



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 15, 2024 – 11:15 AM EST

PDB ID : 8GB5
Title : Crystal structure of SARS-CoV-2 receptor binding domain in complex with neutralizing antibody 25F9
Authors : Yuan, M.; Zhu, X.; Wilson, I.A.
Deposited on : 2023-02-24
Resolution : 3.35 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 : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.21
EDS : 3.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.004 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

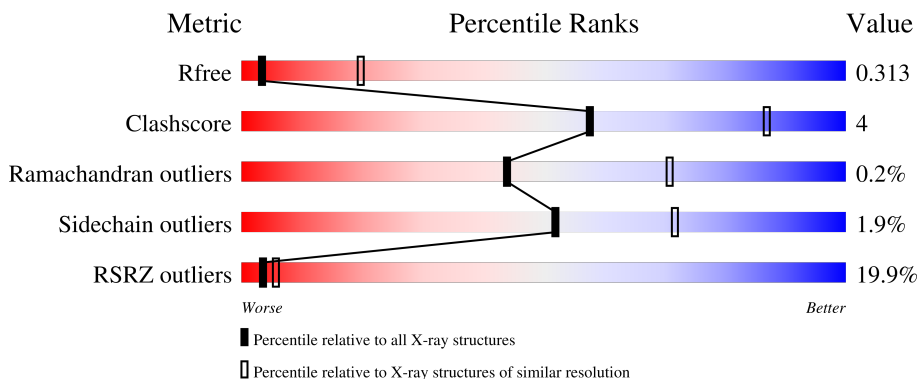
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.35 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1012 (3.40-3.32)
Clashscore	180529	1035 (3.40-3.32)
Ramachandran outliers	177936	1037 (3.40-3.32)
Sidechain outliers	177891	1037 (3.40-3.32)
RSRZ outliers	164620	1012 (3.40-3.32)

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

Mol	Chain	Length	Quality of chain
1	A	205	
1	D	205	
1	G	205	
1	J	205	
2	B	231	

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Mol	Chain	Length	Quality of chain
2	F	231	<p>3% 87% 11%</p>
2	I	231	<p>1% 83% 16%</p>
2	L	231	<p>41% 86% 13%</p>
3	C	216	<p>31% 81% 18%</p>
3	E	216	<p>2% 81% 17%</p>
3	H	216	<p>15% 83% 16%</p>
3	K	216	<p>61% 82% 16%</p>
4	M	3	<p>100%</p>
5	N	5	<p>60% 40%</p>
6	O	4	<p>50% 25% 25%</p>
6	P	4	<p>25% 75%</p>

2 Entry composition i

There are 10 unique types of molecules in this entry. The entry contains 19740 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 Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	195	1543	989	257	289	8	0	0	0
1	D	195	1543	989	257	289	8	0	0	0
1	G	195	1543	989	257	289	8	0	0	0
1	J	195	1543	989	257	289	8	0	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	531	GLY	-	expression tag	UNP P0DTC2
A	532	HIS	-	expression tag	UNP P0DTC2
A	533	HIS	-	expression tag	UNP P0DTC2
A	534	HIS	-	expression tag	UNP P0DTC2
A	535	HIS	-	expression tag	UNP P0DTC2
A	536	HIS	-	expression tag	UNP P0DTC2
A	537	HIS	-	expression tag	UNP P0DTC2
D	531	GLY	-	expression tag	UNP P0DTC2
D	532	HIS	-	expression tag	UNP P0DTC2
D	533	HIS	-	expression tag	UNP P0DTC2
D	534	HIS	-	expression tag	UNP P0DTC2
D	535	HIS	-	expression tag	UNP P0DTC2
D	536	HIS	-	expression tag	UNP P0DTC2
D	537	HIS	-	expression tag	UNP P0DTC2
G	531	GLY	-	expression tag	UNP P0DTC2
G	532	HIS	-	expression tag	UNP P0DTC2
G	533	HIS	-	expression tag	UNP P0DTC2
G	534	HIS	-	expression tag	UNP P0DTC2
G	535	HIS	-	expression tag	UNP P0DTC2
G	536	HIS	-	expression tag	UNP P0DTC2
G	537	HIS	-	expression tag	UNP P0DTC2

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Chain	Residue	Modelled	Actual	Comment	Reference
J	531	GLY	-	expression tag	UNP P0DTC2
J	532	HIS	-	expression tag	UNP P0DTC2
J	533	HIS	-	expression tag	UNP P0DTC2
J	534	HIS	-	expression tag	UNP P0DTC2
J	535	HIS	-	expression tag	UNP P0DTC2
J	536	HIS	-	expression tag	UNP P0DTC2
J	537	HIS	-	expression tag	UNP P0DTC2

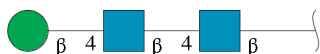
- Molecule 2 is a protein called 25F9 Heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	227	Total	C	N	O	S	0	0	0
			1725	1100	288	331	6			
2	F	227	Total	C	N	O	S	0	0	0
			1723	1099	288	331	5			
2	I	227	Total	C	N	O	S	0	0	0
			1725	1100	288	331	6			
2	L	228	Total	C	N	O	S	0	0	0
			1729	1102	289	332	6			

- Molecule 3 is a protein called 25F9 Light chain.

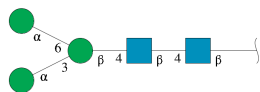
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	214	Total	C	N	O	S	0	0	0
			1585	984	273	323	5			
3	E	213	Total	C	N	O	S	0	0	0
			1579	981	273	321	4			
3	H	214	Total	C	N	O	S	0	0	0
			1585	984	273	323	5			
3	K	213	Total	C	N	O	S	0	0	0
			1579	981	272	322	4			

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



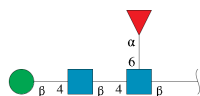
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	M	3	Total	C	N	O	0	0	0
			39	22	2	15			

- Molecule 5 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



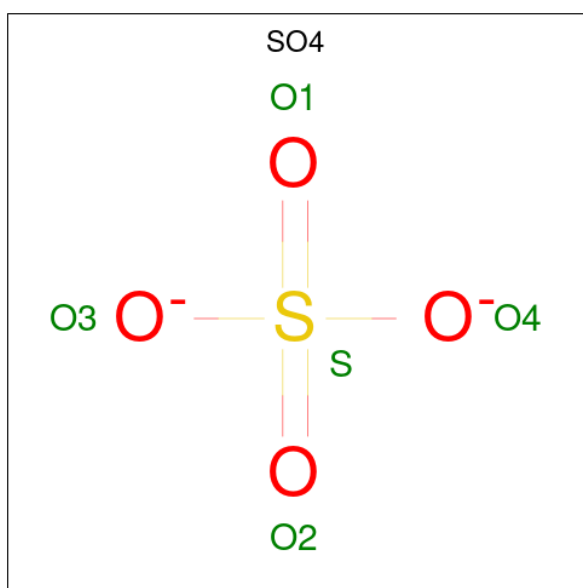
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
5	N	5	61	34	2	25	0	0	0

- Molecule 6 is an oligosaccharide called 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.



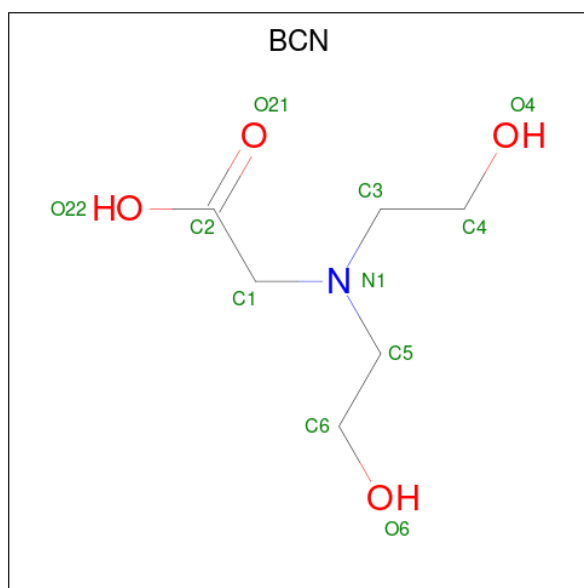
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
6	O	4	49	28	2	19	0	0	0
6	P	4	49	28	2	19	0	0	0

- Molecule 7 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	O	S	0	0
			5	4	1		
7	D	1	Total	O	S	0	0
			5	4	1		
7	E	1	Total	O	S	0	0
			5	4	1		
7	E	1	Total	O	S	0	0
			5	4	1		
7	I	1	Total	O	S	0	0
			5	4	1		
7	J	1	Total	O	S	0	0
			5	4	1		
7	K	1	Total	O	S	0	0
			5	4	1		
7	K	1	Total	O	S	0	0
			5	4	1		

- Molecule 8 is BICINE (three-letter code: BCN) (formula: $C_6H_{13}NO_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	C	1	Total	C	N	O	0	0
			11	6	1	4		
8	E	1	Total	C	N	O	0	0
			11	6	1	4		
8	H	1	Total	C	N	O	0	0
			11	6	1	4		

- Molecule 9 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	K	1	Total	C O	0	0
			6	3 3		

- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	3	Total	O	0	0
			3	3		
10	B	3	Total	O	0	0
			3	3		
10	C	6	Total	O	0	0
			6	6		
10	D	2	Total	O	0	0
			2	2		
10	E	5	Total	O	0	0
			5	5		
10	F	4	Total	O	0	0
			4	4		
10	G	3	Total	O	0	0
			3	3		
10	H	6	Total	O	0	0
			6	6		
10	I	7	Total	O	0	0
			7	7		
10	J	2	Total	O	0	0
			2	2		
10	K	14	Total	O	0	0
			14	14		

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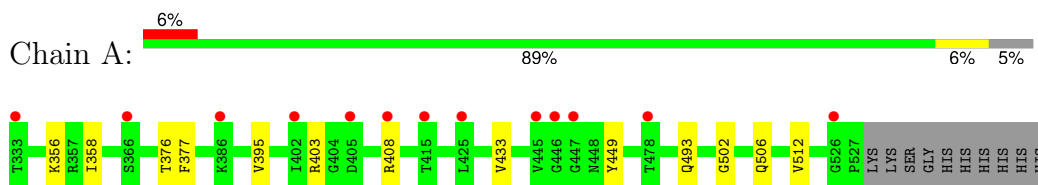
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	L	6	Total O 6 6	0	0

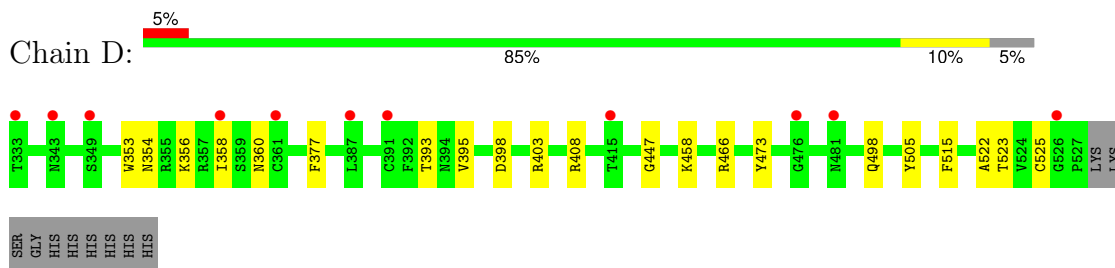
3 Residue-property plots [i](#)

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.

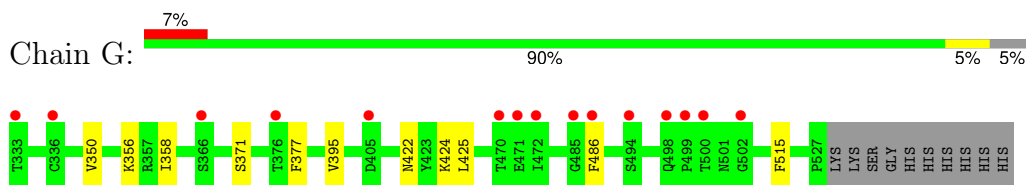
- Molecule 1: Spike protein S1



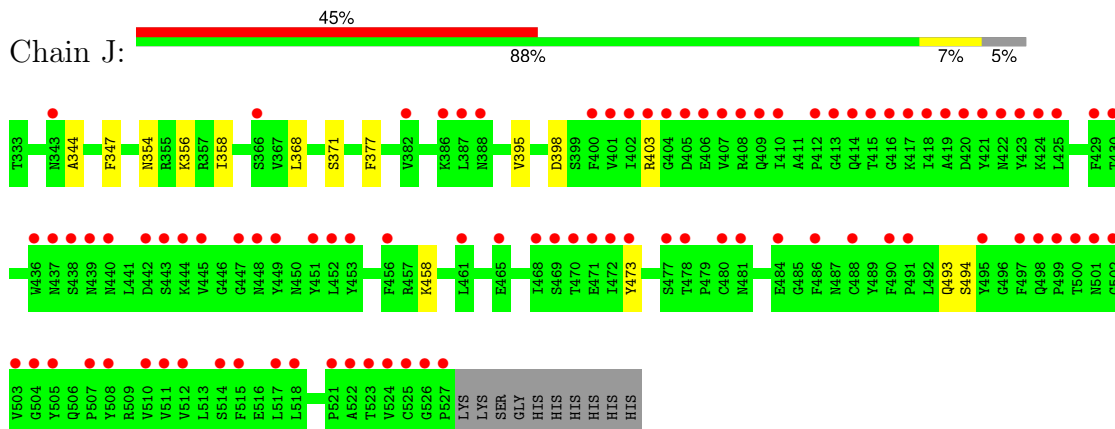
- Molecule 1: Spike protein S1



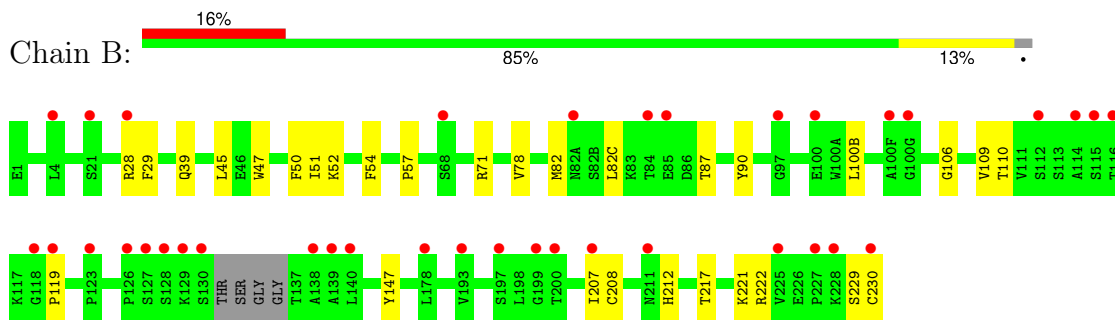
- Molecule 1: Spike protein S1



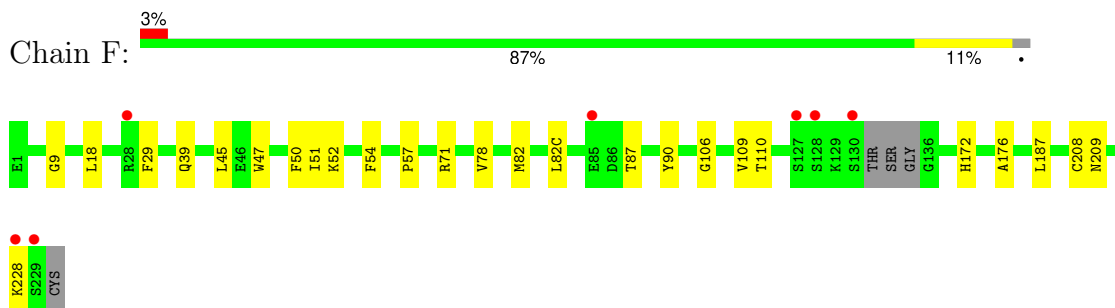
- Molecule 1: Spike protein S1



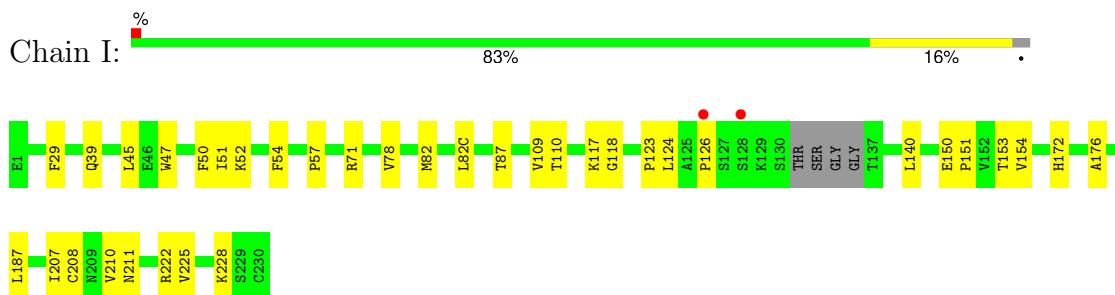
- Molecule 2: 25F9 Heavy chain



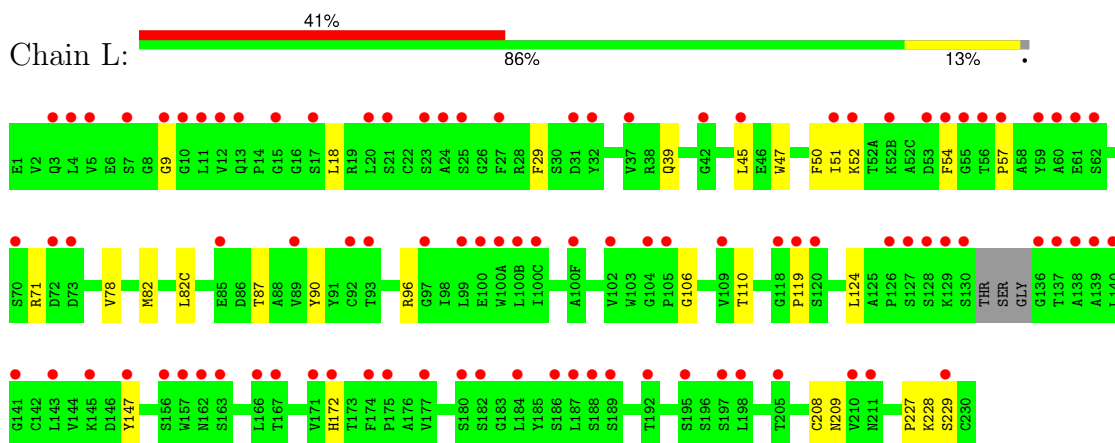
- Molecule 2: 25F9 Heavy chain



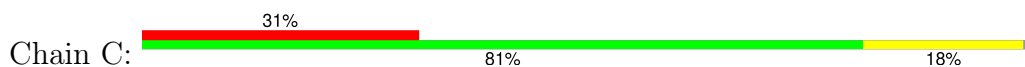
- Molecule 2: 25F9 Heavy chain

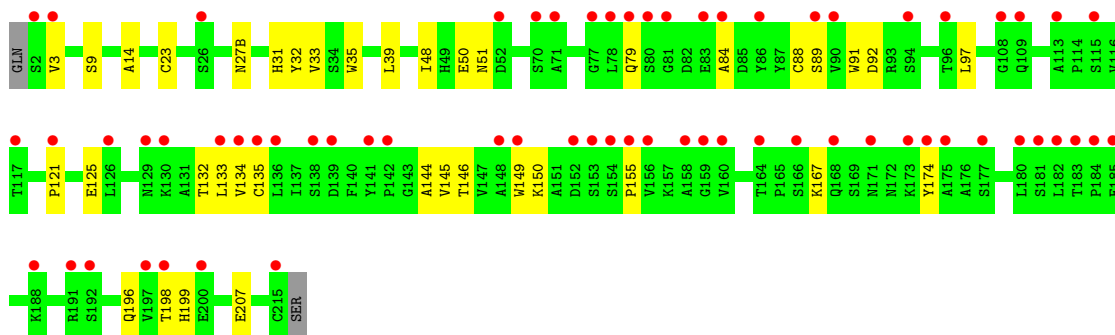


- Molecule 2: 25F9 Heavy chain

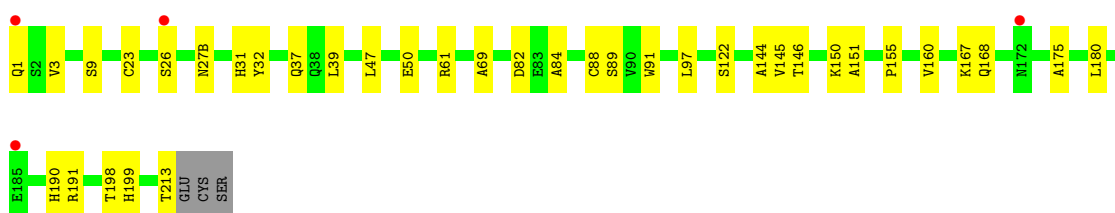
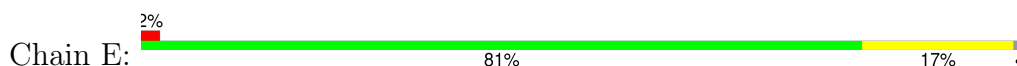


- Molecule 3: 25F9 Light chain

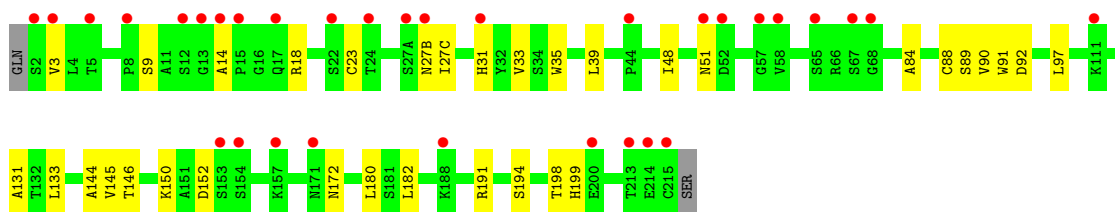
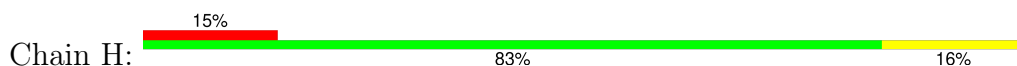




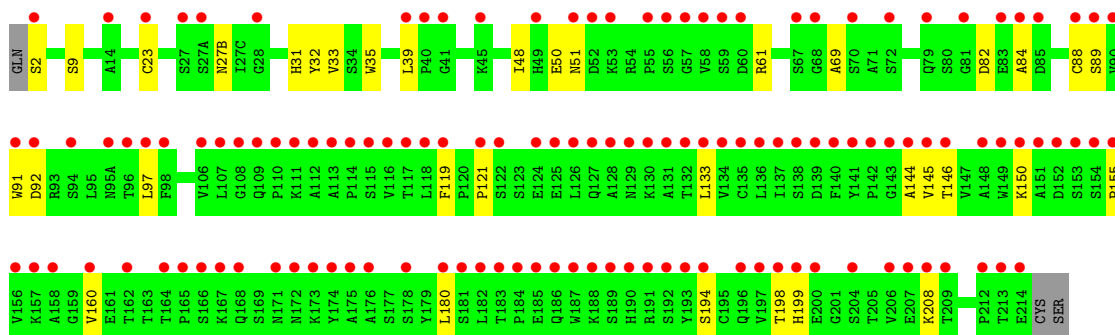
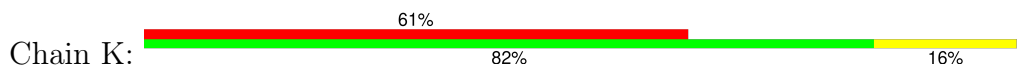
- Molecule 3: 25F9 Light chain



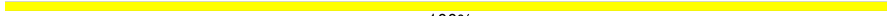
- Molecule 3: 25F9 Light chain



- Molecule 3: 25F9 Light chain



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

Chain M:  100%

MAG1
MAG2
BMA3

- Molecule 5: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N:  60% 40%

MAG1
MAG2
BMA3
MAN4
MAN5

- Molecule 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 O:  50% 25% 25%

MAG1
MAG2
BMA3
FUC4

- Molecule 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 P:  25% 75%

MAG1
MAG2
BMA3
FUC4

4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	92.48Å 105.82Å 118.18Å 83.08° 67.47° 64.04°	Depositor
Resolution (Å)	47.49 – 3.35 47.49 – 3.35	Depositor EDS
% Data completeness (in resolution range)	98.5 (47.49-3.35) 98.4 (47.49-3.35)	Depositor EDS
R_{merge}	0.87	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.44 (at 3.33Å)	Xtrriage
Refinement program	PHENIX 1.19.2	Depositor
R, R_{free}	0.275 , 0.320 0.274 , 0.313	Depositor DCC
R_{free} test set	2562 reflections (4.79%)	wwPDB-VP
Wilson B-factor (Å ²)	39.3	Xtrriage
Anisotropy	0.250	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 89.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.35$, $\langle L^2 \rangle = 0.19$	Xtrriage
Estimated twinning fraction	0.000 for h,h-k,h-l	Xtrriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	19740	wwPDB-VP
Average B, all atoms (Å ²)	75.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 85.08 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.3953e-07. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, FUC, MAN, SO4, BCN, NAG, 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	A	0.25	0/1587	0.48	0/2161
1	D	0.26	0/1587	0.48	0/2161
1	G	0.25	0/1587	0.47	0/2161
1	J	0.26	0/1587	0.48	0/2161
2	B	0.25	0/1769	0.49	0/2409
2	F	0.25	0/1767	0.50	0/2406
2	I	0.25	0/1769	0.50	0/2409
2	L	0.25	0/1773	0.49	0/2414
3	C	0.25	0/1623	0.50	0/2216
3	E	0.25	0/1617	0.49	0/2208
3	H	0.25	0/1623	0.49	0/2216
3	K	0.24	0/1617	0.48	0/2208
All	All	0.25	0/19906	0.49	0/27130

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	A	1543	0	1459	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1543	0	1459	9	0
1	G	1543	0	1459	6	0
1	J	1543	0	1459	8	0
2	B	1725	0	1697	18	0
2	F	1723	0	1696	12	0
2	I	1725	0	1698	19	0
2	L	1729	0	1701	13	0
3	C	1585	0	1532	20	0
3	E	1579	0	1532	21	0
3	H	1585	0	1533	18	0
3	K	1579	0	1528	22	0
4	M	39	0	34	1	0
5	N	61	0	52	1	0
6	O	49	0	43	1	0
6	P	49	0	43	4	0
7	A	5	0	0	1	0
7	D	5	0	0	0	0
7	E	10	0	0	0	0
7	I	5	0	0	0	0
7	J	5	0	0	0	0
7	K	10	0	0	0	0
8	C	11	0	12	1	0
8	E	11	0	11	2	0
8	H	11	0	12	0	0
9	K	6	0	8	1	0
10	A	3	0	0	0	0
10	B	3	0	0	0	0
10	C	6	0	0	1	0
10	D	2	0	0	0	0
10	E	5	0	0	0	0
10	F	4	0	0	0	0
10	G	3	0	0	0	0
10	H	6	0	0	0	0
10	I	7	0	0	0	0
10	J	2	0	0	0	0
10	K	14	0	0	0	0
10	L	6	0	0	0	0
All	All	19740	0	18968	168	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 4.

All (168) 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)
3:H:131:ALA:HB3	3:H:182:LEU:O	1.73	0.89
3:K:92:ASP:HB2	3:K:97:LEU:HD11	1.63	0.79
3:H:92:ASP:HB2	3:H:97:LEU:HD11	1.66	0.77
1:J:371:SER:HB2	6:P:1:NAG:H3	1.67	0.76
1:G:358:ILE:HB	1:G:395:VAL:HG23	1.69	0.73
6:P:2:NAG:H62	6:P:4:FUC:H5	1.70	0.73
1:D:358:ILE:HB	1:D:395:VAL:HG23	1.72	0.71
1:A:358:ILE:HB	1:A:395:VAL:HG23	1.74	0.70
2:I:150:GLU:HG3	2:I:151:PRO:HA	1.73	0.69
2:L:29:PHE:HZ	2:L:78:VAL:HG23	1.58	0.69
3:C:92:ASP:HB2	3:C:97:LEU:HD11	1.76	0.67
1:J:358:ILE:HB	1:J:395:VAL:HG23	1.75	0.66
2:B:119:PRO:HB3	2:B:147:TYR:HB3	1.78	0.66
2:I:140:LEU:HD22	2:I:225:VAL:HG11	1.77	0.65
2:L:228:LYS:HG2	2:L:229:SER:H	1.62	0.65
2:L:52:LYS:O	2:L:71:ARG:NH1	2.31	0.64
3:C:32:TYR:HB3	3:C:50:GLU:HA	1.79	0.63
2:F:29:PHE:HZ	2:F:78:VAL:HG23	1.63	0.62
3:C:33:VAL:N	3:C:51:ASN:OD1	2.27	0.62
3:C:27(B):ASN:O	3:C:31:HIS:HB2	2.00	0.61
2:B:29:PHE:HZ	2:B:78:VAL:HG23	1.65	0.60
3:E:167:LYS:HB2	8:E:303:BCN:H32	1.82	0.60
2:B:207:ILE:HG12	2:B:222:ARG:HG2	1.83	0.60
2:B:39:GLN:HB2	2:B:45:LEU:HD23	1.82	0.60
2:B:229:SER:OG	2:B:230:CYS:N	2.34	0.59
3:K:145:VAL:HG12	3:K:199:HIS:HB2	1.83	0.59
2:L:119:PRO:HB3	2:L:147:TYR:HB3	1.84	0.58
2:F:87:THR:HG23	2:F:110:THR:HA	1.85	0.58
3:H:145:VAL:HG12	3:H:199:HIS:HB2	1.87	0.57
2:L:82:MET:HB3	2:L:82(C):LEU:HD21	1.86	0.57
2:B:212:HIS:HB3	2:B:217:THR:HB	1.85	0.56
1:G:371:SER:HA	6:O:2:NAG:H83	1.88	0.56
3:K:9:SER:HB3	3:K:144:ALA:HB3	1.88	0.56
2:B:52:LYS:O	2:B:71:ARG:NH1	2.39	0.55
1:D:353:TRP:O	1:D:466:ARG:NH1	2.40	0.55
3:C:167:LYS:NZ	10:C:401:HOH:O	2.40	0.54
2:I:87:THR:HG23	2:I:110:THR:HA	1.89	0.54
2:I:29:PHE:HZ	2:I:78:VAL:HG23	1.73	0.54
2:I:176:ALA:HB2	2:I:187:LEU:HD23	1.89	0.54
3:H:133:LEU:HD22	3:H:180:LEU:HD23	1.90	0.54
2:I:153:THR:HG23	2:I:211:ASN:HB3	1.90	0.54
2:L:87:THR:HG23	2:L:110:THR:HA	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L:51:ILE:HG13	2:L:57:PRO:HG3	1.91	0.53
3:E:9:SER:HB3	3:E:144:ALA:HB3	1.90	0.53
1:J:344:ALA:HB3	1:J:347:PHE:HE1	1.74	0.53
2:F:52:LYS:O	2:F:71:ARG:NH1	2.42	0.52
2:I:207:ILE:HG12	2:I:222:ARG:HG2	1.90	0.52
2:B:87:THR:HG23	2:B:110:THR:HA	1.91	0.52
2:I:52:LYS:O	2:I:71:ARG:NH1	2.42	0.52
1:A:449:TYR:HE1	3:E:213:THR:HG22	1.75	0.52
3:H:35:TRP:HB2	3:H:48:ILE:HB	1.92	0.52
1:G:486:PHE:HB2	2:L:227:PRO:HG2	1.92	0.52
2:F:39:GLN:HB2	2:F:45:LEU:HD23	1.90	0.52
3:E:1:GLN:N	3:E:26:SER:OG	2.41	0.51
3:K:150:LYS:HD3	3:K:155:PRO:HA	1.92	0.51
2:B:51:ILE:HG13	2:B:57:PRO:HG3	1.92	0.51
2:I:82:MET:HB3	2:I:82(C):LEU:HD21	1.92	0.51
3:K:39:LEU:HD23	3:K:84:ALA:HB2	1.93	0.50
3:C:39:LEU:HD23	3:C:84:ALA:HB2	1.91	0.50
3:E:89:SER:HA	3:E:97:LEU:O	2.12	0.50
2:I:51:ILE:HG13	2:I:57:PRO:HG3	1.92	0.50
2:F:51:ILE:HG13	2:F:57:PRO:HG3	1.93	0.50
3:H:9:SER:HB3	3:H:144:ALA:HB3	1.93	0.50
2:I:154:VAL:HG22	2:I:210:VAL:HG22	1.94	0.50
3:K:133:LEU:HD22	3:K:180:LEU:HD23	1.93	0.50
3:K:35:TRP:HB2	3:K:48:ILE:HB	1.93	0.49
2:F:9:GLY:HA2	2:F:18:LEU:HD21	1.94	0.49
2:L:90:TYR:O	2:L:106:GLY:HA2	2.12	0.49
2:B:47:TRP:HZ2	2:B:50:PHE:HD2	1.60	0.49
3:E:145:VAL:HG12	3:E:199:HIS:HB2	1.94	0.49
3:K:31:HIS:CD2	3:K:91:TRP:HD1	2.31	0.49
4:M:1:NAG:H61	4:M:2:NAG:HN2	1.77	0.49
3:E:146:THR:OG1	3:E:198:THR:HB	2.12	0.49
2:L:39:GLN:HB2	2:L:45:LEU:HD23	1.93	0.49
3:H:27(B):ASN:O	3:H:31:HIS:HB2	2.13	0.49
3:H:39:LEU:HD23	3:H:84:ALA:HB2	1.95	0.48
7:A:601:SO4:O3	3:E:191:ARG:NH1	2.44	0.48
3:H:33:VAL:N	3:H:51:ASN:OD1	2.27	0.48
5:N:2:NAG:H4	5:N:3:BMA:H2	1.71	0.48
3:E:150:LYS:HD3	3:E:155:PRO:HA	1.96	0.47
3:C:35:TRP:HB2	3:C:48:ILE:HB	1.96	0.47
3:E:31:HIS:CD2	3:E:91:TRP:HD1	2.32	0.47
2:F:82:MET:HB3	2:F:82(C):LEU:HD21	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:403:ARG:HG3	1:D:505:TYR:HA	1.96	0.47
2:F:90:TYR:O	2:F:106:GLY:HA2	2.14	0.47
2:I:39:GLN:HB2	2:I:45:LEU:HD23	1.97	0.47
3:C:196:GLN:HG2	3:C:207:GLU:HB2	1.96	0.46
3:E:37:GLN:HB2	3:E:47:LEU:HD11	1.97	0.46
3:E:151:ALA:HB1	3:E:190:HIS:CD2	2.50	0.46
3:K:31:HIS:HD2	3:K:91:TRP:HD1	1.62	0.46
3:H:31:HIS:CD2	3:H:91:TRP:HD1	2.32	0.46
1:J:354:ASN:O	1:J:398:ASP:HA	2.14	0.46
2:L:47:TRP:HZ2	2:L:50:PHE:HD2	1.64	0.46
3:E:31:HIS:HD2	3:E:91:TRP:HD1	1.64	0.46
3:C:9:SER:HB3	3:C:144:ALA:HB3	1.97	0.46
8:E:303:BCN:H41	8:E:303:BCN:H52	1.44	0.46
3:E:27(B):ASN:O	3:E:31:HIS:HB2	2.16	0.45
2:L:9:GLY:HA2	2:L:18:LEU:HD21	1.99	0.45
1:G:395:VAL:HG12	1:G:515:PHE:HD1	1.81	0.45
3:K:2:SER:O	3:K:2:SER:OG	2.32	0.45
3:E:122:SER:HB2	2:F:228:LYS:NZ	2.31	0.45
3:C:125:GLU:OE2	3:C:132:THR:OG1	2.28	0.45
1:G:350:VAL:HG22	1:G:422:ASN:HB3	1.98	0.45
3:C:146:THR:OG1	3:C:198:THR:HB	2.17	0.45
2:F:176:ALA:HB2	2:F:187:LEU:HD23	1.98	0.45
3:H:14:ALA:HB3	3:K:69:ALA:HB2	1.99	0.45
1:D:458:LYS:HE3	1:D:473:TYR:CE1	2.51	0.44
3:E:61:ARG:NH2	3:E:82:ASP:OD2	2.49	0.44
3:E:160:VAL:HG22	3:E:180:LEU:HD13	1.99	0.44
2:I:47:TRP:HZ2	2:I:50:PHE:HD2	1.66	0.44
3:K:27(B):ASN:O	3:K:31:HIS:HB2	2.17	0.44
3:C:145:VAL:HG12	3:C:199:HIS:HB2	1.99	0.44
3:E:32:TYR:HB3	3:E:50:GLU:HA	1.98	0.44
3:H:152:ASP:OD1	3:H:191:ARG:HB3	2.16	0.44
3:C:150:LYS:HD3	3:C:155:PRO:HA	1.99	0.44
3:H:150:LYS:HB2	3:H:194:SER:HB2	1.99	0.44
1:J:344:ALA:HB3	1:J:347:PHE:CE1	2.53	0.44
3:C:133:LEU:HD23	3:C:149:TRP:CZ3	2.52	0.44
1:G:424:LYS:HD2	1:G:425:LEU:H	1.82	0.44
1:J:458:LYS:HE3	1:J:473:TYR:CE1	2.53	0.43
2:B:82:MET:HB3	2:B:82(C):LEU:HD21	1.99	0.43
1:D:447:GLY:HA2	1:D:498:GLN:HG2	2.00	0.43
2:I:87:THR:HA	2:I:109:VAL:O	2.18	0.43
3:K:33:VAL:N	3:K:51:ASN:OD1	2.28	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:135:CYS:HB2	3:C:149:TRP:CH2	2.54	0.43
3:H:27(C):ILE:HG12	3:H:90:VAL:HG21	2.00	0.43
2:I:153:THR:CG2	2:I:211:ASN:HB3	2.48	0.43
3:K:89:SER:HA	3:K:97:LEU:O	2.18	0.43
2:B:90:TYR:O	2:B:106:GLY:HA2	2.18	0.42
1:D:354:ASN:O	1:D:398:ASP:HA	2.18	0.42
3:E:39:LEU:HD23	3:E:84:ALA:HB2	2.00	0.42
3:K:121:PRO:HD3	3:K:133:LEU:HD12	1.99	0.42
3:K:61:ARG:NH2	3:K:82:ASP:OD2	2.52	0.42
1:A:433:VAL:HG22	1:A:512:VAL:HG13	2.01	0.42
2:I:123:PRO:O	2:I:124:LEU:HD23	2.20	0.42
3:K:119:PHE:CG	2:L:124:LEU:HD13	2.54	0.42
3:C:89:SER:HA	3:C:97:LEU:O	2.19	0.42
1:J:371:SER:HA	6:P:2:NAG:H83	2.02	0.42
3:H:146:THR:OG1	3:H:198:THR:HB	2.20	0.42
2:B:28:ARG:H	2:B:28:ARG:HG2	1.67	0.42
1:D:360:ASN:H	1:D:523:THR:HB	1.85	0.42
1:A:376:THR:OG1	2:B:100(B):LEU:O	2.27	0.42
2:B:119:PRO:HD2	2:B:217:THR:HG21	2.02	0.41
3:K:208:LYS:HD3	3:K:208:LYS:HA	1.90	0.41
2:B:87:THR:HA	2:B:109:VAL:O	2.20	0.41
3:H:133:LEU:HD13	3:H:182:LEU:HD21	2.02	0.41
3:H:89:SER:HA	3:H:97:LEU:O	2.20	0.41
3:C:174:TYR:OH	8:C:301:BCN:H12	2.20	0.41
2:I:117:LYS:HD3	2:I:118:GLY:O	2.19	0.41
2:F:47:TRP:HZ2	2:F:50:PHE:HD2	1.67	0.41
1:J:368:LEU:HD12	6:P:1:NAG:H83	2.02	0.41
3:K:160:VAL:HG22	3:K:180:LEU:HD13	2.02	0.41
2:B:29:PHE:CZ	2:B:78:VAL:HG23	2.52	0.41
3:C:14:ALA:HB3	3:E:69:ALA:HB2	2.01	0.41
3:K:32:TYR:HB3	3:K:50:GLU:HA	2.02	0.41
2:B:221:LYS:HD2	2:B:221:LYS:HA	1.85	0.41
3:H:18:ARG:HB3	9:K:301:GOL:H32	2.02	0.41
3:K:146:THR:OG1	3:K:198:THR:HB	2.21	0.41
3:C:121:PRO:HG3	3:C:133:LEU:HD12	2.03	0.41
3:C:31:HIS:CD2	3:C:91:TRP:HD1	2.39	0.40
1:A:502:GLY:O	1:A:506:GLN:HG3	2.22	0.40
1:D:395:VAL:HG12	1:D:515:PHE:HD1	1.87	0.40
1:D:393:THR:HA	1:D:522:ALA:HA	2.03	0.40
3:E:168:GLN:OE1	3:E:175:ALA:HB2	2.22	0.40
2:F:87:THR:HA	2:F:109:VAL:O	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:126:PRO:HD3	2:I:140:LEU:HD23	2.03	0.40
2:I:228:LYS:HD2	2:I:228:LYS:HA	1.71	0.40
3:K:150:LYS:HB2	3:K:194:SER:HB2	2.03	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	A	193/205 (94%)	189 (98%)	4 (2%)	0	100	100
1	D	193/205 (94%)	185 (96%)	8 (4%)	0	100	100
1	G	193/205 (94%)	187 (97%)	6 (3%)	0	100	100
1	J	193/205 (94%)	187 (97%)	6 (3%)	0	100	100
2	B	223/231 (96%)	216 (97%)	7 (3%)	0	100	100
2	F	223/231 (96%)	216 (97%)	7 (3%)	0	100	100
2	I	223/231 (96%)	216 (97%)	7 (3%)	0	100	100
2	L	224/231 (97%)	218 (97%)	6 (3%)	0	100	100
3	C	212/216 (98%)	201 (95%)	9 (4%)	2 (1%)	14	41
3	E	211/216 (98%)	202 (96%)	8 (4%)	1 (0%)	25	53
3	H	212/216 (98%)	204 (96%)	7 (3%)	1 (0%)	25	53
3	K	211/216 (98%)	202 (96%)	9 (4%)	0	100	100
All	All	2511/2608 (96%)	2423 (96%)	84 (3%)	4 (0%)	44	71

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	3	VAL

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Mol	Chain	Res	Type
3	E	3	VAL
3	H	3	VAL
3	C	134	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	168/177 (95%)	163 (97%)	5 (3%)	36	61
1	D	168/177 (95%)	164 (98%)	4 (2%)	44	67
1	G	168/177 (95%)	166 (99%)	2 (1%)	67	80
1	J	168/177 (95%)	163 (97%)	5 (3%)	36	61
2	B	193/195 (99%)	191 (99%)	2 (1%)	73	84
2	F	192/195 (98%)	188 (98%)	4 (2%)	48	69
2	I	193/195 (99%)	190 (98%)	3 (2%)	58	75
2	L	193/195 (99%)	188 (97%)	5 (3%)	41	65
3	C	178/180 (99%)	175 (98%)	3 (2%)	56	74
3	E	177/180 (98%)	175 (99%)	2 (1%)	70	82
3	H	178/180 (99%)	175 (98%)	3 (2%)	56	74
3	K	177/180 (98%)	175 (99%)	2 (1%)	70	82
All	All	2153/2208 (98%)	2113 (98%)	40 (2%)	52	72

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	356	LYS
1	A	377	PHE
1	A	403	ARG
1	A	408	ARG
1	A	493	GLN
2	B	54	PHE
2	B	208	CYS

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Mol	Chain	Res	Type
3	C	23	CYS
3	C	79	GLN
3	C	88	CYS
1	D	356	LYS
1	D	377	PHE
1	D	408	ARG
1	D	525	CYS
3	E	23	CYS
3	E	88	CYS
2	F	54	PHE
2	F	172	HIS
2	F	208	CYS
2	F	209	ASN
1	G	356	LYS
1	G	377	PHE
3	H	23	CYS
3	H	88	CYS
3	H	172	ASN
2	I	54	PHE
2	I	172	HIS
2	I	208	CYS
1	J	356	LYS
1	J	377	PHE
1	J	403	ARG
1	J	493	GLN
1	J	494	SER
3	K	23	CYS
3	K	88	CYS
2	L	54	PHE
2	L	96	ARG
2	L	172	HIS
2	L	208	CYS
2	L	209	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

16 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	M	1	4,1	14,14,15	0.23	0	17,19,21	0.49	0
4	NAG	M	2	4	14,14,15	0.33	0	17,19,21	0.40	0
4	BMA	M	3	4	11,11,12	0.52	0	15,15,17	0.92	1 (6%)
5	NAG	N	1	5,1	14,14,15	0.79	1 (7%)	17,19,21	0.69	0
5	NAG	N	2	5	14,14,15	0.54	0	17,19,21	1.36	2 (11%)
5	BMA	N	3	5	11,11,12	0.96	1 (9%)	15,15,17	1.59	5 (33%)
5	MAN	N	4	5	11,11,12	0.92	0	15,15,17	0.95	1 (6%)
5	MAN	N	5	5	11,11,12	0.68	0	15,15,17	1.00	2 (13%)
6	NAG	O	1	6,1	14,14,15	0.73	1 (7%)	17,19,21	0.69	0
6	NAG	O	2	6	14,14,15	0.39	0	17,19,21	0.99	2 (11%)
6	BMA	O	3	6	11,11,12	0.76	0	15,15,17	0.66	0
6	FUC	O	4	6	10,10,11	0.68	0	14,14,16	0.77	0
6	NAG	P	1	6,1	14,14,15	0.48	0	17,19,21	1.07	1 (5%)
6	NAG	P	2	6	14,14,15	0.87	1 (7%)	17,19,21	1.10	2 (11%)
6	BMA	P	3	6	11,11,12	0.67	0	15,15,17	0.66	0
6	FUC	P	4	6	10,10,11	0.79	0	14,14,16	0.98	1 (7%)

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
4	NAG	M	1	4,1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	M	2	4	-	1/6/23/26	0/1/1/1
4	BMA	M	3	4	-	0/2/19/22	0/1/1/1
5	NAG	N	1	5,1	-	3/6/23/26	0/1/1/1
5	NAG	N	2	5	-	3/6/23/26	0/1/1/1
5	BMA	N	3	5	-	2/2/19/22	0/1/1/1
5	MAN	N	4	5	-	1/2/19/22	0/1/1/1
5	MAN	N	5	5	-	1/2/19/22	0/1/1/1
6	NAG	O	1	6,1	-	1/6/23/26	0/1/1/1
6	NAG	O	2	6	-	2/6/23/26	0/1/1/1
6	BMA	O	3	6	-	0/2/19/22	0/1/1/1
6	FUC	O	4	6	-	-	0/1/1/1
6	NAG	P	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	P	2	6	-	2/6/23/26	0/1/1/1
6	BMA	P	3	6	-	1/2/19/22	0/1/1/1
6	FUC	P	4	6	-	-	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	P	2	NAG	C1-C2	3.00	1.56	1.52
5	N	1	NAG	C1-C2	2.72	1.56	1.52
6	O	1	NAG	O5-C1	-2.19	1.40	1.43
5	N	3	BMA	C2-C3	2.07	1.55	1.52

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	N	2	NAG	C2-N2-C7	3.85	128.05	122.90
6	P	1	NAG	C1-O5-C5	3.68	117.12	112.19
6	P	2	NAG	C2-N2-C7	3.52	127.62	122.90
5	N	3	BMA	C3-C4-C5	2.98	115.63	110.23
5	N	3	BMA	C2-C3-C4	2.91	115.98	110.86
6	O	2	NAG	C2-N2-C7	2.89	126.77	122.90
4	M	3	BMA	C1-O5-C5	2.64	115.73	112.19
5	N	2	NAG	C1-C2-N2	2.50	114.38	110.43
6	P	4	FUC	C1-O5-C5	2.36	118.53	112.97
5	N	3	BMA	O3-C3-C4	-2.25	105.08	110.38
5	N	5	MAN	C1-O5-C5	2.23	115.17	112.19
5	N	4	MAN	O2-C2-C3	-2.12	105.75	110.15
6	P	2	NAG	C1-C2-N2	2.10	113.74	110.43
5	N	5	MAN	O2-C2-C3	-2.10	105.81	110.15

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	N	3	BMA	O5-C5-C6	2.05	111.65	107.66
5	N	3	BMA	C1-C2-C3	2.03	112.60	109.64
6	O	2	NAG	C1-C2-N2	2.03	113.63	110.43

There are no chirality outliers.

All (19) torsion outliers are listed below:

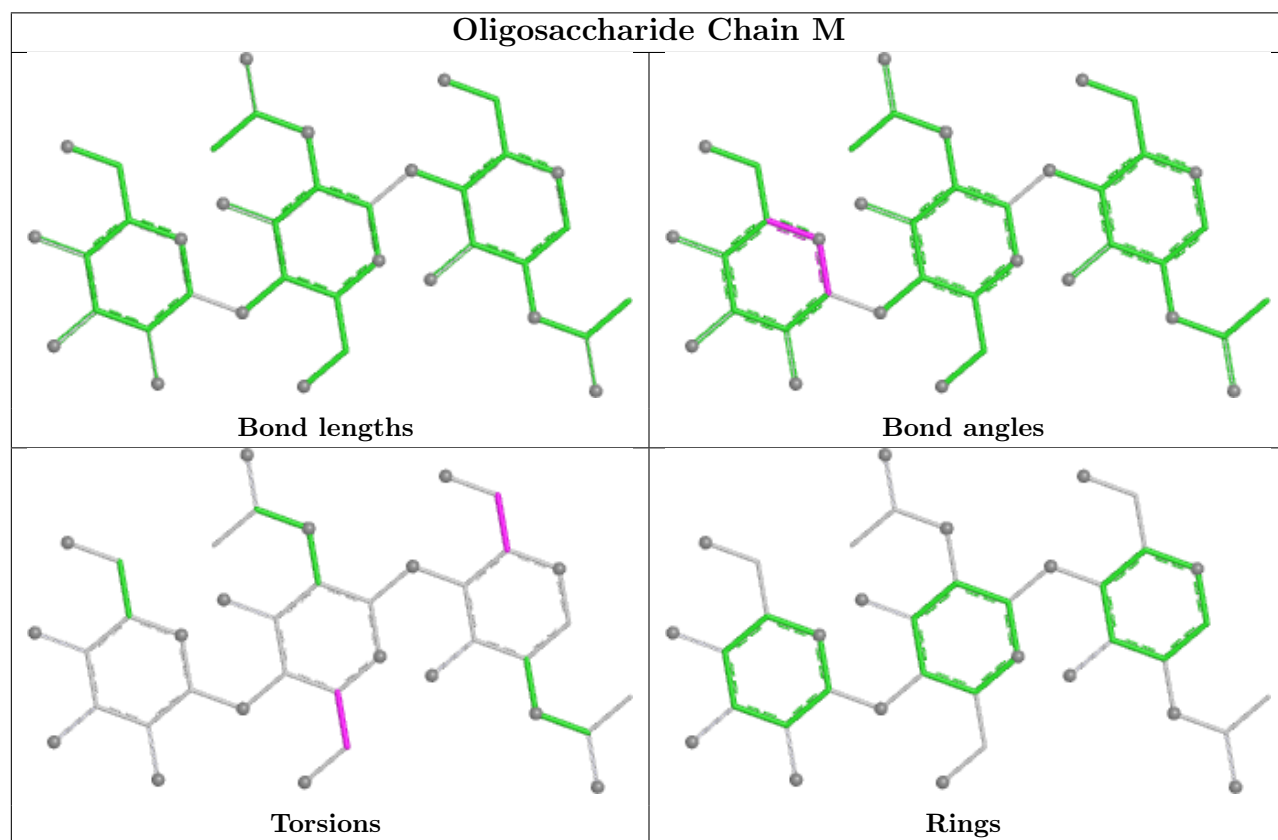
Mol	Chain	Res	Type	Atoms
5	N	2	NAG	C1-C2-N2-C7
6	O	2	NAG	C1-C2-N2-C7
6	P	2	NAG	C1-C2-N2-C7
5	N	2	NAG	C4-C5-C6-O6
5	N	2	NAG	O5-C5-C6-O6
4	M	1	NAG	O5-C5-C6-O6
5	N	3	BMA	O5-C5-C6-O6
4	M	1	NAG	C4-C5-C6-O6
5	N	4	MAN	O5-C5-C6-O6
6	P	2	NAG	O5-C5-C6-O6
4	M	2	NAG	O5-C5-C6-O6
5	N	3	BMA	C4-C5-C6-O6
6	O	2	NAG	O5-C5-C6-O6
6	P	3	BMA	O5-C5-C6-O6
5	N	5	MAN	O5-C5-C6-O6
5	N	1	NAG	C4-C5-C6-O6
5	N	1	NAG	C3-C2-N2-C7
5	N	1	NAG	O5-C5-C6-O6
6	O	1	NAG	C3-C2-N2-C7

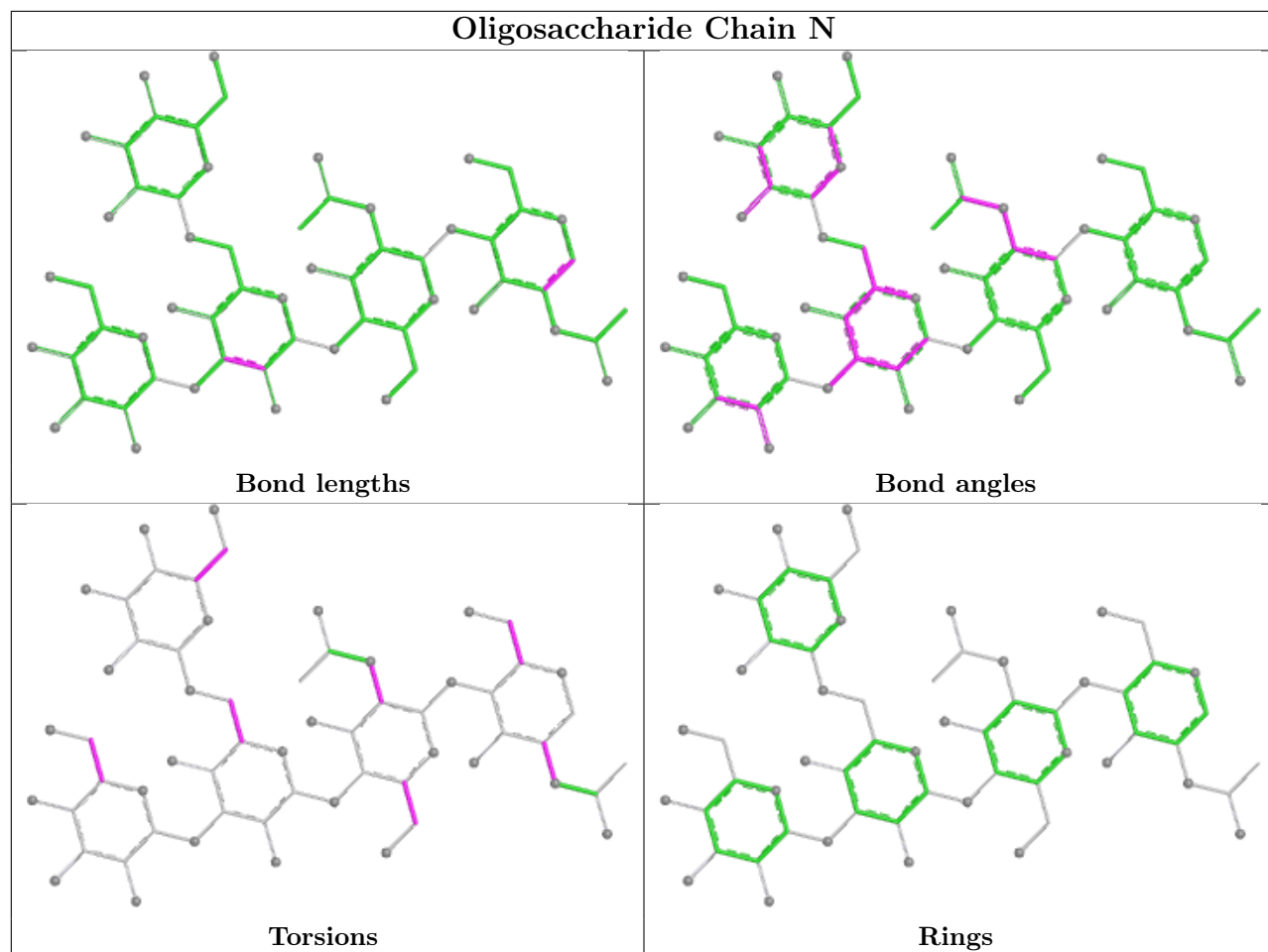
There are no ring outliers.

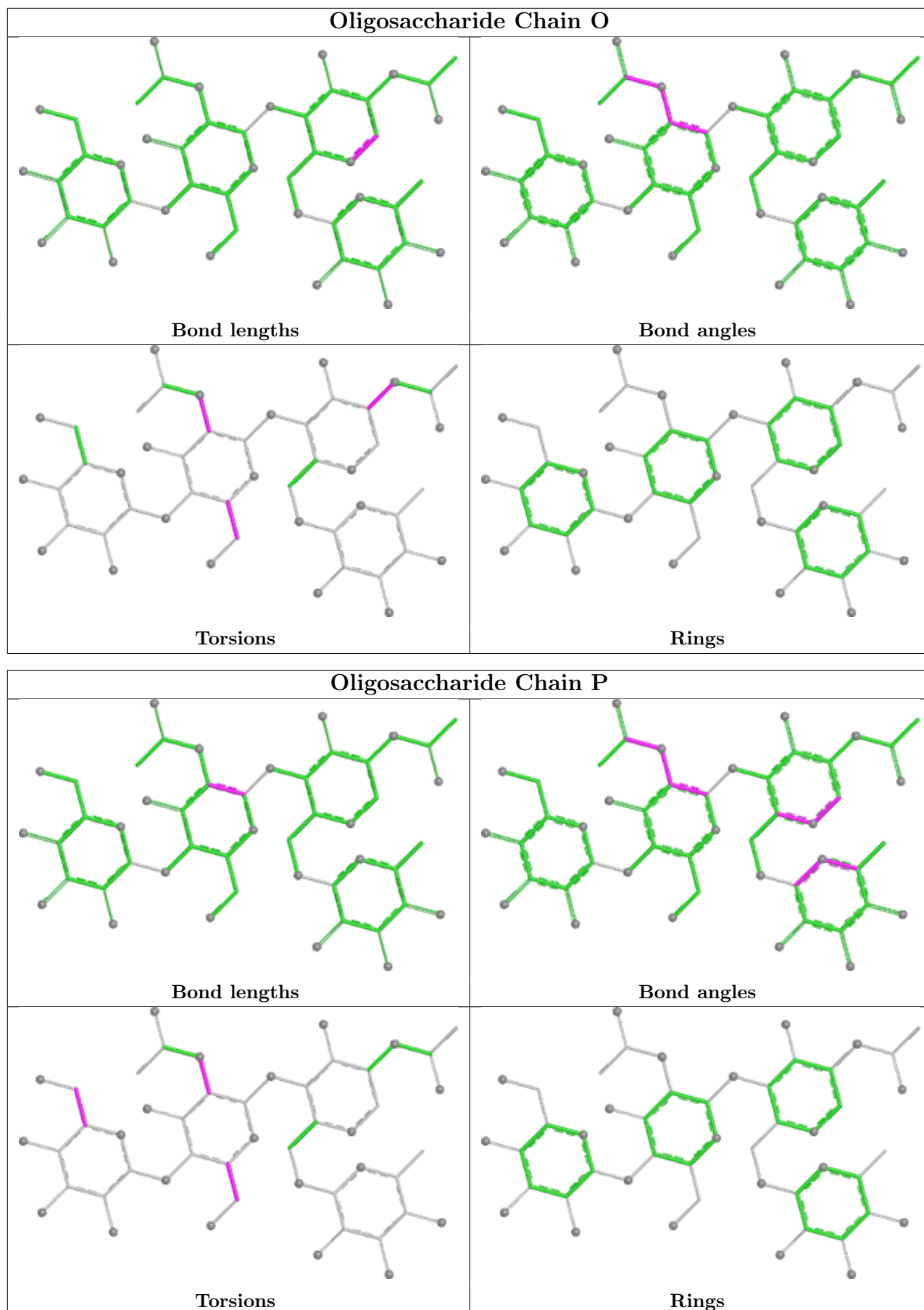
8 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	P	4	FUC	1	0
6	P	1	NAG	2	0
6	P	2	NAG	2	0
4	M	1	NAG	1	0
5	N	3	BMA	1	0
6	O	2	NAG	1	0
5	N	2	NAG	1	0
4	M	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

12 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
7	SO4	E	302	-	4,4,4	0.24	0	6,6,6	0.04	0
7	SO4	I	301	-	4,4,4	0.23	0	6,6,6	0.12	0
7	SO4	D	601	-	4,4,4	0.23	0	6,6,6	0.10	0
7	SO4	K	302	-	4,4,4	0.25	0	6,6,6	0.05	0
7	SO4	K	303	-	4,4,4	0.23	0	6,6,6	0.06	0
8	BCN	C	301	-	10,10,10	1.00	0	11,11,11	1.00	0
7	SO4	A	601	-	4,4,4	0.23	0	6,6,6	0.12	0
9	GOL	K	301	-	5,5,5	0.94	0	5,5,5	1.06	0
8	BCN	H	301	-	10,10,10	0.98	0	11,11,11	1.08	0
7	SO4	E	301	-	4,4,4	0.22	0	6,6,6	0.09	0
8	BCN	E	303	-	10,10,10	1.02	0	11,11,11	1.07	0
7	SO4	J	601	-	4,4,4	0.24	0	6,6,6	0.09	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
8	BCN	E	303	-	-	3/10/10/10	-
9	GOL	K	301	-	-	0/4/4/4	-
8	BCN	H	301	-	-	5/10/10/10	-
8	BCN	C	301	-	-	4/10/10/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	H	301	BCN	N1-C1-C2-O22
8	C	301	BCN	N1-C1-C2-O21
8	C	301	BCN	N1-C1-C2-O22
8	H	301	BCN	N1-C1-C2-O21
8	E	303	BCN	N1-C5-C6-O6
8	E	303	BCN	N1-C3-C4-O4
8	E	303	BCN	C4-C3-N1-C5
8	H	301	BCN	C2-C1-N1-C3
8	C	301	BCN	C4-C3-N1-C1
8	C	301	BCN	C4-C3-N1-C5
8	H	301	BCN	C6-C5-N1-C1
8	H	301	BCN	C2-C1-N1-C5

There are no ring outliers.

4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	C	301	BCN	1	0
7	A	601	SO4	1	0
9	K	301	GOL	1	0
8	E	303	BCN	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	195/205 (95%)	0.75	13 (6%) 25 24	42, 73, 90, 105	0
1	D	195/205 (95%)	0.52	11 (5%) 31 28	40, 61, 85, 103	0
1	G	195/205 (95%)	0.97	15 (7%) 21 21	44, 79, 112, 117	0
1	J	195/205 (95%)	1.94	92 (47%) 0 1	59, 99, 125, 138	0
2	B	227/231 (98%)	1.20	37 (16%) 5 8	66, 85, 108, 124	0
2	F	227/231 (98%)	0.19	7 (3%) 51 44	31, 54, 88, 112	0
2	I	227/231 (98%)	0.38	2 (0%) 81 74	36, 66, 89, 106	0
2	L	228/231 (98%)	1.89	95 (41%) 1 1	70, 99, 118, 140	0
3	C	214/216 (99%)	1.43	66 (30%) 1 3	35, 84, 105, 124	0
3	E	213/216 (98%)	0.27	4 (1%) 66 56	25, 51, 76, 105	0
3	H	214/216 (99%)	0.90	32 (14%) 6 9	33, 63, 91, 106	0
3	K	213/216 (98%)	2.50	131 (61%) 0 0	56, 93, 118, 142	0
All	All	2543/2608 (97%)	1.08	505 (19%) 3 6	25, 75, 112, 142	0

All (505) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	K	214	GLU	5.9
3	K	189	SER	5.5
3	K	171	ASN	5.4
3	K	57	GLY	5.1
3	K	28	GLY	5.0
3	K	153	SER	5.0
3	K	173	LYS	4.9
2	L	139	ALA	4.9
2	B	227	PRO	4.8
3	K	129	ASN	4.8
1	J	501	ASN	4.7

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Mol	Chain	Res	Type	RSRZ
3	K	95(A)	ASN	4.6
3	C	171	ASN	4.5
3	K	213	THR	4.5
1	J	444	LYS	4.5
3	K	51	ASN	4.5
3	H	213	THR	4.5
3	K	115	SER	4.4
2	L	141	GLY	4.3
1	J	445	VAL	4.3
3	K	188	LYS	4.3
3	K	152	ASP	4.3
2	L	21	SER	4.3
1	J	481	ASN	4.3
2	L	100(F)	ALA	4.2
1	J	502	GLY	4.2
3	K	174	TYR	4.2
3	K	121	PRO	4.2
1	G	500	THR	4.2
3	K	184	PRO	4.2
3	H	52	ASP	4.2
3	C	130	LYS	4.2
3	K	156	VAL	4.1
2	L	137	THR	4.1
3	K	126	LEU	4.1
2	B	230	CYS	4.1
3	K	130	LYS	4.1
3	K	168	GLN	4.0
1	J	425	LEU	4.0
3	C	153	SER	4.0
1	J	500	THR	4.0
2	L	56	THR	4.0
3	K	27(A)	SER	4.0
3	K	96	THR	4.0
3	C	173	LYS	3.9
3	K	2	SER	3.9
3	K	155	PRO	3.9
3	K	58	VAL	3.9
2	L	118	GLY	3.9
1	J	443	SER	3.9
3	K	185	GLU	3.9
3	C	191	ARG	3.9
3	H	214	GLU	3.9

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Mol	Chain	Res	Type	RSRZ
3	C	184	PRO	3.9
1	J	417	LYS	3.9
3	K	134	VAL	3.8
3	C	84	ALA	3.8
1	J	518	LEU	3.8
2	L	99	LEU	3.8
2	L	140	LEU	3.8
3	K	70	SER	3.8
3	K	111	LYS	3.8
1	J	416	GLY	3.8
3	K	176	ALA	3.8
3	K	200	GLU	3.8
1	J	403	ARG	3.8
3	C	108	GLY	3.8
3	K	160	VAL	3.8
3	K	199	HIS	3.8
2	L	197	SER	3.7
3	C	115	SER	3.7
1	J	517	LEU	3.7
3	K	113	ALA	3.7
2	L	31	ASP	3.7
2	L	189	SER	3.7
2	L	13	GLN	3.7
3	K	207	GLU	3.6
3	K	149	TRP	3.6
3	K	56	SER	3.6
2	B	197	SER	3.6
3	K	166	SER	3.6
3	K	181	SER	3.6
2	L	92	CYS	3.6
2	L	12	VAL	3.6
1	J	461	LEU	3.6
3	H	215	CYS	3.6
3	K	148	ALA	3.5
2	L	100(B)	LEU	3.5
2	L	62	SER	3.5
1	J	437	ASN	3.5
3	K	112	ALA	3.5
1	J	406	GLU	3.5
1	G	494	SER	3.5
1	A	415	THR	3.5
3	K	151	ALA	3.5

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Mol	Chain	Res	Type	RSRZ
3	K	196	GLN	3.5
1	J	472	ILE	3.5
2	F	130	SER	3.4
3	K	128	ALA	3.4
3	C	96	THR	3.4
3	K	197	VAL	3.4
1	J	418	ILE	3.4
1	J	498	GLN	3.4
3	K	109	GLN	3.4
3	K	133	LEU	3.4
1	J	499	PRO	3.4
1	J	507	PRO	3.4
1	J	527	PRO	3.4
1	G	366	SER	3.4
2	L	25	SER	3.4
2	L	136	GLY	3.4
3	C	70	SER	3.4
1	J	452	LEU	3.4
3	K	164	THR	3.4
2	B	100(F)	ALA	3.3
2	L	210	VAL	3.3
1	J	526	GLY	3.3
3	K	122	SER	3.3
2	L	126	PRO	3.3
3	K	182	LEU	3.3
3	K	157	LYS	3.3
3	E	1	GLN	3.3
1	J	419	ALA	3.3
3	K	180	LEU	3.3
3	K	150	LYS	3.3
2	L	23	SER	3.3
3	K	138	SER	3.3
1	J	405	ASP	3.3
3	H	27(A)	SER	3.3
1	J	439	ASN	3.3
2	L	97	GLY	3.3
2	L	4	LEU	3.3
2	L	198	LEU	3.3
1	J	438	SER	3.2
1	J	477	SER	3.2
1	J	521	PRO	3.2
2	L	11	LEU	3.2

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Mol	Chain	Res	Type	RSRZ
3	K	97	LEU	3.2
1	J	421	TYR	3.2
2	B	85	GLU	3.2
3	C	156	VAL	3.2
3	K	91	TRP	3.2
1	J	522	ALA	3.2
3	K	144	ALA	3.2
1	J	420	ASP	3.2
1	J	413	GLY	3.2
3	K	204	SER	3.2
1	J	408	ARG	3.2
3	C	158	ALA	3.2
2	B	200	THR	3.2
2	I	126	PRO	3.2
1	D	343	ASN	3.2
2	L	85	GLU	3.2
2	L	100	GLU	3.2
3	K	124	GLU	3.2
1	D	361	CYS	3.2
3	K	136	LEU	3.1
3	K	108	GLY	3.1
3	H	58	VAL	3.1
1	J	471	GLU	3.1
3	C	121	PRO	3.1
3	K	114	PRO	3.1
3	K	186	GLN	3.1
3	K	60	ASP	3.1
3	K	92	ASP	3.1
3	K	59	SER	3.1
3	K	154	SER	3.1
1	J	448	ASN	3.1
3	C	81	GLY	3.1
3	H	68	GLY	3.1
1	J	382	VAL	3.1
3	K	167	LYS	3.1
3	K	208	LYS	3.1
3	K	90	VAL	3.1
3	K	107	LEU	3.1
2	B	138	ALA	3.1
2	L	130	SER	3.0
3	K	187	TRP	3.0
3	H	5	THR	3.0

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Mol	Chain	Res	Type	RSRZ
3	K	198	THR	3.0
2	L	24	ALA	3.0
1	J	495	TYR	3.0
2	L	147	TYR	3.0
2	L	53	ASP	3.0
3	K	41	GLY	3.0
3	K	183	THR	3.0
3	C	79	GLN	3.0
2	L	52(B)	LYS	3.0
3	C	83	GLU	3.0
3	K	52	ASP	3.0
1	J	514	SER	3.0
1	J	470	THR	3.0
3	C	117	THR	3.0
3	H	27(B)	ASN	3.0
3	K	146	THR	3.0
2	L	27	PHE	3.0
2	L	175	PRO	3.0
3	K	110	PRO	3.0
2	B	115	SER	3.0
1	J	480	CYS	3.0
1	J	488	CYS	3.0
3	K	141	TYR	3.0
2	L	9	GLY	3.0
3	K	81	GLY	3.0
3	K	212	PRO	3.0
3	H	3	VAL	3.0
2	B	128	SER	3.0
3	C	166	SER	3.0
1	J	449	TYR	2.9
1	J	447	GLY	2.9
3	K	131	ALA	2.9
2	L	162	ASN	2.9
3	C	3	VAL	2.9
1	G	471	GLU	2.9
2	B	127	SER	2.9
3	H	12	SER	2.9
2	B	199	GLY	2.9
3	H	13	GLY	2.9
3	K	175	ALA	2.9
3	C	152	ASP	2.9
2	L	3	GLN	2.9

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Mol	Chain	Res	Type	RSRZ
1	J	402	ILE	2.9
2	B	114	ALA	2.8
3	K	158	ALA	2.8
3	K	132	THR	2.8
3	K	127	GLN	2.8
1	D	476	GLY	2.8
2	B	119	PRO	2.8
3	H	171	ASN	2.8
1	D	387	LEU	2.8
2	L	177	VAL	2.8
2	B	68	SER	2.8
1	J	414	GLN	2.8
1	J	497	PHE	2.8
1	J	407	VAL	2.8
3	C	168	GLN	2.8
3	K	135	CYS	2.8
1	J	490	PHE	2.8
3	E	172	ASN	2.8
3	H	67	SER	2.7
3	H	188	LYS	2.7
3	K	72	SER	2.7
3	C	136	LEU	2.7
2	L	10	GLY	2.7
3	K	118	LEU	2.7
3	K	94	SER	2.7
3	K	49	HIS	2.7
2	L	138	ALA	2.7
2	L	73	ASP	2.7
3	H	154	SER	2.7
3	K	145	VAL	2.7
1	J	422	ASN	2.7
2	B	82(A)	ASN	2.7
3	H	200	GLU	2.7
3	C	174	TYR	2.7
1	J	503	VAL	2.7
2	L	5	VAL	2.7
3	C	90	VAL	2.7
1	A	366	SER	2.7
3	C	89	SER	2.7
2	L	174	PHE	2.7
1	J	409	GLN	2.7
1	J	511	VAL	2.7

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Mol	Chain	Res	Type	RSRZ
2	L	171	VAL	2.7
1	J	525	CYS	2.7
2	L	17	SER	2.6
2	L	180	SER	2.6
3	C	192	SER	2.6
3	K	106	VAL	2.6
2	F	128	SER	2.6
2	L	127	SER	2.6
3	C	94	SER	2.6
3	K	194	SER	2.6
2	L	102	VAL	2.6
2	L	100(C)	ILE	2.6
1	G	336	CYS	2.6
2	B	126	PRO	2.6
2	L	105	PRO	2.6
3	K	67	SER	2.6
1	J	440	ASN	2.6
3	H	111	LYS	2.6
1	J	410	ILE	2.6
3	C	180	LEU	2.6
3	K	40	PRO	2.6
2	L	7	SER	2.6
3	C	80	SER	2.6
3	C	181	SER	2.6
3	K	27	SER	2.6
1	J	415	THR	2.6
2	B	84	THR	2.6
2	L	89	VAL	2.6
2	L	93	THR	2.6
2	L	211	ASN	2.6
1	J	508	TYR	2.6
3	K	165	PRO	2.6
1	G	405	ASP	2.6
2	B	112	SER	2.6
2	F	228	LYS	2.6
3	H	2	SER	2.6
3	H	51	ASN	2.6
3	K	137	ILE	2.5
1	G	486	PHE	2.5
3	C	126	LEU	2.5
1	J	504	GLY	2.5
1	J	424	LYS	2.5

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Mol	Chain	Res	Type	RSRZ
1	G	333	THR	2.5
3	K	162	THR	2.5
3	K	178	SER	2.5
2	L	72	ASP	2.5
3	K	172	ASN	2.5
2	B	118	GLY	2.5
3	K	143	GLY	2.5
3	K	55	PRO	2.5
3	K	206	VAL	2.5
1	G	470	THR	2.5
1	J	469	SER	2.5
3	C	177	SER	2.5
3	C	159	GLY	2.5
2	L	119	PRO	2.5
1	J	484	GLU	2.5
2	L	166	LEU	2.5
2	L	182	SER	2.5
3	C	148	ALA	2.5
1	J	524	VAL	2.5
3	E	185	GLU	2.5
1	J	387	LEU	2.4
1	G	376	THR	2.4
1	J	386	LYS	2.4
2	B	228	LYS	2.4
1	G	502	GLY	2.4
3	K	79	GLN	2.4
2	F	229	SER	2.4
1	J	451	TYR	2.4
1	J	510	VAL	2.4
3	H	15	PRO	2.4
2	L	54	PHE	2.4
3	H	24	THR	2.4
1	J	404	GLY	2.4
3	C	71	ALA	2.4
3	C	175	ALA	2.4
3	K	84	ALA	2.4
2	L	195	SER	2.4
3	E	26	SER	2.4
1	D	358	ILE	2.4
3	K	39	LEU	2.4
2	B	100	GLU	2.4
3	C	200	GLU	2.4

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Mol	Chain	Res	Type	RSRZ
2	L	129	LYS	2.4
2	L	186	SER	2.4
3	K	89	SER	2.4
2	B	211	ASN	2.4
1	D	391	CYS	2.4
3	K	83	GLU	2.4
1	D	349	SER	2.4
3	H	153	SER	2.4
3	K	98	PHE	2.4
3	C	185	GLU	2.4
2	L	55	GLY	2.4
1	J	401	VAL	2.4
3	C	164	THR	2.4
3	C	109	GLN	2.4
3	H	17	GLN	2.4
1	J	400	PHE	2.3
3	H	14	ALA	2.3
3	K	68	GLY	2.3
2	L	145	LYS	2.3
2	L	32	TYR	2.3
2	B	130	SER	2.3
3	C	2	SER	2.3
1	D	481	ASN	2.3
3	K	139	ASP	2.3
1	J	465	GLU	2.3
2	B	225	VAL	2.3
3	C	197	VAL	2.3
3	K	191	ARG	2.3
2	B	4	LEU	2.3
2	L	157	TRP	2.3
2	L	187	LEU	2.3
2	L	205	THR	2.3
2	B	21	SER	2.3
2	I	128	SER	2.3
3	C	138	SER	2.3
3	C	154	SER	2.3
1	J	388	ASN	2.3
3	C	77	GLY	2.3
3	C	215	CYS	2.3
2	L	167	THR	2.3
2	B	28	ARG	2.3
1	D	526	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	100(G)	GLY	2.3
1	J	343	ASN	2.3
3	C	78	LEU	2.3
1	J	486	PHE	2.3
1	J	473	TYR	2.3
3	K	193	TYR	2.3
1	J	512	VAL	2.3
2	L	37	VAL	2.3
2	L	143	LEU	2.3
2	L	188	SER	2.3
3	C	133	LEU	2.3
3	K	190	HIS	2.2
1	D	415	THR	2.2
1	J	453	TYR	2.2
1	J	505	TYR	2.2
1	A	446	GLY	2.2
3	H	57	GLY	2.2
1	A	402	ILE	2.2
2	L	51	ILE	2.2
2	L	163	SER	2.2
2	L	229	SER	2.2
3	K	85	ASP	2.2
3	K	116	VAL	2.2
2	L	45	LEU	2.2
3	C	113	ALA	2.2
3	C	182	LEU	2.2
1	A	526	GLY	2.2
1	A	425	LEU	2.2
2	L	15	GLY	2.2
2	L	61	GLU	2.2
1	J	436	TRP	2.2
2	F	127	SER	2.2
3	C	149	TRP	2.2
3	K	119	PHE	2.2
1	A	445	VAL	2.2
2	L	184	LEU	2.2
3	C	86	TYR	2.2
3	K	23	CYS	2.2
2	B	97	GLY	2.2
1	J	491	PRO	2.2
2	L	156	SER	2.2
1	J	430	THR	2.2

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Mol	Chain	Res	Type	RSRZ
2	B	193	VAL	2.2
3	C	198	THR	2.2
2	B	129	LYS	2.1
1	G	499	PRO	2.1
1	J	366	SER	2.1
2	L	120	SER	2.1
3	C	134	VAL	2.1
1	A	478	THR	2.1
1	D	333	THR	2.1
1	J	523	THR	2.1
3	C	129	ASN	2.1
3	K	209	THR	2.1
2	L	60	ALA	2.1
1	A	447	GLY	2.1
2	L	42	GLY	2.1
1	J	429	PHE	2.1
3	K	125	GLU	2.1
2	L	57	PRO	2.1
3	C	160	VAL	2.1
2	L	128	SER	2.1
2	B	207	ILE	2.1
2	L	59	TYR	2.1
1	A	405	ASP	2.1
3	C	139	ASP	2.1
1	A	386	LYS	2.1
3	C	135	CYS	2.1
2	L	172	HIS	2.1
3	C	183	THR	2.1
3	H	22	SER	2.1
3	K	117	THR	2.1
1	J	423	TYR	2.1
2	F	28	ARG	2.1
3	C	188	LYS	2.1
3	K	53	LYS	2.1
3	K	140	PHE	2.1
1	J	412	PRO	2.1
2	L	20	LEU	2.1
3	C	142	PRO	2.1
3	H	8	PRO	2.1
3	H	44	PRO	2.1
3	K	88	CYS	2.1
2	L	100(A)	TRP	2.1

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Mol	Chain	Res	Type	RSRZ
2	B	139	ALA	2.1
1	A	408	ARG	2.1
3	H	157	LYS	2.1
2	B	116	THR	2.1
2	L	192	THR	2.1
2	L	70	SER	2.1
3	H	65	SER	2.1
1	G	498	GLN	2.1
1	J	456	PHE	2.1
3	K	142	PRO	2.1
3	K	14	ALA	2.0
2	L	104	GLY	2.0
1	A	333	THR	2.0
1	J	478	THR	2.0
2	B	140	LEU	2.0
3	C	52	ASP	2.0
2	B	123	PRO	2.0
2	L	109	VAL	2.0
3	H	31	HIS	2.0
2	L	52	LYS	2.0
3	K	45	LYS	2.0
1	G	472	ILE	2.0
1	J	468	ILE	2.0
1	G	485	GLY	2.0
3	C	141	TYR	2.0
1	J	515	PHE	2.0
2	B	178	LEU	2.0
3	C	26	SER	2.0
3	K	192	SER	2.0
1	J	442	ASP	2.0
3	C	155	PRO	2.0
2	F	85	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.

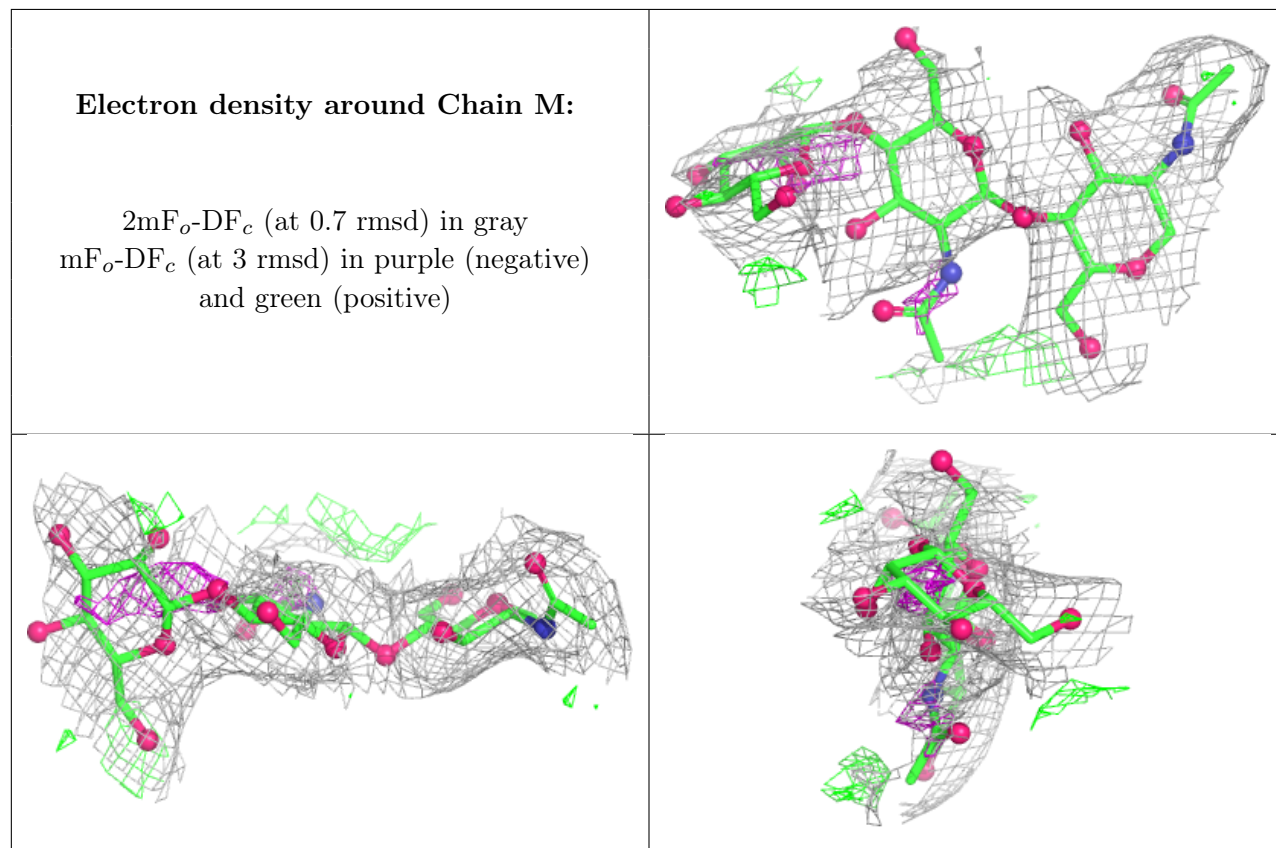
6.3 Carbohydrates [i](#)

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.

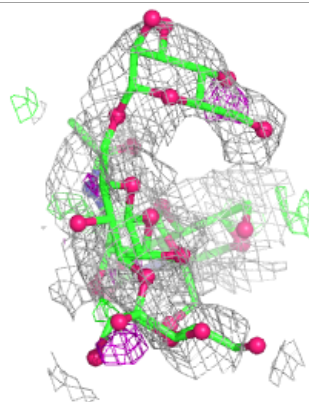
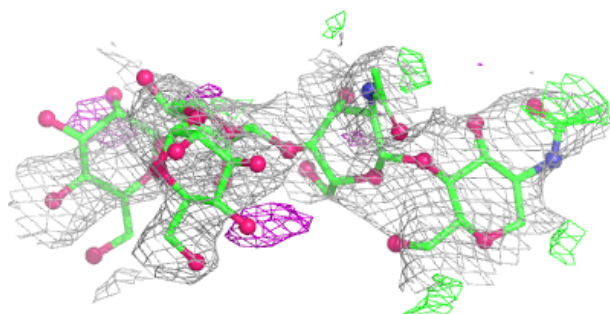
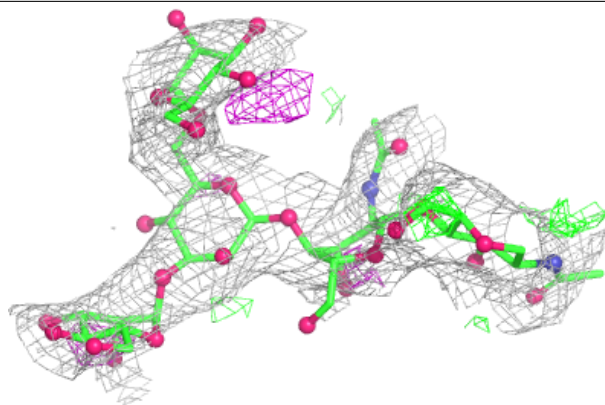
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	BMA	P	3	11/12	0.45	0.18	73,82,100,100	0
4	BMA	M	3	11/12	0.48	0.18	62,90,107,116	0
5	MAN	N	5	11/12	0.50	0.19	65,81,100,101	0
4	NAG	M	2	14/15	0.50	0.20	75,93,115,117	0
6	FUC	P	4	10/11	0.52	0.23	47,98,115,115	0
6	BMA	O	3	11/12	0.55	0.17	67,74,107,116	0
6	NAG	O	2	14/15	0.57	0.17	89,101,107,109	0
5	MAN	N	4	11/12	0.57	0.20	60,100,116,132	0
5	NAG	N	2	14/15	0.58	0.20	68,86,98,115	0
5	BMA	N	3	11/12	0.60	0.16	72,86,101,106	0
6	FUC	O	4	10/11	0.63	0.19	57,89,102,108	0
6	NAG	P	2	14/15	0.65	0.19	73,91,116,118	0
5	NAG	N	1	14/15	0.73	0.20	61,71,102,105	0
6	NAG	P	1	14/15	0.76	0.20	56,82,112,112	0
6	NAG	O	1	14/15	0.79	0.16	51,84,96,105	0
4	NAG	M	1	14/15	0.84	0.12	32,57,83,96	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.



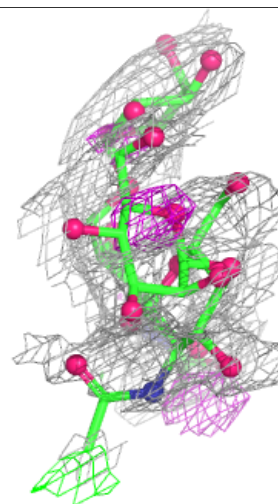
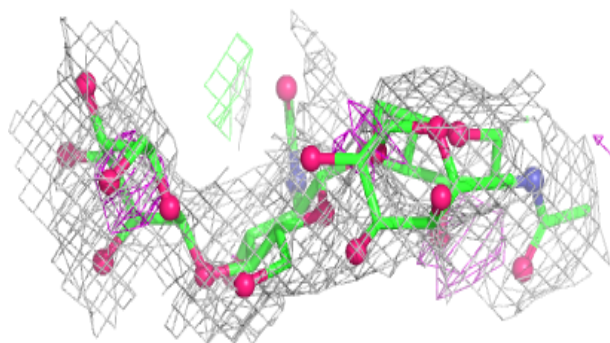
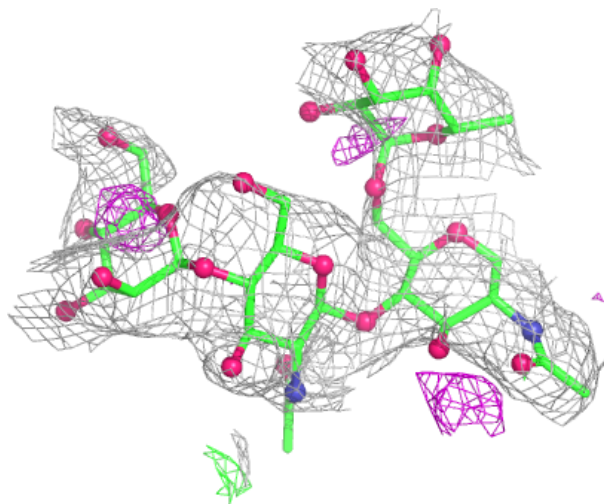
Electron density around Chain N:

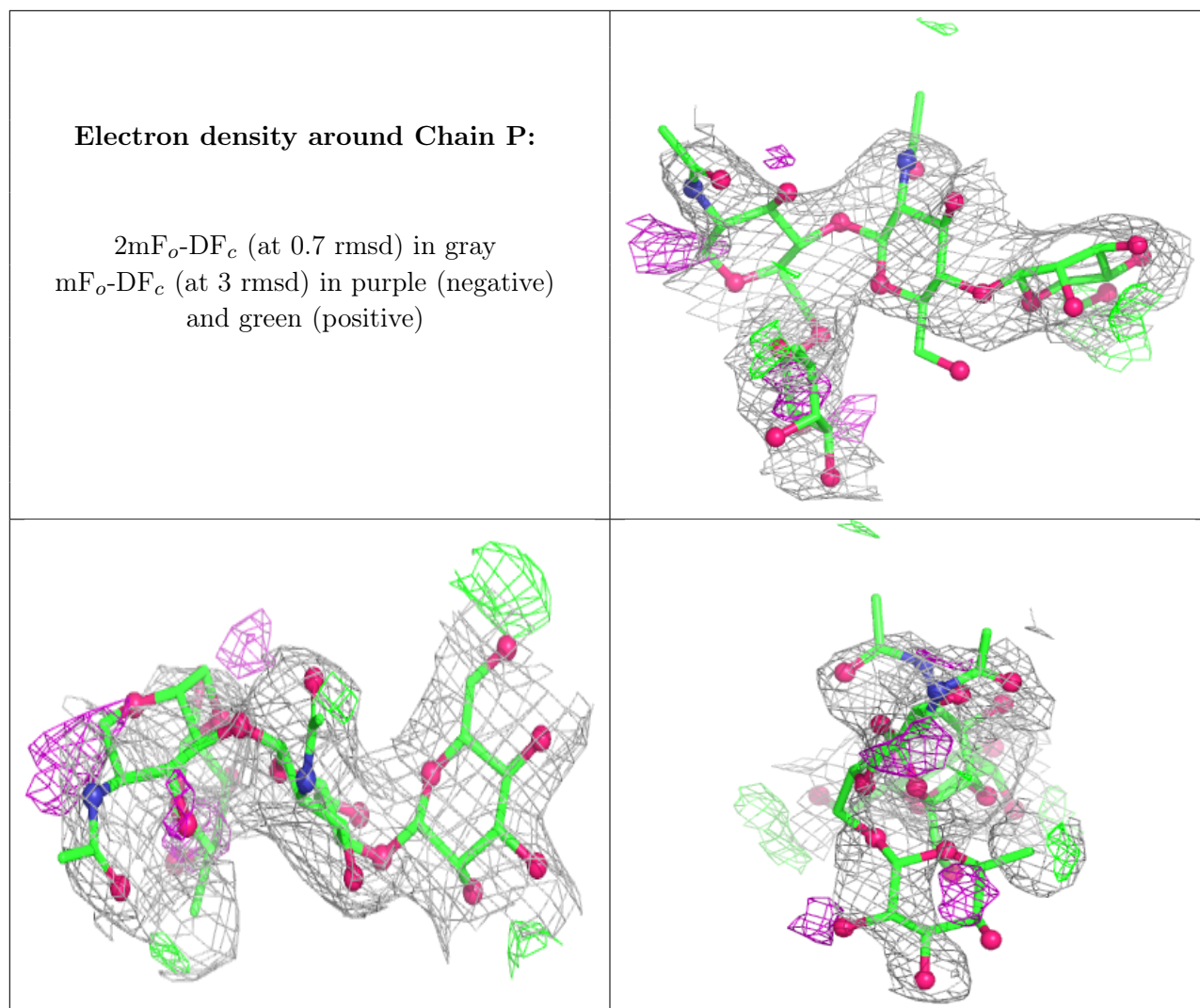
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around Chain O:

$2mF_o-DF_c$ (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
7	SO4	I	301	5/5	0.80	0.29	70,90,120,123	0
8	BCN	E	303	11/11	0.84	0.16	47,68,75,79	0
7	SO4	E	301	5/5	0.86	0.32	81,84,104,125	0
7	SO4	K	303	5/5	0.86	0.11	68,71,93,99	0
7	SO4	E	302	5/5	0.86	0.12	48,52,87,114	0
8	BCN	H	301	11/11	0.86	0.12	39,51,67,68	0
9	GOL	K	301	6/6	0.88	0.13	29,40,56,56	0
8	BCN	C	301	11/11	0.89	0.11	38,49,66,79	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
7	SO4	J	601	5/5	0.89	0.13	57,76,99,99	0
7	SO4	K	302	5/5	0.91	0.13	57,65,85,104	0
7	SO4	D	601	5/5	0.96	0.09	57,72,93,102	0
7	SO4	A	601	5/5	0.98	0.07	53,57,75,80	0

6.5 Other polymers [i](#)

There are no such residues in this entry.