



# Full wwPDB X-ray Structure Validation Report ⓘ

Oct 10, 2023 – 03:52 PM EDT

PDB ID : 7L0N  
Title : Circulating SARS-CoV-2 spike N439K variants maintain fitness while evading antibody-mediated immunity  
Authors : Snell, G.; Czudnochowski, N.; Dillen, J.; Nix, J.C.; Croll, T.I.; Corti, D.  
Deposited on : 2020-12-11  
Resolution : 2.78 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35.1

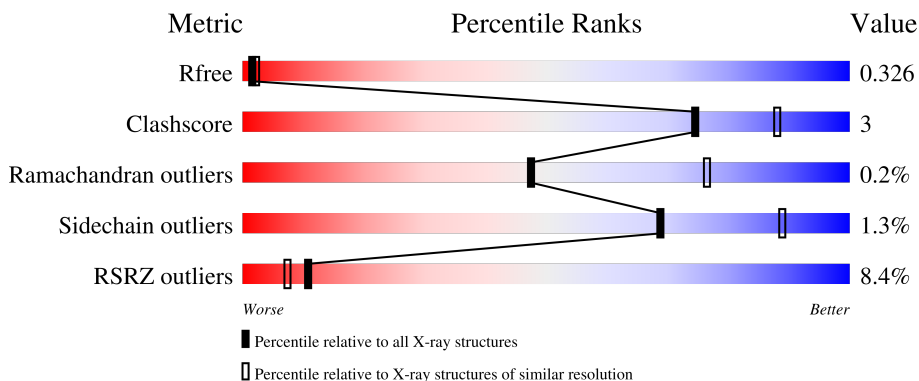
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.78 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	4107 (2.80-2.76)
Clashscore	141614	4575 (2.80-2.76)
Ramachandran outliers	138981	4487 (2.80-2.76)
Sidechain outliers	138945	4489 (2.80-2.76)
RSRZ outliers	127900	4027 (2.80-2.76)

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  $\geq 3$ , 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	214	 4% 90% 9%
1	D	214	 % 92% 8%
2	A	230	 3% 89% 8% .
2	C	230	 7% 90% 7% .
3	L	215	 9% 91% 8% .

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Mol	Chain	Length	Quality of chain
3	N	215	
4	H	223	
4	M	223	
5	E	597	
5	F	597	
6	R	204	
6	S	204	
7	G	6	
8	I	5	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
15	NAG	E	702	-	-	-	X
7	MAN	G	5	X	-	-	-
8	MAN	I	4	-	-	-	X
9	CL	N	702	-	-	-	X

## 2 Entry composition

There are 17 unique types of molecules in this entry. The entry contains 26468 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 Monoclonal antibody S309 Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	B	213	Total 1624	C 1011	N 277	O 332	S 4	0	0	0
1	D	213	Total 1624	C 1011	N 277	O 332	S 4	0	0	0

- Molecule 2 is a protein called Monoclonal antibody S309 Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	222	Total 1674	C 1058	N 282	O 327	S 7	0	0	0
2	C	224	Total 1692	C 1069	N 286	O 330	S 7	0	0	0

- Molecule 3 is a protein called Monoclonal antibody S304 Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	213	Total 1627	C 1021	N 271	O 330	S 5	0	0	0
3	N	213	Total 1627	C 1021	N 271	O 330	S 5	0	0	0

- Molecule 4 is a protein called Monoclonal antibody S304 Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	H	212	Total 1600	C 1016	N 263	O 315	S 6	0	0	0
4	M	215	Total 1619	C 1026	N 266	O 321	S 6	0	0	0

- Molecule 5 is a protein called Angiotensin-converting enzyme 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	579	Total 4733	C 3031	N 784	O 891	S 27	0	0	0
5	F	596	Total 4862	C 3111	N 805	O 917	S 29	0	0	0

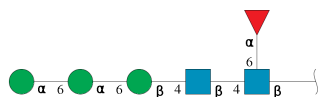
- Molecule 6 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	R	203	Total 1609	C 1034	N 268	O 299	S 8	0	0	0
6	S	201	Total 1598	C 1027	N 268	O 295	S 8	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

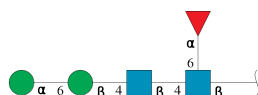
Chain	Residue	Modelled	Actual	Comment	Reference
R	439	LYS	ASN	variant	UNP P0DTC2
S	439	LYS	ASN	variant	UNP P0DTC2

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-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
			Total	C	N	O			
7	G	6	Total 71	C 40	N 2	O 29	0	0	0

- 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.

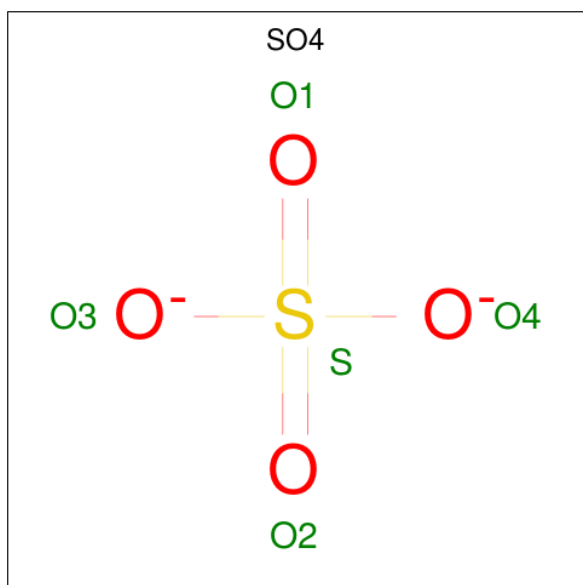


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
8	I	5	Total 60	C 34	N 2	O 24	0	0	0

- Molecule 9 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	B	1	Total Cl 1 1	0	0
9	A	1	Total Cl 1 1	0	0
9	D	1	Total Cl 1 1	0	0
9	C	2	Total Cl 2 2	0	0
9	H	3	Total Cl 3 3	0	0
9	N	2	Total Cl 2 2	0	0
9	M	5	Total Cl 5 5	0	0
9	E	1	Total Cl 1 1	0	0
9	F	6	Total Cl 6 6	0	0
9	R	2	Total Cl 2 2	0	0
9	S	3	Total Cl 3 3	0	0

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).

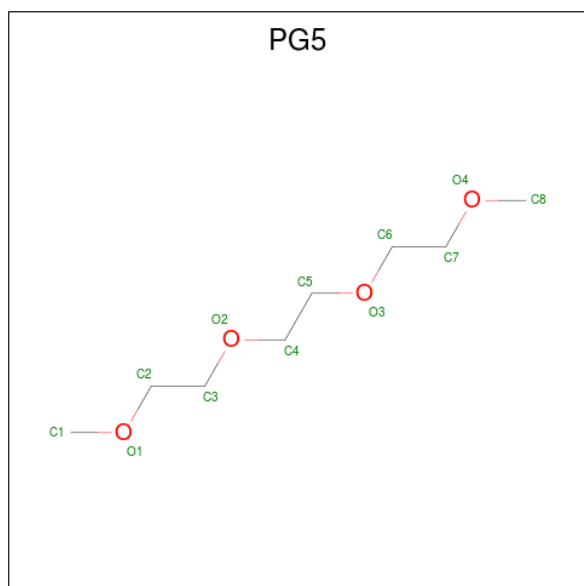


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
10	L	1	Total	O	S	0	0
			5	4	1		
10	N	1	Total	O	S	0	0
			5	4	1		

- Molecule 11 is SODIUM ION (three-letter code: NA) (formula: Na).

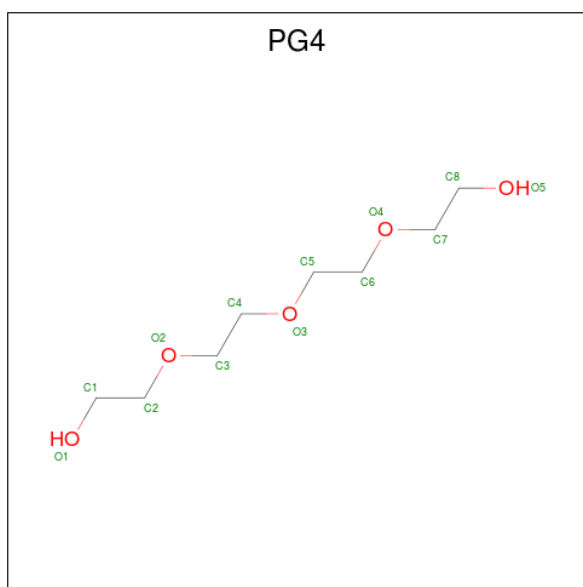
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	H	3	Total	Na	0	0
			3	3		
11	F	2	Total	Na	0	0
			2	2		
11	R	1	Total	Na	0	0
			1	1		

- Molecule 12 is 1-METHOXY-2-[2-(2-METHOXY-ETHOXY)]-ETHANE (three-letter code: PG5) (formula: C<sub>8</sub>H<sub>18</sub>O<sub>4</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
12	H	1	Total	C	O	0	0
			12	8	4		

- Molecule 13 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C<sub>8</sub>H<sub>18</sub>O<sub>5</sub>).



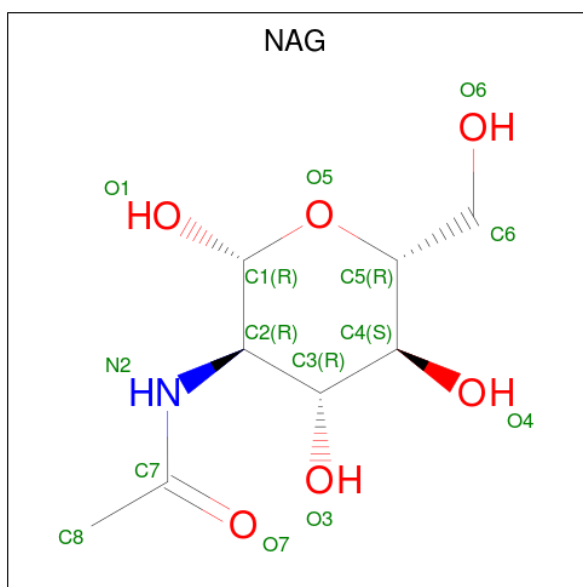
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
13	N	1	Total C O 13 8 5	0	0

- Molecule 14 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
14	E	1	Total Zn 1 1	0	0
14	F	1	Total Zn 1 1	0	0

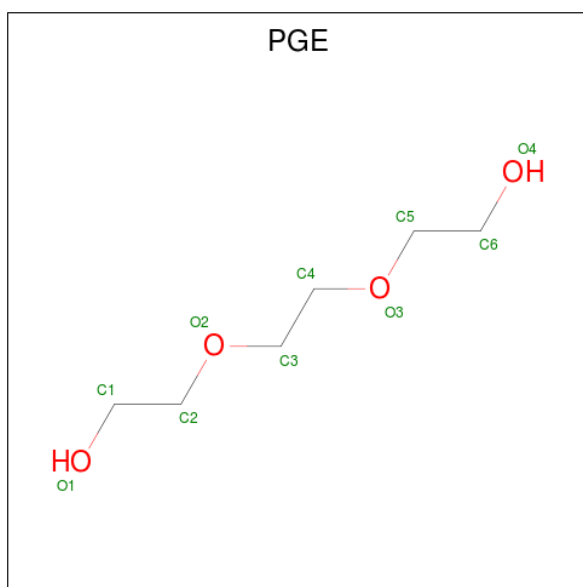
- Molecule 15 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
15	E	1	14	8	1	5	0	0
15	E	1	14	8	1	5	0	0
15	E	1	14	8	1	5	0	0
15	E	1	14	8	1	5	0	0
15	F	1	14	8	1	5	0	0
15	F	1	14	8	1	5	0	0
15	F	1	14	8	1	5	0	0
15	F	1	14	8	1	5	0	0
15	F	1	14	8	1	5	0	0

- Molecule 16 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
16	E	1	Total	C O	0	0
			10	6 4		
16	S	1	Total	C O	0	0
			10	6 4		

- Molecule 17 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
17	B	32	Total	O	0	0
			32	32		
17	A	8	Total	O	0	0
			8	8		
17	D	19	Total	O	0	0
			19	19		
17	C	8	Total	O	0	0
			8	8		
17	L	22	Total	O	0	0
			22	22		
17	H	12	Total	O	0	0
			12	12		
17	N	11	Total	O	0	0
			11	11		
17	M	15	Total	O	0	0
			15	15		
17	E	15	Total	O	0	0
			15	15		
17	F	37	Total	O	0	0
			37	37		

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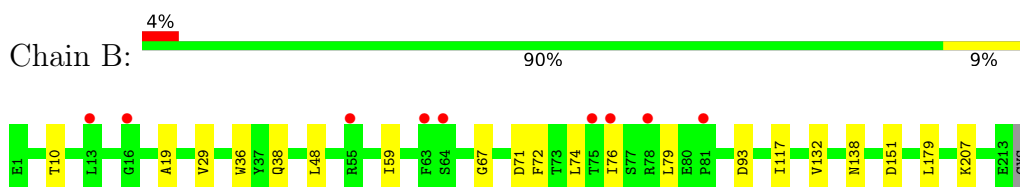
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
17	R	24	Total 24	O 24	0	0
17	S	29	Total 29	O 29	0	0

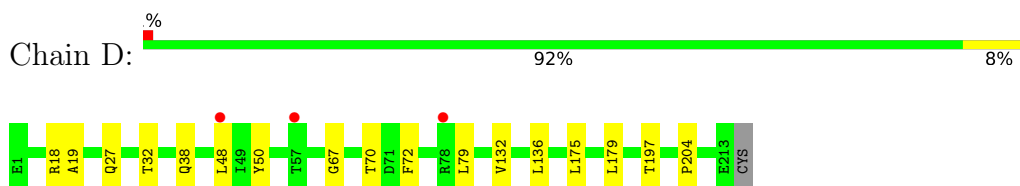
### 3 Residue-property plots [i](#)

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.

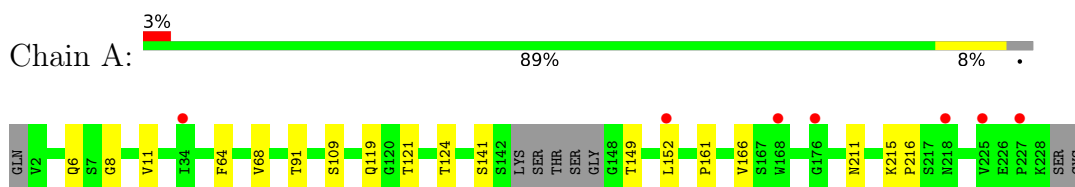
- Molecule 1: Monoclonal antibody S309 Fab light chain



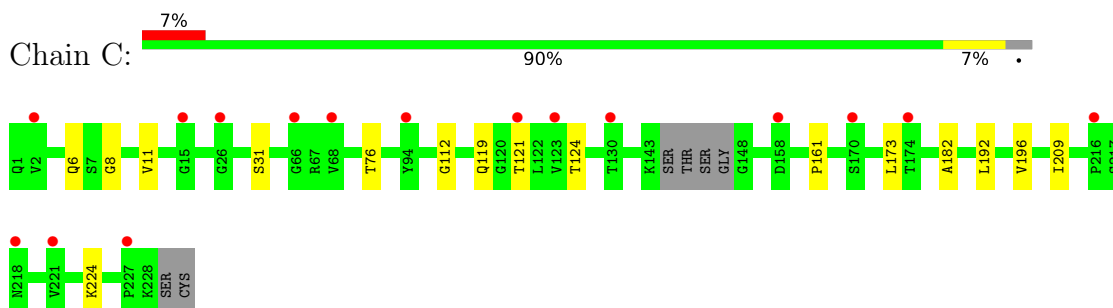
- Molecule 1: Monoclonal antibody S309 Fab light chain



- Molecule 2: Monoclonal antibody S309 Fab heavy chain

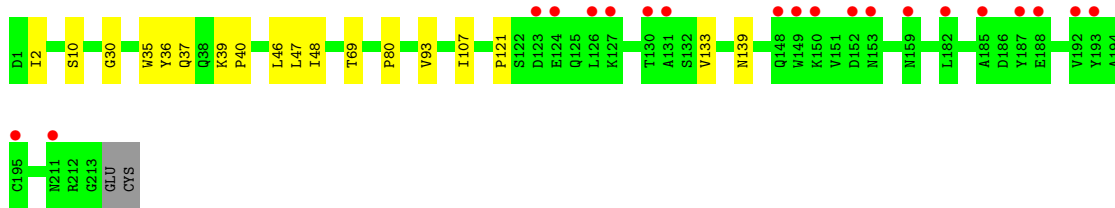


- Molecule 2: Monoclonal antibody S309 Fab heavy chain

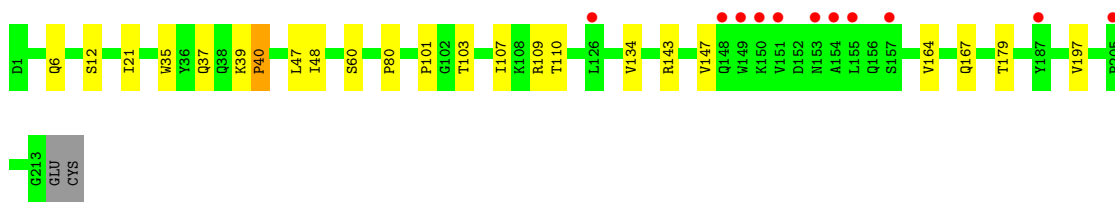
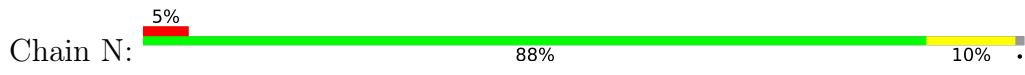


- Molecule 3: Monoclonal antibody S304 Fab light chain

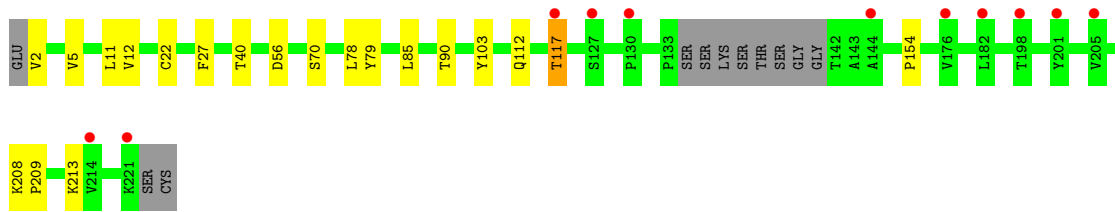
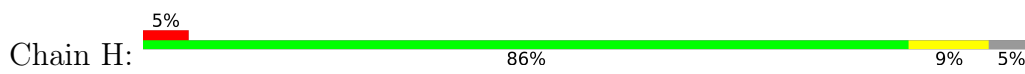




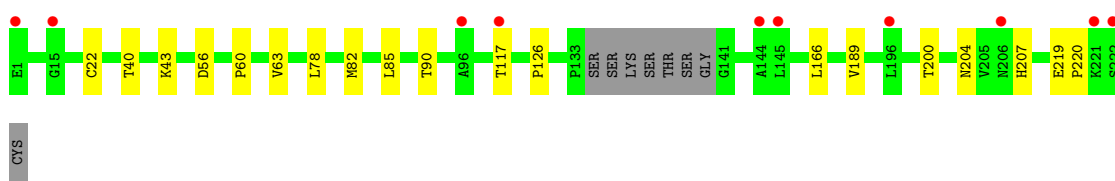
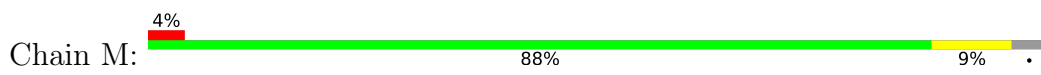
• Molecule 3: Monoclonal antibody S304 Fab light chain



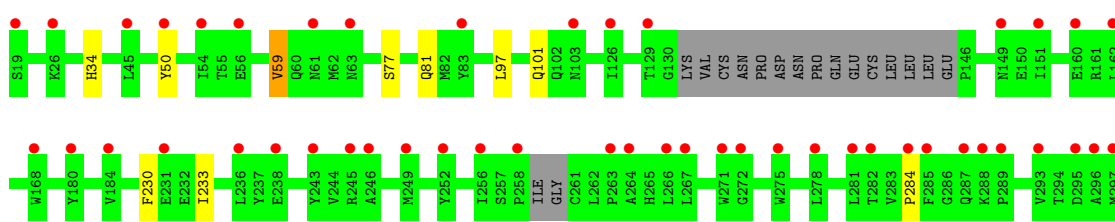
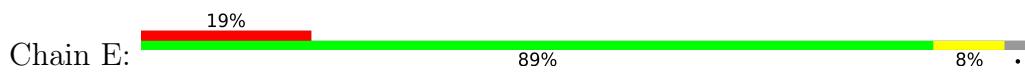
• Molecule 4: Monoclonal antibody S304 Fab heavy chain

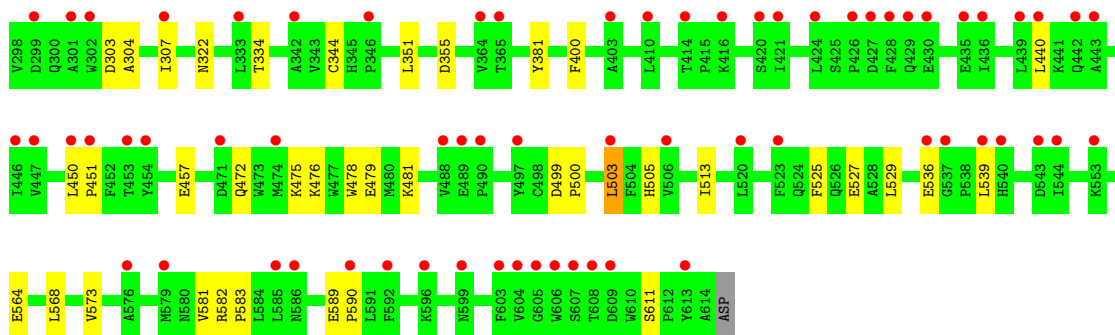


• Molecule 4: Monoclonal antibody S304 Fab heavy chain

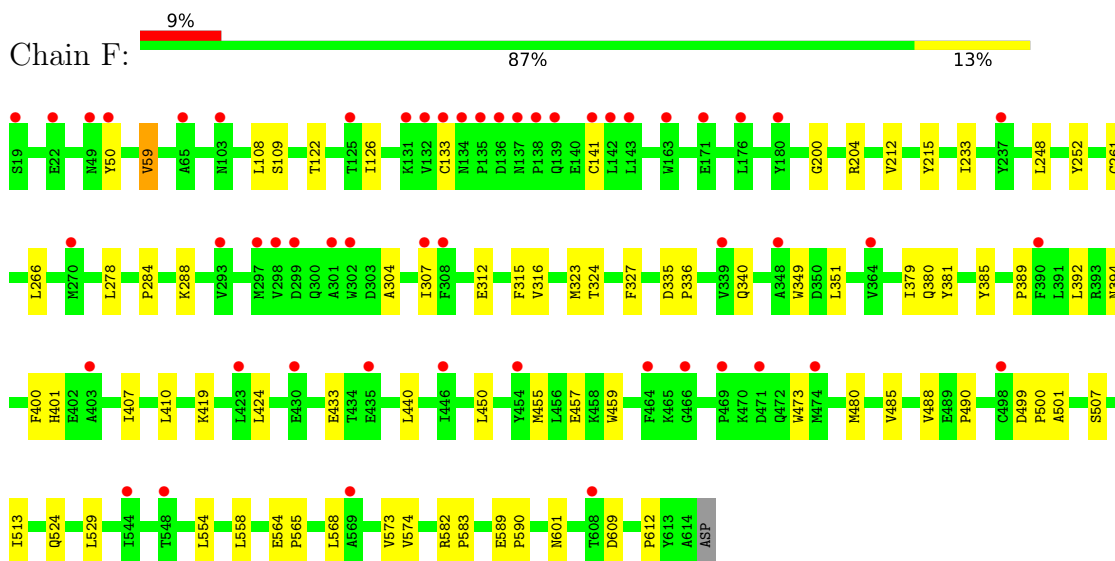


• Molecule 5: Angiotensin-converting enzyme 2

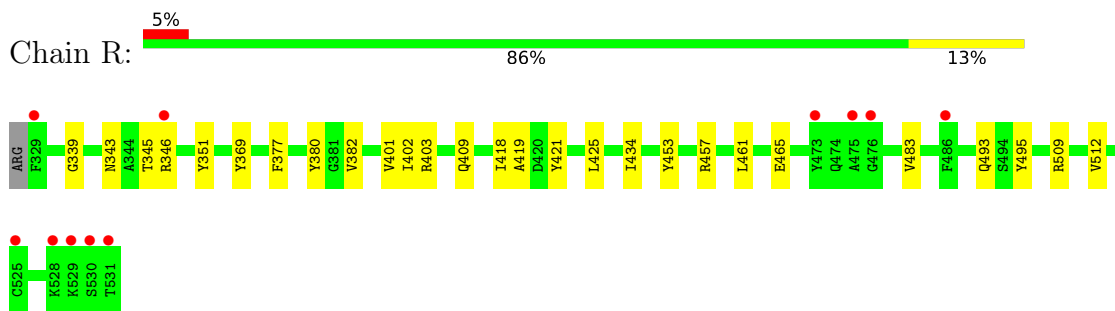




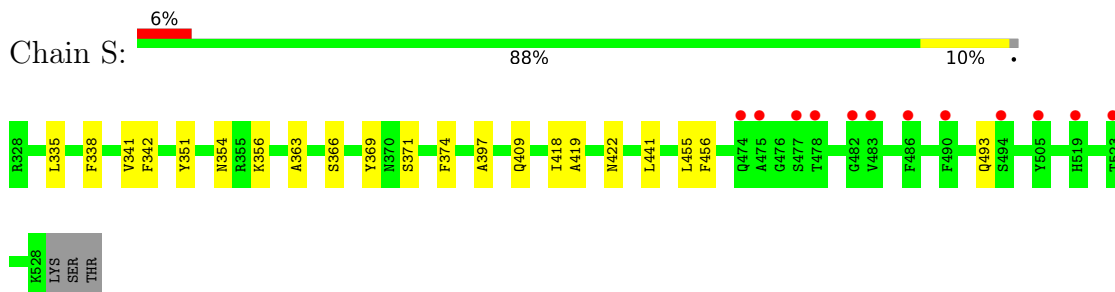
- Molecule 5: Angiotensin-converting enzyme 2



- Molecule 6: Spike protein S1

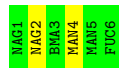


- Molecule 6: Spike protein S1




- Molecule 7: alpha-D-mannopyranose-(1-6)-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 G:  67% 33%



- 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 I:  80% 20%



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	77.98Å 186.58Å 194.52Å 90.00° 96.40° 90.00°	Depositor
Resolution (Å)	48.90 – 2.78 48.90 – 2.78	Depositor EDS
% Data completeness (in resolution range)	92.9 (48.90-2.78) 92.9 (48.90-2.78)	Depositor EDS
$R_{merge}$	0.51	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.38 (at 2.77Å)	Xtrriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.290 , 0.325 0.291 , 0.326	Depositor DCC
$R_{free}$ test set	6375 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	47.5	Xtrriage
Anisotropy	0.489	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 47.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.40$ , $\langle L^2 \rangle = 0.23$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.88	EDS
Total number of atoms	26468	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	86.0	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 43.40 % 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 1.7733e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: PG5, NA, BMA, PGE, ZN, CL, NAG, PG4, MAN, FUC, SO4

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	0.27	0/1657	0.52	0/2250
1	D	0.27	0/1657	0.51	0/2250
2	A	0.28	0/1716	0.52	0/2338
2	C	0.28	0/1734	0.54	0/2361
3	L	0.27	0/1663	0.52	0/2260
3	N	0.27	0/1663	0.53	0/2260
4	H	0.28	0/1641	0.52	0/2236
4	M	0.28	0/1660	0.51	0/2261
5	E	0.24	0/4866	0.47	0/6606
5	F	0.24	0/4999	0.48	0/6792
6	R	0.26	0/1655	0.51	0/2251
6	S	0.25	0/1644	0.51	0/2236
All	All	0.26	0/26555	0.50	0/36101

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	1624	0	1582	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1624	0	1582	9	0
2	A	1674	0	1628	12	0
2	C	1692	0	1652	11	0
3	L	1627	0	1587	9	0
3	N	1627	0	1587	15	0
4	H	1600	0	1545	10	0
4	M	1619	0	1562	9	0
5	E	4733	0	4507	22	0
5	F	4862	0	4634	39	0
6	R	1609	0	1537	19	0
6	S	1598	0	1525	12	0
7	G	71	0	61	1	0
8	I	60	0	52	1	0
9	A	1	0	0	0	0
9	B	1	0	0	0	0
9	C	2	0	0	0	0
9	D	1	0	0	0	0
9	E	1	0	0	0	0
9	F	6	0	0	0	0
9	H	3	0	0	0	0
9	M	5	0	0	0	0
9	N	2	0	0	0	0
9	R	2	0	0	0	0
9	S	3	0	0	0	0
10	L	5	0	0	0	0
10	N	5	0	0	0	0
11	F	2	0	0	0	0
11	H	3	0	0	0	0
11	R	1	0	0	0	0
12	H	12	0	18	0	0
13	N	13	0	18	1	0
14	E	1	0	0	0	0
14	F	1	0	0	0	0
15	E	56	0	52	0	0
15	F	70	0	65	0	0
16	E	10	0	14	0	0
16	S	10	0	14	0	0
17	A	8	0	0	0	0
17	B	32	0	0	0	0
17	C	8	0	0	0	0
17	D	19	0	0	0	0
17	E	15	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
17	F	37	0	0	0	0
17	H	12	0	0	0	0
17	L	22	0	0	0	0
17	M	15	0	0	0	0
17	N	11	0	0	0	0
17	R	24	0	0	0	0
17	S	29	0	0	0	0
All	All	26468	0	25222	166	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 3.

All (166) 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:M:219:GLU:HG2	4:M:220:PRO:HD2	1.67	0.75
3:L:37:GLN:HB2	3:L:47:LEU:HD11	1.66	0.74
3:N:37:GLN:HB2	3:N:47:LEU:HD11	1.71	0.72
6:R:409:GLN:HB3	6:R:419:ALA:HB2	1.75	0.68
2:A:6:GLN:HB3	2:A:121:THR:HG23	1.77	0.65
6:S:354:ASN:HD21	6:S:356:LYS:HE2	1.62	0.65
4:H:70:SER:HB2	4:H:79:TYR:HB2	1.79	0.64
1:B:67:GLY:HA3	1:B:72:PHE:HA	1.80	0.62
5:F:284:PRO:HG3	5:F:440:LEU:HD13	1.80	0.62
2:C:31:SER:HB3	6:S:335:LEU:HD21	1.81	0.61
4:M:166:LEU:HD21	4:M:189:VAL:HG21	1.83	0.60
3:N:21:ILE:HD12	3:N:103:THR:HG21	1.83	0.60
2:C:11:VAL:HG11	2:C:161:PRO:HG3	1.84	0.60
5:F:499:ASP:N	5:F:500:PRO:HD2	2.16	0.59
3:N:107:ILE:HB	3:N:167:GLN:HE22	1.68	0.58
6:R:402:ILE:HD12	6:R:418:ILE:HD13	1.86	0.58
5:F:50:TYR:CE1	5:F:59:VAL:HG13	2.38	0.58
2:A:6:GLN:H	2:A:119:GLN:HE22	1.52	0.57
3:N:39:LYS:HB3	3:N:40:PRO:HD2	1.87	0.57
1:B:38:GLN:HB2	1:B:48:LEU:HD11	1.87	0.56
5:E:284:PRO:HG3	5:E:440:LEU:HD13	1.86	0.56
4:M:90:THR:HG23	4:M:117:THR:HA	1.86	0.56
6:S:418:ILE:HA	6:S:422:ASN:HD22	1.70	0.56
2:C:6:GLN:H	2:C:119:GLN:HE22	1.55	0.55
2:C:11:VAL:HG12	2:C:124:THR:HB	1.88	0.55
6:R:402:ILE:HG22	6:R:403:ARG:N	2.22	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:389:PRO:HG2	5:F:392:LEU:HD12	1.89	0.54
4:M:40:THR:HB	4:M:43:LYS:HB2	1.89	0.54
6:R:339:GLY:O	6:R:343:ASN:HB2	2.07	0.54
5:F:490:PRO:HA	5:F:612:PRO:HG2	1.89	0.54
5:F:524:GLN:HG2	5:F:583:PRO:HG2	1.90	0.54
3:N:134:VAL:HG22	3:N:179:THR:HG22	1.88	0.54
2:A:11:VAL:HG21	2:A:161:PRO:HG3	1.90	0.54
1:D:50:TYR:HB2	2:C:112:GLY:HA2	1.89	0.53
4:M:56:ASP:HB3	6:S:369:TYR:CG	2.43	0.53
5:E:527:GLU:HA	5:E:539:LEU:HD11	1.90	0.53
5:F:529:LEU:HD11	5:F:554:LEU:HD13	1.90	0.53
4:H:90:THR:HG23	4:H:117:THR:HA	1.88	0.53
6:R:345:THR:HG23	6:R:346:ARG:HG2	1.89	0.53
3:N:35:TRP:HB2	3:N:48:ILE:HB	1.90	0.52
5:E:450:LEU:HB2	5:E:451:PRO:HD3	1.92	0.52
5:E:564:GLU:HB3	5:E:568:LEU:HD23	1.92	0.52
6:R:461:LEU:HD22	6:R:465:GLU:HB3	1.91	0.52
2:C:173:LEU:HD21	2:C:196:VAL:HG21	1.92	0.52
3:L:80:PRO:HA	3:L:107:ILE:HD13	1.90	0.52
4:H:103:TYR:HD1	6:R:382:VAL:HG12	1.75	0.51
3:N:80:PRO:HA	3:N:107:ILE:HD13	1.92	0.51
5:E:525:PHE:HD1	5:E:573:VAL:HG11	1.75	0.51
5:E:499:ASP:N	5:E:500:PRO:CD	2.73	0.51
3:L:39:LYS:HB3	3:L:40:PRO:HD2	1.92	0.51
5:F:455:MET:HG2	5:F:485:VAL:CG2	2.41	0.51
5:F:248:LEU:HD21	5:F:278:LEU:HD11	1.92	0.51
5:F:407:ILE:HA	5:F:410:LEU:HD12	1.92	0.51
7:G:2:NAG:H83	7:G:4:MAN:H61	1.92	0.51
3:N:107:ILE:HB	3:N:167:GLN:NE2	2.26	0.51
5:F:212:VAL:HG11	5:F:565:PRO:HG3	1.93	0.50
5:E:230:PHE:HA	5:E:233:ILE:HD12	1.94	0.50
3:L:10:SER:HB3	3:N:12:SER:HB3	1.94	0.50
6:R:401:VAL:HG22	6:R:509:ARG:HG2	1.93	0.50
2:C:8:GLY:H	2:C:121:THR:HG22	1.77	0.50
5:F:457:GLU:HG2	5:F:513:ILE:HB	1.94	0.50
3:N:147:VAL:HG12	3:N:197:VAL:HG22	1.94	0.50
6:R:421:TYR:CD1	6:R:457:ARG:HB2	2.47	0.49
5:F:564:GLU:HG3	5:F:565:PRO:HD2	1.94	0.49
1:D:197:THR:HG22	1:D:204:PRO:HG3	1.95	0.49
5:E:503:LEU:HD23	5:E:505:HIS:H	1.78	0.49
5:F:133:CYS:HA	5:F:141:CYS:HA	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:109:SER:HB2	6:R:345:THR:CG2	2.43	0.49
4:M:22:CYS:HB3	4:M:78:LEU:HB3	1.94	0.49
5:E:472:GLN:HG2	5:E:475:LYS:HE3	1.95	0.49
5:F:455:MET:HG2	5:F:485:VAL:HG21	1.95	0.48
2:A:8:GLY:H	2:A:121:THR:HG22	1.77	0.48
3:L:121:PRO:HD3	3:L:133:VAL:HG22	1.95	0.48
4:H:2:VAL:HG13	4:H:27:PHE:CD1	2.49	0.48
5:E:77:SER:O	5:E:81:GLN:HG2	2.14	0.48
5:E:97:LEU:O	5:E:101:GLN:HG2	2.14	0.47
5:E:525:PHE:O	5:E:529:LEU:HG	2.14	0.47
5:F:122:THR:O	5:F:126:ILE:HG12	2.15	0.47
2:A:91:THR:HG23	2:A:124:THR:HA	1.95	0.47
3:L:2:ILE:HD12	3:L:93:VAL:HG23	1.96	0.47
6:R:453:TYR:HB3	6:R:495:TYR:CE2	2.49	0.47
6:S:366:SER:HA	6:S:369:TYR:CD2	2.49	0.47
4:M:82:MET:HB3	4:M:85:LEU:HD21	1.96	0.47
5:E:457:GLU:HG2	5:E:513:ILE:HB	1.96	0.47
1:D:132:VAL:HG13	1:D:179:LEU:HB3	1.97	0.46
3:N:6:GLN:HG2	3:N:101:PRO:HD2	1.97	0.46
1:D:67:GLY:HA3	1:D:72:PHE:HA	1.97	0.46
5:E:304:ALA:HA	5:E:307:ILE:HD12	1.97	0.46
5:F:459:TRP:HD1	5:F:480:MET:HE3	1.80	0.46
4:H:12:VAL:HG11	4:H:85:LEU:HD12	1.97	0.46
2:A:166:VAL:HA	2:A:211:ASN:O	2.16	0.46
4:H:22:CYS:HB3	4:H:78:LEU:HB3	1.97	0.46
5:F:200:GLY:O	5:F:204:ARG:HG3	2.15	0.46
4:M:60:PRO:HG2	4:M:63:VAL:HG22	1.97	0.46
2:C:209:ILE:HG12	2:C:224:LYS:HG3	1.98	0.46
5:E:476:LYS:HA	5:E:479:GLU:HB2	1.98	0.46
3:L:93:VAL:HG22	6:R:380:TYR:CE1	2.51	0.45
5:F:233:ILE:HD13	5:F:450:LEU:HD13	1.98	0.45
5:F:459:TRP:HD1	5:F:480:MET:CE	2.29	0.45
1:D:32:THR:HG22	6:S:441:LEU:HD22	1.97	0.45
5:F:582:ARG:N	5:F:583:PRO:CD	2.80	0.45
3:N:109:ARG:HG2	3:N:110:THR:N	2.31	0.45
2:C:8:GLY:H	2:C:121:THR:CG2	2.29	0.45
5:F:108:LEU:O	5:F:109:SER:HB2	2.17	0.45
6:S:455:LEU:HD22	6:S:493:GLN:HG3	1.99	0.45
1:B:132:VAL:HG13	1:B:179:LEU:HB3	1.99	0.45
2:A:109:SER:HB2	6:R:345:THR:HG21	1.99	0.45
2:A:6:GLN:HB3	2:A:121:THR:CG2	2.44	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:64:PHE:O	2:A:68:VAL:HG12	2.17	0.44
5:E:589:GLU:N	5:E:590:PRO:HD2	2.32	0.44
1:D:38:GLN:HB2	1:D:48:LEU:HD11	1.98	0.44
1:D:19:ALA:HB2	1:D:79:LEU:HD11	2.00	0.44
3:N:143:ARG:HH11	3:N:164:VAL:HG11	1.82	0.44
4:M:126:PRO:HD3	4:M:207:HIS:ND1	2.33	0.44
1:B:36:TRP:CE2	1:B:74:LEU:HB2	2.52	0.44
2:A:215:LYS:N	2:A:216:PRO:CD	2.80	0.44
1:D:136:LEU:HB2	1:D:175:LEU:HB3	2.00	0.43
5:F:554:LEU:HG	5:F:558:LEU:HD11	2.00	0.43
5:E:101:GLN:O	5:E:101:GLN:HG3	2.18	0.43
5:F:589:GLU:N	5:F:590:PRO:HD2	2.34	0.43
1:B:19:ALA:HB2	1:B:79:LEU:HD11	2.00	0.43
2:C:6:GLN:H	2:C:119:GLN:NE2	2.16	0.43
5:E:582:ARG:N	5:E:583:PRO:CD	2.82	0.43
6:S:409:GLN:HB3	6:S:419:ALA:HB2	2.00	0.43
4:H:56:ASP:HB3	6:R:369:TYR:CG	2.54	0.43
3:N:39:LYS:HB3	3:N:40:PRO:CD	2.48	0.43
5:E:351:LEU:HB2	5:E:355:ASP:HB3	1.99	0.43
5:F:261:CYS:HB2	5:F:488:VAL:HB	2.00	0.43
4:H:11:LEU:HB2	4:H:154:PRO:HG3	2.02	0.42
6:R:402:ILE:HG22	6:R:403:ARG:O	2.20	0.42
5:F:419:LYS:HG3	5:F:424:LEU:HD23	2.00	0.42
2:C:182:ALA:HA	2:C:192:LEU:HB3	2.01	0.42
3:L:35:TRP:HB2	3:L:48:ILE:HB	2.00	0.42
5:F:501:ALA:O	5:F:507:SER:OG	2.36	0.42
1:B:19:ALA:HB3	1:B:76:ILE:HB	2.01	0.42
3:N:60:SER:HB2	13:N:703:PG4:H72	2.01	0.42
5:F:304:ALA:HA	5:F:307:ILE:HD12	2.02	0.42
5:F:349:TRP:HB3	5:F:351:LEU:HD12	2.02	0.42
5:F:323:MET:CE	5:F:379:ILE:HG21	2.50	0.42
5:F:573:VAL:HG13	5:F:574:VAL:HG23	2.02	0.42
1:B:48:LEU:HD23	1:B:59:ILE:HD12	2.01	0.41
5:F:288:LYS:HD2	5:F:433:GLU:HB2	2.01	0.41
5:F:315:PHE:CD1	5:F:380:GLN:HG3	2.56	0.41
3:L:36:TYR:CE2	3:L:46:LEU:HD23	2.56	0.41
5:F:215:TYR:CZ	5:F:568:LEU:HD13	2.55	0.41
5:F:336:PRO:HB2	5:F:340:GLN:CG	2.50	0.41
1:B:29:VAL:HG13	1:B:93:ASP:HB2	2.02	0.41
4:H:208:LYS:N	4:H:209:PRO:CD	2.84	0.41
5:F:252:TYR:CZ	5:F:266:LEU:HD22	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:S:341:VAL:HG11	6:S:397:ALA:HB1	2.03	0.41
2:A:6:GLN:H	2:A:119:GLN:NE2	2.18	0.41
6:S:338:PHE:HE2	6:S:363:ALA:HB1	1.86	0.41
6:S:342:PHE:HB2	8:I:1:NAG:H82	2.03	0.41
5:F:324:THR:HG23	5:F:327:PHE:H	1.86	0.41
6:R:377:PHE:CD1	6:R:434:ILE:HG12	2.56	0.41
6:S:371:SER:HB2	6:S:374:PHE:CD2	2.56	0.41
5:F:312:GLU:O	5:F:316:VAL:HG23	2.21	0.41
6:R:425:LEU:HD21	6:R:512:VAL:HG11	2.02	0.41
4:H:5:VAL:HG13	4:H:112:GLN:HE22	1.86	0.40
5:E:34:HIS:CE1	6:R:493:GLN:HB3	2.56	0.40
5:E:50:TYR:CE1	5:E:59:VAL:HG13	2.56	0.40
1:D:27:GLN:O	1:D:70:THR:HG22	2.21	0.40
1:B:117:ILE:HB	1:B:207:LYS:HB3	2.02	0.40
5:E:478:TRP:HA	5:E:481:LYS:HB2	2.02	0.40
5:F:554:LEU:O	5:F:558:LEU:HG	2.22	0.40
6:R:402:ILE:CG2	6:R:403:ARG:N	2.83	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	211/214 (99%)	192 (91%)	17 (8%)	2 (1%)	17 44
1	D	211/214 (99%)	198 (94%)	13 (6%)	0	100 100
2	A	218/230 (95%)	206 (94%)	11 (5%)	1 (0%)	29 58
2	C	220/230 (96%)	210 (96%)	10 (4%)	0	100 100
3	L	211/215 (98%)	197 (93%)	12 (6%)	2 (1%)	17 44
3	N	211/215 (98%)	198 (94%)	12 (6%)	1 (0%)	29 58
4	H	208/223 (93%)	196 (94%)	12 (6%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	M	211/223 (95%)	198 (94%)	13 (6%)	0	100	100
5	E	573/597 (96%)	547 (96%)	26 (4%)	0	100	100
5	F	594/597 (100%)	571 (96%)	23 (4%)	0	100	100
6	R	201/204 (98%)	195 (97%)	6 (3%)	0	100	100
6	S	199/204 (98%)	187 (94%)	12 (6%)	0	100	100
All	All	3268/3366 (97%)	3095 (95%)	167 (5%)	6 (0%)	47	76

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	151	ASP
3	L	30	GLY
1	B	138	ASN
2	A	141	SER
3	L	139	ASN
3	N	40	PRO

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	184/185 (100%)	182 (99%)	2 (1%)	73	90
1	D	184/185 (100%)	183 (100%)	1 (0%)	88	95
2	A	185/192 (96%)	183 (99%)	2 (1%)	73	90
2	C	187/192 (97%)	186 (100%)	1 (0%)	88	95
3	L	186/188 (99%)	185 (100%)	1 (0%)	88	95
3	N	186/188 (99%)	186 (100%)	0	100	100
4	H	177/186 (95%)	174 (98%)	3 (2%)	60	85
4	M	179/186 (96%)	177 (99%)	2 (1%)	73	90
5	E	510/527 (97%)	499 (98%)	11 (2%)	52	80
5	F	526/527 (100%)	516 (98%)	10 (2%)	57	83

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	R	176/177 (99%)	174 (99%)	2 (1%)	73	90
6	S	174/177 (98%)	172 (99%)	2 (1%)	73	90
All	All	2854/2910 (98%)	2817 (99%)	37 (1%)	69	89

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	10	THR
1	B	71	ASP
2	A	149	THR
2	A	152	LEU
1	D	18	ARG
2	C	76	THR
3	L	69	THR
4	H	40	THR
4	H	117	THR
4	H	213	LYS
4	M	200	THR
4	M	204	ASN
5	E	59	VAL
5	E	303	ASP
5	E	322	ASN
5	E	334	THR
5	E	344	CYS
5	E	381	TYR
5	E	400	PHE
5	E	503	LEU
5	E	536	GLU
5	E	581	VAL
5	E	611	SER
5	F	59	VAL
5	F	335	ASP
5	F	381	TYR
5	F	385	TYR
5	F	394	ASN
5	F	400	PHE
5	F	401	HIS
5	F	473	TRP
5	F	601	ASN
5	F	609	ASP
6	R	351	TYR

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Mol	Chain	Res	Type
6	R	483	VAL
6	S	351	TYR
6	S	456	PHE

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

Mol	Chain	Res	Type
1	B	138	ASN
3	L	148	GLN
3	L	161	GLN
4	H	112	GLN
3	N	167	GLN
5	E	210	ASN
5	E	522	GLN
5	E	599	ASN
5	F	42	GLN
5	F	522	GLN
6	S	354	ASN

### 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](#)

11 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
7	NAG	G	1	7,6	14,14,15	0.38	0	17,19,21	0.67	0
7	NAG	G	2	7	14,14,15	0.34	0	17,19,21	0.64	0
7	BMA	G	3	7	11,11,12	0.42	0	15,15,17	0.92	0
7	MAN	G	4	7	11,11,12	0.40	0	15,15,17	0.69	0
7	MAN	G	5	7	11,11,12	0.40	0	15,15,17	0.80	0
7	FUC	G	6	7	10,10,11	0.45	0	14,14,16	0.75	0
8	NAG	I	1	8,6	14,14,15	0.36	0	17,19,21	0.54	0
8	NAG	I	2	8	14,14,15	0.38	0	17,19,21	0.77	0
8	BMA	I	3	8	11,11,12	0.42	0	15,15,17	0.70	0
8	MAN	I	4	8	11,11,12	0.45	0	15,15,17	0.90	0
8	FUC	I	5	8	10,10,11	0.39	0	14,14,16	0.51	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
7	NAG	G	1	7,6	-	0/6/23/26	0/1/1/1
7	NAG	G	2	7	-	2/6/23/26	0/1/1/1
7	BMA	G	3	7	-	0/2/19/22	0/1/1/1
7	MAN	G	4	7	-	2/2/19/22	0/1/1/1
7	MAN	G	5	7	1/1/4/5	0/2/19/22	0/1/1/1
7	FUC	G	6	7	-	-	0/1/1/1
8	NAG	I	1	8,6	-	0/6/23/26	0/1/1/1
8	NAG	I	2	8	-	4/6/23/26	0/1/1/1
8	BMA	I	3	8	-	2/2/19/22	0/1/1/1
8	MAN	I	4	8	-	2/2/19/22	0/1/1/1
8	FUC	I	5	8	-	-	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
7	G	5	MAN	C1

All (12) torsion outliers are listed below:

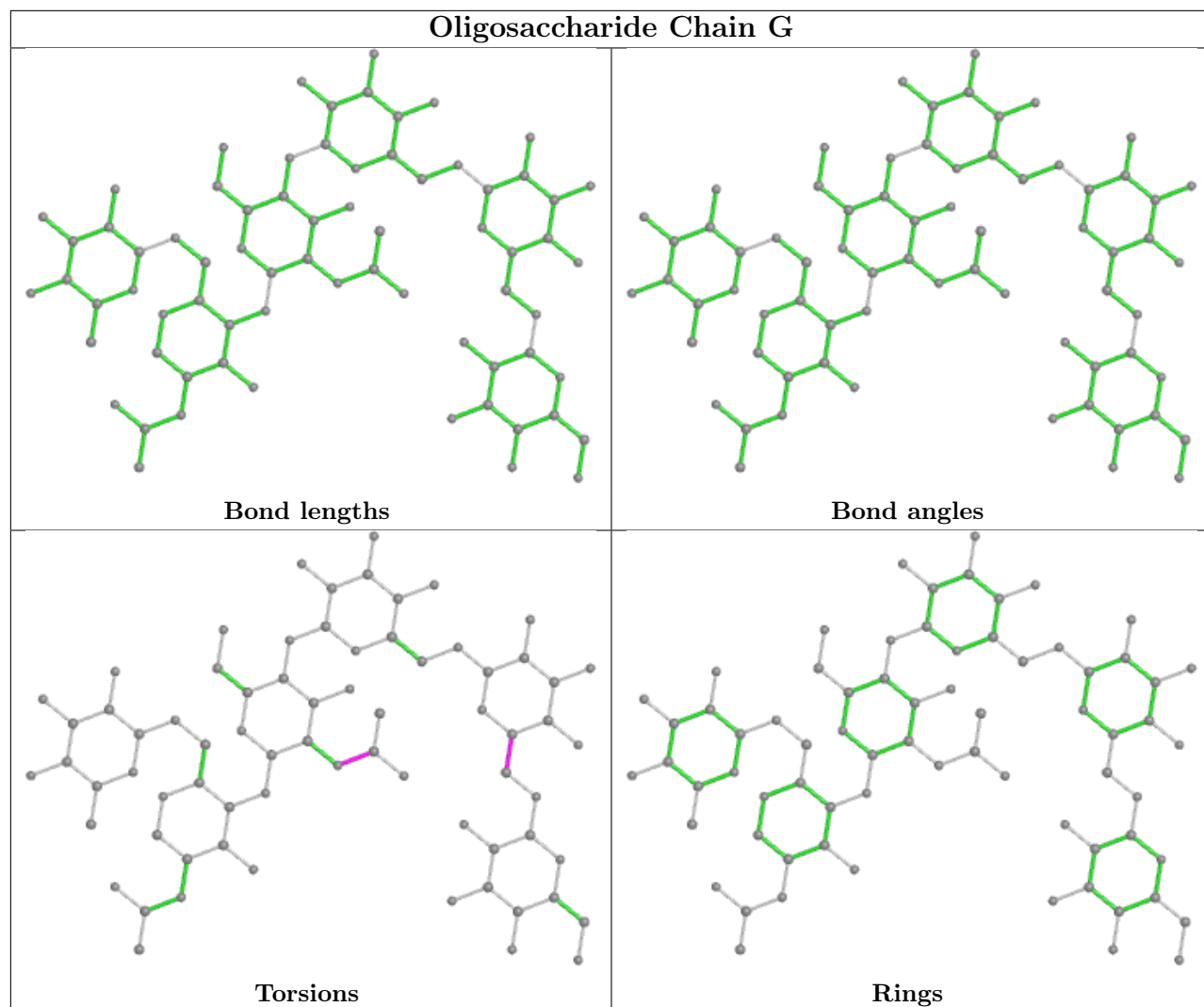
Mol	Chain	Res	Type	Atoms
8	I	2	NAG	O7-C7-N2-C2
8	I	2	NAG	C8-C7-N2-C2
7	G	4	MAN	O5-C5-C6-O6
8	I	2	NAG	O5-C5-C6-O6
7	G	2	NAG	C8-C7-N2-C2
8	I	2	NAG	C4-C5-C6-O6
7	G	4	MAN	C4-C5-C6-O6
8	I	4	MAN	O5-C5-C6-O6
7	G	2	NAG	O7-C7-N2-C2
8	I	4	MAN	C4-C5-C6-O6
8	I	3	BMA	C4-C5-C6-O6
8	I	3	BMA	O5-C5-C6-O6

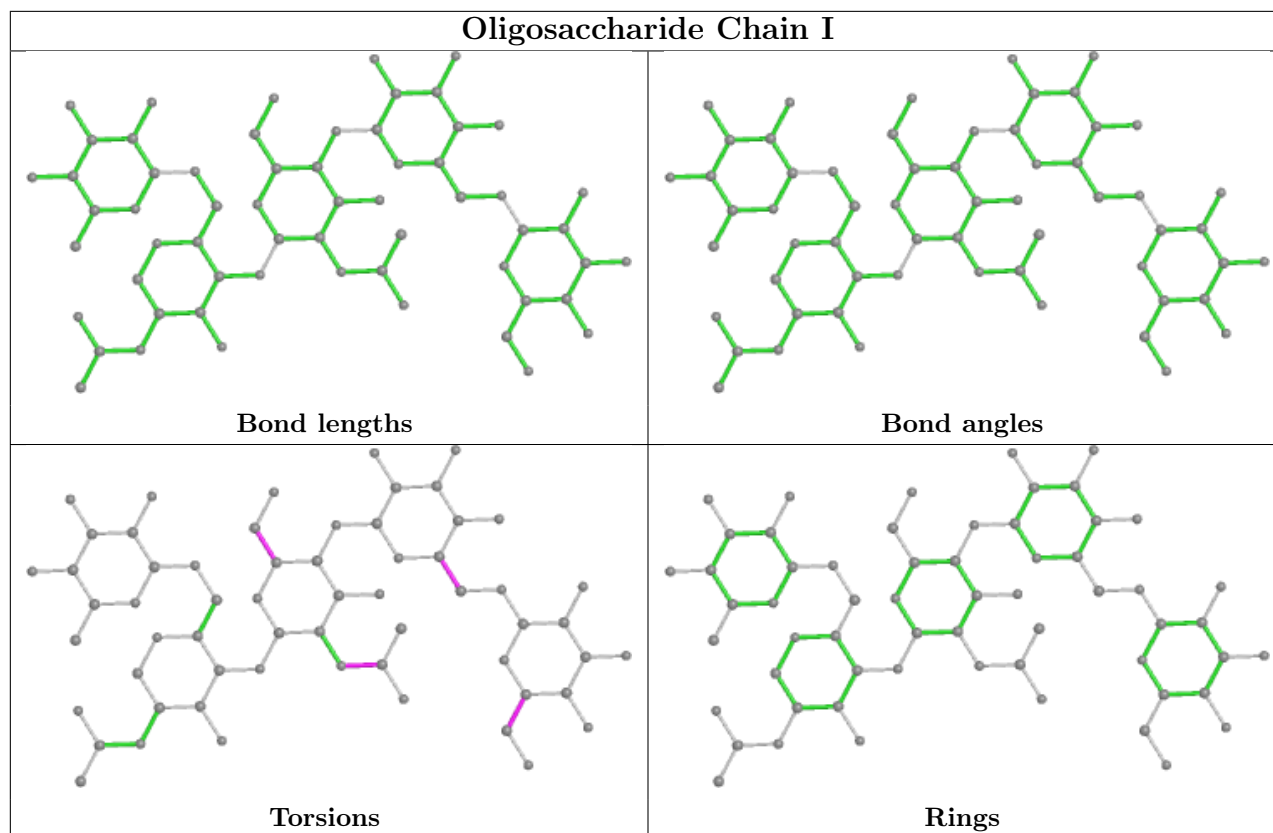
There are no ring outliers.

3 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	G	4	MAN	1	0
7	G	2	NAG	1	0
8	I	1	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](#)

Of 50 ligands modelled in this entry, 35 are monoatomic - leaving 15 for Mogul analysis.

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	$\# Z  > 2$
15	NAG	F	704	5	14,14,15	0.38	0	17,19,21	0.89	1 (5%)
15	NAG	F	705	5	14,14,15	0.34	0	17,19,21	0.87	1 (5%)
10	SO4	N	700	-	4,4,4	0.39	0	6,6,6	0.05	0
15	NAG	F	702	5	14,14,15	0.36	0	17,19,21	0.74	0
16	PGE	E	706	-	9,9,9	0.15	0	8,8,8	0.10	0
15	NAG	E	702	5	14,14,15	0.43	0	17,19,21	0.92	1 (5%)
10	SO4	L	700	-	4,4,4	0.39	0	6,6,6	0.05	0
15	NAG	F	706	5	14,14,15	0.33	0	17,19,21	0.83	0
15	NAG	F	703	5	14,14,15	0.36	0	17,19,21	0.70	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
16	PGE	S	602	-	9,9,9	0.17	0	8,8,8	0.11	0
13	PG4	N	703	-	12,12,12	0.18	0	11,11,11	0.08	0
12	PG5	H	702	-	11,11,11	0.19	0	10,10,10	0.10	0
15	NAG	E	705	5	14,14,15	0.41	0	17,19,21	1.30	1 (5%)
15	NAG	E	703	5	14,14,15	0.37	0	17,19,21	0.90	1 (5%)
15	NAG	E	704	5	14,14,15	0.47	0	17,19,21	1.02	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
15	NAG	F	704	5	-	0/6/23/26	0/1/1/1
15	NAG	F	705	5	-	2/6/23/26	0/1/1/1
15	NAG	F	702	5	-	2/6/23/26	0/1/1/1
16	PGE	E	706	-	-	2/7/7/7	-
15	NAG	E	702	5	-	3/6/23/26	0/1/1/1
15	NAG	F	706	5	-	4/6/23/26	0/1/1/1
15	NAG	F	703	5	-	2/6/23/26	0/1/1/1
16	PGE	S	602	-	-	5/7/7/7	-
13	PG4	N	703	-	-	5/10/10/10	-
12	PG5	H	702	-	-	6/9/9/9	-
15	NAG	E	705	5	-	2/6/23/26	0/1/1/1
15	NAG	E	703	5	-	2/6/23/26	0/1/1/1
15	NAG	E	704	5	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	E	705	NAG	C1-O5-C5	4.58	118.40	112.19
15	F	705	NAG	C1-O5-C5	2.74	115.90	112.19
15	E	704	NAG	C4-C3-C2	2.71	115.00	111.02
15	E	702	NAG	C4-C3-C2	2.59	114.81	111.02
15	E	703	NAG	C4-C3-C2	2.40	114.54	111.02
15	F	704	NAG	C1-O5-C5	2.18	115.15	112.19

There are no chirality outliers.

All (39) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
15	E	702	NAG	C8-C7-N2-C2
15	E	702	NAG	O7-C7-N2-C2
15	E	703	NAG	C8-C7-N2-C2
15	E	703	NAG	O7-C7-N2-C2
15	E	704	NAG	C1-C2-N2-C7
15	E	704	NAG	C8-C7-N2-C2
15	E	704	NAG	O7-C7-N2-C2
15	F	705	NAG	C8-C7-N2-C2
15	F	705	NAG	O7-C7-N2-C2
15	F	706	NAG	C4-C5-C6-O6
12	H	702	PG5	O2-C4-C5-O3
13	N	703	PG4	O3-C5-C6-O4
15	F	706	NAG	O5-C5-C6-O6
16	S	602	PGE	O2-C3-C4-O3
12	H	702	PG5	O1-C2-C3-O2
15	E	705	NAG	O5-C5-C6-O6
15	F	702	NAG	O5-C5-C6-O6
16	S	602	PGE	O3-C5-C6-O4
15	F	702	NAG	C4-C5-C6-O6
13	N	703	PG4	O4-C7-C8-O5
15	F	703	NAG	C8-C7-N2-C2
15	E	705	NAG	C4-C5-C6-O6
15	F	706	NAG	C8-C7-N2-C2
16	S	602	PGE	C3-C4-O3-C5
13	N	703	PG4	C1-C2-O2-C3
15	F	703	NAG	O7-C7-N2-C2
16	E	706	PGE	C6-C5-O3-C4
15	F	706	NAG	O7-C7-N2-C2
12	H	702	PG5	C6-C7-O4-C8
12	H	702	PG5	C4-C5-O3-C6
12	H	702	PG5	O3-C6-C7-O4
15	E	704	NAG	C3-C2-N2-C7
16	E	706	PGE	C3-C4-O3-C5
12	H	702	PG5	C3-C2-O1-C1
13	N	703	PG4	C5-C6-O4-C7
13	N	703	PG4	C8-C7-O4-C6
16	S	602	PGE	O1-C1-C2-O2
15	E	702	NAG	C1-C2-N2-C7
16	S	602	PGE	C1-C2-O2-C3



There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
13	N	703	PG4	1	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	B	213/214 (99%)	0.52	9 (4%) 36 30	58, 74, 97, 109	0
1	D	213/214 (99%)	0.49	3 (1%) 75 73	55, 73, 92, 106	0
2	A	222/230 (96%)	0.56	7 (3%) 47 42	61, 78, 96, 114	0
2	C	224/230 (97%)	0.76	16 (7%) 16 11	61, 85, 101, 106	0
3	L	213/215 (99%)	0.79	20 (9%) 8 6	49, 68, 122, 133	0
3	N	213/215 (99%)	0.54	11 (5%) 27 22	45, 66, 108, 126	0
4	H	212/223 (95%)	0.65	11 (5%) 27 22	47, 83, 105, 126	0
4	M	215/223 (96%)	0.61	10 (4%) 31 25	45, 72, 94, 128	0
5	E	579/597 (96%)	1.15	114 (19%) 1 0	64, 116, 162, 189	0
5	F	596/597 (99%)	0.77	53 (8%) 9 6	55, 84, 111, 149	0
6	R	203/204 (99%)	0.72	11 (5%) 25 20	50, 73, 101, 125	0
6	S	201/204 (98%)	0.74	12 (5%) 21 16	47, 71, 99, 114	0
All	All	3304/3366 (98%)	0.75	277 (8%) 11 7	45, 80, 138, 189	0

All (277) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	E	266	LEU	9.5
5	F	135	PRO	8.6
5	F	430	GLU	7.4
5	F	136	ASP	7.2
1	B	63	PHE	7.1
6	R	530	SER	6.6
5	E	275	TRP	6.5
6	R	475	ALA	6.5
5	E	284	PRO	6.1
5	E	297	MET	5.8
5	E	606	TRP	5.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	E	267	LEU	5.7
5	F	103	ASN	5.5
2	C	218	ASN	5.2
5	E	447	VAL	5.2
5	E	180	TYR	5.1
6	S	477	SER	4.9
5	E	443	ALA	4.9
5	F	301	ALA	4.7
5	E	364	VAL	4.7
5	E	590	PRO	4.7
3	L	148	GLN	4.7
5	F	137	ASN	4.6
5	E	289	PRO	4.6
6	S	519	HIS	4.4
5	E	342	ALA	4.4
5	F	471	ASP	4.3
5	E	429	GLN	4.3
5	E	258	PRO	4.3
6	R	529	LYS	4.2
5	E	490	PRO	4.2
5	E	19	SER	4.2
5	F	139	GLN	4.2
5	E	427	ASP	4.1
5	E	604	VAL	4.0
3	L	149	TRP	3.9
5	E	416	LYS	3.9
2	C	170	SER	3.9
5	E	450	LEU	3.8
5	E	439	LEU	3.8
5	F	302	TRP	3.7
4	M	196	LEU	3.7
5	E	440	LEU	3.7
5	E	609	ASP	3.7
4	M	221	LYS	3.6
5	E	520	LEU	3.6
5	F	138	PRO	3.6
3	L	187	TYR	3.6
5	F	307	ILE	3.6
5	F	131	LYS	3.5
3	L	127	LYS	3.5
3	L	150	LYS	3.5
5	E	607	SER	3.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	E	536	GLU	3.5
5	E	454	TYR	3.5
5	E	243	TYR	3.4
3	L	124	GLU	3.4
5	E	129	THR	3.4
5	E	301	ALA	3.4
5	E	599	ASN	3.4
5	E	592	PHE	3.4
5	E	539	LEU	3.4
5	F	339	VAL	3.3
1	D	78	ARG	3.3
5	F	132	VAL	3.3
3	L	192	VAL	3.3
5	E	256	ILE	3.2
3	N	151	VAL	3.2
5	E	430	GLU	3.2
3	L	182	LEU	3.2
5	F	390	PHE	3.2
2	A	218	ASN	3.2
5	E	184	VAL	3.1
5	F	544	ILE	3.1
5	E	410	LEU	3.1
6	R	528	LYS	3.1
5	E	287	GLN	3.1
4	H	176	VAL	3.1
5	E	299	ASP	3.1
5	E	346	PRO	3.1
5	E	365	THR	3.1
3	N	153	ASN	3.0
5	E	271	TRP	3.0
5	E	608	THR	3.0
4	M	1	GLU	3.0
5	F	423	LEU	3.0
2	C	121	THR	3.0
4	H	214	VAL	3.0
3	L	126	LEU	3.0
5	F	142	LEU	3.0
3	L	153	ASN	3.0
5	F	498	CYS	3.0
3	L	211	ASN	2.9
6	S	523	THR	2.9
4	H	144	ALA	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	E	414	THR	2.9
5	F	125	THR	2.9
5	E	428	PHE	2.9
3	L	193	TYR	2.9
5	E	288	LYS	2.9
5	E	295	ASP	2.9
2	C	26	GLY	2.9
1	B	64	SER	2.9
4	H	205	VAL	2.8
5	F	474	MET	2.8
5	F	180	TYR	2.8
5	E	168	TRP	2.8
5	E	50	TYR	2.8
6	S	494	SER	2.8
2	A	227	PRO	2.8
5	F	176	LEU	2.8
5	E	451	PRO	2.8
3	N	157	SER	2.8
5	E	236	LEU	2.8
5	E	424	LEU	2.8
5	F	134	ASN	2.8
5	E	579	MET	2.8
5	F	133	CYS	2.8
5	E	296	ALA	2.7
5	E	540	HIS	2.7
5	E	83	TYR	2.7
5	E	285	PHE	2.7
5	E	56	GLU	2.7
5	E	282	THR	2.7
2	A	168	TRP	2.7
5	E	54	ILE	2.7
5	E	160	GLU	2.7
1	B	16	GLY	2.7
3	L	159	ASN	2.7
5	F	171	GLU	2.7
5	F	548	THR	2.7
3	N	148	GLN	2.6
3	N	155	LEU	2.6
5	E	231	GLU	2.6
5	E	553	LYS	2.6
5	E	61	ASN	2.6
3	N	150	LYS	2.6

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	E	307	ILE	2.6
6	S	505	TYR	2.6
2	C	68	VAL	2.6
6	S	486	PHE	2.6
2	C	94	TYR	2.6
2	C	130	THR	2.6
5	E	421	ILE	2.6
5	E	446	ILE	2.6
5	E	586	ASN	2.6
5	F	297	MET	2.6
5	E	238	GLU	2.6
6	R	329	PHE	2.6
5	E	489	GLU	2.5
2	C	66	GLY	2.5
5	E	435	GLU	2.5
5	E	436	ILE	2.5
6	S	475	ALA	2.5
3	N	149	TRP	2.5
6	S	483	VAL	2.5
4	M	222	SER	2.5
3	L	185	ALA	2.5
6	S	482	GLY	2.5
5	E	245	ARG	2.5
5	E	544	ILE	2.5
6	S	474	GLN	2.5
4	H	201	TYR	2.5
5	E	426	PRO	2.5
5	E	293	VAL	2.5
3	L	195	CYS	2.5
5	E	246	ALA	2.4
5	E	471	ASP	2.4
2	C	15	GLY	2.4
5	F	469	PRO	2.4
5	E	264	ALA	2.4
5	E	278	LEU	2.4
5	E	453	THR	2.4
1	B	76	ILE	2.4
6	S	490	PHE	2.4
2	A	152	LEU	2.4
5	F	237	TYR	2.4
1	B	81	PRO	2.4
4	H	130	PRO	2.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	F	466	GLY	2.4
5	F	163	TRP	2.4
3	L	152	ASP	2.4
5	E	420	SER	2.4
5	E	333	LEU	2.3
5	F	569	ALA	2.3
4	M	206	ASN	2.3
5	E	403	ALA	2.3
4	M	117	THR	2.3
5	E	103	ASN	2.3
6	R	486	PHE	2.3
1	B	55	ARG	2.3
5	E	162	LEU	2.3
5	F	608	THR	2.3
5	F	446	ILE	2.3
2	C	2	VAL	2.3
3	L	123	ASP	2.3
4	H	221	LYS	2.3
5	E	281	LEU	2.3
5	F	50	TYR	2.3
6	R	531	THR	2.3
5	F	141	CYS	2.3
5	E	523	PHE	2.3
5	E	506	VAL	2.3
5	E	272	GLY	2.2
4	H	182	LEU	2.2
5	F	143	LEU	2.2
5	F	22	GLU	2.2
5	E	488	VAL	2.2
5	E	537	GLY	2.2
5	E	613	TYR	2.2
2	A	34	ILE	2.2
5	F	364	VAL	2.2
2	C	216	PRO	2.2
5	E	263	PRO	2.2
3	L	130	THR	2.2
2	A	176	GLY	2.2
5	E	605	GLY	2.2
6	R	476	GLY	2.2
2	C	221	VAL	2.2
5	E	63	ASN	2.2
1	D	48	LEU	2.2

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	E	596	LYS	2.2
5	E	252	TYR	2.2
5	F	19	SER	2.2
4	M	145	LEU	2.2
5	E	503	LEU	2.2
5	E	302	TRP	2.2
1	D	57	THR	2.2
4	H	198	THR	2.2
1	B	78	ARG	2.2
5	E	26	LYS	2.2
5	E	497	TYR	2.1
5	E	442	GLN	2.1
4	M	15	GLY	2.1
4	H	117	THR	2.1
3	N	205	PRO	2.1
5	F	299	ASP	2.1
3	L	131	ALA	2.1
4	M	144	ALA	2.1
5	E	576	ALA	2.1
6	S	478	THR	2.1
2	A	225	VAL	2.1
2	C	174	THR	2.1
5	F	308	PHE	2.1
6	R	346	ARG	2.1
2	C	123	VAL	2.1
5	F	293	VAL	2.1
3	N	187	TYR	2.1
5	F	454	TYR	2.1
3	N	154	ALA	2.1
5	E	249	MET	2.1
5	E	474	MET	2.1
5	F	464	PHE	2.1
2	C	158	ASP	2.1
3	N	126	LEU	2.1
5	F	403	ALA	2.1
5	F	270	MET	2.1
4	H	127	SER	2.1
5	F	435	GLU	2.1
5	F	298	VAL	2.1
5	F	348	ALA	2.1
5	E	585	LEU	2.0
2	C	227	PRO	2.0

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Mol	Chain	Res	Type	RSRZ
6	R	473	TYR	2.0
4	M	96	ALA	2.0
5	E	149	ASN	2.0
5	F	65	ALA	2.0
1	B	75	THR	2.0
1	B	13	LEU	2.0
5	E	45	LEU	2.0
3	L	188	GLU	2.0
5	E	126	ILE	2.0
5	E	151	ILE	2.0
5	F	49	ASN	2.0
5	E	543	ASP	2.0
5	E	603	PHE	2.0
6	R	525	CYS	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](#)

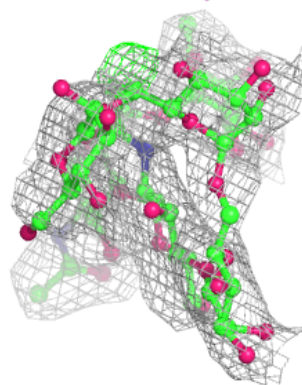
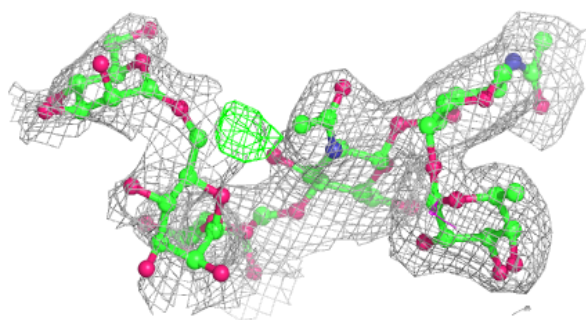
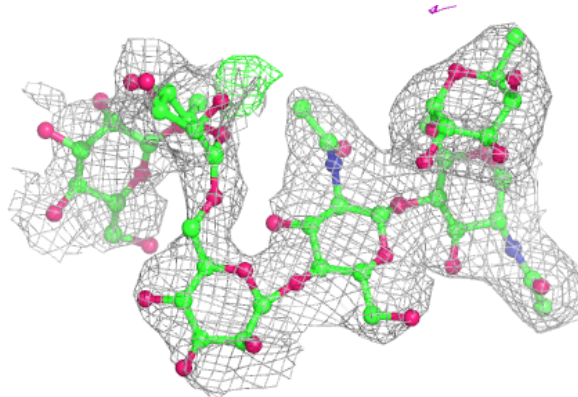
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
8	MAN	I	4	11/12	0.39	0.41	140,144,146,147	0
8	BMA	I	3	11/12	0.62	0.29	122,127,131,132	0
7	MAN	G	4	11/12	0.64	0.26	148,150,152,152	0
7	BMA	G	3	11/12	0.74	0.26	117,123,128,135	0
7	MAN	G	5	11/12	0.77	0.26	144,149,150,150	0
8	NAG	I	2	14/15	0.85	0.22	91,98,102,108	0
7	NAG	G	1	14/15	0.88	0.19	72,75,79,82	0
8	NAG	I	1	14/15	0.89	0.21	78,80,82,87	0
7	NAG	G	2	14/15	0.89	0.20	89,92,95,102	0
8	FUC	I	5	10/11	0.89	0.23	74,75,76,76	0
7	FUC	G	6	10/11	0.91	0.21	79,80,80,81	0

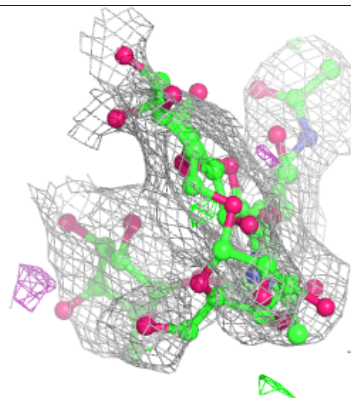
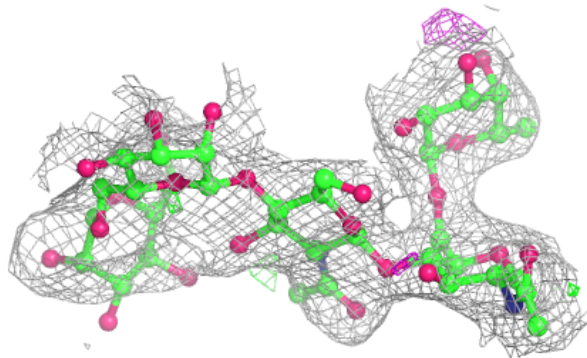
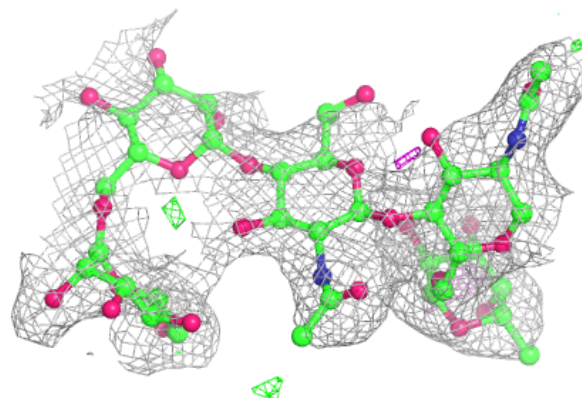
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around Chain 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)



## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
15	NAG	E	702	14/15	0.61	0.44	133,140,143,145	0
12	PG5	H	702	12/12	0.68	0.40	116,120,122,122	0
9	CL	M	303	1/1	0.68	0.13	113,113,113,113	0
16	PGE	S	602	10/10	0.71	0.28	97,103,109,110	0
11	NA	F	711	1/1	0.73	0.14	84,84,84,84	0
15	NAG	E	704	14/15	0.73	0.27	121,127,130,131	0
9	CL	N	702	1/1	0.73	0.54	114,114,114,114	0
13	PG4	N	703	13/13	0.79	0.26	84,94,96,96	0
15	NAG	F	706	14/15	0.80	0.16	135,137,137,138	0
15	NAG	F	704	14/15	0.83	0.19	94,97,99,100	0
9	CL	H	707	1/1	0.83	0.22	113,113,113,113	0
16	PGE	E	706	10/10	0.83	0.31	91,96,98,98	0
15	NAG	F	702	14/15	0.83	0.44	100,102,106,107	0
15	NAG	F	705	14/15	0.84	0.23	99,101,102,103	0
9	CL	C	701	1/1	0.84	0.12	105,105,105,105	0
9	CL	F	713	1/1	0.85	0.20	117,117,117,117	0
15	NAG	E	703	14/15	0.86	0.20	97,98,99,100	0
15	NAG	E	705	14/15	0.86	0.23	99,102,105,105	0
15	NAG	F	703	14/15	0.87	0.21	85,86,88,89	0
9	CL	A	301	1/1	0.87	0.18	98,98,98,98	0
9	CL	M	302	1/1	0.87	0.17	88,88,88,88	0
10	SO4	L	700	5/5	0.88	0.26	158,158,159,159	0
9	CL	F	709	1/1	0.88	0.26	101,101,101,101	0
9	CL	M	305	1/1	0.88	0.21	97,97,97,97	0
9	CL	R	602	1/1	0.89	0.26	105,105,105,105	0
11	NA	H	704	1/1	0.89	0.14	56,56,56,56	0
10	SO4	N	700	5/5	0.90	0.21	139,139,139,139	0
9	CL	S	604	1/1	0.90	0.29	103,103,103,103	0
9	CL	M	304	1/1	0.92	0.33	95,95,95,95	0
9	CL	N	701	1/1	0.93	0.15	75,75,75,75	0
9	CL	F	710	1/1	0.94	0.07	66,66,66,66	0
9	CL	F	712	1/1	0.94	0.13	91,91,91,91	0
9	CL	H	706	1/1	0.95	0.13	82,82,82,82	0
11	NA	H	701	1/1	0.95	0.28	38,38,38,38	0
9	CL	S	603	1/1	0.95	0.34	88,88,88,88	0
9	CL	C	700	1/1	0.95	0.15	76,76,76,76	0
11	NA	R	603	1/1	0.95	0.08	50,50,50,50	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
9	CL	R	601	1/1	0.95	0.27	95,95,95,95	0
9	CL	D	700	1/1	0.96	0.20	92,92,92,92	0
9	CL	E	707	1/1	0.96	0.07	77,77,77,77	0
9	CL	B	700	1/1	0.96	0.06	83,83,83,83	0
9	CL	F	714	1/1	0.96	0.13	76,76,76,76	0
11	NA	H	705	1/1	0.96	0.13	52,52,52,52	0
14	ZN	F	701	1/1	0.97	0.17	77,77,77,77	0
9	CL	M	301	1/1	0.97	0.11	67,67,67,67	0
9	CL	S	601	1/1	0.97	0.31	94,94,94,94	0
9	CL	F	707	1/1	0.97	0.18	64,64,64,64	0
11	NA	F	708	1/1	0.97	0.18	90,90,90,90	0
14	ZN	E	701	1/1	0.97	0.12	95,95,95,95	0
9	CL	H	703	1/1	0.98	0.13	81,81,81,81	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.