Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2024 – 02:33 AM EST

PDB ID	:	8V9Q
Title	:	Crystal structure of mGalNAc-T1 in complex with the mucin glycopeptide Muc5AC-13, Mn2+, and UDP.
Authors	:	Samara, N.L.; Collette, A.M.
Deposited on	:	2023-12-08
Resolution	:	2.29 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 ⓘ 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 ⓘ) were used in the production of this report:

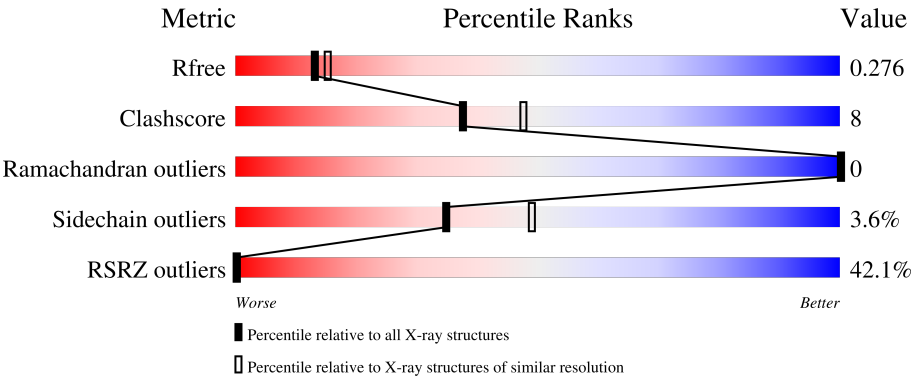
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.29 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	A	559	11% 77% 11% • 11%
1	B	559	60% 62% 18% • 20%
2	D	16	12% 100%
2	F	16	75% 81% 12% 6%
2	H	16	25% 6% 25% 12% 56%

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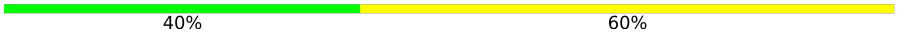
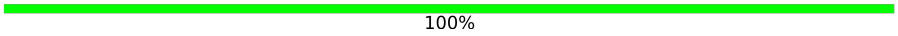
Mol	Chain	Length	Quality of chain
3	X	5	
4	C	2	

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	MAN	X	4	-	-	-	X
4	NAG	C	2	-	-	-	X

2 Entry composition

There are 12 unique types of molecules in this entry. The entry contains 16274 atoms, of which 7964 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.

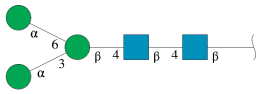
- Molecule 1 is a protein called Polypeptide N-acetylgalactosaminyltransferase 1 soluble form.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	500	Total	C	H	N	O	S	0	0	0
			7974	2543	3946	717	739	29			
1	B	449	Total	C	H	N	O	S	0	0	0
			7227	2302	3579	656	664	26			

- Molecule 2 is a protein called Mucin-5AC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	16	Total	C	H	N	O	0	0	0
			207	63	103	16	25			
2	F	15	Total	C	H	N	O	0	0	0
			193	59	96	15	23			
2	H	7	Total	C	H	N	O	0	0	0
			73	26	28	7	12			

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

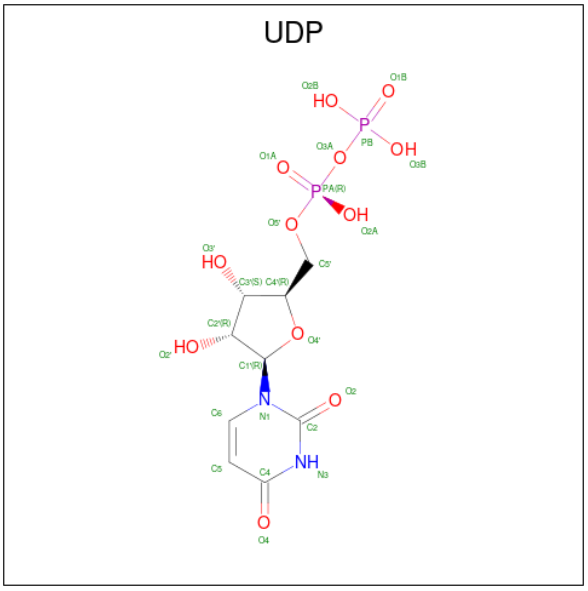


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	X	5	Total	C	H	N	O	0	0	0
			115	34	54	2	25			

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

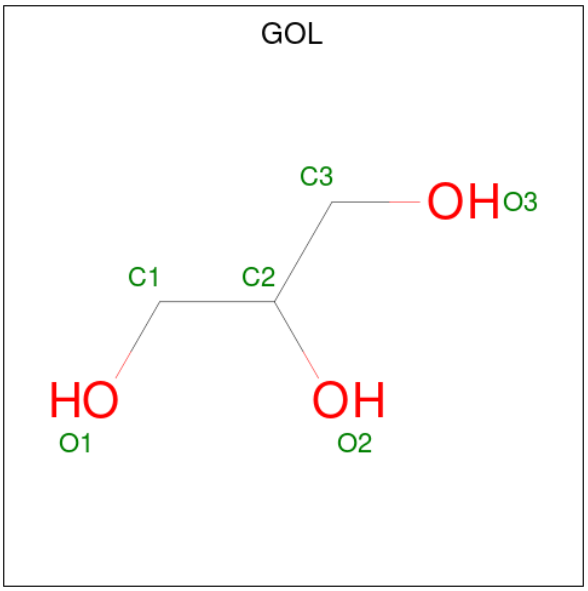
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	C	2	Total	C	H	N	O	0	0	0
			53	16	25	2	10			

- Molecule 5 is URIDINE-5'-DIPHOSPHATE (three-letter code: UDP) (formula: $C_9H_{14}N_2O_{12}P_2$) (labeled as "Ligand of Interest" by depositor).



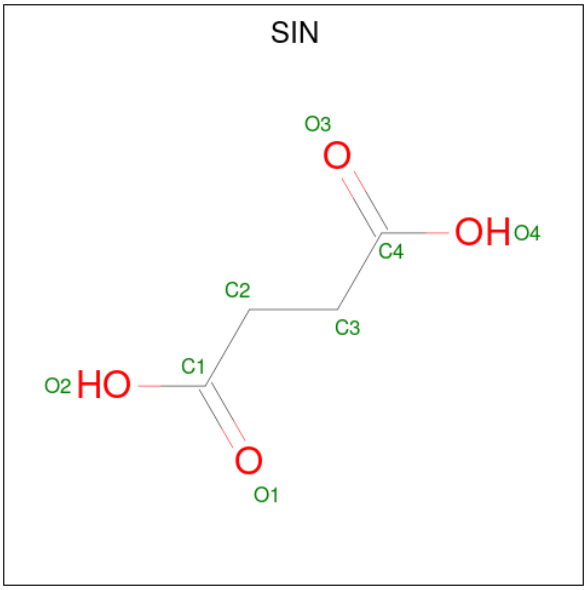
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
5	A	1	Total	C	H	N	O	P	0	0
			36	9	11	2	12	2		
5	B	1	Total	C	H	N	O	P	0	0
			36	9	11	2	12	2		

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



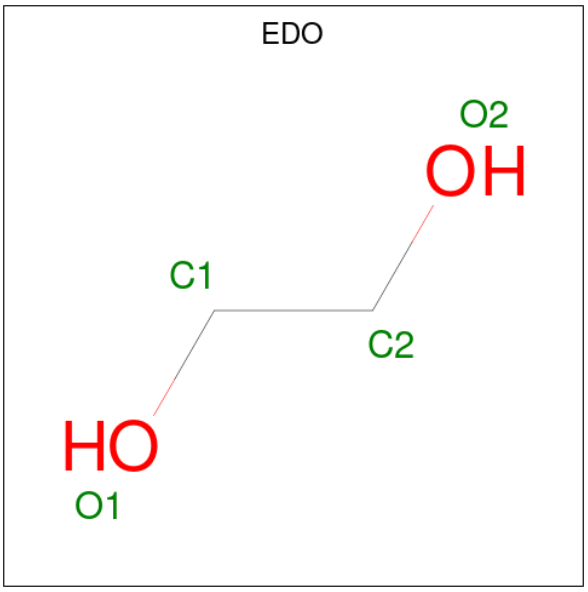
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total C H O 13 3 7 3	0	0
6	A	1	Total C H O 14 3 8 3	0	0

- Molecule 7 is SUCCINIC ACID (three-letter code: SIN) (formula: $C_4H_6O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	1	Total C H O 12 4 4 4	0	0

- Molecule 8 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).

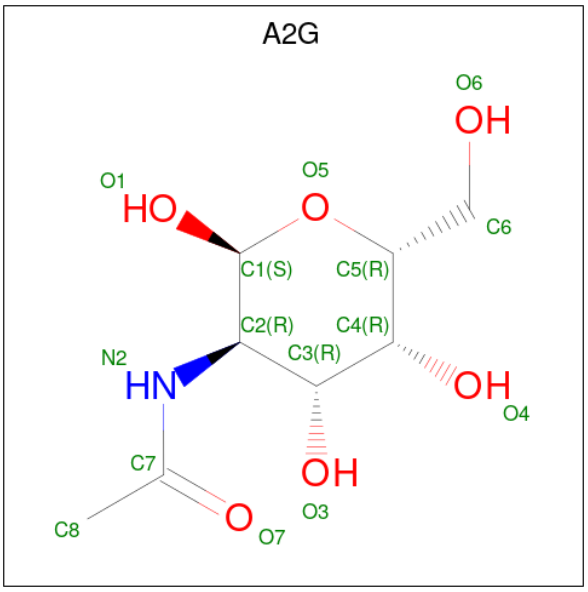


Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total C H O 10 2 6 2	0	0
8	A	1	Total C H O 10 2 6 2	0	0
8	A	1	Total C H O 9 2 5 2	0	0
8	D	1	Total C H O 10 2 6 2	0	0
8	D	1	Total C O 4 2 2	0	0

- Molecule 9 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn) (labeled as "Ligand of Interest" by depositor).

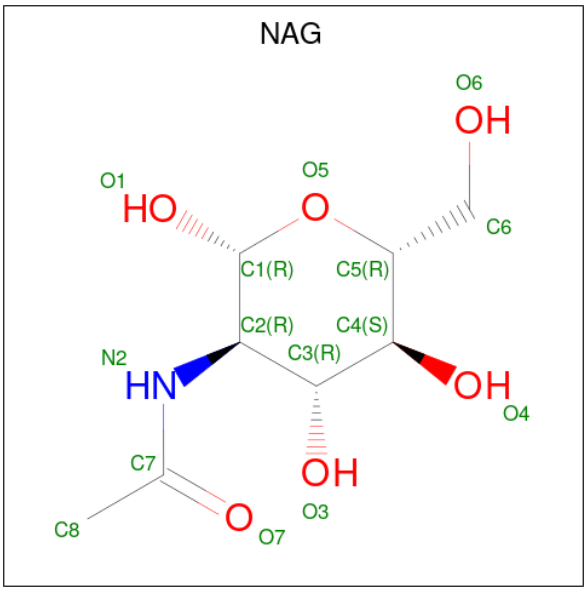
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	1	Total Mn 1 1	0	0
9	B	1	Total Mn 1 1	0	0

- Molecule 10 is 2-acetamido-2-deoxy-alpha-D-galactopyranose (three-letter code: A2G) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
10	D	1	Total	C	H	N	O	0	0
			28	8	14	1	5		
10	F	1	Total	C	H	N	O	0	0
			28	8	14	1	5		
10	H	1	Total	C	H	N	O	0	0
			27	8	13	1	5		

- Molecule 11 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
11	B	1	Total	C	H	N	O	0	0
			28	8	14	1	5		
11	B	1	Total	C	H	N	O	0	0
			28	8	14	1	5		

- Molecule 12 is water.

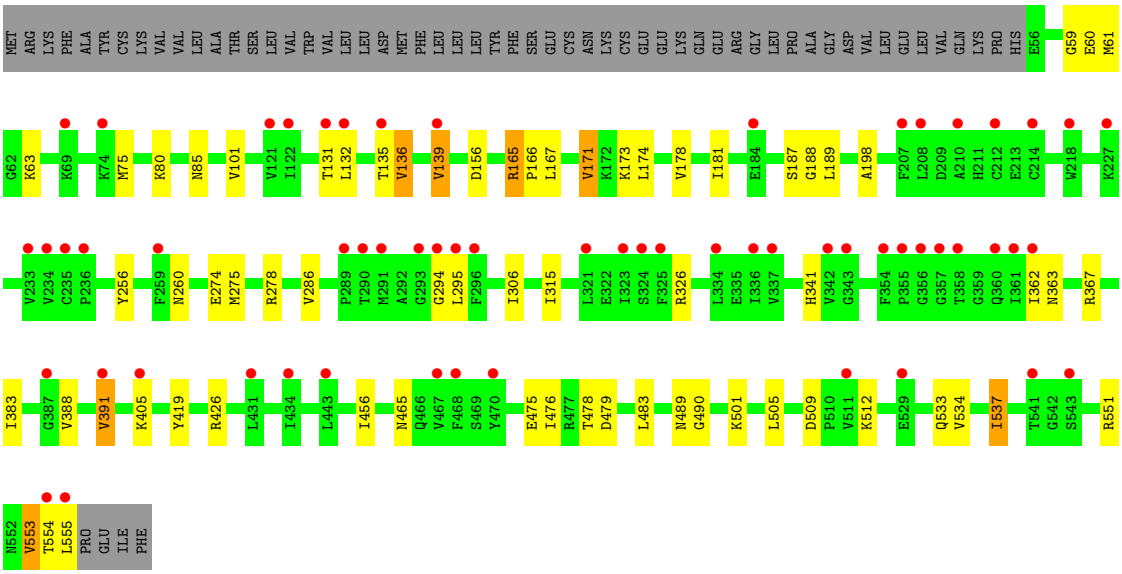
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
12	A	132	Total	O	0	0
			132	132		
12	D	4	Total	O	0	0
			4	4		
12	B	1	Total	O	0	0
			1	1		

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.

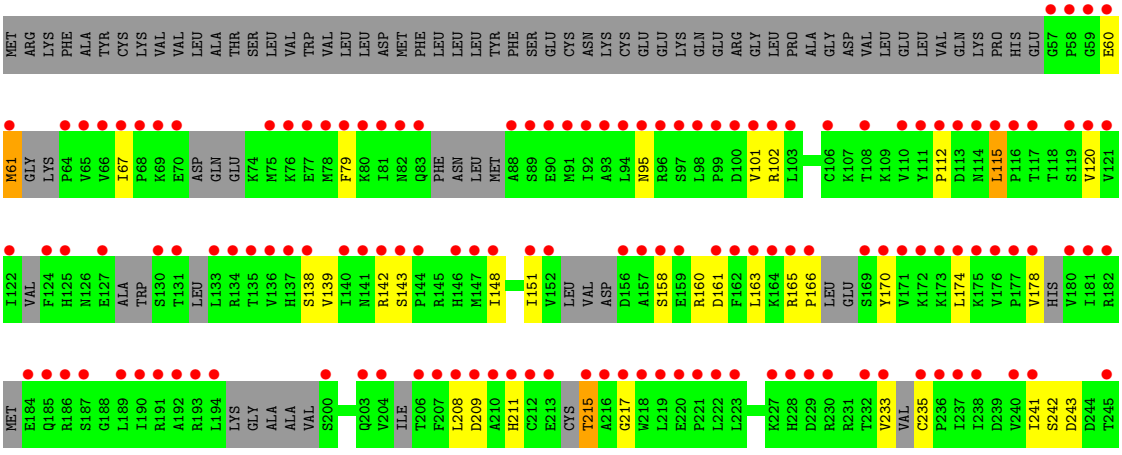
• Molecule 1: Polypeptide N-acetylgalactosaminyltransferase 1 soluble form

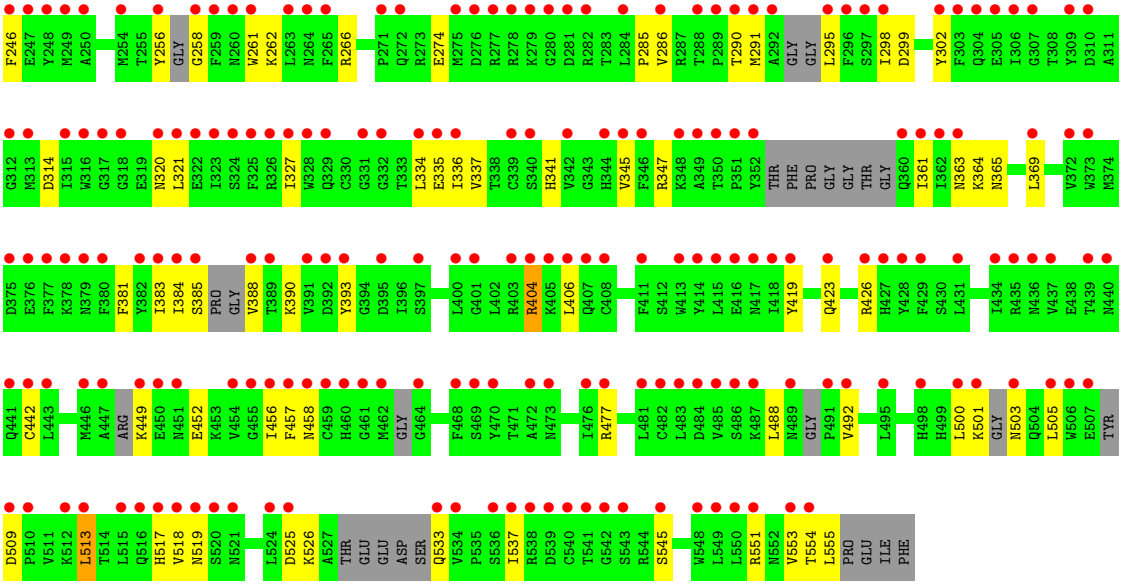
Chain A:



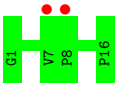
• Molecule 1: Polypeptide N-acetylgalactosaminyltransferase 1 soluble form

Chain B:

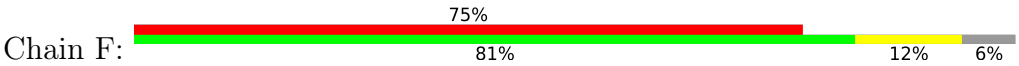


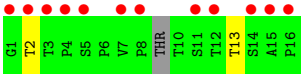


• Molecule 2: Mucin-5AC

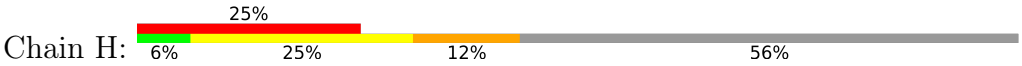


• Molecule 2: Mucin-5AC

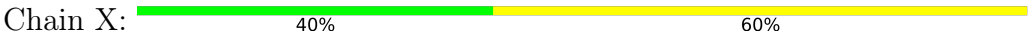




• Molecule 2: Mucin-5AC

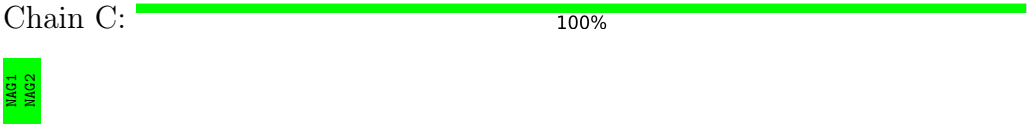


• Molecule 3: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



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

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	59.63Å 72.76Å 148.50Å 90.00° 95.44° 90.00°	Depositor
Resolution (Å)	29.90 – 2.29 29.90 – 2.29	Depositor EDS
% Data completeness (in resolution range)	96.6 (29.90-2.29) 96.6 (29.90-2.29)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.30 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.248 , 0.278 0.245 , 0.276	Depositor DCC
R_{free} test set	2757 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	40.2	Xtriage
Anisotropy	0.096	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 55.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	16274	wwPDB-VP
Average B, all atoms (Å^2)	89.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.65% 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: A2G, BMA, MAN, GOL, SIN, EDO, MN, NAG, UDP

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	0.26	0/4119	0.56	0/5570
1	B	0.25	0/3705	0.54	0/4970
2	D	0.34	0/107	0.53	0/151
2	F	0.33	0/99	0.51	0/138
2	H	0.24	0/45	0.43	0/62
All	All	0.26	0/8075	0.55	0/10891

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	1
1	B	0	1
All	All	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	551	ARG	Sidechain
1	B	551	ARG	Sidechain

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	4028	3946	3983	41	1
1	B	3648	3579	3604	75	0
2	D	104	103	103	0	0
2	F	97	96	95	3	0
2	H	45	28	41	6	0
3	X	61	54	52	0	0
4	C	28	25	25	0	0
5	A	25	11	10	2	0
5	B	25	11	10	3	0
6	A	12	15	16	0	0
7	A	8	4	4	0	0
8	A	12	17	18	0	0
8	D	8	6	12	0	0
9	A	1	0	0	0	0
9	B	1	0	0	0	0
10	D	14	14	12	0	0
10	F	14	14	12	2	0
10	H	14	13	12	3	0
11	B	28	28	26	0	0
12	A	132	0	0	3	0
12	B	1	0	0	0	0
12	D	4	0	0	0	0
All	All	8310	7964	8035	124	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 8.

All (124) 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:B:158:SER:HB3	1:B:163:LEU:HD13	1.52	0.89
1:B:258:GLY:N	1:B:290:THR:HG1	1.69	0.88
1:A:509:ASP:OD2	1:A:512:LYS:HE2	1.87	0.74
1:B:298:ILE:HD11	1:B:302:TYR:HD2	1.54	0.73
1:B:404:ARG:HE	1:B:404:ARG:HA	1.60	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:60:GLU:O	1:B:61:MET:HB2	1.95	0.65
1:B:160:ARG:HB2	1:B:163:LEU:HD12	1.79	0.65
1:A:274:GLU:HG2	1:A:286:VAL:HG13	1.81	0.63
2:H:13:THR:HA	10:H:101:A2G:N2	2.14	0.62
1:B:314:ASP:OD1	1:B:365:ASN:ND2	2.33	0.62
1:B:233:VAL:HG21	1:B:327:ILE:HD13	1.82	0.61
1:A:465:ASN:H	10:H:101:A2G:H8A	1.66	0.60
1:A:490:GLY:O	1:A:537:ILE:HD11	2.02	0.60
1:B:423:GLN:OE1	1:B:477:ARG:NH2	2.34	0.59
1:A:501:LYS:HD3	1:A:505:LEU:HD13	1.85	0.58
1:B:364:LYS:HG3	1:B:393:TYR:HA	1.85	0.58
1:B:235:CYS:N	1:B:335:GLU:O	2.38	0.57
1:B:139:VAL:O	1:B:143:SER:OG	2.13	0.57
1:A:533:GLN:O	12:A:701:HOH:O	2.18	0.56
1:B:120:VAL:HG13	1:B:208:LEU:HD12	1.85	0.56
1:A:388:VAL:O	1:A:391:VAL:HG13	2.07	0.55
1:A:132:LEU:O	1:A:136:VAL:HG13	2.06	0.55
1:B:258:GLY:N	1:B:290:THR:OG1	2.37	0.55
1:A:275:MET:SD	1:A:278:ARG:NH2	2.79	0.55
1:B:274:GLU:HG2	1:B:286:VAL:HG13	1.88	0.54
1:B:505:LEU:HD22	1:B:518:VAL:CG1	2.37	0.54
1:B:120:VAL:CG1	1:B:208:LEU:HD12	2.38	0.54
1:A:476:ILE:HG21	1:A:483:LEU:HD12	1.89	0.54
1:A:59:GLY:HA2	1:A:63:LYS:O	2.08	0.53
1:B:347:ARG:H	2:F:2:THR:HG21	1.74	0.52
1:B:449:LYS:HG2	1:B:452:GLU:CD	2.30	0.51
1:A:60:GLU:O	1:A:61:MET:HB2	2.10	0.51
1:A:135:THR:O	1:A:139:VAL:HG13	2.11	0.51
1:A:260:ASN:HB2	1:A:479:ASP:OD1	2.10	0.51
1:B:233:VAL:HG22	1:B:298:ILE:HD13	1.91	0.51
1:B:385:SER:C	1:B:388:VAL:HG12	2.30	0.51
1:B:505:LEU:HD22	1:B:518:VAL:HG11	1.92	0.51
1:B:526:LYS:HG2	1:B:545:SER:HB2	1.92	0.51
1:B:112:PRO:O	1:B:115:LEU:HD13	2.10	0.51
1:A:188:GLY:HA3	12:A:815:HOH:O	2.11	0.51
1:B:161:ASP:N	1:B:161:ASP:OD1	2.43	0.51
1:A:188:GLY:HA2	1:A:315:ILE:HG13	1.92	0.50
1:A:156:ASP:OD2	5:A:601:UDP:N3	2.39	0.50
1:B:158:SER:HB3	1:B:163:LEU:CD1	2.34	0.50
1:B:112:PRO:HG2	1:B:115:LEU:HD11	1.94	0.50
1:B:369:LEU:C	1:B:369:LEU:HD23	2.32	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:171:VAL:HG13	1:A:178:VAL:HB	1.94	0.50
1:B:242:SER:O	1:B:246:PHE:HA	2.12	0.50
1:B:363:ASN:HD22	1:B:381:PHE:HZ	1.59	0.49
1:B:383:ILE:HD11	1:B:553:VAL:HG11	1.94	0.49
1:B:501:LYS:O	1:B:503:ASN:N	2.45	0.49
1:B:235:CYS:HB2	1:B:336:ILE:HD13	1.94	0.49
1:B:361:ILE:HD11	1:B:388:VAL:HG11	1.95	0.49
1:A:306:ILE:O	1:A:326:ARG:HD2	2.14	0.48
1:B:165:ARG:N	1:B:166:PRO:CD	2.76	0.48
1:A:383:ILE:HD11	1:A:553:VAL:CG1	2.44	0.48
1:B:525:ASP:OD1	1:B:526:LYS:N	2.43	0.48
1:B:142:ARG:HD3	1:B:215:THR:C	2.34	0.47
1:A:362:ILE:HG22	1:A:363:ASN:H	1.79	0.47
1:B:361:ILE:CD1	1:B:388:VAL:HG11	2.44	0.47
1:B:262:LYS:N	1:B:384:ILE:HD11	2.29	0.47
1:B:321:LEU:HD12	1:B:321:LEU:H	1.81	0.46
1:A:174:LEU:HD12	1:A:178:VAL:HG21	1.97	0.46
1:B:457:PHE:CG	1:B:458:ASN:N	2.83	0.46
1:A:405:LYS:C	1:A:405:LYS:HD3	2.36	0.46
1:B:170:TYR:CE1	1:B:174:LEU:HD21	2.51	0.46
1:B:361:ILE:HG23	1:B:361:ILE:O	2.16	0.46
1:B:388:VAL:O	1:B:388:VAL:HG13	2.16	0.46
1:B:503:ASN:O	1:B:517:HIS:NE2	2.49	0.46
2:F:13:THR:HG21	10:F:101:A2G:O5	2.16	0.46
1:B:215:THR:HG21	1:B:341:HIS:HB2	1.97	0.46
1:B:60:GLU:O	1:B:61:MET:CB	2.64	0.45
1:A:362:ILE:O	1:A:363:ASN:HB2	2.15	0.45
2:H:13:THR:HG22	2:H:14:SER:N	2.32	0.45
1:B:285:PRO:HB3	1:B:337:VAL:HG22	1.98	0.45
1:A:75:MET:SD	1:A:85:ASN:ND2	2.89	0.44
1:B:533:GLN:OE1	1:B:533:GLN:N	2.50	0.44
1:B:503:ASN:HB2	10:F:101:A2G:O3	2.18	0.44
1:B:79:PHE:CE1	1:B:243:ASP:O	2.71	0.44
1:A:383:ILE:HD11	1:A:553:VAL:HG13	1.99	0.44
1:A:478:THR:HG23	1:A:478:THR:O	2.17	0.44
1:B:211:HIS:NE2	5:B:601:UDP:O1A	2.51	0.44
2:H:10:THR:CG2	2:H:11:SER:N	2.80	0.43
1:B:518:VAL:HG13	1:B:519:ASN:N	2.33	0.43
1:B:151:ILE:O	1:B:178:VAL:HA	2.17	0.43
1:B:500:LEU:O	1:B:501:LYS:C	2.56	0.43
1:B:151:ILE:HB	1:B:178:VAL:HG22	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:475:GLU:OE2	12:A:702:HOH:O	2.20	0.43
1:B:102:ARG:CZ	1:B:217:GLY:HA3	2.49	0.43
1:A:489:ASN:HA	1:A:537:ILE:HD12	2.01	0.43
1:B:298:ILE:HD11	1:B:302:TYR:CD2	2.44	0.43
1:A:554:THR:O	1:A:555:LEU:C	2.56	0.43
1:B:211:HIS:CE1	5:B:601:UDP:O1A	2.72	0.43
1:B:291:MET:O	1:B:320:ASN:HB2	2.19	0.43
1:B:101:VAL:HG23	1:B:341:HIS:CG	2.54	0.42
1:B:442:CYS:O	1:B:456:ILE:HG13	2.19	0.42
1:B:321:LEU:HB2	1:B:369:LEU:HD11	2.01	0.42
1:A:189:LEU:HD12	5:A:601:UDP:O4'	2.20	0.42
1:A:456:ILE:O	1:A:456:ILE:HG23	2.19	0.42
1:B:291:MET:CE	1:B:334:LEU:HD11	2.50	0.42
1:A:171:VAL:CG2	1:A:178:VAL:HG11	2.49	0.42
1:A:156:ASP:OD2	1:A:187:SER:O	2.37	0.42
1:B:509:ASP:O	1:B:513:LEU:N	2.51	0.42
2:H:10:THR:HG23	2:H:11:SER:N	2.35	0.42
1:A:165:ARG:N	1:A:166:PRO:CD	2.83	0.41
1:A:367:ARG:HD2	1:A:388:VAL:O	2.20	0.41
1:B:298:ILE:HD12	1:B:299:ASP:H	1.85	0.41
1:B:492:VAL:HG22	1:B:537:ILE:HD11	2.01	0.41
1:B:442:CYS:C	1:B:456:ILE:HG13	2.41	0.41
1:B:513:LEU:N	1:B:513:LEU:HD12	2.35	0.41
1:B:554:THR:O	1:B:555:LEU:C	2.58	0.41
5:B:601:UDP:O2B	2:F:2:THR:HG23	2.21	0.41
2:H:13:THR:HA	10:H:101:A2G:HN2	1.84	0.41
1:B:286:VAL:O	1:B:336:ILE:N	2.52	0.41
1:A:101:VAL:HG23	1:A:341:HIS:CG	2.56	0.41
1:A:490:GLY:N	1:A:537:ILE:HD11	2.36	0.41
2:H:15:ALA:HB1	2:H:16:PRO:HD2	2.02	0.41
1:B:209:ASP:OD1	1:B:295:LEU:HD11	2.21	0.41
1:B:241:ILE:HB	1:B:345:VAL:HG22	2.03	0.41
1:A:294:GLY:C	1:A:295:LEU:HD12	2.41	0.40
1:A:315:ILE:O	1:A:315:ILE:HG12	2.22	0.40
1:A:181:ILE:N	1:A:181:ILE:HD12	2.37	0.40
1:B:158:SER:HB3	1:B:163:LEU:HB3	2.02	0.40
1:B:261:TRP:O	1:B:262:LYS:CB	2.68	0.40

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)
1:A:80:LYS:HZ3	1:A:198:ALA:O[2_656]	1.55	0.05

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	498/559 (89%)	479 (96%)	19 (4%)	0	100	100
1	B	399/559 (71%)	380 (95%)	19 (5%)	0	100	100
2	D	14/16 (88%)	14 (100%)	0	0	100	100
2	F	11/16 (69%)	11 (100%)	0	0	100	100
2	H	5/16 (31%)	3 (60%)	2 (40%)	0	100	100
All	All	927/1166 (80%)	887 (96%)	40 (4%)	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	447/501 (89%)	433 (97%)	14 (3%)	40	55
1	B	409/501 (82%)	393 (96%)	16 (4%)	32	46
2	D	14/14 (100%)	14 (100%)	0	100	100
2	F	13/14 (93%)	13 (100%)	0	100	100
2	H	6/14 (43%)	4 (67%)	2 (33%)	0	0

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	889/1044 (85%)	857 (96%)	32 (4%)	35 49

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	131	THR
1	A	136	VAL
1	A	139	VAL
1	A	165	ARG
1	A	167	LEU
1	A	171	VAL
1	A	173	LYS
1	A	256	TYR
1	A	391	VAL
1	A	419	TYR
1	A	426	ARG
1	A	534	VAL
1	A	537	ILE
1	A	553	VAL
1	B	61	MET
1	B	67	ILE
1	B	95	ASN
1	B	115	LEU
1	B	138	SER
1	B	148	ILE
1	B	215	THR
1	B	256	TYR
1	B	266	ARG
1	B	390	LYS
1	B	404	ARG
1	B	406	LEU
1	B	419	TYR
1	B	426	ARG
1	B	488	LEU
1	B	513	LEU
2	H	10	THR
2	H	11	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	72	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

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	$\#\|Z\| > 2$
4	NAG	C	1	1,4	14,14,15	0.28	0	17,19,21	0.49	0
4	NAG	C	2	4	14,14,15	0.29	0	17,19,21	0.62	0
3	NAG	X	1	3,1	14,14,15	0.18	0	17,19,21	0.40	0
3	NAG	X	2	3	14,14,15	0.20	0	17,19,21	0.68	1 (5%)
3	BMA	X	3	3	11,11,12	0.72	0	15,15,17	0.87	0
3	MAN	X	4	3	11,11,12	0.56	0	15,15,17	1.03	2 (13%)
3	MAN	X	5	3	11,11,12	0.68	0	15,15,17	1.04	2 (13%)

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	C	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	C	2	4	-	0/6/23/26	0/1/1/1
3	NAG	X	1	3,1	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	X	2	3	-	2/6/23/26	0/1/1/1
3	BMA	X	3	3	-	2/2/19/22	0/1/1/1
3	MAN	X	4	3	-	0/2/19/22	0/1/1/1
3	MAN	X	5	3	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	X	5	MAN	C1-O5-C5	2.85	116.05	112.19
3	X	4	MAN	C1-O5-C5	2.72	115.88	112.19
3	X	5	MAN	O2-C2-C3	-2.20	105.72	110.14
3	X	2	NAG	C1-O5-C5	2.13	115.08	112.19
3	X	4	MAN	O2-C2-C3	-2.01	106.10	110.14

There are no chirality outliers.

All (7) torsion outliers are listed below:

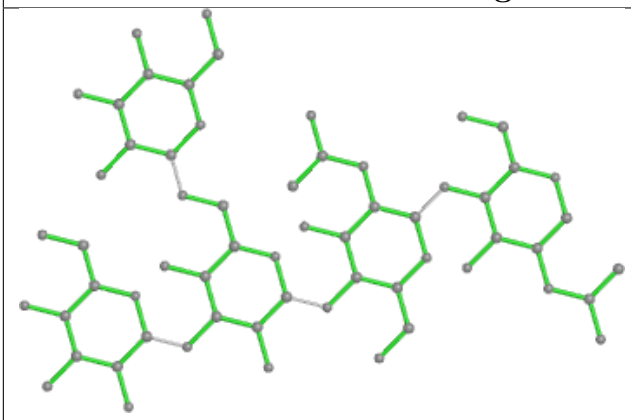
Mol	Chain	Res	Type	Atoms
3	X	2	NAG	C8-C7-N2-C2
3	X	2	NAG	O7-C7-N2-C2
4	C	1	NAG	C8-C7-N2-C2
4	C	1	NAG	O7-C7-N2-C2
3	X	5	MAN	O5-C5-C6-O6
3	X	3	BMA	C4-C5-C6-O6
3	X	3	BMA	O5-C5-C6-O6

There are no ring outliers.

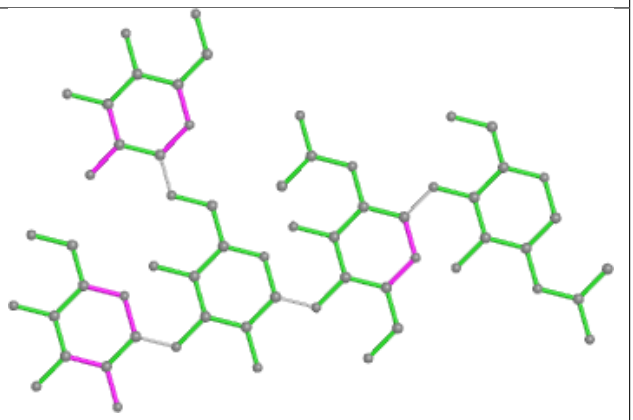
No monomer is involved in short contacts.

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

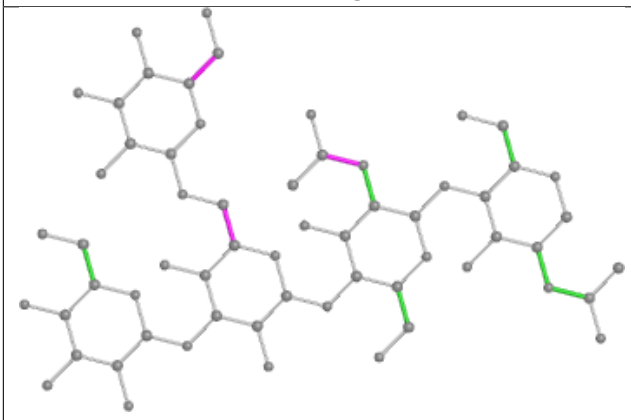
Oligosaccharide Chain X



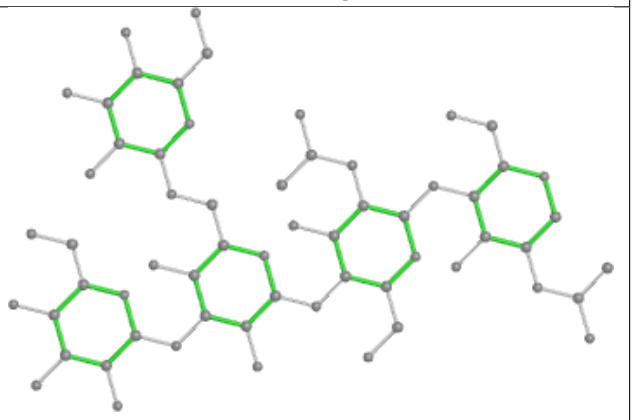
Bond lengths



Bond angles

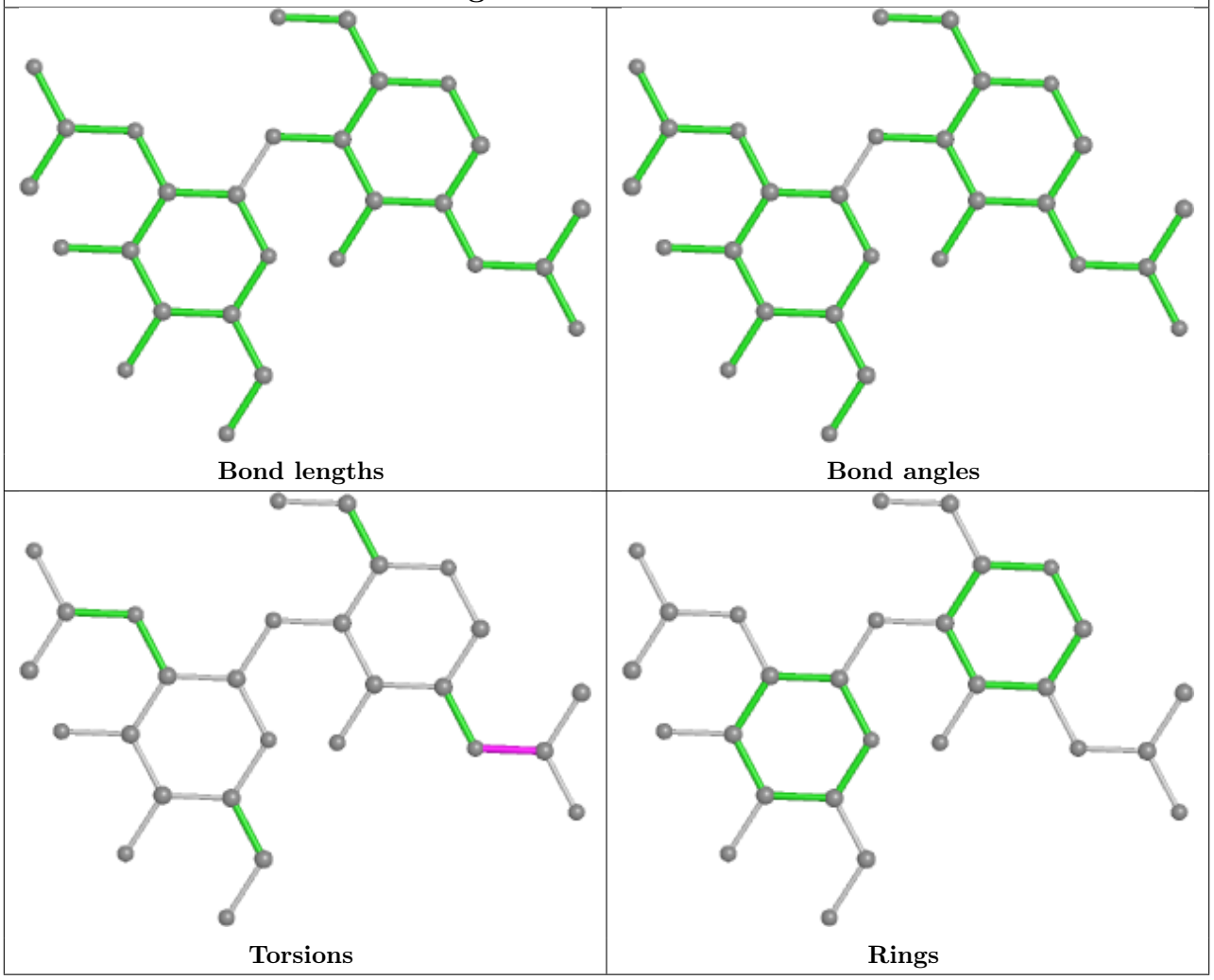


Torsions



Rings

Oligosaccharide Chain C



5.6 Ligand geometry (i)

Of 17 ligands modelled in this entry, 2 are monoatomic - leaving 15 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	$\#\|Z\| > 2$
8	EDO	A	605	-	3,3,3	0.51	0	2,2,2	0.20	0
8	EDO	D	103	-	3,3,3	0.48	0	2,2,2	0.26	0
10	A2G	H	101	2	14,14,15	1.78	4 (28%)	17,19,21	1.21	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
10	A2G	F	101	2	14,14,15	1.83	5 (35%)	17,19,21	2.23	7 (41%)
11	NAG	B	603	-	14,14,15	0.21	0	17,19,21	0.50	0
8	EDO	A	606	-	3,3,3	0.48	0	2,2,2	0.31	0
5	UDP	A	601	9	24,26,26	3.70	13 (54%)	37,40,40	1.47	6 (16%)
5	UDP	B	601	9	24,26,26	3.74	13 (54%)	37,40,40	1.63	6 (16%)
6	GOL	A	608	-	5,5,5	0.91	0	5,5,5	0.89	0
6	GOL	A	602	-	5,5,5	0.87	0	5,5,5	0.96	0
8	EDO	A	604	-	3,3,3	0.45	0	2,2,2	0.38	0
10	A2G	D	101	2	14,14,15	1.74	3 (21%)	17,19,21	0.89	0
11	NAG	B	602	1	14,14,15	0.25	0	17,19,21	0.52	0
7	SIN	A	603	-	7,7,7	1.15	0	8,8,8	1.56	1 (12%)
8	EDO	D	102	-	3,3,3	0.47	0	2,2,2	0.30	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
8	EDO	A	605	-	-	1/1/1/1	-
8	EDO	D	103	-	-	0/1/1/1	-
10	A2G	H	101	2	-	4/6/23/26	0/1/1/1
10	A2G	F	101	2	-	3/6/23/26	0/1/1/1
11	NAG	B	603	-	-	2/6/23/26	0/1/1/1
8	EDO	A	606	-	-	0/1/1/1	-
5	UDP	A	601	9	-	2/16/32/32	0/2/2/2
5	UDP	B	601	9	-	0/16/32/32	0/2/2/2
6	GOL	A	608	-	-	0/4/4/4	-
6	GOL	A	602	-	-	1/4/4/4	-
8	EDO	A	604	-	-	1/1/1/1	-
10	A2G	D	101	2	-	0/6/23/26	0/1/1/1
11	NAG	B	602	1	-	4/6/23/26	0/1/1/1
7	SIN	A	603	-	-	2/5/5/5	-
8	EDO	D	102	-	-	0/1/1/1	-

All (38) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	601	UDP	O4'-C4'	7.31	1.61	1.45
5	A	601	UDP	O4'-C4'	7.28	1.61	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	601	UDP	C3'-C4'	-7.21	1.34	1.53
5	B	601	UDP	C3'-C4'	-7.08	1.34	1.53
5	B	601	UDP	C2-N1	6.91	1.49	1.38
5	B	601	UDP	C2-N3	6.90	1.50	1.38
5	A	601	UDP	C2-N1	6.83	1.49	1.38
5	A	601	UDP	C2-N3	6.77	1.50	1.38
5	B	601	UDP	C6-C5	6.16	1.49	1.35
5	A	601	UDP	C6-C5	6.06	1.49	1.35
5	B	601	UDP	O4'-C1'	-5.04	1.30	1.42
5	A	601	UDP	O4'-C1'	-4.87	1.30	1.42
5	B	601	UDP	C4-N3	4.41	1.46	1.38
5	A	601	UDP	C4-N3	4.22	1.46	1.38
10	F	101	A2G	C7-N2	3.50	1.46	1.34
10	H	101	A2G	C7-N2	3.44	1.46	1.34
10	D	101	A2G	C7-N2	3.34	1.45	1.34
5	A	601	UDP	C6-N1	3.02	1.45	1.38
5	B	601	UDP	O3'-C3'	2.98	1.50	1.43
5	B	601	UDP	C6-N1	2.96	1.45	1.38
5	A	601	UDP	O3'-C3'	2.91	1.49	1.43
5	A	601	UDP	O2'-C2'	-2.78	1.36	1.43
5	B	601	UDP	O2'-C2'	-2.77	1.36	1.43
5	B	601	UDP	C5-C4	2.75	1.49	1.43
5	B	601	UDP	O4-C4	-2.70	1.19	1.24
5	A	601	UDP	O4-C4	-2.68	1.19	1.24
5	A	601	UDP	C5-C4	2.64	1.49	1.43
10	F	101	A2G	O5-C5	2.58	1.48	1.43
5	B	601	UDP	O2-C2	-2.57	1.18	1.23
5	A	601	UDP	O2-C2	-2.49	1.18	1.23
10	D	101	A2G	C3-C2	-2.31	1.47	1.52
10	F	101	A2G	C3-C2	-2.29	1.47	1.52
10	H	101	A2G	C3-C2	-2.23	1.47	1.52
10	H	101	A2G	O5-C1	2.16	1.47	1.43
10	F	101	A2G	C2-N2	2.15	1.50	1.46
10	H	101	A2G	C2-N2	2.08	1.49	1.46
10	F	101	A2G	O7-C7	-2.07	1.18	1.23
10	D	101	A2G	O5-C1	2.06	1.47	1.43

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	B	601	UDP	C4-N3-C2	-5.10	119.86	126.58
5	A	601	UDP	C4-N3-C2	-4.94	120.07	126.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	F	101	A2G	O5-C1-C2	-4.53	104.14	111.29
10	F	101	A2G	C8-C7-N2	4.14	123.11	116.10
5	A	601	UDP	N3-C2-N1	3.82	119.95	114.89
5	B	601	UDP	N3-C2-N1	3.80	119.93	114.89
10	F	101	A2G	C1-C2-N2	3.63	116.69	110.49
5	B	601	UDP	C5-C4-N3	3.24	119.69	114.84
5	A	601	UDP	C5-C4-N3	3.12	119.51	114.84
10	F	101	A2G	O5-C5-C4	3.09	118.34	110.83
5	B	601	UDP	PA-O3A-PB	-3.00	122.53	132.83
5	B	601	UDP	O4-C4-C5	-2.78	120.28	125.16
5	A	601	UDP	O4-C4-C5	-2.76	120.31	125.16
10	H	101	A2G	C8-C7-N2	2.71	120.69	116.10
10	F	101	A2G	O7-C7-C8	-2.33	117.73	122.06
10	F	101	A2G	C3-C4-C5	2.25	114.26	110.24
5	A	601	UDP	PA-O3A-PB	-2.19	125.32	132.83
7	A	603	SIN	C2-C3-C4	-2.17	108.94	113.60
10	F	101	A2G	C1-O5-C5	2.12	115.07	112.19
5	B	601	UDP	C2'-C3'-C4'	2.02	106.57	102.64
5	A	601	UDP	O2-C2-N1	-2.00	120.12	122.79

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	B	603	NAG	O5-C5-C6-O6
10	H	101	A2G	C4-C5-C6-O6
11	B	603	NAG	C4-C5-C6-O6
10	F	101	A2G	O7-C7-N2-C2
10	F	101	A2G	C8-C7-N2-C2
10	H	101	A2G	O7-C7-N2-C2
10	H	101	A2G	C8-C7-N2-C2
11	B	602	NAG	C8-C7-N2-C2
11	B	602	NAG	O7-C7-N2-C2
10	H	101	A2G	O5-C5-C6-O6
10	F	101	A2G	C1-C2-N2-C7
8	A	604	EDO	O1-C1-C2-O2
8	A	605	EDO	O1-C1-C2-O2
11	B	602	NAG	C4-C5-C6-O6
6	A	602	GOL	O1-C1-C2-O2
7	A	603	SIN	C2-C3-C4-O4
7	A	603	SIN	C2-C3-C4-O3
11	B	602	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
5	A	601	UDP	C2'-C1'-N1-C6
5	A	601	UDP	O4'-C1'-N1-C6

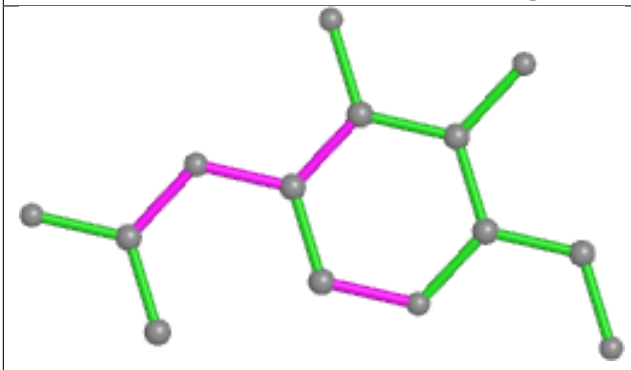
There are no ring outliers.

4 monomers are involved in 10 short contacts:

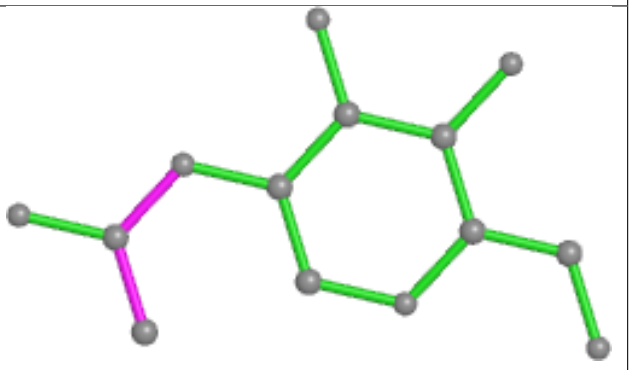
Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	H	101	A2G	3	0
10	F	101	A2G	2	0
5	A	601	UDP	2	0
5	B	601	UDP	3	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

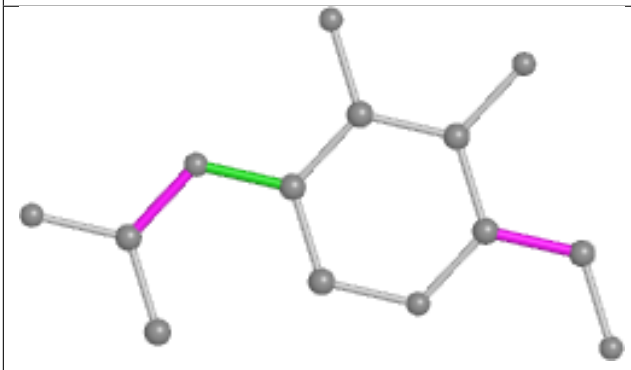
Ligand A2G H 101



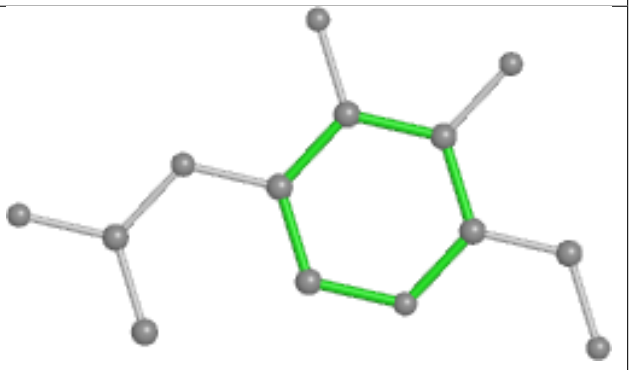
Bond lengths



Bond angles

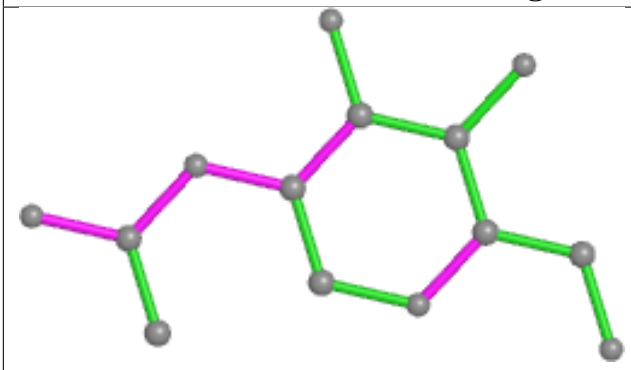


Torsions

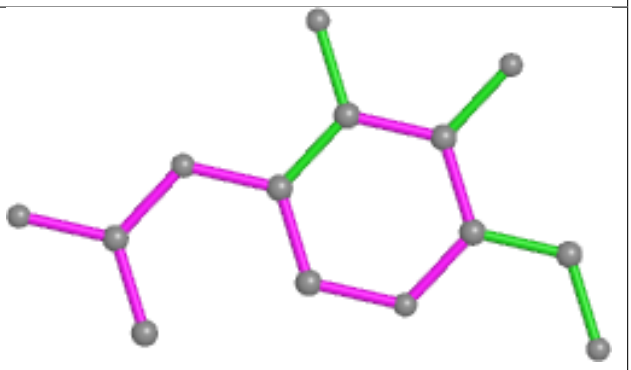


Rings

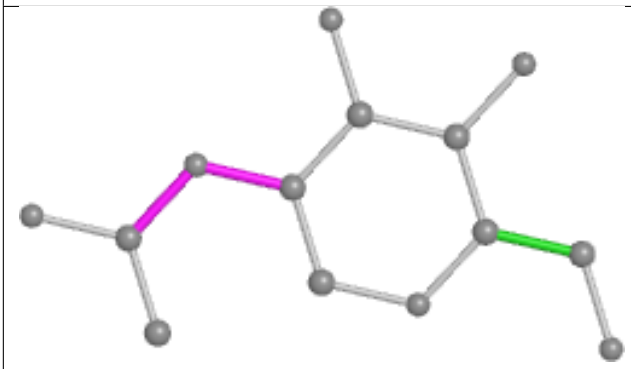
Ligand A2G F 101



Bond lengths



Bond angles



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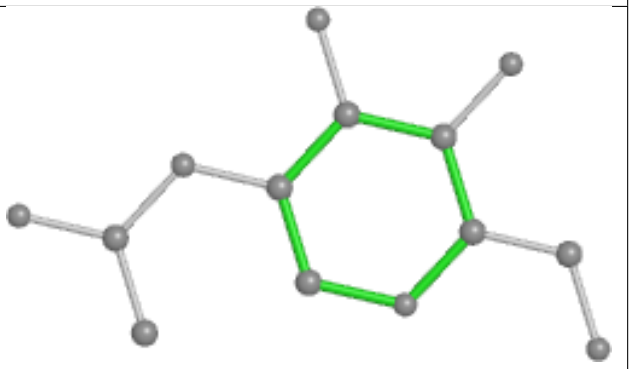
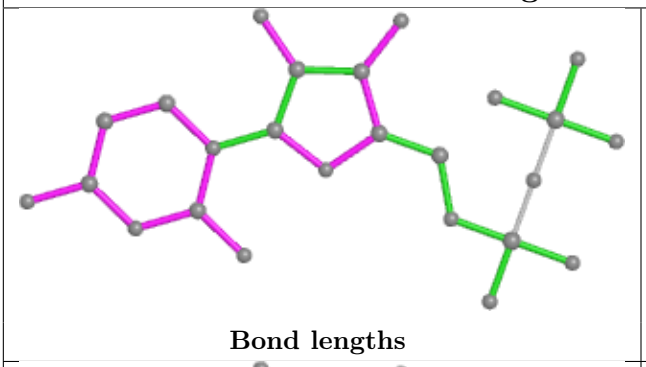
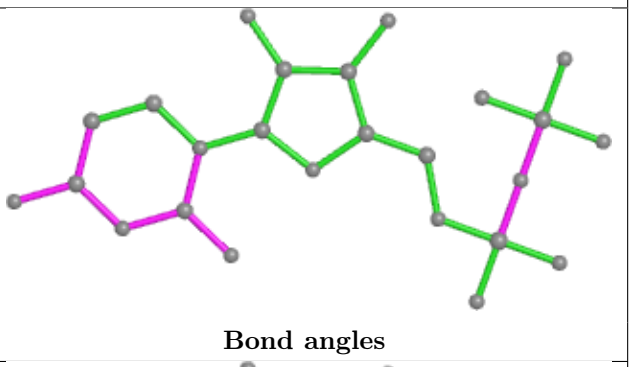


Rings

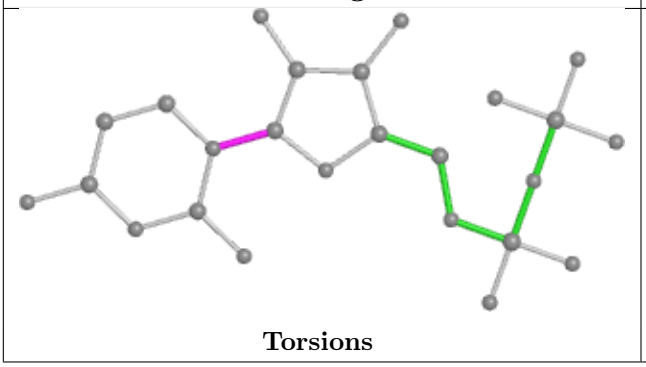
Ligand UDP A 601



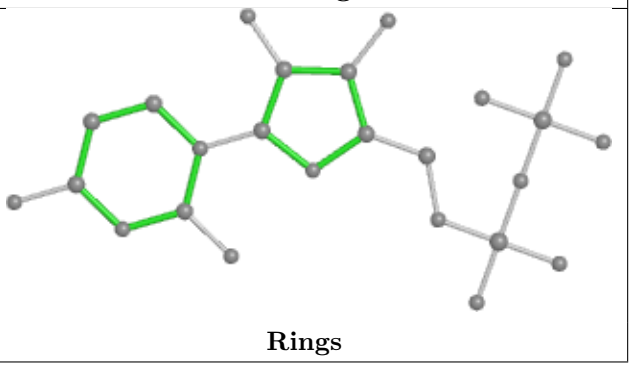
Bond lengths



Bond angles

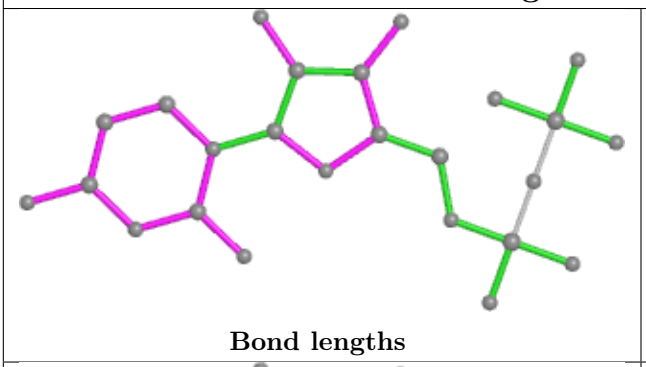


Torsions

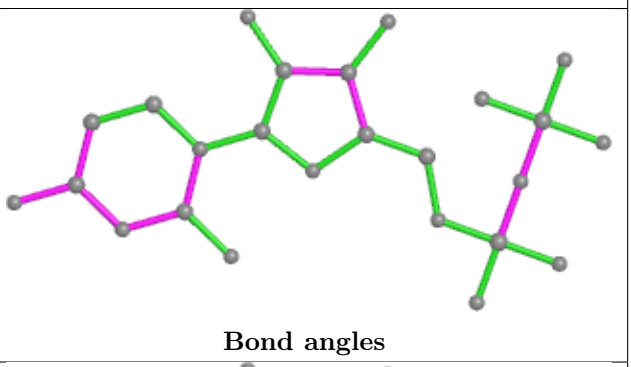


Rings

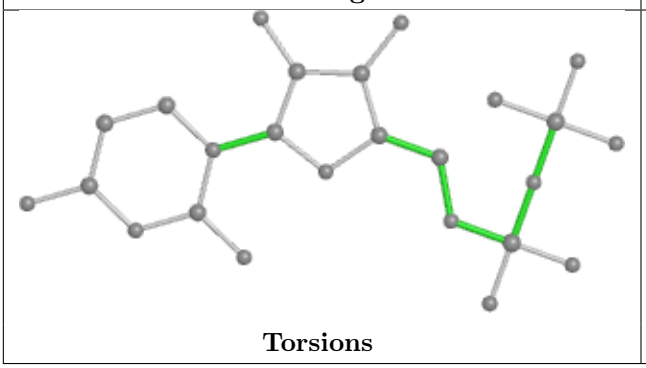
Ligand UDP B 601



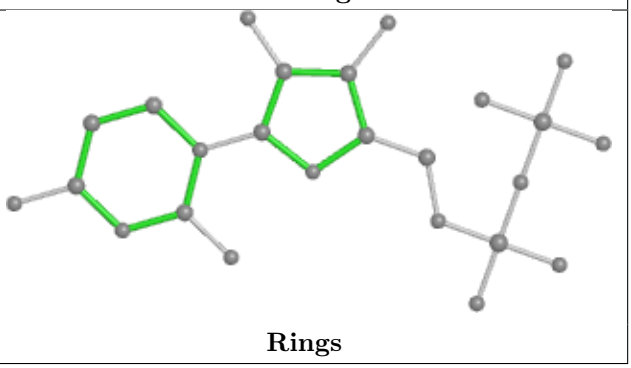
Bond lengths



Bond angles

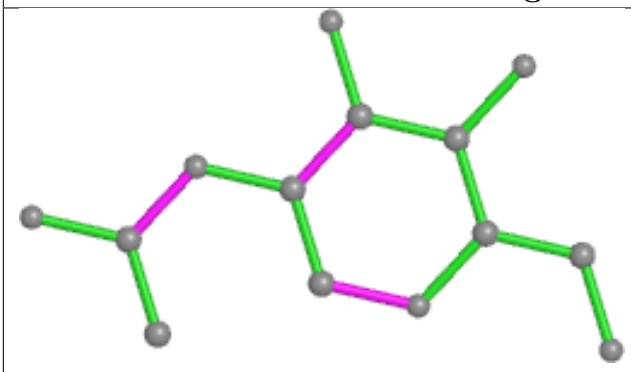


Torsions

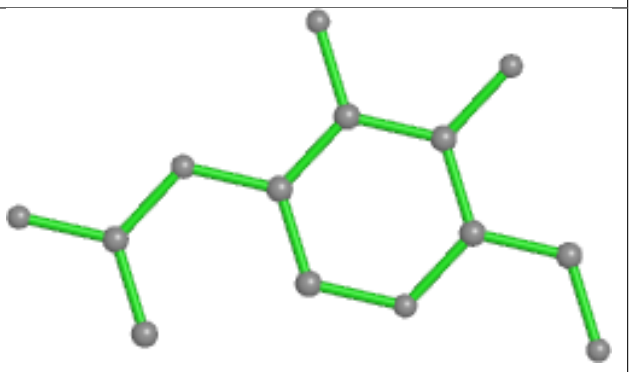


Rings

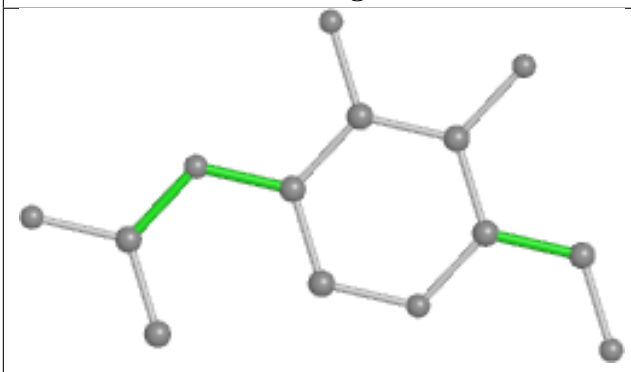
Ligand A2G D 101



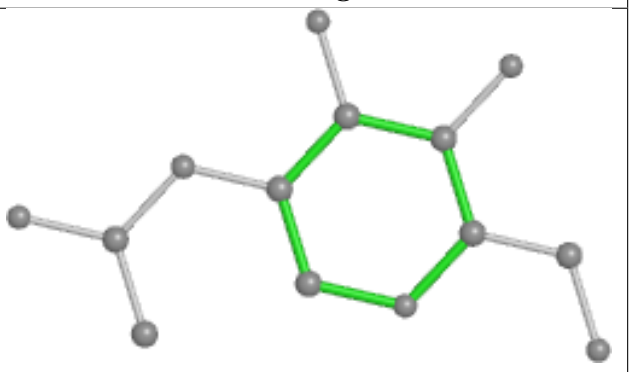
Bond lengths



Bond angles



Torsions



Rings

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	A	500/559 (89%)	0.96	60 (12%) 4 6	22, 38, 63, 113	0
1	B	449/559 (80%)	3.56	338 (75%) 0 0	84, 124, 158, 209	0
2	D	16/16 (100%)	0.99	2 (12%) 3 5	30, 39, 64, 72	0
2	F	15/16 (93%)	2.99	12 (80%) 0 0	110, 130, 146, 170	0
2	H	7/16 (43%)	2.37	4 (57%) 0 0	72, 93, 121, 137	0
All	All	987/1166 (84%)	2.18	416 (42%) 0 0	22, 64, 149, 209	0

All (416) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	66	VAL	10.6
1	B	457	PHE	9.8
1	B	296	PHE	9.7
1	B	540	CYS	9.5
1	B	292	ALA	9.5
1	B	349	ALA	9.5
1	B	361	ILE	9.4
1	B	462	MET	9.4
1	B	94	LEU	9.2
1	B	212	CYS	9.0
1	B	65	VAL	9.0
1	B	388	VAL	8.9
1	B	133	LEU	8.9
1	B	316	TRP	8.7
1	B	295	LEU	8.5
1	B	500	LEU	8.4
1	B	170	TYR	8.3
1	B	124	PHE	8.3
1	B	246	PHE	8.3
1	B	91	MET	8.3

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Mol	Chain	Res	Type	RSRZ
1	B	163	LEU	8.3
1	B	208	LEU	7.9
1	B	382	TYR	7.6
1	B	541	THR	7.6
1	B	136	VAL	7.5
1	B	180	VAL	7.5
1	B	275	MET	7.5
1	B	309	TYR	7.4
1	B	58	PRO	7.2
1	B	406	LEU	7.2
1	B	156	ASP	7.2
1	B	115	LEU	7.1
1	B	485	VAL	7.1
1	B	235	CYS	7.1
1	B	280	GLY	6.9
1	B	174	LEU	6.8
1	B	325	PHE	6.7
1	B	458	ASN	6.6
1	B	207	PHE	6.5
1	B	442	CYS	6.5
1	B	407	GLN	6.5
1	B	162	PHE	6.4
1	B	248	TYR	6.4
1	B	176	VAL	6.3
1	B	389	THR	6.3
1	B	249	MET	6.3
1	B	284	LEU	6.2
1	B	312	GLY	6.1
1	B	114	ASN	6.1
1	B	247	GLU	6.1
1	B	238	ILE	6.1
1	B	281	ASP	6.1
1	B	75	MET	6.0
1	B	209	ASP	5.9
1	B	439	THR	5.9
1	B	81	ILE	5.9
1	B	215	THR	5.9
1	B	437	VAL	5.8
1	B	68	PRO	5.8
1	B	135	THR	5.7
1	B	95	ASN	5.7
1	B	393	TYR	5.7

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Mol	Chain	Res	Type	RSRZ
1	B	279	LYS	5.7
1	A	555	LEU	5.7
1	B	329	GLN	5.7
1	B	362	ILE	5.7
1	B	440	ASN	5.7
1	B	524	LEU	5.7
1	B	121	VAL	5.6
1	B	165	ARG	5.6
1	B	80	LYS	5.6
1	B	538	ARG	5.6
1	B	503	ASN	5.5
1	B	456	ILE	5.5
1	B	429	PHE	5.5
1	B	122	ILE	5.5
1	B	460	HIS	5.5
1	B	116	PRO	5.4
1	B	297	SER	5.4
1	B	191	ARG	5.4
1	B	78	MET	5.4
1	B	88	ALA	5.3
1	B	350	THR	5.3
2	H	12	THR	5.3
1	B	383	ILE	5.3
1	B	79	PHE	5.3
1	B	428	TYR	5.3
1	B	158	SER	5.3
1	B	228	HIS	5.2
1	B	537	ILE	5.2
1	B	352	TYR	5.2
1	B	185	GLN	5.2
1	B	218	TRP	5.2
1	B	157	ALA	5.2
1	B	67	ILE	5.2
1	B	184	GLU	5.1
1	B	404	ARG	5.1
1	B	241	ILE	5.1
1	B	213	GLU	5.1
1	B	413	TRP	5.1
1	B	520	SER	5.1
2	F	16	PRO	5.0
1	B	210	ALA	5.0
1	A	122	ILE	5.0

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Mol	Chain	Res	Type	RSRZ
1	B	142	ARG	5.0
1	B	230	ARG	5.0
1	B	461	GLY	5.0
1	B	120	VAL	4.9
1	B	169	SER	4.9
1	B	324	SER	4.9
1	B	543	SER	4.9
1	B	455	GLY	4.9
1	B	434	ILE	4.9
1	B	236	PRO	4.9
1	B	272	GLN	4.8
1	B	417	ASN	4.8
1	B	533	GLN	4.8
1	B	206	THR	4.8
1	B	90	GLU	4.8
1	B	397	SER	4.8
1	B	83	GLN	4.7
1	B	525	ASP	4.7
1	B	82	ASN	4.7
1	B	111	TYR	4.7
1	B	545	SER	4.7
1	B	346	PHE	4.7
1	B	459	CYS	4.7
1	B	391	VAL	4.7
1	A	208	LEU	4.7
1	B	190	ILE	4.6
1	B	360	GLN	4.6
1	B	351	PRO	4.5
1	B	470	TYR	4.5
1	B	334	LEU	4.5
1	B	96	ARG	4.5
1	B	200	SER	4.4
1	B	550	LEU	4.4
1	B	161	ASP	4.4
1	B	193	ARG	4.4
1	B	265	PHE	4.4
1	B	277	ARG	4.4
1	B	336	ILE	4.3
1	B	291	MET	4.3
2	F	15	ALA	4.3
1	B	519	ASN	4.3
1	A	235	CYS	4.3

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Mol	Chain	Res	Type	RSRZ
1	B	486	SER	4.3
1	B	521	ASN	4.3
1	B	426	ARG	4.3
1	B	505	LEU	4.3
1	B	69	LYS	4.2
1	B	103	LEU	4.2
2	F	4	PRO	4.2
1	B	159	GLU	4.2
1	B	146	HIS	4.1
1	B	144	PRO	4.1
1	B	306	ILE	4.1
1	B	182	ARG	4.1
1	A	334	LEU	4.1
1	B	76	LYS	4.1
1	B	138	SER	4.1
1	B	171	VAL	4.1
1	B	216	ALA	4.0
1	B	372	VAL	4.0
1	B	542	GLY	4.0
1	B	101	VAL	4.0
1	B	342	VAL	4.0
1	B	414	TYR	4.0
1	B	64	PRO	4.0
1	B	307	GLY	4.0
1	B	113	ASP	4.0
1	B	98	LEU	4.0
1	B	278	ARG	4.0
1	B	173	LYS	3.9
1	A	541	THR	3.9
1	A	295	LEU	3.9
1	B	89	SER	3.9
1	B	554	THR	3.9
1	B	315	ILE	3.9
1	A	543	SER	3.9
1	B	211	HIS	3.9
1	B	70	GLU	3.8
1	B	403	ARG	3.8
2	F	5	SER	3.8
1	A	207	PHE	3.8
1	B	172	LYS	3.8
1	B	369	LEU	3.8
1	B	134	ARG	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	131	THR	3.7
1	B	233	VAL	3.7
1	B	506	TRP	3.7
1	B	256	TYR	3.7
1	A	342	VAL	3.7
1	A	362	ILE	3.7
1	B	436	ASN	3.7
1	B	187	SER	3.7
1	B	303	PHE	3.7
1	B	373	TRP	3.7
1	B	317	GLY	3.7
1	B	323	ILE	3.7
1	A	325	PHE	3.6
1	A	354	PHE	3.6
1	B	261	TRP	3.6
1	B	137	HIS	3.6
1	B	106	CYS	3.6
1	B	501	LYS	3.6
1	B	401	GLY	3.6
1	B	423	GLN	3.6
1	B	441	GLN	3.6
2	F	8	PRO	3.5
1	A	343	GLY	3.5
1	B	377	PHE	3.5
1	B	181	ILE	3.5
1	A	355	PRO	3.5
1	B	143	SER	3.5
1	B	549	LEU	3.5
1	B	164	LYS	3.5
1	B	385	SER	3.5
1	B	548	TRP	3.5
1	B	61	MET	3.5
1	B	189	LEU	3.5
1	B	321	LEU	3.5
1	A	212	CYS	3.5
1	B	328	TRP	3.4
1	B	400	LEU	3.4
1	A	139	VAL	3.4
1	B	151	ILE	3.4
2	F	1	GLY	3.4
1	B	376	GLU	3.4
1	B	447	ALA	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	119	SER	3.4
1	B	177	PRO	3.4
1	B	427	HIS	3.4
1	B	194	LEU	3.4
1	B	408	CYS	3.4
1	B	186	ARG	3.4
1	A	234	VAL	3.3
1	B	286	VAL	3.3
1	B	454	VAL	3.3
1	B	492	VAL	3.3
1	B	112	PRO	3.3
1	B	130	SER	3.3
1	A	291	MET	3.3
1	B	92	ILE	3.3
1	B	290	THR	3.3
1	B	483	LEU	3.3
1	B	175	LYS	3.3
1	A	184	GLU	3.3
1	B	147	MET	3.2
1	B	204	VAL	3.2
1	B	59	GLY	3.2
1	B	446	MET	3.2
1	B	517	HIS	3.2
1	A	293	GLY	3.2
1	A	358	THR	3.2
1	B	298	ILE	3.2
1	A	361	ILE	3.1
1	B	416	GLU	3.1
1	B	302	TYR	3.1
1	B	534	VAL	3.1
1	A	214	CYS	3.1
1	B	344	HIS	3.1
1	B	178	VAL	3.1
1	B	57	GLY	3.1
1	A	324	SER	3.1
1	B	451	ASN	3.1
1	B	473	ASN	3.1
1	B	108	THR	3.1
2	H	16	PRO	3.1
1	A	357	GLY	3.1
1	B	468	PHE	3.1
1	B	240	VAL	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	363	ASN	3.0
1	B	411	PHE	3.0
2	F	2	THR	3.0
2	F	12	THR	3.0
1	B	227	LYS	3.0
2	F	11	SER	3.0
1	B	258	GLY	3.0
1	A	554	THR	3.0
1	A	387	GLY	3.0
1	B	379	ASN	3.0
1	A	218	TRP	3.0
1	B	380	PHE	3.0
1	B	166	PRO	3.0
1	B	282	ARG	3.0
1	B	536	SER	2.9
1	B	245	THR	2.9
2	H	15	ALA	2.9
1	B	125	HIS	2.9
1	A	227	LYS	2.9
1	B	348	LYS	2.9
1	A	69	LYS	2.9
1	A	468	PHE	2.9
1	B	259	PHE	2.9
1	B	219	LEU	2.9
1	B	418	ILE	2.9
1	B	97	SER	2.8
1	B	339	CYS	2.8
1	B	232	THR	2.8
1	A	321	LEU	2.8
1	B	481	LEU	2.8
1	B	305	GLU	2.8
1	B	322	GLU	2.8
1	B	203	GLN	2.8
1	B	141	ASN	2.8
1	B	310	ASP	2.8
1	A	135	THR	2.8
1	A	210	ALA	2.8
1	B	271	PRO	2.8
1	B	378	LYS	2.8
1	B	127	GLU	2.8
1	B	551	ARG	2.8
1	B	515	LEU	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	148	ILE	2.7
1	B	237	ILE	2.7
1	B	516	GLN	2.7
1	B	140	ILE	2.7
1	B	221	PRO	2.7
1	B	152	VAL	2.7
1	B	553	VAL	2.7
1	B	443	LEU	2.7
2	F	3	THR	2.7
1	B	476	ILE	2.7
1	A	236	PRO	2.7
1	A	296	PHE	2.7
1	B	331	GLY	2.7
1	B	384	ILE	2.7
1	B	100	ASP	2.7
1	B	375	ASP	2.7
1	B	223	LEU	2.7
1	B	263	LEU	2.7
1	A	294	GLY	2.7
1	A	529	GLU	2.6
1	B	229	ASP	2.6
1	B	250	ALA	2.6
1	B	482	CYS	2.6
2	F	7	VAL	2.6
1	B	60	GLU	2.6
1	B	392	ASP	2.6
1	B	276	ASP	2.6
2	D	8	PRO	2.6
1	A	290	THR	2.5
1	B	487	LYS	2.5
1	A	233	VAL	2.5
1	B	110	VAL	2.5
1	A	336	ILE	2.5
1	A	259	PHE	2.5
1	B	304	GLN	2.5
1	B	449	LYS	2.5
1	B	326	ARG	2.5
1	B	512	LYS	2.5
1	B	254	MET	2.5
1	B	509	ASP	2.5
1	B	435	ARG	2.5
1	B	484	ASP	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	340	SER	2.4
1	B	507	GLU	2.4
1	B	320	ASN	2.4
1	B	491	PRO	2.4
1	B	472	ALA	2.4
1	B	518	VAL	2.4
1	B	313	MET	2.4
1	A	356	GLY	2.4
1	B	327	ILE	2.4
1	B	395	ASP	2.4
1	B	217	GLY	2.4
1	A	391	VAL	2.4
1	A	470	TYR	2.3
1	B	99	PRO	2.3
1	B	318	GLY	2.3
1	B	77	GLU	2.3
1	B	288	THR	2.3
1	B	469	SER	2.3
1	B	489	ASN	2.3
1	A	323	ILE	2.3
1	B	539	ASP	2.3
1	B	415	LEU	2.2
1	B	102	ARG	2.2
1	B	513	LEU	2.2
1	A	289	PRO	2.2
1	A	511	VAL	2.2
1	B	345	VAL	2.2
2	F	14	SER	2.2
1	B	222	LEU	2.2
1	B	495	LEU	2.2
1	B	419	TYR	2.2
1	B	510	PRO	2.2
1	B	289	PRO	2.2
1	B	450	GLU	2.2
2	H	14	SER	2.2
1	A	360	GLN	2.2
1	A	131	THR	2.2
1	B	192	ALA	2.2
1	B	498	HIS	2.2
1	A	132	LEU	2.1
1	B	431	LEU	2.1
2	D	7	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	93	ALA	2.1
1	B	260	ASN	2.1
1	A	121	VAL	2.1
1	B	405	LYS	2.1
1	B	264	ASN	2.1
1	A	434	ILE	2.1
1	B	220	GLU	2.1
1	A	467	VAL	2.1
1	B	117	THR	2.1
1	A	337	VAL	2.1
1	B	332	GLY	2.1
1	B	464	GLY	2.1
1	B	335	GLU	2.0
1	A	443	LEU	2.0
1	A	405	LYS	2.0
1	B	477	ARG	2.0
1	A	74	LYS	2.0
1	A	431	LEU	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)

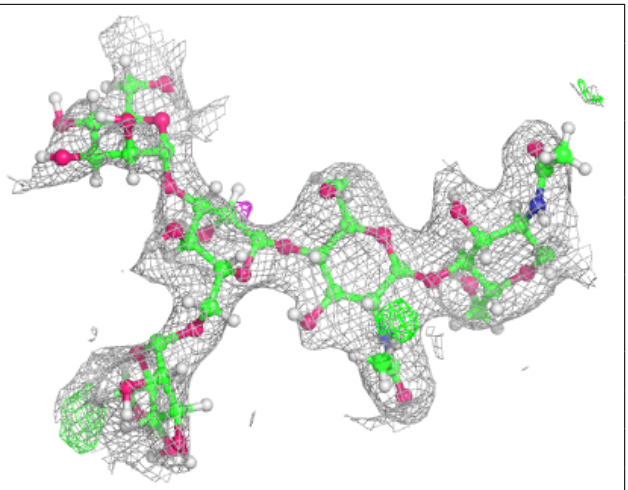
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

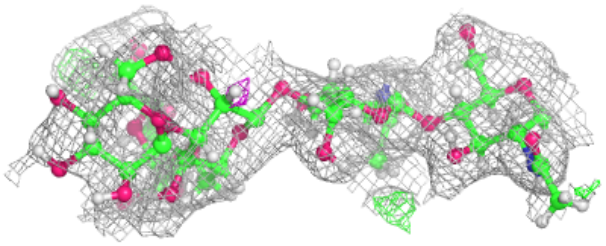
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	MAN	X	4	11/12	0.42	0.48	101,119,142,151	0
3	MAN	X	5	11/12	0.45	0.40	86,103,118,122	0
3	BMA	X	3	11/12	0.61	0.39	93,106,127,131	0
4	NAG	C	2	14/15	0.67	0.48	75,90,108,111	0
3	NAG	X	2	14/15	0.75	0.25	58,77,98,105	0
4	NAG	C	1	14/15	0.84	0.18	51,60,72,80	0
3	NAG	X	1	14/15	0.92	0.11	48,62,85,85	0

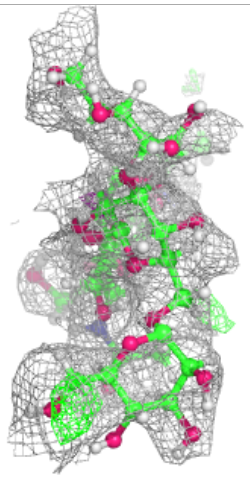
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around Chain X:

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

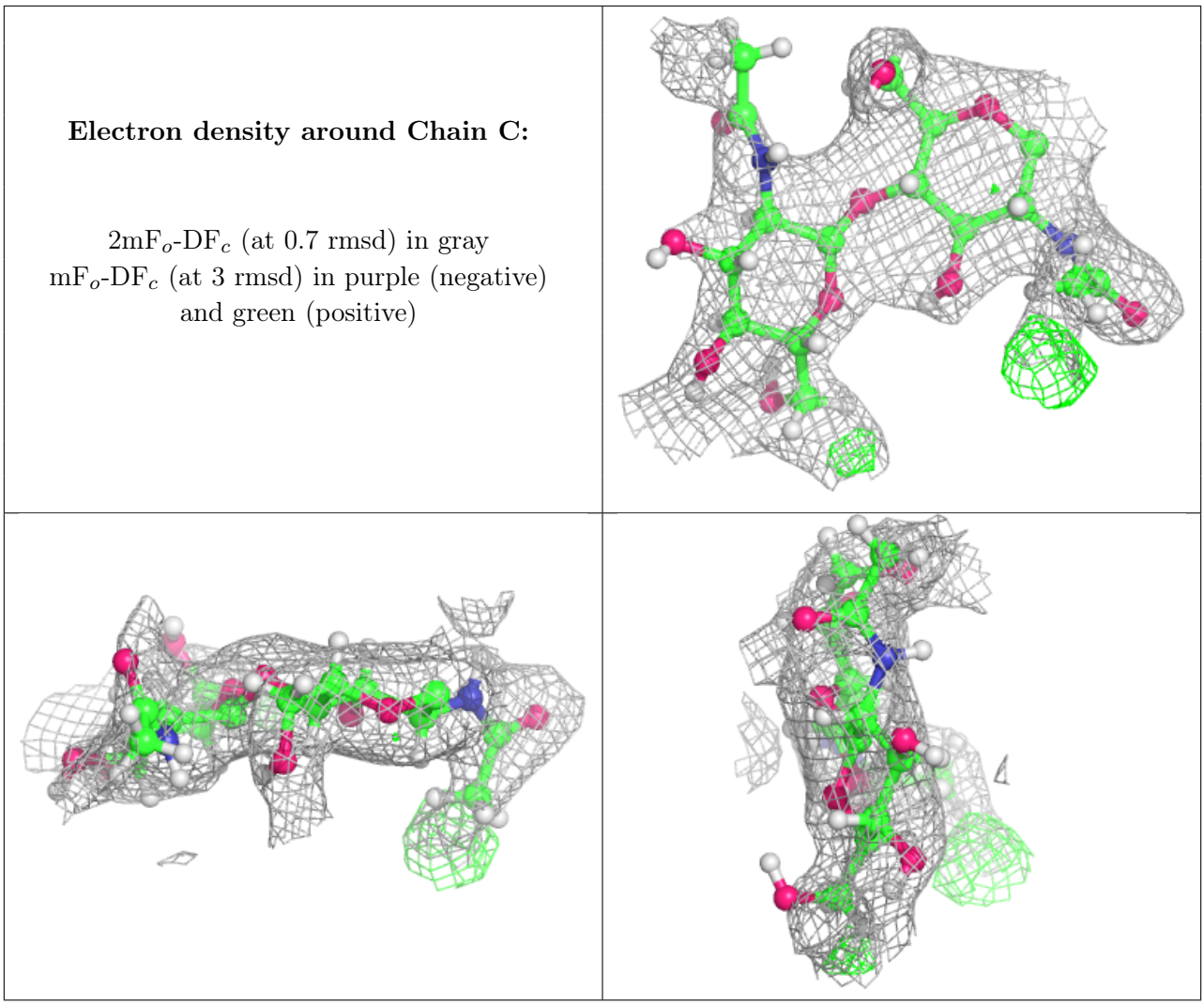






Electron density around Chain C:

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



6.4 Ligands

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^{th} 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^2)	Q<0.9
9	MN	B	604	1/1	0.61	0.12	143,143,143,143	0
10	A2G	F	101	14/15	0.62	0.32	116,134,152,158	0
6	GOL	A	602	6/6	0.63	0.24	54,77,96,96	0
11	NAG	B	603	14/15	0.64	0.26	84,110,138,138	0
5	UDP	B	601	25/25	0.71	0.23	118,132,152,158	0
6	GOL	A	608	6/6	0.74	0.30	34,56,87,104	0
8	EDO	D	102	4/4	0.77	0.20	41,50,77,77	0
7	SIN	A	603	8/8	0.81	0.23	59,78,93,93	0

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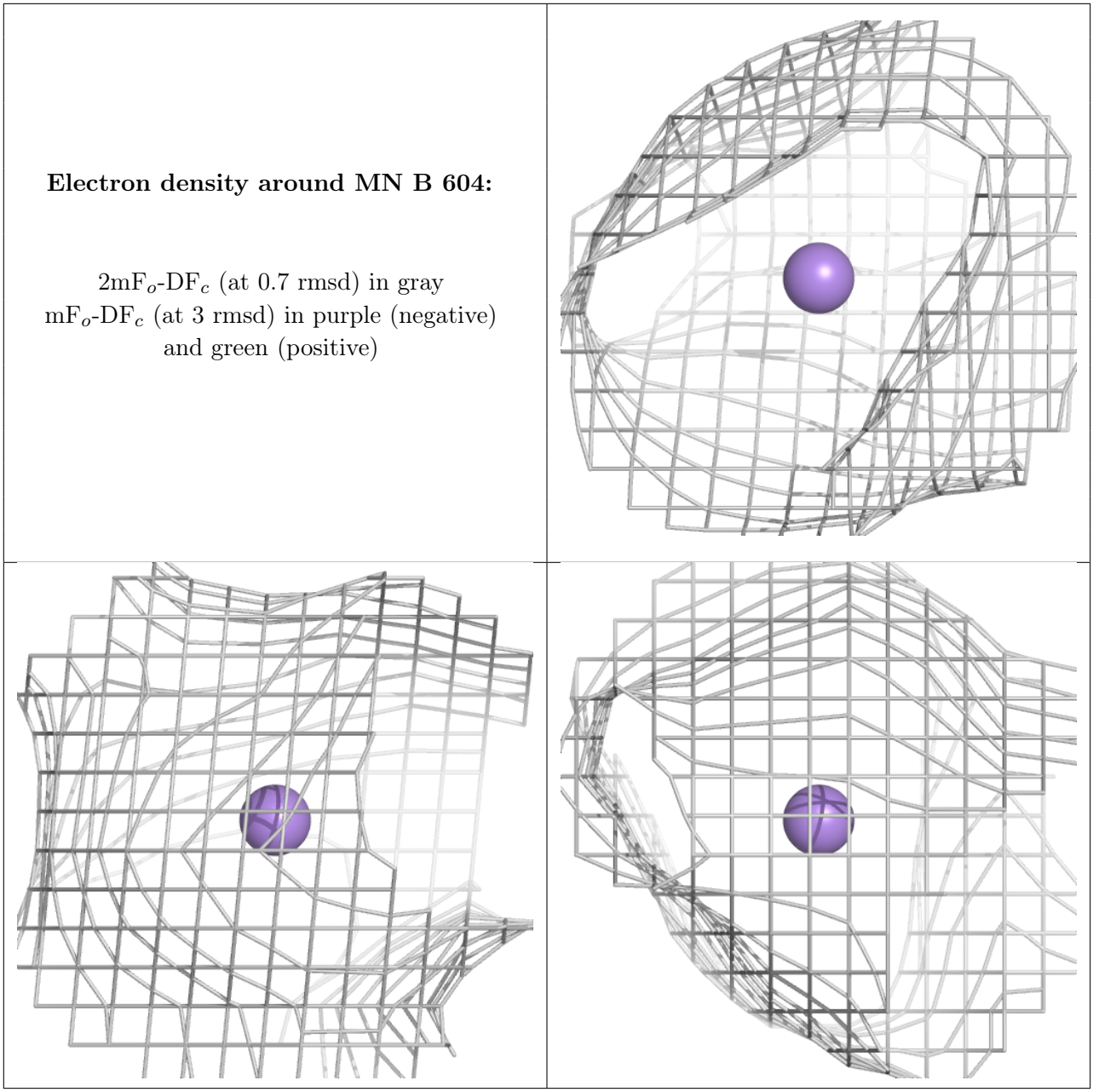
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
10	A2G	H	101	14/15	0.82	0.21	42,57,72,82	0
11	NAG	B	602	14/15	0.83	0.22	93,113,126,139	0
8	EDO	A	605	4/4	0.83	0.25	31,37,45,45	0
8	EDO	D	103	4/4	0.88	0.21	24,34,35,37	0
8	EDO	A	606	4/4	0.88	0.24	37,45,55,66	0
8	EDO	A	604	4/4	0.88	0.16	39,46,53,60	0
5	UDP	A	601	25/25	0.92	0.25	18,42,56,63	0
10	A2G	D	101	14/15	0.96	0.20	19,26,33,34	0
9	MN	A	607	1/1	0.99	0.13	25,25,25,25	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

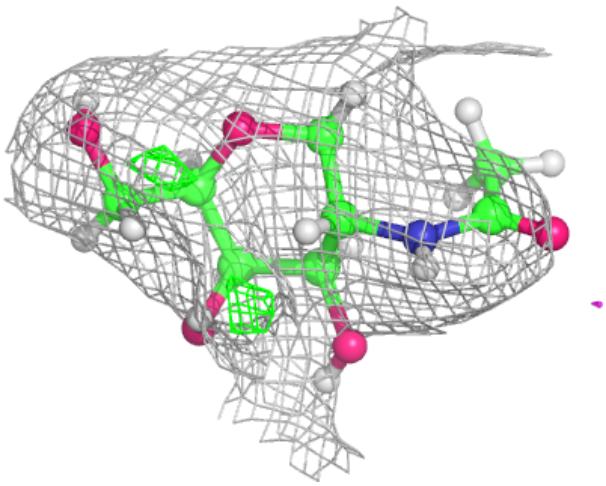
Electron density around MN B 604:

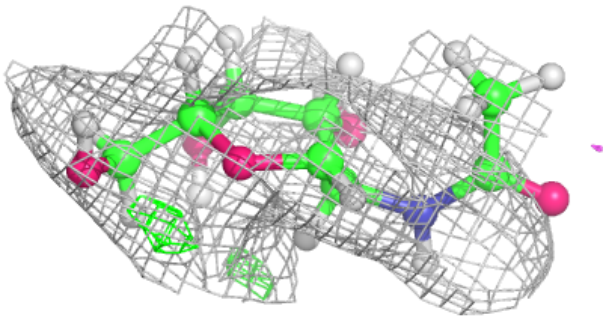
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

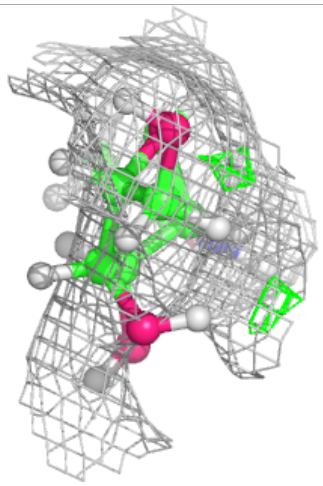


Electron density around A2G F 101:

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

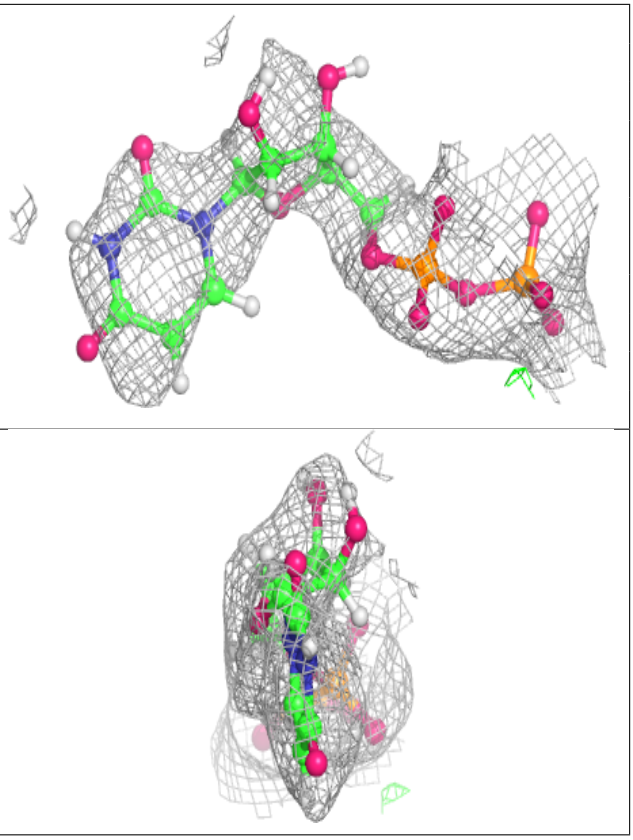


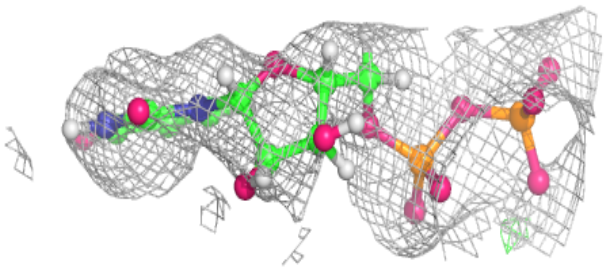




Electron density around UDP B 601:

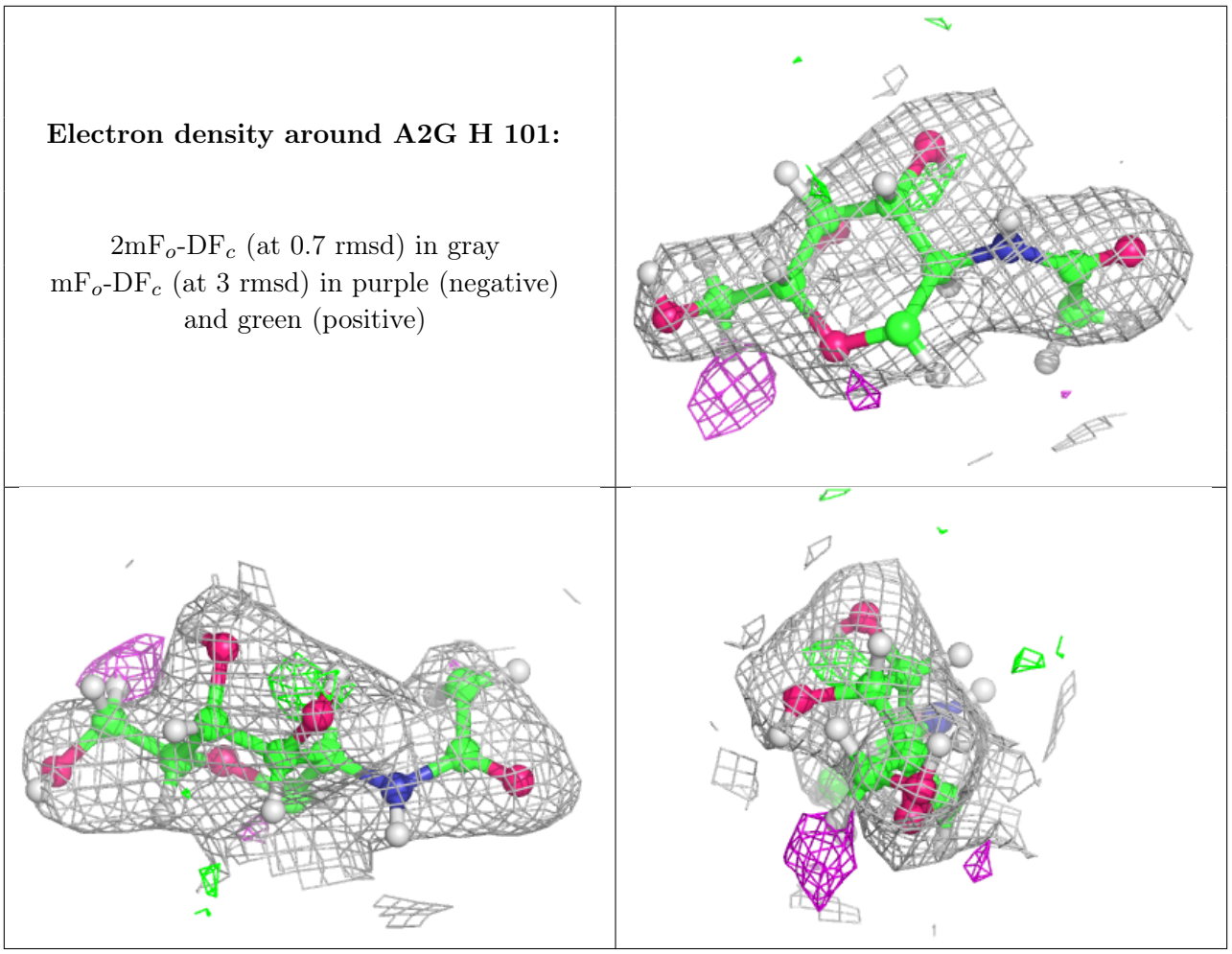
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





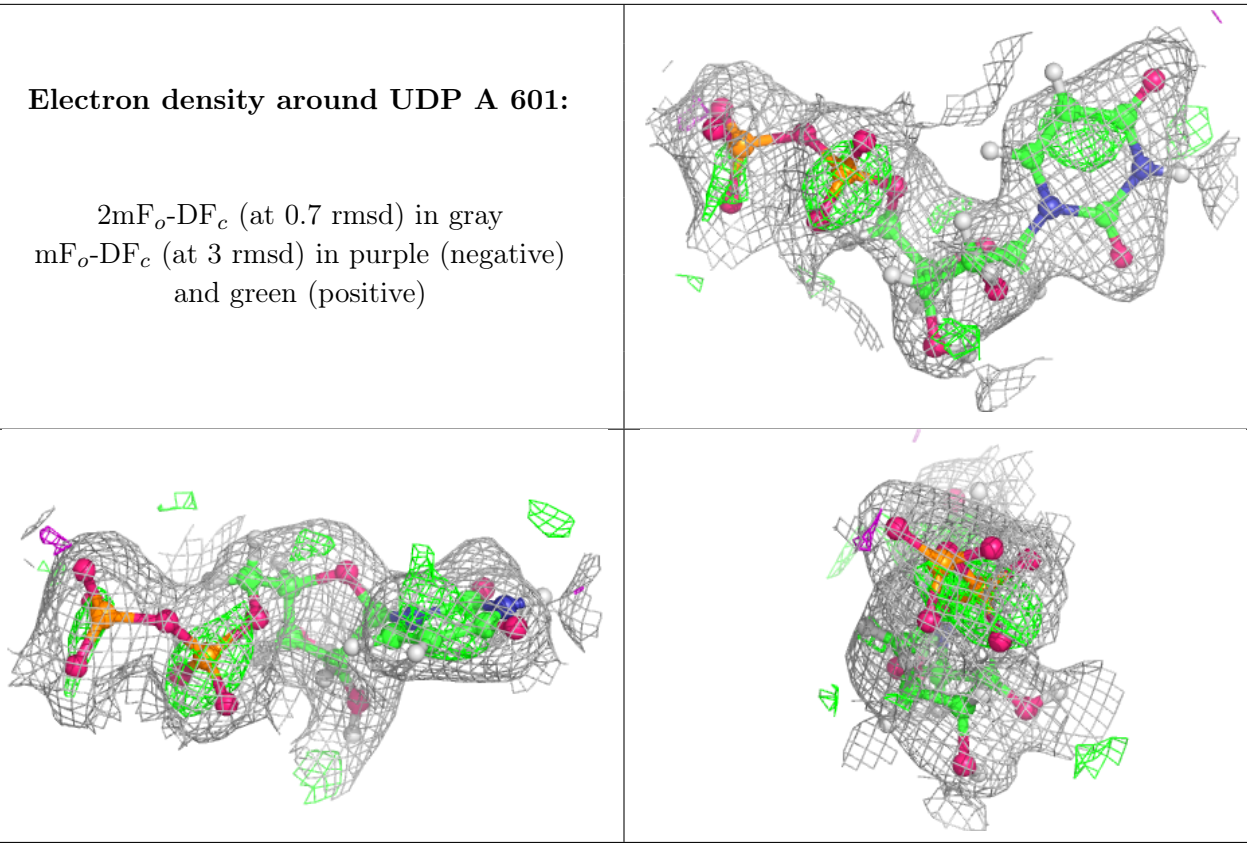
Electron density around A2G H 101:

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



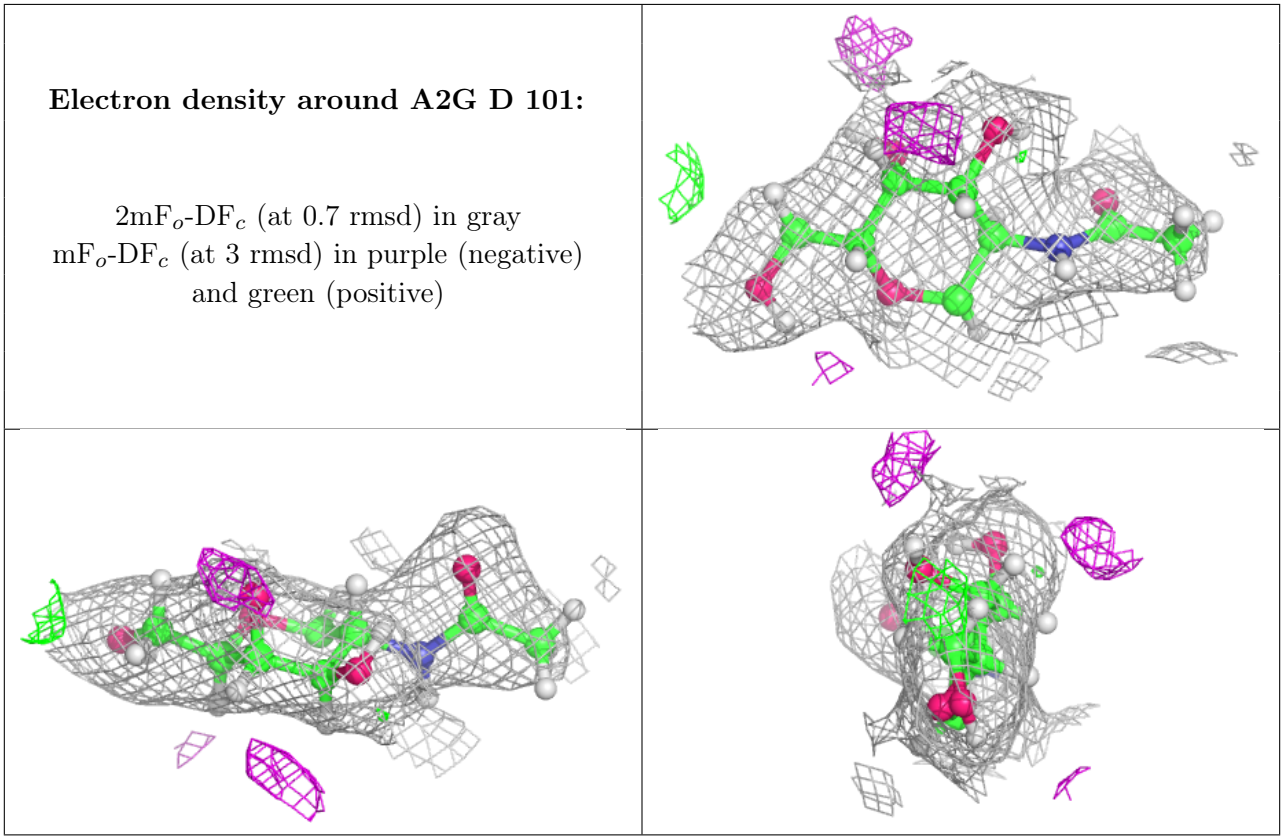
Electron density around UDP A 601:

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



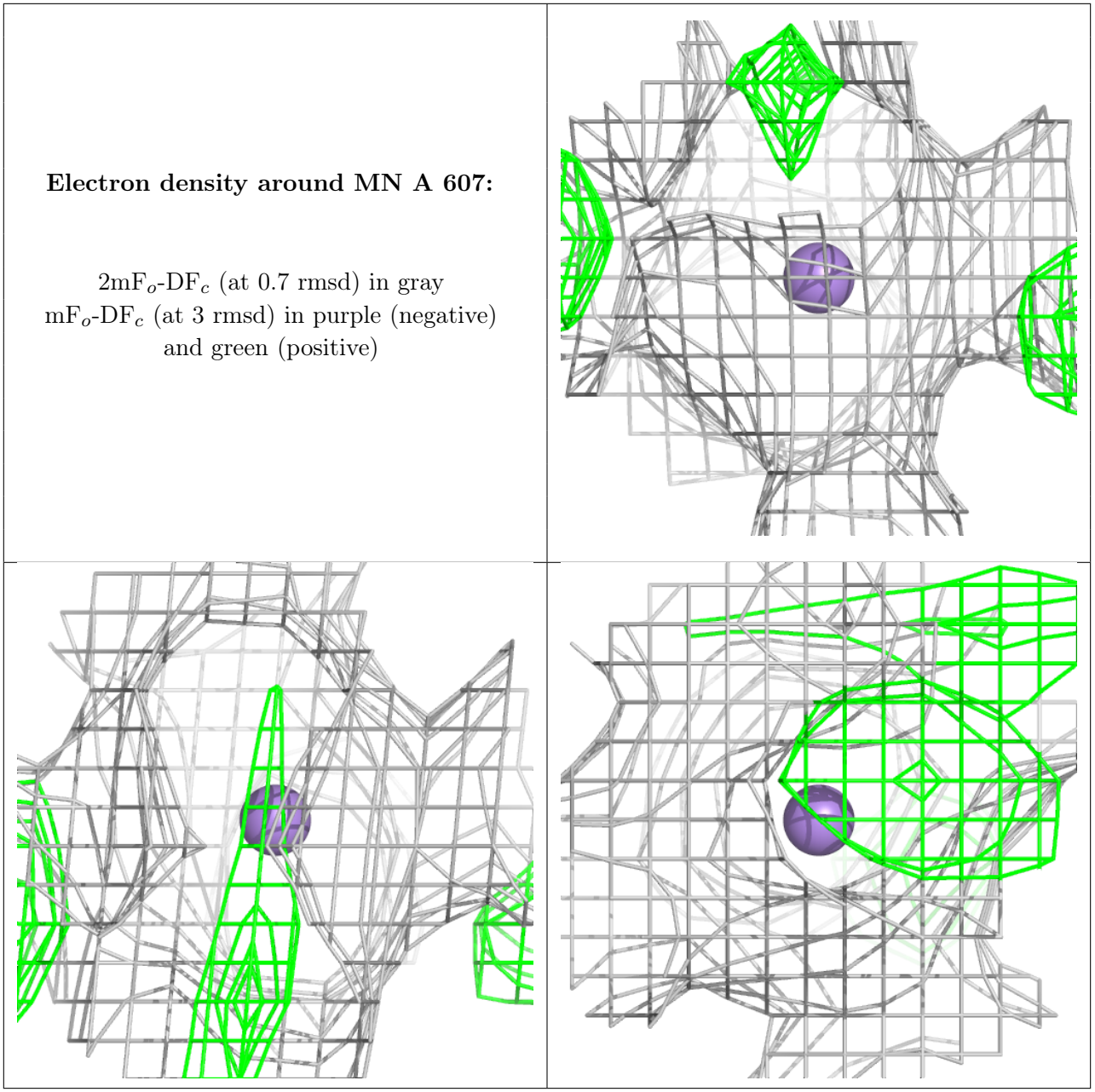
Electron density around A2G D 101:

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



Electron density around MN A 607:

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



6.5 Other polymers

There are no such residues in this entry.