wwPDB EM Validation Summary Report

Nov 7, 2026 – 01:34 pm GMT

PDB ID	:	32PE / pdb_000032pe
EMDB ID	:	EMD-59049
Title	:	Structural characterization of hibernating ribosomes in the Gram-negative pathogen Enterobacter cloacae complex with E-site tRNA and no bS21
Authors	:	Vasanthakrishnan, R.K.B.S.; Olivier, D.; Sophie, C.; Yann, L.C.; Sylvie, G.D.; Sassi, M.; Emmanuel, G.; Reynald, G.
Deposited on	:	2026-07-19
Resolution	:	2.80 Å(reported)
Based on initial model	:	8B0X

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

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

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

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

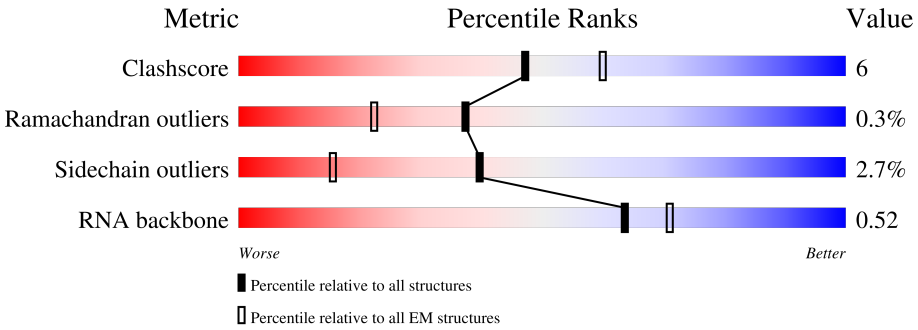
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.2
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

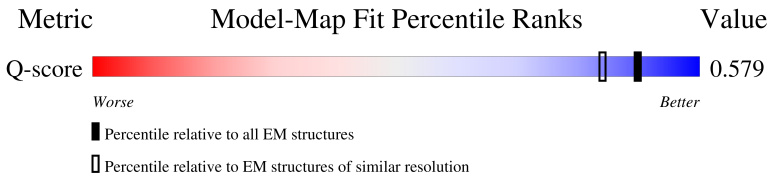
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.80 Å.

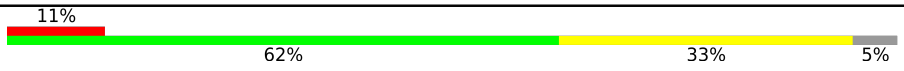
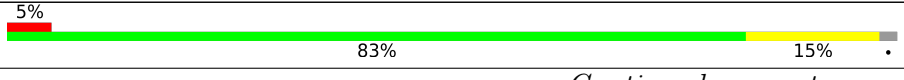
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.





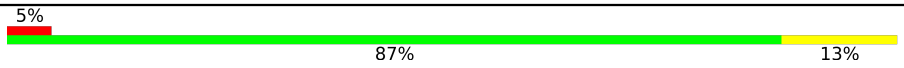
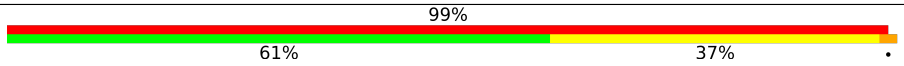
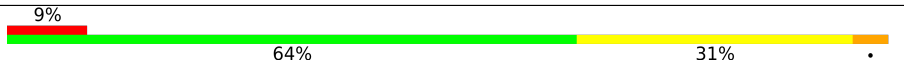
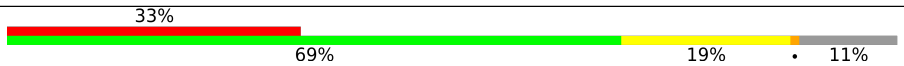
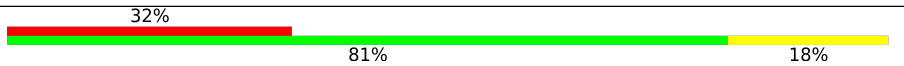
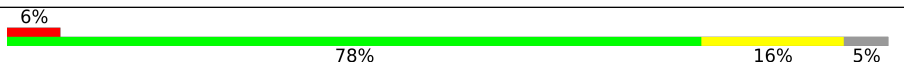
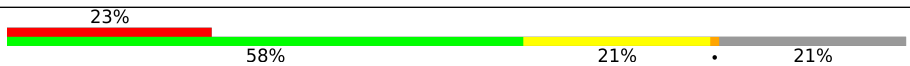
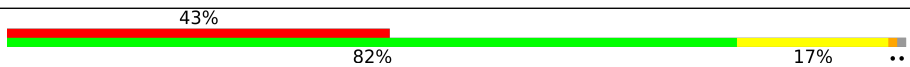
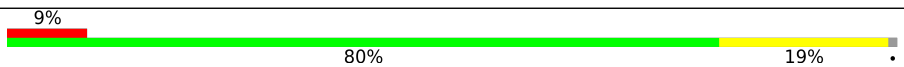
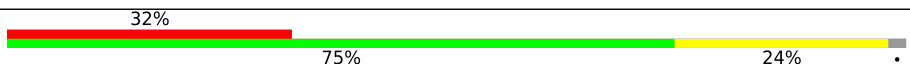
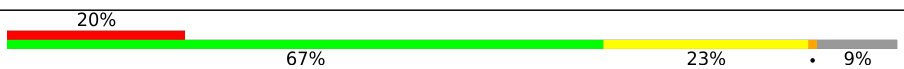
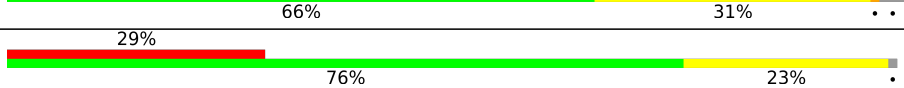
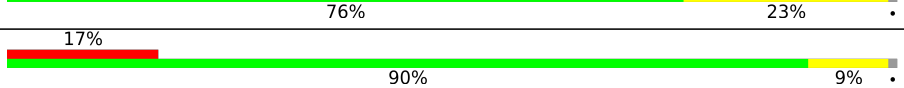
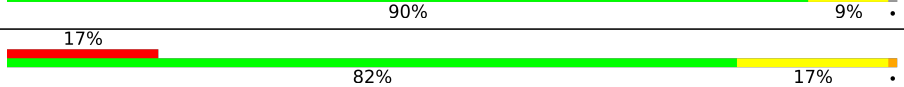
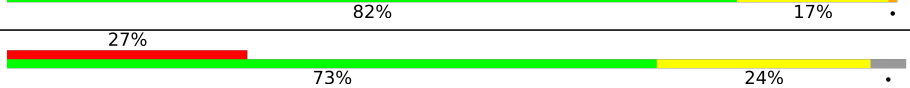
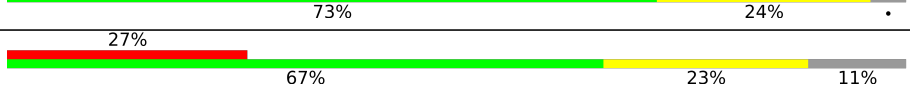
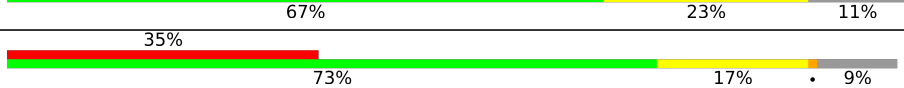
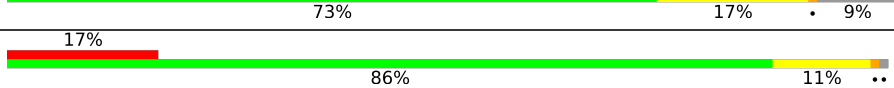
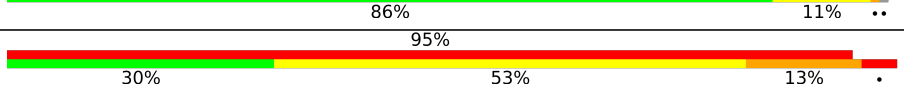
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	11806 (2.30 - 3.30)

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	0	55	
2	1	46	
3	2	65	

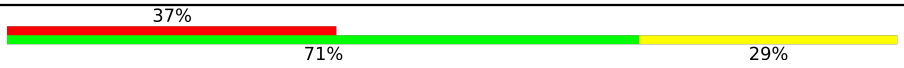
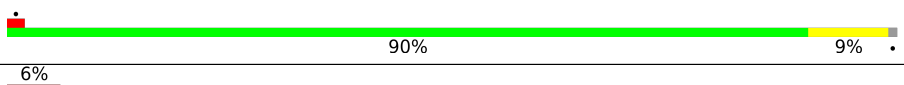
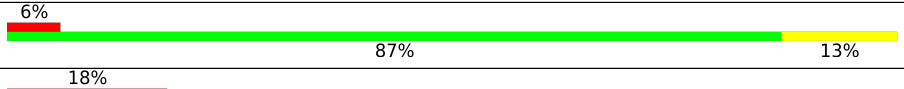
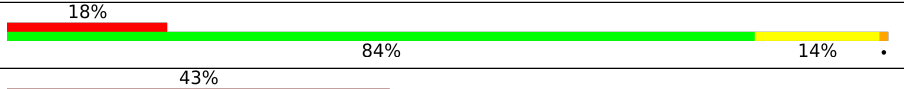
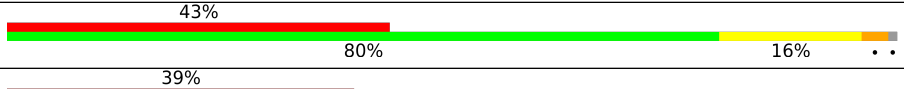
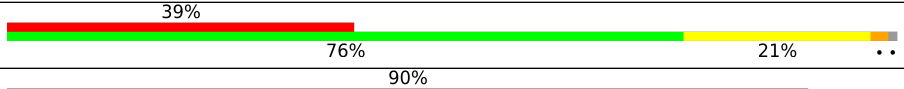
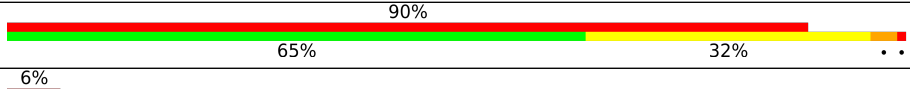
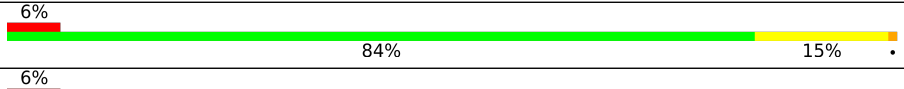
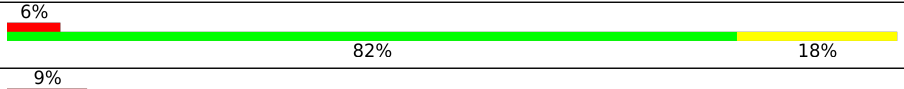
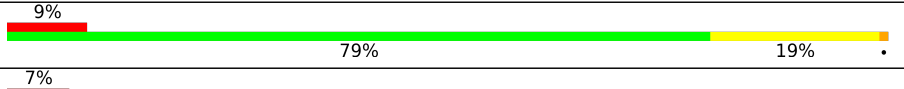
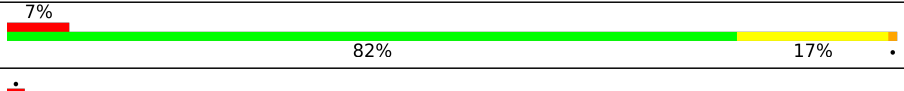
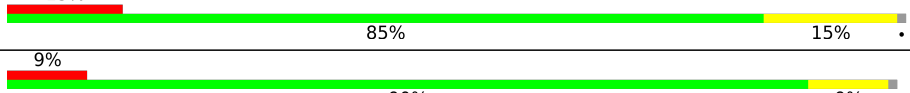
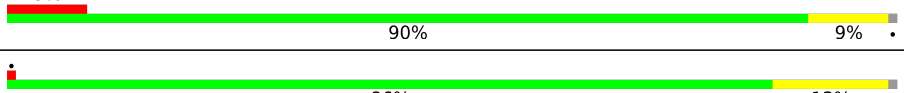
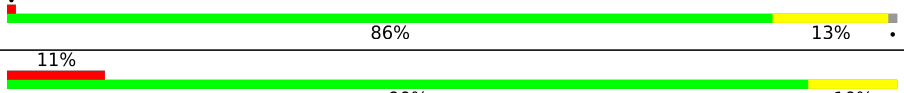
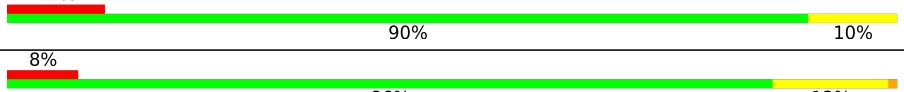
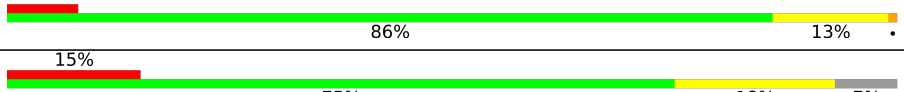
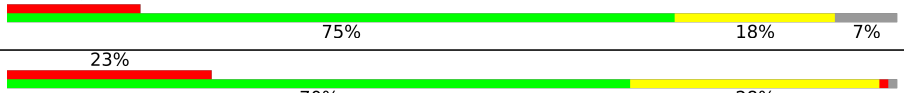
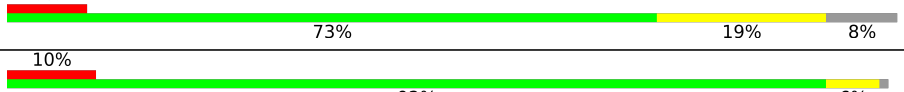
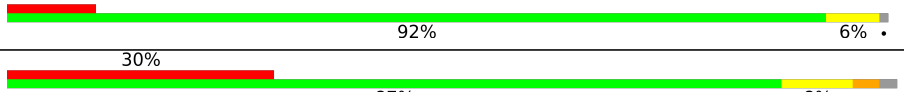
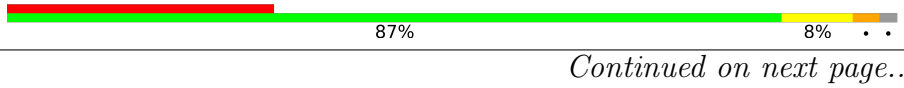
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Mol	Chain	Length	Quality of chain
4	3	38	
5	4	70	
6	5	234	
7	A	1541	
8	B	241	
9	C	233	
10	D	206	
11	E	166	
12	F	131	
13	G	156	
14	H	130	
15	I	130	
16	J	103	
17	K	129	
18	L	124	
19	M	118	
20	N	101	
21	O	89	
22	P	82	
23	Q	84	
24	R	75	
25	S	92	
26	T	87	
27	V	77	
28	W	15	

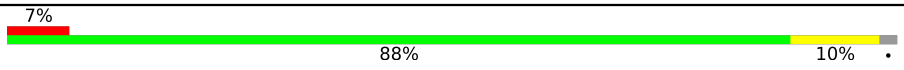
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Mol	Chain	Length	Quality of chain
29	X	95	
30	a	2904	
31	b	116	
32	c	273	
33	d	209	
34	e	201	
35	f	179	
36	g	177	
37	h	149	
38	i	142	
39	j	123	
40	k	144	
41	l	136	
42	m	127	
43	n	117	
44	o	115	
45	p	118	
46	q	103	
47	r	110	
48	s	100	
49	t	104	
50	u	94	
51	v	85	
52	w	78	
53	x	63	

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Mol	Chain	Length	Quality of chain
54	y	59	
55	z	57	

2 Entry composition (i)

There are 58 unique types of molecules in this entry. The entry contains 146853 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 Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	0	52	Total	C	N	O	0	0
			426	275	78	73		

- Molecule 2 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	1	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 3 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	2	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 4 is a protein called Large ribosomal subunit protein bL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	3	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 5 is a protein called Large ribosomal subunit protein bL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	4	67	Total	C	N	O	S	0	0
			526	325	100	95	6		

- Molecule 6 is a protein called Large ribosomal subunit protein uL1.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	5	233	Total	C	N	O	S	0	0
			1714	1069	311	328	6		

- Molecule 7 is a RNA chain called 16S RNA (1539-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
7	A	1539	Total	C	N	O	P	0	0
			33035	14741	6061	10694	1539		

- Molecule 8 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	B	225	Total	C	N	O	S	0	0
			1761	1110	317	326	8		

- Molecule 9 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	C	207	Total	C	N	O	S	0	0
			1632	1034	306	289	3		

- Molecule 10 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	D	205	Total	C	N	O	S	0	0
			1645	1026	316	299	4		

- Molecule 11 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	E	157	Total	C	N	O	S	0	0
			1156	719	218	213	6		

- Molecule 12 is a protein called Small ribosomal subunit protein bS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	F	104	Total	C	N	O	S	0	0
			845	533	152	153	7		

- Molecule 13 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	G	155	Total	C	N	O	S	0	0
			1228	767	238	219	4		

- Molecule 14 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	H	129	Total	C	N	O	S	0	0
			978	618	171	183	6		

- Molecule 15 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	I	128	Total	C	N	O	S	0	0
			1028	638	206	181	3		

- Molecule 16 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	J	98	Total	C	N	O	S	0	0
			788	493	151	143	1		

- Molecule 17 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	K	117	Total	C	N	O	S	0	0
			877	540	173	161	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	119	IAS	ASN	modified residue	UNP A0A837F5X1

- Molecule 18 is a protein called Small ribosomal subunit protein uS12.

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

- Molecule 19 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	M	115	Total	C	N	O	S	0	0
			895	554	178	160	3		

- Molecule 20 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	N	100	Total	C	N	O	S	0	0
			796	493	161	139	3		

- Molecule 21 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	O	88	Total	C	N	O	S	0	0
			709	438	144	126	1		

- Molecule 22 is a protein called Small ribosomal subunit protein bS16.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	P	82	Total	C	N	O	S	0	0
			640	400	127	112	1		

- Molecule 23 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	Q	81	Total	C	N	O	S	0	0
			658	416	123	116	3		

- Molecule 24 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	R	67	Total	C	N	O	S	0	0
			555	351	106	97	1		

- Molecule 25 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	S	84	Total	C	N	O	S	0	0
			668	427	127	112	2		

- Molecule 26 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	T	86	Total	C	N	O	S	0	0
			668	411	138	116	3		

- Molecule 27 is a RNA chain called tRNA (77-MER).

Mol	Chain	Residues	Atoms						AltConf	Trace
27	V	77	Total	C	N	O	P	S	0	0
			1644	734	297	535	77	1		

- Molecule 28 is a RNA chain called non-STOP mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	W	10	Total	C	N	O	P	0	0
			219	97	41	71	10		

- Molecule 29 is a protein called Ribosome hibernation promoting factor.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	X	95	Total	C	N	O	S	0	0
			764	481	137	144	2		

- Molecule 30 is a RNA chain called 23S RNA (2904-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
30	a	2904	Total	C	N	O	P	0	0
			62357	27823	11472	20158	2904		

- Molecule 31 is a RNA chain called 5S RNA (116-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
31	b	116	Total	C	N	O	P	0	0
			2481	1105	449	811	116		

- Molecule 32 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	c	271	Total	C	N	O	S	0	0
			2079	1285	423	364	7		

- Molecule 33 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	d	209	Total	C	N	O	S	0	0
			1568	982	288	295	3		

- Molecule 34 is a protein called Large ribosomal subunit protein uL4.

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

- Molecule 35 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	f	178	Total	C	N	O	S	0	0
			1417	901	251	259	6		

- Molecule 36 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	g	176	Total	C	N	O	S	0	0
			1317	833	241	241	2		

- Molecule 37 is a protein called Large ribosomal subunit protein bL9.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	h	149	Total	C	N	O	S	0	0
			1102	693	197	211	1		

- Molecule 38 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	i	142	Total	C	N	O	S	0	0
			1130	713	211	201	5		

- Molecule 39 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	j	123	Total	C	N	O	S	0	0
			947	594	181	166	6		

- Molecule 40 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	k	144	Total	C	N	O	S	0	0
			1051	651	207	191	2		

- Molecule 41 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	l	136	Total	C	N	O	S	0	0
			1074	685	204	179	6		

- Molecule 42 is a protein called Large ribosomal subunit protein bL17.

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

- Molecule 43 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	n	116	Total	C	N	O	0	0
			890	550	178	162		

- Molecule 44 is a protein called Large ribosomal subunit protein bL19.

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

- Molecule 45 is a protein called Large ribosomal subunit protein bL20.

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

- Molecule 46 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	q	103	Total	C	N	O	S	0	0
			815	515	153	145	2		

- Molecule 47 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	r	110	Total	C	N	O	S	0	0
			855	530	166	156	3		

- Molecule 48 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	s	93	Total 739	C 467	N 139	O 131	S 2	0	0

- Molecule 49 is a protein called Large ribosomal subunit protein uL24.

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

- Molecule 50 is a protein called Large ribosomal subunit protein bL25.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	u	94	Total 746	C 476	N 135	O 133	S 2	0	0

- Molecule 51 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	v	78	Total 592	C 364	N 119	O 108	S 1	0	0

- Molecule 52 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	w	77	Total 626	C 388	N 129	O 107	S 2	0	0

- Molecule 53 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	x	62	Total 499	C 308	N 99	O 91	S 1	0	0

- Molecule 54 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	y	58	Total 453	C 285	N 87	O 79	S 2	0	0

- Molecule 55 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	z	55	Total	C	N	O	S	0	0
			435	264	92	78	1		

- Molecule 56 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
56	3	1	Total	Zn	0
			1	1	
56	4	1	Total	Zn	0
			1	1	

- Molecule 57 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
57	A	95	Total	Mg	0
			95	95	
57	a	251	Total	Mg	0
			251	251	
57	b	5	Total	Mg	0
			5	5	
57	c	2	Total	Mg	0
			2	2	
57	d	1	Total	Mg	0
			1	1	
57	p	2	Total	Mg	0
			2	2	
57	z	1	Total	Mg	0
			1	1	

- Molecule 58 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
58	A	45	Total	K	0
			45	45	
58	a	108	Total	K	0
			108	108	
58	b	1	Total	K	0
			1	1	
58	c	4	Total	K	0
			4	4	
58	d	1	Total	K	0
			1	1	

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Mol	Chain	Residues	Atoms	AltConf
58	e	2	Total K 2 2	0
58	f	1	Total K 1 1	0

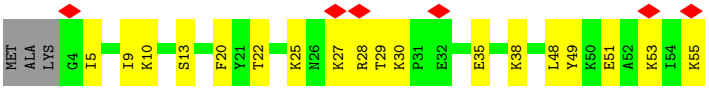
3 Residue-property plots (i)

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

• Molecule 1: Large ribosomal subunit protein bL33

Chain 0:

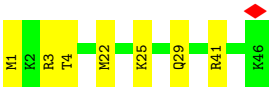




• Molecule 2: Large ribosomal subunit protein bL34

Chain 1:

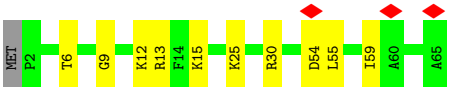




• Molecule 3: Large ribosomal subunit protein bL35

Chain 2:

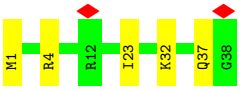




• Molecule 4: Large ribosomal subunit protein bL36

Chain 3:

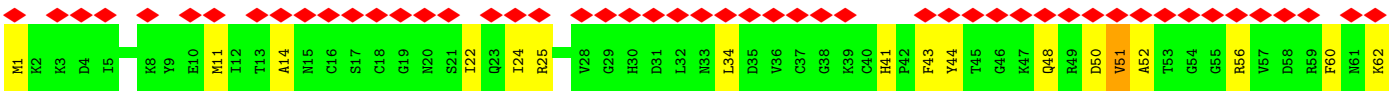




• Molecule 5: Large ribosomal subunit protein bL31

Chain 4:

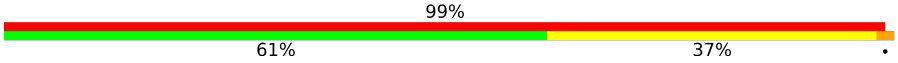


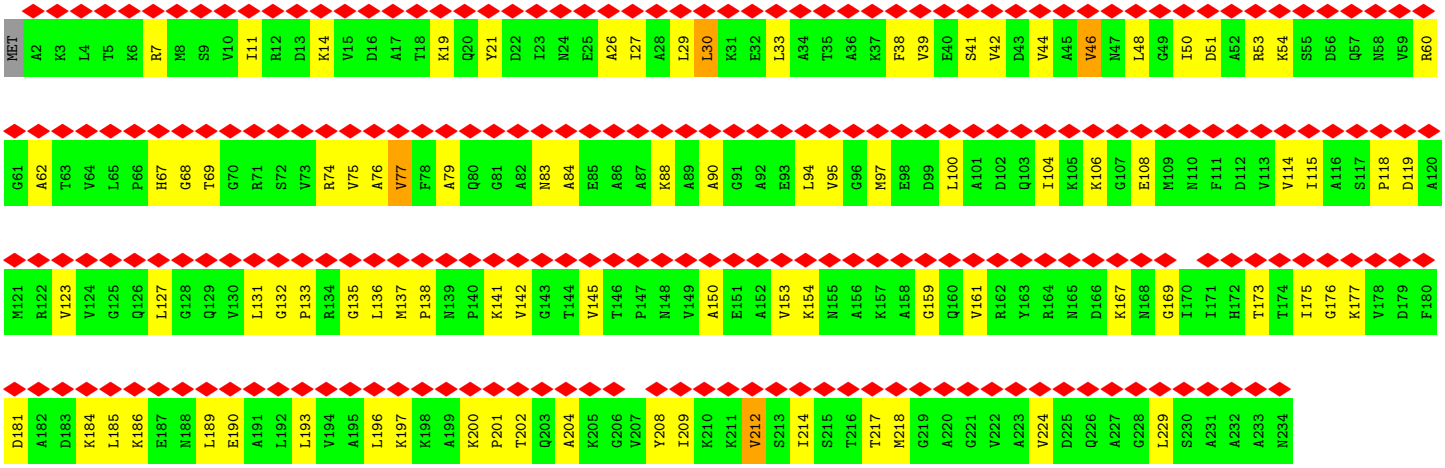




• Molecule 6: Large ribosomal subunit protein uL1

Chain 5:

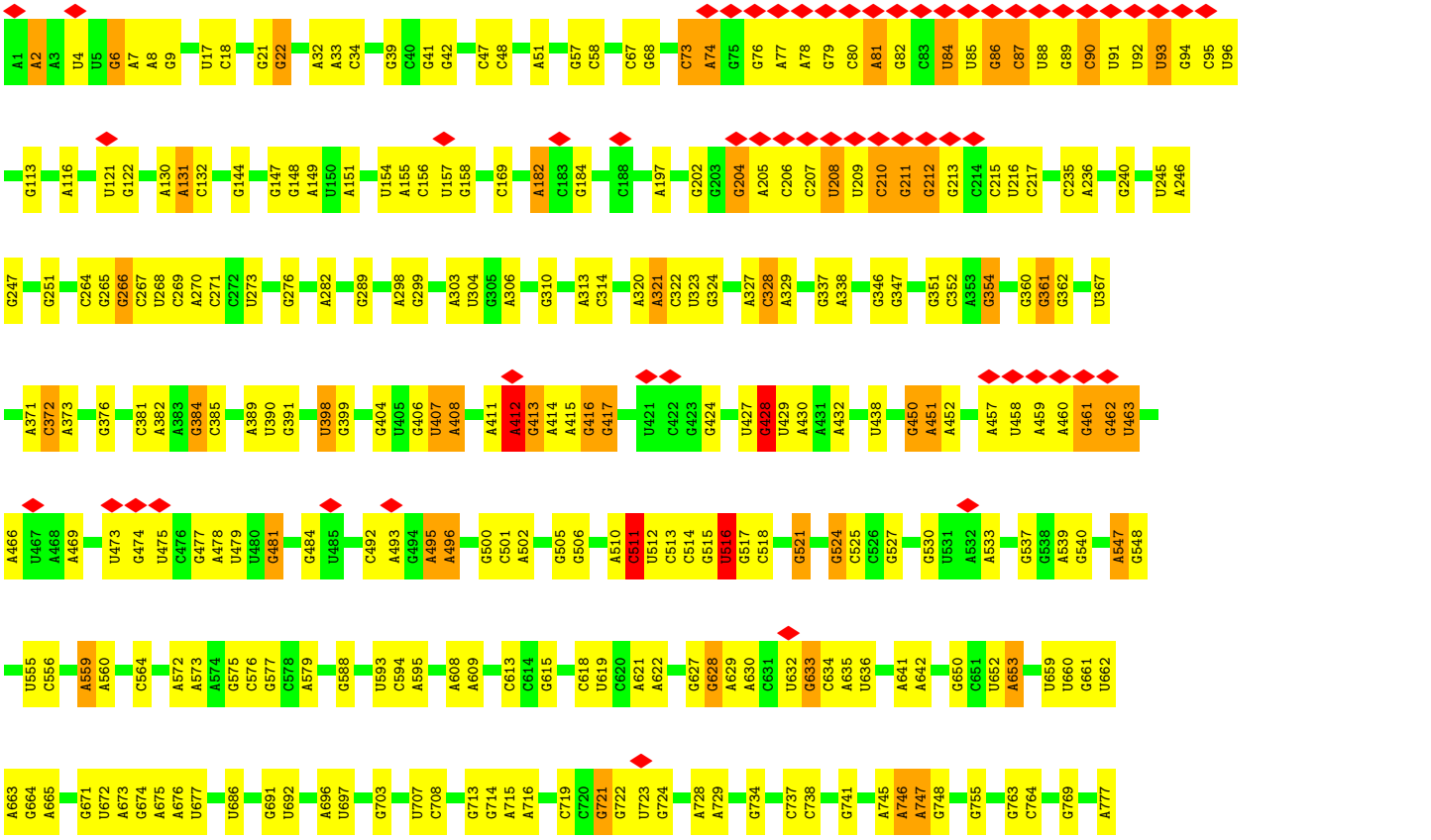


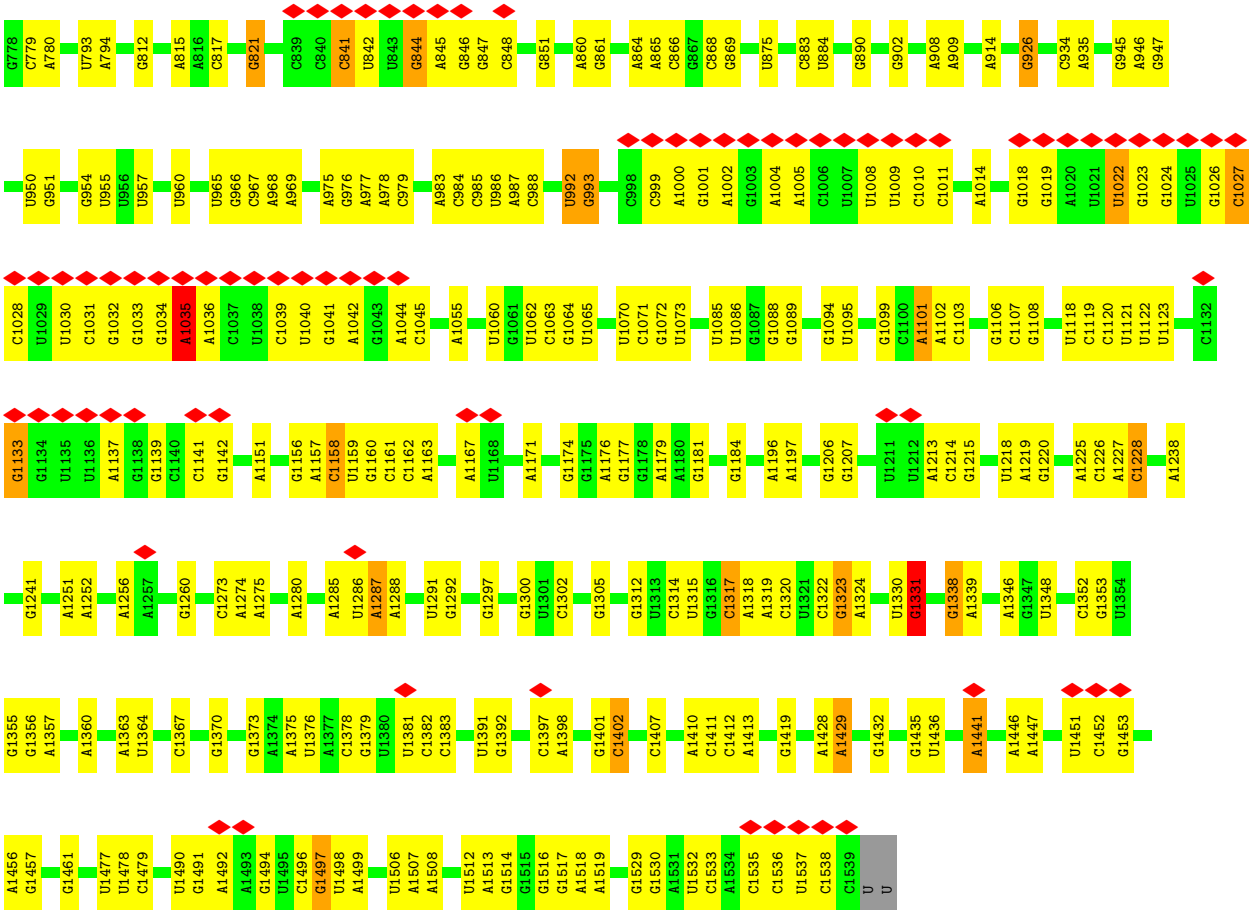


• Molecule 7: 16S RNA (1539-MER)

Chain A:



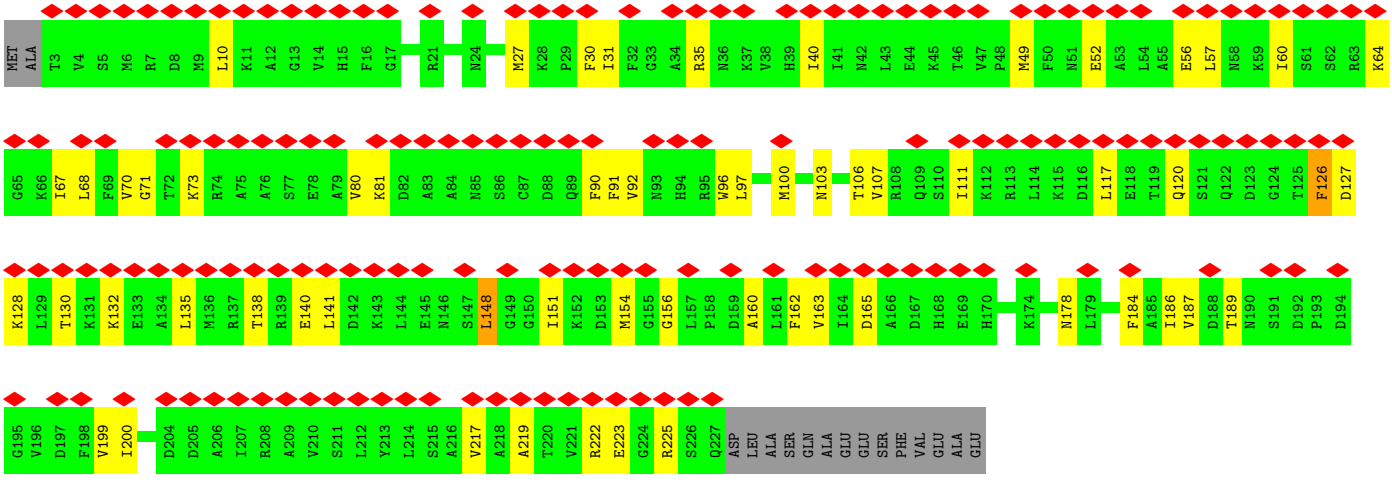




• Molecule 8: Small ribosomal subunit protein uS2

Chain B:

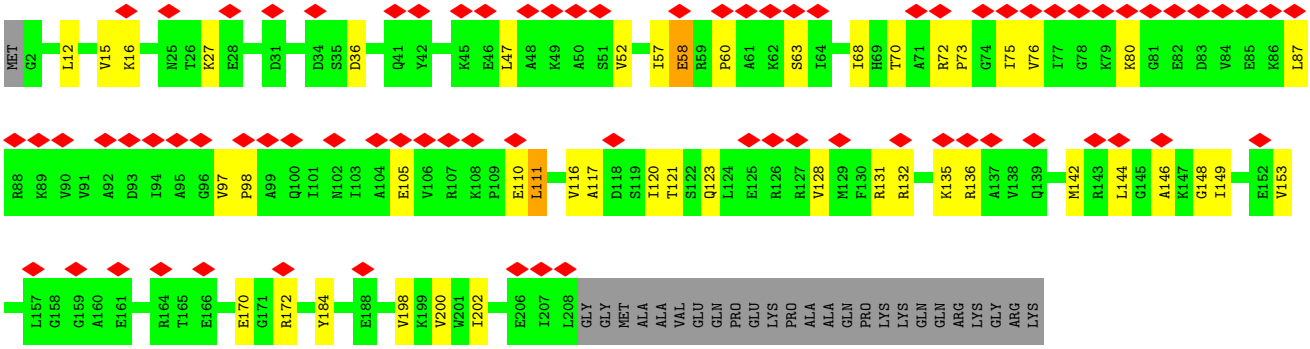




• Molecule 9: 30S ribosomal protein S3

Chain C:

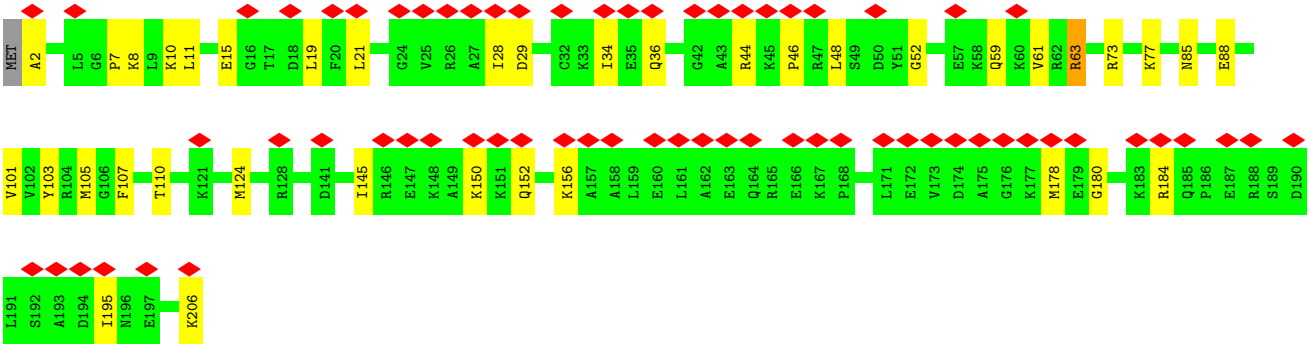




• Molecule 10: Small ribosomal subunit protein uS4

Chain D:

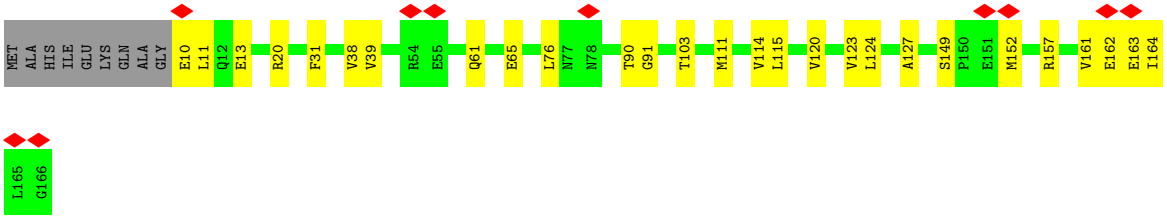




• Molecule 11: 30S ribosomal protein S5

Chain E:

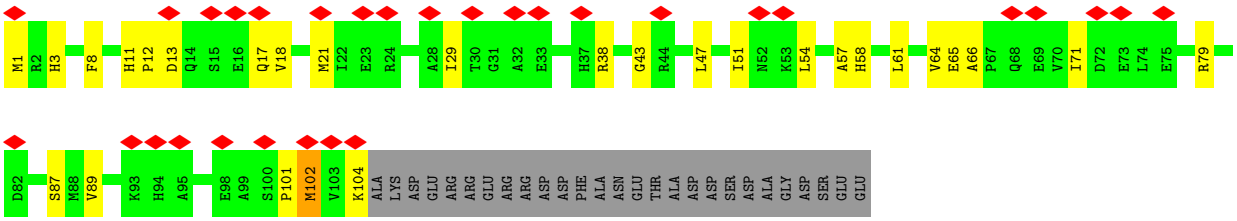




• Molecule 12: Small ribosomal subunit protein bS6

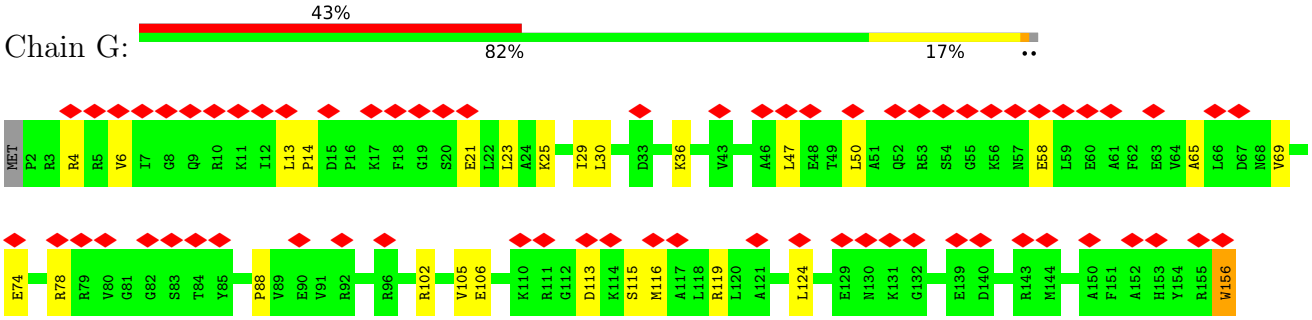
Chain F:





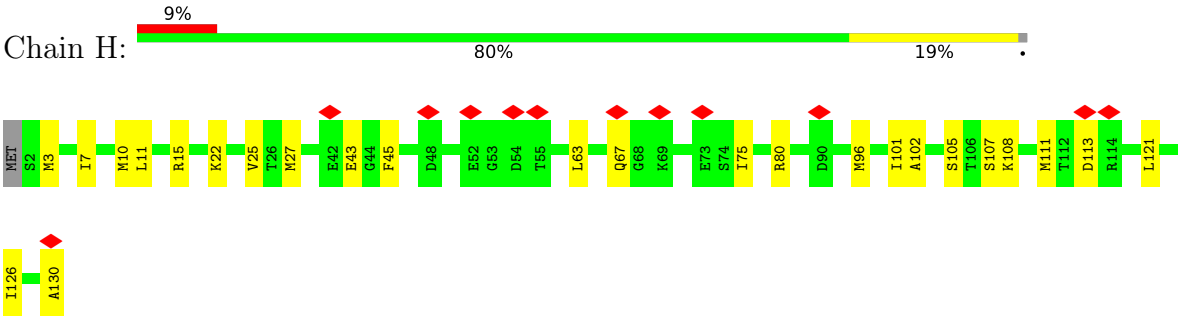
• Molecule 13: Small ribosomal subunit protein uS7

Chain G:



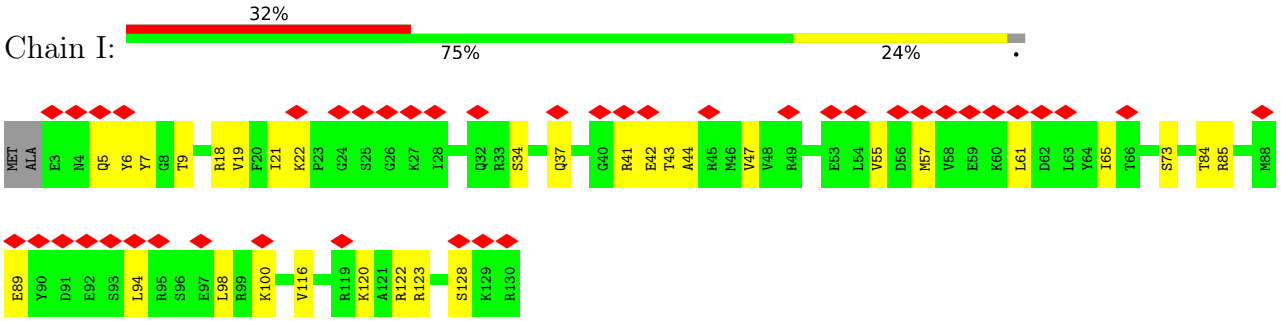
• Molecule 14: Small ribosomal subunit protein uS8

Chain H:



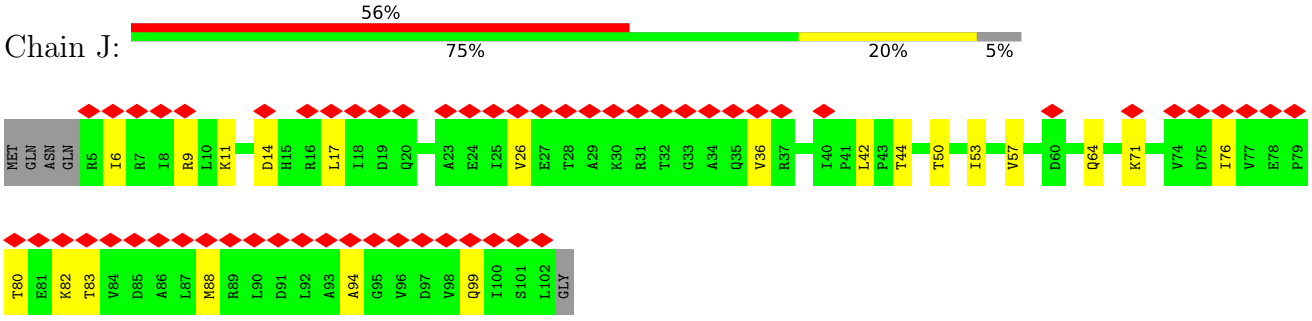
• Molecule 15: Small ribosomal subunit protein uS9

Chain I:



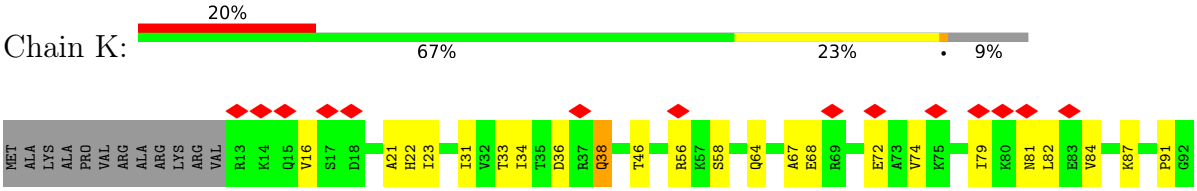
• Molecule 16: 30S ribosomal protein S10

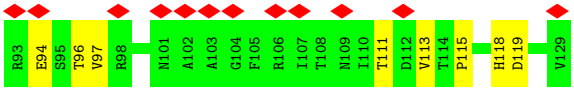
Chain J:



• Molecule 17: Small ribosomal subunit protein uS11

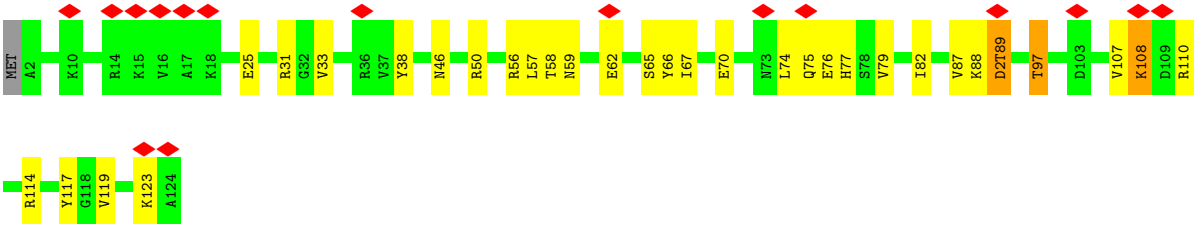
Chain K:





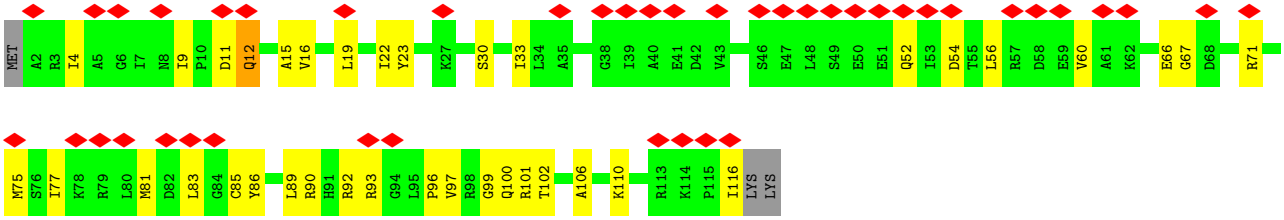
• Molecule 18: Small ribosomal subunit protein uS12



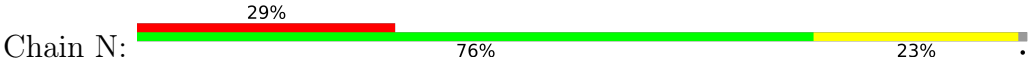


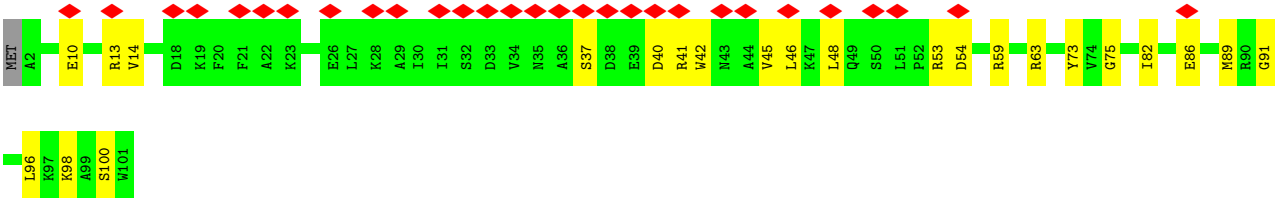
• Molecule 19: Small ribosomal subunit protein uS13



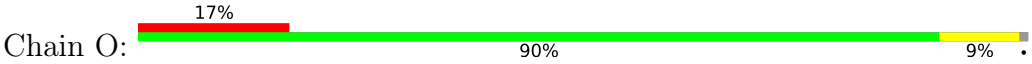


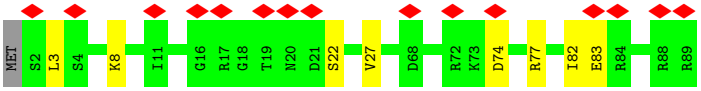
• Molecule 20: Small ribosomal subunit protein uS14



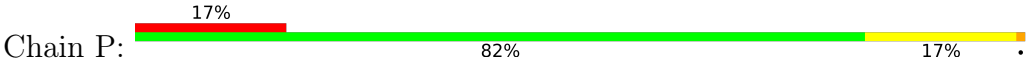


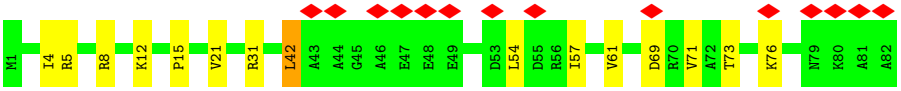
• Molecule 21: Small ribosomal subunit protein uS15





• Molecule 22: Small ribosomal subunit protein bS16

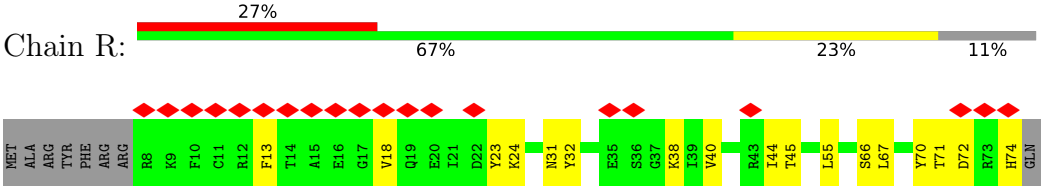




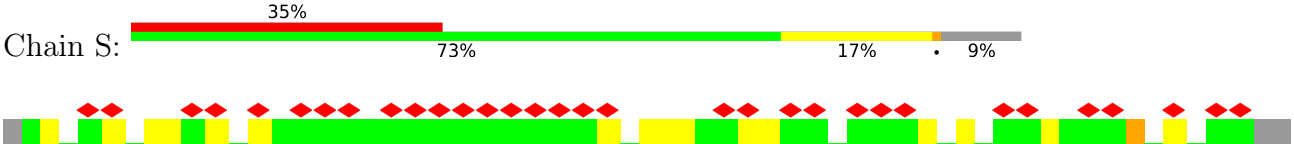
• Molecule 23: Small ribosomal subunit protein uS17



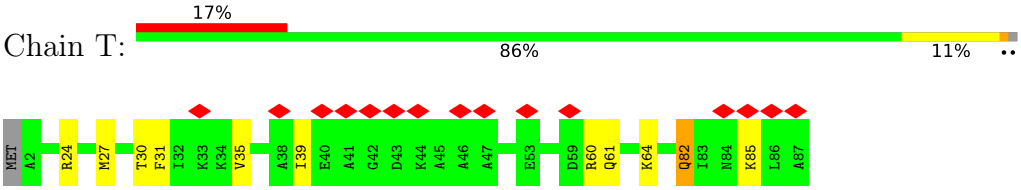
• Molecule 24: 30S ribosomal protein S18



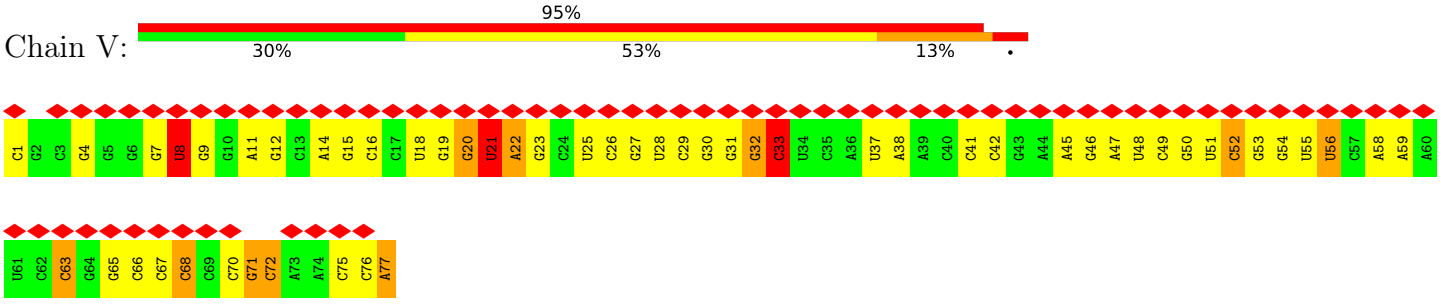
• Molecule 25: Small ribosomal subunit protein uS19



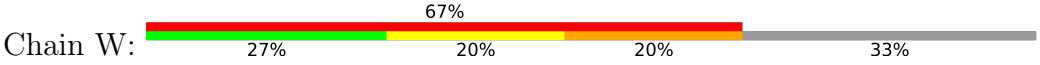
• Molecule 26: Small ribosomal subunit protein bS20

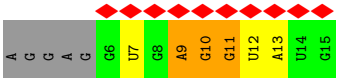


• Molecule 27: tRNA (77-MER)



• Molecule 28: non-STOP mRNA

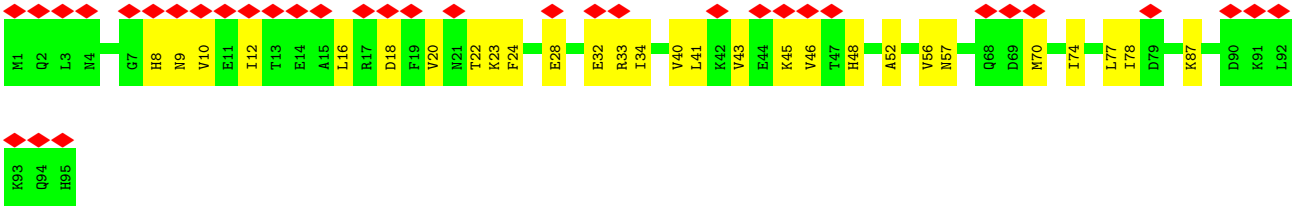




• Molecule 29: Ribosome hibernation promoting factor

Chain X:

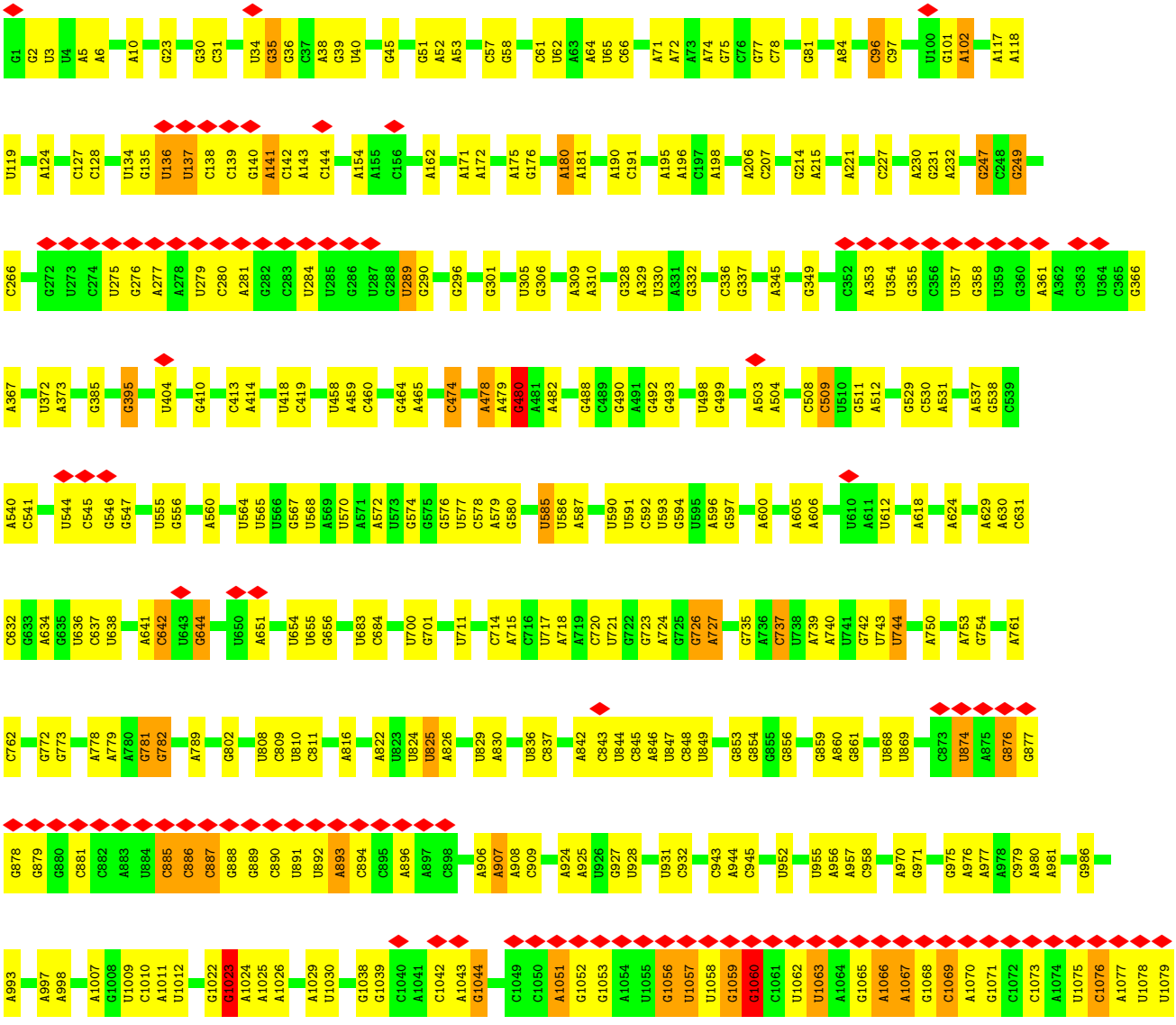


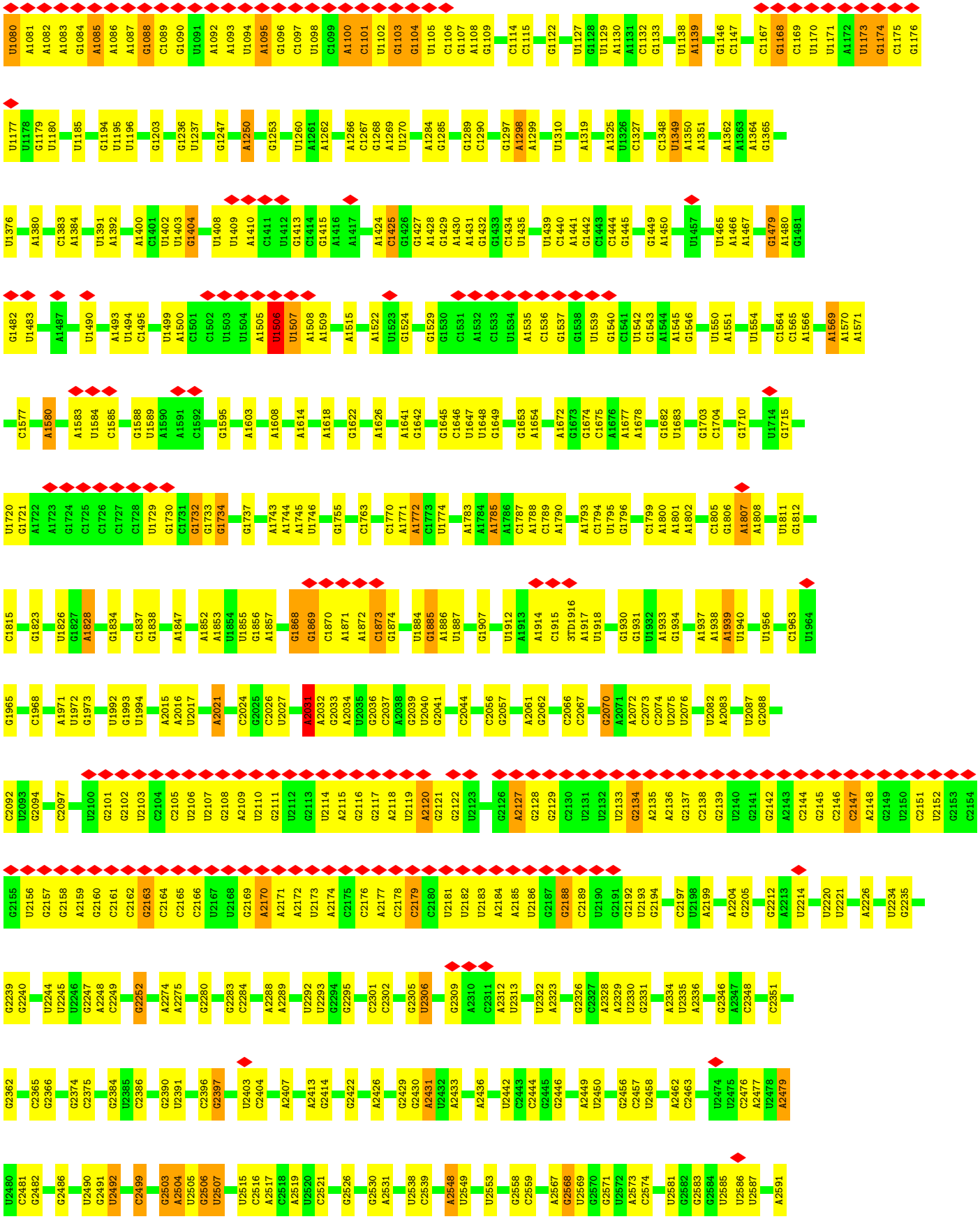


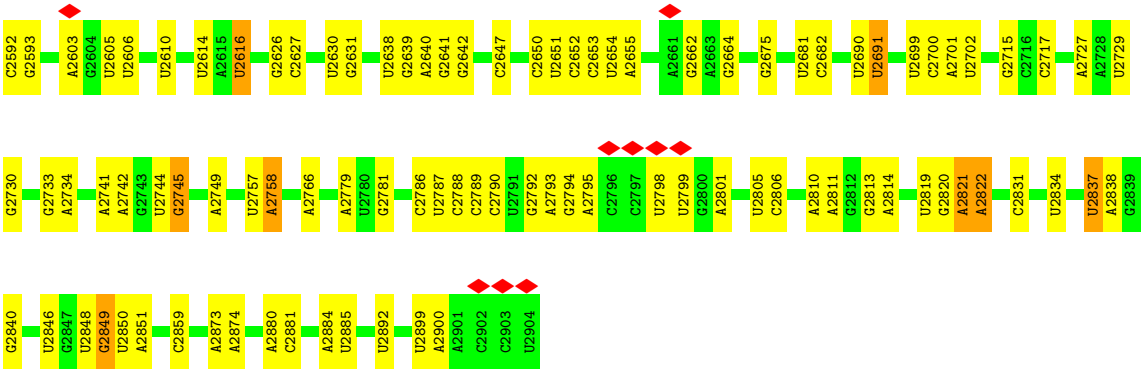
• Molecule 30: 23S RNA (2904-MER)

Chain a:

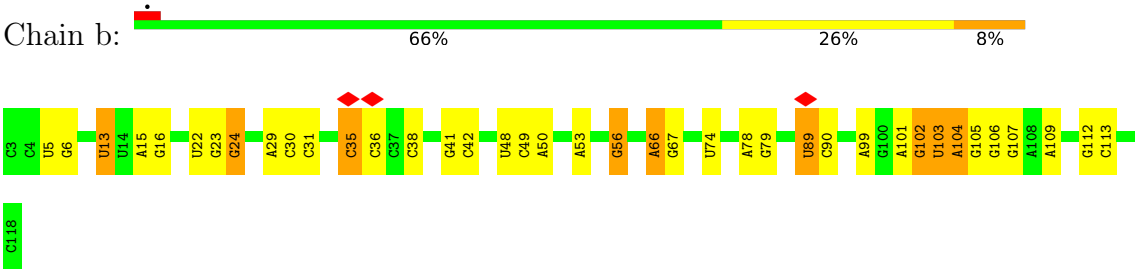




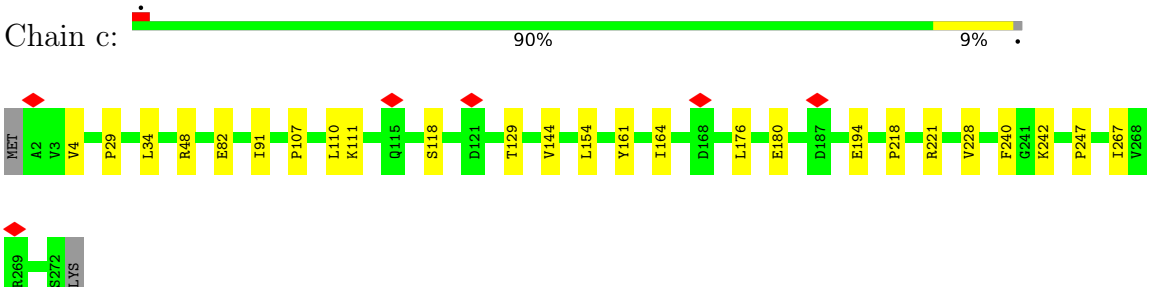

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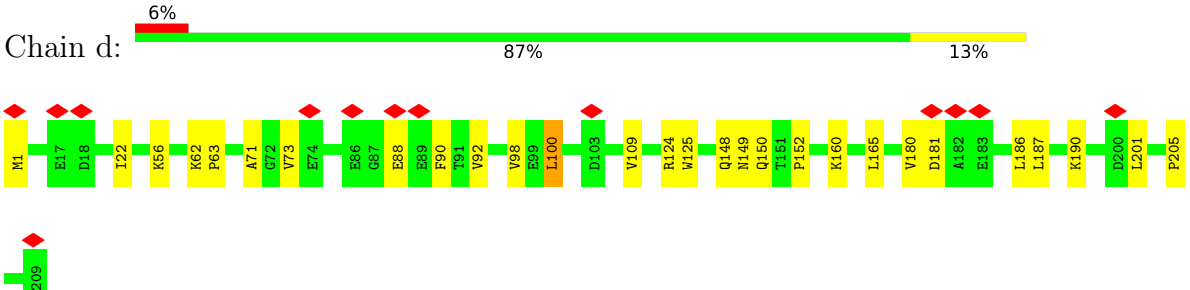
• Molecule 31: 5S RNA (116-MER)



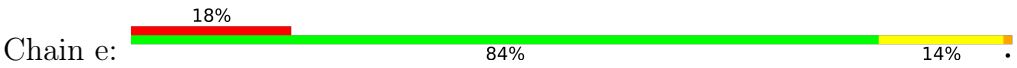
• Molecule 32: Large ribosomal subunit protein uL2

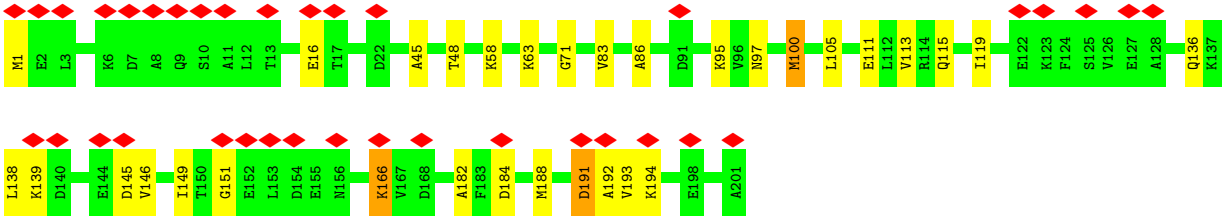


• Molecule 33: Large ribosomal subunit protein uL3

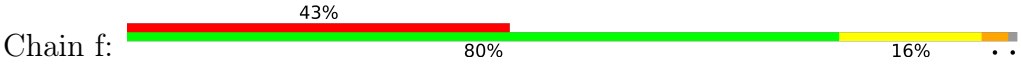


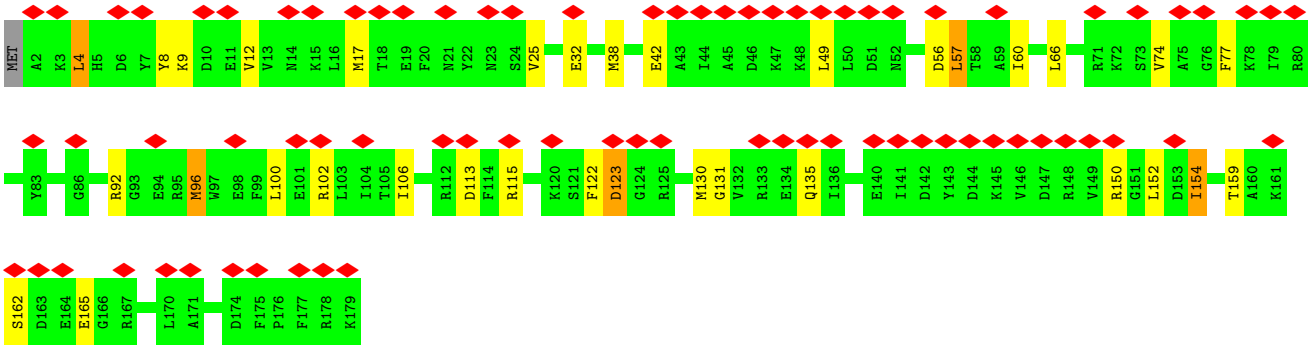
• Molecule 34: Large ribosomal subunit protein uL4



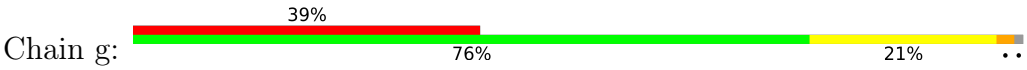


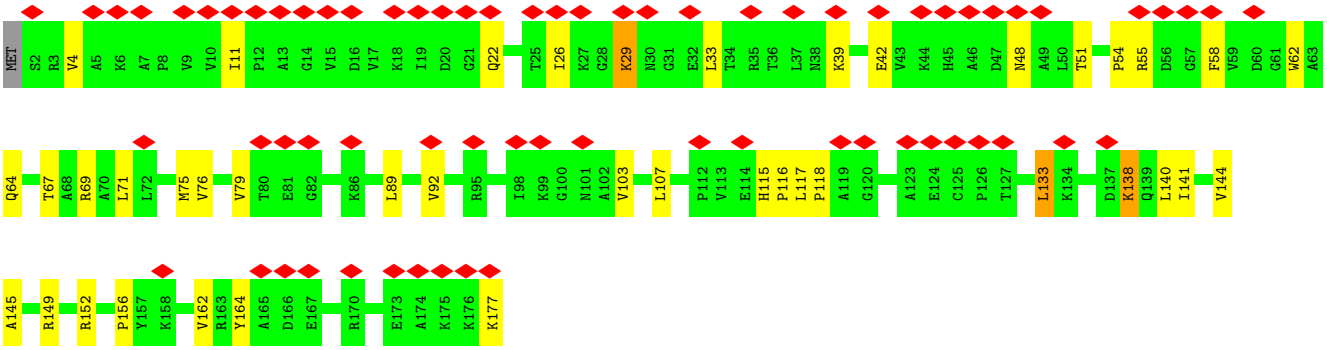
• Molecule 35: Large ribosomal subunit protein uL5



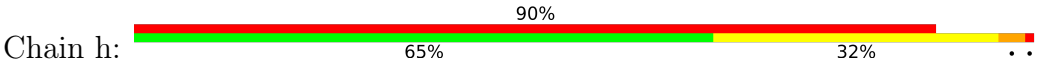


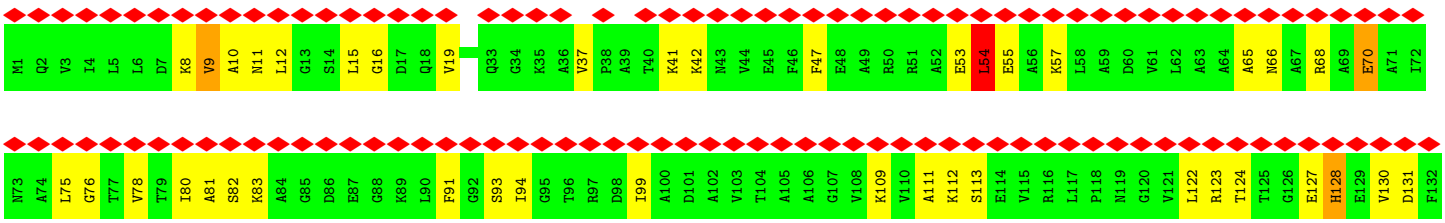
• Molecule 36: Large ribosomal subunit protein uL6

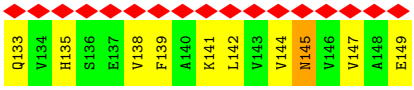




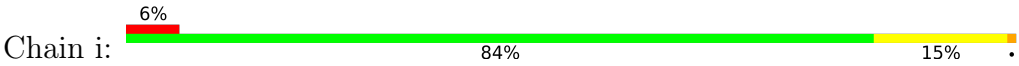
• Molecule 37: Large ribosomal subunit protein bL9

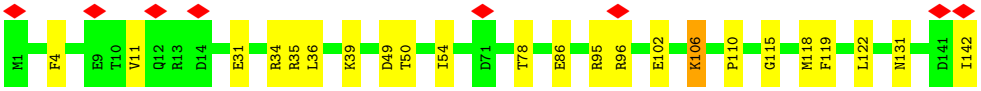




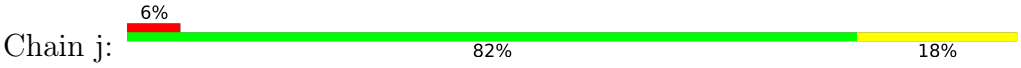


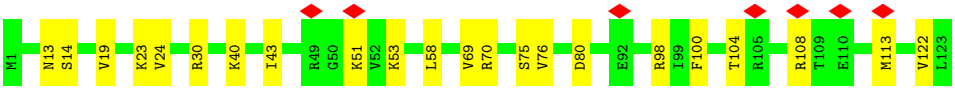
• Molecule 38: Large ribosomal subunit protein uL13



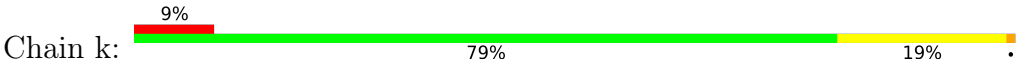


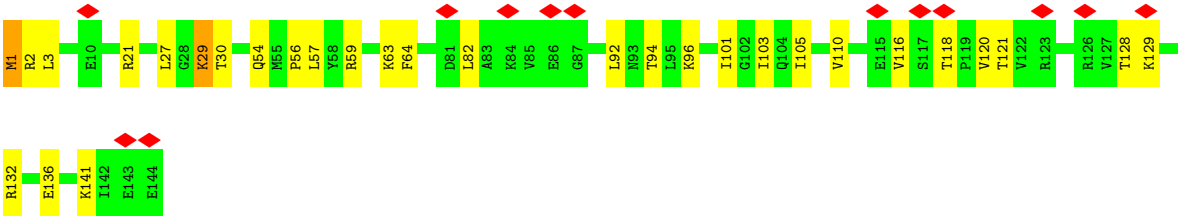
• Molecule 39: Large ribosomal subunit protein uL14



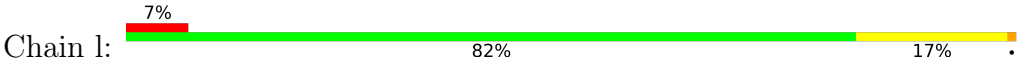


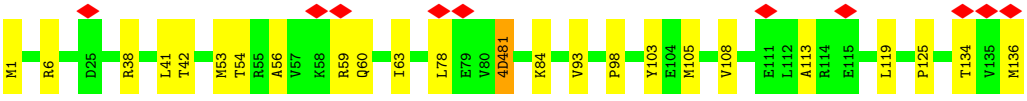
• Molecule 40: Large ribosomal subunit protein uL15



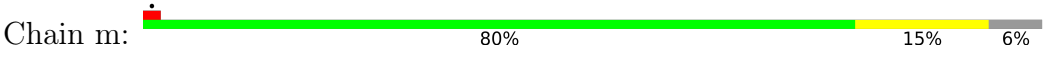


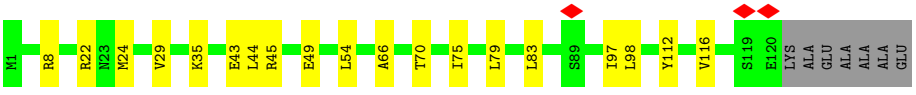
• Molecule 41: Large ribosomal subunit protein uL16



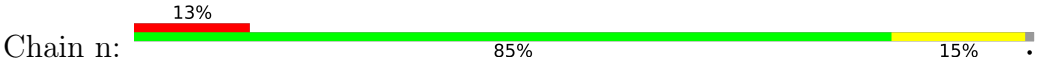


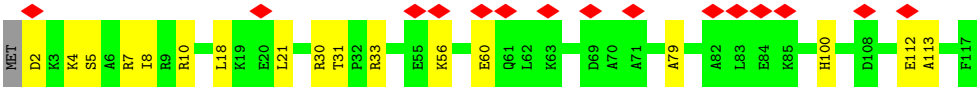
• Molecule 42: Large ribosomal subunit protein bL17



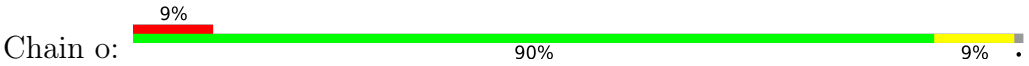


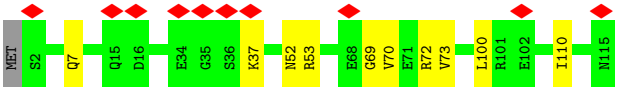
• Molecule 43: Large ribosomal subunit protein uL18



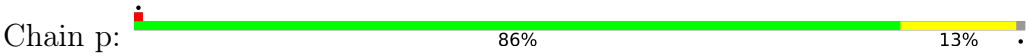


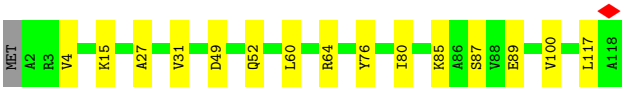
• Molecule 44: Large ribosomal subunit protein bL19



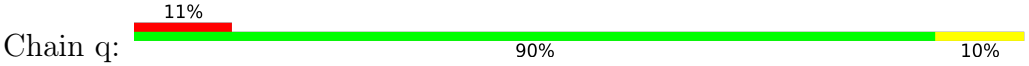


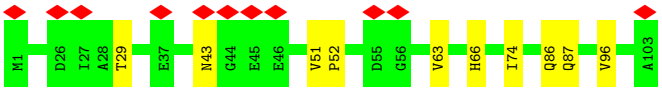
• Molecule 45: Large ribosomal subunit protein bL20



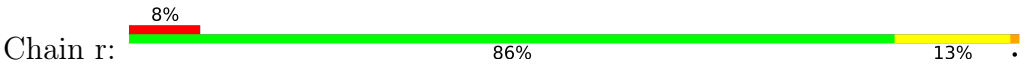


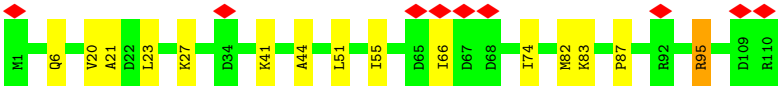
• Molecule 46: Large ribosomal subunit protein bL21





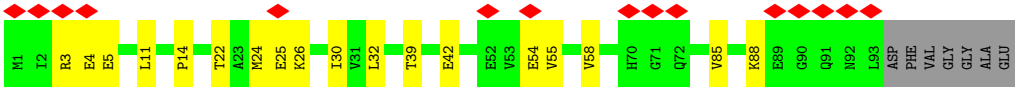
• Molecule 47: Large ribosomal subunit protein uL22





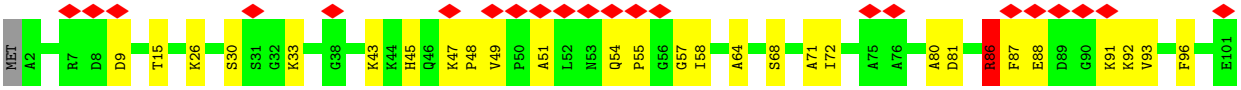
• Molecule 48: Large ribosomal subunit protein uL23





• Molecule 49: Large ribosomal subunit protein uL24



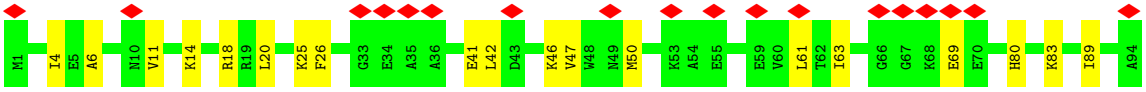




• Molecule 50: Large ribosomal subunit protein bL25

Chain u:

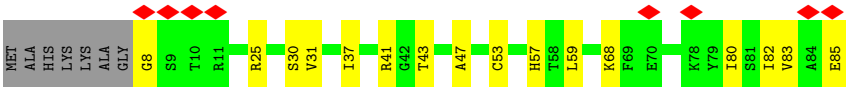




• Molecule 51: Large ribosomal subunit protein bL27

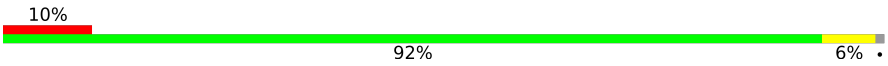
Chain v:

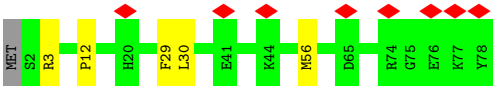




• Molecule 52: Large ribosomal subunit protein bL28

Chain w:

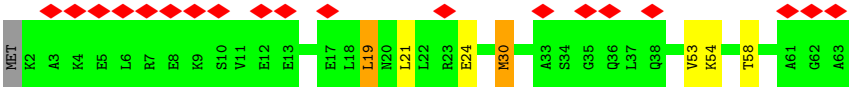




• Molecule 53: Large ribosomal subunit protein uL29

Chain x:

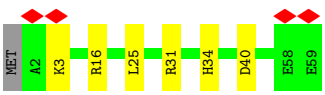




• Molecule 54: Large ribosomal subunit protein uL30

Chain y:

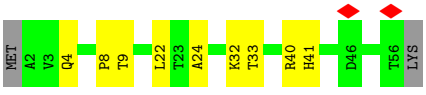




• Molecule 55: Large ribosomal subunit protein bL32

Chain z:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	70464	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	35	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.290	Depositor
Minimum map value	-0.891	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.075	Depositor
Recommended contour level	0.45	Depositor
Map size (Å)	542.72, 542.72, 542.72	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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: 4SU, OMG, 6MZ, OMC, 1MG, G7M, UR3, OMU, H2U, 3TD, MEQ, PSU, 5MC, 2MA, ZN, K, 2MG, IAS, 4OC, MS6, MA6, 4D4, 5MU, D2T, 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	0	0.34	0/433	0.34	0/576
2	1	0.40	0/380	0.39	0/498
3	2	0.38	0/513	0.37	0/676
4	3	0.38	0/303	0.38	0/397
5	4	0.20	0/536	0.46	0/718
6	5	0.17	0/1729	0.38	0/2331
7	A	0.77	0/36710	0.79	13/57263 (0.0%)
8	B	0.24	0/1792	0.38	0/2414
9	C	0.28	0/1659	0.36	0/2236
10	D	0.27	0/1666	0.33	0/2227
11	E	0.33	0/1169	0.40	0/1573
12	F	0.28	0/864	0.40	0/1168
13	G	0.24	0/1246	0.34	0/1673
14	H	0.33	0/988	0.38	0/1325
15	I	0.27	0/1040	0.44	0/1384
16	J	0.25	0/798	0.38	0/1078
17	K	0.29	0/884	0.36	0/1191
18	L	0.36	0/960	0.47	0/1286
19	M	0.27	0/903	0.41	0/1208
20	N	0.26	0/808	0.35	0/1076
21	O	0.28	0/717	0.29	0/955
22	P	0.33	0/650	0.41	0/876
23	Q	0.29	0/667	0.39	0/893
24	R	0.30	0/564	0.42	0/756
25	S	0.25	0/685	0.37	0/922
26	T	0.30	0/674	0.35	0/894
27	V	0.42	0/1724	0.86	2/2687 (0.1%)
28	W	0.41	0/245	0.86	0/381
29	X	0.26	0/775	0.41	0/1041
30	a	0.90	0/69263	0.82	13/108053 (0.0%)
31	b	0.76	0/2773	0.87	0/4323

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	c	0.39	0/2117	0.40	0/2845
33	d	0.43	0/1578	0.51	0/2123
34	e	0.34	0/1571	0.35	0/2113
35	f	0.26	0/1440	0.35	0/1935
36	g	0.32	0/1338	0.49	0/1807
37	h	0.20	0/1113	0.47	0/1504
38	i	0.41	0/1153	0.45	0/1552
39	j	0.37	0/956	0.39	0/1281
40	k	0.39	0/1060	0.54	0/1411
41	l	0.35	0/1072	0.35	0/1434
42	m	0.40	0/973	0.44	0/1301
43	n	0.28	0/900	0.36	0/1206
44	o	0.35	0/929	0.32	0/1242
45	p	0.46	0/960	0.48	0/1278
46	q	0.35	0/828	0.45	0/1105
47	r	0.36	0/862	0.38	0/1154
48	s	0.34	0/745	0.43	0/996
49	t	0.36	0/796	0.53	0/1062
50	u	0.31	0/760	0.38	0/1022
51	v	0.38	0/599	0.41	0/795
52	w	0.37	0/636	0.39	0/849
53	x	0.27	0/500	0.33	0/665
54	y	0.35	0/458	0.39	0/613
55	z	0.37	0/441	0.33	0/589
All	All	0.73	0/157903	0.73	28/235961 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
36	g	0	2
40	k	0	1
41	l	0	1
49	t	0	1
All	All	0	5

There are no bond length outliers.

The worst 5 of 28 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	A	412	A	O4'-C1'-N9	7.86	114.49	108.20
30	a	511	G	O4'-C1'-N9	7.45	114.16	108.20
30	a	1310	U	C2-N1-C1'	7.11	126.23	117.70
7	A	511	C	N1-C2-O2	6.52	122.81	118.90
7	A	73	C	C2-N1-C1'	6.29	125.72	118.80

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
36	g	149	ARG	Sidechain
36	g	152	ARG	Sidechain
40	k	2	ARG	Sidechain
41	l	81	4D4	Mainchain
49	t	86	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	0	426	0	464	9	0
2	1	377	0	418	5	0
3	2	504	0	572	6	0
4	3	302	0	340	4	0
5	4	526	0	522	14	0
6	5	1714	0	1796	74	0
7	A	33035	0	16642	304	0
8	B	1761	0	1780	36	0
9	C	1632	0	1707	29	0
10	D	1645	0	1708	25	0
11	E	1156	0	1199	17	0
12	F	845	0	838	17	0
13	G	1228	0	1276	16	0
14	H	978	0	1035	17	0
15	I	1028	0	1075	18	0
16	J	788	0	830	13	0
17	K	877	0	884	16	0
18	L	957	0	1017	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	M	895	0	956	27	0
20	N	796	0	830	16	0
21	O	709	0	738	5	0
22	P	640	0	655	9	0
23	Q	658	0	699	13	0
24	R	555	0	578	12	0
25	S	668	0	693	15	0
26	T	668	0	710	6	0
27	V	1644	0	842	32	0
28	W	219	0	108	6	0
29	X	764	0	770	19	0
30	a	62357	0	31367	464	0
31	b	2481	0	1256	22	0
32	c	2079	0	2148	19	0
33	d	1568	0	1619	16	0
34	e	1552	0	1619	24	0
35	f	1417	0	1454	23	0
36	g	1317	0	1376	23	0
37	h	1102	0	1139	36	0
38	i	1130	0	1155	14	0
39	j	947	0	1025	15	0
40	k	1051	0	1120	20	0
41	l	1074	0	1137	15	0
42	m	960	0	1000	11	0
43	n	890	0	922	11	0
44	o	917	0	962	8	0
45	p	947	0	1019	10	0
46	q	815	0	837	7	0
47	r	855	0	915	10	0
48	s	739	0	809	11	0
49	t	788	0	843	18	0
50	u	746	0	765	11	0
51	v	592	0	605	10	0
52	w	626	0	652	4	0
53	x	499	0	536	5	0
54	y	453	0	488	3	0
55	z	435	0	447	7	0
56	3	1	0	0	0	0
56	4	1	0	0	0	0
57	A	95	0	0	0	0
57	a	251	0	0	0	0
57	b	5	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
57	c	2	0	0	0	0
57	d	1	0	0	0	0
57	p	2	0	0	0	0
57	z	1	0	0	0	0
58	A	45	0	0	0	0
58	a	108	0	0	0	0
58	b	1	0	0	0	0
58	c	4	0	0	0	0
58	d	1	0	0	0	0
58	e	2	0	0	0	0
58	f	1	0	0	0	0
All	All	146853	0	98897	1477	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 6.

The worst 5 of 1477 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)
30:a:289:U:H3	30:a:349:G:H1	1.04	0.95
30:a:2120:A:N6	30:a:2169:G:H21	1.66	0.94
30:a:2120:A:H61	30:a:2169:G:N2	1.66	0.94
30:a:2840:G:H4'	42:m:49:GLU:OE1	1.66	0.93
30:a:2137:G:H1	30:a:2156:U:H3	1.10	0.92

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	0	50/55 (91%)	48 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	1	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
3	2	62/65 (95%)	61 (98%)	1 (2%)	0	100	100
4	3	36/38 (95%)	36 (100%)	0	0	100	100
5	4	65/70 (93%)	56 (86%)	7 (11%)	2 (3%)	3	12
6	5	231/234 (99%)	212 (92%)	19 (8%)	0	100	100
8	B	223/241 (92%)	204 (92%)	19 (8%)	0	100	100
9	C	205/233 (88%)	196 (96%)	9 (4%)	0	100	100
10	D	203/206 (98%)	197 (97%)	6 (3%)	0	100	100
11	E	155/166 (93%)	143 (92%)	12 (8%)	0	100	100
12	F	102/131 (78%)	96 (94%)	6 (6%)	0	100	100
13	G	153/156 (98%)	146 (95%)	7 (5%)	0	100	100
14	H	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
15	I	126/130 (97%)	116 (92%)	9 (7%)	1 (1%)	16	44
16	J	96/103 (93%)	87 (91%)	8 (8%)	1 (1%)	12	38
17	K	113/129 (88%)	106 (94%)	6 (5%)	1 (1%)	14	41
18	L	120/124 (97%)	104 (87%)	13 (11%)	3 (2%)	4	16
19	M	113/118 (96%)	109 (96%)	4 (4%)	0	100	100
20	N	98/101 (97%)	97 (99%)	1 (1%)	0	100	100
21	O	86/89 (97%)	84 (98%)	2 (2%)	0	100	100
22	P	80/82 (98%)	76 (95%)	4 (5%)	0	100	100
23	Q	79/84 (94%)	75 (95%)	4 (5%)	0	100	100
24	R	65/75 (87%)	62 (95%)	3 (5%)	0	100	100
25	S	82/92 (89%)	78 (95%)	4 (5%)	0	100	100
26	T	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
29	X	93/95 (98%)	86 (92%)	7 (8%)	0	100	100
32	c	269/273 (98%)	258 (96%)	11 (4%)	0	100	100
33	d	206/209 (99%)	190 (92%)	15 (7%)	1 (0%)	24	55
34	e	199/201 (99%)	195 (98%)	4 (2%)	0	100	100
35	f	176/179 (98%)	164 (93%)	11 (6%)	1 (1%)	21	51
36	g	174/177 (98%)	157 (90%)	15 (9%)	2 (1%)	11	36
37	h	147/149 (99%)	120 (82%)	24 (16%)	3 (2%)	6	21

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
38	i	140/142 (99%)	136 (97%)	4 (3%)	0	100	100
39	j	121/123 (98%)	119 (98%)	2 (2%)	0	100	100
40	k	142/144 (99%)	131 (92%)	11 (8%)	0	100	100
41	l	132/136 (97%)	126 (96%)	6 (4%)	0	100	100
42	m	118/127 (93%)	110 (93%)	8 (7%)	0	100	100
43	n	114/117 (97%)	112 (98%)	2 (2%)	0	100	100
44	o	112/115 (97%)	108 (96%)	4 (4%)	0	100	100
45	p	115/118 (98%)	112 (97%)	2 (2%)	1 (1%)	14	41
46	q	101/103 (98%)	92 (91%)	9 (9%)	0	100	100
47	r	108/110 (98%)	106 (98%)	2 (2%)	0	100	100
48	s	91/100 (91%)	82 (90%)	9 (10%)	0	100	100
49	t	101/104 (97%)	91 (90%)	10 (10%)	0	100	100
50	u	92/94 (98%)	83 (90%)	9 (10%)	0	100	100
51	v	76/85 (89%)	73 (96%)	3 (4%)	0	100	100
52	w	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
53	x	60/63 (95%)	59 (98%)	1 (2%)	0	100	100
54	y	56/59 (95%)	54 (96%)	2 (4%)	0	100	100
55	z	53/57 (93%)	53 (100%)	0	0	100	100
All	All	5869/6143 (96%)	5525 (94%)	328 (6%)	16 (0%)	37	66

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	4	22	ILE
5	4	51	VAL
18	L	108	LYS
33	d	149	ASN
35	f	123	ASP

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	0	47/49 (96%)	45 (96%)	2 (4%)	26	60
2	1	38/38 (100%)	37 (97%)	1 (3%)	40	75
3	2	51/52 (98%)	50 (98%)	1 (2%)	48	80
4	3	34/34 (100%)	34 (100%)	0	100	100
5	4	59/60 (98%)	58 (98%)	1 (2%)	53	83
6	5	177/178 (99%)	169 (96%)	8 (4%)	24	58
8	B	189/201 (94%)	184 (97%)	5 (3%)	40	75
9	C	171/190 (90%)	168 (98%)	3 (2%)	51	82
10	D	172/173 (99%)	169 (98%)	3 (2%)	53	83
11	E	119/125 (95%)	118 (99%)	1 (1%)	73	90
12	F	91/113 (80%)	88 (97%)	3 (3%)	33	69
13	G	127/128 (99%)	125 (98%)	2 (2%)	55	83
14	H	104/105 (99%)	103 (99%)	1 (1%)	68	88
15	I	106/107 (99%)	102 (96%)	4 (4%)	29	64
16	J	87/91 (96%)	87 (100%)	0	100	100
17	K	89/98 (91%)	84 (94%)	5 (6%)	19	50
18	L	102/103 (99%)	99 (97%)	3 (3%)	37	73
19	M	94/97 (97%)	91 (97%)	3 (3%)	34	70
20	N	82/83 (99%)	81 (99%)	1 (1%)	63	87
21	O	75/76 (99%)	75 (100%)	0	100	100
22	P	63/63 (100%)	60 (95%)	3 (5%)	23	56
23	Q	75/78 (96%)	71 (95%)	4 (5%)	20	52
24	R	58/65 (89%)	56 (97%)	2 (3%)	32	68
25	S	72/79 (91%)	71 (99%)	1 (1%)	59	85
26	T	65/66 (98%)	63 (97%)	2 (3%)	35	70
29	X	82/82 (100%)	82 (100%)	0	100	100
32	c	215/217 (99%)	211 (98%)	4 (2%)	50	81
33	d	163/163 (100%)	161 (99%)	2 (1%)	63	87
34	e	165/165 (100%)	160 (97%)	5 (3%)	36	72
35	f	150/151 (99%)	144 (96%)	6 (4%)	28	63
36	g	135/136 (99%)	128 (95%)	7 (5%)	21	53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
37	h	112/112 (100%)	104 (93%)	8 (7%)	13 39
38	i	116/116 (100%)	112 (97%)	4 (3%)	32 68
39	j	104/104 (100%)	103 (99%)	1 (1%)	68 88
40	k	103/103 (100%)	98 (95%)	5 (5%)	22 55
41	l	107/107 (100%)	104 (97%)	3 (3%)	38 73
42	m	100/103 (97%)	99 (99%)	1 (1%)	68 88
43	n	87/88 (99%)	85 (98%)	2 (2%)	44 78
44	o	99/100 (99%)	97 (98%)	2 (2%)	48 80
45	p	89/90 (99%)	89 (100%)	0	100 100
46	q	84/84 (100%)	83 (99%)	1 (1%)	63 87
47	r	92/92 (100%)	89 (97%)	3 (3%)	33 69
48	s	80/84 (95%)	79 (99%)	1 (1%)	61 86
49	t	84/85 (99%)	77 (92%)	7 (8%)	10 32
50	u	77/77 (100%)	74 (96%)	3 (4%)	28 64
51	v	60/64 (94%)	59 (98%)	1 (2%)	53 83
52	w	68/69 (99%)	68 (100%)	0	100 100
53	x	53/54 (98%)	50 (94%)	3 (6%)	18 49
54	y	48/49 (98%)	47 (98%)	1 (2%)	47 79
55	z	47/49 (96%)	47 (100%)	0	100 100
All	All	4867/4996 (97%)	4738 (97%)	129 (3%)	40 74

5 of 129 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
49	t	30	SER
49	t	91	LYS
22	P	42	LEU
22	P	12	LYS
50	u	11	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 46 such sidechains are listed below:

Mol	Chain	Res	Type
34	e	92	HIS

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Mol	Chain	Res	Type
43	n	98	GLN
34	e	136	GLN
38	i	130	HIS
45	p	72	ASN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
27	V	76/77 (98%)	33 (43%)	1 (1%)
28	W	9/15 (60%)	4 (44%)	0
30	a	2903/2904 (99%)	412 (14%)	0
31	b	115/116 (99%)	19 (16%)	0
7	A	1538/1541 (99%)	229 (14%)	11 (0%)
All	All	4641/4653 (99%)	697 (15%)	12 (0%)

5 of 697 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
7	A	2	A
7	A	4	U
7	A	6	G
7	A	9	G
7	A	22	G

5 of 12 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
7	A	547	A
7	A	1026	G
27	V	20	G
7	A	1035	A
7	A	407	U

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

45 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	$\#\|Z\| > 2$
30	PSU	a	1912	30	18,21,22	2.09	8 (44%)	22,30,33	1.87	4 (18%)
7	2MG	A	966	7	23,26,27	2.57	7 (30%)	32,38,41	2.10	9 (28%)
7	UR3	A	1498	7	19,22,23	2.56	6 (31%)	26,32,35	1.36	2 (7%)
7	MA6	A	1518	7	23,26,27	1.30	3 (13%)	34,38,41	2.26	9 (26%)
30	PSU	a	2606	30	18,21,22	2.18	8 (44%)	22,30,33	1.86	3 (13%)
27	PSU	V	56	27	18,21,22	1.92	7 (38%)	22,30,33	1.81	3 (13%)
30	2MG	a	2446	30	23,26,27	2.59	7 (30%)	32,38,41	2.19	12 (37%)
33	MEQ	d	150	33	8,9,10	0.95	0	5,10,12	0.83	0
17	IAS	K	119	17	6,7,8	1.72	1 (16%)	6,8,10	2.79	2 (33%)
30	1MG	a	742	30	22,26,27	2.54	6 (27%)	33,39,42	2.10	7 (21%)
7	G7M	A	527	58,7	23,26,27	2.15	5 (21%)	35,39,42	1.91	7 (20%)
30	5MU	a	744	30	19,22,23	2.59	7 (36%)	28,32,35	3.80	11 (39%)
30	PSU	a	2581	58,30	18,21,22	2.29	9 (50%)	22,30,33	1.99	5 (22%)
30	PSU	a	2605	30	18,21,22	2.14	7 (38%)	22,30,33	1.90	3 (13%)
27	4SU	V	8	27	18,21,22	3.69	8 (44%)	26,30,33	2.20	5 (19%)
7	5MC	A	967	7	18,22,23	1.93	6 (33%)	26,32,35	1.36	2 (7%)
27	OMC	V	33	27	19,22,23	1.79	4 (21%)	26,31,34	0.95	2 (7%)
30	PSU	a	743	57,30	18,21,22	2.13	9 (50%)	22,30,33	1.86	3 (13%)
30	3TD	a	1916	30	18,22,23	6.50	13 (72%)	22,32,35	1.74	3 (13%)
41	MS6	l	82	41	5,7,8	0.60	0	2,7,9	1.40	0
30	OMG	a	2252	58,30	23,26,27	2.39	6 (26%)	33,38,41	1.85	8 (24%)
30	6MZ	a	1618	30	22,25,26	2.44	4 (18%)	30,36,39	2.28	10 (33%)
27	H2U	V	21	27	18,21,22	4.31	5 (27%)	21,30,33	5.05	6 (28%)
30	G7M	a	2070	58,30	23,26,27	2.24	5 (21%)	35,39,42	1.81	7 (20%)
41	4D4	l	81	41	9,11,12	0.83	0	8,13,15	1.76	2 (25%)
30	5MU	a	1940	58,30	19,22,23	2.68	7 (36%)	28,32,35	3.87	10 (35%)
7	2MG	A	1207	58,7	23,26,27	2.58	6 (26%)	32,38,41	2.06	10 (31%)
30	2MA	a	2504	58,57,30	22,25,26	1.38	2 (9%)	33,37,40	2.01	7 (21%)
30	PSU	a	1918	30	18,21,22	6.19	11 (61%)	22,30,33	2.14	6 (27%)
18	D2T	L	89	18	7,9,10	1.02	0	6,11,13	1.88	3 (50%)
7	2MG	A	1516	7	23,26,27	2.60	7 (30%)	32,38,41	2.09	10 (31%)
7	4OC	A	1402	7	20,23,24	2.24	5 (25%)	26,32,35	1.01	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
27	5MU	V	55	27	19,22,23	2.46	7 (36%)	28,32,35	3.71	11 (39%)
30	PSU	a	952	30	18,21,22	2.19	8 (44%)	22,30,33	1.90	4 (18%)
30	PSU	a	2505	58,30	18,21,22	2.22	7 (38%)	22,30,33	1.87	3 (13%)
30	2MG	a	1834	30	23,26,27	2.58	7 (30%)	32,38,41	2.20	11 (34%)
30	5MC	a	1963	58,30	18,22,23	1.99	5 (27%)	26,32,35	1.39	2 (7%)
30	PSU	a	2458	30	18,21,22	2.30	8 (44%)	22,30,33	1.96	4 (18%)
7	PSU	A	516	57,7	18,21,22	2.05	7 (38%)	22,30,33	1.90	4 (18%)
7	5MC	A	1407	7	18,22,23	2.00	6 (33%)	26,32,35	1.27	2 (7%)
7	MA6	A	1519	7	23,26,27	1.29	3 (13%)	34,38,41	2.29	9 (26%)
30	OMC	a	2499	57,30	19,22,23	1.82	4 (21%)	26,31,34	1.15	2 (7%)
30	OMU	a	2553	58,57,30	19,22,23	2.68	7 (36%)	26,31,34	1.86	5 (19%)
30	H2U	a	2450	30	18,21,22	4.02	5 (27%)	21,30,33	5.22	7 (33%)
30	6MZ	a	2031	30	22,25,26	2.44	4 (18%)	30,36,39	2.51	10 (33%)

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
30	PSU	a	1912	30	-	0/7/25/26	0/2/2/2
7	2MG	A	966	7	-	0/9/27/28	0/3/3/3
7	UR3	A	1498	7	-	0/7/25/26	0/2/2/2
7	MA6	A	1518	7	-	0/11/29/30	0/3/3/3
30	PSU	a	2606	30	-	0/7/25/26	0/2/2/2
27	PSU	V	56	27	-	1/7/25/26	0/2/2/2
30	2MG	a	2446	30	-	2/9/27/28	0/3/3/3
33	MEQ	d	150	33	-	2/8/9/11	-
17	IAS	K	119	17	-	3/7/7/8	-
30	1MG	a	742	30	-	0/7/25/26	0/3/3/3
7	G7M	A	527	58,7	-	3/7/25/26	0/3/3/3
30	5MU	a	744	30	-	0/7/25/26	0/2/2/2
30	PSU	a	2581	58,30	-	0/7/25/26	0/2/2/2
30	PSU	a	2605	30	-	0/7/25/26	0/2/2/2
27	4SU	V	8	27	-	0/7/25/26	0/2/2/2
7	5MC	A	967	7	-	0/7/25/26	0/2/2/2
27	OMC	V	33	27	-	2/9/27/28	0/2/2/2
30	PSU	a	743	57,30	-	1/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
30	3TD	a	1916	30	-	2/7/25/26	0/2/2/2
41	MS6	l	82	41	-	3/4/6/8	-
30	OMG	a	2252	58,30	-	1/9/27/28	0/3/3/3
30	6MZ	a	1618	30	-	0/9/27/28	0/3/3/3
27	H2U	V	21	27	-	5/7/38/39	0/2/2/2
30	G7M	a	2070	58,30	-	2/7/25/26	0/3/3/3
41	4D4	l	81	41	-	4/11/12/14	-
30	5MU	a	1940	58,30	-	0/7/25/26	0/2/2/2
7	2MG	A	1207	58,7	-	2/9/27/28	0/3/3/3
30	2MA	a	2504	58,57,30	-	2/7/25/26	0/3/3/3
30	PSU	a	1918	30	-	0/7/25/26	0/2/2/2
18	D2T	L	89	18	-	2/7/12/14	-
7	2MG	A	1516	7	-	0/9/27/28	0/3/3/3
7	4OC	A	1402	7	-	1/9/29/30	0/2/2/2
27	5MU	V	55	27	-	0/7/25/26	0/2/2/2
30	PSU	a	952	30	-	0/7/25/26	0/2/2/2
30	PSU	a	2505	58,30	-	2/7/25/26	0/2/2/2
30	2MG	a	1834	30	-	0/9/27/28	0/3/3/3
30	5MC	a	1963	58,30	-	0/7/25/26	0/2/2/2
30	PSU	a	2458	30	-	0/7/25/26	0/2/2/2
7	PSU	A	516	57,7	-	0/7/25/26	0/2/2/2
7	5MC	A	1407	7	-	0/7/25/26	0/2/2/2
7	MA6	A	1519	7	-	5/11/29/30	0/3/3/3
30	OMC	a	2499	57,30	-	0/9/27/28	0/2/2/2
30	OMU	a	2553	58,57,30	-	0/9/27/28	0/2/2/2
30	H2U	a	2450	30	-	0/7/38/39	0/2/2/2
30	6MZ	a	2031	30	-	2/9/27/28	0/3/3/3

The worst 5 of 257 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	a	1918	PSU	C2'-C1'	-18.46	1.29	1.53
30	a	1916	3TD	C2'-C1'	-18.23	1.30	1.53
30	a	1916	3TD	O4'-C1'	14.34	1.63	1.43
30	a	1918	PSU	O4'-C1'	13.57	1.62	1.43
27	V	21	H2U	O4-C4	10.34	1.44	1.23

The worst 5 of 247 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	a	2450	H2U	C4-N3-C2	-15.30	113.10	125.79
27	V	21	H2U	O2-C2-N1	-13.77	105.82	123.11
27	V	21	H2U	C4-N3-C2	-13.71	114.42	125.79
30	a	2450	H2U	O2-C2-N1	-11.68	108.45	123.11
30	a	1940	5MU	C4-N3-C2	-8.75	116.02	127.35

There are no chirality outliers.

5 of 47 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	A	1207	2MG	N1-C2-N2-CM2
7	A	1207	2MG	N3-C2-N2-CM2
7	A	1519	MA6	C5-C6-N6-C9
7	A	1519	MA6	C5-C6-N6-C10
27	V	21	H2U	O4'-C4'-C5'-O5'

There are no ring outliers.

10 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
33	d	150	MEQ	2	0
27	V	8	4SU	1	0
27	V	33	OMC	1	0
30	a	2252	OMG	1	0
27	V	21	H2U	2	0
30	a	2504	2MA	1	0
18	L	89	D2T	2	0
7	A	1402	4OC	1	0
7	A	516	PSU	1	0
30	a	2031	6MZ	2	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 521 ligands modelled in this entry, 521 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.

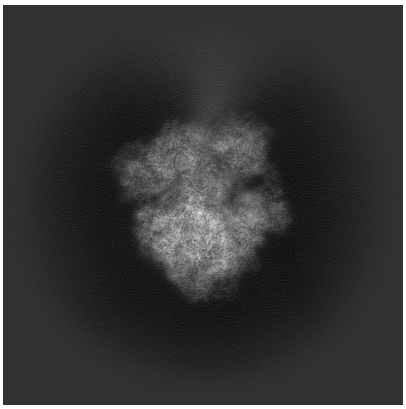
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-59049. These allow visual inspection of the internal detail of the map and identification of artifacts.

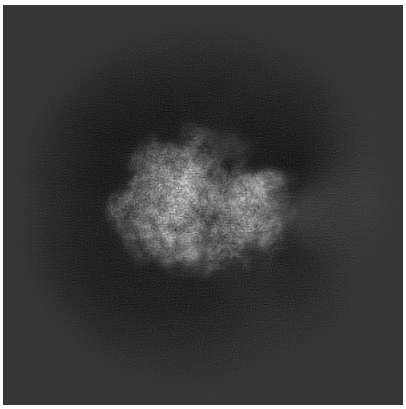
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

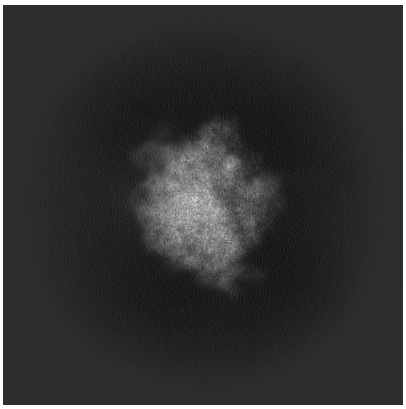
6.1.1 Primary map



X

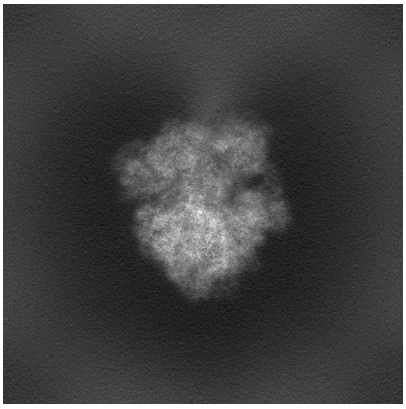


Y

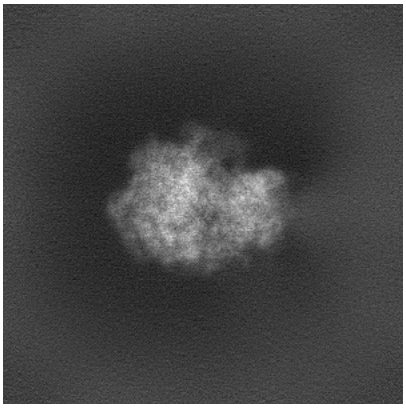


Z

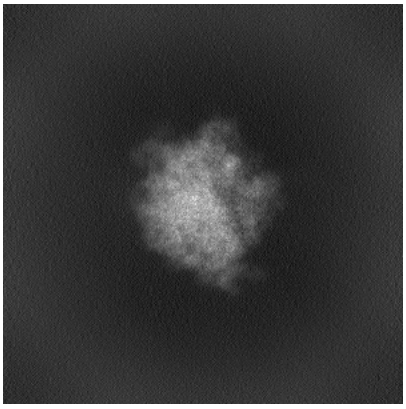
6.1.2 Raw map



X



Y

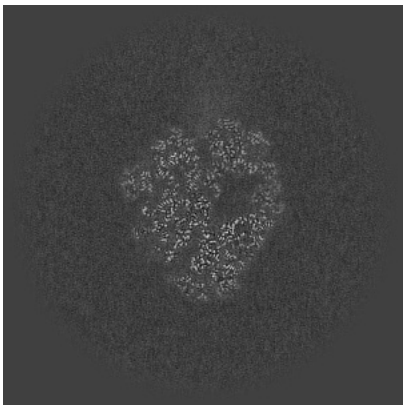


Z

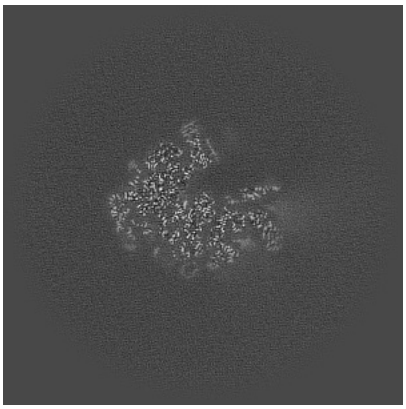
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

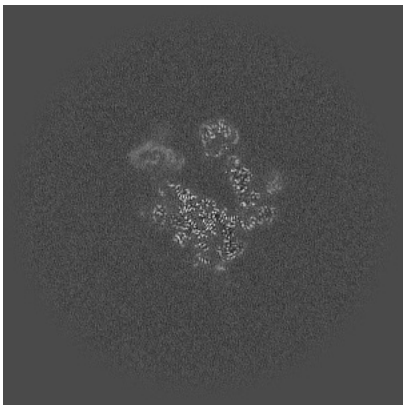
6.2.1 Primary map



X Index: 256

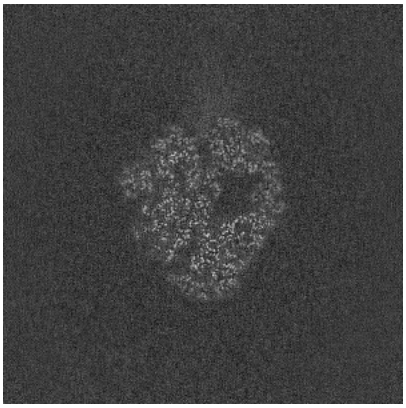


Y Index: 256

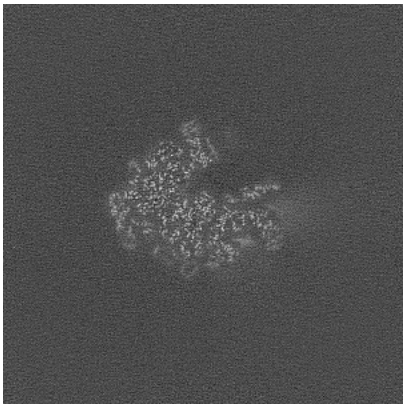


Z Index: 256

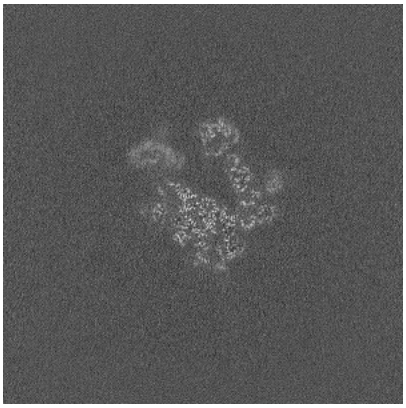
6.2.2 Raw map



X Index: 256



Y Index: 256

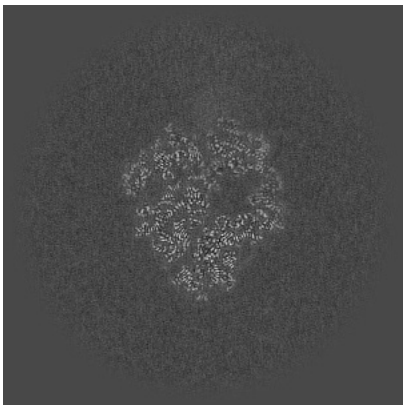


Z Index: 256

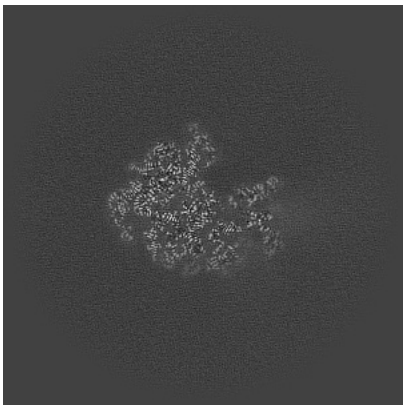
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

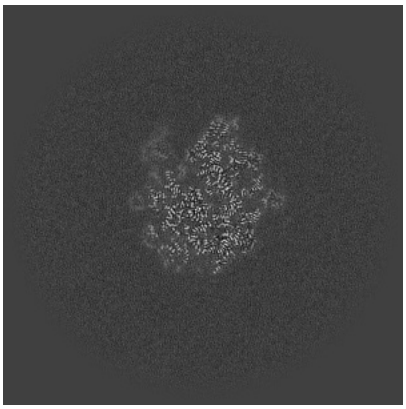
6.3.1 Primary map



X Index: 261

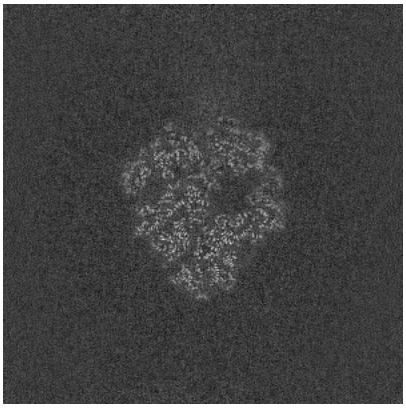


Y Index: 250

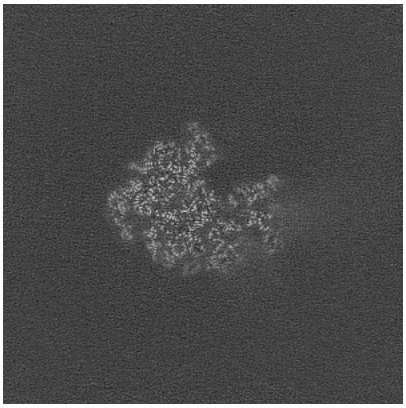


Z Index: 234

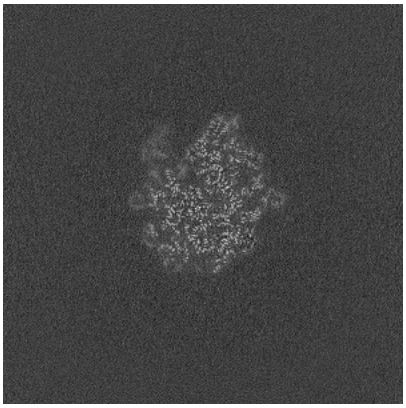
6.3.2 Raw map



X Index: 261



Y Index: 250

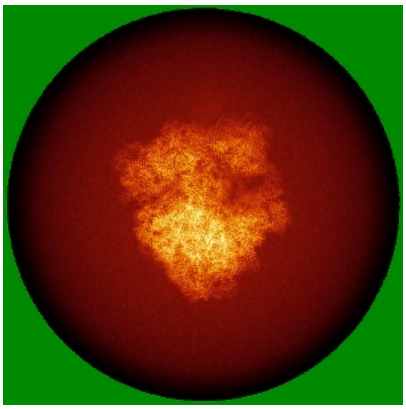


Z Index: 234

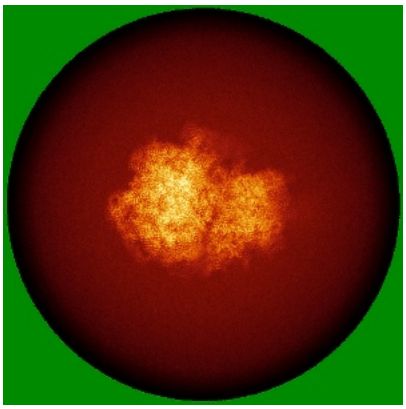
The images above show the largest variance slices of the map in three orthogonal directions.

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

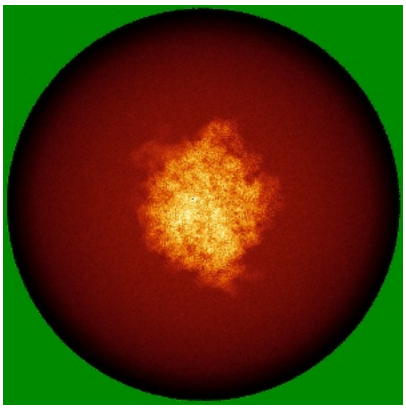
6.4.1 Primary map



X

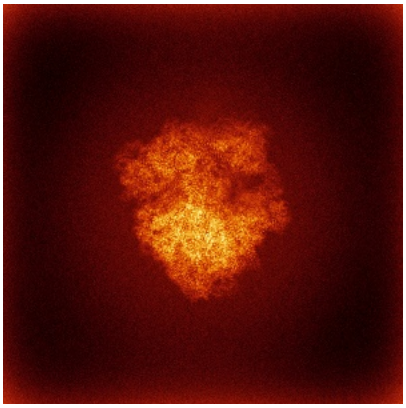


Y

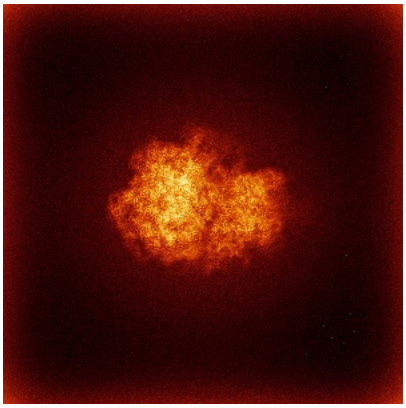


Z

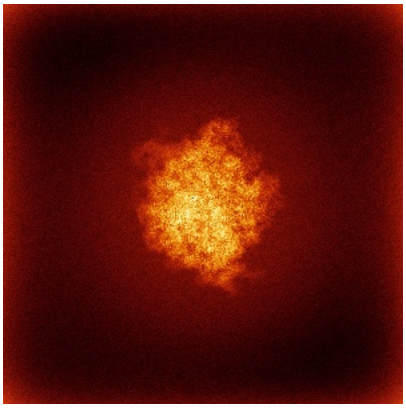
6.4.2 Raw map



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 (i)

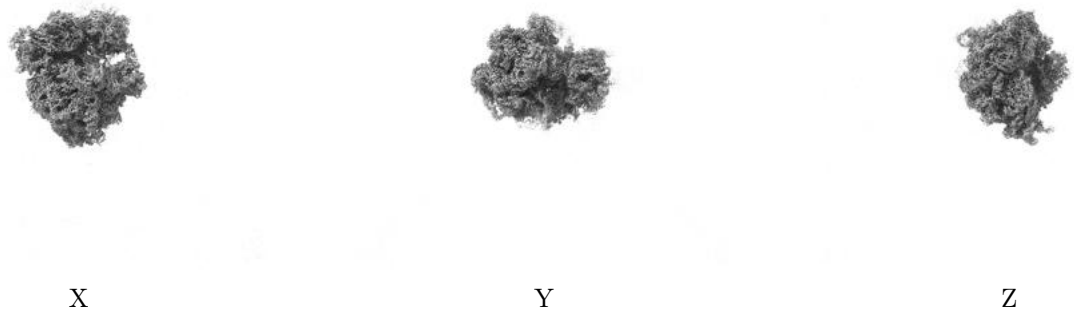
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.45. 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.

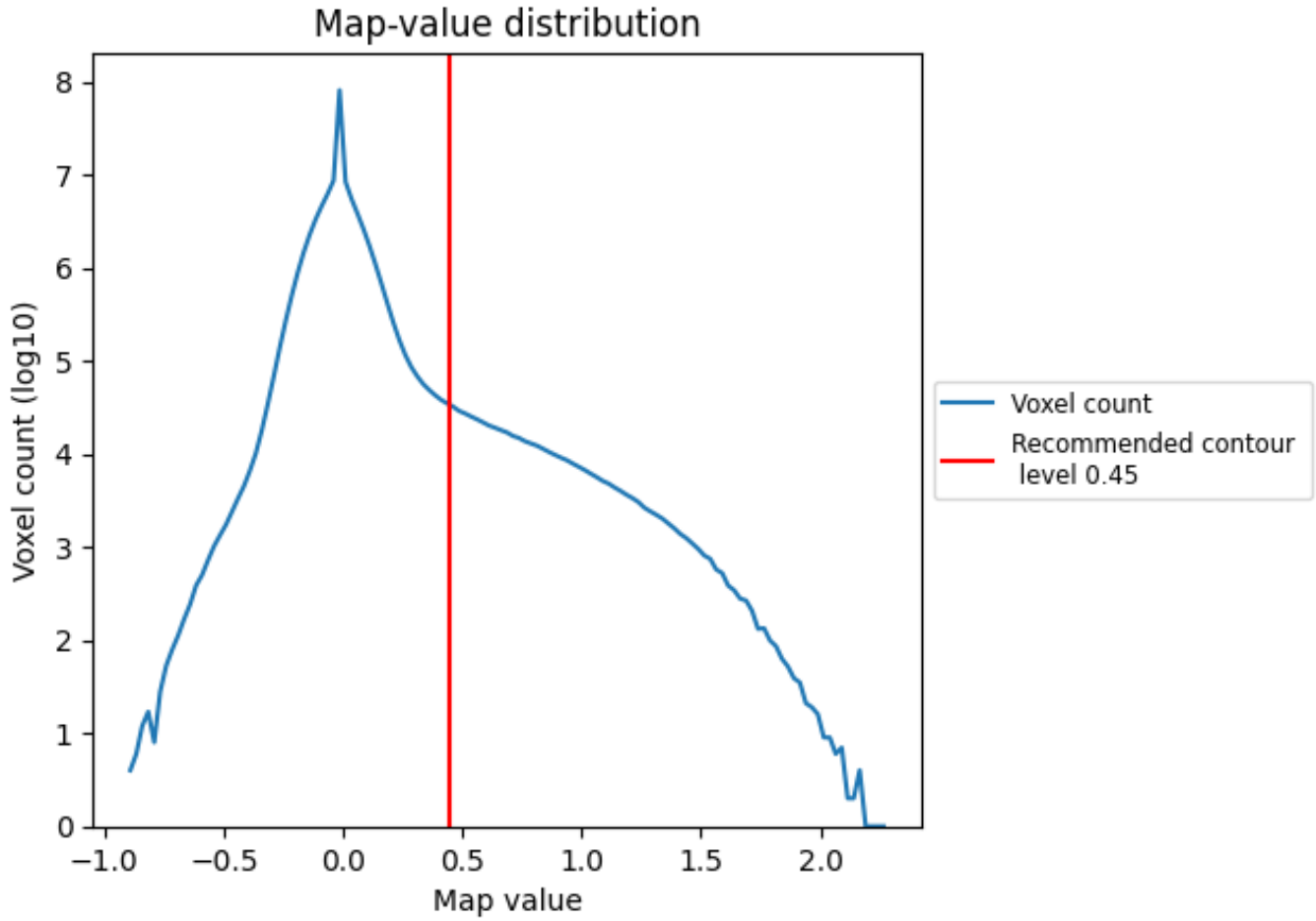
6.6 Mask visualisation (i)

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

7 Map analysis

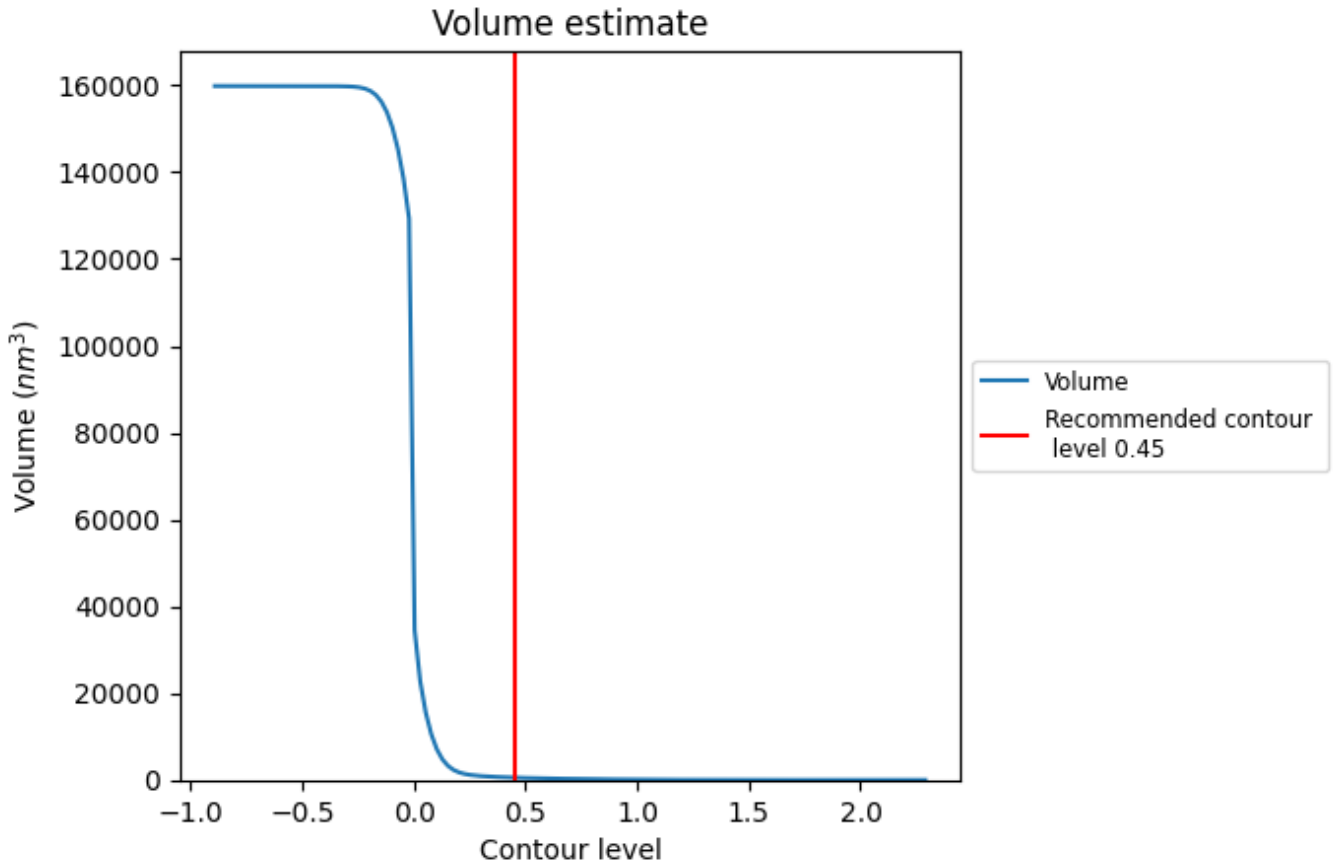
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

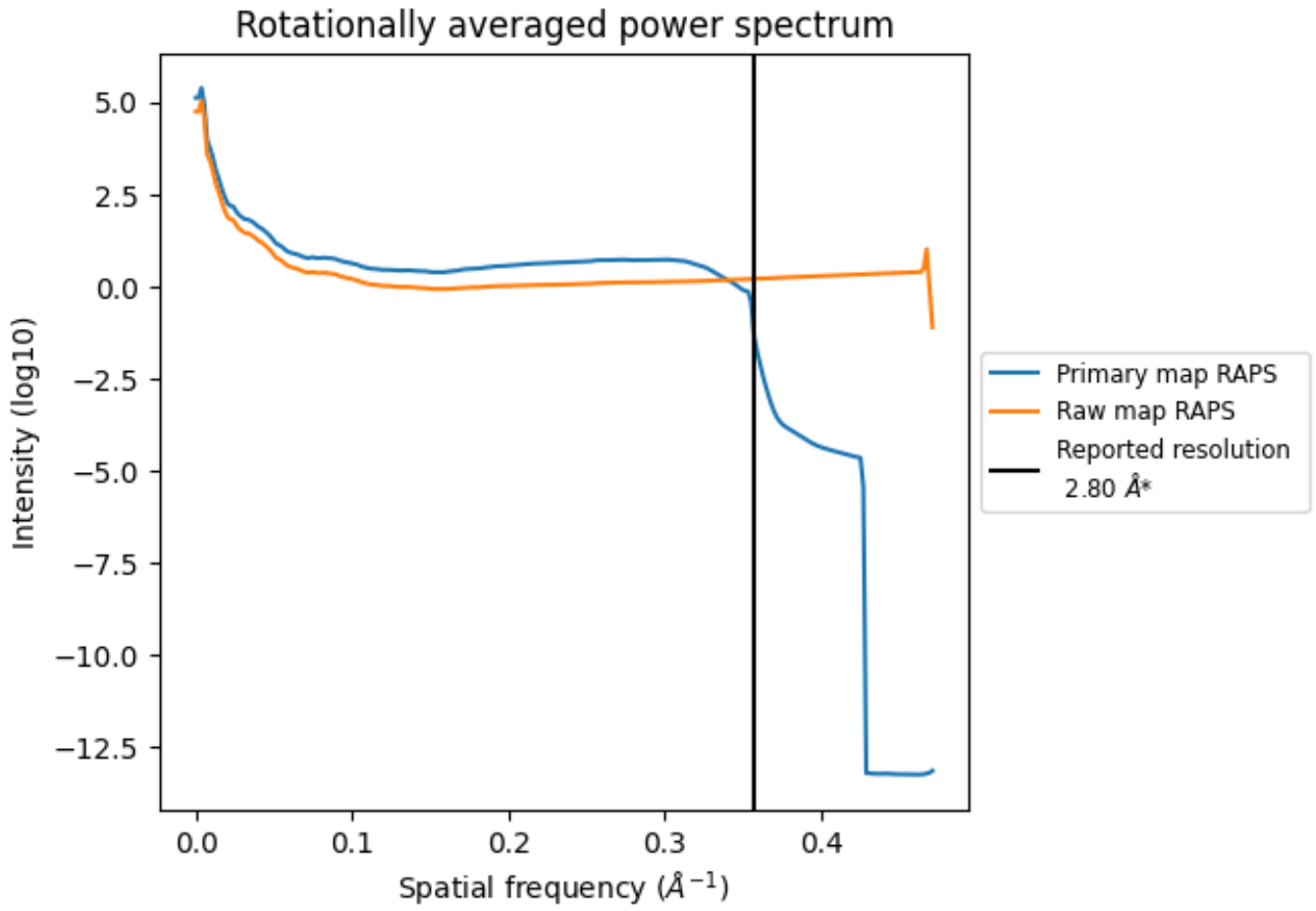
7.2 Volume estimate (i)



The volume at the recommended contour level is 537 nm^3; this corresponds to an approximate mass of 485 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)

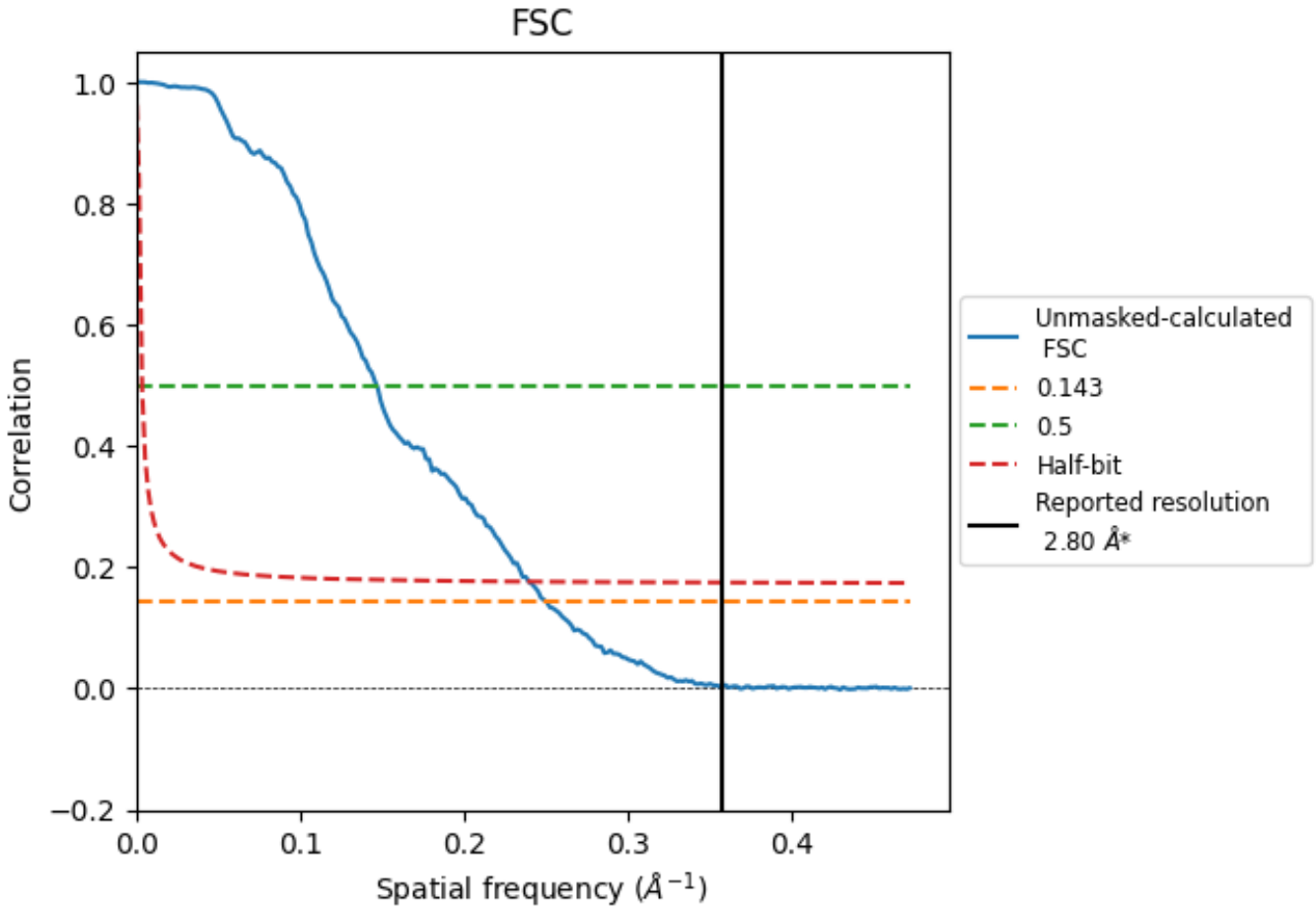


*Reported resolution corresponds to spatial frequency of 0.357 Å^{-1}

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.357 Å^{-1}

8.2 Resolution estimates (i)

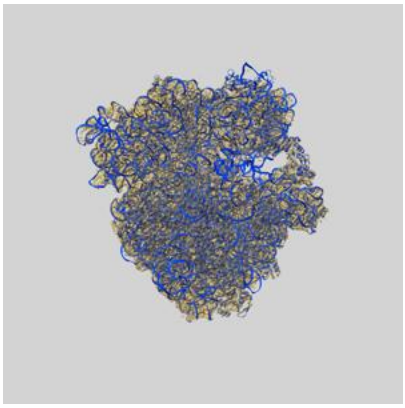
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.80	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.00	6.82	4.18

*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 4.00 differs from the reported value 2.8 by more than 10 %

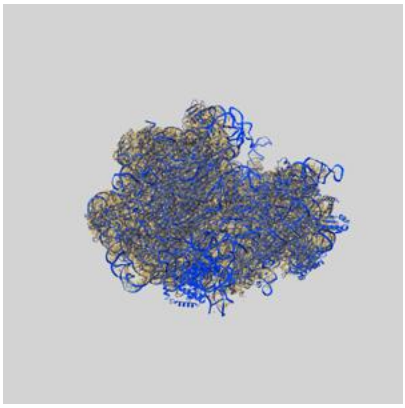
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-59049 and PDB model 32PE. Per-residue inclusion information can be found in section 3 on page 16.

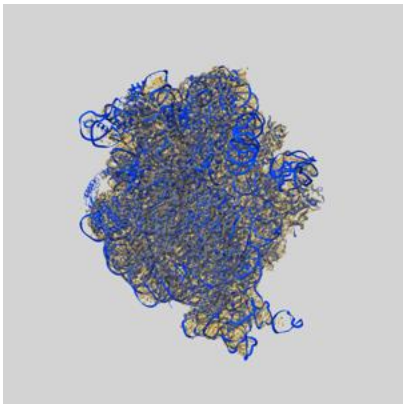
9.1 Map-model overlay



X



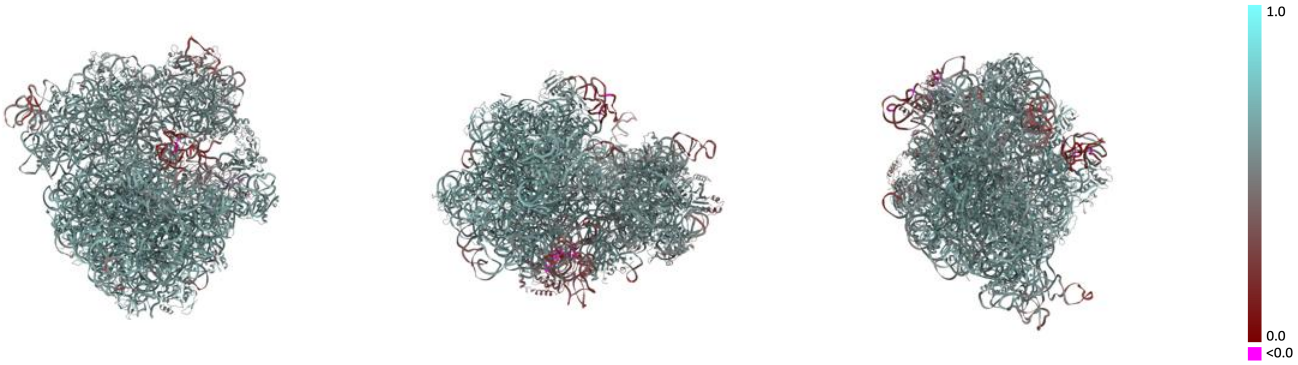
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.45 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.

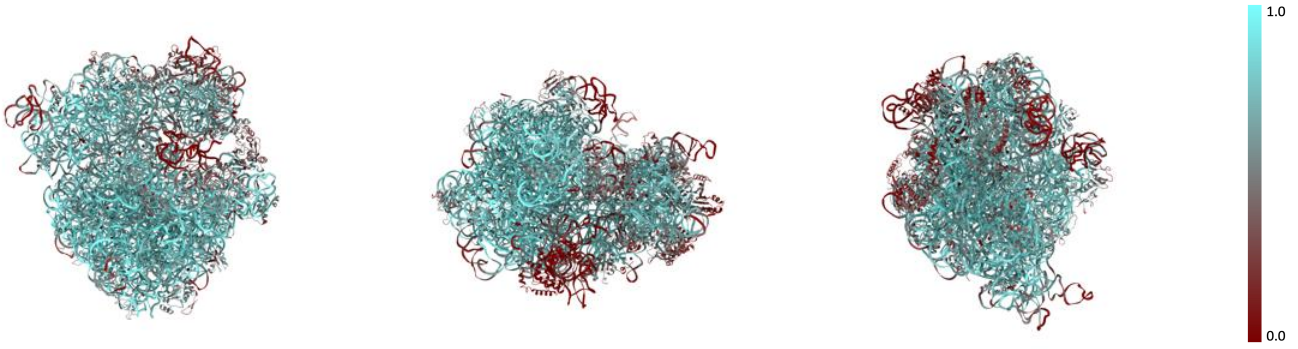
9.2 Q-score mapped to coordinate model



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.

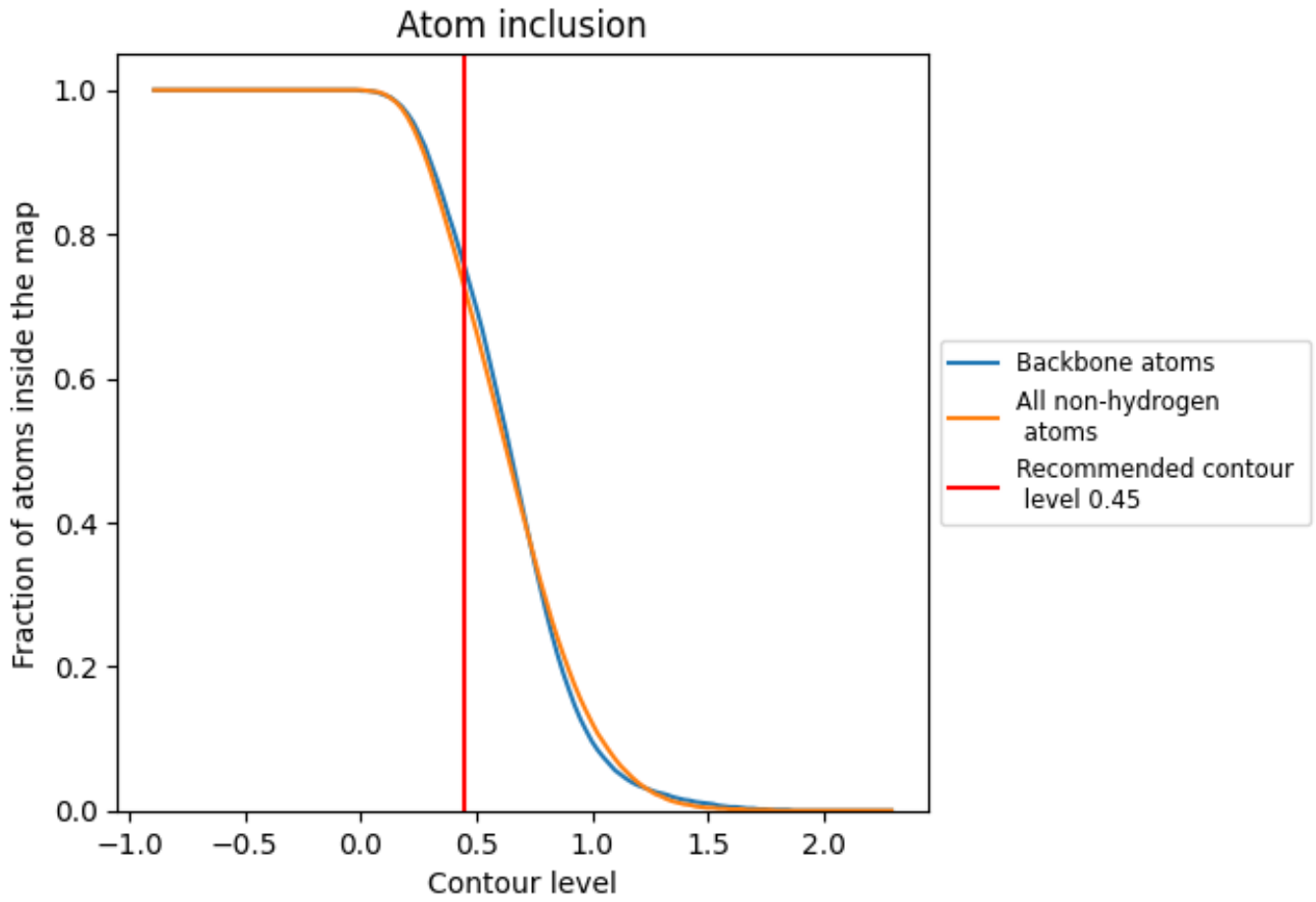
9.3 Atom inclusion mapped to coordinate model



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 (0.45).

9.4 Atom inclusion (i)



At the recommended contour level, 75% of all backbone atoms, 72% 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 (0.45) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7230	0.5790
0	0.6530	0.6090
1	0.8340	0.6340
2	0.8210	0.6290
3	0.7270	0.6170
4	0.2210	0.5130
5	0.0360	0.3160
A	0.7720	0.5740
B	0.2720	0.5170
C	0.5000	0.5630
D	0.5250	0.5720
E	0.6670	0.5990
F	0.5190	0.5600
G	0.4520	0.5450
H	0.6490	0.6000
I	0.4990	0.5570
J	0.3540	0.5150
K	0.5630	0.5770
L	0.6290	0.5880
M	0.4850	0.5620
N	0.5200	0.5610
O	0.6350	0.5900
P	0.6590	0.5910
Q	0.5530	0.5830
R	0.5130	0.5480
S	0.4660	0.5450
T	0.6250	0.5810
V	0.1870	0.4000
W	0.1640	0.4140
X	0.4500	0.5680
a	0.8190	0.5910
b	0.8030	0.5890
c	0.7940	0.6300
d	0.7470	0.6190
e	0.6500	0.6030



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Chain	Atom inclusion	Q-score
f	0.4450	0.5560
g	0.4480	0.5510
h	0.1210	0.4470
i	0.7640	0.6140
j	0.7160	0.6240
k	0.7220	0.6170
l	0.7170	0.6160
m	0.8060	0.6250
n	0.6410	0.5930
o	0.7130	0.6220
p	0.7970	0.6270
q	0.6910	0.6160
r	0.7350	0.6200
s	0.6460	0.6000
t	0.5610	0.5720
u	0.6140	0.5940
v	0.7430	0.6220
w	0.7180	0.6070
x	0.5610	0.5630
y	0.7300	0.6140
z	0.7480	0.6230