



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 11:05 AM UTC

PDB ID : 5FA2 / pdb_00005fa2
Title : Crystal structure of 426c.TM4deltaV1-3 p120
Authors : Scharf, L.; Bjorkman, P.J.
Deposited on : 2015-12-10
Resolution : 2.00 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

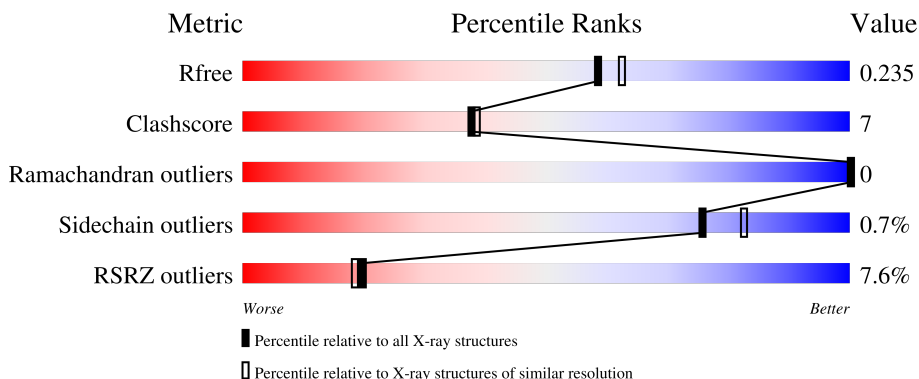
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.00 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}	180053	10052 (2.00-2.00)
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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	353	 7% 85% 9% • 5%
1	B	353	 7% 83% 11% • 5%
2	C	5	 60% 40%
3	D	4	 50% 50%

2 Entry composition i

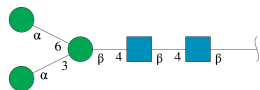
There are 7 unique types of molecules in this entry. The entry contains 5875 atoms, of which 15 are hydrogens and 0 are deuteriums.

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 gp120.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	336	2570	1614	443	491	22	0	0	0
1	B	336	2554	1605	439	488	22	0	0	0

- Molecule 2 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-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	5	61	34	2	25	0	0	0

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



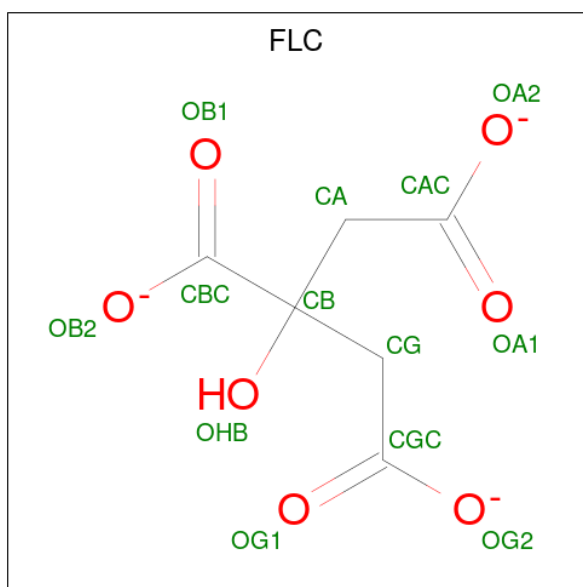
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	D	4	50	28	2	20	0	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



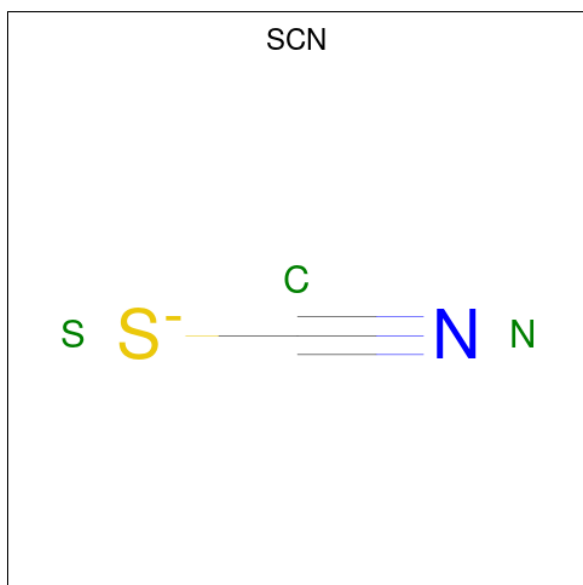
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
4	A	1	Total 14	8	1	5	0	0
4	A	1	Total 14	8	1	5	0	0
4	A	1	Total 14	8	1	5	0	0
4	A	1	Total 14	8	1	5	0	0
4	A	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0
4	B	1	Total 14	8	1	5	0	0

- Molecule 5 is CITRATE ANION (CCD ID: FLC) (formula: $C_6H_5O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 13 6 7	0	0
5	A	1	Total C H O 18 6 5 7	0	0
5	B	1	Total C O 13 6 7	0	0
5	B	1	Total C O 13 6 7	0	0

- Molecule 6 is THIOCYANATE ION (CCD ID: SCN) (formula: CNS).



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

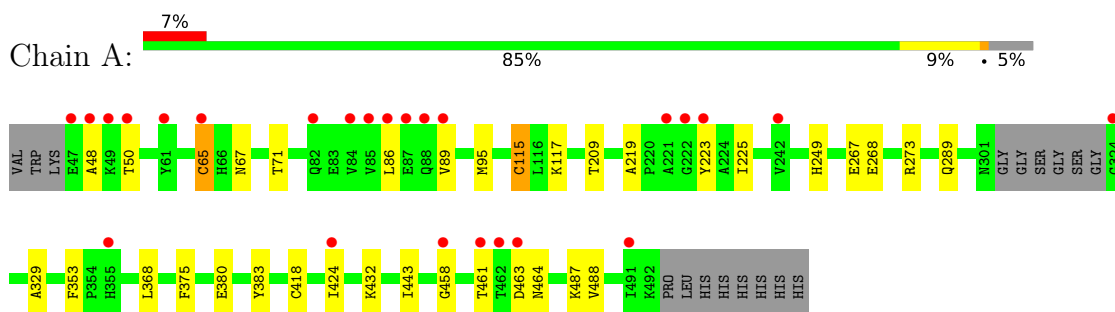
- Molecule 7 is water.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	230	Total	H	O	0	0
			232	2	230		
7	B	186	Total	H	O	0	0
			194	8	186		

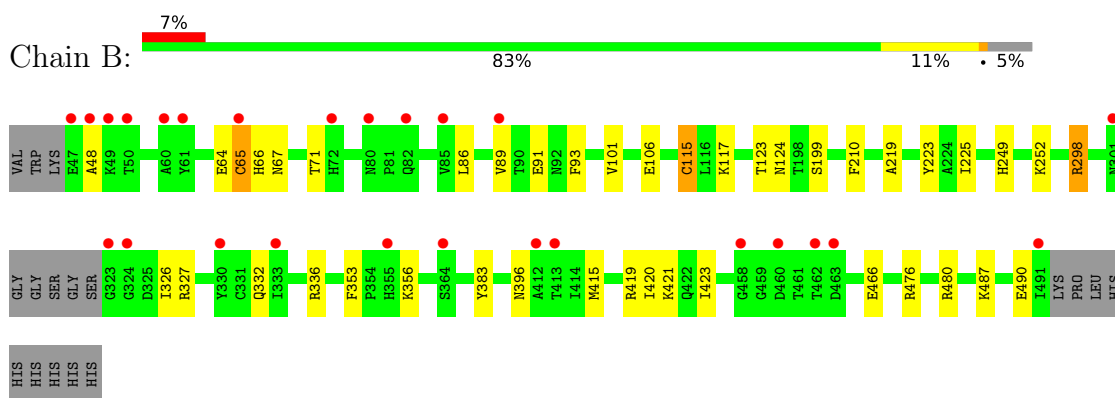
3 Residue-property plots [i](#)

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: gp120



- Molecule 1: gp120



- Molecule 2: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 3: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-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	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	144.85Å 85.91Å 90.04Å 90.00° 104.77° 90.00°	Depositor
Resolution (Å)	35.80 – 2.00 35.80 – 2.00	Depositor EDS
% Data completeness (in resolution range)	97.4 (35.80-2.00) 89.4 (35.80-2.00)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.29 (at 1.82Å)	Xtrriage
Refinement program	PHENIX 1.10pre_2135	Depositor
R, R_{free}	0.207 , 0.232 0.209 , 0.235	Depositor DCC
R_{free} test set	2000 reflections (2.27%)	wwPDB-VP
Wilson B-factor (Å ²)	30.5	Xtrriage
Anisotropy	0.376	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 38.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5875	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.83% 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: NAG, MAN, BMA, SCN, FLC

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	0.78	0/2622	0.88	5/3568 (0.1%)
1	B	0.78	0/2605	0.91	9/3546 (0.3%)
All	All	0.78	0/5227	0.89	14/7114 (0.2%)

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	65	CYS	N-CA-C	6.93	118.83	111.28
1	B	115	CYS	N-CA-C	6.71	120.68	112.23
1	B	199	SER	N-CA-C	6.11	118.14	108.79
1	A	115	CYS	N-CA-C	5.87	120.50	113.23
1	B	65	CYS	N-CA-C	5.79	117.59	111.28
1	A	353	PHE	CA-C-N	-5.46	114.33	119.85
1	A	353	PHE	C-N-CA	-5.46	114.33	119.85
1	B	353	PHE	CA-C-N	-5.38	114.42	119.85
1	B	353	PHE	C-N-CA	-5.38	114.42	119.85
1	B	298	ARG	CA-C-N	-5.32	114.76	120.03
1	B	298	ARG	C-N-CA	-5.32	114.76	120.03
1	B	298	ARG	N-CA-C	-5.31	98.96	109.10
1	B	249	HIS	N-CA-C	-5.21	104.00	110.41
1	A	249	HIS	N-CA-C	-5.07	104.18	110.41

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	2570	0	2462	32	0
1	B	2554	0	2438	37	0
2	C	61	0	52	3	0
3	D	50	0	43	0	0
4	A	70	0	65	1	0
4	B	84	0	78	2	0
5	A	26	5	10	2	0
5	B	26	0	10	4	0
6	A	3	0	0	1	0
7	A	230	2	0	3	0
7	B	186	8	0	3	0
All	All	5860	15	5158	74	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 7.

All (74) 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)
4:B:602:NAG:O7	4:B:602:NAG:O3	1.98	0.81
1:A:65:CYS:SG	1:A:115:CYS:HB3	2.20	0.80
1:A:65:CYS:HB2	1:A:115:CYS:SG	2.21	0.80
1:B:65:CYS:HB2	1:B:115:CYS:SG	2.22	0.80
1:A:432:LYS:NZ	5:A:611:FLC:OG1	2.13	0.76
1:B:65:CYS:SG	1:B:115:CYS:HB3	2.28	0.73
1:A:209:THR:HG21	2:C:4:MAN:C6	2.24	0.68
1:A:383:TYR:OH	1:A:424:ILE:HG22	1.96	0.66
1:B:65:CYS:HG	1:B:115:CYS:HB3	1.62	0.64
1:B:336:ARG:HG3	1:B:396:ASN:HB3	1.81	0.62
1:B:48:ALA:HB3	1:B:223:TYR:HE2	1.66	0.61
1:A:209:THR:HG21	2:C:4:MAN:H61	1.83	0.60
1:B:223:TYR:CE2	1:B:490:GLU:HB3	2.36	0.60
1:B:356:LYS:HG2	1:B:466:GLU:HG2	1.82	0.60
1:B:65:CYS:CB	1:B:115:CYS:HG	2.15	0.60
1:A:86:LEU:HB2	1:A:89:VAL:HG11	1.85	0.59

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:65:CYS:SG	1:A:115:CYS:SG	3.01	0.58
1:B:65:CYS:SG	1:B:115:CYS:SG	3.02	0.58
4:A:601:NAG:H62	7:A:832:HOH:O	2.04	0.58
1:B:86:LEU:HB2	1:B:89:VAL:HG11	1.86	0.57
1:B:65:CYS:HG	1:B:115:CYS:CB	2.18	0.57
1:A:65:CYS:CB	1:A:115:CYS:SG	2.93	0.54
1:A:50:THR:HG22	1:A:488:VAL:HG11	1.89	0.53
1:A:65:CYS:SG	1:A:115:CYS:CB	2.93	0.53
1:B:65:CYS:CB	1:B:115:CYS:SG	2.93	0.53
4:B:602:NAG:O7	4:B:602:NAG:C3	2.57	0.52
1:A:65:CYS:HG	1:A:115:CYS:CB	2.23	0.52
1:A:65:CYS:HG	1:A:115:CYS:HB3	1.74	0.51
1:A:268:GLU:O	1:A:289:GLN:NE2	2.43	0.51
1:A:273:ARG:NH1	7:A:706:HOH:O	2.42	0.51
1:A:268:GLU:C	1:A:289:GLN:NE2	2.69	0.51
1:B:65:CYS:HB2	1:B:115:CYS:HG	1.73	0.51
1:B:67:ASN:O	1:B:71:THR:HG23	2.11	0.51
1:B:332:GLN:HG2	1:B:415:MET:SD	2.52	0.50
1:B:65:CYS:SG	1:B:115:CYS:CB	2.98	0.49
1:A:48:ALA:HB3	1:A:223:TYR:HE1	1.76	0.49
1:B:423:ILE:HG13	5:B:611:FLC:OA1	2.13	0.49
1:A:463:ASP:O	1:A:464:ASN:HB3	2.12	0.48
1:A:375:PHE:HA	6:A:613:SCN:S	2.54	0.47
1:B:298:ARG:HG3	1:B:420:ILE:HD12	1.96	0.47
5:B:612:FLC:CBC	5:B:612:FLC:OA2	2.62	0.47
1:B:123:THR:HG22	1:B:124:ASN:N	2.29	0.47
1:A:65:CYS:HG	1:A:115:CYS:HG	1.62	0.47
1:B:476:ARG:O	1:B:480:ARG:HG3	2.15	0.47
1:B:298:ARG:NH2	1:B:326:ILE:O	2.41	0.47
1:B:327:ARG:HH22	5:B:611:FLC:HA2	1.81	0.46
1:B:124:ASN:HB2	7:B:802:HOH:O	2.16	0.46
1:B:93:PHE:CE2	1:B:487:LYS:HG2	2.52	0.45
1:B:252:LYS:NZ	7:B:708:HOH:O	2.48	0.45
1:A:67:ASN:O	1:A:71:THR:HG23	2.15	0.45
1:B:383:TYR:CD1	1:B:421:LYS:HD3	2.52	0.45
1:B:48:ALA:HB3	1:B:223:TYR:CE2	2.51	0.44
1:A:461:THR:O	1:A:461:THR:OG1	2.32	0.44
1:A:368:LEU:HB2	5:A:611:FLC:OA1	2.18	0.44
1:A:267:GLU:O	1:A:289:GLN:NE2	2.51	0.44
1:A:50:THR:CG2	1:A:488:VAL:HG11	2.48	0.44
1:B:48:ALA:CB	1:B:223:TYR:HE2	2.29	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:219:ALA:HB2	1:A:225:ILE:HG13	2.00	0.43
1:B:219:ALA:HB2	1:B:225:ILE:HG13	2.00	0.43
1:B:419:ARG:HH21	5:B:611:FLC:CGC	2.31	0.43
1:B:101:VAL:HG12	1:B:476:ARG:HG2	2.00	0.43
1:A:95:MET:SD	1:A:273:ARG:HD3	2.60	0.42
1:A:329:ALA:HB3	1:A:418:CYS:HB2	2.01	0.42
1:A:380:GLU:HG3	1:A:443:ILE:HD13	2.02	0.42
1:B:106:GLU:HG2	7:B:872:HOH:O	2.18	0.42
1:B:490:GLU:O	1:B:490:GLU:HG3	2.20	0.42
1:A:458:GLY:O	7:A:701:HOH:O	2.21	0.41
1:B:66:HIS:HE1	1:B:210:PHE:CE1	2.38	0.41
1:A:86:LEU:CB	1:A:89:VAL:HG11	2.48	0.41
1:A:268:GLU:C	1:A:289:GLN:HE22	2.27	0.41
1:B:64:GLU:OE1	1:B:66:HIS:HB2	2.20	0.41
1:B:101:VAL:HG21	1:B:480:ARG:HG2	2.03	0.40
2:C:1:NAG:H62	2:C:2:NAG:N2	2.37	0.40
1:B:123:THR:CG2	1:B:124:ASN:N	2.85	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	332/353 (94%)	324 (98%)	8 (2%)	0	100	100
1	B	332/353 (94%)	325 (98%)	7 (2%)	0	100	100
All	All	664/706 (94%)	649 (98%)	15 (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	283/313 (90%)	281 (99%)	2 (1%)	76	82
1	B	279/313 (89%)	277 (99%)	2 (1%)	76	82
All	All	562/626 (90%)	558 (99%)	4 (1%)	76	82

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

Mol	Chain	Res	Type
1	A	117	LYS
1	A	487	LYS
1	B	91	GLU
1	B	117	LYS

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

Mol	Chain	Res	Type
1	B	229	ASN

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](#)

9 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	2,1	14,14,15	0.20	0	17,19,21	0.79	1 (5%)
2	NAG	C	2	2	14,14,15	0.25	0	17,19,21	0.65	1 (5%)
2	BMA	C	3	2	11,11,12	0.77	1 (9%)	15,15,17	0.99	1 (6%)
2	MAN	C	4	2	11,11,12	0.26	0	15,15,17	0.52	0
2	MAN	C	5	2	11,11,12	0.65	0	15,15,17	0.92	1 (6%)
3	NAG	D	1	3,1	14,14,15	0.20	0	17,19,21	0.76	1 (5%)
3	NAG	D	2	3	14,14,15	0.24	0	17,19,21	0.62	1 (5%)
3	BMA	D	3	3	11,11,12	0.55	0	15,15,17	0.73	0
3	MAN	D	4	3	11,11,12	0.26	0	15,15,17	0.52	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	2,1	-	0/6/23/26	0/1/1/1
2	NAG	C	2	2	-	2/6/23/26	0/1/1/1
2	BMA	C	3	2	-	2/2/19/22	0/1/1/1
2	MAN	C	4	2	-	1/2/19/22	0/1/1/1
2	MAN	C	5	2	-	0/2/19/22	0/1/1/1
3	NAG	D	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	D	2	3	-	2/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	1/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	3	BMA	O5-C1	-2.03	1.40	1.43

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	1	NAG	C1-O5-C5	2.74	115.86	112.19

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1	NAG	C1-O5-C5	2.57	115.62	112.19
2	C	3	BMA	C1-O5-C5	2.26	115.22	112.19
2	C	2	NAG	C1-O5-C5	2.17	115.09	112.19
3	D	2	NAG	C1-O5-C5	2.13	115.04	112.19
2	C	5	MAN	C1-O5-C5	2.01	114.88	112.19

There are no chirality outliers.

All (10) torsion outliers are listed below:

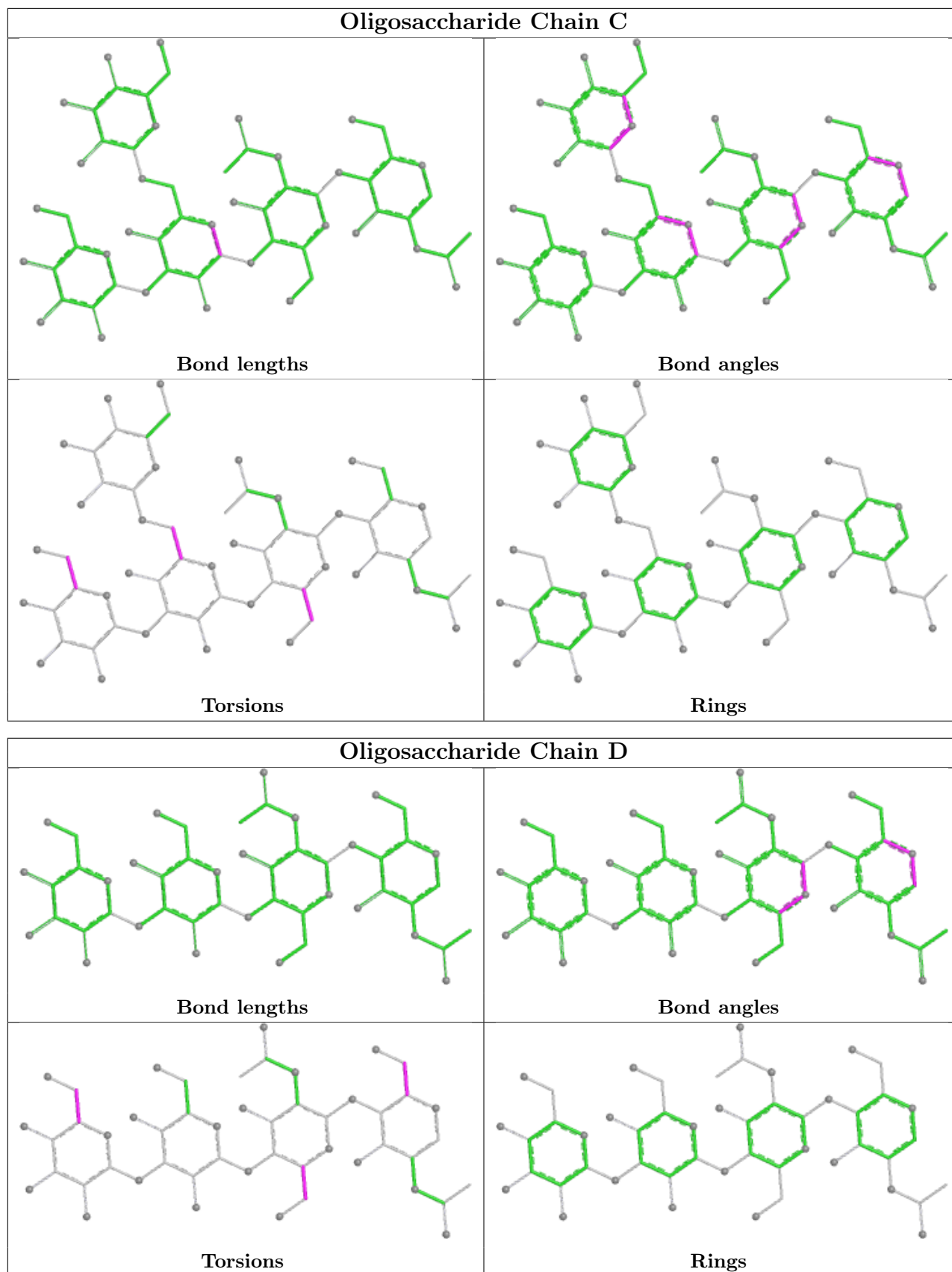
Mol	Chain	Res	Type	Atoms
2	C	2	NAG	O5-C5-C6-O6
3	D	2	NAG	O5-C5-C6-O6
2	C	2	NAG	C4-C5-C6-O6
3	D	2	NAG	C4-C5-C6-O6
3	D	1	NAG	O5-C5-C6-O6
2	C	4	MAN	O5-C5-C6-O6
3	D	4	MAN	O5-C5-C6-O6
2	C	3	BMA	O5-C5-C6-O6
2	C	3	BMA	C4-C5-C6-O6
3	D	1	NAG	C4-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1	NAG	1	0
2	C	4	MAN	2	0
2	C	2	NAG	1	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

16 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
4	NAG	A	604	1	14,14,15	0.26	0	17,19,21	0.67	1 (5%)
4	NAG	B	606	1	14,14,15	0.22	0	17,19,21	0.51	0
6	SCN	A	613	-	1,2,2	0.84	0	0,1,1	-	-
4	NAG	B	601	1	14,14,15	0.40	0	17,19,21	0.46	0
4	NAG	B	604	1	14,14,15	0.48	0	17,19,21	0.84	0
4	NAG	A	601	1	14,14,15	0.29	0	17,19,21	0.56	0
4	NAG	B	605	1	14,14,15	0.37	0	17,19,21	0.70	0
4	NAG	B	603	1	14,14,15	0.31	0	17,19,21	0.60	1 (5%)
5	FLC	A	611	-	12,12,12	1.21	1 (8%)	17,17,17	1.23	1 (5%)
5	FLC	B	612	-	12,12,12	1.21	0	17,17,17	1.19	1 (5%)
5	FLC	A	612	-	12,12,12	1.19	1 (8%)	17,17,17	1.21	1 (5%)
5	FLC	B	611	-	12,12,12	1.19	1 (8%)	17,17,17	1.22	1 (5%)
4	NAG	B	602	1	14,14,15	0.39	0	17,19,21	0.70	0
4	NAG	A	602	1	14,14,15	0.38	0	17,19,21	0.60	0
4	NAG	A	605	1	14,14,15	0.28	0	17,19,21	0.65	1 (5%)
4	NAG	A	603	1	14,14,15	0.29	0	17,19,21	0.56	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	NAG	A	604	1	-	0/6/23/26	0/1/1/1
4	NAG	B	606	1	-	2/6/23/26	0/1/1/1
4	NAG	B	601	1	-	0/6/23/26	0/1/1/1
4	NAG	B	604	1	-	0/6/23/26	0/1/1/1
4	NAG	A	601	1	-	0/6/23/26	0/1/1/1
4	NAG	B	605	1	-	0/6/23/26	0/1/1/1
4	NAG	B	603	1	-	0/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	FLC	A	611	-	-	0/16/16/16	-
5	FLC	B	612	-	-	0/16/16/16	-
5	FLC	A	612	-	-	2/16/16/16	-
5	FLC	B	611	-	-	2/16/16/16	-
4	NAG	B	602	1	-	3/6/23/26	0/1/1/1
4	NAG	A	602	1	-	2/6/23/26	0/1/1/1
4	NAG	A	605	1	-	2/6/23/26	0/1/1/1
4	NAG	A	603	1	-	2/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	611	FLC	CB-CBC	-2.26	1.51	1.53
5	B	611	FLC	CB-CBC	-2.23	1.51	1.53
5	A	612	FLC	CB-CBC	-2.20	1.51	1.53

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	612	FLC	OB2-CBC-CB	3.53	119.91	113.14
5	B	611	FLC	OB2-CBC-CB	2.78	118.48	113.14
5	A	611	FLC	OB2-CBC-CB	2.77	118.46	113.14
5	A	612	FLC	OB2-CBC-CB	2.77	118.46	113.14
4	A	604	NAG	C1-O5-C5	2.20	115.13	112.19
4	A	605	NAG	C1-O5-C5	2.15	115.07	112.19
4	B	603	NAG	C1-O5-C5	2.01	114.88	112.19

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	602	NAG	C3-C2-N2-C7
4	B	602	NAG	O5-C5-C6-O6
4	A	602	NAG	O5-C5-C6-O6
4	A	602	NAG	C4-C5-C6-O6
4	B	602	NAG	C4-C5-C6-O6
4	A	605	NAG	O5-C5-C6-O6
5	B	611	FLC	CB-CA-CAC-OA1
5	B	611	FLC	CB-CA-CAC-OA2
4	B	606	NAG	C4-C5-C6-O6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
5	A	612	FLC	CB-CG-CGC-OG1
5	A	612	FLC	CB-CG-CGC-OG2
4	A	603	NAG	C4-C5-C6-O6
4	B	606	NAG	O5-C5-C6-O6
4	A	603	NAG	O5-C5-C6-O6
4	A	605	NAG	C4-C5-C6-O6

There are no ring outliers.

6 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	613	SCN	1	0
4	A	601	NAG	1	0
5	A	611	FLC	2	0
5	B	612	FLC	1	0
5	B	611	FLC	3	0
4	B	602	NAG	2	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, 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	336/353 (95%)	0.36	25 (7%) 20 19	28, 42, 74, 89	0
1	B	336/353 (95%)	0.58	26 (7%) 19 18	32, 48, 73, 94	0
All	All	672/706 (95%)	0.47	51 (7%) 20 18	28, 45, 73, 94	0

All (51) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	462	THR	5.1
1	B	323	GLY	4.5
1	B	48	ALA	4.4
1	A	461	THR	3.9
1	A	61	TYR	3.7
1	B	412	ALA	3.5
1	A	47	GLU	3.4
1	B	80	ASN	3.3
1	A	463	ASP	3.3
1	B	85	VAL	3.2
1	A	50	THR	3.2
1	A	89	VAL	3.0
1	A	355	HIS	3.0
1	A	88	GLN	2.9
1	B	72	HIS	2.9
1	B	491	ILE	2.8
1	B	65	CYS	2.8
1	A	491	ILE	2.8
1	A	48	ALA	2.8
1	B	50	THR	2.7
1	A	424	ILE	2.7
1	B	301	ASN	2.7
1	A	86	LEU	2.6
1	B	355	HIS	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	324	GLY	2.6
1	B	324	GLY	2.6
1	A	84	VAL	2.6
1	B	413	THR	2.6
1	A	223	TYR	2.5
1	B	61	TYR	2.5
1	B	47	GLU	2.4
1	A	85	VAL	2.4
1	B	462	THR	2.4
1	B	460	ASP	2.3
1	B	330	TYR	2.3
1	B	364	SER	2.3
1	B	333	ILE	2.3
1	A	221	ALA	2.3
1	A	222	GLY	2.2
1	B	60	ALA	2.2
1	B	82	GLN	2.2
1	A	458	GLY	2.2
1	B	463	ASP	2.2
1	A	242	VAL	2.1
1	B	89	VAL	2.1
1	A	87	GLU	2.1
1	A	65	CYS	2.1
1	A	49	LYS	2.1
1	A	82	GLN	2.1
1	B	458	GLY	2.1
1	B	49	LYS	2.0

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

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

6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

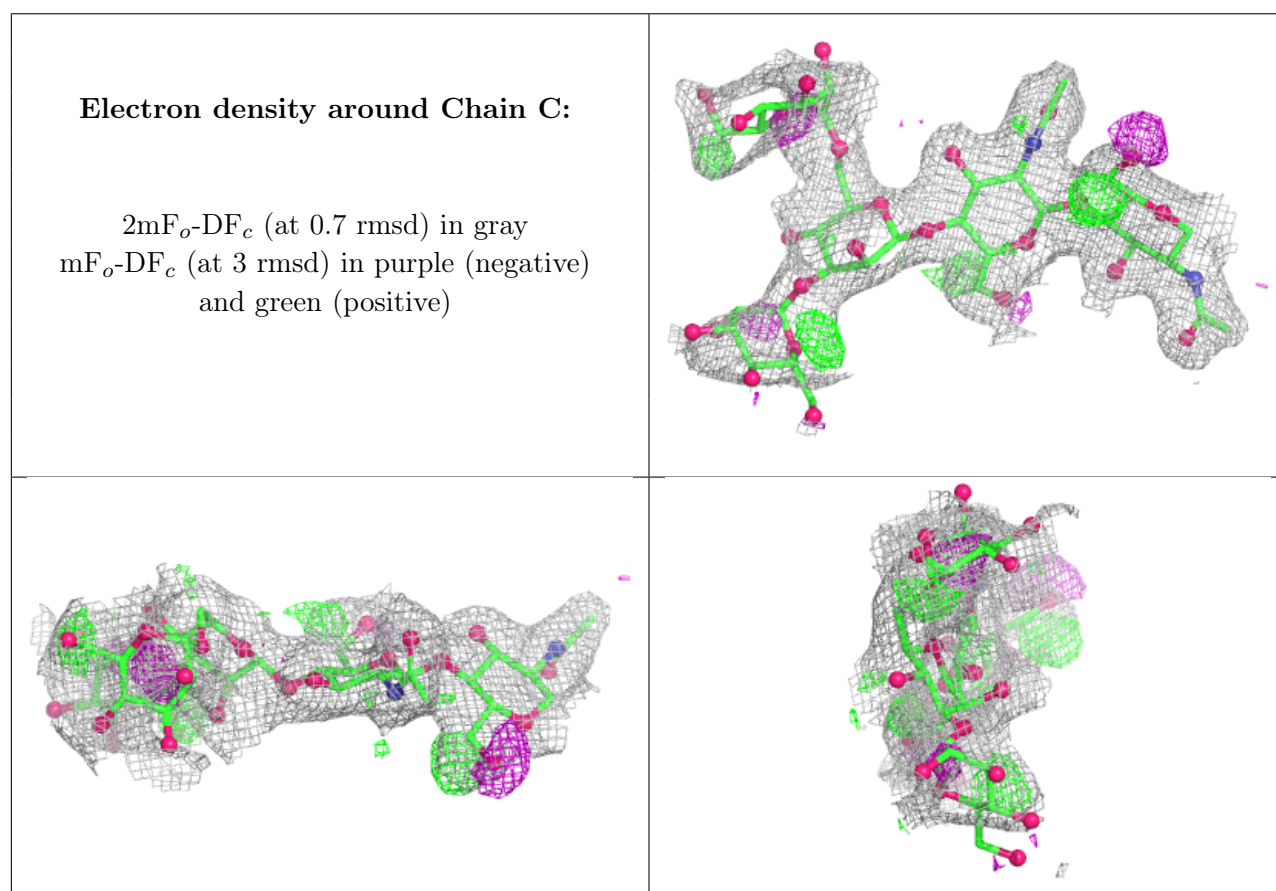
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	MAN	C	5	11/12	0.35	0.19	104,109,112,113	0

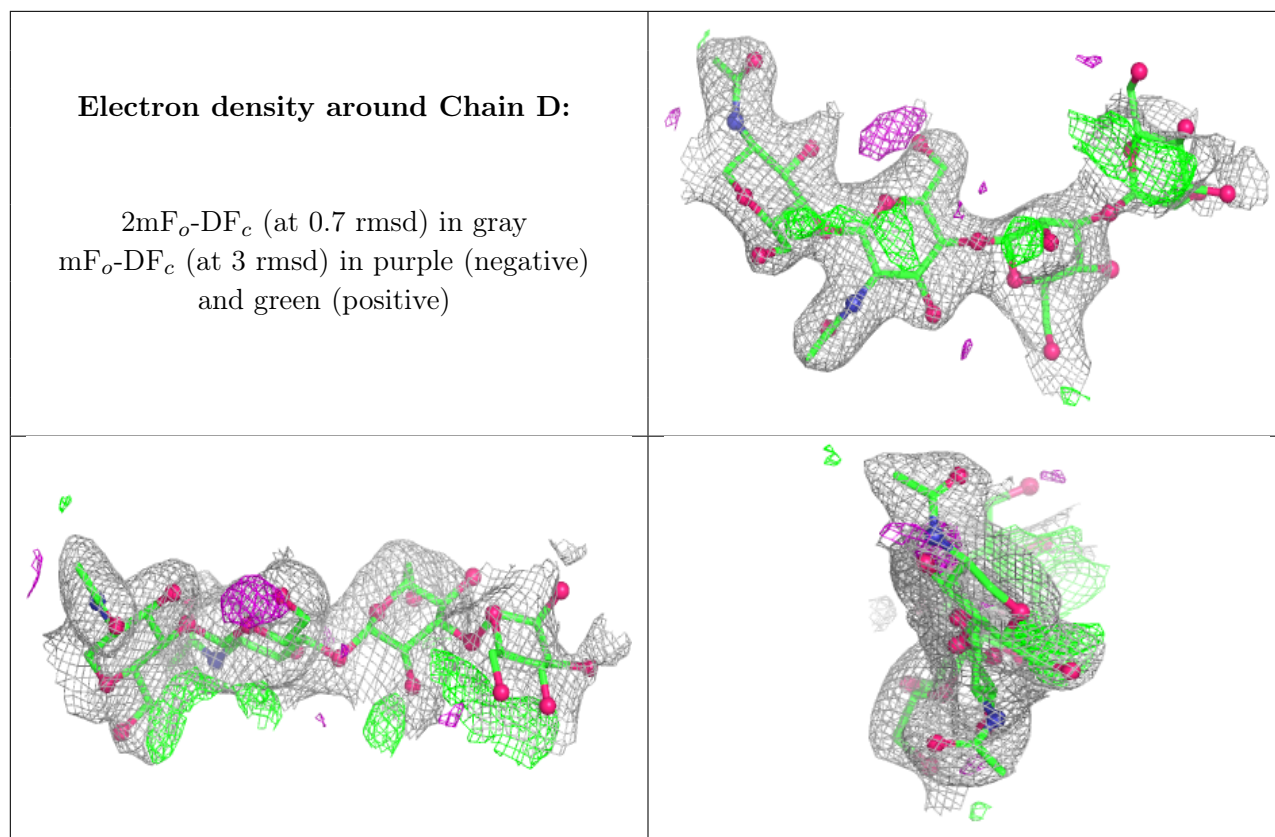
Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	MAN	D	4	11/12	0.42	0.21	118,125,132,136	0
2	MAN	C	4	11/12	0.60	0.21	98,101,111,120	0
3	BMA	D	3	11/12	0.65	0.13	89,95,107,114	0
2	BMA	C	3	11/12	0.71	0.13	72,87,96,98	0
3	NAG	D	2	14/15	0.79	0.14	57,64,74,81	0
2	NAG	C	1	14/15	0.89	0.11	37,38,44,52	0
2	NAG	C	2	14/15	0.89	0.11	46,48,57,63	0
3	NAG	D	1	14/15	0.91	0.11	41,48,57,59	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
4	NAG	B	606	14/15	0.48	0.18	85,91,100,102	0
6	SCN	A	613	3/3	0.62	0.26	36,36,44,59	0
5	FLC	A	611	13/13	0.63	0.28	34,43,53,53	13
4	NAG	B	604	14/15	0.64	0.19	84,90,97,103	0
5	FLC	B	611	13/13	0.67	0.30	40,46,56,59	13
4	NAG	B	601	14/15	0.68	0.17	68,77,85,89	0
4	NAG	A	601	14/15	0.69	0.15	61,67,71,79	0
4	NAG	B	602	14/15	0.73	0.18	43,60,71,75	0
4	NAG	B	603	14/15	0.75	0.14	74,84,88,90	0
4	NAG	B	605	14/15	0.77	0.12	71,74,81,86	0
5	FLC	A	612	13/13	0.79	0.21	53,58,70,72	18
4	NAG	A	604	14/15	0.80	0.15	55,59,65,68	0
4	NAG	A	602	14/15	0.81	0.13	56,60,65,67	0
4	NAG	A	605	14/15	0.82	0.12	65,72,80,81	0

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	FLC	B	612	13/13	0.83	0.17	48,56,59,66	13
4	NAG	A	603	14/15	0.83	0.14	42,45,50,52	0

6.5 Other polymers [i](#)

There are no such residues in this entry.