



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 15, 2024 – 04:36 PM EST

PDB ID : 3PZO
Title : Structure of the hyperthermostable endo-1,4-beta-D-mannanase from *Thermotoga petrophila* RKU-1 in complex with three maltose molecules
Authors : Santos, C.R.; Meza, A.N.; Paiva, J.H.; Silva, J.C.; Ruller, R.; Prade, R.A.; Squina, F.M.; Murakami, M.T.
Deposited on : 2010-12-14
Resolution : 1.55 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

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

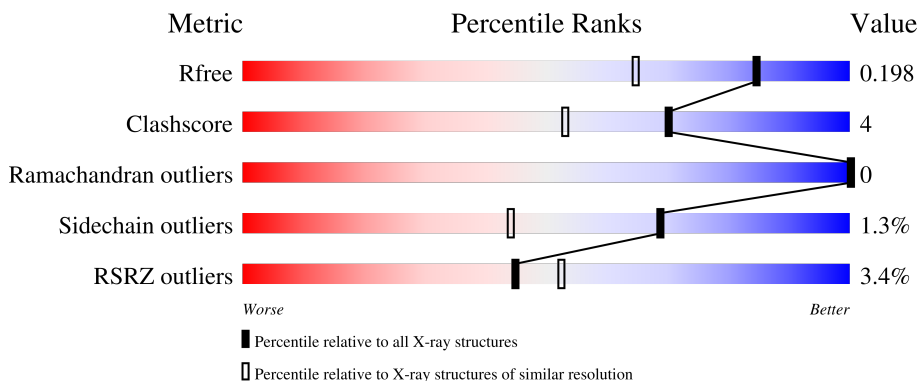
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.55 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}	130704	1483 (1.56-1.56)
Clashscore	141614	1529 (1.56-1.56)
Ramachandran outliers	138981	1498 (1.56-1.56)
Sidechain outliers	138945	1495 (1.56-1.56)
RSRZ outliers	127900	1465 (1.56-1.56)

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 of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. 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	383	 3% 79% 14% 7%
2	B	2	 100%
2	C	2	 100%

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	GLC	C	1	-	-	-	X

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 3293 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 Mannan endo-1,4-beta-mannosidase. Glycosyl Hydrolase family 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	357	2944	1895	483	555	11	0	4	0

There are 21 discrepancies between the modelled and reference sequences:

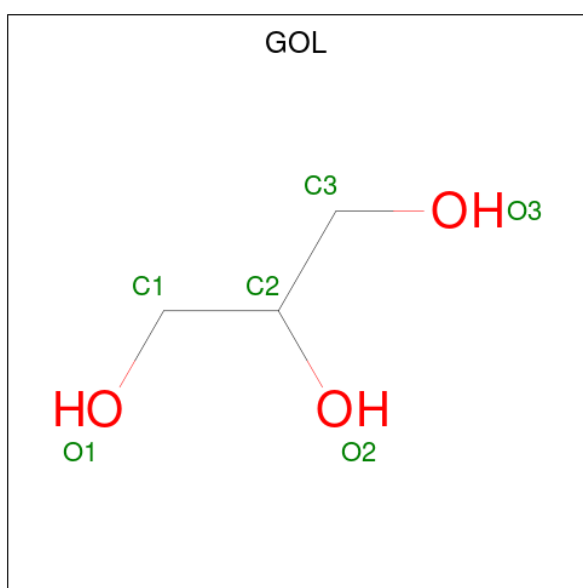
Chain	Residue	Modelled	Actual	Comment	Reference
A	11	MET	-	expression tag	UNP A5IMX7
A	12	GLY	-	expression tag	UNP A5IMX7
A	13	SER	-	expression tag	UNP A5IMX7
A	14	SER	-	expression tag	UNP A5IMX7
A	15	HIS	-	expression tag	UNP A5IMX7
A	16	HIS	-	expression tag	UNP A5IMX7
A	17	HIS	-	expression tag	UNP A5IMX7
A	18	HIS	-	expression tag	UNP A5IMX7
A	19	HIS	-	expression tag	UNP A5IMX7
A	20	HIS	-	expression tag	UNP A5IMX7
A	21	SER	-	expression tag	UNP A5IMX7
A	22	SER	-	expression tag	UNP A5IMX7
A	23	GLY	-	expression tag	UNP A5IMX7
A	24	LEU	-	expression tag	UNP A5IMX7
A	25	VAL	-	expression tag	UNP A5IMX7
A	26	PRO	-	expression tag	UNP A5IMX7
A	27	ARG	-	expression tag	UNP A5IMX7
A	28	GLY	-	expression tag	UNP A5IMX7
A	29	SER	-	expression tag	UNP A5IMX7
A	30	HIS	-	expression tag	UNP A5IMX7
A	31	MET	-	expression tag	UNP A5IMX7

- Molecule 2 is an oligosaccharide called alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose.



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	B	2	Total	C	O	0	0	0
			23	12	11			
2	C	2	Total	C	O	0	0	0
			23	12	11			

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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

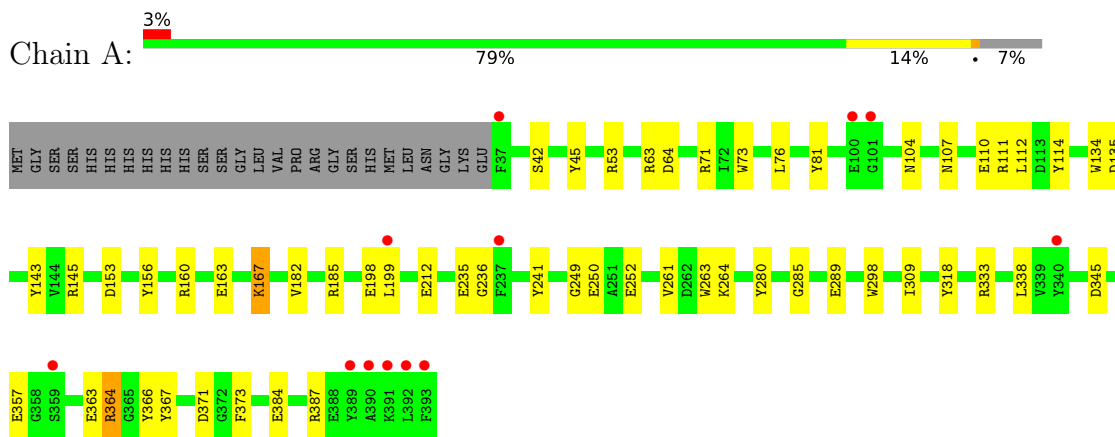
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	291	Total	O	0	0
			291	291		

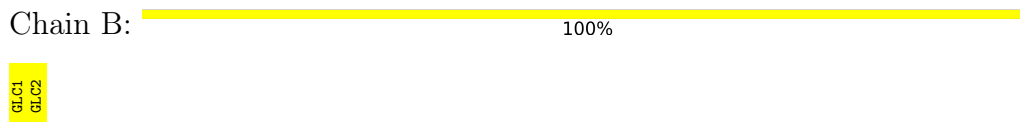
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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.

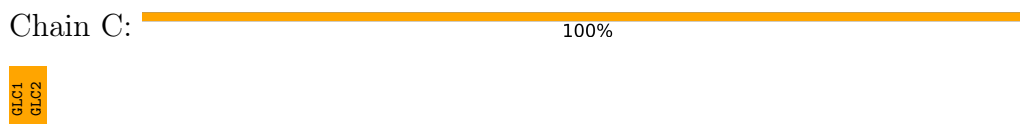
- Molecule 1: Mannan endo-1,4-beta-mannosidase. Glycosyl Hydrolase family 5



- Molecule 2: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose



- Molecule 2: alpha-D-glucopyranose-(1-4)-alpha-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	55.29Å 83.30Å 92.08Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.30 – 1.55 40.30 – 1.55	Depositor EDS
% Data completeness (in resolution range)	97.6 (40.30-1.55) 97.6 (40.30-1.55)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.56 (at 1.55Å)	Xtrriage
Refinement program	REFMAC 5.5.0110	Depositor
R, R_{free}	0.170 , 0.202 0.168 , 0.198	Depositor DCC
R_{free} test set	3072 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	16.7	Xtrriage
Anisotropy	0.174	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.40 , 47.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	3293	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.28% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GLC, GOL

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	1.58	21/3054 (0.7%)	1.43	29/4139 (0.7%)

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	212	GLU	CG-CD	8.16	1.64	1.51
1	A	163	GLU	CG-CD	8.13	1.64	1.51
1	A	42	SER	CB-OG	6.57	1.50	1.42
1	A	373	PHE	CD2-CE2	6.41	1.52	1.39
1	A	250	GLU	CG-CD	-6.21	1.42	1.51
1	A	160	ARG	CB-CG	6.15	1.69	1.52
1	A	104	ASN	CB-CG	6.10	1.65	1.51
1	A	163	GLU	CD-OE1	6.05	1.32	1.25
1	A	249	GLY	N-CA	5.97	1.55	1.46
1	A	114	TYR	CE1-CZ	5.92	1.46	1.38
1	A	81	TYR	CE1-CZ	5.78	1.46	1.38
1	A	182	VAL	CB-CG2	5.76	1.65	1.52
1	A	318	TYR	CE1-CZ	5.75	1.46	1.38
1	A	45	TYR	CD2-CE2	5.59	1.47	1.39
1	A	156	TYR	CE2-CZ	5.59	1.45	1.38
1	A	289	GLU	CD-OE1	5.57	1.31	1.25
1	A	111	ARG	CZ-NH2	5.57	1.40	1.33
1	A	298	TRP	CZ3-CH2	5.46	1.48	1.40
1	A	110	GLU	CD-OE1	5.43	1.31	1.25
1	A	104	ASN	CG-OD1	5.23	1.35	1.24
1	A	367	TYR	CD1-CE1	5.17	1.47	1.39

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	143	TYR	CB-CG-CD2	-10.50	114.70	121.00
1	A	364	ARG	NE-CZ-NH1	10.11	125.36	120.30
1	A	185	ARG	NE-CZ-NH1	9.86	125.23	120.30
1	A	364	ARG	NE-CZ-NH2	-9.57	115.52	120.30
1	A	185	ARG	NE-CZ-NH2	-8.52	116.04	120.30
1	A	338	LEU	CB-CG-CD1	-8.16	97.14	111.00
1	A	135	ASP	CB-CG-OD1	7.82	125.34	118.30
1	A	111	ARG	NE-CZ-NH2	-7.67	116.46	120.30
1	A	345	ASP	CB-CG-OD2	7.20	124.78	118.30
1	A	387	ARG	NE-CZ-NH1	7.17	123.88	120.30
1	A	63	ARG	NE-CZ-NH2	-7.04	116.78	120.30
1	A	280	TYR	CB-CG-CD2	-6.76	116.94	121.00
1	A	371	ASP	CB-CG-OD2	-6.62	112.34	118.30
1	A	235	GLU	OE1-CD-OE2	6.47	131.06	123.30
1	A	71	ARG	NE-CZ-NH2	-6.39	117.11	120.30
1	A	345	ASP	CB-CG-OD1	-6.28	112.64	118.30
1	A	333	ARG	NE-CZ-NH1	5.59	123.10	120.30
1	A	143	TYR	CG-CD2-CE2	-5.59	116.83	121.30
1	A	63	ARG	NE-CZ-NH1	5.57	123.08	120.30
1	A	366	TYR	CB-CG-CD1	-5.45	117.73	121.00
1	A	81	TYR	CB-CG-CD1	-5.44	117.74	121.00
1	A	241	TYR	CB-CG-CD2	-5.43	117.74	121.00
1	A	81	TYR	CD1-CG-CD2	5.33	123.76	117.90
1	A	81	TYR	CD1-CE1-CZ	-5.24	115.08	119.80
1	A	145	ARG	NE-CZ-NH2	-5.24	117.68	120.30
1	A	153	ASP	CB-CG-OD1	5.17	122.96	118.30
1	A	111	ARG	NE-CZ-NH1	5.16	122.88	120.30
1	A	387	ARG	NE-CZ-NH2	-5.15	117.73	120.30
1	A	167	LYS	CD-CE-NZ	5.06	123.33	111.70

There are no chirality outliers.

There are no planarity outliers.

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	A	2944	0	2762	20	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	23	0	21	0	0
2	C	23	0	21	5	0
3	A	12	0	15	0	0
4	A	291	0	0	11	0
All	All	3293	0	2819	21	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (21) 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:167:LYS:HE2	4:A:469:HOH:O	1.57	1.04
1:A:364:ARG:HD3	4:A:431:HOH:O	1.85	0.76
1:A:64[A]:ASP:OD1	4:A:510:HOH:O	2.04	0.76
1:A:261:VAL:HG11	4:A:541:HOH:O	1.92	0.69
1:A:134:TRP:HB3	2:C:1:GLC:H1	1.80	0.63
1:A:167:LYS:HE3	4:A:470:HOH:O	1.98	0.61
1:A:198:GLU:OE1	2:C:2:GLC:H62	2.05	0.56
1:A:236:GLY:HA2	1:A:263:TRP:CD1	2.41	0.56
1:A:384:GLU:HG3	4:A:552:HOH:O	2.09	0.52
4:A:602:HOH:O	2:C:2:GLC:C6	2.60	0.49
1:A:384:GLU:OE1	4:A:666:HOH:O	2.20	0.48
1:A:53:ARG:HD3	1:A:357:GLU:OE2	2.17	0.44
1:A:53:ARG:NH1	1:A:357:GLU:CG	2.81	0.43
1:A:112:LEU:HD12	1:A:112:LEU:HA	1.89	0.43
1:A:364:ARG:CD	4:A:431:HOH:O	2.55	0.43
1:A:134:TRP:CD1	2:C:1:GLC:H62	2.55	0.42
1:A:264:LYS:HG3	1:A:309:ILE:HD11	2.02	0.41
1:A:363:GLU:HG2	1:A:364:ARG:HG3	2.01	0.41
1:A:107:ASN:ND2	4:A:587:HOH:O	2.53	0.41
1:A:198:GLU:OE1	2:C:2:GLC:C6	2.68	0.41
1:A:285:GLY:N	4:A:489:HOH:O	2.54	0.41

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	360/383 (94%)	349 (97%)	11 (3%)	0	100 100

There are no Ramachandran outliers to report.

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	A	309/326 (95%)	305 (99%)	4 (1%)	69 44

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	TRP
1	A	76	LEU
1	A	199	LEU
1	A	252	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

4 monosaccharides 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
2	GLC	B	1	2	12,12,12	1.12	1 (8%)	17,17,17	1.98	7 (41%)
2	GLC	B	2	2	11,11,12	1.90	5 (45%)	15,15,17	1.75	5 (33%)
2	GLC	C	1	2	12,12,12	1.12	2 (16%)	17,17,17	2.20	6 (35%)
2	GLC	C	2	2	11,11,12	2.16	4 (36%)	15,15,17	3.59	5 (33%)

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	GLC	B	1	2	-	0/2/22/22	0/1/1/1
2	GLC	B	2	2	-	0/2/19/22	0/1/1/1
2	GLC	C	1	2	-	1/2/22/22	0/1/1/1
2	GLC	C	2	2	-	2/2/19/22	0/1/1/1

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	2	GLC	C2-C3	4.96	1.59	1.52
2	C	2	GLC	C1-C2	3.32	1.59	1.52
2	B	2	GLC	C2-C3	3.13	1.57	1.52
2	B	2	GLC	O5-C1	3.05	1.48	1.43
2	C	2	GLC	O3-C3	2.81	1.49	1.43
2	B	2	GLC	O5-C5	2.43	1.48	1.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2	GLC	C1-C2	2.28	1.57	1.52
2	C	1	GLC	O1-C1	2.21	1.46	1.39
2	C	2	GLC	O6-C6	2.17	1.51	1.42
2	B	1	GLC	C4-C5	2.16	1.57	1.53
2	B	2	GLC	O2-C2	2.08	1.47	1.43
2	C	1	GLC	O4-C4	2.04	1.47	1.43

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	2	GLC	C1-C2-C3	10.59	122.68	109.67
2	C	2	GLC	C1-O5-C5	6.65	121.21	112.19
2	C	1	GLC	O5-C5-C4	5.35	119.41	109.69
2	C	2	GLC	O3-C3-C2	4.42	118.45	109.99
2	C	1	GLC	C3-C4-C5	-3.74	103.57	110.24
2	B	1	GLC	C4-C3-C2	-3.67	104.42	110.82
2	B	2	GLC	O5-C5-C6	3.25	112.31	107.20
2	C	1	GLC	O4-C4-C5	3.05	116.86	109.30
2	C	1	GLC	C1-O5-C5	2.94	119.22	113.66
2	B	1	GLC	C3-C4-C5	2.94	115.49	110.24
2	B	2	GLC	O3-C3-C2	2.79	115.34	109.99
2	C	2	GLC	O4-C4-C5	-2.76	102.45	109.30
2	B	1	GLC	O2-C2-C3	-2.73	104.03	110.35
2	B	2	GLC	C2-C3-C4	2.69	115.55	110.89
2	B	1	GLC	O4-C4-C3	-2.50	104.56	110.35
2	C	1	GLC	C6-C5-C4	-2.46	107.23	113.00
2	C	1	GLC	O5-C1-C2	2.34	114.46	110.28
2	B	1	GLC	O5-C5-C6	2.22	111.96	106.44
2	B	1	GLC	O5-C1-C2	2.15	114.12	110.28
2	C	2	GLC	O4-C4-C3	-2.14	105.40	110.35
2	B	2	GLC	C3-C4-C5	2.11	114.01	110.24
2	B	2	GLC	C1-C2-C3	2.10	112.25	109.67
2	B	1	GLC	O3-C3-C2	2.00	114.98	110.35

There are no chirality outliers.

All (3) torsion outliers are listed below:

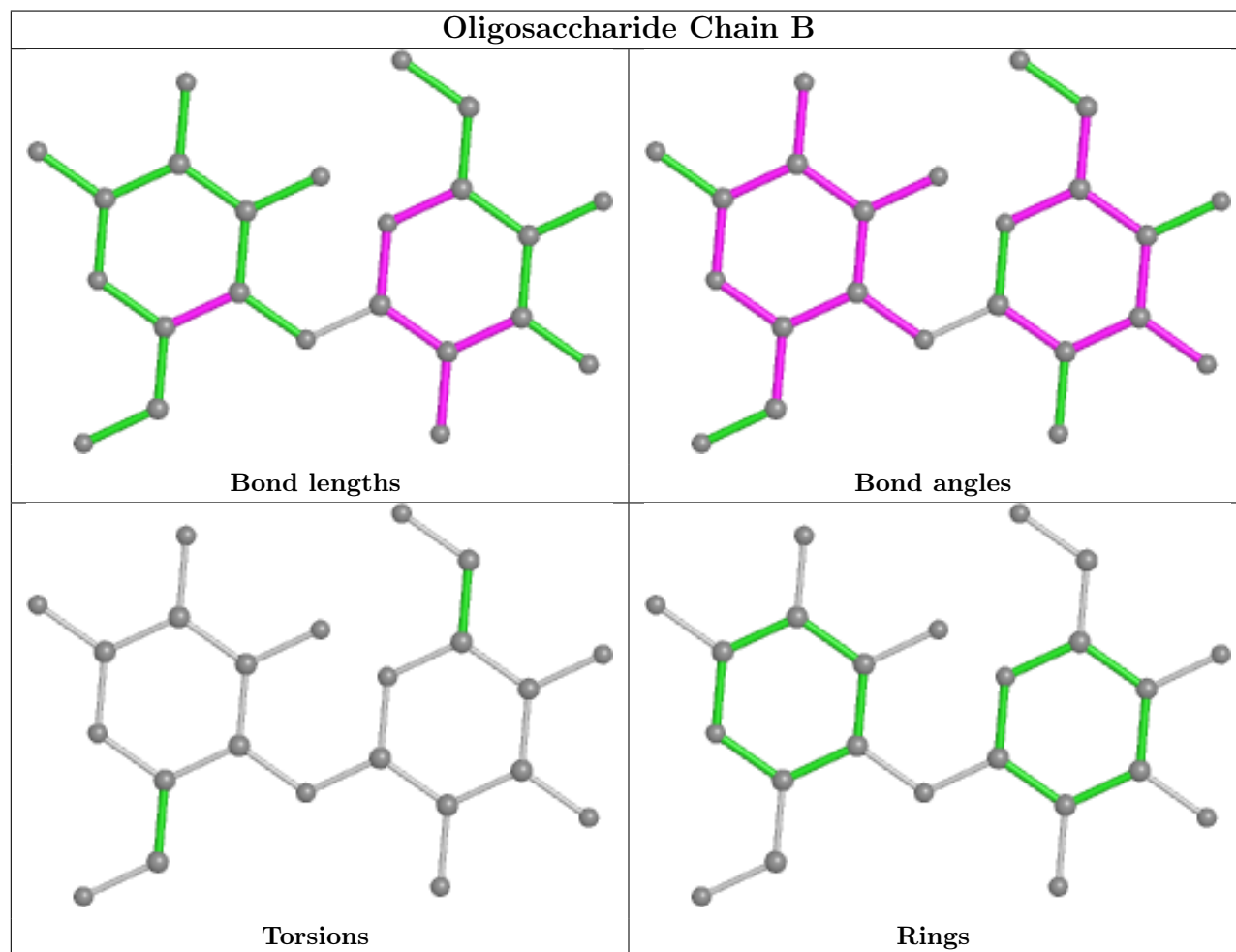
Mol	Chain	Res	Type	Atoms
2	C	2	GLC	O5-C5-C6-O6
2	C	2	GLC	C4-C5-C6-O6
2	C	1	GLC	O5-C5-C6-O6

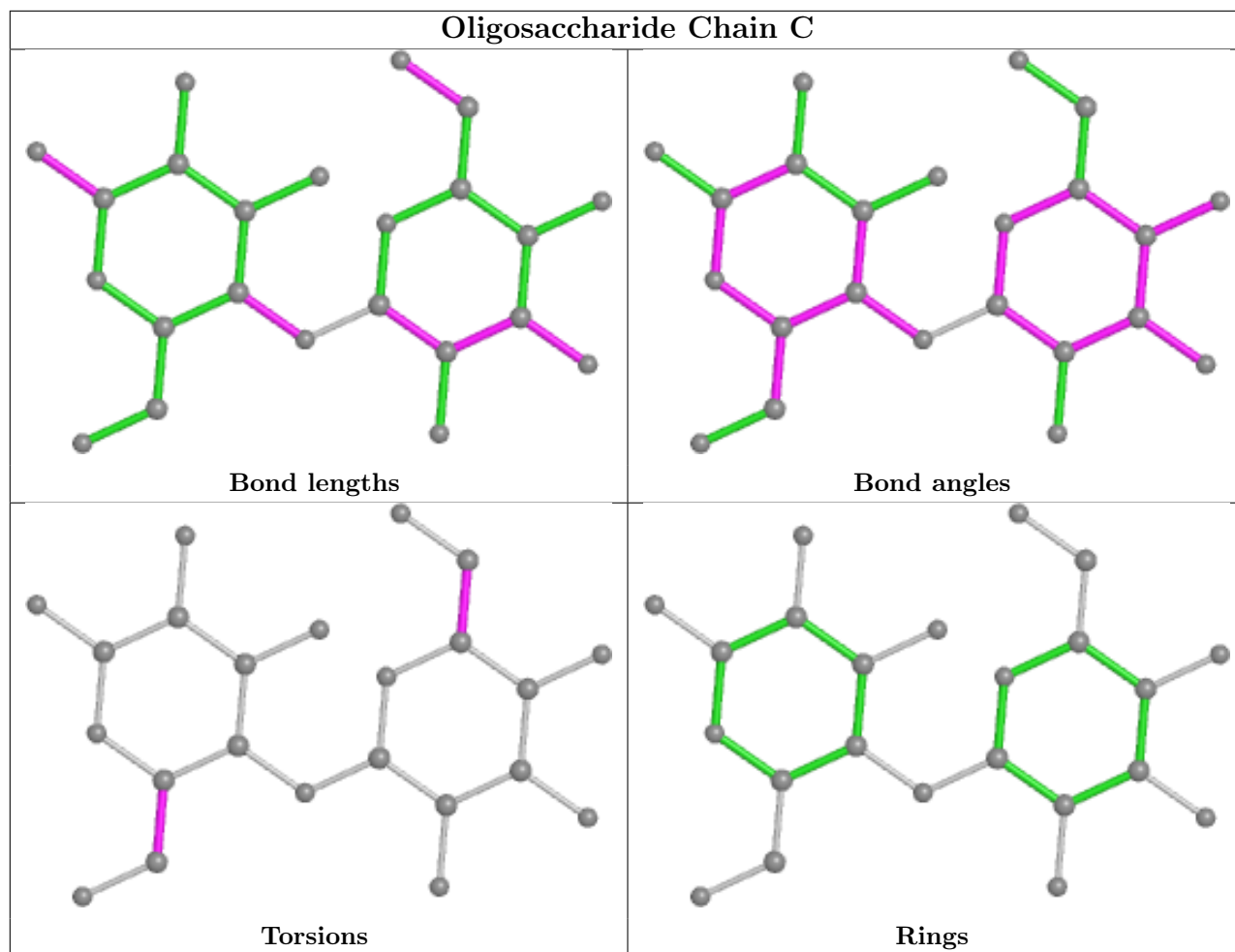
There are no ring outliers.

2 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	GLC	3	0
2	C	1	GLC	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.





5.6 Ligand geometry [i](#)

2 ligands 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	GOL	A	402	-	5,5,5	0.80	0	5,5,5	1.27	1 (20%)
3	GOL	A	401	-	5,5,5	0.68	0	5,5,5	1.75	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
3	GOL	A	402	-	-	1/4/4/4	-
3	GOL	A	401	-	-	2/4/4/4	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
3	A	401	GOL	C3-C2-C1	3.35	124.72	111.70
3	A	402	GOL	C3-C2-C1	-2.25	102.96	111.70

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	402	GOL	O1-C1-C2-C3
3	A	401	GOL	O2-C2-C3-O3
3	A	401	GOL	O1-C1-C2-O2

There are no ring outliers.

No monomer is involved in short contacts.

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	A	357/383 (93%)	0.07	12 (3%) 45 52	9, 15, 27, 43	4 (1%)

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	392	LEU	7.7
1	A	393	PHE	6.2
1	A	37	PHE	4.9
1	A	389	TYR	4.2
1	A	359	SER	4.2
1	A	340	TYR	3.7
1	A	101	GLY	3.0
1	A	100	GLU	2.7
1	A	199	LEU	2.5
1	A	391	LYS	2.2
1	A	237	PHE	2.1
1	A	390	ALA	2.0

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

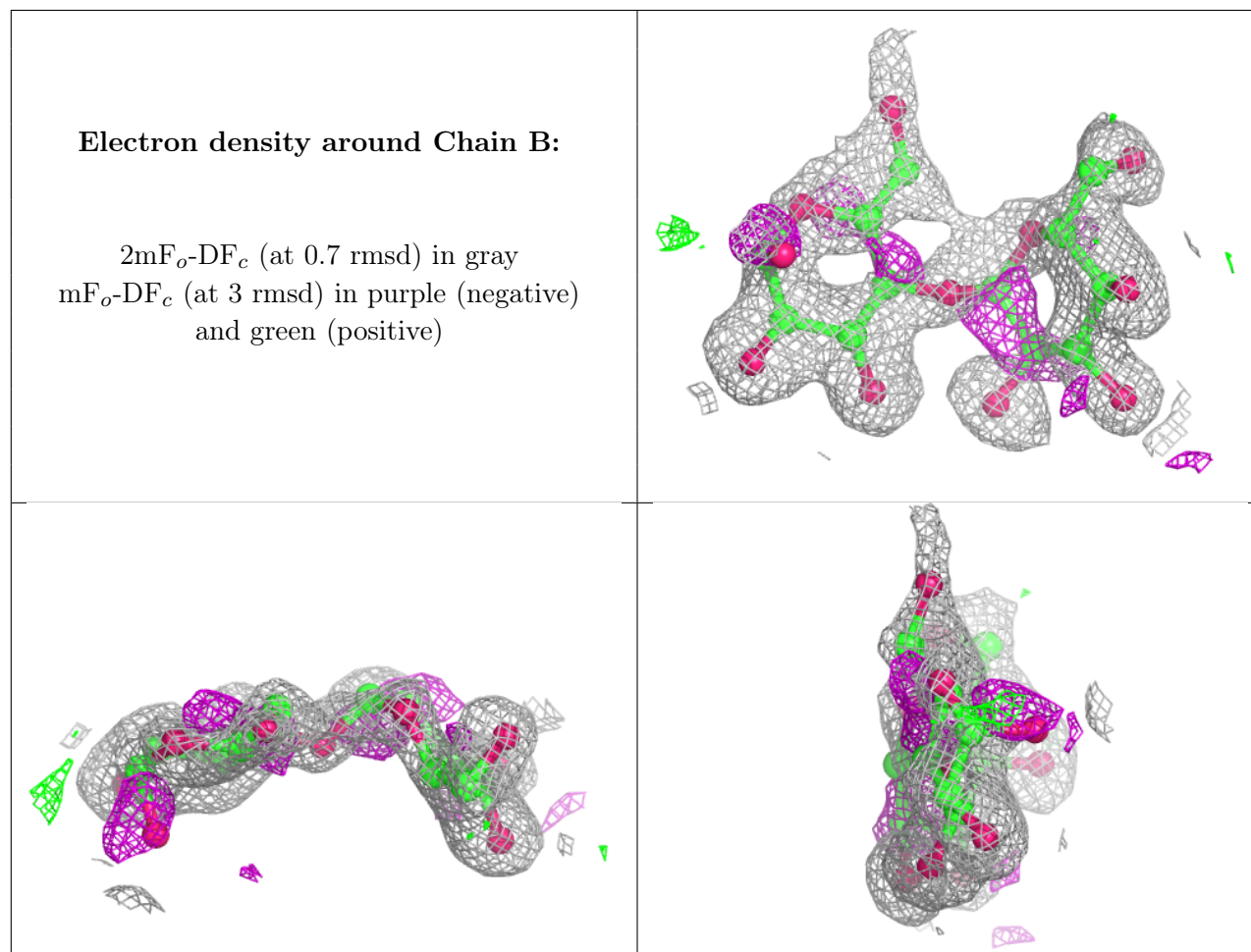
There are no non-standard protein/DNA/RNA residues in this entry.

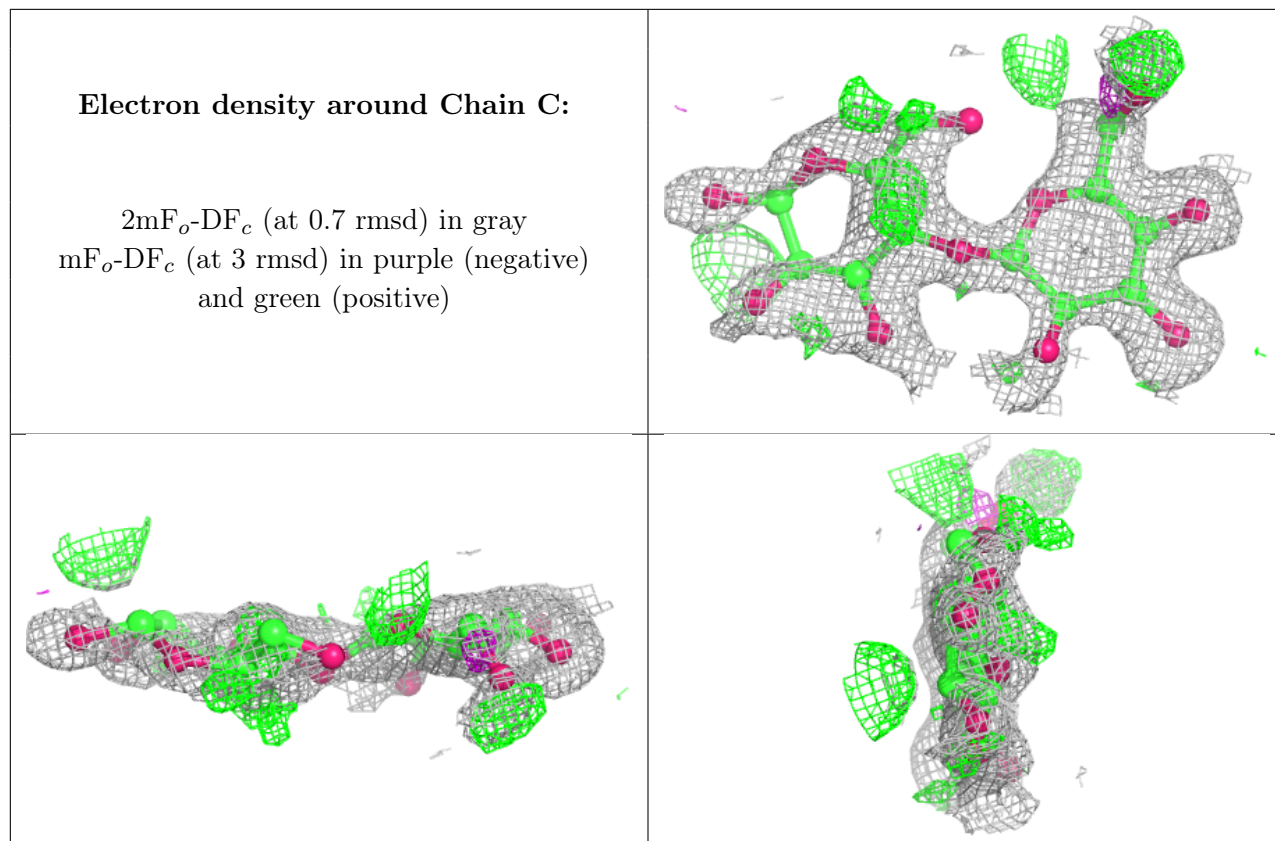
6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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	B-factors(\AA^2)	Q<0.9
2	GLC	C	1	12/12	0.46	0.69	30,35,37,39	12
2	GLC	B	2	11/12	0.65	0.29	28,38,42,43	0
2	GLC	B	1	12/12	0.79	0.28	21,40,47,49	0
2	GLC	C	2	11/12	0.93	0.23	17,22,31,33	5

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.





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. 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	B-factors(Å ²)	Q<0.9
3	GOL	A	401	6/6	0.92	0.09	21,33,34,34	0
3	GOL	A	402	6/6	0.95	0.10	15,21,27,29	0

6.5 Other polymers [i](#)

There are no such residues in this entry.