Full wwPDB X-ray Structure Validation Report (i)

Oct 28, 2024 – 04:58 pm GMT

PDB ID	:	3ZP1
Title	:	INFLUENZA VIRUS (VN1194) H5 HA with LSTc
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Deposited on	:	2013-02-26
Resolution	:	2.60 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

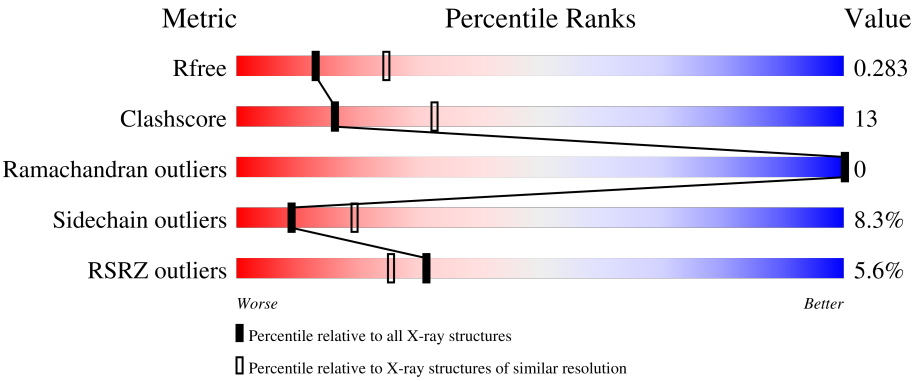
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.60 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3775 (2.60-2.60)
Clashscore	180529	4181 (2.60-2.60)
Ramachandran outliers	177936	4129 (2.60-2.60)
Sidechain outliers	177891	4129 (2.60-2.60)
RSRZ outliers	164620	3775 (2.60-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	E	326	6% 75% 21%
2	F	166	5% 74% 17% 5%
3	A	2	50% 50%

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
3	SIA	A	2	X	-	-	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 3990 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 HAEMAGGLUTININ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	E	321	Total	C	N	O	S	4	0	0
			2549	1611	440	483	15			

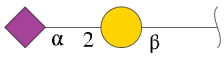
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	40	LYS	THR	conflict	UNP Q6DQ34

- Molecule 2 is a protein called HAEMAGGLUTININ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	F	158	Total	C	N	O	S	0	0	0
			1272	791	221	252	8			

- Molecule 3 is an oligosaccharide called N-acetyl-alpha-neuraminic acid-(2-2)-beta-D-galacto pyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	A	2	Total	C	N	O	0	0	0
			23	13	1	9			

- Molecule 4 is water.

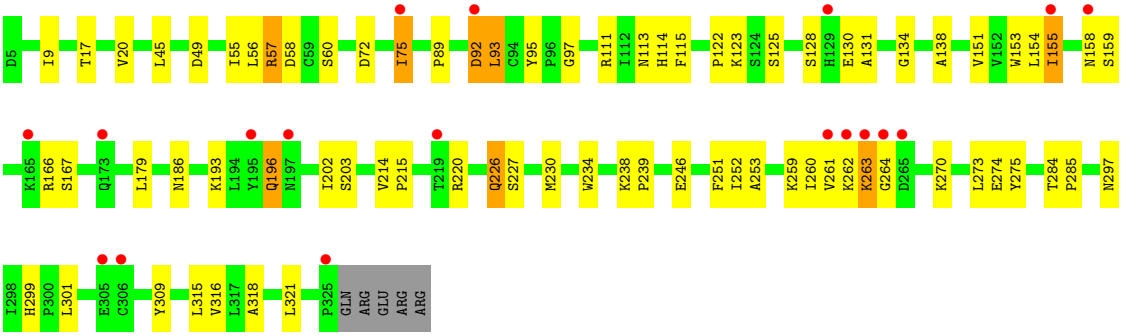
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	E	84	Total	O	0	0
			84	84		
4	F	62	Total	O	0	0
			62	62		

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.

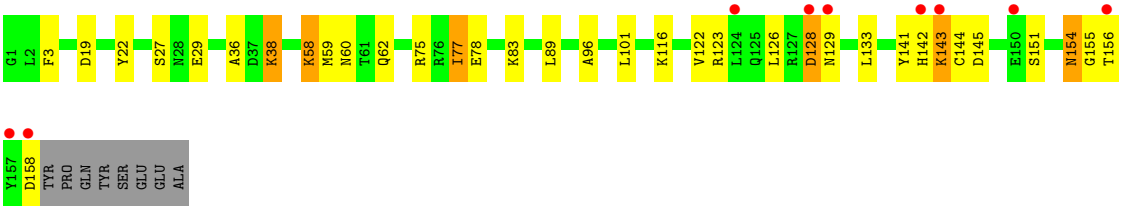
• Molecule 1: HAEMAGGLUTININ

Chain E:



• Molecule 2: HAEMAGGLUTININ

Chain F:



• Molecule 3: N-acetyl-alpha-neuraminic acid-(2-2)-beta-D-galactopyranose

Chain A:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α, β, γ	101.09Å 101.09Å 448.46Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	30.00 – 2.60 30.00 – 2.60	Depositor EDS
% Data completeness (in resolution range)	90.2 (30.00-2.60) 90.1 (30.00-2.60)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	5.74 (at 2.61Å)	Xtriage
Refinement program	REFMAC 5.5.0088	Depositor
R, R_{free}	0.223 , 0.286 0.238 , 0.283	Depositor DCC
R_{free} test set	1257 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	56.6	Xtriage
Anisotropy	0.027	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 41.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	3990	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.89% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SIA, GAL

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	E	0.50	0/2611	0.63	0/3546
2	F	0.60	0/1296	0.66	0/1742
All	All	0.53	0/3907	0.64	0/5288

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
2	F	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	F	142	HIS	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	2549	0	2495	70	0
2	F	1272	0	1186	30	0
3	A	23	0	15	0	0
4	E	84	0	0	4	0
4	F	62	0	0	2	0
All	All	3990	0	3696	97	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 13.

All (97) 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)
1:E:113:ASN:OD1	1:E:264:GLY:CA	1.67	1.40
1:E:56:LEU:O	1:E:57:ARG:HG2	1.44	1.18
1:E:57:ARG:HG3	1:E:58:ASP:N	1.63	1.12
1:E:186:ASN:HD22	1:E:227:SER:HB2	1.12	1.09
1:E:262:LYS:O	1:E:263:LYS:HD3	1.57	1.04
1:E:57:ARG:HG3	1:E:58:ASP:H	0.90	1.02
1:E:113:ASN:OD1	1:E:264:GLY:HA3	0.85	1.01
1:E:60:SER:OG	1:E:92:ASP:HB2	1.64	0.98
1:E:186:ASN:ND2	1:E:227:SER:HB2	1.79	0.97
2:F:29:GLU:OE2	2:F:143:LYS:HE3	1.64	0.96
1:E:261:VAL:CG2	1:E:262:LYS:N	2.30	0.94
2:F:154:ASN:HD22	2:F:155:GLY:N	1.66	0.93
1:E:130:GLU:HB3	1:E:155:ILE:HG22	1.53	0.89
1:E:263:LYS:O	1:E:263:LYS:HE3	1.73	0.88
1:E:57:ARG:CG	1:E:58:ASP:H	1.74	0.84
1:E:261:VAL:HG22	1:E:262:LYS:H	1.41	0.84
1:E:186:ASN:HD22	1:E:227:SER:CB	1.91	0.83
1:E:56:LEU:O	1:E:57:ARG:CG	2.27	0.83
1:E:262:LYS:O	1:E:263:LYS:CD	2.30	0.80
1:E:263:LYS:HD3	1:E:263:LYS:C	1.99	0.80
1:E:263:LYS:O	1:E:263:LYS:CD	2.30	0.80
1:E:125:SER:O	1:E:166:ARG:NH2	2.14	0.80
1:E:263:LYS:O	1:E:263:LYS:CE	2.30	0.79
1:E:261:VAL:HG22	1:E:262:LYS:N	1.96	0.78
1:E:263:LYS:O	1:E:263:LYS:CG	2.30	0.78
1:E:122:PRO:O	1:E:125:SER:HB3	1.85	0.75
2:F:29:GLU:OE2	2:F:143:LYS:CE	2.34	0.74
1:E:263:LYS:CD	1:E:263:LYS:C	2.54	0.74
1:E:299:HIS:HD2	1:E:301:LEU:H	1.33	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:19:ASP:HB3	2:F:36:ALA:HB2	1.70	0.73
1:E:261:VAL:HG23	1:E:262:LYS:N	2.03	0.72
2:F:151:SER:O	2:F:154:ASN:ND2	2.24	0.70
2:F:77:ILE:H	2:F:77:ILE:HD13	1.57	0.70
1:E:263:LYS:O	1:E:263:LYS:HG2	1.92	0.70
2:F:154:ASN:HD22	2:F:154:ASN:C	1.95	0.69
1:E:57:ARG:CG	1:E:58:ASP:N	2.37	0.69
2:F:19:ASP:HB2	4:F:2013:HOH:O	1.92	0.68
1:E:58:ASP:O	1:E:89:PRO:HB3	1.94	0.68
1:E:193:LYS:HD2	4:E:2063:HOH:O	1.93	0.68
1:E:114:HIS:HB3	1:E:261:VAL:HG22	1.76	0.67
1:E:159:SER:O	1:E:196:GLN:OE1	2.12	0.67
2:F:126:LEU:O	2:F:129:ASN:HB2	1.95	0.66
1:E:238:LYS:HB3	1:E:239:PRO:HD2	1.79	0.65
2:F:126:LEU:N	2:F:126:LEU:HD23	2.12	0.65
2:F:154:ASN:ND2	2:F:156:THR:H	1.96	0.64
1:E:134:GLY:HA3	1:E:153:TRP:HB3	1.79	0.64
1:E:113:ASN:OD1	1:E:264:GLY:C	2.36	0.63
1:E:115:PHE:HE1	1:E:260:ILE:HG12	1.63	0.61
2:F:145:ASP:OD1	2:F:145:ASP:C	2.39	0.61
2:F:128:ASP:O	2:F:141:TYR:CE2	2.53	0.61
1:E:45:LEU:HD11	1:E:273:LEU:HB2	1.83	0.61
2:F:128:ASP:O	2:F:141:TYR:HE2	1.85	0.59
1:E:151:VAL:HB	1:E:252:ILE:HG22	1.84	0.58
2:F:154:ASN:ND2	2:F:155:GLY:N	2.48	0.58
1:E:9:ILE:HD11	2:F:122:VAL:HG21	1.85	0.58
1:E:179:LEU:HD23	1:E:234:TRP:HB3	1.86	0.57
2:F:154:ASN:ND2	2:F:154:ASN:C	2.57	0.57
1:E:125:SER:OG	1:E:166:ARG:NH1	2.38	0.57
1:E:72:ASP:O	1:E:75:ILE:HG12	2.05	0.56
1:E:309:TYR:HD2	2:F:89:LEU:HD22	1.70	0.56
2:F:154:ASN:HD22	2:F:155:GLY:H	1.53	0.56
2:F:3:PHE:O	2:F:116:LYS:HD2	2.06	0.55
1:E:92:ASP:OD1	1:E:92:ASP:C	2.45	0.54
2:F:154:ASN:HD21	2:F:156:THR:H	1.56	0.54
1:E:58:ASP:O	1:E:89:PRO:CB	2.55	0.53
1:E:20:VAL:HG21	1:E:318:ALA:HB2	1.91	0.52
1:E:159:SER:HB3	1:E:196:GLN:OE1	2.10	0.52
1:E:111:ARG:NH2	4:E:2049:HOH:O	2.43	0.52
1:E:93:LEU:N	1:E:93:LEU:HD23	2.26	0.51
1:E:20:VAL:HG12	1:E:316:VAL:HG12	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:299:HIS:CD2	1:E:301:LEU:H	2.21	0.51
1:E:203:SER:OG	1:E:246:GLU:HB3	2.11	0.50
2:F:123:ARG:HD2	4:F:2050:HOH:O	2.12	0.49
2:F:129:ASN:O	2:F:141:TYR:CD2	2.65	0.49
1:E:97:GLY:HA3	1:E:230:MET:O	2.12	0.49
1:E:89:PRO:HA	4:E:2033:HOH:O	2.13	0.48
1:E:123:LYS:HE2	1:E:131:ALA:O	2.13	0.48
1:E:138:ALA:HB2	1:E:226:GLN:HE21	1.80	0.47
1:E:113:ASN:OD1	1:E:264:GLY:N	2.41	0.47
1:E:55:ILE:HD12	1:E:275:TYR:HB2	1.98	0.45
2:F:58:LYS:HA	2:F:58:LYS:HD3	1.55	0.45
1:E:285:PRO:HD3	1:E:301:LEU:O	2.17	0.45
1:E:60:SER:CB	1:E:92:ASP:HB2	2.46	0.44
1:E:49:ASP:HB3	4:E:2030:HOH:O	2.18	0.44
1:E:92:ASP:OD1	1:E:92:ASP:O	2.37	0.43
1:E:95:TYR:CD1	1:E:230:MET:HG2	2.53	0.43
1:E:158:ASN:O	1:E:159:SER:HB2	2.19	0.43
2:F:59:MET:HE3	2:F:96:ALA:HA	2.01	0.42
2:F:59:MET:CE	2:F:96:ALA:HA	2.50	0.41
2:F:75:ARG:NH1	2:F:78:GLU:OE1	2.52	0.41
1:E:93:LEU:HD23	1:E:93:LEU:H	1.85	0.41
1:E:309:TYR:CD2	2:F:89:LEU:HD22	2.54	0.41
2:F:154:ASN:ND2	2:F:156:THR:N	2.66	0.40
2:F:38:LYS:H	2:F:38:LYS:HG2	1.72	0.40
1:E:202:ILE:HD11	1:E:251:PHE:HA	2.03	0.40
1:E:214:VAL:HA	1:E:215:PRO:HD3	1.91	0.40
1:E:251:PHE:CE2	1:E:253:ALA:HB2	2.56	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	E	319/326 (98%)	308 (97%)	11 (3%)	0	100	100
2	F	156/166 (94%)	151 (97%)	5 (3%)	0	100	100
All	All	475/492 (96%)	459 (97%)	16 (3%)	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	E	289/294 (98%)	269 (93%)	20 (7%)	13	28
2	F	134/141 (95%)	119 (89%)	15 (11%)	5	9
All	All	423/435 (97%)	388 (92%)	35 (8%)	9	19

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	17	THR
1	E	57	ARG
1	E	75	ILE
1	E	92	ASP
1	E	93	LEU
1	E	128	SER
1	E	154	LEU
1	E	155	ILE
1	E	167	SER
1	E	196	GLN
1	E	220	ARG
1	E	226	GLN
1	E	259	LYS
1	E	263	LYS
1	E	270	LYS
1	E	274	GLU
1	E	284	THR
1	E	297	ASN

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Mol	Chain	Res	Type
1	E	315	LEU
1	E	321	LEU
2	F	22	TYR
2	F	27	SER
2	F	38	LYS
2	F	58	LYS
2	F	60	ASN
2	F	62	GLN
2	F	77	ILE
2	F	83	LYS
2	F	101	LEU
2	F	128	ASP
2	F	133	LEU
2	F	143	LYS
2	F	144	CYS
2	F	154	ASN
2	F	158	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	91	ASN
1	E	173	GLN
1	E	186	ASN
1	E	226	GLN
1	E	297	ASN
1	E	299	HIS
2	F	62	GLN
2	F	125	GLN
2	F	146	ASN
2	F	154	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)

2 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	$\#\|Z\| > 2$
3	GAL	A	1	3	2,2,12	0.50	0	1,1,17	0.29	0
3	SIA	A	2	3	20,20,21	2.35	2 (10%)	24,28,31	2.43	8 (33%)

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	SIA	A	2	3	1/1/8/9	4/18/34/38	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2	SIA	O4-C4	-9.70	1.22	1.43
3	A	2	SIA	C4-C5	-2.54	1.51	1.53

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	2	SIA	C3-C4-C5	5.84	118.52	111.46
3	A	2	SIA	O4-C4-C5	4.66	120.49	109.77
3	A	2	SIA	O4-C4-C3	4.45	120.98	109.94
3	A	2	SIA	C6-C5-N5	-4.18	103.97	110.91
3	A	2	SIA	C6-O6-C2	2.74	117.20	111.34
3	A	2	SIA	C4-C5-N5	2.67	115.66	110.38
3	A	2	SIA	O6-C2-C1	2.52	112.64	107.70
3	A	2	SIA	C8-C7-C6	2.22	117.24	113.03

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
3	A	2	SIA	C4

All (4) torsion outliers are listed below:

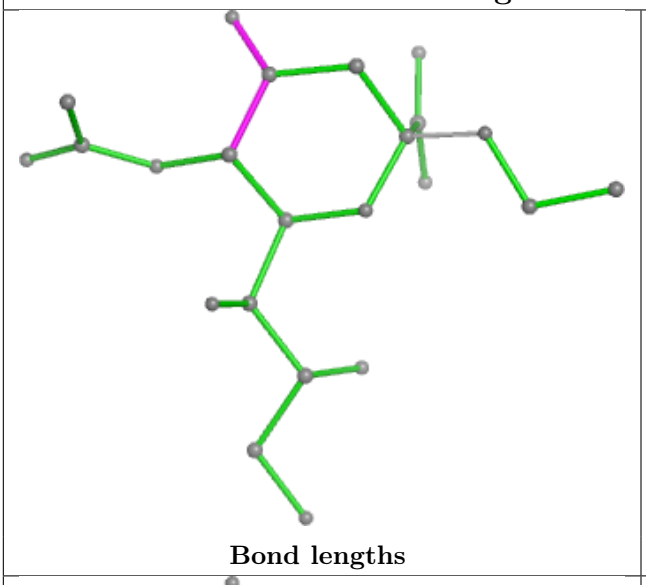
Mol	Chain	Res	Type	Atoms
3	A	2	SIA	C11-C10-N5-C5
3	A	2	SIA	O10-C10-N5-C5
3	A	2	SIA	O1A-C1-C2-O6
3	A	2	SIA	C6-C7-C8-O8

There are no ring outliers.

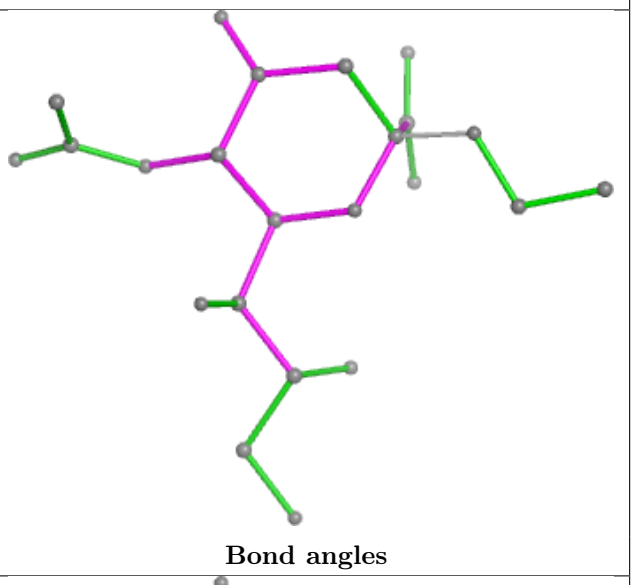
No monomer is involved in short contacts.

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

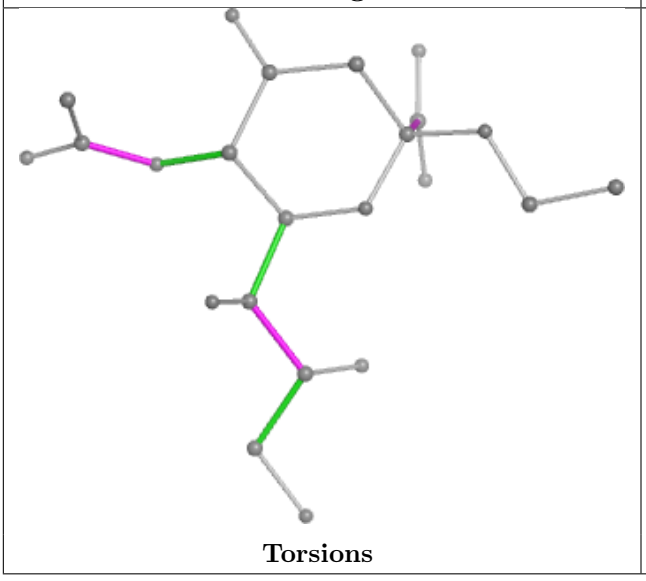
Oligosaccharide Chain A



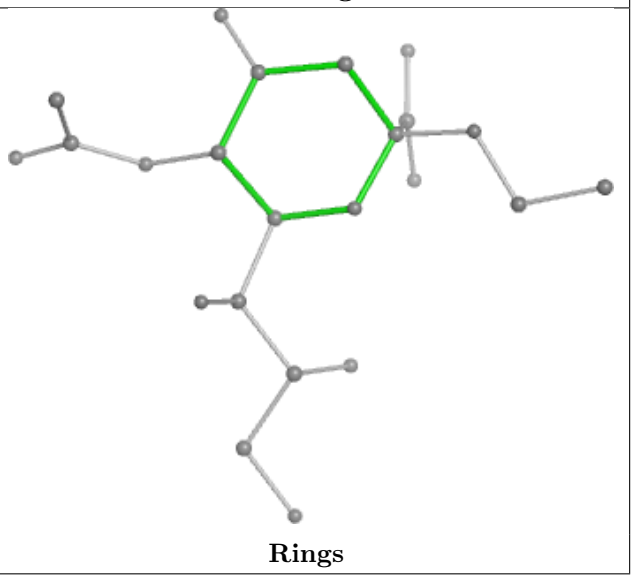
Bond lengths



Bond angles



Torsions



Rings

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	E	321/326 (98%)	0.43	18 (5%) 31 25	31, 65, 85, 91	1 (0%)
2	F	158/166 (95%)	0.04	9 (5%) 30 25	25, 47, 73, 95	0
All	All	479/492 (97%)	0.30	27 (5%) 31 25	25, 60, 84, 95	1 (0%)

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	F	142	HIS	5.0
1	E	264	GLY	4.2
1	E	263	LYS	4.0
1	E	173	GLN	4.0
1	E	265	ASP	3.4
2	F	158	ASP	3.3
1	E	75	ILE	3.3
2	F	128	ASP	3.2
1	E	261	VAL	3.1
1	E	262	LYS	2.8
2	F	156	THR	2.8
1	E	92	ASP	2.8
2	F	150	GLU	2.7
1	E	305	GLU	2.6
2	F	143	LYS	2.6
1	E	165	LYS	2.5
2	F	129	ASN	2.4
1	E	219	THR	2.4
1	E	158	ASN	2.4
2	F	124	LEU	2.3
1	E	195	TYR	2.2
1	E	129	HIS	2.1
1	E	325	PRO	2.0
1	E	306	CYS	2.0

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Mol	Chain	Res	Type	RSRZ
1	E	197	ASN	2.0
2	F	157	TYR	2.0
1	E	155	ILE	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)

SUGAR-RSR INFOmissingINFO

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.