



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 8, 2025 – 09:53 PM JST

PDB ID : 5GSQ / pdb_00005gsq
Title : Crystal structure of IgG Fc with a homogeneous glycoform and Antibody-Dependent Cellular Cytotoxicity
Authors : Chen, C.-L.; Hsu, J.-C.; Lin, C.-W.; Wu, C.-Y.; Wong, C.-H.; Ma, C.
Deposited on : 2016-08-17
Resolution : 1.85 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4-5-2 with Phenix2.0rc1
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 2.0rc1
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.006 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.45.1

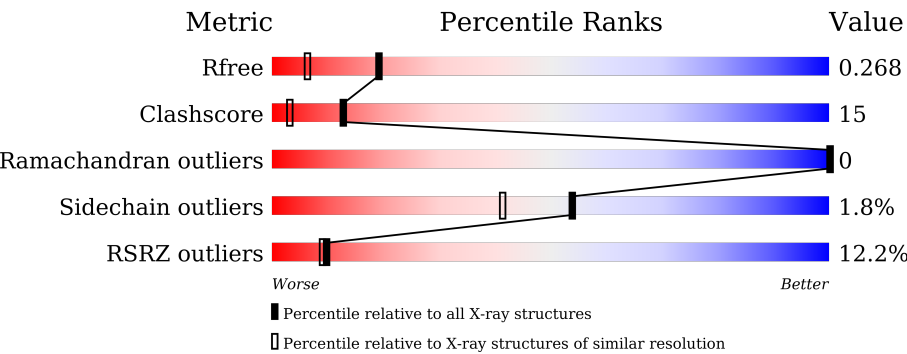
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.85 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}	164625	3097 (1.86-1.86)
Clashscore	180529	3359 (1.86-1.86)
Ramachandran outliers	177936	3335 (1.86-1.86)
Sidechain outliers	177891	3335 (1.86-1.86)
RSRZ outliers	164620	3097 (1.86-1.86)

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

Mol	Chain	Length	Quality of chain
1	A	225	8% 73% 17% • 8%
1	B	225	8% 76% 16% 8%
1	C	225	11% 71% 21% 8%
1	D	225	18% 62% 22% • 14%
2	E	7	71% 29%
2	F	7	71% 29%

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Mol	Chain	Length	Quality of chain
3	G	8	 75%25%
4	H	5	 100%

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	MAN	E	7	-	-	X	-
4	NAG	H	1	-	-	X	-
4	NAG	H	5	-	-	X	-

2 Entry composition [i](#)

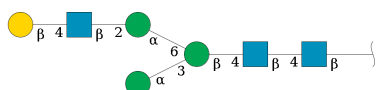
There are 5 unique types of molecules in this entry. The entry contains 7717 atoms, of which 0 are hydrogens and 0 are deuteriums.

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.

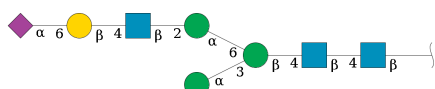
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	208	Total	C	N	O	S	0	0	0
			1664	1059	280	319	6			
1	B	208	Total	C	N	O	S	0	0	0
			1664	1059	280	319	6			
1	C	208	Total	C	N	O	S	0	0	0
			1664	1059	280	319	6			
1	D	194	Total	C	N	O	S	0	0	0
			1555	992	261	296	6			

- Molecule 2 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)-2-acetamido-2-deoxy-beta-D-glucopyranose.



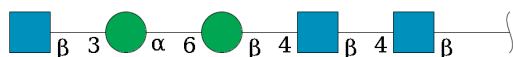
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	7	Total	C	N	O	0	0	0
			86	48	3	35			
2	F	7	Total	C	N	O	0	0	0
			86	48	3	35			

- Molecule 3 is an oligosaccharide called N-acetyl-alpha-neuraminic acid-(2-6)-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)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	G	8	Total	C	N	O	0	0	0
			106	59	4	43			

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	H	5	Total	C	N	O	0	0	0
			64	36	3	25			

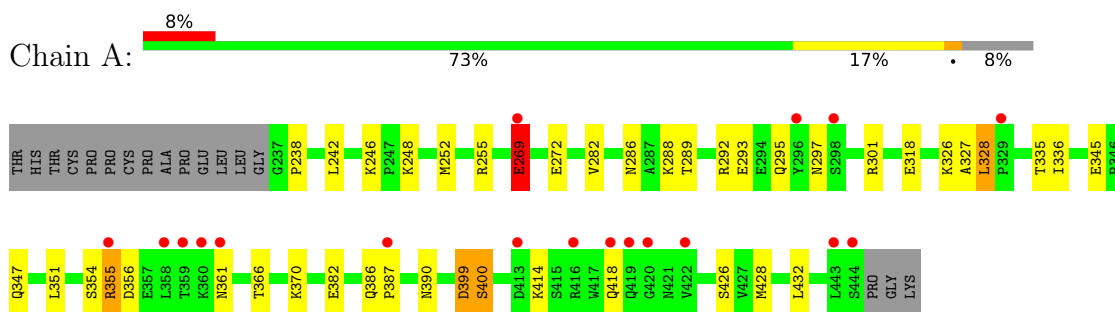
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	224	Total	O	0	0
			224	224		
5	B	226	Total	O	0	0
			226	226		
5	C	198	Total	O	0	0
			198	198		
5	D	180	Total	O	0	0
			180	180		

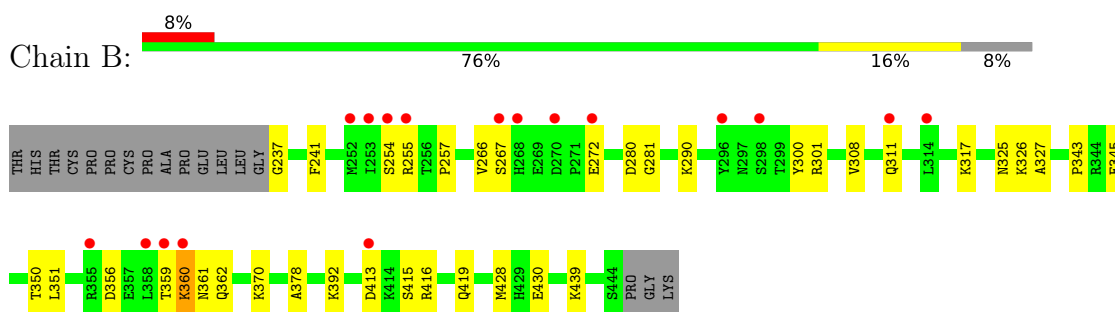
3 Residue-property plots [i](#)

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.

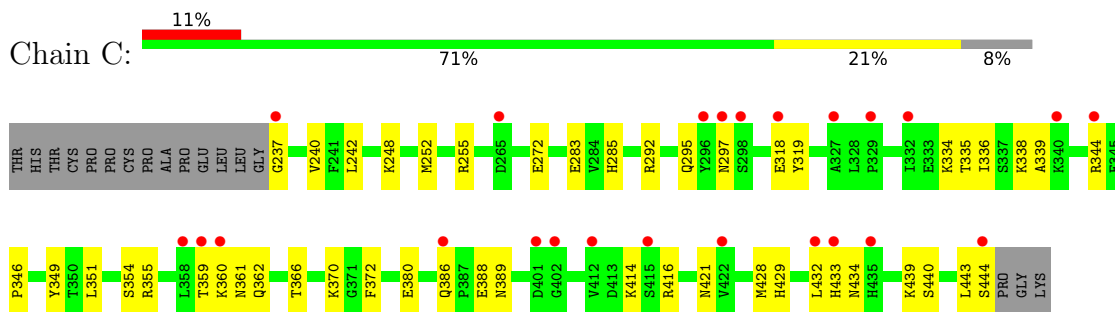
- Molecule 1: Ig gamma-1 chain C region



- Molecule 1: Ig gamma-1 chain C region

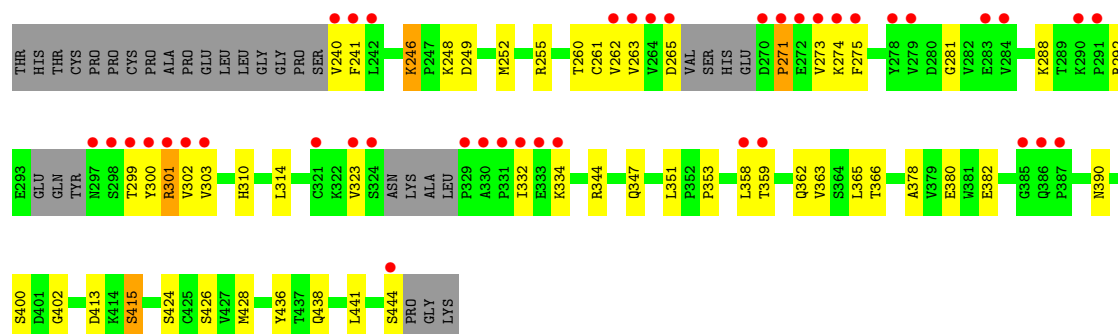


- Molecule 1: Ig gamma-1 chain C region



- Molecule 1: Ig gamma-1 chain C region





- Molecule 2: 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)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain E: 71% 29%



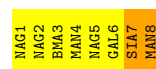
- Molecule 2: beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain F: 71% 29%



- Molecule 3: N-acetyl-alpha-neuraminic acid-(2-6)-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)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G: 75% 25%



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

Chain H: 100%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	50.18Å 158.41Å 66.91Å 90.00° 109.04° 90.00°	Depositor
Resolution (Å)	49.42 – 1.85 49.42 – 1.85	Depositor EDS
% Data completeness (in resolution range)	86.8 (49.42-1.85) 84.0 (49.42-1.85)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	0.03	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.98 (at 1.86Å)	Xtriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.227 , 0.267 0.228 , 0.268	Depositor DCC
R_{free} test set	3640 reflections (4.34%)	wwPDB-VP
Wilson B-factor (Å ²)	16.6	Xtriage
Anisotropy	0.105	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 42.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.036 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	7717	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.56% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, SIA, GAL, BMA, 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	0.48	2/1710 (0.1%)	0.62	2/2330 (0.1%)
1	B	0.37	0/1710	0.55	0/2330
1	C	0.37	0/1710	0.57	0/2330
1	D	0.72	7/1595 (0.4%)	0.60	1/2168 (0.0%)
All	All	0.50	9/6725 (0.1%)	0.58	3/9158 (0.0%)

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	301	ARG	NE-CZ	-10.85	1.21	1.33
1	D	301	ARG	CZ-NH2	-10.17	1.20	1.33
1	D	301	ARG	CD-NE	-9.53	1.32	1.46
1	D	271	PRO	CA-CB	-9.21	1.47	1.53
1	A	355	ARG	NE-CZ	-8.01	1.24	1.33
1	D	301	ARG	CZ-NH1	-7.82	1.21	1.32
1	D	246	LYS	CE-NZ	-6.62	1.29	1.49
1	D	246	LYS	CD-CE	-6.23	1.33	1.52
1	A	269	GLU	CD-OE1	-5.73	1.14	1.25

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	355	ARG	NE-CZ-NH1	-8.78	112.72	121.50
1	D	246	LYS	CG-CD-CE	-5.68	98.24	111.30
1	A	355	ARG	NH1-CZ-NH2	5.01	125.82	119.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1664	0	1630	38	0
1	B	1664	0	1630	38	0
1	C	1664	0	1630	39	0
1	D	1555	0	1528	70	1
2	E	86	0	73	7	0
2	F	86	0	73	2	0
3	G	106	0	89	1	1
4	H	64	0	53	26	0
5	A	224	0	0	20	1
5	B	226	0	0	26	2
5	C	198	0	0	17	1
5	D	180	0	0	20	0
All	All	7717	0	6706	203	3

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 15.

All (203) 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:400:SER:N	5:A:603:HOH:O	1.95	0.99
1:D:344:ARG:NH2	5:D:601:HOH:O	1.93	0.99
1:C:370:LYS:NZ	5:C:601:HOH:O	1.97	0.96
1:D:301:ARG:HE	4:H:1:NAG:H81	1.25	0.96
1:B:267:SER:C	5:B:604:HOH:O	2.08	0.94
1:C:338:LYS:NZ	1:C:339:ALA:O	2.02	0.91
1:D:248:LYS:NZ	1:D:380:GLU:OE2	2.04	0.91
1:D:246:LYS:HZ1	4:H:5:NAG:H3	1.38	0.89
1:A:293:GLU:OE1	5:A:601:HOH:O	1.90	0.89
1:D:402:GLY:O	5:D:601:HOH:O	1.89	0.88
1:A:272:GLU:OE2	5:A:602:HOH:O	1.92	0.86
1:B:272:GLU:O	1:B:325:ASN:ND2	2.09	0.86
1:B:430:GLU:OE1	5:B:601:HOH:O	1.93	0.85
1:D:400:SER:O	5:D:602:HOH:O	1.96	0.84
1:D:390:ASN:ND2	5:D:604:HOH:O	2.11	0.83

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:246:LYS:NZ	4:H:5:NAG:HN2	1.76	0.82
1:B:280:ASP:OD1	5:B:602:HOH:O	1.95	0.82
5:D:720:HOH:O	4:H:5:NAG:O7	1.97	0.81
1:B:267:SER:OG	5:B:604:HOH:O	1.98	0.80
4:H:1:NAG:N2	4:H:1:NAG:O4	2.14	0.79
1:C:344:ARG:NH1	5:C:606:HOH:O	2.15	0.79
1:B:360:LYS:HD2	1:B:362:GLN:H	1.47	0.79
1:A:361:ASN:O	5:A:604:HOH:O	2.02	0.78
1:D:415:SER:HB2	5:D:726:HOH:O	1.84	0.78
1:D:301:ARG:HE	4:H:1:NAG:C8	1.97	0.77
1:C:386:GLN:OE1	5:C:602:HOH:O	2.03	0.77
1:D:240:VAL:O	1:D:334:LYS:NZ	2.12	0.77
1:C:346:PRO:HB3	1:C:372:PHE:HB3	1.65	0.77
1:B:360:LYS:HE3	1:B:362:GLN:HB2	1.66	0.76
1:C:318:GLU:CD	1:C:335:THR:HG23	2.11	0.76
1:B:317:LYS:HA	5:B:602:HOH:O	1.86	0.76
1:C:429:HIS:HB3	1:C:432:LEU:HD23	1.67	0.75
1:C:252:MET:SD	5:C:733:HOH:O	2.44	0.74
1:D:246:LYS:HD3	1:D:246:LYS:H	1.52	0.74
1:B:326:LYS:O	5:B:605:HOH:O	2.03	0.74
1:D:275:PHE:N	5:D:607:HOH:O	2.20	0.74
1:D:301:ARG:CZ	4:H:1:NAG:O7	2.36	0.73
1:D:240:VAL:HG21	1:D:323:VAL:HG21	1.71	0.73
1:C:237:GLY:N	5:C:609:HOH:O	2.21	0.72
1:B:301:ARG:NH2	5:B:608:HOH:O	2.19	0.72
1:A:297:ASN:O	5:A:605:HOH:O	2.07	0.72
1:B:345:GLU:O	5:B:606:HOH:O	2.07	0.72
1:A:328:LEU:O	5:A:606:HOH:O	2.07	0.71
1:D:260:THR:OG1	4:H:5:NAG:H62	1.90	0.71
1:B:416:ARG:NH2	5:B:610:HOH:O	2.23	0.70
1:C:439:LYS:NZ	5:C:612:HOH:O	2.24	0.70
1:D:301:ARG:NH2	4:H:1:NAG:O7	2.25	0.70
1:A:382:GLU:OE1	5:A:607:HOH:O	2.10	0.69
1:B:281:GLY:O	5:B:607:HOH:O	2.09	0.69
1:D:246:LYS:HE2	5:D:606:HOH:O	1.94	0.68
1:D:246:LYS:CE	4:H:5:NAG:HN2	2.06	0.67
1:D:444:SER:O	5:D:605:HOH:O	2.12	0.67
1:D:261:CYS:SG	5:D:701:HOH:O	2.51	0.67
1:C:318:GLU:OE2	1:C:335:THR:HG23	1.95	0.66
1:A:386:GLN:NE2	1:A:387:PRO:HD2	2.10	0.66
1:C:421:ASN:ND2	5:C:614:HOH:O	2.25	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:D:720:HOH:O	4:H:5:NAG:C7	2.44	0.66
1:B:267:SER:O	5:B:604:HOH:O	2.07	0.66
1:B:290:LYS:HE3	5:B:699:HOH:O	1.96	0.65
1:D:246:LYS:NZ	4:H:5:NAG:H3	2.12	0.65
1:D:246:LYS:HD3	1:D:246:LYS:N	2.11	0.64
1:A:390:ASN:OD1	5:A:608:HOH:O	2.15	0.64
1:B:327:ALA:HB3	5:B:651:HOH:O	1.97	0.64
1:D:246:LYS:HZ2	4:H:5:NAG:HN2	1.44	0.64
1:A:327:ALA:O	5:A:609:HOH:O	2.15	0.63
4:H:1:NAG:H4	4:H:2:NAG:N2	2.12	0.63
1:B:343:PRO:HG3	5:B:613:HOH:O	1.99	0.62
1:A:248:LYS:NZ	1:A:255:ARG:HH12	1.97	0.62
1:D:301:ARG:NE	4:H:1:NAG:O7	2.32	0.62
1:D:438:GLN:NE2	5:D:609:HOH:O	2.32	0.62
1:B:419:GLN:NE2	5:B:603:HOH:O	1.96	0.62
1:D:249:ASP:OD2	5:D:606:HOH:O	2.16	0.62
1:A:295:GLN:O	1:A:297:ASN:N	2.32	0.61
1:D:299:THR:CG2	4:H:1:NAG:H2	2.32	0.60
5:A:823:HOH:O	2:E:5:NAG:H82	2.00	0.60
1:D:382:GLU:OE2	1:D:426:SER:OG	2.20	0.59
1:B:360:LYS:HE2	1:B:362:GLN:O	2.02	0.59
1:D:240:VAL:O	1:D:241:PHE:HD2	1.85	0.59
5:B:817:HOH:O	2:F:7:MAN:H62	2.02	0.59
1:D:292:ARG:HD2	1:D:300:TYR:CD1	2.38	0.59
1:A:361:ASN:OD1	5:A:610:HOH:O	2.17	0.59
5:C:777:HOH:O	3:G:8:MAN:H61	2.02	0.58
4:H:4:MAN:O4	4:H:5:NAG:H2	2.03	0.58
1:C:272:GLU:OE2	5:C:607:HOH:O	2.17	0.58
1:D:248:LYS:HD2	1:D:252:MET:SD	2.44	0.57
1:A:248:LYS:HZ2	1:A:255:ARG:HH12	1.50	0.57
4:H:2:NAG:HO3	4:H:3:BMA:HO2	1.50	0.56
1:C:252:MET:HG3	1:C:428:MET:HE1	1.86	0.56
1:C:240:VAL:O	1:C:334:LYS:HE2	2.06	0.56
1:A:292:ARG:NH1	5:A:626:HOH:O	2.38	0.55
1:C:283:GLU:HG2	1:C:285:HIS:CE1	2.41	0.55
1:B:311:GLN:OE1	1:B:311:GLN:N	2.38	0.55
5:B:804:HOH:O	2:E:7:MAN:H2	2.07	0.55
1:D:378:ALA:HB3	1:D:428:MET:HE3	1.88	0.55
1:B:272:GLU:OE2	1:B:326:LYS:HB2	2.07	0.55
5:B:818:HOH:O	2:E:7:MAN:O2	2.04	0.55
1:D:281:GLY:N	5:D:612:HOH:O	2.40	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:355:ARG:HG2	5:C:618:HOH:O	2.06	0.54
1:C:389:ASN:ND2	5:C:603:HOH:O	2.12	0.54
1:A:242:LEU:HD23	1:A:336:ILE:HG23	1.90	0.54
1:D:359:THR:C	5:D:608:HOH:O	2.51	0.54
1:A:345:GLU:HG3	1:A:432:LEU:HD23	1.90	0.54
1:A:252:MET:HE2	1:A:428:MET:HE1	1.89	0.53
1:C:388:GLU:OE1	1:C:416:ARG:NH2	2.42	0.53
4:H:5:NAG:O4	4:H:5:NAG:O6	2.24	0.53
1:B:360:LYS:HD2	1:B:361:ASN:N	2.23	0.53
1:D:362:GLN:OE1	1:D:413:ASP:HA	2.07	0.53
1:D:262:VAL:HG13	1:D:303:VAL:HG22	1.90	0.53
1:D:323:VAL:HG22	1:D:332:ILE:HG23	1.91	0.53
5:B:812:HOH:O	2:E:7:MAN:C3	2.57	0.53
1:A:289:THR:HG23	5:A:690:HOH:O	2.09	0.52
1:B:237:GLY:N	5:B:623:HOH:O	2.42	0.52
1:A:269:GLU:CD	1:A:269:GLU:H	2.18	0.52
5:B:812:HOH:O	2:E:7:MAN:H2	2.10	0.51
1:B:255:ARG:NE	5:B:620:HOH:O	2.40	0.51
1:D:271:PRO:O	1:D:292:ARG:NH1	2.43	0.51
1:A:347:GLN:NE2	5:A:612:HOH:O	2.23	0.51
1:A:399:ASP:OD1	5:A:603:HOH:O	2.19	0.51
1:B:266:VAL:O	1:B:300:TYR:N	2.34	0.51
1:D:248:LYS:O	1:D:252:MET:HG3	2.11	0.51
1:C:292:ARG:NH1	5:C:627:HOH:O	2.44	0.51
1:A:361:ASN:HB3	5:A:711:HOH:O	2.11	0.50
1:A:326:LYS:N	5:A:602:HOH:O	2.45	0.50
1:C:255:ARG:NH1	5:C:620:HOH:O	2.36	0.50
1:B:272:GLU:OE2	1:B:326:LYS:N	2.40	0.50
1:D:301:ARG:HE	4:H:1:NAG:C7	2.24	0.50
1:A:355:ARG:HG3	1:A:356:ASP:H	1.78	0.49
1:D:353:PRO:HD3	1:D:365:LEU:CD2	2.43	0.49
1:C:361:ASN:ND2	5:C:628:HOH:O	2.45	0.49
5:B:812:HOH:O	2:E:7:MAN:H3	2.13	0.48
1:D:288:LYS:NZ	5:D:616:HOH:O	2.46	0.48
1:D:301:ARG:NE	4:H:1:NAG:C7	2.77	0.48
1:D:252:MET:HB2	1:D:255:ARG:HG3	1.95	0.48
1:A:355:ARG:HG3	1:A:356:ASP:N	2.30	0.47
1:D:310:HIS:O	1:D:314:LEU:HD13	2.13	0.47
1:D:332:ILE:HD11	1:D:334:LYS:HE3	1.96	0.47
1:D:365:LEU:HB3	1:D:441:LEU:HD23	1.96	0.47
1:B:311:GLN:H	1:B:311:GLN:CD	2.11	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:275:PHE:HE1	5:D:701:HOH:O	1.98	0.47
4:H:1:NAG:H4	4:H:2:NAG:C7	2.45	0.47
1:B:370:LYS:NZ	5:B:619:HOH:O	2.39	0.47
1:C:318:GLU:OE2	1:C:319:TYR:N	2.48	0.46
1:B:413:ASP:OD1	1:B:415:SER:OG	2.30	0.46
1:D:240:VAL:C	1:D:241:PHE:HD2	2.23	0.46
1:A:288:LYS:HD3	5:A:730:HOH:O	2.14	0.46
1:D:240:VAL:CG2	1:D:323:VAL:HG21	2.42	0.46
1:D:351:LEU:HB2	1:D:366:THR:HB	1.98	0.46
1:B:360:LYS:CD	1:B:362:GLN:H	2.24	0.46
1:D:359:THR:O	5:D:608:HOH:O	2.20	0.46
1:D:390:ASN:ND2	5:D:619:HOH:O	2.48	0.46
1:D:271:PRO:HB2	1:D:292:ARG:NH1	2.31	0.45
1:D:347:GLN:HG3	5:D:624:HOH:O	2.16	0.45
1:A:318:GLU:HG3	1:A:335:THR:CG2	2.46	0.45
1:B:241:PHE:CZ	2:F:2:NAG:H61	2.51	0.45
1:D:240:VAL:HG21	1:D:323:VAL:CG2	2.45	0.45
1:A:301:ARG:HD3	5:A:601:HOH:O	2.15	0.45
1:C:252:MET:HG3	1:C:428:MET:CE	2.46	0.45
1:C:388:GLU:CD	1:C:416:ARG:HH22	2.24	0.45
1:D:248:LYS:HG2	1:D:255:ARG:NH2	2.32	0.45
1:D:358:LEU:HD23	1:D:363:VAL:HG11	2.00	0.44
1:C:388:GLU:OE2	5:C:608:HOH:O	2.20	0.44
1:A:246:LYS:HD3	1:A:246:LYS:HA	1.86	0.44
1:A:414:LYS:HD3	1:A:418:GLN:NE2	2.33	0.44
1:C:252:MET:HE2	1:C:428:MET:HE1	1.99	0.44
1:B:413:ASP:CG	1:B:415:SER:HG	2.25	0.43
1:B:378:ALA:HB3	1:B:428:MET:HE3	2.00	0.43
1:D:301:ARG:NE	4:H:1:NAG:H81	2.10	0.43
1:C:433:HIS:CE1	1:C:434:ASN:OD1	2.71	0.43
1:D:265:ASP:HA	1:D:299:THR:OG1	2.18	0.43
1:C:349:TYR:HD1	5:C:612:HOH:O	2.02	0.43
1:D:246:LYS:N	1:D:246:LYS:CD	2.79	0.43
1:B:392:LYS:HB3	5:B:657:HOH:O	2.19	0.42
1:A:414:LYS:O	1:A:414:LYS:HG2	2.19	0.42
1:B:350:THR:HG23	1:B:439:LYS:HB3	2.02	0.42
1:B:360:LYS:CE	1:B:362:GLN:HB2	2.45	0.42
1:D:246:LYS:HE3	4:H:5:NAG:HN2	1.81	0.42
1:A:426:SER:OG	5:A:611:HOH:O	2.20	0.42
1:D:273:VAL:O	1:D:274:LYS:HD3	2.20	0.42
1:A:370:LYS:HB2	1:A:370:LYS:HE2	1.90	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:436:TYR:OH	1:D:438:GLN:NE2	2.48	0.42
1:B:356:ASP:O	1:B:359:THR:HG23	2.20	0.41
1:C:242:LEU:HG	1:C:336:ILE:HG12	2.02	0.41
1:D:263:VAL:HG12	1:D:302:VAL:O	2.20	0.41
1:D:353:PRO:HD3	1:D:365:LEU:HD23	2.01	0.41
1:C:248:LYS:HE2	1:C:380:GLU:OE1	2.21	0.41
1:D:299:THR:HG23	4:H:1:NAG:H2	2.02	0.41
1:C:351:LEU:HB2	1:C:366:THR:HB	2.03	0.41
1:A:286:ASN:HD22	1:A:286:ASN:H	1.68	0.41
1:C:360:LYS:O	1:C:414:LYS:NZ	2.47	0.41
1:A:238:PRO:HD2	1:A:328:LEU:HD13	2.02	0.41
1:A:286:ASN:H	1:A:286:ASN:ND2	2.19	0.41
1:C:360:LYS:HG3	1:C:362:GLN:H	1.86	0.41
1:C:361:ASN:HA	1:C:414:LYS:HE2	2.03	0.41
1:C:295:GLN:O	1:C:297:ASN:N	2.51	0.41
1:C:444:SER:HB3	5:C:694:HOH:O	2.21	0.41
1:D:323:VAL:HG22	1:D:332:ILE:CG2	2.51	0.41
1:D:271:PRO:HB3	1:D:300:TYR:HE1	1.86	0.40
1:C:429:HIS:HB3	1:C:432:LEU:CD2	2.46	0.40
1:A:351:LEU:HB2	1:A:366:THR:HB	2.03	0.40
1:B:257:PRO:HG2	1:B:308:VAL:O	2.22	0.40
5:B:812:HOH:O	2:E:7:MAN:C2	2.68	0.40
1:C:443:LEU:O	1:C:444:SER:OG	2.36	0.40
4:H:5:NAG:N2	4:H:5:NAG:H5	2.36	0.40

All (3) 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)
3:G:7:SIA:O1B	5:B:772:HOH:O[2_659]	2.09	0.11
1:D:252:MET:SD	5:A:790:HOH:O[1_655]	2.15	0.05
5:B:661:HOH:O	5:C:699:HOH:O[2_649]	2.17	0.03

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	206/225 (92%)	203 (98%)	3 (2%)	0	100	100
1	B	206/225 (92%)	203 (98%)	3 (2%)	0	100	100
1	C	206/225 (92%)	197 (96%)	9 (4%)	0	100	100
1	D	186/225 (83%)	183 (98%)	3 (2%)	0	100	100
All	All	804/900 (89%)	786 (98%)	18 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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	194/208 (93%)	188 (97%)	6 (3%)	35	20
1	B	194/208 (93%)	191 (98%)	3 (2%)	60	50
1	C	194/208 (93%)	191 (98%)	3 (2%)	60	50
1	D	182/208 (88%)	180 (99%)	2 (1%)	70	62
All	All	764/832 (92%)	750 (98%)	14 (2%)	54	41

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	269	GLU
1	A	282	VAL
1	A	328	LEU
1	A	354	SER
1	A	399	ASP
1	A	400	SER
1	B	254	SER
1	B	351	LEU
1	B	360	LYS
1	C	354	SER

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Mol	Chain	Res	Type
1	C	359	THR
1	C	440	SER
1	D	415	SER
1	D	424	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	285	HIS
1	A	386	GLN
1	C	285	HIS
1	C	295	GLN
1	C	315	ASN
1	C	361	ASN
1	C	384	ASN
1	D	285	HIS
1	D	390	ASN
1	D	438	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](#)

27 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	E	1	1,2	14,14,15	1.84	3 (21%)	17,19,21	1.38	3 (17%)
2	NAG	E	2	2	14,14,15	1.91	4 (28%)	17,19,21	1.52	3 (17%)
2	BMA	E	3	2	11,11,12	1.50	2 (18%)	15,15,17	2.13	3 (20%)
2	MAN	E	4	2	11,11,12	1.80	3 (27%)	15,15,17	1.65	2 (13%)
2	NAG	E	5	2	14,14,15	1.86	3 (21%)	17,19,21	1.19	2 (11%)
2	GAL	E	6	2	11,11,12	1.60	1 (9%)	15,15,17	1.28	1 (6%)
2	MAN	E	7	2	11,11,12	1.93	4 (36%)	15,15,17	1.47	3 (20%)
2	NAG	F	1	1,2	14,14,15	1.74	2 (14%)	17,19,21	1.43	2 (11%)
2	NAG	F	2	2	14,14,15	1.82	3 (21%)	17,19,21	1.13	1 (5%)
2	BMA	F	3	2	11,11,12	1.66	3 (27%)	15,15,17	1.55	3 (20%)
2	MAN	F	4	2	11,11,12	1.86	4 (36%)	15,15,17	1.17	1 (6%)
2	NAG	F	5	2	14,14,15	1.81	4 (28%)	17,19,21	1.37	3 (17%)
2	GAL	F	6	2	11,11,12	1.64	2 (18%)	15,15,17	0.97	1 (6%)
2	MAN	F	7	2	11,11,12	2.06	4 (36%)	15,15,17	1.87	3 (20%)
3	NAG	G	1	3,1	14,14,15	2.54	4 (28%)	17,19,21	1.78	7 (41%)
3	NAG	G	2	3	14,14,15	1.85	4 (28%)	17,19,21	1.27	1 (5%)
3	BMA	G	3	3	11,11,12	1.43	1 (9%)	15,15,17	1.68	3 (20%)
3	MAN	G	4	3	11,11,12	1.87	2 (18%)	15,15,17	1.08	2 (13%)
3	NAG	G	5	3	14,14,15	1.82	4 (28%)	17,19,21	1.61	4 (23%)
3	GAL	G	6	3	11,11,12	1.44	2 (18%)	15,15,17	1.22	2 (13%)
3	SIA	G	7	3	20,20,21	2.36	10 (50%)	24,28,31	1.42	4 (16%)
3	MAN	G	8	3	11,11,12	1.92	4 (36%)	15,15,17	0.84	0
4	NAG	H	1	1,4	14,14,15	1.65	3 (21%)	17,19,21	3.40	7 (41%)
4	NAG	H	2	4	14,14,15	2.12	5 (35%)	17,19,21	2.32	7 (41%)
4	BMA	H	3	4	11,11,12	1.85	1 (9%)	15,15,17	3.60	6 (40%)
4	MAN	H	4	4	11,11,12	2.12	3 (27%)	15,15,17	2.67	5 (33%)
4	NAG	H	5	4	14,14,15	2.33	4 (28%)	17,19,21	5.41	8 (47%)

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	E	1	1,2	-	1/6/23/26	0/1/1/1
2	NAG	E	2	2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	BMA	E	3	2	-	0/2/19/22	0/1/1/1
2	MAN	E	4	2	-	2/2/19/22	0/1/1/1
2	NAG	E	5	2	-	0/6/23/26	0/1/1/1
2	GAL	E	6	2	-	0/2/19/22	0/1/1/1
2	MAN	E	7	2	-	2/2/19/22	1/1/1/1
2	NAG	F	1	1,2	-	0/6/23/26	0/1/1/1
2	NAG	F	2	2	-	0/6/23/26	0/1/1/1
2	BMA	F	3	2	-	0/2/19/22	0/1/1/1
2	MAN	F	4	2	-	1/2/19/22	0/1/1/1
2	NAG	F	5	2	-	0/6/23/26	0/1/1/1
2	GAL	F	6	2	-	1/2/19/22	0/1/1/1
2	MAN	F	7	2	-	2/2/19/22	0/1/1/1
3	NAG	G	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	G	2	3	-	2/6/23/26	0/1/1/1
3	BMA	G	3	3	-	0/2/19/22	0/1/1/1
3	MAN	G	4	3	-	1/2/19/22	0/1/1/1
3	NAG	G	5	3	-	0/6/23/26	0/1/1/1
3	GAL	G	6	3	-	1/2/19/22	0/1/1/1
3	SIA	G	7	3	-	5/18/34/38	0/1/1/1
3	MAN	G	8	3	-	2/2/19/22	0/1/1/1
4	NAG	H	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	H	2	4	-	3/6/23/26	0/1/1/1
4	BMA	H	3	4	-	0/2/19/22	0/1/1/1
4	MAN	H	4	4	-	2/2/19/22	0/1/1/1
4	NAG	H	5	4	-	3/6/23/26	0/1/1/1

All (89) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	1	NAG	O5-C1	6.98	1.54	1.43
4	H	5	NAG	O5-C1	5.63	1.52	1.43
3	G	7	SIA	C4-C5	-5.29	1.48	1.53
4	H	3	BMA	O5-C1	5.04	1.51	1.43
2	F	7	MAN	O5-C1	4.87	1.51	1.43
4	H	5	NAG	C7-N2	4.67	1.50	1.34
4	H	4	MAN	O5-C1	4.66	1.51	1.43
2	E	6	GAL	O5-C1	4.38	1.50	1.43
3	G	8	MAN	O5-C1	4.36	1.50	1.43
2	F	6	GAL	O5-C1	4.35	1.50	1.43
2	F	4	MAN	O5-C1	4.34	1.50	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	2	NAG	O5-C1	4.28	1.50	1.43
4	H	2	NAG	O5-C1	4.28	1.50	1.43
3	G	7	SIA	O6-C2	4.21	1.49	1.43
2	E	4	MAN	O5-C1	4.19	1.50	1.43
2	F	2	NAG	O5-C1	4.15	1.50	1.43
3	G	2	NAG	O5-C1	4.12	1.50	1.43
2	E	1	NAG	O5-C1	4.12	1.50	1.43
3	G	5	NAG	O5-C1	4.06	1.50	1.43
3	G	4	MAN	O5-C1	4.03	1.50	1.43
4	H	1	NAG	O5-C1	3.97	1.50	1.43
2	F	1	NAG	O5-C1	3.97	1.50	1.43
2	E	7	MAN	O5-C1	3.96	1.50	1.43
2	E	3	BMA	O5-C1	3.92	1.50	1.43
4	H	4	MAN	C2-C3	-3.88	1.46	1.52
3	G	7	SIA	C2-C1	3.86	1.55	1.52
2	E	5	NAG	O5-C1	3.72	1.49	1.43
4	H	2	NAG	C7-N2	3.71	1.47	1.34
3	G	3	BMA	O5-C1	3.62	1.49	1.43
2	E	2	NAG	C7-N2	3.62	1.46	1.34
2	E	1	NAG	C7-N2	3.61	1.46	1.34
2	E	5	NAG	C7-N2	3.60	1.46	1.34
3	G	1	NAG	C7-N2	3.55	1.46	1.34
3	G	5	NAG	C7-N2	3.55	1.46	1.34
3	G	4	MAN	C2-C3	-3.52	1.47	1.52
2	F	5	NAG	O5-C1	3.50	1.49	1.43
2	F	5	NAG	C7-N2	3.49	1.46	1.34
2	F	3	BMA	O5-C1	3.48	1.49	1.43
3	G	7	SIA	C10-N5	3.48	1.46	1.34
3	G	1	NAG	O5-C5	3.45	1.50	1.43
3	G	2	NAG	C7-N2	3.44	1.46	1.34
2	F	1	NAG	C7-N2	3.40	1.46	1.34
4	H	2	NAG	C2-N2	3.30	1.51	1.46
3	G	6	GAL	O5-C1	3.29	1.49	1.43
2	F	2	NAG	C7-N2	3.22	1.45	1.34
2	F	3	BMA	C2-C3	-3.19	1.47	1.52
2	E	7	MAN	C2-C3	-3.12	1.47	1.52
3	G	7	SIA	C5-N5	3.09	1.50	1.45
4	H	5	NAG	C8-C7	3.01	1.56	1.50
2	E	4	MAN	C2-C3	-2.94	1.48	1.52
3	G	8	MAN	C2-C3	-2.91	1.48	1.52
2	F	4	MAN	C2-C3	-2.89	1.48	1.52
2	F	7	MAN	O2-C2	2.82	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	7	MAN	O2-C2	2.80	1.49	1.43
2	F	7	MAN	C2-C3	-2.78	1.48	1.52
4	H	4	MAN	O2-C2	2.72	1.49	1.43
2	E	3	BMA	C2-C3	-2.67	1.48	1.52
2	E	5	NAG	C2-N2	2.67	1.50	1.46
4	H	2	NAG	C3-C2	-2.65	1.46	1.52
3	G	8	MAN	O2-C2	2.63	1.48	1.43
3	G	7	SIA	C3-C4	-2.48	1.48	1.52
2	E	7	MAN	O5-C5	2.42	1.48	1.43
3	G	1	NAG	C2-N2	2.42	1.50	1.46
3	G	7	SIA	O1B-C1	-2.41	1.22	1.30
3	G	7	SIA	O10-C10	-2.38	1.17	1.23
4	H	1	NAG	C3-C2	-2.36	1.47	1.52
3	G	6	GAL	C2-C3	-2.32	1.49	1.52
3	G	2	NAG	C2-N2	2.30	1.50	1.46
2	F	6	GAL	C2-C3	-2.29	1.49	1.52
4	H	5	NAG	O5-C5	2.28	1.48	1.43
2	F	5	NAG	C2-N2	2.27	1.50	1.46
2	F	2	NAG	C3-C2	-2.23	1.47	1.52
4	H	1	NAG	C7-N2	2.23	1.42	1.34
2	F	7	MAN	O5-C5	2.23	1.48	1.43
2	E	2	NAG	C2-N2	2.22	1.50	1.46
3	G	5	NAG	C2-N2	2.20	1.50	1.46
2	F	3	BMA	O5-C5	2.18	1.47	1.43
3	G	7	SIA	O6-C6	2.18	1.47	1.44
2	F	5	NAG	O5-C5	2.16	1.47	1.43
2	E	1	NAG	C2-N2	2.12	1.49	1.46
2	F	4	MAN	O5-C5	2.11	1.47	1.43
3	G	7	SIA	O1A-C1	2.11	1.28	1.22
3	G	8	MAN	O5-C5	2.07	1.47	1.43
3	G	5	NAG	C3-C2	-2.06	1.48	1.52
3	G	2	NAG	O5-C5	2.05	1.47	1.43
2	E	4	MAN	O5-C5	2.02	1.47	1.43
2	E	2	NAG	O5-C5	2.02	1.47	1.43
2	F	4	MAN	O2-C2	2.00	1.47	1.43
4	H	2	NAG	O5-C5	2.00	1.47	1.43

All (87) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	5	NAG	C2-N2-C7	13.07	141.52	122.90
4	H	3	BMA	C1-O5-C5	-12.07	95.83	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	5	NAG	C1-O5-C5	-11.38	96.77	112.19
4	H	5	NAG	C1-C2-N2	-10.15	93.15	110.49
4	H	1	NAG	C1-C2-N2	-9.95	93.49	110.49
4	H	4	MAN	O3-C3-C2	-8.57	93.58	109.99
4	H	5	NAG	O5-C5-C6	7.34	118.70	107.20
2	E	3	BMA	O3-C3-C2	-5.98	98.53	109.99
4	H	1	NAG	C2-N2-C7	-5.71	114.77	122.90
4	H	2	NAG	O3-C3-C2	-4.63	99.88	109.47
3	G	3	BMA	C1-C2-C3	4.55	115.26	109.67
2	F	7	MAN	C1-O5-C5	-4.49	106.10	112.19
4	H	2	NAG	C1-C2-N2	4.42	118.05	110.49
4	H	1	NAG	O7-C7-N2	-4.02	114.57	121.95
2	E	4	MAN	C1-O5-C5	-3.95	106.84	112.19
3	G	5	NAG	C2-N2-C7	-3.92	117.32	122.90
2	F	1	NAG	C2-N2-C7	-3.88	117.37	122.90
2	E	2	NAG	C2-N2-C7	-3.87	117.39	122.90
4	H	1	NAG	O7-C7-C8	3.86	129.22	122.06
4	H	2	NAG	O4-C4-C5	-3.75	99.99	109.30
2	F	3	BMA	O3-C3-C2	-3.66	102.99	109.99
4	H	1	NAG	C1-O5-C5	-3.58	107.34	112.19
2	E	3	BMA	C1-C2-C3	3.44	113.89	109.67
3	G	1	NAG	C2-N2-C7	-3.39	118.08	122.90
4	H	5	NAG	C3-C4-C5	-3.32	104.32	110.24
2	F	7	MAN	C6-C5-C4	-3.21	105.49	113.00
4	H	2	NAG	C4-C3-C2	3.17	115.66	111.02
2	E	4	MAN	O5-C5-C6	3.15	112.14	107.20
4	H	3	BMA	O5-C1-C2	-3.13	105.93	110.77
4	H	4	MAN	C1-O5-C5	-3.07	108.03	112.19
2	F	7	MAN	O5-C1-C2	-3.00	106.14	110.77
4	H	1	NAG	C4-C3-C2	-2.99	106.64	111.02
2	E	7	MAN	C1-O5-C5	-2.97	108.17	112.19
4	H	3	BMA	O5-C5-C6	2.92	111.78	107.20
2	E	7	MAN	O5-C5-C6	2.91	111.77	107.20
3	G	7	SIA	C4-C5-N5	-2.89	104.66	110.38
2	E	1	NAG	C2-N2-C7	-2.86	118.83	122.90
4	H	2	NAG	C2-N2-C7	2.79	126.87	122.90
3	G	1	NAG	C1-O5-C5	2.76	115.93	112.19
4	H	3	BMA	C2-C3-C4	2.75	115.66	110.89
4	H	5	NAG	C4-C3-C2	2.74	115.03	111.02
2	F	2	NAG	O4-C4-C3	-2.73	104.04	110.35
2	F	4	MAN	C1-C2-C3	2.67	112.95	109.67
3	G	3	BMA	O6-C6-C5	-2.63	102.25	111.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	3	BMA	C1-C2-C3	2.62	112.89	109.67
3	G	7	SIA	O1B-C1-C2	2.61	120.49	113.03
3	G	4	MAN	O2-C2-C1	-2.58	103.88	109.15
3	G	5	NAG	C1-C2-N2	-2.56	106.12	110.49
4	H	3	BMA	O6-C6-C5	-2.51	102.67	111.29
3	G	1	NAG	C8-C7-N2	2.51	120.35	116.10
4	H	4	MAN	O2-C2-C1	-2.50	104.05	109.15
2	F	3	BMA	O2-C2-C1	-2.49	104.06	109.15
2	E	5	NAG	C8-C7-N2	2.48	120.31	116.10
4	H	5	NAG	O4-C4-C3	-2.46	104.65	110.35
2	F	5	NAG	C4-C3-C2	2.46	114.63	111.02
3	G	7	SIA	O1B-C1-O1A	-2.46	118.50	124.09
2	E	6	GAL	C1-C2-C3	2.46	112.69	109.67
4	H	2	NAG	C1-O5-C5	2.45	115.52	112.19
3	G	6	GAL	O6-C6-C5	-2.44	102.92	111.29
4	H	3	BMA	C1-C2-C3	2.41	112.63	109.67
2	E	2	NAG	C8-C7-N2	2.37	120.12	116.10
3	G	1	NAG	O5-C5-C4	2.36	116.56	110.83
2	F	5	NAG	C3-C4-C5	2.30	114.34	110.24
2	E	1	NAG	O5-C1-C2	-2.29	107.67	111.29
4	H	5	NAG	O5-C5-C4	-2.28	105.27	110.83
2	F	1	NAG	O4-C4-C5	-2.28	103.64	109.30
2	E	5	NAG	C2-N2-C7	-2.28	119.66	122.90
3	G	5	NAG	C4-C3-C2	2.26	114.33	111.02
3	G	1	NAG	O4-C4-C5	-2.24	103.73	109.30
3	G	2	NAG	C8-C7-N2	2.23	119.87	116.10
3	G	5	NAG	O4-C4-C3	-2.22	105.22	110.35
3	G	6	GAL	C1-C2-C3	2.21	112.38	109.67
3	G	1	NAG	C6-C5-C4	-2.20	107.85	113.00
3	G	3	BMA	O5-C5-C6	-2.19	103.77	107.20
4	H	2	NAG	O5-C5-C4	2.16	116.09	110.83
4	H	1	NAG	C3-C4-C5	2.15	114.07	110.24
2	E	1	NAG	C8-C7-N2	2.14	119.72	116.10
2	E	7	MAN	O5-C1-C2	-2.12	107.50	110.77
3	G	1	NAG	O5-C5-C6	-2.11	103.89	107.20
2	F	5	NAG	C8-C7-N2	2.07	119.60	116.10
3	G	7	SIA	C6-C5-N5	2.06	114.34	110.91
4	H	4	MAN	O5-C1-C2	-2.04	107.62	110.77
3	G	4	MAN	O5-C1-C2	2.03	113.91	110.77
2	E	2	NAG	C1-O5-C5	-2.03	109.44	112.19
2	F	6	GAL	O2-C2-C3	-2.02	106.09	110.14
4	H	4	MAN	O2-C2-C3	-2.02	106.09	110.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	3	BMA	O6-C6-C5	-2.00	104.42	111.29

There are no chirality outliers.

All (30) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	7	SIA	C6-C7-C8-C9
3	G	7	SIA	O7-C7-C8-C9
3	G	7	SIA	O7-C7-C8-O8
3	G	8	MAN	O5-C5-C6-O6
4	H	2	NAG	O5-C5-C6-O6
2	E	7	MAN	O5-C5-C6-O6
4	H	4	MAN	O5-C5-C6-O6
3	G	8	MAN	C4-C5-C6-O6
2	F	7	MAN	O5-C5-C6-O6
4	H	1	NAG	O5-C5-C6-O6
4	H	2	NAG	C4-C5-C6-O6
4	H	4	MAN	C4-C5-C6-O6
3	G	2	NAG	O5-C5-C6-O6
2	F	7	MAN	C4-C5-C6-O6
2	E	4	MAN	O5-C5-C6-O6
2	E	7	MAN	C4-C5-C6-O6
4	H	1	NAG	C4-C5-C6-O6
4	H	5	NAG	C1-C2-N2-C7
2	E	4	MAN	C4-C5-C6-O6
3	G	7	SIA	O8-C8-C9-O9
4	H	2	NAG	C1-C2-N2-C7
3	G	7	SIA	C6-C7-C8-O8
4	H	5	NAG	O5-C5-C6-O6
3	G	2	NAG	C4-C5-C6-O6
2	E	1	NAG	O5-C5-C6-O6
3	G	6	GAL	O5-C5-C6-O6
3	G	4	MAN	O5-C5-C6-O6
2	F	6	GAL	O5-C5-C6-O6
2	F	4	MAN	O5-C5-C6-O6
4	H	5	NAG	C3-C2-N2-C7

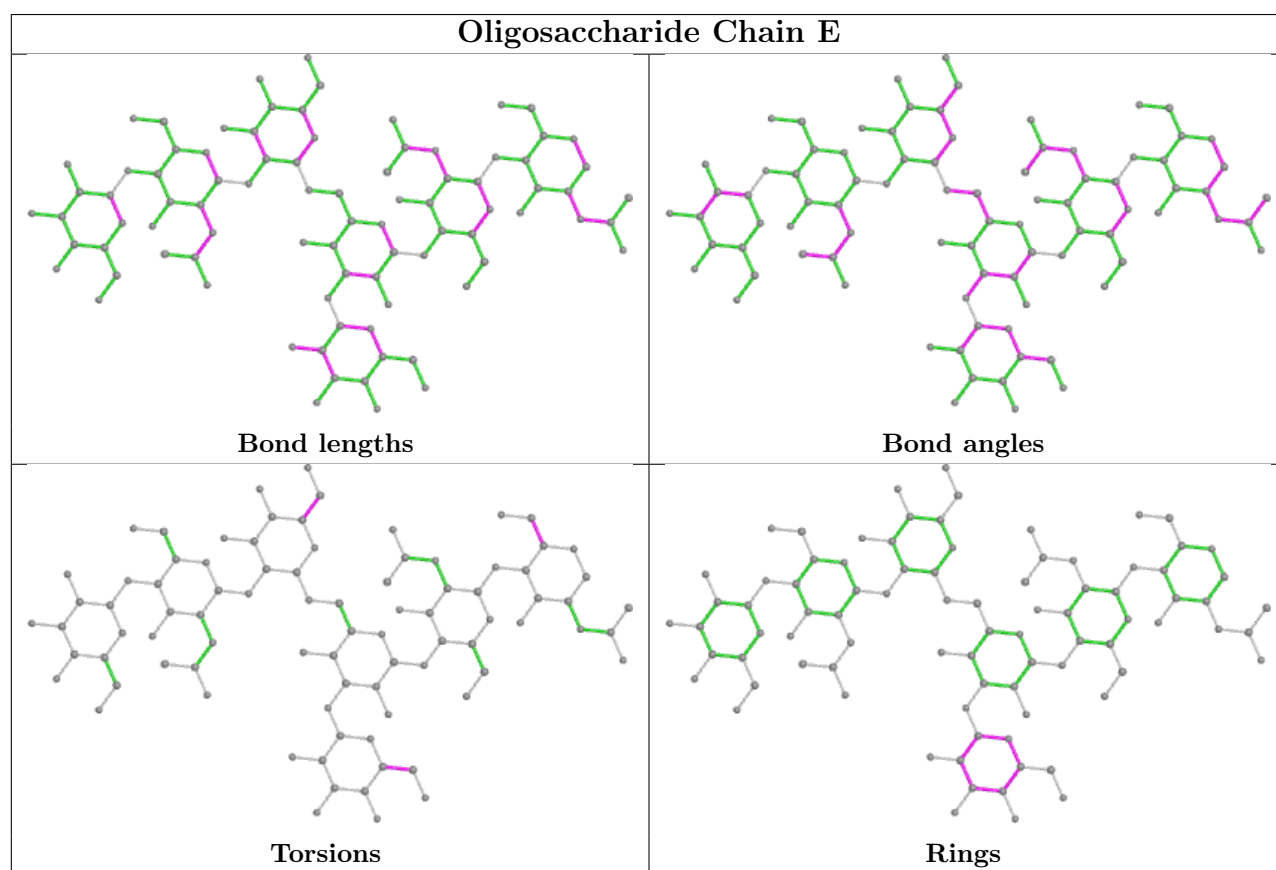
All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	7	MAN	C1-C2-C3-C4-C5-O5

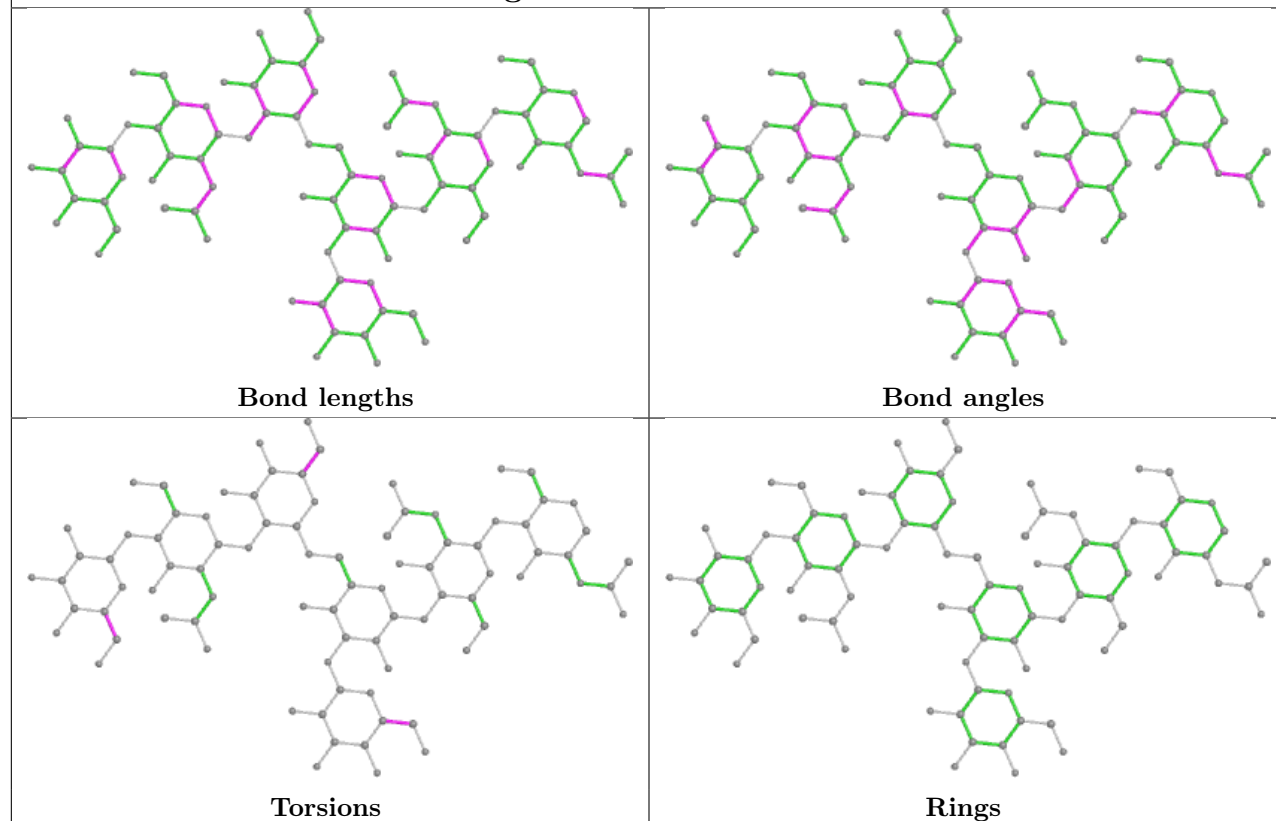
11 monomers are involved in 37 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	H	3	BMA	1	0
3	G	8	MAN	1	0
2	E	5	NAG	1	0
4	H	2	NAG	3	0
4	H	5	NAG	12	0
4	H	4	MAN	1	0
2	F	7	MAN	1	0
2	F	2	NAG	1	0
2	E	7	MAN	6	0
4	H	1	NAG	13	0
3	G	7	SIA	0	1

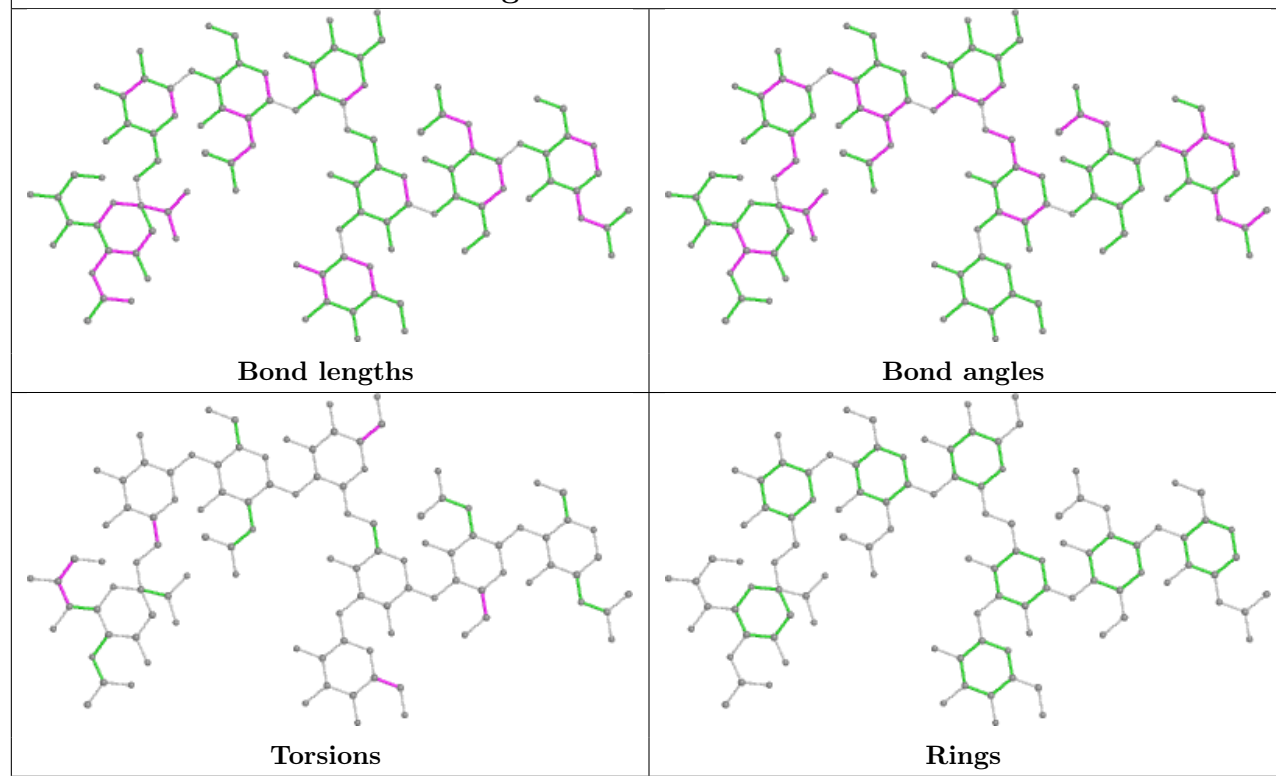
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

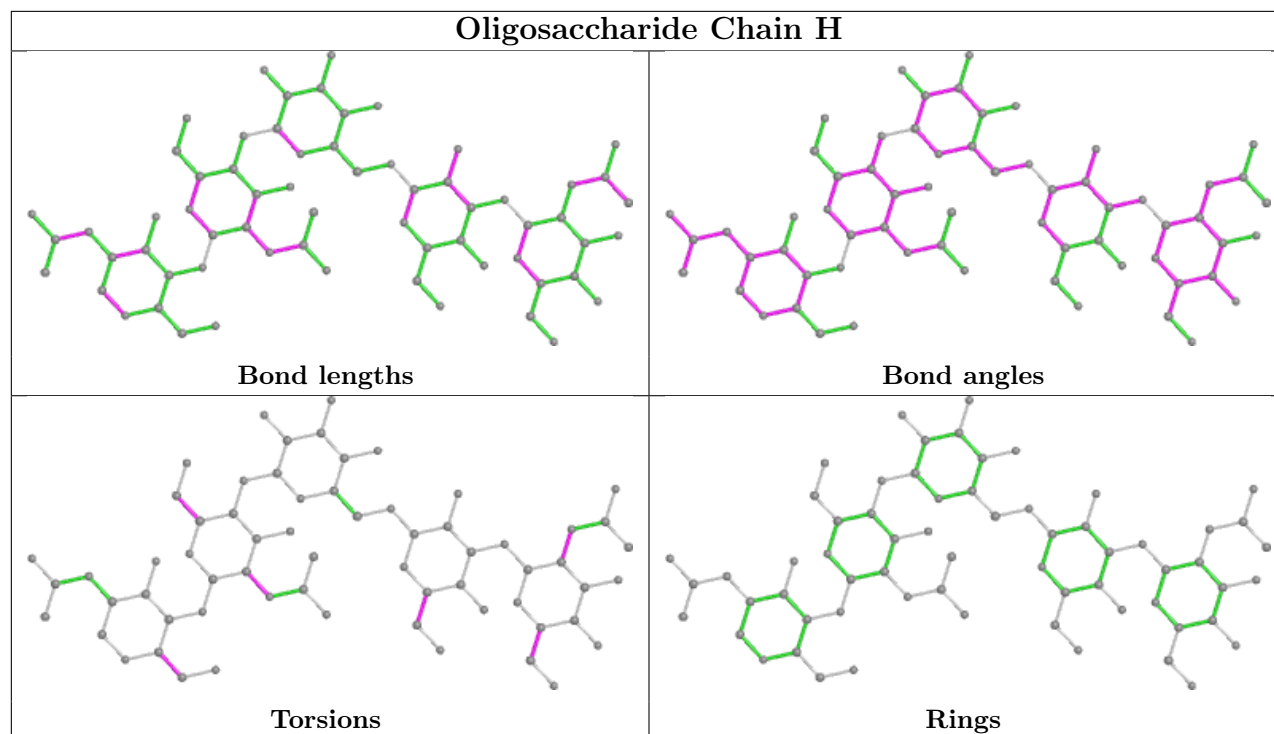


Oligosaccharide Chain F



Oligosaccharide Chain G





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

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	208/225 (92%)	0.37	18 (8%) 17 18	7, 20, 41, 62	0
1	B	208/225 (92%)	0.60	17 (8%) 19 20	9, 24, 41, 56	0
1	C	208/225 (92%)	0.93	24 (11%) 11 10	10, 28, 46, 56	0
1	D	194/225 (86%)	1.05	41 (21%) 3 3	7, 26, 72, 99	0
All	All	818/900 (90%)	0.73	100 (12%) 10 9	7, 25, 50, 99	0

All (100) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	296	TYR	7.1
1	D	323	VAL	6.7
1	D	273	VAL	5.9
1	D	264	VAL	5.6
1	D	263	VAL	5.3
1	D	324	SER	5.2
1	D	300	TYR	5.1
1	D	332	ILE	4.7
1	D	240	VAL	4.6
1	D	331	PRO	4.4
1	B	358	LEU	4.2
1	A	296	TYR	4.1
1	D	262	VAL	4.0
1	C	359	THR	4.0
1	C	237	GLY	4.0
1	D	330	ALA	3.8
1	B	359	THR	3.8
1	D	270	ASP	3.7
1	C	402	GLY	3.6
1	C	358	LEU	3.6
1	B	311	GLN	3.6

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Mol	Chain	Res	Type	RSRZ
1	D	302	VAL	3.6
1	D	265	ASP	3.5
1	B	254	SER	3.5
1	B	298	SER	3.5
1	D	299	THR	3.4
1	A	358	LEU	3.4
1	D	386	GLN	3.4
1	D	444	SER	3.2
1	D	333	GLU	3.2
1	A	413	ASP	3.0
1	B	272	GLU	3.0
1	B	296	TYR	3.0
1	D	241	PHE	3.0
1	D	298	SER	2.9
1	D	303	VAL	2.9
1	C	298	SER	2.9
1	D	385	GLY	2.9
1	D	291	PRO	2.8
1	D	278	TYR	2.8
1	B	270	ASP	2.7
1	A	269	GLU	2.6
1	C	360	LYS	2.6
1	D	334	LYS	2.6
1	B	314	LEU	2.6
1	C	327	ALA	2.6
1	B	253	ILE	2.5
1	A	420	GLY	2.5
1	B	355	ARG	2.5
1	C	412	VAL	2.5
1	A	419	GLN	2.5
1	D	358	LEU	2.5
1	A	355	ARG	2.5
1	D	279	VAL	2.5
1	B	268	HIS	2.5
1	B	267	SER	2.4
1	D	359	THR	2.4
1	D	242	LEU	2.4
1	A	361	ASN	2.4
1	D	297	ASN	2.4
1	A	387	PRO	2.4
1	D	271	PRO	2.4
1	D	329	PRO	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	422	VAL	2.3
1	C	415	SER	2.3
1	D	301	ARG	2.3
1	D	274	LYS	2.3
1	B	252	MET	2.3
1	C	433	HIS	2.3
1	A	298	SER	2.3
1	A	329	PRO	2.3
1	C	386	GLN	2.3
1	C	401	ASP	2.3
1	C	340	LYS	2.2
1	A	359	THR	2.2
1	B	255	ARG	2.2
1	C	332	ILE	2.2
1	C	329	PRO	2.2
1	D	272	GLU	2.2
1	C	435	HIS	2.2
1	A	416	ARG	2.2
1	C	432	LEU	2.2
1	D	321	CYS	2.1
1	C	297	ASN	2.1
1	D	290	LYS	2.1
1	B	413	ASP	2.1
1	A	360	LYS	2.1
1	A	444	SER	2.1
1	D	283	GLU	2.1
1	C	265	ASP	2.0
1	D	284	VAL	2.0
1	D	387	PRO	2.0
1	A	418	GLN	2.0
1	C	318	GLU	2.0
1	C	344	ARG	2.0
1	A	422	VAL	2.0
1	B	360	LYS	2.0
1	A	443	LEU	2.0
1	C	444	SER	2.0
1	D	275	PHE	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

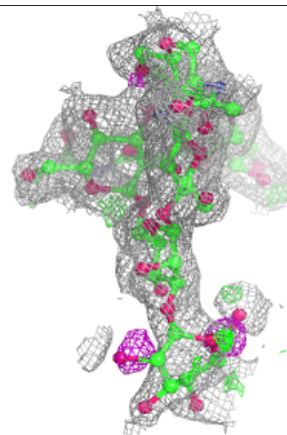
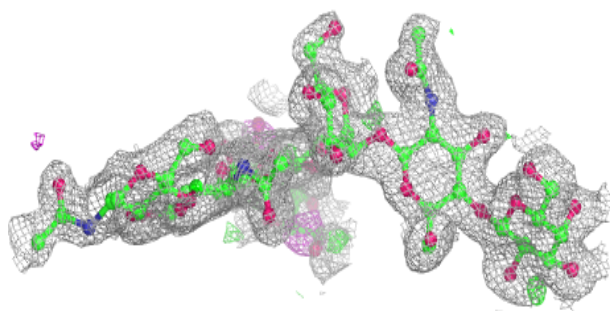
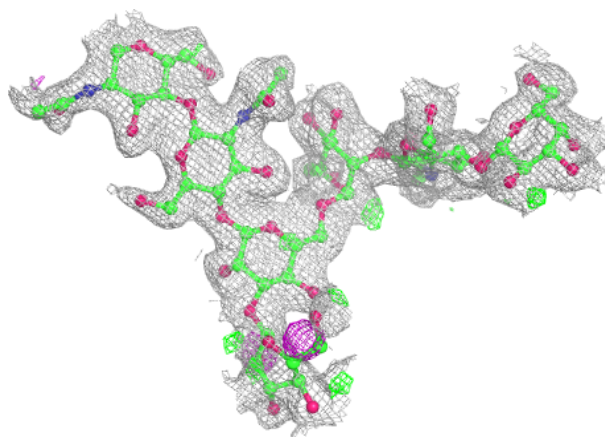
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	NAG	H	1	14/15	0.36	0.22	90,95,101,101	0
4	NAG	H	2	14/15	0.38	0.24	79,86,91,91	0
4	MAN	H	4	11/12	0.46	0.19	57,65,67,69	0
4	NAG	H	5	14/15	0.48	0.23	40,50,59,60	0
4	BMA	H	3	11/12	0.58	0.20	68,71,75,79	0
2	MAN	F	7	11/12	0.59	0.25	41,52,57,59	0
2	MAN	E	7	11/12	0.63	0.24	34,43,47,51	0
3	MAN	G	8	11/12	0.75	0.14	43,50,54,58	0
2	MAN	F	4	11/12	0.76	0.16	29,33,41,50	0
3	MAN	G	4	11/12	0.81	0.13	30,32,37,39	0
2	NAG	F	1	14/15	0.84	0.14	26,32,36,38	0
2	NAG	F	5	14/15	0.85	0.13	24,30,41,43	0
3	SIA	G	7	20/21	0.85	0.13	16,23,29,42	0
3	NAG	G	1	14/15	0.85	0.12	36,41,49,49	0
3	BMA	G	3	11/12	0.85	0.12	31,36,46,52	0
2	BMA	F	3	11/12	0.87	0.11	27,31,36,43	0
2	NAG	E	1	14/15	0.87	0.11	28,36,39,42	0
2	NAG	F	2	14/15	0.88	0.13	26,30,35,37	0
2	MAN	E	4	11/12	0.89	0.10	25,28,31,40	0
2	GAL	F	6	11/12	0.90	0.11	21,28,33,38	0
3	NAG	G	2	14/15	0.91	0.10	30,33,39,43	0
2	BMA	E	3	11/12	0.91	0.10	20,25,28,33	0
3	NAG	G	5	14/15	0.92	0.11	17,25,35,36	0
2	NAG	E	2	14/15	0.92	0.09	21,27,30,37	0
2	NAG	E	5	14/15	0.93	0.07	19,24,29,32	0
3	GAL	G	6	11/12	0.94	0.07	12,17,19,21	0
2	GAL	E	6	11/12	0.95	0.07	13,18,26,35	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.

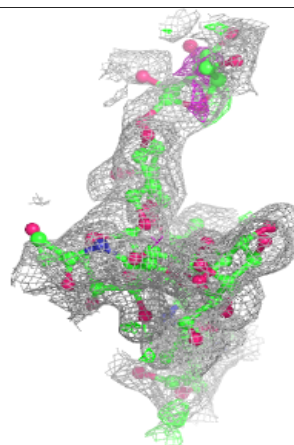
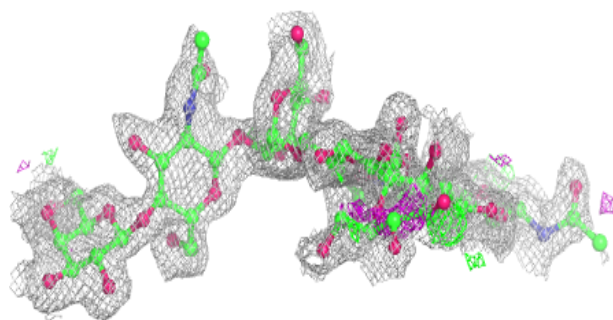
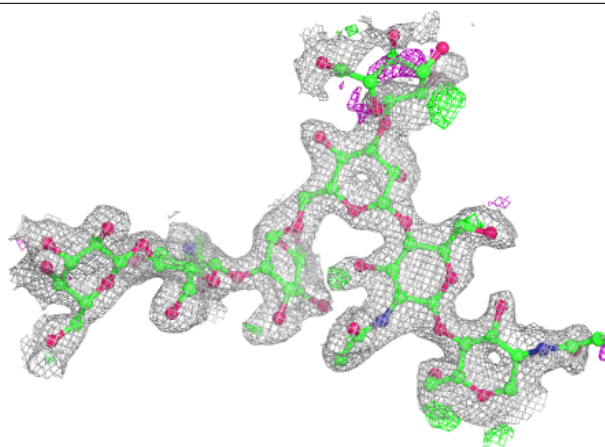
Electron density around Chain E:

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

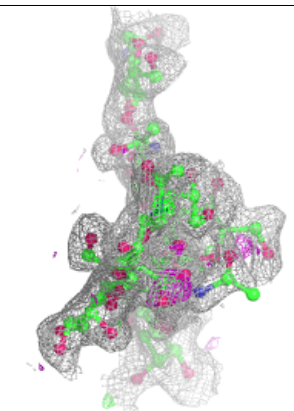
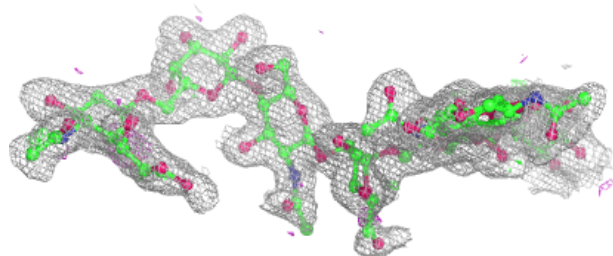
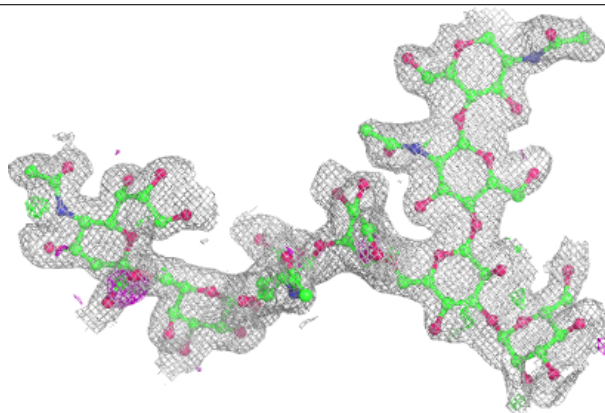


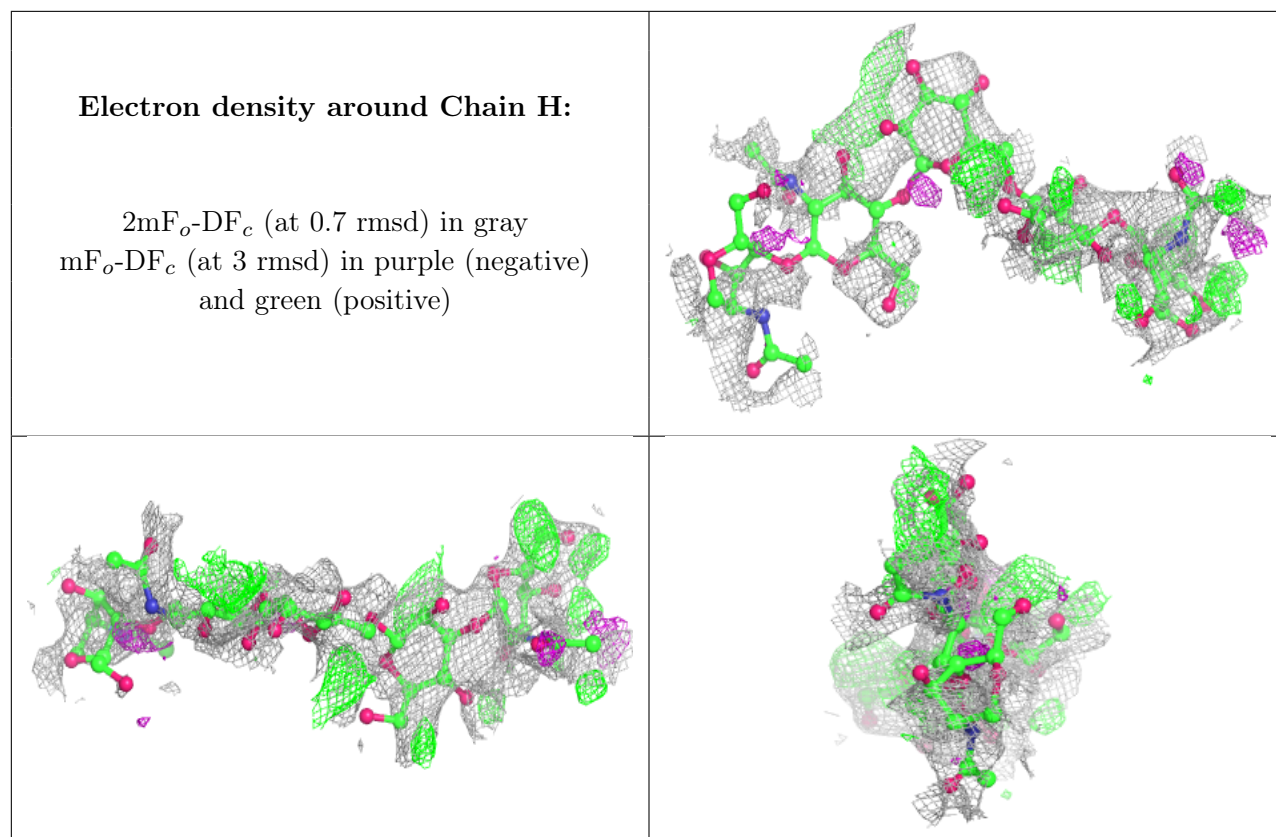
Electron density around Chain F:

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

**Electron density around Chain G:**

$2mF_o-DF_c$ (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.