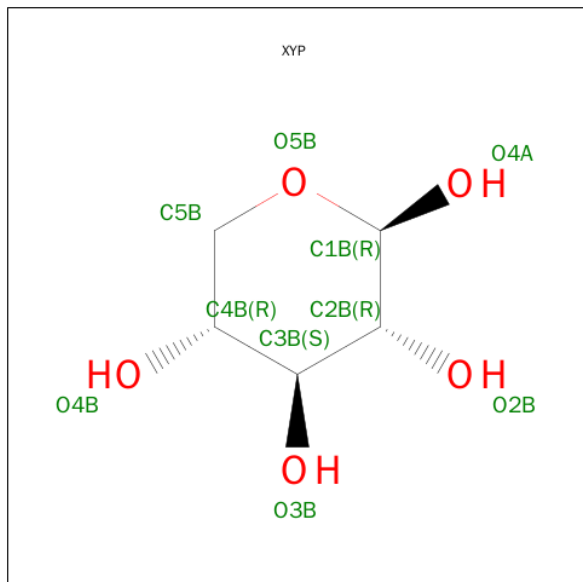
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	M	3	Total	C	N	O	0	0
			38	22	2	14		

- Molecule 4 is SUGAR (BETA-D-MANNOSE) (three-letter code: BMA) (formula: C₆H₁₂O₆).



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

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

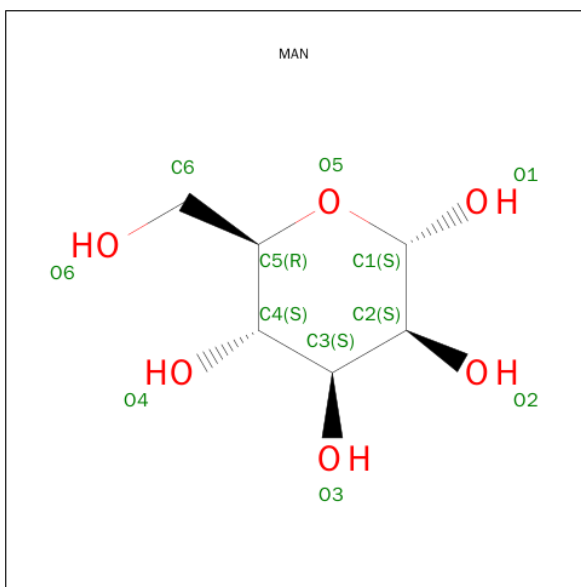


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	M	1	Total	C	O	0	0
			9	5	4		

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

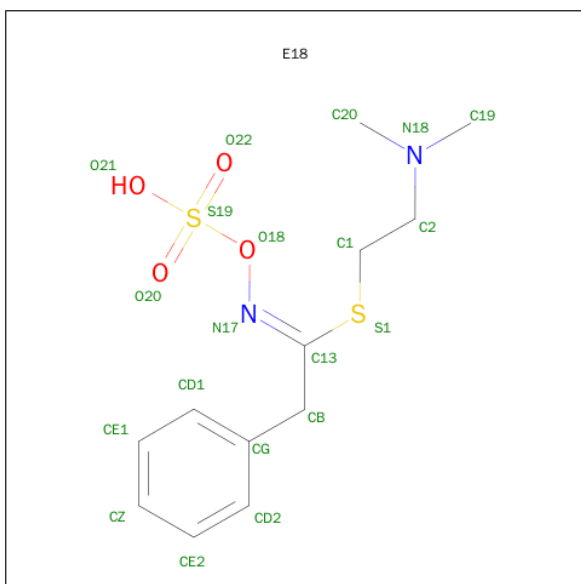
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	M	5	Total	C	N	O	0	0
			58	33	2	23		

- Molecule 7 is SUGAR (ALPHA-D-MANNOSE) (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



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

- Molecule 8 is 2-(DIMETHYLAMINO)ETHYL (1Z)-2-PHENYL-N-(SULFOOXY)ETHANIMIDOTHIOATE (three-letter code: E18) (formula: $C_{12}H_{18}N_2O_4S_2$).

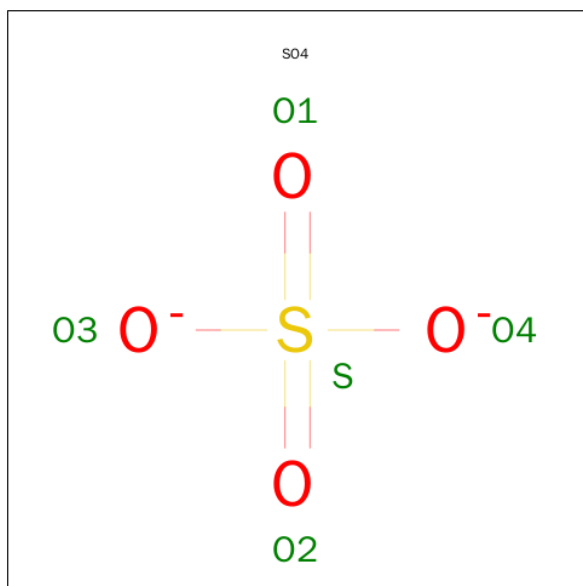


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
8	M	1	Total	C	N	O	S	0	0
			20	12	2	4	2		

- Molecule 9 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	M	1	Total	O	S	0	1
			10	8	2		
10	M	1	Total	O	S	0	0
			5	4	1		
10	M	1	Total	O	S	0	0
			5	4	1		
10	M	1	Total	O	S	0	0
			5	4	1		
10	M	1	Total	O	S	0	0
			5	4	1		
10	M	1	Total	O	S	0	0
			5	4	1		

- Molecule 11 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

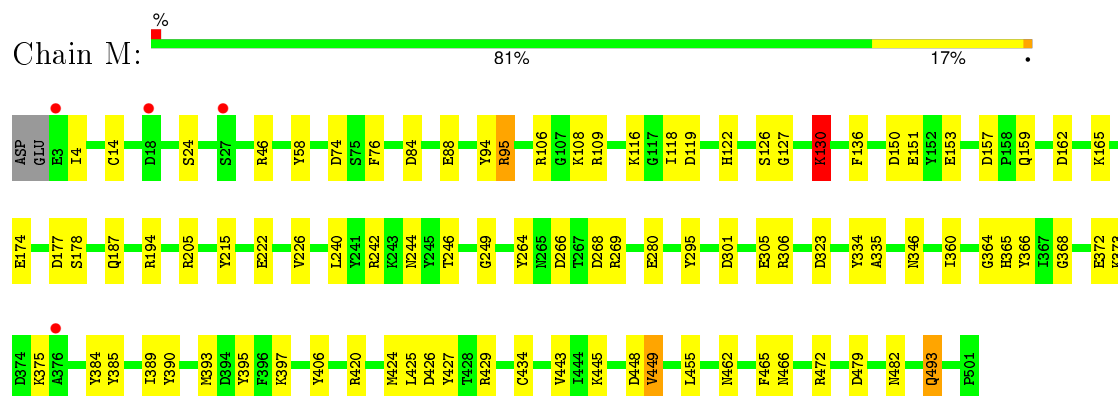
- Molecule 12 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	M	764	Total	O	0	0
			764	764		

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: MYROSINASE



4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	136.25Å 137.57Å 80.72Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	68.78 – 1.60 68.78 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.8 (68.78-1.60) 99.8 (68.78-1.60)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.56 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.143 , 0.164 0.153 , 0.174	Depositor DCC
R_{free} test set	5075 reflections (5.37%)	DCC
Wilson B-factor (Å ²)	13.6	Xtriage
Anisotropy	0.015	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.38 , 54.1	EDS
Estimated twinning fraction	0.017 for -k,-h,-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 99606 reflections	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	5238	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.78% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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: XYP, E18, ZN, BMA, NAG, GOL, 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	1.42	20/4284 (0.5%)	1.35	45/5824 (0.8%)

The worst 5 of 20 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	390	TYR	CE2-CZ	-9.47	1.26	1.38
1	M	178	SER	CB-OG	9.17	1.54	1.42
1	M	24	SER	CB-OG	6.99	1.51	1.42
1	M	222	GLU	CD-OE2	6.96	1.33	1.25
1	M	372	GLU	CD-OE1	6.93	1.33	1.25

The worst 5 of 45 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	M	242	ARG	NE-CZ-NH2	-11.80	114.40	120.30
1	M	205	ARG	NE-CZ-NH2	9.06	124.83	120.30
1	M	268	ASP	CB-CG-OD1	8.62	126.06	118.30
1	M	426	ASP	CB-CG-OD1	8.33	125.80	118.30
1	M	242	ARG	NE-CZ-NH1	8.04	124.32	120.30

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	M	4082	0	3830	51	0
2	M	168	0	154	22	0
3	M	38	0	33	2	0
4	M	11	0	10	4	0
5	M	9	0	8	2	0
6	M	58	0	48	3	0
7	M	22	0	20	2	0
8	M	20	0	18	2	0
9	M	1	0	0	0	0
10	M	40	0	0	0	0
11	M	25	0	30	4	0
12	M	764	0	0	25	5
All	All	5238	0	4151	68	5

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 9.

The worst 5 of 68 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:346:ASN:HD21	2:M:971:NAG:C1	0.99	1.61
1:M:244:ASN:HD21	2:M:931:NAG:C1	0.92	1.57
1:M:373:LYS:NZ	12:M:3539:HOH:O	1.81	1.14
1:M:130:LYS:HB3	12:M:3254:HOH:O	1.49	1.12
1:M:493:GLN:NE2	12:M:3675:HOH:O	1.92	1.00

All (5) 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)
12:M:3250:HOH:O	12:M:3250:HOH:O[4_576]	1.49	0.71
12:M:3285:HOH:O	12:M:3285:HOH:O[3_656]	1.66	0.54
12:M:3198:HOH:O	12:M:3741:HOH:O[3_656]	2.12	0.08
12:M:3255:HOH:O	12:M:3715:HOH:O[6_565]	2.18	0.02
12:M:3285:HOH:O	12:M:3743:HOH:O[3_656]	2.19	0.01

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	518/501 (103%)	504 (97%)	13 (2%)	1 (0%)	52 28

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	454/437 (104%)	453 (100%)	1 (0%)	95 91

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

Mol	Chain	Res	Type
1	M	130	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	M	122	HIS
1	M	244	ASN
1	M	346	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 ⓘ

8 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	941	1,3	14,14,15	1.45	2 (14%)	15,19,21	1.68	4 (26%)
3	FUC	M	942	3	10,10,11	0.67	0	14,14,16	1.53	3 (21%)
3	NAG	M	943	3,4	14,14,15	1.05	2 (14%)	15,19,21	1.77	5 (33%)
6	NAG	M	951	1,6	14,14,15	1.96	4 (28%)	15,19,21	2.23	4 (26%)
6	FUC	M	952	6	10,10,11	1.25	1 (10%)	14,14,16	2.68	6 (42%)
6	NAG	M	953	6	14,14,15	2.06	4 (28%)	15,19,21	2.58	7 (46%)
6	BMA	M	954	7,6	11,11,12	1.45	1 (9%)	14,15,17	2.43	6 (42%)
6	XYP	M	955	6	9,9,10	0.45	0	12,12,14	2.47	6 (50%)

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	941	1,3	-	0/6/23/26	0/1/1/1
3	FUC	M	942	3	-	0/0/17/20	0/1/1/1
3	NAG	M	943	3,4	-	0/6/23/26	0/1/1/1
6	NAG	M	951	1,6	-	0/6/23/26	0/1/1/1
6	FUC	M	952	6	-	0/0/17/20	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	M	953	6	-	0/6/23/26	0/1/1/1
6	BMA	M	954	7,6	-	0/2/19/22	0/1/1/1
6	XYP	M	955	6	-	0/0/14/17	0/1/1/1

The worst 5 of 14 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	M	951	NAG	O5-C1	-4.84	1.35	1.43
6	M	953	NAG	O4-C4	-2.59	1.36	1.43
6	M	952	FUC	C2-C3	-2.35	1.49	1.52
3	M	943	NAG	O5-C1	-2.17	1.40	1.43
6	M	951	NAG	C1-C2	2.15	1.55	1.52

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	M	953	NAG	O3-C3-C2	-6.50	96.23	109.11
6	M	955	XYP	C1B-C2B-C3B	-5.47	103.07	109.54
6	M	954	BMA	O3-C3-C4	-5.20	98.62	110.34
6	M	951	NAG	C1-O5-C5	-5.13	105.73	112.25
6	M	952	FUC	O3-C3-C2	-4.60	101.69	110.00

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	M	943	NAG	2	0
6	M	951	NAG	1	0
6	M	954	BMA	2	0

5.6 Ligand geometry ⓘ

Of 31 ligands modelled in this entry, 1 is monoatomic - leaving 30 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	E18	M	1501	-	17,20,20	1.19	1 (5%)	16,26,26	1.51	3 (18%)
10	SO4	M	1503[A]	-	4,4,4	0.66	0	6,6,6	0.57	0
10	SO4	M	1503[B]	-	4,4,4	0.77	0	6,6,6	1.36	1 (16%)
10	SO4	M	1504	-	4,4,4	1.42	1 (25%)	6,6,6	0.98	0
10	SO4	M	1505	-	4,4,4	0.67	0	6,6,6	0.63	0
10	SO4	M	1506	-	4,4,4	0.95	0	6,6,6	0.73	0
10	SO4	M	1507	-	4,4,4	0.79	0	6,6,6	0.74	0
10	SO4	M	1508	-	4,4,4	0.91	0	6,6,6	1.58	1 (16%)
10	SO4	M	1509	-	4,4,4	0.29	0	6,6,6	0.22	0
11	GOL	M	2511	-	5,5,5	0.54	0	5,5,5	1.02	0
11	GOL	M	2512[A]	-	5,5,5	0.87	0	5,5,5	2.44	1 (20%)
11	GOL	M	2512[B]	-	5,5,5	0.87	0	5,5,5	2.43	1 (20%)
11	GOL	M	2513	-	5,5,5	0.49	0	5,5,5	0.88	0
11	GOL	M	2514	-	5,5,5	0.42	0	5,5,5	1.16	1 (20%)
2	NAG	M	901	1	14,14,15	1.10	1 (7%)	15,19,21	2.06	5 (33%)
2	NAG	M	911	1,2	14,14,15	1.40	1 (7%)	15,19,21	1.57	3 (20%)
2	NAG	M	913	2	14,14,15	0.87	0	15,19,21	1.66	3 (20%)
2	NAG	M	921	1,2	14,14,15	1.86	5 (35%)	15,19,21	1.69	4 (26%)
2	NAG	M	923	2	14,14,15	0.68	0	15,19,21	2.75	7 (46%)
2	NAG	M	931	1	14,14,15	0.84	0	15,19,21	2.42	5 (33%)
4	BMA	M	944	3,5	11,11,12	0.95	0	14,15,17	2.77	4 (28%)
5	XYP	M	945	4	9,9,10	1.21	1 (11%)	12,12,14	2.44	6 (50%)
7	MAN	M	956	6	11,11,12	0.82	0	14,15,17	1.83	3 (21%)
7	MAN	M	957	6	11,11,12	1.11	0	14,15,17	1.31	1 (7%)
2	NAG	M	961	1,2	14,14,15	0.80	0	15,19,21	1.54	2 (13%)
2	NAG	M	963	2	14,14,15	0.54	0	15,19,21	1.46	2 (13%)
2	NAG	M	971	1	14,14,15	0.59	0	15,19,21	1.40	3 (20%)
2	NAG	M	981	1,2	14,14,15	1.80	5 (35%)	15,19,21	1.69	4 (26%)
2	NAG	M	983	2	14,14,15	1.24	2 (14%)	15,19,21	1.91	5 (33%)
2	NAG	M	991	1	14,14,15	1.12	1 (7%)	15,19,21	1.76	4 (26%)

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	E18	M	1501	-	-	1/8/16/16	0/1/1/1
10	SO4	M	1503[A]	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1503[B]	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1504	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1505	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1506	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1507	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1508	-	-	0/0/0/0	0/0/0/0
10	SO4	M	1509	-	-	0/0/0/0	0/0/0/0
11	GOL	M	2511	-	-	0/4/4/4	0/0/0/0
11	GOL	M	2512[A]	-	-	0/4/4/4	0/0/0/0
11	GOL	M	2512[B]	-	-	0/4/4/4	0/0/0/0
11	GOL	M	2513	-	-	0/4/4/4	0/0/0/0
11	GOL	M	2514	-	-	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	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	913	2	-	0/6/23/26	0/1/1/1
2	NAG	M	921	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	923	2	-	0/6/23/26	0/1/1/1
2	NAG	M	931	1	-	0/6/23/26	0/1/1/1
4	BMA	M	944	3,5	-	0/2/19/22	0/1/1/1
5	XYP	M	945	4	-	0/0/14/17	0/1/1/1
7	MAN	M	956	6	-	0/2/19/22	0/1/1/1
7	MAN	M	957	6	-	0/2/19/22	0/1/1/1
2	NAG	M	961	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	963	2	-	0/6/23/26	0/1/1/1
2	NAG	M	971	1	-	0/6/23/26	0/1/1/1
2	NAG	M	981	1,2	-	0/6/23/26	0/1/1/1
2	NAG	M	983	2	-	0/6/23/26	0/1/1/1
2	NAG	M	991	1	-	0/6/23/26	0/1/1/1

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	M	981	NAG	O5-C1	-4.23	1.36	1.43
2	M	921	NAG	C2-N2	-4.14	1.39	1.46
8	M	1501	E18	O18-N17	-3.81	1.36	1.45
2	M	911	NAG	O5-C1	-3.48	1.37	1.43
2	M	921	NAG	O5-C1	-3.17	1.38	1.43

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	M	923	NAG	C1-O5-C5	-6.92	103.47	112.25
4	M	944	BMA	C1-O5-C5	-6.88	103.52	112.25
5	M	945	XYP	O3B-C3B-C2B	-5.24	100.53	110.00
2	M	963	NAG	C1-O5-C5	-4.63	106.37	112.25
2	M	931	NAG	C1-O5-C5	-4.50	106.54	112.25

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	M	1501	E18	CB-C13-S1-C1

There are no ring outliers.

13 monomers are involved in 34 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	M	1501	E18	2	0
11	M	2511	GOL	3	0
11	M	2513	GOL	1	0
2	M	911	NAG	2	0
2	M	913	NAG	2	0
2	M	931	NAG	11	0
4	M	944	BMA	4	0
5	M	945	XYP	2	0
7	M	957	MAN	2	0
2	M	961	NAG	2	0
2	M	963	NAG	2	0
2	M	971	NAG	3	0
2	M	991	NAG	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, 95th 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 ²)	Q<0.9
1	M	499/501 (99%)	-0.32	4 (0%) 87 87	7, 11, 24, 51	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	M	3	GLU	3.2
1	M	18	ASP	2.1
1	M	376	ALA	2.1
1	M	27	SER	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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, 95th 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 ²)	Q<0.9
3	NAG	M	941	14/15	0.94	0.08	0.01	12,15,18,18	0
6	BMA	M	954	11/12	0.91	0.16	-	22,26,30,33	0
6	NAG	M	951	14/15	0.94	0.09	-	16,19,25,27	0
6	NAG	M	953	14/15	0.88	0.15	-	19,23,30,33	0
6	FUC	M	952	10/11	0.94	0.12	-	22,25,30,31	0
3	NAG	M	943	14/15	0.91	0.12	-	20,27,32,39	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
6	XYP	M	955	9/10	0.93	0.18	-	30,38,43,47	0
3	FUC	M	942	10/11	0.90	0.12	-	22,31,36,42	0

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, 95th 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(\AA^2)	Q<0.9
2	NAG	M	961	14/15	0.71	0.28	66.06	39,46,61,63	0
7	MAN	M	957	11/12	0.64	0.28	18.89	35,43,44,45	0
10	SO4	M	1503[B]	5/5	0.89	0.17	17.08	18,26,32,32	5
11	GOL	M	2512[A]	6/6	0.90	0.15	16.12	8,16,22,23	1
11	GOL	M	2512[B]	6/6	0.90	0.15	11.13	14,16,22,23	1
10	SO4	M	1504	5/5	0.98	0.10	6.53	20,22,31,31	5
2	NAG	M	963	14/15	0.79	0.19	6.28	40,46,52,53	0
8	E18	M	1501	20/20	0.91	0.15	4.39	16,23,39,40	20
10	SO4	M	1503[A]	5/5	0.89	0.17	3.94	24,29,44,45	5
11	GOL	M	2513	6/6	0.96	0.11	3.85	14,27,30,37	6
2	NAG	M	901	14/15	0.89	0.15	0.75	24,36,41,46	0
2	NAG	M	921	14/15	0.95	0.08	0.22	14,24,28,35	0
2	NAG	M	981	14/15	0.96	0.07	-0.81	11,14,18,19	0
10	SO4	M	1505	5/5	0.97	0.08	-	19,25,31,32	5
2	NAG	M	911	14/15	0.90	0.17	-	19,27,31,33	0
5	XYP	M	945	9/10	0.79	0.23	-	37,41,43,45	0
2	NAG	M	923	14/15	0.70	0.31	-	38,45,54,57	0
2	NAG	M	971	14/15	0.76	0.23	-	57,60,62,62	0
10	SO4	M	1509	5/5	0.82	0.19	-	36,39,42,42	5
2	NAG	M	983	14/15	0.82	0.23	-	22,37,46,48	0
10	SO4	M	1507	5/5	0.89	0.17	-	25,36,41,43	5
2	NAG	M	913	14/15	0.76	0.34	-	37,42,47,48	0
2	NAG	M	931	14/15	0.84	0.28	-	37,54,64,90	0
10	SO4	M	1508	5/5	0.74	0.20	-	18,29,40,41	5
2	NAG	M	991	14/15	0.78	0.20	-	30,39,49,53	0
11	GOL	M	2511	6/6	0.78	0.22	-	34,36,36,40	6
10	SO4	M	1506	5/5	0.99	0.07	-	19,19,23,27	0
7	MAN	M	956	11/12	0.79	0.27	-	36,42,48,52	0
4	BMA	M	944	11/12	0.75	0.20	-	37,39,46,47	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
11	GOL	M	2514	6/6	0.68	0.18	-	37,45,45,46	6
9	ZN	M	1502	1/1	1.00	0.07	-	8,8,8,8	1

6.5 Other polymers [i](#)

There are no such residues in this entry.