



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 21, 2023 – 02:07 PM EDT

PDB ID : 8SMT  
Title : Crystal structure of antibody WRAIR-2134 in complex with SARS-CoV-2 receptor binding domain  
Authors : Sankhala, R.S.; Jensen, J.L.; Joyce, M.G.  
Deposited on : 2023-04-26  
Resolution : 3.16 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 : 2.33  
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) : 2.33

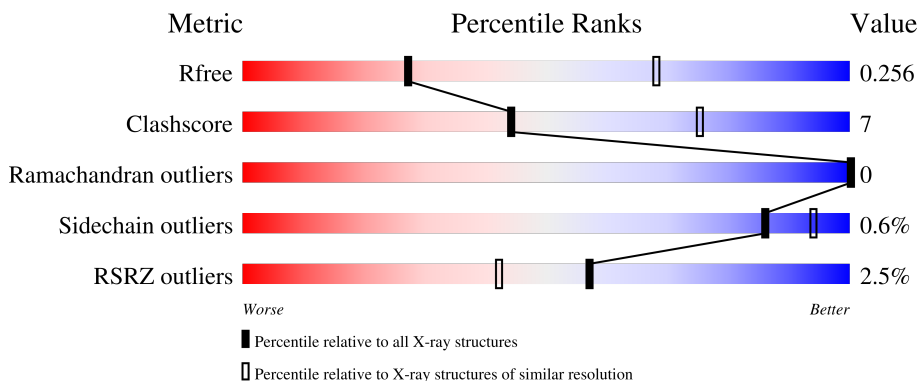
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.16 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	1665 (3.20-3.12)
Clashscore	141614	1804 (3.20-3.12)
Ramachandran outliers	138981	1770 (3.20-3.12)
Sidechain outliers	138945	1769 (3.20-3.12)
RSRZ outliers	127900	1616 (3.20-3.12)

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	A	231	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 82%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">3%      82%      17%      .</p>
1	D	231	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 82%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 17%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">2%      82%      17%      .</p>
1	H	231	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 87%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">3%      87%      13%      .</p>
1	I	231	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 85%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 14%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">%      85%      14%      .</p>
2	B	214	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 86%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 13%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="margin-left: 10px;">3%      86%      13%      .</p>

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Mol	Chain	Length	Quality of chain
2	F	214	 82% 16% .
2	J	214	 88% 11% .
2	L	214	 82% 17% .
3	C	205	 87% 10% .
3	E	205	 88% 8% .
3	G	205	 85% 10% .
3	K	205	 86% 9% .
4	M	3	 100%
5	N	3	 33% 67%

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 19682 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 WRAIR-2134 Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	229	Total 1743	C 1104	N 289	O 343	S 7	0	0	0
1	D	231	Total 1755	C 1110	N 291	O 346	S 8	0	0	0
1	H	231	Total 1755	C 1110	N 291	O 346	S 8	0	0	0
1	I	230	Total 1749	C 1107	N 290	O 345	S 7	0	0	0

- Molecule 2 is a protein called WRAIR-2134 Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	211	Total 1583	C 991	N 259	O 327	S 6	0	0	0
2	F	211	Total 1583	C 991	N 259	O 327	S 6	0	0	0
2	J	212	Total 1589	C 994	N 260	O 329	S 6	0	0	0
2	L	211	Total 1583	C 991	N 259	O 327	S 6	0	0	0

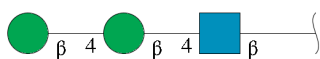
- Molecule 3 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	199	Total 1574	C 1006	N 267	O 293	S 8	0	0	0
3	E	198	Total 1564	C 1000	N 264	O 292	S 8	0	0	0
3	G	196	Total 1550	C 992	N 258	O 292	S 8	0	1	0
3	K	197	Total 1551	C 992	N 259	O 292	S 8	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	528	GLY	-	expression tag	UNP P0DTC2
C	529	SER	-	expression tag	UNP P0DTC2
C	530	HIS	-	expression tag	UNP P0DTC2
C	531	HIS	-	expression tag	UNP P0DTC2
C	532	HIS	-	expression tag	UNP P0DTC2
C	533	HIS	-	expression tag	UNP P0DTC2
C	534	HIS	-	expression tag	UNP P0DTC2
C	535	HIS	-	expression tag	UNP P0DTC2
E	528	GLY	-	expression tag	UNP P0DTC2
E	529	SER	-	expression tag	UNP P0DTC2
E	530	HIS	-	expression tag	UNP P0DTC2
E	531	HIS	-	expression tag	UNP P0DTC2
E	532	HIS	-	expression tag	UNP P0DTC2
E	533	HIS	-	expression tag	UNP P0DTC2
E	534	HIS	-	expression tag	UNP P0DTC2
E	535	HIS	-	expression tag	UNP P0DTC2
G	528	GLY	-	expression tag	UNP P0DTC2
G	529	SER	-	expression tag	UNP P0DTC2
G	530	HIS	-	expression tag	UNP P0DTC2
G	531	HIS	-	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
K	528	GLY	-	expression tag	UNP P0DTC2
K	529	SER	-	expression tag	UNP P0DTC2
K	530	HIS	-	expression tag	UNP P0DTC2
K	531	HIS	-	expression tag	UNP P0DTC2
K	532	HIS	-	expression tag	UNP P0DTC2
K	533	HIS	-	expression tag	UNP P0DTC2
K	534	HIS	-	expression tag	UNP P0DTC2
K	535	HIS	-	expression tag	UNP P0DTC2

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



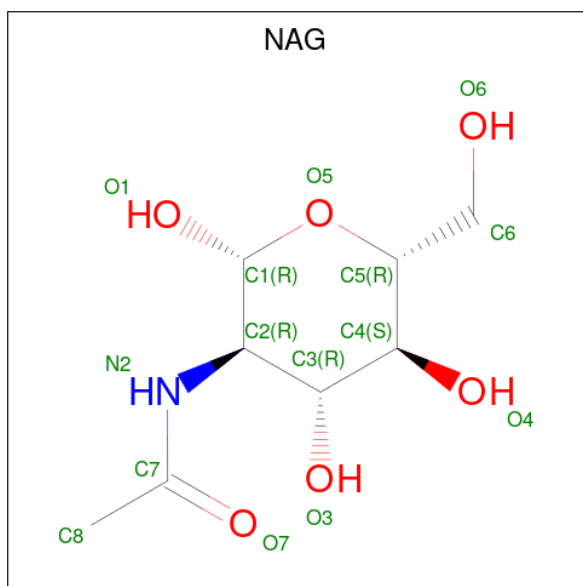
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	M	3	36	20	1	15	0	0	0

- Molecule 5 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			
5	N	3	39	22	2	15	0	0	0

- Molecule 6 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).

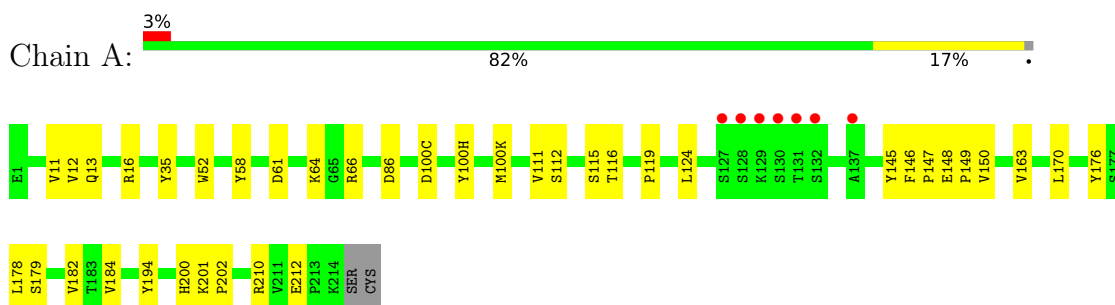


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
6	C	1	14	8	1	5	0	0
6	E	1	14	8	1	5	0	0

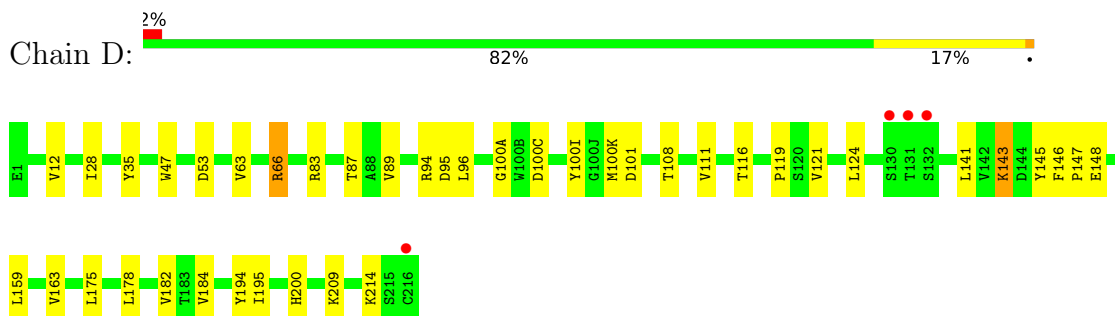
### 3 Residue-property plots [i](#)

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.

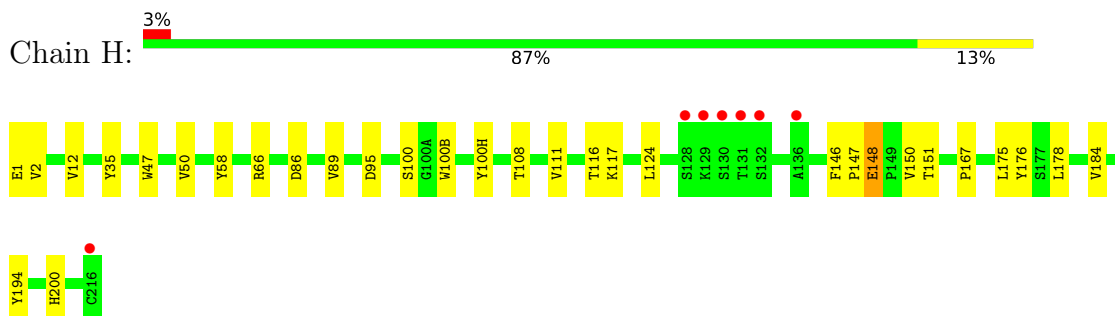
- Molecule 1: WRAIR-2134 Fab heavy chain



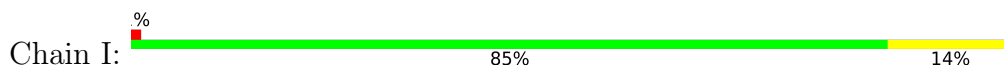
- Molecule 1: WRAIR-2134 Fab heavy chain



- Molecule 1: WRAIR-2134 Fab heavy chain

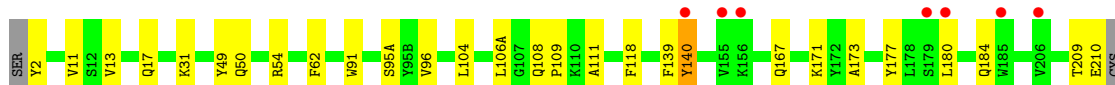
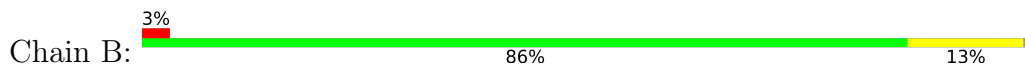


- Molecule 1: WRAIR-2134 Fab heavy chain

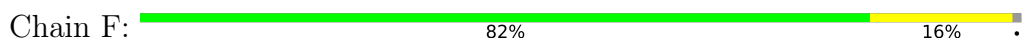




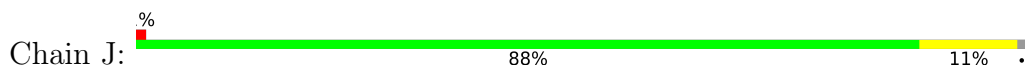
• Molecule 2: WRAIR-2134 Fab light chain



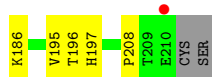
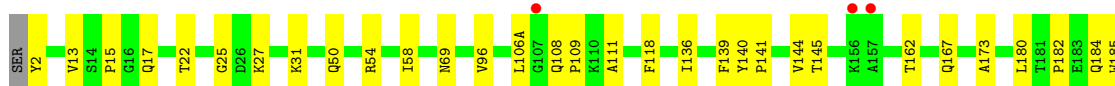
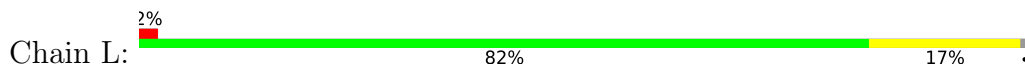
• Molecule 2: WRAIR-2134 Fab light chain



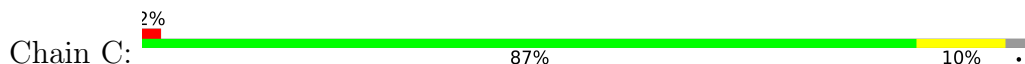
• Molecule 2: WRAIR-2134 Fab light chain



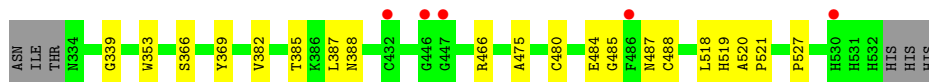
• Molecule 2: WRAIR-2134 Fab light chain



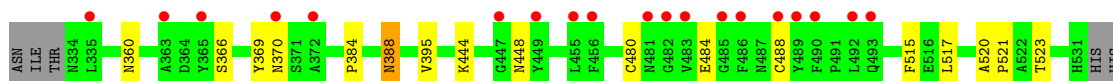
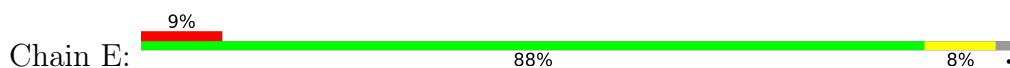
• Molecule 3: Spike protein S1





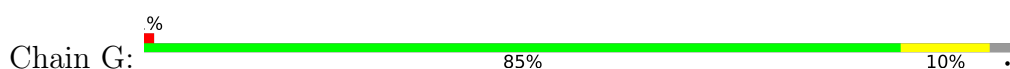


- Molecule 3: Spike protein S1

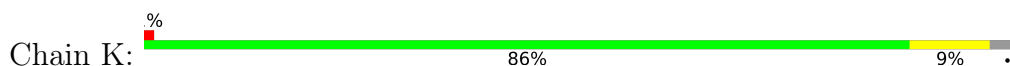


HIS  
HIS

- Molecule 3: Spike protein S1



- Molecule 3: Spike protein S1



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



MAG1  
MAG2  
BMA3

- Molecule 5: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



MAG1  
MAG2  
BMA3

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	143.19Å 154.43Å 165.25Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.15 – 3.16 49.15 – 3.16	Depositor EDS
% Data completeness (in resolution range)	93.0 (49.15-3.16) 93.0 (49.15-3.16)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.99 (at 3.19Å)	Xtrriage
Refinement program	PHENIX 1.11.1_2575	Depositor
R, $R_{free}$	0.214 , 0.249 0.222 , 0.256	Depositor DCC
$R_{free}$ test set	2987 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	76.4	Xtrriage
Anisotropy	0.081	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 42.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	19682	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	84.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.95% of the height of the origin peak. No significant pseudotranslation is detected.*

<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: BMA, NAG

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	0.31	0/1789	0.57	0/2438
1	D	0.29	0/1801	0.58	0/2454
1	H	0.31	0/1801	0.59	0/2454
1	I	0.29	0/1795	0.58	0/2446
2	B	0.32	0/1623	0.55	0/2218
2	F	0.34	0/1623	0.56	0/2218
2	J	0.56	0/1629	0.69	0/2226
2	L	0.31	0/1623	0.53	0/2218
3	C	0.29	0/1621	0.53	0/2205
3	E	0.30	0/1610	0.55	0/2190
3	G	0.31	0/1597	0.55	0/2172
3	K	0.33	0/1595	0.57	0/2170
All	All	0.34	0/20107	0.57	0/27409

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	1743	0	1680	33	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	D	1755	0	1690	37	0
1	H	1755	0	1690	23	0
1	I	1749	0	1685	30	0
2	B	1583	0	1522	19	0
2	F	1583	0	1522	23	0
2	J	1589	0	1530	22	0
2	L	1583	0	1522	28	0
3	C	1574	0	1475	15	0
3	E	1564	0	1468	15	0
3	G	1550	0	1460	23	0
3	K	1551	0	1459	15	0
4	M	36	0	31	3	0
5	N	39	0	34	2	0
6	C	14	0	13	1	0
6	E	14	0	13	2	0
All	All	19682	0	18794	255	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 7.

All (255) 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:C:480:CYS:SG	3:C:488:CYS:SG	1.38	1.37
3:E:480:CYS:SG	3:E:488:CYS:SG	1.30	1.29
3:G:480:CYS:SG	3:G:488:CYS:SG	1.26	1.26
3:G:382:VAL:HB	3:G:387:LEU:HD21	1.20	1.10
3:G:480:CYS:SG	3:G:488:CYS:CB	2.43	1.06
3:E:480:CYS:SG	3:E:488:CYS:CB	2.45	1.03
3:G:382:VAL:CB	3:G:387:LEU:HD21	1.87	1.03
1:I:195:ILE:HG22	1:I:210:ARG:HG2	1.41	1.02
3:C:480:CYS:SG	3:C:488:CYS:CB	2.56	0.93
1:I:195:ILE:CG2	1:I:210:ARG:HG2	1.99	0.92
3:C:382:VAL:HB	3:C:387:LEU:HD11	1.63	0.81
1:A:13:GLN:HB3	1:D:28:ILE:HD13	1.64	0.77
1:I:195:ILE:HG22	1:I:210:ARG:CG	2.15	0.75
3:G:382:VAL:HB	3:G:387:LEU:CD2	2.08	0.74
3:G:339:GLY:HA2	4:M:1:NAG:H82	1.67	0.73
2:L:108:GLN:HB3	2:L:109:PRO:HD2	1.69	0.73
1:D:89:VAL:HG22	1:D:108:THR:HG22	1.73	0.71
1:I:66:ARG:NH2	1:I:86:ASP:OD2	2.22	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:96:LEU:HD21	1:I:100(I):TYR:HB2	1.72	0.71
1:H:66:ARG:NH2	1:H:86:ASP:OD2	2.24	0.71
6:E:601:NAG:H83	6:E:601:NAG:H3	1.72	0.70
1:A:66:ARG:NH2	1:A:86:ASP:OD2	2.24	0.70
2:L:144:VAL:CG1	2:L:195:VAL:HG13	2.22	0.69
2:L:136:ILE:HG22	2:L:139:PHE:CE1	2.28	0.69
1:D:96:LEU:HD21	1:D:100(I):TYR:HB2	1.74	0.68
3:G:382:VAL:CG1	3:G:387:LEU:HD21	2.24	0.68
3:G:342:PHE:HB2	4:M:1:NAG:H83	1.75	0.68
2:B:209:THR:HG23	2:B:210:GLU:HG2	1.77	0.66
1:H:89:VAL:HG22	1:H:108:THR:HG22	1.77	0.66
1:I:134:GLY:H	2:L:27:LYS:HE3	1.60	0.66
3:K:366:SER:O	3:K:370:ASN:HB2	1.94	0.66
1:H:150:VAL:CG1	1:H:178:LEU:HD21	2.26	0.66
1:I:150:VAL:HG23	1:I:200:HIS:CD2	2.30	0.66
2:F:111:ALA:HB3	2:F:140:TYR:H	1.61	0.66
1:A:147:PRO:HB2	1:A:200:HIS:HE2	1.60	0.65
1:H:1:GLU:HG2	1:H:2:VAL:H	1.61	0.65
2:J:106(A):LEU:HD23	2:J:140:TYR:HE2	1.61	0.65
3:K:342:PHE:HB2	5:N:1:NAG:H82	1.80	0.63
1:A:12:VAL:HG13	1:A:111:VAL:HG22	1.81	0.63
3:C:485:GLY:H	3:C:488:CYS:HB2	1.62	0.62
2:J:141:PRO:HD2	2:J:197:HIS:NE2	2.14	0.62
4:M:2:BMA:H4	4:M:3:BMA:O2	1.98	0.62
2:F:108:GLN:HG2	2:F:140:TYR:CG	2.36	0.61
2:L:15:PRO:HD3	2:L:106(A):LEU:O	2.01	0.60
3:C:388:ASN:OD1	3:C:527:PRO:HD2	2.02	0.60
3:K:353:TRP:CE2	3:K:466:ARG:HB2	2.36	0.60
1:I:82(B):SER:HB3	1:I:83:ARG:NH2	2.17	0.60
3:G:353:TRP:CE2	3:G:466:ARG:HB2	2.37	0.60
1:H:95:ASP:OD2	1:H:100(H):TYR:HA	2.01	0.59
3:E:480:CYS:SG	3:E:488:CYS:HB3	2.42	0.59
1:A:147:PRO:HB2	1:A:200:HIS:NE2	2.18	0.58
1:D:83:ARG:O	1:D:111:VAL:HG21	2.03	0.58
2:J:55:PRO:HD2	2:J:58:ILE:HG13	1.85	0.58
1:D:63:VAL:HA	1:D:66:ARG:HD3	1.85	0.58
3:G:366:SER:O	3:G:370:ASN:HB2	2.02	0.58
1:D:214:LYS:NZ	2:F:122:SER:H	2.02	0.58
1:I:150:VAL:HG23	1:I:200:HIS:HD2	1.68	0.58
1:H:147:PRO:HB2	1:H:200:HIS:HE2	1.68	0.57
1:A:35:TYR:CE1	1:A:100(K):MET:HG2	2.39	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:484:GLU:HA	3:E:488:CYS:O	2.04	0.57
3:K:408:ARG:HH21	3:K:414:GLN:HB3	1.69	0.57
1:A:179:SER:HG	2:B:177:TYR:HE2	1.52	0.57
2:J:28:LEU:HD12	2:J:28:LEU:O	2.05	0.57
1:A:12:VAL:CG1	1:A:111:VAL:HG22	2.34	0.57
1:H:147:PRO:HB2	1:H:200:HIS:NE2	2.20	0.56
2:F:106(A):LEU:HA	2:F:140:TYR:OH	2.06	0.56
1:A:13:GLN:HB3	1:D:28:ILE:CD1	2.34	0.56
1:D:119:PRO:HB3	1:D:145:TYR:HB3	1.88	0.55
1:D:146:PHE:HB2	1:D:175:LEU:CD2	2.37	0.55
1:D:100(C):ASP:OD2	3:G:466:ARG:NH1	2.37	0.55
1:D:12:VAL:HG13	1:D:111:VAL:HG12	1.88	0.55
1:H:116:THR:HA	1:H:146:PHE:HD1	1.73	0.54
2:L:144:VAL:HG11	2:L:195:VAL:HG13	1.88	0.54
3:C:366:SER:HA	3:C:369:TYR:CZ	2.43	0.54
3:E:444:LYS:HE2	3:E:448:ASN:HA	1.90	0.54
2:F:2:TYR:CZ	2:F:31:LYS:HE3	2.43	0.54
1:A:201:LYS:HB2	1:A:202:PRO:HD3	1.89	0.54
1:H:167:PRO:HG2	2:L:162:THR:CG2	2.37	0.54
1:I:83:ARG:O	1:I:111:VAL:HG11	2.09	0.53
1:I:124:LEU:HB3	2:J:118:PHE:CD2	2.43	0.53
1:A:150:VAL:CG1	1:A:178:LEU:HD21	2.39	0.53
1:I:42:GLY:HA3	2:J:163:THR:HG21	1.91	0.53
2:L:2:TYR:CZ	2:L:31:LYS:HE3	2.44	0.53
3:G:366:SER:HA	3:G:369:TYR:CZ	2.44	0.53
2:B:139:PHE:CE1	2:B:173:ALA:HA	2.44	0.53
3:E:366:SER:HA	3:E:369:TYR:CZ	2.44	0.53
2:B:13:VAL:HG22	2:B:17:GLN:HB2	1.91	0.52
3:G:480:CYS:SG	3:G:488:CYS:HB3	2.42	0.52
1:D:146:PHE:HB2	1:D:175:LEU:HD22	1.91	0.52
2:F:13:VAL:HG21	2:F:19:ALA:HB2	1.92	0.52
3:G:382:VAL:HG21	3:G:387:LEU:HD11	1.90	0.52
1:A:61:ASP:HA	1:A:64:LYS:HD3	1.92	0.52
3:C:353:TRP:CE2	3:C:466:ARG:HB2	2.44	0.52
3:C:484:GLU:HG3	3:C:488:CYS:O	2.09	0.52
2:L:140:TYR:HB3	2:L:141:PRO:HD3	1.92	0.52
1:I:95:ASP:OD2	1:I:100(H):TYR:HA	2.10	0.52
1:A:147:PRO:HD2	1:A:200:HIS:CE1	2.45	0.51
3:G:393:THR:HA	3:G:522:ALA:HA	1.92	0.51
3:K:366:SER:HA	3:K:369:TYR:CZ	2.44	0.51
1:A:52:TRP:HD1	1:A:100(H):TYR:HH	1.58	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:520:ALA:HB1	3:C:521:PRO:CD	2.40	0.51
1:H:148:GLU:HG2	1:H:176:TYR:CE2	2.46	0.51
1:A:100(C):ASP:OD2	3:C:466:ARG:NH2	2.44	0.51
1:D:87:THR:OG1	1:D:111:VAL:HG22	2.10	0.51
2:B:2:TYR:CZ	2:B:31:LYS:HE3	2.47	0.50
1:D:214:LYS:HZ1	2:F:122:SER:H	1.58	0.50
1:A:12:VAL:O	1:A:111:VAL:HA	2.11	0.50
2:B:54:ARG:NH1	2:B:62:PHE:O	2.43	0.50
1:A:119:PRO:HB3	1:A:145:TYR:HB3	1.94	0.50
1:D:147:PRO:HB2	1:D:200:HIS:NE2	2.27	0.50
3:C:518:LEU:HG	3:C:519:HIS:N	2.26	0.50
2:J:106(A):LEU:HD23	2:J:140:TYR:CE2	2.45	0.50
2:L:111:ALA:HB3	2:L:140:TYR:H	1.77	0.50
3:C:339:GLY:HA2	6:C:601:NAG:H83	1.93	0.50
1:H:150:VAL:HG13	1:H:178:LEU:HD21	1.94	0.49
1:A:116:THR:HA	1:A:146:PHE:HD1	1.78	0.49
1:H:167:PRO:HG2	2:L:162:THR:HG23	1.95	0.49
3:K:353:TRP:NE1	3:K:466:ARG:HB2	2.27	0.49
1:I:134:GLY:N	2:L:27:LYS:HE3	2.25	0.49
2:F:141:PRO:HB2	2:F:197:HIS:NE2	2.28	0.49
1:H:35:TYR:HE2	2:L:96:VAL:HG21	1.78	0.49
2:J:141:PRO:HD2	2:J:197:HIS:CE1	2.48	0.49
3:C:475:ALA:HB3	3:C:487:ASN:HB3	1.93	0.49
2:B:106(A):LEU:HA	2:B:140:TYR:OH	2.13	0.48
3:C:520:ALA:HB1	3:C:521:PRO:HD2	1.94	0.48
3:K:383:SER:HB2	3:K:386:LYS:HB2	1.95	0.48
1:A:35:TYR:HE2	2:B:96:VAL:HG21	1.78	0.48
1:A:112:SER:HB3	1:A:146:PHE:HE2	1.78	0.48
1:I:13:GLN:HG2	1:I:14:PRO:HD2	1.95	0.48
2:J:49:TYR:CD1	2:J:55:PRO:HG3	2.48	0.48
2:J:54:ARG:HG3	2:J:58:ILE:HB	1.94	0.48
3:K:388:ASN:OD1	3:K:527:PRO:HD2	2.14	0.48
1:A:163:VAL:HG22	1:A:182:VAL:HB	1.95	0.48
1:D:116:THR:HA	1:D:146:PHE:HD1	1.78	0.48
2:F:108:GLN:HG2	2:F:140:TYR:CD1	2.48	0.48
1:H:50:VAL:HG12	1:H:58:TYR:HB2	1.96	0.48
1:I:117:LYS:HG2	1:I:118:GLY:N	2.28	0.48
3:E:360:ASN:HA	3:E:523:THR:HB	1.96	0.48
3:G:353:TRP:NE1	3:G:466:ARG:HB2	2.29	0.48
2:B:111:ALA:HB3	2:B:140:TYR:H	1.79	0.47
3:E:520:ALA:HB1	3:E:521:PRO:HD2	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:395:VAL:HG22	3:E:515:PHE:HD1	1.80	0.47
2:L:139:PHE:CE1	2:L:173:ALA:HA	2.49	0.47
2:F:108:GLN:HG3	2:F:109:PRO:HD2	1.97	0.47
1:I:166:PHE:CE1	2:J:135:LEU:HD13	2.49	0.47
2:J:32:TYR:CE2	3:K:462:LYS:HD3	2.50	0.47
2:L:141:PRO:HB2	2:L:197:HIS:NE2	2.29	0.47
3:G:357:ARG:HD3	3:G:396:TYR:CE2	2.50	0.47
2:F:169:ASN:C	2:F:171:LYS:H	2.17	0.46
1:D:147:PRO:HD2	1:D:200:HIS:CE1	2.51	0.46
3:E:369:TYR:CD2	3:E:384:PRO:HB2	2.50	0.46
2:B:49:TYR:HD2	2:B:50:GLN:HG3	1.80	0.46
1:D:121:VAL:O	1:D:209:LYS:HE2	2.15	0.46
1:I:147:PRO:HB2	1:I:200:HIS:HE2	1.79	0.46
1:D:12:VAL:O	1:D:111:VAL:HA	2.16	0.46
1:I:96:LEU:HD21	1:I:100(I):TYR:CB	2.45	0.46
1:I:182:VAL:HG22	1:I:184:VAL:HG13	1.97	0.46
2:B:91:TRP:CE2	2:B:95(A):SER:HA	2.51	0.46
2:L:25:GLY:O	2:L:69:ASN:HB3	2.16	0.46
1:H:117:LYS:H	1:H:147:PRO:HD3	1.81	0.46
1:D:141:LEU:HD21	1:D:143:LYS:HD3	1.98	0.45
1:H:184:VAL:HG21	1:H:194:TYR:CZ	2.51	0.45
1:A:184:VAL:HG21	1:A:194:TYR:CZ	2.51	0.45
3:G:383:SER:HB2	3:G:386:LYS:HB2	1.99	0.45
1:D:195:ILE:HG13	1:D:209:LYS:C	2.37	0.45
1:A:11:VAL:HG11	1:A:146:PHE:CZ	2.52	0.45
1:D:35:TYR:HE1	1:D:95:ASP:HB2	1.81	0.45
1:D:159:LEU:HD21	1:D:182:VAL:HG21	1.99	0.45
2:B:167:GLN:HG2	2:B:171:LYS:O	2.17	0.45
1:D:124:LEU:HB3	2:F:118:PHE:CD2	2.51	0.45
5:N:2:NAG:H4	5:N:3:BMA:H2	1.48	0.45
1:A:61:ASP:HA	1:A:64:LYS:CD	2.47	0.45
1:D:111:VAL:O	1:D:111:VAL:HG23	2.17	0.45
2:F:180:LEU:HB3	2:F:184:GLN:HG3	1.97	0.45
1:H:116:THR:HA	1:H:146:PHE:CD1	2.52	0.45
1:A:115:SER:O	1:A:146:PHE:HB3	2.17	0.44
2:F:17:GLN:OE1	2:L:22:THR:HG23	2.17	0.44
2:J:137:SER:HB2	2:J:167:GLN:OE1	2.17	0.44
2:L:108:GLN:HB3	2:L:109:PRO:CD	2.41	0.44
2:L:139:PHE:CE2	2:L:144:VAL:HG21	2.52	0.44
3:K:520:ALA:HB1	3:K:521:PRO:HD2	1.99	0.44
1:A:210:ARG:HE	1:A:212:GLU:CD	2.20	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:53:ASP:OD2	3:G:357:ARG:NH2	2.50	0.44
2:B:109:PRO:O	2:B:109:PRO:HG2	2.17	0.44
1:I:96:LEU:HD11	2:J:49:TYR:CD2	2.53	0.44
1:H:100:SER:HG	1:H:100(B):TRP:HD1	1.64	0.44
1:I:100(C):ASP:OD2	3:K:466:ARG:NH1	2.44	0.44
3:E:520:ALA:HB1	3:E:521:PRO:CD	2.48	0.44
3:G:378:LYS:HD2	3:G:378:LYS:HA	1.77	0.44
3:E:366:SER:O	3:E:370:ASN:HB2	2.18	0.44
1:I:148:GLU:N	1:I:149:PRO:HD3	2.33	0.43
3:G:447:GLY:HA2	3:G:498:GLN:HG3	2.00	0.43
2:L:54:ARG:HD2	2:L:58:ILE:O	2.18	0.43
1:D:146:PHE:HB3	1:D:147:PRO:HD3	2.00	0.43
1:I:96:LEU:HD22	1:I:100(J):GLY:O	2.18	0.43
2:L:167:GLN:OE1	2:L:173:ALA:HB2	2.18	0.43
2:F:162:THR:HG22	2:F:163:THR:O	2.18	0.43
2:J:111:ALA:O	2:J:139:PHE:HA	2.19	0.43
2:J:180:LEU:HB3	2:J:184:GLN:HG3	2.01	0.43
2:B:91:TRP:NE1	2:B:95(A):SER:HA	2.34	0.43
1:D:35:TYR:CE1	1:D:100(K):MET:HG2	2.53	0.43
1:A:148:GLU:N	1:A:149:PRO:HD2	2.34	0.43
2:J:35:TRP:HB2	2:J:48:ILE:HB	2.01	0.43
1:A:170:LEU:HD13	1:A:176:TYR:CE1	2.54	0.42
1:I:147:PRO:HB2	1:I:200:HIS:NE2	2.35	0.42
2:L:185:TRP:CZ2	2:L:208:PRO:HA	2.54	0.42
1:A:11:VAL:HG11	1:A:146:PHE:HZ	1.84	0.42
1:D:184:VAL:HG21	1:D:194:TYR:CZ	2.54	0.42
1:I:12:VAL:O	1:I:111:VAL:HA	2.18	0.42
2:L:180:LEU:HB3	2:L:184:GLN:HG3	2.01	0.42
3:K:520:ALA:HB1	3:K:521:PRO:CD	2.48	0.42
2:F:67:SER:OG	2:J:189:ARG:NH2	2.53	0.42
1:D:143:LYS:HB2	1:D:143:LYS:HE3	1.79	0.42
3:E:517:LEU:HD12	3:E:517:LEU:HA	1.92	0.42
1:H:148:GLU:HG2	1:H:176:TYR:CZ	2.54	0.42
3:G:357:ARG:HD3	3:G:396:TYR:CZ	2.55	0.42
2:F:139:PHE:CE1	2:F:173:ALA:HA	2.54	0.42
1:D:47:TRP:CG	2:F:96:VAL:HB	2.54	0.42
1:D:163:VAL:HG22	1:D:182:VAL:HB	2.01	0.42
1:H:124:LEU:HB3	2:L:118:PHE:CD2	2.55	0.42
2:J:140:TYR:HB3	2:J:141:PRO:HD3	2.01	0.42
1:A:58:TYR:CD2	2:B:95(A):SER:HB2	2.55	0.42
1:D:94:ARG:NH2	1:D:101:ASP:OD2	2.42	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:47:TRP:CG	2:L:96:VAL:HB	2.55	0.41
2:F:54:ARG:HD2	2:F:58:ILE:O	2.20	0.41
2:F:89:GLN:HA	2:F:97:VAL:O	2.21	0.41
1:A:16:ARG:NH2	1:D:100(A):GLY:HA2	2.35	0.41
1:H:146:PHE:HB2	1:H:175:LEU:CD2	2.51	0.41
1:I:146:PHE:HB2	1:I:175:LEU:CD2	2.50	0.41
3:K:408:ARG:NH2	3:K:414:GLN:HB3	2.34	0.41
1:I:163:VAL:HG22	1:I:182:VAL:HB	2.01	0.41
2:J:46:LEU:HD21	2:J:49:TYR:HB3	2.03	0.41
2:F:16:GLY:O	2:F:77:GLY:HA2	2.21	0.41
2:L:145:THR:HB	2:L:196:THR:HB	2.03	0.41
1:H:12:VAL:O	1:H:111:VAL:HA	2.21	0.41
2:B:11:VAL:O	2:B:104:LEU:HA	2.20	0.41
2:J:49:TYR:HD1	2:J:55:PRO:HG3	1.86	0.41
1:D:100(C):ASP:HB2	3:G:355:ARG:O	2.21	0.41
2:F:144:VAL:CG2	2:F:195:VAL:HG13	2.51	0.41
1:I:61:ASP:OD1	2:J:95(B):TYR:HE1	2.04	0.41
2:L:182:PRO:O	2:L:186:LYS:HG3	2.19	0.41
6:E:601:NAG:H3	6:E:601:NAG:C8	2.44	0.41
2:F:92:ASP:HB2	2:F:95(B):TYR:HB3	2.03	0.41
2:L:13:VAL:HG22	2:L:17:GLN:HB2	2.02	0.41
3:K:357:ARG:HD3	3:K:396:TYR:CZ	2.56	0.41
1:D:145:TYR:OH	1:D:178:LEU:HD23	2.21	0.40
3:E:388:ASN:HD22	3:E:388:ASN:HA	1.62	0.40
1:A:124:LEU:HB3	2:B:118:PHE:CD2	2.56	0.40
1:I:159:LEU:HD21	1:I:182:VAL:HG21	2.02	0.40
3:C:369:TYR:CZ	3:C:385:THR:HG22	2.56	0.40
3:E:395:VAL:HG22	3:E:515:PHE:CD1	2.56	0.40
3:K:382:VAL:HG13	3:K:430:THR:HG23	2.03	0.40
2:B:180:LEU:HB3	2:B:184:GLN:HG3	2.04	0.40
1:A:58:TYR:CE2	2:B:95(A):SER:HB2	2.56	0.40
1:D:145:TYR:HE1	1:D:148:GLU:O	2.04	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	227/231 (98%)	214 (94%)	13 (6%)	0	100	100
1	D	229/231 (99%)	222 (97%)	7 (3%)	0	100	100
1	H	229/231 (99%)	221 (96%)	8 (4%)	0	100	100
1	I	228/231 (99%)	219 (96%)	9 (4%)	0	100	100
2	B	209/214 (98%)	203 (97%)	6 (3%)	0	100	100
2	F	209/214 (98%)	200 (96%)	9 (4%)	0	100	100
2	J	210/214 (98%)	206 (98%)	4 (2%)	0	100	100
2	L	209/214 (98%)	200 (96%)	9 (4%)	0	100	100
3	C	197/205 (96%)	181 (92%)	16 (8%)	0	100	100
3	E	196/205 (96%)	182 (93%)	14 (7%)	0	100	100
3	G	195/205 (95%)	180 (92%)	15 (8%)	0	100	100
3	K	195/205 (95%)	183 (94%)	12 (6%)	0	100	100
All	All	2533/2600 (97%)	2411 (95%)	122 (5%)	0	100	100

There are no Ramachandran outliers to report.

### 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	193/195 (99%)	193 (100%)	0	100	100
1	D	195/195 (100%)	193 (99%)	2 (1%)	76	89
1	H	195/195 (100%)	193 (99%)	2 (1%)	76	89
1	I	194/195 (100%)	193 (100%)	1 (0%)	88	95
2	B	179/182 (98%)	177 (99%)	2 (1%)	73	88
2	F	179/182 (98%)	178 (99%)	1 (1%)	86	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	J	180/182 (99%)	179 (99%)	1 (1%)	86	94
2	L	179/182 (98%)	178 (99%)	1 (1%)	86	94
3	C	171/177 (97%)	171 (100%)	0	100	100
3	E	170/177 (96%)	169 (99%)	1 (1%)	86	94
3	G	169/177 (96%)	169 (100%)	0	100	100
3	K	169/177 (96%)	167 (99%)	2 (1%)	71	87
All	All	2173/2216 (98%)	2160 (99%)	13 (1%)	86	94

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	108	GLN
2	B	140	TYR
1	D	66	ARG
1	D	143	LYS
2	F	50	GLN
1	H	148	GLU
1	H	151	THR
1	I	148	GLU
2	J	95(B)	TYR
2	L	50	GLN
3	E	388	ASN
3	K	408	ARG
3	K	424	LYS

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

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates i

6 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	4,3	14,14,15	0.42	0	17,19,21	1.04	1 (5%)
4	BMA	M	2	4	11,11,12	0.29	0	15,15,17	1.26	3 (20%)
4	BMA	M	3	4	11,11,12	0.35	0	15,15,17	1.13	1 (6%)
5	NAG	N	1	3,5	14,14,15	0.32	0	17,19,21	1.16	1 (5%)
5	NAG	N	2	5	14,14,15	0.37	0	17,19,21	1.25	3 (17%)
5	BMA	N	3	5	11,11,12	0.28	0	15,15,17	0.69	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
4	NAG	M	1	4,3	-	3/6/23/26	0/1/1/1
4	BMA	M	2	4	-	1/2/19/22	0/1/1/1
4	BMA	M	3	4	-	0/2/19/22	0/1/1/1
5	NAG	N	1	3,5	-	1/6/23/26	0/1/1/1
5	NAG	N	2	5	-	2/6/23/26	0/1/1/1
5	BMA	N	3	5	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	N	2	NAG	C1-O5-C5	3.18	116.51	112.19
5	N	1	NAG	C1-O5-C5	2.96	116.20	112.19
4	M	1	NAG	C1-O5-C5	2.70	115.85	112.19
5	N	2	NAG	O5-C5-C6	2.24	110.71	107.20
4	M	2	BMA	C2-C3-C4	-2.21	107.07	110.89

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	M	3	BMA	C1-C2-C3	-2.15	107.02	109.67
4	M	2	BMA	C1-C2-C3	2.06	112.19	109.67
5	N	2	NAG	C2-N2-C7	-2.05	119.98	122.90
4	M	2	BMA	C3-C4-C5	-2.03	106.61	110.24

There are no chirality outliers.

All (8) torsion outliers are listed below:

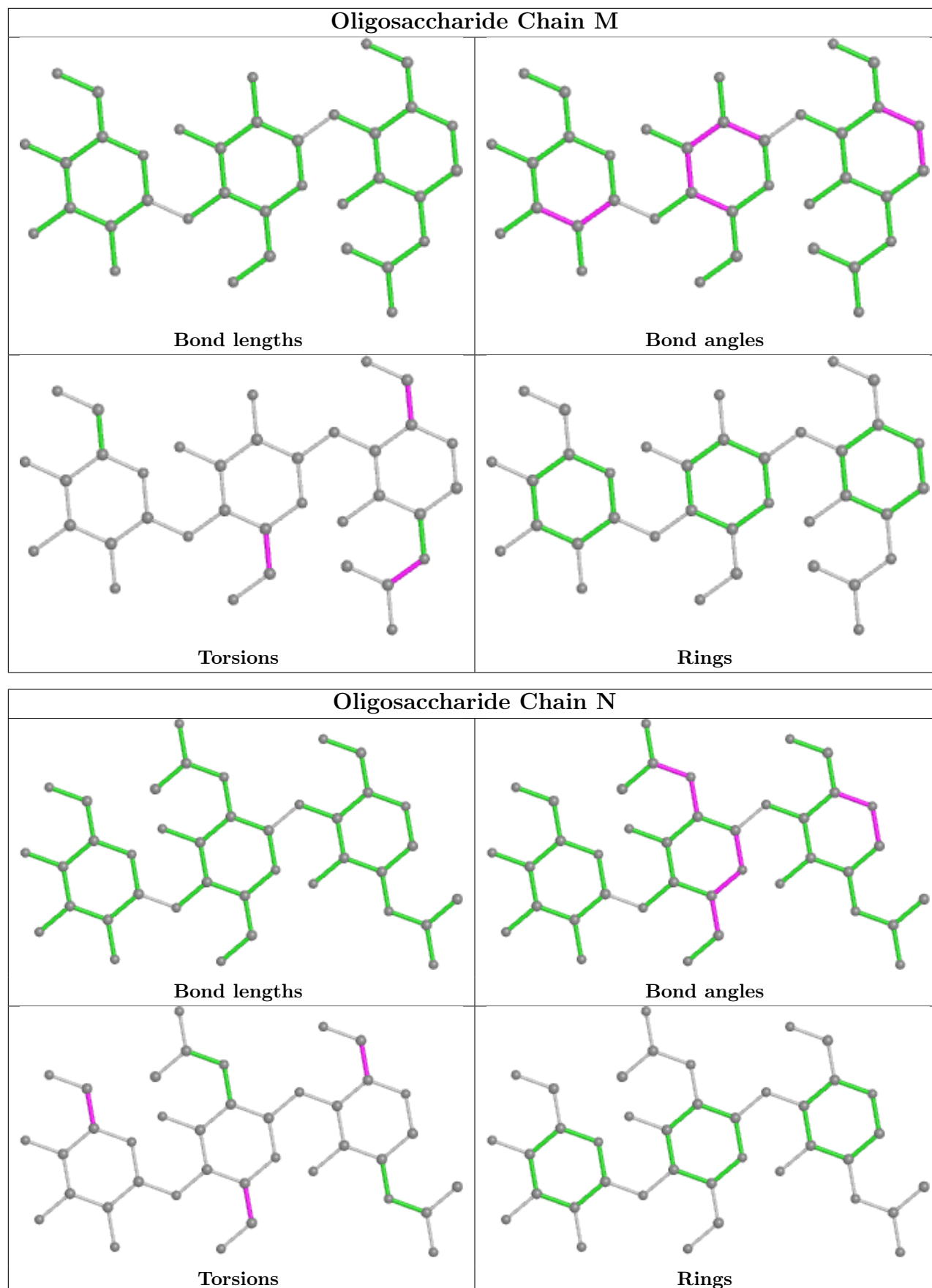
Mol	Chain	Res	Type	Atoms
4	M	1	NAG	C8-C7-N2-C2
4	M	1	NAG	O7-C7-N2-C2
5	N	2	NAG	C4-C5-C6-O6
5	N	2	NAG	O5-C5-C6-O6
5	N	1	NAG	O5-C5-C6-O6
5	N	3	BMA	O5-C5-C6-O6
4	M	2	BMA	O5-C5-C6-O6
4	M	1	NAG	C4-C5-C6-O6

There are no ring outliers.

6 monomers are involved in 5 short contacts:

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

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	NAG	C	601	3	14,14,15	0.47	0	17,19,21	0.89	1 (5%)
6	NAG	E	601	3	14,14,15	1.22	2 (14%)	17,19,21	1.48	2 (11%)

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
6	NAG	C	601	3	-	2/6/23/26	0/1/1/1
6	NAG	E	601	3	-	5/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	E	601	NAG	C1-C2	3.72	1.57	1.52
6	E	601	NAG	O5-C1	2.22	1.47	1.43

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	E	601	NAG	C2-N2-C7	4.20	128.89	122.90
6	E	601	NAG	C1-O5-C5	3.33	116.70	112.19
6	C	601	NAG	C1-O5-C5	2.29	115.29	112.19

There are no chirality outliers.

All (7) torsion outliers are listed below:



Mol	Chain	Res	Type	Atoms
6	E	601	NAG	C8-C7-N2-C2
6	E	601	NAG	O7-C7-N2-C2
6	E	601	NAG	C4-C5-C6-O6
6	E	601	NAG	O5-C5-C6-O6
6	C	601	NAG	O5-C5-C6-O6
6	C	601	NAG	C1-C2-N2-C7
6	E	601	NAG	C3-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	C	601	NAG	1	0
6	E	601	NAG	2	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [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	A	229/231 (99%)	0.06	7 (3%) 49 32	55, 78, 123, 212	0
1	D	231/231 (100%)	-0.02	4 (1%) 70 57	44, 69, 114, 208	0
1	H	231/231 (100%)	-0.05	7 (3%) 50 33	43, 62, 104, 198	0
1	I	230/231 (99%)	0.06	2 (0%) 84 75	44, 73, 138, 247	0
2	B	211/214 (98%)	0.28	7 (3%) 46 29	57, 92, 140, 160	0
2	F	211/214 (98%)	-0.12	1 (0%) 91 86	47, 63, 94, 138	0
2	J	212/214 (99%)	-0.13	2 (0%) 84 75	44, 65, 101, 178	0
2	L	211/214 (98%)	0.03	4 (1%) 66 53	49, 79, 123, 143	0
3	C	199/205 (97%)	0.34	5 (2%) 57 42	69, 107, 154, 217	0
3	E	198/205 (96%)	0.51	19 (9%) 8 4	64, 114, 174, 216	0
3	G	196/205 (95%)	0.07	3 (1%) 73 61	59, 89, 145, 196	0
3	K	197/205 (96%)	-0.05	2 (1%) 82 73	48, 69, 124, 153	0
All	All	2556/2600 (98%)	0.08	63 (2%) 57 42	43, 77, 140, 247	0

All (63) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	486	PHE	6.6
1	H	131	THR	6.0
1	A	132	SER	5.7
3	E	482	GLY	4.6
1	I	132	SER	4.4
1	H	130	SER	4.3
1	A	129	LYS	4.2
1	A	127	SER	4.2
1	A	131	THR	4.1
3	E	489	TYR	4.0
3	E	486	PHE	4.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	J	94	SER	3.9
3	K	484	GLU	3.9
1	A	128	SER	3.8
3	C	530	HIS	3.7
1	H	132	SER	3.7
1	D	132	SER	3.5
1	A	130	SER	3.5
3	E	492	LEU	3.3
3	E	485	GLY	3.3
3	C	447	GLY	3.3
2	B	156	LYS	3.3
1	H	129	LYS	3.3
1	I	131	THR	3.3
3	E	493	GLN	3.2
1	D	131	THR	3.2
3	E	447	GLY	3.2
2	B	140	TYR	3.0
1	D	216	CYS	3.0
1	D	130	SER	2.9
3	G	445	VAL	2.9
2	L	107	GLY	2.9
2	F	94	SER	2.7
3	G	519	HIS	2.7
2	B	179	SER	2.7
2	B	185	TRP	2.7
3	E	490	PHE	2.7
3	E	483	VAL	2.7
3	C	432	CYS	2.6
3	E	456	PHE	2.6
3	C	446	GLY	2.6
1	H	136	ALA	2.6
3	K	333	THR	2.6
3	G	481	ASN	2.6
3	E	335	LEU	2.5
3	E	488	CYS	2.4
3	E	372	ALA	2.4
3	E	481	ASN	2.4
2	B	206	VAL	2.3
3	E	455	LEU	2.3
2	B	155	VAL	2.3
2	L	157	ALA	2.3
1	H	128	SER	2.3

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Mol	Chain	Res	Type	RSRZ
3	E	449	TYR	2.3
2	J	93	SER	2.2
2	L	210	GLU	2.2
3	E	363	ALA	2.2
2	L	156	LYS	2.1
2	B	180	LEU	2.1
3	E	365	TYR	2.1
1	H	216	CYS	2.1
3	E	370	ASN	2.1
1	A	137	ALA	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](#)

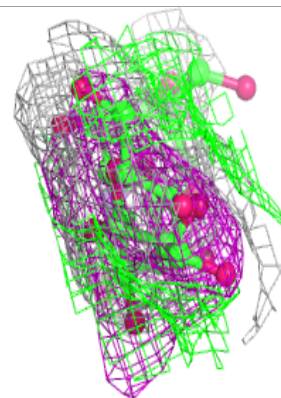
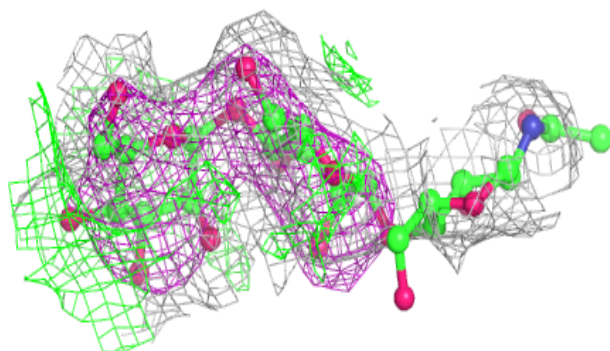
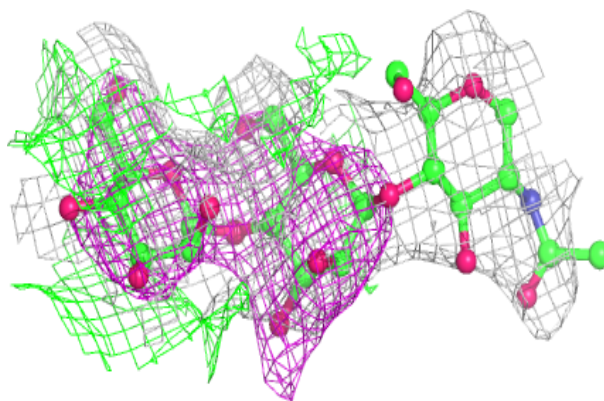
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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
5	BMA	N	3	11/12	0.28	0.37	158,162,169,170	0
5	NAG	N	2	14/15	0.75	0.24	123,142,153,159	0
4	NAG	M	1	14/15	0.80	0.32	106,127,138,142	0
4	BMA	M	3	11/12	0.80	0.33	30,30,30,30	0
4	BMA	M	2	11/12	0.88	0.31	30,30,30,30	0
5	NAG	N	1	14/15	0.89	0.20	80,92,116,118	0

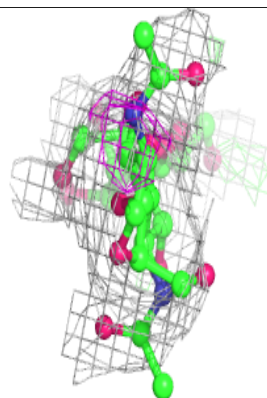
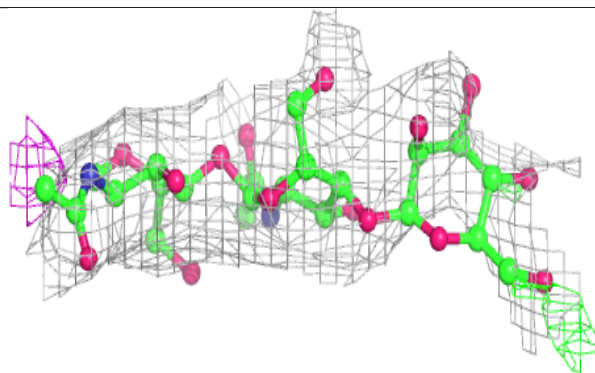
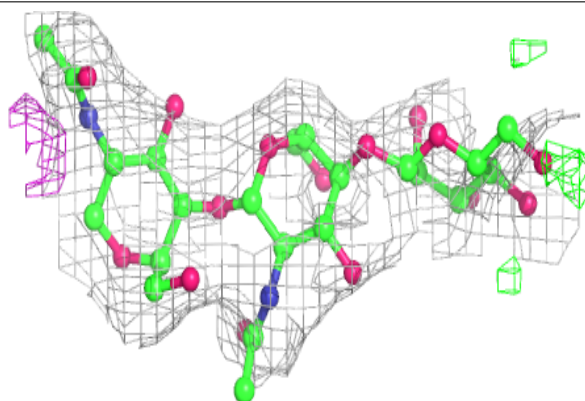
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around Chain M:**

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

**Electron density around Chain N:**

$2mF_o-DF_c$  (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
6	NAG	E	601	14/15	0.77	0.34	125,132,138,139	0
6	NAG	C	601	14/15	0.82	0.34	105,123,140,140	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.