



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 16, 2020 – 08:14 PM BST

PDB ID : 6ZJU  
Title : Cold-adapted beta-D-galactosidase from *Arthrobacter* sp. 32cB mutant E441Q  
in complex with saccharose  
Authors : Rutkiewicz, M.; Bujacz, A.; Bujacz, G.  
Deposited on : 2020-06-29  
Resolution : 1.75 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](mailto: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.

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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 : 2.13.1  
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) : 2.13.1

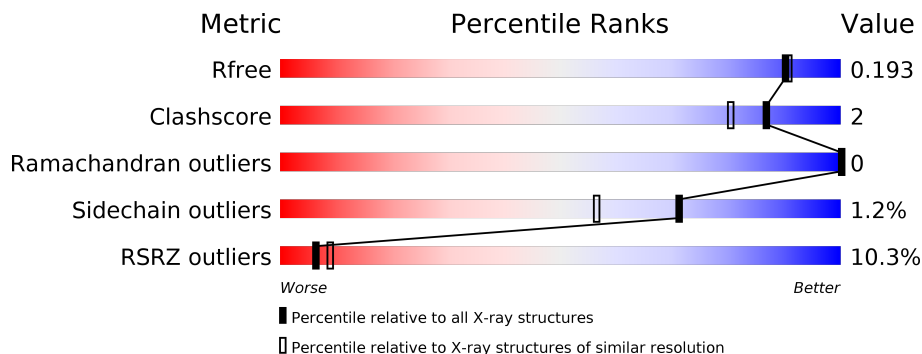
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

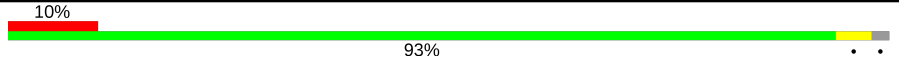


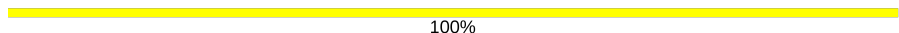
The reported resolution of this entry is 1.75 Å.

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	2340 (1.76-1.76)
Clashscore	141614	2466 (1.76-1.76)
Ramachandran outliers	138981	2437 (1.76-1.76)
Sidechain outliers	138945	2437 (1.76-1.76)
RSRZ outliers	127900	2298 (1.76-1.76)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	1010	
2	B	2	
2	C	2	
2	D	2	

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FRU	C	2	-	-	-	X
2	FRU	D	2	-	-	-	X
3	ACT	A	1106	-	-	-	X

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 8477 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.

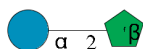
- Molecule 1 is a protein called Beta-galactosidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	987	7627	4803	1361	1445	18	0	6	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	441	GLN	GLU	engineered mutation	UNP A0A023UGN9

- Molecule 2 is an oligosaccharide called beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose.



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
			Total	C	O			
2	B	2	23	12	11	0	0	0
2	C	2	23	12	11	0	0	0
2	D	2	23	12	11	0	0	0

- Molecule 3 is ACETATE ION (three-letter code: ACT) (formula: C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>).

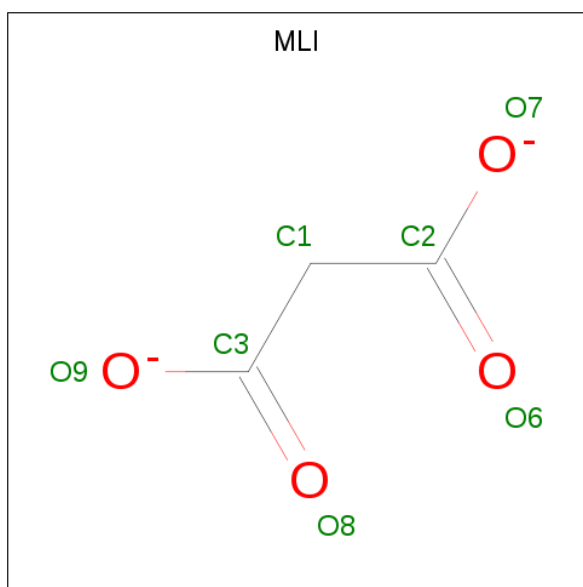


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0
3	A	1	Total C O 4 2 2	0	0

- Molecule 4 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	3	Total Na 3 3	0	0

- Molecule 5 is MALONATE ION (three-letter code: MLI) (formula: C<sub>3</sub>H<sub>2</sub>O<sub>4</sub>).



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

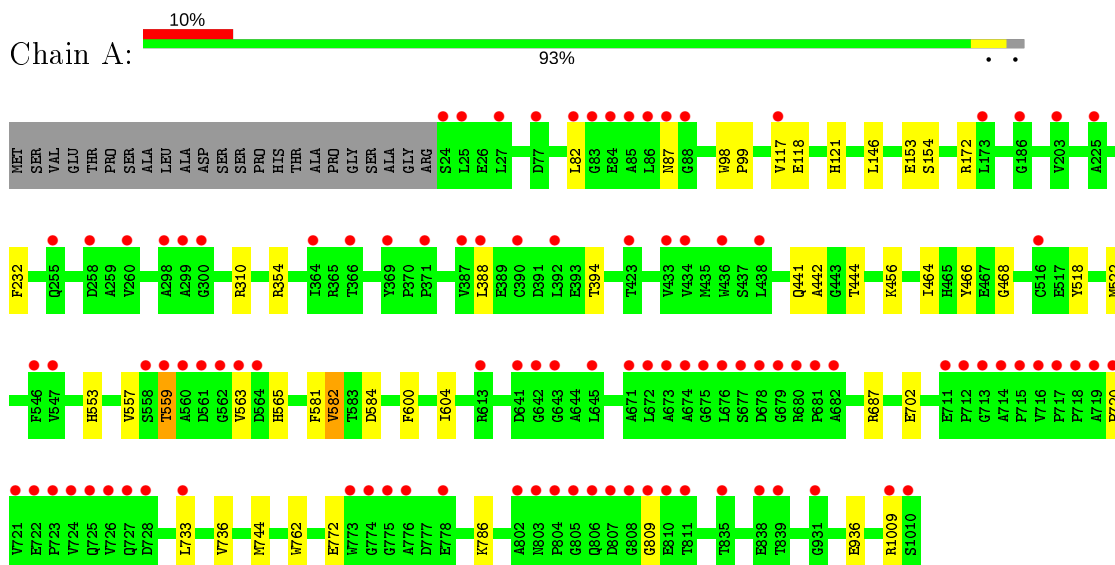
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	751	Total O 751 751	0	0

### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

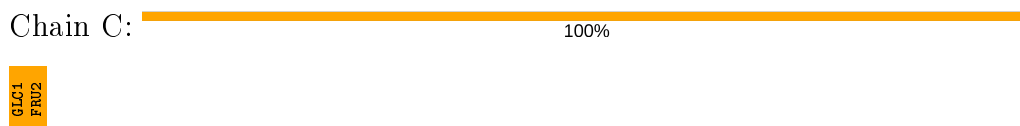
- Molecule 1: Beta-galactosidase



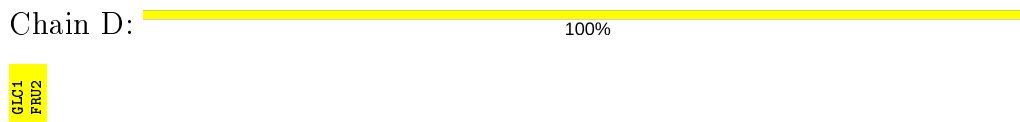
- Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose



- Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose



- Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	138.24Å 138.24Å 127.57Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	43.65 – 1.75 45.25 – 1.75	Depositor EDS
% Data completeness (in resolution range)	99.9 (43.65-1.75) 99.9 (45.25-1.75)	Depositor EDS
$R_{merge}$	0.13	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.03 (at 1.75Å)	Xtrriage
Refinement program	PHENIX 1.12_2829	Depositor
R, $R_{free}$	0.170 , 0.182 0.178 , 0.193	Depositor DCC
$R_{free}$ test set	2101 reflections (1.49%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	30.6	Xtrriage
Anisotropy	0.314	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.40 , 51.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.015 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.97	EDS
Total number of atoms	8477	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.39% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical 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: NA, GLC, FRU, MLI, ACT

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	0.55	0/7844	0.68	0/10691

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	7627	0	7338	30	0
2	B	23	0	21	0	0
2	C	23	0	21	4	0
2	D	23	0	21	0	0
3	A	20	0	15	1	0
4	A	3	0	0	0	0
5	A	7	0	2	0	0
6	A	751	0	0	8	0
All	All	8477	0	7418	32	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 (32) 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:354:ARG:HE	2:C:2:FRU:H62	1.16	1.08
1:A:354:ARG:NE	2:C:2:FRU:H62	1.95	0.81
1:A:118:GLU:HG3	1:A:121:HIS:HB2	1.74	0.67
3:A:1104:ACT:H2	6:A:1813:HOH:O	1.95	0.65
1:A:354:ARG:HE	2:C:2:FRU:C6	2.00	0.65
1:A:786:LYS:NZ	6:A:1202:HOH:O	2.31	0.62
2:C:1:GLC:O4	2:C:1:GLC:O6	2.04	0.59
1:A:118:GLU:O	1:A:118:GLU:HG3	2.04	0.57
1:A:553:HIS:HB2	1:A:582:VAL:HG22	1.87	0.56
1:A:441:GLN:NE2	6:A:1206:HOH:O	2.39	0.55
1:A:936:GLU:OE2	1:A:1009:ARG:NH1	2.40	0.54
1:A:581:PHE:CE2	6:A:1594:HOH:O	2.54	0.51
1:A:744:MET:HG2	6:A:1848:HOH:O	2.10	0.51
1:A:117:VAL:O	1:A:117:VAL:HG12	2.13	0.49
1:A:394:THR:OG1	1:A:442:ALA:HA	2.13	0.49
1:A:687:ARG:HD2	1:A:702:GLU:OE2	2.15	0.46
1:A:772:GLU:HB2	6:A:1273:HOH:O	2.14	0.46
1:A:466:TYR:CZ	1:A:468:GLY:HA3	2.51	0.46
1:A:720:PRO:O	1:A:809:GLY:HA3	2.17	0.45
1:A:559:THR:HG22	1:A:563:VAL:HB	2.01	0.42
1:A:153:GLU:HA	1:A:154:SER:HA	1.77	0.42
1:A:456[A]:LYS:HD3	1:A:464:ILE:HG12	2.02	0.42
1:A:600:PHE:O	1:A:604:ILE:HG12	2.19	0.42
1:A:733:LEU:O	1:A:736[A]:VAL:HG12	2.19	0.42
1:A:456[A]:LYS:HD2	6:A:1282:HOH:O	2.18	0.41
1:A:557:VAL:CG2	1:A:565:HIS:CE1	3.02	0.41
1:A:557:VAL:HG23	1:A:565:HIS:NE2	2.35	0.41
1:A:146:LEU:C	1:A:146:LEU:HD12	2.41	0.41
1:A:522:MET:HA	1:A:584:ASP:HA	2.03	0.41
1:A:444:THR:HG21	6:A:1395:HOH:O	2.21	0.40
1:A:82:LEU:N	1:A:82:LEU:HD12	2.36	0.40
1:A:98:TRP:N	1:A:99:PRO:CD	2.84	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	991/1010 (98%)	963 (97%)	28 (3%)	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	781/793 (98%)	772 (99%)	9 (1%)	71 56

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	87	ASN
1	A	172	ARG
1	A	232	PHE
1	A	310	ARG
1	A	388	LEU
1	A	518	TYR
1	A	559	THR
1	A	582	VAL
1	A	762	TRP

Some 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](#)

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	GLC	B	1	2	11,11,12	0.51	0	15,15,17	0.80	0
2	FRU	B	2	2	11,12,12	0.79	0	10,18,18	1.03	1 (10%)
2	GLC	C	1	2	11,11,12	0.83	0	15,15,17	2.24	8 (53%)
2	FRU	C	2	2	11,12,12	0.55	0	10,18,18	2.01	3 (30%)
2	GLC	D	1	2	11,11,12	0.85	0	15,15,17	2.37	7 (46%)
2	FRU	D	2	2	11,12,12	0.77	0	10,18,18	1.00	1 (10%)

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	GLC	B	1	2	-	0/2/19/22	0/1/1/1
2	FRU	B	2	2	-	0/5/24/24	0/1/1/1
2	GLC	C	1	2	-	2/2/19/22	0/1/1/1
2	FRU	C	2	2	-	4/5/24/24	0/1/1/1
2	GLC	D	1	2	-	1/2/19/22	0/1/1/1
2	FRU	D	2	2	-	2/5/24/24	0/1/1/1

There are no bond length outliers.

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed( $^{\circ}$ )	Ideal( $^{\circ}$ )
2	D	1	GLC	C3-C4-C5	4.54	118.34	110.24
2	C	1	GLC	C1-O5-C5	4.51	118.30	112.19
2	C	2	FRU	O4-C4-C5	4.32	123.53	111.05
2	D	1	GLC	C1-C2-C3	-4.18	104.53	109.67
2	C	1	GLC	C2-C3-C4	-3.29	105.20	110.89
2	D	1	GLC	O5-C1-C2	-3.26	105.73	110.77
2	C	1	GLC	C1-C2-C3	2.89	113.21	109.67
2	C	1	GLC	O5-C1-C2	2.84	115.15	110.77
2	C	2	FRU	C5-C4-C3	-2.83	92.83	101.91
2	D	1	GLC	O2-C2-C3	2.82	115.79	110.14
2	C	2	FRU	C6-C5-C4	2.82	121.89	115.09
2	D	1	GLC	O3-C3-C2	2.59	114.94	109.99
2	D	1	GLC	C1-O5-C5	2.48	115.55	112.19
2	B	2	FRU	O1-C1-C2	-2.46	106.64	111.86
2	C	1	GLC	O5-C5-C6	2.38	110.93	107.20
2	C	1	GLC	O3-C3-C2	2.32	114.45	109.99
2	D	2	FRU	O2-C2-O5	-2.28	105.10	109.50
2	C	1	GLC	C6-C5-C4	-2.26	107.71	113.00
2	C	1	GLC	O3-C3-C4	-2.23	105.18	110.35
2	D	1	GLC	O4-C4-C5	-2.18	103.89	109.30

There are no chirality outliers.

All (9) torsion outliers are listed below:

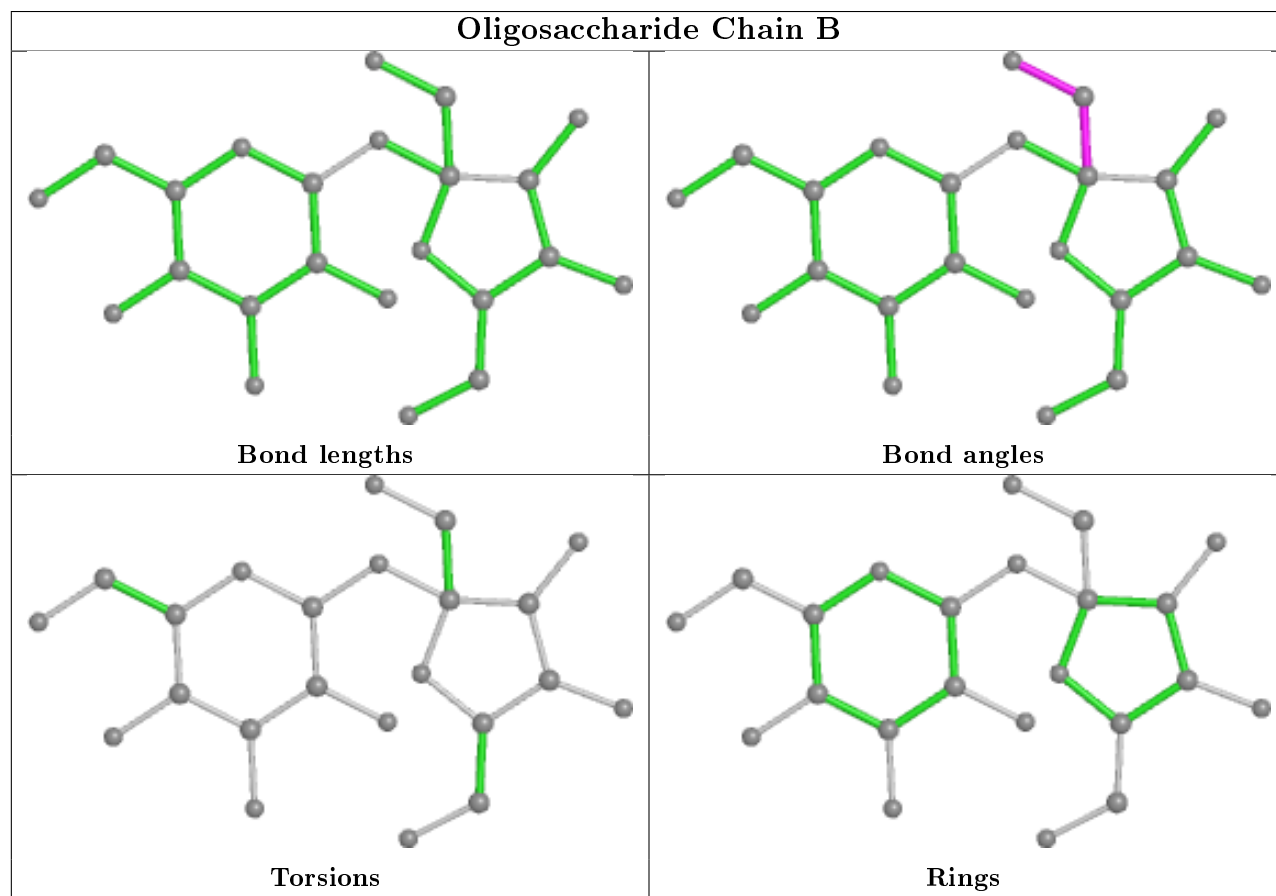
Mol	Chain	Res	Type	Atoms
2	C	1	GLC	O5-C5-C6-O6
2	D	1	GLC	O5-C5-C6-O6
2	D	2	FRU	O1-C1-C2-O5
2	C	2	FRU	C4-C5-C6-O6
2	C	2	FRU	O1-C1-C2-C3
2	C	2	FRU	O1-C1-C2-O2
2	D	2	FRU	O1-C1-C2-O2
2	C	1	GLC	C4-C5-C6-O6
2	C	2	FRU	O5-C5-C6-O6

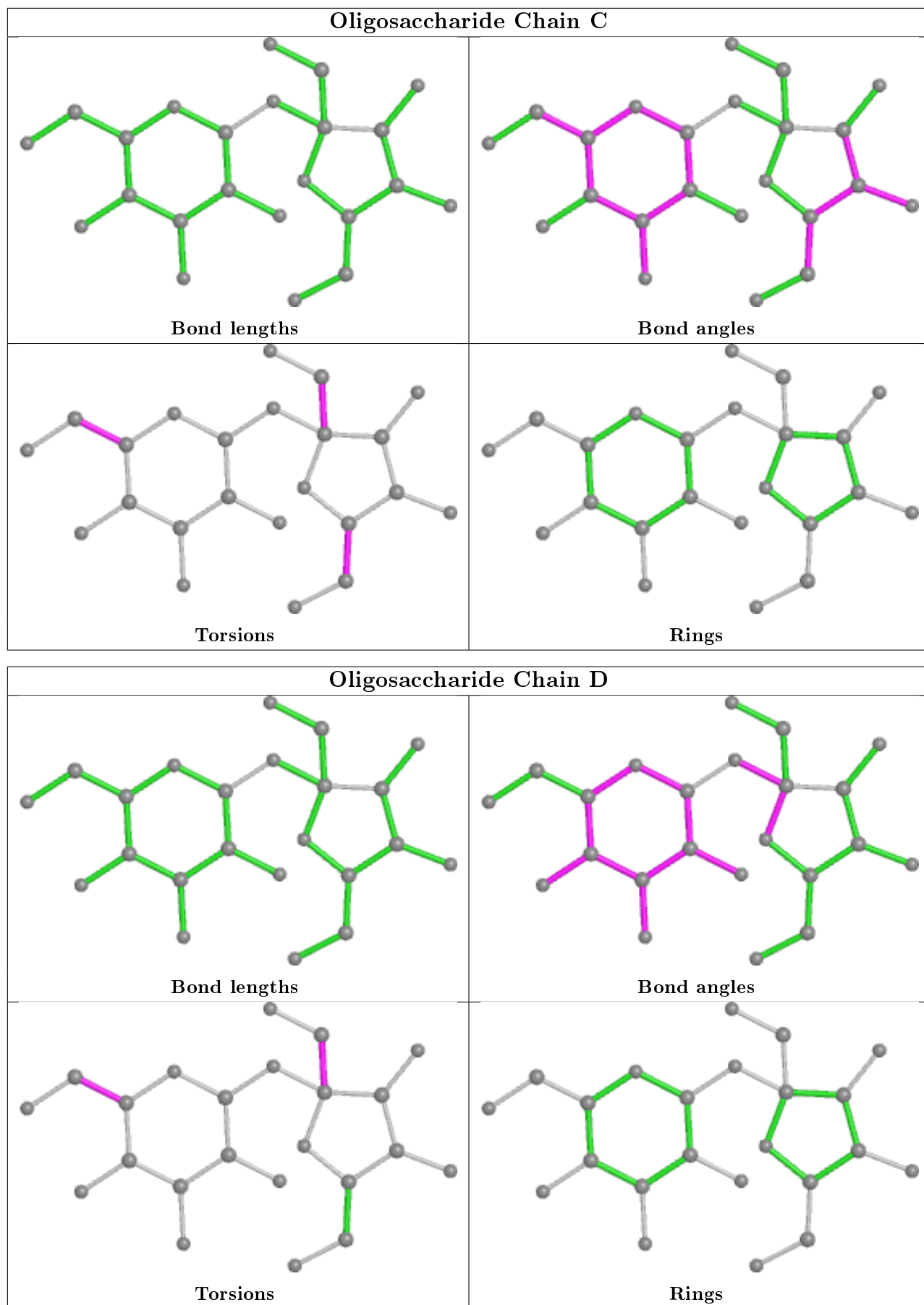
There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2	FRU	3	0
2	C	1	GLC	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

Of 9 ligands modelled in this entry, 3 are monoatomic - leaving 6 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
3	ACT	A	1104	-	1,3,3	9.85	1 (100%)	0,3,3	0.00	-
3	ACT	A	1108	-	1,3,3	8.51	1 (100%)	0,3,3	0.00	-
3	ACT	A	1105	-	1,3,3	3.15	1 (100%)	0,3,3	0.00	-
3	ACT	A	1106	-	1,3,3	8.53	1 (100%)	0,3,3	0.00	-
3	ACT	A	1107	-	1,3,3	3.76	1 (100%)	0,3,3	0.00	-
5	MLI	A	1112	-	0,6,6	0.00	-	0,7,7	0.00	-

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	1112	-	-	0/0/4/4	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1104	ACT	CH3-C	9.85	1.61	1.48
3	A	1106	ACT	CH3-C	8.53	1.59	1.48
3	A	1108	ACT	CH3-C	8.51	1.59	1.48
3	A	1107	ACT	CH3-C	3.76	1.53	1.48
3	A	1105	ACT	CH3-C	3.15	1.52	1.48

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.



1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1104	ACT	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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	987/1010 (97%)	0.35	102 (10%) <b>6</b>   <b>9</b>	24, 38, 71, 125	0

All (102) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	563	VAL	14.8
1	A	560	ALA	11.8
1	A	559	THR	11.3
1	A	716	VAL	10.5
1	A	561	ASP	9.7
1	A	562	GLY	9.5
1	A	676	LEU	9.2
1	A	85	ALA	8.8
1	A	677	SER	7.0
1	A	774	GLY	6.6
1	A	678	ASP	6.3
1	A	679	GLY	6.2
1	A	808	GLY	5.9
1	A	87	ASN	5.9
1	A	674	ALA	5.7
1	A	719	ALA	5.7
1	A	558	SER	5.7
1	A	84	GLU	4.9
1	A	775	GLY	4.9
1	A	713	GLY	4.8
1	A	675	GLY	4.8
1	A	721	VAL	4.8
1	A	715	PRO	4.7
1	A	86	LEU	4.6
1	A	642	GLY	4.6
1	A	673	ALA	4.5
1	A	804	PRO	4.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	714	ALA	4.5
1	A	806	GLN	4.4
1	A	809	GLY	4.3
1	A	680	ARG	4.0
1	A	803	ASN	4.0
1	A	776	ALA	4.0
1	A	727	GLN	3.9
1	A	807	ASP	3.7
1	A	613	ARG	3.7
1	A	728	ASP	3.7
1	A	392	LEU	3.6
1	A	773	TRP	3.6
1	A	681	PRO	3.6
1	A	805	GLY	3.6
1	A	726	VAL	3.6
1	A	27	LEU	3.4
1	A	83	GLY	3.4
1	A	390	CYS	3.3
1	A	1010	SER	3.3
1	A	641	ASP	3.3
1	A	725	GLN	3.3
1	A	712	PRO	3.3
1	A	723	PRO	3.2
1	A	77	ASP	3.1
1	A	811	THR	3.1
1	A	724	VAL	3.1
1	A	298	ALA	3.0
1	A	82	LEU	3.0
1	A	173	LEU	3.0
1	A	299	ALA	3.0
1	A	839	THR	3.0
1	A	433	VAL	2.9
1	A	672	LEU	2.8
1	A	364	ILE	2.8
1	A	186	GLY	2.8
1	A	387	VAL	2.8
1	A	438	LEU	2.8
1	A	838	GLU	2.8
1	A	388	LEU	2.8
1	A	255	GLN	2.8
1	A	88	GLY	2.7
1	A	258	ASP	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	369	TYR	2.7
1	A	203	VAL	2.6
1	A	717	PRO	2.6
1	A	366	THR	2.5
1	A	720	PRO	2.5
1	A	516	CYS	2.5
1	A	25	LEU	2.5
1	A	564	ASP	2.5
1	A	931	GLY	2.5
1	A	682	ALA	2.5
1	A	643	GLY	2.4
1	A	645	LEU	2.4
1	A	802	ALA	2.4
1	A	711	GLU	2.3
1	A	835	THR	2.3
1	A	718	PRO	2.3
1	A	722	GLU	2.3
1	A	117	VAL	2.2
1	A	260	VAL	2.2
1	A	423	THR	2.2
1	A	671	ALA	2.2
1	A	434	VAL	2.2
1	A	225	ALA	2.1
1	A	810	GLU	2.1
1	A	1009	ARG	2.1
1	A	547	VAL	2.1
1	A	24	SER	2.1
1	A	778	GLU	2.1
1	A	371	PRO	2.0
1	A	546	PHE	2.0
1	A	733	LEU	2.0
1	A	436	TRP	2.0
1	A	300	GLY	2.0

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

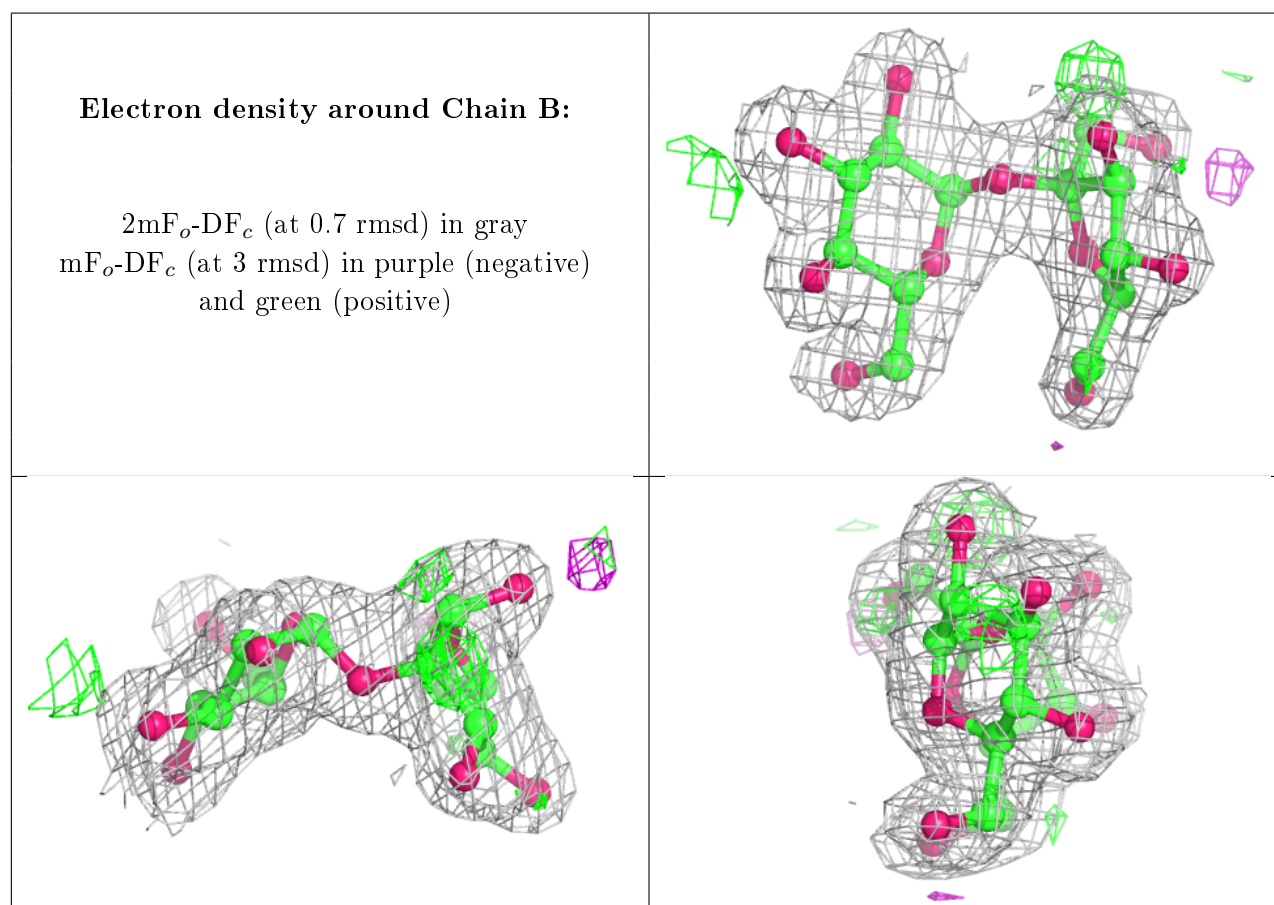
There are no non-standard protein/DNA/RNA residues in this entry.

### 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, 95<sup>th</sup> 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.

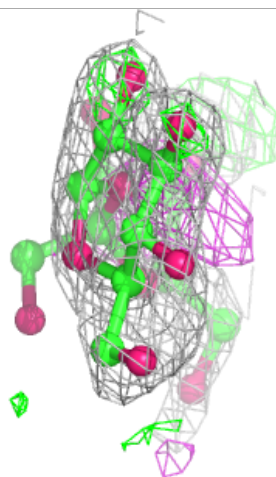
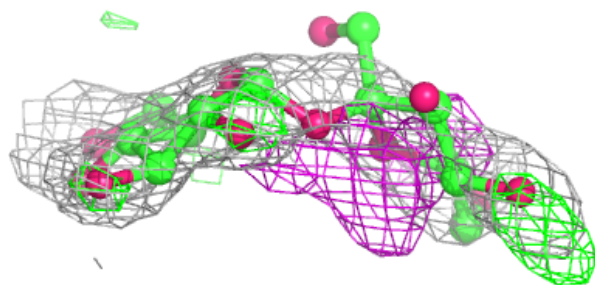
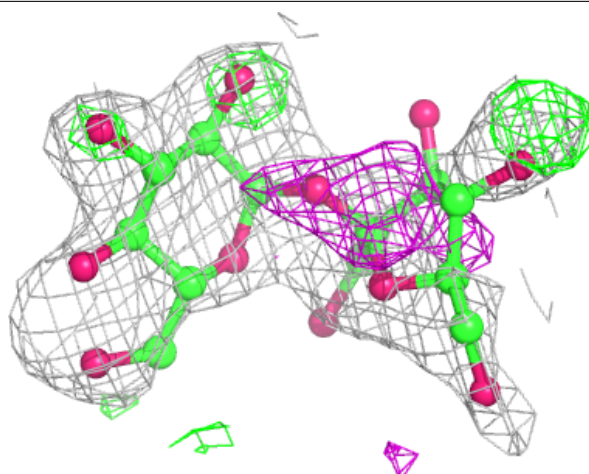
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	FRU	C	2	12/12	0.47	0.48	98,101,103,104	0
2	GLC	C	1	11/12	0.49	0.26	92,94,97,97	0
2	GLC	D	1	11/12	0.53	0.36	71,80,89,90	0
2	FRU	D	2	12/12	0.77	0.43	86,89,94,95	0
2	FRU	B	2	12/12	0.93	0.10	34,43,48,50	0
2	GLC	B	1	11/12	0.95	0.07	27,28,34,34	0

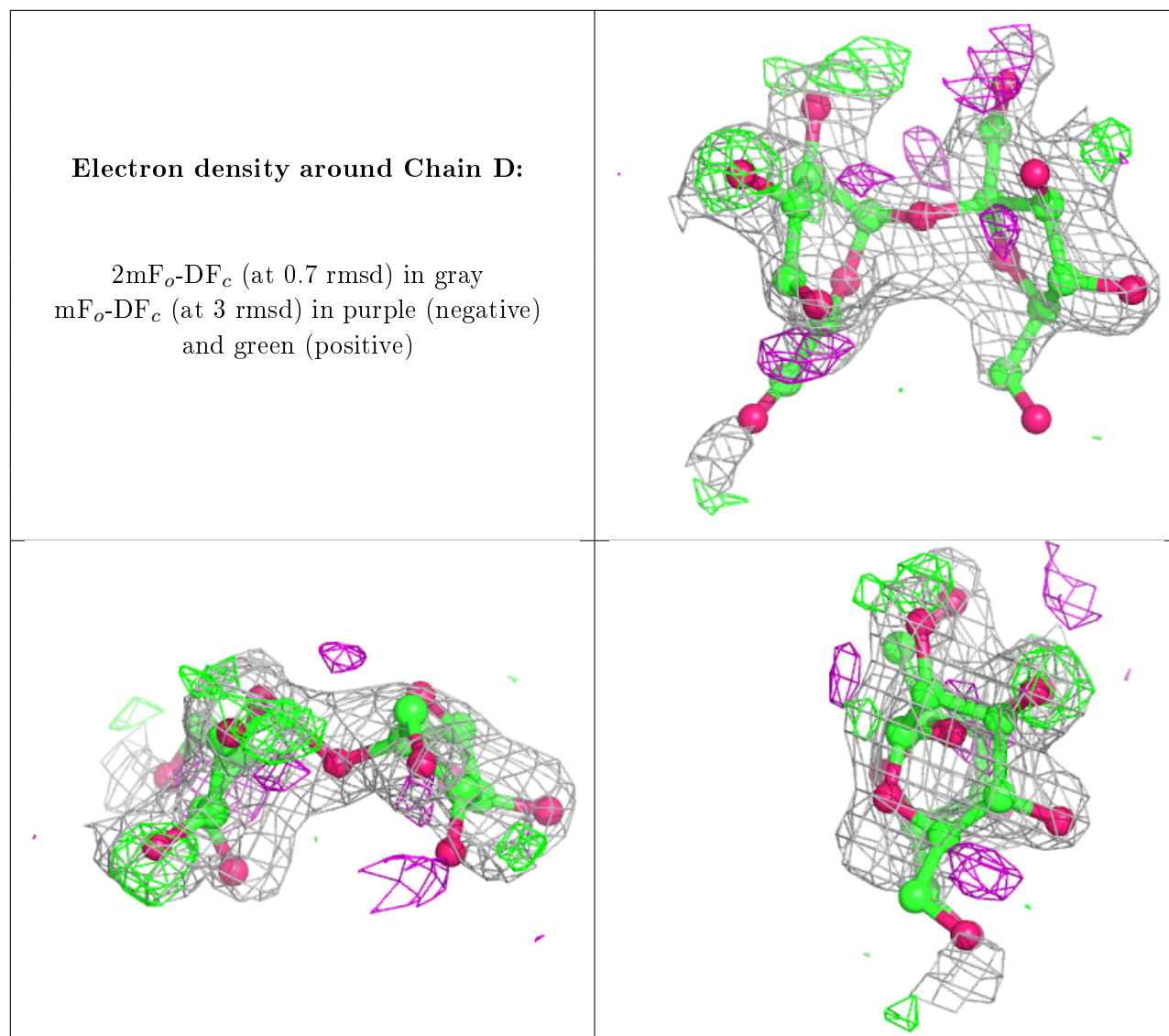
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



**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)





## 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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
3	ACT	A	1106	4/4	0.60	0.55	82,83,83,83	0
5	MLI	A	1112	7/7	0.67	0.17	79,80,81,81	0
3	ACT	A	1108	4/4	0.80	0.41	74,74,75,75	0
3	ACT	A	1105	4/4	0.86	0.35	73,75,75,76	0
3	ACT	A	1107	4/4	0.90	0.14	40,45,46,48	0
3	ACT	A	1104	4/4	0.95	0.07	41,43,44,45	0
4	NA	A	1110	1/1	0.97	0.07	35,35,35,35	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	NA	A	1109	1/1	0.98	0.07	38,38,38,38	0
4	NA	A	1111	1/1	0.98	0.19	38,38,38,38	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.