wwPDB EM Validation Summary Report ⓘ

Aug 4, 2025 – 11:04 AM EDT

PDB ID	:	8W2N / pdb_00008w2n
EMDB ID	:	EMD-43752
Title	:	E. coli 70S ribosome with unmodified Lys-tRNAPro(GGG) in the P/P conformation on a slippery CCC-C codon and Elongation Factor P bound (uL1 in the open conformation)
Authors	:	Kimbrough, E.M.; Dunham, C.M.; Nguyen, H.A.
Deposited on	:	2024-02-20
Resolution	:	3.20 Å(reported)

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

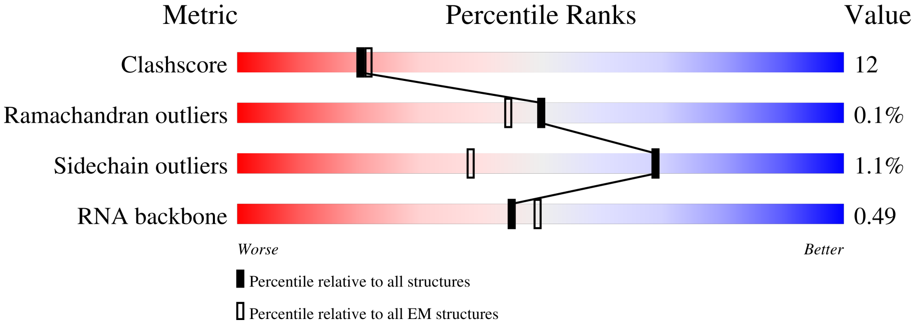
EMDB validation analysis	:	0.0.1.dev126
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

1 Overall quality at a glance ⓘ

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

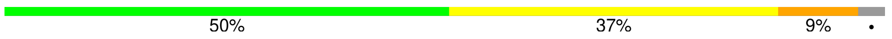
The reported resolution of this entry is 3.20 Å.

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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	1	2904	
2	2	1540	
3	3	120	
4	4	18	
5	5	77	
6	6	188	
7	B	273	

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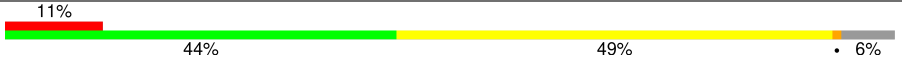
Mol	Chain	Length	Quality of chain
8	C	209	 75% 24%
9	D	201	 73% 26%
10	E	179	 58% 40%
11	F	177	 67% 31%
12	G	149	 50% 50%
13	J	142	 75% 24%
14	K	123	 79% 21%
15	L	144	 74% 26%
16	M	136	 78% 22%
17	N	127	 68% 26% 6%
18	O	117	 76% 23%
19	P	115	 73% 24%
20	Q	118	 74% 25%
21	R	103	 67% 33%
22	S	110	 65% 35%
23	T	100	 57% 37% 6%
24	U	104	 69% 30%
25	V	94	 63% 37%
26	W	84	 64% 26% 10%
27	X	78	 74% 24%
28	Y	63	 65% 33%
29	Z	59	 68% 31%
30	a	70	 11% 44% 49% 6%
31	b	57	 65% 32%
32	c	55	 62% 33% 5%

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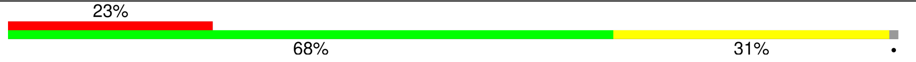
Mol	Chain	Length	Quality of chain
33	d	46	
34	e	65	
35	f	38	
36	g	241	
37	h	233	
38	i	206	
39	j	167	
40	k	135	
41	l	179	
42	m	130	
43	n	130	
44	o	103	
45	p	129	
46	q	124	
47	r	118	
48	s	101	
49	t	89	
50	u	82	
51	v	84	
52	w	75	
53	x	92	
54	y	87	
55	z	71	

2 Entry composition (i)

There are 57 unique types of molecules in this entry. The entry contains 145329 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 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	2815	60445	26964	11140	19526	2815	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	747	C	U	conflict	GB 1914786293
1	887	A	U	conflict	GB 1914786293
1	1847	G	A	conflict	GB 1914786293
1	2069	A	G	conflict	GB 1914786293

- Molecule 2 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	1532	32887	14674	6033	10648	1532	0	0

- Molecule 3 is a RNA chain called 5S mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	3	120	2569	1144	468	837	120	0	0

- Molecule 4 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	4	6	125	56	21	42	6	0	0

- Molecule 5 is a RNA chain called tRNA^ProL (GGG).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	5	77	1648	733	297	541	77	0	0

- Molecule 6 is a protein called Elongation factor P.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	6	188	1461	928	242	286	5	0	0

- Molecule 7 is a protein called 50S ribosomal protein L2.

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

- Molecule 8 is a protein called 50S ribosomal protein L3.

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

- Molecule 9 is a protein called 50S ribosomal protein L4.

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

- Molecule 10 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	E	177	1410	899	249	256	6	0	0

- Molecule 11 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	175	1313	826	241	244	2	0	0

- Molecule 12 is a protein called 50S ribosomal protein L9.

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

- Molecule 13 is a protein called 50S ribosomal protein L13.

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

- Molecule 14 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	K	123	946	593	181	166	6	0	0

- Molecule 15 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	L	144	1053	654	207	190	2	0	0

- Molecule 16 is a protein called 50S ribosomal protein L16.

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

- Molecule 17 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	N	119	951	588	195	163	5	0	0

- Molecule 18 is a protein called 50S ribosomal protein L18.

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

- Molecule 19 is a protein called 50S ribosomal protein L19.

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

- Molecule 20 is a protein called 50S ribosomal protein L20.

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

- Molecule 21 is a protein called 50S ribosomal protein L21.

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

- Molecule 22 is a protein called 50S ribosomal protein L22.

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

- Molecule 23 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	T	94	746	470	140	134	2	0	0

- Molecule 24 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	U	103	788	498	148	142	0	0

- Molecule 25 is a protein called 50S ribosomal protein L25.

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

- Molecule 26 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	W	76	582	360	117	104	1	0	0

- Molecule 27 is a protein called 50S ribosomal protein L28.

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

- Molecule 28 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	Y	62	501	308	98	94	1	0	0

- Molecule 29 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Z	58	448	281	87	78	2	0	0

- Molecule 30 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	a	66	522	323	99	94	6	0	0

- Molecule 31 is a protein called 50S ribosomal protein L32.

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

- Molecule 32 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	c	52	426	275	78	73	0	0

- Molecule 33 is a protein called 50S ribosomal protein L34.

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

- Molecule 34 is a protein called 50S ribosomal protein L35.

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

- Molecule 35 is a protein called 50S ribosomal protein L36.

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

- Molecule 36 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	g	225	1760	1113	316	323	8	0	0

- Molecule 37 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	h	208	1636	1036	307	290	3	0	0

- Molecule 38 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	i	205	1643	1026	315	298	4	0	0

- Molecule 39 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	j	156	1152	717	217	212	6	0	0

- Molecule 40 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	k	104	848	536	153	152	7	0	0

- Molecule 41 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	l	151	1181	735	227	215	4	0	0

- Molecule 42 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	m	129	979	616	173	184	6	0	0

- Molecule 43 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	n	127	1022	634	206	179	3	0	0

- Molecule 44 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	o	99	790	495	151	143	1	0	0

- Molecule 45 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	p	117	877	540	174	160	3	0	0

- Molecule 46 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	q	123	957	591	196	165	5	0	0

- Molecule 47 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	r	116	Total	C	N	O	S	0	0
			900	558	181	158	3		

- Molecule 48 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	s	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 49 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	t	88	Total	C	N	O	S	0	0
			714	439	144	130	1		

- Molecule 50 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	u	82	Total	C	N	O	S	0	0
			649	406	128	114	1		

- Molecule 51 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	v	80	Total	C	N	O	S	0	0
			648	411	121	113	3		

- Molecule 52 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	w	66	Total	C	N	O	S	0	0
			544	344	102	97	1		

- Molecule 53 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	x	83	Total	C	N	O	S	0	0
			663	424	126	111	2		

- Molecule 54 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	y	86	Total 669	C 414	N 138	O 114	S 3	0	0

- Molecule 55 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	z	70	Total 589	C 366	N 125	O 97	S 1	0	0

- Molecule 56 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
56	1	290	Total 290	Mg 290	0
56	2	138	Total 138	Mg 138	0
56	3	10	Total 10	Mg 10	0
56	B	3	Total 3	Mg 3	0
56	C	2	Total 2	Mg 2	0
56	D	4	Total 4	Mg 4	0
56	E	1	Total 1	Mg 1	0
56	J	1	Total 1	Mg 1	0
56	L	2	Total 2	Mg 2	0
56	M	1	Total 1	Mg 1	0
56	P	2	Total 2	Mg 2	0
56	Q	2	Total 2	Mg 2	0
56	R	2	Total 2	Mg 2	0
56	S	1	Total 1	Mg 1	0
56	T	1	Total 1	Mg 1	0
56	Z	2	Total 2	Mg 2	0

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Mol	Chain	Residues	Atoms	AltConf
56	b	2	Total Mg 2 2	0
56	d	1	Total Mg 1 1	0
56	e	3	Total Mg 3 3	0
56	f	2	Total Mg 2 2	0
56	i	3	Total Mg 3 3	0
56	j	2	Total Mg 2 2	0
56	l	2	Total Mg 2 2	0
56	m	2	Total Mg 2 2	0
56	q	1	Total Mg 1 1	0
56	y	1	Total Mg 1 1	0

- Molecule 57 is water.

Mol	Chain	Residues	Atoms	AltConf
57	1	508	Total O 508 508	0
57	2	395	Total O 395 395	0
57	3	17	Total O 17 17	0
57	5	5	Total O 5 5	0
57	C	1	Total O 1 1	0
57	D	2	Total O 2 2	0
57	E	7	Total O 7 7	0
57	F	3	Total O 3 3	0
57	G	4	Total O 4 4	0

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Mol	Chain	Residues	Atoms	AltConf
57	J	2	Total O 2 2	0
57	L	1	Total O 1 1	0
57	N	1	Total O 1 1	0
57	O	1	Total O 1 1	0
57	P	2	Total O 2 2	0
57	T	1	Total O 1 1	0
57	V	2	Total O 2 2	0
57	W	1	Total O 1 1	0
57	X	1	Total O 1 1	0
57	Y	8	Total O 8 8	0
57	Z	1	Total O 1 1	0
57	a	2	Total O 2 2	0
57	c	2	Total O 2 2	0
57	g	10	Total O 10 10	0
57	h	11	Total O 11 11	0
57	i	1	Total O 1 1	0
57	k	5	Total O 5 5	0
57	l	9	Total O 9 9	0
57	m	5	Total O 5 5	0
57	n	4	Total O 4 4	0
57	p	2	Total O 2 2	0

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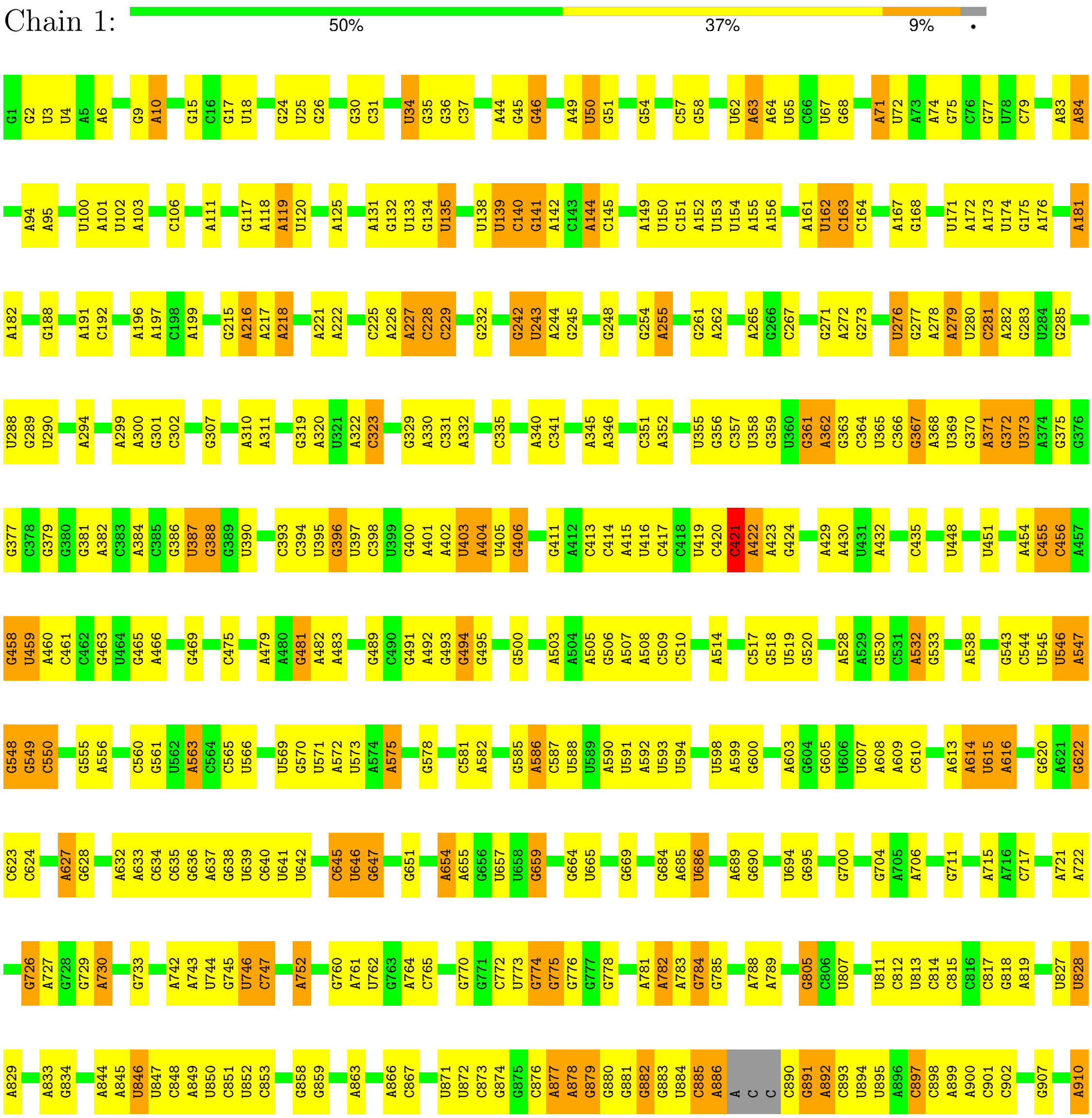
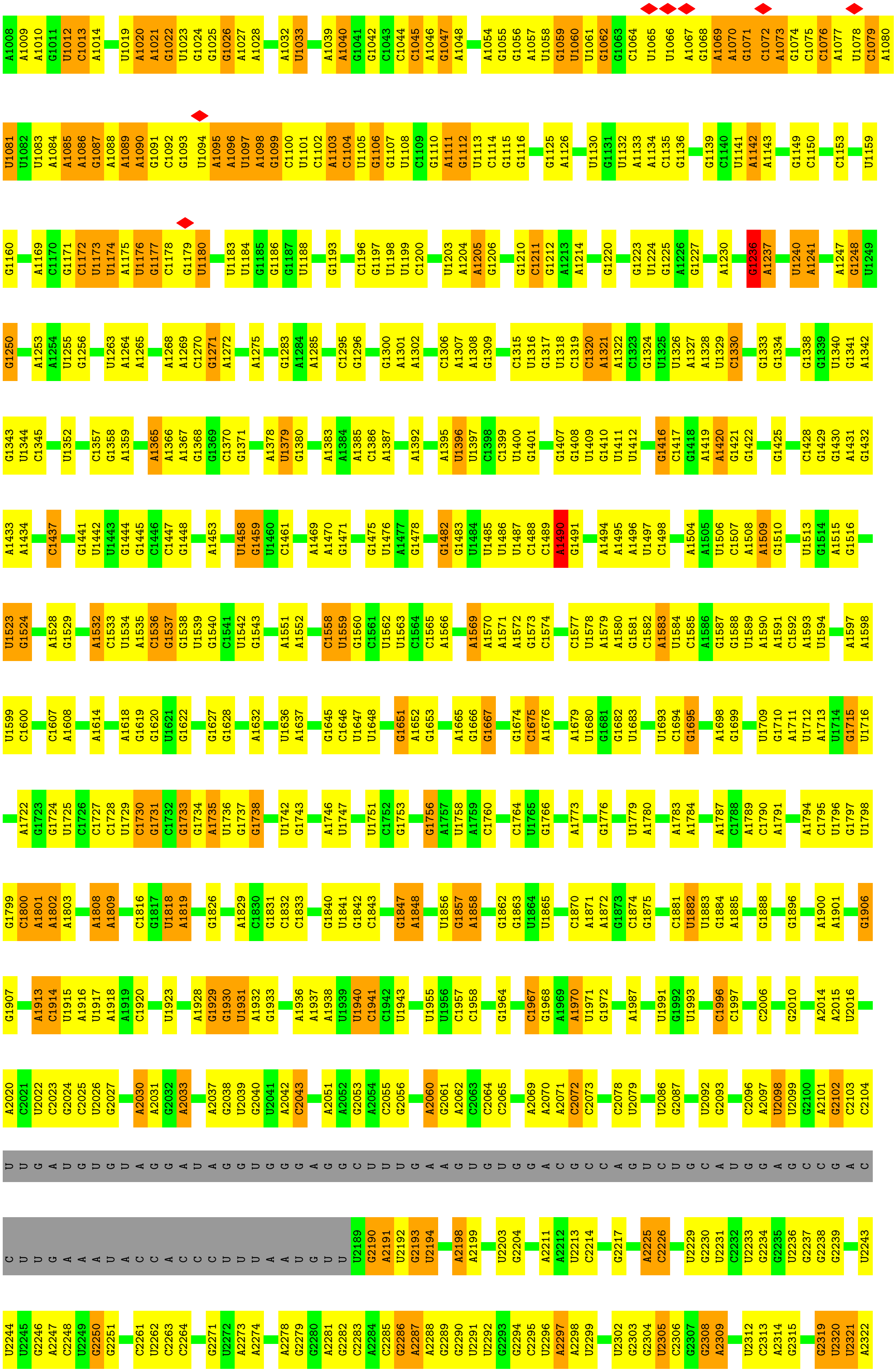
Mol	Chain	Residues	Atoms	AltConf
57	q	3	Total O 3 3	0
57	r	6	Total O 6 6	0
57	s	1	Total O 1 1	0
57	t	5	Total O 5 5	0
57	u	1	Total O 1 1	0
57	v	3	Total O 3 3	0
57	w	6	Total O 6 6	0
57	x	5	Total O 5 5	0
57	y	3	Total O 3 3	0
57	z	7	Total O 7 7	0

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: 23S ribosomal RNA




A1008 A1009 A1010 G1011 U1012 C1013 A1014 U1019 A1020 A1021 G1022 U1023 G1024 G1025 G1026 A1027 A1028 A1032 U1033 A1039 A1040 G1041 G1042 C1043 C1044 C1045 A1046 G1047 A1048 A1054 G1055 G1056 A1057 U1058 G1059 U1060 U1061 G1062 G1063 C1064 U1065 U1066 A1067 G1068 A1069 A1070 G1071 C1072 A1073 G1074 C1075 C1076 A1077 U1078 C1079 A1080
U1081 U1082 U1083 A1084 A1085 A1086 G1087 A1088 A1089 A1090 G1091 C1092 G1093 U1094 A1095 A1096 U1097 A1098 G1099 C1100 U1101 C1102 A1103 C1104 U1105 G1106 G1107 U1108 C1109 G1110 A1111 G1112 U1113 C1114 G1115 G1116 G1125 A1126 U1130 G1131 U1132 A1133 A1134 C1135 G1136 G1139 C1140 U1141 A1142 A1143 G1149 C1150 C1153 U1159
G1160 A1169 C1170 G1171 C1172 U1173 U1174 A1175 U1176 G1177 C1178 G1179 U1180 U1183 U1184 G1185 G1186 G1187 U1188 G1193 C1196 G1197 U1198 U1199 C1200 U1203 A1204 A1205 G1206 G1210 C1211 G1212 A1213 A1214 G1220 G1223 U1224 G1225 A1226 G1227 A1230 G1236 A1237 U1240 A1241 A1247 G1248 U1249
G1250 A1253 A1254 U1255 G1256 U1263 A1264 A1265 A1268 A1269 C1270 G1271 A1272 A1275 G1283 A1284 A1285 C1295 G1296 G1300 A1301 A1302 C1306 A1307 A1308 G1309 C1315 U1316 G1317 U1318 C1319 C1320 A1321 A1322 C1323 G1324 U1325 U1326 A1327 A1328 U1329 C1330 G1333 G1334 G1338 G1339 U1340 G1341 A1342
G1343 U1344 C1345 U1352 C1357 G1358 A1359 A1365 A1366 A1367 G1368 G1369 C1370 G1371 A1378 U1379 G1380 A1383 A1384 A1385 C1386 A1387 A1392 A1395 U1396 U1397 C1398 C1399 U1400 G1401 G1407 G1408 U1409 G1410 U1411 U1412 G1416 C1417 G1418 A1419 A1420 G1421 G1422 G1425 C1428 G1429 G1430 A1431 G1432
A1433 A1434 C1437 G1441 U1442 U1443 G1444 G1445 C1446 C1447 G1448 A1453 U1458 G1459 U1460 C1461 A1469 A1470 G1471 G1475 U1476 A1477 G1478 G1482 G1483 U1484 U1485 U1486 U1487 C1488 C1489 A1490 G1491 A1494 A1495 A1496 U1497 C1498 A1504 A1505 U1506 C1507 A1508 A1509 G1510 U1513 G1514 A1515 G1516
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A1722 G1723 G1724 U1725 C1726 C1727 C1728 U1729 C1730 G1731 C1732 G1733 G1734 A1735 U1736 G1737 G1738 U1742 G1743 A1746 U1747 U1751 C1752 G1753 G1756 A1757 U1758 A1759 C1760 C1764 U1765 G1766 A1773 G1776 U1779 A1780 A1783 A1784 A1787 C1788 A1789 C1790 A1791 A1794 C1795 U1796 G1797 U1798
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G1907 A1913 C1914 U1915 A1916 U1917 A1918 A1919 C1920 U1923 A1928 G1929 G1930 U1931 A1932 G1933 A1936 A1937 A1938 U1939 U1940 C1941 C1942 U1943 U1955 U1956 C1957 C1958 G1964 C1967 G1968 A1969 A1970 U1971 G1972 A1987 U1991 G1992 U1993 C1996 C1997 C2006 G2010 A2014 A2015 U2016
A2020 C2021 U2022 C2023 G2024 C2025 U2026 G2027 A2030 A2031 G2032 A2033 A2037 G2038 U2039 G2040 U2041 A2042 C2043 A2051 A2052 G2053 A2054 C2055 G2056 A2060 G2061 A2062 C2063 C2064 C2065 A2069 A2070 A2071 C2072 C2073 C2078 U2079 U2086 G2087 U2092 G2093 C2096 A2097 U2098 U2099 G2100 A2101 G2102 C2103 C2104
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C U U G A A A U A C C A C C C U U U A A U G U U U2189 G2190 A2191 U2192 G2193 U2194 A2198 A2199 U2203 G2204 A2211 A2212 U2213 C2214 G2217 A2225 C2226 U2229 G2230 U2231 C2232 U2233 G2234 G2235 U2236 G2237 G2238 G2239 U2243
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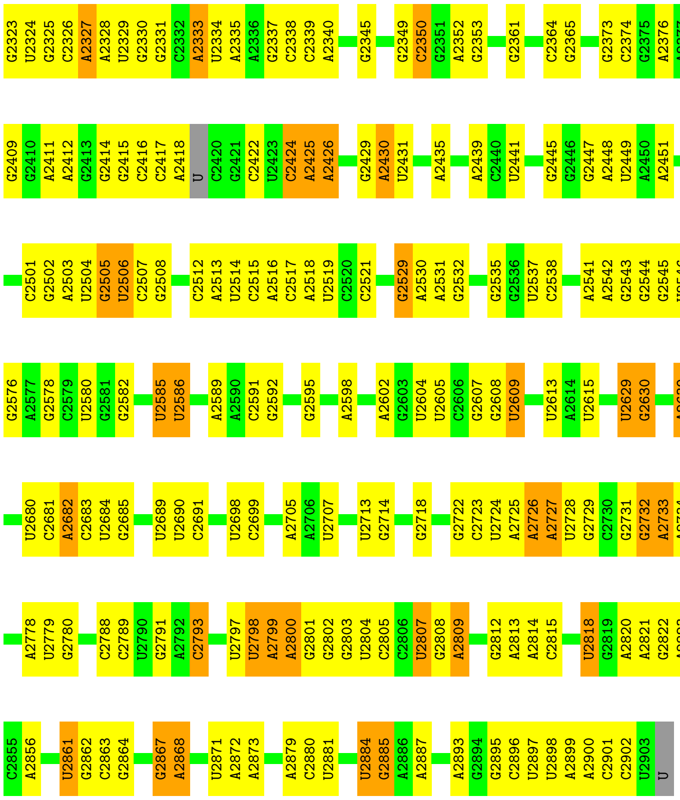
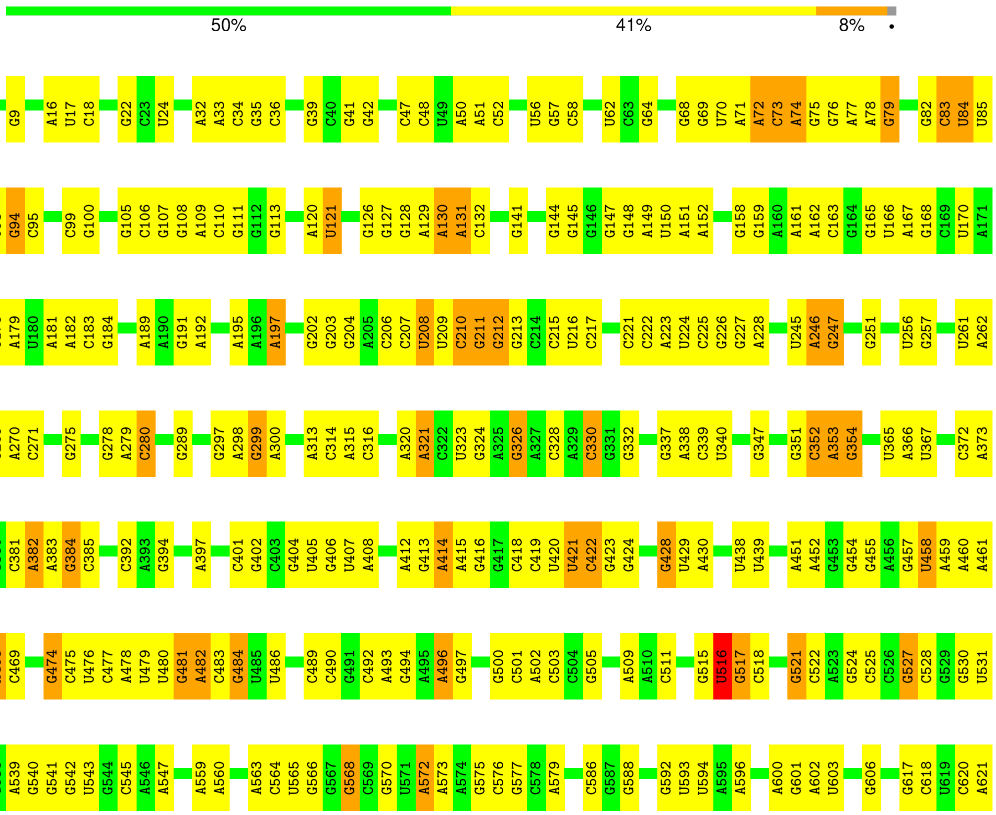
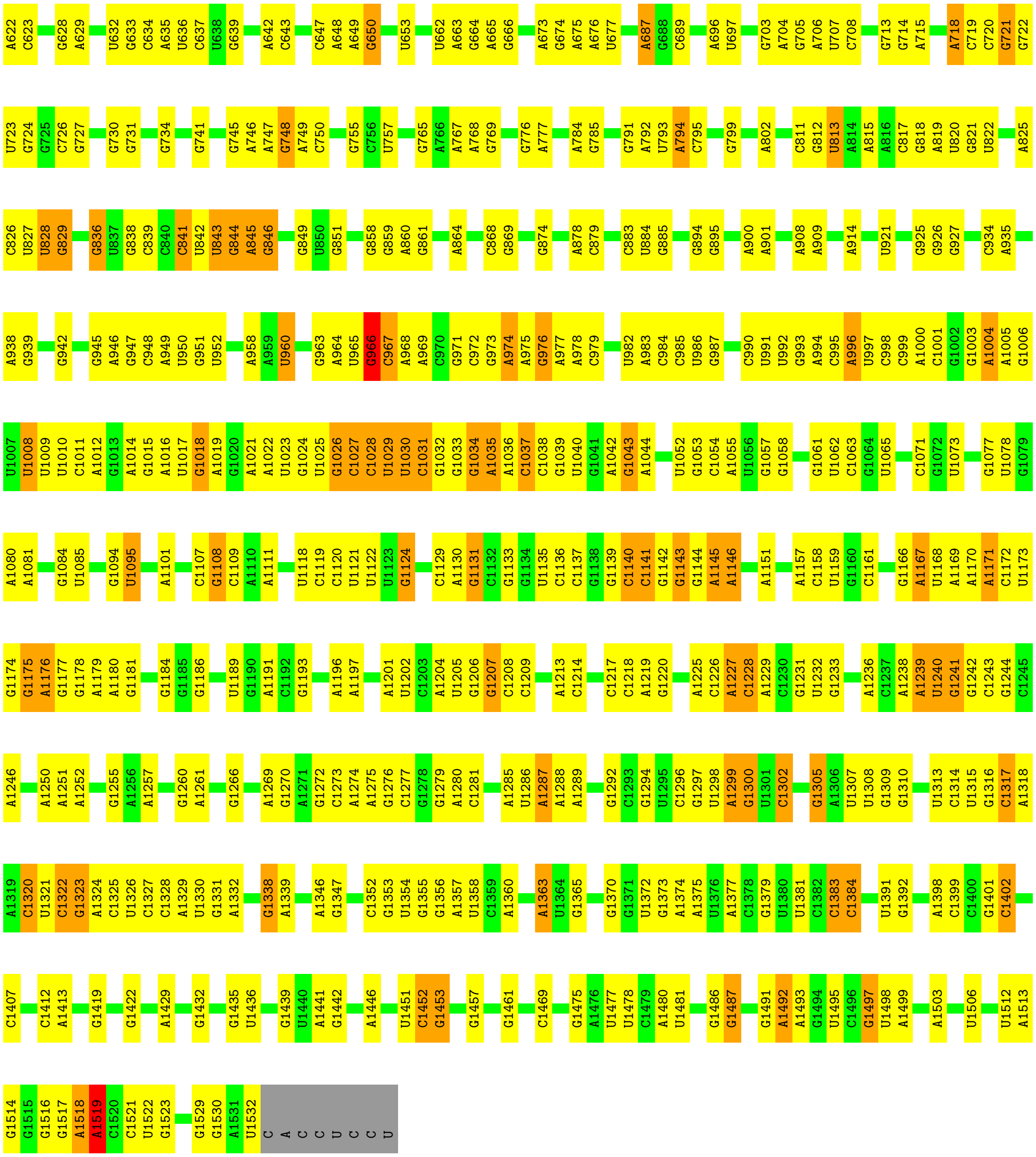


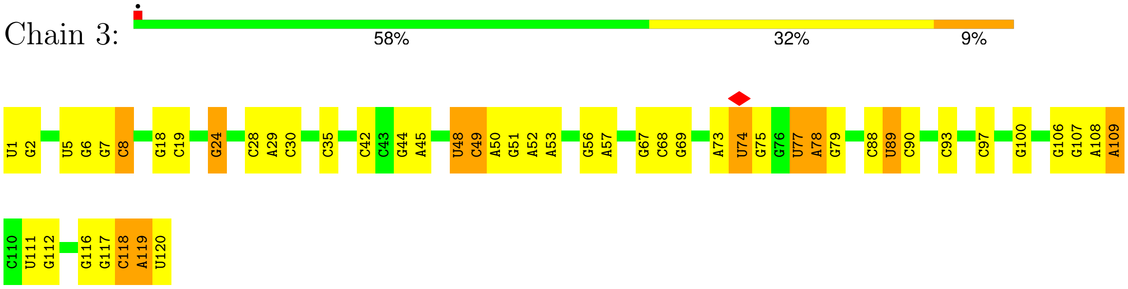
• Molecule 2: 16S ribosomal RNA

Chain 2:

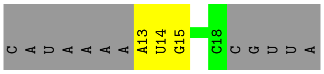




- Molecule 3: 5S mRNA

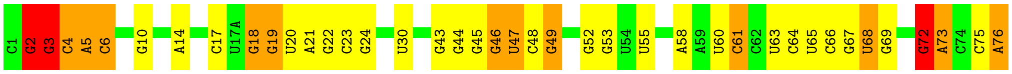


- Molecule 4: mRNA



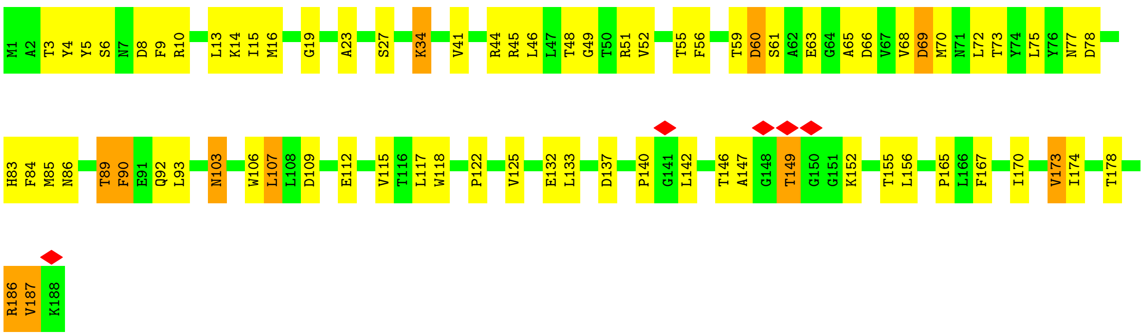
- Molecule 5: tRNA^ProL (GGG)

Chain 5:



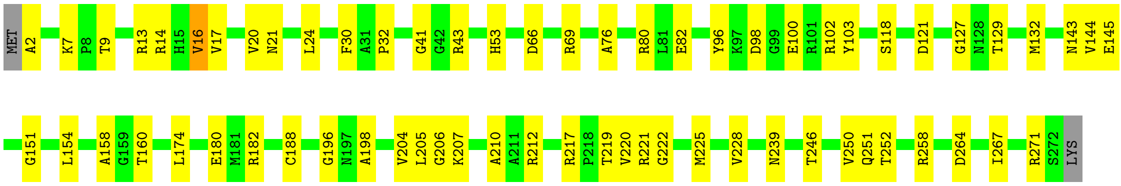
- Molecule 6: Elongation factor P

Chain 6:



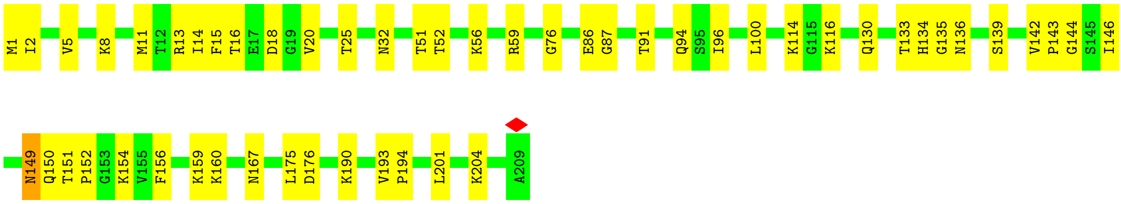
- Molecule 7: 50S ribosomal protein L2

Chain B:



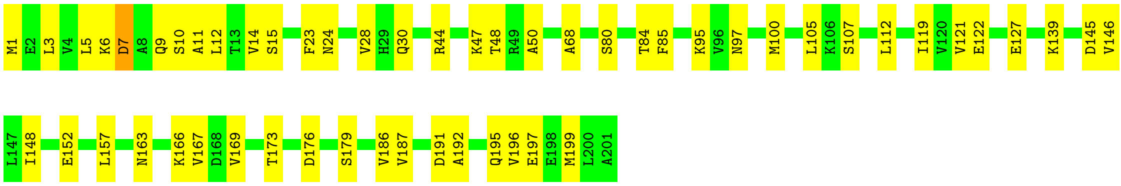
- Molecule 8: 50S ribosomal protein L3

Chain C:



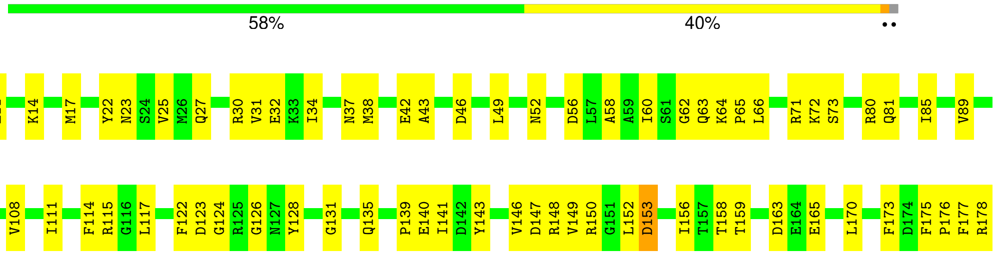
- Molecule 9: 50S ribosomal protein L4

Chain D:



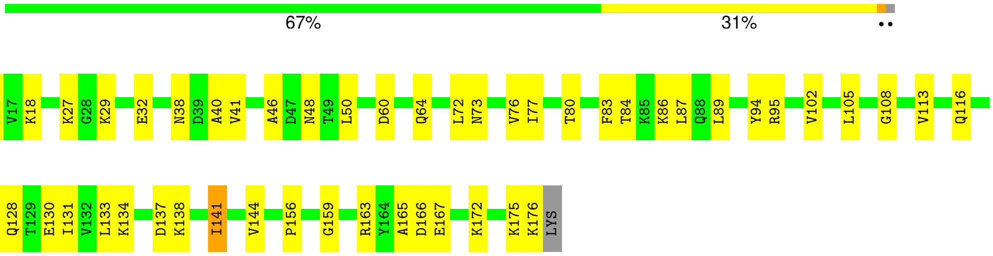
- Molecule 10: 50S ribosomal protein L5

Chain E:



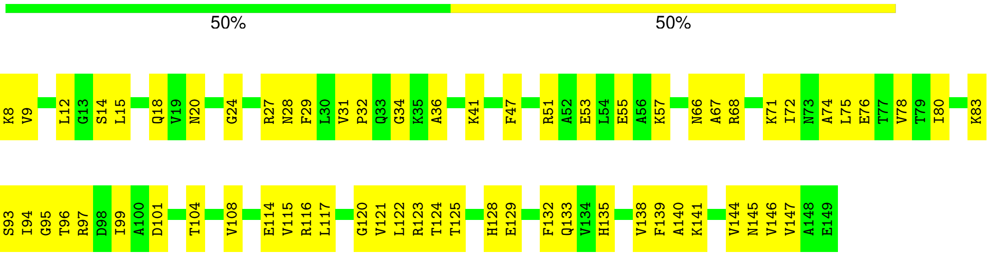
- Molecule 11: 50S ribosomal protein L6

Chain F:



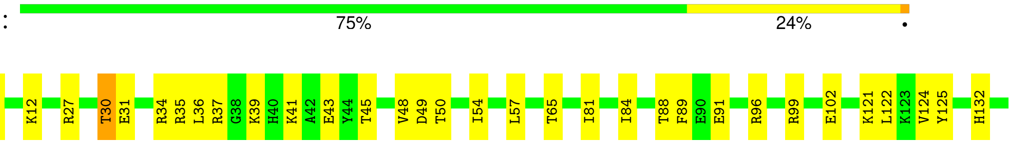
- Molecule 12: 50S ribosomal protein L9

Chain G:

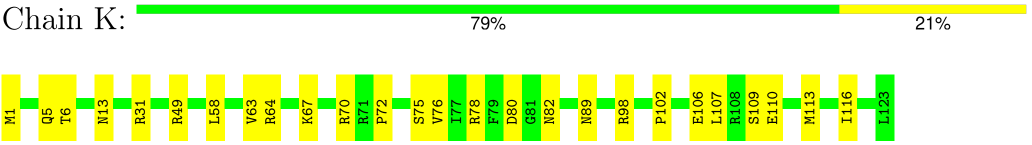


- Molecule 13: 50S ribosomal protein L13

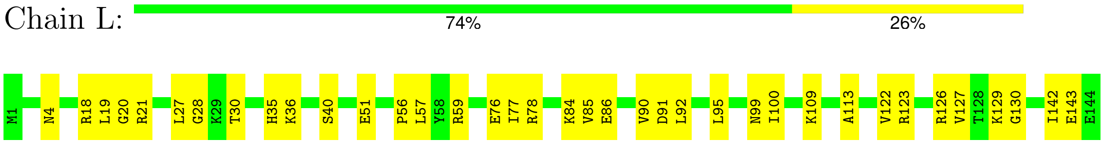
Chain J:



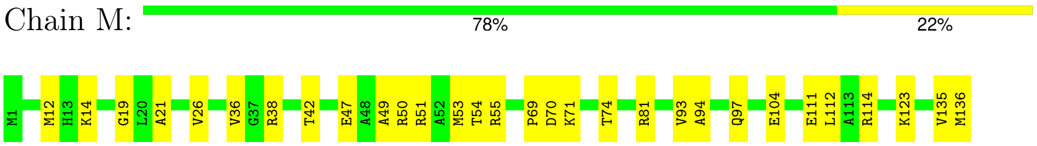
- Molecule 14: 50S ribosomal protein L14



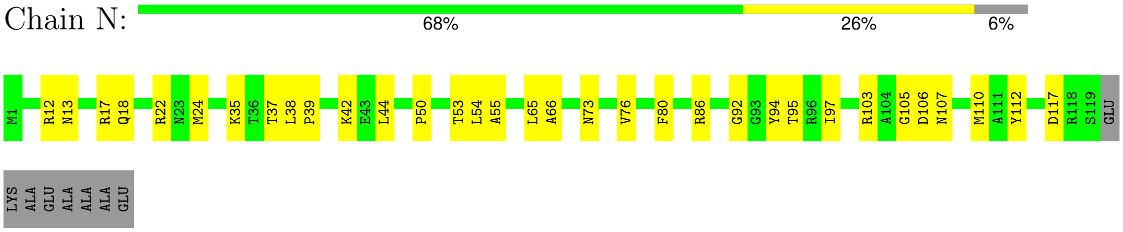
- Molecule 15: 50S ribosomal protein L15



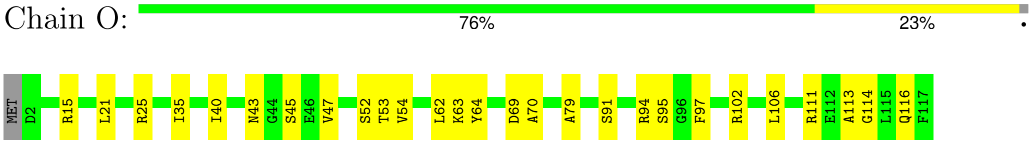
- Molecule 16: 50S ribosomal protein L16



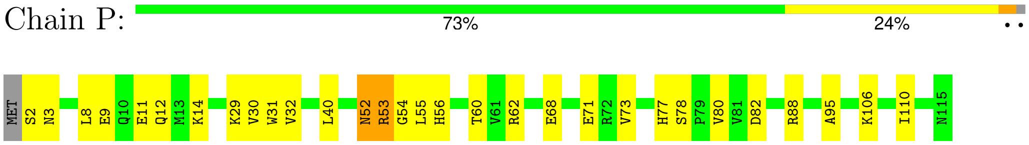
- Molecule 17: 50S ribosomal protein L17



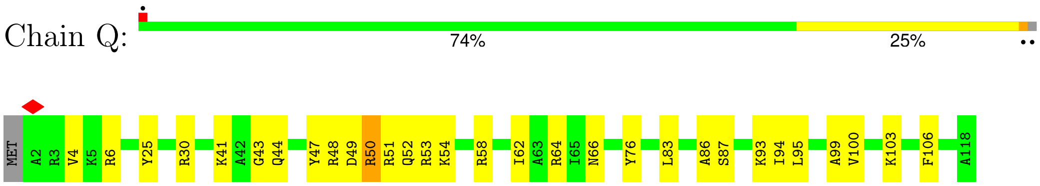
- Molecule 18: 50S ribosomal protein L18



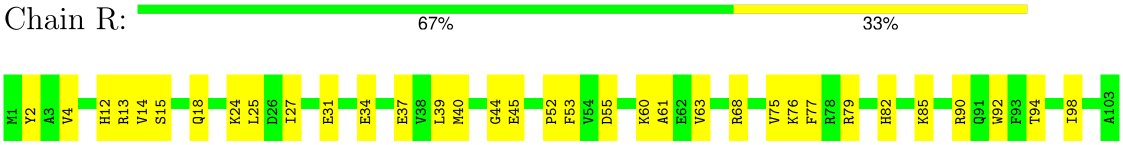
- Molecule 19: 50S ribosomal protein L19



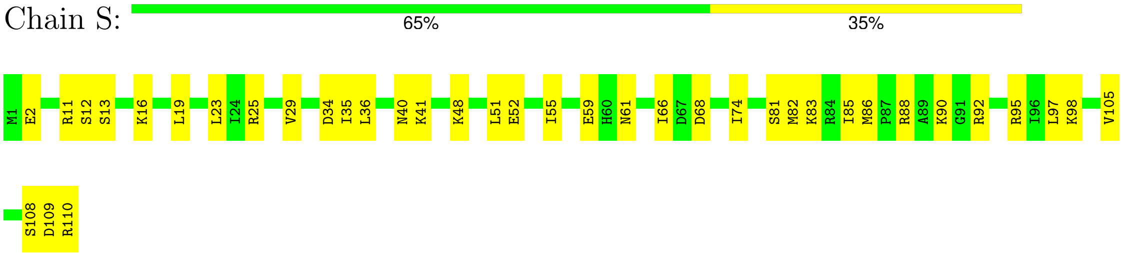
- Molecule 20: 50S ribosomal protein L20



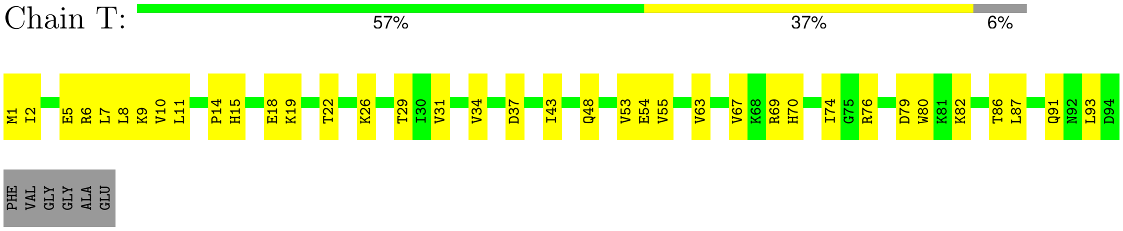
- Molecule 21: 50S ribosomal protein L21



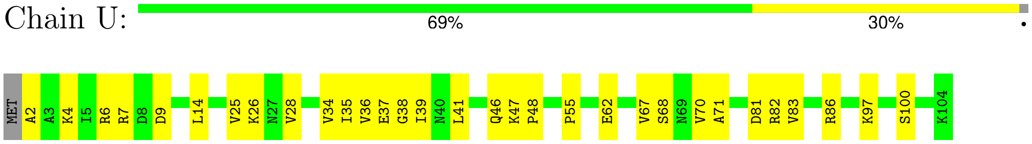
- Molecule 22: 50S ribosomal protein L22



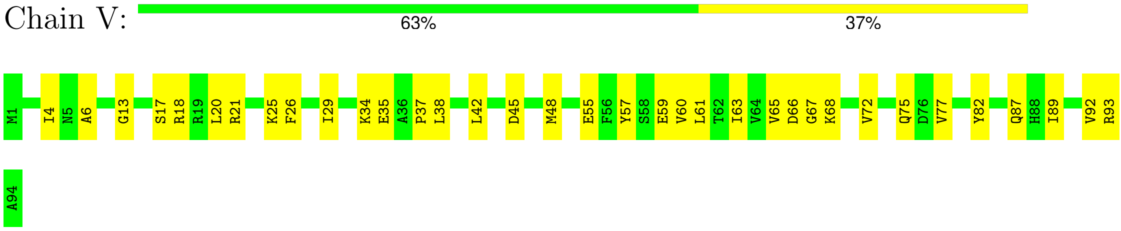
- Molecule 23: 50S ribosomal protein L23



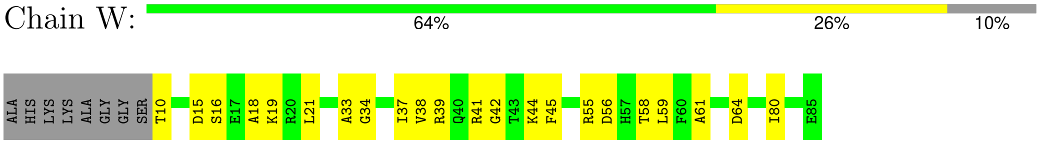
- Molecule 24: 50S ribosomal protein L24



- Molecule 25: 50S ribosomal protein L25

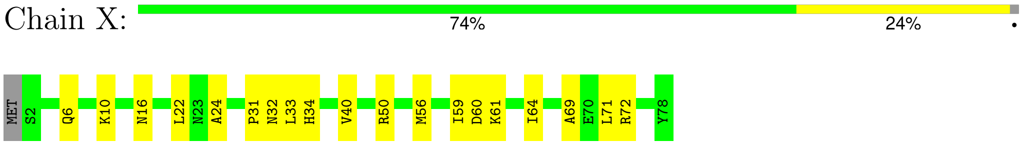


- Molecule 26: 50S ribosomal protein L27



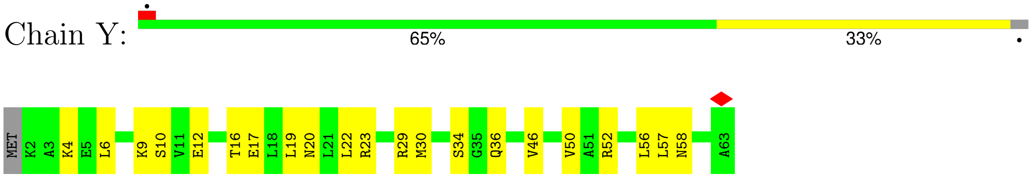
- Molecule 27: 50S ribosomal protein L28

Chain X:



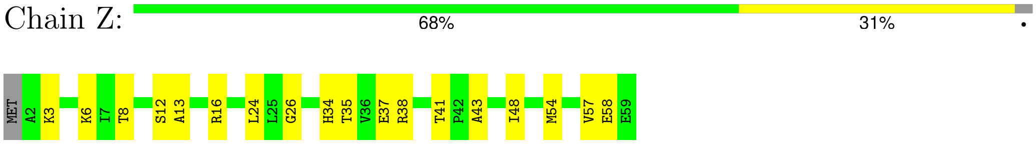
- Molecule 28: 50S ribosomal protein L29

Chain Y:



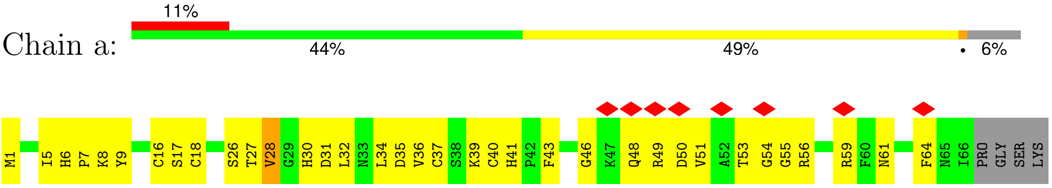
- Molecule 29: 50S ribosomal protein L30

Chain Z:



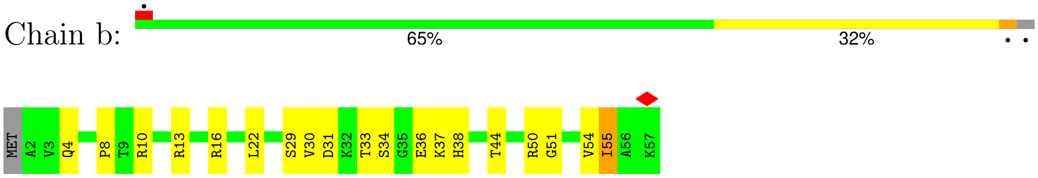
- Molecule 30: 50S ribosomal protein L31

Chain a:



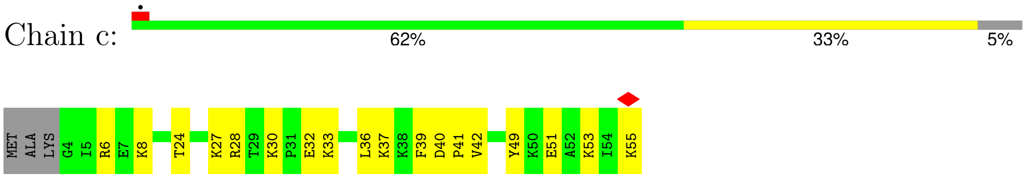
- Molecule 31: 50S ribosomal protein L32

Chain b:



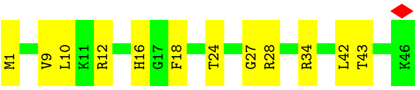
- Molecule 32: 50S ribosomal protein L33

Chain c:



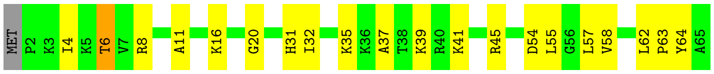
- Molecule 33: 50S ribosomal protein L34

Chain d:



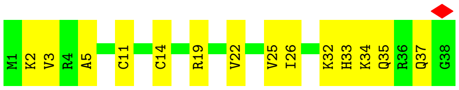
- Molecule 34: 50S ribosomal protein L35

Chain e:



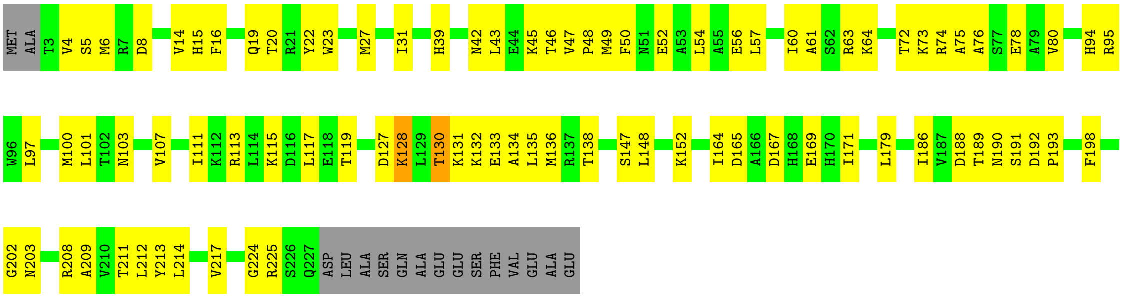
- Molecule 35: 50S ribosomal protein L36

Chain f:



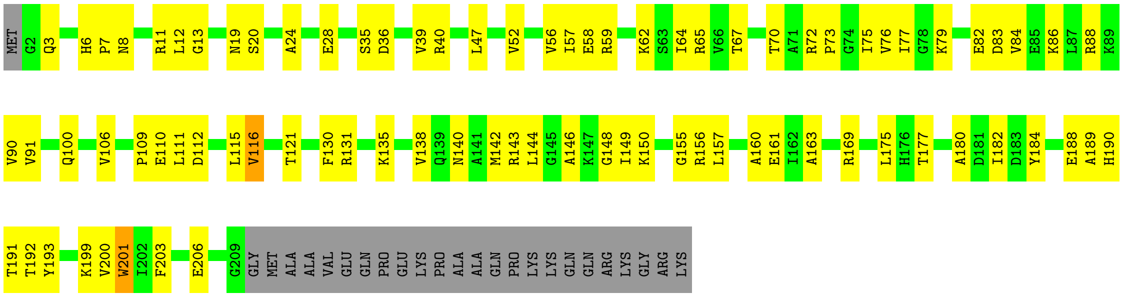
- Molecule 36: 30S ribosomal protein S2

Chain g:



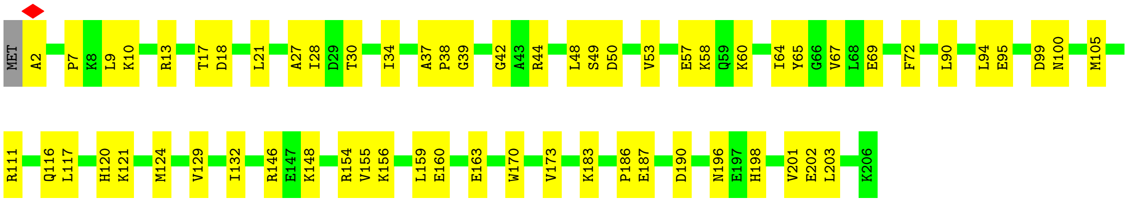
- Molecule 37: 30S ribosomal protein S3

Chain h:



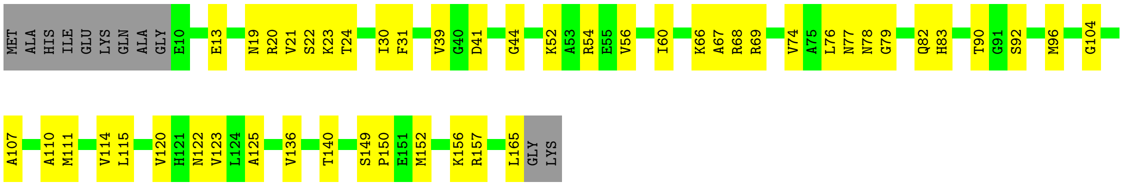
- Molecule 38: 30S ribosomal protein S4

Chain i:



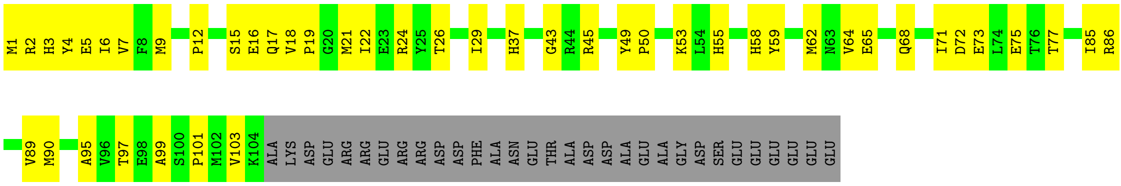
- Molecule 39: 30S ribosomal protein S5

Chain j:



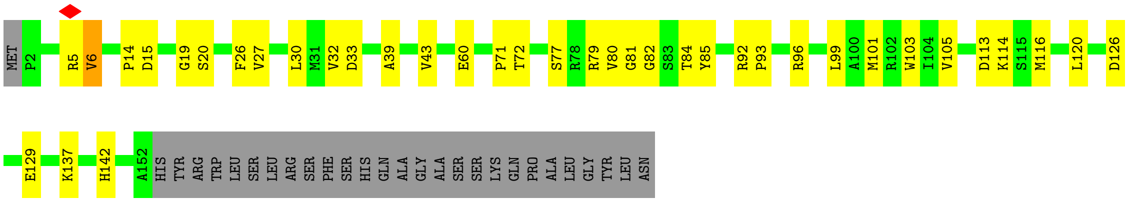
- Molecule 40: 30S ribosomal protein S6

Chain k:



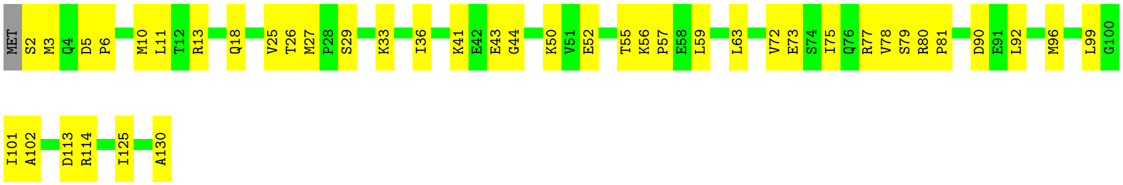
- Molecule 41: 30S ribosomal protein S7

Chain l:



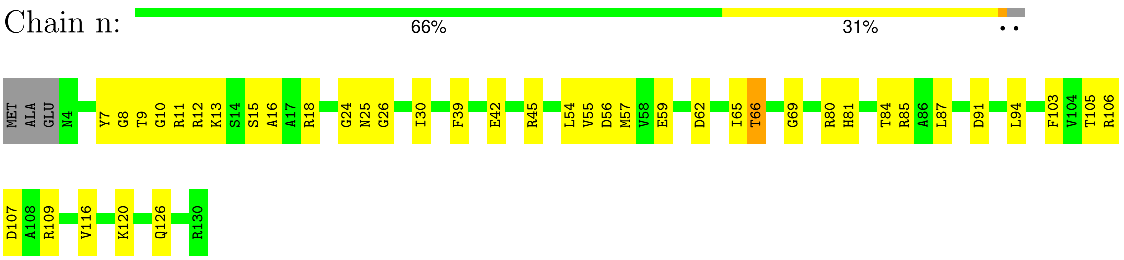
- Molecule 42: 30S ribosomal protein S8

Chain m:



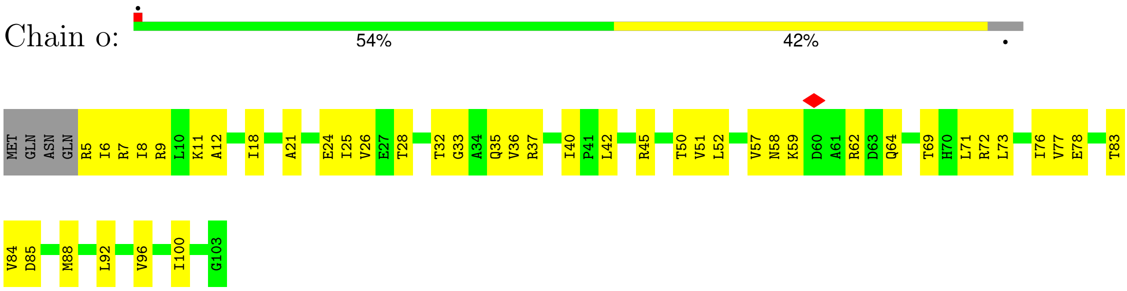
- Molecule 43: 30S ribosomal protein S9

Chain n:



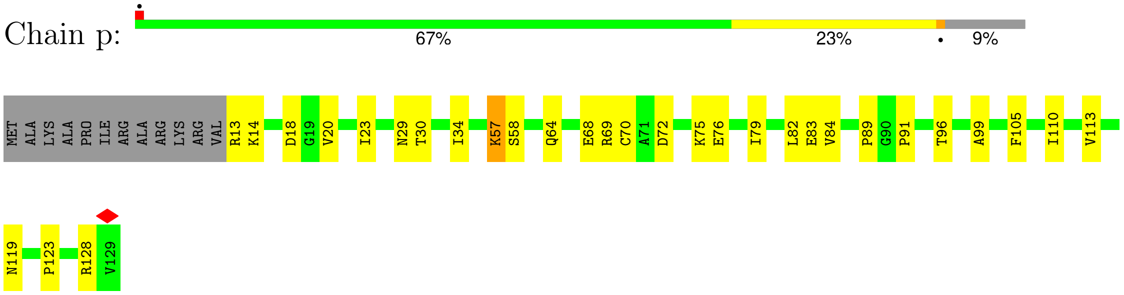
- Molecule 44: 30S ribosomal protein S10

Chain o:



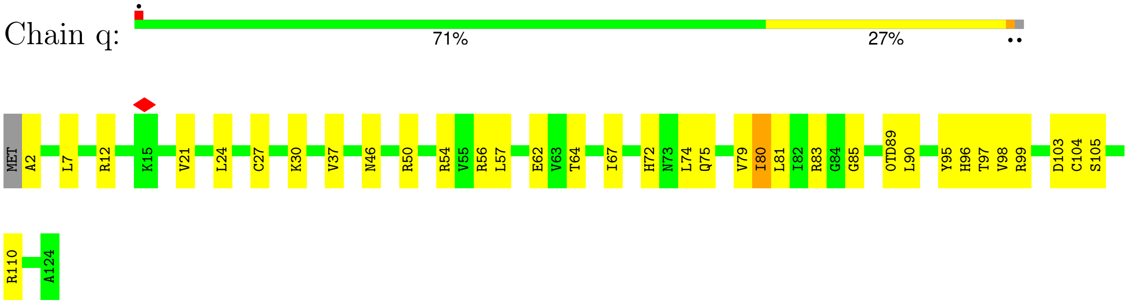
- Molecule 45: 30S ribosomal protein S11

Chain p:



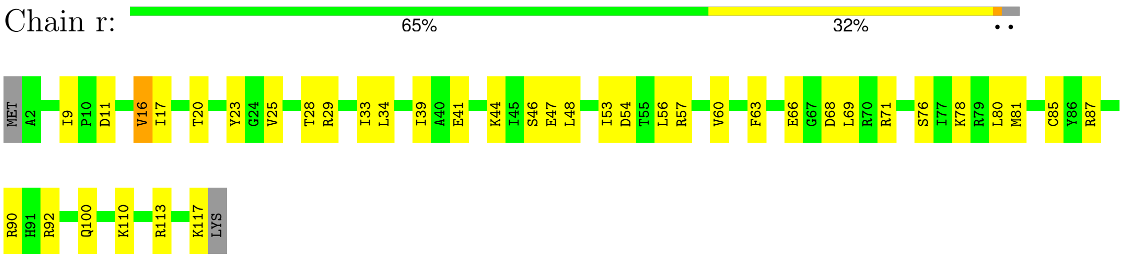
- Molecule 46: 30S ribosomal protein S12

Chain q:

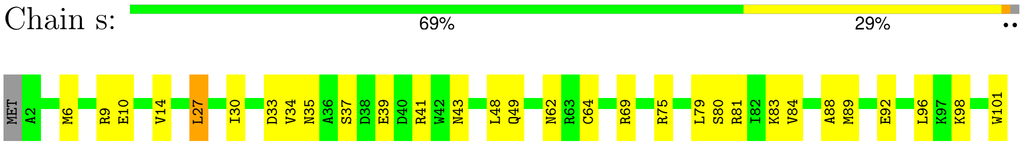


- Molecule 47: 30S ribosomal protein S13

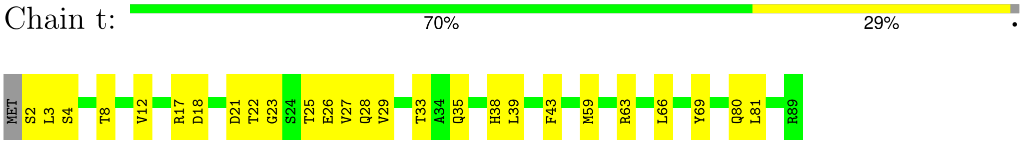
Chain r:



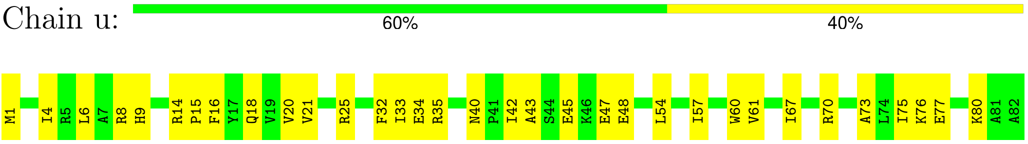
- Molecule 48: 30S ribosomal protein S14



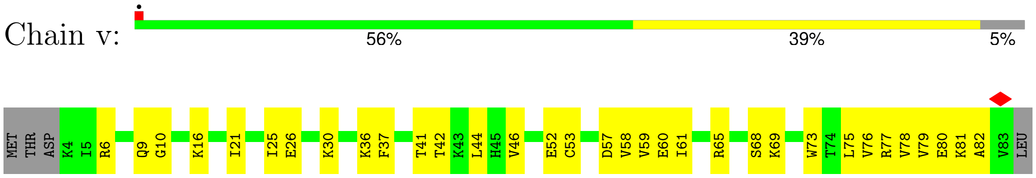
- Molecule 49: 30S ribosomal protein S15



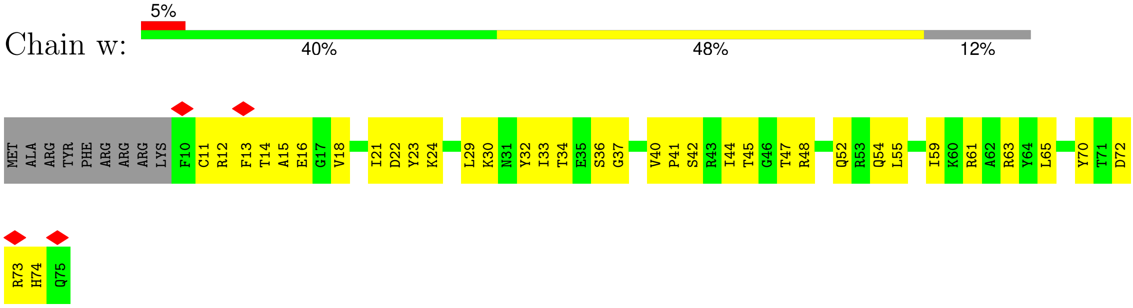
- Molecule 50: 30S ribosomal protein S16



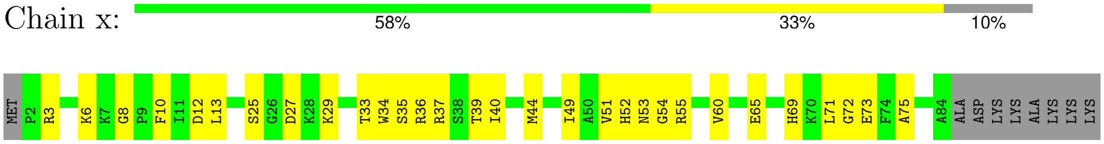
- Molecule 51: 30S ribosomal protein S17



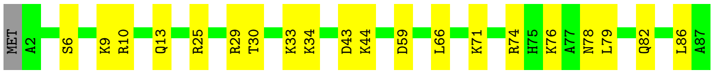
- Molecule 52: 30S ribosomal protein S18



- Molecule 53: 30S ribosomal protein S19

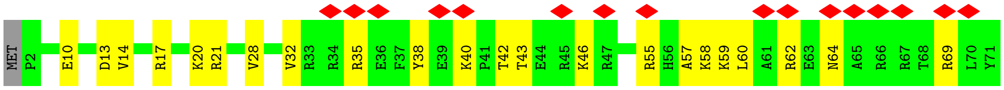


- Molecule 54: 30S ribosomal protein S20



- Molecule 55: 30S ribosomal protein S21

Chain z:



4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	74503	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	56.07	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.031	Depositor
Minimum map value	-0.019	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.00251	Depositor
Map size (Å)	547.328, 547.328, 547.328	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.069, 1.069, 1.069	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: G7M, PSU, 5MC, MA6, UR3, KEO, 0TD, 2MG, 4OC, 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	1	0.74	1/67700 (0.0%)	0.47	7/105611 (0.0%)
2	2	0.62	0/36543	0.42	1/57001 (0.0%)
3	3	0.60	0/2872	0.46	0/4478
4	4	0.53	0/138	0.65	0/212
5	5	0.49	0/1841	0.64	3/2870 (0.1%)
6	6	0.90	1/1470 (0.1%)	1.06	6/1992 (0.3%)
7	B	0.82	2/2121 (0.1%)	0.68	0/2852
8	C	0.75	0/1586	0.70	1/2134 (0.0%)
9	D	0.66	0/1571	0.57	0/2113
10	E	0.54	0/1434	0.60	0/1926
11	F	0.54	0/1333	0.58	0/1805
12	G	0.38	0/1122	0.58	0/1515
13	J	0.67	0/1152	0.62	0/1551
14	K	0.76	0/955	0.62	0/1279
15	L	0.77	0/1062	0.80	2/1413 (0.1%)
16	M	0.66	0/1093	0.58	0/1460
17	N	0.81	0/964	0.70	1/1289 (0.1%)
18	O	0.55	0/902	0.62	1/1209 (0.1%)
19	P	0.80	1/929 (0.1%)	0.70	1/1242 (0.1%)
20	Q	0.93	2/960 (0.2%)	0.66	1/1278 (0.1%)
21	R	0.75	1/829 (0.1%)	0.61	0/1107
22	S	0.69	0/864	0.61	0/1156
23	T	0.62	0/752	0.59	0/1005
24	U	0.55	0/796	0.55	0/1062
25	V	0.64	0/766	0.59	0/1025
26	W	0.71	0/589	0.62	0/779
27	X	0.74	0/635	0.61	0/848
28	Y	0.53	0/502	0.55	0/667
29	Z	0.68	0/452	0.57	0/605
30	a	0.28	0/531	0.49	0/709
31	b	0.68	0/450	0.64	0/599
32	c	0.71	0/433	0.60	0/576

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	d	0.78	0/380	0.59	0/498
34	e	0.86	0/513	0.72	0/676
35	f	0.79	0/303	0.72	0/397
36	g	0.37	0/1791	0.52	0/2413
37	h	0.59	1/1663 (0.1%)	0.66	0/2241
38	i	0.50	0/1665	0.56	0/2227
39	j	0.63	0/1165	0.59	0/1568
40	k	0.49	0/867	0.53	0/1171
41	l	0.57	0/1195	0.63	0/1602
42	m	0.66	0/989	0.56	0/1326
43	n	0.55	0/1034	0.61	0/1375
44	o	0.50	0/800	0.56	0/1082
45	p	0.59	1/893 (0.1%)	0.58	0/1205
46	q	0.60	0/960	0.61	0/1286
47	r	0.52	0/909	0.59	0/1215
48	s	0.62	0/817	0.57	0/1088
49	t	0.61	0/722	0.55	0/964
50	u	0.63	0/659	0.73	2/884 (0.2%)
51	v	0.54	0/657	0.55	0/881
52	w	0.53	0/553	0.55	0/743
53	x	0.46	0/680	0.57	0/915
54	y	0.51	0/675	0.49	0/895
55	z	0.27	0/597	0.47	0/792
All	All	0.68	10/155834 (0.0%)	0.51	26/232812 (0.0%)

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	B	143	ASN	CA-C	-7.59	1.46	1.53
1	1	2102	G	C1’-N9	-7.38	1.36	1.48
20	Q	25	TYR	CA-C	-6.36	1.44	1.52
6	6	77	ASN	CA-C	-6.12	1.45	1.52
20	Q	48	ARG	CA-C	-5.88	1.44	1.52

The worst 5 of 26 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	C	149	ASN	N-CA-C	10.53	125.08	109.59
6	6	149	THR	N-CA-C	9.82	121.58	111.07
15	L	36	LYS	N-CA-C	9.01	131.70	113.31
5	5	2	G	C4’-C3’-O3’	8.30	121.85	109.40
6	6	60	ASP	N-CA-C	8.23	121.98	109.23

There are no chirality outliers.

There are no planarity outliers.

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	1	60445	0	30406	1004	0
2	2	32887	0	16565	590	0
3	3	2569	0	1301	40	0
4	4	125	0	66	2	0
5	5	1648	0	834	24	0
6	6	1461	0	1421	52	0
7	B	2082	0	2154	47	0
8	C	1565	0	1616	47	0
9	D	1552	0	1619	41	0
10	E	1410	0	1444	63	0
11	F	1313	0	1358	38	0
12	G	1111	0	1148	58	0
13	J	1129	0	1162	37	0
14	K	946	0	1023	24	0
15	L	1053	0	1128	31	0
16	M	1074	0	1157	21	0
17	N	951	0	994	21	0
18	O	892	0	923	19	0
19	P	917	0	962	24	0
20	Q	947	0	1019	22	0
21	R	816	0	839	27	0
22	S	857	0	922	27	0
23	T	746	0	811	27	0
24	U	788	0	844	23	0
25	V	753	0	780	25	0
26	W	582	0	599	17	0
27	X	625	0	652	16	0
28	Y	501	0	531	15	0
29	Z	448	0	488	15	0
30	a	522	0	524	28	0
31	b	444	0	458	16	0
32	c	426	0	464	15	0
33	d	377	0	418	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
34	e	504	0	572	19	0
35	f	302	0	343	12	0
36	g	1760	0	1787	61	0
37	h	1636	0	1710	64	0
38	i	1643	0	1706	43	0
39	j	1152	0	1196	42	0
40	k	848	0	846	35	0
41	l	1181	0	1238	29	0
42	m	979	0	1031	33	0
43	n	1022	0	1070	36	0
44	o	790	0	831	37	0
45	p	877	0	887	25	0
46	q	957	0	1017	30	0
47	r	900	0	965	31	0
48	s	805	0	844	26	0
49	t	714	0	734	25	0
50	u	649	0	666	33	0
51	v	648	0	691	28	0
52	w	544	0	560	31	0
53	x	663	0	688	25	0
54	y	669	0	719	17	0
55	z	589	0	629	19	0
56	1	290	0	0	0	0
56	2	138	0	0	0	0
56	3	10	0	0	0	0
56	B	3	0	0	0	0
56	C	2	0	0	0	0
56	D	4	0	0	0	0
56	E	1	0	0	0	0
56	J	1	0	0	0	0
56	L	2	0	0	0	0
56	M	1	0	0	0	0
56	P	2	0	0	0	0
56	Q	2	0	0	0	0
56	R	2	0	0	0	0
56	S	1	0	0	0	0
56	T	1	0	0	0	0
56	Z	2	0	0	0	0
56	b	2	0	0	0	0
56	d	1	0	0	0	0
56	e	3	0	0	0	0
56	f	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
56	i	3	0	0	0	0
56	j	2	0	0	0	0
56	l	2	0	0	0	0
56	m	2	0	0	0	0
56	q	1	0	0	0	0
56	y	1	0	0	0	0
57	1	508	0	0	44	0
57	2	395	0	0	36	0
57	3	17	0	0	1	0
57	5	5	0	0	2	0
57	C	1	0	0	0	0
57	D	2	0	0	3	0
57	E	7	0	0	0	0
57	F	3	0	0	0	0
57	G	4	0	0	0	0
57	J	2	0	0	0	0
57	L	1	0	0	0	0
57	N	1	0	0	0	0
57	O	1	0	0	0	0
57	P	2	0	0	0	0
57	T	1	0	0	0	0
57	V	2	0	0	1	0
57	W	1	0	0	0	0
57	X	1	0	0	0	0
57	Y	8	0	0	1	0
57	Z	1	0	0	3	0
57	a	2	0	0	1	0
57	c	2	0	0	0	0
57	g	10	0	0	0	0
57	h	11	0	0	3	0
57	i	1	0	0	0	0
57	k	5	0	0	0	0
57	l	9	0	0	0	0
57	m	5	0	0	0	0
57	n	4	0	0	0	0
57	p	2	0	0	2	0
57	q	3	0	0	0	0
57	r	6	0	0	1	0
57	s	1	0	0	0	0
57	t	5	0	0	1	0
57	u	1	0	0	4	0
57	v	3	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
57	w	6	0	0	0	0
57	x	5	0	0	0	0
57	y	3	0	0	0	0
57	z	7	0	0	2	0
All	All	145329	0	97360	2856	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 12.

The worst 5 of 2856 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:1:2799:A:H5”	57:1:3407:HOH:O	1.32	1.22
29:Z:3:LYS:HE2	57:Z:201:HOH:O	1.46	1.14
51:v:75:LEU:HD11	57:v:101:HOH:O	1.62	0.98
50:u:14:ARG:HG2	57:u:101:HOH:O	1.63	0.98
46:q:72:HIS:HB3	46:q:99:ARG:HH22	1.29	0.96

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	6	185/188 (98%)	167 (90%)	16 (9%)	2 (1%)	12	44
7	B	269/273 (98%)	243 (90%)	26 (10%)	0	100	100
8	C	207/209 (99%)	184 (89%)	23 (11%)	0	100	100
9	D	199/201 (99%)	189 (95%)	10 (5%)	0	100	100
10	E	175/179 (98%)	161 (92%)	14 (8%)	0	100	100
11	F	173/177 (98%)	161 (93%)	12 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
12	G	147/149 (99%)	133 (90%)	14 (10%)	0	100	100
13	J	140/142 (99%)	134 (96%)	6 (4%)	0	100	100
14	K	121/123 (98%)	110 (91%)	11 (9%)	0	100	100
15	L	142/144 (99%)	127 (89%)	15 (11%)	0	100	100
16	M	134/136 (98%)	123 (92%)	11 (8%)	0	100	100
17	N	117/127 (92%)	108 (92%)	9 (8%)	0	100	100
18	O	114/117 (97%)	108 (95%)	6 (5%)	0	100	100
19	P	112/115 (97%)	108 (96%)	4 (4%)	0	100	100
20	Q	115/118 (98%)	112 (97%)	3 (3%)	0	100	100
21	R	101/103 (98%)	92 (91%)	9 (9%)	0	100	100
22	S	108/110 (98%)	106 (98%)	2 (2%)	0	100	100
23	T	92/100 (92%)	87 (95%)	5 (5%)	0	100	100
24	U	101/104 (97%)	95 (94%)	6 (6%)	0	100	100
25	V	92/94 (98%)	82 (89%)	10 (11%)	0	100	100
26	W	74/84 (88%)	67 (90%)	7 (10%)	0	100	100
27	X	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
28	Y	60/63 (95%)	58 (97%)	2 (3%)	0	100	100
29	Z	56/59 (95%)	54 (96%)	2 (4%)	0	100	100
30	a	64/70 (91%)	54 (84%)	10 (16%)	0	100	100
31	b	54/57 (95%)	50 (93%)	4 (7%)	0	100	100
32	c	50/55 (91%)	45 (90%)	5 (10%)	0	100	100
33	d	44/46 (96%)	41 (93%)	3 (7%)	0	100	100
34	e	62/65 (95%)	53 (86%)	9 (14%)	0	100	100
35	f	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
36	g	223/241 (92%)	198 (89%)	24 (11%)	1 (0%)	30	64
37	h	206/233 (88%)	189 (92%)	17 (8%)	0	100	100
38	i	203/206 (98%)	191 (94%)	12 (6%)	0	100	100
39	j	154/167 (92%)	144 (94%)	10 (6%)	0	100	100
40	k	102/135 (76%)	96 (94%)	6 (6%)	0	100	100
41	l	149/179 (83%)	141 (95%)	8 (5%)	0	100	100
42	m	127/130 (98%)	122 (96%)	5 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
43	n	125/130 (96%)	116 (93%)	9 (7%)	0	100	100
44	o	97/103 (94%)	86 (89%)	11 (11%)	0	100	100
45	p	115/129 (89%)	106 (92%)	9 (8%)	0	100	100
46	q	120/124 (97%)	112 (93%)	8 (7%)	0	100	100
47	r	114/118 (97%)	103 (90%)	11 (10%)	0	100	100
48	s	98/101 (97%)	96 (98%)	2 (2%)	0	100	100
49	t	86/89 (97%)	84 (98%)	2 (2%)	0	100	100
50	u	80/82 (98%)	72 (90%)	8 (10%)	0	100	100
51	v	78/84 (93%)	76 (97%)	2 (3%)	0	100	100
52	w	64/75 (85%)	59 (92%)	5 (8%)	0	100	100
53	x	81/92 (88%)	75 (93%)	6 (7%)	0	100	100
54	y	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
55	z	68/71 (96%)	66 (97%)	2 (3%)	0	100	100
All	All	5793/6100 (95%)	5374 (93%)	416 (7%)	3 (0%)	50	80

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	6	165	PRO
6	6	187	VAL
36	g	128	LYS

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	6	154/154 (100%)	139 (90%)	15 (10%)	6	27
7	B	216/218 (99%)	215 (100%)	1 (0%)	86	93
8	C	164/164 (100%)	164 (100%)	0	100	100
9	D	165/165 (100%)	164 (99%)	1 (1%)	84	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
10	E	148/150 (99%)	147 (99%)	1 (1%)	81	92
11	F	136/138 (99%)	134 (98%)	2 (2%)	60	81
12	G	114/114 (100%)	114 (100%)	0	100	100
13	J	116/116 (100%)	115 (99%)	1 (1%)	75	89
14	K	104/104 (100%)	104 (100%)	0	100	100
15	L	103/103 (100%)	101 (98%)	2 (2%)	52	76
16	M	109/109 (100%)	108 (99%)	1 (1%)	75	89
17	N	99/103 (96%)	98 (99%)	1 (1%)	73	87
18	O	86/87 (99%)	85 (99%)	1 (1%)	67	85
19	P	99/100 (99%)	95 (96%)	4 (4%)	27	59
20	Q	89/90 (99%)	87 (98%)	2 (2%)	47	73
21	R	84/84 (100%)	84 (100%)	0	100	100
22	S	93/93 (100%)	93 (100%)	0	100	100
23	T	81/84 (96%)	81 (100%)	0	100	100
24	U	84/85 (99%)	83 (99%)	1 (1%)	67	85
25	V	78/78 (100%)	77 (99%)	1 (1%)	65	83
26	W	58/62 (94%)	57 (98%)	1 (2%)	56	78
27	X	67/68 (98%)	67 (100%)	0	100	100
28	Y	54/55 (98%)	54 (100%)	0	100	100
29	Z	48/49 (98%)	48 (100%)	0	100	100
30	a	59/62 (95%)	58 (98%)	1 (2%)	56	78
31	b	47/48 (98%)	46 (98%)	1 (2%)	48	74
32	c	47/49 (96%)	47 (100%)	0	100	100
33	d	38/38 (100%)	38 (100%)	0	100	100
34	e	51/52 (98%)	50 (98%)	1 (2%)	50	75
35	f	34/34 (100%)	33 (97%)	1 (3%)	37	67
36	g	187/199 (94%)	186 (100%)	1 (0%)	86	93
37	h	171/190 (90%)	168 (98%)	3 (2%)	54	77
38	i	172/173 (99%)	171 (99%)	1 (1%)	84	92
39	j	119/126 (94%)	119 (100%)	0	100	100
40	k	91/116 (78%)	91 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
41	l	124/147 (84%)	121 (98%)	3 (2%)	44	71
42	m	104/105 (99%)	104 (100%)	0	100	100
43	n	105/107 (98%)	103 (98%)	2 (2%)	52	76
44	o	86/90 (96%)	86 (100%)	0	100	100
45	p	90/99 (91%)	90 (100%)	0	100	100
46	q	102/103 (99%)	101 (99%)	1 (1%)	73	87
47	r	94/96 (98%)	91 (97%)	3 (3%)	34	65
48	s	83/84 (99%)	82 (99%)	1 (1%)	67	85
49	t	76/77 (99%)	76 (100%)	0	100	100
50	u	65/65 (100%)	65 (100%)	0	100	100
51	v	74/78 (95%)	74 (100%)	0	100	100
52	w	57/65 (88%)	57 (100%)	0	100	100
53	x	72/79 (91%)	72 (100%)	0	100	100
54	y	65/66 (98%)	64 (98%)	1 (2%)	60	81
55	z	60/61 (98%)	60 (100%)	0	100	100
All	All	4822/4982 (97%)	4767 (99%)	55 (1%)	69	86

5 of 55 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
19	P	53	ARG
30	a	28	VAL
54	y	30	THR
46	q	80	ILE
19	P	60	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 88 such sidechains are listed below:

Mol	Chain	Res	Type
38	i	74	ASN
46	q	29	GLN
38	i	152	GLN
43	n	75	GLN
48	s	49	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2811/2904 (96%)	522 (18%)	46 (1%)
2	2	1530/1540 (99%)	260 (16%)	6 (0%)
3	3	119/120 (99%)	22 (18%)	0
4	4	5/18 (27%)	1 (20%)	0
5	5	76/77 (98%)	24 (31%)	4 (5%)
All	All	4541/4659 (97%)	829 (18%)	56 (1%)

5 of 829 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	10	A
1	1	15	G
1	1	34	U
1	1	35	G
1	1	36	G

5 of 56 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	1801	A
5	5	72	G
1	1	2190	G
5	5	18	G
2	2	1109	C

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

13 non-standard protein/DNA/RNA residues are 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	$\#\|Z\| > 2$
2	4OC	2	1402	2	20,23,24	2.92	8 (40%)	25,32,35	1.14	3 (12%)
2	2MG	2	966	2	18,26,27	2.39	7 (38%)	16,38,41	1.44	3 (18%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
6	KEO	6	34	6	16,18,19	0.74	0	15,21,23	1.54	1 (6%)
2	5MC	2	967	2	19,22,23	3.45	8 (42%)	26,32,35	1.07	2 (7%)
2	2MG	2	1207	2	18,26,27	2.35	7 (38%)	16,38,41	1.70	5 (31%)
2	MA6	2	1518	2	19,26,27	1.79	2 (10%)	18,38,41	3.06	3 (16%)
2	5MC	2	1407	2	19,22,23	3.29	8 (42%)	26,32,35	1.06	1 (3%)
46	0TD	q	89	46	8,9,10	2.55	2 (25%)	6,11,13	1.24	0
2	G7M	2	527	2	20,26,27	3.79	9 (45%)	16,39,42	1.16	1 (6%)
2	MA6	2	1519	2	19,26,27	1.84	3 (15%)	18,38,41	3.08	3 (16%)
2	UR3	2	1498	2	19,22,23	2.48	5 (26%)	26,32,35	1.58	3 (11%)
2	2MG	2	1516	2	18,26,27	2.30	7 (38%)	16,38,41	2.31	6 (37%)
2	PSU	2	516	2	18,21,22	1.06	1 (5%)	21,30,33	2.03	4 (19%)

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
2	4OC	2	1402	2	-	2/9/29/30	0/2/2/2
2	2MG	2	966	2	-	0/5/27/28	0/3/3/3
6	KEO	6	34	6	-	8/19/20/22	-
2	5MC	2	967	2	-	2/7/25/26	0/2/2/2
2	2MG	2	1207	2	-	0/5/27/28	0/3/3/3
2	MA6	2	1518	2	-	0/7/29/30	0/3/3/3
2	5MC	2	1407	2	-	0/7/25/26	0/2/2/2
46	0TD	q	89	46	-	2/7/12/14	-
2	G7M	2	527	2	-	2/3/25/26	0/3/3/3
2	MA6	2	1519	2	-	2/7/29/30	0/3/3/3
2	UR3	2	1498	2	-	0/7/25/26	0/2/2/2
2	2MG	2	1516	2	-	0/5/27/28	0/3/3/3
2	PSU	2	516	2	-	2/7/25/26	0/2/2/2

The worst 5 of 67 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	2	527	G7M	C8-N7	9.60	1.50	1.33
2	2	527	G7M	C8-N9	9.55	1.50	1.33
2	2	967	5MC	C6-C5	8.49	1.48	1.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	2	1407	5MC	C6-C5	8.37	1.48	1.34
2	2	1402	4OC	C4-N3	6.43	1.43	1.32

The worst 5 of 35 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	2	1519	MA6	N1-C6-N6	-10.76	104.41	116.83
2	2	1518	MA6	N1-C6-N6	-10.61	104.58	116.83
2	2	1519	MA6	N3-C2-N1	-6.39	120.00	128.67
2	2	1518	MA6	N3-C2-N1	-6.33	120.08	128.67
2	2	1516	2MG	N1-C2-N2	6.02	122.70	116.56

There are no chirality outliers.

5 of 20 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	2	516	PSU	O4'-C1'-C5-C4
2	2	516	PSU	O4'-C1'-C5-C6
2	2	967	5MC	O4'-C4'-C5'-O5'
2	2	967	5MC	C3'-C4'-C5'-O5'
2	2	1519	MA6	O4'-C4'-C5'-O5'

There are no ring outliers.

7 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	2	1402	4OC	1	0
2	2	966	2MG	1	0
6	6	34	KEO	3	0
2	2	1207	2MG	2	0
2	2	1518	MA6	2	0
2	2	1519	MA6	1	0
2	2	516	PSU	1	0

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 481 ligands modelled in this entry, 481 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)

There are no chain breaks in this entry.

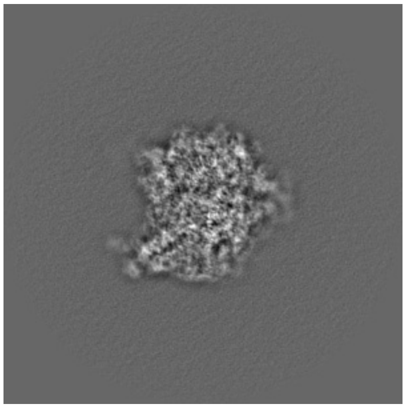
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-43752. These allow visual inspection of the internal detail of the map and identification of artifacts.

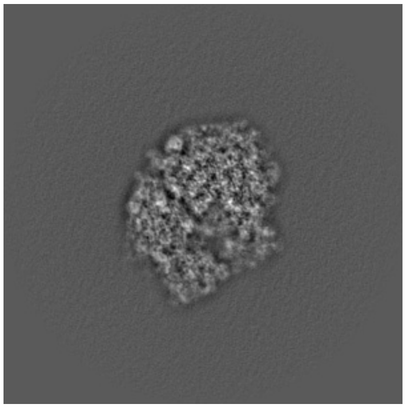
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

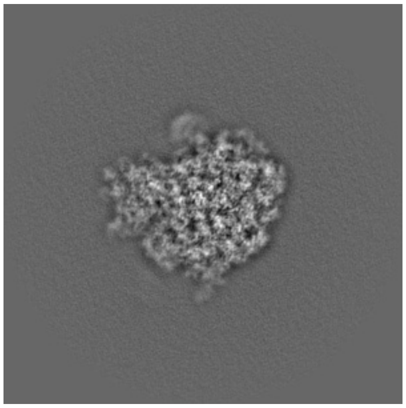
6.1.1 Primary map



X

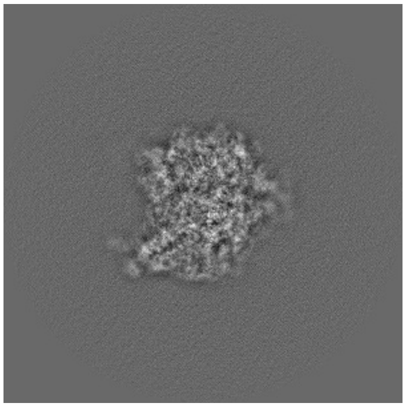


Y

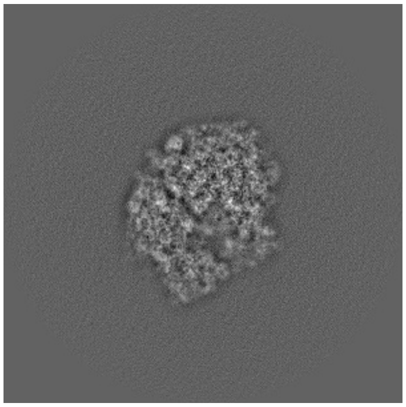


Z

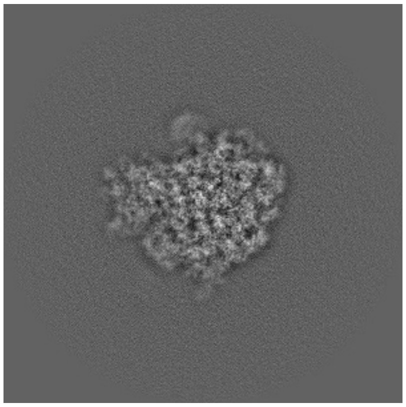
6.1.2 Raw map



X



Y

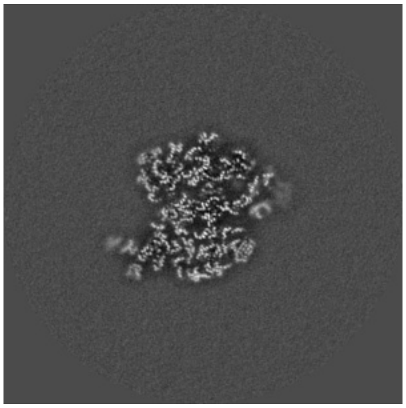


Z

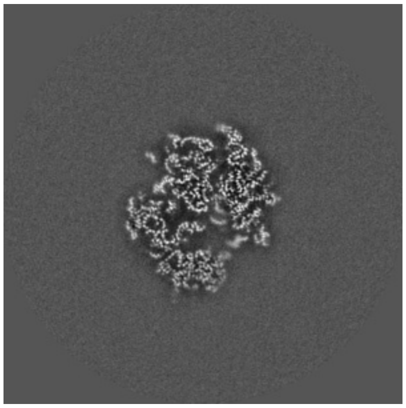
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

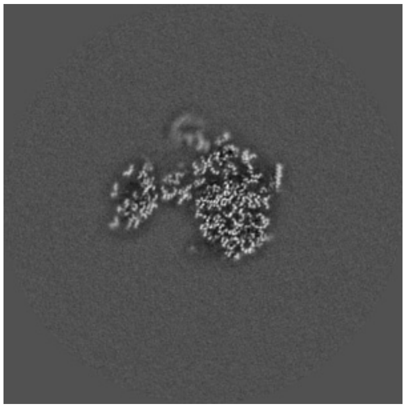
6.2.1 Primary map



X Index: 256

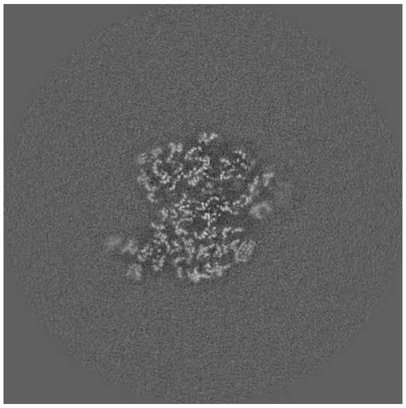


Y Index: 256

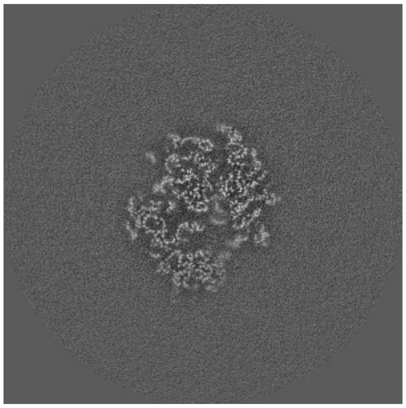


Z Index: 256

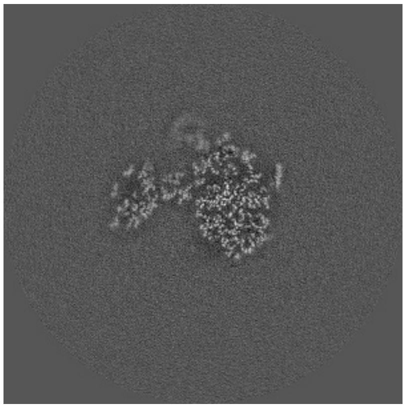
6.2.2 Raw map



X Index: 256



Y Index: 256

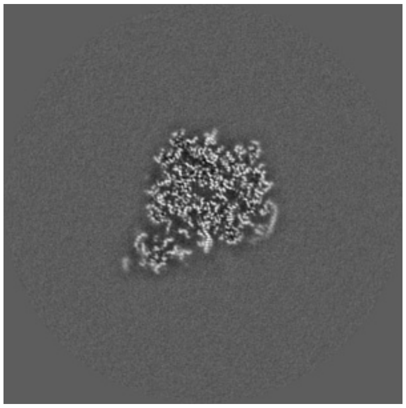


Z Index: 256

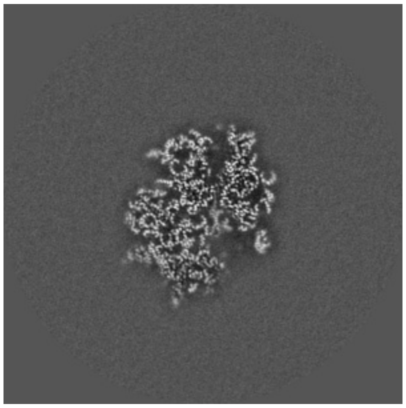
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ

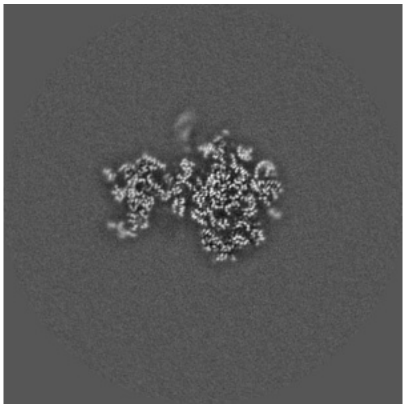
6.3.1 Primary map



X Index: 283

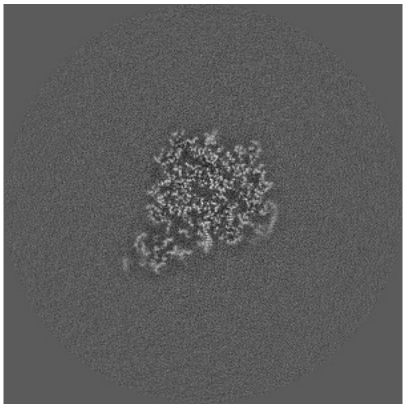


Y Index: 263

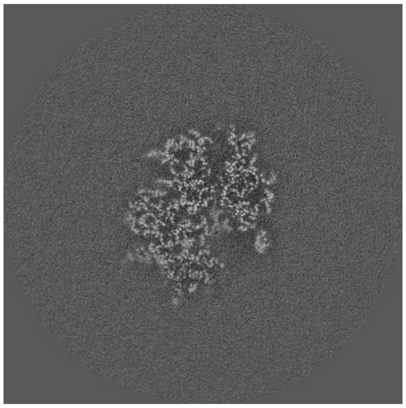


Z Index: 241

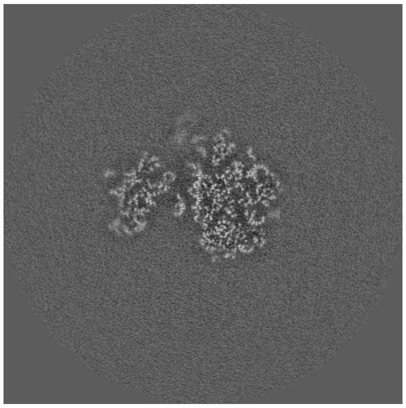
6.3.2 Raw map



X Index: 283



Y Index: 263

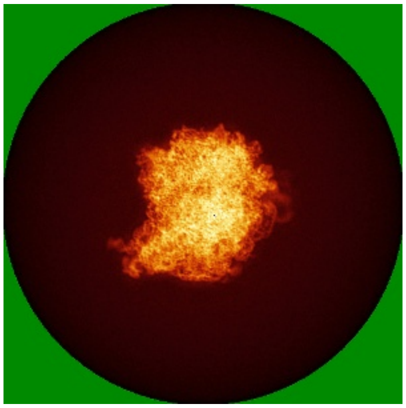


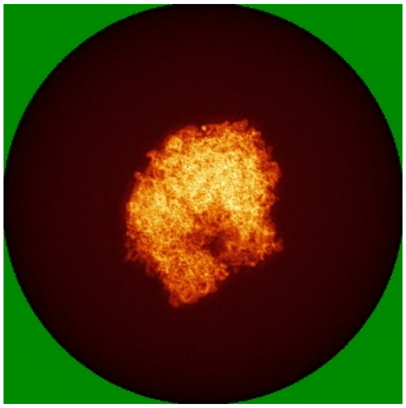
Z Index: 247

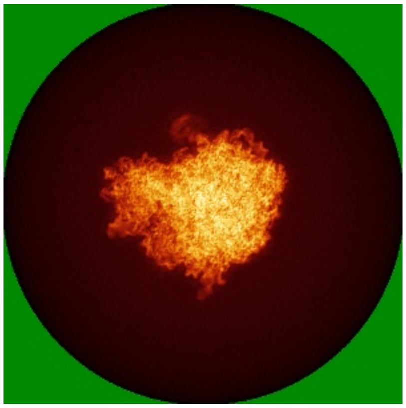
The images above show the largest variance slices of the map in three orthogonal directions.

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

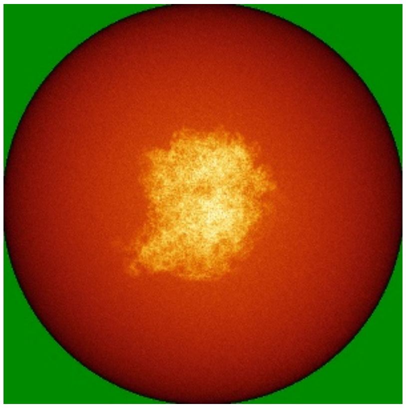
6.4.1 Primary map

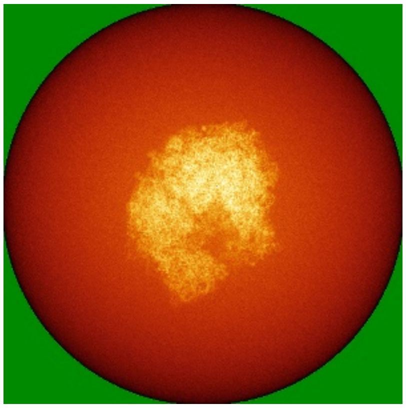

X

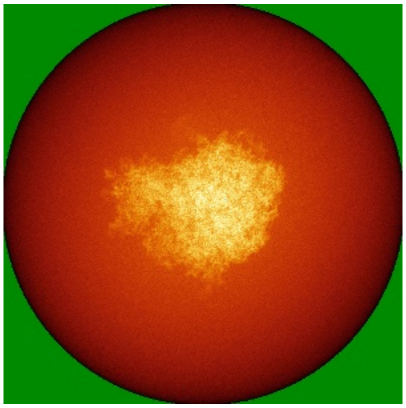

Y


Z

6.4.2 Raw map


X

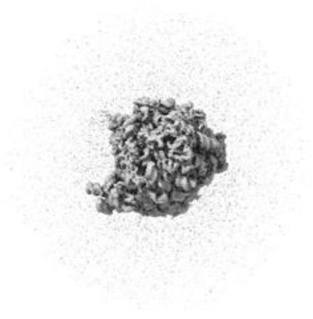

Y


Z

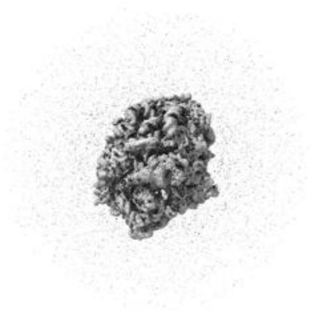
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views

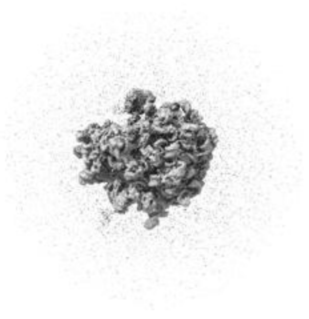
6.5.1 Primary map



X



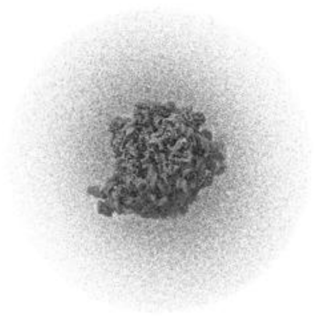
Y



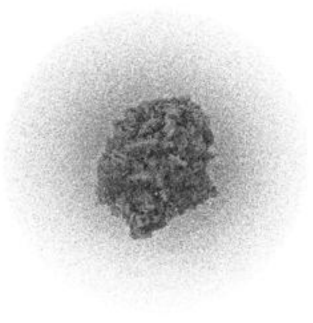
Z

The images above show the 3D surface view of the map at the recommended contour level 0.00251. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

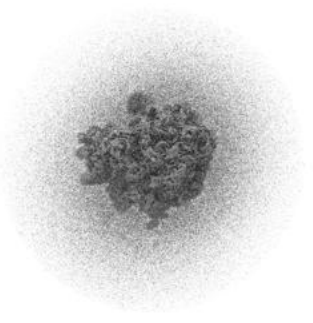
6.5.2 Raw map



X



Y



Z

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

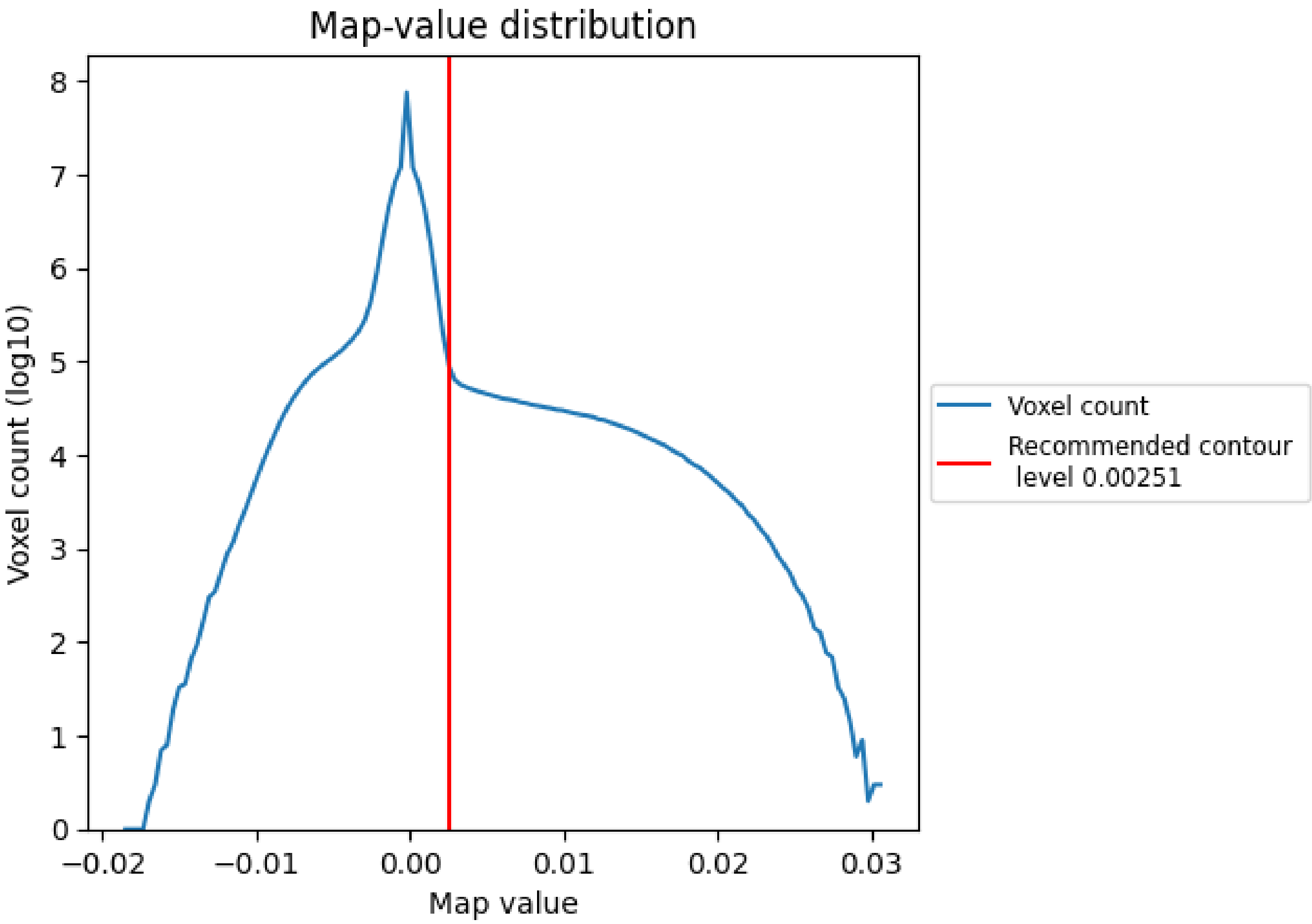
6.6 Mask visualisation

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

7 Map analysis ⓘ

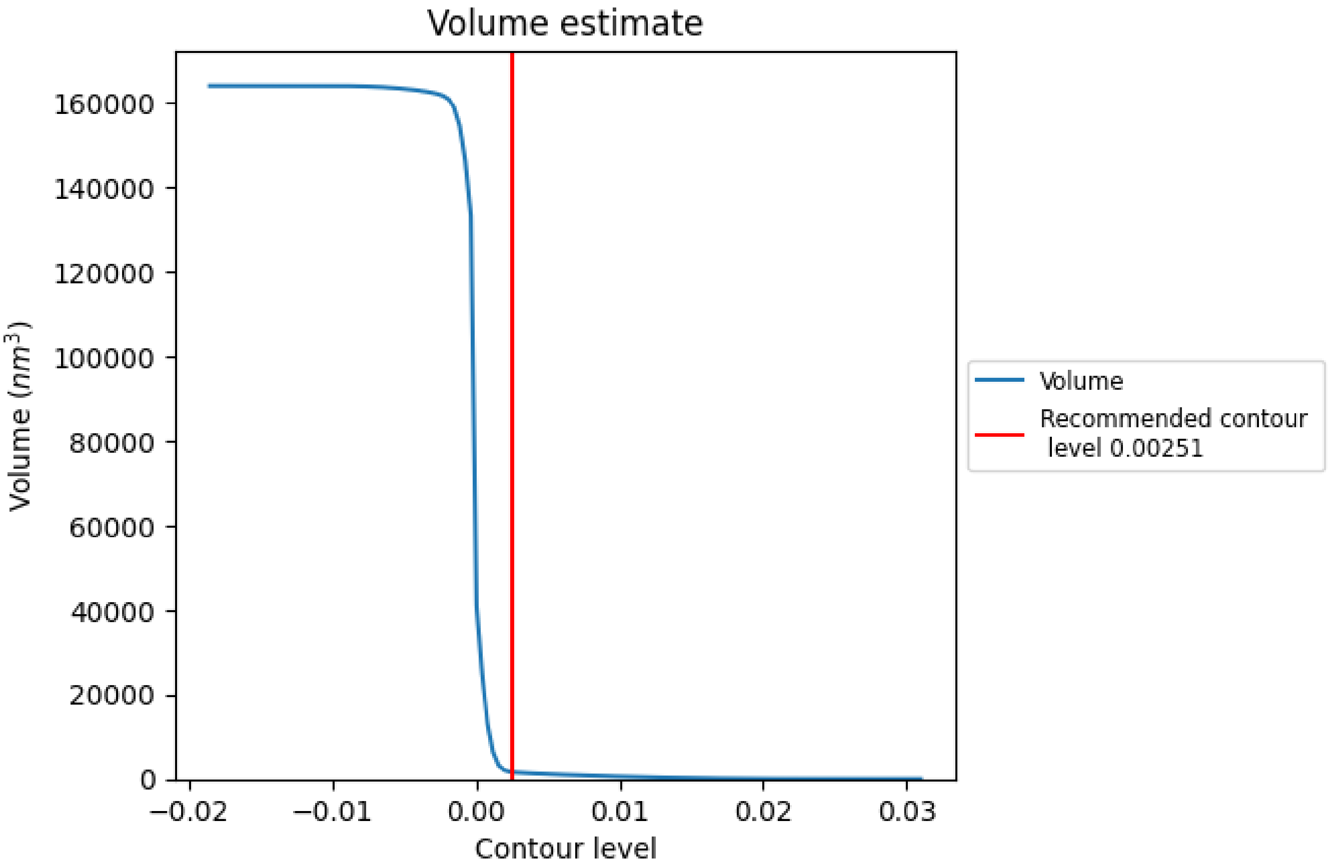
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution ⓘ



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

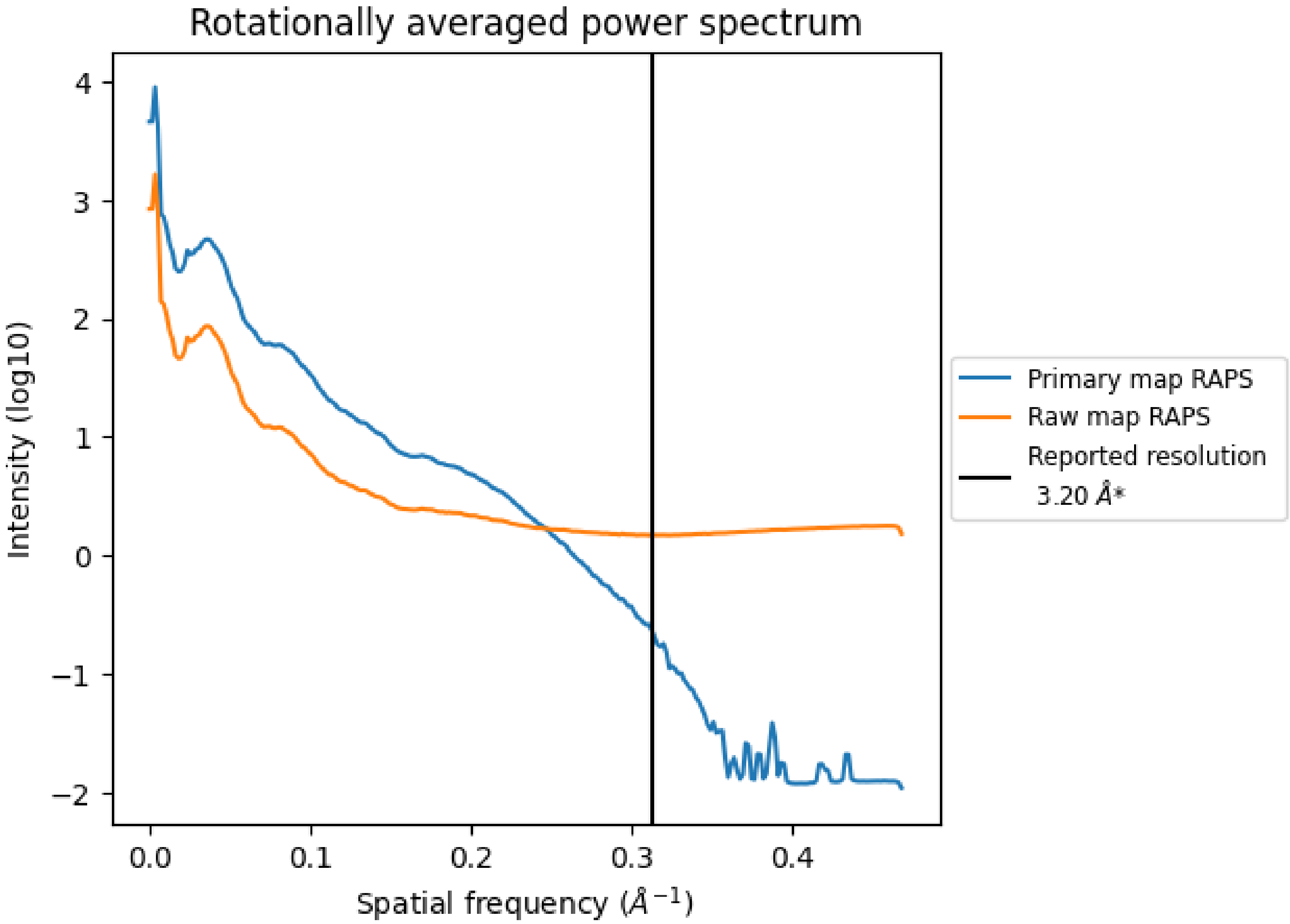
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 1650 nm^3; this corresponds to an approximate mass of 1491 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)

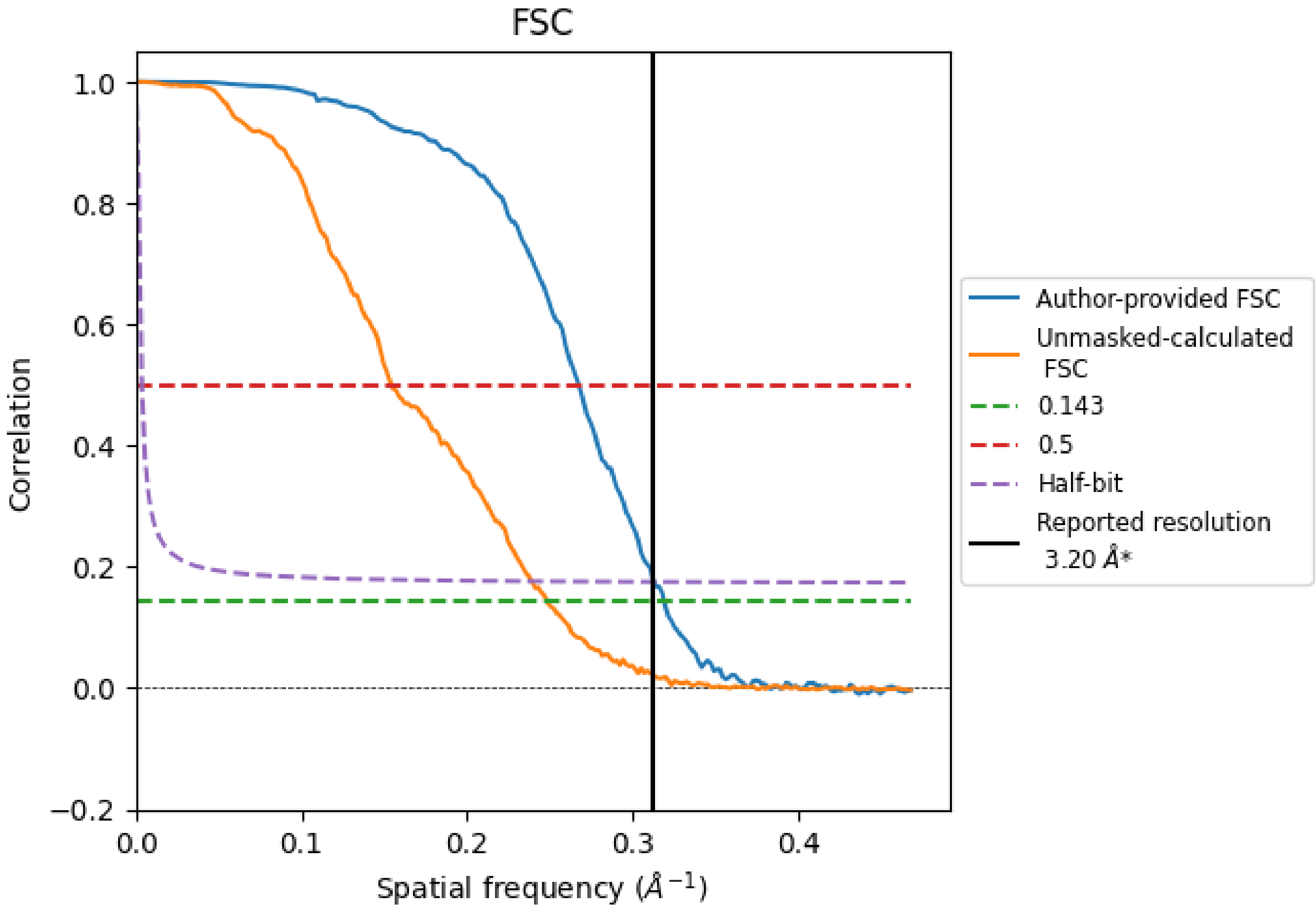


*Reported resolution corresponds to spatial frequency of 0.312 $Å^{-1}$

8 Fourier-Shell correlation (i)

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 (i)



*Reported resolution corresponds to spatial frequency of 0.312 $Å^{-1}$

8.2 Resolution estimates (i)

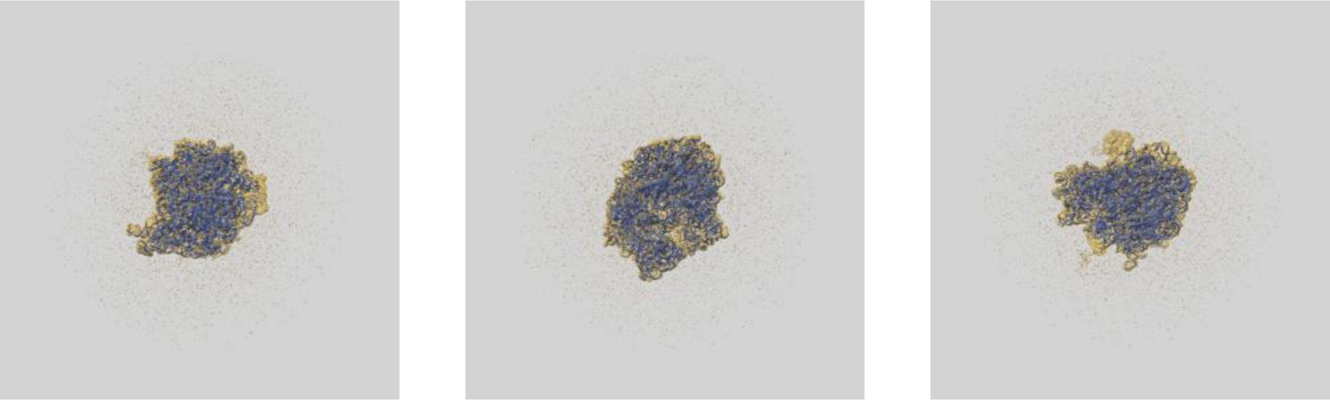
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.13	3.74	3.20
Unmasked-calculated*	4.03	6.48	4.19

*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 4.03 differs from the reported value 3.2 by more than 10 %

9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-43752 and PDB model 8W2N. Per-residue inclusion information can be found in section 3 on page 17.

9.1 Map-model overlay



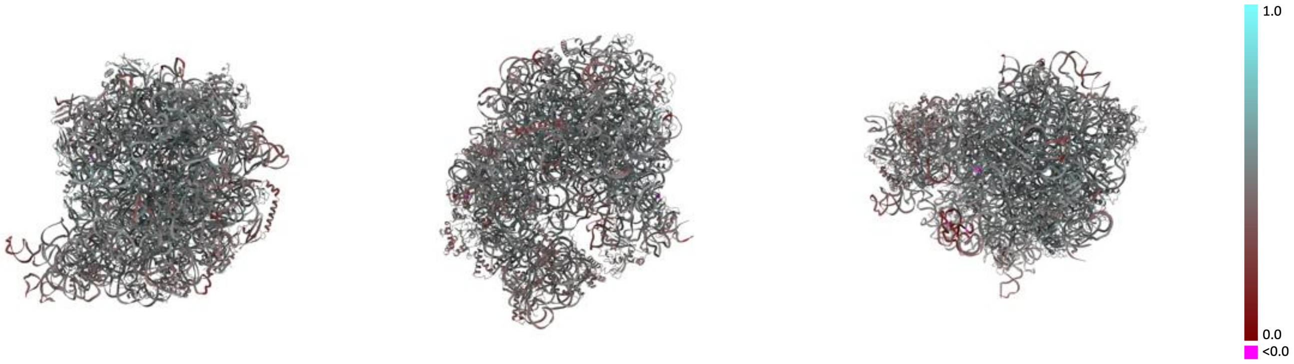
X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.00251 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.

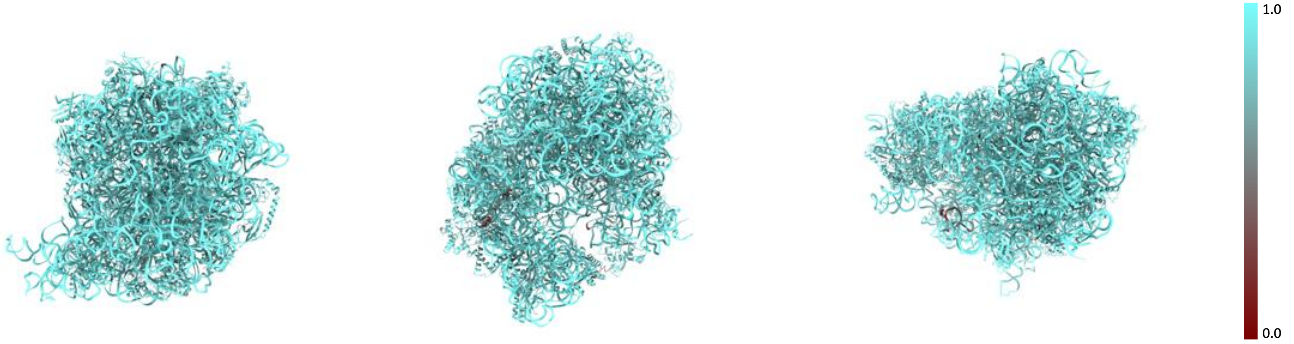
9.2 Q-score mapped to coordinate model ⓘ



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.

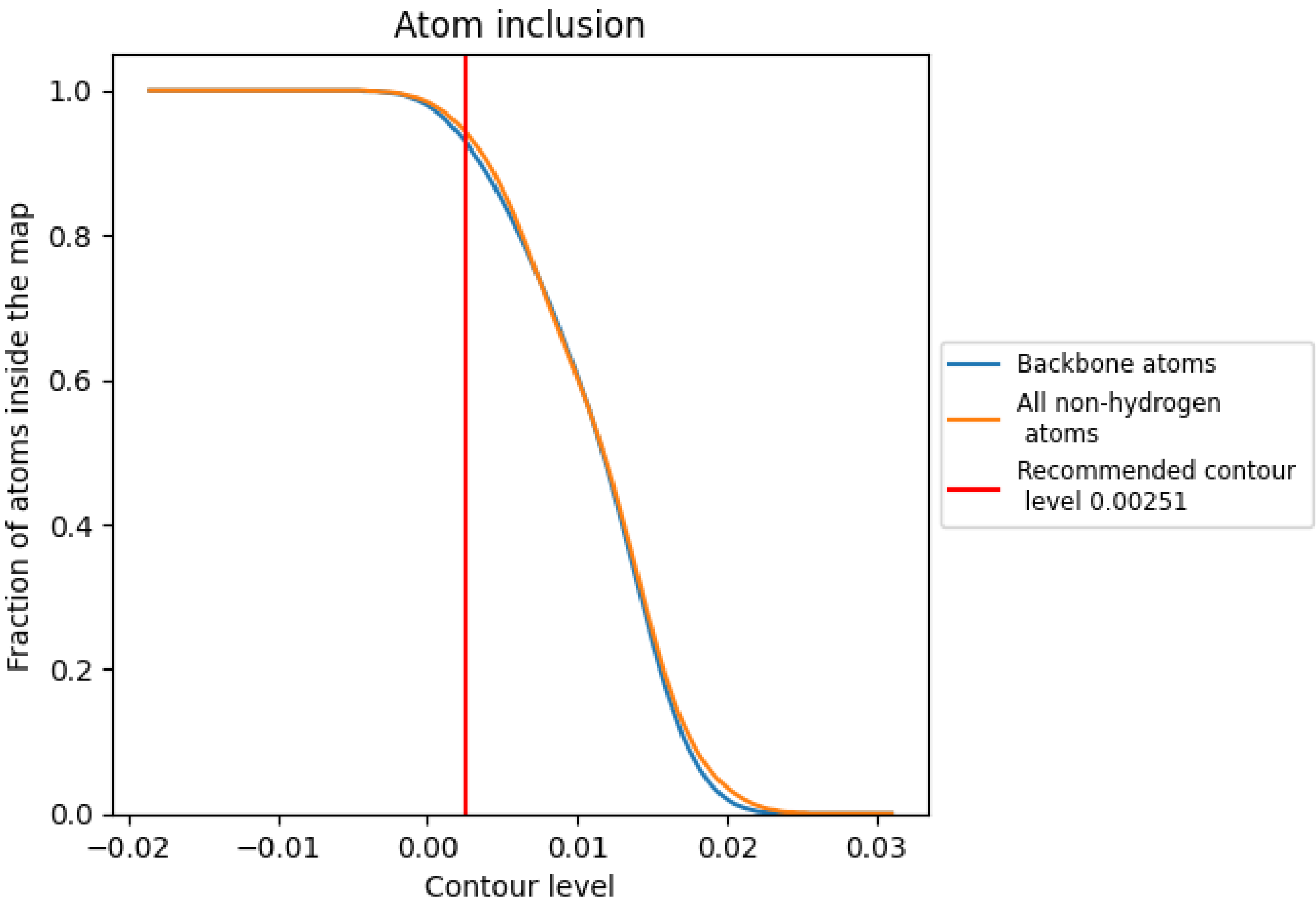
9.3 Atom inclusion mapped to coordinate model ⓘ



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 (0.00251).

9.4 Atom inclusion ⓘ



At the recommended contour level, 93% of all backbone atoms, 94% 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 (0.00251) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	▬ 0.9440	▬ 0.4770
1	▬ 0.9800	▬ 0.4850
2	▬ 0.9850	▬ 0.4700
3	▬ 0.9820	▬ 0.4600
4	▬ 0.9200	▬ 0.5050
5	▬ 0.9730	▬ 0.4610
6	▬ 0.7960	▬ 0.4400
B	▬ 0.8890	▬ 0.5260
C	▬ 0.8960	▬ 0.5140
D	▬ 0.8940	▬ 0.4920
E	▬ 0.8710	▬ 0.4300
F	▬ 0.9260	▬ 0.4540
G	▬ 0.9110	▬ 0.3870
J	▬ 0.8950	▬ 0.5020
K	▬ 0.8860	▬ 0.5130
L	▬ 0.8790	▬ 0.5070
M	▬ 0.8990	▬ 0.5090
N	▬ 0.8840	▬ 0.5100
O	▬ 0.8970	▬ 0.4590
P	▬ 0.8940	▬ 0.5130
Q	▬ 0.8750	▬ 0.4930
R	▬ 0.9120	▬ 0.5100
S	▬ 0.8730	▬ 0.5020
T	▬ 0.8500	▬ 0.4830
U	▬ 0.8940	▬ 0.4790
V	▬ 0.9240	▬ 0.4850
W	▬ 0.8780	▬ 0.5180
X	▬ 0.8770	▬ 0.5010
Y	▬ 0.8900	▬ 0.4320
Z	▬ 0.9130	▬ 0.4980
a	▬ 0.7460	▬ 0.4060
b	▬ 0.8880	▬ 0.5120
c	▬ 0.8900	▬ 0.4850
d	▬ 0.8510	▬ 0.5170
e	▬ 0.8460	▬ 0.5240

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Chain	Atom inclusion	Q-score
f	0.8060	0.4940
g	0.8260	0.4160
h	0.8930	0.4670
i	0.8450	0.4480
j	0.8820	0.4830
k	0.9010	0.4470
l	0.8820	0.4350
m	0.8930	0.4880
n	0.8650	0.4510
o	0.8560	0.4480
p	0.8990	0.4700
q	0.8730	0.4960
r	0.8840	0.4410
s	0.8540	0.4580
t	0.8850	0.4520
u	0.8770	0.4890
v	0.8860	0.4620
w	0.8130	0.4280
x	0.8810	0.4530
y	0.8440	0.4250
z	0.5600	0.4060