Full wwPDB X-ray Structure Validation Report (i)

Sep 6, 2023 – 01:35 AM EDT

PDB ID	:	4EW9
Title	:	The liganded structure of C. bescii family 3 pectate lyase
Authors	:	Alahuhta, P.M.; Lunin, V.V.
Deposited on	:	2012-04-26
Resolution	:	1.60 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 (1)) were used in the production of this report:

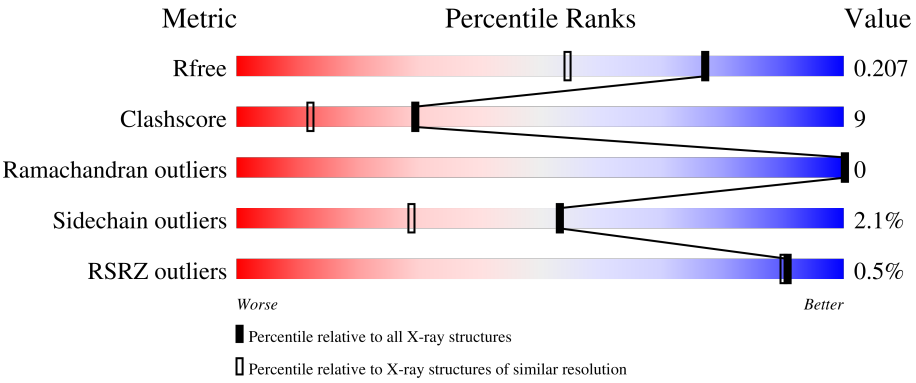
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 1.60 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	3398 (1.60-1.60)
Clashscore	141614	3665 (1.60-1.60)
Ramachandran outliers	138981	3564 (1.60-1.60)
Sidechain outliers	138945	3563 (1.60-1.60)
RSRZ outliers	127900	3321 (1.60-1.60)

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	195	80% 18% .
1	B	195	% 86% 14%
2	C	2	100%
2	D	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
4	MPD	A	208	-	-	X	-

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 3654 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.

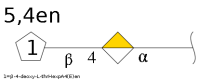
- Molecule 1 is a protein called Pectate lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	195	Total	C	N	O	S	0	16	0
			1578	997	264	311	6			
1	B	195	Total	C	N	O	S	0	12	0
			1557	981	259	311	6			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP B9MKT4
A	0	THR	-	expression tag	UNP B9MKT4
B	-1	GLY	-	expression tag	UNP B9MKT4
B	0	THR	-	expression tag	UNP B9MKT4

- Molecule 2 is an oligosaccharide called 4-deoxy-beta-L-threo-hex-4-enopyranuronic acid-(1-4)-alpha-D-galactopyranuronic acid.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	2	Total	C	O		0	0	0
			24	12	12				
2	D	2	Total	C	O		0	0	0
			24	12	12				

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total	Ca	0	0
			5	5		

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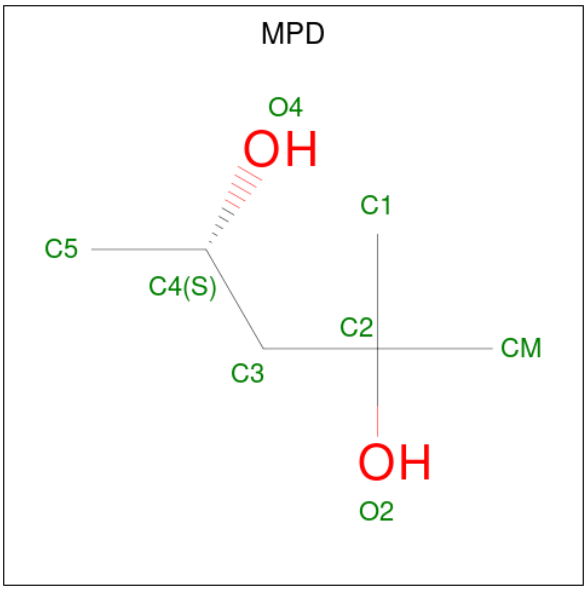
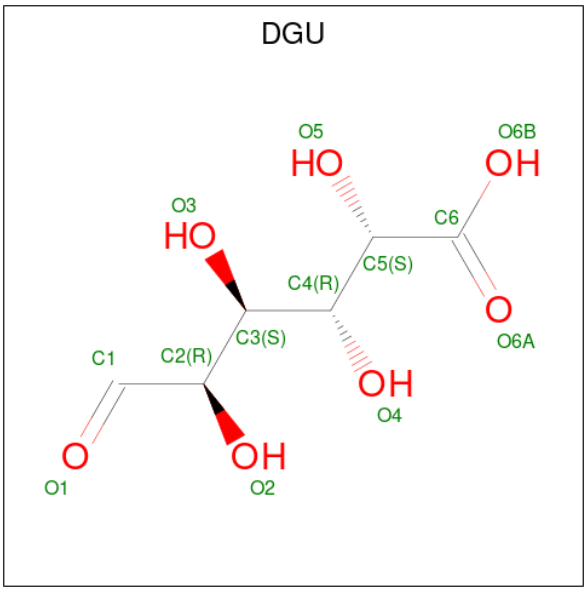
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	4	Total Ca 4 4	0	0

- Molecule 4 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: $C_6H_{14}O_2$).



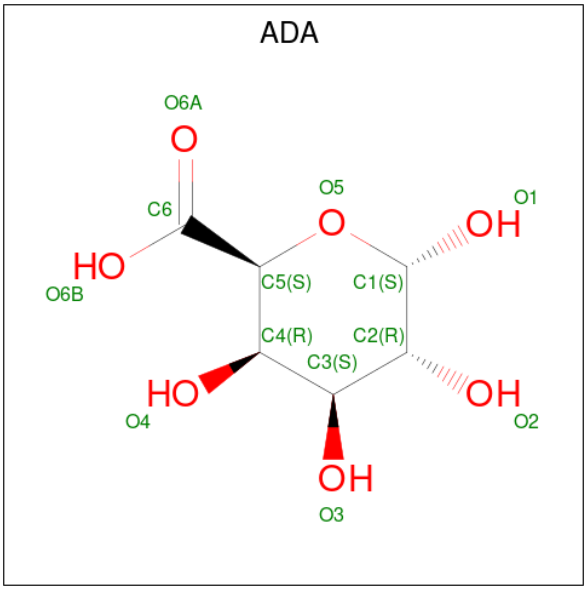
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 8 6 2	0	0
4	A	1	Total C O 8 6 2	0	0
4	A	1	Total C O 8 6 2	0	0
4	B	1	Total C O 8 6 2	0	0

- Molecule 5 is D-galacturonic acid (three-letter code: DGU) (formula: $C_6H_{10}O_7$).



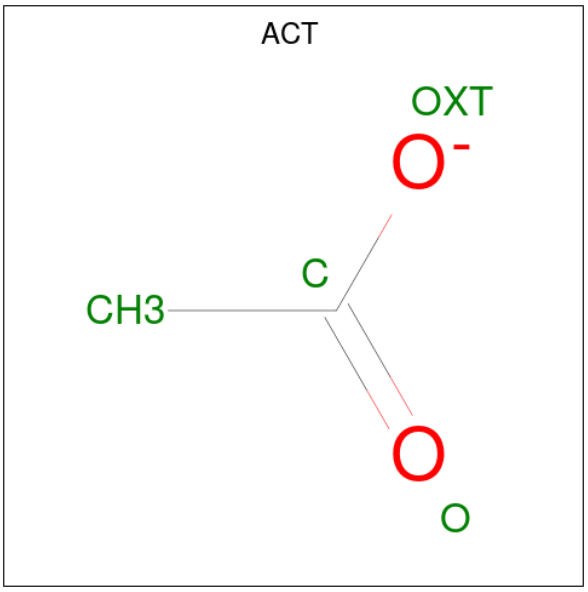
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 13 6 7	0	0
5	B	1	Total C O 13 6 7	0	0

- Molecule 6 is alpha-D-galactopyranuronic acid (three-letter code: ADA) (formula: $C_6H_{10}O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C O 13 6 7	0	0

- Molecule 7 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



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

- Molecule 8 is water.

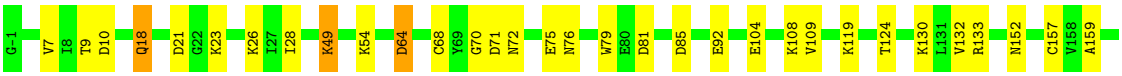
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	223	Total O 230 230	0	7
8	B	151	Total O 153 153	0	3

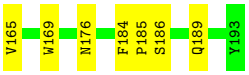
3 Residue-property plots (i)

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: Pectate lyase

Chain A:



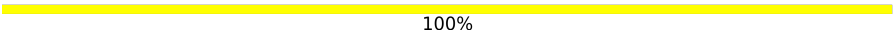


• Molecule 1: Pectate lyase

Chain B:

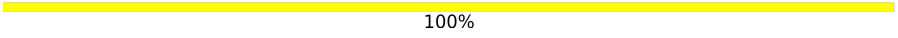
• Molecule 2: 4-deoxy-beta-L-threo-hex-4-enopyranuronic acid-(1-4)-alpha-D-galactopyranuronic acid

Chain C:



• Molecule 2: 4-deoxy-beta-L-threo-hex-4-enopyranuronic acid-(1-4)-alpha-D-galactopyranuronic acid

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	136.95Å 35.90Å 98.69Å 90.00° 132.00° 90.00°	Depositor
Resolution (Å)	33.85 – 1.60 33.85 – 1.60	Depositor EDS
% Data completeness (in resolution range)	98.4 (33.85-1.60) 98.4 (33.85-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	2.00 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.164 , 0.204 0.170 , 0.207	Depositor DCC
R_{free} test set	2371 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	17.4	Xtriage
Anisotropy	0.409	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 55.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.014 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	3654	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.13% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: ACT, DGU, AQA, CA, ADA, MPD

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	1.19	3/1630 (0.2%)	1.15	9/2205 (0.4%)
1	B	1.06	0/1596	1.07	6/2161 (0.3%)
All	All	1.13	3/3226 (0.1%)	1.11	15/4366 (0.3%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	104	GLU	CD-OE2	-5.42	1.19	1.25
1	A	169	TRP	CD2-CE2	5.07	1.47	1.41
1	A	79	TRP	CD2-CE2	5.01	1.47	1.41

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	133	ARG	NE-CZ-NH1	-8.50	116.05	120.30
1	A	21	ASP	CB-CG-OD1	8.27	125.74	118.30
1	B	21	ASP	CB-CG-OD1	7.74	125.27	118.30
1	A	10	ASP	CB-CG-OD1	7.43	124.98	118.30
1	A	71	ASP	CB-CG-OD1	6.30	123.97	118.30
1	A	64	ASP	CB-CG-OD2	6.01	123.71	118.30
1	B	133	ARG	NE-CZ-NH2	5.96	123.28	120.30
1	B	21	ASP	CB-CG-OD2	-5.89	112.99	118.30
1	B	71	ASP	CB-CG-OD1	5.86	123.58	118.30
1	B	85	ASP	CB-CG-OD2	5.73	123.46	118.30
1	A	109	VAL	CG1-CB-CG2	-5.66	101.84	110.90
1	A	64	ASP	CB-CG-OD1	-5.33	113.51	118.30
1	A	85	ASP	CB-CG-OD2	5.17	122.95	118.30
1	A	184	PHE	CB-CG-CD1	5.16	124.41	120.80
1	A	133	ARG	NE-CZ-NH2	-5.07	117.76	120.30

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	1578	0	1586	41	0
1	B	1557	0	1553	17	0
2	C	24	0	13	0	0
2	D	24	0	12	0	0
3	A	5	0	0	0	0
3	B	4	0	0	0	0
4	A	24	0	42	15	0
4	B	8	0	14	0	0
5	A	13	0	0	1	0
5	B	13	0	0	0	0
6	A	13	0	9	0	0
7	A	4	0	3	0	0
7	B	4	0	3	0	0
8	A	230	0	0	15	0
8	B	153	0	0	2	0
All	All	3654	0	3235	62	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 9.

All (62) 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:119[B]:LYS:HE2	4:A:208:MPD:C5	1.51	1.37
4:A:208:MPD:HM3	8:A:522:HOH:O	1.17	1.29
1:A:119[B]:LYS:CE	4:A:208:MPD:H51	1.65	1.26
1:B:76[B]:ASN:ND2	8:B:394:HOH:O	1.73	1.14
1:A:119[B]:LYS:CE	4:A:208:MPD:C5	2.24	1.10
1:A:119[B]:LYS:HE2	4:A:208:MPD:H51	1.09	1.03
1:A:119[B]:LYS:HE2	4:A:208:MPD:H52	1.41	0.99
4:A:208:MPD:CM	8:A:522:HOH:O	1.87	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:119[B]:LYS:NZ	4:A:208:MPD:H51	1.86	0.88
1:A:76[A]:ASN:OD1	8:A:384:HOH:O	1.90	0.87
1:A:92[B]:GLU:HG3	8:A:411:HOH:O	1.84	0.76
1:B:35:GLY:H	1:B:41:GLN:HE22	1.38	0.71
1:A:152[A]:ASN:OD1	8:A:491:HOH:O	2.08	0.71
1:A:70:GLY:H	1:A:72:ASN:HD21	1.39	0.69
1:B:179[A]:LYS:O	1:B:179[A]:LYS:HG2	1.92	0.69
1:A:119[B]:LYS:CE	4:A:208:MPD:H52	2.09	0.68
1:A:119[B]:LYS:HZ1	4:A:208:MPD:H51	1.64	0.63
1:A:119[B]:LYS:CD	4:A:208:MPD:H52	2.29	0.62
1:A:68:CYS:HB3	1:A:72:ASN:ND2	2.15	0.62
1:A:124[A]:THR:HG22	8:A:481:HOH:O	1.99	0.62
1:A:119[B]:LYS:HD3	4:A:208:MPD:H52	1.82	0.61
1:B:26:LYS:HE2	1:B:28[A]:ILE:HD11	1.84	0.59
1:A:124[A]:THR:HG23	8:A:491:HOH:O	2.03	0.59
1:A:119[B]:LYS:CD	4:A:208:MPD:C5	2.81	0.58
1:A:70:GLY:H	1:A:72:ASN:ND2	2.00	0.58
1:A:23[A]:LYS:HE2	8:A:445:HOH:O	2.05	0.55
1:B:35:GLY:H	1:B:41:GLN:NE2	2.03	0.55
1:A:92[B]:GLU:CG	8:A:411:HOH:O	2.50	0.55
1:A:68:CYS:HB3	1:A:72:ASN:HD22	1.73	0.54
1:B:54:LYS:HA	1:B:75[B]:GLU:O	2.08	0.53
4:A:207:MPD:HM3	8:A:475:HOH:O	2.08	0.53
1:A:152[B]:ASN:HD21	1:A:176:ASN:HD22	1.58	0.52
1:A:26:LYS:HE2	1:A:28[A]:ILE:HD11	1.94	0.50
5:A:210:DGU:O3	5:A:210:DGU:O5	2.31	0.49
1:A:49[B]:LYS:HA	1:A:70:GLY:O	2.12	0.49
1:A:119[B]:LYS:HD3	4:A:208:MPD:C5	2.42	0.48
1:B:130:LYS:HA	1:B:157:CYS:O	2.14	0.48
1:A:130:LYS:HA	1:A:157:CYS:O	2.14	0.48
1:B:35:GLY:N	1:B:41:GLN:HE22	2.08	0.48
1:A:186:SER:H	1:A:189:GLN:HE21	1.62	0.48
1:B:186:SER:H	1:B:189:GLN:NE2	2.11	0.48
1:A:185:PRO:HD2	1:A:189:GLN:HE22	1.78	0.47
1:B:121:LYS:HA	1:B:147:GLU:O	2.16	0.45
1:A:18:GLN:HE21	1:A:18:GLN:HA	1.82	0.45
1:B:88:THR:HA	1:B:111:GLN:O	2.17	0.45
1:A:23[A]:LYS:NZ	8:A:446:HOH:O	2.16	0.45
1:A:132:VAL:O	1:A:159:ALA:HA	2.17	0.44
1:B:152[B]:ASN:OD1	1:B:176:ASN:HB2	2.17	0.44
1:B:41:GLN:NE2	1:B:63:CYS:HA	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:179[A]:LYS:O	1:B:179[A]:LYS:CG	2.64	0.43
1:B:124[A]:THR:HG22	8:B:440:HOH:O	2.18	0.43
1:A:23[A]:LYS:CE	8:A:445:HOH:O	2.66	0.43
1:A:165:VAL:HG22	8:A:315:HOH:O	2.18	0.43
1:A:9:THR:HG23	8:A:355[A]:HOH:O	2.19	0.42
1:A:54:LYS:HA	1:A:75[A]:GLU:O	2.20	0.42
1:A:81:ASP:C	1:A:81:ASP:OD1	2.58	0.42
1:A:26:LYS:CE	1:A:28[A]:ILE:HD11	2.50	0.42
1:B:186:SER:H	1:B:189:GLN:HE21	1.67	0.41
1:A:186:SER:H	1:A:189:GLN:NE2	2.17	0.40
1:A:18:GLN:NE2	8:A:335:HOH:O	2.55	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	209/195 (107%)	198 (95%)	11 (5%)	0	100	100
1	B	205/195 (105%)	193 (94%)	12 (6%)	0	100	100
All	All	414/390 (106%)	391 (94%)	23 (6%)	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	181/165 (110%)	176 (97%)	5 (3%)	43 18
1	B	177/165 (107%)	174 (98%)	3 (2%)	60 38
All	All	358/330 (108%)	350 (98%)	8 (2%)	53 27

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	49[A]	LYS
1	A	49[B]	LYS
1	A	64	ASP
1	A	108	LYS
1	B	25	ILE
1	B	64	ASP
1	B	108	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	72	ASN
1	A	189	GLN
1	B	41	GLN
1	B	137	ASN
1	B	189	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)

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	ADA	C	1	2	13,13,13	0.99	1 (7%)	18,19,19	0.98	1 (5%)
2	AQA	C	2	3,2	10,11,12	0.93	1 (10%)	13,15,17	0.56	0
2	ADA	D	1	2	13,13,13	1.04	1 (7%)	18,19,19	0.83	0
2	AQA	D	2	3,2	10,11,12	1.14	1 (10%)	13,15,17	1.38	2 (15%)

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	ADA	C	1	2	-	0/4/24/24	0/1/1/1
2	AQA	C	2	3,2	-	0/4/17/20	0/1/1/1
2	ADA	D	1	2	-	0/4/24/24	0/1/1/1
2	AQA	D	2	3,2	-	0/4/17/20	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1	ADA	O1-C1	-2.76	1.30	1.39
2	D	2	AQA	O6B-C6	-2.57	1.23	1.30
2	C	2	AQA	O6A-C6	2.30	1.28	1.22
2	C	1	ADA	O6A-C6	2.07	1.28	1.22

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	2	AQA	O6B-C6-C5	2.77	121.11	114.20
2	D	2	AQA	O6A-C6-C5	-2.62	113.54	120.48
2	C	1	ADA	O5-C5-C4	2.22	113.53	109.57

There are no chirality outliers.

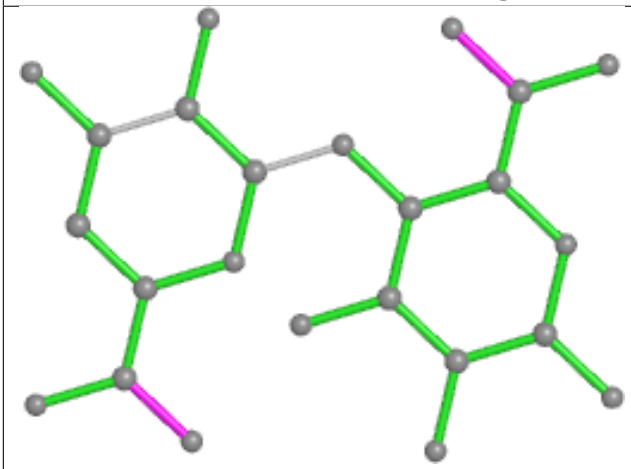
There are no torsion outliers.

There are no ring outliers.

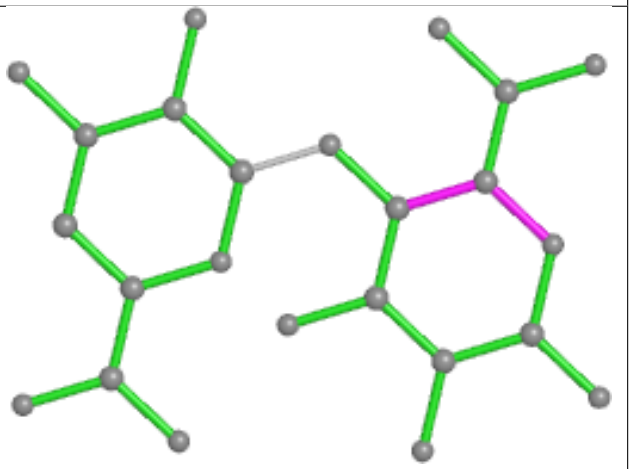
No monomer is involved in short contacts.

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

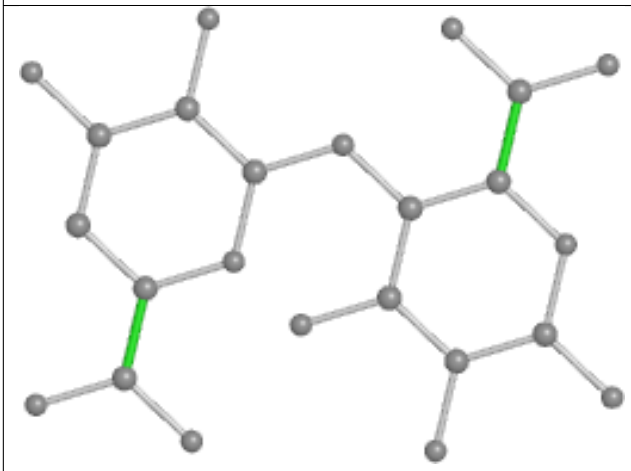
Oligosaccharide Chain C



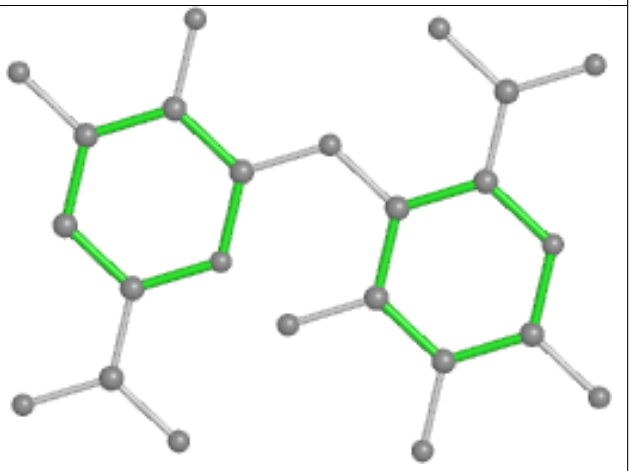
Bond lengths



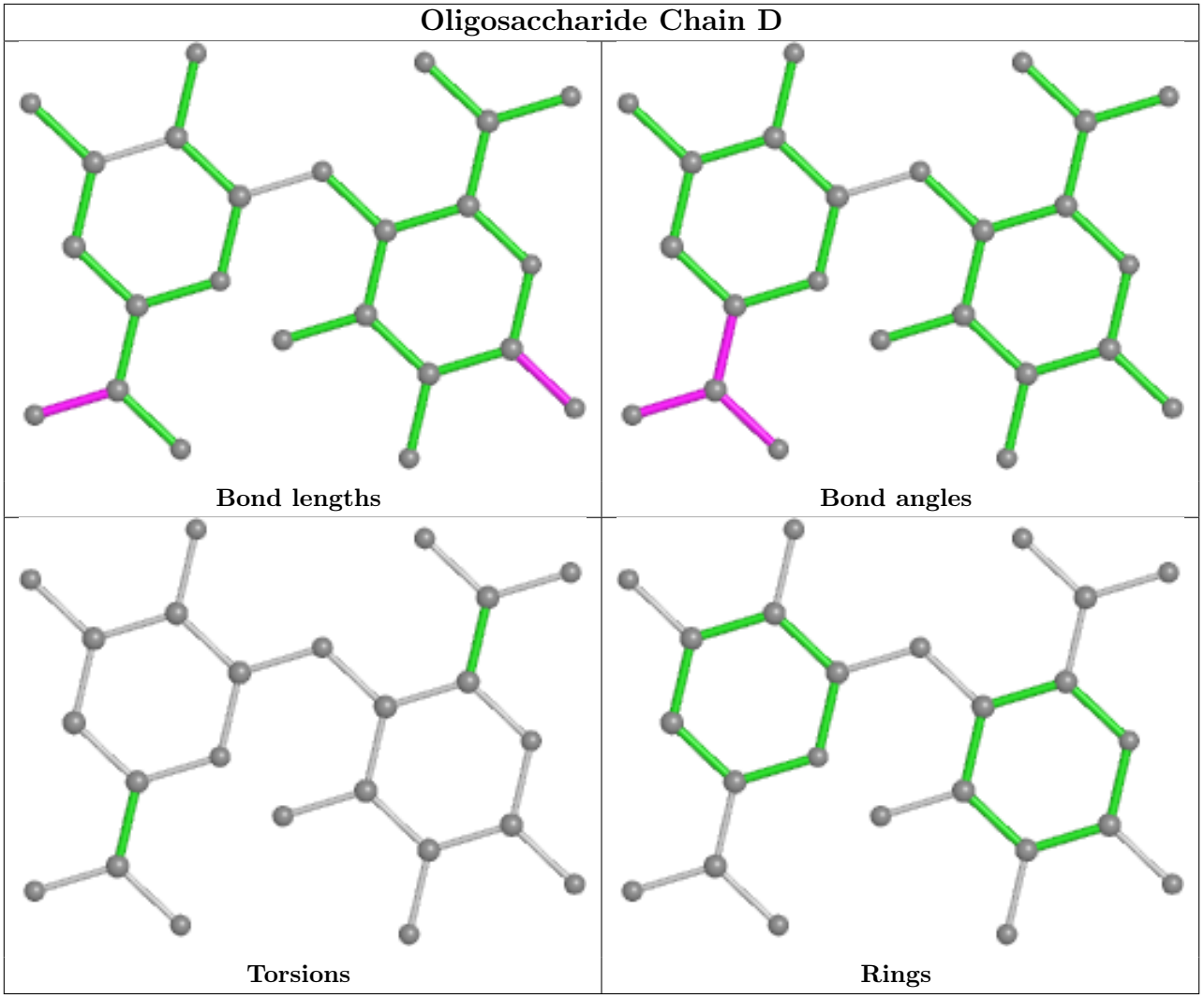
Bond angles



Torsions



Rings



5.6 Ligand geometry (i)

Of 18 ligands modelled in this entry, 9 are monoatomic - leaving 9 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	MPD	A	208	-	7,7,7	0.44	0	9,10,10	1.75	3 (33%)
5	DGU	A	210	3	11,12,12	1.88	2 (18%)	15,16,16	1.22	2 (13%)
6	ADA	A	211	3	13,13,13	1.37	2 (15%)	18,19,19	1.22	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
7	ACT	B	208	-	3,3,3	0.80	0	3,3,3	1.16	0
5	DGU	B	207	3	11,12,12	1.21	1 (9%)	15,16,16	4.28	7 (46%)
4	MPD	B	205	-	7,7,7	0.46	0	9,10,10	0.48	0
4	MPD	A	207	-	7,7,7	0.28	0	9,10,10	0.44	0
4	MPD	A	206	-	7,7,7	0.43	0	9,10,10	0.61	0
7	ACT	A	212	-	3,3,3	0.77	0	3,3,3	0.46	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
4	MPD	A	208	-	-	2/5/5/5	-
5	DGU	A	210	3	-	12/16/18/18	-
6	ADA	A	211	3	-	0/4/24/24	0/1/1/1
5	DGU	B	207	3	-	7/16/18/18	-
4	MPD	B	205	-	-	0/5/5/5	-
4	MPD	A	207	-	-	2/5/5/5	-
4	MPD	A	206	-	-	4/5/5/5	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	210	DGU	C3-C2	5.23	1.61	1.53
6	A	211	ADA	O6A-C6	3.19	1.31	1.22
5	A	210	DGU	O6B-C6	-3.13	1.20	1.30
5	B	207	DGU	O6B-C6	-3.08	1.20	1.30
6	A	211	ADA	O6B-C6	-2.87	1.21	1.30

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	207	DGU	C4-C3-C2	-13.16	90.57	113.54
5	B	207	DGU	O2-C2-C1	7.33	127.38	110.08
5	B	207	DGU	C3-C4-C5	3.59	119.97	113.60
5	B	207	DGU	O3-C3-C2	3.45	115.50	109.17
4	A	208	MPD	O2-C2-CM	-2.92	98.71	108.08
5	B	207	DGU	C3-C2-C1	-2.55	103.08	111.10
4	A	208	MPD	O2-C2-C1	2.51	116.12	108.08
5	A	210	DGU	O3-C3-C2	2.46	113.67	109.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	207	DGU	O4-C4-C5	2.37	113.53	109.21
5	A	210	DGU	C3-C4-C5	2.33	117.73	113.60
6	A	211	ADA	O6B-C6-C5	2.31	122.11	113.65
5	B	207	DGU	O5-C5-C4	2.26	115.24	110.45
4	A	208	MPD	CM-C2-C1	-2.13	106.14	110.57
6	A	211	ADA	O6A-C6-C5	-2.13	113.01	120.81

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	207	MPD	O2-C2-C3-C4
4	A	207	MPD	CM-C2-C3-C4
5	A	210	DGU	O2-C2-C3-C4
5	A	210	DGU	O2-C2-C3-O3
5	A	210	DGU	C1-C2-C3-C4
5	A	210	DGU	C1-C2-C3-O3
5	A	210	DGU	C2-C3-C4-C5
5	A	210	DGU	C2-C3-C4-O4
5	A	210	DGU	O3-C3-C4-C5
5	A	210	DGU	O3-C3-C4-O4
5	A	210	DGU	C3-C4-C5-O5
5	A	210	DGU	O4-C4-C5-O5
5	A	210	DGU	O4-C4-C5-C6
5	B	207	DGU	C1-C2-C3-C4
5	B	207	DGU	C1-C2-C3-O3
5	B	207	DGU	C3-C4-C5-O5
5	B	207	DGU	C3-C4-C5-C6
5	B	207	DGU	O4-C4-C5-O5
5	B	207	DGU	O4-C4-C5-C6
5	B	207	DGU	O2-C2-C3-O3
4	A	206	MPD	O2-C2-C3-C4
4	A	208	MPD	O2-C2-C3-C4
4	A	206	MPD	C2-C3-C4-O4
4	A	206	MPD	CM-C2-C3-C4
4	A	208	MPD	CM-C2-C3-C4
5	A	210	DGU	C3-C4-C5-C6
4	A	206	MPD	C2-C3-C4-C5

There are no ring outliers.

3 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	208	MPD	14	0
5	A	210	DGU	1	0
4	A	207	MPD	1	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

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	195/195 (100%)	-0.29	0 100 100	12, 18, 31, 46	3 (1%)
1	B	195/195 (100%)	-0.24	2 (1%) 82 82	13, 22, 33, 51	1 (0%)
All	All	390/390 (100%)	-0.26	2 (0%) 91 90	12, 20, 33, 51	4 (1%)

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	0	THR	4.5
1	B	-1	GLY	4.4

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

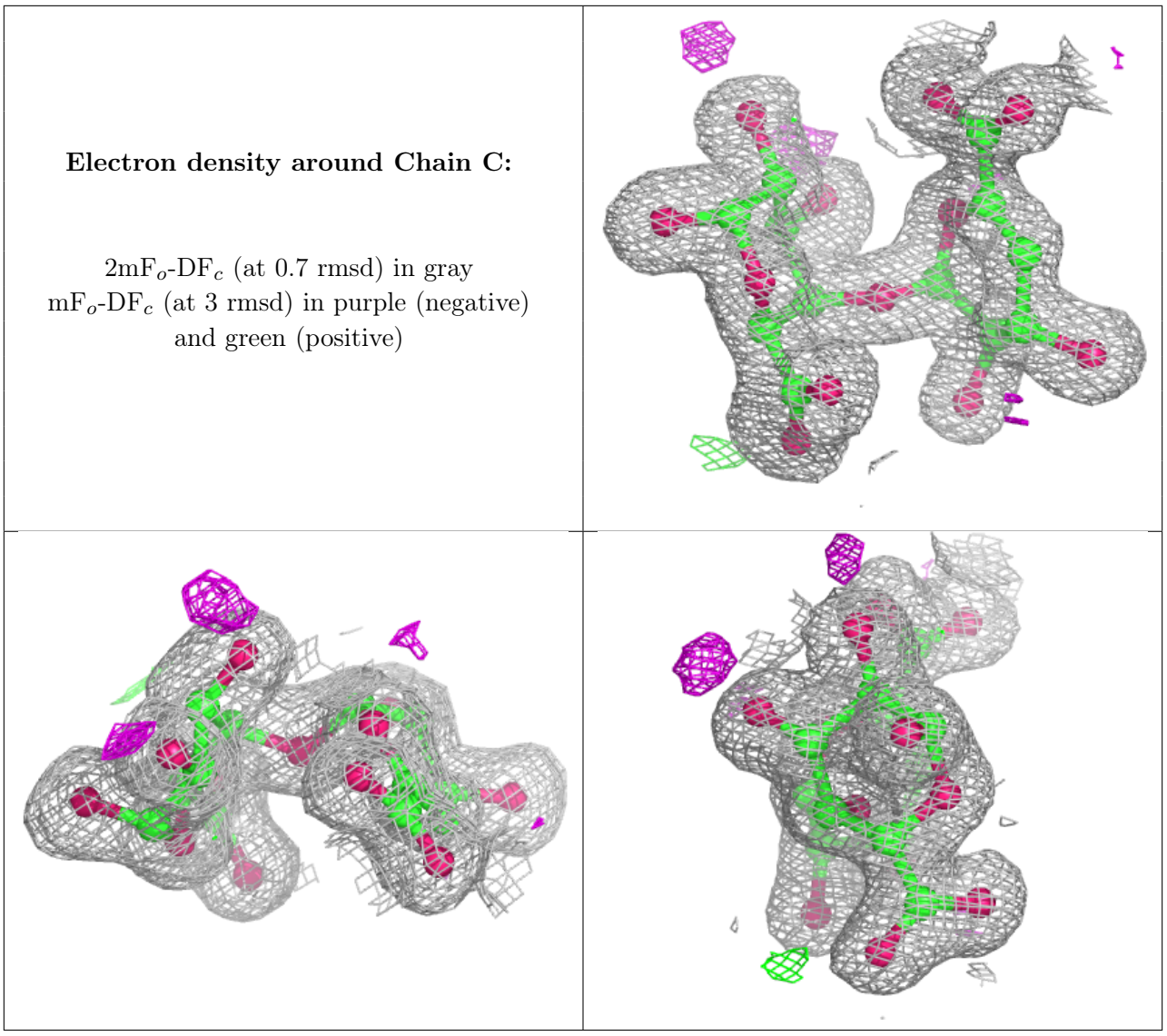
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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	ADA	C	1	13/13	0.95	0.09	21,24,26,30	0
2	ADA	D	1	13/13	0.95	0.07	23,25,29,32	0
2	AQA	C	2	11/12	0.97	0.14	19,22,23,25	0
2	AQA	D	2	11/12	0.97	0.07	17,21,23,24	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.

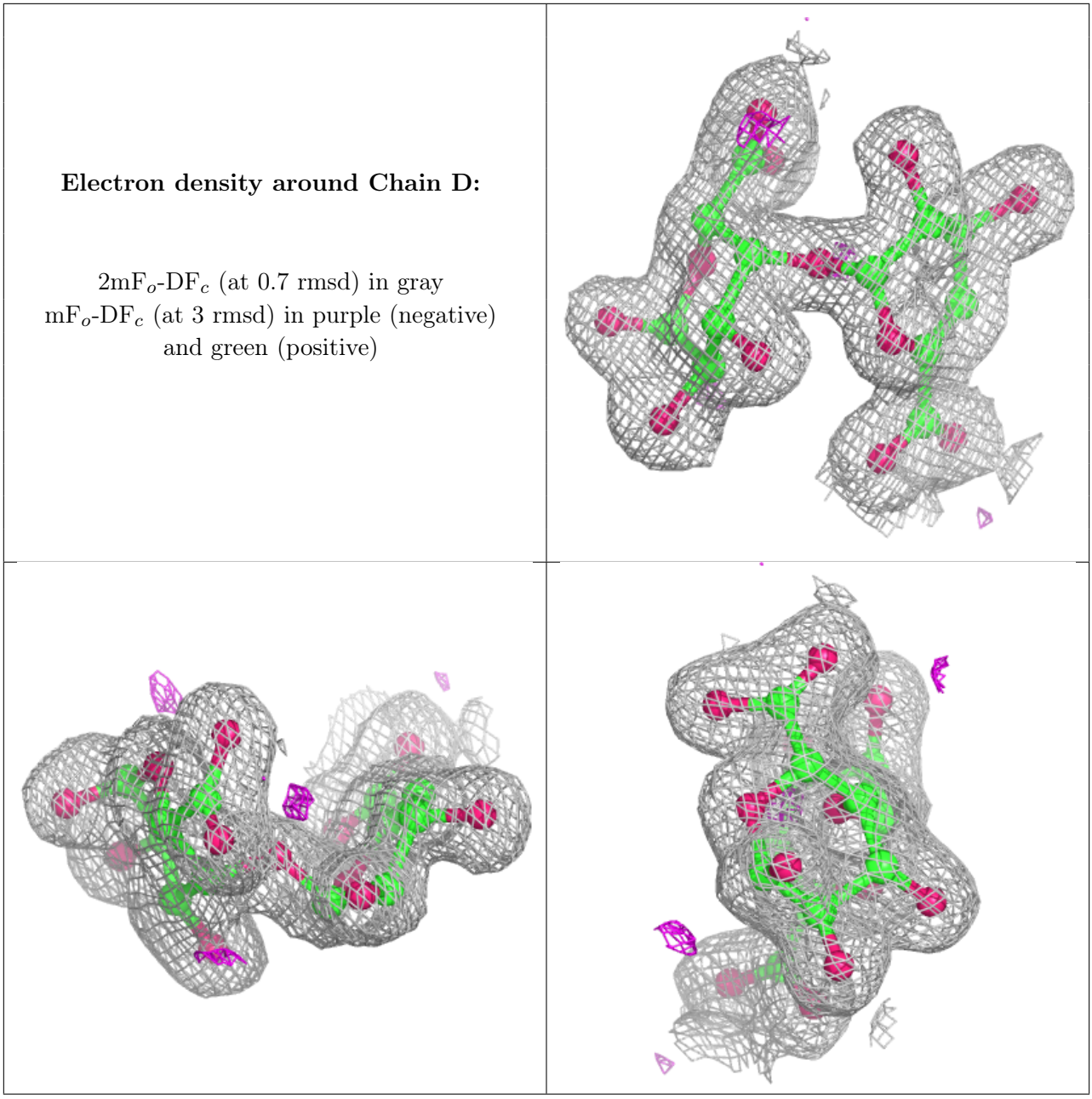
Electron density around Chain C:

$2mF_o$-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 (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, 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
4	MPD	A	207	8/8	0.82	0.16	40,42,46,48	8
7	ACT	B	208	4/4	0.84	0.17	48,52,53,54	0
4	MPD	A	208	8/8	0.85	0.22	23,28,31,32	8

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MPD	B	205	8/8	0.88	0.15	47,54,59,63	0
7	ACT	A	212	4/4	0.90	0.17	32,42,44,50	0
4	MPD	A	206	8/8	0.91	0.16	37,39,42,46	0
5	DGU	B	207	13/13	0.92	0.15	16,27,40,48	13
6	ADA	A	211	13/13	0.93	0.18	23,26,30,33	0
5	DGU	A	210	13/13	0.95	0.18	16,32,51,52	13
3	CA	A	203	1/1	0.99	0.03	20,20,20,20	0
3	CA	A	205	1/1	0.99	0.08	22,22,22,22	1
3	CA	B	201	1/1	0.99	0.04	19,19,19,19	0
3	CA	B	202	1/1	1.00	0.05	19,19,19,19	0
3	CA	B	203	1/1	1.00	0.04	19,19,19,19	0
3	CA	B	204	1/1	1.00	0.05	18,18,18,18	0
3	CA	A	204	1/1	1.00	0.04	20,20,20,20	0
3	CA	A	202	1/1	1.00	0.04	17,17,17,17	0
3	CA	A	201	1/1	1.00	0.04	17,17,17,17	0

6.5 Other polymers (i)

There are no such residues in this entry.