wwPDB EM Validation Summary Report

Mar 13, 2024 – 01:57 PM JST

PDB ID	:	3J8G
EMDB ID	:	EMD-6149
Title	:	Electron cryo-microscopy structure of EngA bound with the 50S ribosomal subunit
Authors	:	Zhang, X.; Yan, K.; Zhang, Y.; Li, N.; Ma, C.; Li, Z.; Zhang, Y.; Feng, B.; Liu, J.; Sun, Y.; Xu, Y.; Lei, J.; Gao, N.
Deposited on	:	2014-10-24
Resolution	:	5.00 Å(reported)
Based on initial models	:	2HJG, 2WWQ

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

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

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

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

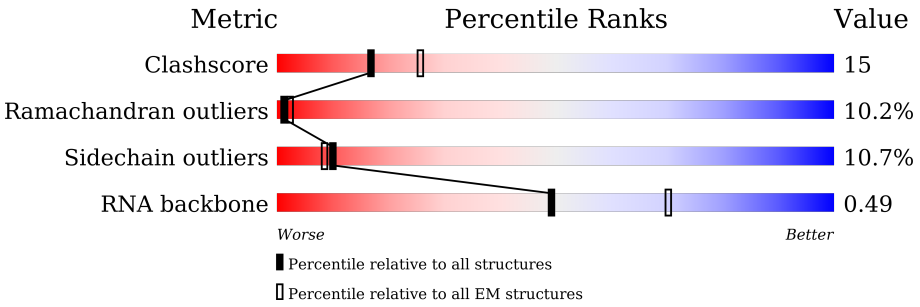
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 5.00 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)
Clashscore	158937	4297
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	A	117	6% 13% 42% 44% ·
2	B	2903	9% 11% 38% 50% ·
3	0	78	51% 58% 23% 15% · ·
4	K	123	18% 56% 33% 7% · ·
5	L	144	47% 57% 22% 16% · ·
6	1	63	48% 68% 24% 5% ·
7	M	136	14% 54% 34% 12%

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Mol	Chain	Length	Quality of chain
8	N	127	23% 53% 33% 6% 6%
9	O	117	39% 59% 27% 9%
10	P	115	32% 48% 31% 17%
11	Q	118	42% 52% 25% 19%
12	R	103	45% 47% 39% 13%
13	S	110	45% 53% 39% 6%
14	D	209	24% 53% 34% 9%
15	T	100	30% 46% 29% 15% 7%
16	2	59	46% 46% 46% 7%
17	U	104	51% 60% 28% 7% 5%
18	W	94	24% 60% 32% 6%
19	X	490	51% 48% 29% 5% 15%
20	E	201	49% 52% 32% 12%
21	Y	85	42% 35% 39% 14% 5% 7%
22	3	57	28% 49% 32% 14%
23	5	234	77% 59% 30% 8%
24	6	46	26% 46% 41% 13%
25	7	65	48% 49% 32% 14%
26	8	38	18% 47% 42% 8%
27	C	273	23% 50% 33% 13%
28	F	179	45% 47% 38% 13%
29	G	177	20% 53% 34% 8%
30	H	149	85% 65% 27% 7%
31	I	142	94% 71% 23%
32	J	142	38% 49% 34% 13%

2 Entry composition (i)

There are 32 unique types of molecules in this entry. The entry contains 94855 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 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	115	2455	1097	451	795	112	0	0

- Molecule 2 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	2874	61689	27523	11353	19941	2872	0	0

- Molecule 3 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	0	77	625	388	129	106	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	K	121	931	582	179	164	6	0	0

- Molecule 5 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	L	143	1045	649	206	189	1	0	0

- Molecule 6 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	1	63	509	313	99	95	2	0	0

- Molecule 7 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	M	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 8 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	N	120	Total	C	N	O	S	0	0
			960	593	196	166	5		

- Molecule 9 is a protein called 50S ribosomal protein L18.

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

- Molecule 10 is a protein called 50S ribosomal protein L19.

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

- Molecule 11 is a protein called 50S ribosomal protein L20.

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

- Molecule 12 is a protein called 50S ribosomal protein L21.

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

- Molecule 13 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	S	110	Total	C	N	O	S	0	0
			857	532	166	156	3		

- Molecule 14 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	D	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 15 is a protein called 50S ribosomal protein L23.

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

- Molecule 16 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	2	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 17 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	U	99	Total	C	N	O	0	0
			755	479	140	136		

- Molecule 18 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	W	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 19 is a protein called GTPase Der.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	X	418	Total	C	N	O	S	0	0
			3280	2074	582	610	14		

- Molecule 20 is a protein called 50S ribosomal protein L4.

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

- Molecule 21 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Y	79	Total	C	N	O	S	0	0
			596	367	120	108	1		

- Molecule 22 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	3	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 23 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	5	234	Total	C	N	O	S	0	0
			1733	1081	315	330	7		

- Molecule 24 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	6	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 25 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	7	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 26 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	8	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

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

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

- Molecule 28 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	F	178	Total	C	N	O	S	0	0
			1420	905	251	258	6		

- Molecule 29 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	G	175	Total	C	N	O	S	0	0
			1316	827	242	245	2		

- Molecule 30 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	H	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 31 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	I	141	Total	C	N	O	S	0	0
			1032	651	179	196	6		

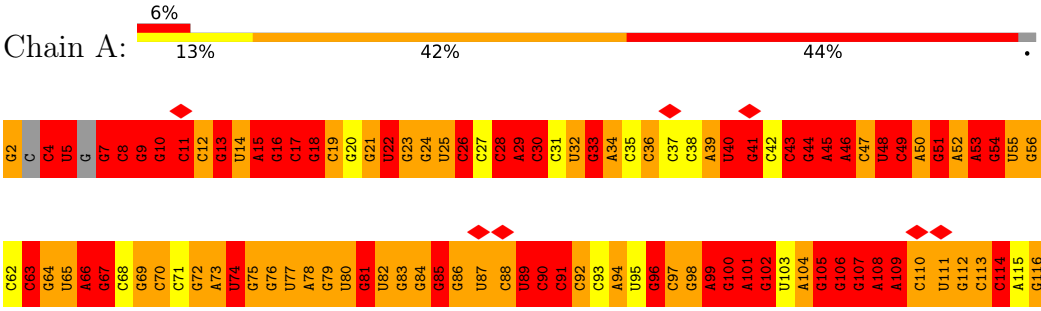
- Molecule 32 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	J	142	Total	C	N	O	S	0	0
			1129	714	212	199	4		

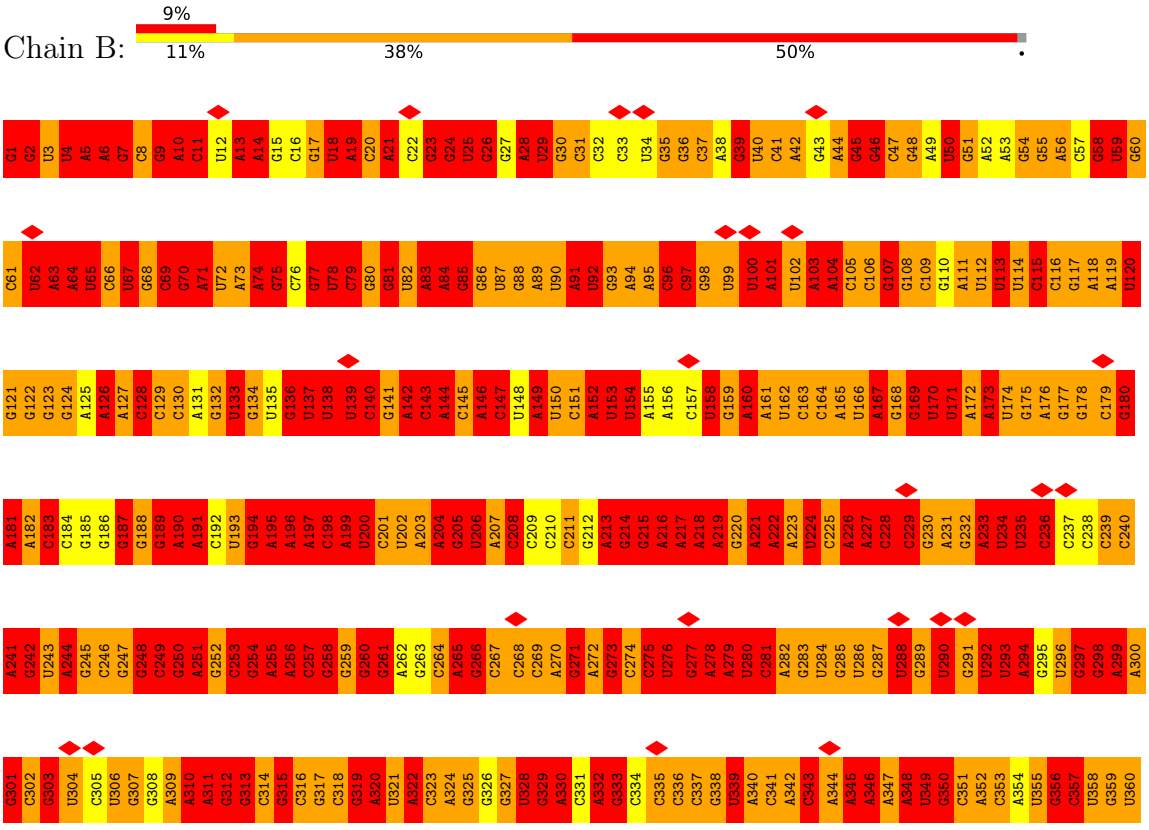
3 Residue-property plots (i)

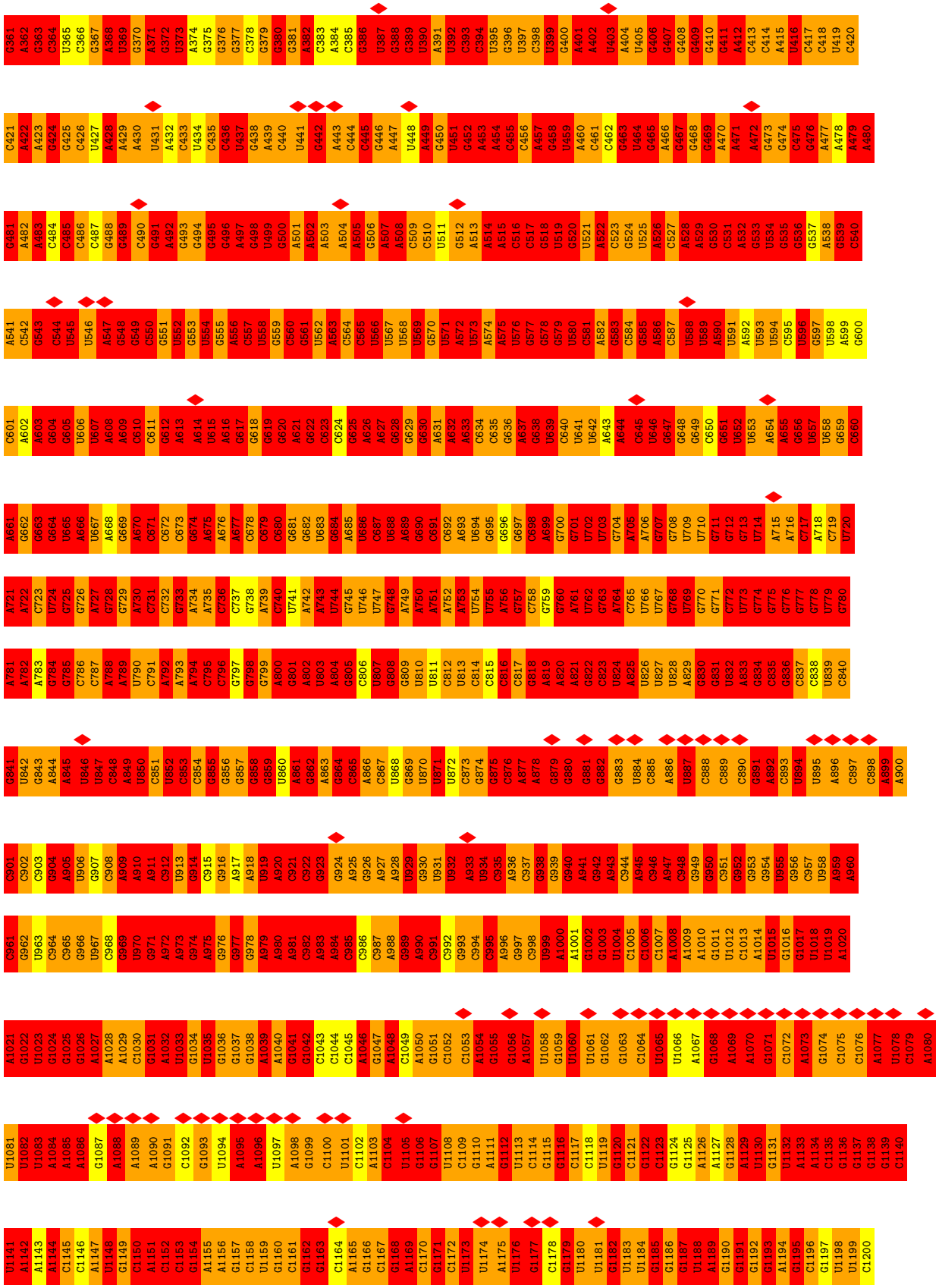
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 5S rRNA



• Molecule 2: 23S rRNA



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C1261 A1262 U1263 A1264 A1265 G1266 U1267 A1268 A1269 C1270 G1271 A1272 U1273 A1274 A1275 A1276 G1277 C1278 G1279 G1280 G1281 U1282 G1283 A1284 A1285 A1286 A1287 G1288 C1289 C1290 C1291 G1292 C1293 U1294 C1295 G1296 C1297 C1298 G1299 G1300 A1301 A1302 G1303 A1304 C1305 C1306 A1307 A1308 G1309 G1310 G1311 U1312 U1313 C1314 C1315 U1316 G1317 U1318 C1319 C1320
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G1501 A1502 A1503 A1504 A1505 U1506 C1507 A1508 A1509 G1510 G1511 C1512 U1513 G1514 A1515 G1516 G1517 C1518 G1519 U1520 G1521 A1522 U1523 G1524 A1525 C1526 G1527 A1528 G1529 G1530 C1531 A1532 C1533 U1534 A1535 C1536 G1537 G1538 U1539 G1540 C1541 U1542 G1543 A1544 A1545 G1546 C1547 A1548 A1549 C1550 A1551 A1552 A1553 U1554 G1555 C1556 C1557 C1558 U1559 G1560
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G1681 G1682 U1683 G1684 C1685 C1686 G1687 U1688 A1689 A1690 C1691 U1692 U1693 C1694 G1695 G1696 G1697 A1698 G1699 A1700 A1701 G1702 G1703 C1704 A1705 C1706 G1707 C1708 U1709 G1710 A1711 U1712 A1713 U1714 G1715 U1716 A1717 G1718 G1719 U1720 G1721 A1722 G1723 G1724 U1725 C1726 C1727 C1728 U1729 C1730 G1731 C1732 G1733 G1734 A1735 U1736 G1737 G1738 A1739 C1740
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G G G U U A G C C A A G G C G A A G C C U C U U G A1885 U1886 C1887 G1888 A1889 A1890 G1891 C1892 C1893 C1894 C1895 G1896 G1897 U1898 A1899 A1900 A1901 C1902 G1903 G1904 C1905 G1906 G1907 C1908 C1909 G1910 U1911 A1912 A1913 C1914 U1915 A1916 U1917 A1918 A1919 C1920
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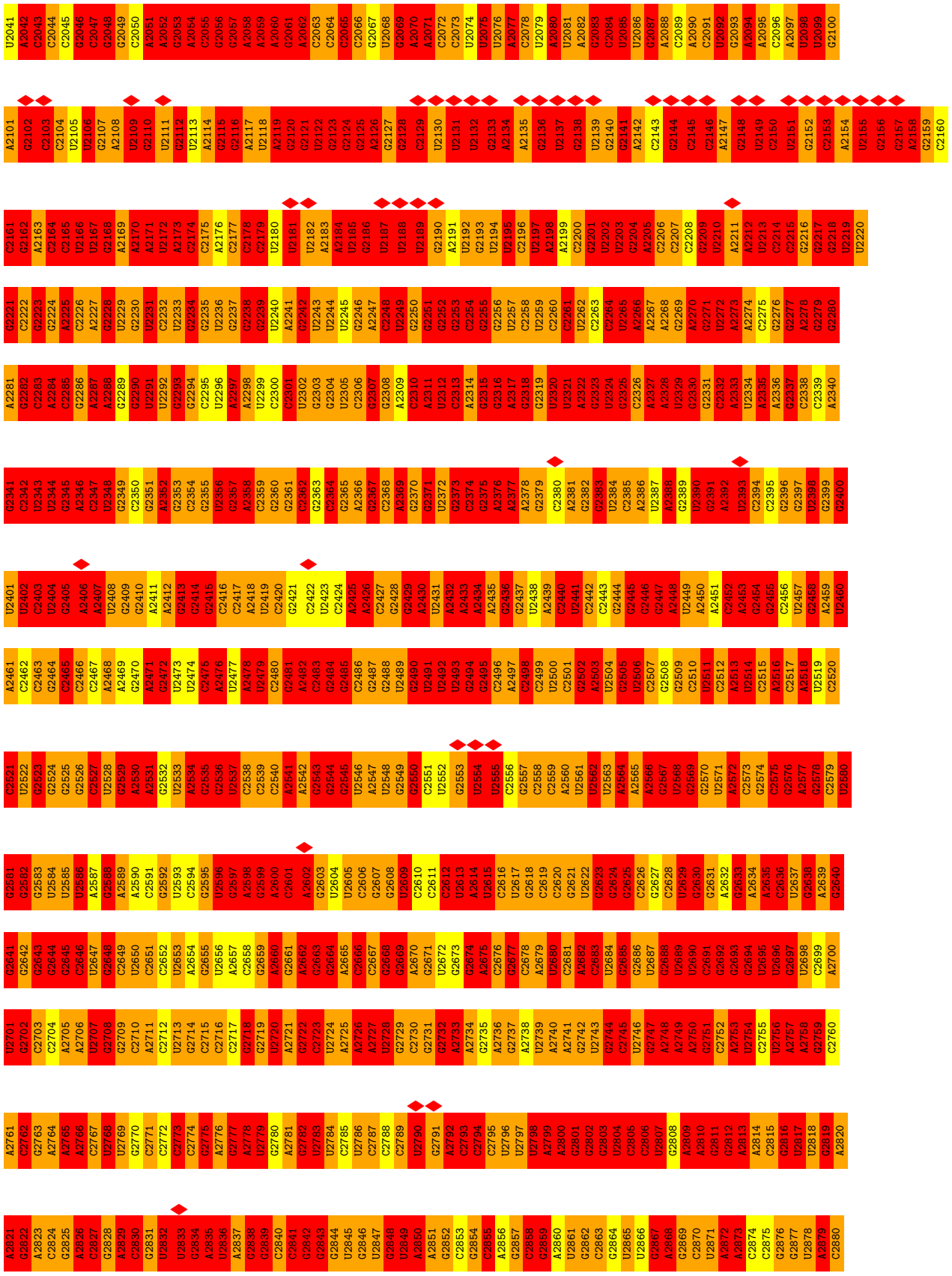
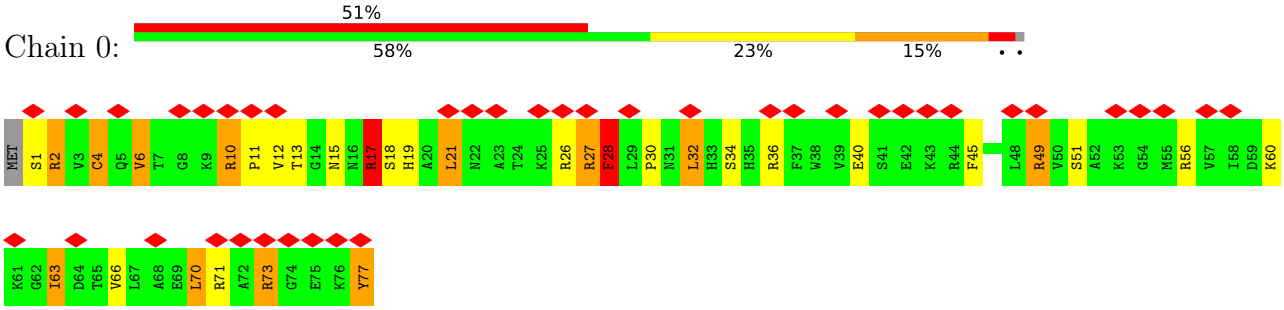
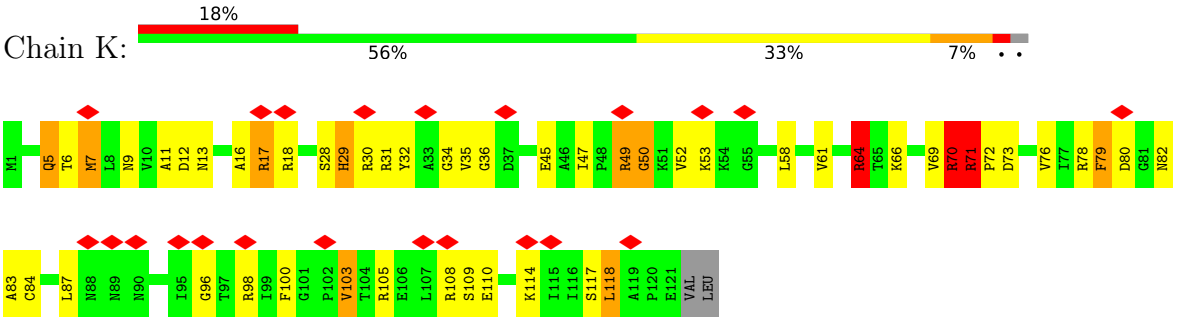


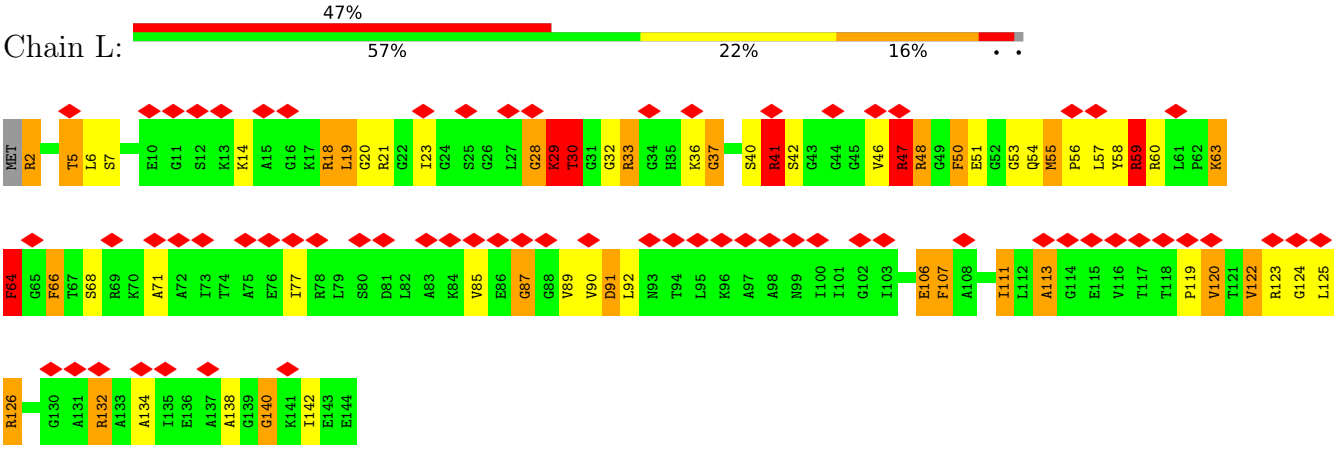
• Molecule 3: 50S ribosomal protein L28



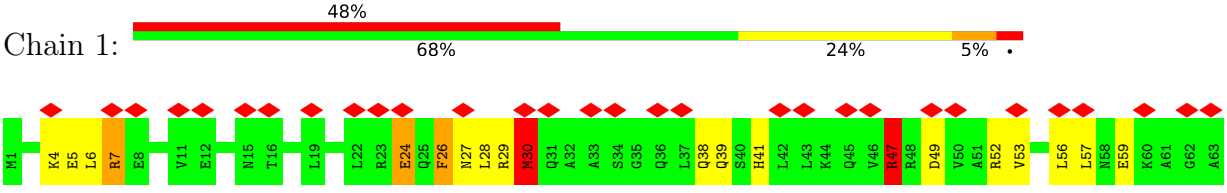
• Molecule 4: 50S ribosomal protein L14



• Molecule 5: 50S ribosomal protein L15

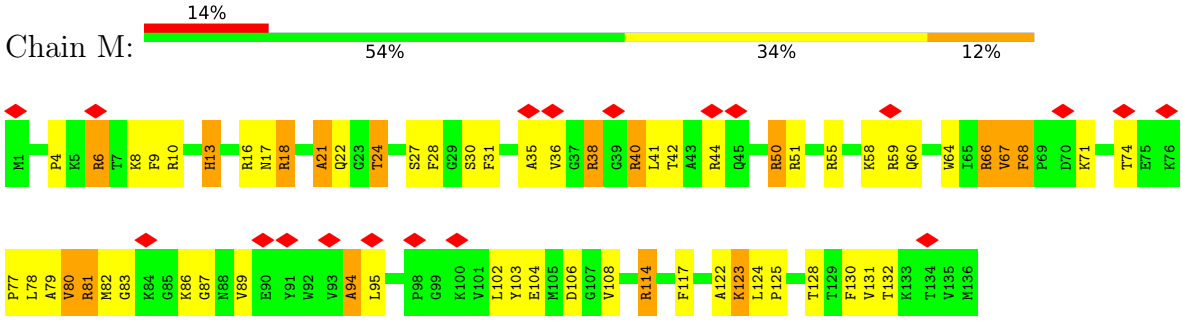


• Molecule 6: 50S ribosomal protein L29



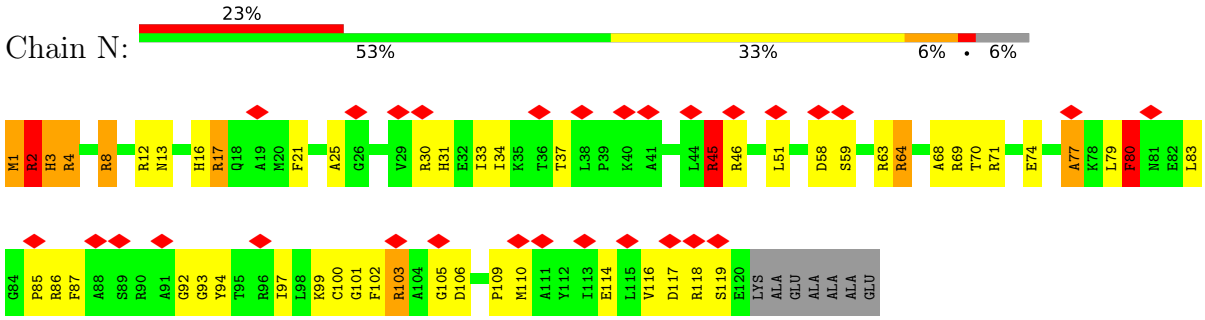
• Molecule 7: 50S ribosomal protein L16

Chain M:



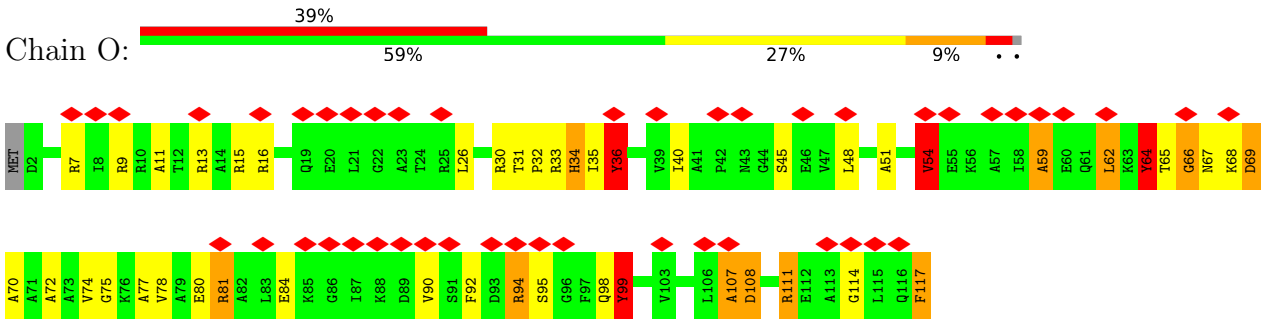
• Molecule 8: 50S ribosomal protein L17

Chain N:



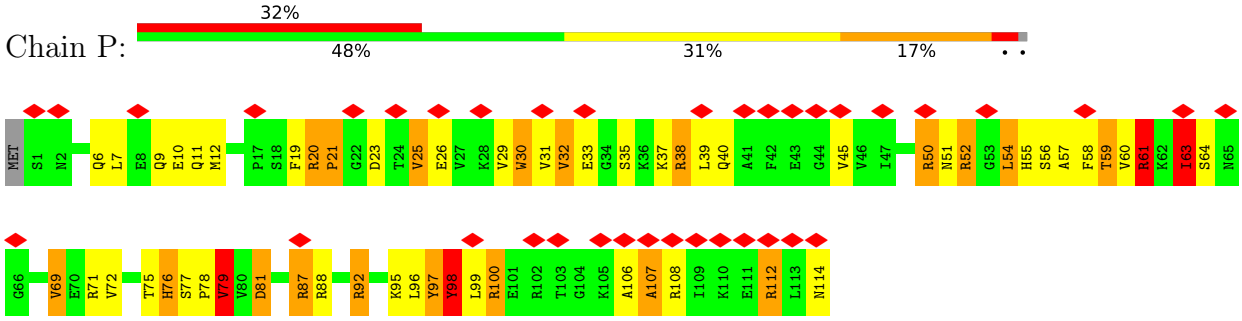
• Molecule 9: 50S ribosomal protein L18

Chain O:



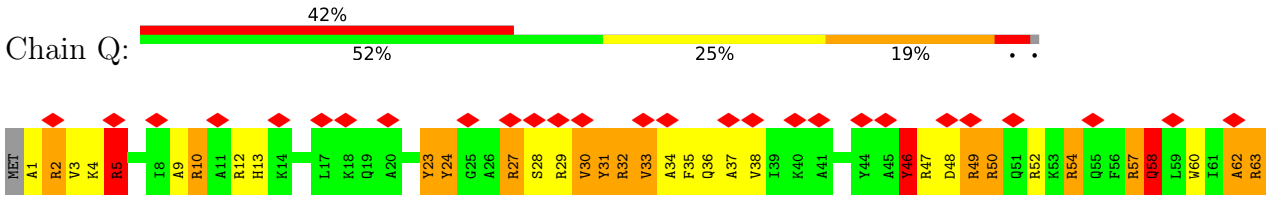
• Molecule 10: 50S ribosomal protein L19

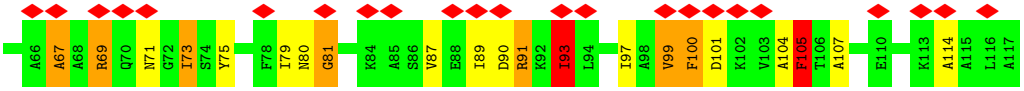
Chain P:



• Molecule 11: 50S ribosomal protein L20

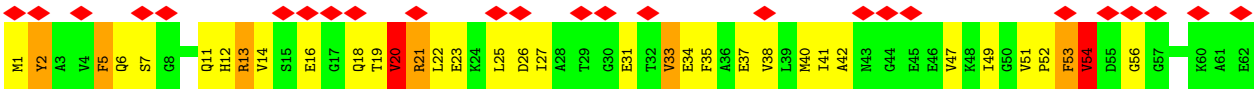
Chain Q:

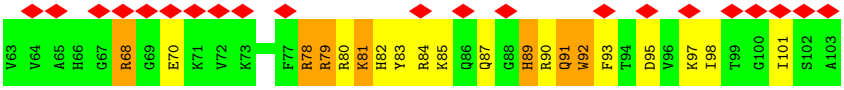




• Molecule 12: 50S ribosomal protein L21

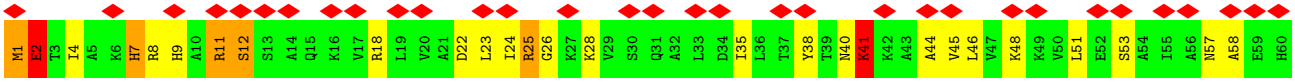
Chain R:

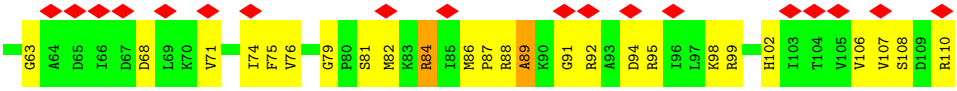




• Molecule 13: 50S ribosomal protein L22

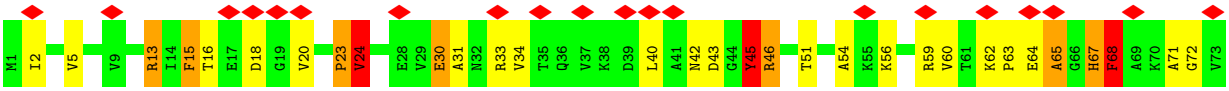
Chain S:

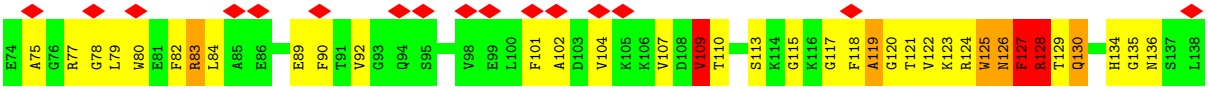


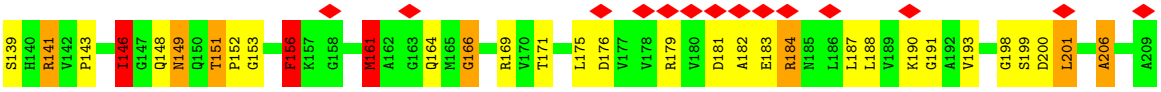


• Molecule 14: 50S ribosomal protein L3

Chain D:

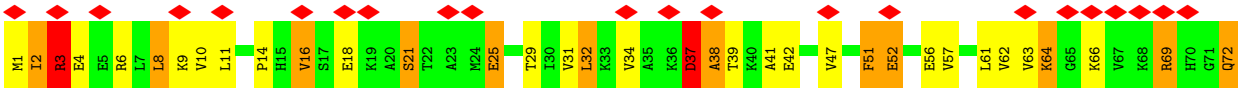


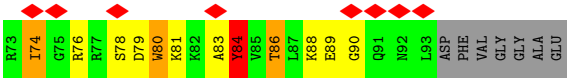




• Molecule 15: 50S ribosomal protein L23

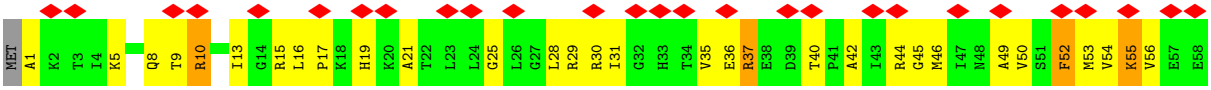
Chain T:





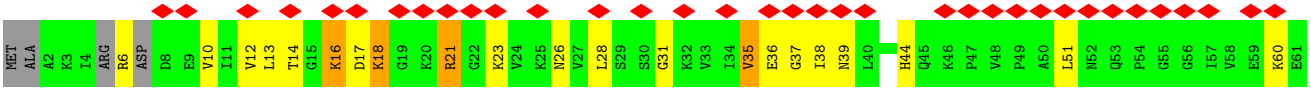
- Molecule 16: 50S ribosomal protein L30

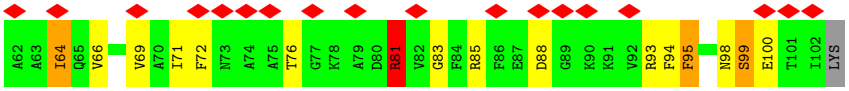
Chain 2:



- Molecule 17: 50S ribosomal protein L24

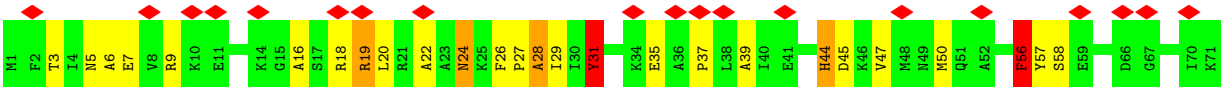
Chain U:

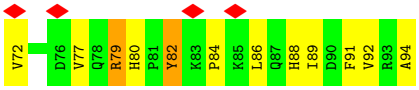




- Molecule 18: 50S ribosomal protein L25

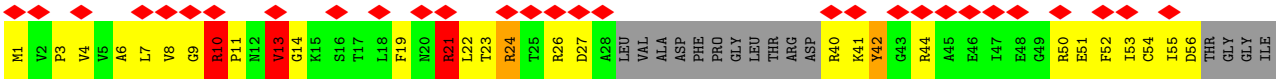
Chain W:

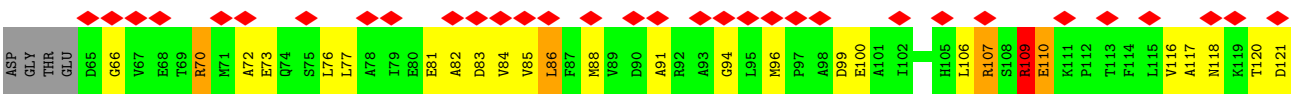


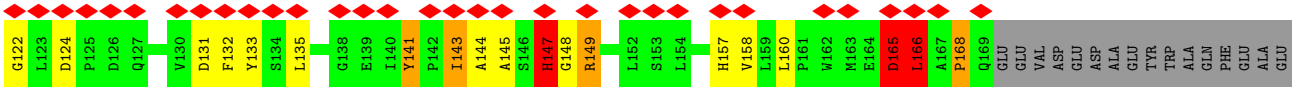


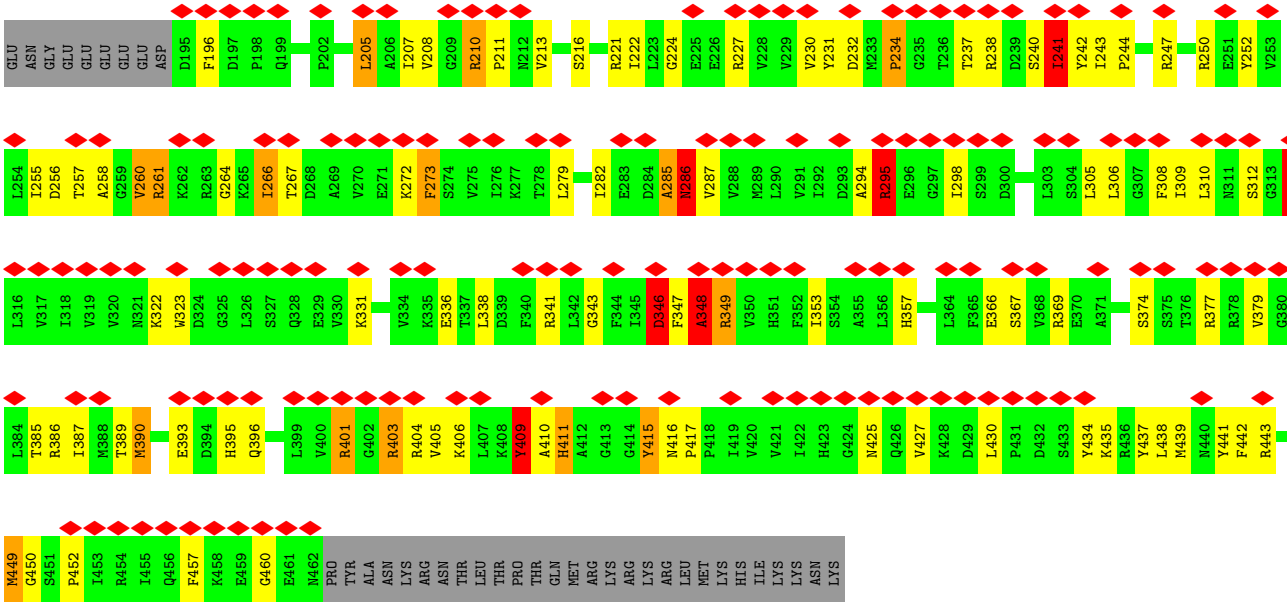
- Molecule 19: GTPase Der

Chain X:



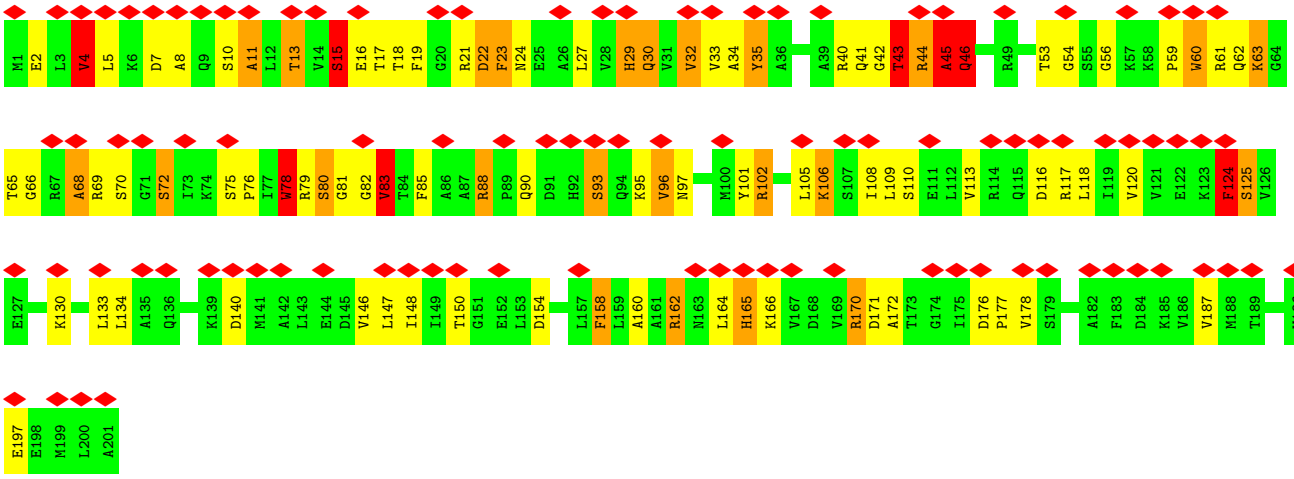






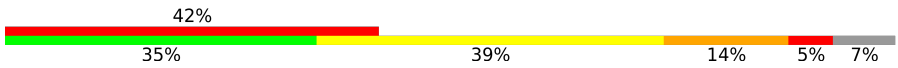
• Molecule 20: 50S ribosomal protein L4

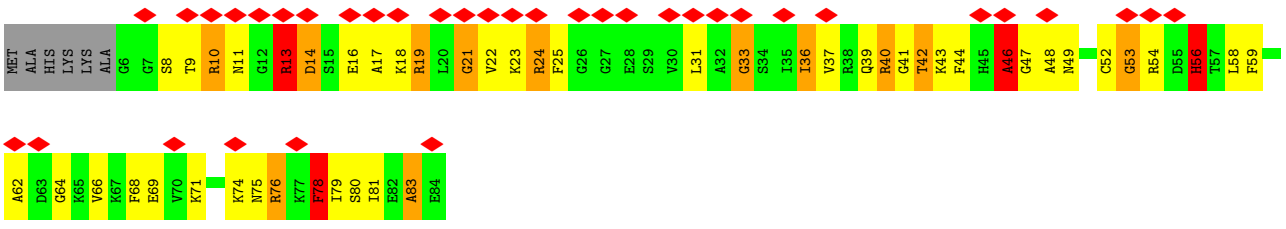
Chain E:



• Molecule 21: 50S ribosomal protein L27

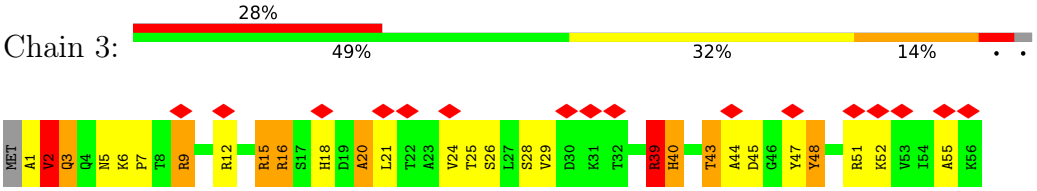
Chain Y:





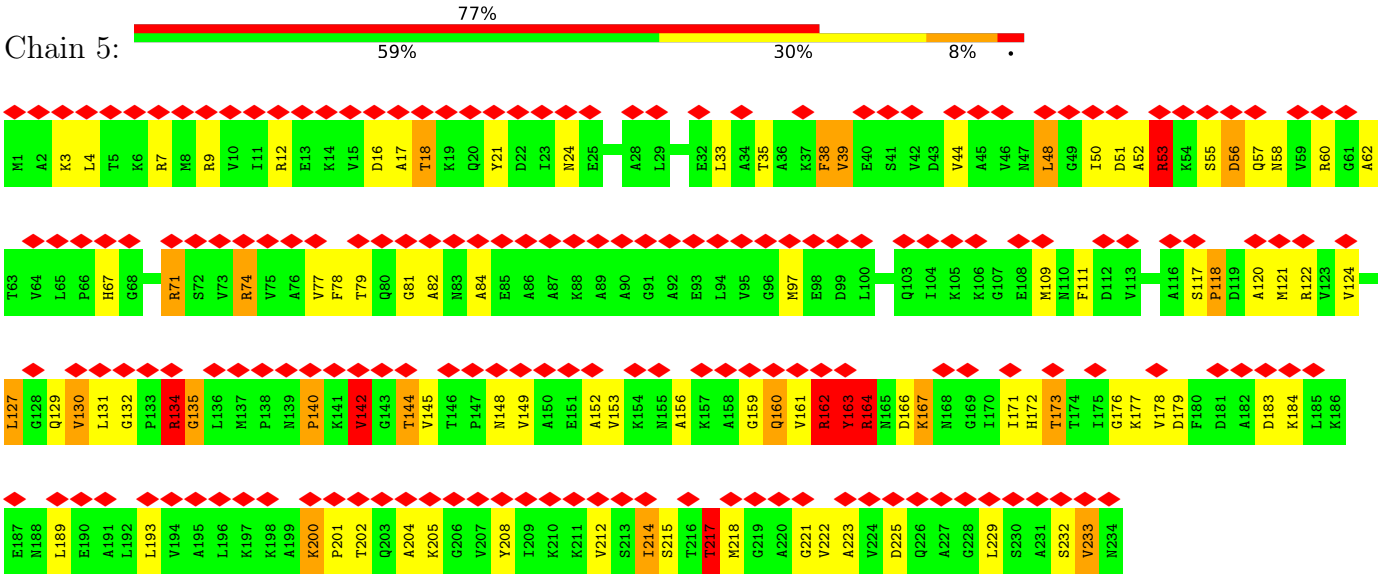
• Molecule 22: 50S ribosomal protein L32

Chain 3:



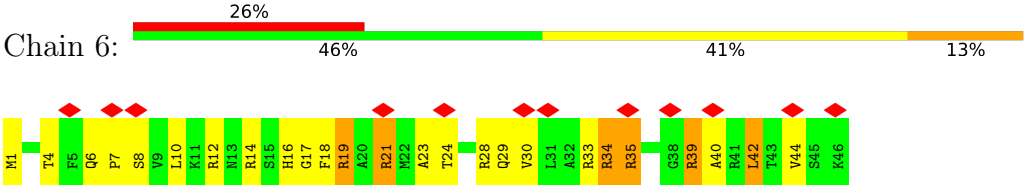
• Molecule 23: 50S ribosomal protein L1

Chain 5:



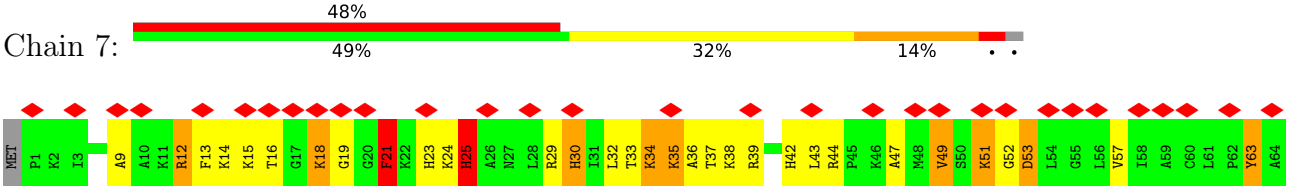
• Molecule 24: 50S ribosomal protein L34

Chain 6:



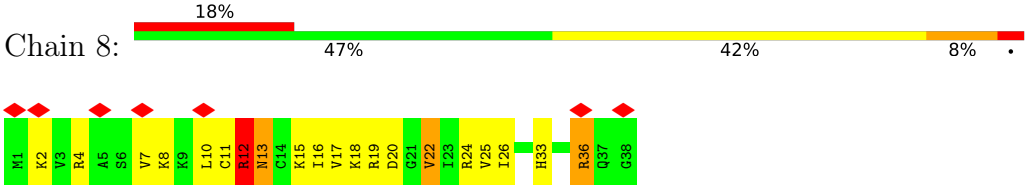
• Molecule 25: 50S ribosomal protein L35

Chain 7:



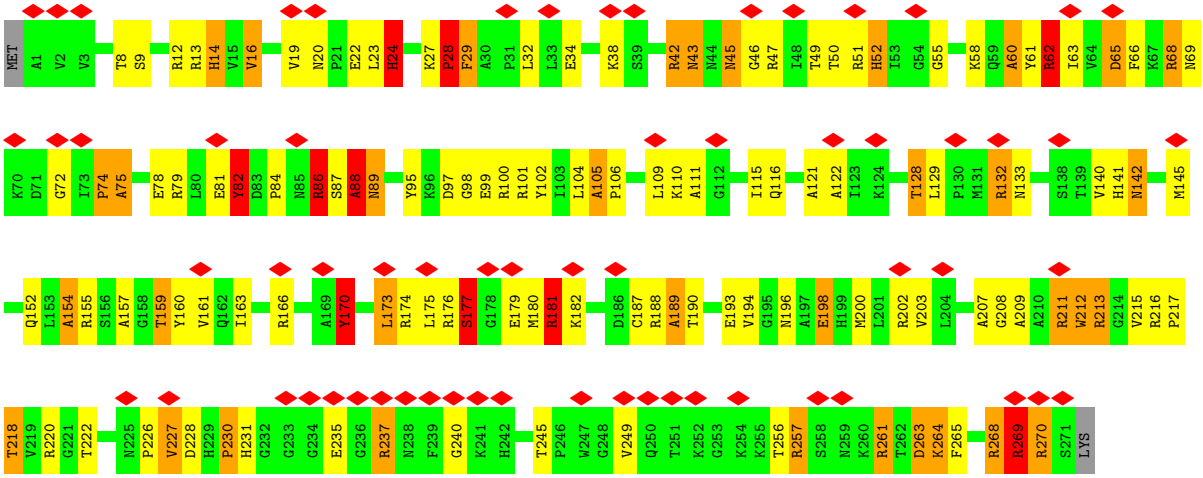
• Molecule 26: 50S ribosomal protein L36

Chain 8:



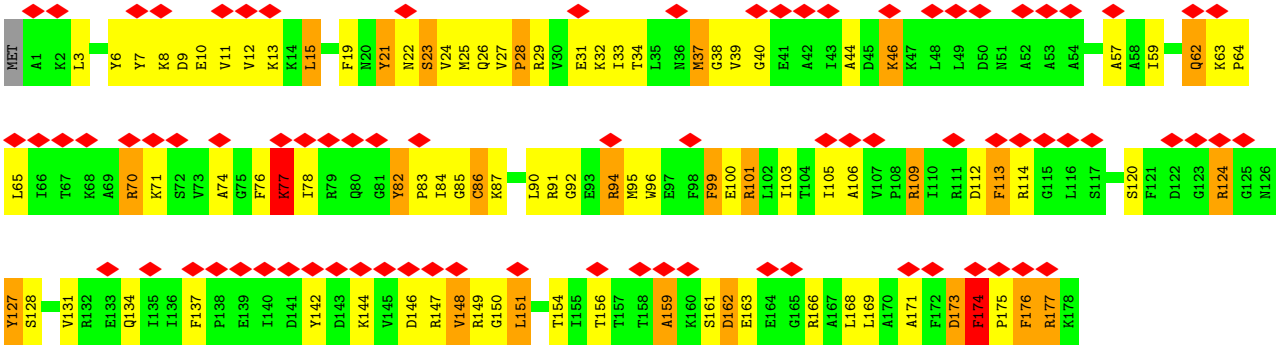
• Molecule 27: 50S ribosomal protein L2

Chain C:



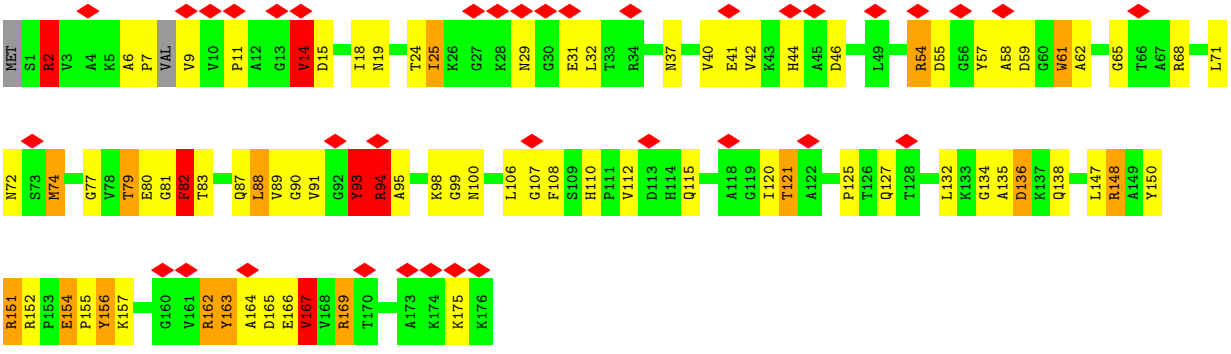
• Molecule 28: 50S ribosomal protein L5

Chain F:



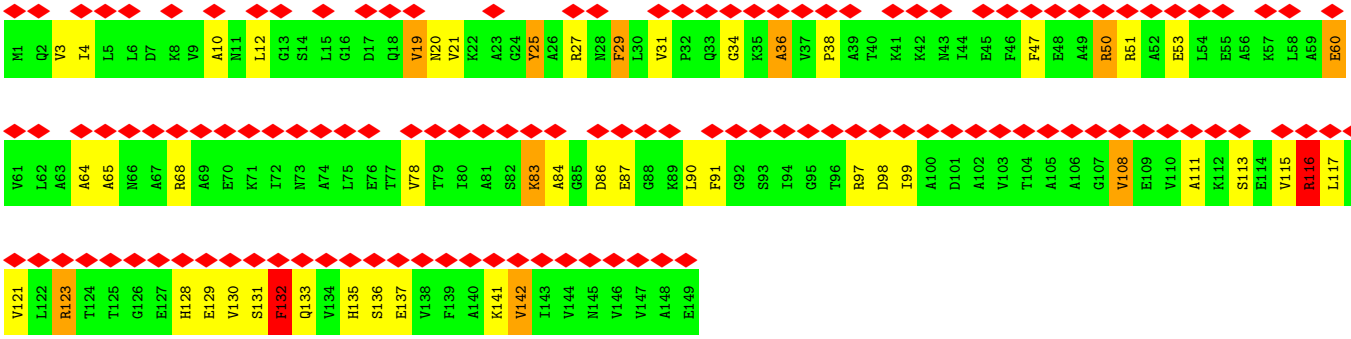
• Molecule 29: 50S ribosomal protein L6

Chain G:



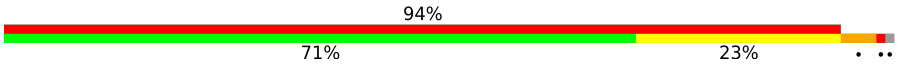
• Molecule 30: 50S ribosomal protein L9

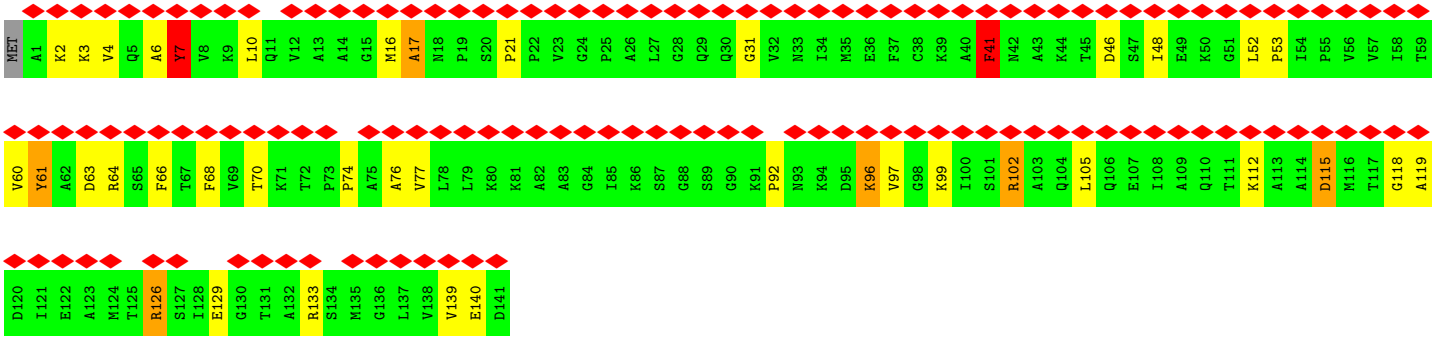
Chain H:



• Molecule 31: 50S ribosomal protein L11

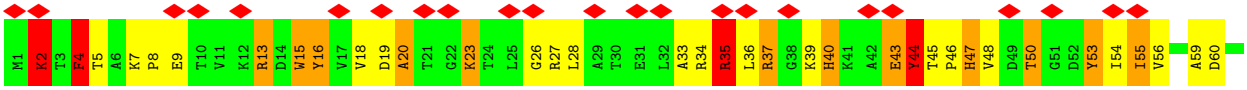
Chain I:

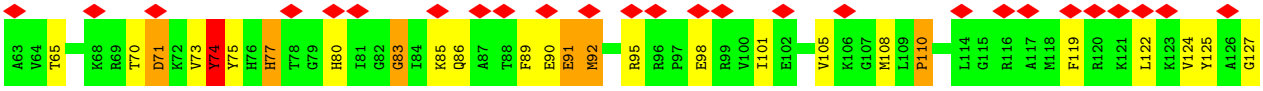


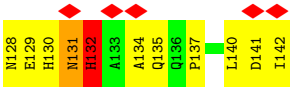


• Molecule 32: 50S ribosomal protein L13

Chain J:







4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	189614	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	Not provided	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	Not provided	
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI EAGLE (4k x 4k)	Depositor
Maximum map value	0.232	Depositor
Minimum map value	-0.093	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.045	Depositor
Map size (Å)	373.088, 373.088, 373.088	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1659, 1.1659, 1.1659	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	3.57	414/2744 (15.1%)	3.75	637/4276 (14.9%)
2	B	3.66	11120/69092 (16.1%)	3.80	17069/107787 (15.8%)
3	0	1.89	7/635 (1.1%)	2.19	18/848 (2.1%)
4	K	1.72	6/940 (0.6%)	2.04	23/1258 (1.8%)
5	L	1.89	18/1054 (1.7%)	2.13	35/1403 (2.5%)
6	1	1.66	2/510 (0.4%)	1.81	4/677 (0.6%)
7	M	1.78	7/1093 (0.6%)	2.07	34/1460 (2.3%)
8	N	1.83	10/973 (1.0%)	2.11	35/1301 (2.7%)
9	O	1.84	12/902 (1.3%)	2.08	26/1209 (2.2%)
10	P	1.83	13/929 (1.4%)	2.13	26/1242 (2.1%)
11	Q	1.81	9/960 (0.9%)	2.35	47/1278 (3.7%)
12	R	1.75	4/829 (0.5%)	2.09	26/1107 (2.3%)
13	S	1.83	9/864 (1.0%)	2.06	22/1156 (1.9%)
14	D	1.81	19/1586 (1.2%)	2.12	48/2134 (2.2%)
15	T	1.88	7/744 (0.9%)	2.05	24/994 (2.4%)
16	2	1.84	8/453 (1.8%)	2.15	14/605 (2.3%)
17	U	1.71	2/761 (0.3%)	1.94	13/1013 (1.3%)
18	W	1.74	5/766 (0.7%)	2.12	22/1025 (2.1%)
19	X	1.73	26/3334 (0.8%)	2.01	98/4502 (2.2%)
20	E	1.83	25/1571 (1.6%)	2.01	44/2113 (2.1%)
21	Y	1.84	8/603 (1.3%)	2.19	20/797 (2.5%)
22	3	1.85	2/450 (0.4%)	2.17	18/599 (3.0%)
23	5	1.68	18/1748 (1.0%)	1.99	52/2355 (2.2%)
24	6	1.97	5/380 (1.3%)	2.15	17/498 (3.4%)
25	7	1.82	6/513 (1.2%)	2.15	14/676 (2.1%)
26	8	1.72	3/303 (1.0%)	2.04	3/397 (0.8%)
27	C	1.87	34/2121 (1.6%)	2.07	66/2852 (2.3%)
28	F	1.75	16/1444 (1.1%)	2.21	59/1937 (3.0%)
29	G	1.77	12/1335 (0.9%)	2.13	40/1803 (2.2%)
30	H	1.71	8/1122 (0.7%)	1.87	17/1515 (1.1%)
31	I	1.65	5/1046 (0.5%)	1.92	28/1410 (2.0%)
32	J	1.79	12/1152 (1.0%)	2.02	36/1551 (2.3%)
All	All	3.21	11852/102957 (11.5%)	3.42	18635/153778 (12.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	69
2	B	0	1764
3	0	0	5
4	K	0	4
5	L	0	10
6	1	0	6
7	M	0	9
8	N	0	4
9	O	0	5
10	P	0	7
11	Q	0	11
12	R	0	8
13	S	0	3
14	D	0	11
15	T	0	3
16	2	0	4
17	U	0	4
18	W	0	2
19	X	0	25
20	E	0	7
21	Y	0	6
22	3	0	4
23	5	0	7
24	6	0	3
25	7	0	3
26	8	0	1
27	C	0	11
28	F	0	6
29	G	0	9
30	H	0	9
31	I	0	3
32	J	0	9
All	All	0	2032

The worst 5 of 11852 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	159	G	N7-C5	-23.28	1.25	1.39
2	B	1674	G	N7-C5	-21.28	1.26	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	770	G	N7-C5	-20.77	1.26	1.39
2	B	1626	A	N7-C5	-20.30	1.27	1.39
2	B	1641	A	N7-C5	-19.84	1.27	1.39

The worst 5 of 18635 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1784	A	N1-C6-N6	27.35	135.01	118.60
2	B	319	G	N1-C6-O6	25.96	135.47	119.90
2	B	332	A	N1-C6-N6	25.93	134.16	118.60
2	B	909	A	N1-C6-N6	25.56	133.93	118.60
2	B	2270	A	N1-C6-N6	25.05	133.63	118.60

There are no chirality outliers.

5 of 2032 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2	G	Sidechain
1	A	4	C	Sidechain
1	A	5	U	Sidechain
1	A	7	G	Sidechain
1	A	8	C	Sidechain

5.2 Too-close contacts (i)

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	A	2455	0	1253	65	0
2	B	61689	0	30889	2037	0
3	0	625	0	655	7	0
4	K	931	0	1003	12	0
5	L	1045	0	1117	16	0
6	1	509	0	543	8	0
7	M	1074	0	1157	17	0
8	N	960	0	1000	14	0
9	O	892	0	923	10	0
10	P	917	0	965	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
11	Q	947	0	1022	16	0
12	R	816	0	839	13	0
13	S	857	0	922	18	0
14	D	1565	0	1616	24	0
15	T	738	0	807	9	0
16	2	449	0	491	4	0
17	U	755	0	807	6	0
18	W	753	0	780	11	0
19	X	3280	0	3334	47	0
20	E	1552	0	1619	27	0
21	Y	596	0	610	14	0
22	3	444	0	461	7	0
23	5	1733	0	1824	19	0
24	6	377	0	418	4	0
25	7	504	0	574	8	0
26	8	302	0	343	8	0
27	C	2082	0	2157	31	0
28	F	1420	0	1460	18	0
29	G	1316	0	1364	15	0
30	H	1111	0	1148	13	0
31	I	1032	0	1088	3	0
32	J	1129	0	1162	30	0
All	All	94855	0	64351	2462	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 15.

The worst 5 of 2462 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)
19:X:347:PHE:CD2	19:X:449:MET:CG	2.00	1.45
19:X:347:PHE:CD2	19:X:449:MET:HG2	1.49	1.26
19:X:347:PHE:CD2	19:X:449:MET:HG3	1.84	0.97
19:X:449:MET:HA	19:X:449:MET:CE	1.97	0.94
19:X:347:PHE:HD2	19:X:449:MET:HG2	0.77	0.90

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
3	0	75/78 (96%)	54 (72%)	11 (15%)	10 (13%)	0 4
4	K	119/123 (97%)	84 (71%)	21 (18%)	14 (12%)	0 6
5	L	141/144 (98%)	108 (77%)	23 (16%)	10 (7%)	1 16
6	1	61/63 (97%)	49 (80%)	12 (20%)	0	100 100
7	M	134/136 (98%)	97 (72%)	18 (13%)	19 (14%)	0 4
8	N	118/127 (93%)	91 (77%)	20 (17%)	7 (6%)	1 19
9	O	114/117 (97%)	96 (84%)	12 (10%)	6 (5%)	2 21
10	P	112/115 (97%)	81 (72%)	18 (16%)	13 (12%)	0 6
11	Q	115/118 (98%)	87 (76%)	17 (15%)	11 (10%)	0 10
12	R	101/103 (98%)	71 (70%)	23 (23%)	7 (7%)	1 16
13	S	108/110 (98%)	83 (77%)	16 (15%)	9 (8%)	1 13
14	D	207/209 (99%)	143 (69%)	42 (20%)	22 (11%)	0 8
15	T	91/100 (91%)	58 (64%)	17 (19%)	16 (18%)	0 3
16	2	56/59 (95%)	46 (82%)	7 (12%)	3 (5%)	2 21
17	U	94/104 (90%)	66 (70%)	16 (17%)	12 (13%)	0 5
18	W	92/94 (98%)	77 (84%)	10 (11%)	5 (5%)	2 21
19	X	410/490 (84%)	329 (80%)	46 (11%)	35 (8%)	1 12
20	E	199/201 (99%)	145 (73%)	28 (14%)	26 (13%)	0 4
21	Y	77/85 (91%)	43 (56%)	15 (20%)	19 (25%)	0 1
22	3	54/57 (95%)	36 (67%)	10 (18%)	8 (15%)	0 4
23	5	232/234 (99%)	185 (80%)	23 (10%)	24 (10%)	0 9
24	6	44/46 (96%)	33 (75%)	7 (16%)	4 (9%)	1 12
25	7	62/65 (95%)	44 (71%)	11 (18%)	7 (11%)	0 7
26	8	36/38 (95%)	26 (72%)	6 (17%)	4 (11%)	0 8
27	C	269/273 (98%)	201 (75%)	35 (13%)	33 (12%)	0 5

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
28	F	176/179 (98%)	119 (68%)	41 (23%)	16 (9%)	1 12
29	G	171/177 (97%)	128 (75%)	26 (15%)	17 (10%)	0 10
30	H	147/149 (99%)	109 (74%)	25 (17%)	13 (9%)	1 12
31	I	139/142 (98%)	114 (82%)	16 (12%)	9 (6%)	1 18
32	J	140/142 (99%)	102 (73%)	21 (15%)	17 (12%)	0 6
All	All	3894/4078 (96%)	2905 (75%)	593 (15%)	396 (10%)	1 9

5 of 396 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	0	15	ASN
3	0	28	PHE
3	0	70	LEU
5	L	29	LYS
5	L	41	ARG

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
3	0	67/68 (98%)	62 (92%)	5 (8%)	13 39
4	K	102/104 (98%)	92 (90%)	10 (10%)	8 28
5	L	102/103 (99%)	89 (87%)	13 (13%)	4 20
6	1	55/55 (100%)	50 (91%)	5 (9%)	9 31
7	M	109/109 (100%)	105 (96%)	4 (4%)	34 58
8	N	100/103 (97%)	93 (93%)	7 (7%)	15 41
9	O	86/87 (99%)	73 (85%)	13 (15%)	3 16
10	P	99/100 (99%)	87 (88%)	12 (12%)	5 22
11	Q	89/90 (99%)	81 (91%)	8 (9%)	9 32
12	R	84/84 (100%)	69 (82%)	15 (18%)	2 11
13	S	93/93 (100%)	88 (95%)	5 (5%)	22 49

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
14	D	164/164 (100%)	143 (87%)	21 (13%)	4 20
15	T	80/84 (95%)	69 (86%)	11 (14%)	3 19
16	2	48/49 (98%)	44 (92%)	4 (8%)	11 36
17	U	81/85 (95%)	72 (89%)	9 (11%)	6 24
18	W	78/78 (100%)	71 (91%)	7 (9%)	9 32
19	X	357/419 (85%)	324 (91%)	33 (9%)	9 31
20	E	165/165 (100%)	152 (92%)	13 (8%)	12 38
21	Y	59/63 (94%)	55 (93%)	4 (7%)	16 42
22	3	47/48 (98%)	40 (85%)	7 (15%)	3 16
23	5	181/181 (100%)	158 (87%)	23 (13%)	4 20
24	6	38/38 (100%)	35 (92%)	3 (8%)	12 38
25	7	51/52 (98%)	44 (86%)	7 (14%)	3 19
26	8	34/34 (100%)	31 (91%)	3 (9%)	10 33
27	C	216/218 (99%)	190 (88%)	26 (12%)	5 22
28	F	149/150 (99%)	131 (88%)	18 (12%)	5 22
29	G	136/138 (99%)	115 (85%)	21 (15%)	2 15
30	H	114/114 (100%)	105 (92%)	9 (8%)	12 38
31	I	109/110 (99%)	100 (92%)	9 (8%)	11 36
32	J	116/116 (100%)	99 (85%)	17 (15%)	3 16
All	All	3209/3302 (97%)	2867 (89%)	342 (11%)	10 26

5 of 342 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
24	6	34	ARG
29	G	14	VAL
25	7	37	THR
27	C	213	ARG
29	G	120	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 68 such sidechains are listed below:

Mol	Chain	Res	Type
29	G	110	HIS

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Mol	Chain	Res	Type
30	H	128	HIS
32	J	86	GLN
14	D	136	ASN
14	D	134	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	112/117 (95%)	20 (17%)	4 (3%)
2	B	2873/2903 (98%)	580 (20%)	122 (4%)
All	All	2985/3020 (98%)	600 (20%)	126 (4%)

5 of 600 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	13	G
1	A	14	U
1	A	15	A
1	A	16	G

5 of 126 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	1284	A
2	B	2402	U
2	B	1730	C
2	B	2336	A
2	B	2601	C

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)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

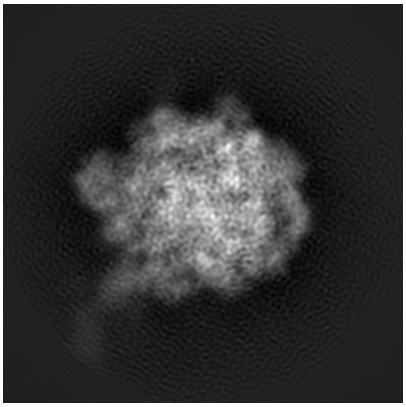
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-6149. These allow visual inspection of the internal detail of the map and identification of artifacts.

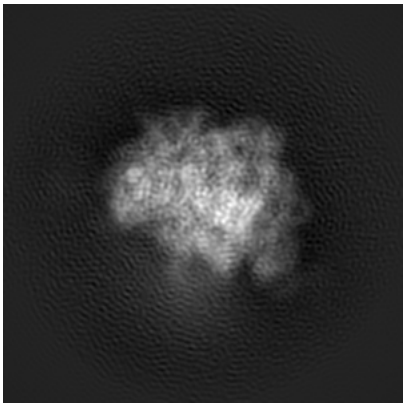
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

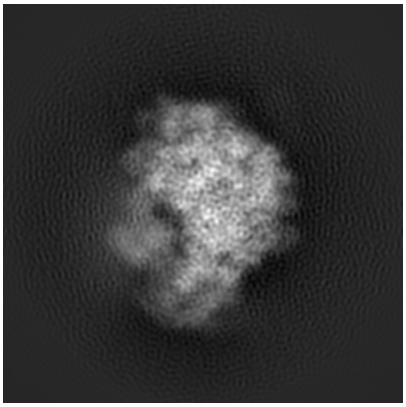
6.1.1 Primary map



X



Y

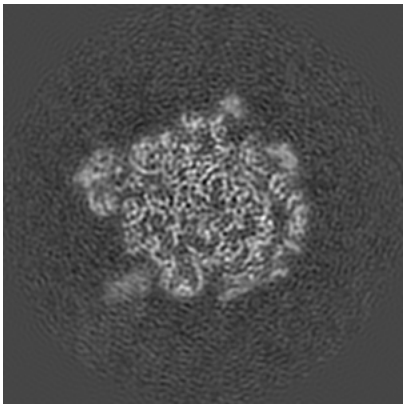


Z

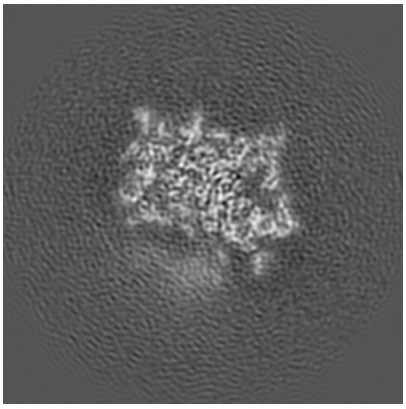
The images above show the map projected in three orthogonal directions.

6.2 Central slices

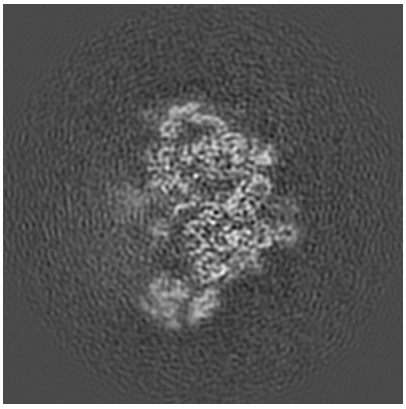
6.2.1 Primary map



X Index: 160



Y Index: 160

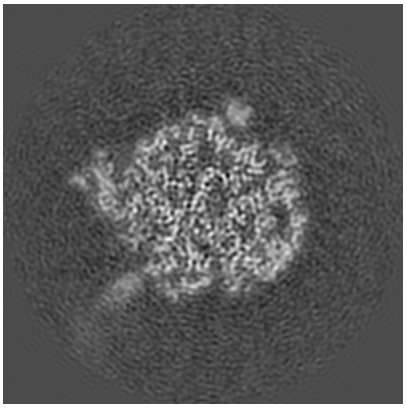


Z Index: 160

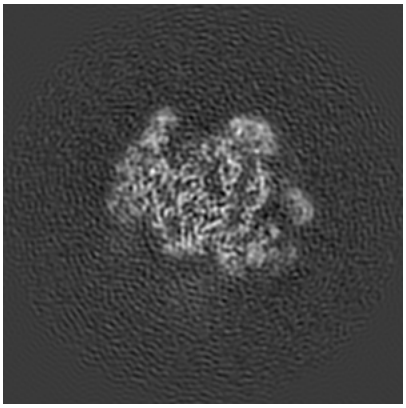
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

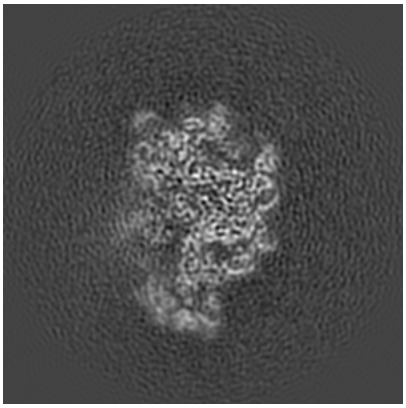
6.3.1 Primary map



X Index: 166



Y Index: 181

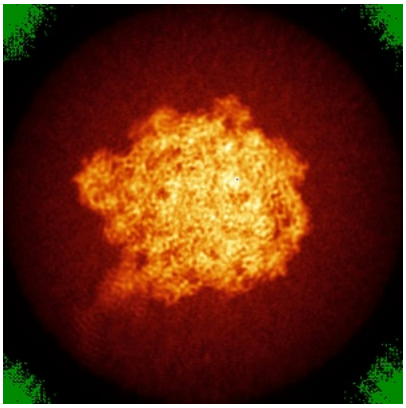


Z Index: 176

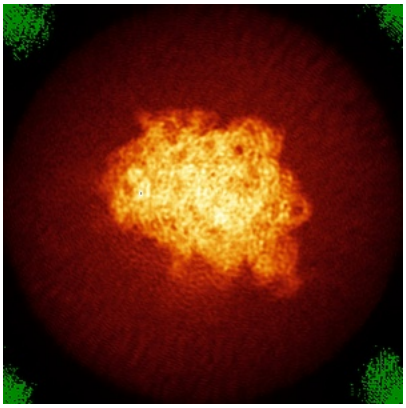
The images above show the largest variance slices of the map in three orthogonal directions.

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

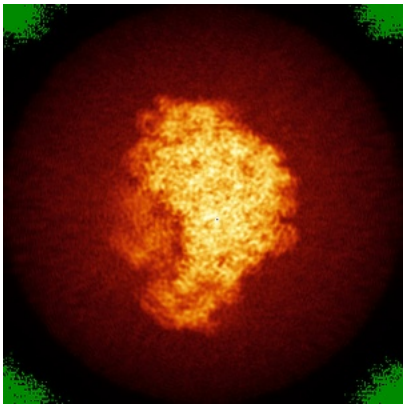
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

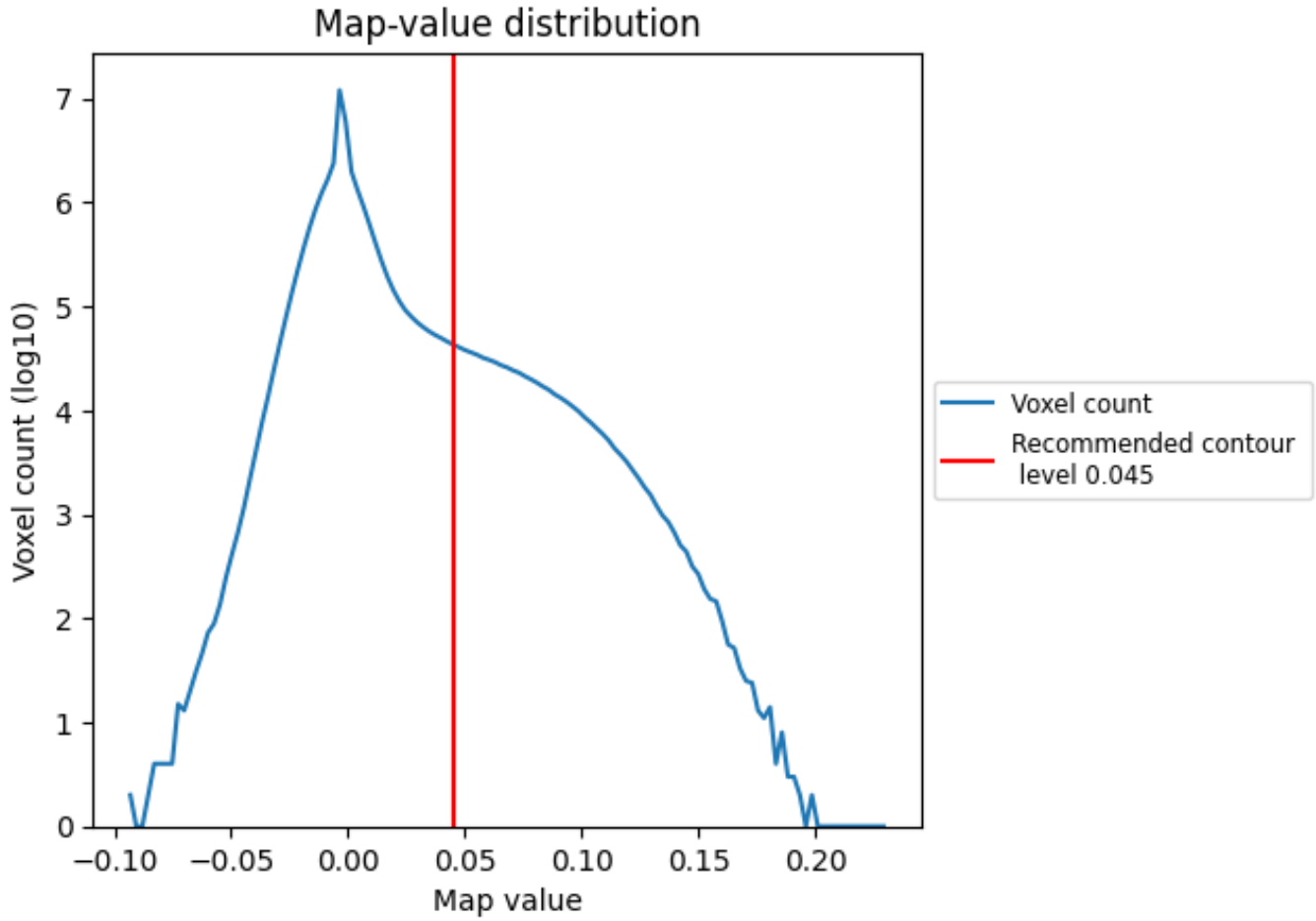
6.6 Mask visualisation (i)

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

7 Map analysis

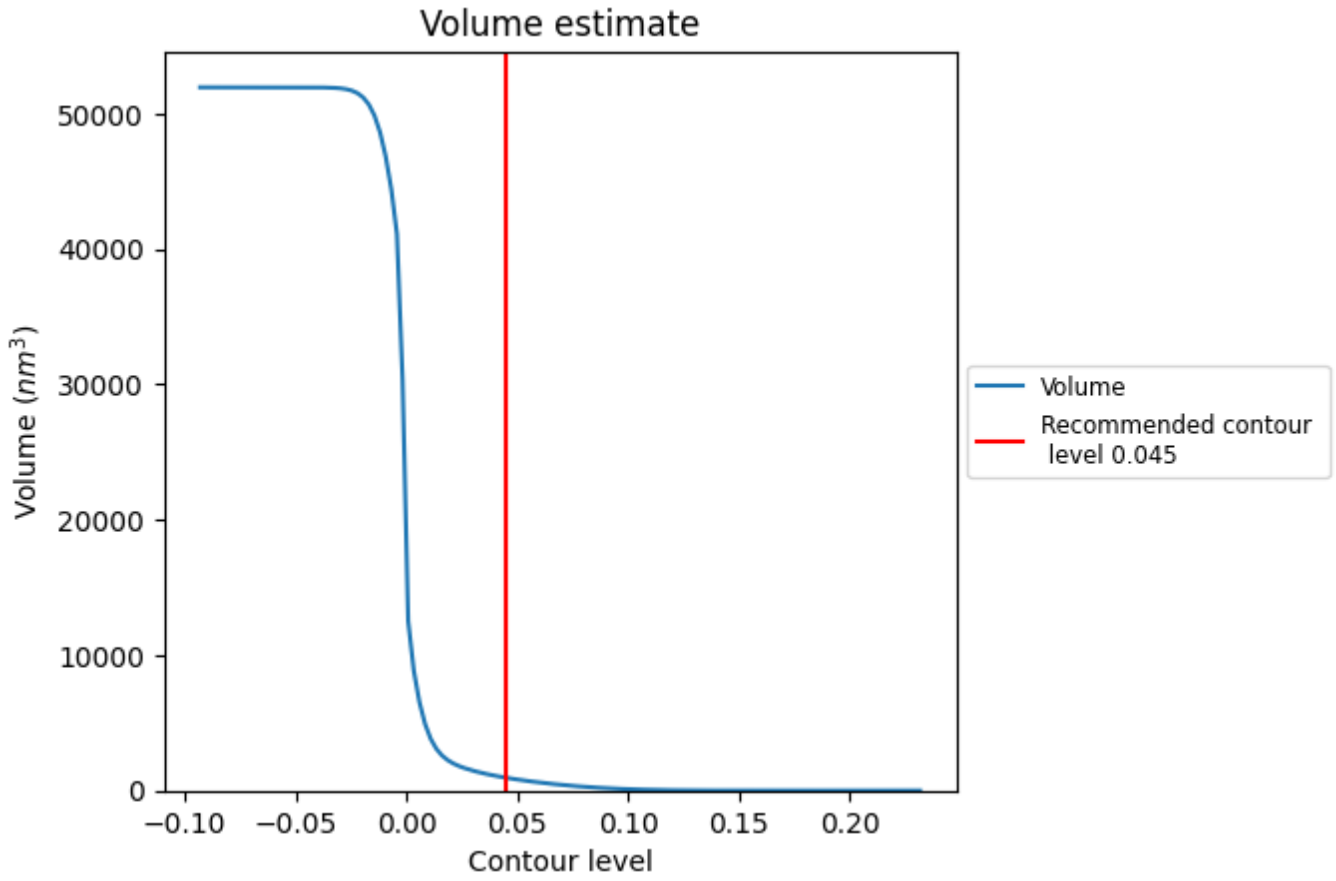
This section contains the results of statistical analysis of the map.

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.

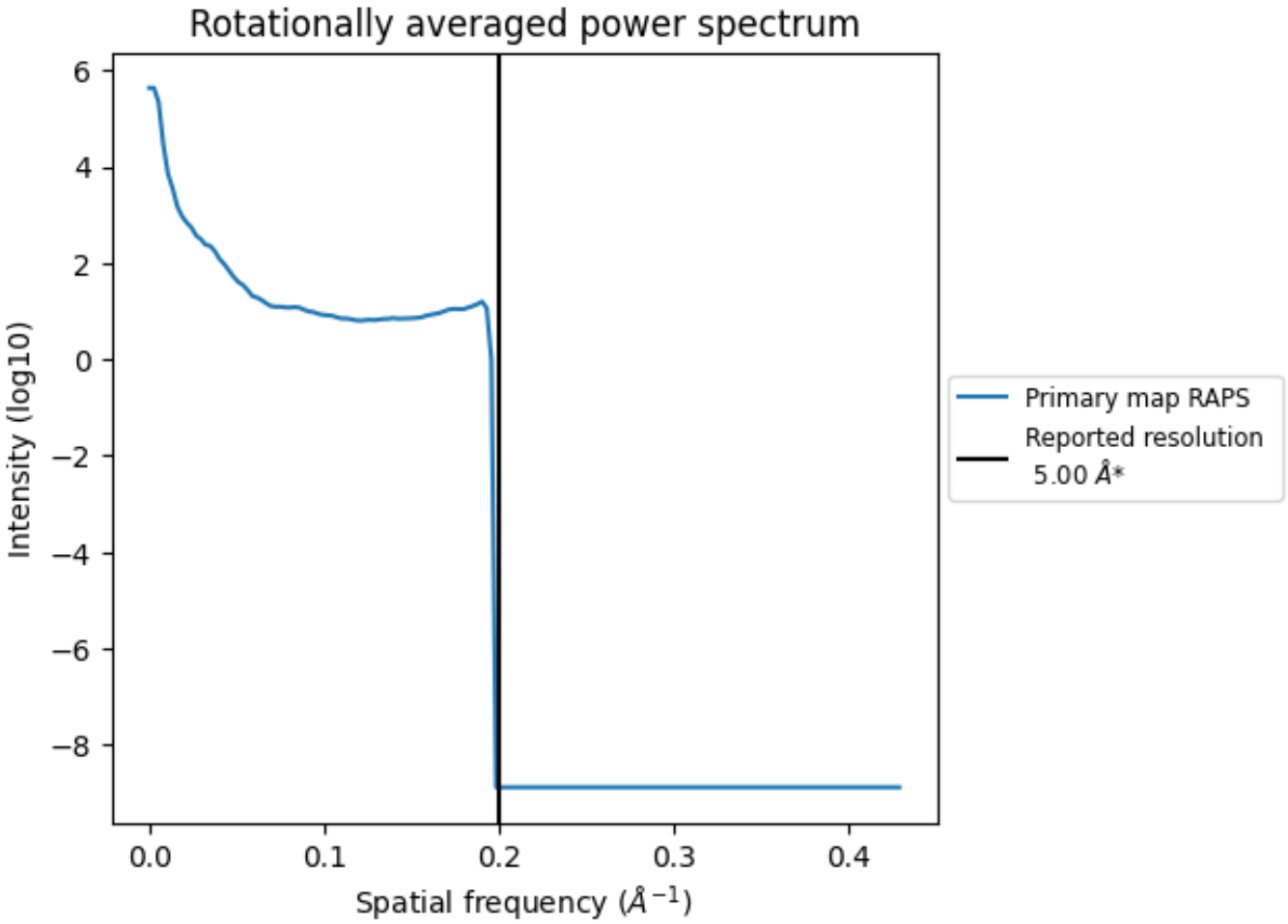
7.2 Volume estimate (i)



The volume at the recommended contour level is 946 nm^3; this corresponds to an approximate mass of 854 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)

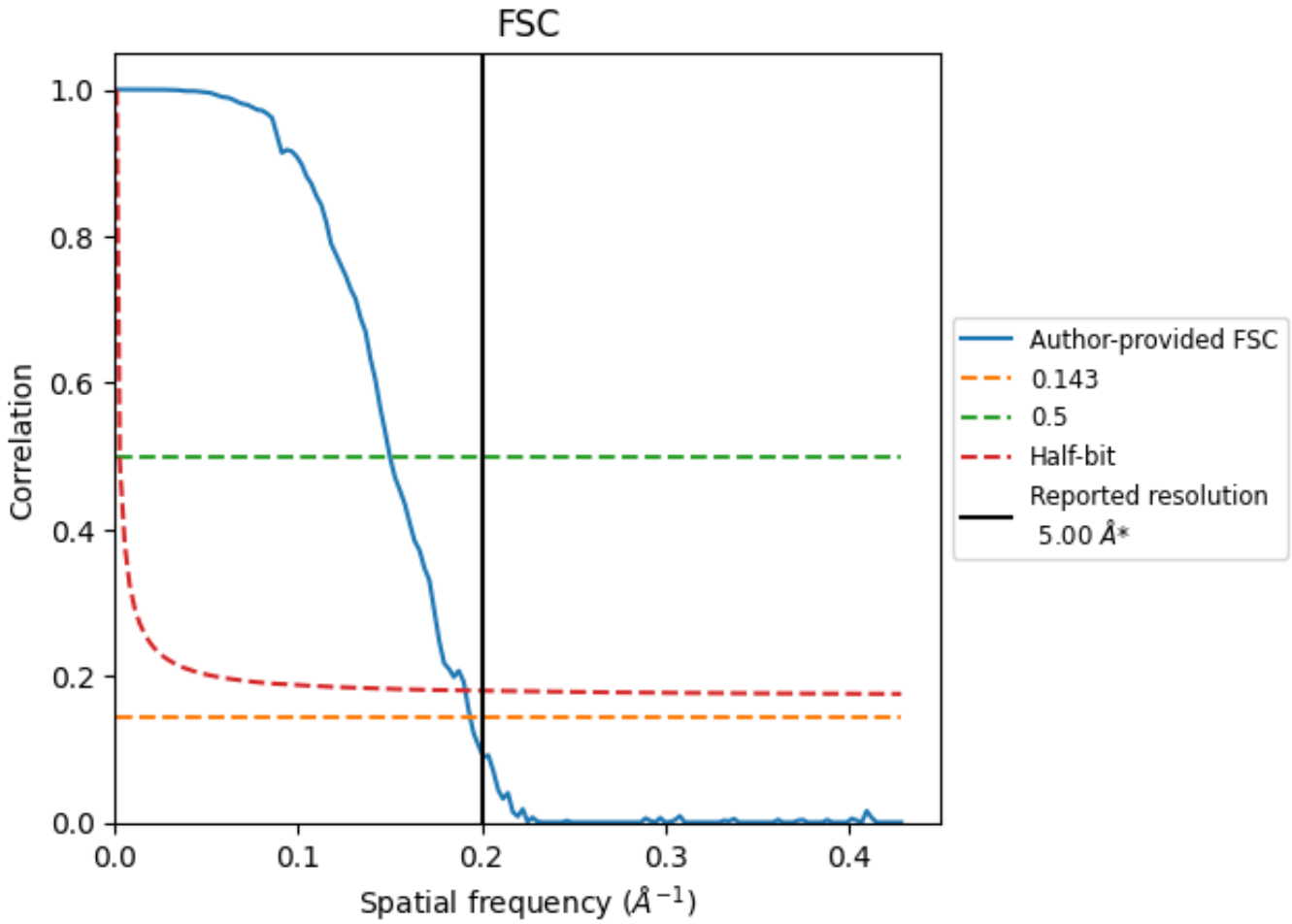


*Reported resolution corresponds to spatial frequency of 0.200 Å^{-1}

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 0.200 Å^{-1}

8.2 Resolution estimates (i)

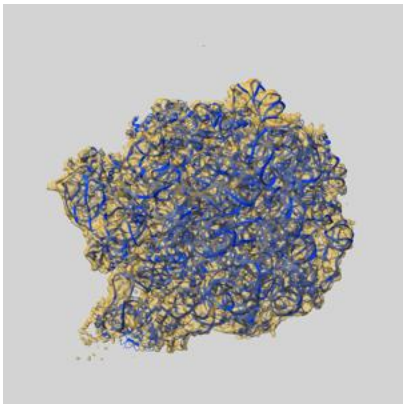
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	5.00	-	-
Author-provided FSC curve	5.16	6.67	5.23
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

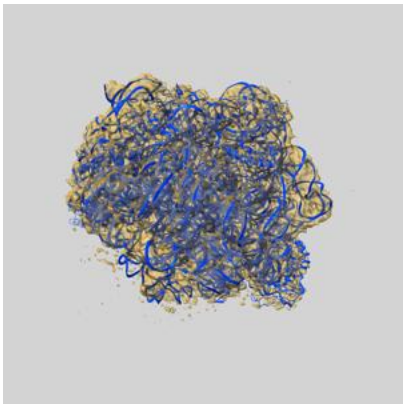
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-6149 and PDB model 3J8G. Per-residue inclusion information can be found in section 3 on page 9.

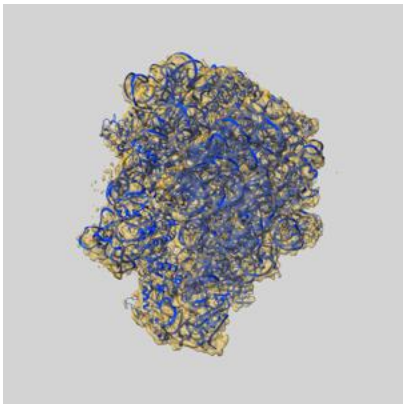
9.1 Map-model overlay



X



Y



Z

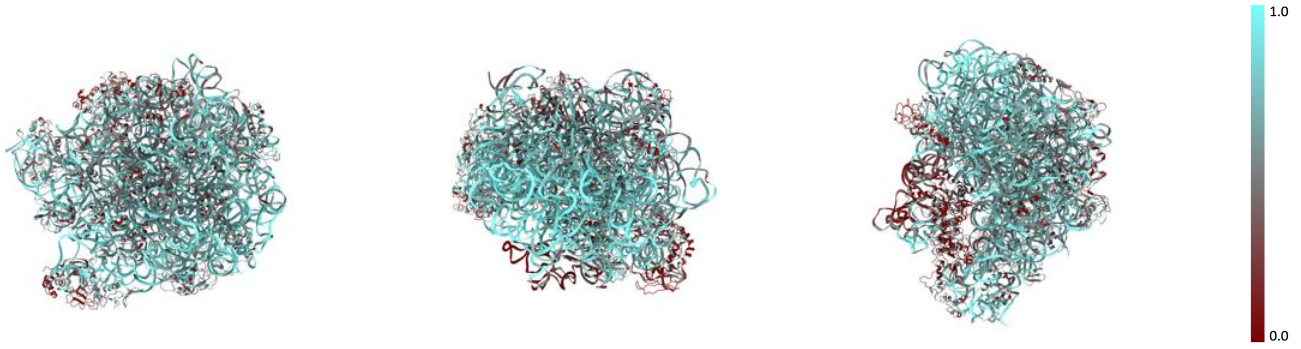
The images above show the 3D surface view of the map at the recommended contour level 0.045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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.

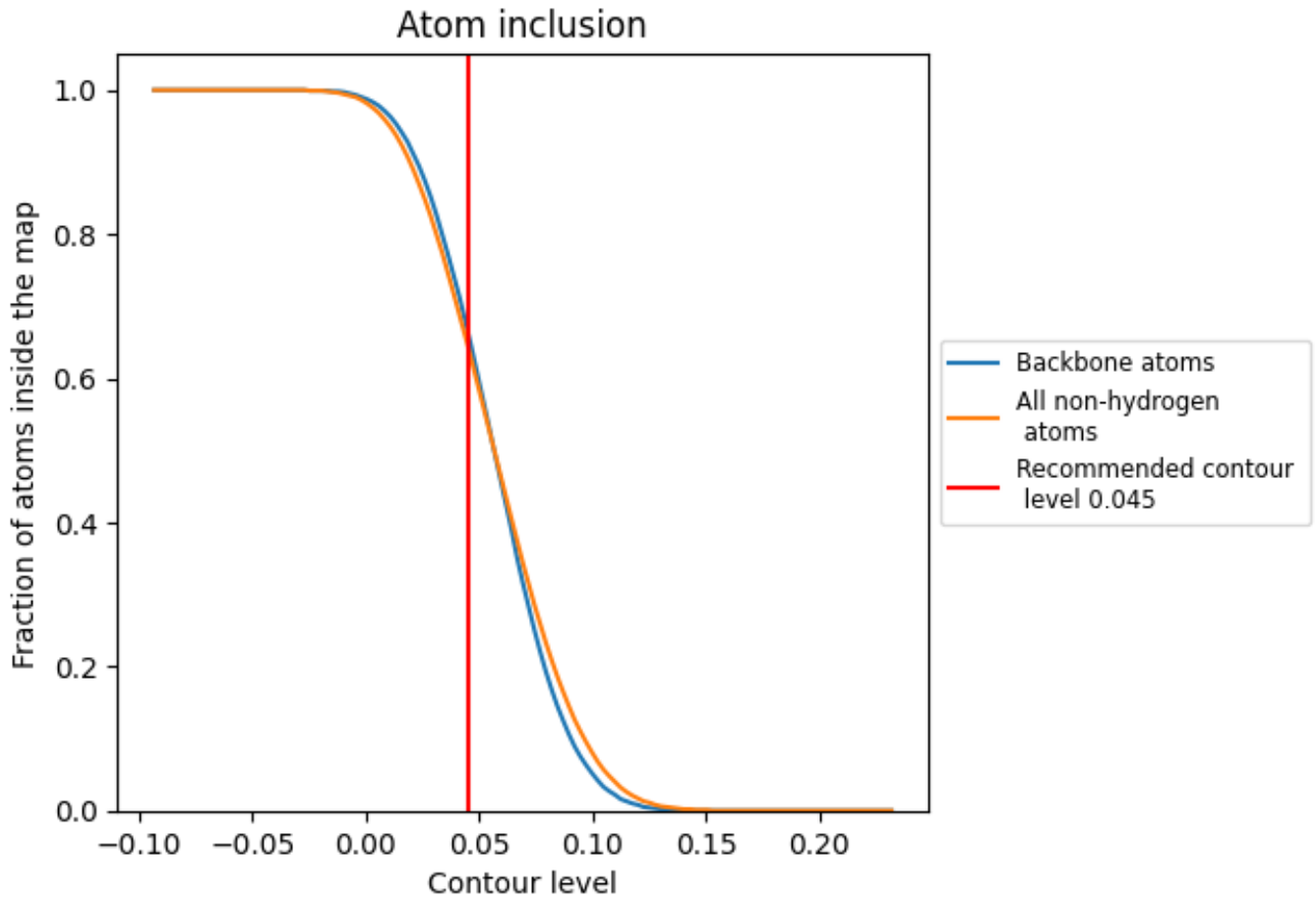
9.3 Atom inclusion mapped to coordinate model



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 (0.045).

9.4 Atom inclusion (i)



At the recommended contour level, 66% of all backbone atoms, 65% 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 (0.045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6460	0.1310
0	0.4330	0.0960
1	0.4370	0.0650
2	0.4600	0.0490
3	0.5190	0.1010
5	0.2170	0.0350
6	0.5320	0.1150
7	0.4440	0.0550
8	0.6370	0.1510
A	0.7770	0.1370
B	0.7330	0.1480
C	0.5890	0.1510
D	0.6000	0.1610
E	0.4220	0.0490
F	0.4560	0.0680
G	0.6020	0.1610
H	0.1650	0.0600
I	0.0460	0.0270
J	0.5010	0.1070
K	0.6060	0.1510
L	0.4460	0.0560
M	0.6140	0.1780
N	0.6190	0.1280
O	0.5280	0.0920
P	0.5610	0.1610
Q	0.5000	0.0650
R	0.4560	0.0500
S	0.4400	0.0580
T	0.5250	0.1040
U	0.4280	0.0400
W	0.5580	0.1540
X	0.3430	0.0850
Y	0.4840	0.0580