



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 6, 2023 – 02:22 am GMT

PDB ID : 2W59
Title : STRUCTURE OF AN AVIAN IGY-FC 3-4 FRAGMENT
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Deposited on : 2008-12-08
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

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

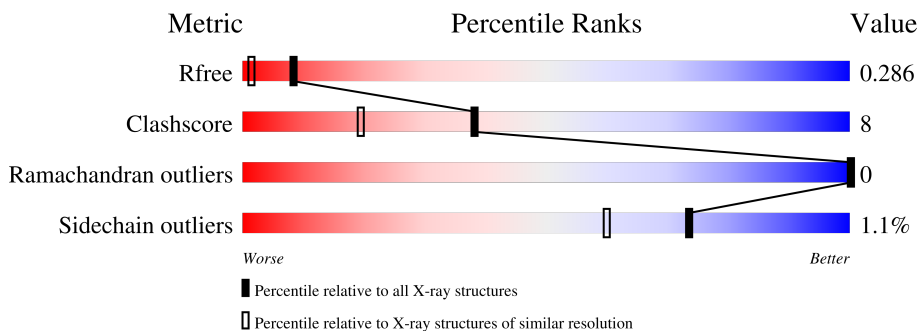
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.75 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)

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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	231	81% (0 types), 12% (1 type), 7% (2 types), 0% (3 types), 0% (not modelled)
1	B	231	78% (0 types), 14% (1 type), 7% (2 types), 0% (3 types), 0% (not modelled)
2	C	3	100% (0 types), 0% (1 type), 0% (2 types), 0% (3 types), 0% (not modelled)
2	D	3	100% (0 types), 0% (1 type), 0% (2 types), 0% (3 types), 0% (not modelled)

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
2	NAG	C	1	X	-	-	-
2	MAN	C	3	X	-	-	-
2	MAN	D	3	X	-	-	-

2 Entry composition [i](#)

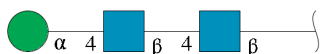
There are 4 unique types of molecules in this entry. The entry contains 4072 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 IGY FCU3-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	215	1701	1082	293	315	11	0	4	0
1	B	214	1701	1082	292	315	12	0	5	0

- Molecule 2 is an oligosaccharide called alpha-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	3	39	22	2	15	0	0	0
2	D	3	39	22	2	15	0	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: C₃H₈O₃).



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


- Molecule 4 is water.

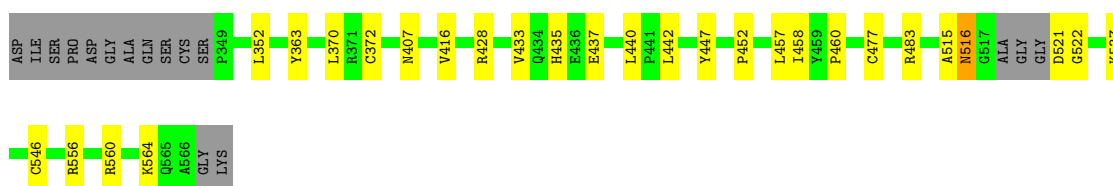
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	271	Total O 271 271	0	0
4	B	285	Total O 285 285	0	0

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. 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. 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.

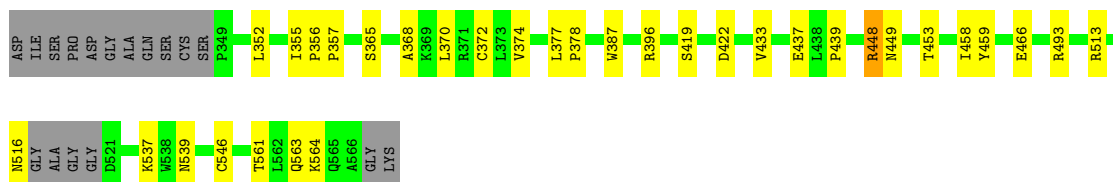
- Molecule 1: IGY FCU3-4

Chain A:  81% 12% 7%



- Molecule 1: IGY FCU3-4

Chain B:  78% 14% 7%



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

Chain C:  100%



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

Chain D:  100%



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	68.48Å 80.14Å 99.14Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.57 – 1.75 52.06 – 1.68	Depositor EDS
% Data completeness (in resolution range)	99.4 (49.57-1.75) 96.9 (52.06-1.68)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.24 (at 1.68Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.169 , 0.196 0.280 , 0.286	Depositor DCC
R_{free} test set	3101 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	21.3	Xtrriage
Anisotropy	0.228	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 51.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	4072	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.12% 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: GOL, NAG, MAN

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	0.33	0/1759	0.52	0/2400
1	B	0.34	0/1762	0.57	2/2404 (0.1%)
All	All	0.34	0/3521	0.55	2/4804 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	448	ARG	NE-CZ-NH2	-7.43	116.58	120.30
1	B	448	ARG	NE-CZ-NH1	7.00	123.80	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	1701	0	1684	20	0
1	B	1701	0	1682	32	0
2	C	39	0	34	0	0
2	D	39	0	34	0	0
3	A	6	0	8	2	0
3	B	30	0	40	8	0
4	A	271	0	0	4	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	285	0	0	7	1
All	All	4072	0	3482	53	1

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 8.

All (53) 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:B:419:SER:H	3:B:605:GOL:H32	1.20	1.02
1:B:563:GLN:OE1	4:B:701:HOH:O	1.88	0.89
1:A:564:LYS:NZ	4:A:701:HOH:O	2.09	0.85
1:A:352:LEU:HD11	1:A:372:CYS:SG	2.24	0.78
1:B:422:ASP:OD1	3:B:605:GOL:H31	1.87	0.74
1:A:515:ALA:N	1:A:516:ASN:HA	2.06	0.70
1:B:419:SER:N	3:B:605:GOL:H32	2.02	0.70
1:B:513:ARG:HD3	4:B:896:HOH:O	1.90	0.70
1:B:352:LEU:HD11	1:B:372[A]:CYS:SG	2.33	0.68
1:B:459:TYR:CE1	3:B:606:GOL:H31	2.31	0.64
1:A:363:TYR:CD1	1:A:556:ARG:HD2	2.33	0.64
1:B:352:LEU:HD11	1:B:372[B]:CYS:SG	2.38	0.63
1:B:365:SER:HB3	4:B:926:HOH:O	1.98	0.63
1:A:435:HIS:CE1	1:A:437:GLU:HG2	2.35	0.61
1:A:440:LEU:HG	4:A:880:HOH:O	2.01	0.60
1:B:372[B]:CYS:HB2	1:B:387:TRP:CZ2	2.36	0.60
3:A:604:GOL:H31	1:B:466:GLU:OE1	2.04	0.57
1:B:437:GLU:O	1:B:439:PRO:HD3	2.06	0.55
1:B:563:GLN:CD	4:B:701:HOH:O	2.37	0.54
1:B:357:PRO:HB3	1:B:368:ALA:HB1	1.89	0.54
1:A:483:ARG:CZ	1:A:521:ASP:HB3	2.39	0.53
1:B:372[A]:CYS:HB2	1:B:387:TRP:CZ2	2.44	0.53
4:A:808:HOH:O	3:B:608:GOL:H32	2.09	0.53
1:B:449:ASN:ND2	1:B:453:THR:HG22	2.23	0.53
1:A:433:VAL:CG1	1:A:442:LEU:HB3	2.40	0.52
1:B:561:THR:O	3:B:608:GOL:H31	2.09	0.52
1:A:452:PRO:HG2	1:A:521:ASP:OD1	2.09	0.51
1:B:448:ARG:HD3	4:B:725:HOH:O	2.10	0.51
1:B:449:ASN:HB2	3:B:607:GOL:O2	2.11	0.51
1:A:521:ASP:CG	1:A:522:GLY:H	2.14	0.51
1:A:435:HIS:HE1	1:A:437:GLU:HG2	1.75	0.51
1:B:493:ARG:HD2	1:B:537:LYS:HE2	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:537:LYS:HD2	4:A:795:HOH:O	2.11	0.50
1:A:460:PRO:HG3	1:A:560:ARG:HB3	1.92	0.49
1:A:516:ASN:C	1:A:516:ASN:ND2	2.66	0.49
1:B:396:ARG:HG3	4:B:760:HOH:O	2.14	0.48
1:B:539:ASN:HA	1:B:564:LYS:HD2	1.95	0.48
1:A:352:LEU:HB3	1:A:442:LEU:HD22	1.96	0.47
1:A:516:ASN:C	1:A:516:ASN:HD22	2.18	0.47
1:B:352:LEU:HD13	1:B:433:VAL:HG21	1.96	0.47
1:B:448:ARG:HD2	1:B:449:ASN:O	2.15	0.47
1:B:458:ILE:O	3:B:606:GOL:H2	2.17	0.45
1:A:428:ARG:HA	1:A:447:TYR:HB3	1.98	0.45
1:B:352:LEU:HD13	1:B:433:VAL:CG2	2.49	0.43
1:B:377:LEU:HA	1:B:378:PRO:HD3	1.88	0.42
1:B:352:LEU:HD13	1:B:374:VAL:HG22	2.02	0.42
1:B:355:ILE:HA	1:B:356:PRO:HD3	1.88	0.42
1:A:370:LEU:HB2	1:A:416:VAL:CG1	2.50	0.41
1:B:516:ASN:ND2	4:B:709:HOH:O	2.52	0.41
1:A:458:ILE:HG23	1:A:477[A]:CYS:SG	2.61	0.41
1:B:357:PRO:HG3	1:B:370:LEU:HD23	2.02	0.41
1:B:374:VAL:HG22	1:B:433:VAL:HG21	2.03	0.41
1:A:457:LEU:HD22	3:A:604:GOL:H11	2.04	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:789:HOH:O	4:B:748:HOH:O[3_455]	1.41	0.79

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	215/231 (93%)	214 (100%)	1 (0%)	0	100	100
1	B	215/231 (93%)	211 (98%)	4 (2%)	0	100	100
All	All	430/462 (93%)	425 (99%)	5 (1%)	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	194/201 (96%)	190 (98%)	4 (2%)	53	31
1	B	195/201 (97%)	193 (99%)	2 (1%)	76	63
All	All	389/402 (97%)	383 (98%)	6 (2%)	73	49

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	407	ASN
1	A	516	ASN
1	A	546[A]	CYS
1	A	546[B]	CYS
1	B	546[A]	CYS
1	B	546[B]	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	351	GLN
1	A	516	ASN
1	B	449	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](#)

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	NAG	C	1	2,1	14,14,15	0.51	0	17,19,21	1.09	1 (5%)
2	NAG	C	2	2	14,14,15	0.48	0	17,19,21	1.18	1 (5%)
2	MAN	C	3	2	11,11,12	0.74	0	15,15,17	1.34	1 (6%)
2	NAG	D	1	2,1	14,14,15	0.48	0	17,19,21	1.30	1 (5%)
2	NAG	D	2	2	14,14,15	0.51	0	17,19,21	1.18	2 (11%)
2	MAN	D	3	2	11,11,12	0.73	0	15,15,17	1.64	2 (13%)

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	1/1/5/7	2/6/23/26	0/1/1/1
2	NAG	C	2	2	-	3/6/23/26	0/1/1/1
2	MAN	C	3	2	1/1/4/5	1/2/19/22	0/1/1/1
2	NAG	D	1	2,1	-	3/6/23/26	0/1/1/1
2	NAG	D	2	2	-	3/6/23/26	0/1/1/1
2	MAN	D	3	2	1/1/4/5	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	3	MAN	C1-C2-C3	4.91	115.70	109.67
2	C	3	MAN	C1-C2-C3	4.03	114.62	109.67
2	D	1	NAG	C1-O5-C5	3.89	117.47	112.19
2	C	2	NAG	C4-C3-C2	-3.69	105.60	111.02
2	D	2	NAG	C1-O5-C5	3.30	116.66	112.19
2	C	1	NAG	C1-O5-C5	2.65	115.78	112.19
2	D	3	MAN	C2-C3-C4	2.43	115.11	110.89
2	D	2	NAG	C2-N2-C7	-2.17	119.81	122.90

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	C	1	NAG	C1
2	C	3	MAN	C1
2	D	3	MAN	C1

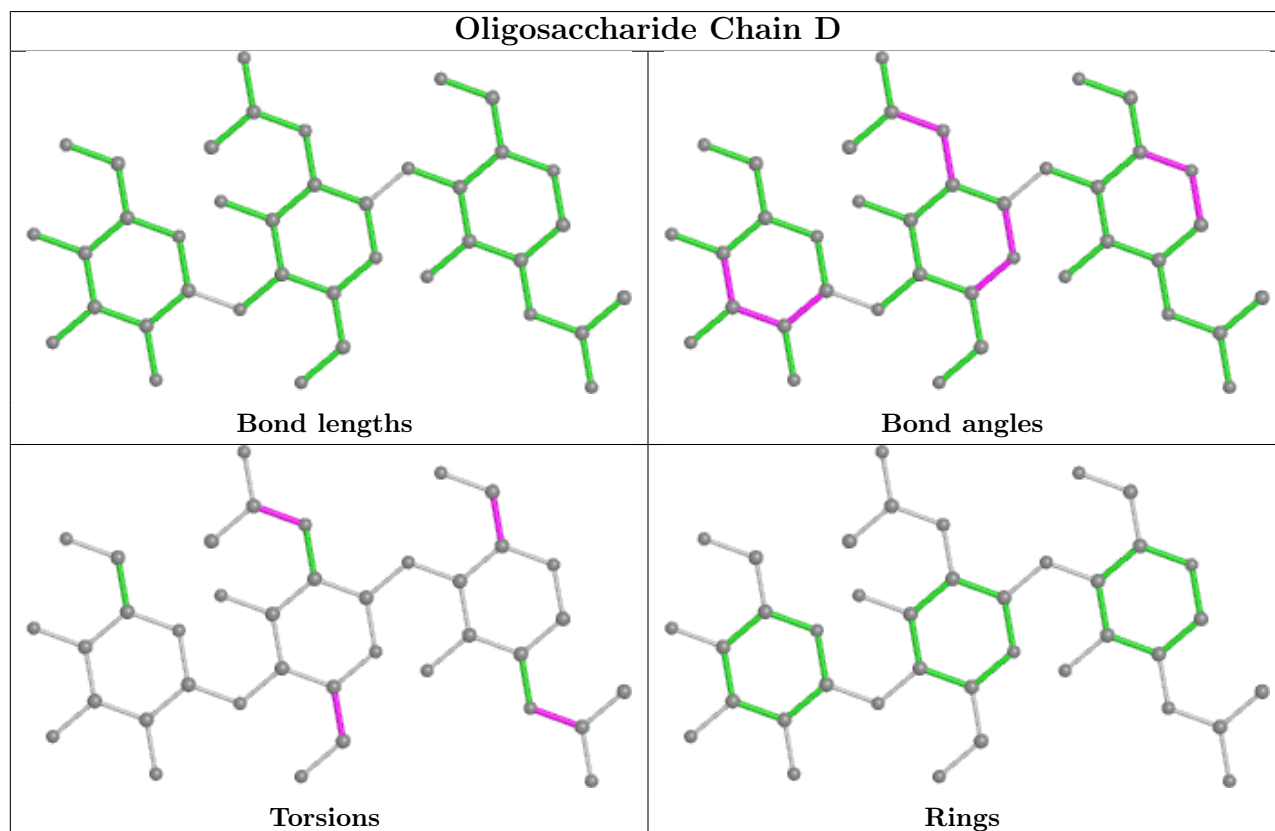
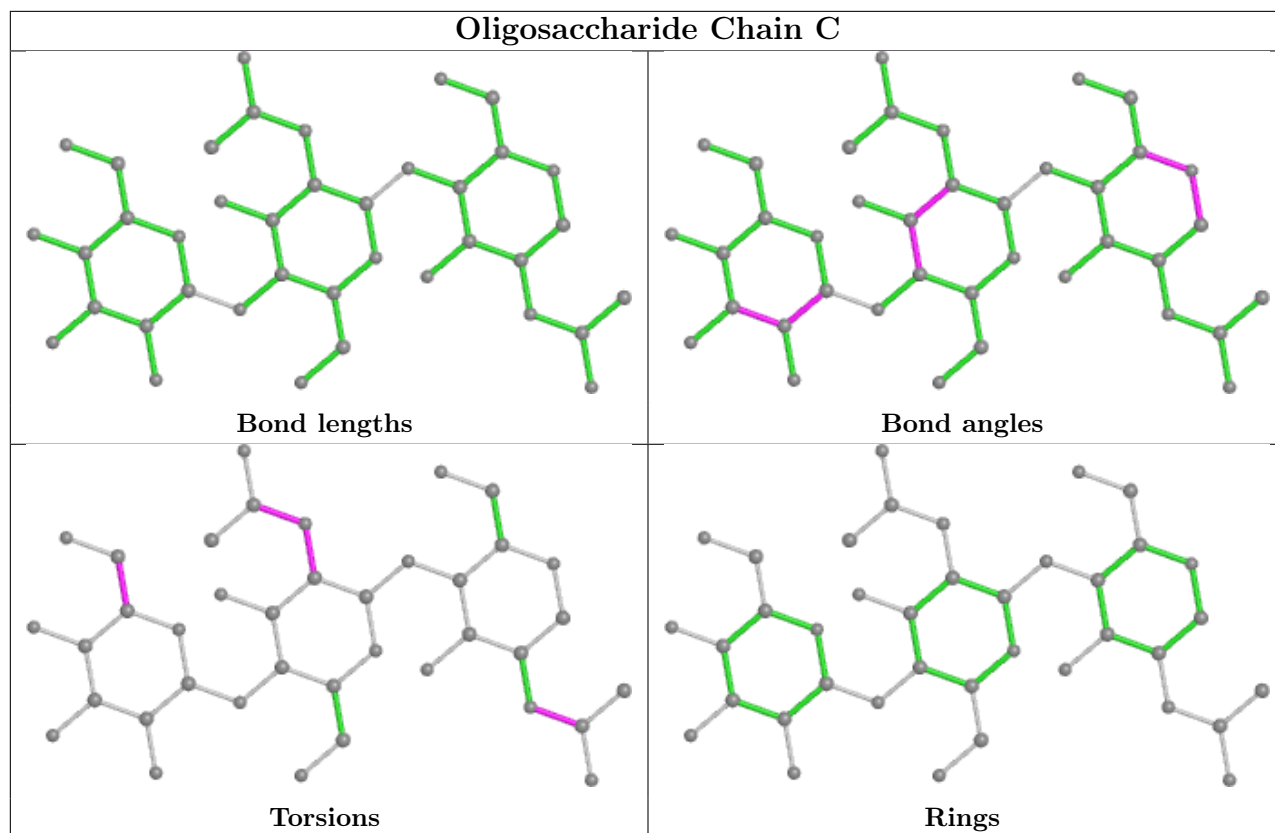
All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	C	2	NAG	C3-C2-N2-C7
2	D	1	NAG	O7-C7-N2-C2
2	D	1	NAG	C8-C7-N2-C2
2	C	1	NAG	C8-C7-N2-C2
2	D	2	NAG	C8-C7-N2-C2
2	C	1	NAG	O7-C7-N2-C2
2	D	2	NAG	O7-C7-N2-C2
2	C	2	NAG	C8-C7-N2-C2
2	C	2	NAG	O7-C7-N2-C2
2	D	1	NAG	O5-C5-C6-O6
2	C	3	MAN	O5-C5-C6-O6
2	D	2	NAG	O5-C5-C6-O6

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.



5.6 Ligand geometry

6 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
3	GOL	A	604	-	5,5,5	0.33	0	5,5,5	0.35	0
3	GOL	B	608	-	5,5,5	0.36	0	5,5,5	0.22	0
3	GOL	B	606	-	5,5,5	0.35	0	5,5,5	0.54	0
3	GOL	B	607	-	5,5,5	0.27	0	5,5,5	0.32	0
3	GOL	B	605	-	5,5,5	0.45	0	5,5,5	0.50	0
3	GOL	B	604	-	5,5,5	0.39	0	5,5,5	0.59	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	GOL	A	604	-	-	2/4/4/4	-
3	GOL	B	608	-	-	2/4/4/4	-
3	GOL	B	606	-	-	2/4/4/4	-
3	GOL	B	607	-	-	3/4/4/4	-
3	GOL	B	605	-	-	2/4/4/4	-
3	GOL	B	604	-	-	4/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	604	GOL	C1-C2-C3-O3
3	A	604	GOL	O2-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
3	B	604	GOL	C1-C2-C3-O3
3	B	607	GOL	C1-C2-C3-O3
3	B	607	GOL	O2-C2-C3-O3
3	B	608	GOL	C1-C2-C3-O3
3	B	608	GOL	O2-C2-C3-O3
3	B	604	GOL	O2-C2-C3-O3
3	B	604	GOL	O1-C1-C2-C3
3	B	605	GOL	C1-C2-C3-O3
3	B	606	GOL	C1-C2-C3-O3
3	B	606	GOL	O2-C2-C3-O3
3	B	604	GOL	O1-C1-C2-O2
3	B	605	GOL	O2-C2-C3-O3
3	B	607	GOL	O1-C1-C2-C3

There are no ring outliers.

5 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	604	GOL	2	0
3	B	608	GOL	2	0
3	B	606	GOL	2	0
3	B	607	GOL	1	0
3	B	605	GOL	3	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](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

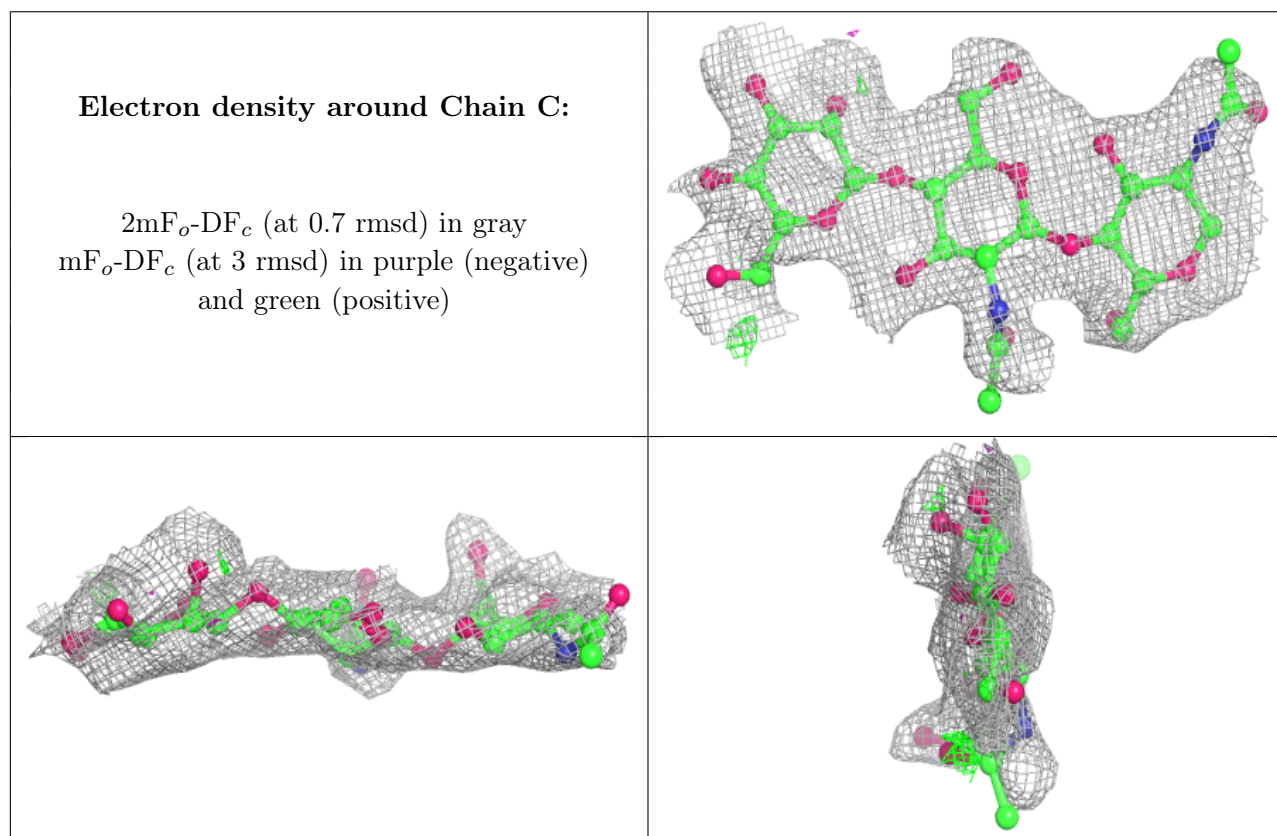
6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

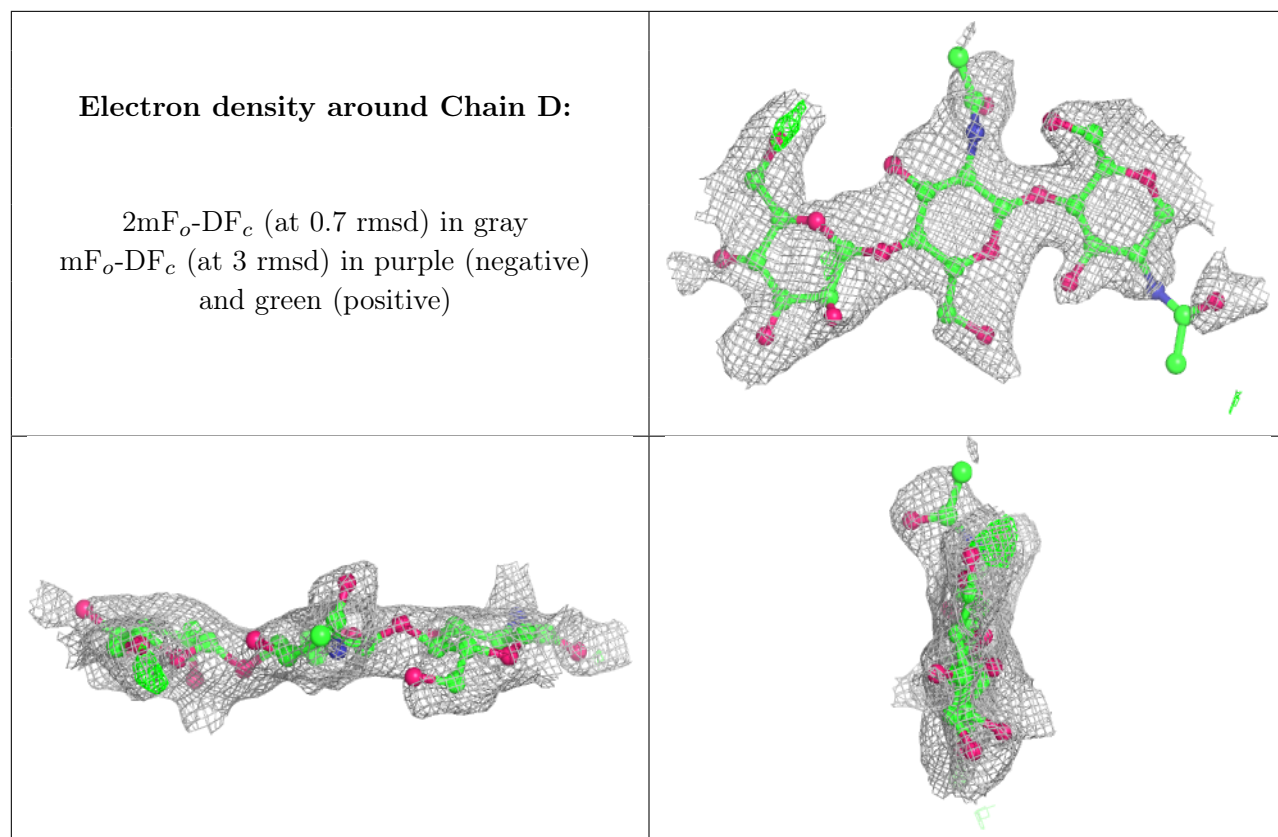
Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

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](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.