Full wwPDB X-ray Structure Validation Report (i)

Jun 25, 2024 – 08:33 PM EDT

PDB ID	:	6YTB
Title	:	GLYCOSYLATED KNOB/DUMMY-HOLE/DUMMY FC FRAGMENT
Authors	:	Kuglstatter, A.; Leibrock, L.; Benz, J.
Deposited on	:	2020-04-24
Resolution	:	1.65 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

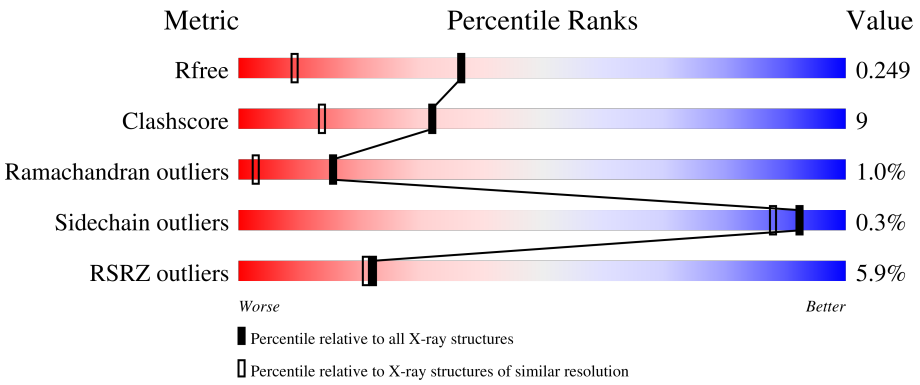
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.65 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	1827 (1.66-1.66)
Clashscore	141614	1931 (1.66-1.66)
Ramachandran outliers	138981	1891 (1.66-1.66)
Sidechain outliers	138945	1891 (1.66-1.66)
RSRZ outliers	127900	1791 (1.66-1.66)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	245	7%, 69%, 16%, •, 13%
2	B	245	3%, 75%, 10%, •, 13%
3	C	8	12%, 62%, 25%
3	D	8	25%, 75%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 3873 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 Immunoglobulin gamma-1 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	207	1718	1099	286	326	7	0	8	0

There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	366	TRP	THR	engineered mutation	UNP P0DOX5
A	370	GLU	LYS	engineered mutation	UNP P0DOX5
A	448	GLY	-	expression tag	UNP P0DOX5
A	449	GLY	-	expression tag	UNP P0DOX5
A	450	GLY	-	expression tag	UNP P0DOX5
A	451	GLY	-	expression tag	UNP P0DOX5
A	452	SER	-	expression tag	UNP P0DOX5
A	453	HIS	-	expression tag	UNP P0DOX5
A	454	HIS	-	expression tag	UNP P0DOX5
A	455	HIS	-	expression tag	UNP P0DOX5
A	456	HIS	-	expression tag	UNP P0DOX5
A	457	HIS	-	expression tag	UNP P0DOX5
A	458	HIS	-	expression tag	UNP P0DOX5
A	459	HIS	-	expression tag	UNP P0DOX5
A	460	HIS	-	expression tag	UNP P0DOX5

- Molecule 2 is a protein called Immunoglobulin gamma-1 heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	209	1730	1104	290	329	7	0	8	0

There are 17 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	357	LYS	GLU	engineered mutation	UNP P0DOX5

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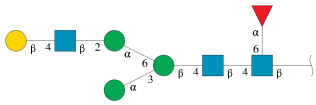
Chain	Residue	Modelled	Actual	Comment	Reference
B	366	SER	THR	engineered mutation	UNP P0DOX5
B	368	ALA	LEU	engineered mutation	UNP P0DOX5
B	407	VAL	TYR	engineered mutation	UNP P0DOX5
B	448	GLY	-	expression tag	UNP P0DOX5
B	449	GLY	-	expression tag	UNP P0DOX5
B	450	GLY	-	expression tag	UNP P0DOX5
B	451	GLY	-	expression tag	UNP P0DOX5
B	452	SER	-	expression tag	UNP P0DOX5
B	453	HIS	-	expression tag	UNP P0DOX5
B	454	HIS	-	expression tag	UNP P0DOX5
B	455	HIS	-	expression tag	UNP P0DOX5
B	456	HIS	-	expression tag	UNP P0DOX5
B	457	HIS	-	expression tag	UNP P0DOX5
B	458	HIS	-	expression tag	UNP P0DOX5
B	459	HIS	-	expression tag	UNP P0DOX5
B	460	HIS	-	expression tag	UNP P0DOX5

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	8	96	54	3	39	0	0	0
			Total	C	N	O			
3	D	8	96	54	3	39	0	0	0

- Molecule 4 is water.

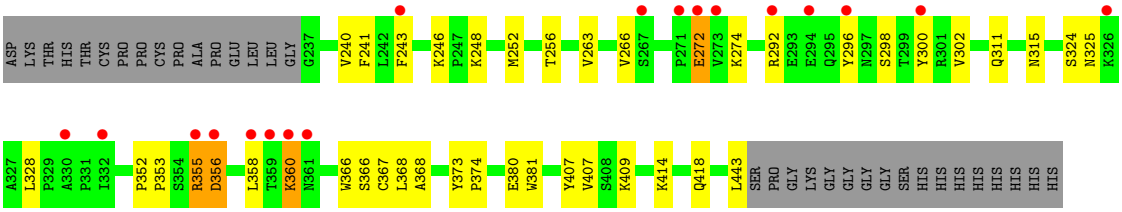
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	A	93	93	93	0	0
			Total	O		
4	B	140	140	140	0	0

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.

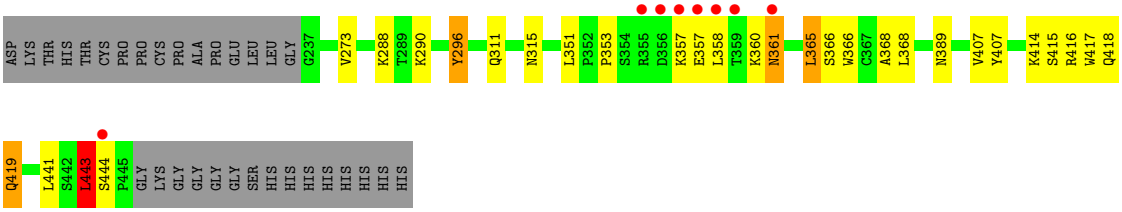
• Molecule 1: Immunoglobulin gamma-1 heavy chain

Chain A:



• Molecule 2: Immunoglobulin gamma-1 heavy chain

Chain B:



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

Chain C:

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

Chain D:

NAG1
NAG2
BMA3
MAN4
NAG5
GAL6
MAN7
FUC8

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	49.16Å 75.22Å 149.48Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.70 – 1.65 74.74 – 1.65	Depositor EDS
% Data completeness (in resolution range)	91.4 (46.70-1.65) 91.4 (74.74-1.65)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.61 (at 1.65Å)	Xtriage
Refinement program	PHENIX dev_3893	Depositor
R, R_{free}	0.216 , 0.249 0.216 , 0.249	Depositor DCC
R_{free} test set	3023 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å^2)	28.2	Xtriage
Anisotropy	0.046	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 36.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	3873	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 16.66% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, MAN, FUC, NAG, GAL

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	0.51	1/1771 (0.1%)	0.82	7/2405 (0.3%)
2	B	0.52	1/1783 (0.1%)	0.83	7/2421 (0.3%)
All	All	0.51	2/3554 (0.1%)	0.83	14/4826 (0.3%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
2	B	0	1
All	All	0	3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	360	LYS	CE-NZ	8.24	1.69	1.49
2	B	443	LEU	CG-CD2	-6.55	1.27	1.51

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	443	LEU	CB-CG-CD2	15.29	136.99	111.00
2	B	365	LEU	CB-CG-CD1	10.10	128.18	111.00
1	A	360	LYS	CG-CD-CE	-9.00	84.90	111.90
1	A	360	LYS	CD-CE-NZ	-8.43	92.31	111.70
1	A	328	LEU	CA-CB-CG	7.46	132.46	115.30
2	B	273	VAL	CG1-CB-CG2	7.20	122.42	110.90
1	A	356	ASP	CB-CG-OD2	-7.07	111.94	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	443	LEU	CA-CB-CG	6.78	130.89	115.30
2	B	443	LEU	CD1-CG-CD2	-6.70	90.39	110.50
1	A	443	LEU	CB-CG-CD2	6.41	121.89	111.00
2	B	296	TYR	CB-CG-CD1	-6.35	117.19	121.00
1	A	360	LYS	CB-CG-CD	6.03	127.28	111.60
1	A	360	LYS	CA-CB-CG	5.85	126.27	113.40
2	B	296	TYR	CB-CG-CD2	5.38	124.22	121.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	272	GLU	Sidechain
1	A	355	ARG	Peptide
2	B	389	ASN	Peptide

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	1718	0	1678	37	0
2	B	1730	0	1690	20	0
3	C	96	0	82	3	0
3	D	96	0	82	0	0
4	A	93	0	0	6	2
4	B	140	0	0	4	2
All	All	3873	0	3532	55	2

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

All (55) 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:360:LYS:CE	1:A:360:LYS:NZ	1.69	1.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:290:LYS:NZ	4:B:601:HOH:O	1.89	1.05
1:A:360:LYS:NZ	1:A:360:LYS:HG3	1.67	1.03
1:A:360:LYS:HG3	1:A:360:LYS:HZ2	1.38	0.88
1:A:360:LYS:NZ	1:A:360:LYS:CG	2.36	0.88
1:A:360:LYS:NZ	1:A:360:LYS:CD	2.38	0.85
1:A:352:PRO:O	4:A:601:HOH:O	1.95	0.84
1:A:366[A]:TRP:CD1	4:A:601:HOH:O	2.44	0.71
1:A:360:LYS:O	1:A:414:LYS:HE2	1.92	0.69
1:A:366[A]:TRP:CH2	1:A:409:LYS:HD3	2.29	0.68
1:A:256:THR:HG23	4:A:652:HOH:O	1.93	0.67
1:A:380:GLU:OE2	4:A:602:HOH:O	2.14	0.66
1:A:366[A]:TRP:HD1	4:A:601:HOH:O	1.79	0.64
1:A:272:GLU:O	1:A:325:ASN:ND2	2.31	0.64
1:A:246:LYS:NZ	3:C:6:GAL:O4	2.18	0.63
1:A:355:ARG:HA	1:A:358:LEU:HD23	1.82	0.61
1:A:360:LYS:HZ2	1:A:360:LYS:CG	2.07	0.60
2:B:415:SER:O	2:B:419:GLN:HG2	2.02	0.59
1:A:368[A]:LEU:HD13	1:A:407[A]:TYR:CZ	2.37	0.59
2:B:288:LYS:O	4:B:601:HOH:O	2.17	0.57
2:B:365:LEU:HD12	2:B:441:LEU:CD2	2.35	0.56
2:B:351:LEU:HB2	2:B:366[A]:SER:HB2	1.91	0.52
1:A:360:LYS:HZ2	1:A:360:LYS:CD	2.20	0.51
2:B:365:LEU:HD11	2:B:417:TRP:CZ3	2.46	0.51
1:A:373[A]:TYR:CG	1:A:374:PRO:HA	2.47	0.50
2:B:360:LYS:O	2:B:361:ASN:CB	2.60	0.50
1:A:360:LYS:HG3	1:A:360:LYS:HZ1	1.72	0.49
2:B:416:ARG:O	2:B:419:GLN:HB2	2.12	0.49
1:A:243:PHE:CG	3:C:5:NAG:H5	2.47	0.49
1:A:353:PRO:HA	4:A:601:HOH:O	2.12	0.48
2:B:358:LEU:O	2:B:414:LYS:HD3	2.14	0.48
1:A:296:TYR:C	1:A:298:SER:H	2.17	0.48
2:B:288:LYS:HB2	4:B:601:HOH:O	2.12	0.48
2:B:353:PRO:HA	4:B:607:HOH:O	2.14	0.48
1:A:240:VAL:HG22	1:A:263:VAL:HG22	1.95	0.48
2:B:414:LYS:HD2	2:B:418:GLN:NE2	2.31	0.46
1:A:292:ARG:CB	1:A:302:VAL:HG22	2.45	0.46
1:A:367:CYS:HB2	1:A:381:TRP:CZ2	2.51	0.46
2:B:357[A]:LYS:HD2	2:B:360:LYS:HG3	1.97	0.45
1:A:248:LYS:O	1:A:252[B]:MET:HG3	2.17	0.45
2:B:311:GLN:HG3	2:B:315:ASN:ND2	2.32	0.45
1:A:266:VAL:O	1:A:300:TYR:HB2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:353:PRO:HD3	2:B:365:LEU:HD13	2.00	0.44
2:B:414:LYS:HB3	2:B:414:LYS:HE2	1.70	0.44
2:B:443:LEU:HD13	2:B:444:SER:N	2.33	0.43
1:A:414:LYS:HE3	1:A:414:LYS:HB3	1.65	0.43
1:A:241:PHE:CE1	3:C:2:NAG:H4	2.54	0.42
1:A:414:LYS:O	1:A:418:GLN:HG3	2.19	0.42
1:A:366[A]:TRP:CH2	2:B:368[A]:ALA:HB1	2.55	0.42
1:A:407[A]:TYR:CE2	2:B:407[A]:VAL:HG11	2.56	0.41
1:A:274:LYS:HB3	1:A:324:SER:HB2	2.03	0.41
1:A:292:ARG:HB2	1:A:302:VAL:HG22	2.02	0.41
1:A:311:GLN:HG3	1:A:315:ASN:ND2	2.36	0.41
1:A:296:TYR:C	1:A:298:SER:N	2.74	0.40
2:B:357[A]:LYS:O	2:B:360:LYS:HB2	2.21	0.40

All (2) 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:602:HOH:O	4:B:702:HOH:O[3_555]	2.00	0.20
4:A:644:HOH:O	4:B:640:HOH:O[3_555]	2.05	0.15

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	203/245 (83%)	195 (96%)	7 (3%)	1 (0%)	29 11
2	B	205/245 (84%)	200 (98%)	2 (1%)	3 (2%)	10 1
All	All	408/490 (83%)	395 (97%)	9 (2%)	4 (1%)	15 3

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	356	ASP
2	B	361	ASN
2	B	419	GLN
2	B	296	TYR

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	200/223 (90%)	200 (100%)	0	100	100
2	B	202/223 (91%)	201 (100%)	1 (0%)	88	81
All	All	402/446 (90%)	401 (100%)	1 (0%)	92	89

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	443	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	418	GLN
2	B	418	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)

16 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	C	1	1,3	14,14,15	0.30	0	17,19,21	0.64	0
3	NAG	C	2	3	14,14,15	0.34	0	17,19,21	0.49	0
3	BMA	C	3	3	11,11,12	1.20	1 (9%)	15,15,17	1.27	2 (13%)
3	MAN	C	4	3	11,11,12	1.11	1 (9%)	15,15,17	1.61	3 (20%)
3	NAG	C	5	3	14,14,15	0.84	1 (7%)	17,19,21	0.65	0
3	GAL	C	6	3	11,11,12	1.33	2 (18%)	15,15,17	1.52	2 (13%)
3	MAN	C	7	3	11,11,12	1.35	3 (27%)	15,15,17	1.24	1 (6%)
3	FUC	C	8	3	10,10,11	0.86	1 (10%)	14,14,16	0.95	1 (7%)
3	NAG	D	1	2,3	14,14,15	0.51	0	17,19,21	0.60	0
3	NAG	D	2	3	14,14,15	0.68	1 (7%)	17,19,21	0.69	0
3	BMA	D	3	3	11,11,12	0.88	1 (9%)	15,15,17	0.78	0
3	MAN	D	4	3	11,11,12	0.90	1 (9%)	15,15,17	1.50	2 (13%)
3	NAG	D	5	3	14,14,15	0.51	0	17,19,21	0.45	0
3	GAL	D	6	3	11,11,12	1.42	2 (18%)	15,15,17	1.23	2 (13%)
3	MAN	D	7	3	11,11,12	1.21	1 (9%)	15,15,17	0.83	0
3	FUC	D	8	3	10,10,11	1.00	1 (10%)	14,14,16	0.75	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	C	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	C	2	3	-	0/6/23/26	0/1/1/1
3	BMA	C	3	3	-	0/2/19/22	0/1/1/1
3	MAN	C	4	3	-	1/2/19/22	0/1/1/1
3	NAG	C	5	3	-	0/6/23/26	0/1/1/1
3	GAL	C	6	3	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MAN	C	7	3	-	2/2/19/22	0/1/1/1
3	FUC	C	8	3	-	-	0/1/1/1
3	NAG	D	1	2,3	-	0/6/23/26	0/1/1/1
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	-	0/6/23/26	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	FUC	D	8	3	-	-	0/1/1/1

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	3	BMA	C1-C2	3.55	1.60	1.52
3	C	6	GAL	C1-C2	3.36	1.59	1.52
3	D	6	GAL	C1-C2	3.17	1.59	1.52
3	C	7	MAN	C1-C2	2.84	1.58	1.52
3	D	6	GAL	O2-C2	2.74	1.49	1.43
3	D	7	MAN	O5-C1	-2.69	1.39	1.43
3	D	3	BMA	O5-C1	-2.66	1.39	1.43
3	C	5	NAG	O5-C1	-2.54	1.39	1.43
3	D	2	NAG	O5-C1	-2.38	1.39	1.43
3	D	8	FUC	C2-C3	2.38	1.56	1.52
3	D	4	MAN	O5-C5	2.38	1.48	1.43
3	C	7	MAN	O5-C1	-2.31	1.40	1.43
3	C	7	MAN	C2-C3	2.13	1.55	1.52
3	C	6	GAL	C2-C3	2.12	1.55	1.52
3	C	4	MAN	C2-C3	-2.06	1.49	1.52
3	C	8	FUC	C1-C2	2.01	1.56	1.52

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	4	MAN	C1-O5-C5	4.42	118.19	112.19
3	C	4	MAN	C1-O5-C5	4.28	117.99	112.19
3	C	4	MAN	O2-C2-C3	-3.45	103.23	110.14
3	D	4	MAN	O2-C2-C3	-3.14	103.84	110.14
3	C	6	GAL	C1-O5-C5	3.09	116.38	112.19
3	C	3	BMA	C1-O5-C5	2.75	115.92	112.19
3	C	3	BMA	O2-C2-C3	-2.74	104.65	110.14
3	C	7	MAN	O2-C2-C3	-2.63	104.86	110.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	6	GAL	C1-C2-C3	2.56	112.82	109.67
3	C	6	GAL	C1-C2-C3	2.44	112.66	109.67
3	D	6	GAL	O2-C2-C1	2.38	114.03	109.15
3	C	8	FUC	C1-C2-C3	2.31	112.51	109.67
3	C	4	MAN	C3-C4-C5	2.00	113.81	110.24

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	D	6	GAL	O5-C5-C6-O6
3	C	7	MAN	O5-C5-C6-O6
3	C	7	MAN	C4-C5-C6-O6
3	D	6	GAL	C4-C5-C6-O6
3	C	4	MAN	C4-C5-C6-O6

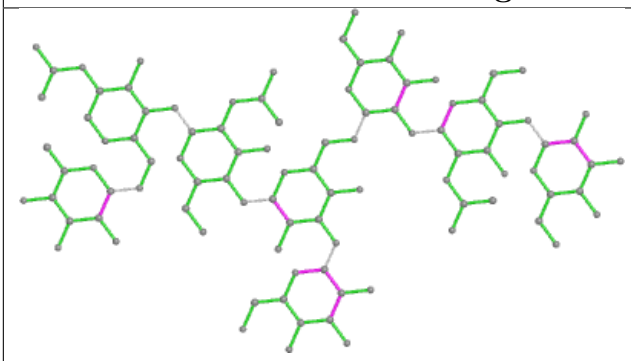
There are no ring outliers.

3 monomers are involved in 3 short contacts:

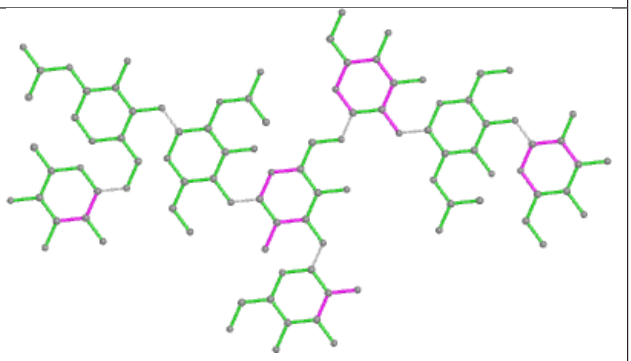
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	6	GAL	1	0
3	C	5	NAG	1	0
3	C	2	NAG	1	0

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

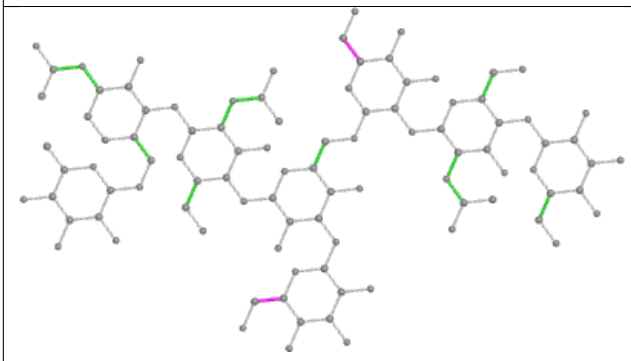
Oligosaccharide Chain C



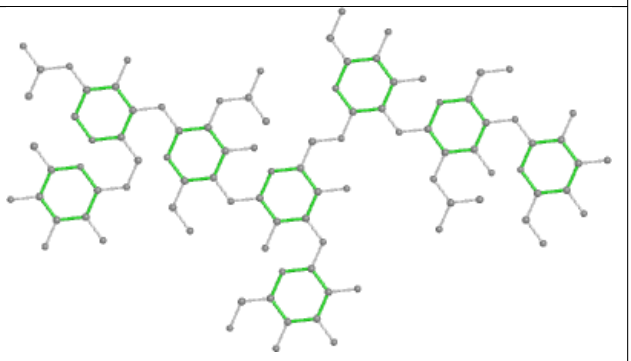
Bond lengths



Bond angles

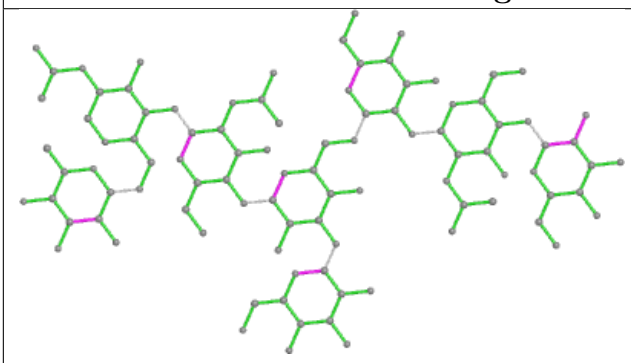


Torsions

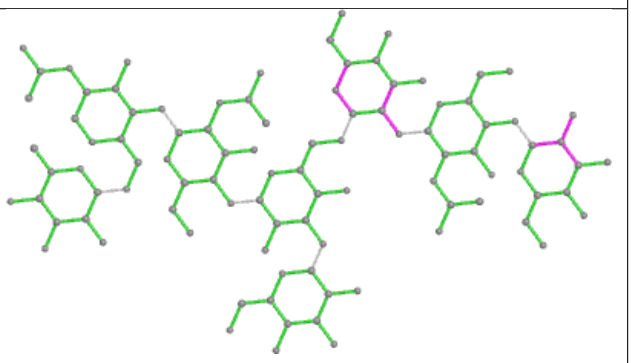


Rings

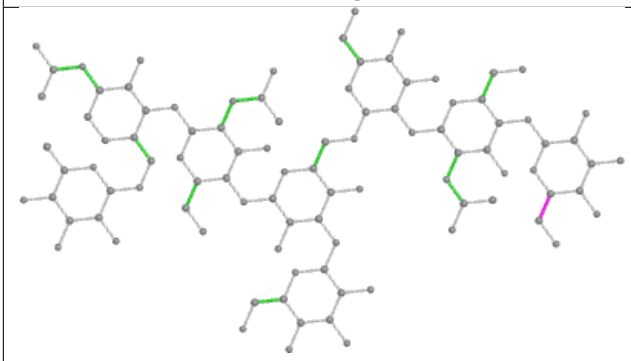
Oligosaccharide Chain D



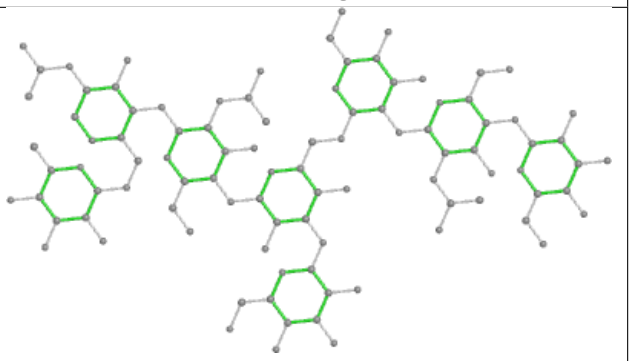
Bond lengths



Bond angles



Torsions



Rings

5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 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	212/245 (86%)	0.39	18 (8%)	10	10	20, 35, 82, 92	10 (4%)
2	B	214/245 (87%)	0.13	8 (3%)	41	41	19, 30, 55, 84	10 (4%)
All	All	426/490 (86%)	0.26	26 (6%)	22	19	19, 32, 73, 92	20 (4%)

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	358	LEU	7.9
2	B	359	THR	4.6
1	A	356	ASP	4.2
2	B	355	ARG	4.1
1	A	359	THR	4.0
1	A	355	ARG	3.9
1	A	358	LEU	3.7
2	B	444	SER	3.6
1	A	330	ALA	3.6
1	A	300	TYR	3.6
1	A	271	PRO	3.1
1	A	272	GLU	3.1
1	A	360	LYS	3.0
1	A	267	SER	2.9
2	B	356	ASP	2.8
1	A	326	LYS	2.8
1	A	296	TYR	2.7
1	A	273	VAL	2.6
1	A	361	ASN	2.6
2	B	357[A]	LYS	3.7
2	B	357[A]	LYS	3.7
1	A	292	ARG	2.4
1	A	332	ILE	2.3
1	A	294	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	361	ASN	2.1
1	A	243	PHE	2.1

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)

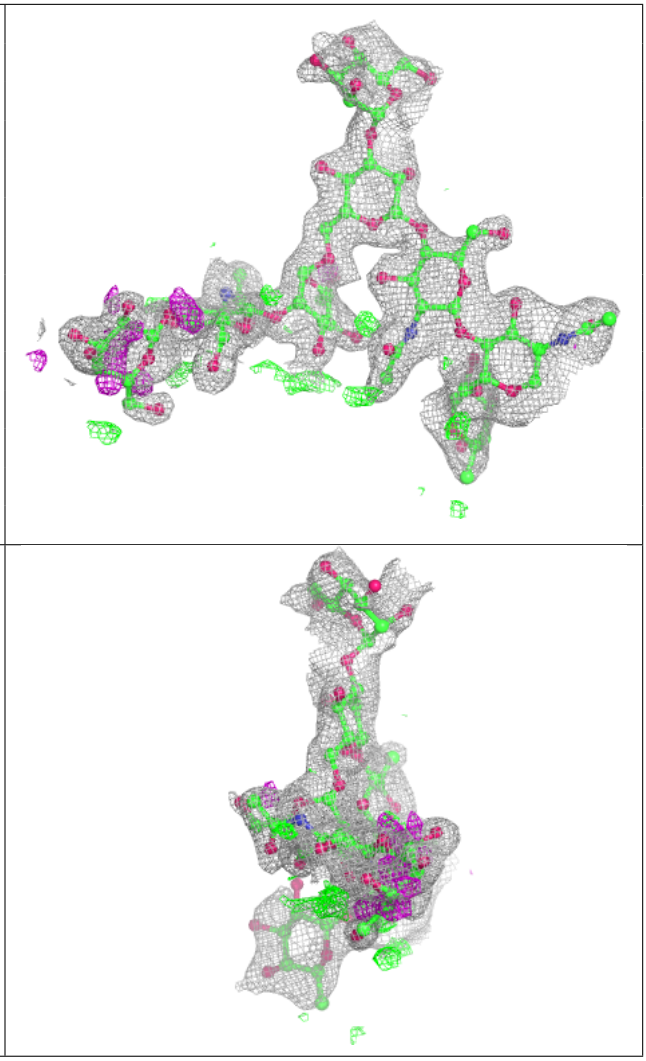
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	MAN	C	7	11/12	0.68	0.20	75,81,84,86	0
3	NAG	C	5	14/15	0.78	0.17	41,46,50,52	0
3	NAG	C	1	14/15	0.79	0.13	59,71,77,78	0
3	GAL	C	6	11/12	0.80	0.27	39,41,46,49	0
3	FUC	C	8	10/11	0.80	0.19	82,88,90,93	0
3	MAN	D	7	11/12	0.82	0.16	52,59,66,71	0
3	FUC	D	8	10/11	0.83	0.12	39,41,44,46	0
3	NAG	C	2	14/15	0.84	0.13	44,54,65,67	0
3	BMA	C	3	11/12	0.86	0.12	43,51,60,62	0
3	GAL	D	6	11/12	0.86	0.24	34,39,50,50	0
3	MAN	C	4	11/12	0.89	0.17	41,49,59,61	0
3	MAN	D	4	11/12	0.89	0.10	35,40,44,46	0
3	NAG	D	5	14/15	0.89	0.12	34,38,47,47	0
3	NAG	D	1	14/15	0.93	0.08	30,37,47,48	0
3	BMA	D	3	11/12	0.94	0.09	35,39,42,46	0
3	NAG	D	2	14/15	0.95	0.09	30,37,44,44	0

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

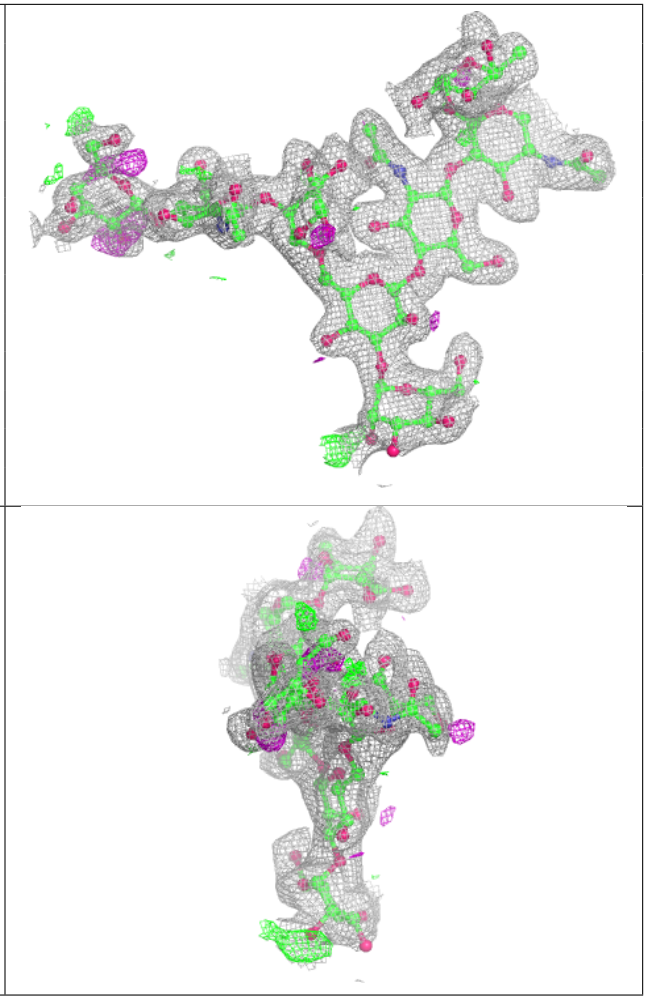
Electron density around Chain C:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain D:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.