



# Full wwPDB X-ray Structure Validation Report ⓘ

Jul 11, 2024 – 06:05 PM EDT

PDB ID : 8VVL  
Title : CCHFV GP38 bound to c13G8 Fab  
Authors : Hjorth, C.K.; Mishra, A.K.; McLellan, J.S.  
Deposited on : 2024-01-31  
Resolution : 1.80 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)  
Xtrriage (Phenix) : 1.13  
EDS : 2.37.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

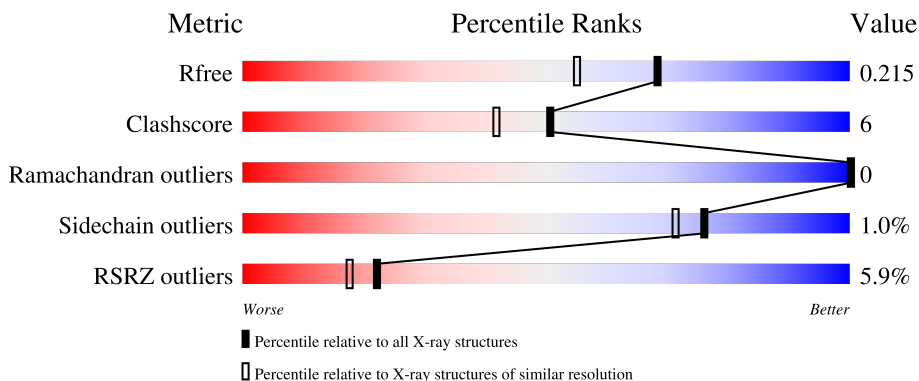
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.80 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	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	268	 13% 71% 15% 1% 1%
2	H	226	 % 88% 7% 5%
3	L	213	 % 92% 8%
4	B	2	 100%

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 5823 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 GP38.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	233	1874	1204	316	345	9	0	0	0

- Molecule 2 is a protein called c13G8 Fab Heavy Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	H	215	1627	1031	270	317	9	0	0	0

- Molecule 3 is a protein called c13G8 Fab Light Chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	L	212	1620	1021	269	324	6	0	0	0

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



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	B	2	28	16	2	10	0	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



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

- Molecule 6 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O S		
6	A	1	5	4 1	0	0
6	A	1	5	4 1	0	0
6	A	1	5	4 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total O S 5 4 1	0	0
6	H	1	Total O S 5 4 1	0	0
6	L	1	Total O S 5 4 1	0	0

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	2	Total Cl 2 2	0	0
7	H	2	Total Cl 2 2	0	0
7	L	2	Total Cl 2 2	0	0

- Molecule 8 is COBALT (II) ION (three-letter code: CO) (formula: Co).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	L	1	Total Co 1 1	0	0

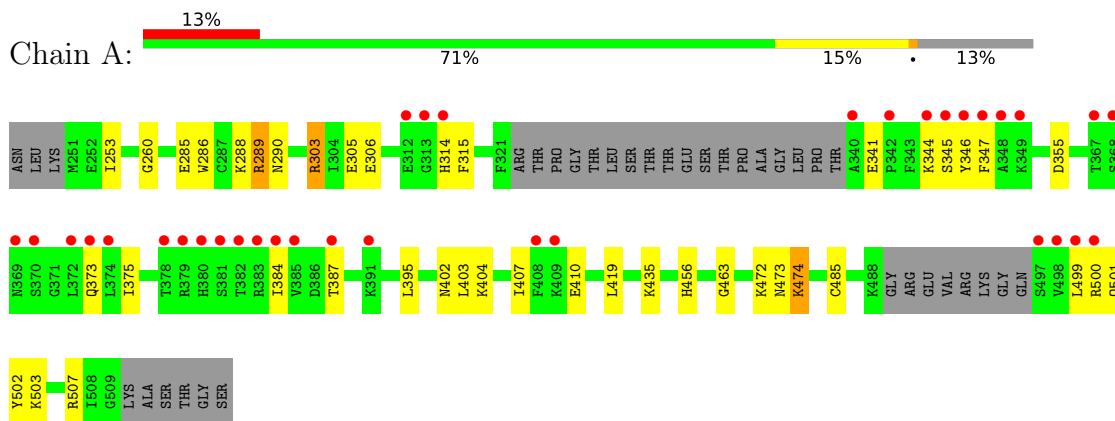
- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	199	Total O 199 199	0	0
9	H	221	Total O 221 221	0	0
9	L	203	Total O 203 203	0	0

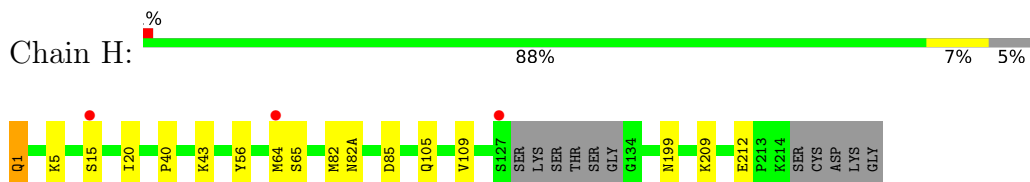
### 3 Residue-property plots

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.

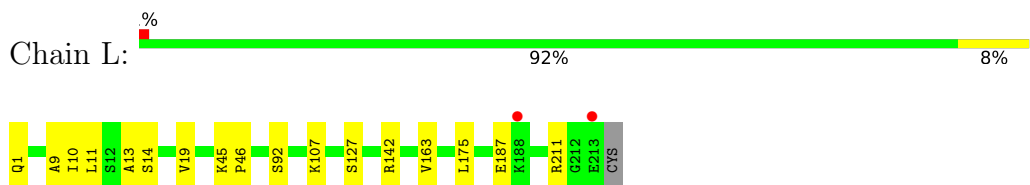
- Molecule 1: GP38



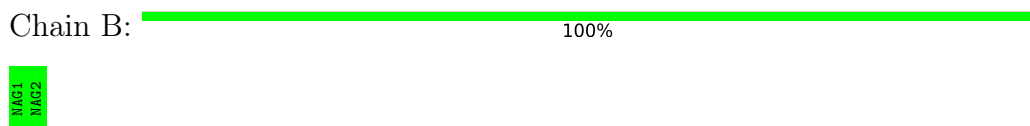
- Molecule 2: c13G8 Fab Heavy Chain



- Molecule 3: c13G8 Fab Light Chain



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



## 4 Data and refinement statistics

Property	Value	Source
Space group	I 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	100.43Å 67.63Å 140.98Å 90.00° 96.53° 90.00°	Depositor
Resolution (Å)	45.16 – 1.80 45.16 – 1.80	Depositor EDS
% Data completeness (in resolution range)	94.5 (45.16-1.80) 94.5 (45.16-1.80)	Depositor EDS
$R_{merge}$	0.03	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.36 (at 1.81Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.200 , 0.215 0.199 , 0.215	Depositor DCC
$R_{free}$ test set	4111 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	27.3	Xtrriage
Anisotropy	0.842	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 49.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	5823	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.79% 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: CL, SO4, PCA, NAG, CO

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	0.30	0/1908	0.55	0/2572
2	H	0.31	0/1660	0.57	0/2262
3	L	0.30	0/1654	0.54	0/2252
All	All	0.31	0/5222	0.55	0/7086

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	1874	0	1893	32	0
2	H	1627	0	1599	11	1
3	L	1620	0	1563	16	0
4	B	28	0	25	0	0
5	A	14	0	13	1	0
6	A	20	0	0	1	0
6	H	5	0	0	0	0
6	L	5	0	0	0	0
7	A	2	0	0	1	0
7	H	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	L	2	0	0	0	0
8	L	1	0	0	0	0
9	A	199	0	0	11	1
9	H	221	0	0	6	2
9	L	203	0	0	4	2
All	All	5823	0	5093	59	5

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 6.

All (59) 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:H:85:ASP:OD1	9:H:401:HOH:O	1.78	0.99
5:A:601:NAG:O7	9:A:701:HOH:O	1.81	0.97
1:A:373:GLN:O	9:A:702:HOH:O	1.99	0.80
1:A:473:ASN:HA	9:A:703:HOH:O	1.85	0.76
3:L:14:SER:OG	9:L:401:HOH:O	2.06	0.72
1:A:285:GLU:HG3	9:A:869:HOH:O	1.89	0.71
1:A:472:LYS:O	9:A:703:HOH:O	2.09	0.69
2:H:212:GLU:OE1	9:H:402:HOH:O	2.11	0.68
2:H:65:SER:OG	9:H:403:HOH:O	2.11	0.68
2:H:82(A):ASN:OD1	9:H:404:HOH:O	2.13	0.67
6:A:604:SO4:O4	9:A:704:HOH:O	2.13	0.65
1:A:474:LYS:HD3	1:A:474:LYS:H	1.65	0.61
3:L:142:ARG:NH2	9:L:405:HOH:O	2.26	0.60
1:A:345:SER:O	9:A:705:HOH:O	2.17	0.60
1:A:341:GLU:HB2	1:A:344:LYS:HD2	1.83	0.60
1:A:387:THR:OG1	1:A:500:ARG:HB3	2.02	0.59
1:A:315:PHE:O	1:A:347:PHE:N	2.34	0.58
2:H:5:LYS:HE3	2:H:105:GLN:NE2	2.19	0.57
3:L:127:SER:OG	9:L:402:HOH:O	2.17	0.57
1:A:260:GLY:HA3	1:A:286:TRP:CD1	2.41	0.56
1:A:384:ILE:HG23	1:A:499:LEU:HB3	1.88	0.56
1:A:375:ILE:HG23	1:A:463:GLY:HA2	1.89	0.54
1:A:314:HIS:HB3	1:A:346:TYR:HB3	1.89	0.54
1:A:384:ILE:HG22	1:A:501:GLN:HG2	1.90	0.54
1:A:387:THR:O	1:A:502:TYR:HB3	2.08	0.54
2:H:209:LYS:NZ	9:H:408:HOH:O	2.32	0.54
3:L:163:VAL:HG22	3:L:175:LEU:HD12	1.90	0.53
3:L:45:LYS:HD2	3:L:46:PRO:HD2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:305:GLU:HG3	1:A:456:HIS:HB2	1.90	0.51
2:H:64:MET:HE3	9:H:411:HOH:O	2.10	0.51
1:A:306:GLU:OE1	9:A:706:HOH:O	2.19	0.51
1:A:402:ASN:O	1:A:403:LEU:HD23	2.10	0.51
2:H:40:PRO:HB2	2:H:43:LYS:HD3	1.94	0.50
3:L:107:LYS:HE3	9:L:401:HOH:O	2.12	0.49
1:A:355:ASP:OD1	7:A:607:CL:CL	2.68	0.49
2:H:20:ILE:HD11	2:H:109:VAL:HG21	1.94	0.48
1:A:456:HIS:ND1	1:A:456:HIS:O	2.45	0.48
1:A:253:ILE:HD11	9:A:796:HOH:O	2.12	0.48
1:A:288:LYS:HE3	2:H:56:TYR:CD1	2.48	0.48
1:A:404:LYS:HD3	1:A:419:LEU:HD11	1.95	0.47
3:L:187:GLU:O	3:L:211:ARG:NH2	2.47	0.47
3:L:11:LEU:HD21	3:L:19:VAL:HB	1.97	0.46
1:A:387:THR:HG22	9:A:750:HOH:O	2.16	0.46
1:A:303:ARG:NE	9:A:714:HOH:O	2.38	0.46
1:A:485:CYS:O	1:A:501:GLN:HA	2.16	0.45
3:L:187:GLU:HA	3:L:211:ARG:NE	2.32	0.45
3:L:13:ALA:HB2	3:L:19:VAL:HG11	1.98	0.44
3:L:10:ILE:HD12	3:L:10:ILE:N	2.33	0.44
1:A:289:ARG:HG2	1:A:290:ASN:N	2.33	0.44
3:L:211:ARG:HG2	3:L:211:ARG:NH1	2.33	0.43
2:H:82:MET:HE2	2:H:82:MET:HB2	1.83	0.43
1:A:410:GLU:CD	1:A:410:GLU:H	2.22	0.43
1:A:395:LEU:HD23	1:A:407:ILE:HD11	2.01	0.43
3:L:9:ALA:HB3	3:L:10:ILE:HD12	2.01	0.43
3:L:211:ARG:HG2	3:L:211:ARG:HH11	1.85	0.42
1:A:404:LYS:CD	1:A:419:LEU:HD11	2.49	0.42
3:L:45:LYS:HD2	3:L:45:LYS:HA	1.80	0.41
1:A:253:ILE:HD12	3:L:92:SER:O	2.21	0.41
1:A:435:LYS:HE3	1:A:435:LYS:HB3	1.92	0.41

All (5) 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)
9:H:617:HOH:O	9:H:618:HOH:O[4_354]	1.56	0.64
9:L:592:HOH:O	9:L:592:HOH:O[2_355]	1.83	0.37
9:H:471:HOH:O	9:H:530:HOH:O[4_354]	1.85	0.35
2:H:1:PCA:OE	2:H:15:SER:OG[4_354]	2.13	0.07
9:A:733:HOH:O	9:L:568:HOH:O[2_455]	2.16	0.04

## 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	227/268 (85%)	221 (97%)	6 (3%)	0	100	100
2	H	211/226 (93%)	209 (99%)	2 (1%)	0	100	100
3	L	210/213 (99%)	206 (98%)	4 (2%)	0	100	100
All	All	648/707 (92%)	636 (98%)	12 (2%)	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	212/240 (88%)	207 (98%)	5 (2%)	49	36
2	H	184/193 (95%)	183 (100%)	1 (0%)	88	87
3	L	181/182 (100%)	181 (100%)	0	100	100
All	All	577/615 (94%)	571 (99%)	6 (1%)	76	71

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	289	ARG
1	A	303	ARG
1	A	474	LYS
1	A	503	LYS
1	A	507	ARG

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Mol	Chain	Res	Type
2	H	199	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
2	H	3	GLN
2	H	82(A)	ASN
2	H	105	GLN
2	H	199	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](#)

2 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
2	PCA	H	1	2	7,8,9	1.78	1 (14%)	9,10,12	2.18	5 (55%)
3	PCA	L	1	3	7,8,9	1.79	1 (14%)	9,10,12	2.17	5 (55%)

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
2	PCA	H	1	2	-	0/0/11/13	0/1/1/1
3	PCA	L	1	3	-	0/0/11/13	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	L	1	PCA	CD-N	4.62	1.46	1.34
2	H	1	PCA	CD-N	4.59	1.46	1.34

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	1	PCA	OE-CD-CG	-3.09	121.38	126.76
3	L	1	PCA	CA-N-CD	-3.01	103.27	113.58
3	L	1	PCA	OE-CD-CG	-2.98	121.55	126.76
2	H	1	PCA	CA-N-CD	-2.87	103.76	113.58
2	H	1	PCA	CB-CA-C	-2.72	108.96	112.70
3	L	1	PCA	CB-CA-N	2.71	111.09	103.30
2	H	1	PCA	CB-CA-N	2.64	110.88	103.30
2	H	1	PCA	CG-CD-N	2.60	115.12	108.39
3	L	1	PCA	CG-CD-N	2.47	114.79	108.39
3	L	1	PCA	CB-CA-C	-2.40	109.39	112.70

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	H	1	PCA	0	1

## 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	$\# Z  > 2$
4	NAG	B	1	1,4	14,14,15	0.31	0	17,19,21	0.51	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	NAG	B	2	4	14,14,15	0.38	0	17,19,21	0.44	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	B	1	1,4	-	0/6/23/26	0/1/1/1
4	NAG	B	2	4	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

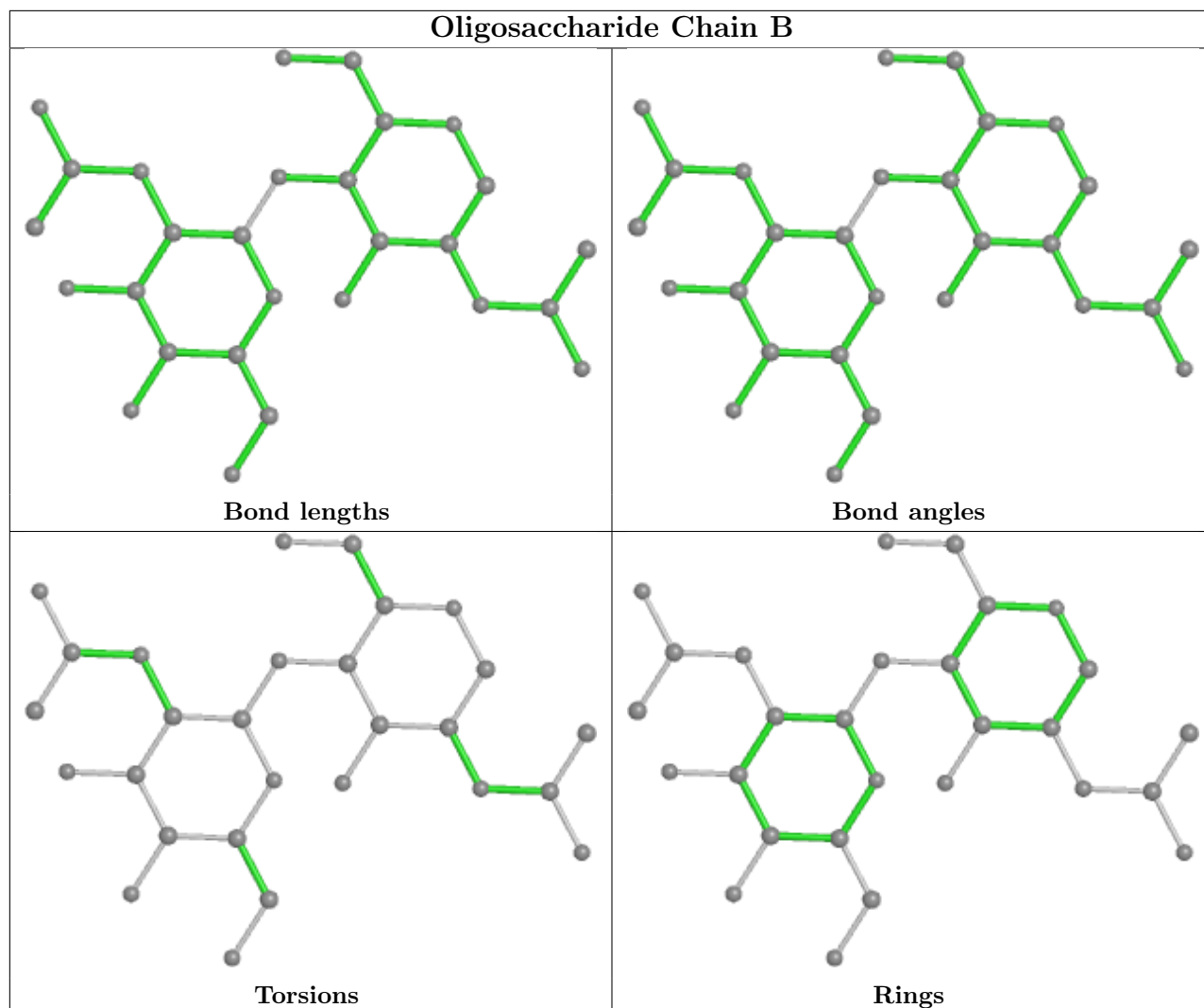
There are no chirality outliers.

There are no torsion outliers.

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.



## 5.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 7 are monoatomic - leaving 7 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
6	SO4	H	301	-	4,4,4	0.11	0	6,6,6	0.09	0
6	SO4	A	602	-	4,4,4	0.15	0	6,6,6	0.09	0
6	SO4	A	603	-	4,4,4	0.17	0	6,6,6	0.13	0
5	NAG	A	601	1	14,14,15	0.25	0	17,19,21	0.54	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	SO4	L	301	-	4,4,4	0.13	0	6,6,6	0.09	0
6	SO4	A	604	-	4,4,4	0.13	0	6,6,6	0.05	0
6	SO4	A	605	-	4,4,4	0.14	0	6,6,6	0.07	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
5	NAG	A	601	1	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	601	NAG	C3-C2-N2-C7
5	A	601	NAG	C1-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	601	NAG	1	0
6	A	604	SO4	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

### 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<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	233/268 (86%)	0.71	34 (14%) <b>2</b> <b>1</b>	24, 43, 73, 98	0
2	H	214/226 (94%)	-0.02	3 (1%) 75 72	23, 35, 47, 54	0
3	L	211/213 (99%)	0.07	2 (0%) 84 82	23, 35, 55, 66	0
All	All	658/707 (93%)	0.27	39 (5%) <b>22</b> <b>17</b>	23, 38, 65, 98	0

All (39) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	380	HIS	6.9
1	A	348	ALA	6.7
1	A	381	SER	6.5
1	A	498	VAL	6.2
1	A	383	ARG	5.1
1	A	382	THR	5.0
1	A	346	TYR	4.4
1	A	349	LYS	4.3
1	A	340	ALA	4.2
1	A	368	SER	4.1
1	A	379	ARG	4.1
1	A	314	HIS	4.0
1	A	372	LEU	3.9
1	A	384	ILE	3.8
1	A	370	SER	3.7
1	A	347	PHE	3.6
1	A	385	VAL	3.5
1	A	345	SER	3.5
1	A	373	GLN	3.4
1	A	344	LYS	3.3
3	L	213	GLU	3.2
2	H	64	MET	3.1
1	A	497	SER	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	342	PRO	2.8
1	A	378	THR	2.7
1	A	387	THR	2.7
1	A	391	LYS	2.7
3	L	188	LYS	2.7
1	A	500	ARG	2.6
1	A	313	GLY	2.6
1	A	499	LEU	2.5
2	H	15	SER	2.5
2	H	127	SER	2.5
1	A	369	ASN	2.5
1	A	374	LEU	2.4
1	A	367	THR	2.3
1	A	312	GLU	2.3
1	A	409	LYS	2.1
1	A	408	PHE	2.0

## 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.

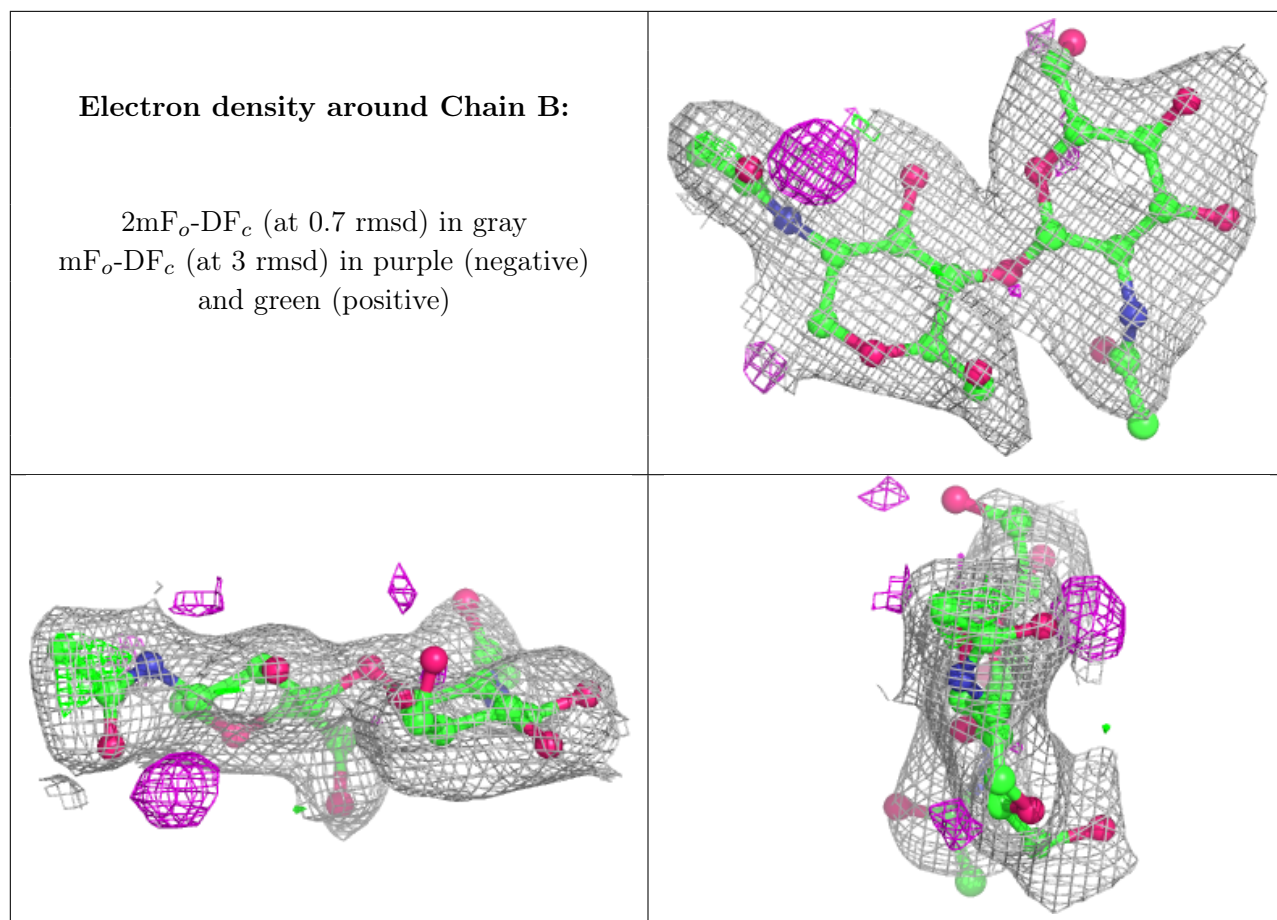
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	PCA	L	1	8/9	0.90	0.12	32,34,37,40	0
2	PCA	H	1	8/9	0.91	0.15	43,48,49,51	0

## 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
4	NAG	B	1	14/15	0.69	0.20	65,70,73,75	0
4	NAG	B	2	14/15	0.76	0.28	74,75,75,76	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.



## 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	SO4	A	602	5/5	0.76	0.26	41,41,43,45	5
6	SO4	A	603	5/5	0.77	0.23	28,31,34,34	5
5	NAG	A	601	14/15	0.80	0.34	51,56,60,60	0
6	SO4	A	604	5/5	0.84	0.18	45,46,49,50	5
6	SO4	L	301	5/5	0.90	0.14	45,47,49,50	5
6	SO4	A	605	5/5	0.91	0.17	47,47,49,49	5
6	SO4	H	301	5/5	0.93	0.10	39,41,44,45	5
8	CO	L	302	1/1	0.94	0.07	65,65,65,65	1
7	CL	H	303	1/1	0.97	0.04	44,44,44,44	0
7	CL	H	302	1/1	0.97	0.04	50,50,50,50	0
7	CL	A	607	1/1	0.98	0.10	34,34,34,34	0
7	CL	L	303	1/1	0.98	0.08	34,34,34,34	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
7	CL	L	304	1/1	0.98	0.05	42,42,42,42	0
7	CL	A	606	1/1	0.98	0.12	40,40,40,40	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.