WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Feb 26, 2024 – 03:47 AM EST

PDB ID	:	6WD3
EMDB ID	:	EMD-21622
Title	:	Cryo-EM of elongating ribosome with EF-Tu*GTP elucidates tRNA proof-reading (Cognate Structure II-B1)
Authors	:	Loveland, A.B.; Demo, G.; Korostelev, A.A.
Deposited on	:	2020-03-31
Resolution	:	3.60 Å(reported)

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

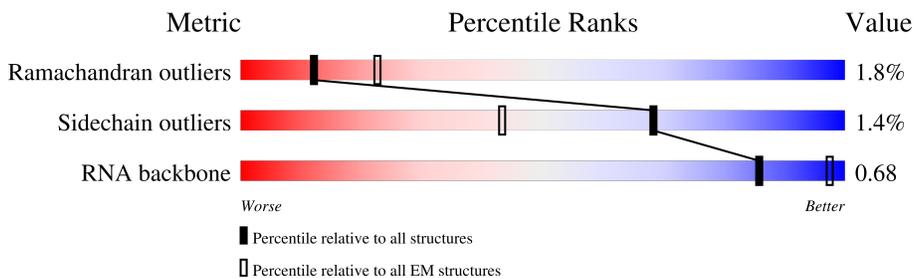|		
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.60 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		1.8%
Sidechain outliers		1.4%
RNA backbone		0.68

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
RNA backbone	4643	859

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	b	271	97% •
2	c	209	98% •
3	d	201	98% •
4	e	177	98% •
5	f	176	• 98% •
6	g	149	10% 97% •
7	h	131	11% 95% 5% •
8	i	141	7% 96% •

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Mol	Chain	Length	Quality of chain
9	j	142	98%
10	k	122	96%
11	l	143	97%
12	m	136	99%
13	n	120	100%
14	o	116	97%
15	p	114	100%
16	q	117	100%
17	r	103	96%
18	s	110	96%
19	t	93	99%
20	u	102	98%
21	v	94	96%
22	w	75	99%
23	x	77	99%
24	y	63	97%
25	z	58	98%
26	B	56	100%
27	C	50	6% 98%
28	D	46	98%
29	E	64	97%
30	F	38	97%
31	G	225	97%
32	H	206	99%
33	I	205	99%

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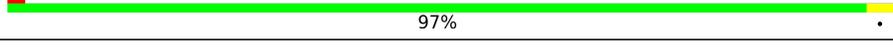| Mol	Chain	Length	Quality of chain
34	J	157	96%
35	K	100	96%
36	L	151	99%
37	M	129	98%
38	N	127	94% 6%
39	O	98	5% 90% 10%
40	P	116	96%
41	Q	123	93% 7%
42	R	114	95% 5%
43	S	100	99%
44	T	88	99%
45	U	82	98%
46	V	80	90% 10%
47	W	65	97%
48	X	79	97%
49	Y	85	98%
50	Z	65	89% 11%
51	a	223	7% 60% 40%
52	3	1539	91% 9%
53	1	2903	88% 12%
54	2	120	92% 8%
55	5	77	91% 9%
55	6	77	91% 9%
56	4	18	6% 83% 17%
57	7	76	82% 18%
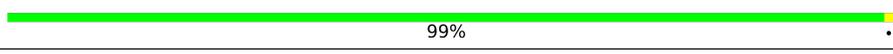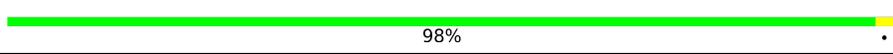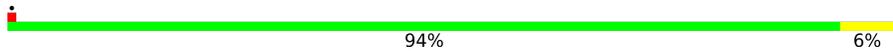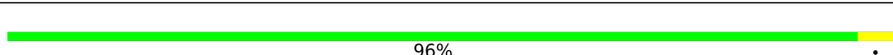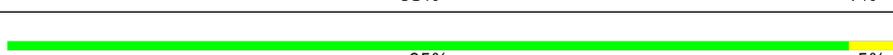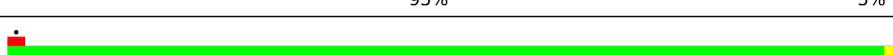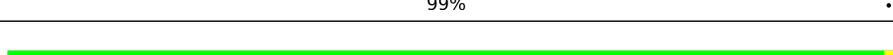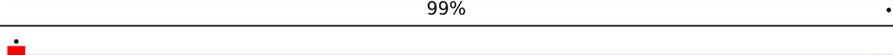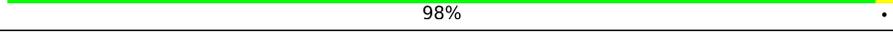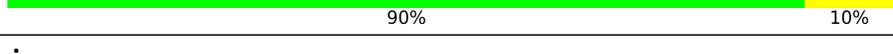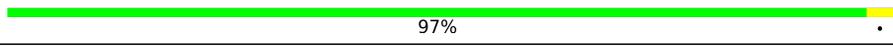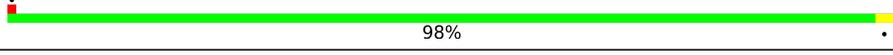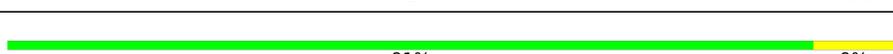
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Mol	Chain	Length	Quality of chain
58	8	400	94%
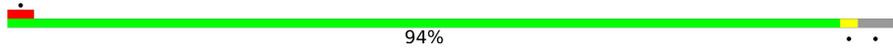
2   Entity composition ⓘ

There are 61 unique types of molecules in this entry. The entry contains 153211 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 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	b	271	Total 2083	C 1288	N 423	O 365	S 7	0	0

- Molecule 2 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	c	209	Total 1565	C 979	N 288	O 294	S 4	0	0

- Molecule 3 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	d	201	Total 1552	C 974	N 283	O 290	S 5	0	0

- Molecule 4 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	e	177	Total 1411	C 899	N 249	O 257	S 6	0	0

- Molecule 5 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	f	176	Total 1323	C 832	N 243	O 246	S 2	0	0

- Molecule 6 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	g	149	Total 1111	C 699	N 197	O 214	S 1	0	0

- Molecule 7 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	h	131	Total	C	N	O	S	0	0
			989	625	175	184	5		

- Molecule 8 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	i	141	Total	C	N	O	S	0	0
			1032	651	179	196	6		

- Molecule 9 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	j	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

- Molecule 10 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	k	122	Total	C	N	O	S	0	0
			939	587	180	166	6		

- Molecule 11 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	l	143	Total	C	N	O	S	0	0
			1045	649	206	189	1		

- Molecule 12 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	m	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 13 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	n	120	Total	C	N	O	S	0	0
			961	593	196	167	5		

- Molecule 14 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	o	116	Total 892	C 552	N 178	O 162	0	0

- Molecule 15 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	p	114	Total 917	C 574	N 179	O 163	S 1	0	0

- Molecule 16 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	q	117	Total 947	C 604	N 192	O 151	0	0

- Molecule 17 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	r	103	Total 816	C 516	N 153	O 145	S 2	0	0

- Molecule 18 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	s	110	Total 857	C 532	N 166	O 156	S 3	0	0

- Molecule 19 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	t	93	Total 739	C 466	N 139	O 132	S 2	0	0

- Molecule 20 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	u	102	Total 780	C 492	N 146	O 142	0	0

- Molecule 21 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	v	94	Total 753	C 479	N 137	O 134	S 3	0	0

- Molecule 22 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	w	75	Total 575	C 356	N 116	O 102	S 1	0	0

- Molecule 23 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	x	77	Total 625	C 388	N 129	O 106	S 2	0	0

- Molecule 24 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	y	63	Total 509	C 313	N 99	O 95	S 2	0	0

- Molecule 25 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	z	58	Total 449	C 281	N 87	O 79	S 2	0	0

- Molecule 26 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	B	56	Total 444	C 269	N 94	O 80	S 1	0	0

- Molecule 27 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	C	50	Total 410	C 263	N 75	O 72	0	0

- Molecule 28 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	D	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 29 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	E	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 30 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	F	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 31 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	G	225	Total	C	N	O	S	0	0
			1757	1111	315	323	8		

- Molecule 32 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	H	206	Total	C	N	O	S	0	0
			1625	1028	305	289	3		

- Molecule 33 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	I	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 34 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	J	157	Total	C	N	O	S	0	0
			1157	719	218	214	6		

- Molecule 35 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	K	100	Total 818	C 515	N 148	O 149	S 6	0	0

- Molecule 36 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	L	151	Total 1182	C 735	N 227	O 216	S 4	0	0

- Molecule 37 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	M	129	Total 979	C 616	N 173	O 184	S 6	0	0

- Molecule 38 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	N	127	Total 1022	C 634	N 206	O 179	S 3	0	0

- Molecule 39 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	O	98	Total 787	C 493	N 150	O 143	S 1	0	0

- Molecule 40 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	P	116	Total 870	C 535	N 173	O 159	S 3	0	0

- Molecule 41 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	Q	123	Total 955	C 590	N 196	O 165	S 4	0	0

- Molecule 42 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	R	114	Total 884	C 546	N 178	O 157	S 3	0	0

- Molecule 43 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	S	100	Total 805	C 499	N 164	O 139	S 3	0	0

- Molecule 44 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	T	88	Total 714	C 439	N 144	O 130	S 1	0	0

- Molecule 45 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	U	82	Total 649	C 406	N 128	O 114	S 1	0	0

- Molecule 46 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	V	80	Total 649	C 411	N 121	O 114	S 3	0	0

- Molecule 47 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	W	65	Total 536	C 339	N 100	O 96	S 1	0	0

- Molecule 48 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	X	79	Total 638	C 408	N 120	O 108	S 2	0	0

- Molecule 49 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	Y	85	Total 665	C 411	N 137	O 114	S 3	0	0

- Molecule 50 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	Z	65	Total 545	C 335	N 117	O 92	S 1	0	0

- Molecule 51 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	a	134	Total 1027	C 645	N 186	O 194	S 2	0	0

- Molecule 52 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	3	1539	Total 33012	C 14725	N 6052	O 10697	P 1538	0	0

- Molecule 53 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	1	2903	Total 62317	C 27801	N 11468	O 20146	P 2902	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	747	C	U	variant	GB 1036415628

- Molecule 54 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	2	120	Total 2568	C 1145	N 471	O 833	P 119	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
2	120	A	-	insertion	GB 1370526515

- Molecule 55 is a RNA chain called tRNAfMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	5	77	Total	C	N	O	P	0	0
			1640	732	297	535	76		
55	6	77	Total	C	N	O	P	0	0
			1640	732	297	535	76		

- Molecule 56 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	4	18	Total	C	N	O	P	0	0
			388	175	76	120	17		

- Molecule 57 is a RNA chain called tRNAPhe.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	7	76	Total	C	N	O	P	0	0
			1619	723	290	531	75		

- Molecule 58 is a protein called Elongation factor Tu.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	8	383	Total	C	N	O	S	0	0
			2961	1876	507	565	13		

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
8	395	SER	-	expression tag	UNP E2QFJ4
8	396	HIS	-	expression tag	UNP E2QFJ4
8	397	HIS	-	expression tag	UNP E2QFJ4
8	398	HIS	-	expression tag	UNP E2QFJ4
8	399	HIS	-	expression tag	UNP E2QFJ4
8	400	HIS	-	expression tag	UNP E2QFJ4
8	401	HIS	-	expression tag	UNP E2QFJ4

- Molecule 59 is N-FORMYLMETHIONINE (three-letter code: FME) (formula: $C_6H_{11}NO_3S$).

FME
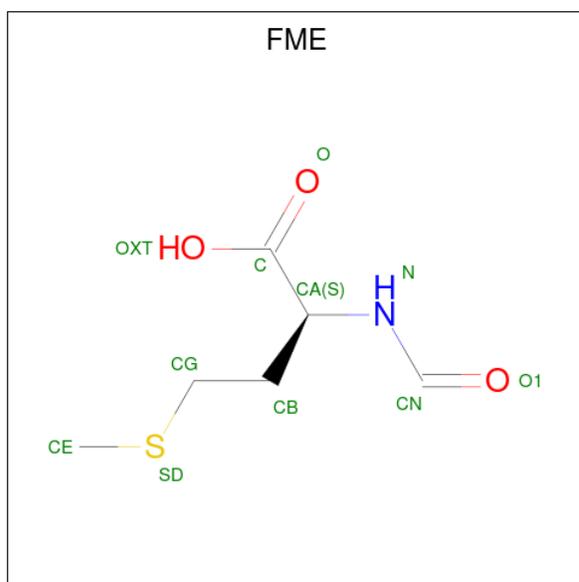
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	S	
59	5	1	10	6	1	2	1	0

- Molecule 60 is PHENYLALANINE (three-letter code: PHE) (formula: $C_9H_{11}NO_2$).

PHE
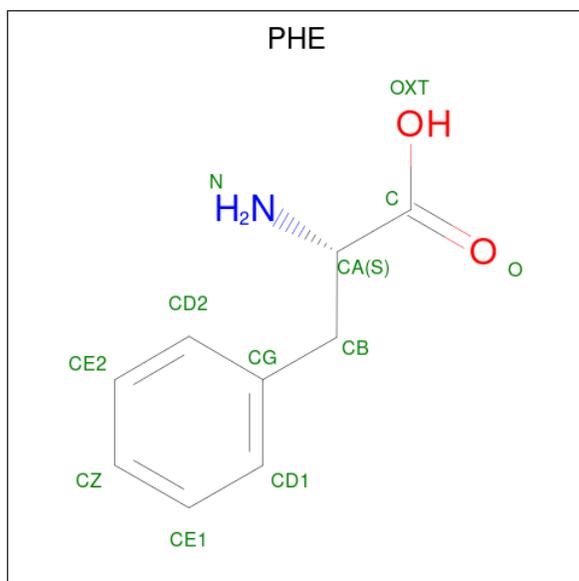
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
60	7	1	11	9	1	1	0

- Molecule 61 is GUANOSINE-5'-DIPHOSPHATE (three-letter code: GDP) (formula: $C_{10}H_{15}N_5O_{11}P_2$).

GDP

Mol	Chain	Residues	Atoms					AltConf
61	8	1	Total	C	N	O	P	0
			28	10	5	11	2	

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: 50S ribosomal protein L2

Chain b:
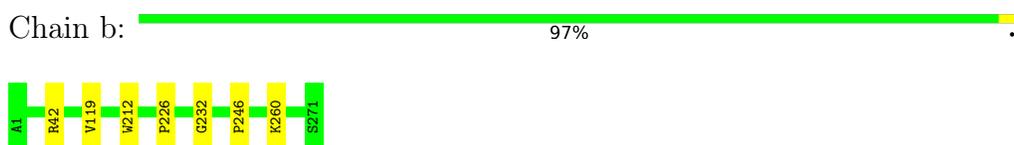
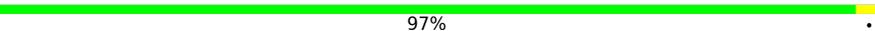- Molecule 2: 50S ribosomal protein L3

Chain c:
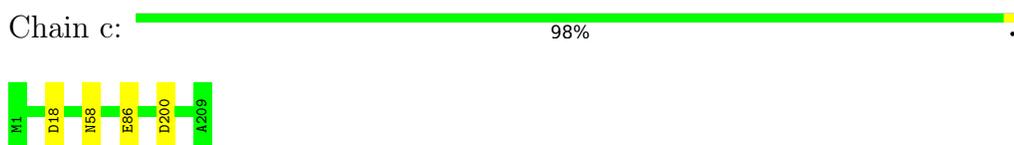
- Molecule 3: 50S ribosomal protein L4

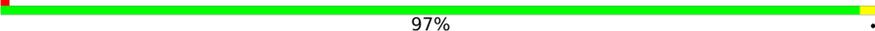Chain d:
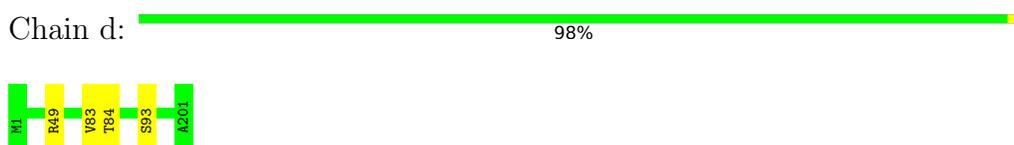
- Molecule 4: 50S ribosomal protein L5

Chain e:
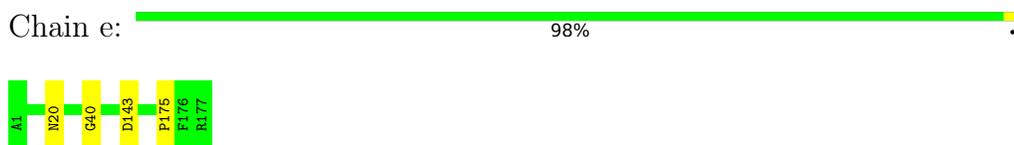
- Molecule 5: 50S ribosomal protein L6

Chain f:
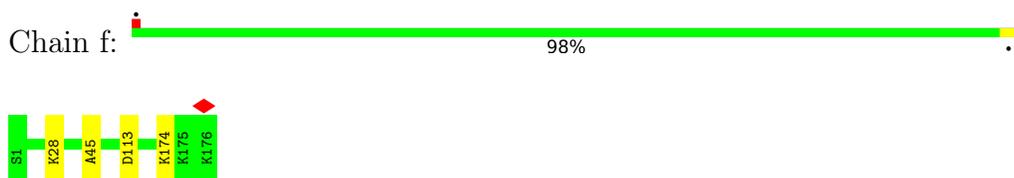
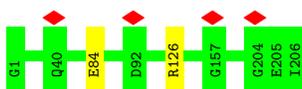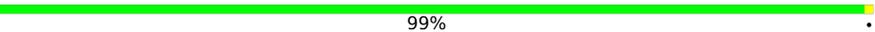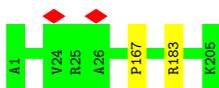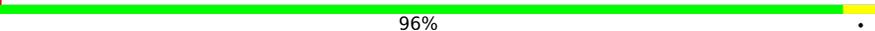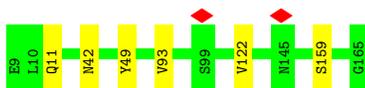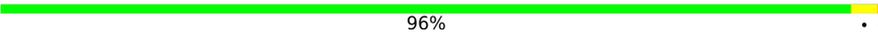- Molecule 6: 50S ribosomal protein L9

10%

Chain g:
97%

M1 V9 A10 N11 L15 F29 K41 N66 A67 R68 A74 L75 E76 T77 S82 G85 G88 G92 D98 D101 S113 E114 F139 E149

- Molecule 7: 50S ribosomal protein L10

11%

Chain h:
95%　5%

M1 A2 A48 G49 V50 Y51 F76 L81 I82 R94 A104 K105 F106 E107 V108 A111 A112 F113 I118 R125 T128 T131

- Molecule 8: 50S ribosomal protein L11

7%

Chain i:
96%

A1 K2 K3 V4 Q11 V12 A13 M16 P21 P22 G31 I34 D46 S47 I48 D63 P92 D141

- Molecule 9: 50S ribosomal protein L13

Chain j:
98%

M1 R13 H76 G82 I142

- Molecule 10: 50S ribosomal protein L14

Chain k:
96%

M1 V35 L86 R105 E110 E121 V122

- Molecule 11: 50S ribosomal protein L15

Chain l:
97%

R2 K29 G52 G53 Q54 G65 T94 E144

- Molecule 12: 50S ribosomal protein L16

Chain m:
99%

M1 R59 P69 M136
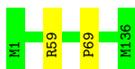
- Molecule 13: 50S ribosomal protein L17

Chain n:

There are no outlier residues recorded for this chain.

- Molecule 14: 50S ribosomal protein L18

Chain o:
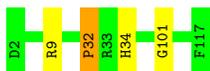
- Molecule 15: 50S ribosomal protein L19

Chain p:

There are no outlier residues recorded for this chain.

- Molecule 16: 50S ribosomal protein L20

Chain q:

There are no outlier residues recorded for this chain.

- Molecule 17: 50S ribosomal protein L21

Chain r:

- Molecule 18: 50S ribosomal protein L22

Chain s:
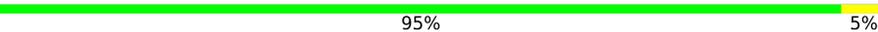
- Molecule 19: 50S ribosomal protein L23

Chain t:

- Molecule 20: 50S ribosomal protein L24

Chain u:

• Molecule 21: 50S ribosomal protein L25

Chain v:

• Molecule 22: 50S ribosomal protein L27

Chain w:
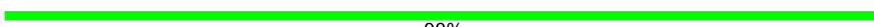
• Molecule 23: 50S ribosomal protein L28

Chain x:
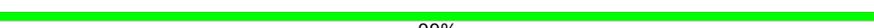
• Molecule 24: 50S ribosomal protein L29

Chain y:
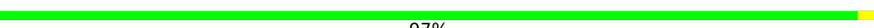
• Molecule 25: 50S ribosomal protein L30

Chain z:
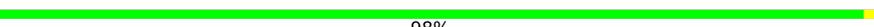
• Molecule 26: 50S ribosomal protein L32

Chain B:

There are no outlier residues recorded for this chain.

• Molecule 27: 50S ribosomal protein L33

Chain C:
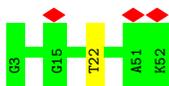
• Molecule 28: 50S ribosomal protein L34

Chain D:
98%

M1 K25 K46
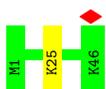
• Molecule 29: 50S ribosomal protein L35

Chain E:
97%

P1 V6 I31 A64

• Molecule 30: 50S ribosomal protein L36

Chain F:
97%

M1 Q37 G38

• Molecule 31: 30S ribosomal protein S2

Chain G:
97%

A1 M5 W22 R94 E132 M135 G148 G154 S225

• Molecule 32: 30S ribosomal protein S3

Chain H:
99%

G1 Q40 E84 D92 R126 G157 G204 E205 I206

• Molecule 33: 30S ribosomal protein S4

Chain I:
99%

A1 V24 R25 A26 P167 R183 K205

• Molecule 34: 30S ribosomal protein S5

Chain J:
96%

E9 L10 Q11 N42 Y49 V93 S99 V122 N145 S159 G165

• Molecule 35: 30S ribosomal protein S6

Chain K: 96%

M1 E40 K56 T92 K93 H94 S100

• Molecule 36: 30S ribosomal protein S7

Chain L: 99%

P1 I6 E57 A151

• Molecule 37: 30S ribosomal protein S8

Chain M: 98%

S1 D47 L60 K68 A129

• Molecule 38: 30S ribosomal protein S9

Chain N: 94% 6%

N3 Y37 T42 V57 I71 D90 L93 A107 Q125 K128 R129

• Molecule 39: 30S ribosomal protein S10

Chain O: 5% 90% 10%

R5 D14 K30 G33 A34 Q35 P41 L42 H56 V57 N58 V77 D85 M88 R89 A93 L102

• Molecule 40: 30S ribosomal protein S11

Chain P: 96%

R12 K13 Q14 P88 G89 P90 K124 R127
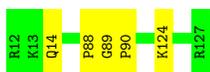
• Molecule 41: 30S ribosomal protein S12

Chain Q: 93% 7%

A1 T2 R8 E24 R35 K43 E75 V86 K87 A123

• Molecule 42: 30S ribosomal protein S13

Chain R:

• Molecule 43: 30S ribosomal protein S14

Chain S:
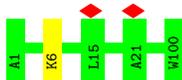
• Molecule 44: 30S ribosomal protein S15

Chain T:

• Molecule 45: 30S ribosomal protein S16

Chain U:
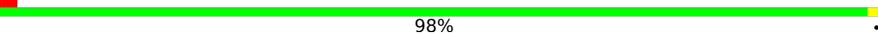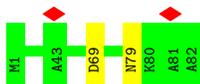
• Molecule 46: 30S ribosomal protein S17

Chain V:
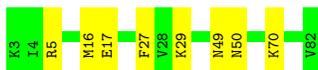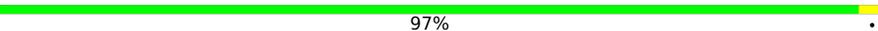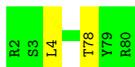
• Molecule 47: 30S ribosomal protein S18

Chain W:
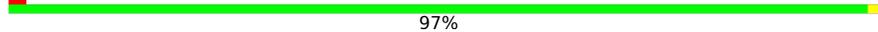
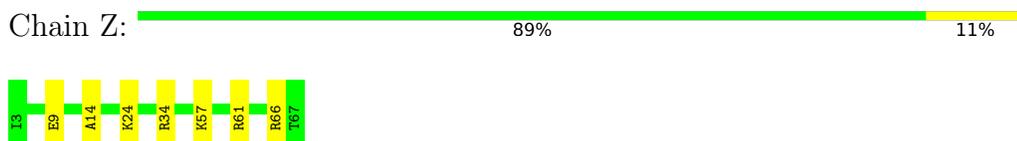• Molecule 48: 30S ribosomal protein S19

Chain X:

• Molecule 49: 30S ribosomal protein S20
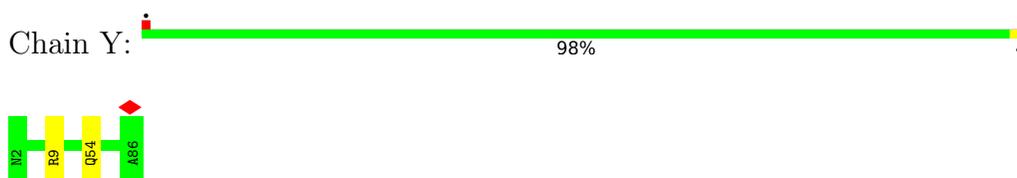
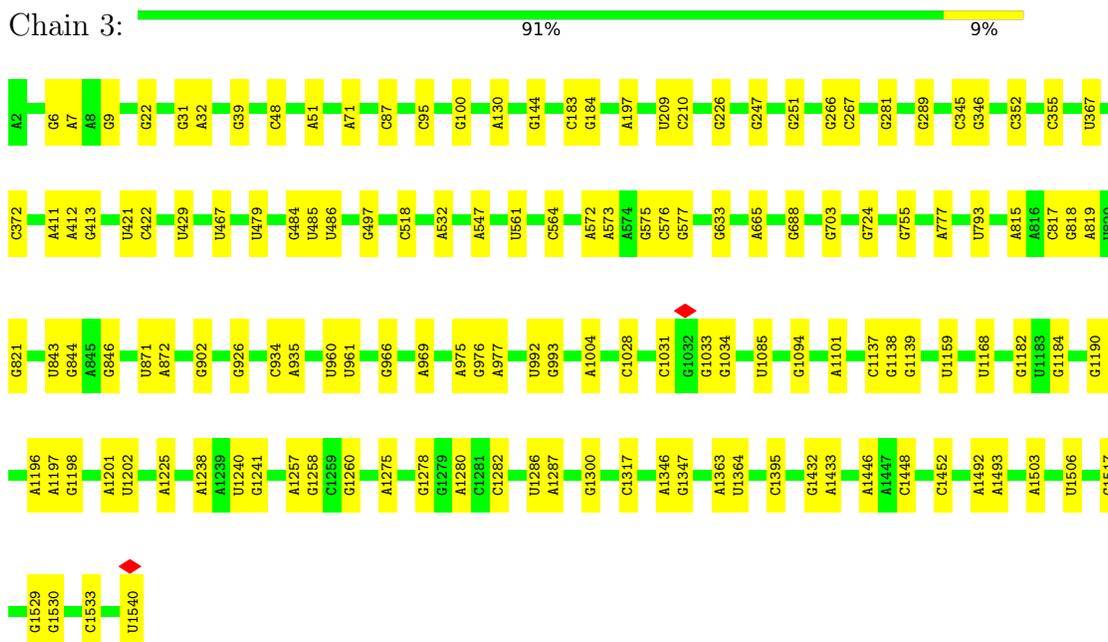Chain Y:

• Molecule 50: 30S ribosomal protein S21
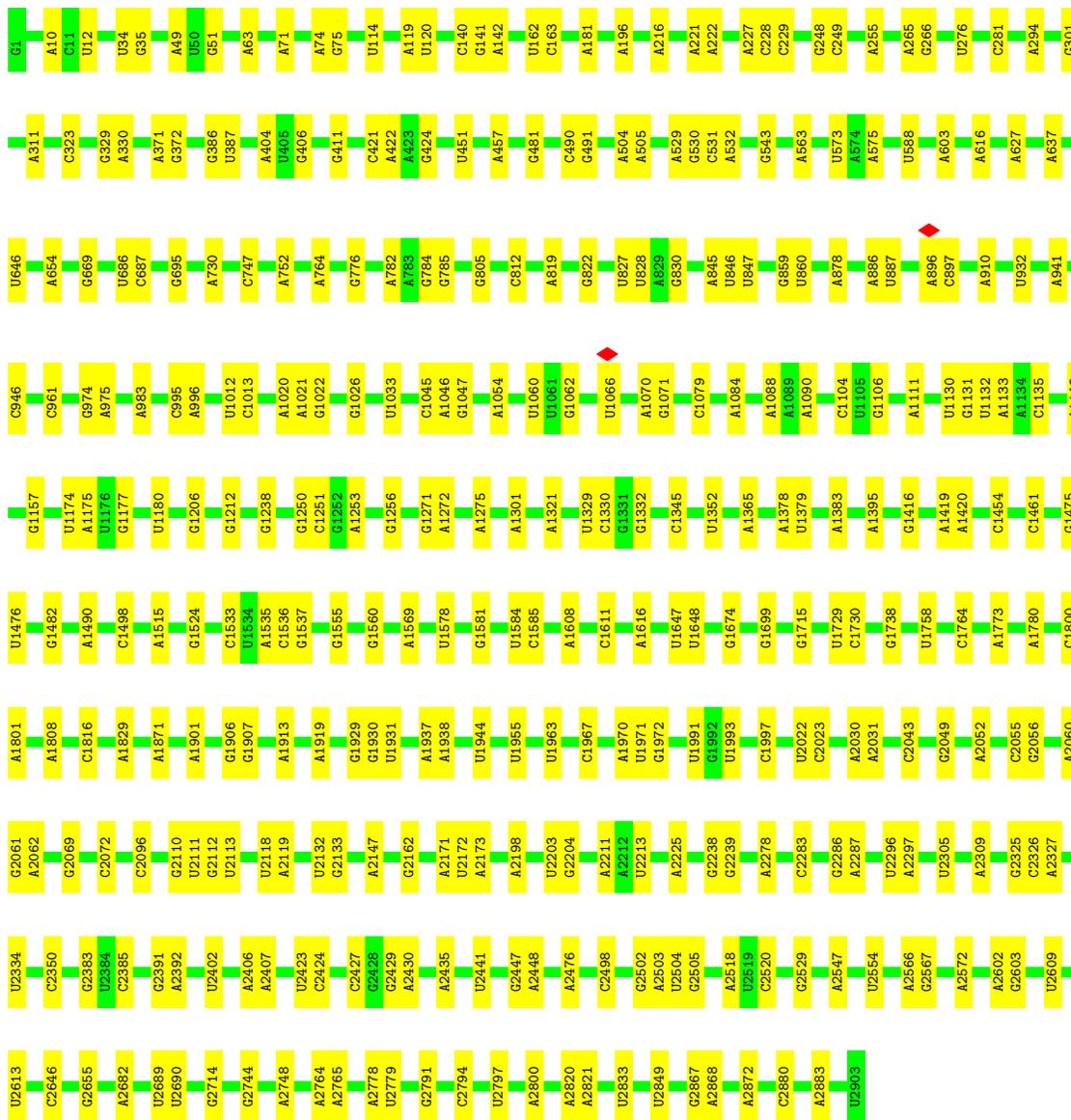
Chain Z:

• Molecule 51: 50S ribosomal protein L1

Chain a:

• Molecule 52: 16S ribosomal RNA

Chain 3:

• Molecule 53: 23S ribosomal RNA

Chain 1:

• Molecule 54: 5S ribosomal RNA

Chain 2:

• Molecule 55: tRNAfMet

Chain 5:

• Molecule 55: tRNAfMet

Chain 6:

91%   9%

C1 G6 C16 C17 U17A G18 G19 U20 U47 C48 A76
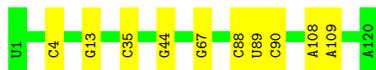
• Molecule 56: mRNA

Chain 4:

6%

83%   17%

A5 A12 A13 A16 A22

• Molecule 57: tRNAPhe

Chain 7:

82%   18%

G1 U8 A9 G10 G18 A21 A26 G44 U45 G46 U47 C48 U55 U59 U60 C61 C62 G63 A76

• Molecule 58: Elongation factor Tu

Chain 8:

94%

S2 K3 E4 T9 G41 D51 ASN ALA PRO GLU GLU LYS ALA ARG GLY I61 P73 D87 K90 N91 M92 D142 D143 S198 Y199 E202 S222 I287 G317 G318 R334 T335 K358 M359 L393 GLY SER HIS HIS HIS HIS HIS HIS

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	7401	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	35	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	18.877	Depositor
Minimum map value	-10.681	Depositor
Average map value	0.115	Depositor
Map value standard deviation	0.882	Depositor
Recommended contour level	1.0	Depositor
Map size (Å)	383.904, 383.904, 383.904	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.333, 1.333, 1.333	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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 RMSZ	Bond lengths #$|Z|$>5	Bond angles RMSZ	Bond angles #$|Z|$>5
1	b	0.25	0/2122	0.61	0/2852
2	c	0.27	0/1586	0.56	0/2134
3	d	0.27	0/1571	0.55	0/2113
4	e	0.29	0/1435	0.54	0/1926
5	f	0.26	0/1343	0.57	0/1816
6	g	0.28	0/1122	0.55	0/1515
7	h	0.30	0/1002	0.66	0/1350
8	i	0.28	0/1046	0.57	0/1410
9	j	0.26	0/1152	0.52	0/1551
10	k	0.26	0/948	0.61	0/1268
11	l	0.26	0/1054	0.60	0/1403
12	m	0.29	0/1093	0.57	0/1460
13	n	0.28	0/974	0.56	0/1301
14	o	0.27	0/902	0.52	0/1209
15	p	0.28	0/929	0.54	0/1242
16	q	0.29	0/960	0.49	0/1278
17	r	0.30	0/829	0.59	0/1107
18	s	0.24	0/864	0.59	0/1156
19	t	0.26	0/745	0.53	0/994
20	u	0.29	0/788	0.55	0/1051
21	v	0.28	0/766	0.53	0/1025
22	w	0.30	0/582	0.52	0/769
23	x	0.28	0/635	0.53	0/848
24	y	0.27	0/510	0.53	0/677
25	z	0.26	0/453	0.58	0/605
26	B	0.25	0/450	0.53	0/599
27	C	0.32	0/417	0.54	0/554
28	D	0.30	0/380	0.55	0/498
29	E	0.28	0/513	0.62	0/676
30	F	0.25	0/303	0.60	0/397
31	G	0.29	0/1788	0.54	0/2408
32	H	0.28	0/1652	0.56	0/2225

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	I	0.27	0/1665	0.54	0/2227
34	J	0.28	0/1170	0.61	0/1573
35	K	0.28	0/836	0.63	0/1128
36	L	0.26	0/1196	0.53	0/1602
37	M	0.26	0/989	0.58	0/1326
38	N	0.28	0/1034	0.56	0/1375
39	O	0.26	0/797	0.58	0/1077
40	P	0.28	0/886	0.54	0/1195
41	Q	0.27	0/969	0.66	0/1300
42	R	0.25	0/893	0.57	0/1193
43	S	0.28	0/817	0.53	0/1088
44	T	0.26	0/722	0.52	0/964
45	U	0.31	0/659	0.54	0/884
46	V	0.28	0/658	0.62	0/881
47	W	0.29	0/545	0.55	0/731
48	X	0.30	0/653	0.55	0/877
49	Y	0.27	0/671	0.49	0/888
50	Z	0.32	0/551	0.62	0/728
51	a	0.27	0/1034	0.50	0/1387
52	3	0.29	0/36963	0.65	0/57662
53	1	0.27	0/69796	0.65	0/108888
54	2	0.27	0/2872	0.65	0/4479
55	5	0.28	0/1832	0.65	0/2855
55	6	0.29	0/1832	0.66	0/2855
56	4	0.27	0/436	0.63	0/679
57	7	0.28	0/1809	0.64	0/2819
58	8	0.28	0/3015	0.59	0/4079
All	All	0.27	0/166214	0.63	0/248157

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	b	269/271 (99%)	224 (83%)	41 (15%)	4 (2%)	10	47
2	c	207/209 (99%)	185 (89%)	20 (10%)	2 (1%)	15	55
3	d	199/201 (99%)	178 (89%)	18 (9%)	3 (2%)	10	47
4	e	175/177 (99%)	147 (84%)	25 (14%)	3 (2%)	9	45
5	f	174/176 (99%)	156 (90%)	16 (9%)	2 (1%)	14	53
6	g	147/149 (99%)	123 (84%)	20 (14%)	4 (3%)	5	35
7	h	129/131 (98%)	92 (71%)	33 (26%)	4 (3%)	4	32
8	i	139/141 (99%)	119 (86%)	14 (10%)	6 (4%)	2	24
9	j	140/142 (99%)	125 (89%)	14 (10%)	1 (1%)	22	61
10	k	120/122 (98%)	100 (83%)	18 (15%)	2 (2%)	9	45
11	l	141/143 (99%)	117 (83%)	21 (15%)	3 (2%)	7	40
12	m	134/136 (98%)	117 (87%)	15 (11%)	2 (2%)	10	47
13	n	118/120 (98%)	99 (84%)	19 (16%)	0	100	100
14	o	114/116 (98%)	104 (91%)	7 (6%)	3 (3%)	5	35
15	p	112/114 (98%)	93 (83%)	19 (17%)	0	100	100
16	q	115/117 (98%)	110 (96%)	5 (4%)	0	100	100
17	r	101/103 (98%)	85 (84%)	14 (14%)	2 (2%)	7	41
18	s	108/110 (98%)	96 (89%)	11 (10%)	1 (1%)	17	57
19	t	91/93 (98%)	79 (87%)	11 (12%)	1 (1%)	14	53
20	u	100/102 (98%)	84 (84%)	14 (14%)	2 (2%)	7	41
21	v	92/94 (98%)	83 (90%)	9 (10%)	0	100	100
22	w	73/75 (97%)	65 (89%)	8 (11%)	0	100	100
23	x	75/77 (97%)	69 (92%)	5 (7%)	1 (1%)	12	50
24	y	61/63 (97%)	55 (90%)	5 (8%)	1 (2%)	9	46
25	z	56/58 (97%)	51 (91%)	5 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
26	B	54/56 (96%)	47 (87%)	7 (13%)	0	100	100
27	C	48/50 (96%)	42 (88%)	6 (12%)	0	100	100
28	D	44/46 (96%)	37 (84%)	7 (16%)	0	100	100
29	E	62/64 (97%)	55 (89%)	6 (10%)	1 (2%)	9	46
30	F	36/38 (95%)	28 (78%)	7 (19%)	1 (3%)	5	34
31	G	223/225 (99%)	203 (91%)	18 (8%)	2 (1%)	17	57
32	H	204/206 (99%)	192 (94%)	11 (5%)	1 (0%)	29	68
33	I	203/205 (99%)	181 (89%)	21 (10%)	1 (0%)	29	68
34	J	155/157 (99%)	130 (84%)	21 (14%)	4 (3%)	5	35
35	K	98/100 (98%)	81 (83%)	13 (13%)	4 (4%)	3	26
36	L	149/151 (99%)	128 (86%)	19 (13%)	2 (1%)	12	50
37	M	127/129 (98%)	113 (89%)	13 (10%)	1 (1%)	19	59
38	N	125/127 (98%)	102 (82%)	17 (14%)	6 (5%)	2	22
39	O	96/98 (98%)	72 (75%)	15 (16%)	9 (9%)	0	8
40	P	114/116 (98%)	94 (82%)	16 (14%)	4 (4%)	3	30
41	Q	121/123 (98%)	94 (78%)	21 (17%)	6 (5%)	2	21
42	R	112/114 (98%)	95 (85%)	12 (11%)	5 (4%)	2	23
43	S	98/100 (98%)	80 (82%)	18 (18%)	0	100	100
44	T	86/88 (98%)	79 (92%)	7 (8%)	0	100	100
45	U	80/82 (98%)	67 (84%)	12 (15%)	1 (1%)	12	50
46	V	78/80 (98%)	60 (77%)	14 (18%)	4 (5%)	2	20
47	W	63/65 (97%)	57 (90%)	5 (8%)	1 (2%)	9	46
48	X	77/79 (98%)	62 (80%)	14 (18%)	1 (1%)	12	50
49	Y	83/85 (98%)	76 (92%)	7 (8%)	0	100	100
50	Z	63/65 (97%)	44 (70%)	14 (22%)	5 (8%)	1	11
51	a	130/223 (58%)	125 (96%)	5 (4%)	0	100	100
58	8	379/400 (95%)	333 (88%)	41 (11%)	5 (1%)	12	50
All	All	6298/6512 (97%)	5433 (86%)	754 (12%)	111 (2%)	12	43

5 of 111 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	b	232	GLY

Continued on next page...

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Mol	Chain	Res	Type
2	c	86	GLU
3	d	83	VAL
5	f	45	ALA
5	f	174	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	b	216/216 (100%)	213 (99%)	3 (1%)	67	85
2	c	164/164 (100%)	162 (99%)	2 (1%)	71	87
3	d	165/165 (100%)	164 (99%)	1 (1%)	86	94
4	e	148/148 (100%)	147 (99%)	1 (1%)	84	93
5	f	137/137 (100%)	135 (98%)	2 (2%)	65	84
6	g	114/114 (100%)	113 (99%)	1 (1%)	78	90
7	h	100/100 (100%)	96 (96%)	4 (4%)	31	65
8	i	109/109 (100%)	109 (100%)	0	100	100
9	j	116/116 (100%)	114 (98%)	2 (2%)	60	82
10	k	103/103 (100%)	100 (97%)	3 (3%)	42	72
11	l	102/102 (100%)	100 (98%)	2 (2%)	55	79
12	m	109/109 (100%)	109 (100%)	0	100	100
13	n	100/100 (100%)	100 (100%)	0	100	100
14	o	86/86 (100%)	84 (98%)	2 (2%)	50	76
15	p	99/99 (100%)	99 (100%)	0	100	100
16	q	89/89 (100%)	89 (100%)	0	100	100
17	r	84/84 (100%)	82 (98%)	2 (2%)	49	75
18	s	93/93 (100%)	90 (97%)	3 (3%)	39	70
19	t	80/80 (100%)	80 (100%)	0	100	100
20	u	83/83 (100%)	83 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
21	v	78/78 (100%)	74 (95%)	4 (5%)	24	58
22	w	57/57 (100%)	56 (98%)	1 (2%)	59	81
23	x	67/67 (100%)	67 (100%)	0	100	100
24	y	55/55 (100%)	54 (98%)	1 (2%)	59	81
25	z	48/48 (100%)	47 (98%)	1 (2%)	53	78
26	B	47/47 (100%)	47 (100%)	0	100	100
27	C	45/45 (100%)	44 (98%)	1 (2%)	52	77
28	D	38/38 (100%)	37 (97%)	1 (3%)	46	74
29	E	51/51 (100%)	50 (98%)	1 (2%)	55	79
30	F	34/34 (100%)	34 (100%)	0	100	100
31	G	186/186 (100%)	182 (98%)	4 (2%)	52	77
32	H	170/170 (100%)	169 (99%)	1 (1%)	86	94
33	I	172/172 (100%)	171 (99%)	1 (1%)	86	94
34	J	119/119 (100%)	117 (98%)	2 (2%)	60	82
35	K	87/87 (100%)	86 (99%)	1 (1%)	73	88
36	L	124/124 (100%)	124 (100%)	0	100	100
37	M	104/104 (100%)	102 (98%)	2 (2%)	57	80
38	N	105/105 (100%)	103 (98%)	2 (2%)	57	80
39	O	86/86 (100%)	85 (99%)	1 (1%)	71	87
40	P	89/89 (100%)	88 (99%)	1 (1%)	73	88
41	Q	103/103 (100%)	101 (98%)	2 (2%)	57	80
42	R	92/92 (100%)	91 (99%)	1 (1%)	73	88
43	S	83/83 (100%)	82 (99%)	1 (1%)	71	87
44	T	76/76 (100%)	75 (99%)	1 (1%)	69	86
45	U	65/65 (100%)	64 (98%)	1 (2%)	65	84
46	V	74/74 (100%)	70 (95%)	4 (5%)	22	57
47	W	56/56 (100%)	55 (98%)	1 (2%)	59	81
48	X	70/70 (100%)	69 (99%)	1 (1%)	67	85
49	Y	65/65 (100%)	63 (97%)	2 (3%)	40	71
50	Z	55/55 (100%)	53 (96%)	2 (4%)	35	67
51	a	110/174 (63%)	109 (99%)	1 (1%)	78	90

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
58	8	318/332 (96%)	314 (99%)	4 (1%)	69	86
All	All	5226/5304 (98%)	5152 (99%)	74 (1%)	68	85

5 of 74 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
44	T	88	ARG
58	8	92	MET
46	V	5	ARG
49	Y	9	ARG
17	r	32	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 94 such sidechains are listed below:

Mol	Chain	Res	Type
31	G	176	ASN
38	N	74	GLN
32	H	18	ASN
35	K	11	HIS
40	P	100	ASN

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
52	3	1538/1539 (99%)	139 (9%)	4 (0%)
53	1	2902/2903 (99%)	327 (11%)	12 (0%)
54	2	119/120 (99%)	9 (7%)	1 (0%)
55	5	76/77 (98%)	7 (9%)	0
55	6	76/77 (98%)	6 (7%)	1 (1%)
56	4	17/18 (94%)	3 (17%)	0
57	7	75/76 (98%)	14 (18%)	0
All	All	4803/4810 (99%)	505 (10%)	18 (0%)

5 of 505 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
52	3	6	G
52	3	7	A
52	3	9	G

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Mol	Chain	Res	Type
52	3	22	G
52	3	31	G

5 of 18 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
53	1	2326	C
55	6	17(A)	U
54	2	88	C
53	1	1020	A
53	1	2296	U

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 ⓘ

3 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
60	PHE	7	101	57	10,11,12	0.66	0	10,13,15	0.37	0
61	GDP	8	501	-	24,30,30	1.47	4 (16%)	30,47,47	2.16	11 (36%)
59	FME	5	101	55	8,9,10	0.51	0	7,9,11	0.89	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.

'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
60	PHE	7	101	57	-	0/5/6/8	0/1/1/1
61	GDP	8	501	-	-	2/12/32/32	0/3/3/3
59	FME	5	101	55	-	1/7/9/11	-

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
61	8	501	GDP	O4'-C1'	3.82	1.46	1.41
61	8	501	GDP	PB-O1B	2.84	1.59	1.50
61	8	501	GDP	PB-O2B	2.26	1.63	1.54
61	8	501	GDP	C8-N7	-2.22	1.31	1.35

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
61	8	501	GDP	O2B-PB-O1B	-4.41	93.41	110.68
61	8	501	GDP	O3B-PB-O1B	4.31	127.56	110.68
61	8	501	GDP	O3B-PB-O2B	3.73	121.87	107.64
61	8	501	GDP	C3'-C2'-C1'	3.49	106.24	100.98
61	8	501	GDP	C8-N7-C5	3.33	109.33	102.99

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
59	5	101	FME	O1-CN-N-CA
61	8	501	GDP	PA-O3A-PB-O2B
61	8	501	GDP	PA-O3A-PB-O3B

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and

any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GDP 8 501

Bond lengths   Bond angles

Torsions   Rings
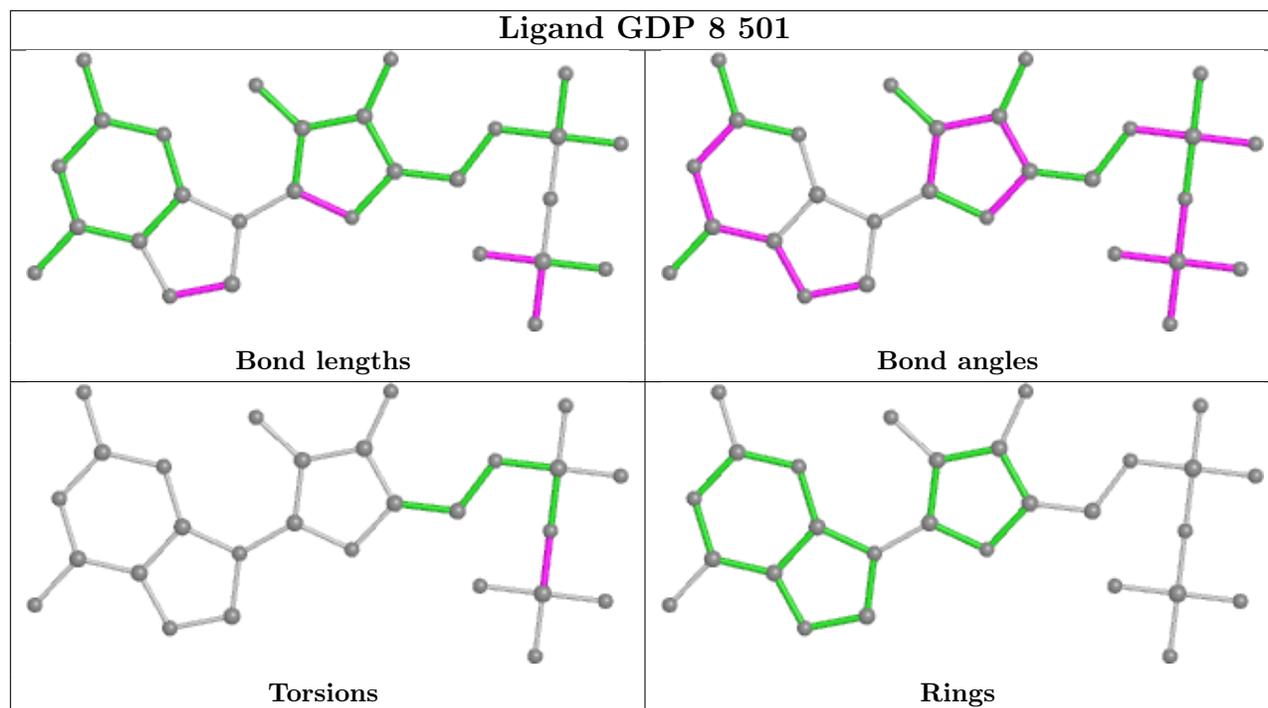
5.7   Other polymers ⓘ

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-21622. 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 ⓘ
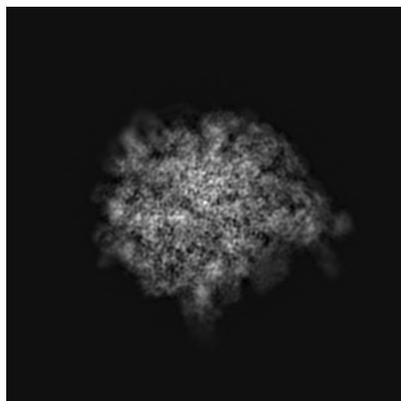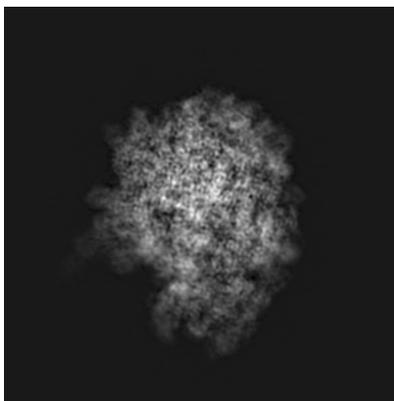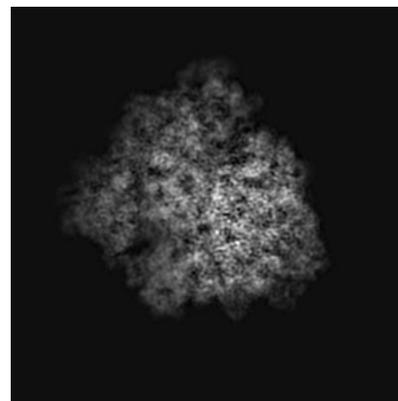
6.1.1 Primary map

| X | Y | Z |

6.1.2 Raw map

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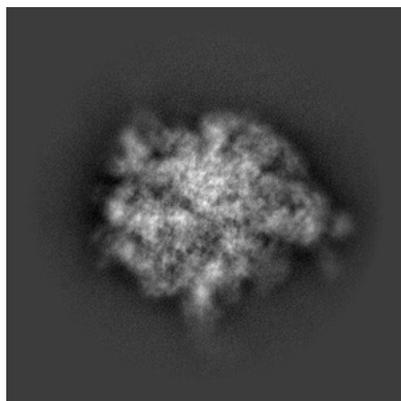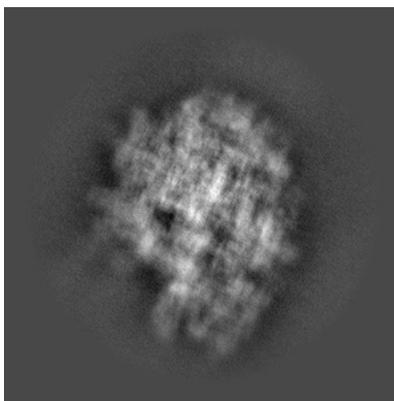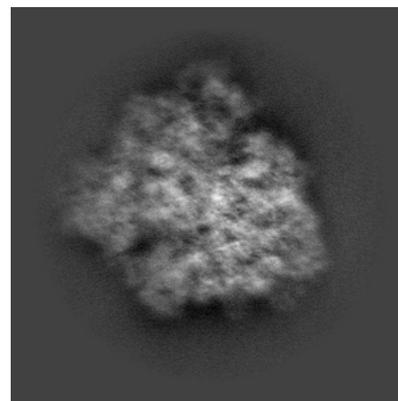
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
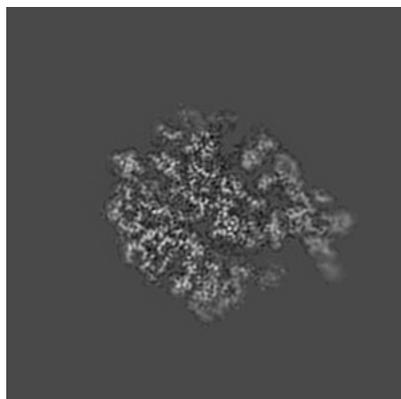
6.2.1   Primary map
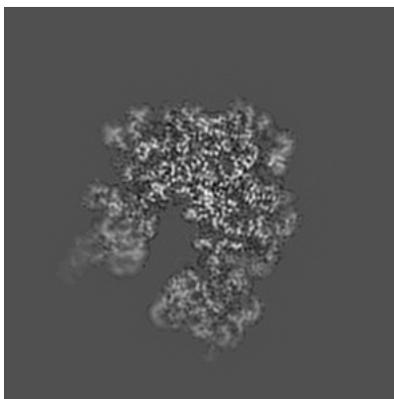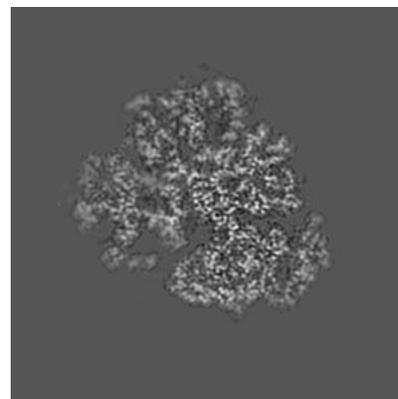
X Index: 144	Y Index: 144	Z Index: 144

6.2.2   Raw map
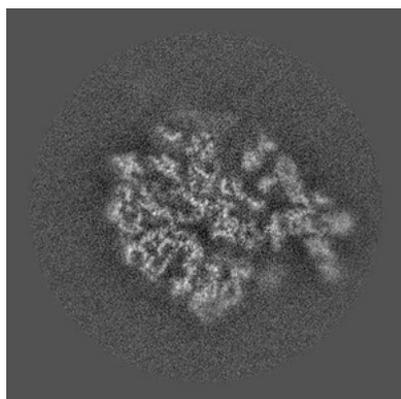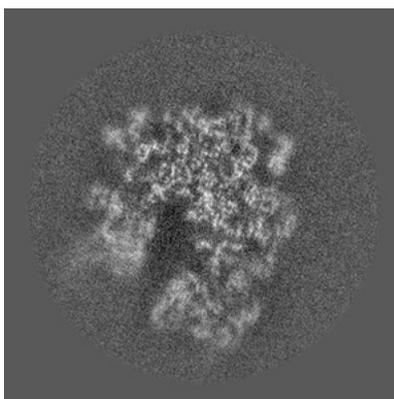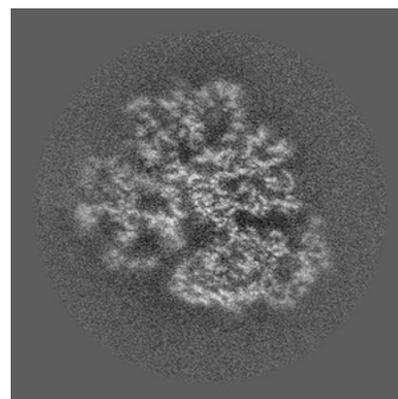
X Index: 144	Y Index: 144	Z Index: 144

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
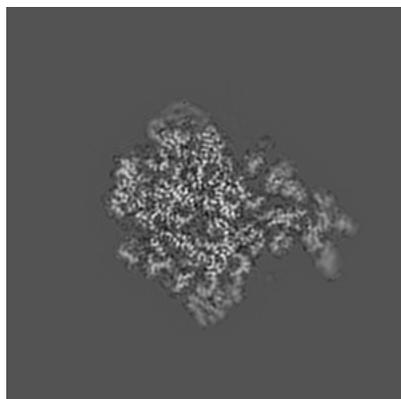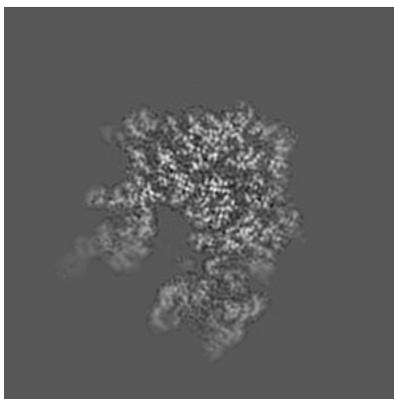
X Index: 149	Y Index: 148	Z Index: 135
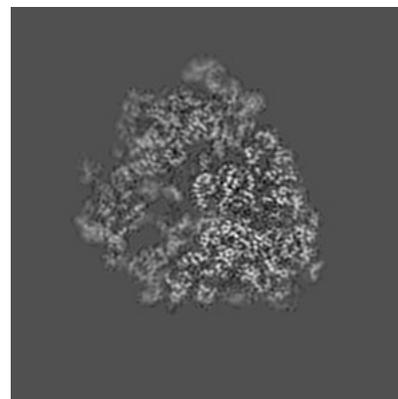
6.3.2 Raw map
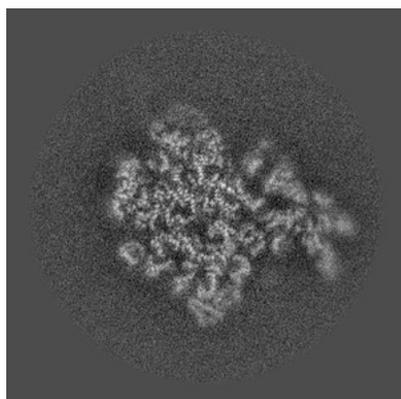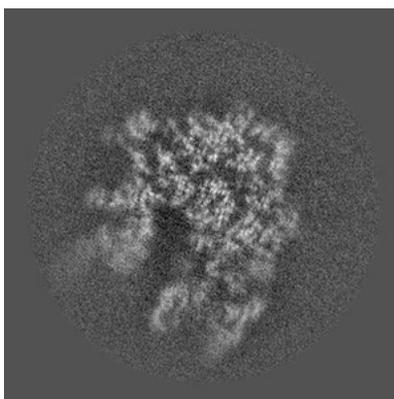
X Index: 148	Y Index: 148	Z Index: 135
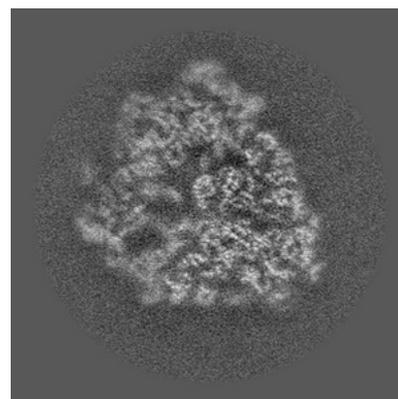
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
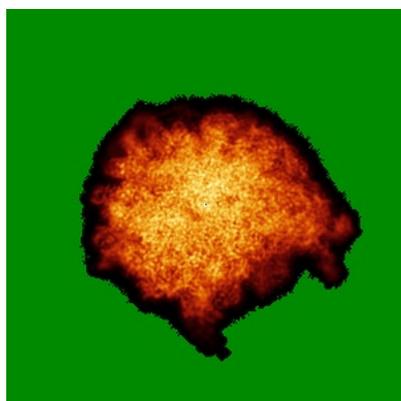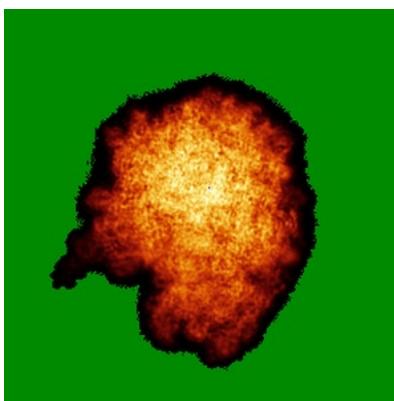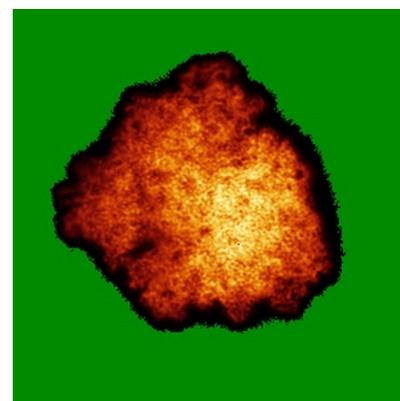
X   Y   Z

6.4.2 Raw map

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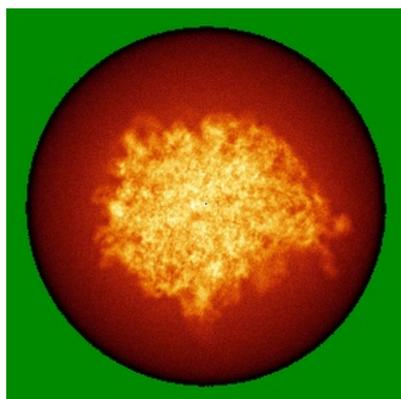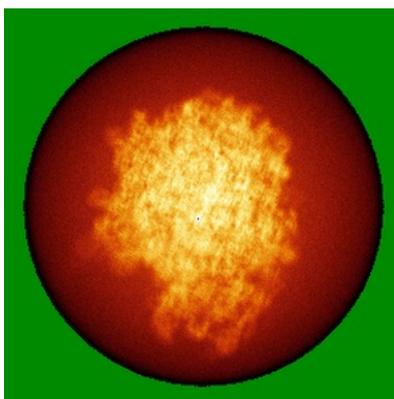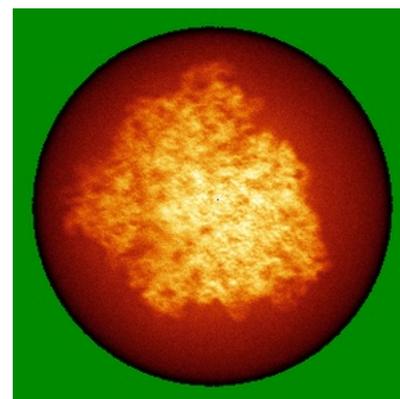
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 1.0. 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
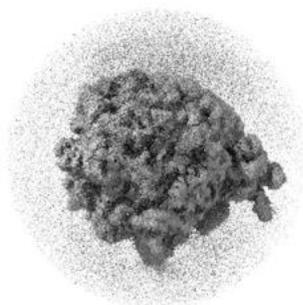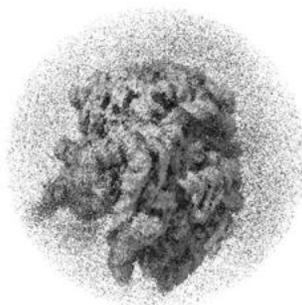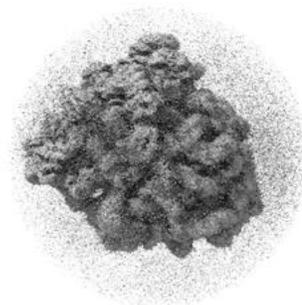
| X | Y | Z |

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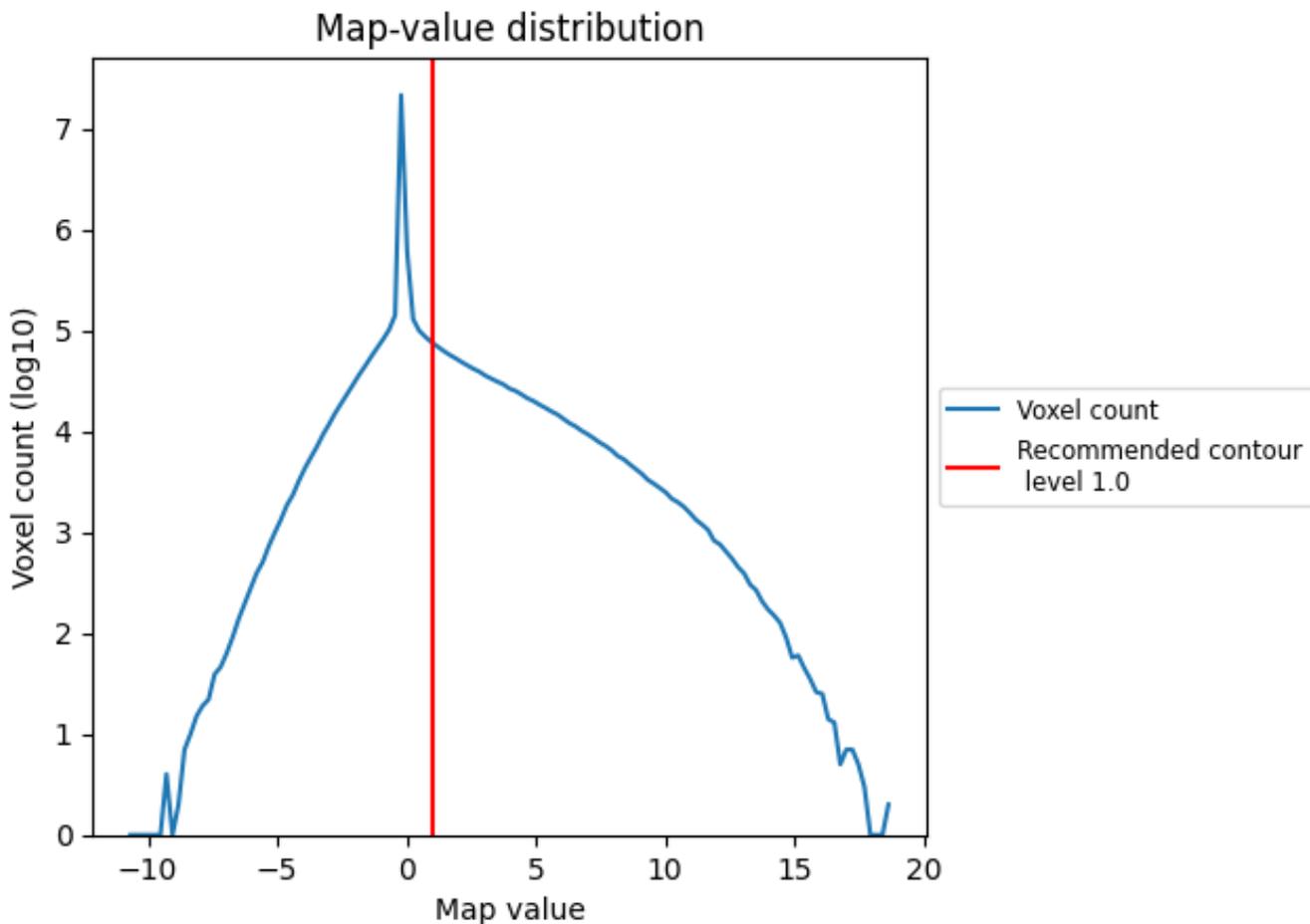
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate ⓘ
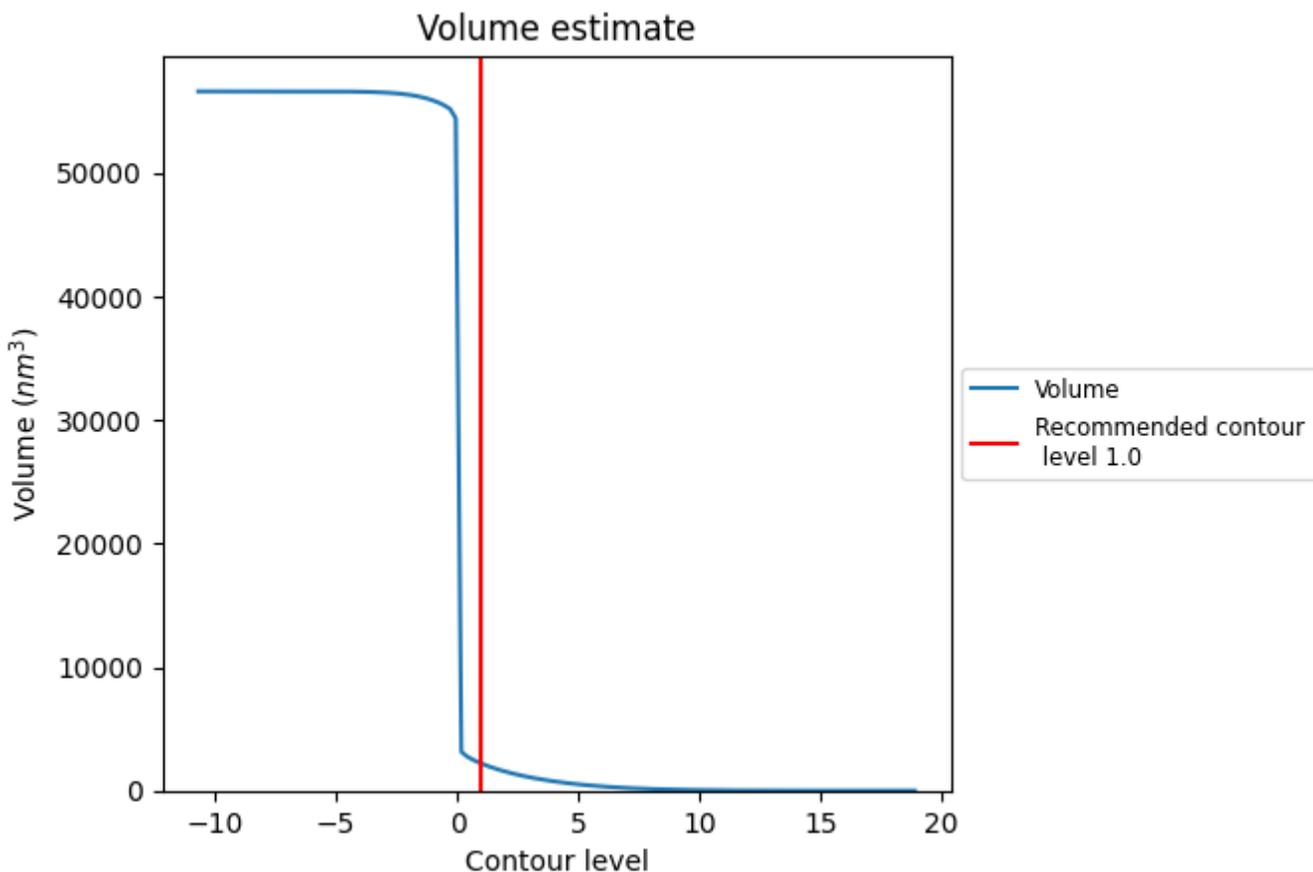
The volume at the recommended contour level is 2191 nm^3; this corresponds to an approximate mass of 1979 kDa.

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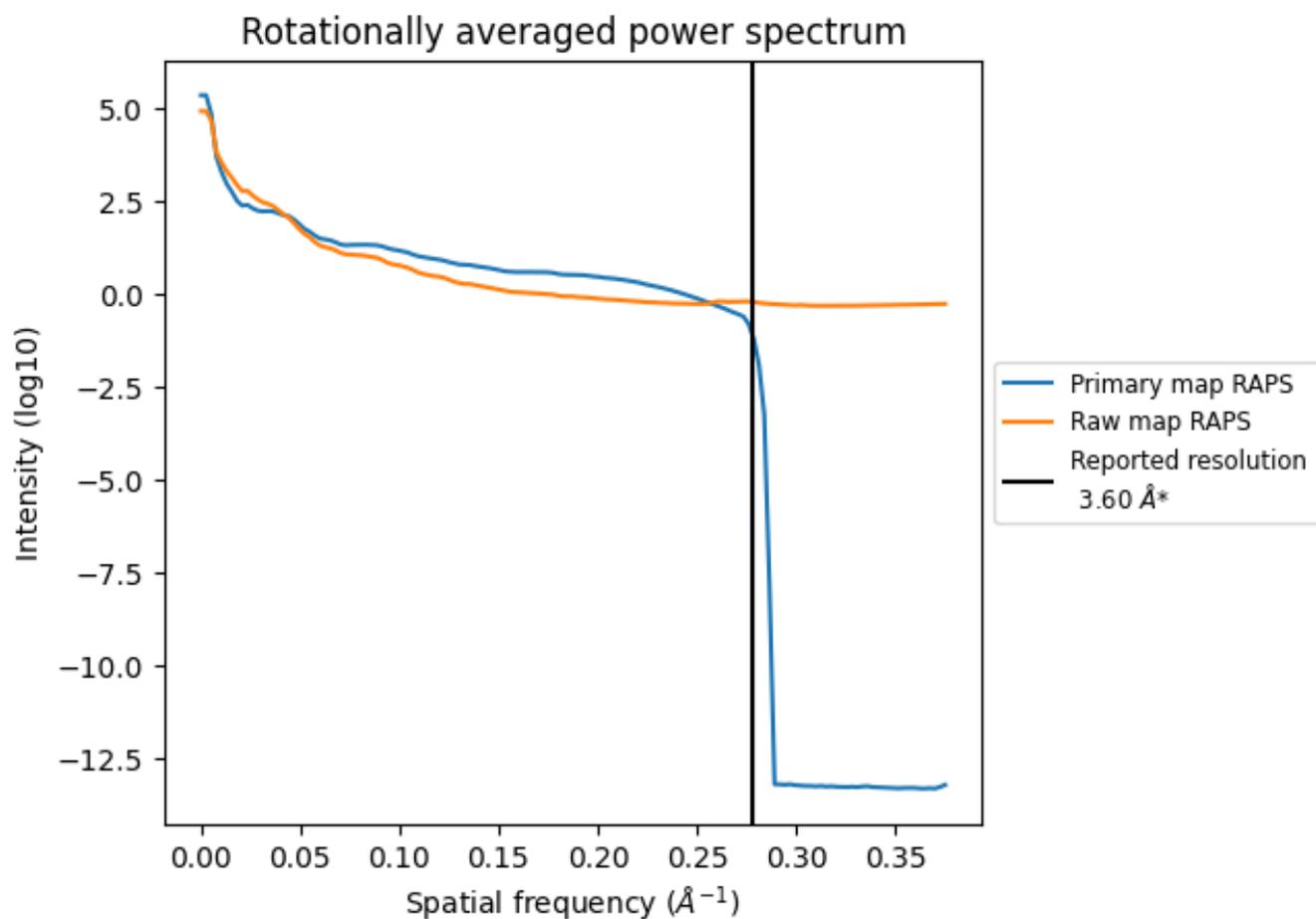
*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

8   Fourier-Shell correlation (i)

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

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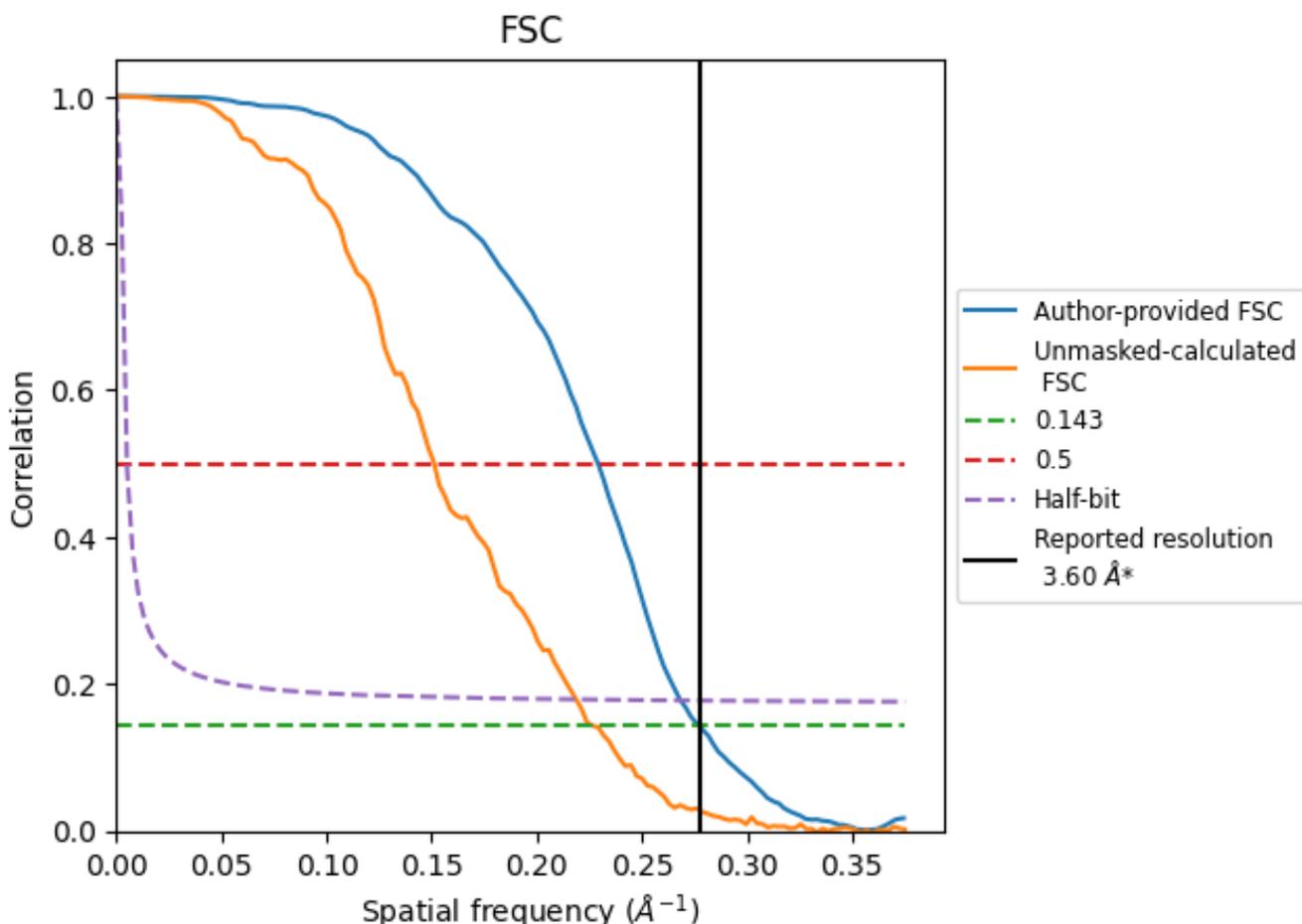
*Reported resolution corresponds to spatial frequency of 0.278 Å^{-1}

8.2   Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	3.61	4.36	3.73
Unmasked-calculated*	4.42	6.61	4.57

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.42 differs from the reported value 3.6 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-21622 and PDB model 6WD3. Per-residue inclusion information can be found in section 3 on page 17.

9.1 Map-model overlay ⓘ

| X | Y | Z |
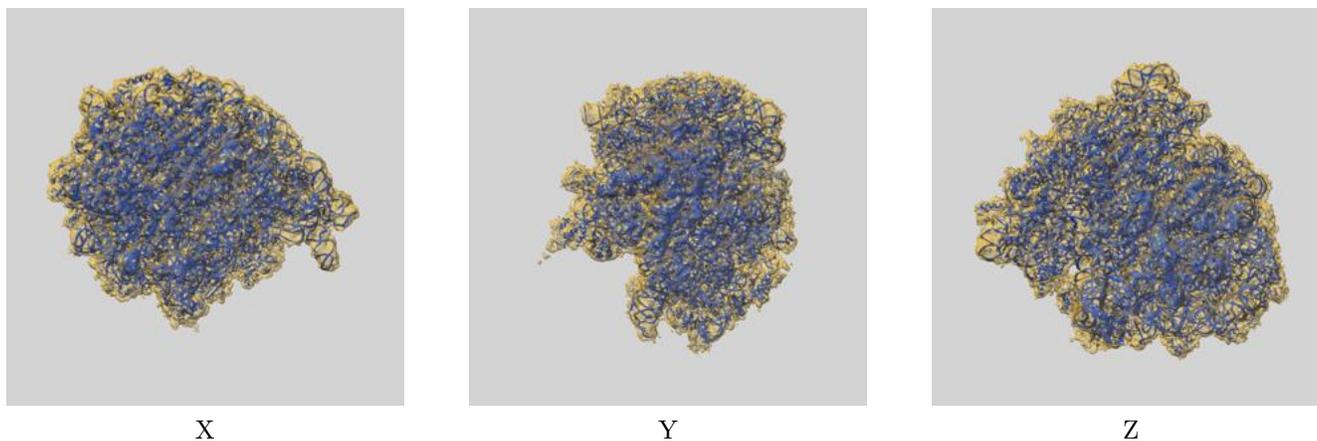
The images above show the 3D surface view of the map at the recommended contour level 1.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2   Q-score mapped to coordinate model ⓘ

X   Y   Z
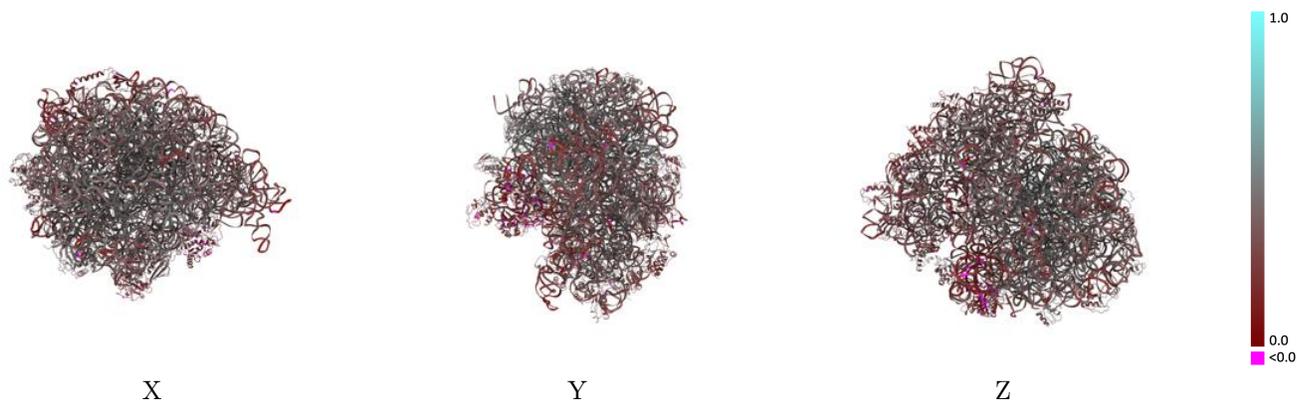
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
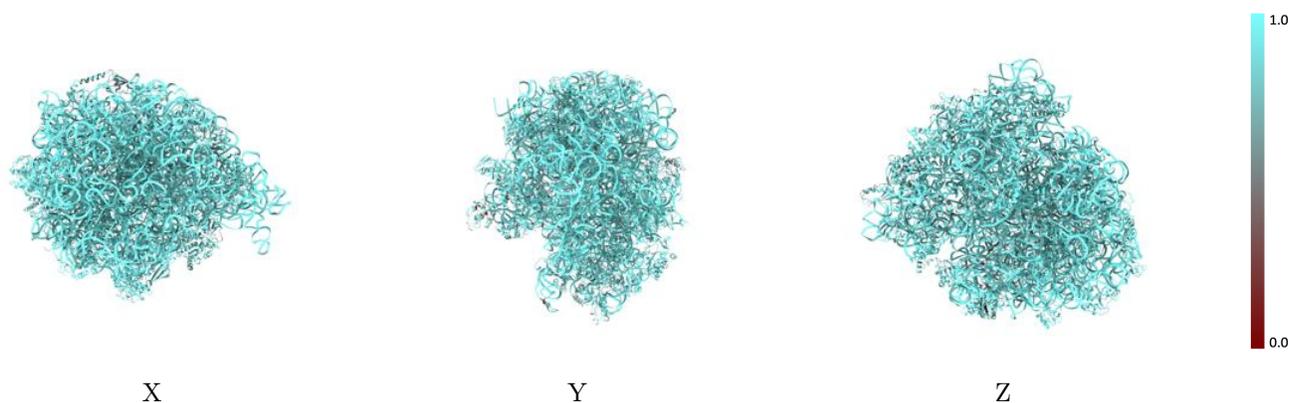
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1.0).

9.4   Atom inclusion ⓘ
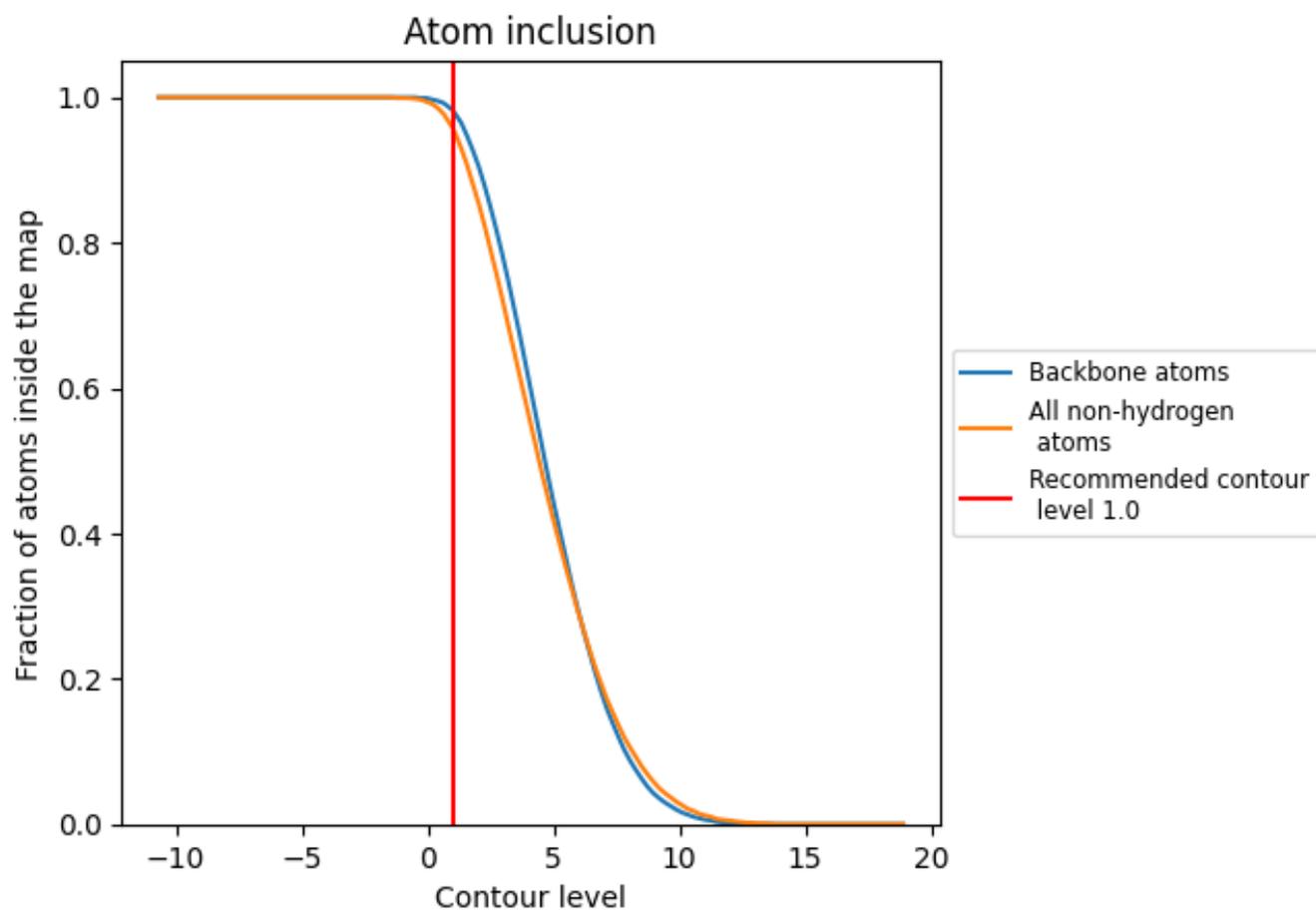
At the recommended contour level, 98% of all backbone atoms, 96% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (1.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9570	0.3630
1	0.9840	0.3850
2	0.9880	0.3360
3	0.9800	0.3470
4	0.8350	0.2100
5	0.9680	0.3190
6	0.8110	0.1460
7	0.9320	0.1770
8	0.8990	0.2070
B	0.9440	0.4370
C	0.8480	0.3910
D	0.9240	0.4510
E	0.9670	0.4760
F	0.9010	0.4220
G	0.9000	0.3150
H	0.8140	0.3500
I	0.8820	0.3080
J	0.9370	0.4040
K	0.9510	0.3740
L	0.9370	0.3380
M	0.9280	0.4100
N	0.8790	0.3320
O	0.7820	0.3150
P	0.9480	0.3810
Q	0.9110	0.4120
R	0.9430	0.3320
S	0.8370	0.3270
T	0.9610	0.3860
U	0.9030	0.3690
V	0.9230	0.3630
W	0.9240	0.3720
X	0.9680	0.3250
Y	0.8980	0.3390
Z	0.8730	0.2940
a	0.7970	0.1520

1.0

0.0
<0.0

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Chain	Atom inclusion	Q-score
b	0.9590	0.4600
c	0.9560	0.4610
d	0.9520	0.4080
e	0.9480	0.3330
f	0.9490	0.3340
g	0.7740	0.2590
h	0.7580	0.1650
i	0.8240	0.1870
j	0.9540	0.4500
k	0.9220	0.4480
l	0.9500	0.4270
m	0.9460	0.4490
n	0.9440	0.4420
o	0.9530	0.3510
p	0.9490	0.4470
q	0.9540	0.4400
r	0.9620	0.4170
s	0.9410	0.4460
t	0.9410	0.4210
u	0.9410	0.3990
v	0.9510	0.4050
w	0.9500	0.4640
x	0.9630	0.4480
y	0.9300	0.3440
z	0.9430	0.4170