WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Nov 12, 2022 – 07:36 PM EST

PDB ID	:	6VAE
EMDB ID	:	EMD-21138
Title	:	Mono-ubiquitinated Fanconi Anemia ID complex bound to ICL DNA
Authors	:	Pavletich, N.P.
Deposited on	:	2019-12-17
Resolution	:	3.50 Å(reported)
Based on initial model	:	3S4W

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.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 3.50 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		4
Ramachandran outliers		0.1%
Sidechain outliers		1.0%

Worse — *Better*

■ Percentile relative to all structures
▯ Percentile relative to all EM structures
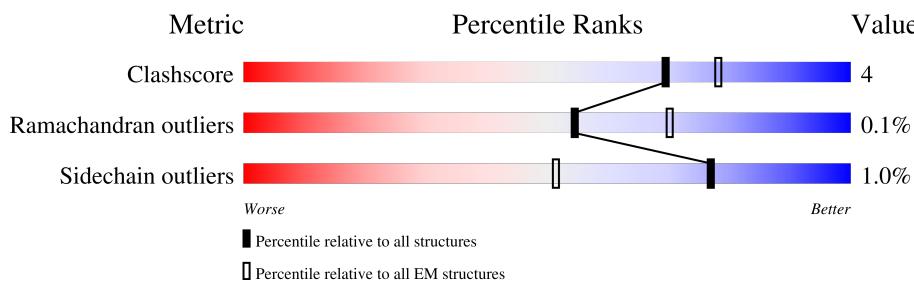
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1328	12% / 81% 9% 10%
2	B	1451	• / 72% 8% 20%
3	C	76	14% / 79% 20% •
3	D	76	7% / 68% 29% •
4	S	29	62% / 90% 10%
5	T	29	45% / 100%
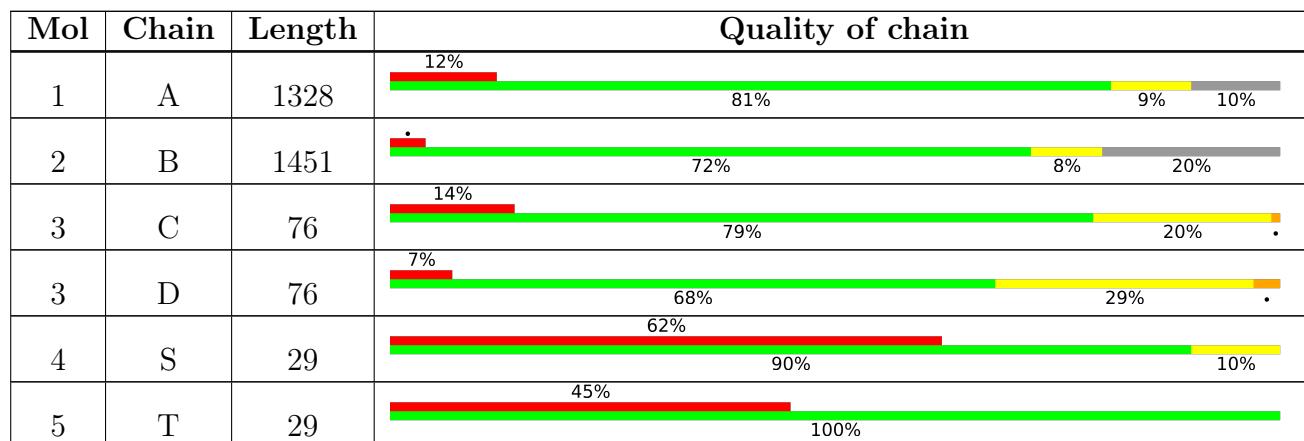
2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 42474 atoms, of which 21307 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 Fanconi anemia, complementation group I.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	1198	Total	C	H	N	O	S	0	0
			19364	6077	9876	1592	1763	56		

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	136	VAL	ALA	conflict	UNP B7ZMF2
A	476	ASN	SER	conflict	UNP B7ZMF2
A	638	GLU	LYS	conflict	UNP B7ZMF2
A	657	GLN	LYS	conflict	UNP B7ZMF2
A	877	LEU	ILE	conflict	UNP B7ZMF2
A	1235	VAL	ALA	conflict	UNP B7ZMF2
A	1274	SER	ASN	conflict	UNP B7ZMF2

- Molecule 2 is a protein called Fanconi anemia group D2 protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	1155	Total	C	H	N	O	S	0	0
			18808	5992	9520	1537	1706	53		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	654	GLN	HIS	conflict	UNP Q9BXW9
B	693	ASN	ASP	conflict	UNP Q9BXW9

- Molecule 3 is a protein called Ubiquitin.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	C	76	Total	C	H	N	O	S	0	0
			1231	378	630	105	117	1		
3	D	76	Total	C	H	N	O	S	0	0
			1231	378	630	105	117	1		

- Molecule 4 is a DNA chain called DNA (29-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
4	S	29	Total	C	H	N	O	P	0	0
			923	282	326	111	175	29		

- Molecule 5 is a DNA chain called DNA (29-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
5	T	29	Total	C	H	N	O	P	0	0
			917	280	325	110	173	29		

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: Fanconi anemia, complementation group I

• Molecule 2: Fanconi anemia group D2 protein

Chain B:

72%   8%   20%

MET VAL SER LYS ARG ARG LEU SER LYS SER GLU ASP LYS GLU SER LEU THR GLU ASP ALA SER LYS THR ARG GLN PRO LEU SER LYS LYS THR LYS LYS SER HIS ILE ALA ASN GLU VAL GLU GLU ASN **D45** **I57** **I58** **L59** **G62** **E63** **S64** **Q65** **R85** N112 E118

R119 **L120** **Q121** ASP GLU GLU ALA SER MET GLY ALA **S130** **Y131** **S132** K133 S134 L135 I136 K137 I149 L153 L157 **E163** **N164** **K165** **N166** **S167** **D168** **E169** **I170** P173 R174 L175 I176 T193 L199 A203 Q208 G220 D221 S222 Q223 H224 L231 **T239** I245 L246

D255 **V262** **D268** K269 L270 L275 E276 **F284** **M292** **I298** **R302** **E303** K304 L305 **H309** **C310** **V311** LEU PRO SER ARG LEU GLN ALA SER GLN VAL LYS LEU LYS SER LYS GLY ARG ALA SER SER SER GLY ASN GLN GLU **S337** **C342** **I343** **I344** **W364** **I365** K366

A367 **N370** **T371** **A372** **S373** **V374** **S375** **E376** D381 L382 C411 L426 C432 **Q448** K463 C469 L502 **K543** **Q544** M555 V558 **K561** **A587** ASP ARG SER GLU GLY SER PRO SER LEU THR GLN GLU ARG ALA ASN LEU SER **D604** **Q640** **N658** **D659** **F660**

Q661 **D662** **A663** **V670** **V671** **P672** **E673** **G674** **D675** **F676** **F677** **F678** **P679** **V680** **L686** **E687** **E688** **Y689** **D690** **T691** **Q692** **D707** PHE ALA LYS ASP GLY GLY PRO VAL THR SER GLN GLU SER GLY GLN LYS LEU VAL **S726** **R738** **R743** **L756** **D757** **E766** **E769** **K770** **S773** **M774** **S775**

A776 **K777** **F787** **N791** **A799** **R815** **P839** **L840** **G841** ASN PHE ASP VAL GLU THR LEU ASP THR PRO HIS THR VAL THR ALA ILE SER ALA ILE ARG LYS LYS GLY LYS ILE GLU ARG LYS GLN LYS THR ASP GLY SER LYS SER SER ASP LEU SER GLU

GLU LYS ASN SER GLU CYS ASP PRO THR PRO SER HIS ARG GLY GLN LEU ASN LYS GLU PHE THR GLY LYS GLU GLU LYS THR SER **L916** **L917** **L928** **V932** **F933** **K943** **L946** ASP THR GLU MET HIS THR GLU ALA THR GLU VAL VAL GLN **L960** **T981** PRO PRO ILE ALA ARG

ARG VAL PRO PHE LEU LYS ASN LYS GLY SER ARG ASN ILE GLY **F1001** **H1014** **C1015** **V1016** **L1019** **L1020** **M1023** **L1037** ALA ALA GLU ASN HIS GLY VAL VAL ASP GLY PRO GLY VAL **K1051** **Q1067** **N1083** **L1086** **G1101** **I1125** **C1130** **Y1133** **L1134** **I1135** **S1145** THR ALA

SER ALA **Q1150** **L1158** **F1162** **P1168** SER GLY ASP LYS GLU LYS SER **N1176** **L1186** **T1193** **V1206** **N1213** **S1214** **P1215** LYS ASP ALA SER **S1220** **F1223** **T1227** **V1237** **A1255** **S1276** **N1280** **R1299** **E1303** **L1306** **L1313** **R1318** **V1324** **T1335** **T1351**

T1354 **L1364** **L1367** **K1400** SER GLN ASN SER GLU GLU SER THR ALA ASP SER GLU GLU SER GLU ASP ASP MET SER SER GLN ALA SER GLU LYS SER ALA THR GLU GLY GLU GLU GLU ASP GLU VAL SER SER ALA GLY LYS GLU GLU GLN GLN ASP SER ASP SER GLU ASP SER GLU TYR ASP ASP SER ASP

- **Molecule 3: Ubiquitin**

14%

Chain C:

79%   20%

M1 **T12** **E16** **V17** **E18** **D21** **T22** N25 **A28** **Q31** **D32** **K33** **D39** R42 F45 **K48** **Q49** **L50** E51 **D52** **G53** **R54** **T55** K63 E64 R72 **G75** **G76**

- **Molecule 3: Ubiquitin**

7%

Chain D:

68%   29%

M1 T7 L8 T9 G10 K11 T12 I13 E16 V17 E18 Q31 D32 P38 D39 R42 L43 K48 Q49 L50 E51 D52 G53 R54 Q62 K63 E64 L67 V70 L71 R72 L73 G76

• Molecule 4: DNA (29-MER)

Chain S:

62%

90%   10%

G1 G2 C3 A4 C5 A6 G7 G8 T9 T10 A17 G18 G19 C20 G21 T22 T23 C24 C25 G26 T27 T28 C29

• Molecule 5: DNA (29-MER)

Chain T:

45%

100%

G30 A31 A32 C33 G34 G35 C41 A50 T53 G54 T55 G56 C57 C58

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	301158	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 $(e^-/Å^2)$	51	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.205	Depositor
Minimum map value	-0.117	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.012	Depositor
Map size (Å)	278.64832, 278.64832, 278.64832	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08847, 1.08847, 1.08847	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	0.67	0/9633	0.77	1/12990 (0.0%)
2	B	0.59	0/9462	0.70	0/12795
3	C	1.05	5/607 (0.8%)	0.98	3/816 (0.4%)
3	D	1.07	4/607 (0.7%)	1.06	6/816 (0.7%)
4	S	0.49	0/669	0.90	0/1031
5	T	0.51	0/663	0.88	0/1020
All	All	0.65	9/21641 (0.0%)	0.77	10/29468 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	4
2	B	0	2
All	All	0	6

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	51	GLU	CD-OE1	-7.81	1.17	1.25
3	D	16	GLU	CD-OE2	-7.69	1.17	1.25
3	C	16	GLU	CD-OE2	-6.99	1.18	1.25
3	C	64	GLU	CD-OE1	-6.89	1.18	1.25
3	C	18	GLU	CD-OE1	-6.51	1.18	1.25
3	C	51	GLU	CD-OE1	-6.19	1.18	1.25
3	C	18	GLU	CD-OE2	-5.79	1.19	1.25
3	D	18	GLU	CD-OE1	-5.32	1.19	1.25
3	D	64	GLU	CD-OE2	-5.11	1.20	1.25

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	42	ARG	CG-CD-NE	7.52	127.60	111.80
3	C	63	LYS	CD-CE-NZ	-6.75	96.17	111.70
3	D	54	ARG	NE-CZ-NH2	-6.62	116.99	120.30
3	D	42	ARG	NE-CZ-NH1	5.50	123.05	120.30
1	A	1172	THR	CA-CB-OG1	-5.43	97.60	109.00
3	D	63	LYS	CD-CE-NZ	-5.42	99.23	111.70
3	C	42	ARG	CG-CD-NE	5.40	123.13	111.80
3	C	39	ASP	CB-CG-OD1	-5.29	113.54	118.30
3	D	70	VAL	CG1-CB-CG2	-5.20	102.58	110.90
3	D	54	ARG	NE-CZ-NH1	5.16	122.88	120.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	373	HIS	Peptide
1	A	452	ALA	Peptide
1	A	547	PHE	Peptide
1	A	641	LEU	Peptide
2	B	1020	LEU	Peptide
2	B	411	CYS	Peptide

5.2　Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	9488	9876	9843	82	0
2	B	9288	9520	9466	60	0
3	C	601	630	629	5	0
3	D	601	630	629	12	0
4	S	597	326	326	2	0
5	T	592	325	325	0	0
All	All	21167	21307	21218	154	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 4.

All (154) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:113:ILE:HD11	1:A:160:LEU:HD12	1.47	0.94
1:A:47:LEU:HD22	1:A:51:PHE:CE1	2.05	0.92
1:A:412:ARG:HG3	1:A:416:GLN:HE22	1.54	0.73
3:D:39:ASP:O	3:D:72:ARG:NH2	2.21	0.72
1:A:113:ILE:HA	1:A:116:VAL:HG12	1.76	0.68
1:A:113:ILE:HD11	1:A:160:LEU:CD1	2.21	0.67
2:B:220:GLY:H	2:B:223:GLN:HE21	1.44	0.65
3:C:22:THR:OG1	3:C:25:ASN:OD1	2.15	0.64
1:A:504:GLN:HE22	1:A:542:LEU:HB3	1.63	0.63
1:A:852:GLN:HE22	1:A:860:SER:HB3	1.63	0.63
1:A:1042:PRO:O	1:A:1046:LEU:HG	1.99	0.62
1:A:218:LEU:HD11	1:A:275:ILE:HG22	1.82	0.61
1:A:62:THR:HG23	1:A:104:LEU:HD22	1.80	0.61
3:D:43:LEU:HD12	3:D:67:LEU:HD12	1.85	0.58
1:A:25:ARG:HG2	1:A:25:ARG:O	2.03	0.58
1:A:154:GLU:O	1:A:158:LYS:HG3	2.03	0.58
2:B:1125:ILE:HD11	2:B:1134:LEU:HD13	1.86	0.58
2:B:1335:THR:HG23	2:B:1364:LEU:HD22	1.87	0.57
1:A:51:PHE:CZ	1:A:69:TYR:HE1	2.23	0.57
1:A:82:GLN:O	1:A:86:VAL:HG23	2.05	0.57
1:A:51:PHE:CZ	1:A:69:TYR:CE1	2.93	0.56
2:B:65:GLN:HG3	2:B:118:GLU:HB2	1.86	0.56
2:B:64:SER:O	2:B:112:ASN:ND2	2.38	0.56
1:A:81:LEU:HG	1:A:86:VAL:CG2	2.35	0.56
2:B:157:LEU:HD23	2:B:199:LEU:HD11	1.86	0.56
1:A:81:LEU:HG	1:A:86:VAL:HG23	1.88	0.55
1:A:1075:VAL:HG13	1:A:1080:ALA:HB2	1.89	0.55
1:A:81:LEU:HD21	1:A:86:VAL:HG22	1.89	0.55
2:B:640:GLN:O	2:B:743:ARG:NH2	2.39	0.54
2:B:1125:ILE:HG23	2:B:1130:CYS:HB2	1.89	0.54
2:B:57:ILE:HD13	2:B:135:LEU:HD13	1.90	0.54
2:B:686:LEU:HD12	2:B:757:ASP:HA	1.89	0.53
2:B:302:ARG:NH2	2:B:367:ALA:O	2.41	0.53
2:B:1186:LEU:HB3	2:B:1237:VAL:HG11	1.90	0.53
1:A:461:ASP:OD1	1:A:498:ARG:NH1	2.42	0.53
1:A:545:LYS:HG2	1:A:615:ARG:HE	1.74	0.52
1:A:47:LEU:HD22	1:A:51:PHE:CZ	2.44	0.52
1:A:125:LYS:HA	1:A:128:GLU:HG2	1.91	0.52
1:A:81:LEU:HD11	1:A:86:VAL:HG22	1.91	0.52
1:A:1141:LEU:HA	1:A:1144:PHE:HB3	1.92	0.52
2:B:1299:ARG:NH2	2:B:1303:GLU:OE1	2.43	0.52
2:B:275:LEU:HD21	2:B:343:ILE:HG13	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:270:LEU:HD22	2:B:304:LYS:HB3	1.92	0.51
2:B:1135:ILE:HD11	2:B:1162:PHE:HD1	1.76	0.51
1:A:113:ILE:O	1:A:117:ARG:HG2	2.11	0.51
1:A:130:LEU:HD23	1:A:133:ILE:HD11	1.92	0.51
1:A:955:THR:HG21	1:A:995:LEU:HB2	1.93	0.51
1:A:665:ASP:HB2	1:A:804:LEU:HD11	1.92	0.50
2:B:1306:LEU:HD21	2:B:1367:LEU:HA	1.93	0.50
1:A:374:SER:O	3:D:48:LYS:NZ	2.31	0.50
2:B:555:MET:HA	2:B:558:VAL:HG12	1.94	0.50
3:D:31:GLN:HE21	3:D:38:PRO:HD3	1.75	0.50
2:B:738:ARG:HD2	2:B:799:ALA:HA	1.94	0.49
2:B:231:LEU:HD22	2:B:245:ILE:HG12	1.94	0.49
1:A:64:ARG:HH11	1:A:64:ARG:HG2	1.77	0.49
1:A:66:ARG:NH1	1:A:66:ARG:HB3	2.28	0.49
3:D:50:LEU:HD11	3:D:67:LEU:HD11	1.95	0.48
2:B:174:ARG:NH2	3:C:33:LYS:O	2.46	0.48
2:B:928:LEU:HB3	2:B:932:VAL:HG11	1.94	0.48
2:B:561:LYS:HE3	3:D:76:GLY:N	2.29	0.48
2:B:659:ASP:O	2:B:663:ALA:HB2	2.13	0.48
1:A:653:THR:HG23	1:A:658:ILE:HG13	1.96	0.47
1:A:1147:GLU:O	1:A:1151:THR:OG1	2.32	0.47
1:A:81:LEU:CG	1:A:86:VAL:CG2	2.93	0.47
2:B:1313:LEU:HD22	2:B:1324:VAL:HG22	1.95	0.47
3:D:7:THR:OG1	3:D:8:LEU:N	2.47	0.47
2:B:463:LYS:HE2	2:B:502:LEU:HD11	1.97	0.47
1:A:134:LEU:HD12	1:A:157:LYS:HG3	1.97	0.47
1:A:761:SER:HB3	1:A:767:ARG:HH11	1.80	0.47
2:B:374:VAL:HG22	2:B:376:GLU:H	1.80	0.47
2:B:1135:ILE:HG12	2:B:1158:LEU:HD23	1.97	0.47
3:C:22:THR:HA	3:C:55:THR:HA	1.96	0.47
2:B:366:LYS:O	2:B:370:ASN:ND2	2.49	0.46
1:A:62:THR:CG2	1:A:104:LEU:HD22	2.45	0.46
1:A:154:GLU:HG2	1:A:158:LYS:HE3	1.98	0.46
2:B:203:ALA:HB3	2:B:208:GLN:HB3	1.97	0.46
2:B:302:ARG:NH1	2:B:381:ASP:OD1	2.49	0.46
1:A:651:ILE:HD13	1:A:738:LYS:HG3	1.97	0.46
2:B:344:ILE:HD11	2:B:426:LEU:HB3	1.98	0.46
1:A:295:VAL:HG23	1:A:301:SER:HB3	1.99	0.45
1:A:595:LEU:O	1:A:602:ARG:NE	2.49	0.45
2:B:1351:THR:HA	2:B:1354:THR:HG22	1.98	0.45
1:A:113:ILE:O	1:A:116:VAL:HG12	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:485:PHE:HZ	1:A:503:VAL:HG11	1.82	0.45
1:A:970:LEU:O	1:A:1019:ARG:NH2	2.50	0.45
1:A:298:GLN:HE21	1:A:336:LYS:HB3	1.80	0.45
1:A:1184:CYS:SG	1:A:1190:ILE:N	2.88	0.45
2:B:149:ILE:O	2:B:153:LEU:HB2	2.17	0.45
3:D:16:GLU:N	3:D:16:GLU:OE2	2.49	0.45
1:A:1107:LYS:HE3	1:A:1182:GLN:NE2	2.32	0.44
2:B:1206:VAL:HG11	2:B:1223:PHE:HB3	1.99	0.44
1:A:1190:ILE:HD13	1:A:1275:LEU:HD11	1.99	0.44
2:B:676:PHE:HD2	2:B:680:VAL:HG21	1.82	0.44
2:B:262:VAL:HG13	2:B:284:PHE:HZ	1.82	0.44
1:A:391:ASP:OD1	1:A:447:ARG:NH2	2.51	0.44
1:A:72:CYS:HB2	1:A:89:ILE:HD11	2.00	0.44
1:A:171:GLN:HE21	1:A:205:MET:HG2	1.82	0.44
1:A:1037:VAL:HG12	1:A:1042:PRO:HG3	2.00	0.44
2:B:1014:HIS:HD2	2:B:1086:LEU:HD21	1.83	0.44
1:A:62:THR:HG23	1:A:104:LEU:CD2	2.46	0.44
1:A:1019:ARG:HA	1:A:1019:ARG:HD3	1.76	0.44
2:B:561:LYS:CE	3:D:76:GLY:H	2.31	0.44
2:B:933:PHE:HB2	2:B:1019:LEU:HD21	1.99	0.43
2:B:1067:GLN:NE2	2:B:1133:TYR:OH	2.51	0.43
1:A:725:LYS:HD3	1:A:725:LYS:HA	1.84	0.43
1:A:341:LEU:HD11	1:A:345:GLN:NE2	2.33	0.43
1:A:389:LEU:HD23	1:A:389:LEU:HA	1.84	0.43
2:B:1016:VAL:O	2:B:1020:LEU:N	2.52	0.43
1:A:113:ILE:CA	1:A:116:VAL:HG12	2.47	0.43
2:B:173:PRO:HA	2:B:176:ILE:HG22	2.00	0.42
1:A:134:LEU:HD11	1:A:160:LEU:HD23	2.01	0.42
2:B:1276:SER:O	2:B:1280:ASN:ND2	2.52	0.42
1:A:897:LYS:HA	1:A:900:LYS:HB2	2.01	0.42
2:B:756:LEU:O	2:B:815:ARG:NH2	2.53	0.42
2:B:1083:ASN:O	2:B:1086:LEU:HB2	2.20	0.42
2:B:133:LYS:HD2	2:B:137:LYS:HG2	2.02	0.42
1:A:215:TYR:CD1	3:D:8:LEU:HD22	2.55	0.42
1:A:548:LYS:HB3	1:A:550:LEU:HD12	2.02	0.42
1:A:1208:LEU:HD23	1:A:1208:LEU:HA	1.94	0.42
2:B:382:LEU:HD23	2:B:382:LEU:HA	1.97	0.41
3:C:39:ASP:O	3:C:72:ARG:NH1	2.54	0.41
1:A:493:LEU:O	1:A:497:GLN:HB2	2.20	0.41
2:B:276:GLU:HA	2:B:342:CYS:SG	2.60	0.41
2:B:298:ILE:HG21	2:B:364:TRP:HA	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:45:PHE:HB3	3:C:50:LEU:HD21	2.02	0.41
1:A:506:LEU:HD13	1:A:513:MET:SD	2.60	0.41
2:B:432:CYS:HG	2:B:469:CYS:CB	2.31	0.41
1:A:1020:GLU:HG2	1:A:1078:ARG:HH11	1.86	0.41
2:B:246:LEU:HD23	2:B:246:LEU:HA	1.90	0.41
1:A:184:VAL:O	1:A:223:LYS:NZ	2.53	0.41
1:A:668:LEU:HD12	1:A:749:VAL:HG22	2.02	0.41
2:B:193:THR:OG1	2:B:223:GLN:OE1	2.37	0.41
2:B:787:PHE:O	2:B:791:ASN:ND2	2.52	0.41
4:S:17:DA:H2"	4:S:18:DG:C8	2.55	0.41
1:A:1041:SER:CB	1:A:1137:GLN:HE22	2.33	0.41
1:A:1081:ALA:HB3	1:A:1082:PRO:HD3	2.03	0.41
2:B:221:ASP:HA	2:B:224:HIS:CD2	2.56	0.41
2:B:561:LYS:CE	3:D:76:GLY:N	2.83	0.41
2:B:690:ASP:HB2	2:B:692:GLN:HE21	1.86	0.41
2:B:561:LYS:HE3	3:D:76:GLY:H	1.86	0.41
1:A:240:LEU:HD23	1:A:240:LEU:HA	1.97	0.40
1:A:504:GLN:HG2	1:A:507:LEU:HD12	2.03	0.40
1:A:969:LEU:HD22	1:A:982:ALA:HB2	2.02	0.40
1:A:1054:HIS:ND1	1:A:1147:GLU:OE1	2.50	0.40
1:A:81:LEU:HD21	1:A:86:VAL:CG2	2.52	0.40
1:A:783:ASP:HA	1:A:786:ASN:HB2	2.03	0.40
2:B:658:ASN:HA	2:B:661:GLN:HG2	2.04	0.40
1:A:102:GLY:HA3	1:A:144:LEU:HD22	2.03	0.40
1:A:275:ILE:HD11	1:A:312:LEU:HD11	2.03	0.40
1:A:642:LEU:HD12	1:A:642:LEU:HA	1.98	0.40
2:B:305:LEU:HD23	2:B:305:LEU:HA	1.97	0.40
1:A:1135:ILE:HD13	1:A:1193:ASN:HB3	2.03	0.40
4:S:18:DG:H2"	4:S:19:DG:C8	2.57	0.40
1:A:430:PHE:CZ	1:A:466:ILE:HG23	2.57	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1180/1328 (89%)	1116 (95%)	62 (5%)	2 (0%)	47	81
2	B	1131/1451 (78%)	1076 (95%)	55 (5%)	0	100	100
3	C	74/76 (97%)	74 (100%)	0	0	100	100
3	D	74/76 (97%)	72 (97%)	2 (3%)	0	100	100
All	All	2459/2931 (84%)	2338 (95%)	119 (5%)	2 (0%)	54	84

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	451	ARG
1	A	548	LYS

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	1093/1205 (91%)	1085 (99%)	8 (1%)	84	93
2	B	1067/1324 (81%)	1060 (99%)	7 (1%)	84	93
3	C	68/68 (100%)	66 (97%)	2 (3%)	42	71
3	D	68/68 (100%)	62 (91%)	6 (9%)	10	38
All	All	2296/2665 (86%)	2273 (99%)	23 (1%)	77	88

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	28	ASP
1	A	64	ARG
1	A	165	CYS
1	A	447	ARG
1	A	457	SER
1	A	1042	PRO

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Mol	Chain	Res	Type
1	A	1141	LEU
1	A	1285	ARG
2	B	255	ASP
2	B	561	LYS
2	B	662	ASP
2	B	770	LYS
2	B	1023	MET
2	B	1193	THR
2	B	1227	THR
3	C	12	THR
3	C	52	ASP
3	D	1	MET
3	D	9	THR
3	D	13	ILE
3	D	52	ASP
3	D	54	ARG
3	D	73	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	35	ASN
1	A	36	GLN
1	A	162	ASN
1	A	171	GLN
1	A	172	GLN
1	A	245	ASN
1	A	298	GLN
1	A	373	HIS
1	A	377	HIS
1	A	443	GLN
1	A	504	GLN
1	A	546	ASN
1	A	673	HIS
1	A	852	GLN
1	A	872	GLN
1	A	921	GLN
1	A	924	GLN
1	A	961	GLN
1	A	1017	ASN
1	A	1071	HIS
1	A	1091	GLN

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Mol	Chain	Res	Type
1	A	1137	GLN
1	A	1182	GLN
2	B	86	HIS
2	B	121	GLN
2	B	209	HIS
2	B	370	ASN
2	B	640	GLN
2	B	692	GLN
2	B	693	ASN
2	B	802	GLN
2	B	1014	HIS
2	B	1063	GLN
2	B	1067	GLN
2	B	1100	GLN
2	B	1320	HIS
2	B	1332	GLN
2	B	1388	ASN
3	C	62	GLN
3	D	31	GLN
3	D	49	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

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 ⓘ

This section contains visualisations of the EMDB entry EMD-21138. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections ⓘ

6.1.1 Primary map

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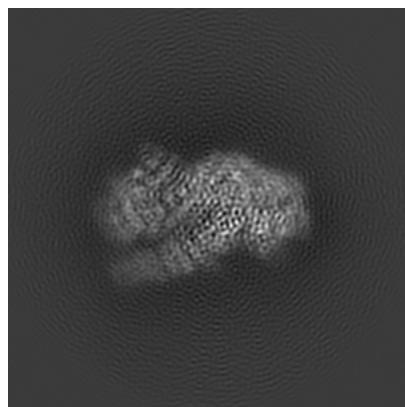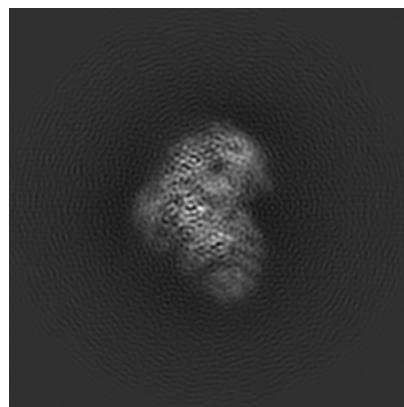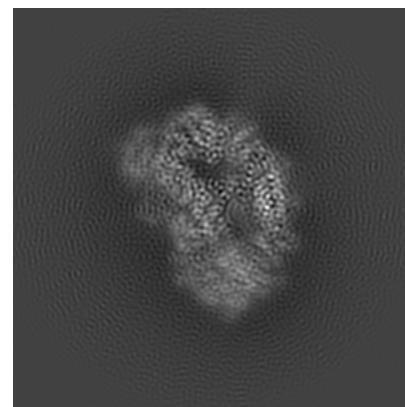
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
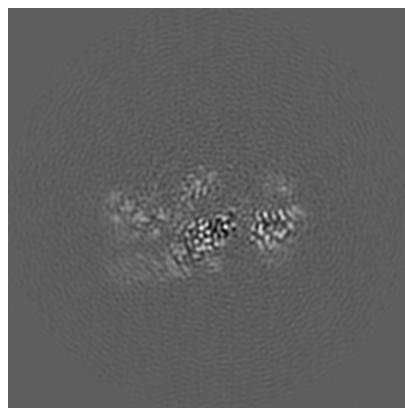
6.2.1 Primary map
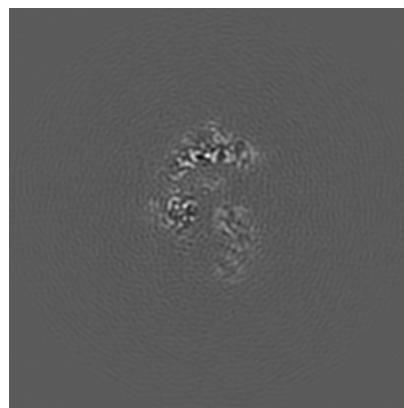
| X Index: 128 | Y Index: 128 | Z Index: 128 |
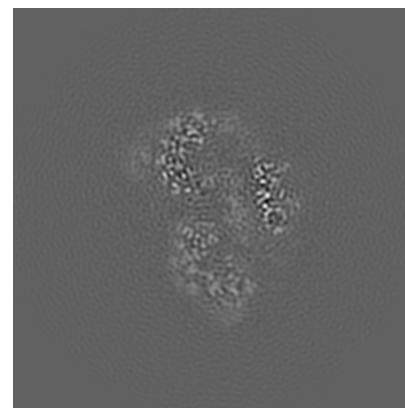
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
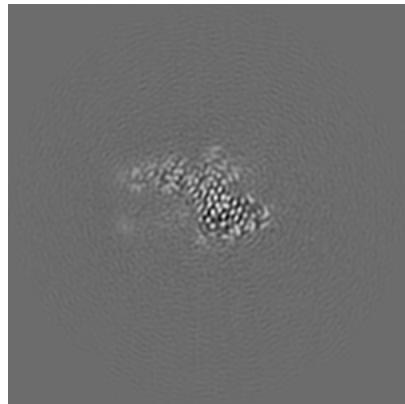
6.3.1 Primary map
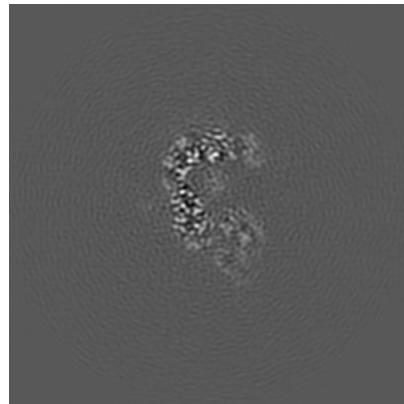
| X Index: 160 | Y Index: 137 | Z Index: 116 |
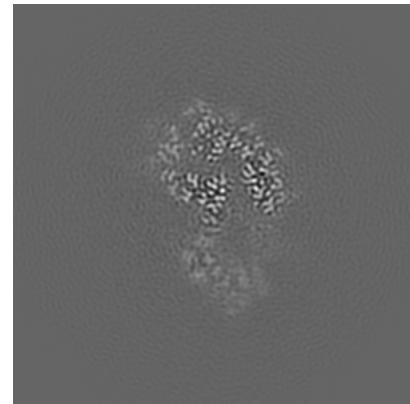
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views ⓘ

6.4.1 Primary map

| X | Y | Z |
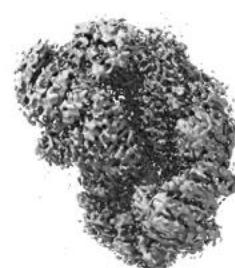
The images above show the 3D surface view of the map at the recommended contour level 0.012. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5 Mask visualisation (i)

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

7 Map analysis ⓘ

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

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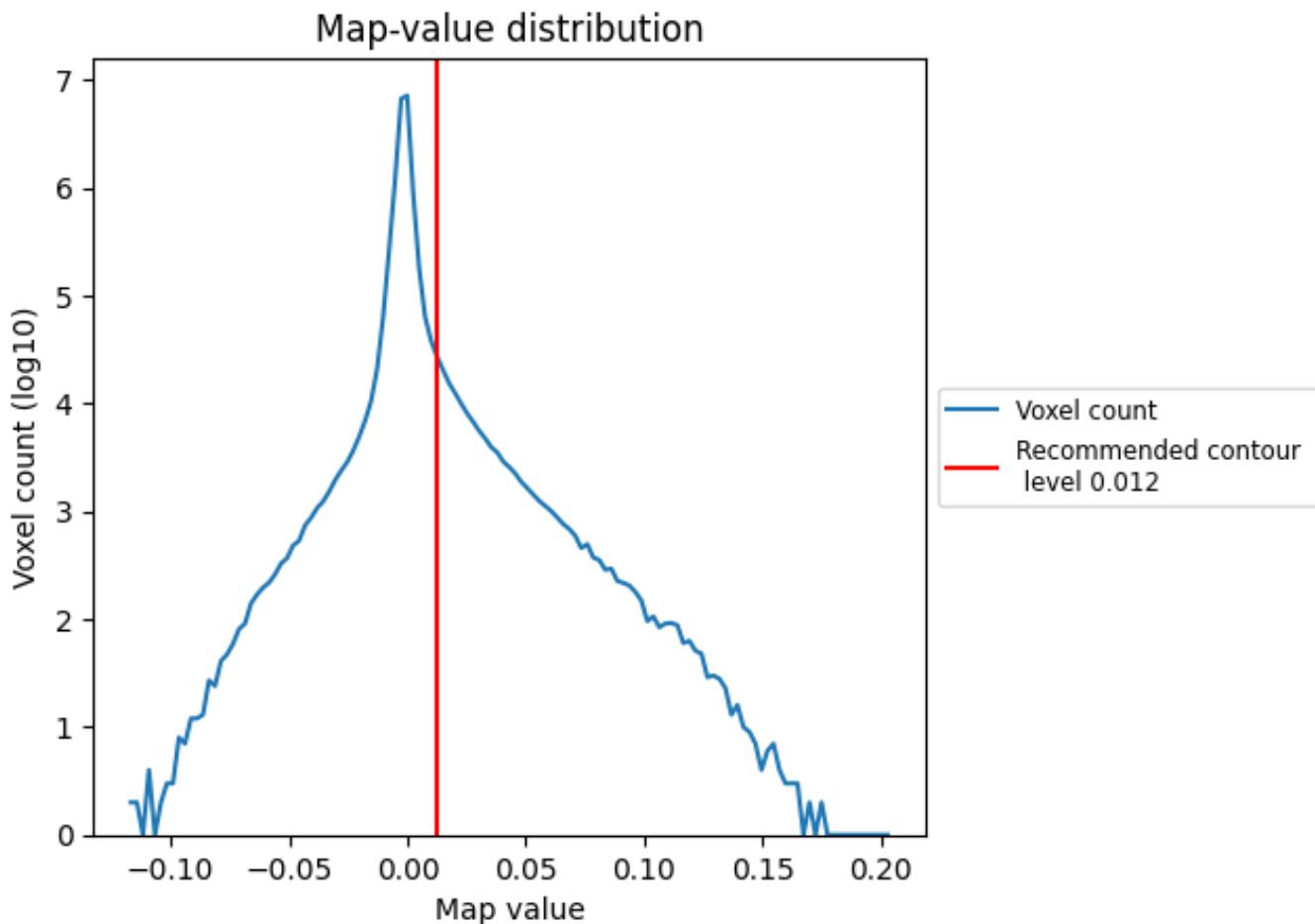
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
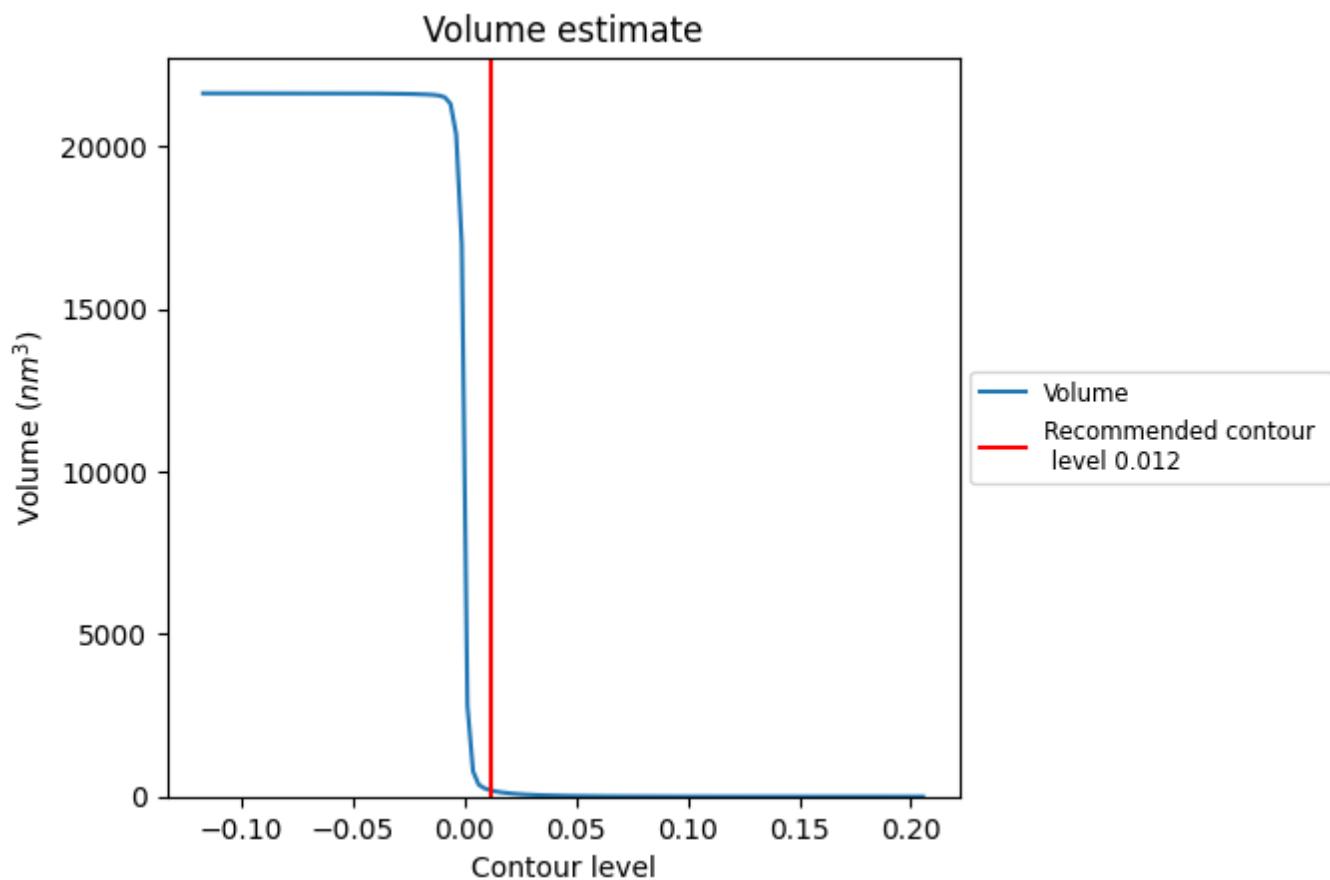
The volume at the recommended contour level is 192 nm^3; this corresponds to an approximate mass of 174 kDa.

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 ⓘ
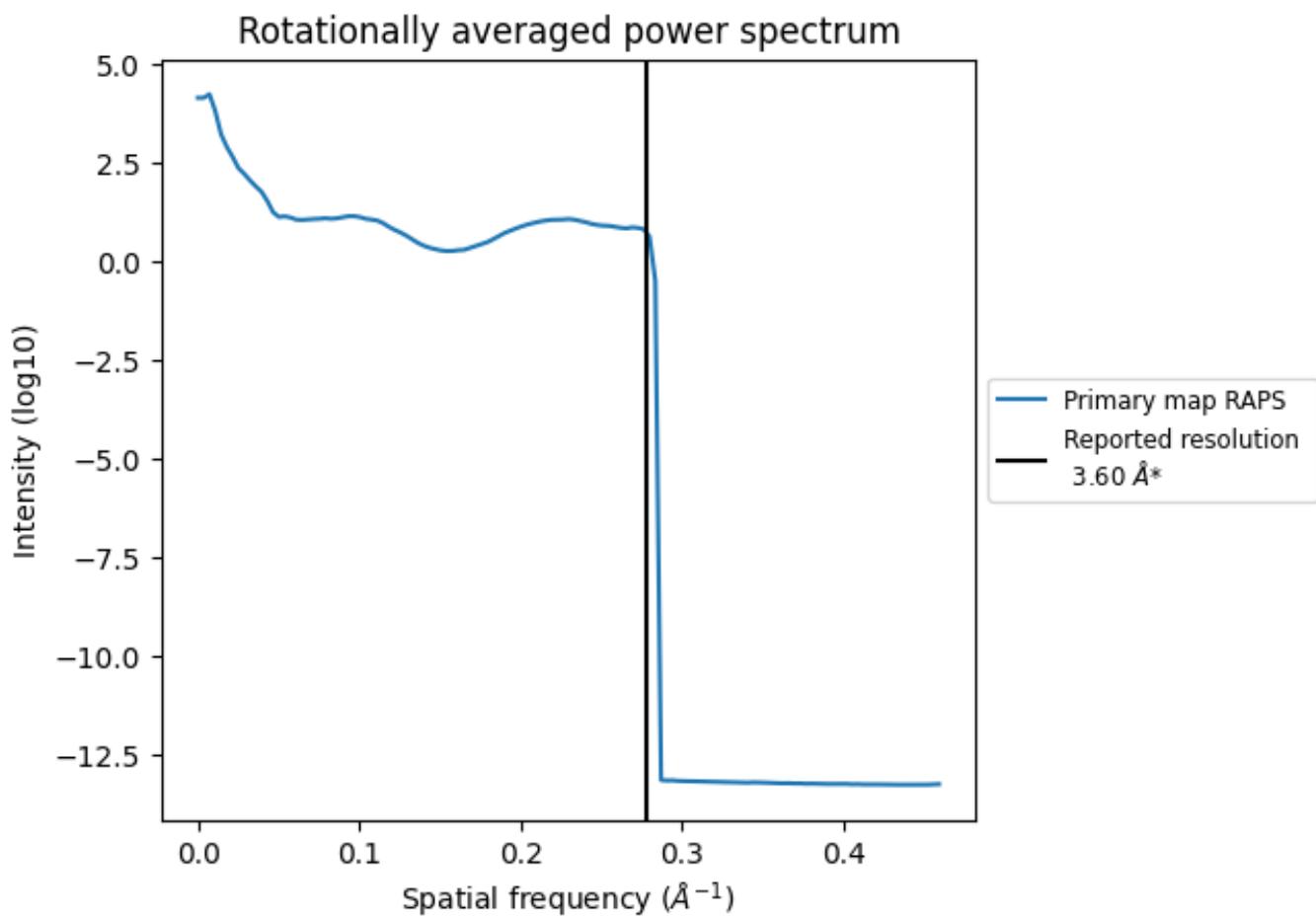
*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

8 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-21138 and PDB model 6VAE. Per-residue inclusion information can be found in section 3 on page 5.

9.1   Map-model overlay ⓘ

X   Y   Z
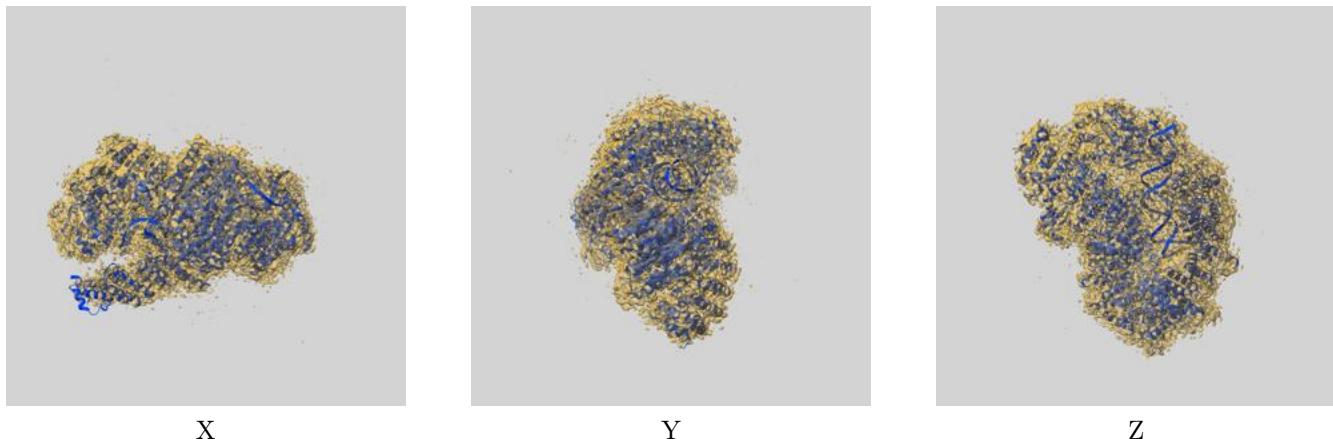
The images above show the 3D surface view of the map at the recommended contour level 0.012 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model　ⓘ

X　　　　　　　　　Y　　　　　　　　　Z
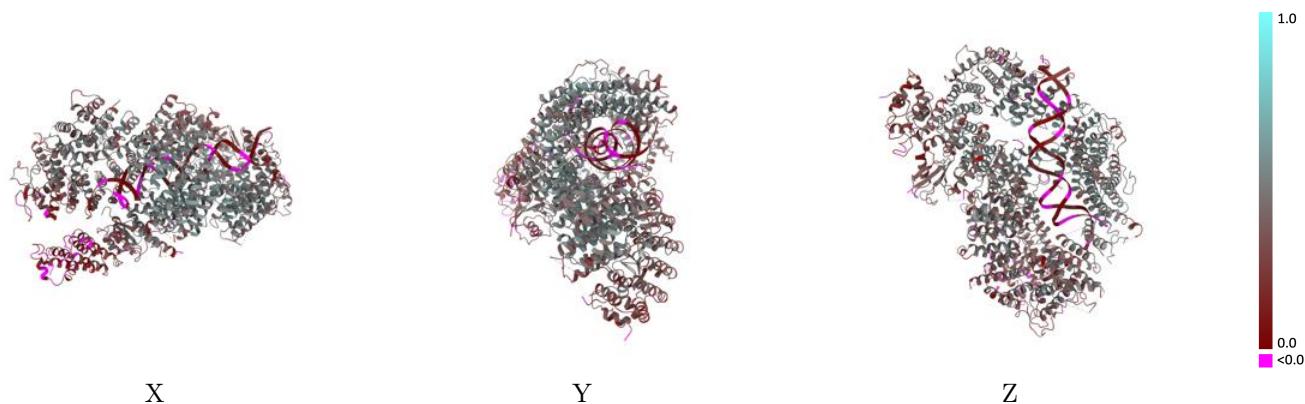
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
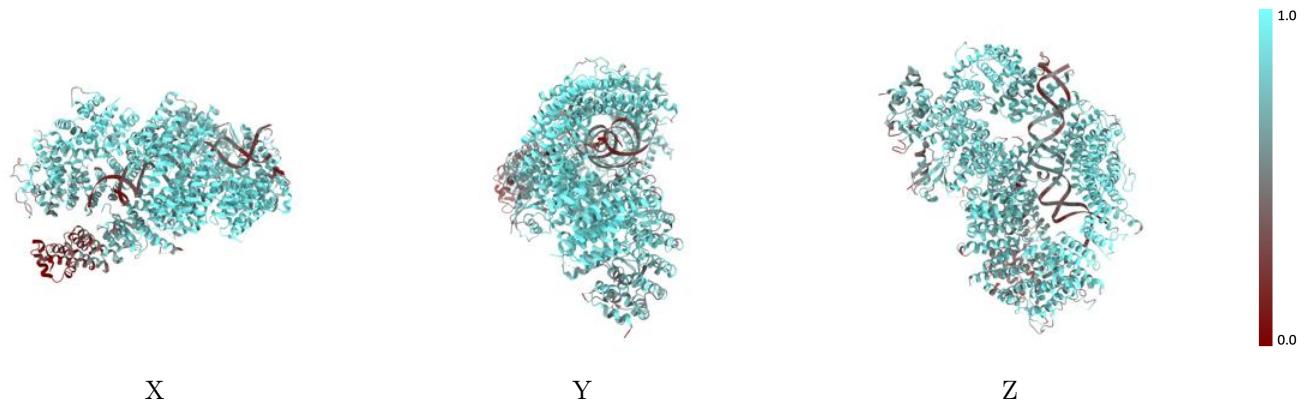
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.012).

9.4 Atom inclusion ⓘ
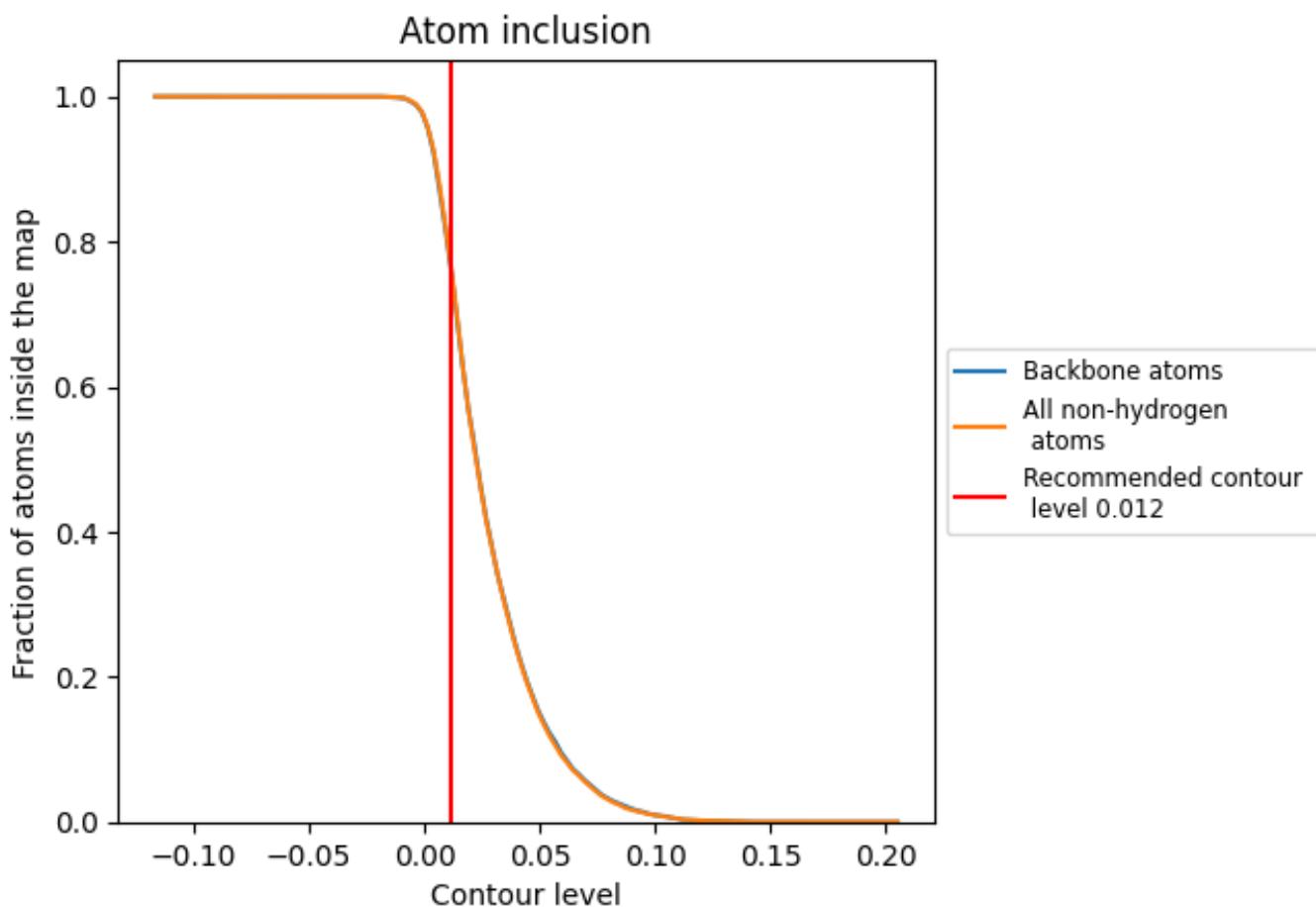
At the recommended contour level, 75% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.012) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7553	0.3690
A	0.7790	0.4040
B	0.7998	0.3810
C	0.6149	0.3220
D	0.7027	0.2900
S	0.3886	0.0630
T	0.3986	0.0700

1.0

0.0
<0.0