WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Nov 21, 2022 – 09:58 PM EST

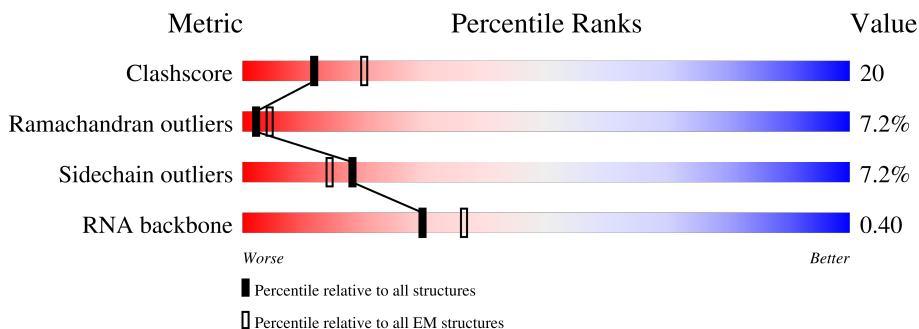|		
PDB ID	:	3J46
EMDB ID	:	EMD-5693
Title	:	Structure of the SecY protein translocation channel in action
Authors	:	Akey, C.W.; Park, E.; Menetret, J.F.; Gumbart, J.C.; Ludtke, S.J.; Li, W.;
		Whynot, A.; Rapoport, T.A.
Deposited on	:	2013-06-18
Resolution	:	10.10 Å(reported)
Based on initial models	:	3I8G, 2I2P, 3J01

1   Overall quality at a glance ⓘ

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

The reported resolution of this entry is 10.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Clashscore		20
Ramachandran outliers		7.2%
Sidechain outliers		7.2%
RNA backbone		0.40

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

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	y	437	13% ▐ 73% 20% 5% •
2	E	56	23% ▐ 46% 48% 5%
3	G	67	10% ▐ 58% 31% 7% •
4	n	101	44% ▐ 59% 30% 6% 5%
5	p	76	16% ▐ 45% 50% 5%
6	a	76	25% ▐ 61% 36% •
7	5	234	14% ▐ 75% 22% •

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Mol	Chain	Length	Quality of chain
8	T	100	17% 88% 10%
9	U	103	15% 95%
10	Y	63	16% 95% 5%
11	1	63	76% 21%
12	2	36	72% 22%
13	3	44	45% 48% 7%
14	4	109	23% 50% 27%

2 Entry composition ⓘ

There are 14 unique types of molecules in this entry. The entry contains 17478 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 Protein translocase subunit SecY.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	y	437	Total 3361	C 2220	N 554	O 569	S 18	0	1

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
y	5	ACE	-	ACETYLATION	UNP P0AGA2
y	68	CYS	SER	ENGINEERED MUTATION	UNP P0AGA2
y	441	NH2	-	AMIDATION	UNP P0AGA2

- Molecule 2 is a protein called Preprotein translocase subunit SecE.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	56	Total 433	C 283	N 76	O 73	S 1	0	1

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	73	ACE	-	ACETYLATION	UNP P0AG96
E	128	NH2	-	AMIDATION	UNP P0AG96

- Molecule 3 is a protein called Protein-export membrane protein SecG.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	67	Total 461	C 301	N 74	O 82	S 4	0	1

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	8	ACE	-	ACETYLATION	UNP P0AG99
G	74	NH2	-	AMIDATION	UNP P0AG99

- Molecule 4 is a protein called NC100.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	n	101	Total 760	C 480	N 132	O 146	S 2	0	0

- Molecule 5 is a RNA chain called P-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	p	76	Total 1621	C 722	N 287	O 536	P 76	0	0

- Molecule 6 is a RNA chain called A-tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	a	76	Total 1626	C 729	N 290	O 531	P 75	S 1	0	0

- Molecule 7 is a protein called 50S ribosomal protein L1.

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

- Molecule 8 is a protein called 50S ribosomal protein L23P.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	T	100	Total 787	C 496	N 146	O 143	S 2	0	0

- Molecule 9 is a protein called 50S ribosomal protein L24P.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	U	103	Total 789	C 498	N 148	O 143	0	0

- Molecule 10 is a protein called 50S ribosomal protein L29P.

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

- Molecule 11 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	1	63	Total 1350	C 603	N 245	O 439	P 63	0	0

- Molecule 12 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	2	36	Total 775	C 345	N 142	O 252	P 36	0	0

- Molecule 13 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	3	44	Total 948	C 423	N 180	O 301	P 44	0	0

- Molecule 14 is a RNA chain called 23S ribosomal RNA.

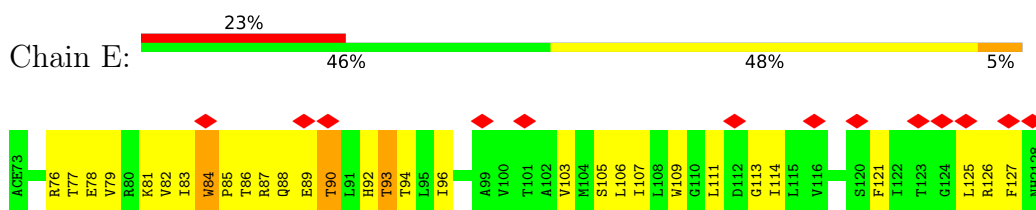| Mol	Chain	Residues	Atoms					AltConf	Trace
14	4	109	Total 2325	C 1038	N 409	O 769	P 109	0	0

3   Residue-property plots ⓘ

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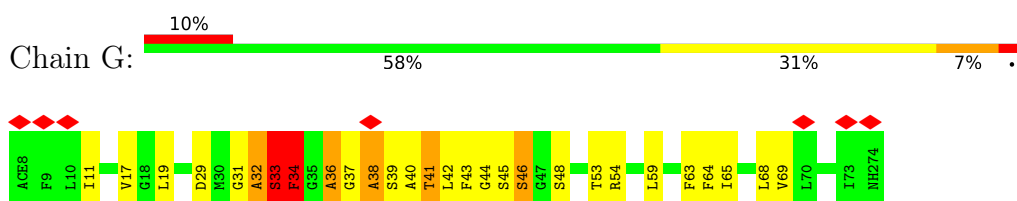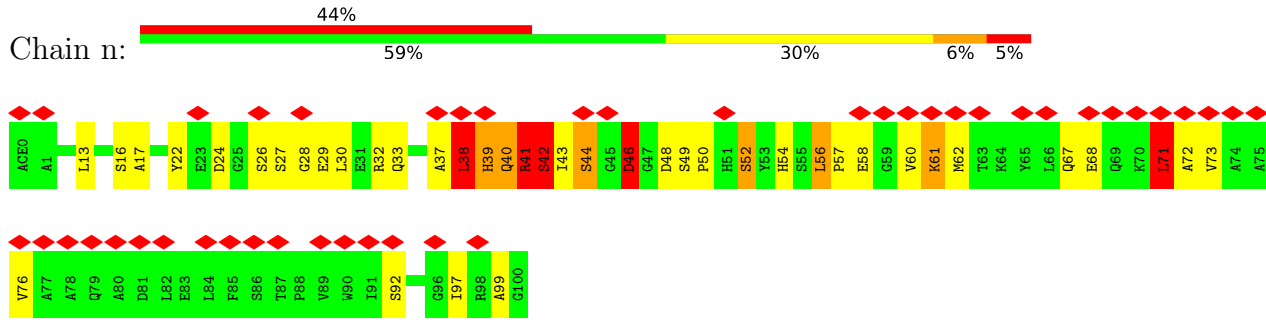
• Molecule 1: Protein translocase subunit SecY
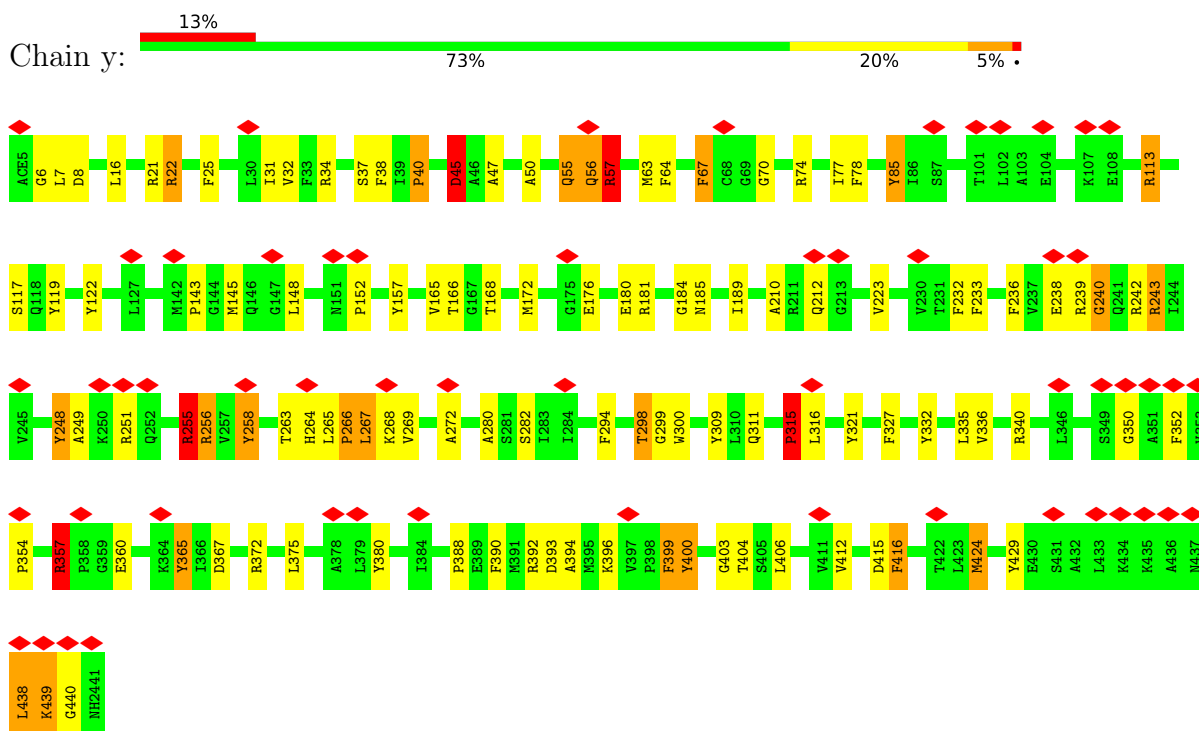
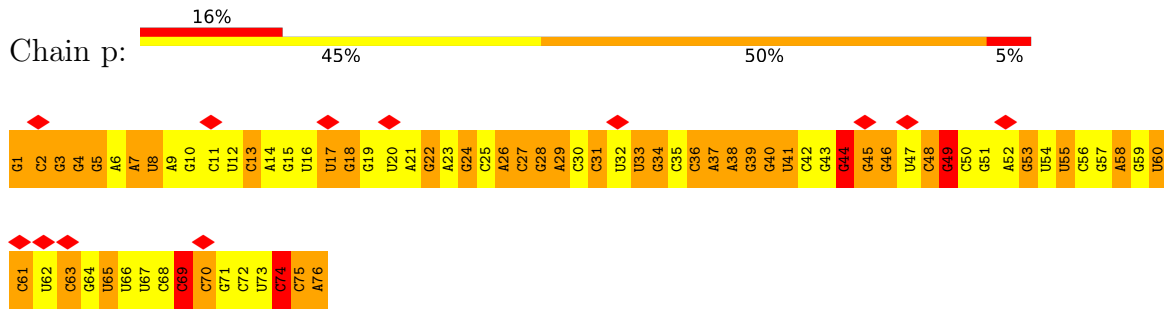• Molecule 2: Preprotein translocase subunit SecE
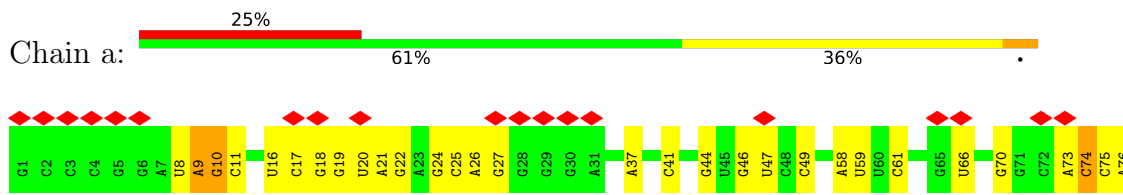

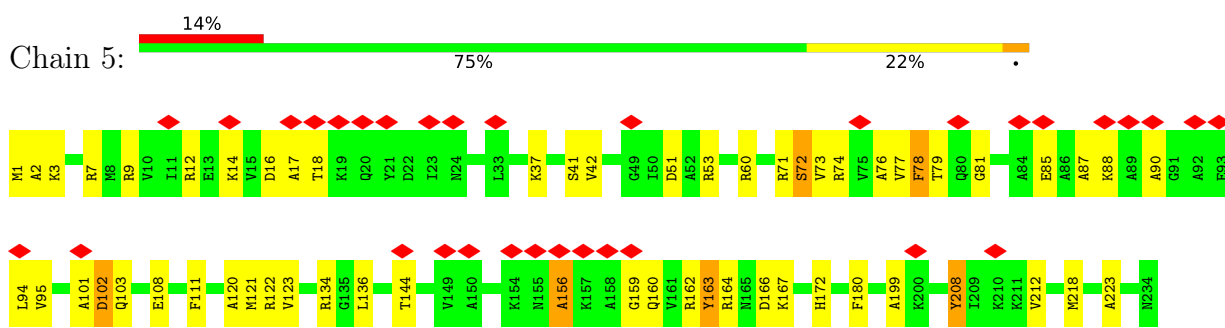• Molecule 3: Protein-export membrane protein SecG

• Molecule 4: NC100

Chain n:

44%

59% 30% 6% 5%

ACE0 A1 L13 S16 A17 Y22 E23 D24 G25 S26 S27 Q28 E29 L30 E31 R32 Q33 A37 L38 H39 Q40 R41 S42 I43 S44 G45 D46 G47 D48 S49 P50 H51 S52 Y53 H54 S55 L56 P57 E58 G59 V60 K61 M62 T63 K64 Y65 L66 Q67 E68 Q69 K70 L71 A72 V73 A74 A75

V76 A77 A78 Q79 A80 D81 L82 E83 L84 F85 S86 T87 P88 V89 W90 I91 S92 G96 I97 R98 A99 G100

• Molecule 5: P-tRNA

Chain p:

16%

45% 50% 5%

G1 C2 G3 G4 G5 A6 A7 U8 A9 G10 C11 U12 C13 A14 G15 U16 U17 G18 G19 U20 A21 G22 A23 G24 C25 A26 C27 G28 A29 C30 C31 U32 U33 G34 C35 C36 A37 A38 G39 G40 U41 C42 G43 G44 G45 G46 U47 C48 G49 C50 G51 A52 G53 U54 U55 C56 G57 A58 G59 U60

C61 U62 C63 G64 U65 U66 C67 C68 C69 C70 G71 C72 U73 C74 C75 A76

• Molecule 6: A-tRNA

Chain a:

25%

61% 36% •

G1 C2 C3 C4 G5 G6 A7 U8 A9 G10 C11 U16 C17 G18 G19 U20 A21 G22 A23 G24 C25 A26 G27 G28 G29 G30 A31 A37 C41 G44 U45 G46 U47 C48 C49 A58 U59 U60 C61 G65 U66 G70 G71 C72 A73 C74 C75 A76

• Molecule 7: 50S ribosomal protein L1

Chain 5:

14%

75% 22% •

M1 A2 K3 R7 M8 R9 V10 I11 R12 E13 K14 V15 D16 A17 T18 K19 Q20 Y21 D22 I23 N24 L33 K37 S41 V42 G49 I50 D51 A52 R53 R60 R71 S72 V73 R74 V75 A76 V77 F78 T79 Q80 G81 A84 E85 A86 A87 K88 A89 A90 G91 A92 E93

L94 V95 A101 D102 Q103 E108 F111 A120 M121 R122 V123 R134 G135 L136 T144 V149 A150 K154 N155 A156 K157 A158 G159 Q160 V161 R162 Y163 R164 N165 D166 K167 H172 F180 A199 K200 Y208 I209 K210 K211 V212 M218 A223 N234

• Molecule 8: 50S ribosomal protein L23P

Chain T:

17%

88% 10% •

M1 R6 V10 L11 R12 A20 T29 A35 K36 D37 A38 A41 E42 I43 L61 K64 G65 K66 V67 K68 R69 Q72 R73 I74 D79 L93 V96 G97 G98 A99 E100
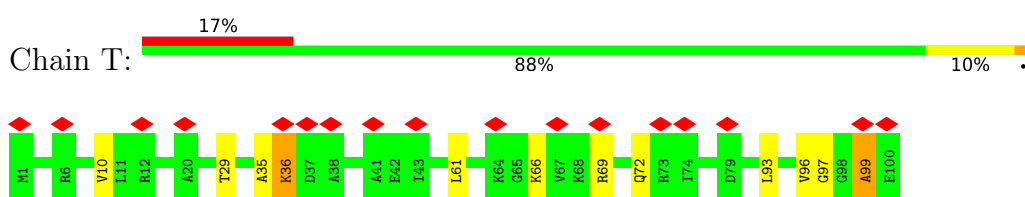
• Molecule 9: 50S ribosomal protein L24P

15%

Chain U:
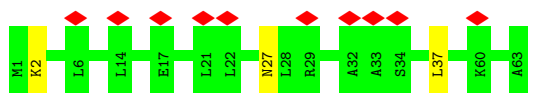95%

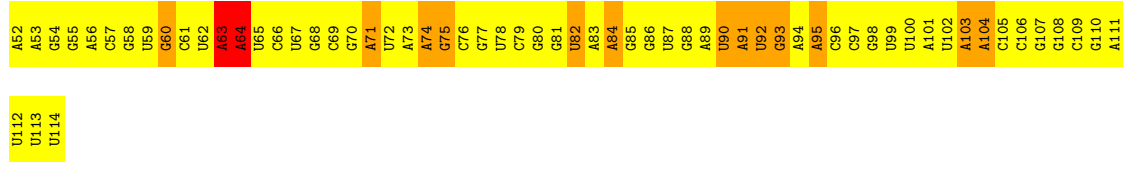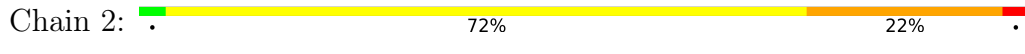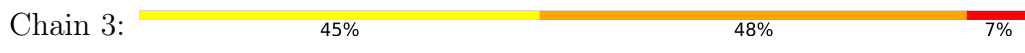A1 A2 V12 K18 G19 L28 S29 S30 I38 N39 V48 P49 N52 A62 A63 I64 A75 K78 D88 K91 K103
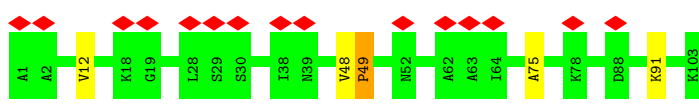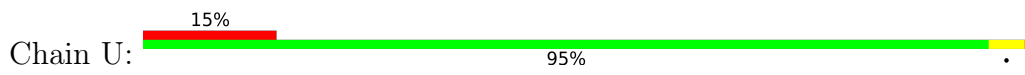
• Molecule 10: 50S ribosomal protein L29P

16%

Chain Y:
95% 5%

M1 K2 L6 L14 E17 L21 L22 N27 L28 R29 A32 A33 S34 L37 K60 A63
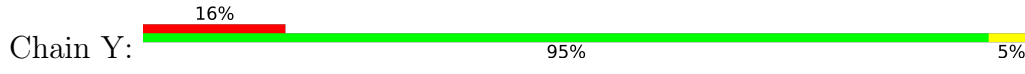
• Molecule 11: 23S ribosomal RNA

Chain 1:
76% 21%

A52 A53 G54 G55 A56 C57 G58 U59 G60 C61 U62 A63 A64 U65 C66 U67 G68 C69 G70 A71 U72 A73 A74 G75 C76 G77 U78 C79 G80 G81 U82 A83 A84 G85 G86 U87 G88 A89 U90 A91 U92 G93 A94 A95 C96 C97 G98 U99 U100 A101 U102 A103 A104 C105 C106 G107 G108 C109 G110 A111

U112 U113 U114
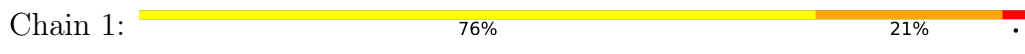
• Molecule 12: 23S ribosomal RNA

Chain 2:
72% 22%

A1307 A1308 A1309 G1310 G1311 U1312 U1313 C1314 C1315 U1316 G1317 U1318 C1319 C1320 A1321 A1322 C1323 G1324 U1325 U1326 A1327 A1328 U1329 C1330 G1331 G1332 G1333 G1334 C1335 A1336 G1337 G1338 G1339 U1340 A1341 A1342

• Molecule 13: 23S ribosomal RNA

Chain 3:
45% 48% 7%

A1515 G1516 G1517 C1518 G1519 U1520 G1521 A1522 U1523 G1524 A1525 C1526 G1527 A1528 C1529 G1530 C1531 A1532 C1533 U1534 A1535 C1536 G1537 G1538 U1539 G1540 C1541 U1542 G1543 A1544 A1545 G1546 C1547 A1548 A1549 C1550 A1551 C1552 A1553 U1554 G1555 C1556 C1557 C1558

• Molecule 14: 23S ribosomal RNA

Chain 4:
23% 50% 27%

C2091 U2092 G2093 A2094 A2095 C2096 A2097 U2098 U2099 G2100 A2101 G2102 C2103 C2104 U2105 U2106 G2107 A2108 U2109 C2110 U2111 G2112 U2113 A2114 G2115 C2116 A2117 U2118 A2119 C2120 G2121 U2122 A2123 G2124 G2125 A2126 G2127 U2128 C2129 U2130 U2131 U2132 G2133 A2134 A2135 U2136 U2137 G2138 U2139 G2140 A2141 A2142 C2143 G2144 C2145 A2146 A2147 G2148 U2149 C2150

U2151 G2152 C2153 A2154 U2155 G2156 G2157 A2158 G2159 C2160 C2161 G2162 A2163 C2164 C2165 U2166 G2167 U2168 A2169 A2170 U2171 U2172 A2173 C2174 C2175 A2176 C2177 C2178 C2179 U2180 U2181 U2182 A2183 A2184 U2185 G2186 U2187 U2188 U2189 G2190 A2191 U2192 G2193 U2194 U2195 C2196 U2197 A2198 A2199

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	53000	Depositor
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	per micrograph	Depositor
Microscope	FEI TECNAI F20	Depositor
Voltage (kV)	160	Depositor
Electron dose $(e^-/Å^2)$	20	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	42000	Depositor
Image detector	KODAK SO-163 FILM	Depositor
Maximum map value	3.245	Depositor
Minimum map value	-0.464	Depositor
Average map value	0.072	Depositor
Map value standard deviation	0.294	Depositor
Recommended contour level	0.8	Depositor
Map size (Å)	407.03998, 407.03998, 407.03998	wwPDB
Map dimensions	192, 192, 192	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.12, 2.12, 2.12	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MIA, ACE, NH2

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	y	1.71	27/3434 (0.8%)	2.07	97/4657 (2.1%)
2	E	1.70	3/437 (0.7%)	2.26	24/596 (4.0%)
3	G	1.65	3/463 (0.6%)	2.12	17/622 (2.7%)
4	n	1.63	2/774 (0.3%)	1.60	14/1048 (1.3%)
5	p	3.30	222/1810 (12.3%)	3.82	397/2820 (14.1%)
6	a	0.35	0/1783	0.77	4/2776 (0.1%)
7	5	1.66	11/1748 (0.6%)	1.92	30/2355 (1.3%)
8	T	0.98	0/794	1.09	1/1060 (0.1%)
9	U	0.96	0/797	1.04	0/1062
10	Y	1.00	0/510	0.90	0/677
11	1	1.62	1/1511 (0.1%)	2.50	178/2354 (7.6%)
12	2	1.63	1/867 (0.1%)	2.45	97/1351 (7.2%)
13	3	3.35	127/1062 (12.0%)	3.85	256/1655 (15.5%)
14	4	3.46	373/2599 (14.4%)	3.88	636/4049 (15.7%)
All	All	2.21	770/18589 (4.1%)	2.66	1751/27082 (6.5%)

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	y	2	18
2	E	0	2
3	G	0	1
4	n	3	0
5	p	0	29
6	a	0	1
7	5	0	3
9	U	0	1
11	1	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
12	2	0	2
13	3	0	19
14	4	0	63
All	All	5	141

The worst 5 of 770 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	n	99	ALA	C-N	31.42	1.89	1.33
13	3	1516	G	O3'-P	25.56	1.91	1.61
4	n	22	TYR	C-N	22.00	1.84	1.34
13	3	1551	A	O3'-P	17.96	1.82	1.61
14	4	2098	U	C2-N3	14.56	1.48	1.37

The worst 5 of 1751 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	p	19	G	N1-C6-O6	24.02	134.31	119.90
14	4	2108	A	N1-C6-N6	22.36	132.01	118.60
5	p	18	G	N1-C6-O6	20.82	132.39	119.90
5	p	37	A	N1-C6-N6	20.71	131.02	118.60
13	3	1535	A	N1-C6-N6	20.48	130.89	118.60

All (5) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	y	55	GLN	CA
1	y	56	GLN	CA
4	n	38	LEU	CA
4	n	39	HIS	CA
4	n	40	GLN	CA

5 of 141 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	y	22	ARG	Sidechain
1	y	34	ARG	Sidechain
1	y	38	PHE	Sidechain
1	y	45	ASP	Sidechain
1	y	57	ARG	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	y	3361	0	3514	0	0
2	E	433	0	466	22	0
3	G	461	0	485	7	0
4	n	760	0	742	0	0
5	p	1621	0	818	0	0
6	a	1626	0	833	0	0
7	5	1733	0	1824	8	0
8	T	787	0	844	20	0
9	U	789	0	847	0	0
10	Y	509	0	543	0	0
11	1	1350	0	678	2	0
12	2	775	0	389	0	0
13	3	948	0	478	0	0
14	4	2325	0	1168	8	0
All	All	17478	0	13629	45	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 20.

The worst 5 of 45 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)
2:E:81:LYS:HD2	8:T:93:LEU:CD1	1.30	1.62
2:E:81:LYS:CD	8:T:93:LEU:HD12	1.04	1.51
2:E:81:LYS:CD	8:T:93:LEU:CD1	1.94	1.21
2:E:81:LYS:HZ3	8:T:93:LEU:CG	1.57	1.17
2:E:81:LYS:CE	8:T:93:LEU:HD12	1.77	1.13

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	
1	y	435/437 (100%)	392 (90%)	18 (4%)	25 (6%)	1	18
2	E	54/56 (96%)	49 (91%)	4 (7%)	1 (2%)	8	38
3	G	65/67 (97%)	57 (88%)	4 (6%)	4 (6%)	1	17
4	n	99/101 (98%)	42 (42%)	26 (26%)	31 (31%)	0	0
7	5	232/234 (99%)	198 (85%)	25 (11%)	9 (4%)	3	23
8	T	98/100 (98%)	71 (72%)	20 (20%)	7 (7%)	1	14
9	U	101/103 (98%)	84 (83%)	14 (14%)	3 (3%)	4	28
10	Y	61/63 (97%)	48 (79%)	11 (18%)	2 (3%)	4	26
All	All	1145/1161 (99%)	941 (82%)	122 (11%)	82 (7%)	2	14

5 of 82 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	y	45	ASP
1	y	56	GLN
1	y	258	TYR
1	y	266	PRO
1	y	298	THR

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	y	353/353 (100%)	330 (94%)	23 (6%)	17	42

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	E	47/47 (100%)	45 (96%)	2 (4%)	29	53
3	G	46/46 (100%)	39 (85%)	7 (15%)	3	14
4	n	77/77 (100%)	61 (79%)	16 (21%)	1	6
7	5	181/181 (100%)	170 (94%)	11 (6%)	18	44
8	T	84/84 (100%)	79 (94%)	5 (6%)	19	44
9	U	84/84 (100%)	82 (98%)	2 (2%)	49	69
10	Y	55/55 (100%)	54 (98%)	1 (2%)	59	77
All	All	927/927 (100%)	860 (93%)	67 (7%)	18	39

5 of 67 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
7	5	144	THR
8	T	36	LYS
9	U	91	LYS
2	E	94	THR
2	E	77	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
7	5	165	ASN
7	5	168	ASN
9	U	52	ASN
8	T	70	HIS
4	n	39	HIS

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	1	62/63 (98%)	13 (20%)	1 (1%)
12	2	35/36 (97%)	8 (22%)	1 (2%)
13	3	43/44 (97%)	7 (16%)	2 (4%)
14	4	108/109 (99%)	39 (36%)	8 (7%)
5	p	75/76 (98%)	17 (22%)	0
6	a	74/76 (97%)	28 (37%)	0
All	All	397/404 (98%)	112 (28%)	12 (3%)

5 of 112 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
5	p	2	C
5	p	4	G
5	p	5	G
5	p	7	A
5	p	8	U

5 of 12 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
14	4	2147	A
14	4	2152	G
14	4	2172	U
14	4	2157	G
13	3	1551	A

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

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
6	MIA	a	37	6	24,31,32	1.85	4 (16%)	26,44,47	3.11	6 (23%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	MIA	a	37	6	-	2/11/33/34	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	a	37	MIA	C13-C14	6.42	1.50	1.32
6	a	37	MIA	C2-S10	4.22	1.79	1.75
6	a	37	MIA	C12-C13	-2.87	1.35	1.48
6	a	37	MIA	C8-N7	-2.06	1.31	1.34

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	a	37	MIA	C11-S10-C2	10.57	110.16	102.27
6	a	37	MIA	C12-N6-C6	-8.85	109.44	122.55
6	a	37	MIA	C5-C6-N1	-3.69	117.74	120.81
6	a	37	MIA	C2-N3-C4	-3.30	110.78	115.32
6	a	37	MIA	C12-C13-C14	-3.28	120.76	127.14

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	a	37	MIA	N6-C12-C13-C14
6	a	37	MIA	C3'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
13	3	2
4	n	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	3	1516:G	O3'	1517:G	P	1.91
1	n	99:ALA	C	100:GLY	N	1.89
1	n	22:TYR	C	23:GLU	N	1.84
1	3	1551:A	O3'	1552:A	P	1.82

6   Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-5693. 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 |
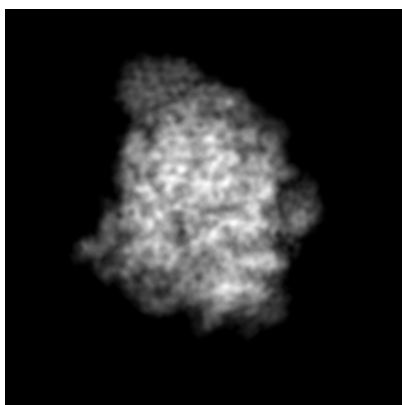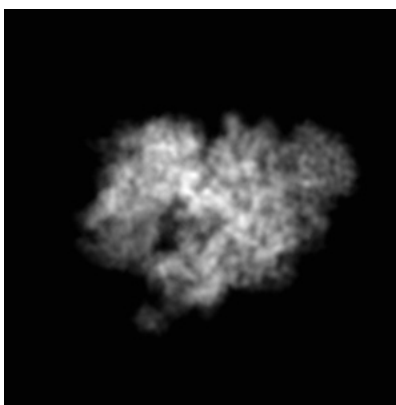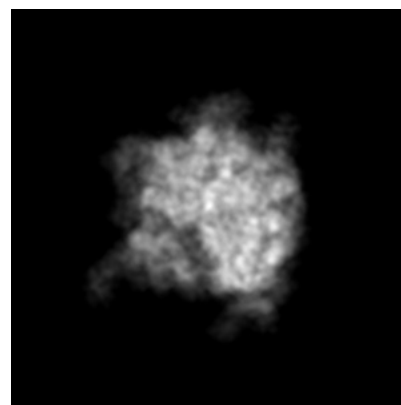
The images above show the map projected in three orthogonal directions.

6.2   Central slices ⓘ
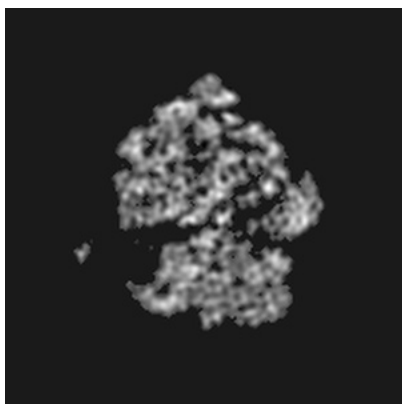
6.2.1   Primary map
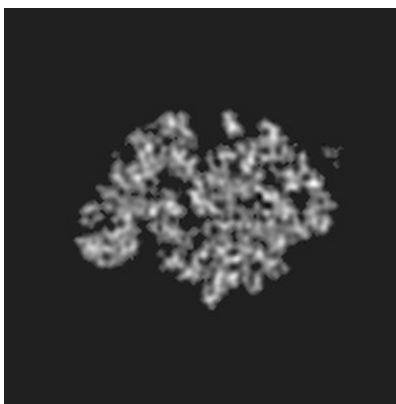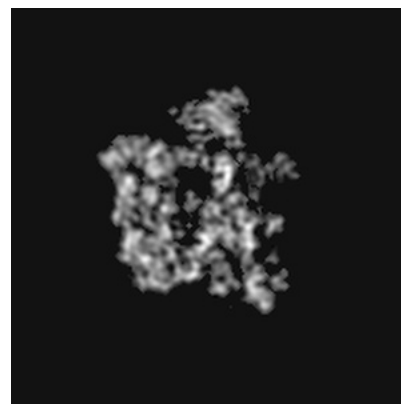
| X Index: 96 | Y Index: 96 | Z Index: 96 |

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

6.3 Largest variance slices ⓘ
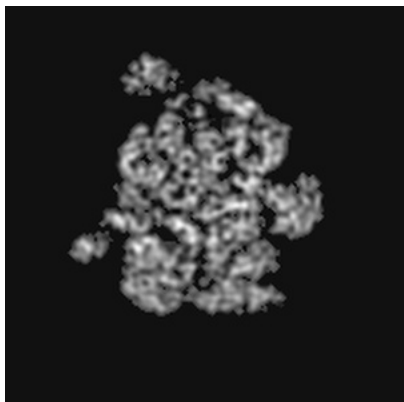
6.3.1 Primary map
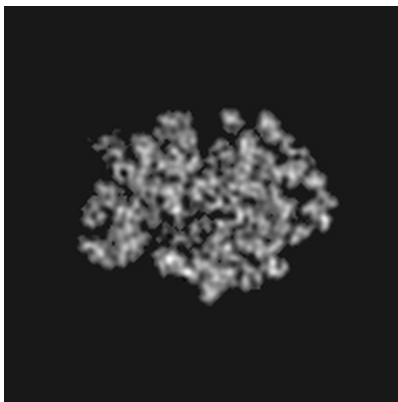
| X Index: 103 | Y Index: 99 | Z Index: 89 |
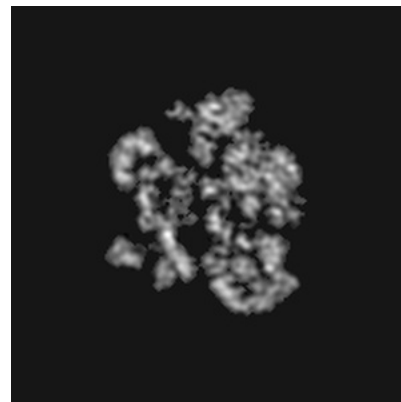
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views ⓘ

6.4.1 Primary map

| X | Y | Z |
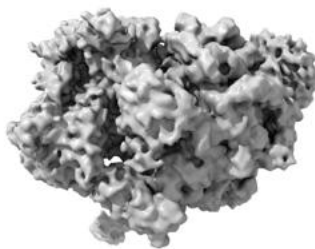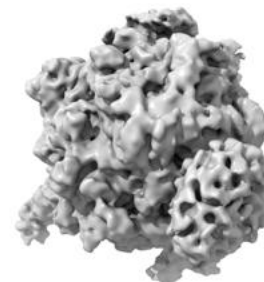
The images above show the 3D surface view of the map at the recommended contour level 0.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5 Mask visualisation ⓘ

This section was not generated.

7　Map analysis ⓘ

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

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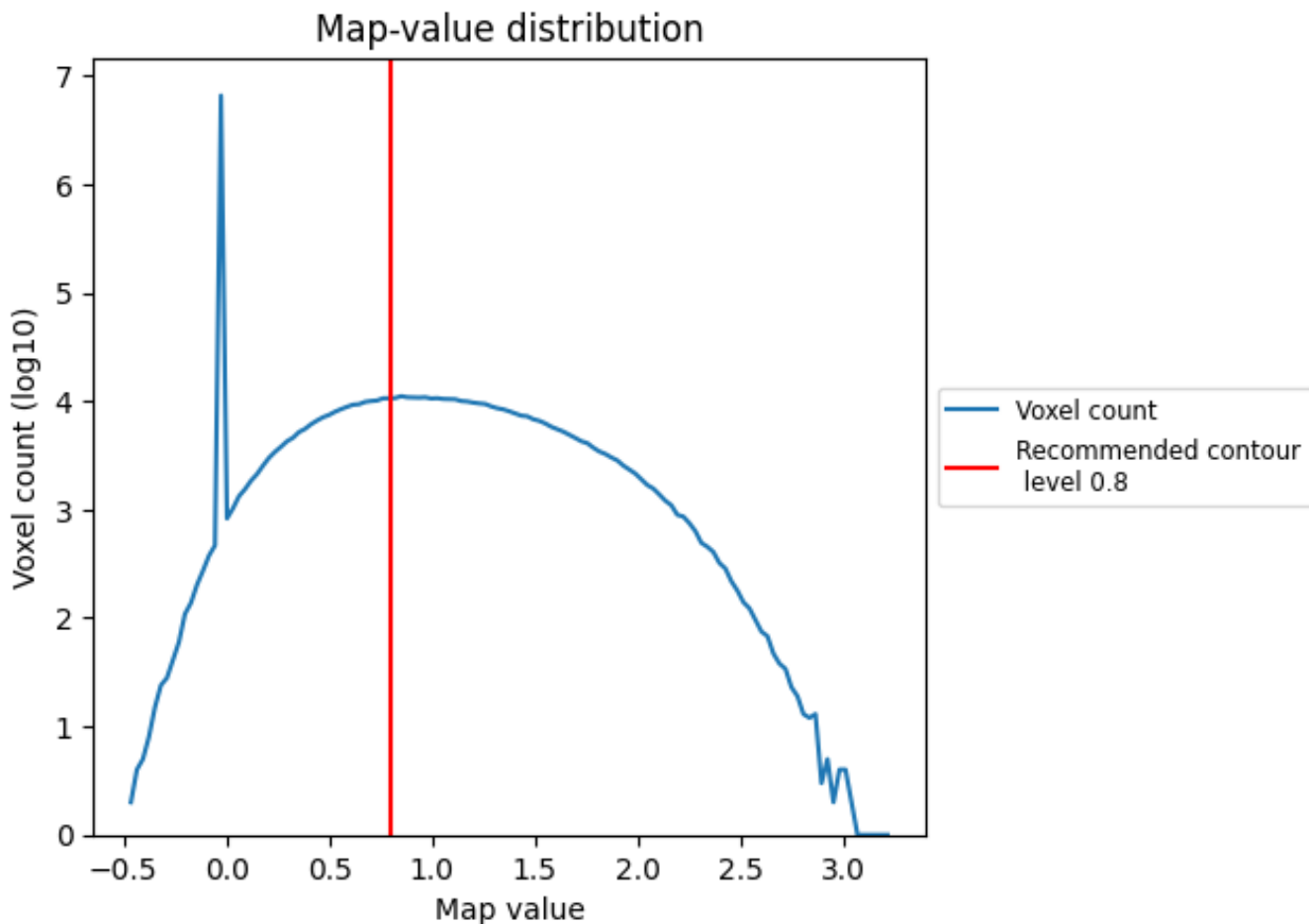
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
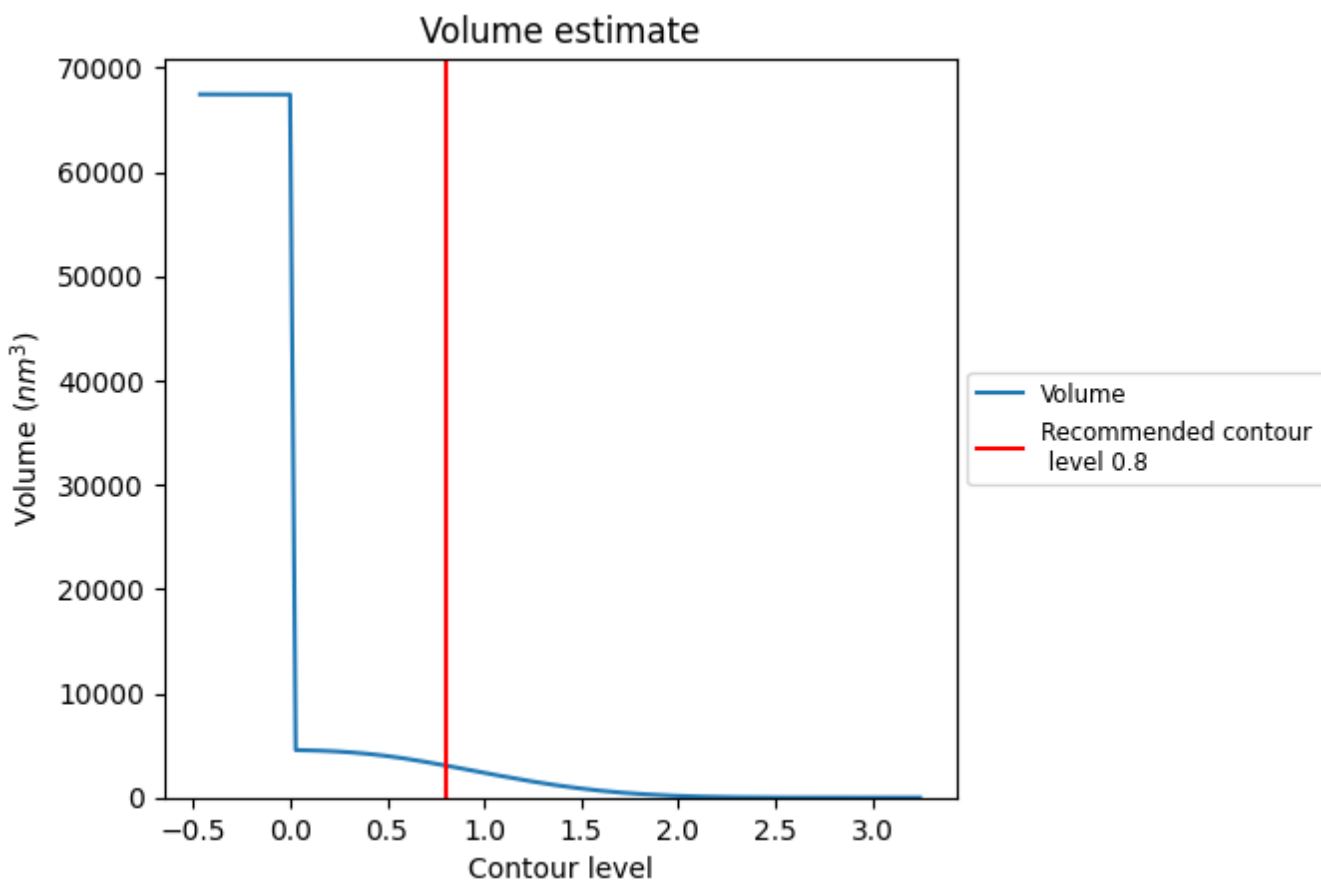
The volume at the recommended contour level is 3075 nm^3; this corresponds to an approximate mass of 2778 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ
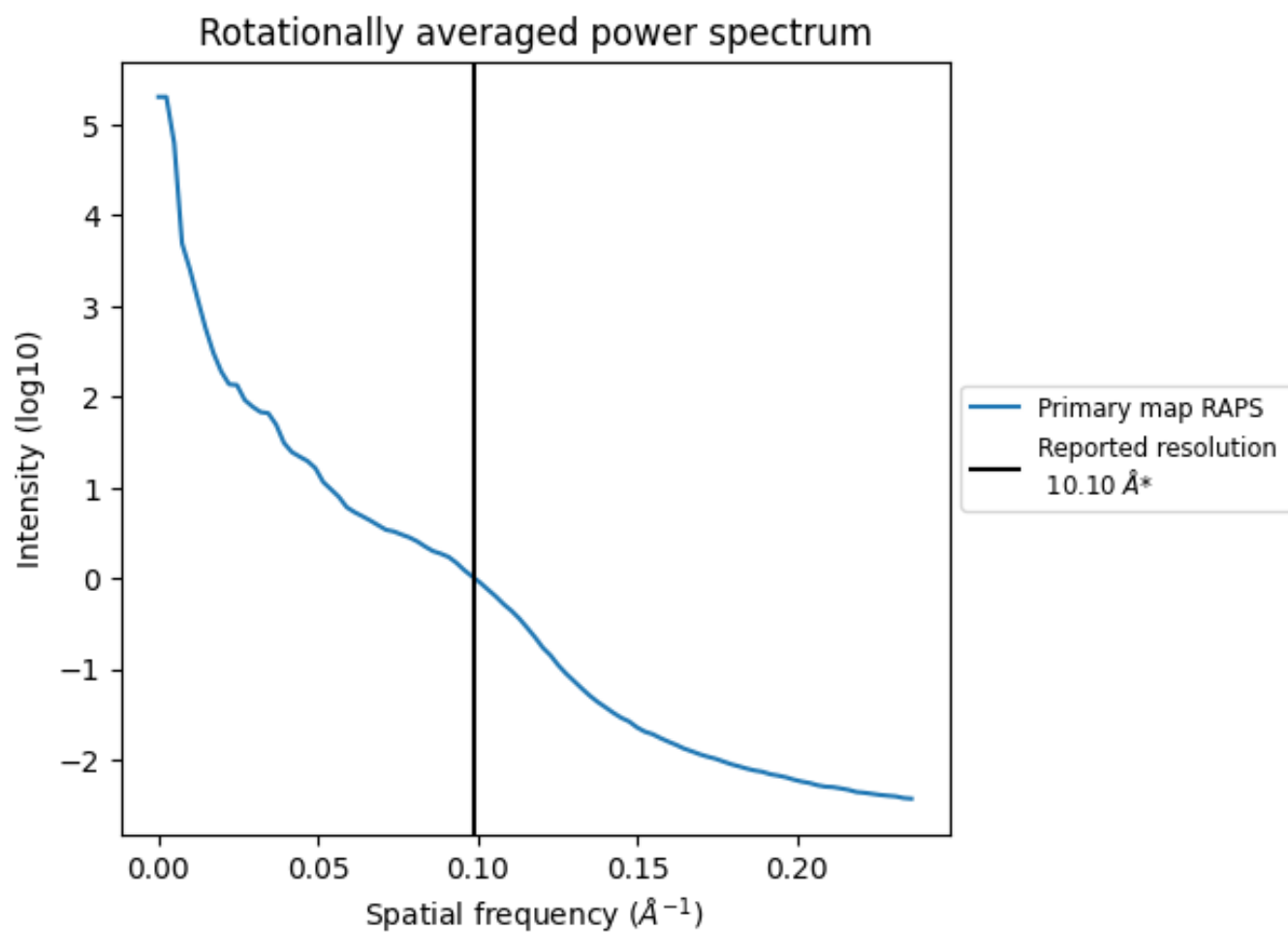
*Reported resolution corresponds to spatial frequency of 0.099 Å^{-1}

8 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-5693 and PDB model 3J46. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay ⓘ

X   Y   Z
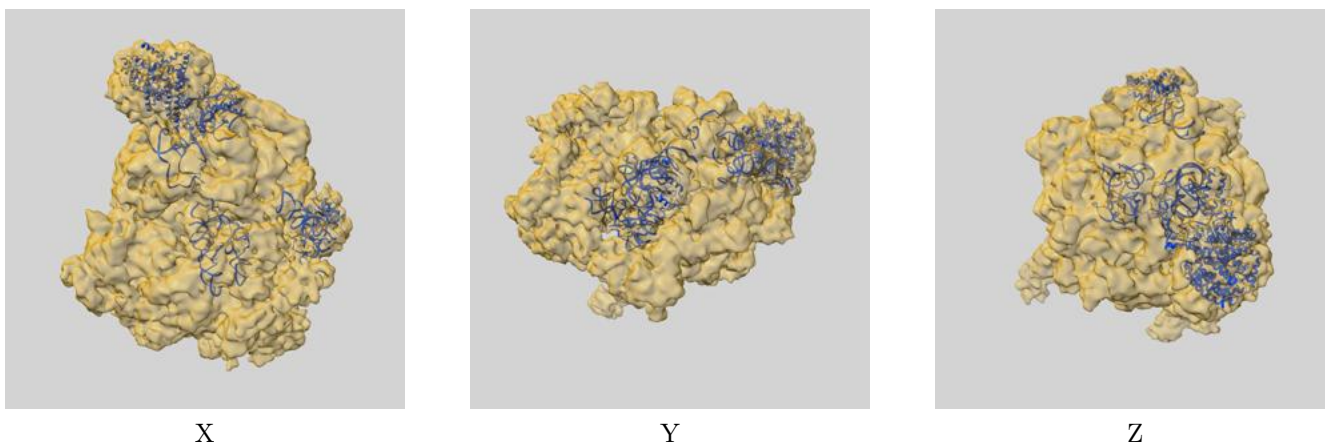
The images above show the 3D surface view of the map at the recommended contour level 0.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ
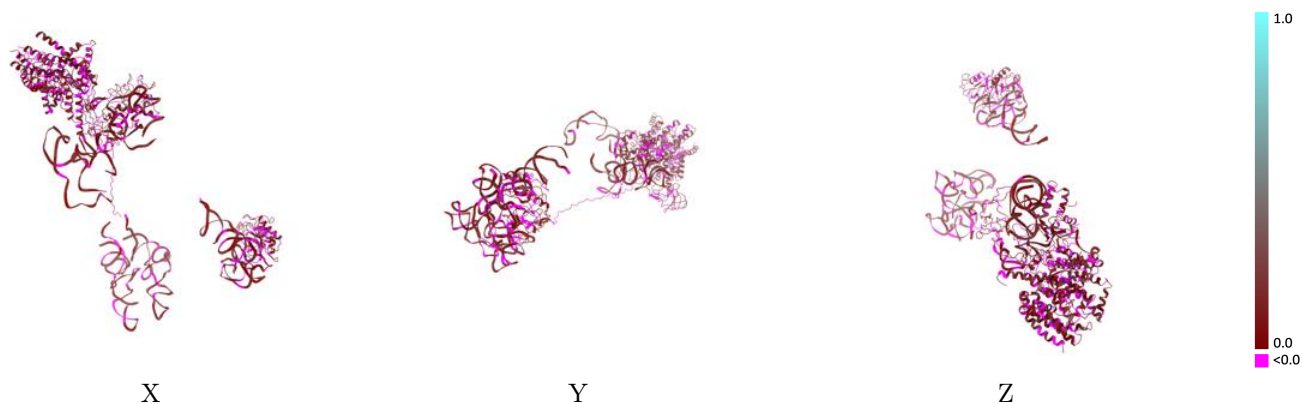
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 ⓘ
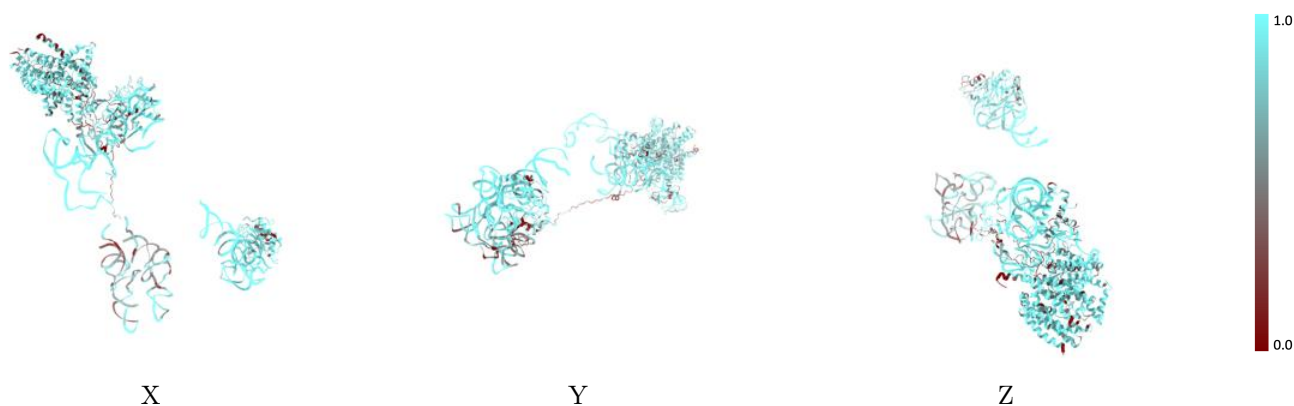
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.8).

9.4   Atom inclusion ⓘ
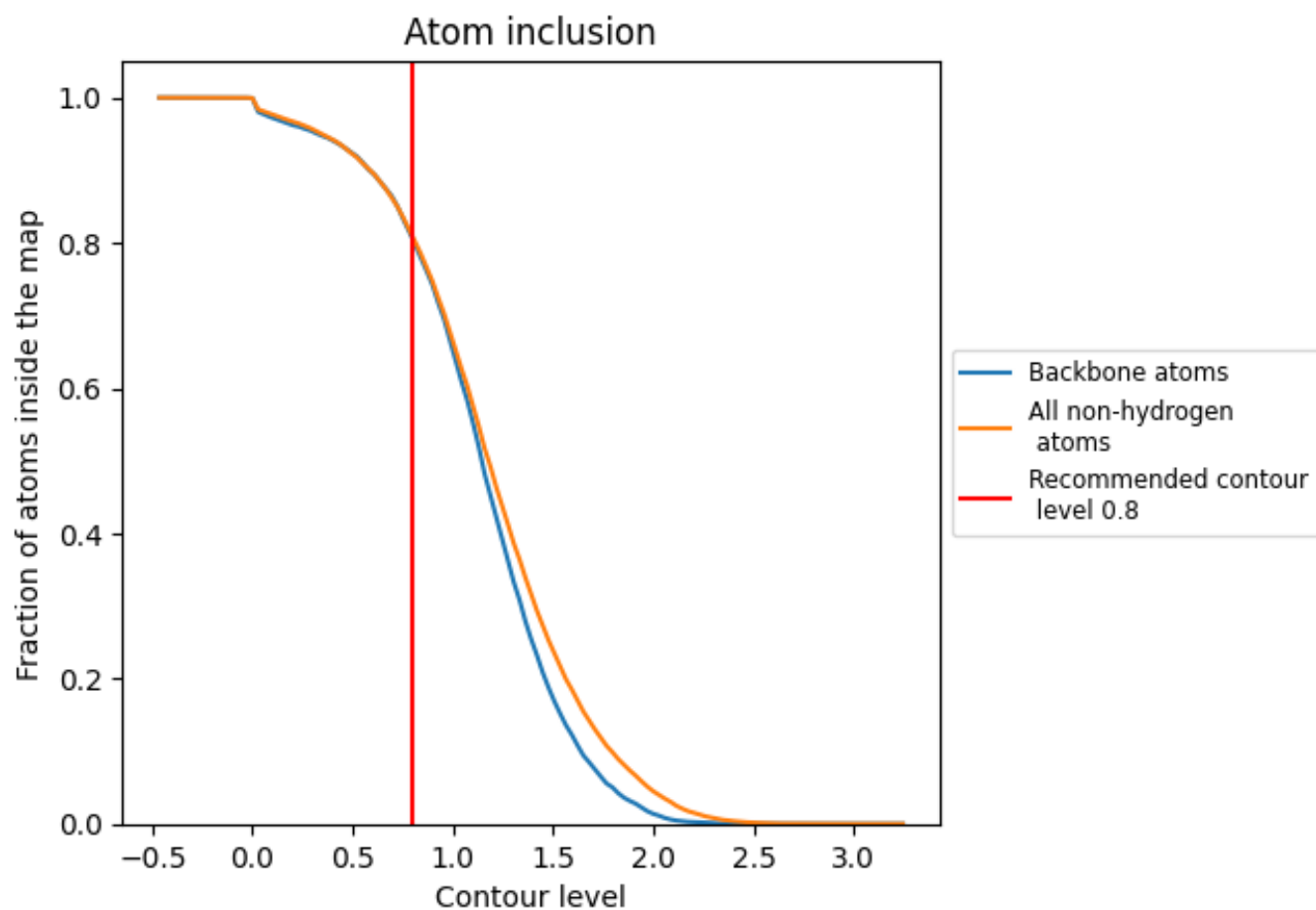
At the recommended contour level, 81% of all backbone atoms, 81% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8085	0.0790
1	0.9526	0.1260
2	0.9548	0.1000
3	0.9589	0.1440
4	0.9630	0.0950
5	0.8074	0.0590
E	0.7238	0.0410
G	0.8581	0.0510
T	0.7276	0.0700
U	0.8108	0.0750
Y	0.7907	0.0870
a	0.6292	0.0690
n	0.5294	-0.0090
p	0.6582	0.0960
y	0.8141	0.0630

1.0

0.0
<0.0