



wwPDB EM Validation Summary Report ⓘ

Mar 6, 2026 – 01:15 PM UTC

PDB ID : 8TPX / pdb_00008tpx
EMDB ID : EMD-41496
Title : Crosslinked 6-deoxyerythronolide B synthase (DEBS) Module 3 in complex with antibody fragment 1B2: trans-oriented 1B2 and ACP
Authors : Cogan, D.P.; Soohoo, A.M.; Chen, M.; Brodsky, K.L.; Liu, Y.; Khosla, C.
Deposited on : 2023-08-05
Resolution : 3.40 Å(reported)
Based on initial model : 6C9U

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 ⓘ 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.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

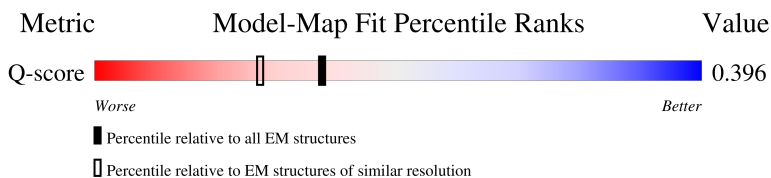
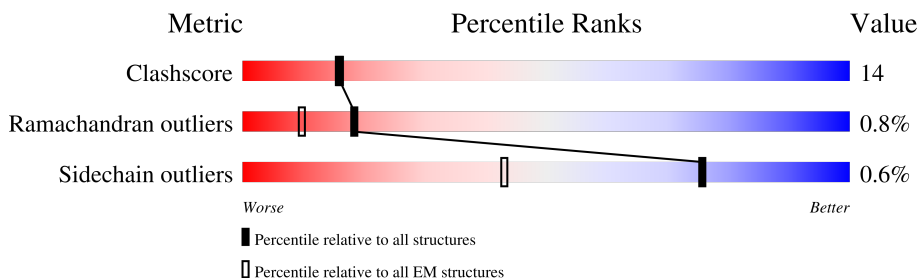
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	1766	 36% 14% 49%
1	B	1766	 40% 11% 49%
1	C	1766	 96%
2	H	249	 51% 31% 18%

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Mol	Chain	Length	Quality of chain
3	L	236	 A horizontal bar chart showing the quality of chain L. The bar is divided into three segments: green (57%), yellow (31%), and grey (11%). A small red dot is at the beginning of the green segment.

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 17177 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 EryAII,EryAII,EryAII,6-deoxyerythronolide-B synthase EryA3, modules 5 and 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	895	Total	C	N	O	S	4	0
			6719	4162	1245	1295	17		
1	B	901	Total	C	N	O	S	5	0
			6763	4184	1252	1309	18		
1	C	72	Total	C	N	O	P S	0	0
			560	347	101	109	1 2		

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	expression tag	UNP Q5UNP5
A	1	ALA	-	expression tag	UNP Q5UNP5
A	2	SER	-	expression tag	UNP Q5UNP5
A	481	THR	SER	conflict	UNP Q5UNP5
B	0	MET	-	expression tag	UNP Q5UNP5
B	1	ALA	-	expression tag	UNP Q5UNP5
B	2	SER	-	expression tag	UNP Q5UNP5
B	481	THR	SER	conflict	UNP Q5UNP5
C	18	MET	-	expression tag	UNP Q5UNP5
C	19	ALA	-	expression tag	UNP Q5UNP5
C	20	SER	-	expression tag	UNP Q5UNP5
C	499	THR	SER	conflict	UNP Q5UNP5

- Molecule 2 is a protein called Antibody Fragment 1B2, Heavy Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	H	205	Total	C	N	O	S	0	0
			1539	978	257	298	6		

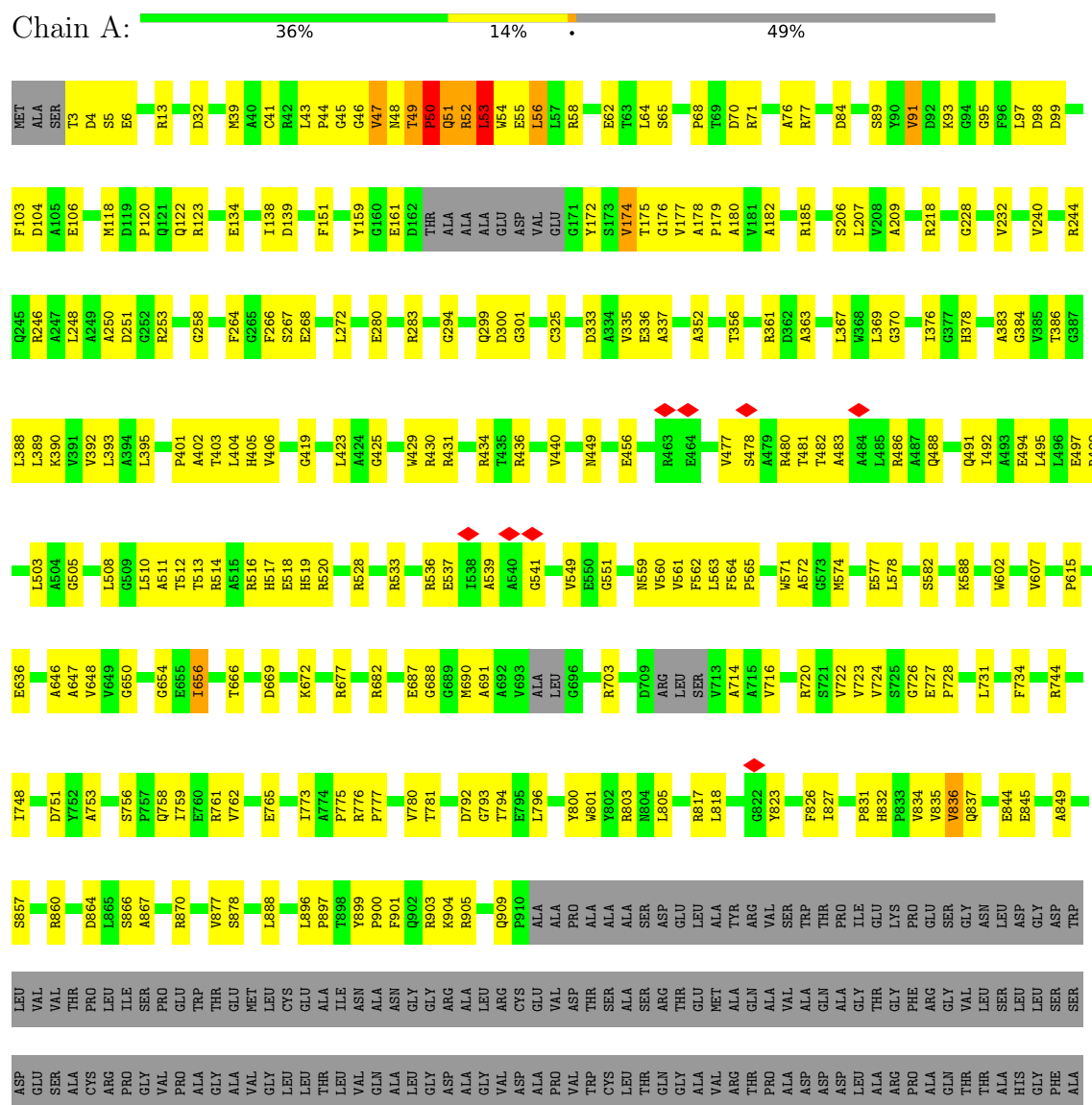
- Molecule 3 is a protein called Antibody Fragment 1B2, Light Chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	L	209	Total	C	N	O	S	0	0
			1596	1001	269	320	6		

3 Residue-property plots

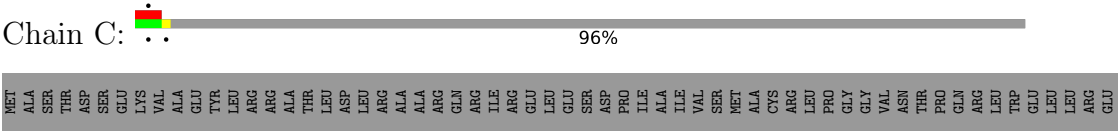
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: EryAII,EryAII,EryAII,6-deoxyerythronolide-B synthase EryA3, modules 5 and 6



ALA	ALA	GLY	TYR	VAL	GLU	GLY	GLY	PHE	GLN	VAL	LEU	ASP	ILE	SER	ARG	GLY	ARG	CYS	SER	ALA	ALA	V745	P565
ALA	ALA	GLU	PRO	PRO	LEU	GLY	ASP	HIS	ASN	VAL	LEU	ALA	GLU	SER	THR	ALA	LEU	THR	SER	ALA	E760	G575	
LEU	LEU	MET	GLY	PRO	SER	PHE	THR	THR	LEU	VAL	GLU	ASP	ARG	VAL	GLY	GLY	GLY	GLN	ARG	THR	R763	E577	
HIS	HIS	GLY	HIS	GLN	LEU	SER	LEU	VAL	GLU	ALA	HIS	ASP	PRO	PRO	VAL	VAL	ALA	ALA	MET	LEU	A774	S581	
HIS	HIS	TRP	ASP	ASP	ALA	ASP	LEU	ALA	VAL	VAL	HIS	ARG	GLU	GLU	LEU	LEU	ARG	THR	ALA	TYR	P775	F585	
HIS	ASP	MET	ALA	VAL	VAL	VAL	ASP	ALA	ASN	TRP	ALA	ARG	PHE	GLU	GLY	GLY	LEU	PRO	ALA	VAL	P776	F585	
HIS	ASP	ASN	ASN	ASN	ALA	ASP	GLN	HIS	ALA	VAL	GLY	GLY	ALA	ALA	CYS	VAL	ALA	ASP	VAL	SER	A778	M599	
ASP	SER	SER	ALA	ALA	ALA	MET	ALA	HIS	VAL	VAL	GLY	GLY	GLU	GLU	ARG	VAL	ALA	ASP	ALA	TRP	Q600	Q600	
TRP	TRP	TRP	TRP	TRP	VAL	THR	THR	THR	ALA	LEU	ARG	SER	THR	THR	PRO	ARG	GLN	ASP	GLN	THR	S784	D621	
LYS	PRO	LYS	LEU	LEU	GLN	ASP	GLY	GLN	VAL	GLY	GLY	SER	ILE	ALA	ASP	GLY	LEU	ASP	ALA	PRO	R789	D621	
THR	THR	THR	GLU	GLU	ASP	PRO	GLY	LEU	VAL	GLY	THR	THR	ALA	ALA	ASP	ASP	ALA	LEU	GLY	ILE	S790	D621	
TRP	TRP	TRP	LEU	LEU	ASP	GLY	ASP	GLY	GLY	PHE	SER	SER	LYS	VAL	ASP	LEU	ARG	GLY	THR	GLU	L637	L637	
PRO	PRO	PHE	ALA	ALA	VAL	VAL	GLU	SER	HIS	VAL	VAL	ALA	THR	LEU	LEU	LEU	PRO	ALA	PHE	LYS	M791	L638	
PHE	PHE	PHE	ALA	ALA	ILE	VAL	VAL	GLY	GLU	ALA	ALA	ALA	ALA	GLY	GLY	ALA	ALA	ARG	GLY	GLU	D797	S640	
GLU	GLU	THR	THR	THR	THR	THR	THR	THR	SER	THR	THR	THR	LEU	LEU	ALA	ARG	GLN	GLY	SER	GLY	A798	V643	
HIS	HIS	THR	LEU	LEU	THR	VAL	VAL	PRO	ALA	ARG	THR	THR	LEU	LEU	VAL	VAL	THR	THR	VAL	GLY	R799	V643	
ASP	ASP	PHE	PHE	PHE	GLN	ILE	ALA	ALA	ALA	PRO	PRO	PRO	ALA	ALA	GLU	VAL	THR	ALA	ASN	GLY	L805	H651	
THR	THR	THR	ASP	ASP	GLY	CYS	ARG	ARG	GLU	THR	TRP	TRP	VAL	LEU	GLU	VAL	HIS	LEU	LEU	ASP	R806	H651	
VAL	VAL	VAL	ARG	ARG	ASP	GLY	ALA	ALA	ILE	ALA	ALA	ALA	LEU	LEU	GLY	ALA	ARG	ASP	GLY	GLY	R806	H651	
ALA	ALA	ALA	THR	THR	LYS	ALA	SER	ASN	VAL	PHE	PRO	PRO	GLU	GLU	ALA	SER	PHE	LEU	ASP	ASP	V661	V661	
PRO	PRO	VAL	VAL	VAL	PHE	THR	SER	SER	ARG	ALA	GLY	GLY	VAL	VAL	SER	LEU	ALA	SER	SER	ASP	L818	V661	
GLY	GLY	ARG	ARG	ARG	VAL	ALA	ALA	ALA	ARG	GLU	GLY	GLY	LEU	LEU	PRO	ALA	GLN	ASP	TRP	LEU	S821	A664	
ASP	ASP	MET	MET	MET	VAL	ALA	LEU	LEU	ALA	LEU	ALA	ALA	GLY	GLY	VAL	VAL	VAL	VAL	LEU	VAL	S821	A664	
HIS	HIS	ASP	ASP	ASP	ALA	ILE	ASP	ARG	PHE	ALA	VAL	VAL	ASP	SER	ALA	SER	ALA	ALA	VAL	VAL	F826	T666	
PHE	PHE	PHE	ASP	ASP	GLY	THR	GLY	ASP	SER	GLY	ASP	ASP	ARG	ARG	CYS	GLY	GLY	GLY	THR	GLY	I827	T666	
THR	THR	THR	THR	THR	HIS	GLY	GLY	GLY	GLY	ARG	GLY	ASP	ALA	ALA	CYS	SER	ARG	CYS	PRO	GLY	E828	E668	
MET	MET	MET	ARG	ARG	SER	ARG	TYR	TYR	LEU	GLY	GLY	ASP	VAL	VAL	GLN	ARG	GLY	ARG	LEU	LEU	V829	E668	
VAL	VAL	VAL	LEU	LEU	ALA	ALA	ALA	ARG	GLY	GLY	THR	THR	GLU	GLU	ASP	PRO	LEU	PRO	ILE	ILE	S830	R677	
GLN	GLN	GLU	THR	THR	ALA	PHE	ALA	GLN	GLY	ALA	LEU	LEU	ALA	ALA	THR	GLY	GLY	VAL	SER	SER	H832	S678	
GLU	GLU	GLU	ALA	ALA	LEU	THR	THR	GLY	ASP	GLY	THR	THR	GLU	GLU	ALA	VAL	GLY	VAL	PRO	GLU	P831	S678	
HIS	HIS	LEU	LEU	LEU	LEU	THR	ARG	VAL	VAL	GLY	GLY	GLY	ALA	ALA	ALA	ALA	THR	ALA	PRO	GLU	P833	R682	
ALA	ALA	ALA	GLY	GLY	LEU	ALA	VAL	VAL	VAL	ALA	ALA	GLY	TYR	TYR	THR	TRP	TRP	ALA	TRP	TRP	P833	S685	
ASP	ASP	ASP	ALA	ALA	ALA	LEU	SER	SER	ASN	GLY	GLY	GLY	CYS	CYS	ARG	GLY	GLY	GLY	THR	GLY	D851	S685	
ILE	ILE	ILE	TYR	TYR	TYR	GLY	GLY	GLY	ALA	PRO	LEU	LEU	SER	SER	GLY	THR	GLY	GLY	GLY	GLU	S851	V693	
ALA	ALA	ALA	ASP	ASP	ALA	ALA	ARG	VAL	MET	ASP	ARG	ARG	ALA	ALA	ALA	VAL	VAL	VAL	MET	VAL	V854	V693	
ALA	ALA	ARG	ARG	ARG	LEU	LEU	ALA	VAL	ALA	SER	SER	SER	VAL	VAL	LEU	GLY	VAL	VAL	GLY	VAL	V854	ALA	
HIS	HIS	THR	THR	THR	ALA	LEU	ARG	ARG	LEU	GLY	LEU	LEU	ALA	ALA	ASP	VAL	ASP	ASP	CYS	CYS	L858	G696	
ILE	ILE	ILE	GLY	GLY	GLY	GLY	TYR	TYR	LYS	THR	ALA	ALA	ILE	ILE	GLY	THR	THR	LEU	GLY	GLY	D861	V700	
ASP	ASP	GLN	GLN	GLN	GLU	ILE	LEU	LEU	ARG	GLY	ASP	ASP	PRO	TRP	PRO	ALA	GLU	LEU	ILE	ILE	D861	V700	
ALA	ALA	TRP	TRP	TRP	LEU	ALA	ASP	ASP	LEU	GLU	ARG	ARG	GLY	GLY	VAL	VAL	SER	ASN	ASN	ASN	L869	D709	
TRP	TRP	TRP	ARG	ARG	ASP	VAL	LEU	LEU	PRO	PRO	LEU	LEU	THR	THR	GLY	VAL	VAL	GLN	ALA	ALA	S878	ALA	
LEU	LEU	LEU	PRO	PRO	ALA	VAL	ARG	ARG	ALA	ALA	MET	MET	ALA	ALA	GLY	LEU	ASP	ASP	PRO	GLY	SER	S878	LEU
GLY	GLY	GLY	ARG	ARG	GLY	ALA	ARG	ALA	GLY	GLN	ARG	THR	MET	MET	VAL	VAL	VAL	GLY	GLY	GLY	R903	V713	
GLY	GLY	ASN	GLY	THR	PRO	VAL	LEU	LEU	GLY	ALA	THR	THR	ALA	ALA	HIS	ASP	ALA	ALA	ARG	ARG	A714	V713	
ASN	ASN	GLY	GLY	GLY	PRO	GLN	SER	SER	LEU	ALA	GLU	GLU	ALA	HIS	GLN	ASP	ALA	ALA	ALA	ALA	W907	V723	
SER	SER	SER	LEU	LEU	ARG	GLN	PHE	ASP	ARG	GLY	GLY	VAL	TYR	THR	GLY	VAL	ARG	GLY	GLY	LEU	L908	V724	
VAL	VAL	SER	PRO	PRO	GLY	GLY	THR	THR	VAL	LEU	VAL	VAL	VAL	THR	VAL	VAL	LEU	VAL	ASP	CYS	PRO	GLN	V724
VAL	VAL	THR	THR	THR	VAL	VAL	GLU	GLU	PRO	PRO	SER	LEU	ALA	ALA	LEU	THR	LEU	VAL	GLY	GLY	ALA	C738	C738
ASP	ASP	VAL	LEU	LEU	LEU	GLY	ARG	HIS	SER	ASP	ALA	ALA	GLY	SER	THR	THR	LEU	ALA	VAL	VAL	ALA	ALA	ALA
LYS	LYS	VAL	VAL	VAL	ILE	GLY	PHE	PHE	LEU	GLU	GLY	GLY	ASN	PHE	GLY	ASN	ALA	VAL	TRP	TRP	PRO	ALA	ALA
LEU	LEU	LEU	SER	SER	ASP	GLY	ASP	ASP	VAL	GLN	PRO	PRO	TYR	ALA	GLY	ASP	LEU	VAL	ALA	ALA	PRO	ALA	ALA
LEU	LEU	LEU	THR	THR	VAL	GLY	THR	THR	VAL	GLN	VAL	VAL	THR	ALA	GLY	THR	GLY	LEU	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	PRO	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	ASP	ASP	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL	THR	ALA	GLY	THR	LEU	VAL	THR	THR	ALA	ALA	ALA
LEU	LEU	LEU	VAL	VAL	ASP	GLY	THR	THR	VAL	VAL	VAL	VAL</											

- Molecule 1: EryAII,EryAII,EryAII,6-deoxyerythronolide-B synthase EryA3, modules 5 and 6





S196	L197	S198	L201	T202	K205	A206	D207	K210	H211	K212	VAL	TYR	A215	C216	T219	H220	L223	K229	S230	F231	ASN	ARG	GLY	GLU	CYS
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	68150	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.701	Depositor
Minimum map value	-0.467	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.031	Depositor
Recommended contour level	0.406	Depositor
Map size ($\text{\AA}$)	563.2, 563.2, 563.2	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.1, 1.1, 1.1	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 4HH

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	0.17	0/6845	0.42	0/9303
1	B	0.16	0/6888	0.41	3/9363 (0.0%)
1	C	0.10	0/538	0.30	0/729
2	H	0.12	0/1575	0.35	0/2141
3	L	0.13	0/1630	0.34	0/2212
All	All	0.16	0/17476	0.40	3/23748 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	353	LEU	N-CA-C	-9.82	101.30	113.18
1	B	355	ASP	N-CA-C	-9.52	101.67	113.28
1	B	354	LEU	N-CA-C	-8.96	102.34	113.28

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	6719	0	6583	203	0
1	B	6763	0	6621	159	0
1	C	560	0	570	21	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	H	1539	0	1511	67	0
3	L	1596	0	1561	53	0
All	All	17177	0	16846	488	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 14.

The worst 5 of 488 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:351:ASN:HA	1:B:354:LEU:HB2	1.31	1.10
3:L:215:ALA:HA	3:L:229:LYS:O	1.65	0.96
1:B:354:LEU:HA	1:B:357:TYR:HB2	1.48	0.93
1:B:351:ASN:CA	1:B:354:LEU:HB2	2.08	0.84
1:B:394:ALA:HA	1:B:399:GLU:H	1.43	0.81

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	891/1766 (50%)	727 (82%)	155 (17%)	9 (1%)	12	40
1	B	900/1766 (51%)	786 (87%)	109 (12%)	5 (1%)	21	50
1	C	69/1766 (4%)	65 (94%)	4 (6%)	0	100	100
2	H	199/249 (80%)	167 (84%)	30 (15%)	2 (1%)	12	40
3	L	203/236 (86%)	180 (89%)	22 (11%)	1 (0%)	24	54
All	All	2262/5783 (39%)	1925 (85%)	320 (14%)	17 (1%)	18	44

5 of 17 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	47	VAL
1	A	50	PRO
1	A	91	VAL
1	A	174	VAL
1	A	49	THR

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	680/1319 (52%)	672 (99%)	8 (1%)	63	72
1	B	684/1319 (52%)	681 (100%)	3 (0%)	84	83
1	C	56/1319 (4%)	56 (100%)	0	100	100
2	H	170/203 (84%)	170 (100%)	0	100	100
3	L	185/208 (89%)	185 (100%)	0	100	100
All	All	1775/4368 (41%)	1764 (99%)	11 (1%)	76	80

5 of 11 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	656	ILE
1	B	354	LEU
1	B	585	PHE
1	B	355	ASP
1	A	52	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	1422	ASN
1	C	1475	HIS
3	L	22	GLN
2	H	15	GLN
1	B	286	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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
1	4HH	C	1449	1	22,26,27	1.21	1 (4%)	27,35,37	0.91	1 (3%)

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
1	4HH	C	1449	1	-	8/33/35/37	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	1449	4HH	CL3-NN	2.26	1.39	1.33

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	1449	4HH	O1P-P-O2P	2.21	122.75	112.44

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	1449	4HH	N-CA-CB-OG

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Mol	Chain	Res	Type	Atoms
1	C	1449	4HH	O3P-CJ-CK-CL1
1	C	1449	4HH	O3P-CJ-CK-CL2
1	C	1449	4HH	O3P-CJ-CK-CM
1	C	1449	4HH	CJ-O3P-P-O1P

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	1449	4HH	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

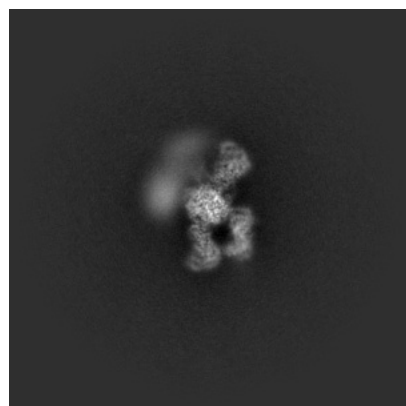
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41496. These allow visual inspection of the internal detail of the map and identification of artifacts.

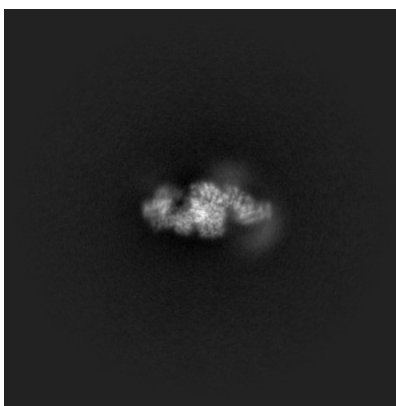
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

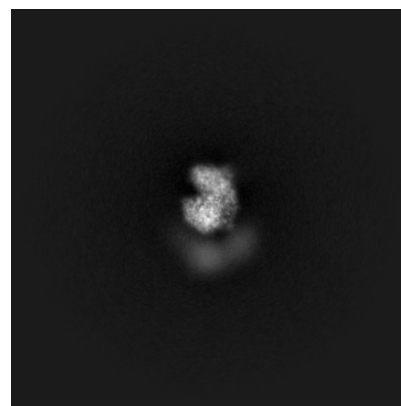
6.1.1 Primary map



X

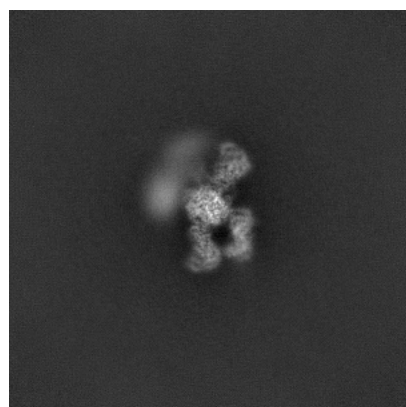


Y

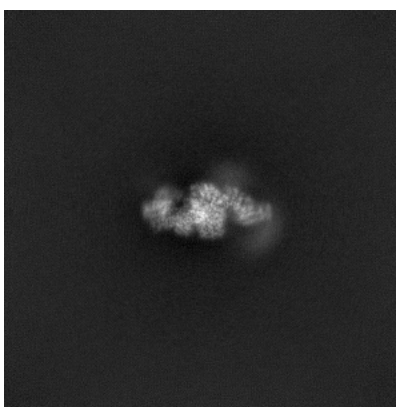


Z

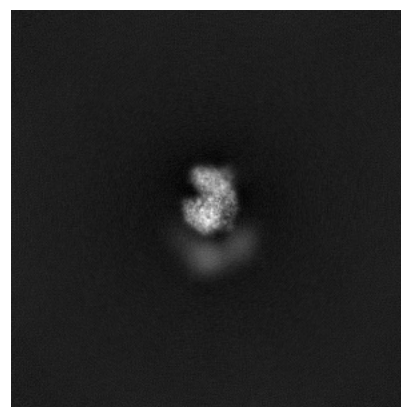
6.1.2 Raw map



X



Y

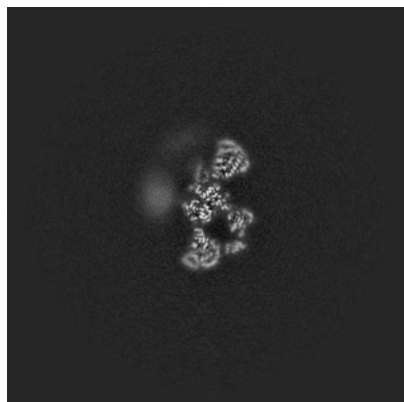


Z

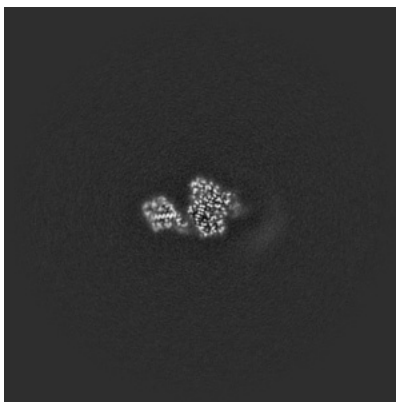
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

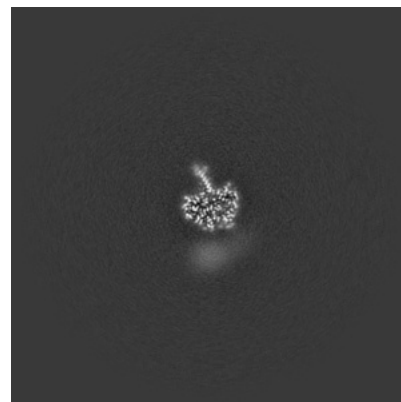
6.2.1 Primary map



X Index: 256

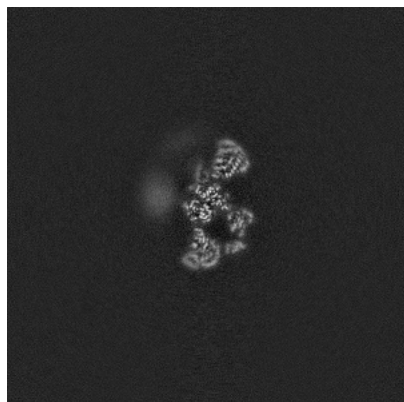


Y Index: 256

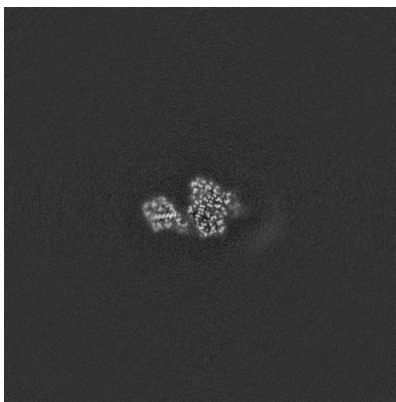


Z Index: 256

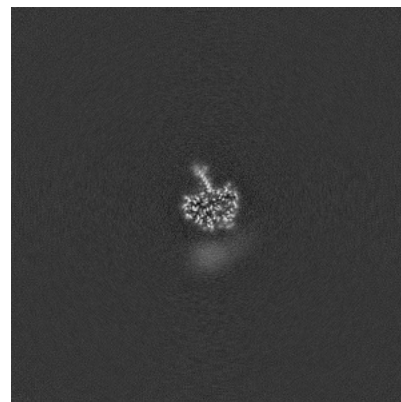
6.2.2 Raw map



X Index: 256



Y Index: 256

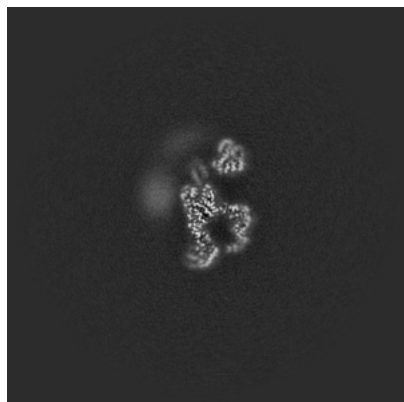


Z Index: 256

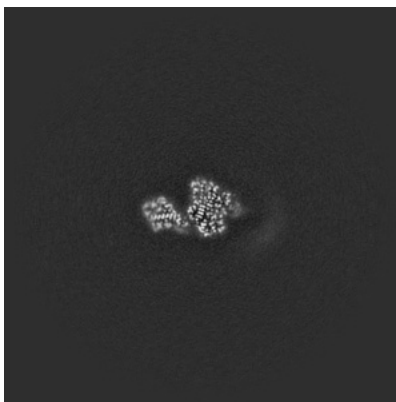
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

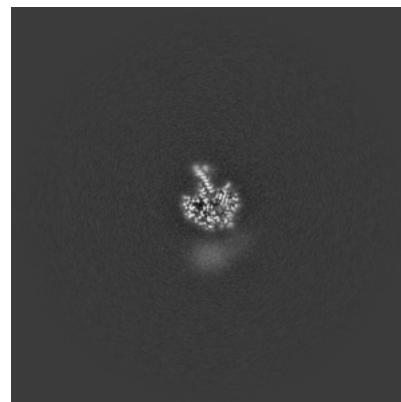
6.3.1 Primary map



X Index: 248

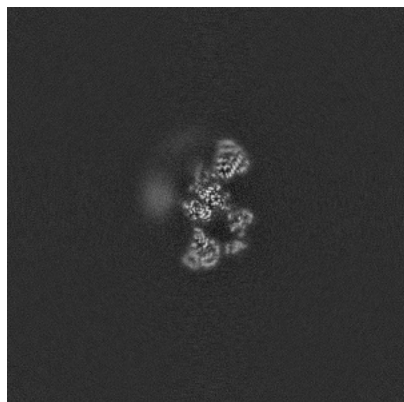


Y Index: 255

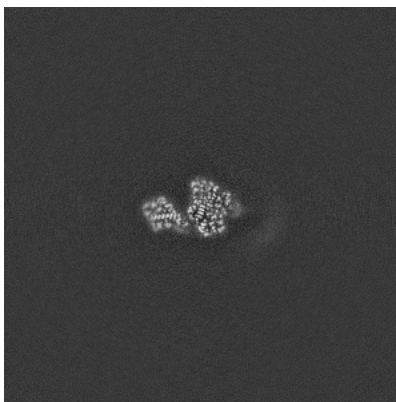


Z Index: 254

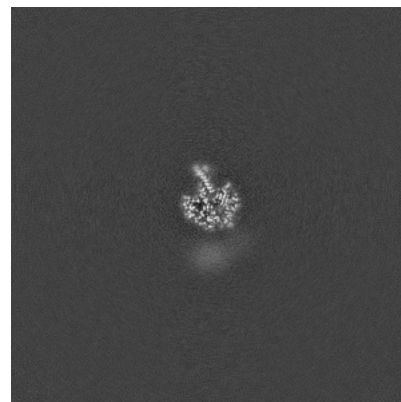
6.3.2 Raw map



X Index: 257



Y Index: 255

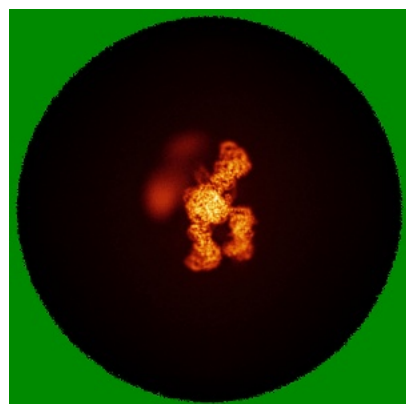


Z Index: 254

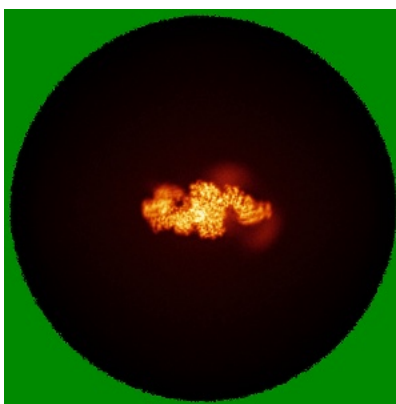
The images above show the largest variance slices of the map in three orthogonal directions.

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

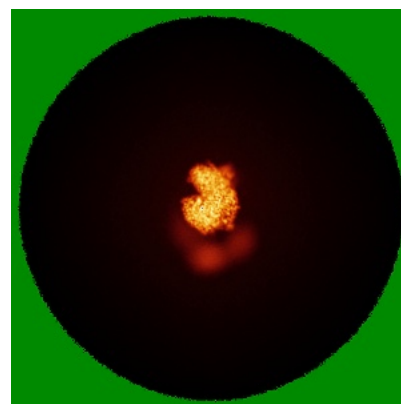
6.4.1 Primary map



X

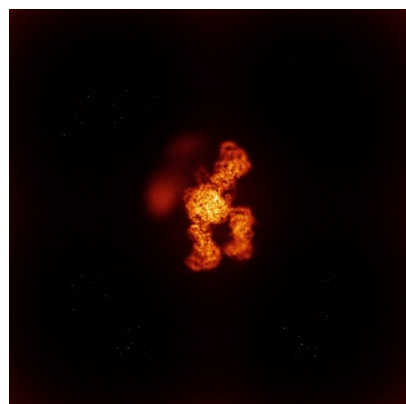


Y

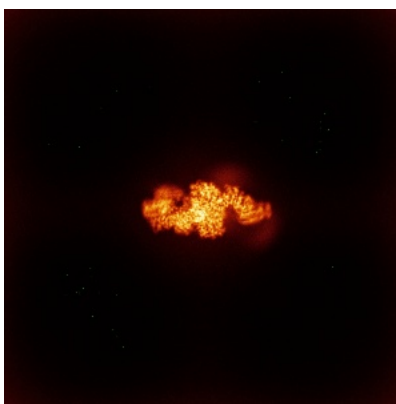


Z

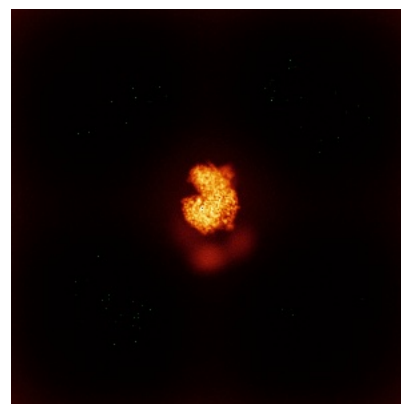
6.4.2 Raw map



X



Y

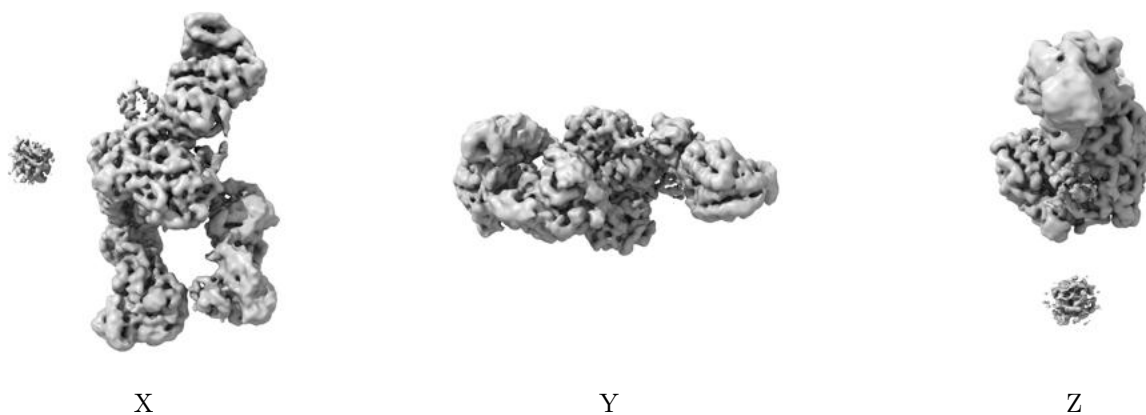


Z

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.

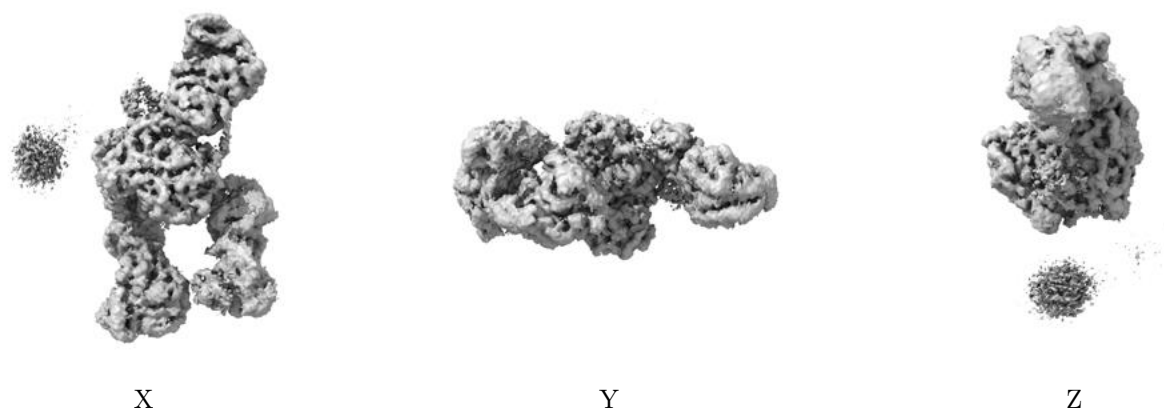
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.406. 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.

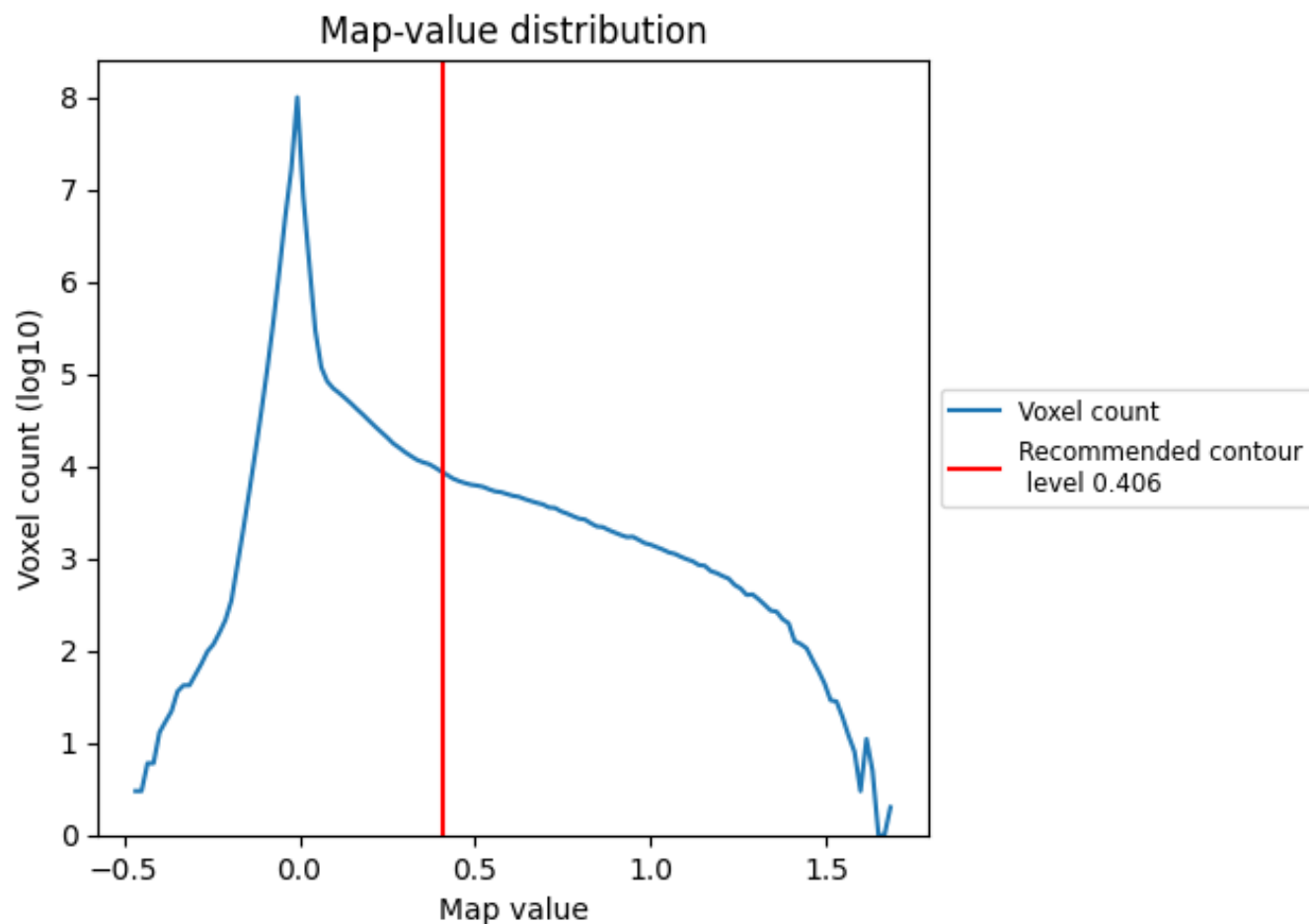
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

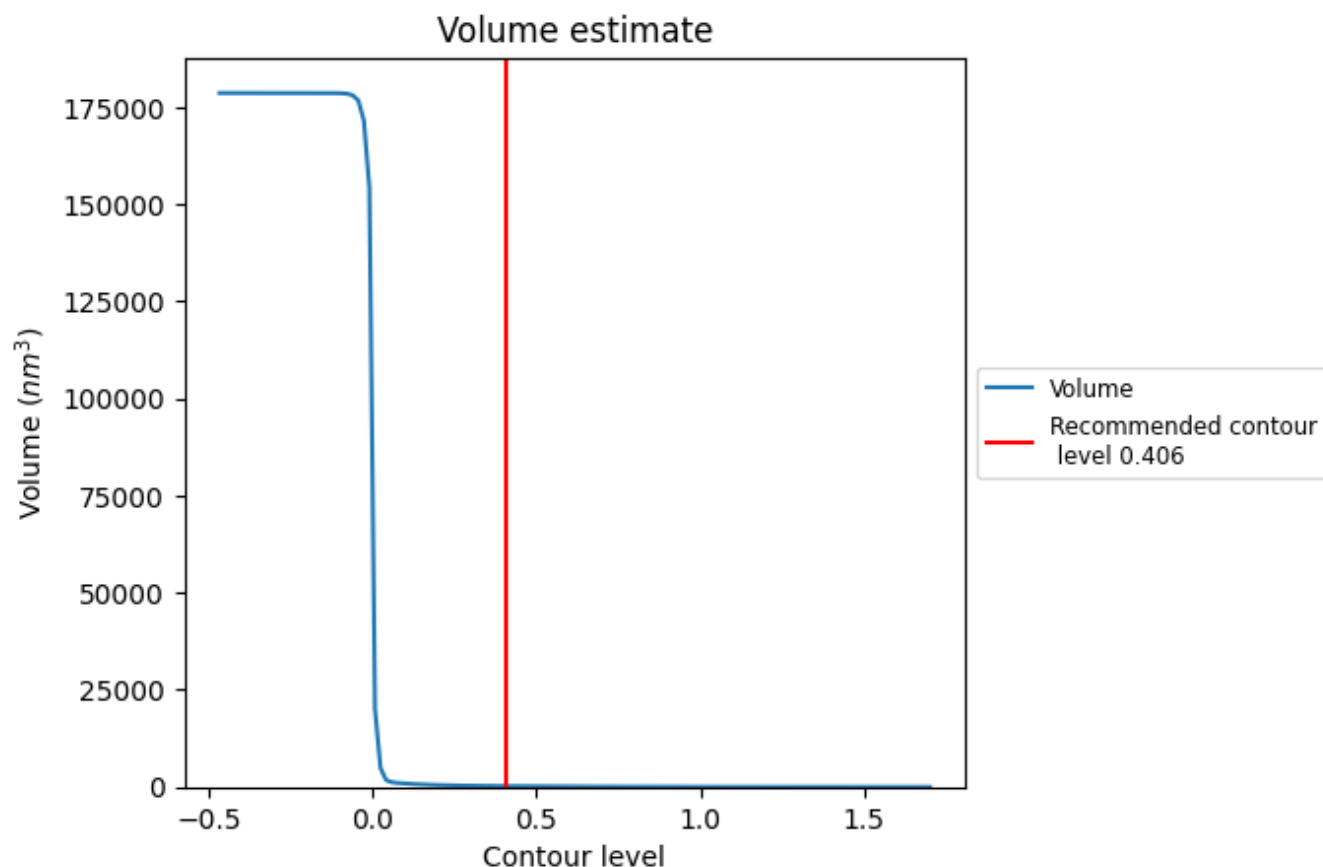
This section contains the results of statistical analysis of the map.

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.

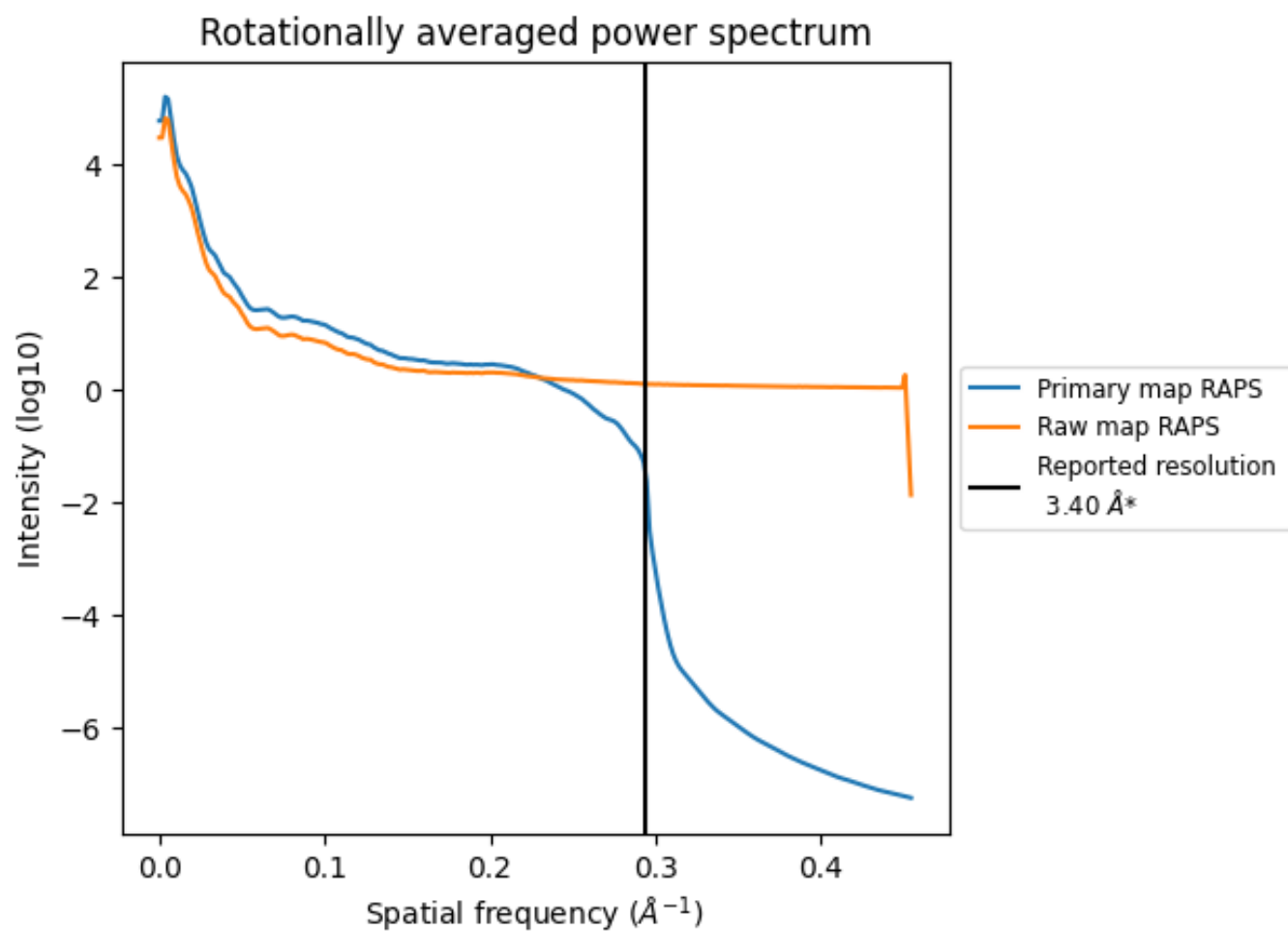
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 213 nm³; this corresponds to an approximate mass of 192 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 ⓘ

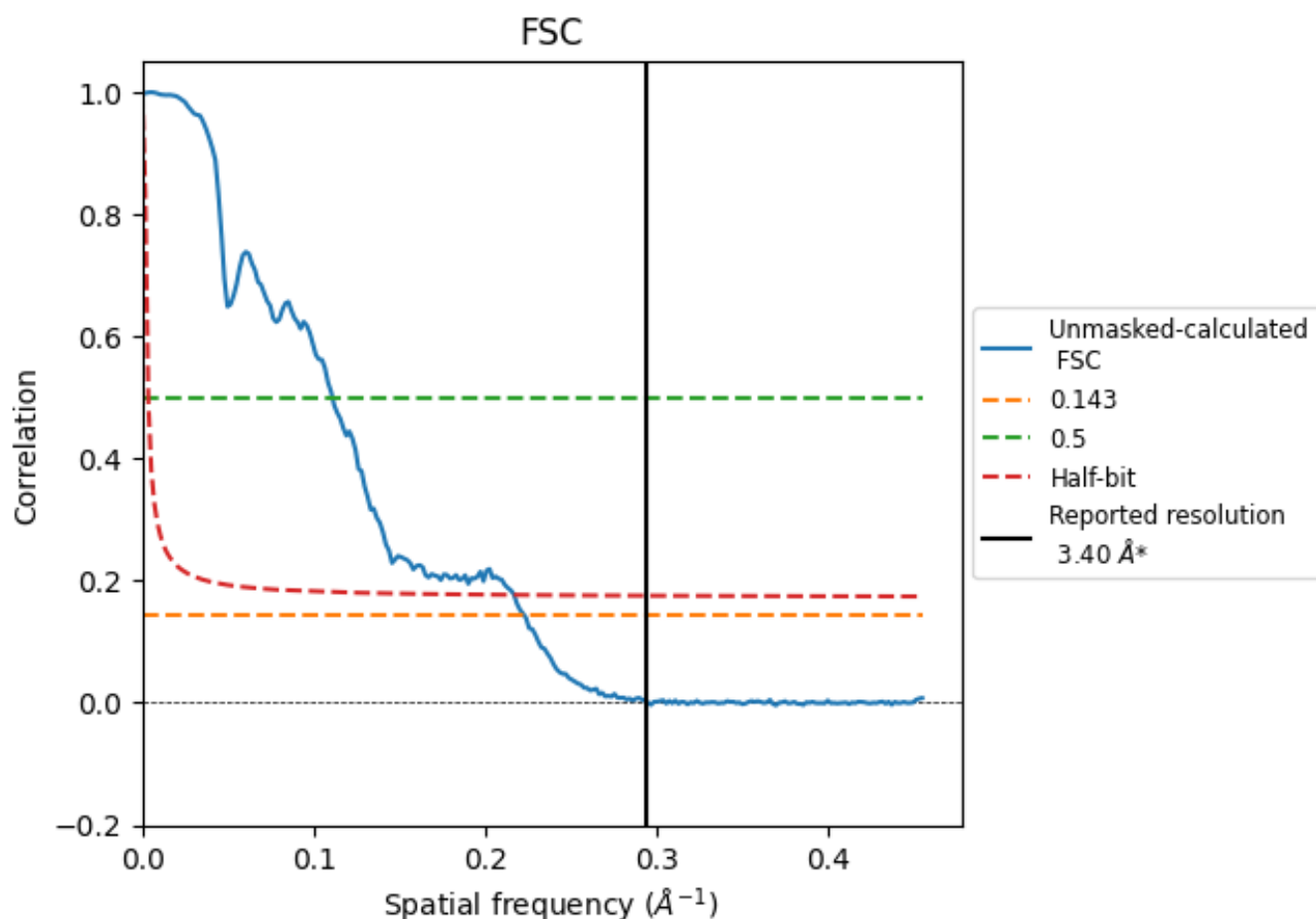


*Reported resolution corresponds to spatial frequency of 0.294 $\text{\AA}^{-1}$

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 0.294 Å⁻¹

8.2 Resolution estimates [i](#)

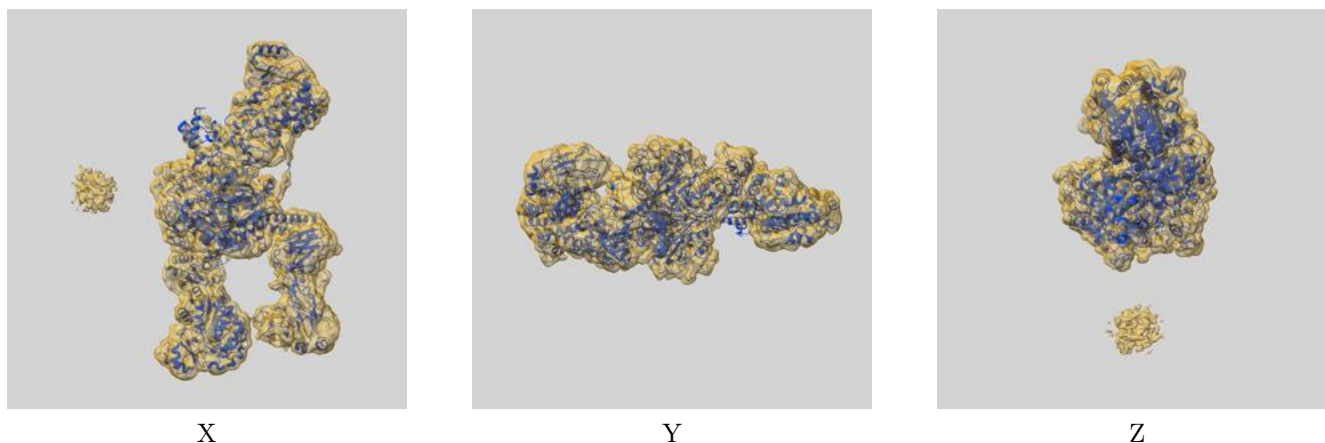
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.49	9.03	4.61

*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 4.49 differs from the reported value 3.4 by more than 10 %

9 Map-model fit [i](#)

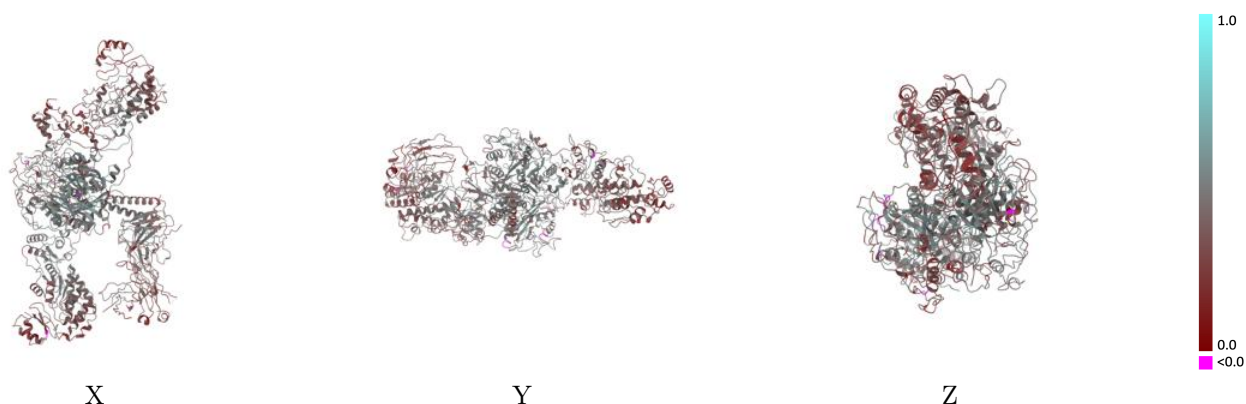
This section contains information regarding the fit between EMDB map EMD-41496 and PDB model 8TPX. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



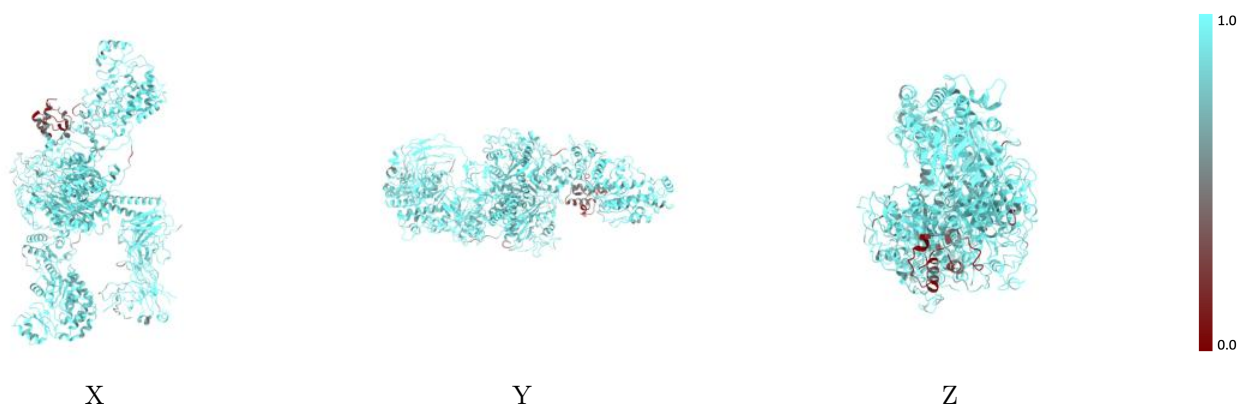
The images above show the 3D surface view of the map at the recommended contour level 0.406 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



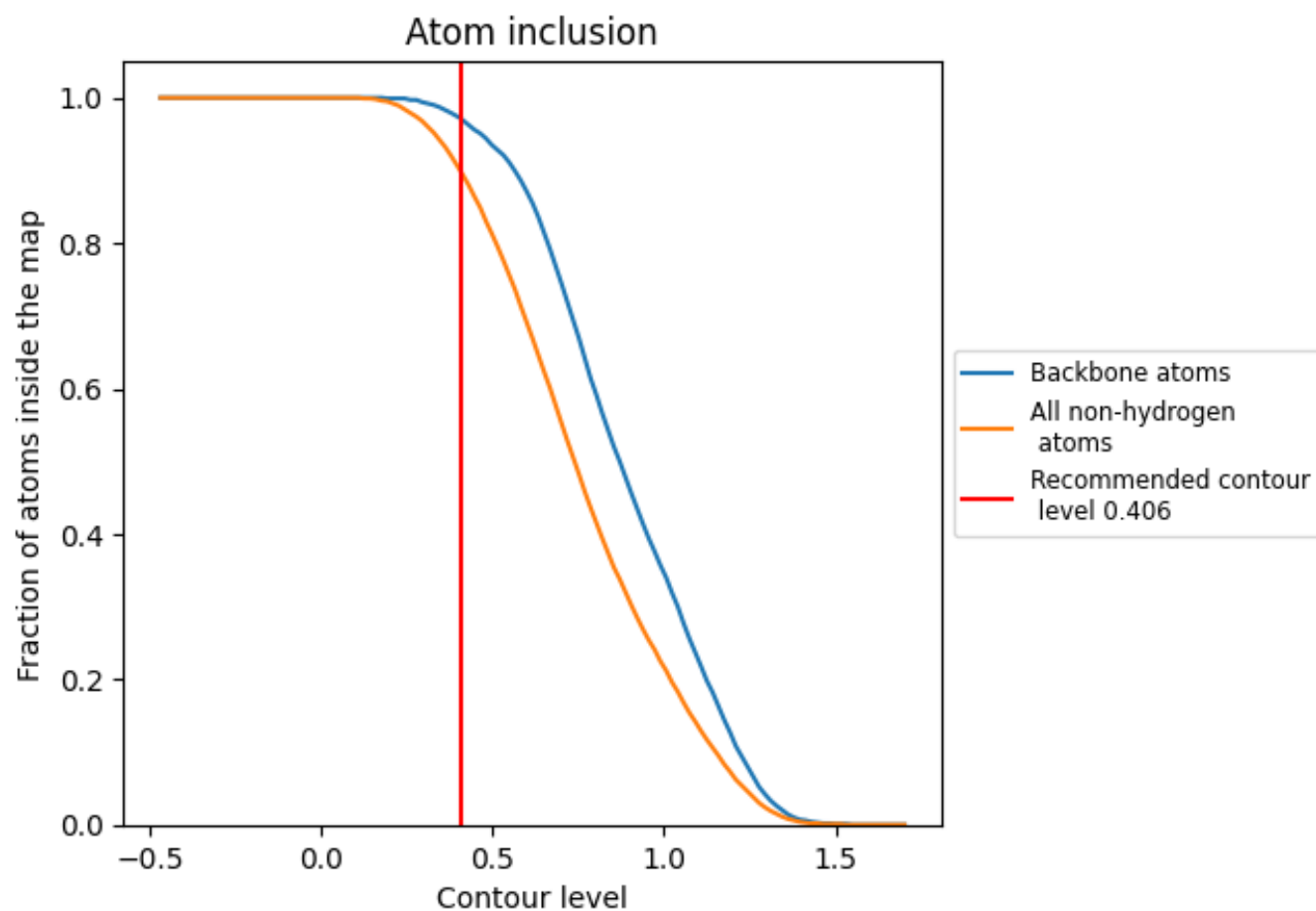
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.406).

9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 90% 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 (0.406) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9000	0.3960
A	0.9250	0.4040
B	0.9200	0.4120
C	0.2850	0.3230
H	0.8980	0.3530
L	0.9290	0.3630

