Full wwPDB EM Validation Report ⓘ

Nov 10, 2024 – 10:03 PM EST

PDB ID : 8FMW
EMDB ID : EMD-29298
Title : The structure of a hibernating ribosome in the Lyme disease pathogen
Authors : Sharma, M.R.; Manjari, S.R.; Agrawal, E.K.; Keshavan, P.; Koripella, R.K.; Majumdar, S.; Marcinkiewicz, A.L.; Lin, Y.P.; Agrawal, R.K.; Banavali, N.K.
Deposited on : 2022-12-25
Resolution : 2.86 Å(reported)

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

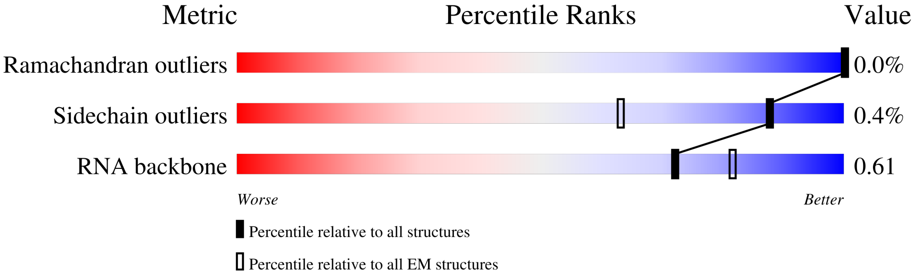
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

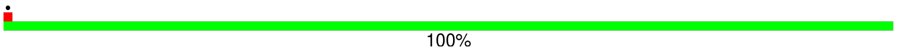
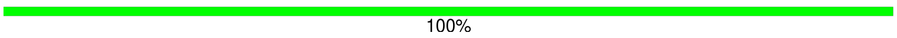
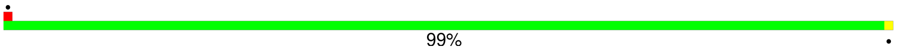
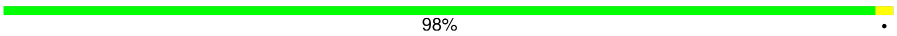
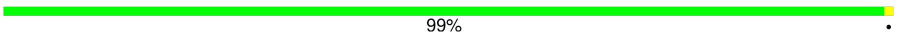
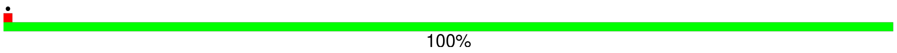
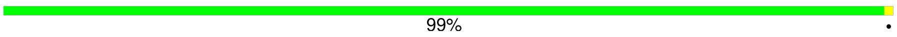
The reported resolution of this entry is 2.86 Å.

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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1529	 85% 15%
2	C	206	 • 100%
3	D	208	 100%
4	E	158	 • 99% •
5	F	97	 98% •
6	G	157	 99% •
7	H	132	 • 100%
8	I	131	 99% •

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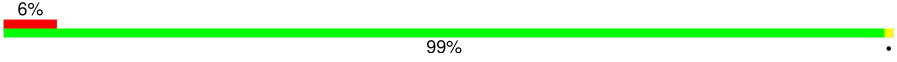
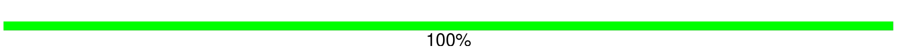
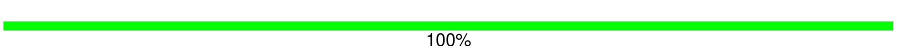
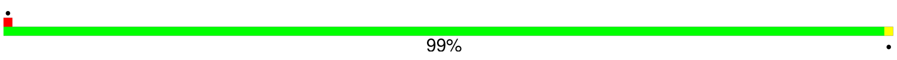
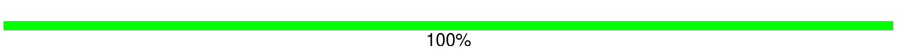
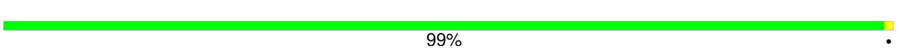
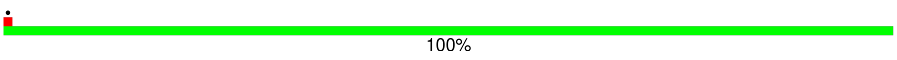
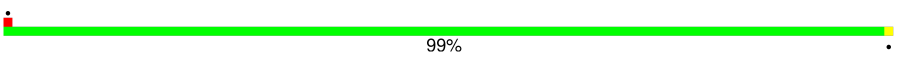
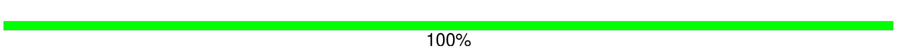
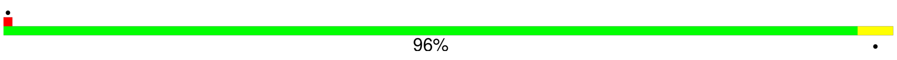
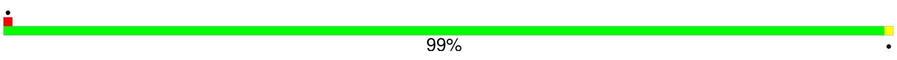
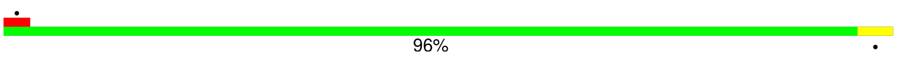
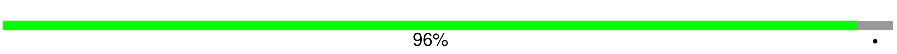
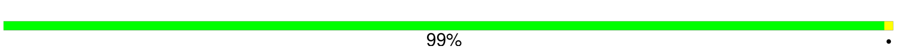
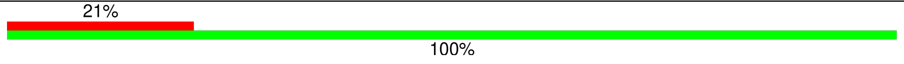
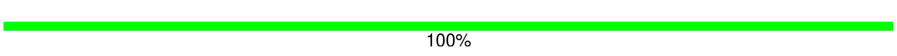
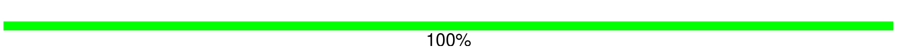
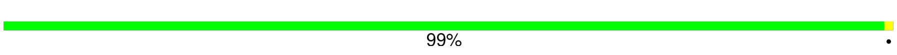
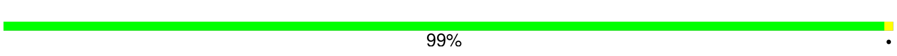
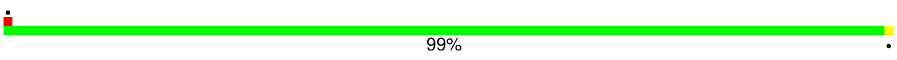
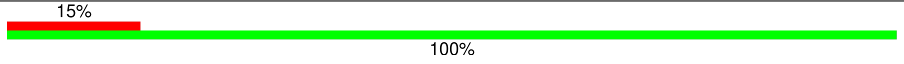
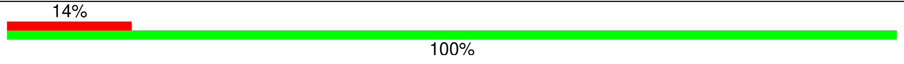
Mol	Chain	Length	Quality of chain
9	J	102	
10	K	117	
11	L	124	
12	M	114	
13	N	60	
14	O	88	
15	P	83	
16	Q	82	
17	R	63	
18	S	84	
19	T	85	
20	U	69	
21	V	28	
22	W	97	
23	X	76	
24	AA	2929	
25	AB	112	
26	AC	221	
27	AD	277	
28	AE	206	
29	AF	209	
30	AG	182	
31	AH	180	
32	AI	148	
33	AJ	162	

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Mol	Chain	Length	Quality of chain
34	AK	139	6% 100%
35	AL	145	100%
36	AM	122	100%
37	AN	145	99%
38	AO	138	98%
39	AP	121	100%
40	AQ	119	98%
41	AR	117	99%
42	AS	114	99%
43	AT	103	100%
44	AU	115	99%
45	AV	98	100%
46	AW	101	97%
47	AX	181	99%
48	AY	74	100%
49	AZ	91	100%
50	Aa	65	100%
51	Ab	100	100%
52	Ac	81	98%
53	Ad	59	100%
54	Ae	51	100%
55	Af	50	100%
56	Ag	66	98%
57	Ah	37	100%
58	Ai	46	85% 13%

2 Entry composition

There are 59 unique types of molecules in this entry. The entry contains 147910 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 ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	1529	32780	14645	5986	10621	1528	0	0

- Molecule 2 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	206	1646	1066	294	284	2	0	0

- Molecule 3 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	208	1689	1069	321	296	3	0	0

- Molecule 4 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	158	1196	763	222	206	5	0	0

- Molecule 5 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	97	814	529	137	144	4	0	0

- Molecule 6 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	G	157	1282	809	235	231	7	0	0

- Molecule 7 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	H	132	1039	662	183	188	6	0	0

- Molecule 8 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	I	131	1043	651	201	188	3	0	0

- Molecule 9 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	J	102	817	524	145	145	3	0	0

- Molecule 10 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	K	117	876	551	163	159	3	0	0

- Molecule 11 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	L	124	968	601	198	165	4	0	0

- Molecule 12 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	M	114	901	554	181	161	5	0	0

- Molecule 13 is a protein called 30S ribosomal protein S14 type Z.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	N	60	491	309	99	76	7	0	0

- Molecule 14 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	O	88	718	455	135	126	2	0	0

- Molecule 15 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	P	83	676	425	127	119	5	0	0

- Molecule 16 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	Q	82	678	436	122	118	2	0	0

- Molecule 17 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	R	63	521	337	95	86	3	0	0

- Molecule 18 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	S	84	669	435	114	119	1	0	0

- Molecule 19 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	T	85	697	439	143	112	3	0	0

- Molecule 20 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	U	69	603	382	119	100	2	0	0

- Molecule 21 is a protein called 30S ribosomal protein bS22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	V	27	240	147	61	31	1	0	0

- Molecule 22 is a protein called Ribosomal subunit interface protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	W	97	818	528	145	144	1	0	0

- Molecule 23 is a RNA chain called E-site t-RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
23	X	76	1618	722	284	536	76	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
X	?	-	U	deletion	GB AE000783.1
X	74	C	U	conflict	GB AE000783.1
X	75	C	U	conflict	GB AE000783.1

- Molecule 24 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
24	AA	2929	62816	28077	11503	20307	2929	0	0

- Molecule 25 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
25	AB	112	2398	1071	434	781	112	0	0

- Molecule 26 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
26	AC	221	884	442	221	221	0	0

- Molecule 27 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	AD	277	2156	1354	414	383	5	0	0

- Molecule 28 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	AE	206	1564	995	278	286	5	0	0

- Molecule 29 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	AF	209	1658	1056	301	299	2	0	0

- Molecule 30 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	AG	182	1439	930	240	265	4	0	0

- Molecule 31 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	AH	180	1405	895	249	259	2	0	0

- Molecule 32 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	AI	148	751	423	161	166	1	0	0

- Molecule 33 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
33	AJ	162	648	324	162	162	0	0

- Molecule 34 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	AK	139	Total 556	C 278	N 139	O 139	0	0

- Molecule 35 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	AL	145	Total 1171	C 756	N 211	O 202	S 2	0	0

- Molecule 36 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	AM	122	Total 942	C 593	N 174	O 170	S 5	0	0

- Molecule 37 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	AN	145	Total 1129	C 716	N 210	O 201	S 2	0	0

- Molecule 38 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	AO	138	Total 1092	C 693	N 204	O 188	S 7	0	0

- Molecule 39 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	AP	121	Total 1004	C 643	N 193	O 164	S 4	0	0

- Molecule 40 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	AQ	119	Total 968	C 613	N 184	O 170	S 1	0	0

- Molecule 41 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	AR	117	Total	C	N	O	S	0	0
			951	613	174	161	3		

- Molecule 42 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	AS	114	Total	C	N	O	S	0	0
			943	597	189	155	2		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AS	40	ARG	UNK	conflict	UNP O51206

- Molecule 43 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	AT	103	Total	C	N	O	S	0	0
			859	552	148	157	2		

- Molecule 44 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	AU	115	Total	C	N	O	S	0	0
			918	574	180	158	6		

- Molecule 45 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	AV	98	Total	C	N	O	S	0	0
			784	507	134	140	3		

- Molecule 46 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	AW	101	Total	C	N	O	S	0	0
			800	501	155	140	4		

- Molecule 47 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	AX	181	1432	912	245	273	2	0	0

- Molecule 48 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
48	AY	74	571	359	112	100	0	0

- Molecule 49 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	AZ	91	705	452	135	115	3	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	Aa	65	553	352	102	95	4	0	0

- Molecule 51 is a protein called 50S ribosomal protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	Ab	100	814	518	158	133	5	0	0

- Molecule 52 is a protein called 50S ribosomal protein L31 type B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	Ac	81	656	419	114	121	2	0	0

- Molecule 53 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	Ad	59	484	300	99	80	5	0	0

- Molecule 54 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	Ae	51	425	266	80	76	3	0	0

- Molecule 55 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	Af	50	422	260	95	64	3	0	0

- Molecule 56 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	Ag	66	548	346	111	88	3	0	0

- Molecule 57 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	Ah	37	305	192	63	46	4	0	0

- Molecule 58 is a protein called 50S ribosomal protein bL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	Ai	46	375	236	72	65	2	0	0

- Molecule 59 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

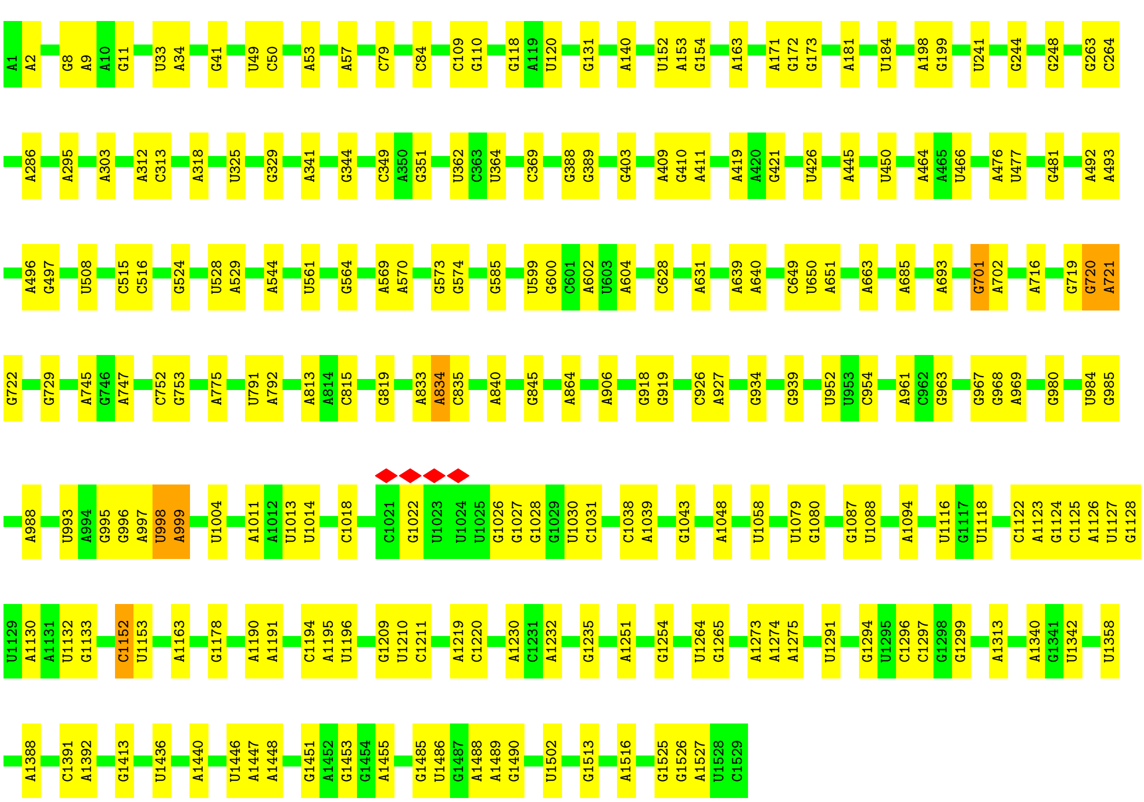
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
59	N	1	1	1	0
59	R	1	1	1	0
59	Ad	1	1	1	0
59	Ah	1	1	1	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

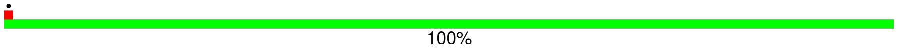
- Molecule 1: 16S ribosomal RNA

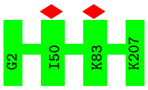
Chain A:



- Molecule 2: 30S ribosomal protein S3

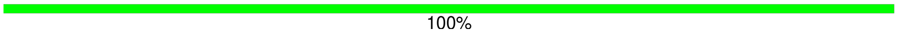
Chain C:

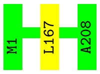




- Molecule 3: 30S ribosomal protein S4

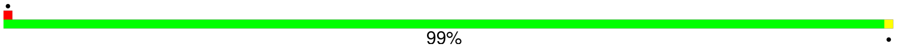
Chain D:

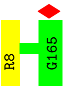




- Molecule 4: 30S ribosomal protein S5

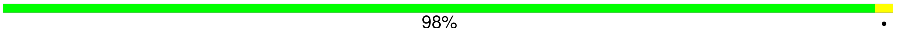
Chain E:

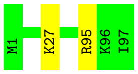




- Molecule 5: 30S ribosomal protein S6

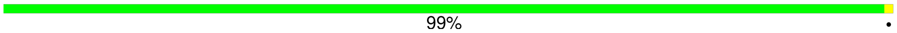
Chain F:

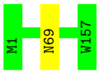




- Molecule 6: 30S ribosomal protein S7

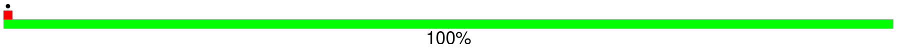
Chain G:

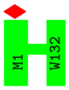




- Molecule 7: 30S ribosomal protein S8

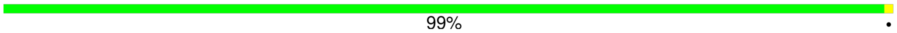
Chain H:

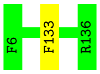




- Molecule 8: 30S ribosomal protein S9

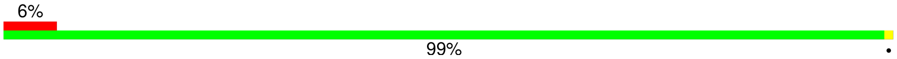
Chain I:

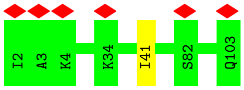




- Molecule 9: 30S ribosomal protein S10

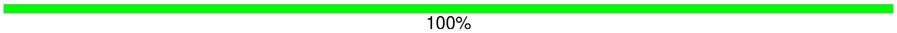
Chain J:





- Molecule 10: 30S ribosomal protein S11

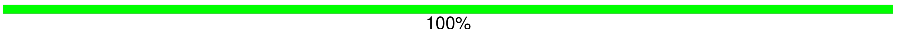
Chain K:



There are no outlier residues recorded for this chain.

- Molecule 11: 30S ribosomal protein S12

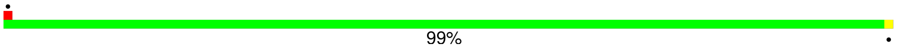
Chain L:

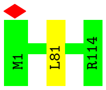


There are no outlier residues recorded for this chain.

- Molecule 12: 30S ribosomal protein S13

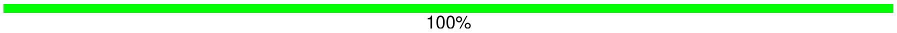
Chain M:





- Molecule 13: 30S ribosomal protein S14 type Z

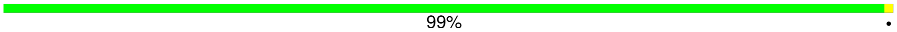
Chain N:

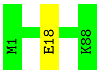


There are no outlier residues recorded for this chain.

- Molecule 14: 30S ribosomal protein S15

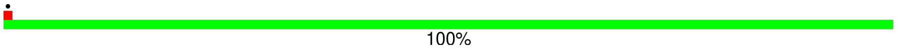
Chain O:

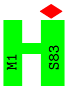




- Molecule 15: 30S ribosomal protein S16

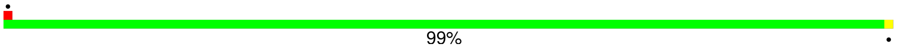
Chain P:

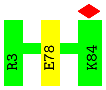




- Molecule 16: 30S ribosomal protein S17

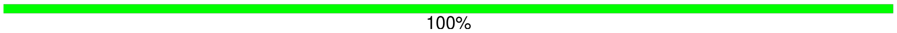
Chain Q:





- Molecule 17: 30S ribosomal protein S18

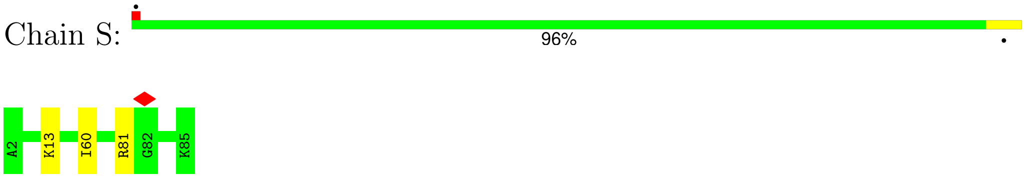
Chain R:



There are no outlier residues recorded for this chain.

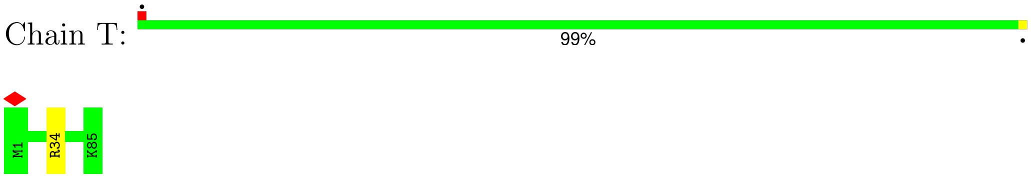
- Molecule 18: 30S ribosomal protein S19

Chain S:



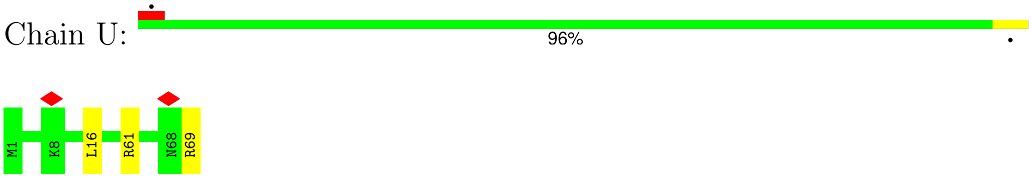
- Molecule 19: 30S ribosomal protein S20

Chain T:



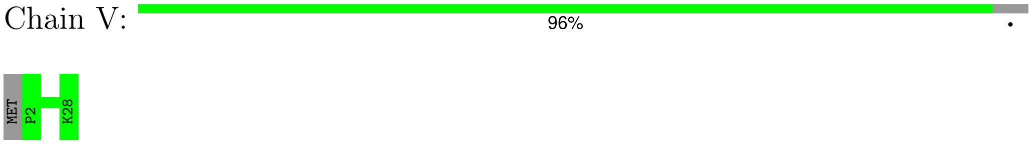
- Molecule 20: 30S ribosomal protein S21

Chain U:



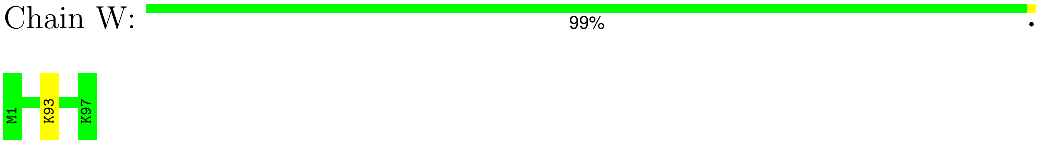
- Molecule 21: 30S ribosomal protein bS22

Chain V:



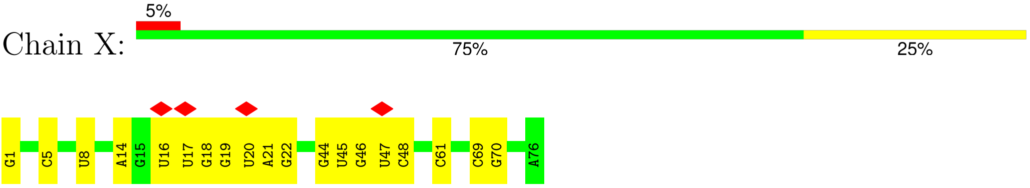
- Molecule 22: Ribosomal subunit interface protein

Chain W:



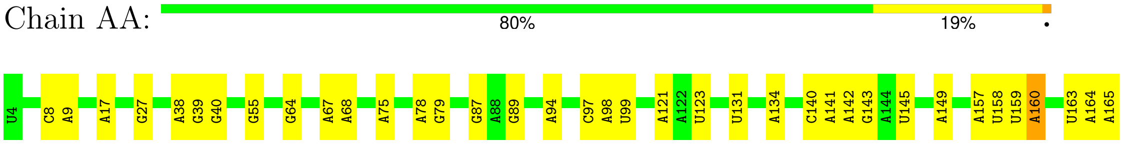
- Molecule 23: E-site t-RNA

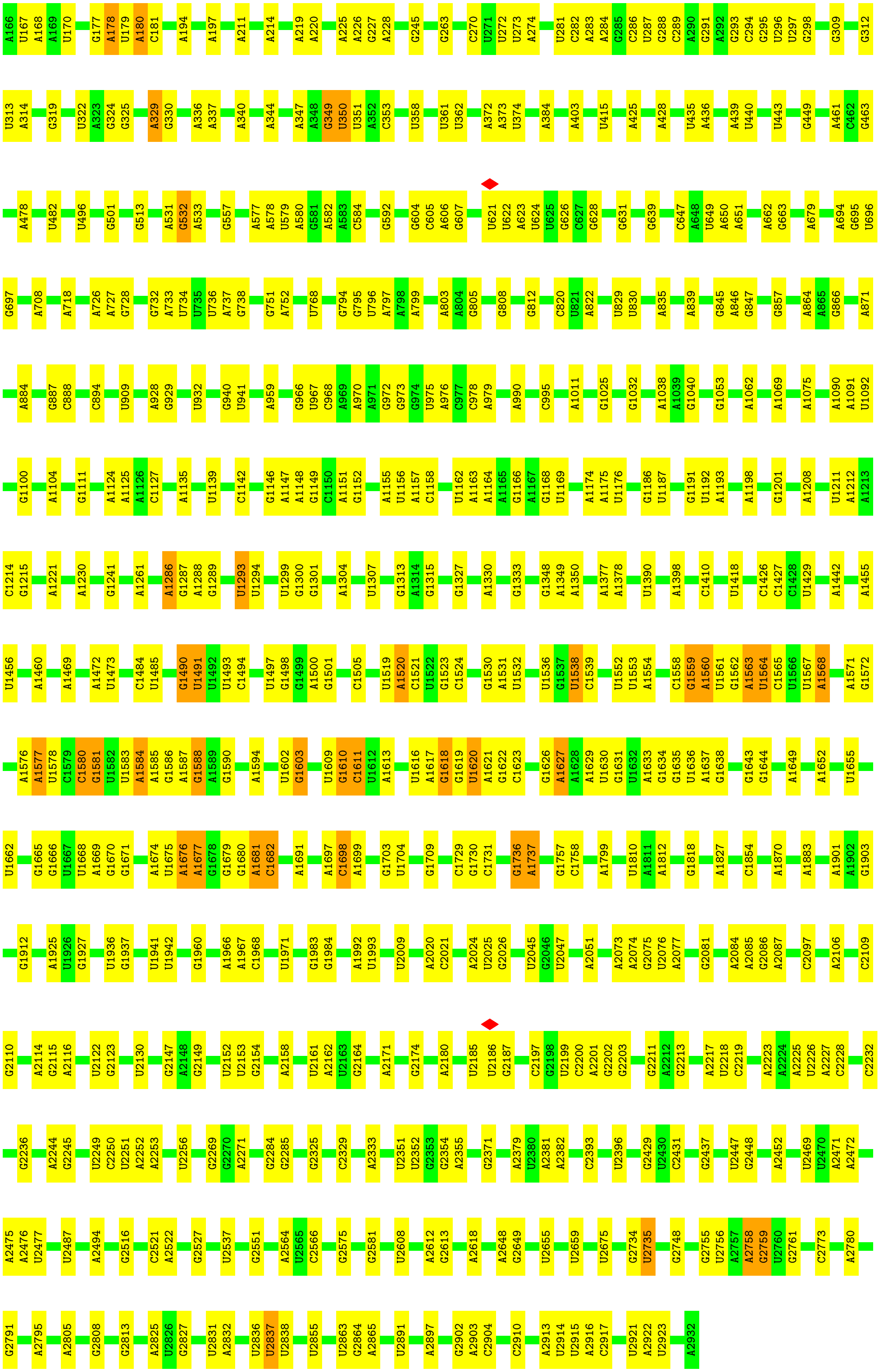
Chain X:



- Molecule 24: 23S ribosomal RNA

Chain AA:

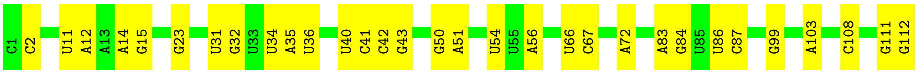




A166 U167 A168 A169 U170 G177 A178 U179 A180 C181 A194 A197 A211 A214 A219 A220 A225 A226 G227 A228 G245 G263 C270 U271 U272 U273 A274 U281 C282 A283 A284 G285 C286 U287 G288 C289 A290 G291 A292 G293 C294 G295 U296 U297 G298 G309 G312
U313 A314 G319 U322 A323 G324 G325 A329 G330 A336 A337 A340 A344 A347 A348 G349 U350 U351 A352 C353 U358 U361 U362 A372 A373 U374 A384 A403 U415 A425 A428 U435 A436 A439 U440 U443 G449 A461 C462 G463
A478 U482 U496 G501 G513 A531 G532 A533 G557 A577 A578 U579 A580 G581 A582 A583 C584 G592 G604 C605 A606 G607 U621 U622 A623 U624 U625 G626 C627 G628 G631 G639 C647 A648 U649 A650 A651 A662 G663 A679 A694 G695 U696
G697 A708 A718 A726 A727 G728 G732 A733 U734 U735 U736 A737 G738 G751 A752 U768 G794 G795 U796 A797 A798 A799 A803 A804 G805 G808 G812 C820 U821 A822 U829 U830 A835 A839 G845 A846 G847 G857 A864 A865 G866 A871
A884 G887 C888 C894 U909 A928 G929 U932 G940 U941 A959 G966 U967 C968 A969 A970 A971 G972 G973 G974 U975 A976 C977 C978 A979 A990 C995 A1011 G1025 G1032 A1038 A1039 G1040 G1053 A1062 A1069 A1075 A1090 A1091 U1092
G1100 A1104 G1111 A1124 A1125 A1126 C1127 A1135 U1139 C1142 G1146 A1147 A1148 G1149 C1150 A1151 G1152 A1155 U1156 A1157 C1158 U1162 A1163 A1164 A1165 G1166 A1167 G1168 U1169 A1174 A1175 U1176 G1186 U1187 G1191 U1192 A1193 A1198 G1201 A1208 U1211 A1212 A1213
C1214 G1215 A1221 A1230 G1241 A1261 A1286 G1287 A1288 G1289 U1293 U1294 U1299 G1300 G1301 A1304 U1307 G1313 A1314 G1315 G1327 A1330 G1333 G1348 A1349 A1350 A1377 A1378 U1390 A1398 C1410 U1418 C1426 C1427 C1428 U1429 A1442 A1455
U1456 A1460 A1469 A1472 U1473 C1484 U1485 G1490 U1491 U1492 U1493 C1494 U1497 G1498 G1499 A1500 G1501 C1505 U1519 A1520 C1521 U1522 G1523 C1524 G1530 A1531 U1532 U1536 G1537 U1538 C1539 U1552 U1553 A1554 C1558 G1559 A1560 U1561 G1562 A1563 U1564 C1565 U1566 U1567 A1568 A1571 G1572
A1576 A1577 U1578 C1579 C1580 G1581 U1582 U1583 A1584 A1585 G1586 A1587 G1588 A1589 G1590 A1594 U1602 G1603 U1609 G1610 C1611 U1612 A1613 U1616 A1617 G1618 G1619 U1620 A1621 G1622 C1623 G1626 A1627 A1628 A1629 U1630 G1631 U1632 A1633 G1634 G1635 U1636 A1637 G1638 G1643 G1644 A1649 A1652 U1655
U1662 G1665 G1666 U1667 U1668 A1669 G1670 G1671 A1674 U1675 A1676 A1677 G1678 G1679 G1680 A1681 C1682 A1691 A1697 C1698 A1699 G1703 U1704 G1709 C1729 G1730 C1731 G1736 A1737 G1757 C1758 A1799 U1810 A1811 A1812 G1818 A1827 C1854 A1870 A1883 A1901 A1902 G1903
G1912 A1925 U1926 G1927 U1936 G1937 U1941 U1942 G1960 A1966 A1967 C1968 U1971 G1983 G1984 A1992 U1993 U2009 A2020 C2021 A2024 U2025 G2026 U2045 G2046 U2047 A2051 A2073 A2074 G2075 U2076 A2077 G2081 A2084 A2085 G2086 A2087 C2097 A2106 C2109
G2110 A2114 G2115 A2116 U2122 G2123 U2130 G2147 A2148 G2149 U2152 U2153 G2154 A2158 U2161 A2162 U2163 G2164 A2171 G2174 A2180 U2185 U2186 G2187 C2197 G2198 U2199 C2200 A2201 G2202 G2203 G2211 A2212 G2213 A2217 U2218 C2219 A2223 A2224 A2225 U2226 A2227 C2228 C2232
G2236 A2244 G2245 U2249 C2250 U2251 A2252 A2253 U2256 G2269 G2270 A2271 G2284 G2285 G2325 C2329 A2333 U2351 U2352 G2353 G2354 A2355 G2371 A2379 U2380 A2381 A2382 C2393 U2396 G2429 U2430 C2431 G2437 U2447 G2448 A2452 U2469 U2470 A2471 A2472
A2475 A2476 U2477 U2487 A2494 G2516 C2521 A2522 G2527 U2537 G2551 A2564 U2565 C2566 G2575 G2581 U2608 A2612 G2613 A2618 A2648 G2649 U2655 U2659 U2675 G2734 U2735 G2748 G2755 U2756 A2757 A2758 G2759 U2760 G2761 C2773 A2780
G2791 A2795 A2805 G2808 G2813 A2825 U2826 G2827 U2831 A2832 U2836 U2837 U2838 U2855 U2863 G2864 A2865 U2891 A2897 G2902 A2903 C2904 C2910 A2913 U2914 U2915 A2916 C2917 U2921 A2922 U2923 A2932

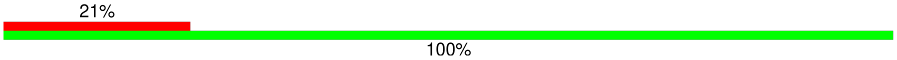
- Molecule 25: 5S ribosomal RNA

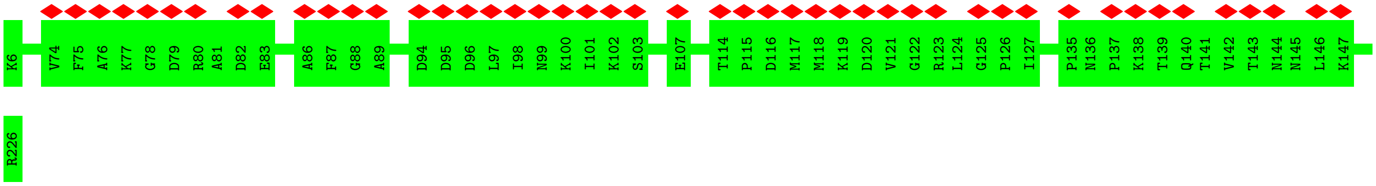
Chain AB:



- Molecule 26: 50S ribosomal protein L1

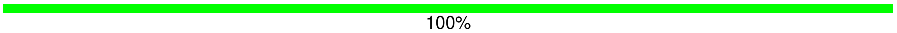
Chain AC:

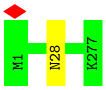




- Molecule 27: 50S ribosomal protein L2

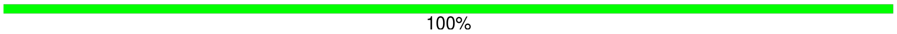
Chain AD:





- Molecule 28: 50S ribosomal protein L3

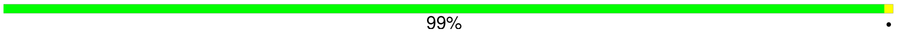
Chain AE:



There are no outlier residues recorded for this chain.

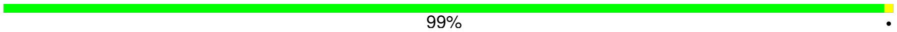
- Molecule 29: 50S ribosomal protein L4

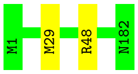
Chain AF:



- Molecule 30: 50S ribosomal protein L5

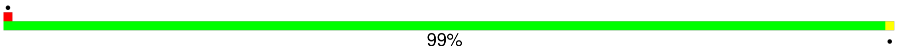
Chain AG:

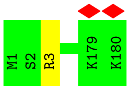




- Molecule 31: 50S ribosomal protein L6

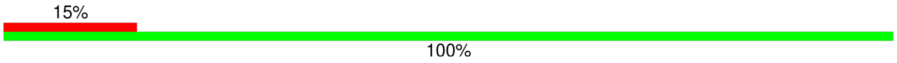
Chain AH:

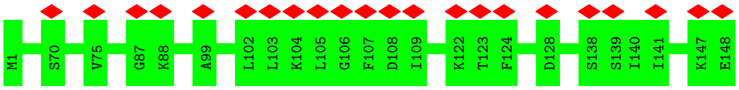




- Molecule 32: 50S ribosomal protein L9

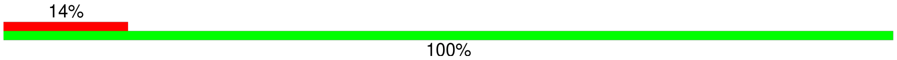
Chain AI:

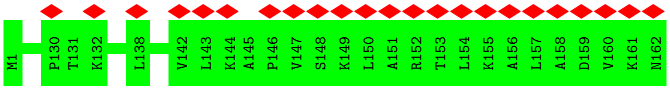




- Molecule 33: 50S ribosomal protein L10

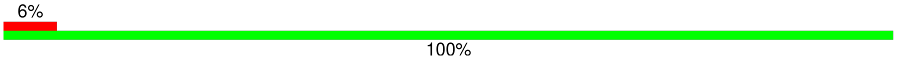
Chain AJ:

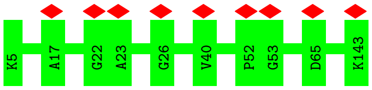




- Molecule 34: 50S ribosomal protein L11

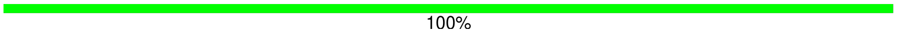
Chain AK:





- Molecule 35: 50S ribosomal protein L13

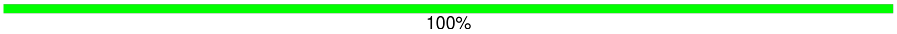
Chain AL:



There are no outlier residues recorded for this chain.

- Molecule 36: 50S ribosomal protein L14

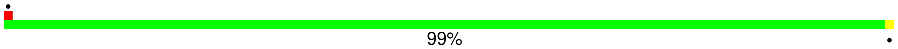
Chain AM:

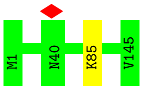


There are no outlier residues recorded for this chain.

- Molecule 37: 50S ribosomal protein L15

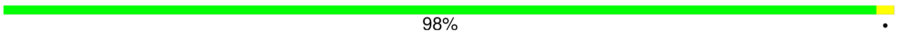
Chain AN:

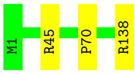




- Molecule 38: 50S ribosomal protein L16

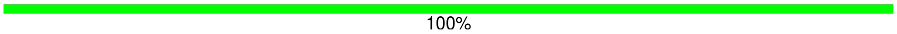
Chain AO:





- Molecule 39: 50S ribosomal protein L17

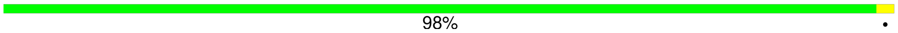
Chain AP:

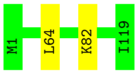


There are no outlier residues recorded for this chain.

- Molecule 40: 50S ribosomal protein L18

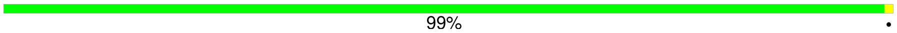
Chain AQ:

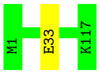




- Molecule 41: 50S ribosomal protein L19

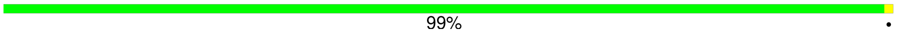
Chain AR:

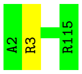




- Molecule 42: 50S ribosomal protein L20

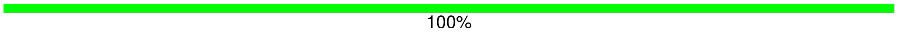
Chain AS:





- Molecule 43: 50S ribosomal protein L21

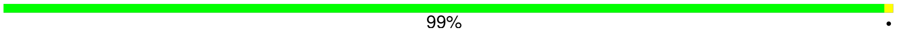
Chain AT:

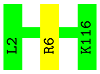


There are no outlier residues recorded for this chain.

- Molecule 44: 50S ribosomal protein L22

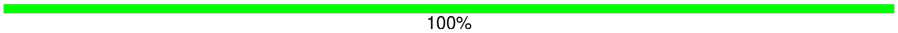
Chain AU:





- Molecule 45: 50S ribosomal protein L23

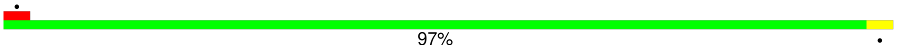
Chain AV:

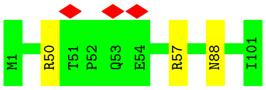


There are no outlier residues recorded for this chain.

- Molecule 46: 50S ribosomal protein L24

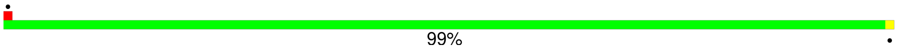
Chain AW:

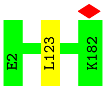




- Molecule 47: 50S ribosomal protein L25

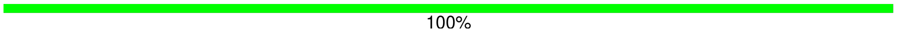
Chain AX:





- Molecule 48: 50S ribosomal protein L27

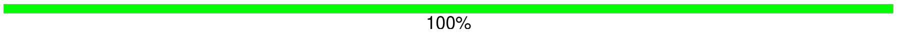
Chain AY:



There are no outlier residues recorded for this chain.

- Molecule 49: 50S ribosomal protein L28

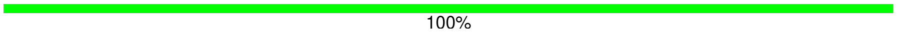
Chain AZ:



There are no outlier residues recorded for this chain.

- Molecule 50: 50S ribosomal protein L29

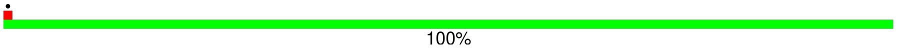
Chain Aa:

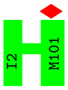


There are no outlier residues recorded for this chain.

- Molecule 51: 50S ribosomal protein uL30

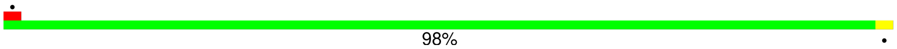
Chain Ab:

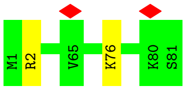




- Molecule 52: 50S ribosomal protein L31 type B

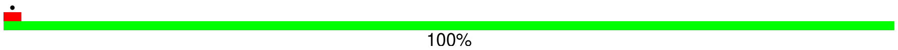
Chain Ac:

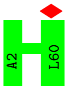




- Molecule 53: 50S ribosomal protein L32

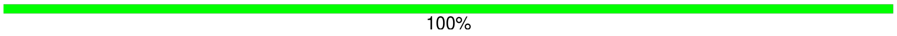
Chain Ad:





- Molecule 54: 50S ribosomal protein L33

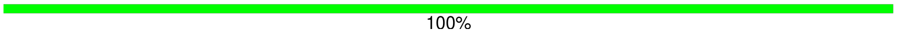
Chain Ae:



There are no outlier residues recorded for this chain.

- Molecule 55: 50S ribosomal protein L34

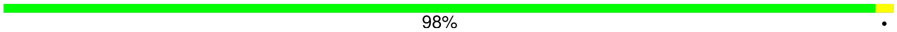
Chain Af:

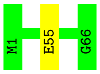


There are no outlier residues recorded for this chain.

- Molecule 56: 50S ribosomal protein L35

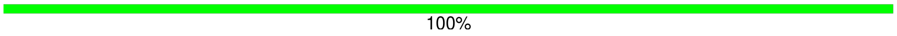
Chain Ag:





- Molecule 57: 50S ribosomal protein L36

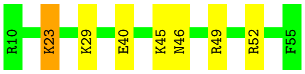
Chain Ah:



There are no outlier residues recorded for this chain.

- Molecule 58: 50S ribosomal protein bL38

Chain Ai:



4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	288776	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	67.527	Depositor
Minimum defocus (nm)	820	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	105000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.084	Depositor
Minimum map value	-0.439	Depositor
Average map value	-0.002	Depositor
Map value standard deviation	0.039	Depositor
Recommended contour level	0.07	Depositor
Map size (Å)	493.245, 493.245, 493.245	wwPDB
Map dimensions	450, 450, 450	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0961, 1.0961, 1.0961	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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| >5$	RMSZ	$\#\|Z\| >5$
1	A	0.25	0/36721	0.79	28/57268 (0.0%)
2	C	0.39	0/1673	0.53	0/2240
3	D	0.36	0/1716	0.55	1/2298 (0.0%)
4	E	0.42	0/1215	0.56	0/1626
5	F	0.38	0/826	0.62	0/1098
6	G	0.32	0/1302	0.55	0/1734
7	H	0.46	0/1053	0.58	0/1406
8	I	0.32	0/1056	0.50	0/1405
9	J	0.36	0/828	0.59	1/1108 (0.1%)
10	K	0.42	0/891	0.56	0/1201
11	L	0.39	0/983	0.52	0/1318
12	M	0.33	0/907	0.69	2/1208 (0.2%)
13	N	0.37	0/500	0.55	0/662
14	O	0.40	0/724	0.57	1/956 (0.1%)
15	P	0.36	0/685	0.48	0/913
16	Q	0.52	1/686 (0.1%)	0.61	0/910
17	R	0.39	0/532	0.54	0/705
18	S	0.33	0/683	0.79	5/917 (0.5%)
19	T	0.39	0/700	0.68	1/918 (0.1%)
20	U	0.34	0/609	0.74	3/800 (0.4%)
21	V	0.38	0/242	0.45	0/307
22	W	0.37	0/832	0.58	1/1110 (0.1%)
23	X	0.34	1/1807 (0.1%)	0.77	0/2812
24	AA	0.33	0/70389	0.83	156/109770 (0.1%)
25	AB	0.27	0/2684	0.72	0/4183
26	AC	0.24	0/883	0.45	0/1102
27	AD	0.54	0/2196	0.59	1/2935 (0.0%)
28	AE	0.52	0/1588	0.54	0/2122
29	AF	0.50	0/1682	0.54	1/2249 (0.0%)
30	AG	0.35	0/1460	0.53	1/1955 (0.1%)
31	AH	0.38	0/1422	0.50	0/1903
32	AI	0.30	0/756	0.51	0/973

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	AJ	0.23	0/647	0.43	0/807
34	AK	0.25	0/555	0.46	0/692
35	AL	0.54	0/1197	0.54	0/1612
36	AM	0.56	0/951	0.59	0/1276
37	AN	0.49	0/1142	0.59	0/1515
38	AO	0.51	0/1110	0.68	1/1480 (0.1%)
39	AP	0.52	0/1020	0.54	0/1353
40	AQ	0.38	0/979	0.62	2/1299 (0.2%)
41	AR	0.61	1/962 (0.1%)	0.65	0/1280
42	AS	0.59	0/954	0.60	0/1264
43	AT	0.56	0/872	0.53	0/1163
44	AU	0.53	0/931	0.57	0/1245
45	AV	0.47	0/796	0.54	0/1065
46	AW	0.40	0/803	0.55	0/1059
47	AX	0.38	0/1451	0.52	1/1955 (0.1%)
48	AY	0.53	0/577	0.52	0/760
49	AZ	0.45	0/713	0.53	0/943
50	Aa	0.41	0/559	0.58	0/739
51	Ab	0.47	0/818	0.55	0/1079
52	Ac	0.31	0/669	0.52	0/893
53	Ad	0.55	0/492	0.51	0/654
54	Ae	0.44	0/429	0.68	0/568
55	Af	0.53	0/425	0.57	0/551
56	Ag	0.57	0/554	0.61	2/726 (0.3%)
57	Ah	0.49	0/306	0.54	0/400
58	Ai	0.72	1/381 (0.3%)	1.31	7/502 (1.4%)
All	All	0.35	4/160524 (0.0%)	0.76	215/238992 (0.1%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
23	X	1	G	OP3-P	-10.73	1.48	1.61
16	Q	78	GLU	CG-CD	-5.97	1.43	1.51
58	Ai	40	GLU	CD-OE2	-5.81	1.19	1.25
41	AR	33	GLU	CB-CG	-5.18	1.42	1.52

All (215) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	999	A	O5'-P-OP1	-31.82	72.51	110.70
24	AA	1559	G	O5'-P-OP1	-31.12	73.36	110.70
24	AA	1967	A	O5'-P-OP1	-31.07	73.41	110.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
24	AA	1677	A	O5'-P-OP1	-31.06	73.43	110.70
1	A	1265	G	O5'-P-OP1	-29.81	74.93	110.70
24	AA	1677	A	OP1-P-OP2	-27.76	77.96	119.60
1	A	721	A	OP1-P-OP2	-27.54	78.29	119.60
1	A	721	A	O5'-P-OP1	-27.27	77.97	110.70
24	AA	1967	A	OP1-P-OP2	-27.06	79.01	119.60
1	A	1265	G	OP1-P-OP2	-26.97	79.15	119.60
1	A	999	A	OP1-P-OP2	-26.73	79.50	119.60
24	AA	1559	G	OP1-P-OP2	-26.67	79.59	119.60
1	A	999	A	O5'-P-OP2	20.05	134.77	110.70
24	AA	1677	A	O5'-P-OP2	19.03	133.54	110.70
24	AA	1967	A	O5'-P-OP2	18.36	132.73	110.70
1	A	1265	G	O5'-P-OP2	17.80	132.06	110.70
1	A	720	G	OP1-P-O3'	15.01	138.21	105.20
1	A	720	G	OP2-P-O3'	-14.89	72.43	105.20
24	AA	1559	G	O5'-P-OP2	14.84	128.51	110.70
24	AA	1558	C	OP2-P-O3'	-14.46	73.40	105.20
24	AA	1558	C	OP1-P-O3'	14.03	136.05	105.20
24	AA	1676	A	OP1-P-O3'	13.88	135.73	105.20
1	A	721	A	O5'-P-OP2	13.86	127.33	110.70
1	A	1264	U	OP1-P-O3'	13.80	135.56	105.20
24	AA	1966	A	OP1-P-O3'	13.74	135.44	105.20
1	A	1264	U	OP2-P-O3'	-13.67	75.12	105.20
1	A	998	U	OP1-P-O3'	13.04	133.90	105.20
24	AA	1966	A	OP2-P-O3'	-12.78	77.09	105.20
24	AA	1676	A	OP2-P-O3'	-12.45	77.80	105.20
1	A	998	U	OP2-P-O3'	-11.69	79.49	105.20
24	AA	531	A	OP2-P-O3'	-11.41	80.10	105.20
24	AA	177	G	OP1-P-O3'	-11.26	80.44	105.20
24	AA	272	U	OP1-P-O3'	-11.22	80.53	105.20
24	AA	1736	G	OP1-P-O3'	-11.21	80.55	105.20
24	AA	2836	U	OP2-P-O3'	-11.19	80.58	105.20
24	AA	1610	G	OP2-P-O3'	-11.18	80.59	105.20
24	AA	1586	G	OP2-P-O3'	-11.17	80.62	105.20
24	AA	1519	U	OP1-P-O3'	-11.16	80.64	105.20
24	AA	1609	U	OP1-P-O3'	-11.16	80.65	105.20
24	AA	1619	G	OP1-P-O3'	-11.11	80.76	105.20
24	AA	1286	A	OP1-P-O3'	-11.10	80.77	105.20
24	AA	1560	A	OP2-P-O3'	-11.10	80.78	105.20
24	AA	1576	A	OP1-P-O3'	-11.07	80.84	105.20
24	AA	159	U	OP1-P-O3'	-11.07	80.85	105.20
24	AA	349	G	OP2-P-O3'	-10.99	81.01	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
24	AA	1500	A	OP1-P-O3'	-10.99	81.03	105.20
24	AA	1584	A	OP1-P-O3'	-10.95	81.10	105.20
24	AA	157	A	OP1-P-O3'	-10.93	81.16	105.20
24	AA	1633	A	OP1-P-O3'	-10.93	81.16	105.20
24	AA	1585	A	OP1-P-O3'	-10.92	81.17	105.20
24	AA	2447	U	OP1-P-O3'	-10.91	81.20	105.20
24	AA	1299	U	OP1-P-O3'	-10.90	81.22	105.20
24	AA	1520	A	OP1-P-O3'	-10.89	81.25	105.20
24	AA	1559	G	OP1-P-O3'	-10.88	81.25	105.20
1	A	833	A	OP1-P-O3'	-10.88	81.27	105.20
24	AA	1580	C	OP2-P-O3'	-10.87	81.29	105.20
24	AA	140	C	OP2-P-O3'	-10.87	81.30	105.20
24	AA	1567	U	OP1-P-O3'	-10.86	81.31	105.20
24	AA	1490	G	OP1-P-O3'	-10.85	81.33	105.20
24	AA	1287	G	OP2-P-O3'	-10.83	81.37	105.20
24	AA	324	G	OP1-P-O3'	-10.83	81.37	105.20
24	AA	1552	U	OP1-P-O3'	-10.83	81.37	105.20
24	AA	1300	G	OP1-P-O3'	-10.82	81.39	105.20
24	AA	180	A	OP1-P-O3'	-10.82	81.40	105.20
24	AA	1626	G	OP1-P-O3'	-10.82	81.40	105.20
24	AA	1563	A	OP1-P-O3'	-10.80	81.43	105.20
24	AA	1618	G	OP1-P-O3'	-10.78	81.49	105.20
24	AA	1643	G	OP1-P-O3'	-10.78	81.49	105.20
24	AA	2758	A	OP2-P-O3'	-10.78	81.49	105.20
24	AA	1674	A	OP1-P-O3'	-10.76	81.52	105.20
24	AA	1602	U	OP2-P-O3'	-10.76	81.53	105.20
1	A	476	A	OP1-P-O3'	-10.76	81.53	105.20
24	AA	1697	A	OP1-P-O3'	-10.74	81.58	105.20
24	AA	1681	A	OP2-P-O3'	-10.66	81.74	105.20
24	AA	1587	A	OP2-P-O3'	-10.61	81.86	105.20
24	AA	1587	A	OP1-P-O3'	-10.57	81.95	105.20
24	AA	1681	A	OP1-P-O3'	-10.55	81.98	105.20
24	AA	1580	C	OP1-P-O3'	-10.49	82.12	105.20
24	AA	2758	A	OP1-P-O3'	-10.45	82.22	105.20
24	AA	2734	G	OP2-P-O3'	-10.41	82.30	105.20
24	AA	1697	A	OP2-P-O3'	-10.28	82.59	105.20
24	AA	140	C	OP1-P-O3'	-10.21	82.73	105.20
24	AA	1602	U	OP1-P-O3'	-10.21	82.75	105.20
1	A	476	A	OP2-P-O3'	-10.19	82.78	105.20
24	AA	1674	A	OP2-P-O3'	-10.13	82.92	105.20
24	AA	2734	G	OP1-P-O3'	-10.12	82.92	105.20
24	AA	1559	G	OP2-P-O3'	-10.11	82.95	105.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
24	AA	1643	G	OP2-P-O3'	-10.01	83.17	105.20
24	AA	1552	U	OP2-P-O3'	-9.98	83.24	105.20
24	AA	1300	G	OP2-P-O3'	-9.97	83.26	105.20
24	AA	324	G	OP2-P-O3'	-9.97	83.27	105.20
24	AA	1618	G	OP2-P-O3'	-9.96	83.29	105.20
24	AA	1563	A	OP2-P-O3'	-9.95	83.30	105.20
24	AA	180	A	OP2-P-O3'	-9.87	83.50	105.20
24	AA	1490	G	OP2-P-O3'	-9.87	83.50	105.20
24	AA	1611	C	OP1-P-OP2	9.83	134.35	119.60
24	AA	1287	G	OP1-P-O3'	-9.80	83.65	105.20
24	AA	1520	A	OP2-P-O3'	-9.77	83.72	105.20
24	AA	1567	U	OP2-P-O3'	-9.76	83.74	105.20
24	AA	2447	U	OP2-P-O3'	-9.74	83.77	105.20
24	AA	157	A	OP2-P-O3'	-9.70	83.85	105.20
24	AA	1633	A	OP2-P-O3'	-9.66	83.95	105.20
24	AA	1584	A	OP2-P-O3'	-9.61	84.06	105.20
1	A	833	A	OP2-P-O3'	-9.59	84.09	105.20
24	AA	1500	A	OP2-P-O3'	-9.58	84.12	105.20
24	AA	1626	G	OP2-P-O3'	-9.55	84.20	105.20
24	AA	1585	A	OP2-P-O3'	-9.53	84.23	105.20
24	AA	1299	U	OP2-P-O3'	-9.52	84.25	105.20
24	AA	1610	G	OP1-P-O3'	-9.49	84.32	105.20
24	AA	1286	A	OP2-P-O3'	-9.26	84.83	105.20
24	AA	1560	A	OP1-P-O3'	-9.21	84.94	105.20
24	AA	1609	U	OP2-P-O3'	-9.14	85.08	105.20
24	AA	159	U	OP2-P-O3'	-9.12	85.13	105.20
24	AA	1576	A	OP2-P-O3'	-9.09	85.21	105.20
24	AA	2836	U	OP1-P-O3'	-8.94	85.54	105.20
24	AA	1736	G	OP2-P-O3'	-8.90	85.62	105.20
24	AA	177	G	OP2-P-O3'	-8.84	85.75	105.20
24	AA	1619	G	OP2-P-O3'	-8.81	85.81	105.20
24	AA	272	U	OP2-P-O3'	-8.78	85.88	105.20
24	AA	349	G	OP1-P-O3'	-8.62	86.23	105.20
20	U	16	LEU	CA-CB-CG	8.58	135.03	115.30
24	AA	531	A	OP1-P-O3'	-8.57	86.35	105.20
24	AA	1519	U	OP2-P-O3'	-8.45	86.61	105.20
40	AQ	64	LEU	CB-CG-CD2	-8.37	96.78	111.00
3	D	167	LEU	CA-CB-CG	8.35	134.50	115.30
18	S	13	LYS	CD-CE-NZ	-8.19	92.86	111.70
9	J	41	ILE	CG1-CB-CG2	-8.04	93.71	111.40
24	AA	1586	G	OP1-P-O3'	-8.00	87.61	105.20
24	AA	1627	A	OP1-P-OP2	7.76	131.24	119.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
58	Ai	52	ARG	NE-CZ-NH2	-7.68	116.46	120.30
24	AA	2735	U	OP1-P-OP2	7.65	131.08	119.60
20	U	69	ARG	CG-CD-NE	7.58	127.72	111.80
18	S	81	ARG	CG-CD-NE	7.53	127.62	111.80
24	AA	1610	G	OP1-P-OP2	7.53	130.89	119.60
1	A	752	C	N1-C2-O2	7.49	123.39	118.90
24	AA	1581	G	OP1-P-OP2	7.44	130.76	119.60
24	AA	1560	A	OP1-P-OP2	7.38	130.68	119.60
24	AA	178	A	OP1-P-OP2	7.38	130.67	119.60
1	A	477	U	OP1-P-OP2	7.38	130.66	119.60
24	AA	1682	C	OP1-P-OP2	7.37	130.66	119.60
24	AA	1577	A	OP1-P-OP2	7.36	130.64	119.60
24	AA	532	G	OP1-P-OP2	7.33	130.59	119.60
24	AA	1698	C	OP1-P-OP2	7.30	130.55	119.60
24	AA	2759	G	OP1-P-OP2	7.28	130.53	119.60
24	AA	141	A	OP1-P-OP2	7.24	130.46	119.60
24	AA	1588	G	OP1-P-OP2	7.23	130.44	119.60
12	M	81	LEU	CB-CG-CD1	7.22	123.27	111.00
24	AA	2448	G	OP1-P-OP2	7.22	130.43	119.60
24	AA	1675	U	OP1-P-OP2	7.21	130.42	119.60
24	AA	1301	G	OP1-P-OP2	7.21	130.41	119.60
24	AA	1603	G	OP1-P-OP2	7.20	130.40	119.60
24	AA	325	G	OP1-P-OP2	7.19	130.39	119.60
24	AA	1521	C	OP1-P-OP2	7.19	130.38	119.60
24	AA	1564	U	OP1-P-OP2	7.18	130.37	119.60
24	AA	1737	A	OP1-P-OP2	7.17	130.36	119.60
24	AA	1619	G	OP1-P-OP2	7.15	130.32	119.60
1	A	834	A	OP1-P-OP2	7.14	130.31	119.60
24	AA	1553	U	OP1-P-OP2	7.13	130.30	119.60
24	AA	1644	G	OP1-P-OP2	7.13	130.29	119.60
24	AA	160	A	OP1-P-OP2	7.12	130.28	119.60
24	AA	1585	A	OP1-P-OP2	7.11	130.27	119.60
24	AA	2837	U	OP1-P-OP2	7.11	130.26	119.60
24	AA	181	C	OP1-P-OP2	7.10	130.25	119.60
24	AA	1586	G	OP1-P-OP2	7.10	130.25	119.60
24	AA	158	U	OP1-P-OP2	7.10	130.25	119.60
24	AA	1501	G	OP1-P-OP2	7.10	130.25	119.60
24	AA	1491	U	OP1-P-OP2	7.09	130.24	119.60
24	AA	1561	U	OP1-P-OP2	7.09	130.24	119.60
24	AA	1300	G	OP1-P-OP2	7.07	130.21	119.60
24	AA	1568	A	OP1-P-OP2	7.07	130.20	119.60
24	AA	1634	G	OP1-P-OP2	7.07	130.20	119.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
24	AA	1287	G	OP1-P-OP2	7.06	130.20	119.60
24	AA	273	U	OP1-P-OP2	7.05	130.18	119.60
27	AD	28	ASN	C-N-CA	7.05	139.33	121.70
24	AA	1288	A	OP1-P-OP2	7.04	130.15	119.60
58	Ai	52	ARG	NE-CZ-NH1	7.01	123.81	120.30
18	S	81	ARG	CB-CG-CD	6.89	129.50	111.60
24	AA	1620	U	OP1-P-OP2	6.85	129.87	119.60
24	AA	1520	A	OP1-P-OP2	6.67	129.60	119.60
1	A	752	C	C2-N1-C1'	6.62	126.08	118.80
1	A	1152	C	N1-C2-O2	6.59	122.86	118.90
18	S	81	ARG	CA-CB-CG	-6.56	98.96	113.40
30	AG	29	MET	CB-CG-SD	6.45	131.75	112.40
58	Ai	45	LYS	CD-CE-NZ	6.44	126.52	111.70
24	AA	350	U	OP1-P-OP2	6.33	129.10	119.60
24	AA	1587	A	OP1-P-OP2	6.19	128.89	119.60
47	AX	123	LEU	CA-CB-CG	6.04	129.19	115.30
58	Ai	23	LYS	CG-CD-CE	5.98	129.84	111.90
24	AA	1390	U	C2-N1-C1'	5.94	124.83	117.70
58	Ai	49	ARG	CA-CB-CG	5.83	126.22	113.40
1	A	752	C	N3-C2-O2	-5.81	117.83	121.90
58	Ai	23	LYS	CB-CG-CD	5.75	126.55	111.60
58	Ai	23	LYS	CD-CE-NZ	5.75	124.92	111.70
24	AA	647	C	C2-N1-C1'	5.64	125.00	118.80
40	AQ	64	LEU	CB-CG-CD1	5.58	120.48	111.00
24	AA	647	C	N1-C2-O2	5.57	122.24	118.90
12	M	81	LEU	CB-CG-CD2	5.54	120.41	111.00
1	A	1152	C	C2-N1-C1'	5.53	124.88	118.80
29	AF	163	MET	CG-SD-CE	5.43	108.89	100.20
24	AA	1293	U	P-O3'-C3'	5.37	126.14	119.70
18	S	60	ILE	CG1-CB-CG2	-5.34	99.66	111.40
1	A	701	G	OP2-P-O3'	5.33	116.93	105.20
20	U	69	ARG	CB-CG-CD	5.27	125.31	111.60
24	AA	1676	A	P-O3'-C3'	5.27	126.03	119.70
56	Ag	55	GLU	CG-CD-OE2	-5.19	107.93	118.30
24	AA	329	A	OP1-P-O3'	5.15	116.53	105.20
24	AA	1567	U	C2-N1-C1'	5.12	123.85	117.70
14	O	18	GLU	CA-CB-CG	5.11	124.65	113.40
19	T	34	ARG	CB-CG-CD	5.09	124.83	111.60
56	Ag	55	GLU	CG-CD-OE1	5.07	128.43	118.30
24	AA	329	A	P-O3'-C3'	5.06	125.77	119.70
24	AA	1538	U	P-O3'-C3'	5.04	125.74	119.70
22	W	93	LYS	CA-CB-CG	5.02	124.45	113.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	628	C	C2-N1-C1'	5.01	124.31	118.80
38	AO	45	ARG	CA-CB-CG	-5.01	102.38	113.40

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	C	204/206 (99%)	194 (95%)	10 (5%)	0	100	100
3	D	206/208 (99%)	196 (95%)	10 (5%)	0	100	100
4	E	156/158 (99%)	147 (94%)	9 (6%)	0	100	100
5	F	95/97 (98%)	88 (93%)	7 (7%)	0	100	100
6	G	155/157 (99%)	138 (89%)	17 (11%)	0	100	100
7	H	130/132 (98%)	123 (95%)	7 (5%)	0	100	100
8	I	129/131 (98%)	118 (92%)	11 (8%)	0	100	100
9	J	100/102 (98%)	92 (92%)	8 (8%)	0	100	100
10	K	115/117 (98%)	105 (91%)	10 (9%)	0	100	100
11	L	122/124 (98%)	114 (93%)	8 (7%)	0	100	100
12	M	112/114 (98%)	105 (94%)	7 (6%)	0	100	100
13	N	58/60 (97%)	57 (98%)	1 (2%)	0	100	100
14	O	86/88 (98%)	84 (98%)	2 (2%)	0	100	100
15	P	81/83 (98%)	79 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
16	Q	80/82 (98%)	74 (92%)	6 (8%)	0	100	100
17	R	61/63 (97%)	57 (93%)	4 (7%)	0	100	100
18	S	82/84 (98%)	76 (93%)	6 (7%)	0	100	100
19	T	83/85 (98%)	81 (98%)	2 (2%)	0	100	100
20	U	67/69 (97%)	65 (97%)	2 (3%)	0	100	100
21	V	25/28 (89%)	24 (96%)	1 (4%)	0	100	100
22	W	95/97 (98%)	87 (92%)	8 (8%)	0	100	100
26	AC	219/221 (99%)	211 (96%)	8 (4%)	0	100	100
27	AD	275/277 (99%)	259 (94%)	16 (6%)	0	100	100
28	AE	204/206 (99%)	195 (96%)	9 (4%)	0	100	100
29	AF	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
30	AG	180/182 (99%)	168 (93%)	12 (7%)	0	100	100
31	AH	178/180 (99%)	170 (96%)	8 (4%)	0	100	100
32	AI	146/148 (99%)	134 (92%)	12 (8%)	0	100	100
33	AJ	160/162 (99%)	153 (96%)	7 (4%)	0	100	100
34	AK	137/139 (99%)	131 (96%)	6 (4%)	0	100	100
35	AL	143/145 (99%)	136 (95%)	7 (5%)	0	100	100
36	AM	120/122 (98%)	113 (94%)	7 (6%)	0	100	100
37	AN	143/145 (99%)	116 (81%)	27 (19%)	0	100	100
38	AO	136/138 (99%)	118 (87%)	17 (12%)	1 (1%)	19	36
39	AP	119/121 (98%)	111 (93%)	8 (7%)	0	100	100
40	AQ	117/119 (98%)	111 (95%)	6 (5%)	0	100	100
41	AR	115/117 (98%)	105 (91%)	10 (9%)	0	100	100
42	AS	112/114 (98%)	104 (93%)	8 (7%)	0	100	100
43	AT	101/103 (98%)	94 (93%)	7 (7%)	0	100	100
44	AU	113/115 (98%)	108 (96%)	5 (4%)	0	100	100
45	AV	96/98 (98%)	92 (96%)	4 (4%)	0	100	100
46	AW	99/101 (98%)	90 (91%)	9 (9%)	0	100	100
47	AX	179/181 (99%)	168 (94%)	11 (6%)	0	100	100
48	AY	72/74 (97%)	69 (96%)	3 (4%)	0	100	100
49	AZ	89/91 (98%)	86 (97%)	3 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	Aa	63/65 (97%)	61 (97%)	2 (3%)	0	100	100
51	Ab	98/100 (98%)	95 (97%)	3 (3%)	0	100	100
52	Ac	79/81 (98%)	67 (85%)	12 (15%)	0	100	100
53	Ad	57/59 (97%)	52 (91%)	5 (9%)	0	100	100
54	Ae	49/51 (96%)	42 (86%)	7 (14%)	0	100	100
55	Af	48/50 (96%)	42 (88%)	6 (12%)	0	100	100
56	Ag	64/66 (97%)	57 (89%)	7 (11%)	0	100	100
57	Ah	35/37 (95%)	32 (91%)	3 (9%)	0	100	100
58	Ai	44/46 (96%)	39 (89%)	5 (11%)	0	100	100
All	All	6239/6348 (98%)	5831 (94%)	407 (6%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
38	AO	70	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	
2	C	179/179 (100%)	179 (100%)	0	100	100
3	D	184/184 (100%)	184 (100%)	0	100	100
4	E	125/125 (100%)	124 (99%)	1 (1%)	79	90
5	F	88/88 (100%)	86 (98%)	2 (2%)	45	70
6	G	136/136 (100%)	135 (99%)	1 (1%)	81	91
7	H	115/115 (100%)	115 (100%)	0	100	100
8	I	113/113 (100%)	112 (99%)	1 (1%)	75	88
9	J	93/93 (100%)	93 (100%)	0	100	100
10	K	91/91 (100%)	91 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
11	L	106/106 (100%)	106 (100%)	0	100	100
12	M	99/99 (100%)	99 (100%)	0	100	100
13	N	53/53 (100%)	53 (100%)	0	100	100
14	O	79/79 (100%)	79 (100%)	0	100	100
15	P	75/75 (100%)	75 (100%)	0	100	100
16	Q	79/79 (100%)	79 (100%)	0	100	100
17	R	56/56 (100%)	56 (100%)	0	100	100
18	S	76/76 (100%)	76 (100%)	0	100	100
19	T	75/75 (100%)	75 (100%)	0	100	100
20	U	65/65 (100%)	64 (98%)	1 (2%)	60	81
21	V	26/27 (96%)	26 (100%)	0	100	100
22	W	91/91 (100%)	91 (100%)	0	100	100
27	AD	229/229 (100%)	229 (100%)	0	100	100
28	AE	168/168 (100%)	168 (100%)	0	100	100
29	AF	181/181 (100%)	180 (99%)	1 (1%)	84	92
30	AG	155/155 (100%)	154 (99%)	1 (1%)	84	92
31	AH	156/156 (100%)	155 (99%)	1 (1%)	84	92
32	AI	34/134 (25%)	34 (100%)	0	100	100
35	AL	127/127 (100%)	127 (100%)	0	100	100
36	AM	103/103 (100%)	103 (100%)	0	100	100
37	AN	124/124 (100%)	123 (99%)	1 (1%)	79	90
38	AO	115/115 (100%)	114 (99%)	1 (1%)	75	88
39	AP	110/110 (100%)	110 (100%)	0	100	100
40	AQ	104/104 (100%)	103 (99%)	1 (1%)	73	87
41	AR	103/103 (100%)	103 (100%)	0	100	100
42	AS	99/99 (100%)	98 (99%)	1 (1%)	73	87
43	AT	96/96 (100%)	96 (100%)	0	100	100
44	AU	100/100 (100%)	99 (99%)	1 (1%)	73	87
45	AV	88/88 (100%)	88 (100%)	0	100	100
46	AW	89/89 (100%)	86 (97%)	3 (3%)	32	57
47	AX	163/163 (100%)	163 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
48	AY	60/60 (100%)	60 (100%)	0	100	100
49	AZ	76/76 (100%)	76 (100%)	0	100	100
50	Aa	61/61 (100%)	61 (100%)	0	100	100
51	Ab	93/93 (100%)	93 (100%)	0	100	100
52	Ac	73/73 (100%)	71 (97%)	2 (3%)	40	65
53	Ad	54/54 (100%)	54 (100%)	0	100	100
54	Ae	48/48 (100%)	48 (100%)	0	100	100
55	Af	44/44 (100%)	44 (100%)	0	100	100
56	Ag	61/61 (100%)	61 (100%)	0	100	100
57	Ah	36/36 (100%)	36 (100%)	0	100	100
58	Ai	40/40 (100%)	37 (92%)	3 (8%)	11	24
All	All	4994/5095 (98%)	4972 (100%)	22 (0%)	88	95

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	E	8	ARG
5	F	27	LYS
5	F	95	ARG
6	G	69	ASN
8	I	133	PHE
20	U	61	ARG
29	AF	21	ARG
30	AG	48	ARG
31	AH	3	ARG
37	AN	85	LYS
38	AO	138	ARG
40	AQ	82	LYS
42	AS	3	ARG
44	AU	6	ARG
46	AW	50	ARG
46	AW	57	ARG
46	AW	88	ASN
52	Ac	2	ARG
52	Ac	76	LYS
58	Ai	23	LYS
58	Ai	29	LYS
58	Ai	46	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
6	G	143	HIS
11	L	46	ASN
12	M	35	ASN
29	AF	170	ASN
36	AM	110	ASN
37	AN	51	GLN
37	AN	113	ASN
39	AP	31	HIS
40	AQ	69	ASN
46	AW	88	ASN
52	Ac	75	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	1528/1529 (99%)	217 (14%)	17 (1%)
23	X	75/76 (98%)	18 (24%)	1 (1%)
24	AA	2928/2929 (99%)	524 (17%)	42 (1%)
25	AB	111/112 (99%)	31 (27%)	4 (3%)
All	All	4642/4646 (99%)	790 (17%)	64 (1%)

All (790) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	2	A
1	A	9	A
1	A	11	G
1	A	33	U
1	A	34	A
1	A	41	G
1	A	49	U
1	A	50	C
1	A	53	A
1	A	57	A
1	A	79	C
1	A	84	C
1	A	109	C
1	A	110	G
1	A	118	G
1	A	120	U

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Mol	Chain	Res	Type
1	A	131	G
1	A	140	A
1	A	152	U
1	A	153	A
1	A	154	G
1	A	163	A
1	A	171	A
1	A	172	G
1	A	173	G
1	A	181	A
1	A	184	U
1	A	198	A
1	A	199	G
1	A	241	U
1	A	244	G
1	A	248	G
1	A	263	G
1	A	264	C
1	A	286	A
1	A	295	A
1	A	303	A
1	A	313	C
1	A	318	A
1	A	325	U
1	A	329	G
1	A	341	A
1	A	344	G
1	A	349	C
1	A	351	G
1	A	362	U
1	A	364	U
1	A	369	C
1	A	388	G
1	A	389	G
1	A	403	G
1	A	409	A
1	A	410	G
1	A	411	A
1	A	419	A
1	A	421	G
1	A	426	U
1	A	445	A

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Mol	Chain	Res	Type
1	A	450	U
1	A	464	A
1	A	466	U
1	A	481	G
1	A	493	A
1	A	497	G
1	A	508	U
1	A	515	C
1	A	516	C
1	A	524	G
1	A	528	U
1	A	529	A
1	A	544	A
1	A	561	U
1	A	564	G
1	A	569	A
1	A	570	A
1	A	573	G
1	A	574	G
1	A	585	G
1	A	599	U
1	A	600	G
1	A	602	A
1	A	604	A
1	A	631	A
1	A	640	A
1	A	650	U
1	A	651	A
1	A	663	A
1	A	685	A
1	A	693	A
1	A	701	G
1	A	702	A
1	A	716	A
1	A	719	G
1	A	720	G
1	A	721	A
1	A	722	G
1	A	729	G
1	A	745	A
1	A	747	A
1	A	753	G

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Mol	Chain	Res	Type
1	A	775	A
1	A	791	U
1	A	792	A
1	A	813	A
1	A	815	C
1	A	819	G
1	A	835	C
1	A	840	A
1	A	845	G
1	A	864	A
1	A	906	A
1	A	918	G
1	A	919	G
1	A	926	C
1	A	927	A
1	A	934	G
1	A	939	G
1	A	952	U
1	A	954	C
1	A	961	A
1	A	963	G
1	A	967	G
1	A	968	G
1	A	969	A
1	A	980	G
1	A	984	U
1	A	985	G
1	A	988	A
1	A	993	U
1	A	995	G
1	A	996	G
1	A	997	A
1	A	998	U
1	A	999	A
1	A	1004	U
1	A	1011	A
1	A	1013	U
1	A	1014	U
1	A	1018	C
1	A	1022	G
1	A	1026	G
1	A	1027	G

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Mol	Chain	Res	Type
1	A	1028	G
1	A	1030	U
1	A	1031	C
1	A	1038	C
1	A	1039	A
1	A	1043	G
1	A	1048	A
1	A	1058	U
1	A	1079	U
1	A	1080	G
1	A	1087	G
1	A	1088	U
1	A	1094	A
1	A	1116	U
1	A	1118	U
1	A	1123	A
1	A	1124	G
1	A	1125	C
1	A	1126	A
1	A	1128	G
1	A	1130	A
1	A	1132	U
1	A	1133	G
1	A	1152	C
1	A	1153	U
1	A	1163	A
1	A	1178	G
1	A	1190	A
1	A	1191	A
1	A	1194	C
1	A	1196	U
1	A	1209	G
1	A	1210	U
1	A	1211	C
1	A	1219	A
1	A	1220	C
1	A	1230	A
1	A	1232	A
1	A	1235	G
1	A	1251	A
1	A	1254	G
1	A	1273	A

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Mol	Chain	Res	Type
1	A	1274	A
1	A	1275	A
1	A	1291	U
1	A	1294	G
1	A	1296	C
1	A	1297	C
1	A	1299	G
1	A	1313	A
1	A	1340	A
1	A	1342	U
1	A	1358	U
1	A	1388	A
1	A	1391	C
1	A	1392	A
1	A	1413	G
1	A	1436	U
1	A	1440	A
1	A	1446	U
1	A	1447	A
1	A	1448	A
1	A	1451	G
1	A	1453	G
1	A	1455	A
1	A	1486	U
1	A	1488	A
1	A	1489	A
1	A	1490	G
1	A	1502	U
1	A	1513	G
1	A	1516	A
1	A	1525	G
1	A	1526	G
1	A	1527	A
23	X	5	C
23	X	8	U
23	X	14	A
23	X	16	U
23	X	17	U
23	X	18	G
23	X	19	G
23	X	20	U
23	X	21	A

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Mol	Chain	Res	Type
23	X	22	G
23	X	44	G
23	X	45	U
23	X	46	G
23	X	47	U
23	X	48	C
23	X	61	C
23	X	69	C
23	X	70	G
24	AA	9	A
24	AA	17	A
24	AA	27	G
24	AA	38	A
24	AA	39	G
24	AA	40	G
24	AA	55	G
24	AA	64	G
24	AA	67	A
24	AA	68	A
24	AA	75	A
24	AA	78	A
24	AA	79	G
24	AA	87	G
24	AA	89	G
24	AA	94	A
24	AA	97	C
24	AA	98	A
24	AA	99	U
24	AA	121	A
24	AA	123	U
24	AA	131	U
24	AA	134	A
24	AA	142	A
24	AA	143	G
24	AA	145	U
24	AA	149	A
24	AA	160	A
24	AA	163	U
24	AA	164	A
24	AA	165	A
24	AA	167	U
24	AA	168	A

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Mol	Chain	Res	Type
24	AA	170	U
24	AA	178	A
24	AA	179	U
24	AA	180	A
24	AA	194	A
24	AA	197	A
24	AA	211	A
24	AA	214	A
24	AA	219	A
24	AA	220	A
24	AA	226	A
24	AA	227	G
24	AA	228	A
24	AA	245	G
24	AA	263	G
24	AA	270	C
24	AA	274	A
24	AA	281	U
24	AA	282	C
24	AA	283	A
24	AA	284	A
24	AA	286	C
24	AA	287	U
24	AA	288	G
24	AA	289	C
24	AA	291	G
24	AA	293	G
24	AA	294	C
24	AA	295	G
24	AA	296	U
24	AA	297	U
24	AA	298	G
24	AA	309	G
24	AA	312	G
24	AA	313	U
24	AA	314	A
24	AA	319	G
24	AA	322	U
24	AA	330	G
24	AA	336	A
24	AA	337	A
24	AA	340	A

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Mol	Chain	Res	Type
24	AA	344	A
24	AA	347	A
24	AA	349	G
24	AA	350	U
24	AA	351	U
24	AA	353	C
24	AA	358	U
24	AA	361	U
24	AA	362	U
24	AA	373	A
24	AA	374	U
24	AA	384	A
24	AA	403	A
24	AA	415	U
24	AA	425	A
24	AA	428	A
24	AA	435	U
24	AA	436	A
24	AA	439	A
24	AA	440	U
24	AA	443	U
24	AA	449	G
24	AA	461	A
24	AA	463	G
24	AA	478	A
24	AA	482	U
24	AA	496	U
24	AA	501	G
24	AA	513	G
24	AA	532	G
24	AA	533	A
24	AA	557	G
24	AA	577	A
24	AA	579	U
24	AA	580	A
24	AA	582	A
24	AA	584	C
24	AA	592	G
24	AA	604	G
24	AA	605	C
24	AA	606	A
24	AA	607	G

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Mol	Chain	Res	Type
24	AA	621	U
24	AA	622	U
24	AA	623	A
24	AA	624	U
24	AA	626	G
24	AA	628	G
24	AA	631	G
24	AA	639	G
24	AA	649	U
24	AA	650	A
24	AA	651	A
24	AA	662	A
24	AA	663	G
24	AA	679	A
24	AA	694	A
24	AA	695	G
24	AA	696	U
24	AA	697	G
24	AA	708	A
24	AA	718	A
24	AA	726	A
24	AA	727	A
24	AA	728	G
24	AA	732	G
24	AA	734	U
24	AA	736	U
24	AA	737	A
24	AA	738	G
24	AA	751	G
24	AA	752	A
24	AA	768	U
24	AA	794	G
24	AA	795	G
24	AA	796	U
24	AA	797	A
24	AA	799	A
24	AA	803	A
24	AA	805	G
24	AA	808	G
24	AA	812	G
24	AA	820	C
24	AA	822	A

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Mol	Chain	Res	Type
24	AA	829	U
24	AA	830	U
24	AA	835	A
24	AA	839	A
24	AA	845	G
24	AA	846	A
24	AA	847	G
24	AA	857	G
24	AA	864	A
24	AA	866	G
24	AA	871	A
24	AA	884	A
24	AA	887	G
24	AA	888	C
24	AA	894	C
24	AA	909	U
24	AA	928	A
24	AA	929	G
24	AA	932	U
24	AA	940	G
24	AA	941	U
24	AA	959	A
24	AA	966	G
24	AA	967	U
24	AA	968	C
24	AA	970	A
24	AA	972	G
24	AA	973	G
24	AA	975	U
24	AA	976	A
24	AA	978	C
24	AA	979	A
24	AA	990	A
24	AA	995	C
24	AA	1011	A
24	AA	1025	G
24	AA	1032	G
24	AA	1038	A
24	AA	1040	G
24	AA	1053	G
24	AA	1062	A
24	AA	1069	A

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Mol	Chain	Res	Type
24	AA	1075	A
24	AA	1090	A
24	AA	1092	U
24	AA	1100	G
24	AA	1104	A
24	AA	1111	G
24	AA	1124	A
24	AA	1125	A
24	AA	1127	C
24	AA	1135	A
24	AA	1139	U
24	AA	1142	C
24	AA	1147	A
24	AA	1148	A
24	AA	1149	G
24	AA	1151	A
24	AA	1152	G
24	AA	1156	U
24	AA	1157	A
24	AA	1158	C
24	AA	1162	U
24	AA	1163	A
24	AA	1164	A
24	AA	1166	G
24	AA	1168	G
24	AA	1169	U
24	AA	1174	A
24	AA	1175	A
24	AA	1176	U
24	AA	1186	G
24	AA	1187	U
24	AA	1191	G
24	AA	1193	A
24	AA	1198	A
24	AA	1201	G
24	AA	1208	A
24	AA	1211	U
24	AA	1212	A
24	AA	1214	C
24	AA	1215	G
24	AA	1221	A
24	AA	1230	A

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Mol	Chain	Res	Type
24	AA	1241	G
24	AA	1261	A
24	AA	1286	A
24	AA	1289	G
24	AA	1294	U
24	AA	1304	A
24	AA	1307	U
24	AA	1313	G
24	AA	1315	G
24	AA	1327	G
24	AA	1330	A
24	AA	1333	G
24	AA	1348	G
24	AA	1349	A
24	AA	1350	A
24	AA	1377	A
24	AA	1378	A
24	AA	1398	A
24	AA	1410	C
24	AA	1418	U
24	AA	1427	C
24	AA	1429	U
24	AA	1442	A
24	AA	1455	A
24	AA	1456	U
24	AA	1460	A
24	AA	1469	A
24	AA	1472	A
24	AA	1473	U
24	AA	1484	C
24	AA	1485	U
24	AA	1490	G
24	AA	1491	U
24	AA	1493	U
24	AA	1494	C
24	AA	1497	U
24	AA	1498	G
24	AA	1505	C
24	AA	1520	A
24	AA	1524	C
24	AA	1530	G
24	AA	1531	A

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Mol	Chain	Res	Type
24	AA	1532	U
24	AA	1536	U
24	AA	1538	U
24	AA	1539	C
24	AA	1554	A
24	AA	1559	G
24	AA	1560	A
24	AA	1562	G
24	AA	1563	A
24	AA	1564	U
24	AA	1565	C
24	AA	1568	A
24	AA	1571	A
24	AA	1572	G
24	AA	1577	A
24	AA	1578	U
24	AA	1580	C
24	AA	1581	G
24	AA	1583	U
24	AA	1584	A
24	AA	1588	G
24	AA	1590	G
24	AA	1594	A
24	AA	1603	G
24	AA	1610	G
24	AA	1611	C
24	AA	1613	A
24	AA	1616	U
24	AA	1618	G
24	AA	1620	U
24	AA	1621	A
24	AA	1623	C
24	AA	1627	A
24	AA	1629	A
24	AA	1630	U
24	AA	1631	G
24	AA	1636	U
24	AA	1637	A
24	AA	1638	G
24	AA	1649	A
24	AA	1652	A
24	AA	1655	U

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Mol	Chain	Res	Type
24	AA	1662	U
24	AA	1665	G
24	AA	1666	G
24	AA	1668	U
24	AA	1669	A
24	AA	1670	G
24	AA	1671	G
24	AA	1677	A
24	AA	1679	G
24	AA	1680	G
24	AA	1681	A
24	AA	1682	C
24	AA	1691	A
24	AA	1699	A
24	AA	1704	U
24	AA	1709	G
24	AA	1729	C
24	AA	1730	G
24	AA	1731	C
24	AA	1736	G
24	AA	1737	A
24	AA	1757	G
24	AA	1758	C
24	AA	1799	A
24	AA	1810	U
24	AA	1812	A
24	AA	1818	G
24	AA	1827	A
24	AA	1854	C
24	AA	1870	A
24	AA	1883	A
24	AA	1901	A
24	AA	1903	G
24	AA	1912	G
24	AA	1925	A
24	AA	1927	G
24	AA	1937	G
24	AA	1941	U
24	AA	1942	U
24	AA	1960	G
24	AA	1968	C
24	AA	1971	U

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Mol	Chain	Res	Type
24	AA	1983	G
24	AA	1984	G
24	AA	1992	A
24	AA	1993	U
24	AA	2009	U
24	AA	2020	A
24	AA	2021	C
24	AA	2024	A
24	AA	2025	U
24	AA	2026	G
24	AA	2045	U
24	AA	2047	U
24	AA	2051	A
24	AA	2073	A
24	AA	2074	A
24	AA	2075	G
24	AA	2076	U
24	AA	2077	A
24	AA	2081	G
24	AA	2084	A
24	AA	2085	A
24	AA	2086	G
24	AA	2087	A
24	AA	2097	C
24	AA	2106	A
24	AA	2109	C
24	AA	2110	G
24	AA	2114	A
24	AA	2115	G
24	AA	2116	A
24	AA	2122	U
24	AA	2123	G
24	AA	2130	U
24	AA	2147	G
24	AA	2149	G
24	AA	2153	U
24	AA	2154	G
24	AA	2158	A
24	AA	2161	U
24	AA	2162	A
24	AA	2164	G
24	AA	2171	A

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Mol	Chain	Res	Type
24	AA	2174	G
24	AA	2180	A
24	AA	2185	U
24	AA	2186	U
24	AA	2187	G
24	AA	2197	C
24	AA	2199	U
24	AA	2200	C
24	AA	2201	A
24	AA	2202	G
24	AA	2203	G
24	AA	2211	G
24	AA	2213	G
24	AA	2217	A
24	AA	2218	U
24	AA	2219	C
24	AA	2223	A
24	AA	2225	A
24	AA	2226	U
24	AA	2227	A
24	AA	2228	C
24	AA	2232	C
24	AA	2236	G
24	AA	2244	A
24	AA	2245	G
24	AA	2249	U
24	AA	2250	C
24	AA	2252	A
24	AA	2253	A
24	AA	2256	U
24	AA	2269	G
24	AA	2271	A
24	AA	2284	G
24	AA	2285	G
24	AA	2325	G
24	AA	2329	C
24	AA	2333	A
24	AA	2351	U
24	AA	2352	U
24	AA	2354	G
24	AA	2355	A
24	AA	2371	G

Continued on next page...

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Mol	Chain	Res	Type
24	AA	2379	A
24	AA	2381	A
24	AA	2382	A
24	AA	2393	C
24	AA	2396	U
24	AA	2429	G
24	AA	2431	C
24	AA	2437	G
24	AA	2452	A
24	AA	2469	U
24	AA	2471	A
24	AA	2472	A
24	AA	2475	A
24	AA	2476	A
24	AA	2477	U
24	AA	2487	U
24	AA	2494	A
24	AA	2516	G
24	AA	2521	C
24	AA	2522	A
24	AA	2527	G
24	AA	2537	U
24	AA	2551	G
24	AA	2564	A
24	AA	2566	C
24	AA	2575	G
24	AA	2581	G
24	AA	2608	U
24	AA	2612	A
24	AA	2613	G
24	AA	2618	A
24	AA	2648	A
24	AA	2649	G
24	AA	2655	U
24	AA	2659	U
24	AA	2675	U
24	AA	2735	U
24	AA	2748	G
24	AA	2756	U
24	AA	2758	A
24	AA	2759	G
24	AA	2761	G

Continued on next page...

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Mol	Chain	Res	Type
24	AA	2773	C
24	AA	2780	A
24	AA	2791	G
24	AA	2795	A
24	AA	2805	A
24	AA	2808	G
24	AA	2813	G
24	AA	2825	A
24	AA	2827	G
24	AA	2832	A
24	AA	2837	U
24	AA	2838	U
24	AA	2855	U
24	AA	2863	U
24	AA	2864	G
24	AA	2865	A
24	AA	2891	U
24	AA	2897	A
24	AA	2902	G
24	AA	2903	A
24	AA	2904	C
24	AA	2910	C
24	AA	2913	A
24	AA	2914	U
24	AA	2915	U
24	AA	2916	A
24	AA	2917	C
24	AA	2921	U
24	AA	2923	U
25	AB	2	C
25	AB	11	U
25	AB	12	A
25	AB	14	A
25	AB	15	G
25	AB	23	G
25	AB	31	U
25	AB	32	G
25	AB	34	U
25	AB	35	A
25	AB	36	U
25	AB	40	U
25	AB	41	C

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Mol	Chain	Res	Type
25	AB	42	C
25	AB	43	G
25	AB	50	G
25	AB	51	A
25	AB	54	U
25	AB	56	A
25	AB	66	U
25	AB	67	C
25	AB	72	A
25	AB	83	A
25	AB	84	G
25	AB	86	U
25	AB	87	C
25	AB	99	G
25	AB	103	A
25	AB	108	C
25	AB	111	G
25	AB	112	G

All (64) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	8	G
1	A	171	A
1	A	312	A
1	A	492	A
1	A	496	A
1	A	639	A
1	A	649	C
1	A	701	G
1	A	720	G
1	A	834	A
1	A	995	G
1	A	996	G
1	A	1122	C
1	A	1127	U
1	A	1195	A
1	A	1209	G
1	A	1485	G
23	X	18	G
24	AA	8	C
24	AA	142	A

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Mol	Chain	Res	Type
24	AA	179	U
24	AA	225	A
24	AA	329	A
24	AA	350	U
24	AA	372	A
24	AA	532	G
24	AA	578	A
24	AA	733	A
24	AA	928	A
24	AA	940	G
24	AA	967	U
24	AA	1091	A
24	AA	1146	G
24	AA	1155	A
24	AA	1192	U
24	AA	1293	U
24	AA	1426	C
24	AA	1484	C
24	AA	1523	G
24	AA	1538	U
24	AA	1577	A
24	AA	1583	U
24	AA	1617	A
24	AA	1622	G
24	AA	1635	G
24	AA	1636	U
24	AA	1668	U
24	AA	1670	G
24	AA	1676	A
24	AA	1698	C
24	AA	1703	G
24	AA	1936	U
24	AA	2073	A
24	AA	2152	U
24	AA	2249	U
24	AA	2251	U
24	AA	2755	G
24	AA	2831	U
24	AA	2837	U
24	AA	2922	A
25	AB	31	U
25	AB	34	U

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Mol	Chain	Res	Type
25	AB	35	A
25	AB	86	U

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 4 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.

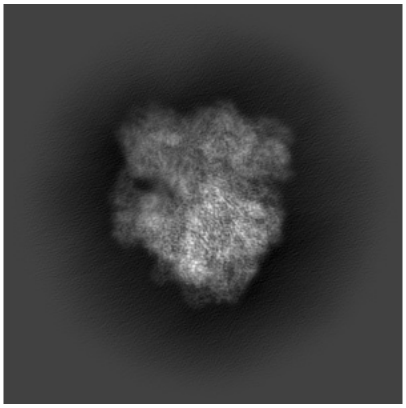
6 Map visualisation

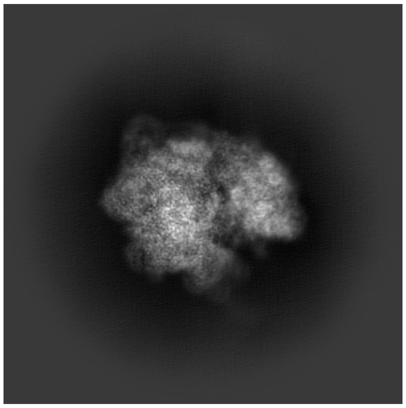
This section contains visualisations of the EMDB entry EMD-29298. These allow visual inspection of the internal detail of the map and identification of artifacts.

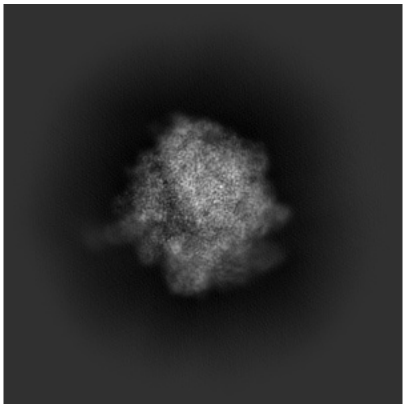
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

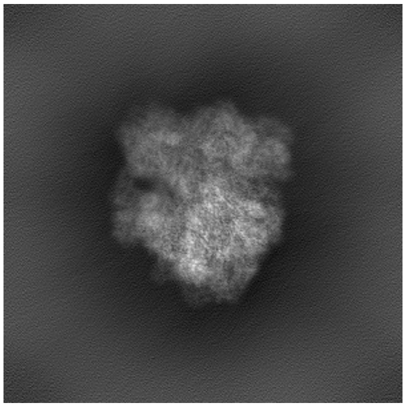
6.1.1 Primary map

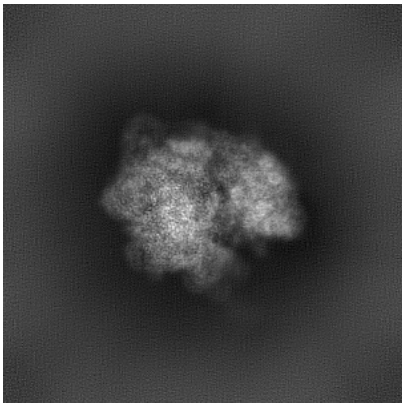

X

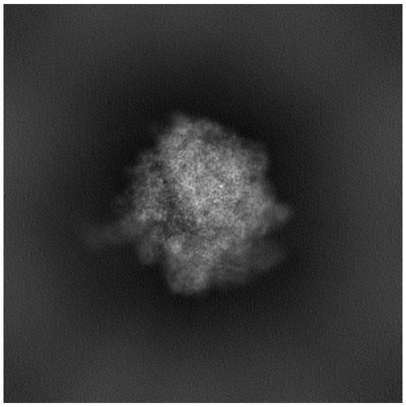

Y


Z

6.1.2 Raw map


X

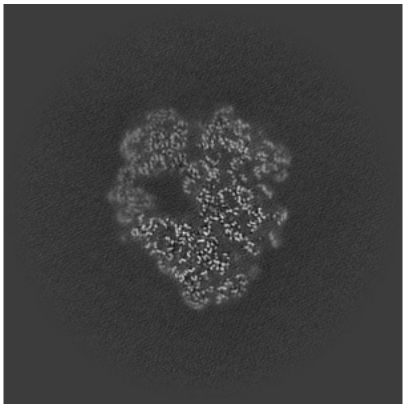

Y


Z

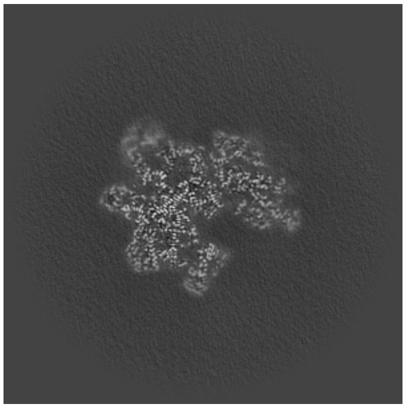
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

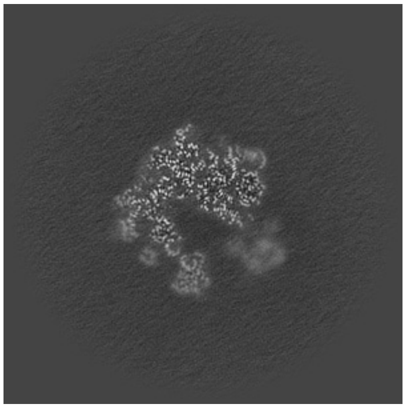
6.2.1 Primary map



X Index: 225

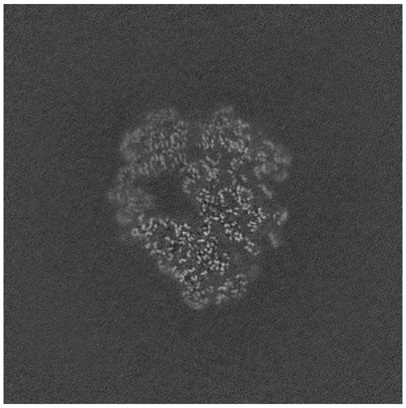


Y Index: 225

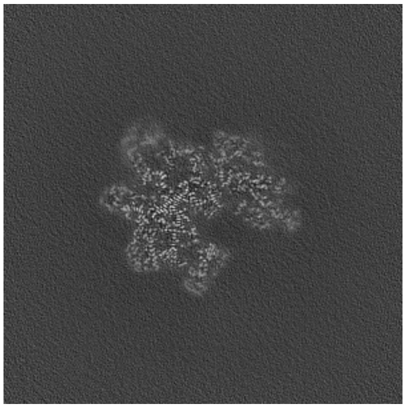


Z Index: 225

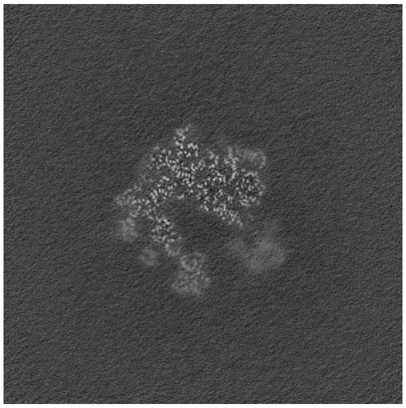
6.2.2 Raw map



X Index: 225



Y Index: 225

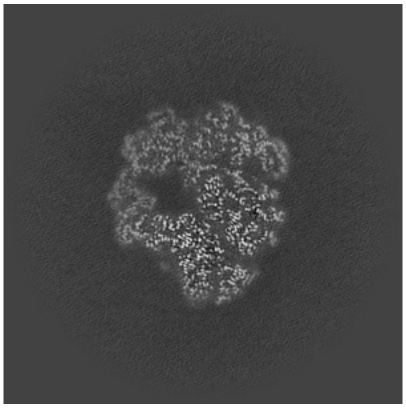


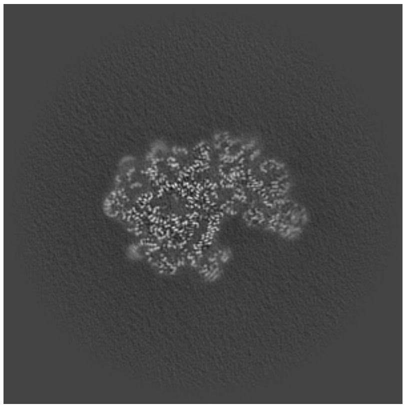
Z Index: 225

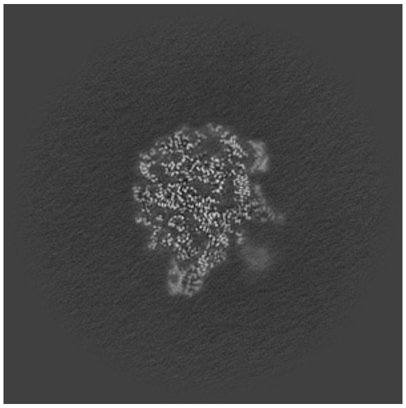
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

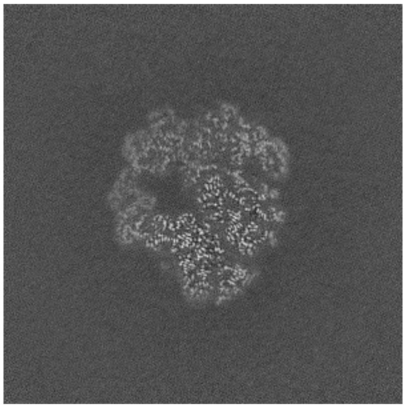
6.3.1 Primary map

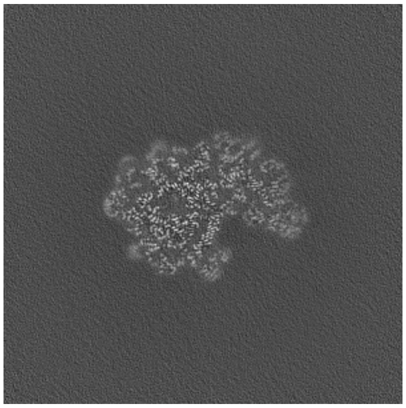

X Index: 220

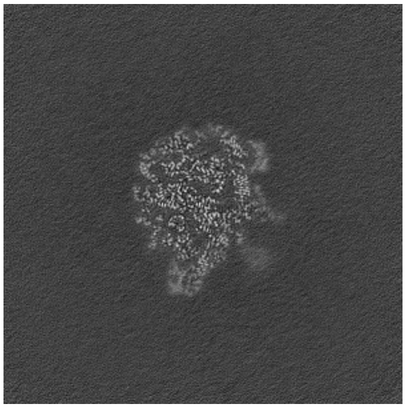

Y Index: 243


Z Index: 191

6.3.2 Raw map


X Index: 220

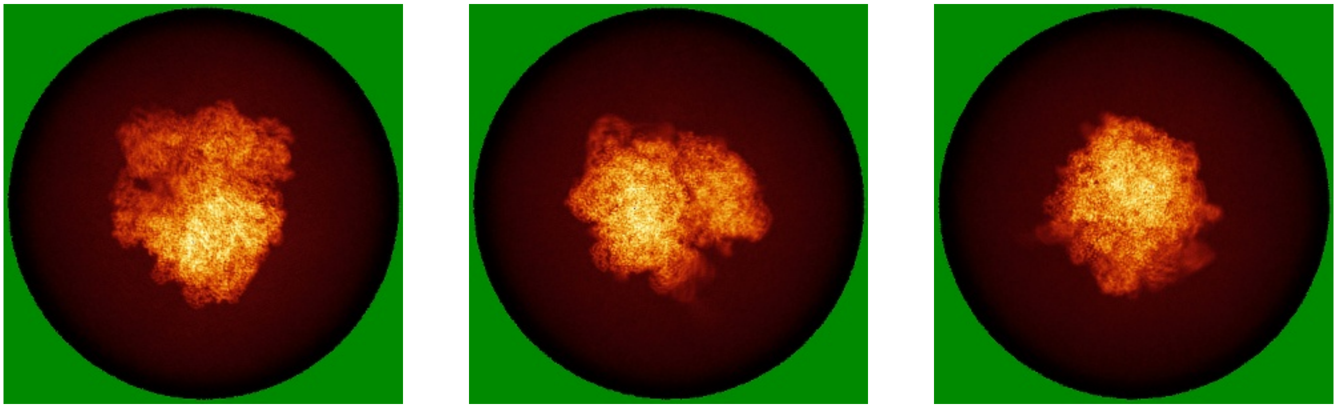

Y Index: 243


Z Index: 191

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

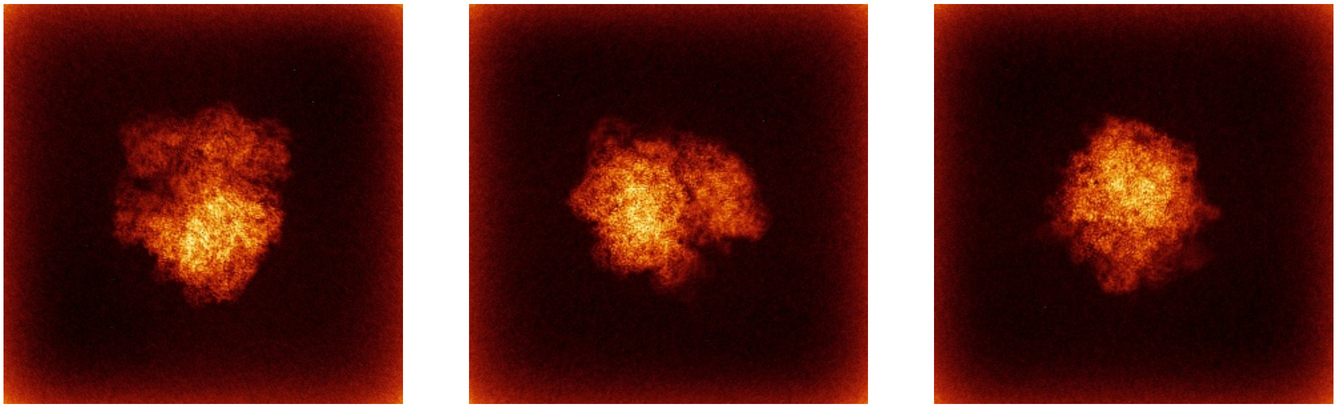
6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map



X Y Z

6.4.2 Raw map

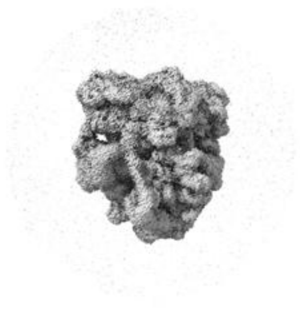


X Y Z

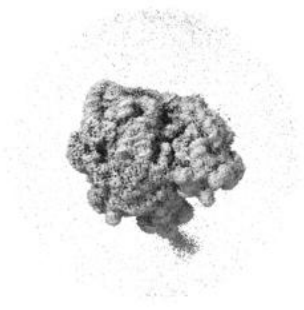
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views

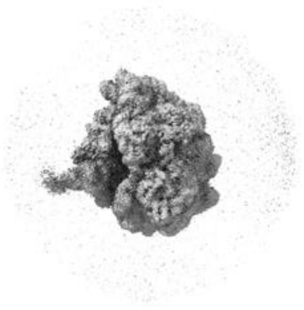
6.5.1 Primary map



X



Y

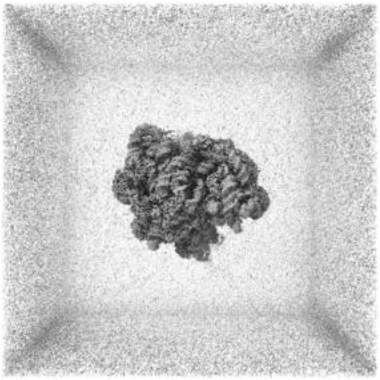


Z

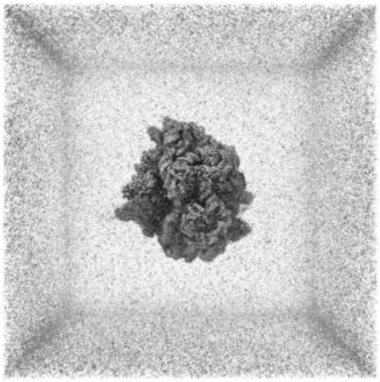
The images above show the 3D surface view of the map at the recommended contour level 0.07. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

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.

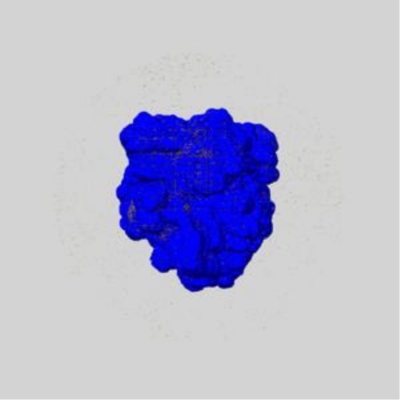
6.6 Mask visualisation ⓘ

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

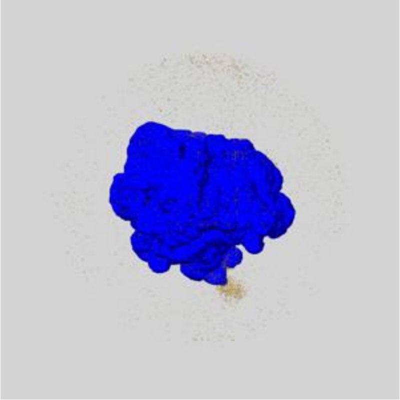
A mask typically either:

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

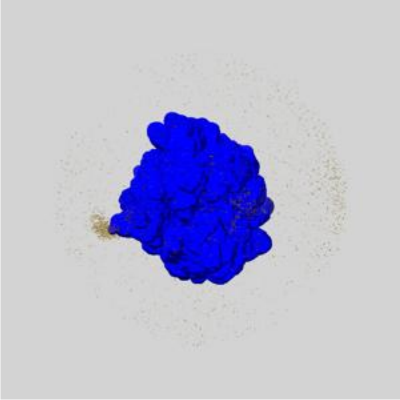
6.6.1 emd_29298_msk_1.map ⓘ



X



Y

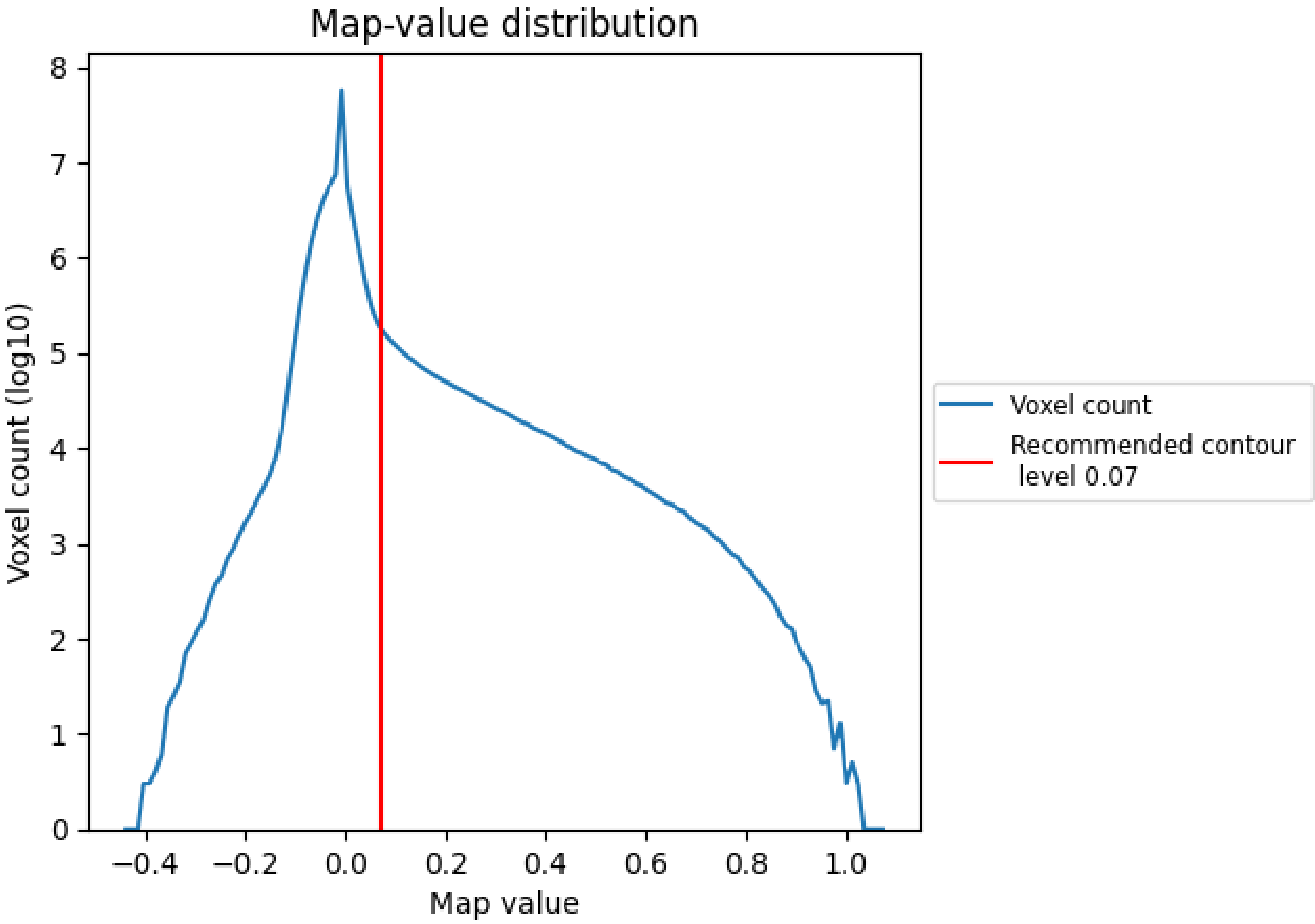


Z

7 Map analysis ⓘ

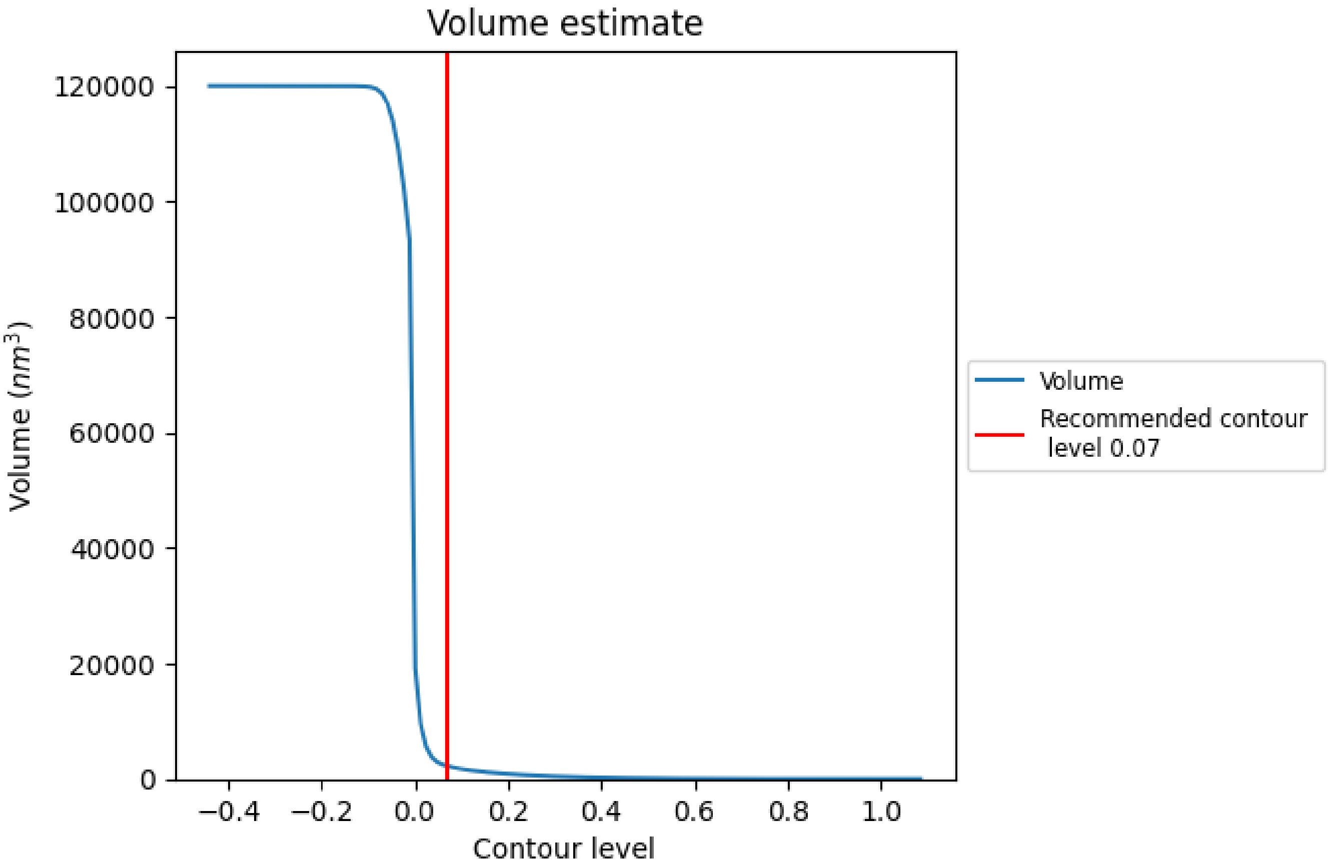
This section contains the results of statistical analysis of the map.

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.

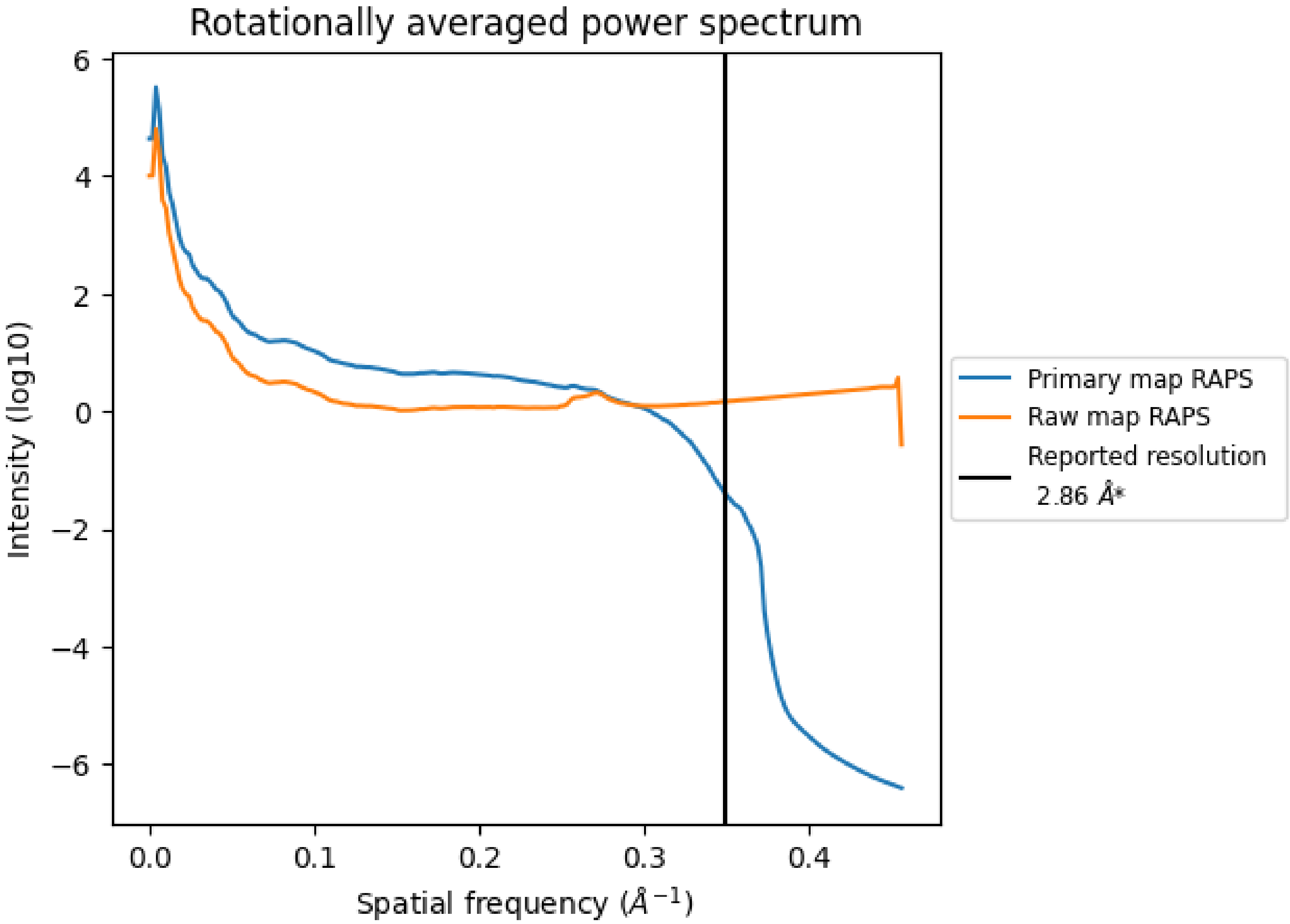
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 2290 nm^3; this corresponds to an approximate mass of 2069 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 ⓘ

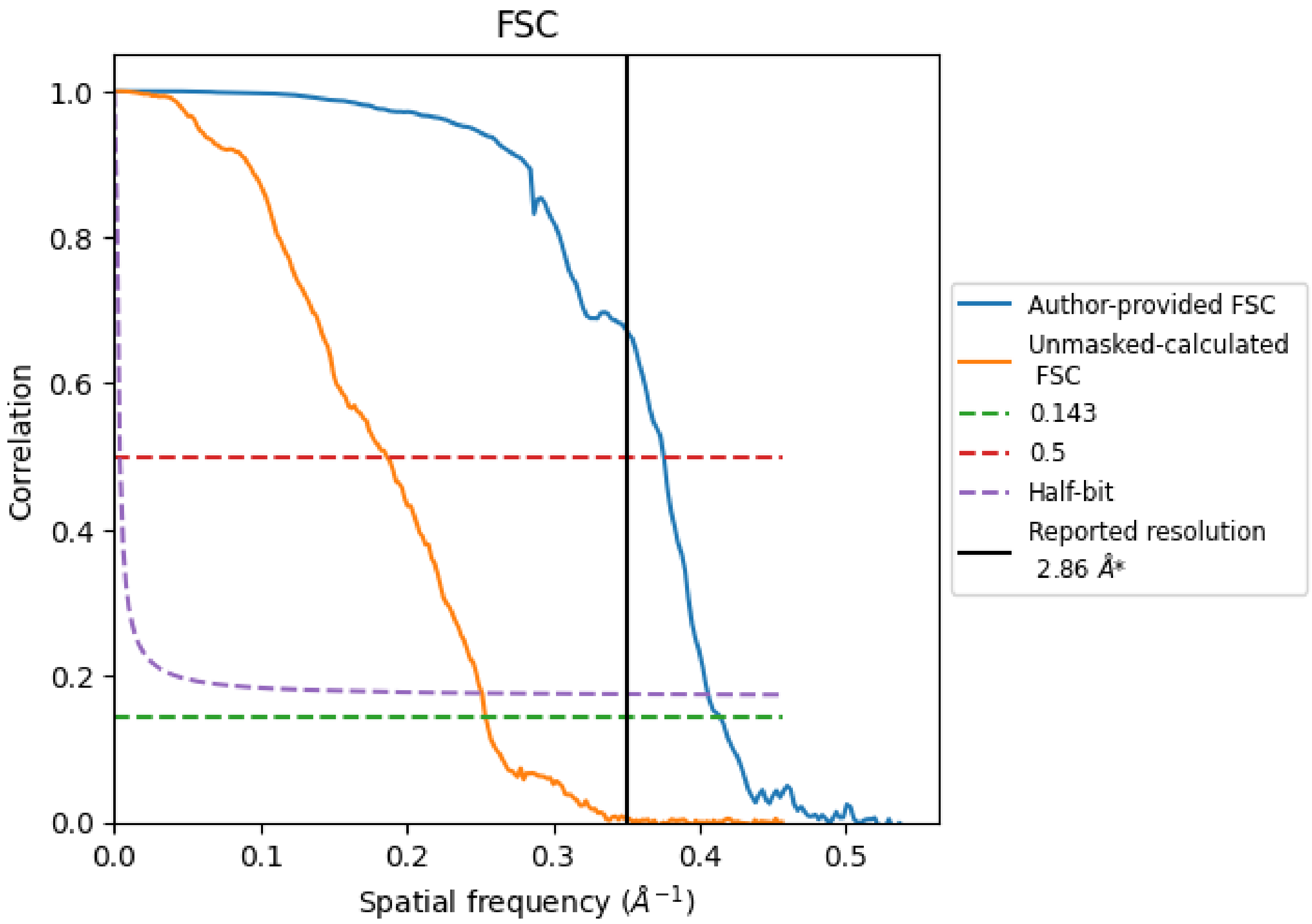


*Reported resolution corresponds to spatial frequency of 0.350 $\AA^{-1}$

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 0.350 $Å^{-1}$

8.2 Resolution estimates ⓘ

Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	2.86	-	-
Author-provided FSC curve	2.41	2.66	2.46
Unmasked-calculated*	3.94	5.36	3.98

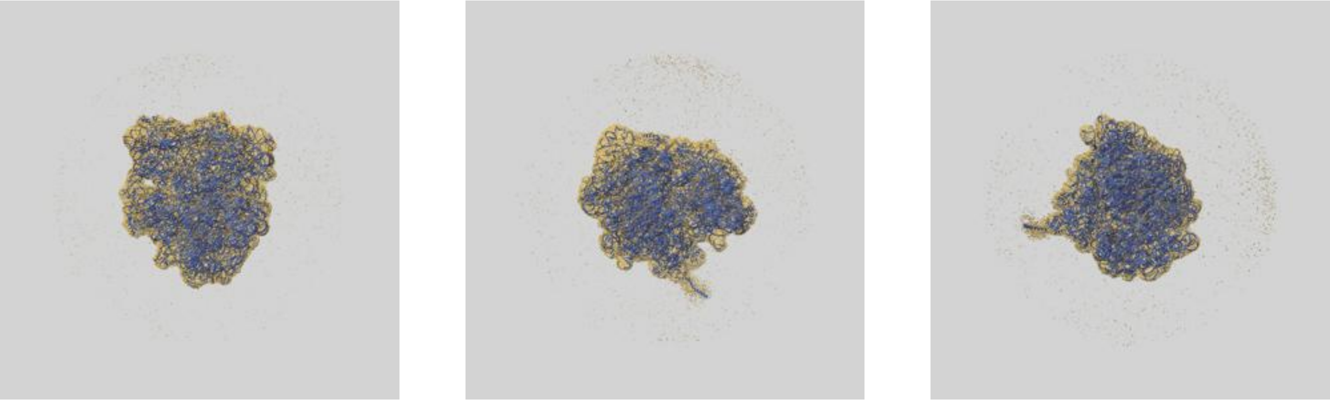
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from author-provided FSC intersecting FSC 0.143 CUT-OFF 2.41 differs from the reported value 2.86 by more than 10 %

The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.94 differs from the reported value 2.86 by more than 10 %

9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-29298 and PDB model 8FMW. Per-residue inclusion information can be found in section 3 on page 14.

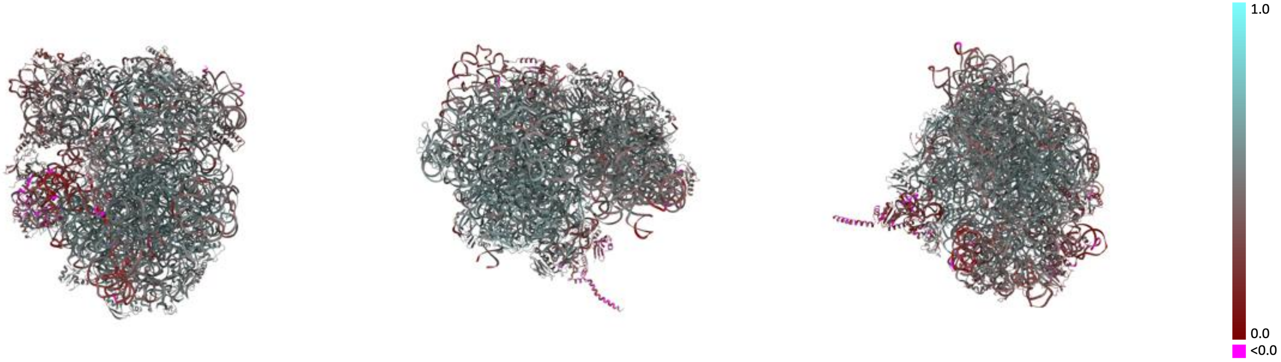
9.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.07 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.

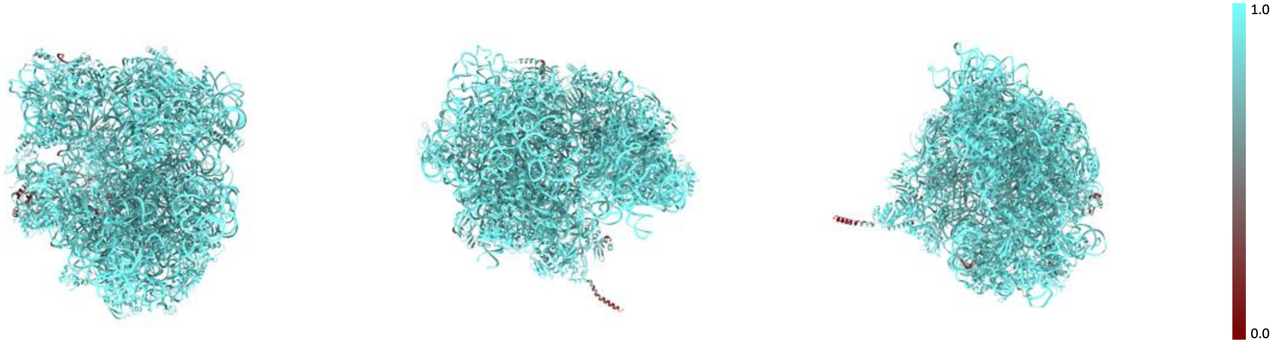
9.2 Q-score mapped to coordinate model ⓘ



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.

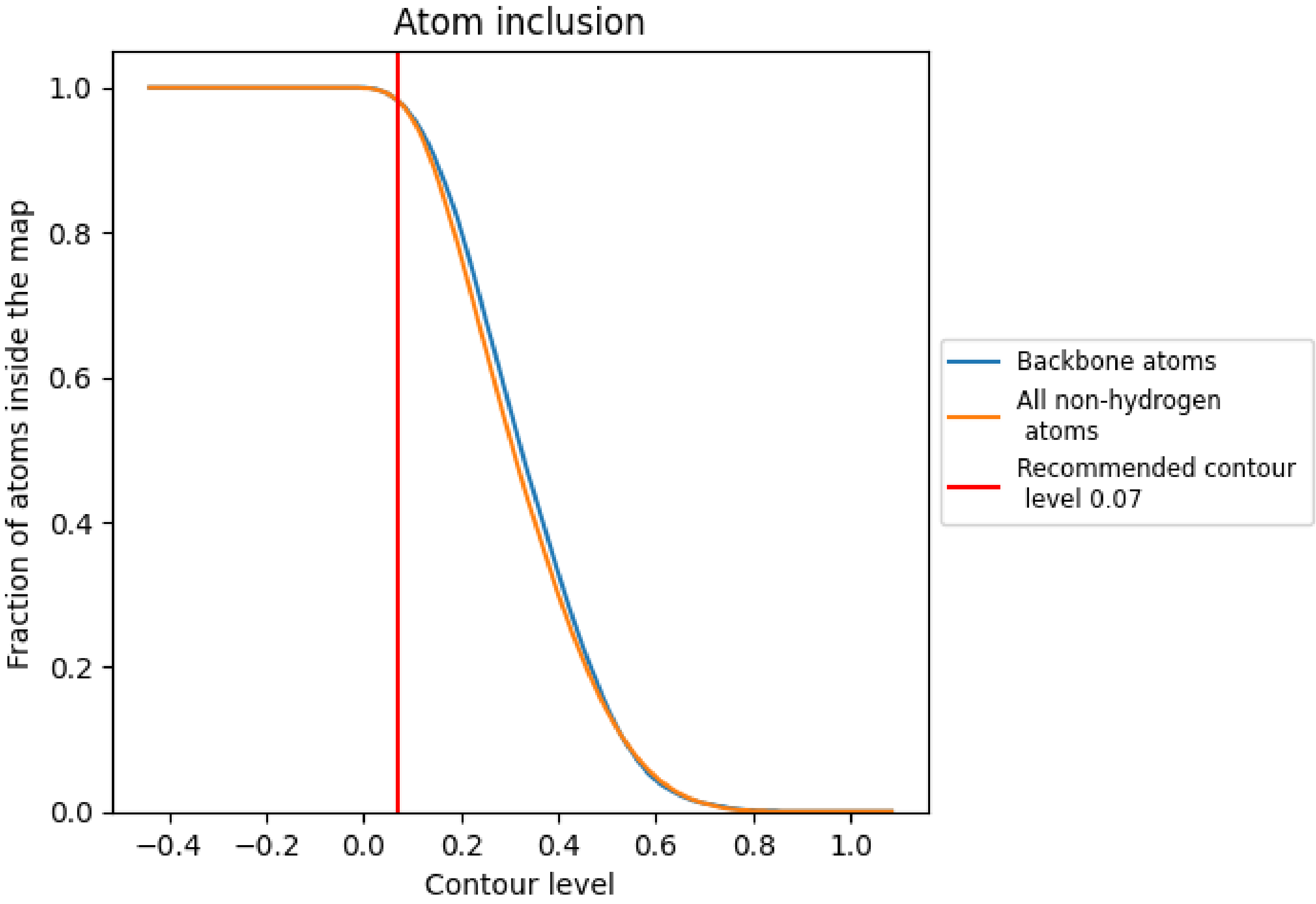
9.3 Atom inclusion mapped to coordinate model ⓘ



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 (0.07).

9.4 Atom inclusion ⓘ



At the recommended contour level, 98% of all backbone atoms, 98% 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 (0.07) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9820	0.4840
A	0.9910	0.4700
AA	0.9930	0.5000
AB	0.9970	0.4510
AC	0.7340	0.1960
AD	0.9880	0.5780
AE	0.9940	0.5670
AF	0.9970	0.5480
AG	0.9860	0.4340
AH	0.9800	0.4740
AI	0.8320	0.3580
AJ	0.8300	0.2170
AK	0.8880	0.2360
AL	0.9930	0.5710
AM	0.9880	0.5760
AN	0.9730	0.5120
AO	0.9830	0.5420
AP	0.9890	0.5660
AQ	0.9870	0.4750
AR	0.9910	0.5480
AS	0.9820	0.5510
AT	0.9850	0.5370
AU	0.9880	0.5640
AV	0.9790	0.5270
AW	0.9400	0.4880
AX	0.9780	0.4350
AY	0.9980	0.5920
AZ	0.9860	0.5530
Aa	0.9760	0.4790
Ab	0.9910	0.5640
Ac	0.9290	0.3210
Ad	0.9810	0.5560
Ae	0.9810	0.5340
Af	0.9980	0.5930
Ag	0.9910	0.5820

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Chain	Atom inclusion	Q-score
Ah	0.9770	0.5590
Ai	0.9640	0.3980
C	0.9450	0.4380
D	0.9760	0.4510
E	0.9750	0.5080
F	0.9750	0.4180
G	0.9620	0.3930
H	0.9820	0.4960
I	0.9670	0.3780
J	0.8770	0.3970
K	0.9840	0.4780
L	0.9820	0.5340
M	0.9460	0.4190
N	0.9550	0.4430
O	0.9870	0.4820
P	0.9880	0.4870
Q	0.9850	0.5020
R	0.9880	0.4800
S	0.9620	0.3940
T	0.9440	0.4220
U	0.8830	0.3720
V	0.9830	0.5760
W	0.9490	0.5020
X	0.8620	0.2780