



wwPDB EM Validation Summary Report ⓘ

Mar 21, 2022 – 07:41 pm GMT

PDB ID : 7QG8
EMDB ID : EMD-13952
Title : Structure of the collided E. coli disome - VemP-stalled 70S ribosome
Authors : Kratzat, H.; Buschauer, R.; Berninghausen, O.; Beckmann, R.
Deposited on : 2021-12-07
Resolution : 3.97 Å(reported)

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

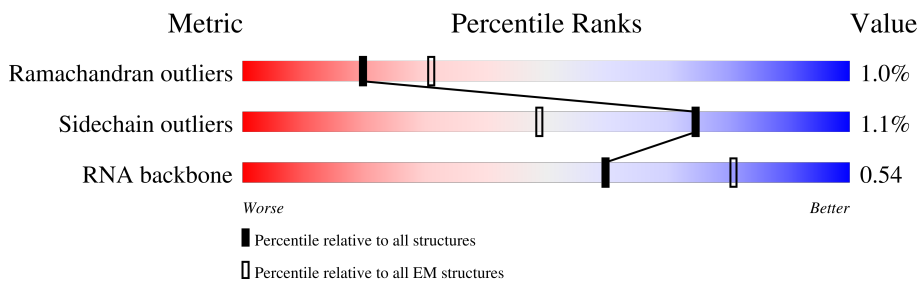
EMDB validation analysis : 0.0.0.dev97
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.27

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 3.97 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	A	73	
2	s	179	
3	M	75	
4	O	120	
5	P	273	
6	Q	209	
7	R	201	
8	S	179	






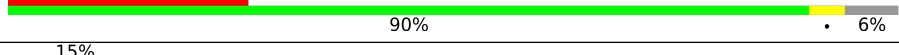
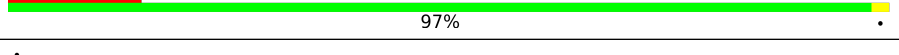


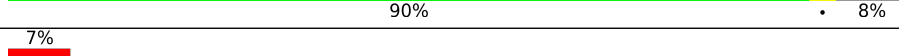
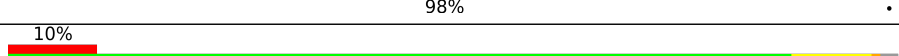
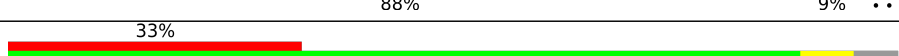

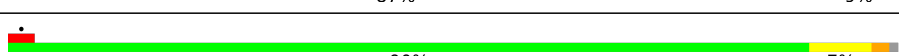
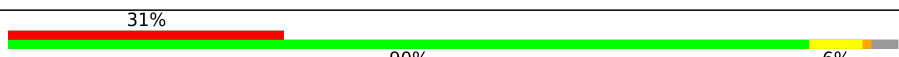
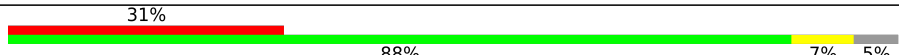
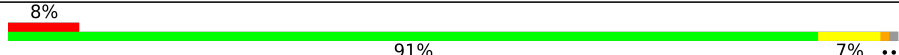
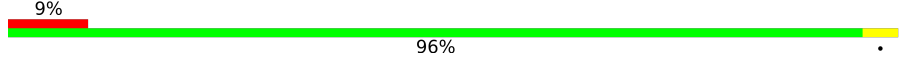



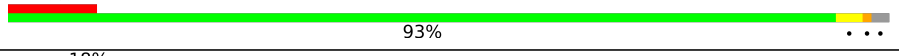
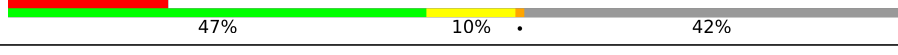

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Mol	Chain	Length	Quality of chain
9	T	177	6% 98% ..
10	U	149	55% 93% 7% .
11	V	142	39% 98% ..
12	W	142	. 95% 5%
13	X	123	41% 95% ..
14	Y	144	12% 89% 8% ..
15	Z	136	. 90% 9% .
16	a	127	. 83% 10% 6%
17	b	117	. 94% 5% .
18	c	115	17% 91% 6% ..
19	d	118	. 88% 10% ..
20	e	103	17% 95% ..
21	f	110	. 97% .
22	g	100	8% 90% . 7%
23	h	104	7% 94% ...
24	i	94	7% 100%
25	j	85	. 85% .. 12%
26	k	78	8% 91% 8% .
27	l	63	29% 94% 6%
28	m	59	5% 95% ..
29	n	57	5% 82% 16% .
30	o	55	5% 85% 5% 9%
31	p	46	. 89% 11%
32	q	65	. 88% 9% ..
33	r	55	. 60% 9% 31%

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Mol	Chain	Length	Quality of chain
34	N	2903	
35	L	70	
36	C	223	
37	0	1539	
38	1	239	
39	2	218	
40	3	206	
41	4	162	
42	5	131	
43	6	156	
44	7	130	
45	8	130	
46	9	103	
47	D	129	
48	E	124	
49	F	118	
50	G	101	
51	H	89	
52	I	82	
53	J	84	
54	K	75	
55	t	92	
56	u	87	
57	v	88	

2 Entry composition

There are 60 unique types of molecules in this entry. The entry contains 147108 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 A-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	73	1561	695	279	514	73	0	0

- Molecule 2 is a protein called VemP nascent chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	s	37	316	198	58	58	2	0	0

- Molecule 3 is a RNA chain called P-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	M	75	1594	711	281	527	75	0	0

- Molecule 4 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	O	118	2529	1126	464	821	118	0	0

- Molecule 5 is a protein called 50S ribosomal protein L2.

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

- Molecule 6 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	Q	209	1564	979	288	293	4	0	0

- Molecule 7 is a protein called 50S ribosomal protein L4.

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

- Molecule 8 is a protein called 50S ribosomal protein L5.

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

- Molecule 9 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	T	176	1322	832	243	245	2	0	0

- Molecule 10 is a protein called 50S ribosomal protein L9.

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

- Molecule 11 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	V	141	1031	651	179	195	6	0	0

- Molecule 12 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	W	142	1128	714	212	198	4	0	0

- Molecule 13 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	X	122	938	587	180	165	6	0	0

- Molecule 14 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	Y	143	1044	649	206	188	1	0	0

- Molecule 15 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	Z	136	1073	686	205	176	6	0	0

- Molecule 16 is a protein called 50S ribosomal protein L17.

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

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	123	ALA	GLU	variant	UNP P0AG44

- Molecule 17 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
17	b	116	891	552	178	161	0	0

- Molecule 18 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	c	114	915	573	179	162	1	0	0

- Molecule 19 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
19	d	117	946	604	192	150	0	0

- Molecule 20 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	e	103	815	516	153	144	2	0	0

- Molecule 21 is a protein called 50S ribosomal protein L22.

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

- Molecule 22 is a protein called 50S ribosomal protein L23.

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

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
g	98	SER	GLY	variant	UNP P0ADZ0

- Molecule 23 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
23	h	102	779	492	146	141	0	0

- Molecule 24 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	i	94	752	479	137	133	3	0	0

- Molecule 25 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	j	75	568	353	113	101	1	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
j	3	UNK	HIS	variant	UNP P0A7L8

- Molecule 26 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	k	77	624	388	129	105	2	0	0

- Molecule 27 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	l	63	508	313	99	94	2	0	0

- Molecule 28 is a protein called 50S ribosomal protein L30.

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

- Molecule 29 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	n	56	443	269	94	79	1	0	0

- Molecule 30 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	o	50	409	263	75	71	0	0

- Molecule 31 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	p	46	376	228	90	56	2	0	0

- Molecule 32 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	q	64	503	323	105	73	2	0	0

- Molecule 33 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	r	38	Total	C	N	O	S	0	0
			301	185	65	47	4		

- Molecule 34 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	N	2897	Total	C	N	O	P	1	0
			62215	27754	11448	20115	2898		

- Molecule 35 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	L	55	Total	C	N	O	S	0	0
			419	258	76	79	6		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	68	SER	GLY	variant	UNP P0A7M9

- Molecule 36 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	C	134	Total	C	N	O	S	0	0
			1027	645	186	194	2		

- Molecule 37 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	0	1532	Total	C	N	O	P	0	0
			32873	14661	6031	10649	1532		

- Molecule 38 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	1	218	Total	C	N	O	S	0	0
			1704	1081	305	311	7		

- Molecule 39 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	2	206	1624	1028	305	288	3	0	0

- Molecule 40 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	3	205	1642	1026	315	297	4	0	0

- Molecule 41 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	4	150	1105	687	211	201	6	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
4	4	MET	ILE	variant	UNP P0A7W1

- Molecule 42 is a protein called 30S ribosomal protein S6, non-modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	5	100	817	515	148	148	6	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
5	101	SER	PRO	variant	UNP P02358

- Molecule 43 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	6	144	1129	705	213	207	4	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
6	78	HIS	ARG	variant	UNP P02359

- Molecule 44 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	7	129	978	616	173	183	6	0	0

- Molecule 45 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	8	127	1021	634	206	178	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
8	3	ASP	GLU	variant	UNP P0A7X3

- Molecule 46 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	9	98	786	493	150	142	1	0	0

- Molecule 47 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	D	117	876	540	174	159	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	5	ALA	PRO	variant	UNP P0A7R9

- Molecule 48 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	E	123	954	590	196	164	4	0	0

- Molecule 49 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	F	114	883	546	178	156	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	1	VAL	MET	variant	UNP P0A7S9

- Molecule 50 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	G	96	773	483	160	127	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	40	ALA	ASP	variant	UNP P0AG59

- Molecule 51 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	H	88	709	437	143	128	1	0	0

- Molecule 52 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	I	82	648	406	128	113	1	0	0

- Molecule 53 is a protein called 30S ribosomal protein S17.

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

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
J	2	ALA	THR	variant	UNP P0AG63

- Molecule 54 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
54	K	55	455	288	86	81	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	15	THR	ALA	variant	UNP P0A7T7
K	19	VAL	GLN	variant	UNP P0A7T7

- Molecule 55 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	t	79	637	408	120	107	2	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
t	82	TYR	GLY	variant	UNP P0A7U3
t	83	TYR	HIS	variant	UNP P0A7U3

- Molecule 56 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	u	85	664	411	137	113	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
u	1	LEU	MET	variant	UNP P0A7U7

- Molecule 57 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	v	51	421	263	86	71	1	0	0

- Molecule 58 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
58	A	2	Total 2	Mg 2	0

- Molecule 59 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		AltConf
59	A	1	Total 1	K 1	0

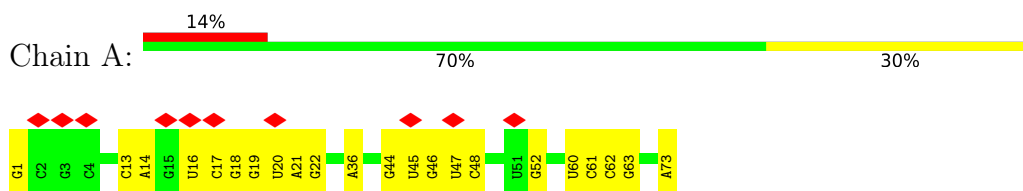
- Molecule 60 is water.

Mol	Chain	Residues	Atoms		AltConf
60	A	9	Total 9	O 9	0

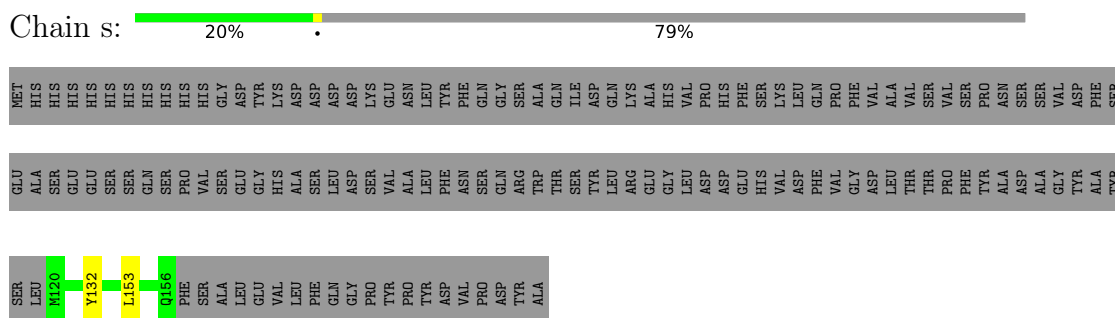
3 Residue-property plots [i](#)

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.

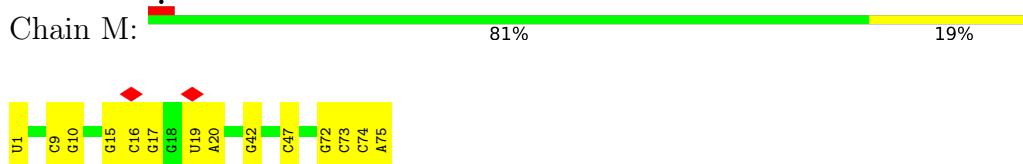
- Molecule 1: A-site tRNA



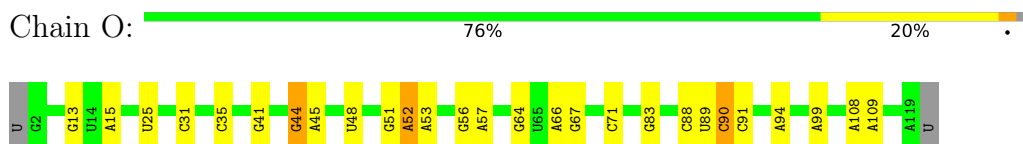
- Molecule 2: VemP nascent chain



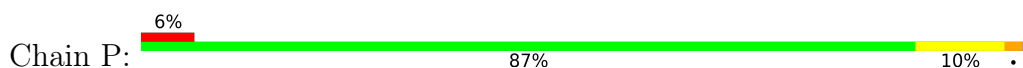
- Molecule 3: P-site tRNA

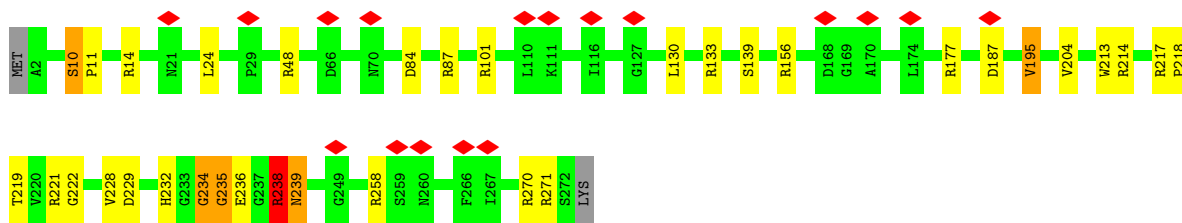


- Molecule 4: 5S rRNA

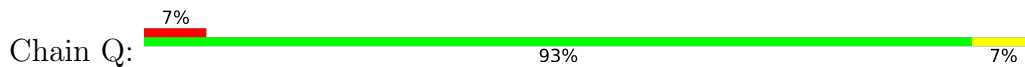


- Molecule 5: 50S ribosomal protein L2

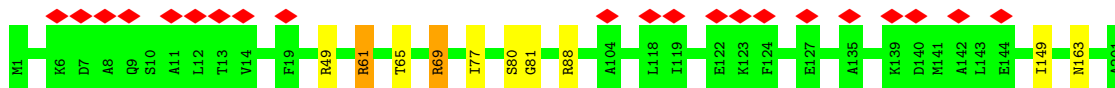




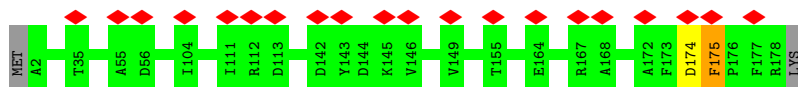
- Molecule 6: 50S ribosomal protein L3



- Molecule 7: 50S ribosomal protein L4



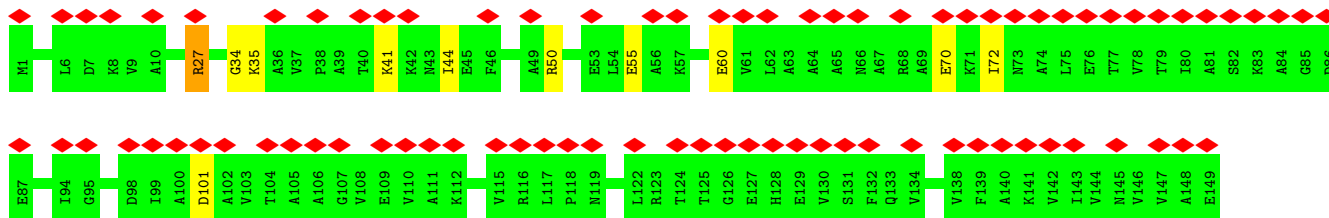
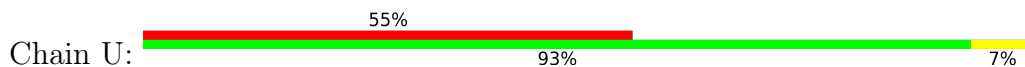
- Molecule 8: 50S ribosomal protein L5



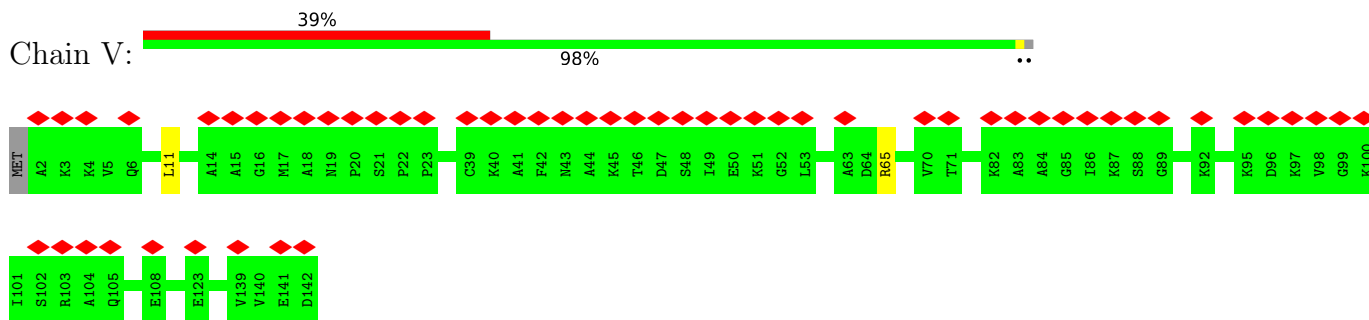
- Molecule 9: 50S ribosomal protein L6



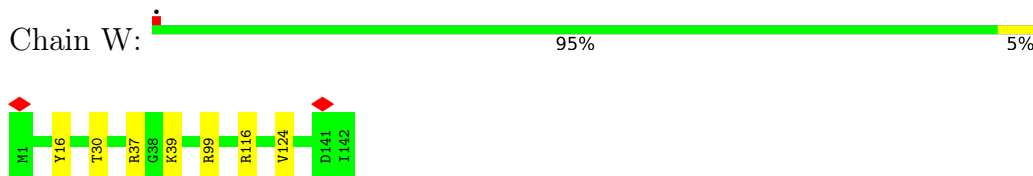
- Molecule 10: 50S ribosomal protein L9



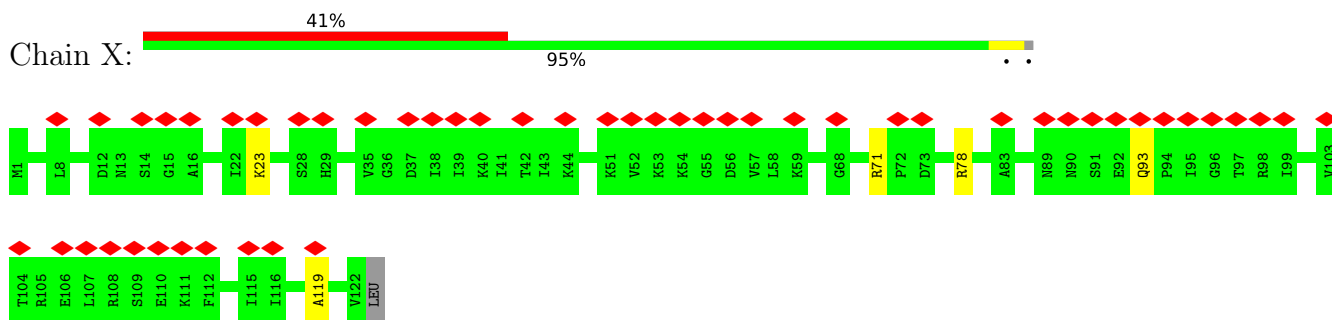
- Molecule 11: 50S ribosomal protein L11



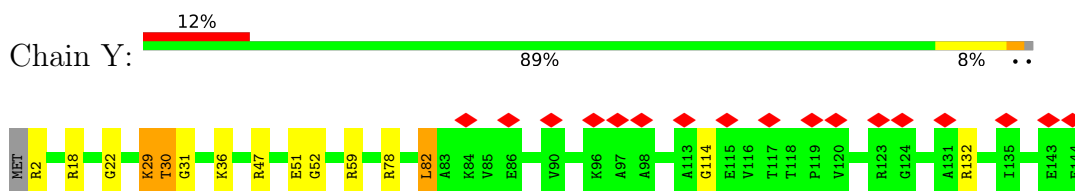
• Molecule 12: 50S ribosomal protein L13



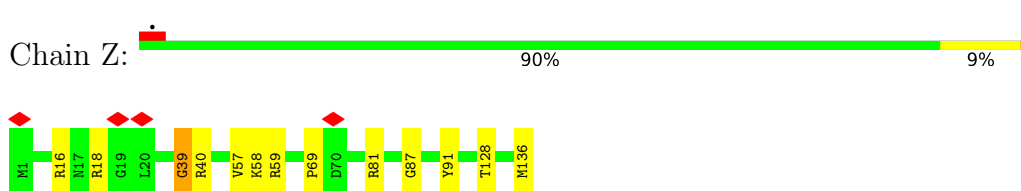
• Molecule 13: 50S ribosomal protein L14



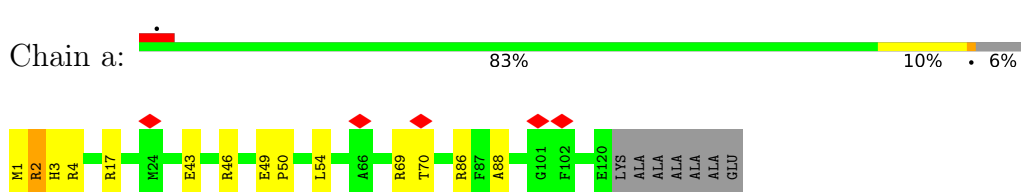
• Molecule 14: 50S ribosomal protein L15



• Molecule 15: 50S ribosomal protein L16

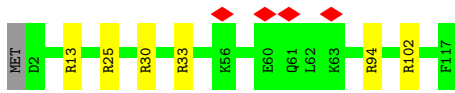


• Molecule 16: 50S ribosomal protein L17

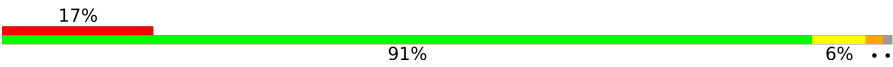


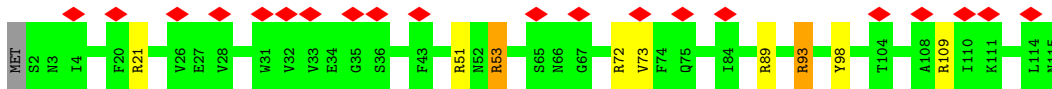
- Molecule 17: 50S ribosomal protein L18

Chain b:  94% 5%




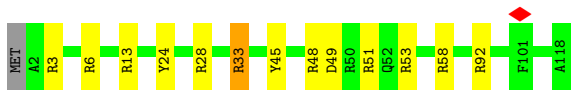
- Molecule 18: 50S ribosomal protein L19

Chain c:  17% 91% 6%



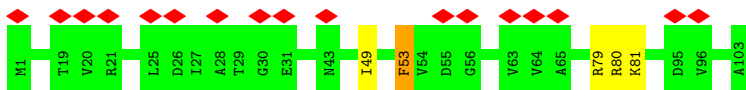
- Molecule 19: 50S ribosomal protein L20

Chain d:  88% 10%



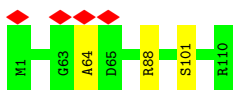
- Molecule 20: 50S ribosomal protein L21

Chain e:  17% 95%

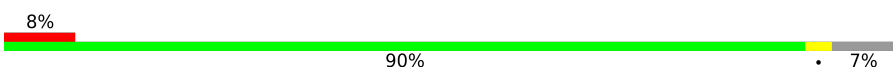


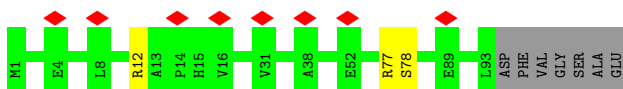
- Molecule 21: 50S ribosomal protein L22

Chain f:  97%

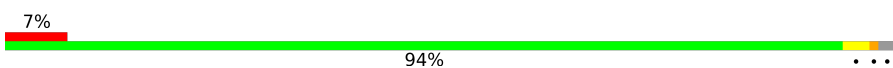


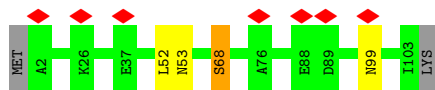
- Molecule 22: 50S ribosomal protein L23

Chain g:  8% 90% 7%

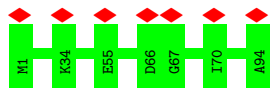


- Molecule 23: 50S ribosomal protein L24

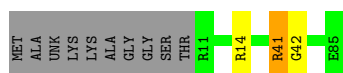
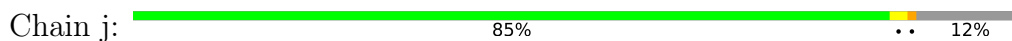
Chain h:  7% 94%



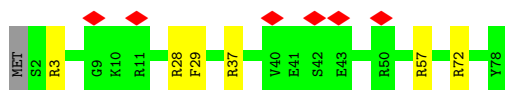
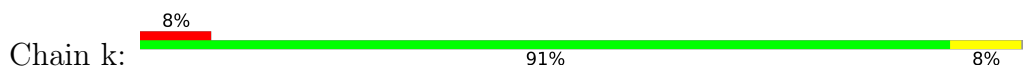
- Molecule 24: 50S ribosomal protein L25



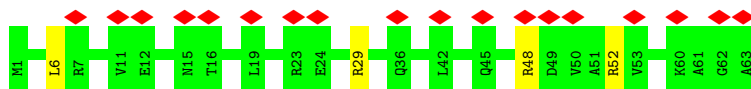
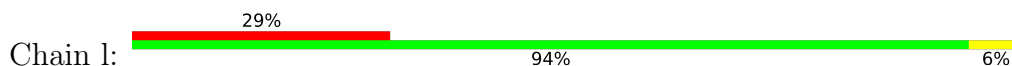
- Molecule 25: 50S ribosomal protein L27



- Molecule 26: 50S ribosomal protein L28



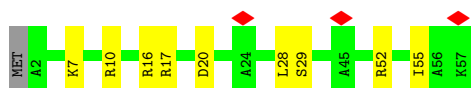
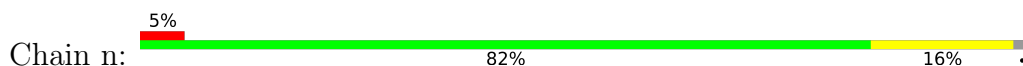
- Molecule 27: 50S ribosomal protein L29



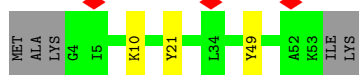
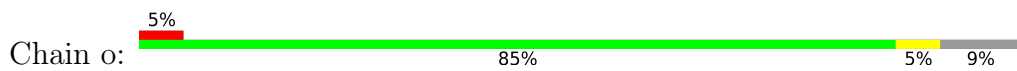
- Molecule 28: 50S ribosomal protein L30



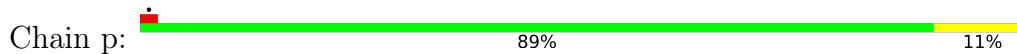
- Molecule 29: 50S ribosomal protein L32



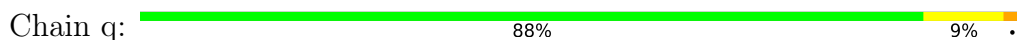
- Molecule 30: 50S ribosomal protein L33



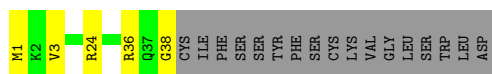
• Molecule 31: 50S ribosomal protein L34



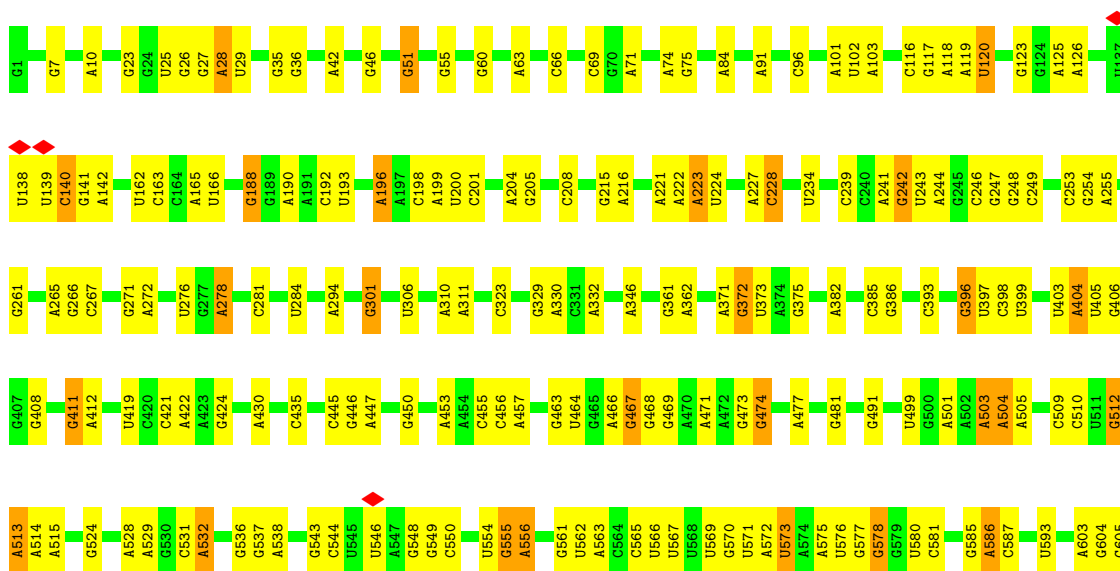
• Molecule 32: 50S ribosomal protein L35

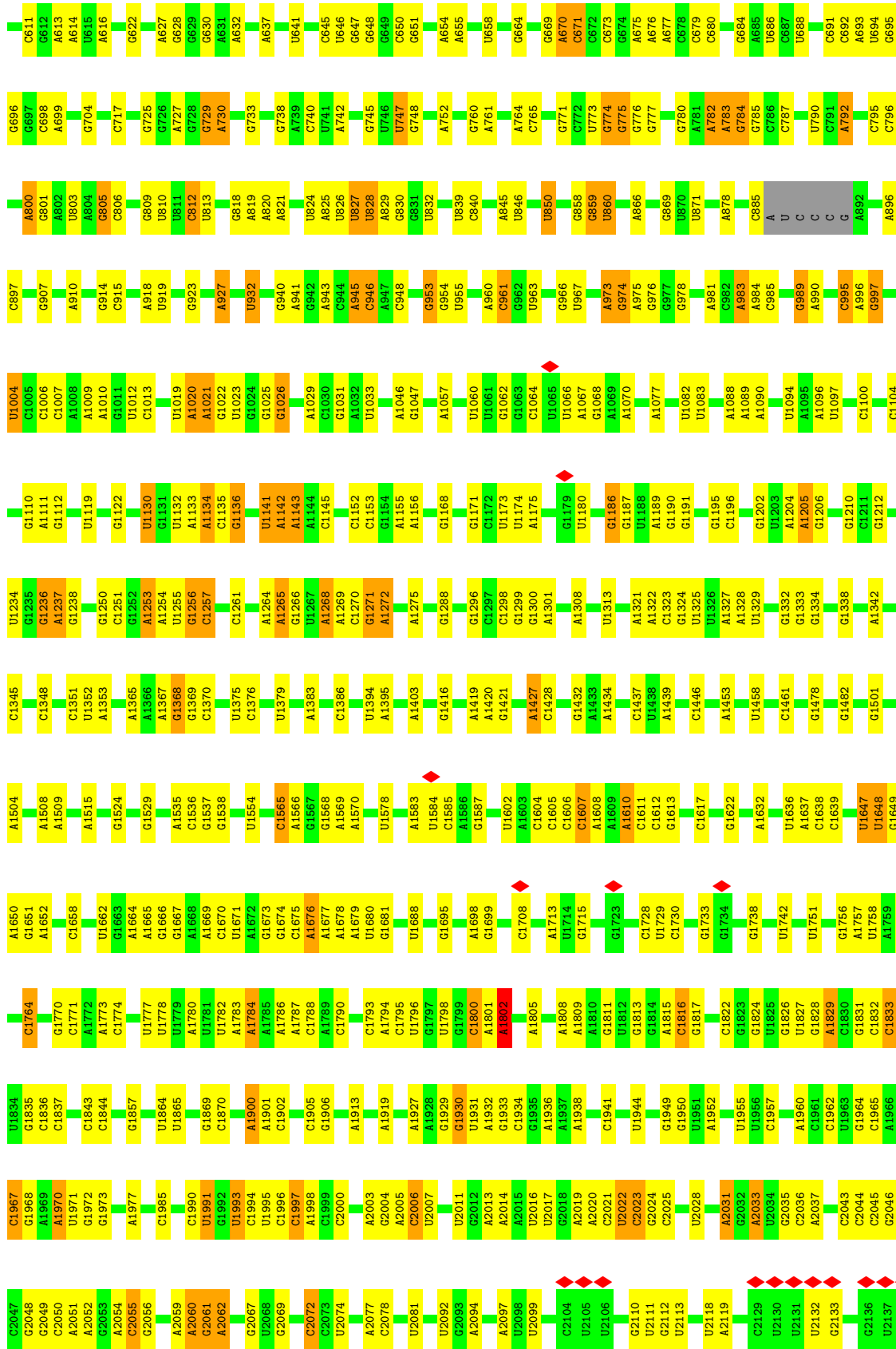


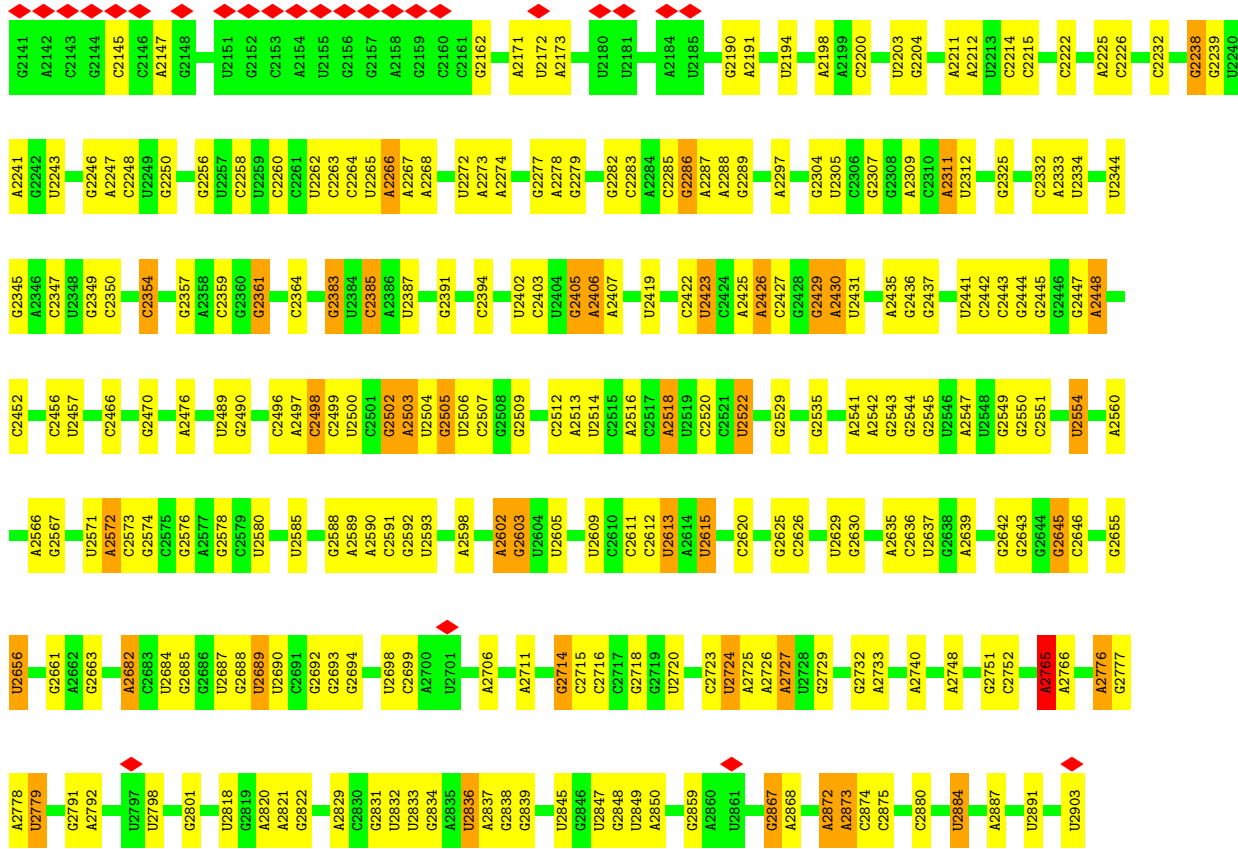
• Molecule 33: 50S ribosomal protein L36



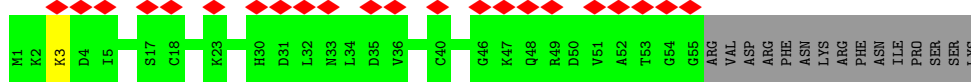
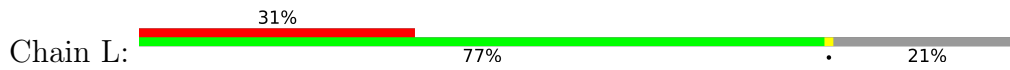
• Molecule 34: 23S rRNA



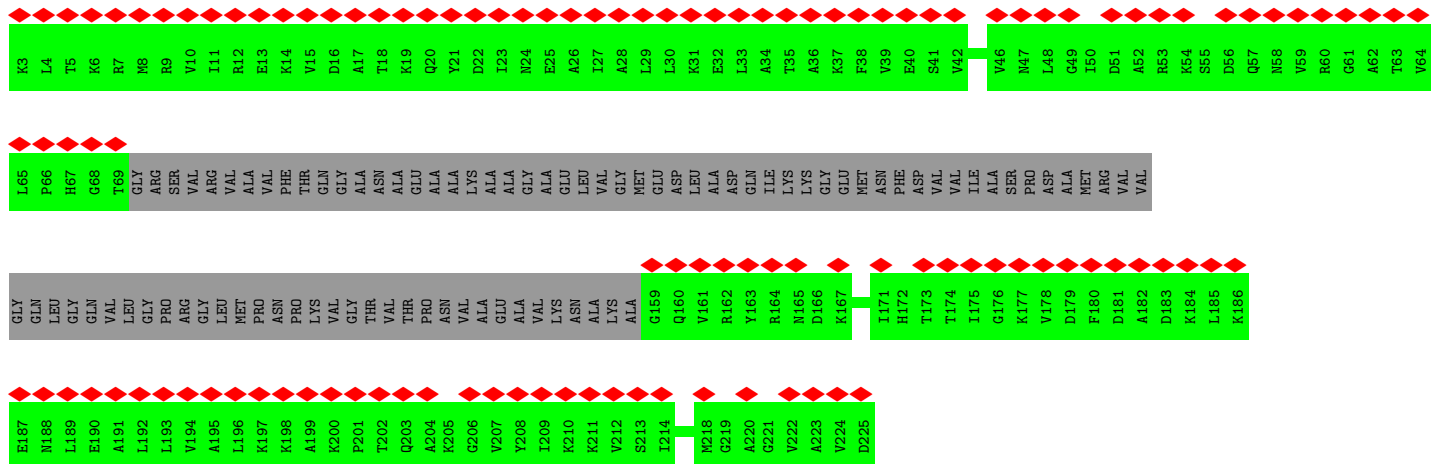




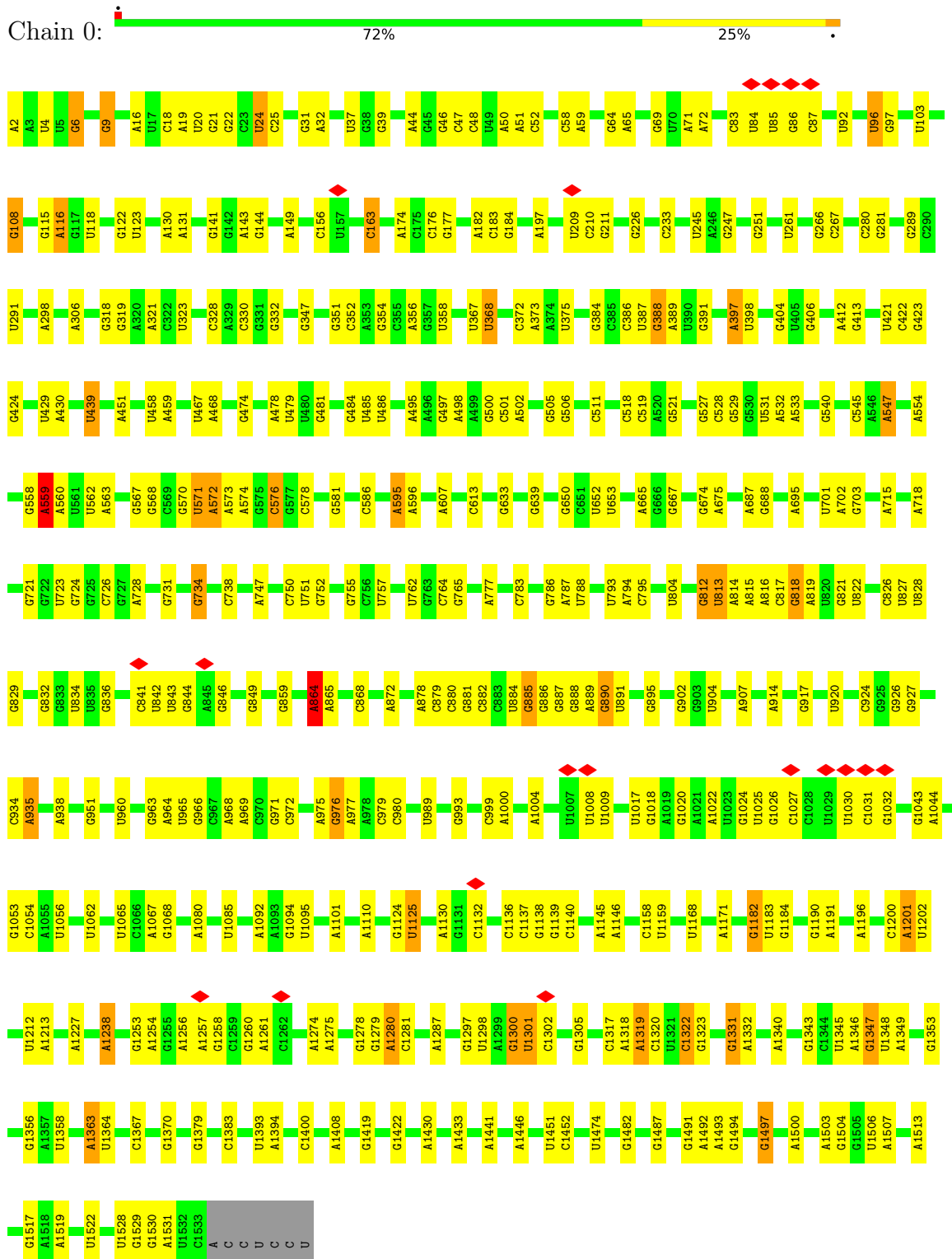
• Molecule 35: 50S ribosomal protein L31



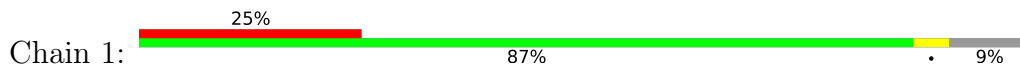
• Molecule 36: 50S ribosomal protein L1

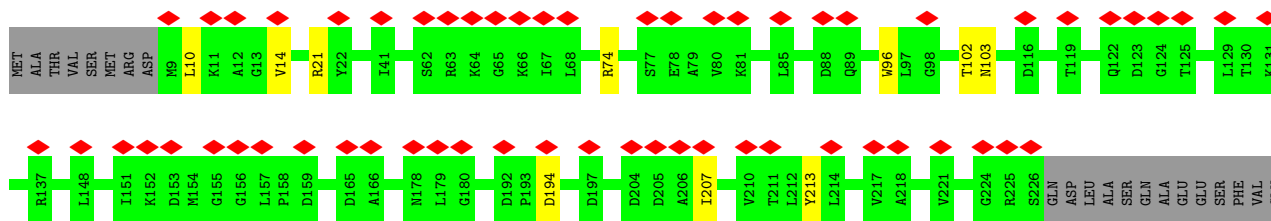


• Molecule 37: 16S rRNA

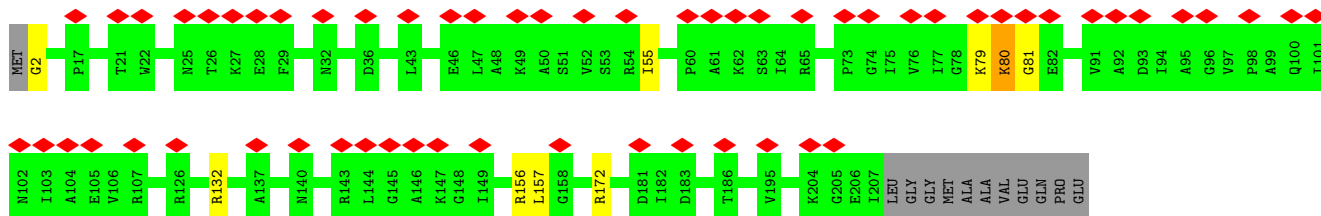


• Molecule 38: 30S ribosomal protein S2





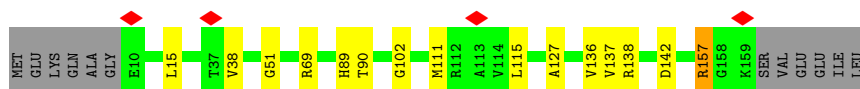
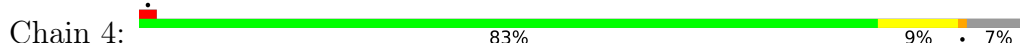
• Molecule 39: 30S ribosomal protein S3



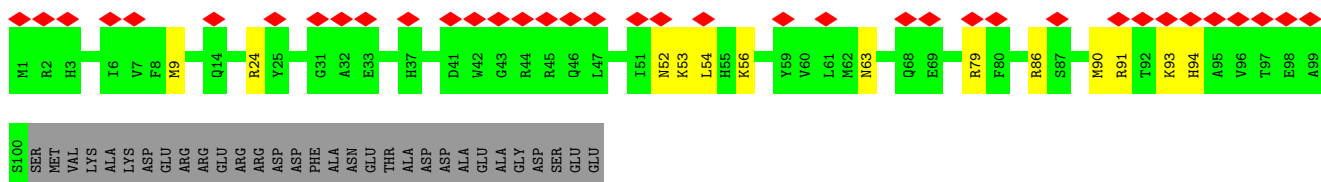
• Molecule 40: 30S ribosomal protein S4



• Molecule 41: 30S ribosomal protein S5

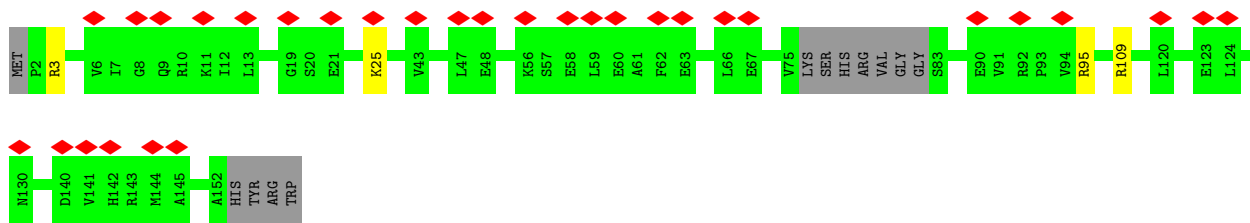


• Molecule 42: 30S ribosomal protein S6, non-modified isoform

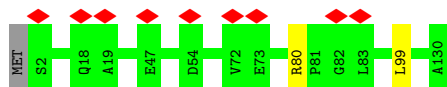


• Molecule 43: 30S ribosomal protein S7

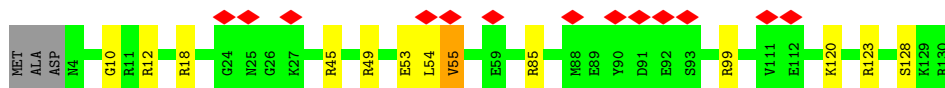
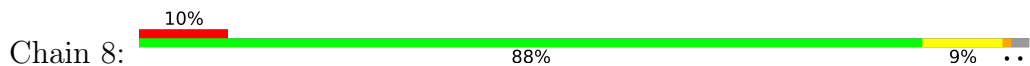




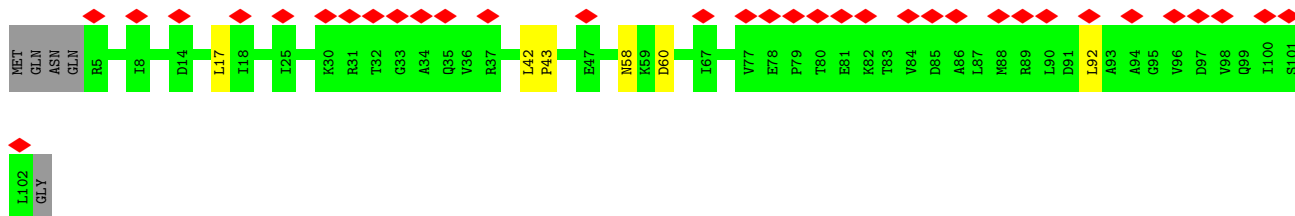
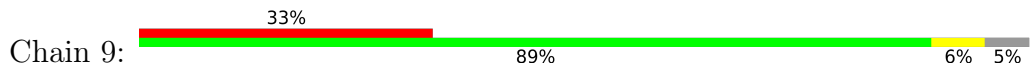
• Molecule 44: 30S ribosomal protein S8



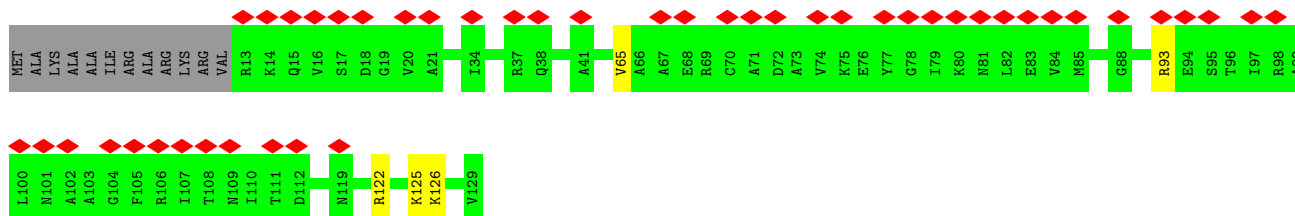
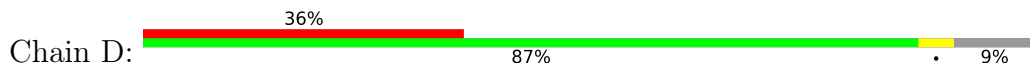
• Molecule 45: 30S ribosomal protein S9



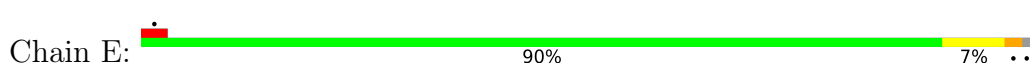
• Molecule 46: 30S ribosomal protein S10

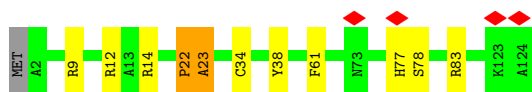


• Molecule 47: 30S ribosomal protein S11



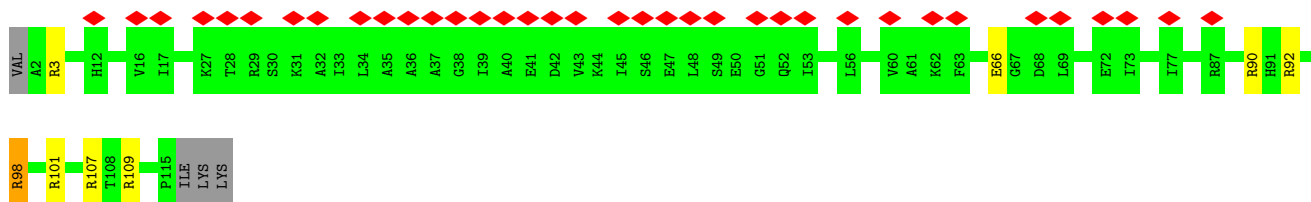
• Molecule 48: 30S ribosomal protein S12





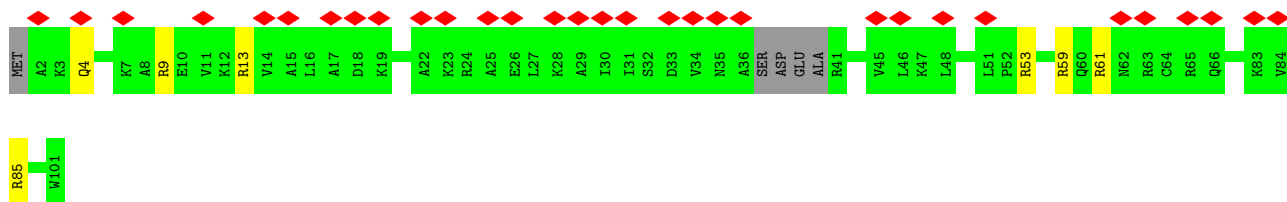
- Molecule 49: 30S ribosomal protein S13

Chain F: 31% 90% 6% ..



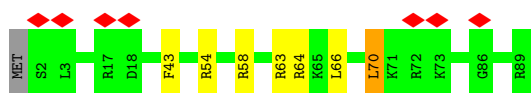
- Molecule 50: 30S ribosomal protein S14

Chain G: 31% 88% 7% 5%



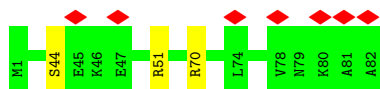
- Molecule 51: 30S ribosomal protein S15

Chain H: 8% 91% 7% ..



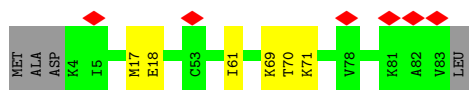
- Molecule 52: 30S ribosomal protein S16

Chain I: 9% 96% .

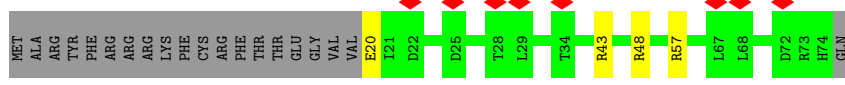


- Molecule 53: 30S ribosomal protein S17

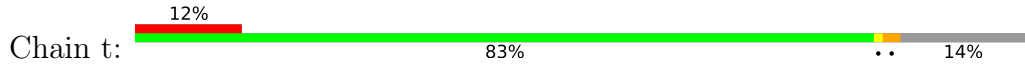
Chain J: 7% 88% 7% 5%



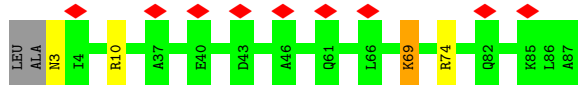
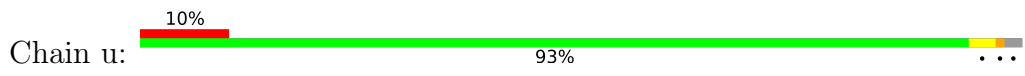
- Molecule 54: 30S ribosomal protein S18



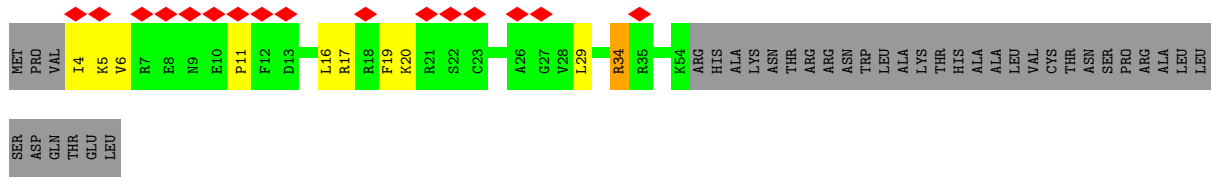
• Molecule 55: 30S ribosomal protein S19



• Molecule 56: 30S ribosomal protein S20



• Molecule 57: 30S ribosomal protein S21



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	75081	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	2.540	Depositor
Minimum map value	-0.736	Depositor
Average map value	-0.008	Depositor
Map value standard deviation	0.148	Depositor
Recommended contour level	0.45	Depositor
Map size (\AA)	654.0, 654.0, 654.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.09, 1.09, 1.09	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: K, 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	A	0.66	1/1744 (0.1%)	0.86	0/2716
2	s	0.90	1/326 (0.3%)	0.80	1/441 (0.2%)
3	M	0.63	3/1779 (0.2%)	0.83	2/2768 (0.1%)
4	O	0.79	1/2828 (0.0%)	0.88	7/4410 (0.2%)
5	P	1.41	22/2121 (1.0%)	1.32	27/2852 (0.9%)
6	Q	1.18	3/1585 (0.2%)	1.13	8/2134 (0.4%)
7	R	0.97	3/1571 (0.2%)	1.02	9/2113 (0.4%)
8	S	0.67	0/1434	0.85	0/1926
9	T	0.67	0/1342	0.83	4/1816 (0.2%)
10	U	0.51	0/1122	0.78	1/1515 (0.1%)
11	V	0.53	0/1045	0.66	0/1410
12	W	1.10	3/1151 (0.3%)	1.10	7/1551 (0.5%)
13	X	1.15	0/947	1.19	4/1268 (0.3%)
14	Y	1.30	3/1053 (0.3%)	1.38	12/1403 (0.9%)
15	Z	1.13	2/1092 (0.2%)	1.19	6/1460 (0.4%)
16	a	1.28	3/973 (0.3%)	1.29	10/1301 (0.8%)
17	b	0.84	2/901 (0.2%)	1.08	8/1209 (0.7%)
18	c	1.09	3/927 (0.3%)	1.19	8/1240 (0.6%)
19	d	1.32	4/959 (0.4%)	1.37	15/1278 (1.2%)
20	e	1.08	1/828 (0.1%)	1.08	3/1107 (0.3%)
21	f	1.02	1/864 (0.1%)	1.09	1/1156 (0.1%)
22	g	0.91	0/744	1.01	1/994 (0.1%)
23	h	0.82	1/787 (0.1%)	0.89	0/1051
24	i	0.78	0/765	0.87	0/1025
25	j	1.21	2/575 (0.3%)	1.29	5/762 (0.7%)
26	k	1.09	1/634 (0.2%)	1.15	6/848 (0.7%)
27	l	0.71	0/509	1.04	4/677 (0.6%)
28	m	0.86	0/452	1.08	2/605 (0.3%)
29	n	1.16	2/449 (0.4%)	1.42	7/599 (1.2%)
30	o	1.31	7/416 (1.7%)	0.96	1/554 (0.2%)
31	p	1.38	3/379 (0.8%)	1.76	6/498 (1.2%)
32	q	1.15	0/512	1.26	6/676 (0.9%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	r	1.16	1/302 (0.3%)	1.35	5/397 (1.3%)
34	N	1.24	514/69681 (0.7%)	1.04	349/108706 (0.3%)
35	L	0.61	0/426	0.78	0/570
36	C	0.28	0/1034	0.51	0/1387
37	0	0.97	134/36809 (0.4%)	0.93	106/57423 (0.2%)
38	1	0.82	2/1735 (0.1%)	0.94	4/2338 (0.2%)
39	2	0.85	1/1651 (0.1%)	0.95	4/2225 (0.2%)
40	3	0.76	0/1664	0.98	6/2227 (0.3%)
41	4	1.12	1/1118 (0.1%)	1.21	7/1504 (0.5%)
42	5	0.90	1/835 (0.1%)	1.03	4/1128 (0.4%)
43	6	0.66	0/1142	0.95	6/1532 (0.4%)
44	7	0.88	0/988	0.99	2/1326 (0.2%)
45	8	0.86	0/1033	1.13	7/1375 (0.5%)
46	9	0.74	0/796	1.01	2/1077 (0.2%)
47	D	0.86	1/892 (0.1%)	1.03	3/1205 (0.2%)
48	E	1.09	3/968 (0.3%)	1.22	7/1300 (0.5%)
49	F	0.85	1/892 (0.1%)	1.12	9/1193 (0.8%)
50	G	0.86	0/784	1.14	7/1043 (0.7%)
51	H	0.94	0/717	1.13	8/959 (0.8%)
52	I	0.94	0/658	1.16	3/884 (0.3%)
53	J	0.82	0/657	1.02	0/881
54	K	0.98	1/462 (0.2%)	1.10	2/621 (0.3%)
55	t	0.81	0/652	1.05	3/877 (0.3%)
56	u	0.89	0/670	1.06	3/888 (0.3%)
57	v	0.99	1/426 (0.2%)	1.15	2/565 (0.4%)
All	All	1.09	733/159806 (0.5%)	1.02	720/238994 (0.3%)

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
5	P	0	3
6	Q	0	1
8	S	0	2
10	U	0	1
11	V	0	1
14	Y	0	2
15	Z	0	2
23	h	0	1
32	q	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
34	N	0	6
37	0	0	5
38	1	0	3
39	2	0	2
41	4	0	5
42	5	0	2
45	8	0	4
47	D	0	1
48	E	0	2
53	J	0	2
55	t	0	1
56	u	0	1
57	v	0	1
All	All	0	49

The worst 5 of 733 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
34	N	2873	A	C6-N1	-20.40	1.21	1.35
34	N	2765	A	C6-N1	-18.58	1.22	1.35
34	N	2502	G	P-OP2	16.61	1.77	1.49
34	N	503	A	C6-N1	-15.24	1.24	1.35
34	N	1156	A	P-OP2	15.21	1.74	1.49

The worst 5 of 720 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
34	N	2506[A]	U	OP1-P-O3'	17.17	142.97	105.20
34	N	2506[B]	U	OP1-P-O3'	17.17	142.97	105.20
31	p	39	ARG	NE-CZ-NH1	16.09	128.35	120.30
31	p	39	ARG	NE-CZ-NH2	-14.86	112.87	120.30
3	M	73	C	O3'-P-O5'	14.33	131.23	104.00

There are no chirality outliers.

5 of 49 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
5	P	195	VAL	Peptide
5	P	234	GLY	Peptide
5	P	238	ARG	Peptide
6	Q	151	THR	Peptide

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Mol	Chain	Res	Type	Group
8	S	174	ASP	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	s	35/179 (20%)	32 (91%)	3 (9%)	0	100	100
5	P	269/273 (98%)	247 (92%)	18 (7%)	4 (2%)	10	45
6	Q	207/209 (99%)	195 (94%)	11 (5%)	1 (0%)	29	66
7	R	199/201 (99%)	191 (96%)	8 (4%)	0	100	100
8	S	175/179 (98%)	163 (93%)	11 (6%)	1 (1%)	25	62
9	T	174/177 (98%)	165 (95%)	9 (5%)	0	100	100
10	U	147/149 (99%)	125 (85%)	19 (13%)	3 (2%)	7	39
11	V	139/142 (98%)	112 (81%)	27 (19%)	0	100	100
12	W	140/142 (99%)	136 (97%)	4 (3%)	0	100	100
13	X	120/123 (98%)	109 (91%)	9 (8%)	2 (2%)	9	42
14	Y	141/144 (98%)	121 (86%)	16 (11%)	4 (3%)	5	33
15	Z	134/136 (98%)	119 (89%)	10 (8%)	5 (4%)	3	27
16	a	118/127 (93%)	102 (86%)	14 (12%)	2 (2%)	9	42
17	b	114/117 (97%)	108 (95%)	6 (5%)	0	100	100
18	c	112/115 (97%)	104 (93%)	8 (7%)	0	100	100
19	d	115/118 (98%)	115 (100%)	0	0	100	100
20	e	101/103 (98%)	92 (91%)	8 (8%)	1 (1%)	15	52

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
21	f	108/110 (98%)	100 (93%)	7 (6%)	1 (1%)	17	54
22	g	91/100 (91%)	80 (88%)	9 (10%)	2 (2%)	6	37
23	h	100/104 (96%)	84 (84%)	14 (14%)	2 (2%)	7	39
24	i	92/94 (98%)	89 (97%)	3 (3%)	0	100	100
25	j	73/85 (86%)	71 (97%)	2 (3%)	0	100	100
26	k	75/78 (96%)	71 (95%)	3 (4%)	1 (1%)	12	47
27	l	61/63 (97%)	56 (92%)	5 (8%)	0	100	100
28	m	56/59 (95%)	52 (93%)	4 (7%)	0	100	100
29	n	54/57 (95%)	48 (89%)	5 (9%)	1 (2%)	8	40
30	o	48/55 (87%)	45 (94%)	3 (6%)	0	100	100
31	p	44/46 (96%)	40 (91%)	4 (9%)	0	100	100
32	q	62/65 (95%)	56 (90%)	5 (8%)	1 (2%)	9	44
33	r	36/55 (66%)	35 (97%)	1 (3%)	0	100	100
35	L	53/70 (76%)	45 (85%)	7 (13%)	1 (2%)	8	40
36	C	130/223 (58%)	123 (95%)	7 (5%)	0	100	100
38	1	216/239 (90%)	187 (87%)	28 (13%)	1 (0%)	29	66
39	2	204/218 (94%)	186 (91%)	16 (8%)	2 (1%)	15	52
40	3	203/206 (98%)	182 (90%)	21 (10%)	0	100	100
41	4	148/162 (91%)	116 (78%)	30 (20%)	2 (1%)	11	45
42	5	98/131 (75%)	81 (83%)	11 (11%)	6 (6%)	1	18
43	6	140/156 (90%)	130 (93%)	10 (7%)	0	100	100
44	7	127/130 (98%)	121 (95%)	6 (5%)	0	100	100
45	8	125/130 (96%)	103 (82%)	20 (16%)	2 (2%)	9	44
46	9	96/103 (93%)	84 (88%)	9 (9%)	3 (3%)	4	31
47	D	115/129 (89%)	102 (89%)	13 (11%)	0	100	100
48	E	121/124 (98%)	104 (86%)	15 (12%)	2 (2%)	9	42
49	F	112/118 (95%)	103 (92%)	8 (7%)	1 (1%)	17	54
50	G	92/101 (91%)	77 (84%)	14 (15%)	1 (1%)	14	50
51	H	86/89 (97%)	81 (94%)	5 (6%)	0	100	100
52	I	80/82 (98%)	69 (86%)	10 (12%)	1 (1%)	12	47
53	J	78/84 (93%)	66 (85%)	9 (12%)	3 (4%)	3	27

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
54	K	53/75 (71%)	49 (92%)	3 (6%)	1 (2%)	8	40
55	t	77/92 (84%)	73 (95%)	4 (5%)	0	100	100
56	u	83/87 (95%)	78 (94%)	4 (5%)	1 (1%)	13	49
57	v	49/88 (56%)	41 (84%)	7 (14%)	1 (2%)	7	39
All	All	5826/6442 (90%)	5264 (90%)	503 (9%)	59 (1%)	20	52

5 of 59 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	P	239	ASN
10	U	72	ILE
14	Y	36	LYS
15	Z	58	LYS
20	e	53	PHE

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	s	34/158 (22%)	34 (100%)	0	100	100
5	P	216/218 (99%)	215 (100%)	1 (0%)	88	93
6	Q	164/164 (100%)	161 (98%)	3 (2%)	59	77
7	R	165/165 (100%)	161 (98%)	4 (2%)	49	69
8	S	148/150 (99%)	148 (100%)	0	100	100
9	T	137/138 (99%)	137 (100%)	0	100	100
10	U	114/114 (100%)	107 (94%)	7 (6%)	18	47
11	V	109/110 (99%)	108 (99%)	1 (1%)	78	87
12	W	116/116 (100%)	116 (100%)	0	100	100
13	X	103/104 (99%)	103 (100%)	0	100	100
14	Y	102/103 (99%)	102 (100%)	0	100	100
15	Z	109/109 (100%)	108 (99%)	1 (1%)	78	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
16	a	100/102 (98%)	97 (97%)	3 (3%)	41	64
17	b	86/87 (99%)	86 (100%)	0	100	100
18	c	98/100 (98%)	95 (97%)	3 (3%)	40	63
19	d	89/90 (99%)	88 (99%)	1 (1%)	73	84
20	e	84/84 (100%)	82 (98%)	2 (2%)	49	69
21	f	93/93 (100%)	93 (100%)	0	100	100
22	g	80/85 (94%)	80 (100%)	0	100	100
23	h	83/85 (98%)	82 (99%)	1 (1%)	71	83
24	i	78/78 (100%)	78 (100%)	0	100	100
25	j	56/62 (90%)	55 (98%)	1 (2%)	59	77
26	k	67/68 (98%)	67 (100%)	0	100	100
27	l	55/55 (100%)	55 (100%)	0	100	100
28	m	48/49 (98%)	48 (100%)	0	100	100
29	n	47/48 (98%)	46 (98%)	1 (2%)	53	72
30	o	45/49 (92%)	45 (100%)	0	100	100
31	p	38/38 (100%)	38 (100%)	0	100	100
32	q	51/52 (98%)	49 (96%)	2 (4%)	32	58
33	r	34/50 (68%)	34 (100%)	0	100	100
35	L	48/63 (76%)	48 (100%)	0	100	100
36	C	110/174 (63%)	110 (100%)	0	100	100
38	1	180/198 (91%)	179 (99%)	1 (1%)	86	91
39	2	170/178 (96%)	169 (99%)	1 (1%)	86	91
40	3	172/173 (99%)	171 (99%)	1 (1%)	86	91
41	4	113/123 (92%)	110 (97%)	3 (3%)	44	66
42	5	87/112 (78%)	86 (99%)	1 (1%)	73	84
43	6	119/129 (92%)	118 (99%)	1 (1%)	81	88
44	7	104/105 (99%)	104 (100%)	0	100	100
45	8	105/107 (98%)	104 (99%)	1 (1%)	76	85
46	9	86/90 (96%)	85 (99%)	1 (1%)	71	83
47	D	90/98 (92%)	89 (99%)	1 (1%)	73	84
48	E	103/104 (99%)	103 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
49	F	92/96 (96%)	91 (99%)	1 (1%)	73	84
50	G	79/83 (95%)	79 (100%)	0	100	100
51	H	75/77 (97%)	74 (99%)	1 (1%)	69	81
52	I	65/65 (100%)	65 (100%)	0	100	100
53	J	74/77 (96%)	73 (99%)	1 (1%)	67	80
54	K	48/66 (73%)	48 (100%)	0	100	100
55	t	70/80 (88%)	68 (97%)	2 (3%)	42	64
56	u	65/66 (98%)	65 (100%)	0	100	100
57	v	43/76 (57%)	35 (81%)	8 (19%)	1	10
All	All	4847/5264 (92%)	4792 (99%)	55 (1%)	74	84

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

Mol	Chain	Res	Type
29	n	28	LEU
41	4	115	LEU
57	v	29	LEU
57	v	6	VAL
32	q	2	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
36	C	172	HIS
45	8	32	GLN
38	1	177	ASN
42	5	11	HIS
49	F	8	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	72/73 (98%)	19 (26%)	8 (11%)
3	M	74/75 (98%)	11 (14%)	0
34	N	2894/2903 (99%)	519 (17%)	34 (1%)
37	0	1531/1539 (99%)	275 (17%)	22 (1%)
4	O	117/120 (97%)	21 (17%)	1 (0%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
All	All	4688/4710 (99%)	845 (18%)	65 (1%)

5 of 845 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	13	C
1	A	14	A
1	A	16	U
1	A	17	C
1	A	18	G

5 of 65 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
37	0	1190	G
37	0	1300	G
34	N	784	G
34	N	774	G
37	0	1345	U

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 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.

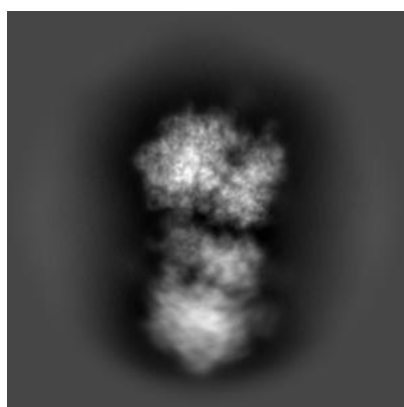
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13952. These allow visual inspection of the internal detail of the map and identification of artifacts.

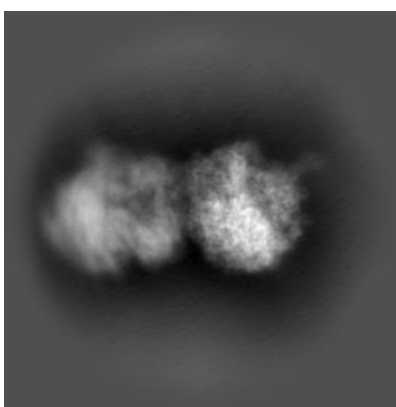
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

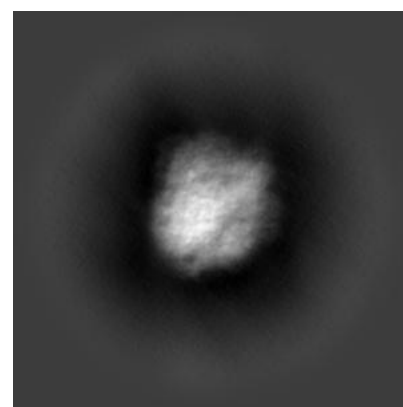
6.1.1 Primary map



X



Y

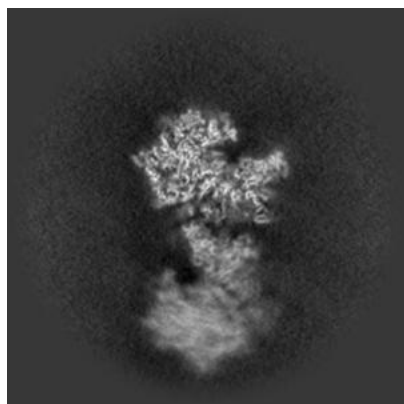


Z

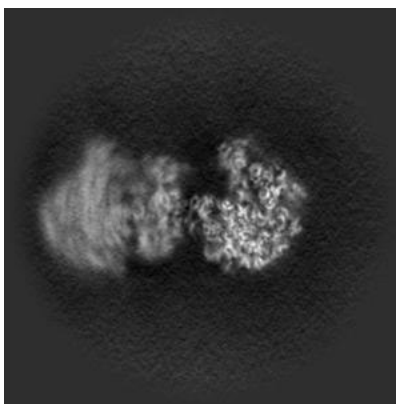
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

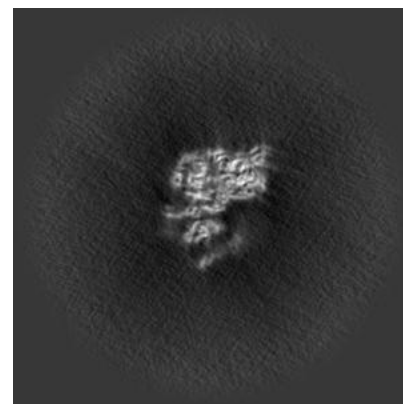
6.2.1 Primary map



X Index: 300



Y Index: 300

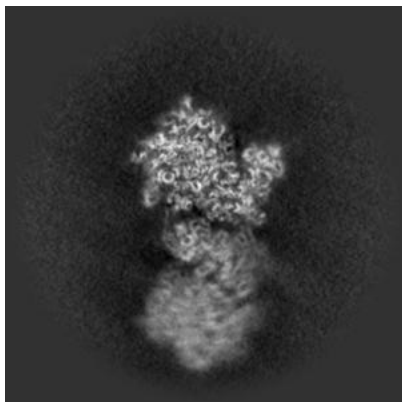


Z Index: 300

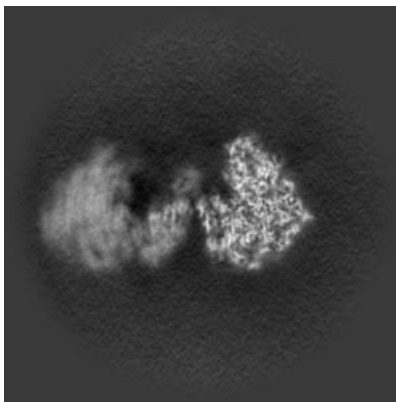
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

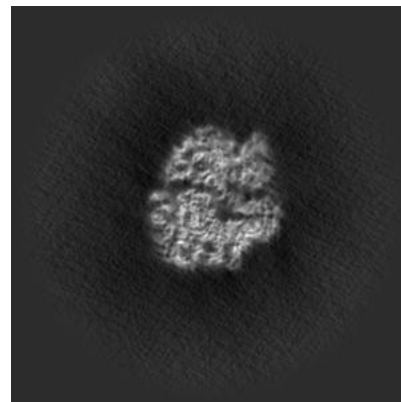
6.3.1 Primary map



X Index: 282



Y Index: 275



Z Index: 348

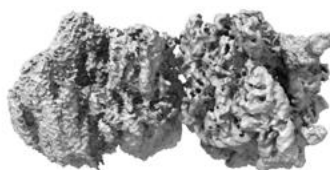
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.45. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

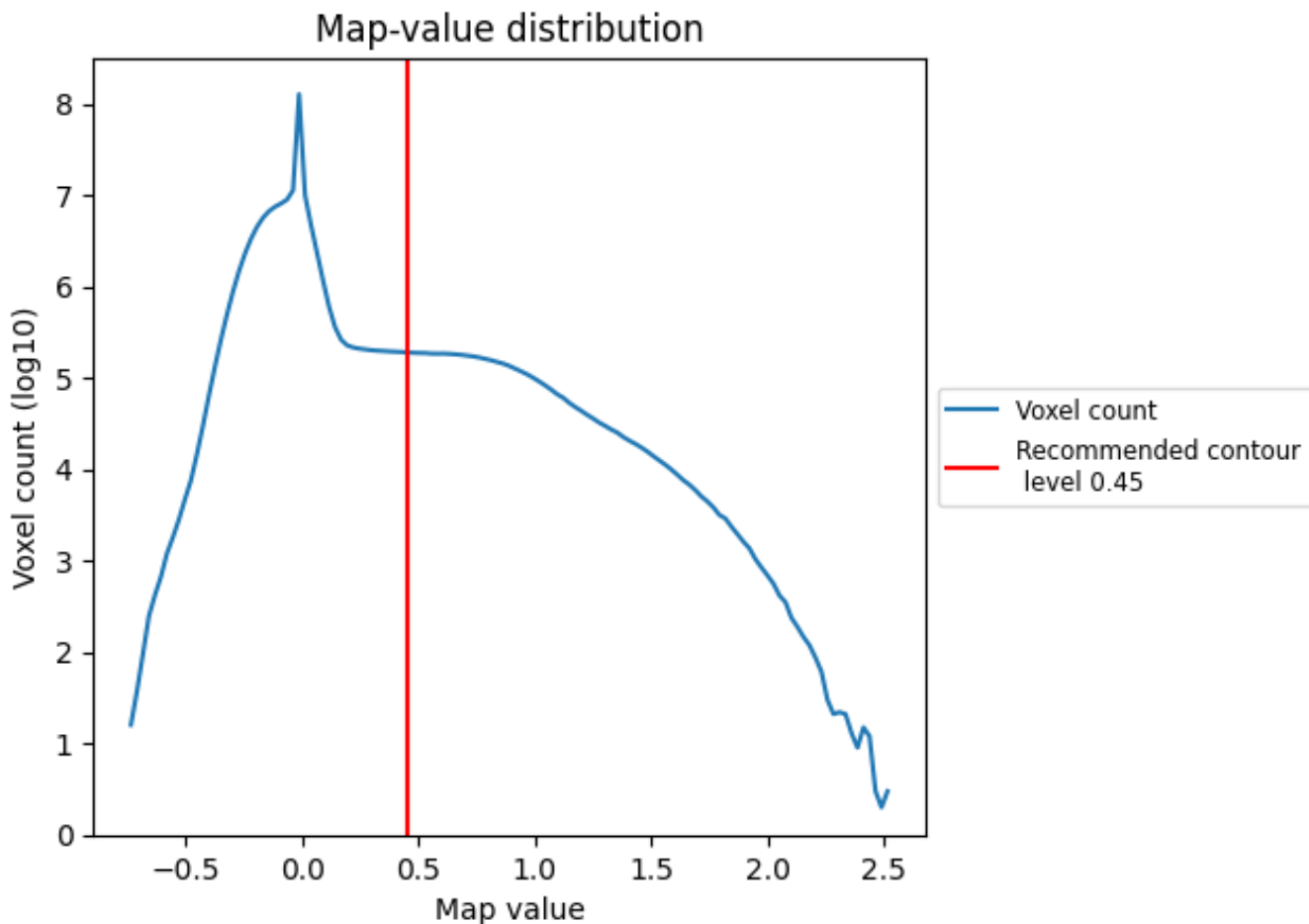
6.5 Mask visualisation

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

7 Map analysis [i](#)

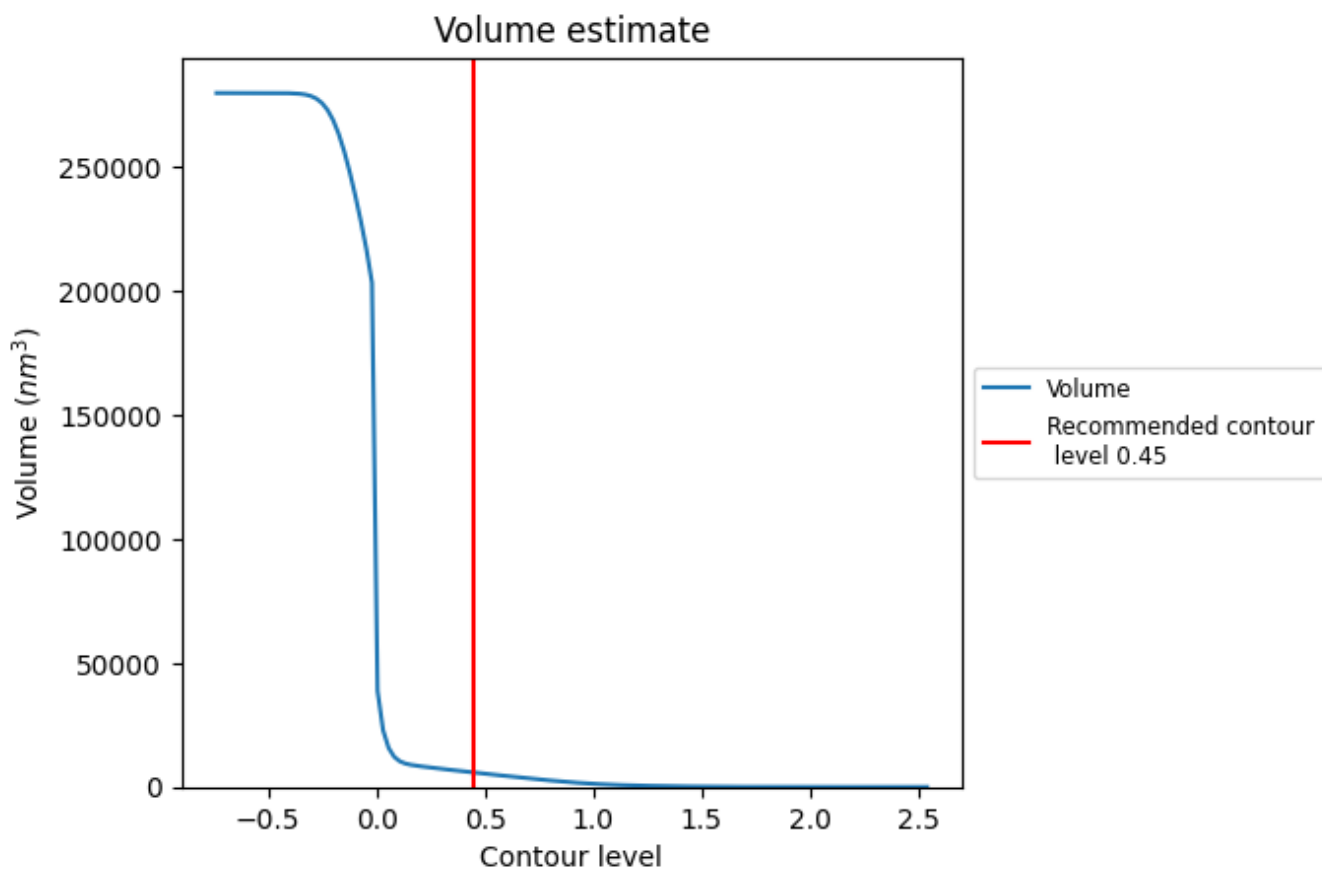
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

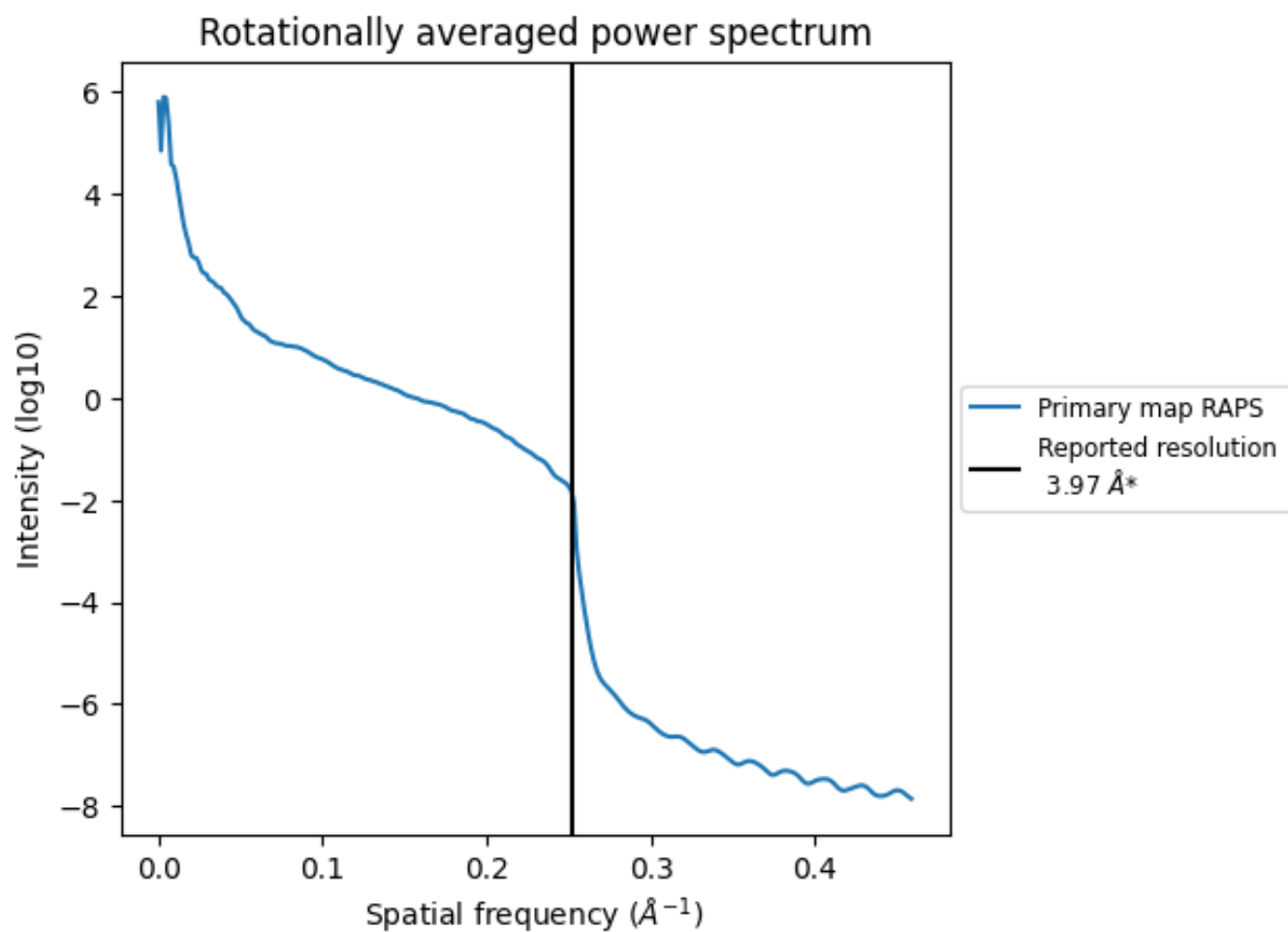
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 5826 nm^3 ; this corresponds to an approximate mass of 5263 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 0.252\AA^{-1}

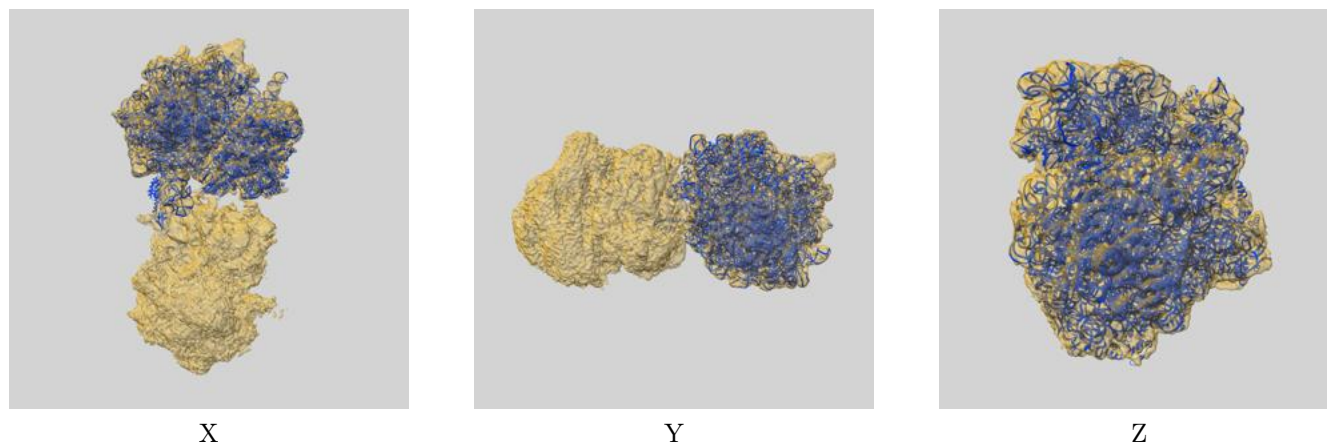
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

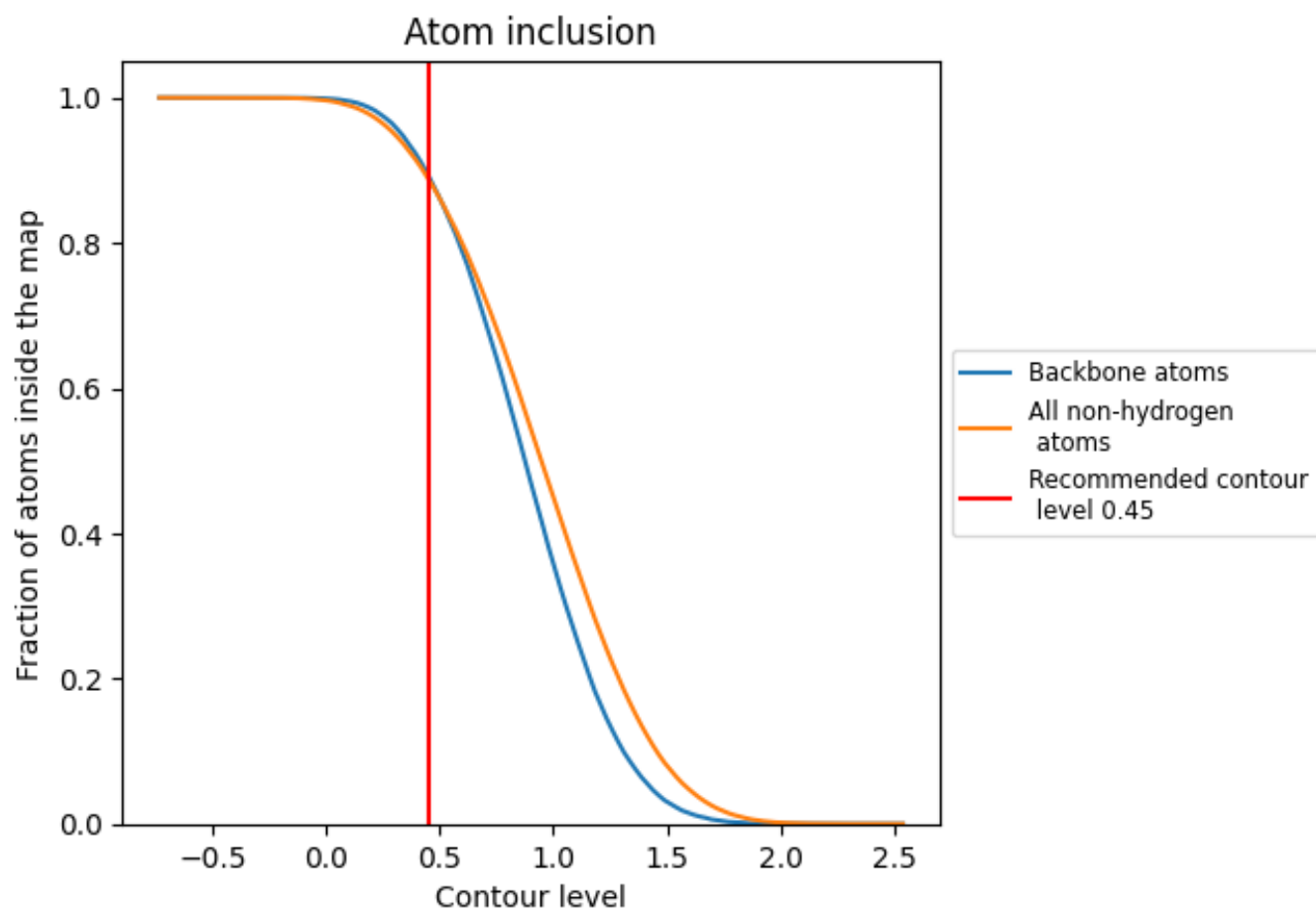
This section contains information regarding the fit between EMDB map EMD-13952 and PDB model 7QG8. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



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 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 89% of all non-hydrogen atoms, are inside the map.