



wwPDB EM Validation Summary Report ⓘ

Apr 22, 2025 – 06:35 pm BST

PDB ID : 9GHD / pdb_00009ghd
EMDB ID : EMD-51353
Title : Escherichia coli 70S ribosome in complex with Staphylococcus aureus FusB-EF-G (FusB-EF-G-70S*)
Authors : Gonzalez-Lopez, A.; Selmer, M.
Deposited on : 2024-08-15
Resolution : 2.41 Å (reported)
Based on initial models : 8P2H, 9GHE

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev117
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.42

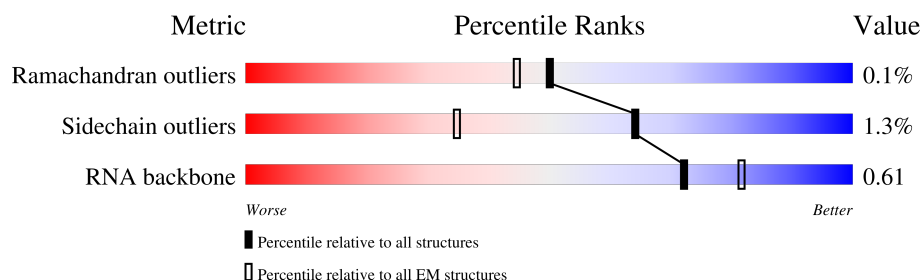
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.41 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




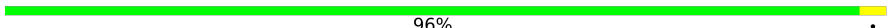











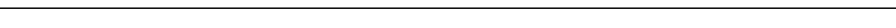




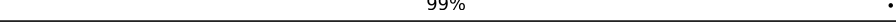

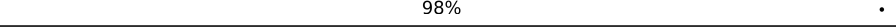



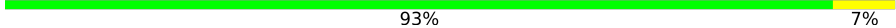
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	0	55	
2	1	46	
3	2	65	
4	3	38	
5	4	70	
6	9	24	
7	A	1554	
8	B	241	

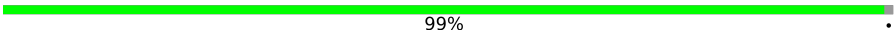
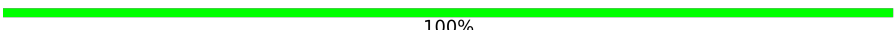
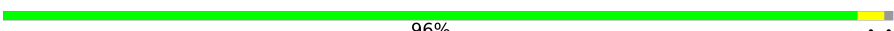
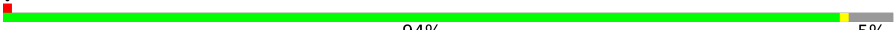






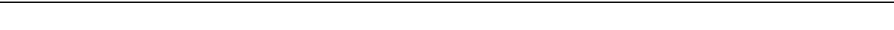

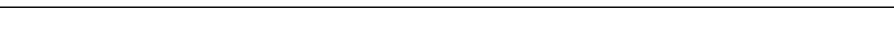
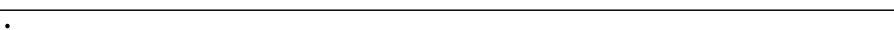
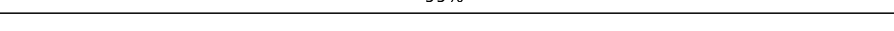
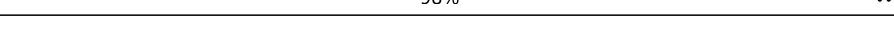
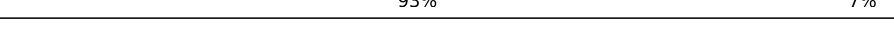

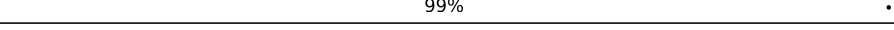

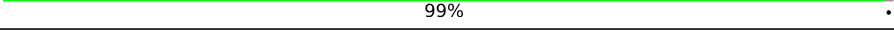
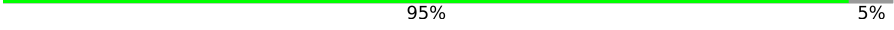
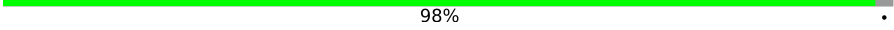
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Mol	Chain	Length	Quality of chain
9	C	233	 88% 12%
10	D	206	 96% .
11	E	167	 90% . 8%
12	F	135	 75% 25%
13	G	179	 80% . 16%
14	H	130	 99% .
15	I	130	 95% . .
16	J	103	 89% . 7%
17	K	129	 89% . 9%
18	L	124	 93% 5% .
19	M	118	 97% . .
20	N	101	 99% .
21	O	89	 99% .
22	P	82	 96% .
23	Q	84	 92% . 6%
24	R	75	 85% 15%
25	S	92	 91% 9%
26	T	87	 99% .
27	U	71	 76% . 23%
28	V	213	 10% 98% .
29	W	693	 30% 69%
30	Z	77	 75% 23% .
31	a	2930	 84% 11% 5%
32	b	119	 93% 7%
33	c	273	 99% .

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Mol	Chain	Length	Quality of chain
34	d	209	 99% .
35	e	201	 100%
36	f	179	 96% ..
37	g	177	 94% . 5%
38	h	149	 26% . 72%
39	i	142	 99% .
40	j	123	 99% .
41	k	144	 99% .
42	l	136	 99% .
43	m	127	 93% 7%
44	n	117	 97% ..
45	o	115	 98% ..
46	p	118	 99% .
47	q	103	 99% .
48	r	110	 98% ..
49	s	100	 93% 7%
50	t	104	 89% 11%
51	u	94	 99% .
52	v	85	 88% 12%
53	w	78	 99% .
54	x	63	 95% 5%
55	y	59	 98% .
56	z	57	 95% 5%

2 Entry composition

There are 59 unique types of molecules in this entry. The entry contains 143666 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 Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	0	50	Total	C	N	O	0	0
			413	267	75	71		

- Molecule 2 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	45	Total	C	N	O	S	0	0
			367	222	88	55	2		

- Molecule 3 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 4 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	3	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 5 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	4	60	Total	C	N	O	S	0	0
			480	299	90	85	6		

- Molecule 6 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	9	7	Total	C	N	O	P	0	0
			154	69	32	46	7		

- Molecule 7 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	A	1514	Total	C	N	O	P	0	0
			32500	14503	5963	10520	1514		

- Molecule 8 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	B	222	Total	C	N	O	S	0	0
			1737	1099	312	318	8		

- Molecule 9 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	C	206	Total	C	N	O	S	0	0
			1624	1028	305	288	3		

- Molecule 10 is a protein called 30S ribosomal protein S4.

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

- Molecule 11 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	E	154	Total	C	N	O	S	0	0
			1135	706	215	208	6		

- Molecule 12 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	F	101	Total	C	N	O	S	0	0
			824	520	149	149	6		

- Molecule 13 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	G	150	Total	C	N	O	S	0	0
			1176	732	226	214	4		

- Molecule 14 is a protein called 30S ribosomal protein S8.

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

- Molecule 15 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	I	125	Total	C	N	O	S	0	0
			1001	622	200	176	3		

- Molecule 16 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	J	96	Total	C	N	O	S	0	0
			775	487	148	139	1		

- Molecule 17 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	K	117	Total	C	N	O	S	0	0
			877	540	173	161	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	119	IAS	ASN	modified residue	UNP P0A7R9

- Molecule 18 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	L	121	Total	C	N	O	S	0	0
			942	582	193	162	5		

- Molecule 19 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	M	115	Total	C	N	O	S	0	0
			891	552	179	157	3		

- Molecule 20 is a protein called 30S ribosomal protein S14.

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

- Molecule 21 is a protein called Small ribosomal subunit protein uS15.

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

- Molecule 22 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	P	79	Total	C	N	O	S	0	0
			629	394	124	110	1		

- Molecule 23 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Q	79	Total	C	N	O	S	0	0
			641	406	120	112	3		

- Molecule 24 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	R	64	Total	C	N	O	S	0	0
			524	330	99	94	1		

- Molecule 25 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	S	84	Total	C	N	O	S	0	0
			668	427	127	112	2		

- Molecule 26 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	T	86	Total	C	N	O	S	0	0
			670	414	138	115	3		

- Molecule 27 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	U	55	Total	C	N	O	S	0	0
			460	287	95	77	1		

- Molecule 28 is a protein called Far1.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	V	212	Total	C	N	O	S	0	0
			1765	1139	290	328	8		

- Molecule 29 is a protein called Elongation factor G.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	W	214	Total	C	N	O	S	0	0
			1647	1035	277	323	12		

- Molecule 30 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Z	76	Total	C	N	O	P	0	0
			1623	723	294	530	76		

- Molecule 31 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	a	2782	Total	C	N	O	P	0	0
			59756	26665	11017	19292	2782		

- Molecule 32 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	b	119	Total	C	N	O	P	0	0
			2549	1135	466	829	119		

- Molecule 33 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	c	271	Total	C	N	O	S	0	0
			2082	1288	423	364	7		

- Molecule 34 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	d	207	Total	C	N	O	S	0	0
			1552	972	286	291	3		

- Molecule 35 is a protein called 50S ribosomal protein L4.

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

- Molecule 36 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	f	177	Total	C	N	O	S	0	0
			1410	899	249	256	6		

- Molecule 37 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	g	168	Total	C	N	O	S	0	0
			1255	791	228	234	2		

- Molecule 38 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	h	41	Total	C	N	O	S	0	0
			303	194	54	54	1		

- Molecule 39 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	i	141	Total	C	N	O	S	0	0
			1121	709	211	198	3		

- Molecule 40 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	j	123	Total	C	N	O	S	0	0
			946	593	181	166	6		

- Molecule 41 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	k	144	Total	C	N	O	S	0	0
			1053	654	207	190	2		

- Molecule 42 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	l	136	Total	C	N	O	S	0	0
			1075	686	205	177	7		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
l	82	MS6	MET	modified residue	UNP P0ADY7

- Molecule 43 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	m	118	Total	C	N	O	S	0	0
			945	585	194	161	5		

- Molecule 44 is a protein called 50S ribosomal protein L18.

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

- Molecule 45 is a protein called 50S ribosomal protein L19.

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

- Molecule 46 is a protein called 50S ribosomal protein L20.

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

- Molecule 47 is a protein called 50S ribosomal protein L21.

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

- Molecule 48 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	r	109	Total	C	N	O	S	0	0
			845	526	162	154	3		

- Molecule 49 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	s	93	Total	C	N	O	S	0	0
			738	466	139	131	2		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
50	t	93	Total	C	N	O	S	0	0
			717	452	135	130			

- Molecule 51 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	u	93	Total	C	N	O	S	0	0
			745	474	136	133	2		

- Molecule 52 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	v	75	Total	C	N	O	S	0	0
			569	353	113	102	1		

- Molecule 53 is a protein called 50S ribosomal protein L28.

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

- Molecule 54 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	x	60	Total	C	N	O	S	0	0
			491	303	96	91	1		

- Molecule 55 is a protein called 50S ribosomal protein L30.

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

- Molecule 56 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	z	54	Total	C	N	O	S	0	0
			429	260	91	77	1		

- Molecule 57 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
57	3	1	Total	Zn	0
			1	1	
57	4	1	Total	Zn	0
			1	1	

- Molecule 58 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
58	A	31	Total	K	0
			31	31	
58	F	1	Total	K	0
			1	1	
58	M	1	Total	K	0
			1	1	
58	a	76	Total	K	0
			76	76	
58	c	2	Total	K	0
			2	2	
58	e	1	Total	K	0
			1	1	


- Molecule 59 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

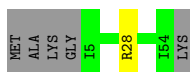
Mol	Chain	Residues	Atoms		AltConf
59	A	55	Total 55	Mg 55	0
59	a	240	Total 240	Mg 240	0
59	b	3	Total 3	Mg 3	0
59	c	2	Total 2	Mg 2	0
59	d	1	Total 1	Mg 1	0
59	p	1	Total 1	Mg 1	0
59	z	1	Total 1	Mg 1	0

3 Residue-property plots [i](#)

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: Large ribosomal subunit protein bL33

Chain 0:  89% 9%



- Molecule 2: Large ribosomal subunit protein bL34

Chain 1:  98%



- Molecule 3: 50S ribosomal protein L35

Chain 2:  97%




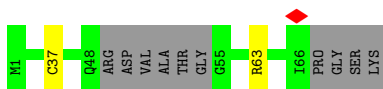
- Molecule 4: 50S ribosomal protein L36

Chain 3:  97%



- Molecule 5: 50S ribosomal protein L31

Chain 4:  83% 14%




- Molecule 6: mRNA

Chain 9:  25% 71%


G G C C A A A G G G G U U A A A
A13 G19 C A A A A A

• Molecule 7: 16S rRNA

Chain A:  84% 13%


A A2 A3 U4 U5 G6 A7 A8 A9 U12 U13 A32 G39 C47 C48 A51 G69 U70 A71 A72 C73 A74 G75 A81 G82 C83 U84 U85 G86 C87 U88 G94 C95 A119 A120 U121 G122 A131 G144 G159 G164 A182 C183 A197 G198 A199
G202 G A C C U C G C C215 G226 G240 U245 A246 G247 G251 G266 C267 G289 G305 A321 C328 A329 C330 G347 C352 A353 G354 U367 C372 U398 G406 A411 A412 C413 A414 U421 C422
G423 G424 U429 U438 U439 G457 U467 A468 A469 G484 U485 U486 U508 C511 U516 G517 C518 G521 G527 U531 A532 C536 A547 A559 U562 A572 A573 C576 A595 A596 G633 U641 G650 G654 A665 G688
A702 U723 G724 G734 G755 A777 U793 A794 A815 A816 C817 G832 C839 C A U U G A G G847 C848 G849 G874 U884 G887 G890 A914 G926 C934 U960 U961 G966 A969 A975 G976 A977 C984
U991 U992 G993 A994 A1004 G1020 C1027 G1028 U1029 U1030 C1031 G1032 G1033 G1034 A1035 A1036 G1039 A1042 G1043 A1044 C1045 A1046 G1047 U1065 U1085 G1094 A1101 G1124 C1129 G1137 G1138 G1139 A1145 A1146 A1196 A1197 G1207 U1211 U1212 A1213 C1214 A1225 C1226
A1227 A1238 G1256 G1260 A1275 A1280 A1287 U1298 A1299 G1300 G1317 A1316 A1319 C1320 G1338 A1346 G1353 A1363 C1378 G1379 C1397 A1398 G1419 A1433 A1447 C1452 G1453 G1459 A1492 A1493 G1494 G1497 A1503 G1504 G1505 U1506 G1516
G1517 G1529 G1530 A1533 A1534 C C C U C C C U U A A A A A A G C

• Molecule 8: 30S ribosomal protein S2

Chain B:  89% 8%

MET ALA THR VAL M6 M7 W23 E78 R95 N103 Q122 D123 D127 K128 L129 L135 L161 D165 D204 S226 GLN ASP LEU ALA SER GLN ALA GLU SER PHE VAL ALA GLU

• Molecule 9: 30S ribosomal protein S3

Chain C:  88% 12%


MET G2 K80 L144 I207 LEU GLY GLY MET ALA VAL GLU GLN PRO GLU LYS PRO ALA ALA GLN PRO LYS LYS GLN ARG LYS ARG LYS

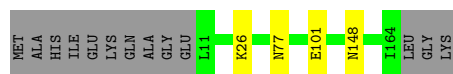
• Molecule 10: 30S ribosomal protein S4

Chain D:  96%




- Molecule 11: 30S ribosomal protein S5

Chain E:  90% 8%




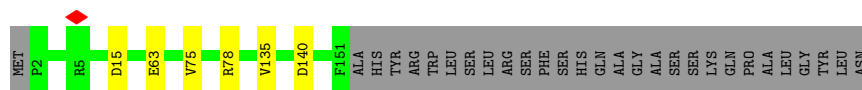
- Molecule 12: 30S ribosomal protein S6

Chain F:  75% 25%



- Molecule 13: 30S ribosomal protein S7

Chain G:  80% 16%



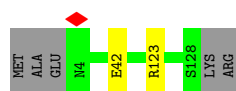
- Molecule 14: 30S ribosomal protein S8

Chain H:  99%




- Molecule 15: 30S ribosomal protein S9

Chain I:  95%




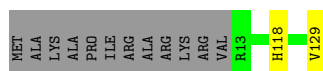
- Molecule 16: 30S ribosomal protein S10

Chain J:  89% 7%



- Molecule 17: Small ribosomal subunit protein uS11

Chain K:  89% . 9%



- Molecule 18: 30S ribosomal protein S12

Chain L:  93% 5% .



- Molecule 19: 30S ribosomal protein S13

Chain M:  97% . .



- Molecule 20: 30S ribosomal protein S14

Chain N:  99% .



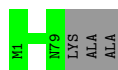
- Molecule 21: Small ribosomal subunit protein uS15

Chain O:  99% .



- Molecule 22: 30S ribosomal protein S16

Chain P:  96% .



- Molecule 23: 30S ribosomal protein S17

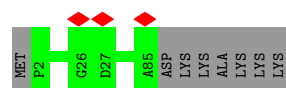
Chain Q:  92% . 6%



- Molecule 24: 30S ribosomal protein S18

MET
ALA
ARG
TYR
PHE
ARG
ARG
ARG
LYS
PHE
C11
H74
GLN

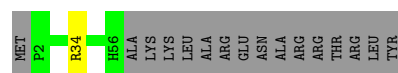
- Chain S: 91% 9%



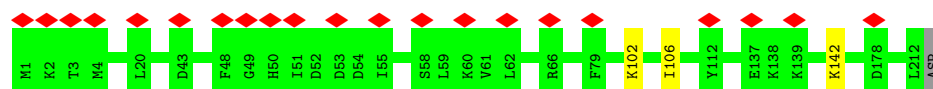
- Chain T:  99%



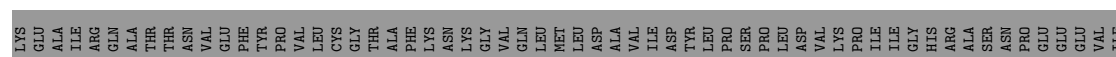
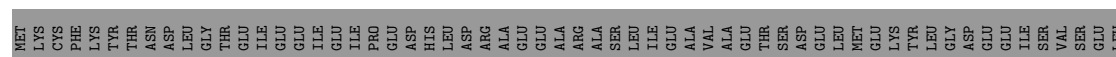
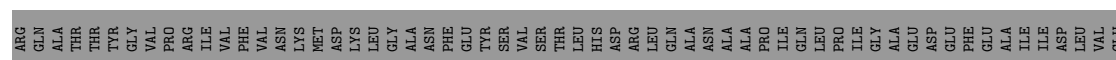
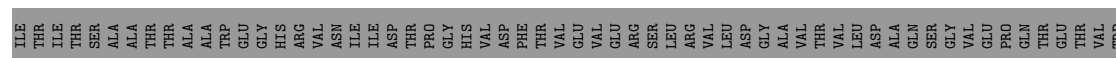
- Chain U: 76% 23%



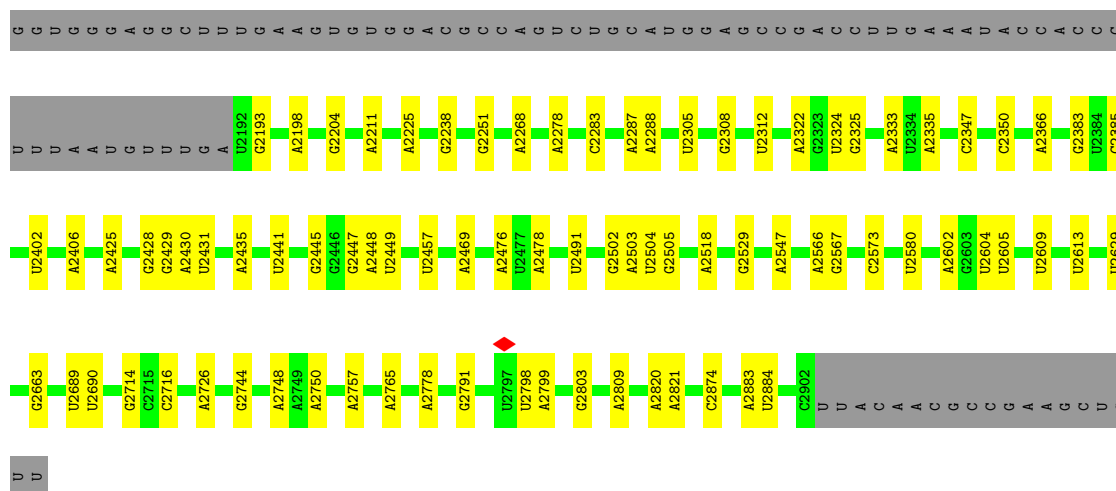
- Chain V: 10% 98%



- Chain W:  30% 69%

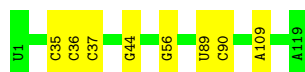






- Molecule 32: 5S rRNA

Chain b: 93% 7%



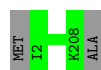
- Molecule 33: 50S ribosomal protein L2

Chain c: 99% .



- Molecule 34: 50S ribosomal protein L3

Chain d: 99% .



- Molecule 35: 50S ribosomal protein L4

Chain e: 100%

There are no outlier residues recorded for this chain.

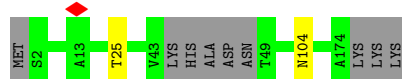
- Molecule 36: 50S ribosomal protein L5

Chain f: 96% . .



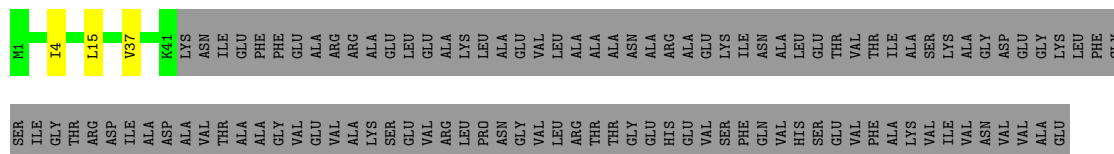
- Molecule 37: 50S ribosomal protein L6

Chain g:  94% 5%



- Molecule 38: 50S ribosomal protein L9

Chain h:  26% 72%



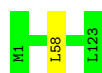
- Molecule 39: 50S ribosomal protein L13

Chain i:  99%



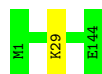
- Molecule 40: 50S ribosomal protein L14

Chain j:  99%



- Molecule 41: 50S ribosomal protein L15

Chain k:  99%



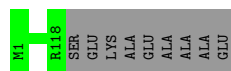
- Molecule 42: Large ribosomal subunit protein uL16

Chain l:  99%



- Molecule 43: 50S ribosomal protein L17

Chain m:  93% 7%



- Molecule 44: 50S ribosomal protein L18

Chain n:  97% ..



- Molecule 45: 50S ribosomal protein L19

Chain o:  98% ..



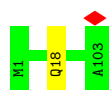
- Molecule 46: 50S ribosomal protein L20

Chain p:  99% .



- Molecule 47: 50S ribosomal protein L21

Chain q:  99% .



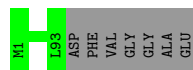
- Molecule 48: 50S ribosomal protein L22

Chain r:  98% ..




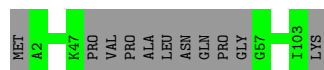
- Molecule 49: 50S ribosomal protein L23

Chain s:  93% 7%



- Molecule 50: 50S ribosomal protein L24

Chain t:  89% 11%




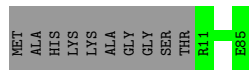
- Molecule 51: 50S ribosomal protein L25

Chain u:  99%



- Molecule 52: Large ribosomal subunit protein bL27

Chain v:  88%



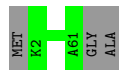
- Molecule 53: 50S ribosomal protein L28

Chain w:  99%



- Molecule 54: 50S ribosomal protein L29

Chain x:  95%



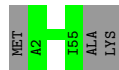
- Molecule 55: 50S ribosomal protein L30

Chain y:  98%



- Molecule 56: 50S ribosomal protein L32

Chain z:  95%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	30847	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45.47	Depositor
Minimum defocus (nm)	700	Depositor
Maximum defocus (nm)	1000	Depositor
Magnification	130000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.843	Depositor
Minimum map value	-0.416	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	388.68002, 388.68002, 388.68002	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.6478, 0.6478, 0.6478	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MS6, 1MG, PSU, ZN, G7M, OMU, 3TD, MG, 5MU, 2MG, 2MA, 5MC, H2U, OMG, MA6, OMC, 4D4, 6MZ, MEQ, UR3, 4OC, D2T, K, IAS

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	0	0.31	0/420	0.54	0/560
2	1	0.30	0/370	0.58	0/487
3	2	0.33	0/513	0.54	0/676
4	3	0.30	0/303	0.58	0/397
5	4	0.32	0/488	0.56	0/649
6	9	0.47	0/173	0.83	0/268
7	A	0.42	0/36110	0.89	0/56322
8	B	0.29	0/1768	0.54	0/2381
9	C	0.28	0/1651	0.53	0/2225
10	D	0.29	0/1665	0.54	0/2227
11	E	0.29	0/1148	0.54	0/1545
12	F	0.28	0/843	0.50	0/1140
13	G	0.29	0/1190	0.52	0/1595
14	H	0.29	0/989	0.55	0/1326
15	I	0.29	0/1013	0.56	0/1350
16	J	0.28	0/784	0.60	0/1059
17	K	0.30	0/884	0.53	0/1191
18	L	0.29	0/945	0.61	0/1268
19	M	0.29	0/900	0.54	0/1204
20	N	0.30	0/817	0.53	0/1088
21	O	0.29	0/722	0.50	0/964
22	P	0.28	0/639	0.56	0/859
23	Q	0.28	0/650	0.56	0/871
24	R	0.28	0/532	0.55	0/715
25	S	0.32	0/685	0.54	0/922
26	T	0.28	0/676	0.48	0/895
27	U	0.32	0/467	0.60	0/620
28	V	0.29	0/1798	0.49	0/2415
29	W	0.30	0/1679	0.51	0/2261
30	Z	0.45	0/1813	0.89	0/2825
31	a	0.41	0/66355	0.89	4/103511 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	b	0.43	0/2850	0.90	0/4444
33	c	0.29	0/2121	0.57	0/2852
34	d	0.29	0/1562	0.52	0/2102
35	e	0.28	0/1571	0.51	0/2113
36	f	0.29	0/1434	0.54	0/1926
37	g	0.29	0/1273	0.54	0/1725
38	h	0.30	0/306	0.55	0/413
39	i	0.28	0/1144	0.52	0/1541
40	j	0.28	0/955	0.55	0/1279
41	k	0.31	0/1062	0.52	0/1413
42	l	0.29	0/1073	0.55	0/1433
43	m	0.28	0/958	0.53	0/1281
44	n	0.29	0/902	0.54	0/1209
45	o	0.29	0/929	0.54	0/1242
46	p	0.28	0/960	0.52	0/1278
47	q	0.30	0/829	0.54	0/1107
48	r	0.28	0/852	0.55	0/1142
49	s	0.27	0/744	0.54	0/994
50	t	0.30	0/721	0.56	0/956
51	u	0.29	0/758	0.54	0/1015
52	v	0.32	0/576	0.54	0/762
53	w	0.30	0/635	0.54	0/848
54	x	0.26	0/492	0.48	0/655
55	y	0.29	0/453	0.51	0/605
56	z	0.30	0/435	0.56	0/581
All	All	0.38	0/154585	0.81	4/230732 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	3	0	1
10	D	0	1
16	J	0	1
17	K	0	1
27	U	0	1
All	All	0	5

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
31	a	512	G	O4'-C1'-N9	6.25	113.20	108.20
31	a	2447	G	C3'-C2'-C1'	-5.36	97.21	101.50
31	a	242	G	C3'-C2'-C1'	-5.03	97.47	101.50
31	a	512	G	C1'-O4'-C4'	-5.01	105.89	109.90

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	3	36	ARG	Sidechain
10	D	184	ARG	Sidechain
16	J	38	GLY	Peptide
17	K	118	HIS	Peptide
27	U	34	ARG	Sidechain

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	48/55 (87%)	48 (100%)	0	0	100	100
2	1	43/46 (94%)	43 (100%)	0	0	100	100
3	2	62/65 (95%)	60 (97%)	2 (3%)	0	100	100
4	3	36/38 (95%)	36 (100%)	0	0	100	100
5	4	56/70 (80%)	55 (98%)	1 (2%)	0	100	100
8	B	220/241 (91%)	214 (97%)	5 (2%)	1 (0%)	25	36
9	C	204/233 (88%)	198 (97%)	6 (3%)	0	100	100
10	D	203/206 (98%)	202 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	E	152/167 (91%)	150 (99%)	2 (1%)	0	100	100
12	F	99/135 (73%)	98 (99%)	1 (1%)	0	100	100
13	G	148/179 (83%)	147 (99%)	1 (1%)	0	100	100
14	H	127/130 (98%)	127 (100%)	0	0	100	100
15	I	123/130 (95%)	120 (98%)	3 (2%)	0	100	100
16	J	92/103 (89%)	87 (95%)	4 (4%)	1 (1%)	12	17
17	K	113/129 (88%)	111 (98%)	2 (2%)	0	100	100
18	L	118/124 (95%)	114 (97%)	4 (3%)	0	100	100
19	M	113/118 (96%)	111 (98%)	2 (2%)	0	100	100
20	N	98/101 (97%)	98 (100%)	0	0	100	100
21	O	86/89 (97%)	86 (100%)	0	0	100	100
22	P	77/82 (94%)	75 (97%)	2 (3%)	0	100	100
23	Q	77/84 (92%)	77 (100%)	0	0	100	100
24	R	62/75 (83%)	62 (100%)	0	0	100	100
25	S	82/92 (89%)	81 (99%)	1 (1%)	0	100	100
26	T	84/87 (97%)	84 (100%)	0	0	100	100
27	U	53/71 (75%)	53 (100%)	0	0	100	100
28	V	210/213 (99%)	208 (99%)	2 (1%)	0	100	100
29	W	212/693 (31%)	209 (99%)	3 (1%)	0	100	100
33	c	269/273 (98%)	265 (98%)	4 (2%)	0	100	100
34	d	204/209 (98%)	200 (98%)	4 (2%)	0	100	100
35	e	199/201 (99%)	196 (98%)	3 (2%)	0	100	100
36	f	175/179 (98%)	174 (99%)	1 (1%)	0	100	100
37	g	164/177 (93%)	162 (99%)	2 (1%)	0	100	100
38	h	39/149 (26%)	38 (97%)	1 (3%)	0	100	100
39	i	139/142 (98%)	138 (99%)	1 (1%)	0	100	100
40	j	121/123 (98%)	119 (98%)	2 (2%)	0	100	100
41	k	142/144 (99%)	139 (98%)	2 (1%)	1 (1%)	19	27
42	l	132/136 (97%)	131 (99%)	1 (1%)	0	100	100
43	m	116/127 (91%)	113 (97%)	3 (3%)	0	100	100
44	n	114/117 (97%)	112 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
45	o	112/115 (97%)	110 (98%)	2 (2%)	0	100	100
46	p	115/118 (98%)	114 (99%)	1 (1%)	0	100	100
47	q	101/103 (98%)	100 (99%)	1 (1%)	0	100	100
48	r	107/110 (97%)	106 (99%)	1 (1%)	0	100	100
49	s	91/100 (91%)	90 (99%)	1 (1%)	0	100	100
50	t	89/104 (86%)	89 (100%)	0	0	100	100
51	u	91/94 (97%)	90 (99%)	1 (1%)	0	100	100
52	v	73/85 (86%)	72 (99%)	1 (1%)	0	100	100
53	w	75/78 (96%)	75 (100%)	0	0	100	100
54	x	58/63 (92%)	58 (100%)	0	0	100	100
55	y	56/59 (95%)	55 (98%)	1 (2%)	0	100	100
56	z	52/57 (91%)	52 (100%)	0	0	100	100
All	All	5832/6819 (86%)	5752 (99%)	77 (1%)	3 (0%)	50	64

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
16	J	57	VAL
41	k	29	LYS
8	B	165	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	0	46/49 (94%)	45 (98%)	1 (2%)	47	65
2	1	37/38 (97%)	37 (100%)	0	100	100
3	2	51/52 (98%)	50 (98%)	1 (2%)	50	68
4	3	34/34 (100%)	34 (100%)	0	100	100
5	4	55/62 (89%)	53 (96%)	2 (4%)	30	47

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	B	184/199 (92%)	178 (97%)	6 (3%)	33	51
9	C	170/190 (90%)	169 (99%)	1 (1%)	84	92
10	D	172/173 (99%)	166 (96%)	6 (4%)	31	49
11	E	117/126 (93%)	113 (97%)	4 (3%)	32	50
12	F	88/116 (76%)	88 (100%)	0	100	100
13	G	124/147 (84%)	118 (95%)	6 (5%)	21	35
14	H	104/105 (99%)	104 (100%)	0	100	100
15	I	103/107 (96%)	101 (98%)	2 (2%)	52	70
16	J	85/90 (94%)	83 (98%)	2 (2%)	44	63
17	K	89/98 (91%)	88 (99%)	1 (1%)	70	84
18	L	101/103 (98%)	96 (95%)	5 (5%)	20	34
19	M	93/96 (97%)	92 (99%)	1 (1%)	70	84
20	N	83/84 (99%)	83 (100%)	0	100	100
21	O	76/77 (99%)	76 (100%)	0	100	100
22	P	64/65 (98%)	64 (100%)	0	100	100
23	Q	73/78 (94%)	71 (97%)	2 (3%)	40	58
24	R	55/65 (85%)	55 (100%)	0	100	100
25	S	72/79 (91%)	72 (100%)	0	100	100
26	T	65/66 (98%)	65 (100%)	0	100	100
27	U	48/61 (79%)	48 (100%)	0	100	100
28	V	203/204 (100%)	200 (98%)	3 (2%)	60	77
29	W	174/579 (30%)	171 (98%)	3 (2%)	56	73
33	c	216/218 (99%)	215 (100%)	1 (0%)	86	94
34	d	162/163 (99%)	162 (100%)	0	100	100
35	e	165/165 (100%)	165 (100%)	0	100	100
36	f	148/150 (99%)	143 (97%)	5 (3%)	32	50
37	g	130/138 (94%)	128 (98%)	2 (2%)	60	77
38	h	32/114 (28%)	29 (91%)	3 (9%)	7	10
39	i	115/116 (99%)	115 (100%)	0	100	100
40	j	104/104 (100%)	103 (99%)	1 (1%)	73	85
41	k	103/103 (100%)	103 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
42	l	107/107 (100%)	106 (99%)	1 (1%)	75	87
43	m	98/103 (95%)	98 (100%)	0	100	100
44	n	86/87 (99%)	83 (96%)	3 (4%)	31	49
45	o	99/100 (99%)	98 (99%)	1 (1%)	73	85
46	p	89/90 (99%)	89 (100%)	0	100	100
47	q	84/84 (100%)	83 (99%)	1 (1%)	67	82
48	r	92/93 (99%)	91 (99%)	1 (1%)	70	84
49	s	80/84 (95%)	80 (100%)	0	100	100
50	t	76/85 (89%)	76 (100%)	0	100	100
51	u	77/78 (99%)	77 (100%)	0	100	100
52	v	56/63 (89%)	56 (100%)	0	100	100
53	w	67/68 (98%)	67 (100%)	0	100	100
54	x	54/55 (98%)	54 (100%)	0	100	100
55	y	48/49 (98%)	48 (100%)	0	100	100
56	z	46/48 (96%)	46 (100%)	0	100	100
All	All	4900/5608 (87%)	4835 (99%)	65 (1%)	64	80

5 of 65 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
40	j	58	LEU
44	n	2	ASP
13	G	78	ARG
13	G	75	VAL
44	n	49	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 41 such sidechains are listed below:

Mol	Chain	Res	Type
29	W	551	ASN
47	q	43	ASN
33	c	37	ASN
46	p	44	GLN
51	u	49	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
30	Z	75/77 (97%)	17 (22%)	3 (4%)
31	a	2774/2930 (94%)	310 (11%)	0
32	b	118/119 (99%)	8 (6%)	0
6	9	6/24 (25%)	1 (16%)	0
7	A	1508/1554 (97%)	177 (11%)	37 (2%)
All	All	4481/4704 (95%)	513 (11%)	40 (0%)

5 of 513 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
6	9	19	G
7	A	4	U
7	A	5	U
7	A	8	A
7	A	9	G

5 of 40 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
7	A	1225	A
7	A	1459	G
7	A	1298	U
7	A	1397	C
30	Z	7	G

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

39 non-standard protein/DNA/RNA residues 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
7	2MG	A	1516	7	18,26,27	1.01	2 (11%)	16,38,41	0.79	0
18	D2T	L	89	18	7,9,10	0.95	0	6,11,13	2.24	4 (66%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
31	PSU	a	746	31,59	18,21,22	0.91	1 (5%)	22,30,33	0.62	0
31	5MU	a	747	31	19,22,23	0.27	0	28,32,35	0.37	0
31	H2U	a	2449	31	18,21,22	0.61	0	21,30,33	0.85	2 (9%)
7	2MG	A	1207	7,58	18,26,27	1.02	2 (11%)	16,38,41	0.75	0
31	5MU	a	1939	58,31	19,22,23	0.28	0	28,32,35	0.35	0
17	IAS	K	119	17	6,7,8	0.92	0	6,8,10	1.01	0
31	2MG	a	1835	31	18,26,27	1.04	2 (11%)	16,38,41	0.67	0
7	5MC	A	967	7	18,22,23	0.32	0	26,32,35	0.49	0
7	PSU	A	516	7,59	18,21,22	0.90	1 (5%)	22,30,33	0.64	0
31	2MG	a	2445	31	18,26,27	1.03	2 (11%)	16,38,41	0.69	0
31	3TD	a	1915	31	18,22,23	0.96	1 (5%)	22,32,35	0.63	0
31	OMC	a	2498	31,59	19,22,23	0.27	0	26,31,34	0.48	0
31	G7M	a	2069	31	20,26,27	1.15	3 (15%)	17,39,42	0.48	0
34	MEQ	d	150	34	8,9,10	0.42	0	5,10,12	0.54	0
7	MA6	A	1519	7	18,26,27	0.74	0	19,38,41	0.56	0
31	PSU	a	955	31	18,21,22	0.92	1 (5%)	22,30,33	0.58	0
31	PSU	a	1911	31	18,21,22	0.89	1 (5%)	22,30,33	0.65	0
31	PSU	a	2605	31	18,21,22	0.93	1 (5%)	22,30,33	0.74	0
7	2MG	A	966	7	18,26,27	1.01	2 (11%)	16,38,41	0.81	0
31	OMG	a	2251	58,30,31	18,26,27	1.00	2 (11%)	19,38,41	0.69	0
31	6MZ	a	2030	31	18,25,26	0.68	0	16,36,39	0.77	1 (6%)
7	5MC	A	1407	7	18,22,23	0.33	0	26,32,35	0.58	0
31	PSU	a	2457	31	18,21,22	0.91	1 (5%)	22,30,33	0.60	0
31	6MZ	a	1618	31	18,25,26	0.67	0	16,36,39	0.70	1 (6%)
31	PSU	a	2504	58,31	18,21,22	0.89	1 (5%)	22,30,33	0.69	0
31	2MA	a	2503	58,31,59	19,25,26	1.03	1 (5%)	21,37,40	1.81	5 (23%)
31	5MC	a	1962	31	18,22,23	0.33	0	26,32,35	0.48	0
42	4D4	l	81	42	9,11,12	0.50	0	8,13,15	0.60	0
7	UR3	A	1498	7	19,22,23	0.28	0	26,32,35	0.68	0
31	1MG	a	745	31	18,26,27	0.97	1 (5%)	19,39,42	0.53	0
7	4OC	A	1402	7	20,23,24	0.37	0	26,32,35	0.49	0
31	PSU	a	2580	58,31	18,21,22	0.94	1 (5%)	22,30,33	0.78	1 (4%)
31	PSU	a	2604	31	18,21,22	0.91	1 (5%)	22,30,33	0.69	0
7	MA6	A	1518	7	18,26,27	0.75	0	19,38,41	0.46	0
31	OMU	a	2552	31	19,22,23	0.20	0	26,31,34	0.46	0
31	PSU	a	1917	31	18,21,22	0.90	1 (5%)	22,30,33	0.54	0
7	G7M	A	527	7	20,26,27	1.14	2 (10%)	17,39,42	0.50	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
7	2MG	A	1516	7	-	0/5/27/28	0/3/3/3
18	D2T	L	89	18	-	2/7/12/14	-
31	PSU	a	746	31,59	-	3/7/25/26	0/2/2/2
31	5MU	a	747	31	-	0/7/25/26	0/2/2/2
31	H2U	a	2449	31	-	0/7/38/39	0/2/2/2
7	2MG	A	1207	7,58	-	0/5/27/28	0/3/3/3
31	5MU	a	1939	58,31	-	0/7/25/26	0/2/2/2
17	IAS	K	119	17	-	2/7/7/8	-
31	2MG	a	1835	31	-	0/5/27/28	0/3/3/3
7	5MC	A	967	7	-	0/7/25/26	0/2/2/2
7	PSU	A	516	7,59	-	0/7/25/26	0/2/2/2
31	2MG	a	2445	31	-	0/5/27/28	0/3/3/3
31	3TD	a	1915	31	-	2/7/25/26	0/2/2/2
31	OMC	a	2498	31,59	-	0/9/27/28	0/2/2/2
31	G7M	a	2069	31	-	2/3/25/26	0/3/3/3
34	MEQ	d	150	34	-	2/8/9/11	-
7	MA6	A	1519	7	-	0/7/29/30	0/3/3/3
31	PSU	a	955	31	-	0/7/25/26	0/2/2/2
31	PSU	a	1911	31	-	2/7/25/26	0/2/2/2
31	PSU	a	2605	31	-	0/7/25/26	0/2/2/2
7	2MG	A	966	7	-	0/5/27/28	0/3/3/3
31	OMG	a	2251	58,30,31	-	1/5/27/28	0/3/3/3
31	6MZ	a	2030	31	-	2/5/27/28	0/3/3/3
7	5MC	A	1407	7	-	0/7/25/26	0/2/2/2
31	PSU	a	2457	31	-	0/7/25/26	0/2/2/2
31	6MZ	a	1618	31	-	0/5/27/28	0/3/3/3
31	PSU	a	2504	58,31	-	0/7/25/26	0/2/2/2
31	2MA	a	2503	58,31,59	-	2/3/25/26	0/3/3/3
31	5MC	a	1962	31	-	4/7/25/26	0/2/2/2
42	4D4	l	81	42	-	1/11/12/14	-
7	UR3	A	1498	7	-	0/7/25/26	0/2/2/2
31	1MG	a	745	31	-	0/3/25/26	0/3/3/3
7	4OC	A	1402	7	-	0/9/29/30	0/2/2/2
31	PSU	a	2580	58,31	-	0/7/25/26	0/2/2/2
31	PSU	a	2604	31	-	0/7/25/26	0/2/2/2
7	MA6	A	1518	7	-	0/7/29/30	0/3/3/3
31	OMU	a	2552	31	-	0/9/27/28	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
31	PSU	a	1917	31	-	0/7/25/26	0/2/2/2
7	G7M	A	527	7	-	1/3/25/26	0/3/3/3

The worst 5 of 30 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
31	a	2580	PSU	C6-C5	3.74	1.39	1.35
31	a	2605	PSU	C6-C5	3.66	1.39	1.35
31	a	1915	3TD	C6-C5	3.64	1.39	1.35
31	a	746	PSU	C6-C5	3.62	1.39	1.35
31	a	2457	PSU	C6-C5	3.59	1.39	1.35

The worst 5 of 14 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
31	a	2503	2MA	C5-C6-N1	-5.49	117.40	121.01
31	a	2503	2MA	C5-C6-N6	4.23	126.79	120.35
18	L	89	D2T	CB-CA-N	3.81	117.23	109.10
31	a	2503	2MA	CM2-C2-N1	2.85	121.61	117.15
18	L	89	D2T	OD1-CG-CB	-2.53	117.15	122.44

There are no chirality outliers.

5 of 26 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
31	a	746	PSU	C2'-C1'-C5-C4
31	a	1911	PSU	O4'-C1'-C5-C4
31	a	1911	PSU	O4'-C1'-C5-C6
31	a	1915	3TD	C3'-C4'-C5'-O5'
31	a	1915	3TD	O4'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 417 ligands modelled in this entry, 417 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

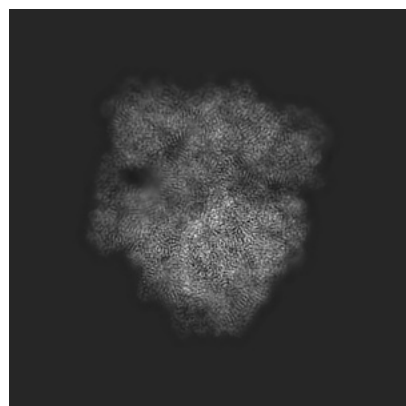
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51353. These allow visual inspection of the internal detail of the map and identification of artifacts.

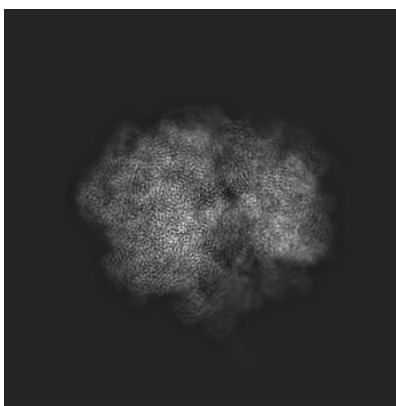
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

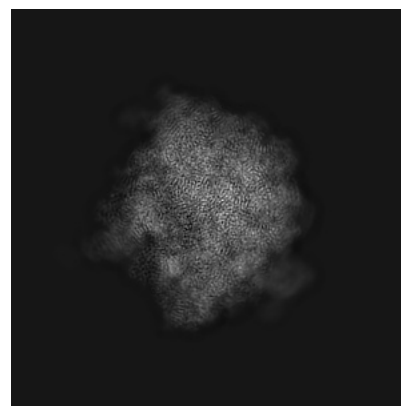
6.1.1 Primary map



X

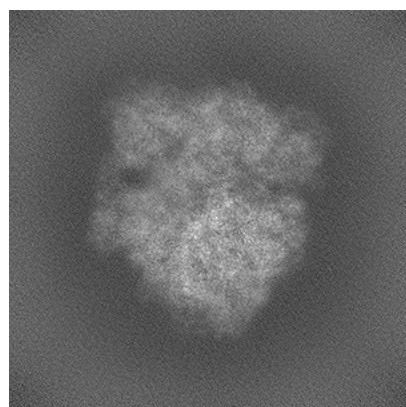


Y

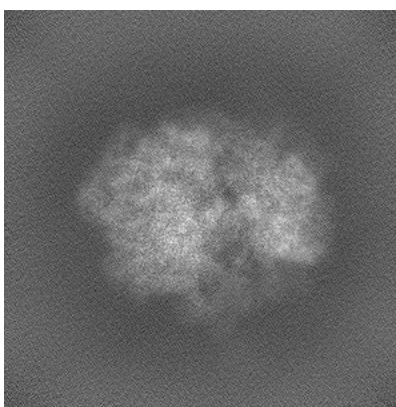


Z

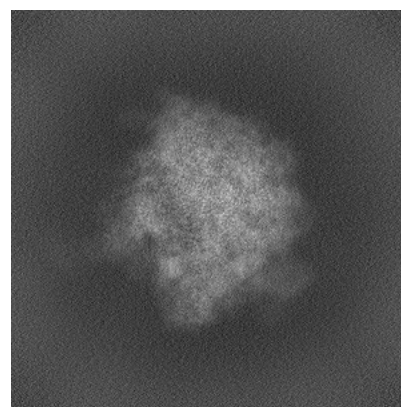
6.1.2 Raw map



X



Y

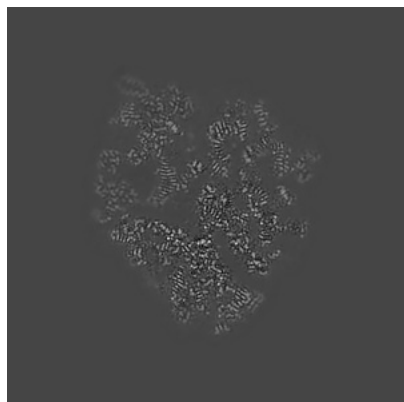


Z

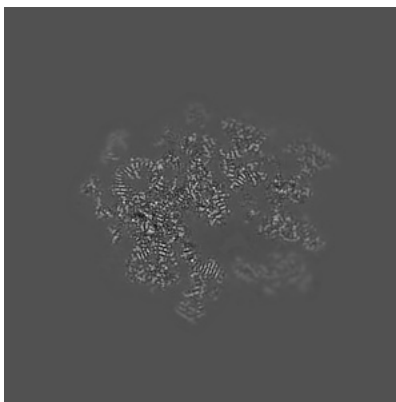
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

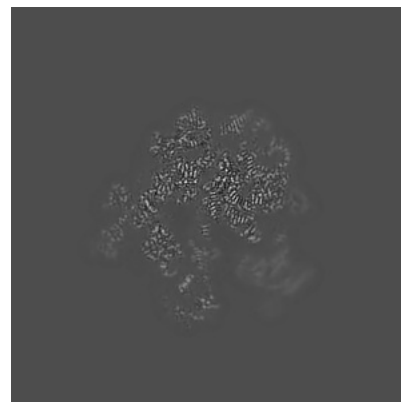
6.2.1 Primary map



X Index: 300

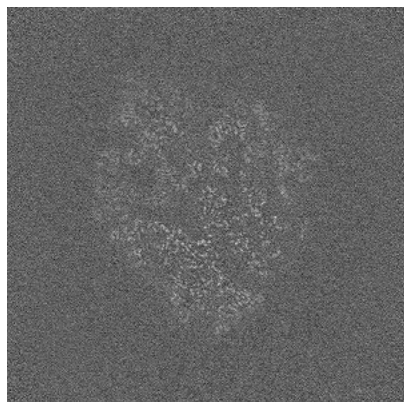


Y Index: 300

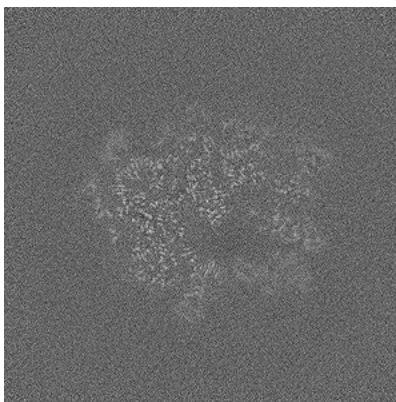


Z Index: 300

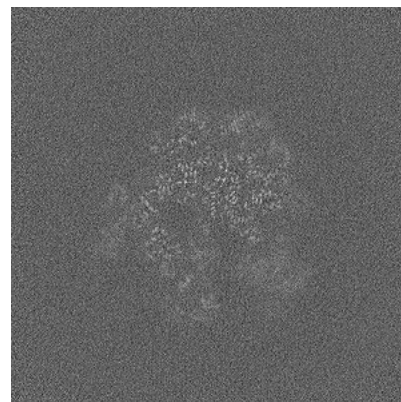
6.2.2 Raw map



X Index: 300



Y Index: 300



Z Index: 300

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

6.3 Largest variance slices [i](#)

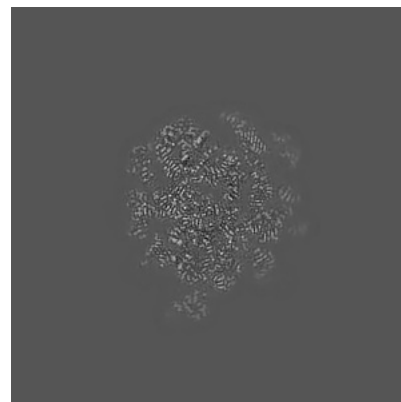
6.3.1 Primary map



X Index: 286

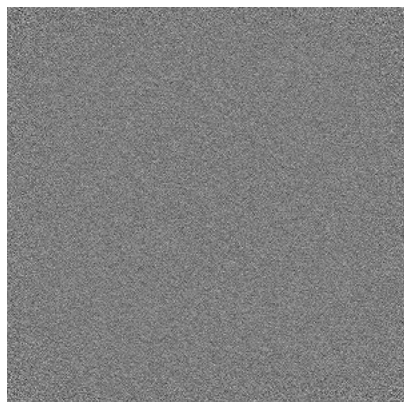


Y Index: 319

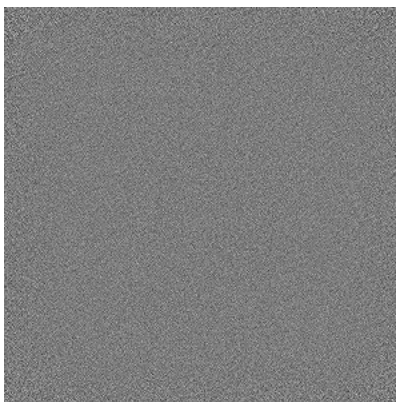


Z Index: 241

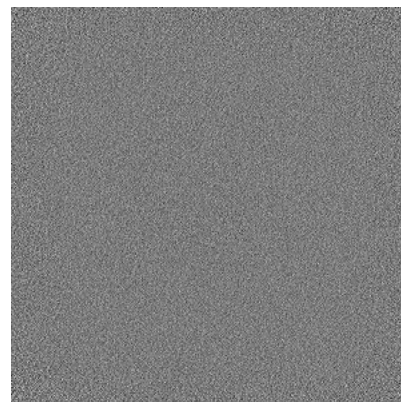
6.3.2 Raw map



X Index: 0



Y Index: 0

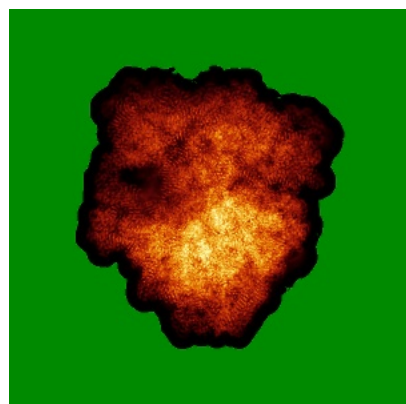


Z Index: 0

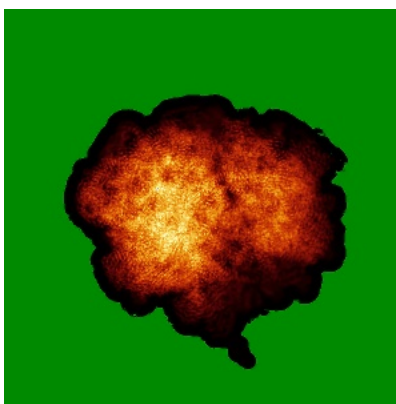
The images above show the largest variance slices of the map in three orthogonal directions.

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

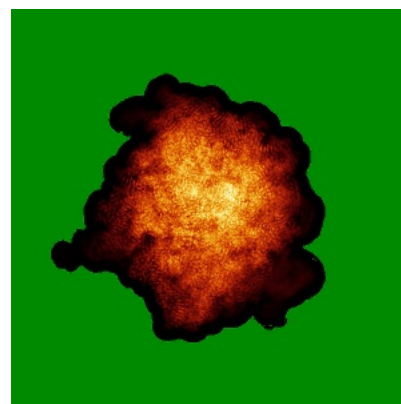
6.4.1 Primary map



X

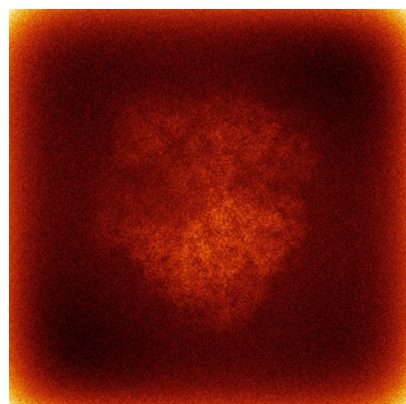


Y

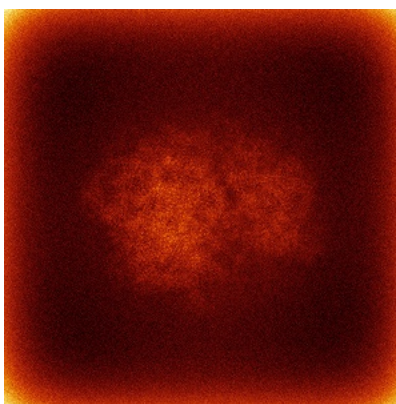


Z

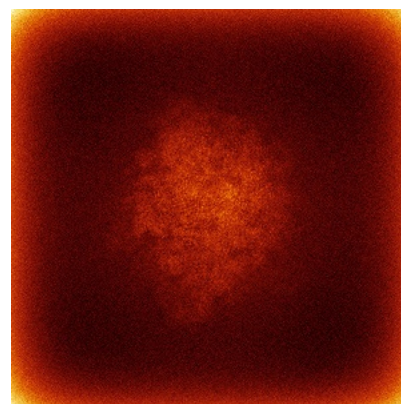
6.4.2 Raw map



X



Y

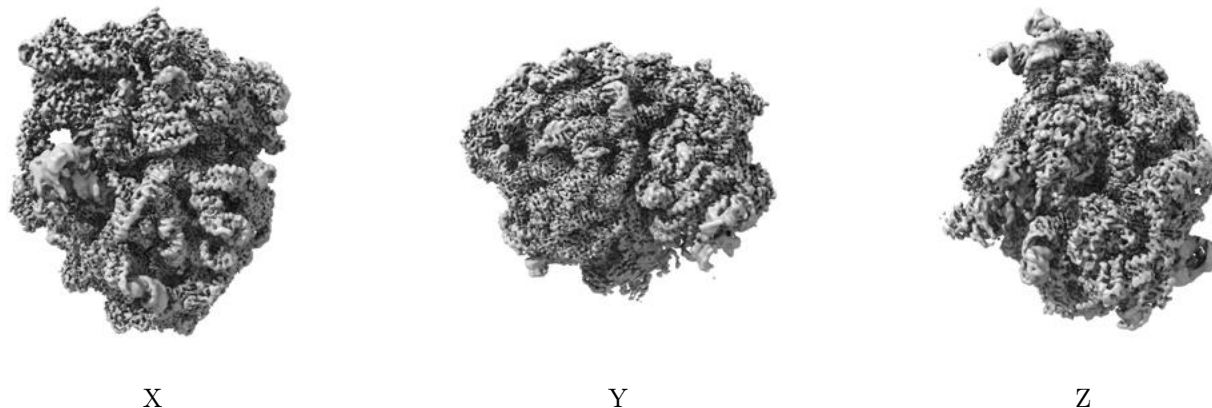


Z

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

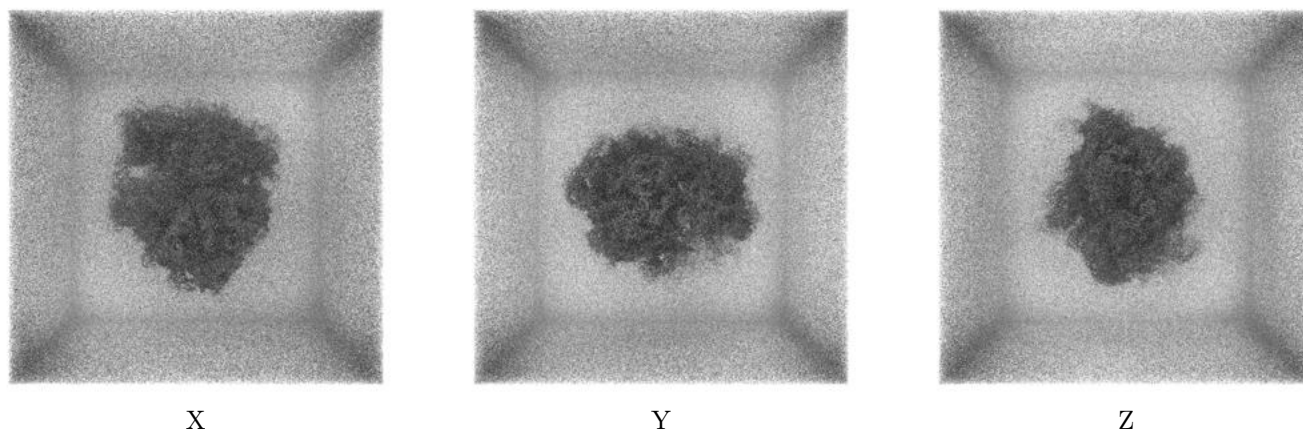
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

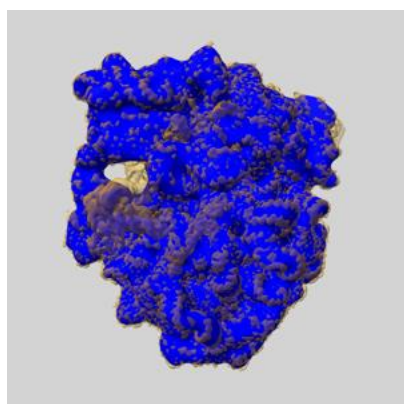
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

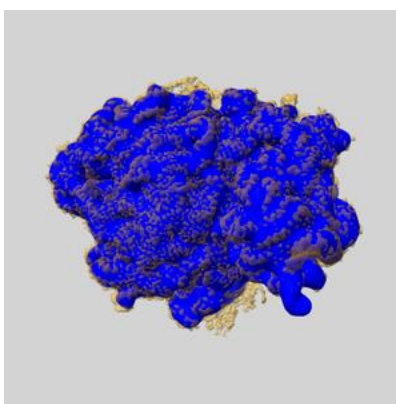
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

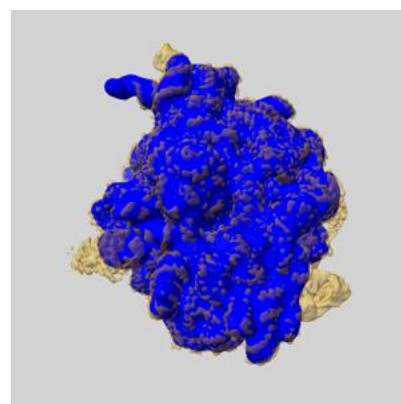
6.6.1 emd_51353_msk_1.map [i](#)



X



Y

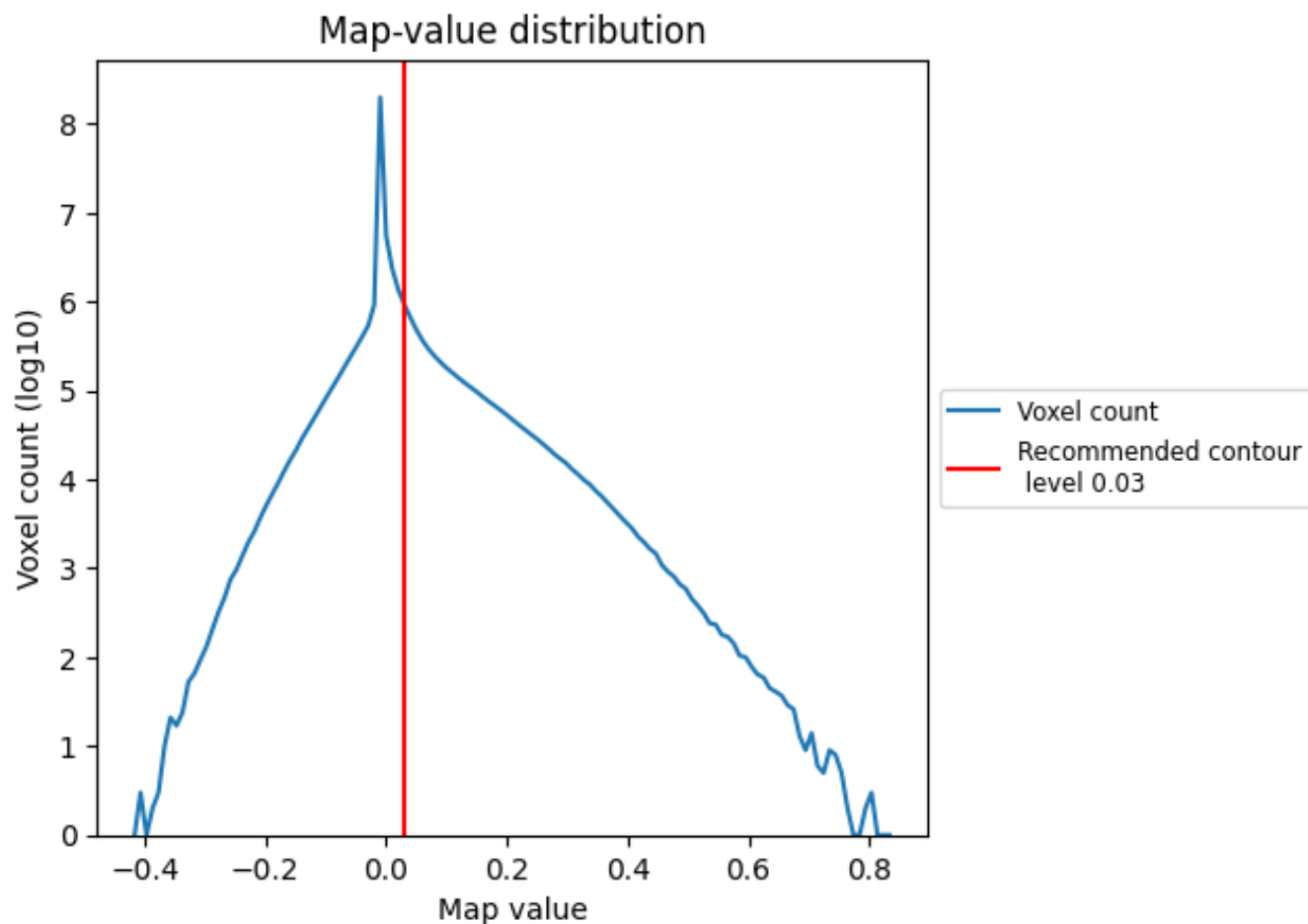


Z

7 Map analysis [i](#)

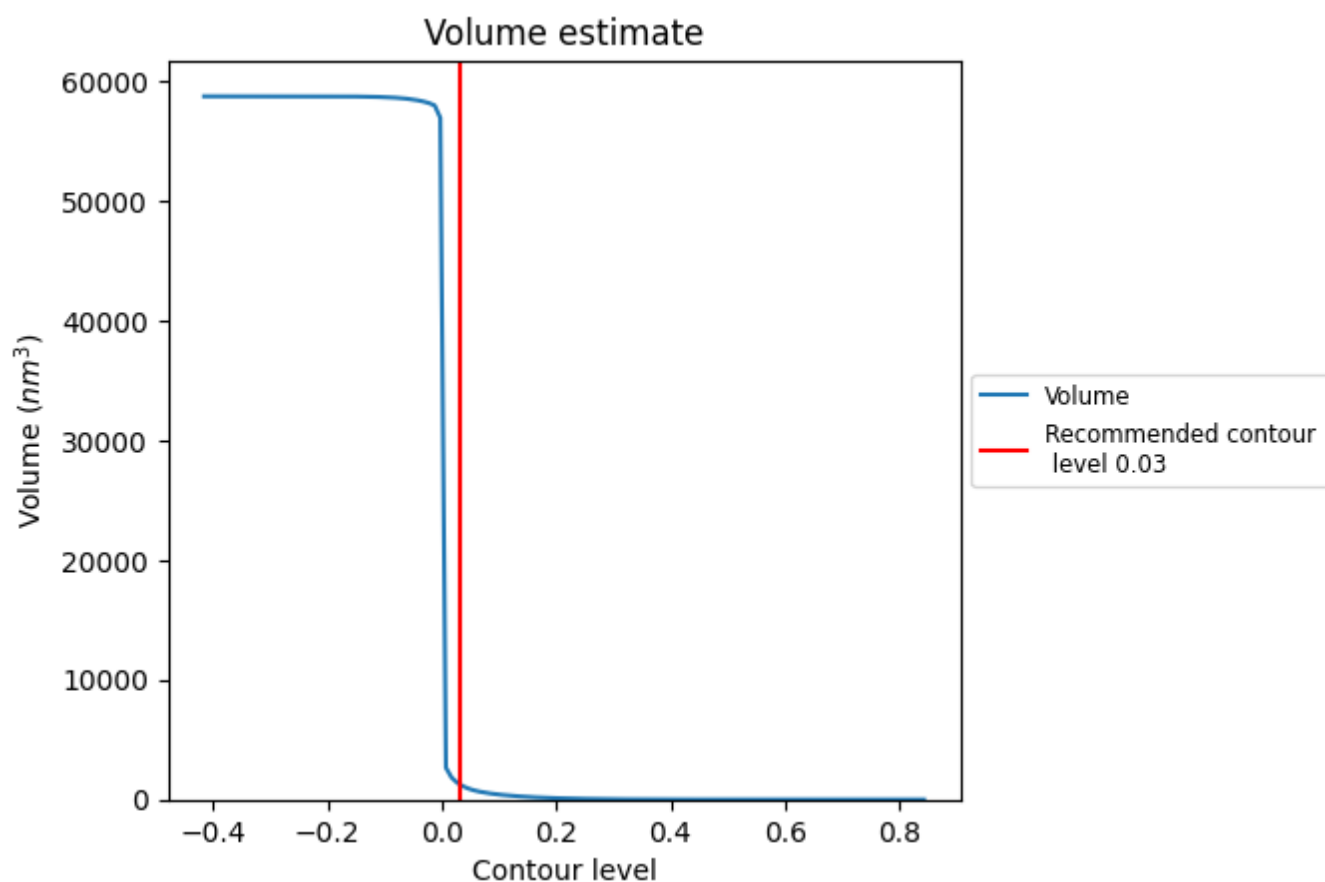
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

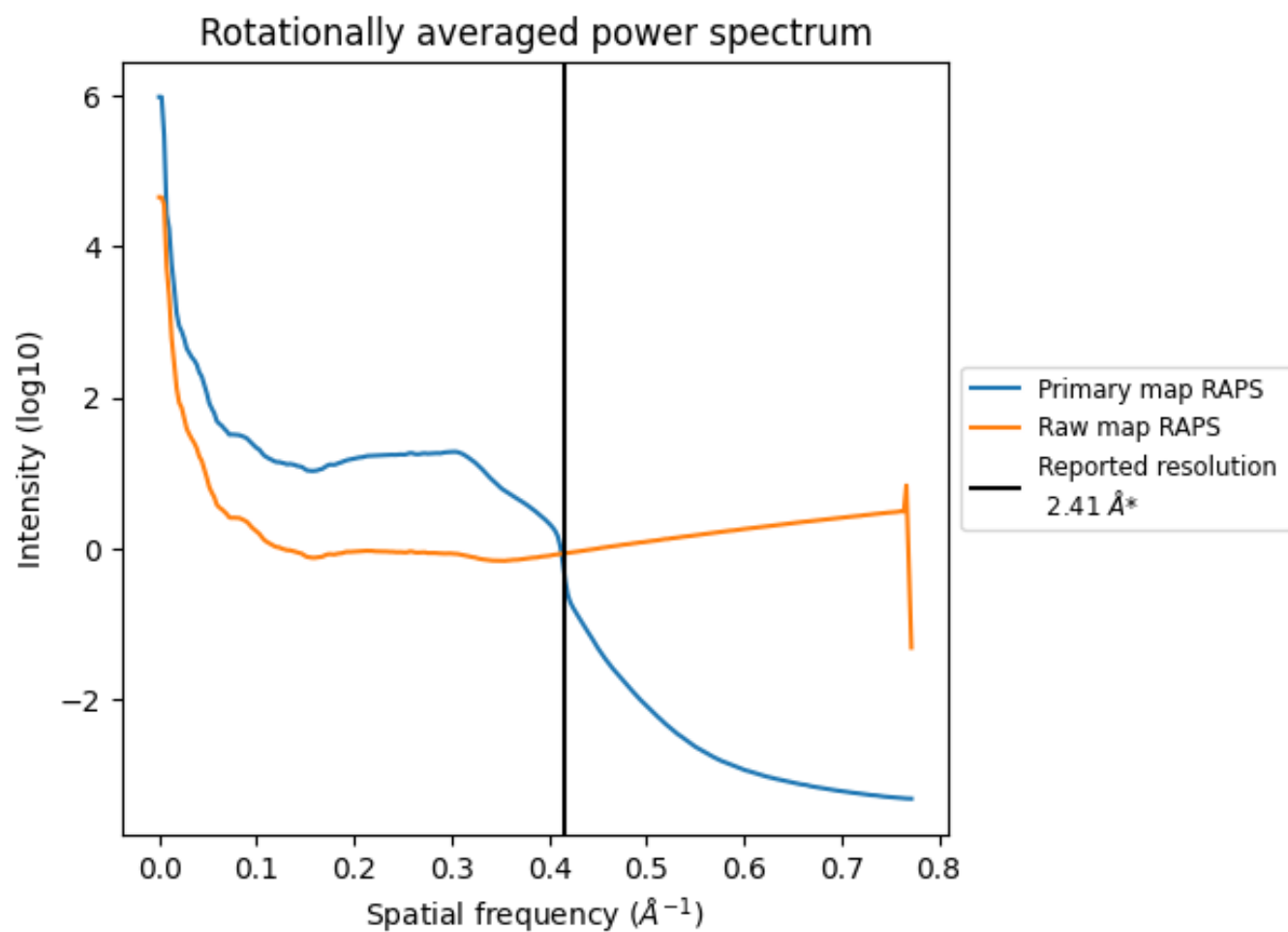
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1309 nm^3 ; this corresponds to an approximate mass of 1183 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 ⓘ

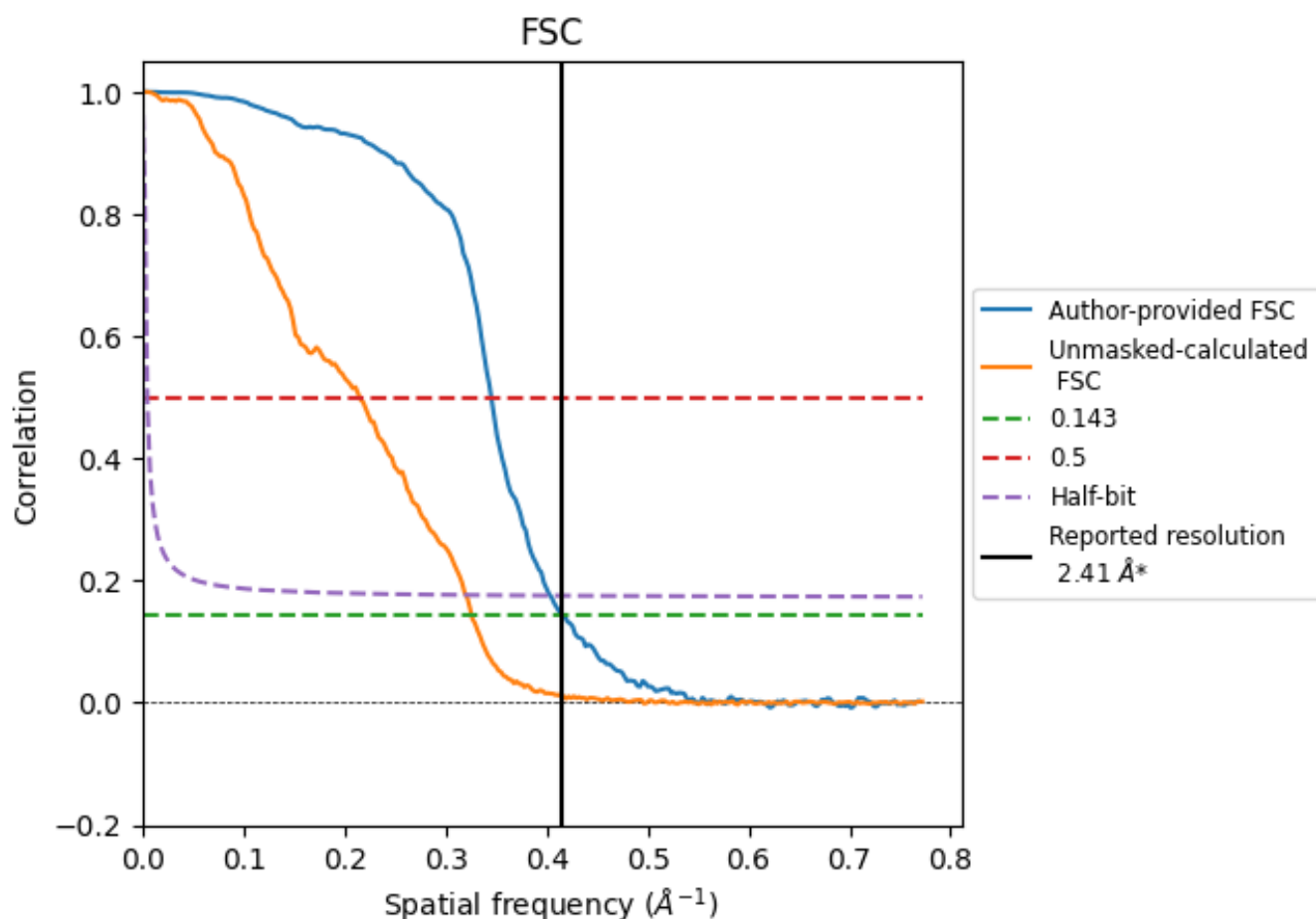


*Reported resolution corresponds to spatial frequency of 0.415 \AA^{-1}

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.415 \AA^{-1}

8.2 Resolution estimates [i](#)

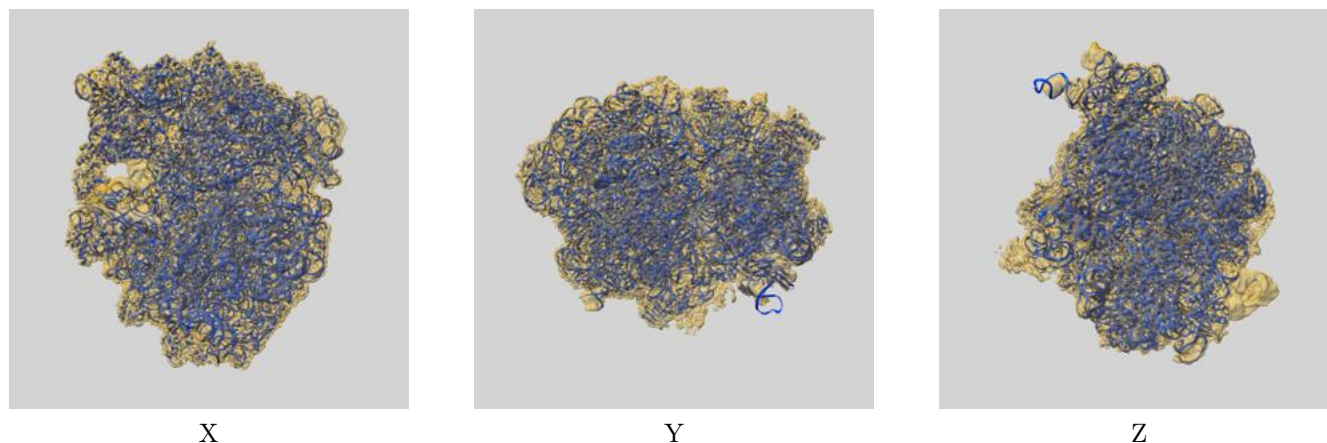
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.41	-	-
Author-provided FSC curve	2.41	2.90	2.48
Unmasked-calculated*	3.07	4.65	3.12

*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 3.07 differs from the reported value 2.41 by more than 10 %

9 Map-model fit [i](#)

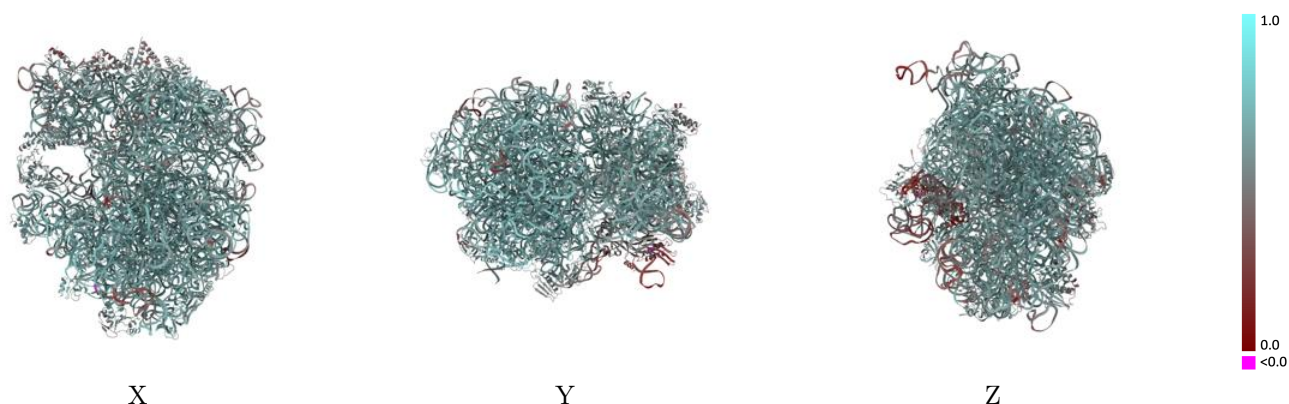
This section contains information regarding the fit between EMDB map EMD-51353 and PDB model 9GHD. Per-residue inclusion information can be found in section [3](#) on page [15](#).

9.1 Map-model overlay [i](#)



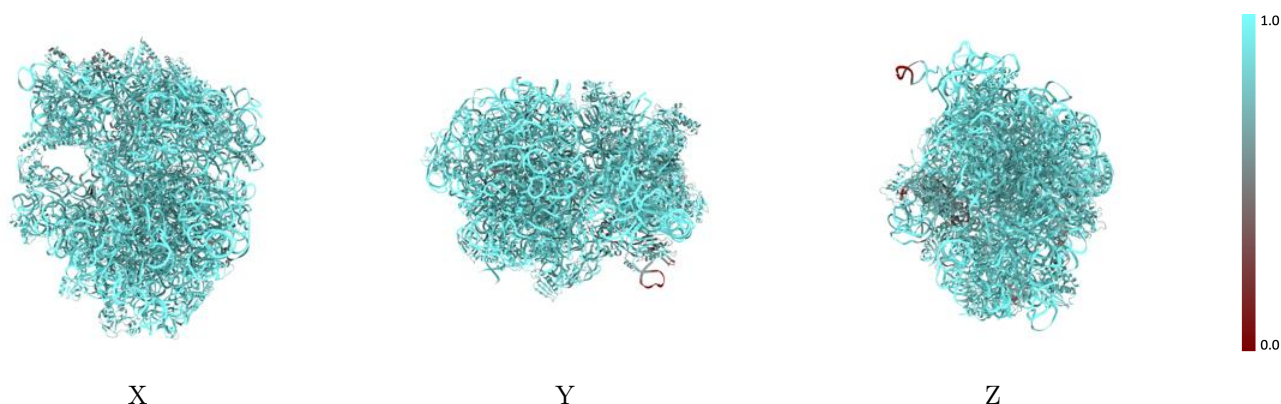
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



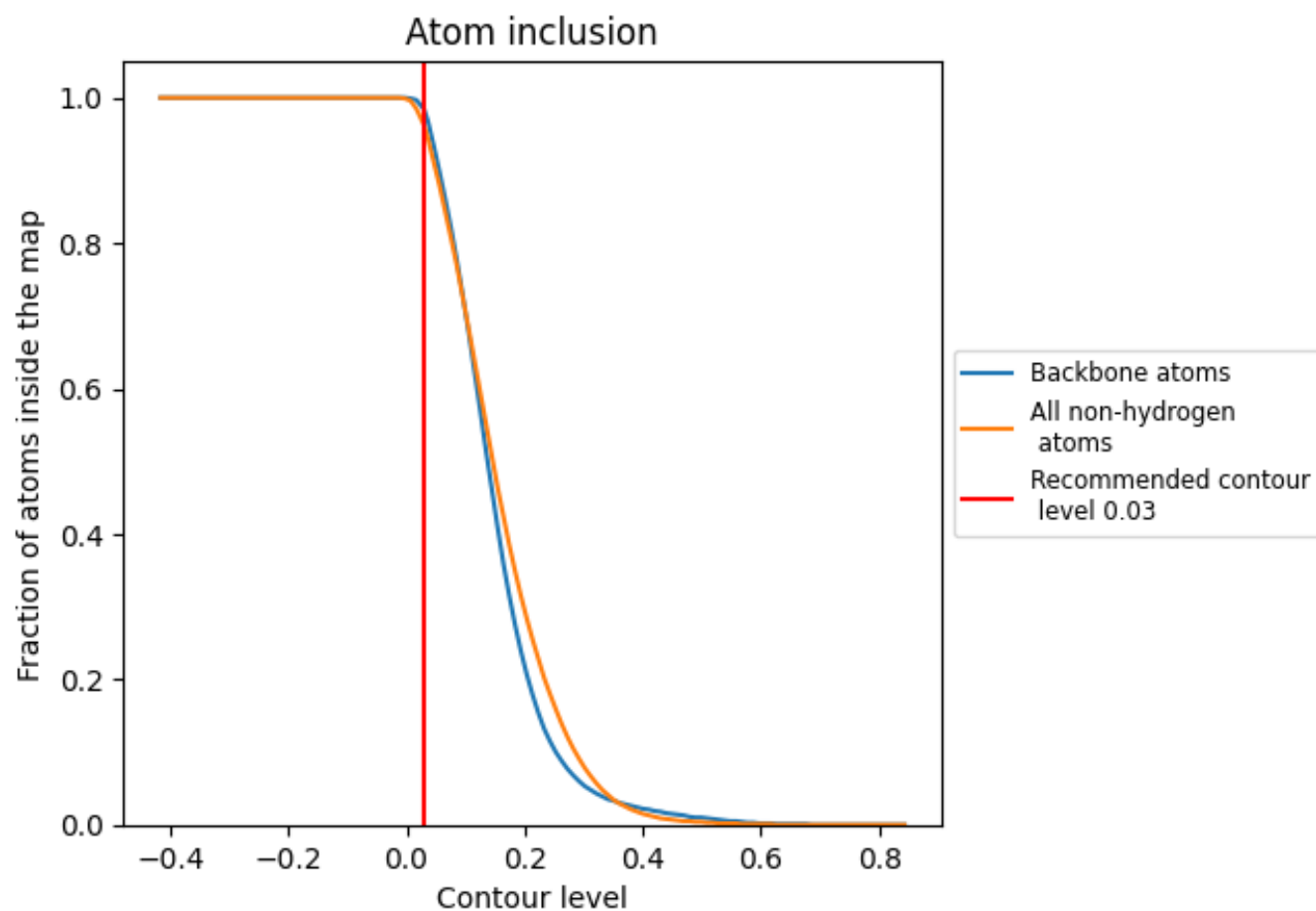
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.03).







































































9.4 Atom inclusion [i](#)



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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9620	 0.6240
0	 0.9330	 0.6220
1	 0.9970	 0.7090
2	 0.9980	 0.6990
3	 0.9630	 0.6300
4	 0.8370	 0.4940
9	 0.9870	 0.6180
A	 0.9820	 0.6220
B	 0.8210	 0.5000
C	 0.8980	 0.5630
D	 0.9090	 0.5680
E	 0.9430	 0.6170
F	 0.9130	 0.5560
G	 0.8640	 0.5350
H	 0.9530	 0.6170
I	 0.9020	 0.5510
J	 0.8200	 0.4980
K	 0.9240	 0.5970
L	 0.9430	 0.6120
M	 0.9050	 0.5690
N	 0.9260	 0.5700
O	 0.9360	 0.6030
P	 0.9360	 0.6020
Q	 0.9250	 0.5740
R	 0.9280	 0.5850
S	 0.8940	 0.5490
T	 0.9440	 0.5970
U	 0.8570	 0.5340
V	 0.6450	 0.3290
W	 0.6640	 0.3060
Z	 0.9530	 0.5880
a	 0.9900	 0.6550
b	 0.9910	 0.6330
c	 0.9800	 0.6800
d	 0.9700	 0.6680



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Chain	Atom inclusion	Q-score
e	 0.9360	 0.6270
f	 0.8890	 0.5440
g	 0.8770	 0.5400
h	 0.8970	 0.5560
i	 0.9750	 0.6620
j	 0.9510	 0.6490
k	 0.9660	 0.6570
l	 0.9650	 0.6520
m	 0.9930	 0.6870
n	 0.9320	 0.6000
o	 0.9480	 0.6450
p	 0.9870	 0.6920
q	 0.9400	 0.6290
r	 0.9650	 0.6590
s	 0.9350	 0.6080
t	 0.9480	 0.6070
u	 0.9120	 0.6000
v	 0.9730	 0.6690
w	 0.9680	 0.6590
x	 0.9210	 0.5830
y	 0.9540	 0.6570
z	 0.9780	 0.6680