wwPDB EM Validation Summary Report ⓘ

Jul 15, 2025 – 11:58 AM EDT

PDB ID	:	8VL1 / pdb_00008vl1
EMDB ID	:	EMD-43335
Title	:	Escherichia coli transcription-translation loosely coupled complex (TTC-LC) containing mRNA with a 36 nt long spacer, ops signal, RfaH, NusA, and fMet-tRNAs in E-site and P-site
Authors	:	Molodtsov, V.; Wang, C.; Ebright, R.H.
Deposited on	:	2024-01-11
Resolution	:	5.30 Å(reported)

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

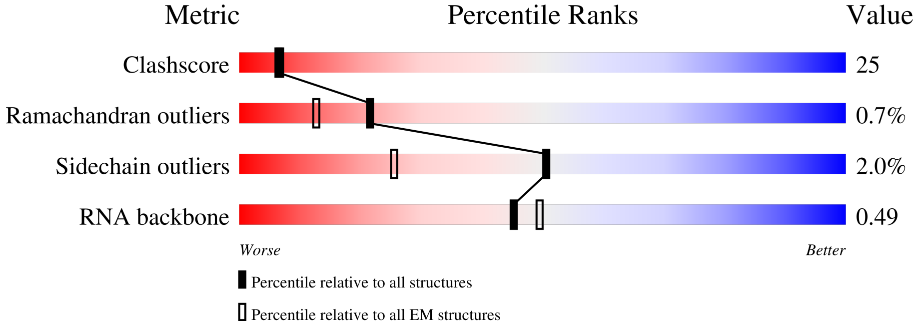
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline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

1 Overall quality at a glance

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

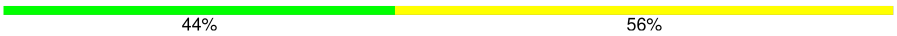
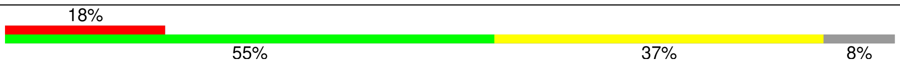
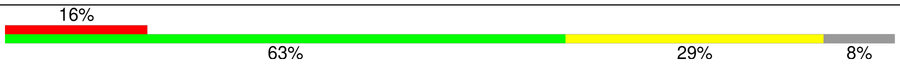
The reported resolution of this entry is 5.30 Å.

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	0	103	
2	1	110	
3	2	100	
4	3	104	
5	4	94	
6	5	38	
7	6	38	

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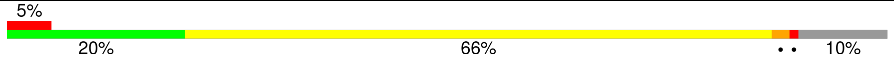
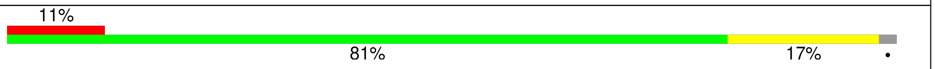
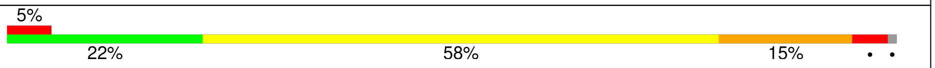
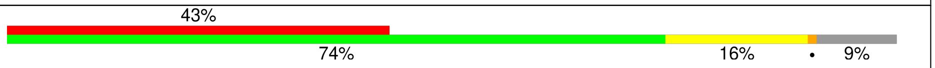
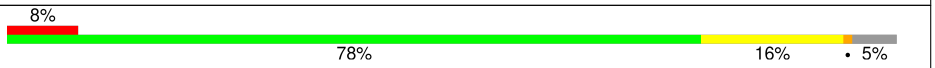
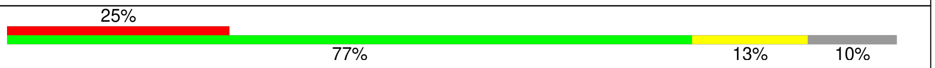
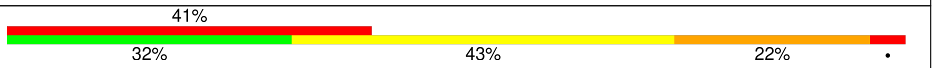
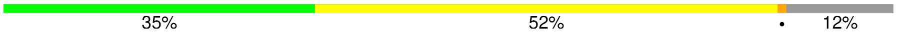
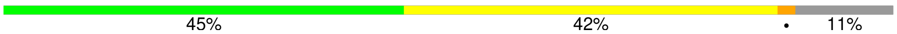
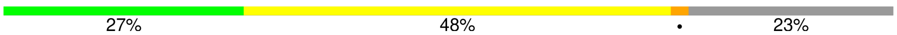
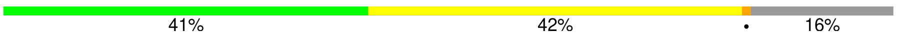
Mol	Chain	Length	Quality of chain
8	7	53	
9	9	165	
10	A	76	
10	B	76	
11	AA	1342	
12	AB	162	
13	AC	329	
13	AD	329	
14	AE	1407	
15	AF	91	
16	AG	495	
17	C	75	
18	D	1542	
19	E	87	
20	F	71	
21	G	241	
22	H	557	
23	I	233	
24	J	206	
25	K	167	
26	L	135	
27	M	179	
28	N	130	
29	O	130	
30	P	103	

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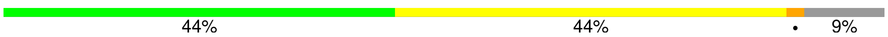
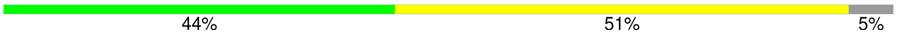
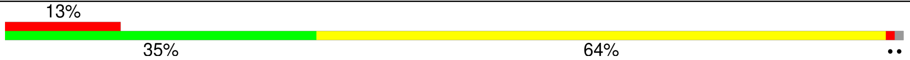
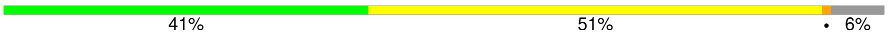
Mol	Chain	Length	Quality of chain
31	Q	129	
32	R	124	
33	S	101	
34	T	89	
35	U	82	
36	V	84	
37	W	92	
38	X	118	
39	Y	142	
40	Z	121	
41	a	2904	
42	b	85	
43	c	78	
44	d	120	
45	e	63	
46	f	59	
47	g	70	
48	h	273	
49	i	57	
50	j	209	
51	k	55	
52	l	201	
53	m	46	
54	n	179	
55	o	65	

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Mol	Chain	Length	Quality of chain
56	p	177	
57	q	38	
58	r	149	
59	s	142	
60	t	123	
61	u	144	
62	v	136	
63	w	127	
64	x	117	
65	y	115	
66	z	118	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
68	ZN	AE	1502	-	-	X	-

2 Entry composition

There are 68 unique types of molecules in this entry. The entry contains 280047 atoms, of which 98639 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Ribosomal protein L21.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	0	103	1655	516	839	153	145	2	0	0

- Molecule 2 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	1	110	1779	532	922	166	156	3	0	0

- Molecule 3 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	2	94	1557	470	811	140	134	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
4	3	103	1632	498	844	148	142	0	0

- Molecule 5 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	4	94	1533	479	780	137	134	3	0	0

- Molecule 6 is a DNA chain called NT DNA ops.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	5	35	726	342	141	208	35	0	0

- Molecule 7 is a DNA chain called T DNA ops.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	6	35	Total 703	C 336	N 117	O 215	P 35	0	0

- Molecule 8 is a RNA chain called mRNA with 36 nt long spacer.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	7	25	Total 527	C 235	N 80	O 187	P 25	0	0

- Molecule 9 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	9	148	Total 1117	C 705	N 196	O 209	S 7	0	0

- Molecule 10 is a RNA chain called E-site and P-site tRNA (fMet).

Mol	Chain	Residues	Atoms						AltConf	Trace
10	A	76	Total 2446	C 723	H 826	N 295	O 527	P 75	0	0
10	B	76	Total 2434	C 723	H 814	N 295	O 527	P 75	0	0

- Molecule 11 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	AA	1316	Total 10381	C 6514	N 1810	O 2014	S 43	0	0

- Molecule 12 is a protein called Transcription antitermination protein RfaH.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	AB	161	Total 1286	C 828	N 222	O 232	S 4	0	0

- Molecule 13 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	AC	221	Total 1698	C 1060	N 299	O 333	S 6	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
13	AD	299	Total 2078	C 1287	N 378	O 407	S 6	0	0

- Molecule 14 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	AE	1337	Total 10404	C 6535	N 1856	O 1963	S 50	0	0

- Molecule 15 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	AF	82	Total 650	C 396	N 122	O 131	S 1	0	0

- Molecule 16 is a protein called Transcription termination/antitermination protein NusA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	AG	495	Total 3852	C 2396	N 669	O 774	S 13	0	0

- Molecule 17 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms						AltConf	Trace
17	C	66	Total 1103	C 344	H 559	N 102	O 97	S 1	0	0

- Molecule 18 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	D	1524	Total 49126	C 14585	H 16423	N 6003	O 10591	P 1524	0	0

- Molecule 19 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms						AltConf	Trace
19	E	86	Total 1388	C 414	H 719	N 138	O 114	S 3	0	0

- Molecule 20 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
20	F	70	1218	366	629	125	97	1	0	0

- Molecule 21 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
21	G	225	3545	1113	1785	316	323	8	0	0

- Molecule 22 is a protein called 30S ribosomal protein S1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
22	H	259	3184	1073	1454	305	349	3	0	0

- Molecule 23 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
23	I	208	3346	1036	1710	307	290	3	0	0

- Molecule 24 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
24	J	205	3350	1026	1707	315	298	4	0	0

- Molecule 25 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
25	K	156	2348	717	1196	217	212	6	0	0

- Molecule 26 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
26	L	104	1694	536	846	153	152	7	0	0

- Molecule 27 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
27	M	151	2416	735	1235	227	215	4	0	0

- Molecule 28 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
28	N	129	2010	616	1031	173	184	6	0	0

- Molecule 29 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
29	O	127	2092	634	1070	206	179	3	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
30	P	99	1621	495	831	151	143	1	0	0

- Molecule 31 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
31	Q	117	1764	540	887	174	160	3	0	0

- Molecule 32 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
32	R	121	1940	580	1001	194	161	4	0	0

- Molecule 33 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
33	S	100	1649	499	844	164	139	3	0	0

- Molecule 34 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
34	T	88	1448	439	734	144	130	1	0	0

- Molecule 35 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
35	U	82	1315	406	666	128	114	1	0	0

- Molecule 36 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
36	V	80	1339	411	691	121	113	3	0	0

- Molecule 37 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
37	W	83	1351	424	688	126	111	2	0	0

- Molecule 38 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
38	X	116	1864	558	964	181	158	3	0	0

- Molecule 39 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	Y	141	1032	651	179	196	6	0	0

- Molecule 40 is a protein called 50S ribosomal protein L7/L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	Z	30	227	144	33	47	3	0	0

- Molecule 41 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
41	a	2880	92918	27587	31077	11398	19976	2880	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	887	A	U	conflict	GB 937521852

- Molecule 42 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
42	b	76	1181	360	599	117	104	1	0	0

- Molecule 43 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
43	c	77	1277	388	652	129	106	2	0	0

- Molecule 44 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
44	d	120	3870	1144	1301	468	837	120	0	0

- Molecule 45 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
45	e	62	1032	308	531	98	94	1	0	0

- Molecule 46 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
46	f	58	936	281	488	87	78	2	0	0

- Molecule 47 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
47	g	66	1042	323	520	99	94	6	0	0

- Molecule 48 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
48	h	271	4236	1288	2154	423	364	7	0	0

- Molecule 49 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
49	i	56	903	269	459	94	80	1	0	0

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

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
50	j	209	3182	979	1617	288	294	4	0	0

- Molecule 51 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
51	k	52	890	275	464	78	73	0	0

- Molecule 52 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
52	l	201	3171	974	1619	283	290	5	0	0

- Molecule 53 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
53	m	46	795	228	418	90	57	2	0	0

- Molecule 54 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
54	n	177	2853	899	1443	249	256	6	0	0

- Molecule 55 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
55	o	64	1076	323	572	105	74	2	0	0

- Molecule 56 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
56	p	175	2671	826	1358	241	244	2	0	0

- Molecule 57 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
57	q	38	645	185	343	65	48	4	0	0

- Molecule 58 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
58	r	149	2259	699	1148	197	214	1	0	0

- Molecule 59 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
59	s	142	2291	714	1162	212	199	4	0	0

- Molecule 60 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
60	t	123	1969	593	1023	181	166	6	0	0

- Molecule 61 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
61	u	144	2182	654	1129	207	190	2	0	0

- Molecule 62 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
62	v	136	2231	686	1157	205	177	6	0	0

- Molecule 63 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
63	w	119	1945	588	994	195	163	5	0	0

- Molecule 64 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
64	x	116	1815	552	923	178	162	0	0

- Molecule 65 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
65	y	114	1879	574	962	179	163	1	0	0

- Molecule 66 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
66	z	117	1967	604	1020	192	151	0	0

- Molecule 67 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
67	AE	1	1	1	0

- Molecule 68 is ZINC ION (CCD ID: ZN) (formula: Zn).

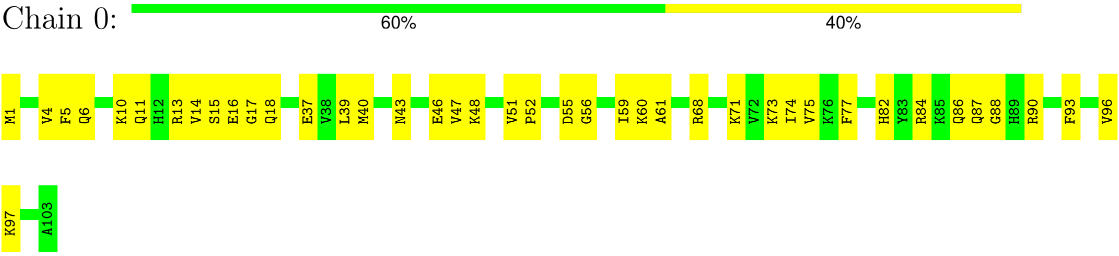
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
68	AE	2	2	2	0

3 Residue-property plots ⓘ

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

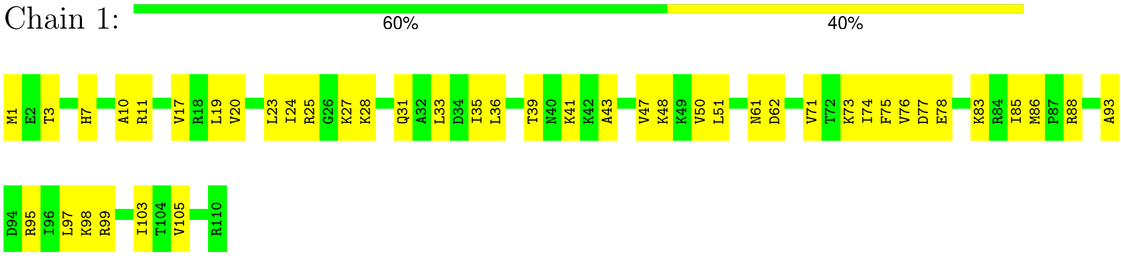
- Molecule 1: Ribosomal protein L21

Chain 0:



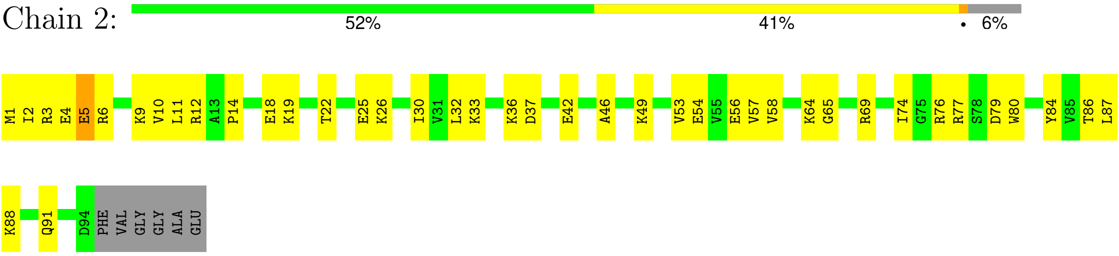
- Molecule 2: 50S ribosomal protein L22

Chain 1:



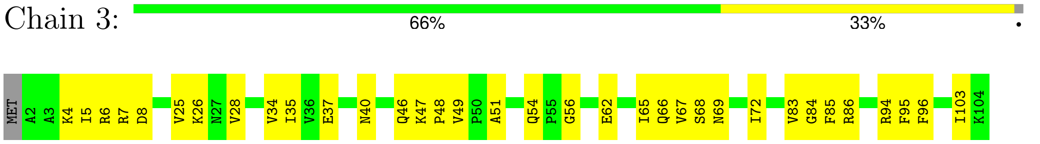
- Molecule 3: 50S ribosomal protein L23

Chain 2:

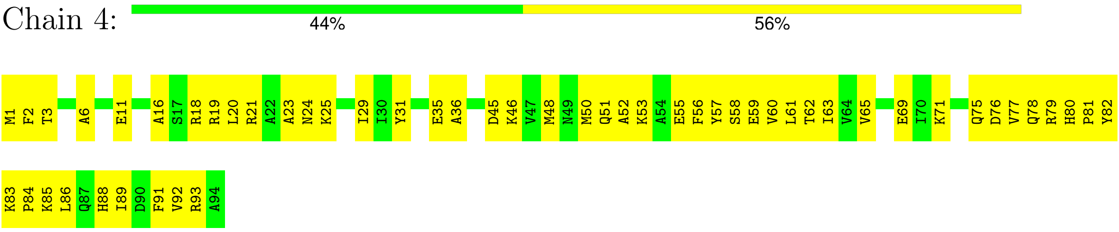


- Molecule 4: 50S ribosomal protein L24

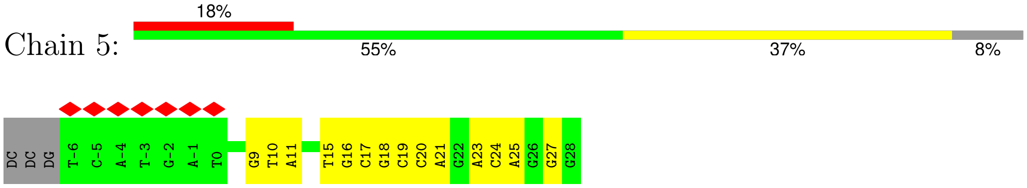
Chain 3:



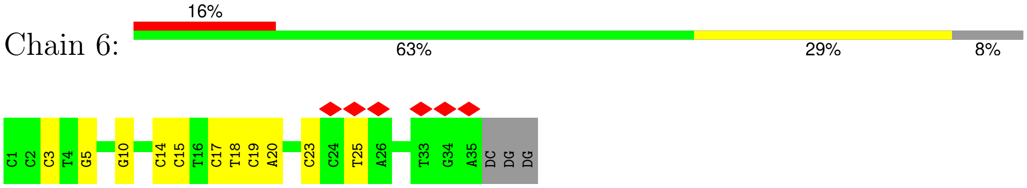
- Molecule 5: 50S ribosomal protein L25



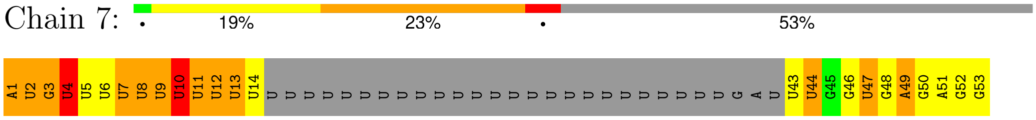
- Molecule 6: NT DNA ops



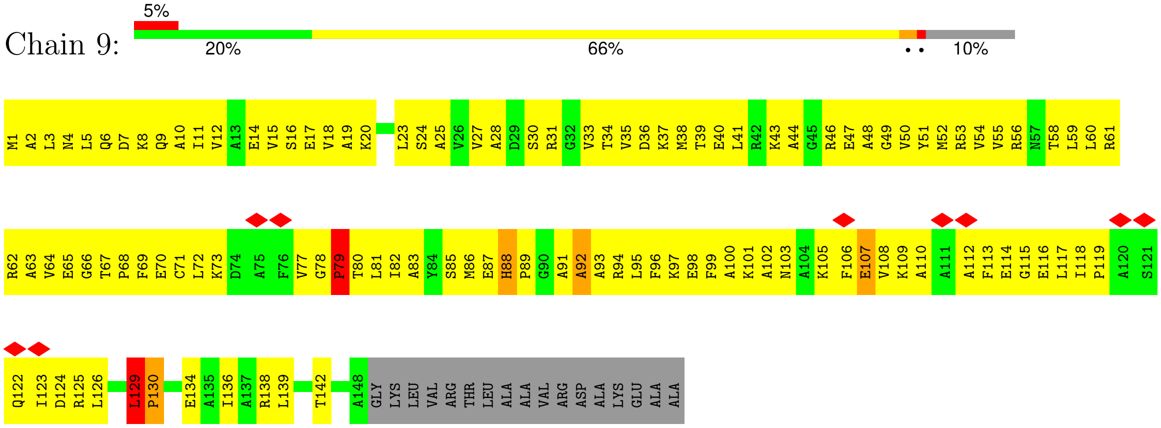
- Molecule 7: T DNA ops



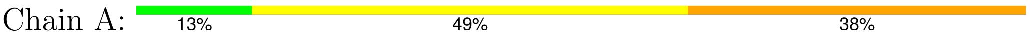
- Molecule 8: mRNA with 36 nt long spacer

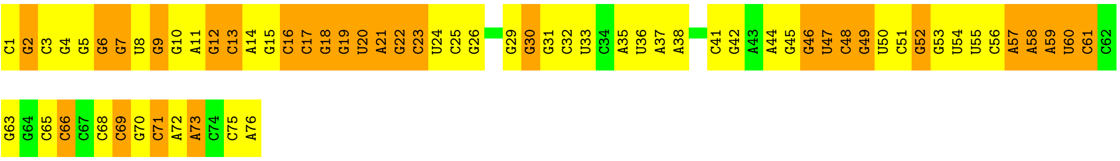


- Molecule 9: 50S ribosomal protein L10



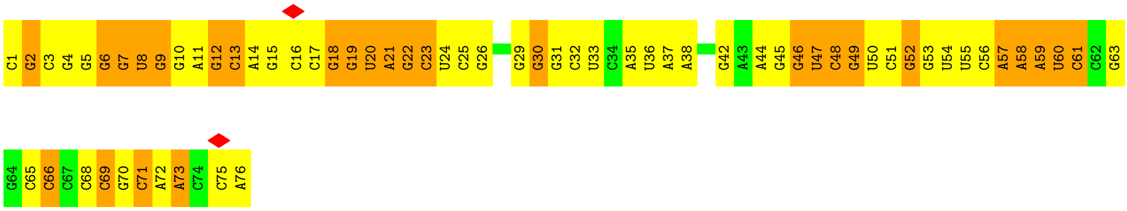
- Molecule 10: E-site and P-site tRNA (fMet)





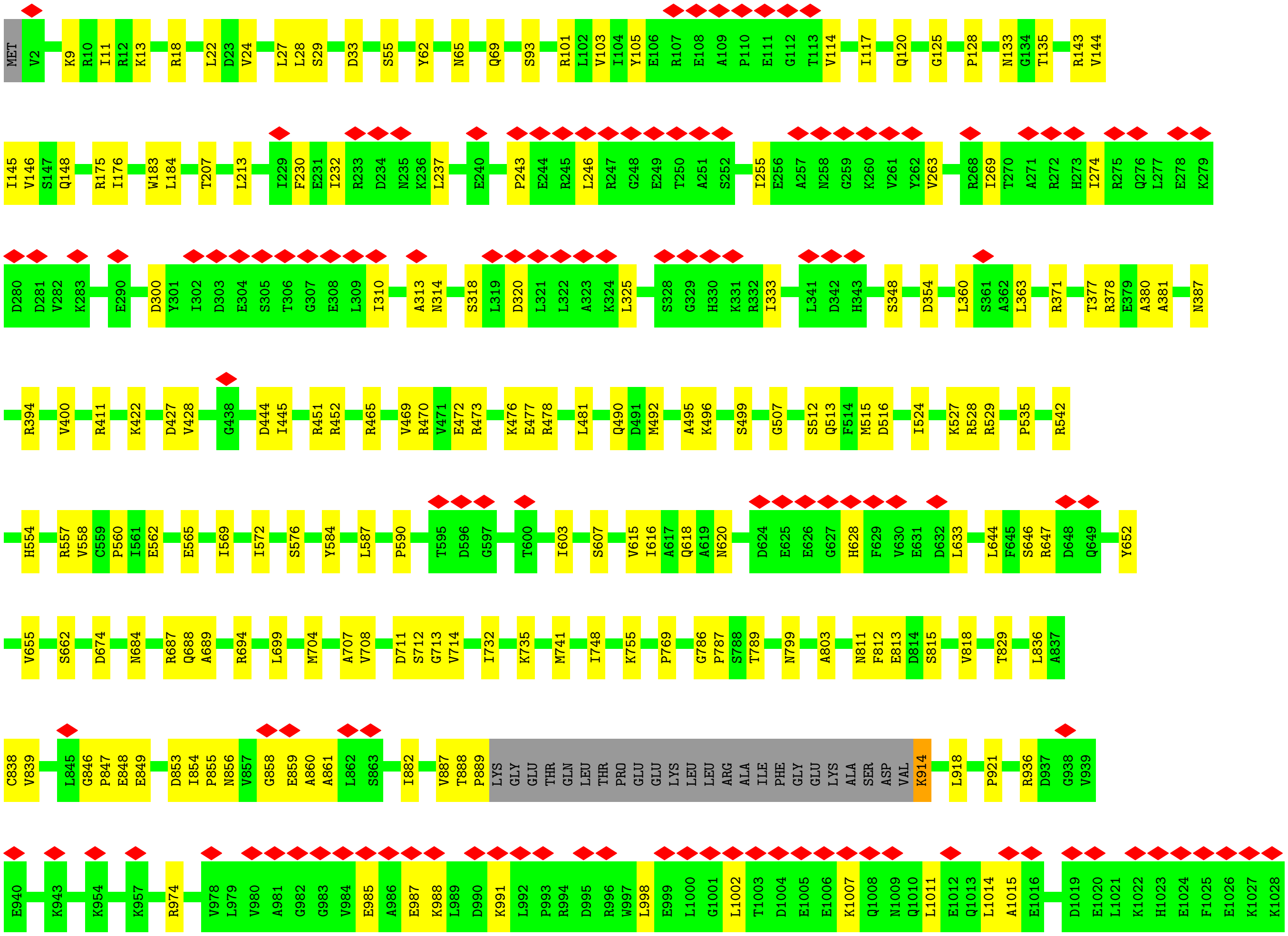
- Molecule 10: E-site and P-site tRNA (fMet)

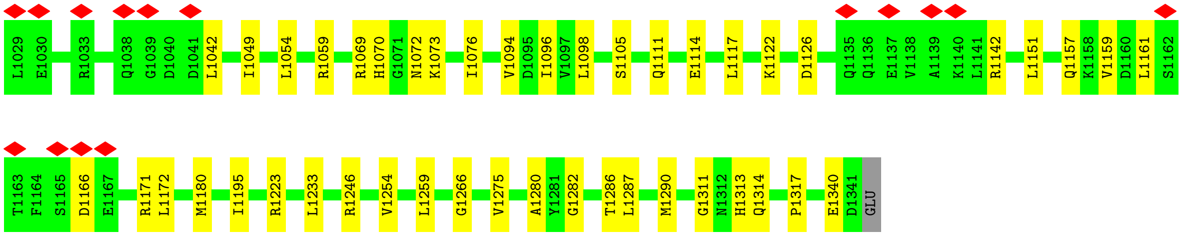
Chain B:



- Molecule 11: DNA-directed RNA polymerase subunit beta

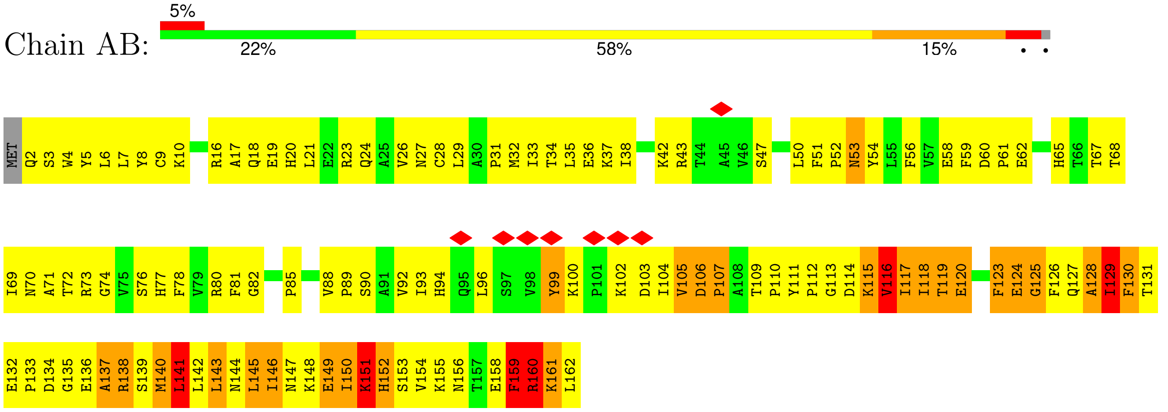
Chain AA:





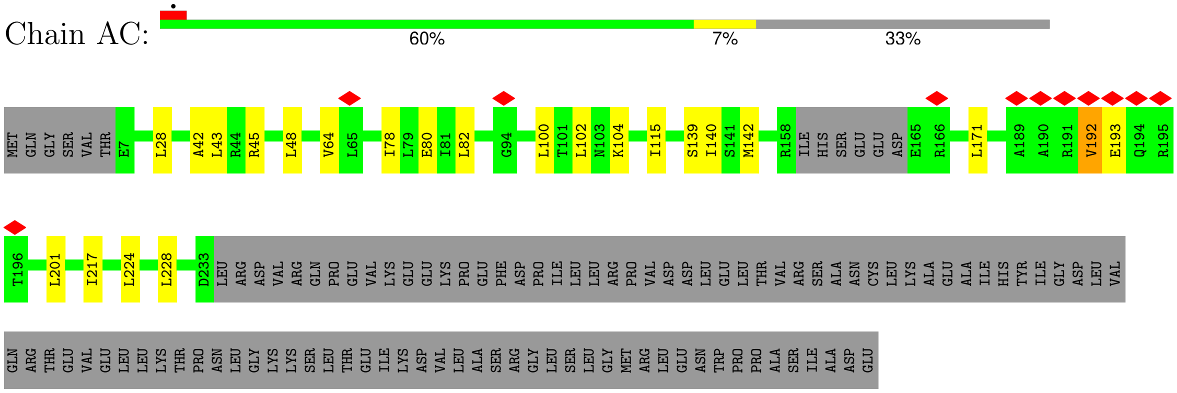
- Molecule 12: Transcription antitermination protein RfaH

Chain AB:



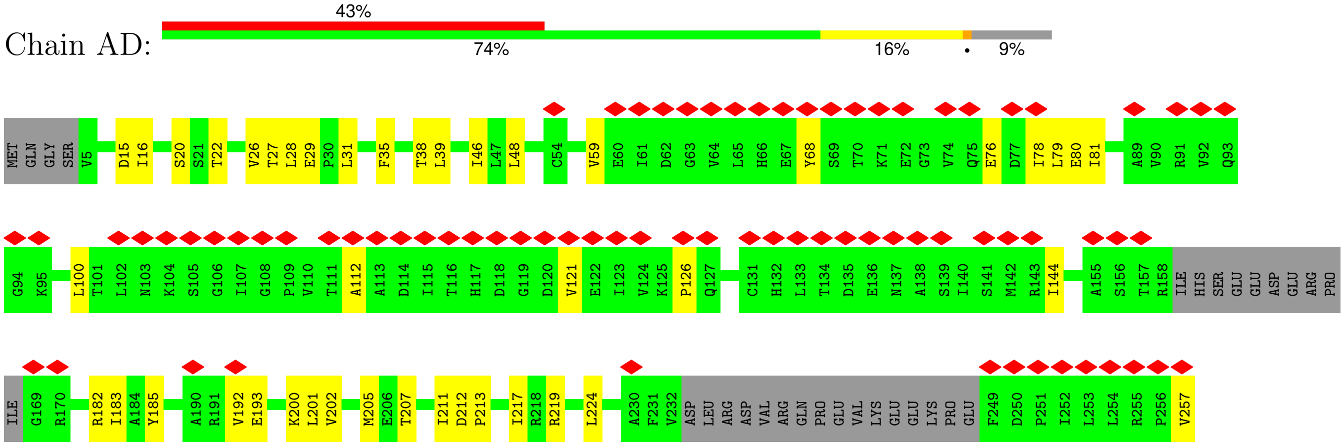
- Molecule 13: DNA-directed RNA polymerase subunit alpha

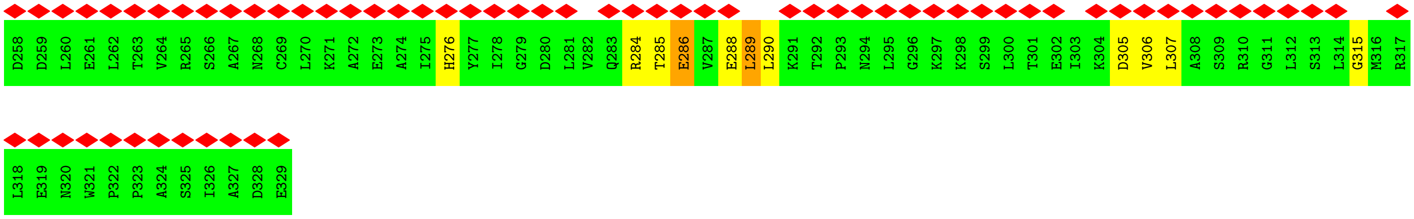
Chain AC:



- Molecule 13: DNA-directed RNA polymerase subunit alpha

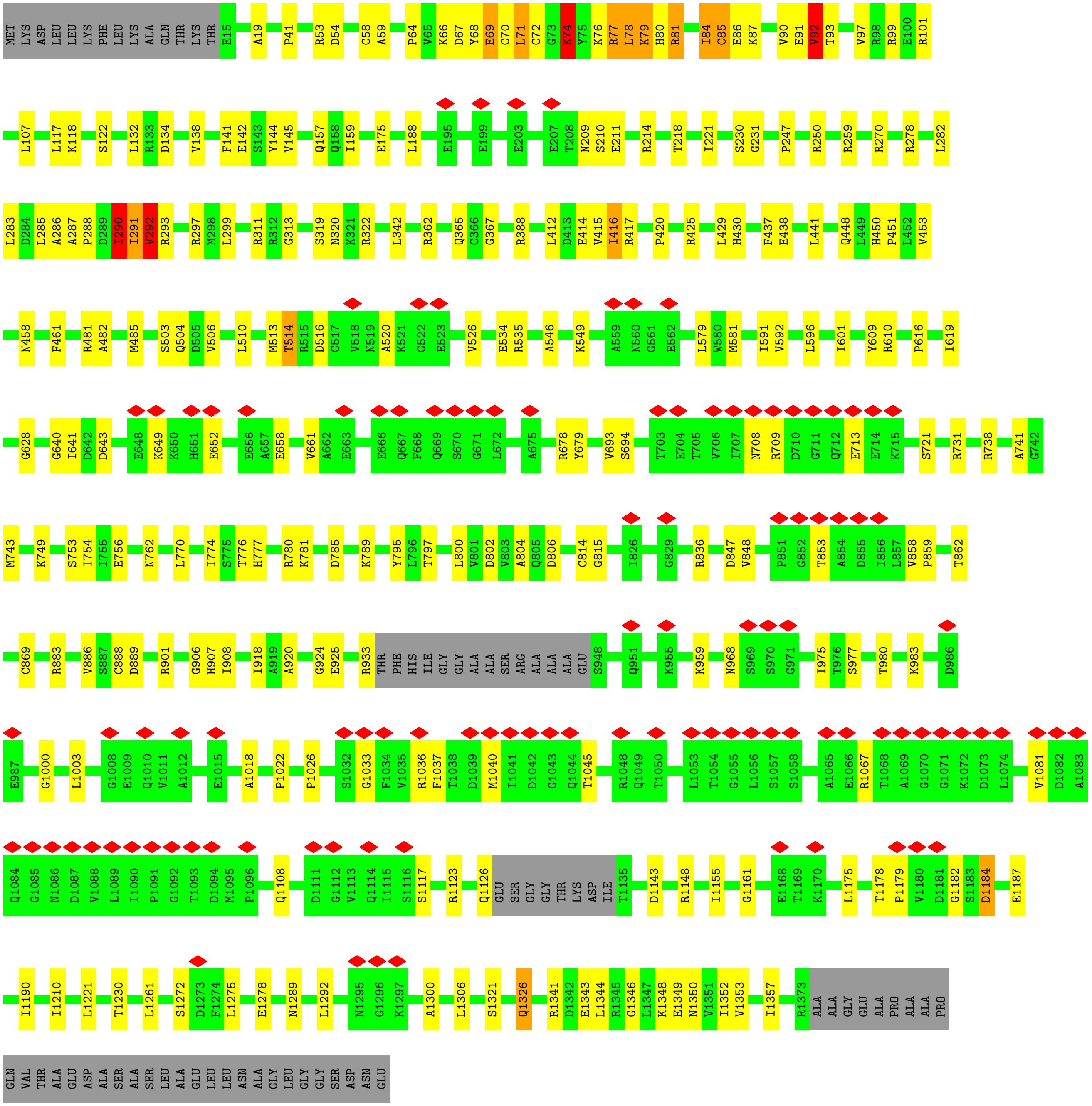
Chain AD:



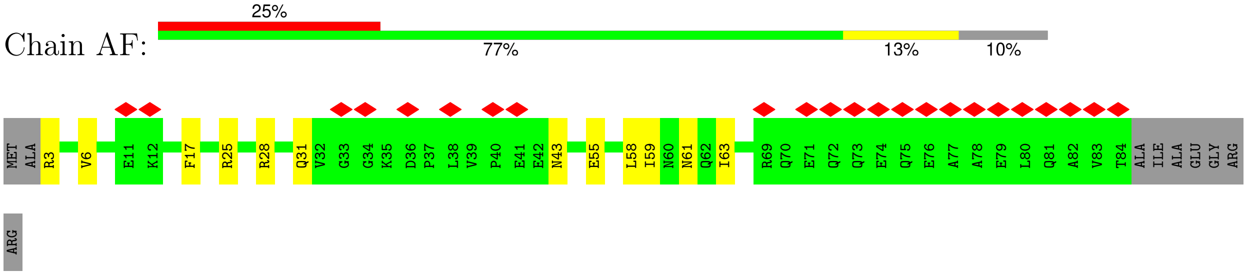


- Molecule 14: DNA-directed RNA polymerase subunit beta'

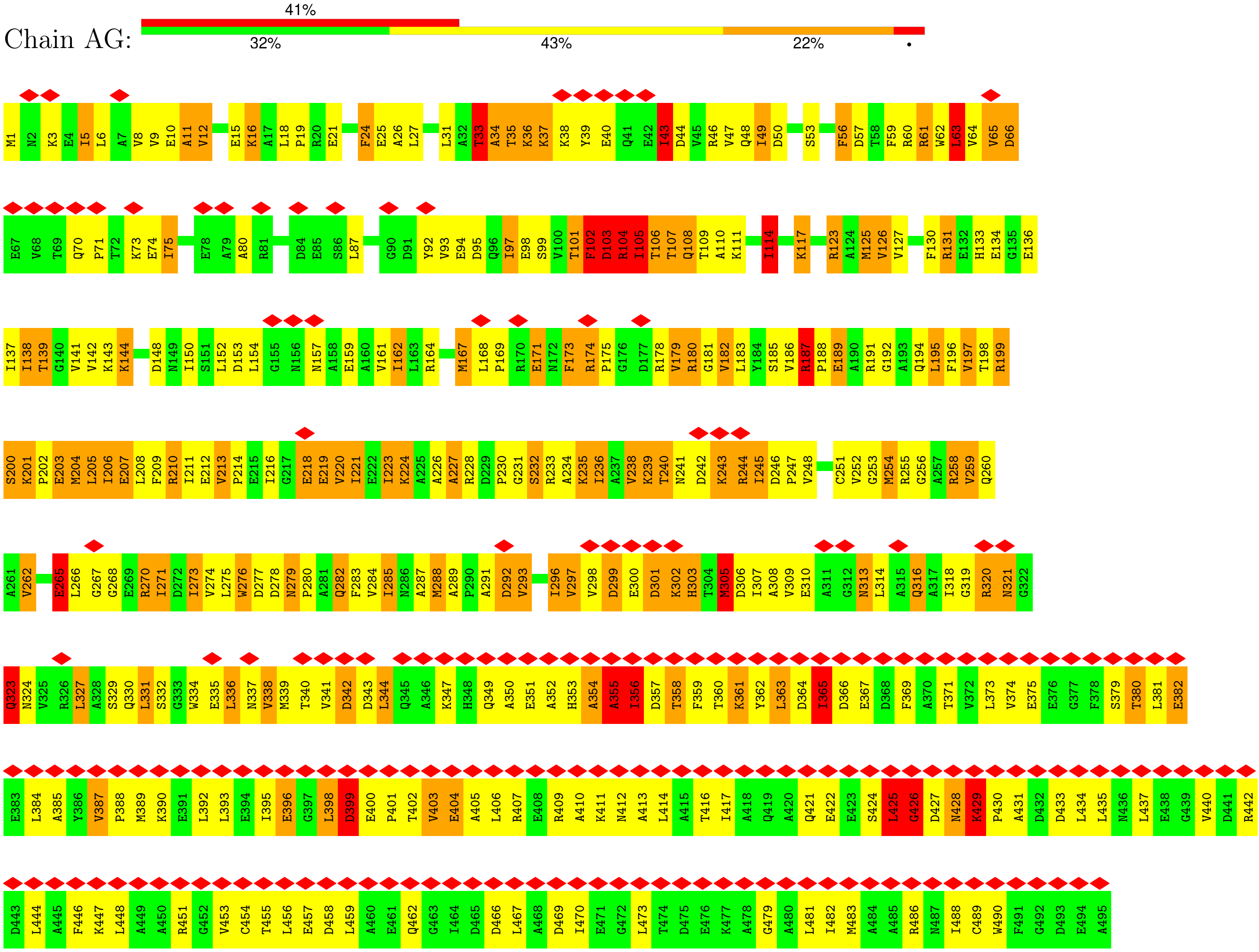
Chain AE:



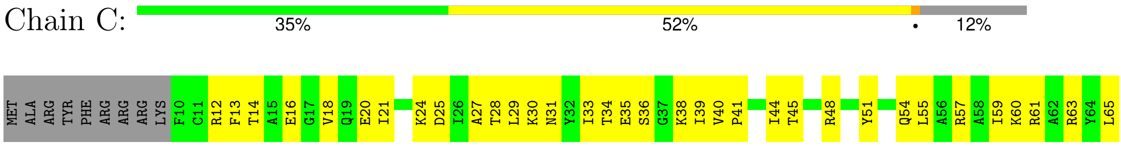
- Molecule 15: DNA-directed RNA polymerase subunit omega

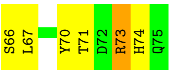


- Molecule 16: Transcription termination/antitermination protein NusA



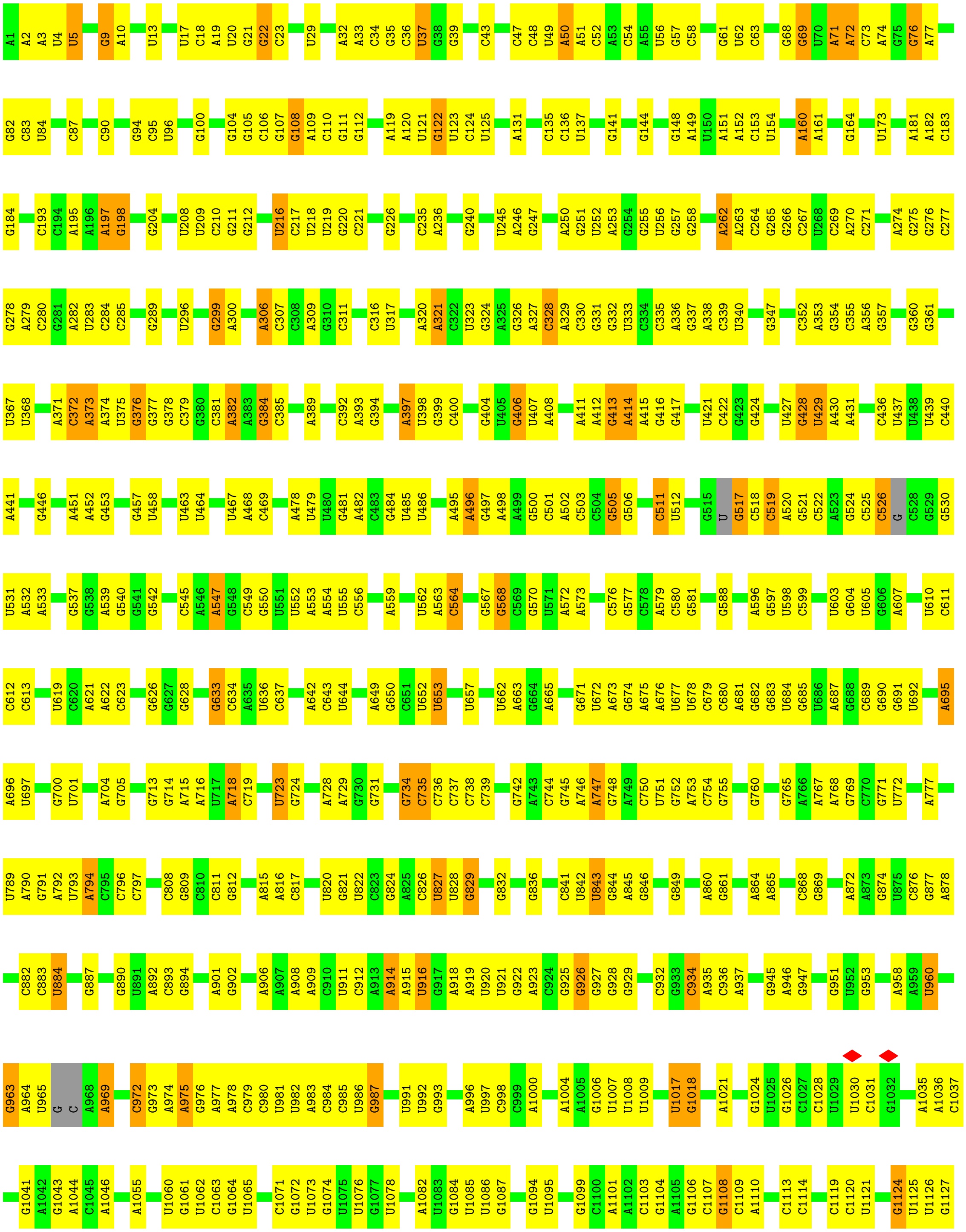
- Molecule 17: 30S ribosomal protein S18

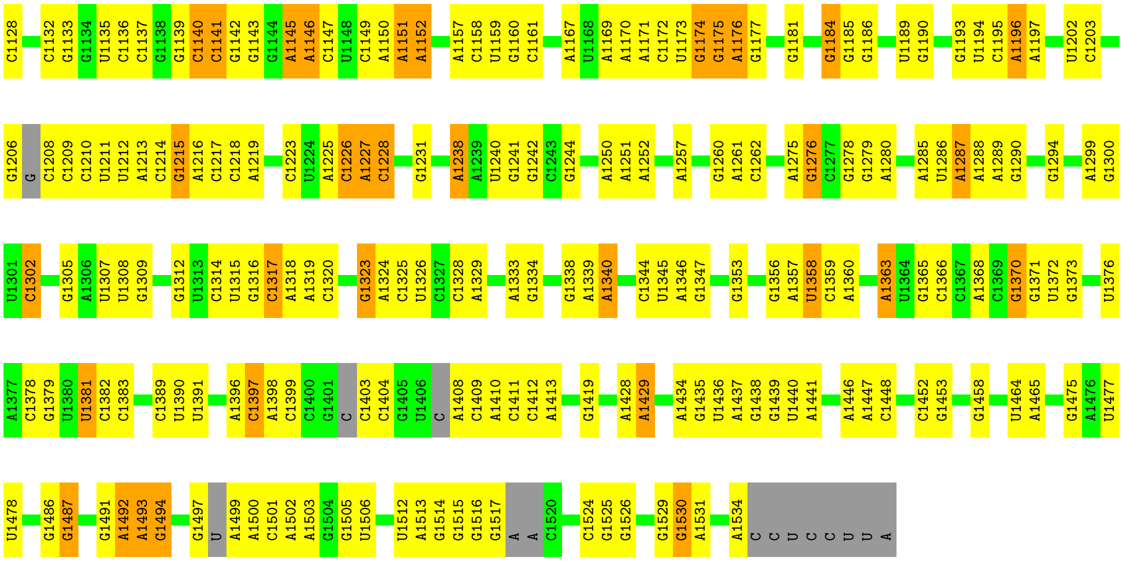




- Molecule 18: 16S rRNA

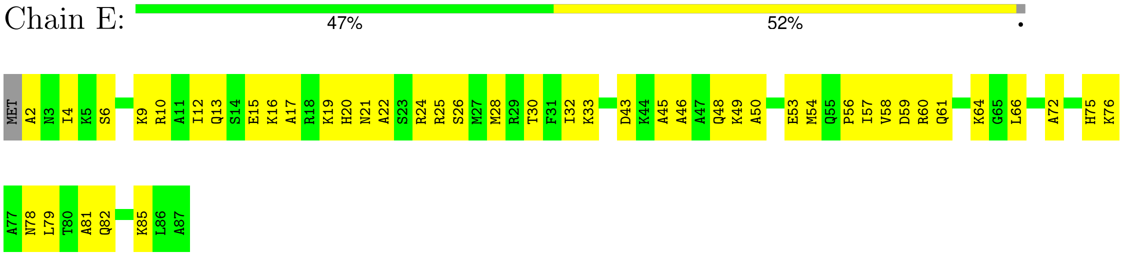
Chain D:





- Molecule 19: 30S ribosomal protein S20

Chain E:

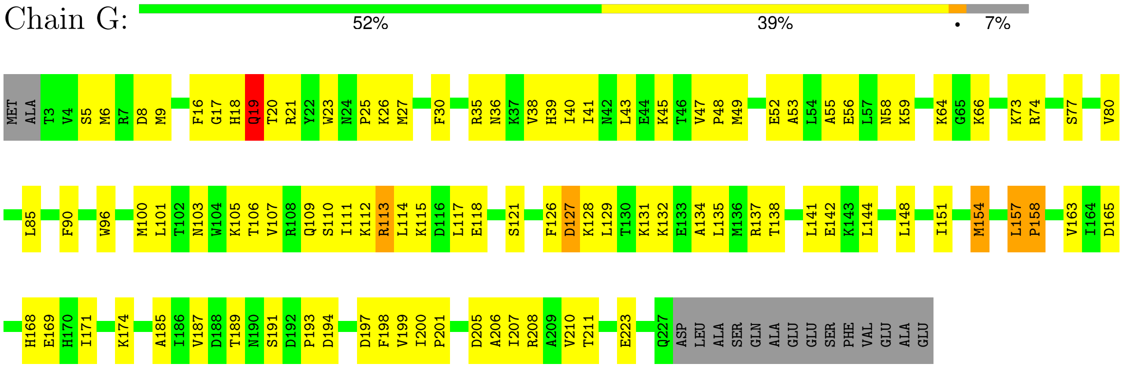


- Molecule 20: 30S ribosomal protein S21

Chain F:

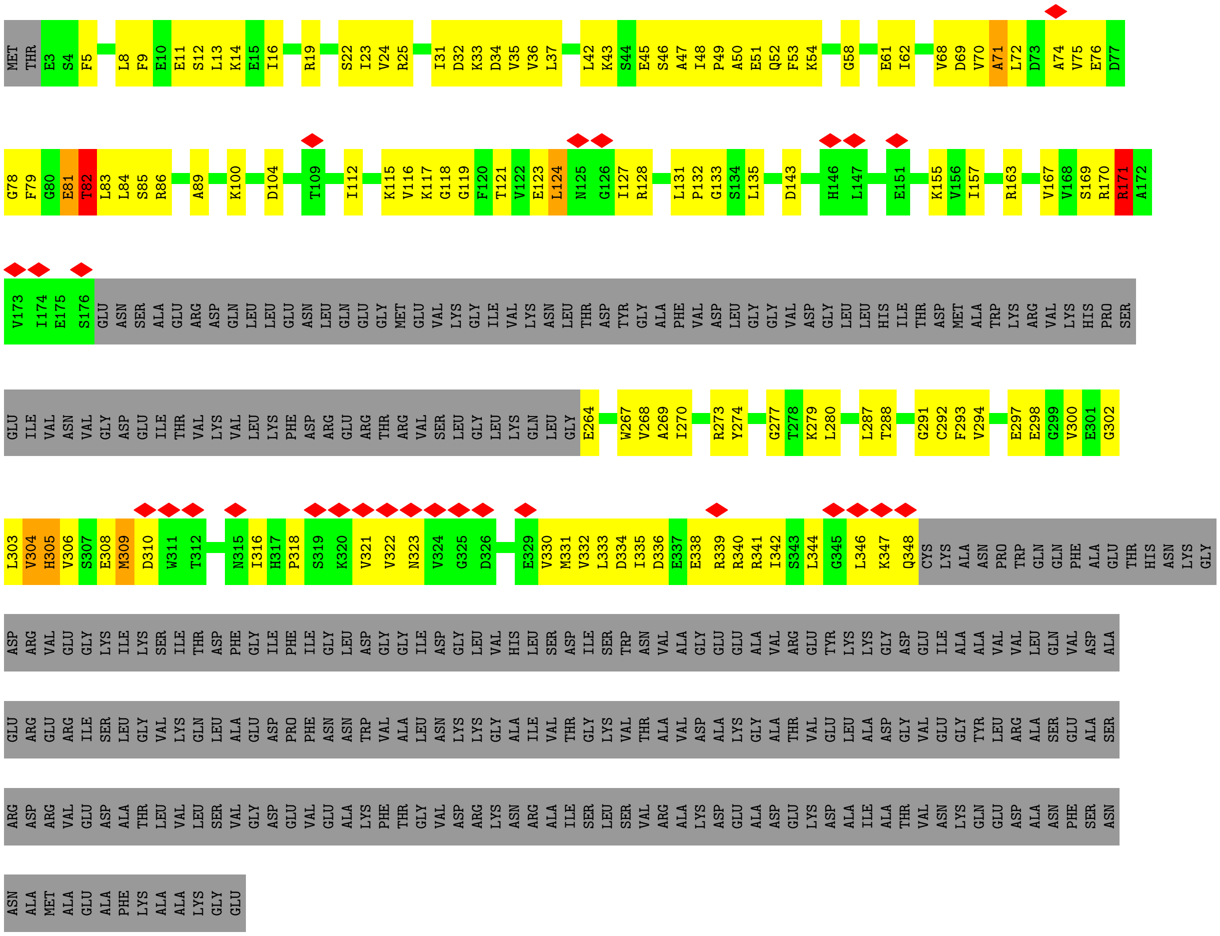
- Molecule 21: 30S ribosomal protein S2

Chain G:



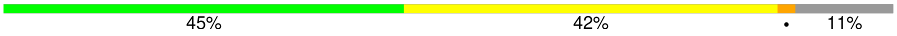
- Molecule 22: 30S ribosomal protein S1

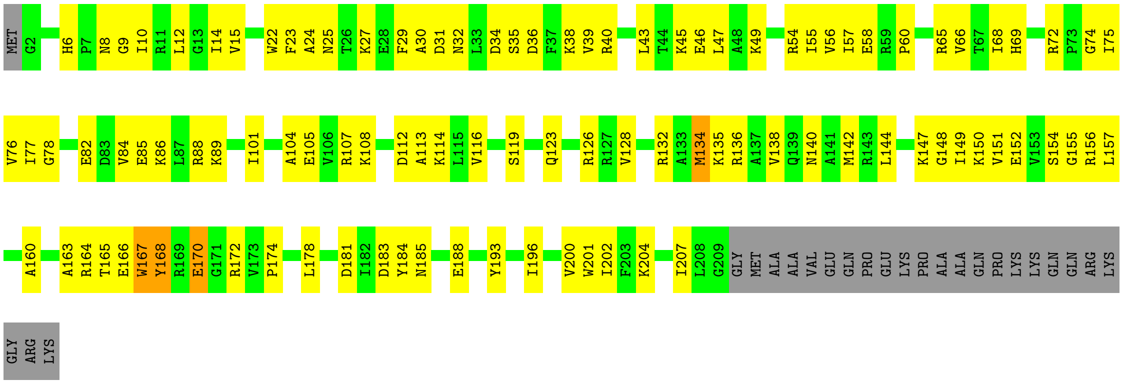
Chain H:



- Molecule 23: 30S ribosomal protein S3

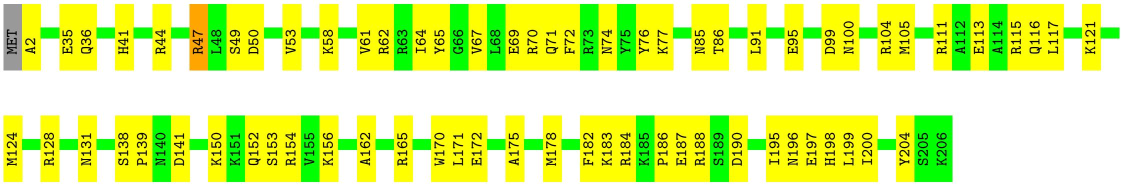
Chain I:





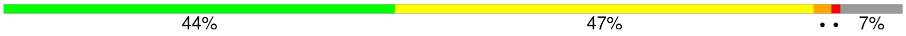
- Molecule 24: 30S ribosomal protein S4

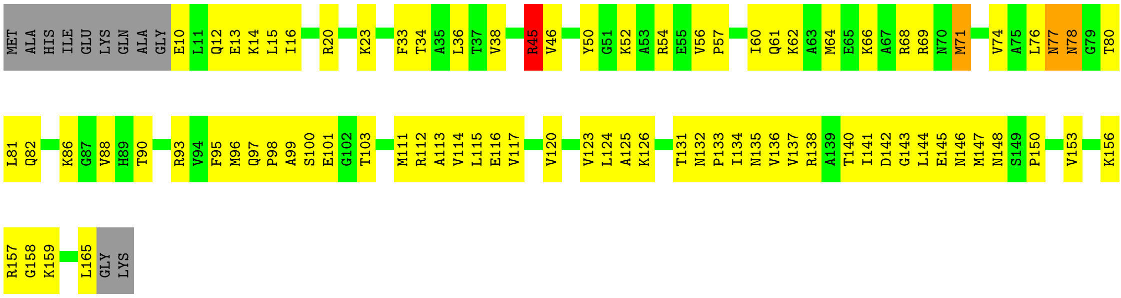
Chain J:



- Molecule 25: 30S ribosomal protein S5

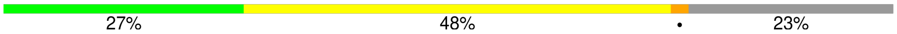
Chain K:

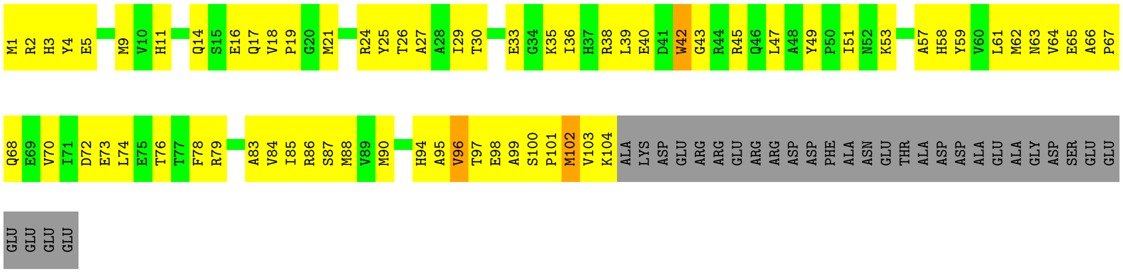




- Molecule 26: 30S ribosomal protein S6

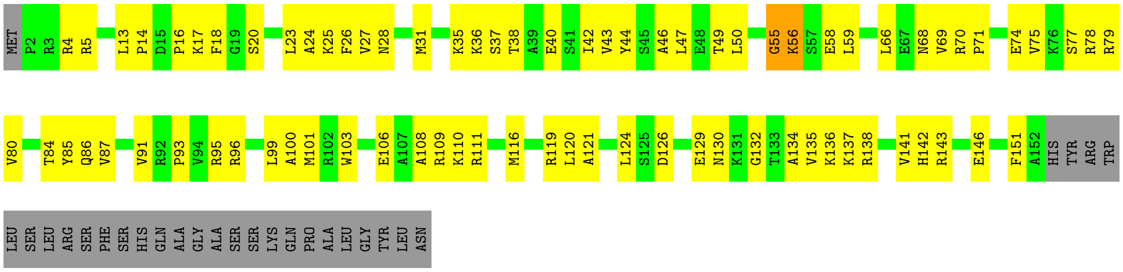
Chain L:





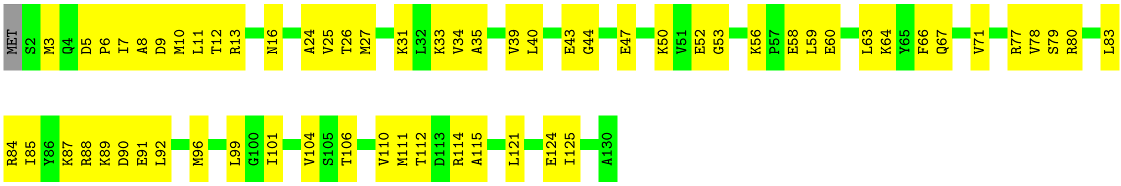
- Molecule 27: 30S ribosomal protein S7

Chain M:



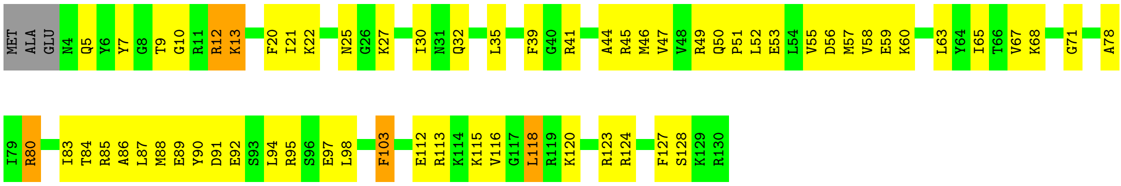
- Molecule 28: 30S ribosomal protein S8

Chain N:



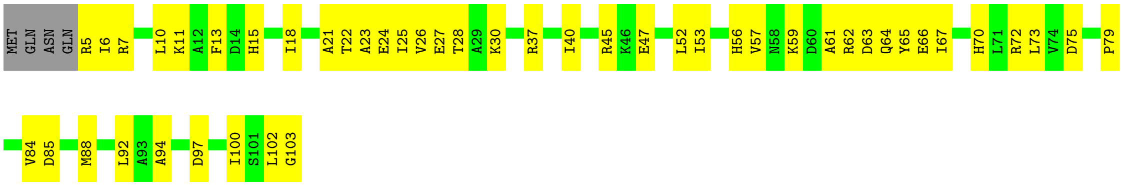
- Molecule 29: 30S ribosomal protein S9

Chain O:



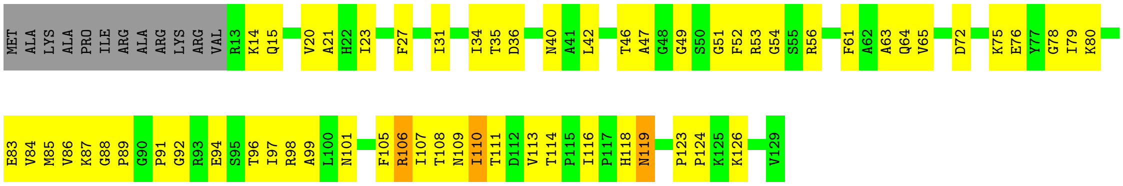
- Molecule 30: 30S ribosomal protein S10

Chain P:



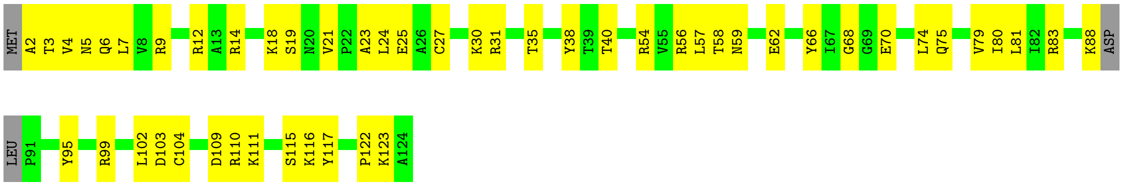
- Molecule 31: 30S ribosomal protein S11

Chain Q:



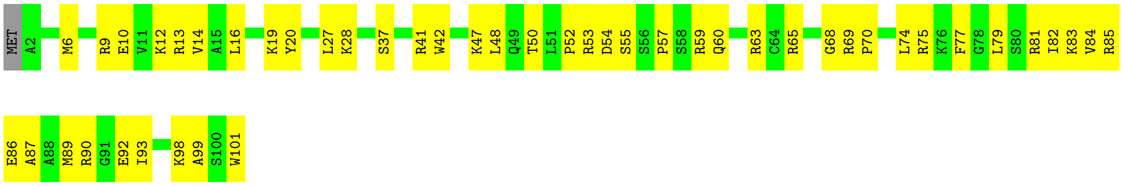
- Molecule 32: 30S ribosomal protein S12

Chain R:

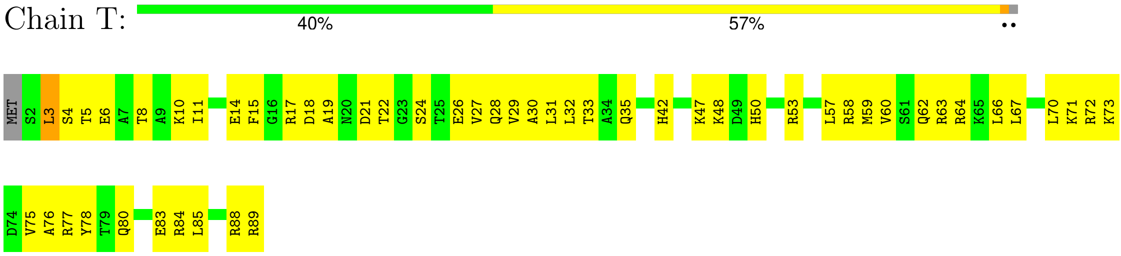


- Molecule 33: 30S ribosomal protein S14

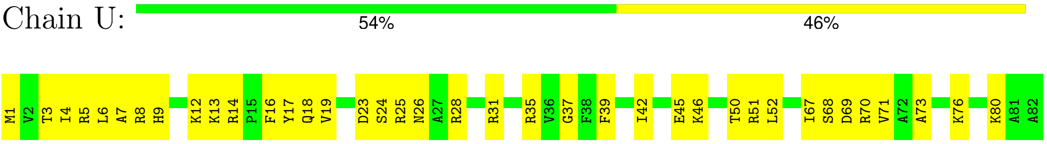
Chain S:



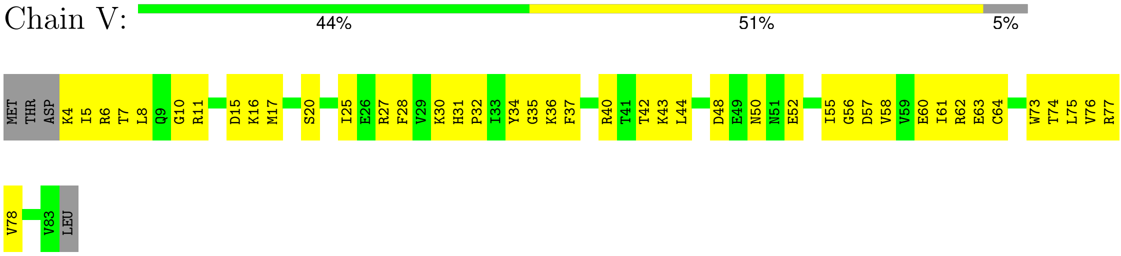
- Molecule 34: Small ribosomal subunit protein uS15



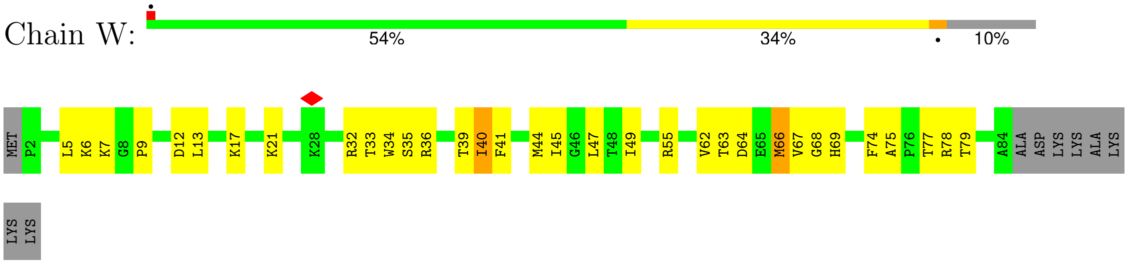
- Molecule 35: 30S ribosomal protein S16



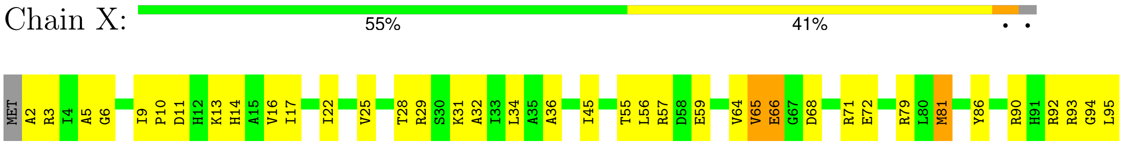
- Molecule 36: 30S ribosomal protein S17



- Molecule 37: 30S ribosomal protein S19

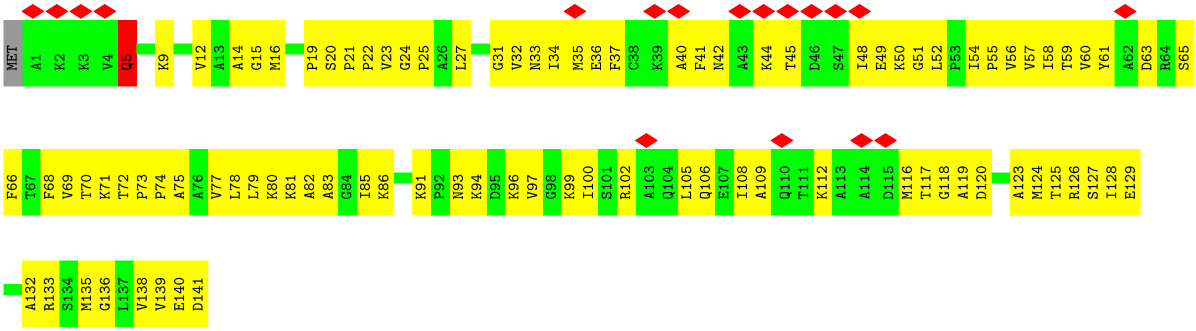


- Molecule 38: 30S ribosomal protein S13



- Molecule 39: 50S ribosomal protein L11

Chain Y:

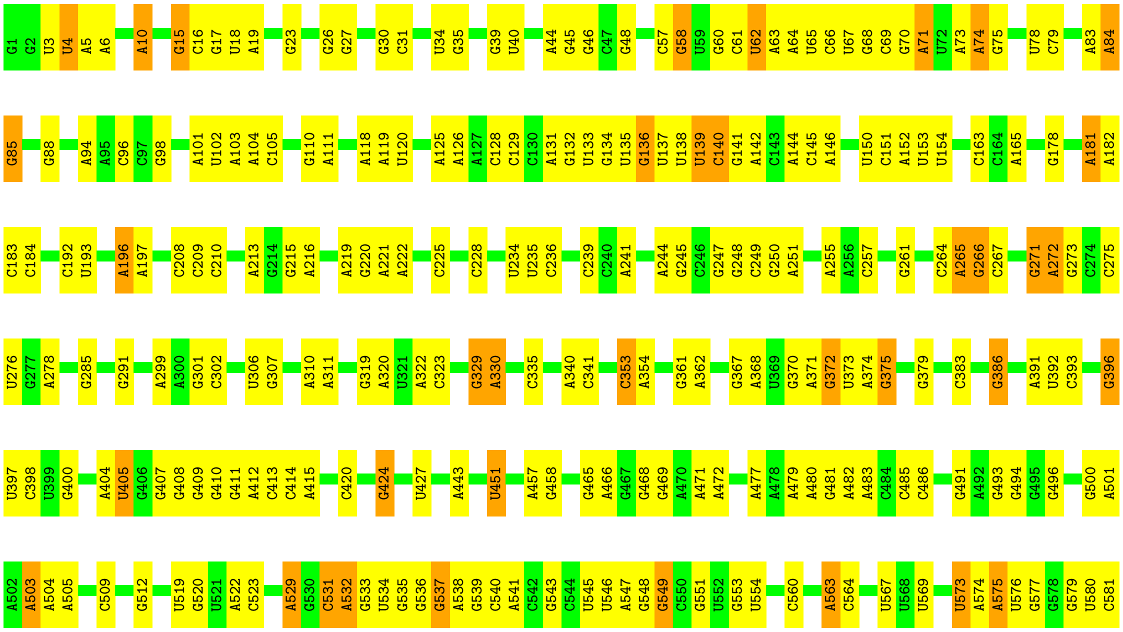


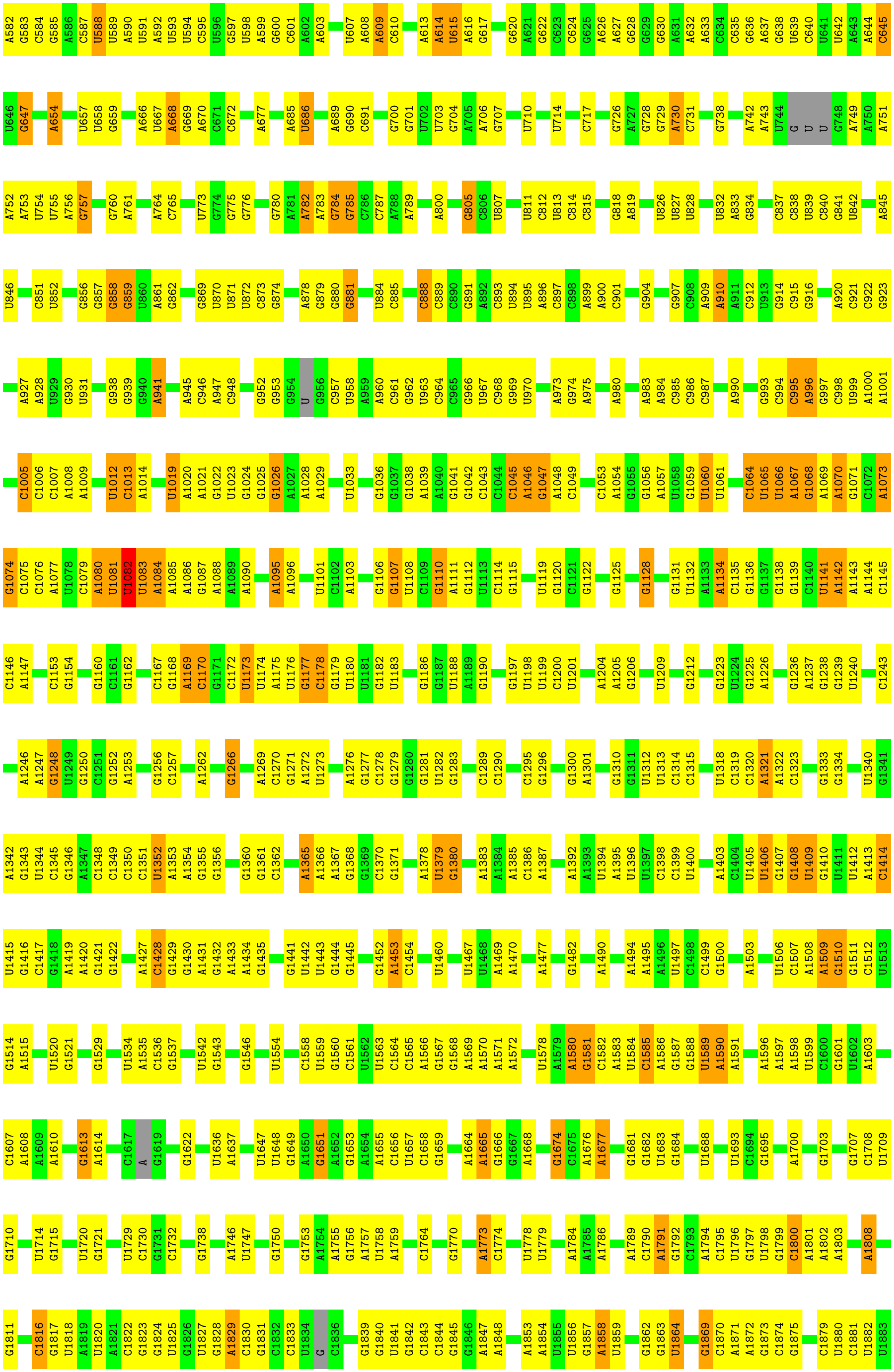
- Molecule 40: 50S ribosomal protein L7/L12

Chain Z:

- Molecule 41: 23S rRNA

Chain a:

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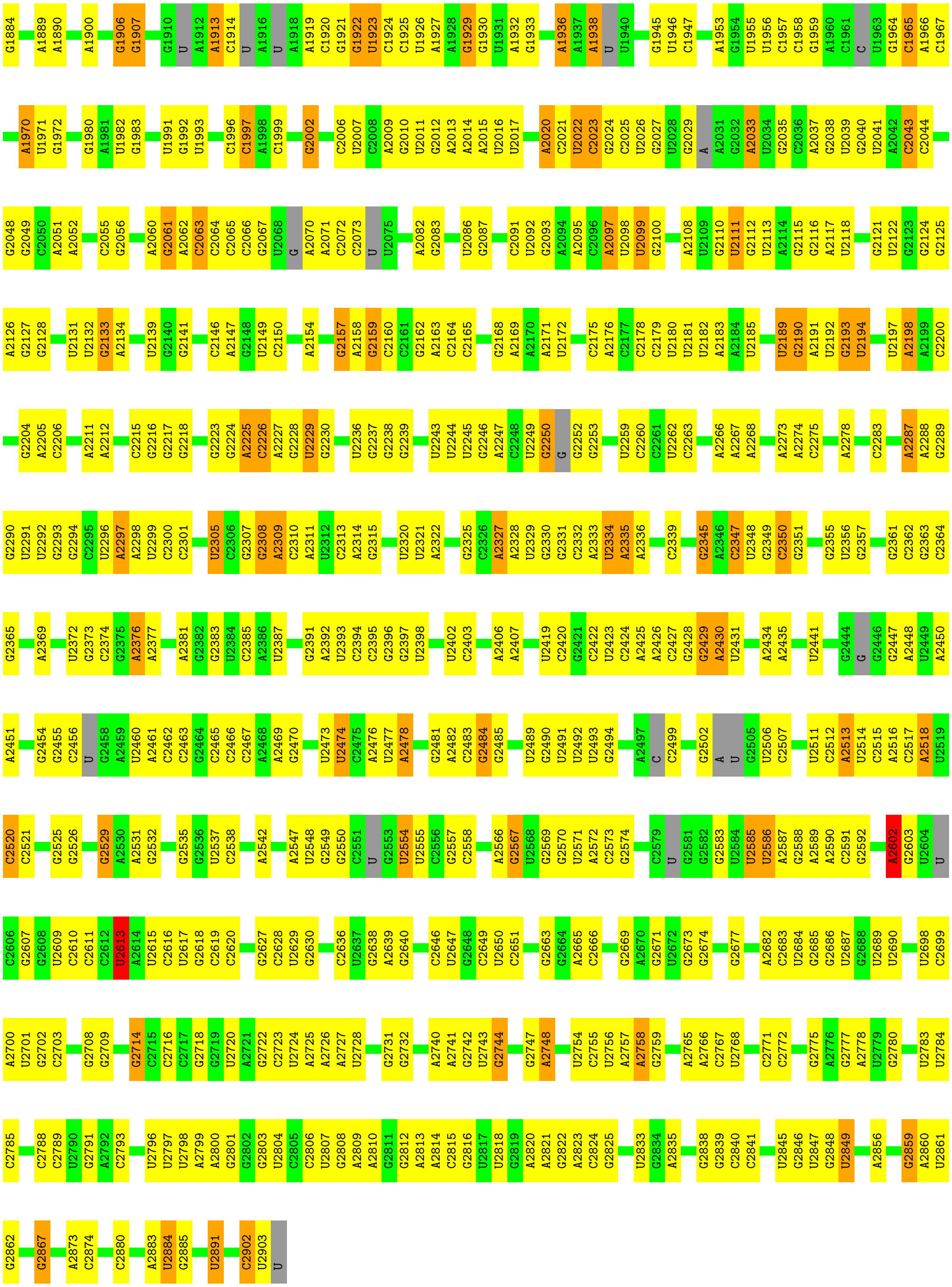
U646 G647 A654 U657 U658 G659 A666 U667 A668 G669 A670 C671 C672 A677 A685 U686 A689 G690 C691 G700 G701 U702 U703 G704 A705 A706 G707 U710 U714 C717 G726 A727 G728 G729 A730 C731 G738 A742 A743 U744 G U U G748 A749 A750 A751
A752 A753 U754 U755 A756 G757 G760 A761 A764 C765 U773 G774 G775 G776 G780 A781 A782 A783 G784 G785 C786 C787 A788 A789 A800 G805 C806 U807 U811 C812 U813 C814 C815 G818 A819 U826 U827 U828 U832 A833 G834 C837 C838 U839 C840 G841 U842 A845
U846 C851 U852 G856 G857 G858 G859 U860 A861 G862 G869 U870 U871 U872 C873 G874 A878 G879 G880 G881 U884 C885 C888 C889 C890 G891 A892 C893 U894 U895 A896 C897 C898 A899 A900 C901 G904 G907 C908 A909 A910 A911 C912 U913 G914 C915 G916 A920 C921 C922 G923
A927 A928 U929 G930 U931 G938 G939 G940 A941 A945 C946 A947 C948 G952 G953 G954 U G956 C957 U958 A959 A960 C961 G962 U963 C964 C965 C966 U967 C968 G969 U970 A973 G974 A975 A980 A983 A984 C985 C986 C987 A990 G993 C994 C995 A996 G997 C998 U999 A1000 A1001
C1005 C1006 C1007 A1008 A1009 U1012 C1013 A1014 U1019 A1020 A1021 G1022 U1023 G1024 G1025 G1026 A1027 A1028 A1029 U1033 G1036 G1037 G1038 A1039 A1040 G1041 C1042 C1043 C1044 C1045 A1046 G1047 A1048 C1049 C1053 A1054 G1055 G1056 A1057 U1058 G1059 U1060 U1061 C1064 U1065 U1066 A1067 G1068 A1069 A1070 G1071 C1072 A1073
G1074 C1075 C1076 A1077 U1078 C1079 A1080 U1081 U1082 U1083 A1084 A1085 A1086 G1087 A1088 A1089 A1090 A1095 A1096 U1101 C1102 A1103 G1106 G1107 U1108 C1109 G1110 A1111 G1112 U1113 C1114 G1115 U1119 G1120 C1121 G1122 G1125 G1128 G1131 U1132 A1133 A1134 C1135 G1136 G1137 G1138 G1139 C1140 U1141 A1142 A1143 A1144 C1145
C1146 A1147 C1153 G1154 G1160 C1161 G1162 C1167 G1168 A1169 C1170 G1171 C1172 U1173 U1174 A1175 U1176 G1177 C1178 G1179 U1180 U1181 G1182 U1183 G1186 G1187 U1188 A1189 G1190 G1197 U1198 U1199 C1200 U1201 A1204 A1205 G1206 U1209 G1212 G1223 U1224 G1225 A1226 G1236 A1237 G1238 G1239 U1240 C1243
A1246 A1247 G1248 U1249 G1250 C1251 G1252 A1253 G1256 C1257 A1262 G1266 A1269 C1270 G1271 A1272 U1273 A1276 G1277 C1278 G1279 G1280 G1281 U1282 G1283 C1289 C1290 C1295 G1296 G1300 A1301 G1310 G1311 U1312 U1313 C1314 C1315 U1318 C1319 C1320 A1321 A1322 C1323 G1333 G1334 U1340 G1341
A1342 G1343 U1344 C1345 G1346 A1347 C1348 C1349 C1350 C1351 U1352 A1353 A1354 G1355 G1356 G1360 G1361 C1362 A1365 A1366 A1367 G1368 G1369 C1370 G1371 A1378 U1379 G1380 A1383 A1384 A1385 C1386 A1387 A1392 A1393 U1394 A1395 U1396 U1397 C1398 C1399 U1400 A1403 C1404 U1405 U1406 G1407 G1408 U1409 G1410 U1411 U1412 A1413 C1414
U1415 G1416 C1417 G1418 A1419 A1420 G1421 G1422 A1427 C1428 G1429 G1430 A1431 G1432 A1433 A1434 G1435 G1441 U1442 U1443 G1444 G1445 G1452 A1453 C1454 U1460 U1467 U1468 A1469 A1470 A1477 G1482 A1490 A1494 A1495 A1496 U1497 C1498 C1499 G1500 A1503 U1506 C1507 A1508 A1509 G1510 G1511 C1512 U1513
G1514 A1515 U1520 G1521 G1529 U1534 A1535 C1536 G1537 U1542 G1543 G1546 U1554 C1558 U1559 G1560 C1561 U1562 U1563 C1564 C1565 A1566 G1567 G1568 A1569 A1570 A1571 A1572 U1578 A1579 A1580 G1581 C1582 A1583 U1584 C1585 A1586 G1587 G1588 U1589 A1590 A1591 A1596 A1597 A1598 U1599 C1600 G1601 U1602 A1603
C1607 A1608 A1609 A1610 G1613 A1614 C1617 A G1619 G1622 U1636 A1637 U1647 U1648 G1649 A1650 G1651 A1652 G1653 A1654 A1655 C1656 U1657 C1658 G1659 A1664 A1665 G1666 G1667 A1668 G1674 C1675 A1676 A1677 G1681 G1682 U1683 G1684 U1688 U1693 C1694 G1695 A1700 G1703 G1707 C1708 U1709
G1710 U1714 G1715 U1720 G1721 U1729 C1730 G1731 C1732 G1738 A1746 U1747 G1750 G1753 A1754 A1755 G1756 A1757 U1758 A1759 C1764 G1770 A1773 C1774 U1778 U1779 A1784 A1785 A1786 A1789 C1790 A1791 G1792 C1793 A1794 C1795 U1796 G1797 U1798 G1799 C1800 A1801 A1802 A1803 A1808
G1811 C1816 G1817 U1818 A1819 U1820 A1821 C1822 G1823 G1824 U1825 G1826 U1827 G1828 A1829 C1830 G1831 C1832 C1833 U1834 G C1836 G1839 G1840 U1841 G1842 C1843 C1844 G1845 G1846 A1847 A1848 A1853 A1854 U1855 G1856 G1857 A1858 U1859 G1862 G1863 U1864 G1869 C1870 A1871 A1872 G1873 C1874 G1875 C1879 U1880 C1881 U1882 U1883

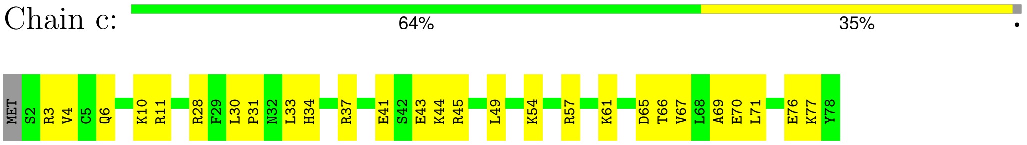


- Molecule 42: 50S ribosomal protein L27

Chain b:

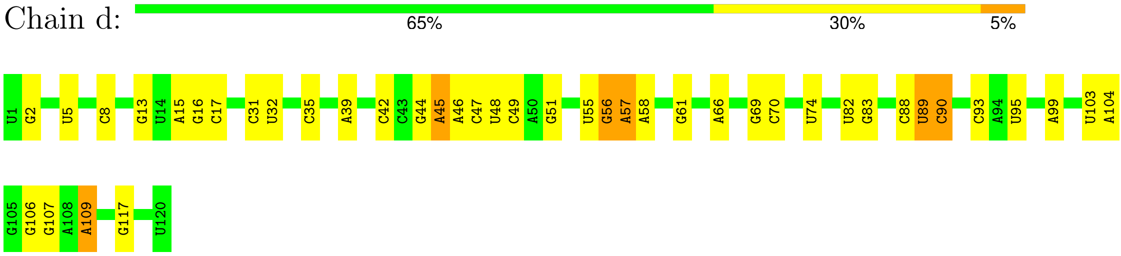
- Molecule 43: 50S ribosomal protein L28

Chain c:



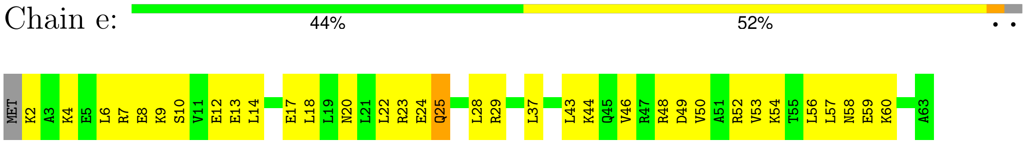
- Molecule 44: 5S rRNA

Chain d:



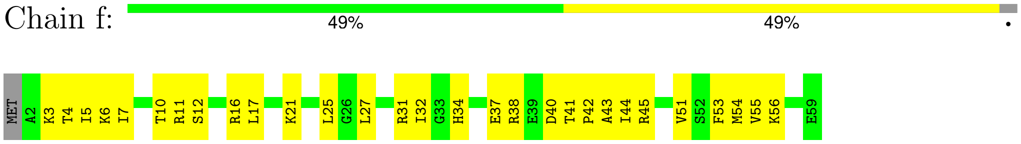
- Molecule 45: 50S ribosomal protein L29

Chain e:



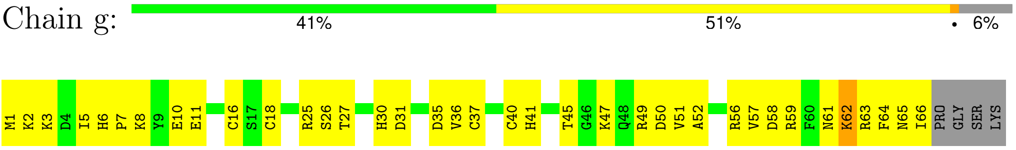
- Molecule 46: 50S ribosomal protein L30

Chain f:



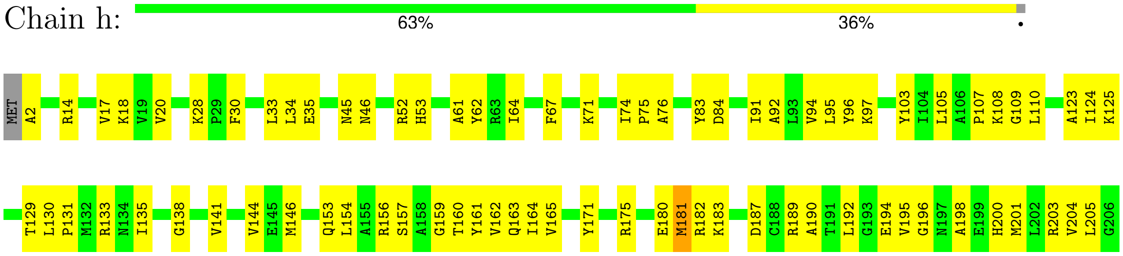
- Molecule 47: 50S ribosomal protein L31

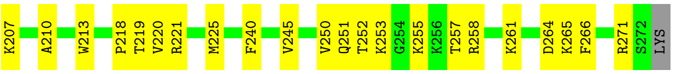
Chain g:



- Molecule 48: 50S ribosomal protein L2

Chain h:



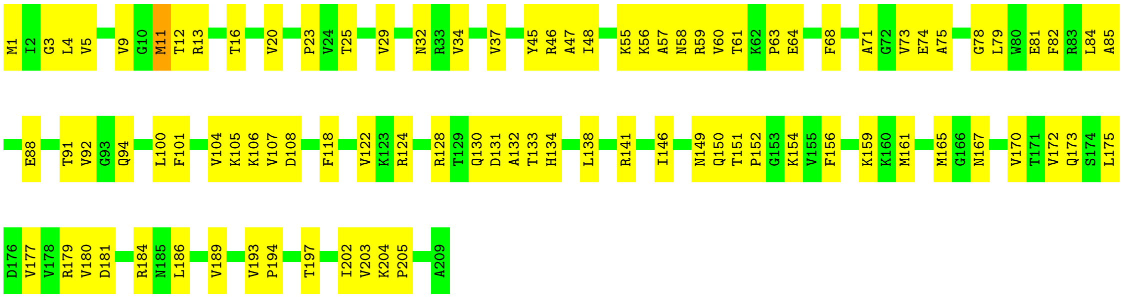


- Molecule 49: 50S ribosomal protein L32

Chain i:

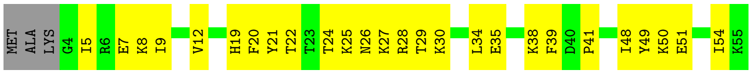
- Molecule 50: 50S ribosomal protein L3

Chain j:



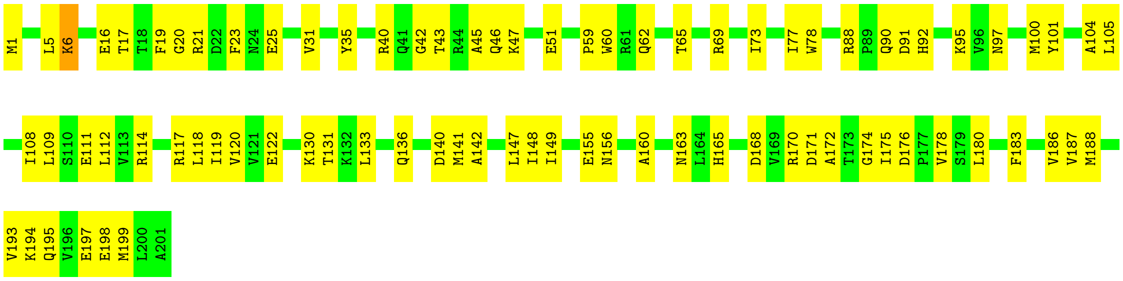
- Molecule 51: 50S ribosomal protein L33

Chain k:



- Molecule 52: 50S ribosomal protein L4

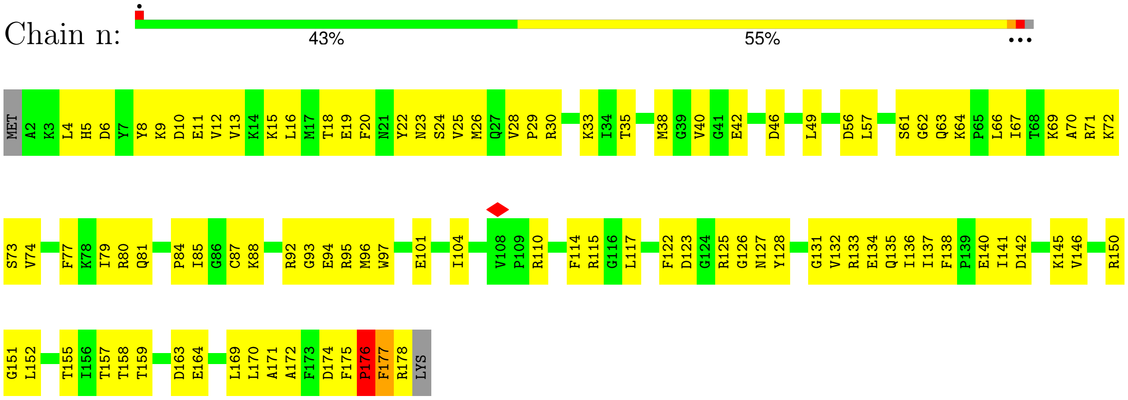
Chain l:



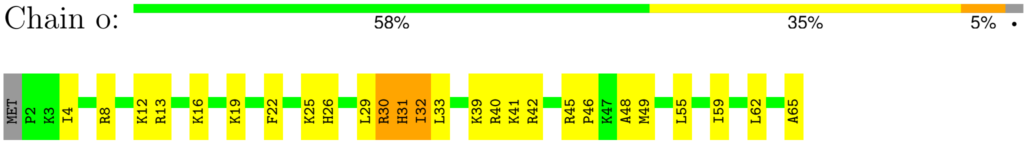
- Molecule 53: 50S ribosomal protein L34

Chain m:

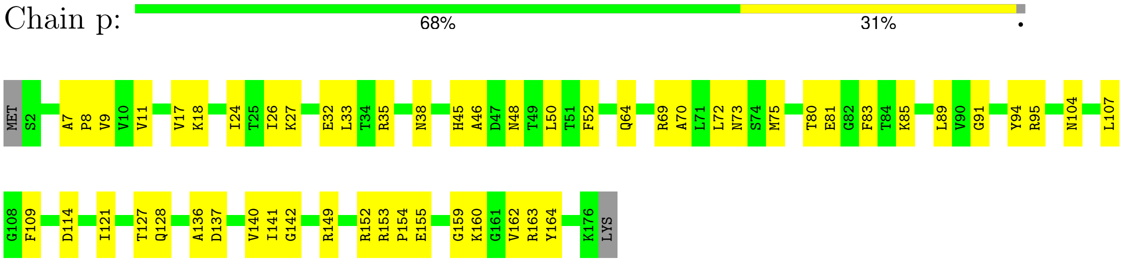
- Molecule 54: 50S ribosomal protein L5



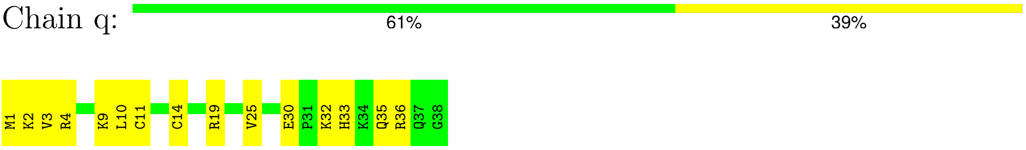
- Molecule 55: 50S ribosomal protein L35



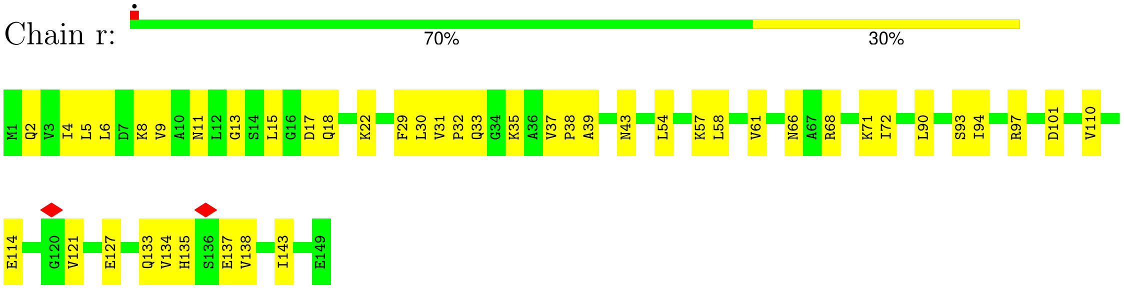
- Molecule 56: 50S ribosomal protein L6



- Molecule 57: 50S ribosomal protein L36

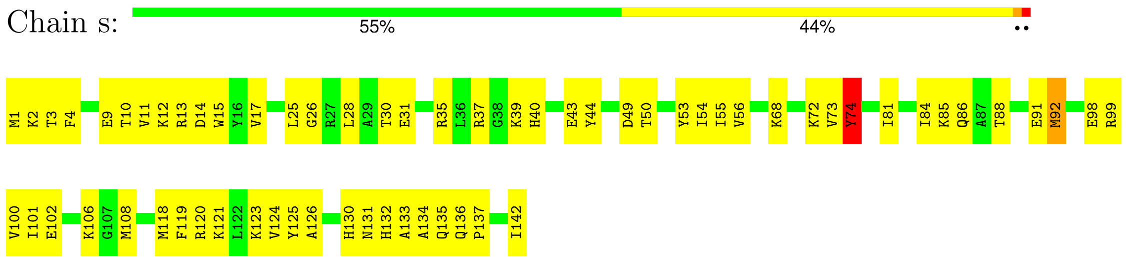


- Molecule 58: 50S ribosomal protein L9



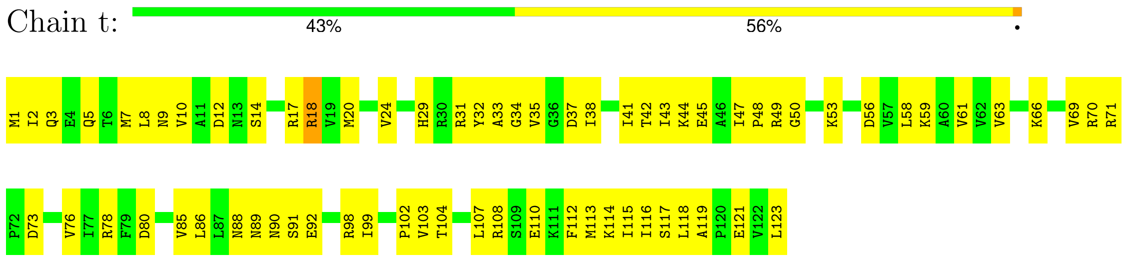
- Molecule 59: 50S ribosomal protein L13

Chain s:



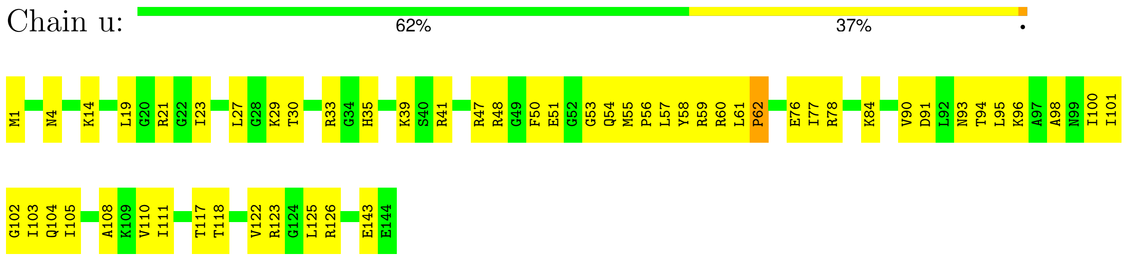
- Molecule 60: 50S ribosomal protein L14

Chain t:



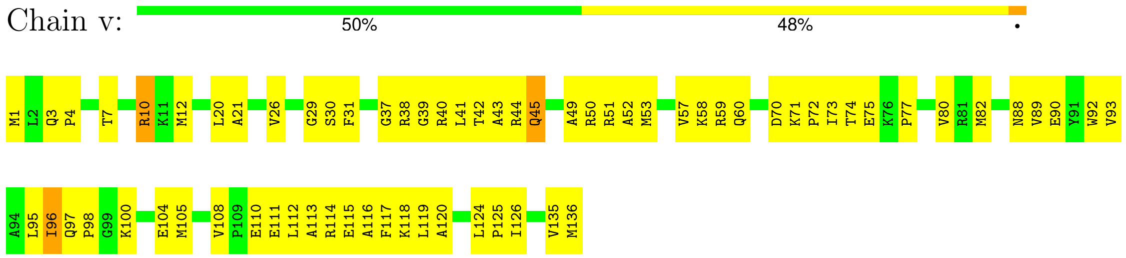
- Molecule 61: 50S ribosomal protein L15

Chain u:



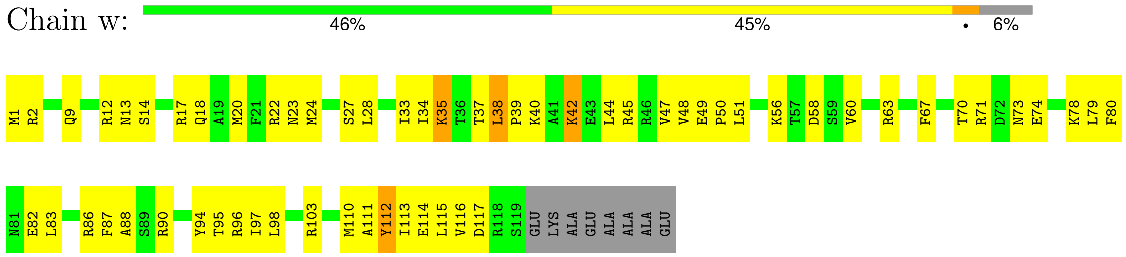
- Molecule 62: 50S ribosomal protein L16

Chain v:



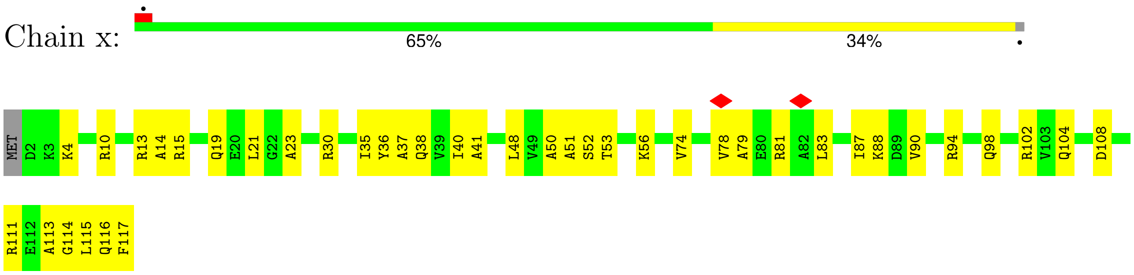
- Molecule 63: 50S ribosomal protein L17

Chain w:



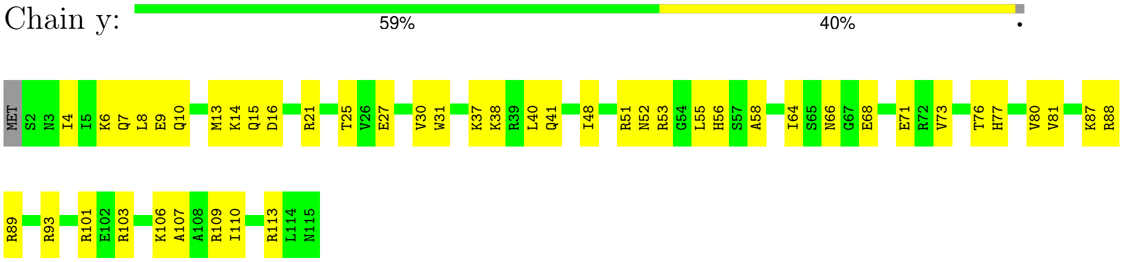
- Molecule 64: 50S ribosomal protein L18

Chain x:



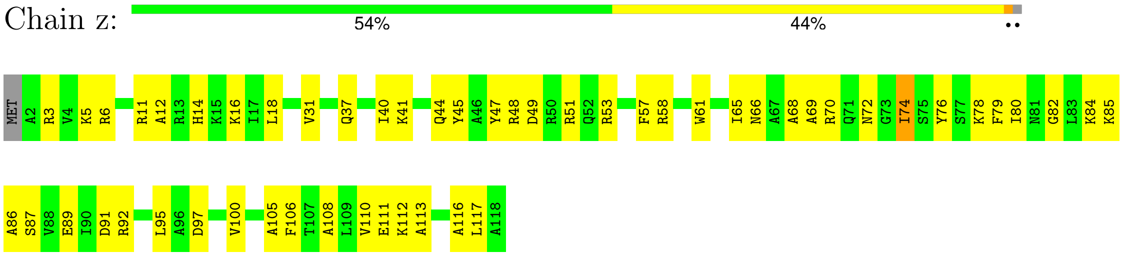
- Molecule 65: 50S ribosomal protein L19

Chain y:



- Molecule 66: 50S ribosomal protein L20

Chain z:



4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	20048	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{Å}^2$)	50	Depositor
Minimum defocus (nm)	1250	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.035	Depositor
Minimum map value	-0.007	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.0032	Depositor
Map size (Å)	532.48, 532.48, 532.48	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 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	0	0.43	0/829	0.51	0/1107
2	1	0.60	0/864	0.63	0/1156
3	2	0.55	1/752 (0.1%)	0.67	0/1005
4	3	0.35	0/796	0.48	0/1062
5	4	0.57	0/766	0.63	0/1025
6	5	0.57	0/816	0.78	0/1259
7	6	0.57	0/783	0.78	0/1203
8	7	0.61	2/585 (0.3%)	0.91	3/906 (0.3%)
9	9	0.37	0/1131	0.73	2/1524 (0.1%)
10	A	0.27	0/1810	0.58	0/2821
10	B	0.27	0/1810	0.58	0/2821
11	AA	0.38	0/10547	0.62	0/14232
12	AB	0.60	0/1317	1.21	17/1786 (1.0%)
13	AC	0.38	0/1718	0.62	0/2328
13	AD	0.37	0/2096	0.69	3/2854 (0.1%)
14	AE	0.39	0/10561	0.64	5/14258 (0.0%)
15	AF	0.30	0/652	0.61	0/879
16	AG	0.97	6/3897 (0.2%)	1.40	49/5273 (0.9%)
17	C	0.68	0/553	0.81	1/743 (0.1%)
18	D	0.29	0/36610	0.41	9/57091 (0.0%)
19	E	0.61	0/675	0.72	0/895
20	F	0.53	0/597	0.61	0/792
21	G	0.68	5/1791 (0.3%)	0.79	8/2413 (0.3%)
22	H	0.38	0/1746	0.81	0/2382
23	I	0.57	1/1663 (0.1%)	0.68	4/2241 (0.2%)
24	J	0.46	0/1665	0.58	0/2227
25	K	0.72	2/1165 (0.2%)	0.86	6/1568 (0.4%)
26	L	0.68	1/867 (0.1%)	0.79	1/1171 (0.1%)
27	M	0.56	0/1195	0.69	2/1602 (0.1%)
28	N	0.50	0/989	0.58	0/1326
29	O	0.66	3/1034 (0.3%)	0.79	3/1375 (0.2%)
30	P	0.51	0/800	0.73	0/1082

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
31	Q	0.72	2/893 (0.2%)	0.76	2/1205 (0.2%)
32	R	0.49	0/952	0.59	0/1274
33	S	0.52	0/817	0.61	0/1088
34	T	0.57	1/722 (0.1%)	0.68	0/964
35	U	0.41	0/659	0.53	0/884
36	V	0.49	0/657	0.62	0/881
37	W	0.55	1/680 (0.1%)	0.62	1/915 (0.1%)
38	X	0.45	0/909	0.72	1/1215 (0.1%)
39	Y	0.38	2/1046 (0.2%)	0.66	2/1410 (0.1%)
40	Z	0.13	0/227	0.41	0/304
41	a	0.30	0/69247	0.43	10/107985 (0.0%)
42	b	0.41	0/589	0.55	0/779
43	c	0.51	0/635	0.61	0/848
44	d	0.25	0/2872	0.37	0/4478
45	e	0.69	2/502 (0.4%)	0.65	1/667 (0.1%)
46	f	0.52	0/452	0.57	0/605
47	g	0.45	1/531 (0.2%)	0.64	0/709
48	h	0.49	1/2121 (0.0%)	0.59	1/2852 (0.0%)
49	i	0.41	0/450	0.55	0/599
50	j	0.51	0/1586	0.57	1/2134 (0.0%)
51	k	0.45	0/433	0.63	0/576
52	l	0.51	1/1571 (0.1%)	0.62	0/2113
53	m	0.45	0/380	0.56	0/498
54	n	0.46	0/1434	0.66	1/1926 (0.1%)
55	o	0.51	0/513	0.71	1/676 (0.1%)
56	p	0.41	0/1333	0.62	2/1805 (0.1%)
57	q	0.45	0/303	0.64	0/397
58	r	0.28	0/1122	0.48	0/1515
59	s	0.70	2/1152 (0.2%)	0.74	2/1551 (0.1%)
60	t	0.52	0/955	0.75	3/1279 (0.2%)
61	u	0.43	0/1062	0.59	0/1413
62	v	0.60	1/1093 (0.1%)	0.77	3/1460 (0.2%)
63	w	0.83	2/964 (0.2%)	0.80	3/1289 (0.2%)
64	x	0.34	0/902	0.50	0/1209
65	y	0.41	0/929	0.54	0/1242
66	z	0.62	2/960 (0.2%)	0.62	0/1278
All	All	0.41	39/194733 (0.0%)	0.56	147/286430 (0.1%)

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
9	9	0	3
12	AB	0	2
13	AC	0	1
13	AD	0	2
14	AE	0	4
16	AG	0	6
21	G	0	1
22	H	0	5
23	I	0	1
25	K	0	2
29	O	0	1
38	X	0	1
39	Y	0	1
54	n	0	1
55	o	0	1
59	s	0	1
61	u	0	2
All	All	0	35

The worst 5 of 39 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	AG	429	LYS	C-N	13.90	1.51	1.33
63	w	35	LYS	CE-NZ	-12.73	1.11	1.49
29	O	80	ARG	CD-NE	-10.50	1.31	1.46
63	w	42	LYS	CD-CE	-9.41	1.24	1.52
25	K	45	ARG	CG-CD	7.73	1.75	1.52

The worst 5 of 147 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
16	AG	104	ARG	CA-C-N	17.96	154.29	121.97
16	AG	104	ARG	C-N-CA	17.96	154.29	121.97
16	AG	246	ASP	CA-C-N	14.50	137.97	119.84
16	AG	246	ASP	C-N-CA	14.50	137.97	119.84
16	AG	354	ALA	O-C-N	-13.70	107.29	122.09

There are no chirality outliers.

5 of 35 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	9	107	GLU	Peptide

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Mol	Chain	Res	Type	Group
9	9	79	PRO	Peptide
9	9	92	ALA	Peptide
12	AB	140	MET	Peptide
12	AB	151	LYS	Peptide

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	0	816	839	839	54	0
2	1	857	922	922	68	0
3	2	746	811	811	59	0
4	3	788	844	844	43	0
5	4	753	780	780	88	0
6	5	726	0	392	112	0
7	6	703	0	396	34	0
8	7	527	0	262	83	0
9	9	1117	0	1155	258	0
10	A	1620	826	827	108	0
10	B	1620	814	827	112	0
11	AA	10381	0	10388	386	0
12	AB	1286	0	1300	437	0
13	AC	1698	0	1718	13	0
13	AD	2078	0	1891	37	0
14	AE	10404	0	10625	276	0
15	AF	650	0	658	10	0
16	AG	3852	0	3828	900	0
17	C	544	559	560	106	0
18	D	32703	16423	16453	734	0
19	E	669	719	719	78	0
20	F	589	629	629	58	0
21	G	1760	1785	1787	155	0
22	H	1730	1454	1455	168	0
23	I	1636	1710	1710	130	0
24	J	1643	1707	1707	85	0
25	K	1152	1196	1196	122	0
26	L	848	846	846	105	0
27	M	1181	1235	1238	124	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
28	N	979	1031	1031	94	0
29	O	1022	1070	1070	88	0
30	P	790	831	831	103	0
31	Q	877	887	887	96	0
32	R	939	1001	1001	92	0
33	S	805	844	844	73	0
34	T	714	734	734	91	0
35	U	649	666	666	58	0
36	V	648	691	691	68	0
37	W	663	688	688	48	0
38	X	900	964	965	113	0
39	Y	1032	0	1088	211	0
40	Z	227	0	237	31	0
41	a	61841	31077	31120	1317	0
42	b	582	599	599	46	0
43	c	625	652	652	35	0
44	d	2569	1301	1301	40	0
45	e	501	531	531	46	0
46	f	448	488	488	37	0
47	g	522	520	520	64	0
48	h	2082	2154	2154	138	0
49	i	444	459	458	49	0
50	j	1565	1617	1616	121	0
51	k	426	464	464	46	0
52	l	1552	1619	1619	125	0
53	m	377	418	418	30	0
54	n	1410	1443	1444	157	0
55	o	504	572	572	53	0
56	p	1313	1358	1358	74	0
57	q	302	343	343	25	0
58	r	1111	1148	1148	49	0
59	s	1129	1162	1162	127	0
60	t	946	1023	1023	104	0
61	u	1053	1129	1129	77	0
62	v	1074	1157	1157	122	0
63	w	951	994	994	103	0
64	x	892	923	923	44	0
65	y	917	962	962	56	0
66	z	947	1020	1019	84	0
67	AE	1	0	0	0	0
68	AE	2	0	0	3	0
All	All	181408	98639	132670	7740	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 25.

The worst 5 of 7740 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)
25:K:45:ARG:CD	25:K:45:ARG:CG	1.75	1.65
6:5:11:DA:C5'	12:AB:67:THR:HG22	1.20	1.60
6:5:10:DT:C7	11:AA:62:TYR:CD2	1.84	1.59
16:AG:425:LEU:CD2	16:AG:429:LYS:HE2	1.21	1.59
16:AG:287:ALA:CA	16:AG:331:LEU:HD12	1.19	1.59

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	101/103 (98%)	97 (96%)	4 (4%)	0	100	100
2	1	108/110 (98%)	107 (99%)	1 (1%)	0	100	100
3	2	92/100 (92%)	87 (95%)	5 (5%)	0	100	100
4	3	101/104 (97%)	98 (97%)	3 (3%)	0	100	100
5	4	92/94 (98%)	89 (97%)	3 (3%)	0	100	100
9	9	146/165 (88%)	100 (68%)	43 (30%)	3 (2%)	5	29
11	AA	1312/1342 (98%)	1197 (91%)	114 (9%)	1 (0%)	48	83
12	AB	159/162 (98%)	107 (67%)	41 (26%)	11 (7%)	1	11
13	AC	217/329 (66%)	203 (94%)	12 (6%)	2 (1%)	14	51
13	AD	293/329 (89%)	263 (90%)	27 (9%)	3 (1%)	13	49
14	AE	1331/1407 (95%)	1211 (91%)	114 (9%)	6 (0%)	25	64
15	AF	80/91 (88%)	77 (96%)	3 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
16	AG	493/495 (100%)	375 (76%)	86 (17%)	32 (6%)	1	12
17	C	64/75 (85%)	63 (98%)	1 (2%)	0	100	100
19	E	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
20	F	68/71 (96%)	68 (100%)	0	0	100	100
21	G	223/241 (92%)	212 (95%)	10 (4%)	1 (0%)	30	68
22	H	255/557 (46%)	182 (71%)	66 (26%)	7 (3%)	4	25
23	I	206/233 (88%)	193 (94%)	13 (6%)	0	100	100
24	J	203/206 (98%)	201 (99%)	2 (1%)	0	100	100
25	K	154/167 (92%)	145 (94%)	8 (5%)	1 (1%)	22	60
26	L	102/135 (76%)	97 (95%)	4 (4%)	1 (1%)	13	49
27	M	149/179 (83%)	140 (94%)	8 (5%)	1 (1%)	19	56
28	N	127/130 (98%)	123 (97%)	4 (3%)	0	100	100
29	O	125/130 (96%)	116 (93%)	8 (6%)	1 (1%)	16	54
30	P	97/103 (94%)	89 (92%)	8 (8%)	0	100	100
31	Q	115/129 (89%)	107 (93%)	8 (7%)	0	100	100
32	R	117/124 (94%)	112 (96%)	5 (4%)	0	100	100
33	S	98/101 (97%)	97 (99%)	1 (1%)	0	100	100
34	T	86/89 (97%)	83 (96%)	3 (4%)	0	100	100
35	U	80/82 (98%)	76 (95%)	4 (5%)	0	100	100
36	V	78/84 (93%)	74 (95%)	4 (5%)	0	100	100
37	W	81/92 (88%)	80 (99%)	1 (1%)	0	100	100
38	X	114/118 (97%)	103 (90%)	9 (8%)	2 (2%)	7	33
39	Y	139/142 (98%)	101 (73%)	38 (27%)	0	100	100
40	Z	28/121 (23%)	22 (79%)	6 (21%)	0	100	100
42	b	74/85 (87%)	73 (99%)	1 (1%)	0	100	100
43	c	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
45	e	60/63 (95%)	57 (95%)	3 (5%)	0	100	100
46	f	56/59 (95%)	52 (93%)	4 (7%)	0	100	100
47	g	64/70 (91%)	62 (97%)	2 (3%)	0	100	100
48	h	269/273 (98%)	255 (95%)	14 (5%)	0	100	100
49	i	54/57 (95%)	49 (91%)	5 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	j	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
51	k	50/55 (91%)	50 (100%)	0	0	100	100
52	l	199/201 (99%)	188 (94%)	11 (6%)	0	100	100
53	m	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
54	n	175/179 (98%)	160 (91%)	14 (8%)	1 (1%)	22	60
55	o	62/65 (95%)	57 (92%)	4 (6%)	1 (2%)	8	37
56	p	173/177 (98%)	162 (94%)	11 (6%)	0	100	100
57	q	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
58	r	147/149 (99%)	139 (95%)	8 (5%)	0	100	100
59	s	140/142 (99%)	133 (95%)	7 (5%)	0	100	100
60	t	121/123 (98%)	114 (94%)	7 (6%)	0	100	100
61	u	142/144 (99%)	134 (94%)	8 (6%)	0	100	100
62	v	134/136 (98%)	129 (96%)	5 (4%)	0	100	100
63	w	117/127 (92%)	112 (96%)	5 (4%)	0	100	100
64	x	114/117 (97%)	107 (94%)	7 (6%)	0	100	100
65	y	112/115 (97%)	105 (94%)	7 (6%)	0	100	100
66	z	115/118 (98%)	111 (96%)	4 (4%)	0	100	100
All	All	10058/11053 (91%)	9175 (91%)	809 (8%)	74 (1%)	21	56

5 of 74 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
12	AB	107	PRO
12	AB	125	GLY
12	AB	130	PHE
12	AB	137	ALA
12	AB	141	LEU

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	0	84/84 (100%)	84 (100%)	0	100	100
2	1	93/93 (100%)	93 (100%)	0	100	100
3	2	81/84 (96%)	81 (100%)	0	100	100
4	3	84/85 (99%)	84 (100%)	0	100	100
5	4	78/78 (100%)	78 (100%)	0	100	100
9	9	112/123 (91%)	112 (100%)	0	100	100
11	AA	1135/1157 (98%)	1130 (100%)	5 (0%)	89	91
12	AB	141/142 (99%)	124 (88%)	17 (12%)	4	16
13	AC	186/286 (65%)	186 (100%)	0	100	100
13	AD	185/286 (65%)	185 (100%)	0	100	100
14	AE	1122/1168 (96%)	1104 (98%)	18 (2%)	58	74
15	AF	70/75 (93%)	69 (99%)	1 (1%)	62	76
16	AG	409/409 (100%)	288 (70%)	121 (30%)	0	2
17	C	57/65 (88%)	57 (100%)	0	100	100
19	E	65/66 (98%)	65 (100%)	0	100	100
20	F	60/61 (98%)	60 (100%)	0	100	100
21	G	187/199 (94%)	187 (100%)	0	100	100
22	H	137/461 (30%)	137 (100%)	0	100	100
23	I	171/190 (90%)	171 (100%)	0	100	100
24	J	172/173 (99%)	171 (99%)	1 (1%)	84	88
25	K	119/126 (94%)	119 (100%)	0	100	100
26	L	91/116 (78%)	91 (100%)	0	100	100
27	M	124/147 (84%)	124 (100%)	0	100	100
28	N	104/105 (99%)	104 (100%)	0	100	100
29	O	105/107 (98%)	105 (100%)	0	100	100
30	P	86/90 (96%)	86 (100%)	0	100	100
31	Q	90/99 (91%)	90 (100%)	0	100	100
32	R	101/104 (97%)	101 (100%)	0	100	100
33	S	83/84 (99%)	83 (100%)	0	100	100
34	T	76/77 (99%)	76 (100%)	0	100	100
35	U	65/65 (100%)	65 (100%)	0	100	100
36	V	74/78 (95%)	74 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	W	72/79 (91%)	72 (100%)	0	100	100
38	X	94/96 (98%)	94 (100%)	0	100	100
39	Y	109/110 (99%)	109 (100%)	0	100	100
40	Z	26/85 (31%)	26 (100%)	0	100	100
42	b	58/63 (92%)	58 (100%)	0	100	100
43	c	67/68 (98%)	67 (100%)	0	100	100
45	e	54/55 (98%)	54 (100%)	0	100	100
46	f	48/49 (98%)	48 (100%)	0	100	100
47	g	59/62 (95%)	59 (100%)	0	100	100
48	h	216/218 (99%)	216 (100%)	0	100	100
49	i	47/48 (98%)	47 (100%)	0	100	100
50	j	164/164 (100%)	164 (100%)	0	100	100
51	k	47/49 (96%)	47 (100%)	0	100	100
52	l	165/165 (100%)	165 (100%)	0	100	100
53	m	38/38 (100%)	38 (100%)	0	100	100
54	n	148/150 (99%)	148 (100%)	0	100	100
55	o	51/52 (98%)	51 (100%)	0	100	100
56	p	136/138 (99%)	136 (100%)	0	100	100
57	q	34/34 (100%)	34 (100%)	0	100	100
58	r	114/114 (100%)	114 (100%)	0	100	100
59	s	116/116 (100%)	116 (100%)	0	100	100
60	t	104/104 (100%)	104 (100%)	0	100	100
61	u	103/103 (100%)	103 (100%)	0	100	100
62	v	109/109 (100%)	109 (100%)	0	100	100
63	w	99/103 (96%)	99 (100%)	0	100	100
64	x	86/87 (99%)	86 (100%)	0	100	100
65	y	99/100 (99%)	99 (100%)	0	100	100
66	z	89/90 (99%)	89 (100%)	0	100	100
All	All	8299/9132 (91%)	8136 (98%)	163 (2%)	50	68

5 of 163 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
16	AG	273	ILE
16	AG	340	THR
16	AG	282	GLN
16	AG	309	VAL
16	AG	361	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 124 such sidechains are listed below:

Mol	Chain	Res	Type
16	AG	337	ASN
58	r	133	GLN
24	J	36	GLN
57	q	13	ASN
64	x	38	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
10	A	75/76 (98%)	29 (38%)	8 (10%)
10	B	75/76 (98%)	29 (38%)	8 (10%)
18	D	1514/1542 (98%)	289 (19%)	20 (1%)
41	a	2859/2904 (98%)	510 (17%)	0
44	d	119/120 (99%)	15 (12%)	0
8	7	23/53 (43%)	14 (60%)	3 (13%)
All	All	4665/4771 (97%)	886 (18%)	39 (0%)

5 of 886 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	7	3	G
8	7	4	U
8	7	5	U
8	7	7	U
8	7	8	U

5 of 39 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
18	D	992	U
18	D	1447	A
18	D	1145	A

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Mol	Chain	Res	Type
18	D	1212	U
18	D	1492	A

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 oligosaccharides 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.

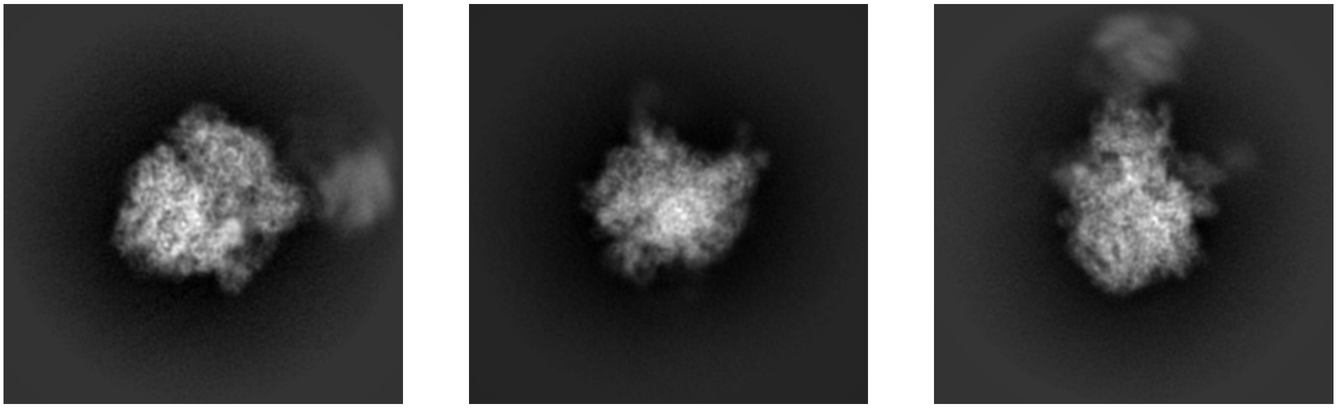
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-43335. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

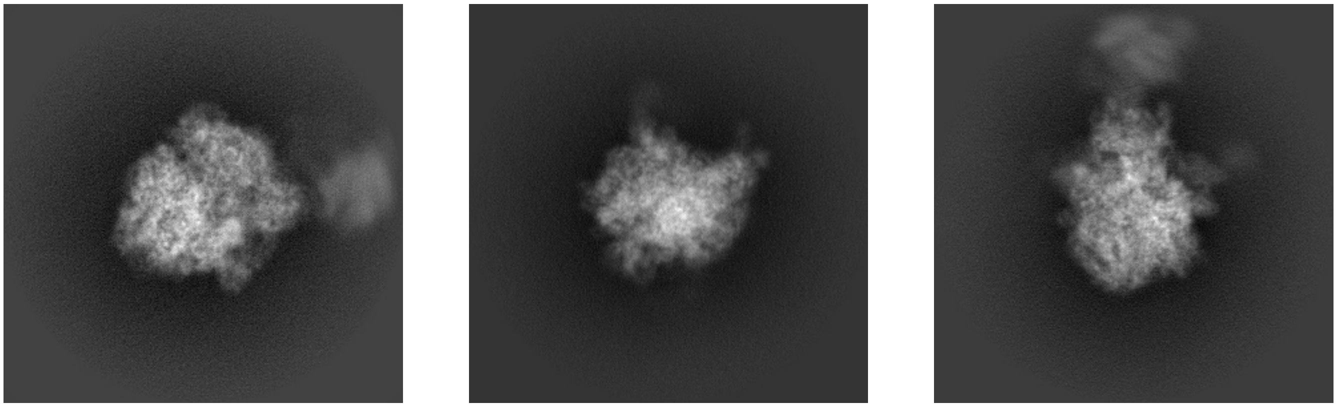
6.1 Orthogonal projections ⓘ

6.1.1 Primary map



X Y Z

6.1.2 Raw map

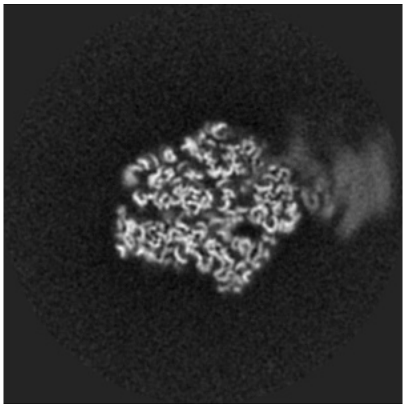


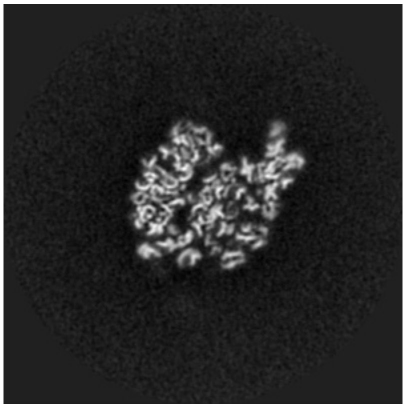
X Y Z

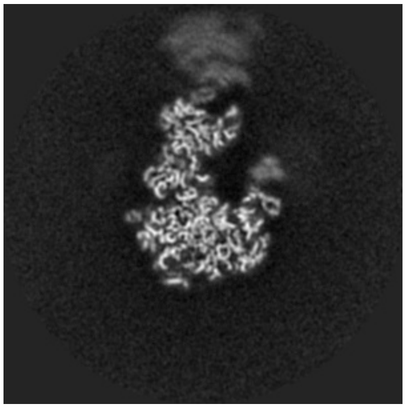
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

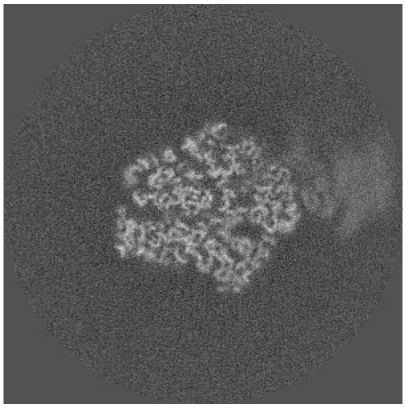
6.2.1 Primary map

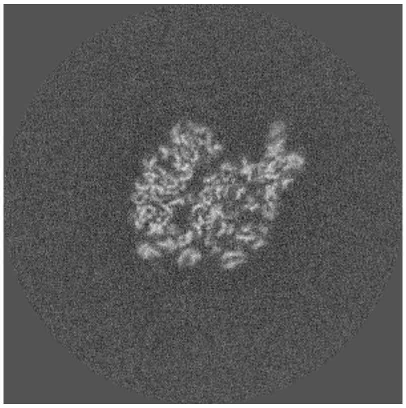

X Index: 256

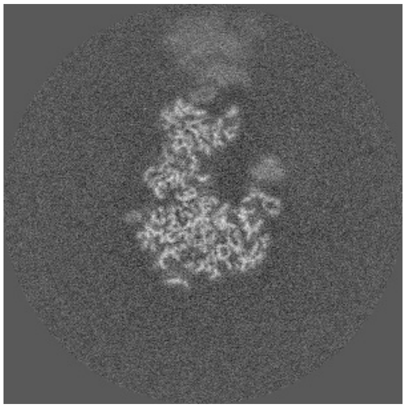

Y Index: 256


Z Index: 256

6.2.2 Raw map


X Index: 256

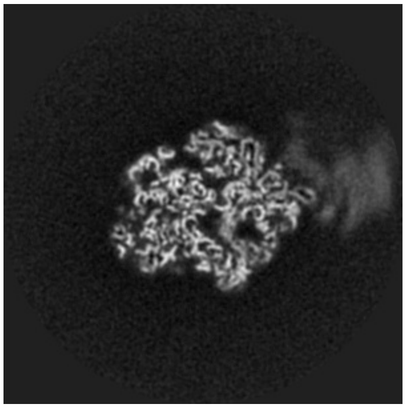

Y Index: 256


Z Index: 256

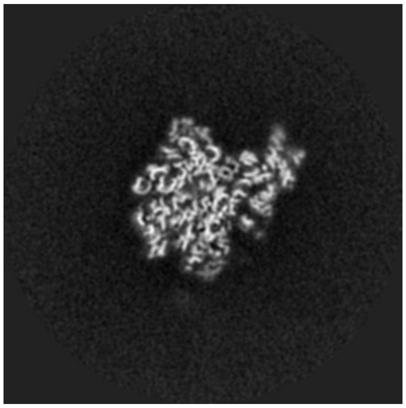
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

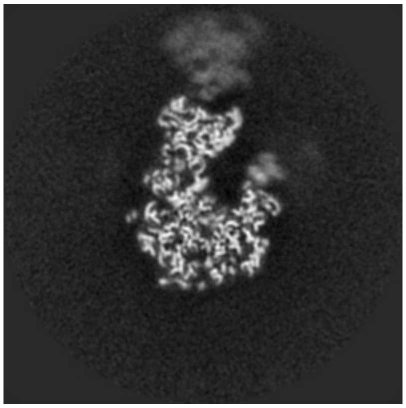
6.3.1 Primary map



X Index: 249

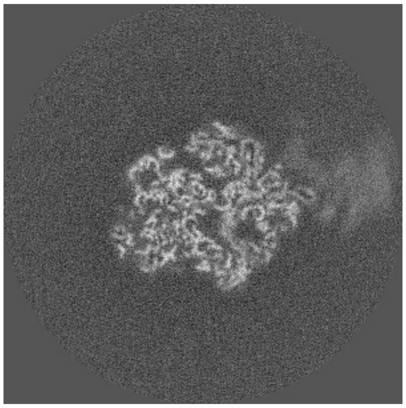


Y Index: 246

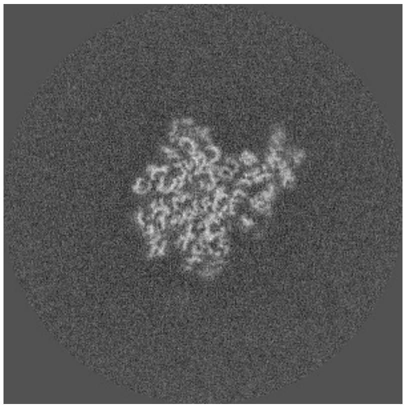


Z Index: 250

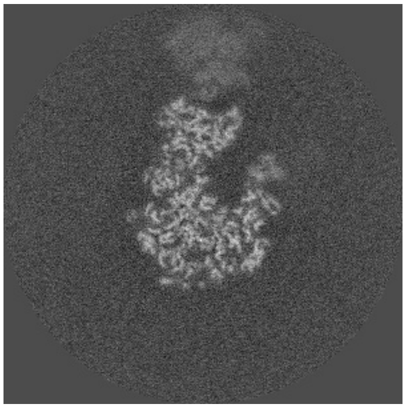
6.3.2 Raw map



X Index: 249



Y Index: 246

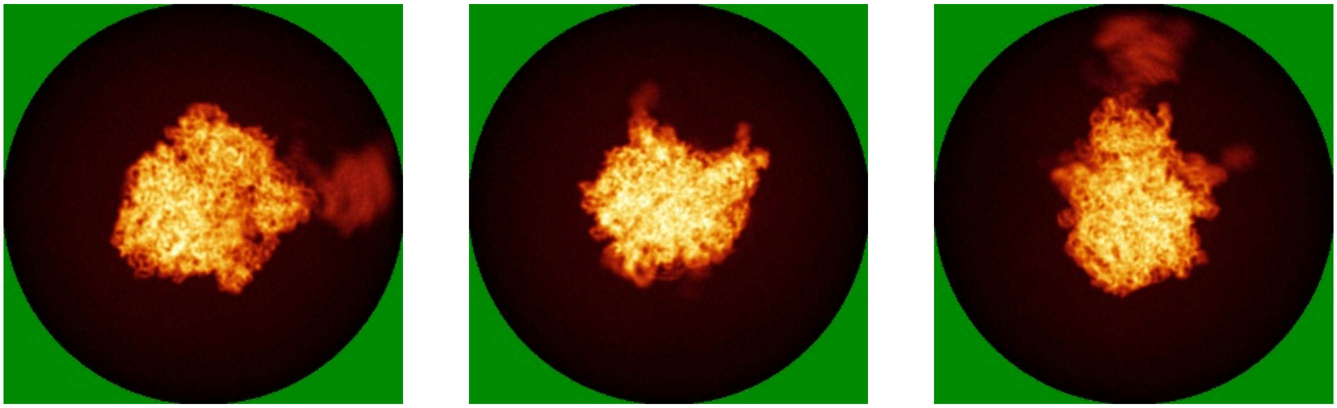


Z Index: 252

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

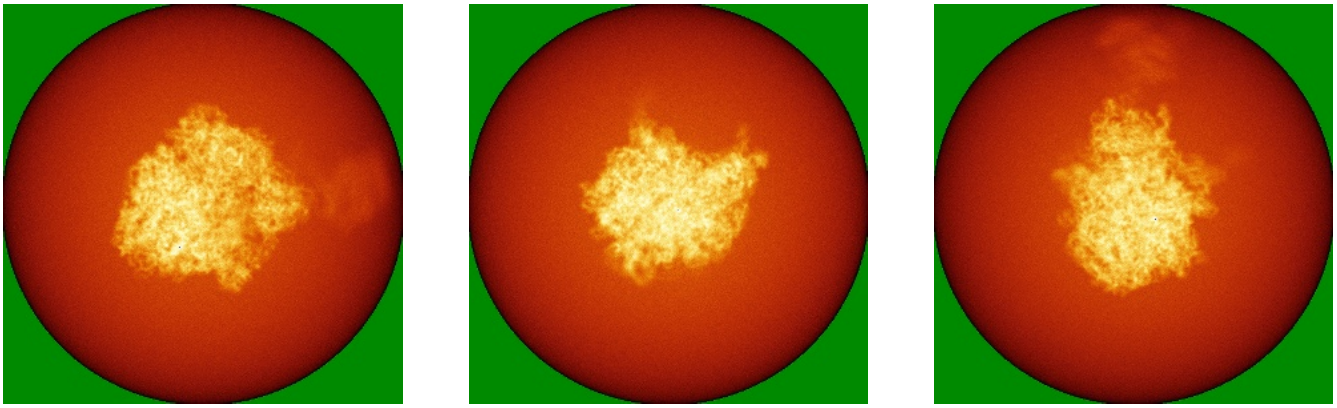
6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map



X Y Z

6.4.2 Raw map



X Y Z

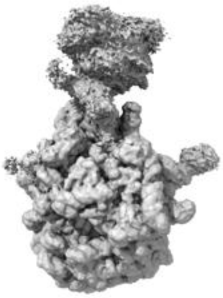
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X

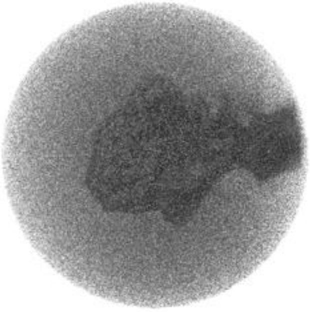
Y



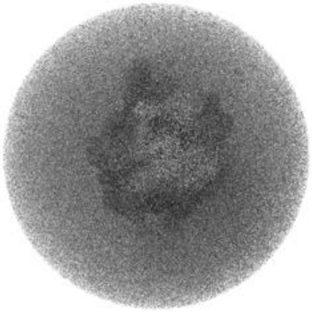
Z

The images above show the 3D surface view of the map at the recommended contour level 0.0032. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

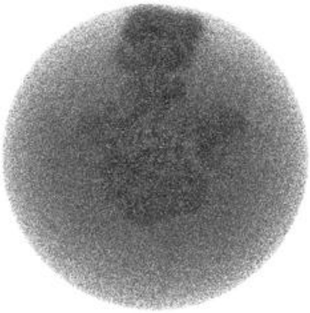
6.5.2 Raw map



X



Y



Z

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

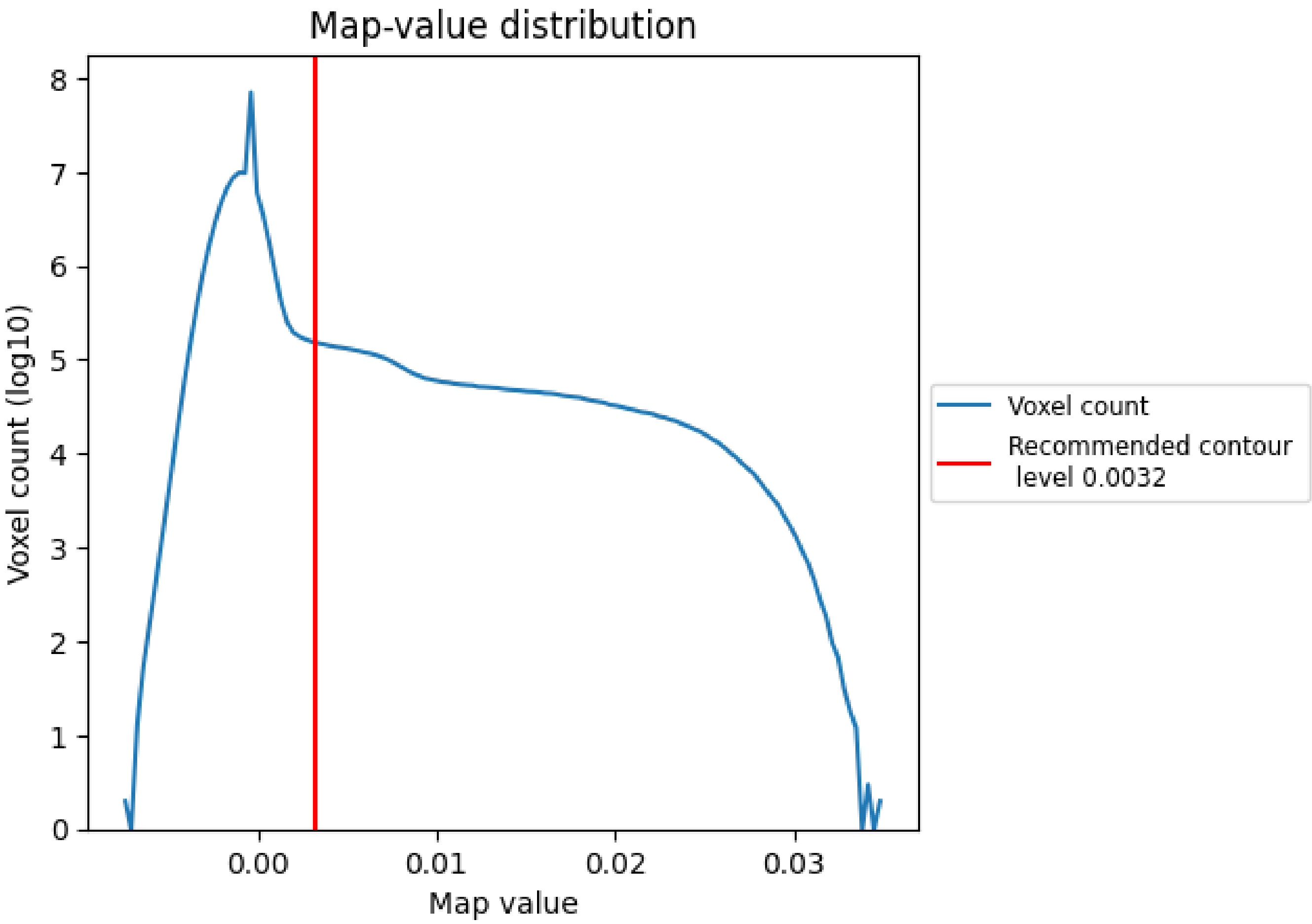
6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

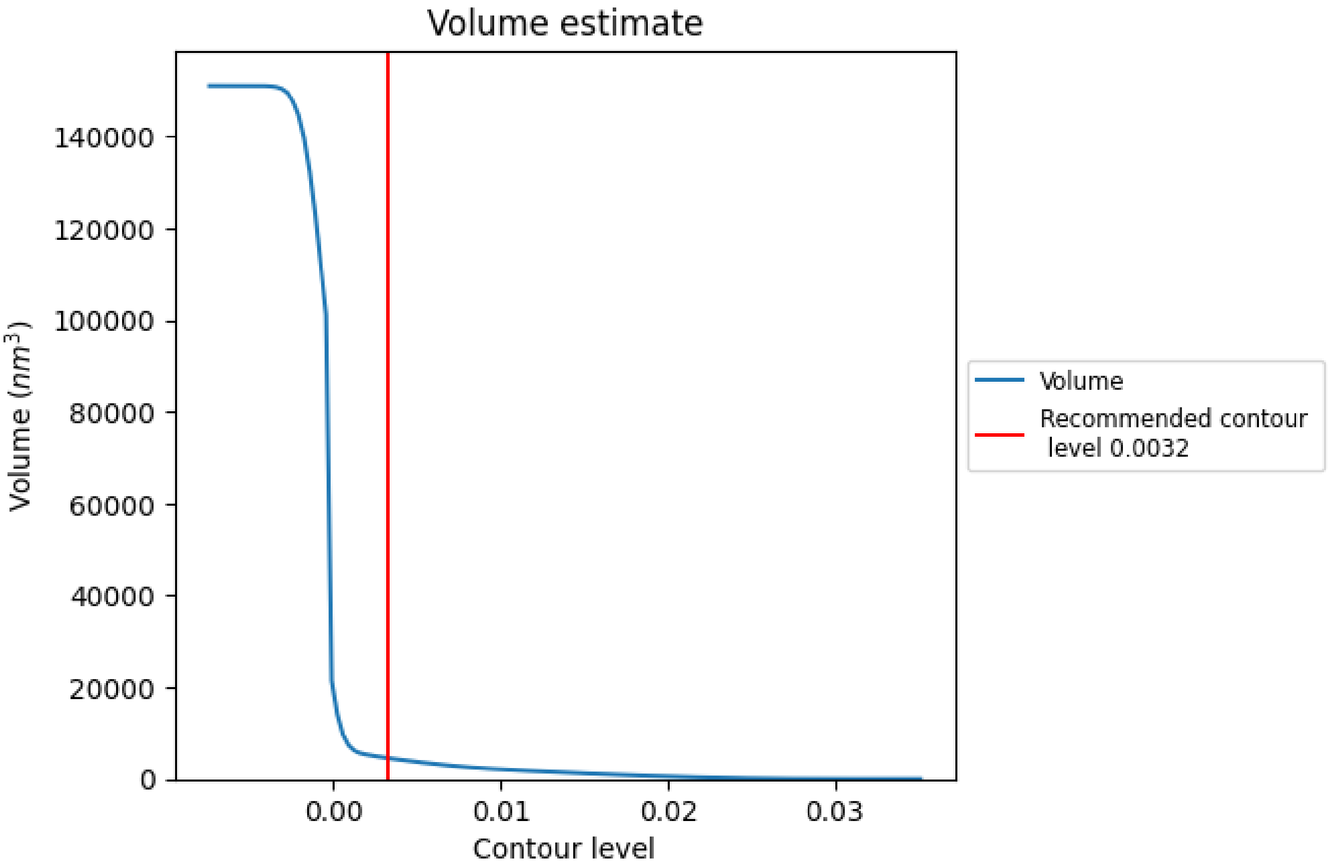
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution ⓘ



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

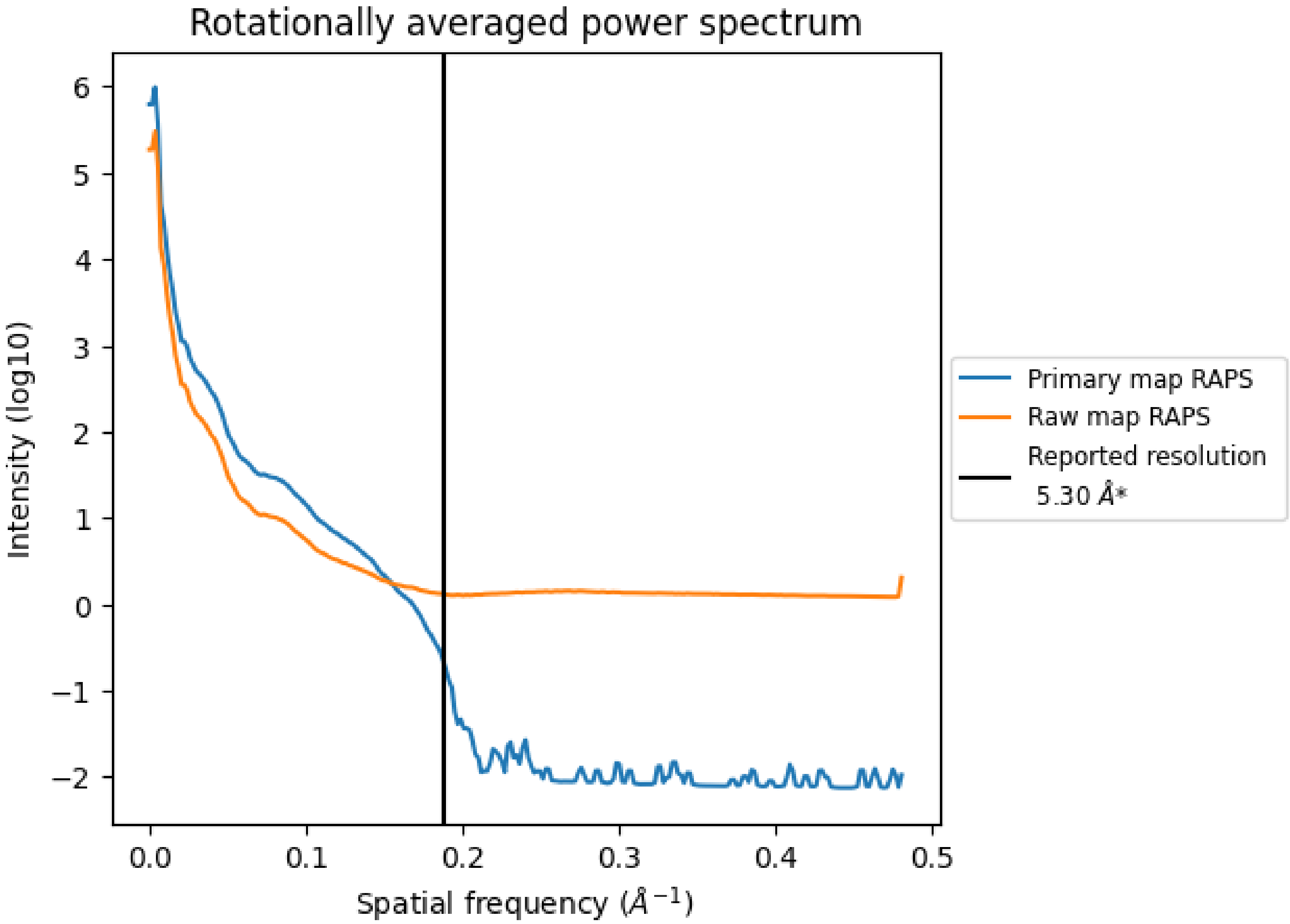
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 4617 nm^3; this corresponds to an approximate mass of 4171 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ

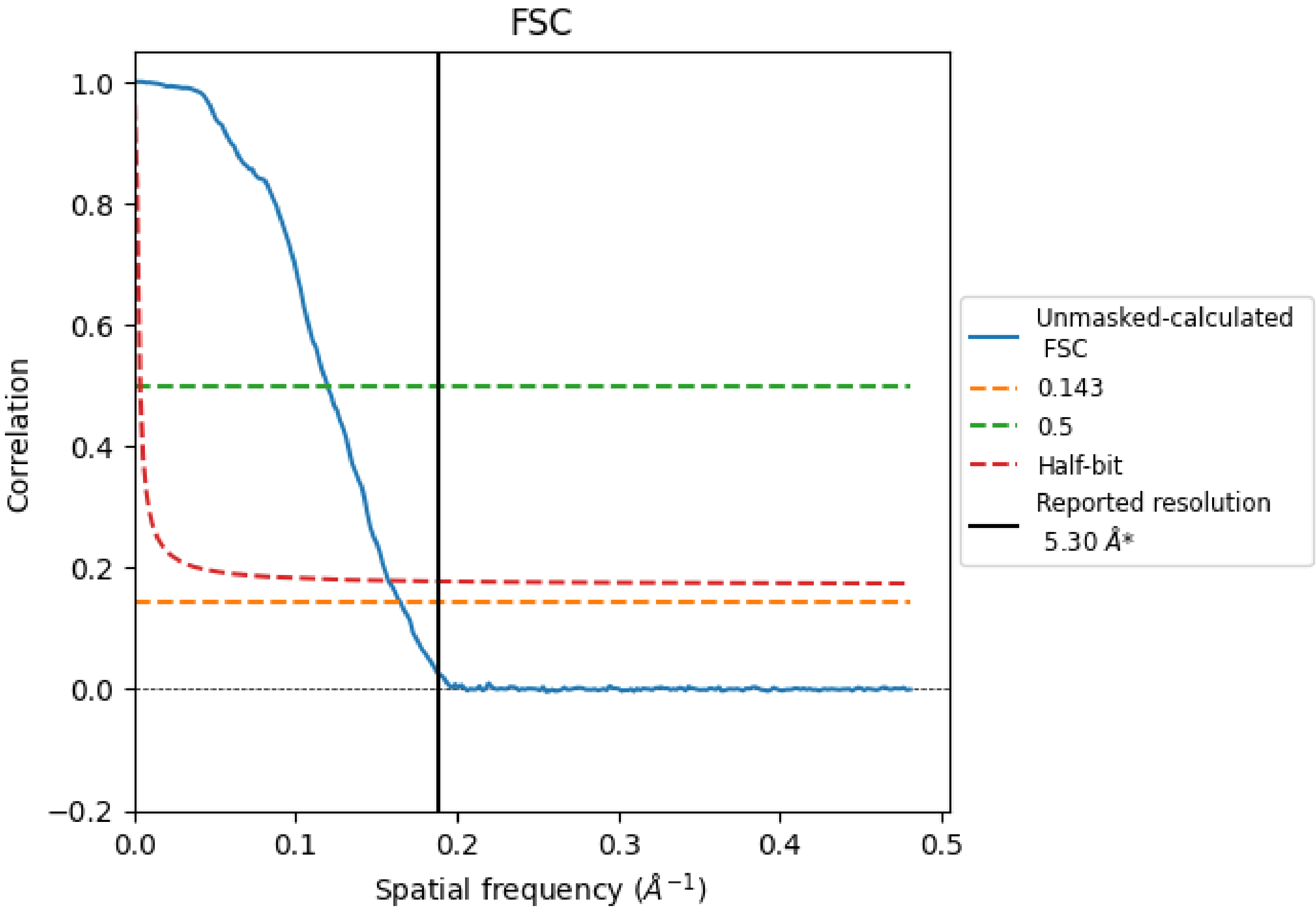


*Reported resolution corresponds to spatial frequency of 0.189 $Å^{-1}$

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 0.189 $Å^{-1}$

8.2 Resolution estimates (i)

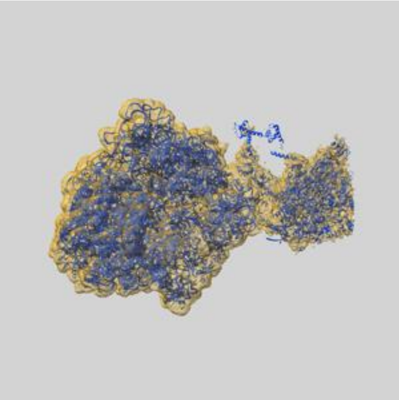
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	5.30	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.06	8.35	6.35

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.06 differs from the reported value 5.3 by more than 10 %

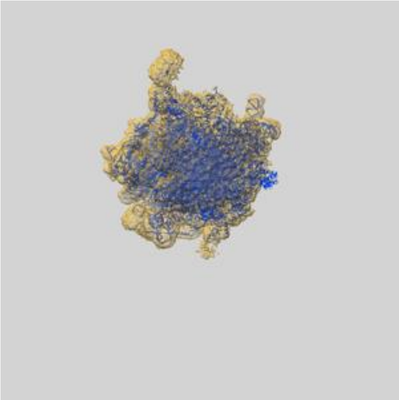
9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-43335 and PDB model 8VL1. Per-residue inclusion information can be found in section 3 on page 17.

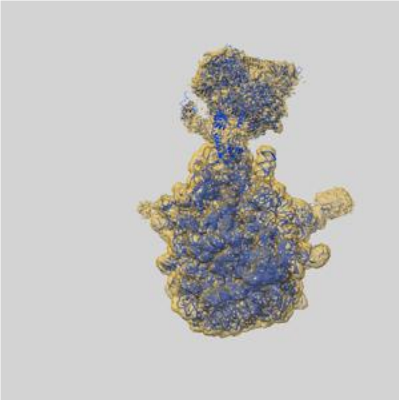
9.1 Map-model overlay ⓘ



X



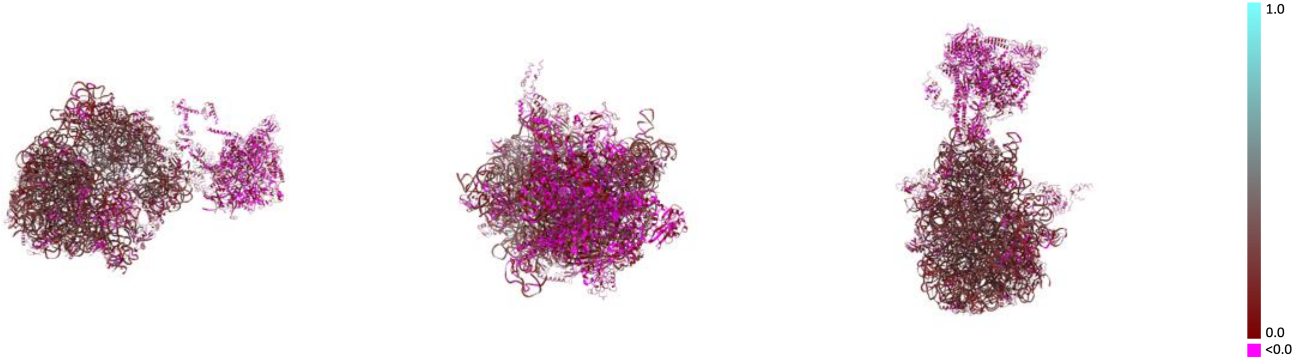
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0032 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

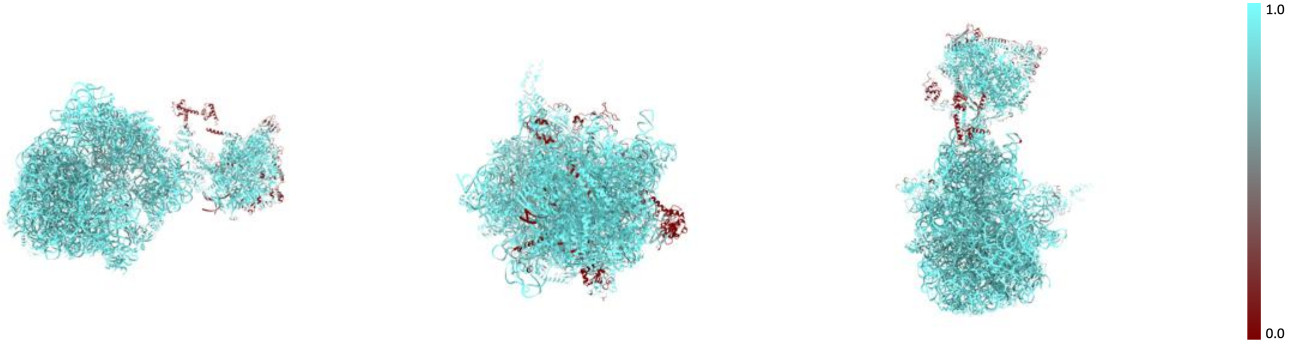
9.2 Q-score mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

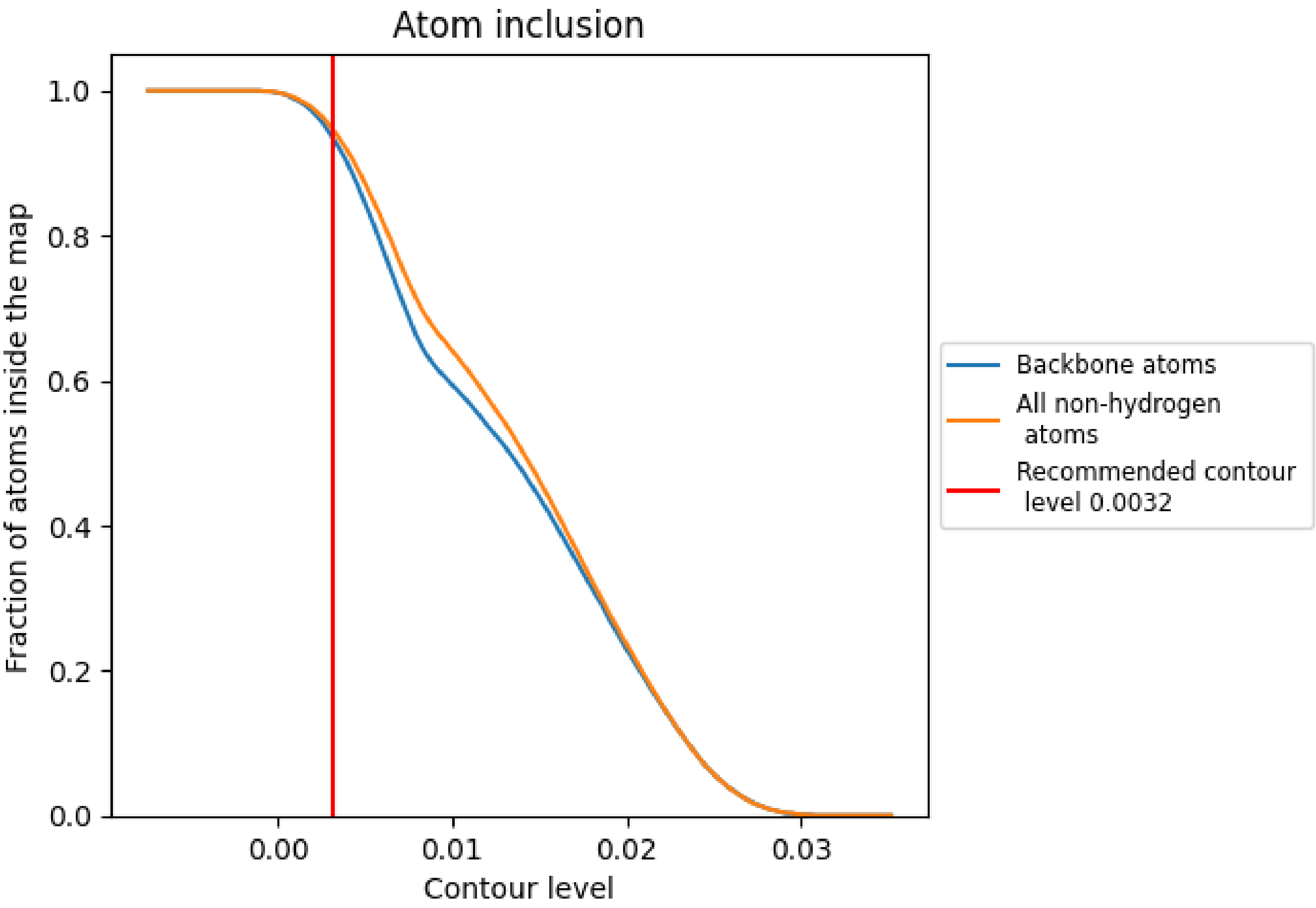
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0032).

9.4 Atom inclusion ⓘ



At the recommended contour level, 93% of all backbone atoms, 94% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.0032) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9450	0.1690
0	0.9860	0.1640
1	0.9800	0.1890
2	0.9740	0.1670
3	0.9850	0.1450
4	0.9820	0.1480
5	0.7960	0.0610
6	0.8010	0.0410
7	0.9830	0.0840
9	0.9400	0.0720
A	0.9990	0.1890
AA	0.8670	0.0310
AB	0.8960	0.0830
AC	0.9080	0.0330
AD	0.5300	0.0270
AE	0.8970	0.0400
AF	0.6910	0.0140
AG	0.5570	0.0550
B	0.9490	0.1000
C	0.9940	0.1750
D	0.9970	0.2270
E	0.9880	0.1450
F	0.9820	0.1930
G	0.9750	0.1590
H	0.8660	0.0740
I	0.9710	0.1820
J	0.9860	0.1610
K	0.9890	0.2160
L	0.9880	0.1690
M	0.9840	0.1640
N	0.9760	0.1830
O	0.9810	0.1480
P	0.9740	0.1640
Q	0.9870	0.1760
R	0.9910	0.2180

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Chain	Atom inclusion	Q-score
S	🟦 0.9830	🟥 0.1590
T	🟦 0.9860	🟥 0.1650
U	🟦 0.9860	🟥 0.1450
V	🟦 0.9780	🟥 0.1870
W	🟦 0.9290	🟥 0.1100
X	🟦 0.9680	🟥 0.1290
Y	🟦 0.8430	🟥 0.0730
Z	🟦 0.9340	🟥 0.0500
a	🟦 0.9980	🟥 0.2190
b	🟦 0.9750	🟥 0.1500
c	🟦 0.9820	🟥 0.1810
d	🟦 0.9980	🟥 0.1840
e	🟦 0.9900	🟥 0.1330
f	🟦 0.9860	🟥 0.1770
g	🟦 0.9770	🟥 0.0970
h	🟦 0.9860	🟥 0.1680
i	🟦 0.9740	🟥 0.2050
j	🟦 0.9810	🟥 0.1510
k	🟦 0.9900	🟥 0.1420
l	🟦 0.9740	🟥 0.1510
m	🟦 0.9890	🟥 0.1910
n	🟦 0.9690	🟥 0.1210
o	🟦 0.9820	🟥 0.1500
p	🟦 0.9840	🟥 0.1350
q	🟦 0.9830	🟥 0.1490
r	🟦 0.9170	🟥 0.1190
s	🟦 0.9780	🟥 0.1690
t	🟦 0.9590	🟥 0.1590
u	🟦 0.9870	🟥 0.1610
v	🟦 0.9870	🟥 0.1810
w	🟦 0.9770	🟥 0.1650
x	🟦 0.9700	🟥 0.0960
y	🟦 0.9760	🟥 0.1460
z	🟦 0.9870	🟥 0.1550