



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 26, 2026 – 03:15 PM EDT

PDB ID : 8JA5 / pdb_00008ja5
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:

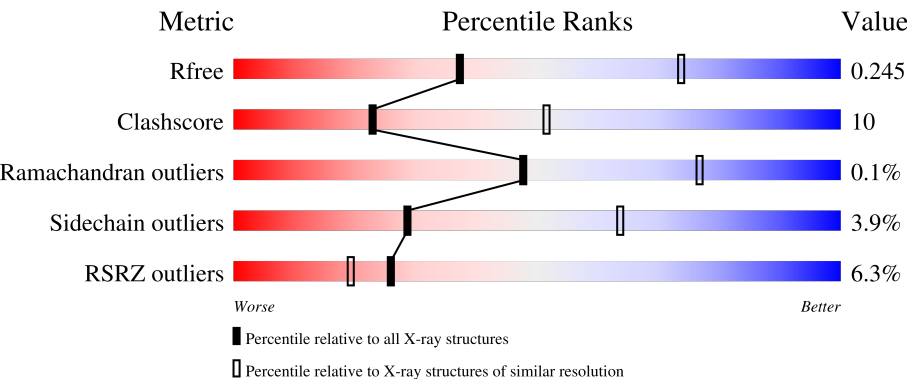
MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance i

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.



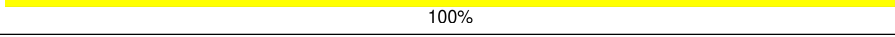
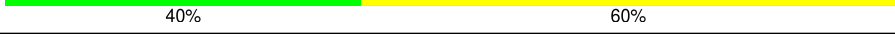
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R _{free}	180053	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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	12% 63% 28% • 7%
1	H	233	6% 68% 23% • 7%
2	L	216	7% 72% 26% •
3	A	423	4% 75% 22% ••
3	D	423	3% 78% 19% ••

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Mol	Chain	Length	Quality of chain
4	C	219	
5	E	4	
6	F	6	
7	G	2	
7	I	2	
7	K	2	
8	J	5	

2 Entry composition

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
1	H	216	Total	C	N	O	S	0	0	0
			1615	1027	263	320	5			
1	B	216	Total	C	N	O	S	0	0	0
			1615	1027	263	320	5			

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

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

- Molecule 3 is a protein called Glycoprotein G.

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

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.

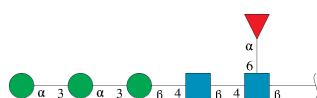
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	C	216	Total 1654	C 1040	N 277	O 332	S 5	0	0	0

- 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
5	E	4	Total 50	C 28	N 2	O 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.



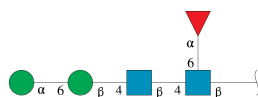
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
6	F	6	Total 71	C 40	N 2	O 29	0	0	0

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



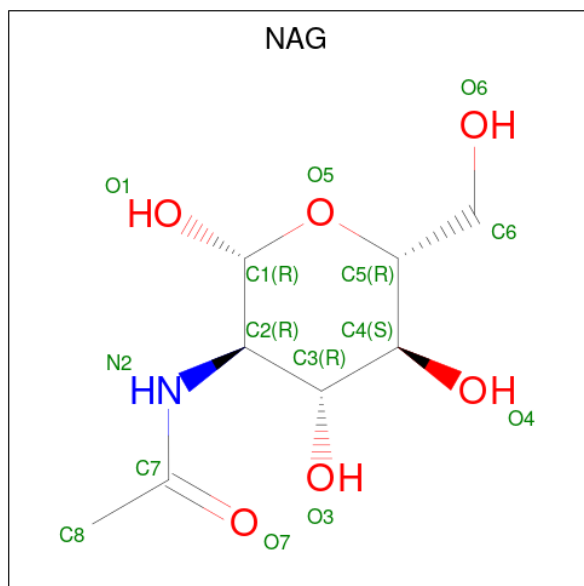
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
7	G	2	Total	C	N	O	0	0	0
			28	16	2	10			
7	I	2	Total	C	N	O	0	0	0
			28	16	2	10			
7	K	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 8 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-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
8	J	5	Total	C	N	O	0	0	0
			60	34	2	24			

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).



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		

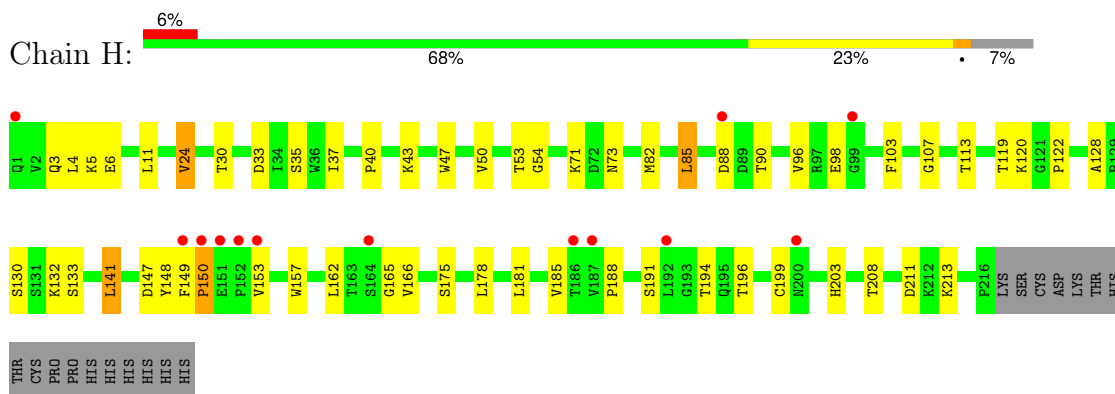
- Molecule 10 is water.

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

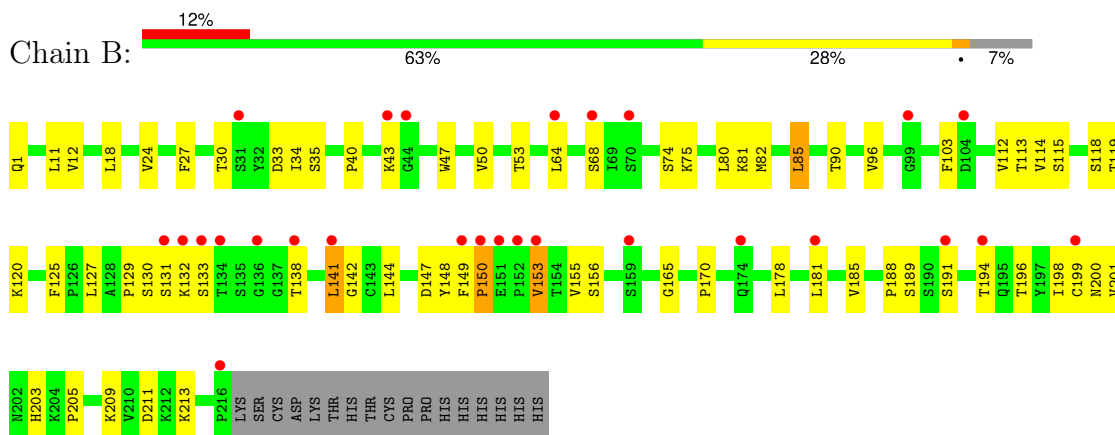
3 Residue-property plots [i](#)

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.

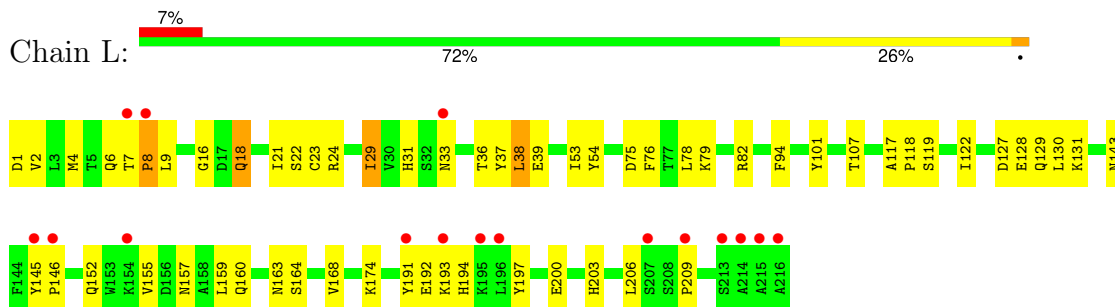
• Molecule 1: 14F8 antibody heavy chain



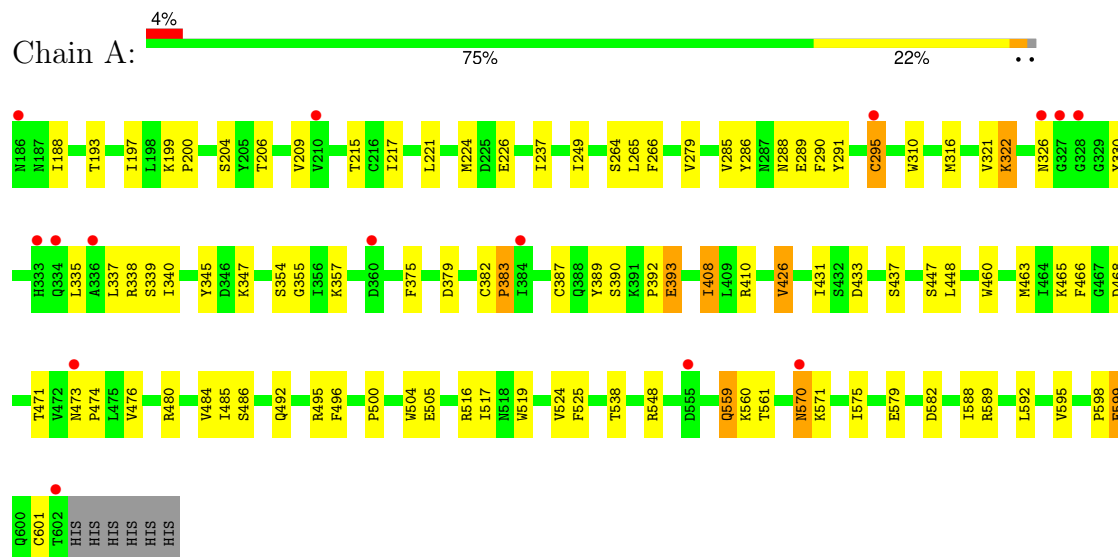
• Molecule 1: 14F8 antibody heavy chain



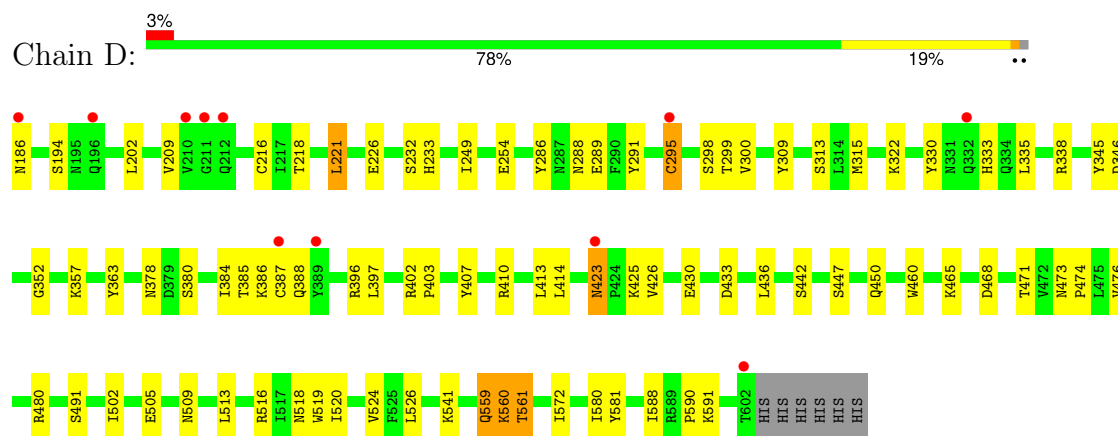
• Molecule 2: 14F8 antibody light chain



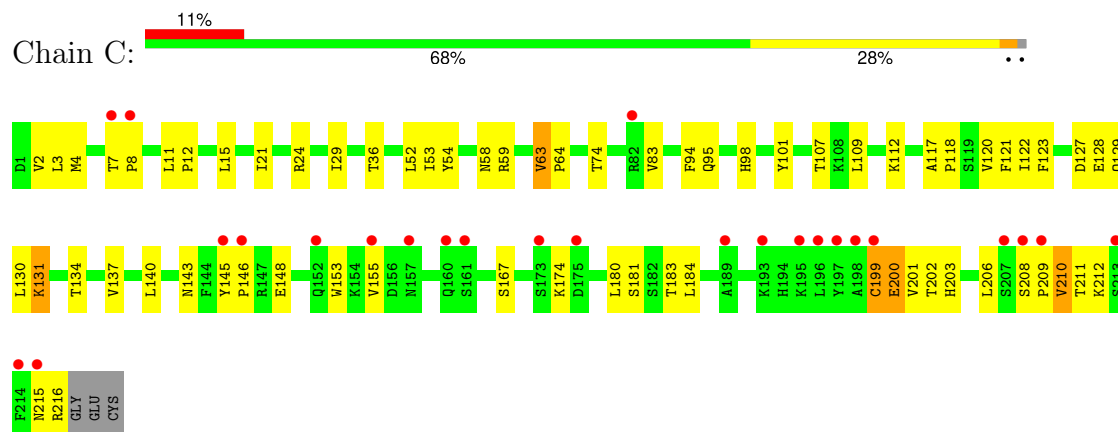
- Molecule 3: Glycoprotein G



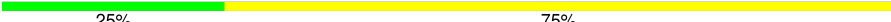
- Molecule 3: Glycoprotein G



- 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

Chain E:  25% 75%

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%

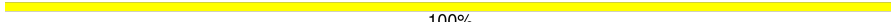
MAG1
MAG2

- 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 36.45 – 2.79	Depositor EDS
% Data completeness (in resolution range)	99.0 (36.45-2.79) 99.5 (36.45-2.79)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 2.81Å)	Xtriage
Refinement program	PHENIX (1.20.1_4487: ???)	Depositor
R, R_{free}	0.217 , 0.245 0.217 , 0.245	Depositor DCC
R_{free} test set	3171 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	62.3	Xtriage
Anisotropy	0.092	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 57.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
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

Xtriage'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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MAN, NAG, FUC, 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	0.84	0/1656	1.22	3/2263 (0.1%)
1	H	0.87	0/1656	1.27	4/2263 (0.2%)
2	L	0.81	1/1690 (0.1%)	1.05	15/2297 (0.7%)
3	A	0.71	0/3376	0.91	9/4592 (0.2%)
3	D	0.72	1/3376 (0.0%)	0.90	9/4592 (0.2%)
4	C	0.75	0/1690	0.97	8/2297 (0.3%)
All	All	0.77	2/13444 (0.0%)	1.03	48/18304 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	L	192	GLU	CA-C	-5.40	1.47	1.53
3	D	330	TYR	CA-C	-5.10	1.48	1.52

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	L	145	TYR	CA-C-N	-9.65	109.77	119.90
2	L	145	TYR	C-N-CA	-9.65	109.77	119.90
1	H	128	ALA	N-CA-C	8.46	120.58	109.83
3	A	570	ASN	CA-C-N	-7.91	111.83	122.99
3	A	570	ASN	C-N-CA	-7.91	111.83	122.99
4	C	145	TYR	CA-C-N	-7.75	110.99	119.98
4	C	145	TYR	C-N-CA	-7.75	110.99	119.98
3	D	330	TYR	N-CA-C	-7.71	101.56	112.13
4	C	143	ASN	N-CA-C	7.66	121.97	111.39
3	D	460	TRP	N-CA-C	7.22	120.02	111.71
2	L	143	ASN	N-CA-C	7.18	121.30	111.39
1	H	150	PRO	CB-CA-C	7.12	120.67	111.21
2	L	191	TYR	N-CA-C	-6.80	98.58	109.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	131	SER	N-CA-C	-6.79	103.94	111.82
2	L	145	TYR	N-CA-C	6.50	121.05	112.35
3	A	548	ARG	N-CA-C	6.23	118.77	108.99
4	C	145	TYR	N-CA-C	6.17	120.57	112.17
3	A	322	LYS	CA-C-N	-6.09	114.36	120.21
3	A	322	LYS	C-N-CA	-6.09	114.36	120.21
2	L	129	GLN	N-CA-C	-6.08	104.57	112.23
2	L	119	SER	N-CA-C	-6.03	99.36	109.07
3	A	570	ASN	CB-CA-C	-5.82	101.87	111.36
3	D	385	THR	N-CA-C	5.72	118.00	111.02
3	A	383	PRO	CB-CA-C	-5.71	105.33	113.09
2	L	155	VAL	N-CA-C	-5.67	100.41	108.58
2	L	194	HIS	N-CA-C	-5.65	101.92	110.28
2	L	164	SER	N-CA-C	5.61	118.04	108.90
4	C	64	PRO	N-CA-C	5.56	119.01	111.22
3	A	335	LEU	N-CA-C	5.48	118.63	110.14
1	B	150	PRO	CB-CA-C	5.47	118.49	111.21
1	H	194	THR	N-CA-C	-5.44	107.30	114.31
3	A	215	THR	N-CA-C	5.41	118.92	110.32
2	L	174	LYS	N-CA-C	5.38	116.95	111.14
2	L	197	TYR	N-CA-C	-5.38	100.33	108.67
4	C	63	VAL	CA-C-N	-5.33	115.10	120.21
4	C	63	VAL	C-N-CA	-5.33	115.10	120.21
3	D	560	LYS	N-CA-C	5.33	117.95	110.23
3	D	299	THR	N-CA-C	-5.32	106.57	113.16
2	L	29	ILE	CA-CB-CG2	5.28	119.47	110.50
4	C	145	TYR	N-CA-CB	5.25	115.38	110.39
2	L	117	ALA	CA-C-N	-5.20	114.63	120.14
2	L	117	ALA	C-N-CA	-5.20	114.63	120.14
1	B	149	PHE	CB-CA-C	-5.19	104.58	113.04
3	D	194	SER	N-CA-C	-5.18	106.64	113.17
3	D	386	LYS	N-CA-C	-5.14	106.86	112.72
1	H	175	SER	N-CA-C	-5.11	105.84	111.71
3	D	423	ASN	CA-C-N	-5.08	113.48	119.84
3	D	423	ASN	C-N-CA	-5.08	113.48	119.84

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	B	1615	0	1591	49	0
1	H	1615	0	1591	42	0
2	L	1654	0	1607	35	0
3	A	3296	0	3238	61	0
3	D	3296	0	3240	58	0
4	C	1654	0	1598	43	0
5	E	50	0	43	0	0
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	1	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	276	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 (276) 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:463:MET:HE1	3:A:496:PHE:HA	1.51	0.92
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:C:95:GLN:NE2	4:C:98:HIS:H	1.83	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
1:B:120:LYS:HZ1	1:B:147:ASP:HB3	1.54	0.72
3:D:447:SER:O	3:D:516:ARG:NH2	2.23	0.71
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
4:C:215:ASN:O	4:C:216:ARG:C	2.42	0.62
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
3:D:254:GLU:CD	3:D:322:LYS:NZ	2.58	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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:A:437:SER:HB3	3:A:465:LYS:HZ2	1.65	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
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
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:A:463:MET:HE1	3:A:496:PHE:HD1	1.68	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
3:D:254:GLU:CD	3:D:322:LYS:HZ1	2.15	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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
3:A:224:MET:HE1	3:A:575:ILE:CG2	2.40	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:345:TYR:OH	3:D:430:GLU:OE1	2.24	0.51
3:A:437:SER:HB3	3:A:465:LYS:NZ	2.25	0.51
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
1:H:181:LEU:C	1:H:181:LEU:HD12	2.38	0.49
2:L:39:GLU:HG2	2:L:54:TYR:HA	1.95	0.49
2:L:4:MET:HE3	2:L:23:CYS:SG	2.53	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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:196:THR:HG23	1:H:213:LYS:HE3	1.96	0.47
1:B:127:LEU:HB2	1:B:142:GLY:C	2.38	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:199:LYS:NZ	10:A:803:HOH:O	2.46	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
3:D:233:HIS:C	3:D:233:HIS:CD2	2.92	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
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
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: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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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:2:VAL:HG12	4:C:4:MET:HE2	2.00	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
3:A:389:TYR:N	3:A:389:TYR:CD1	2.85	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:221:LEU:C	3:D:221:LEU:HD23	2.42	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
3:D:295:CYS:HB3	3:D:315:MET:HE3	2.01	0.43
2:L:31:HIS:HB3	2:L:33:ASN:OD1	2.19	0.43
1:B:209:LYS:HB2	1:B:209:LYS:HE2	1.72	0.43
3:D:425:LYS:HB3	3:D:425:LYS:HE2	1.66	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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
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
3:A:224:MET:HE1	3:A:575:ILE:HG21	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
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

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
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:A:221:LEU:C	3:A:221:LEU:HD23	2.45	0.41
3:D:397:LEU:HD23	3:D:397:LEU:HA	1.86	0.41
3:A:492:GLN:CD	3:A:492:GLN:H	2.29	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
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

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	L	214/216 (99%)	205 (96%)	8 (4%)	1 (0%)	24	55
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%)	48	77

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	L	8	PRO

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	B	187/204 (92%)	175 (94%)	12 (6%)	16	44
1	H	187/204 (92%)	182 (97%)	5 (3%)	39	74
2	L	187/189 (99%)	181 (97%)	6 (3%)	34	70
3	A	374/380 (98%)	359 (96%)	15 (4%)	28	63
3	D	374/380 (98%)	363 (97%)	11 (3%)	37	73
4	C	187/194 (96%)	177 (95%)	10 (5%)	20	52
All	All	1496/1551 (96%)	1437 (96%)	59 (4%)	28	64

All (59) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	H	24	VAL
1	H	85	LEU
1	H	88	ASP
1	H	119	THR
1	H	141	LEU
2	L	18	GLN

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Mol	Chain	Res	Type
2	L	38	LEU
2	L	131	LYS
2	L	157	ASN
2	L	159	LEU
2	L	168	VAL
3	A	193	THR
3	A	249	ILE
3	A	291	TYR
3	A	295	CYS
3	A	322	LYS
3	A	354	SER
3	A	393	GLU
3	A	408	ILE
3	A	426	VAL
3	A	476	VAL
3	A	505	GLU
3	A	517	ILE
3	A	519	TRP
3	A	559	GLN
3	A	599	GLU
1	B	18	LEU
1	B	24	VAL
1	B	64	LEU
1	B	80	LEU
1	B	85	LEU
1	B	118	SER
1	B	138	THR
1	B	141	LEU
1	B	153	VAL
1	B	181	LEU
1	B	189	SER
1	B	194	THR
4	C	131	LYS
4	C	148	GLU
4	C	155	VAL
4	C	174	LYS
4	C	183	THR
4	C	199	CYS
4	C	200	GLU
4	C	201	VAL
4	C	202	THR
4	C	210	VAL

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Mol	Chain	Res	Type
3	D	186	ASN
3	D	221	LEU
3	D	291	TYR
3	D	295	CYS
3	D	313	SER
3	D	476	VAL
3	D	491	SER
3	D	505	GLU
3	D	559	GLN
3	D	561	THR
3	D	572	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
1	H	3	GLN
2	L	98	HIS
2	L	157	ASN
3	A	334	GLN
3	A	381	ASN
3	A	404	ASN
3	A	473	ASN
3	A	490	GLN
3	A	518	ASN
3	A	564	ASN
1	B	39	GLN
1	B	174	GLN
1	B	202	ASN
4	C	43	GLN
4	C	47	GLN
4	C	81	ASN
4	C	95	GLN
4	C	160	GLN
4	C	194	HIS
4	C	203	HIS
3	D	191	GLN
3	D	277	ASN
3	D	333	HIS
3	D	358	GLN
3	D	490	GLN
3	D	509	ASN
3	D	586	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

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	1.06	1 (7%)	17,19,21	1.94	4 (23%)
5	NAG	E	2	5	14,14,15	0.37	0	17,19,21	2.21	4 (23%)
5	BMA	E	3	5	11,11,12	0.30	0	15,15,17	0.81	1 (6%)
5	MAN	E	4	5	11,11,12	0.15	0	15,15,17	0.58	0
6	NAG	F	1	6,3	14,14,15	0.92	1 (7%)	17,19,21	0.69	0
6	NAG	F	2	6	14,14,15	0.56	0	17,19,21	0.43	0
6	BMA	F	3	6	11,11,12	1.80	3 (27%)	15,15,17	1.04	1 (6%)
6	MAN	F	4	6	11,11,12	2.02	2 (18%)	15,15,17	1.16	1 (6%)
6	MAN	F	5	6	11,11,12	1.94	5 (45%)	15,15,17	1.12	2 (13%)
6	FUC	F	6	6	10,10,11	1.85	2 (20%)	14,14,16	0.88	0
7	NAG	G	1	7,3	14,14,15	0.40	0	17,19,21	0.81	0
7	NAG	G	2	7	14,14,15	1.00	1 (7%)	17,19,21	0.78	1 (5%)
7	NAG	I	1	7,3	14,14,15	0.40	0	17,19,21	0.66	1 (5%)
7	NAG	I	2	7	14,14,15	0.48	0	17,19,21	1.58	2 (11%)
8	NAG	J	1	3,8	14,14,15	0.58	0	17,19,21	0.68	0
8	NAG	J	2	8	14,14,15	0.64	0	17,19,21	0.54	0
8	BMA	J	3	8	11,11,12	1.56	3 (27%)	15,15,17	0.74	0
8	MAN	J	4	8	11,11,12	1.85	4 (36%)	15,15,17	1.14	2 (13%)
8	FUC	J	5	8	10,10,11	1.23	2 (20%)	14,14,16	1.04	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	NAG	K	1	7,3	14,14,15	0.64	1 (7%)	17,19,21	0.98	1 (5%)
7	NAG	K	2	7	14,14,15	0.31	0	17,19,21	0.90	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	-	1/6/23/26	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	6,3	-	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	-	5/6/23/26	0/1/1/1
8	NAG	J	1	3,8	-	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 (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	4	MAN	C2-C3	3.89	1.58	1.52
6	F	6	FUC	C2-C3	3.89	1.58	1.52
6	F	4	MAN	O5-C5	3.77	1.50	1.43
6	F	6	FUC	O5-C5	3.67	1.50	1.43
6	F	1	NAG	O5-C1	-3.28	1.38	1.43
5	E	1	NAG	C1-C2	3.18	1.56	1.52
8	J	4	MAN	O5-C5	3.07	1.49	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	F	3	BMA	O5-C1	3.02	1.48	1.43
6	F	5	MAN	O5-C5	2.97	1.49	1.43
8	J	4	MAN	C1-C2	2.94	1.59	1.52
6	F	3	BMA	O5-C5	2.94	1.49	1.43
8	J	4	MAN	C2-C3	2.61	1.56	1.52
6	F	3	BMA	O2-C2	2.60	1.48	1.43
6	F	5	MAN	C4-C5	2.57	1.58	1.53
6	F	5	MAN	C1-C2	2.54	1.58	1.52
7	G	2	NAG	C1-C2	2.53	1.55	1.52
8	J	4	MAN	C4-C3	2.49	1.58	1.52
6	F	5	MAN	C2-C3	2.42	1.56	1.52
8	J	5	FUC	C4-C5	2.25	1.57	1.52
8	J	3	BMA	O5-C5	2.21	1.47	1.43
8	J	3	BMA	C4-C3	2.19	1.58	1.52
8	J	5	FUC	C2-C3	2.12	1.55	1.52
8	J	3	BMA	C4-C5	2.11	1.57	1.53
6	F	5	MAN	C4-C3	2.09	1.57	1.52
7	K	1	NAG	O5-C1	-2.03	1.40	1.43

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	2	NAG	C2-N2-C7	6.32	131.37	122.90
7	I	2	NAG	C2-N2-C7	4.65	129.13	122.90
5	E	1	NAG	O3-C3-C2	-4.57	99.91	109.40
5	E	1	NAG	O5-C1-C2	-4.19	104.81	111.29
5	E	2	NAG	C1-C2-N2	3.49	115.94	110.43
7	I	2	NAG	C1-C2-N2	3.38	115.75	110.43
7	K	2	NAG	C1-O5-C5	3.26	116.55	112.19
5	E	2	NAG	C8-C7-N2	3.08	121.22	116.12
5	E	1	NAG	C1-O5-C5	2.98	116.18	112.19
5	E	2	NAG	C1-O5-C5	2.97	116.17	112.19
6	F	4	MAN	O3-C3-C2	2.71	115.58	110.05
5	E	1	NAG	C3-C4-C5	-2.21	106.22	110.23
5	E	3	BMA	C1-O5-C5	2.21	115.15	112.19
7	K	1	NAG	C1-O5-C5	2.19	115.12	112.19
8	J	4	MAN	O3-C3-C2	2.16	114.47	110.05
6	F	3	BMA	C1-C2-C3	-2.15	106.52	109.64
6	F	5	MAN	O3-C3-C2	2.11	114.35	110.05
7	G	2	NAG	C2-N2-C7	2.09	125.70	122.90
8	J	4	MAN	C1-O5-C5	2.09	114.98	112.19
7	I	1	NAG	O4-C4-C5	-2.05	104.27	109.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	F	5	MAN	O2-C2-C1	2.00	113.80	109.22

There are no chirality outliers.

All (15) torsion outliers are listed below:

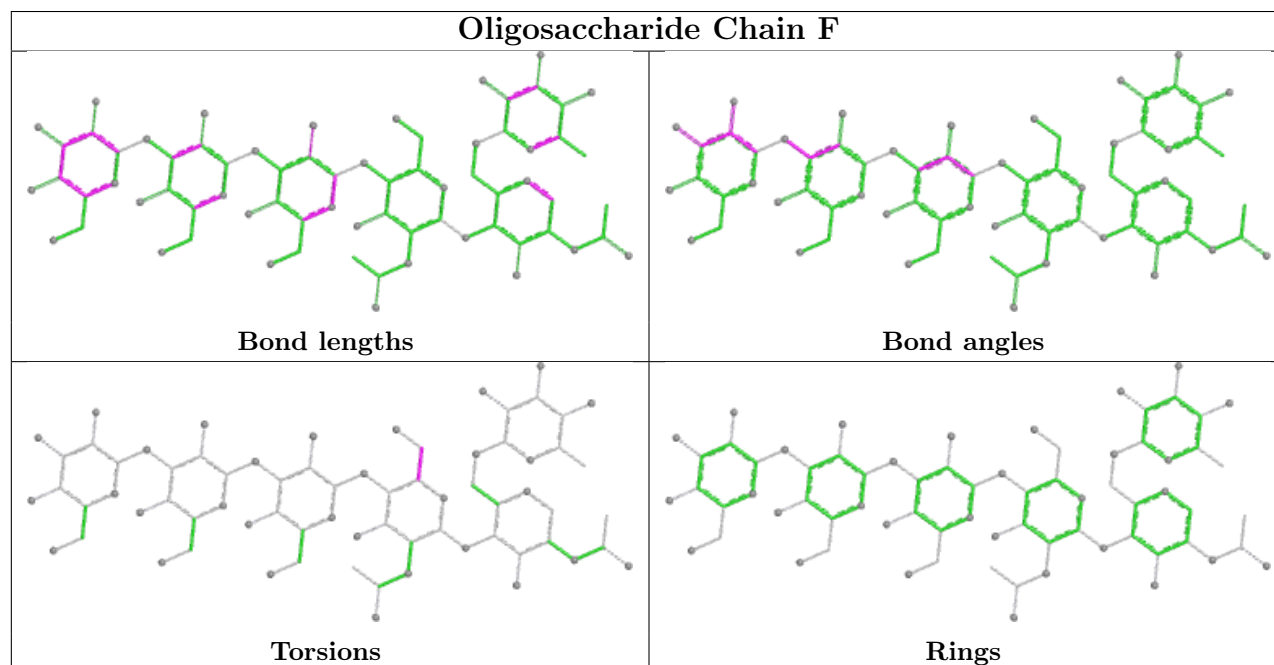
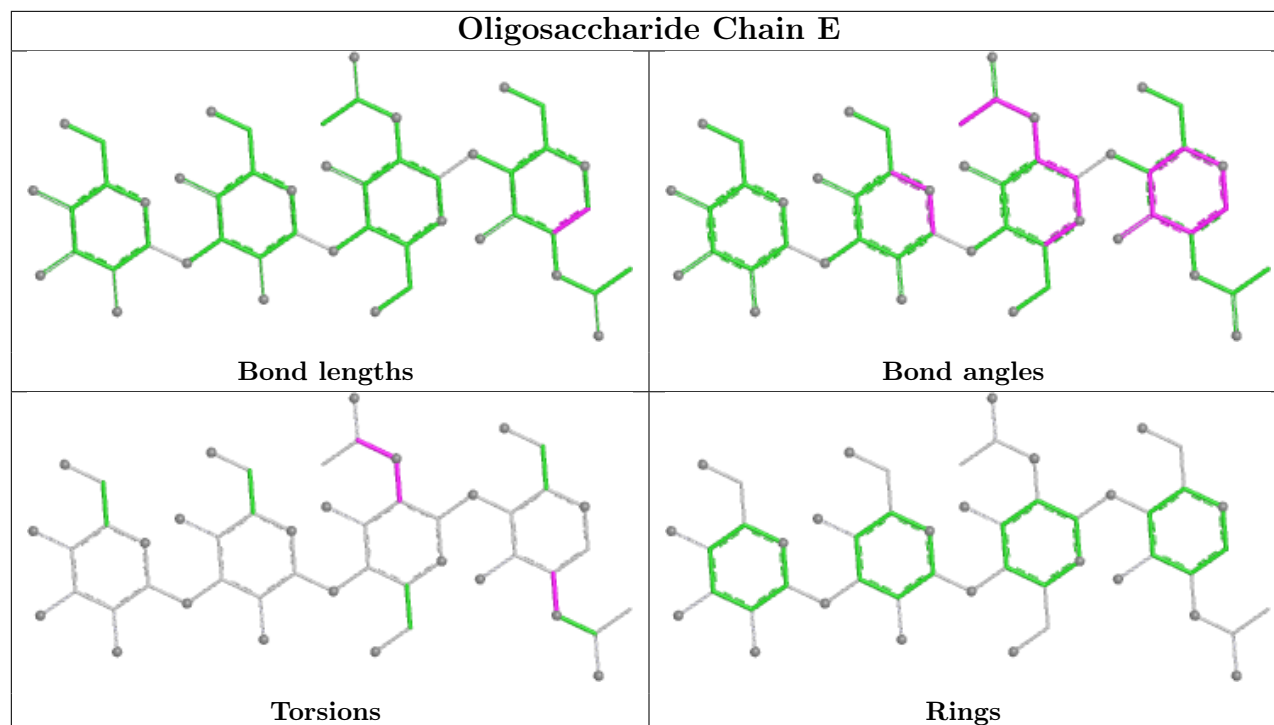
Mol	Chain	Res	Type	Atoms
5	E	2	NAG	C1-C2-N2-C7
5	E	2	NAG	C8-C7-N2-C2
5	E	2	NAG	O7-C7-N2-C2
7	G	2	NAG	O5-C5-C6-O6
7	G	2	NAG	C4-C5-C6-O6
7	I	2	NAG	C8-C7-N2-C2
7	I	2	NAG	O7-C7-N2-C2
8	J	3	BMA	O5-C5-C6-O6
6	F	2	NAG	O5-C5-C6-O6
6	F	2	NAG	C4-C5-C6-O6
5	E	1	NAG	C1-C2-N2-C7
7	I	2	NAG	C1-C2-N2-C7
8	J	3	BMA	C4-C5-C6-O6
7	I	2	NAG	C3-C2-N2-C7
7	I	2	NAG	C4-C5-C6-O6

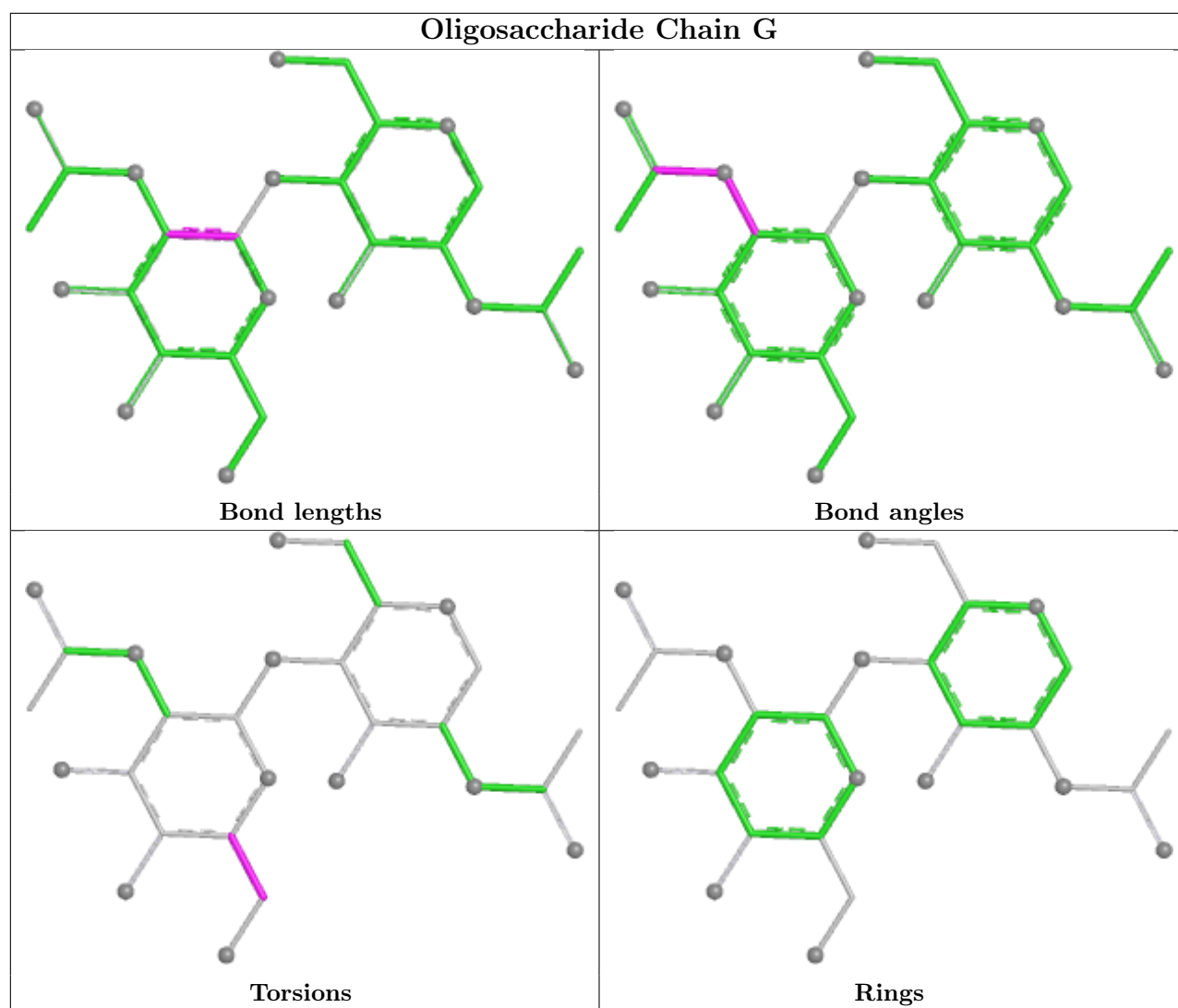
There are no ring outliers.

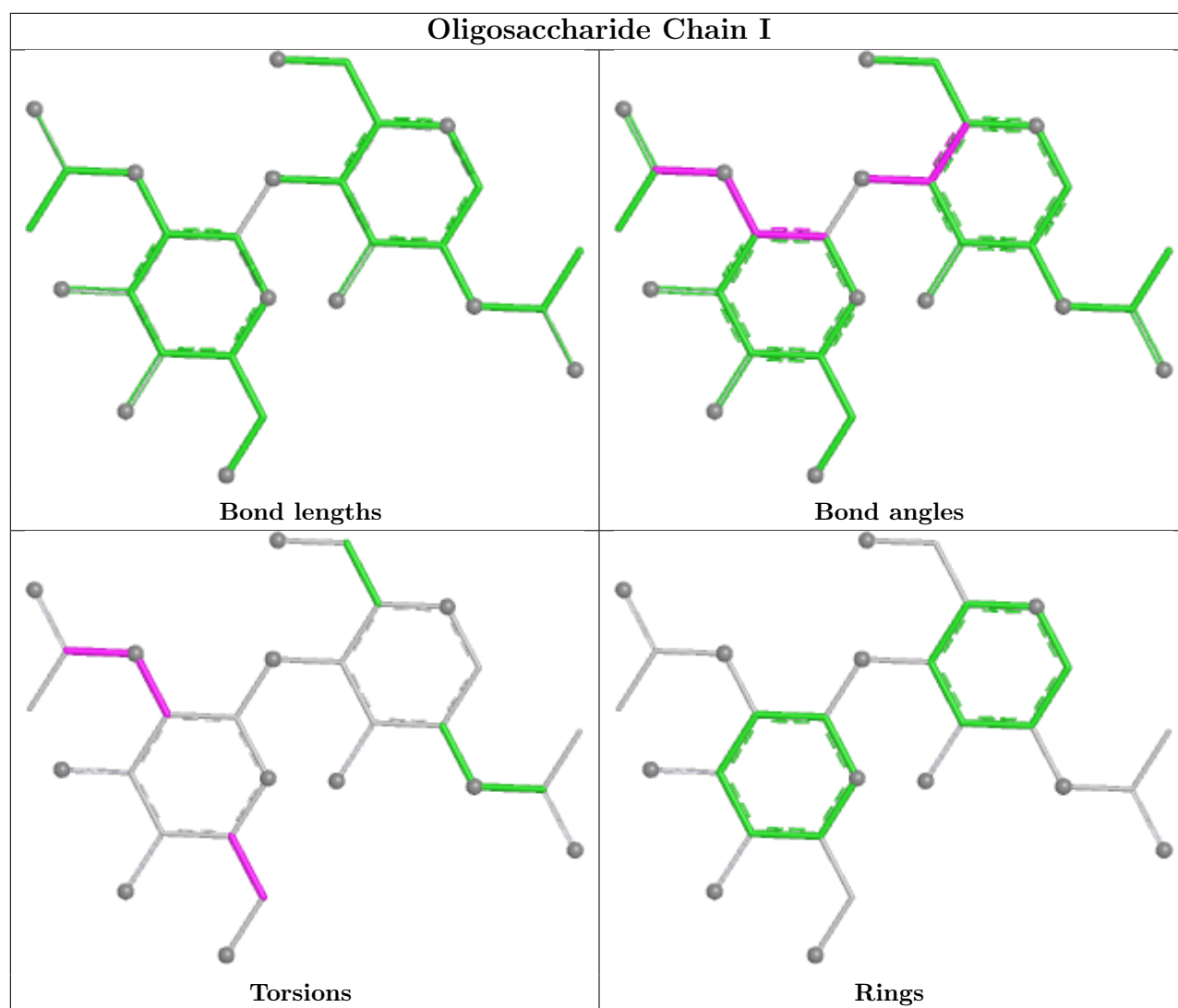
1 monomer is involved in 1 short contact:

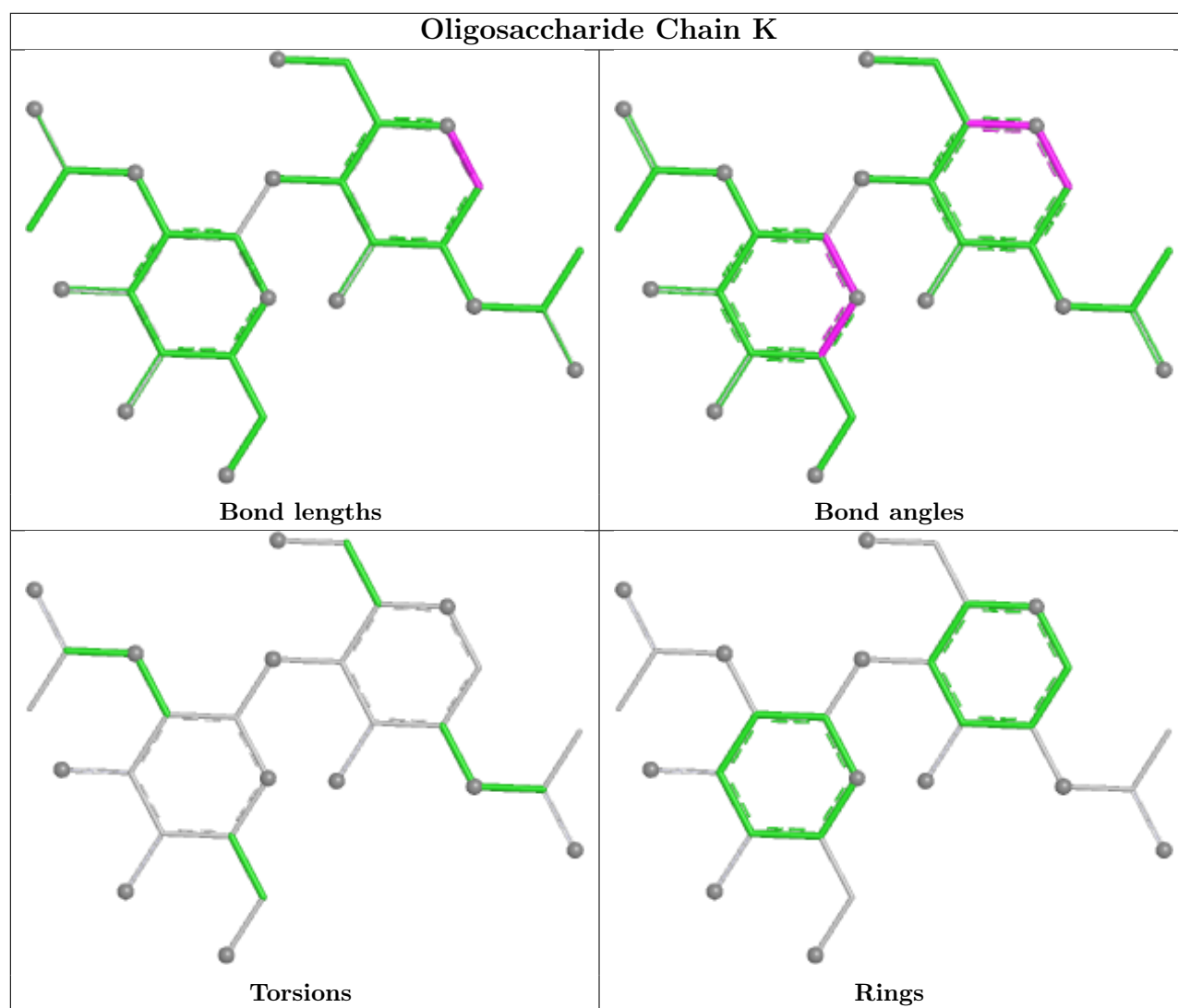
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	I	2	NAG	1	0

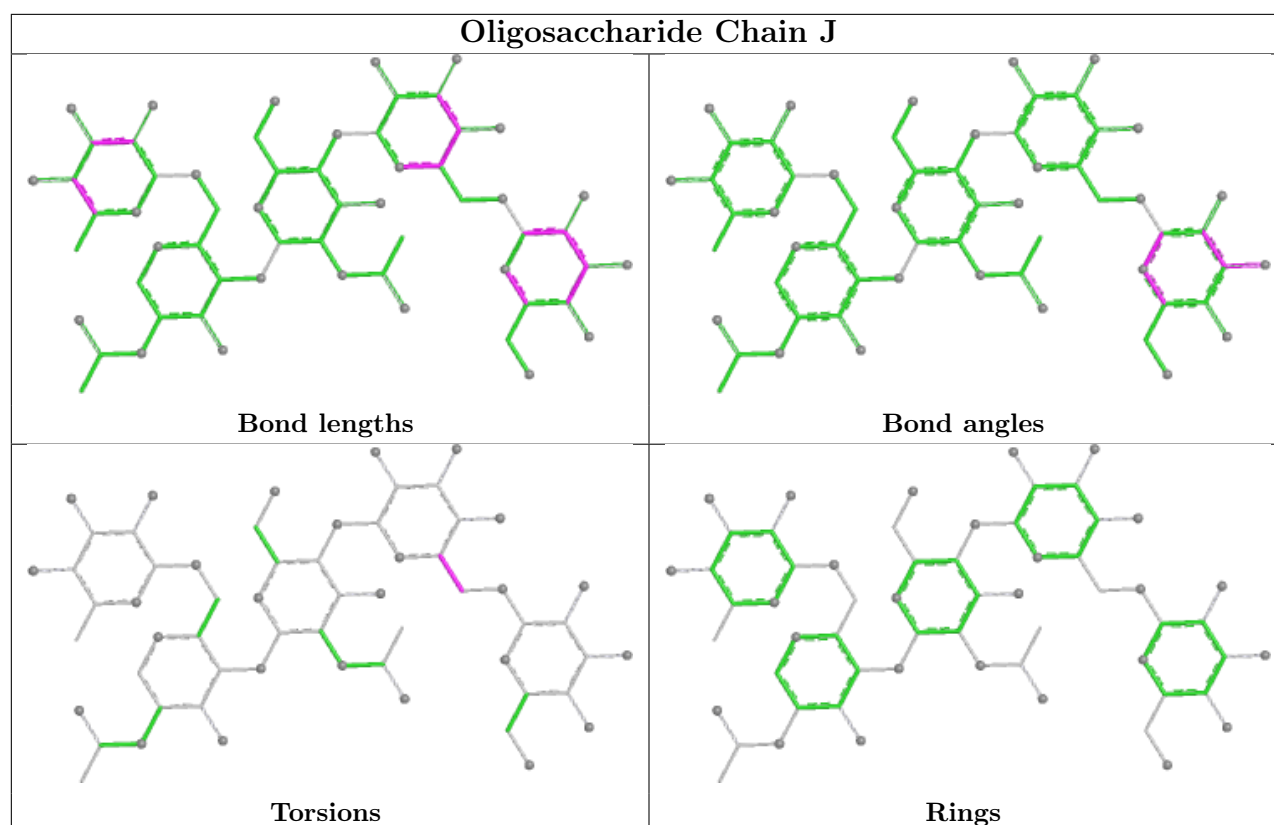
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.











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	0.40	0	17,19,21	0.72	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%)	0.87	27 (12%) 8 6	46, 62, 119, 137	0
1	H	216/233 (92%)	0.62	13 (6%) 27 21	41, 57, 81, 85	0
2	L	216/216 (100%)	0.49	16 (7%) 20 15	38, 67, 115, 132	0
3	A	417/423 (98%)	0.18	15 (3%) 46 37	40, 58, 85, 98	0
3	D	417/423 (98%)	0.23	11 (2%) 57 47	45, 64, 92, 107	0
4	C	216/219 (98%)	0.61	25 (11%) 9 7	38, 78, 115, 133	0
All	All	1698/1747 (97%)	0.43	107 (6%) 26 19	38, 62, 103, 137	0

All (107) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	149	PHE	5.8
3	A	326	ASN	5.7
1	B	150	PRO	4.8
2	L	7	THR	4.5
2	L	213	SER	4.4
3	A	473	ASN	4.3
4	C	7	THR	4.1
2	L	214	ALA	3.9
4	C	214	PHE	3.8
1	H	149	PHE	3.8
3	D	602	THR	3.8
3	A	360	ASP	3.7
1	B	152	PRO	3.6
1	H	150	PRO	3.5
2	L	215	ALA	3.5
3	D	186	ASN	3.5
3	D	295	CYS	3.4
2	L	196	LEU	3.4
1	B	136	GLY	3.3

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Mol	Chain	Res	Type	RSRZ
1	B	133	SER	3.3
4	C	175	ASP	3.3
3	A	555	ASP	3.2
3	D	387	CYS	3.2
1	B	151	GLU	3.2
4	C	173	SER	3.2
4	C	145	TYR	3.1
1	H	164	SER	3.1
1	H	151	GLU	3.1
1	B	132	LYS	3.1
1	H	187	VAL	3.1
1	B	70	SER	3.1
4	C	213	SER	3.0
2	L	145	TYR	3.0
2	L	193	LYS	3.0
3	A	602	THR	3.0
3	A	328	GLY	3.0
1	H	152	PRO	2.9
1	B	31	SER	2.9
4	C	207	SER	2.9
2	L	8	PRO	2.9
1	B	216	PRO	2.8
1	B	99	GLY	2.8
1	H	88	ASP	2.8
1	B	141	LEU	2.8
3	D	210	VAL	2.8
2	L	191	TYR	2.8
1	B	44	GLY	2.7
1	B	134	THR	2.7
1	B	153	VAL	2.7
3	A	336	ALA	2.7
1	B	159	SER	2.6
4	C	215	ASN	2.6
3	A	186	ASN	2.6
1	B	131	SER	2.6
1	B	199	CYS	2.6
1	B	104	ASP	2.5
2	L	195	LYS	2.5
2	L	146	PRO	2.5
3	A	295	CYS	2.5
4	C	196	LEU	2.5
3	D	211	GLY	2.5

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Mol	Chain	Res	Type	RSRZ
4	C	209	PRO	2.5
1	H	1	GLN	2.5
4	C	155	VAL	2.5
1	B	181	LEU	2.4
2	L	207	SER	2.4
3	A	333	HIS	2.4
2	L	154	LYS	2.4
2	L	216	ALA	2.4
4	C	208	SER	2.4
4	C	193	LYS	2.4
1	B	138	THR	2.4
4	C	199	CYS	2.4
3	A	210	VAL	2.3
2	L	209	PRO	2.3
4	C	197	TYR	2.3
4	C	189	ALA	2.3
1	H	200	ASN	2.3
3	D	196	GLN	2.3
3	A	570	ASN	2.2
4	C	146	PRO	2.2
4	C	198	ALA	2.2
1	B	174	GLN	2.2
1	B	68	SER	2.2
3	D	423	ASN	2.2
3	D	332	GLN	2.2
4	C	161	SER	2.2
4	C	82	ARG	2.1
1	H	153	VAL	2.1
3	A	327	GLY	2.1
2	L	33	ASN	2.1
3	D	389	TYR	2.1
4	C	195	LYS	2.1
1	B	194	THR	2.1
3	D	212	GLN	2.1
1	H	99	GLY	2.1
1	B	191	SER	2.0
1	B	43	LYS	2.0
1	H	186	THR	2.0
1	H	192	LEU	2.0
1	B	64	LEU	2.0
3	A	334	GLN	2.0
4	C	152	GLN	2.0

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Mol	Chain	Res	Type	RSRZ
3	A	384	ILE	2.0
4	C	8	PRO	2.0
4	C	160	GLN	2.0
4	C	157	ASN	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](#)

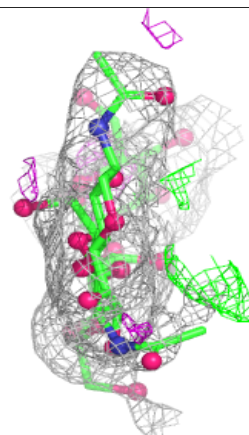
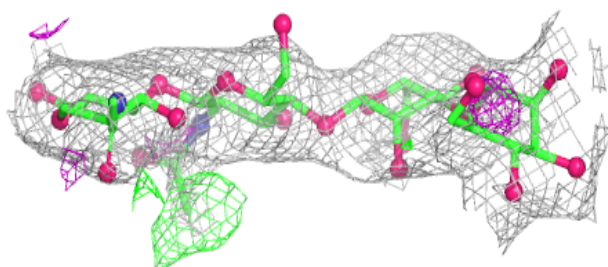
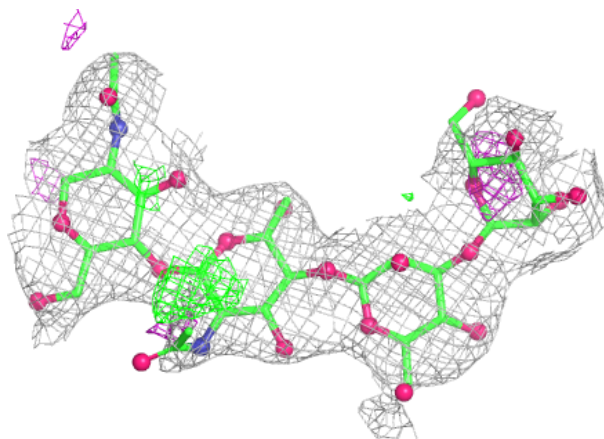
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	NAG	E	1	14/15	-	-	66,72,81,85	0
5	NAG	E	2	14/15	-	-	82,85,91,95	0
5	BMA	E	3	11/12	-	-	94,96,97,102	0
5	MAN	E	4	11/12	-	-	98,103,107,109	0
6	NAG	F	1	14/15	-	-	53,63,69,72	0
6	NAG	F	2	14/15	-	-	64,78,83,90	0
6	BMA	F	3	11/12	-	-	87,91,99,104	0
6	MAN	F	4	11/12	-	-	99,108,111,112	0
6	MAN	F	5	11/12	-	-	103,113,116,116	0
6	FUC	F	6	10/11	-	-	64,68,70,70	0
7	NAG	I	2	14/15	0.61	0.16	92,105,111,113	0
8	NAG	J	2	14/15	0.65	0.18	82,93,99,101	0
7	NAG	G	2	14/15	0.71	0.16	98,103,111,111	0
7	NAG	I	1	14/15	0.78	0.14	81,90,99,101	0
8	NAG	J	1	14/15	0.81	0.13	64,74,79,84	0
7	NAG	K	1	14/15	0.86	0.11	80,89,93,98	0
7	NAG	K	2	14/15	0.86	0.13	96,103,105,106	0
7	NAG	G	1	14/15	0.88	0.10	65,78,96,100	0
8	BMA	J	3	11/12	-	-	96,100,104,108	0
8	MAN	J	4	11/12	-	-	101,105,108,109	0
8	FUC	J	5	10/11	-	-	69,75,77,80	0

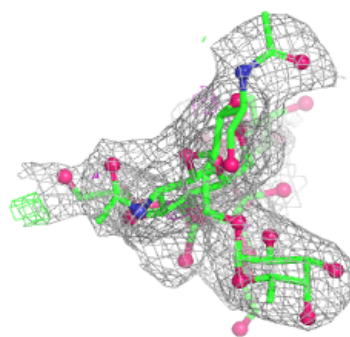
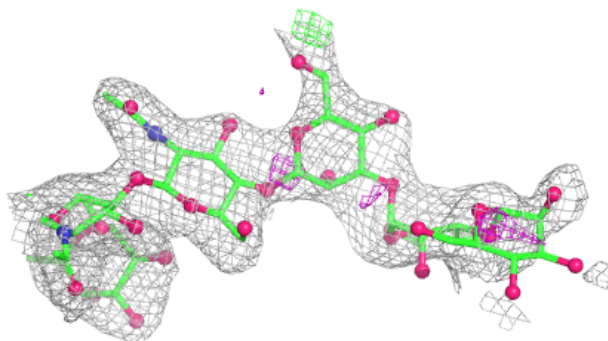
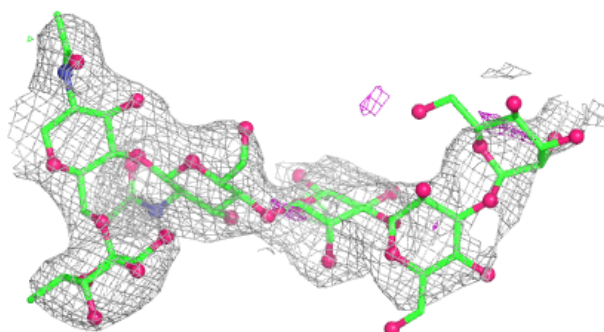
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

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)

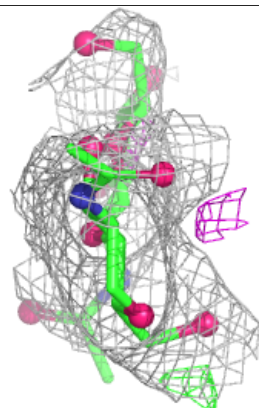
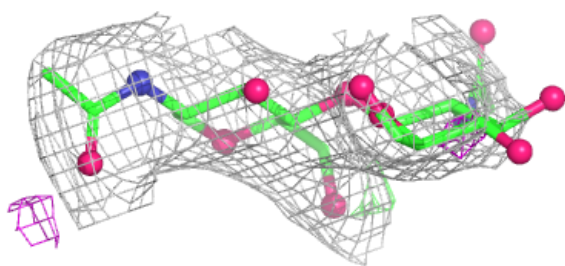
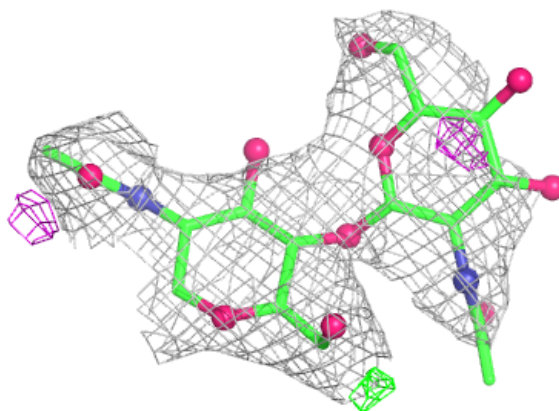
**Electron density around Chain F:**

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



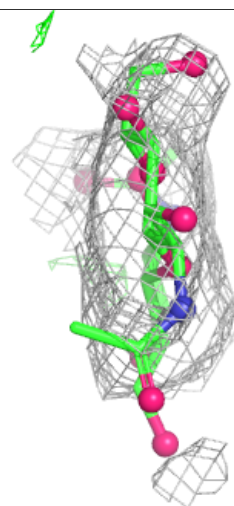
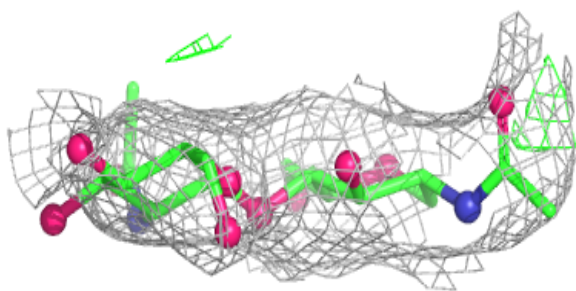
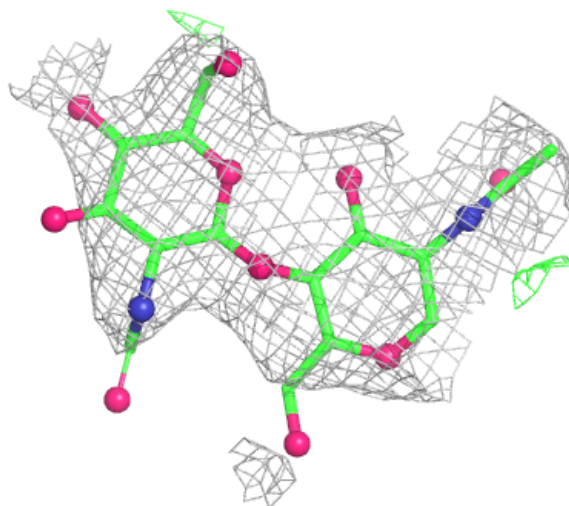
Electron density around Chain G:

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



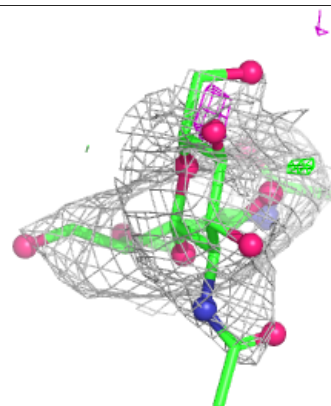
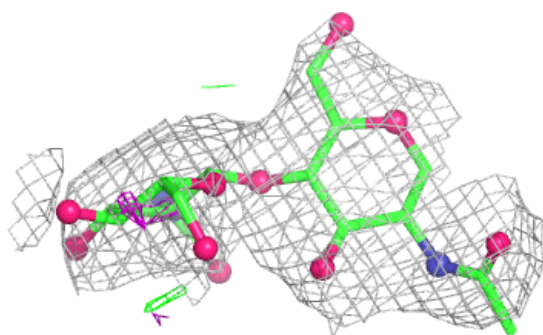
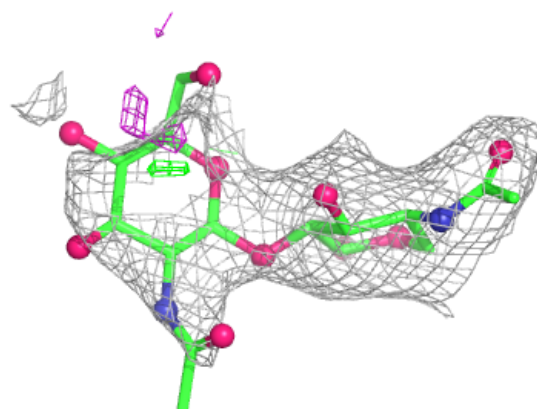
Electron density around Chain I:

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

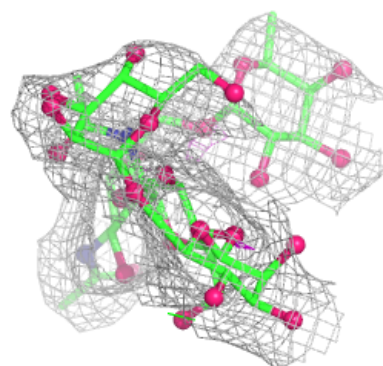
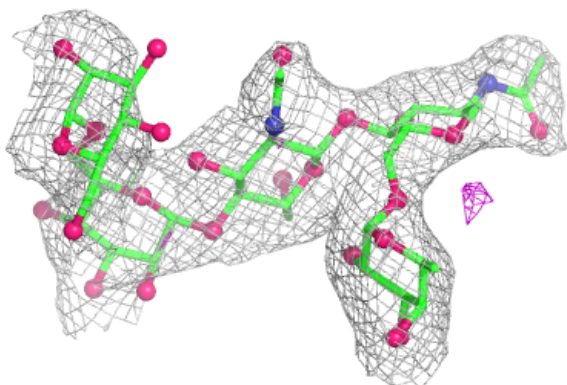
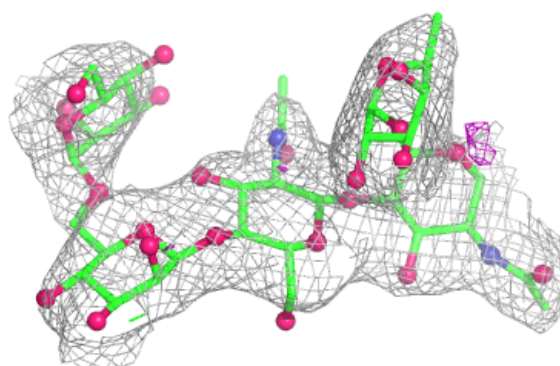


Electron density around Chain K:

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

**Electron density around Chain J:**

$2mF_o-DF_c$ (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(Å ²)	Q<0.9
9	NAG	D	701	14/15	0.70	0.16	81,88,91,92	0
9	NAG	A	701	14/15	0.85	0.11	73,81,85,86	0

6.5 Other polymers [i](#)

There are no such residues in this entry.