W O R L D W I D E
wwPDB
P R O T E I N   D A T A   B A N K

Full wwPDB X-ray Structure Validation Report (i)

Aug 26, 2024 – 07:29 pm BST

PDB ID	:	5NGL
Title	:	The endo-beta1,6-glucanase BT3312
Authors	:	Basle, A.; Temple, M.; Cuskin, F.; Lowe, E.; Gilbert, H.
Deposited on	:	2017-03-17
Resolution	:	1.85 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 (i) 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 (i)) were used in the production of this report:

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.002 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.38.2

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 1.85 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.
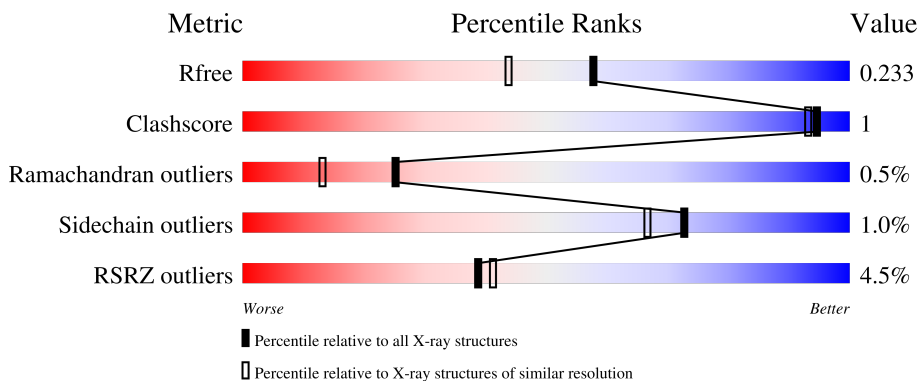
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3097 (1.86-1.86)
Clashscore	180529	3359 (1.86-1.86)
Ramachandran outliers	177936	3335 (1.86-1.86)
Sidechain outliers	177891	3335 (1.86-1.86)
RSRZ outliers	164620	3097 (1.86-1.86)

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	494	% 88% · 9%
1	B	494	% 88% · 8%
1	C	494	10% 85% 5% · 9%
2	D	2	50% 50%
2	E	2	100%

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Mol	Chain	Length	Quality of chain
2	F	2	50%　　　　　　　　　　　　　　　50%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 11412 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 Glucosylceramidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	450	Total	C	N	O	S	0	1	0
			3569	2259	592	701	17			
1	B	454	Total	C	N	O	S	0	1	0
			3593	2273	596	707	17			
1	C	452	Total	C	N	O	S	0	0	0
			3576	2262	594	703	17			

There are 57 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	MET	-	initiating methionine	UNP A0A173SYZ2
A	4	GLY	-	expression tag	UNP A0A173SYZ2
A	5	SER	-	expression tag	UNP A0A173SYZ2
A	6	SER	-	expression tag	UNP A0A173SYZ2
A	7	HIS	-	expression tag	UNP A0A173SYZ2
A	8	HIS	-	expression tag	UNP A0A173SYZ2
A	9	HIS	-	expression tag	UNP A0A173SYZ2
A	10	HIS	-	expression tag	UNP A0A173SYZ2
A	11	HIS	-	expression tag	UNP A0A173SYZ2
A	12	HIS	-	expression tag	UNP A0A173SYZ2
A	13	SER	-	expression tag	UNP A0A173SYZ2
A	14	SER	-	expression tag	UNP A0A173SYZ2
A	15	GLY	-	expression tag	UNP A0A173SYZ2
A	16	PRO	-	expression tag	UNP A0A173SYZ2
A	17	GLN	-	expression tag	UNP A0A173SYZ2
A	18	GLN	-	expression tag	UNP A0A173SYZ2
A	19	GLY	-	expression tag	UNP A0A173SYZ2
A	20	LEU	-	expression tag	UNP A0A173SYZ2
A	21	ARG	-	expression tag	UNP A0A173SYZ2
B	3	MET	-	initiating methionine	UNP A0A173SYZ2
B	4	GLY	-	expression tag	UNP A0A173SYZ2
B	5	SER	-	expression tag	UNP A0A173SYZ2
B	6	SER	-	expression tag	UNP A0A173SYZ2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	7	HIS	-	expression tag	UNP A0A173SYZ2
B	8	HIS	-	expression tag	UNP A0A173SYZ2
B	9	HIS	-	expression tag	UNP A0A173SYZ2
B	10	HIS	-	expression tag	UNP A0A173SYZ2
B	11	HIS	-	expression tag	UNP A0A173SYZ2
B	12	HIS	-	expression tag	UNP A0A173SYZ2
B	13	SER	-	expression tag	UNP A0A173SYZ2
B	14	SER	-	expression tag	UNP A0A173SYZ2
B	15	GLY	-	expression tag	UNP A0A173SYZ2
B	16	PRO	-	expression tag	UNP A0A173SYZ2
B	17	GLN	-	expression tag	UNP A0A173SYZ2
B	18	GLN	-	expression tag	UNP A0A173SYZ2
B	19	GLY	-	expression tag	UNP A0A173SYZ2
B	20	LEU	-	expression tag	UNP A0A173SYZ2
B	21	ARG	-	expression tag	UNP A0A173SYZ2
C	3	MET	-	initiating methionine	UNP A0A173SYZ2
C	4	GLY	-	expression tag	UNP A0A173SYZ2
C	5	SER	-	expression tag	UNP A0A173SYZ2
C	6	SER	-	expression tag	UNP A0A173SYZ2
C	7	HIS	-	expression tag	UNP A0A173SYZ2
C	8	HIS	-	expression tag	UNP A0A173SYZ2
C	9	HIS	-	expression tag	UNP A0A173SYZ2
C	10	HIS	-	expression tag	UNP A0A173SYZ2
C	11	HIS	-	expression tag	UNP A0A173SYZ2
C	12	HIS	-	expression tag	UNP A0A173SYZ2
C	13	SER	-	expression tag	UNP A0A173SYZ2
C	14	SER	-	expression tag	UNP A0A173SYZ2
C	15	GLY	-	expression tag	UNP A0A173SYZ2
C	16	PRO	-	expression tag	UNP A0A173SYZ2
C	17	GLN	-	expression tag	UNP A0A173SYZ2
C	18	GLN	-	expression tag	UNP A0A173SYZ2
C	19	GLY	-	expression tag	UNP A0A173SYZ2
C	20	LEU	-	expression tag	UNP A0A173SYZ2
C	21	ARG	-	expression tag	UNP A0A173SYZ2

- Molecule 2 is an oligosaccharide called beta-D-glucopyranose-(1-6)-1-DEOXYNOJIRIMYCIN.
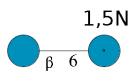
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	D	2	Total 22	C 12	N 1	O 9	0	0	0
2	E	2	Total 22	C 12	N 1	O 9	0	0	0
2	F	2	Total 22	C 12	N 1	O 9	0	0	0

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	2	Total 2	Na 2	0	0

- Molecule 4 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	213	Total 213	O 213	0	0
4	B	296	Total 296	O 296	0	0
4	C	97	Total 97	O 97	0	0

3 Residue-property plots ⓘ

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.
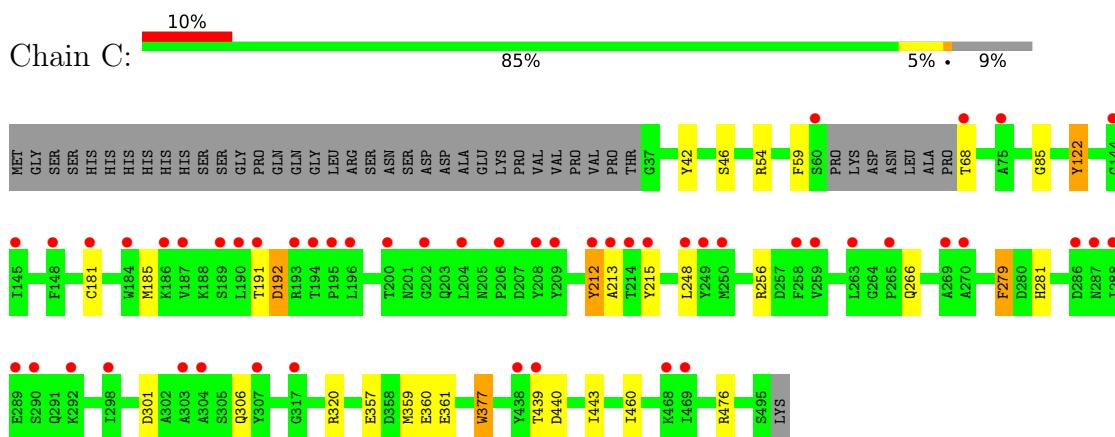
- Molecule 1: Glucosylceramidase
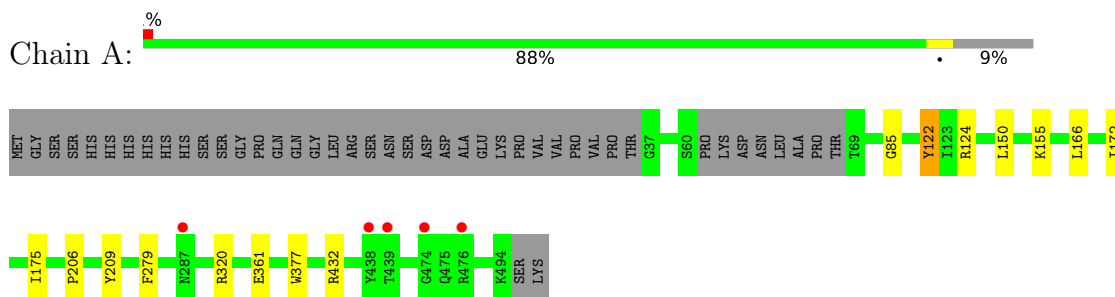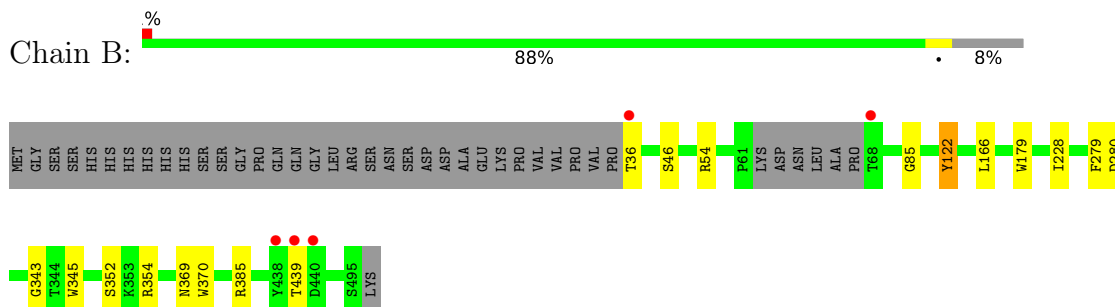
Chain A:

- Molecule 1: Glucosylceramidase

Chain B:

- Molecule 1: Glucosylceramidase

Chain C:

- Molecule 2: beta-D-glucopyranose-(1-6)-1-DEOXYNOJIRIMYCIN

Chain D: 50% 50%

NOJ1 BGC2

• Molecule 2: beta-D-glucopyranose-(1-6)-1-DEOXYNOJIRIMYCIN

Chain E: 100%

NOJ1 BGC2

• Molecule 2: beta-D-glucopyranose-(1-6)-1-DEOXYNOJIRIMYCIN

Chain F: 50% 50%

NOJ1 BGC2

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	62.38Å 78.77Å 145.53Å 90.00° 94.94° 90.00°	Depositor
Resolution (Å)	48.79 – 1.85 48.79 – 1.85	Depositor EDS
% Data completeness (in resolution range)	97.3 (48.79-1.85) 97.3 (48.79-1.85)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.81 (at 1.86Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.188 , 0.228 0.196 , 0.233	Depositor DCC
R_{free} test set	5841 reflections (4.87%)	wwPDB-VP
Wilson B-factor (Å^2)	22.5	Xtriage
Anisotropy	0.575	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 43.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	11412	wwPDB-VP
Average B, all atoms (Å^2)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.34% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: NOJ, NA, BGC

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	0/3656	0.77	1/4966 (0.0%)
1	B	0.74	0/3681	0.81	3/5002 (0.1%)
1	C	0.60	0/3660	0.74	1/4972 (0.0%)
All	All	0.66	0/10997	0.77	5/14940 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	280	ASP	CB-CG-OD1	6.34	124.01	118.30
1	B	385	ARG	NE-CZ-NH1	6.13	123.36	120.30
1	C	185	MET	CG-SD-CE	5.51	109.02	100.20
1	B	354	ARG	NE-CZ-NH1	5.45	123.02	120.30
1	A	432	ARG	NE-CZ-NH1	5.33	122.97	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	A	3569	0	3420	6	0
1	B	3593	0	3445	6	0
1	C	3576	0	3426	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	22	0	22	0	0
2	E	22	0	22	0	0
2	F	22	0	22	0	0
3	B	2	0	0	0	0
4	A	213	0	0	0	0
4	B	296	0	0	1	0
4	C	97	0	0	1	0
All	All	11412	0	10357	26	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 1.

All (26) 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:C:440:ASP:HB3	1:C:443:ILE:HD12	1.75	0.66
1:A:320:ARG:NE	1:A:361:GLU:OE1	2.33	0.56
1:C:85:GLY:HA3	1:C:122:TYR:O	2.08	0.54
1:A:85:GLY:HA3	1:A:122:TYR:O	2.10	0.51
1:B:54:ARG:NH2	4:B:603:HOH:O	2.43	0.51
1:B:166:LEU:CD1	1:B:228:ILE:HD12	2.42	0.50
1:C:320:ARG:NH1	1:C:361:GLU:OE1	2.47	0.47
1:C:212:TYR:O	1:C:215:TYR:HB3	2.15	0.46
1:C:439:THR:HG23	4:C:665:HOH:O	2.16	0.45
1:B:343:GLY:HA3	1:B:345:TRP:CZ3	2.51	0.45
1:C:59:PHE:CE2	1:C:476:ARG:HD3	2.52	0.44
1:A:124:ARG:HA	1:A:175:ILE:O	2.18	0.44
1:B:369:ASN:O	1:B:370:TRP:HB2	2.17	0.44
1:C:181:CYS:SG	1:C:248:LEU:HD13	2.57	0.44
1:A:150:LEU:O	1:A:155:LYS:NZ	2.51	0.43
1:C:256:ARG:HD2	1:C:301:ASP:OD2	2.19	0.43
1:C:360:GLU:HG3	1:C:460:ILE:HD13	2.02	0.42
1:B:46[B]:SER:HB2	1:B:352:SER:HA	2.02	0.42
1:C:191:THR:O	1:C:192:ASP:HB2	2.19	0.41
1:C:213:ALA:HB3	1:C:266:GLN:NE2	2.35	0.41
1:C:279:PHE:CZ	1:C:281:HIS:HB3	2.55	0.41
1:A:206:PRO:HA	1:A:209:TYR:CD1	2.55	0.41
1:C:359:MET:HG3	1:C:460:ILE:HD11	2.03	0.41
1:C:42:TYR:CE2	1:C:54:ARG:HD2	2.56	0.40
1:A:166:LEU:HD23	1:A:172:ILE:HG22	2.03	0.40
1:B:85:GLY:HA3	1:B:122:TYR:O	2.21	0.40

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	447/494 (90%)	427 (96%)	19 (4%)	1 (0%)	44	32
1	B	451/494 (91%)	429 (95%)	20 (4%)	2 (0%)	30	18
1	C	448/494 (91%)	418 (93%)	26 (6%)	4 (1%)	14	5
All	All	1346/1482 (91%)	1274 (95%)	65 (5%)	7 (0%)	25	13

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	192	ASP
1	A	279	PHE
1	B	279	PHE
1	B	439	THR
1	C	306	GLN
1	C	279	PHE
1	C	377	TRP

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	384/422 (91%)	382 (100%)	2 (0%)	86	84
1	B	388/422 (92%)	385 (99%)	3 (1%)	79	74

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	385/422 (91%)	379 (98%)	6 (2%)	58	46
All	All	1157/1266 (91%)	1146 (99%)	11 (1%)	73	67

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

Mol	Chain	Res	Type
1	A	122	TYR
1	A	377	TRP
1	B	36	THR
1	B	122	TYR
1	B	179	TRP
1	C	46	SER
1	C	68	THR
1	C	122	TYR
1	C	212	TYR
1	C	357	GLU
1	C	377	TRP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	463	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 ⓘ

6 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	NOJ	D	1	2	11,11,11	1.07	1 (9%)	13,15,15	2.06	2 (15%)
2	BGC	D	2	2	11,11,12	0.49	0	15,15,17	0.68	0
2	NOJ	E	1	2	11,11,11	1.48	3 (27%)	13,15,15	2.15	3 (23%)
2	BGC	E	2	2	11,11,12	0.42	0	15,15,17	1.12	1 (6%)
2	NOJ	F	1	2	11,11,11	0.61	0	13,15,15	2.41	3 (23%)
2	BGC	F	2	2	11,11,12	0.43	0	15,15,17	0.89	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
2	NOJ	D	1	2	-	0/2/19/19	0/1/1/1
2	BGC	D	2	2	-	0/2/19/22	0/1/1/1
2	NOJ	E	1	2	-	0/2/19/19	0/1/1/1
2	BGC	E	2	2	-	0/2/19/22	0/1/1/1
2	NOJ	F	1	2	-	0/2/19/19	0/1/1/1
2	BGC	F	2	2	-	0/2/19/22	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	1	NOJ	C1-N5	-3.01	1.42	1.47
2	E	1	NOJ	C5-N5	-2.81	1.43	1.47
2	D	1	NOJ	C1-N5	-2.22	1.44	1.47
2	E	1	NOJ	O2-C2	2.16	1.47	1.43

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	F	1	NOJ	C1-N5-C5	6.88	124.49	109.61
2	E	1	NOJ	C1-N5-C5	6.53	123.74	109.61
2	D	1	NOJ	C1-N5-C5	6.44	123.53	109.61
2	F	1	NOJ	C1-C2-C3	3.98	115.00	110.33
2	D	1	NOJ	C1-C2-C3	2.76	113.57	110.33
2	E	1	NOJ	C2-C3-C4	2.51	115.24	110.89

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| Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	E	1	NOJ	O3-C3-C2	-2.34	105.50	109.99
2	E	2	BGC	O4-C4-C3	-2.25	105.15	110.35
2	F	1	NOJ	C2-C3-C4	2.24	114.77	110.89

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.

Oligosaccharide Chain D

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths

Bond angles

Torsions

Rings
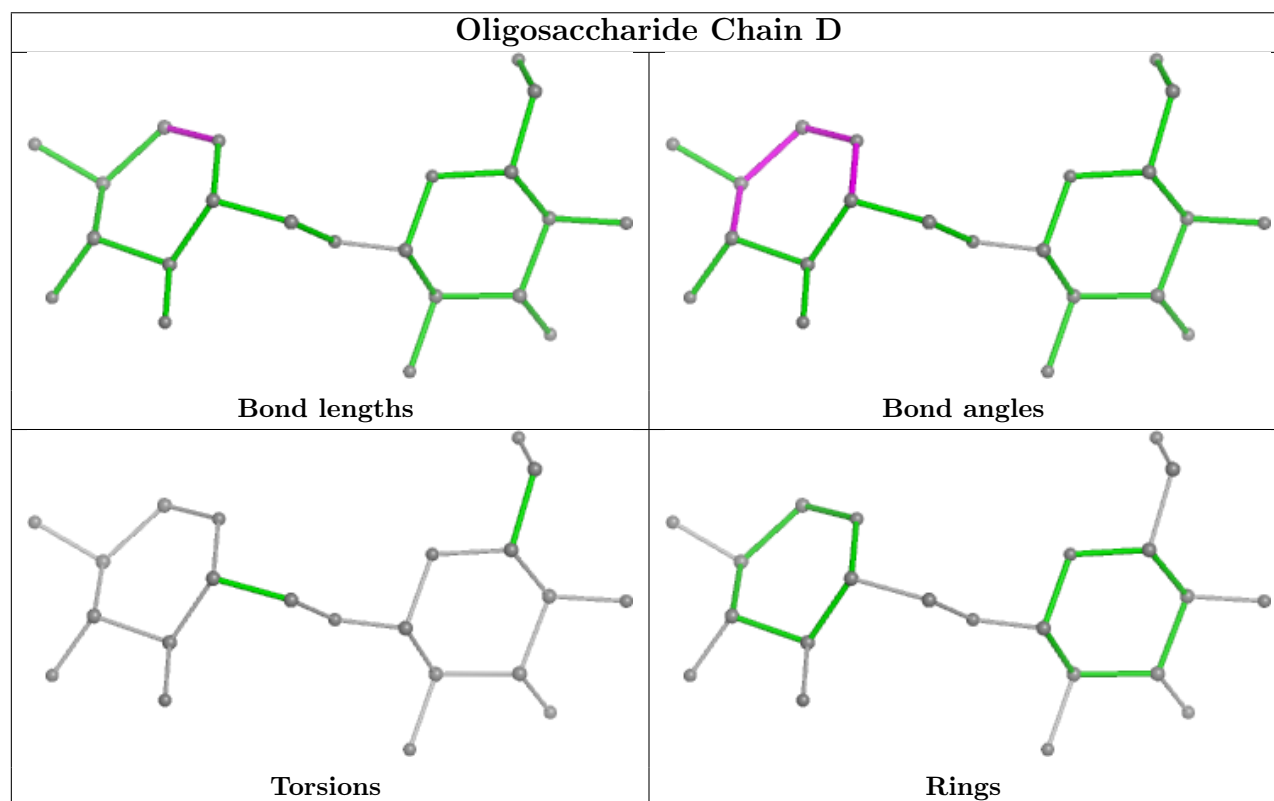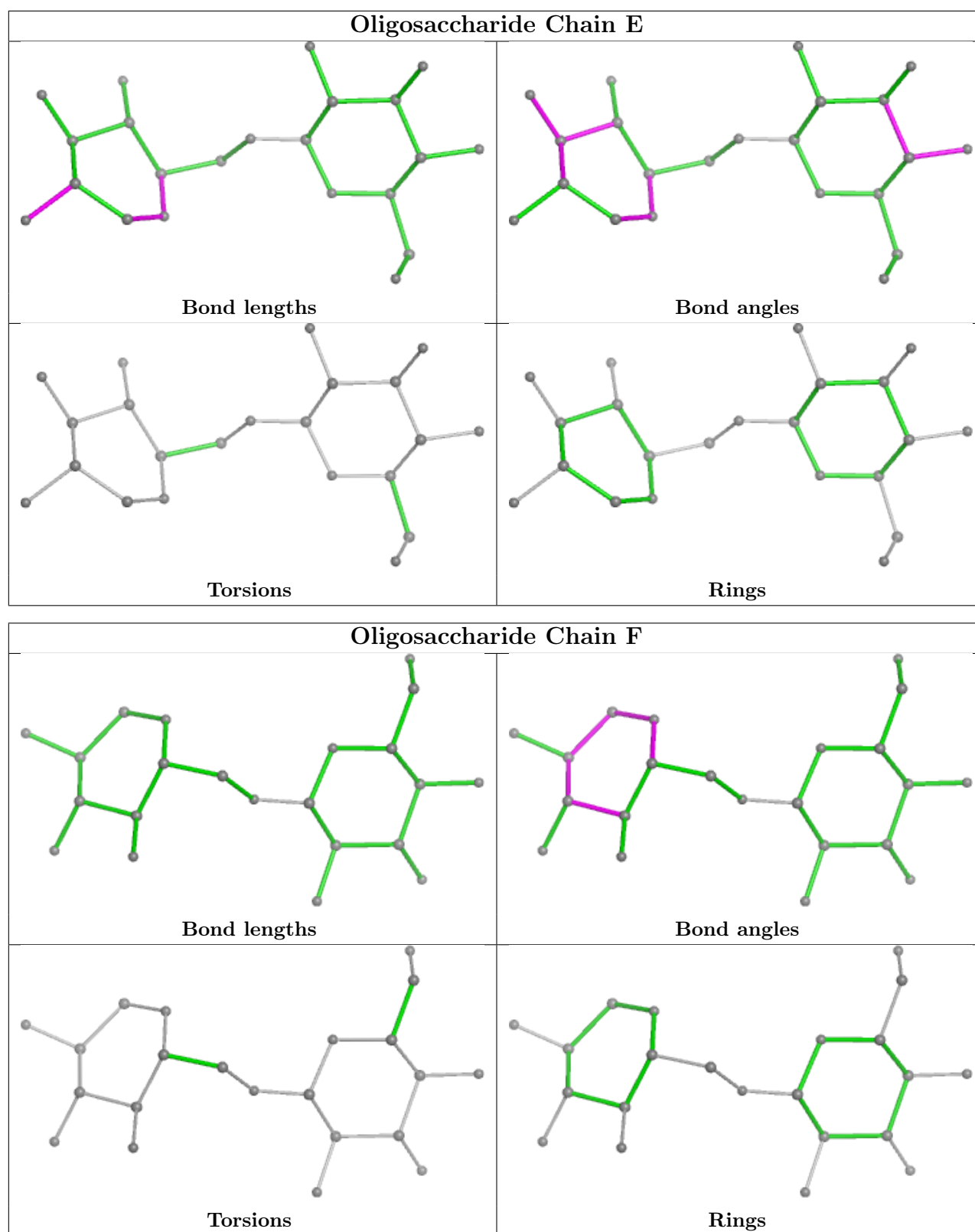
5.6   Ligand geometry ⓘ

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 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 ⓘ

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 ⓘ

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, 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(Å²)	Q<0.9
1	A	450/494 (91%)	-0.11	5 (1%)	77	81	16, 26, 47, 95	1 (0%)
1	B	454/494 (91%)	-0.45	5 (1%)	77	81	13, 20, 35, 93	1 (0%)
1	C	452/494 (91%)	0.76	51 (11%)	11	11	22, 39, 63, 82	0
All	All	1356/1482 (91%)	0.07	61 (4%)	39	41	13, 27, 56, 95	2 (0%)

All (61) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	438	TYR	5.0
1	C	288	ILE	4.3
1	C	196	LEU	4.2
1	C	190	LEU	4.1
1	B	439	THR	3.9
1	C	145	ILE	3.8
1	A	438	TYR	3.7
1	C	438	TYR	3.4
1	C	303	ALA	3.3
1	C	204	LEU	3.3
1	C	249	TYR	3.3
1	C	213	ALA	3.2
1	C	68	THR	3.1
1	C	439	THR	3.1
1	C	186	LYS	3.0
1	C	60	SER	2.9
1	B	68	THR	2.9
1	C	286	ASP	2.9
1	C	184	TRP	2.8
1	C	189	SER	2.8
1	C	195	PRO	2.8
1	C	208	TYR	2.8
1	C	215	TYR	2.8

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Mol	Chain	Res	Type	RSRZ
1	C	181	CYS	2.8
1	C	250	MET	2.7
1	A	474	GLY	2.6
1	C	187	VAL	2.6
1	C	307	TYR	2.6
1	A	476	ARG	2.6
1	C	194	THR	2.6
1	C	469	ILE	2.5
1	C	304	ALA	2.5
1	C	212	TYR	2.5
1	C	298	ILE	2.5
1	C	317	GLY	2.4
1	B	36	THR	2.4
1	C	148	PHE	2.4
1	C	290	SER	2.3
1	B	440	ASP	2.3
1	C	270	ALA	2.3
1	C	287	ASN	2.3
1	C	263	LEU	2.3
1	C	292	LYS	2.2
1	C	289	GLU	2.2
1	C	209	TYR	2.2
1	C	468	LYS	2.2
1	A	439	THR	2.2
1	C	248	LEU	2.2
1	C	269	ALA	2.2
1	C	265	PRO	2.2
1	C	214	THR	2.1
1	C	75	ALA	2.1
1	C	191	THR	2.1
1	C	202	GLY	2.1
1	C	259	VAL	2.1
1	C	200	THR	2.1
1	A	287	ASN	2.0
1	C	144	GLY	2.0
1	C	206	PRO	2.0
1	C	193	ARG	2.0
1	C	258	PHE	2.0

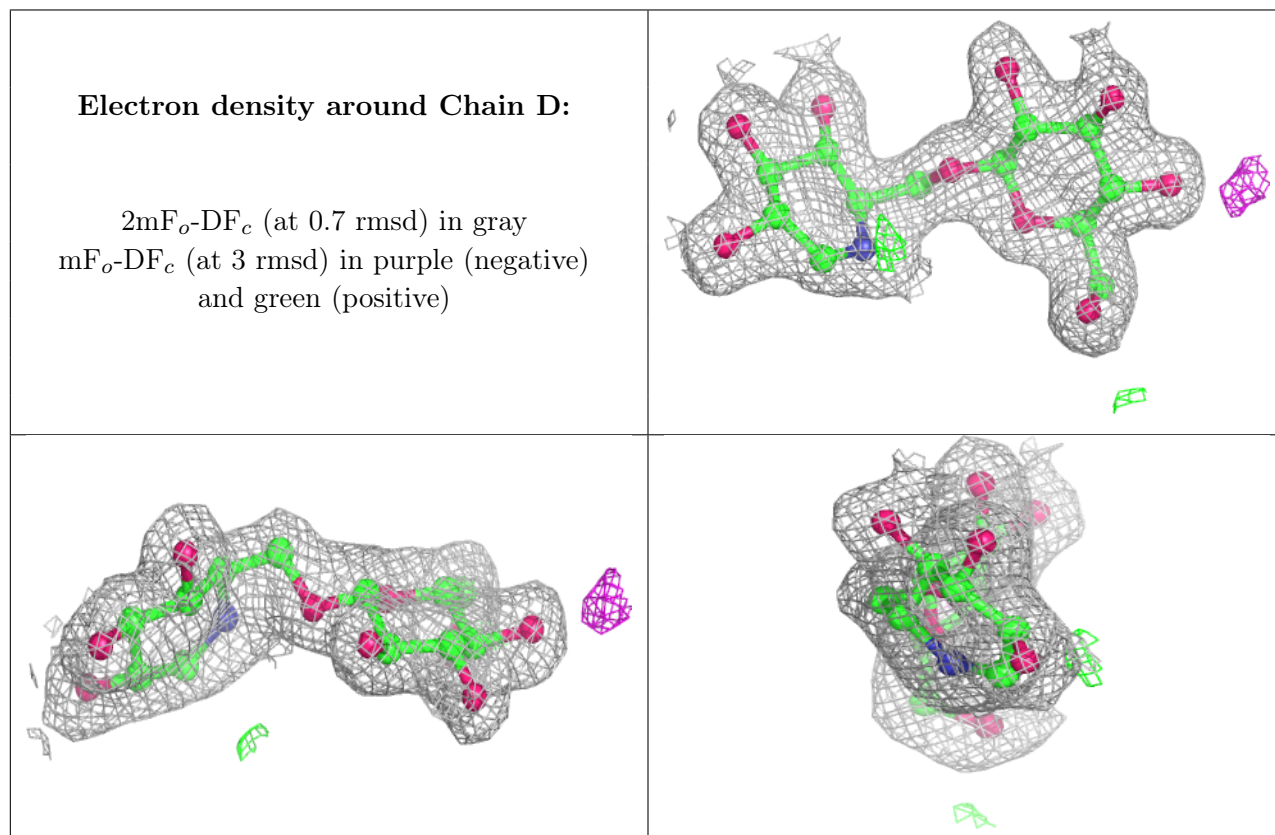## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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, 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
2	BGC	D	2	11/12	0.91	0.08	28,30,31,31	0
2	BGC	F	2	11/12	0.91	0.09	40,41,44,48	0
2	NOJ	F	1	11/11	0.92	0.09	30,36,37,37	0
2	NOJ	D	1	11/11	0.97	0.05	21,24,28,30	0
2	NOJ	E	1	11/11	0.98	0.04	14,16,19,20	0
2	BGC	E	2	11/12	0.98	0.04	19,20,22,23	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.
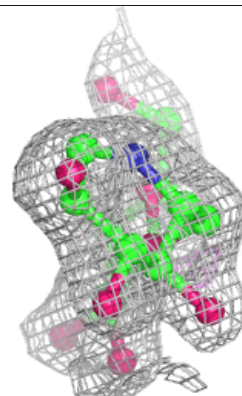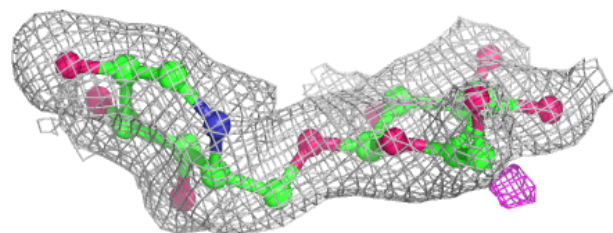

Electron density around Chain D:

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

Electron density around Chain E:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
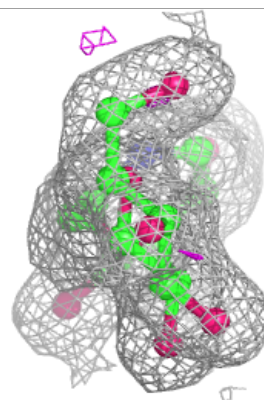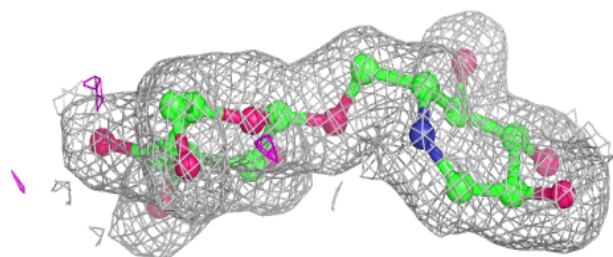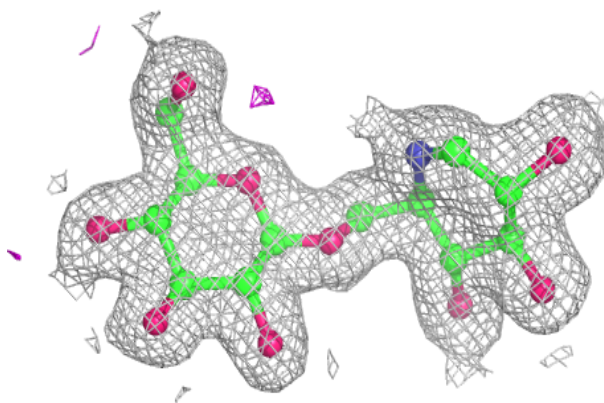
Electron density around Chain F:

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

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	NA	B	502	1/1	0.97	0.13	33,33,33,33	0
3	NA	B	501	1/1	0.98	0.09	28,28,28,28	0

6.5 Other polymers (i)

There are no such residues in this entry.