wwPDB EM Validation Summary Report ⓘ

Nov 19, 2022 – 11:21 pm GMT

PDB ID	:	6FAI
EMDB ID	:	EMD-4214
Title	:	Structure of a eukaryotic cytoplasmic pre-40S ribosomal subunit
Authors	:	Scaiola, A.; Pena, C.; Weisser, M.; Boehringer, D.; Leibundgut, M.; Klingauf-Nerurkar, P.; Gerhardy, S.; Panse, V.G.; Ban, N.
Deposited on	:	2017-12-15
Resolution	:	3.40 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:

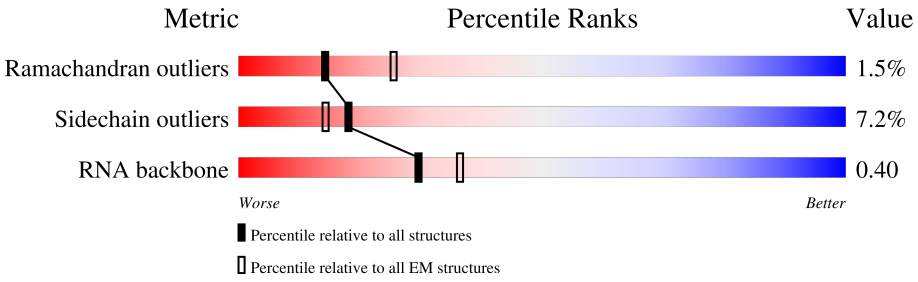
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.40 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	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	b	82	91% 7% ·
2	c	67	82% 12% 6%
3	d	56	7% 62% · 34%
4	e	63	68% 8% 24%
5	g	319	14% 92% 8% ·
6	h	274	62% · 34%
7	i	483	52% · 46%
8	j	463	· 10% 90%

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Mol	Chain	Length	Quality of chain
9	k	788	81% 15%
10	l	425	62% 5% 33%
11	2	1800	62% 35%
12	A	252	74% 8% 18%
13	B	255	77% 7% 16%
14	C	254	76% 9% 15%
15	D	240	74% 78% 6% 16%
16	E	261	92% 7%
17	F	225	87% 8%
18	G	236	90% 8%
19	H	190	87% 9%
20	I	200	84% 10% 6%
21	J	197	84% 10% 6%
22	L	156	82% 8% 10%
23	M	143	11% 82% 5% 13%
24	N	151	91% 9%
25	O	137	86% 7% 7%
26	P	142	85% 5% 11%
27	Q	143	83% 6% 11%
28	R	136	85% 7% 8%
29	S	146	88% 8%
30	T	144	92% 8%
31	U	121	5% 78% 7% 15%
32	V	87	91% 9%
33	W	130	85% 11%

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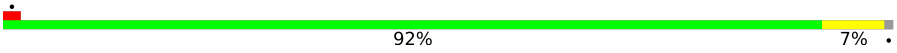
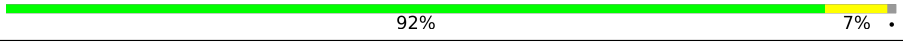
Mol	Chain	Length	Quality of chain
34	X	145	
35	Y	135	
36	Z	108	

2 Entry composition (i)

There are 38 unique types of molecules in this entry. The entry contains 84964 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	b	81	610	382	110	113	5	0	0

- Molecule 2 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	c	63	497	306	99	91	1	0	0

- Molecule 3 is a protein called 40S ribosomal protein S29-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	d	37	302	186	62	50	4	0	0

- Molecule 4 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	e	48	384	242	81	59	2	0	0

- Molecule 5 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	g	317	2431	1538	417	468	8	0	0

- Molecule 6 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	h	181	1436	917	261	254	4	0	0

- Molecule 7 is a protein called Essential nuclear protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	i	262	Total	C	N	O	S	0	0
			2133	1388	364	378	3		

- Molecule 8 is a protein called Protein LTV1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	j	46	Total	C	N	O	S	0	0
			396	242	57	95	2		

- Molecule 9 is a protein called Ribosome biogenesis protein TSR1.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	k	670	Total	C	N	O	S	0	0
			5402	3449	937	1002	14		

- Molecule 10 is a protein called Serine/threonine-protein kinase RIO2.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	l	286	Total	C	N	O	S	0	0
			2322	1464	410	430	18		

- Molecule 11 is a RNA chain called 20S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	2	1775	Total	C	N	O	P	0	0
			37824	16909	6694	12446	1775		

- Molecule 12 is a protein called 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	A	206	Total	C	N	O	S	0	0
			1611	1036	285	288	2		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	206	PHE	ASP	conflict	UNP P32905

- Molecule 13 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	B	214	Total	C	N	O	S	0	0
			1709	1084	310	311	4		

- Molecule 14 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	C	217	Total	C	N	O	S	0	0
			1635	1047	289	297	2		

- Molecule 15 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	D	202	Total	C	N	O	S	0	0
			1576	998	290	282	6		

- Molecule 16 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	E	260	Total	C	N	O	S	0	0
			2068	1316	389	360	3		

- Molecule 17 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	F	206	Total	C	N	O	S	0	0
			1609	1007	300	299	3		

- Molecule 18 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	G	232	Total	C	N	O	S	0	0
			1873	1172	366	332	3		

- Molecule 19 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	H	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 20 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	I	188	Total	C	N	O	S	0	0
			1489	925	298	264	2		

- Molecule 21 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	J	185	Total	C	N	O	S	0	0
			1494	943	289	261	1		

- Molecule 22 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	L	140	Total	C	N	O	S	0	0
			1129	724	215	187	3		

- Molecule 23 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	M	125	Total	C	N	O	S	0	0
			941	591	166	182	2		

- Molecule 24 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	N	150	Total	C	N	O	S	0	0
			1192	759	224	207	2		

- Molecule 25 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	O	127	Total	C	N	O	S	0	0
			926	569	185	169	3		

- Molecule 26 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	P	127	Total	C	N	O	S	0	0
			1001	637	186	171	7		

- Molecule 27 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	Q	127	Total 993	C 640	N 177	O 176	0	0

- Molecule 28 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	R	125	Total 1000	C 625	N 188	O 185	S 2	0	0

- Molecule 29 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	S	135	Total 1110	C 696	N 215	O 197	S 2	0	0

- Molecule 30 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	T	143	Total 1112	C 694	N 208	O 208	S 2	0	0

- Molecule 31 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	U	103	Total 819	C 519	N 148	O 151	S 1	0	0

- Molecule 32 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	V	87	Total 684	C 420	N 125	O 137	S 2	0	0

- Molecule 33 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	W	129	Total 1021	C 650	N 188	O 180	S 3	0	0

- Molecule 34 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	X	144	Total	C	N	O	S	0	0
			1121	708	220	191	2		

- Molecule 35 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	Y	134	Total	C	N	O	0	0
			1073	676	208	189		

- Molecule 36 is a protein called 40S ribosomal protein S25-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	Z	63	Total	C	N	O	0	0
			512	328	94	90		

- Molecule 37 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
37	b	1	Total	Zn	0
			1	1	
37	d	1	Total	Zn	0
			1	1	

- Molecule 38 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

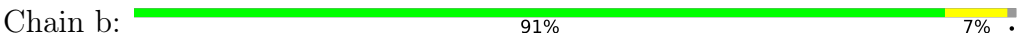
Mol	Chain	Residues	Atoms		AltConf
38	2	46	Total	Mg	0
			46	46	

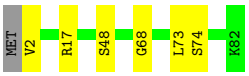
3 Residue-property plots (i)

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

• Molecule 1: 40S ribosomal protein S27-A

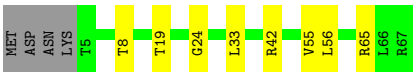
Chain b:





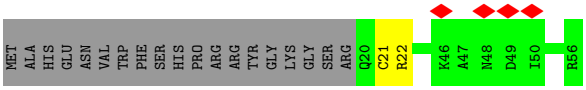
• Molecule 2: 40S ribosomal protein S28-A

Chain c:



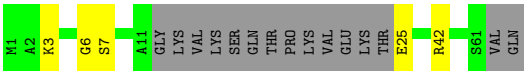
• Molecule 3: 40S ribosomal protein S29-A

Chain d:



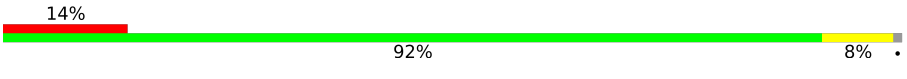
• Molecule 4: 40S ribosomal protein S30-A

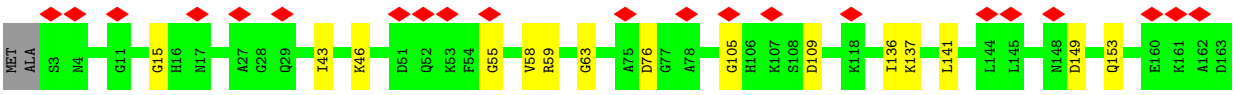
Chain e:

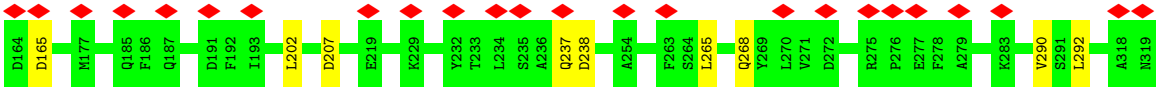


• Molecule 5: Guanine nucleotide-binding protein subunit beta-like protein

Chain g:

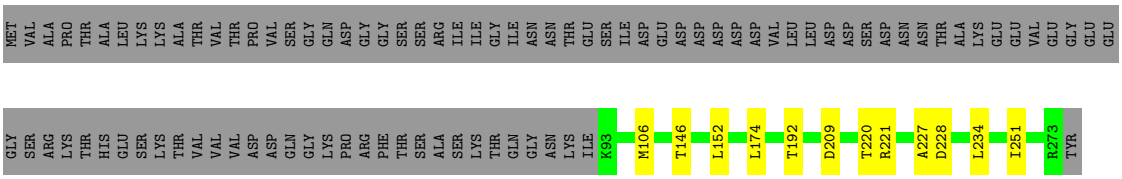






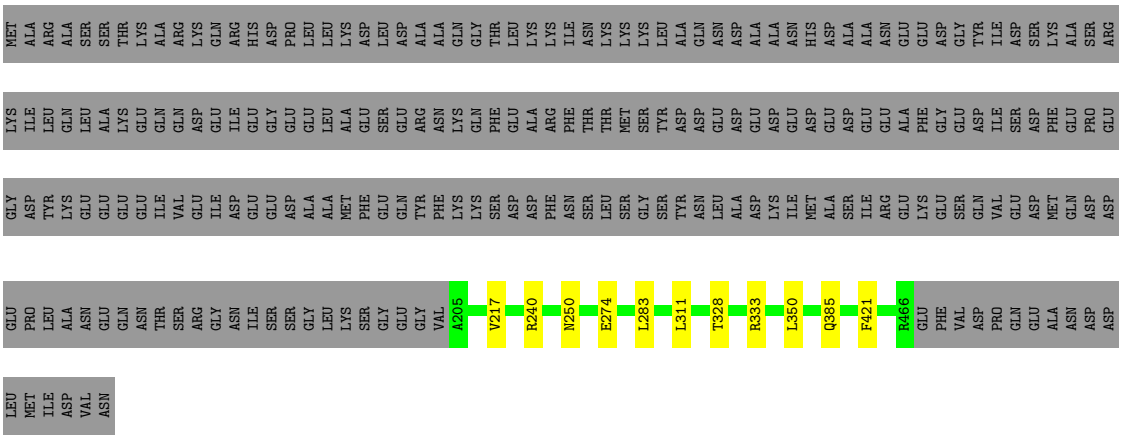
• Molecule 6: Pre-rRNA-processing protein PNO1

Chain h:



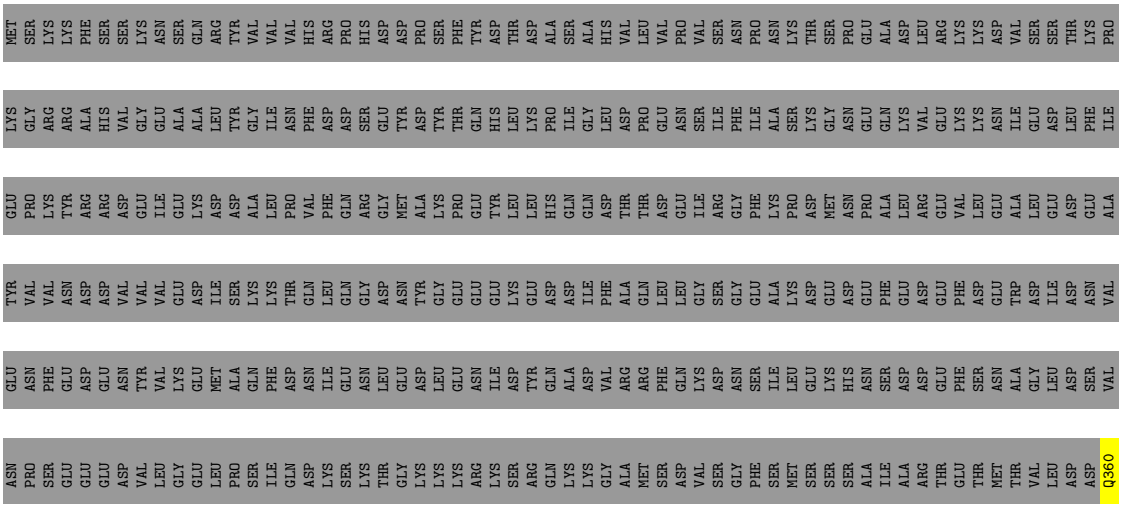
• Molecule 7: Essential nuclear protein 1

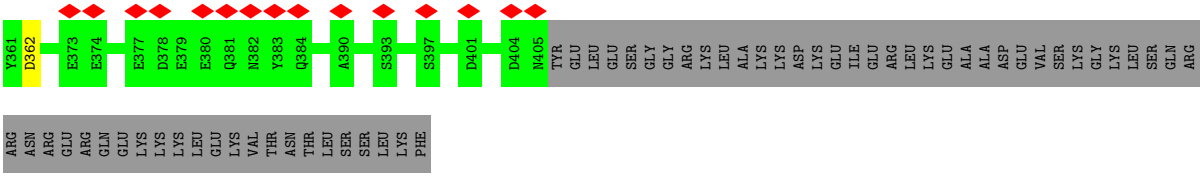
Chain i:



• Molecule 8: Protein LTV1

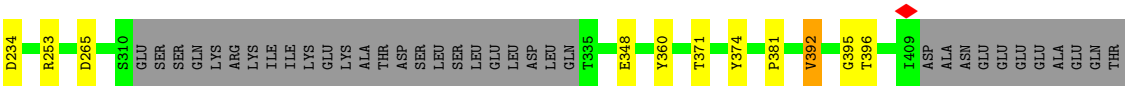
Chain j:

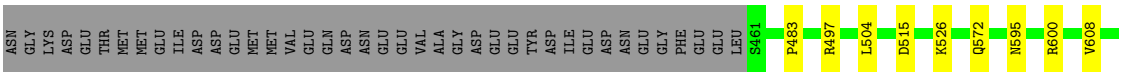




• Molecule 9: Ribosome biogenesis protein TSR1

Chain k:



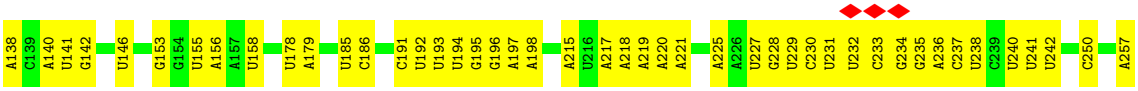


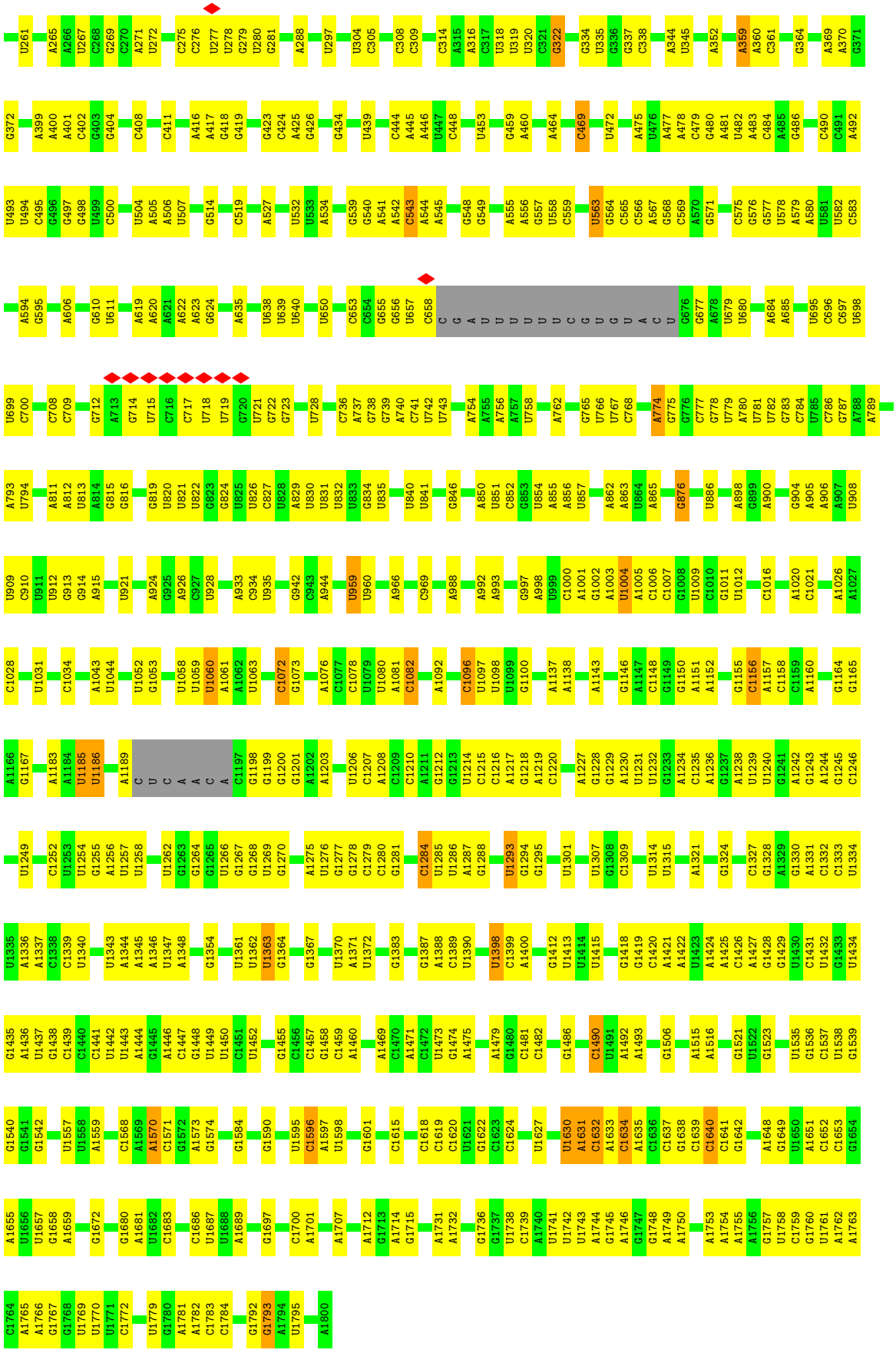
• Molecule 10: Serine/threonine-protein kinase RIO2

Chain l:

• Molecule 11: 20S ribosomal RNA

Chain 2:

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G372 A399 A400 A401 C402 G403 G404 C408 C411 A416 A417 G418 G419 G423 C424 A425 G426 G434 U439 C444 A445 A446 U447 C448 U453 G459 A460 A464 C469 U472 A475 U476 A477 A478 C479 G480 A481 U482 A483 C484 A485 G486 C490 C491 A492
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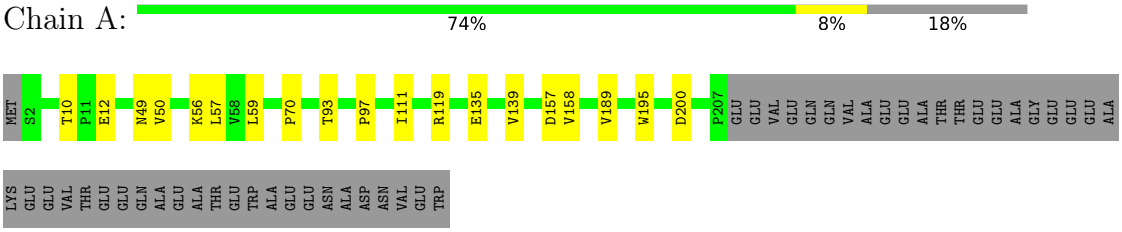
U699 C700 C708 C709 G712 A713 G714 U715 C716 C717 U718 U719 G720 U721 G722 G723 U728 C736 A737 G738 G739 A740 C741 U742 U743 A754 A755 A756 A757 U758 A762 G765 U766 U767 C768 A774 G775 G776 C777 G778 U779 A780 U781 U782 G783 C784 U785 C786 G787 A788 A789
A793 U794 A811 A812 U813 A814 G815 C816 G819 U820 U821 U822 G823 G824 U825 U826 C827 U828 A829 U830 U831 U832 U833 G834 U835 U840 U841 G846 A850 U851 C852 G853 U854 A855 A856 U857 A862 A863 U864 A865 G876 U886 A898 G899 A900 G904 A905 A906 A907 U908
U909 C910 U911 U912 G913 G914 A915 U921 A924 G925 A926 C927 U928 A933 C934 U935 G942 C943 A944 U959 U960 A966 C969 A988 A992 A993 G997 A998 U999 C1000 A1001 G1002 A1003 U1004 A1005 C1006 C1007 G1008 U1009 C1010 G1011 U1012 C1016 A1020 C1021 A1026 A1027
C1028 U1031 C1034 A1043 U1044 U1052 G1053 U1058 U1059 U1060 A1061 A1062 U1063 C1072 G1073 A1076 G1077 C1078 U1079 U1080 A1081 C1082 A1092 C1096 U1097 U1098 U1099 G1100 A1137 A1138 A1143 G1146 A1147 C1148 G1149 G1150 A1151 A1152 G1155 C1156 A1157 C1158 C1159 A1160 G1164 G1165
A1166 G1167 A1183 A1184 U1185 U1186 A1189 C U C A A C A C1197 G1198 G1199 G1200 G1201 A1202 A1203 U1206 C1207 A1208 C1209 C1210 A1211 G1212 G1213 U1214 C1215 C1216 A1217 G1218 A1219 C1220 A1227 G1228 G1229 A1230 U1231 U1232 G1233 A1234 C1235 A1236 G1237 A1238 U1239 U1240 G1241 A1242 G1243 A1244 G1245 C1246
U1249 C1262 U1253 U1254 G1255 A1256 U1257 U1258 U1262 G1263 G1264 G1265 U1266 G1267 G1268 U1269 G1270 A1275 U1276 G1277 G1278 C1279 C1280 G1281 C1284 U1285 U1286 A1287 G1288 U1293 G1294 G1295 U1301 U1307 G1308 C1309 U1314 U1315 A1321 G1324 C1327 G1328 A1329 G1330 A1331 C1332 C1333 U1334
U1335 A1336 A1337 C1338 C1339 U1340 U1343 A1344 A1345 A1346 U1347 A1348 G1354 U1361 U1362 U1363 G1364 G1367 U1370 A1371 U1372 G1383 G1387 A1388 C1389 U1390 U1398 C1399 A1400 G1412 U1413 U1414 U1415 G1418 G1419 C1420 A1421 A1422 U1423 A1424 A1425 C1426 A1427 G1428 G1429 U1430 C1431 U1432 G1433 U1434
G1435 A1436 U1437 G1438 C1439 C1440 C1441 U1442 U1443 A1444 G1445 A1446 C1447 G1448 U1449 U1450 C1451 U1452 G1455 C1456 C1457 G1458 C1459 A1460 A1469 C1470 A1471 C1472 U1473 G1474 A1475 A1479 G1480 C1481 C1482 G1486 C1490 U1491 A1492 A1493 G1506 A1515 A1516 G1521 U1522 G1523 U1535 G1536 C1537 U1538 G1539
G1540 G1541 G1542 U1557 U1558 A1559 C1568 A1569 A1570 C1571 G1572 A1573 C1574 G1584 G1590 U1595 C1596 A1597 U1598 G1601 C1615 C1618 C1619 C1620 U1621 G1622 C1623 C1624 U1627 U1630 A1631 C1632 A1633 C1634 A1635 C1636 C1637 G1638 C1639 C1640 C1641 C1642 A1648 G1649 U1650 A1651 C1652 C1653 G1654
A1655 U1656 U1657 G1658 A1659 G1672 G1680 A1681 U1682 C1683 C1686 U1687 U1688 A1689 G1697 C1700 A1701 A1707 A1712 G1713 A1714 G1715 A1731 A1732 G1736 G1737 U1738 C1739 A1740 U1741 U1742 U1743 A1744 U1745 A1746 G1747 G1748 A1749 A1750 A1753 A1754 A1755 A1756 G1757 U1758 C1759 G1760 U1761 A1762 A1763
C1764 A1765 A1766 G1767 G1768 U1769 U1770 U1771 C1772 U1779 G1780 A1781 A1782 C1783 C1784 G1792 G1793 A1794 U1795 A1800

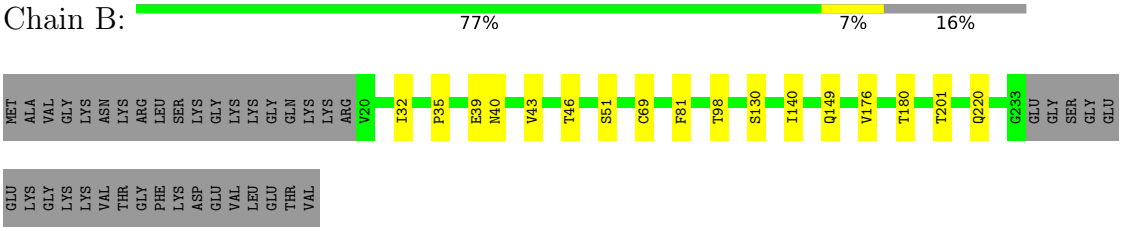
• Molecule 12: 40S ribosomal protein S0-A

Chain A:



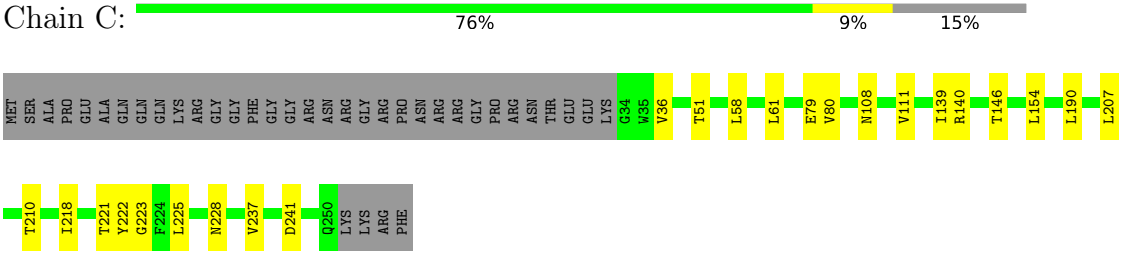
• Molecule 13: 40S ribosomal protein S1-A

Chain B:



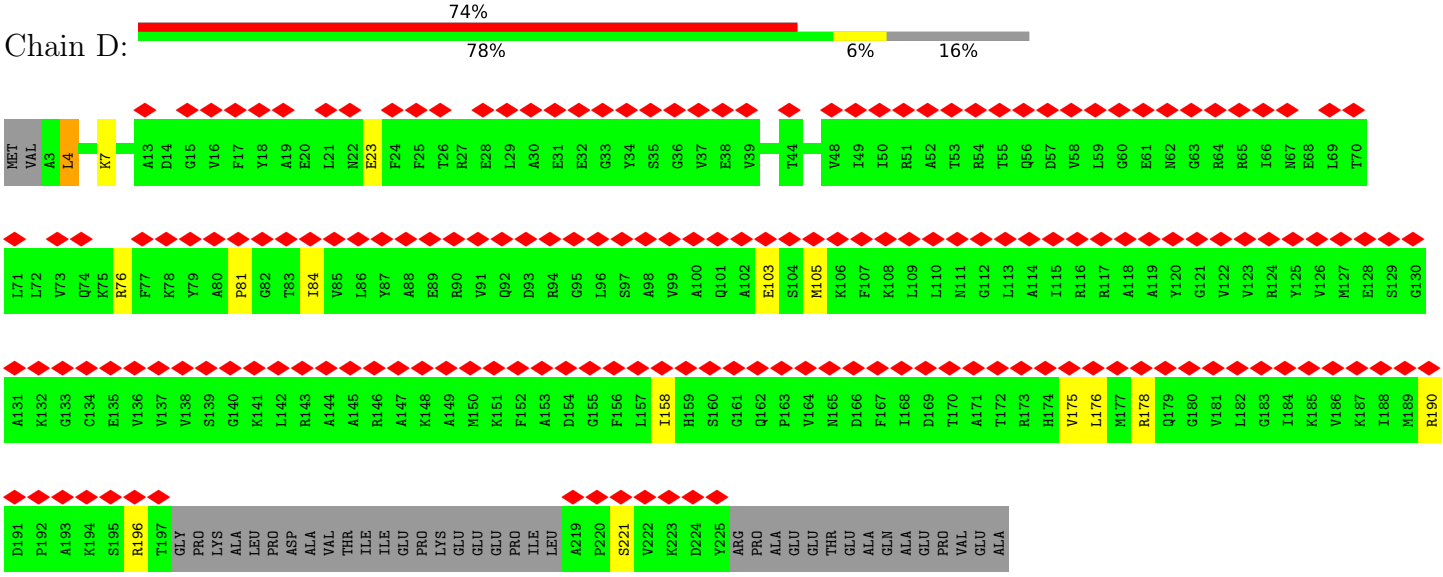
• Molecule 14: 40S ribosomal protein S2

Chain C:



• Molecule 15: 40S ribosomal protein S3

Chain D:

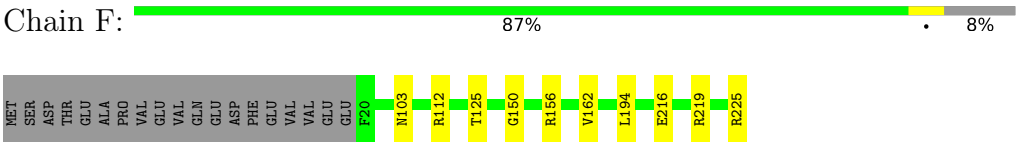


• Molecule 16: 40S ribosomal protein S4-A

Chain E:

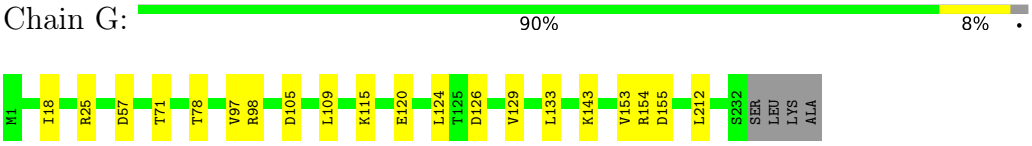
• Molecule 17: 40S ribosomal protein S5

Chain F:



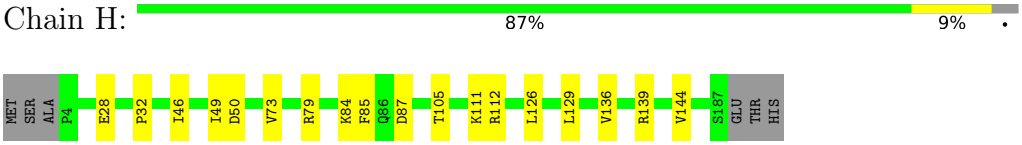
• Molecule 18: 40S ribosomal protein S6-A

Chain G:



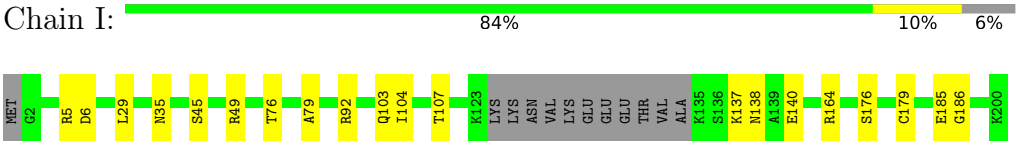
• Molecule 19: 40S ribosomal protein S7-A

Chain H:



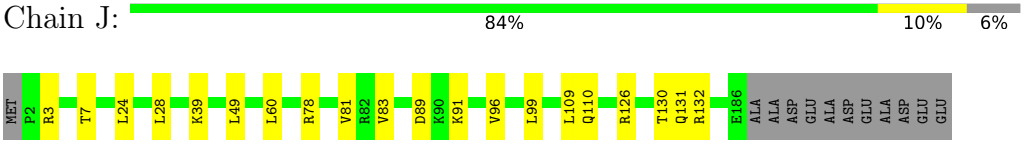
• Molecule 20: 40S ribosomal protein S8-A

Chain I:



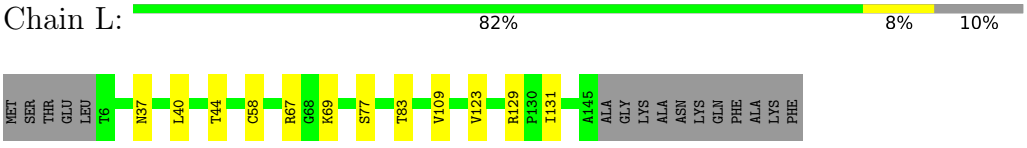
• Molecule 21: 40S ribosomal protein S9-A

Chain J:



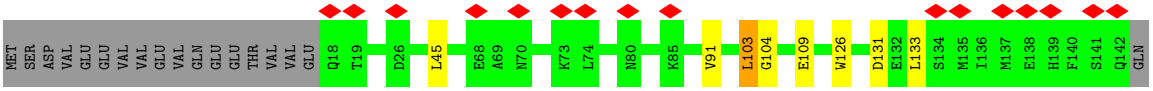
• Molecule 22: 40S ribosomal protein S11-A

Chain L:



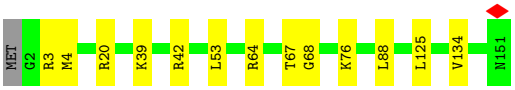
• Molecule 23: 40S ribosomal protein S12

Chain M:



• Molecule 24: 40S ribosomal protein S13

Chain N:

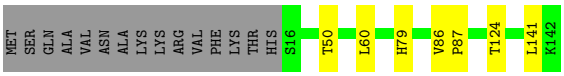


• Molecule 25: 40S ribosomal protein S14-A

Chain O:

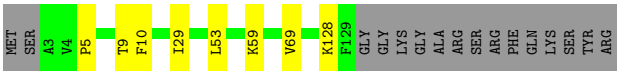
• Molecule 26: 40S ribosomal protein S15

Chain P:



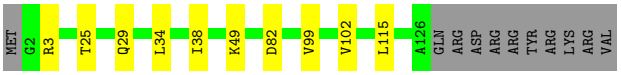
• Molecule 27: 40S ribosomal protein S16-A

Chain Q:



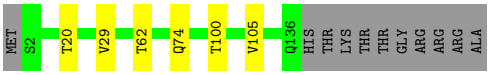
• Molecule 28: 40S ribosomal protein S17-A

Chain R:



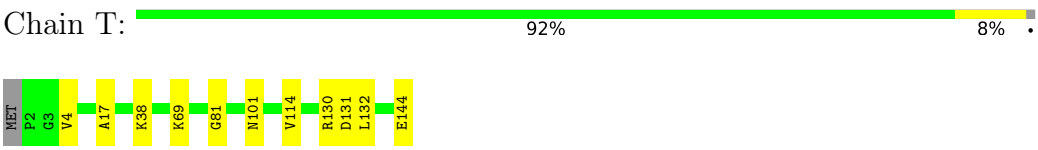
• Molecule 29: 40S ribosomal protein S18-A

Chain S:



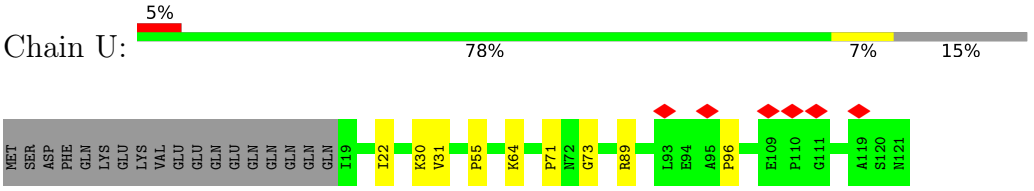
• Molecule 30: 40S ribosomal protein S19-A

Chain T:



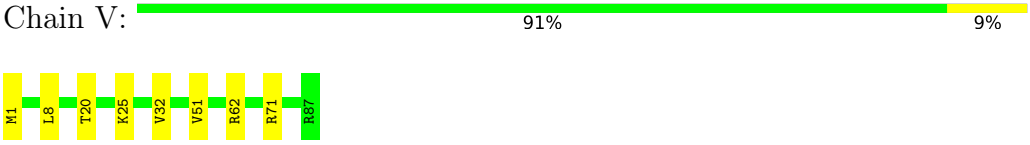
• Molecule 31: 40S ribosomal protein S20

Chain U:



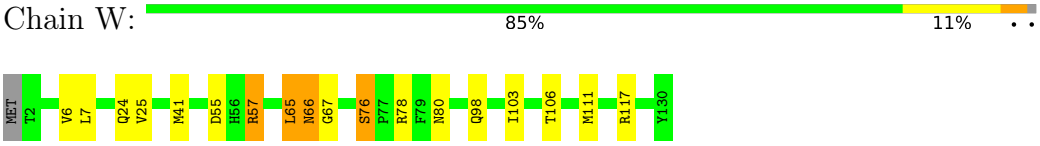
• Molecule 32: 40S ribosomal protein S21-A

Chain V:



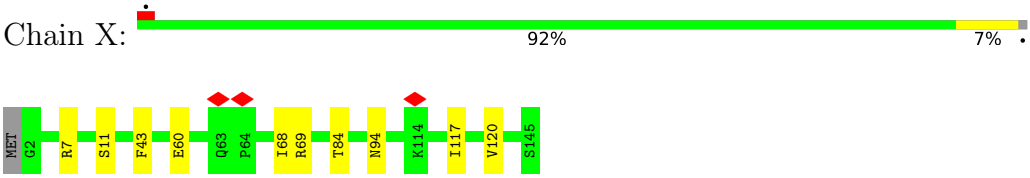
• Molecule 33: 40S ribosomal protein S22-A

Chain W:



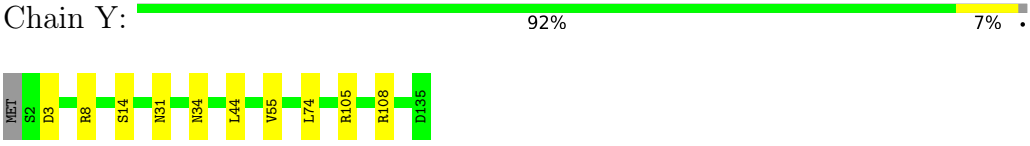
• Molecule 34: 40S ribosomal protein S23-A

Chain X:



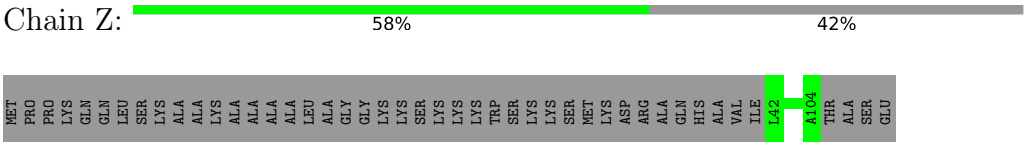
• Molecule 35: 40S ribosomal protein S24-A

Chain Y:



• Molecule 36: 40S ribosomal protein S25-A

Chain Z:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	165168	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 ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.393	Depositor
Minimum map value	-0.144	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.010	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	444.8, 444.8, 444.8	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.39, 1.39, 1.39	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	b	0.37	0/620	0.57	0/838
2	c	0.31	0/499	0.46	0/670
3	d	0.34	0/306	0.52	0/404
4	e	0.34	0/390	0.55	0/517
5	g	0.34	0/2484	0.47	0/3382
6	h	0.31	0/1462	0.49	0/1969
7	i	0.36	0/2188	0.46	0/2970
8	j	0.38	0/403	0.42	0/543
9	k	0.31	0/5528	0.48	0/7477
10	l	0.34	0/2368	0.48	0/3181
11	2	0.60	1/42303 (0.0%)	1.02	100/65912 (0.2%)
12	A	0.37	0/1653	0.56	0/2261
13	B	0.35	0/1735	0.55	0/2335
14	C	0.44	0/1665	0.60	0/2263
15	D	0.36	0/1596	0.45	0/2142
16	E	0.47	0/2109	0.60	0/2839
17	F	0.33	0/1629	0.47	0/2202
18	G	0.32	0/1897	0.47	0/2532
19	H	0.33	0/1506	0.48	0/2028
20	I	0.39	0/1514	0.54	0/2021
21	J	0.43	0/1519	0.60	0/2035
22	L	0.51	0/1155	0.56	0/1557
23	M	0.37	0/949	0.49	0/1284
24	N	0.39	0/1215	0.54	0/1638
25	O	0.32	0/937	0.52	0/1261
26	P	0.30	0/1022	0.46	0/1373
27	Q	0.34	0/1011	0.49	0/1362
28	R	0.35	0/1010	0.49	0/1355
29	S	0.33	0/1128	0.47	0/1518
30	T	0.33	0/1130	0.45	0/1517
31	U	0.35	0/829	0.49	0/1121
32	V	0.38	0/693	0.54	0/935

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	W	0.57	0/1038	0.68	2/1395 (0.1%)
34	X	0.47	0/1139	0.57	0/1518
35	Y	0.44	0/1087	0.55	0/1449
36	Z	0.34	0/519	0.46	0/696
All	All	0.49	1/90236 (0.0%)	0.81	102/130500 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	2	99	C	N1-C6	-6.38	1.33	1.37

The worst 5 of 102 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	2	1185	U	OP2-P-O3'	-10.53	82.04	105.20
11	2	1096	C	N1-C2-O2	9.85	124.81	118.90
11	2	1185	U	OP1-P-O3'	-9.38	84.56	105.20
11	2	1004	U	C2-N1-C1'	9.19	128.73	117.70
11	2	1257	U	C2-N1-C1'	8.77	128.22	117.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	b	79/82 (96%)	69 (87%)	9 (11%)	1 (1%)	12 39

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	c	61/67 (91%)	53 (87%)	7 (12%)	1 (2%)	9 34
3	d	35/56 (62%)	32 (91%)	2 (6%)	1 (3%)	4 24
4	e	44/63 (70%)	36 (82%)	7 (16%)	1 (2%)	6 28
5	g	315/319 (99%)	279 (89%)	30 (10%)	6 (2%)	8 31
6	h	179/274 (65%)	165 (92%)	12 (7%)	2 (1%)	14 44
7	i	260/483 (54%)	247 (95%)	12 (5%)	1 (0%)	34 67
8	j	44/463 (10%)	42 (96%)	2 (4%)	0	100 100
9	k	664/788 (84%)	599 (90%)	54 (8%)	11 (2%)	9 34
10	l	282/425 (66%)	253 (90%)	21 (7%)	8 (3%)	5 24
12	A	204/252 (81%)	181 (89%)	17 (8%)	6 (3%)	4 24
13	B	212/255 (83%)	184 (87%)	24 (11%)	4 (2%)	8 31
14	C	215/254 (85%)	196 (91%)	15 (7%)	4 (2%)	8 31
15	D	198/240 (82%)	182 (92%)	14 (7%)	2 (1%)	15 46
16	E	258/261 (99%)	235 (91%)	20 (8%)	3 (1%)	13 41
17	F	204/225 (91%)	184 (90%)	19 (9%)	1 (0%)	29 61
18	G	230/236 (98%)	216 (94%)	14 (6%)	0	100 100
19	H	182/190 (96%)	162 (89%)	16 (9%)	4 (2%)	6 29
20	I	184/200 (92%)	160 (87%)	19 (10%)	5 (3%)	5 26
21	J	183/197 (93%)	163 (89%)	18 (10%)	2 (1%)	14 44
22	L	138/156 (88%)	129 (94%)	9 (6%)	0	100 100
23	M	123/143 (86%)	110 (89%)	9 (7%)	4 (3%)	4 22
24	N	148/151 (98%)	137 (93%)	10 (7%)	1 (1%)	22 55
25	O	125/137 (91%)	113 (90%)	10 (8%)	2 (2%)	9 34
26	P	125/142 (88%)	116 (93%)	8 (6%)	1 (1%)	19 51
27	Q	125/143 (87%)	112 (90%)	11 (9%)	2 (2%)	9 34
28	R	123/136 (90%)	114 (93%)	9 (7%)	0	100 100
29	S	133/146 (91%)	122 (92%)	11 (8%)	0	100 100
30	T	141/144 (98%)	131 (93%)	7 (5%)	3 (2%)	7 30
31	U	101/121 (84%)	93 (92%)	4 (4%)	4 (4%)	3 18
32	V	85/87 (98%)	77 (91%)	8 (9%)	0	100 100
33	W	127/130 (98%)	110 (87%)	11 (9%)	6 (5%)	2 15

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
34	X	142/145 (98%)	128 (90%)	12 (8%)	2 (1%)	11 37
35	Y	132/135 (98%)	119 (90%)	12 (9%)	1 (1%)	19 51
36	Z	61/108 (56%)	56 (92%)	5 (8%)	0	100 100
All	All	5862/7354 (80%)	5305 (90%)	468 (8%)	89 (2%)	14 36

5 of 89 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
9	k	483	PRO
12	A	189	VAL
13	B	81	PHE
23	M	104	GLY
23	M	109	GLU

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	b	70/71 (99%)	65 (93%)	5 (7%)	14 44
2	c	56/60 (93%)	49 (88%)	7 (12%)	4 17
3	d	33/49 (67%)	32 (97%)	1 (3%)	41 68
4	e	40/54 (74%)	36 (90%)	4 (10%)	7 27
5	g	259/262 (99%)	241 (93%)	18 (7%)	15 45
6	h	158/238 (66%)	148 (94%)	10 (6%)	18 47
7	i	234/424 (55%)	224 (96%)	10 (4%)	29 59
8	j	44/419 (10%)	42 (96%)	2 (4%)	27 58
9	k	580/703 (82%)	557 (96%)	23 (4%)	31 60
10	l	260/384 (68%)	243 (94%)	17 (6%)	17 46
12	A	171/210 (81%)	158 (92%)	13 (8%)	13 41
13	B	191/224 (85%)	178 (93%)	13 (7%)	16 45
14	C	176/205 (86%)	157 (89%)	19 (11%)	6 24

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
15	D	164/195 (84%)	150 (92%)	14 (8%)	10 35
16	E	221/222 (100%)	205 (93%)	16 (7%)	14 43
17	F	173/191 (91%)	164 (95%)	9 (5%)	23 53
18	G	198/201 (98%)	178 (90%)	20 (10%)	7 27
19	H	165/170 (97%)	151 (92%)	14 (8%)	10 35
20	I	150/161 (93%)	135 (90%)	15 (10%)	7 27
21	J	158/166 (95%)	140 (89%)	18 (11%)	5 21
22	L	125/137 (91%)	113 (90%)	12 (10%)	8 29
23	M	101/119 (85%)	96 (95%)	5 (5%)	24 54
24	N	127/128 (99%)	115 (91%)	12 (9%)	8 30
25	O	91/105 (87%)	84 (92%)	7 (8%)	13 40
26	P	105/118 (89%)	99 (94%)	6 (6%)	20 50
27	Q	107/119 (90%)	101 (94%)	6 (6%)	21 51
28	R	113/124 (91%)	103 (91%)	10 (9%)	10 33
29	S	120/129 (93%)	114 (95%)	6 (5%)	24 54
30	T	115/116 (99%)	107 (93%)	8 (7%)	15 44
31	U	96/114 (84%)	91 (95%)	5 (5%)	23 53
32	V	74/74 (100%)	66 (89%)	8 (11%)	6 24
33	W	110/111 (99%)	96 (87%)	14 (13%)	4 16
34	X	119/120 (99%)	111 (93%)	8 (7%)	16 46
35	Y	112/113 (99%)	103 (92%)	9 (8%)	12 38
36	Z	56/89 (63%)	56 (100%)	0	100 100
All	All	5072/6325 (80%)	4708 (93%)	364 (7%)	18 43

5 of 364 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
21	J	7	THR
26	P	79	HIS
21	J	81	VAL
23	M	45	LEU
28	R	38	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 74 such sidechains are listed below:

Mol	Chain	Res	Type
26	P	128	HIS
34	X	99	ASN
28	R	123	ASN
30	T	138	GLN
13	B	211	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	2	1770/1800 (98%)	632 (35%)	20 (1%)

5 of 632 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	2	4	C
11	2	17	C
11	2	25	C
11	2	26	A
11	2	34	G

5 of 20 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
11	2	1458	G
11	2	1573	A
11	2	1652	C
11	2	1631	A
11	2	779	U

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 48 ligands modelled in this entry, 48 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 (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
11	2	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	2	1377:U	O3'	1378:U	P	3.76
1	2	902:G	O3'	903:U	P	3.04

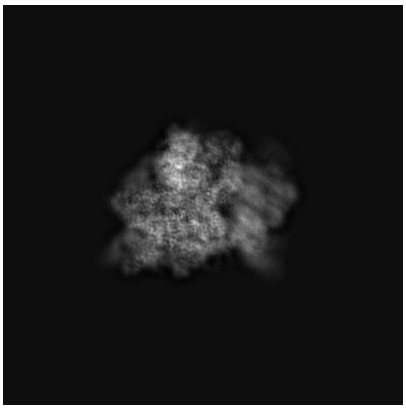
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-4214. These allow visual inspection of the internal detail of the map and identification of artifacts.

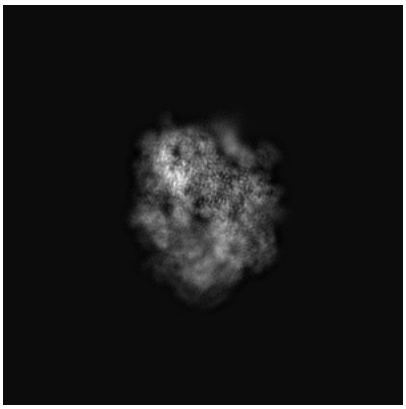
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

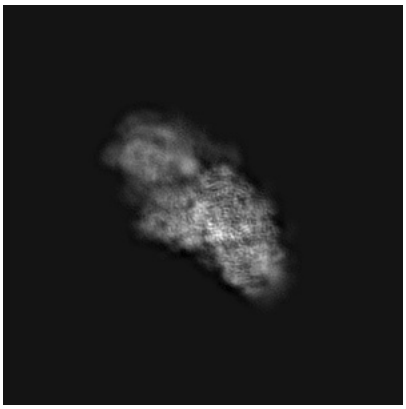
6.1.1 Primary map



X

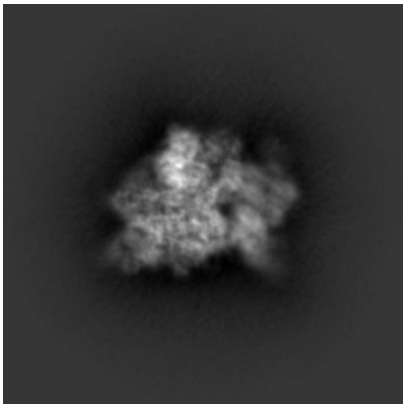


Y

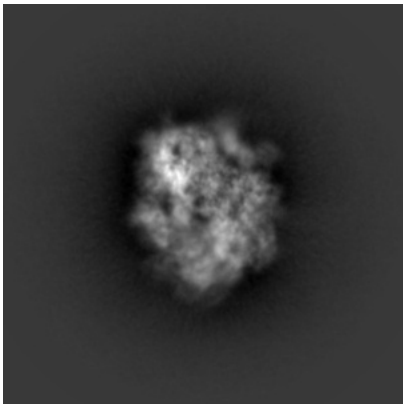


Z

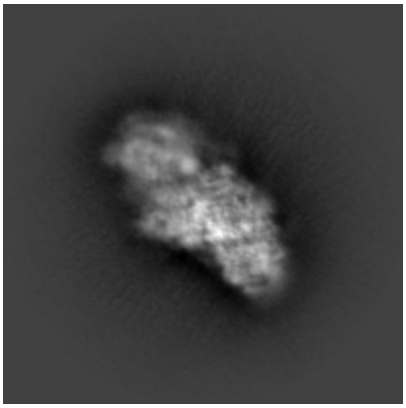
6.1.2 Raw map



X



Y

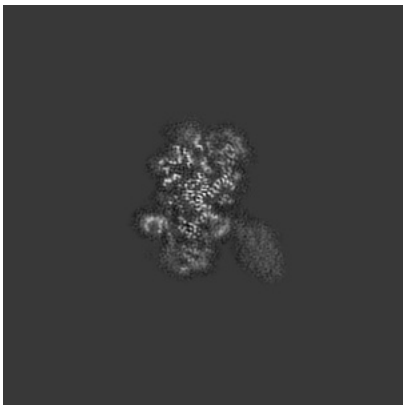


Z

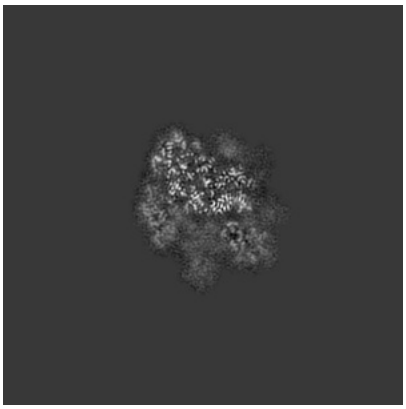
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

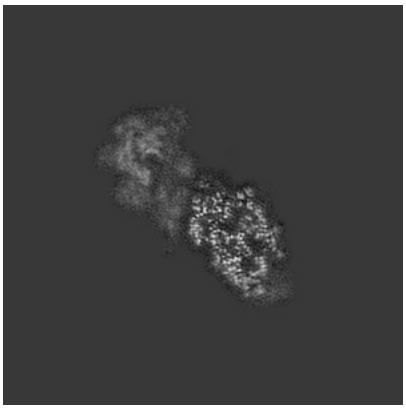
6.2.1 Primary map



X Index: 160

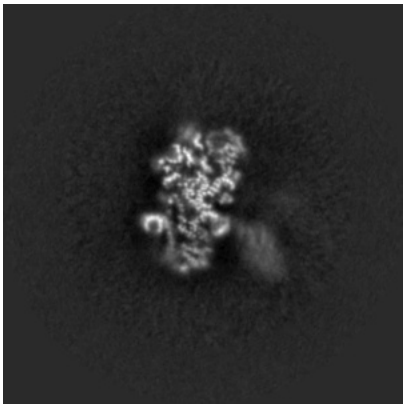


Y Index: 160

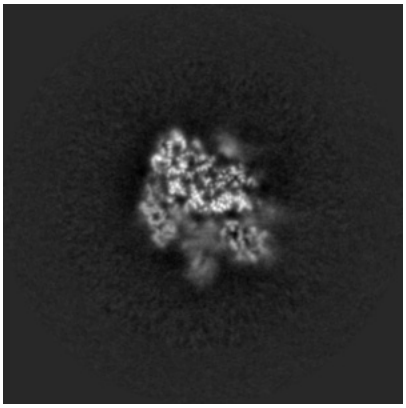


Z Index: 160

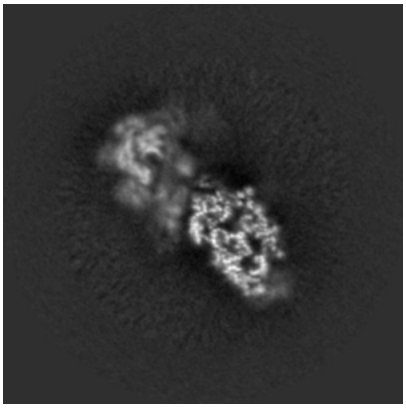
6.2.2 Raw map



X Index: 160



Y Index: 160

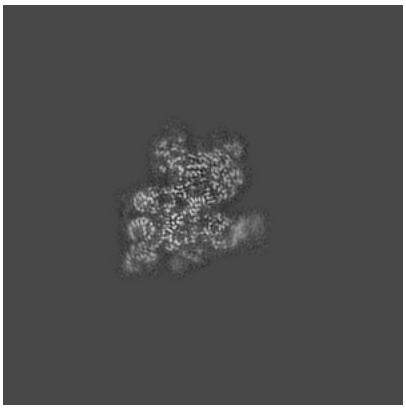


Z Index: 160

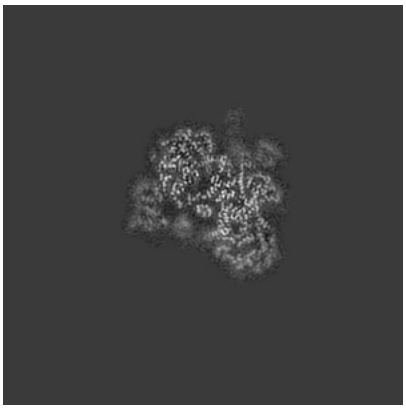
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

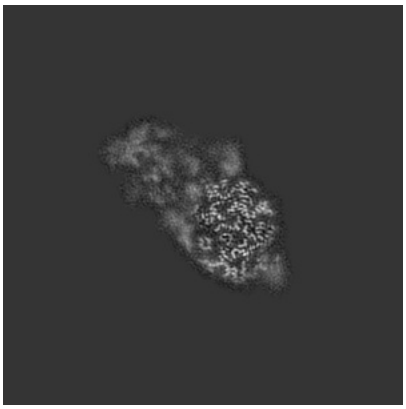
6.3.1 Primary map



X Index: 178

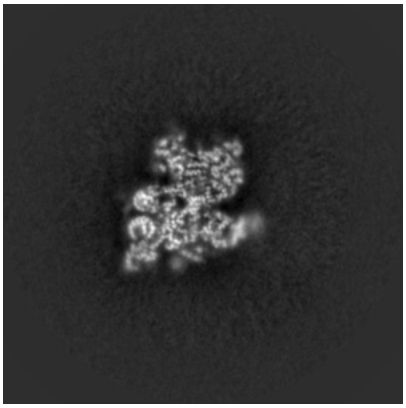


Y Index: 141

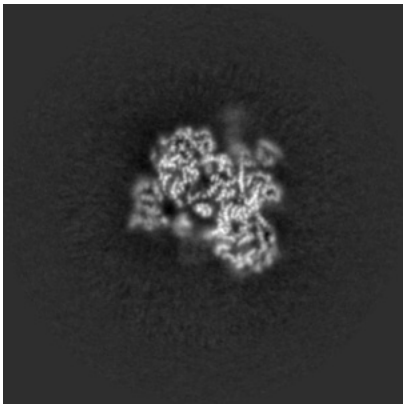


Z Index: 144

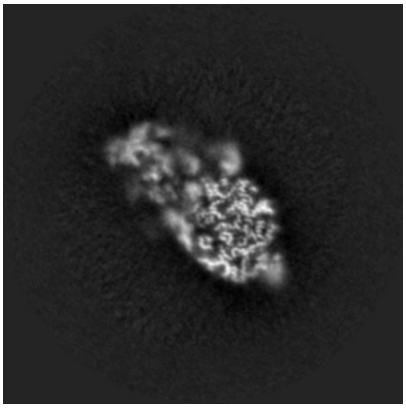
6.3.2 Raw map



X Index: 178



Y Index: 141

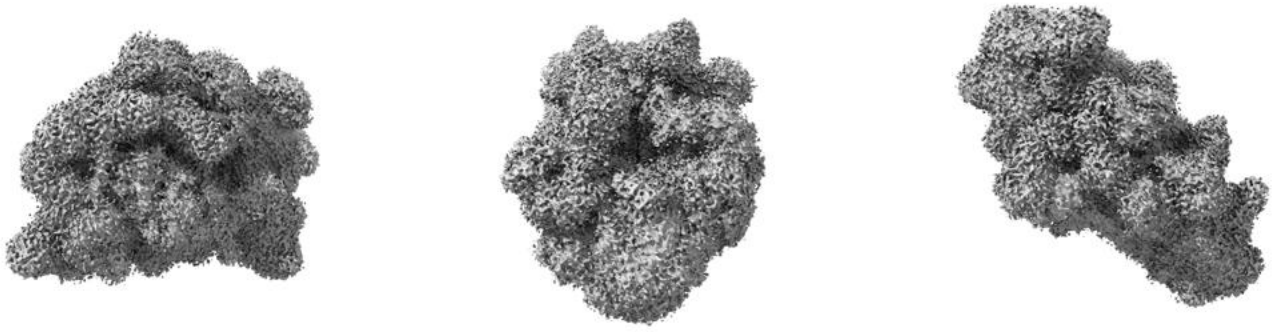


Z Index: 144

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

6.4 Orthogonal surface views (i)

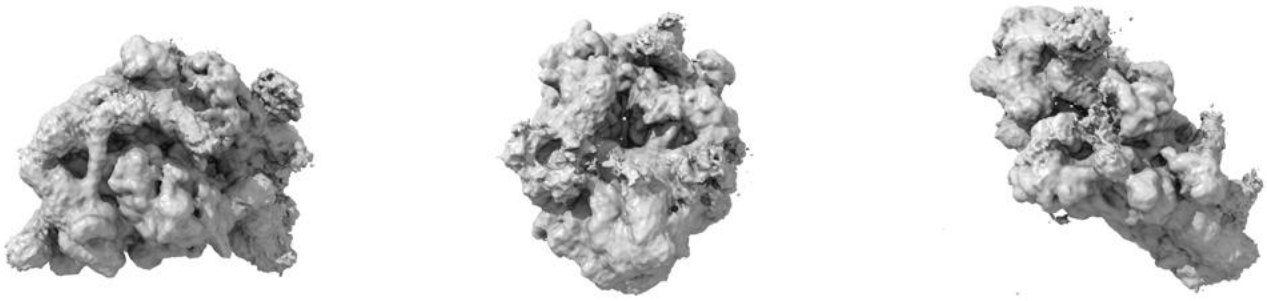
6.4.1 Primary map



X Y Z

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

6.4.2 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.

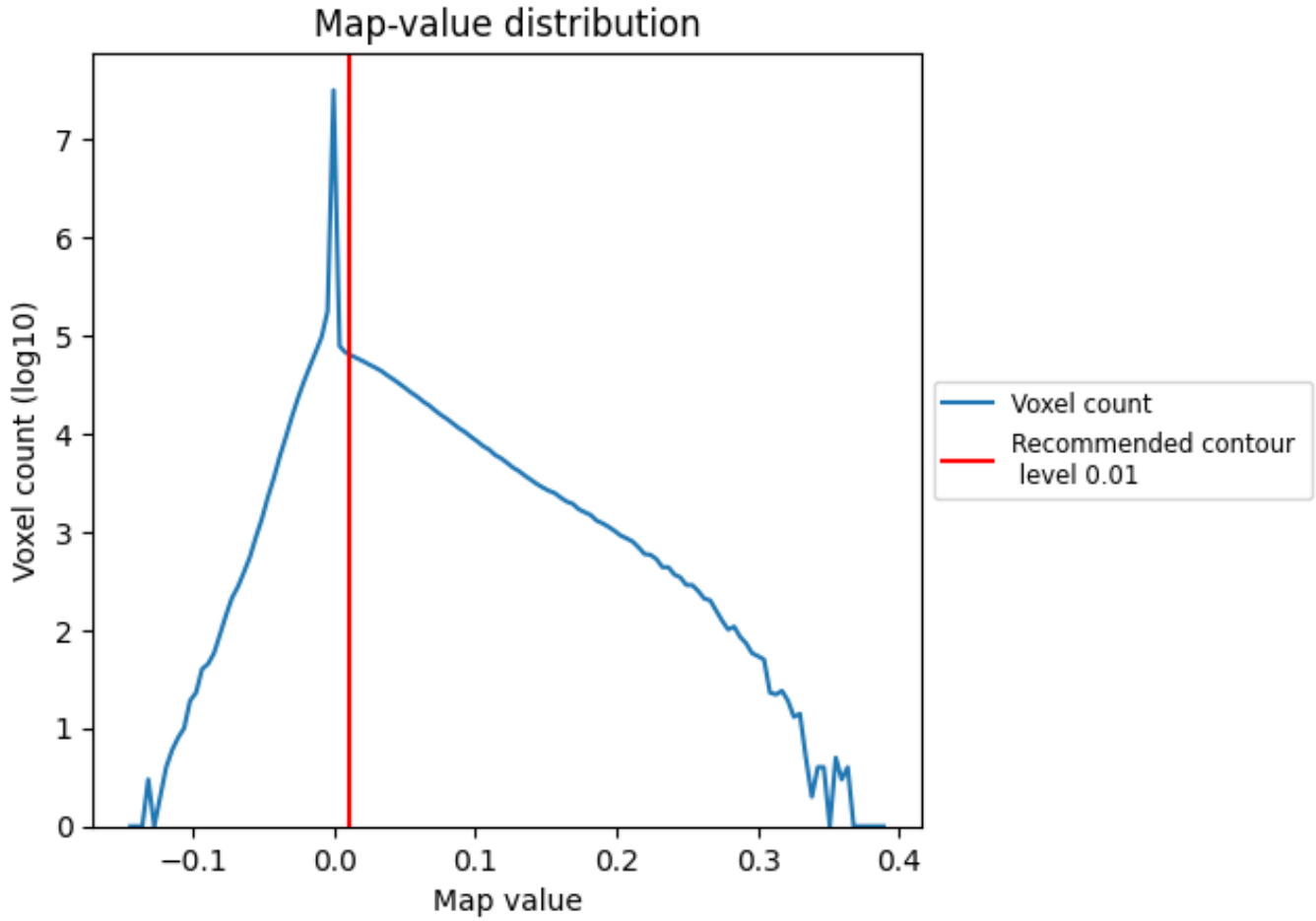
6.5 Mask visualisation (i)

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

7 Map analysis

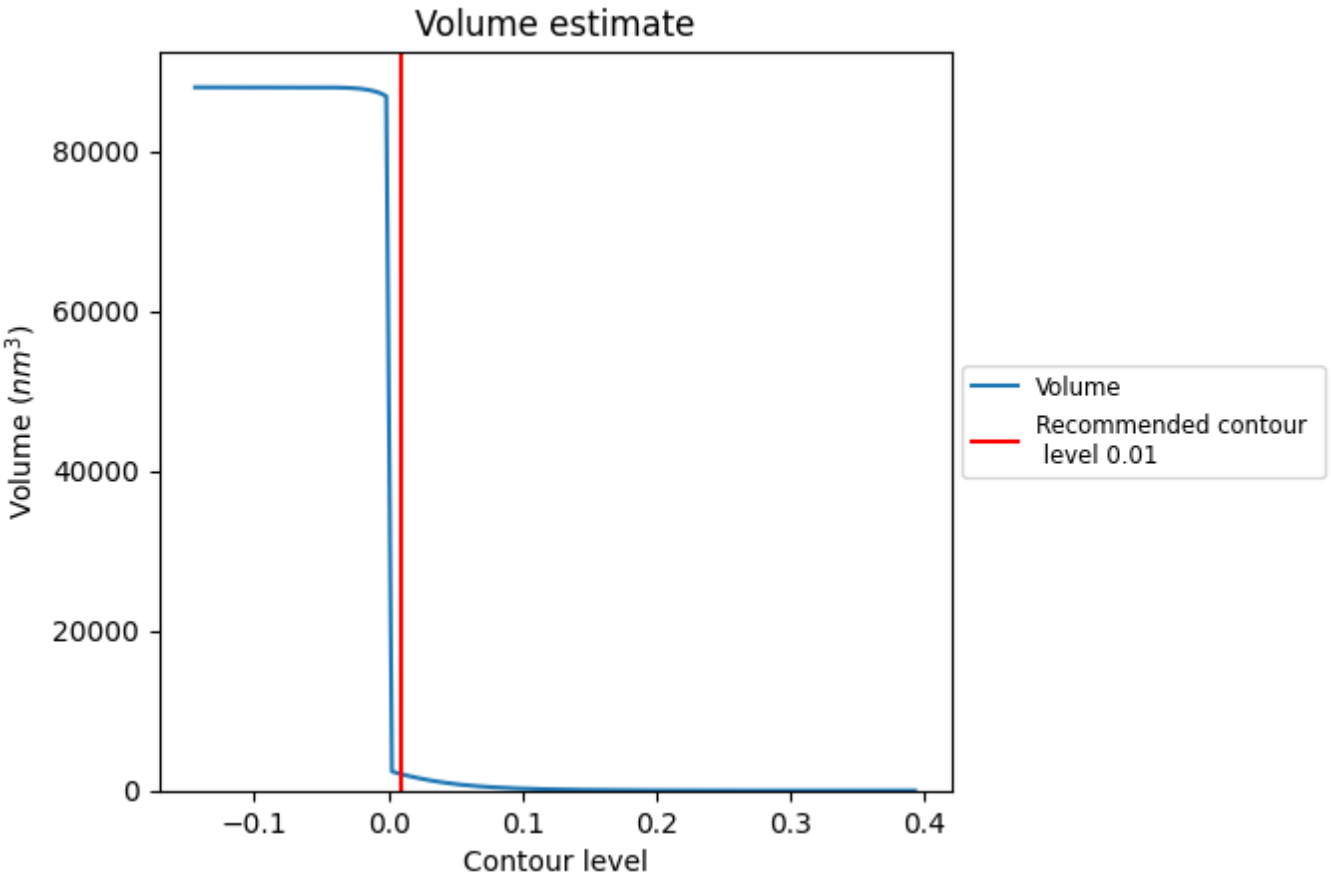
This section contains the results of statistical analysis of the map.

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.

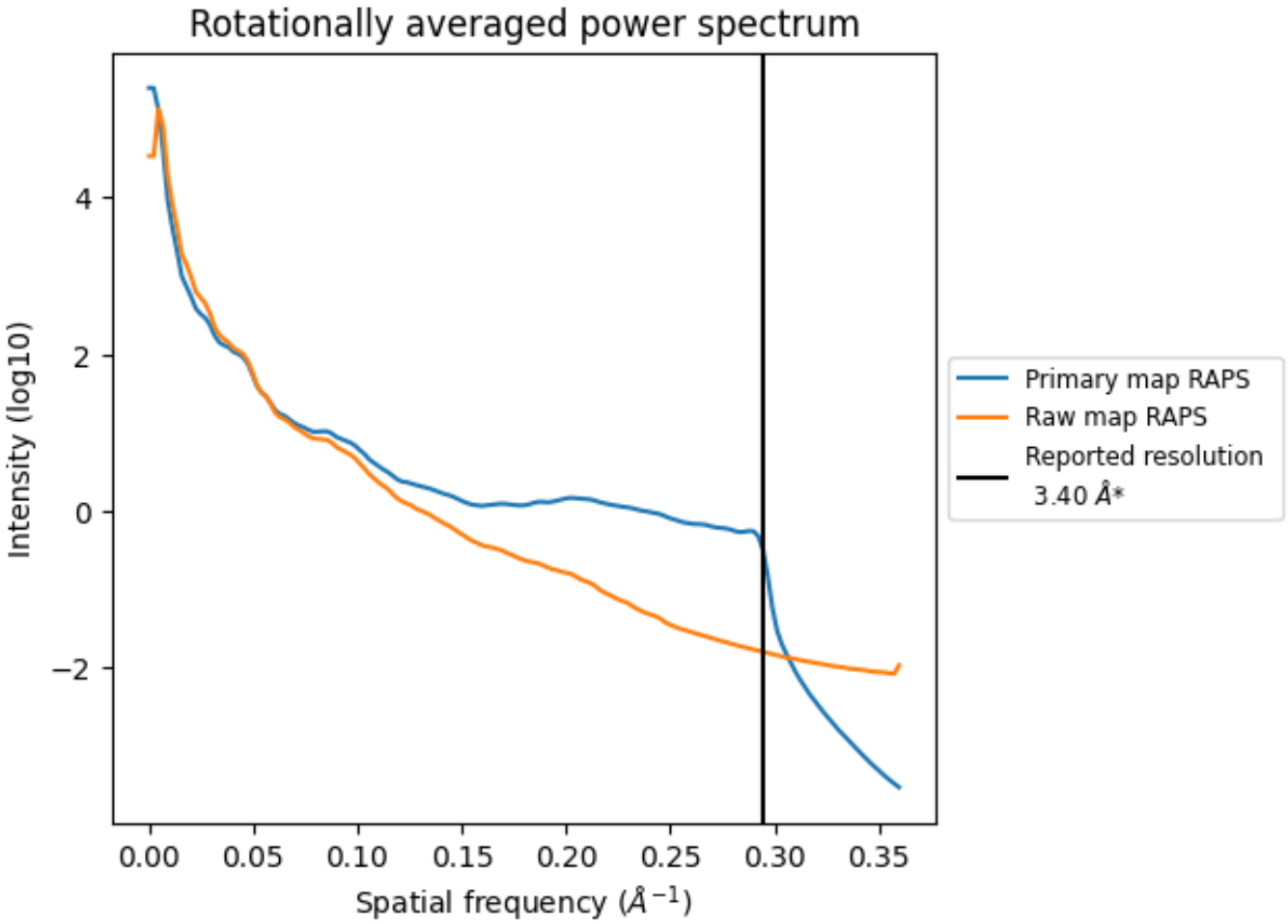
7.2 Volume estimate (i)



The volume at the recommended contour level is 2041 nm^3; this corresponds to an approximate mass of 1844 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 (i)

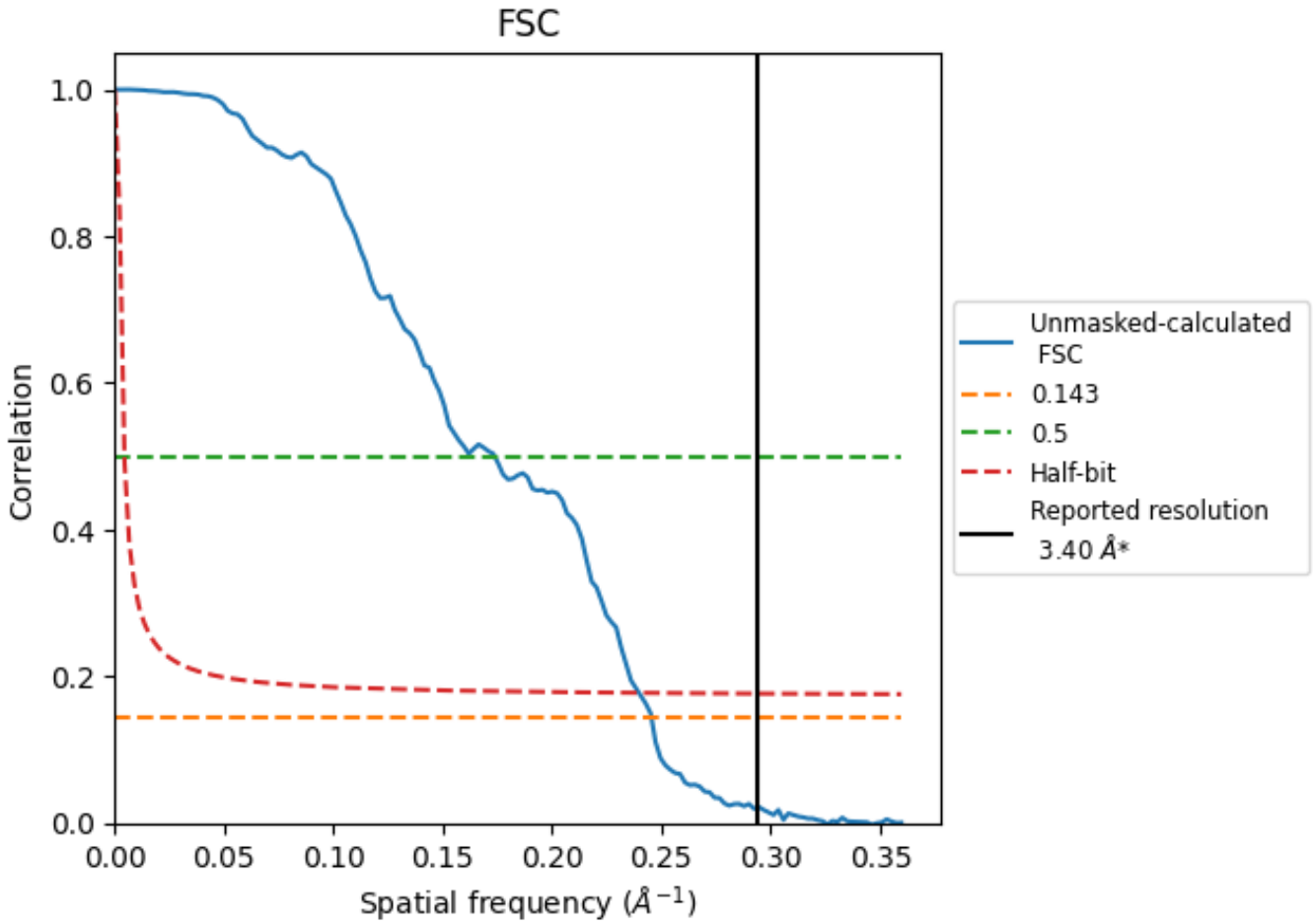


*Reported resolution corresponds to spatial frequency of 0.294 Å^{-1}

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 0.294 Å^{-1}

8.2 Resolution estimates (i)

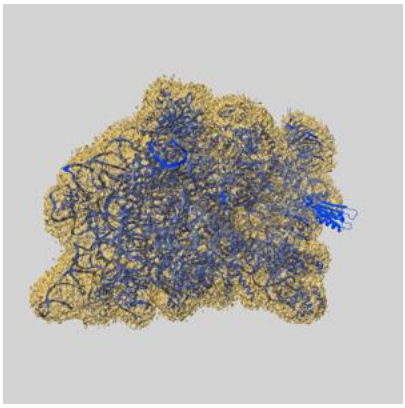
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.07	5.76	4.17

*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 4.07 differs from the reported value 3.4 by more than 10 %

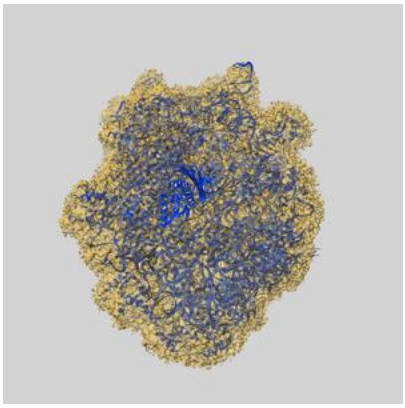
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-4214 and PDB model 6FAI. Per-residue inclusion information can be found in section 3 on page 11.

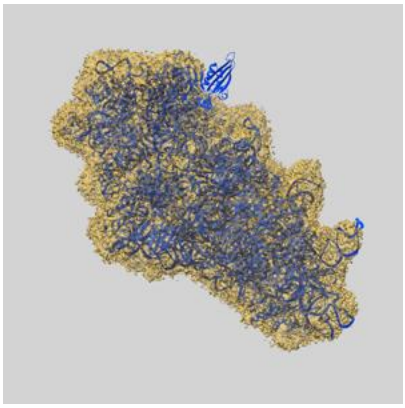
9.1 Map-model overlay



X



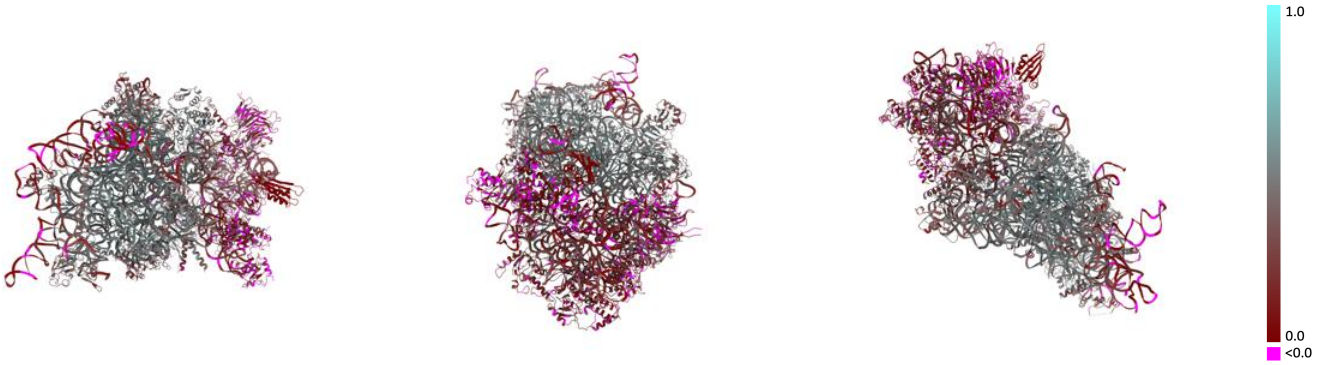
Y



Z

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

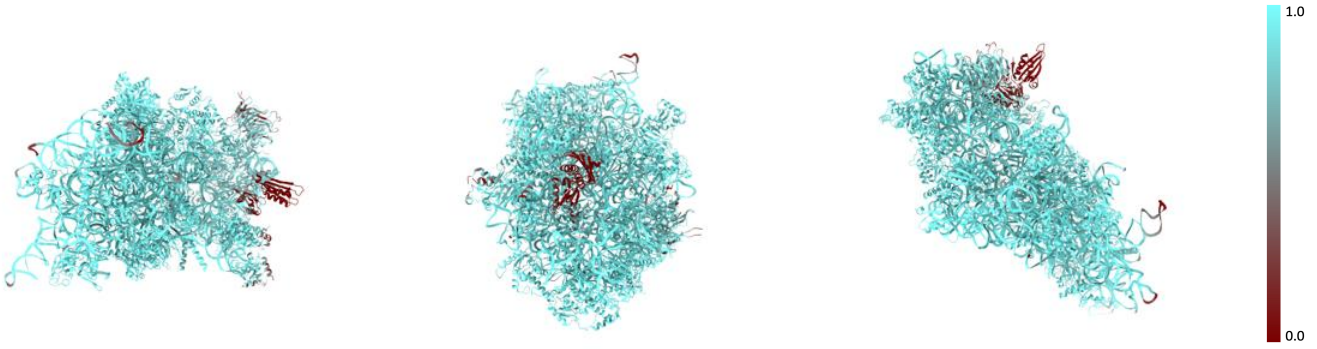
9.2 Q-score mapped to coordinate model



X Y Z

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

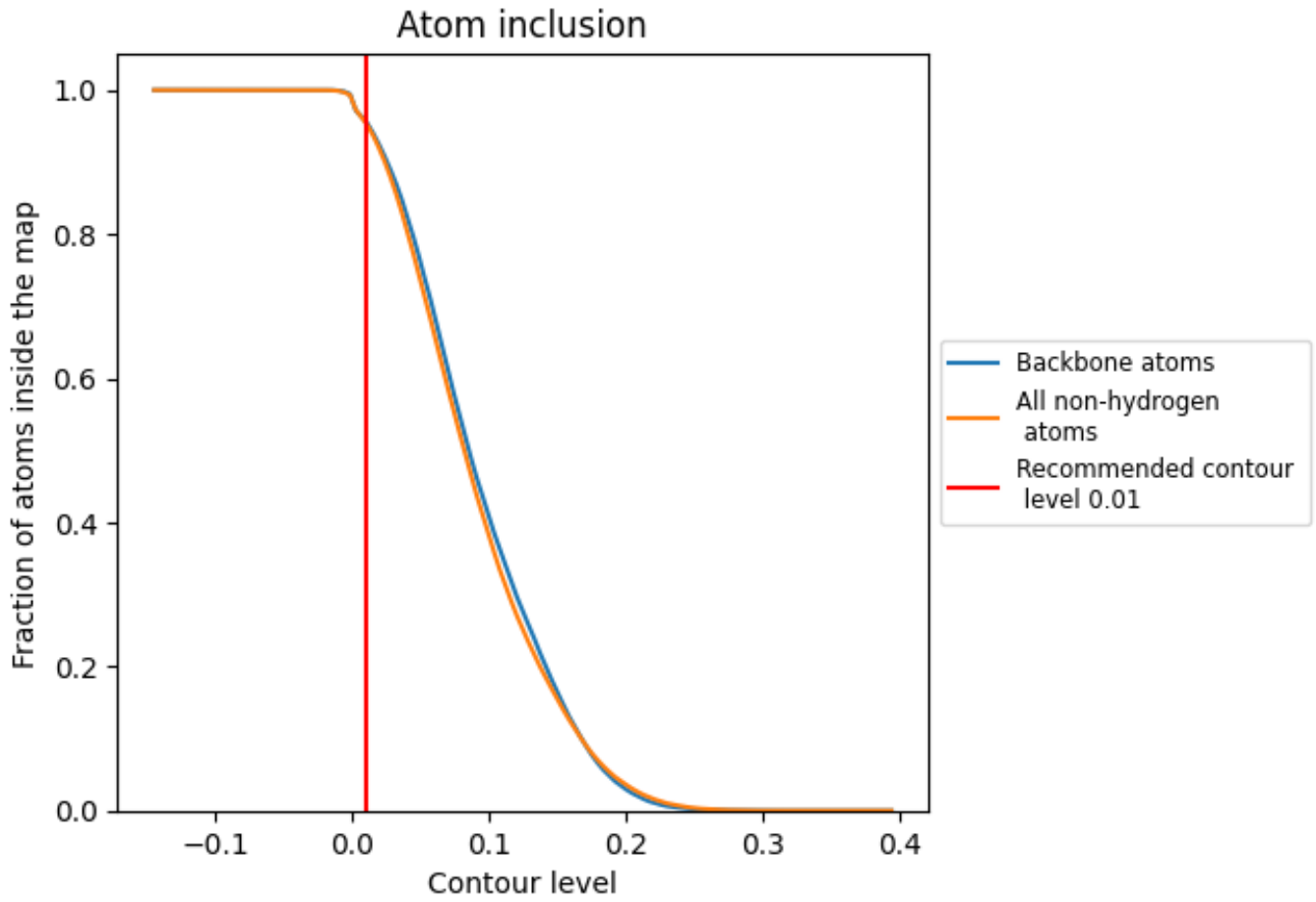
9.3 Atom inclusion mapped to coordinate model



X Y Z

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

9.4 Atom inclusion (i)



At the recommended contour level, 96% of all backbone atoms, 95% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9545	0.3280
2	0.9855	0.3450
A	0.9936	0.4650
B	0.9869	0.4070
C	0.9913	0.4910
D	0.1163	0.0110
E	0.9906	0.5140
F	0.9809	0.1790
G	0.9934	0.4050
H	0.9883	0.3830
I	0.9937	0.4530
J	0.9896	0.4900
L	0.9954	0.5100
M	0.7853	0.0600
N	0.9861	0.4620
O	0.9922	0.3990
P	0.9732	0.2270
Q	0.9774	0.1420
R	0.9753	0.2020
S	0.9824	0.1630
T	0.9898	0.1610
U	0.7998	0.0910
V	0.9925	0.4870
W	0.9940	0.5380
X	0.9653	0.4560
Y	0.9923	0.4780
Z	0.9677	0.1420
b	0.9917	0.4760
c	0.9727	0.1660
d	0.8288	0.0570
e	0.9592	0.3900
g	0.7238	0.0850
h	0.9815	0.3650
i	0.9612	0.0920
j	0.6564	0.0400

Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
k	0.9779	0.3780
l	0.9550	0.1840