WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Feb 4, 2026 – 02:29 PM JST

PDB ID	:	9VTR / pdb_00009vtr
EMDB ID	:	EMD-65340
Title	:	Target DNA-bound type I-F3 TniQ-Cascade of Vibrio parahaemolyticus in full R-loop state 2
Authors	:	Ishihara, K.; Numata, T.
Deposited on	:	2025-07-11
Resolution	:	2.89 Å(reported)
Based on initial model	:	.

The following versions of software and data (see references (i)) were used in the production of this report:
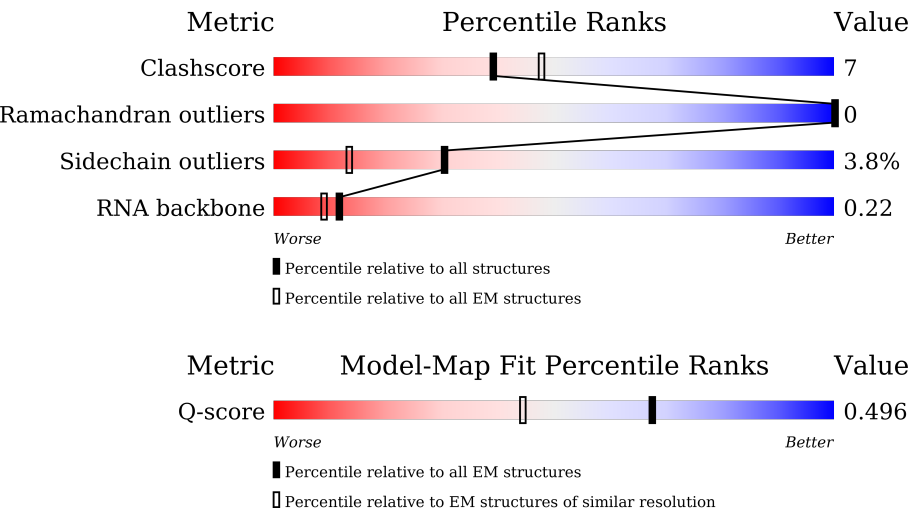
EMDB validation analysis	:	0.0.1.dev129
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

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 2.89 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
Sidechain outliers		3.8%
RNA backbone		0.22

Worse   *Better*

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

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.496

Worse   *Better*

▮ Percentile relative to all EM structures
▯ Percentile relative to EM structures of similar resolution

Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	12148 (2.39 - 3.39)

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	1	60	47% 48% 5%
2	2	75	29% 20% 51%
3	3	75	7% • 92%

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Mol	Chain	Length	Quality of chain
4	A	347	89% 10%
4	B	347	85% 14%
4	C	347	82% 17%
4	D	347	84% 15%
4	E	347	83% 14%
4	F	347	66% 18% 14%
5	G	640	7% 75% 14% 11%
6	H	198	77% 13% 9%
7	I	406	23% 67% 25% 6%
7	J	406	11% 60% 24% 15%

2   Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 29332 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 RNA chain called crRNA from Vibrio parahaemolyticus.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	57	Total	C	N	O	P	0	0
			1221	548	231	386	56		

- Molecule 2 is a DNA chain called Target strand DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	37	Total	C	N	O	P	0	0
			759	362	130	230	37		

- Molecule 3 is a DNA chain called Non-target strand DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	3	6	Total	C	N	O	P	0	0
			123	58	23	36	6		

- Molecule 4 is a protein called Type I-F CRISPR-associated protein Csy3.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	A	345	Total	C	N	O	S	0	0
			2725	1739	461	512	13		
4	B	345	Total	C	N	O	S	0	0
			2745	1752	463	517	13		
4	C	345	Total	C	N	O	S	0	0
			2752	1756	463	520	13		
4	D	346	Total	C	N	O	S	0	0
			2756	1758	464	521	13		
4	E	340	Total	C	N	O	S	0	0
			2727	1741	458	515	13		
4	F	297	Total	C	N	O	S	0	0
			2392	1537	401	442	12		

- Molecule 5 is a protein called CRISPR-associated protein Csy2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	G	568	4231	2671	766	773	21	0	0

There are 97 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	293	UNK	THR	conflict	UNP Q87GC9
G	294	UNK	GLU	conflict	UNP Q87GC9
G	295	UNK	SER	conflict	UNP Q87GC9
G	296	UNK	SER	conflict	UNP Q87GC9
G	297	UNK	VAL	conflict	UNP Q87GC9
G	298	UNK	TRP	conflict	UNP Q87GC9
G	299	UNK	VAL	conflict	UNP Q87GC9
G	300	UNK	ILE	conflict	UNP Q87GC9
G	301	UNK	SER	conflict	UNP Q87GC9
G	302	UNK	PRO	conflict	UNP Q87GC9
G	303	UNK	ASN	conflict	UNP Q87GC9
G	304	UNK	LYS	conflict	UNP Q87GC9
G	305	UNK	LEU	conflict	UNP Q87GC9
G	306	UNK	ALA	conflict	UNP Q87GC9
G	307	UNK	LEU	conflict	UNP Q87GC9
G	308	UNK	ARG	conflict	UNP Q87GC9
G	309	UNK	LYS	conflict	UNP Q87GC9
G	310	UNK	LYS	conflict	UNP Q87GC9
G	311	UNK	SER	conflict	UNP Q87GC9
G	312	UNK	ILE	conflict	UNP Q87GC9
G	313	UNK	ILE	conflict	UNP Q87GC9
G	314	UNK	GLY	conflict	UNP Q87GC9
G	315	UNK	ASP	conflict	UNP Q87GC9
G	316	UNK	ILE	conflict	UNP Q87GC9
G	317	UNK	LYS	conflict	UNP Q87GC9
G	318	UNK	MET	conflict	UNP Q87GC9
G	319	UNK	MET	conflict	UNP Q87GC9
G	320	UNK	LEU	conflict	UNP Q87GC9
G	321	UNK	SER	conflict	UNP Q87GC9
G	322	UNK	GLN	conflict	UNP Q87GC9
G	323	UNK	TRP	conflict	UNP Q87GC9
G	324	UNK	LEU	conflict	UNP Q87GC9
G	325	UNK	ARG	conflict	UNP Q87GC9
G	326	UNK	THR	conflict	UNP Q87GC9
G	327	UNK	THR	conflict	UNP Q87GC9
G	328	UNK	PRO	conflict	UNP Q87GC9
G	329	UNK	THR	conflict	UNP Q87GC9

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Chain	Residue	Modelled	Actual	Comment	Reference
G	330	UNK	HIS	conflict	UNP Q87GC9
G	331	UNK	GLU	conflict	UNP Q87GC9
G	332	UNK	GLU	conflict	UNP Q87GC9
G	333	UNK	LYS	conflict	UNP Q87GC9
G	334	UNK	LEU	conflict	UNP Q87GC9
G	335	UNK	ASP	conflict	UNP Q87GC9
G	336	UNK	ILE	conflict	UNP Q87GC9
G	337	UNK	ARG	conflict	UNP Q87GC9
G	338	UNK	LYS	conflict	UNP Q87GC9
G	339	UNK	LEU	conflict	UNP Q87GC9
G	340	UNK	THR	conflict	UNP Q87GC9
G	341	UNK	GLU	conflict	UNP Q87GC9
G	342	UNK	ARG	conflict	UNP Q87GC9
G	343	UNK	PHE	conflict	UNP Q87GC9
G	344	UNK	ASN	conflict	UNP Q87GC9
G	345	UNK	VAL	conflict	UNP Q87GC9
G	346	UNK	ASP	conflict	UNP Q87GC9
G	347	UNK	LEU	conflict	UNP Q87GC9
G	348	UNK	ALA	conflict	UNP Q87GC9
G	349	UNK	LYS	conflict	UNP Q87GC9
G	350	UNK	THR	conflict	UNP Q87GC9
G	351	UNK	LYS	conflict	UNP Q87GC9
G	352	UNK	PHE	conflict	UNP Q87GC9
G	353	UNK	ALA	conflict	UNP Q87GC9
G	354	UNK	ASN	conflict	UNP Q87GC9
G	355	UNK	ARG	conflict	UNP Q87GC9
G	356	UNK	TYR	conflict	UNP Q87GC9
G	357	UNK	ALA	conflict	UNP Q87GC9
G	358	UNK	TYR	conflict	UNP Q87GC9
G	359	UNK	ASP	conflict	UNP Q87GC9
G	360	UNK	PRO	conflict	UNP Q87GC9
G	361	UNK	LEU	conflict	UNP Q87GC9
G	362	UNK	LEU	conflict	UNP Q87GC9
G	363	UNK	THR	conflict	UNP Q87GC9
G	364	UNK	GLN	conflict	UNP Q87GC9
G	365	UNK	LEU	conflict	UNP Q87GC9
G	366	UNK	ILE	conflict	UNP Q87GC9
G	367	UNK	TYR	conflict	UNP Q87GC9
G	?	UNK	ASN	conflict	UNP Q87GC9
G	?	UNK	CYS	conflict	UNP Q87GC9
G	?	UNK	ILE	conflict	UNP Q87GC9
G	?	UNK	GLY	conflict	UNP Q87GC9

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Chain	Residue	Modelled	Actual	Comment	Reference
G	?	UNK	SER	conflict	UNP Q87GC9
G	?	UNK	ILE	conflict	UNP Q87GC9
G	?	UNK	ILE	conflict	UNP Q87GC9
G	?	UNK	HIS	conflict	UNP Q87GC9
G	?	UNK	SER	conflict	UNP Q87GC9
G	?	UNK	PRO	conflict	UNP Q87GC9
G	?	UNK	PRO	conflict	UNP Q87GC9
G	?	UNK	GLN	conflict	UNP Q87GC9
G	?	UNK	TYR	conflict	UNP Q87GC9
G	?	UNK	ALA	conflict	UNP Q87GC9
G	?	UNK	PRO	conflict	UNP Q87GC9
G	?	UNK	LYS	conflict	UNP Q87GC9
G	?	UNK	CYS	conflict	UNP Q87GC9
G	?	UNK	GLU	conflict	UNP Q87GC9
G	?	UNK	GLY	conflict	UNP Q87GC9
G	?	UNK	ASN	conflict	UNP Q87GC9
G	?	UNK	ASP	conflict	UNP Q87GC9
G	?	UNK	ASP	conflict	UNP Q87GC9

- Molecule 6 is a protein called CRISPR-associated protein, Csy4 family.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	181	Total 1452	C 926	N 258	O 265	S 3	0	0

- Molecule 7 is a protein called TniQ.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	I	381	Total 2798	C 1788	N 491	O 504	S 15	0	0
7	J	347	Total 2650	C 1684	N 466	O 483	S 17	0	0

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	-6	GLY	-	expression tag	UNP Q87GD0
I	-5	PRO	-	expression tag	UNP Q87GD0
I	-4	ARG	-	expression tag	UNP Q87GD0
I	-3	ILE	-	expression tag	UNP Q87GD0
I	-2	SER	-	expression tag	UNP Q87GD0
I	-1	GLU	-	expression tag	UNP Q87GD0

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Chain	Residue	Modelled	Actual	Comment	Reference
I	0	PHE	-	expression tag	UNP Q87GD0
J	-6	GLY	-	expression tag	UNP Q87GD0
J	-5	PRO	-	expression tag	UNP Q87GD0
J	-4	ARG	-	expression tag	UNP Q87GD0
J	-3	ILE	-	expression tag	UNP Q87GD0
J	-2	SER	-	expression tag	UNP Q87GD0
J	-1	GLU	-	expression tag	UNP Q87GD0
J	0	PHE	-	expression tag	UNP Q87GD0

- Molecule 8 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
8	1	1	Total 1	Mg 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: crRNA from Vibrio parahaemolyticus

Chain 1:

- Molecule 2: Target strand DNA

Chain 2:
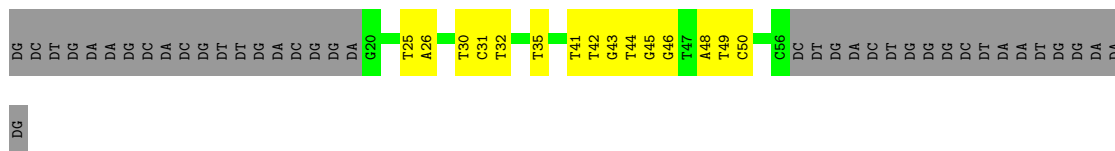
- Molecule 3: Non-target strand DNA

Chain 3:
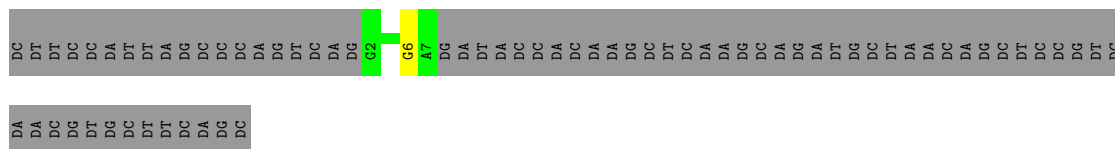
- Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain A:

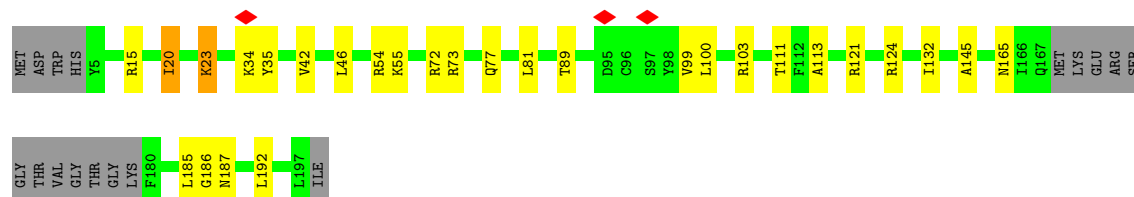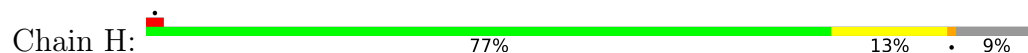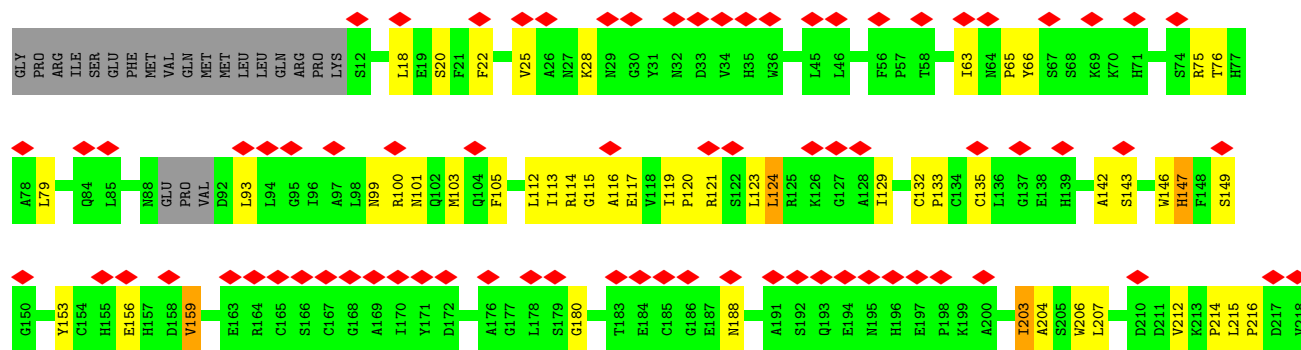- Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain B: 85%   14%

M1 M10 K11 E14 A15 S16 D17 V18 L40 G41 M42 K43 E44 A49 Y50 K51 Q55 I56 T61 S64 P70 V78 I85 V91 S96 W125 E126 N130 W141 R144 T197 F209 F215 R216 L217 Y224 V228 F229

V233 K234 Q242 V246 L254 H285 R286 E287 D288 V289 P295 N296 T297 G298 K299 E313 L321 P322 M325 I326 N335 L336 I337 L341 L342 Q343 Q344 K345 GLY THR

• Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain C: 82%   17%

M1 K2 L3 S8 Y9 M10 K11 S12 V18 N23 K51 D57 P70 C77 V78 I85 E86 C87 S96 K102 P106 R110 Q114 L118 W125 W141 T152 T180 N181 R184 T197 F215 P222 F229 L254

W269 Y270 P271 G283 A284 E287 C291 Y292 R293 H294 P295 K299 F302 T303 L304 L305 E306 K307 A308 D309 Q310 Y311 L312 E313 Q314 L315 Q316 V320 L321 P322 M325 I326 N327 D328 L329 I332 I337 L342 Q343 Q344 K345 GLY THR

• Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain D: 84%   15%

M1 K2 L3 P4 L7 M10 V18 N23 K29 L40 G41 M42 G45 L97 E107 V108 L118 W125 W141 L142 W143 T152 K157 P158 W159 P160 I173 Y177 K187 K194 L195 I196 T197 S226 N238 L254 K258

P271 Y282 G283 A284 E287 C291 K299 T303 L304 L305 E306 K307 Y311 L315 L321 M325 L329 I332 I337 N335 L336 I337 G340 Q344 K345 G346 THR

• Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain E: 83%   14%

M1 P4 L7 K11 E14 I19 N23 M42 K47 S48 A49 Q67 P70 V78 E86 C87 E88 V91 V108 E121 K122 W125 W141 L142 W143 T152 W161 GLU ASP GLU LYS ALA I167 S168 P169 F170 H171 T197 A213

T214 F215 R216 L217 N220 V228 F229 K237 I240 Y241 Q242 K258 T265 P271 P276 H281 Y282 G283 R286 E287 D288 R293 T297 G298 K299 L304 Q310 E313 I332 G340 K345 GLY THR

• Molecule 4: Type I-F CRISPR-associated protein Csy3

Chain F: 66%   18%   14%

M1 E14 V18 I19 F20 L21 V22 N23 W24 P25 R28 K29 L32 V38 ALA LEU GLY MET LYS GLU GLY SER LYS SER ALA TYR LYS TYR ASP GLY GLN ILE ASP ALA ASP VAL THR ALA TYR SER LEU ALA GLN GLY ASN PRO HIS E72 I85 V91 K102

V108 T111 L115 I116 K117 L118 K122 R131 I136 R144 E147 S151 T152 S153 I154 P160 W161 GLU ASP GLU LYS ALA ILE SER F170 A178 GLY THR ASN HIS F183 H186 W189 D190 N191 L192 L195 Q202 F209 E210 V211 S212 A213 T214

• Molecule 5: CRISPR-associated protein Csy2

Chain G:

7%

75% 14% 11%
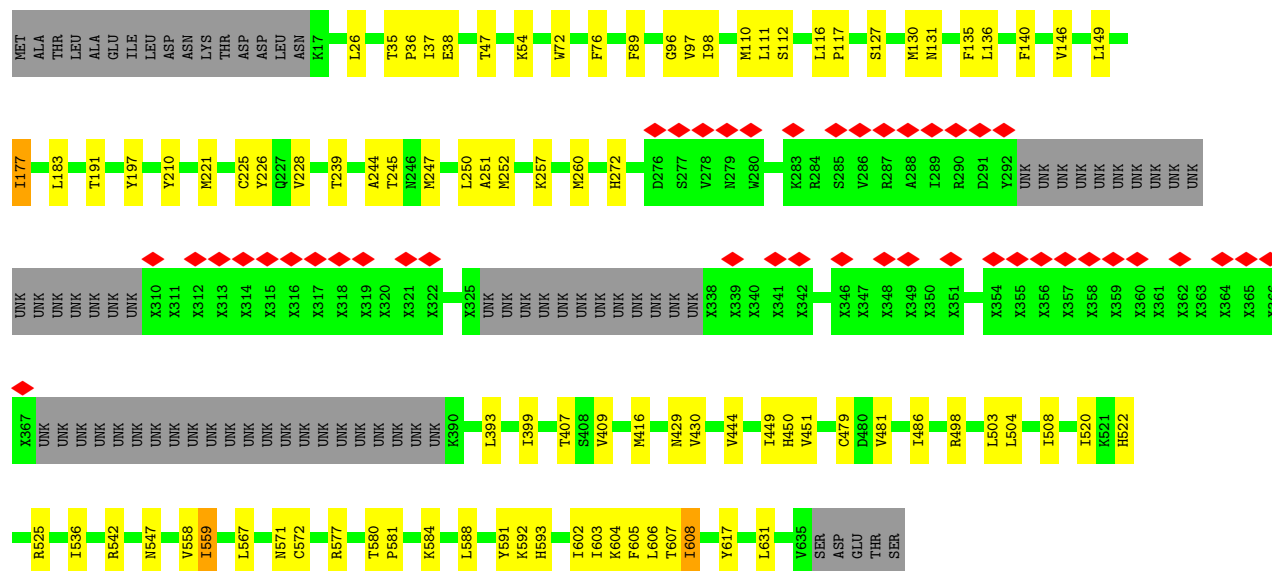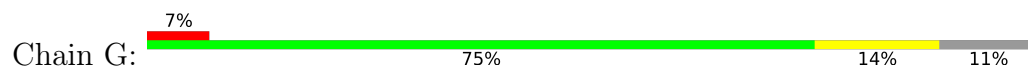
• Molecule 6: CRISPR-associated protein, Csy4 family

Chain H:

77% 13% 9%

• Molecule 7: TniQ

Chain I:

23%

67% 25% 6%

P219 L220 S221 Y222 R223 W224 M227 H228 W229 W230 S234 S235 S236 C237 K238 T239 R240 E244 W249 E250 N254 K258 L259 I260 G261 K262 F268 E269 Y270 C271 V272 L273 S274 K275 N276 D277 L278 R279 V280 K281 D282 I283 L284 G285 K286 I287 L288 S291 I292 Q293 L294 P295

N298 F299 R300 S301 N302 I303 M308 F309 Q310 Y311 I312 E313 T314 L323 R327 M330 L331 E332 I333 C334 V335 L336 L337 N338 C339 S340 R341 V344 Q350 K361 R362 E363 I364 L365 I366 V367 Y370 L374 C379 L380 W381 L382 F385 Q386 S387 D388 E389 F390

N391 R392 Y395 LEU SER ARG TRP

• Molecule 7: TniQ

11%

Chain J:

60%   24%   •   15%

GLY PRO ARG ILE SER GLU PHE MET VAL GLN MET MET LEU LEU GLN ARG PRO LYS SER TYR P14 L18 F22 I23 N29 N32 F37 V41 K42 L45 R51 T55 F56 Y66 K70 H71 S72 I73 L79 L82 T86 L93 L98 N99

R100 N101 Q102 M103 Q104 F105 S106 R114 G115 A116 E117 V118 I119 P120 L123 L124 R125 K126 I129 C132 P133 C134 C135 E138 H139 A142 S143 Y144 R145 W146 H147 F148 S149 G150 Y151 E152 H155 D158 I162 E163 R164 C165 S166 C167 G168 Y173 R174 Y175 A176 G177

L178 S179 N188 I189 S190 A191 S192 Q193 E194 N195 H196 K199 S205 A208 D211 D217 L220 R223 W224 G225 F226 M227 H228 W229 W230 S231 S234 SER SER CYS LYS THR ARG N241 F245 L246 A247 E250 E269 V272 K275 N276 D277 L278 K281

L284 G285 K286 I287 L288 Q293 L294 P295 D296 R297 N298 F299 N302 I303 I304 L305 K306 E307 M308 F309 Q310 L316 D319 ASN GLY LYS LEU ALA ASN LEU ARG MET ASN MET L331 L337 N338 C339 S340 R341 E342 E349 P354 P355 ASN ARG GLN LEU GLY LYS ARG GLU

ILE LEU ILE VAL THR GLU TYR ALA PHE TYR LEU G375 Y378 W381 L382 S383 E384 F385 Q386 E389 F390 N391 R392 S393 F394 Y395 L396 SER ARG TRP

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	12291	Depositor
Resolution determination method	Not provided	
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	49.92	Depositor
Minimum defocus (nm)	1400	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	60000	Depositor
Image detector	GATAN K3 BIOCONTINUUM (6k x 4k)	Depositor
Maximum map value	1.545	Depositor
Minimum map value	-0.659	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.19	Depositor
Map size (Å)	345.91998, 345.91998, 345.91998	wwPDB
Map dimensions	460, 460, 460	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.752, 0.752, 0.752	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	1	0.12	0/1368	0.30	0/2129
2	2	0.20	0/848	0.42	0/1308
3	3	0.14	0/137	0.30	0/209
4	A	0.12	0/2797	0.30	0/3800
4	B	0.10	0/2818	0.25	0/3826
4	C	0.12	0/2825	0.29	0/3836
4	D	0.10	0/2829	0.25	0/3841
4	E	0.10	0/2799	0.26	0/3798
4	F	0.12	0/2455	0.32	0/3330
5	G	0.11	0/4090	0.30	0/5564
6	H	0.12	0/1483	0.35	0/1995
7	I	0.14	0/2867	0.41	0/3910
7	J	0.15	0/2717	0.43	1/3689 (0.0%)
All	All	0.12	0/30033	0.32	1/41235 (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
7	J	0	1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	J	308	MET	CA-CB-CG	5.94	125.97	114.10

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	J	106	SER	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	1	1221	0	620	5	0
2	2	759	0	421	15	0
3	3	123	0	68	1	0
4	A	2725	0	2625	20	0
4	B	2745	0	2650	30	0
4	C	2752	0	2664	36	0
4	D	2756	0	2667	35	0
4	E	2727	0	2650	37	0
4	F	2392	0	2312	37	0
5	G	4231	0	3915	54	0
6	H	1452	0	1408	17	0
7	I	2798	0	2427	76	0
7	J	2650	0	2373	74	0
8	1	1	0	0	0	0
All	All	29332	0	26800	394	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 394 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)
7:J:101:ASN:HD21	7:J:103:MET:HG2	1.20	1.04
2:2:48:DA:H62	4:D:238:ASN:HD21	1.25	0.82
4:F:118:LEU:HD11	4:F:316:GLN:HB3	1.61	0.82
7:I:294:LEU:HB2	7:I:295:PRO:HD3	1.63	0.80
7:I:381:TRP:HA	7:I:385:PHE:HB2	1.63	0.79

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	
4	A	343/347 (99%)	335 (98%)	8 (2%)	0	100	100
4	B	343/347 (99%)	333 (97%)	10 (3%)	0	100	100
4	C	343/347 (99%)	330 (96%)	13 (4%)	0	100	100
4	D	344/347 (99%)	335 (97%)	9 (3%)	0	100	100
4	E	336/347 (97%)	323 (96%)	13 (4%)	0	100	100
4	F	287/347 (83%)	274 (96%)	13 (4%)	0	100	100
5	G	518/640 (81%)	490 (95%)	28 (5%)	0	100	100
6	H	177/198 (89%)	166 (94%)	11 (6%)	0	100	100
7	I	377/406 (93%)	336 (89%)	41 (11%)	0	100	100
7	J	339/406 (84%)	301 (89%)	38 (11%)	0	100	100
All	All	3407/3732 (91%)	3223 (95%)	184 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	A	291/303 (96%)	280 (96%)	11 (4%)	28	63
4	B	295/303 (97%)	284 (96%)	11 (4%)	29	64
4	C	298/303 (98%)	292 (98%)	6 (2%)	50	79
4	D	298/303 (98%)	291 (98%)	7 (2%)	45	77

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	E	298/303 (98%)	292 (98%)	6 (2%)	50	79
4	F	259/303 (86%)	242 (93%)	17 (7%)	14	39
5	G	419/488 (86%)	407 (97%)	12 (3%)	37	72
6	H	151/176 (86%)	145 (96%)	6 (4%)	27	61
7	I	247/368 (67%)	229 (93%)	18 (7%)	11	34
7	J	258/368 (70%)	244 (95%)	14 (5%)	18	49
All	All	2814/3218 (87%)	2706 (96%)	108 (4%)	30	63

5 of 108 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	F	297	THR
6	H	23	LYS
7	J	173	TYR
5	G	97	VAL
5	G	449	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 33 such sidechains are listed below:

Mol	Chain	Res	Type
7	J	101	ASN
7	J	139	HIS
7	J	386	GLN
4	E	5	ASN
4	D	238	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	55/60 (91%)	24 (43%)	0

5 of 24 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	3	G
1	1	9	G
1	1	10	A
1	1	14	A

Continued on next page...

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Mol	Chain	Res	Type
1	1	15	C

There are no RNA pucker outliers to report.

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 ⓘ

There are no oligosaccharides in this entry.

5.6   Ligand geometry ⓘ

Of 1 ligands modelled in this entry, 1 is 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 (i)

This section contains visualisations of the EMDB entry EMD-65340. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections (i)

6.1.1 Primary map
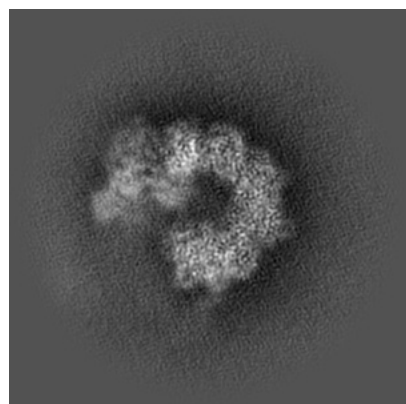
X
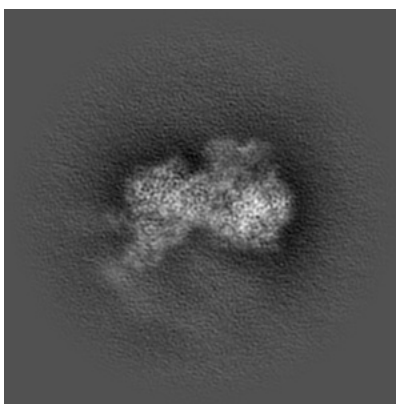
Y
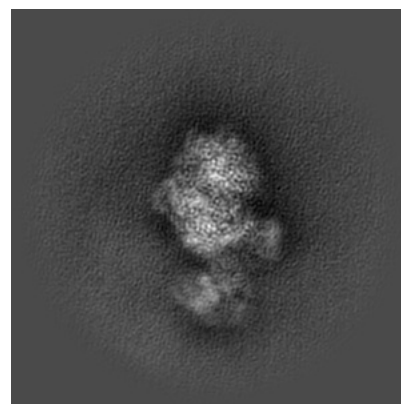
Z

6.1.2 Raw map

X

Y

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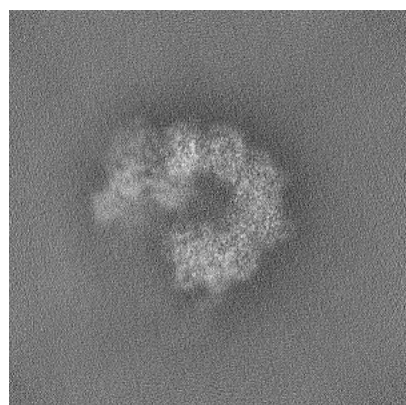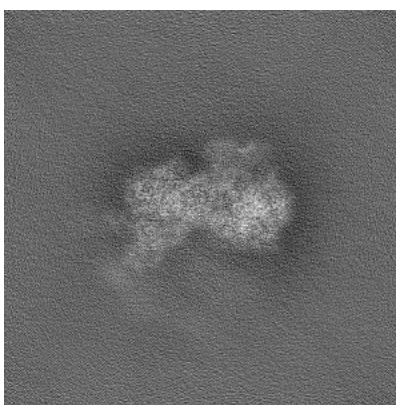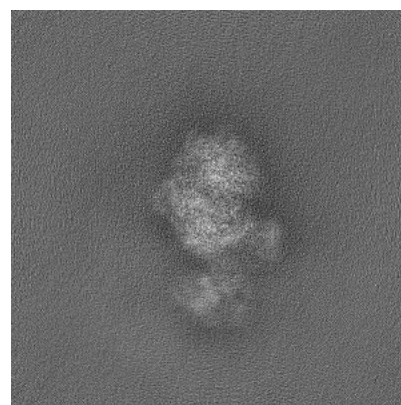
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
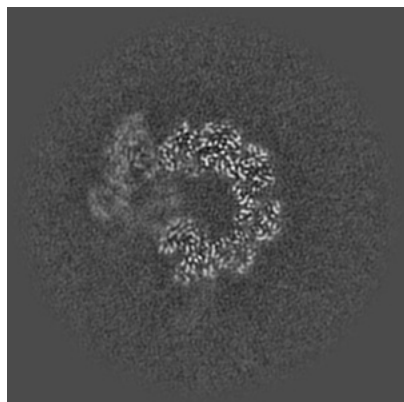
6.2.1   Primary map
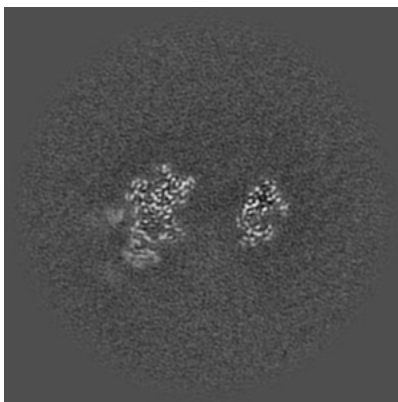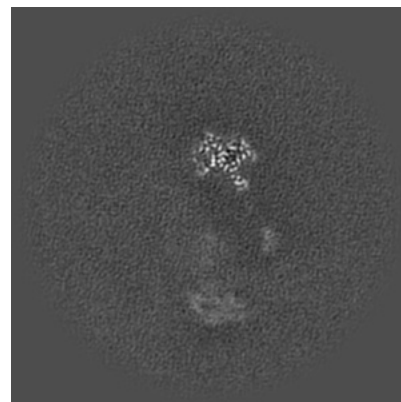
X Index: 230   Y Index: 230   Z Index: 230

6.2.2   Raw map
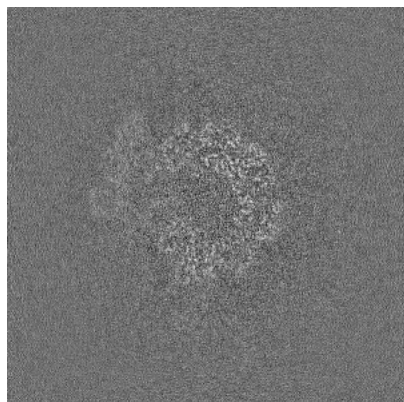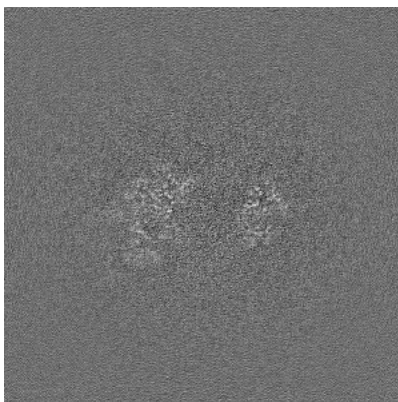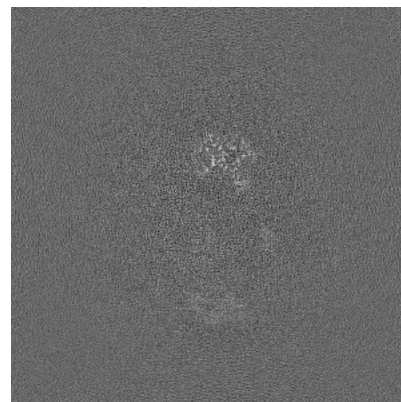
X Index: 230   Y Index: 230   Z Index: 230

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

6.3 Largest variance slices (i)

6.3.1 Primary map
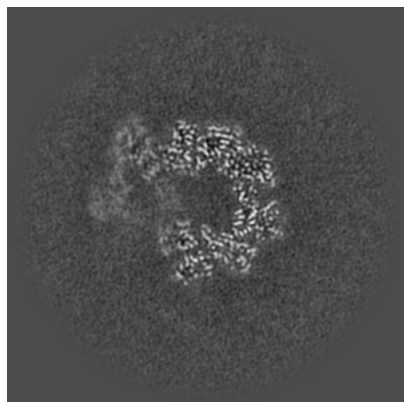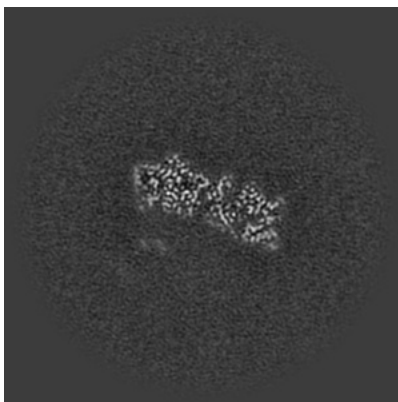
| X Index: 234 | Y Index: 265 | Z Index: 276 |
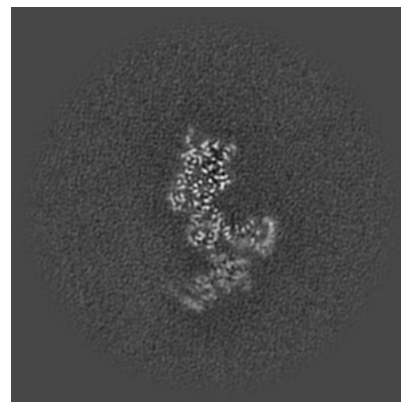
6.3.2 Raw map
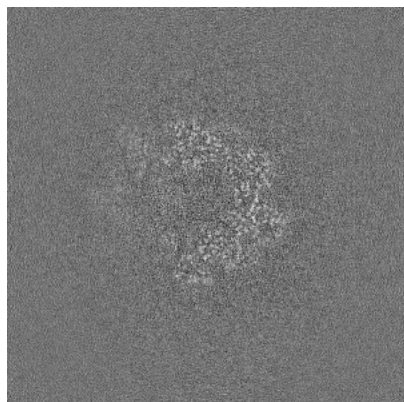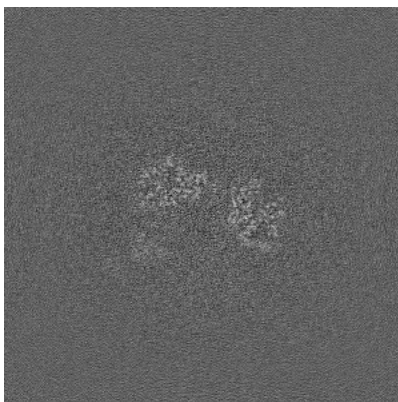
| X Index: 239 | Y Index: 258 | Z Index: 250 |
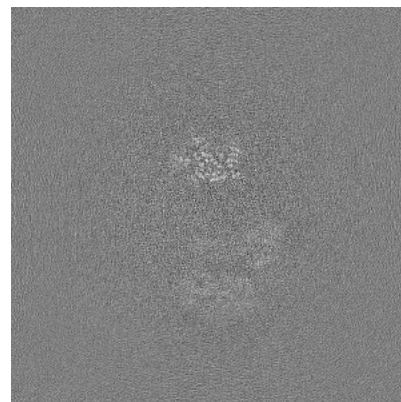
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1   Primary map
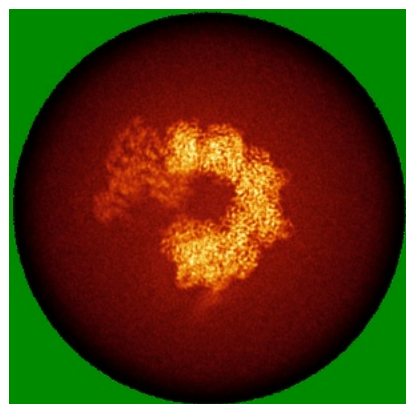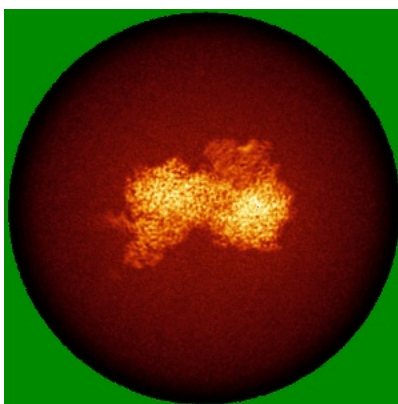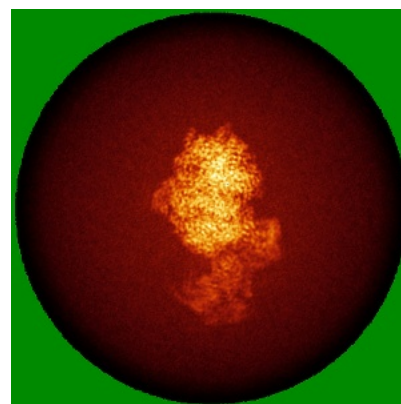
| X | Y | Z |

6.4.2   Raw map

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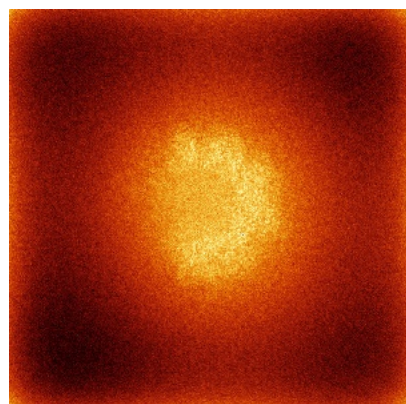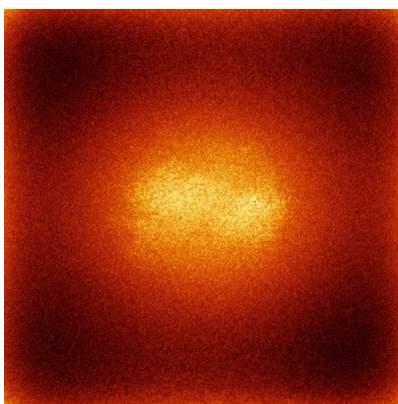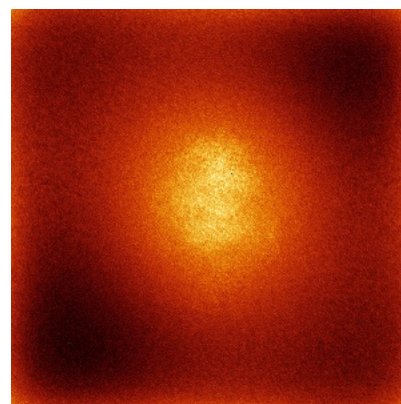
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z
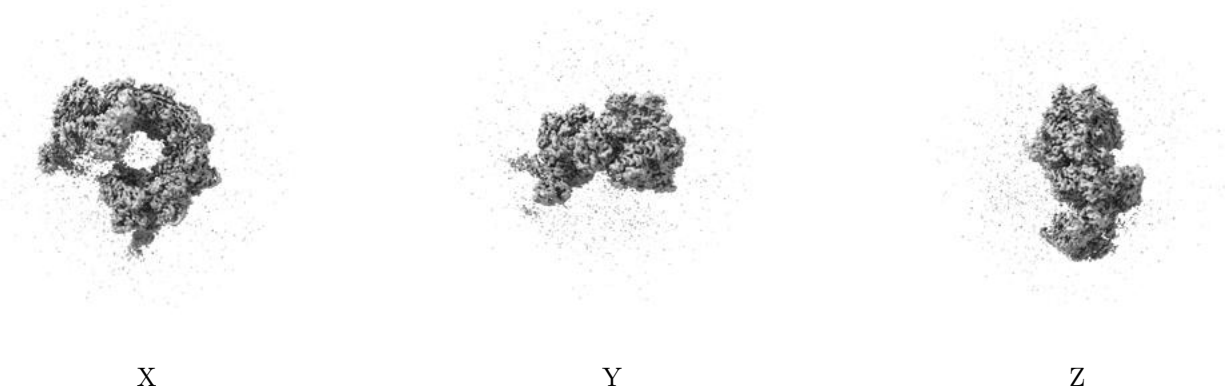
The images above show the 3D surface view of the map at the recommended contour level 0.19. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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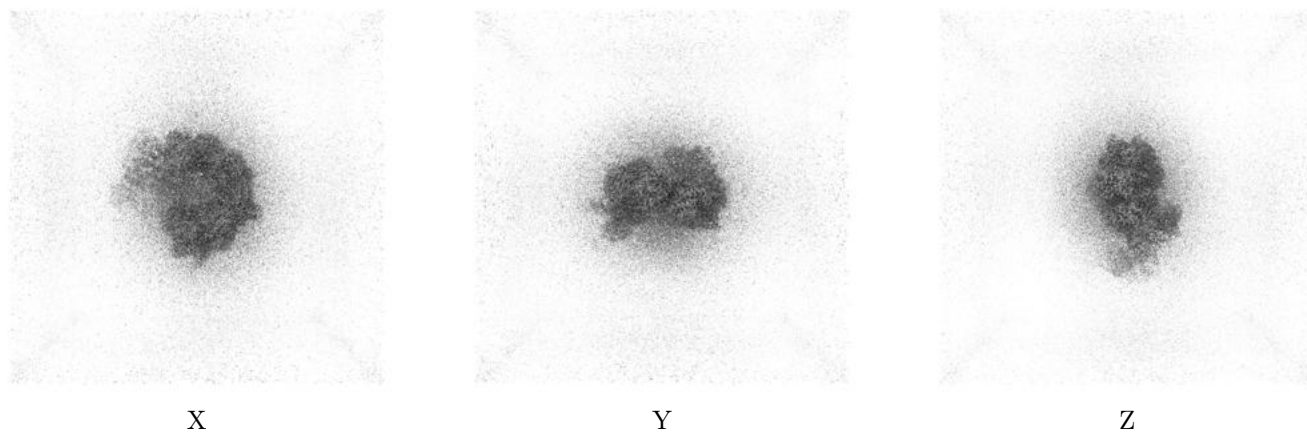
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

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_65340_msk_1.map ⓘ

X   Y   Z
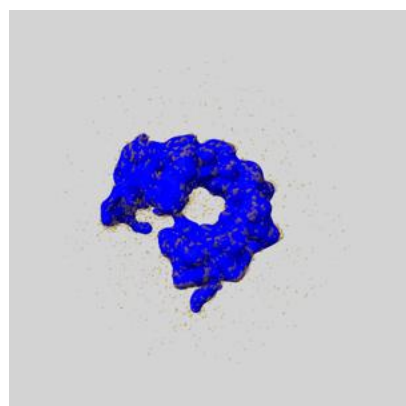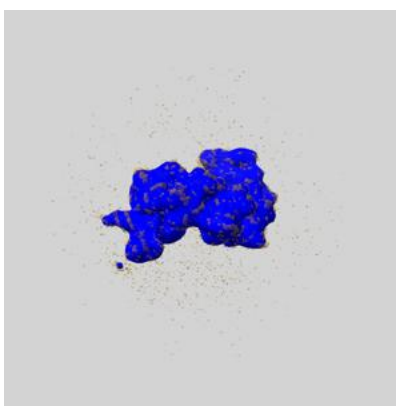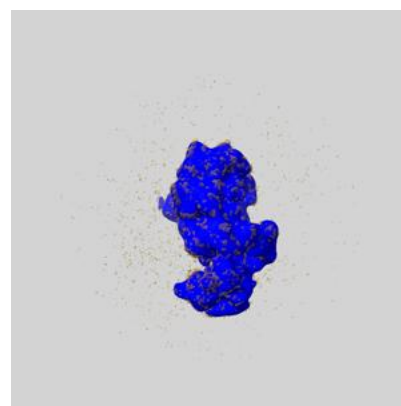
7   Map analysis ⓘ

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 ⓘ
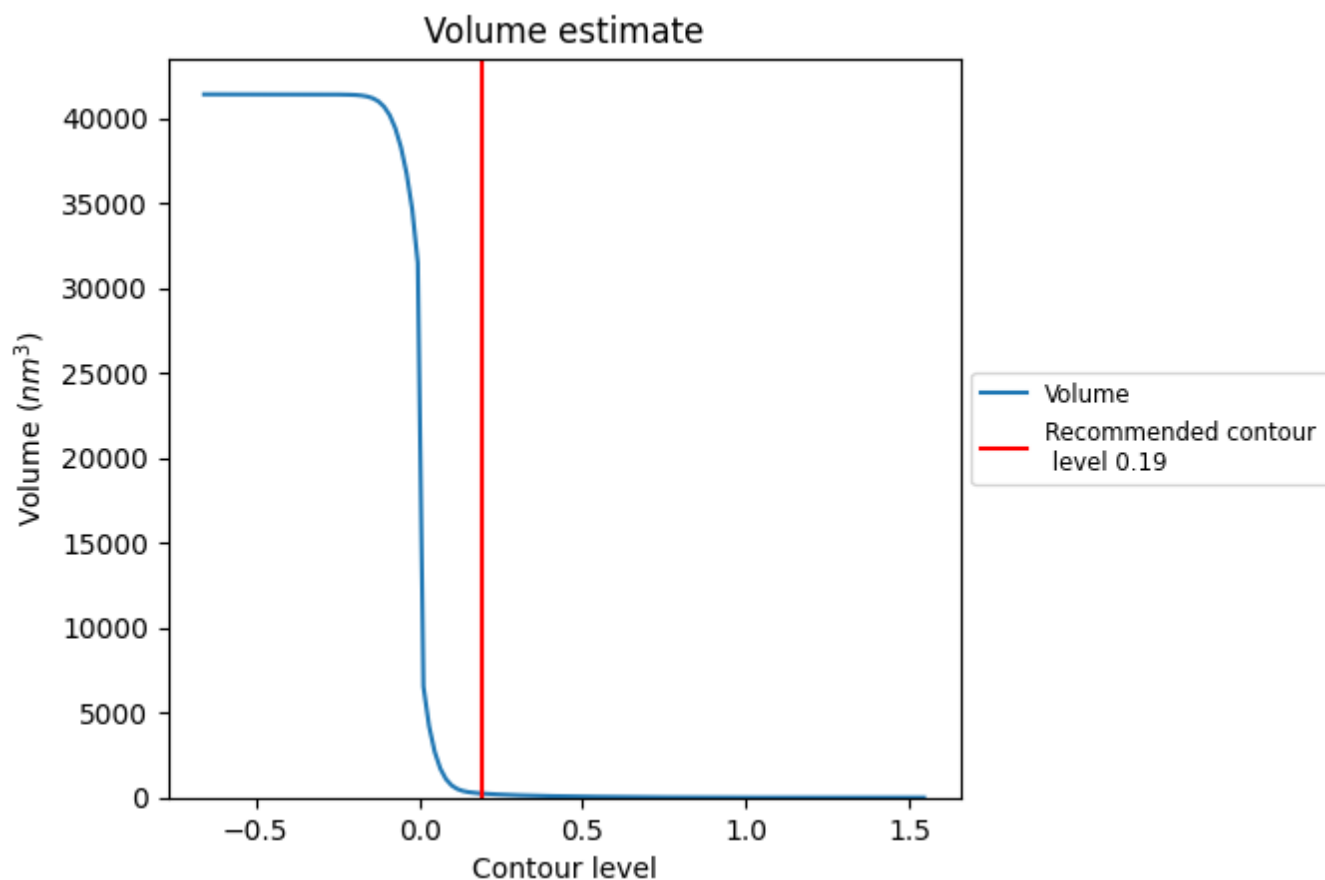
The volume at the recommended contour level is 241 nm^3; this corresponds to an approximate mass of 217 kDa.

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 ⓘ
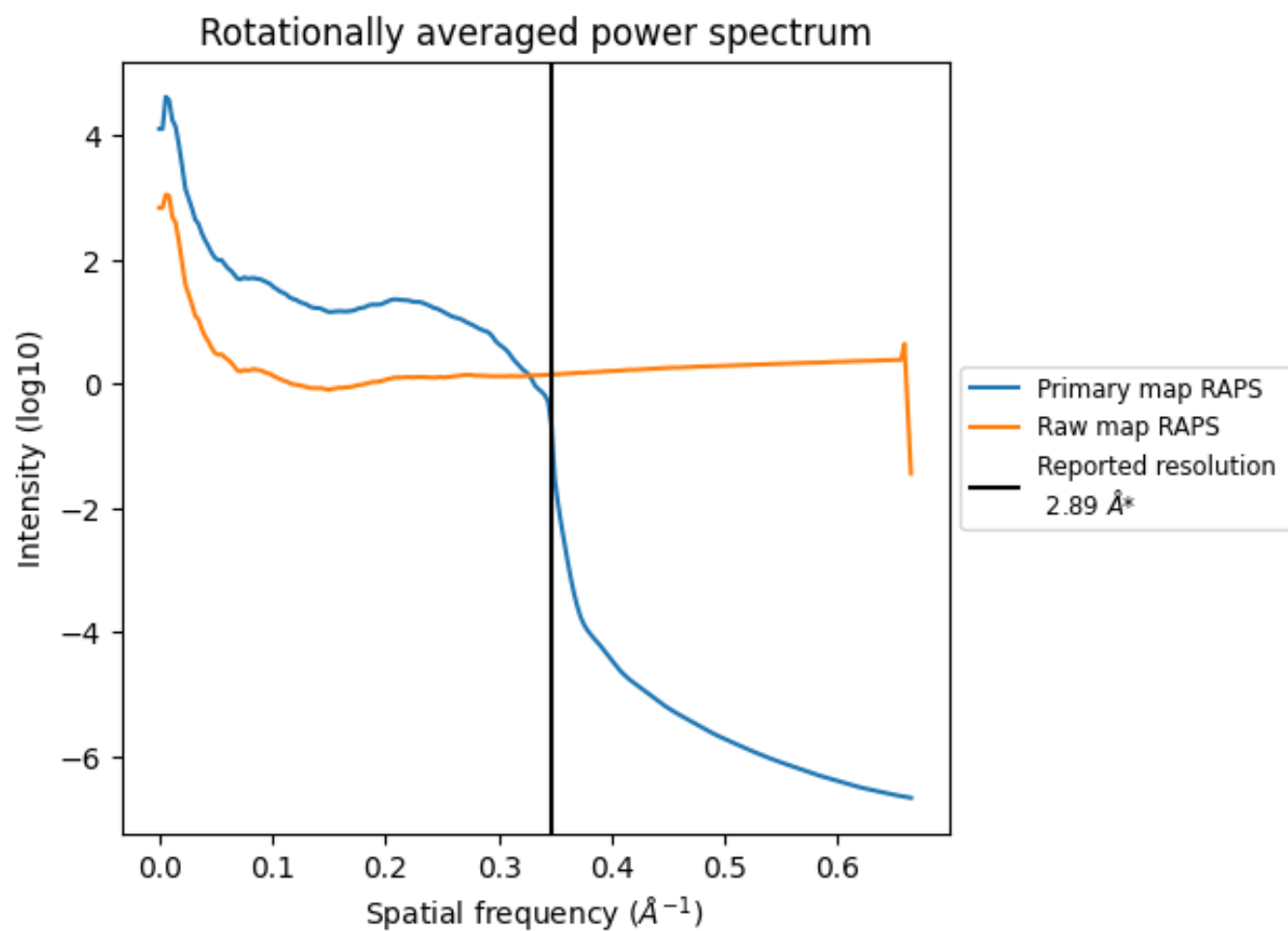
*Reported resolution corresponds to spatial frequency of 0.346 Å^{-1}

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 ⓘ
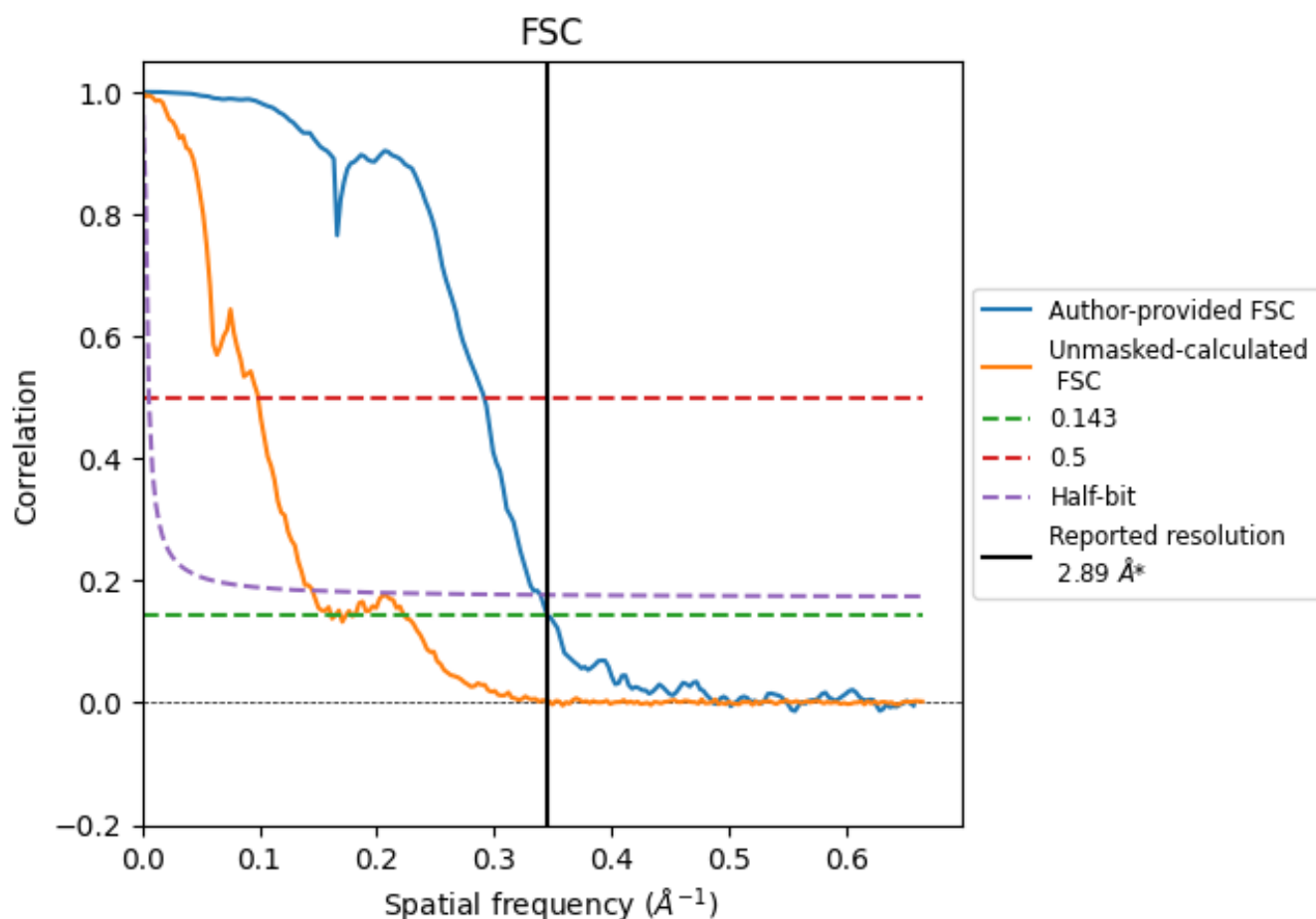
*Reported resolution corresponds to spatial frequency of 0.346 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	2.89	3.43	2.95
Unmasked-calculated*	6.21	10.13	6.89

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

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-65340 and PDB model 9VTR. Per-residue inclusion information can be found in section 3 on page 9.

9.1   Map-model overlay ⓘ

| X | Y | Z |
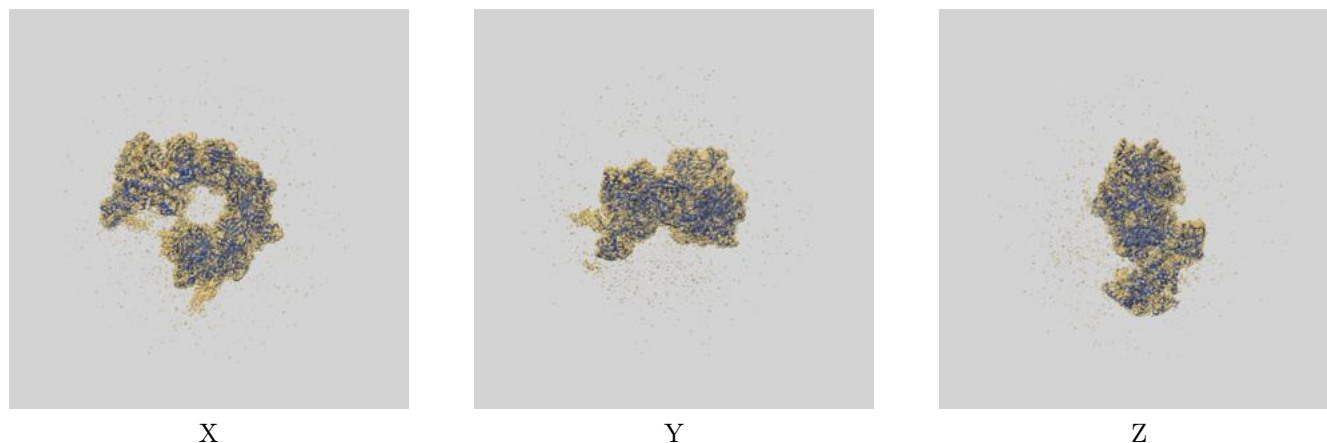
The images above show the 3D surface view of the map at the recommended contour level 0.19 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

X   Y   Z
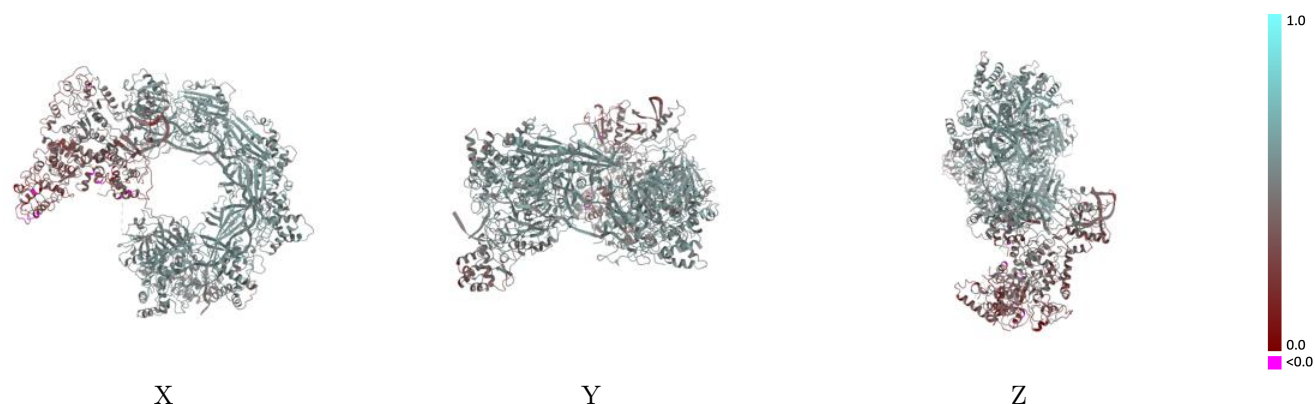
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
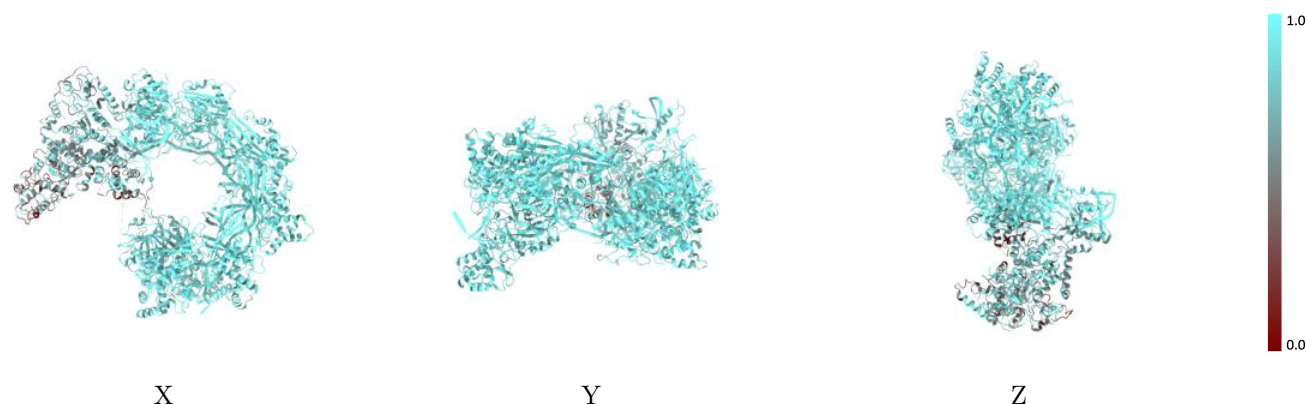
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.19).

9.4 Atom inclusion ⓘ
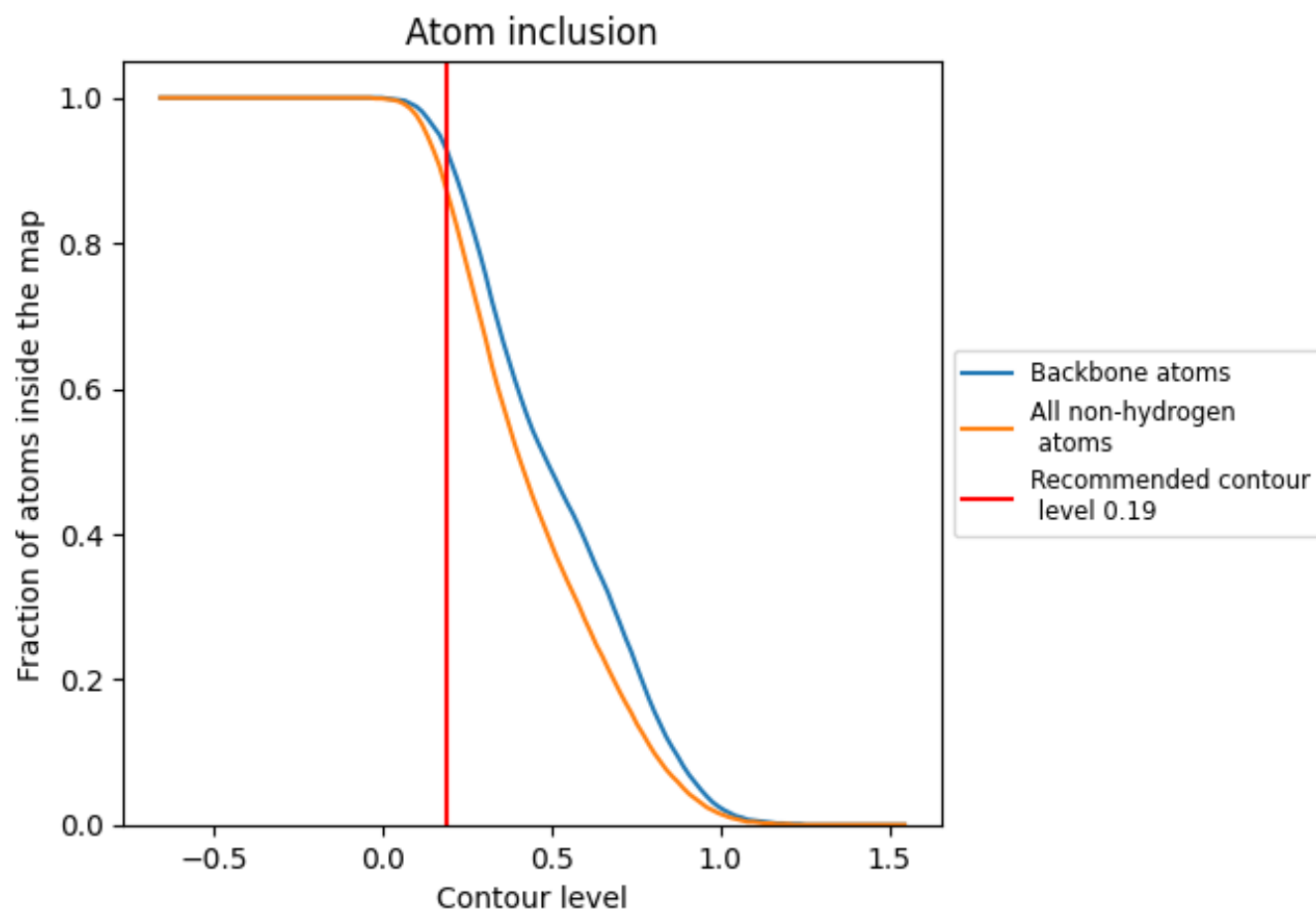
At the recommended contour level, 93% of all backbone atoms, 87% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.19) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8710	0.4960
1	0.9680	0.5050
2	0.8700	0.5070
3	0.9840	0.4660
A	0.9420	0.5560
B	0.9440	0.5590
C	0.9460	0.5570
D	0.9270	0.5470
E	0.9400	0.5550
F	0.9280	0.5330
G	0.8740	0.4940
H	0.8140	0.3760
I	0.6310	0.3440
J	0.6970	0.3780

1.0

0.0
<0.0