



# Full wwPDB EM Validation Report ⓘ

Nov 4, 2024 – 08:41 PM JST

PDB ID : 8JXA  
EMDB ID : EMD-36694  
Title : cryo-EM structure of rat megalin bodyB  
Authors : Goto, S.; Tsutsumi, A.; Lee, Y.; Hosojima, M.; Kabasawa, H.; Komochi, K.; Yun-san, L.; Nagatoshi, S.; Tsumoto, K.; Nishizawa, T.; Kikkawa, M.; Saito, A.  
Deposited on : 2023-06-30  
Resolution : 3.80 Å (reported)  
Based on initial model : .

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

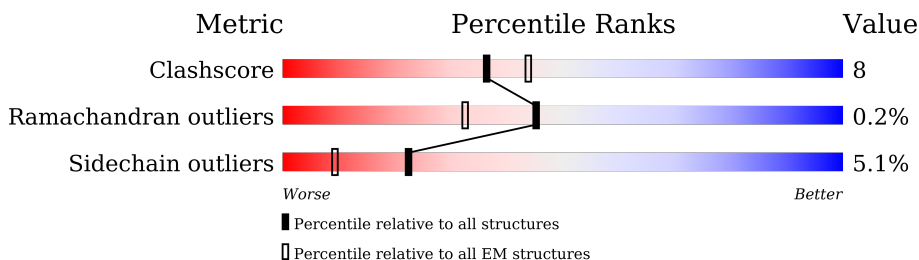
EMDB validation analysis : 0.0.1.dev113  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.80 Å.

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




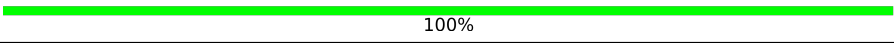


Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	4660	
1	B	4660	
2	M	5	
3	C	3	
3	D	3	
4	E	5	
4	H	5	
4	I	5	

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Mol	Chain	Length	Quality of chain
5	F	2	 50% 100%
5	G	2	 100%
5	J	2	 100%
6	K	3	 100%

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 11889 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 LDL receptor related protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1077	Total 8455	C 5100	N 1537	O 1687	S 131	0	0
1	B	361	Total 2904	C 1844	N 493	O 549	S 18	0	0

- Molecule 2 is a protein called unclear peptide.

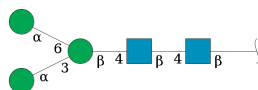
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	M	5	Total 28	C 16	N 6	O 6	0	0

- Molecule 3 is an oligosaccharide called 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				AltConf	Trace
			Total	C	N	O		
3	C	3	Total 39	C 22	N 2	O 15	0	0
3	D	3	Total 39	C 22	N 2	O 15	0	0

- Molecule 4 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				AltConf	Trace
4	E	5	Total	C	N	O	0	0
			61	34	2	25		
4	H	5	Total	C	N	O	0	0
			61	34	2	25		
4	I	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 5 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
5	F	2	Total	C	N	O	0	0
			28	16	2	10		
5	G	2	Total	C	N	O	0	0
			28	16	2	10		
5	J	2	Total	C	N	O	0	0
			28	16	2	10		

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



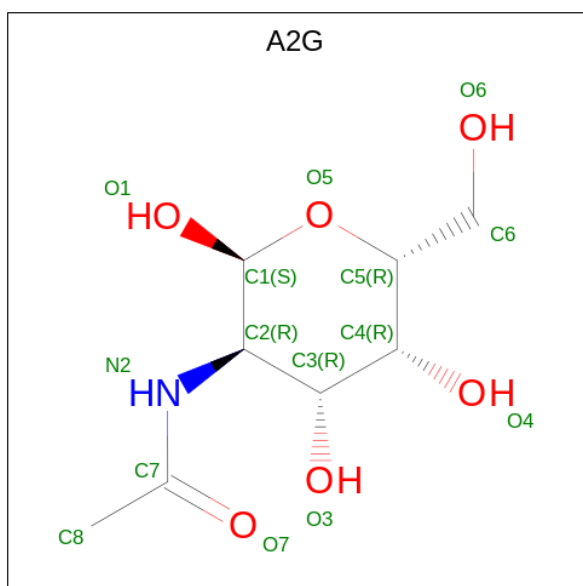
Mol	Chain	Residues	Atoms				AltConf	Trace
6	K	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



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

- Molecule 8 is 2-acetamido-2-deoxy- $\alpha$ -D-galactopyranose (three-letter code: A2G) (formula:  $C_8H_{15}NO_6$ ).



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

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

- Molecule 9 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
9	A	20	Total	Ca	0
			20	20	













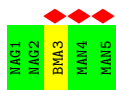




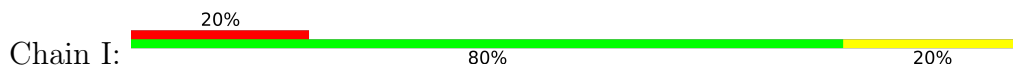








- Molecule 4: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



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



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	101096	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.252	Depositor
Minimum map value	-0.147	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.0434	Depositor
Map size ( $\text{\AA}$ )	366.86002, 366.86002, 366.86002	wwPDB
Map dimensions	260, 260, 260	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.411, 1.411, 1.411	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: BMA, MAN, A2G, NAG, CA

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	0/8659	0.54	0/11737
1	B	0.24	0/2981	0.50	0/4047
2	M	0.14	0/7	0.28	0/8
All	All	0.27	0/11647	0.53	0/15792

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8455	0	7527	128	0
1	B	2904	0	2797	42	0
2	M	28	0	12	0	0
3	C	39	0	34	0	0
3	D	39	0	34	1	0
4	E	61	0	52	0	0
4	H	61	0	52	0	0
4	I	61	0	52	0	0
5	F	28	0	25	0	0
5	G	28	0	25	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	J	28	0	25	0	0
6	K	39	0	34	0	0
7	A	28	0	26	0	0
8	A	70	0	60	0	0
9	A	20	0	0	0	0
All	All	11889	0	10755	170	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 8.

All (170) 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:4179:LYS:HA	1:B:4357:GLN:HB2	1.66	0.76
1:B:4086:ILE:HG22	1:B:4107:VAL:HG12	1.74	0.70
1:A:3238:ARG:NH1	1:A:3464:GLN:O	2.26	0.69
1:A:3092:MET:SD	1:A:3092:MET:N	2.67	0.66
1:B:4129:SER:O	1:B:4130:ASN:ND2	2.28	0.66
1:A:2961:ARG:HG2	1:A:2963:PRO:HD2	1.78	0.66
1:A:3525:GLU:OE2	1:A:3525:GLU:N	2.26	0.65
1:A:3329:VAL:HG11	1:A:3373:THR:HA	1.77	0.65
1:A:3282:VAL:O	1:A:3469:ASN:ND2	2.30	0.64
1:B:4141:LYS:O	1:B:4178:ARG:NH2	2.20	0.64
1:A:3085:ASP:OD2	1:A:3086:ASN:ND2	2.30	0.64
1:A:3305:HIS:HB3	1:A:3481:LEU:CD2	2.31	0.61
1:A:2929:GLY:HA2	1:A:2966:ARG:HB3	1.83	0.61
1:A:3880:CYS:HA	1:A:3883:ILE:HB	1.82	0.60
1:B:4168:ILE:HG23	1:B:4181:LEU:HB2	1.84	0.60
1:B:4180:TRP:N	1:B:4357:GLN:OE1	2.33	0.60
1:A:3597:GLU:HG3	1:A:3598:SER:H	1.66	0.60
1:B:4375:LEU:HD23	1:B:4375:LEU:H	1.66	0.59
1:A:1233:LEU:HD23	1:A:1233:LEU:H	1.67	0.59
1:B:4061:PRO:HG3	1:B:4089:ILE:HG12	1.84	0.59
1:A:3455:ASP:OD1	1:A:3456:ILE:N	2.36	0.58
1:A:3094:ARG:HD3	1:A:3097:ASN:HD21	1.68	0.57
1:A:3385:ASP:OD1	1:A:3388:LEU:N	2.36	0.57
1:A:3607:ARG:NH2	1:A:3620:ASP:O	2.37	0.57
1:A:3314:VAL:O	1:A:3315:ASP:HB3	2.05	0.57
1:A:3759:ARG:O	1:A:3767:ARG:NH2	2.32	0.56
1:A:3782:GLN:HE22	1:A:3825:CYS:HA	1.70	0.56
1:A:3794:ASP:OD2	1:B:4167:ARG:NH2	2.39	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2981:SER:OG	1:A:2982:ASP:N	2.39	0.56
1:A:3886:GLU:OE1	1:A:3889:GLN:NE2	2.34	0.55
1:B:4138:LEU:HD22	1:B:4174:ASP:HA	1.88	0.55
1:A:3766:PHE:HD2	1:A:3774:ILE:HD11	1.70	0.55
1:B:4106:THR:HG21	1:B:4146:PRO:HB2	1.89	0.55
1:B:4213:GLU:HG2	1:B:4224:VAL:HG22	1.88	0.55
1:A:3122:SER:O	1:A:3150:ARG:NH1	2.40	0.55
1:A:3657:ASP:OD1	1:A:3693:ARG:NH2	2.33	0.55
1:A:3664:ASP:OD2	1:A:3664:ASP:N	2.38	0.55
1:B:4163:ALA:HA	1:B:4189:PRO:HG2	1.87	0.55
1:B:4176:ARG:HG3	1:B:4176:ARG:HH11	1.72	0.55
1:A:2956:THR:O	1:A:2965:ARG:NH1	2.40	0.54
1:A:3332:PRO:HA	1:A:3353:MET:HE3	1.89	0.54
1:A:3055:GLU:N	1:A:3065:GLU:OE1	2.40	0.54
1:A:2953:THR:O	1:A:2970:GLN:NE2	2.41	0.53
1:A:2985:ASP:OD1	1:A:2986:GLU:N	2.42	0.53
1:A:3288:TRP:HZ3	1:A:3299:SER:HB3	1.73	0.53
1:A:3354:ASP:OD1	1:A:3356:THR:HG22	2.09	0.53
1:A:3635:ARG:NH1	1:A:3647:GLY:O	2.42	0.52
1:A:3471:CYS:HB3	1:A:3475:ASN:HA	1.91	0.52
1:A:3005:GLY:HA3	1:A:3020:CYS:HB3	1.92	0.51
1:A:3304:ARG:O	1:A:3305:HIS:HB2	2.10	0.51
1:B:4093:TRP:CE2	1:B:4325:GLN:HB3	2.46	0.51
1:A:3082:PHE:CZ	1:A:3084:CYS:HB3	2.46	0.51
1:A:3329:VAL:HG13	1:A:3372:ILE:HG23	1.92	0.51
1:B:4162:ASP:HB3	1:B:4165:SER:HB2	1.92	0.51
1:A:3064:ASP:N	1:A:3064:ASP:OD1	2.44	0.51
1:A:2986:GLU:HG3	1:A:3006:ARG:HD2	1.93	0.50
1:A:3426:ASP:OD2	1:A:3429:THR:OG1	2.27	0.50
1:A:3592:GLU:O	1:A:3606:LYS:NZ	2.45	0.50
1:A:3283:SER:HA	1:A:3469:ASN:HD21	1.77	0.49
1:A:3520:LEU:HD13	1:A:3521:CYS:O	2.13	0.49
1:A:3300:ASP:OD1	1:A:3303:GLY:N	2.46	0.49
1:A:3287:TYR:OH	1:A:3353:MET:HB3	2.13	0.49
1:B:4087:GLN:HG2	1:B:4147:ASP:HA	1.94	0.49
1:A:3500:GLN:HB3	1:A:3511:MET:SD	2.53	0.49
1:A:2964:ASN:HD22	1:A:2981:SER:HB2	1.77	0.48
1:A:3063:SER:HA	1:A:3066:GLN:HG3	1.95	0.48
1:A:3520:LEU:HD23	1:A:3527:CYS:SG	2.53	0.48
1:B:4084:GLU:OE2	1:B:4110:GLN:NE2	2.47	0.48
1:A:3874:ASP:OD1	1:A:3874:ASP:N	2.46	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3651:PRO:HD2	1:A:3654:TRP:CE3	2.49	0.47
1:A:3803:GLU:OE2	1:A:3803:GLU:N	2.37	0.47
1:B:4163:ALA:HB1	1:B:4188:GLN:NE2	2.29	0.47
1:A:3210:TYR:OH	1:A:3764:SER:N	2.46	0.47
1:A:3791:ASP:OD1	1:A:3792:GLU:N	2.47	0.47
1:B:4193:ALA:HB3	1:B:4202:PHE:HB2	1.97	0.47
1:B:4180:TRP:CE2	1:B:4357:GLN:HG2	2.50	0.47
1:A:3916:ASP:OD1	1:A:3916:ASP:N	2.44	0.47
1:A:3330:LEU:HD22	1:A:3337:VAL:HG22	1.98	0.46
1:A:3371:ALA:HB1	1:A:3415:LEU:HD23	1.98	0.46
1:A:3096:CYS:SG	1:A:3133:THR:HG22	2.56	0.46
1:A:3822:ARG:N	1:A:3831:GLU:OE2	2.49	0.46
1:A:3205:PHE:HA	1:A:3456:ILE:HA	1.97	0.46
1:B:4091:TYR:HA	1:B:4103:VAL:HA	1.98	0.46
1:A:3858:GLN:HB2	1:A:3861:TRP:CD1	2.51	0.45
1:B:4174:ASP:OD1	1:B:4174:ASP:N	2.47	0.45
1:A:3535:ASP:HA	1:A:3553:ARG:HD2	1.98	0.45
1:B:4086:ILE:HA	1:B:4107:VAL:HA	1.97	0.45
1:B:4209:GLN:OE1	1:B:4211:LYS:NZ	2.38	0.45
1:A:3425:THR:HG22	1:A:3432:VAL:HG22	1.98	0.45
1:A:3382:TYR:OH	1:A:3437:LYS:O	2.28	0.45
1:A:2902:GLY:HA3	1:A:2908:CYS:HA	1.98	0.45
1:A:3225:LEU:HD22	1:A:3256:MET:HE1	1.98	0.45
1:A:3409:LEU:HD11	1:A:3424:TRP:CE2	2.52	0.45
1:A:3648:ARG:NH1	1:A:3661:ASP:O	2.50	0.45
1:A:3307:LYS:HG2	1:A:3308:MET:N	2.32	0.45
1:A:3038:GLN:HB3	1:A:3046:CYS:HB3	1.98	0.45
1:B:4384:ARG:HB3	1:B:4411:TYR:CD1	2.52	0.45
1:A:3213:ASN:HB2	1:A:3224:ILE:HG13	2.00	0.44
1:A:3305:HIS:O	1:A:3481:LEU:HD21	2.17	0.44
1:A:3246:ILE:HG13	1:A:3277:LEU:HD23	1.98	0.44
1:B:4145:GLN:HG3	1:B:4147:ASP:OD1	2.18	0.44
1:A:2956:THR:HA	1:A:2967:CYS:SG	2.58	0.44
1:A:3320:PHE:CD1	1:A:3345:HIS:HB3	2.53	0.44
1:A:3374:ILE:HG12	1:A:3381:LEU:HD12	1.99	0.44
1:A:3892:ARG:NH2	1:A:3896:SER:O	2.51	0.44
1:B:4118:LYS:HG2	1:B:4137:ASP:HA	2.00	0.44
1:A:3300:ASP:OD1	1:A:3304:ARG:N	2.51	0.44
1:A:3354:ASP:HA	1:A:3483:LEU:HD13	2.00	0.44
1:A:2956:THR:OG1	1:A:2965:ARG:NH1	2.51	0.43
1:A:3691:ASN:ND2	1:A:3707:CYS:O	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2961:ARG:NH1	1:A:3671:ASP:OD2	2.50	0.43
1:A:3013:ARG:HG3	1:A:3014:CYS:SG	2.59	0.43
1:A:3382:TYR:HB3	1:A:3415:LEU:HD11	2.01	0.43
1:A:3088:HIS:NE2	1:A:3103:SER:HB2	2.33	0.43
1:B:4123:PRO:HB3	1:B:4125:PHE:CZ	2.54	0.43
1:B:4165:SER:O	1:B:4167:ARG:HG3	2.19	0.43
1:A:3858:GLN:HB2	1:A:3861:TRP:HD1	1.83	0.43
1:A:2931:ASN:HD21	1:A:2966:ARG:NH2	2.18	0.42
1:A:3225:LEU:HD23	1:A:3228:LEU:HD21	2.00	0.42
1:B:4195:ASN:HD22	1:B:4238:ILE:HG21	1.83	0.42
1:B:4343:LEU:HB2	1:B:4354:ALA:HB3	2.01	0.42
1:A:3123:ARG:HB2	1:A:3150:ARG:HH11	1.84	0.42
1:A:3605:ASN:ND2	1:A:3621:CYS:O	2.52	0.42
1:A:3780:CYS:HA	1:A:3792:GLU:OE2	2.19	0.42
1:A:3728:ARG:HD2	1:A:3732:HIS:HA	2.00	0.42
1:A:2909:ARG:HG2	1:A:2911:SER:H	1.85	0.42
1:A:3498:ASP:OD2	1:A:3527:CYS:HB2	2.20	0.42
1:A:3016:ARG:N	1:A:3026:GLU:OE2	2.53	0.42
1:A:2953:THR:HB	1:A:2970:GLN:O	2.19	0.42
1:A:3906:ASN:OD1	1:A:3906:ASN:N	2.53	0.42
1:A:3018:ASN:HB2	1:A:3023:TYR:CE2	2.54	0.42
1:A:3269:HIS:HB2	1:A:3532:TRP:CZ2	2.55	0.42
1:A:3290:ASP:N	1:A:3290:ASP:OD1	2.53	0.42
1:B:4161:SER:HB3	1:B:4168:ILE:HD13	2.02	0.42
1:A:3094:ARG:HD3	1:A:3097:ASN:ND2	2.34	0.41
1:A:3314:VAL:HG21	1:A:3339:TRP:CZ2	2.54	0.41
1:A:3852:LYS:N	1:A:3871:ASP:OD2	2.53	0.41
1:B:4292:GLU:HG3	1:B:4293:LYS:HG3	2.01	0.41
1:A:3123:ARG:HB2	1:A:3150:ARG:NH1	2.35	0.41
1:A:3212:ARG:NH2	1:A:3763:GLU:OE2	2.47	0.41
1:A:3271:LEU:HD11	1:A:3274:ALA:HB2	2.02	0.41
1:A:3317:ASN:O	1:A:3318:ASN:C	2.58	0.41
1:B:4299:GLN:NE2	1:B:4305:GLU:O	2.37	0.41
1:A:1227:PRO:HG2	1:A:1230:MET:HB2	2.03	0.41
1:A:3009:ARG:HG3	1:A:3011:SER:H	1.86	0.41
1:A:3891:PHE:HB3	1:A:3899:VAL:O	2.21	0.41
1:B:4215:ALA:HB2	1:B:4222:ARG:HA	2.03	0.41
1:A:3170:GLU:HB2	1:A:3177:ILE:HG13	2.01	0.41
3:D:1:NAG:H61	3:D:2:NAG:C7	2.50	0.41
1:A:2922:SER:OG	1:A:2924:ASN:OD1	2.22	0.41
1:A:3090:ILE:HD12	1:A:3102:CYS:SG	2.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:4106:THR:HB	1:B:4149:LEU:HD22	2.02	0.41
1:A:3750:ASN:O	1:A:3754:GLU:HG3	2.20	0.41
1:A:3321:CYS:SG	1:A:3640:GLY:HA3	2.61	0.41
1:A:3361:ILE:HG22	1:A:3362:ILE:HG12	2.03	0.41
1:A:3788:ASP:N	1:A:3788:ASP:OD1	2.52	0.41
1:A:3353:MET:O	1:A:3483:LEU:HB3	2.20	0.41
1:A:3710:ASN:O	1:A:3714:GLN:HG2	2.20	0.41
1:B:4253:GLU:HB3	1:B:4255:VAL:HG22	2.03	0.41
1:A:3796:GLU:HA	1:A:3796:GLU:OE1	2.21	0.40
1:A:3314:VAL:O	1:A:3315:ASP:CB	2.69	0.40
1:A:3320:PHE:HD2	1:A:3360:VAL:HG21	1.87	0.40
1:A:3427:TRP:CD1	1:A:3452:LYS:HB2	2.55	0.40
1:A:3808:THR:OG1	1:A:3827:ASP:OD2	2.38	0.40
1:A:3890:ARG:HD3	1:A:3900:TYR:HB3	2.03	0.40
1:B:4262:ASP:OD1	1:B:4262:ASP:N	2.54	0.40
1:B:4143:LEU:HD23	1:B:4146:PRO:HG3	2.03	0.40
1:B:4069:TYR:CZ	1:B:4311:LEU:HD11	2.57	0.40
1:B:4204:THR:HG22	1:B:4212:ILE:HA	2.03	0.40
1:A:3463:ARG:HA	1:A:3463:ARG:HD2	1.87	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	1073/4660 (23%)	984 (92%)	87 (8%)	2 (0%)	44 74
1	B	359/4660 (8%)	332 (92%)	26 (7%)	1 (0%)	37 69
2	M	1/5 (20%)	1 (100%)	0	0	100 100
All	All	1433/9325 (15%)	1317 (92%)	113 (8%)	3 (0%)	45 74

All (3) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
1	A	3315	ASP
1	B	4414	VAL
1	A	3305	HIS

### 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	965/4089 (24%)	923 (96%)	42 (4%)	24	48
1	B	320/4089 (8%)	297 (93%)	23 (7%)	12	36
2	M	1/1 (100%)	1 (100%)	0	100	100
All	All	1286/8179 (16%)	1221 (95%)	65 (5%)	22	45

All (65) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1233	LEU
1	A	1241	ASP
1	A	1245	ILE
1	A	1268	VAL
1	A	2906	ASN
1	A	2931	ASN
1	A	2941	GLN
1	A	2945	CYS
1	A	2972	TRP
1	A	2981	SER
1	A	2992	MET
1	A	3009	ARG
1	A	3039	PHE
1	A	3069	LEU
1	A	3082	PHE
1	A	3111	CYS
1	A	3165	CYS
1	A	3299	SER
1	A	3354	ASP
1	A	3373	THR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	3395	ASP
1	A	3415	LEU
1	A	3416	THR
1	A	3468	SER
1	A	3505	ARG
1	A	3511	MET
1	A	3514	CYS
1	A	3533	LYS
1	A	3541	SER
1	A	3582	ASP
1	A	3597	GLU
1	A	3608	CYS
1	A	3664	ASP
1	A	3666	SER
1	A	3691	ASN
1	A	3741	CYS
1	A	3842	THR
1	A	3843	TYR
1	A	3881	PHE
1	A	3891	PHE
1	A	3897	ARG
1	A	3923	ARG
1	B	4062	GLU
1	B	4083	GLU
1	B	4084	GLU
1	B	4090	ASP
1	B	4108	LEU
1	B	4110	GLN
1	B	4130	ASN
1	B	4144	MET
1	B	4147	ASP
1	B	4160	TRP
1	B	4164	LYS
1	B	4179	LYS
1	B	4188	GLN
1	B	4194	VAL
1	B	4217	MET
1	B	4246	VAL
1	B	4268	LEU
1	B	4279	LEU
1	B	4311	LEU
1	B	4313	VAL

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Mol	Chain	Res	Type
1	B	4375	LEU
1	B	4387	HIS
1	B	4414	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2906	ASN
1	A	2931	ASN
1	A	2943	HIS
1	A	3679	ASN
1	A	3714	GLN
1	A	3782	GLN
1	B	4145	GLN
1	B	4387	HIS

### 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](#)

30 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
3	NAG	C	1	1,3	14,14,15	0.33	0	17,19,21	0.51	0
3	NAG	C	2	3	14,14,15	0.29	0	17,19,21	0.65	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	BMA	C	3	3	11,11,12	0.26	0	15,15,17	0.74	0
3	NAG	D	1	1,3	14,14,15	0.33	0	17,19,21	0.89	1 (5%)
3	NAG	D	2	3	14,14,15	0.32	0	17,19,21	0.89	0
3	BMA	D	3	3	11,11,12	0.23	0	15,15,17	0.64	0
4	NAG	E	1	1,4	14,14,15	0.31	0	17,19,21	0.67	0
4	NAG	E	2	4	14,14,15	0.31	0	17,19,21	0.72	0
4	BMA	E	3	4	11,11,12	0.28	0	15,15,17	1.03	1 (6%)
4	MAN	E	4	4	11,11,12	0.25	0	15,15,17	0.77	0
4	MAN	E	5	4	11,11,12	0.21	0	15,15,17	0.75	0
5	NAG	F	1	5,1	14,14,15	0.26	0	17,19,21	0.73	0
5	NAG	F	2	5	14,14,15	0.30	0	17,19,21	0.57	0
5	NAG	G	1	5,1	14,14,15	0.30	0	17,19,21	0.56	0
5	NAG	G	2	5	14,14,15	0.31	0	17,19,21	0.57	0
4	NAG	H	1	1,4	14,14,15	0.31	0	17,19,21	0.92	0
4	NAG	H	2	4	14,14,15	0.32	0	17,19,21	0.61	0
4	BMA	H	3	4	11,11,12	0.25	0	15,15,17	0.89	1 (6%)
4	MAN	H	4	4	11,11,12	0.22	0	15,15,17	0.69	0
4	MAN	H	5	4	11,11,12	0.22	0	15,15,17	0.72	0
4	NAG	I	1	1,4	14,14,15	0.34	0	17,19,21	0.82	1 (5%)
4	NAG	I	2	4	14,14,15	0.29	0	17,19,21	0.72	0
4	BMA	I	3	4	11,11,12	0.23	0	15,15,17	0.85	0
4	MAN	I	4	4	11,11,12	0.24	0	15,15,17	0.68	0
4	MAN	I	5	4	11,11,12	0.23	0	15,15,17	0.65	0
5	NAG	J	1	5	14,14,15	0.28	0	17,19,21	0.50	0
5	NAG	J	2	5	14,14,15	0.31	0	17,19,21	0.73	0
6	NAG	K	1	6	14,14,15	0.27	0	17,19,21	0.57	0
6	NAG	K	2	6	14,14,15	0.31	0	17,19,21	0.65	0
6	BMA	K	3	6	11,11,12	0.23	0	15,15,17	0.74	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	C	2	3	-	0/6/23/26	0/1/1/1
3	BMA	C	3	3	-	0/2/19/22	0/1/1/1
3	NAG	D	1	1,3	-	0/6/23/26	0/1/1/1
3	NAG	D	2	3	-	0/6/23/26	0/1/1/1
3	BMA	D	3	3	-	0/2/19/22	0/1/1/1
4	NAG	E	1	1,4	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	E	2	4	-	0/6/23/26	0/1/1/1
4	BMA	E	3	4	-	0/2/19/22	0/1/1/1
4	MAN	E	4	4	-	0/2/19/22	0/1/1/1
4	MAN	E	5	4	-	0/2/19/22	0/1/1/1
5	NAG	F	1	5,1	-	0/6/23/26	0/1/1/1
5	NAG	F	2	5	-	0/6/23/26	0/1/1/1
5	NAG	G	1	5,1	-	2/6/23/26	0/1/1/1
5	NAG	G	2	5	-	2/6/23/26	0/1/1/1
4	NAG	H	1	1,4	-	4/6/23/26	0/1/1/1
4	NAG	H	2	4	-	0/6/23/26	0/1/1/1
4	BMA	H	3	4	-	1/2/19/22	0/1/1/1
4	MAN	H	4	4	-	0/2/19/22	0/1/1/1
4	MAN	H	5	4	-	0/2/19/22	0/1/1/1
4	NAG	I	1	1,4	-	2/6/23/26	0/1/1/1
4	NAG	I	2	4	-	2/6/23/26	0/1/1/1
4	BMA	I	3	4	-	0/2/19/22	0/1/1/1
4	MAN	I	4	4	-	0/2/19/22	0/1/1/1
4	MAN	I	5	4	-	1/2/19/22	0/1/1/1
5	NAG	J	1	5	-	1/6/23/26	0/1/1/1
5	NAG	J	2	5	-	1/6/23/26	0/1/1/1
6	NAG	K	1	6	-	0/6/23/26	0/1/1/1
6	NAG	K	2	6	-	0/6/23/26	0/1/1/1
6	BMA	K	3	6	-	1/2/19/22	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	3	BMA	C1-C2-C3	2.49	112.72	109.67
4	I	1	NAG	C1-O5-C5	2.47	115.54	112.19
4	H	3	BMA	C1-O5-C5	2.33	115.34	112.19
3	D	1	NAG	C2-N2-C7	-2.12	119.88	122.90

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	I	1	NAG	C8-C7-N2-C2
4	H	1	NAG	C1-C2-N2-C7
4	I	1	NAG	O7-C7-N2-C2

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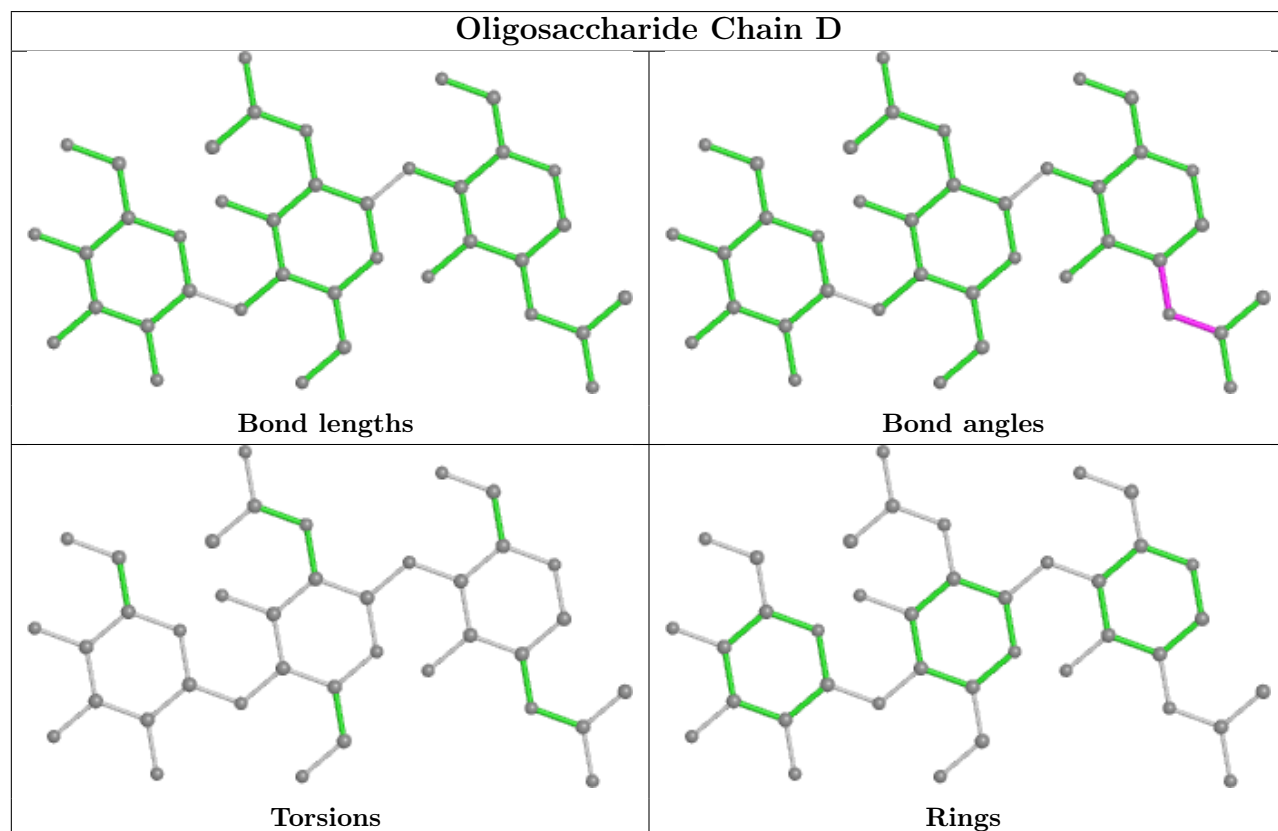
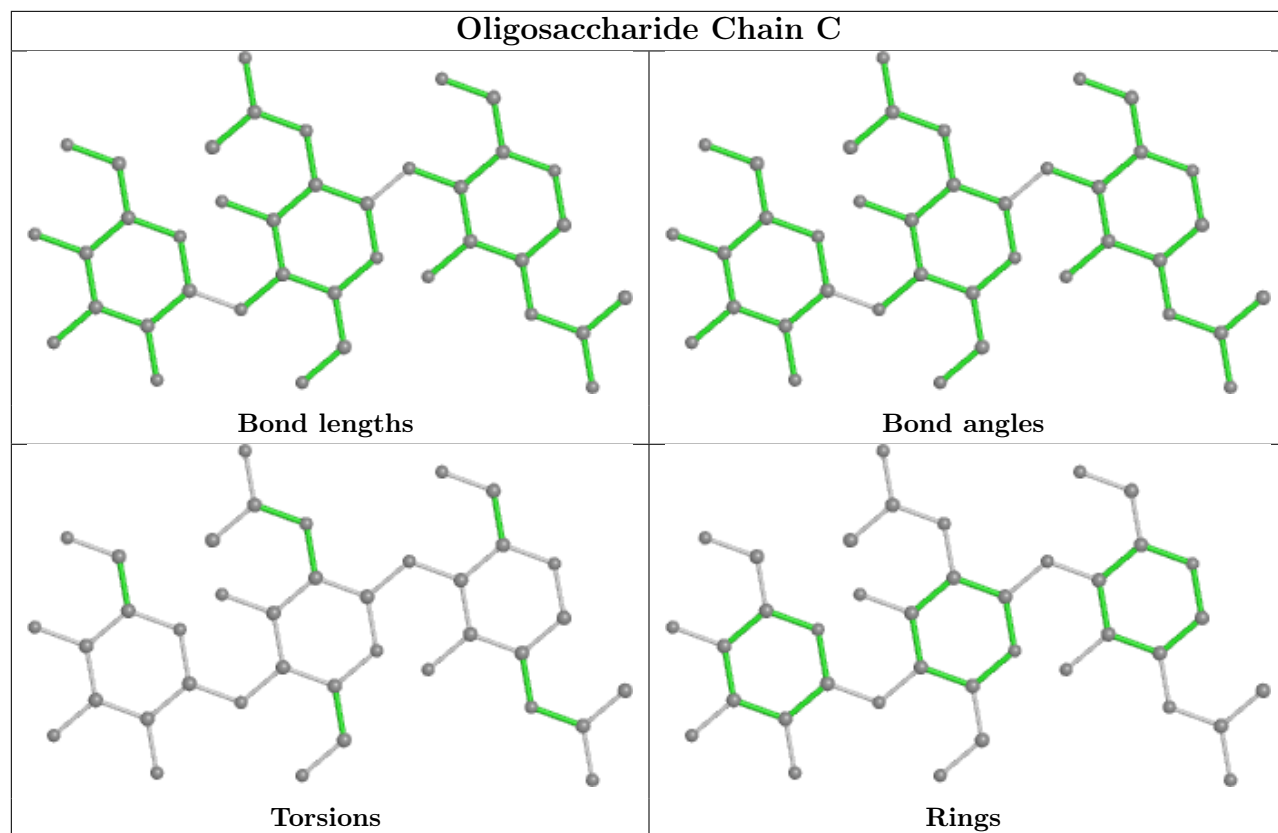
Mol	Chain	Res	Type	Atoms
5	G	1	NAG	C8-C7-N2-C2
5	G	1	NAG	O7-C7-N2-C2
6	K	3	BMA	O5-C5-C6-O6
4	I	5	MAN	O5-C5-C6-O6
5	J	2	NAG	O5-C5-C6-O6
5	J	1	NAG	O5-C5-C6-O6
4	H	1	NAG	C8-C7-N2-C2
4	H	3	BMA	O5-C5-C6-O6
4	H	1	NAG	C3-C2-N2-C7
5	G	2	NAG	C4-C5-C6-O6
4	H	1	NAG	O7-C7-N2-C2
4	I	2	NAG	C8-C7-N2-C2
5	G	2	NAG	O5-C5-C6-O6
4	I	2	NAG	O7-C7-N2-C2

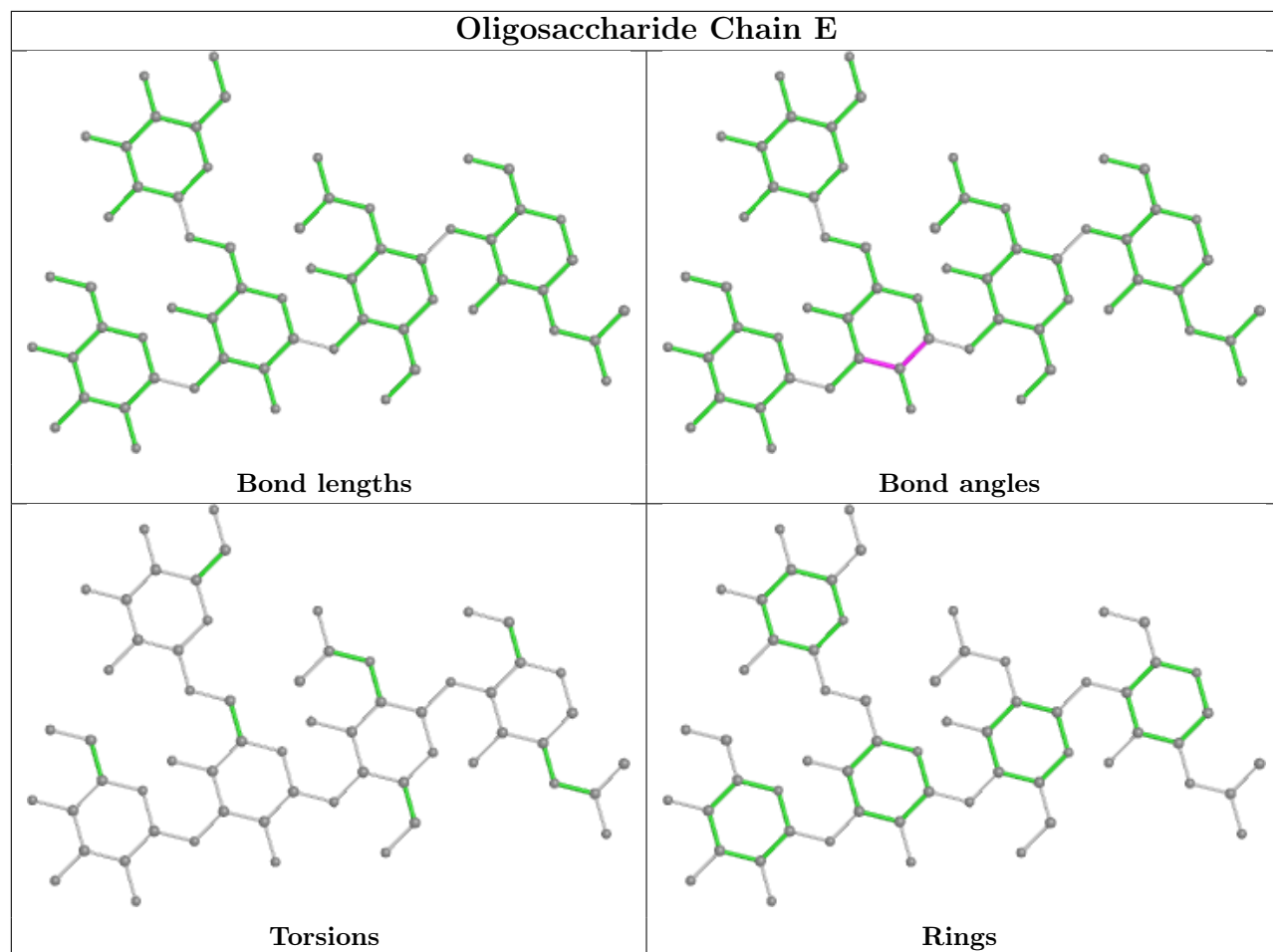
There are no ring outliers.

2 monomers are involved in 1 short contact:

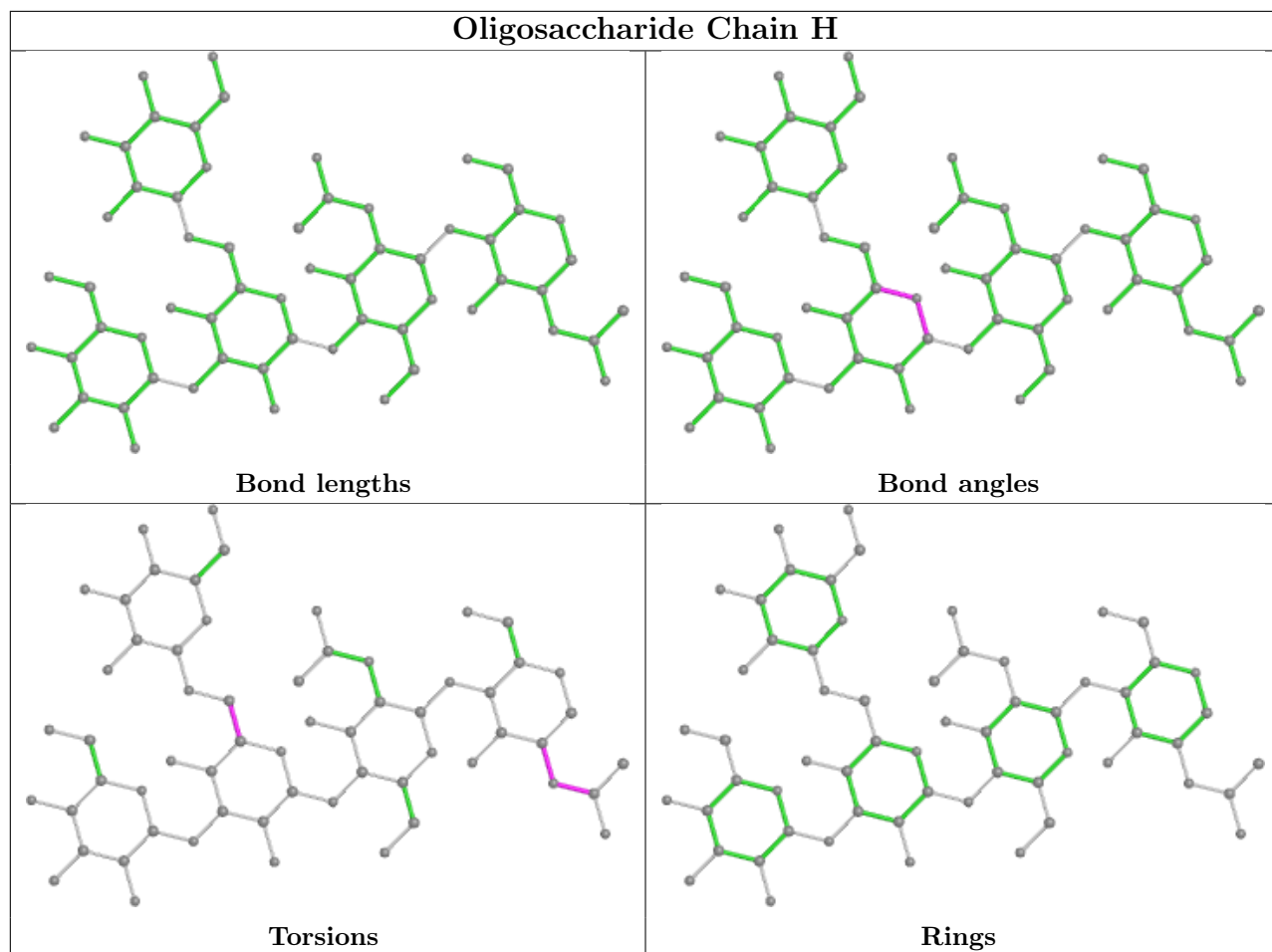
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	2	NAG	1	0
3	D	1	NAG	1	0

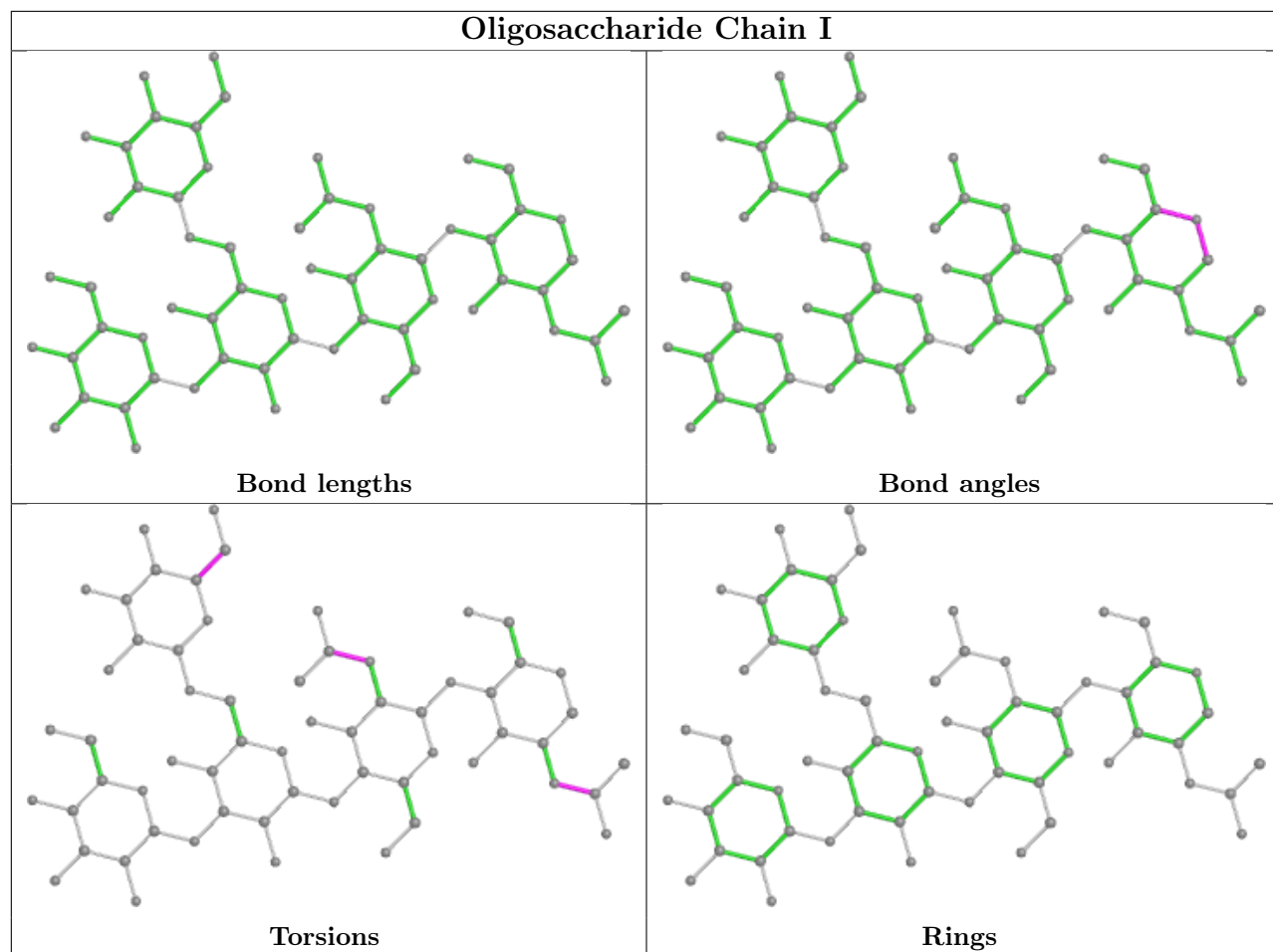
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

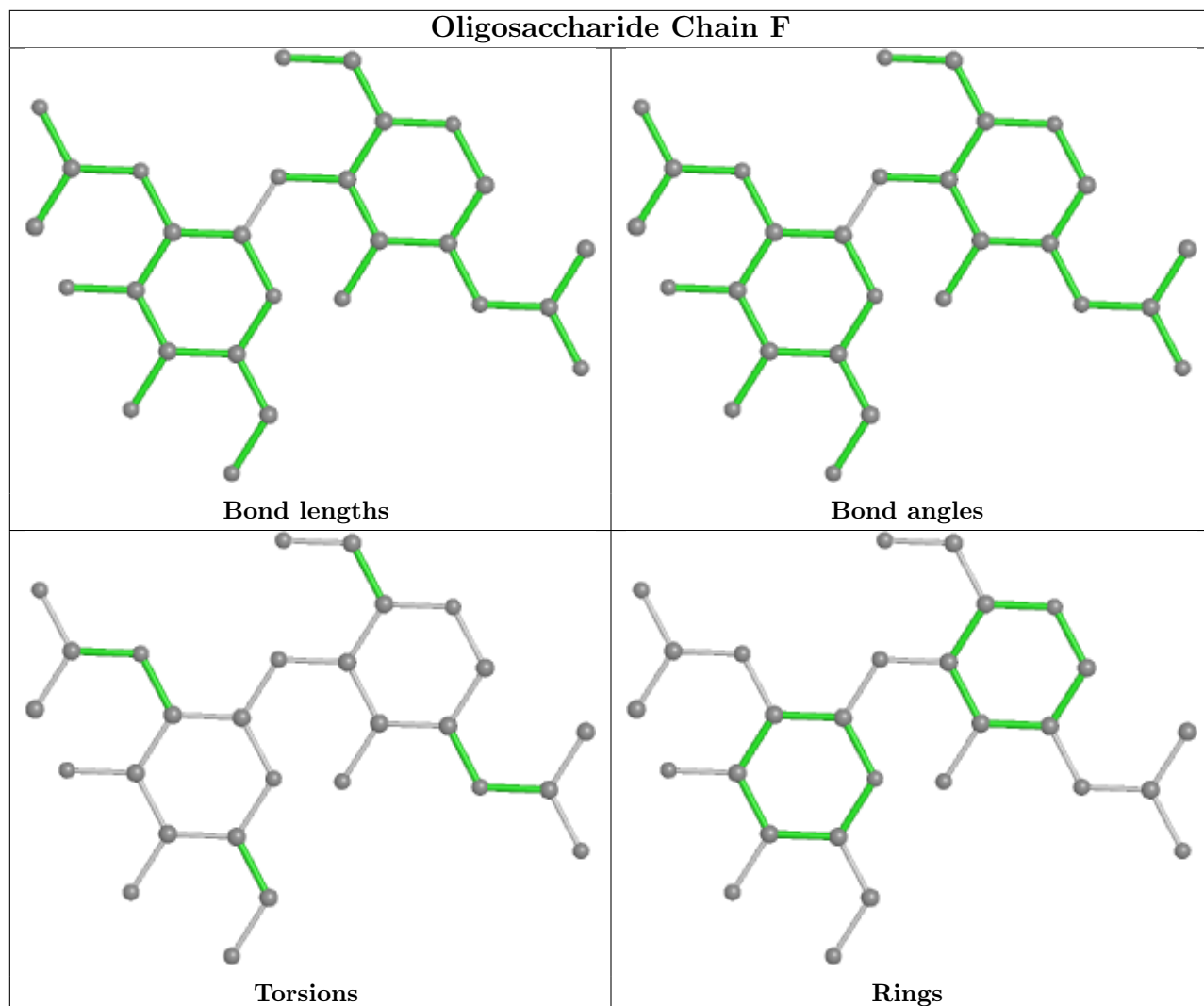


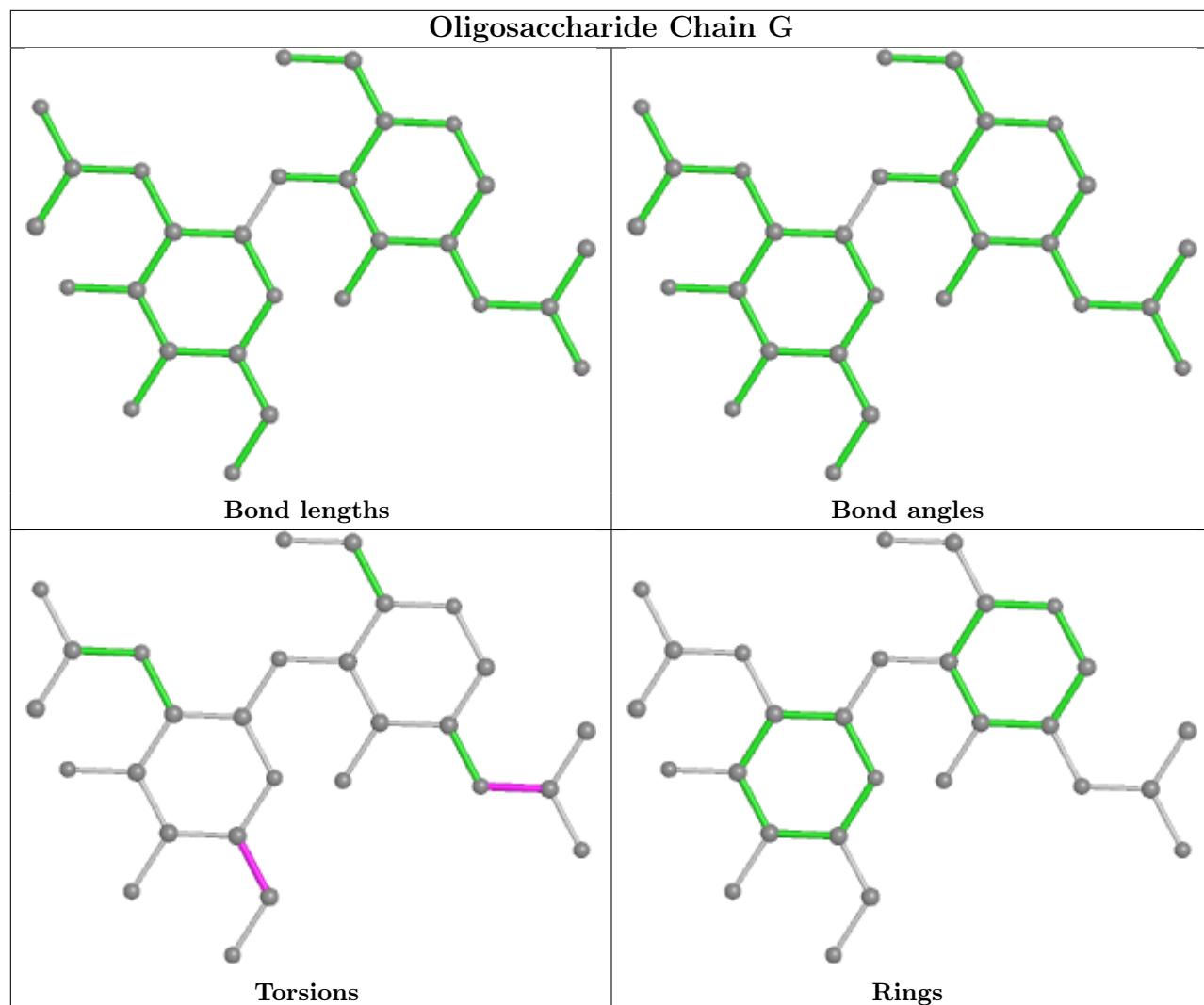


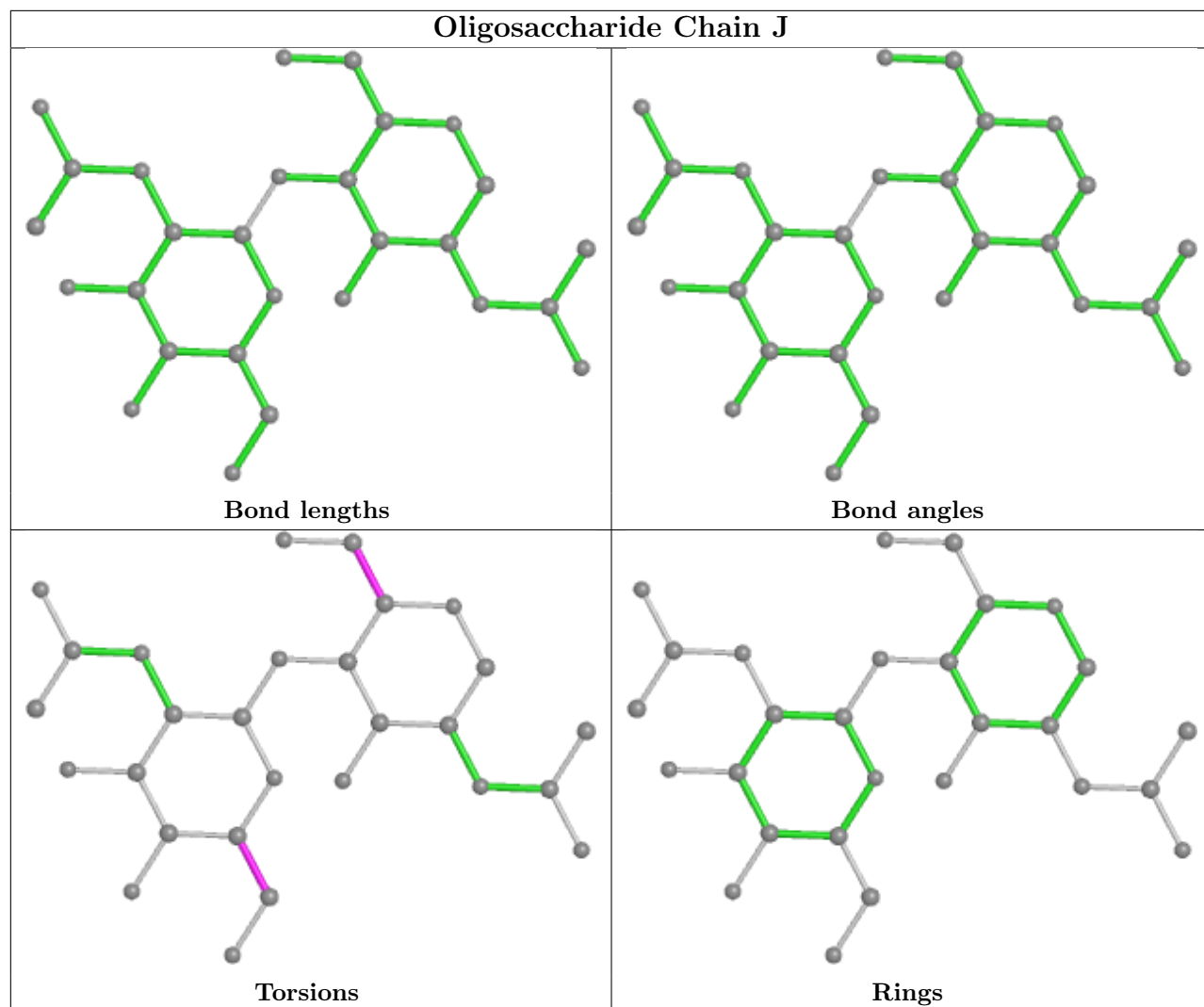


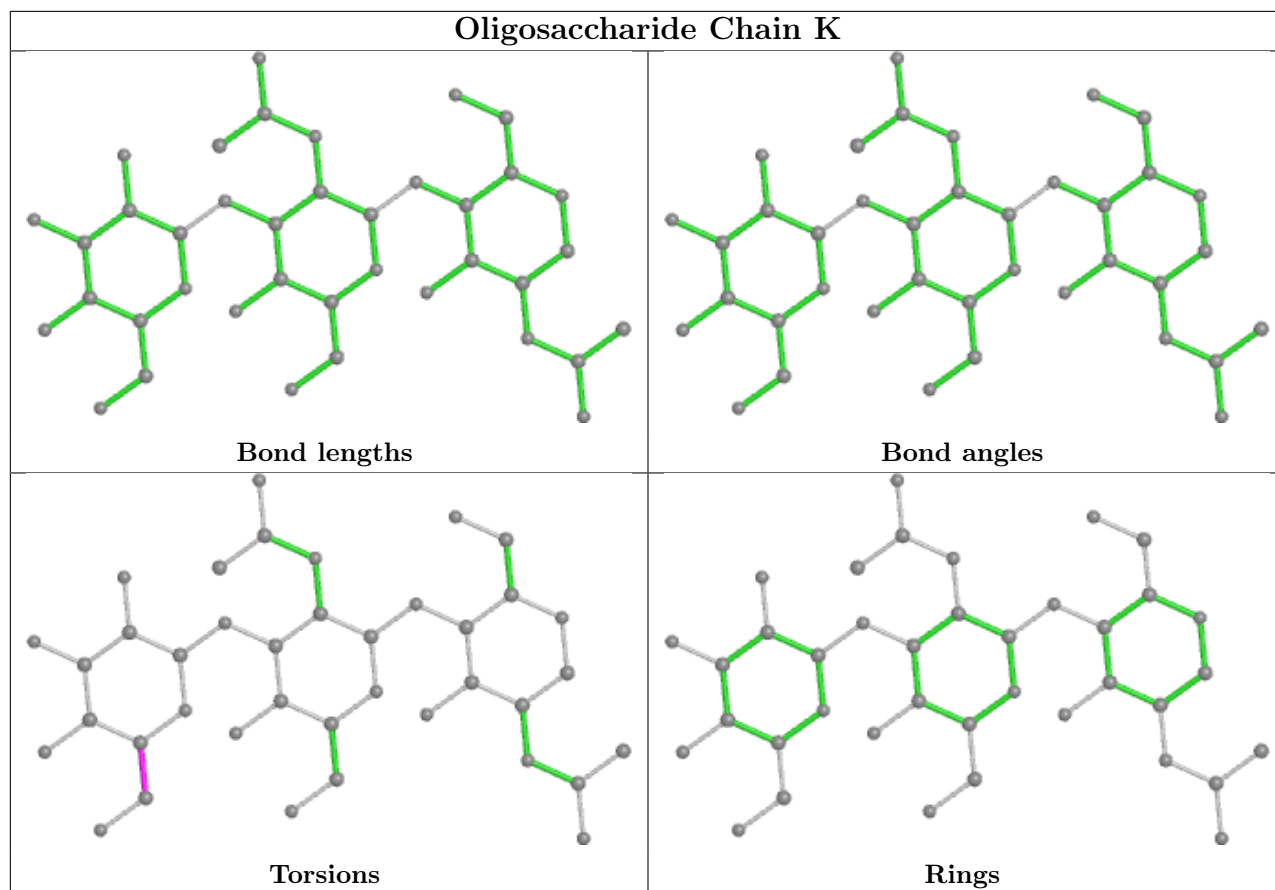












## 5.6 Ligand geometry [i](#)

Of 27 ligands modelled in this entry, 20 are monoatomic - leaving 7 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
8	A2G	A	4703	1	14,14,15	0.40	0	17,19,21	0.69	0
7	NAG	A	4702	1	14,14,15	0.26	0	17,19,21	0.65	0
8	A2G	A	4704	1	14,14,15	0.40	0	17,19,21	0.67	0
8	A2G	A	4705	1	14,14,15	0.41	0	17,19,21	0.53	0
8	A2G	A	4706	1	14,14,15	0.39	0	17,19,21	0.61	0
8	A2G	A	4707	1	14,14,15	0.39	0	17,19,21	0.57	0
7	NAG	A	4701	1	14,14,15	0.30	0	17,19,21	0.60	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	A2G	A	4703	1	-	0/6/23/26	0/1/1/1
7	NAG	A	4702	1	-	3/6/23/26	0/1/1/1
8	A2G	A	4704	1	-	0/6/23/26	0/1/1/1
8	A2G	A	4705	1	-	2/6/23/26	0/1/1/1
8	A2G	A	4706	1	-	0/6/23/26	0/1/1/1
8	A2G	A	4707	1	-	1/6/23/26	0/1/1/1
7	NAG	A	4701	1	-	1/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	4702	NAG	C8-C7-N2-C2
7	A	4702	NAG	O7-C7-N2-C2
7	A	4702	NAG	C1-C2-N2-C7
8	A	4705	A2G	C1-C2-N2-C7
8	A	4707	A2G	O5-C5-C6-O6
7	A	4701	NAG	C1-C2-N2-C7
8	A	4705	A2G	C3-C2-N2-C7

There are no ring outliers.

No monomer is involved in short contacts.

## 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.

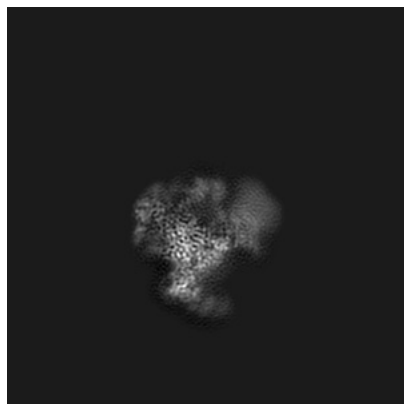
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-36694. These allow visual inspection of the internal detail of the map and identification of artifacts.

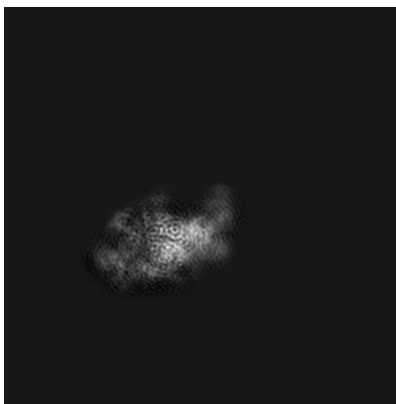
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

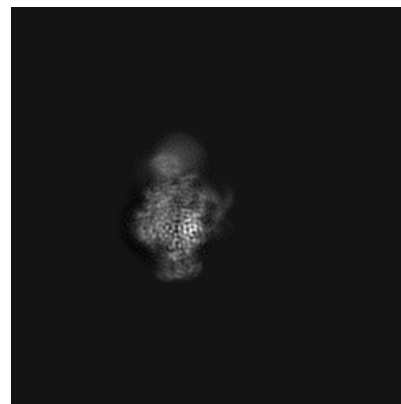
#### 6.1.1 Primary map



X

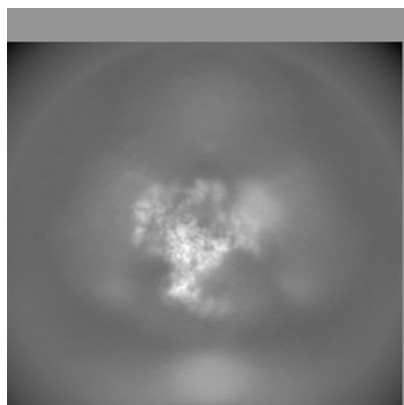


Y

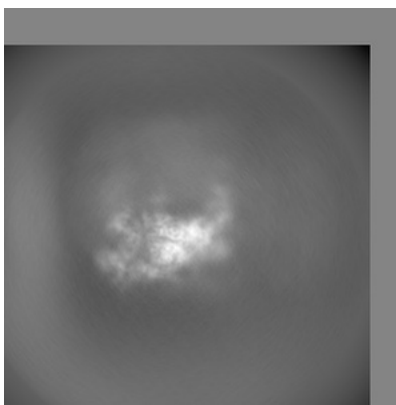


Z

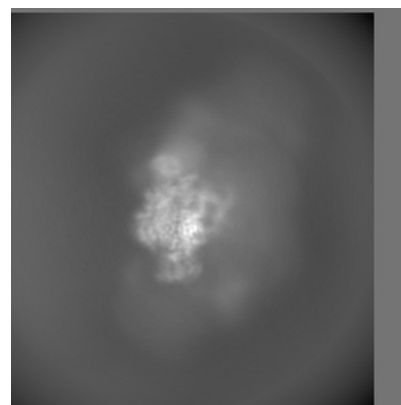
#### 6.1.2 Raw map



X



Y



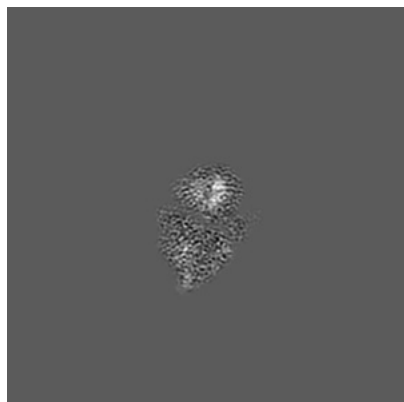
Z

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

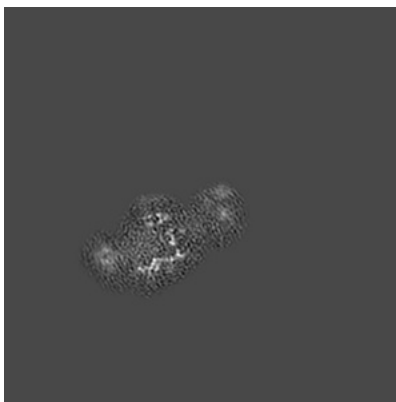


## 6.2 Central slices [i](#)

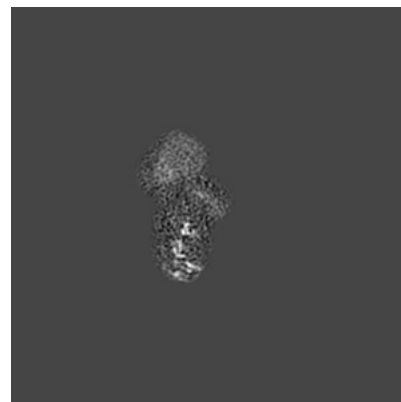
### 6.2.1 Primary map



X Index: 130

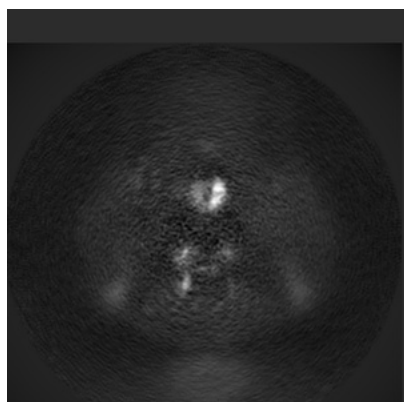


Y Index: 130

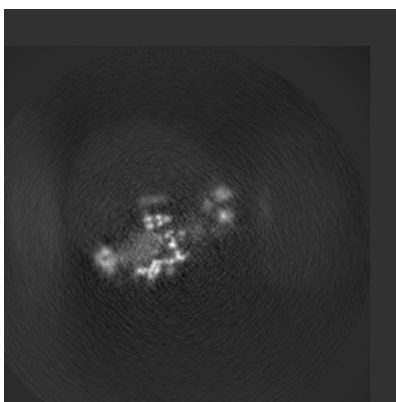


Z Index: 130

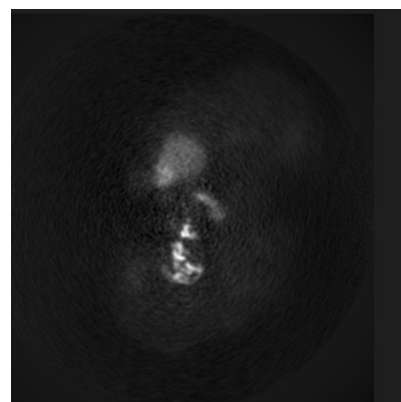
### 6.2.2 Raw map



X Index: 130



Y Index: 130

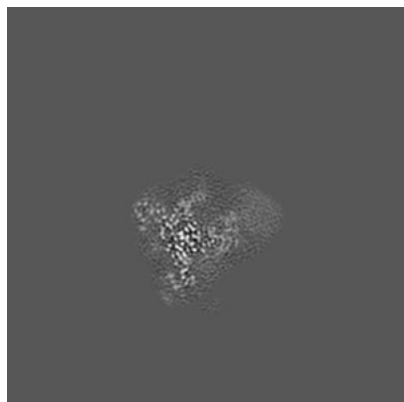


Z Index: 130

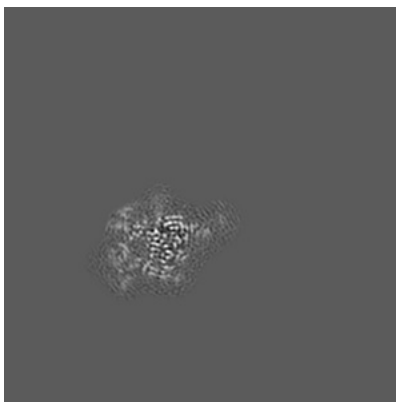
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

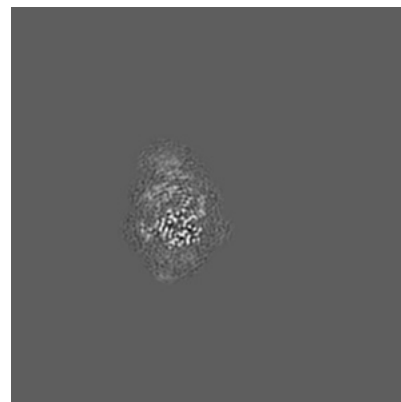
### 6.3.1 Primary map



X Index: 113

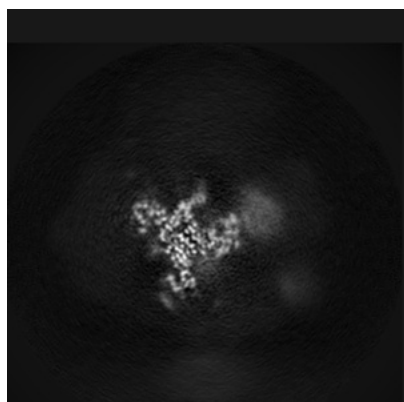


Y Index: 115

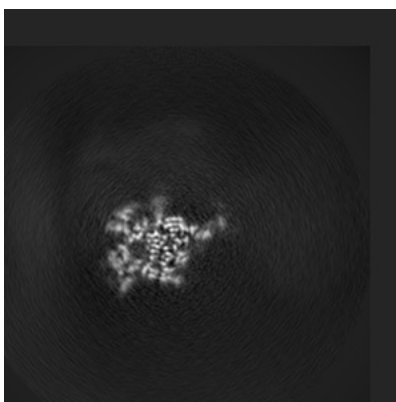


Z Index: 106

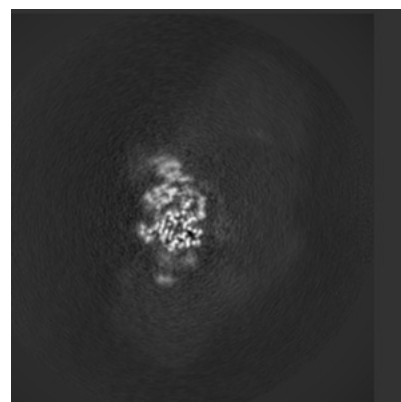
### 6.3.2 Raw map



X Index: 113



Y Index: 115

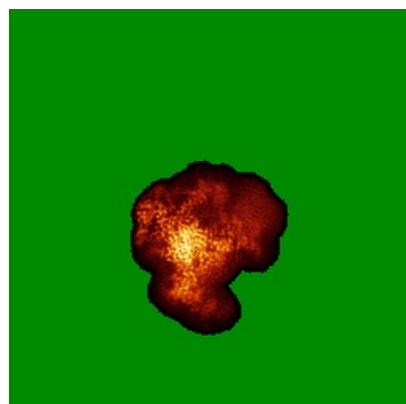


Z Index: 106

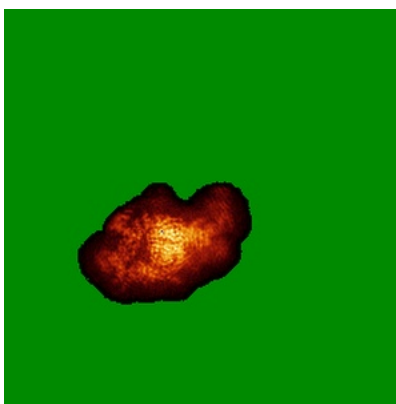
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

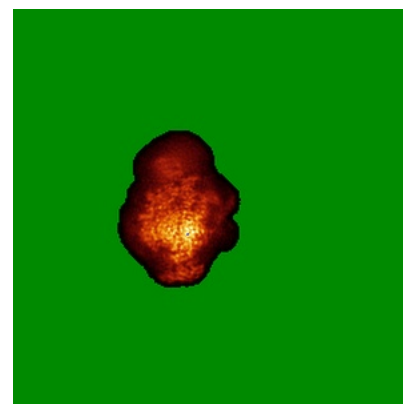
### 6.4.1 Primary map



X

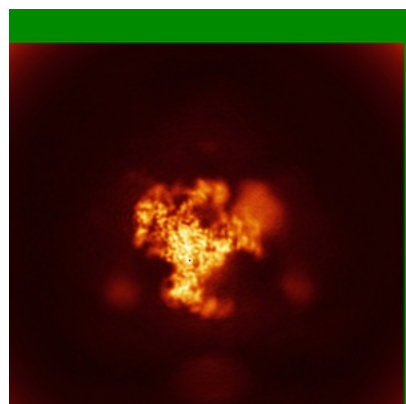


Y

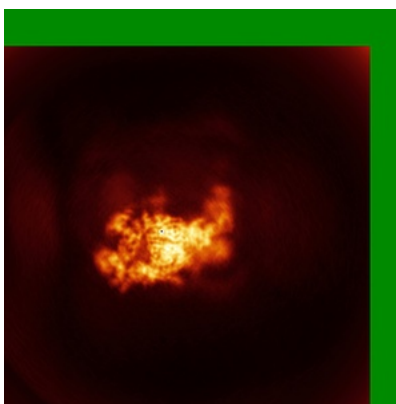


Z

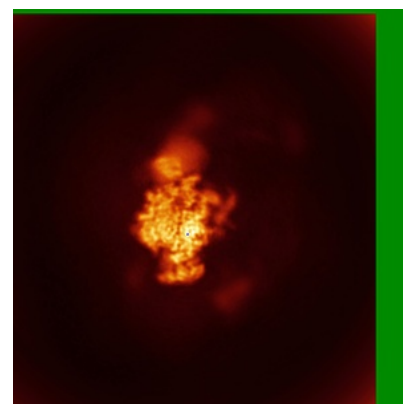
### 6.4.2 Raw map



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.

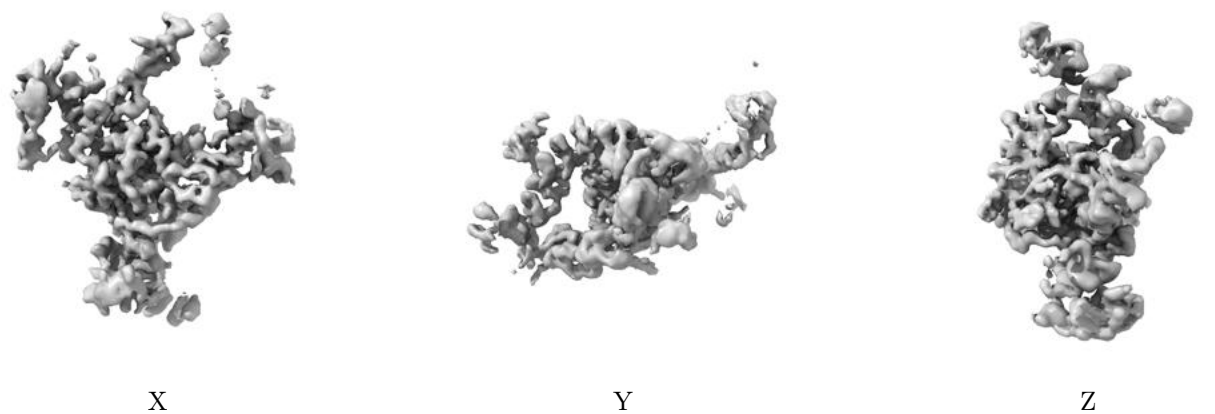
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0434. 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



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.

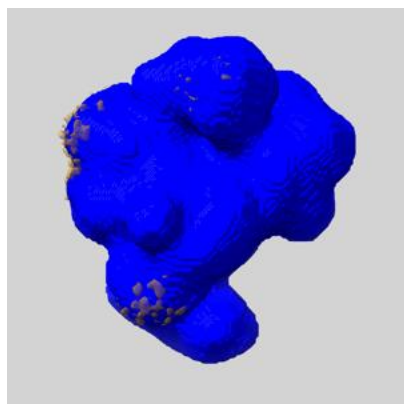
## 6.6 Mask visualisation [i](#)

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

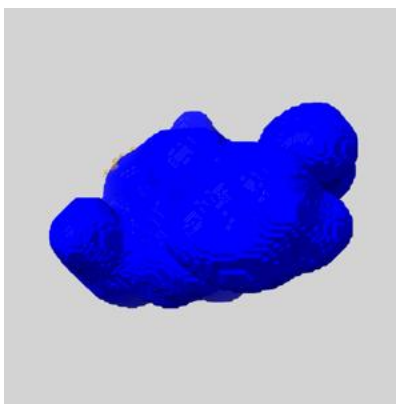
A mask typically either:

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

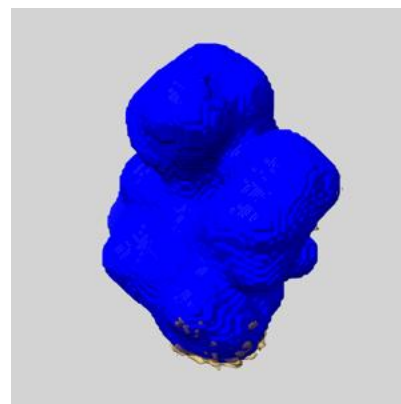
### 6.6.1 emd\_36694\_msk\_1.map [i](#)



X



Y

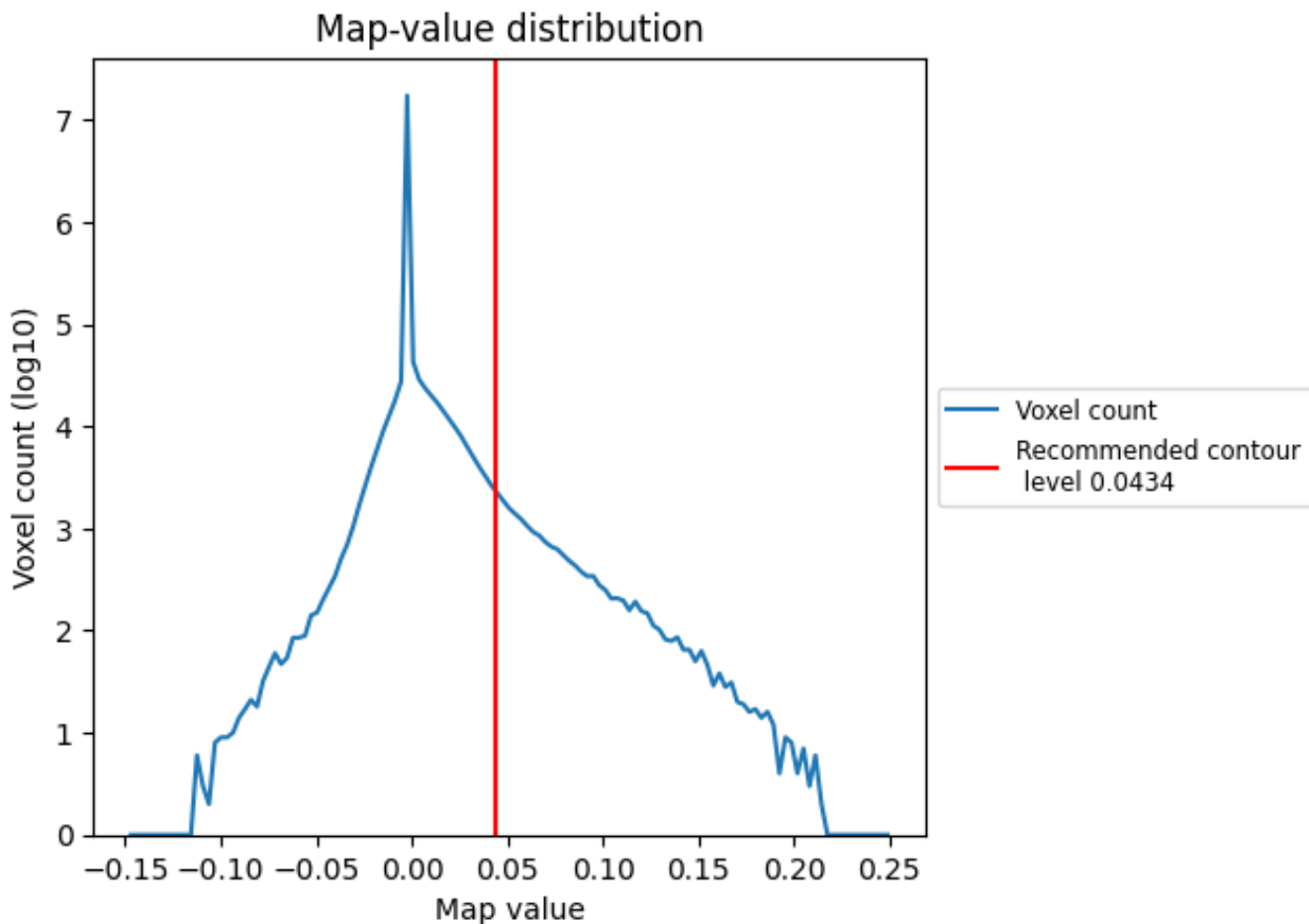


Z

## 7 Map analysis [i](#)

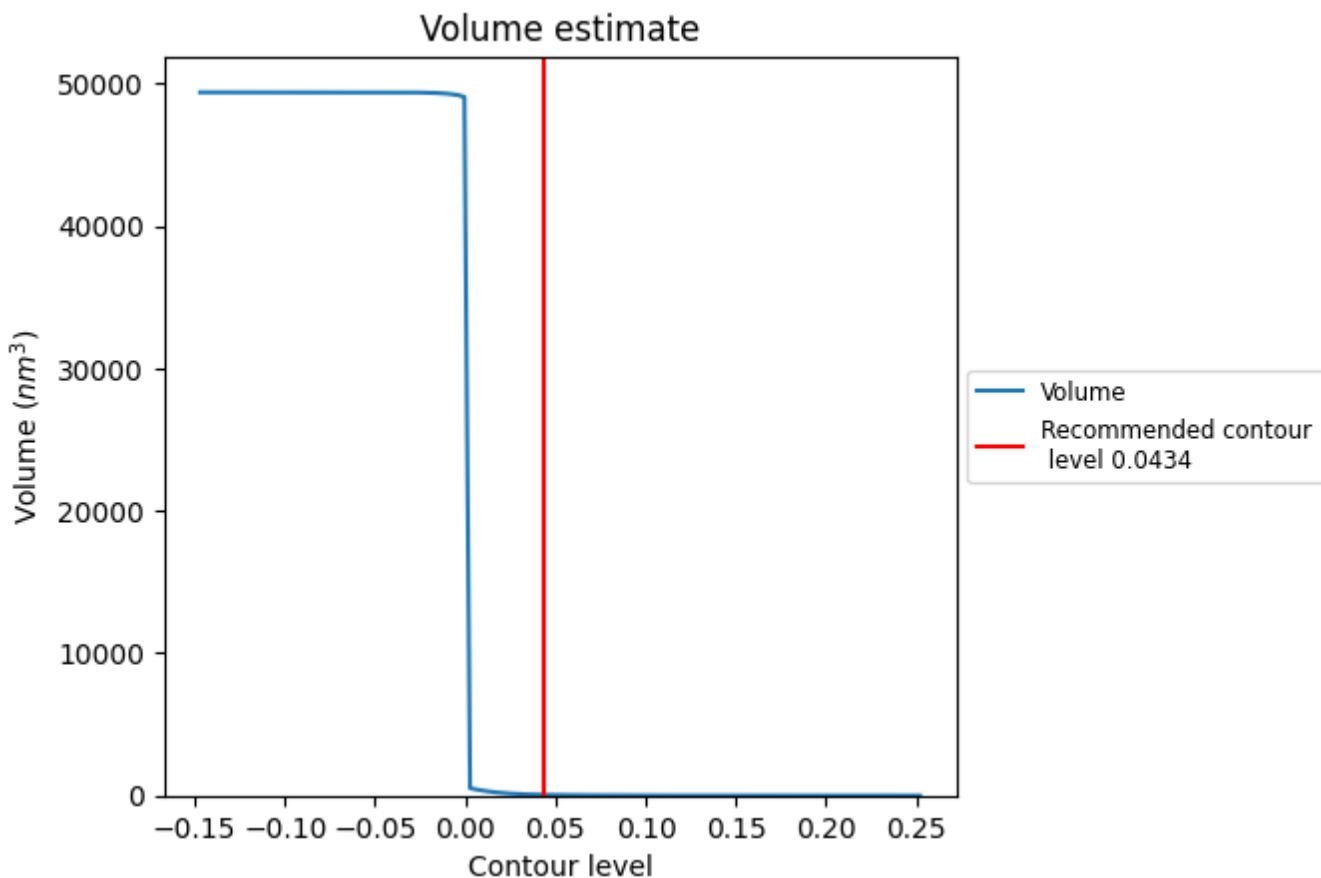
This section contains the results of statistical analysis of the map.

### 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.

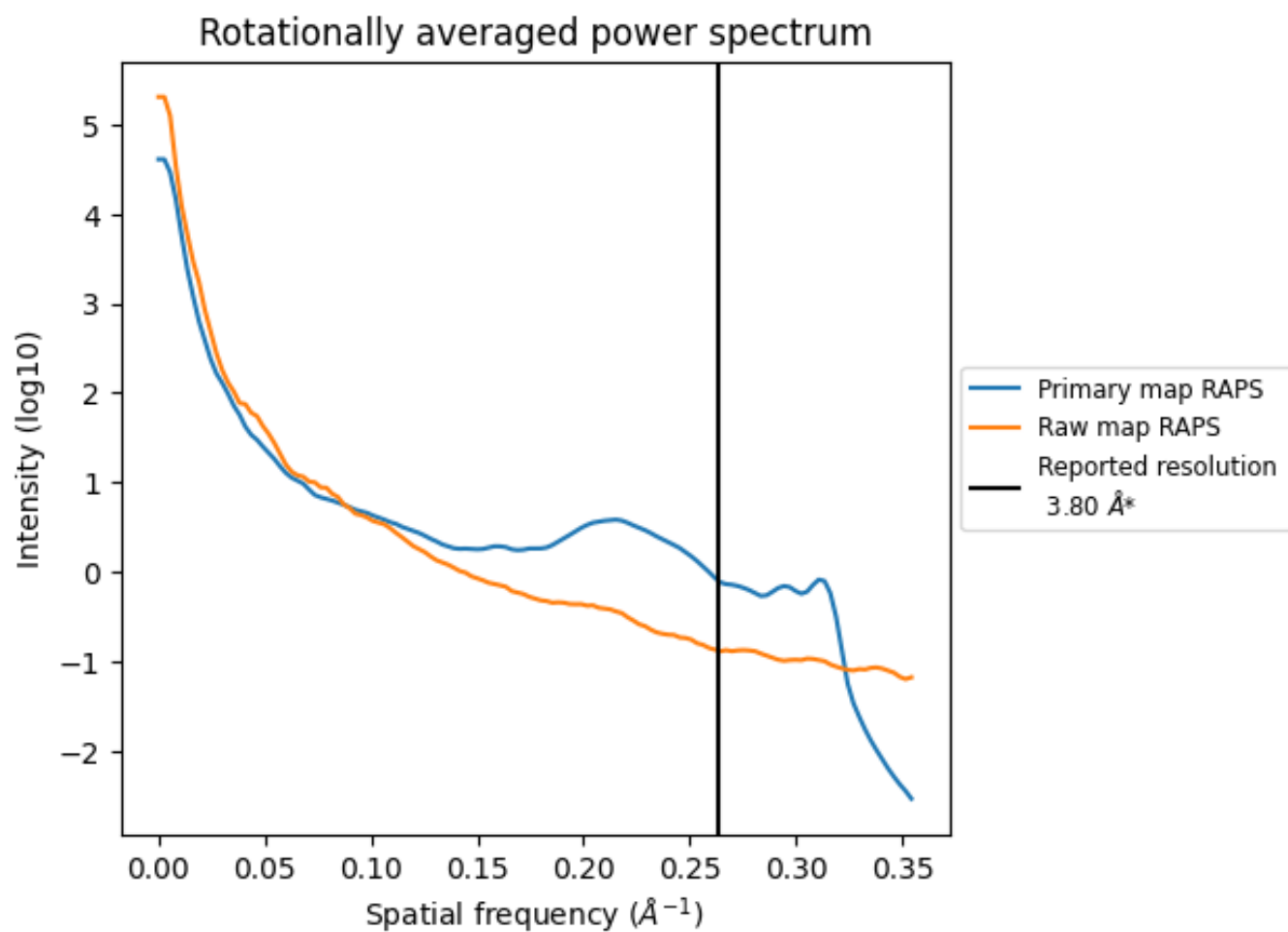
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 55 nm<sup>3</sup>; this corresponds to an approximate mass of 49 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



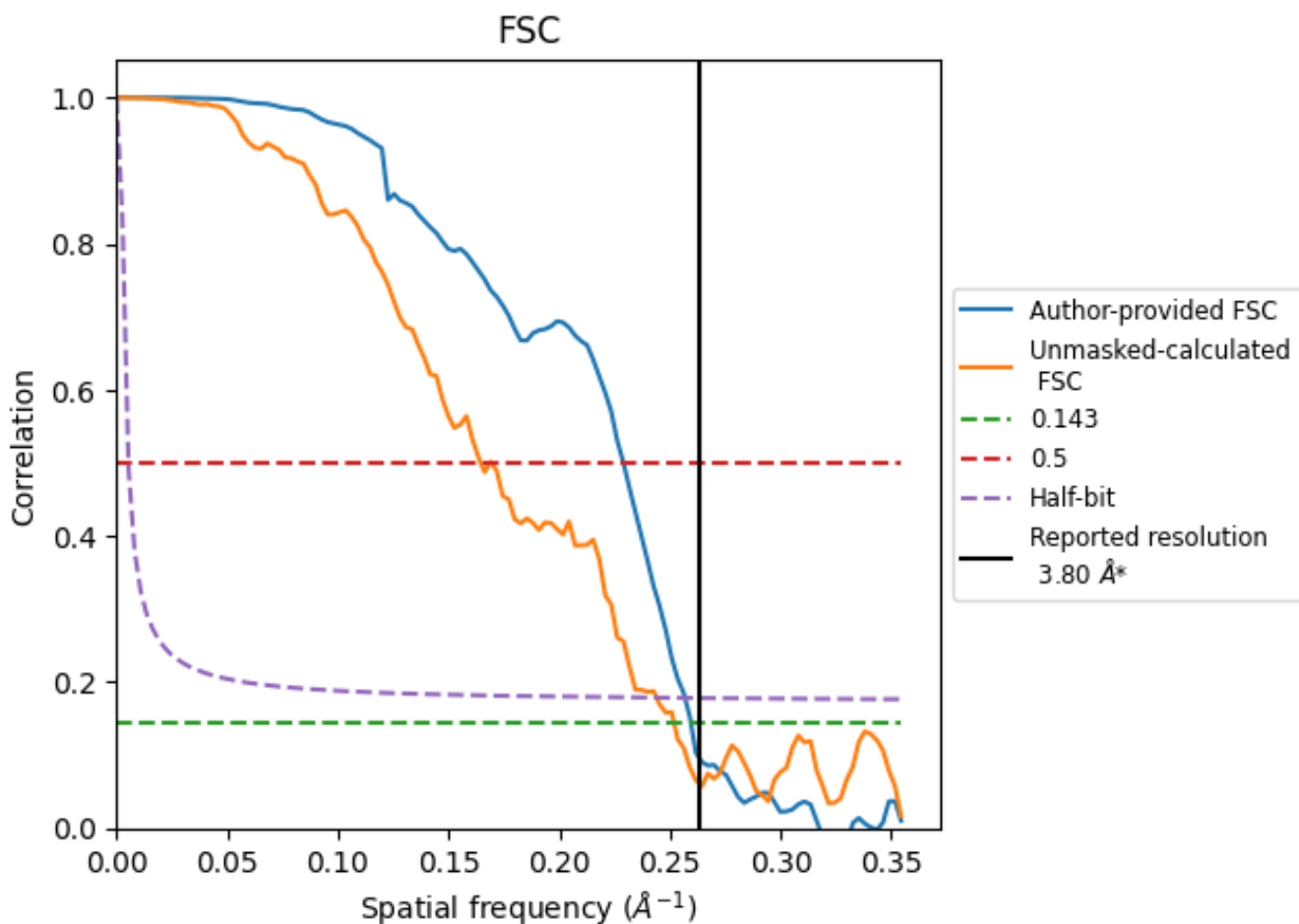
\*Reported resolution corresponds to spatial frequency of 0.263 Å<sup>-1</sup>



## 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 0.263 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

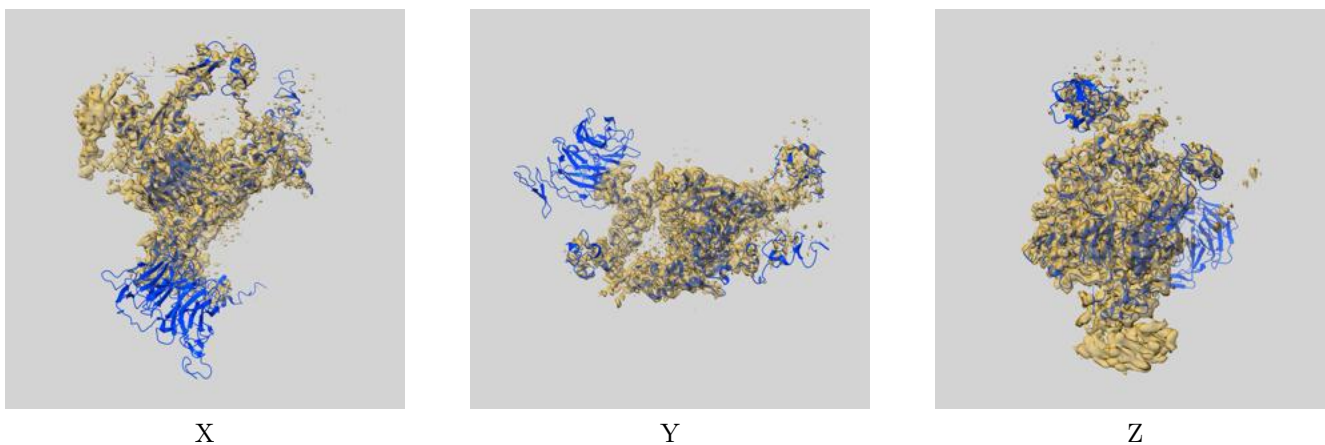
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.80	-	-
Author-provided FSC curve	3.86	4.37	3.89
Unmasked-calculated*	3.97	6.08	4.10

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

## 9 Map-model fit [i](#)

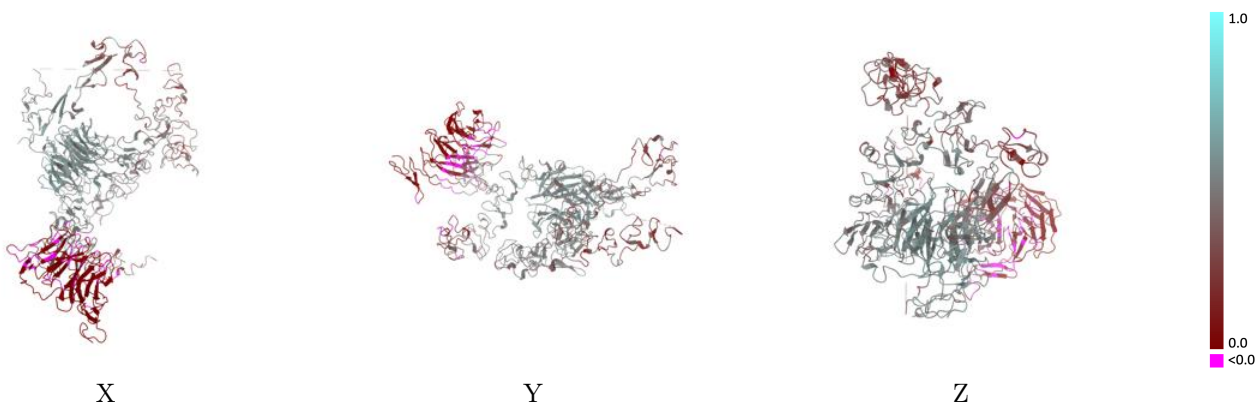
This section contains information regarding the fit between EMDB map EMD-36694 and PDB model 8JXA. Per-residue inclusion information can be found in section 3 on page 8.

### 9.1 Map-model overlay [i](#)



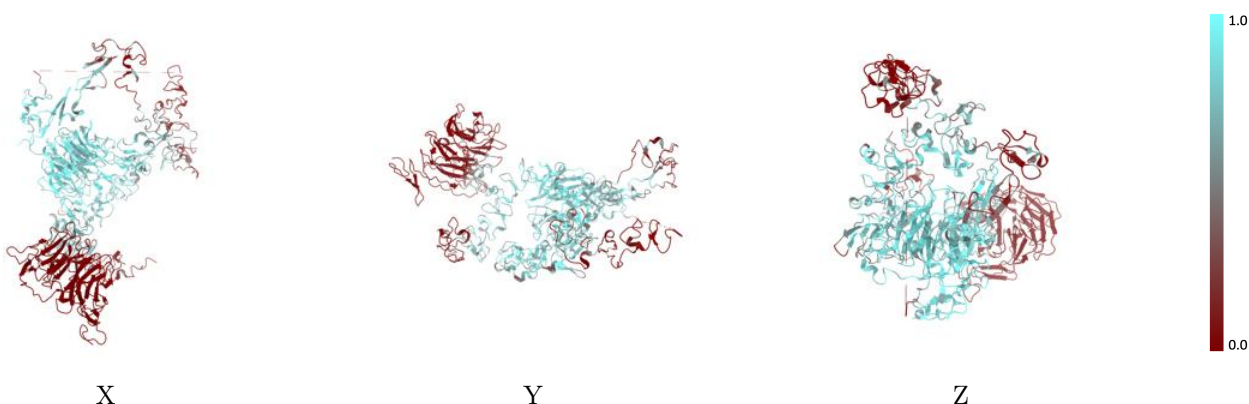
The images above show the 3D surface view of the map at the recommended contour level 0.0434 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



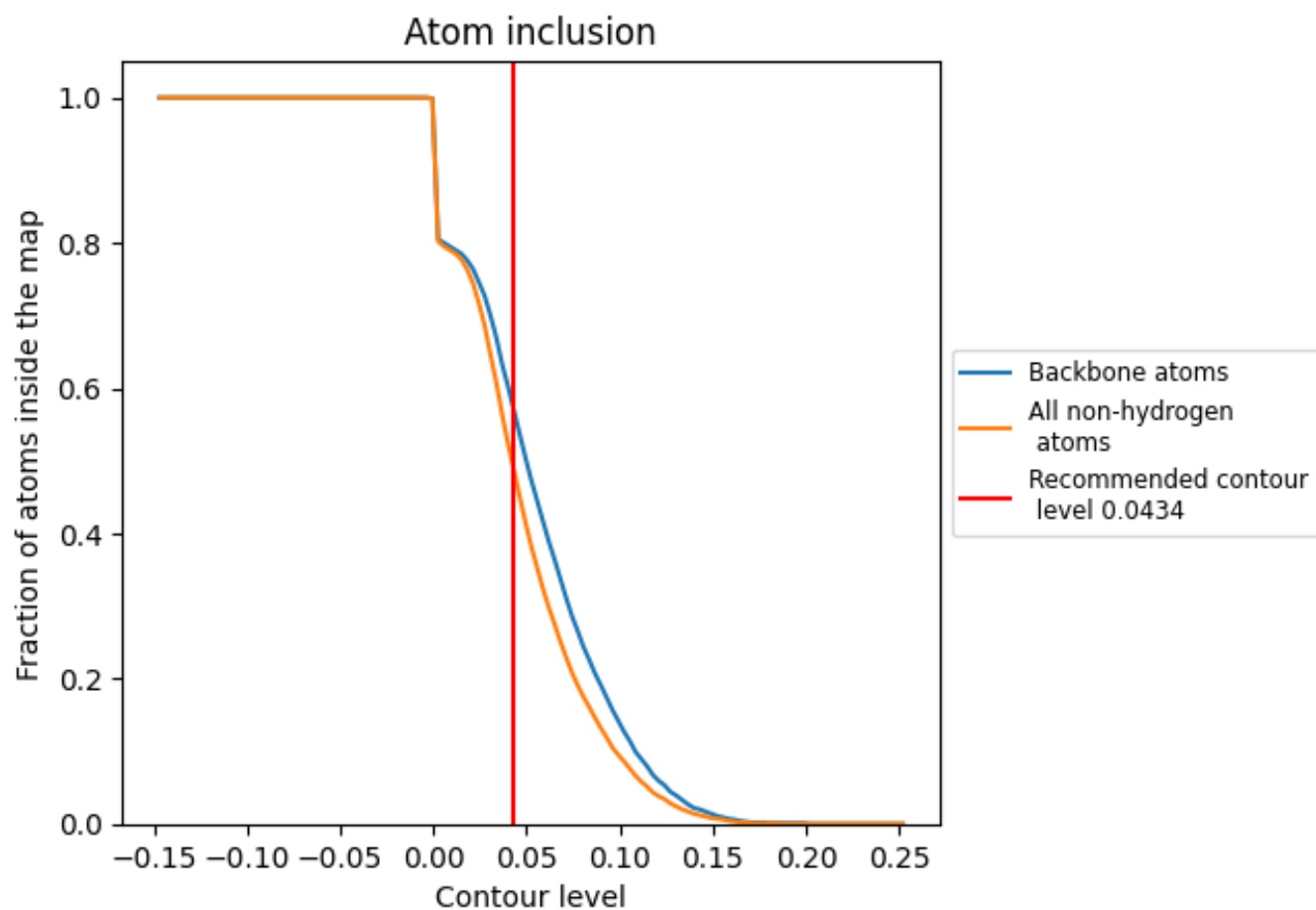
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (0.0434).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 57% of all backbone atoms, 48% 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 (0.0434) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4850	0.3510
A	0.6310	0.4470
B	0.0620	0.0640
C	0.2560	0.3670
D	0.6150	0.4640
E	0.5250	0.4390
F	0.3210	0.4710
G	0.6430	0.5270
H	0.3930	0.3770
I	0.5570	0.4580
J	0.0000	0.0000
K	0.0000	0.0000
M	0.8930	0.5560

