



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 16, 2023 – 09:49 AM EDT

PDB ID : 2A73  
Title : Human Complement Component C3  
Authors : Janssen, B.J.C.; Huizinga, E.G.; Raaijmakers, H.C.A.; Roos, A.; Daha, M.R.;  
Nilsson-Ekdahl, K.; Nilsson, B.; Gros, P.  
Deposited on : 2005-07-04  
Resolution : 3.30 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.35

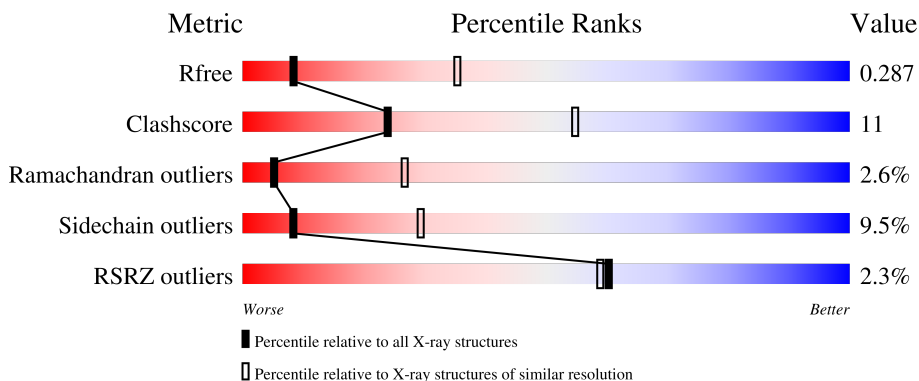
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.30 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	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)

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	643	 5% 73% 22% ..
2	B	991	 % 62% 29% 7% ..
3	C	2	 100%
4	D	5	 20% 40% 40%

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	NAG	C	2	-	-	-	X
4	MAN	D	3	X	-	-	-
4	MAN	D	4	X	-	-	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 12860 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 Complement C3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	635	4950	3153	837	945	15	0	0	0

- Molecule 2 is a protein called Complement C3.

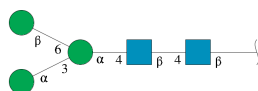
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	976	7821	4943	1331	1501	46	0	0	0

- Molecule 3 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			
3	C	2	28	16	2	10	0	0	0

- Molecule 4 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

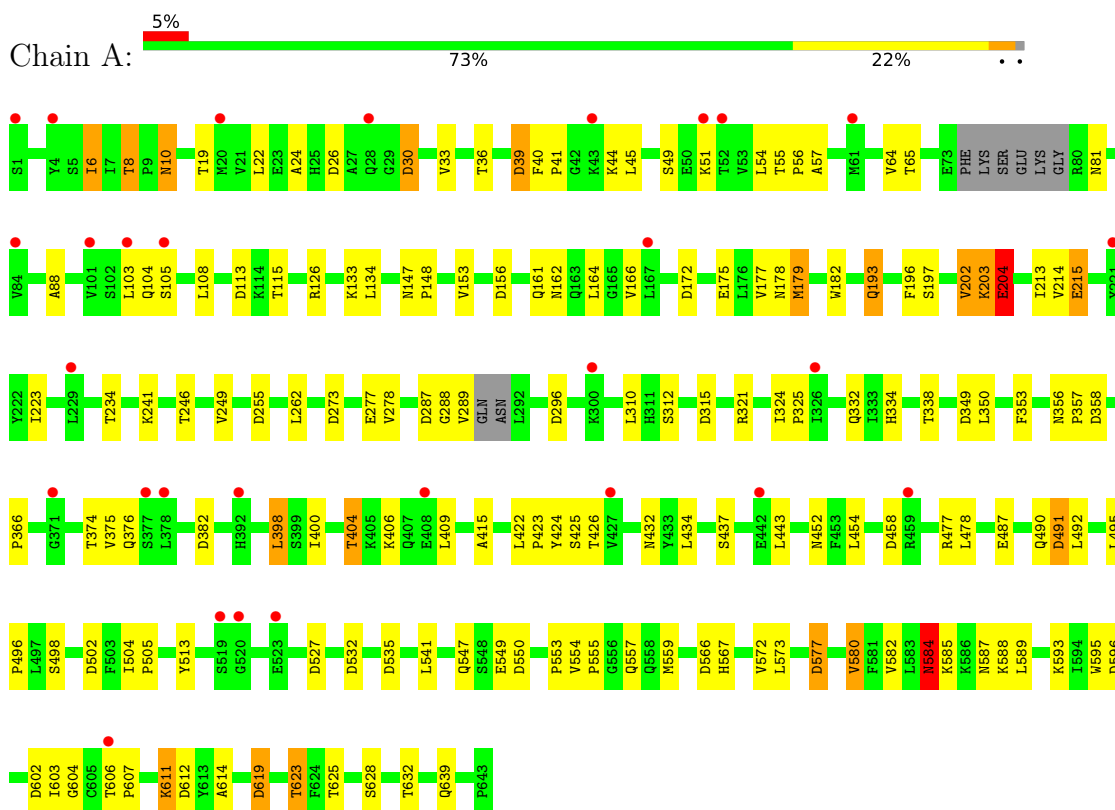


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	D	5	61	34	2	25	0	0	0

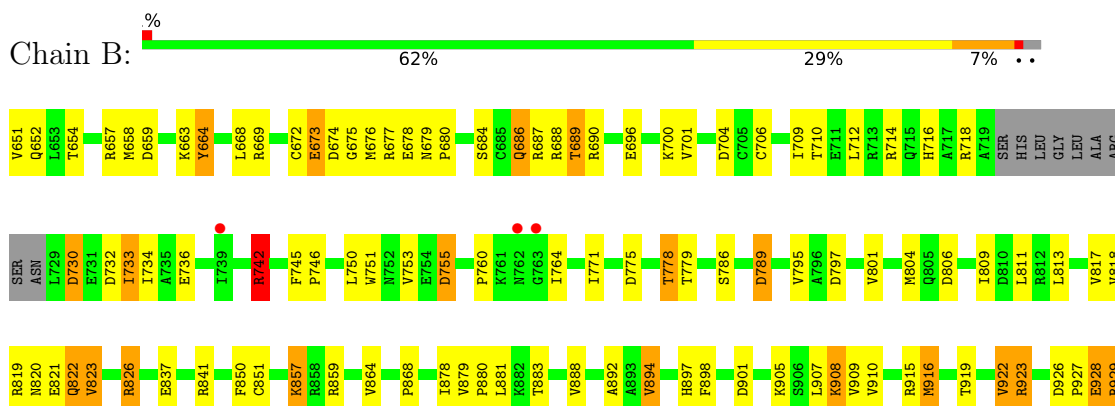
### 3 Residue-property plots

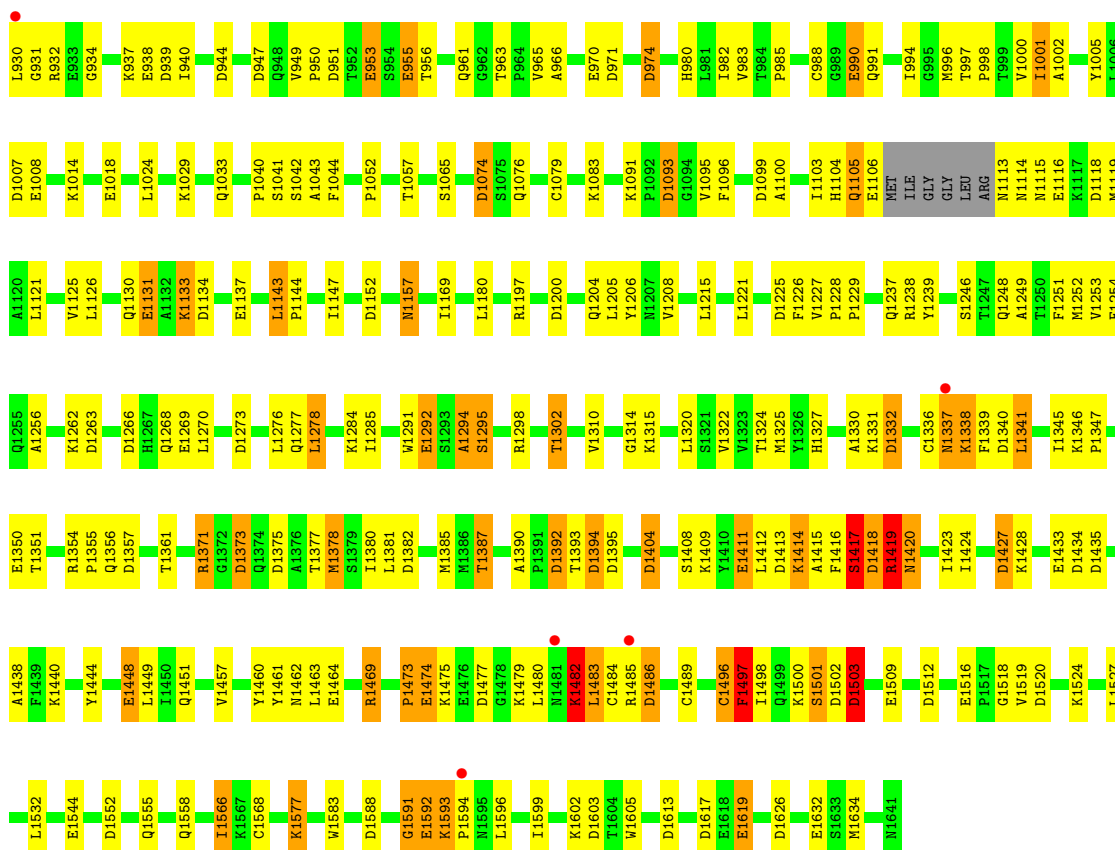
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Complement C3



- Molecule 2: Complement C3





- Molecule 3: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C: 100%

MAG1  
MAG2

- Molecule 4: alpha-D-mannopyranose-(1-3)-[beta-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D: 20% 40% 40%

MAG1  
MAG2  
MAN3  
MAN4  
BMA5

## 4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	116.98Å 156.26Å 271.20Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.00 – 3.30 39.12 – 3.30	Depositor EDS
% Data completeness (in resolution range)	99.8 (40.00-3.30) 99.8 (39.12-3.30)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.58 (at 3.32Å)	Xtrriage
Refinement program	REFMAC 5.2.0003	Depositor
R, $R_{free}$	0.230 , 0.289 0.228 , 0.287	Depositor DCC
$R_{free}$ test set	1882 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	83.5	Xtrriage
Anisotropy	0.201	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 73.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	12860	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	94.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.26% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, MAN, 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	0.21	0/5048	0.56	27/6859 (0.4%)
2	B	0.21	0/7973	0.59	54/10779 (0.5%)
All	All	0.21	0/13021	0.58	81/17638 (0.5%)

There are no bond length outliers.

All (81) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	602	ASP	CB-CG-OD2	5.59	123.33	118.30
2	B	674	ASP	CB-CG-OD2	5.58	123.32	118.30
2	B	730	ASP	CB-CG-OD2	5.51	123.26	118.30
2	B	1512	ASP	CB-CG-OD2	5.51	123.26	118.30
2	B	1413	ASP	CB-CG-OD2	5.49	123.25	118.30
1	A	39	ASP	CB-CG-OD2	5.48	123.23	118.30
2	B	1382	ASP	CB-CG-OD2	5.46	123.22	118.30
2	B	1418	ASP	CB-CG-OD2	5.45	123.21	118.30
2	B	1394	ASP	CB-CG-OD2	5.45	123.20	118.30
1	A	535	ASP	CB-CG-OD2	5.42	123.18	118.30
1	A	255	ASP	CB-CG-OD2	5.38	123.15	118.30
1	A	550	ASP	CB-CG-OD2	5.37	123.14	118.30
2	B	1427	ASP	CB-CG-OD2	5.33	123.10	118.30
1	A	349	ASP	CB-CG-OD2	5.33	123.09	118.30
2	B	1332	ASP	CB-CG-OD2	5.32	123.09	118.30
2	B	1273	ASP	CB-CG-OD2	5.30	123.07	118.30
1	A	382	ASP	CB-CG-OD2	5.29	123.07	118.30
2	B	1434	ASP	CB-CG-OD2	5.29	123.06	118.30
1	A	577	ASP	CB-CG-OD2	5.29	123.06	118.30
1	A	491	ASP	CB-CG-OD2	5.28	123.05	118.30
2	B	1392	ASP	CB-CG-OD2	5.26	123.03	118.30
2	B	901	ASP	CB-CG-OD2	5.25	123.03	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1486	ASP	CB-CG-OD2	5.25	123.03	118.30
2	B	1099	ASP	CB-CG-OD2	5.25	123.03	118.30
2	B	789	ASP	CB-CG-OD2	5.25	123.02	118.30
2	B	806	ASP	CB-CG-OD2	5.24	123.02	118.30
2	B	1395	ASP	CB-CG-OD2	5.24	123.01	118.30
1	A	315	ASP	CB-CG-OD2	5.22	123.00	118.30
2	B	1617	ASP	CB-CG-OD2	5.21	122.99	118.30
2	B	1503	ASP	CB-CG-OD2	5.21	122.99	118.30
1	A	566	ASP	CB-CG-OD2	5.21	122.98	118.30
2	B	1357	ASP	CB-CG-OD2	5.20	122.98	118.30
2	B	1152	ASP	CB-CG-OD2	5.20	122.98	118.30
2	B	704	ASP	CB-CG-OD2	5.20	122.98	118.30
2	B	1373	ASP	CB-CG-OD2	5.20	122.98	118.30
2	B	1375	ASP	CB-CG-OD2	5.20	122.98	118.30
1	A	596	ASP	CB-CG-OD2	5.19	122.97	118.30
1	A	30	ASP	CB-CG-OD2	5.19	122.97	118.30
1	A	527	ASP	CB-CG-OD2	5.19	122.97	118.30
2	B	944	ASP	CB-CG-OD2	5.18	122.97	118.30
2	B	1074	ASP	CB-CG-OD2	5.18	122.97	118.30
1	A	612	ASP	CB-CG-OD2	5.17	122.96	118.30
1	A	26	ASP	CB-CG-OD2	5.17	122.95	118.30
2	B	1435	ASP	CB-CG-OD2	5.17	122.95	118.30
1	A	502	ASP	CB-CG-OD2	5.16	122.94	118.30
2	B	1520	ASP	CB-CG-OD2	5.16	122.94	118.30
1	A	358	ASP	CB-CG-OD2	5.16	122.94	118.30
2	B	1007	ASP	CB-CG-OD2	5.16	122.94	118.30
1	A	532	ASP	CB-CG-OD2	5.15	122.93	118.30
2	B	775	ASP	CB-CG-OD2	5.15	122.93	118.30
2	B	755	ASP	CB-CG-OD2	5.14	122.93	118.30
2	B	1266	ASP	CB-CG-OD2	5.14	122.93	118.30
1	A	458	ASP	CB-CG-OD2	5.13	122.92	118.30
1	A	113	ASP	CB-CG-OD2	5.13	122.92	118.30
2	B	797	ASP	CB-CG-OD2	5.13	122.92	118.30
2	B	1200	ASP	CB-CG-OD2	5.13	122.92	118.30
2	B	1588	ASP	CB-CG-OD2	5.12	122.91	118.30
2	B	926	ASP	CB-CG-OD2	5.12	122.91	118.30
1	A	296	ASP	CB-CG-OD2	5.11	122.90	118.30
1	A	273	ASP	CB-CG-OD2	5.11	122.90	118.30
1	A	619	ASP	CB-CG-OD2	5.10	122.89	118.30
2	B	951	ASP	CB-CG-OD2	5.10	122.89	118.30
2	B	1263	ASP	CB-CG-OD2	5.10	122.89	118.30
2	B	1477	ASP	CB-CG-OD2	5.09	122.88	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	939	ASP	CB-CG-OD2	5.08	122.88	118.30
2	B	947	ASP	CB-CG-OD2	5.08	122.88	118.30
2	B	1613	ASP	CB-CG-OD2	5.08	122.87	118.30
1	A	172	ASP	CB-CG-OD2	5.06	122.85	118.30
1	A	156	ASP	CB-CG-OD2	5.05	122.85	118.30
2	B	1502	ASP	CB-CG-OD2	5.05	122.85	118.30
2	B	732	ASP	CB-CG-OD2	5.05	122.84	118.30
2	B	1603	ASP	CB-CG-OD2	5.04	122.84	118.30
2	B	971	ASP	CB-CG-OD2	5.03	122.83	118.30
2	B	1093	ASP	CB-CG-OD2	5.03	122.83	118.30
1	A	287	ASP	CB-CG-OD2	5.03	122.83	118.30
2	B	659	ASP	CB-CG-OD2	5.03	122.82	118.30
2	B	1552	ASP	CB-CG-OD2	5.03	122.82	118.30
2	B	974	ASP	CB-CG-OD2	5.02	122.82	118.30
2	B	1134	ASP	CB-CG-OD2	5.01	122.81	118.30
2	B	1118	ASP	CB-CG-OD2	5.01	122.81	118.30
2	B	1225	ASP	CB-CG-OD2	5.00	122.80	118.30

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	4950	0	5012	83	0
2	B	7821	0	7743	211	0
3	C	28	0	25	0	0
4	D	61	0	52	4	0
All	All	12860	0	12832	286	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 11.

All (286) 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:A:584:ASN:HB3	1:A:585:LYS:CA	1.85	1.07
1:A:584:ASN:CB	1:A:585:LYS:HA	1.84	1.06
2:B:908:LYS:HE3	2:B:1417:SER:HA	1.38	1.05
2:B:1484:CYS:HA	2:B:1489:CYS:HB2	1.37	1.04
1:A:584:ASN:HB3	1:A:585:LYS:HA	0.99	0.98
1:A:203:LYS:O	1:A:204:GLU:HB3	1.65	0.96
1:A:554:VAL:HG22	1:A:555:PRO:HD2	1.50	0.91
2:B:1593:LYS:HB2	2:B:1594:PRO:HA	1.51	0.90
2:B:1228:PRO:HB2	2:B:1229:PRO:HD3	1.62	0.82
2:B:927:PRO:O	2:B:928:GLU:HB2	1.80	0.81
2:B:1484:CYS:HA	2:B:1489:CYS:CB	2.11	0.81
2:B:1404:ASP:OD1	2:B:1404:ASP:N	2.16	0.77
2:B:961:GLN:HG2	2:B:966:ALA:HB3	1.67	0.76
2:B:929:ARG:O	2:B:931:GLY:N	2.16	0.74
2:B:1325:MET:CE	4:D:1:NAG:H5	2.18	0.74
2:B:1524:LYS:HD3	2:B:1544:GLU:HB2	1.70	0.72
1:A:203:LYS:O	1:A:204:GLU:CB	2.38	0.72
2:B:822:GLN:HG3	2:B:879:VAL:HG22	1.73	0.71
2:B:686:GLN:CD	2:B:686:GLN:H	1.95	0.69
2:B:1593:LYS:CB	2:B:1594:PRO:HA	2.21	0.69
2:B:1249:ALA:O	2:B:1253:VAL:HG23	1.92	0.69
2:B:997:THR:HB	2:B:998:PRO:HD3	1.75	0.69
1:A:426:THR:HG21	1:A:432:ASN:H	1.58	0.69
2:B:811:LEU:HB3	2:B:905:LYS:HD2	1.74	0.69
1:A:541:LEU:HD22	2:B:786:SER:HB3	1.74	0.69
2:B:1473:PRO:O	2:B:1474:GLU:HB2	1.92	0.69
2:B:1419:ARG:HG3	2:B:1419:ARG:HH11	1.58	0.68
2:B:998:PRO:HG3	2:B:1251:PHE:CE1	2.29	0.67
2:B:1496:CYS:O	2:B:1497:PHE:HB3	1.92	0.67
1:A:554:VAL:CG2	1:A:555:PRO:HD2	2.23	0.67
1:A:249:VAL:HG21	1:A:278:VAL:HG21	1.77	0.65
2:B:813:LEU:HD22	2:B:907:LEU:HB3	1.79	0.64
2:B:1392:ASP:OD2	2:B:1394:ASP:HB2	1.98	0.64
1:A:554:VAL:HG22	1:A:555:PRO:CD	2.27	0.64
1:A:580:VAL:HG13	2:B:745:PHE:CD1	2.33	0.64
2:B:1014:LYS:O	2:B:1294:ALA:HB2	1.98	0.64
2:B:710:THR:O	2:B:714:ARG:HB2	1.98	0.63
2:B:686:GLN:O	2:B:689:THR:HG22	1.99	0.62
2:B:1320:LEU:HG	2:B:1320:LEU:O	1.98	0.62
2:B:1501:SER:C	2:B:1503:ASP:H	2.03	0.62
2:B:657:ARG:HD3	2:B:676:MET:HB3	1.81	0.62
2:B:1116:GLU:HA	2:B:1119:MET:HB2	1.80	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1001:ILE:HD11	2:B:1254:PHE:CD1	2.35	0.62
2:B:1237:GLN:OE1	2:B:1239:TYR:OH	2.18	0.62
2:B:956:THR:HG23	2:B:1324:THR:HG22	1.82	0.61
2:B:1008:GLU:HG3	2:B:1262:LYS:HE3	1.82	0.60
2:B:823:VAL:HG23	2:B:878:ILE:HG13	1.82	0.60
2:B:929:ARG:C	2:B:931:GLY:H	2.02	0.60
2:B:1325:MET:HE1	4:D:1:NAG:H5	1.84	0.60
2:B:1291:TRP:O	2:B:1292:GLU:HB2	2.01	0.60
1:A:213:ILE:HG13	1:A:234:THR:HB	1.84	0.60
1:A:6:ILE:HG23	1:A:625:THR:HB	1.82	0.59
2:B:991:GLN:HG2	2:B:1460:TYR:CZ	2.37	0.59
2:B:1228:PRO:CB	2:B:1229:PRO:HD3	2.32	0.59
2:B:809:ILE:HD11	2:B:892:ALA:HB3	1.85	0.59
2:B:680:PRO:HB2	2:B:1438:ALA:O	2.02	0.59
2:B:1380:ILE:CD1	2:B:1460:TYR:HD1	2.15	0.59
2:B:1325:MET:HE3	4:D:1:NAG:H5	1.85	0.59
1:A:202:VAL:O	1:A:204:GLU:N	2.34	0.59
2:B:965:VAL:HG11	2:B:1254:PHE:HE1	1.68	0.59
1:A:24:ALA:HB2	1:A:54:LEU:HD13	1.84	0.59
2:B:965:VAL:CG1	2:B:1254:PHE:HE1	2.16	0.59
2:B:714:ARG:HH12	2:B:718:ARG:NH2	2.02	0.58
2:B:675:GLY:O	2:B:706:CYS:HB3	2.04	0.58
1:A:147:ASN:HB2	1:A:148:PRO:HD2	1.84	0.57
2:B:1484:CYS:O	2:B:1486:ASP:N	2.37	0.57
2:B:821:GLU:OE1	2:B:1387:THR:HG21	2.04	0.57
1:A:374:THR:O	1:A:376:GLN:N	2.38	0.57
2:B:742:ARG:HG2	2:B:745:PHE:CZ	2.40	0.57
2:B:818:VAL:HG11	2:B:1451:GLN:HG3	1.86	0.57
2:B:1408:SER:OG	2:B:1427:ASP:OD1	2.18	0.57
2:B:706:CYS:HA	2:B:709:ILE:HG22	1.87	0.57
2:B:850:PHE:HB3	2:B:880:PRO:HA	1.87	0.56
2:B:991:GLN:O	2:B:994:ILE:HG13	2.06	0.56
2:B:997:THR:O	2:B:1001:ILE:HG23	2.05	0.56
1:A:334:HIS:HB2	1:A:353:PHE:HB3	1.86	0.56
2:B:657:ARG:HA	2:B:676:MET:HE1	1.87	0.56
1:A:588:LYS:O	1:A:593:LYS:HD2	2.06	0.56
2:B:1448:GLU:O	2:B:1449:LEU:HB2	2.06	0.56
1:A:434:LEU:HB2	1:A:513:TYR:HE2	1.70	0.56
2:B:663:LYS:O	2:B:664:TYR:HB2	2.06	0.56
2:B:1498:ILE:HD12	2:B:1605:TRP:HB2	1.87	0.56
1:A:584:ASN:ND2	1:A:587:ASN:H	2.03	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:894:VAL:CG2	2:B:897:HIS:HB2	2.36	0.55
2:B:908:LYS:O	2:B:908:LYS:HG3	2.06	0.55
2:B:955:GLU:O	2:B:955:GLU:HG3	2.06	0.55
2:B:1126:LEU:HD11	2:B:1147:ILE:HG23	1.87	0.55
2:B:826:ARG:NH2	2:B:1444:TYR:O	2.40	0.55
2:B:1341:LEU:HB3	2:B:1469:ARG:HD3	1.87	0.55
2:B:1593:LYS:HB2	2:B:1594:PRO:CA	2.31	0.55
1:A:30:ASP:HB3	1:A:56:PRO:HD3	1.89	0.55
2:B:778:THR:OG1	2:B:779:THR:N	2.39	0.55
2:B:990:GLU:HG2	2:B:1461:TYR:OH	2.06	0.55
2:B:679:ASN:HB2	2:B:688:ARG:HH21	1.71	0.55
2:B:818:VAL:HB	2:B:821:GLU:CD	2.28	0.55
2:B:1276:LEU:HB2	2:B:1285:ILE:HB	1.88	0.55
2:B:1484:CYS:C	2:B:1486:ASP:H	2.10	0.54
2:B:851:CYS:SG	2:B:881:LEU:HD11	2.47	0.54
2:B:927:PRO:O	2:B:928:GLU:CB	2.55	0.54
2:B:1408:SER:O	2:B:1409:LYS:HB3	2.08	0.54
2:B:985:PRO:HG3	2:B:1423:ILE:HG21	1.90	0.54
1:A:374:THR:HG22	1:A:375:VAL:H	1.74	0.53
2:B:1390:ALA:HB3	2:B:1444:TYR:HE1	1.74	0.53
2:B:1501:SER:O	2:B:1503:ASP:N	2.42	0.53
2:B:910:VAL:HG11	2:B:1418:ASP:HA	1.90	0.53
2:B:1180:LEU:HD23	2:B:1221:LEU:HD11	1.90	0.53
2:B:1121:LEU:O	2:B:1125:VAL:HG23	2.08	0.53
1:A:147:ASN:HB2	1:A:148:PRO:CD	2.39	0.53
2:B:1479:LYS:HD2	2:B:1566:ILE:HD11	1.91	0.52
2:B:919:THR:HG21	2:B:1238:ARG:O	2.09	0.52
2:B:1380:ILE:HD11	2:B:1460:TYR:HD1	1.74	0.52
2:B:1385:MET:O	2:B:1419:ARG:HG2	2.09	0.52
1:A:582:VAL:HG12	1:A:582:VAL:O	2.10	0.52
2:B:734:ILE:HG22	2:B:736:GLU:H	1.74	0.52
2:B:1001:ILE:HG13	2:B:1002:ALA:N	2.24	0.52
2:B:750:LEU:HD11	2:B:771:ILE:HG21	1.92	0.52
2:B:915:ARG:HD2	2:B:1325:MET:HE2	1.92	0.52
2:B:1001:ILE:HD11	2:B:1254:PHE:CE1	2.45	0.52
2:B:1338:LYS:N	2:B:1338:LYS:HZ2	2.08	0.52
2:B:1419:ARG:HG3	2:B:1419:ARG:NH1	2.19	0.51
2:B:1555:GLN:H	2:B:1558:GLN:NE2	2.08	0.51
2:B:1130:GLN:HA	2:B:1133:LYS:HG3	1.92	0.51
2:B:1276:LEU:HD23	2:B:1310:VAL:HG22	1.92	0.51
1:A:126:ARG:NH2	1:A:573:LEU:O	2.44	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:166:VAL:HG11	1:A:572:VAL:HG11	1.92	0.51
1:A:366:PRO:HD2	1:A:406:LYS:HG2	1.92	0.51
2:B:689:THR:HG23	2:B:690:ARG:HG2	1.93	0.51
1:A:262:LEU:HD22	1:A:288:GLY:HA3	1.93	0.51
1:A:584:ASN:HD21	1:A:587:ASN:HB2	1.76	0.51
1:A:404:THR:CG2	1:A:415:ALA:H	2.24	0.50
2:B:922:VAL:O	2:B:923:ARG:O	2.28	0.50
2:B:1591:GLY:O	2:B:1596:LEU:HD12	2.11	0.50
1:A:338:THR:HG21	1:A:350:LEU:HD23	1.93	0.50
1:A:215:GLU:HB3	1:A:321:ARG:NH2	2.27	0.49
2:B:663:LYS:H	2:B:663:LYS:HD2	1.77	0.49
2:B:1248:GLN:O	2:B:1252:MET:HB2	2.11	0.49
1:A:577:ASP:HB2	2:B:746:PRO:HG2	1.94	0.49
2:B:1496:CYS:O	2:B:1497:PHE:CB	2.60	0.49
1:A:572:VAL:HG12	2:B:753:VAL:HG22	1.94	0.49
2:B:1105:GLN:O	2:B:1106:GLU:C	2.50	0.49
2:B:1270:LEU:HB2	2:B:1291:TRP:HB2	1.94	0.49
2:B:1278:LEU:HD22	2:B:1302:THR:HG21	1.95	0.49
1:A:443:LEU:H	1:A:443:LEU:HD23	1.77	0.49
2:B:733:ILE:HG22	2:B:734:ILE:H	1.78	0.49
2:B:950:PRO:HB3	2:B:1599:ILE:HD12	1.95	0.48
2:B:888:VAL:HG23	2:B:907:LEU:HD22	1.95	0.48
2:B:1091:LYS:HE3	2:B:1095:VAL:HB	1.95	0.48
2:B:657:ARG:O	2:B:658:MET:HB3	2.14	0.48
1:A:332:GLN:HE21	1:A:357:PRO:HA	1.78	0.48
1:A:567:HIS:HB2	2:B:760:PRO:HB3	1.96	0.48
2:B:1014:LYS:HZ2	2:B:1292:GLU:H	1.62	0.48
1:A:554:VAL:CG2	1:A:555:PRO:CD	2.90	0.47
2:B:1448:GLU:HB2	2:B:1482:LYS:HG2	1.96	0.47
2:B:1228:PRO:HB2	2:B:1229:PRO:CD	2.39	0.47
1:A:398:LEU:HD22	1:A:400:ILE:HG13	1.96	0.47
2:B:1065:SER:HB2	2:B:1131:GLU:HB3	1.96	0.47
2:B:1014:LYS:HD2	2:B:1292:GLU:HA	1.96	0.47
2:B:1516:GLU:HB3	2:B:1519:VAL:HG23	1.97	0.46
1:A:126:ARG:HG3	2:B:751:TRP:CH2	2.51	0.46
2:B:1593:LYS:CB	2:B:1594:PRO:CA	2.92	0.46
1:A:22:LEU:HD13	1:A:33:VAL:HG11	1.98	0.46
2:B:1095:VAL:HG12	2:B:1096:PHE:N	2.30	0.46
1:A:161:GLN:O	1:A:162:ASN:HB2	2.16	0.46
2:B:1157:ASN:N	2:B:1157:ASN:HD22	2.12	0.46
2:B:818:VAL:O	2:B:821:GLU:HB2	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:LEU:HB2	1:A:196:PHE:CD1	2.51	0.46
2:B:1215:LEU:HD23	2:B:1256:ALA:HB1	1.98	0.46
1:A:179:MET:HA	1:A:202:VAL:HG23	1.98	0.46
1:A:547:GLN:HE22	1:A:559:MET:HA	1.81	0.46
2:B:1336:CYS:HB3	2:B:1339:PHE:O	2.16	0.46
2:B:1414:LYS:O	2:B:1415:ALA:C	2.54	0.46
2:B:1516:GLU:HG3	2:B:1518:GLY:H	1.79	0.46
1:A:553:PRO:HG3	2:B:801:VAL:HG12	1.98	0.45
1:A:584:ASN:CB	1:A:585:LYS:CA	2.65	0.45
2:B:669:ARG:O	2:B:673:GLU:HB2	2.17	0.45
2:B:1227:VAL:N	2:B:1228:PRO:CD	2.79	0.45
2:B:1482:LYS:HA	2:B:1483:LEU:HA	1.69	0.45
1:A:134:LEU:HD12	1:A:595:TRP:CZ3	2.51	0.45
1:A:606:THR:HA	1:A:607:PRO:HD3	1.82	0.45
2:B:1052:PRO:O	2:B:1100:ALA:HB2	2.16	0.45
2:B:1337:ASN:C	2:B:1338:LYS:HD3	2.37	0.45
1:A:55:THR:HG22	1:A:57:ALA:H	1.80	0.45
2:B:1043:ALA:O	2:B:1057:THR:OG1	2.27	0.45
1:A:495:LEU:HD12	1:A:496:PRO:HD2	1.98	0.45
2:B:1411:GLU:HB3	2:B:1423:ILE:HB	1.99	0.45
1:A:504:ILE:CG2	1:A:505:PRO:HA	2.47	0.45
2:B:908:LYS:CE	2:B:1417:SER:HA	2.28	0.45
2:B:929:ARG:C	2:B:931:GLY:N	2.66	0.45
2:B:1380:ILE:O	2:B:1457:VAL:HA	2.16	0.45
1:A:175:GLU:CD	1:A:175:GLU:H	2.20	0.45
1:A:437:SER:OG	1:A:452:ASN:HB2	2.17	0.45
1:A:589:LEU:O	2:B:795:VAL:HG11	2.17	0.45
2:B:817:VAL:O	2:B:909:VAL:HA	2.17	0.44
2:B:956:THR:OG1	2:B:1324:THR:HG22	2.17	0.44
2:B:1079:CYS:O	2:B:1083:LYS:HB2	2.17	0.44
2:B:1005:TYR:HA	2:B:1262:LYS:HD2	1.99	0.44
2:B:1065:SER:CB	2:B:1131:GLU:HB3	2.47	0.44
1:A:249:VAL:CG2	1:A:278:VAL:HG21	2.46	0.44
2:B:998:PRO:HG3	2:B:1251:PHE:CD1	2.53	0.44
1:A:356:ASN:HB3	1:A:357:PRO:HD2	2.00	0.44
2:B:931:GLY:O	2:B:932:ARG:HB2	2.16	0.44
1:A:356:ASN:HB3	1:A:357:PRO:CD	2.48	0.44
2:B:940:ILE:HD13	2:B:1322:VAL:HG21	1.99	0.44
2:B:1208:VAL:HG12	2:B:1253:VAL:CG2	2.48	0.44
2:B:1501:SER:C	2:B:1503:ASP:N	2.70	0.44
2:B:668:LEU:HG	2:B:701:VAL:HG21	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:689:THR:O	2:B:690:ARG:HB2	2.19	0.43
2:B:965:VAL:HG13	2:B:1254:PHE:CE1	2.53	0.43
2:B:915:ARG:HG2	2:B:1327:HIS:CE1	2.54	0.43
2:B:818:VAL:HG23	2:B:1419:ARG:HH21	1.83	0.43
2:B:965:VAL:CG1	2:B:1254:PHE:CE1	2.99	0.43
2:B:996:MET:O	2:B:1000:VAL:HG23	2.18	0.43
2:B:1143:LEU:N	2:B:1144:PRO:CD	2.81	0.43
2:B:1103:ILE:HG23	2:B:1378:MET:HG3	1.99	0.43
2:B:949:VAL:HG23	2:B:1327:HIS:O	2.18	0.43
2:B:953:GLU:H	2:B:953:GLU:HG3	1.51	0.43
1:A:6:ILE:HD13	1:A:88:ALA:HB2	2.00	0.43
2:B:672:CYS:HB2	2:B:701:VAL:CG1	2.49	0.43
2:B:1354:ARG:CZ	2:B:1361:THR:HG22	2.48	0.43
2:B:652:GLN:O	2:B:654:THR:N	2.49	0.43
2:B:1008:GLU:HG3	2:B:1262:LYS:CE	2.49	0.43
2:B:1380:ILE:HD11	2:B:1460:TYR:CD1	2.52	0.43
2:B:1632:GLU:C	2:B:1634:MET:H	2.23	0.43
1:A:487:GLU:O	1:A:490:GLN:HB2	2.19	0.42
2:B:677:ARG:HG3	2:B:734:ILE:HD11	2.01	0.42
1:A:19:THR:HA	1:A:65:THR:HG22	1.99	0.42
2:B:1340:ASP:OD2	2:B:1371:ARG:NH2	2.52	0.42
2:B:1380:ILE:HD12	2:B:1460:TYR:HD1	1.82	0.42
2:B:1414:LYS:HD3	2:B:1420:ASN:HB2	2.01	0.42
4:D:3:MAN:O4	4:D:4:MAN:C1	2.65	0.42
1:A:39:ASP:HB2	1:A:44:LYS:HD2	1.99	0.42
2:B:1294:ALA:O	2:B:1295:SER:HB3	2.20	0.42
2:B:1354:ARG:HB2	2:B:1355:PRO:HD2	2.00	0.42
2:B:1527:LEU:O	2:B:1577:LYS:HA	2.19	0.42
2:B:963:THR:HG22	2:B:965:VAL:H	1.84	0.42
2:B:1346:LYS:HA	2:B:1347:PRO:HD3	1.91	0.42
2:B:1381:LEU:HB2	2:B:1424:ILE:HB	2.00	0.42
2:B:1497:PHE:HE1	2:B:1500:LYS:HZ3	1.68	0.42
1:A:611:LYS:H	1:A:611:LYS:HD2	1.84	0.42
2:B:888:VAL:CG2	2:B:907:LEU:HD22	2.49	0.42
2:B:1380:ILE:CD1	2:B:1460:TYR:CD1	3.01	0.42
1:A:603:ILE:HA	1:A:604:GLY:HA2	1.73	0.42
2:B:1040:PRO:HA	2:B:1041:SER:HA	1.44	0.42
2:B:1592:GLU:H	2:B:1592:GLU:HG2	1.56	0.42
2:B:1593:LYS:CD	2:B:1593:LYS:H	2.31	0.42
1:A:40:PHE:HA	1:A:41:PRO:HA	1.61	0.42
1:A:504:ILE:H	1:A:504:ILE:HG13	1.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:553:PRO:HA	1:A:557:GLN:HE22	1.85	0.42
1:A:606:THR:HB	1:A:619:ASP:HB3	2.01	0.42
2:B:1390:ALA:HB3	2:B:1444:TYR:CE1	2.52	0.42
2:B:1619:GLU:H	2:B:1619:GLU:CD	2.23	0.42
2:B:1341:LEU:O	2:B:1469:ARG:HD3	2.19	0.41
1:A:193:GLN:H	1:A:193:GLN:HG2	1.48	0.41
1:A:214:VAL:O	1:A:321:ARG:HB2	2.19	0.41
1:A:312:SER:HB2	2:B:1356:GLN:HG3	2.02	0.41
1:A:324:ILE:HA	1:A:325:PRO:HD3	1.83	0.41
2:B:750:LEU:CD1	2:B:771:ILE:HG21	2.50	0.41
2:B:1014:LYS:NZ	2:B:1292:GLU:H	2.19	0.41
2:B:1206:TYR:CE2	2:B:1462:ASN:HB2	2.55	0.41
2:B:883:THR:HA	2:B:909:VAL:HB	2.00	0.41
2:B:1277:GLN:HB2	2:B:1284:LYS:HZ3	1.84	0.41
2:B:1482:LYS:O	2:B:1482:LYS:HG3	2.20	0.41
2:B:1074:ASP:OD2	2:B:1076:GLN:HB2	2.19	0.41
1:A:178:ASN:O	1:A:202:VAL:HG21	2.21	0.41
1:A:422:LEU:HB3	1:A:423:PRO:HD2	2.02	0.41
1:A:614:ALA:HB1	1:A:632:THR:HG22	2.02	0.41
2:B:819:ARG:O	2:B:820:ASN:HB2	2.21	0.41
1:A:153:VAL:HG21	1:A:182:TRP:HZ3	1.84	0.41
2:B:1204:GLN:HG3	2:B:1464:GLU:HG2	2.02	0.41
1:A:454:LEU:HD13	1:A:454:LEU:HA	1.96	0.41
2:B:1227:VAL:HB	2:B:1228:PRO:HD3	2.01	0.41
1:A:10:ASN:HD22	1:A:10:ASN:HA	1.62	0.41
2:B:916:MET:O	2:B:1325:MET:HA	2.21	0.41
2:B:923:ARG:NH1	2:B:938:GLU:HG3	2.36	0.41
2:B:1205:LEU:HD23	2:B:1205:LEU:HA	1.94	0.41
2:B:1338:LYS:HB2	2:B:1338:LYS:NZ	2.35	0.41
2:B:1583:TRP:CD1	2:B:1583:TRP:C	2.95	0.41
1:A:8:THR:HG23	1:A:623:THR:OG1	2.21	0.41
2:B:878:ILE:HG13	2:B:878:ILE:O	2.21	0.41
2:B:837:GLU:HB3	2:B:868:PRO:HD3	2.04	0.40
2:B:1227:VAL:N	2:B:1228:PRO:HD2	2.36	0.40
2:B:1029:LYS:O	2:B:1033:GLN:HG3	2.21	0.40
1:A:133:LYS:HG3	1:A:477:ARG:HH22	1.86	0.40
2:B:1113:ASN:OD1	2:B:1115:ASN:ND2	2.54	0.40
1:A:504:ILE:HG22	1:A:505:PRO:HA	2.04	0.40
2:B:1104:HIS:O	2:B:1105:GLN:C	2.59	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	629/643 (98%)	564 (90%)	54 (9%)	11 (2%)	9	35
2	B	970/991 (98%)	853 (88%)	87 (9%)	30 (3%)	4	23
All	All	1599/1634 (98%)	1417 (89%)	141 (9%)	41 (3%)	5	27

All (41) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	203	LYS
1	A	204	GLU
1	A	424	TYR
2	B	923	ARG
2	B	930	LEU
2	B	1295	SER
2	B	1330	ALA
1	A	64	VAL
2	B	928	GLU
2	B	1268	GLN
2	B	1473	PRO
1	A	49	SER
1	A	425	SER
1	A	584	ASN
2	B	742	ARG
2	B	934	GLY
2	B	1105	GLN
2	B	1294	ALA
2	B	1331	LYS
2	B	1474	GLU
2	B	1475	LYS
2	B	1501	SER
1	A	81	ASN
1	A	628	SER
2	B	929	ARG

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Mol	Chain	Res	Type
2	B	1044	PHE
2	B	1377	THR
2	B	1417	SER
2	B	1482	LYS
2	B	1497	PHE
1	A	45	LEU
1	A	549	GLU
2	B	664	TYR
2	B	678	GLU
2	B	857	LYS
2	B	1292	GLU
2	B	1315	LYS
2	B	1419	ARG
2	B	1314	GLY
2	B	1591	GLY
2	B	764	ILE

### 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	560/567 (99%)	525 (94%)	35 (6%)	18	47
2	B	867/878 (99%)	766 (88%)	101 (12%)	5	22
All	All	1427/1445 (99%)	1291 (90%)	136 (10%)	8	29

All (136) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	ILE
1	A	8	THR
1	A	10	ASN
1	A	36	THR
1	A	51	LYS
1	A	103	LEU
1	A	104	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	105	SER
1	A	115	THR
1	A	164	LEU
1	A	177	VAL
1	A	179	MET
1	A	193	GLN
1	A	197	SER
1	A	202	VAL
1	A	204	GLU
1	A	215	GLU
1	A	223	ILE
1	A	241	LYS
1	A	246	THR
1	A	277	GLU
1	A	289	VAL
1	A	310	LEU
1	A	398	LEU
1	A	404	THR
1	A	409	LEU
1	A	478	LEU
1	A	491	ASP
1	A	492	LEU
1	A	498	SER
1	A	580	VAL
1	A	584	ASN
1	A	611	LYS
1	A	623	THR
1	A	639	GLN
2	B	651	VAL
2	B	673	GLU
2	B	684	SER
2	B	686	GLN
2	B	687	ARG
2	B	689	THR
2	B	696	GLU
2	B	700	LYS
2	B	712	LEU
2	B	716	HIS
2	B	730	ASP
2	B	733	ILE
2	B	742	ARG
2	B	755	ASP

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	778	THR
2	B	789	ASP
2	B	804	MET
2	B	822	GLN
2	B	823	VAL
2	B	826	ARG
2	B	841	ARG
2	B	857	LYS
2	B	859	ARG
2	B	864	VAL
2	B	894	VAL
2	B	898	PHE
2	B	908	LYS
2	B	916	MET
2	B	922	VAL
2	B	937	LYS
2	B	953	GLU
2	B	955	GLU
2	B	970	GLU
2	B	974	ASP
2	B	980	HIS
2	B	982	ILE
2	B	983	VAL
2	B	988	CYS
2	B	990	GLU
2	B	1001	ILE
2	B	1018	GLU
2	B	1024	LEU
2	B	1042	SER
2	B	1093	ASP
2	B	1114	ASN
2	B	1131	GLU
2	B	1133	LYS
2	B	1137	GLU
2	B	1143	LEU
2	B	1157	ASN
2	B	1169	ILE
2	B	1197	ARG
2	B	1226	PHE
2	B	1246	SER
2	B	1269	GLU
2	B	1278	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	B	1298	ARG
2	B	1302	THR
2	B	1332	ASP
2	B	1337	ASN
2	B	1338	LYS
2	B	1341	LEU
2	B	1345	ILE
2	B	1350	GLU
2	B	1351	THR
2	B	1371	ARG
2	B	1373	ASP
2	B	1378	MET
2	B	1387	THR
2	B	1393	THR
2	B	1404	ASP
2	B	1411	GLU
2	B	1412	LEU
2	B	1414	LYS
2	B	1416	PHE
2	B	1417	SER
2	B	1419	ARG
2	B	1420	ASN
2	B	1428	LYS
2	B	1433	GLU
2	B	1440	LYS
2	B	1448	GLU
2	B	1463	LEU
2	B	1469	ARG
2	B	1480	LEU
2	B	1482	LYS
2	B	1483	LEU
2	B	1485	ARG
2	B	1496	CYS
2	B	1497	PHE
2	B	1503	ASP
2	B	1509	GLU
2	B	1532	LEU
2	B	1566	ILE
2	B	1568	CYS
2	B	1577	LYS
2	B	1592	GLU
2	B	1593	LYS

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Mol	Chain	Res	Type
2	B	1602	LYS
2	B	1619	GLU
2	B	1626	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	10	ASN
1	A	178	ASN
1	A	181	GLN
1	A	332	GLN
1	A	334	HIS
1	A	490	GLN
1	A	547	GLN
1	A	557	GLN
1	A	584	ASN
2	B	679	ASN
2	B	686	GLN
2	B	1105	GLN
2	B	1157	ASN
2	B	1261	GLN
2	B	1277	GLN
2	B	1337	ASN
2	B	1472	HIS
2	B	1495	ASN
2	B	1558	GLN
2	B	1620	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](#)

7 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	NAG	C	1	3,1	14,14,15	0.55	0	17,19,21	0.68	0
3	NAG	C	2	3	14,14,15	0.52	0	17,19,21	0.62	0
4	NAG	D	1	2,4	14,14,15	0.64	0	17,19,21	1.18	2 (11%)
4	NAG	D	2	4	14,14,15	0.68	0	17,19,21	1.23	1 (5%)
4	MAN	D	3	4	11,11,12	0.86	1 (9%)	15,15,17	0.68	0
4	MAN	D	4	4	11,11,12	0.64	0	15,15,17	0.68	0
4	BMA	D	5	4	11,11,12	0.64	0	15,15,17	0.75	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
3	NAG	C	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	C	2	3	-	3/6/23/26	0/1/1/1
4	NAG	D	1	2,4	-	2/6/23/26	0/1/1/1
4	NAG	D	2	4	-	2/6/23/26	0/1/1/1
4	MAN	D	3	4	1/1/4/5	1/2/19/22	0/1/1/1
4	MAN	D	4	4	1/1/4/5	2/2/19/22	0/1/1/1
4	BMA	D	5	4	-	2/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	3	MAN	C1-C2	-2.00	1.47	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	2	NAG	C4-C3-C2	4.04	116.94	111.02
4	D	1	NAG	C4-C3-C2	2.96	115.36	111.02

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	1	NAG	C3-C4-C5	2.37	114.47	110.24

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	D	3	MAN	C1
4	D	4	MAN	C1

All (14) torsion outliers are listed below:

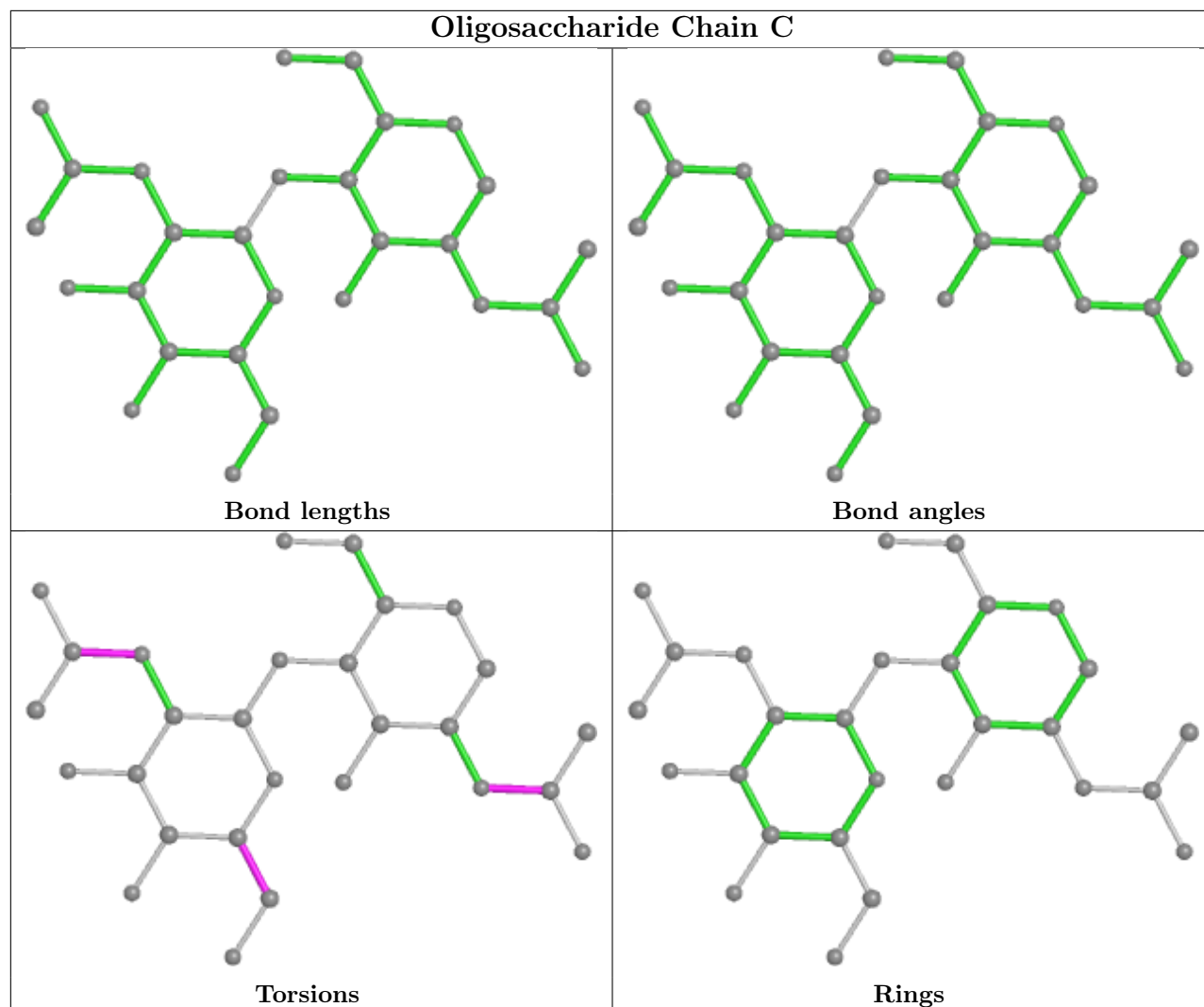
Mol	Chain	Res	Type	Atoms
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2
3	C	2	NAG	C8-C7-N2-C2
3	C	2	NAG	O7-C7-N2-C2
4	D	1	NAG	C8-C7-N2-C2
4	D	1	NAG	O7-C7-N2-C2
4	D	2	NAG	C8-C7-N2-C2
4	D	2	NAG	O7-C7-N2-C2
4	D	5	BMA	O5-C5-C6-O6
4	D	5	BMA	C4-C5-C6-O6
4	D	4	MAN	O5-C5-C6-O6
3	C	2	NAG	O5-C5-C6-O6
4	D	3	MAN	O5-C5-C6-O6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

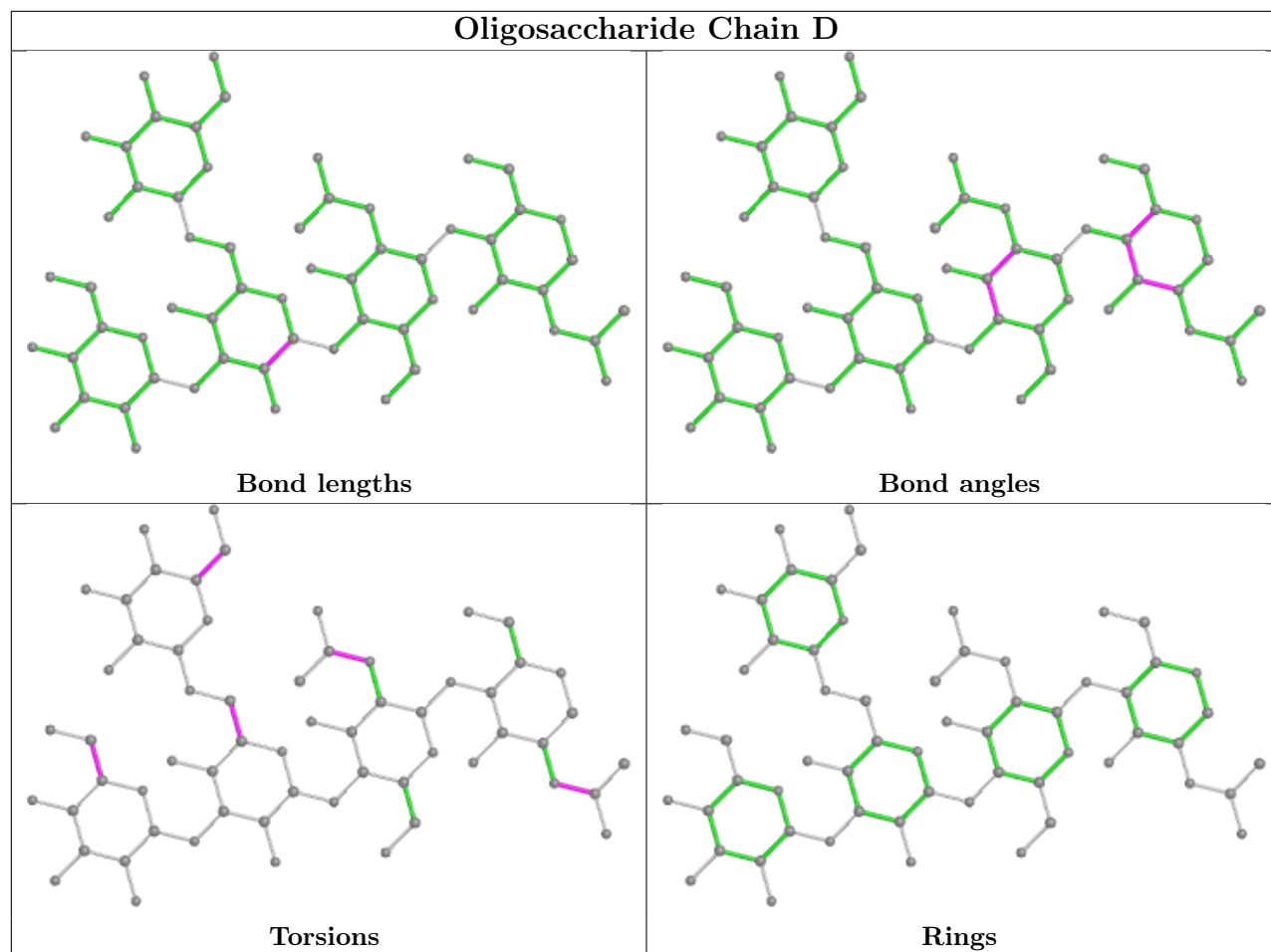
There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	3	MAN	1	0
4	D	1	NAG	3	0
4	D	4	MAN	1	0

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





## 5.6 Ligand geometry [i](#)

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<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	635/643 (98%)	0.33	29 (4%) 32 30	79, 97, 116, 123	0
2	B	976/991 (98%)	0.05	8 (0%) 86 86	71, 91, 108, 129	0
All	All	1611/1634 (98%)	0.16	37 (2%) 60 59	71, 93, 113, 129	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	101	VAL	3.7
1	A	20	MET	3.7
1	A	427	VAL	3.6
2	B	739	ILE	3.6
2	B	762	ASN	3.1
1	A	61	MET	3.1
1	A	300	LYS	3.1
1	A	326	ILE	3.0
1	A	105	SER	3.0
1	A	377	SER	3.0
2	B	1481	ASN	2.9
1	A	1	SER	2.8
2	B	1485	ARG	2.7
2	B	1594	PRO	2.6
1	A	520	GLY	2.5
1	A	378	LEU	2.5
1	A	408	GLU	2.5
2	B	763	GLY	2.5
1	A	103	LEU	2.5
2	B	930	LEU	2.4
1	A	167	LEU	2.4
1	A	459	ARG	2.4
1	A	84	VAL	2.4
1	A	523	GLU	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	52	THR	2.2
1	A	392	HIS	2.2
2	B	1337	ASN	2.2
1	A	229	LEU	2.2
1	A	519	SER	2.2
1	A	221	TYR	2.2
1	A	371	GLY	2.1
1	A	43	LYS	2.1
1	A	442	GLU	2.1
1	A	28	GLN	2.0
1	A	4	TYR	2.0
1	A	51	LYS	2.0
1	A	606	THR	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 6.3 Carbohydrates [i](#)

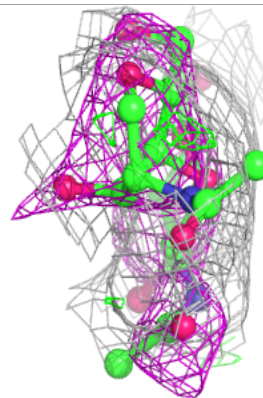
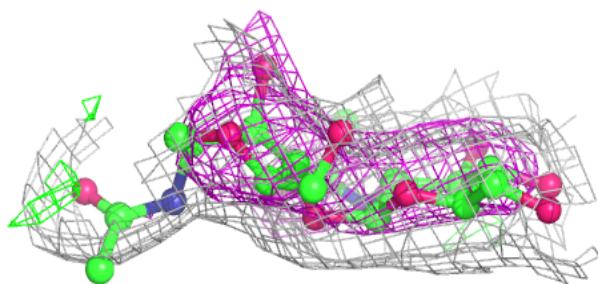
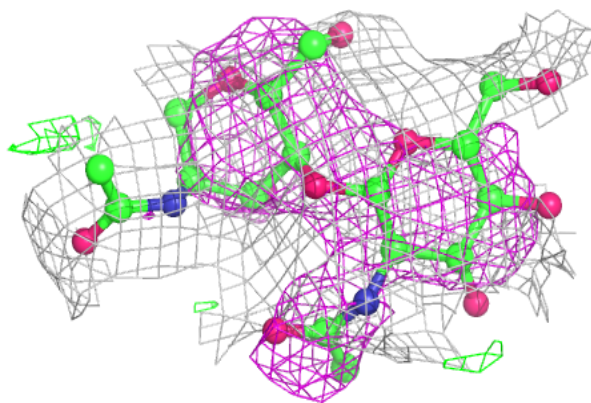
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

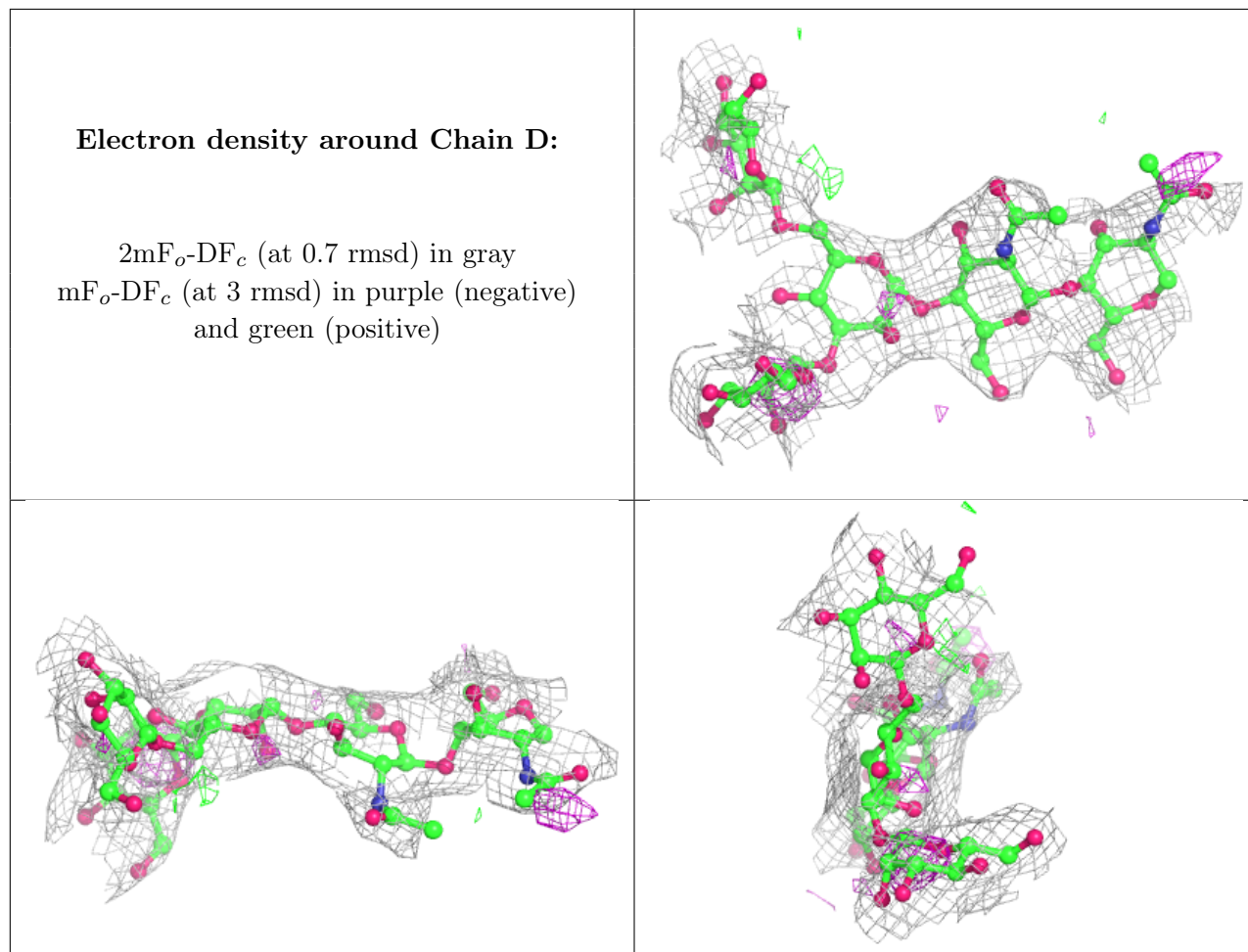
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	BMA	D	5	11/12	0.60	0.32	150,151,152,152	0
4	MAN	D	4	11/12	0.68	0.35	147,148,148,149	0
3	NAG	C	2	14/15	0.71	0.43	106,106,106,107	0
3	NAG	C	1	14/15	0.75	0.36	107,108,108,109	0
4	MAN	D	3	11/12	0.84	0.21	141,144,147,149	0
4	NAG	D	2	14/15	0.89	0.19	126,129,132,138	0
4	NAG	D	1	14/15	0.90	0.21	109,113,116,121	0

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

**Electron density around Chain C:**

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





## 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.