WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Aug 7, 2023 – 02:42 PM EDT

PDB ID	:	5VHH
EMDB ID	:	EMD-8675
Title	:	Conformational Landscape of the p28-Bound Human Proteasome Regulatory Particle
Authors	:	Lu, Y.; Wu, J.; Dong, Y.; Chen, S.; Sun, S.; Ma, Y.B.; Ouyang, Q.; Finley, D.; Kirschner, M.W.; Mao, Y.
Deposited on	:	2017-04-13
Resolution	:	6.10 Å(reported)

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 (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:
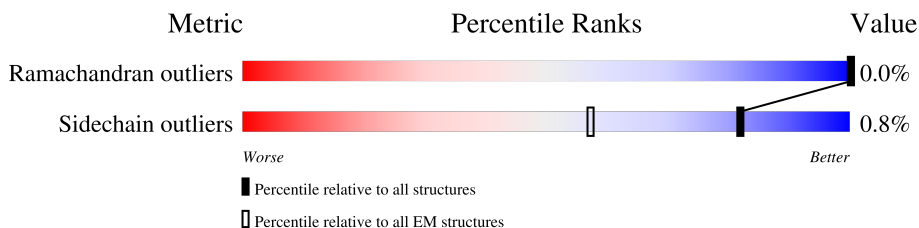
EMDB validation analysis	:	0.0.1.dev50
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 6.10 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.
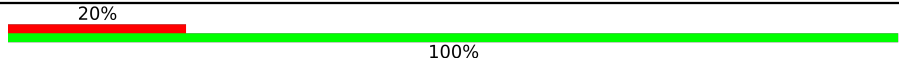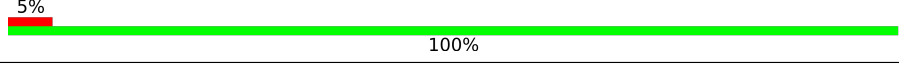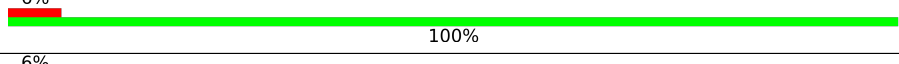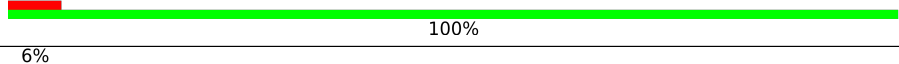
Metric	Percentile Ranks	Value
Ramachandran outliers		0.0%
Sidechain outliers		0.8%

Worse | | *Better*

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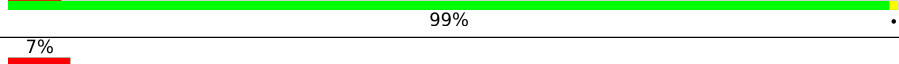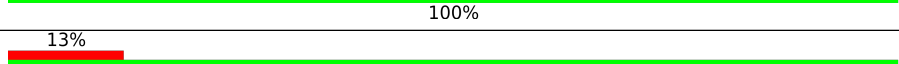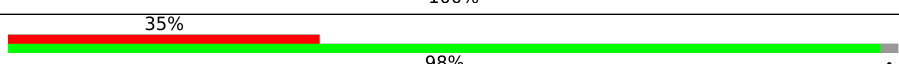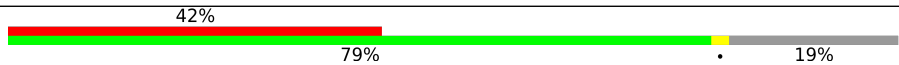
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

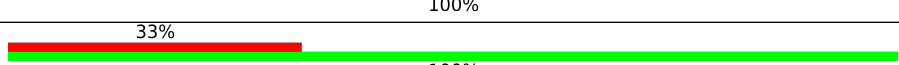The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	352	15% — 96% ··
2	B	340	31% — 97% ·
3	C	385	25% — 88% · 11%
4	D	368	17% — 92% · 7%
5	E	379	15% — 91% · 9%
6	F	380	9% — 94% · 6%
7	U	935	· — 90% 10%
8	V	488	22% — 99% ·
9	W	456	16% — 99% ·

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Mol	Chain	Length	Quality of chain
10	X	385	20% / 100%
11	Y	378	5% / 100%
12	Z	286	6% / 100%
13	a	374	6% / 100%
14	b	191	6% / 99%
15	c	287	7% / 100%
16	d	257	13% / 100%
17	e	70	33% / 100%
18	G	223	35% / 98%
19	f	848	42% / 79% / 19%

2 Entry composition ⓘ

There are 20 unique types of molecules in this entry. The entry contains 55280 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 26S proteasome regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	341	Total	C	N	O	S	0	0
			2677	1690	473	497	17		

- Molecule 2 is a protein called 26S proteasome regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	330	Total	C	N	O	S	0	0
			2579	1624	437	506	12		

- Molecule 3 is a protein called 26S proteasome regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	342	Total	C	N	O	S	0	0
			2709	1701	493	501	14		

- Molecule 4 is a protein called 26S proteasome regulatory subunit 6B.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	344	Total	C	N	O	S	0	0
			2751	1744	480	517	10		

- Molecule 5 is a protein called 26S proteasome regulatory subunit 10B.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	345	Total	C	N	O	S	0	0
			2736	1715	490	515	16		

- Molecule 6 is a protein called 26S proteasome regulatory subunit 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	359	Total	C	N	O	S	0	0
			2807	1772	487	531	17		

- Molecule 7 is a protein called 26S proteasome non-ATPase regulatory subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	U	845	Total 6568	C 4169	N 1118	O 1236	S 45	0	0

- Molecule 8 is a protein called 26S proteasome non-ATPase regulatory subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	V	488	Total 3919	C 2487	N 695	O 723	S 14	0	0

- Molecule 9 is a protein called 26S proteasome non-ATPase regulatory subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	W	456	Total 3703	C 2339	N 635	O 704	S 25	0	0

- Molecule 10 is a protein called 26S proteasome non-ATPase regulatory subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	X	385	Total 3048	C 1939	N 515	O 582	S 12	0	0

- Molecule 11 is a protein called 26S proteasome non-ATPase regulatory subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	Y	378	Total 3115	C 1987	N 533	O 578	S 17	0	0

- Molecule 12 is a protein called 26S proteasome non-ATPase regulatory subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	Z	286	Total 2281	C 1457	N 392	O 427	S 5	0	0

- Molecule 13 is a protein called 26S proteasome non-ATPase regulatory subunit 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	a	374	Total 3003	C 1915	N 511	O 562	S 15	0	0

- Molecule 14 is a protein called 26S proteasome non-ATPase regulatory subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	b	191	Total 1458	C 910	N 261	O 279	S 8	0	0

- Molecule 15 is a protein called 26S proteasome non-ATPase regulatory subunit 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	c	287	Total 2260	C 1430	N 389	O 422	S 19	0	0

- Molecule 16 is a protein called 26S proteasome non-ATPase regulatory subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	d	257	Total 2116	C 1371	N 346	O 390	S 9	0	0

- Molecule 17 is a protein called 26S proteasome complex subunit SEM1.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	e	70	Total 583	C 357	N 89	O 135	S 2	0	0

- Molecule 18 is a protein called 26S proteasome non-ATPase regulatory subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	G	219	Total 1662	C 1036	N 294	O 323	S 9	0	0

- Molecule 19 is a protein called 26S proteasome non-ATPase regulatory subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	f	686	Total 5304	C 3335	N 901	O 1033	S 35	0	0

- Molecule 20 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
20	c	1	Total 1	Zn 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: 26S proteasome regulatory subunit 7

Chain A:

- Molecule 2: 26S proteasome regulatory subunit 4

Chain B:

- Molecule 3: 26S proteasome regulatory subunit 8

Chain C:

G264 T272 M273 N278 F283 E284 A285 T286 K287 M293 I298 D299 I300 L301 D302 S303 A304 L305 P308 G309 R310 I311 P320 N321 E322 E323 L326 R334 R340 G341 I342 N343 L344 R345 K346 E349 L350 A354 E365 M368 E373 R374 Q380 E381

E384 M385 A388 K389 V390 M391 Q392 K393 D394 SER

• Molecule 4: 26S proteasome regulatory subunit 6B

Chain D:

17%

92%   •   7%

D39 L116 P145 GLU ALA ASP SER SER ILE MET MET LEU THR SER ASP GLN LYS PRO ASP VAL MET TYR ALA ASP ILE GLY M170 D171 Q175 R178 E179 A180 T186 H187 F188 E189 K192 R200 P208 H221 H222 T223 T224 A225 A226 R229 V230 S233

E234 F235 V236 Q237 K238 Y239 L240 G241 E242 R252 E256 N257 A258 F263 E266 I267 K273 D276 A277 Q278 T279 G280 A281 D282 Q286 L292 L293 N294 F299 D300 Q301 N304 R313 A314 D315 D328 P334 L335 I348 T349 S350 K351 M352 N353 L354

D368 K369 I370 S371 R388 V406

• Molecule 5: 26S proteasome regulatory subunit 10B

Chain E:

15%

91%   •   9%

D11 H19 R25 Q32 S52 L61 K62 Q63 E66 C83 Q86 S90 G95 T104 L118 V119 M122 S123 H124 E125 D126 P127 G128 N129 V130 I135 S139 GLU GLN ILE ARG GLU LEU ARG GLU VAL ILE LEU GLU LEU PRO LEU THR ASN PRO GLU

LEU PHE GLN ARG VAL GLY ILE ILE PRO PRO K168 L182 S201 K206 Y207 I208 G209 E210 R213 R216 E217 N220 Y221 D224 F243 S244 E245 G246 T247 N262 D265 D266 F267 D268 T269 N280 R281 P282 D283 T284 P287 L295 Q307 G324 E325

I326 L334 N345 D358 F361 K383 LEU ASP TYR LYS PRO VAL

• Molecule 6: 26S proteasome regulatory subunit 6A

Chain F:

9%

94%   •   6%

K53 D71 T85 L97 D98 V99 D100 P101 ASN ASP GLN GLU GLU ASP GLY ALA ASN ILE ASP LEU ASP SER Q116 A122 L139 A142 E143 P165 Y168 D169 S170 D178 E179 R180 Y185 G190 K193 E213 M259 F260 I261 G262 D263 D289 A290

F296 ASP SER GLU K300 D303 N315 G319 F320 Q321 P322 N323 D336 P377 D378 E382 D389 D390 Q428 ALA LYS LYS LYS
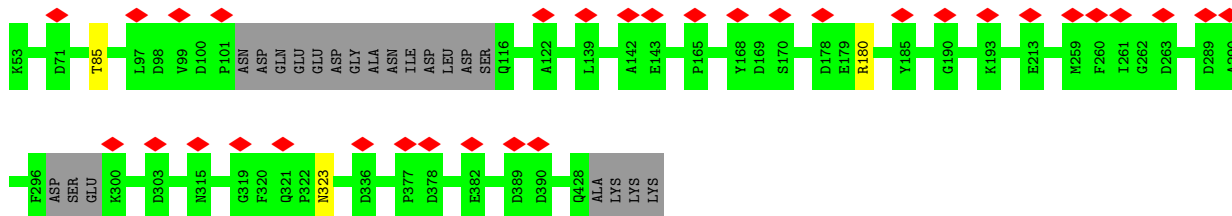
• Molecule 7: 26S proteasome non-ATPase regulatory subunit 1

Chain U:

90% 10%

M1 I2 L71 D86 L87 F88 P119 Q128 Y147 L160 R199 Q227 L252 G272 T273 P274 ILE ALA SER VAL PRO GLY SER THR ASN THR GLY THR VAL PRO GLY SER GLU LYS ASP SER SER MET GLU THR GLU GLU LYS THR SER SER ALA PHE VAL

GLY LYS THR PRO GLU ALA SER PRO E317 P318 K319 T397 A424 T425 Y426 L427 P428 K429 D430 S523 E561 R616 S621 M695 L795 P820 LYS GLU LYS GLU LYS GLU LYS VAL SER THR ALA VAL LEU S834 A837 K844 GLU LYS GLU LYS GLU GLU

GLU LYS MET GLU VAL ASP GLU ALA GLU LYS LYS GLU GLU LYS GLU LYS LYS LYS GLU PRO GLU PRO ASN PHE GLN LEU LEU ASP N880 I921 V925 E926 P927 V928 A929 A930 H931 I935

• Molecule 8: 26S proteasome non-ATPase regulatory subunit 3

Chain V:

22%

99%

P18 P19 G20 E23 P27 P28 G49 D52 G53 K54 T55 A56 T71 L72 E73 D74 I75 K76 E77 H78 V79 K80 Q81 L82 E83 K84 A85 V86 S87 R99 M100 L101 P102 S103 T104 S105 R106 R107 L108 N109 H110 Y111 V112 L113 V117 F120 F121 T122 S123 N124 N125 A126

T127 R128 D129 M139 D140 L145 Q146 F147 R148 L159 Y166 L167 Q168 L169 L170 V171 V172 I173 F174 N177 R180 A184 S188 D189 D190 L191 R200 F220 L221 D222 D225 V226 Y261 S262 Q266 L270 V275 F276 Y290 Q318 V322

G340 E341 L346 Q347 F348 R349 A373 Q381 T391 L419 A420 D421 Q424 D429 S430 P431 E432 E454 K455 G456 Y457 I464 D465 I466 Y467 R470 E471 L474 L505

• Molecule 9: 26S proteasome non-ATPase regulatory subunit 12

Chain W:

16%

99%

M1 A2 D3 E7 R8 A9 D10 G11 R12 I13 V14 K15 V18 T23 Q26 K33 R39 V43 I44 E45 S49 L50 M60 V61 S64 R65 I66 L67 V68 V71 K78 L82 E85 L89 K92 R93 R94 S95 K98 Q99 T110

E114 I115 T116 D117 L118 R129 K135 D158 G175 Y199 N210 T211 K212 E216 E217 E220 K221 K225 Y251 D280 S284 G292 M315 M326 T338 D339 G342 S343 Y370 I373 R377 Q380 L381 L382 D383 L384 E388

I402 L409 R417 P418 K419 W428 L432 Q456

• Molecule 10: 26S proteasome non-ATPase regulatory subunit 11

Chain X:

20%

100%

N38 D39 E40 E41 Q44 E47 L51 E52 L53 G54 S55 L56 L57 A58 G61 Q62 A63 A64 E65 L66 L69 Y72 V73 R74 P75 F76 L77 N78 S79 I80 S81 K82 A83 K84 A85 A86 R87 L88 V89 R90 L95 F96 L97 D98 Q105 E106 L111 I114 K118

L125 E130 T140 H148 K158 K159 M160 D161 D162 K163 V169 Q170 L171 K185 A188 S192 N198 A199 I200 Y201 E221 E222 K223 D224 W225 K226 G238 S244 A269 S272 G273 K274 R314 D315 K355 D371 P392 V393 D394 Y397

K419 T422

• Molecule 11: 26S proteasome non-ATPase regulatory subunit 6

Chain Y:

5%
100%

P12 P15 R32 M42 D62 W63 Q64 I65 K93 N94 L95 S98 R125 S166 L167 E170 W174 K195 Y222 K242 R297 L343 W364 M389
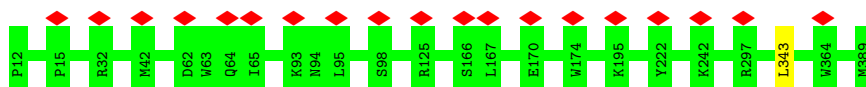
• Molecule 12: 26S proteasome non-ATPase regulatory subunit 7

Chain Z:

6%
100%

A5 V6 Q7 N24 K28 V29 Q44 R90 R114 D125 V144 A164 D181 L198 N202 L206 R209 L220 P221 V269 G290
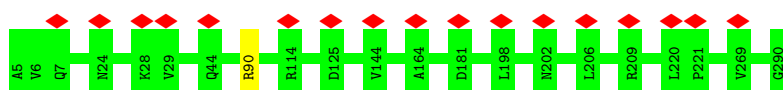
• Molecule 13: 26S proteasome non-ATPase regulatory subunit 13

Chain a:

6%
100%

D3 V4 P5 Q9 P16 G17 Q52 G53 E102 K103 V104 K105 S106 S107 I125 I166 L180 D184 D187 P220 T228 S242 V245 F248 D325 V340 Q344 Q345 T376
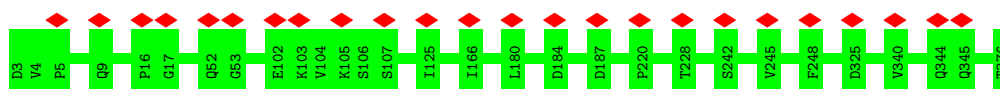
• Molecule 14: 26S proteasome non-ATPase regulatory subunit 4

Chain b:

6%
99%

M1 R25 R42 G69 Q79 E146 E147 E151 A155 K163 D164 G165 T166 P177 G191
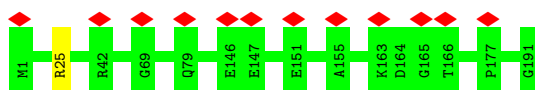
• Molecule 15: 26S proteasome non-ATPase regulatory subunit 14

Chain c:

7%
100%

A24 E52 E85 V151 H183 K186 P187 S188 I189 Q190 H194 N219 G228 Q232 D233 H237 N241 L251 Y255 E261 D279 P280 K281 R282 K310
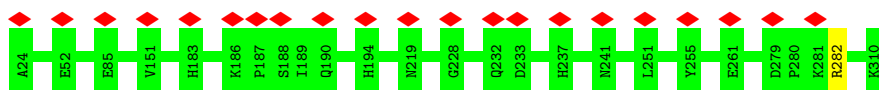
• Molecule 16: 26S proteasome non-ATPase regulatory subunit 8

Chain d:

13%
100%

• Molecule 17: 26S proteasome complex subunit SEM1

Chain e:

• Molecule 18: 26S proteasome non-ATPase regulatory subunit 10

Chain G:
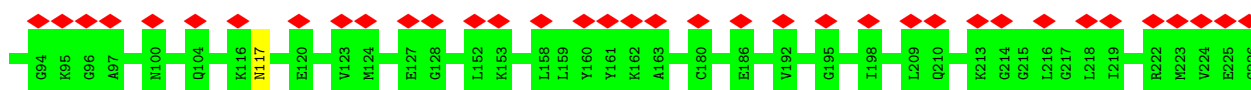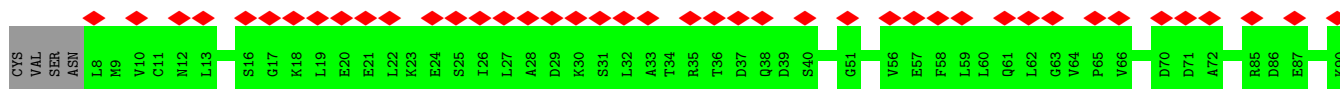
• Molecule 19: 26S proteasome non-ATPase regulatory subunit 2

Chain f:
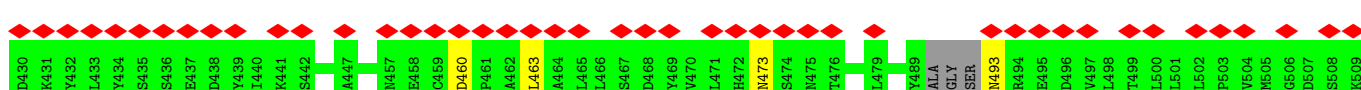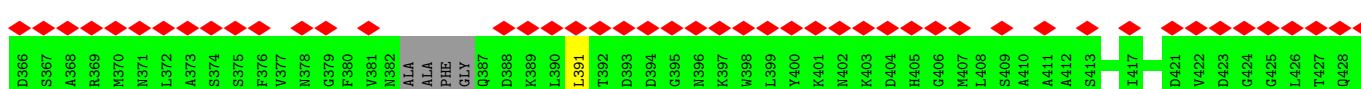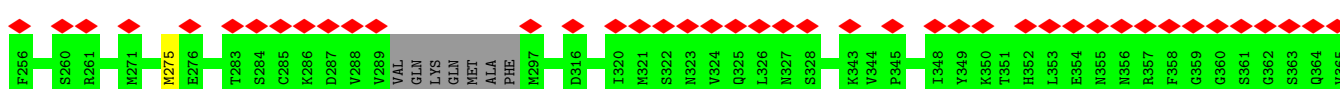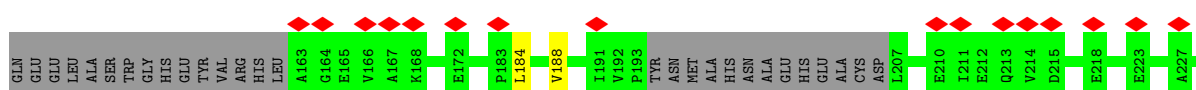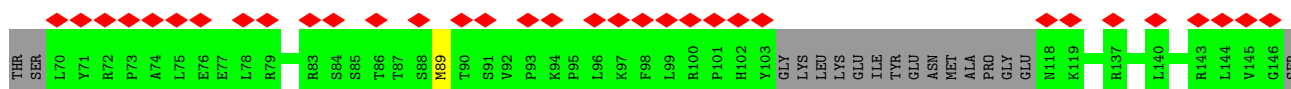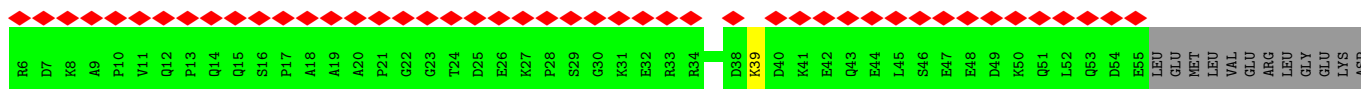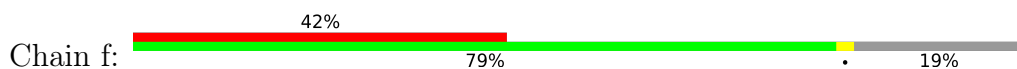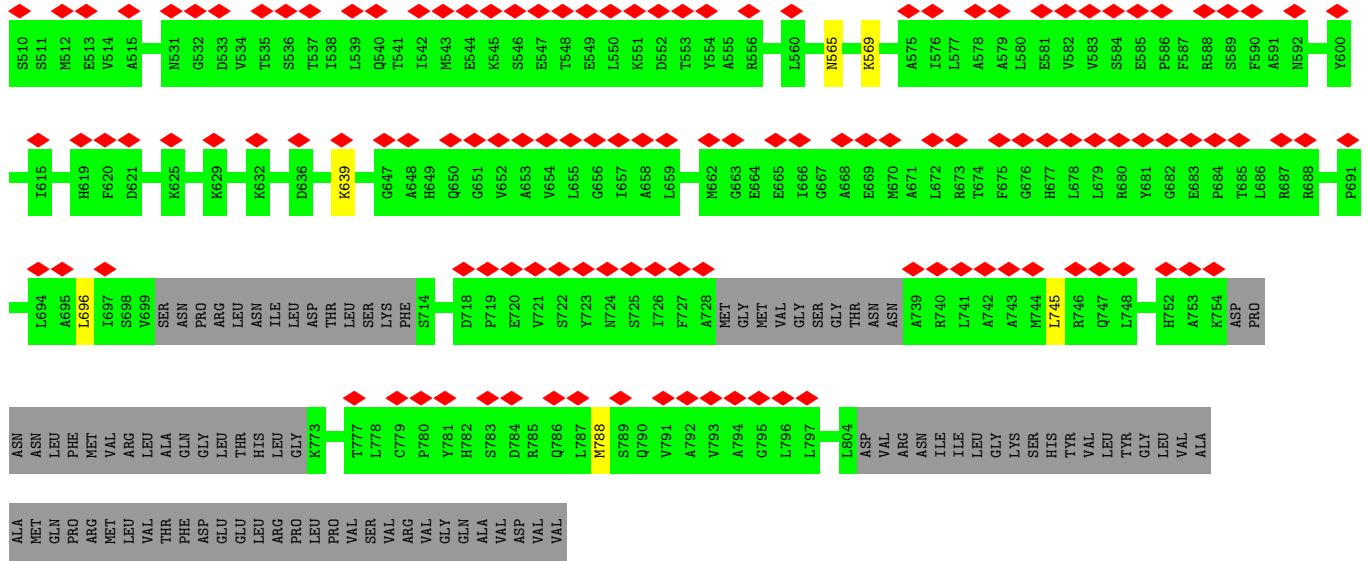
4   Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	27629	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	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	0.018	Depositor
Minimum map value	-0.007	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.004	Depositor
Map size (Å)	250.88, 250.88, 250.88	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.98, 0.98, 0.98	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: ZN

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	0.23	0/2722	0.42	0/3673
2	B	0.23	0/2614	0.42	0/3527
3	C	0.23	0/2741	0.39	0/3681
4	D	0.23	0/2795	0.42	0/3773
5	E	0.24	0/2775	0.41	0/3727
6	F	0.24	0/2843	0.42	0/3827
7	U	0.23	0/6684	0.40	0/9043
8	V	0.25	0/3997	0.43	1/5399 (0.0%)
9	W	0.23	0/3750	0.41	1/5039 (0.0%)
10	X	0.23	0/3091	0.36	0/4165
11	Y	0.23	0/3173	0.37	0/4273
12	Z	0.23	0/2324	0.39	0/3150
13	a	0.23	0/3061	0.38	0/4144
14	b	0.23	0/1478	0.40	0/2001
15	c	0.23	0/2302	0.38	0/3110
16	d	0.24	0/2162	0.38	0/2919
17	e	0.23	0/596	0.39	0/805
18	G	0.23	0/1687	0.37	0/2279
19	f	0.24	0/5377	0.42	0/7248
All	All	0.23	0/56172	0.40	2/75783 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	V	262	SER	N-CA-C	-5.61	95.85	111.00
9	W	221	LYS	C-N-CA	5.13	134.52	121.70

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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

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	335/352 (95%)	305 (91%)	30 (9%)	0	100	100
2	B	324/340 (95%)	293 (90%)	31 (10%)	0	100	100
3	C	334/385 (87%)	321 (96%)	13 (4%)	0	100	100
4	D	340/368 (92%)	316 (93%)	24 (7%)	0	100	100
5	E	341/379 (90%)	316 (93%)	25 (7%)	0	100	100
6	F	351/380 (92%)	332 (95%)	19 (5%)	0	100	100
7	U	837/935 (90%)	805 (96%)	32 (4%)	0	100	100
8	V	484/488 (99%)	429 (89%)	54 (11%)	1 (0%)	47	81
9	W	452/456 (99%)	413 (91%)	38 (8%)	1 (0%)	47	81
10	X	381/385 (99%)	374 (98%)	7 (2%)	0	100	100
11	Y	376/378 (100%)	358 (95%)	18 (5%)	0	100	100
12	Z	284/286 (99%)	268 (94%)	16 (6%)	0	100	100
13	a	372/374 (100%)	351 (94%)	21 (6%)	0	100	100
14	b	189/191 (99%)	174 (92%)	15 (8%)	0	100	100
15	c	285/287 (99%)	272 (95%)	13 (5%)	0	100	100
16	d	255/257 (99%)	237 (93%)	18 (7%)	0	100	100
17	e	68/70 (97%)	63 (93%)	5 (7%)	0	100	100
18	G	217/223 (97%)	213 (98%)	4 (2%)	0	100	100
19	f	664/848 (78%)	591 (89%)	73 (11%)	0	100	100
All	All	6889/7382 (93%)	6431 (93%)	456 (7%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Chain	Res	Type
9	W	221	LYS
8	V	190	ASP

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	293/300 (98%)	291 (99%)	2 (1%)	84	90
2	B	289/298 (97%)	288 (100%)	1 (0%)	92	94
3	C	297/333 (89%)	293 (99%)	4 (1%)	69	82
4	D	301/321 (94%)	297 (99%)	4 (1%)	69	82
5	E	300/333 (90%)	298 (99%)	2 (1%)	84	90
6	F	307/326 (94%)	304 (99%)	3 (1%)	76	86
7	U	717/798 (90%)	713 (99%)	4 (1%)	86	92
8	V	422/422 (100%)	418 (99%)	4 (1%)	78	88
9	W	416/416 (100%)	413 (99%)	3 (1%)	84	90
10	X	331/331 (100%)	331 (100%)	0	100	100
11	Y	334/334 (100%)	333 (100%)	1 (0%)	92	94
12	Z	257/257 (100%)	256 (100%)	1 (0%)	91	94
13	a	334/334 (100%)	334 (100%)	0	100	100
14	b	167/167 (100%)	166 (99%)	1 (1%)	86	92
15	c	252/252 (100%)	251 (100%)	1 (0%)	91	94
16	d	231/231 (100%)	230 (100%)	1 (0%)	91	94
17	e	63/63 (100%)	63 (100%)	0	100	100
18	G	174/178 (98%)	173 (99%)	1 (1%)	86	92
19	f	579/714 (81%)	563 (97%)	16 (3%)	43	65
All	All	6064/6408 (95%)	6015 (99%)	49 (1%)	82	89

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	108	ASP
1	A	231	ASN
2	B	143	LEU
3	C	248	MET
3	C	293	MET
3	C	311	ILE
3	C	391	MET
4	D	116	LEU
4	D	230	VAL
4	D	353	ASN
4	D	370	ILE
5	E	216	ARG
5	E	262	ASN
6	F	85	THR
6	F	180	ARG
6	F	323	ASN
7	U	252	LEU
7	U	397	THR
7	U	427	LEU
7	U	616	ARG
8	V	27	PRO
8	V	188	SER
8	V	200	ARG
8	V	262	SER
9	W	33	LYS
9	W	116	THR
9	W	211	THR
11	Y	343	LEU
12	Z	90	ARG
14	b	25	ARG
15	c	282	ARG
16	d	190	LEU
18	G	117	ASN
19	f	39	LYS
19	f	89	MET
19	f	184	LEU
19	f	188	VAL
19	f	275	MET
19	f	391	LEU
19	f	460	ASP
19	f	463	LEU
19	f	473	ASN
19	f	493	ASN

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Mol	Chain	Res	Type
19	f	565	ASN
19	f	569	LYS
19	f	639	LYS
19	f	696	LEU
19	f	745	LEU
19	f	788	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (63) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	165	GLN
2	B	131	HIS
2	B	193	GLN
2	B	241	ASN
2	B	315	GLN
2	B	332	ASN
3	C	22	GLN
3	C	288	ASN
4	D	65	GLN
4	D	133	HIS
4	D	175	GLN
4	D	286	GLN
4	D	353	ASN
4	D	390	ASN
5	E	45	ASN
5	E	124	HIS
5	E	262	ASN
5	E	316	HIS
6	F	323	ASN
6	F	428	GLN
7	U	247	GLN
7	U	259	GLN
7	U	340	GLN
7	U	415	HIS
7	U	453	HIS
7	U	754	HIS
7	U	801	GLN
8	V	257	ASN
8	V	260	HIS
8	V	279	GLN
8	V	282	ASN
8	V	477	HIS

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Mol	Chain	Res	Type
9	W	86	ASN
9	W	218	ASN
9	W	236	HIS
10	X	349	HIS
10	X	406	ASN
12	Z	189	GLN
12	Z	194	GLN
12	Z	231	GLN
12	Z	282	ASN
13	a	35	HIS
13	a	152	HIS
13	a	241	ASN
13	a	264	ASN
14	b	29	GLN
14	b	34	ASN
14	b	76	HIS
14	b	99	HIS
14	b	149	ASN
15	c	183	HIS
15	c	241	ASN
15	c	254	ASN
16	d	141	GLN
18	G	100	ASN
18	G	117	ASN
19	f	180	GLN
19	f	301	HIS
19	f	327	ASN
19	f	405	HIS
19	f	475	ASN
19	f	493	ASN
19	f	540	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 ⓘ

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 ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
8	V	1
9	W	1
10	X	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	V	237:THR	C	238:ALA	N	3.86
1	W	205:ILE	C	206:SER	N	3.19
1	X	311:ALA	C	312:GLU	N	3.16

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-8675. 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
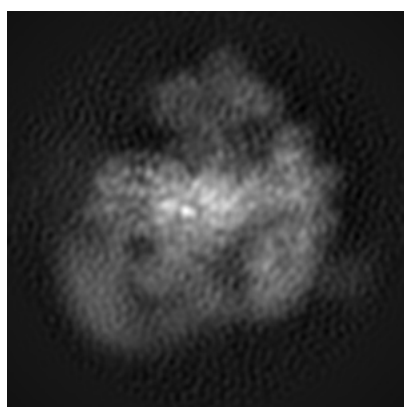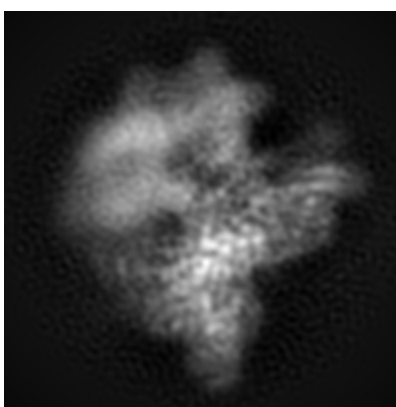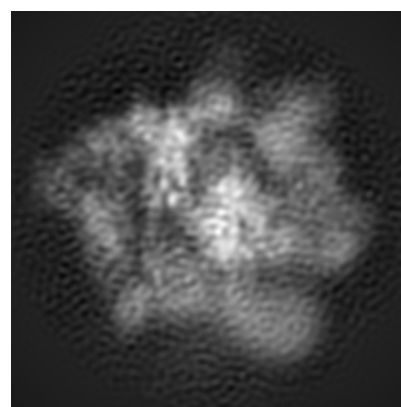
The images above show the map projected in three orthogonal directions.

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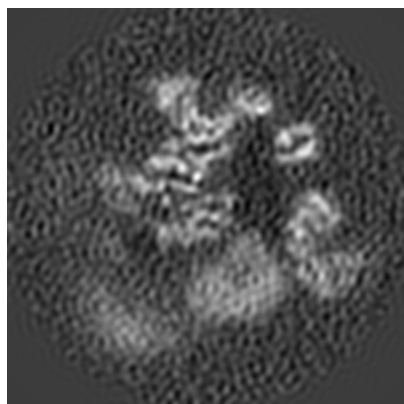
6.2.1 Primary map
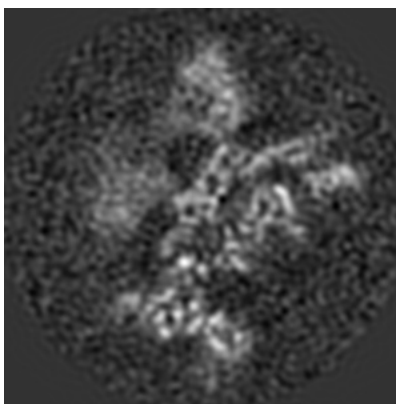
X Index: 128　　　　　　Y Index: 128　　　　　　Z Index: 128
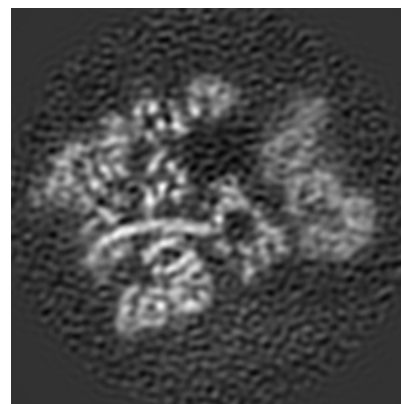
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
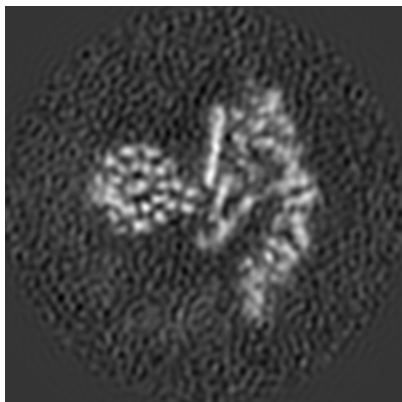
6.3.1 Primary map
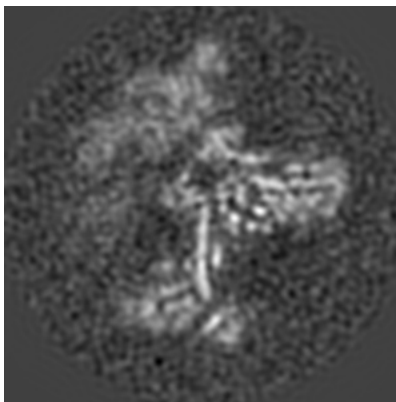
| X Index: 103 | Y Index: 115 | Z Index: 140 |
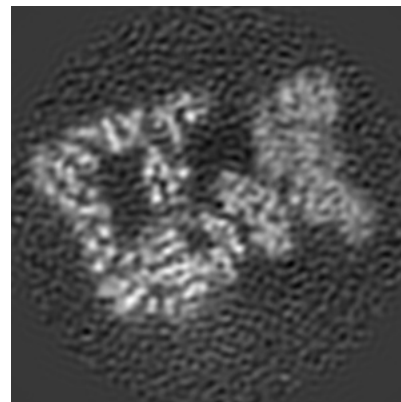
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map

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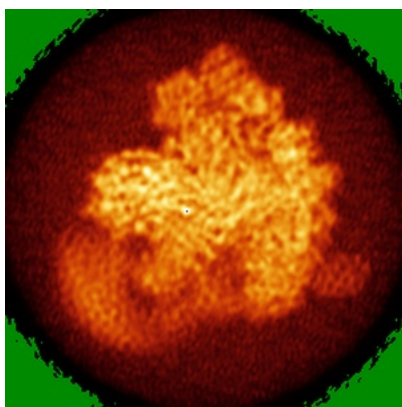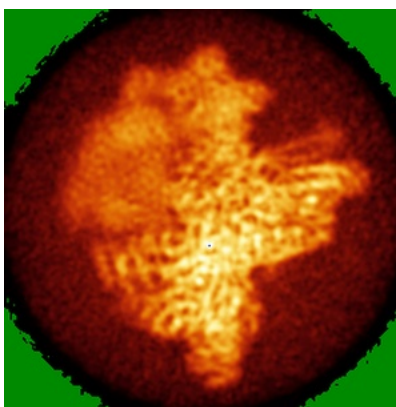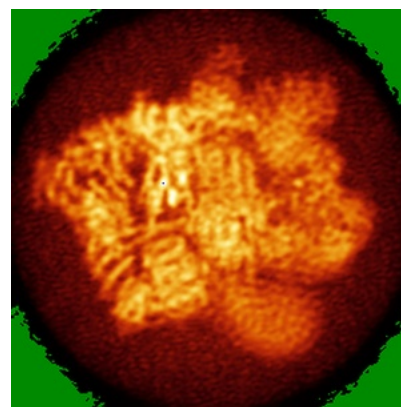
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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 0.004. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

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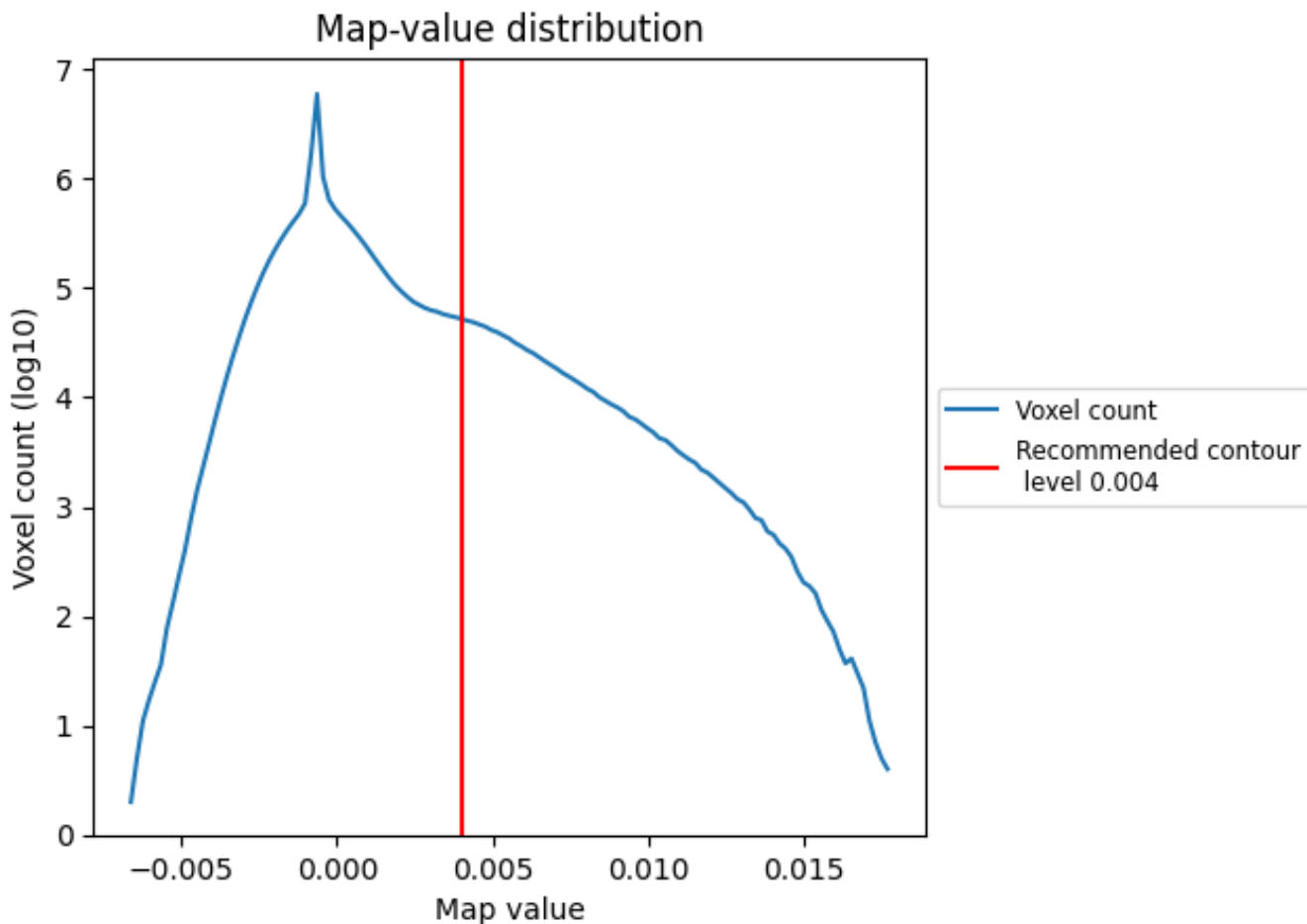
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
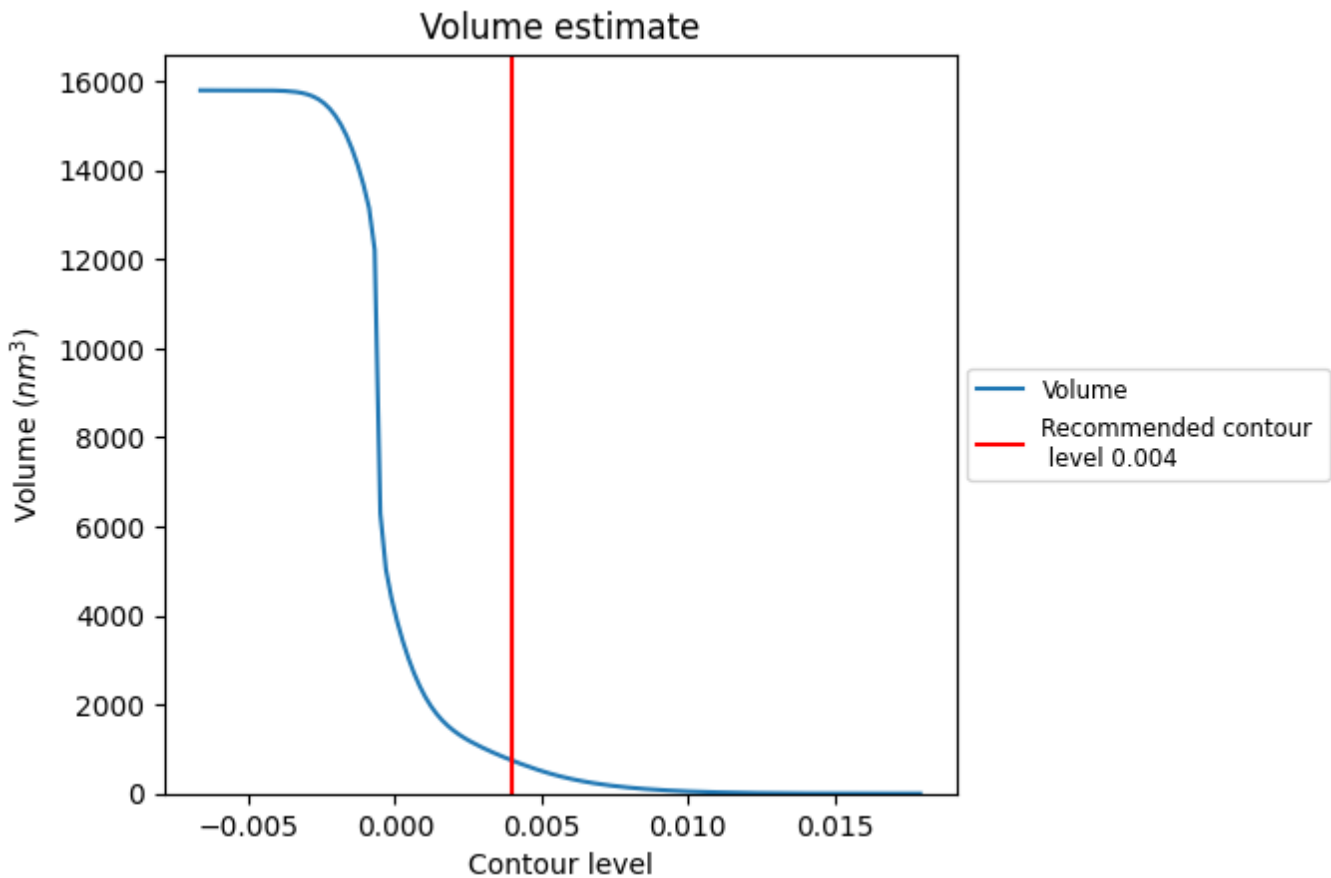
The volume at the recommended contour level is 742 nm^3; this corresponds to an approximate mass of 670 kDa.

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 ⓘ
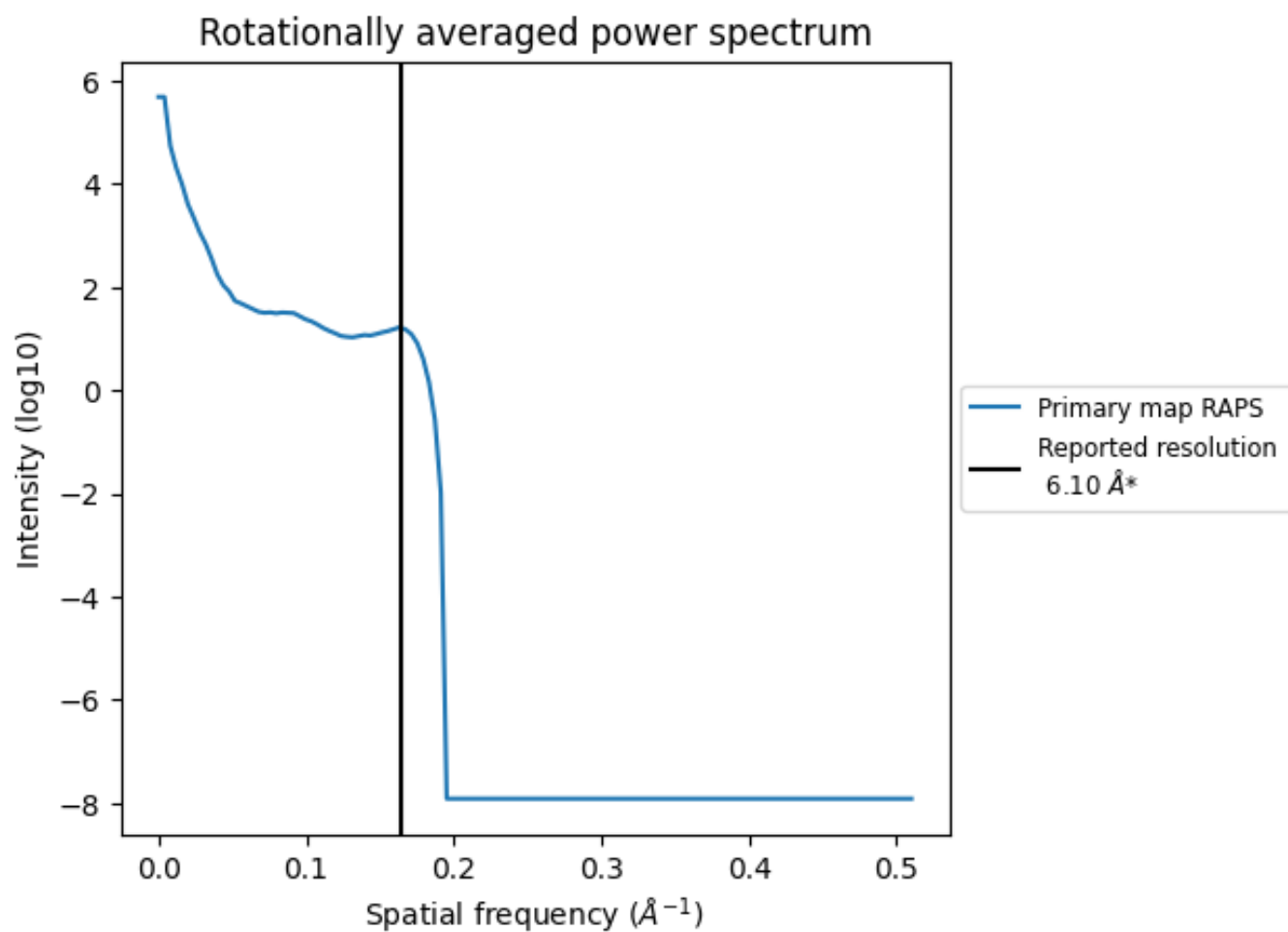
*Reported resolution corresponds to spatial frequency of 0.164 Å^{-1}

8 Fourier-Shell correlation (i)

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

9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-8675 and PDB model 5VHH. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay (i)

| X | Y | Z |
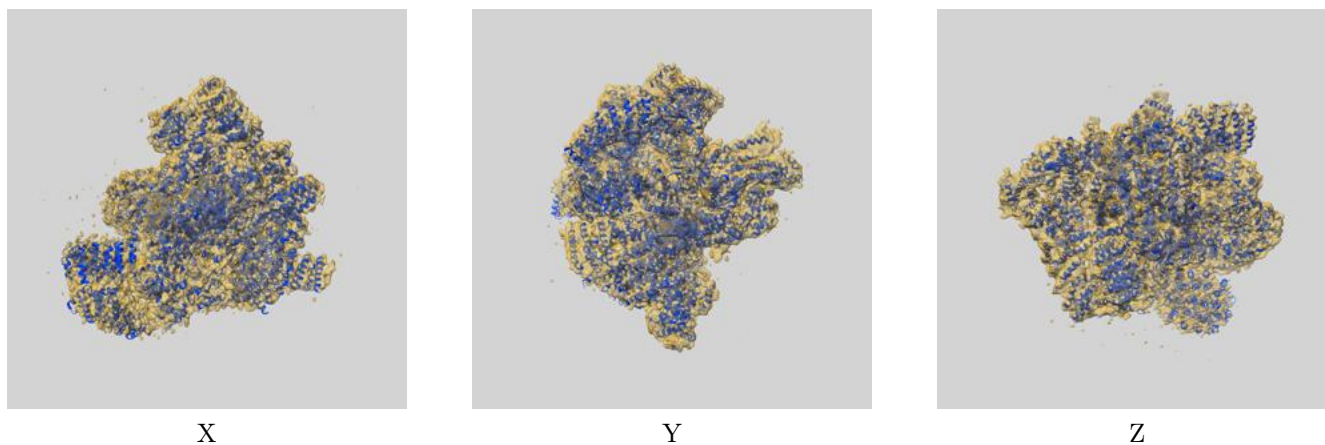
The images above show the 3D surface view of the map at the recommended contour level 0.004 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ

X　　　　　　　　　　Y　　　　　　　　　　Z
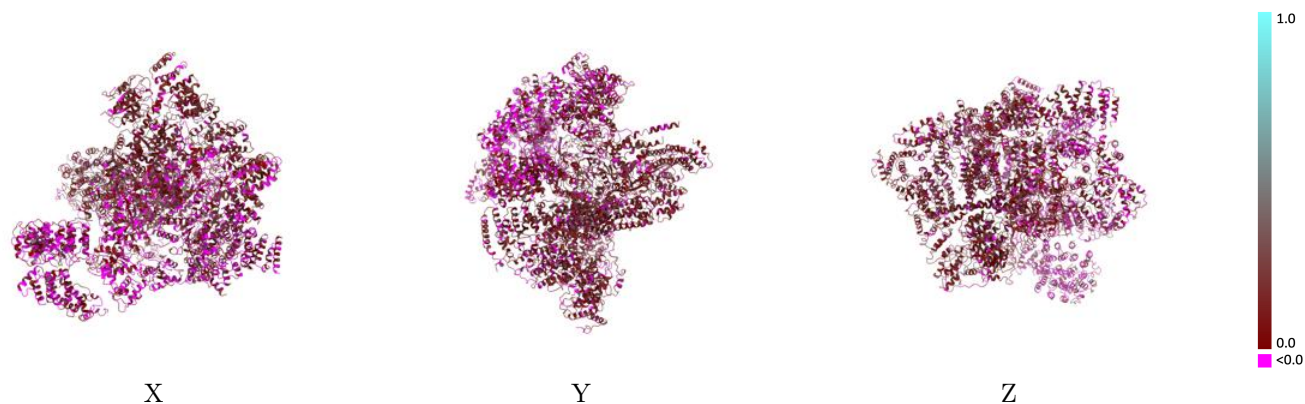
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
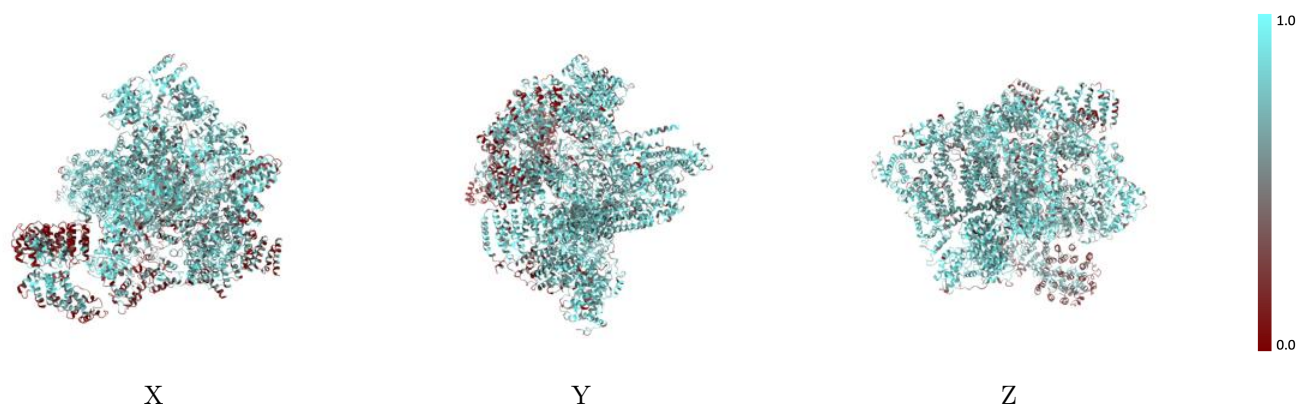
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.004).

9.4　Atom inclusion　ⓘ
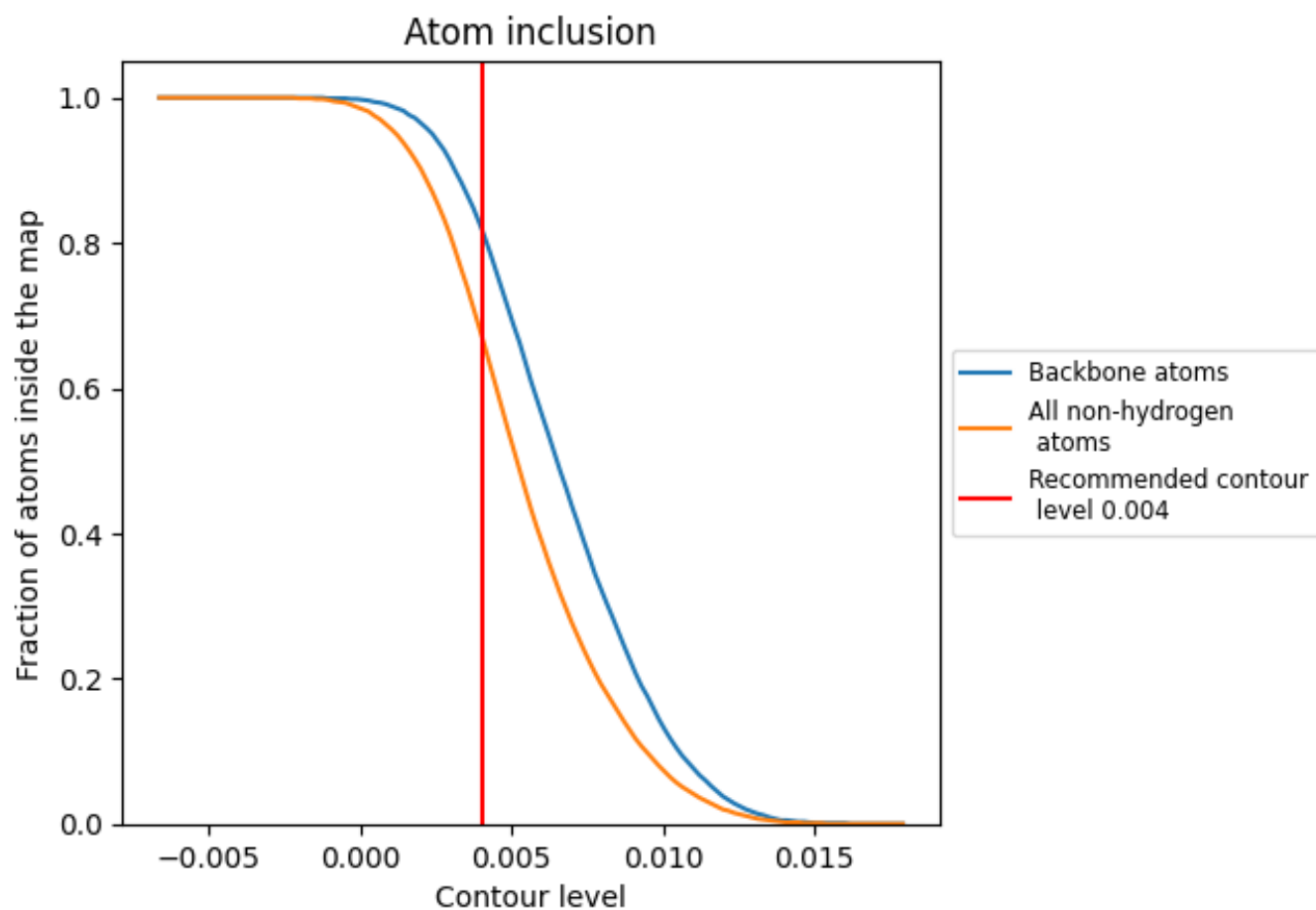
At the recommended contour level, 82% of all backbone atoms, 67% of all non-hydrogen atoms, are inside the map.

9.5　Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.004) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6730	0.1030
A	0.7170	0.0800
B	0.5780	0.0510
C	0.5870	0.0660
D	0.6410	0.0920
E	0.6950	0.0880
F	0.7500	0.1070
G	0.5510	0.0390
U	0.8050	0.1580
V	0.6510	0.1060
W	0.6990	0.1120
X	0.6430	0.1140
Y	0.7680	0.1310
Z	0.7260	0.1460
a	0.7520	0.1380
b	0.7820	0.1490
c	0.7170	0.1450
d	0.7110	0.1270
e	0.4990	0.0720
f	0.4260	0.0190

1.0

0.0
<0.0