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wwPDB EM Validation Summary Report (i)

Jun 26, 2023 – 12:13 PM JST

PDB ID	:	7YSH
EMDB ID	:	EMD-34075
Title	:	Cryo-EM Structure of FGF23-FGFR1c-aKlotho-HS Quaternary Complex
Authors	:	Mohammadi, M.; Chen, L.
Deposited on	:	2022-08-12
Resolution	:	2.74 Å(reported)

This is a wwPDB EM Validation Summary 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:

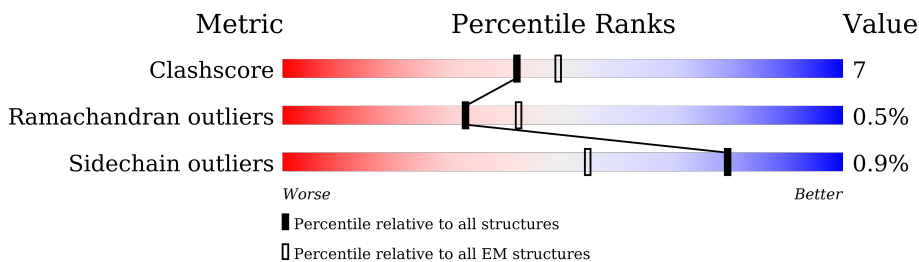|		
EMDB validation analysis	:	0.0.1.dev50
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.33

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 2.74 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		7
Ramachandran outliers		0.5%
Sidechain outliers		0.9%

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	948	83% · · · 14% ·
2	B	273	8% · 48% 16% ·· 34%
3	D	234	· 77% 14% 9%
3	E	234	22% 67% 23% · 9%
4	F	9	33% 44% 56%

2   Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 12480 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 Klotho.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	921	Total 7527	C 4877	N 1281	O 1340	S 29	0	0

- Molecule 2 is a protein called Fibroblast growth factor 23.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	179	Total 1442	C 913	N 265	O 257	S 7	0	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-21	MET	-	initiating methionine	UNP Q9GZV9
B	-20	HIS	-	expression tag	UNP Q9GZV9
B	-19	HIS	-	expression tag	UNP Q9GZV9
B	-18	HIS	-	expression tag	UNP Q9GZV9
B	-17	HIS	-	expression tag	UNP Q9GZV9
B	-16	HIS	-	expression tag	UNP Q9GZV9
B	-15	HIS	-	expression tag	UNP Q9GZV9
B	-14	SER	-	expression tag	UNP Q9GZV9
B	-13	SER	-	expression tag	UNP Q9GZV9
B	-12	GLY	-	expression tag	UNP Q9GZV9
B	-11	LEU	-	expression tag	UNP Q9GZV9
B	-10	VAL	-	expression tag	UNP Q9GZV9
B	-9	PRO	-	expression tag	UNP Q9GZV9
B	-8	ARG	-	expression tag	UNP Q9GZV9
B	-7	GLY	-	expression tag	UNP Q9GZV9
B	-6	SER	-	expression tag	UNP Q9GZV9
B	-5	GLY	-	expression tag	UNP Q9GZV9
B	-4	MET	-	expression tag	UNP Q9GZV9
B	-3	LYS	-	expression tag	UNP Q9GZV9
B	-2	GLU	-	expression tag	UNP Q9GZV9
B	-1	THR	-	expression tag	UNP Q9GZV9

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Chain	Residue	Modelled	Actual	Comment	Reference
B	0	ALA	-	expression tag	UNP Q9GZV9
B	1	ALA	-	expression tag	UNP Q9GZV9
B	2	ALA	-	expression tag	UNP Q9GZV9
B	3	LYS	-	expression tag	UNP Q9GZV9
B	4	PHE	-	expression tag	UNP Q9GZV9
B	5	GLU	-	expression tag	UNP Q9GZV9
B	6	ARG	-	expression tag	UNP Q9GZV9
B	7	GLN	-	expression tag	UNP Q9GZV9
B	8	HIS	-	expression tag	UNP Q9GZV9
B	9	MET	-	expression tag	UNP Q9GZV9
B	10	ASP	-	expression tag	UNP Q9GZV9
B	11	SER	-	expression tag	UNP Q9GZV9
B	12	PRO	-	expression tag	UNP Q9GZV9
B	13	ASP	-	expression tag	UNP Q9GZV9
B	14	LEU	-	expression tag	UNP Q9GZV9
B	15	GLY	-	expression tag	UNP Q9GZV9
B	16	THR	-	expression tag	UNP Q9GZV9
B	17	ASP	-	expression tag	UNP Q9GZV9
B	18	ASP	-	expression tag	UNP Q9GZV9
B	19	ASP	-	expression tag	UNP Q9GZV9
B	20	ASP	-	expression tag	UNP Q9GZV9
B	21	LYS	-	expression tag	UNP Q9GZV9
B	22	ALA	-	expression tag	UNP Q9GZV9
B	23	MET	-	expression tag	UNP Q9GZV9
B	24	GLY	-	expression tag	UNP Q9GZV9
B	176	GLN	ARG	variant	UNP Q9GZV9
B	179	GLN	ARG	variant	UNP Q9GZV9

- Molecule 3 is a protein called Isoform 20 of Fibroblast growth factor receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	213	Total	C	N	O	S	0	0
			1679	1070	291	309	9		
3	E	212	Total	C	N	O	S	0	0
			1670	1065	290	306	9		

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	367	GLY	-	expression tag	UNP P11362-20
D	368	THR	-	expression tag	UNP P11362-20
D	369	LYS	-	expression tag	UNP P11362-20

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Chain	Residue	Modelled	Actual	Comment	Reference
D	370	HIS	-	expression tag	UNP P11362-20
D	371	HIS	-	expression tag	UNP P11362-20
D	372	HIS	-	expression tag	UNP P11362-20
D	373	HIS	-	expression tag	UNP P11362-20
D	374	HIS	-	expression tag	UNP P11362-20
D	375	HIS	-	expression tag	UNP P11362-20
E	367	GLY	-	expression tag	UNP P11362-20
E	368	THR	-	expression tag	UNP P11362-20
E	369	LYS	-	expression tag	UNP P11362-20
E	370	HIS	-	expression tag	UNP P11362-20
E	371	HIS	-	expression tag	UNP P11362-20
E	372	HIS	-	expression tag	UNP P11362-20
E	373	HIS	-	expression tag	UNP P11362-20
E	374	HIS	-	expression tag	UNP P11362-20
E	375	HIS	-	expression tag	UNP P11362-20

- Molecule 4 is an oligosaccharide called 2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyra nose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-al pha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2 -(sulfoamino)-alpha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-d eoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-idopyranuron ic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyranose.
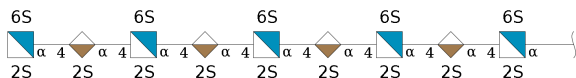
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	F	9	160	54	5	87	14	0	0

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
5	A	1	1	1	0

- Molecule 6 is COPPER (II) ION (three-letter code: CU) (formula: Cu) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Cu	
6	D	1	1	1	0

3   Residue-property plots ⓘ

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

Chain A:
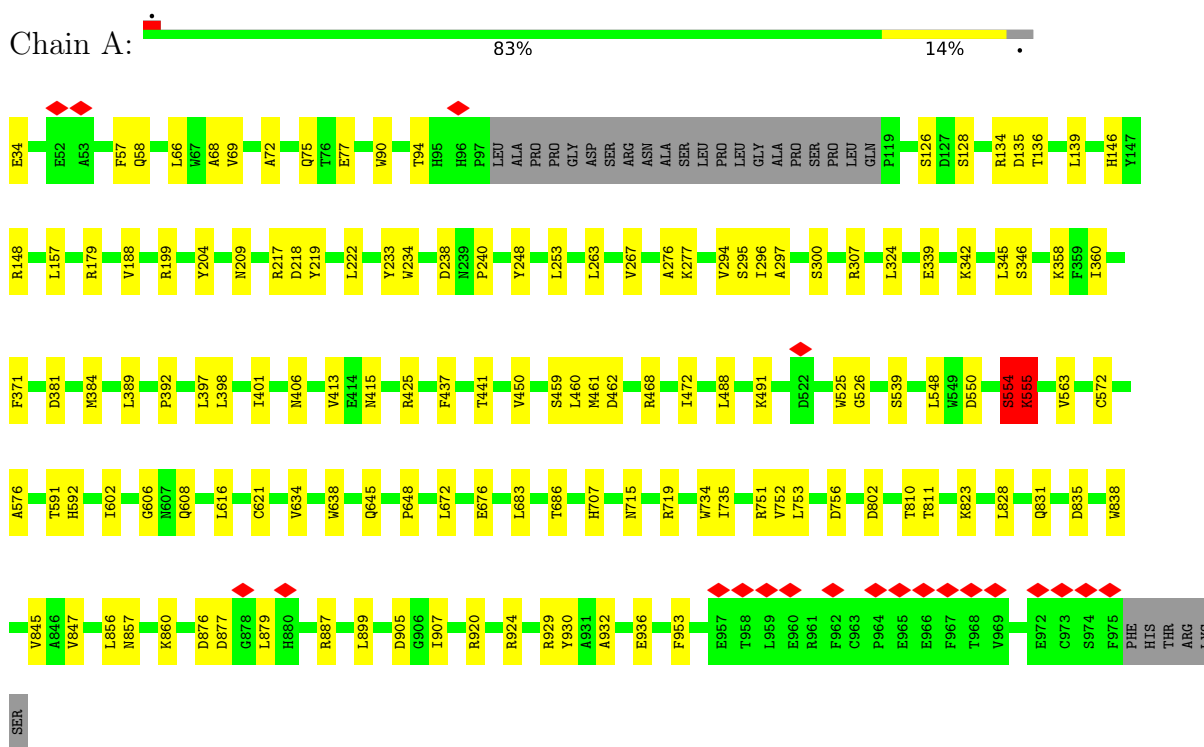
- Molecule 2: Fibroblast growth factor 23

Chain B:
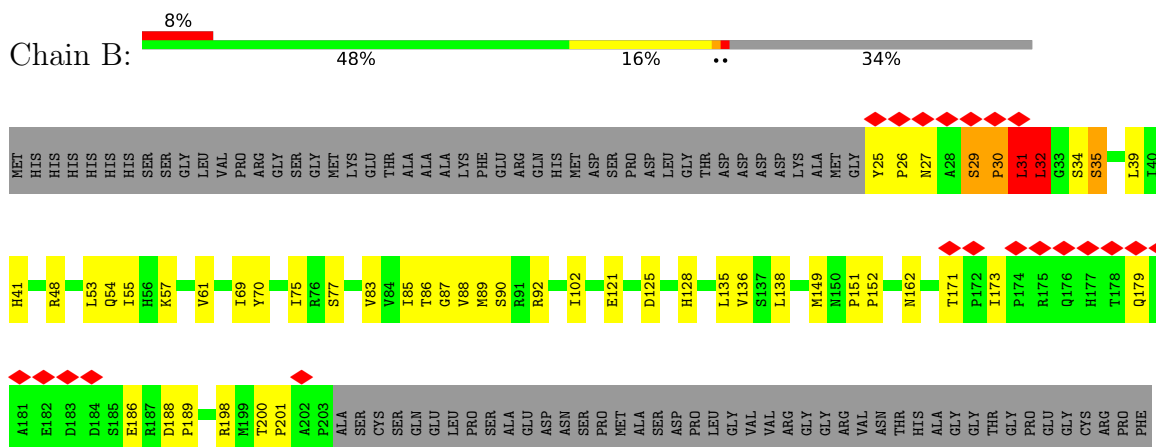
ALA LYS PHE ILE

• Molecule 3: Isoform 20 of Fibroblast growth factor receptor 1

Chain D:

77%   14%   9%

ASP ASN THR LYS PRO ASN R148 A152 K172 T173 V174 N185 L188 R202 R209 W213 S214 D218 S219 V220 V221 P222 S223 D224 K225 C230 I231 N240 L245 E249 R250 R254 P255 K265 S271 N272 V273 S281 K291 V295 N296

G301 L311 N345 S350 E360 ALA LEU GLU GLU ARG PRO GLY THR LYS HIS HIS HIS HIS HIS HIS

• Molecule 3: Isoform 20 of Fibroblast growth factor receptor 1

Chain E:

22%

67%   23%   9%

ASP ASN THR LYS PRO ASN R148 M149 P150 V151 A152 P153 P158 M161 E162 K163 A171 K172 K175 F176 K177 S181 G182 T183 P184 T187 K198 H201 R202 I203 Y206 K207 V208 R209 T212 W213 S214 I215 I216 M217 V220 V221 P222 S223 D224 K225 V232 E233

N234 E235 Y236 G237 S238 I239 N240 L245 R250 H253 L257 T266 V267 A268 L269 G270 S271 N272 F275 M276 C277 Q284 W289 L290 K291 E294 V295 N296 G297 S298 K299 I300 G301 P302 D303 N304 L305 P306 Q309 I310 L311 K312 T313 A314 G315 V316 N317 T318 T319 D320

K321 E322 M323 E324 V325 L326 R329 N330 V331 S332 F333 E334 D335 A336 Y339 T340 C341 L342 A343 G344 L349 S350 H351 H352 L359 GLU ALA LEU GLU GLU ARG PRO GLY THR LYS HIS HIS HIS HIS HIS HIS

• Molecule 4: 2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-id opyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyranose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D-glucopyra nose-(1-4)-2-O-sulfo-alpha-L-idopyranuronic acid-(1-4)-2-deoxy-6-O-sulfo-2-(sulfoamino)-alpha-D -glucopyranose

Chain F:

33%

44%   56%

SGN1 IDS2 SGN3 IDS4 SGN5 IDS6 SGN7 IDS8 SGN9
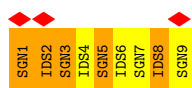
4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1497967	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/\text{Å}^2)$	50.37	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	8.212	Depositor
Minimum map value	-5.145	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.170	Depositor
Recommended contour level	0.6	Depositor
Map size (Å)	280.576, 280.576, 280.576	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.096, 1.096, 1.096	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: IDS, SGN, ZN, CU

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	0.41	0/7768	0.57	2/10567 (0.0%)
2	B	0.42	0/1489	0.61	0/2025
3	D	0.39	2/1726 (0.1%)	0.54	0/2349
3	E	0.39	0/1717	0.63	0/2337
All	All	0.41	2/12700 (0.0%)	0.58	2/17278 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	3
2	B	0	1
All	All	0	4

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	219	SER	C-O	-6.32	1.11	1.23
3	D	219	SER	CA-CB	-5.74	1.44	1.52

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	345	LEU	CA-CB-CG	5.41	127.74	115.30
1	A	554	SER	C-N-CA	5.29	134.92	121.70

There are no chirality outliers.

All (4) planarity outliers are listed below:

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Mol	Chain	Res	Type	Group
1	A	253	LEU	Peptide
1	A	554	SER	Peptide
1	A	555	LYS	Peptide
2	B	171	THR	Peptide

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	7527	0	7259	77	0
2	B	1442	0	1379	46	0
3	D	1679	0	1659	20	0
3	E	1670	0	1654	53	0
4	F	160	0	51	4	0
5	A	1	0	0	0	0
6	D	1	0	0	0	0
All	All	12480	0	12002	178	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.

The worst 5 of 178 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)
3:E:177:LYS:HG2	3:E:214:SER:CB	1.69	1.22
2:B:25:TYR:CG	2:B:26:PRO:HD3	1.76	1.20
3:E:177:LYS:HG2	3:E:214:SER:HB3	1.14	1.12
3:E:177:LYS:CE	3:E:212:THR:OG1	2.09	1.01
3:E:177:LYS:NZ	3:E:212:THR:OG1	1.96	0.99

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	917/948 (97%)	846 (92%)	69 (8%)	2 (0%)	47	69
2	B	177/273 (65%)	154 (87%)	18 (10%)	5 (3%)	5	7
3	D	211/234 (90%)	199 (94%)	12 (6%)	0	100	100
3	E	210/234 (90%)	188 (90%)	22 (10%)	0	100	100
All	All	1515/1689 (90%)	1387 (92%)	121 (8%)	7 (0%)	32	48

5 of 7 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	35	SER
1	A	555	LYS
2	B	31	LEU
2	B	34	SER
1	A	554	SER

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	793/815 (97%)	788 (99%)	5 (1%)	86	91
2	B	156/229 (68%)	152 (97%)	4 (3%)	46	66
3	D	187/206 (91%)	187 (100%)	0	100	100
3	E	186/206 (90%)	183 (98%)	3 (2%)	62	78
All	All	1322/1456 (91%)	1310 (99%)	12 (1%)	79	87

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	32	LEU
2	B	35	SER
3	E	223	SER
3	E	198	LYS
1	A	621	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 24 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	857	ASN
2	B	179	GLN
2	B	156	GLN
3	D	244	GLN
1	A	378	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

9 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	SGN	F	1	4	19,20,20	1.67	3 (15%)	24,31,31	3.42	3 (12%)
4	IDS	F	2	4	16,16,17	1.91	4 (25%)	17,24,26	3.82	3 (17%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	SGN	F	3	4	18,19,20	1.51	3 (16%)	22,29,31	2.49	3 (13%)
4	IDS	F	4	4	16,16,17	1.80	4 (25%)	17,24,26	2.23	6 (35%)
4	SGN	F	5	4	18,19,20	1.51	3 (16%)	22,29,31	1.59	3 (13%)
4	IDS	F	6	4	16,16,17	1.84	4 (25%)	17,24,26	2.22	5 (29%)
4	SGN	F	7	4	18,19,20	1.49	3 (16%)	22,29,31	3.09	5 (22%)
4	IDS	F	8	4	16,16,17	2.01	5 (31%)	17,24,26	2.55	5 (29%)
4	SGN	F	9	4	18,19,20	1.41	2 (11%)	22,29,31	1.16	2 (9%)

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	SGN	F	1	4	-	5/11/31/31	0/1/1/1
4	IDS	F	2	4	-	0/9/26/29	0/1/1/1
4	SGN	F	3	4	-	7/11/28/31	0/1/1/1
4	IDS	F	4	4	-	0/9/26/29	0/1/1/1
4	SGN	F	5	4	-	3/11/28/31	0/1/1/1
4	IDS	F	6	4	-	2/9/26/29	0/1/1/1
4	SGN	F	7	4	-	6/11/28/31	0/1/1/1
4	IDS	F	8	4	-	0/9/26/29	0/1/1/1
4	SGN	F	9	4	-	4/11/28/31	0/1/1/1

The worst 5 of 31 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	F	6	IDS	O5-C1	-4.64	1.36	1.43
4	F	4	IDS	O5-C1	-4.36	1.36	1.43
4	F	2	IDS	O5-C1	-4.34	1.36	1.43
4	F	1	SGN	O4-C4	4.30	1.53	1.43
4	F	8	IDS	O5-C1	-4.11	1.37	1.43

The worst 5 of 35 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	2	IDS	O4-C4-C5	14.21	141.61	109.74
4	F	1	SGN	O4-C4-C5	-12.25	78.87	109.30
4	F	7	SGN	O4-C4-C5	11.01	136.63	109.30

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W O R L D W I D E
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PROTEIN DATA BANK

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	F	3	SGN	O4-C4-C3	10.51	134.64	110.35
4	F	1	SGN	O4-C4-C3	-10.29	86.55	110.35

There are no chirality outliers.

5 of 27 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	F	3	SGN	O5-C5-C6-O6
4	F	3	SGN	C2-N2-S1-O2S
4	F	3	SGN	C2-N2-S1-O3S
4	F	5	SGN	C2-N2-S1-O1S
4	F	5	SGN	C2-N2-S1-O2S

There are no ring outliers.

5 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	2	IDS	1	0
4	F	5	SGN	1	0
4	F	1	SGN	1	0
4	F	3	SGN	1	0
4	F	8	IDS	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 F

Bond lengths

Bond angles

Torsions

Rings
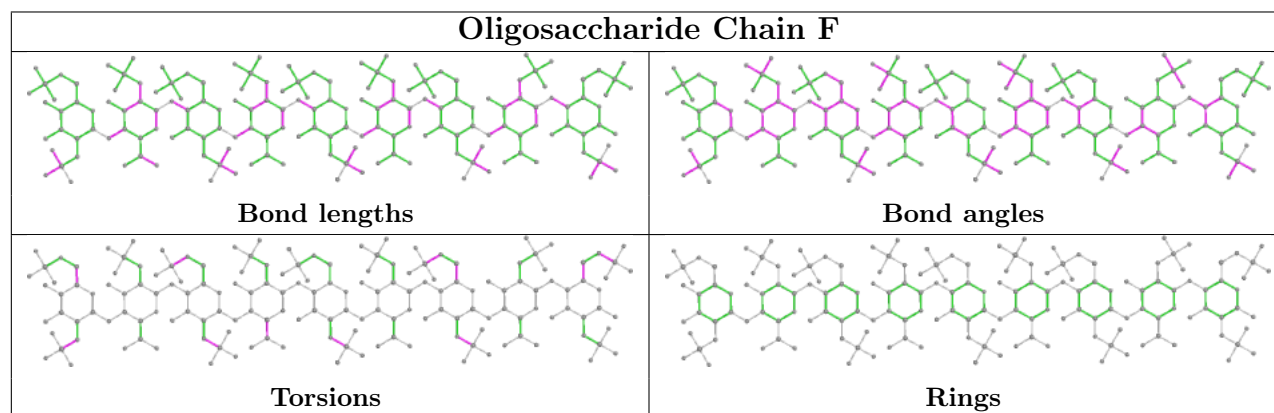
5.6 Ligand geometry (i)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 ⓘ

This section contains visualisations of the EMDB entry EMD-34075. 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 ⓘ
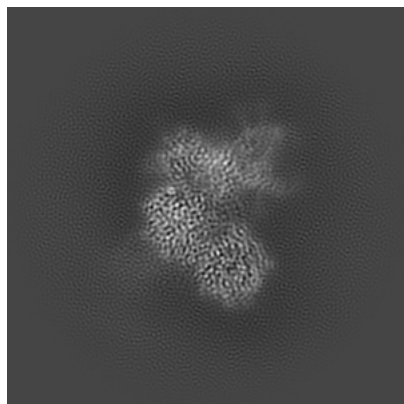
6.1.1 Primary map

X
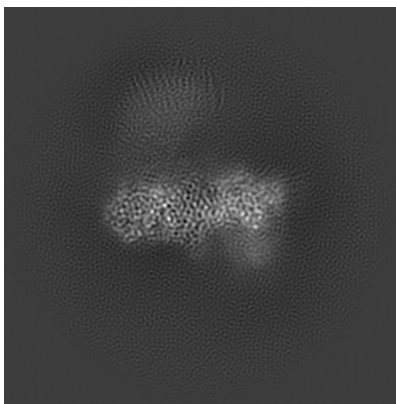
Y
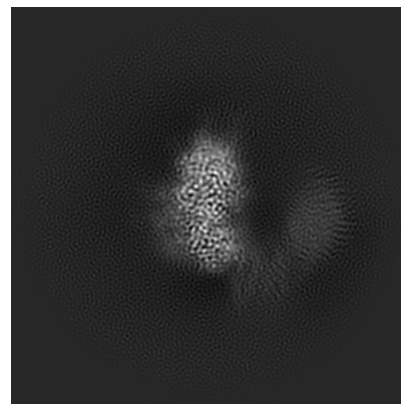
Z

6.1.2 Raw map

X

Y

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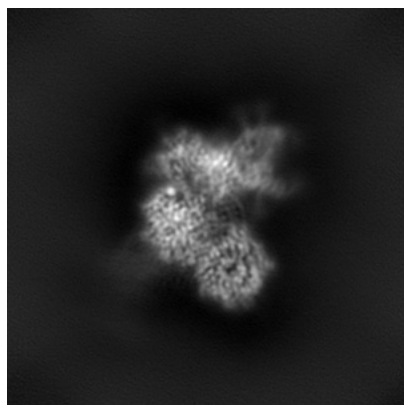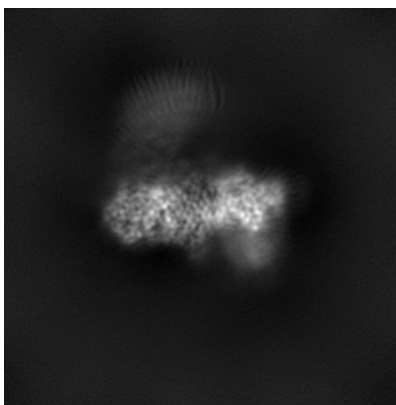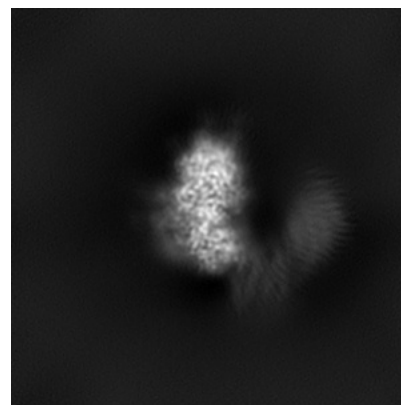
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
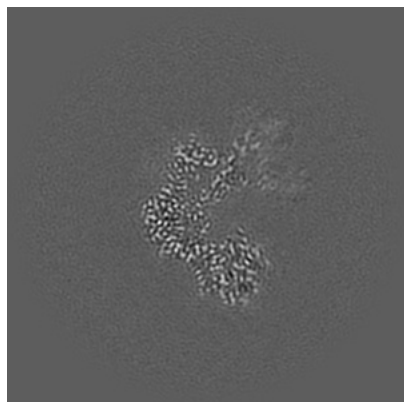
6.2.1 Primary map
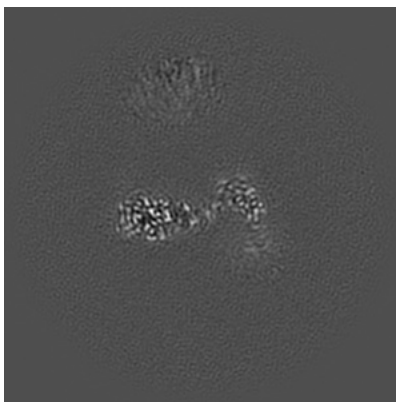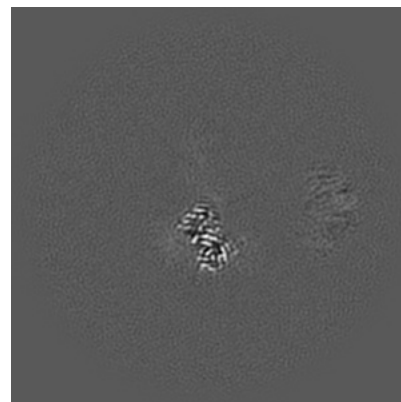
| X Index: 128 | Y Index: 128 | Z Index: 128 |

6.2.2 Raw map
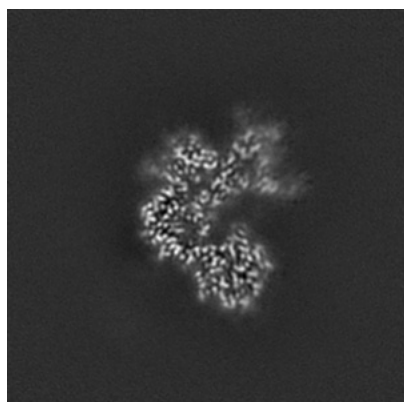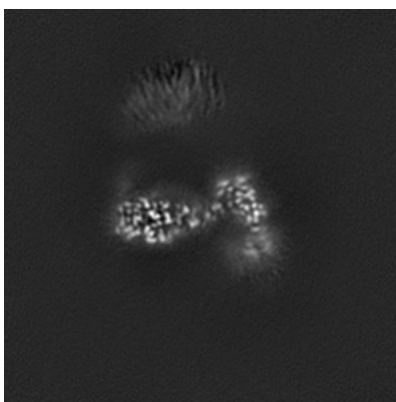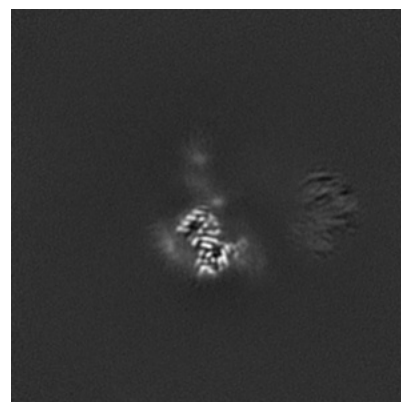
| X Index: 128 | Y Index: 128 | Z Index: 128 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
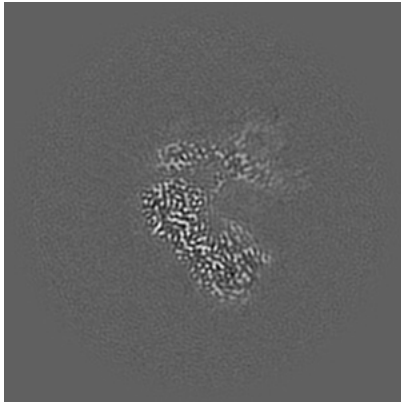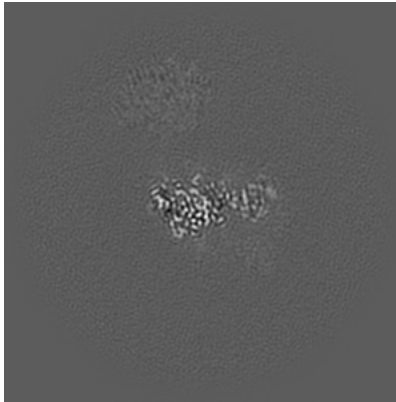
| X Index: 123 | Y Index: 108 | Z Index: 96 |
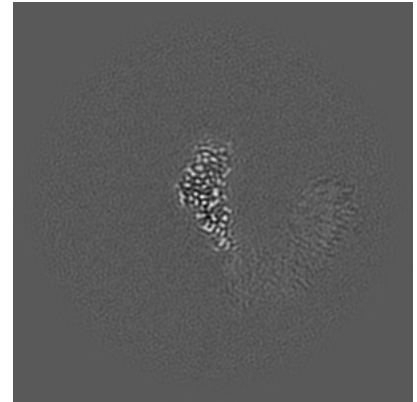
6.3.2 Raw map
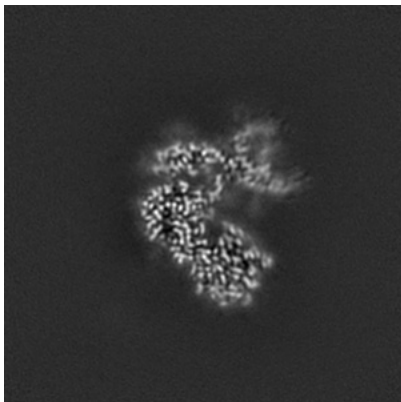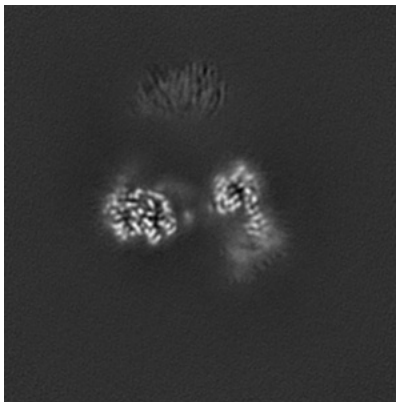
| X Index: 124 | Y Index: 138 | Z Index: 156 |
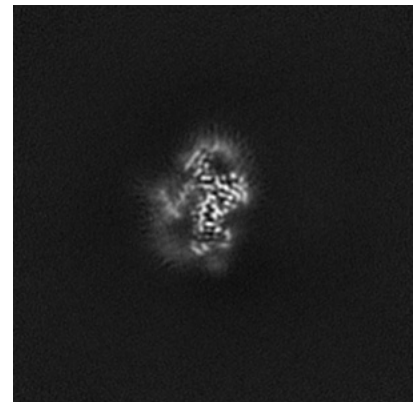
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
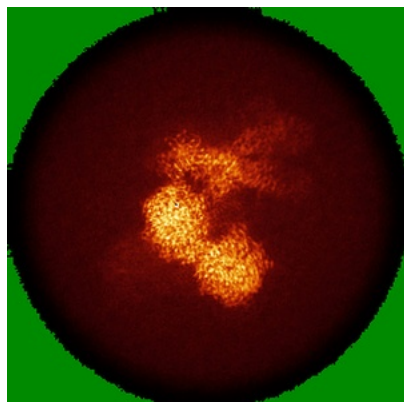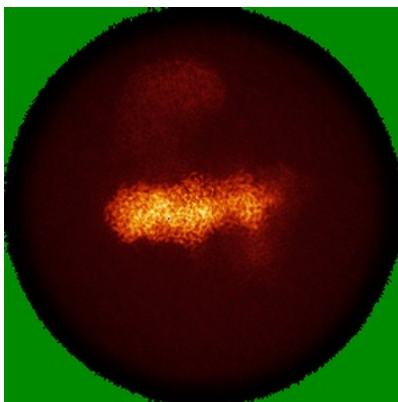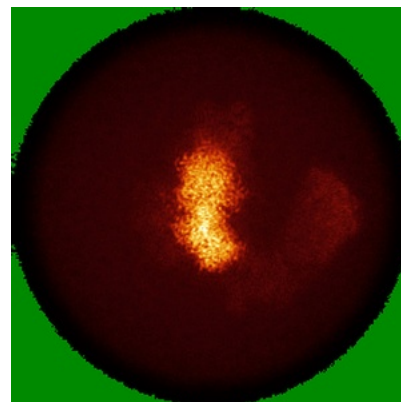
| X | Y | Z |

6.4.2 Raw map

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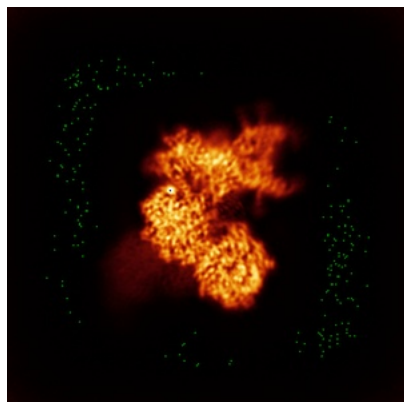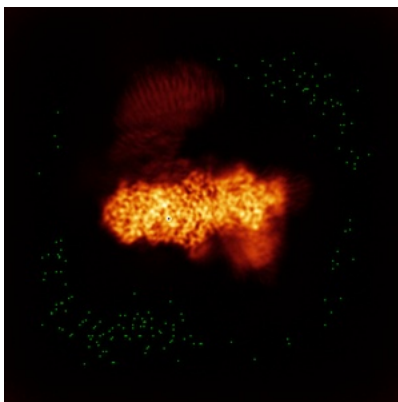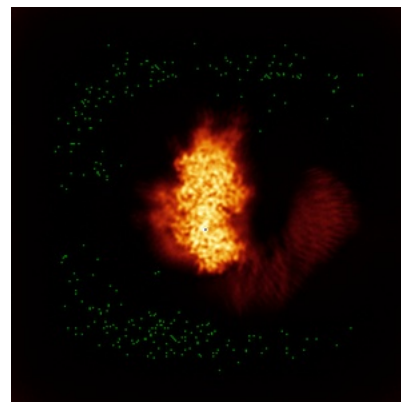
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |
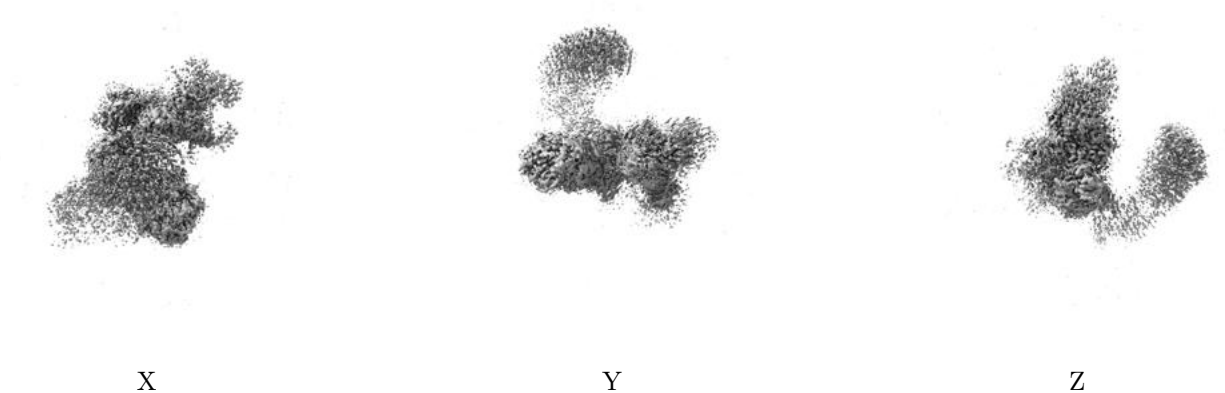
The images above show the 3D surface view of the map at the recommended contour level 0.6. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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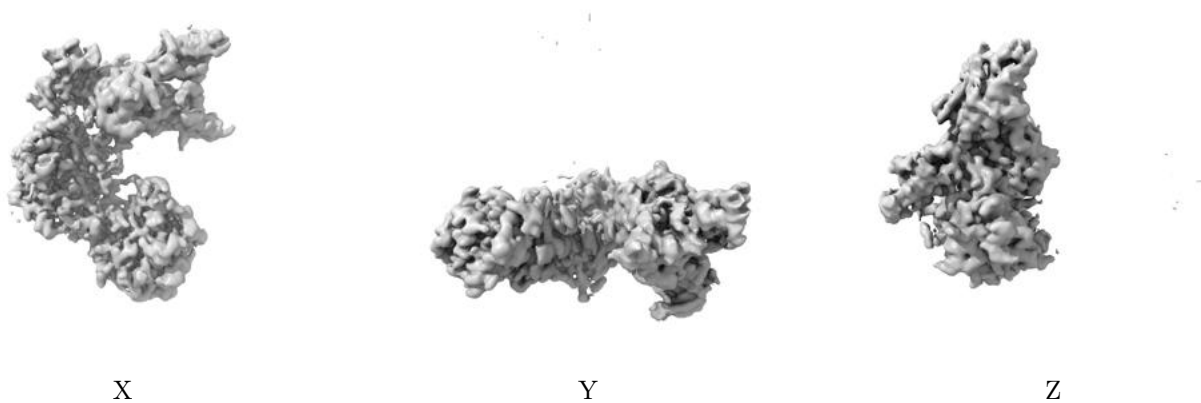
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6   Mask visualisation ⓘ

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_34075_msk_1.map ⓘ

X   Y   Z
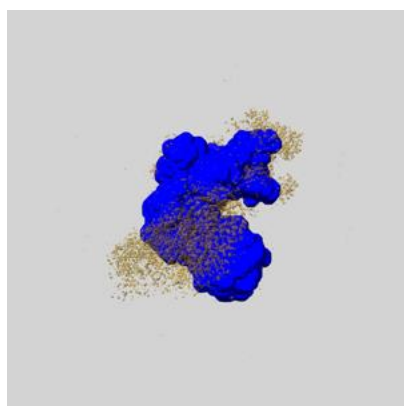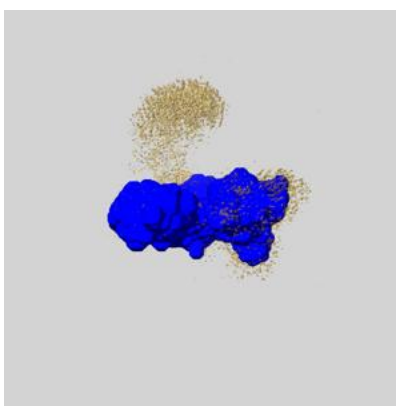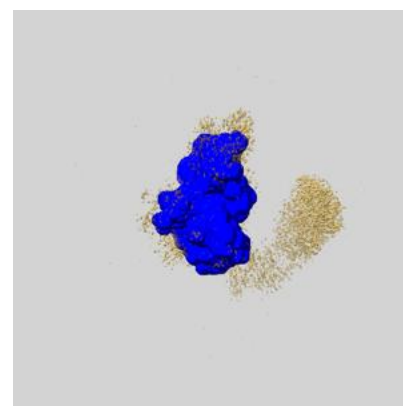
7 Map analysis ⓘ

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 ⓘ
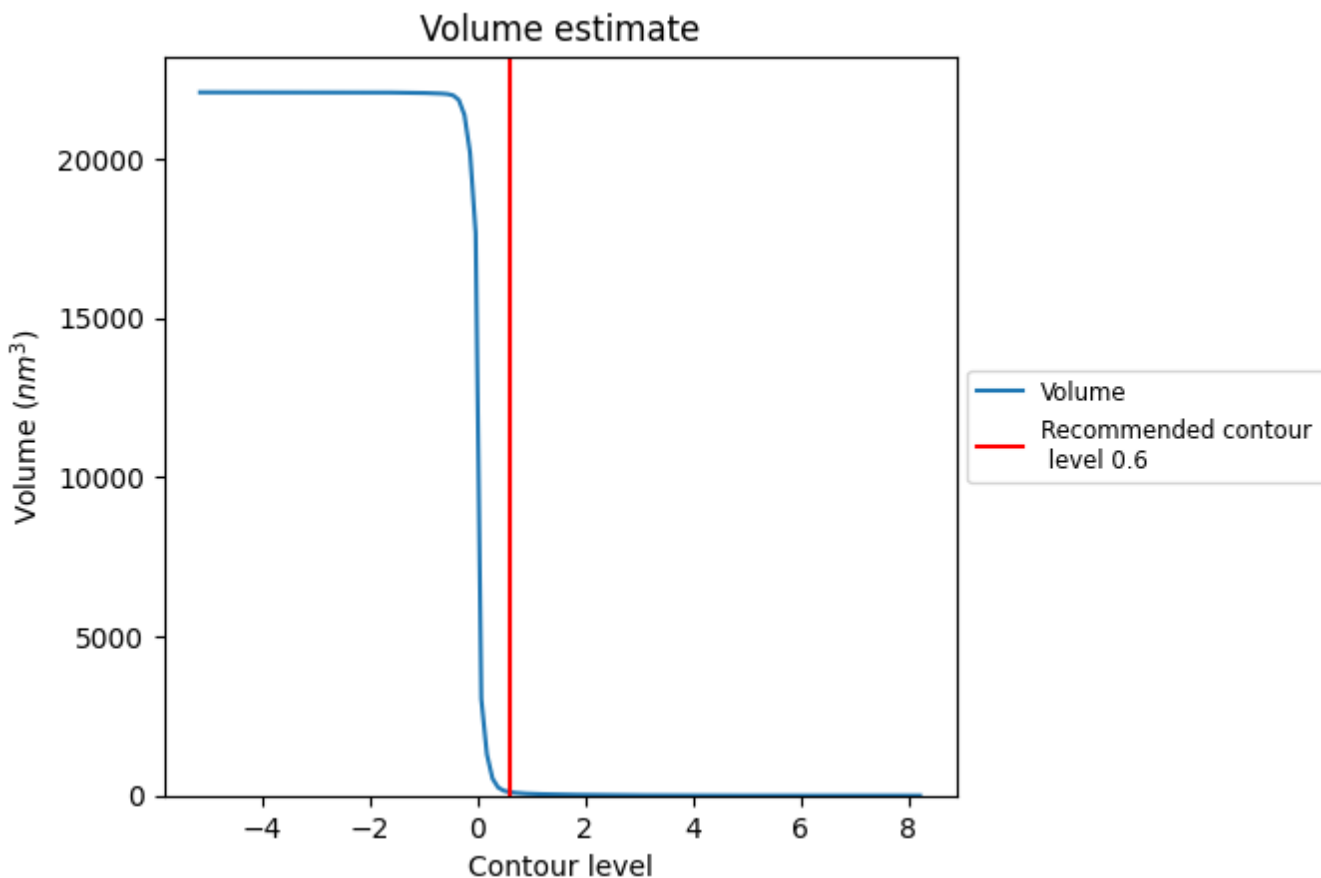
The volume at the recommended contour level is 109 nm^3; this corresponds to an approximate mass of 98 kDa.

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 ⓘ
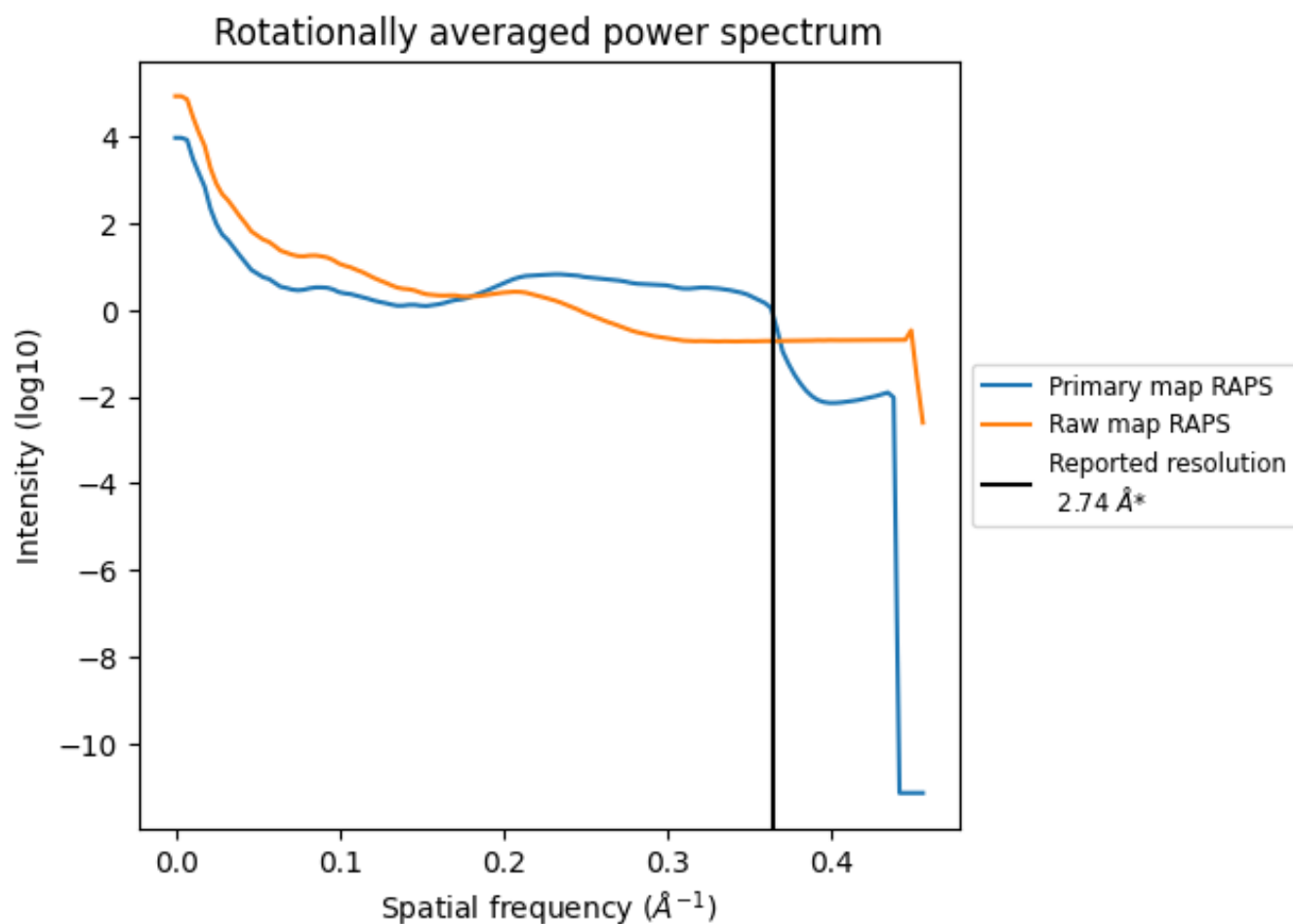
*Reported resolution corresponds to spatial frequency of 0.365 Å^{-1}

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 ⓘ
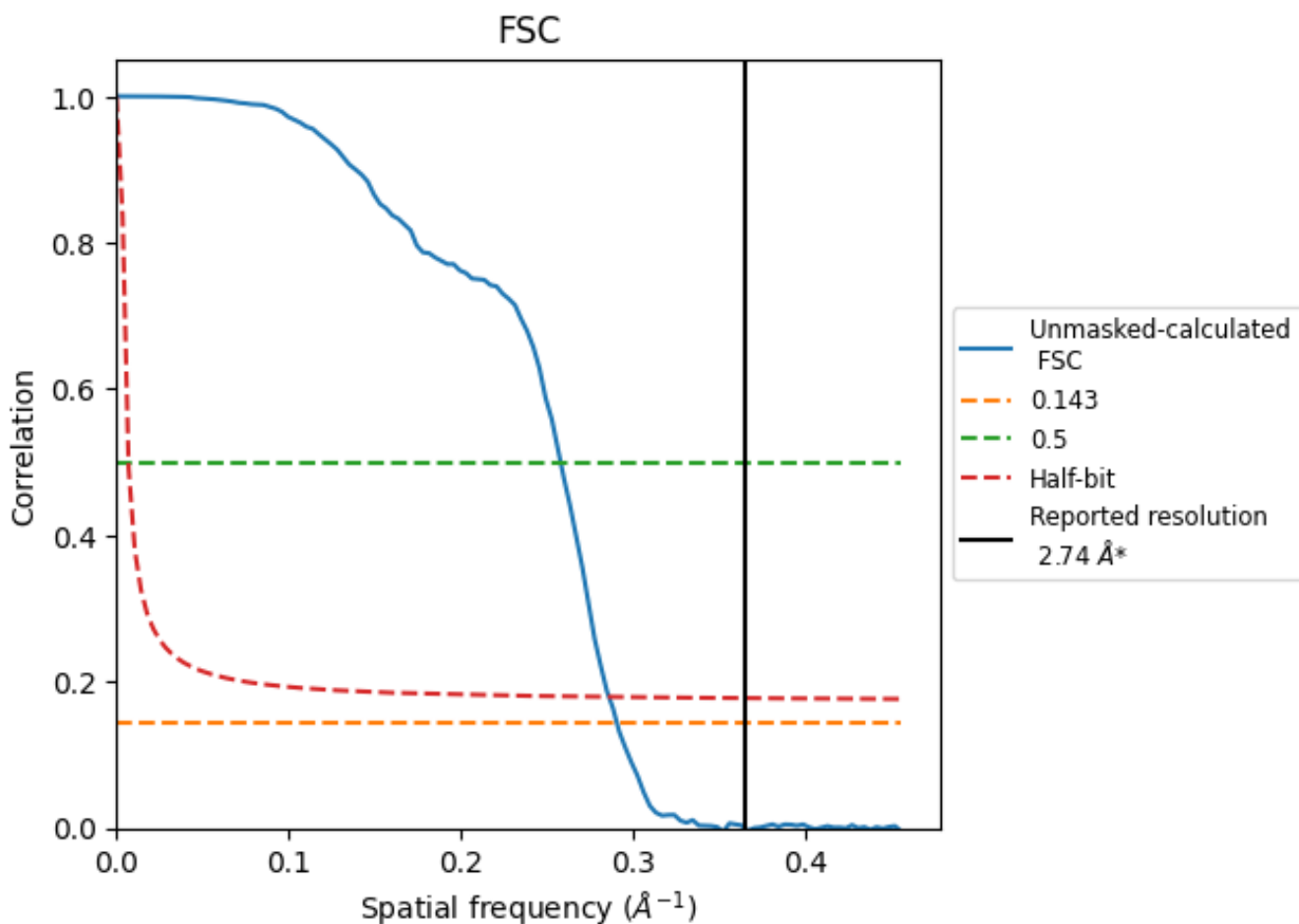
*Reported resolution corresponds to spatial frequency of 0.365 Å^{-1}

8.2   Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.74	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.44	3.87	3.49

*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 3.44 differs from the reported value 2.74 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-34075 and PDB model 7YSH. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay ⓘ

X   Y   Z
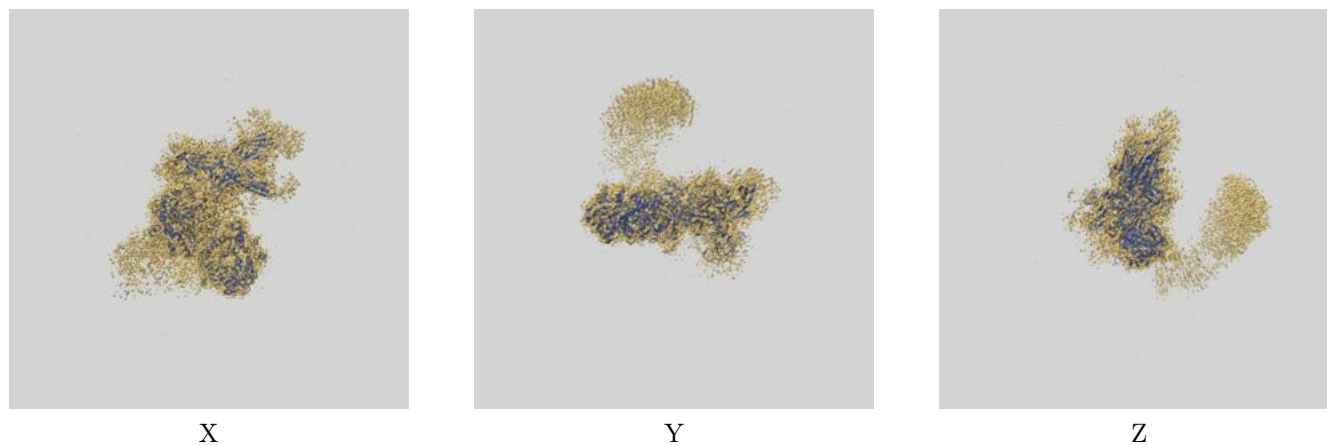
The images above show the 3D surface view of the map at the recommended contour level 0.6 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

X   Y   Z
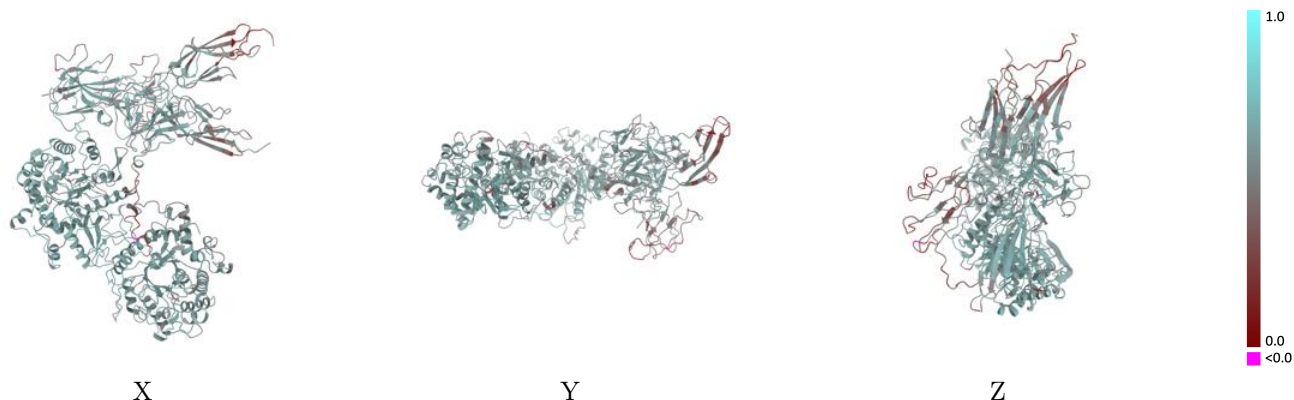
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
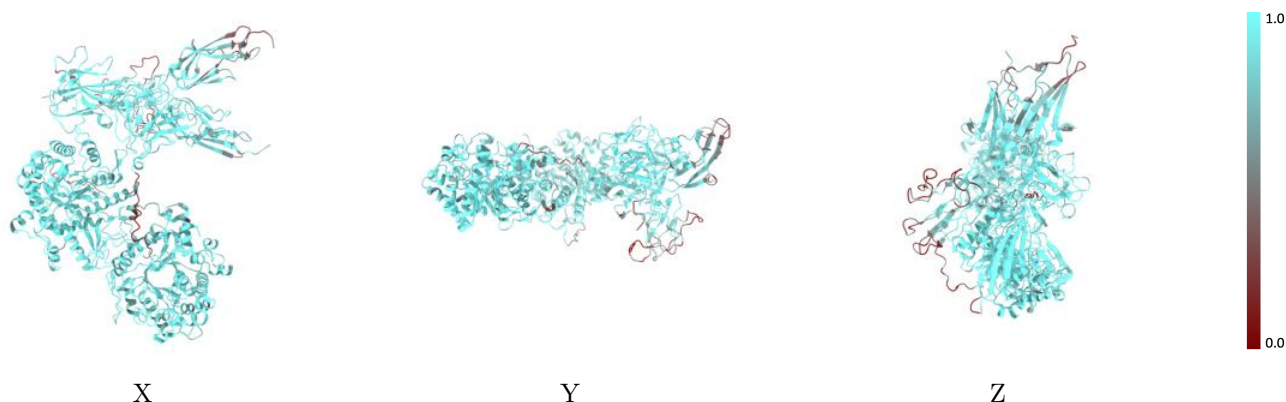
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.6).

9.4   Atom inclusion ⓘ
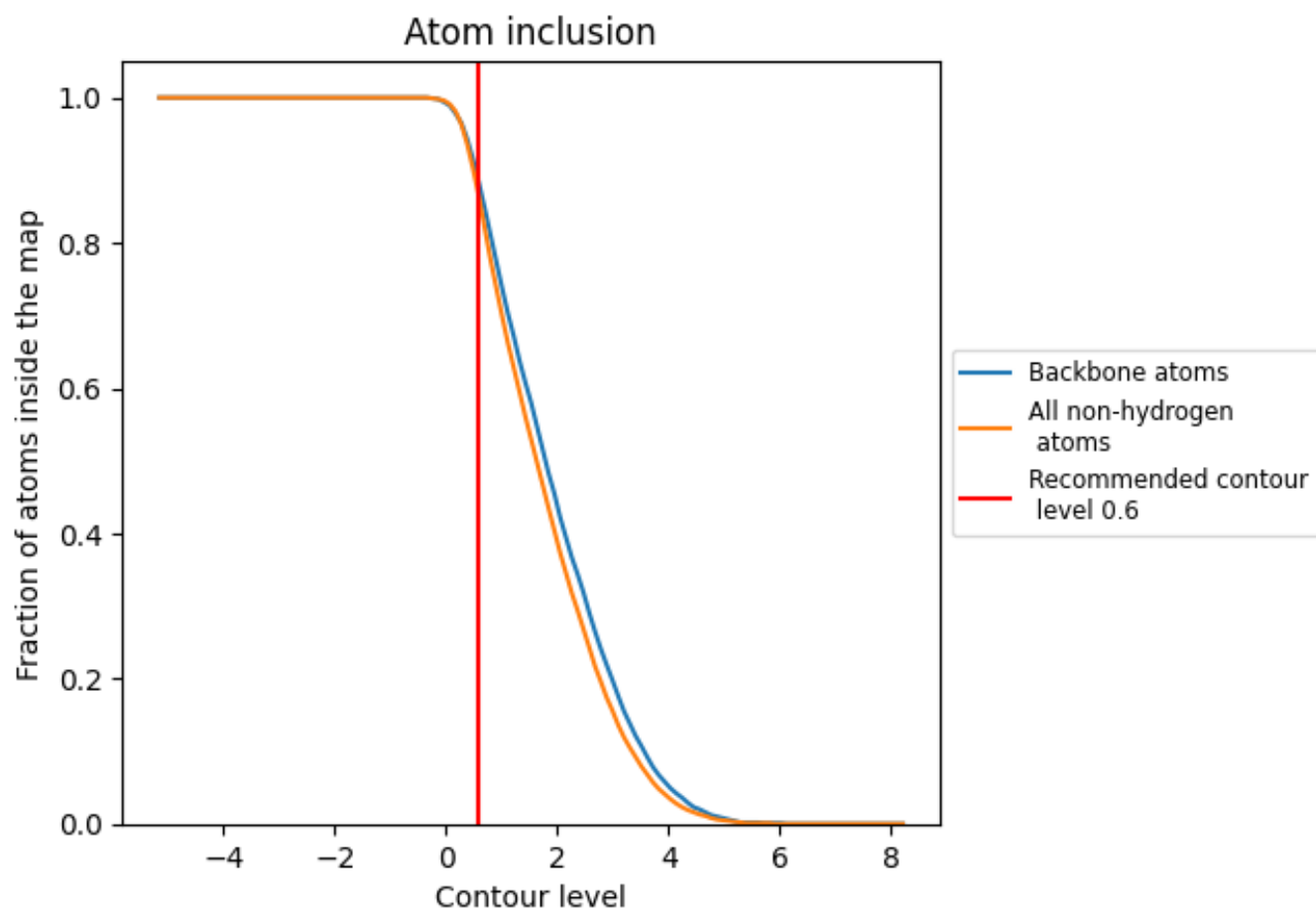
At the recommended contour level, 88% of all backbone atoms, 86% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.6) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8620	0.5550
A	0.9240	0.5930
B	0.8330	0.5430
D	0.8760	0.5430
E	0.6380	0.4230
F	0.4310	0.3410

1.0

0.0
<0.0