



# wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 17, 2023 – 06:19 PM EST

PDB ID : 4WSX  
Title : The crystal structure of hemagglutinin from A/Jiangxi-Donghu/346/2013 influenza virus  
Authors : Yang, H.; Carney, P.J.; Chang, J.C.; Villanueva, J.M.; Stevens, J.  
Deposited on : 2014-10-28  
Resolution : 2.70 Å (reported)

This is a wwPDB X-ray Structure Validation Summary 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 : 2.36  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

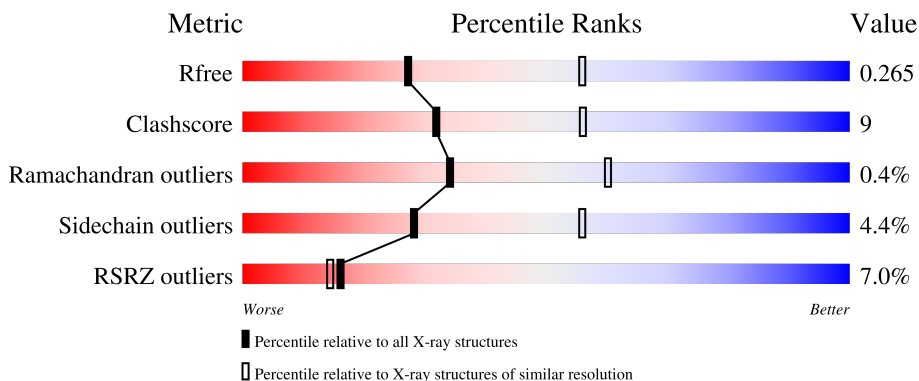
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.70 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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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	327	
1	C	327	
1	E	327	
1	G	327	
1	I	327	

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Mol	Chain	Length	Quality of chain	
1	K	327	5%	77% 19% ..
1	M	327	6%	77% 19% ..
1	O	327	6%	76% 20% ..
1	Q	327	7%	76% 20% ..
1	S	327	9%	77% 19% ..
1	U	327	9%	76% 20% ..
1	W	327	6%	78% 18% ..
2	B	174	5%	78% 17% ..
2	D	174	6%	77% 18% ..
2	F	174	7%	77% 18% ..
2	H	174	6%	77% 18% ..
2	J	174	19%	76% 20% ..
2	L	174	14%	76% 20% ..
2	N	174	18%	76% 18% 5% ..
2	P	174	7%	79% 16% ..
2	R	174	6%	77% 18% ..
2	T	174	7%	78% 17% ..
2	V	174	6%	78% 17% ..
2	X	174	17%	76% 18% ..

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 46260 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 Hemagglutinin HA1 chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	319	2441	1508	450	466	17	0	0	0
1	C	319	2441	1508	450	466	17	0	0	0
1	E	319	2441	1508	450	466	17	0	0	0
1	G	319	2441	1508	450	466	17	0	0	0
1	I	319	2441	1508	450	466	17	0	0	0
1	K	319	2441	1508	450	466	17	0	0	0
1	M	319	2441	1508	450	466	17	0	0	0
1	O	319	2441	1508	450	466	17	0	0	0
1	Q	319	2441	1508	450	466	17	0	0	0
1	S	319	2441	1508	450	466	17	0	0	0
1	U	319	2441	1508	450	466	17	0	0	0
1	W	319	2441	1508	450	466	17	0	0	0

- Molecule 2 is a protein called Hemagglutinin HA2 chain.

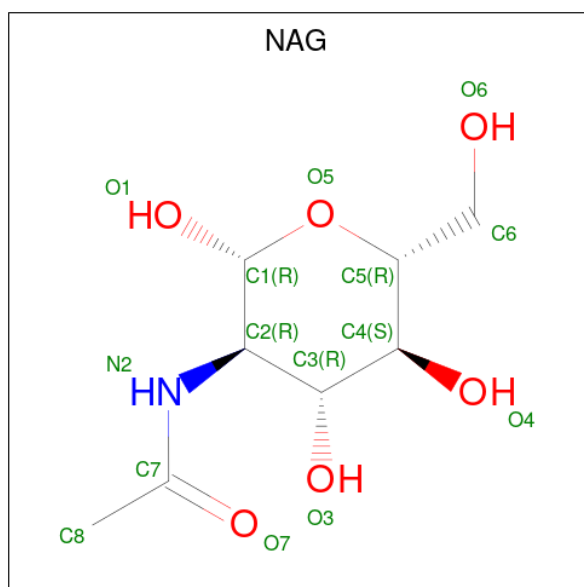
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	172	1386	856	240	282	8	0	0	0
2	D	172	1386	856	240	282	8	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	F	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	H	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	J	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	L	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	N	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	P	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	R	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	T	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	V	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0
2	X	172	Total 1386	C 856	N 240	O 282	S 8	0	0	0

- Molecule 3 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		
3	A	1	Total 14	C 8	N 1	O 5	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total	C	N	O	0	0
			14	8	1	5		
3	C	1	Total	C	N	O	0	0
			14	8	1	5		
3	D	1	Total	C	N	O	0	0
			14	8	1	5		
3	E	1	Total	C	N	O	0	0
			14	8	1	5		
3	F	1	Total	C	N	O	0	0
			14	8	1	5		
3	G	1	Total	C	N	O	0	0
			14	8	1	5		
3	H	1	Total	C	N	O	0	0
			14	8	1	5		
3	I	1	Total	C	N	O	0	0
			14	8	1	5		
3	J	1	Total	C	N	O	0	0
			14	8	1	5		
3	K	1	Total	C	N	O	0	0
			14	8	1	5		
3	L	1	Total	C	N	O	0	0
			14	8	1	5		
3	M	1	Total	C	N	O	0	0
			14	8	1	5		
3	N	1	Total	C	N	O	0	0
			14	8	1	5		
3	O	1	Total	C	N	O	0	0
			14	8	1	5		
3	P	1	Total	C	N	O	0	0
			14	8	1	5		
3	Q	1	Total	C	N	O	0	0
			14	8	1	5		
3	R	1	Total	C	N	O	0	0
			14	8	1	5		
3	S	1	Total	C	N	O	0	0
			14	8	1	5		
3	T	1	Total	C	N	O	0	0
			14	8	1	5		
3	U	1	Total	C	N	O	0	0
			14	8	1	5		
3	V	1	Total	C	N	O	0	0
			14	8	1	5		

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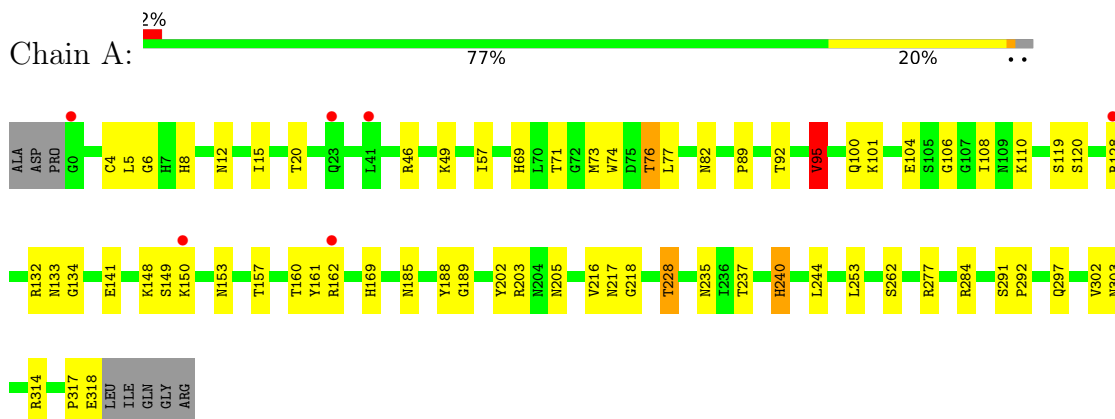
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>				<b>ZeroOcc</b>	<b>AltConf</b>
3	W	1	Total	C	N	O	0	0
			14	8	1	5		
3	X	1	Total	C	N	O	0	0
			14	8	1	5		

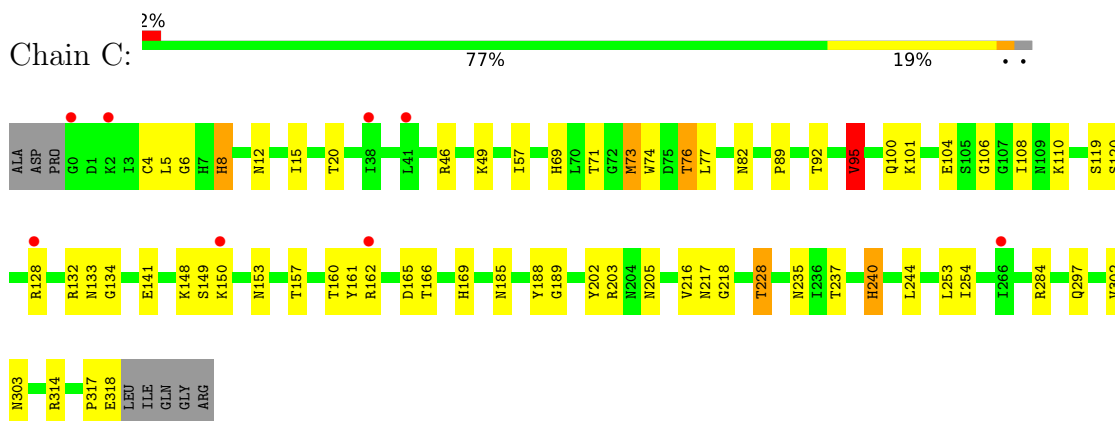
### 3 Residue-property plots [i](#)

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.

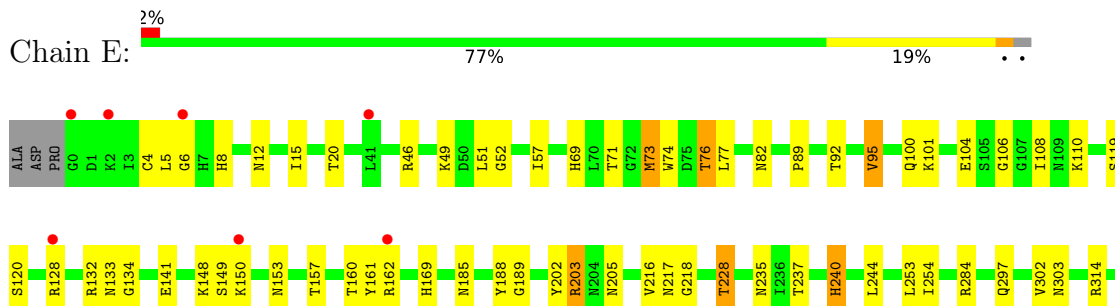
- Molecule 1: Hemagglutinin HA1 chain



- Molecule 1: Hemagglutinin HA1 chain



- Molecule 1: Hemagglutinin HA1 chain





P317  
E318  
LEU  
ILE  
GLN  
GLY  
ARG

- Molecule 1: Hemagglutinin HA1 chain

Chain G: 2% 77% 19% ..

ALA ASP PRO G0 C4 L5 G6 H7 H8 N12 N15 T20 T38 T43 R46 K49 K50 L51 G52 I57 H69 R70 L71 G72 M73 M74 D75 T76 L77 N82 P89 T92 Y95 Q100 K101 E104 S105 G106 G107 I108 N109 K110 S119

S120 R128 R132 N133 G134 E141 K148 S149 K150 N153 T157 T160 Y161 R162 H169 N185 Y188 Y202 R203 H204 N205 V216 N217 G218 T228 N235 I236 T237 H240 L244 L253 R284 S291 P292 Q297 V302 N303

R314  
P317  
E318  
LEU  
ILE  
GLN  
GLY  
ARG

- Molecule 1: Hemagglutinin HA1 chain

Chain I: 6% 76% 20% ..

ALA ASP PRO D1 K2 T3 C4 L5 G6 H7 H8 N12 G13 T14 I15 T20 Q23 R46 K49 I57 L68 H69 L70 T71 G72 M73 M74 D75 T76 L77 N82 A85 P89 T92 Y95 Q100 K101 E104 S105 G106 G107 I108 N109 K110

G118 S119 I121 T127 R128 R132 N133 G134 E141 K148 S149 K150 G151 Q152 N153 T157 Y160 Y161 R162 H169 N185 Y188 G189 S196 V197 Y202 R203 V216 N217 G218 Q219 T228 G233 D234 N235 I236 T237 H240 L244 L253 R284

Q297 V302 N303 R304 G312 M313 N315 V316 P317 E318 LEU ILE GLN GLY ARG

- Molecule 1: Hemagglutinin HA1 chain

Chain K: 5% 77% 19% ..

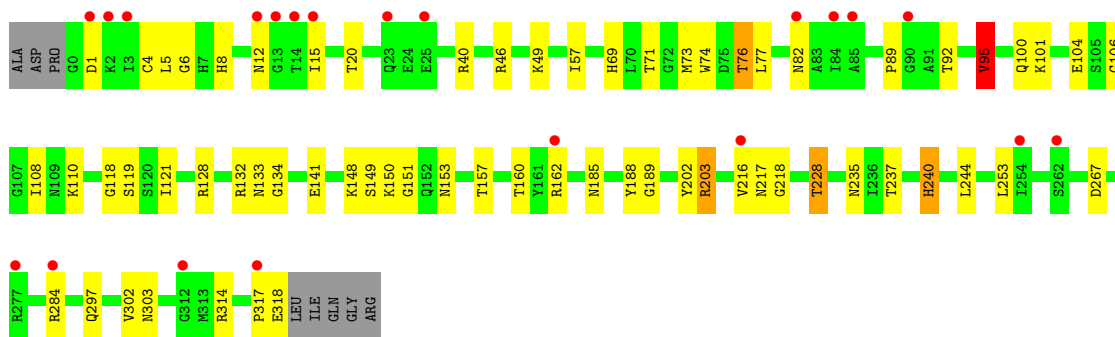
ALA ASP PRO D1 C4 L5 G6 H7 H8 N12 G13 T14 I15 Q23 R46 K49 I57 L60 H69 L70 T71 G72 M73 M74 D75 L77 N82 P89 G90 A91 T92 Y95 Q100 K101 E104 S105 G106 G107 I108 N109 K110 G118 S119 S120

I121 R128 N133 G134 E141 K148 S149 G151 N153 T157 T160 Y161 R162 N185 Y188 G189 R203 V216 N217 G218 Q221 T228 N235 I236 T237 H240 L244 L253 R284 S291 P292 G296 Q297 V302 N303

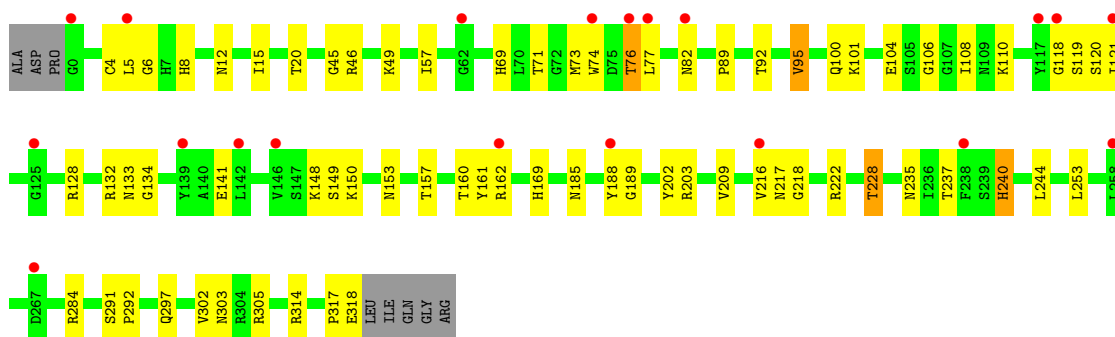
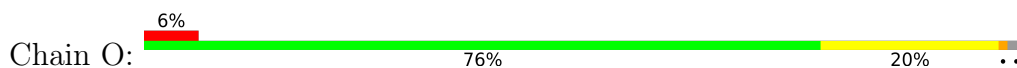
R314 N315 V316 P317 E318 LEU ILE GLN GLY ARG

- Molecule 1: Hemagglutinin HA1 chain

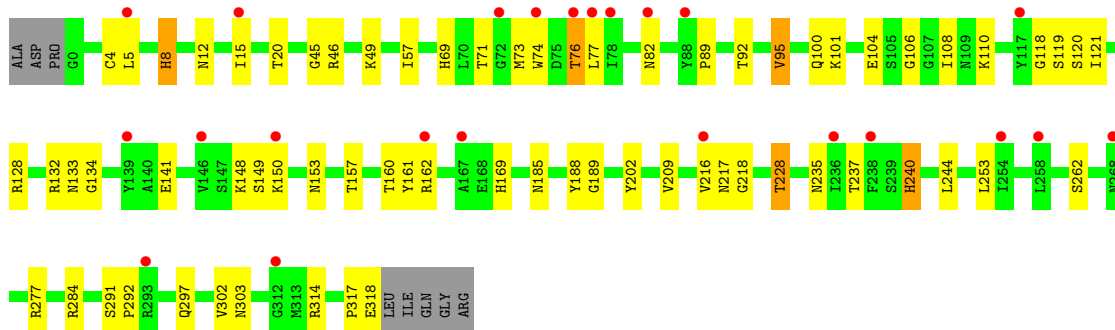
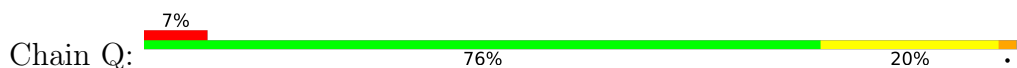
Chain M: 6% 77% 19% ..



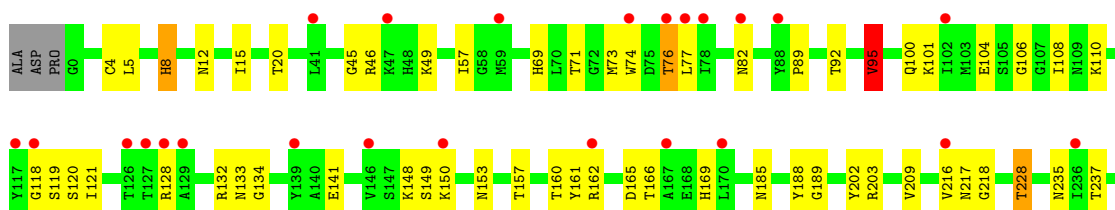
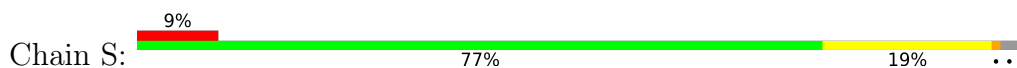
• Molecule 1: Hemagglutinin HA1 chain

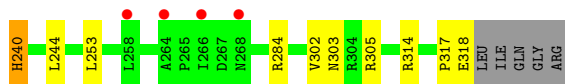


• Molecule 1: Hemagglutinin HA1 chain

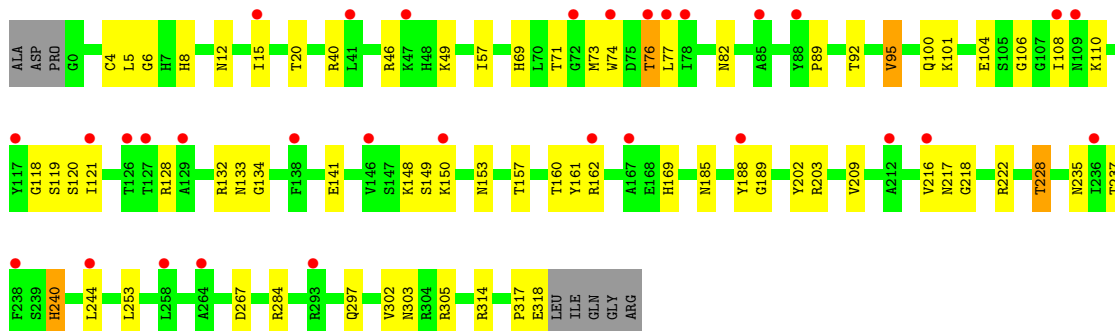
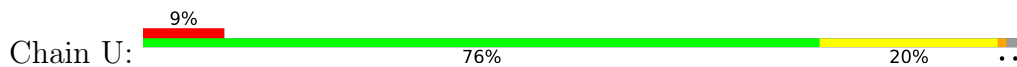


• Molecule 1: Hemagglutinin HA1 chain

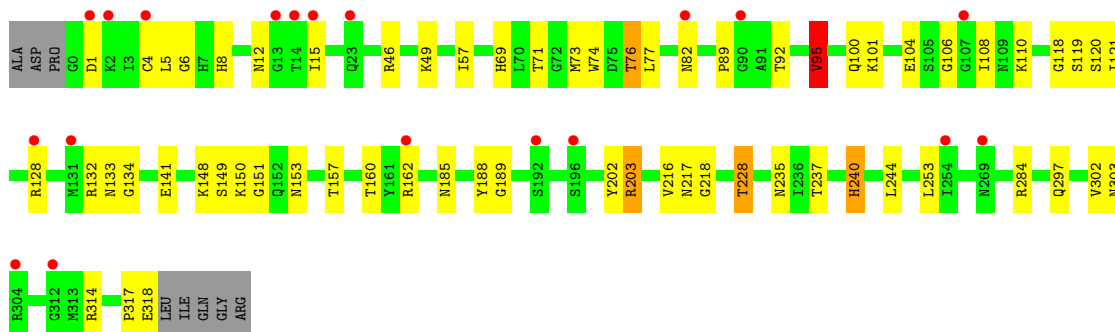
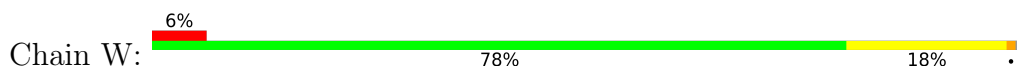




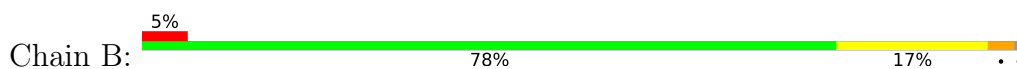
• Molecule 1: Hemagglutinin HA1 chain



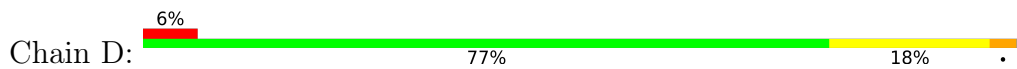
• Molecule 1: Hemagglutinin HA1 chain



• Molecule 2: Hemagglutinin HA2 chain

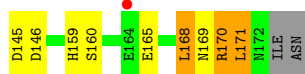
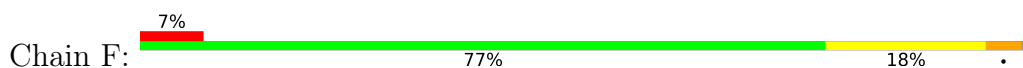


• Molecule 2: Hemagglutinin HA2 chain

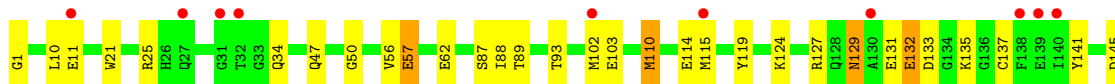
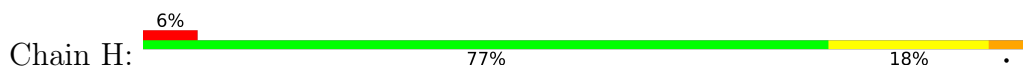




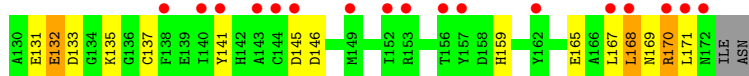
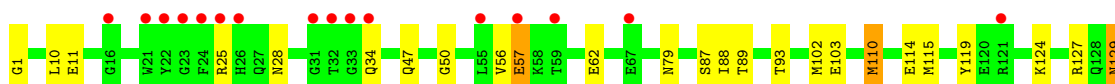
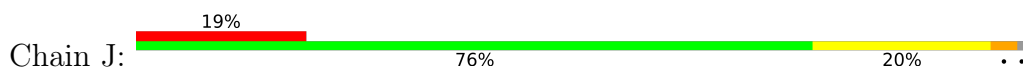
- Molecule 2: Hemagglutinin HA2 chain



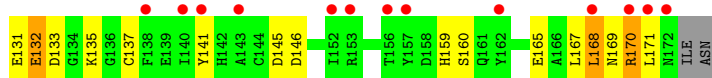
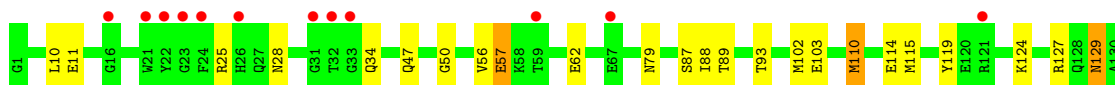
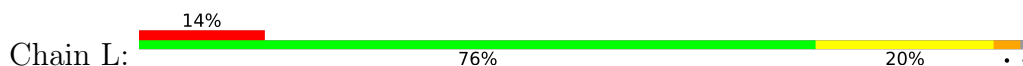
- Molecule 2: Hemagglutinin HA2 chain



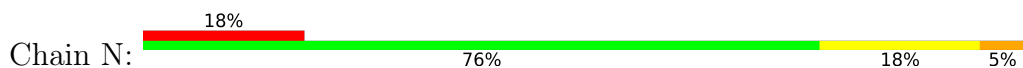
- Molecule 2: Hemagglutinin HA2 chain

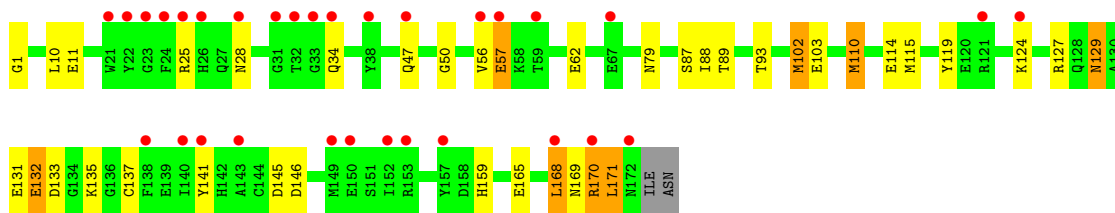


- Molecule 2: Hemagglutinin HA2 chain

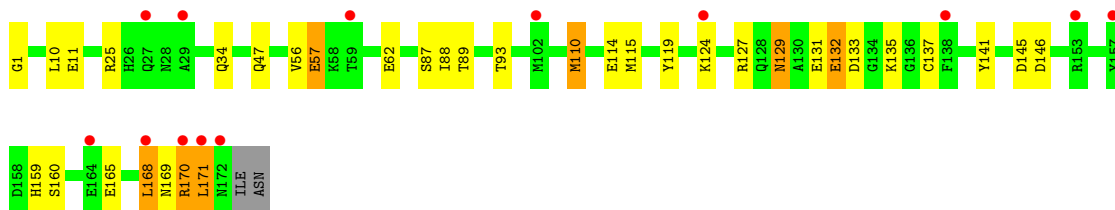
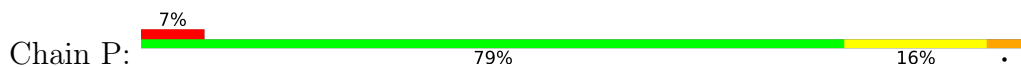


- Molecule 2: Hemagglutinin HA2 chain

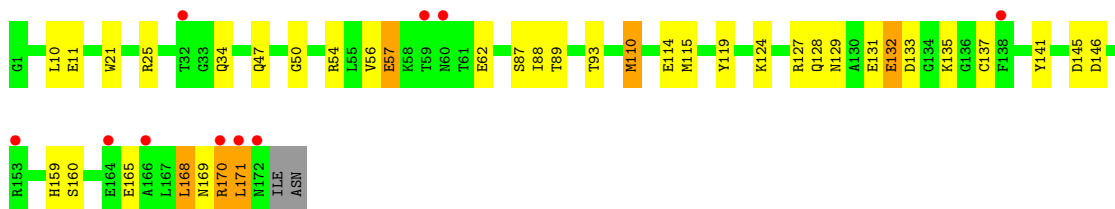
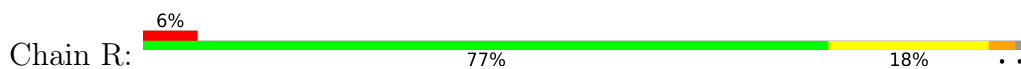




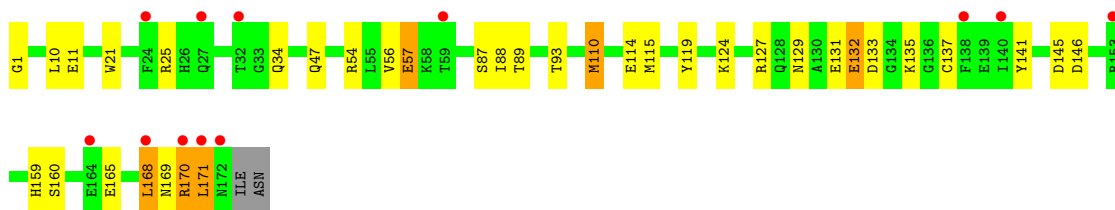
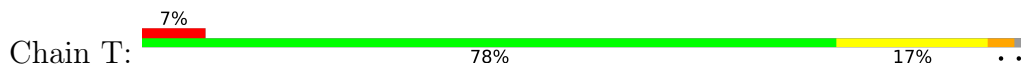
• Molecule 2: Hemagglutinin HA2 chain



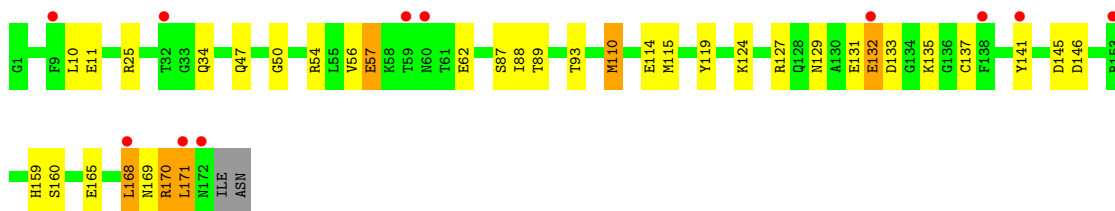
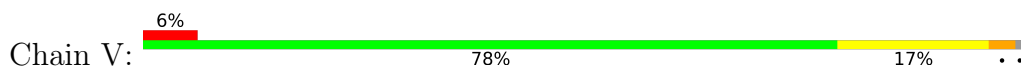
• Molecule 2: Hemagglutinin HA2 chain




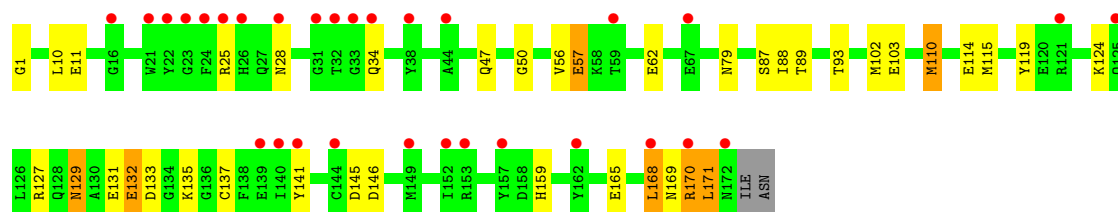
• Molecule 2: Hemagglutinin HA2 chain



• Molecule 2: Hemagglutinin HA2 chain



## ● Molecule 2: Hemagglutinin HA2 chain

Chain X:  17% 76% 18%

## 4 Data and refinement statistics i

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	217.40Å 217.61Å 146.27Å 90.00° 89.98° 90.00°	Depositor
Resolution (Å)	48.76 – 2.70 48.62 – 2.70	Depositor EDS
% Data completeness (in resolution range)	99.9 (48.76-2.70) 99.6 (48.62-2.70)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.67 (at 2.69Å)	Xtrriage
Refinement program	REFMAC 5.8.0049	Depositor
R, $R_{free}$	0.243 , 0.266 0.243 , 0.265	Depositor DCC
$R_{free}$ test set	9317 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	62.6	Xtrriage
Anisotropy	0.194	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 44.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.466 for k,h,-l 0.460 for -k,-h,-l 0.001 for -1/2*h-1/2*k+1,1/2*h+1/2*k+1,-1/2*h+1/2*k 0.002 for -1/2*h-1/2*k-1,1/2*h+1/2*k-1,1/2*h-1/2*k 0.001 for -1/2*h+1/2*k-1,-1/2*h+1/2*k+1,1/2*h+1/2*k 0.002 for -1/2*h+1/2*k+1,-1/2*h+1/2*k-1,-1/2*h-1/2*k 0.003 for -1/2*h+1/2*k+1,1/2*h-1/2*k+1,1/2*h+1/2*k 0.003 for -1/2*h-1/2*k+1,-1/2*h-1/2*k-1,1/2*h-1/2*k 0.002 for -1/2*h-1/2*k-1,-1/2*h-1/2*k+1,-1/2*h+1/2*k 0.004 for -1/2*h+1/2*k-1,1/2*h-1/2*k-1,-1/2*h-1/2*k 0.466 for -h,-k,l	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	46260	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	86.0	wwPDB-VP

<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.

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.79% of the height of the origin peak. No significant pseudotranslation is detected.*



## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.66	0/2490	0.80	1/3373 (0.0%)
1	C	0.66	0/2490	0.80	1/3373 (0.0%)
1	E	0.66	0/2490	0.80	1/3373 (0.0%)
1	G	0.66	0/2490	0.80	1/3373 (0.0%)
1	I	0.58	0/2490	0.79	3/3373 (0.1%)
1	K	0.59	0/2490	0.78	3/3373 (0.1%)
1	M	0.58	0/2490	0.78	3/3373 (0.1%)
1	O	0.57	0/2490	0.78	0/3373
1	Q	0.56	0/2490	0.77	0/3373
1	S	0.57	0/2490	0.77	1/3373 (0.0%)
1	U	0.57	0/2490	0.77	0/3373
1	W	0.59	0/2490	0.78	3/3373 (0.1%)
2	B	0.65	0/1411	0.75	0/1904
2	D	0.65	1/1411 (0.1%)	0.75	0/1904
2	F	0.66	1/1411 (0.1%)	0.76	0/1904
2	H	0.66	1/1411 (0.1%)	0.75	0/1904
2	J	0.64	1/1411 (0.1%)	0.73	0/1904
2	L	0.63	0/1411	0.73	0/1904
2	N	0.64	1/1411 (0.1%)	0.73	1/1904 (0.1%)
2	P	0.64	1/1411 (0.1%)	0.76	0/1904
2	R	0.63	0/1411	0.76	1/1904 (0.1%)
2	T	0.64	1/1411 (0.1%)	0.77	1/1904 (0.1%)
2	V	0.64	0/1411	0.76	1/1904 (0.1%)
2	X	0.63	1/1411 (0.1%)	0.73	0/1904
All	All	0.62	8/46812 (0.0%)	0.77	21/63324 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	C	0	2
1	E	0	2
1	G	0	2
1	I	0	2
1	K	0	2
1	M	0	2
1	O	0	2
1	Q	0	2
1	S	0	2
1	U	0	2
1	W	0	2
All	All	0	24

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	1	GLY	N-CA	5.82	1.54	1.46
2	H	1	GLY	N-CA	5.37	1.54	1.46
2	N	1	GLY	N-CA	5.31	1.54	1.46
2	J	1	GLY	N-CA	5.28	1.53	1.46
2	P	1	GLY	N-CA	5.12	1.53	1.46

The worst 5 of 21 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	N	102	MET	CG-SD-CE	-5.41	91.54	100.20
1	I	95	VAL	CB-CA-C	-5.38	101.17	111.40
1	W	95	VAL	CB-CA-C	-5.37	101.20	111.40
1	I	203	ARG	CG-CD-NE	-5.36	100.54	111.80
2	R	54	ARG	NE-CZ-NH1	5.31	122.95	120.30

There are no chirality outliers.

5 of 24 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	149	SER	Peptide
1	A	82	ASN	Peptide
1	C	149	SER	Peptide
1	C	82	ASN	Peptide
1	E	82	ASN	Peptide

## 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	2441	0	2392	42	0
1	C	2441	0	2392	44	0
1	E	2441	0	2392	41	0
1	G	2441	0	2392	42	0
1	I	2441	0	2392	40	0
1	K	2441	0	2392	39	0
1	M	2441	0	2392	38	0
1	O	2441	0	2392	46	0
1	Q	2441	0	2392	44	0
1	S	2441	0	2392	46	0
1	U	2441	0	2392	43	0
1	W	2441	0	2392	37	0
2	B	1386	0	1284	37	0
2	D	1386	0	1284	38	0
2	F	1386	0	1284	41	0
2	H	1386	0	1284	41	0
2	J	1386	0	1284	45	0
2	L	1386	0	1284	44	0
2	N	1386	0	1284	41	1
2	P	1386	0	1284	37	0
2	R	1386	0	1284	36	0
2	T	1386	0	1284	34	0
2	V	1386	0	1284	36	0
2	X	1386	0	1284	41	0
3	A	14	0	13	0	0
3	B	14	0	13	0	0
3	C	14	0	13	0	0
3	D	14	0	13	0	0
3	E	14	0	13	0	0
3	F	14	0	13	0	0
3	G	14	0	13	0	0
3	H	14	0	13	0	0
3	I	14	0	13	1	0
3	J	14	0	13	1	0
3	K	14	0	13	0	0
3	L	14	0	13	1	0
3	M	14	0	13	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	N	14	0	13	1	0
3	O	14	0	13	0	0
3	P	14	0	13	0	0
3	Q	14	0	13	0	0
3	R	14	0	13	0	0
3	S	14	0	13	0	0
3	T	14	0	13	0	0
3	U	14	0	13	0	0
3	V	14	0	13	0	0
3	W	14	0	13	0	0
3	X	14	0	13	1	0
All	All	46260	0	44424	806	1

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 9.

The worst 5 of 806 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)
2:T:89:THR:O	2:T:93:THR:HG23	1.65	0.97
2:V:89:THR:O	2:V:93:THR:HG23	1.66	0.96
2:L:89:THR:O	2:L:93:THR:HG23	1.66	0.96
2:P:89:THR:O	2:P:93:THR:HG23	1.66	0.95
2:X:89:THR:O	2:X:93:THR:HG23	1.66	0.95

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:171:LEU:CG	2:N:171:LEU:CD1[2_656]	1.80	0.40

## 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	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	C	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	E	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	G	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	I	317/327 (97%)	299 (94%)	17 (5%)	1 (0%)	41	66
1	K	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	M	317/327 (97%)	299 (94%)	17 (5%)	1 (0%)	41	66
1	O	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	Q	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
1	S	317/327 (97%)	299 (94%)	17 (5%)	1 (0%)	41	66
1	U	317/327 (97%)	299 (94%)	17 (5%)	1 (0%)	41	66
1	W	317/327 (97%)	300 (95%)	16 (5%)	1 (0%)	41	66
2	B	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	D	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	F	170/174 (98%)	157 (92%)	12 (7%)	1 (1%)	25	50
2	H	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	J	170/174 (98%)	157 (92%)	12 (7%)	1 (1%)	25	50
2	L	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	N	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	P	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	R	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	T	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	V	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
2	X	170/174 (98%)	158 (93%)	11 (6%)	1 (1%)	25	50
All	All	5844/6012 (97%)	5490 (94%)	330 (6%)	24 (0%)	34	60

5 of 24 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	150	LYS
2	B	170	ARG
1	C	150	LYS
2	D	170	ARG

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Mol	Chain	Res	Type
1	E	150	LYS

### 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	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	C	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	E	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	G	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	I	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	K	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	M	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	O	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	Q	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	S	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	U	269/275 (98%)	257 (96%)	12 (4%)	27	55
1	W	269/275 (98%)	257 (96%)	12 (4%)	27	55
2	B	146/148 (99%)	140 (96%)	6 (4%)	30	59
2	D	146/148 (99%)	140 (96%)	6 (4%)	30	59
2	F	146/148 (99%)	139 (95%)	7 (5%)	25	53
2	H	146/148 (99%)	140 (96%)	6 (4%)	30	59
2	J	146/148 (99%)	141 (97%)	5 (3%)	37	66
2	L	146/148 (99%)	140 (96%)	6 (4%)	30	59
2	N	146/148 (99%)	140 (96%)	6 (4%)	30	59
2	P	146/148 (99%)	139 (95%)	7 (5%)	25	53
2	R	146/148 (99%)	139 (95%)	7 (5%)	25	53
2	T	146/148 (99%)	139 (95%)	7 (5%)	25	53
2	V	146/148 (99%)	139 (95%)	7 (5%)	25	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	X	146/148 (99%)	140 (96%)	6 (4%)	30	59
All	All	4980/5076 (98%)	4760 (96%)	220 (4%)	28	56

5 of 220 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	101	LYS
2	P	168	LEU
2	X	171	LEU
2	V	160	SER
1	M	314	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 64 such sidechains are listed below:

Mol	Chain	Res	Type
1	U	240	HIS
1	W	8	HIS
1	I	240	HIS
1	I	219	GLN
1	W	159	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](#)

24 non-standard protein/DNA/RNA residues 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	$\# Z  > 2$
3	NAG	V	301	2	14,14,15	0.83	0	17,19,21	2.03	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	NAG	M	401	1	14,14,15	0.48	0	17,19,21	2.99	8 (47%)
3	NAG	D	301	2	14,14,15	1.25	2 (14%)	17,19,21	3.10	9 (52%)
3	NAG	S	401	1	14,14,15	0.52	0	17,19,21	1.51	3 (17%)
3	NAG	P	301	2	14,14,15	0.77	0	17,19,21	1.52	3 (17%)
3	NAG	I	401	1	14,14,15	0.56	0	17,19,21	2.70	5 (29%)
3	NAG	E	401	1	14,14,15	0.55	0	17,19,21	1.90	4 (23%)
3	NAG	T	301	2	14,14,15	0.80	1 (7%)	17,19,21	1.84	4 (23%)
3	NAG	W	401	1	14,14,15	0.47	0	17,19,21	2.85	6 (35%)
3	NAG	B	301	2	14,14,15	1.26	1 (7%)	17,19,21	3.00	9 (52%)
3	NAG	Q	401	1	14,14,15	0.52	0	17,19,21	1.61	3 (17%)
3	NAG	F	301	2	14,14,15	1.18	1 (7%)	17,19,21	2.99	9 (52%)
3	NAG	K	401	1	14,14,15	0.46	0	17,19,21	2.78	3 (17%)
3	NAG	J	301	2	14,14,15	0.72	0	17,19,21	2.05	3 (17%)
3	NAG	X	301	2	14,14,15	0.78	0	17,19,21	2.57	6 (35%)
3	NAG	N	301	2	14,14,15	0.75	0	17,19,21	2.41	4 (23%)
3	NAG	A	401	1	14,14,15	0.56	0	17,19,21	2.18	6 (35%)
3	NAG	H	301	2	14,14,15	1.19	1 (7%)	17,19,21	2.61	7 (41%)
3	NAG	C	401	1	14,14,15	0.46	0	17,19,21	1.81	3 (17%)
3	NAG	L	301	2	14,14,15	0.84	0	17,19,21	2.55	5 (29%)
3	NAG	G	401	1	14,14,15	0.63	0	17,19,21	2.06	3 (17%)
3	NAG	O	401	1	14,14,15	0.49	0	17,19,21	1.61	2 (11%)
3	NAG	R	301	2	14,14,15	0.95	1 (7%)	17,19,21	1.89	4 (23%)
3	NAG	U	401	1	14,14,15	0.49	0	17,19,21	1.54	3 (17%)

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
3	NAG	V	301	2	-	2/6/23/26	0/1/1/1
3	NAG	M	401	1	-	2/6/23/26	0/1/1/1
3	NAG	D	301	2	-	2/6/23/26	0/1/1/1
3	NAG	S	401	1	-	2/6/23/26	0/1/1/1
3	NAG	P	301	2	-	2/6/23/26	0/1/1/1
3	NAG	I	401	1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	E	401	1	-	2/6/23/26	0/1/1/1
3	NAG	T	301	2	-	2/6/23/26	0/1/1/1
3	NAG	W	401	1	-	2/6/23/26	0/1/1/1
3	NAG	B	301	2	-	1/6/23/26	0/1/1/1
3	NAG	Q	401	1	-	1/6/23/26	0/1/1/1
3	NAG	F	301	2	-	1/6/23/26	0/1/1/1
3	NAG	K	401	1	-	2/6/23/26	0/1/1/1
3	NAG	J	301	2	-	2/6/23/26	0/1/1/1
3	NAG	X	301	2	-	2/6/23/26	0/1/1/1
3	NAG	N	301	2	-	2/6/23/26	0/1/1/1
3	NAG	A	401	1	-	2/6/23/26	0/1/1/1
3	NAG	H	301	2	-	2/6/23/26	0/1/1/1
3	NAG	C	401	1	-	2/6/23/26	0/1/1/1
3	NAG	L	301	2	-	0/6/23/26	0/1/1/1
3	NAG	G	401	1	-	2/6/23/26	0/1/1/1
3	NAG	O	401	1	-	0/6/23/26	0/1/1/1
3	NAG	R	301	2	-	2/6/23/26	0/1/1/1
3	NAG	U	401	1	-	1/6/23/26	0/1/1/1

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	301	NAG	O7-C7	3.19	1.30	1.23
3	B	301	NAG	O7-C7	3.06	1.30	1.23
3	F	301	NAG	O7-C7	2.88	1.29	1.23
3	D	301	NAG	O7-C7	2.83	1.29	1.23
3	D	301	NAG	O5-C1	2.28	1.47	1.43

The worst 5 of 115 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	M	401	NAG	C1-O5-C5	9.68	125.31	112.19
3	K	401	NAG	C1-O5-C5	9.58	125.17	112.19
3	I	401	NAG	C1-O5-C5	9.57	125.16	112.19
3	W	401	NAG	C1-O5-C5	8.92	124.28	112.19
3	X	301	NAG	C1-O5-C5	8.57	123.80	112.19

There are no chirality outliers.

5 of 40 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	M	401	NAG	O5-C5-C6-O6
3	X	301	NAG	O5-C5-C6-O6
3	P	301	NAG	O5-C5-C6-O6
3	E	401	NAG	O5-C5-C6-O6
3	K	401	NAG	O5-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	I	401	NAG	1	0
3	J	301	NAG	1	0
3	X	301	NAG	1	0
3	N	301	NAG	1	0
3	L	301	NAG	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

24 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$
3	NAG	V	301	2	14,14,15	0.83	0	17,19,21	2.03	3 (17%)
3	NAG	M	401	1	14,14,15	0.48	0	17,19,21	2.99	8 (47%)
3	NAG	D	301	2	14,14,15	1.25	2 (14%)	17,19,21	3.10	9 (52%)
3	NAG	S	401	1	14,14,15	0.52	0	17,19,21	1.51	3 (17%)
3	NAG	P	301	2	14,14,15	0.77	0	17,19,21	1.52	3 (17%)
3	NAG	I	401	1	14,14,15	0.56	0	17,19,21	2.70	5 (29%)
3	NAG	E	401	1	14,14,15	0.55	0	17,19,21	1.90	4 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	NAG	T	301	2	14,14,15	0.80	1 (7%)	17,19,21	1.84	4 (23%)
3	NAG	W	401	1	14,14,15	0.47	0	17,19,21	2.85	6 (35%)
3	NAG	B	301	2	14,14,15	1.26	1 (7%)	17,19,21	3.00	9 (52%)
3	NAG	Q	401	1	14,14,15	0.52	0	17,19,21	1.61	3 (17%)
3	NAG	F	301	2	14,14,15	1.18	1 (7%)	17,19,21	2.99	9 (52%)
3	NAG	K	401	1	14,14,15	0.46	0	17,19,21	2.78	3 (17%)
3	NAG	J	301	2	14,14,15	0.72	0	17,19,21	2.05	3 (17%)
3	NAG	X	301	2	14,14,15	0.78	0	17,19,21	2.57	6 (35%)
3	NAG	N	301	2	14,14,15	0.75	0	17,19,21	2.41	4 (23%)
3	NAG	A	401	1	14,14,15	0.56	0	17,19,21	2.18	6 (35%)
3	NAG	H	301	2	14,14,15	1.19	1 (7%)	17,19,21	2.61	7 (41%)
3	NAG	C	401	1	14,14,15	0.46	0	17,19,21	1.81	3 (17%)
3	NAG	L	301	2	14,14,15	0.84	0	17,19,21	2.55	5 (29%)
3	NAG	G	401	1	14,14,15	0.63	0	17,19,21	2.06	3 (17%)
3	NAG	O	401	1	14,14,15	0.49	0	17,19,21	1.61	2 (11%)
3	NAG	R	301	2	14,14,15	0.95	1 (7%)	17,19,21	1.89	4 (23%)
3	NAG	U	401	1	14,14,15	0.49	0	17,19,21	1.54	3 (17%)

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
3	NAG	V	301	2	-	2/6/23/26	0/1/1/1
3	NAG	M	401	1	-	2/6/23/26	0/1/1/1
3	NAG	D	301	2	-	2/6/23/26	0/1/1/1
3	NAG	S	401	1	-	2/6/23/26	0/1/1/1
3	NAG	P	301	2	-	2/6/23/26	0/1/1/1
3	NAG	I	401	1	-	2/6/23/26	0/1/1/1
3	NAG	E	401	1	-	2/6/23/26	0/1/1/1
3	NAG	T	301	2	-	2/6/23/26	0/1/1/1
3	NAG	W	401	1	-	2/6/23/26	0/1/1/1
3	NAG	B	301	2	-	1/6/23/26	0/1/1/1
3	NAG	Q	401	1	-	1/6/23/26	0/1/1/1
3	NAG	F	301	2	-	1/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	K	401	1	-	2/6/23/26	0/1/1/1
3	NAG	J	301	2	-	2/6/23/26	0/1/1/1
3	NAG	X	301	2	-	2/6/23/26	0/1/1/1
3	NAG	N	301	2	-	2/6/23/26	0/1/1/1
3	NAG	A	401	1	-	2/6/23/26	0/1/1/1
3	NAG	H	301	2	-	2/6/23/26	0/1/1/1
3	NAG	C	401	1	-	2/6/23/26	0/1/1/1
3	NAG	L	301	2	-	0/6/23/26	0/1/1/1
3	NAG	G	401	1	-	2/6/23/26	0/1/1/1
3	NAG	O	401	1	-	0/6/23/26	0/1/1/1
3	NAG	R	301	2	-	2/6/23/26	0/1/1/1
3	NAG	U	401	1	-	1/6/23/26	0/1/1/1

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	301	NAG	O7-C7	3.19	1.30	1.23
3	B	301	NAG	O7-C7	3.06	1.30	1.23
3	F	301	NAG	O7-C7	2.88	1.29	1.23
3	D	301	NAG	O7-C7	2.83	1.29	1.23
3	D	301	NAG	O5-C1	2.28	1.47	1.43

The worst 5 of 115 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	M	401	NAG	C1-O5-C5	9.68	125.31	112.19
3	K	401	NAG	C1-O5-C5	9.58	125.17	112.19
3	I	401	NAG	C1-O5-C5	9.57	125.16	112.19
3	W	401	NAG	C1-O5-C5	8.92	124.28	112.19
3	X	301	NAG	C1-O5-C5	8.57	123.80	112.19

There are no chirality outliers.

5 of 40 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	M	401	NAG	O5-C5-C6-O6
3	X	301	NAG	O5-C5-C6-O6
3	P	301	NAG	O5-C5-C6-O6
3	E	401	NAG	O5-C5-C6-O6
3	K	401	NAG	O5-C5-C6-O6

There are no ring outliers.

5 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	I	401	NAG	1	0
3	J	301	NAG	1	0
3	X	301	NAG	1	0
3	N	301	NAG	1	0
3	L	301	NAG	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	A	319/327 (97%)	0.04	6 (1%) 66 69	44, 62, 87, 130	0
1	C	319/327 (97%)	0.09	8 (2%) 57 59	44, 63, 87, 131	0
1	E	319/327 (97%)	0.08	7 (2%) 62 63	43, 62, 87, 132	0
1	G	319/327 (97%)	0.03	6 (1%) 66 69	42, 63, 86, 131	0
1	I	319/327 (97%)	0.40	19 (5%) 21 20	53, 80, 117, 165	0
1	K	319/327 (97%)	0.39	17 (5%) 26 25	53, 80, 117, 158	0
1	M	319/327 (97%)	0.37	21 (6%) 18 16	53, 79, 117, 161	0
1	O	319/327 (97%)	0.47	20 (6%) 20 19	55, 88, 122, 149	0
1	Q	319/327 (97%)	0.44	23 (7%) 15 13	55, 88, 121, 154	0
1	S	319/327 (97%)	0.55	28 (8%) 10 8	56, 89, 121, 151	0
1	U	319/327 (97%)	0.55	31 (9%) 7 6	56, 89, 120, 151	0
1	W	319/327 (97%)	0.42	19 (5%) 21 20	51, 80, 116, 162	0
2	B	172/174 (98%)	0.56	8 (4%) 31 30	64, 96, 146, 193	0
2	D	172/174 (98%)	0.55	11 (6%) 19 18	65, 99, 145, 188	0
2	F	172/174 (98%)	0.59	12 (6%) 16 14	63, 97, 140, 182	0
2	H	172/174 (98%)	0.48	10 (5%) 23 22	55, 93, 138, 184	0
2	J	172/174 (98%)	1.03	33 (19%) 1 0	65, 115, 175, 219	0
2	L	172/174 (98%)	0.99	25 (14%) 2 1	64, 113, 173, 211	0
2	N	172/174 (98%)	1.16	31 (18%) 1 1	65, 116, 180, 219	0
2	P	172/174 (98%)	0.51	13 (7%) 13 12	48, 81, 124, 184	0
2	R	172/174 (98%)	0.45	10 (5%) 23 22	46, 82, 124, 185	0
2	T	172/174 (98%)	0.40	12 (6%) 16 14	46, 81, 124, 194	0
2	V	172/174 (98%)	0.36	11 (6%) 19 18	47, 83, 125, 178	0
2	X	172/174 (98%)	0.93	30 (17%) 1 1	60, 108, 168, 213	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
All	All	5892/6012 (98%)	0.44	411 (6%) 16 14	42, 81, 140, 219	0

The worst 5 of 411 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	N	33	GLY	19.6
2	L	33	GLY	13.1
2	X	33	GLY	8.6
2	J	33	GLY	8.1
2	V	153	ARG	6.8

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
3	NAG	P	301	14/15	0.49	0.31	83,87,94,97	0
3	NAG	V	301	14/15	0.53	0.30	86,90,95,96	0
3	NAG	N	301	14/15	0.63	0.27	92,96,102,103	0
3	NAG	X	301	14/15	0.63	0.31	91,95,102,102	0
3	NAG	R	301	14/15	0.64	0.28	82,84,88,89	0
3	NAG	L	301	14/15	0.70	0.23	91,95,102,103	0
3	NAG	T	301	14/15	0.70	0.24	80,85,89,90	0
3	NAG	H	301	14/15	0.71	0.18	80,84,86,86	0
3	NAG	J	301	14/15	0.72	0.23	97,101,108,108	0
3	NAG	B	301	14/15	0.73	0.17	81,84,87,88	0
3	NAG	D	301	14/15	0.75	0.17	85,88,92,92	0
3	NAG	F	301	14/15	0.79	0.15	81,84,89,89	0
3	NAG	G	401	14/15	0.81	0.19	100,107,110,110	0
3	NAG	E	401	14/15	0.81	0.18	97,105,107,110	0
3	NAG	A	401	14/15	0.82	0.17	103,110,114,118	0
3	NAG	Q	401	14/15	0.82	0.21	99,112,116,117	0
3	NAG	C	401	14/15	0.83	0.19	95,105,109,109	0
3	NAG	U	401	14/15	0.85	0.20	101,114,121,121	0
3	NAG	O	401	14/15	0.86	0.20	97,111,116,117	0
3	NAG	S	401	14/15	0.88	0.20	97,111,117,119	0
3	NAG	W	401	14/15	0.90	0.13	64,72,75,78	0
3	NAG	I	401	14/15	0.91	0.13	63,71,76,77	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	NAG	M	401	14/15	0.92	0.12	63,72,76,78	0
3	NAG	K	401	14/15	0.93	0.10	67,75,81,82	0

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 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( $\text{\AA}^2$ )	Q<0.9
3	NAG	P	301	14/15	0.49	0.31	83,87,94,97	0
3	NAG	V	301	14/15	0.53	0.30	86,90,95,96	0
3	NAG	N	301	14/15	0.63	0.27	92,96,102,103	0
3	NAG	X	301	14/15	0.63	0.31	91,95,102,102	0
3	NAG	R	301	14/15	0.64	0.28	82,84,88,89	0
3	NAG	L	301	14/15	0.70	0.23	91,95,102,103	0
3	NAG	T	301	14/15	0.70	0.24	80,85,89,90	0
3	NAG	H	301	14/15	0.71	0.18	80,84,86,86	0
3	NAG	J	301	14/15	0.72	0.23	97,101,108,108	0
3	NAG	B	301	14/15	0.73	0.17	81,84,87,88	0
3	NAG	D	301	14/15	0.75	0.17	85,88,92,92	0
3	NAG	F	301	14/15	0.79	0.15	81,84,89,89	0
3	NAG	G	401	14/15	0.81	0.19	100,107,110,110	0
3	NAG	E	401	14/15	0.81	0.18	97,105,107,110	0
3	NAG	A	401	14/15	0.82	0.17	103,110,114,118	0
3	NAG	Q	401	14/15	0.82	0.21	99,112,116,117	0
3	NAG	C	401	14/15	0.83	0.19	95,105,109,109	0
3	NAG	U	401	14/15	0.85	0.20	101,114,121,121	0
3	NAG	O	401	14/15	0.86	0.20	97,111,116,117	0
3	NAG	S	401	14/15	0.88	0.20	97,111,117,119	0
3	NAG	W	401	14/15	0.90	0.13	64,72,75,78	0
3	NAG	I	401	14/15	0.91	0.13	63,71,76,77	0
3	NAG	M	401	14/15	0.92	0.12	63,72,76,78	0
3	NAG	K	401	14/15	0.93	0.10	67,75,81,82	0



## 6.5 Other polymers [i](#)

There are no such residues in this entry.