



# wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 09:48 PM UTC

PDB ID : 5D6D / pdb\_00005d6d  
Title : Crystal structure of GASDALIE IgG1 Fc in complex with FcgRIIIa  
Authors : Ahmed, A.A.; Bjorkman, P.J.  
Deposited on : 2015-08-12  
Resolution : 3.13 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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)  
Xtriage (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

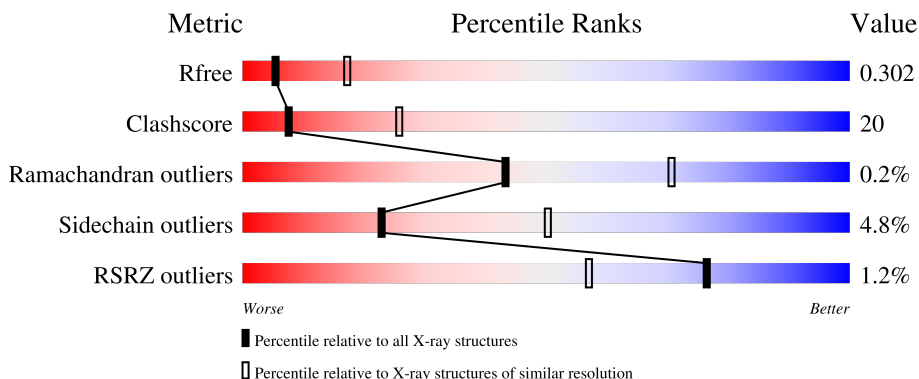
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.13 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	2351 (3.18-3.10)
Clashscore	190562	2452 (3.18-3.10)
Ramachandran outliers	187476	2324 (3.18-3.10)
Sidechain outliers	187428	2324 (3.18-3.10)
RSRZ outliers	180081	2351 (3.18-3.10)

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  $\geq 3$ , 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	249	 51% 29% 16%
1	B	249	 61% 20% 16%
2	C	240	 48% 15% 35%
3	D	9	 44% 44% 11%
4	E	8	 62% 25% 12%

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
6	NAG	C	302	X	-	-	-

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 4755 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 Ig gamma-1 chain C region.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	209	1630	1038	275	311	6	0	0	0
1	B	208	1660	1057	278	319	6	0	0	0

There are 62 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	198	MET	-	initiating methionine	UNP P01857
A	199	GLU	-	expression tag	UNP P01857
A	200	PHE	-	expression tag	UNP P01857
A	201	GLY	-	expression tag	UNP P01857
A	202	LEU	-	expression tag	UNP P01857
A	203	SER	-	expression tag	UNP P01857
A	204	TRP	-	expression tag	UNP P01857
A	205	LEU	-	expression tag	UNP P01857
A	206	PHE	-	expression tag	UNP P01857
A	207	LEU	-	expression tag	UNP P01857
A	208	VAL	-	expression tag	UNP P01857
A	209	ALA	-	expression tag	UNP P01857
A	210	ILE	-	expression tag	UNP P01857
A	211	LEU	-	expression tag	UNP P01857
A	212	LYS	-	expression tag	UNP P01857
A	213	GLY	-	expression tag	UNP P01857
A	214	VAL	-	expression tag	UNP P01857
A	215	GLN	-	expression tag	UNP P01857
A	216	CYS	-	expression tag	UNP P01857
A	217	GLU	-	expression tag	UNP P01857
A	218	VAL	-	expression tag	UNP P01857
A	219	GLN	-	expression tag	UNP P01857
A	220	LEU	-	expression tag	UNP P01857
A	221	LEU	-	expression tag	UNP P01857
A	222	GLU	-	expression tag	UNP P01857

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Chain	Residue	Modelled	Actual	Comment	Reference
A	223	THR	-	expression tag	UNP P01857
A	224	SER	-	expression tag	UNP P01857
A	236	ALA	GLY	engineered mutation	UNP P01857
A	239	ASP	SER	engineered mutation	UNP P01857
A	330	LEU	ALA	engineered mutation	UNP P01857
A	332	GLU	ILE	engineered mutation	UNP P01857
B	198	MET	-	initiating methionine	UNP P01857
B	199	GLU	-	expression tag	UNP P01857
B	200	PHE	-	expression tag	UNP P01857
B	201	GLY	-	expression tag	UNP P01857
B	202	LEU	-	expression tag	UNP P01857
B	203	SER	-	expression tag	UNP P01857
B	204	TRP	-	expression tag	UNP P01857
B	205	LEU	-	expression tag	UNP P01857
B	206	PHE	-	expression tag	UNP P01857
B	207	LEU	-	expression tag	UNP P01857
B	208	VAL	-	expression tag	UNP P01857
B	209	ALA	-	expression tag	UNP P01857
B	210	ILE	-	expression tag	UNP P01857
B	211	LEU	-	expression tag	UNP P01857
B	212	LYS	-	expression tag	UNP P01857
B	213	GLY	-	expression tag	UNP P01857
B	214	VAL	-	expression tag	UNP P01857
B	215	GLN	-	expression tag	UNP P01857
B	216	CYS	-	expression tag	UNP P01857
B	217	GLU	-	expression tag	UNP P01857
B	218	VAL	-	expression tag	UNP P01857
B	219	GLN	-	expression tag	UNP P01857
B	220	LEU	-	expression tag	UNP P01857
B	221	LEU	-	expression tag	UNP P01857
B	222	GLU	-	expression tag	UNP P01857
B	223	THR	-	expression tag	UNP P01857
B	224	SER	-	expression tag	UNP P01857
B	236	ALA	GLY	engineered mutation	UNP P01857
B	239	ASP	SER	engineered mutation	UNP P01857
B	330	LEU	ALA	engineered mutation	UNP P01857
B	332	GLU	ILE	engineered mutation	UNP P01857

- Molecule 2 is a protein called Low affinity immunoglobulin gamma Fc region receptor III-A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	157	1217	775	211	227	4	0	0	0

There are 51 discrepancies between the modelled and reference sequences:

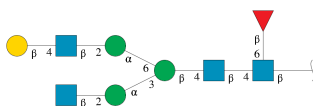
Chain	Residue	Modelled	Actual	Comment	Reference
C	-17	MET	-	expression tag	UNP P08637
C	-16	TRP	-	expression tag	UNP P08637
C	-15	GLN	-	expression tag	UNP P08637
C	-14	LEU	-	expression tag	UNP P08637
C	-13	LEU	-	expression tag	UNP P08637
C	-12	LEU	-	expression tag	UNP P08637
C	-11	PRO	-	expression tag	UNP P08637
C	-10	THR	-	expression tag	UNP P08637
C	-9	ALA	-	expression tag	UNP P08637
C	-8	LEU	-	expression tag	UNP P08637
C	-7	LEU	-	expression tag	UNP P08637
C	-6	LEU	-	expression tag	UNP P08637
C	-5	LEU	-	expression tag	UNP P08637
C	38	GLN	ASN	engineered mutation	UNP P08637
C	74	GLN	ASN	engineered mutation	UNP P08637
C	169	GLN	ASN	engineered mutation	UNP P08637
C	188	SER	-	expression tag	UNP P08637
C	189	ARG	-	expression tag	UNP P08637
C	190	GLY	-	expression tag	UNP P08637
C	191	GLY	-	expression tag	UNP P08637
C	192	GLY	-	expression tag	UNP P08637
C	193	GLY	-	expression tag	UNP P08637
C	194	SER	-	expression tag	UNP P08637
C	195	GLY	-	expression tag	UNP P08637
C	196	GLY	-	expression tag	UNP P08637
C	197	GLY	-	expression tag	UNP P08637
C	198	GLY	-	expression tag	UNP P08637
C	199	HIS	-	expression tag	UNP P08637
C	200	VAL	-	expression tag	UNP P08637
C	201	LEU	-	expression tag	UNP P08637
C	202	ASN	-	expression tag	UNP P08637
C	203	ASP	-	expression tag	UNP P08637
C	204	ILE	-	expression tag	UNP P08637
C	205	PHE	-	expression tag	UNP P08637
C	206	GLU	-	expression tag	UNP P08637
C	207	ALA	-	expression tag	UNP P08637
C	208	GLN	-	expression tag	UNP P08637
C	209	LYS	-	expression tag	UNP P08637
C	210	ILE	-	expression tag	UNP P08637
C	211	GLU	-	expression tag	UNP P08637
C	212	TRP	-	expression tag	UNP P08637
C	213	HIS	-	expression tag	UNP P08637

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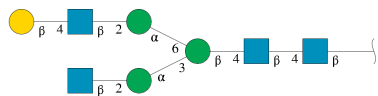
Chain	Residue	Modelled	Actual	Comment	Reference
C	214	GLU	-	expression tag	UNP P08637
C	215	THR	-	expression tag	UNP P08637
C	216	GLY	-	expression tag	UNP P08637
C	217	HIS	-	expression tag	UNP P08637
C	218	HIS	-	expression tag	UNP P08637
C	219	HIS	-	expression tag	UNP P08637
C	220	HIS	-	expression tag	UNP P08637
C	221	HIS	-	expression tag	UNP P08637
C	222	HIS	-	expression tag	UNP P08637

- Molecule 3 is an oligosaccharide called beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[beta-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



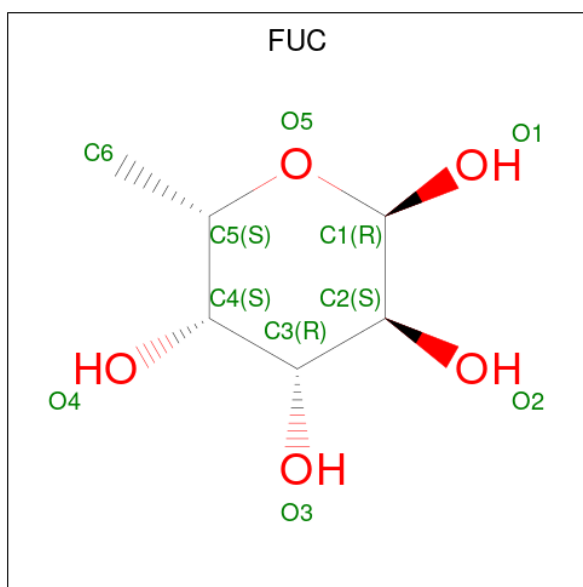
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
			Total	C	N				O
3	D	9	110	62	4	44	0	0	0

- Molecule 4 is an oligosaccharide called beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-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.



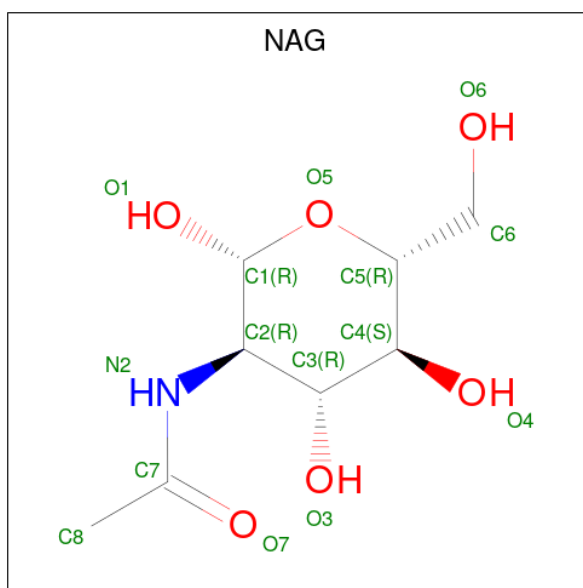
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
			Total	C	N				O
4	E	8	100	56	4	40	0	0	0

- Molecule 5 is alpha-L-fucopyranose (CCD ID: FUC) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>5</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	C	O	0	0
			10	6	4		

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula:  $C_8H_{15}NO_6$ ).

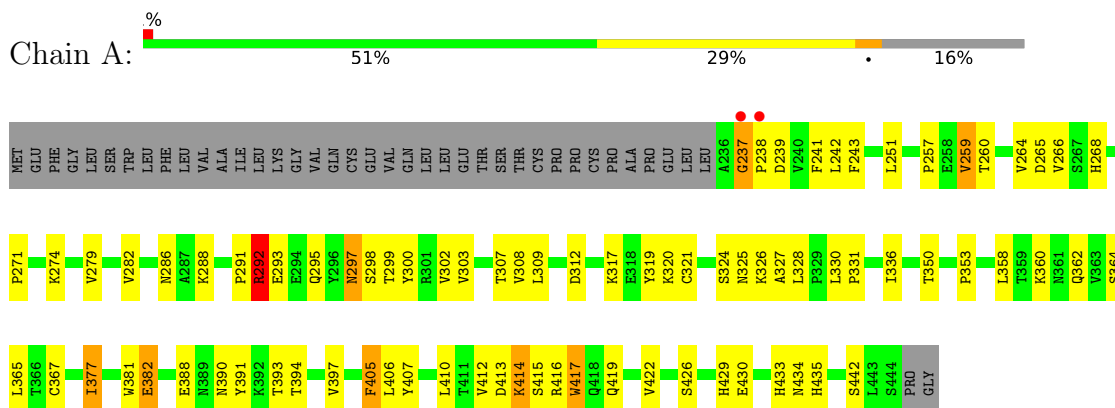


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	C	1	Total	C	N	O	0	0
			14	8	1	5		
6	C	1	Total	C	N	O	0	0
			14	8	1	5		

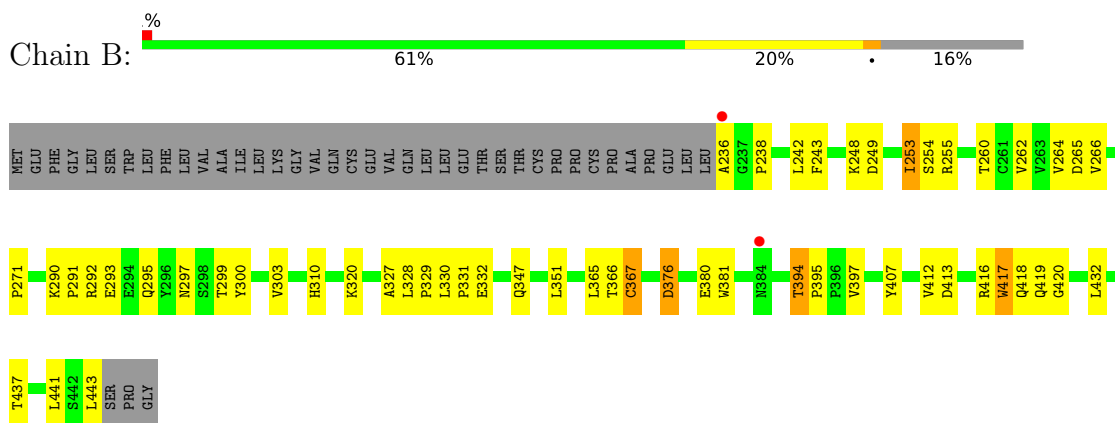
### 3 Residue-property plots [i](#)

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.

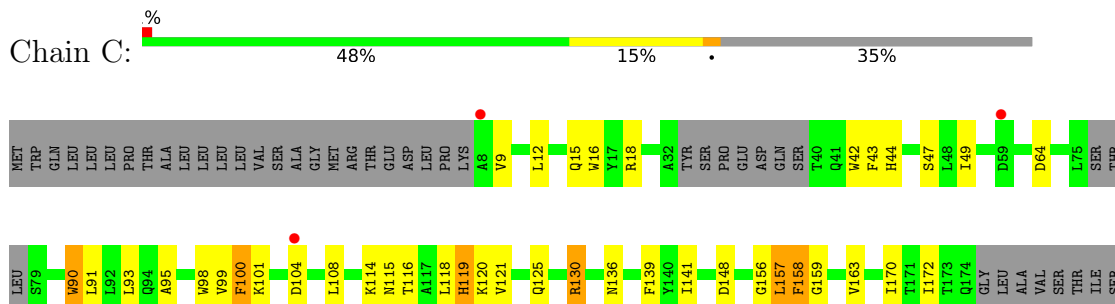
- Molecule 1: Ig gamma-1 chain C region



- Molecule 1: Ig gamma-1 chain C region



- Molecule 2: Low affinity immunoglobulin gamma Fc region receptor III-A



SER PHE PHE PRO PRO PRO SER ARG GLY GLY GLY SER GLY GLY HIS VAL LEU ASN ASP ILE PHE GLU ALA GLN LYS ILE GLU TRP HIS GLU THR GLY HIS HIS HIS HIS HIS

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

Chain D:  44% 44% 11%

MAG1  
MAG2  
BMA3  
MAM4  
MAG5  
GAL6  
MAM7  
MAG8  
FUL9

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

Chain E:  62% 25% 12%

MAG1  
MAG2  
BMA3  
MAM4  
MAG5  
GAL6  
MAM7  
MAG8

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.38Å 94.50Å 108.67Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	71.31 – 3.13 71.31 – 3.13	Depositor EDS
% Data completeness (in resolution range)	99.3 (71.31-3.13) 99.6 (71.31-3.13)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.41 (at 3.13Å)	Xtrriage
Refinement program	PHENIX 1.8.2_1309	Depositor
R, $R_{free}$	0.271 , 0.296 0.273 , 0.302	Depositor DCC
$R_{free}$ test set	1404 reflections (10.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	81.1	Xtrriage
Anisotropy	0.414	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 43.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	4755	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	35.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.46% 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: NAG, FUC, MAN, BMA, GAL, FUL

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	1.21	0/1675	1.10	5/2290 (0.2%)
1	B	0.55	0/1706	0.88	7/2327 (0.3%)
2	C	0.58	0/1249	0.83	2/1701 (0.1%)
All	All	0.85	0/4630	0.95	14/6318 (0.2%)

There are no bond length outliers.

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	90	TRP	N-CA-C	8.56	120.69	111.36
1	A	292	ARG	N-CA-C	-7.93	98.28	110.10
1	B	327	ALA	N-CA-C	-7.16	104.68	113.41
1	A	237	GLY	C-N-CD	7.09	136.19	120.60
1	A	251	LEU	N-CA-C	6.13	118.04	111.36

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	1630	0	1564	86	0
1	B	1660	0	1609	60	0
2	C	1217	0	1112	54	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	110	0	94	3	0
4	E	100	0	84	4	0
5	B	10	0	10	1	0
6	C	28	0	26	5	0
All	All	4755	0	4499	186	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 20.

The worst 5 of 186 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)
5:B:509:FUC:C1	4:E:1:NAG:O6	1.82	1.28
1:B:330:LEU:HD12	1:B:331:PRO:HD2	1.38	1.03
1:A:237:GLY:O	1:A:328:LEU:HD23	1.63	0.97
2:C:157:LEU:HD11	6:C:301:NAG:C8	1.94	0.96
1:B:419:GLN:N	1:B:420:GLY:HA2	1.79	0.94

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	207/249 (83%)	202 (98%)	4 (2%)	1 (0%)	24	54
1	B	206/249 (83%)	195 (95%)	11 (5%)	0	100	100
2	C	151/240 (63%)	140 (93%)	11 (7%)	0	100	100
All	All	564/738 (76%)	537 (95%)	26 (5%)	1 (0%)	43	70

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	286	ASN

### 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	184/230 (80%)	172 (94%)	12 (6%)	15	40
1	B	191/230 (83%)	184 (96%)	7 (4%)	30	57
2	C	126/209 (60%)	121 (96%)	5 (4%)	28	55
All	All	501/669 (75%)	477 (95%)	24 (5%)	23	50

5 of 24 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	254	SER
1	B	376	ASP
1	B	347	GLN
1	B	416	ARG
1	A	350	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	342	GLN
1	B	433	HIS
2	C	136	ASN
2	C	115	ASN
1	B	295	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](#)

17 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
3	NAG	D	1	3,1	14,14,15	0.72	0	17,19,21	0.71	1 (5%)
3	NAG	D	2	3	14,14,15	0.61	0	17,19,21	0.70	0
3	BMA	D	3	3	11,11,12	0.54	0	15,15,17	0.99	1 (6%)
3	MAN	D	4	3	11,11,12	0.56	0	15,15,17	0.65	0
3	NAG	D	5	3	14,14,15	0.54	0	17,19,21	0.88	1 (5%)
3	GAL	D	6	3	11,11,12	0.52	0	15,15,17	0.54	0
3	MAN	D	7	3	11,11,12	0.45	0	15,15,17	0.62	0
3	NAG	D	8	3	14,14,15	0.63	0	17,19,21	0.84	0
3	FUL	D	9	3	10,10,11	1.23	0	14,14,16	1.27	2 (14%)
4	NAG	E	1	4,1	14,14,15	1.22	1 (7%)	17,19,21	2.73	2 (11%)
4	NAG	E	2	4	14,14,15	0.48	0	17,19,21	0.78	1 (5%)
4	BMA	E	3	4	11,11,12	0.62	0	15,15,17	0.47	0
4	MAN	E	4	4	11,11,12	0.58	0	15,15,17	0.60	0
4	NAG	E	5	4	14,14,15	0.52	0	17,19,21	0.78	1 (5%)
4	GAL	E	6	4	11,11,12	0.63	0	15,15,17	0.29	0
4	MAN	E	7	4	11,11,12	0.50	0	15,15,17	0.51	0
4	NAG	E	8	4	14,14,15	0.30	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
3	NAG	D	1	3,1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
3	MAN	D	4	3	-	0/2/19/22	0/1/1/1
3	NAG	D	5	3	-	1/6/23/26	0/1/1/1
3	GAL	D	6	3	-	2/2/19/22	0/1/1/1
3	MAN	D	7	3	-	0/2/19/22	0/1/1/1
3	NAG	D	8	3	-	2/6/23/26	0/1/1/1
3	FUL	D	9	3	-	-	0/1/1/1
4	NAG	E	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	E	2	4	-	0/6/23/26	0/1/1/1
4	BMA	E	3	4	-	0/2/19/22	0/1/1/1
4	MAN	E	4	4	-	1/2/19/22	0/1/1/1
4	NAG	E	5	4	-	2/6/23/26	0/1/1/1
4	GAL	E	6	4	-	2/2/19/22	0/1/1/1
4	MAN	E	7	4	-	2/2/19/22	0/1/1/1
4	NAG	E	8	4	-	0/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	E	1	NAG	O6-C6	-3.96	1.25	1.42

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	1	NAG	O6-C6-C5	10.70	147.75	111.33
3	D	3	BMA	C1-C2-C3	2.78	113.69	109.64
4	E	1	NAG	C2-N2-C7	-2.63	119.38	122.90
3	D	9	FUL	C6-C5-C4	-2.49	108.52	113.08
4	E	5	NAG	C2-N2-C7	-2.43	119.64	122.90

There are no chirality outliers.

5 of 16 torsion outliers are listed below:

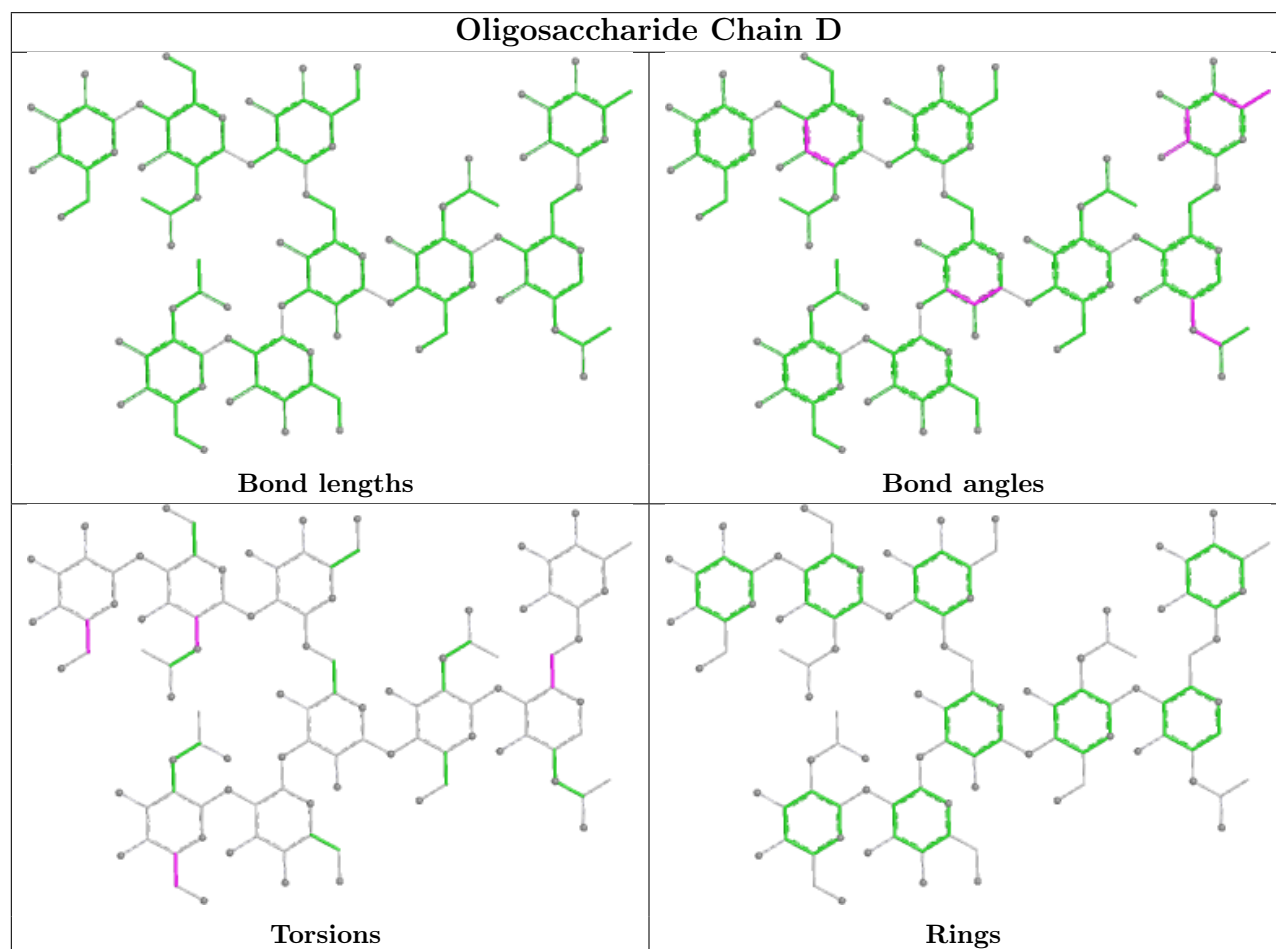
Mol	Chain	Res	Type	Atoms
4	E	6	GAL	O5-C5-C6-O6
4	E	6	GAL	C4-C5-C6-O6
3	D	6	GAL	O5-C5-C6-O6
3	D	8	NAG	O5-C5-C6-O6
4	E	5	NAG	O5-C5-C6-O6

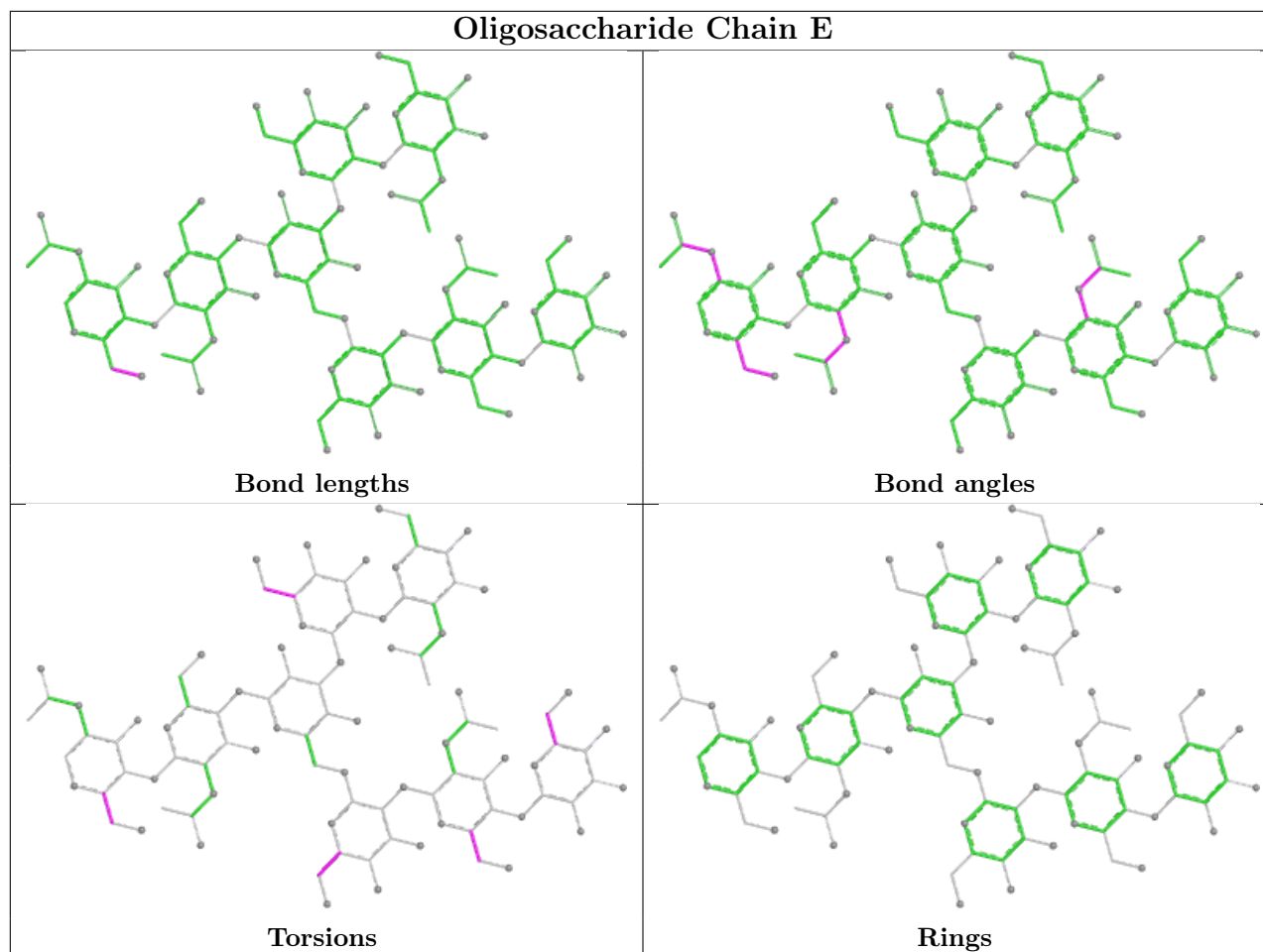
There are no ring outliers.

3 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	9	FUL	1	0
4	E	1	NAG	4	0
3	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](#)

3 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	$\# Z  > 2$
6	NAG	C	301	2	14,14,15	1.84	1 (7%)	17,19,21	1.93	4 (23%)
6	NAG	C	302	2	14,14,15	0.28	0	17,19,21	0.54	0
5	FUC	B	509	-	10,10,11	0.88	0	14,14,16	2.05	5 (35%)

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
6	NAG	C	301	2	-	3/6/23/26	0/1/1/1
6	NAG	C	302	2	1/1/5/7	0/6/23/26	0/1/1/1
5	FUC	B	509	-	-	-	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	301	NAG	O5-C1	-6.55	1.32	1.43

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	301	NAG	C1-O5-C5	-4.94	105.57	112.19
5	B	509	FUC	C2-C3-C4	4.33	118.47	110.86
5	B	509	FUC	C1-C2-C3	3.74	115.08	109.64
6	C	301	NAG	C2-N2-C7	3.26	127.28	122.90
5	B	509	FUC	C3-C4-C5	2.76	114.00	109.81

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	C	302	NAG	C1

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	C	301	NAG	C1-C2-N2-C7
6	C	301	NAG	O5-C5-C6-O6
6	C	301	NAG	C4-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	301	NAG	3	0
6	C	302	NAG	2	0
5	B	509	FUC	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 [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, 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	209/249 (83%)	-0.18	2 (0%) 79 61	12, 25, 48, 63	0
1	B	208/249 (83%)	-0.05	2 (0%) 79 61	10, 28, 55, 84	0
2	C	157/240 (65%)	0.18	3 (1%) 66 45	15, 37, 89, 114	0
All	All	574/738 (77%)	-0.03	7 (1%) 76 57	10, 29, 72, 114	0

The worst 5 of 7 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	104	ASP	3.3
1	A	238	PRO	3.1
1	B	384	ASN	2.4
1	B	236	ALA	2.3
2	C	8	ALA	2.3

### 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
3	NAG	D	8	14/15	0.65	0.16	54,80,90,98	0
3	FUL	D	9	10/11	0.67	0.13	53,68,83,94	0
4	NAG	E	8	14/15	0.68	0.15	76,96,108,127	0

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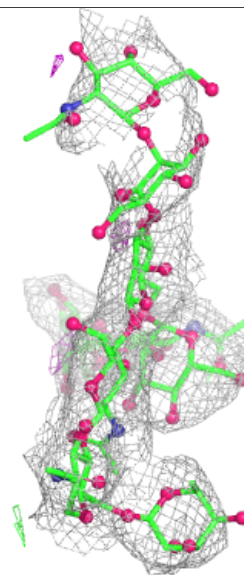
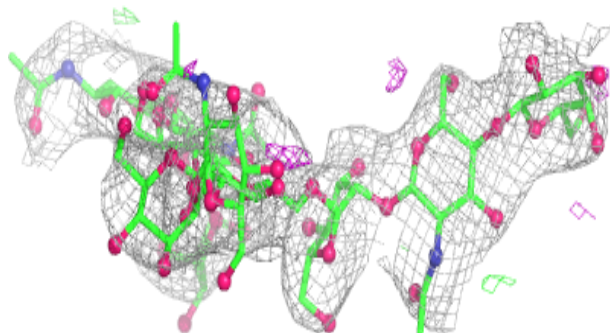
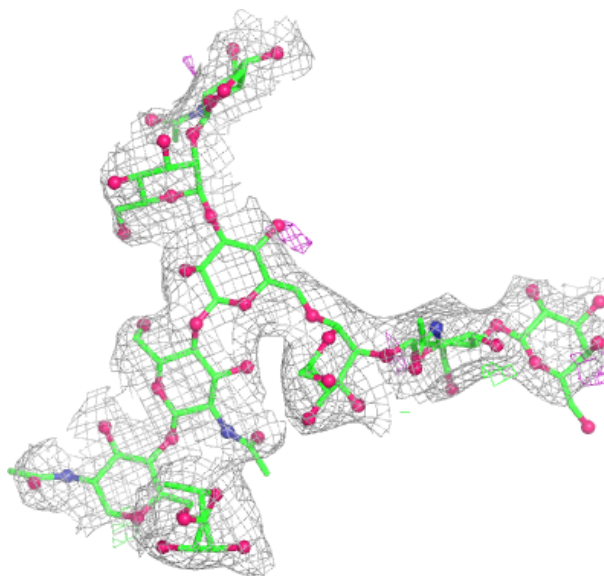
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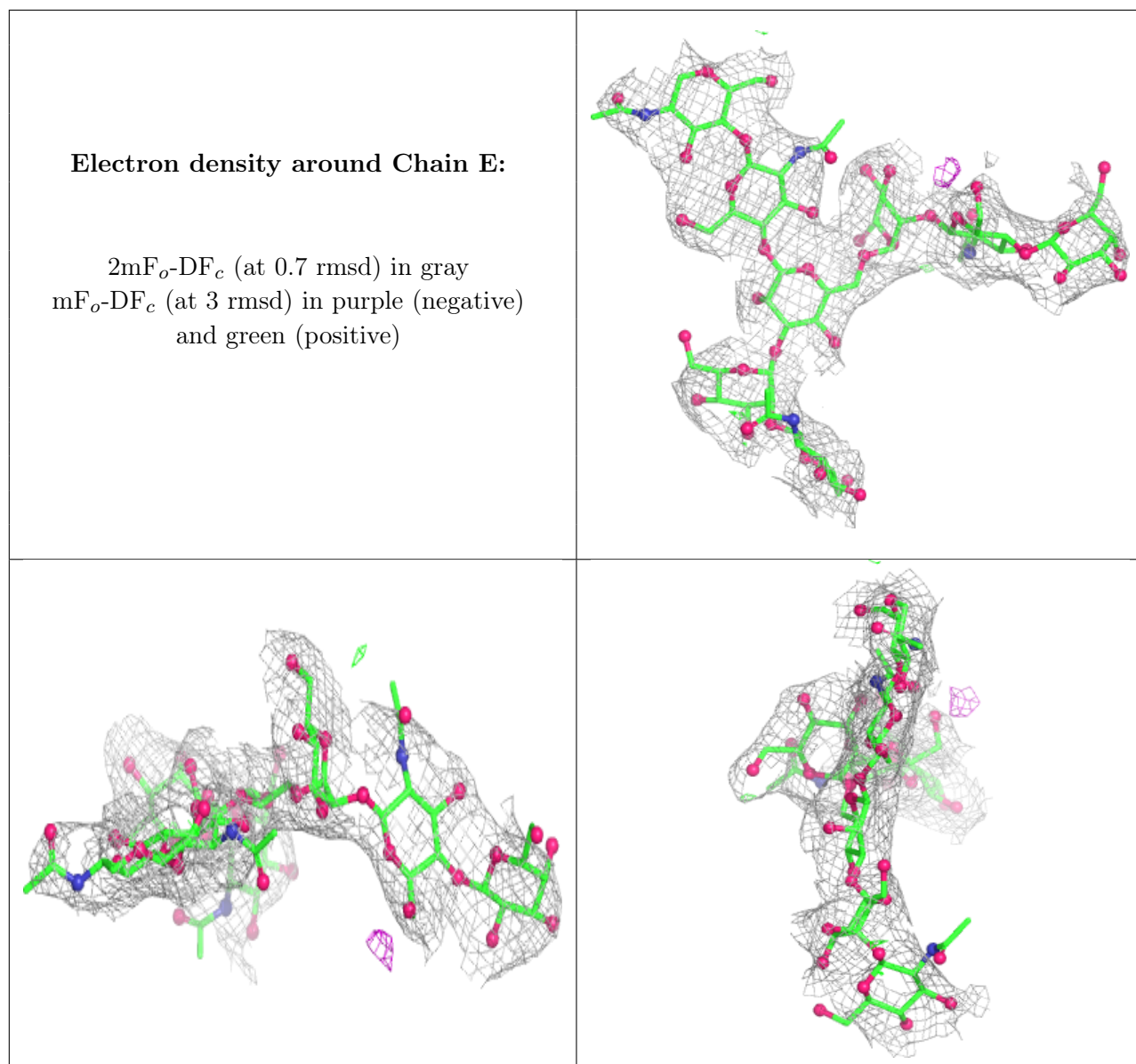
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	GAL	E	6	11/12	0.74	0.15	26,46,58,63	0
3	MAN	D	7	11/12	0.74	0.12	48,62,70,71	0
3	GAL	D	6	11/12	0.80	0.15	27,39,50,53	0
4	NAG	E	5	14/15	0.80	0.12	31,38,57,59	0
4	MAN	E	7	11/12	0.84	0.10	58,67,75,79	0
3	BMA	D	3	11/12	0.84	0.12	34,41,48,56	0
4	NAG	E	1	14/15	0.85	0.09	43,58,73,80	0
3	MAN	D	4	11/12	0.87	0.09	30,36,41,44	0
4	NAG	E	2	14/15	0.87	0.10	29,51,63,63	0
3	NAG	D	1	14/15	0.89	0.10	34,41,52,59	0
3	NAG	D	5	14/15	0.90	0.09	23,36,43,48	0
4	MAN	E	4	11/12	0.91	0.07	35,45,49,50	0
4	BMA	E	3	11/12	0.92	0.09	36,47,52,54	0
3	NAG	D	2	14/15	0.92	0.11	33,40,51,51	0

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

**Electron density around Chain D:**

$2mF_o-DF_c$  (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
6	NAG	C	302	14/15	0.54	0.17	61,73,88,91	0
5	FUC	B	509	10/11	0.66	0.17	75,85,91,92	0
6	NAG	C	301	14/15	0.83	0.12	30,41,67,68	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.