



Full wwPDB EM Validation Report ⓘ

May 12, 2024 – 09:15 am BST

PDB ID : 6SD4
EMDB ID : EMD-10148
Title : Structure of the RBM3/collar region of the Salmonella flagella MS-ring protein
FliF with 34-fold symmetry applied
Authors : Johnson, S.; Fong, Y.H.; Deme, J.C.; Furlong, E.J.; Kuhlen, L.; Lea, S.M.
Deposited on : 2019-07-26
Resolution : 2.80 Å(reported)
Based on initial model : 6SCN

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

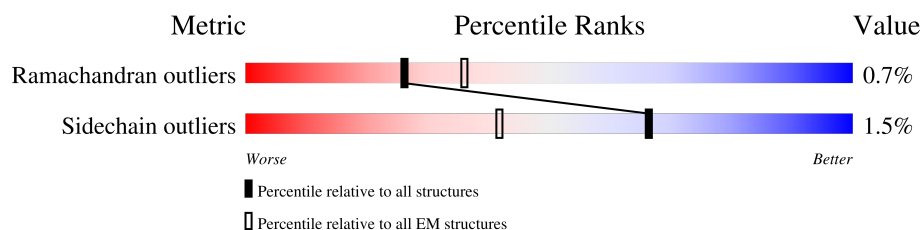
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

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 2.80 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)
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 $\leq 5\%$. 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	560	
1	B	560	
1	C	560	
1	D	560	
1	E	560	
1	F	560	
1	G	560	
1	H	560	
1	I	560	

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Mol	Chain	Length	Quality of chain	
1	J	560		
1	K	560		
1	L	560		
1	M	560		
1	N	560		
1	O	560		
1	P	560		
1	Q	560		
1	R	560		
1	S	560		
1	T	560		
1	U	560		
1	V	560		
1	W	560		
1	X	560		
1	Y	560		
1	Z	560		
1	a	560		
1	b	560		
1	c	560		
1	d	560		
1	e	560		
1	f	560		
1	g	560		
1	h	560		

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 40562 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 Flagellar M-ring protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	B	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	C	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	D	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	E	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	F	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	G	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	H	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	I	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	J	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	K	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	L	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	M	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	N	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	O	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	P	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Q	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		

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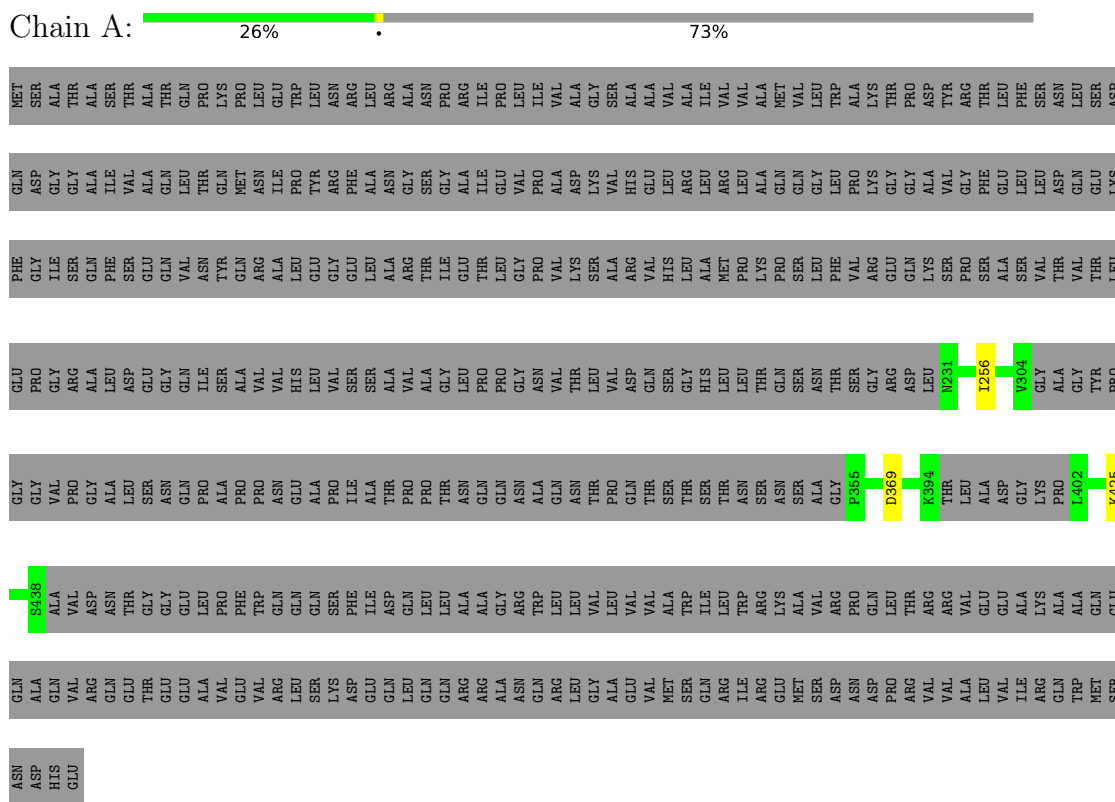
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Mol	Chain	Residues	Atoms					AltConf	Trace
1	R	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	S	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	T	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	U	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	V	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	W	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	X	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Y	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	Z	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	a	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	b	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	c	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	d	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	e	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	f	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	g	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		
1	h	151	Total	C	N	O	S	0	0
			1193	726	223	241	3		

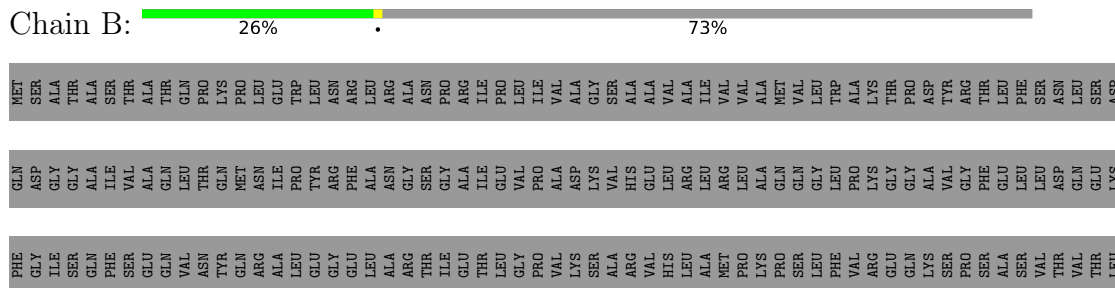
3 Residue-property plots

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: Flagellar M-ring protein



- Molecule 1: Flagellar M-ring protein



ASN ASP HIS GLU	GLN	ALA	GLN	VAL	GLN	VAL	GLN	GLU	ALA	VAL	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU
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• Molecule 1: Flagellar M-ring protein



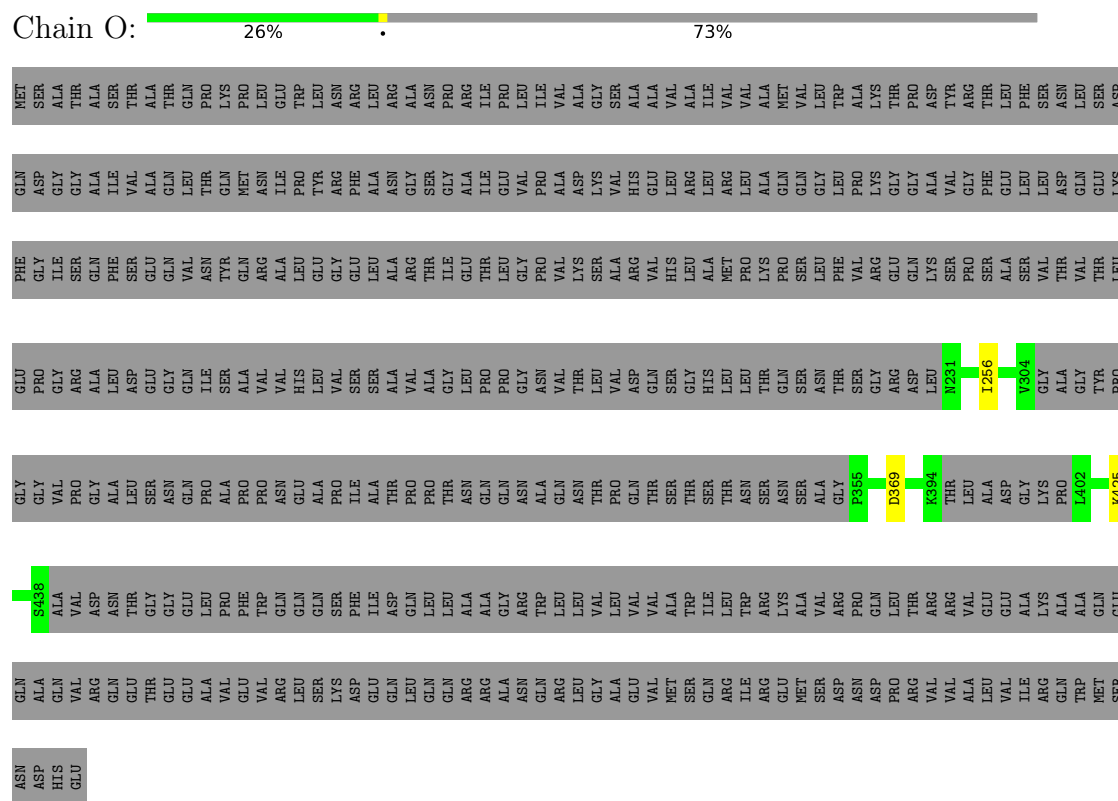
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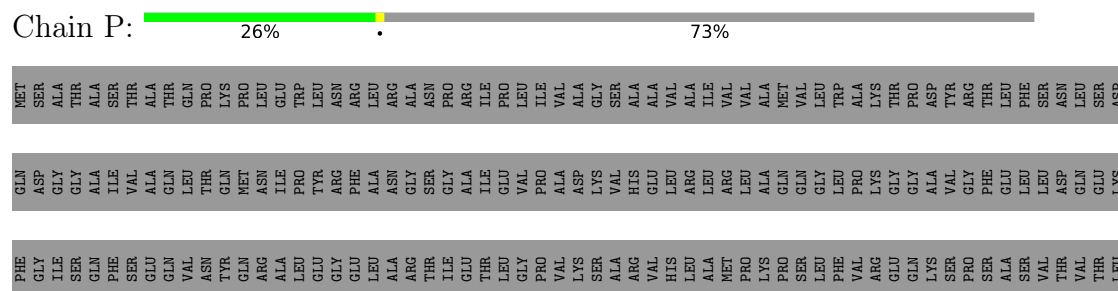


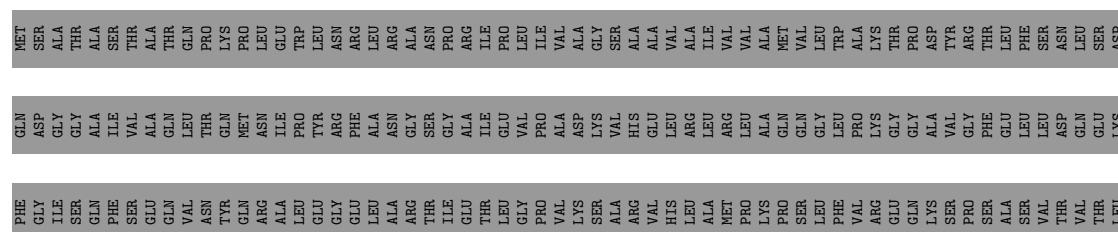
MET	SER	ALA	THR	ALA	SER	THR	ALA	THR	THR	GLN	LYS	PRO	LEU	LEU	TRP	LEU	ASN	ARG	LEU	ARG	ALA	PRO	ILE	GLY	SER	ALA	VAL	ALA	THR	ASP
GLN	ASP	GLY	THR	GLY	ILE	GLN	VAL	GLN	THR	ASN	TYR	ARG	PHE	ALA	THR	GLN	GLN	GLY	ARG	ALA	ARG	GLY	VAL	VAL	VAL	VAL	VAL	VAL	VAL	LYS
PHE	GLY	ILE	SER	GLN	PHE	SER	GLU	VAL	GLN	ASN	TYR	ARG	GLU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

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ASN ASP HIS GLU	GLN	ALA	GLN	VAL	GLN	VAL	GLN	GLU	ALA	VAL	GLU	VAL	VAL	GLU	LEU	SER	GLN	GLN	ASP	GLU	GLN	LEU	GLN	GLN	GLY	GLY	GLU	GLU	ARG	ASP	ASN	ASP	PRO	ARG	VAL	VAL	ALA	VAL	ASP	ASN	GLU	ARG	ILE	ARG	ILE	GLU	VAL	GLU	VAL	MET	SER	GLN	ARG	ILE	ARG	GLU	VAL	GLN	THR	LEU	VAL	ASP	GLN	SER	SER	GLY	GLY	HIS	LEU	LEU	THR	GLN	SER	THR	ASN	GLY	GLY	VAL	PRO	THR	ASN	GLN	GLY	GLY	ALA	ALA	GLY	THR	PRO	THR	ILE	PRO	GLU	ASN	GLN	ASP	VAL	LEU	THR	ASN	GLN	GLY	VAL	PRO	GLU	GLN	THR	ASN	GLY	GLY	VAL	PRO	GLY	ARG	GLY	PRO	GLN	ASP	GLY	PRO																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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● Molecule 1: Flagellar M-ring protein



ASN	ASP	HIS	GLU	GLN	ALA	GLN	VAL	ARG	GLN	ASP	THR	GLY	THR	GLY	GLU	GLN	ARG	LEU	GLN	GLN	GLY	ASP	GLN	LEU	GLN	VAL	GLU	VAL	GLU	VAL	GLU	VAL	GLU	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GL
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● Molecule 1: Flagellar M-ring protein

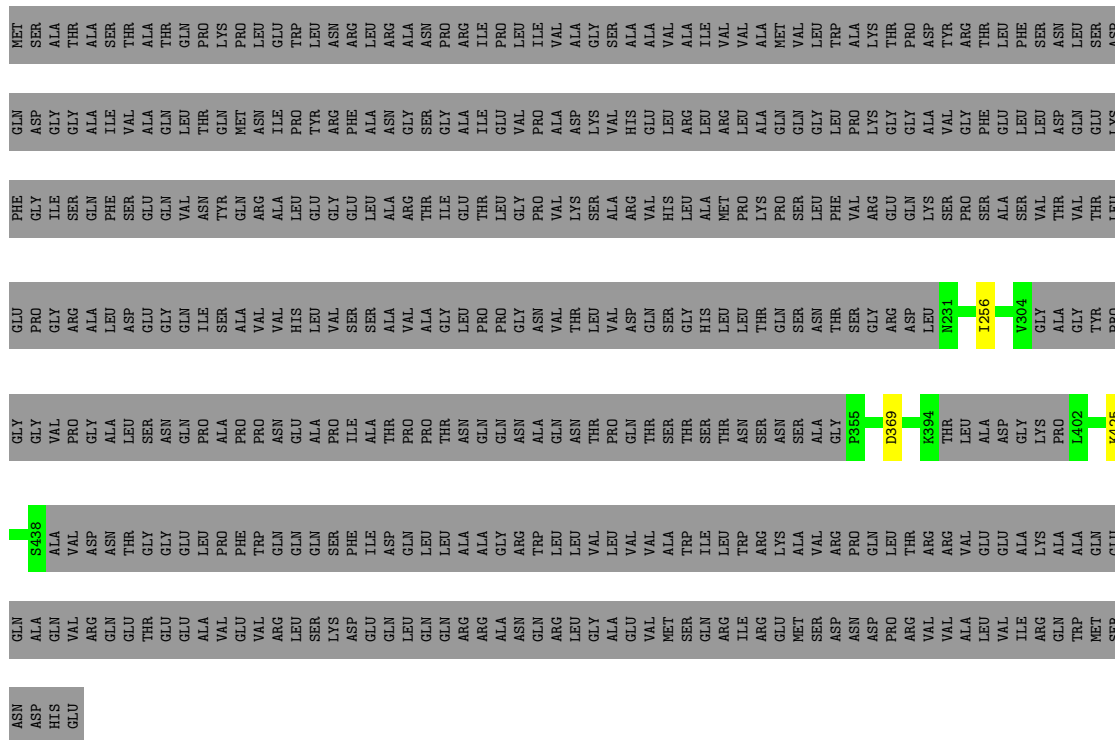


MET	SER	ALA	THR	ALA	SER	THR	ALA	THR	GLN	PRO	LYS	PRO	LEU	TRP	LEU	ASN	ARG	LEU	ARG	GLN	GLY	ILE	PRO	GLY	SER	GLY	VAL	ALA	GLY	THR	VAL	ASP	LEU	TRP	ALA	TYR	ARG	THR	GLY	GLU	ASP	ASN	LEU	ASP		
GLN	ASP	GLY	THR	GLY	ILE	GLN	VAL	ALA	GLN	THR	GLN	MET	ASN	ILE	PRO	TYR	PHE	ALA	ARG	GLY	ILE	GLU	VAL	GLY	LEU	VAL	GLN	GLY	VAL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



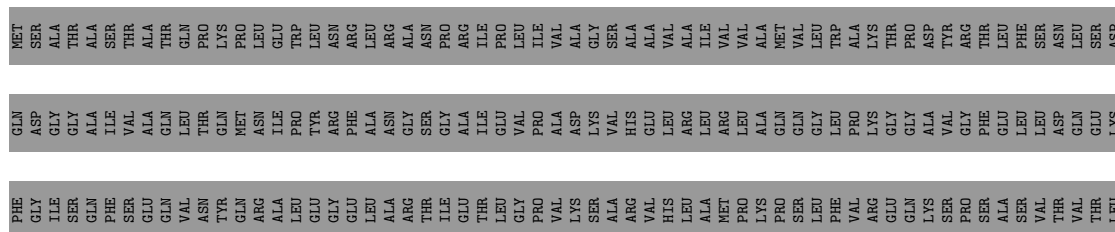
- Molecule 1: Flagellar M-ring protein

Chain Y: 26% 73%



- Molecule 1: Flagellar M-ring protein

Chain Z: 26% . 73%







4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C34	Depositor
Number of particles used	140606	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 ($e^-/\text{\AA}^2$)	48	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	0.094	Depositor
Minimum map value	-0.051	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	355.104, 355.104, 355.104	wwPDB
Map dimensions	432, 432, 432	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.822, 0.822, 0.822	Depositor

5 Model quality

5.1 Standard geometry

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	0.47	0/1205	0.47	0/1624
1	B	0.47	0/1205	0.47	0/1624
1	C	0.47	0/1205	0.47	0/1624
1	D	0.47	0/1205	0.47	0/1624
1	E	0.47	0/1205	0.47	0/1624
1	F	0.47	0/1205	0.47	0/1624
1	G	0.47	0/1205	0.47	0/1624
1	H	0.46	0/1205	0.47	0/1624
1	I	0.47	0/1205	0.47	0/1624
1	J	0.47	0/1205	0.47	0/1624
1	K	0.47	0/1205	0.47	0/1624
1	L	0.47	0/1205	0.47	0/1624
1	M	0.47	0/1205	0.47	0/1624
1	N	0.47	0/1205	0.47	0/1624
1	O	0.47	0/1205	0.47	0/1624
1	P	0.47	0/1205	0.47	0/1624
1	Q	0.47	0/1205	0.47	0/1624
1	R	0.47	0/1205	0.47	0/1624
1	S	0.47	0/1205	0.47	0/1624
1	T	0.47	0/1205	0.47	0/1624
1	U	0.47	0/1205	0.47	0/1624
1	V	0.47	0/1205	0.47	0/1624
1	W	0.47	0/1205	0.47	0/1624
1	X	0.47	0/1205	0.47	0/1624
1	Y	0.47	0/1205	0.47	0/1624
1	Z	0.47	0/1205	0.47	0/1624
1	a	0.46	0/1205	0.47	0/1624
1	b	0.47	0/1205	0.47	0/1624
1	c	0.47	0/1205	0.47	0/1624
1	d	0.47	0/1205	0.47	0/1624
1	e	0.47	0/1205	0.47	0/1624
1	f	0.47	0/1205	0.47	0/1624
1	g	0.47	0/1205	0.47	0/1624
1	h	0.47	0/1205	0.47	0/1624

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
All	All	0.47	0/40970	0.47	0/55216

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](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	B	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	C	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	D	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	E	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	F	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	G	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	H	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	I	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	J	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	K	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	L	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	M	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	N	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	O	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	P	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Q	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	R	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	S	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	T	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	U	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	V	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	W	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	X	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Y	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	Z	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	a	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	b	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	c	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	d	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	e	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	f	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	g	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
1	h	145/560 (26%)	130 (90%)	14 (10%)	1 (1%)	22	53
All	All	4930/19040 (26%)	4420 (90%)	476 (10%)	34 (1%)	26	53

All (34) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	256	ILE
1	B	256	ILE
1	C	256	ILE
1	D	256	ILE
1	E	256	ILE
1	F	256	ILE
1	G	256	ILE

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Mol	Chain	Res	Type
1	H	256	ILE
1	I	256	ILE
1	J	256	ILE
1	K	256	ILE
1	L	256	ILE
1	M	256	ILE
1	N	256	ILE
1	O	256	ILE
1	P	256	ILE
1	Q	256	ILE
1	R	256	ILE
1	S	256	ILE
1	T	256	ILE
1	U	256	ILE
1	V	256	ILE
1	W	256	ILE
1	X	256	ILE
1	Y	256	ILE
1	Z	256	ILE
1	a	256	ILE
1	b	256	ILE
1	c	256	ILE
1	d	256	ILE
1	e	256	ILE
1	f	256	ILE
1	g	256	ILE
1	h	256	ILE

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	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	B	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	C	134/467 (29%)	132 (98%)	2 (2%)	65	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	E	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	F	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	G	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	H	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	I	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	J	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	K	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	L	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	M	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	N	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	O	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	P	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Q	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	R	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	S	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	T	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	U	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	V	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	W	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	X	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Y	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	Z	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	a	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	b	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	c	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	d	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	e	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	f	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	g	134/467 (29%)	132 (98%)	2 (2%)	65	89
1	h	134/467 (29%)	132 (98%)	2 (2%)	65	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	4556/15878 (29%)	4488 (98%)	68 (2%)	66	89

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	369	ASP
1	A	425	LYS
1	B	369	ASP
1	B	425	LYS
1	C	369	ASP
1	C	425	LYS
1	D	369	ASP
1	D	425	LYS
1	E	369	ASP
1	E	425	LYS
1	F	369	ASP
1	F	425	LYS
1	G	369	ASP
1	G	425	LYS
1	H	369	ASP
1	H	425	LYS
1	I	369	ASP
1	I	425	LYS
1	J	369	ASP
1	J	425	LYS
1	K	369	ASP
1	K	425	LYS
1	L	369	ASP
1	L	425	LYS
1	M	369	ASP
1	M	425	LYS
1	N	369	ASP
1	N	425	LYS
1	O	369	ASP
1	O	425	LYS
1	P	369	ASP
1	P	425	LYS
1	Q	369	ASP
1	Q	425	LYS
1	R	369	ASP
1	R	425	LYS
1	S	369	ASP

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Mol	Chain	Res	Type
1	S	425	LYS
1	T	369	ASP
1	T	425	LYS
1	U	369	ASP
1	U	425	LYS
1	V	369	ASP
1	V	425	LYS
1	W	369	ASP
1	W	425	LYS
1	X	369	ASP
1	X	425	LYS
1	Y	369	ASP
1	Y	425	LYS
1	Z	369	ASP
1	Z	425	LYS
1	a	369	ASP
1	a	425	LYS
1	b	369	ASP
1	b	425	LYS
1	c	369	ASP
1	c	425	LYS
1	d	369	ASP
1	d	425	LYS
1	e	369	ASP
1	e	425	LYS
1	f	369	ASP
1	f	425	LYS
1	g	369	ASP
1	g	425	LYS
1	h	369	ASP
1	h	425	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (111) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	263	HIS
1	A	277	GLN
1	A	434	ASN
1	B	263	HIS
1	B	277	GLN
1	B	365	ASN
1	B	434	ASN

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Mol	Chain	Res	Type
1	C	263	HIS
1	C	277	GLN
1	C	434	ASN
1	D	263	HIS
1	D	277	GLN
1	D	434	ASN
1	E	263	HIS
1	E	434	ASN
1	F	263	HIS
1	F	365	ASN
1	F	434	ASN
1	G	263	HIS
1	G	277	GLN
1	G	365	ASN
1	G	434	ASN
1	H	263	HIS
1	H	434	ASN
1	I	263	HIS
1	I	277	GLN
1	I	365	ASN
1	I	434	ASN
1	J	263	HIS
1	J	277	GLN
1	J	365	ASN
1	J	434	ASN
1	K	263	HIS
1	K	277	GLN
1	K	365	ASN
1	K	434	ASN
1	L	263	HIS
1	L	277	GLN
1	L	434	ASN
1	M	263	HIS
1	M	277	GLN
1	M	365	ASN
1	M	434	ASN
1	N	263	HIS
1	N	277	GLN
1	N	365	ASN
1	N	434	ASN
1	O	263	HIS
1	O	434	ASN

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Mol	Chain	Res	Type
1	P	263	HIS
1	P	434	ASN
1	Q	263	HIS
1	Q	277	GLN
1	Q	365	ASN
1	Q	434	ASN
1	R	263	HIS
1	R	365	ASN
1	R	434	ASN
1	S	263	HIS
1	S	277	GLN
1	S	434	ASN
1	T	263	HIS
1	T	277	GLN
1	T	434	ASN
1	U	263	HIS
1	U	277	GLN
1	U	365	ASN
1	U	434	ASN
1	V	263	HIS
1	V	277	GLN
1	V	434	ASN
1	W	263	HIS
1	W	277	GLN
1	W	434	ASN
1	X	263	HIS
1	X	365	ASN
1	X	434	ASN
1	Y	263	HIS
1	Y	277	GLN
1	Y	365	ASN
1	Y	434	ASN
1	Z	263	HIS
1	Z	365	ASN
1	Z	411	GLN
1	Z	434	ASN
1	a	263	HIS
1	a	431	ASN
1	a	434	ASN
1	b	263	HIS
1	b	277	GLN
1	b	365	ASN

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Mol	Chain	Res	Type
1	b	434	ASN
1	c	263	HIS
1	c	277	GLN
1	c	365	ASN
1	c	434	ASN
1	d	263	HIS
1	d	277	GLN
1	d	365	ASN
1	d	434	ASN
1	e	263	HIS
1	e	277	GLN
1	e	434	ASN
1	f	263	HIS
1	f	434	ASN
1	g	263	HIS
1	g	277	GLN
1	g	365	ASN
1	g	434	ASN
1	h	263	HIS
1	h	434	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.

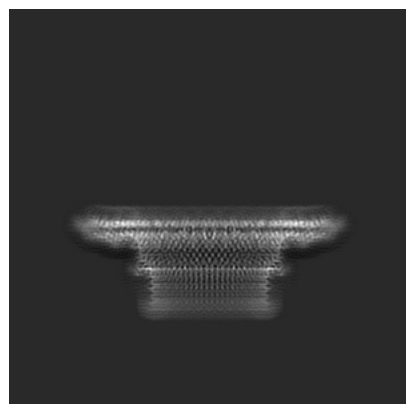
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-10148. These allow visual inspection of the internal detail of the map and identification of artifacts.

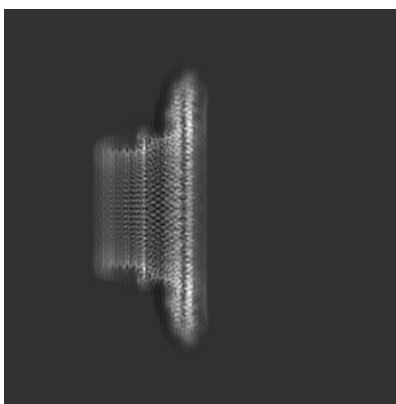
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

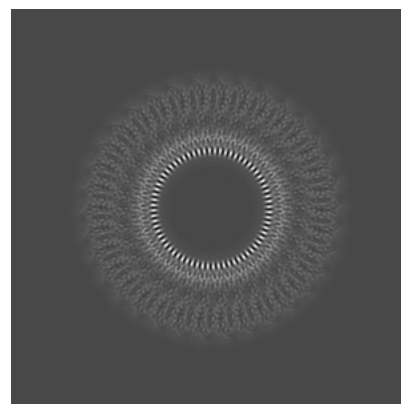
6.1.1 Primary map



X

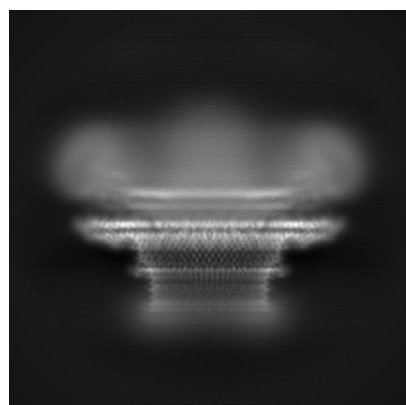


Y

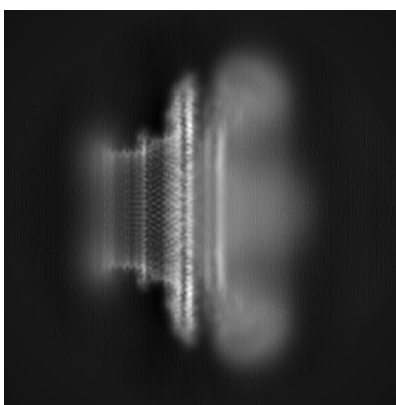


Z

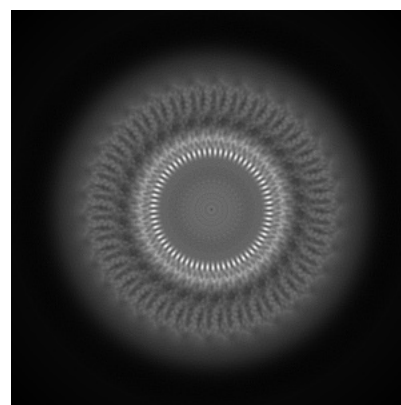
6.1.2 Raw map



X



Y



Z

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

6.2 Central slices [i](#)

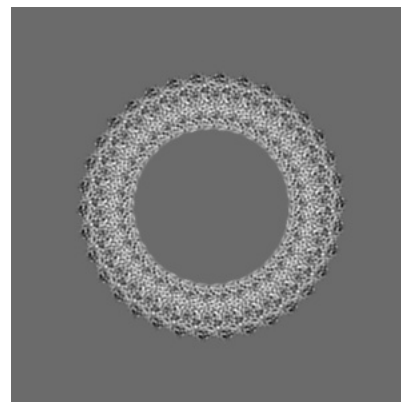
6.2.1 Primary map



X Index: 216

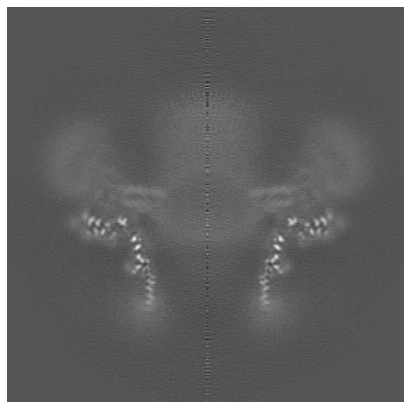


Y Index: 216

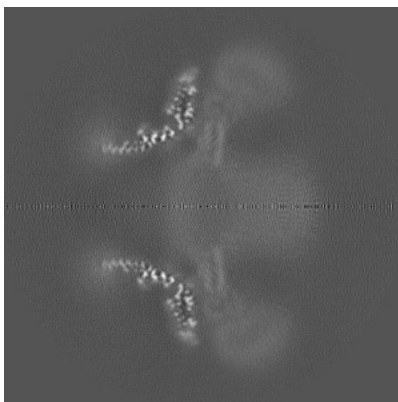


Z Index: 216

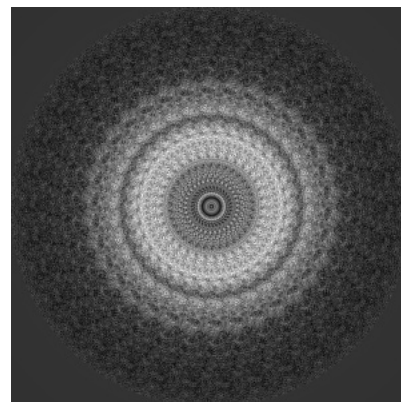
6.2.2 Raw map



X Index: 216



Y Index: 216



Z Index: 216

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

6.3 Largest variance slices [i](#)

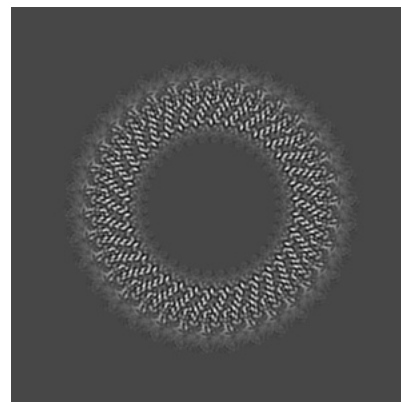
6.3.1 Primary map



X Index: 155

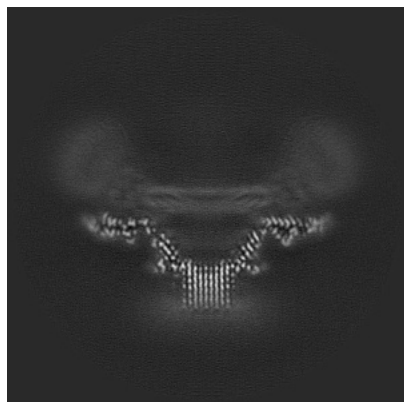


Y Index: 155

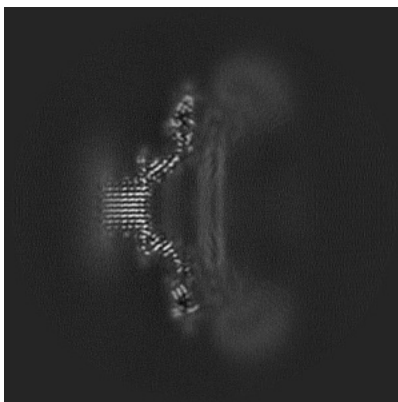


Z Index: 198

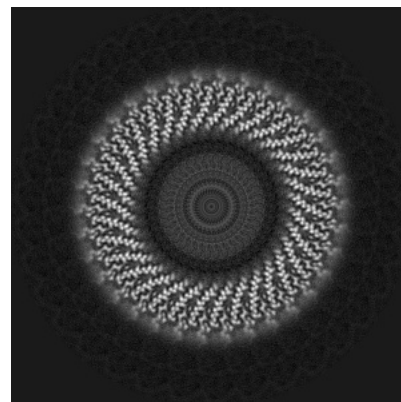
6.3.2 Raw map



X Index: 155



Y Index: 154

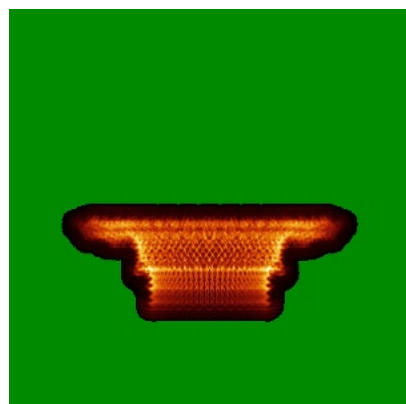


Z Index: 200

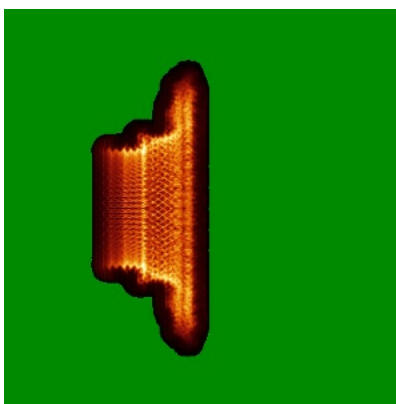
The images above show the largest variance slices of the map in three orthogonal directions.

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

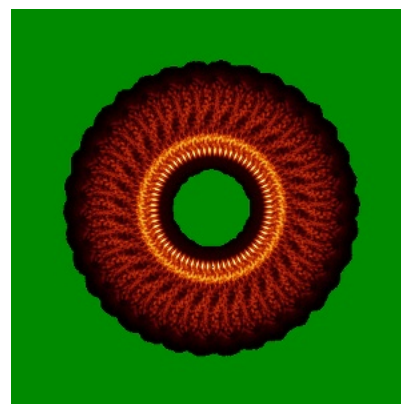
6.4.1 Primary map



X

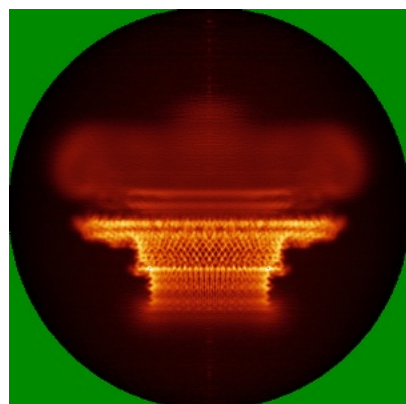


Y

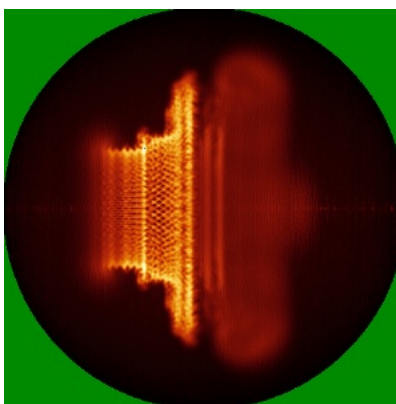


Z

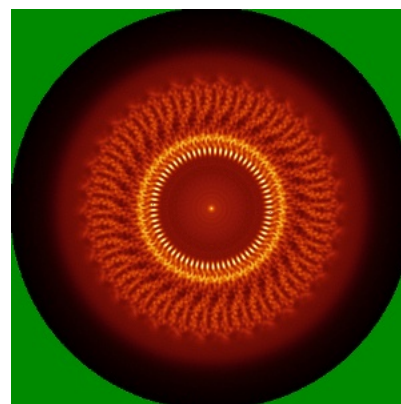
6.4.2 Raw map



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 0.01. 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.

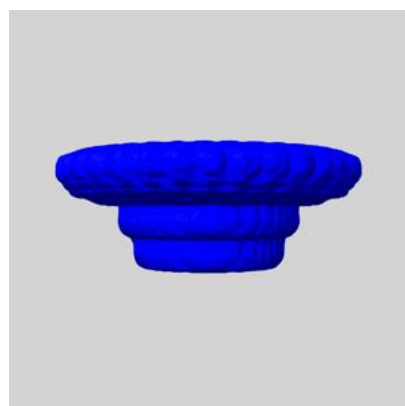
6.6 Mask visualisation [i](#)

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

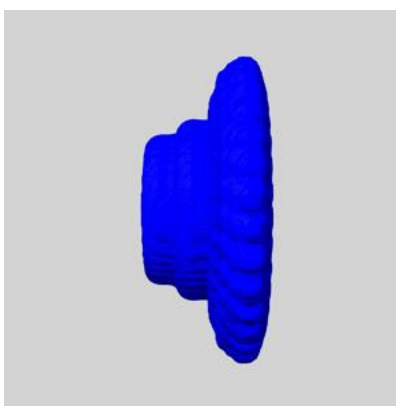
A mask typically either:

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

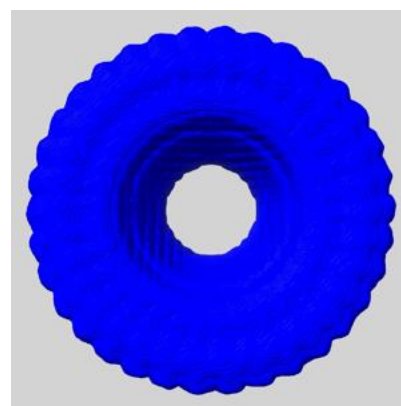
6.6.1 emd_10148_msk_1.map [i](#)



X



Y

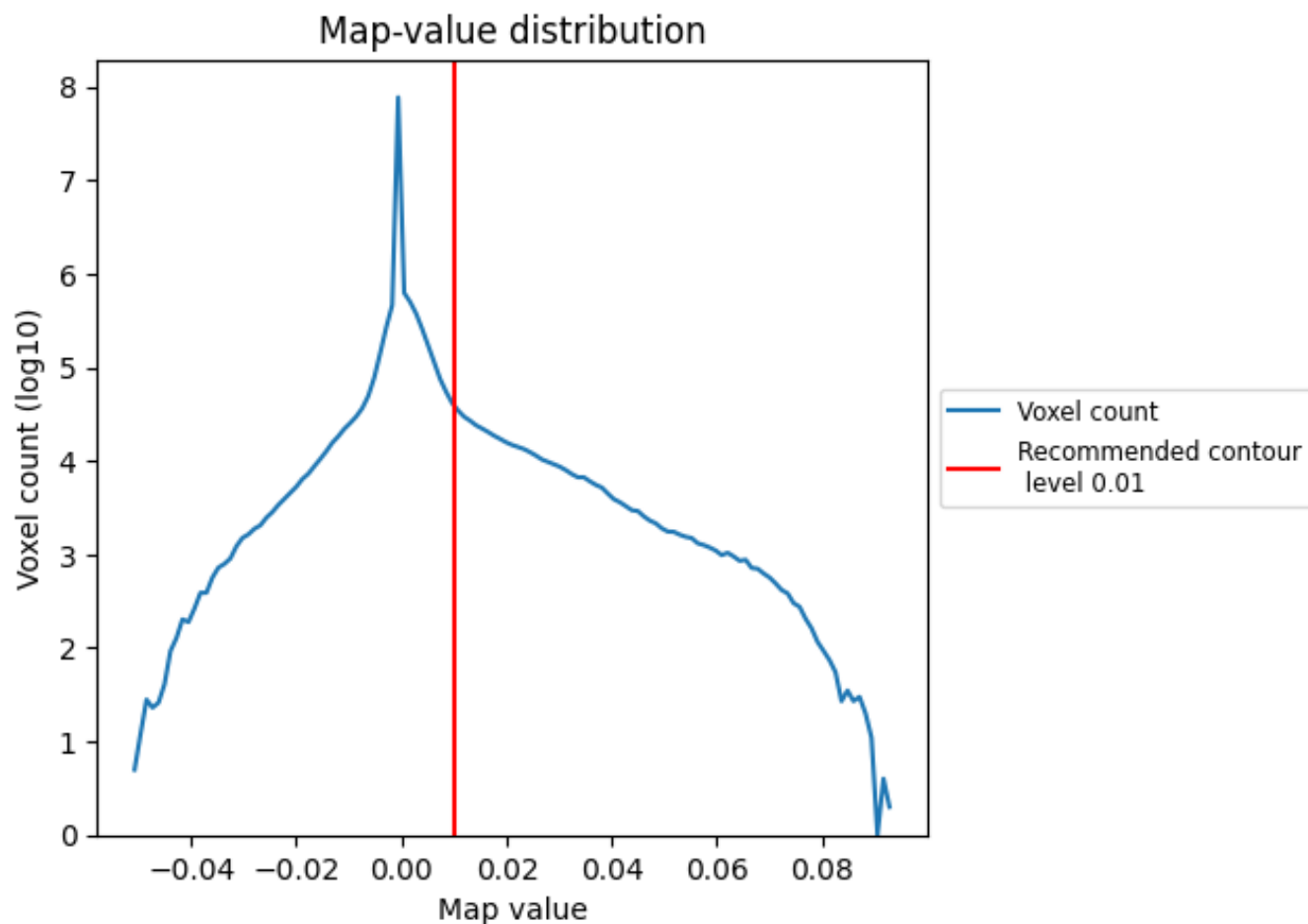


Z

7 Map analysis [i](#)

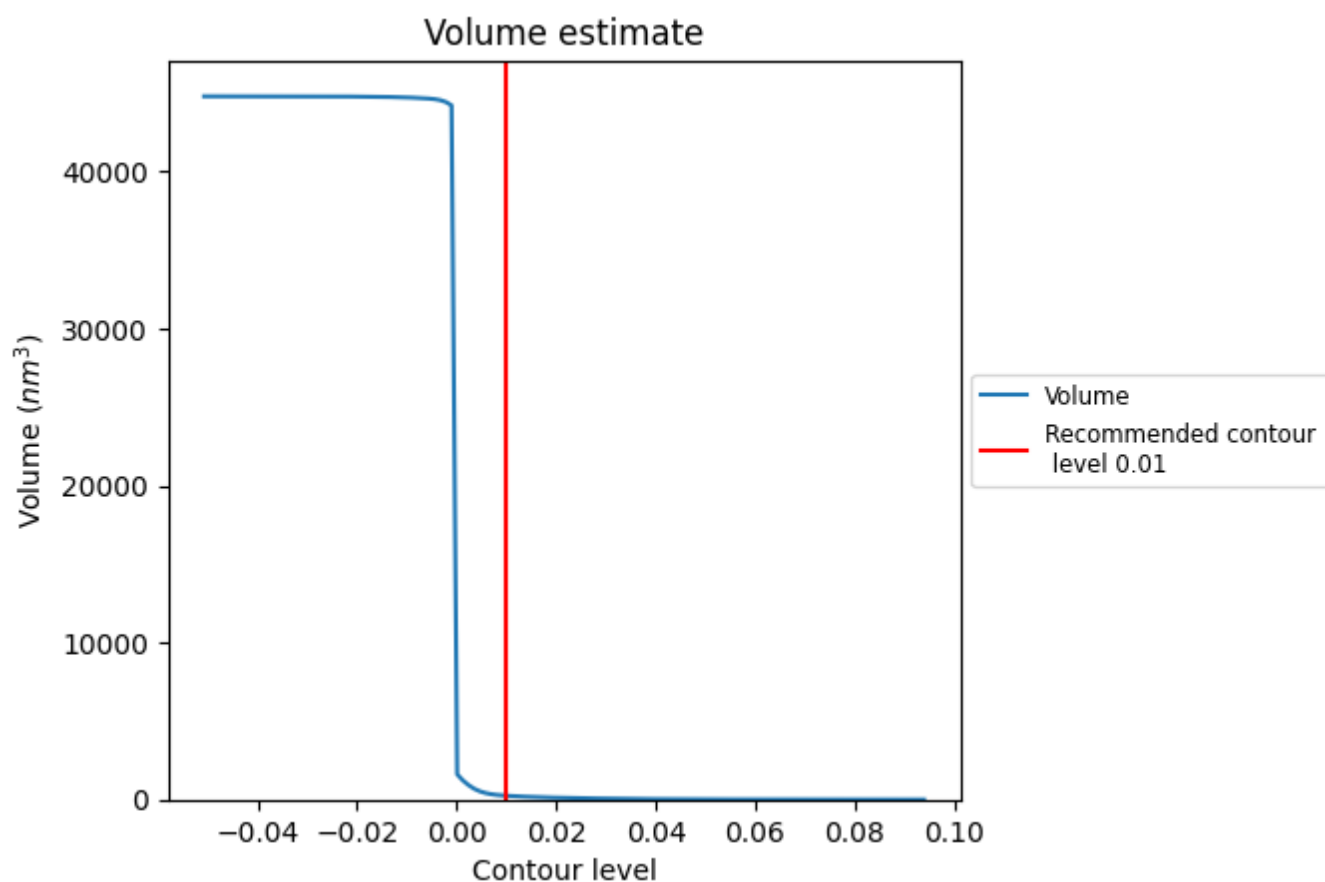
This section contains the results of statistical analysis of the map.

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.

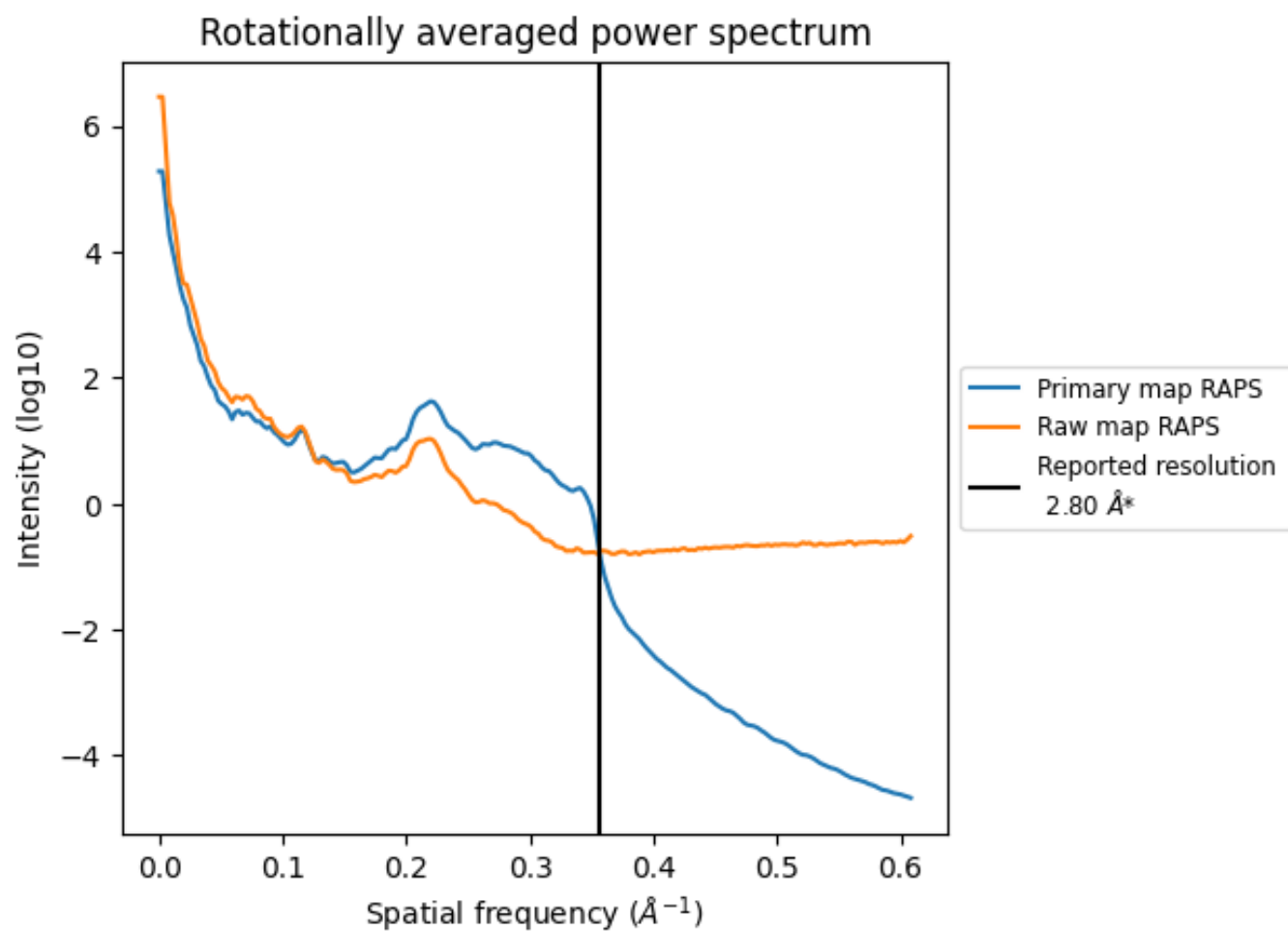
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 244 nm³; this corresponds to an approximate mass of 220 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 ⓘ

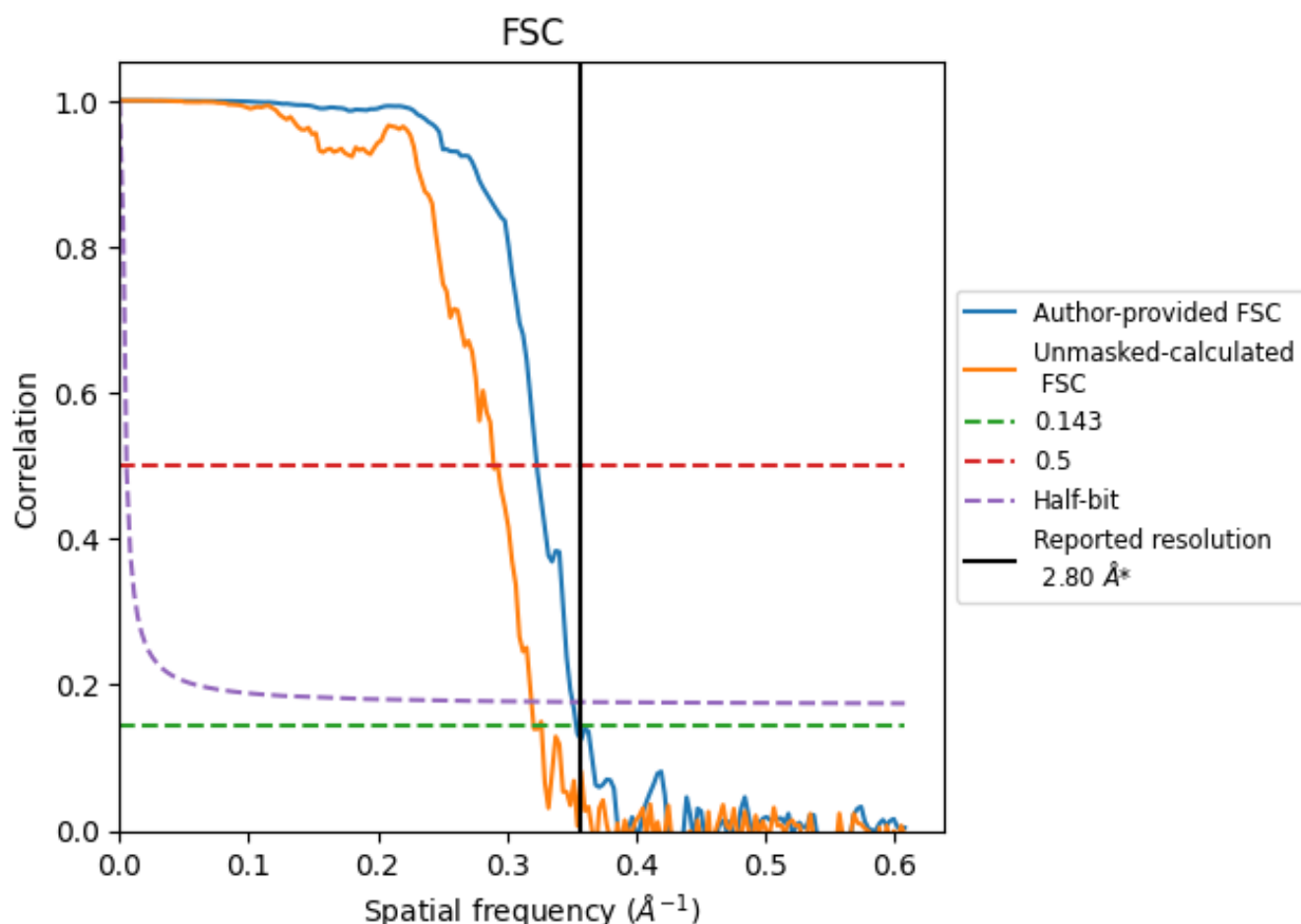


*Reported resolution corresponds to spatial frequency of 0.357 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.357 \AA^{-1}

8.2 Resolution estimates [i](#)

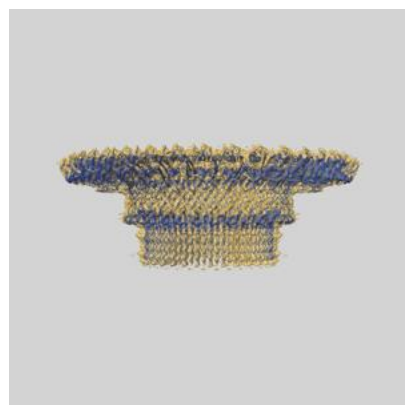
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	2.82	3.09	2.85
Unmasked-calculated*	3.12	3.45	3.13

*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 3.12 differs from the reported value 2.8 by more than 10 %

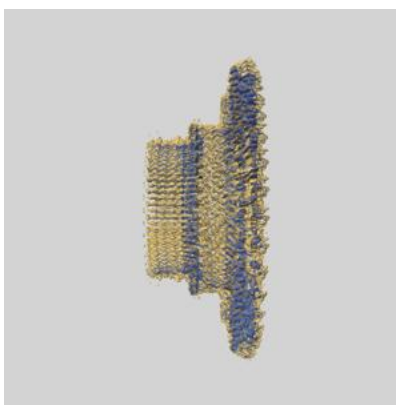
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-10148 and PDB model 6SD4. Per-residue inclusion information can be found in section [3](#) on page [6](#).

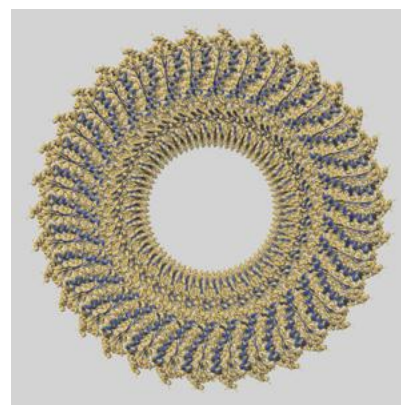
9.1 Map-model overlay [i](#)



X



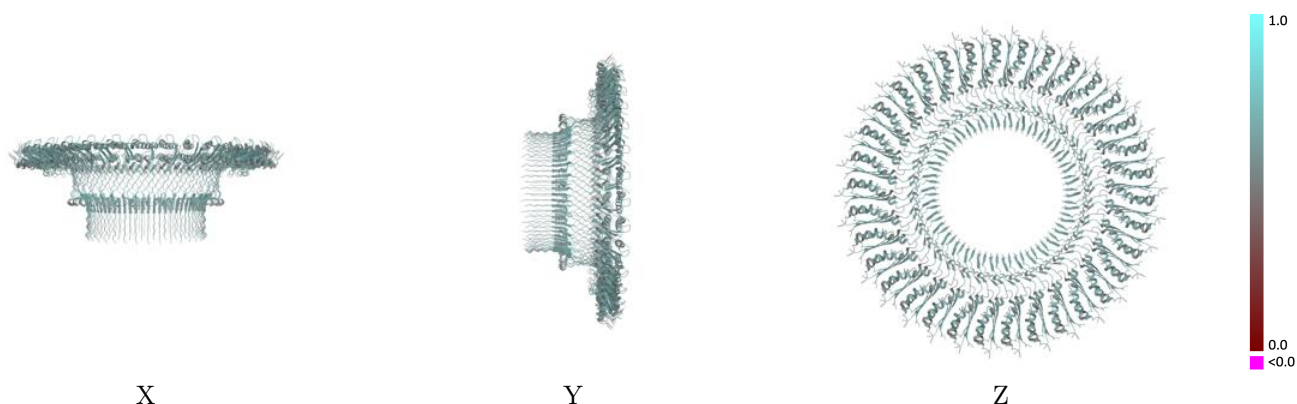
Y



Z

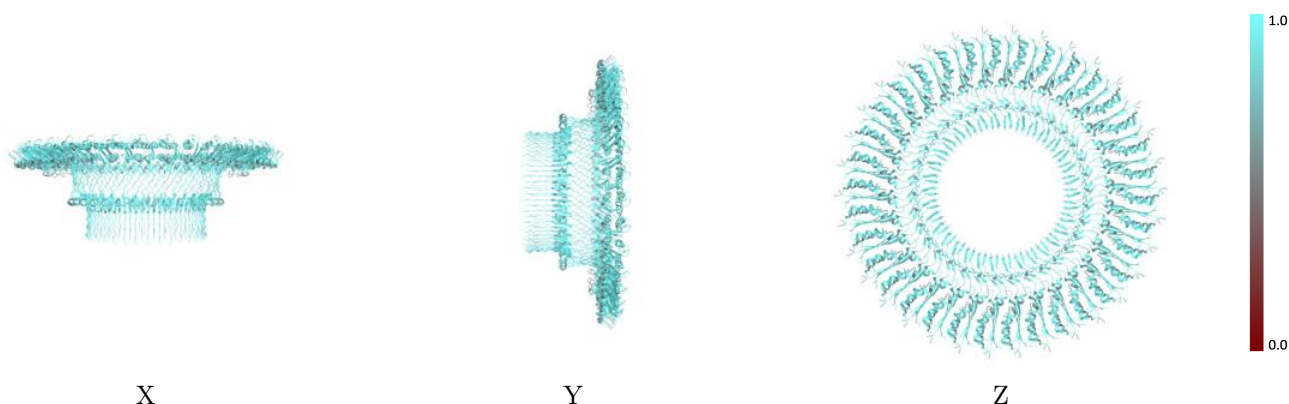
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



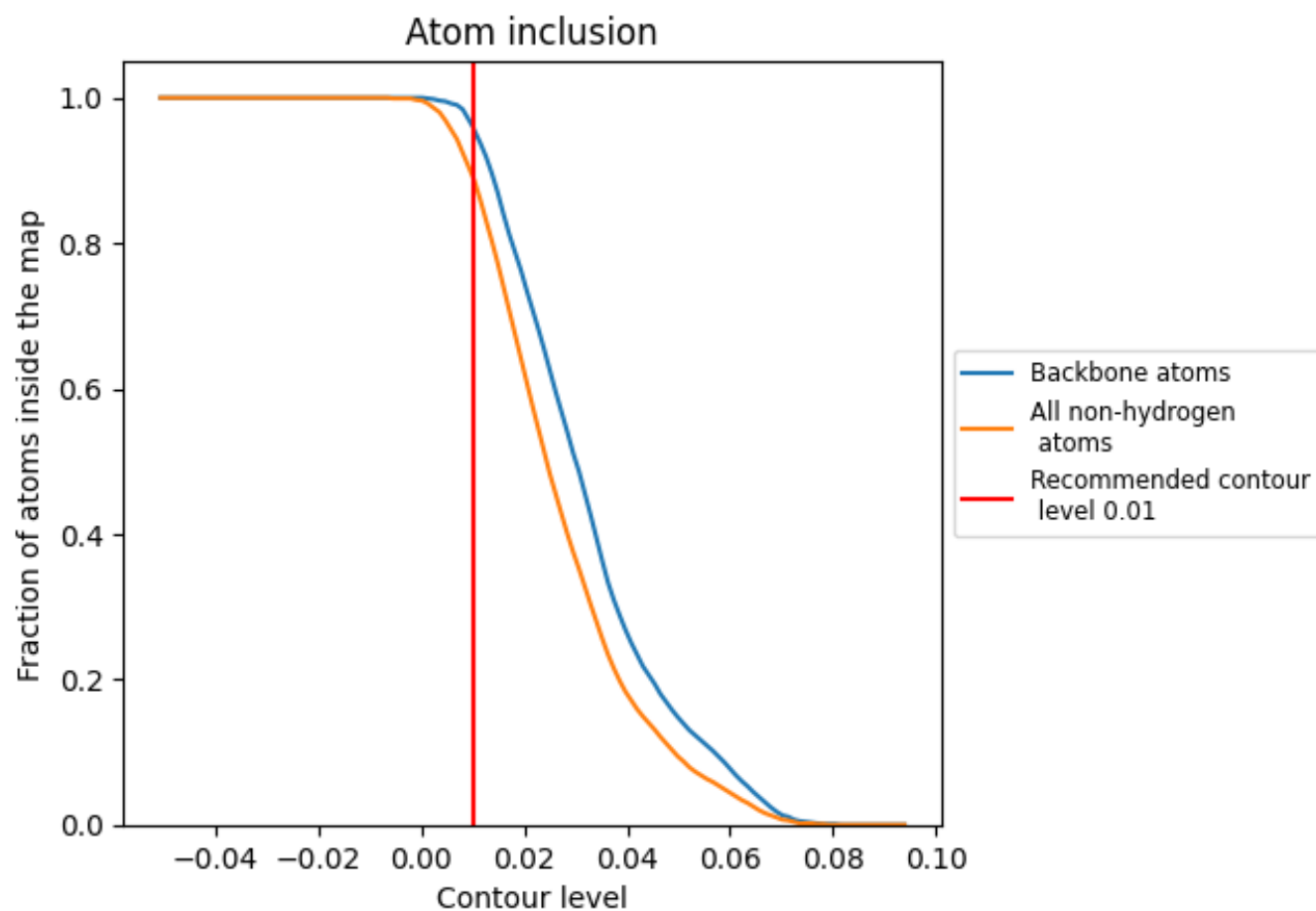
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.01).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 89% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8910	 0.5920
A	 0.8920	 0.5910
B	 0.8930	 0.5920
C	 0.8920	 0.5930
D	 0.8860	 0.5930
E	 0.8880	 0.5920
F	 0.8930	 0.5900
G	 0.8880	 0.5950
H	 0.8930	 0.5950
I	 0.8930	 0.5920
J	 0.8980	 0.5920
K	 0.8960	 0.5900
L	 0.8910	 0.5890
M	 0.8890	 0.5910
N	 0.8820	 0.5890
O	 0.8900	 0.5930
P	 0.8900	 0.5910
Q	 0.8920	 0.5900
R	 0.8940	 0.5910
S	 0.8930	 0.5940
T	 0.8930	 0.5960
U	 0.8930	 0.5960
V	 0.8930	 0.5930
W	 0.8880	 0.5910
X	 0.8930	 0.5950
Y	 0.8940	 0.5930
Z	 0.8930	 0.5880
a	 0.8940	 0.5880
b	 0.8920	 0.5880
c	 0.8940	 0.5910
d	 0.8760	 0.5850
e	 0.8850	 0.5930
f	 0.8920	 0.5950
g	 0.8860	 0.5920
h	 0.8910	 0.5930

