



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 29, 2024 – 04:12 PM JST

PDB ID : 8JA5
Title : Crystal structure of Nipah Virus attachment (G) glycoprotein in complex with neutralizing antibody 14F8
Authors : Li, Y.H.; Huang, X.Y.; Xu, J.J.; Chen, W.
Deposited on : 2023-05-05
Resolution : 2.79 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36.2
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) : 2.36.2

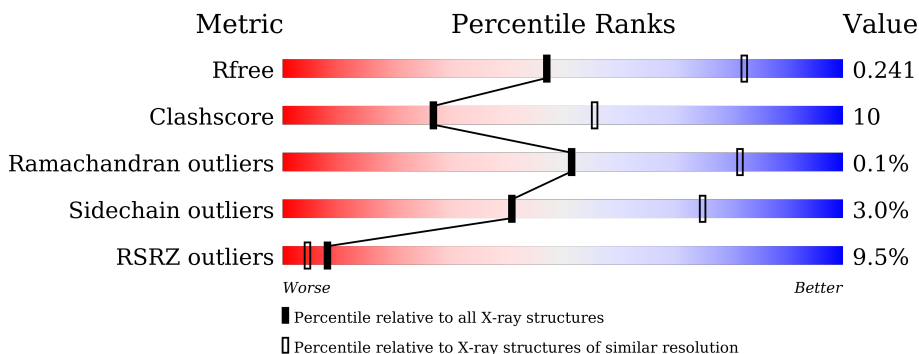
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.79 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.







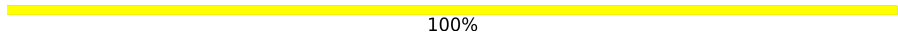
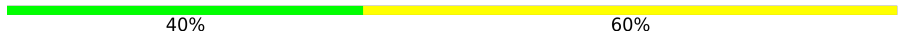
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	B	233	
1	H	233	
2	L	216	
3	A	423	
3	D	423	
4	C	219	

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Mol	Chain	Length	Quality of chain
5	E	4	 25% 75%
6	F	6	 17% 83%
7	G	2	 50% 50%
7	I	2	 50% 50%
7	K	2	 100%
8	J	5	 40% 60%

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
6	MAN	F	5	-	-	-	X
7	NAG	K	2	-	-	-	X
8	BMA	J	3	-	-	-	X

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 13483 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 14F8 antibody heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	H	216	Total 1615	C 1027	N 263	O 320	S 5	0	0	0
1	B	216	Total 1615	C 1027	N 263	O 320	S 5	0	0	0

- Molecule 2 is a protein called 14F8 antibody light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	L	216	Total 1654	C 1040	N 277	O 332	S 5	0	0	0

- Molecule 3 is a protein called Glycoprotein G.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	A	417	Total 3296	C 2100	N 556	O 619	S 21	0	0	0
3	D	417	Total 3296	C 2100	N 556	O 619	S 21	0	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	603	HIS	-	expression tag	UNP Q9IH62
A	604	HIS	-	expression tag	UNP Q9IH62
A	605	HIS	-	expression tag	UNP Q9IH62
A	606	HIS	-	expression tag	UNP Q9IH62
A	607	HIS	-	expression tag	UNP Q9IH62
A	608	HIS	-	expression tag	UNP Q9IH62
D	603	HIS	-	expression tag	UNP Q9IH62
D	604	HIS	-	expression tag	UNP Q9IH62
D	605	HIS	-	expression tag	UNP Q9IH62
D	606	HIS	-	expression tag	UNP Q9IH62

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Chain	Residue	Modelled	Actual	Comment	Reference
D	607	HIS	-	expression tag	UNP Q9IH62
D	608	HIS	-	expression tag	UNP Q9IH62

- Molecule 4 is a protein called 14F8 antibody light chain.

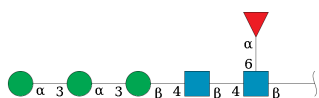
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	C	216	1654	1040	277	332	5	0	0	0

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	E	4	50	28	2	20	0	0	0

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-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.



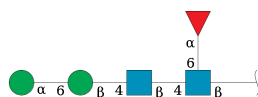
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	F	6	71	40	2	29	0	0	0

- Molecule 7 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



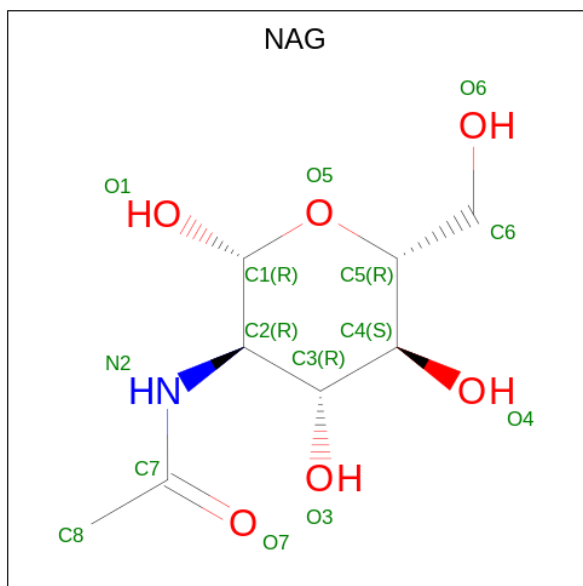
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	G	2	Total	C	N	O	0	0	0
			28	16	2	10			
7	I	2	Total	C	N	O	0	0	0
			28	16	2	10			
7	K	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 8 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-mannopyranos e-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acet amido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
8	J	5	Total	C	N	O	0	0	0
			60	34	2	24			

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
9	A	1	Total	C	N	O	0	0
			14	8	1	5		
9	D	1	Total	C	N	O	0	0
			14	8	1	5		

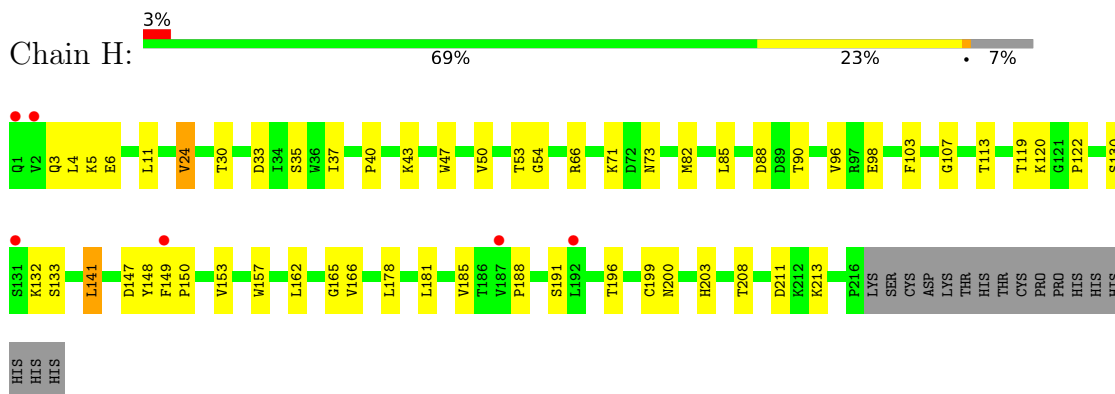
- Molecule 10 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	H	14	Total O 14 14	0	0
10	L	11	Total O 11 11	0	0
10	A	15	Total O 15 15	0	0
10	B	6	Total O 6 6	0	0
10	C	5	Total O 5 5	0	0
10	D	9	Total O 9 9	0	0

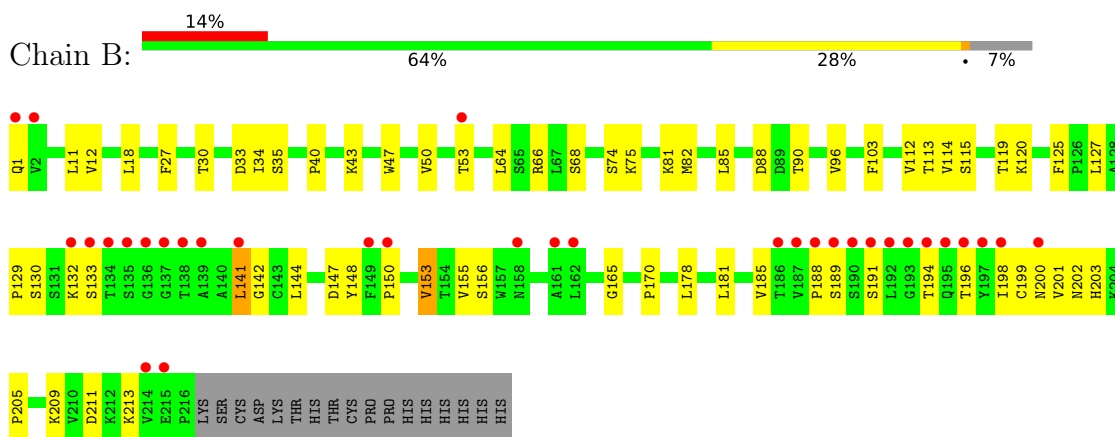
3 Residue-property plots [i](#)

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.

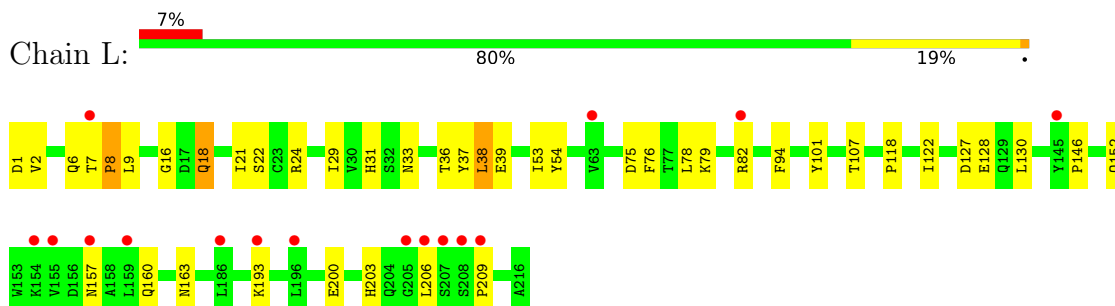
- Molecule 1: 14F8 antibody heavy chain



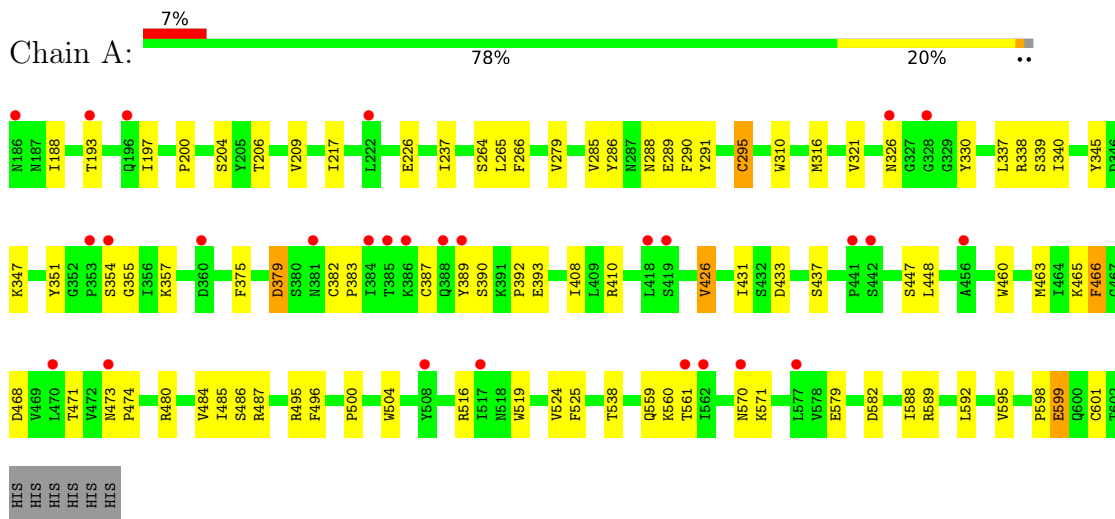
- Molecule 1: 14F8 antibody heavy chain



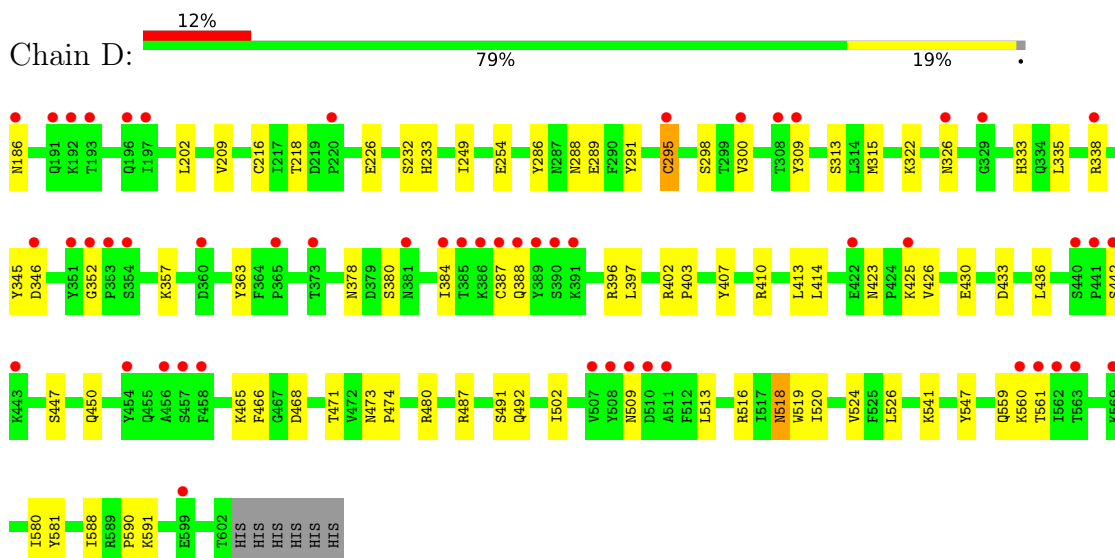
- Molecule 2: 14F8 antibody light chain



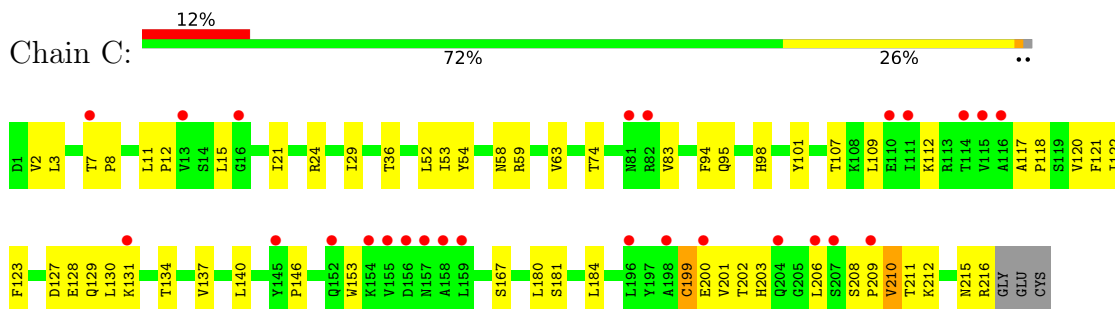
- Molecule 3: Glycoprotein G



- Molecule 3: Glycoprotein G



- Molecule 4: 14F8 antibody light chain



- Molecule 5: 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



MAG1
MAG2
BMA3
MAN4

- Molecule 6: alpha-D-mannopyranose-(1-3)-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 F:  17% 83%

MAG1
MAG2
BMA3
MAN4
MAN5
FUC6

- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  50% 50%

MAG1
MAG2

- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  50% 50%

MAG1
MAG2

- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:  100%

MAG1
MAG2

- Molecule 8: alpha-D-mannopyranose-(1-6)-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 J:  40% 60%

MAG1
MAG2
BMA3
MAN4
FUC5

4 Data and refinement statistics

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, α , β , γ	125.96Å 125.96Å 317.26Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	36.45 – 2.79 37.83 – 2.79	Depositor EDS
% Data completeness (in resolution range)	99.0 (36.45-2.79) 99.5 (37.83-2.79)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 2.81Å)	Xtrriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.217 , 0.245 0.217 , 0.241	Depositor DCC
R_{free} test set	3171 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	62.3	Xtrriage
Anisotropy	0.092	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 47.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	13483	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.45% 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, FUC, MAN, BMA

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	B	0.59	0/1656	0.76	0/2263
1	H	0.59	0/1656	0.80	0/2263
2	L	0.63	0/1690	0.80	0/2297
3	A	0.59	0/3376	0.76	0/4592
3	D	0.60	0/3376	0.76	0/4592
4	C	0.58	0/1690	0.74	0/2297
All	All	0.60	0/13444	0.77	0/18304

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	1615	0	1591	49	0
1	H	1615	0	1591	42	0
2	L	1654	0	1607	34	0
3	A	3296	0	3238	56	0
3	D	3296	0	3240	59	0
4	C	1654	0	1598	42	0
5	E	50	0	43	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	F	71	0	61	0	0
7	G	28	0	25	0	0
7	I	28	0	25	1	0
7	K	28	0	25	0	0
8	J	60	0	52	0	0
9	A	14	0	13	0	0
9	D	14	0	13	2	0
10	A	15	0	0	0	0
10	B	6	0	0	0	0
10	C	5	0	0	0	0
10	D	9	0	0	1	0
10	H	14	0	0	1	0
10	L	11	0	0	0	0
All	All	13483	0	13122	270	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

All (270) 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)
4:C:206:LEU:HD13	4:C:209:PRO:HG2	1.40	1.01
3:A:326:ASN:HD22	3:A:330:TYR:HB3	1.41	0.85
3:A:447:SER:O	3:A:516:ARG:NH2	2.10	0.83
4:C:2:VAL:HG11	4:C:29:ILE:HD11	1.62	0.81
3:A:463:MET:CE	3:A:496:PHE:HA	2.11	0.81
3:D:396:ARG:NH2	10:D:801:HOH:O	2.15	0.78
4:C:95:GLN:NE2	4:C:98:HIS:H	1.83	0.76
1:B:120:LYS:HZ1	1:B:147:ASP:HB3	1.48	0.76
3:A:463:MET:HE1	3:A:496:PHE:HA	1.67	0.76
1:H:96:VAL:HG11	1:H:103:PHE:HB3	1.68	0.75
3:A:410:ARG:NH1	3:A:431:ILE:O	2.19	0.75
3:D:388:GLN:N	3:D:388:GLN:OE1	2.20	0.75
1:H:188:PRO:HG2	1:H:191:SER:HB3	1.69	0.74
1:B:120:LYS:NZ	1:B:147:ASP:HB3	2.02	0.74
4:C:21:ILE:HG12	4:C:107:THR:HG21	1.70	0.74
1:B:150:PRO:HD2	1:B:203:HIS:CE1	2.23	0.73
3:A:326:ASN:ND2	3:A:330:TYR:HB3	2.03	0.73
1:B:47:TRP:HZ2	1:B:50:VAL:HG23	1.53	0.73
3:A:200:PRO:HB3	3:A:595:VAL:HG22	1.70	0.72
3:D:447:SER:O	3:D:516:ARG:NH2	2.23	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:125:PHE:CD2	4:C:129:GLN:HB2	2.24	0.71
2:L:29:ILE:HG22	2:L:36:THR:HG23	1.73	0.70
3:D:471:THR:OG1	3:D:474:PRO:O	2.10	0.70
1:B:96:VAL:HG11	1:B:103:PHE:HB3	1.74	0.69
1:B:96:VAL:CG1	1:B:103:PHE:HB3	2.22	0.69
4:C:95:GLN:HE21	4:C:98:HIS:H	1.37	0.68
1:H:96:VAL:CG1	1:H:103:PHE:HB3	2.23	0.68
3:D:518:ASN:O	3:D:541:LYS:NZ	2.27	0.68
1:H:120:LYS:HE3	1:H:147:ASP:O	1.93	0.67
1:H:40:PRO:HB2	1:H:43:LYS:HB2	1.77	0.67
3:A:204:SER:HB3	3:A:592:LEU:H	1.57	0.67
1:H:162:LEU:HD21	1:H:185:VAL:HG21	1.76	0.66
3:D:450:GLN:OE1	3:D:516:ARG:NH1	2.28	0.66
3:A:579:GLU:HB3	3:A:588:ILE:HD11	1.79	0.65
3:D:338:ARG:NH2	3:D:423:ASN:O	2.29	0.65
4:C:29:ILE:HD12	4:C:95:GLN:HG3	1.77	0.65
3:A:197:ILE:HG21	3:A:601:CYS:O	1.97	0.65
3:D:346:ASP:OD2	3:D:407:TYR:HE1	1.80	0.64
3:A:484:VAL:HG23	3:A:485:ILE:HG12	1.80	0.64
4:C:200:GLU:OE2	4:C:210:VAL:HG22	1.98	0.64
3:D:414:LEU:HD22	3:D:426:VAL:CG1	2.28	0.63
1:H:113:THR:OG1	10:H:301:HOH:O	2.15	0.63
1:B:188:PRO:HG2	1:B:191:SER:HB2	1.79	0.62
3:D:414:LEU:HD22	3:D:426:VAL:HG12	1.81	0.62
1:H:37:ILE:HD12	1:H:96:VAL:HG21	1.82	0.62
2:L:2:VAL:HG11	2:L:29:ILE:HD11	1.81	0.62
3:A:437:SER:HB3	3:A:465:LYS:HZ2	1.63	0.62
1:B:75:LYS:HA	1:B:75:LYS:HE2	1.80	0.61
2:L:146:PRO:HD2	2:L:203:HIS:CE1	2.36	0.61
1:B:47:TRP:CZ2	1:B:50:VAL:HG23	2.33	0.61
1:H:147:ASP:HA	1:H:178:LEU:HB3	1.83	0.61
1:H:90:THR:HG23	1:H:113:THR:HA	1.83	0.61
3:A:226:GLU:HG3	3:A:286:TYR:CE2	2.35	0.61
1:H:150:PRO:HD2	1:H:203:HIS:CE1	2.36	0.61
2:L:7:THR:OG1	2:L:22:SER:HB2	2.01	0.61
1:B:132:LYS:HD2	4:C:211:THR:HG23	1.81	0.61
1:H:33:ASP:OD1	1:H:53:THR:HG23	2.01	0.61
1:H:11:LEU:HD11	1:H:149:PHE:HE2	1.66	0.60
3:D:333:HIS:CD2	3:D:335:LEU:HD23	2.37	0.60
3:D:286:TYR:O	3:D:357:LYS:HD3	2.01	0.60
3:A:582:ASP:OD2	3:A:589:ARG:NH2	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:33:ASP:OD1	1:B:53:THR:HG23	2.03	0.59
3:A:288:ASN:O	3:A:289:GLU:HB2	2.03	0.58
4:C:215:ASN:O	4:C:216:ARG:C	2.42	0.58
1:H:132:LYS:HB3	2:L:122:ILE:HG22	1.85	0.57
1:B:188:PRO:HG2	1:B:191:SER:CB	2.34	0.57
3:D:254:GLU:CD	3:D:322:LYS:NZ	2.58	0.57
1:B:133:SER:HA	4:C:121:PHE:HD2	1.69	0.57
3:A:279:VAL:HG13	3:A:295:CYS:SG	2.45	0.57
1:B:40:PRO:HB2	1:B:43:LYS:HB2	1.87	0.57
1:H:47:TRP:HZ2	1:H:50:VAL:HG23	1.68	0.56
2:L:21:ILE:HD12	2:L:78:LEU:HD23	1.86	0.56
1:H:47:TRP:CZ2	1:H:50:VAL:HG23	2.40	0.56
2:L:24:ARG:HG3	2:L:24:ARG:HH11	1.71	0.56
3:A:473:ASN:HB3	3:A:474:PRO:HD3	1.88	0.56
3:D:410:ARG:HD3	3:D:430:GLU:HB2	1.87	0.55
3:A:410:ARG:HH22	3:A:433:ASP:HB3	1.71	0.55
1:H:35:SER:HB2	1:H:50:VAL:HG22	1.89	0.55
1:B:119:THR:HB	1:B:150:PRO:HG2	1.89	0.55
3:D:309:TYR:CE2	9:D:701:NAG:H5	2.42	0.55
3:D:363:TYR:HB3	3:D:413:LEU:HD22	1.87	0.55
4:C:137:VAL:HG13	4:C:184:LEU:HB3	1.88	0.55
3:A:463:MET:HE3	3:A:496:PHE:HA	1.86	0.54
1:B:147:ASP:HA	1:B:178:LEU:HB3	1.90	0.54
3:A:286:TYR:O	3:A:357:LYS:HD3	2.06	0.54
1:B:74:SER:O	3:D:402:ARG:HG2	2.07	0.54
3:D:468:ASP:OD1	3:D:516:ARG:NH1	2.39	0.54
1:B:82:MET:HB3	1:B:85:LEU:HD11	1.90	0.54
3:A:392:PRO:HD2	3:A:393:GLU:OE2	2.08	0.53
1:B:150:PRO:HB2	1:B:205:PRO:HG2	1.91	0.53
4:C:208:SER:N	4:C:209:PRO:HD3	2.24	0.53
3:D:473:ASN:HB3	3:D:474:PRO:HD3	1.91	0.53
1:B:155:VAL:HG12	1:B:201:VAL:HG22	1.91	0.53
4:C:24:ARG:HA	4:C:74:THR:O	2.10	0.52
1:H:122:PRO:HD2	1:H:208:THR:HG21	1.90	0.52
4:C:29:ILE:HG22	4:C:36:THR:HG23	1.92	0.52
3:D:333:HIS:HD2	3:D:335:LEU:CD2	2.22	0.52
4:C:12:PRO:HB2	4:C:112:LYS:HE3	1.90	0.51
3:D:520:ILE:HD13	3:D:541:LYS:HG3	1.92	0.51
4:C:199:CYS:SG	4:C:199:CYS:O	2.69	0.51
3:D:518:ASN:HB3	3:D:541:LYS:HZ1	1.74	0.51
3:A:437:SER:HB3	3:A:465:LYS:NZ	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:387:CYS:HB2	3:A:390:SER:HB2	1.93	0.51
2:L:160:GLN:HB3	2:L:163:ASN:HD21	1.76	0.50
3:D:346:ASP:OD2	3:D:407:TYR:CE1	2.63	0.50
1:B:30:THR:O	1:B:53:THR:HB	2.12	0.50
3:D:518:ASN:HB3	3:D:541:LYS:NZ	2.26	0.49
3:D:333:HIS:HD2	3:D:335:LEU:HD23	1.77	0.49
1:B:132:LYS:HE3	4:C:212:LYS:O	2.12	0.49
2:L:7:THR:OG1	2:L:8:PRO:HD3	2.13	0.49
2:L:39:GLU:HG2	2:L:54:TYR:HA	1.95	0.49
2:L:24:ARG:HG3	2:L:24:ARG:NH1	2.26	0.49
1:B:11:LEU:HD11	1:B:115:SER:HB3	1.94	0.49
3:D:480:ARG:HD2	3:D:519:TRP:CD1	2.48	0.49
3:D:378:ASN:OD1	3:D:380:SER:OG	2.22	0.48
1:H:11:LEU:HD11	1:H:149:PHE:CE2	2.48	0.48
2:L:127:ASP:HA	2:L:130:LEU:HB2	1.95	0.48
4:C:128:GLU:O	4:C:131:LYS:HB2	2.13	0.48
2:L:193:LYS:O	2:L:193:LYS:HG2	2.14	0.48
1:B:198:ILE:HG12	1:B:213:LYS:HG2	1.96	0.48
1:H:6:GLU:OE2	1:H:107:GLY:HA3	2.13	0.48
3:D:254:GLU:OE2	3:D:322:LYS:NZ	2.47	0.48
2:L:18:GLN:HE22	2:L:79:LYS:HD3	1.78	0.48
4:C:118:PRO:HD2	4:C:206:LEU:HD12	1.96	0.48
3:D:559:GLN:HB3	3:D:560:LYS:H	1.46	0.48
4:C:7:THR:HB	4:C:8:PRO:HD3	1.96	0.48
1:H:196:THR:HG23	1:H:213:LYS:HE3	1.96	0.47
3:A:226:GLU:HG3	3:A:286:TYR:HE2	1.78	0.47
1:H:54:GLY:HA3	3:A:559:GLN:OE1	2.14	0.47
3:A:471:THR:HB	3:A:474:PRO:O	2.13	0.47
2:L:118:PRO:HD3	2:L:203:HIS:ND1	2.29	0.47
1:B:127:LEU:HB3	4:C:123:PHE:CD2	2.49	0.47
7:I:2:NAG:H3	7:I:2:NAG:H83	1.95	0.47
3:A:197:ILE:HD12	3:A:598:PRO:CG	2.45	0.47
2:L:39:GLU:HA	2:L:53:ILE:O	2.15	0.47
3:A:264:SER:HB2	3:A:266:PHE:CE2	2.50	0.47
4:C:52:LEU:HA	4:C:63:VAL:HG21	1.97	0.47
3:A:340:ILE:HG12	3:A:426:VAL:CG2	2.44	0.47
3:A:486:SER:HB3	3:A:495:ARG:HG3	1.96	0.47
3:D:315:MET:HE3	3:D:315:MET:HB3	1.74	0.46
1:H:165:GLY:O	1:H:185:VAL:HA	2.16	0.46
3:A:559:GLN:HB3	3:A:560:LYS:H	1.57	0.46
2:L:9:LEU:HD21	4:C:3:LEU:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:29:ILE:HG22	2:L:36:THR:CG2	2.45	0.46
1:B:35:SER:OG	1:B:50:VAL:HG22	2.15	0.46
3:D:309:TYR:CD2	9:D:701:NAG:H5	2.51	0.46
2:L:24:ARG:NH1	2:L:75:ASP:OD1	2.47	0.46
3:A:460:TRP:CD2	3:A:500:PRO:HA	2.50	0.46
2:L:6:GLN:HA	2:L:22:SER:O	2.16	0.46
4:C:95:GLN:HE21	4:C:98:HIS:N	2.10	0.46
2:L:29:ILE:HD13	2:L:29:ILE:HA	1.60	0.46
4:C:53:ILE:HD13	4:C:59:ARG:HA	1.97	0.46
4:C:117:ALA:HB1	4:C:206:LEU:HG	1.97	0.46
3:D:450:GLN:HB2	3:D:516:ARG:CZ	2.45	0.46
2:L:152:GLN:HB2	2:L:200:GLU:HB3	1.98	0.45
1:B:127:LEU:HB2	1:B:142:GLY:O	2.16	0.45
1:H:35:SER:HB2	1:H:98:GLU:OE2	2.16	0.45
2:L:1:ASP:OD1	2:L:1:ASP:N	2.49	0.45
2:L:206:LEU:HD13	2:L:209:PRO:HD2	1.98	0.45
4:C:11:LEU:HD23	4:C:109:LEU:HD12	1.98	0.45
1:B:129:PRO:HD3	1:B:141:LEU:HB2	1.99	0.45
4:C:94:PHE:CE1	4:C:101:TYR:HB3	2.51	0.45
3:D:295:CYS:HB3	3:D:315:MET:HE3	1.98	0.45
3:D:509:ASN:HD21	3:D:526:LEU:HG	1.81	0.45
1:H:153:VAL:HG23	1:H:181:LEU:HD21	1.97	0.45
2:L:94:PHE:CZ	2:L:101:TYR:HB3	2.52	0.45
3:A:188:ILE:HA	3:A:599:GLU:HA	1.98	0.45
1:H:11:LEU:HD12	1:H:11:LEU:HA	1.71	0.45
3:D:397:LEU:HD13	3:D:502:ILE:HD11	1.99	0.45
3:D:397:LEU:CD1	3:D:502:ILE:HD11	2.47	0.45
3:D:403:PRO:HG3	3:D:502:ILE:HD13	1.99	0.45
1:H:3:GLN:NE2	1:H:5:LYS:HE2	2.31	0.45
1:H:120:LYS:O	1:H:148:TYR:HA	2.17	0.45
1:B:27:PHE:HE1	1:B:34:ILE:HD11	1.81	0.45
4:C:54:TYR:O	4:C:58:ASN:HB2	2.17	0.45
4:C:122:ILE:HD12	4:C:211:THR:O	2.16	0.45
1:H:30:THR:O	1:H:53:THR:HB	2.16	0.44
1:H:153:VAL:CG2	1:H:181:LEU:HD21	2.47	0.44
4:C:137:VAL:HG22	4:C:153:TRP:CH2	2.52	0.44
3:A:468:ASP:OD1	3:A:516:ARG:NH1	2.50	0.44
1:B:170:PRO:HD2	4:C:167:SER:OG	2.17	0.44
4:C:127:ASP:HA	4:C:130:LEU:HB2	2.00	0.44
1:H:71:LYS:HE2	1:H:73:ASN:OD1	2.17	0.44
1:H:181:LEU:C	1:H:181:LEU:HD12	2.38	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:389:TYR:N	3:A:389:TYR:CD1	2.85	0.44
3:D:345:TYR:OH	3:D:430:GLU:OE1	2.24	0.44
3:A:209:VAL:HG12	3:A:217:ILE:HD13	2.00	0.44
1:B:1:GLN:O	1:B:1:GLN:HG3	2.16	0.44
3:D:465:LYS:HB3	3:D:465:LYS:HE2	1.49	0.44
3:A:197:ILE:HD12	3:A:598:PRO:HG3	1.98	0.44
3:A:466:PHE:O	3:A:480:ARG:HG2	2.18	0.44
3:D:580:ILE:HD12	3:D:591:LYS:HD2	1.99	0.44
1:H:199:CYS:O	1:H:211:ASP:HA	2.17	0.44
4:C:146:PRO:HD2	4:C:203:HIS:NE2	2.33	0.44
1:B:12:VAL:O	1:B:114:VAL:HA	2.17	0.43
3:A:524:VAL:O	3:A:561:THR:HG21	2.18	0.43
1:B:156:SER:OG	1:B:200:ASN:HB2	2.18	0.43
1:B:130:SER:H	1:B:133:SER:HB2	1.83	0.43
1:B:199:CYS:O	1:B:211:ASP:HA	2.17	0.43
3:D:581:TYR:HA	3:D:588:ILE:HD13	1.99	0.43
3:A:382:CYS:HA	3:A:383:PRO:HD3	1.86	0.43
3:D:209:VAL:HG11	3:D:590:PRO:HG2	2.00	0.43
2:L:128:GLU:H	2:L:128:GLU:HG3	1.54	0.43
2:L:31:HIS:HB3	2:L:33:ASN:OD1	2.19	0.43
1:B:127:LEU:HB2	1:B:142:GLY:C	2.38	0.43
1:B:209:LYS:HB2	1:B:209:LYS:HE2	1.72	0.43
3:D:254:GLU:CD	3:D:322:LYS:HZ3	2.21	0.43
3:D:425:LYS:HB3	3:D:425:LYS:HE2	1.66	0.43
1:H:30:THR:HG21	3:A:504:TRP:CZ3	2.54	0.42
3:A:290:PHE:HZ	3:A:330:TYR:CE1	2.38	0.42
1:B:90:THR:HG23	1:B:112:VAL:O	2.19	0.42
1:B:125:PHE:CE2	4:C:129:GLN:HB2	2.52	0.42
3:D:232:SER:HA	3:D:249:ILE:O	2.20	0.42
3:D:233:HIS:CD2	3:D:233:HIS:C	2.92	0.42
1:H:141:LEU:HD11	1:H:157:TRP:CZ3	2.54	0.42
2:L:8:PRO:O	2:L:107:THR:HG23	2.19	0.42
2:L:16:GLY:HA2	2:L:82:ARG:HA	2.01	0.42
1:B:68:SER:OG	1:B:81:LYS:HB3	2.19	0.42
3:D:352:GLY:HA3	3:D:442:SER:O	2.20	0.42
3:A:285:VAL:HG22	3:A:355:GLY:HA3	2.01	0.42
4:C:206:LEU:HD23	4:C:206:LEU:HA	1.85	0.42
1:H:132:LYS:HA	1:H:132:LYS:HD3	1.85	0.42
2:L:206:LEU:HD13	2:L:209:PRO:HG2	2.00	0.42
3:A:570:ASN:O	3:A:571:LYS:HD2	2.20	0.42
3:D:433:ASP:HA	3:D:436:LEU:HD13	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:33:ASN:HB2	3:A:237:ILE:HG23	2.01	0.42
1:B:90:THR:HG23	1:B:113:THR:HA	2.01	0.42
3:A:316:MET:HB3	3:A:337:LEU:HD11	2.01	0.42
1:B:96:VAL:HG12	1:B:103:PHE:HB3	2.00	0.42
4:C:120:VAL:HA	4:C:140:LEU:O	2.19	0.42
4:C:180:LEU:HD23	4:C:181:SER:N	2.34	0.42
3:D:202:LEU:HD12	3:D:202:LEU:HA	1.85	0.42
3:D:513:LEU:HD13	3:D:519:TRP:CE2	2.55	0.42
3:A:375:PHE:CD1	3:A:408:ILE:HD13	2.55	0.42
2:L:206:LEU:HD23	2:L:206:LEU:HA	1.86	0.41
4:C:129:GLN:HG2	4:C:134:THR:O	2.20	0.41
3:A:316:MET:CB	3:A:337:LEU:HD11	2.51	0.41
1:B:11:LEU:HD23	1:B:119:THR:HG22	2.01	0.41
1:B:153:VAL:HG13	1:B:203:HIS:HD2	1.85	0.41
1:B:165:GLY:O	1:B:185:VAL:HA	2.20	0.41
3:D:288:ASN:O	3:D:289:GLU:HB2	2.20	0.41
3:D:524:VAL:HB	3:D:561:THR:HG21	2.03	0.41
1:B:120:LYS:O	1:B:148:TYR:HA	2.20	0.41
1:H:130:SER:H	1:H:133:SER:HB3	1.85	0.41
2:L:33:ASN:HD21	2:L:37:TYR:HE1	1.67	0.41
3:A:379:ASP:OD2	3:A:393:GLU:HA	2.21	0.41
4:C:15:LEU:HD23	4:C:83:VAL:O	2.20	0.41
3:D:384:ILE:HA	3:D:387:CYS:SG	2.60	0.41
3:A:338:ARG:HG3	3:A:339:SER:N	2.36	0.41
3:A:448:LEU:HD23	3:A:448:LEU:HA	1.89	0.41
1:B:196:THR:HG22	1:B:198:ILE:HG13	2.03	0.41
1:H:82:MET:HB3	1:H:85:LEU:HD11	2.01	0.41
3:A:206:THR:HB	3:A:265:LEU:O	2.20	0.41
3:D:397:LEU:HD23	3:D:397:LEU:HA	1.86	0.41
3:D:298:SER:OG	3:D:300:VAL:HG22	2.21	0.41
3:D:450:GLN:HB2	3:D:516:ARG:NH2	2.36	0.41
1:B:127:LEU:HD11	1:B:144:LEU:HB2	2.02	0.40
3:A:289:GLU:O	3:A:321:VAL:HG22	2.21	0.40
3:D:216:CYS:SG	3:D:218:THR:HG23	2.61	0.40
3:D:518:ASN:OD1	3:D:518:ASN:N	2.55	0.40
3:A:310:TRP:O	3:A:347:LYS:HE2	2.21	0.40
3:A:345:TYR:OH	3:A:410:ARG:HD2	2.21	0.40
3:D:226:GLU:HG3	3:D:286:TYR:CE2	2.57	0.40
1:H:4:LEU:HG	1:H:24:VAL:HG22	2.04	0.40
1:H:141:LEU:HG	1:H:185:VAL:HG13	2.04	0.40
1:H:166:VAL:HG22	1:H:185:VAL:HB	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:188:PRO:HG2	1:H:191:SER:CB	2.45	0.40
2:L:38:LEU:HD13	2:L:76:PHE:CD2	2.57	0.40
3:A:525:PHE:CE2	3:A:538:THR:HB	2.57	0.40
4:C:118:PRO:HD2	4:C:206:LEU:CD1	2.51	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	214/233 (92%)	208 (97%)	6 (3%)	0	100	100
1	H	214/233 (92%)	212 (99%)	2 (1%)	0	100	100
2	L	214/216 (99%)	205 (96%)	8 (4%)	1 (0%)	29	61
3	A	415/423 (98%)	398 (96%)	17 (4%)	0	100	100
3	D	415/423 (98%)	395 (95%)	20 (5%)	0	100	100
4	C	214/219 (98%)	204 (95%)	10 (5%)	0	100	100
All	All	1686/1747 (96%)	1622 (96%)	63 (4%)	1 (0%)	51	81

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	L	8	PRO

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	B	187/204 (92%)	177 (95%)	10 (5%)	22	54
1	H	187/204 (92%)	181 (97%)	6 (3%)	39	73
2	L	187/189 (99%)	184 (98%)	3 (2%)	62	88
3	A	374/380 (98%)	363 (97%)	11 (3%)	42	76
3	D	374/380 (98%)	363 (97%)	11 (3%)	42	76
4	C	187/194 (96%)	183 (98%)	4 (2%)	53	84
All	All	1496/1551 (96%)	1451 (97%)	45 (3%)	41	75

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	24	VAL
1	H	66	ARG
1	H	88	ASP
1	H	119	THR
1	H	141	LEU
1	H	200	ASN
2	L	18	GLN
2	L	38	LEU
2	L	157	ASN
3	A	193	THR
3	A	291	TYR
3	A	295	CYS
3	A	351	TYR
3	A	354	SER
3	A	379	ASP
3	A	426	VAL
3	A	466	PHE
3	A	487	ARG
3	A	519	TRP
3	A	599	GLU
1	B	18	LEU
1	B	64	LEU
1	B	66	ARG
1	B	88	ASP
1	B	141	LEU
1	B	153	VAL
1	B	181	LEU
1	B	189	SER

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Mol	Chain	Res	Type
1	B	194	THR
1	B	202	ASN
4	C	199	CYS
4	C	201	VAL
4	C	202	THR
4	C	210	VAL
3	D	186	ASN
3	D	291	TYR
3	D	295	CYS
3	D	313	SER
3	D	326	ASN
3	D	466	PHE
3	D	487	ARG
3	D	491	SER
3	D	492	GLN
3	D	518	ASN
3	D	547	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
2	L	157	ASN
3	A	334	GLN
3	A	381	ASN
3	A	404	ASN
3	A	473	ASN
1	B	202	ASN
4	C	81	ASN
4	C	95	GLN
4	C	203	HIS
3	D	191	GLN
3	D	333	HIS

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

21 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
5	NAG	E	1	3,5	14,14,15	1.00	1 (7%)	17,19,21	1.93	4 (23%)
5	NAG	E	2	5	14,14,15	0.37	0	17,19,21	2.10	4 (23%)
5	BMA	E	3	5	11,11,12	0.31	0	15,15,17	0.82	1 (6%)
5	MAN	E	4	5	11,11,12	0.15	0	15,15,17	0.64	0
6	NAG	F	1	3,6	14,14,15	0.97	1 (7%)	17,19,21	0.69	0
6	NAG	F	2	6	14,14,15	0.54	0	17,19,21	0.41	0
6	BMA	F	3	6	11,11,12	1.81	3 (27%)	15,15,17	1.20	3 (20%)
6	MAN	F	4	6	11,11,12	2.04	3 (27%)	15,15,17	1.32	3 (20%)
6	MAN	F	5	6	11,11,12	1.96	5 (45%)	15,15,17	1.20	2 (13%)
6	FUC	F	6	6	10,10,11	1.83	2 (20%)	14,14,16	0.93	0
7	NAG	G	1	7,3	14,14,15	0.40	0	17,19,21	0.80	0
7	NAG	G	2	7	14,14,15	0.97	2 (14%)	17,19,21	0.75	0
7	NAG	I	1	7,3	14,14,15	0.38	0	17,19,21	0.65	1 (5%)
7	NAG	I	2	7	14,14,15	0.48	0	17,19,21	1.49	2 (11%)
8	NAG	J	1	8,3	14,14,15	0.54	0	17,19,21	0.67	0
8	NAG	J	2	8	14,14,15	0.63	0	17,19,21	0.52	0
8	BMA	J	3	8	11,11,12	1.57	4 (36%)	15,15,17	0.91	1 (6%)
8	MAN	J	4	8	11,11,12	1.87	4 (36%)	15,15,17	1.24	2 (13%)
8	FUC	J	5	8	10,10,11	1.26	2 (20%)	14,14,16	1.15	2 (14%)
7	NAG	K	1	7,3	14,14,15	0.66	1 (7%)	17,19,21	0.95	1 (5%)
7	NAG	K	2	7	14,14,15	0.30	0	17,19,21	0.88	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	E	1	3,5	-	0/6/23/26	0/1/1/1
5	NAG	E	2	5	-	3/6/23/26	0/1/1/1
5	BMA	E	3	5	-	0/2/19/22	0/1/1/1
5	MAN	E	4	5	-	0/2/19/22	0/1/1/1
6	NAG	F	1	3,6	-	0/6/23/26	0/1/1/1
6	NAG	F	2	6	-	2/6/23/26	0/1/1/1
6	BMA	F	3	6	-	0/2/19/22	0/1/1/1
6	MAN	F	4	6	-	0/2/19/22	0/1/1/1
6	MAN	F	5	6	-	0/2/19/22	0/1/1/1
6	FUC	F	6	6	-	-	0/1/1/1
7	NAG	G	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	G	2	7	-	2/6/23/26	0/1/1/1
7	NAG	I	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	I	2	7	-	4/6/23/26	0/1/1/1
8	NAG	J	1	8,3	-	0/6/23/26	0/1/1/1
8	NAG	J	2	8	-	0/6/23/26	0/1/1/1
8	BMA	J	3	8	-	2/2/19/22	0/1/1/1
8	MAN	J	4	8	-	0/2/19/22	0/1/1/1
8	FUC	J	5	8	-	-	0/1/1/1
7	NAG	K	1	7,3	-	0/6/23/26	0/1/1/1
7	NAG	K	2	7	-	0/6/23/26	0/1/1/1

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	4	MAN	C2-C3	4.03	1.58	1.52
6	F	6	FUC	C2-C3	4.03	1.58	1.52
6	F	4	MAN	O5-C5	3.62	1.50	1.43
6	F	1	NAG	O5-C1	-3.46	1.38	1.43
6	F	6	FUC	O5-C5	3.40	1.50	1.43
6	F	3	BMA	O5-C1	3.17	1.48	1.43
8	J	4	MAN	C1-C2	3.08	1.59	1.52
8	J	4	MAN	O5-C5	2.94	1.49	1.43
5	E	1	NAG	C1-C2	2.90	1.56	1.52
6	F	5	MAN	O5-C5	2.85	1.49	1.43
6	F	3	BMA	O5-C5	2.82	1.49	1.43
8	J	4	MAN	C2-C3	2.70	1.56	1.52
6	F	5	MAN	C1-C2	2.67	1.58	1.52
6	F	5	MAN	C4-C5	2.60	1.58	1.53
6	F	3	BMA	O2-C2	2.56	1.48	1.43
8	J	4	MAN	C4-C3	2.54	1.58	1.52
6	F	5	MAN	C2-C3	2.50	1.56	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	G	2	NAG	C1-C2	2.31	1.55	1.52
8	J	3	BMA	C4-C3	2.23	1.58	1.52
8	J	5	FUC	C4-C5	2.23	1.57	1.52
8	J	5	FUC	C2-C3	2.19	1.55	1.52
7	K	1	NAG	O5-C1	-2.14	1.40	1.43
6	F	5	MAN	C4-C3	2.13	1.57	1.52
8	J	3	BMA	C4-C5	2.13	1.57	1.53
8	J	3	BMA	O5-C5	2.12	1.47	1.43
7	G	2	NAG	O5-C1	-2.04	1.40	1.43
6	F	4	MAN	O3-C3	2.03	1.47	1.43
8	J	3	BMA	O5-C1	2.01	1.46	1.43

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	2	NAG	C2-N2-C7	5.94	131.37	122.90
5	E	1	NAG	O3-C3-C2	-4.62	99.91	109.47
7	I	2	NAG	C2-N2-C7	4.37	129.13	122.90
5	E	1	NAG	O5-C1-C2	-4.10	104.81	111.29
7	K	2	NAG	C1-O5-C5	3.22	116.55	112.19
5	E	2	NAG	C1-C2-N2	3.19	115.94	110.49
7	I	2	NAG	C1-C2-N2	3.08	115.75	110.49
5	E	2	NAG	C8-C7-N2	3.02	121.22	116.10
5	E	1	NAG	C1-O5-C5	2.94	116.18	112.19
5	E	2	NAG	C1-O5-C5	2.93	116.17	112.19
6	F	4	MAN	O3-C3-C2	2.92	115.58	109.99
6	F	3	BMA	C1-C2-C3	-2.56	106.52	109.67
8	J	3	BMA	O5-C5-C6	2.53	111.17	107.20
6	F	4	MAN	O5-C5-C6	2.37	110.92	107.20
8	J	4	MAN	O3-C3-C2	2.34	114.47	109.99
8	J	5	FUC	C1-C2-C3	2.31	112.51	109.67
6	F	5	MAN	O3-C3-C2	2.28	114.35	109.99
6	F	5	MAN	O2-C2-C1	2.27	113.80	109.15
6	F	4	MAN	O2-C2-C1	2.27	113.80	109.15
5	E	1	NAG	C3-C4-C5	-2.25	106.22	110.24
5	E	3	BMA	C1-O5-C5	2.18	115.15	112.19
7	K	1	NAG	C1-O5-C5	2.16	115.12	112.19
6	F	3	BMA	O5-C5-C6	2.08	110.47	107.20
8	J	4	MAN	C1-O5-C5	2.06	114.98	112.19
6	F	3	BMA	O2-C2-C1	2.03	113.31	109.15
7	I	1	NAG	O4-C4-C5	-2.03	104.27	109.30
8	J	5	FUC	O5-C5-C4	2.01	113.12	109.52

There are no chirality outliers.

All (13) torsion outliers are listed below:

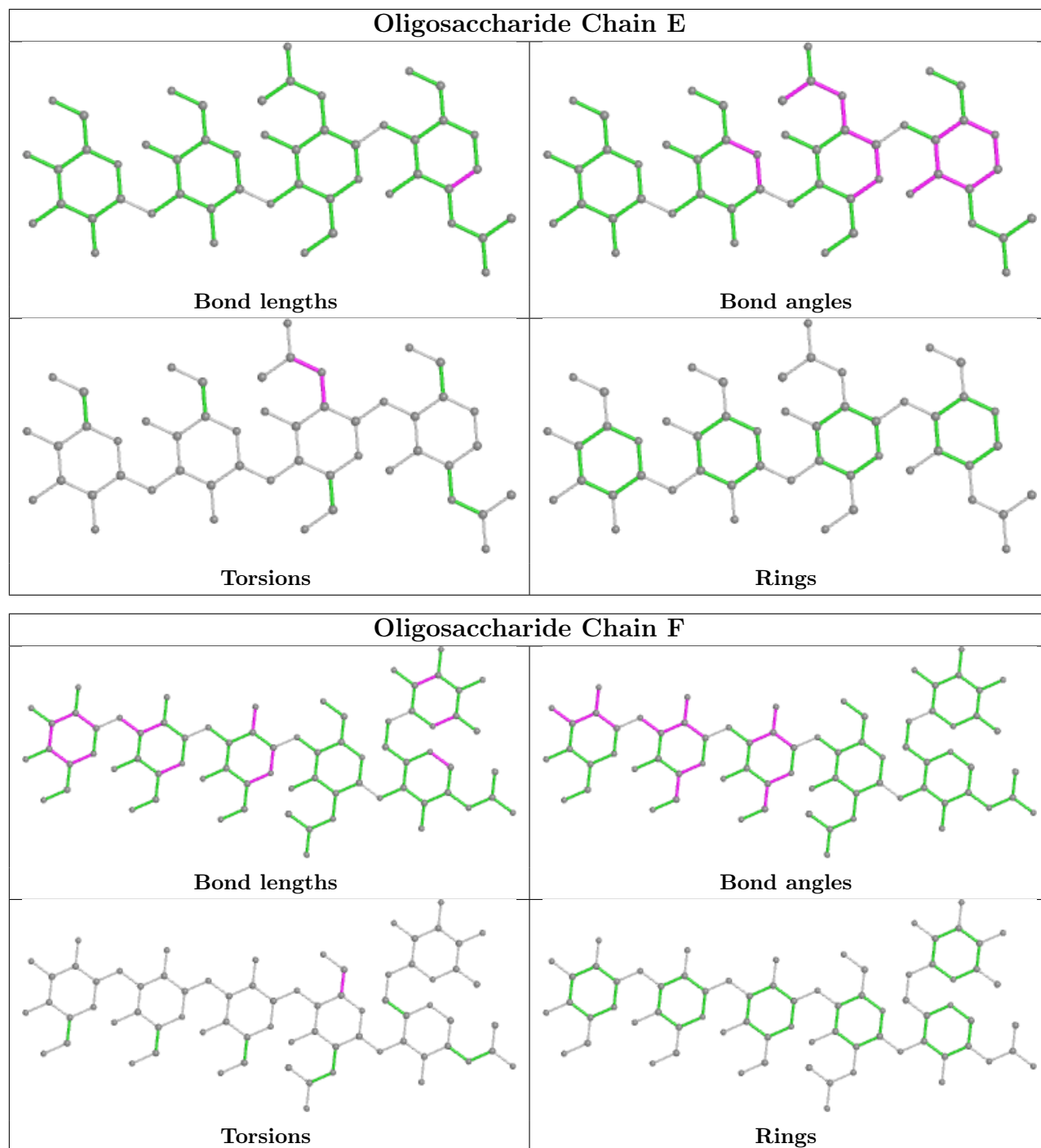
Mol	Chain	Res	Type	Atoms
5	E	2	NAG	C8-C7-N2-C2
5	E	2	NAG	O7-C7-N2-C2
5	E	2	NAG	C1-C2-N2-C7
7	G	2	NAG	O5-C5-C6-O6
7	G	2	NAG	C4-C5-C6-O6
7	I	2	NAG	C8-C7-N2-C2
7	I	2	NAG	O7-C7-N2-C2
8	J	3	BMA	O5-C5-C6-O6
6	F	2	NAG	O5-C5-C6-O6
6	F	2	NAG	C4-C5-C6-O6
8	J	3	BMA	C4-C5-C6-O6
7	I	2	NAG	C3-C2-N2-C7
7	I	2	NAG	C4-C5-C6-O6

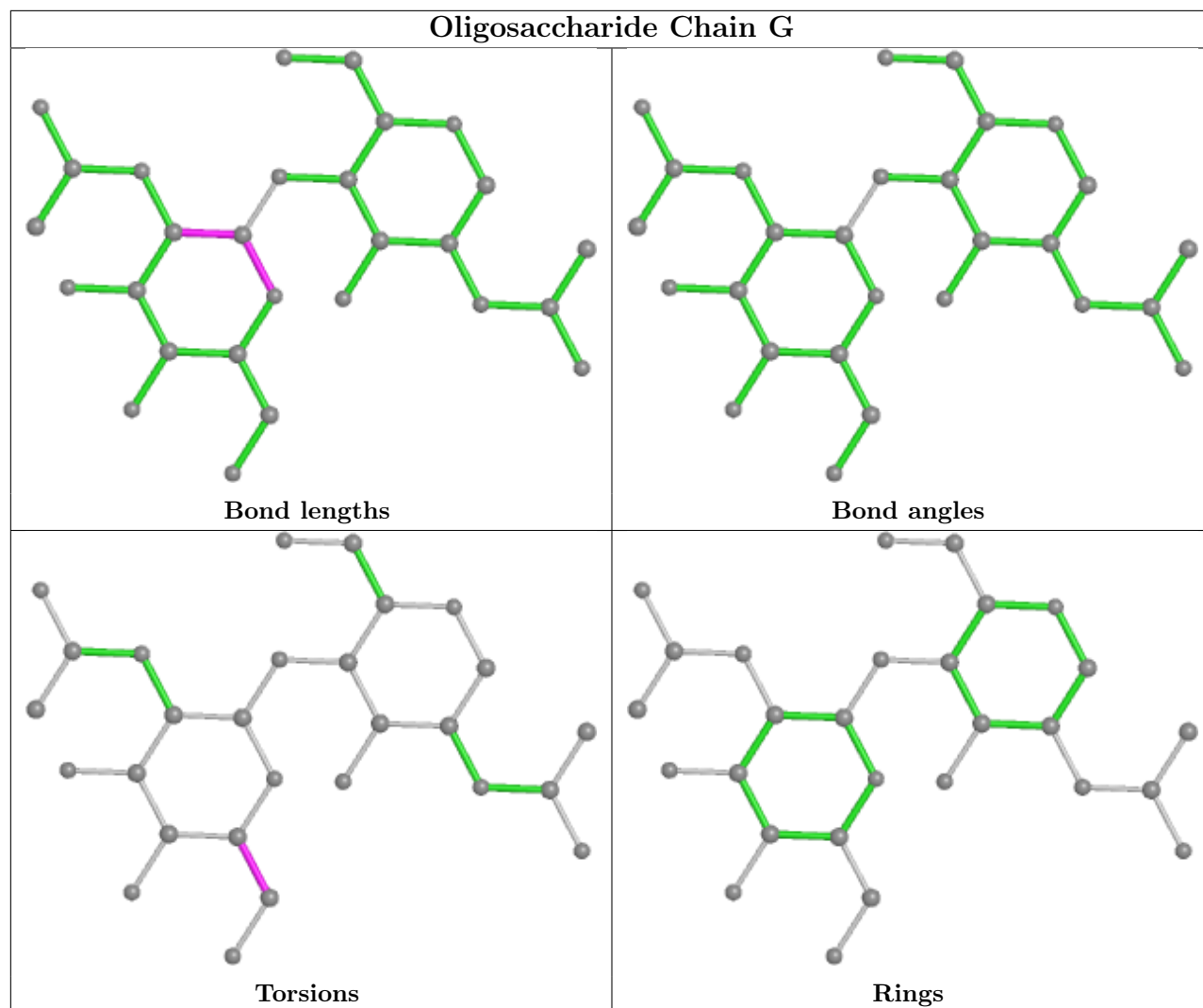
There are no ring outliers.

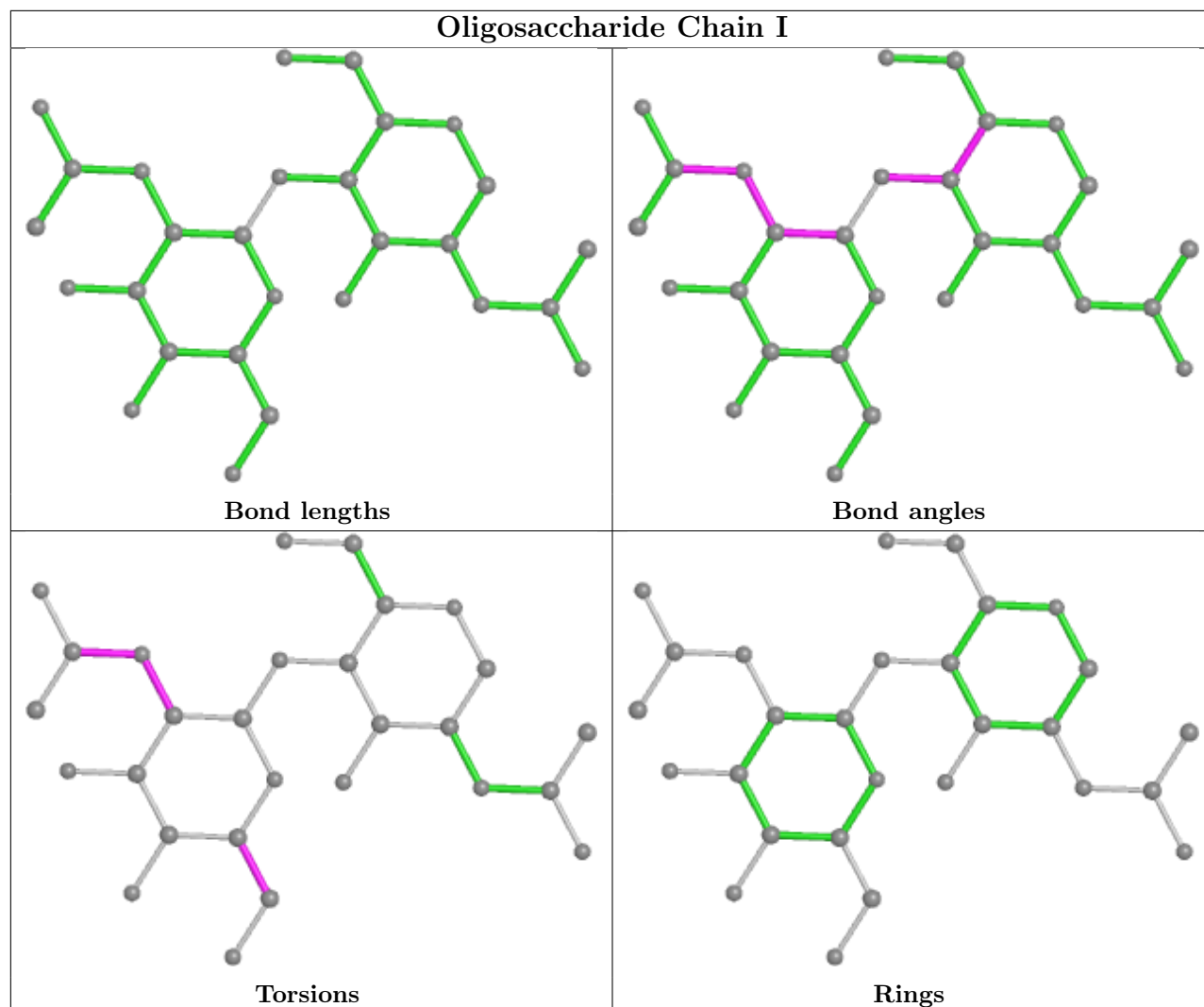
1 monomer is involved in 1 short contact:

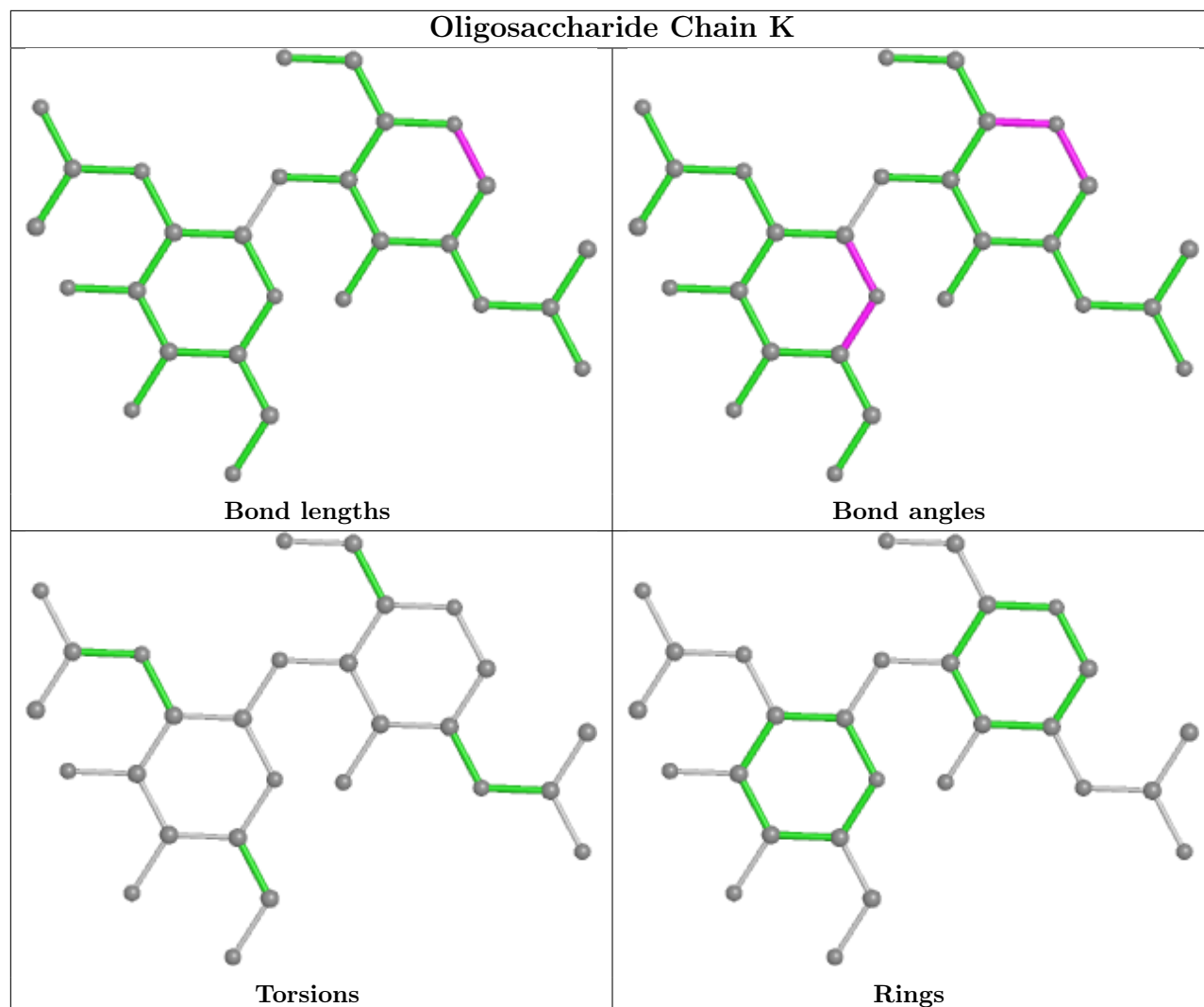
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	I	2	NAG	1	0

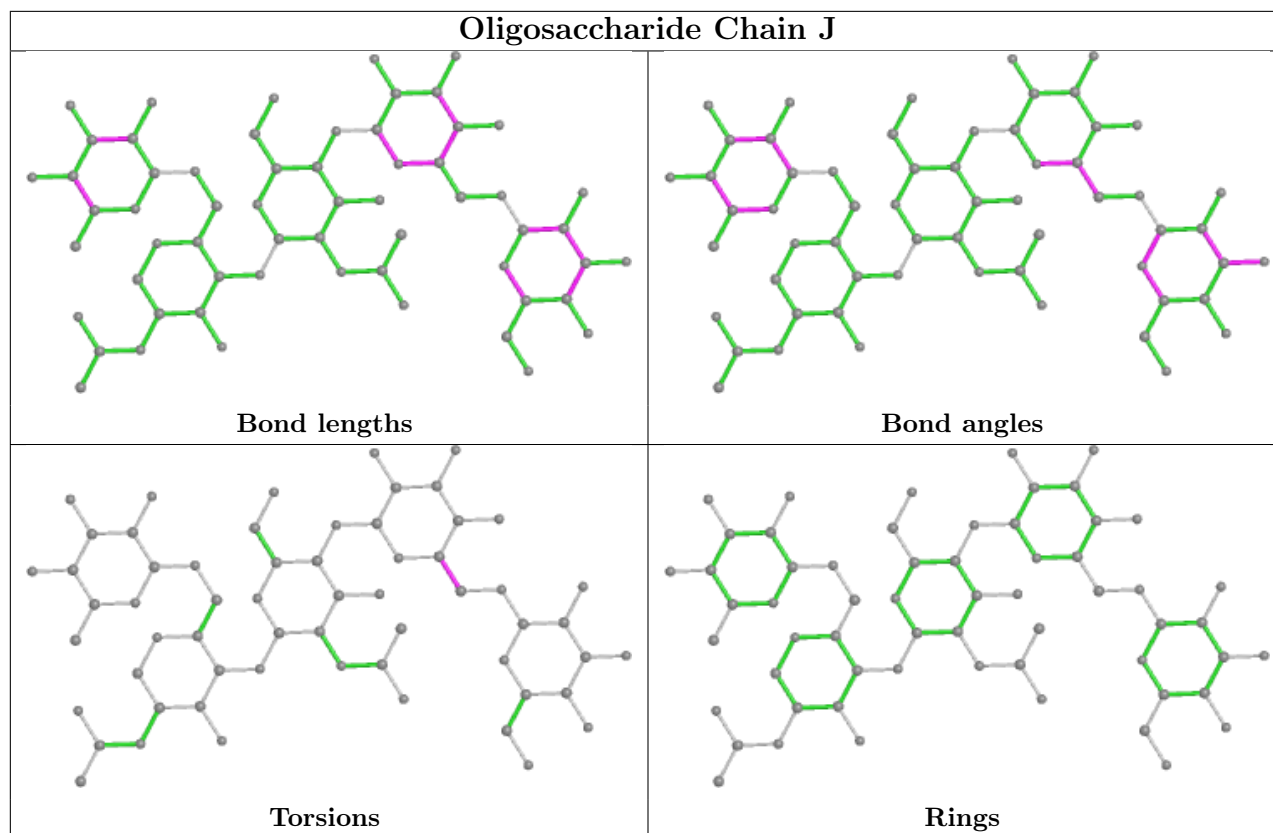
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











5.6 Ligand geometry [i](#)

2 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	$\# Z > 2$
9	NAG	D	701	3	14,14,15	0.48	0	17,19,21	0.72	0
9	NAG	A	701	3	14,14,15	0.39	0	17,19,21	0.71	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
9	NAG	D	701	3	-	0/6/23/26	0/1/1/1
9	NAG	A	701	3	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	A	701	NAG	O5-C5-C6-O6
9	A	701	NAG	C4-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	D	701	NAG	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	B	216/233 (92%)	0.92	33 (15%) 2 1	46, 62, 119, 137	0
1	H	216/233 (92%)	0.30	6 (2%) 53 43	41, 57, 81, 85	0
2	L	216/216 (100%)	0.44	16 (7%) 14 8	38, 67, 115, 132	0
3	A	417/423 (98%)	0.46	28 (6%) 17 10	40, 58, 85, 98	0
3	D	417/423 (98%)	0.71	52 (12%) 3 2	45, 64, 92, 107	0
4	C	216/219 (98%)	0.62	26 (12%) 4 2	38, 78, 115, 133	0
All	All	1698/1747 (97%)	0.58	161 (9%) 8 4	38, 62, 103, 137	0

All (161) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	136	GLY	7.6
2	L	154	LYS	6.0
1	B	196	THR	6.0
1	B	192	LEU	5.8
1	H	1	GLN	5.5
1	B	134	THR	5.5
3	D	196	GLN	5.0
1	B	133	SER	4.8
3	D	387	CYS	4.8
1	B	187	VAL	4.8
4	C	155	VAL	4.8
1	B	191	SER	4.7
1	B	149	PHE	4.7
1	B	132	LYS	4.7
1	B	194	THR	4.6
3	A	326	ASN	4.4
3	D	389	TYR	4.3
4	C	157	ASN	4.2
1	B	141	LEU	4.2

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Mol	Chain	Res	Type	RSRZ
2	L	159	LEU	4.2
1	B	198	ILE	4.1
3	D	191	GLN	4.1
3	D	186	ASN	4.1
3	D	309	TYR	4.1
3	D	386	LYS	4.0
2	L	196	LEU	3.9
3	D	508	TYR	3.9
1	B	1	GLN	3.9
3	A	328	GLY	3.9
1	B	190	SER	3.8
2	L	193	LYS	3.8
4	C	152	GLN	3.8
3	D	442	SER	3.7
3	D	441	PRO	3.7
3	A	360	ASP	3.7
1	B	135	SER	3.6
4	C	206	LEU	3.6
1	H	187	VAL	3.5
2	L	206	LEU	3.5
1	B	195	GLN	3.5
3	D	454	TYR	3.5
1	B	197	TYR	3.5
2	L	7	THR	3.5
3	A	388	GLN	3.5
1	B	137	GLY	3.4
2	L	209	PRO	3.4
3	D	373	THR	3.3
1	B	161	ALA	3.3
3	D	353	PRO	3.3
3	D	352	GLY	3.3
4	C	209	PRO	3.3
1	B	162	LEU	3.3
4	C	145	TYR	3.2
1	B	139	ALA	3.2
3	A	384	ILE	3.2
3	A	473	ASN	3.2
1	B	193	GLY	3.2
3	A	386	LYS	3.1
3	D	440	SER	3.1
3	D	509	ASN	3.1
2	L	186	LEU	3.1

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Mol	Chain	Res	Type	RSRZ
2	L	82	ARG	3.0
3	A	186	ASN	3.0
4	C	154	LYS	3.0
3	D	338	ARG	3.0
3	D	384	ILE	3.0
1	B	158	ASN	3.0
3	A	570	ASN	3.0
4	C	204	GLN	3.0
4	C	114	THR	3.0
1	B	188	PRO	3.0
1	B	215	GLU	3.0
3	D	456	ALA	2.9
4	C	198	ALA	2.9
1	H	192	LEU	2.9
1	H	149	PHE	2.9
3	D	385	THR	2.9
3	D	560	LYS	2.9
3	D	458	PHE	2.8
2	L	145	TYR	2.8
3	D	561	THR	2.8
4	C	196	LEU	2.7
3	D	388	GLN	2.7
3	A	385	THR	2.7
3	D	300	VAL	2.7
1	B	150	PRO	2.7
4	C	116	ALA	2.7
3	D	329	GLY	2.7
3	D	510	ASP	2.7
1	B	200	ASN	2.7
4	C	207	SER	2.7
4	C	158	ALA	2.6
1	H	131	SER	2.6
3	A	456	ALA	2.6
4	C	131	LYS	2.6
3	A	517	ILE	2.6
3	D	197	ILE	2.6
3	D	422	GLU	2.6
1	B	53	THR	2.6
4	C	115	VAL	2.6
3	A	381	ASN	2.6
3	D	563	THR	2.6
3	A	353	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	H	2	VAL	2.5
3	A	196	GLN	2.5
3	D	391	LYS	2.5
4	C	156	ASP	2.5
3	A	418	LEU	2.5
4	C	7	THR	2.5
4	C	82	ARG	2.5
3	A	419	SER	2.4
3	D	599	GLU	2.4
3	D	351	TYR	2.4
3	D	507	VAL	2.4
3	D	511	ALA	2.4
3	D	326	ASN	2.4
2	L	208	SER	2.4
3	D	308	THR	2.4
3	D	360	ASP	2.4
3	D	346	ASP	2.3
3	D	381	ASN	2.3
3	D	192	LYS	2.3
3	D	562	ILE	2.3
1	B	138	THR	2.3
3	D	443	LYS	2.3
3	A	222	LEU	2.2
1	B	214	VAL	2.2
4	C	200	GLU	2.2
3	D	354	SER	2.2
2	L	157	ASN	2.2
3	A	354	SER	2.2
3	A	441	PRO	2.2
3	A	442	SER	2.2
3	A	470	LEU	2.2
3	D	220	PRO	2.2
3	D	425	LYS	2.2
3	D	295	CYS	2.2
4	C	13	VAL	2.2
2	L	63	VAL	2.1
2	L	207	SER	2.1
3	A	389	TYR	2.1
2	L	205	GLY	2.1
3	A	508	TYR	2.1
3	D	193	THR	2.1
4	C	81	ASN	2.1

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Mol	Chain	Res	Type	RSRZ
3	D	457	SER	2.1
1	B	2	VAL	2.1
4	C	159	LEU	2.1
4	C	16	GLY	2.1
3	A	193	THR	2.1
3	D	569	LYS	2.1
3	D	365	PRO	2.1
3	D	390	SER	2.1
2	L	155	VAL	2.1
4	C	111	ILE	2.1
3	A	577	LEU	2.0
1	B	189	SER	2.0
3	A	562	ILE	2.0
1	B	186	THR	2.0
3	A	561	THR	2.0
4	C	110	GLU	2.0

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

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

6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

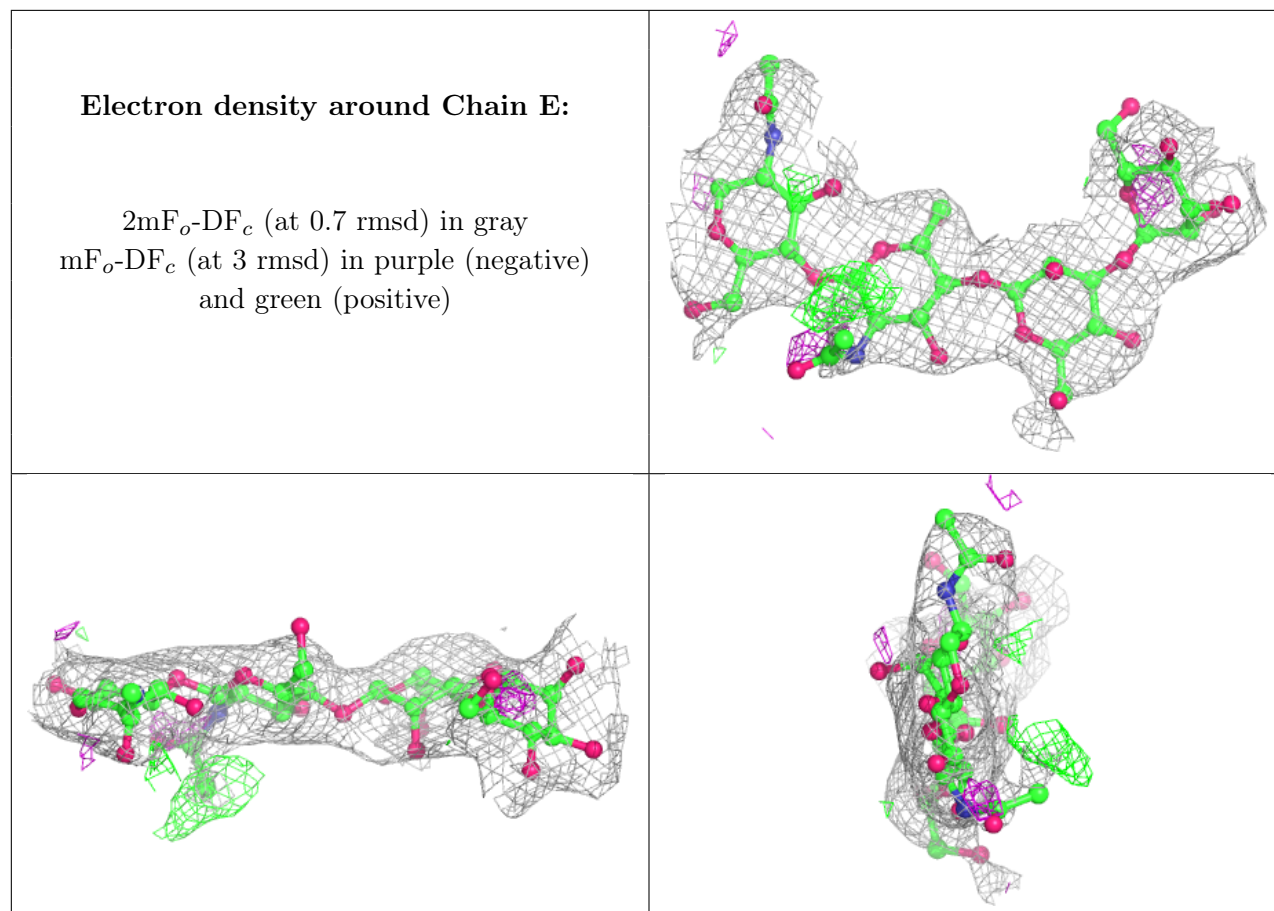
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	MAN	F	5	11/12	0.64	0.62	103,113,116,116	0
5	MAN	E	4	11/12	0.65	0.33	98,103,107,109	0
8	MAN	J	4	11/12	0.75	0.39	101,105,108,109	0
8	BMA	J	3	11/12	0.78	0.40	96,100,104,108	0
7	NAG	K	2	14/15	0.80	0.54	96,103,105,106	0
7	NAG	G	2	14/15	0.81	0.43	98,103,111,111	0
6	BMA	F	3	11/12	0.81	0.40	87,91,99,104	0
6	MAN	F	4	11/12	0.82	0.45	99,108,111,112	0
7	NAG	I	1	14/15	0.83	0.21	81,90,99,101	0
5	NAG	E	2	14/15	0.83	0.31	82,85,91,95	0
7	NAG	I	2	14/15	0.84	0.53	92,105,111,113	0
7	NAG	G	1	14/15	0.85	0.23	65,78,96,100	0

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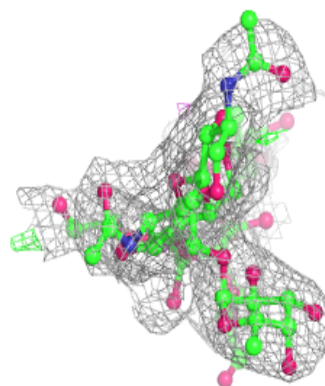
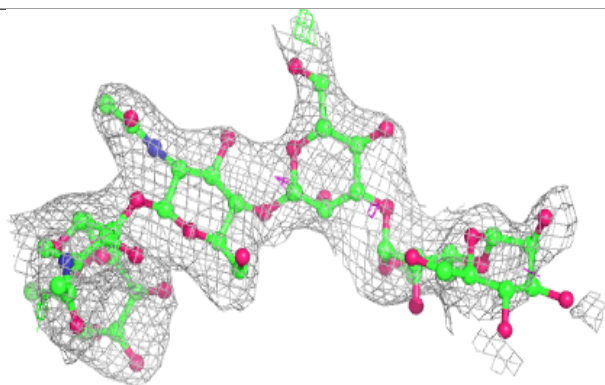
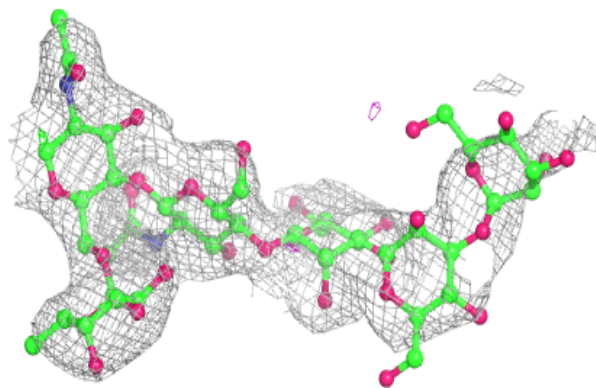
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
8	NAG	J	2	14/15	0.89	0.37	82,93,99,101	0
7	NAG	K	1	14/15	0.89	0.27	80,89,93,98	0
5	BMA	E	3	11/12	0.89	0.27	94,96,97,102	0
6	NAG	F	2	14/15	0.90	0.30	64,78,83,90	0
8	NAG	J	1	14/15	0.93	0.23	64,74,79,84	0
5	NAG	E	1	14/15	0.94	0.14	66,72,81,85	0
8	FUC	J	5	10/11	0.94	0.22	69,75,77,80	0
6	NAG	F	1	14/15	0.95	0.16	53,63,69,72	0
6	FUC	F	6	10/11	0.96	0.27	64,68,70,70	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.

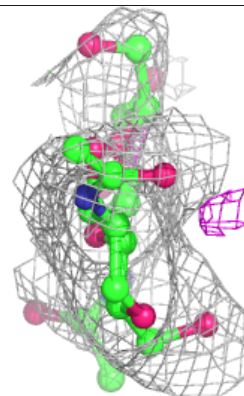
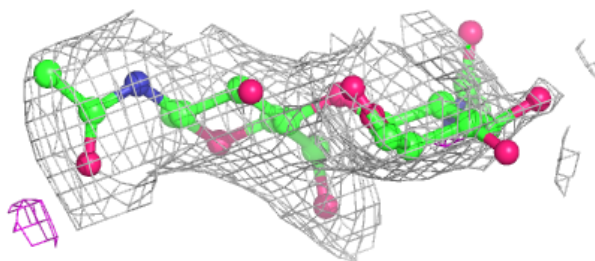
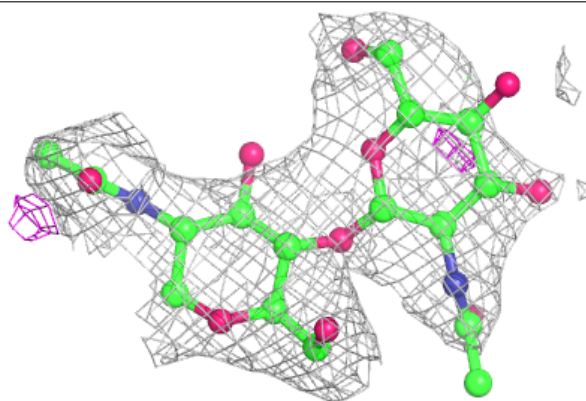


Electron density around Chain F:

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

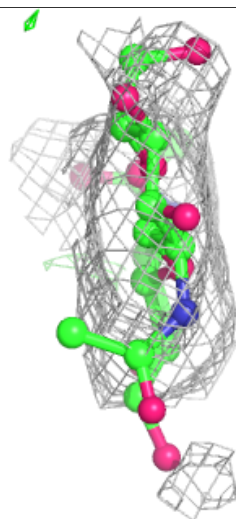
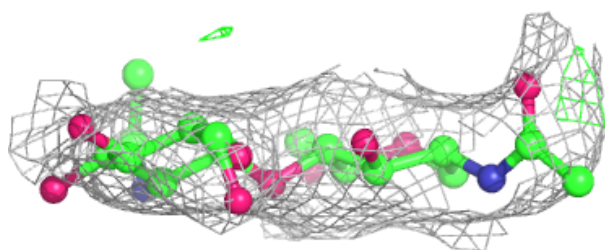
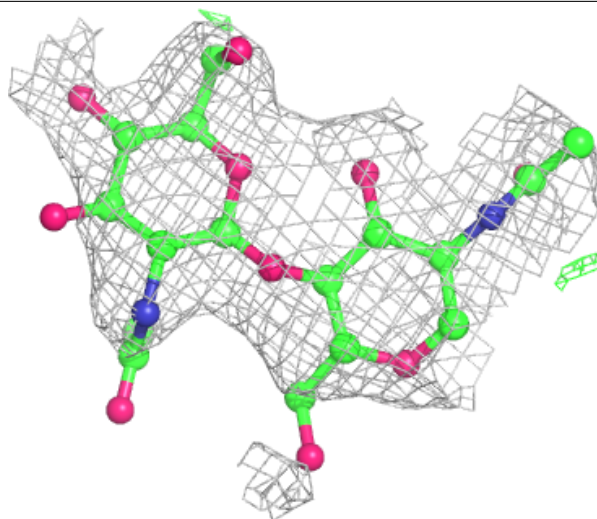
**Electron density around Chain G:**

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



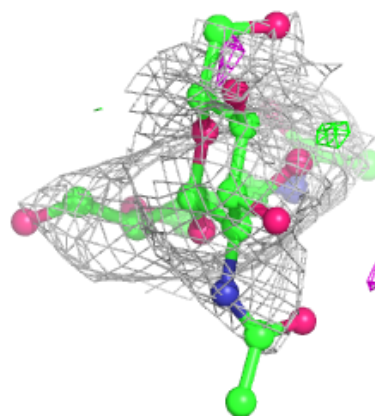
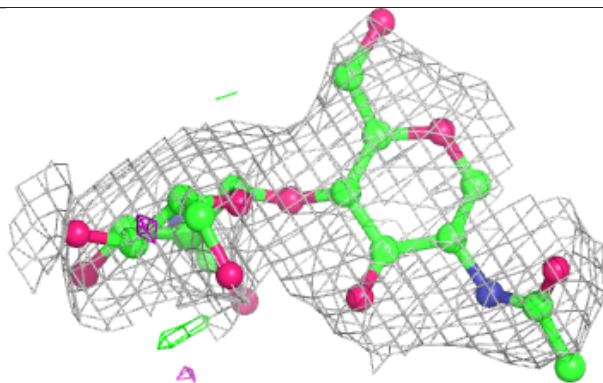
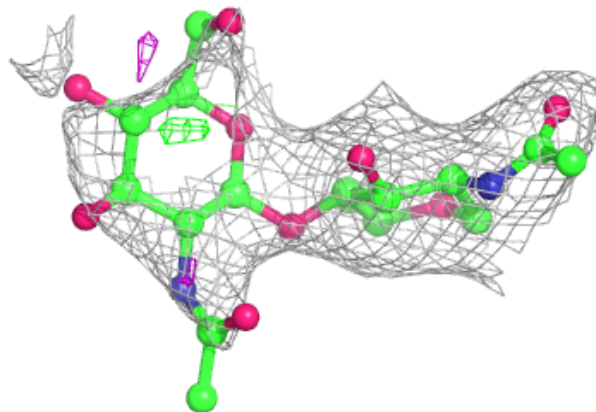
Electron density around Chain I:

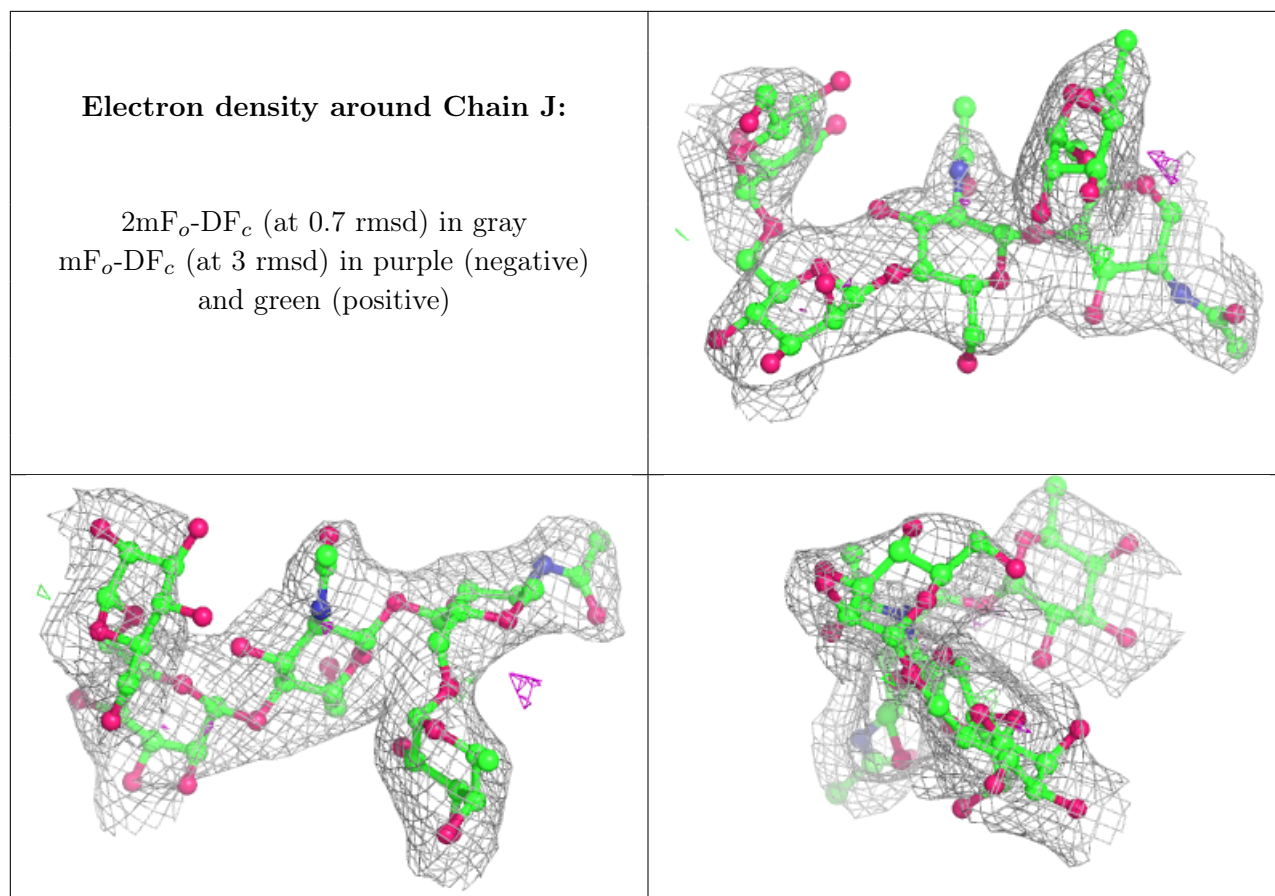
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain K:

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





6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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(\AA^2)	Q<0.9
9	NAG	D	701	14/15	0.80	0.38	81,88,91,92	0
9	NAG	A	701	14/15	0.93	0.34	73,81,85,86	0

6.5 Other polymers [i](#)

There are no such residues in this entry.