wwPDB EM Validation Summary Report

Jun 30, 2025 – 12:42 PM JST

PDB ID	:	9K0Z / pdb_00009k0z
EMDB ID	:	EMD-61959
Title	:	EF-G2 bound 70S ribosome complex of M. smegmatis
Authors	:	Sengupta, J.; Baid, P.
Deposited on	:	2024-10-16
Resolution	:	4.70 Å(reported)
Based on initial model	:	5O61

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:

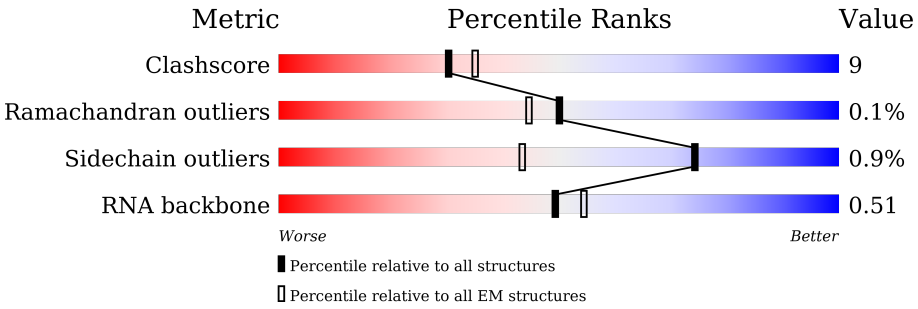
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 4.70 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	2	76	57% 38% 5%
2	3	23	74% 26%
3	4	18	6% 39% 50% 11%
4	5	69	68% 80% 17% .
5	7	709	24% 66% 33% .
6	A	1511	54% 38% 8%
7	B	118	67% 25% 8%

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Mol	Chain	Length	Quality of chain
8	C	208	69% 31%
9	D	200	63% 36%
10	E	180	72% 28%
11	F	96	52% 47%
12	G	155	72% 28%
13	H	131	74% 26%
14	I	126	65% 34%
15	J	99	61% 36%
16	K	115	71% 28%
17	L	122	66% 34%
18	M	116	67% 33%
19	N	60	73% 27%
20	O	88	73% 27%
21	P	113	66% 34%
22	Q	94	60% 40%
23	R	65	85% 15%
24	S	82	76% 23%
25	T	85	61% 38%
26	U	97	80% 20%
27	V	228	12% 67% 33%
28	W	192	8% 84% 16%
29	X	79	82% 18%
30	Y	63	81% 19%
31	Z	64	73% 27%
32	a	59	76% 24%

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Mol	Chain	Length	Quality of chain
33	b	54	85% 15%
34	c	49	67% 31%
35	d	46	76% 24%
36	e	63	83% 17%
37	f	37	84% 16%
38	g	48	63% 38%
39	i	275	80% 19%
40	j	214	81% 17%
41	k	209	85% 15%
42	l	182	58% 41%
43	m	176	77% 23%
44	n	151	79% 21%
45	o	126	65% 35%
46	p	133	62% 37%
47	q	146	81% 18%
48	r	122	77% 22%
49	s	145	82% 18%
50	t	136	79% 21%
51	u	118	79% 21%
52	v	126	76% 23%
53	w	113	79% 21%
54	x	124	93% 7%
55	y	100	84% 16%
56	z	114	85% 15%
57	1	105	74% 18% 8%

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Mol	Chain	Length	Quality of chain
58	h	3127	

2 Entry composition (i)

There are 62 unique types of molecules in this entry. The entry contains 155552 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 P/P-site Phe-tRNA(Phe).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	76	1614	721	287	531	75	0	0

- Molecule 2 is a protein called 50S ribosomal protein bL37.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	3	23	189	111	50	28	0	0

- Molecule 3 is a RNA chain called mRNA fragment.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	4	18	390	176	80	117	17	0	0

- Molecule 4 is a protein called Large ribosomal subunit protein bL12.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	5	69	505	321	83	101	0	0

- Molecule 5 is a protein called Translation elongation factor EF-G.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	7	709	5299	3311	931	1039	18	0	0

- Molecule 6 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	A	1511	32439	14448	5930	10550	1511	0	0

- Molecule 7 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	B	118	Total	C	N	O	P	0	0
			2522	1126	468	810	118		

- Molecule 8 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	C	208	Total	C	N	O	S	0	0
			1660	1036	322	298	4		

- Molecule 9 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	D	200	Total	C	N	O	S	0	0
			1641	1028	316	295	2		

- Molecule 10 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	E	180	Total	C	N	O	S	0	0
			1296	812	245	235	4		

- Molecule 11 is a protein called Small ribosomal subunit protein bS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	F	96	Total	C	N	O	S	0	0
			771	486	138	145	2		

- Molecule 12 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	G	155	Total	C	N	O	S	0	0
			1232	768	241	221	2		

- Molecule 13 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	H	131	Total	C	N	O	S	0	0
			1010	633	189	187	1		

- Molecule 14 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	I	126	Total 994	C 630	N 194	O 170	0	0

- Molecule 15 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	J	99	Total 788	C 495	N 146	O 144	S 3	0	0

- Molecule 16 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	K	115	Total 855	C 528	N 170	O 156	S 1	0	0

- Molecule 17 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	L	122	Total 958	C 594	N 197	O 165	S 2	0	0

- Molecule 18 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	M	116	Total 935	C 572	N 191	O 169	S 3	0	0

- Molecule 19 is a protein called Small ribosomal subunit protein uS14B.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	N	60	Total 477	C 302	N 97	O 73	S 5	0	0

- Molecule 20 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	O	88	Total 720	C 449	N 147	O 124	0	0

- Molecule 21 is a protein called Small ribosomal subunit protein bS16.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	P	113	Total 891	C 570	N 162	O 159	0	0

- Molecule 22 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Q	94	Total 748	C 469	N 142	O 135	S 2	0	0

- Molecule 23 is a protein called Small ribosomal subunit protein bS18B.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	R	65	Total 513	C 318	N 102	O 90	S 3	0	0

- Molecule 24 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	S	82	Total 662	C 425	N 124	O 112	S 1	0	0

- Molecule 25 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	T	85	Total 660	C 402	N 139	O 119	0	0

- Molecule 26 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	U	97	Total 756	C 479	N 138	O 139	0	0

- Molecule 27 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	V	228	Total 1793	C 1132	N 322	O 330	S 9	0	0

- Molecule 28 is a protein called Large ribosomal subunit protein bL25.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	W	192	Total 1428	C 881	N 255	O 292	0	0

- Molecule 29 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	X	79	Total 586	C 361	N 123	O 102	0	0

- Molecule 30 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Y	63	Total 470	C 283	N 103	O 80	S 4	0	0

- Molecule 31 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	Z	64	Total 531	C 324	N 103	O 103	S 1	0	0

- Molecule 32 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	a	59	Total 474	C 292	N 95	O 87	0	0

- Molecule 33 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	b	54	Total 423	C 260	N 93	O 69	S 1	0	0

- Molecule 34 is a protein called Large ribosomal subunit protein bL33A.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	c	49	Total 405	C 248	N 82	O 71	S 4	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	d	46	Total	C	N	O	S	0	0
			377	225	97	54	1		

- Molecule 36 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	e	63	Total	C	N	O	0	0
			502	302	115	85		

- Molecule 37 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	f	37	Total	C	N	O	S	0	0
			299	181	66	47	5		

- Molecule 38 is a protein called Large ribosomal subunit protein bL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	g	48	Total	C	N	O	S	0	0
			364	225	63	71	5		

- Molecule 39 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	i	275	Total	C	N	O	S	0	0
			2110	1298	438	370	4		

- Molecule 40 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	j	214	Total	C	N	O	S	0	0
			1587	982	310	290	5		

- Molecule 41 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	k	209	Total	C	N	O	S	0	0
			1569	969	295	303	2		

- Molecule 42 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	l	182	Total	C	N	O	S	0	0
			1445	907	271	261	6		

- Molecule 43 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	m	176	Total	C	N	O	S	0	0
			1348	845	249	253	1		

- Molecule 44 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	n	151	Total	C	N	O	S	0	0
			1018	635	188	194	1		

- Molecule 45 is a protein called Large ribosomal subunit protein uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	o	126	Total	C	N	O	S	0	0
			918	580	156	180	2		

- Molecule 46 is a protein called Large ribosomal subunit protein uL11.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	p	133	Total	C	N	O	S	0	0
			990	625	175	187	3		

- Molecule 47 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	q	146	Total	C	N	O	S	0	0
			1130	722	207	200	1		

- Molecule 48 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	r	122	Total	C	N	O	S	0	0
			938	586	179	170	3		

- Molecule 49 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	s	145	Total 1078	C 676	N 205	O 194	S 3	0	0

- Molecule 50 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	t	136	Total 1092	C 690	N 213	O 187	S 2	0	0

- Molecule 51 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	u	118	Total 928	C 583	N 180	O 163	S 2	0	0

- Molecule 52 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms				AltConf	Trace
52	v	126	Total 956	C 586	N 199	O 171	0	0

- Molecule 53 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	w	113	Total 907	C 570	N 171	O 165	S 1	0	0

- Molecule 54 is a protein called Large ribosomal subunit protein bL20.

Mol	Chain	Residues	Atoms				AltConf	Trace
54	x	124	Total 988	C 613	N 203	O 172	0	0

- Molecule 55 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	y	100	Total 754	C 478	N 137	O 139	0	0

- Molecule 56 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms				AltConf	Trace
56	z	114	Total	C	N	O	0	0
			873	543	171	159		

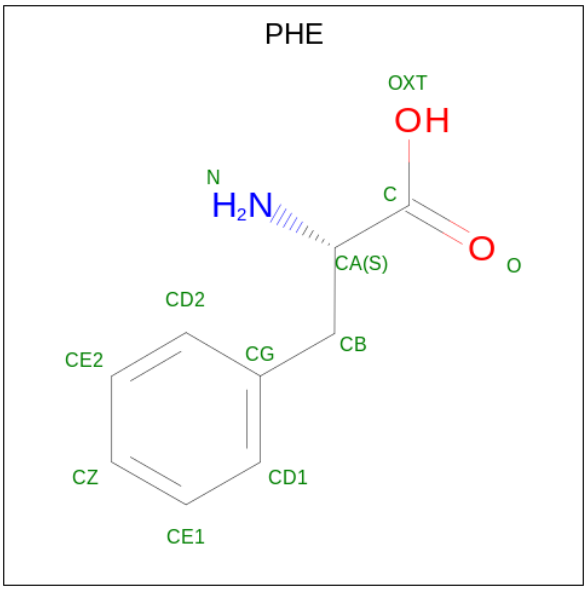
- Molecule 57 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	1	97	Total	C	N	O	S	0	0
			732	456	137	137	2		

- Molecule 58 is a RNA chain called 23S ribosomal RNA.

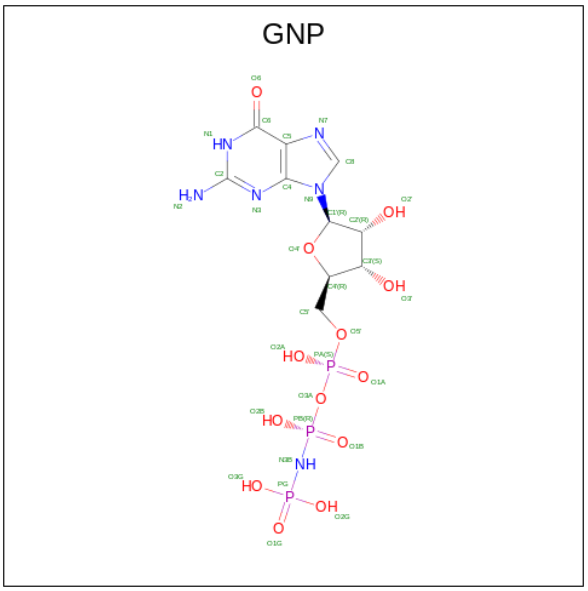
Mol	Chain	Residues	Atoms					AltConf	Trace
58	h	3071	Total	C	N	O	P	0	0
			65953	29397	12129	21356	3071		

- Molecule 59 is PHENYLALANINE (CCD ID: PHE) (formula: $C_9H_{11}NO_2$).



Mol	Chain	Residues	Atoms				AltConf
59	2	1	Total	C	N	O	0
			11	9	1	1	

- Molecule 60 is PHOSPHOAMINOPHOSPHONIC ACID-GUANYLATE ESTER (CCD ID: GNP) (formula: $C_{10}H_{17}N_6O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
60	7	1	Total	C	N	O	P	0
			32	10	6	13	3	

- Molecule 61 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
61	F	1	Total	Mg	0
			1	1	
61	R	1	Total	Mg	0
			1	1	
61	X	1	Total	Mg	0
			1	1	
61	i	3	Total	Mg	0
			3	3	
61	l	1	Total	Mg	0
			1	1	
61	t	1	Total	Mg	0
			1	1	
61	z	1	Total	Mg	0
			1	1	
61	h	3	Total	Mg	0
			3	3	

- Molecule 62 is ZINC ION (CCD ID: ZN) (formula: Zn).

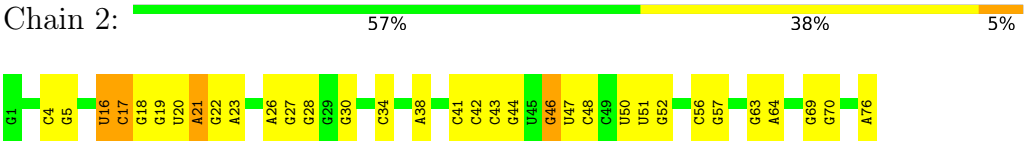
Mol	Chain	Residues	Atoms	AltConf
62	N	1	Total Zn 1 1	0
62	R	1	Total Zn 1 1	0
62	Y	1	Total Zn 1 1	0
62	c	1	Total Zn 1 1	0
62	f	1	Total Zn 1 1	0
62	g	1	Total Zn 1 1	0

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.

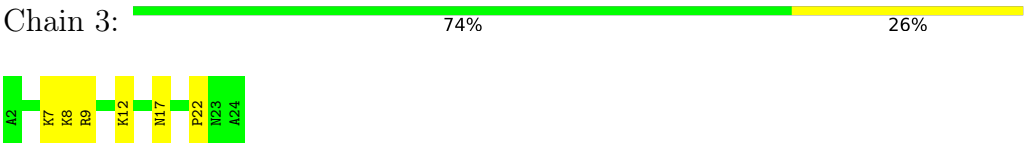
• Molecule 1: P/P-site Phe-tRNA(Phe)

Chain 2:



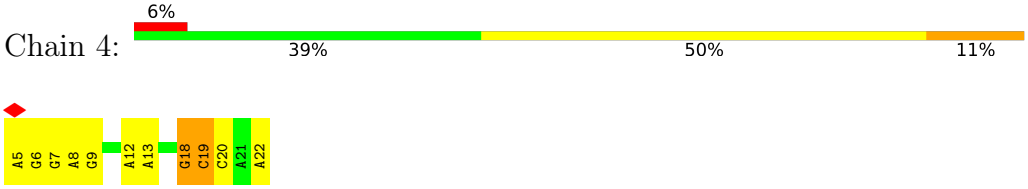
• Molecule 2: 50S ribosomal protein bL37

Chain 3:



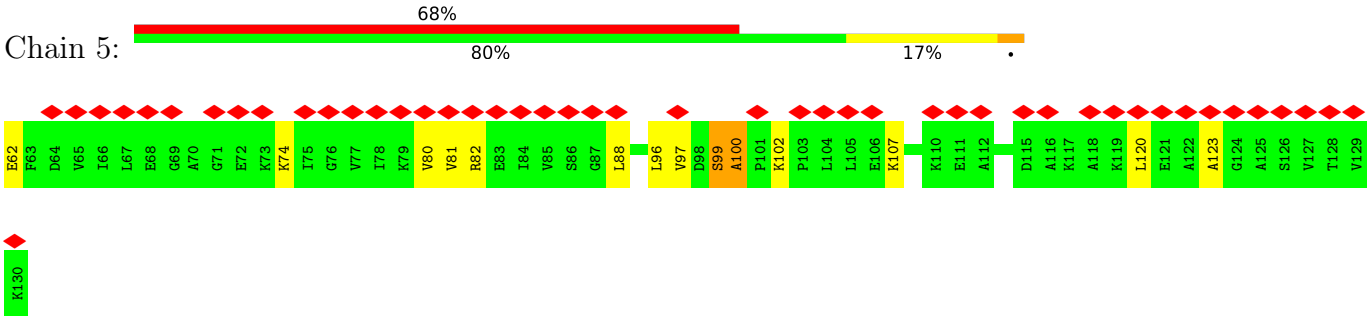
• Molecule 3: mRNA fragment

Chain 4:



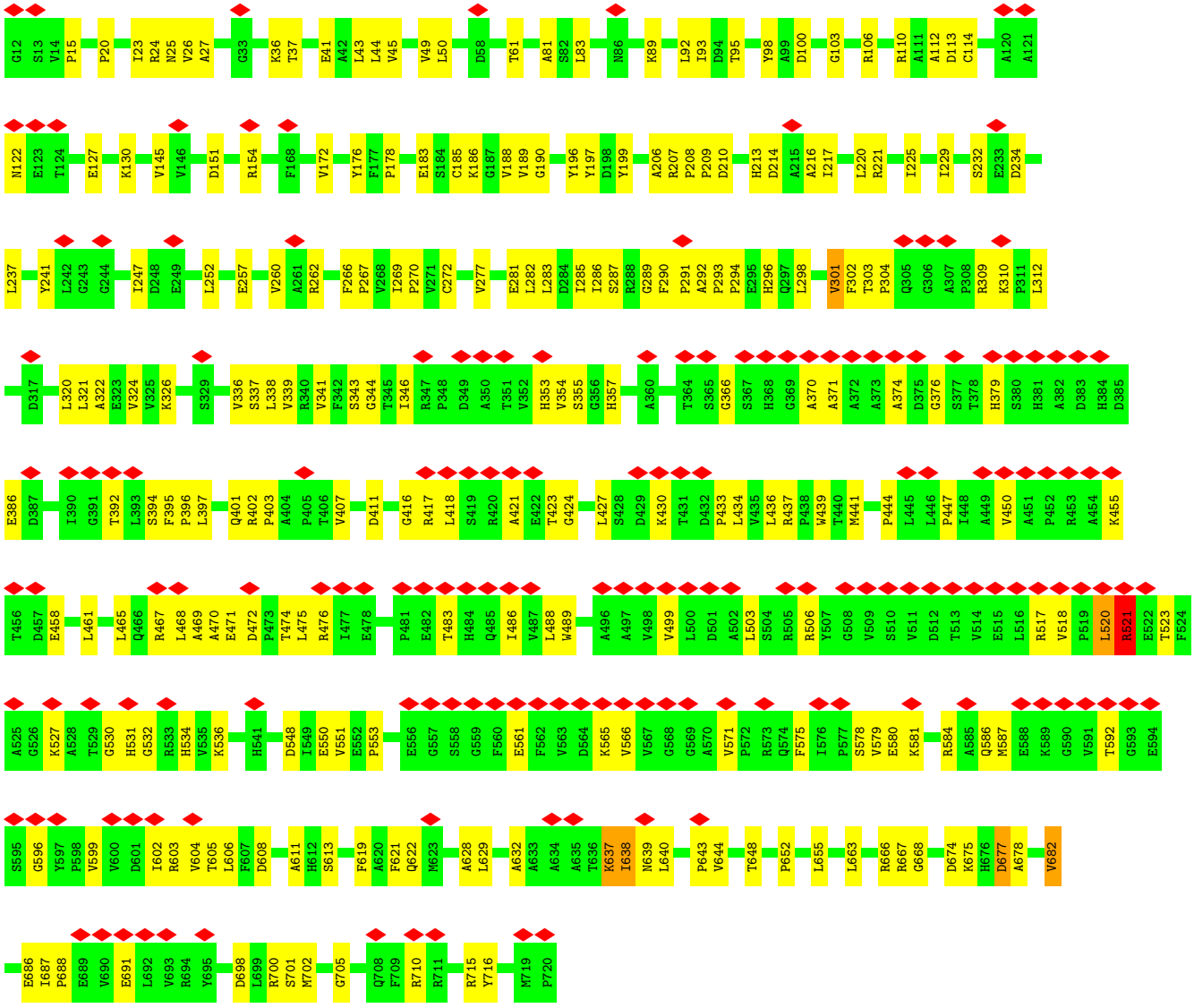
• Molecule 4: Large ribosomal subunit protein bL12

Chain 5:



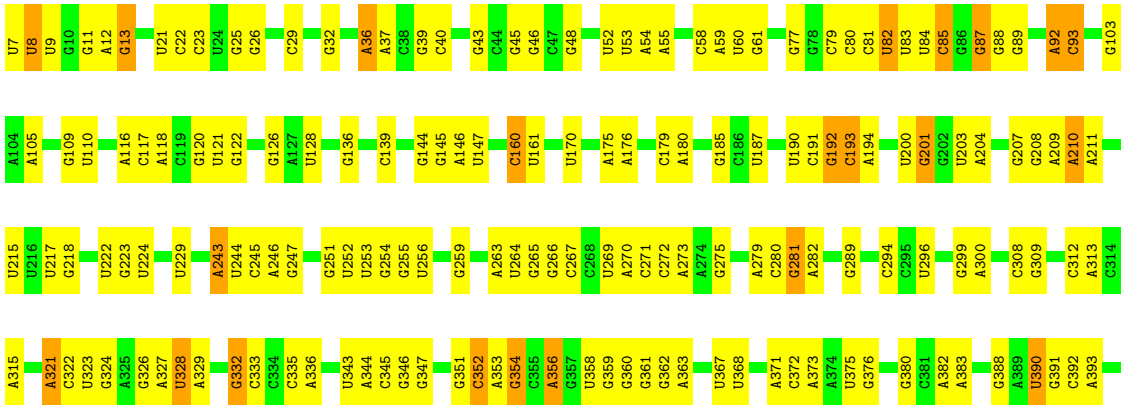
• Molecule 5: Translation elongation factor EF-G

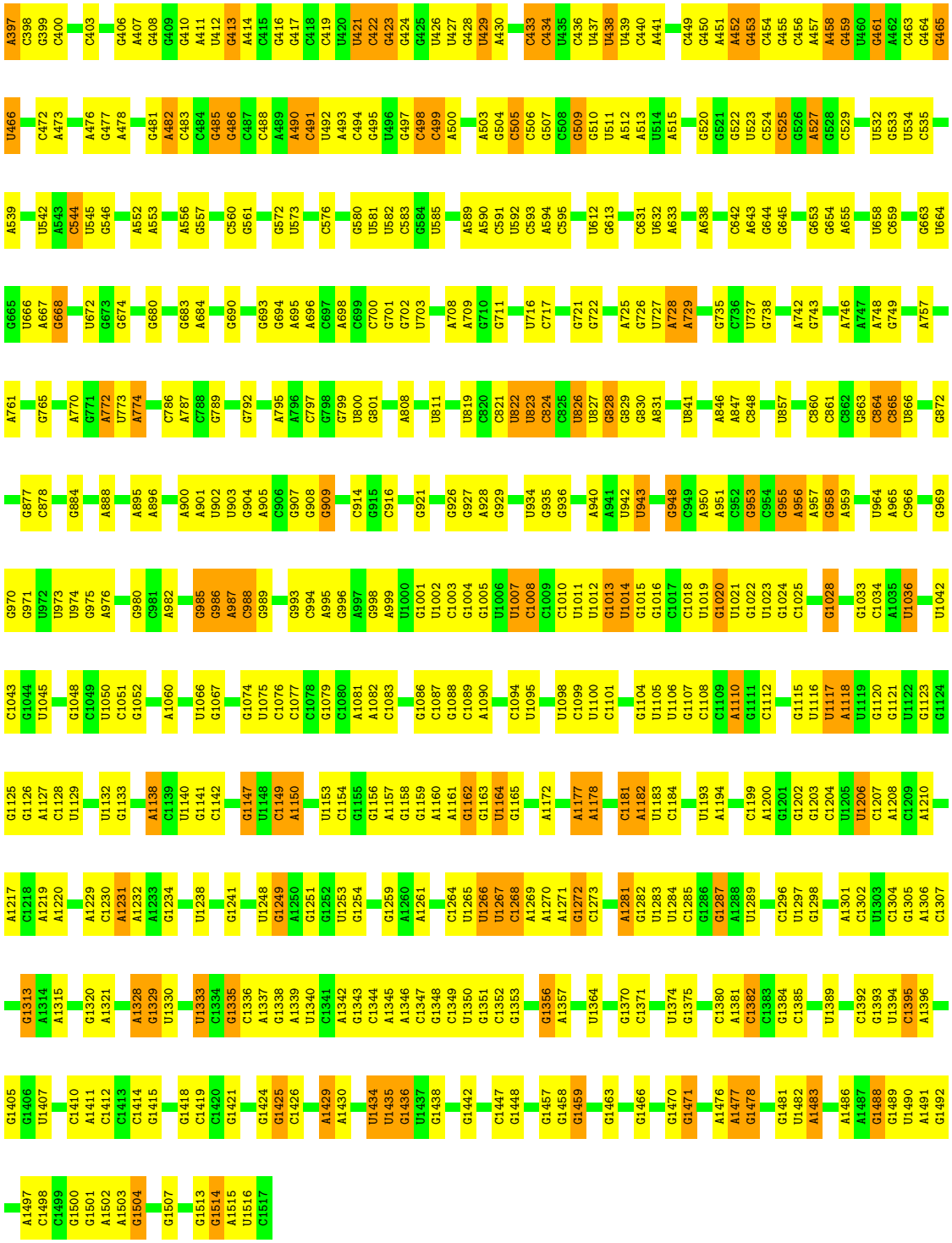
Chain 7:



• Molecule 6: 16S ribosomal RNA

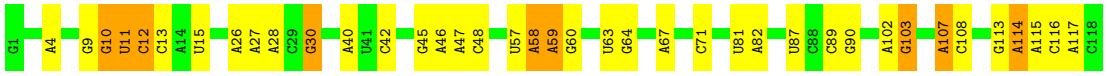
Chain A:





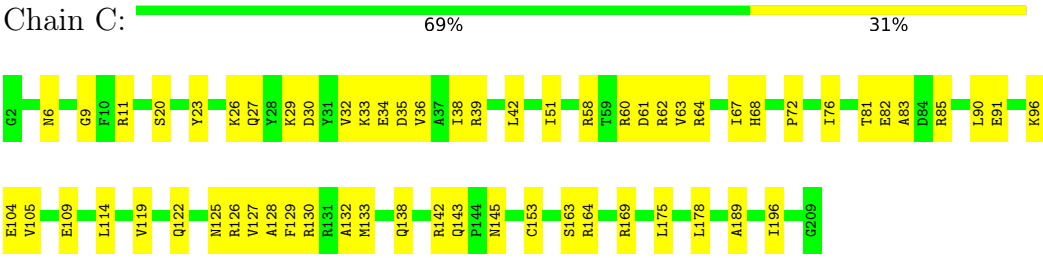
• Molecule 7: 5S ribosomal RNA

Chain B:



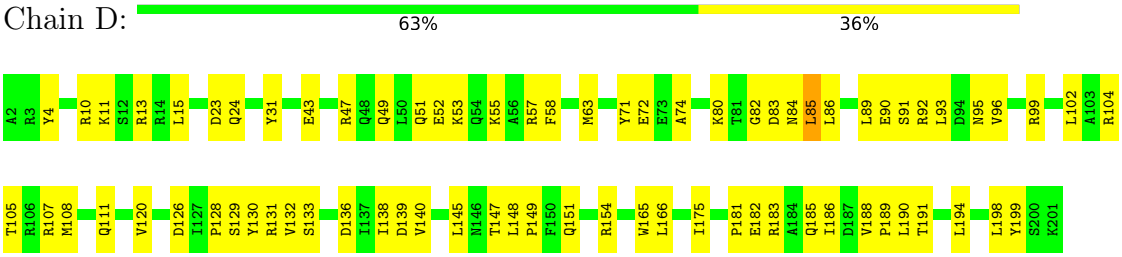
• Molecule 8: Small ribosomal subunit protein uS3

Chain C:



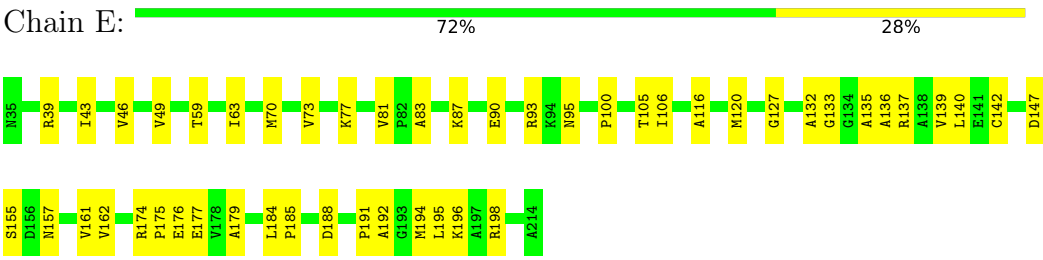
• Molecule 9: Small ribosomal subunit protein uS4

Chain D:



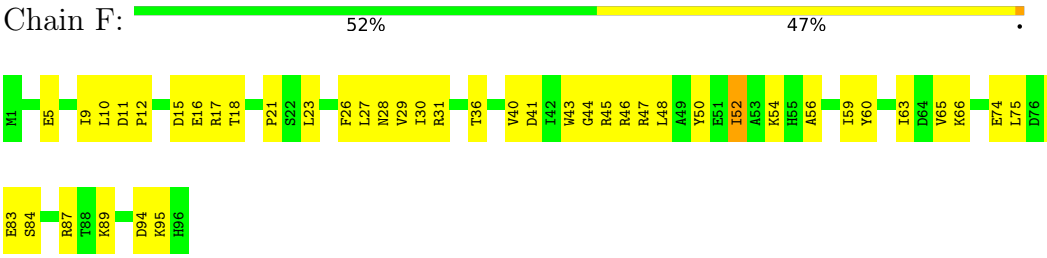
• Molecule 10: Small ribosomal subunit protein uS5

Chain E:



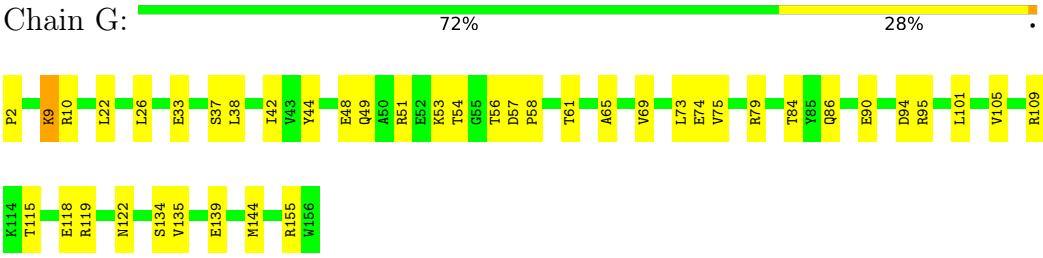
• Molecule 11: Small ribosomal subunit protein bS6

Chain F:



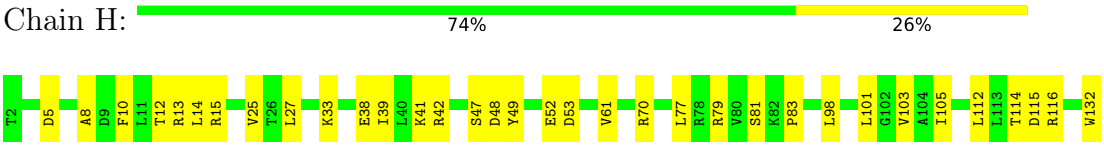
• Molecule 12: Small ribosomal subunit protein uS7

Chain G:



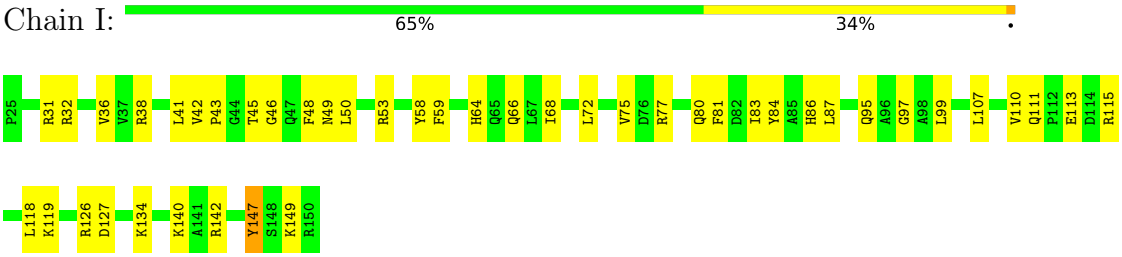
• Molecule 13: Small ribosomal subunit protein uS8

Chain H:



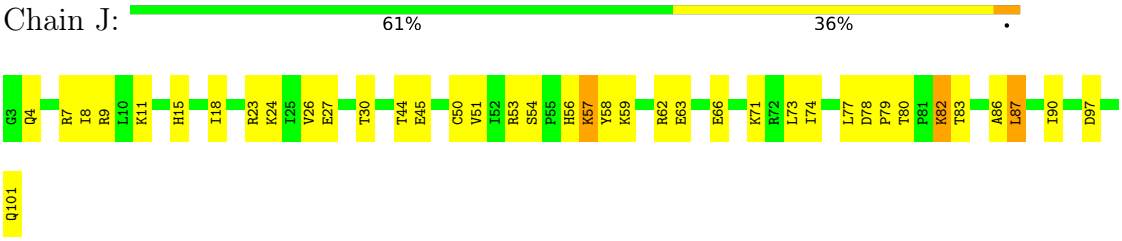
• Molecule 14: Small ribosomal subunit protein uS9

Chain I:



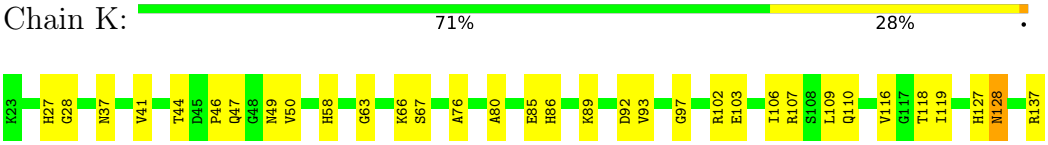
• Molecule 15: Small ribosomal subunit protein uS10

Chain J:



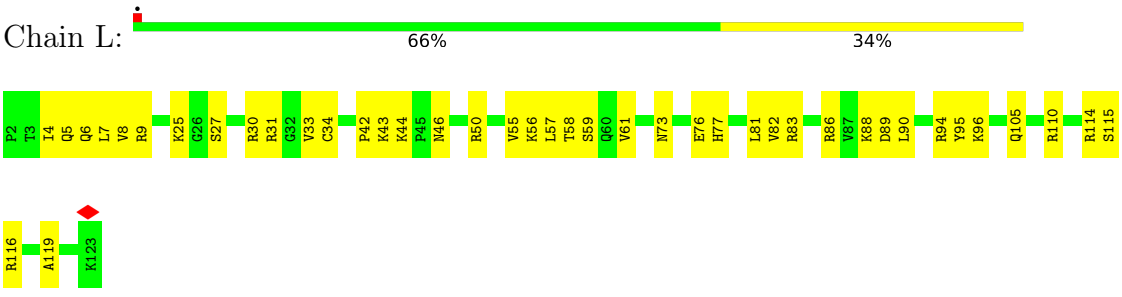
• Molecule 16: Small ribosomal subunit protein uS11

Chain K:



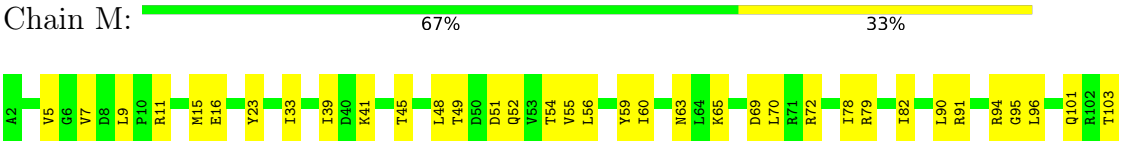
• Molecule 17: Small ribosomal subunit protein uS12

Chain L:



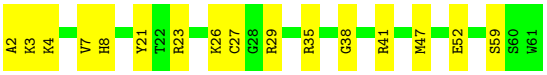
• Molecule 18: Small ribosomal subunit protein uS13

Chain M:



• Molecule 19: Small ribosomal subunit protein uS14B

Chain N:

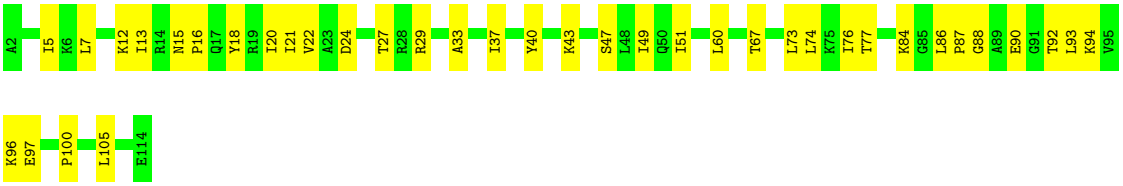


• Molecule 20: Small ribosomal subunit protein uS15

Chain O:

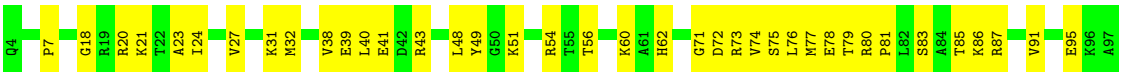
• Molecule 21: Small ribosomal subunit protein bS16

Chain P:



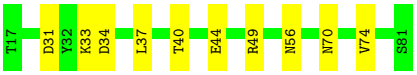
• Molecule 22: Small ribosomal subunit protein uS17

Chain Q:



• Molecule 23: Small ribosomal subunit protein bS18B

Chain R:

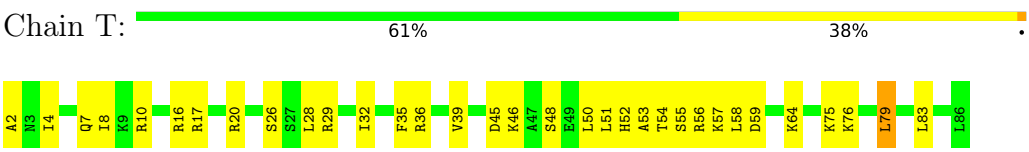


• Molecule 24: Small ribosomal subunit protein uS19

Chain S:

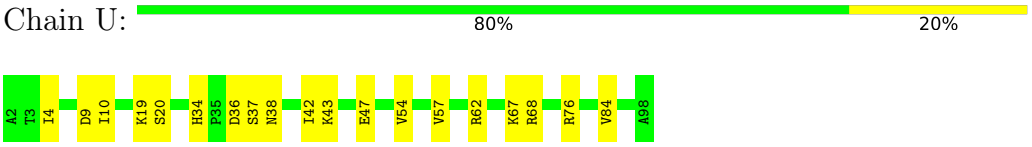
• Molecule 25: Small ribosomal subunit protein bS20

Chain T:



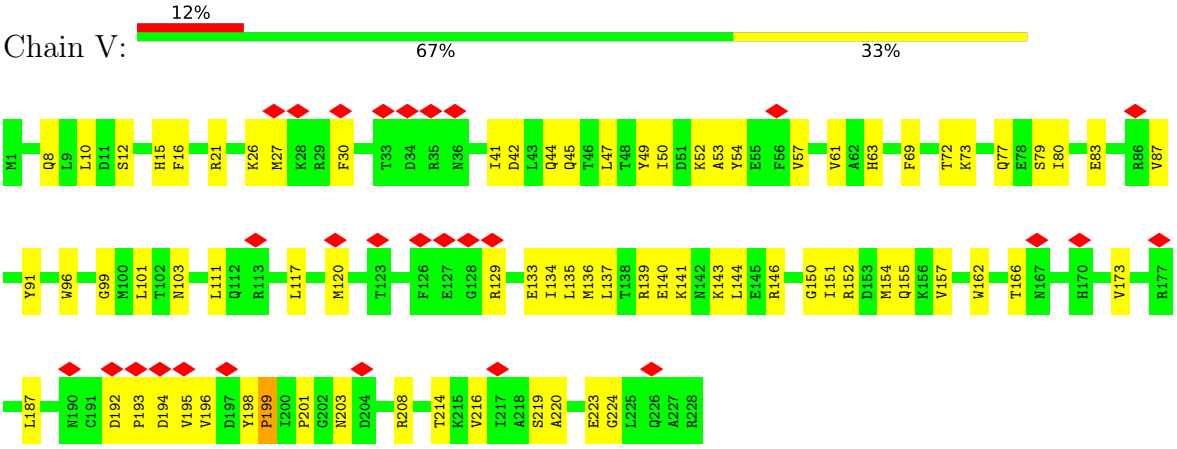
• Molecule 26: Large ribosomal subunit protein uL23

Chain U:



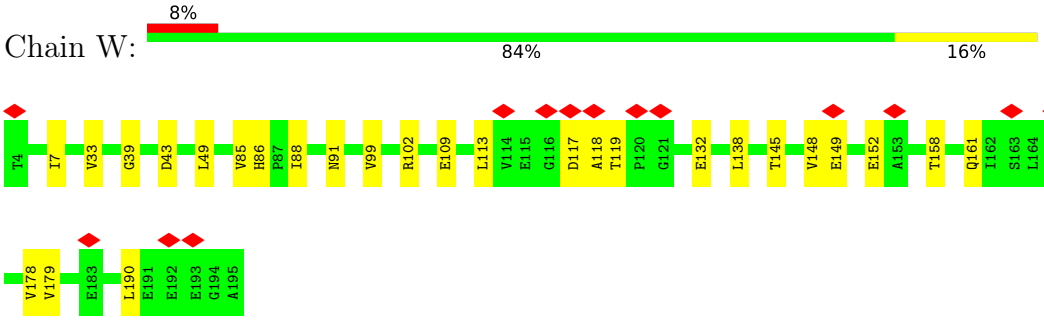
• Molecule 27: Small ribosomal subunit protein uS2

Chain V:



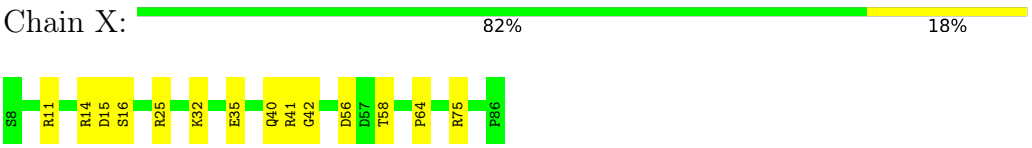
• Molecule 28: Large ribosomal subunit protein bL25

Chain W:



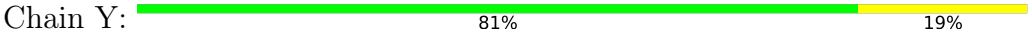
• Molecule 29: Large ribosomal subunit protein bL27

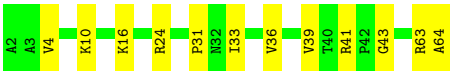
Chain X:



• Molecule 30: Large ribosomal subunit protein bL28

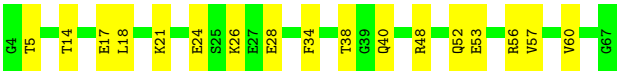
Chain Y:





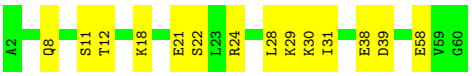
• Molecule 31: Large ribosomal subunit protein uL29

Chain Z:



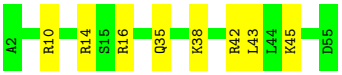
• Molecule 32: Large ribosomal subunit protein uL30

Chain a:



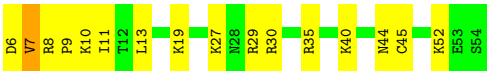
• Molecule 33: Large ribosomal subunit protein bL32

Chain b:



• Molecule 34: Large ribosomal subunit protein bL33A

Chain c:

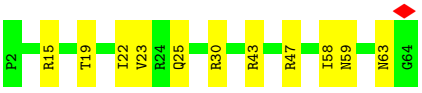


• Molecule 35: Large ribosomal subunit protein bL34

Chain d:

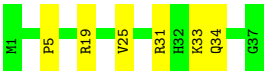
• Molecule 36: Large ribosomal subunit protein bL35

Chain e:



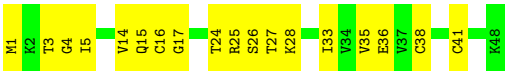
• Molecule 37: 50S ribosomal protein L36

Chain f:



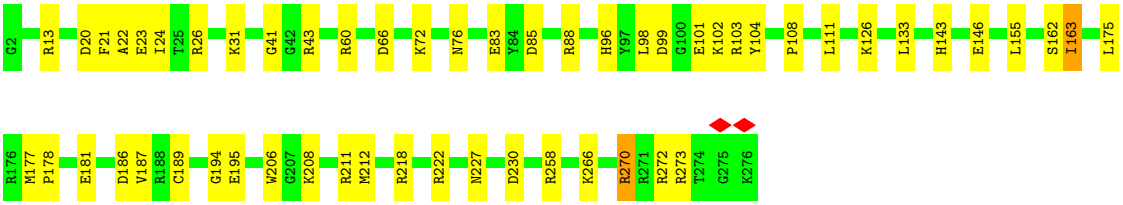
• Molecule 38: Large ribosomal subunit protein bL31

Chain g:



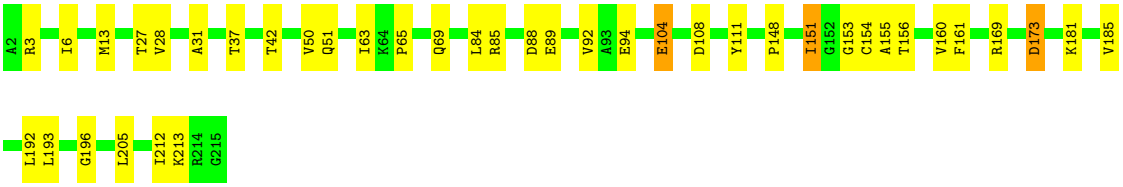
• Molecule 39: Large ribosomal subunit protein uL2

Chain i:



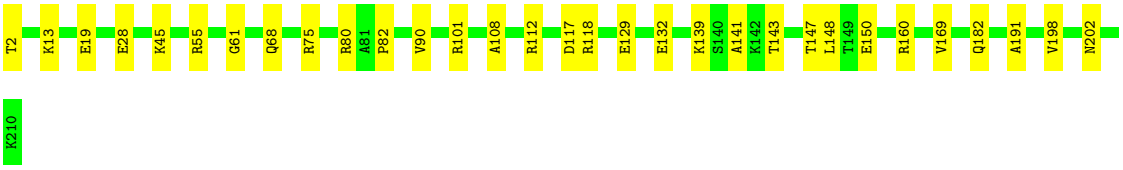
• Molecule 40: Large ribosomal subunit protein uL3

Chain j:



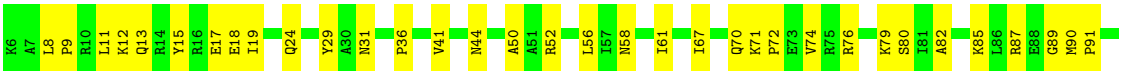
• Molecule 41: Large ribosomal subunit protein uL4

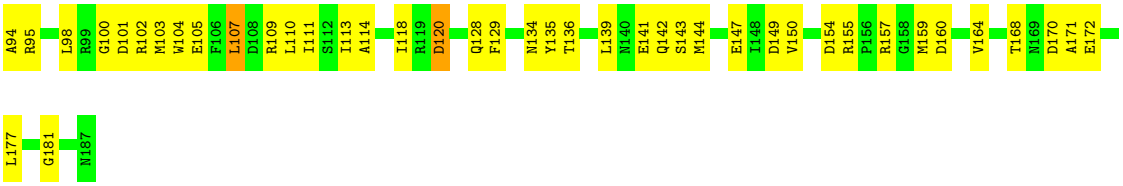
Chain k:



• Molecule 42: Large ribosomal subunit protein uL5

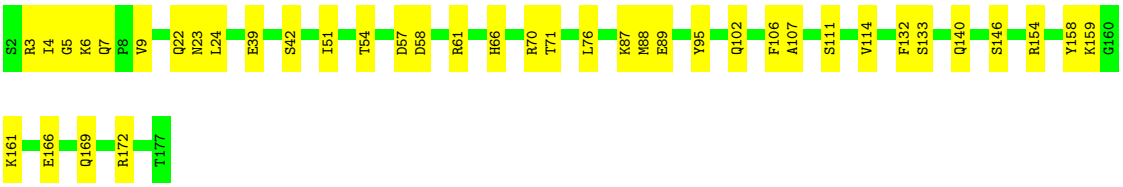
Chain l:





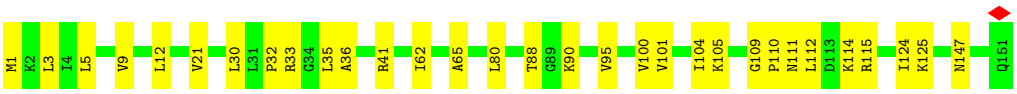
• Molecule 43: Large ribosomal subunit protein uL6

Chain m:



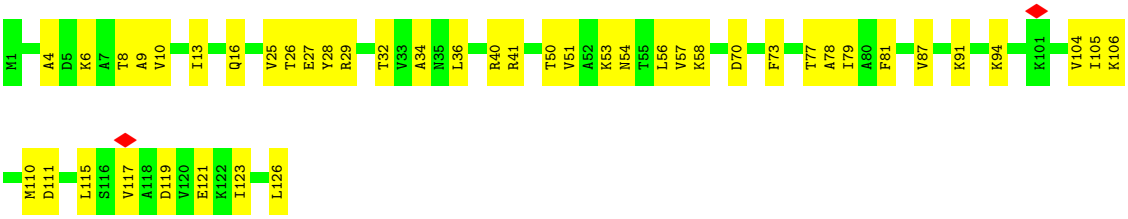
• Molecule 44: 50S ribosomal protein L9

Chain n:



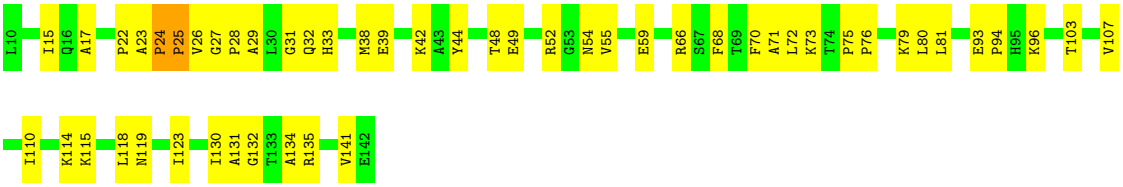
• Molecule 45: Large ribosomal subunit protein uL10

Chain o:



• Molecule 46: Large ribosomal subunit protein uL11

Chain p:



• Molecule 47: Large ribosomal subunit protein uL13

Chain q:

• Molecule 48: 50S ribosomal protein L14

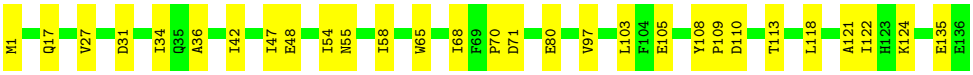
Chain r:

• Molecule 49: Large ribosomal subunit protein uL15

Chain s:

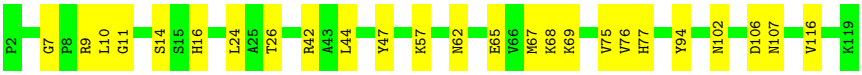
• Molecule 50: Large ribosomal subunit protein uL16

Chain t:



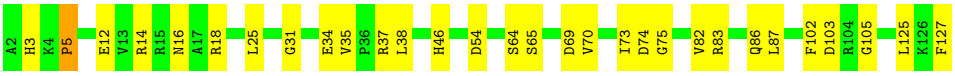
• Molecule 51: Large ribosomal subunit protein bL17

Chain u:



• Molecule 52: Large ribosomal subunit protein uL18

Chain v:

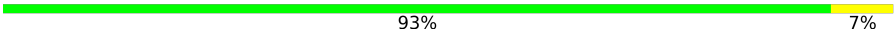


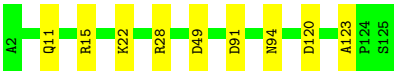
• Molecule 53: 50S ribosomal protein L19

Chain w:

• Molecule 54: Large ribosomal subunit protein bL20

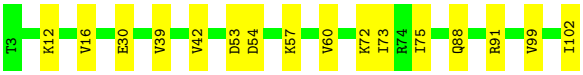
Chain x:





• Molecule 55: Large ribosomal subunit protein bL21

Chain y:

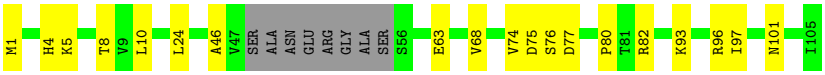


• Molecule 56: Large ribosomal subunit protein uL22

Chain z:

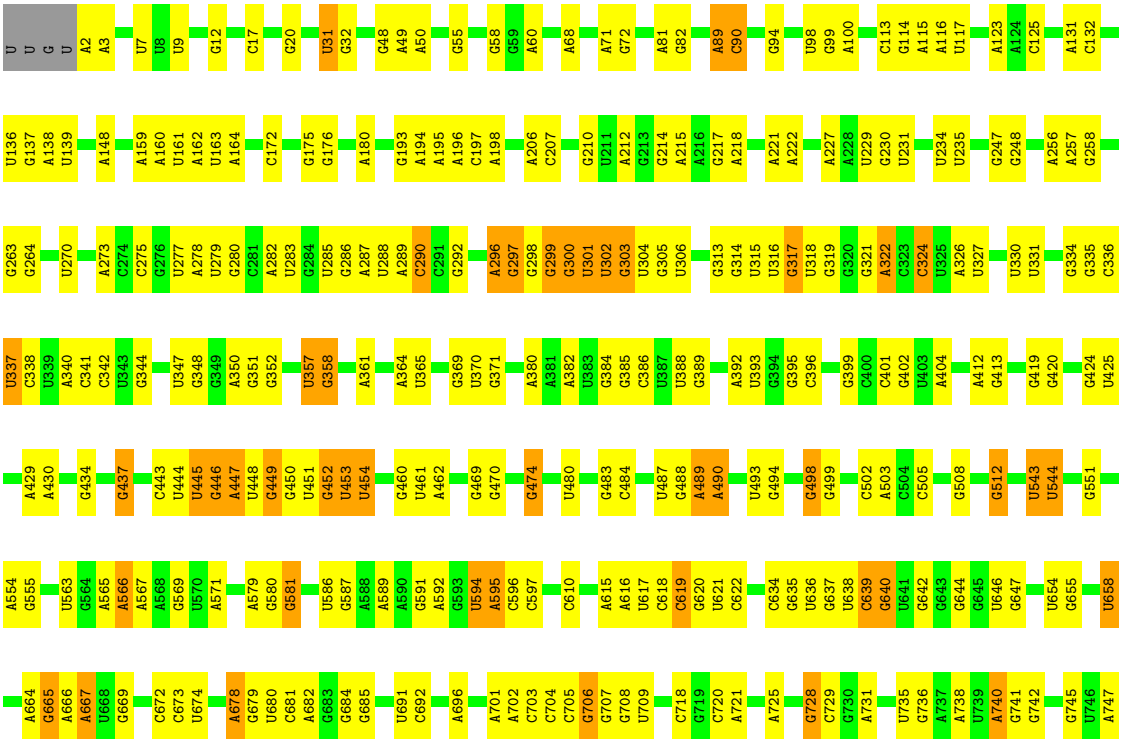
• Molecule 57: Large ribosomal subunit protein uL24

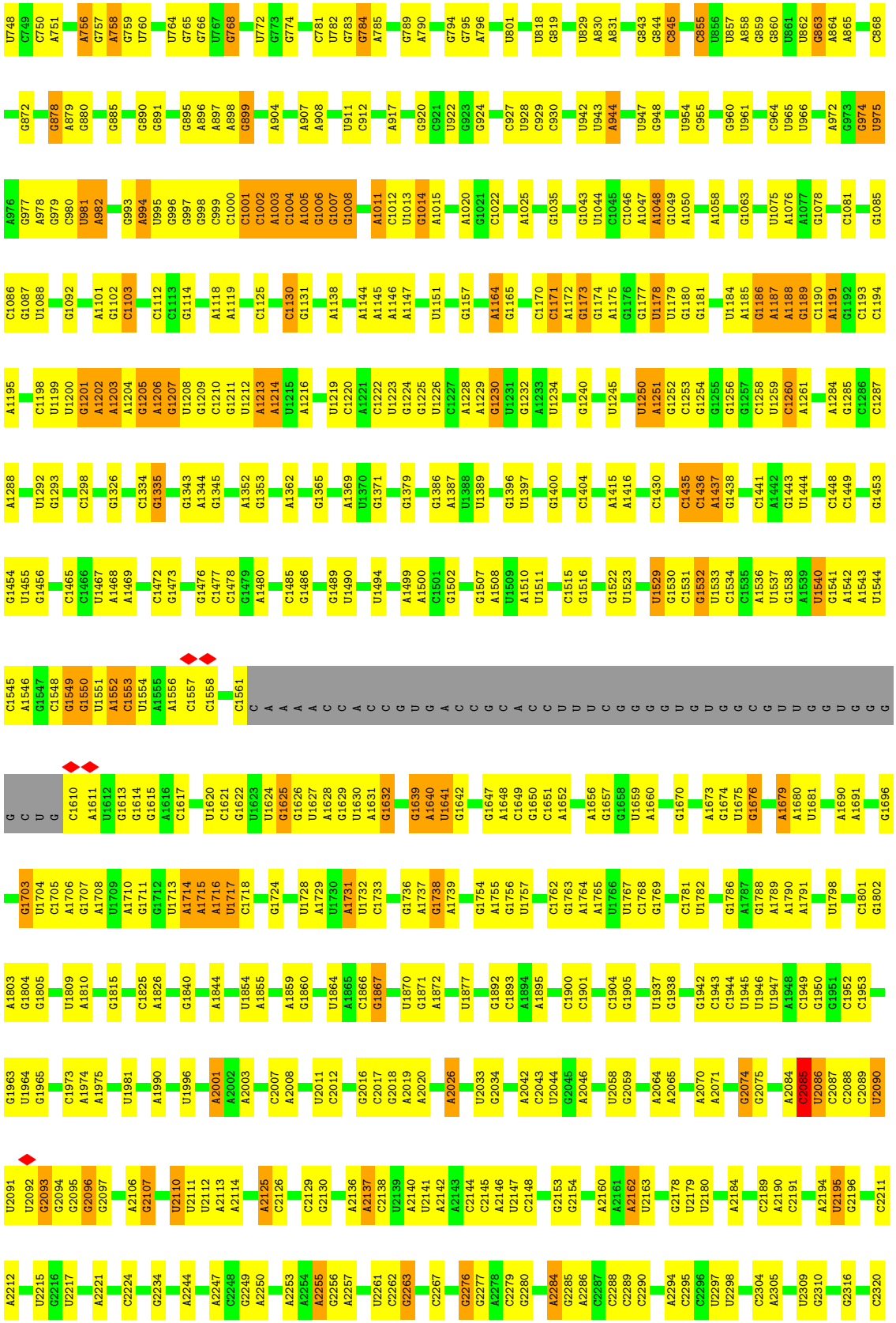
Chain 1:



• Molecule 58: 23S ribosomal RNA

Chain h:

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G872 G878 A879 G880 G885 G890 G891 G895 A896 A897 A898 G899 A904 A907 A908 U911 C912 A917 G920 C921 U922 G923 G924 C927 U928 C929 C930 U942 U943 A944 U947 G948 U954 C955 G960 U961 C964 U965 U966 A972 G973 G974 U975
A976 G977 A978 G979 C980 U981 A982 G993 A994 U995 G996 G997 G998 C999 C1000 C1001 C1002 A1003 C1004 A1005 G1006 G1007 G1008 A1011 C1012 U1013 G1014 A1015 A1020 C1021 C1022 A1025 G1035 G1043 U1044 C1045 C1046 A1047 A1048 G1049 A1050 A1058 G1063 U1075 A1076 A1077 G1078 C1081 G1085
C1086 G1087 U1088 G1092 A1101 G1102 C1103 C1112 C1113 G1114 A1118 A1119 C1125 C1130 G1131 A1138 A1144 A1145 A1146 A1147 U1151 G1157 A1164 G1165 C1170 C1171 A1172 G1173 G1174 A1175 G1176 G1177 U1178 U1179 G1180 G1181 U1184 A1185 G1186 A1187 A1188 G1189 C1190 A1191 G1192 C1193 C1194
A1195 C1198 U1199 U1200 G1201 A1202 A1203 A1204 G1205 A1206 G1207 U1208 G1209 C1210 G1211 U1212 A1213 A1214 U1215 A1216 U1219 C1220 A1221 C1222 U1223 G1224 G1225 U1226 C1227 A1228 A1229 G1230 U1231 G1232 A1233 U1234 G1240 U1245 U1250 A1251 G1252 C1253 G1254 G1255 G1256 G1257 C1258 U1259 C1260 A1261 A1284 G1285 C1286 C1287
A1288 U1292 G1293 C1298 G1326 C1334 G1335 G1343 A1344 G1345 A1352 G1353 A1362 G1365 A1369 U1370 G1371 G1379 G1386 A1387 U1388 U1389 G1396 U1397 G1400 C1404 A1415 A1416 C1430 C1435 C1436 A1437 G1438 C1441 A1442 G1443 U1444 C1448 C1449 G1453
G1454 U1455 G1456 C1465 C1466 U1467 A1468 A1469 C1472 G1473 G1476 C1477 C1478 G1479 A1480 C1485 G1486 G1489 U1490 U1494 A1499 A1500 C1501 G1502 G1507 A1508 U1509 A1510 U1511 C1515 G1516 G1522 U1523 U1529 G1530 C1531 G1532 U1533 C1534 C1535 A1536 U1537 G1538 A1539 U1540 G1541 A1542 A1543 U1544
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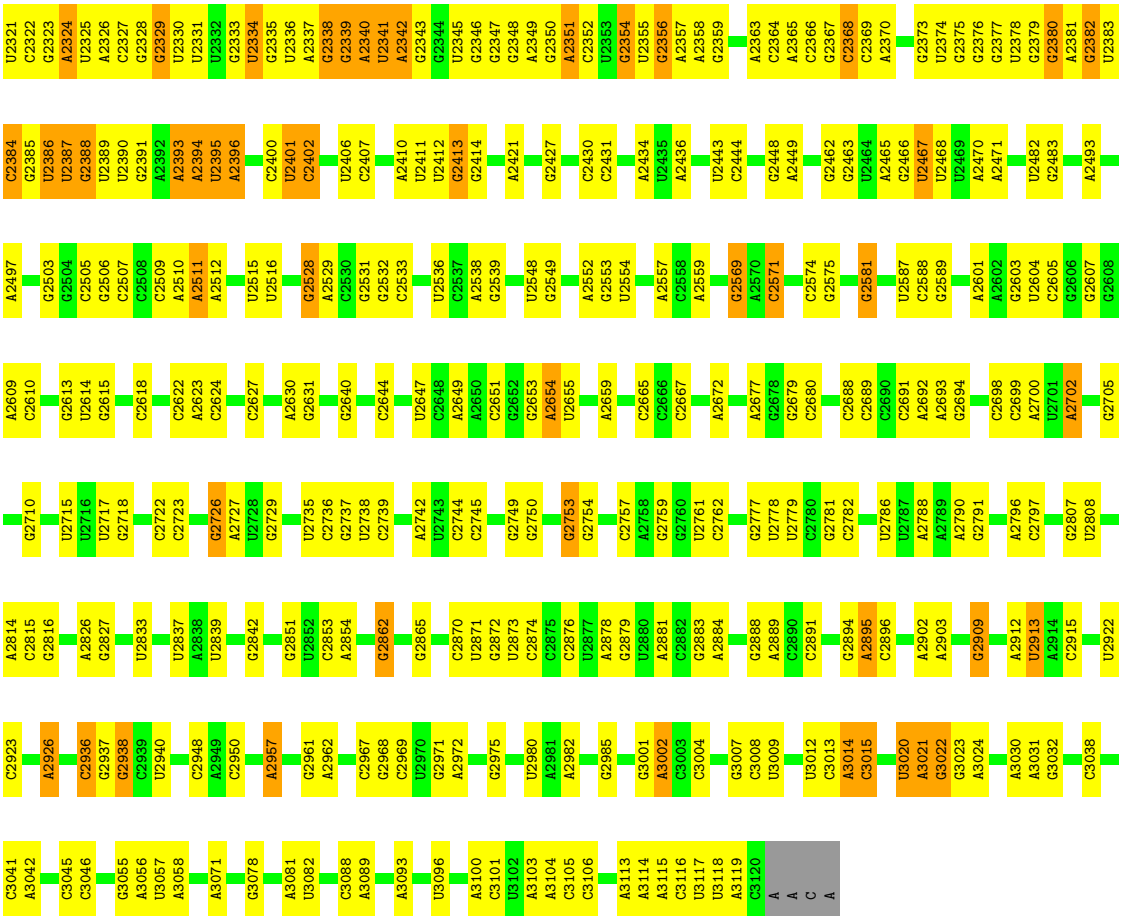
G C U G C1610 A1611 U1612 G1613 G1614 G1615 A1616 C1617 U1620 C1621 G1622 U1623 U1624 G1625 G1626 U1627 A1628 G1629 U1630 A1631 G1632 G1639 A1640 U1641 G1642 G1647 A1648 C1649 G1650 C1651 A1652 A1656 G1657 G1658 U1659 A1660 G1670 A1673 G1674 U1675 G1676 A1679 A1680 U1681 A1690 A1691 G1696
G1703 U1704 C1705 A1706 G1707 A1708 U1709 A1710 G1711 G1712 U1713 A1714 A1715 A1716 U1717 C1718 G1724 U1728 A1729 U1730 A1731 U1732 C1733 G1736 A1737 G1738 A1739 G1754 A1755 G1756 U1757 C1762 G1763 A1764 A1765 U1766 U1767 C1768 G1769 C1781 U1782 G1786 A1787 G1788 A1789 A1790 A1791 U1798 C1801 G1802
A1803 G1804 G1805 U1809 A1810 G1815 C1825 A1826 G1840 A1844 U1854 A1855 A1859 G1860 U1864 A1865 C1866 G1867 U1870 G1871 A1872 U1877 G1892 C1893 A1894 A1895 C1900 C1901 C1904 G1905 U1937 G1938 G1942 C1943 C1944 U1945 U1946 U1947 A1948 C1949 G1950 G1951 C1952 C1953
G1963 U1964 G1965 C1973 A1974 A1975 U1981 A1990 U1996 A2001 A2002 A2003 C2007 A2008 U2011 C2012 G2016 C2017 G2018 A2019 A2020 A2026 U2033 G2034 A2042 C2043 U2044 G2045 A2046 U2058 G2059 A2064 A2065 A2070 A2071 G2074 G2075 A2084 C2085 U2086 C2087 C2088 C2089 U2090
U2091 U2092 G2093 G2094 G2095 G2096 G2097 A2106 G2107 U2110 U2111 U2112 A2113 A2114 A2125 C2126 C2129 G2130 A2136 A2137 C2138 U2139 A2140 U2141 A2142 A2143 C2144 C2145 A2146 U2147 C2148 G2153 G2154 A2160 A2161 A2162 U2163 G2178 U2179 U2180 A2184 C2189 A2190 C2191 A2194 U2195 G2196 C2211
A2212 U2215 G2216 U2217 A2221 C2224 G2234 A2244 A2247 C2248 G2249 A2250 A2253 A2254 A2255 G2256 A2257 U2261 C2262 G2263 C2267 G2276 G2277 A2278 C2279 G2280 A2284 G2285 A2286 C2287 C2288 C2289 C2290 A2294 C2295 C2296 U2297 U2298 C2304 A2305 U2309 G2310 G2316 C2320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C2384 G2385 U2386 U2387 G2388 U2389 U2390 G2391 A2392 A2393 A2394 U2395 A2396 C2400 U2401 C2402 U2406 C2407 A2410 U2411 U2412 G2413 G2414 A2421 G2427 C2430 C2431 A2434 U2435 A2436 U2443 C2444 G2448 A2449 G2462 G2463 U2464 A2465 G2466 U2467 U2468 U2469 A2470 A2471 U2482 G2483 A2493
A2497 G2503 G2504 C2505 G2506 C2507 C2508 C2509 A2510 A2511 A2512 U2515 U2516 G2528 A2529 C2530 G2531 G2532 C2533 U2536 C2537 A2538 G2539 U2548 G2549 A2552 G2553 U2554 A2557 C2558 A2559 G2569 A2570 C2571 C2574 G2575 G2581 U2587 C2588 G2589 A2601 A2602 G2603 U2604 C2605 G2606 G2607 G2608
A2609 C2610 G2613 U2614 G2615 C2618 C2622 A2623 C2624 C2627 A2630 G2631 G2640 C2644 U2647 C2648 A2649 A2650 C2651 G2652 G2653 A2654 U2655 A2659 C2665 C2666 C2667 A2672 A2677 G2678 G2679 C2680 C2688 C2689 C2690 C2691 A2692 A2693 G2694 C2698 C2699 A2700 U2701 A2702 G2705
G2710 U2715 U2716 U2717 G2718 C2722 C2723 G2726 A2727 U2728 G2729 U2735 C2736 G2737 U2738 C2739 A2742 U2743 C2744 C2745 G2749 G2750 G2753 G2754 C2757 A2758 G2759 G2760 U2761 C2762 G2777 U2778 U2779 C2780 G2781 C2782 U2786 U2787 A2788 A2789 A2790 G2791 A2796 C2797 G2807 U2808
A2814 C2815 G2816 A2826 G2827 U2833 U2837 A2838 U2839 G2842 G2851 U2852 C2853 A2854 G2862 G2865 C2870 U2871 G2872 U2873 C2874 C2875 C2876 U2877 A2878 G2879 U2880 A2881 C2882 G2883 A2884 G2888 A2889 C2890 C2891 G2894 A2895 C2896 A2902 A2903 G2909 A2912 U2913 A2914 C2915 U2922
C2923 A2926 C2936 G2937 G2938 C2939 U2940 C2948 A2949 C2950 A2957 G2961 A2962 C2967 G2968 C2969 U2970 G2971 A2972 G2975 U2980 A2981 A2982 G2985 G3001 A3002 C3003 C3004 G3007 C3008 U3009 U3012 C3013 A3014 C3015 U3020 A3021 G3022 G3023 A3024 A3030 A3031 G3032 C3038
C3041 A3042 C3045 C3046 G3055 A3056 U3057 A3058 A3071 G3078 A3081 U3082 C3088 A3089 A3093 U3096 A3100 C3101 U3102 A3103 A3104 C3105 C3106 A3113 A3114 A3115 C3116 U3117 U3118 A3119 C3120 A A C A

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	19431	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 ($e^-/Å^2$)	54	Depositor
Minimum defocus (nm)	1800	Depositor
Maximum defocus (nm)	3300	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.090	Depositor
Minimum map value	-0.027	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.00715	Depositor
Map size (Å)	483.0, 483.0, 483.0	wwPDB
Map dimensions	350, 350, 350	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.38, 1.38, 1.38	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: MG, GNP, ZN

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	2	0.15	0/1802	0.29	0/2807
2	3	0.25	0/191	0.33	0/247
3	4	0.13	0/439	0.27	0/684
4	5	0.17	0/507	0.41	0/678
5	7	0.15	0/5405	0.36	1/7360 (0.0%)
6	A	0.24	0/36309	0.31	0/56657
7	B	0.25	0/2821	0.27	0/4396
8	C	0.20	0/1684	0.48	1/2261 (0.0%)
9	D	0.25	0/1672	0.55	0/2251
10	E	0.26	0/1312	0.45	0/1772
11	F	0.24	0/782	0.45	0/1059
12	G	0.32	1/1252 (0.1%)	0.63	4/1690 (0.2%)
13	H	0.25	0/1025	0.42	0/1385
14	I	0.25	0/1012	0.51	2/1362 (0.1%)
15	J	0.24	0/802	0.49	0/1086
16	K	0.24	0/873	0.49	0/1180
17	L	0.27	0/969	0.50	0/1294
18	M	0.25	0/942	0.51	0/1260
19	N	0.25	0/488	0.42	0/650
20	O	0.24	0/729	0.36	0/977
21	P	0.25	0/908	0.48	0/1226
22	Q	0.26	0/759	0.57	0/1016
23	R	0.24	0/518	0.42	0/693
24	S	0.20	0/680	0.41	0/915
25	T	0.24	0/663	0.48	0/882
26	U	0.28	0/766	0.42	0/1030
27	V	0.21	0/1822	0.53	3/2457 (0.1%)
28	W	0.21	0/1443	0.37	0/1970
29	X	0.28	0/595	0.34	0/798
30	Y	0.33	0/478	0.36	0/641
31	Z	0.24	0/534	0.38	0/713
32	a	0.28	0/477	0.36	0/640

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	b	0.30	0/427	0.41	0/572
34	c	0.22	0/413	0.39	0/553
35	d	0.30	0/380	0.32	0/500
36	e	0.26	0/507	0.37	0/672
37	f	0.25	0/303	0.30	0/401
38	g	0.21	0/372	0.44	0/503
39	i	0.32	0/2153	0.42	0/2895
40	j	0.30	0/1609	0.40	0/2165
41	k	0.28	0/1592	0.40	0/2153
42	l	0.25	0/1467	0.51	0/1973
43	m	0.21	0/1369	0.37	0/1848
44	n	0.19	0/1027	0.43	0/1398
45	o	0.13	0/925	0.33	0/1246
46	p	0.17	0/1006	0.42	0/1364
47	q	0.29	0/1157	0.37	0/1567
48	r	0.28	0/946	0.42	0/1268
49	s	0.29	0/1091	0.45	0/1457
50	t	0.28	0/1118	0.42	0/1506
51	u	0.28	0/945	0.37	0/1267
52	v	0.25	0/966	0.41	1/1298 (0.1%)
53	w	0.28	0/921	0.42	0/1236
54	x	0.30	0/1000	0.34	0/1341
55	y	0.27	0/764	0.32	0/1030
56	z	0.28	0/887	0.37	0/1204
57	1	0.24	0/738	0.41	0/987
58	h	0.31	1/73851 (0.0%)	0.32	3/115230 (0.0%)
All	All	0.27	2/168593 (0.0%)	0.35	15/251671 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
58	h	2894	G	O3'-P	-12.13	1.43	1.61
12	G	2	PRO	N-CD	5.76	1.55	1.47

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	G	2	PRO	CA-N-CD	-13.91	92.53	112.00
58	h	2895	A	O3'-P-O5'	10.16	119.24	104.00
27	V	199	PRO	N-CD-CG	-9.20	89.41	103.20
12	G	2	PRO	N-CD-CG	-8.55	90.37	103.20
14	I	43	PRO	CA-N-CD	-7.98	100.83	112.00

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	2	1614	0	823	19	0
2	3	189	0	205	5	0
3	4	390	0	198	6	0
4	5	505	0	545	10	0
5	7	5299	0	5230	181	0
6	A	32439	0	16321	470	0
7	B	2522	0	1285	19	0
8	C	1660	0	1707	47	0
9	D	1641	0	1668	66	0
10	E	1296	0	1360	36	0
11	F	771	0	797	31	0
12	G	1232	0	1282	31	0
13	H	1010	0	1046	23	0
14	I	994	0	1050	35	0
15	J	788	0	819	33	0
16	K	855	0	863	24	0
17	L	958	0	1045	42	0
18	M	935	0	986	31	0
19	N	477	0	499	15	0
20	O	720	0	760	18	0
21	P	891	0	935	31	0
22	Q	748	0	795	31	0
23	R	513	0	537	8	0
24	S	662	0	677	13	0
25	T	660	0	712	27	0
26	U	756	0	802	12	0
27	V	1793	0	1839	54	0
28	W	1428	0	1443	18	0
29	X	586	0	601	11	0
30	Y	470	0	480	8	0
31	Z	531	0	541	12	0
32	a	474	0	500	8	0
33	b	423	0	463	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
34	c	405	0	407	13	0
35	d	377	0	411	7	0
36	e	502	0	541	11	0
37	f	299	0	321	6	0
38	g	364	0	348	14	0
39	i	2110	0	2165	38	0
40	j	1587	0	1630	32	0
41	k	1569	0	1607	24	0
42	l	1445	0	1476	54	0
43	m	1348	0	1399	31	0
44	n	1018	0	988	25	0
45	o	918	0	959	31	0
46	p	990	0	1021	38	0
47	q	1130	0	1167	23	0
48	r	938	0	1000	20	0
49	s	1078	0	1151	20	0
50	t	1092	0	1128	18	0
51	u	928	0	972	15	0
52	v	956	0	991	21	0
53	w	907	0	938	17	0
54	x	988	0	1038	6	0
55	y	754	0	802	8	0
56	z	873	0	909	12	0
57	1	732	0	782	13	0
58	h	65953	0	33183	675	0
59	2	11	0	8	0	0
60	7	32	0	13	2	0
61	F	1	0	0	0	0
61	R	1	0	0	0	0
61	X	1	0	0	0	0
61	h	3	0	0	0	0
61	i	3	0	0	0	0
61	l	1	0	0	0	0
61	t	1	0	0	0	0
61	z	1	0	0	0	0
62	N	1	0	0	0	0
62	R	1	0	0	0	0
62	Y	1	0	0	0	0
62	c	1	0	0	0	0
62	f	1	0	0	0	0
62	g	1	0	0	0	0
All	All	155552	0	106169	2267	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 9.

The worst 5 of 2267 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)
7:B:60:G:H4'	52:v:12:GLU:HG3	1.42	0.98
58:h:3013:C:H5'	58:h:3014:A:H5'	1.49	0.92
6:A:993:G:H1	6:A:1002:U:H3	1.14	0.89
58:h:1211:G:H21	58:h:1216:A:H62	1.19	0.86
58:h:2528:G:H22	58:h:2536:U:H3	1.20	0.85

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
2	3	21/23 (91%)	20 (95%)	1 (5%)	0	100 100
4	5	67/69 (97%)	61 (91%)	4 (6%)	2 (3%)	3 22
5	7	707/709 (100%)	673 (95%)	33 (5%)	1 (0%)	48 83
8	C	206/208 (99%)	192 (93%)	14 (7%)	0	100 100
9	D	198/200 (99%)	186 (94%)	12 (6%)	0	100 100
10	E	178/180 (99%)	168 (94%)	10 (6%)	0	100 100
11	F	94/96 (98%)	90 (96%)	4 (4%)	0	100 100
12	G	153/155 (99%)	149 (97%)	4 (3%)	0	100 100
13	H	129/131 (98%)	127 (98%)	2 (2%)	0	100 100
14	I	124/126 (98%)	116 (94%)	8 (6%)	0	100 100
15	J	97/99 (98%)	92 (95%)	4 (4%)	1 (1%)	13 49
16	K	113/115 (98%)	110 (97%)	3 (3%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	L	120/122 (98%)	111 (92%)	9 (8%)	0	100	100
18	M	114/116 (98%)	107 (94%)	7 (6%)	0	100	100
19	N	58/60 (97%)	50 (86%)	8 (14%)	0	100	100
20	O	86/88 (98%)	85 (99%)	1 (1%)	0	100	100
21	P	111/113 (98%)	103 (93%)	8 (7%)	0	100	100
22	Q	92/94 (98%)	87 (95%)	5 (5%)	0	100	100
23	R	63/65 (97%)	61 (97%)	2 (3%)	0	100	100
24	S	80/82 (98%)	77 (96%)	3 (4%)	0	100	100
25	T	83/85 (98%)	81 (98%)	2 (2%)	0	100	100
26	U	95/97 (98%)	92 (97%)	3 (3%)	0	100	100
27	V	226/228 (99%)	215 (95%)	10 (4%)	1 (0%)	30	68
28	W	190/192 (99%)	183 (96%)	7 (4%)	0	100	100
29	X	77/79 (98%)	71 (92%)	6 (8%)	0	100	100
30	Y	61/63 (97%)	59 (97%)	2 (3%)	0	100	100
31	Z	62/64 (97%)	61 (98%)	1 (2%)	0	100	100
32	a	57/59 (97%)	56 (98%)	1 (2%)	0	100	100
33	b	52/54 (96%)	50 (96%)	2 (4%)	0	100	100
34	c	47/49 (96%)	45 (96%)	1 (2%)	1 (2%)	5	30
35	d	44/46 (96%)	44 (100%)	0	0	100	100
36	e	61/63 (97%)	60 (98%)	1 (2%)	0	100	100
37	f	35/37 (95%)	34 (97%)	1 (3%)	0	100	100
38	g	46/48 (96%)	43 (94%)	3 (6%)	0	100	100
39	i	273/275 (99%)	261 (96%)	12 (4%)	0	100	100
40	j	212/214 (99%)	200 (94%)	12 (6%)	0	100	100
41	k	207/209 (99%)	201 (97%)	6 (3%)	0	100	100
42	l	180/182 (99%)	170 (94%)	10 (6%)	0	100	100
43	m	174/176 (99%)	169 (97%)	5 (3%)	0	100	100
44	n	149/151 (99%)	138 (93%)	11 (7%)	0	100	100
45	o	124/126 (98%)	118 (95%)	6 (5%)	0	100	100
46	p	131/133 (98%)	123 (94%)	6 (5%)	2 (2%)	8	39
47	q	144/146 (99%)	141 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	r	120/122 (98%)	117 (98%)	3 (2%)	0	100	100
49	s	143/145 (99%)	126 (88%)	17 (12%)	0	100	100
50	t	134/136 (98%)	126 (94%)	8 (6%)	0	100	100
51	u	116/118 (98%)	114 (98%)	2 (2%)	0	100	100
52	v	124/126 (98%)	123 (99%)	1 (1%)	0	100	100
53	w	111/113 (98%)	105 (95%)	6 (5%)	0	100	100
54	x	122/124 (98%)	120 (98%)	2 (2%)	0	100	100
55	y	98/100 (98%)	94 (96%)	4 (4%)	0	100	100
56	z	112/114 (98%)	111 (99%)	1 (1%)	0	100	100
57	1	93/105 (89%)	92 (99%)	1 (1%)	0	100	100
All	All	6714/6830 (98%)	6408 (95%)	298 (4%)	8 (0%)	50	83

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	5	99	SER
34	c	7	VAL
27	V	155	GLN
5	7	677	ASP
15	J	57	LYS

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	
2	3	18/18 (100%)	18 (100%)	0	100	100
4	5	53/53 (100%)	53 (100%)	0	100	100
5	7	564/564 (100%)	557 (99%)	7 (1%)	67	79
8	C	170/170 (100%)	169 (99%)	1 (1%)	84	88
9	D	175/175 (100%)	174 (99%)	1 (1%)	84	88
10	E	127/127 (100%)	125 (98%)	2 (2%)	58	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
11	F	85/85 (100%)	82 (96%)	3 (4%)	31 52
12	G	131/131 (100%)	130 (99%)	1 (1%)	79 85
13	H	107/107 (100%)	107 (100%)	0	100 100
14	I	102/102 (100%)	100 (98%)	2 (2%)	50 69
15	J	89/89 (100%)	87 (98%)	2 (2%)	47 66
16	K	89/89 (100%)	87 (98%)	2 (2%)	47 66
17	L	103/103 (100%)	103 (100%)	0	100 100
18	M	99/99 (100%)	99 (100%)	0	100 100
19	N	49/49 (100%)	49 (100%)	0	100 100
20	O	76/76 (100%)	76 (100%)	0	100 100
21	P	92/92 (100%)	92 (100%)	0	100 100
22	Q	80/80 (100%)	80 (100%)	0	100 100
23	R	55/55 (100%)	54 (98%)	1 (2%)	54 71
24	S	73/73 (100%)	70 (96%)	3 (4%)	26 48
25	T	69/69 (100%)	67 (97%)	2 (3%)	37 58
26	U	83/83 (100%)	82 (99%)	1 (1%)	67 79
27	V	191/191 (100%)	190 (100%)	1 (0%)	86 90
28	W	155/155 (100%)	155 (100%)	0	100 100
29	X	58/58 (100%)	58 (100%)	0	100 100
30	Y	50/50 (100%)	50 (100%)	0	100 100
31	Z	58/58 (100%)	58 (100%)	0	100 100
32	a	52/52 (100%)	51 (98%)	1 (2%)	52 70
33	b	43/43 (100%)	43 (100%)	0	100 100
34	c	47/47 (100%)	47 (100%)	0	100 100
35	d	35/35 (100%)	35 (100%)	0	100 100
36	e	53/53 (100%)	53 (100%)	0	100 100
37	f	35/35 (100%)	35 (100%)	0	100 100
38	g	43/43 (100%)	43 (100%)	0	100 100
39	i	215/215 (100%)	213 (99%)	2 (1%)	75 83
40	j	160/160 (100%)	156 (98%)	4 (2%)	42 62
41	k	169/169 (100%)	168 (99%)	1 (1%)	84 88

Continued on next page...

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
42	l	151/151 (100%)	148 (98%)	3 (2%)	50 69
43	m	148/148 (100%)	148 (100%)	0	100 100
44	n	90/116 (78%)	90 (100%)	0	100 100
45	o	89/89 (100%)	89 (100%)	0	100 100
46	p	102/102 (100%)	102 (100%)	0	100 100
47	q	119/119 (100%)	116 (98%)	3 (2%)	42 62
48	r	100/100 (100%)	99 (99%)	1 (1%)	73 82
49	s	112/112 (100%)	112 (100%)	0	100 100
50	t	114/114 (100%)	112 (98%)	2 (2%)	54 71
51	u	97/97 (100%)	97 (100%)	0	100 100
52	v	93/93 (100%)	92 (99%)	1 (1%)	70 80
53	w	100/100 (100%)	100 (100%)	0	100 100
54	x	97/97 (100%)	97 (100%)	0	100 100
55	y	81/81 (100%)	79 (98%)	2 (2%)	42 62
56	z	90/90 (100%)	90 (100%)	0	100 100
57	1	81/86 (94%)	81 (100%)	0	100 100
All	All	5517/5548 (99%)	5468 (99%)	49 (1%)	74 83

5 of 49 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
27	V	41	ILE
40	j	205	LEU
32	a	58	GLU
40	j	104	GLU
42	l	107	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 33 such sidechains are listed below:

Mol	Chain	Res	Type
47	q	58	ASN
49	s	69	ASN
52	v	16	ASN
27	V	45	GLN
24	S	29	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	75/76 (98%)	16 (21%)	0
3	4	17/18 (94%)	4 (23%)	1 (5%)
58	h	3069/3127 (98%)	563 (18%)	0
6	A	1510/1511 (99%)	299 (19%)	11 (0%)
7	B	117/118 (99%)	17 (14%)	1 (0%)
All	All	4788/4850 (98%)	899 (18%)	13 (0%)

5 of 899 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	16	U
1	2	17	C
1	2	19	G
1	2	20	U
1	2	21	A

5 of 13 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	A	1007	U
6	A	1117	U
7	B	10	G
6	A	1477	A
6	A	1482	U

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 20 ligands modelled in this entry, 18 are monoatomic - leaving 2 for Mogul analysis.

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	$\#\|Z\| > 2$
60	GNP	7	801	-	29,34,34	1.61	7 (24%)	33,54,54	2.11	6 (18%)
59	PHE	2	101	-	10,11,12	0.38	0	10,13,15	0.19	0

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
60	GNP	7	801	-	-	5/14/38/38	0/3/3/3
59	PHE	2	101	-	-	1/5/6/8	0/1/1/1

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
60	7	801	GNP	PB-O3A	4.31	1.64	1.59
60	7	801	GNP	C6-N1	3.15	1.38	1.33
60	7	801	GNP	PG-N3B	3.02	1.71	1.63
60	7	801	GNP	PB-O1B	3.00	1.50	1.46
60	7	801	GNP	PG-O1G	2.75	1.50	1.46

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
60	7	801	GNP	C5-C6-N1	-8.41	111.92	123.43
60	7	801	GNP	C2-N1-C6	5.79	125.14	115.93
60	7	801	GNP	PB-O3A-PA	-2.80	122.74	132.62
60	7	801	GNP	N3-C2-N1	-2.70	123.62	127.22
60	7	801	GNP	C4-C5-C6	-2.55	118.36	120.80

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
59	2	101	PHE	O-C-CA-CB

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Mol	Chain	Res	Type	Atoms
60	7	801	GNP	PG-N3B-PB-O1B
60	7	801	GNP	O4'-C4'-C5'-O5'
60	7	801	GNP	C3'-C4'-C5'-O5'
60	7	801	GNP	C4'-C5'-O5'-PA

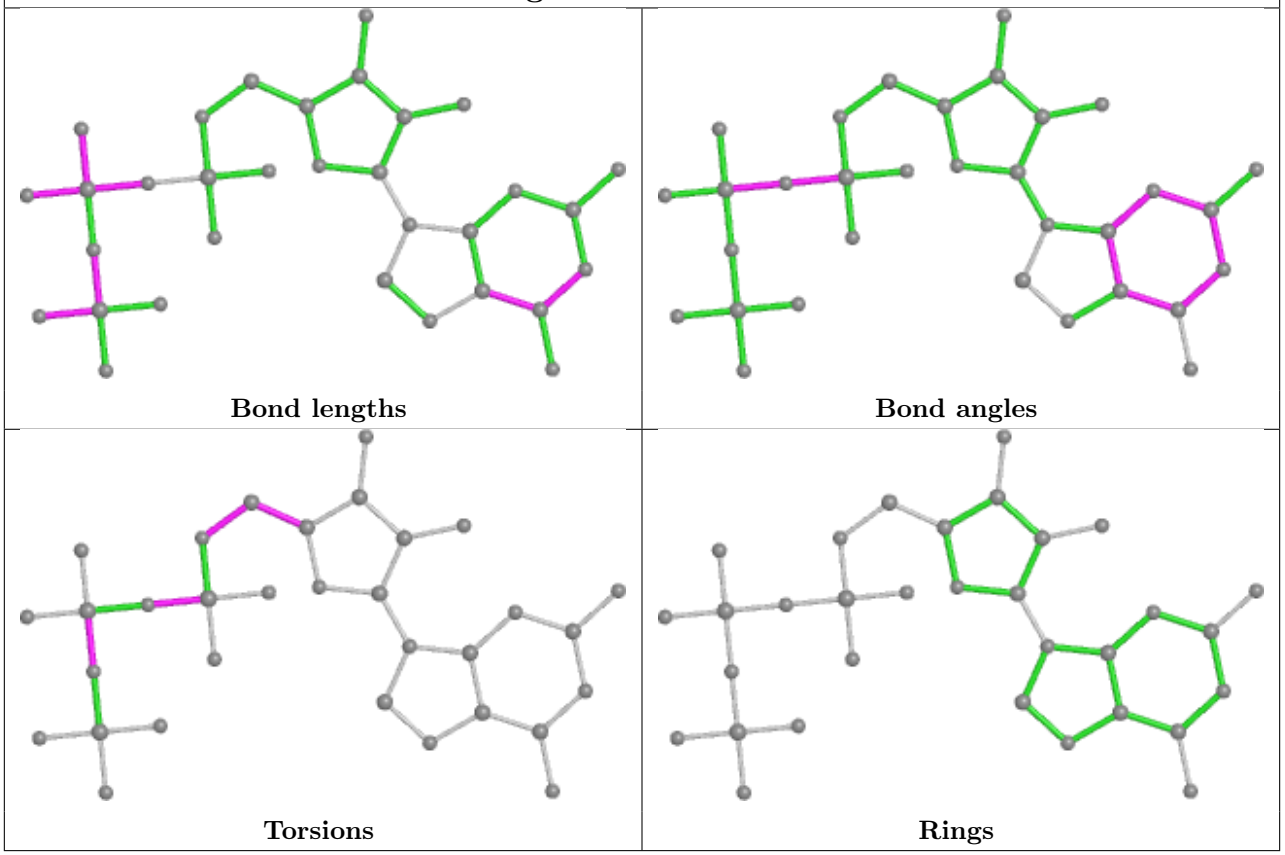
There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
60	7	801	GNP	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GNP 7 801



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.

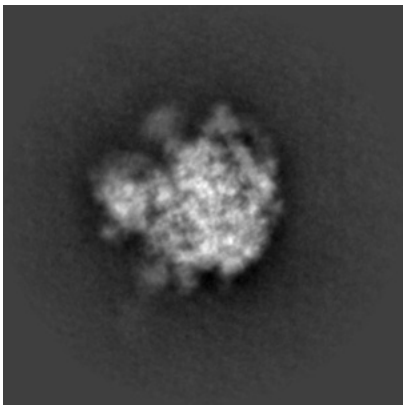
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-61959. These allow visual inspection of the internal detail of the map and identification of artifacts.

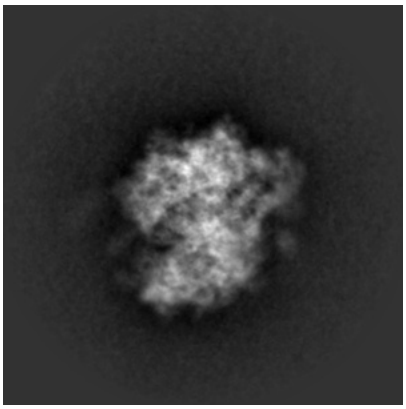
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

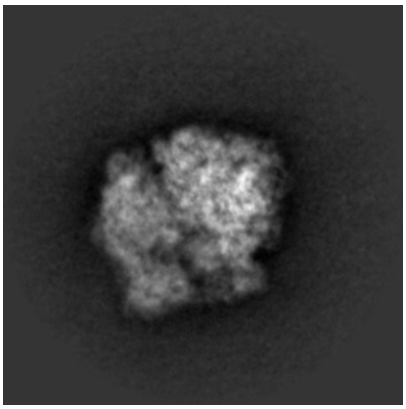
6.1.1 Primary map



X

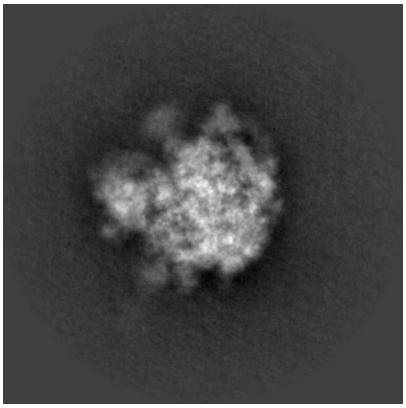


Y

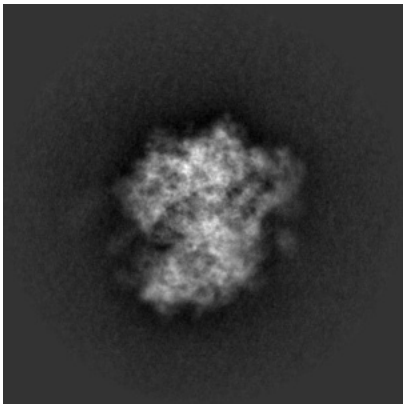


Z

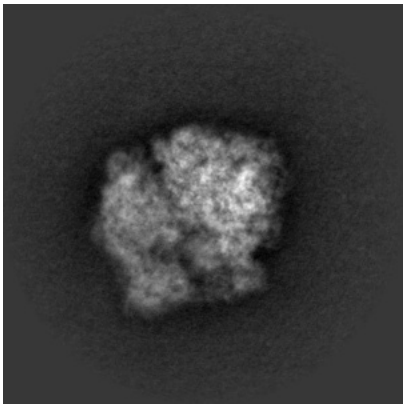
6.1.2 Raw map



X



Y

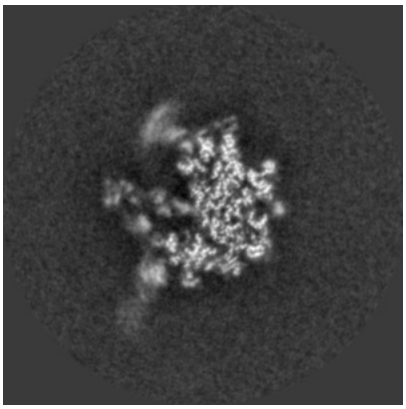


Z

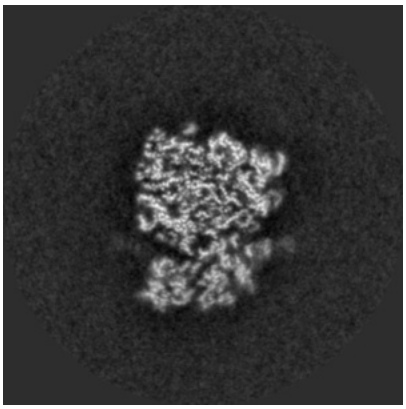
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

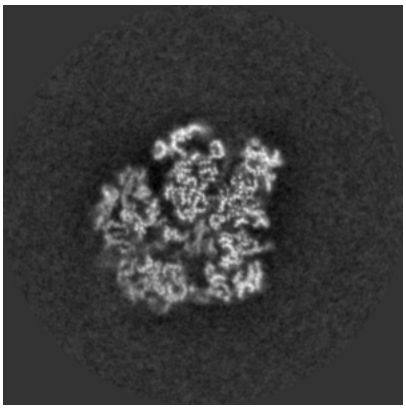
6.2.1 Primary map



X Index: 175

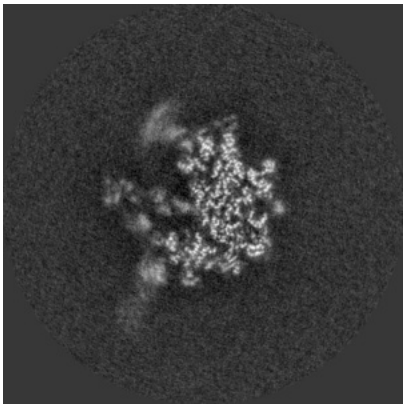


Y Index: 175

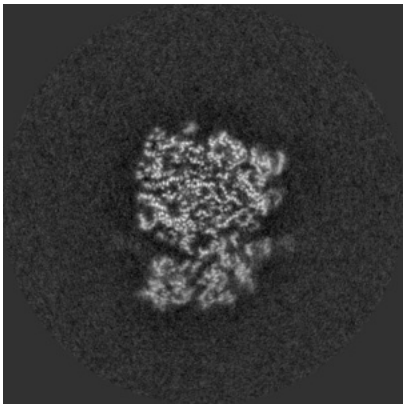


Z Index: 175

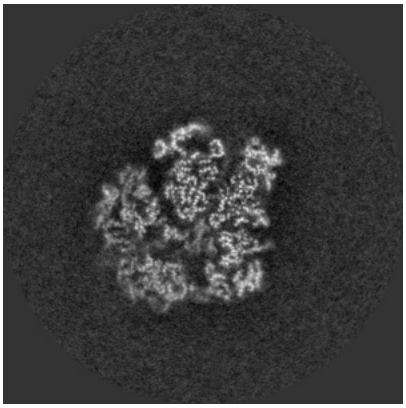
6.2.2 Raw map



X Index: 175



Y Index: 175

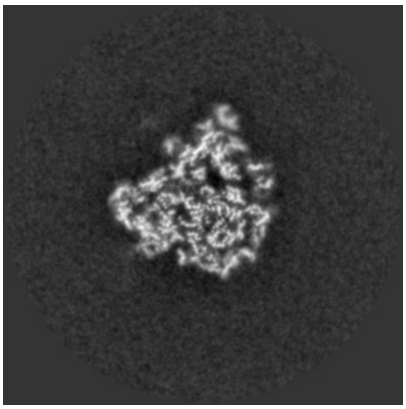


Z Index: 175

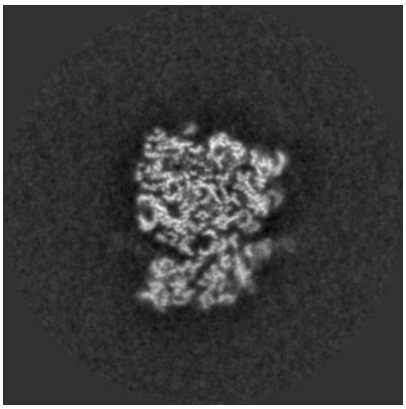
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

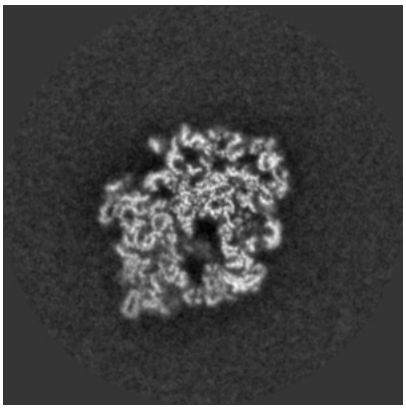
6.3.1 Primary map



X Index: 210

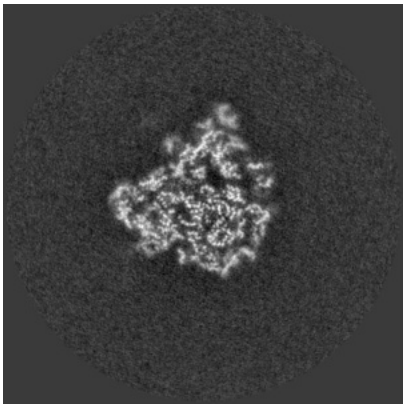


Y Index: 176

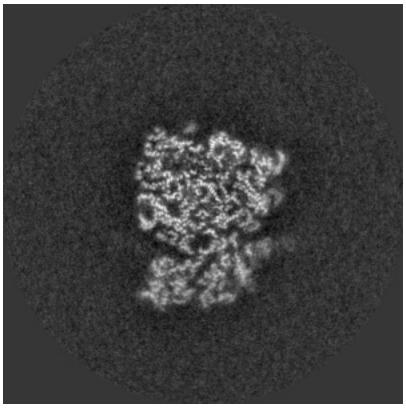


Z Index: 188

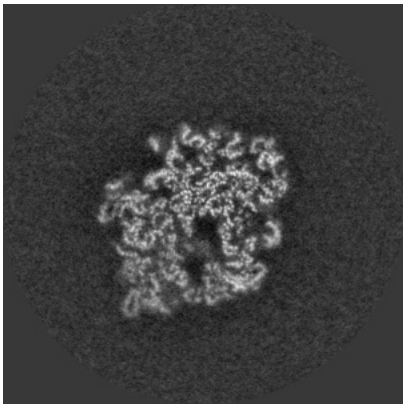
6.3.2 Raw map



X Index: 210



Y Index: 176

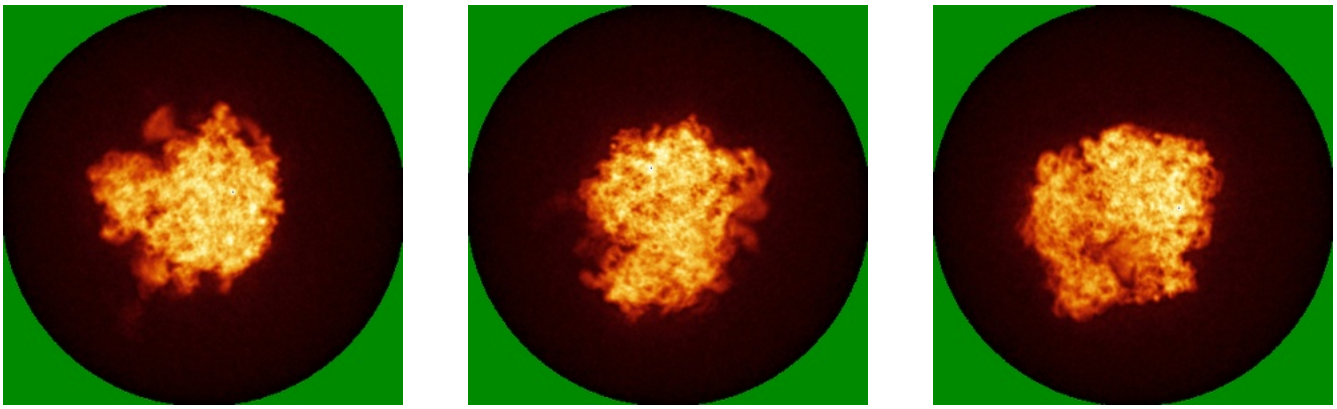


Z Index: 187

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

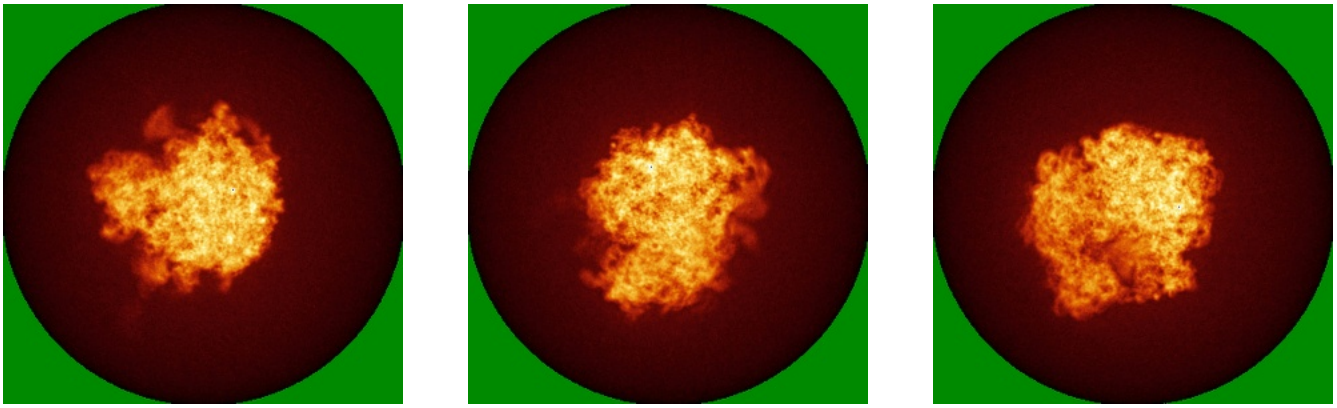
6.4 Orthogonal standard-deviation projections (False-color) (i)

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.

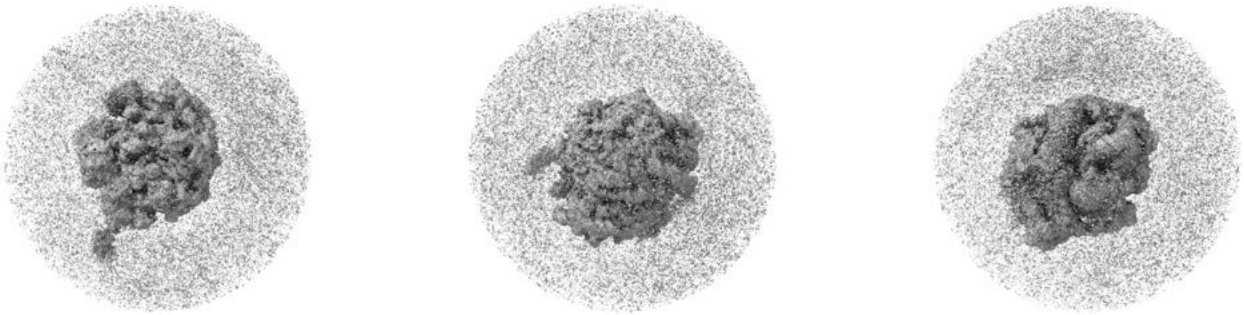
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.00715. 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.

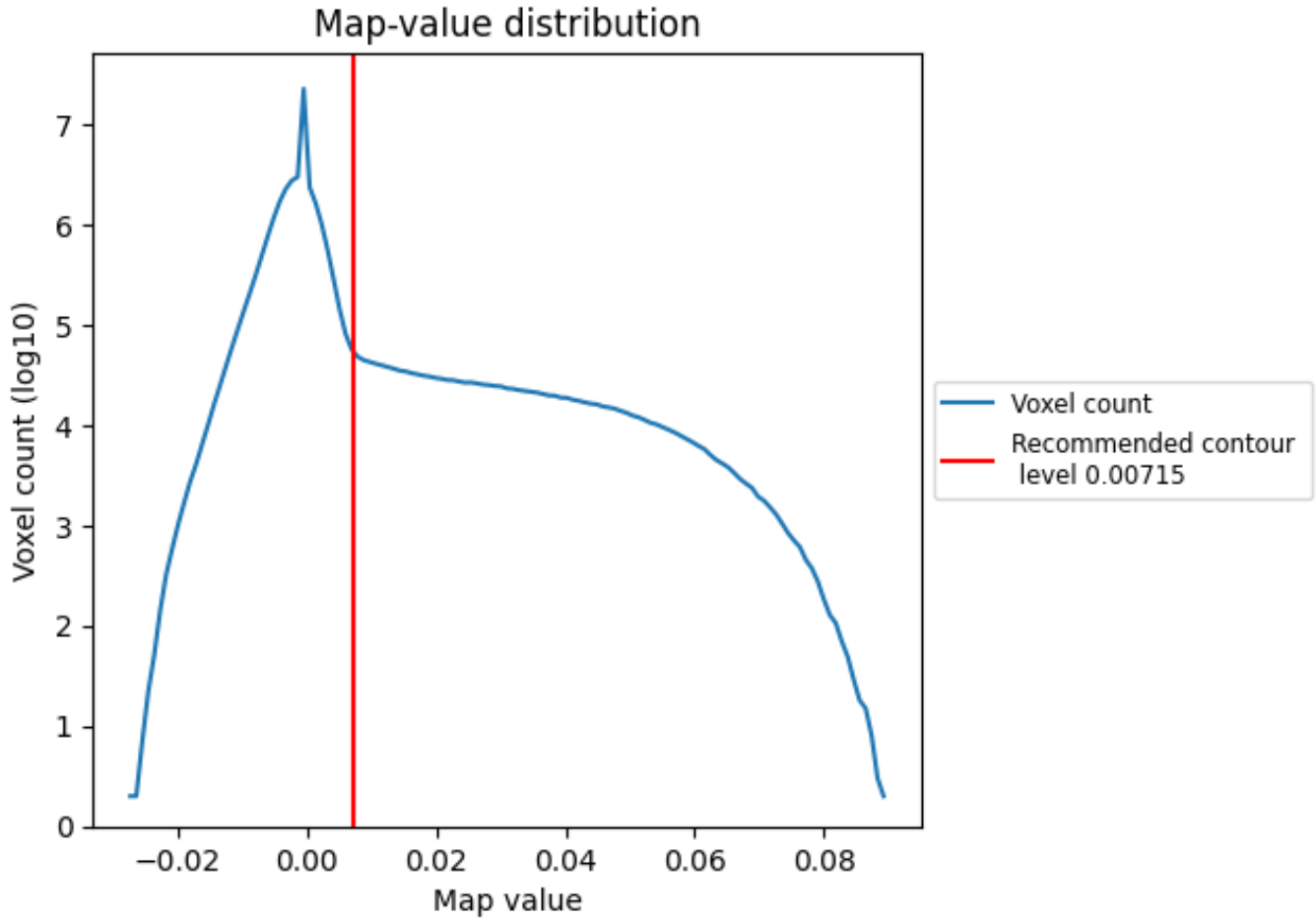
6.6 Mask visualisation (i)

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

7 Map analysis

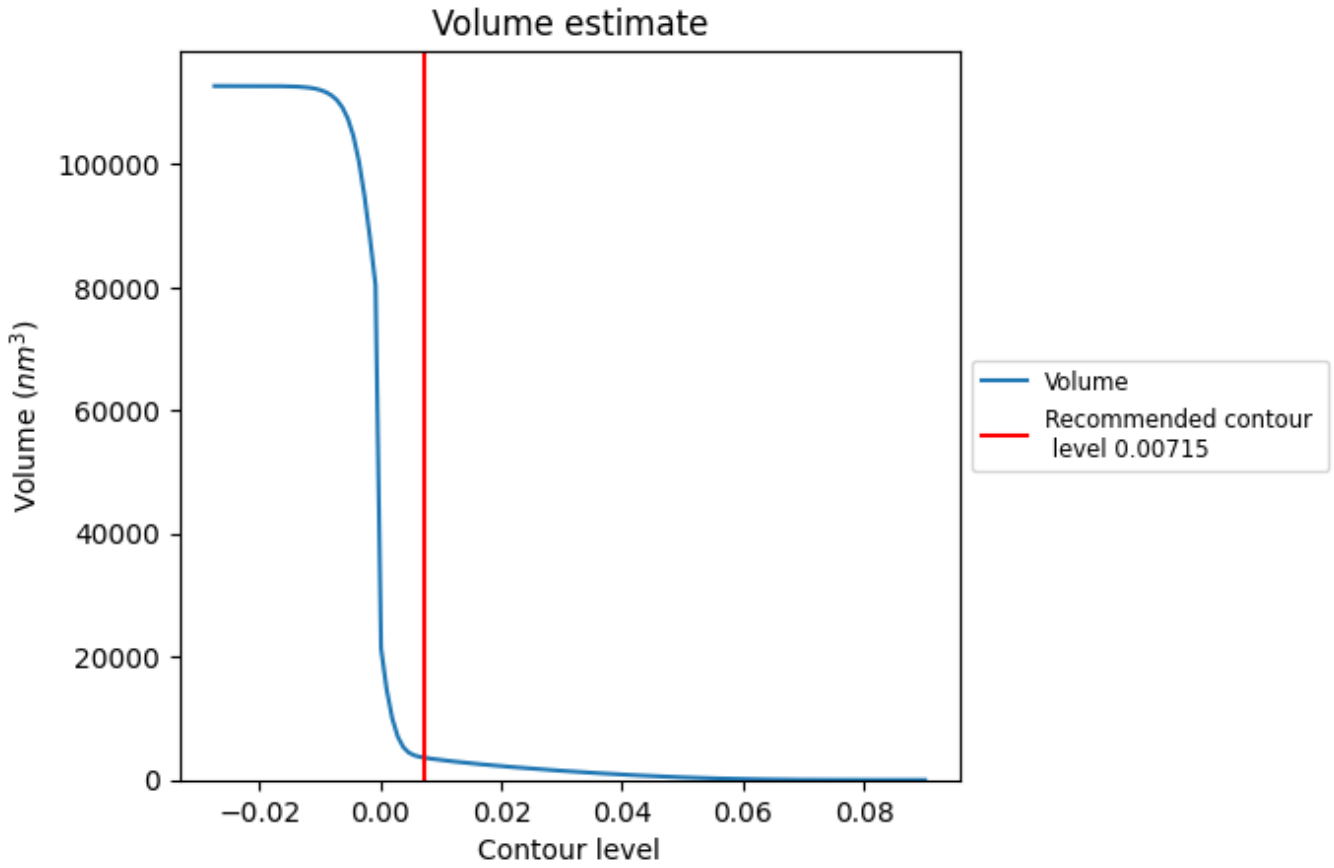
This section contains the results of statistical analysis of the map.

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.

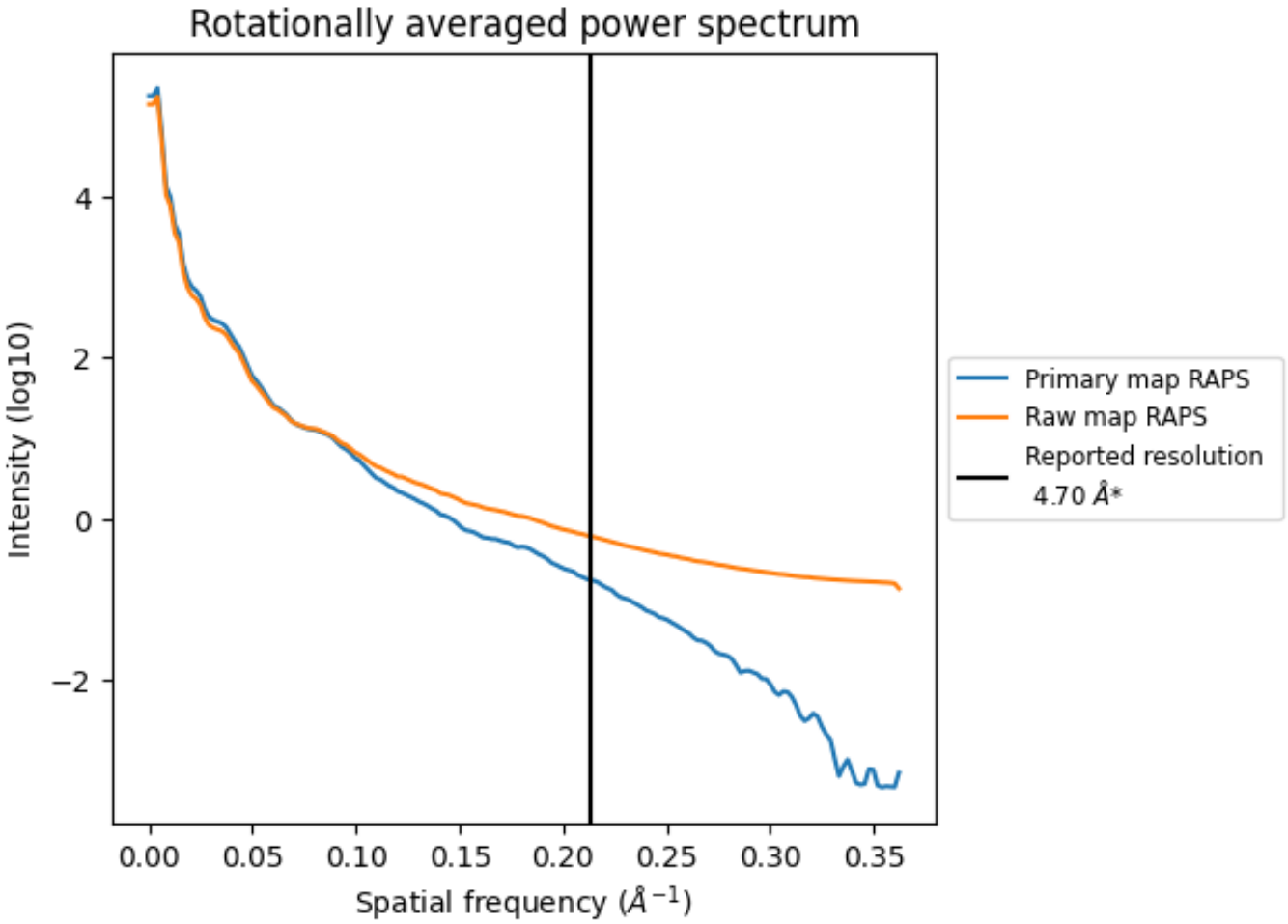
7.2 Volume estimate (i)



The volume at the recommended contour level is 3647 nm^3; this corresponds to an approximate mass of 3295 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)

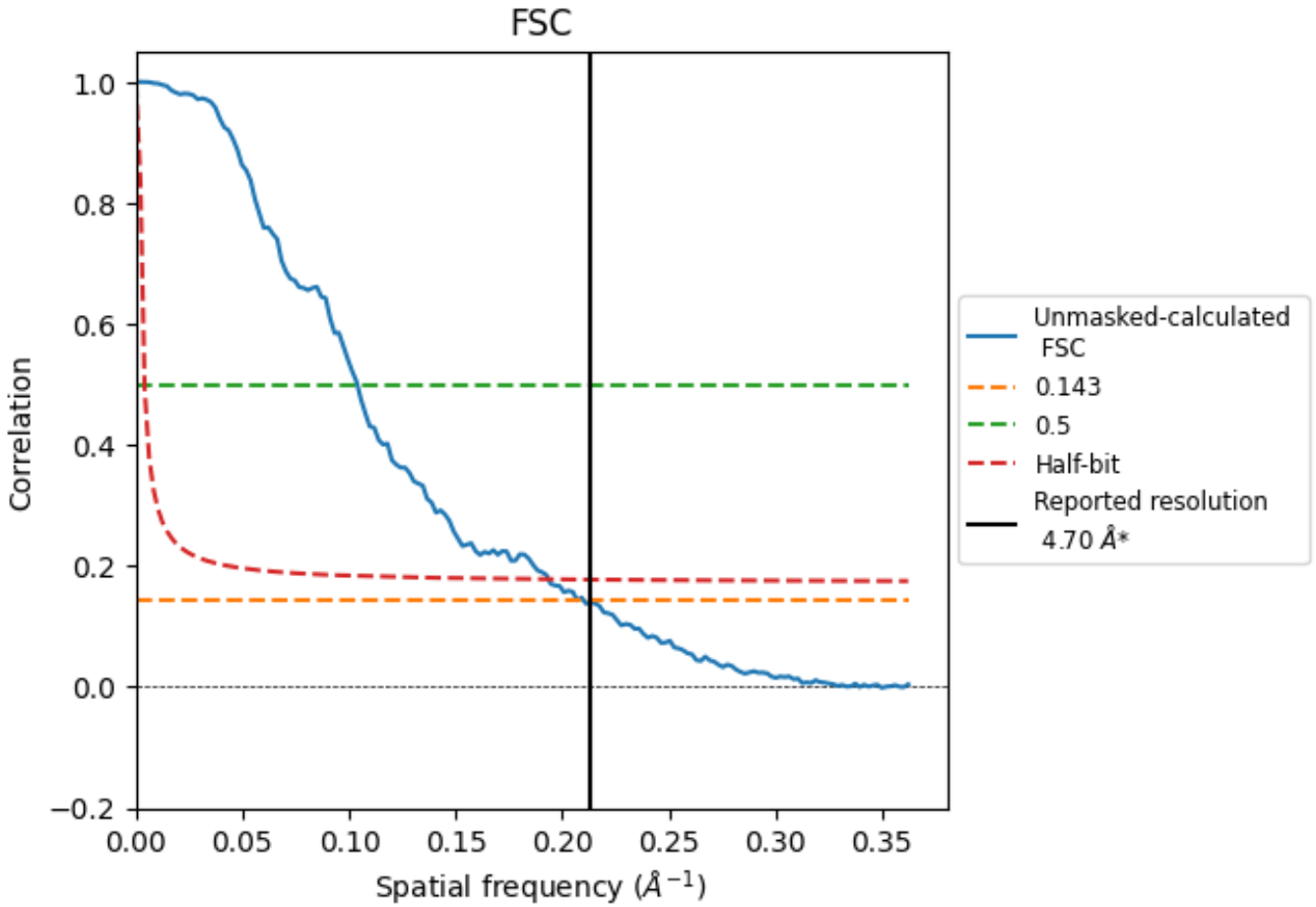


*Reported resolution corresponds to spatial frequency of 0.213 Å^{-1}

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 0.213 Å^{-1}

8.2 Resolution estimates (i)

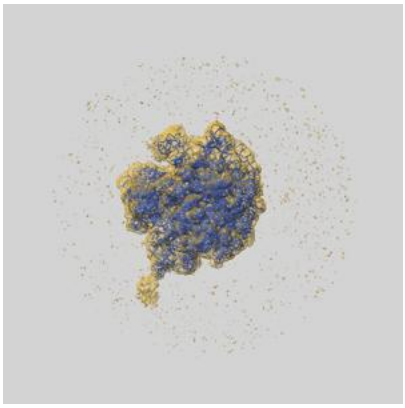
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.83	9.63	5.17

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

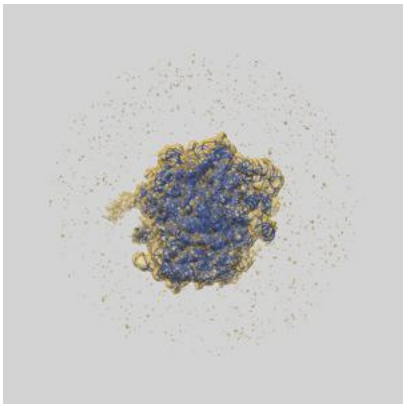
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-61959 and PDB model 9K0Z. Per-residue inclusion information can be found in section 3 on page 17.

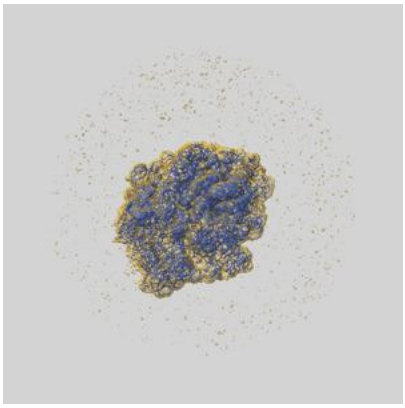
9.1 Map-model overlay



X



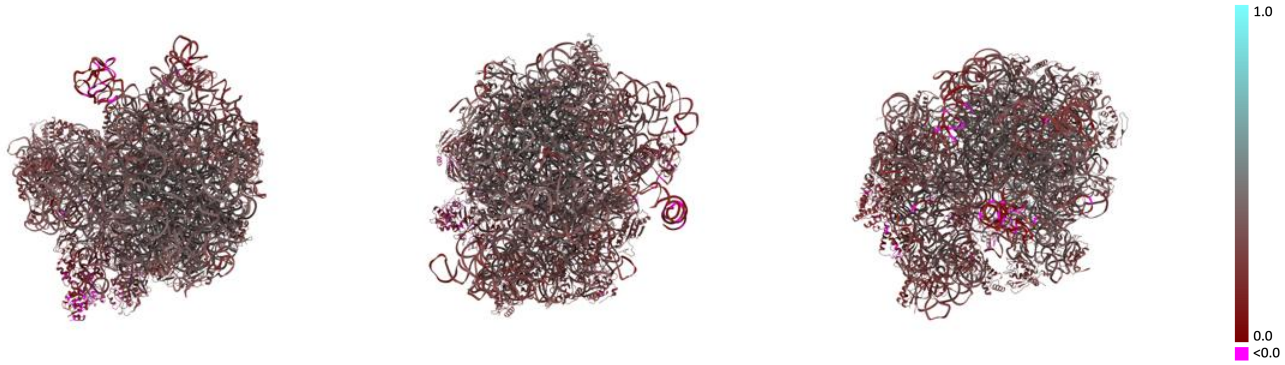
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.00715 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.

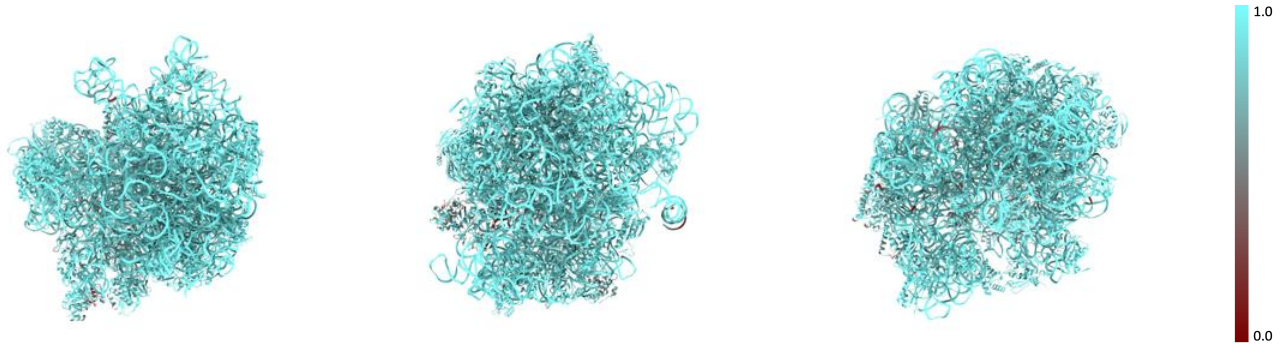
9.2 Q-score mapped to coordinate model (i)



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.

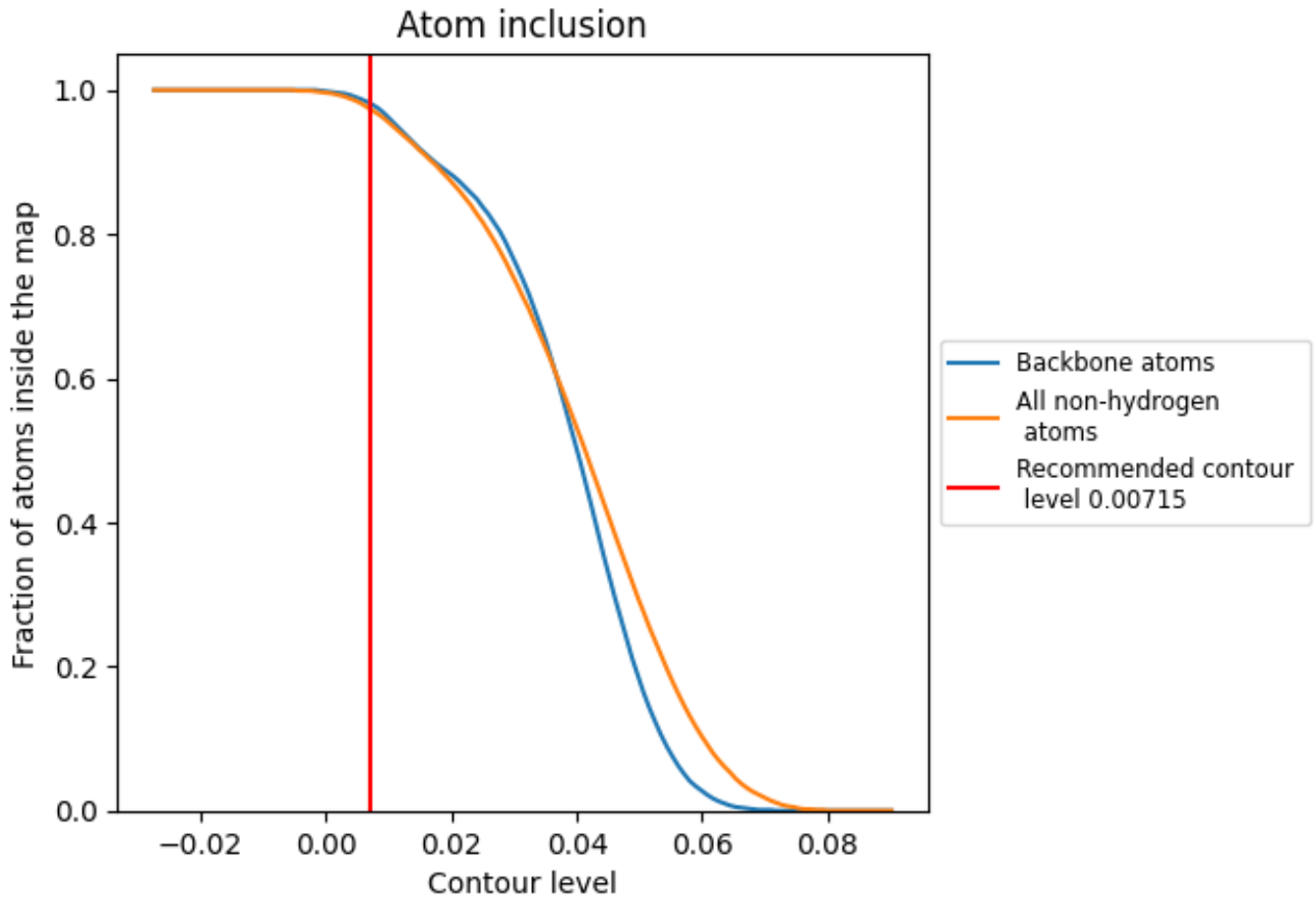
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.00715).

9.4 Atom inclusion (i)



At the recommended contour level, 98% of all backbone atoms, 97% 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 (0.00715) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9730	0.3180
1	0.9880	0.2940
2	0.9910	0.3160
3	0.9940	0.3320
4	0.9180	0.1900
5	0.3080	0.0730
7	0.6530	0.1680
A	0.9990	0.3140
B	0.9990	0.3430
C	0.9790	0.2540
D	0.9850	0.2430
E	0.9570	0.2700
F	0.9550	0.2750
G	0.9780	0.2500
H	0.9920	0.2790
I	0.9970	0.2400
J	0.9920	0.2580
K	0.9920	0.2920
L	0.9580	0.2980
M	0.9930	0.2600
N	0.9890	0.2880
O	0.9630	0.2720
P	0.9700	0.2650
Q	0.9630	0.2720
R	0.9960	0.2770
S	0.9880	0.2570
T	0.9560	0.2300
U	0.9850	0.3260
V	0.7190	0.1700
W	0.8560	0.2780
X	0.9980	0.3770
Y	0.9910	0.3660
Z	0.9960	0.2740
a	0.9870	0.3390
b	0.9880	0.3750

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Chain	Atom inclusion	Q-score
c	0.9620	0.3280
d	0.9860	0.3590
e	0.8790	0.2660
f	0.9970	0.3430
g	0.9970	0.2760
h	0.9960	0.3540
i	0.9760	0.3580
j	0.9940	0.3700
k	0.9860	0.3490
l	0.9890	0.2730
m	0.9860	0.2940
n	0.9410	0.2660
o	0.9000	0.0890
p	0.9690	0.1050
q	0.9870	0.3570
r	0.9770	0.3520
s	0.9950	0.3370
t	0.9860	0.3660
u	0.9890	0.3480
v	0.9960	0.3020
w	0.9770	0.3520
x	0.9920	0.3360
y	0.9950	0.3840
z	0.9880	0.3700