WORLDWIDE PDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Aug 8, 2023 – 10:31 AM JST

PDB ID	:	7YRN
EMDB ID	:	EMD-34063
Title	:	Cyro-EM structure of HCMV glycoprotein B in complex with 1B03 Fab
Authors	:	Wang, H.; Zhu, S.; Liao, H.
Deposited on	:	2022-08-10
Resolution	:	2.99 Å(reported)

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

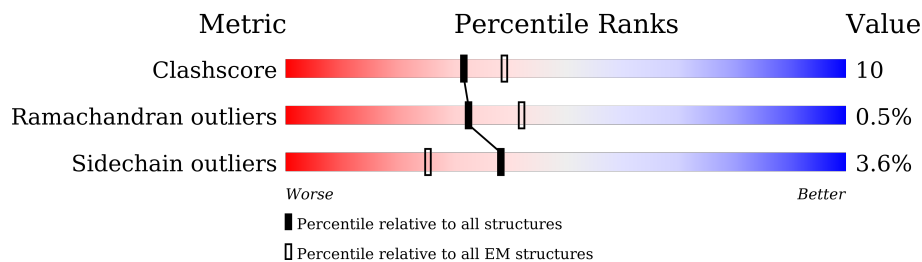|		
EMDB validation analysis	:	0.0.1.dev50
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.99 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.
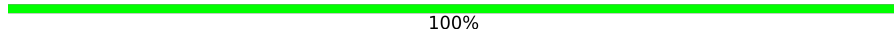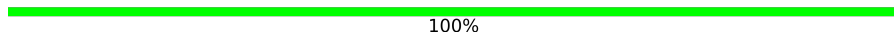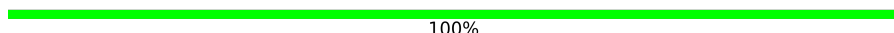
Metric	Percentile Ranks	Value
Clashscore		10
Ramachandran outliers		0.5%
Sidechain outliers		3.6%

Worse *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	731	· 45% 14% · 41%
1	B	731	· 45% 14% · 41%
1	C	731	· 45% 14% · 41%
2	D	223	16% 38% 14% · 47%
2	F	223	16% 38% 14% · 47%
2	H	223	17% 38% 14% · 47%
3	E	214	7% 33% 16% · 50%
3	G	214	7% 33% 16% 50%

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Mol	Chain	Length	Quality of chain
3	I	214	7%　32%　17%　50%
4	J	2	100%
4	K	2	100%
4	L	2	100%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 16080 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 Envelope glycoprotein B.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	434	Total	C	N	O	S	0	0
			3562	2258	609	681	14		
1	B	434	Total	C	N	O	S	0	0
			3562	2258	609	681	14		
1	C	434	Total	C	N	O	S	0	0
			3562	2258	609	681	14		

There are 117 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	156	HIS	ILE	conflict	UNP B9VXM4
A	157	ARG	HIS	conflict	UNP B9VXM4
A	240	ASN	TRP	conflict	UNP B9VXM4
A	242	THR	TYR	conflict	UNP B9VXM4
A	246	SER	CYS	conflict	UNP B9VXM4
A	457	GLU	ARG	conflict	UNP B9VXM4
A	460	GLU	ARG	conflict	UNP B9VXM4
A	700	LYS	-	expression tag	UNP B9VXM4
A	701	GLY	-	expression tag	UNP B9VXM4
A	702	LEU	-	expression tag	UNP B9VXM4
A	703	ASN	-	expression tag	UNP B9VXM4
A	704	ASP	-	expression tag	UNP B9VXM4
A	705	ILE	-	expression tag	UNP B9VXM4
A	706	PHE	-	expression tag	UNP B9VXM4
A	707	GLU	-	expression tag	UNP B9VXM4
A	708	ALA	-	expression tag	UNP B9VXM4
A	709	GLN	-	expression tag	UNP B9VXM4
A	710	LYS	-	expression tag	UNP B9VXM4
A	711	ILE	-	expression tag	UNP B9VXM4
A	712	GLU	-	expression tag	UNP B9VXM4
A	713	TRP	-	expression tag	UNP B9VXM4
A	714	HIS	-	expression tag	UNP B9VXM4
A	715	GLU	-	expression tag	UNP B9VXM4
A	716	LEU	-	expression tag	UNP B9VXM4

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Chain	Residue	Modelled	Actual	Comment	Reference
A	717	GLU	-	expression tag	UNP B9VXM4
A	718	VAL	-	expression tag	UNP B9VXM4
A	719	LEU	-	expression tag	UNP B9VXM4
A	720	PHE	-	expression tag	UNP B9VXM4
A	721	GLN	-	expression tag	UNP B9VXM4
A	722	GLY	-	expression tag	UNP B9VXM4
A	723	PRO	-	expression tag	UNP B9VXM4
A	724	GLY	-	expression tag	UNP B9VXM4
A	725	HIS	-	expression tag	UNP B9VXM4
A	726	HIS	-	expression tag	UNP B9VXM4
A	727	HIS	-	expression tag	UNP B9VXM4
A	728	HIS	-	expression tag	UNP B9VXM4
A	729	HIS	-	expression tag	UNP B9VXM4
A	730	HIS	-	expression tag	UNP B9VXM4
A	731	HIS	-	expression tag	UNP B9VXM4
B	156	HIS	ILE	conflict	UNP B9VXM4
B	157	ARG	HIS	conflict	UNP B9VXM4
B	240	ASN	TRP	conflict	UNP B9VXM4
B	242	THR	TYR	conflict	UNP B9VXM4
B	246	SER	CYS	conflict	UNP B9VXM4
B	457	GLU	ARG	conflict	UNP B9VXM4
B	460	GLU	ARG	conflict	UNP B9VXM4
B	700	LYS	-	expression tag	UNP B9VXM4
B	701	GLY	-	expression tag	UNP B9VXM4
B	702	LEU	-	expression tag	UNP B9VXM4
B	703	ASN	-	expression tag	UNP B9VXM4
B	704	ASP	-	expression tag	UNP B9VXM4
B	705	ILE	-	expression tag	UNP B9VXM4
B	706	PHE	-	expression tag	UNP B9VXM4
B	707	GLU	-	expression tag	UNP B9VXM4
B	708	ALA	-	expression tag	UNP B9VXM4
B	709	GLN	-	expression tag	UNP B9VXM4
B	710	LYS	-	expression tag	UNP B9VXM4
B	711	ILE	-	expression tag	UNP B9VXM4
B	712	GLU	-	expression tag	UNP B9VXM4
B	713	TRP	-	expression tag	UNP B9VXM4
B	714	HIS	-	expression tag	UNP B9VXM4
B	715	GLU	-	expression tag	UNP B9VXM4
B	716	LEU	-	expression tag	UNP B9VXM4
B	717	GLU	-	expression tag	UNP B9VXM4
B	718	VAL	-	expression tag	UNP B9VXM4
B	719	LEU	-	expression tag	UNP B9VXM4

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Chain	Residue	Modelled	Actual	Comment	Reference
B	720	PHE	-	expression tag	UNP B9VXM4
B	721	GLN	-	expression tag	UNP B9VXM4
B	722	GLY	-	expression tag	UNP B9VXM4
B	723	PRO	-	expression tag	UNP B9VXM4
B	724	GLY	-	expression tag	UNP B9VXM4
B	725	HIS	-	expression tag	UNP B9VXM4
B	726	HIS	-	expression tag	UNP B9VXM4
B	727	HIS	-	expression tag	UNP B9VXM4
B	728	HIS	-	expression tag	UNP B9VXM4
B	729	HIS	-	expression tag	UNP B9VXM4
B	730	HIS	-	expression tag	UNP B9VXM4
B	731	HIS	-	expression tag	UNP B9VXM4
C	156	HIS	ILE	conflict	UNP B9VXM4
C	157	ARG	HIS	conflict	UNP B9VXM4
C	240	ASN	TRP	conflict	UNP B9VXM4
C	242	THR	TYR	conflict	UNP B9VXM4
C	246	SER	CYS	conflict	UNP B9VXM4
C	457	GLU	ARG	conflict	UNP B9VXM4
C	460	GLU	ARG	conflict	UNP B9VXM4
C	700	LYS	-	expression tag	UNP B9VXM4
C	701	GLY	-	expression tag	UNP B9VXM4
C	702	LEU	-	expression tag	UNP B9VXM4
C	703	ASN	-	expression tag	UNP B9VXM4
C	704	ASP	-	expression tag	UNP B9VXM4
C	705	ILE	-	expression tag	UNP B9VXM4
C	706	PHE	-	expression tag	UNP B9VXM4
C	707	GLU	-	expression tag	UNP B9VXM4
C	708	ALA	-	expression tag	UNP B9VXM4
C	709	GLN	-	expression tag	UNP B9VXM4
C	710	LYS	-	expression tag	UNP B9VXM4
C	711	ILE	-	expression tag	UNP B9VXM4
C	712	GLU	-	expression tag	UNP B9VXM4
C	713	TRP	-	expression tag	UNP B9VXM4
C	714	HIS	-	expression tag	UNP B9VXM4
C	715	GLU	-	expression tag	UNP B9VXM4
C	716	LEU	-	expression tag	UNP B9VXM4
C	717	GLU	-	expression tag	UNP B9VXM4
C	718	VAL	-	expression tag	UNP B9VXM4
C	719	LEU	-	expression tag	UNP B9VXM4
C	720	PHE	-	expression tag	UNP B9VXM4
C	721	GLN	-	expression tag	UNP B9VXM4
C	722	GLY	-	expression tag	UNP B9VXM4

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Chain	Residue	Modelled	Actual	Comment	Reference
C	723	PRO	-	expression tag	UNP B9VXM4
C	724	GLY	-	expression tag	UNP B9VXM4
C	725	HIS	-	expression tag	UNP B9VXM4
C	726	HIS	-	expression tag	UNP B9VXM4
C	727	HIS	-	expression tag	UNP B9VXM4
C	728	HIS	-	expression tag	UNP B9VXM4
C	729	HIS	-	expression tag	UNP B9VXM4
C	730	HIS	-	expression tag	UNP B9VXM4
C	731	HIS	-	expression tag	UNP B9VXM4

- Molecule 2 is a protein called 1B03 Fab antibody Heavy Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	118	Total	C	N	O	S	0	0
			917	587	151	175	4		
2	F	118	Total	C	N	O	S	0	0
			917	587	151	175	4		
2	H	118	Total	C	N	O	S	0	0
			917	587	151	175	4		

- Molecule 3 is a protein called 1B03 Fab antibody Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	107	Total	C	N	O	S	0	0
			825	518	139	165	3		
3	G	107	Total	C	N	O	S	0	0
			825	518	139	165	3		
3	I	107	Total	C	N	O	S	0	0
			825	518	139	165	3		

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

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

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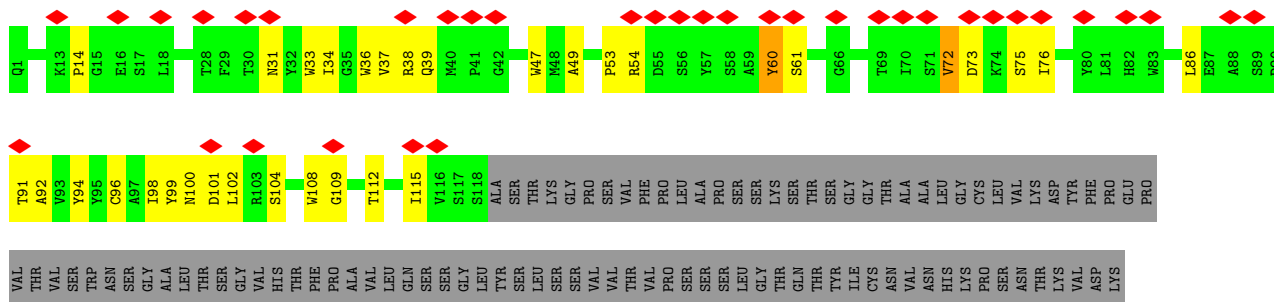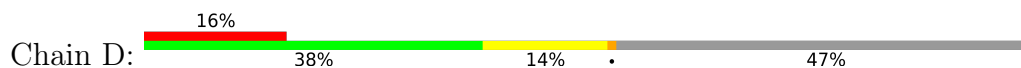| Mol	Chain	Residues	Atoms				AltConf	Trace
4	L	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).
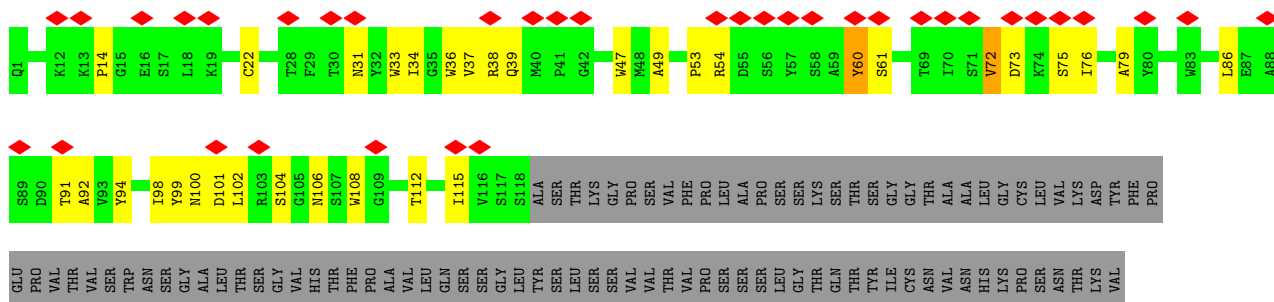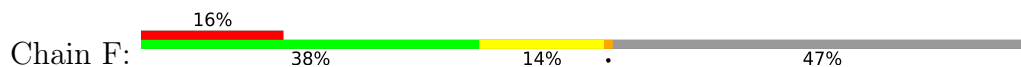

Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	B	1	Total	C	N	O	0
			14	8	1	5	
5	C	1	Total	C	N	O	0
			14	8	1	5	
5	C	1	Total	C	N	O	0
			14	8	1	5	

3 Residue-property plots ⓘ

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

Chain A:

• Molecule 1: Envelope glycoprotein B

Chain B:

• Molecule 1: Envelope glycoprotein B

Chain C:

45%   14% • 41%

ALA GLY ASN SER ALA TYR GLU TYR VAL ASP TYR LEU PHE LYS ARG MET ILE ASP LEU SER SER ILE SER THR VAL ASP SER MET ILE ALA L651 D652 I653 D654 P655 L656 D660 L666 E682 N688 Q692 R693 V694 K695 Y696 V697 E698 ASP LYS GLY LEU ASN ASP ILE PHE

GLU ALA GLN LYS ILE GLU TRP HIS GLU LEU GLU VAL LEU PHE GLN GLY PRO GLY HIS HIS HIS HIS HIS HIS

• Molecule 2: 1B03 Fab antibody Heavy Chain

Chain D:

16%

38%   14%   •   47%

Q1 K13 P14 G15 E16 S17 L18 T28 F29 T30 N31 Y32 W33 I34 G35 W36 V37 R38 Q39 M40 P41 G42 W47 M48 A49 P53 R54 D55 S56 Y57 S58 A59 Y60 S61 G66 T69 I70 S71 V72 D73 K74 S75 I76 Y80 L81 H82 W83 L86 E87 A88 S89 D90

T91 A92 V93 Y94 Y95 C96 A97 I98 Y99 N100 D101 L102 R103 S104 W108 G109 T112 I115 V116 S117 S118 ALA SER THR LYS GLY PRO SER VAL PHE PRO LEU ALA PRO SER SER LYS SER THR SER GLY GLY THR ALA ALA LEU GLY CYS LEU VAL LYS ASP TYR PHE PRO GLU PRO

VAL THR VAL SER TRP ASN SER GLY ALA LEU THR SER GLY VAL HIS THR PHE PRO ALA VAL LEU GLN SER SER GLY LEU TYR SER LEU SER SER VAL VAL THR VAL PRO SER SER SER LEU GLY THR GLN THR TYR ILE CYS ASN VAL ASN HIS LYS PRO SER ASN THR LYS VAL ASP LYS

ARG VAL GLU PRO LYS SER CYS ASP LYS

• Molecule 2: 1B03 Fab antibody Heavy Chain

Chain F:

16%

38%   14%   •   47%

Q1 K12 K13 P14 G15 E16 S17 L18 K19 C22 T28 F29 T30 N31 Y32 W33 I34 G35 W36 V37 R38 Q39 M40 P41 G42 W47 M48 A49 P53 R54 D55 S56 Y57 S58 A59 Y60 S61 T69 I70 S71 V72 D73 K74 S75 I76 A79 Y80 W83 L86 E87 A88

S89 D90 T91 A92 V93 Y94 I98 Y99 N100 D101 L102 R103 S104 G105 N106 S107 W108 G109 T112 I115 V116 S117 S118 ALA SER THR LYS GLY PRO SER VAL PHE PRO LEU ALA PRO SER SER LYS SER THR SER GLY GLY THR ALA ALA LEU GLY CYS LEU VAL LYS ASP TYR PHE PRO

GLU PRO VAL THR VAL SER TRP ASN SER GLY ALA LEU THR SER GLY VAL HIS THR PHE PRO ALA VAL LEU GLN SER SER GLY LEU TYR SER LEU SER SER VAL VAL THR VAL PRO SER SER SER LEU GLY THR GLN THR TYR ILE CYS ASN VAL ASN HIS LYS PRO SER ASN THR LYS VAL

ASP LYS ARG VAL GLU PRO LYS SER CYS ASP LYS

• Molecule 2: 1B03 Fab antibody Heavy Chain

Chain H:

17%

38%   14%   •   47%

Q1 E10 V11 K12 K13 P14 G15 E16 S17 L18 K19 T28 F29 T30 N31 Y32 W33 I34 G35 W36 V37 R38 Q39 M40 P41 G42 W47 M48 A49 F52 P53 R54 D55 S56 Y57 S58 A59 Y60 S61 P62 T69 I70 S71 V72 D73 K74 S75 I76 Y80 L81 H82 W83 L86

E87 A88 S89 D90 T91 A92 V93 Y94 Y95 C96 A97 I98 Y99 N100 D101 L102 R103 S104 G105 N106 S107 W108 G109 T112 I115 V116 S117 S118 ALA SER THR LYS GLY PRO SER VAL PHE PRO LEU ALA PRO SER SER LYS SER THR SER GLY GLY THR ALA ALA LEU GLY CYS LEU VAL LYS

ASP TYR PHE PRO GLU PRO VAL THR VAL SER TRP ASN SER GLY ALA LEU THR SER GLY VAL VAL HIS THR PHE PRO ALA VAL LEU GLN SER SER GLY LEU TYR SER LEU SER SER VAL VAL THR VAL PRO SER SER SER LEU GLY THR GLN THR TYR ILE CYS ASN VAL ASN HIS LYS PRO SER

ASN THR LYS VAL ASP LYS ARG VAL GLU PRO LYS SER CYS ASP LYS

• Molecule 3: 1B03 Fab antibody Light Chain

7%

Chain E: 33%   16%   •   50%

D1 Q6 S7 P8 L11 R18 I21 T22 C23 R24 Y32 L33 N34 W35 Y36 Q37 Q38 K39 P40 G41 R42 A43 P44 K45 L46 L47 I48 H49 T50 T51 L54 Q55 R61 G68 T69 D70 F71 T72 L73 T74 I75 L80 E81 Y86 Q89 Q90 S91 F92 S93

T94 L95 W96 T97 F98 G99 Q100 G101 T102 I106 K107 ARG THR VAL ALA ALA PRO SER VAL PHE ILE PHE PRO PRO SER ASP GLU GLN LEU LYS SER GLY THR ALA SER VAL VAL CYS LEU LEU ASN ASN PHE TYR PRO ARG GLU ALA LYS VAL GLN TRP LYS VAL ASP ASN ALA LEU GLN

SER GLY ASN SER GLN GLU SER VAL THR GLU GLN ASP SER LYS ASP SER THR TYR SER LEU SER SER THR LEU THR LEU SER LYS ALA ASP TYR GLU LYS HIS LYS VAL TYR ALA CYS GLU VAL THR HIS GLN GLY LEU SER SER PRO VAL THR LYS SER PHE ASN ARG GLY GLU CYS

• Molecule 3: 1B03 Fab antibody Light Chain

7%

Chain G: 33%   16%   50%

D1 Q6 S7 P8 S9 S10 L11 D17 R18 I21 T22 C23 R24 Y32 L33 N34 W35 Y36 Q37 P40 G41 R42 A43 P44 K45 L46 L47 I48 H49 T50 T51 L54 Q55 R61 G68 T69 D70 F71 T72 L73 T74 I75 S76 S77 L78 Q79 L80 E81 Y86 Q89

Q90 S91 F92 L95 W96 T97 F98 G99 Q100 G101 T102 I106 K107 ARG THR VAL ALA ALA PRO SER VAL PHE ILE PHE PRO PRO SER ASP GLU GLN LEU LYS SER GLY THR ALA SER VAL VAL CYS LEU LEU ASN ASN PHE TYR PRO ARG GLU ALA LYS VAL GLN TRP LYS VAL ASP ASN

ALA LEU GLN SER GLY ASN SER GLN GLU SER VAL THR GLU GLN ASP SER LYS ASP SER THR TYR SER LEU SER SER THR LEU THR LEU SER LYS ALA ASP TYR GLU LYS HIS LYS VAL TYR ALA CYS GLU VAL THR HIS GLN GLY LEU SER SER PRO VAL THR LYS SER PHE ASN ARG GLY

GLU CYS

• Molecule 3: 1B03 Fab antibody Light Chain

7%

Chain I: 32%   17%   50%

D1 Q6 S7 P8 S9 S10 L11 D17 R18 I21 T22 C23 R24 Y32 L33 N34 W35 Y36 Q37 P40 G41 R42 A43 P44 K45 L46 L47 I48 H49 T50 T51 L54 Q55 P59 S60 R61 G68 T69 D70 F71 T72 L73 T74 I75 S76 S77 L78 Q79 L80 E81 Y86

Q89 Q90 S91 F92 L95 W96 T97 F98 G99 Q100 G101 T102 I106 K107 ARG THR VAL ALA ALA PRO SER VAL PHE ILE PHE PRO PRO SER ASP GLU GLN LEU LYS SER GLY THR ALA SER VAL VAL CYS LEU LEU ASN ASN PHE TYR PRO ARG GLU ALA LYS VAL GLN TRP LYS VAL ASP VAL

ASP ASN ALA LEU GLN SER GLY ASN SER GLN GLU SER VAL THR GLU GLN ASP SER LYS ASP SER THR TYR SER LEU SER SER THR LEU THR LEU SER LYS ALA ASP TYR GLU LYS HIS LYS VAL TYR ALA CYS GLU VAL THR HIS GLN GLY LEU SER SER PRO VAL THR LYS SER PHE ASN

ARG GLY GLU CYS

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

Chain J: 100%

MAG1
NAG2

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

Chain K: 100%

MAG1
NAG2

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

Chain L: 100%

MAG1
NAG2

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	185463	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 $(e^-/\text{Å}^2)$	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.066	Depositor
Minimum map value	-0.031	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.009	Depositor
Map size (Å)	308.16, 308.16, 308.16	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.856, 0.856, 0.856	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.24	0/3645	0.47	0/4942
1	B	0.24	0/3645	0.47	0/4942
1	C	0.24	0/3645	0.47	0/4942
2	D	0.24	0/943	0.48	0/1283
2	F	0.24	0/943	0.48	0/1283
2	H	0.24	0/943	0.48	0/1283
3	E	0.24	0/842	0.52	0/1141
3	G	0.24	0/842	0.52	0/1141
3	I	0.24	0/842	0.52	0/1141
All	All	0.24	0/16290	0.48	0/22098

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 ⓘ

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	3562	0	3423	77	0
1	B	3562	0	3423	76	0
1	C	3562	0	3423	76	0
2	D	917	0	884	22	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	917	0	884	22	0
2	H	917	0	884	22	0
3	E	825	0	812	23	0
3	G	825	0	812	22	0
3	I	825	0	812	23	0
4	J	28	0	25	0	0
4	K	28	0	25	0	0
4	L	28	0	25	0	0
5	A	28	0	26	0	0
5	B	28	0	26	0	0
5	C	28	0	26	0	0
All	All	16080	0	15510	301	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 10.

The worst 5 of 301 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:313:ASN:HD21	3:E:92:PHE:HA	1.48	0.77
3:E:18:ARG:HA	3:E:75:ILE:O	1.85	0.77
3:I:18:ARG:HA	3:I:75:ILE:O	1.85	0.76
3:G:18:ARG:HA	3:G:75:ILE:O	1.87	0.75
1:B:313:ASN:HD21	3:G:92:PHE:HA	1.54	0.72

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	428/731 (58%)	408 (95%)	18 (4%)	2 (0%)	29 68

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	428/731 (58%)	407 (95%)	19 (4%)	2 (0%)	29	68
1	C	428/731 (58%)	408 (95%)	18 (4%)	2 (0%)	29	68
2	D	116/223 (52%)	103 (89%)	12 (10%)	1 (1%)	17	55
2	F	116/223 (52%)	104 (90%)	11 (10%)	1 (1%)	17	55
2	H	116/223 (52%)	103 (89%)	12 (10%)	1 (1%)	17	55
3	E	105/214 (49%)	98 (93%)	7 (7%)	0	100	100
3	G	105/214 (49%)	97 (92%)	8 (8%)	0	100	100
3	I	105/214 (49%)	97 (92%)	8 (8%)	0	100	100
All	All	1947/3504 (56%)	1825 (94%)	113 (6%)	9 (0%)	32	68

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	410	GLN
2	D	72	VAL
1	B	410	GLN
2	F	72	VAL
1	C	410	GLN

5.3.2 Protein sidechains ⓘ

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	395/659 (60%)	386 (98%)	9 (2%)	50	80
1	B	395/659 (60%)	386 (98%)	9 (2%)	50	80
1	C	395/659 (60%)	385 (98%)	10 (2%)	47	79
2	D	99/190 (52%)	95 (96%)	4 (4%)	31	68
2	F	99/190 (52%)	95 (96%)	4 (4%)	31	68
2	H	99/190 (52%)	95 (96%)	4 (4%)	31	68
3	E	95/191 (50%)	87 (92%)	8 (8%)	11	38
3	G	95/191 (50%)	87 (92%)	8 (8%)	11	38

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	I	95/191 (50%)	87 (92%)	8 (8%)	11	38
All	All	1767/3120 (57%)	1703 (96%)	64 (4%)	38	70

5 of 64 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	I	33	LEU
3	I	50	THR
1	B	222	HIS
1	B	185	CYS
3	I	51	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 22 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	212	GLN
1	C	383	ASN
1	C	284	ASN
1	C	485	GLN
2	D	106	ASN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

6 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	J	1	4,1	14,14,15	0.23	0	17,19,21	0.39	0
4	NAG	J	2	4	14,14,15	0.22	0	17,19,21	0.45	0
4	NAG	K	1	4,1	14,14,15	0.23	0	17,19,21	0.39	0
4	NAG	K	2	4	14,14,15	0.24	0	17,19,21	0.46	0
4	NAG	L	1	4,1	14,14,15	0.23	0	17,19,21	0.39	0
4	NAG	L	2	4	14,14,15	0.22	0	17,19,21	0.46	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	J	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	J	2	4	-	0/6/23/26	0/1/1/1
4	NAG	K	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	K	2	4	-	0/6/23/26	0/1/1/1
4	NAG	L	1	4,1	-	2/6/23/26	0/1/1/1
4	NAG	L	2	4	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	K	1	NAG	O5-C5-C6-O6
4	L	1	NAG	O5-C5-C6-O6
4	J	1	NAG	O5-C5-C6-O6
4	K	1	NAG	C4-C5-C6-O6
4	L	1	NAG	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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

Oligosaccharide Chain J

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain K

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain L

Bond lengths

Bond angles

Torsions

Rings
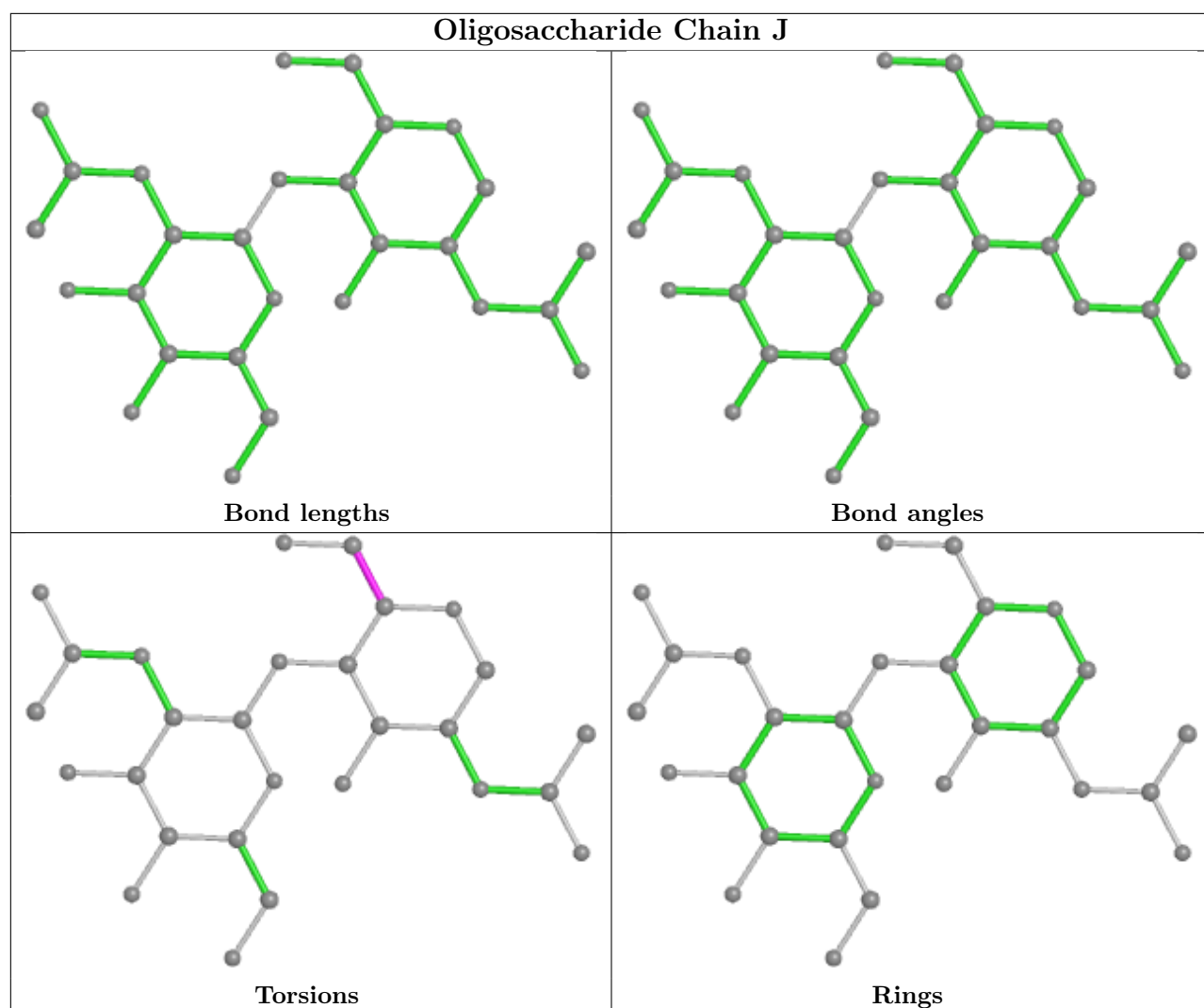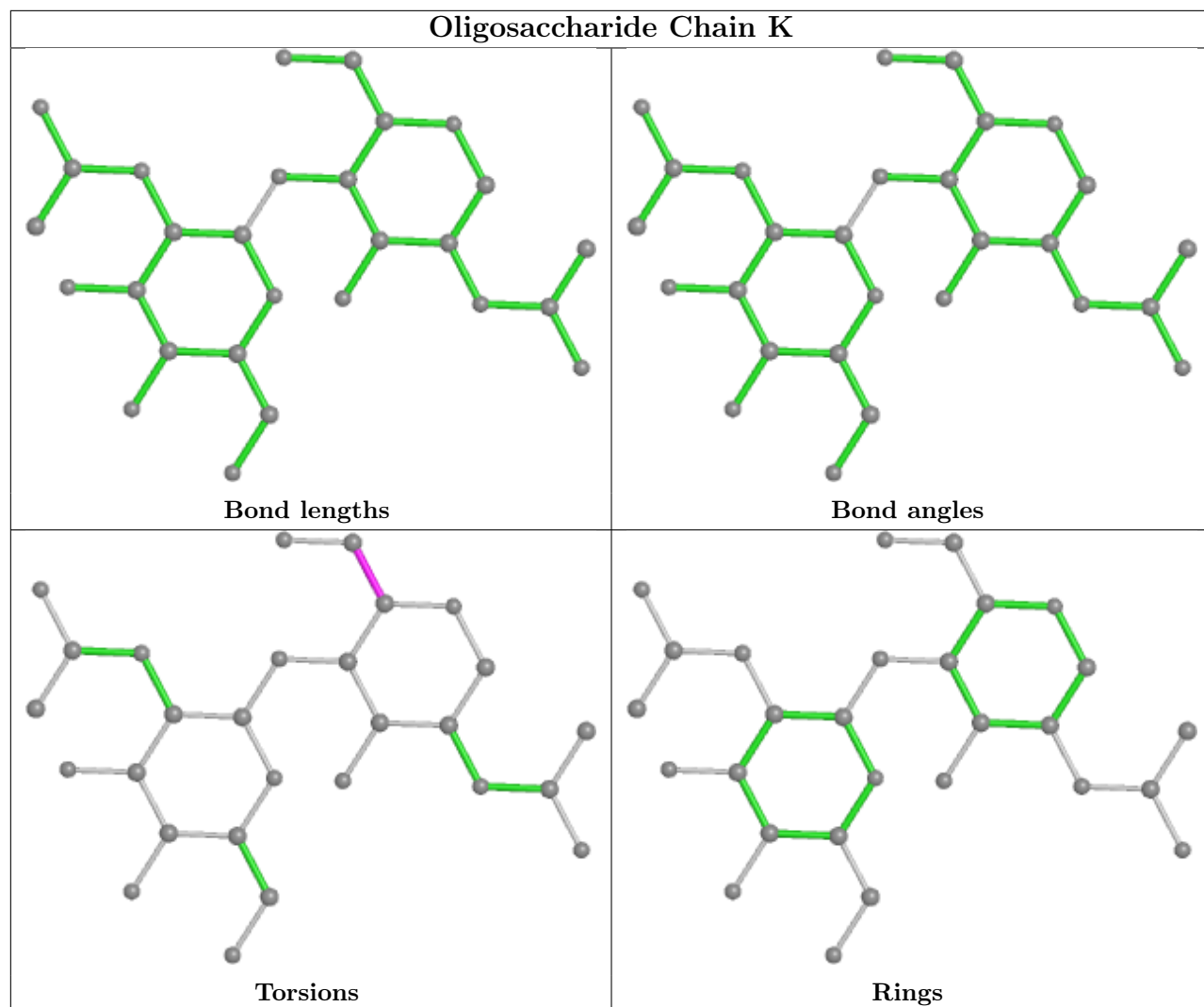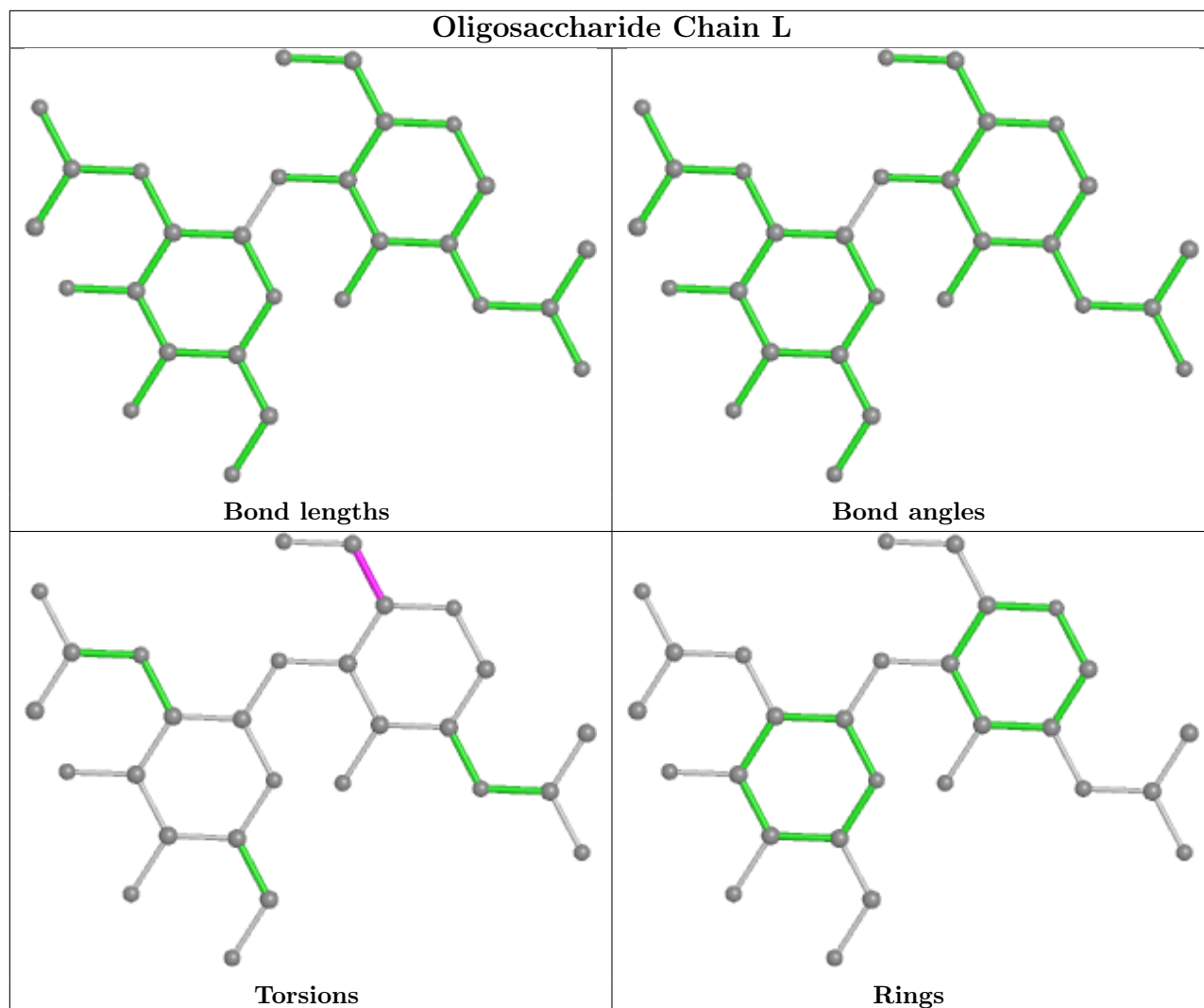
5.6　Ligand geometry　ⓘ

6 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	801	1	14,14,15	0.22	0	17,19,21	0.39	0
5	NAG	C	801	1	14,14,15	0.21	0	17,19,21	0.39	0
5	NAG	C	802	1	14,14,15	0.28	0	17,19,21	0.36	0
5	NAG	A	802	1	14,14,15	0.28	0	17,19,21	0.36	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	NAG	B	802	1	14,14,15	0.28	0	17,19,21	0.36	0
5	NAG	B	801	1	14,14,15	0.21	0	17,19,21	0.40	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	801	1	-	1/6/23/26	0/1/1/1
5	NAG	C	801	1	-	1/6/23/26	0/1/1/1
5	NAG	C	802	1	-	0/6/23/26	0/1/1/1
5	NAG	A	802	1	-	0/6/23/26	0/1/1/1
5	NAG	B	802	1	-	0/6/23/26	0/1/1/1
5	NAG	B	801	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 (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	801	NAG	O5-C5-C6-O6
5	B	801	NAG	O5-C5-C6-O6
5	C	801	NAG	O5-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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

Ligand NAG A 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 801

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 802

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 802

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 802

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 801

Bond lengths

Bond angles

Torsions

Rings
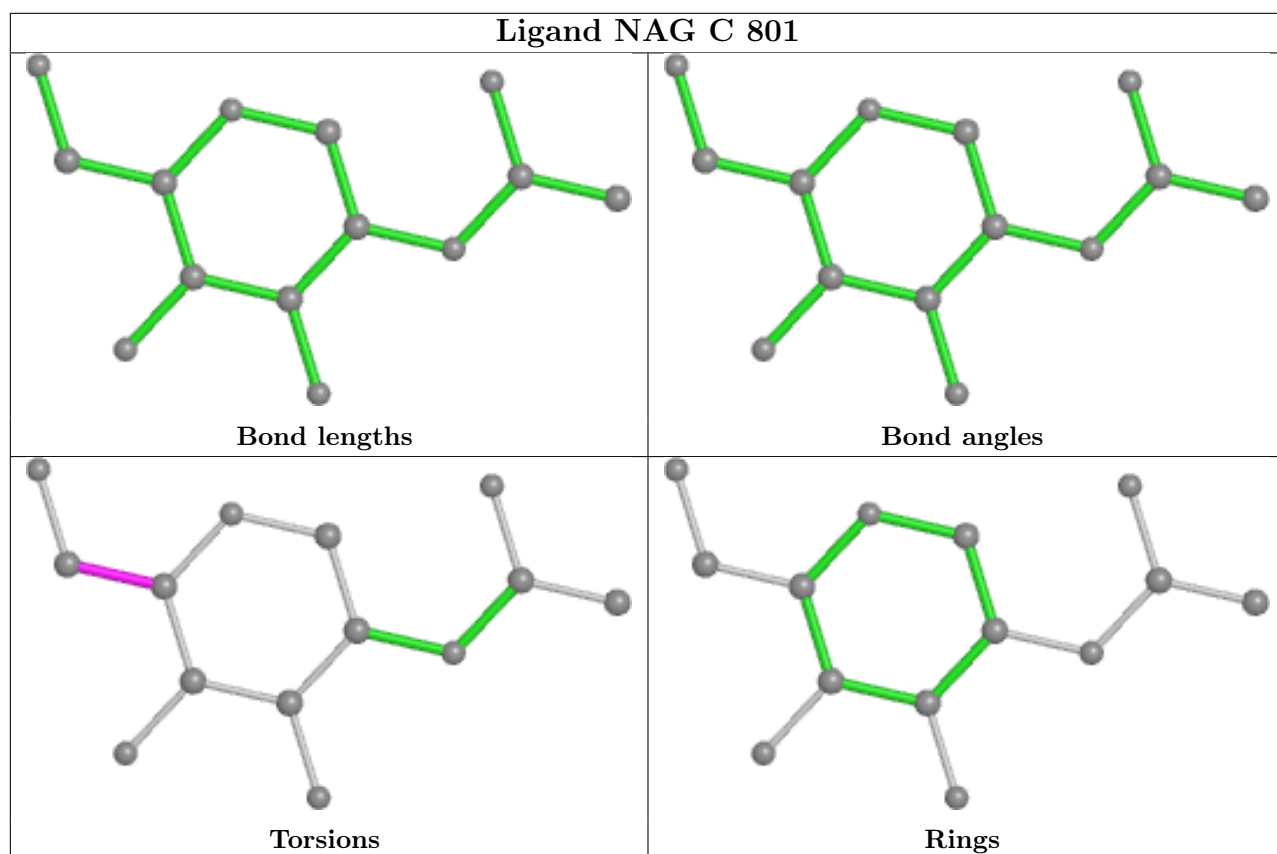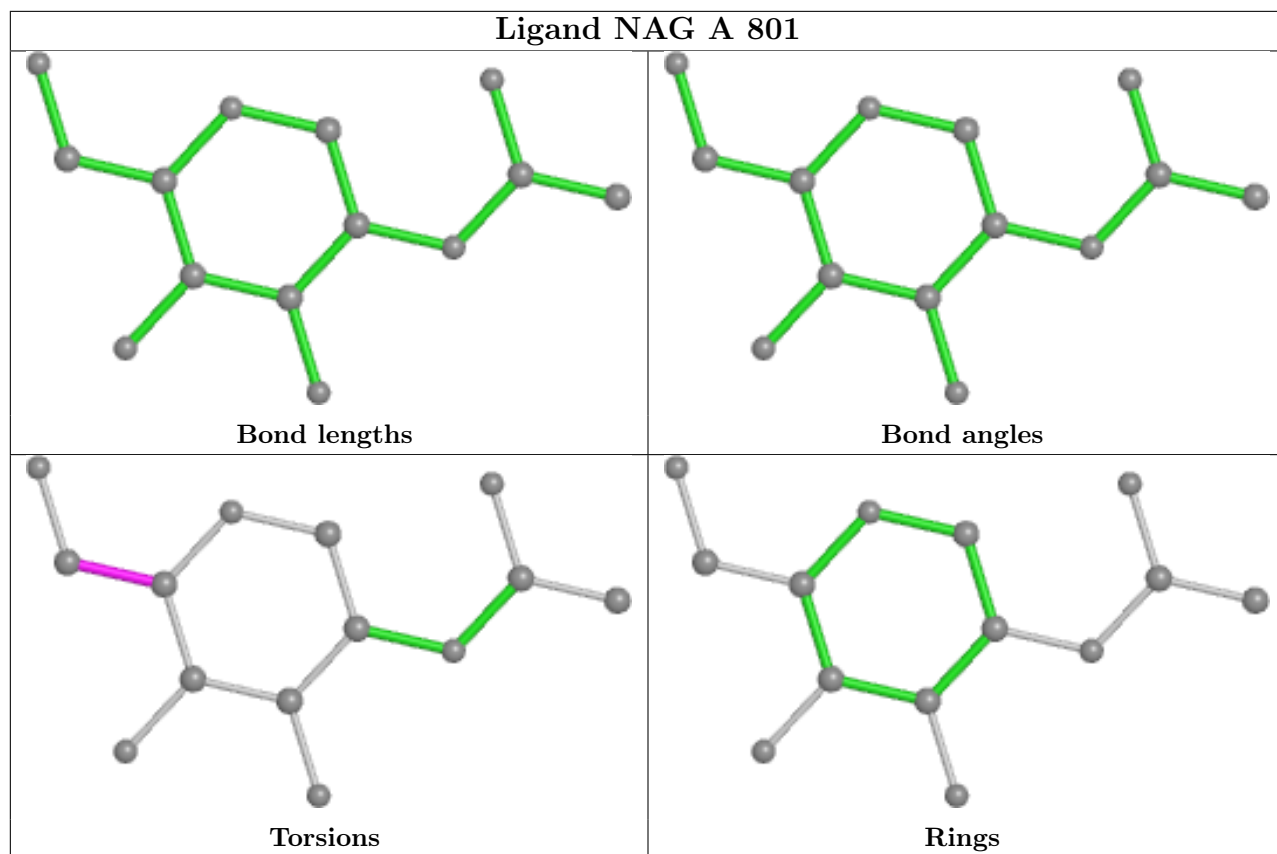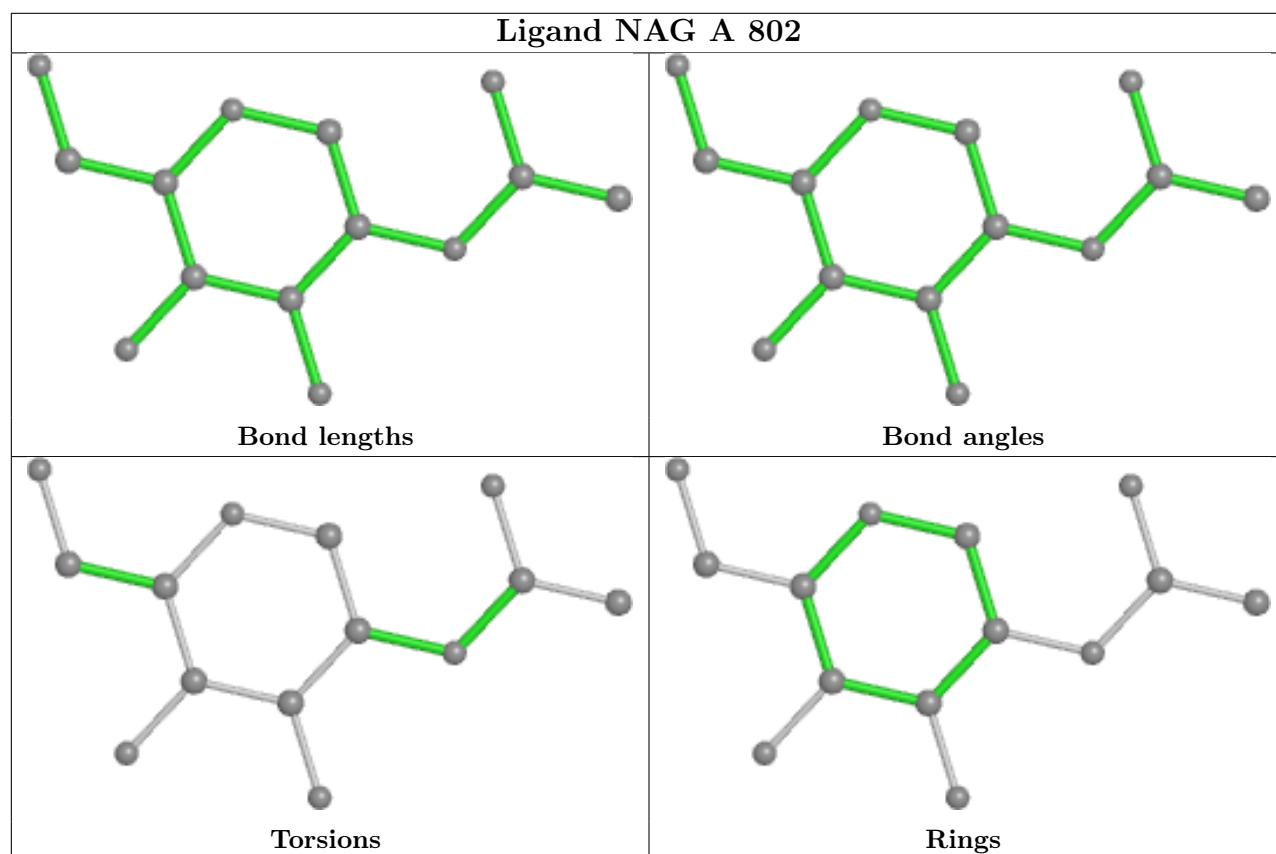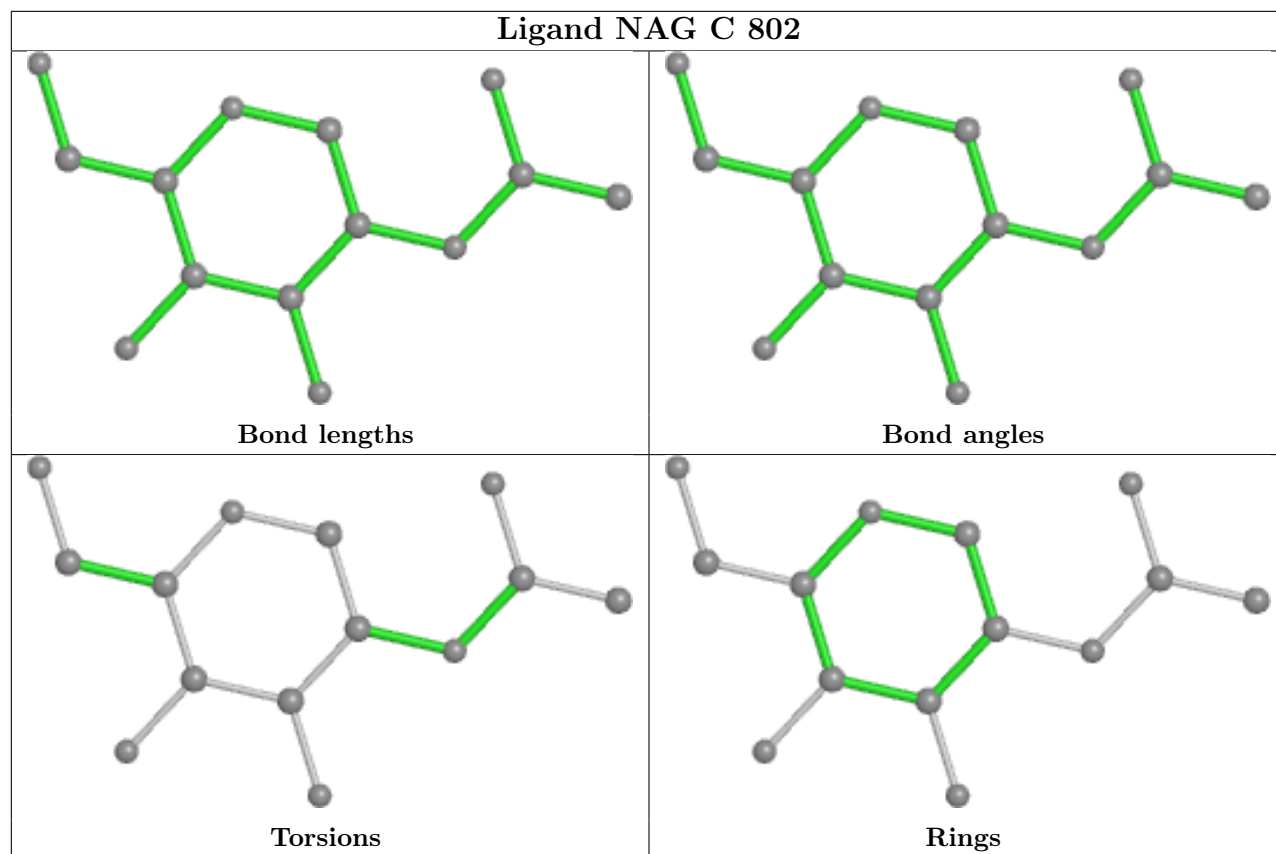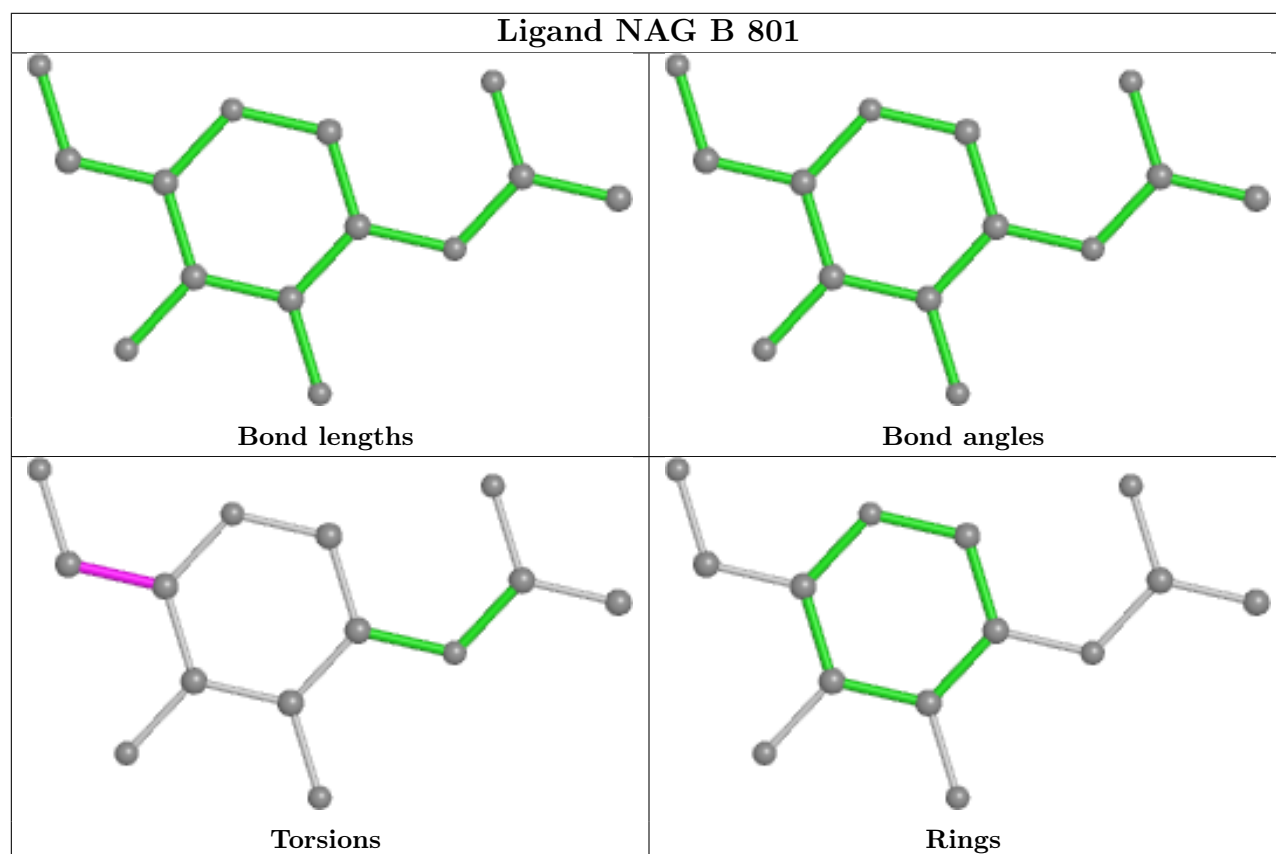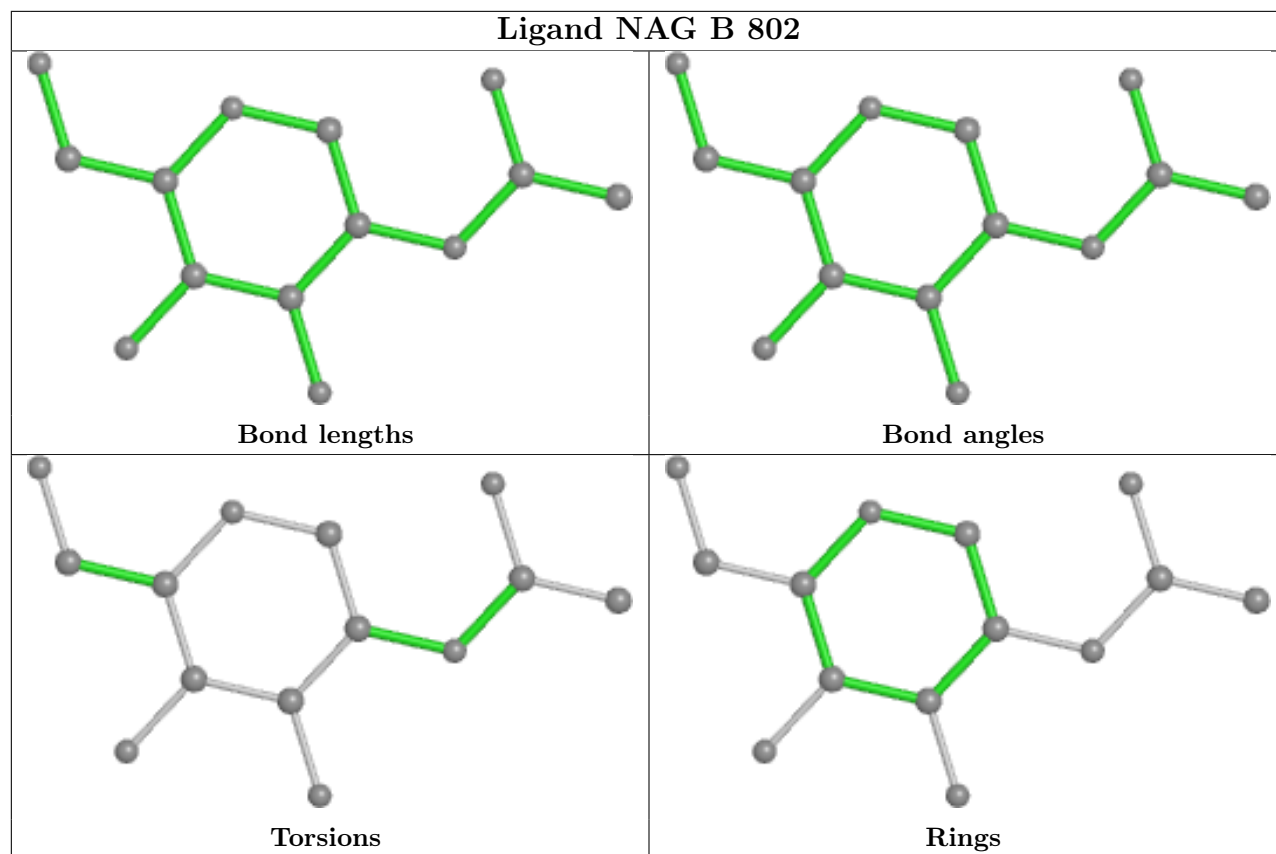
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6　Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-34063. 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
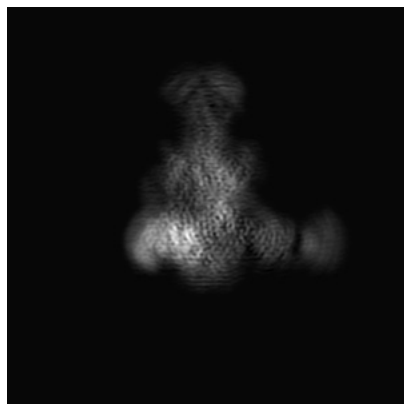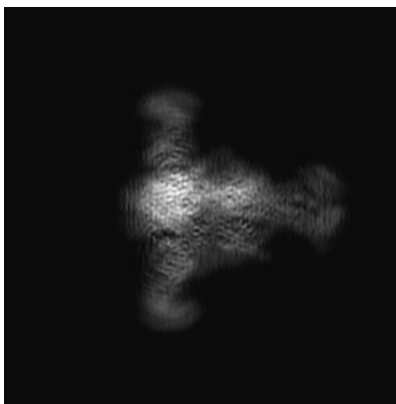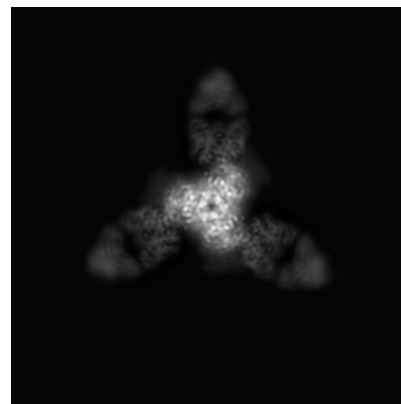
| X | Y | Z |

6.1.2　Raw map

| X | Y | Z |
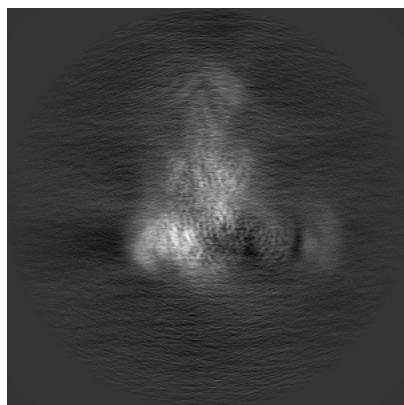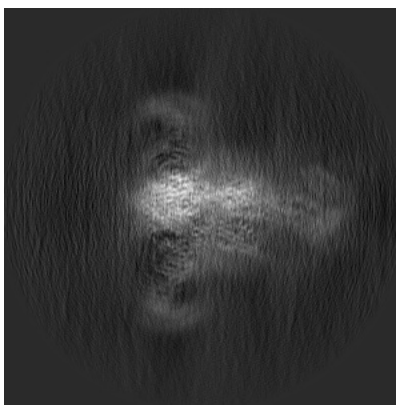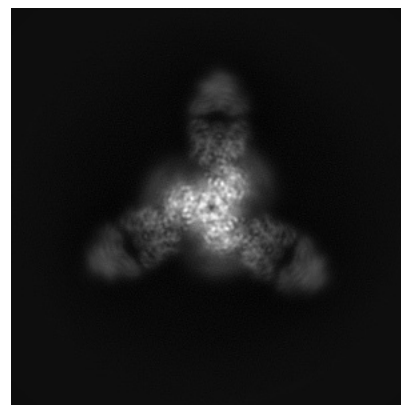
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
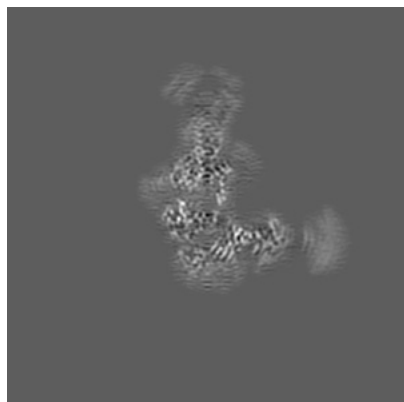
6.2.1   Primary map
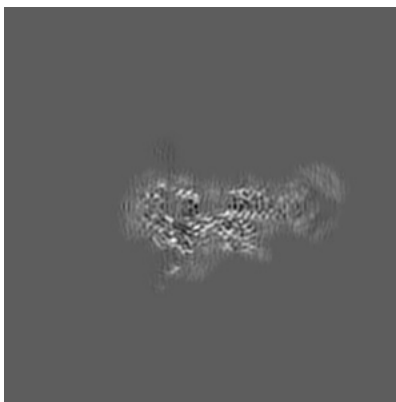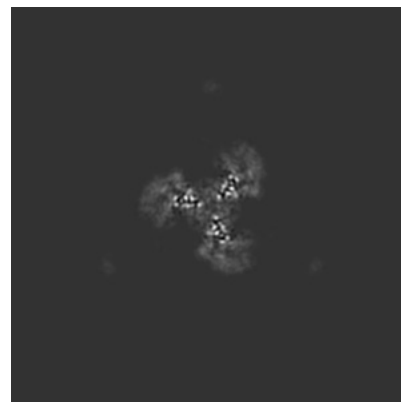
X Index: 180   Y Index: 180   Z Index: 180

6.2.2   Raw map
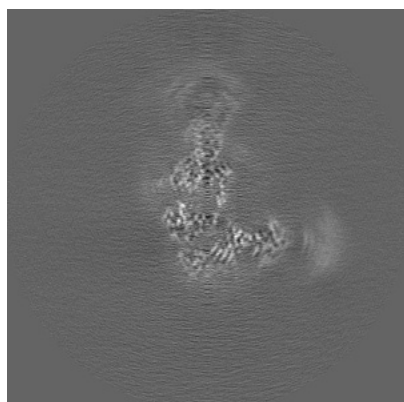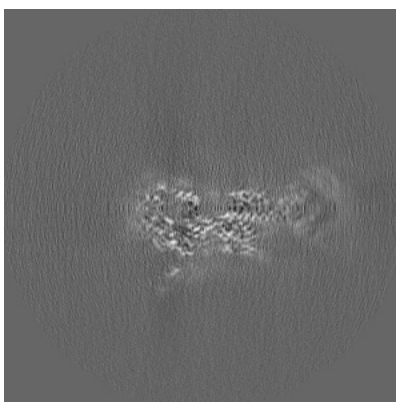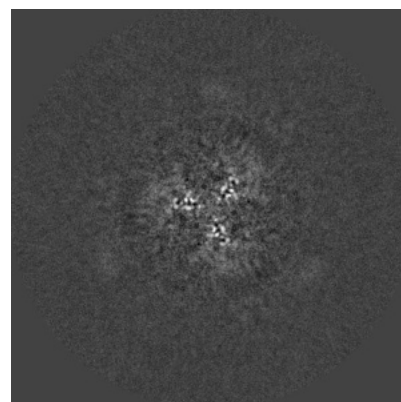
X Index: 180   Y Index: 180   Z Index: 180

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

6.3   Largest variance slices ⓘ

6.3.1   Primary map
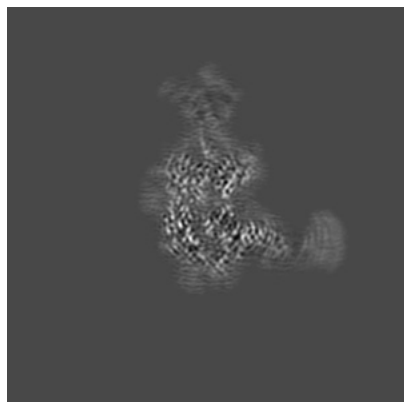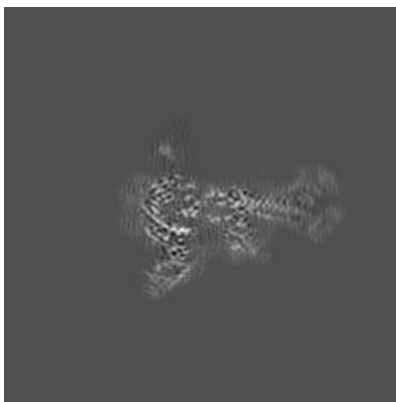
| X Index: 192 | Y Index: 172 | Z Index: 159 |
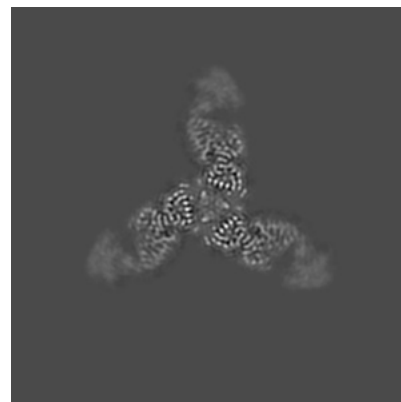
6.3.2   Raw map
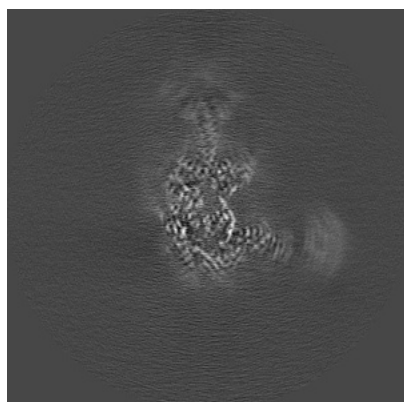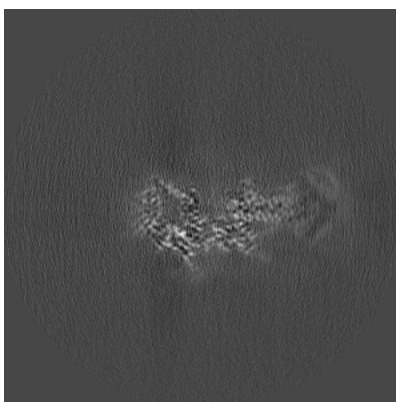
| X Index: 189 | Y Index: 183 | Z Index: 158 |
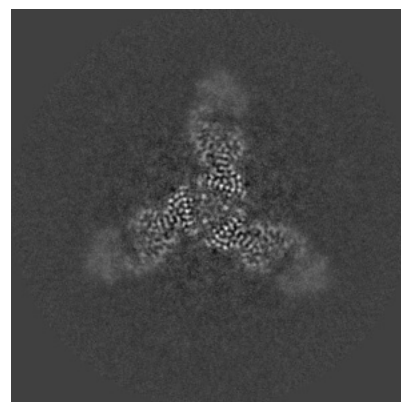
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
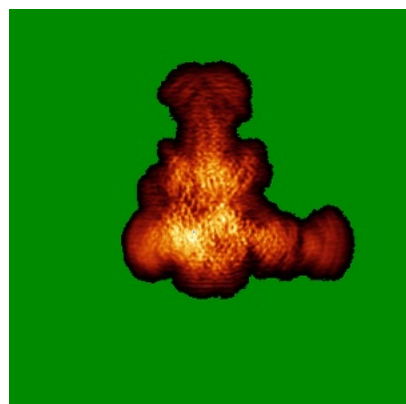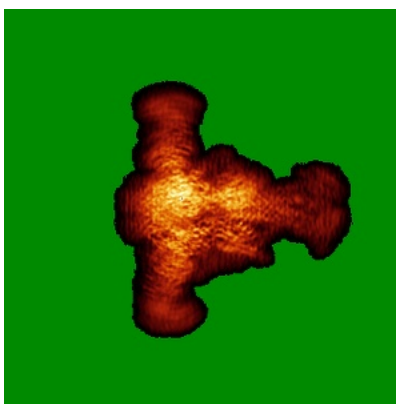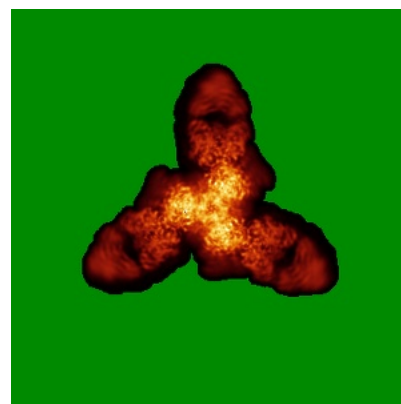
| X | Y | Z |

6.4.2 Raw map

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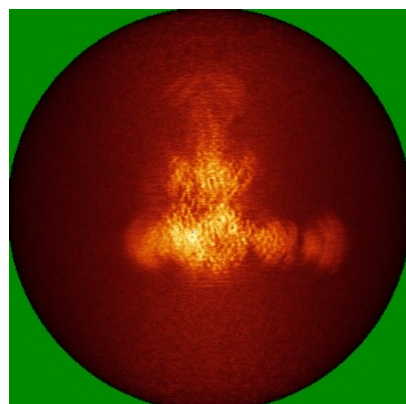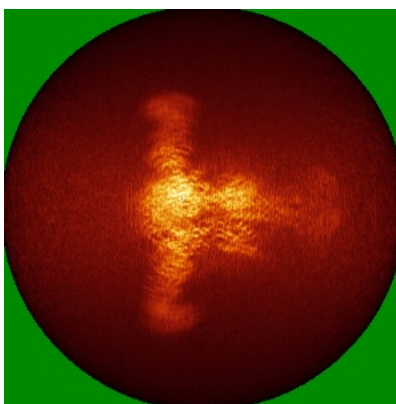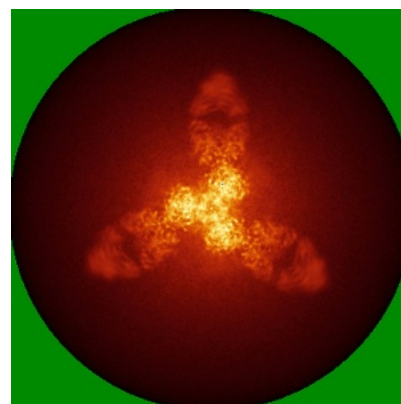
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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 0.009. 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 |
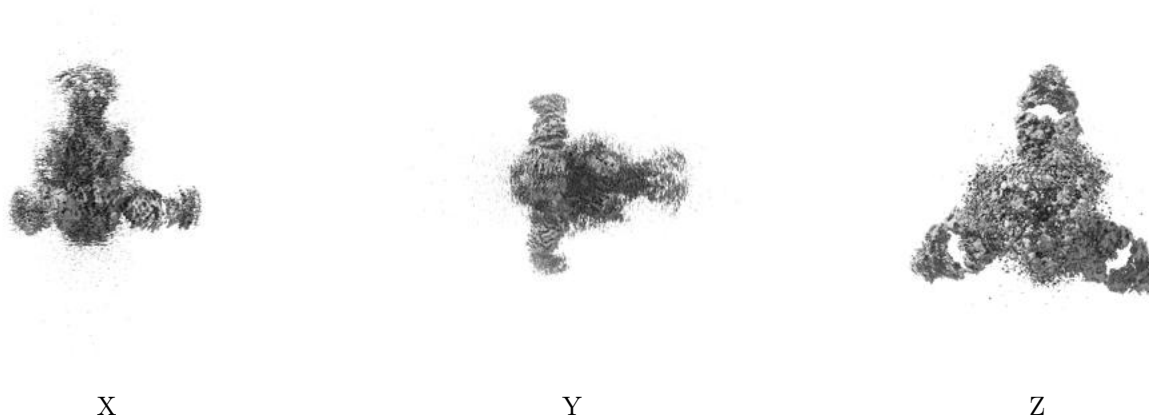
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

7　Map analysis ⓘ

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

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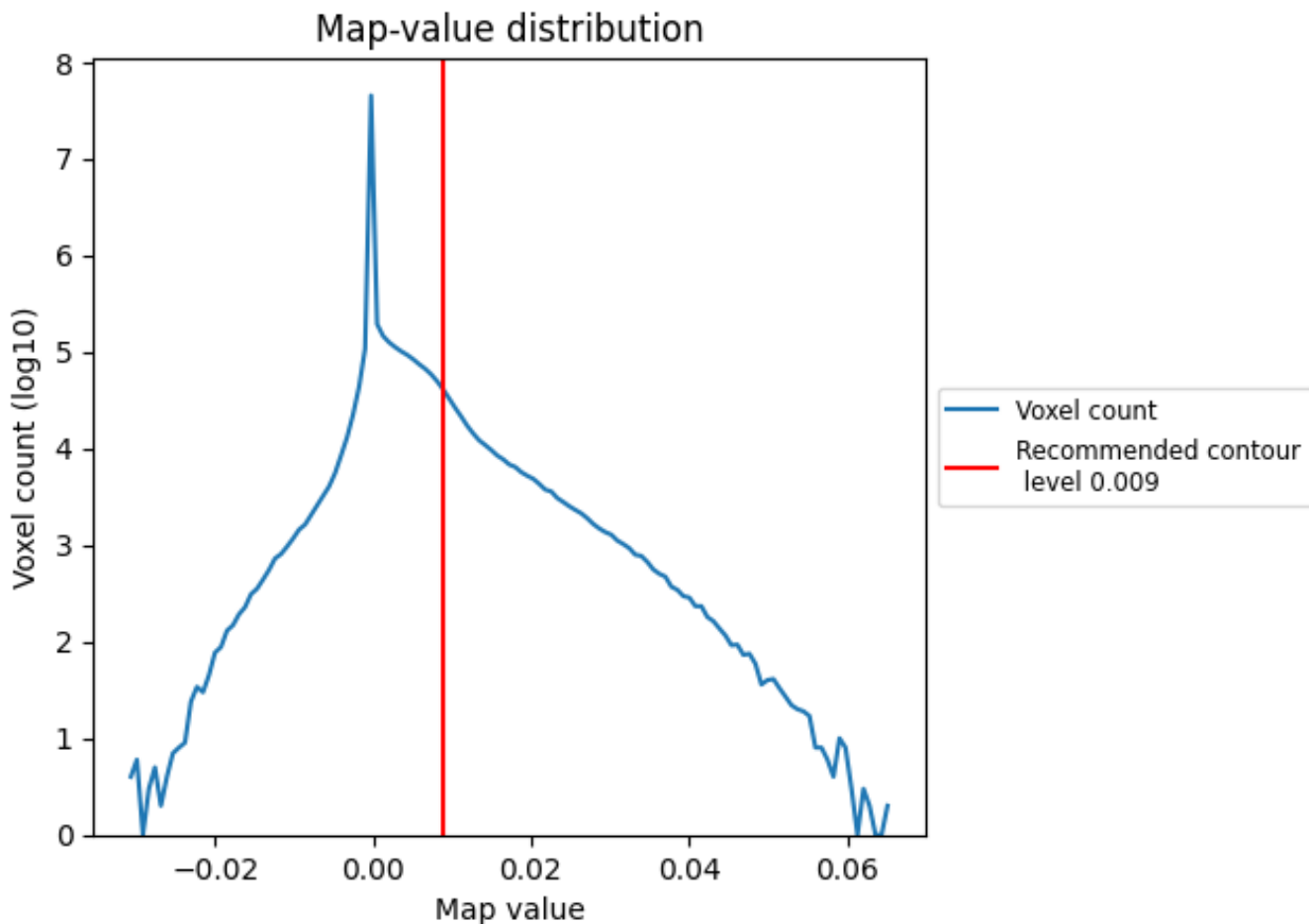
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
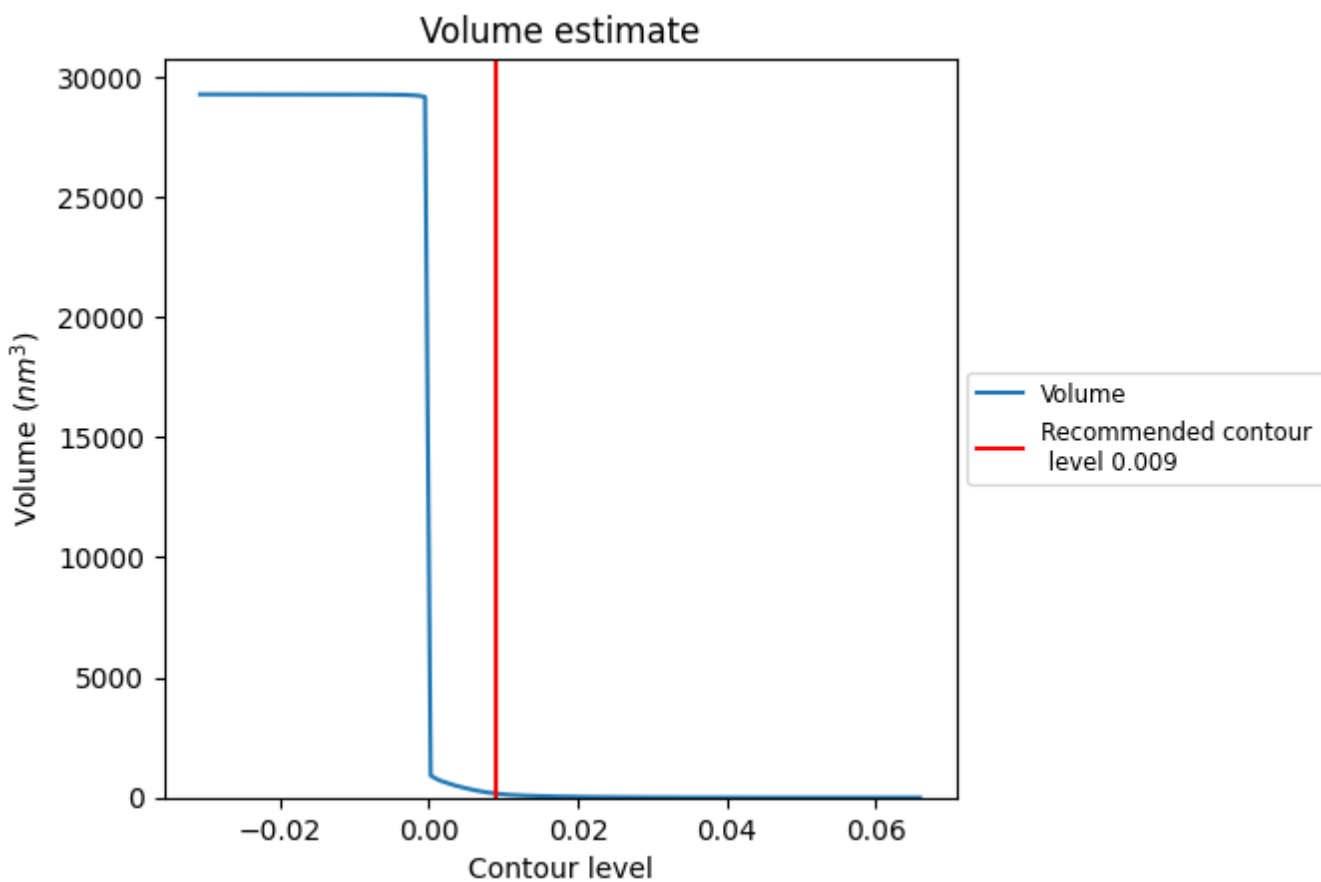
The volume at the recommended contour level is 167 nm^3; this corresponds to an approximate mass of 151 kDa.

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 ⓘ
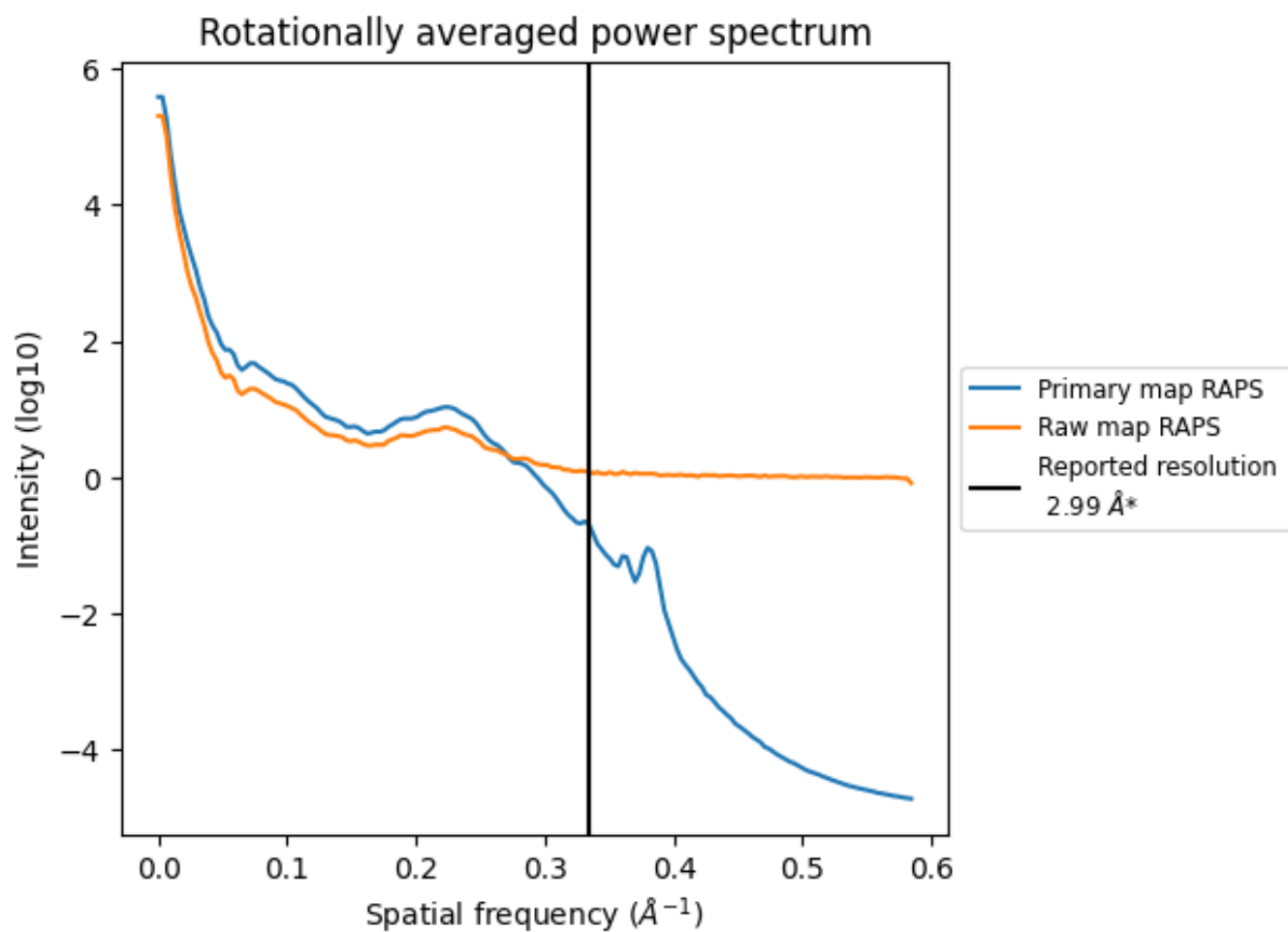
*Reported resolution corresponds to spatial frequency of 0.334 Å^{-1}

8　Fourier-Shell correlation ⓘ

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 ⓘ
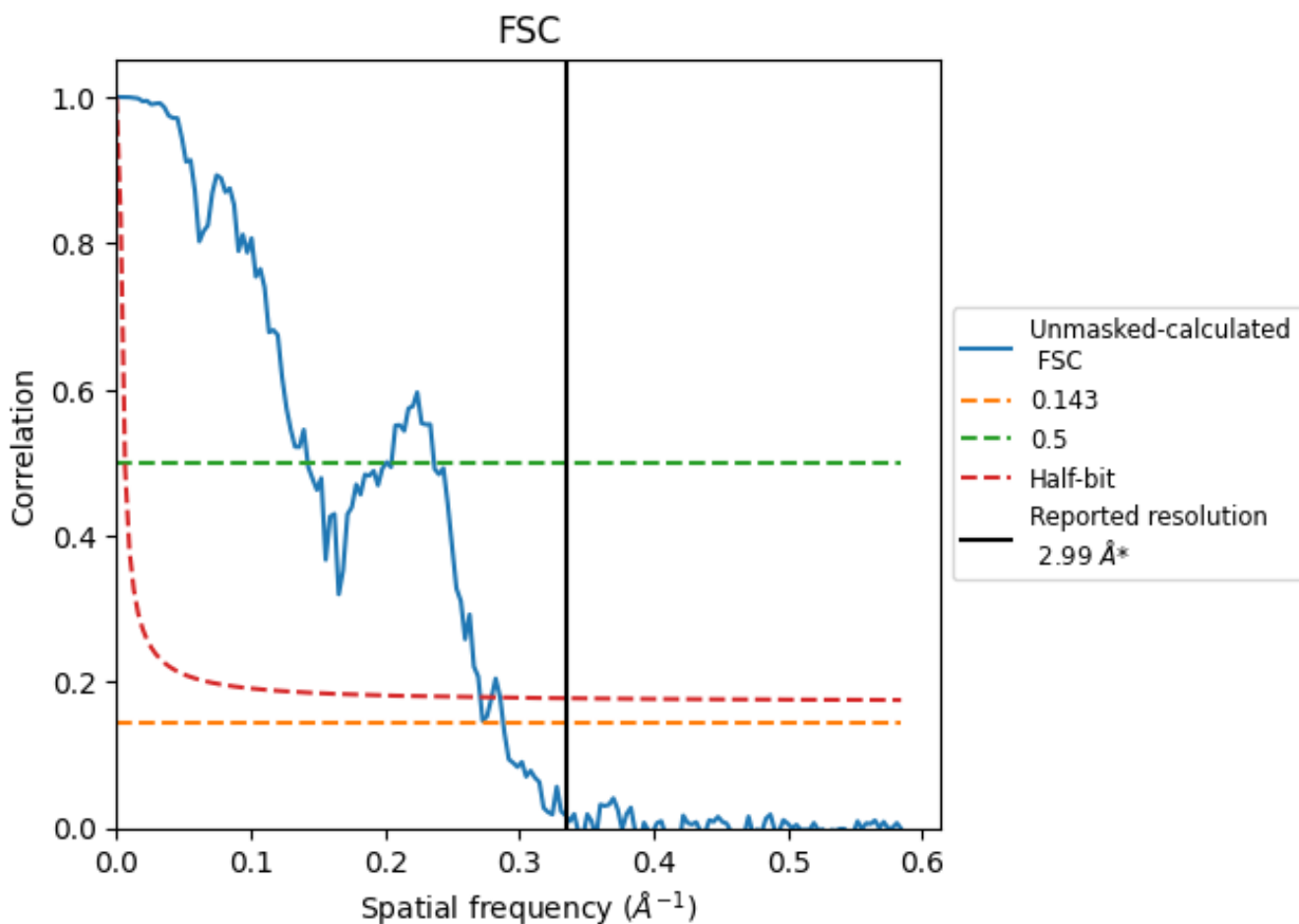
*Reported resolution corresponds to spatial frequency of 0.334 Å^{-1}

8.2 Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.99	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.47	7.02	3.69

*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 3.47 differs from the reported value 2.99 by more than 10 %

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-34063 and PDB model 7YRN. Per-residue inclusion information can be found in section 3 on page 9.

9.1   Map-model overlay ⓘ

X   Y   Z
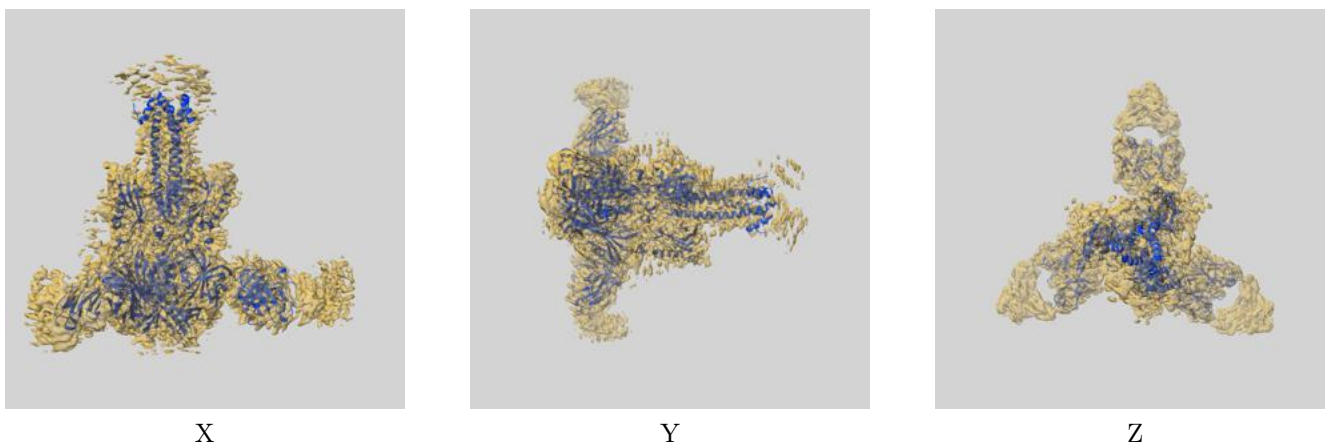
The images above show the 3D surface view of the map at the recommended contour level 0.009 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

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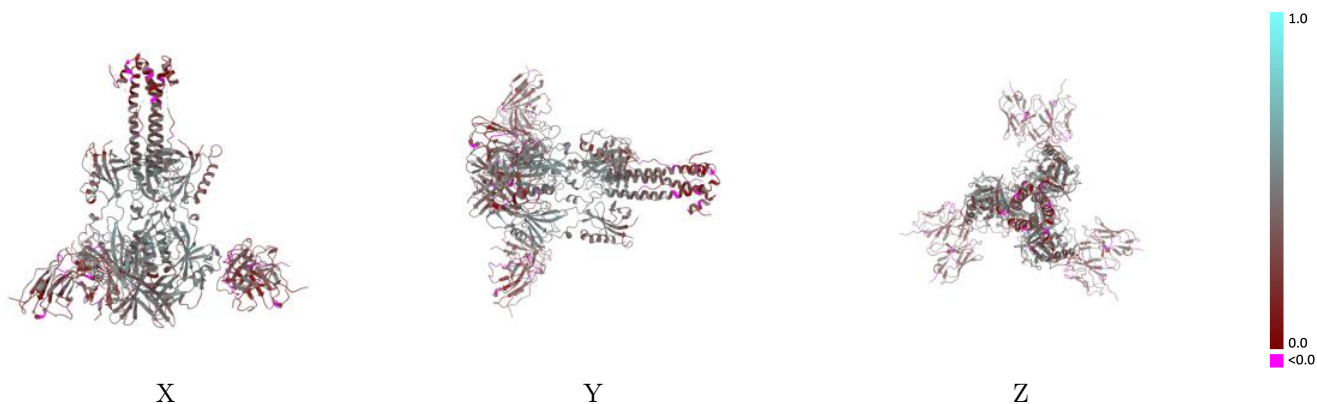
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X   Y   Z
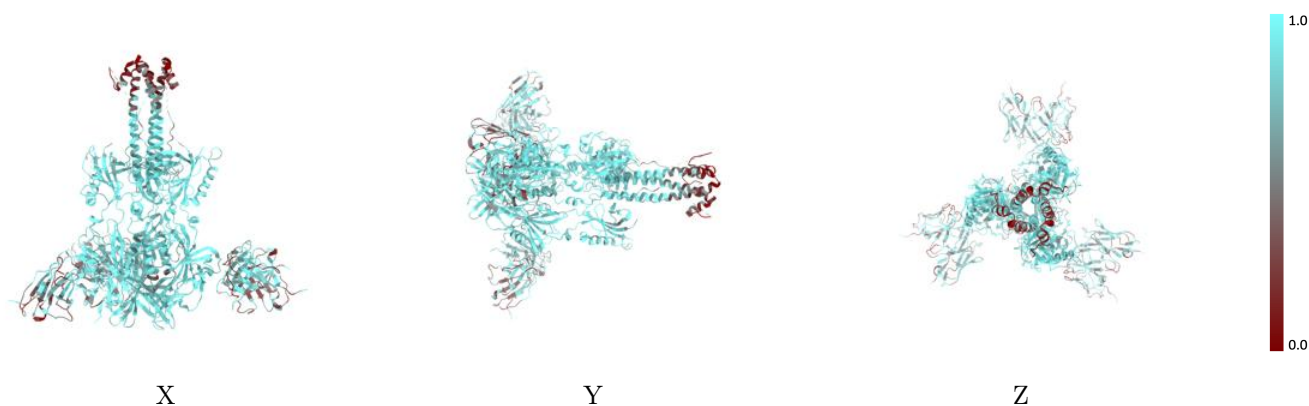
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.009).

9.4 Atom inclusion ⓘ
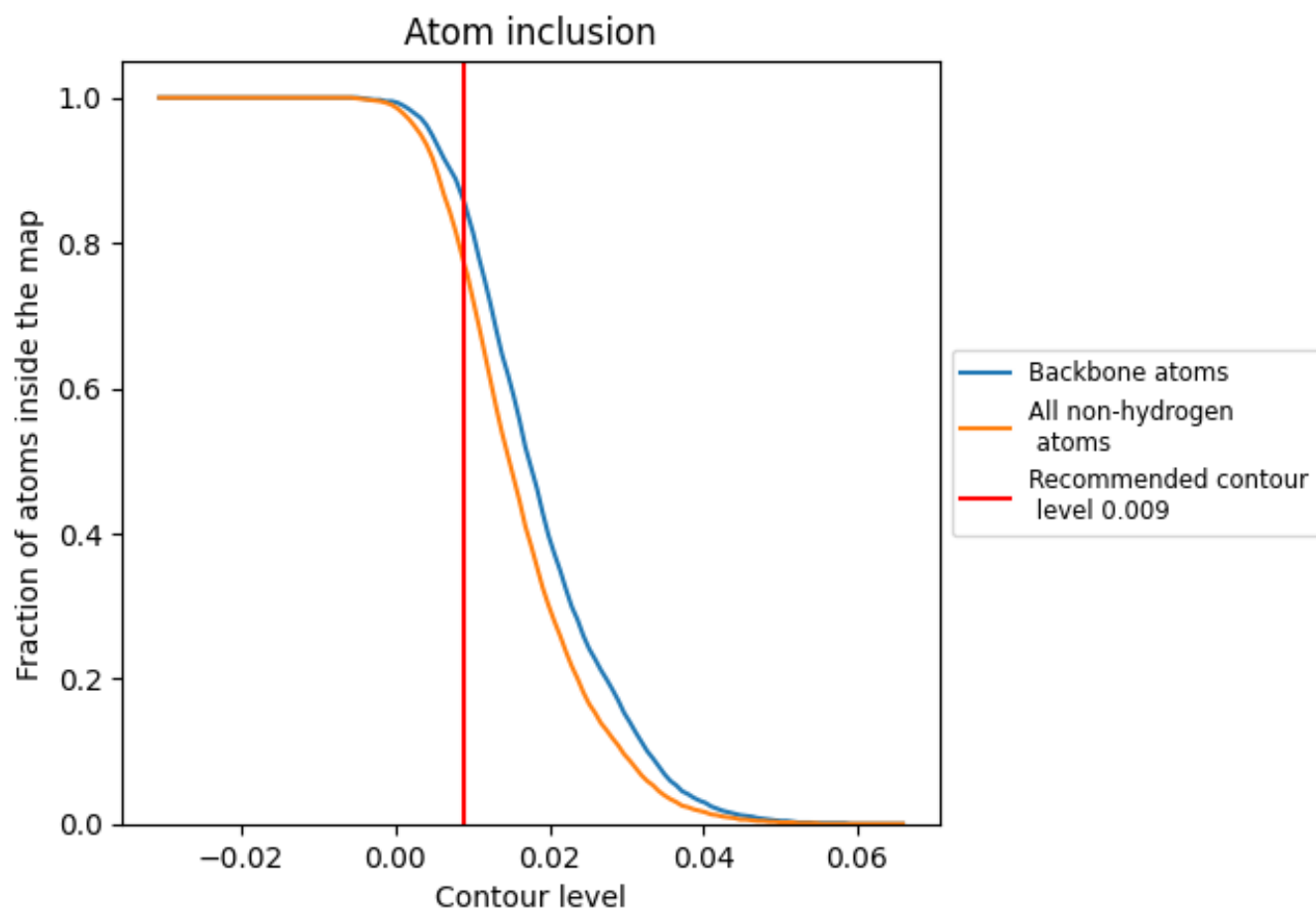
At the recommended contour level, 85% of all backbone atoms, 77% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.009) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7680	0.3750
A	0.8340	0.4270
B	0.8340	0.4260
C	0.8350	0.4280
D	0.5850	0.2560
E	0.6910	0.2790
F	0.5740	0.2560
G	0.6940	0.2790
H	0.5690	0.2550
I	0.6910	0.2800
J	0.8930	0.4820
K	0.8930	0.4590
L	0.8930	0.4790

1.0

0.0
<0.0