Full wwPDB EM Validation Report (i)

Sep 28, 2024 – 11:01 AM EDT

PDB ID	:	6MMV
EMDB ID	:	EMD-9163
Title	:	Triheteromeric NMDA receptor GluN1/GluN2A/GluN2A* Extracellular Domain in the '2-Knuckle-Asymmetric' conformation, in complex with glycine and glutamate, in the presence of 1 micromolar zinc chloride, and at pH 7.4
Authors	:	Jalali-Yazdi, F.; Chowdhury, S.; Yoshioka, C.; Gouaux, E.
Deposited on	:	2018-10-01
Resolution	:	4.71 Å(reported)
Based on initial models	:	5TQ0, 5I57, 5UOW, 4PE5

This is a Full wwPDB EM 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/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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

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

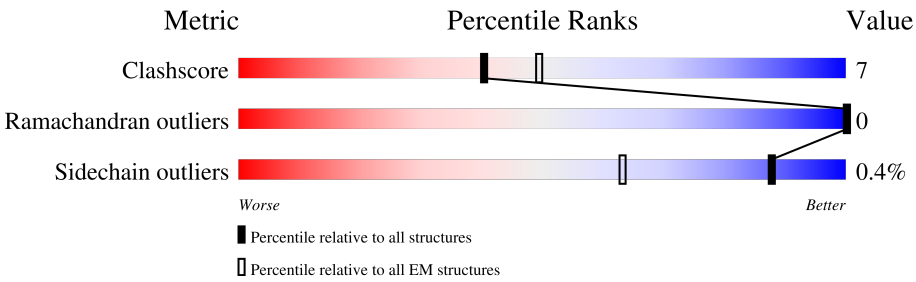
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.71 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	797	31% 69% 14% 17%
1	C	797	10% 67% 15% 18%
2	B	800	14% 67% 13% 20%
3	D	800	12% 67% 13% 20%
4	E	2	100% 50% 50%
4	F	2	50% 50% 50%
4	G	2	50% 50% 50%
4	H	2	50% 50%

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Mol	Chain	Length	Quality of chain
4	I	2	50% 100%
4	J	2	50% 100%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 21139 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Glutamate receptor ionotropic, NMDA 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	658	5231	3305	920	978	28	0	0
1	C	656	5215	3295	918	974	28	0	0

- Molecule 2 is a protein called Glutamate receptor ionotropic, NMDA 2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	642	5082	3250	845	959	28	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	758	THR	SER	conflict	UNP Q00959

- Molecule 3 is a protein called Glutamate receptor ionotropic, NMDA 2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	642	5079	3248	843	960	28	0	0

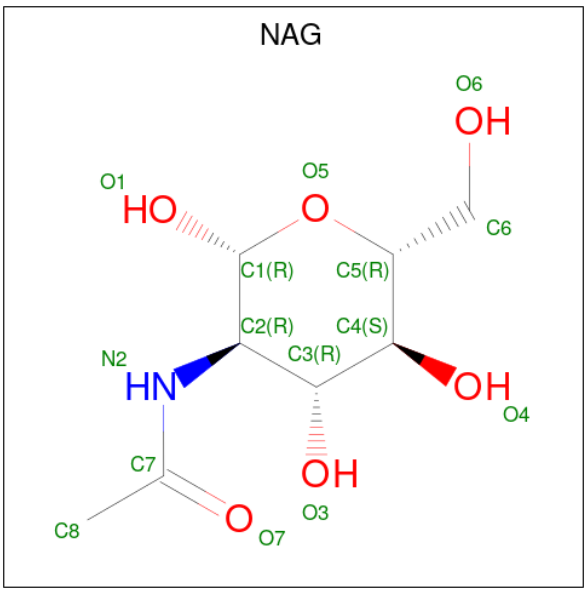
There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	128	SER	HIS	engineered mutation	UNP Q00959
D	687	GLN	ASN	engineered mutation	UNP Q00959
D	758	THR	SER	conflict	UNP Q00959

- 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				AltConf	Trace
			Total	C	N	O		
4	E	2	28	16	2	10	0	0
4	F	2	28	16	2	10	0	0
4	G	2	28	16	2	10	0	0
4	H	2	28	16	2	10	0	0
4	I	2	28	16	2	10	0	0
4	J	2	28	16	2	10	0	0

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

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

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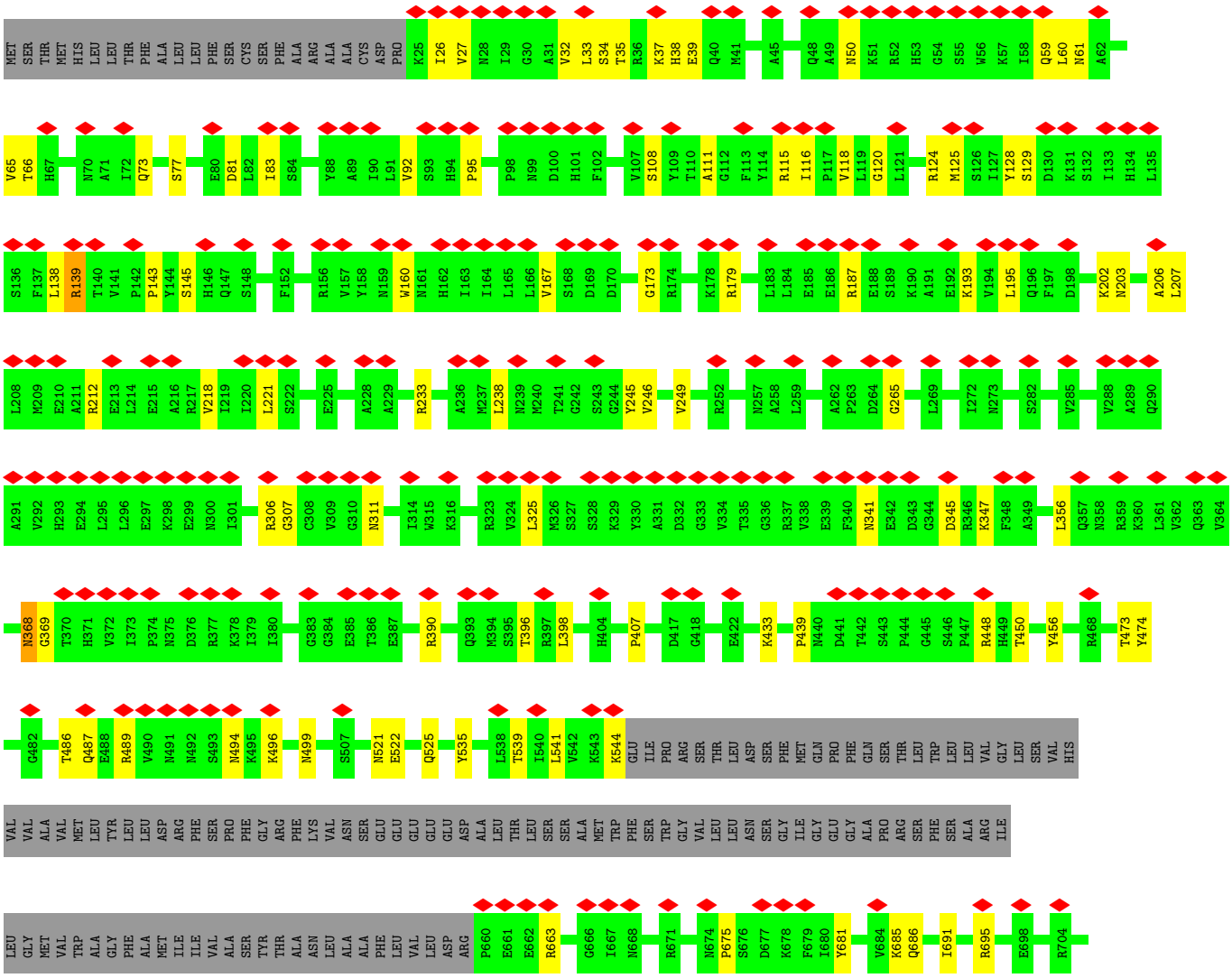
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
5	D	1	14	8	1	5	0
			Total	C	N	O	
5	D	1	14	8	1	5	0

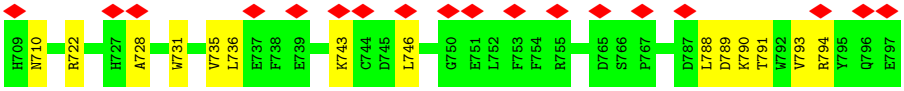
3 Residue-property plots (i)

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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: Glutamate receptor ionotropic, NMDA 1

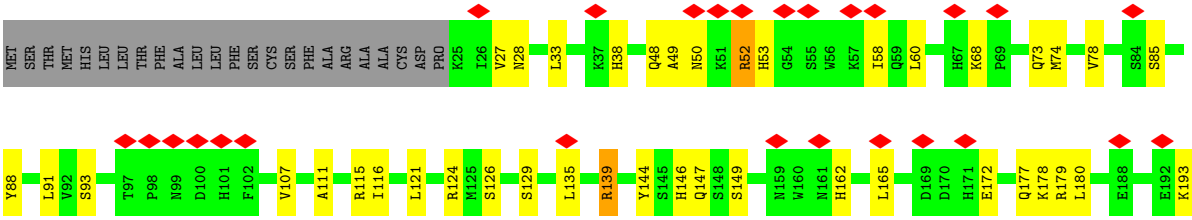
Chain A:





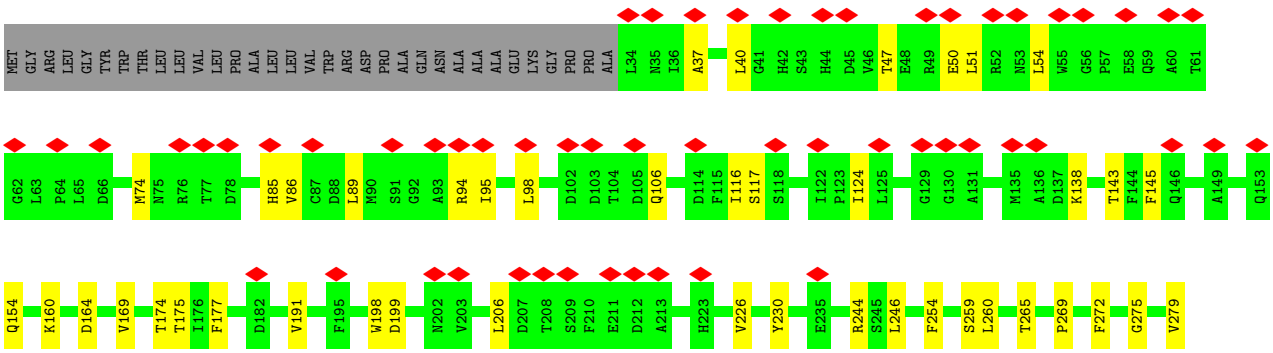
- Molecule 1: Glutamate receptor ionotropic, NMDA 1

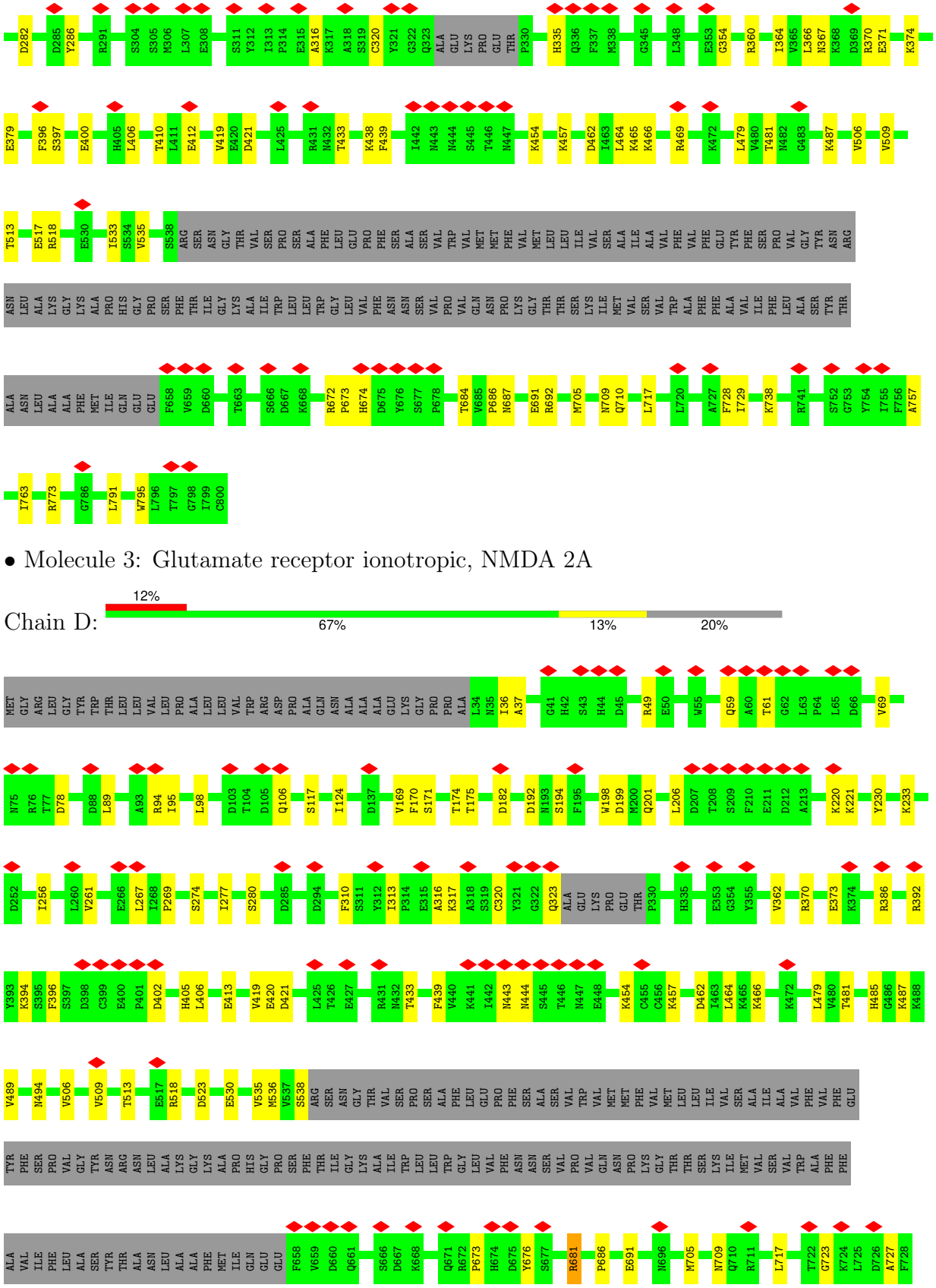
Chain C:



- Molecule 2: Glutamate receptor ionotropic, NMDA 2A

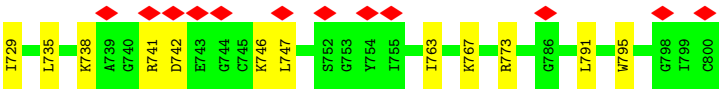
Chain B:





• Molecule 3: Glutamate receptor ionotropic, NMDA 2A

Chain D:



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

Chain E:

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

Chain F:

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

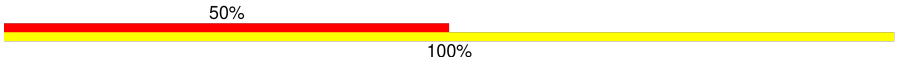
Chain G:

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

Chain H:

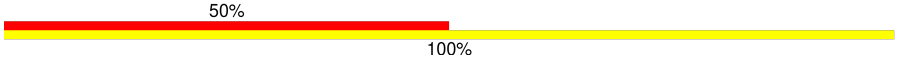
• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:



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

Chain J:



NAG1
NAG2

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	68275	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 BASE (4k x 4k)	Depositor
Maximum map value	24.700	Depositor
Minimum map value	-12.379	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	5.8	Depositor
Map size (Å)	437.76, 437.76, 437.76	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.71, 1.71, 1.71	Depositor

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: 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	0.28	1/5345 (0.0%)	0.48	0/7234
1	C	0.27	0/5328	0.48	0/7211
2	B	0.26	0/5196	0.47	0/7049
3	D	0.27	0/5192	0.49	0/7043
All	All	0.27	1/21061 (0.0%)	0.48	0/28537

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	95	PRO	C-N	6.53	1.46	1.34

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5231	0	5183	73	0
1	C	5215	0	5167	88	0
2	B	5082	0	5007	70	0
3	D	5079	0	5008	70	0
4	E	28	0	25	0	0
4	F	28	0	25	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	G	28	0	25	1	0
4	H	28	0	25	0	0
4	I	28	0	25	0	0
4	J	28	0	25	0	0
5	A	126	0	117	1	0
5	B	70	0	65	1	0
5	C	98	0	91	0	0
5	D	70	0	65	0	0
All	All	21139	0	20853	285	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 7.

All (285) 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:C:521:ASN:HB3	1:C:695:ARG:HH12	1.35	0.91
2:B:421:ASP:OD1	2:B:454:LYS:NZ	2.06	0.87
1:C:124:ARG:NH1	1:C:251:GLU:OE1	2.12	0.83
1:A:790:LYS:HG2	1:A:794:ARG:HH11	1.44	0.82
3:D:421:ASP:OD1	3:D:454:LYS:NZ	2.12	0.81
1:C:48:GLN:O	1:C:52:ARG:NH1	2.13	0.81
1:C:178:LYS:NZ	3:D:182:ASP:OD1	2.13	0.80
1:A:448:ARG:NH1	1:A:450:THR:OG1	2.14	0.80
3:D:513:THR:OG1	3:D:518:ARG:NH1	2.13	0.80
1:C:172:GLU:OE2	1:C:252:ARG:NH2	2.17	0.78
1:C:260:ARG:O	1:C:359:ARG:NH1	2.15	0.78
1:A:521:ASN:HB3	1:A:695:ARG:HH12	1.51	0.75
1:A:202:LYS:NZ	1:A:233:ARG:HH11	1.84	0.75
1:A:202:LYS:HZ2	1:A:233:ARG:HH11	1.37	0.72
1:C:722:ARG:HD2	1:C:743:LYS:HZ3	1.54	0.72
3:D:742:ASP:OD2	3:D:746:LYS:N	2.24	0.70
1:C:135:LEU:O	1:C:322:LYS:NZ	2.22	0.69
3:D:433:THR:HG22	3:D:457:LYS:HB3	1.75	0.69
3:D:394:LYS:NZ	3:D:402:ASP:O	2.22	0.69
1:A:77:SER:O	1:A:81:ASP:HB2	1.93	0.68
1:A:193:LYS:NZ	1:A:207:LEU:O	2.27	0.67
3:D:94:ARG:NH1	3:D:316:ALA:O	2.28	0.67
2:B:98:LEU:HB3	2:B:124:ILE:HG12	1.78	0.66
2:B:160:LYS:NZ	2:B:164:ASP:OD2	2.29	0.65
1:C:193:LYS:NZ	1:C:210:GLU:OE1	2.30	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:144:TYR:O	1:C:147:GLN:HB2	1.97	0.64
1:A:522:GLU:OE2	1:A:695:ARG:NH1	2.30	0.63
2:B:465:LYS:HB3	2:B:469:ARG:HH12	1.64	0.62
3:D:462:ASP:OD2	3:D:795:TRP:NE1	2.31	0.61
2:B:433:THR:HG22	2:B:457:LYS:HB3	1.83	0.61
2:B:465:LYS:HB3	2:B:469:ARG:NH1	2.16	0.61
1:C:212:ARG:NH2	1:C:238:LEU:O	2.33	0.60
1:A:212:ARG:NH1	1:A:245:TYR:OH	2.35	0.59
1:C:146:HIS:CD2	1:C:179:ARG:HH12	2.19	0.59
3:D:466:LYS:HZ1	3:D:791:LEU:HD21	1.67	0.59
2:B:143:THR:HG22	2:B:335:HIS:HB2	1.85	0.59
1:C:790:LYS:HG2	1:C:794:ARG:HH11	1.68	0.59
3:D:535:VAL:HG22	3:D:729:ILE:HG12	1.83	0.59
2:B:154:GLN:HE22	2:B:259:SER:H	1.49	0.59
3:D:738:LYS:HG2	3:D:741:ARG:HH11	1.68	0.59
2:B:705:MET:SD	2:B:709:ASN:ND2	2.76	0.58
1:A:212:ARG:NH2	1:A:238:LEU:O	2.36	0.58
1:C:534:LYS:HB3	1:C:758:PHE:HB2	1.84	0.58
2:B:74:MET:SD	2:B:85:HIS:NE2	2.76	0.58
1:C:541:LEU:HD11	1:C:746:LEU:HB3	1.86	0.58
1:C:722:ARG:HH11	1:C:743:LYS:HZ3	1.52	0.57
1:A:541:LEU:HD11	1:A:746:LEU:HB3	1.84	0.57
1:C:193:LYS:HE2	1:C:195:LEU:HD21	1.87	0.57
3:D:406:LEU:HD22	3:D:506:VAL:HG11	1.86	0.57
2:B:406:LEU:HD22	2:B:506:VAL:HG11	1.87	0.57
3:D:169:VAL:HG22	3:D:199:ASP:HB3	1.86	0.57
3:D:536:MET:O	3:D:727:ALA:HA	2.05	0.57
3:D:705:MET:SD	3:D:709:ASN:ND2	2.78	0.56
1:C:350:ASN:HA	1:C:367:TYR:O	2.05	0.56
3:D:681:ARG:NH2	3:D:723:GLY:O	2.37	0.56
2:B:37:ALA:HB2	2:B:95:ILE:HD13	1.88	0.56
2:B:513:THR:OG1	2:B:518:ARG:NH1	2.39	0.56
2:B:94:ARG:HH11	2:B:316:ALA:H	1.52	0.56
2:B:286:TYR:HB2	2:B:360:ARG:HH11	1.71	0.56
3:D:735:LEU:HD23	3:D:738:LYS:HD3	1.88	0.55
3:D:717:LEU:HD22	3:D:738:LYS:HZ2	1.70	0.55
2:B:50:GLU:O	2:B:54:LEU:HB2	2.07	0.55
1:A:722:ARG:HD2	1:A:743:LYS:HZ3	1.72	0.55
3:D:487:LYS:NZ	3:D:489:VAL:HG22	2.21	0.55
2:B:773:ARG:NH2	1:C:525:GLN:O	2.39	0.55
1:C:722:ARG:NH1	1:C:743:LYS:HZ3	2.05	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:SER:OG	1:A:139:ARG:NH2	2.40	0.55
1:A:202:LYS:NZ	1:A:233:ARG:NH1	2.54	0.54
1:C:223:ALA:N	1:C:253:GLU:OE2	2.40	0.54
2:B:94:ARG:NH1	2:B:316:ALA:O	2.41	0.54
2:B:439:PHE:HB3	2:B:481:THR:HG21	1.88	0.54
1:C:496:LYS:HZ2	3:D:194:SER:N	2.06	0.54
2:B:672:ARG:HG3	2:B:674:HIS:H	1.71	0.54
1:A:73:GLN:NE2	2:B:320:CYS:O	2.41	0.54
1:C:165:LEU:HB3	1:C:194:VAL:HG12	1.90	0.54
1:C:522:GLU:OE2	1:C:695:ARG:NH1	2.40	0.54
1:C:541:LEU:HD21	1:C:746:LEU:HD22	1.89	0.54
1:A:368:ASN:HD22	1:A:369:GLY:H	1.54	0.53
1:C:306:ARG:O	1:C:311:ASN:ND2	2.41	0.53
1:C:463:LEU:HD13	1:C:514:VAL:HG21	1.90	0.53
1:A:448:ARG:HH11	1:A:450:THR:HG1	1.50	0.53
3:D:98:LEU:HB3	3:D:124:ILE:HG12	1.91	0.53
3:D:280:SER:O	3:D:362:VAL:HB	2.09	0.53
2:B:364:ILE:HG22	2:B:374:LYS:HA	1.90	0.53
1:A:487:GLN:HG2	1:A:496:LYS:HB3	1.91	0.53
1:C:28:ASN:ND2	1:C:85:SER:O	2.42	0.53
1:C:33:LEU:HD21	1:C:38:HIS:HB2	1.90	0.53
1:A:685:LYS:HB2	1:A:710:ASN:HB3	1.91	0.53
1:A:789:ASP:HB3	1:A:794:ARG:HB2	1.91	0.53
1:A:138:LEU:HD22	1:A:325:LEU:HB3	1.91	0.53
1:A:145:SER:HB2	1:A:179:ARG:HG2	1.90	0.53
3:D:269:PRO:O	3:D:370:ARG:NH2	2.41	0.52
2:B:517:GLU:OE1	2:B:692:ARG:NH2	2.43	0.52
3:D:175:THR:HG22	3:D:206:LEU:HD13	1.92	0.52
1:C:351:TYR:HB2	1:C:367:TYR:HB3	1.90	0.52
1:A:368:ASN:HD22	1:A:369:GLY:N	2.08	0.52
1:C:496:LYS:HZ3	3:D:192:ASP:C	2.13	0.52
3:D:392:ARG:HH21	3:D:405:HIS:HB2	1.73	0.52
1:C:272:ILE:HD12	1:C:350:ASN:HB3	1.90	0.52
2:B:535:VAL:HG22	2:B:729:ILE:HG12	1.91	0.52
3:D:37:ALA:HB2	3:D:95:ILE:HD13	1.91	0.52
2:B:244:ARG:HH12	2:B:397:SER:HB3	1.75	0.52
3:D:317:LYS:NZ	3:D:323:GLN:HG2	2.25	0.52
1:A:789:ASP:HA	1:A:793:VAL:HB	1.91	0.52
2:B:265:THR:OG1	2:B:282:ASP:OD2	2.16	0.52
1:C:126:SER:HB2	1:C:172:GLU:HB2	1.91	0.52
2:B:509:VAL:HA	2:B:763:ILE:HD12	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:221:LEU:HB3	1:C:249:VAL:HG12	1.91	0.51
2:B:462:ASP:OD2	2:B:795:TRP:NE1	2.44	0.51
1:A:33:LEU:HB3	1:A:39:GLU:OE2	2.11	0.51
1:A:221:LEU:HB3	1:A:249:VAL:HG12	1.92	0.51
3:D:256:ILE:HG12	3:D:277:ILE:HB	1.92	0.51
1:C:704:ARG:NH2	3:D:420:GLU:OE1	2.41	0.51
1:A:115:ARG:NH1	2:B:106:GLN:OE1	2.40	0.51
1:A:124:ARG:HB3	1:A:143:PRO:HA	1.92	0.51
1:C:397:ARG:HH11	1:C:475:GLU:CD	2.14	0.51
1:A:193:LYS:HE2	1:A:195:LEU:HD11	1.93	0.51
1:A:525:GLN:O	3:D:773:ARG:NH2	2.43	0.51
2:B:177:PHE:HE2	2:B:260:LEU:HD21	1.76	0.50
2:B:246:LEU:HD23	3:D:220:LYS:HB3	1.92	0.50
2:B:366:LEU:HD21	2:B:370:ARG:NH1	2.26	0.50
3:D:233:LYS:NZ	3:D:267:LEU:HD23	2.27	0.50
1:C:298:LYS:NZ	1:C:320:LEU:HD11	2.27	0.50
1:C:27:VAL:HG23	1:C:58:ILE:HD11	1.94	0.50
2:B:169:VAL:HG22	2:B:199:ASP:HB3	1.94	0.50
2:B:672:ARG:HD2	2:B:673:PRO:HD2	1.94	0.50
2:B:86:VAL:HG21	2:B:116:ILE:HD13	1.94	0.49
2:B:487:LYS:NZ	2:B:687:ASN:OD1	2.39	0.49
1:C:212:ARG:HH21	1:C:238:LEU:HB3	1.77	0.49
2:B:379:GLU:OE2	5:B:903:NAG:O6	2.30	0.49
1:C:722:ARG:HH11	1:C:743:LYS:NZ	2.10	0.49
1:A:341:ASN:HA	1:A:347:LYS:HE3	1.95	0.49
1:C:505:LEU:HA	1:C:510:ALA:HB3	1.94	0.49
3:D:36:ILE:O	3:D:69:VAL:HA	2.13	0.49
1:C:78:VAL:HG21	1:C:107:VAL:HG22	1.94	0.49
2:B:533:ILE:HG12	2:B:757:ALA:H	1.77	0.49
2:B:464:LEU:HD13	2:B:509:VAL:HG21	1.95	0.49
1:C:49:ALA:O	1:C:53:HIS:ND1	2.46	0.49
1:C:506:LEU:HA	1:C:763:ARG:HH22	1.76	0.49
3:D:413:GLU:OE2	3:D:485:HIS:NE2	2.43	0.49
1:A:489:ARG:HA	1:A:496:LYS:HA	1.95	0.48
1:A:307:GLY:HA2	1:A:311:ASN:HB2	1.94	0.48
1:C:111:ALA:HB1	1:C:116:ILE:HB	1.94	0.48
2:B:138:LYS:NZ	2:B:354:GLY:HA3	2.28	0.48
1:A:125:MET:HB2	1:A:128:TYR:HD2	1.79	0.48
1:C:489:ARG:HH22	3:D:194:SER:HA	1.78	0.48
3:D:317:LYS:HZ3	3:D:323:GLN:HG2	1.77	0.48
1:A:92:VAL:HB	1:A:120:GLY:HA2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:486:THR:HG22	1:A:691:ILE:HD11	1.95	0.48
1:C:722:ARG:NH1	1:C:743:LYS:NZ	2.62	0.48
1:C:307:GLY:HA2	1:C:311:ASN:HB2	1.96	0.48
1:C:790:LYS:HG2	1:C:794:ARG:HE	1.79	0.47
1:A:83:ILE:HG22	1:A:307:GLY:H	1.79	0.47
1:C:403:ILE:HG21	1:C:484:PHE:HE1	1.79	0.47
1:C:536:GLN:HB2	1:C:733:SER:HB2	1.96	0.47
2:B:174:THR:HG22	2:B:230:TYR:HB3	1.96	0.47
2:B:269:PRO:O	2:B:370:ARG:NH2	2.47	0.47
1:A:433:LYS:HG2	1:A:456:TYR:HB3	1.97	0.47
2:B:686:PRO:HA	2:B:691:GLU:OE2	2.14	0.47
1:A:731:TRP:HB3	1:A:736:LEU:HD11	1.96	0.47
2:B:275:GLY:H	2:B:366:LEU:HB3	1.78	0.47
1:C:505:LEU:O	1:C:763:ARG:NH2	2.47	0.47
1:A:167:VAL:HG11	1:A:173:GLY:HA3	1.97	0.47
1:A:439:PRO:HA	1:A:450:THR:HA	1.97	0.47
1:A:539:THR:HG23	1:A:736:LEU:HD12	1.97	0.47
2:B:175:THR:HG22	2:B:206:LEU:HD22	1.97	0.47
1:C:193:LYS:NZ	1:C:210:GLU:HB3	2.30	0.47
1:A:544:LYS:HE2	1:A:663:ARG:HA	1.97	0.47
2:B:154:GLN:NE2	2:B:279:VAL:O	2.48	0.47
2:B:396:PHE:HB2	2:B:400:GLU:OE2	2.15	0.47
2:B:684:THR:HG22	2:B:729:ILE:HB	1.97	0.47
3:D:717:LEU:HB2	3:D:738:LYS:HZ1	1.80	0.47
3:D:487:LYS:N	3:D:494:ASN:OD1	2.47	0.46
2:B:686:PRO:HG2	4:F:1:NAG:H81	1.96	0.46
1:C:129:SER:OG	1:C:139:ARG:NH2	2.48	0.46
3:D:443:ASN:OD1	3:D:444:ASN:N	2.47	0.46
1:A:790:LYS:HG2	1:A:794:ARG:NH1	2.23	0.46
1:A:341:ASN:HD21	1:A:345:ASP:HB2	1.80	0.46
2:B:412:GLU:HG2	2:B:419:VAL:HG21	1.97	0.46
1:C:534:LYS:O	1:C:757:GLY:HA2	2.16	0.46
1:A:160:TRP:O	1:A:187:ARG:NH2	2.43	0.46
3:D:419:VAL:HG11	3:D:479:LEU:HD11	1.97	0.46
2:B:672:ARG:NH1	2:B:673:PRO:HG2	2.31	0.46
1:C:146:HIS:O	1:C:149:SER:HB2	2.16	0.46
1:A:218:VAL:HA	1:A:246:VAL:HB	1.97	0.45
2:B:226:VAL:HG22	2:B:254:PHE:HB2	1.98	0.45
1:C:413:PRO:HA	1:C:453:GLN:HG3	1.97	0.45
1:C:722:ARG:HD2	1:C:743:LYS:NZ	2.29	0.45
1:A:206:ALA:HB2	5:A:803:NAG:H81	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:73:GLN:NE2	3:D:320:CYS:O	2.44	0.45
1:C:233:ARG:HH11	1:C:261:TYR:HE2	1.64	0.45
3:D:59:GLN:NE2	3:D:61:THR:O	2.50	0.45
2:B:138:LYS:HZ2	2:B:354:GLY:HA3	1.82	0.45
3:D:170:PHE:HE1	3:D:198:TRP:HB3	1.82	0.45
3:D:439:PHE:HB3	3:D:481:THR:HG21	1.99	0.45
2:B:464:LEU:HB2	2:B:509:VAL:HG11	1.99	0.45
4:G:1:NAG:H61	4:G:2:NAG:HN2	1.82	0.45
1:A:212:ARG:HH21	1:A:238:LEU:HB3	1.81	0.45
3:D:673:PRO:HA	3:D:676:TYR:HD2	1.81	0.45
3:D:117:SER:HB2	3:D:124:ILE:HD12	1.98	0.45
1:A:35:THR:OG1	1:A:38:HIS:ND1	2.48	0.44
1:A:202:LYS:HZ3	1:A:233:ARG:NH1	2.16	0.44
1:A:681:TYR:HB3	1:A:728:ALA:HB3	1.98	0.44
3:D:464:LEU:HD13	3:D:509:VAL:HG11	1.99	0.44
3:D:310:PHE:HB3	3:D:313:ILE:HD11	2.00	0.44
2:B:717:LEU:HD22	2:B:738:LYS:NZ	2.33	0.44
1:C:50:ASN:HD21	1:C:60:LEU:HB2	1.82	0.44
1:C:115:ARG:NH1	3:D:106:GLN:OE1	2.23	0.44
1:A:499:ASN:ND2	1:A:686:GLN:OE1	2.51	0.44
1:C:539:THR:HG23	1:C:736:LEU:HD12	1.98	0.44
1:C:666:GLY:HA3	1:C:751:GLU:HB2	2.00	0.44
3:D:201:GLN:NE2	3:D:221:LYS:O	2.50	0.44
1:C:341:ASN:OD1	1:C:345:ASP:N	2.47	0.44
3:D:174:THR:HG22	3:D:230:TYR:HB3	2.00	0.44
1:C:78:VAL:HG11	1:C:107:VAL:HG13	1.99	0.44
1:C:722:ARG:CD	1:C:743:LYS:HZ3	2.27	0.44
1:C:667:ILE:HD11	1:C:699:LEU:HD11	1.98	0.44
1:A:306:ARG:O	1:A:311:ASN:ND2	2.38	0.43
2:B:47:THR:OG1	2:B:50:GLU:OE1	2.34	0.43
3:D:513:THR:HG1	3:D:518:ARG:NH1	2.16	0.43
2:B:419:VAL:HG11	2:B:479:LEU:HD11	2.00	0.43
2:B:466:LYS:HZ1	2:B:791:LEU:HD21	1.83	0.43
2:B:535:VAL:HA	2:B:728:PHE:O	2.18	0.43
1:C:91:LEU:HD23	1:C:121:LEU:HD11	1.99	0.43
1:C:433:LYS:HG2	1:C:456:TYR:HB3	2.00	0.43
1:A:108:SER:HA	1:A:118:VAL:HG21	1.99	0.43
1:C:367:TYR:HD1	1:C:372:VAL:HG22	1.84	0.43
1:A:50:ASN:HD21	1:A:60:LEU:HD12	1.84	0.43
1:A:111:ALA:HB1	1:A:116:ILE:HB	2.01	0.43
1:C:496:LYS:HZ2	3:D:194:SER:H	1.65	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:171:SER:OG	3:D:201:GLN:OE1	2.36	0.42
1:A:407:PRO:HG3	1:A:735:VAL:HA	2.00	0.42
2:B:410:THR:HG23	2:B:479:LEU:HD23	2.01	0.42
1:A:34:SER:HA	1:A:66:THR:HG22	2.01	0.42
1:C:93:SER:HB3	1:C:121:LEU:HD12	2.00	0.42
1:C:540:ILE:HA	1:C:729:PHE:O	2.20	0.42
1:A:139:ARG:NE	1:A:345:ASP:OD1	2.46	0.42
1:C:788:LEU:O	1:C:791:THR:OG1	2.34	0.42
1:A:396:THR:O	1:A:473:THR:OG1	2.28	0.42
2:B:138:LYS:NZ	2:B:145:PHE:HA	2.34	0.42
1:A:722:ARG:HH11	1:A:743:LYS:NZ	2.18	0.42
3:D:509:VAL:HA	3:D:763:ILE:HD12	2.02	0.42
3:D:686:PRO:HA	3:D:691:GLU:OE2	2.20	0.42
1:C:544:LYS:HB2	1:C:747:VAL:HG21	2.02	0.42
3:D:538:SER:HA	3:D:747:LEU:HD23	2.02	0.42
2:B:684:THR:O	2:B:710:GLN:NE2	2.34	0.42
1:C:396:THR:O	1:C:473:THR:N	2.53	0.41
1:C:489:ARG:HH12	3:D:194:SER:CA	2.33	0.41
2:B:438:LYS:HB2	2:B:479:LEU:HD12	2.01	0.41
1:C:88:TYR:OH	1:C:303:ASP:OD1	2.30	0.41
1:A:27:VAL:HB	1:A:60:LEU:HD23	2.01	0.41
1:C:68:LYS:HB2	1:C:74:MET:HG2	2.01	0.41
1:C:162:HIS:N	1:C:392:TYR:OH	2.52	0.41
1:C:165:LEU:HD22	1:C:180:LEU:HD23	2.02	0.41
1:C:406:GLU:OE2	1:C:715:ALA:HB2	2.20	0.41
1:A:489:ARG:NH2	1:A:494:ASN:OD1	2.52	0.41
3:D:233:LYS:HA	3:D:261:VAL:HG23	2.01	0.41
3:D:523:ASP:OD2	3:D:767:LYS:HA	2.20	0.41
1:A:32:VAL:HG13	1:A:65:VAL:HG23	2.02	0.41
2:B:272:PHE:O	2:B:370:ARG:NH1	2.52	0.41
1:A:27:VAL:O	1:A:61:ASN:N	2.50	0.41
1:C:193:LYS:HZ2	1:C:210:GLU:HB3	1.85	0.41
3:D:89:LEU:HB3	3:D:95:ILE:HD12	2.02	0.41
1:A:115:ARG:HH12	2:B:106:GLN:CD	2.21	0.41
2:B:40:LEU:HD12	2:B:51:LEU:HD11	2.03	0.41
3:D:373:GLU:CG	3:D:386:ARG:HH12	2.34	0.41
3:D:274:SER:HB2	3:D:396:PHE:HA	2.02	0.41
3:D:487:LYS:HZ2	3:D:489:VAL:HG22	1.86	0.41
1:A:265:GLY:N	1:A:356:LEU:O	2.54	0.40
1:A:675:PRO:HB3	1:A:681:TYR:HE1	1.86	0.40
1:C:481:ASP:HB2	1:C:483:LYS:NZ	2.36	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:398:LEU:H	1:A:474:TYR:HA	1.87	0.40
1:C:489:ARG:HH12	3:D:194:SER:HA	1.86	0.40
1:C:789:ASP:HA	1:C:793:VAL:HB	2.03	0.40
3:D:78:ASP:N	3:D:78:ASP:OD1	2.54	0.40
2:B:191:VAL:HG13	2:B:198:TRP:HB2	2.03	0.40
1:C:177:GLN:OE1	1:C:196:GLN:NE2	2.41	0.40
1:A:788:LEU:O	1:A:791:THR:OG1	2.33	0.40
2:B:89:LEU:HB3	2:B:95:ILE:HD12	2.03	0.40
2:B:367:ASN:HD21	2:B:371:GLU:HB2	1.85	0.40
1:A:26:ILE:HA	1:A:59:GLN:HB2	2.02	0.40
1:A:535:TYR:HB3	3:D:530:GLU:HG2	2.04	0.40
2:B:117:SER:HB2	2:B:124:ILE:HD12	2.03	0.40
3:D:466:LYS:HZ2	3:D:791:LEU:HD11	1.87	0.40
3:D:738:LYS:HA	3:D:741:ARG:HG2	2.03	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 PDB entries followed by that with respect to all EM entries.

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	654/797 (82%)	603 (92%)	51 (8%)	0	100	100
1	C	652/797 (82%)	606 (93%)	46 (7%)	0	100	100
2	B	636/800 (80%)	592 (93%)	44 (7%)	0	100	100
3	D	636/800 (80%)	595 (94%)	41 (6%)	0	100	100
All	All	2578/3194 (81%)	2396 (93%)	182 (7%)	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 PDB entries followed by that with respect to all EM entries.

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	575/691 (83%)	570 (99%)	5 (1%)	75	83
1	C	573/691 (83%)	570 (100%)	3 (0%)	86	90
2	B	567/695 (82%)	567 (100%)	0	100	100
3	D	567/695 (82%)	565 (100%)	2 (0%)	89	91
All	All	2282/2772 (82%)	2272 (100%)	10 (0%)	88	91

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	37	LYS
1	A	139	ARG
1	A	203	ASN
1	A	368	ASN
1	A	390	ARG
1	C	52	ARG
1	C	139	ARG
1	C	448	ARG
3	D	49	ARG
3	D	681	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	50	ASN
1	A	67	HIS
1	A	73	GLN
1	A	404	HIS
2	B	154	GLN
2	B	358	HIS
2	B	404	ASN
2	B	451	ASN
1	C	86	GLN

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Mol	Chain	Res	Type
1	C	449	HIS
1	C	770	GLN
3	D	154	GLN
3	D	451	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)

12 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	E	1	4,1	14,14,15	0.44	0	17,19,21	0.72	0
4	NAG	E	2	4	14,14,15	0.34	0	17,19,21	0.84	1 (5%)
4	NAG	F	1	4,2	14,14,15	0.39	0	17,19,21	1.95	4 (23%)
4	NAG	F	2	4	14,14,15	0.65	1 (7%)	17,19,21	1.05	0
4	NAG	G	1	4,1	14,14,15	0.40	0	17,19,21	0.73	0
4	NAG	G	2	4	14,14,15	0.43	0	17,19,21	1.08	2 (11%)
4	NAG	H	1	4,1	14,14,15	0.64	1 (7%)	17,19,21	1.38	3 (17%)
4	NAG	H	2	4	14,14,15	0.47	0	17,19,21	1.09	0
4	NAG	I	1	4,1	14,14,15	0.74	1 (7%)	17,19,21	2.03	3 (17%)
4	NAG	I	2	4	14,14,15	0.36	0	17,19,21	1.17	1 (5%)
4	NAG	J	1	4,1	14,14,15	0.33	0	17,19,21	0.98	1 (5%)
4	NAG	J	2	4	14,14,15	0.64	0	17,19,21	1.86	3 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	E	1	4,1	-	1/6/23/26	0/1/1/1
4	NAG	E	2	4	-	2/6/23/26	0/1/1/1
4	NAG	F	1	4,2	-	3/6/23/26	0/1/1/1
4	NAG	F	2	4	-	4/6/23/26	0/1/1/1
4	NAG	G	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	G	2	4	-	4/6/23/26	0/1/1/1
4	NAG	H	1	4,1	-	5/6/23/26	0/1/1/1
4	NAG	H	2	4	-	3/6/23/26	0/1/1/1
4	NAG	I	1	4,1	-	3/6/23/26	0/1/1/1
4	NAG	I	2	4	-	0/6/23/26	0/1/1/1
4	NAG	J	1	4,1	-	3/6/23/26	0/1/1/1
4	NAG	J	2	4	-	5/6/23/26	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	I	1	NAG	C1-C2	2.54	1.55	1.52
4	H	1	NAG	C1-C2	2.16	1.55	1.52
4	F	2	NAG	C1-C2	2.05	1.55	1.52

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	I	1	NAG	C1-O5-C5	6.29	120.62	112.19
4	J	2	NAG	C1-O5-C5	5.74	119.89	112.19
4	I	2	NAG	C1-O5-C5	4.49	118.21	112.19
4	F	1	NAG	C1-O5-C5	4.40	118.08	112.19
4	I	1	NAG	C2-N2-C7	3.95	128.19	122.90
4	F	1	NAG	C1-C2-N2	3.39	115.78	110.43
4	H	1	NAG	C2-N2-C7	3.38	127.43	122.90
4	J	2	NAG	C4-C3-C2	3.36	115.94	111.02
4	F	1	NAG	O5-C1-C2	-3.28	106.22	111.29
4	F	1	NAG	C2-N2-C7	2.85	126.72	122.90
4	J	1	NAG	O5-C1-C2	-2.78	106.99	111.29
4	E	2	NAG	C1-O5-C5	2.62	115.69	112.19
4	J	2	NAG	O5-C1-C2	2.55	115.24	111.29

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	G	2	NAG	C1-C2-N2	-2.38	106.68	110.43
4	H	1	NAG	C4-C3-C2	2.31	114.40	111.02
4	G	2	NAG	C2-N2-C7	2.21	125.86	122.90
4	I	1	NAG	C3-C4-C5	-2.12	106.39	110.23
4	H	1	NAG	O5-C1-C2	-2.11	108.03	111.29

There are no chirality outliers.

All (35) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	2	NAG	C8-C7-N2-C2
4	E	2	NAG	O7-C7-N2-C2
4	F	1	NAG	C1-C2-N2-C7
4	F	1	NAG	O7-C7-N2-C2
4	G	1	NAG	C8-C7-N2-C2
4	G	1	NAG	O7-C7-N2-C2
4	G	2	NAG	C3-C2-N2-C7
4	G	2	NAG	C8-C7-N2-C2
4	G	2	NAG	O7-C7-N2-C2
4	H	1	NAG	C8-C7-N2-C2
4	H	1	NAG	O7-C7-N2-C2
4	H	2	NAG	C3-C2-N2-C7
4	H	2	NAG	C8-C7-N2-C2
4	H	2	NAG	O7-C7-N2-C2
4	I	1	NAG	C3-C2-N2-C7
4	I	1	NAG	C8-C7-N2-C2
4	I	1	NAG	O7-C7-N2-C2
4	J	1	NAG	C8-C7-N2-C2
4	J	1	NAG	O7-C7-N2-C2
4	J	2	NAG	O7-C7-N2-C2
4	F	1	NAG	C8-C7-N2-C2
4	J	2	NAG	C8-C7-N2-C2
4	F	2	NAG	C8-C7-N2-C2
4	F	2	NAG	O7-C7-N2-C2
4	J	1	NAG	O5-C5-C6-O6
4	G	2	NAG	O5-C5-C6-O6
4	J	2	NAG	O5-C5-C6-O6
4	F	2	NAG	O5-C5-C6-O6
4	H	1	NAG	O5-C5-C6-O6
4	J	2	NAG	C3-C2-N2-C7
4	E	1	NAG	O5-C5-C6-O6
4	J	2	NAG	C1-C2-N2-C7

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Mol	Chain	Res	Type	Atoms
4	F	2	NAG	C3-C2-N2-C7
4	H	1	NAG	C3-C2-N2-C7
4	H	1	NAG	C1-C2-N2-C7

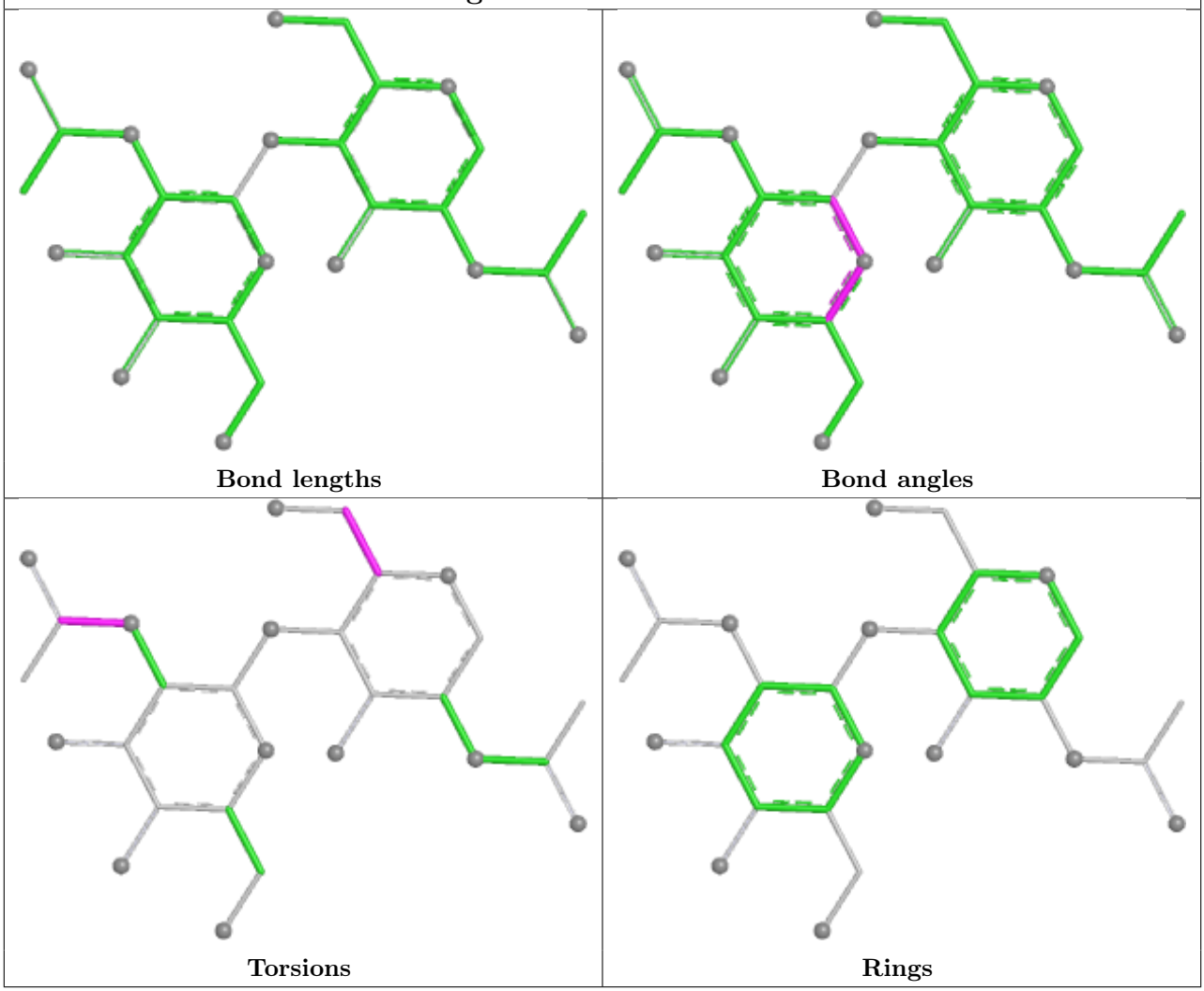
There are no ring outliers.

3 monomers are involved in 2 short contacts:

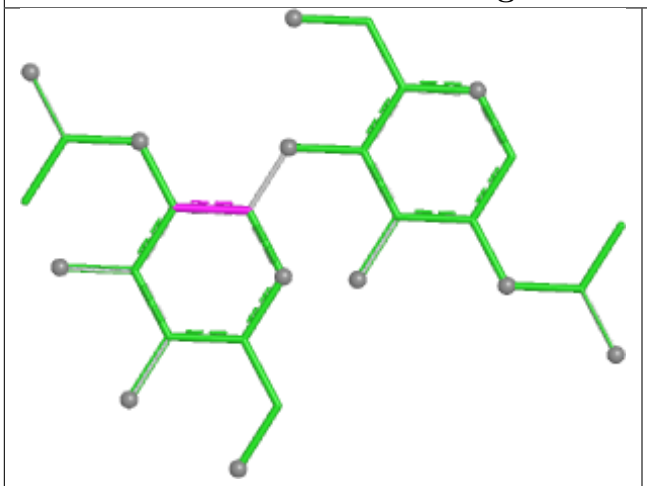
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	G	2	NAG	1	0
4	F	1	NAG	1	0
4	G	1	NAG	1	0

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

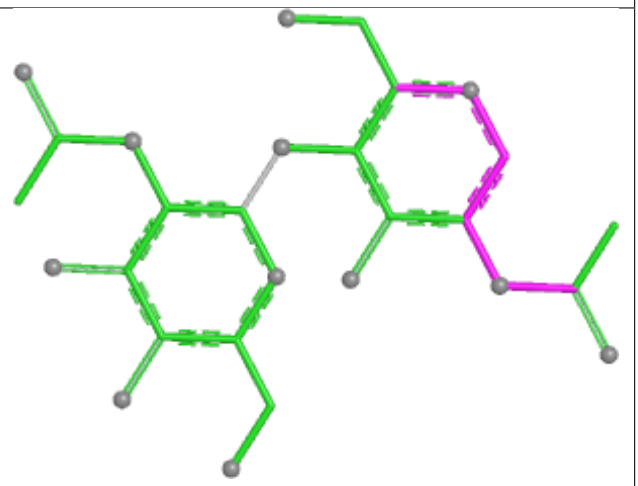
Oligosaccharide Chain E



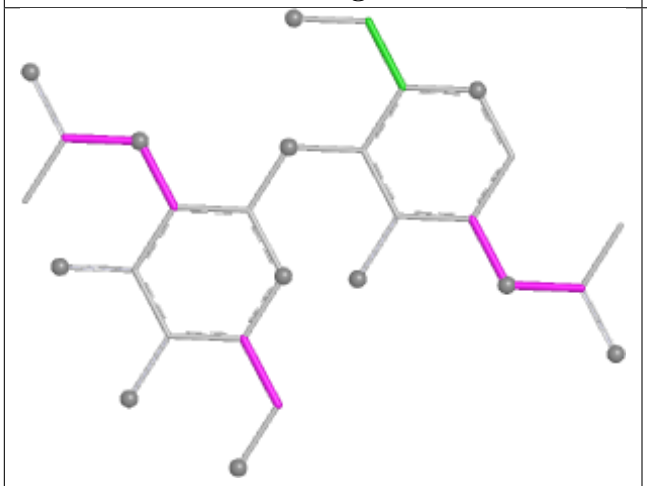
Oligosaccharide Chain F



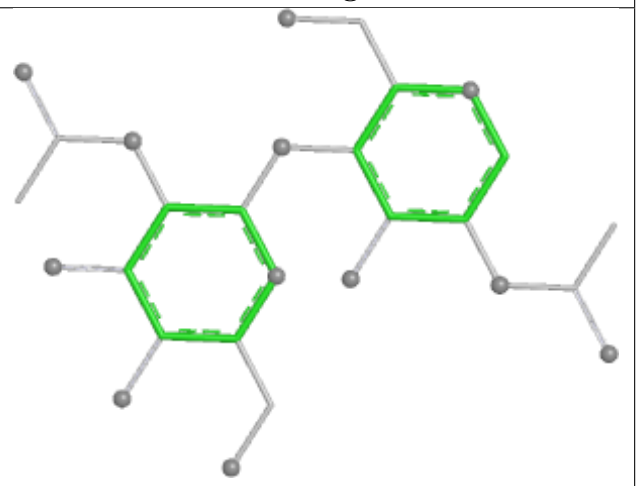
Bond lengths



Bond angles

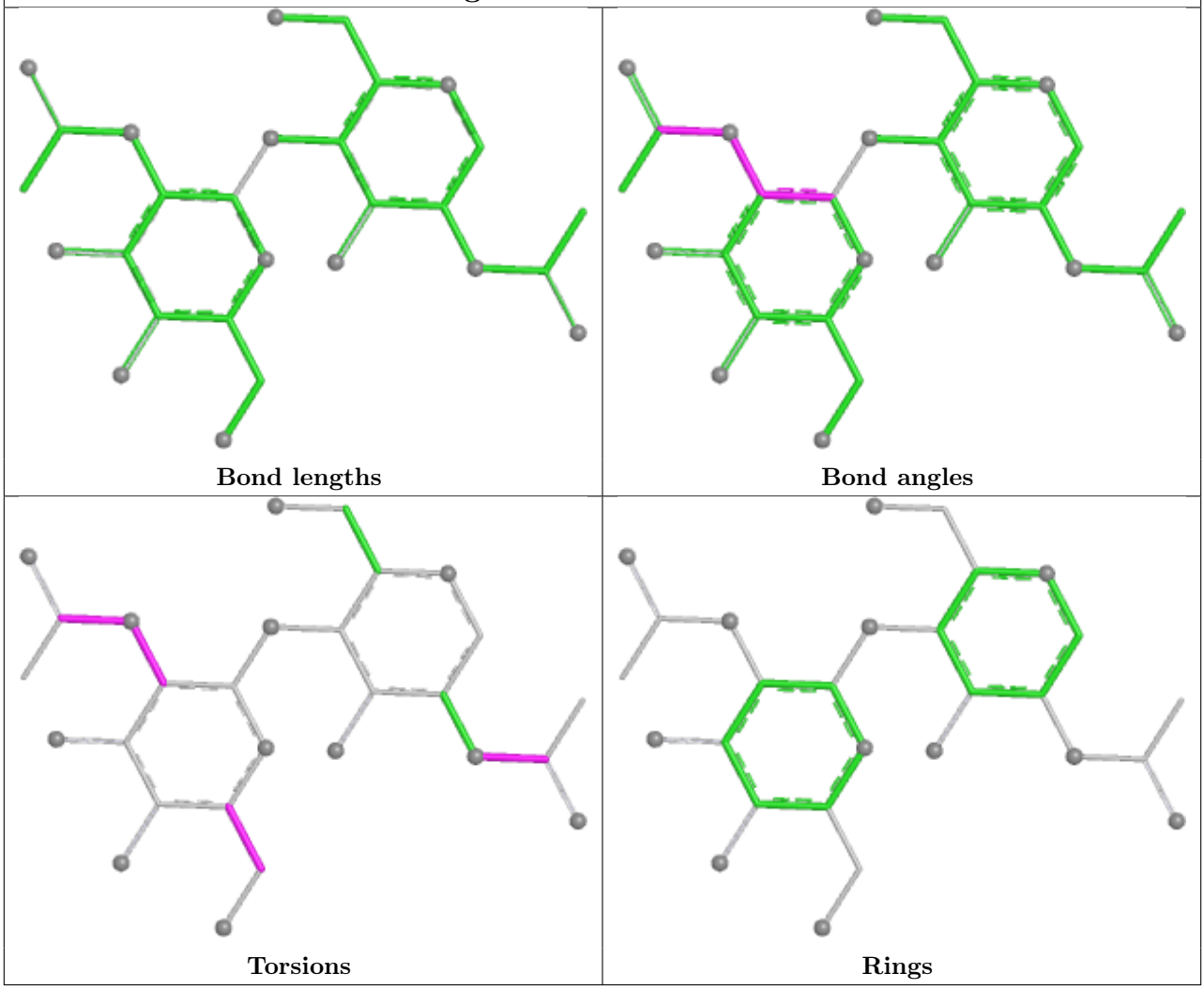


Torsions

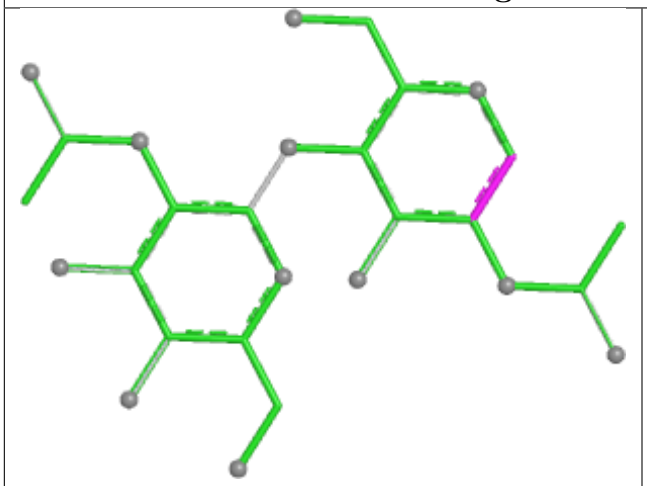


Rings

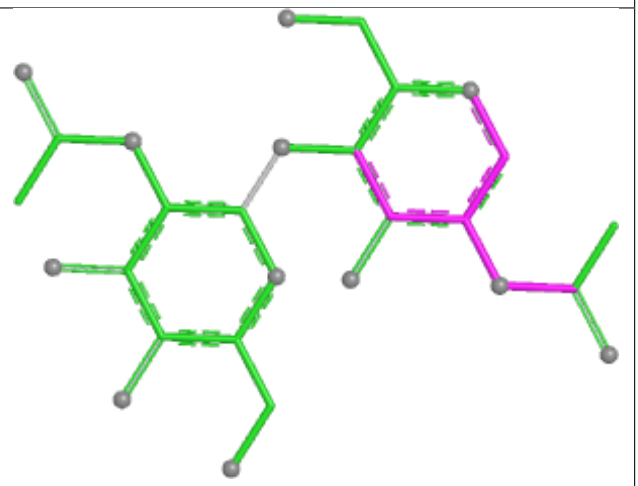
Oligosaccharide Chain G



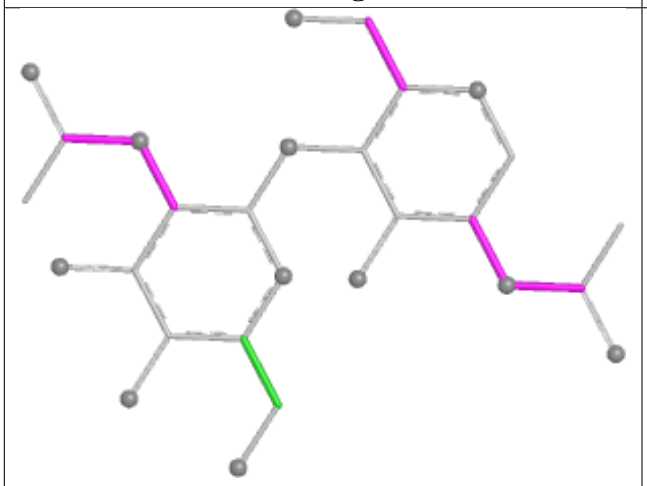
Oligosaccharide Chain H



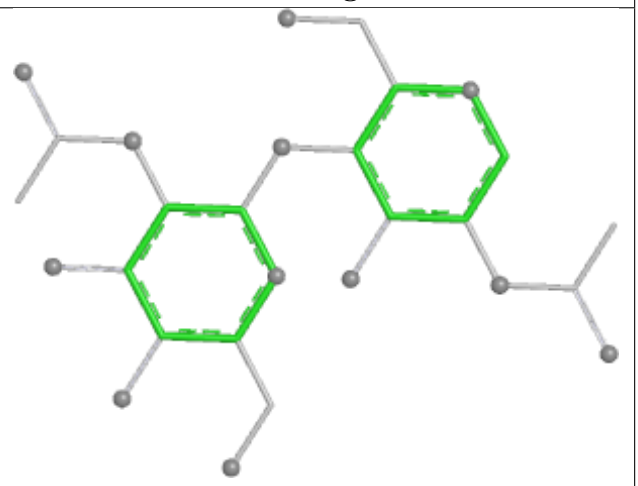
Bond lengths



Bond angles

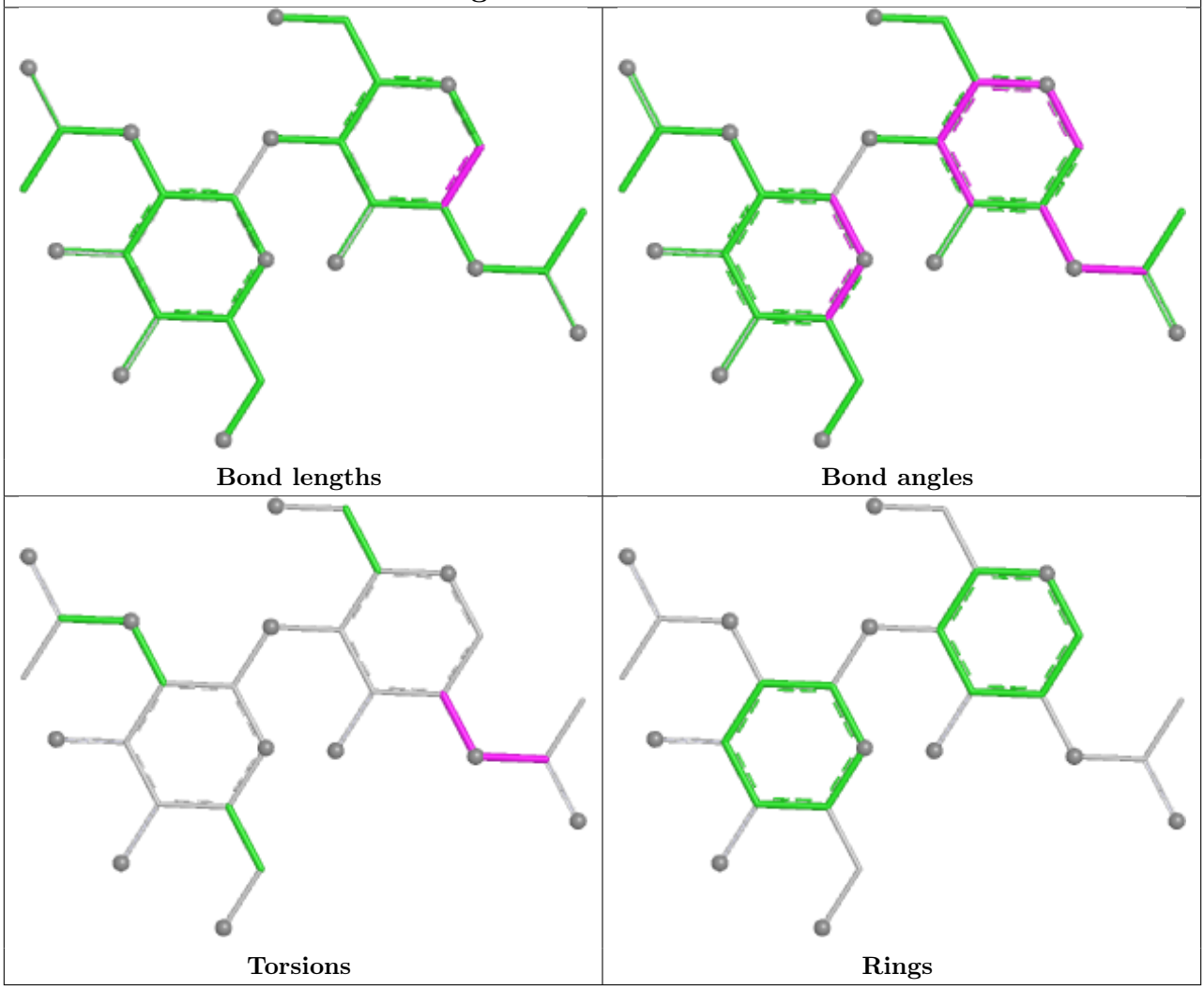


Torsions

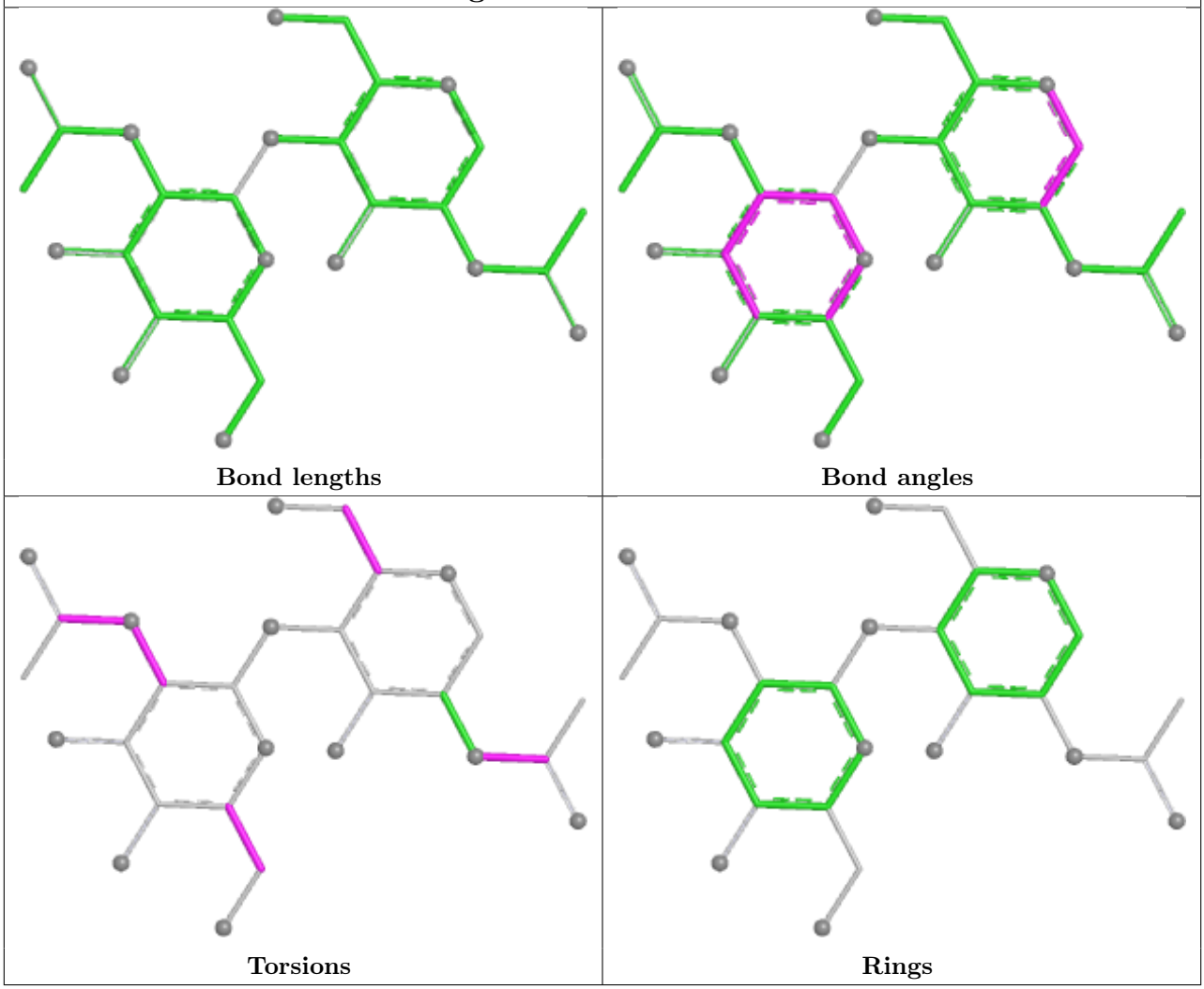


Rings

Oligosaccharide Chain I



Oligosaccharide Chain J



5.6 Ligand geometry (i)

26 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	A	805	1	14,14,15	0.48	0	17,19,21	1.09	1 (5%)
5	NAG	D	902	3	14,14,15	0.38	0	17,19,21	1.04	2 (11%)
5	NAG	D	904	3	14,14,15	0.39	0	17,19,21	1.35	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	C	807	1	14,14,15	0.51	0	17,19,21	1.14	1 (5%)
5	NAG	A	811	1	14,14,15	0.50	0	17,19,21	1.39	1 (5%)
5	NAG	B	904	2	14,14,15	0.35	0	17,19,21	0.82	0
5	NAG	D	905	3	14,14,15	0.39	0	17,19,21	0.69	1 (5%)
5	NAG	B	902	2	14,14,15	0.39	0	17,19,21	0.80	0
5	NAG	A	809	1	14,14,15	0.37	0	17,19,21	0.73	0
5	NAG	A	810	1	14,14,15	0.47	0	17,19,21	0.71	0
5	NAG	D	901	3	14,14,15	0.35	0	17,19,21	1.10	1 (5%)
5	NAG	A	803	1	14,14,15	0.39	0	17,19,21	1.38	1 (5%)
5	NAG	C	813	1	14,14,15	0.34	0	17,19,21	0.79	0
5	NAG	C	804	1	14,14,15	0.36	0	17,19,21	1.44	1 (5%)
5	NAG	C	812	1	14,14,15	0.61	1 (7%)	17,19,21	1.42	3 (17%)
5	NAG	B	901	2	14,14,15	0.51	0	17,19,21	1.08	1 (5%)
5	NAG	A	808	1	14,14,15	0.51	0	17,19,21	2.03	2 (11%)
5	NAG	A	807	1	14,14,15	0.38	0	17,19,21	1.07	2 (11%)
5	NAG	C	811	1	14,14,15	0.59	0	17,19,21	2.07	4 (23%)
5	NAG	C	803	1	14,14,15	0.62	0	17,19,21	1.94	4 (23%)
5	NAG	B	905	2	14,14,15	0.47	0	17,19,21	1.48	1 (5%)
5	NAG	A	806	1	14,14,15	0.66	1 (7%)	17,19,21	0.72	0
5	NAG	A	804	1	14,14,15	0.53	0	17,19,21	0.59	0
5	NAG	D	903	3	14,14,15	0.35	0	17,19,21	0.92	1 (5%)
5	NAG	C	808	1	14,14,15	0.32	0	17,19,21	0.84	1 (5%)
5	NAG	B	903	2	14,14,15	0.60	0	17,19,21	1.98	2 (11%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	805	1	-	2/6/23/26	0/1/1/1
5	NAG	D	902	3	-	3/6/23/26	0/1/1/1
5	NAG	D	904	3	-	2/6/23/26	0/1/1/1
5	NAG	C	807	1	-	3/6/23/26	0/1/1/1
5	NAG	A	811	1	-	2/6/23/26	0/1/1/1
5	NAG	B	904	2	-	2/6/23/26	0/1/1/1
5	NAG	D	905	3	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	B	902	2	-	2/6/23/26	0/1/1/1
5	NAG	A	809	1	-	1/6/23/26	0/1/1/1
5	NAG	A	810	1	-	0/6/23/26	0/1/1/1
5	NAG	D	901	3	-	0/6/23/26	0/1/1/1
5	NAG	A	803	1	-	2/6/23/26	0/1/1/1
5	NAG	C	813	1	-	3/6/23/26	0/1/1/1
5	NAG	C	804	1	-	6/6/23/26	0/1/1/1
5	NAG	C	812	1	-	3/6/23/26	0/1/1/1
5	NAG	B	901	2	-	4/6/23/26	0/1/1/1
5	NAG	A	808	1	-	2/6/23/26	0/1/1/1
5	NAG	A	807	1	-	3/6/23/26	0/1/1/1
5	NAG	C	811	1	-	3/6/23/26	0/1/1/1
5	NAG	C	803	1	-	4/6/23/26	0/1/1/1
5	NAG	B	905	2	-	3/6/23/26	0/1/1/1
5	NAG	A	806	1	-	4/6/23/26	0/1/1/1
5	NAG	A	804	1	-	4/6/23/26	0/1/1/1
5	NAG	D	903	3	-	0/6/23/26	0/1/1/1
5	NAG	C	808	1	-	2/6/23/26	0/1/1/1
5	NAG	B	903	2	-	3/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	806	NAG	C1-C2	2.20	1.55	1.52
5	C	812	NAG	C1-C2	2.06	1.55	1.52

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	808	NAG	C1-O5-C5	7.41	122.12	112.19
5	B	903	NAG	C1-O5-C5	6.96	121.51	112.19
5	C	811	NAG	C1-O5-C5	6.48	120.87	112.19
5	B	905	NAG	C1-O5-C5	5.78	119.94	112.19
5	C	803	NAG	C1-O5-C5	5.33	119.33	112.19
5	A	811	NAG	C1-O5-C5	5.16	119.11	112.19
5	C	804	NAG	C1-O5-C5	5.16	119.10	112.19
5	D	904	NAG	C1-O5-C5	4.93	118.80	112.19
5	A	803	NAG	C1-O5-C5	4.57	118.31	112.19
5	D	901	NAG	C1-O5-C5	3.86	117.36	112.19

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	803	NAG	C4-C3-C2	3.66	116.39	111.02
5	A	805	NAG	C1-O5-C5	3.60	117.01	112.19
5	C	811	NAG	C4-C3-C2	3.57	116.24	111.02
5	B	901	NAG	C1-O5-C5	3.56	116.96	112.19
5	C	803	NAG	O5-C1-C2	3.55	116.79	111.29
5	C	812	NAG	C2-N2-C7	3.52	127.61	122.90
5	C	812	NAG	C1-C2-N2	3.28	115.60	110.43
5	B	903	NAG	C4-C3-C2	3.28	115.82	111.02
5	D	903	NAG	C1-O5-C5	3.14	116.40	112.19
5	C	808	NAG	C1-O5-C5	2.77	115.89	112.19
5	A	807	NAG	C1-O5-C5	2.76	115.89	112.19
5	C	807	NAG	C1-O5-C5	2.61	115.69	112.19
5	C	812	NAG	O5-C1-C2	-2.57	107.31	111.29
5	D	902	NAG	C4-C3-C2	2.54	114.74	111.02
5	C	811	NAG	O5-C1-C2	2.35	114.93	111.29
5	C	811	NAG	C2-N2-C7	2.30	125.98	122.90
5	C	803	NAG	C2-N2-C7	2.27	125.95	122.90
5	A	808	NAG	O5-C1-C2	2.20	114.70	111.29
5	D	905	NAG	C1-O5-C5	2.06	114.94	112.19
5	A	807	NAG	O5-C1-C2	-2.04	108.13	111.29
5	D	902	NAG	O5-C1-C2	-2.01	108.19	111.29

There are no chirality outliers.

All (65) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	803	NAG	C8-C7-N2-C2
5	A	803	NAG	O7-C7-N2-C2
5	A	804	NAG	O7-C7-N2-C2
5	A	805	NAG	C8-C7-N2-C2
5	A	805	NAG	O7-C7-N2-C2
5	A	806	NAG	C8-C7-N2-C2
5	A	806	NAG	O7-C7-N2-C2
5	A	807	NAG	C8-C7-N2-C2
5	A	807	NAG	O7-C7-N2-C2
5	A	808	NAG	C8-C7-N2-C2
5	A	808	NAG	O7-C7-N2-C2
5	B	901	NAG	C3-C2-N2-C7
5	B	901	NAG	C8-C7-N2-C2
5	B	901	NAG	O7-C7-N2-C2
5	B	902	NAG	C8-C7-N2-C2
5	B	902	NAG	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
5	B	904	NAG	C8-C7-N2-C2
5	B	904	NAG	O7-C7-N2-C2
5	B	905	NAG	C8-C7-N2-C2
5	B	905	NAG	O7-C7-N2-C2
5	C	803	NAG	C3-C2-N2-C7
5	C	803	NAG	C8-C7-N2-C2
5	C	803	NAG	O7-C7-N2-C2
5	C	804	NAG	C8-C7-N2-C2
5	C	804	NAG	O7-C7-N2-C2
5	C	807	NAG	C8-C7-N2-C2
5	C	807	NAG	O7-C7-N2-C2
5	C	811	NAG	C3-C2-N2-C7
5	C	811	NAG	C8-C7-N2-C2
5	C	811	NAG	O7-C7-N2-C2
5	C	812	NAG	C1-C2-N2-C7
5	C	812	NAG	C8-C7-N2-C2
5	C	812	NAG	O7-C7-N2-C2
5	C	813	NAG	C3-C2-N2-C7
5	C	813	NAG	C8-C7-N2-C2
5	C	813	NAG	O7-C7-N2-C2
5	D	904	NAG	C8-C7-N2-C2
5	D	904	NAG	O7-C7-N2-C2
5	D	905	NAG	C8-C7-N2-C2
5	D	905	NAG	O7-C7-N2-C2
5	A	804	NAG	C8-C7-N2-C2
5	B	903	NAG	C8-C7-N2-C2
5	B	903	NAG	O7-C7-N2-C2
5	A	811	NAG	O5-C5-C6-O6
5	C	804	NAG	O5-C5-C6-O6
5	A	807	NAG	O5-C5-C6-O6
5	B	905	NAG	O5-C5-C6-O6
5	D	902	NAG	C8-C7-N2-C2
5	A	806	NAG	C4-C5-C6-O6
5	D	902	NAG	O5-C5-C6-O6
5	A	804	NAG	C3-C2-N2-C7
5	C	807	NAG	C3-C2-N2-C7
5	C	803	NAG	O5-C5-C6-O6
5	B	901	NAG	O5-C5-C6-O6
5	A	804	NAG	C1-C2-N2-C7
5	B	903	NAG	C1-C2-N2-C7
5	D	902	NAG	O7-C7-N2-C2
5	A	806	NAG	O5-C5-C6-O6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
5	C	804	NAG	C4-C5-C6-O6
5	C	808	NAG	C8-C7-N2-C2
5	A	811	NAG	C4-C5-C6-O6
5	A	809	NAG	C1-C2-N2-C7
5	C	804	NAG	C1-C2-N2-C7
5	C	808	NAG	O7-C7-N2-C2
5	C	804	NAG	C3-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	803	NAG	1	0
5	B	903	NAG	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

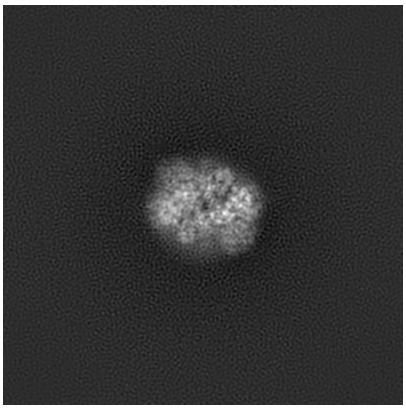
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-9163. These allow visual inspection of the internal detail of the map and identification of artifacts.

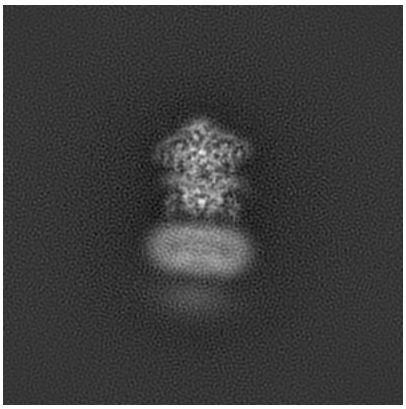
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

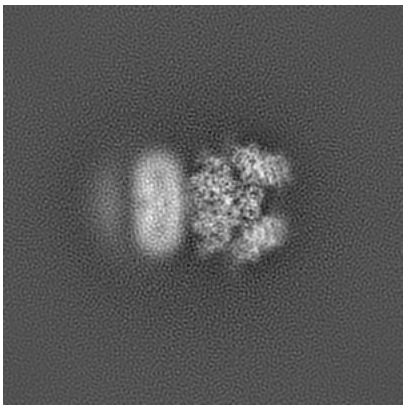
6.1.1 Primary map



X

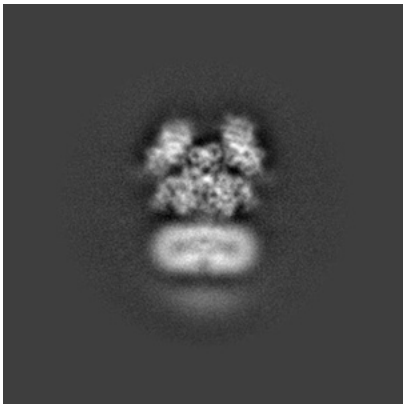


Y

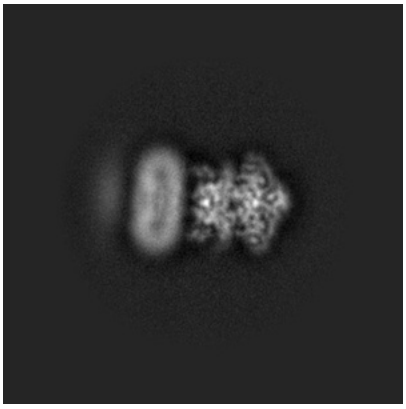


Z

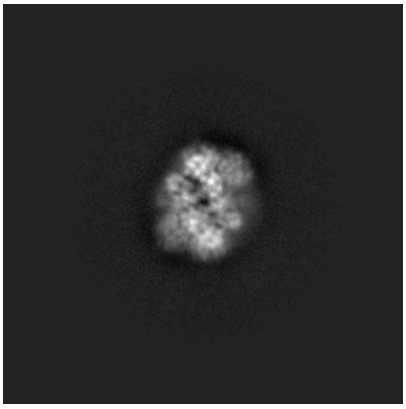
6.1.2 Raw map



X



Y

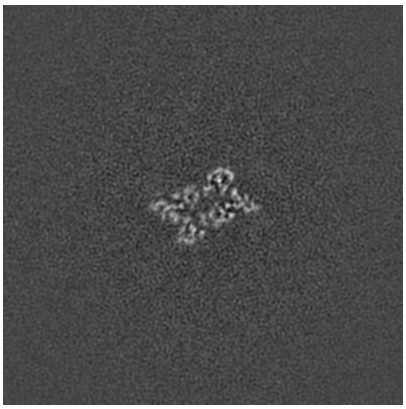


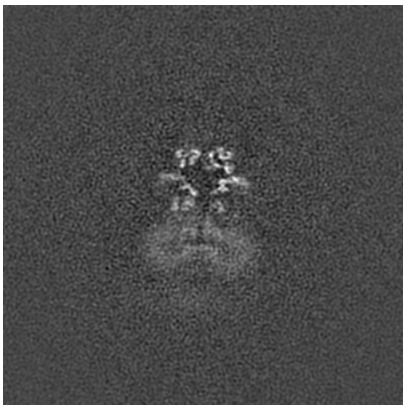
Z

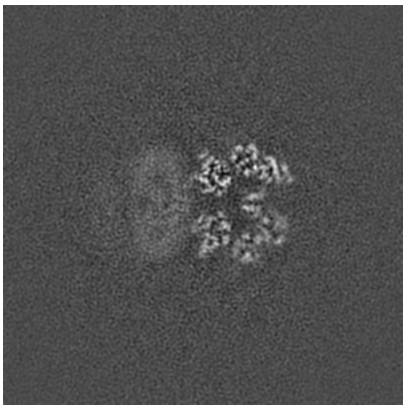
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

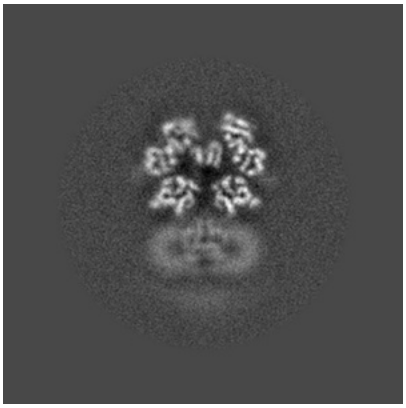
6.2.1 Primary map

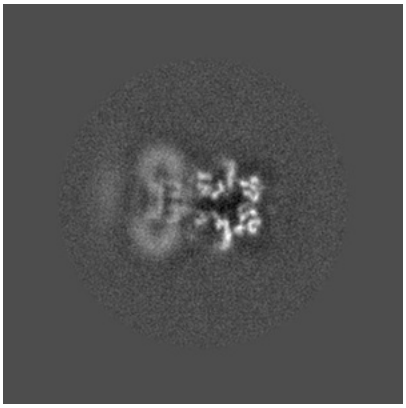

X Index: 128

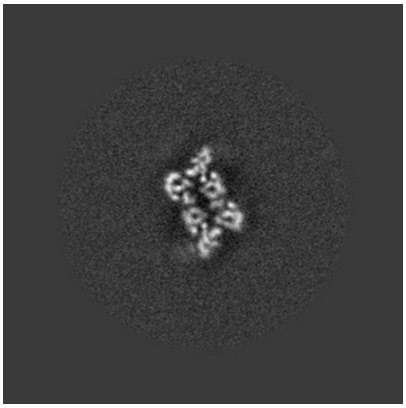

Y Index: 128


Z Index: 128

6.2.2 Raw map


X Index: 128

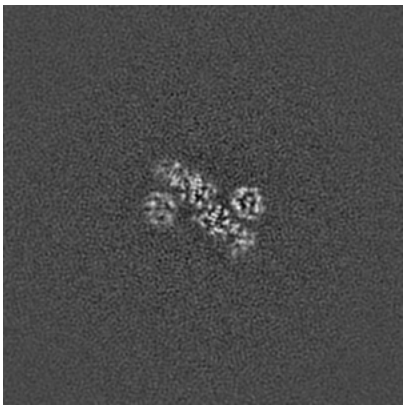

Y Index: 128

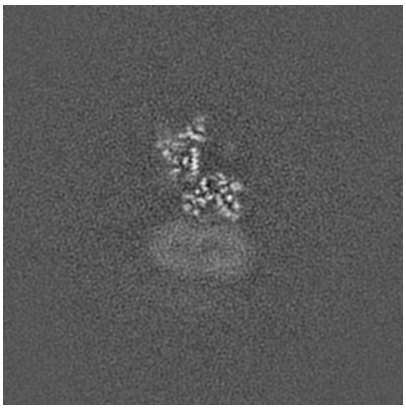

Z Index: 128

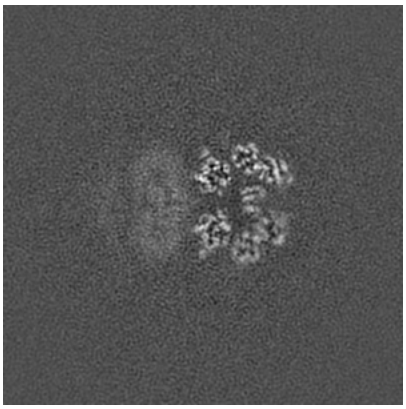
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

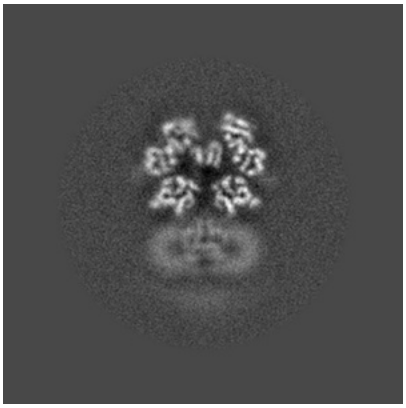
6.3.1 Primary map

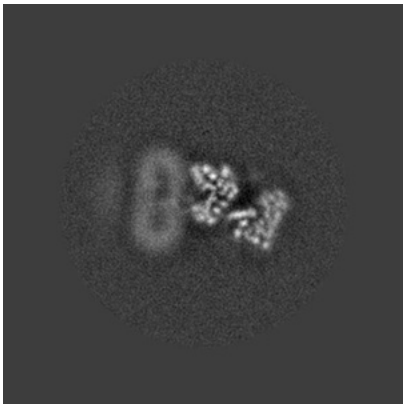

X Index: 156

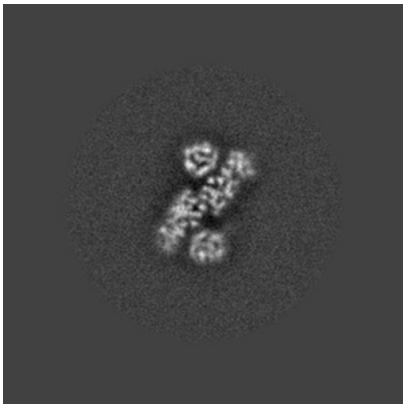

Y Index: 142


Z Index: 127

6.3.2 Raw map


X Index: 128

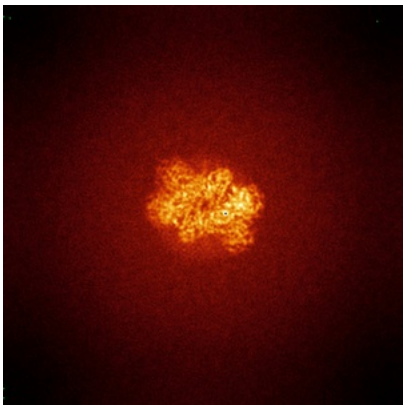

Y Index: 116

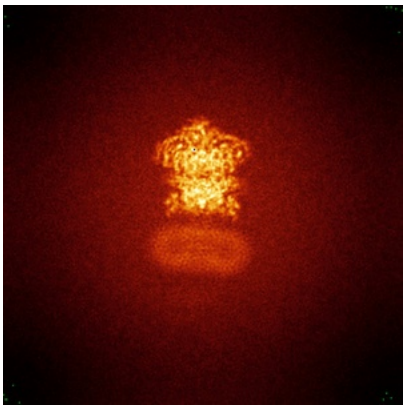

Z Index: 156

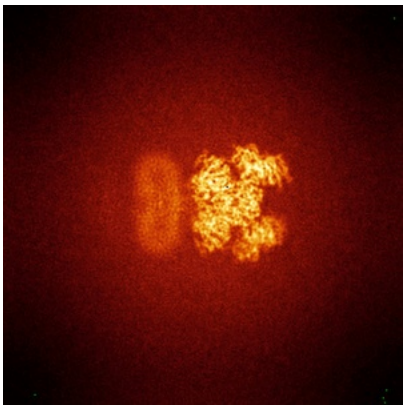
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

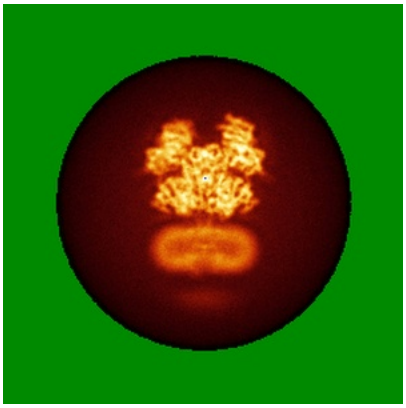
6.4.1 Primary map

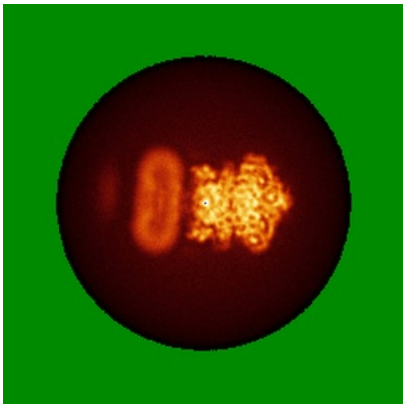

X

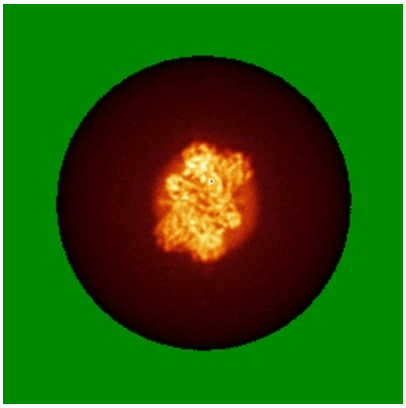

Y


Z

6.4.2 Raw map


X


Y


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

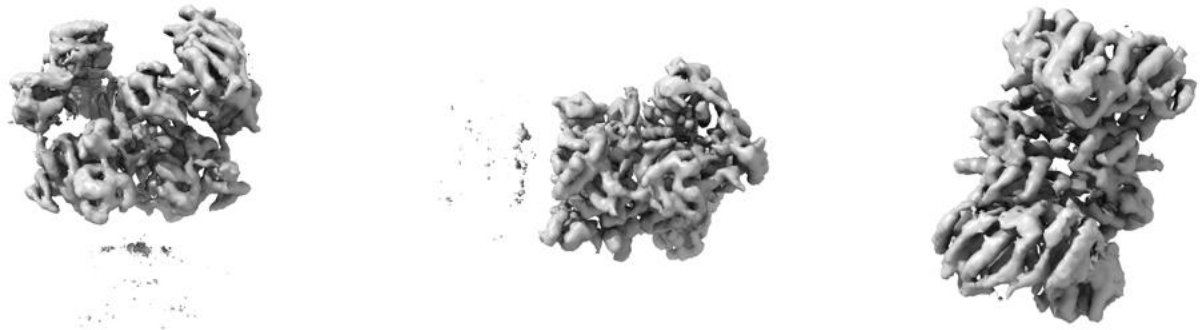
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 5.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

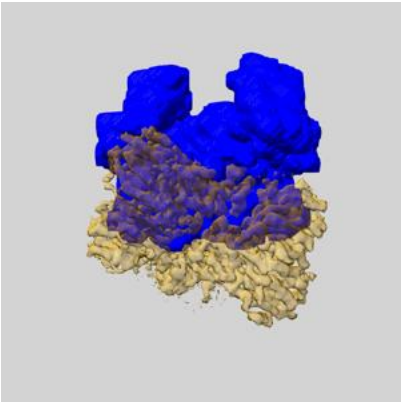
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

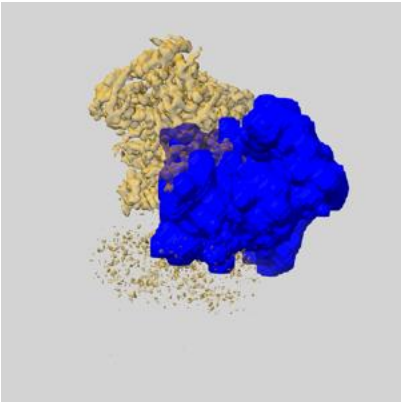
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

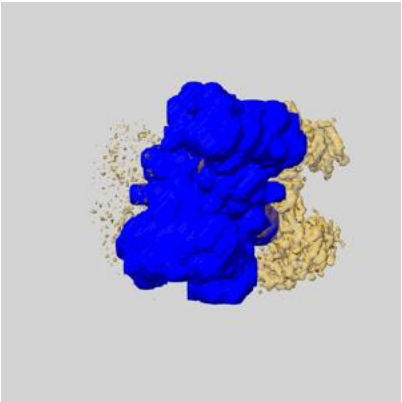
6.6.1 emd_9163_msk_1.map (i)



X



Y

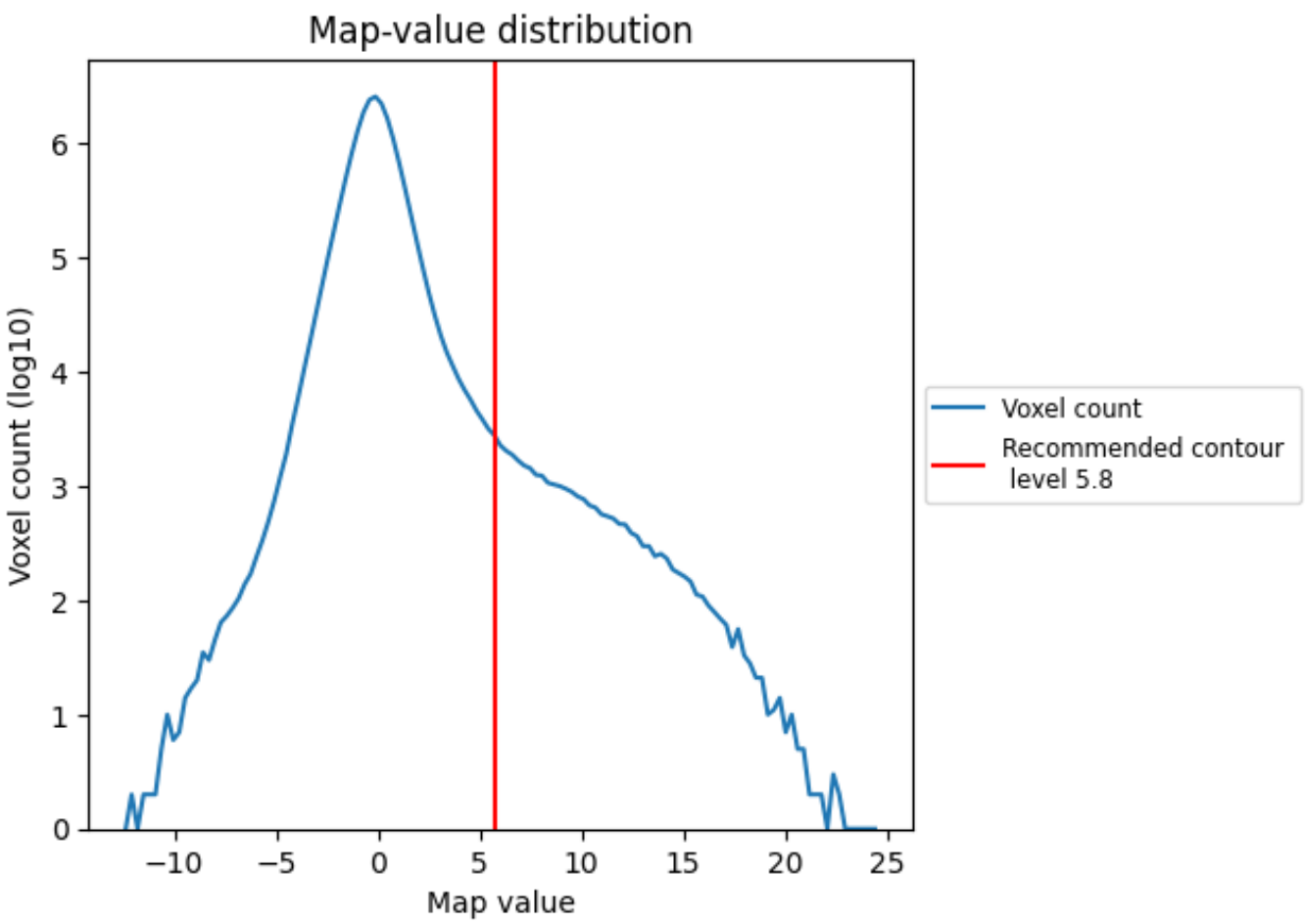


Z

7 Map analysis (i)

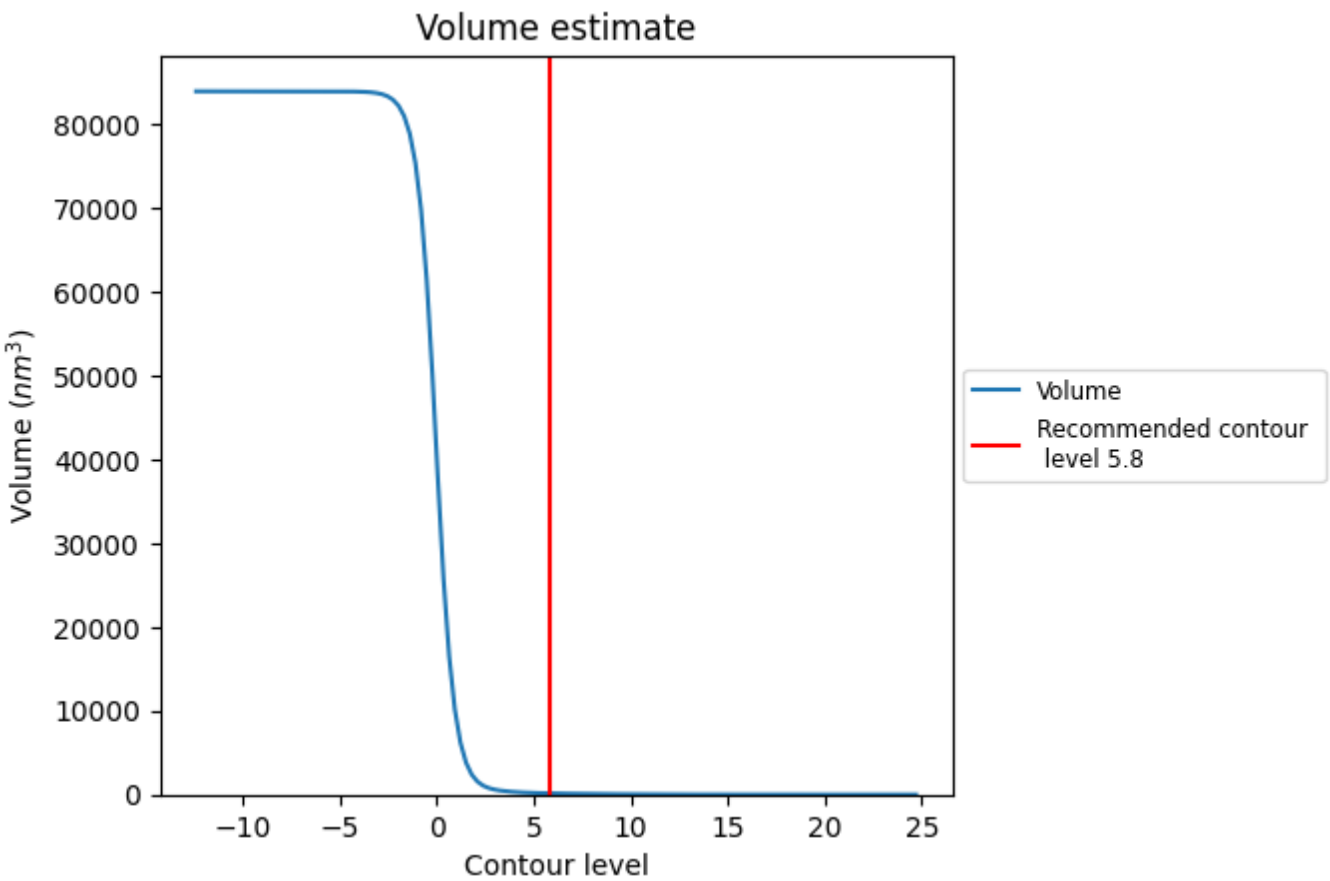
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

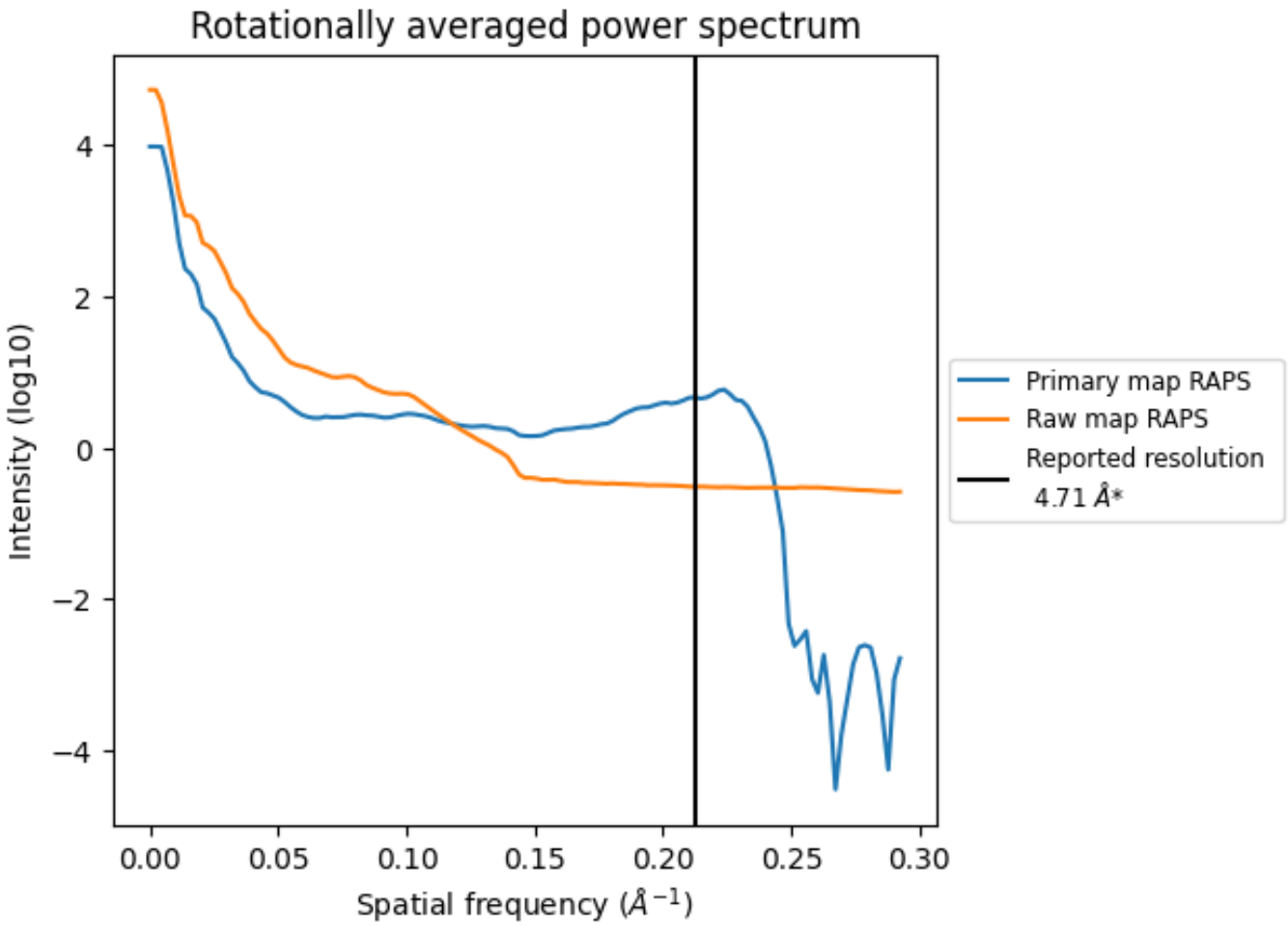
7.2 Volume estimate (i)



The volume at the recommended contour level is 146 nm^3; this corresponds to an approximate mass of 132 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

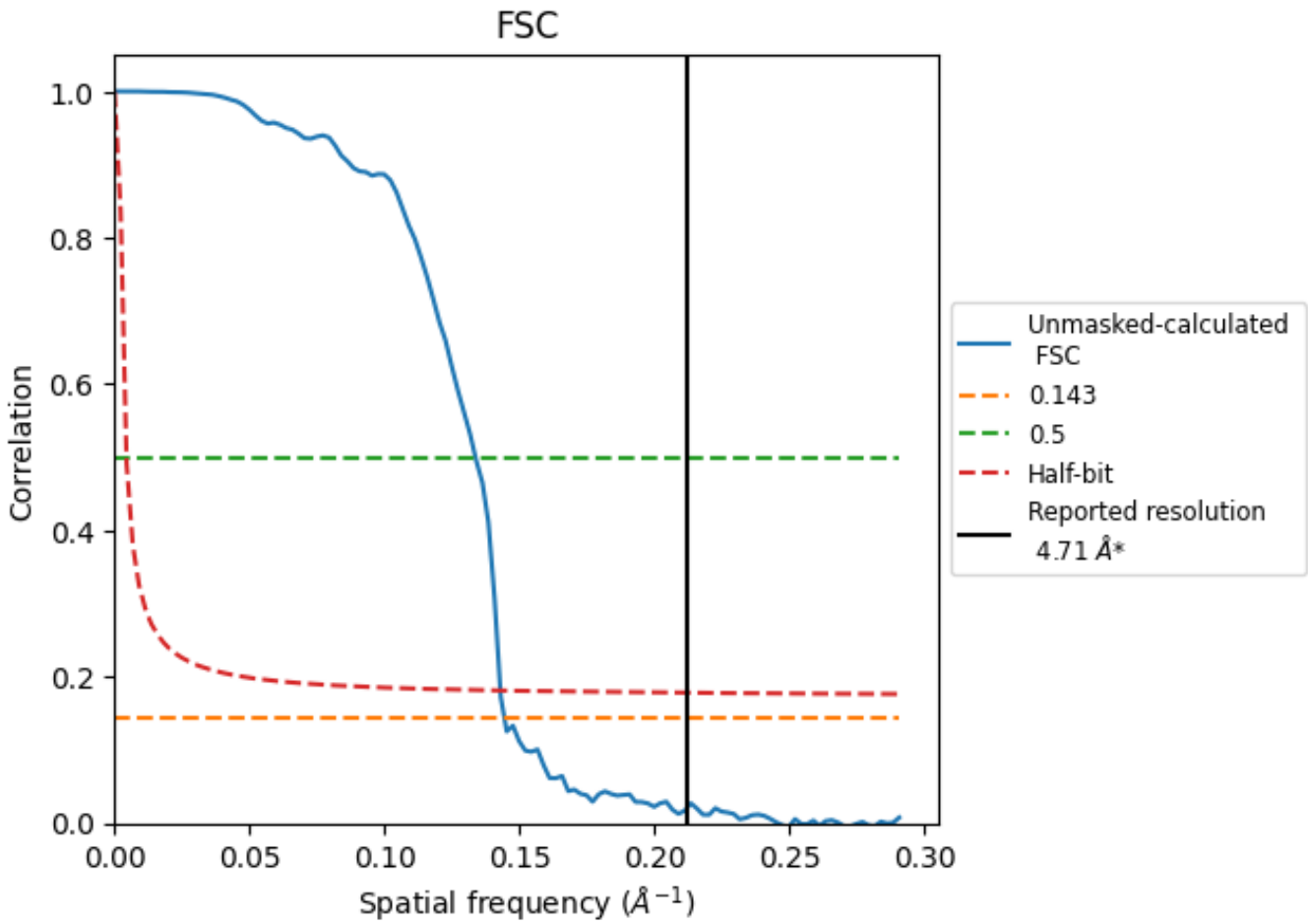


*Reported resolution corresponds to spatial frequency of 0.212 Å^{-1}

8 Fourier-Shell correlation (i)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC (i)



*Reported resolution corresponds to spatial frequency of 0.212 Å^{-1}

8.2 Resolution estimates (i)

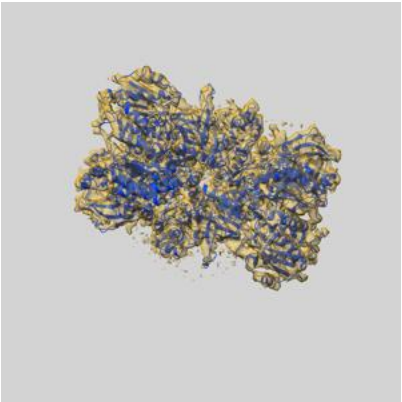
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.71	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.92	7.48	7.00

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.92 differs from the reported value 4.71 by more than 10 %

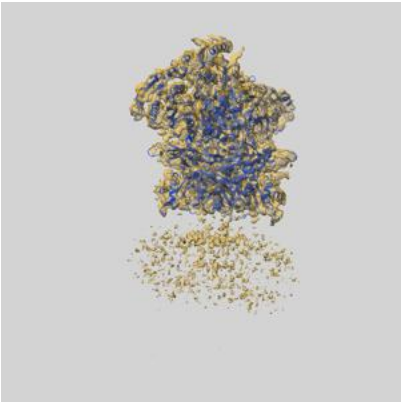
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-9163 and PDB model 6MMV. Per-residue inclusion information can be found in section 3 on page 8.

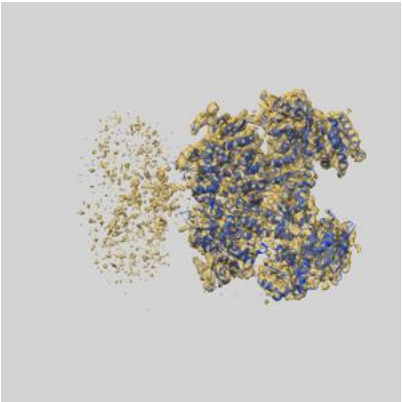
9.1 Map-model overlay (i)



X



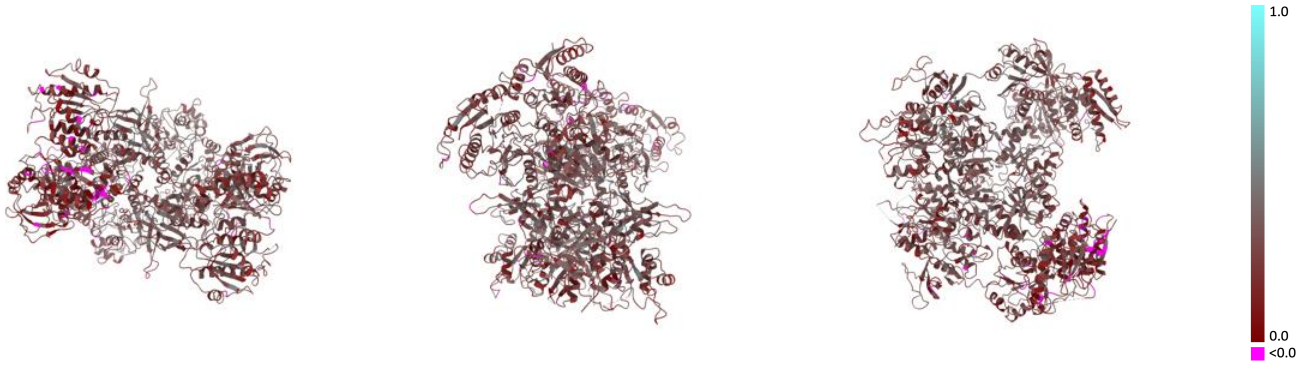
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 5.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

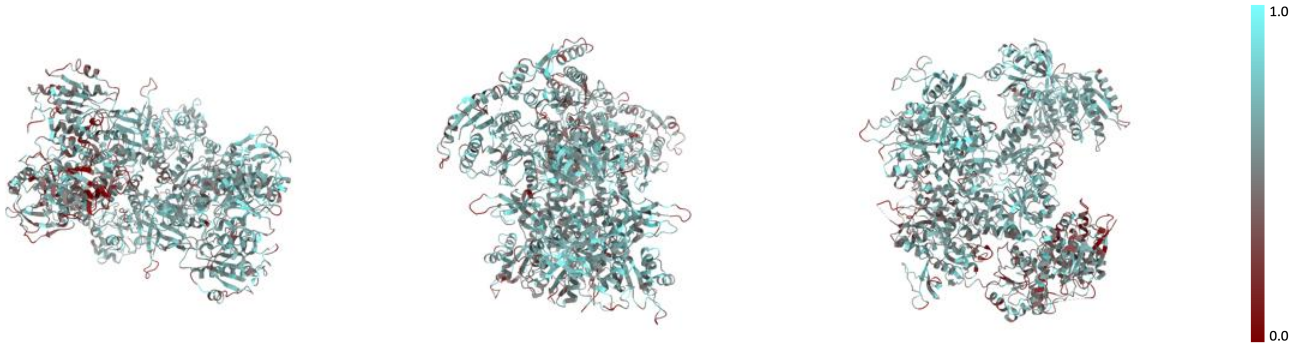
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

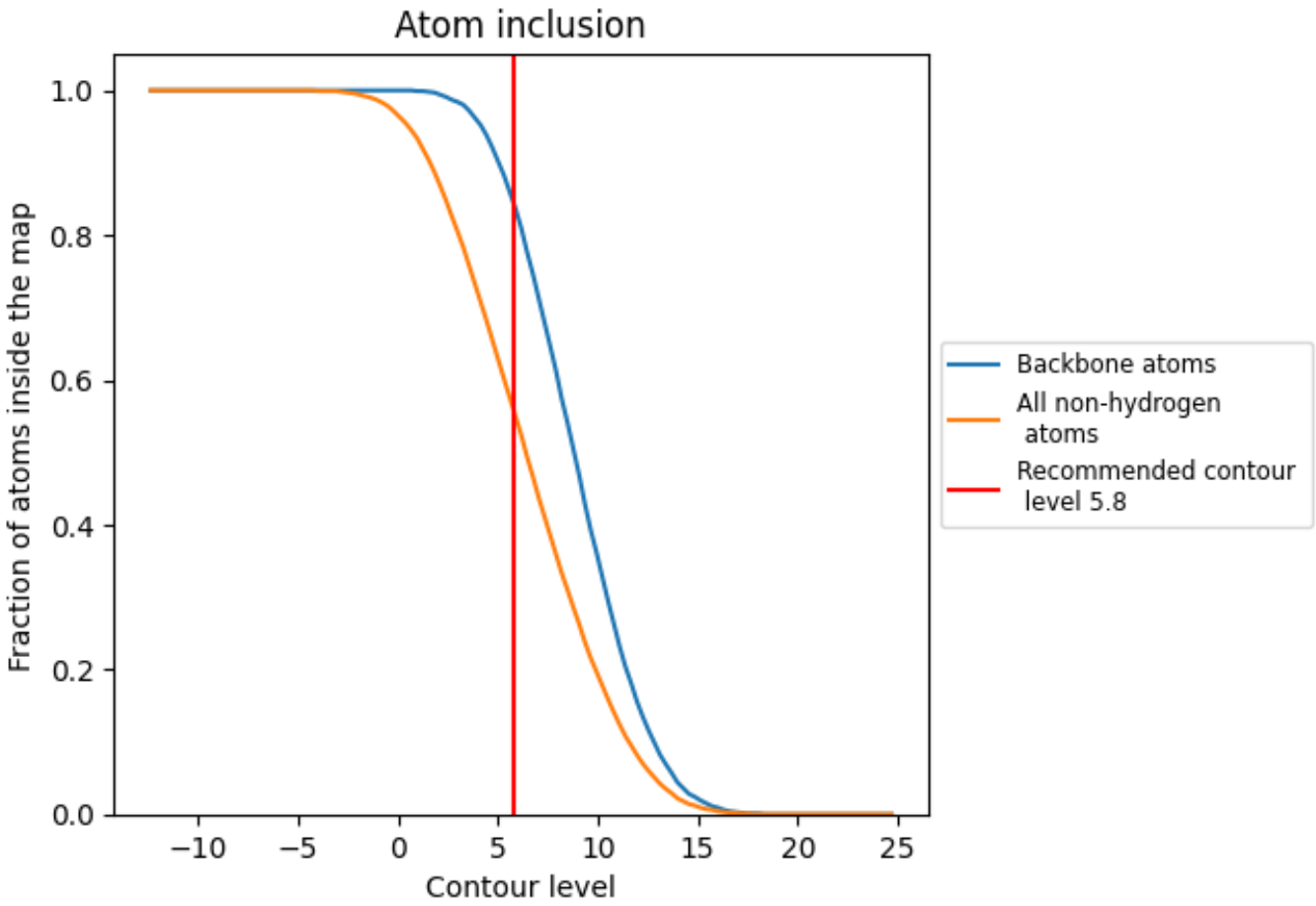
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (5.8).

9.4 Atom inclusion (i)



At the recommended contour level, 84% of all backbone atoms, 56% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (5.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5560	0.2770
A	0.4670	0.2310
B	0.5730	0.2910
C	0.6090	0.2930
D	0.5820	0.2920
E	0.2140	0.2910
F	0.3570	0.3450
G	0.4290	0.3860
H	0.5360	0.3390
I	0.5000	0.3620
J	0.3930	0.3150