wwPDB EM Validation Summary Report ⓘ

Nov 17, 2025 – 05:42 PM JST

PDB ID	:	9KMW / pdb_00009kmw
EMDB ID	:	EMD-62447
Title	:	SARSr-MpCoV-GX Nsp1 bound to the Human 40S Ribosomal subunit-State2
Authors	:	Yuan, S.; Yan, R.; Wu, M.
Deposited on	:	2024-11-18
Resolution	:	2.73 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

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

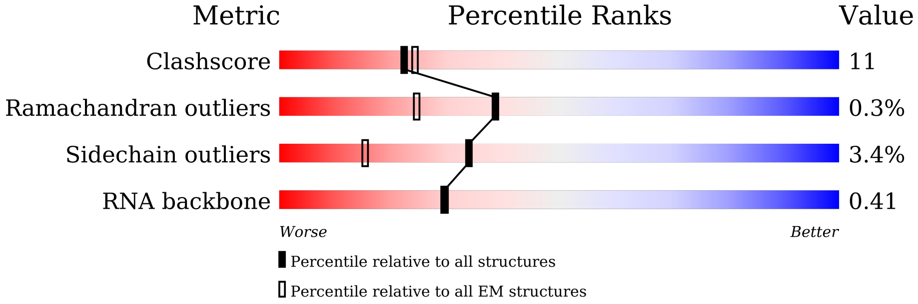
EMDB validation analysis	:	0.0.1.dev129
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

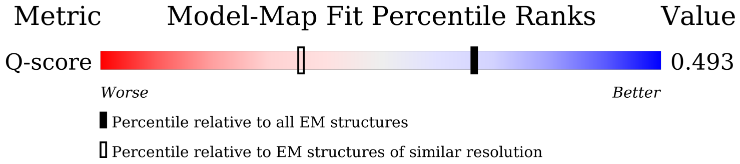
1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.73 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	10432 (2.23 - 3.23)

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	2	1869	
2	A	295	
3	B	264	

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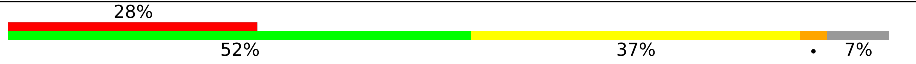
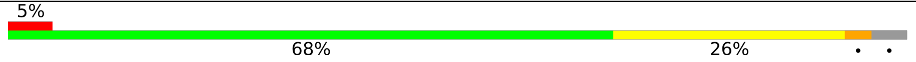
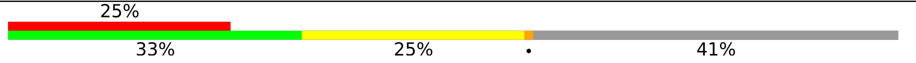
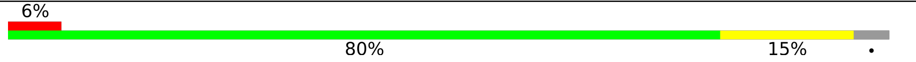
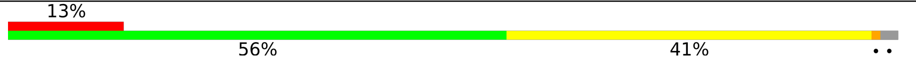
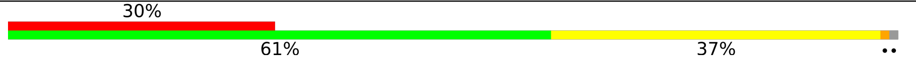
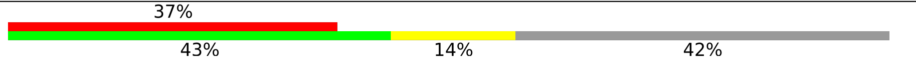
Mol	Chain	Length	Quality of chain
4	C	293	
5	D	243	
6	E	263	
7	F	204	
8	G	249	
9	H	194	
10	I	208	
11	J	194	
12	K	165	
13	L	158	
14	M	132	
15	N	151	
16	O	151	
17	P	145	
18	Q	146	
19	R	135	
20	S	152	
21	T	145	
22	U	119	
23	V	83	
24	W	130	
25	X	143	
26	Y	130	
27	Z	125	
28	a	101	

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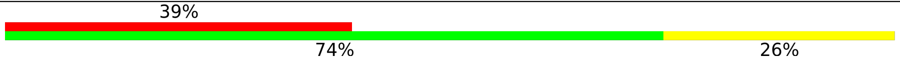
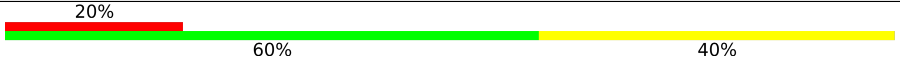
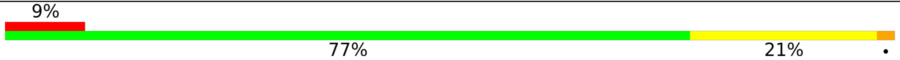
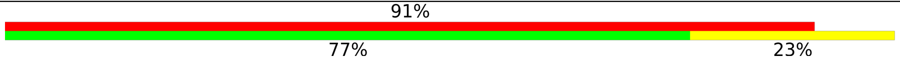
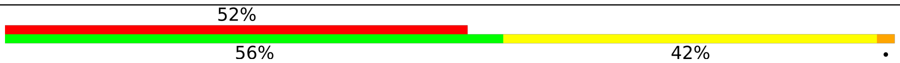
Mol	Chain	Length	Quality of chain
29	b	82	
30	c	62	
31	d	55	
32	e	56	
33	f	74	
34	g	315	
35	h	25	
36	n	180	

2 Entry composition (i)

There are 36 unique types of molecules in this entry. The entry contains 74798 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 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1671	35647	15925	6406	11655	1661	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	213	1686	1072	295	311	8	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	213	1729	1098	309	308	14	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	218	1690	1094	289	297	10	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	D	225	1752	1117	315	313	7	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein eS4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	E	262	2076	1324	386	358	8	0	0

- Molecule 7 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	F	189	1495	934	284	270	7	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	G	230	1864	1164	373	320	7	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	221	ARG	LYS	variant	UNP P62753

- Molecule 9 is a protein called Small ribosomal subunit protein eS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	H	186	1501	957	276	267	1	0	0

- Molecule 10 is a protein called Small ribosomal subunit protein eS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	I	205	1682	1056	331	290	5	0	0

- Molecule 11 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	J	180	1499	955	300	242	2	0	0

- Molecule 12 is a protein called Small ribosomal subunit protein eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	K	97	816	533	144	133	6	0	0

- Molecule 13 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	L	151	Total	C	N	O	S	0	0
			1229	782	230	211	6		

- Molecule 14 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	M	121	Total	C	N	O	S	0	0
			935	586	165	175	9		

- Molecule 15 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	N	149	Total	C	N	O	S	0	0
			1202	770	228	203	1		

- Molecule 16 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	O	135	Total	C	N	O	S	0	0
			1010	618	198	188	6		

- Molecule 17 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	P	126	Total	C	N	O	S	0	0
			1037	659	196	175	7		

- Molecule 18 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	Q	138	Total	C	N	O	S	0	0
			1097	698	206	190	3		

- Molecule 19 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	R	132	Total	C	N	O	S	0	0
			1068	670	199	195	4		

- Molecule 20 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	S	143	1184	743	240	200	1	0	0

- Molecule 21 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	T	144	1123	703	217	200	3	0	0

- Molecule 22 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	U	101	803	504	153	142	4	0	0

- Molecule 23 is a protein called Small ribosomal subunit protein eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	V	82	625	384	116	120	5	0	0

- Molecule 24 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	W	129	1034	659	193	176	6	0	0

- Molecule 25 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	X	141	1098	693	219	183	3	0	0

- Molecule 26 is a protein called Small ribosomal subunit protein eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Y	124	1014	641	198	170	5	0	0

- Molecule 27 is a protein called Small ribosomal subunit protein eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	Z	72	574	368	104	101	1	0	0

- Molecule 28 is a protein called Small ribosomal subunit protein eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	a	99	794	494	165	130	5	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	78	VAL	ALA	conflict	UNP P62854

- Molecule 29 is a protein called Small ribosomal subunit protein eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	b	82	641	402	118	114	7	0	0

- Molecule 30 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	c	62	489	297	97	93	2	0	0

- Molecule 31 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	d	55	459	286	94	74	5	0	0

- Molecule 32 is a protein called Small ribosomal subunit protein eS30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	e	56	442	273	96	72	1	0	0

- Molecule 33 is a protein called Small ribosomal subunit protein eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	f	74	611	385	117	102	7	0	0

- Molecule 34 is a protein called Small ribosomal subunit protein RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	g	314	2441	1537	425	467	12	0	0

- Molecule 35 is a protein called Small ribosomal subunit protein eS32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	h	22	213	130	57	23	3	0	0

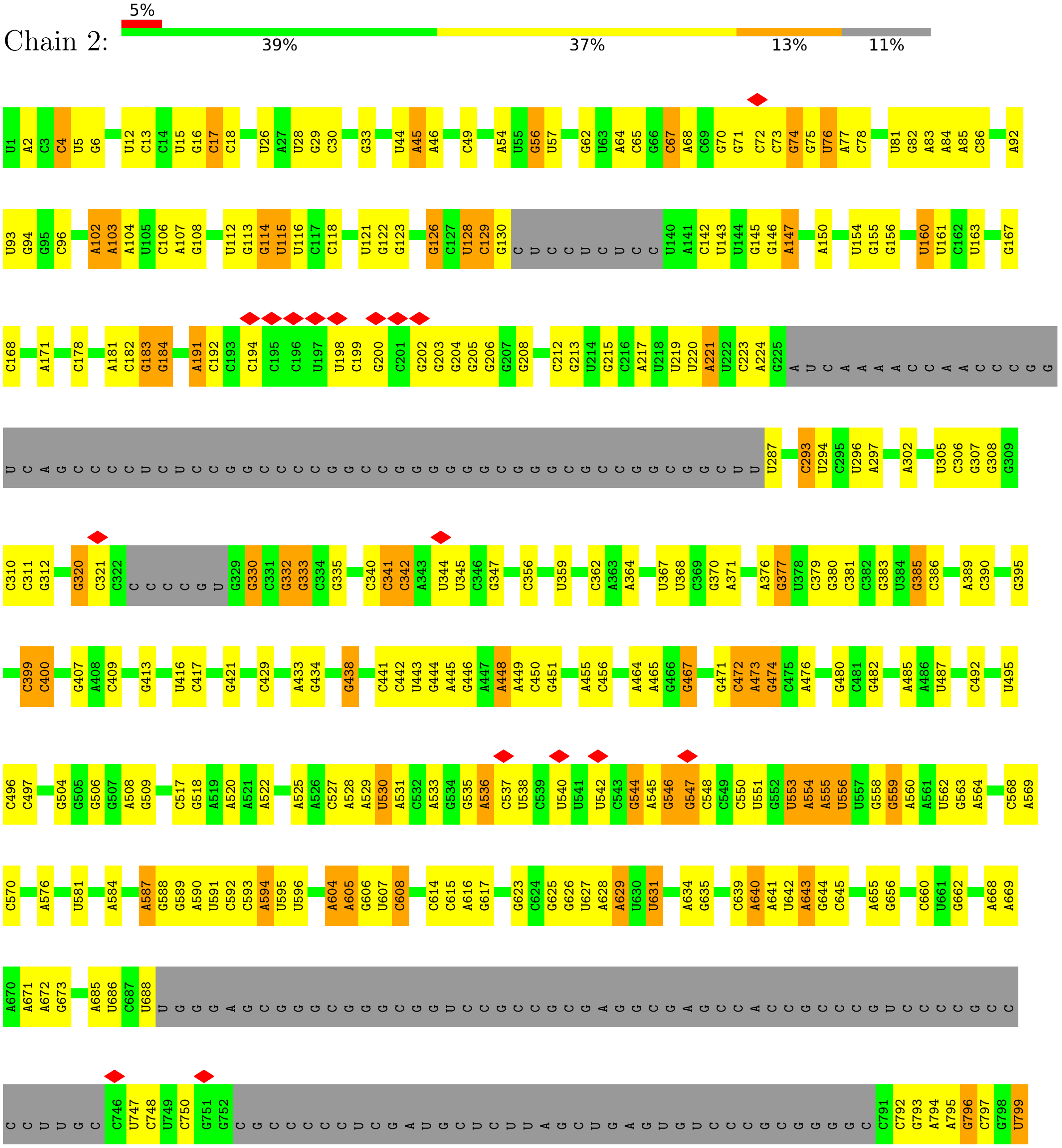
- Molecule 36 is a protein called ORF1ab polyprotein.

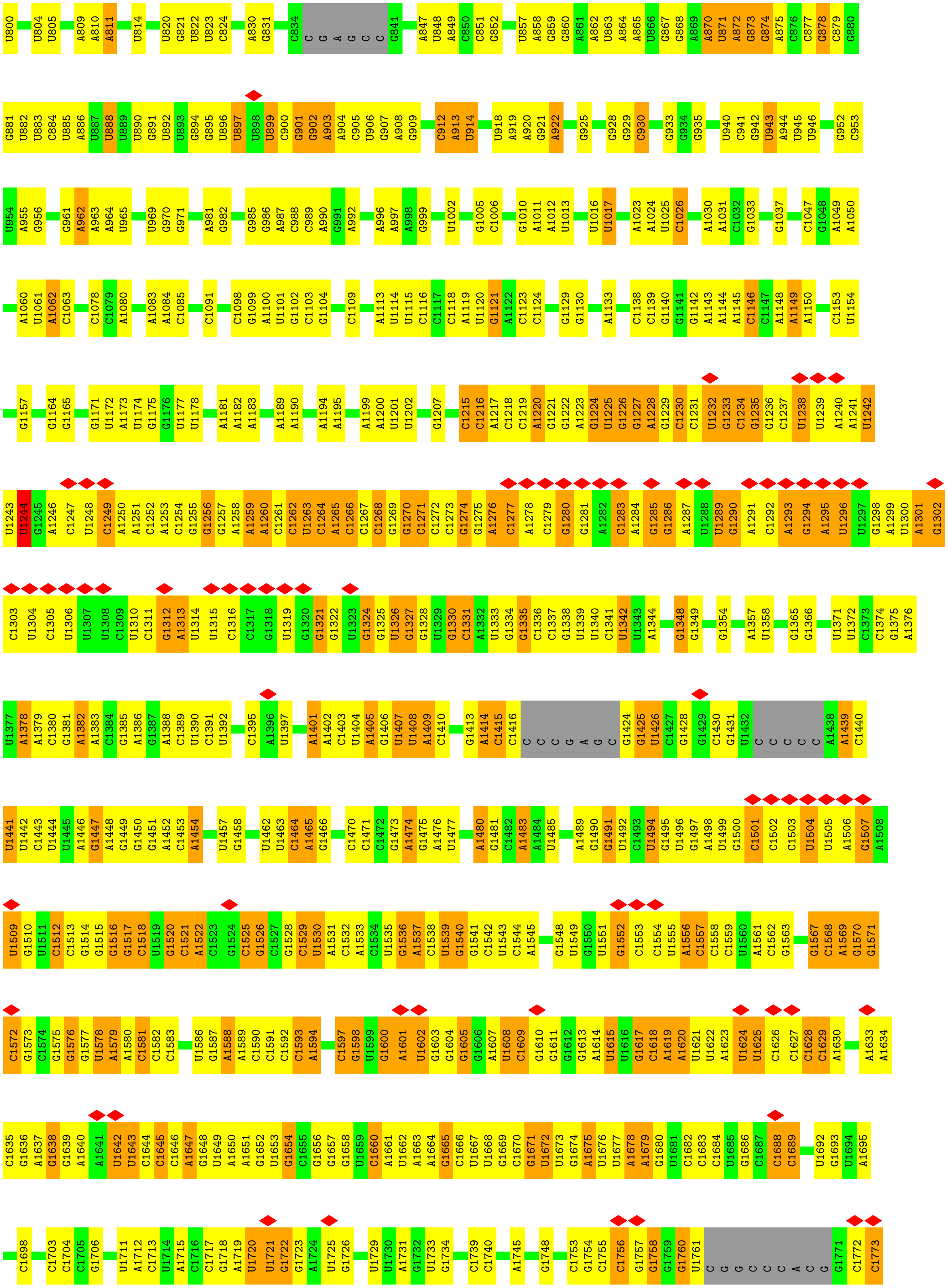
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	n	30	238	144	44	49	1	0	0

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: 18S ribosomal RNA

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G881 U882 U883 C884 U885 A886 U887 U888 U889 U890 G891 U892 U893 G894 G895 U896 U897 U898 U899 C900 G901 G902 A903 A904 C905 U906 G907 A908 G909 C912 A913 U914 U918 A919 A920 G921 A922 G925 G928 G929 C930 G933 G934 G935 U940 C941 G942 U943 A944 U945 U946 G952 C953
U954 A955 G956 G961 A962 A963 A964 U965 U969 G970 G971 A981 G982 G985 G986 A987 C988 C989 A990 G991 A992 A996 A997 A998 G999 U1002 G1005 C1006 G1010 A1011 A1012 U1013 U1016 U1017 A1023 A1024 U1025 C1026 A1030 A1031 C1032 G1033 G1037 C1047 G1048 A1049 A1050
A1060 U1061 A1062 C1063 C1078 C1079 A1080 A1083 A1084 C1085 C1091 C1098 G1099 A1100 U1101 G1102 C1103 G1104 C1109 A1113 U1114 U1115 C1116 C1117 C1118 A1119 U1120 G1121 A1122 C1123 C1124 G1129 G1130 A1133 C1138 C1139 G1140 G1141 G1142 A1143 A1144 A1145 C1146 C1147 A1148 A1149 A1150 C1153 U1154
G1157 G1164 G1165 G1171 U1172 A1173 U1174 G1175 G1176 U1177 U1178 A1181 A1182 A1183 A1189 A1190 A1194 G1195 A1199 A1200 U1201 U1202 G1207 C1215 C1216 A1217 C1218 C1219 A1220 G1221 G1222 A1223 G1224 U1225 G1226 G1227 A1228 G1229 C1230 C1231 U1232 G1233 C1234 G1235 G1236 C1237 U1238 U1239 A1240 A1241 U1242
U1243 U1244 G1245 A1246 C1247 U1248 C1249 A1250 A1251 C1252 A1253 C1254 G1255 G1256 G1257 A1258 A1259 A1260 C1261 C1262 U1263 C1264 A1265 C1266 C1267 C1268 G1269 G1270 C1271 C1272 C1273 G1274 G1275 A1276 C1277 A1278 C1279 G1280 G1281 A1282 C1283 A1284 G1285 G1286 A1287 U1288 U1289 G1290 A1291 C1292 A1293 G1294 A1295 U1296 U1297 G1298 A1299 U1300 A1301 G1302
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U1441 U1442 C1443 U1444 U1445 A1446 G1447 A1448 G1449 G1450 G1451 A1452 C1453 A1454 U1457 G1458 U1462 U1463 C1464 A1465 G1466 C1470 C1471 C1472 G1473 A1474 G1475 A1476 U1477 A1480 G1481 C1482 A1483 A1484 U1485 A1489 G1490 G1491 U1492 C1493 U1494 G1495 U1496 G1497 A1498 U1499 G1500 C1501 C1502 C1503 U1504 U1505 A1506 G1507 A1508
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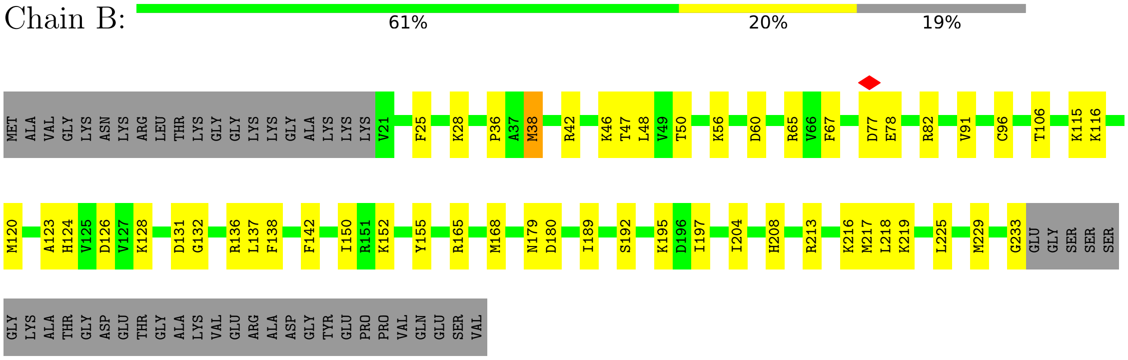
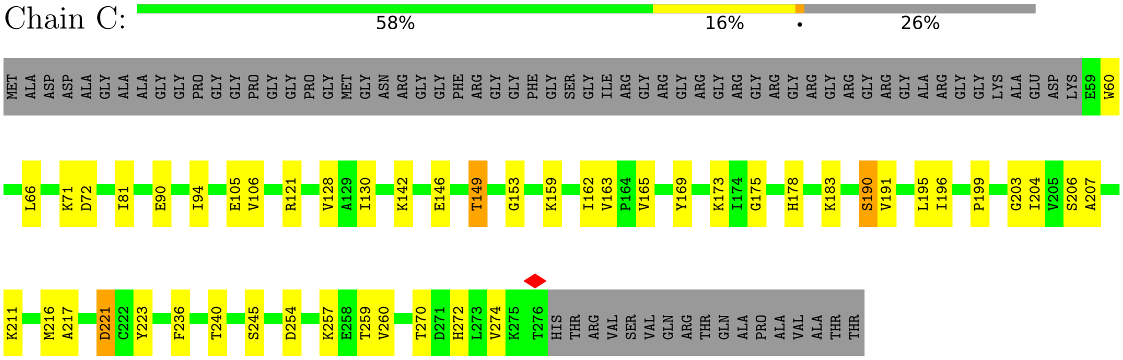
C1572 G1573 C1574 G1575 G1576 G1577 U1578 A1579 A1580 C1581 C1582 C1583 U1586 G1587 A1588 A1589 C1590 C1591 C1592 C1593 A1594 C1597 G1598 U1599 G1600 A1601 U1602 G1603 G1604 G1605 G1606 A1607 U1608 C1609 G1610 G1611 G1612 G1613 A1614 U1615 U1616 G1617 C1618 A1619 A1620 U1621 U1622 A1623 U1624 U1625 C1626 C1627 C1628 C1629 A1630 A1633 A1634
C1635 G1636 A1637 G1638 G1639 A1640 A1641 U1642 U1643 C1644 C1645 C1646 A1647 G1648 G1649 A1650 A1651 U1652 U1653 G1654 C1655 G1656 G1657 G1658 U1659 C1660 A1661 U1662 A1663 A1664 G1665 C1666 U1667 G1668 G1669 C1670 G1671 U1672 U1673 G1674 A1675 U1676 U1677 A1678 A1679 G1680 U1681 C1682 C1683 C1684 U1685 G1686 C1687 C1688 C1689 U1692 G1693 U1694 A1695
C1698 C1703 C1704 C1705 G1706 U1711 A1712 C1713 U1714 A1715 C1716 C1717 G1718 A1719 U1720 U1721 C1722 G1723 A1724 U1725 G1726 U1729 U1730 A1731 G1732 U1733 G1734 C1739 C1740 A1745 G1748 C1753 G1754 C1755 C1756 G1757 G1758 G1759 G1760 U1761 C G G C C C A C G G1771 C1772 C1773

- Molecule 2: Small ribosomal subunit protein uS2

- Molecule 3: Small ribosomal subunit protein eS1



- Molecule 4: Small ribosomal subunit protein uS5



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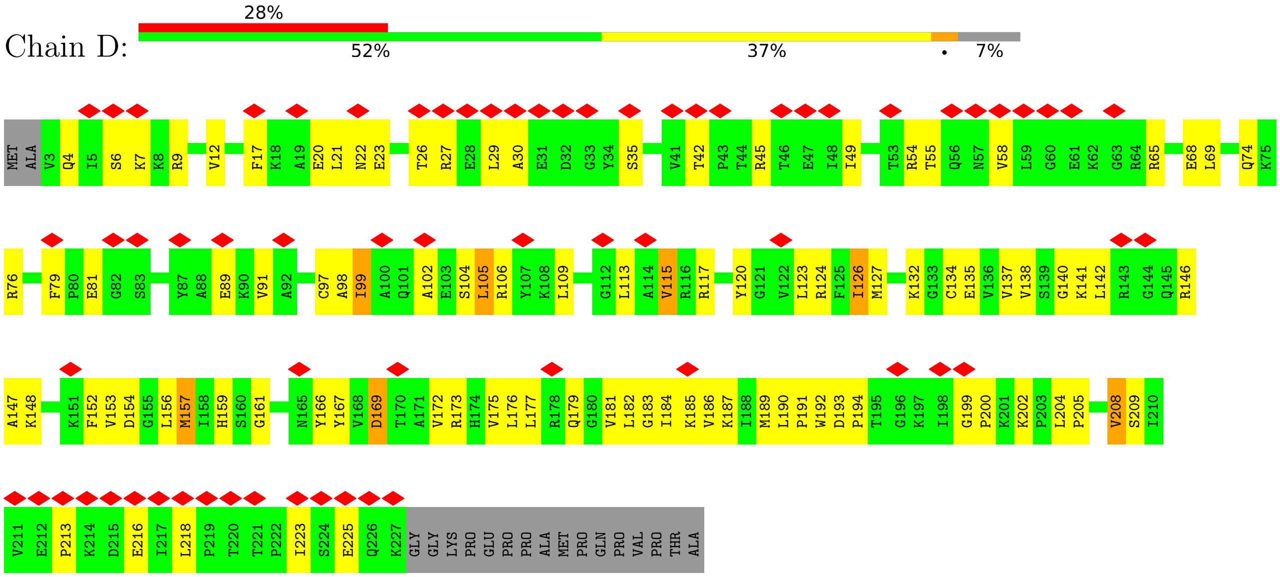
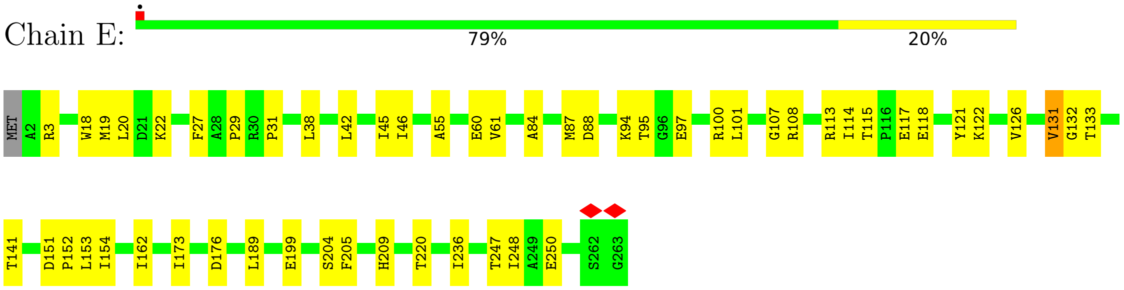
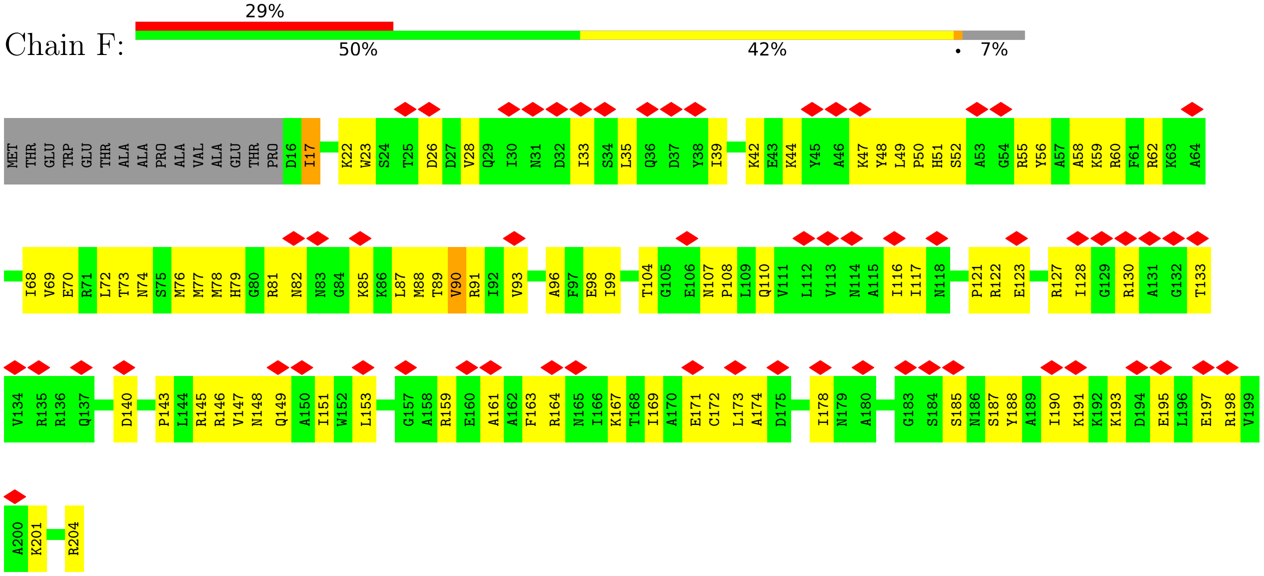


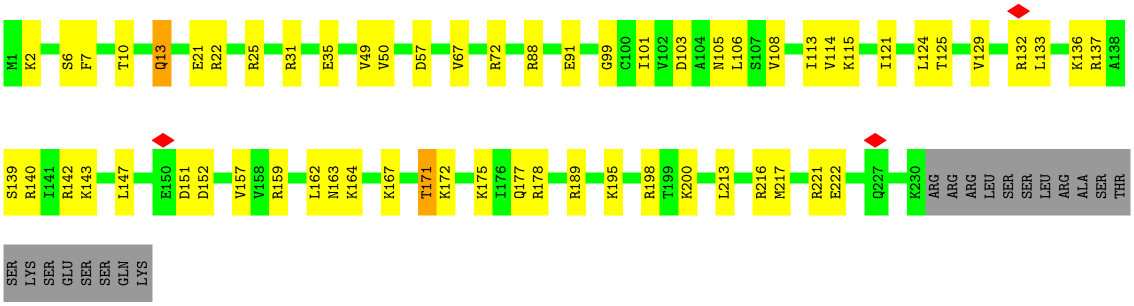
- Molecule 6: Small ribosomal subunit protein eS4, X isoform



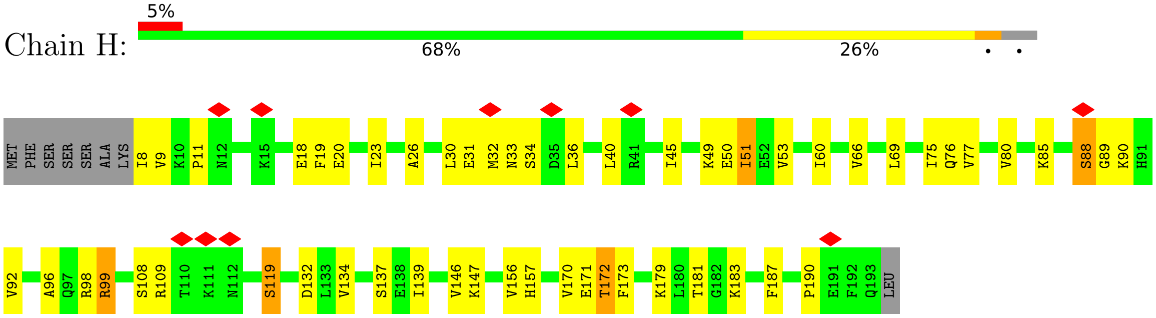
- Molecule 7: Small ribosomal subunit protein uS7



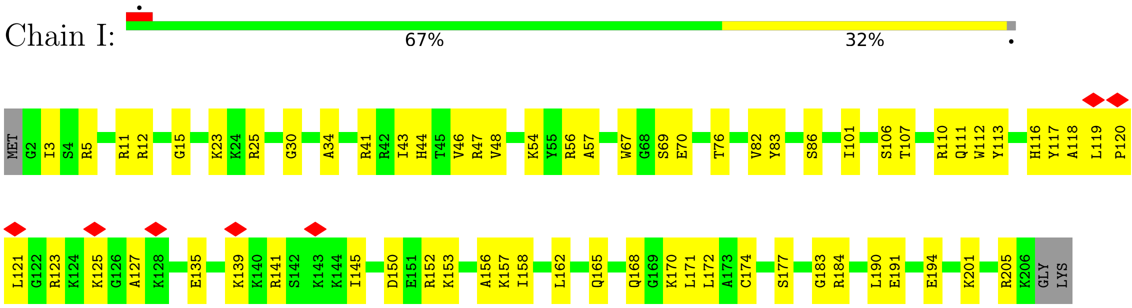
- Molecule 8: Small ribosomal subunit protein eS6



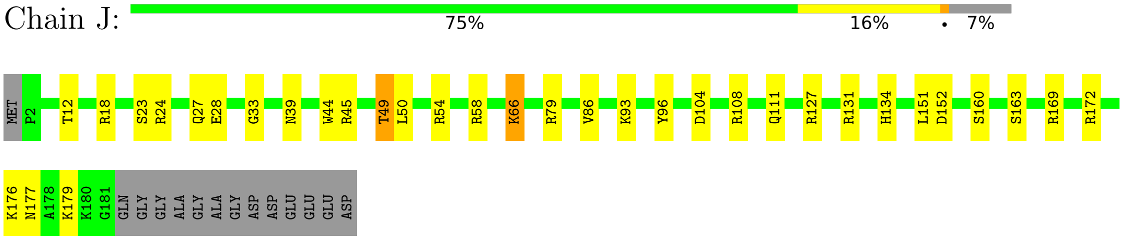
- Molecule 9: Small ribosomal subunit protein eS7



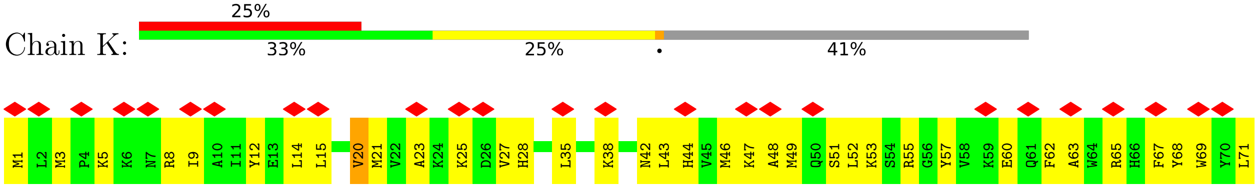
- Molecule 10: Small ribosomal subunit protein eS8

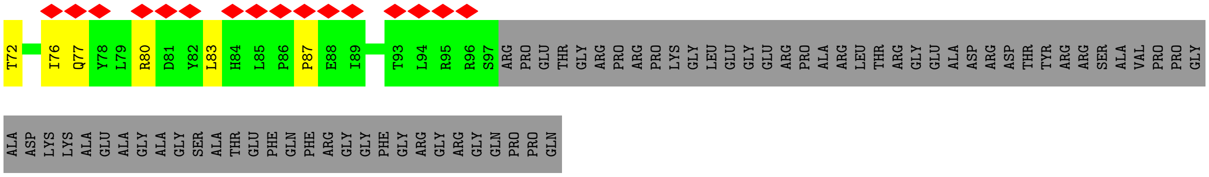


- Molecule 11: Small ribosomal subunit protein uS4



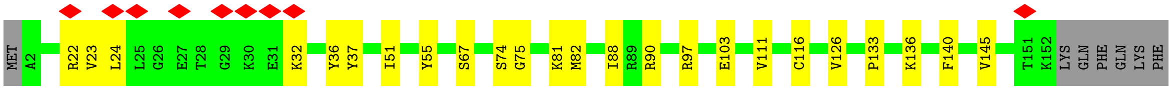
- Molecule 12: Small ribosomal subunit protein eS10





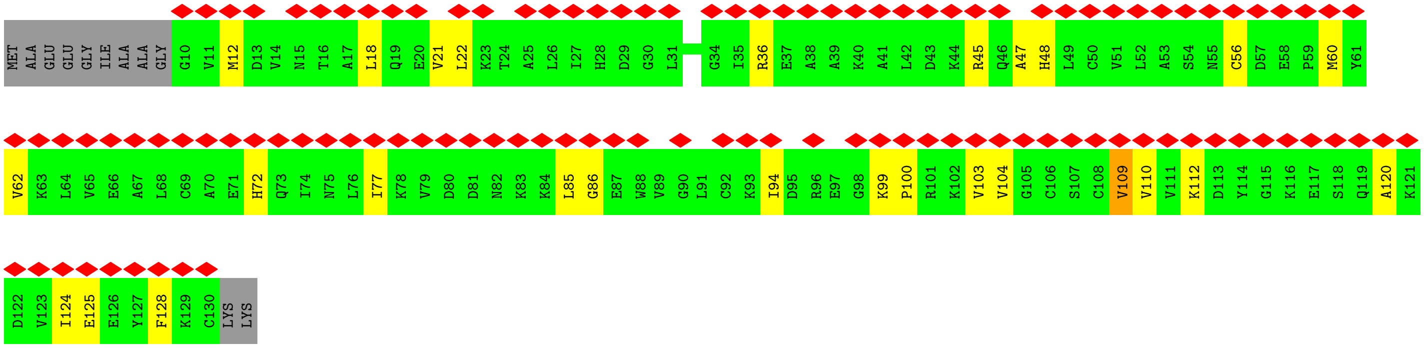
- Molecule 13: Small ribosomal subunit protein uS17

Chain L:



- Molecule 14: Small ribosomal subunit protein eS12

Chain M:

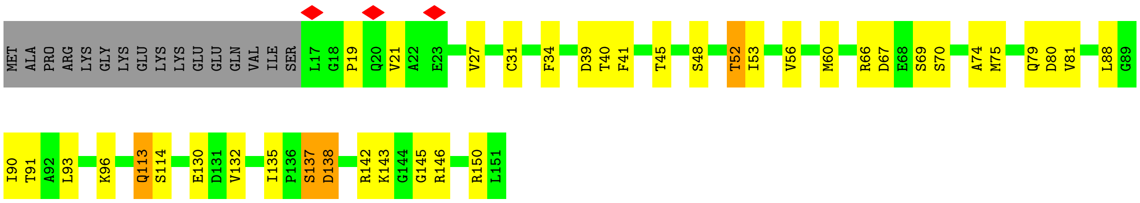


- Molecule 15: Small ribosomal subunit protein uS15

Chain N:

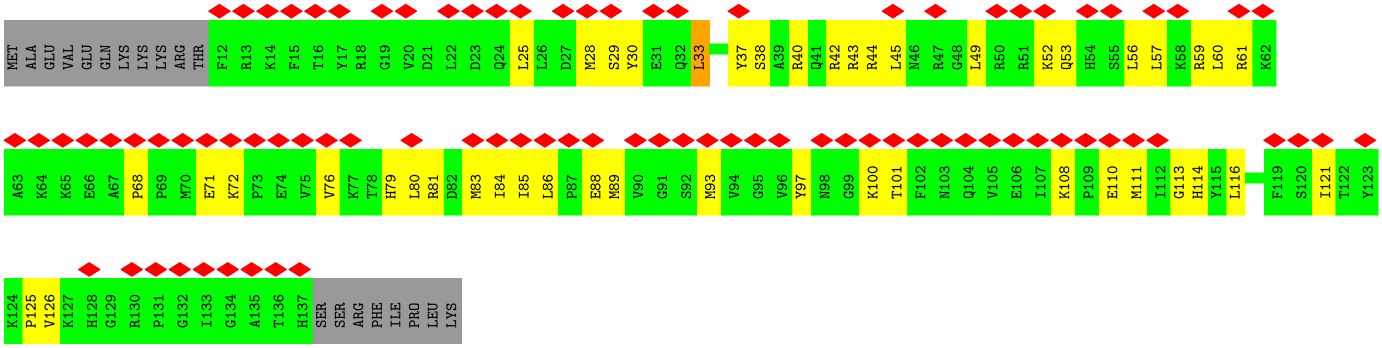
- Molecule 16: Small ribosomal subunit protein uS11

Chain O:



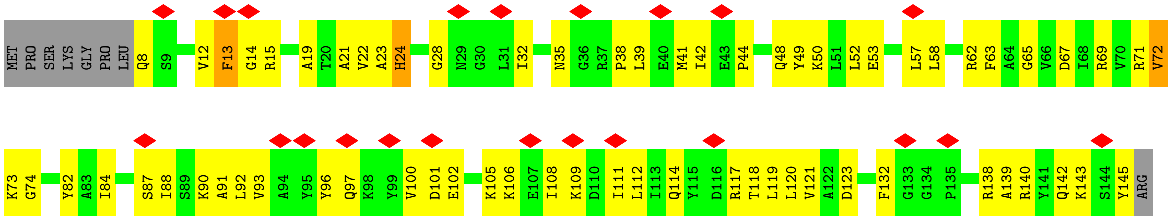
- Molecule 17: Small ribosomal subunit protein uS19

Chain P:



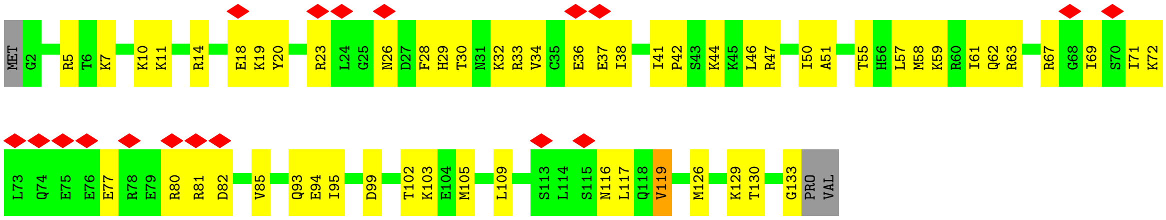
- Molecule 18: Small ribosomal subunit protein uS9

Chain Q:



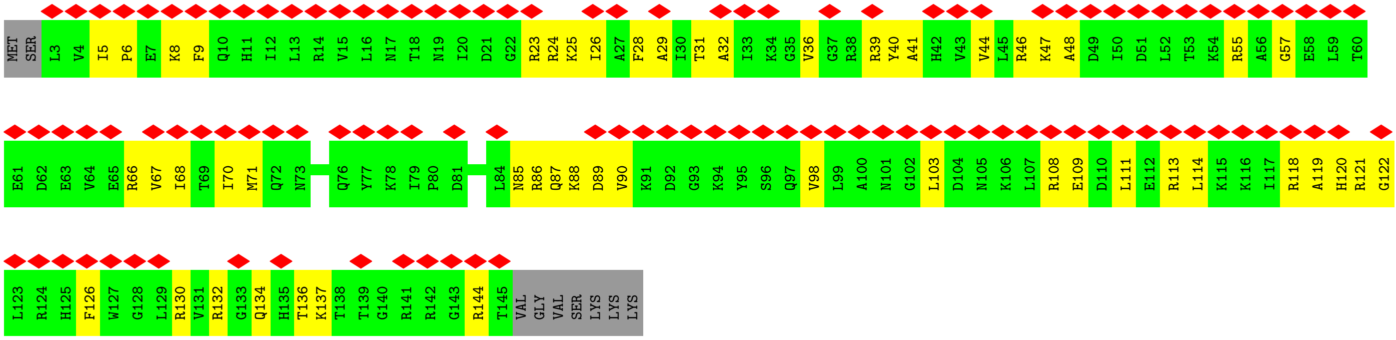
- Molecule 19: Small ribosomal subunit protein eS17

Chain R:

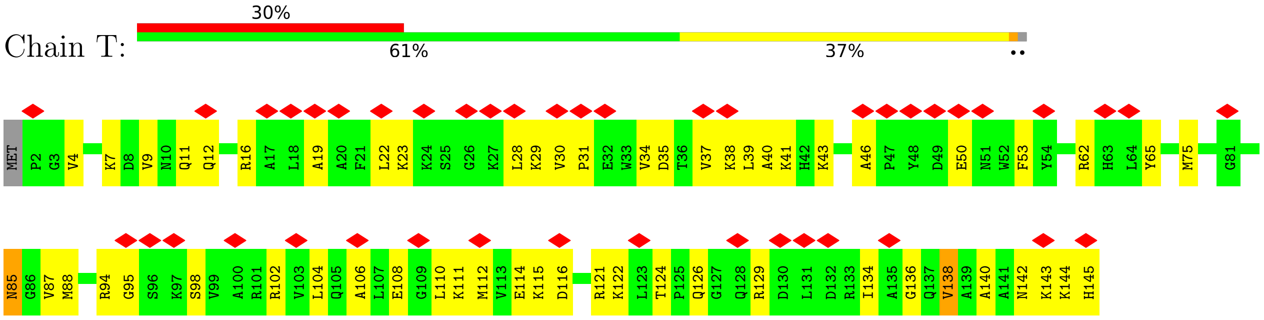


- Molecule 20: Small ribosomal subunit protein uS13

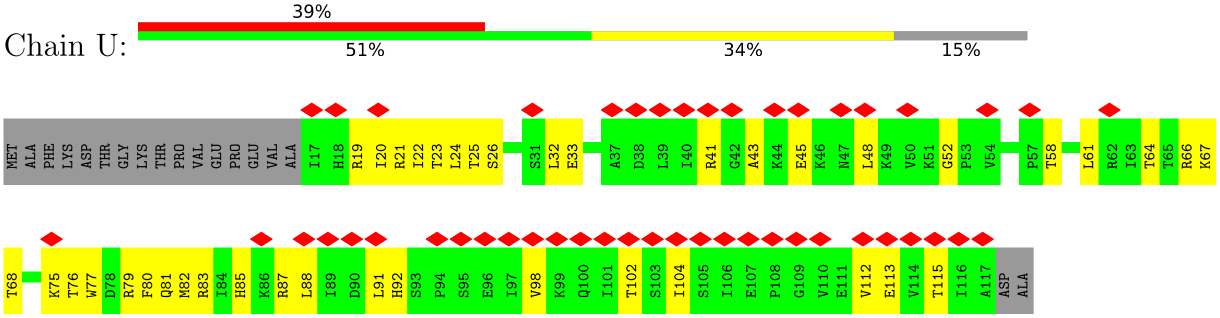
Chain S:



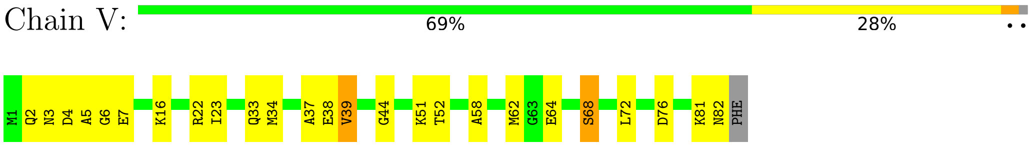
- Molecule 21: Small ribosomal subunit protein eS19



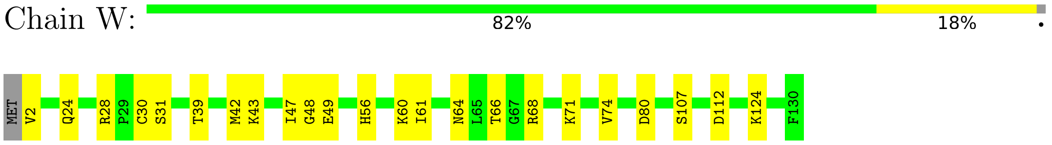
- Molecule 22: Small ribosomal subunit protein uS10



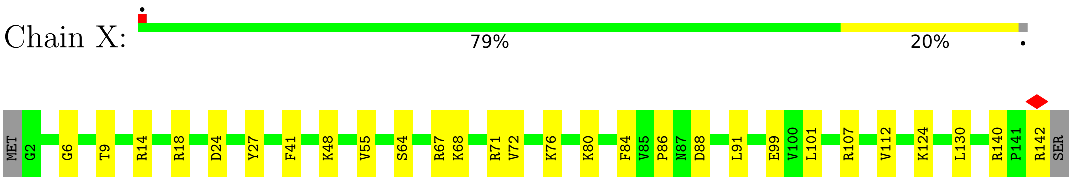
- Molecule 23: Small ribosomal subunit protein eS21



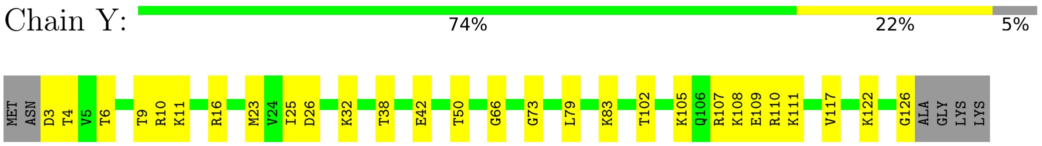
- Molecule 24: Small ribosomal subunit protein uS8



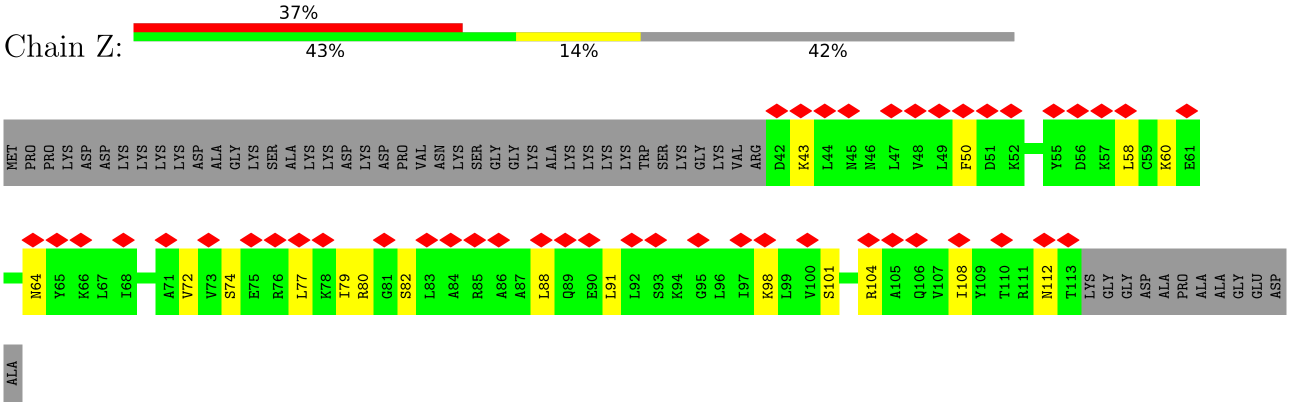
- Molecule 25: Small ribosomal subunit protein uS12



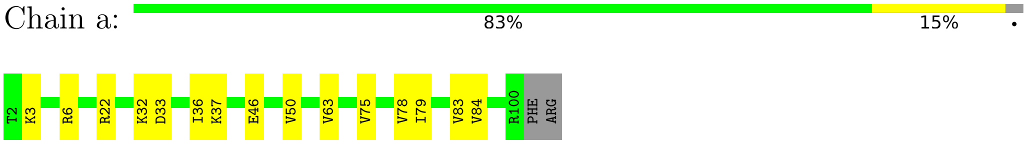
- Molecule 26: Small ribosomal subunit protein eS24



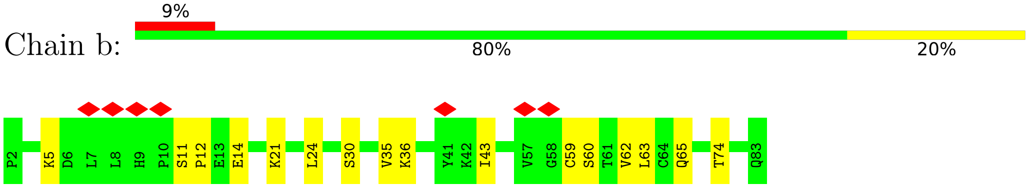
- Molecule 27: Small ribosomal subunit protein eS25



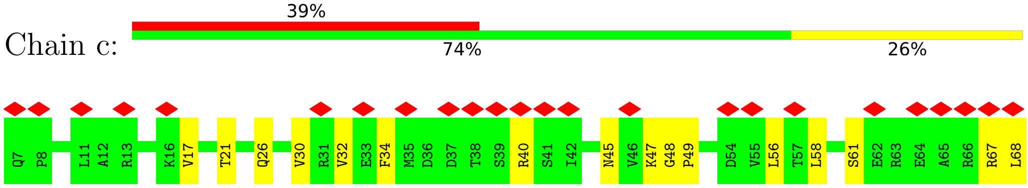
- Molecule 28: Small ribosomal subunit protein eS26



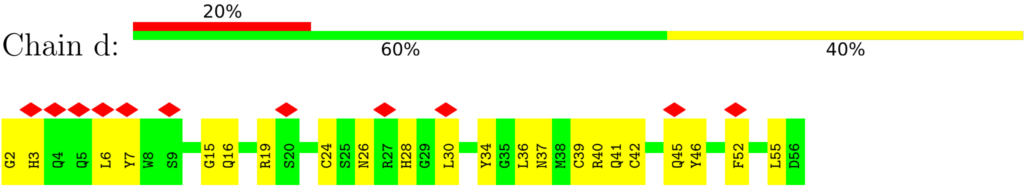
- Molecule 29: Small ribosomal subunit protein eS27



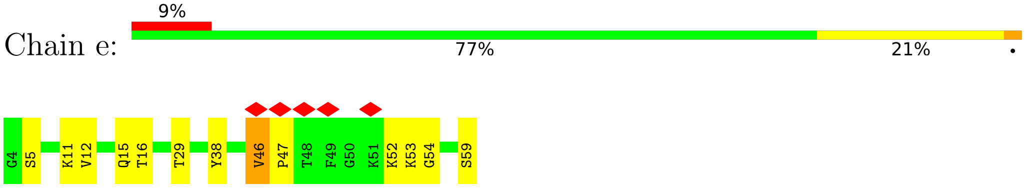
- Molecule 30: Small ribosomal subunit protein eS28



- Molecule 31: Small ribosomal subunit protein uS14

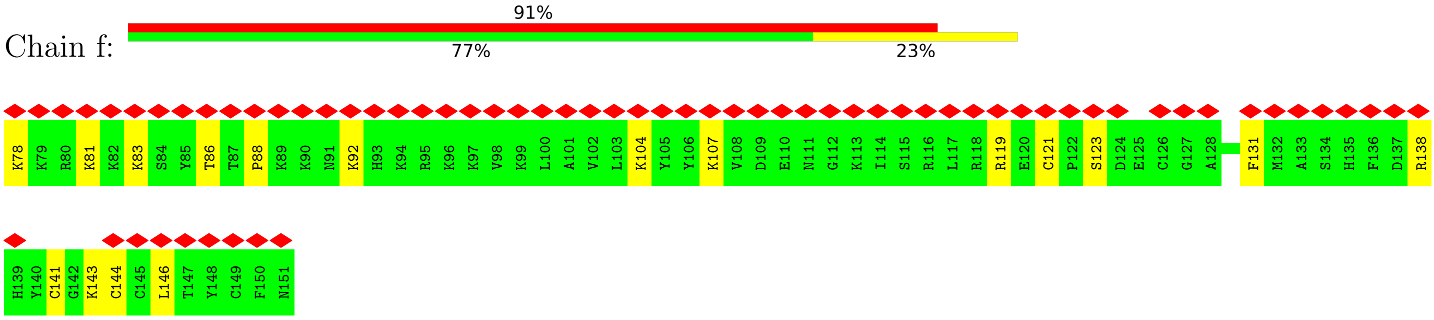


- Molecule 32: Small ribosomal subunit protein eS30



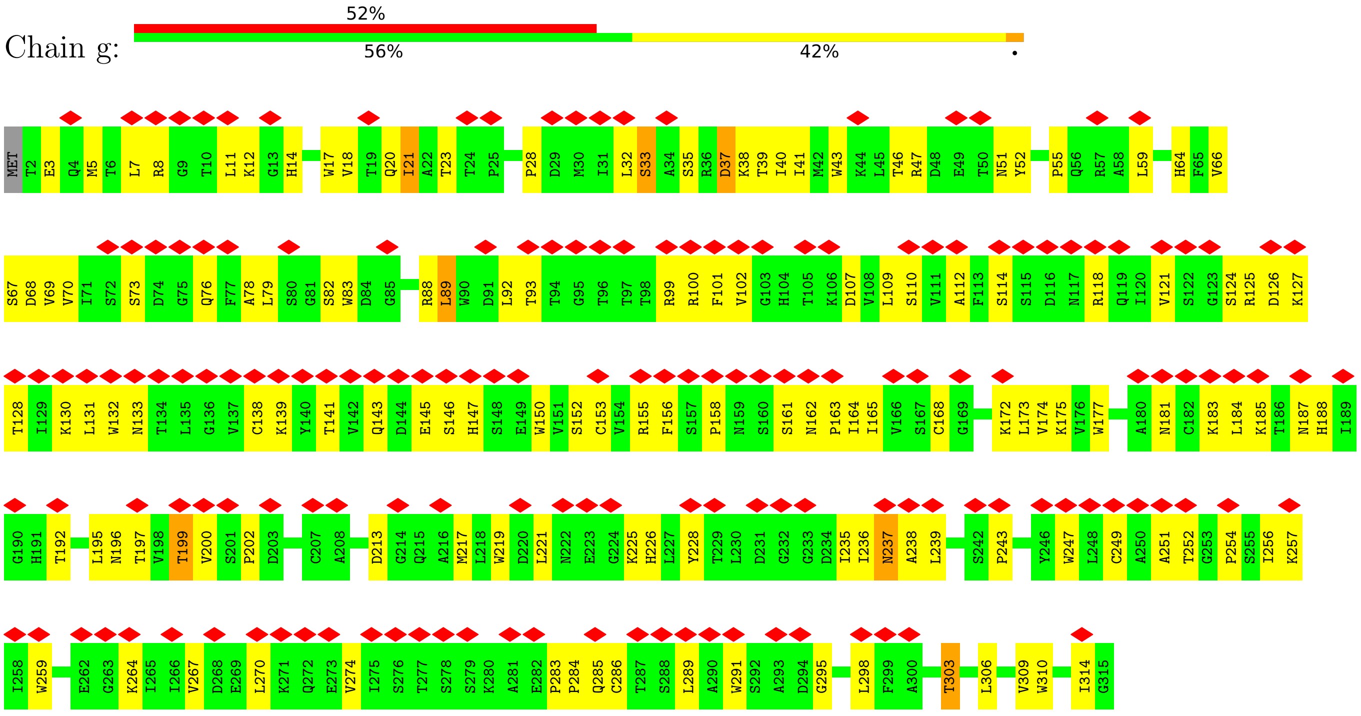
- Molecule 33: Small ribosomal subunit protein eS31

Chain f:



- Molecule 34: Small ribosomal subunit protein RACK1

Chain g:

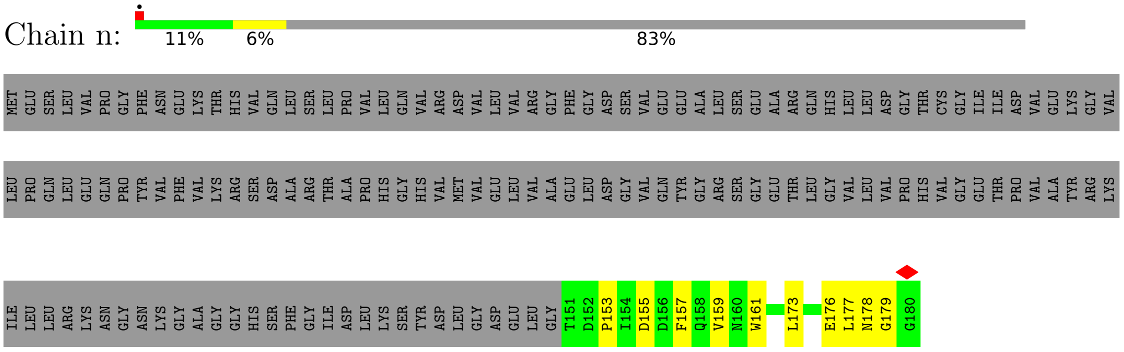


- Molecule 35: Small ribosomal subunit protein eS32

Chain h:

- Molecule 36: ORF1ab polyprotein

Chain n:



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	57459	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.348	Depositor
Minimum map value	-0.994	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.053	Depositor
Recommended contour level	0.158	Depositor
Map size (Å)	486.4, 486.4, 486.4	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.95, 0.95, 0.95	Depositor

5 Model quality

5.1 Standard geometry

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	2	0.21	0/39865	0.30	2/62134 (0.0%)
2	A	0.19	0/1723	0.30	0/2341
3	B	0.18	0/1756	0.33	0/2350
4	C	0.22	0/1726	0.37	0/2332
5	D	0.16	0/1780	0.42	0/2397
6	E	0.22	0/2118	0.33	0/2849
7	F	0.18	0/1516	0.50	0/2037
8	G	0.18	0/1887	0.35	0/2513
9	H	0.17	0/1524	0.36	0/2042
10	I	0.19	0/1711	0.38	0/2282
11	J	0.21	0/1524	0.29	0/2035
12	K	0.13	0/840	0.39	0/1133
13	L	0.22	0/1250	0.33	0/1673
14	M	0.11	0/945	0.34	0/1269
15	N	0.18	0/1226	0.28	0/1649
16	O	0.19	0/1023	0.32	0/1372
17	P	0.15	0/1058	0.40	0/1414
18	Q	0.14	0/1114	0.40	0/1492
19	R	0.14	0/1082	0.34	0/1452
20	S	0.12	0/1202	0.40	0/1610
21	T	0.17	0/1143	0.41	0/1530
22	U	0.12	0/813	0.35	0/1092
23	V	0.18	0/631	0.32	0/844
24	W	0.23	0/1051	0.32	0/1406
25	X	0.21	0/1116	0.32	0/1490
26	Y	0.21	0/1031	0.35	0/1370
27	Z	0.12	0/580	0.38	0/780
28	a	0.20	0/807	0.35	0/1082
29	b	0.22	0/654	0.46	1/876 (0.1%)
30	c	0.13	0/491	0.36	0/656
31	d	0.12	0/470	0.39	0/623
32	e	0.19	0/447	0.47	0/587
33	f	0.11	0/623	0.32	0/822
34	g	0.13	0/2498	0.38	1/3399 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
35	h	0.16	0/214	0.32	0/272
36	n	0.21	0/242	0.36	0/325
All	All	0.20	0/79681	0.33	4/115530 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
16	O	0	1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1501	C	OP1-P-O3’	6.31	126.92	108.00
29	b	12	PRO	CA-N-CD	-5.53	104.26	112.00
1	2	1244	U	OP2-P-O3’	5.15	123.44	108.00
34	g	37	ASP	N-CA-C	-5.07	107.59	112.97

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
16	O	137	SER	Peptide

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	2	35647	0	18022	611	0
2	A	1686	0	1688	37	0
3	B	1729	0	1803	35	0
4	C	1690	0	1777	30	0
5	D	1752	0	1848	77	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	E	2076	0	2177	32	0
7	F	1495	0	1549	86	0
8	G	1864	0	2018	43	0
9	H	1501	0	1593	34	0
10	I	1682	0	1769	58	0
11	J	1499	0	1618	24	0
12	K	816	0	841	40	0
13	L	1229	0	1302	18	0
14	M	935	0	964	15	0
15	N	1202	0	1289	17	0
16	O	1010	0	1034	29	0
17	P	1037	0	1082	47	0
18	Q	1097	0	1161	54	0
19	R	1068	0	1121	39	0
20	S	1184	0	1244	42	0
21	T	1123	0	1153	49	0
22	U	803	0	873	31	0
23	V	625	0	628	16	0
24	W	1034	0	1080	17	0
25	X	1098	0	1167	18	0
26	Y	1014	0	1082	18	0
27	Z	574	0	627	13	0
28	a	794	0	849	14	0
29	b	641	0	665	8	0
30	c	489	0	514	15	0
31	d	459	0	452	25	0
32	e	442	0	487	11	0
33	f	611	0	638	14	0
34	g	2441	0	2396	99	0
35	h	213	0	258	8	0
36	n	238	0	219	6	0
All	All	74798	0	58988	1452	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 11.

The worst 5 of 1452 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:191:A:H62	1:2:208:G:N2	1.61	0.98
1:2:1656:G:H1	1:2:1668:U:H3	1.00	0.98

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:2:1091:C:HO2'	24:W:2:VAL:N	1.61	0.97
1:2:1033:G:H1	1:2:1080:A:HO2'	1.15	0.94
1:2:1290:G:H1	1:2:1301:A:HO2'	1.05	0.93

There are no symmetry-related clashes.

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	A	211/295 (72%)	205 (97%)	5 (2%)	1 (0%)	25	41
3	B	211/264 (80%)	204 (97%)	7 (3%)	0	100	100
4	C	216/293 (74%)	211 (98%)	5 (2%)	0	100	100
5	D	223/243 (92%)	220 (99%)	3 (1%)	0	100	100
6	E	260/263 (99%)	251 (96%)	9 (4%)	0	100	100
7	F	187/204 (92%)	170 (91%)	16 (9%)	1 (0%)	25	41
8	G	228/249 (92%)	221 (97%)	7 (3%)	0	100	100
9	H	184/194 (95%)	174 (95%)	8 (4%)	2 (1%)	12	21
10	I	203/208 (98%)	194 (96%)	9 (4%)	0	100	100
11	J	178/194 (92%)	172 (97%)	5 (3%)	1 (1%)	22	37
12	K	95/165 (58%)	90 (95%)	5 (5%)	0	100	100
13	L	149/158 (94%)	142 (95%)	6 (4%)	1 (1%)	19	33
14	M	119/132 (90%)	110 (92%)	6 (5%)	3 (2%)	4	7
15	N	147/151 (97%)	145 (99%)	2 (1%)	0	100	100
16	O	133/151 (88%)	128 (96%)	5 (4%)	0	100	100
17	P	124/145 (86%)	112 (90%)	12 (10%)	0	100	100
18	Q	136/146 (93%)	127 (93%)	8 (6%)	1 (1%)	19	33

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	R	130/135 (96%)	127 (98%)	3 (2%)	0	100	100
20	S	141/152 (93%)	124 (88%)	17 (12%)	0	100	100
21	T	142/145 (98%)	136 (96%)	6 (4%)	0	100	100
22	U	99/119 (83%)	94 (95%)	5 (5%)	0	100	100
23	V	80/83 (96%)	80 (100%)	0	0	100	100
24	W	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
25	X	139/143 (97%)	137 (99%)	2 (1%)	0	100	100
26	Y	122/130 (94%)	121 (99%)	1 (1%)	0	100	100
27	Z	70/125 (56%)	64 (91%)	6 (9%)	0	100	100
28	a	97/101 (96%)	95 (98%)	1 (1%)	1 (1%)	13	23
29	b	80/82 (98%)	75 (94%)	5 (6%)	0	100	100
30	c	60/62 (97%)	57 (95%)	3 (5%)	0	100	100
31	d	53/55 (96%)	48 (91%)	5 (9%)	0	100	100
32	e	54/56 (96%)	53 (98%)	1 (2%)	0	100	100
33	f	72/74 (97%)	60 (83%)	12 (17%)	0	100	100
34	g	312/315 (99%)	278 (89%)	32 (10%)	2 (1%)	22	37
35	h	20/25 (80%)	20 (100%)	0	0	100	100
36	n	28/180 (16%)	28 (100%)	0	0	100	100
All	All	4830/5567 (87%)	4595 (95%)	222 (5%)	13 (0%)	38	55

5 of 13 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	189	ILE
9	H	171	GLU
28	a	63	VAL
14	M	110	VAL
9	H	88	SER

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	A	179/243 (74%)	169 (94%)	10 (6%)	17	32
3	B	194/231 (84%)	186 (96%)	8 (4%)	26	45
4	C	184/225 (82%)	177 (96%)	7 (4%)	28	48
5	D	189/202 (94%)	176 (93%)	13 (7%)	13	23
6	E	224/225 (100%)	215 (96%)	9 (4%)	27	46
7	F	159/170 (94%)	155 (98%)	4 (2%)	42	63
8	G	200/218 (92%)	192 (96%)	8 (4%)	27	46
9	H	167/174 (96%)	158 (95%)	9 (5%)	18	33
10	I	178/180 (99%)	177 (99%)	1 (1%)	84	90
11	J	160/168 (95%)	158 (99%)	2 (1%)	65	80
12	K	88/136 (65%)	85 (97%)	3 (3%)	32	53
13	L	135/142 (95%)	134 (99%)	1 (1%)	81	89
14	M	102/108 (94%)	100 (98%)	2 (2%)	50	69
15	N	130/131 (99%)	126 (97%)	4 (3%)	35	56
16	O	105/119 (88%)	98 (93%)	7 (7%)	13	24
17	P	112/130 (86%)	110 (98%)	2 (2%)	54	72
18	Q	114/121 (94%)	109 (96%)	5 (4%)	24	42
19	R	119/122 (98%)	112 (94%)	7 (6%)	16	29
20	S	124/132 (94%)	122 (98%)	2 (2%)	58	75
21	T	114/115 (99%)	111 (97%)	3 (3%)	41	62
22	U	93/107 (87%)	92 (99%)	1 (1%)	70	83
23	V	66/67 (98%)	63 (96%)	3 (4%)	23	41
24	W	112/113 (99%)	111 (99%)	1 (1%)	75	86
25	X	113/115 (98%)	110 (97%)	3 (3%)	40	60
26	Y	108/112 (96%)	105 (97%)	3 (3%)	38	59
27	Z	64/103 (62%)	63 (98%)	1 (2%)	58	75
28	a	87/89 (98%)	86 (99%)	1 (1%)	70	83
29	b	74/74 (100%)	73 (99%)	1 (1%)	62	78
30	c	55/55 (100%)	54 (98%)	1 (2%)	54	72
31	d	48/48 (100%)	47 (98%)	1 (2%)	48	69
32	e	45/45 (100%)	42 (93%)	3 (7%)	13	24

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	f	67/67 (100%)	65 (97%)	2 (3%)	36	57
34	g	272/273 (100%)	257 (94%)	15 (6%)	18	32
35	h	21/24 (88%)	21 (100%)	0	100	100
36	n	26/150 (17%)	26 (100%)	0	100	100
All	All	4228/4734 (89%)	4085 (97%)	143 (3%)	34	53

5 of 143 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
26	Y	4	THR
28	a	3	LYS
34	g	23	THR
7	F	90	VAL
7	F	17	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
19	R	116	ASN
30	c	45	ASN
20	S	105	ASN
26	Y	15	ASN
31	d	26	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1661/1869 (88%)	511 (30%)	23 (1%)

5 of 511 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	4	C
1	2	17	C
1	2	26	U
1	2	33	G

5 of 23 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	1409	A
1	2	1464	C
1	2	1428	G
1	2	1517	G
1	2	559	G

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 ⓘ

There are no ligands in this entry.

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.

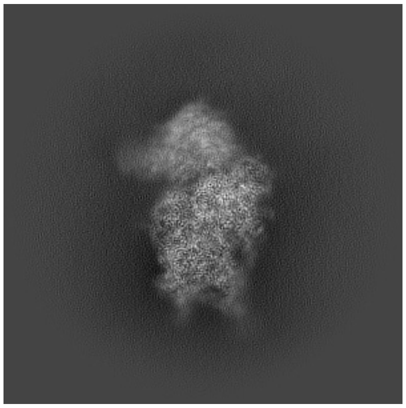
6 Map visualisation ⓘ

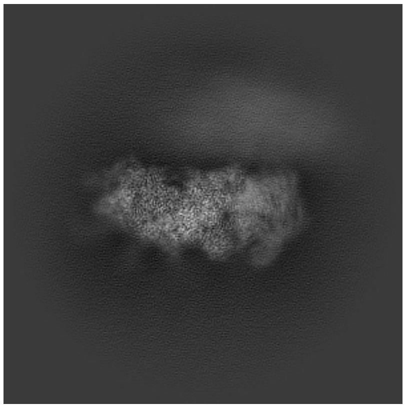
This section contains visualisations of the EMDB entry EMD-62447. These allow visual inspection of the internal detail of the map and identification of artifacts.

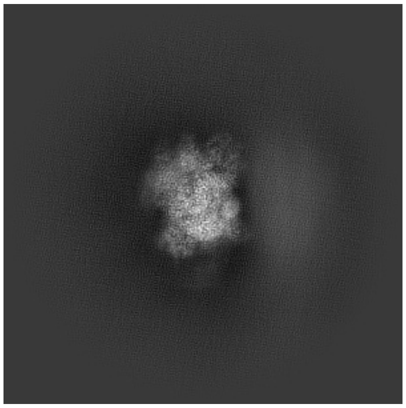
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections ⓘ

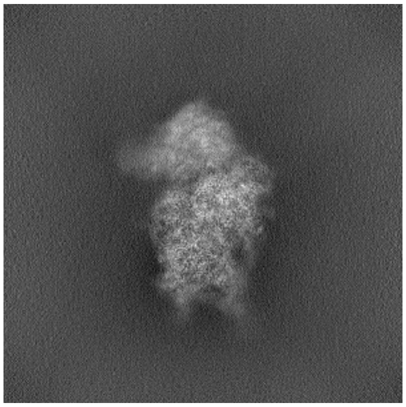
6.1.1 Primary map

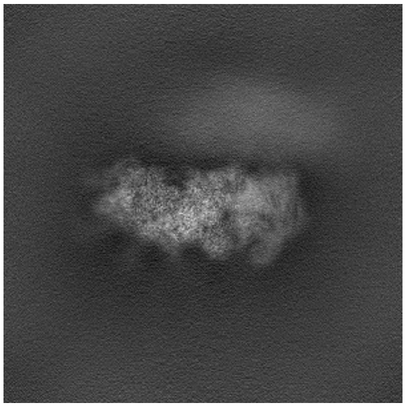

X

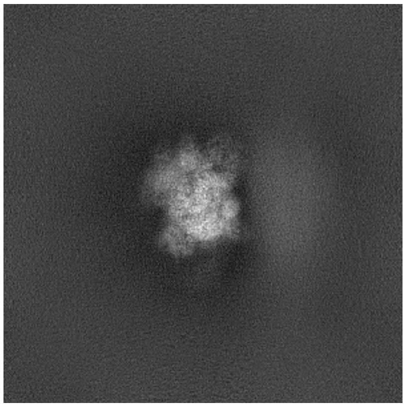

Y


Z

6.1.2 Raw map


X

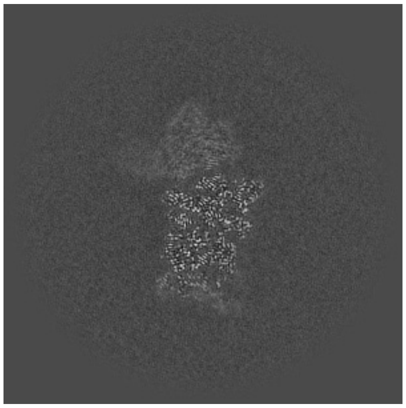

Y


Z

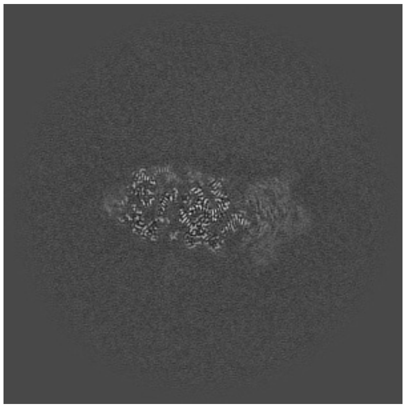
The images above show the map projected in three orthogonal directions.

6.2 Central slices

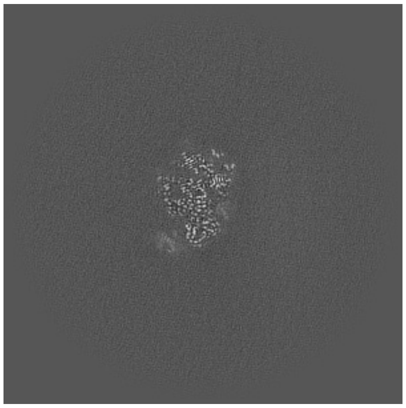
6.2.1 Primary map



X Index: 256

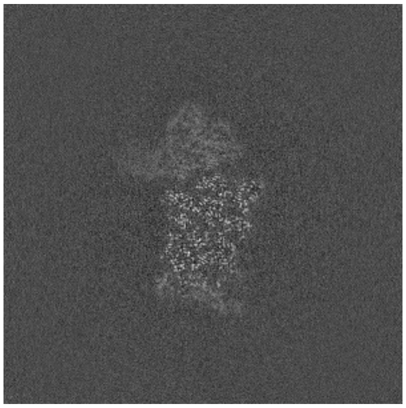


Y Index: 256

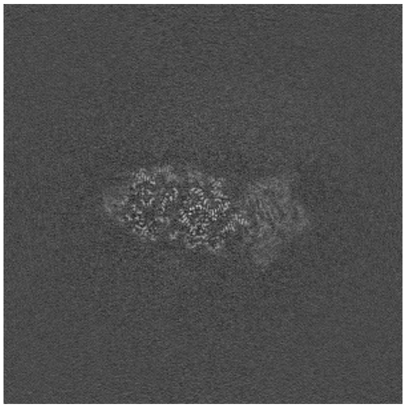


Z Index: 256

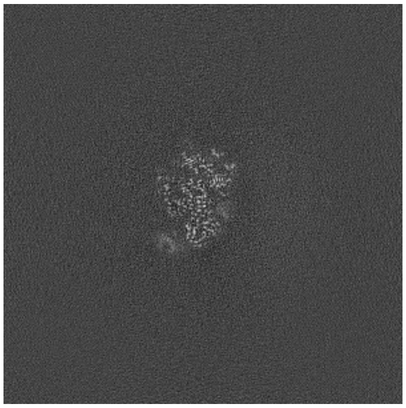
6.2.2 Raw map



X Index: 256



Y Index: 256

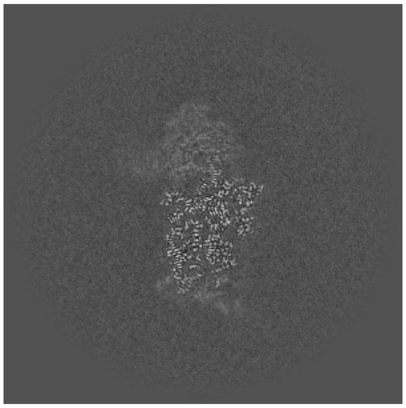


Z Index: 256

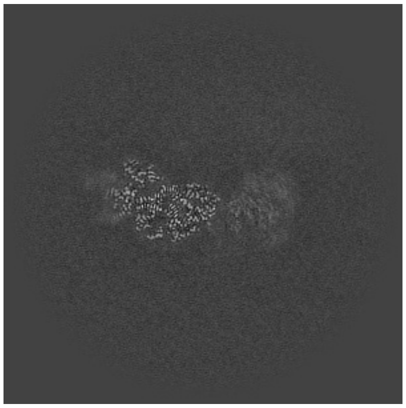
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

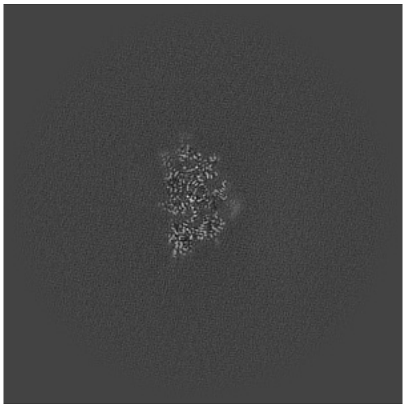
6.3.1 Primary map



X Index: 252

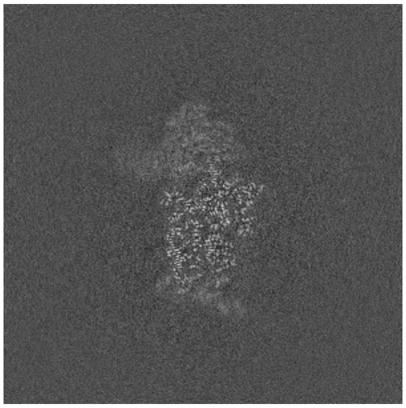


Y Index: 224

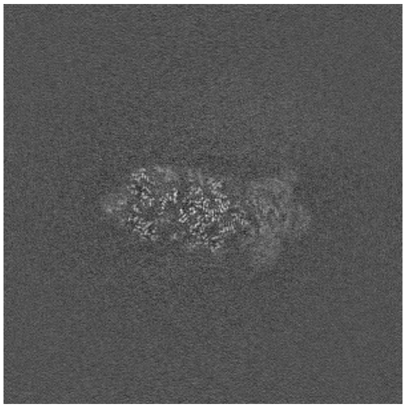


Z Index: 237

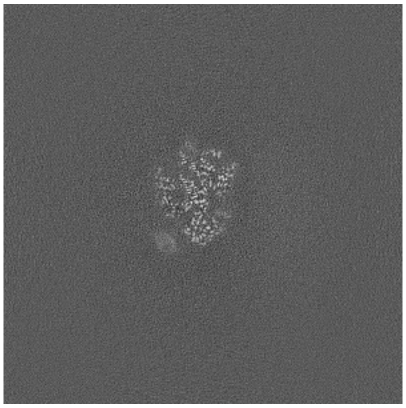
6.3.2 Raw map



X Index: 252



Y Index: 257

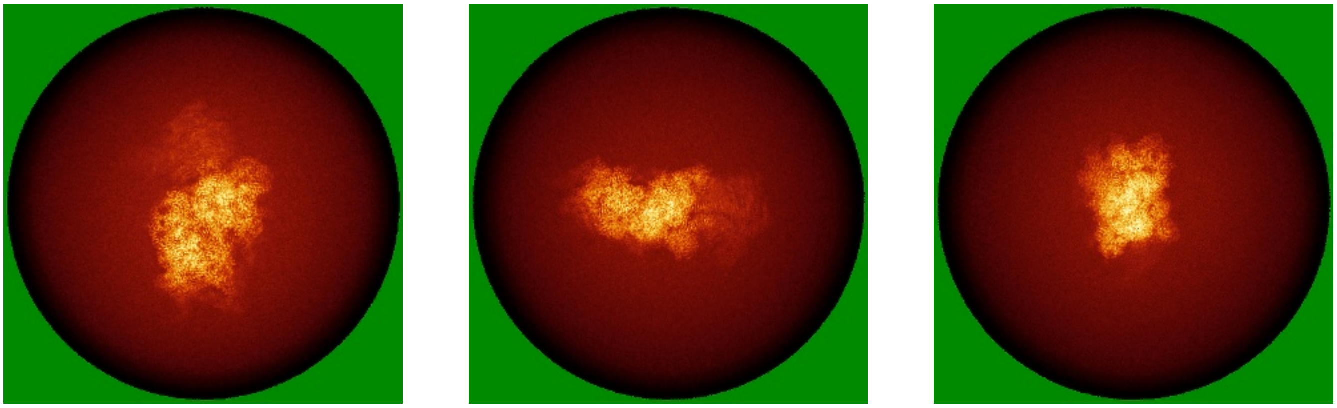


Z Index: 260

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

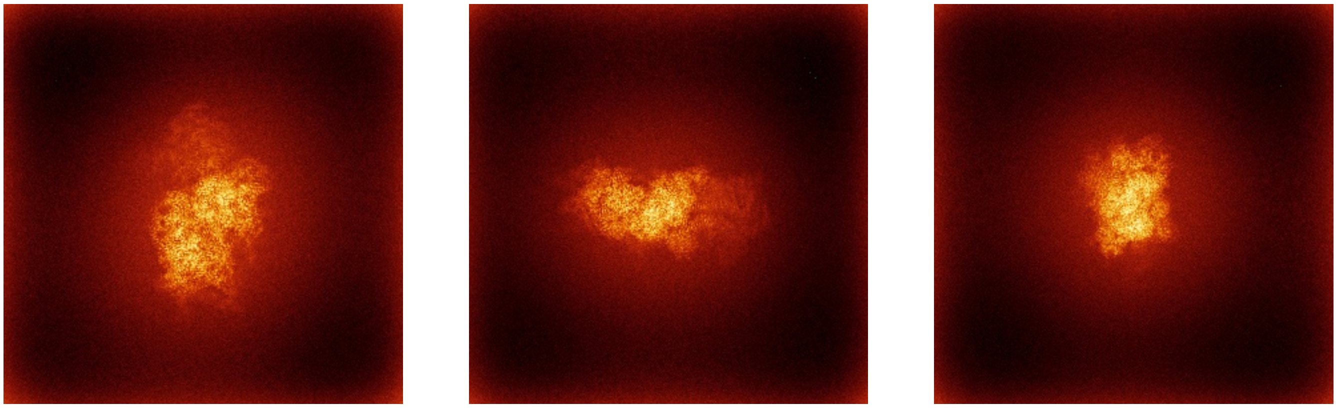
6.4 Orthogonal standard-deviation projections (False-color)

6.4.1 Primary map



X Y Z

6.4.2 Raw map

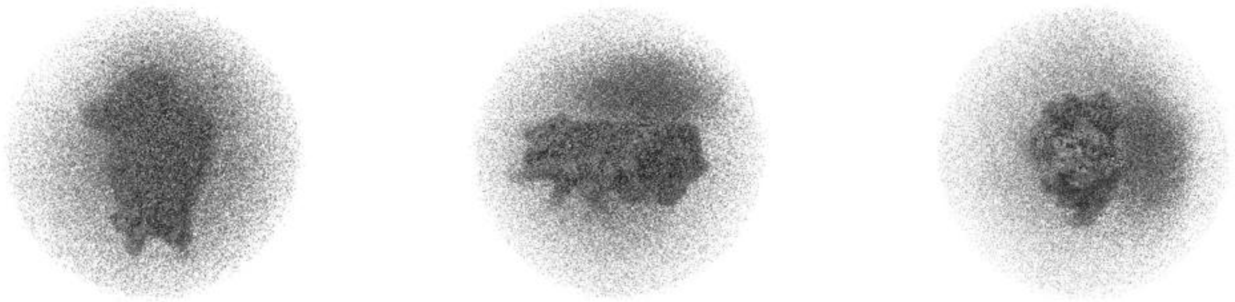


X Y Z

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

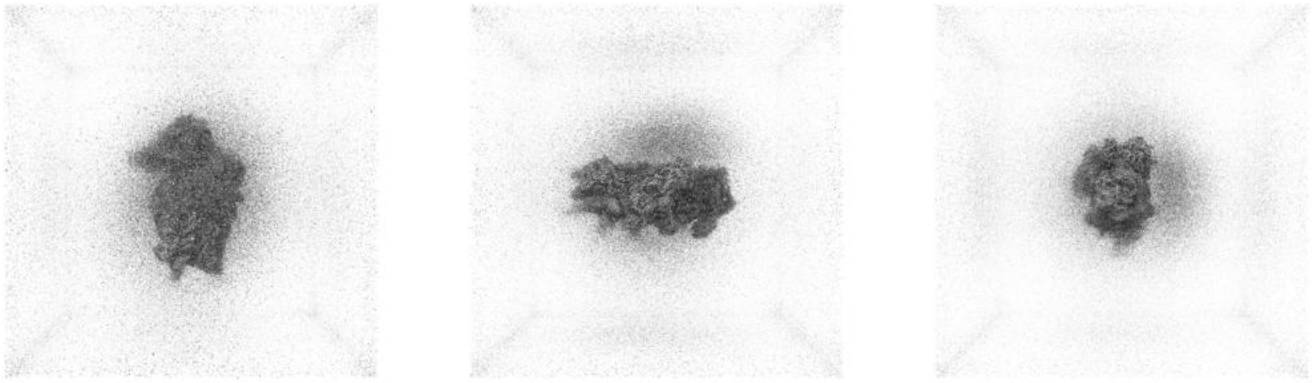
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.158. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

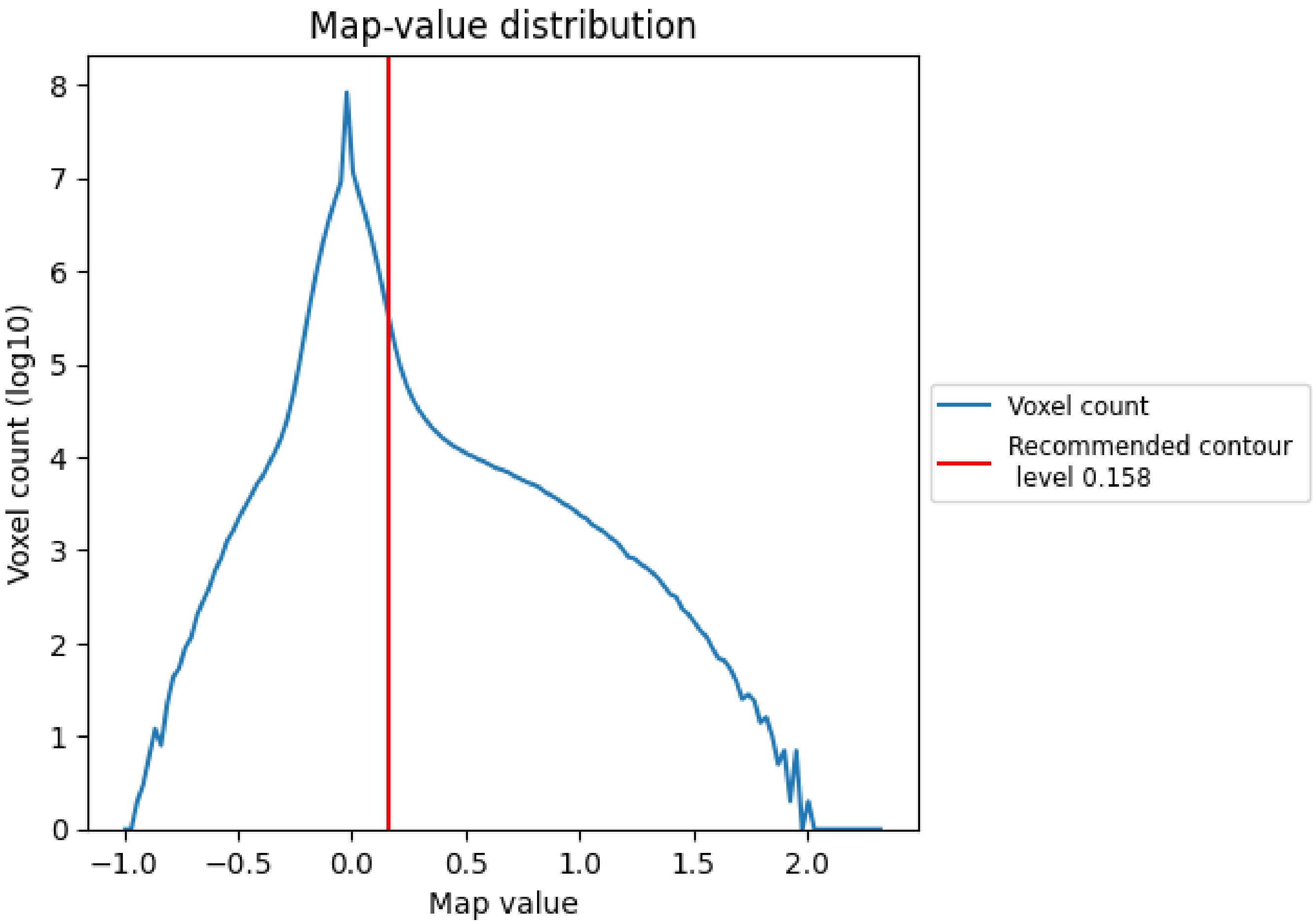
6.6 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

7 Map analysis ⓘ

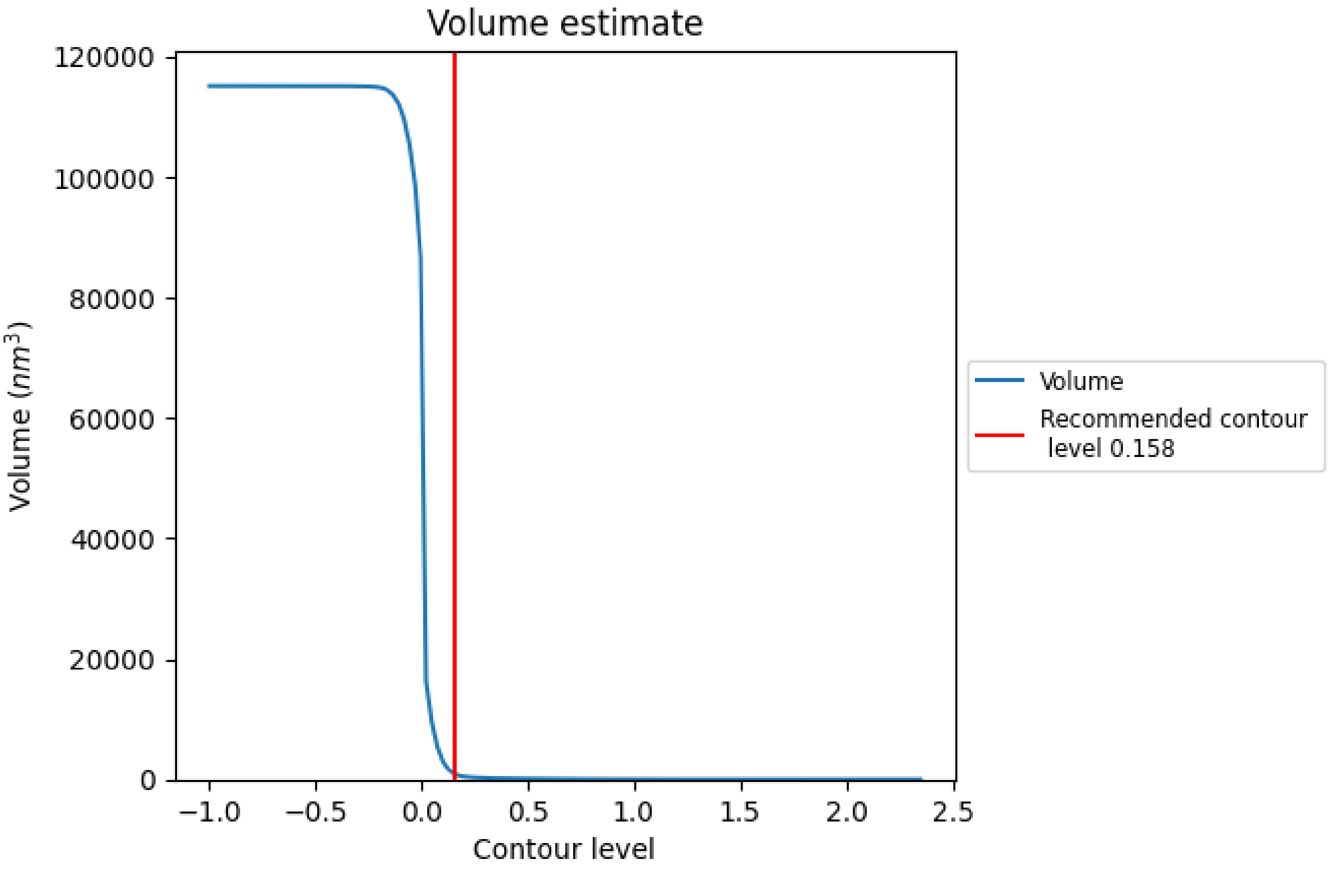
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution ⓘ



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

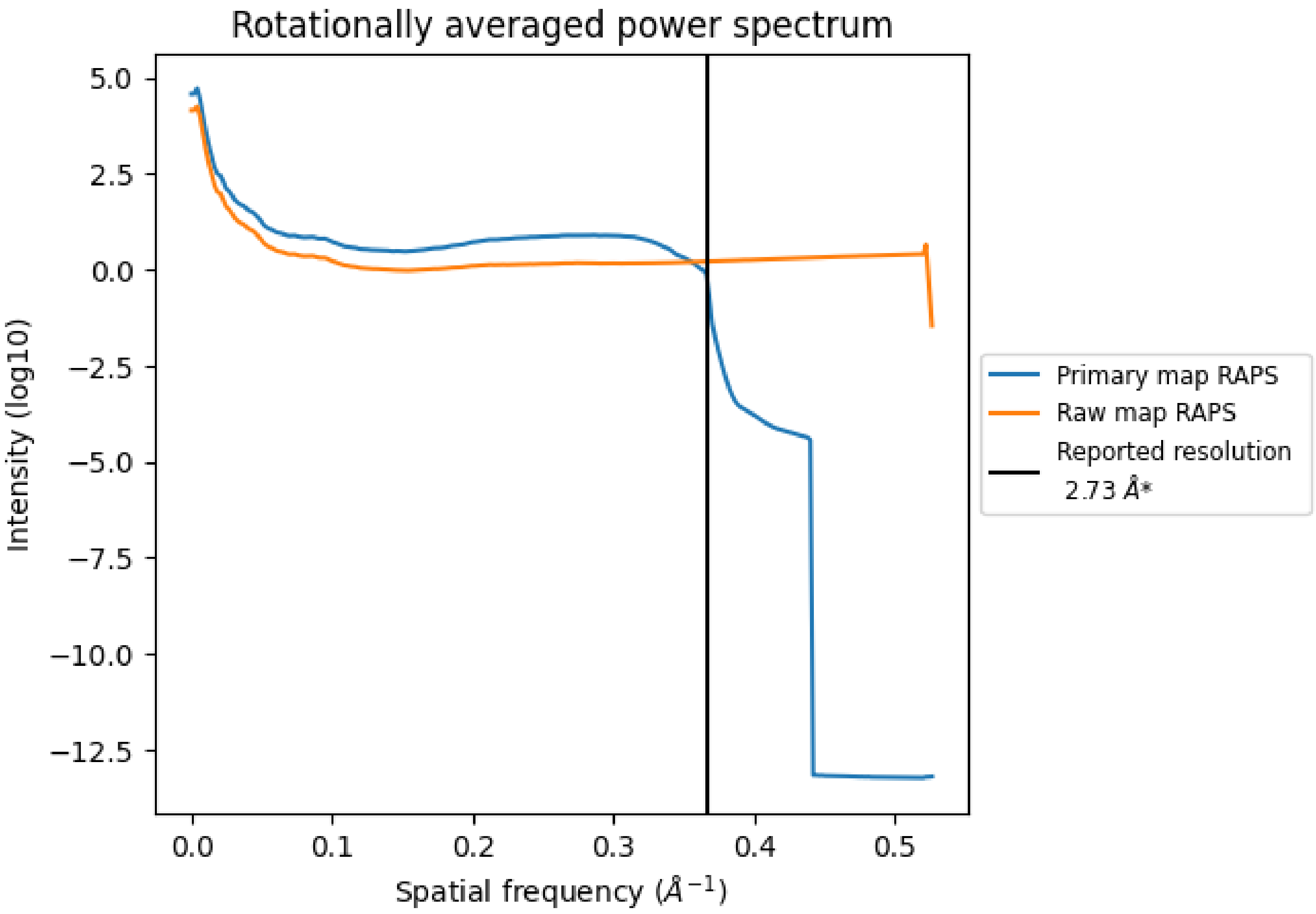
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 919 nm^3; this corresponds to an approximate mass of 831 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 ⓘ

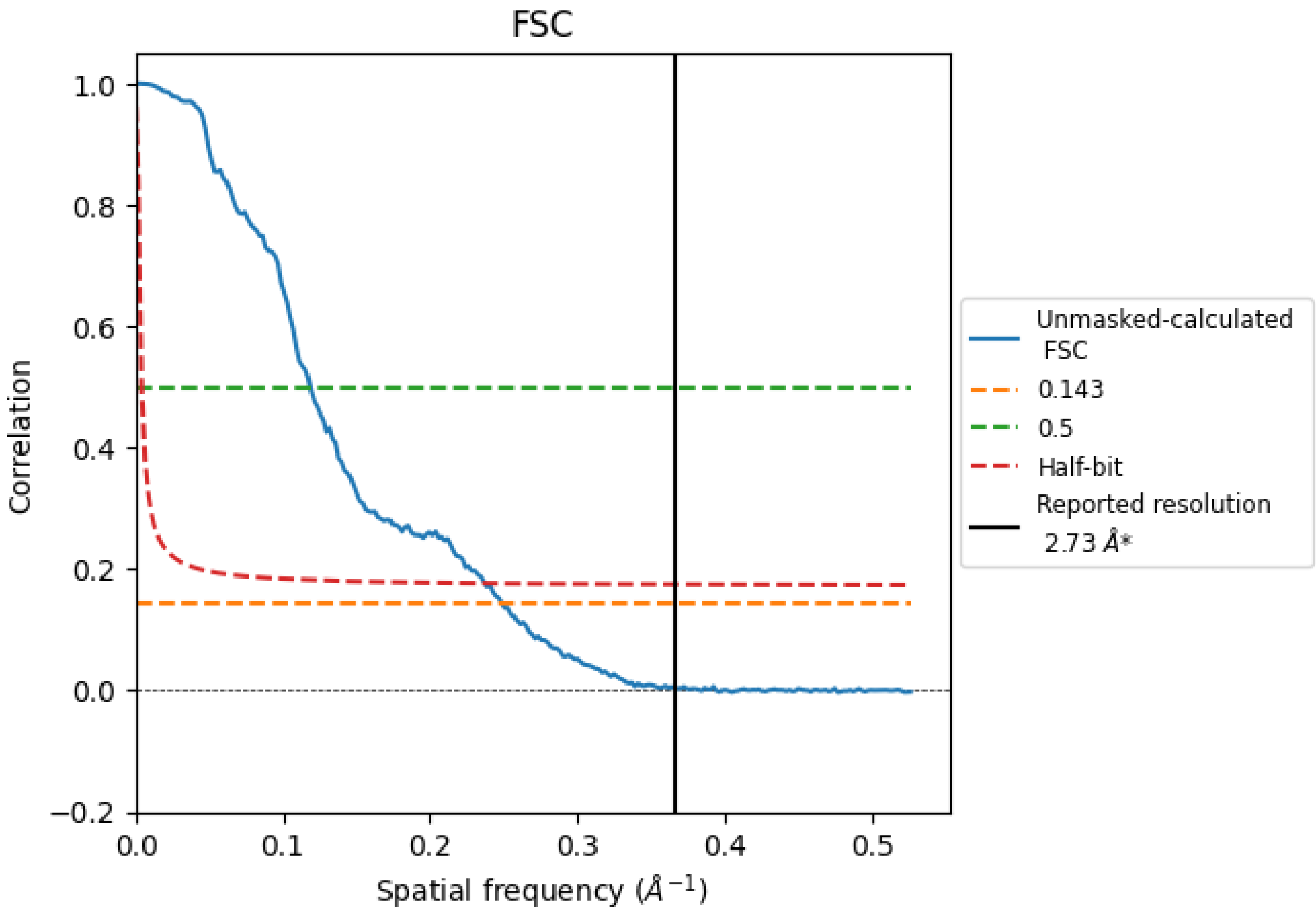


*Reported resolution corresponds to spatial frequency of 0.366 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

8.1 FSC ⓘ



*Reported resolution corresponds to spatial frequency of 0.366 Å^{-1}

8.2 Resolution estimates ⓘ

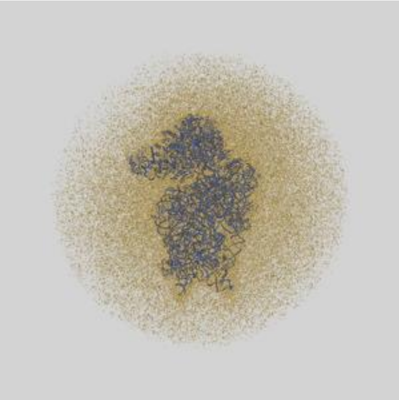
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.73	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.02	8.43	4.22

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.02 differs from the reported value 2.73 by more than 10 %

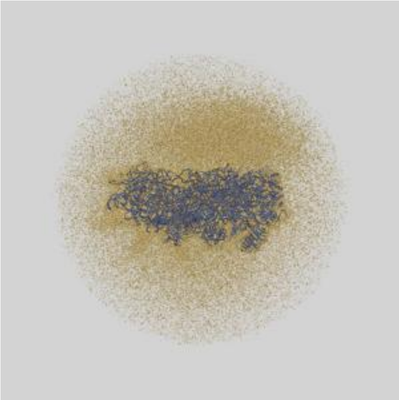
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-62447 and PDB model 9KMW. Per-residue inclusion information can be found in section 3 on page 11.

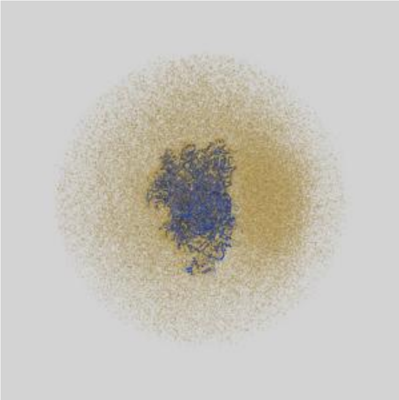
9.1 Map-model overlay (i)



X



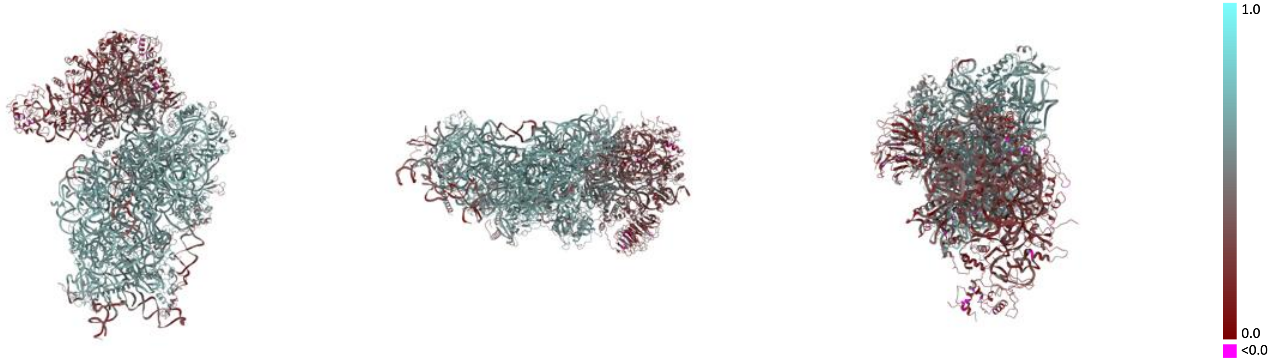
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.158 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.

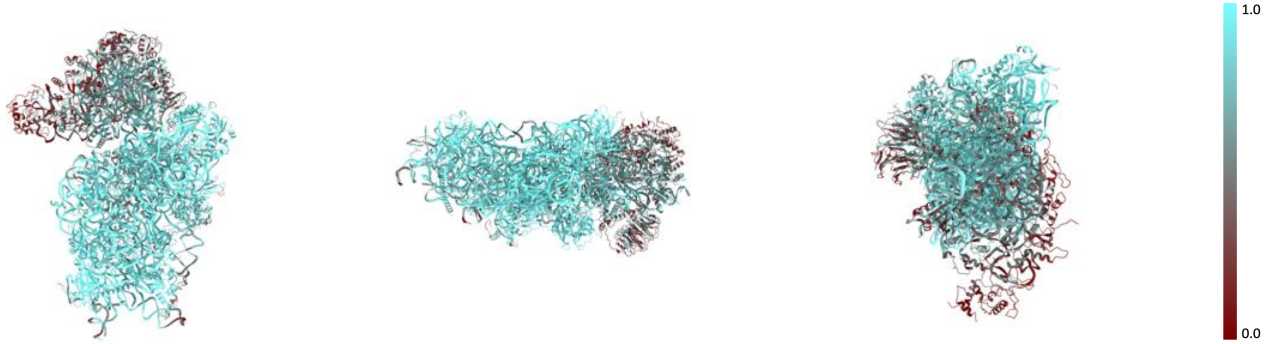
9.2 Q-score mapped to coordinate model ⓘ



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.

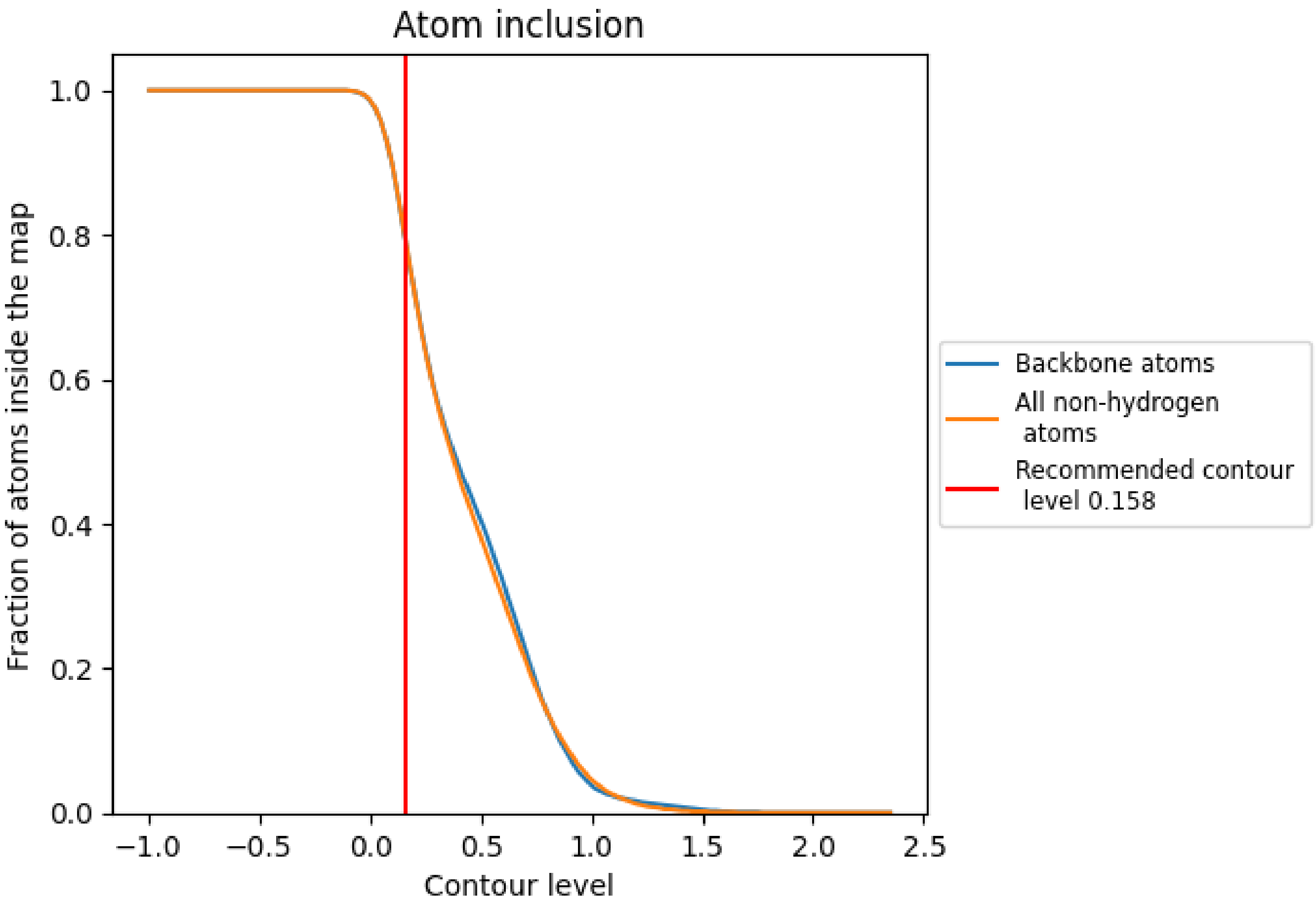
9.3 Atom inclusion mapped to coordinate model ⓘ



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 (0.158).

9.4 Atom inclusion ⓘ



At the recommended contour level, 80% of all backbone atoms, 80% 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 (0.158) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8000	0.4930
2	0.8670	0.5090
A	0.9360	0.5980
B	0.9390	0.5900
C	0.9610	0.6200
D	0.5520	0.3530
E	0.9690	0.6260
F	0.5310	0.3090
G	0.9230	0.5630
H	0.8100	0.5160
I	0.9000	0.5730
J	0.9760	0.6250
K	0.4660	0.2880
L	0.9150	0.6030
M	0.1540	0.2340
N	0.9570	0.6060
O	0.9360	0.5910
P	0.2900	0.2600
Q	0.6570	0.3620
R	0.7000	0.4510
S	0.2470	0.2750
T	0.5420	0.3040
U	0.4580	0.3320
V	0.9660	0.6140
W	0.9800	0.6360
X	0.9700	0.6260
Y	0.9670	0.6210
Z	0.3300	0.2550
a	0.9520	0.6080
b	0.8320	0.5120
c	0.5120	0.3460
d	0.6240	0.3390
e	0.8810	0.5820
f	0.1430	0.2520
g	0.4170	0.2720

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Chain	Atom inclusion	Q-score
h	0.9120	0.5910
n	0.9060	0.5990