



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 08:48 PM EST

PDB ID : 5I0D
Title : Cycloalternan-forming enzyme from *Listeria monocytogenes* in complex with cycloalternan
Authors : Light, S.H.; Minasov, G.; Anderson, W.F.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on : 2016-02-03
Resolution : 1.77 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

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 : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20028442
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) : rb-20028442

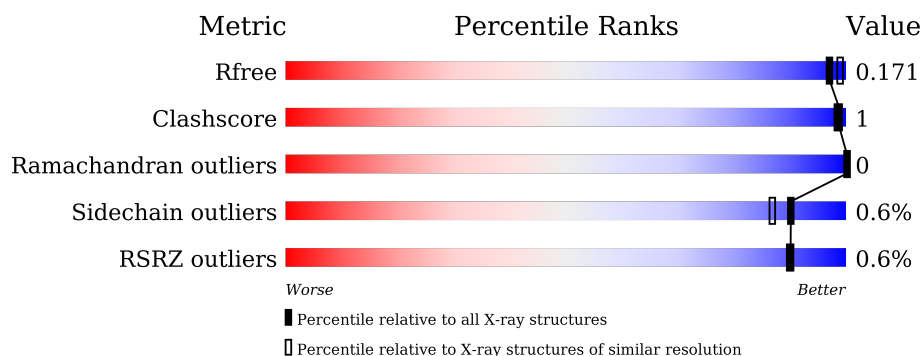
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

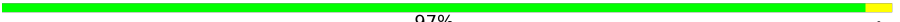

The reported resolution of this entry is 1.77 Å.

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	6655 (1.80-1.76)
Clashscore	102246	7658 (1.80-1.76)
Ramachandran outliers	100387	7570 (1.80-1.76)
Sidechain outliers	100360	7569 (1.80-1.76)
RSRZ outliers	91569	6671 (1.80-1.76)

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	A	1063	 97%
1	B	1063	 96%

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
5	GLC	A	1119	-	-	-	X
5	GLC	A	1121	-	-	-	X
5	GLC	B	1113	-	-	-	X
5	GLC	B	1115	-	-	-	X
5	GLC	B	1119	-	-	-	X
5	GLC	B	1122	-	-	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 20432 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 Lmo2446 protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1060	Total	C	N	O	Se	0	29	0
			8555	5365	1365	1791	34			
1	B	1060	Total	C	N	O	Se	0	35	0
			8610	5391	1370	1815	34			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	29	SER	-	expression tag	UNP Q8Y4J2
A	30	ASN	-	expression tag	UNP Q8Y4J2
B	29	SER	-	expression tag	UNP Q8Y4J2
B	30	ASN	-	expression tag	UNP Q8Y4J2

- Molecule 2 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	3	Total	Mg	0	0
			3	3		
2	A	5	Total	Mg	0	0
			5	5		

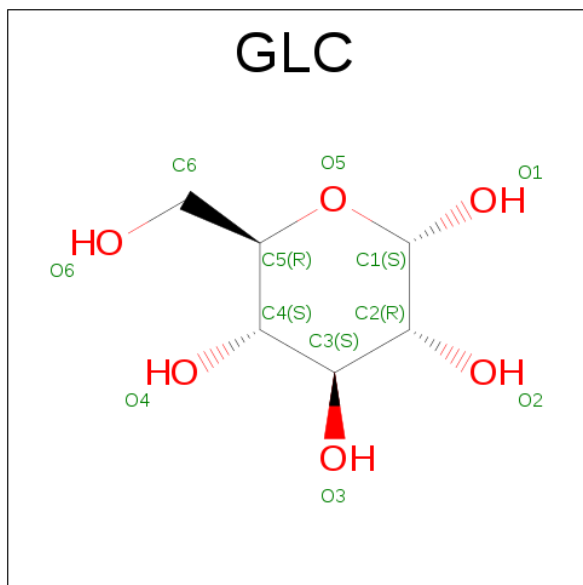
- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Ca	0	0
			1	1		
3	A	1	Total	Ca	0	0
			1	1		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	5	Total	Cl	0	0
			5	5		
4	A	2	Total	Cl	0	0
			2	2		

- Molecule 5 is ALPHA-D-GLUCOSE (three-letter code: GLC) (formula: C₆H₁₂O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			12	6	6		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			12	6	6		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			12	6	6		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			11	6	5		
5	A	1	Total	C	O	0	0
			12	6	6		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			12	6	6		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			12	6	6		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			12	6	6		
5	B	1	Total	C	O	0	0
			11	6	5		
5	B	1	Total	C	O	0	0
			11	6	5		

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

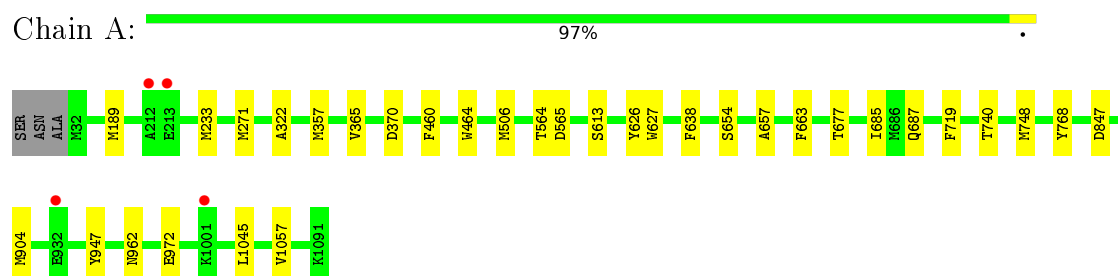
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1415	Total	O	0	11
			1424	1424		
6	B	1398	Total	O	0	16
			1412	1412		

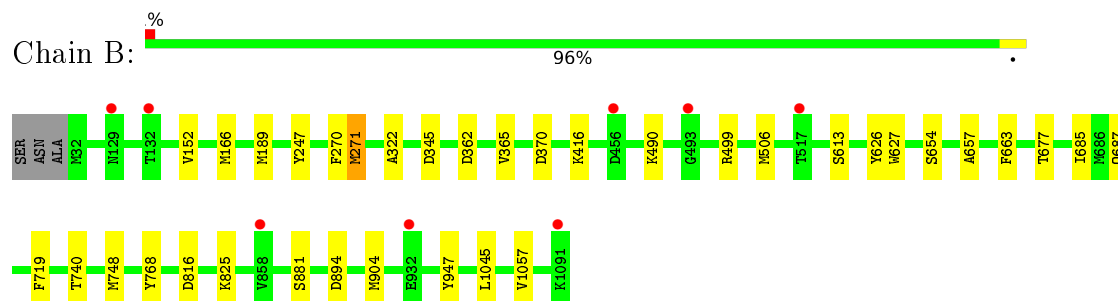
3 Residue-property plots [i](#)

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 ($RSRZ > 2$). 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: Lmo2446 protein



• Molecule 1: Lmo2446 protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	74.75Å 101.23Å 166.39Å 90.00° 101.02° 90.00°	Depositor
Resolution (Å)	30.00 – 1.77 29.91 – 1.77	Depositor EDS
% Data completeness (in resolution range)	98.4 (30.00-1.77) 98.4 (29.91-1.77)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.31 (at 1.77Å)	Xtriage
Refinement program	REFMAC 5.8.0135	Depositor
R, R_{free}	0.144 , 0.171 0.144 , 0.171	Depositor DCC
R_{free} test set	11536 reflections (5.21%)	DCC
Wilson B-factor (Å ²)	16.5	Xtriage
Anisotropy	0.448	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 46.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.015 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	20432	wwPDB-VP
Average B, all atoms (Å ²)	21.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.15% 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, 0.333 respectively for untwinned datasets, and 0.375, 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: CA, GLC, MG, CL

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	0.50	0/8735	0.72	7/11846 (0.1%)
1	B	0.51	2/8790 (0.0%)	0.73	5/11924 (0.0%)
All	All	0.50	2/17525 (0.0%)	0.73	12/23770 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	271[A]	MSE	N-CA	8.33	1.63	1.46
1	B	271[B]	MSE	N-CA	8.33	1.63	1.46

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	271[A]	MSE	CB-CG-SE	8.28	137.54	112.70
1	B	271[B]	MSE	CB-CG-SE	8.28	137.54	112.70
1	A	972	GLU	OE1-CD-OE2	6.77	131.42	123.30
1	A	565	ASP	CB-CG-OD1	6.75	124.38	118.30
1	A	370	ASP	CB-CG-OD1	6.46	124.11	118.30
1	A	847	ASP	CB-CG-OD1	5.58	123.32	118.30
1	A	638	PHE	CB-CG-CD1	5.45	124.62	120.80
1	A	638	PHE	CB-CG-CD2	-5.38	117.03	120.80
1	A	357	MSE	CG-SE-CE	-5.38	87.07	98.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	816	ASP	CB-CG-OD1	5.20	122.98	118.30
1	B	362	ASP	CB-CG-OD1	5.08	122.87	118.30
1	B	370	ASP	CB-CG-OD1	5.06	122.85	118.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	270	PHE	Mainchain

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	8555	0	7851	13	0
1	B	8610	0	7863	15	0
2	A	5	0	0	0	0
2	B	3	0	0	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	2	0	0	0	0
4	B	5	0	0	0	0
5	A	180	0	156	0	0
5	B	234	0	198	0	0
6	A	1424	0	0	3	1
6	B	1412	0	0	2	0
All	All	20432	0	16068	28	1

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 (28) 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:A:189[B]:MSE:HE1	1:A:365:VAL:HG23	1.70	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:271[B]:MSE:HA	1:B:345:ASP:O	2.08	0.54
1:B:613:SER:O	1:B:626:TYR:HA	2.10	0.52
1:B:748:MSE:HG3	1:B:768:TYR:CD1	2.45	0.51
1:B:657:ALA:HB2	1:B:685:ILE:HB	1.93	0.50
1:B:1045:LEU:HD23	1:B:1057[A]:VAL:HG21	1.93	0.50
1:B:152:VAL:HG22	1:B:166[A]:MSE:SE	2.62	0.50
1:A:271[B]:MSE:HE2	6:A:1645:HOH:O	2.12	0.50
1:B:189[B]:MSE:HE1	1:B:365:VAL:HG23	1.94	0.50
1:A:613:SER:O	1:A:626:TYR:HA	2.11	0.50
1:A:657:ALA:HB2	1:A:685:ILE:HB	1.95	0.48
1:B:904:MSE:O	1:B:947:TYR:HA	2.13	0.48
1:B:271[A]:MSE:HE2	6:B:1963:HOH:O	2.14	0.48
1:B:654:SER:HB3	1:B:740:THR:HG21	1.96	0.47
1:B:881[A]:SER:OG	1:B:894[A]:ASP:HB2	2.16	0.46
1:A:654:SER:HB3	1:A:740:THR:HG21	1.98	0.46
1:B:490:LYS:O	1:B:499:ARG:HD3	2.17	0.45
1:A:748:MSE:HG3	1:A:768:TYR:CD1	2.51	0.45
1:A:460:PHE:HB3	1:A:464:TRP:O	2.18	0.44
1:A:677:THR:HG21	1:A:719:PHE:HA	1.99	0.43
1:B:247:TYR:CE1	1:B:271[B]:MSE:HB2	2.54	0.43
1:A:322:ALA:HB3	6:A:1520:HOH:O	2.19	0.43
1:B:677:THR:HG21	1:B:719:PHE:HA	2.02	0.42
1:B:322:ALA:HB3	6:B:2196:HOH:O	2.18	0.42
1:A:904:MSE:O	1:A:947:TYR:HA	2.20	0.41
1:A:962:ASN:ND2	6:A:1222:HOH:O	2.54	0.41
1:A:189[B]:MSE:SE	1:A:233:MSE:SE	3.40	0.40
1:A:1045:LEU:HD23	1:A:1057[A]:VAL:HG21	2.04	0.40

All (1) 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)
6:A:2374:HOH:O	6:A:2374:HOH:O[2_857]	2.17	0.03

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries

of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1086/1063 (102%)	1064 (98%)	22 (2%)	0	100	100
1	B	1093/1063 (103%)	1063 (97%)	30 (3%)	0	100	100
All	All	2179/2126 (102%)	2127 (98%)	52 (2%)	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	919/863 (106%)	914 (100%)	5 (0%)	92	89
1	B	926/863 (107%)	920 (99%)	6 (1%)	90	87
All	All	1845/1726 (107%)	1834 (99%)	11 (1%)	90	87

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

Mol	Chain	Res	Type
1	A	506	MSE
1	A	564	THR
1	A	627	TRP
1	A	663	PHE
1	A	687	GLN
1	B	416	LYS
1	B	506	MSE
1	B	627	TRP
1	B	663	PHE
1	B	687	GLN
1	B	825	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	304	GLN
1	A	965	ASN
1	A	975	HIS
1	A	1064	GLN
1	B	965	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 ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

Of 54 ligands modelled in this entry, 17 are monoatomic - leaving 37 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	$\# Z > 2$
5	GLC	A	1109	5	12,12,12	0.42	0	17,17,17	0.60	0
5	GLC	A	1110	5	11,11,12	0.17	0	15,15,17	0.69	0
5	GLC	A	1111	5	11,11,12	0.31	0	15,15,17	0.93	1 (6%)
5	GLC	A	1112	5	11,11,12	0.30	0	15,15,17	0.80	1 (6%)
5	GLC	A	1113	5	11,11,12	0.40	0	15,15,17	1.09	2 (13%)
5	GLC	A	1114	5	11,11,12	0.20	0	15,15,17	0.86	0
5	GLC	A	1115	5	11,11,12	0.28	0	15,15,17	0.63	0
5	GLC	A	1116	5	12,12,12	0.47	0	17,17,17	0.64	0
5	GLC	A	1117	5	11,11,12	0.39	0	15,15,17	0.95	1 (6%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	GLC	A	1118	5	11,11,12	0.42	0	15,15,17	1.23	2 (13%)
5	GLC	A	1119	5	11,11,12	0.68	0	15,15,17	1.20	0
5	GLC	A	1120	5	11,11,12	0.39	0	15,15,17	0.85	1 (6%)
5	GLC	A	1121	5	12,12,12	0.46	0	17,17,17	0.62	0
5	GLC	A	1122	5	11,11,12	0.38	0	15,15,17	1.09	2 (13%)
5	GLC	A	1123	5	11,11,12	0.20	0	15,15,17	0.83	0
5	GLC	A	1124	-	12,12,12	0.48	0	17,17,17	0.68	0
5	GLC	B	1110	5	11,11,12	0.50	0	15,15,17	0.99	0
5	GLC	B	1111	5	11,11,12	0.37	0	15,15,17	0.93	0
5	GLC	B	1112	5	11,11,12	0.56	0	15,15,17	0.81	1 (6%)
5	GLC	B	1113	5	11,11,12	0.67	0	15,15,17	0.97	0
5	GLC	B	1114	5	12,12,12	0.42	0	17,17,17	0.48	0
5	GLC	B	1115	5	11,11,12	0.28	0	15,15,17	0.68	0
5	GLC	B	1116	5	12,12,12	0.49	0	17,17,17	0.62	0
5	GLC	B	1117	5	11,11,12	0.29	0	15,15,17	0.80	0
5	GLC	B	1118	5	11,11,12	0.44	0	15,15,17	1.06	1 (6%)
5	GLC	B	1119	5	11,11,12	0.45	0	15,15,17	0.73	0
5	GLC	B	1120	5	11,11,12	0.31	0	15,15,17	0.87	1 (6%)
5	GLC	B	1121	5	11,11,12	0.54	0	15,15,17	0.96	0
5	GLC	B	1122	-	12,12,12	0.44	0	17,17,17	0.52	0
5	GLC	B	1123	5	11,11,12	0.46	0	15,15,17	0.82	0
5	GLC	B	1124	5	11,11,12	0.54	0	15,15,17	0.89	0
5	GLC	B	1125	5	11,11,12	0.55	0	15,15,17	0.87	0
5	GLC	B	1126	5	11,11,12	0.46	0	15,15,17	0.92	1 (6%)
5	GLC	B	1127	5	11,11,12	0.35	0	15,15,17	1.06	2 (13%)
5	GLC	B	1128	5	11,11,12	0.27	0	15,15,17	1.03	1 (6%)
5	GLC	B	1129	5	11,11,12	0.38	0	15,15,17	0.95	1 (6%)
5	GLC	B	1130	5	11,11,12	0.25	0	15,15,17	0.72	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
5	GLC	A	1109	5	-	0/2/22/22	0/1/1/1
5	GLC	A	1110	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1111	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1112	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1113	5	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GLC	A	1114	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1115	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1116	5	-	0/2/22/22	0/1/1/1
5	GLC	A	1117	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1118	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1119	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1120	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1121	5	-	0/2/22/22	0/1/1/1
5	GLC	A	1122	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1123	5	-	0/2/19/22	0/1/1/1
5	GLC	A	1124	-	-	0/2/22/22	0/1/1/1
5	GLC	B	1110	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1111	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1112	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1113	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1114	5	-	0/2/22/22	0/1/1/1
5	GLC	B	1115	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1116	5	-	0/2/22/22	0/1/1/1
5	GLC	B	1117	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1118	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1119	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1120	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1121	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1122	-	-	0/2/22/22	0/1/1/1
5	GLC	B	1123	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1124	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1125	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1126	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1127	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1128	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1129	5	-	0/2/19/22	0/1/1/1
5	GLC	B	1130	5	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	1127	GLC	O3-C3-C2	-2.22	105.93	110.01
5	A	1113	GLC	O3-C3-C2	-2.18	106.02	110.01
5	B	1128	GLC	C2-C3-C4	-2.14	107.32	111.05
5	B	1127	GLC	O5-C1-C2	-2.13	107.49	110.89
5	B	1126	GLC	O5-C1-C2	-2.13	107.49	110.89

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1118	GLC	O6-C6-C5	-2.09	104.33	111.30
5	A	1113	GLC	C1-O5-C5	2.07	115.18	112.14
5	A	1122	GLC	C1-C2-C3	2.09	112.08	109.55
5	A	1112	GLC	C1-O5-C5	2.15	115.30	112.14
5	B	1112	GLC	C1-O5-C5	2.19	115.36	112.14
5	A	1118	GLC	C1-O5-C5	2.23	115.42	112.14
5	A	1111	GLC	C1-O5-C5	2.34	115.58	112.14
5	A	1117	GLC	C1-O5-C5	2.34	115.59	112.14
5	B	1120	GLC	C1-O5-C5	2.35	115.59	112.14
5	B	1129	GLC	C1-O5-C5	2.35	115.60	112.14
5	A	1120	GLC	C1-O5-C5	2.57	115.92	112.14
5	B	1118	GLC	C1-O5-C5	2.68	116.08	112.14
5	A	1122	GLC	C1-O5-C5	3.20	116.84	112.14

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 [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	A	1030/1063 (96%)	-0.32	4 (0%)	93 92	11, 18, 30, 46	0
1	B	1030/1063 (96%)	-0.31	8 (0%)	87 87	11, 19, 30, 41	0
All	All	2060/2126 (96%)	-0.31	12 (0%)	90 90	11, 18, 30, 46	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	132	THR	4.6
1	A	212	ALA	3.5
1	B	932	GLU	3.1
1	B	129	ASN	3.0
1	B	858	VAL	2.8
1	B	493	GLY	2.5
1	A	932	GLU	2.5
1	B	1091	LYS	2.4
1	B	517	THR	2.2
1	A	1001	LYS	2.1
1	B	456[A]	ASP	2.1
1	A	213	GLU	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](#)

There are no carbohydrates in this entry.

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, 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
5	GLC	A	1119	11/12	0.84	0.15	4.93	21,27,29,29	0
5	GLC	B	1119	11/12	0.79	0.26	4.62	36,40,41,42	0
5	GLC	B	1113	11/12	0.91	0.14	3.76	22,26,27,27	0
5	GLC	A	1121	12/12	0.83	0.23	3.33	29,31,31,32	12
5	GLC	B	1122	12/12	0.84	0.13	2.81	27,29,30,30	12
5	GLC	B	1115	11/12	0.90	0.09	2.02	22,26,28,28	0
5	GLC	B	1129	11/12	0.88	0.10	1.18	24,25,28,31	0
5	GLC	B	1123	11/12	0.82	0.16	0.60	37,41,43,43	0
5	GLC	A	1114	11/12	0.94	0.10	0.49	31,32,34,34	0
5	GLC	B	1111	11/12	0.92	0.09	0.24	22,22,25,27	0
5	GLC	A	1111	11/12	0.88	0.10	0.13	32,34,36,39	0
5	GLC	A	1110	11/12	0.96	0.07	-0.04	15,17,17,18	0
4	CL	B	1106	1/1	0.99	0.06	-0.07	29,29,29,29	0
5	GLC	A	1115	11/12	0.94	0.07	-0.22	20,21,21,22	0
5	GLC	B	1110	11/12	0.94	0.08	-0.25	17,18,20,20	0
2	MG	B	1102	1/1	0.96	0.07	-0.29	17,17,17,17	0
5	GLC	B	1130	11/12	0.85	0.11	-0.34	34,36,38,40	0
5	GLC	A	1117	11/12	0.93	0.08	-0.37	18,19,21,25	0
5	GLC	B	1128	11/12	0.97	0.07	-0.48	19,20,23,23	0
5	GLC	A	1118	11/12	0.97	0.07	-0.83	15,16,18,18	0
4	CL	A	1108	1/1	0.96	0.06	-0.84	40,40,40,40	0
5	GLC	B	1117	11/12	0.97	0.05	-1.04	16,16,17,17	0
2	MG	A	1101	1/1	0.98	0.04	-1.04	14,14,14,14	0
2	MG	B	1101	1/1	0.99	0.04	-1.07	15,15,15,15	0
2	MG	A	1103	1/1	0.98	0.05	-1.66	14,14,14,14	0
4	CL	B	1107	1/1	0.98	0.04	-2.21	33,33,33,33	0
3	CA	B	1104	1/1	0.99	0.04	-2.26	11,11,11,11	0
3	CA	A	1106	1/1	0.98	0.03	-3.80	14,14,14,14	0
4	CL	B	1109	1/1	0.99	0.03	-3.97	24,24,24,24	0
5	GLC	A	1123	11/12	0.80	0.28	-	34,34,35,35	11
5	GLC	B	1126	11/12	0.73	0.28	-	43,49,51,51	0
5	GLC	A	1112	11/12	0.91	0.16	-	41,42,45,46	0
5	GLC	B	1120	11/12	0.83	0.31	-	42,43,43,43	0
4	CL	B	1105	1/1	0.97	0.04	-	26,26,26,26	0
5	GLC	A	1122	11/12	0.80	0.26	-	29,31,32,34	11

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
5	GLC	B	1112	11/12	0.86	0.17	-	29,30,31,31	0
2	MG	A	1104	1/1	0.90	0.16	-	33,33,33,33	0
5	GLC	A	1113	11/12	0.85	0.16	-	36,40,44,46	0
5	GLC	A	1116	12/12	0.92	0.12	-	22,30,33,34	0
4	CL	A	1107	1/1	0.99	0.08	-	35,35,35,35	0
5	GLC	B	1125	11/12	0.74	0.24	-	44,45,47,47	0
4	CL	B	1108	1/1	0.94	0.15	-	34,34,34,34	0
5	GLC	B	1121	11/12	0.79	0.34	-	41,44,46,48	0
2	MG	A	1102	1/1	0.97	0.13	-	25,25,25,25	0
5	GLC	B	1114	12/12	0.85	0.14	-	27,35,37,38	0
5	GLC	A	1124	12/12	0.74	0.20	-	29,31,33,35	12
5	GLC	A	1109	12/12	0.97	0.06	-	17,20,22,23	0
5	GLC	A	1120	11/12	0.91	0.22	-	28,30,32,32	0
5	GLC	B	1124	11/12	0.83	0.17	-	40,42,43,44	0
5	GLC	B	1118	11/12	0.83	0.23	-	33,37,38,40	0
2	MG	B	1103	1/1	0.98	0.09	-	32,32,32,32	0
5	GLC	B	1127	11/12	0.78	0.17	-	27,36,39,41	0
2	MG	A	1105	1/1	0.85	0.16	-	41,41,41,41	0
5	GLC	B	1116	12/12	0.94	0.09	-	18,21,21,22	0

6.5 Other polymers [i](#)

There are no such residues in this entry.