



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2023 – 05:32 AM JST

PDB ID : 6KXL
Title : Crystal structure of the catalytic domain of *Chitiniphilus shinanonensis* chitinase ChiL (CsChiL) complexed with N,N'-diacetylchitobiose
Authors : Ueda, M.; Shimosaka, M.; Arai, R.
Deposited on : 2019-09-12
Resolution : 1.35 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

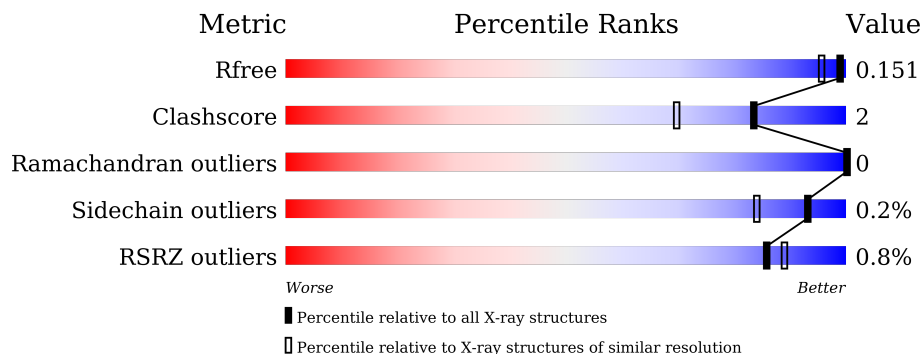
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.35 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	1509 (1.38-1.34)
Clashscore	141614	1551 (1.38-1.34)
Ramachandran outliers	138981	1530 (1.38-1.34)
Sidechain outliers	138945	1530 (1.38-1.34)
RSRZ outliers	127900	1487 (1.38-1.34)

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	372	<p>96%</p>
1	B	372	<p>94% 5%</p>
2	C	2	<p>100%</p>
2	D	2	<p>100%</p>

2 Entry composition i

There are 10 unique types of molecules in this entry. The entry contains 7354 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 Family 18 chitinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	368	Total	C	N	O	S	0	9	0
			2970	1892	503	569	6			
1	B	367	Total	C	N	O	S	0	10	0
			2963	1894	498	565	6			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	35	GLY	-	expression tag	UNP F8WSX2
A	36	GLY	-	expression tag	UNP F8WSX2
A	37	SER	-	expression tag	UNP F8WSX2
A	38	GLY	-	expression tag	UNP F8WSX2
A	39	GLY	-	expression tag	UNP F8WSX2
A	40	SER	-	expression tag	UNP F8WSX2
B	35	GLY	-	expression tag	UNP F8WSX2
B	36	GLY	-	expression tag	UNP F8WSX2
B	37	SER	-	expression tag	UNP F8WSX2
B	38	GLY	-	expression tag	UNP F8WSX2
B	39	GLY	-	expression tag	UNP F8WSX2
B	40	SER	-	expression tag	UNP F8WSX2

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



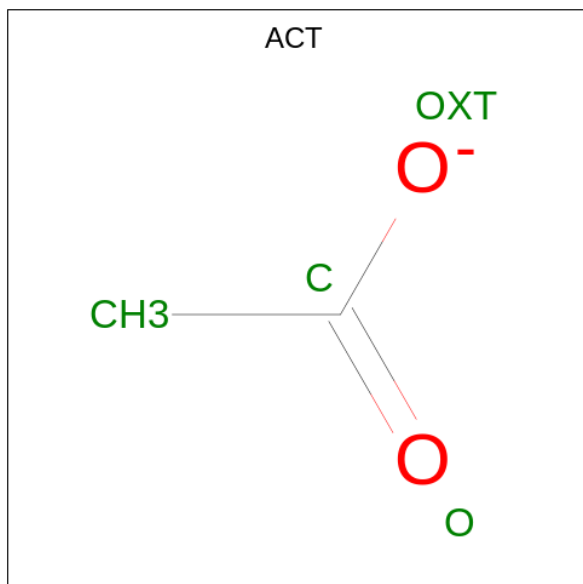
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	C	2	Total	C	N	O	0	0	0
			29	16	2	11			

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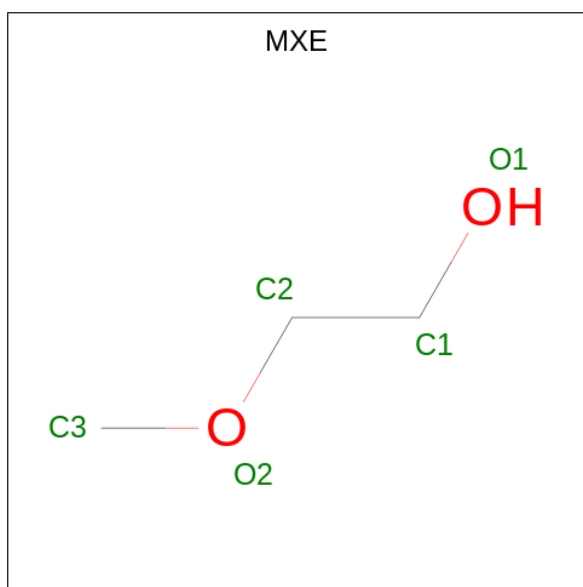
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	D	2	29	16	2	11	0	0	0

- Molecule 3 is ACETATE ION (three-letter code: ACT) (formula: C₂H₃O₂).



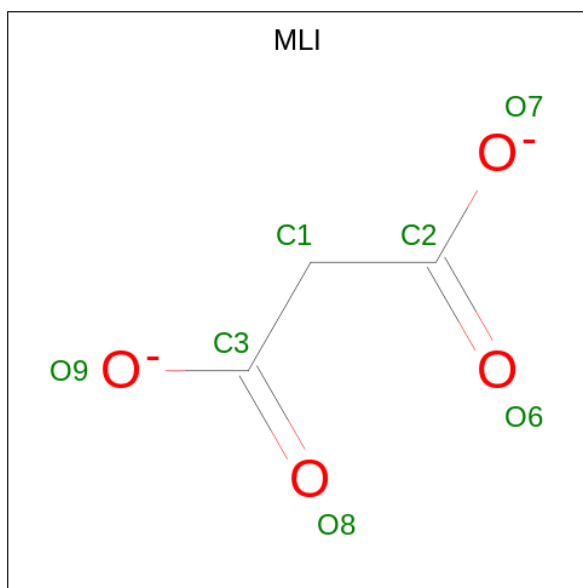
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
3	A	1	4	2	2	0	0
3	B	1	4	2	2	0	0

- Molecule 4 is 2-METHOXYETHANOL (three-letter code: MXE) (formula: C₃H₈O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
4	A	1	5	3	2	0	0

- Molecule 5 is MALONATE ION (three-letter code: MLI) (formula: $C_3H_2O_4$).



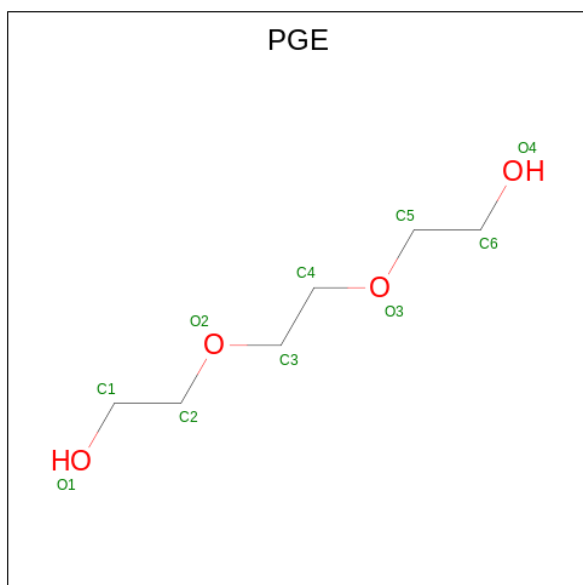
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
5	A	1	7	3	4	0	0
5	A	1	7	3	4	0	0
5	A	1	7	3	4	0	0

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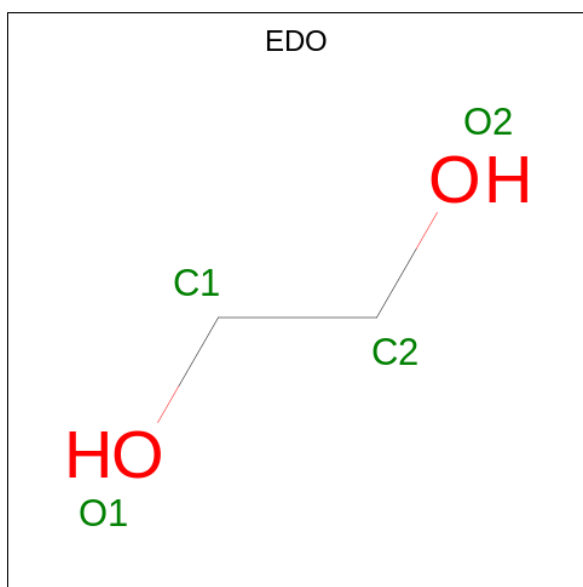
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	C	O	0	0
			7	3	4		
5	B	1	Total	C	O	0	0
			7	3	4		

- Molecule 6 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C₆H₁₄O₄).



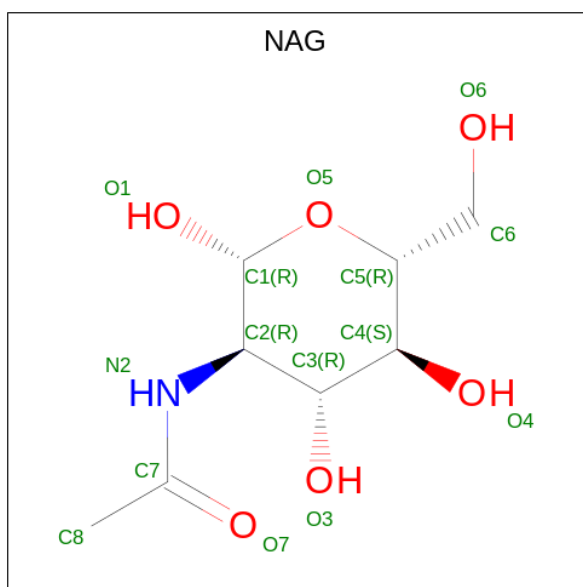
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	A	1	Total	C	O	0	0
			7	4	3		
6	B	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



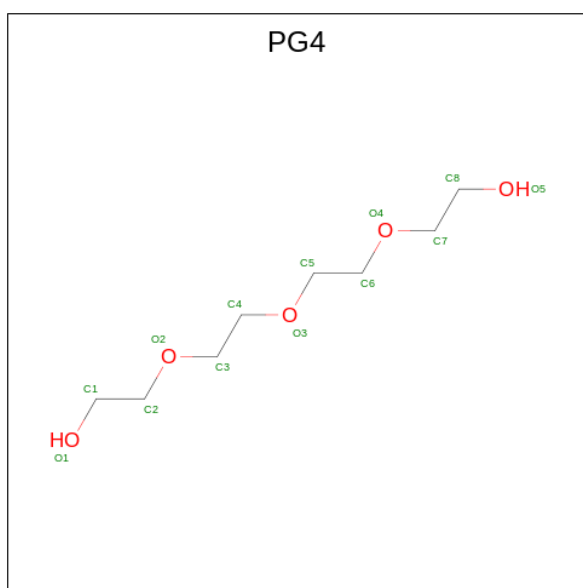
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	A	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0
7	B	1	Total C O 4 2 2	0	0

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
8	A	1	Total	C	N	O	0	0
			15	8	1	6		
8	B	1	Total	C	N	O	0	0
			15	8	1	6		

- Molecule 9 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: $C_8H_{18}O_5$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	C	O	0	0
			13	8	5		
9	B	1	Total	C	O	0	0
			13	8	5		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	B	1	Total	C	O	0	0
			13	8	5		

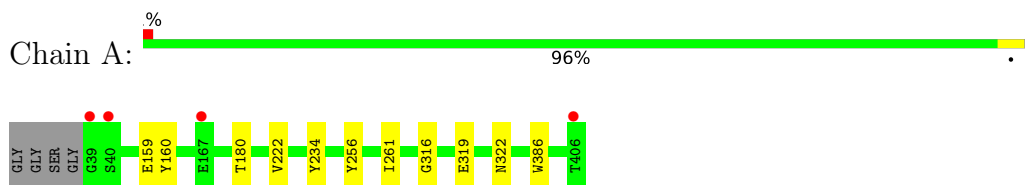
- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	641	Total	O	0	1
			642	642		
10	B	569	Total	O	0	1
			570	570		

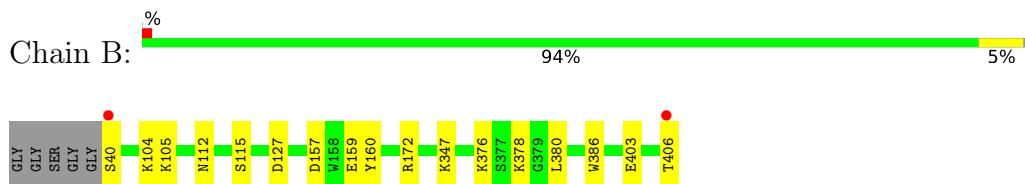
3 Residue-property plots [i](#)

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.

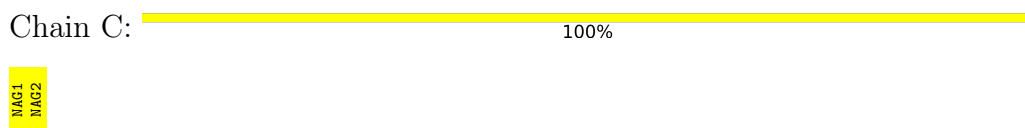
- Molecule 1: Family 18 chitinase



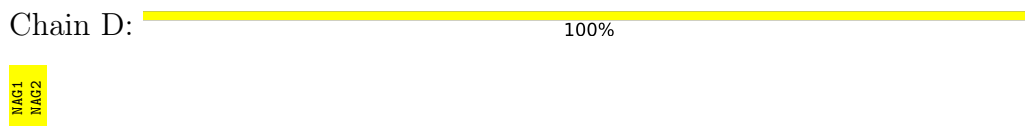
- Molecule 1: Family 18 chitinase



- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-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	68.98Å 82.50Å 131.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	31.21 – 1.35 31.19 – 1.35	Depositor EDS
% Data completeness (in resolution range)	95.2 (31.21-1.35) 95.2 (31.19-1.35)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.70 (at 1.35Å)	Xtrriage
Refinement program	REFMAC 5.8.0253	Depositor
R, R_{free}	0.118 , 0.148 0.122 , 0.151	Depositor DCC
R_{free} test set	7906 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	12.0	Xtrriage
Anisotropy	0.553	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 52.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	7354	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 5.20% 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: ACT, MXE, MLI, NAG, EDO, PGE, PG4

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	0.60	0/3062	0.69	0/4143
1	B	0.60	0/3067	0.69	0/4149
All	All	0.60	0/6129	0.69	0/8292

There are no bond length outliers.

There are no bond angle outliers.

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	2970	0	2843	9	0
1	B	2963	0	2861	13	0
2	C	29	0	27	2	0
2	D	29	0	27	2	0
3	A	4	0	3	0	0
3	B	4	0	3	0	0
4	A	5	0	8	0	0
5	A	21	0	6	1	0
5	B	14	0	4	0	0
6	A	7	0	9	0	0
6	B	7	0	9	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	12	0	18	1	0
7	B	8	0	12	2	0
8	A	15	0	15	5	0
8	B	15	0	15	4	0
9	B	39	0	54	1	0
10	A	642	0	0	4	0
10	B	570	0	0	4	0
All	All	7354	0	5914	29	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 2.

All (29) 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)
10:B:609:HOH:O	2:D:2:NAG:O7	2.04	0.73
1:B:386:TRP:CZ2	8:B:510:NAG:H3	2.23	0.72
1:B:406:THR:HG22	10:B:941:HOH:O	1.91	0.70
8:A:510:NAG:H4	2:C:2:NAG:H4	1.74	0.69
10:A:612:HOH:O	2:C:2:NAG:O7	2.12	0.67
5:A:505:MLI:H12	10:A:997:HOH:O	1.95	0.66
1:B:386:TRP:CE2	8:B:510:NAG:H3	2.33	0.63
1:A:386:TRP:CE2	8:A:510:NAG:H1	2.35	0.62
1:A:386:TRP:CZ2	8:A:510:NAG:H1	2.35	0.61
1:B:159:GLU:OE2	8:B:510:NAG:O7	2.22	0.58
1:A:234:TYR:HE1	8:A:510:NAG:H62	1.69	0.57
9:B:505:PG4:H41	10:B:1007:HOH:O	2.11	0.50
7:A:509:EDO:H21	10:A:1013:HOH:O	2.12	0.49
1:B:159:GLU:HA	1:B:160:TYR:CD1	2.51	0.45
1:A:159:GLU:HA	1:A:160:TYR:CD1	2.51	0.45
1:B:104:LYS:HG3	1:B:112:ASN:ND2	2.31	0.45
1:B:127[A]:ASP:OD1	1:B:172:ARG:NH2	2.50	0.44
1:A:256:TYR:CE2	1:A:261:ILE:HG21	2.53	0.44
1:B:347:LYS:HZ1	7:B:508:EDO:C1	2.30	0.44
1:B:378:LYS:HB3	1:B:380:LEU:HG	2.00	0.44
1:A:316:GLY:HA3	1:A:319:GLU:O	2.19	0.43
8:B:510:NAG:H2	2:D:2:NAG:O4	2.19	0.42
1:A:322[A]:ASN:OD1	10:A:601:HOH:O	2.22	0.41
1:A:180:THR:HA	1:A:222:VAL:HG12	2.03	0.41
1:A:234:TYR:CE1	8:A:510:NAG:H62	2.53	0.41
1:B:105:LYS:NZ	10:B:621:HOH:O	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:115[B]:SER:OG	1:B:157:ASP:OD2	2.38	0.41
1:B:376:LYS:CE	1:B:403:GLU:O	2.69	0.40
1:B:347:LYS:CE	7:B:508:EDO:H11	2.51	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	375/372 (101%)	365 (97%)	10 (3%)	0	100	100
1	B	376/372 (101%)	367 (98%)	9 (2%)	0	100	100
All	All	751/744 (101%)	732 (98%)	19 (2%)	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	304/296 (103%)	304 (100%)	0	100	100
1	B	306/296 (103%)	305 (100%)	1 (0%)	92	83
All	All	610/592 (103%)	609 (100%)	1 (0%)	93	84

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

Mol	Chain	Res	Type
1	B	40	SER

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	NAG	C	1	2	15,15,15	0.63	0	21,21,21	1.17	2 (9%)
2	NAG	C	2	2	14,14,15	0.52	0	17,19,21	0.79	0
2	NAG	D	1	2	15,15,15	0.46	0	21,21,21	1.14	2 (9%)
2	NAG	D	2	2	14,14,15	0.51	0	17,19,21	0.83	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	NAG	C	1	2	-	0/6/26/26	0/1/1/1
2	NAG	C	2	2	-	0/6/23/26	0/1/1/1
2	NAG	D	1	2	-	0/6/26/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	D	2	2	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	1	NAG	C1-O5-C5	-2.32	109.29	113.66
2	D	1	NAG	C3-C4-C5	-2.25	106.23	110.24
2	D	1	NAG	C1-O5-C5	-2.16	109.58	113.66
2	C	1	NAG	C3-C2-N2	-2.13	106.60	110.62

There are no chirality outliers.

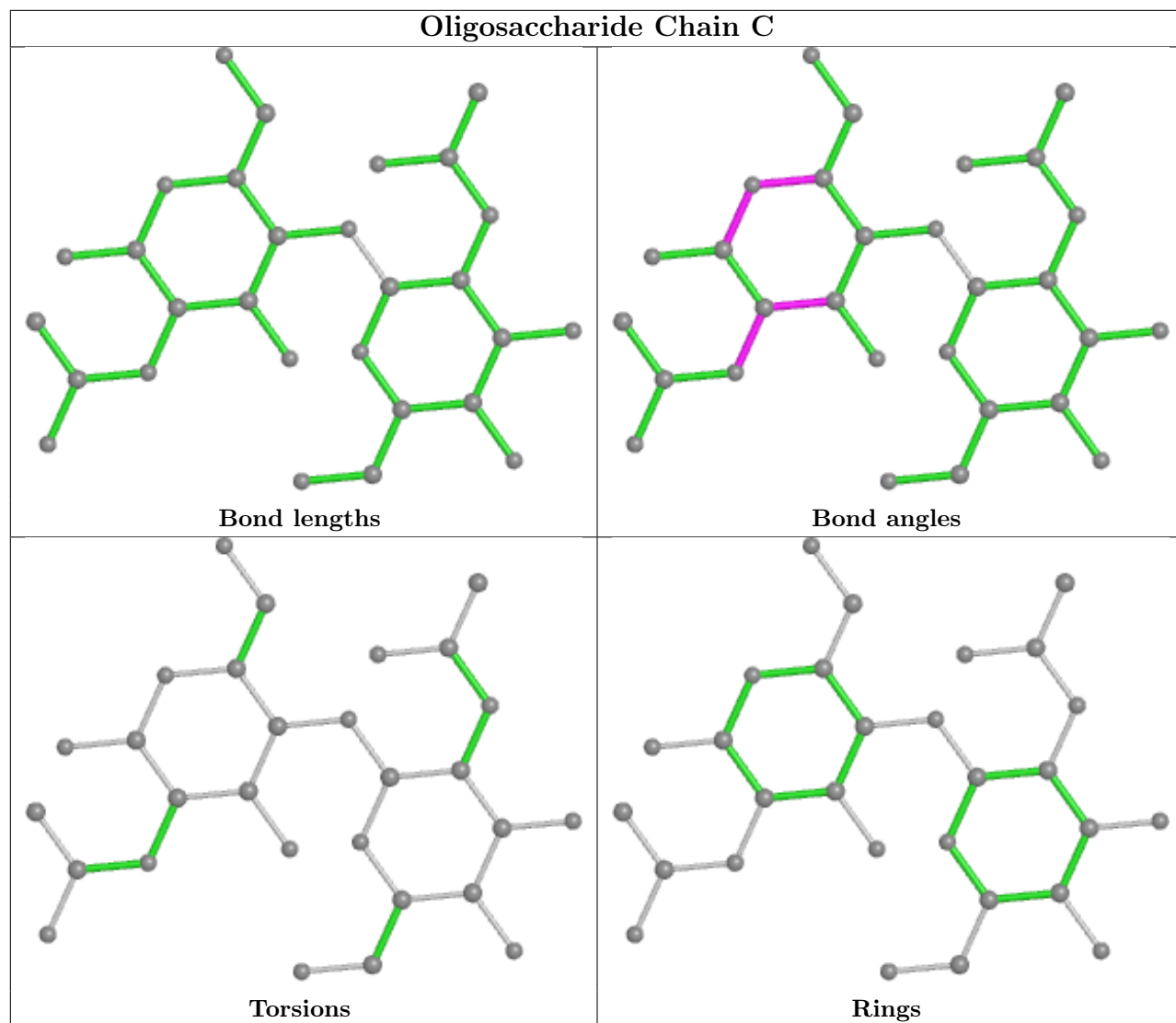
There are no torsion outliers.

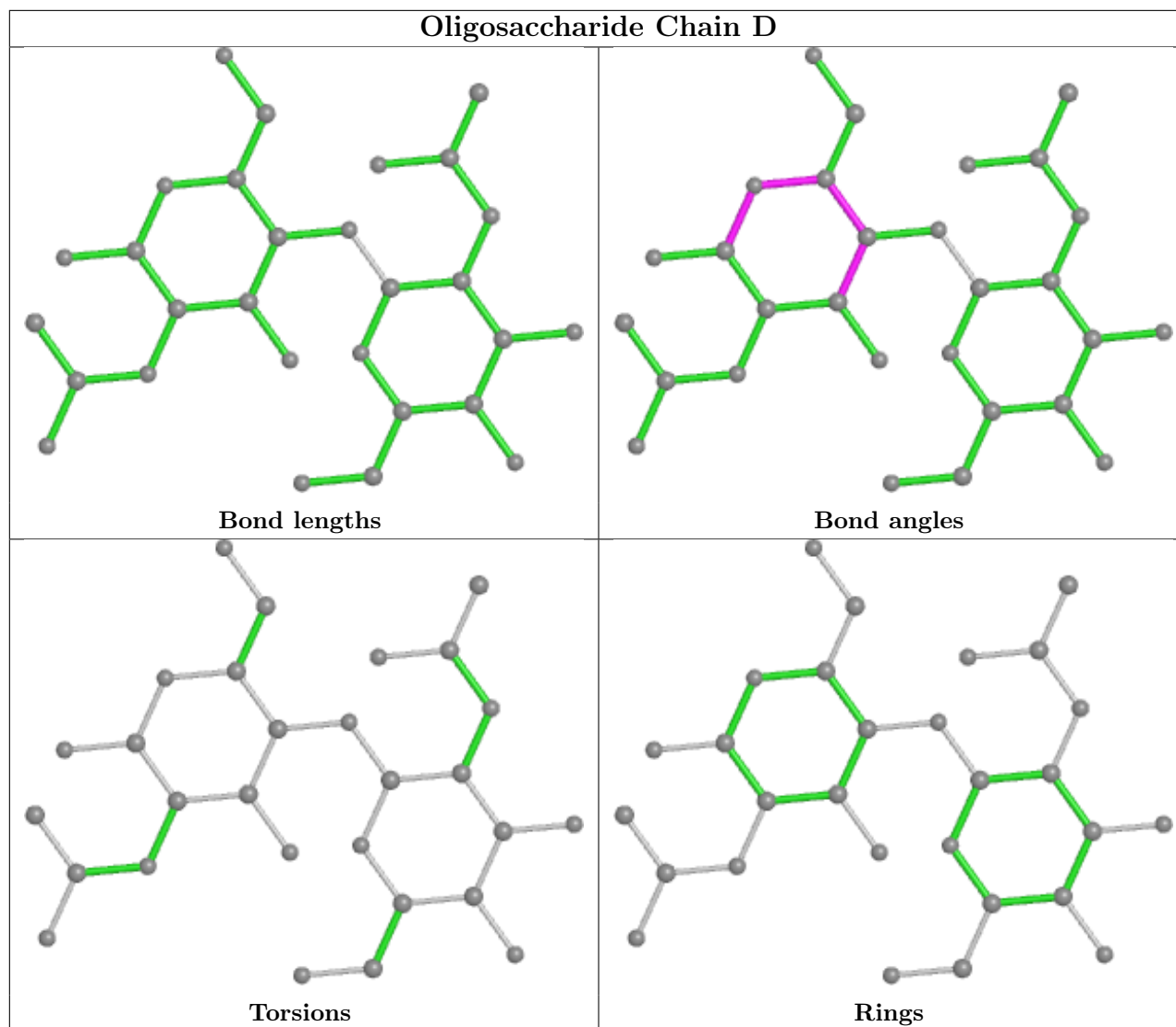
There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	NAG	2	0
2	D	2	NAG	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](#)

20 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	$\# Z > 2$
5	MLI	A	504	-	6,6,6	1.59	1 (16%)	7,7,7	0.99	0
6	PGE	B	507	-	6,6,9	0.16	0	5,5,8	0.18	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	MLI	A	503	-	6,6,6	1.41	0	7,7,7	1.21	1 (14%)
5	MLI	B	502	-	6,6,6	1.40	0	7,7,7	1.31	1 (14%)
5	MLI	A	505	-	6,6,6	1.11	0	7,7,7	1.84	2 (28%)
8	NAG	B	510	-	15,15,15	0.74	0	21,21,21	1.29	1 (4%)
7	EDO	A	508	-	3,3,3	0.18	0	2,2,2	0.30	0
9	PG4	B	504	-	12,12,12	0.22	0	11,11,11	0.24	0
7	EDO	A	507	-	3,3,3	0.12	0	2,2,2	0.28	0
7	EDO	B	508	-	3,3,3	0.14	0	2,2,2	0.41	0
4	MXE	A	502	-	4,4,4	0.33	0	3,3,3	0.29	0
9	PG4	B	506	-	12,12,12	0.19	0	11,11,11	0.08	0
9	PG4	B	505	-	12,12,12	0.21	0	11,11,11	0.19	0
3	ACT	A	501	-	3,3,3	1.02	0	3,3,3	0.70	0
7	EDO	B	509	-	3,3,3	0.14	0	2,2,2	0.47	0
6	PGE	A	506	-	6,6,9	0.11	0	5,5,8	0.19	0
5	MLI	B	503	-	6,6,6	1.59	1 (16%)	7,7,7	1.16	0
3	ACT	B	501	-	3,3,3	0.76	0	3,3,3	0.92	0
7	EDO	A	509	-	3,3,3	0.13	0	2,2,2	0.42	0
8	NAG	A	510	-	15,15,15	0.78	0	21,21,21	2.21	9 (42%)

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	MLI	A	505	-	-	2/4/4/4	-
5	MLI	A	504	-	-	1/4/4/4	-
5	MLI	B	503	-	-	0/4/4/4	-
6	PGE	A	506	-	-	0/4/4/7	-
8	NAG	B	510	-	-	0/6/26/26	0/1/1/1
6	PGE	B	507	-	-	1/4/4/7	-
9	PG4	B	505	-	-	5/10/10/10	-
7	EDO	A	508	-	-	1/1/1/1	-
5	MLI	A	503	-	-	0/4/4/4	-
7	EDO	A	509	-	-	1/1/1/1	-
9	PG4	B	504	-	-	4/10/10/10	-
7	EDO	A	507	-	-	0/1/1/1	-
5	MLI	B	502	-	-	1/4/4/4	-
8	NAG	A	510	-	-	4/6/26/26	0/1/1/1
7	EDO	B	508	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	MXE	A	502	-	-	1/2/2/2	-
7	EDO	B	509	-	-	1/1/1/1	-
9	PG4	B	506	-	-	7/10/10/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	503	MLI	C1-C3	2.21	1.54	1.51
5	A	504	MLI	C1-C2	2.18	1.54	1.51

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	B	510	NAG	C1-C2-N2	-4.58	105.42	110.73
8	A	510	NAG	O3-C3-C4	-4.40	100.17	110.35
8	A	510	NAG	C1-C2-C3	3.93	115.90	110.54
8	A	510	NAG	O3-C3-C2	3.83	117.39	109.66
8	A	510	NAG	C3-C4-C5	3.50	116.48	110.24
8	A	510	NAG	O4-C4-C3	-3.28	102.78	110.35
5	A	505	MLI	O6-C2-C1	-3.07	113.10	122.08
8	A	510	NAG	C4-C3-C2	2.67	114.26	110.34
8	A	510	NAG	C1-O5-C5	-2.28	109.36	113.66
8	A	510	NAG	O5-C1-C2	2.26	111.79	109.52
5	B	502	MLI	O6-C2-C1	-2.23	115.55	122.08
5	A	503	MLI	O6-C2-C1	-2.19	115.68	122.08
5	A	505	MLI	O8-C3-C1	-2.11	115.90	122.08
8	A	510	NAG	O4-C4-C5	2.01	114.29	109.30

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	B	504	PG4	O3-C5-C6-O4
8	A	510	NAG	C4-C5-C6-O6
6	B	507	PGE	O2-C3-C4-O3
9	B	505	PG4	O1-C1-C2-O2
9	B	505	PG4	C6-C5-O3-C4
8	A	510	NAG	O5-C5-C6-O6
8	A	510	NAG	C8-C7-N2-C2
9	B	506	PG4	O2-C3-C4-O3
7	A	508	EDO	O1-C1-C2-O2

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Mol	Chain	Res	Type	Atoms
9	B	506	PG4	O4-C7-C8-O5
9	B	504	PG4	O4-C7-C8-O5
5	A	505	MLI	C3-C1-C2-O6
5	A	505	MLI	C3-C1-C2-O7
4	A	502	MXE	C1-C2-O2-C3
9	B	506	PG4	C1-C2-O2-C3
9	B	505	PG4	C8-C7-O4-C6
8	A	510	NAG	O7-C7-N2-C2
9	B	504	PG4	C1-C2-O2-C3
9	B	504	PG4	C6-C5-O3-C4
7	B	509	EDO	O1-C1-C2-O2
5	A	504	MLI	C2-C1-C3-O9
9	B	506	PG4	O1-C1-C2-O2
9	B	506	PG4	O3-C5-C6-O4
7	A	509	EDO	O1-C1-C2-O2
9	B	506	PG4	C3-C4-O3-C5
9	B	505	PG4	O4-C7-C8-O5
5	B	502	MLI	C2-C1-C3-O9
9	B	506	PG4	C5-C6-O4-C7
9	B	505	PG4	O2-C3-C4-O3

There are no ring outliers.

6 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	505	MLI	1	0
8	B	510	NAG	4	0
7	B	508	EDO	2	0
9	B	505	PG4	1	0
7	A	509	EDO	1	0
8	A	510	NAG	5	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	368/372 (98%)	-0.28	4 (1%) 80 84	9, 12, 20, 43	0
1	B	367/372 (98%)	-0.23	2 (0%) 91 92	10, 13, 22, 45	0
All	All	735/744 (98%)	-0.25	6 (0%) 86 89	9, 13, 21, 45	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	406	THR	9.9
1	B	406	THR	9.1
1	A	39	GLY	5.9
1	B	40	SER	4.3
1	A	40	SER	3.9
1	A	167	GLU	2.1

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

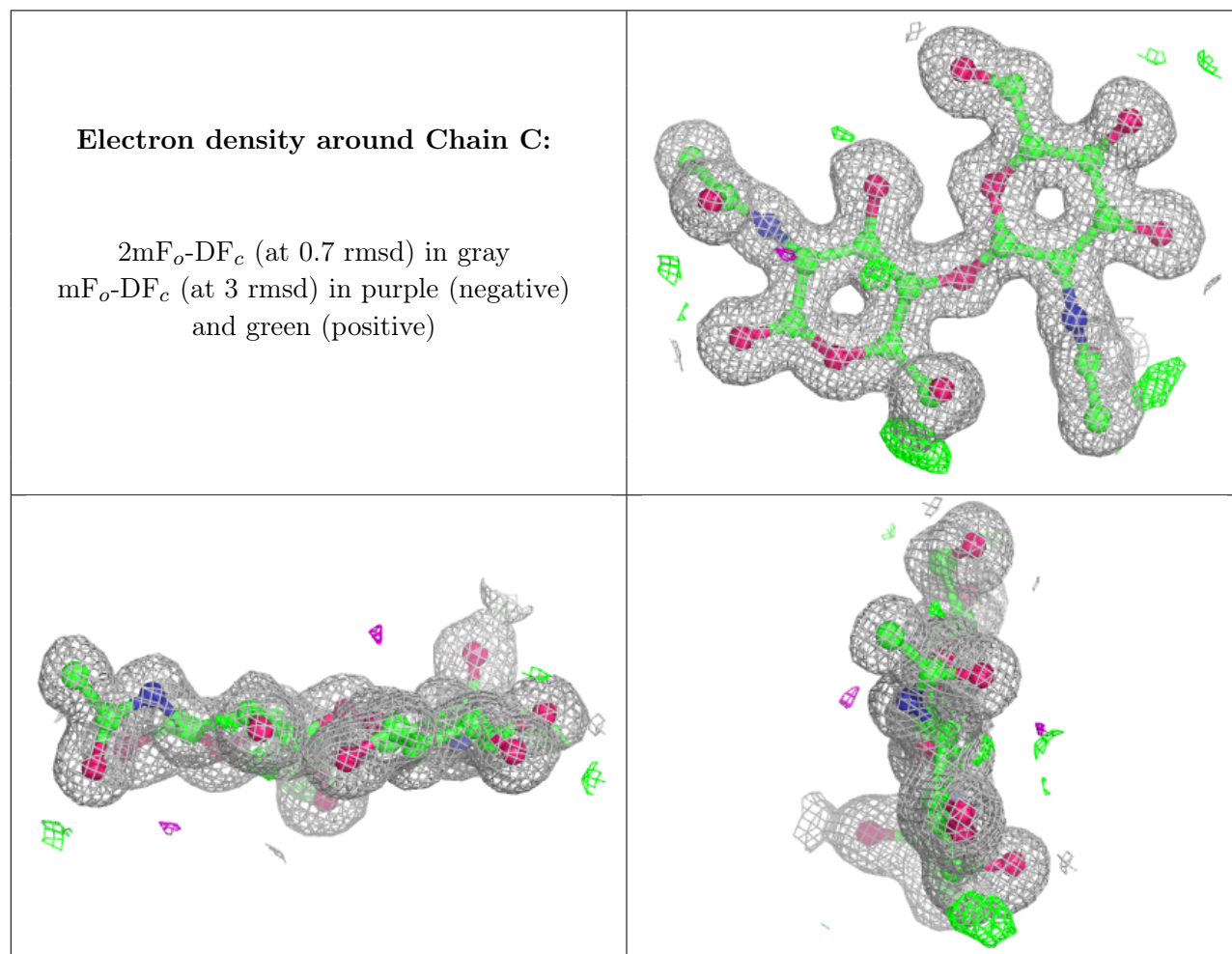
There are no non-standard protein/DNA/RNA residues in this entry.

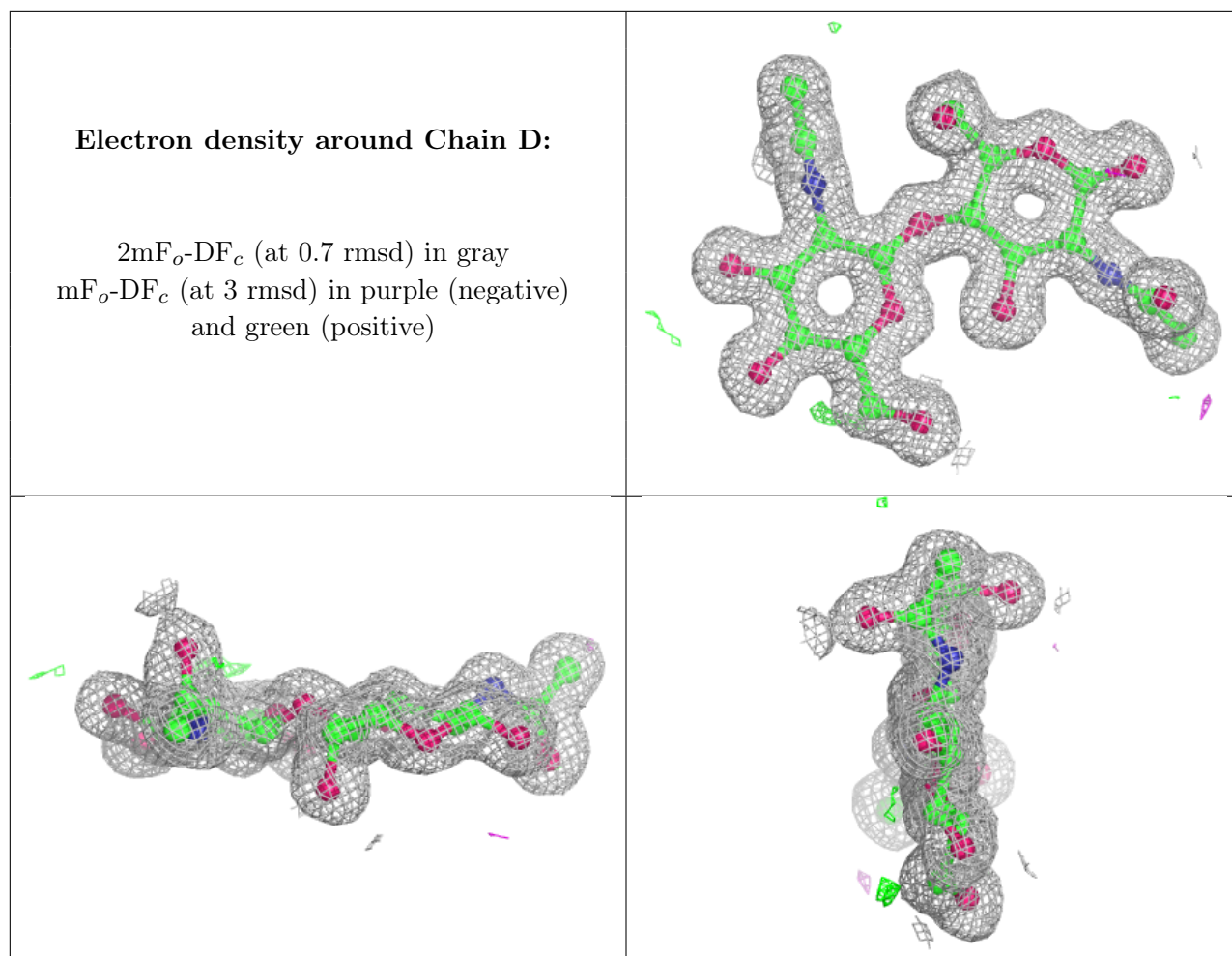
6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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	NAG	C	1	15/15	0.96	0.06	12,13,17,18	0
2	NAG	C	2	14/15	0.96	0.06	12,14,17,19	0
2	NAG	D	2	14/15	0.96	0.05	14,16,21,21	0
2	NAG	D	1	15/15	0.97	0.06	13,15,17,19	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.





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
7	EDO	A	507	4/4	0.64	0.12	42,43,45,46	0
7	EDO	B	509	4/4	0.66	0.20	30,31,31,32	4
8	NAG	A	510	15/15	0.74	0.25	15,19,21,24	15
8	NAG	B	510	15/15	0.74	0.28	17,20,23,24	15
7	EDO	B	508	4/4	0.77	0.25	26,27,29,29	4
3	ACT	B	501	4/4	0.77	0.16	27,28,28,37	4
4	MXE	A	502	5/5	0.79	0.20	21,22,23,23	5
7	EDO	A	509	4/4	0.79	0.12	30,31,32,34	4
5	MLI	A	505	7/7	0.79	0.19	19,21,23,25	7
3	ACT	A	501	4/4	0.81	0.17	27,27,28,33	4

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
9	PG4	B	505	13/13	0.83	0.12	30,37,42,45	0
9	PG4	B	506	13/13	0.83	0.16	36,44,48,50	0
6	PGE	A	506	7/10	0.84	0.10	34,35,40,42	0
9	PG4	B	504	13/13	0.86	0.14	24,37,41,42	0
7	EDO	A	508	4/4	0.88	0.10	28,29,34,40	0
6	PGE	B	507	7/10	0.88	0.13	38,40,46,55	0
5	MLI	A	503	7/7	0.88	0.11	16,16,21,26	7
5	MLI	B	503	7/7	0.90	0.12	19,23,24,25	7
5	MLI	B	502	7/7	0.92	0.18	21,22,29,32	0
5	MLI	A	504	7/7	0.95	0.09	16,19,21,22	7

6.5 Other polymers [i](#)

There are no such residues in this entry.