wwPDB X-ray Structure Validation Summary Report (i)

Dec 1, 2021 – 02:19 pm GMT

PDB ID	:	7NOX
Title	:	Structure of SGBP BO2743 from Bacteroides ovatus in complex with mixed-linked gluco-nonasaccharide
Authors	:	Correia, V.C.; Trovao, F.; Pinheiro, B.A.; Palma, A.S.; Carvalho, A.L.
Deposited on	:	2021-02-26
Resolution	:	1.43 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
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

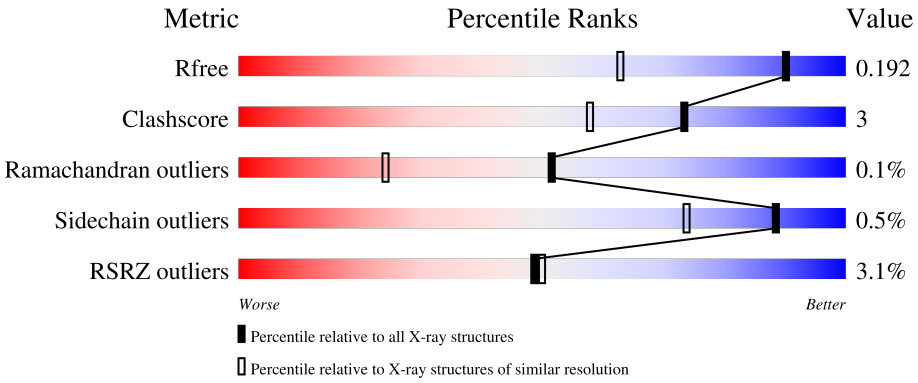
MolProbity	:	4.02b-467
Mogul	:	1.8.4 (270009), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 1.43 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	2021 (1.46-1.42)
Clashscore	141614	2086 (1.46-1.42)
Ramachandran outliers	138981	2047 (1.46-1.42)
Sidechain outliers	138945	2047 (1.46-1.42)
RSRZ outliers	127900	1993 (1.46-1.42)

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 <=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	598	2% 81% 6% 13%
1	B	598	4% 85% · 13%
2	C	9	78% 22%
2	D	9	78% 22%

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	PGE	A	605	-	-	X	-

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 9707 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 Surface glycan-binding protein BO2743.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	520	Total	C	N	O	S	0	17	0
			4196	2660	690	825	21			
1	B	520	Total	C	N	O	S	0	8	0
			4152	2625	690	816	21			

There are 156 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-38	MET	-	initiating methionine	UNP A7LY27
A	-37	HIS	-	expression tag	UNP A7LY27
A	-36	HIS	-	expression tag	UNP A7LY27
A	-35	HIS	-	expression tag	UNP A7LY27
A	-34	HIS	-	expression tag	UNP A7LY27
A	-33	HIS	-	expression tag	UNP A7LY27
A	-32	HIS	-	expression tag	UNP A7LY27
A	-31	SER	-	expression tag	UNP A7LY27
A	-30	SER	-	expression tag	UNP A7LY27
A	-29	GLY	-	expression tag	UNP A7LY27
A	-28	VAL	-	expression tag	UNP A7LY27
A	-27	ASP	-	expression tag	UNP A7LY27
A	-26	ASN	-	expression tag	UNP A7LY27
A	-25	LYS	-	expression tag	UNP A7LY27
A	-24	PHE	-	expression tag	UNP A7LY27
A	-23	ASN	-	expression tag	UNP A7LY27
A	-22	LYS	-	expression tag	UNP A7LY27
A	-21	GLU	-	expression tag	UNP A7LY27
A	-20	ARG	-	expression tag	UNP A7LY27
A	-19	ARG	-	expression tag	UNP A7LY27
A	-18	ARG	-	expression tag	UNP A7LY27
A	-17	ALA	-	expression tag	UNP A7LY27
A	-16	ARG	-	expression tag	UNP A7LY27
A	-15	ARG	-	expression tag	UNP A7LY27
A	-14	GLU	-	expression tag	UNP A7LY27

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	ILE	-	expression tag	UNP A7LY27
A	-12	ARG	-	expression tag	UNP A7LY27
A	-11	HIS	-	expression tag	UNP A7LY27
A	-10	LEU	-	expression tag	UNP A7LY27
A	-9	PRO	-	expression tag	UNP A7LY27
A	-8	ASN	-	expression tag	UNP A7LY27
A	-7	LEU	-	expression tag	UNP A7LY27
A	-6	ASN	-	expression tag	UNP A7LY27
A	-5	ARG	-	expression tag	UNP A7LY27
A	-4	GLU	-	expression tag	UNP A7LY27
A	-3	GLN	-	expression tag	UNP A7LY27
A	-2	ARG	-	expression tag	UNP A7LY27
A	-1	ARG	-	expression tag	UNP A7LY27
A	0	ALA	-	expression tag	UNP A7LY27
A	1	PHE	-	expression tag	UNP A7LY27
A	2	ILE	-	expression tag	UNP A7LY27
A	3	ARG	-	expression tag	UNP A7LY27
A	4	SER	-	expression tag	UNP A7LY27
A	5	LEU	-	expression tag	UNP A7LY27
A	6	ARG	-	expression tag	UNP A7LY27
A	7	ASP	-	expression tag	UNP A7LY27
A	8	ASP	-	expression tag	UNP A7LY27
A	9	PRO	-	expression tag	UNP A7LY27
A	10	SER	-	expression tag	UNP A7LY27
A	11	GLN	-	expression tag	UNP A7LY27
A	12	SER	-	expression tag	UNP A7LY27
A	13	ALA	-	expression tag	UNP A7LY27
A	14	ASN	-	expression tag	UNP A7LY27
A	15	LEU	-	expression tag	UNP A7LY27
A	16	LEU	-	expression tag	UNP A7LY27
A	17	ALA	-	expression tag	UNP A7LY27
A	18	GLU	-	expression tag	UNP A7LY27
A	19	ALA	-	expression tag	UNP A7LY27
A	20	LYS	-	expression tag	UNP A7LY27
A	21	LYS	-	expression tag	UNP A7LY27
A	22	LEU	-	expression tag	UNP A7LY27
A	23	ASN	-	expression tag	UNP A7LY27
A	24	ASP	-	expression tag	UNP A7LY27
A	25	ALA	-	expression tag	UNP A7LY27
A	26	GLN	-	expression tag	UNP A7LY27
A	27	PRO	-	expression tag	UNP A7LY27
A	28	LYS	-	expression tag	UNP A7LY27

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	29	GLY	-	expression tag	UNP A7LY27
A	30	THR	-	expression tag	UNP A7LY27
A	31	GLU	-	expression tag	UNP A7LY27
A	32	ASN	-	expression tag	UNP A7LY27
A	33	LEU	-	expression tag	UNP A7LY27
A	34	TYR	-	expression tag	UNP A7LY27
A	35	PHE	-	expression tag	UNP A7LY27
A	36	GLN	-	expression tag	UNP A7LY27
A	37	SER	-	expression tag	UNP A7LY27
A	38	MET	-	expression tag	UNP A7LY27
A	559	GLN	-	expression tag	UNP A7LY27
B	-38	MET	-	initiating methionine	UNP A7LY27
B	-37	HIS	-	expression tag	UNP A7LY27
B	-36	HIS	-	expression tag	UNP A7LY27
B	-35	HIS	-	expression tag	UNP A7LY27
B	-34	HIS	-	expression tag	UNP A7LY27
B	-33	HIS	-	expression tag	UNP A7LY27
B	-32	HIS	-	expression tag	UNP A7LY27
B	-31	SER	-	expression tag	UNP A7LY27
B	-30	SER	-	expression tag	UNP A7LY27
B	-29	GLY	-	expression tag	UNP A7LY27
B	-28	VAL	-	expression tag	UNP A7LY27
B	-27	ASP	-	expression tag	UNP A7LY27
B	-26	ASN	-	expression tag	UNP A7LY27
B	-25	LYS	-	expression tag	UNP A7LY27
B	-24	PHE	-	expression tag	UNP A7LY27
B	-23	ASN	-	expression tag	UNP A7LY27
B	-22	LYS	-	expression tag	UNP A7LY27
B	-21	GLU	-	expression tag	UNP A7LY27
B	-20	ARG	-	expression tag	UNP A7LY27
B	-19	ARG	-	expression tag	UNP A7LY27
B	-18	ARG	-	expression tag	UNP A7LY27
B	-17	ALA	-	expression tag	UNP A7LY27
B	-16	ARG	-	expression tag	UNP A7LY27
B	-15	ARG	-	expression tag	UNP A7LY27
B	-14	GLU	-	expression tag	UNP A7LY27
B	-13	ILE	-	expression tag	UNP A7LY27
B	-12	ARG	-	expression tag	UNP A7LY27
B	-11	HIS	-	expression tag	UNP A7LY27
B	-10	LEU	-	expression tag	UNP A7LY27
B	-9	PRO	-	expression tag	UNP A7LY27
B	-8	ASN	-	expression tag	UNP A7LY27

Continued on next page...

Continued from previous page...

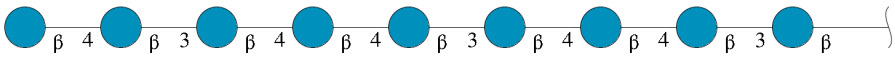
Chain	Residue	Modelled	Actual	Comment	Reference
B	-7	LEU	-	expression tag	UNP A7LY27
B	-6	ASN	-	expression tag	UNP A7LY27
B	-5	ARG	-	expression tag	UNP A7LY27
B	-4	GLU	-	expression tag	UNP A7LY27
B	-3	GLN	-	expression tag	UNP A7LY27
B	-2	ARG	-	expression tag	UNP A7LY27
B	-1	ARG	-	expression tag	UNP A7LY27
B	0	ALA	-	expression tag	UNP A7LY27
B	1	PHE	-	expression tag	UNP A7LY27
B	2	ILE	-	expression tag	UNP A7LY27
B	3	ARG	-	expression tag	UNP A7LY27
B	4	SER	-	expression tag	UNP A7LY27
B	5	LEU	-	expression tag	UNP A7LY27
B	6	ARG	-	expression tag	UNP A7LY27
B	7	ASP	-	expression tag	UNP A7LY27
B	8	ASP	-	expression tag	UNP A7LY27
B	9	PRO	-	expression tag	UNP A7LY27
B	10	SER	-	expression tag	UNP A7LY27
B	11	GLN	-	expression tag	UNP A7LY27
B	12	SER	-	expression tag	UNP A7LY27
B	13	ALA	-	expression tag	UNP A7LY27
B	14	ASN	-	expression tag	UNP A7LY27
B	15	LEU	-	expression tag	UNP A7LY27
B	16	LEU	-	expression tag	UNP A7LY27
B	17	ALA	-	expression tag	UNP A7LY27
B	18	GLU	-	expression tag	UNP A7LY27
B	19	ALA	-	expression tag	UNP A7LY27
B	20	LYS	-	expression tag	UNP A7LY27
B	21	LYS	-	expression tag	UNP A7LY27
B	22	LEU	-	expression tag	UNP A7LY27
B	23	ASN	-	expression tag	UNP A7LY27
B	24	ASP	-	expression tag	UNP A7LY27
B	25	ALA	-	expression tag	UNP A7LY27
B	26	GLN	-	expression tag	UNP A7LY27
B	27	PRO	-	expression tag	UNP A7LY27
B	28	LYS	-	expression tag	UNP A7LY27
B	29	GLY	-	expression tag	UNP A7LY27
B	30	THR	-	expression tag	UNP A7LY27
B	31	GLU	-	expression tag	UNP A7LY27
B	32	ASN	-	expression tag	UNP A7LY27
B	33	LEU	-	expression tag	UNP A7LY27
B	34	TYR	-	expression tag	UNP A7LY27

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
B	35	PHE	-	expression tag	UNP A7LY27
B	36	GLN	-	expression tag	UNP A7LY27
B	37	SER	-	expression tag	UNP A7LY27
B	38	MET	-	expression tag	UNP A7LY27
B	559	GLN	-	expression tag	UNP A7LY27

- Molecule 2 is an oligosaccharide called beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose.

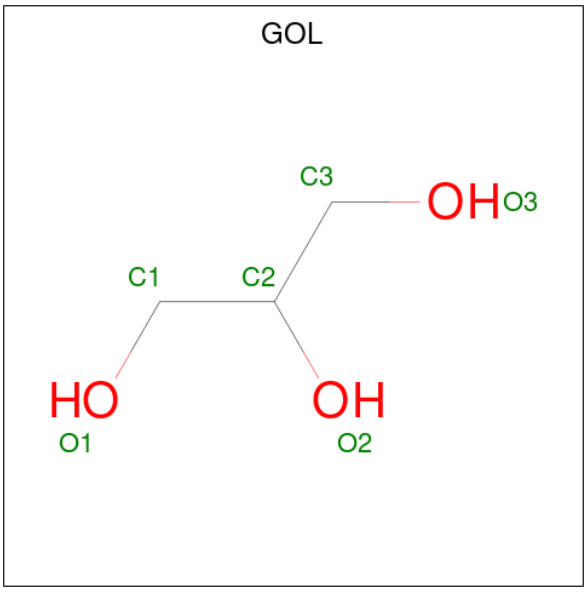


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
2	C	9	Total C O 100 54 46	0	0	0
2	D	9	Total C O 101 54 47	0	1	0

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

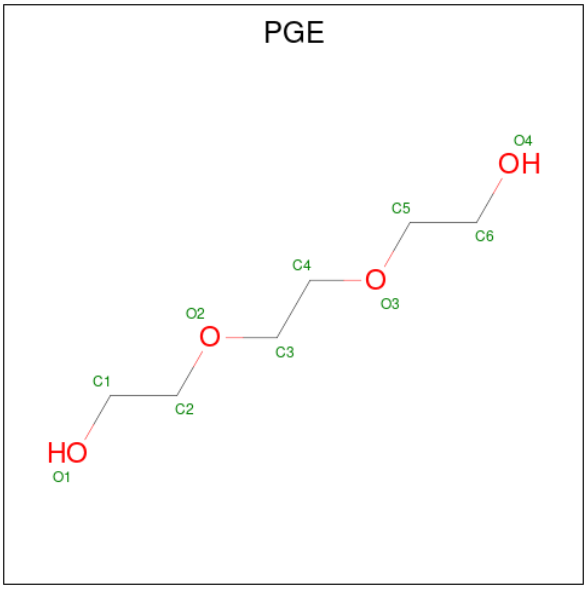
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mg 1 1	0	0
3	B	1	Total Mg 1 1	0	0

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 5 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: $C_6H_{14}O_4$).

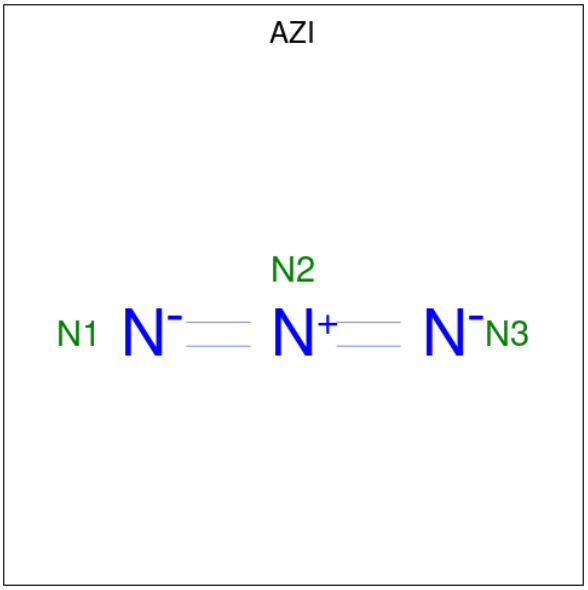


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 10 6 4	0	0
5	A	1	Total C O 10 6 4	0	0
5	A	1	Total C O 10 6 4	0	0
5	A	1	Total C O 10 6 4	0	0
5	B	1	Total C O 10 6 4	0	0
5	B	1	Total C O 10 6 4	0	0
5	B	1	Total C O 10 6 4	0	0
5	B	1	Total C O 10 6 4	0	0

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

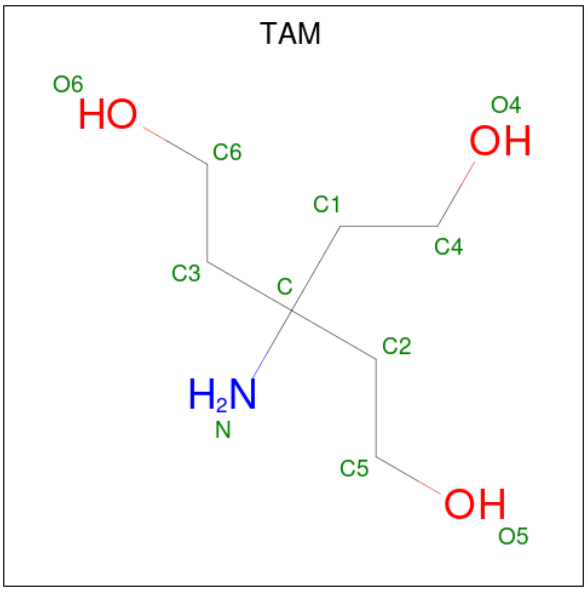
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	2	Total Na 2 2	0	0
6	B	1	Total Na 1 1	0	0

- Molecule 7 is AZIDE ION (three-letter code: AZI) (formula: N_3).



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

- Molecule 8 is TRIS(HYDROXYETHYL)AMINOMETHANE (three-letter code: TAM) (formula: $C_7H_{17}NO_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	B	1	Total C N O 11 7 1 3	0	0

- Molecule 9 is water.

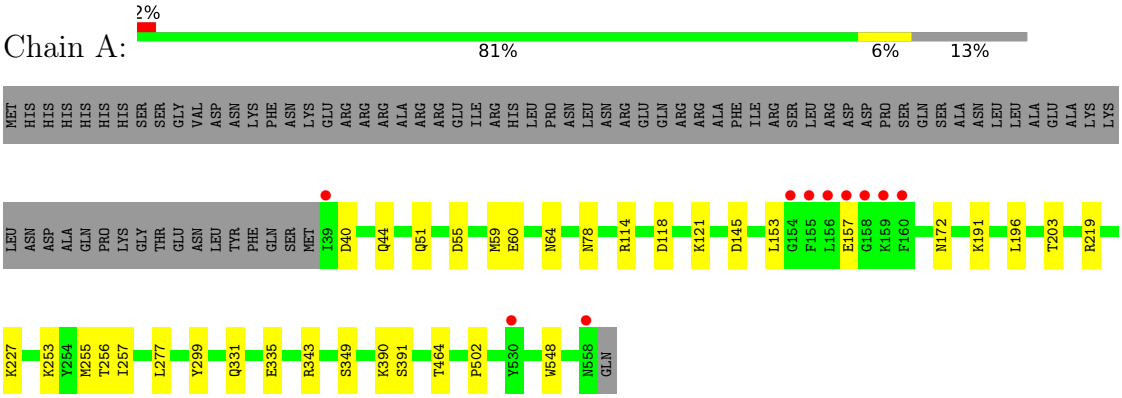
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	516	Total O 516 516	0	0
9	B	474	Total O 474 474	0	0

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.

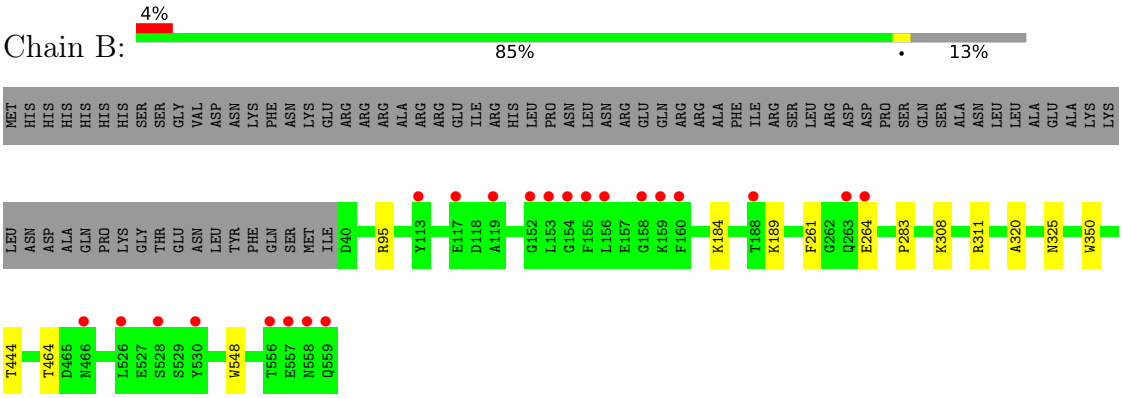
• Molecule 1: Surface glycan-binding protein BO2743

Chain A:



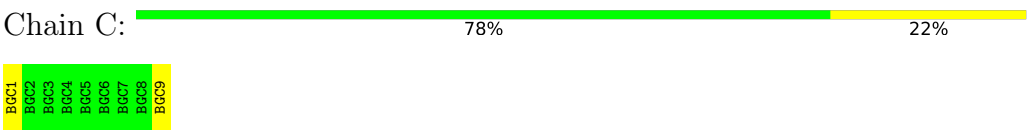
• Molecule 1: Surface glycan-binding protein BO2743

Chain B:



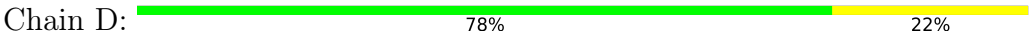
• Molecule 2: beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose

Chain C:



• Molecule 2: beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-4)-beta-D-glucopyranose-(1-3)-beta-D-glucopyranose

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	87.84Å 88.44Å 156.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.86 – 1.43 62.32 – 1.43	Depositor EDS
% Data completeness (in resolution range)	78.3 (44.86-1.43) 78.4 (62.32-1.43)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.41 (at 1.43Å)	Xtriage
Refinement program	PHENIX 1.19	Depositor
R, R_{free}	0.162 , 0.190 0.164 , 0.192	Depositor DCC
R_{free} test set	8680 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å^2)	17.5	Xtriage
Anisotropy	0.420	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.001 for k,h,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	9707	wwPDB-VP
Average B, all atoms (Å^2)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.19% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: TAM, GOL, NA, BGC, AZI, PGE, MG

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	0.65	0/4349	0.79	2/5911 (0.0%)
1	B	0.64	0/4276	0.76	0/5811
All	All	0.65	0/8625	0.78	2/11722 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	153	LEU	CB-CA-C	5.82	121.26	110.20
1	A	145	ASP	CB-CG-OD1	5.53	123.28	118.30

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	A	4196	0	4019	31	0
1	B	4152	0	3961	14	0
2	C	100	0	84	2	0
2	D	101	0	80	2	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	12	0	14	1	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	18	0	22	1	0
5	A	40	0	56	18	0
5	B	40	0	56	7	0
6	A	2	0	0	0	0
6	B	1	0	0	0	0
7	A	24	0	0	1	0
7	B	18	0	0	1	0
8	B	11	0	17	0	0
9	A	516	0	0	10	0
9	B	474	0	0	5	0
All	All	9707	0	8309	56	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 3.

The worst 5 of 56 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:331:GLN:HE21	1:A:335:GLU:HG3	1.38	0.87
1:A:196:LEU:HA	5:A:606:PGE:H5	1.59	0.83
1:A:203:THR:HG23	7:A:611:AZI:N3	1.97	0.80
1:A:196:LEU:HD23	5:A:606:PGE:H42	1.65	0.76
1:B:264:GLU:N	1:B:264:GLU:OE2	2.22	0.72

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	535/598 (90%)	520 (97%)	14 (3%)	1 (0%)	47 23
1	B	526/598 (88%)	516 (98%)	10 (2%)	0	100 100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1061/1196 (89%)	1036 (98%)	24 (2%)	1 (0%)	51 24

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	157	GLU

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	455/511 (89%)	451 (99%)	4 (1%)	78 54
1	B	446/511 (87%)	445 (100%)	1 (0%)	93 83
All	All	901/1022 (88%)	896 (99%)	5 (1%)	88 68

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	ASP
1	A	464[A]	THR
1	A	464[B]	THR
1	A	548	TRP
1	B	548	TRP

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

Mol	Chain	Res	Type
1	A	331	GLN
1	B	331	GLN

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)

19 monosaccharides are modelled in this entry.

There are no bond length outliers.

There are no bond angle outliers.

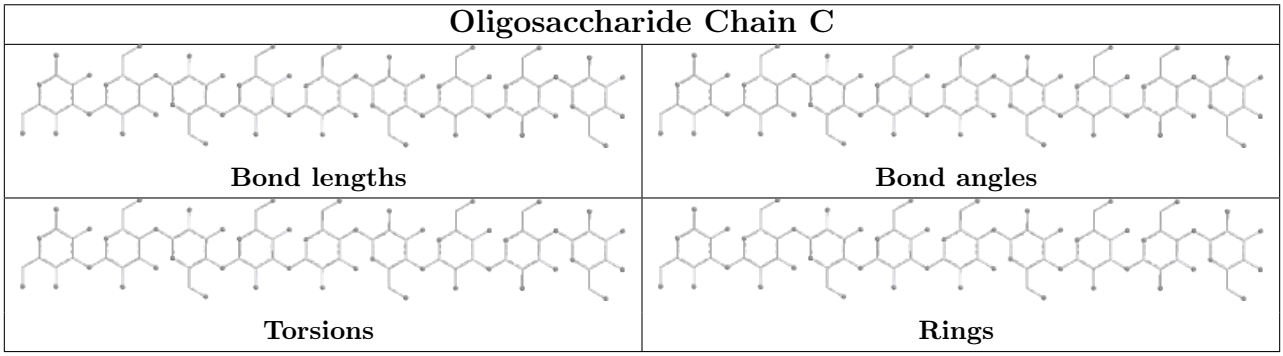
There are no chirality outliers.

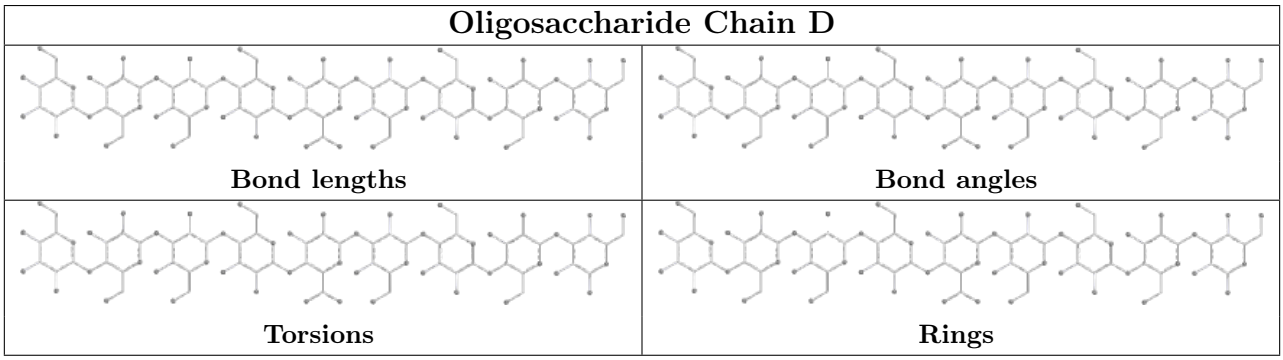
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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)

Of 33 ligands modelled in this entry, 5 are monoatomic - leaving 28 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

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 (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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	520/598 (86%)	-0.04	10 (1%)	66	67	12, 18, 32, 51	0
1	B	520/598 (86%)	-0.07	22 (4%)	36	37	13, 20, 42, 60	0
All	All	1040/1196 (86%)	-0.06	32 (3%)	49	50	12, 19, 38, 60	0

The worst 5 of 32 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	158	GLY	11.1
1	A	160	PHE	9.8
1	B	160	PHE	8.5
1	A	159	LYS	8.5
1	A	156	LEU	8.2

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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
2	BGC	C	9	11/12	0.57	0.31	44,60,65,66	0
2	BGC	D	9	11/12	0.66	0.35	35,54,65,65	0
2	BGC	D	1	12/12	0.74	0.30	43,51,59,60	0
2	BGC	D	8	11/12	0.74	0.26	30,40,48,61	0
2	BGC	C	1	12/12	0.74	0.26	49,59,64,72	0

Continued on next page...

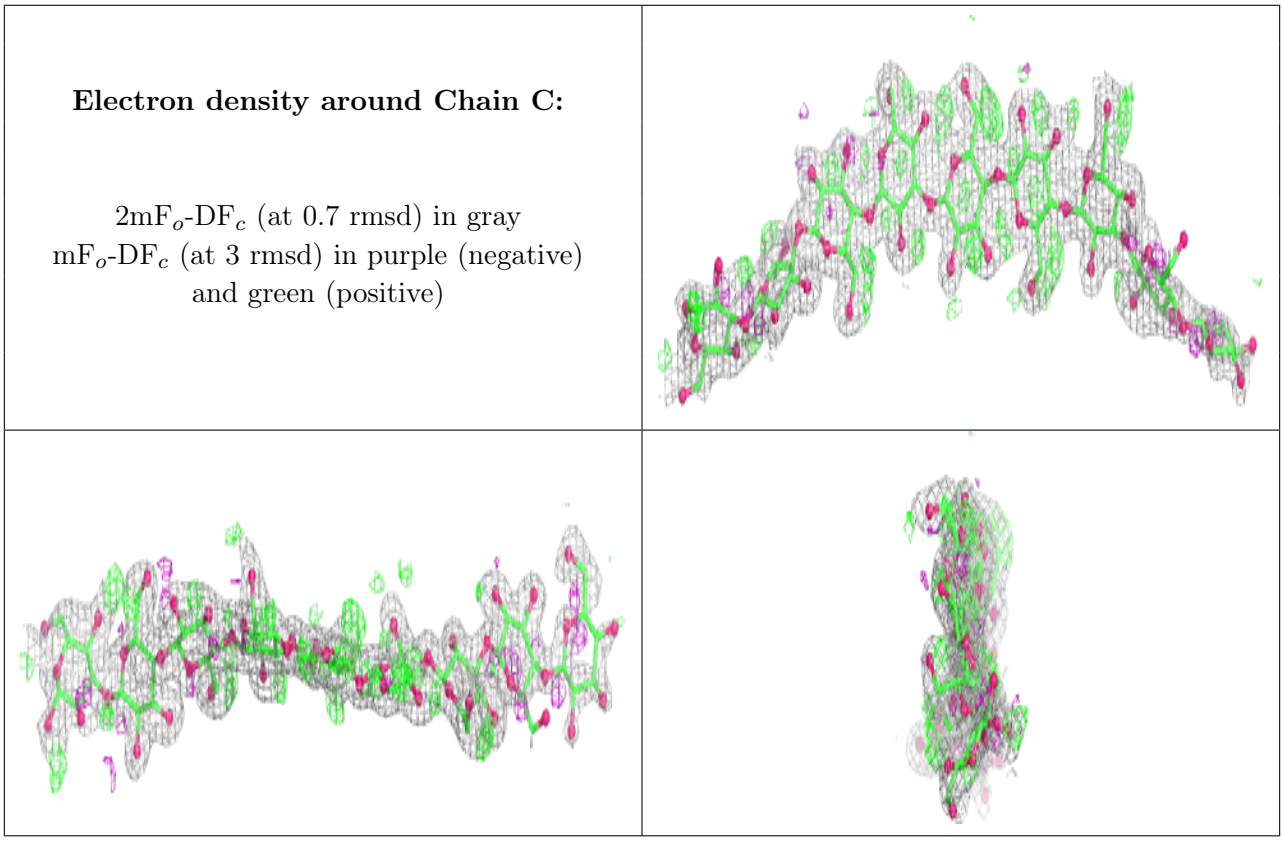
Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	BGC	C	8	11/12	0.84	0.24	33,37,54,60	0
2	BGC	D	7	11/12	0.87	0.10	23,27,29,37	0
2	BGC	D	5[A]	11/12	0.87	0.11	18,22,29,31	1
2	BGC	D	5[B]	11/12	0.87	0.11	18,22,28,29	1
2	BGC	C	4	11/12	0.89	0.10	17,20,24,30	0
2	BGC	C	7	11/12	0.89	0.08	21,27,32,34	0
2	BGC	D	4	11/12	0.89	0.10	15,21,24,30	0
2	BGC	C	2	11/12	0.89	0.09	21,28,43,48	0
2	BGC	D	6	11/12	0.90	0.09	15,21,30,30	0
2	BGC	D	3	11/12	0.90	0.11	19,26,30,32	0
2	BGC	C	5	11/12	0.91	0.10	15,23,29,31	0
2	BGC	C	6	11/12	0.91	0.09	18,23,28,31	0
2	BGC	D	2	11/12	0.93	0.10	25,32,45,45	0
2	BGC	C	3	11/12	0.95	0.08	16,22,27,28	0

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.

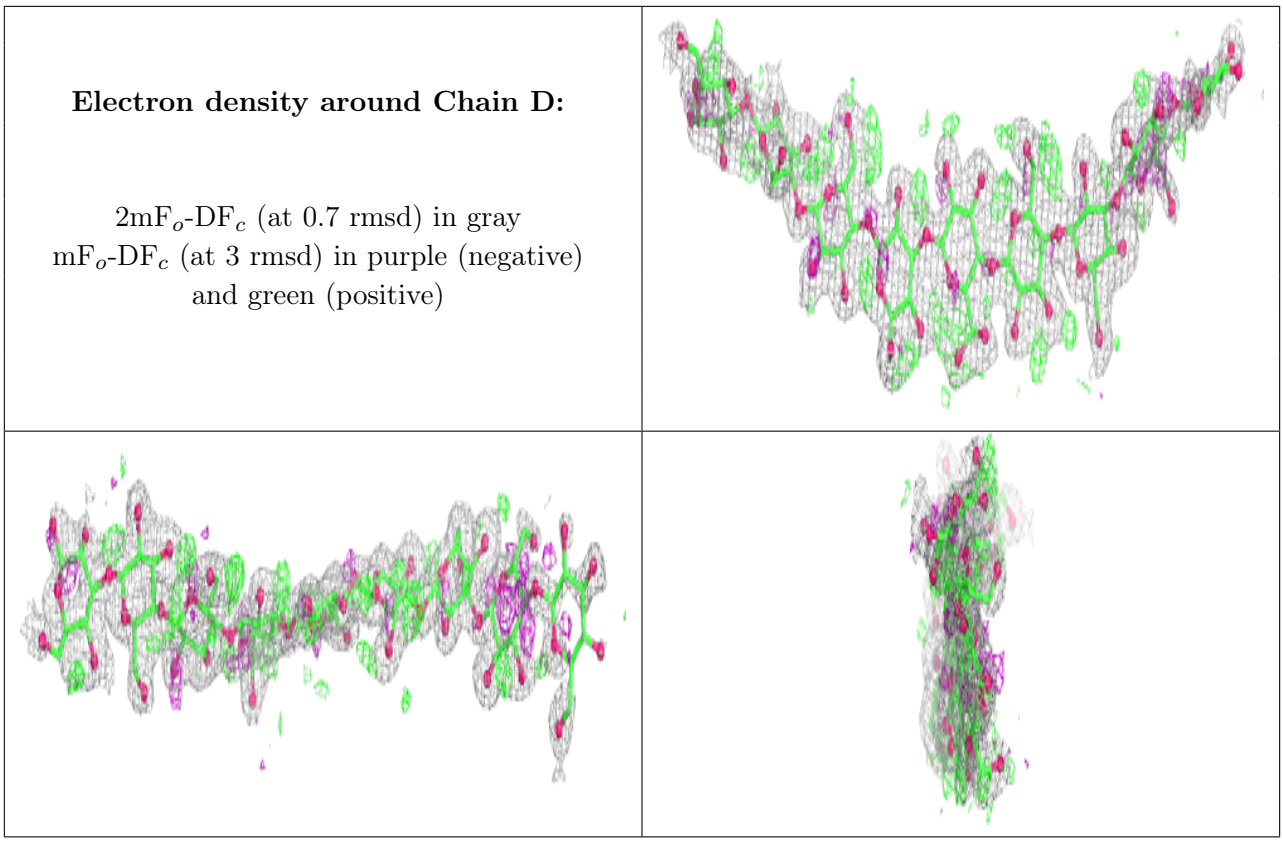
Electron density around Chain C:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around Chain D:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



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. The B-factors column lists the minimum, median, 95^{th} 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
5	PGE	B	608	10/10	0.47	0.33	31,52,65,66	0
5	PGE	A	607	10/10	0.77	0.39	36,49,54,57	0
7	AZI	B	614	3/3	0.77	0.27	43,43,50,52	0
7	AZI	B	612	3/3	0.78	0.25	39,39,46,48	0
8	TAM	B	602	11/11	0.79	0.33	26,48,69,79	0
5	PGE	A	605	10/10	0.81	0.19	28,48,55,63	0
7	AZI	A	616	3/3	0.82	0.11	41,41,45,48	0
5	PGE	B	606	10/10	0.83	0.14	34,39,52,52	0
5	PGE	B	607	10/10	0.83	0.22	41,52,58,65	0
4	GOL	A	602	6/6	0.83	0.14	29,36,44,45	0
7	AZI	A	615	3/3	0.83	0.19	42,42,42,60	0
7	AZI	A	614	3/3	0.84	0.16	34,34,36,38	0
4	GOL	B	603	6/6	0.84	0.11	27,39,44,54	0
5	PGE	A	606	10/10	0.86	0.26	23,38,55,57	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	PGE	B	609	10/10	0.86	0.25	28,39,55,58	0
4	GOL	B	604	6/6	0.87	0.23	27,47,55,59	0
7	AZI	B	616	3/3	0.89	0.22	26,26,34,34	0
7	AZI	A	611	3/3	0.89	0.28	38,38,39,55	0
7	AZI	A	617	3/3	0.90	0.15	32,32,44,46	0
7	AZI	A	613	3/3	0.91	0.10	40,40,57,59	0
7	AZI	B	613	3/3	0.93	0.39	32,32,35,40	0
7	AZI	B	615	3/3	0.93	0.26	44,44,46,57	0
5	PGE	A	604	10/10	0.94	0.17	30,37,68,78	0
7	AZI	B	611	3/3	0.94	0.14	27,27,31,49	0
7	AZI	A	610	3/3	0.95	0.09	29,29,31,51	0
4	GOL	A	603	6/6	0.96	0.13	15,18,27,31	0
7	AZI	A	612	3/3	0.96	0.29	33,33,40,41	0
4	GOL	B	605	6/6	0.97	0.12	18,23,24,29	0
6	NA	A	608	1/1	0.97	0.07	23,23,23,23	0
6	NA	B	610	1/1	0.97	0.06	25,25,25,25	0
3	MG	B	601	1/1	0.99	0.07	16,16,16,16	0
6	NA	A	609	1/1	0.99	0.07	28,28,28,28	0
3	MG	A	601	1/1	0.99	0.07	16,16,16,16	0

6.5 Other polymers (i)

There are no such residues in this entry.