WORLDWIDE PDB
PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Jul 2, 2024 – 07:27 PM JST

PDB ID	:	8XT1
EMDB ID	:	EMD-38633
Title	:	Cryo-EM structure of the human 39S mitoribosome with 5uM Tigecycline
Authors	:	Li, X.; Wang, M.; Cheng, J.
Deposited on	:	2024-01-10
Resolution	:	3.10 Å(reported)
Based on initial model	:	7A5I

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 (i) symbol.

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

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

EMDB validation analysis	:	0.0.1.dev92
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)	:	2.37.1

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 3.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
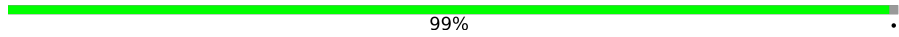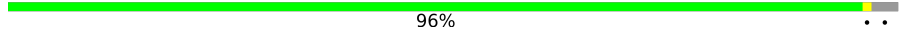
Metric	Percentile Ranks	Value
Ramachandran outliers		0.0%
Sidechain outliers		0.2%
RNA backbone		0.52

Worse   *Better*

▌ Percentile relative to all structures

▯ Percentile relative to all EM structures
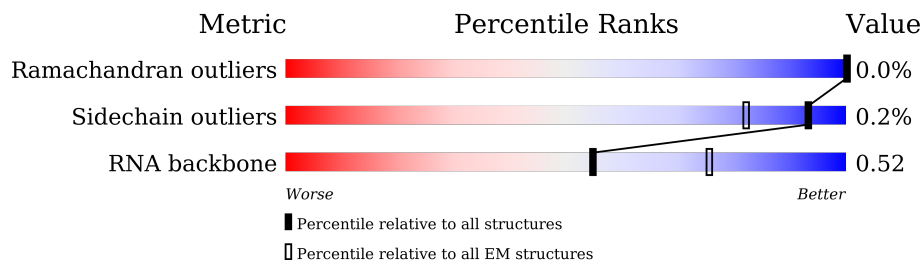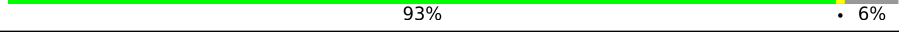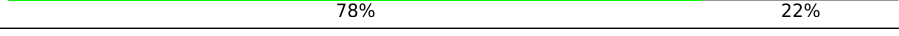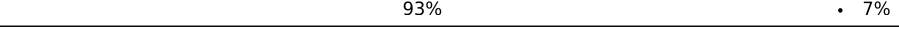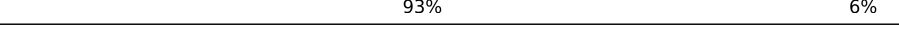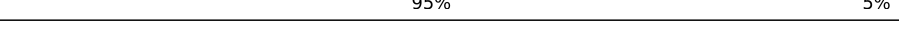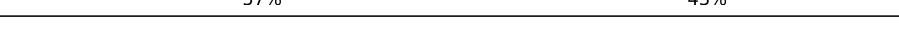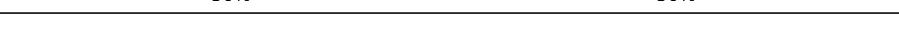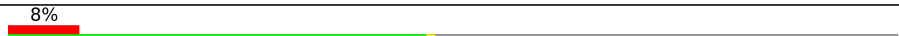
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	L1	1559	72% 23% • •
2	L2	69	57% 23% • 19%
3	LB	305	78% 22%
4	LC	348	87% 13%
5	LD	311	80% 20%
6	LI	267	36% 64%
7	LJ	261	60% • 39%
8	LK	192	5% 90% • 9%
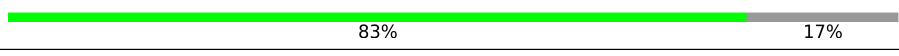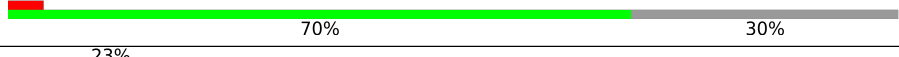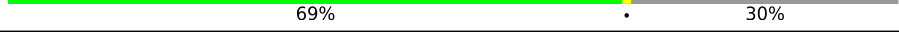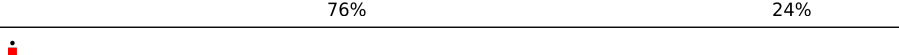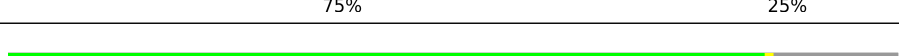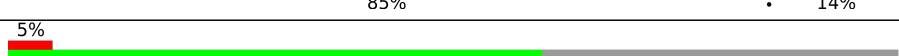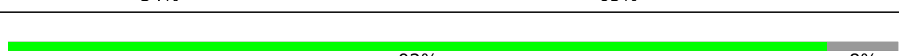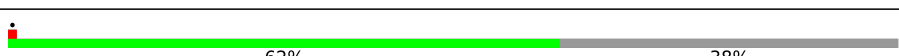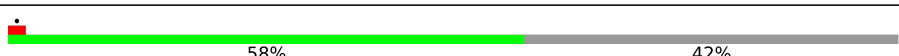
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Mol	Chain	Length	Quality of chain
9	LM	178	99%
10	LN	145	79% 21%
11	LO	296	96%
12	LP	251	88% 12%
13	LQ	175	85% 13%
14	LR	179	80% 18%
15	LS	292	75% 25%
16	LT	149	93% 6%
17	LU	205	78% 22%
18	LV	212	78% 22%
19	LW	153	93% 7%
20	LX	216	93% 6%
21	La	148	75% 25%
22	Lb	256	95% 5%
23	Lu	250	70% 30%
24	Ld	161	74% 25%
25	Lf	188	57% 43%
26	Lg	65	80% 20%
27	Lh	92	50% 50%
28	Li	188	50% 49%
29	Lj	103	37% 63%
30	Lk	423	93% 7%
31	Ll	380	93% 7%
32	Lm	338	87% 13%
33	Ln	206	8% 47% 52%

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Mol	Chain	Length	Quality of chain
34	Lo	137	89% · 9%
35	Lp	142	68% · 32%
36	Lq	215	69% 31%
37	Lr	332	83% 17%
38	Ls	306	70% 30%
39	Lt	279	23% 75% · 22%
40	Lv	212	8% 62% 38%
41	Lw	166	80% 20%
42	Lx	158	69% · 30%
43	Ly	128	76% 24%
44	Lz	123	75% 25%
45	L3	112	85% · 14%
46	L4	138	5% 60% 40%
47	L5	128	6% 34% · 65%
48	L6	102	92% 8%
49	L7	206	62% 38%
50	L8	222	58% 42%
51	SR	196	74% · 26%
52	Sf	439	84% 16%

2   Entry composition ⓘ

There are 55 unique types of molecules in this entry. The entry contains 100095 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called 16s rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	L1	1500	Total 31847	C 14290	N 5750	O 10307	P 1500	0	0

- Molecule 2 is a RNA chain called Val tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L2	56	Total 1191	C 534	N 214	O 387	P 56	0	0

- Molecule 3 is a protein called Large ribosomal subunit protein uL2m.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	LB	237	Total 1851	C 1151	N 375	O 316	S 9	0	0

- Molecule 4 is a protein called Large ribosomal subunit protein uL3m.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	LC	304	Total 2393	C 1538	N 415	O 429	S 11	0	0

- Molecule 5 is a protein called Large ribosomal subunit protein uL4m.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	LD	250	Total 2013	C 1294	N 365	O 348	S 6	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein bL9m.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	LI	95	Total 784	C 498	N 152	O 134	0	0

- Molecule 7 is a protein called Large ribosomal subunit protein uL10m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	LJ	158	1283	828	235	210	10	0	0

- Molecule 8 is a protein called Large ribosomal subunit protein uL11m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	LK	175	1330	847	237	244	2	0	0

- Molecule 9 is a protein called Large ribosomal subunit protein uL13m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	LM	177	1451	934	259	251	7	0	0

- Molecule 10 is a protein called Large ribosomal subunit protein uL14m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	LN	115	889	559	171	154	5	0	0

- Molecule 11 is a protein called Large ribosomal subunit protein uL15m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	LO	287	2305	1472	425	402	6	0	0

- Molecule 12 is a protein called Large ribosomal subunit protein uL16m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	LP	221	1779	1138	325	306	10	0	0

- Molecule 13 is a protein called Large ribosomal subunit protein bL17m.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LQ	152	1245	784	239	215	7	0	0

- Molecule 14 is a protein called Mitochondrial ribosomal protein L18, isoform CRA_b.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	LR	146	Total 1189	C 743	N 226	O 215	S 5	0	0

- Molecule 15 is a protein called Large ribosomal subunit protein bL19m.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	LS	219	Total 1822	C 1168	N 322	O 323	S 9	0	0

- Molecule 16 is a protein called Large ribosomal subunit protein bL20m.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	LT	140	Total 1153	C 732	N 231	O 186	S 4	0	0

- Molecule 17 is a protein called Large ribosomal subunit protein bL21m.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	LU	160	Total 1284	C 829	N 226	O 225	S 4	0	0

- Molecule 18 is a protein called 39S ribosomal protein L22, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	LV	166	Total 1368	C 875	N 254	O 232	S 7	0	0

- Molecule 19 is a protein called Large ribosomal subunit protein uL23m.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	LW	143	Total 1188	C 752	N 224	O 208	S 4	0	0

- Molecule 20 is a protein called Large ribosomal subunit protein uL24m.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	LX	202	Total 1652	C 1053	N 294	O 297	S 8	0	0

- Molecule 21 is a protein called Large ribosomal subunit protein bL27m.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	La	111	Total	C	N	O	S	0	0
			871	558	164	146	3		

- Molecule 22 is a protein called Large ribosomal subunit protein bL28m.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Lb	243	Total	C	N	O	S	0	0
			2035	1317	351	362	5		

- Molecule 23 is a protein called Large ribosomal subunit protein uL29m.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Lu	176	Total	C	N	O	S	0	0
			1517	970	291	252	4		

- Molecule 24 is a protein called Large ribosomal subunit protein uL30m.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Ld	120	Total	C	N	O	S	0	0
			978	626	183	166	3		

- Molecule 25 is a protein called Large ribosomal subunit protein bL32m.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Lf	108	Total	C	N	O	S	0	0
			880	545	172	157	6		

- Molecule 26 is a protein called Large ribosomal subunit protein bL33m.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Lg	52	Total	C	N	O	S	0	0
			433	278	83	70	2		

- Molecule 27 is a protein called Large ribosomal subunit protein bL34m.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	Lh	46	Total	C	N	O	S	0	0
			376	233	83	59	1		

- Molecule 28 is a protein called Large ribosomal subunit protein bL35m.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	Li	95	Total 831	C 539	N 162	O 127	S 3	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein bL36m.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Lj	38	Total 341	C 217	N 72	O 48	S 4	0	0

- Molecule 30 is a protein called Large ribosomal subunit protein mL37.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Lk	394	Total 3210	C 2073	N 560	O 566	S 11	0	0

- Molecule 31 is a protein called Large ribosomal subunit protein mL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	Ll	354	Total 2947	C 1881	N 525	O 532	S 9	0	0

- Molecule 32 is a protein called Large ribosomal subunit protein mL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	Lm	293	Total 2382	C 1525	N 404	O 435	S 18	0	0

- Molecule 33 is a protein called Large ribosomal subunit protein mL40.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	Ln	99	Total 836	C 535	N 144	O 155	S 2	0	0

- Molecule 34 is a protein called Large ribosomal subunit protein mL41.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	Lo	124	Total 997	C 644	N 170	O 181	S 2	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein mL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	Lp	97	Total 815	C 514	N 147	O 149	S 5	0	0

- Molecule 36 is a protein called Large ribosomal subunit protein mL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	Lq	148	Total 1178	C 733	N 229	O 213	S 3	0	0

- Molecule 37 is a protein called Large ribosomal subunit protein mL44.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	Lr	275	Total 2217	C 1415	N 383	O 410	S 9	0	0

- Molecule 38 is a protein called Large ribosomal subunit protein mL45.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Ls	214	Total 1754	C 1117	N 304	O 320	S 13	0	0

- Molecule 39 is a protein called Large ribosomal subunit protein mL46.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	Lt	217	Total 1762	C 1124	N 310	O 323	S 5	0	0

- Molecule 40 is a protein called Large ribosomal subunit protein mL48.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	Lv	131	Total 1039	C 663	N 169	O 203	S 4	0	0

- Molecule 41 is a protein called Large ribosomal subunit protein mL49.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	Lw	132	Total 1097	C 710	N 191	O 194	S 2	0	0

- Molecule 42 is a protein called Large ribosomal subunit protein mL50.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	Lx	110	Total 895	C 568	N 156	O 168	S 3	0	0

- Molecule 43 is a protein called Large ribosomal subunit protein mL51.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Ly	97	Total 827	C 532	N 165	O 126	S 4	0	0

- Molecule 44 is a protein called 39S ribosomal protein L52, mitochondrial.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	Lz	92	Total 732	C 454	N 142	O 134	S 2	0	0

- Molecule 45 is a protein called Large ribosomal subunit protein mL53.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	L3	96	Total 743	C 462	N 143	O 133	S 5	0	0

- Molecule 46 is a protein called Large ribosomal subunit protein mL54.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	L4	83	Total 703	C 446	N 124	O 130	S 3	0	0

- Molecule 47 is a protein called Large ribosomal subunit protein mL55.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	L5	45	Total 372	C 232	N 76	O 62	S 2	0	0

- Molecule 48 is a protein called Large ribosomal subunit protein mL63.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	L6	94	Total 797	C 501	N 165	O 128	S 3	0	0

- Molecule 49 is a protein called Large ribosomal subunit protein mL62.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	L7	127	Total 1058	C 661	N 201	O 192	S 4	0	0

- Molecule 50 is a protein called Large ribosomal subunit protein mL64.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	L8	128	Total 1076	C 671	N 208	O 192	S 5	0	0

- Molecule 51 is a protein called Large ribosomal subunit protein mL66.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	SR	146	Total 1203	C 764	N 232	O 199	S 8	0	0

- Molecule 52 is a protein called Large ribosomal subunit protein mL65.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	Sf	370	Total 3036	C 1946	N 542	O 534	S 14	0	0

- Molecule 53 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
53	L1	90	Total 90	Mg 90	0
53	LB	1	Total 1	Mg 1	0
53	LC	1	Total 1	Mg 1	0
53	La	1	Total 1	Mg 1	0
53	Lw	1	Total 1	Mg 1	0
53	L6	1	Total 1	Mg 1	0

- Molecule 54 is TIGECYCLINE (three-letter code: T1C) (formula: $C_{29}H_{41}N_5O_8$) (labeled as "Ligand of Interest" by depositor).
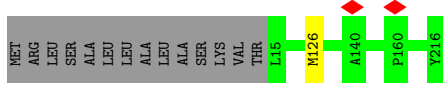
T1C
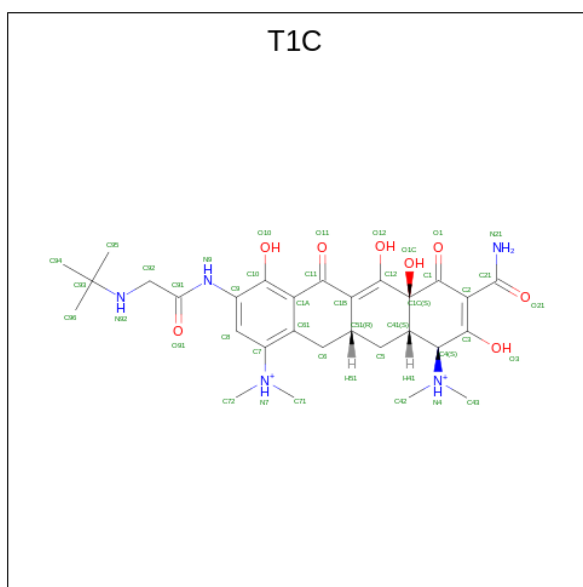
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
54	L1	1	42	29	5	8	0

- Molecule 55 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
55	Lf	1	1	1	0
55	Lj	1	Total	Zn	0
			1	1	
55	SR	1	Total	Zn	0
			1	1	

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: 16s rRNA

Chain L1:

C1373 A1383 G1384 U1385 C1386 A1389 C1390 G1400 U1416 A1419 U1426 U1430 A1431 U1432 U1438 U1439 C A1441 A1442 A1443 U1444 C1450 C1451 U1452 G1461 C1464 G1467 A1471 C1479 U1480 C1485 A1486 C1487 A1488 C1492 C1498 C1499 C1502 G1503 U1504 A1505 A1506

A1510 U1513 A1520 A1521 C1522 G1526 U A U U A1531 U1532 A1537 C1538 A1539 C1540 C1541 C1542 A1547 A1548 G1549 A1550 U1558 U

• Molecule 2: Val tRNA

Chain L2:

57%   23%   •   19%

C A1603 G1604 A1605 G1608 U1609 A1610 G1611 C1612 U1613 U1614 A1615 A1616 C C A C A A1621 C1627 C1628 A1640 G1641 G1644 A1645 U1646 U U1648 C1649 A1650 A1651 C U U A A C U1658 A1661 C C1663 G1669 A1670

• Molecule 3: Large ribosomal subunit protein uL2m

Chain LB:

78%   22%

MET ALA LEU CYS ALA LEU THR ARG ALA ALA LEU ARG SER LEU ASN LEU ALA PRO PRO THR VAL ALA ALA PRO ALA PRO SER LEU PHE PRO ALA ALA GLN MET MET ASN ASN GLY LEU LEU GLN GLN PRO SER ALA LEU MET LEU LEU PRO CYS ARG PRO VAL LEU THR SER VAL ALA LEU ASN

A61 R171 K297 LEU PRO SER ALA SER ALA GLN SER

• Molecule 4: Large ribosomal subunit protein uL3m

Chain LC:

87%   13%

MET PRO GLY TRP ARG LEU LEU THR GLN GLY VAL GLY ALA GLN VAL LEU GLY ARG LEU GLY ASP GLY LEU ALA ALA LEU GLY PRO GLY ASN ARG THR HIS ILE TRP LEU PHE VAL ARG LEU HIS GLY LYS S45 A348

• Molecule 5: Large ribosomal subunit protein uL4m

Chain LD:

80%   20%

MET LEU GLN PHE VAL ARG ALA GLY ALA ALA TRP LEU ARG PRO THR GLY SER GLN GLY LEU SER SER LEU ALA GLU GLU ALA ALA ARG ALA THR GLU ASN PRO GLU GLN VAL ALA SER GLU GLY LEU LEU PRO E45 P294 ARG PRO LEU PRO HIS ALA THR GLN GLY PRO ALA ALA THR

PRO TYR HIS CYS

• Molecule 6: Large ribosomal subunit protein bL9m

Chain LI:

36%   64%

MET ALA ALA PRO VAL VAL THR ALA PRO GLY ARG ALA LEU LEU ARG ALA ALA GLY ALA ARG LEU LEU ARG GLY VAL GLY VAL GLN GLU LEU LEU ARG PRO ARG HIS GLU ASN ALA PRO ASP LEU ALA CYS ASN PHE SER LEU SER GLN ASN ARG GLY T53 R147 GLN GLU GLY LYS LEU

GLU LYS ILE GLN THR LYS ALA GLY GLU ALA THR VAL LYS PHE LEU LYS SER CYS ARG LEU GLU VAL GLY MET LYS ASN ASN VAL LYS TRP LEU ASN PRO GLU ILE VAL ALA ARG HIS PHE LYS ASN LEU GLY VAL VAL VAL ALA PRO HIS THR LEU LYS LEU PRO GLU GLU PRO

ILE THR ARG TRP GLY GLU TYR TRP CYS GLU VAL THR VAL ASN GLY LEU ASP THR VAL ARG VAL PRO MET SER VAL VAL ASN PHE GLU LYS PRO LYS THR LYS ARG TYR LYS TYR TRP LEU ALA GLN GLN ALA ALA LYS ALA MET ALA PRO THR SER PRO GLN ILE

• Molecule 7: Large ribosomal subunit protein uL10m

Chain LJ: 60% • 39%

MET ALA ALA ALA VAL ALA GLY MET LEU ARG GLY GLY LEU LEU PRO GLN ALA GLY ARG LEU PRO THR LEU GLN THR VAL ARG TYR GLY **S30** **I60** **P66** SER PRO PRO SER PRO PRO GLN GLU GLU ILE **G77** **D137** **E163** **L197** PRO SER LEU PRO LEU VAL GLN GLY GLU

LEU VAL GLY GLY GLY LEU THR CYS LEU THR ALA GLN THR HIS SER LEU LEU GLN HIS GLN PRO LEU GLN LEU THR THR LEU LEU ASP GLN TYR ILE ARG GLU GLN ARG GLU LYS ASP SER VAL MET SER ALA ASN GLY LYS PRO ASP ASP PRO ASP THR VAL PRO ASP SER

• Molecule 8: Large ribosomal subunit protein uL11m

Chain LK: 5% 90% • 9%

MET SER LYS LEU GLY ARG ALA ALA ARG GLY LEU ARG PRO GLU GLU VAL GLY **G18** **L28** **T57** **I60** **K61** **D158** **L183** **A184** **A185** **Q186** **E187** **E188** **A189** **A190** **K191** **K192**

• Molecule 9: Large ribosomal subunit protein uL13m

Chain LM: 99% •

MET **S2** **L178**

• Molecule 10: Large ribosomal subunit protein uL14m

Chain LN: 79% 21%

MET ALA PHE PHE THR GLY LEU TRP GLY PRO PHE THR CYS VAL SER ARG VAL LEU LEU SER HIS HIS CYS PHE SER THR THR GLY SER LEU SER **A31** **V145**

• Molecule 11: Large ribosomal subunit protein uL15m

Chain LO: 96% • •

MET ALA GLY PRO LEU GLN GLY GLY GLY **A10** **R39** **L252** **S296**

• Molecule 12: Large ribosomal subunit protein uL16m

Chain LP: 88% 12%

MET TRP ARG LEU LEU ALA ARG ALA SER ALA PRO LEU LEU ARG VAL PRO LEU SER ASP SER TRP ALA LEU LEU PRO ALA SER ALA GLY VAL **K31** **R73** **V251**

• Molecule 13: Large ribosomal subunit protein bL17m

Chain LQ:

85%   13%

MET ARG LEU SER VAL ALA ALA ALA I9 I110 P111 N112 Q160 GLU ALA SER ASN HIS SER SER HIS THR ALA GLN THR PRO GLY ILE

• Molecule 14: Mitochondrial ribosomal protein L18, isoform CRA_b

Chain LR:

80%   18%

MET ALA LEU ARG SER GLN PHE TRP GLY PHE SER VAL CYS ARG ASN PRO GLY CYS ARG PHE ALA ALA LEU SER THR SER SER GLU PRO ALA ALA LYS PRO E34 V35 D36 L115 D155 E179

• Molecule 15: Large ribosomal subunit protein bL19m

Chain LS:

75%   25%

MET ALA ALA CYS ILE ALA ALA GLY HIS TRP ALA ALA MET GLY LEU GLY ARG SER PHE GLN ALA ALA ARG THR LEU LEU PRO PRO PRO ALA SER ILE ALA CYS ARG VAL HIS ALA GLY PRO VAL ARG GLN GLN SER THR GLY PRO SER GLU PRO GLY ALA PHE PRO PRO PRO LYS PRO

VAL ILE VAL ASP LYS HIS ARG PRO VAL GLU PRO GLU ARG R74 R96 N212 R291 S292

• Molecule 16: Large ribosomal subunit protein bL20m

Chain LT:

93%   6%

MET VAL PHE LEU THR ALA GLN LEU TRP L10 K26 D134 G135 K136 H149

• Molecule 17: Large ribosomal subunit protein bL21m

Chain LU:

78%   22%

MET ALA ALA SER SER LEU THR VAL THR LEU GLY ARG LEU ALA SER ALA CYS SER HIS ILE LEU ARG PRO SER GLY PRO GLY ALA ALA SER LEU TRP SER ALA SER ARG ARG PHE ASN SER GLN SER THR S45 K81 L204 LEU

• Molecule 18: 39S ribosomal protein L22, mitochondrial

Chain LV:

78%   22%

MET ALA ALA ALA VAL LEU GLY GLN LEU GLY ALA LEU TRP ILE HIS ASN LEU ARG SER ARG GLY LYS LEU ALA LEU GLY LEU LEU SER PHE HIS SER VAL LEU PRO GLN SER TYR ILE HIS THR SER ALA SER LEU ASP I47 V129 L212

• Molecule 19: Large ribosomal subunit protein uL23m

Chain LW:

93%   7%

M1 E113 LYS ASP GLU SER PRO GLU GLY GLY SER ALA ALA D124 R134 L153

• Molecule 20: Large ribosomal subunit protein uL24m

Chain LX:
93%　　6%

MET ARG LEU SER ALA LEU LEU ALA LEU ALA ALA SER LYS VAL THR L115 M126 A140 P160 Y216

• Molecule 21: Large ribosomal subunit protein bL27m

Chain La:
75%　　25%

MET ALA SER VAL LEU VAL LEU ALA LEU ARG THR ARG THR ALA VAL THR SER LEU LEU SER PRO THR PRO ALA THR ALA LEU ALA VAL ARG TYR ALA SER LYS LYS SER GLY GLY S38 L148

• Molecule 22: Large ribosomal subunit protein bL28m

Chain Lb:
95%　　5%

MET P2 L238 L243 S244 GLU PRO ALA VAL VAL GLN LYS ARG ALA SER GLY GLN

• Molecule 23: Large ribosomal subunit protein uL29m

Chain Lu:
70%　　30%

MET ALA ALA ALA GLY LEU ALA LEU LEU LEU CYS ARG ARG VAL ALA SER SER ALA LEU LEU LYS SER SER ARG SER LEU ILE THR PRO GLN VAL PRO ALA CYS THR GLY PHE PHE LEU SER LEU LEU PRO LYS SER THR PRO ASN VAL THR SER PHE HIS GLN TYR ARG LEU LEU HIS THR THR LEU SER

ARG LYS G63 R196 F238 PRO HIS LEU ALA GLU GLN ALA GLN LYS SER SER LEU VAL

• Molecule 24: Large ribosomal subunit protein uL30m

Chain Ld:
74%　　25%

MET ALA GLY ILE LEU ARG LEU VAL VAL GLN TRP PRO PRO GLY ARG LEU GLN THR VAL THR LYS GLY VAL GLU SER LEU ILE CYS THR ASP TRP ILE ARG HIS K35 Q47 V154 GLU GLN LYS ALA HIS GLU SER

• Molecule 25: Large ribosomal subunit protein bL32m

Chain Lf:
57%　　43%

MET ALA LEU ALA MET LEU VAL LEU VAL VAL VAL SER PRO TRP SER ALA ALA ARG GLY VAL LEU ARG ASN TYR TRP GLU ARG LEU LEU ARG LYS LEU PRO GLN SER ARG PRO GLY PHE PRO SER PRO PRO TRP GLY PRO ALA LEU ALA VAL GLN GLY PRO ALA MET PHE THR GLU GLU ALA ALA ASN

ASP THR SER GLY SER LYS GLU ASN SER SER LEU LEU ASP SER ILE PHE TRP MET A79 T186 GLN ASN

• Molecule 26: Large ribosomal subunit protein bL33m

Chain Lg: 80%   20%

MET PHE LEU SER ALA VAL PHE ALA LYS SER LYS SER K14 L65

• Molecule 27: Large ribosomal subunit protein bL34m

Chain Lh: 50%   50%

MET ALA VAL LEU ALA GLY SER LEU LEU GLY PRO THR SER ARG SER ALA LEU LEU GLY GLY ARG TRP LEU GLN PRO ARG ALA ALA TRP LEU GLY PHE PRO ASP ALA TRP GLY LEU PRO THR PRO GLN GLN ALA ARG GLY K47 H92

• Molecule 28: Large ribosomal subunit protein bL35m

Chain Li: 50%   •   49%

MET ALA ALA SER ALA PHE GLY ALA VAL ARG ALA ALA SER GLY ILE LEU ARG PRO LEU ASN ILE LEU ALA SER SER THR TYR ARG ASN CYS VAL LYS ASN ALA SER LEU ILE SER ALA LEU SER THR GLY ARG PHE SER HIS ILE GLN THR PRO VAL VAL SER SER THR PRO ARG LEU

THR THR SER GLU ARG ASN LEU THR CYS GLY HIS THR SER VAL ILE LEU ASN ARG MET ALA PRO VAL LEU PRO SER VAL LEU LYS LEU PRO VAL ARG SER L94 D112 V188

• Molecule 29: Large ribosomal subunit protein bL36m

Chain Lj: 37%   63%

MET ALA ASN LEU PHE ILE ARG LYS MET VAL ASN PRO LEU LEU TYR LEU SER ARG HIS THR VAL LYS PRO ARG ALA LEU SER THR PHE LEU PHE GLY SER ILE ARG GLY ALA ALA PRO VAL ALA VAL GLU PRO GLY ALA ALA VAL ARG SER LEU LEU SER PRO GLY LEU LEU PRO HIS LEU

LEU PRO ALA LEU GLY F66 M103

• Molecule 30: Large ribosomal subunit protein mL37

Chain Lk: 93%   7%

MET ALA LEU ALA SER GLY PRO ALA ARG ARG ALA LEU ALA LEU GLY SER GLY GLN LEU LEU GLY LEU GLY GLY PHE GLY ALA PRO ARG ARG GLY A30 A423

• Molecule 31: Large ribosomal subunit protein mL38

Chain Ll: 93%   •   7%

MET ALA PRO TRP TRP ARG ALA ALA LEU CYS GLU ARG ARG ARG GLY TRP ARG GLY PHE SER THR SER ALA VAL LEU GLY **R27** **L161** **E181** **R244** **S288** **Y380**

• Molecule 32: Large ribosomal subunit protein mL39

Chain Lm:　87%　13%

MET GLU ALA LEU ALA MET GLY SER ARG ALA LEU ARG LEU TRP LEU VAL ALA PRO GLY GLY LEU ILE LYS TRP ARG PHE ILE ALA THR SER SER ALA SER **Q34** **E326** ASP GLN SER LYS ALA THR GLU GLU CYS THR SER THR

• Molecule 33: Large ribosomal subunit protein mL40

8%

Chain Ln:　47%　52%

MET THR ALA SER VAL LEU ARG SER ILE SER LEU ALA LEU LEU ARG PRO THR SER GLY LEU LEU GLY THR TRP GLN GLN LEU THR GLN LEU LEU ARG GLU GLU THR HIS GLN ARG ALA SER LEU LEU SER PHE TRP GLU LEU ILE PRO MET ARG SER GLU LEU ARG LYS LYS LYS LYS VAL ASP PRO LYS LYS

ASP GLN GLU ALA LYS GLU ARG LEU LYS ARG LYS ILE ARG LEU GLU LYS ALA THR GLN GLU LEU LEU **I83** **P84** **I85** **F88** **I89** **T90** **P91** **L92** **K93** **F94** **L95** **D96** **K97** **A98** **R99** **V104** **E105** **L106** **L117** **L152** **E153** **P181** ILE PRO ASN TYR GLN PRO PRO GLU GLY ARG TYR

ASN ASP ILE THR LYS VAL TYR THR GLN VAL GLU PHE LYS ARG

• Molecule 34: Large ribosomal subunit protein mL41

Chain Lo:　89%　9%

MET GLY VAL LEU ALA ALA ALA ARG CYS LEU VAL ARG **G14** **K102** **D106** **K116** **R137**

• Molecule 35: Large ribosomal subunit protein mL42

Chain Lp:　68%　32%

MET ALA VAL ALA ALA VAL LYS TRP VAL MET SER LYS ARG THR ILE LEU LYS HIS LEU PHE PRO VAL GLN ASN GLY ALA LEU TYR CYS VAL CYS HIS LYS SER **T35** **R77** PRO ASP PRO VAL HIS ASN ASN GLU GLU THR HIS **D89** **K99** **R142**

• Molecule 36: Large ribosomal subunit protein mL43

Chain Lq:　69%　31%

MET **T2** **Q149** ASP PRO ALA ALA PRO ALA GLN ASP THR GLY LEU ARG LEU SER ALA VAL ALA PRO GLN ILE LEU LEU PRO GLY TRP PRO ASP PRO ASP ASP LEU PRO THR VAL ASP PRO ILE SER SER SER LEU THR SER ALA PRO ALA PRO MET LEU SER ALA VAL SER CYS LEU PRO ILE

VAL PRO ALA LEU THR THR VAL CYS SER ALA

• Molecule 37: Large ribosomal subunit protein mL44

Chain Lr:

83% 17%

MET ALA SER GLY LEU VAL ARG LEU LEU GLN GLN GLY HIS ARG CYS LEU LEU ALA PRO VAL ALA PRO LYS LEU VAL PRO PRO VAL ARG GLY V31 Q107 LEU GLY ILE GLU LYS GLU VAL ALA VAL LEU LEU ASN L119 D277 Y316 SER LYS PRO LYS GLU THR LEU ARG ALA GLU LYS

SER ILE THR ALA SER

• Molecule 38: Large ribosomal subunit protein mL45

Chain Ls:

70% 30%

MET ALA ALA PRO ILE PRO GLN GLY PHE SER CYS LEU SER ARG PHE LEU GLY TRP TRP PHE ARG ALA GLN PRO VAL LEU VAL THR GLN SER ALA ALA ILE VAL PRO VAL ARG THR LYS LYS ARG PHE THR PRO PRO ILE TYR GLN PRO LYS PHE LYS THR GLU LYS GLU PHE MET GLN HIS ALA

ARG LYS ALA GLY LEU VAL ILE PRO PRO GLU K71 A95 R96 I97 S98 SER LEU SER LYS GLU LEU LEU GLU ARG THR E110 R111 M112 K113 K114 M202 E295 ALA GLN GLY VAL ALA GLN LYS PRO GLN LEU ALA

• Molecule 39: Large ribosomal subunit protein mL46

Chain Lt:

23%
75% 22%

MET ALA ALA PRO VAL ARG ARG THR LEU LEU GLY VAL ALA GLY GLY TRP ARG ARG PHE GLU ARG LEU TRP ALA GLY SER LEU SER ARG SER LEU ALA LEU ALA ALA ALA PRO SER SER ASN GLY S43 L63 E68 R81 S85 D86 H87 E88 L89 R90 A91 L92 D93 E94

N95 Q96 R97 L98 A99 K100 K101 K102 A103 D104 LEU HIS ASP GLU GLU ASP GLU GLN ASP ILE LEU L116 A117 Q118 D119 L120 E121 K127 Q130 F131 K132 L133 G134 A135 R136 I137 T138 E139 A140 D141 E142 K143 L149 K164 D169 E189 L192 A193 M200 E201 A202

L205 F217 PRO GLN ALA MET ARG THR GLU SER ASN L227 L239 T240 G241 D242 F243 S244 Q245 A246 C247 N248 K249 G250 D258 E259 L260 G261 D262 K265 P266 A270 S277 D278 L279

• Molecule 40: Large ribosomal subunit protein mL48

Chain Lv:

8%
62% 38%

MET SER GLY THR LEU GLU GLU LYS VAL LEU LEU CYS LEU ARG ASN ASN THR ILE PHE LEU GLN ALA PHE SER LEU LEU ARG PHE ARG THR SER GLY GLU LYS PRO ILE TYR SER VAL GLY GLY ILE LEU LEU SER ILE SER ARG PRO Y48 E66 GLU PRO LYS LYS LYS LYS LYS GLY LYS VAL GLU

V77 L82 G83 T84 D85 K130 E133 V134 L135 Q136 L137 Q138 ASP GLN GLY SER LYS M144 L145 L146 D147 S148 T151 D193 PHE LYS GLY ARG PHE LYS ALA ARG PRO GLU GLU LEU GLU GLU LEU ALA LYS LEU LYS

• Molecule 41: Large ribosomal subunit protein mL49

Chain Lw:

80% 20%

MET ALA ALA THR MET PHE ARG ALA THR LEU ARG GLY TRP ARG THR GLY VAL ALA GLY LYS GLY CYS SER GLY ALA LEU LEU SER GLN THR THR GLN LEU GLY PRO ASP Y35 F166

• Molecule 42: Large ribosomal subunit protein mL50

Chain Lx:

• Molecule 43: Large ribosomal subunit protein mL51

Chain Ly:

• Molecule 44: 39S ribosomal protein L52, mitochondrial

Chain Lz:

• Molecule 45: Large ribosomal subunit protein mL53

Chain L3:

• Molecule 46: Large ribosomal subunit protein mL54

Chain L4:

• Molecule 47: Large ribosomal subunit protein mL55

Chain L5:

• Molecule 48: Large ribosomal subunit protein mL63

Chain L6:

• Molecule 49: Large ribosomal subunit protein mL62

Chain L7:
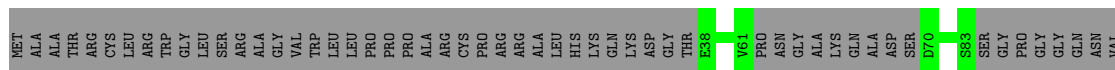
• Molecule 50: Large ribosomal subunit protein mL64

Chain L8:
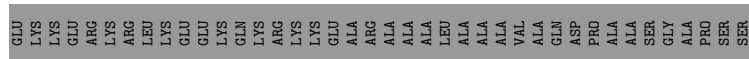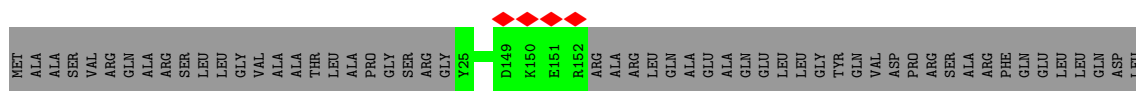
• Molecule 51: Large ribosomal subunit protein mL66

Chain SR:
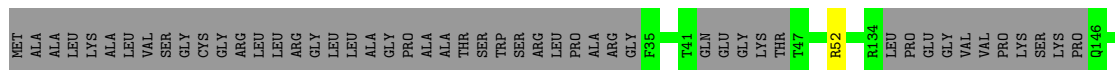
• Molecule 52: Large ribosomal subunit protein mL65

Chain Sf:
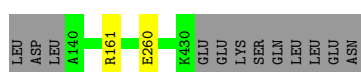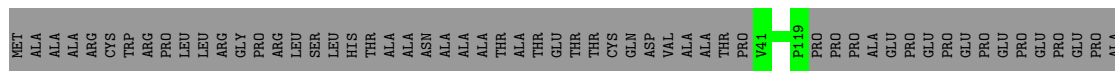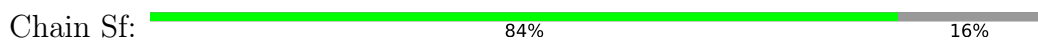
4   Experimental information   ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	57266	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION; Relion	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.070	Depositor
Minimum map value	-0.017	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	446.88, 446.88, 446.88	wwPDB
Map dimensions	420, 420, 420	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.064, 1.064, 1.064	Depositor

5　Model quality ⓘ

5.1　Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, T1C, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$|Z|$ >5	RMSZ	#$|Z|$ >5
1	L1	0.29	0/35628	0.97	105/55448 (0.2%)
2	L2	0.28	0/1328	1.00	1/2056 (0.0%)
3	LB	0.27	0/1888	0.62	0/2538
4	LC	0.28	0/2462	0.55	0/3340
5	LD	0.34	0/2071	0.63	0/2817
6	LI	0.35	0/798	0.77	0/1073
7	LJ	0.39	1/1308 (0.1%)	0.83	2/1761 (0.1%)
8	LK	0.31	0/1348	0.63	1/1813 (0.1%)
9	LM	0.29	0/1495	0.57	0/2029
10	LN	0.29	0/904	0.59	0/1218
11	LO	0.29	0/2359	0.62	1/3185 (0.0%)
12	LP	0.28	0/1826	0.57	0/2458
13	LQ	0.30	0/1269	0.64	0/1708
14	LR	0.30	0/1215	0.68	2/1645 (0.1%)
15	LS	0.32	0/1863	0.60	0/2509
16	LT	0.30	0/1174	0.59	0/1572
17	LU	0.31	0/1311	0.64	0/1778
18	LV	0.30	0/1402	0.57	0/1886
19	LW	0.34	0/1217	0.68	1/1644 (0.1%)
20	LX	0.29	0/1697	0.62	0/2302
21	La	0.28	0/893	0.56	0/1204
22	Lb	0.28	0/2090	0.55	1/2825 (0.0%)
23	Lu	0.30	0/1552	0.60	0/2079
24	Ld	0.32	0/1003	0.57	0/1354
25	Lf	0.32	0/895	0.60	0/1201
26	Lg	0.29	0/438	0.67	0/583
27	Lh	0.25	0/382	0.63	0/507
28	Li	0.27	0/852	0.60	1/1136 (0.1%)
29	Lj	0.25	0/349	0.60	0/461
30	Lk	0.28	0/3305	0.55	0/4502
31	Ll	0.32	0/3042	0.65	1/4140 (0.0%)
32	Lm	0.29	0/2439	0.55	0/3299

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	Ln	0.38	0/855	0.78	3/1152 (0.3%)
34	Lo	0.33	0/1025	0.64	0/1379
35	Lp	0.32	0/839	0.64	0/1136
36	Lq	0.28	0/1202	0.59	0/1626
37	Lr	0.29	0/2264	0.55	1/3059 (0.0%)
38	Ls	0.31	0/1800	0.62	0/2436
39	Lt	0.30	0/1797	0.68	1/2422 (0.0%)
40	Lv	0.30	0/1055	0.63	0/1427
41	Lw	0.34	0/1134	0.65	0/1547
42	Lx	0.33	0/918	0.64	0/1249
43	Ly	0.26	0/849	0.57	0/1135
44	Lz	0.29	0/747	0.57	0/1005
45	L3	0.35	0/754	0.74	1/1017 (0.1%)
46	L4	0.31	0/722	0.68	0/978
47	L5	0.27	0/379	0.76	1/510 (0.2%)
48	L6	0.32	0/818	0.62	0/1097
49	L7	0.28	0/1071	0.61	0/1433
50	L8	0.28	0/1107	0.58	0/1498
51	SR	0.33	0/1238	0.65	0/1676
52	Sf	0.29	0/3114	0.58	0/4225
All	All	0.30	1/105491 (0.0%)	0.77	123/150078 (0.1%)

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
8	LK	0	2
11	LO	0	1
12	LP	0	1
13	LQ	0	1
18	LV	0	1
23	Lu	0	1
31	Ll	0	1
All	All	0	8

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	LJ	163	GLU	CG-CD	-5.88	1.43	1.51

The worst 5 of 123 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	L1	23	C	C2-N1-C1'	11.02	130.92	118.80
1	L1	23	C	N1-C2-O2	10.61	125.27	118.90
1	L1	23	C	N3-C2-O2	-8.84	115.72	121.90
1	L1	823	C	C2-N1-C1'	8.28	127.90	118.80
1	L1	23	C	C6-N1-C1'	-8.08	111.10	120.80

There are no chirality outliers.

5 of 8 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	LK	57	THR	Peptide
8	LK	60	ILE	Peptide
11	LO	39	ARG	Sidechain
12	LP	73	ARG	Sidechain
13	LQ	110	ILE	Peptide

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	
3	LB	235/305 (77%)	227 (97%)	8 (3%)	0	100	100
4	LC	302/348 (87%)	277 (92%)	25 (8%)	0	100	100
5	LD	248/311 (80%)	238 (96%)	10 (4%)	0	100	100
6	LI	93/267 (35%)	88 (95%)	5 (5%)	0	100	100
7	LJ	154/261 (59%)	138 (90%)	16 (10%)	0	100	100
8	LK	173/192 (90%)	163 (94%)	10 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	LM	175/178 (98%)	165 (94%)	10 (6%)	0	100	100
10	LN	113/145 (78%)	107 (95%)	6 (5%)	0	100	100
11	LO	285/296 (96%)	276 (97%)	9 (3%)	0	100	100
12	LP	219/251 (87%)	212 (97%)	7 (3%)	0	100	100
13	LQ	150/175 (86%)	138 (92%)	11 (7%)	1 (1%)	22	57
14	LR	144/179 (80%)	140 (97%)	4 (3%)	0	100	100
15	LS	217/292 (74%)	202 (93%)	15 (7%)	0	100	100
16	LT	138/149 (93%)	134 (97%)	4 (3%)	0	100	100
17	LU	158/205 (77%)	151 (96%)	7 (4%)	0	100	100
18	LV	164/212 (77%)	157 (96%)	7 (4%)	0	100	100
19	LW	139/153 (91%)	138 (99%)	1 (1%)	0	100	100
20	LX	200/216 (93%)	185 (92%)	15 (8%)	0	100	100
21	La	109/148 (74%)	104 (95%)	5 (5%)	0	100	100
22	Lb	241/256 (94%)	227 (94%)	14 (6%)	0	100	100
23	Lu	174/250 (70%)	172 (99%)	2 (1%)	0	100	100
24	Ld	118/161 (73%)	111 (94%)	7 (6%)	0	100	100
25	Lf	106/188 (56%)	101 (95%)	5 (5%)	0	100	100
26	Lg	50/65 (77%)	50 (100%)	0	0	100	100
27	Lh	44/92 (48%)	43 (98%)	1 (2%)	0	100	100
28	Li	93/188 (50%)	91 (98%)	2 (2%)	0	100	100
29	Lj	36/103 (35%)	36 (100%)	0	0	100	100
30	Lk	392/423 (93%)	382 (97%)	10 (3%)	0	100	100
31	Ll	352/380 (93%)	327 (93%)	25 (7%)	0	100	100
32	Lm	291/338 (86%)	283 (97%)	8 (3%)	0	100	100
33	Ln	97/206 (47%)	87 (90%)	10 (10%)	0	100	100
34	Lo	122/137 (89%)	115 (94%)	7 (6%)	0	100	100
35	Lp	93/142 (66%)	89 (96%)	4 (4%)	0	100	100
36	Lq	146/215 (68%)	135 (92%)	11 (8%)	0	100	100
37	Lr	271/332 (82%)	265 (98%)	6 (2%)	0	100	100
38	Ls	210/306 (69%)	204 (97%)	6 (3%)	0	100	100
39	Lt	211/279 (76%)	186 (88%)	23 (11%)	2 (1%)	17	52

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
40	Lv	125/212 (59%)	121 (97%)	4 (3%)	0	100	100
41	Lw	130/166 (78%)	122 (94%)	8 (6%)	0	100	100
42	Lx	108/158 (68%)	105 (97%)	3 (3%)	0	100	100
43	Ly	95/128 (74%)	90 (95%)	5 (5%)	0	100	100
44	Lz	90/123 (73%)	86 (96%)	4 (4%)	0	100	100
45	L3	94/112 (84%)	88 (94%)	6 (6%)	0	100	100
46	L4	81/138 (59%)	75 (93%)	6 (7%)	0	100	100
47	L5	43/128 (34%)	41 (95%)	2 (5%)	0	100	100
48	L6	92/102 (90%)	89 (97%)	3 (3%)	0	100	100
49	L7	119/206 (58%)	114 (96%)	5 (4%)	0	100	100
50	L8	126/222 (57%)	123 (98%)	3 (2%)	0	100	100
51	SR	140/196 (71%)	138 (99%)	2 (1%)	0	100	100
52	Sf	366/439 (83%)	353 (96%)	12 (3%)	1 (0%)	41	73
All	All	8072/10674 (76%)	7689 (95%)	379 (5%)	4 (0%)	100	100

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
39	Lt	266	PRO
39	Lt	270	ALA
52	Sf	260	GLU
13	LQ	111	PRO

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	
3	LB	191/245 (78%)	191 (100%)	0	100	100
4	LC	258/290 (89%)	258 (100%)	0	100	100
5	LD	217/262 (83%)	217 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	LI	86/228 (38%)	86 (100%)	0	100	100
7	LJ	145/232 (62%)	145 (100%)	0	100	100
8	LK	138/150 (92%)	138 (100%)	0	100	100
9	LM	155/156 (99%)	155 (100%)	0	100	100
10	LN	98/124 (79%)	98 (100%)	0	100	100
11	LO	245/249 (98%)	245 (100%)	0	100	100
12	LP	188/211 (89%)	188 (100%)	0	100	100
13	LQ	133/150 (89%)	132 (99%)	1 (1%)	81	92
14	LR	128/154 (83%)	128 (100%)	0	100	100
15	LS	201/256 (78%)	200 (100%)	1 (0%)	88	94
16	LT	118/126 (94%)	117 (99%)	1 (1%)	81	92
17	LU	145/180 (81%)	144 (99%)	1 (1%)	84	93
18	LV	146/182 (80%)	146 (100%)	0	100	100
19	LW	128/135 (95%)	128 (100%)	0	100	100
20	LX	180/191 (94%)	179 (99%)	1 (1%)	86	94
21	La	91/119 (76%)	91 (100%)	0	100	100
22	Lb	219/229 (96%)	219 (100%)	0	100	100
23	Lu	159/223 (71%)	159 (100%)	0	100	100
24	Ld	111/147 (76%)	110 (99%)	1 (1%)	78	91
25	Lf	97/164 (59%)	97 (100%)	0	100	100
26	Lg	49/60 (82%)	49 (100%)	0	100	100
27	Lh	40/72 (56%)	40 (100%)	0	100	100
28	Li	88/166 (53%)	88 (100%)	0	100	100
29	Lj	37/89 (42%)	37 (100%)	0	100	100
30	Lk	353/368 (96%)	353 (100%)	0	100	100
31	Ll	313/332 (94%)	313 (100%)	0	100	100
32	Lm	269/303 (89%)	269 (100%)	0	100	100
33	Ln	91/190 (48%)	91 (100%)	0	100	100
34	Lo	104/112 (93%)	102 (98%)	2 (2%)	57	81
35	Lp	93/133 (70%)	92 (99%)	1 (1%)	73	89
36	Lq	130/186 (70%)	130 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	Lr	241/288 (84%)	241 (100%)	0	100	100
38	Ls	196/274 (72%)	196 (100%)	0	100	100
39	Lt	188/236 (80%)	184 (98%)	4 (2%)	53	79
40	Lv	117/188 (62%)	117 (100%)	0	100	100
41	Lw	122/148 (82%)	122 (100%)	0	100	100
42	Lx	104/148 (70%)	103 (99%)	1 (1%)	76	90
43	Ly	86/110 (78%)	86 (100%)	0	100	100
44	Lz	73/97 (75%)	73 (100%)	0	100	100
45	L3	81/90 (90%)	81 (100%)	0	100	100
46	L4	78/116 (67%)	78 (100%)	0	100	100
47	L5	40/113 (35%)	39 (98%)	1 (2%)	47	75
48	L6	80/87 (92%)	80 (100%)	0	100	100
49	L7	117/181 (65%)	117 (100%)	0	100	100
50	L8	110/178 (62%)	110 (100%)	0	100	100
51	SR	133/169 (79%)	132 (99%)	1 (1%)	81	92
52	Sf	326/381 (86%)	325 (100%)	1 (0%)	92	96
All	All	7236/9218 (78%)	7219 (100%)	17 (0%)	93	97

5 of 17 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
47	L5	58	LYS
52	Sf	161	ARG
34	Lo	116	LYS
35	Lp	99	LYS
39	Lt	127	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
45	L3	15	GLN
52	Sf	373	GLN
52	Sf	375	ASN
16	LT	94	GLN
33	Ln	143	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L1	1491/1559 (95%)	346 (23%)	15 (1%)
2	L2	51/69 (73%)	17 (33%)	0
All	All	1542/1628 (94%)	363 (23%)	15 (0%)

5 of 363 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L1	5	A
1	L1	6	A
1	L1	8	C
1	L1	9	U
1	L1	11	G

5 of 15 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	L1	575	A
1	L1	1319	G
1	L1	837	A
1	L1	1371	U
1	L1	930	A

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 99 ligands modelled in this entry, 98 are monoatomic - leaving 1 for Mogul analysis.

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	$\#|Z| > 2$
54	T1C	L1	1690	53	44,45,45	1.18	4 (9%)	53,72,72	1.07	5 (9%)

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
54	T1C	L1	1690	53	-	11/22/80/80	0/4/4/4

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
54	L1	1690	T1C	C21-N21	5.45	1.47	1.33
54	L1	1690	T1C	O11-C11	2.21	1.27	1.23
54	L1	1690	T1C	C7-N7	2.16	1.48	1.42
54	L1	1690	T1C	C4-N4	2.15	1.52	1.47

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
54	L1	1690	T1C	C1-C1C-C12	3.11	113.53	109.88
54	L1	1690	T1C	C11-C1B-C12	2.86	121.07	118.80
54	L1	1690	T1C	O1C-C1C-C12	-2.71	105.81	110.14
54	L1	1690	T1C	C1C-C41-C4	2.69	115.31	111.64
54	L1	1690	T1C	C1C-C1-C2	2.12	119.12	115.75

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
54	L1	1690	T1C	C92-C91-N9-C9
54	L1	1690	T1C	C41-C4-N4-C43
54	L1	1690	T1C	C3-C4-N4-C43
54	L1	1690	T1C	C3-C4-N4-C42
54	L1	1690	T1C	C3-C2-C21-O21

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 T1C L1 1690

Bond lengths | Bond angles

Torsions | Rings
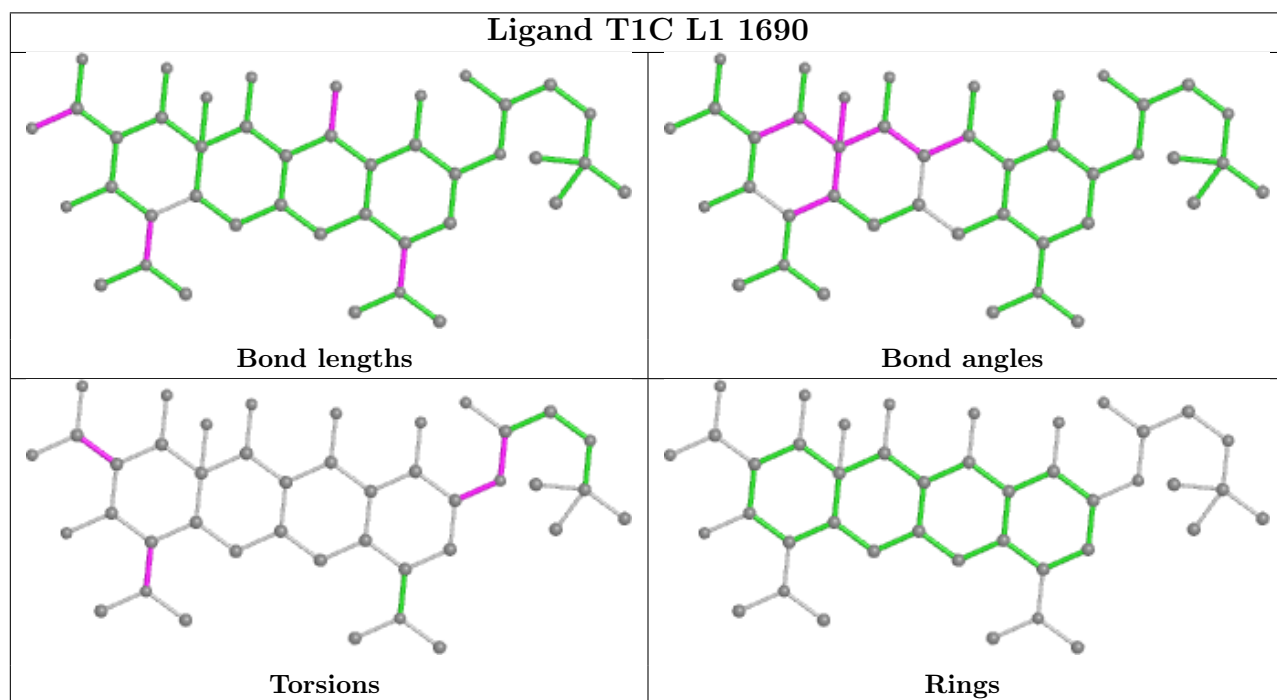
5.7 Other polymers ⓘ

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-38633. 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 ⓘ
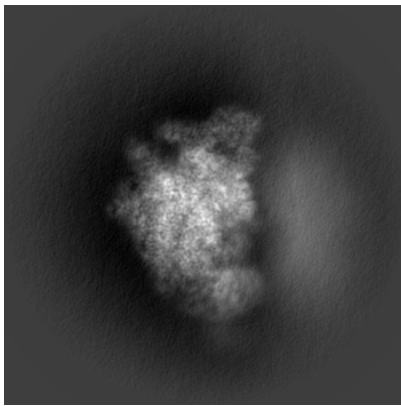
6.1.1 Primary map

X
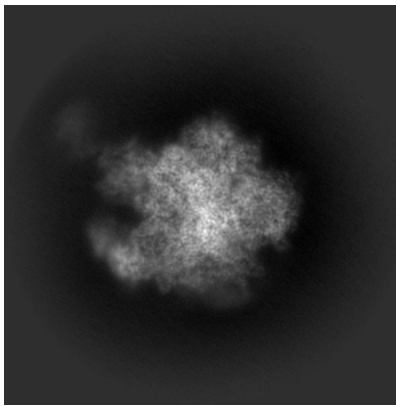
Y
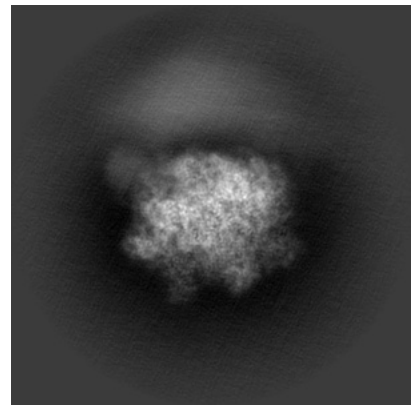
Z

6.1.2 Raw map

X

Y

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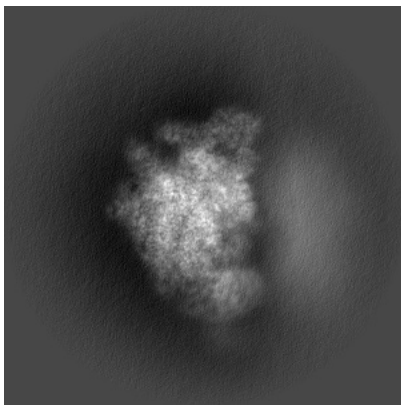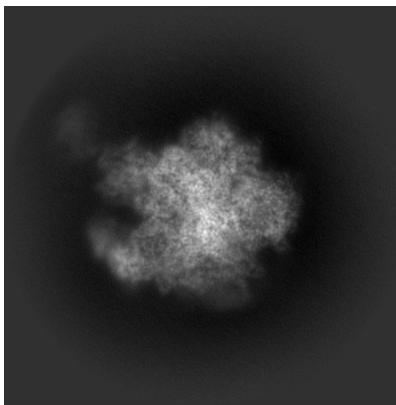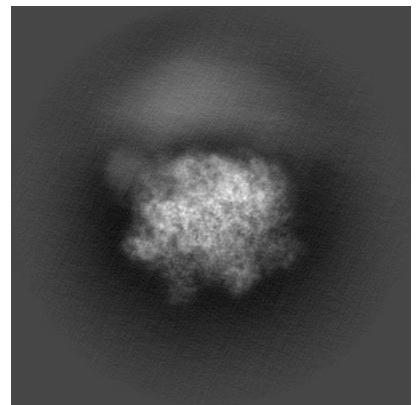
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
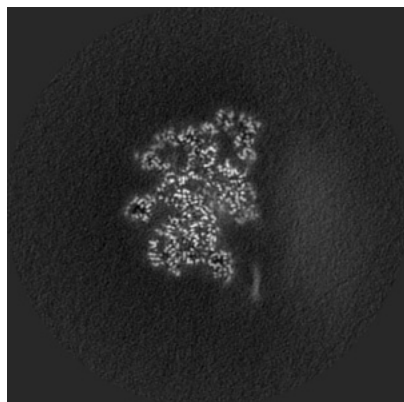
6.2.1 Primary map
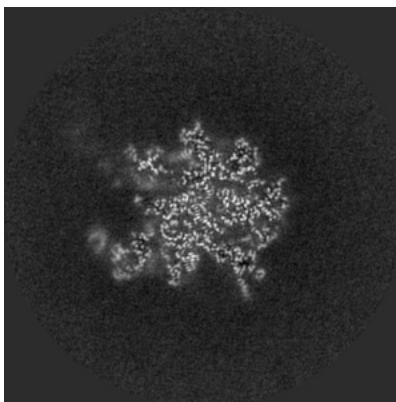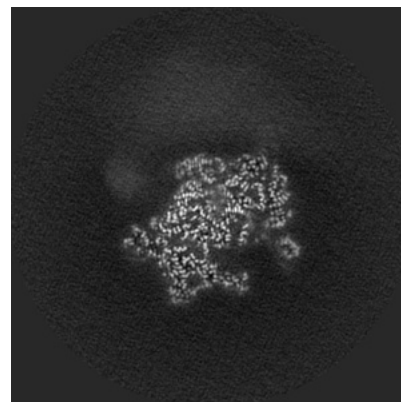
X Index: 210   Y Index: 210   Z Index: 210

6.2.2 Raw map
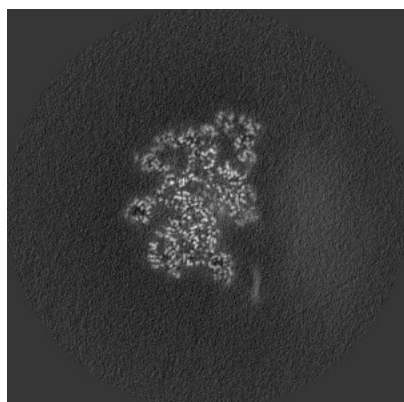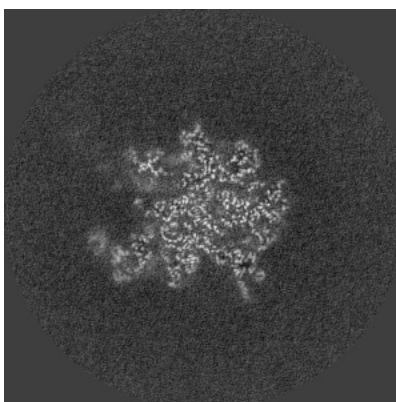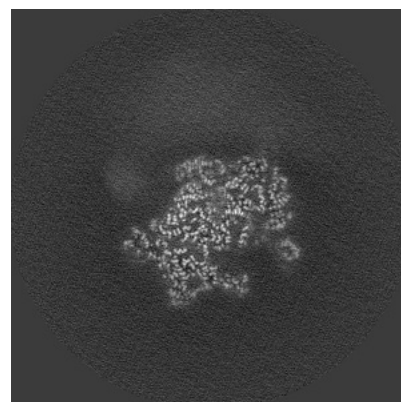
X Index: 210   Y Index: 210   Z Index: 210

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

6.3 Largest variance slices (i)

6.3.1 Primary map
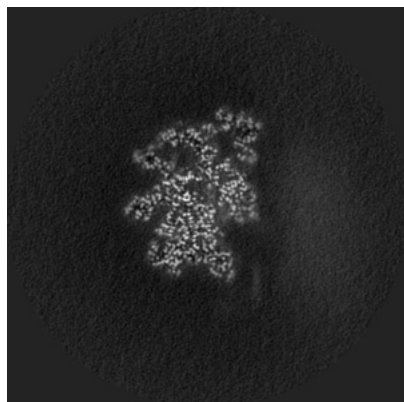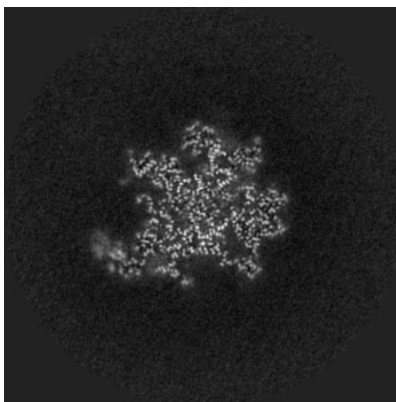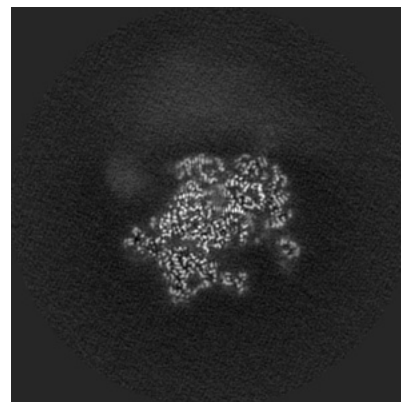
X Index: 208 Y Index: 201 Z Index: 211

6.3.2 Raw map
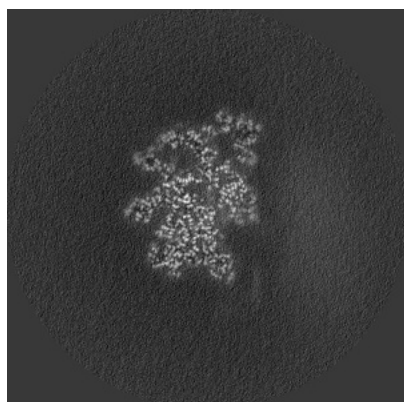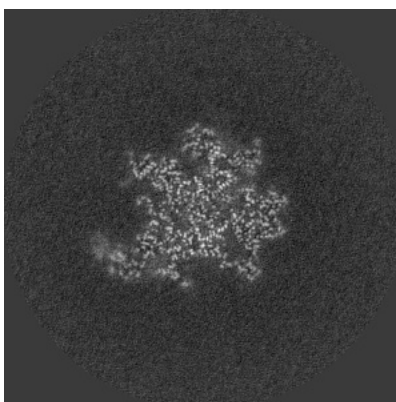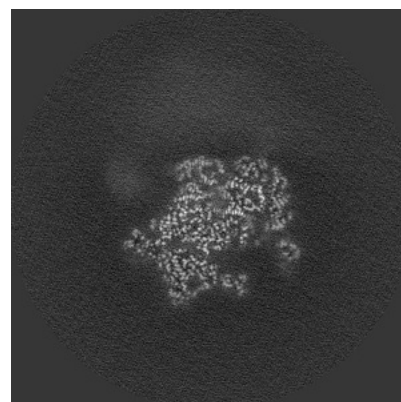
X Index: 208 Y Index: 201 Z Index: 211

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
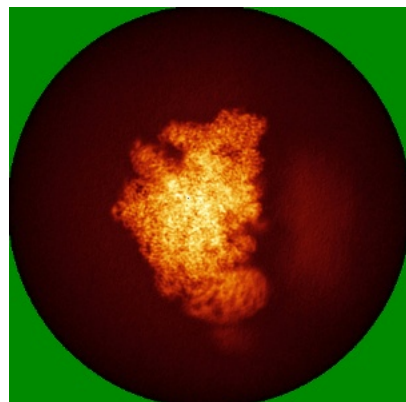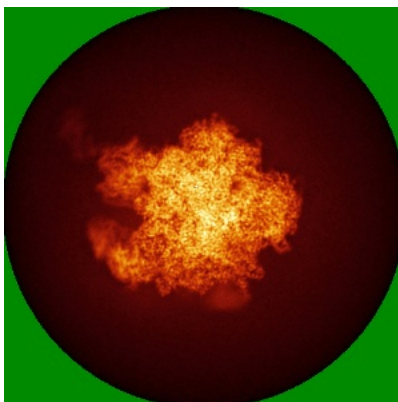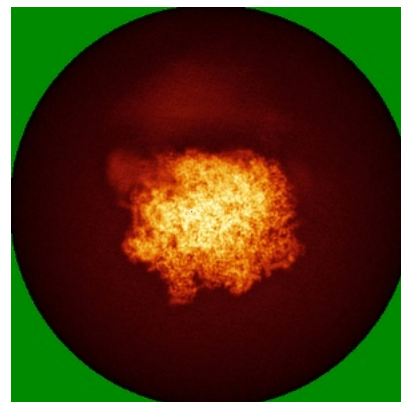
X　　　　　　　　　　Y　　　　　　　　　　Z

6.4.2　Raw map

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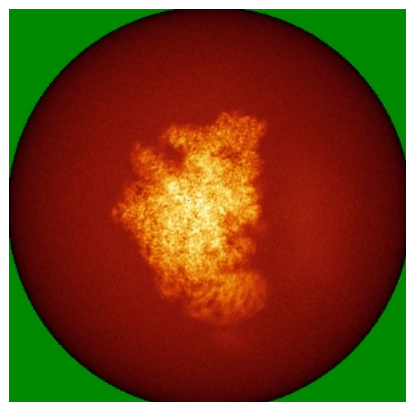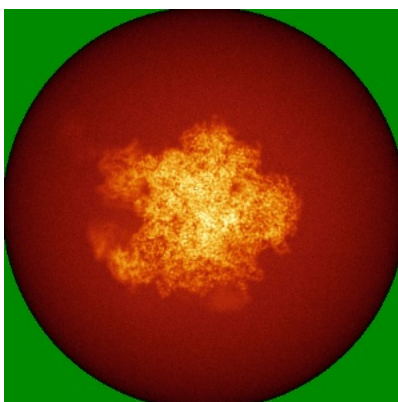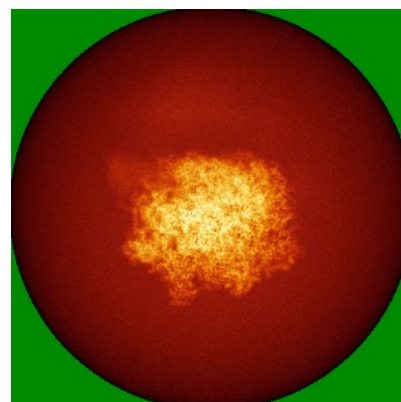
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views ⓘ

6.5.1   Primary map

| X | Y | Z |
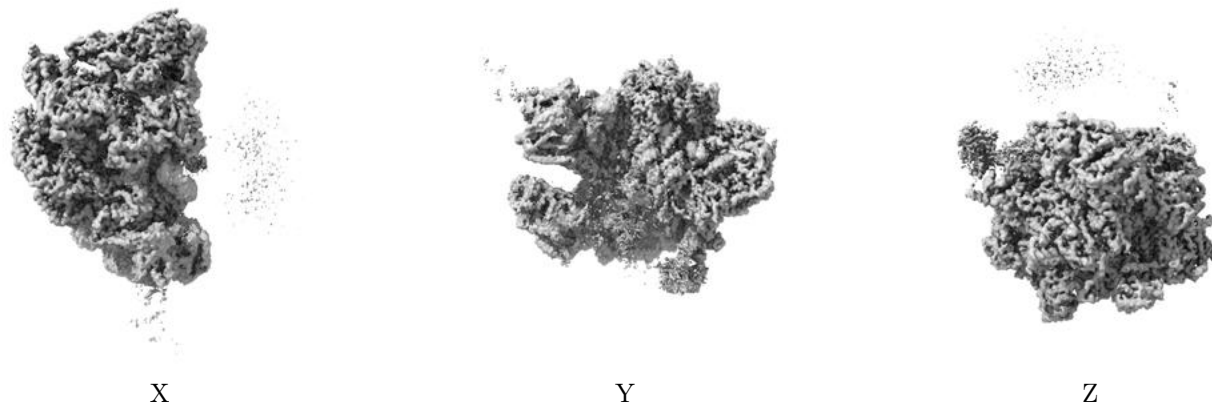
The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2   Raw map

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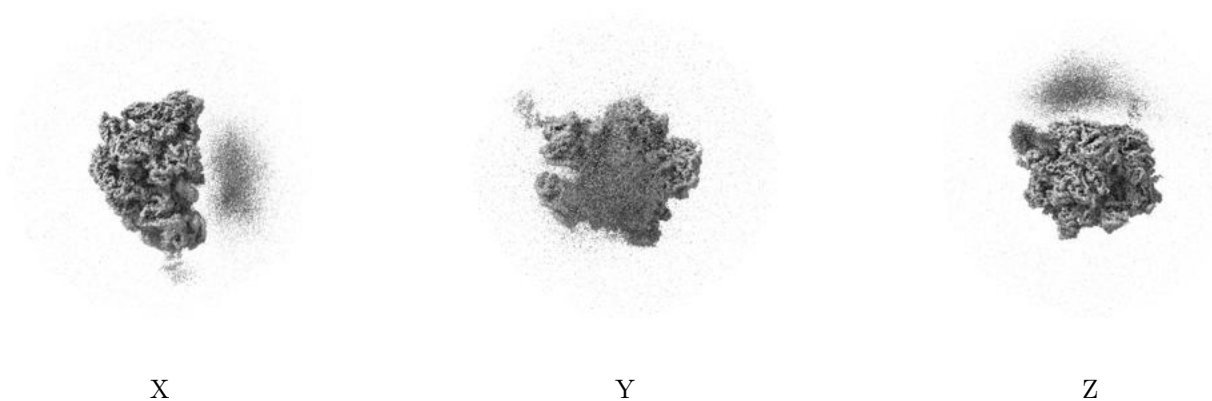
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

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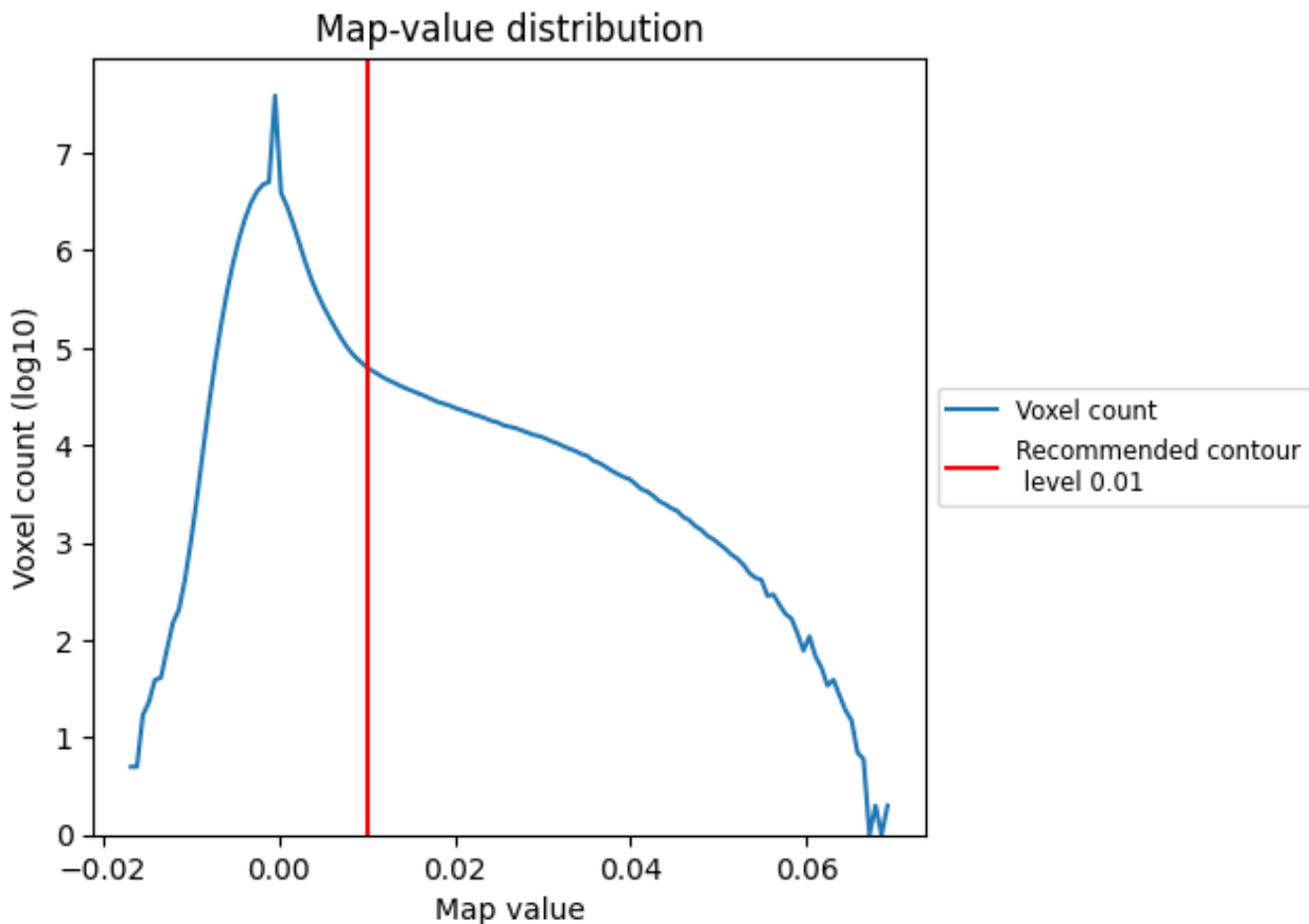
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
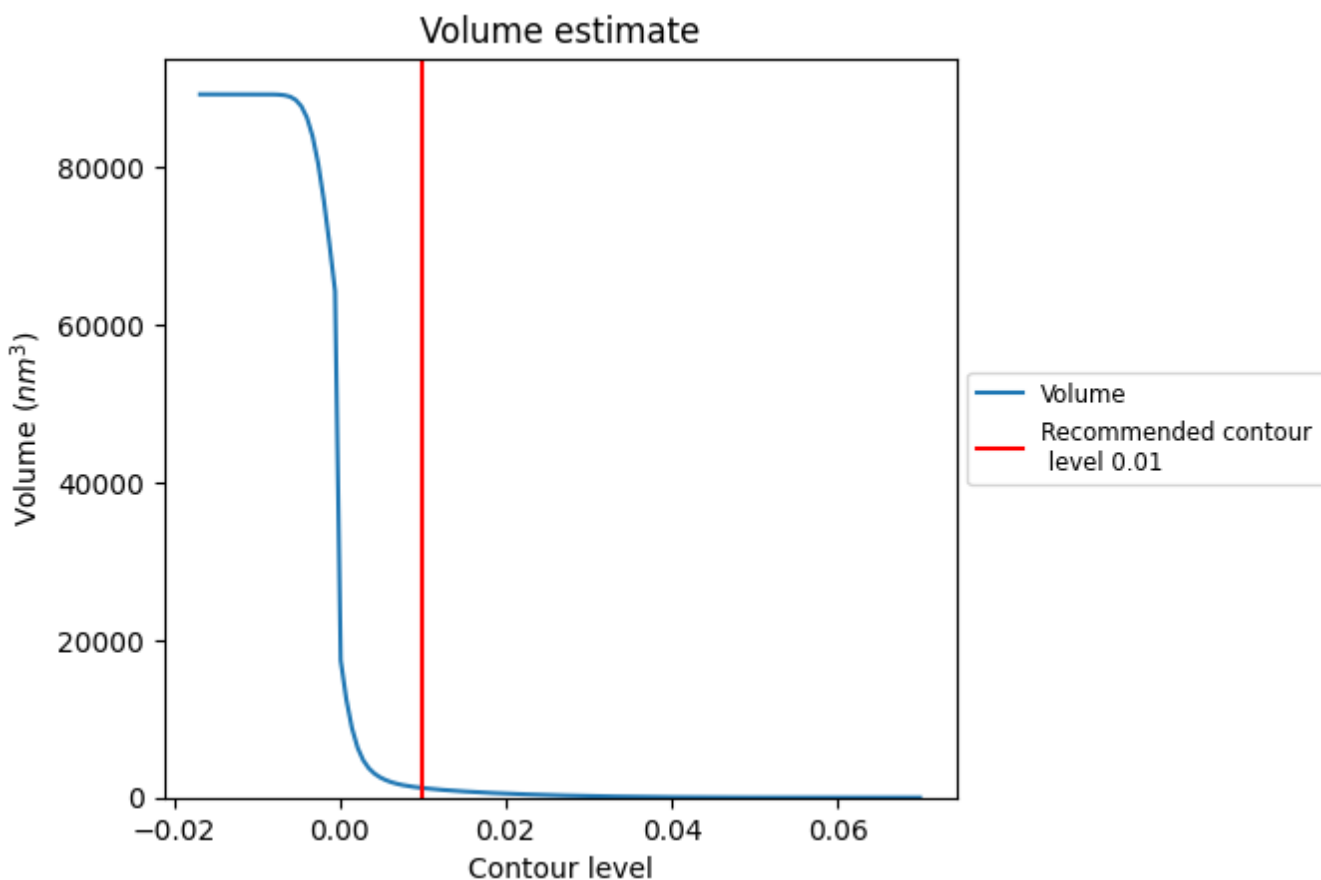
The volume at the recommended contour level is 1215 nm^3; this corresponds to an approximate mass of 1097 kDa.

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   ⓘ
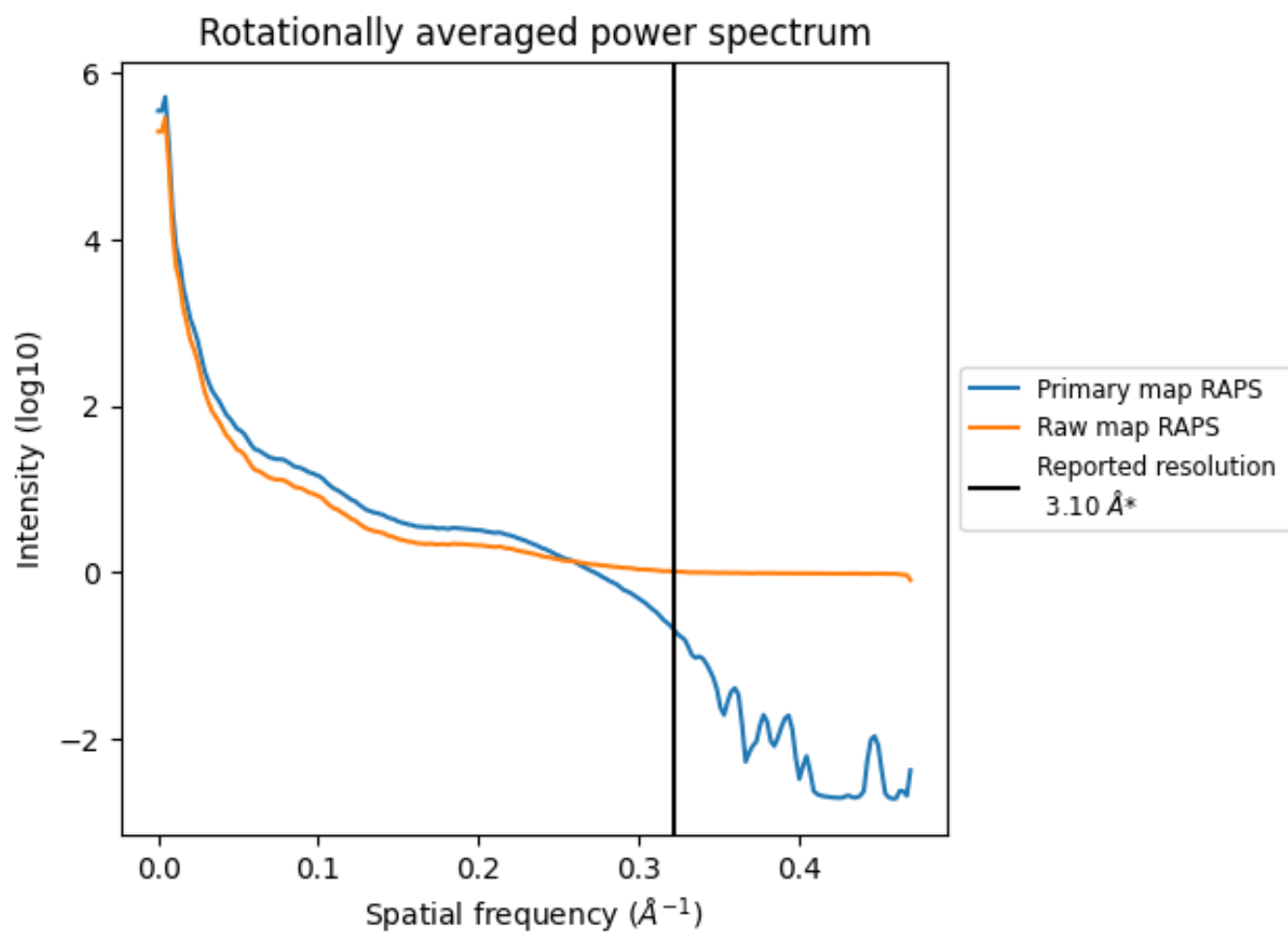
*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

8.1 FSC ⓘ
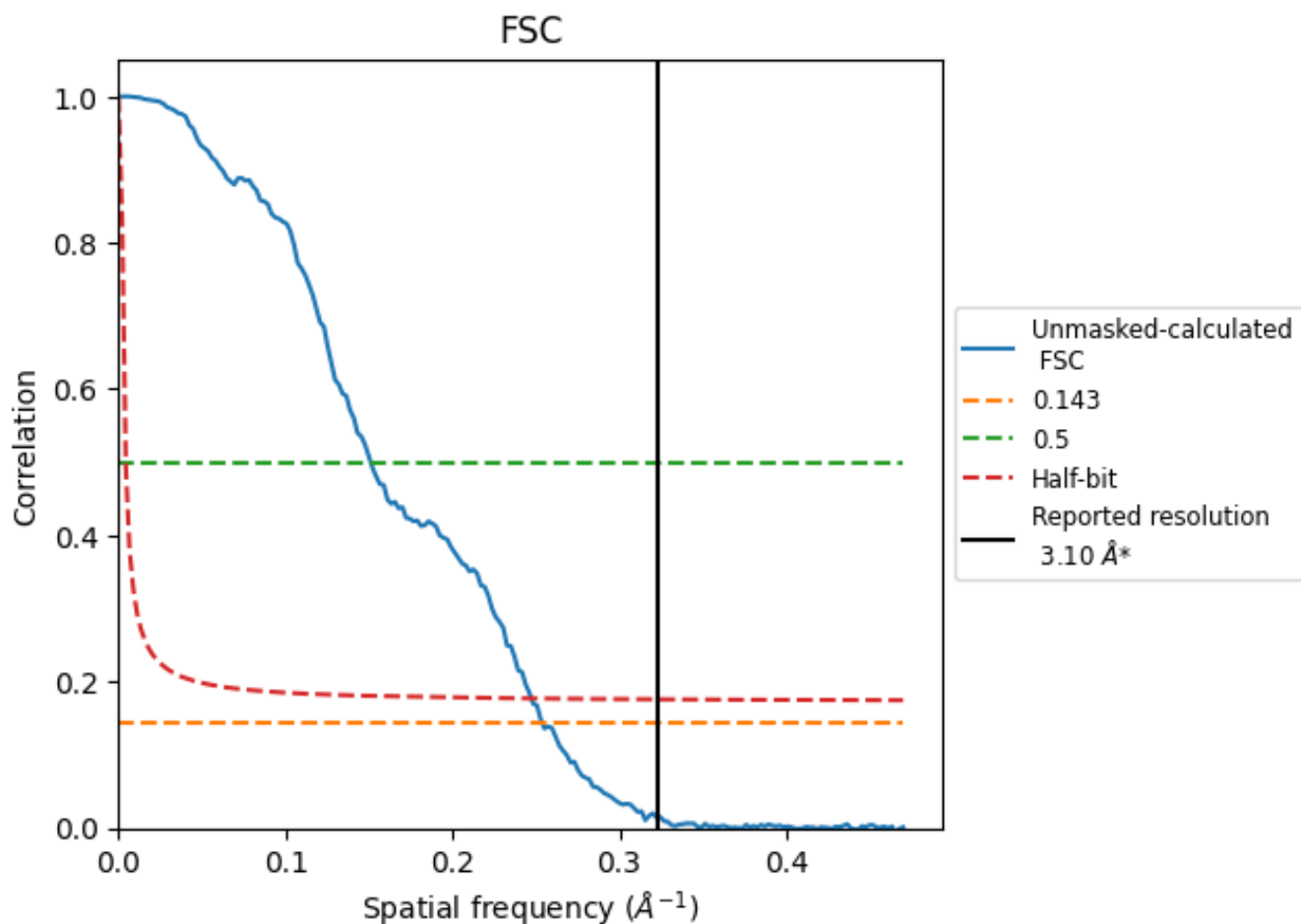
*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.94	6.62	4.05

*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 3.94 differs from the reported value 3.1 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-38633 and PDB model 8XT1. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay ⓘ

| X | Y | Z |
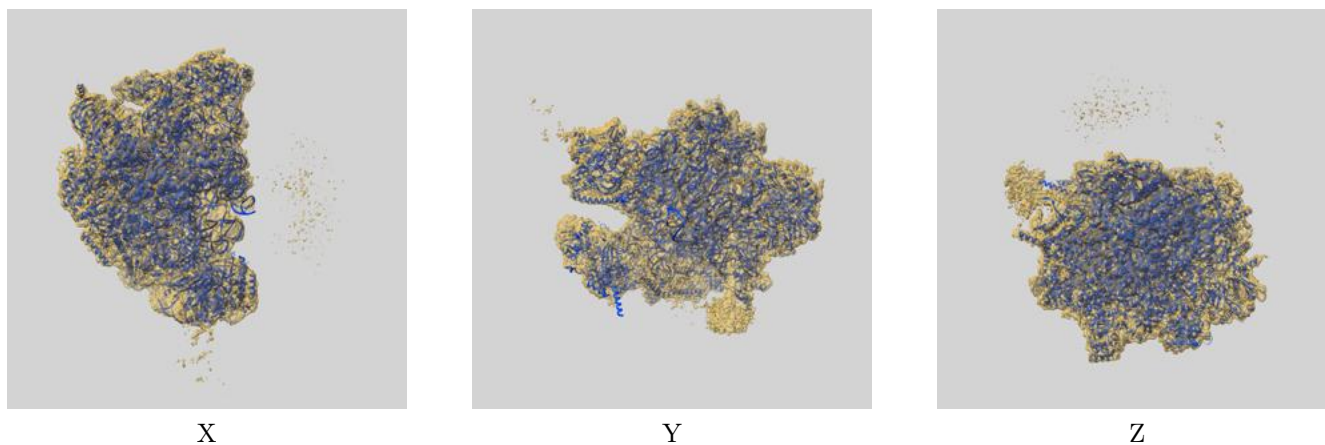
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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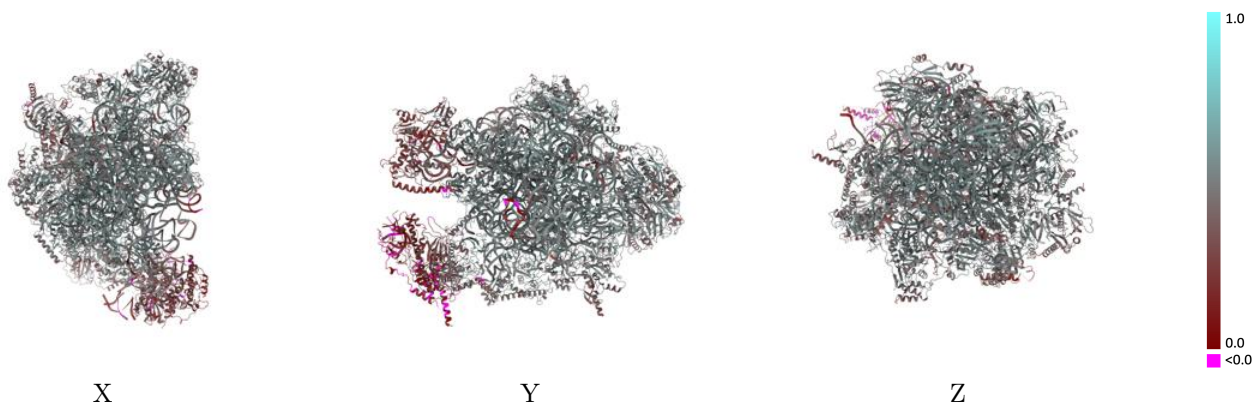
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
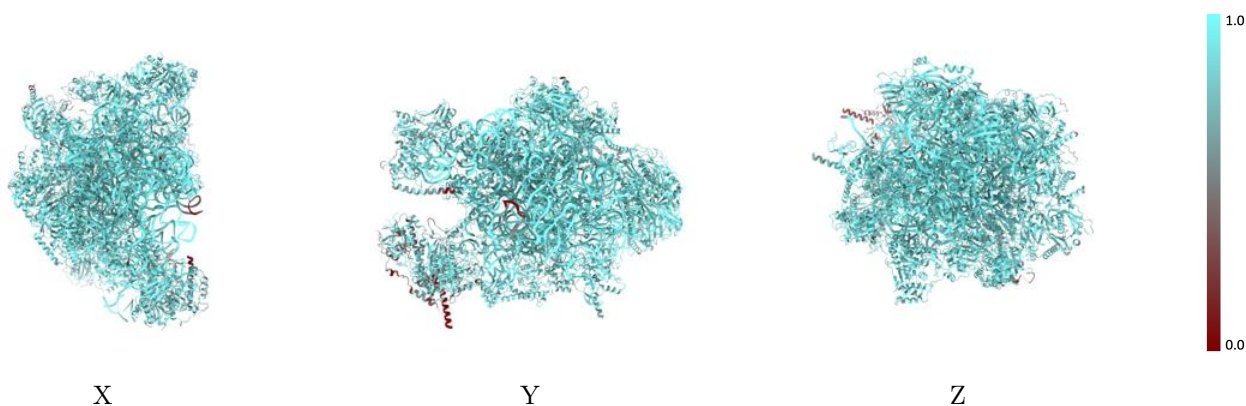
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.01).

9.4 Atom inclusion ⓘ
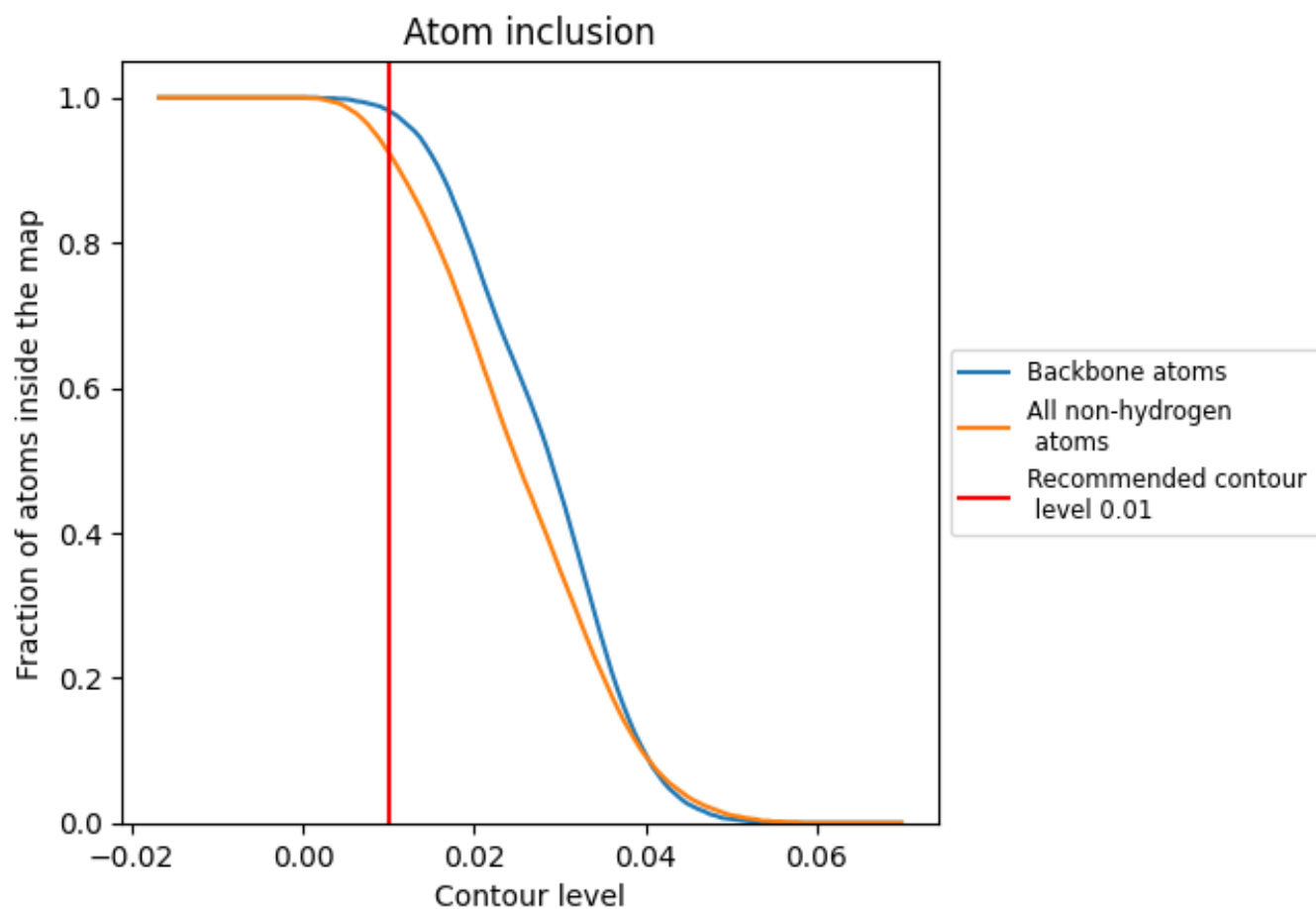
At the recommended contour level, 98% of all backbone atoms, 92% of all non-hydrogen atoms, are inside the map.

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9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9240	0.4720
L1	0.9850	0.5040
L2	0.9430	0.2800
L3	0.8810	0.3790
L4	0.7640	0.2940
L5	0.6690	0.1720
L6	0.9620	0.5170
L7	0.8810	0.4380
L8	0.8690	0.4140
LB	0.9290	0.5130
LC	0.9410	0.5090
LD	0.9510	0.5220
LI	0.8900	0.4540
LJ	0.8350	0.3700
LK	0.7500	0.2480
LM	0.9580	0.5160
LN	0.9160	0.5050
LO	0.9450	0.5150
LP	0.9300	0.5070
LQ	0.9330	0.5110
LR	0.9160	0.4580
LS	0.8890	0.4800
LT	0.9400	0.5120
LU	0.9270	0.5130
LV	0.9440	0.5170
LW	0.9160	0.4950
LX	0.8800	0.4520
La	0.9640	0.5360
Lb	0.9080	0.4800
Ld	0.9380	0.5210
Lf	0.9250	0.5010
Lg	0.9450	0.4890
Lh	0.9860	0.5490
Li	0.9760	0.5470
Lj	0.9720	0.5370

1.0

0.0
<0.0

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Chain	Atom inclusion	Q-score
Lk	0.9060	0.4860
Ll	0.8850	0.4080
Lm	0.8790	0.4460
Ln	0.6680	0.1900
Lo	0.9050	0.4810
Lp	0.9000	0.4880
Lq	0.9500	0.5270
Lr	0.9040	0.4820
Ls	0.8260	0.4260
Lt	0.5790	0.1240
Lu	0.9230	0.4930
Lv	0.7080	0.2640
Lw	0.9360	0.4980
Lx	0.8830	0.4500
Ly	0.9670	0.5370
Lz	0.9100	0.4680
SR	0.9600	0.5070
Sf	0.9220	0.5040