



Full wwPDB EM Validation Report ⓘ

Mar 11, 2025 – 03:08 PM EDT

PDB ID : 6VZ7
EMDB ID : EMD-21486
Title : Escherichia coli transcription-translation complex C1 (TTC-C1) containing a 27 nt long mRNA spacer, NusG, and fMet-tRNAs at P-site and E-site
Authors : Molodtsov, V.; Wang, C.; Su, M.; Ebright, R.H.
Deposited on : 2020-02-27
Resolution : 7.00 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev117
MolProbity : 4.02b-467
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) : 2.41.4

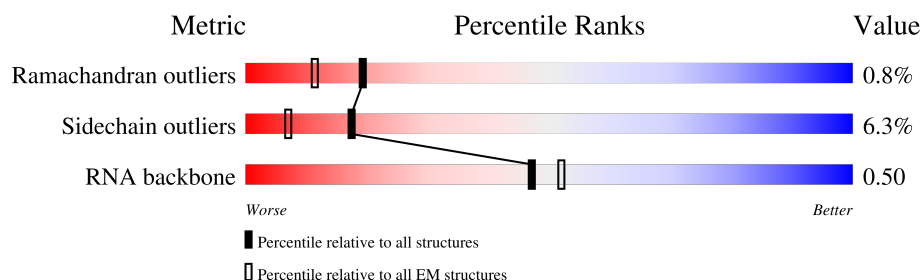
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 7.00 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	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 $\leq 5\%$. 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	0	103	<div> <div>100%</div> <div> <div></div> <div>93%</div> <div>7%</div> </div> </div>
2	1	110	<div> <div>100%</div> <div> <div></div> <div>92%</div> <div>8%</div> </div> </div>
3	2	94	<div> <div>100%</div> <div> <div></div> <div>95%</div> <div>5%</div> </div> </div>
4	3	103	<div> <div>100%</div> <div> <div></div> <div>92%</div> <div>8%</div> </div> </div>
5	4	94	<div> <div>100%</div> <div> <div></div> <div>96%</div> <div>.</div> </div> </div>
6	5	27	<div> <div>85%</div> <div> <div></div> <div>63%</div> <div>22%</div> <div>15%</div> </div> </div>
7	6	27	<div> <div>100%</div> <div> <div></div> <div>85%</div> <div>15%</div> </div> </div>
8	7	16	<div> <div>100%</div> <div> <div></div> <div>44%</div> <div>44%</div> <div>12%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
9	A	76	
9	B	76	
10	AA	1341	
11	AB	112	
12	AC	230	
12	AD	230	
13	AE	1358	
14	AF	83	
15	C	66	
16	D	1542	
17	E	86	
18	F	70	
19	G	225	
20	H	557	
21	I	208	
22	J	205	
23	K	156	
24	L	104	
25	M	151	
26	N	129	
27	O	127	
28	P	99	
29	Q	117	
30	R	123	
31	S	100	

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Mol	Chain	Length	Quality of chain
32	T	88	<div>100%</div> <div>86%14%</div>
33	U	82	<div>100%</div> <div>94%6%</div>
34	V	80	<div>100%</div> <div>98%.</div>
35	W	83	<div>100%</div> <div>95%5%</div>
36	X	116	<div>100%</div> <div>90%10%</div>
37	Y	3	<div>100%</div> <div>33%67%</div>
38	a	2903	<div>99%</div> <div>81%18%. .</div>
39	b	76	<div>100%</div> <div>99%.</div>
40	c	77	<div>100%</div> <div>95%5%</div>
41	d	120	<div>100%</div> <div>86%14%</div>
42	e	62	<div>100%</div> <div>98%.</div>
43	f	58	<div>100%</div> <div>97%.</div>
44	g	66	<div>100%</div> <div>91%9%</div>
45	h	271	<div>100%</div> <div>93%7%</div>
46	i	56	<div>100%</div> <div>89%11%</div>
47	j	209	<div>100%</div> <div>97%.</div>
48	k	52	<div>100%</div> <div>94%6%</div>
49	l	201	<div>100%</div> <div>93%7%</div>
50	m	46	<div>100%</div> <div>93%7%</div>
51	n	177	<div>100%</div> <div>90%10%</div>
52	o	64	<div>100%</div> <div>92%8%</div>
53	p	175	<div>100%</div> <div>98%.</div>
54	q	38	<div>100%</div> <div>95%5%</div>
55	r	149	<div>100%</div> <div>93%7%</div>
56	s	142	<div>100%</div> <div>96%.</div>

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Mol	Chain	Length	Quality of chain
57	t	123	<div> <div>100%</div> <div> </div> <div>95%</div> <div>5%</div> </div>
58	u	144	<div> <div>100%</div> <div> </div> <div>96%</div> <div>.</div> </div>
59	v	136	<div> <div>100%</div> <div> </div> <div>96%</div> <div>.</div> </div>
60	w	119	<div> <div>100%</div> <div> </div> <div>93%</div> <div>7%</div> </div>
61	x	116	<div> <div>100%</div> <div> </div> <div>95%</div> <div>5%</div> </div>
62	y	114	<div> <div>100%</div> <div> </div> <div>96%</div> <div>.</div> </div>
63	z	117	<div> <div>100%</div> <div> </div> <div>97%</div> <div>.</div> </div>

2 Entry composition

There are 65 unique types of molecules in this entry. The entry contains 299447 atoms, of which 125488 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 50S ribosomal protein L21.

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

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

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

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

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

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

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

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

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

- Molecule 6 is a DNA chain called NT DNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	5	23	Total	C	H	N	O	P	0	0
			732	225	260	87	137	23		

- Molecule 7 is a DNA chain called T DNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	6	27	Total	C	H	N	O	P	0	0
			848	259	306	89	167	27		

- Molecule 8 is a RNA chain called mRNA with 27 nt long spacer.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	7	16	Total	C	H	N	O	P	0	0
			515	154	168	62	115	16		

- Molecule 9 is a RNA chain called E-site and P-site tRNA (fMet).

Mol	Chain	Residues	Atoms						AltConf	Trace
9	A	76	Total	C	H	N	O	P	0	0
			2446	723	826	295	527	75		
9	B	76	Total	C	H	N	O	P	0	0
			2433	723	813	295	527	75		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	U	deletion	GB 1848954948
B	?	-	U	deletion	GB 1848954948

- Molecule 10 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	AA	1322	Total	C	H	N	O	S	0	0
			20852	6539	10427	1817	2026	43		

- Molecule 11 is a protein called Transcription termination/antitermination protein NusG.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	AB	98	Total	C	H	N	O	S	0	0
			1573	505	783	139	140	6		

- Molecule 12 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	AC	230	Total	C	H	N	O	S	0	0
			3599	1112	1813	317	351	6		

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Mol	Chain	Residues	Atoms						AltConf	Trace
12	AD	228	Total	C	H	N	O	S	0	0
			3556	1100	1789	312	349	6		

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

Mol	Chain	Residues	Atoms						AltConf	Trace
13	AE	1335	Total	C	H	N	O	S	0	0
			20999	6526	10611	1854	1958	50		

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

Mol	Chain	Residues	Atoms						AltConf	Trace
14	AF	83	Total	C	H	N	O	S	0	0
			1318	399	663	123	132	1		

- Molecule 15 is a protein called 30S ribosomal protein S18.

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

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

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

- Molecule 17 is a protein called 30S ribosomal protein S20.

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

- Molecule 18 is a protein called 30S ribosomal protein S21.

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

- Molecule 19 is a protein called 30S ribosomal protein S2.

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

- Molecule 20 is a protein called 30S ribosomal protein S1.

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

- Molecule 21 is a protein called 30S ribosomal protein S3.

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

- Molecule 22 is a protein called 30S ribosomal protein S4.

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

- Molecule 23 is a protein called 30S ribosomal protein S5.

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

- Molecule 24 is a protein called 30S ribosomal protein S6.

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

- Molecule 25 is a protein called 30S ribosomal protein S7.

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

- Molecule 26 is a protein called 30S ribosomal protein S8.

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

- Molecule 27 is a protein called 30S ribosomal protein S9.

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

- Molecule 28 is a protein called 30S ribosomal protein S10.

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

- Molecule 29 is a protein called 30S ribosomal protein S11.

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

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

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

- Molecule 31 is a protein called 30S ribosomal protein S14.

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

- Molecule 32 is a protein called 30S ribosomal protein S15.

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

- Molecule 33 is a protein called 30S ribosomal protein S16.

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

- Molecule 34 is a protein called 30S ribosomal protein S17.

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

- Molecule 35 is a protein called 30S ribosomal protein S19.

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

- Molecule 36 is a protein called 30S ribosomal protein S13.

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

- Molecule 37 is a RNA chain called mRNA in the ribosomal RNA entrance pore.

Mol	Chain	Residues	Atoms						AltConf	Trace
37	Y	3	Total	C	H	N	O	P	0	0
			90	27	30	6	24	3		

- Molecule 38 is a RNA chain called 23S rRNA.

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

- Molecule 39 is a protein called 50S ribosomal protein L27.

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

- Molecule 40 is a protein called 50S ribosomal protein L28.

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

- Molecule 41 is a RNA chain called 5S rRNA.

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

- Molecule 42 is a protein called 50S ribosomal protein L29.

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

- Molecule 43 is a protein called 50S ribosomal protein L30.

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

- Molecule 44 is a protein called 50S ribosomal protein L31.

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

- Molecule 45 is a protein called 50S ribosomal protein L2.

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

- Molecule 46 is a protein called 50S ribosomal protein L32.

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

- Molecule 47 is a protein called 50S ribosomal protein L3.

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

- Molecule 48 is a protein called 50S ribosomal protein L33.

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

- Molecule 49 is a protein called 50S ribosomal protein L4.

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

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

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

- Molecule 51 is a protein called 50S ribosomal protein L5.

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

- Molecule 52 is a protein called 50S ribosomal protein L35.

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

- Molecule 53 is a protein called 50S ribosomal protein L6.

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

- Molecule 54 is a protein called 50S ribosomal protein L36.

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

- Molecule 55 is a protein called 50S ribosomal protein L9.

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

- Molecule 56 is a protein called 50S ribosomal protein L13.

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

- Molecule 57 is a protein called 50S ribosomal protein L14.

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

- Molecule 58 is a protein called 50S ribosomal protein L15.

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

- Molecule 59 is a protein called 50S ribosomal protein L16.

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

- Molecule 60 is a protein called 50S ribosomal protein L17.

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

- Molecule 61 is a protein called 50S ribosomal protein L18.

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

- Molecule 62 is a protein called 50S ribosomal protein L19.

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

- Molecule 63 is a protein called 50S ribosomal protein L20.

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

- Molecule 64 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
64	7	1	Total	Mg	0
			1	1	

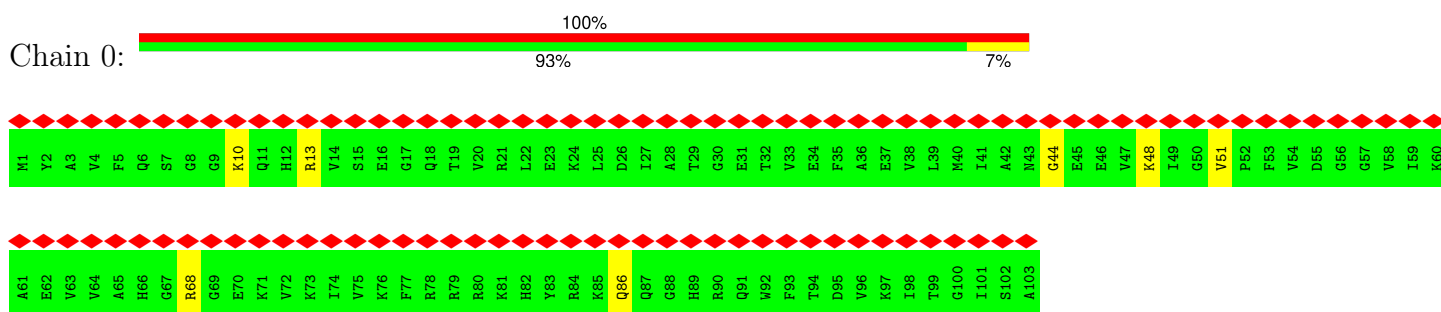
- Molecule 65 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
65	AA	2	Total	Zn	0
			2	2	

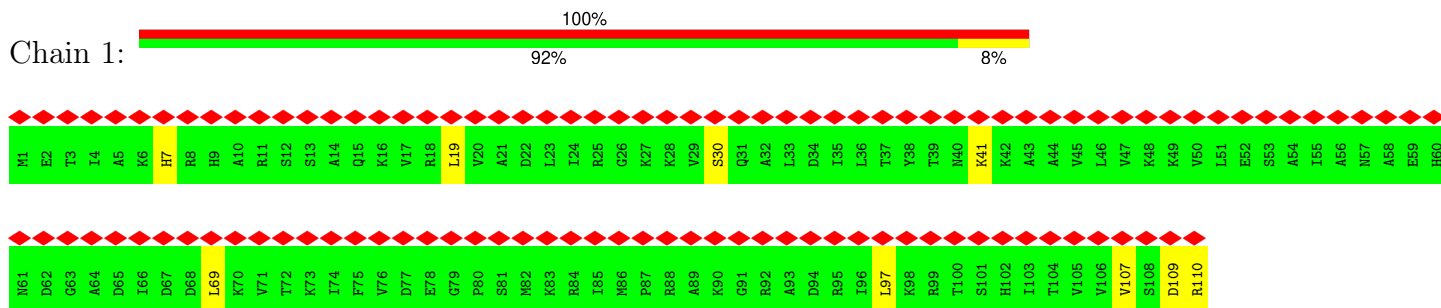
3 Residue-property plots

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.

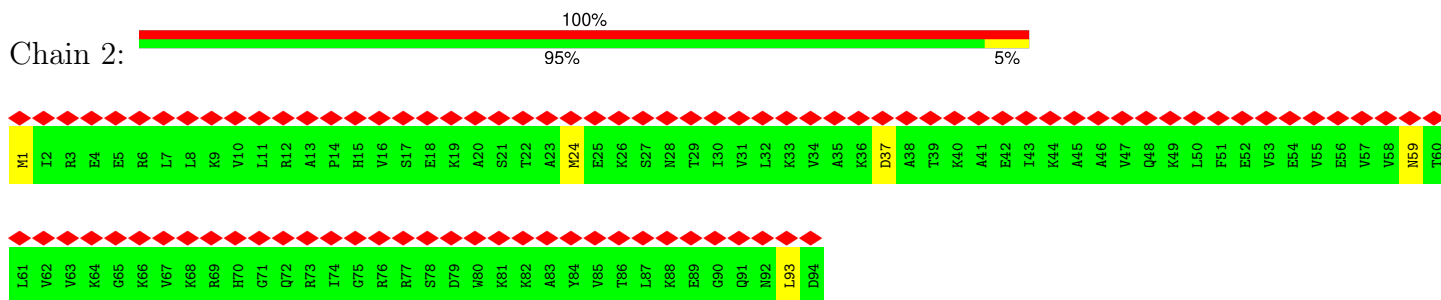
- Molecule 1: 50S ribosomal protein L21



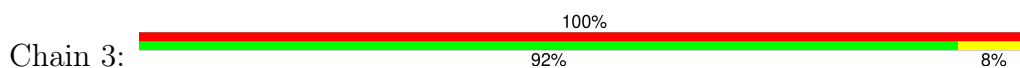
- Molecule 2: 50S ribosomal protein L22

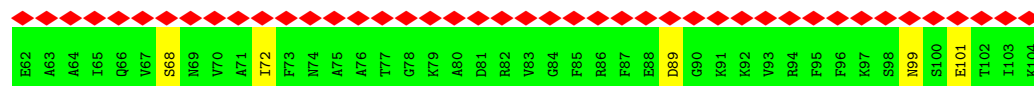


- Molecule 3: 50S ribosomal protein L23

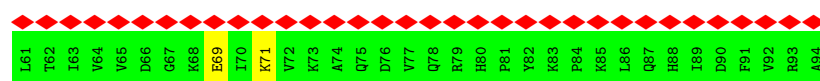
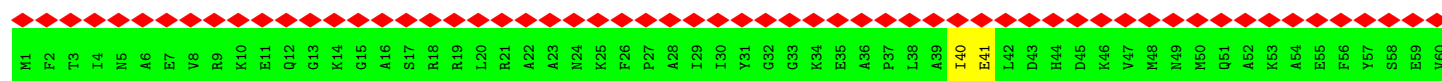


- Molecule 4: 50S ribosomal protein L24

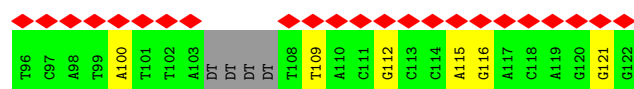
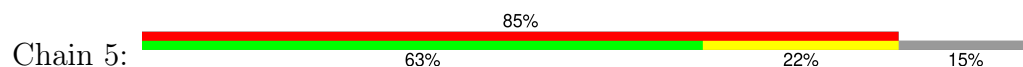




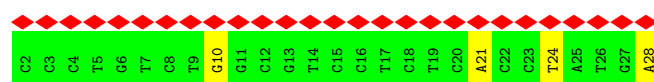
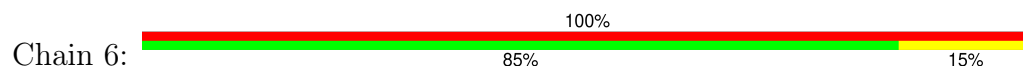
• Molecule 5: 50S ribosomal protein L25



• Molecule 6: NT DNA



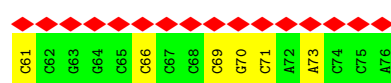
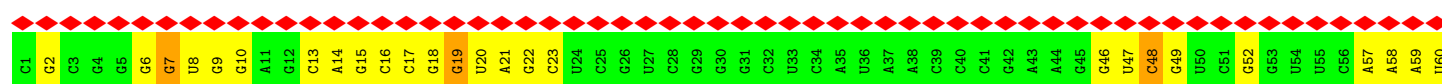
• Molecule 7: T DNA



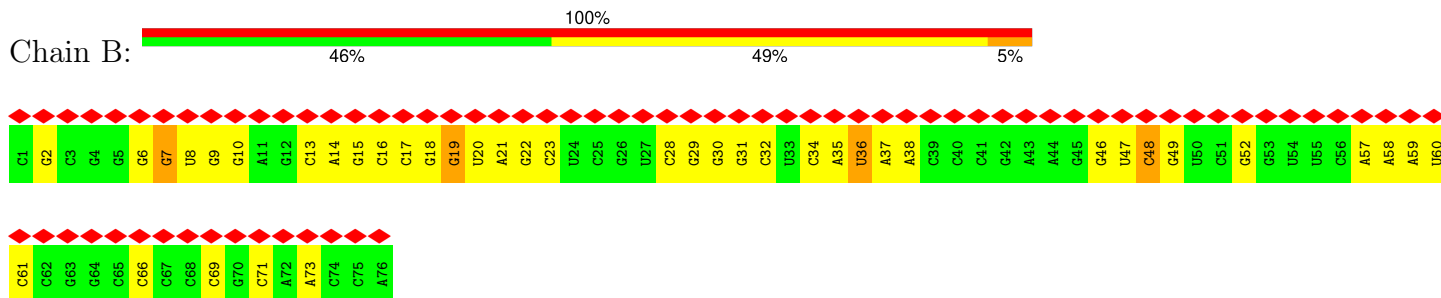
• Molecule 8: mRNA with 27 nt long spacer



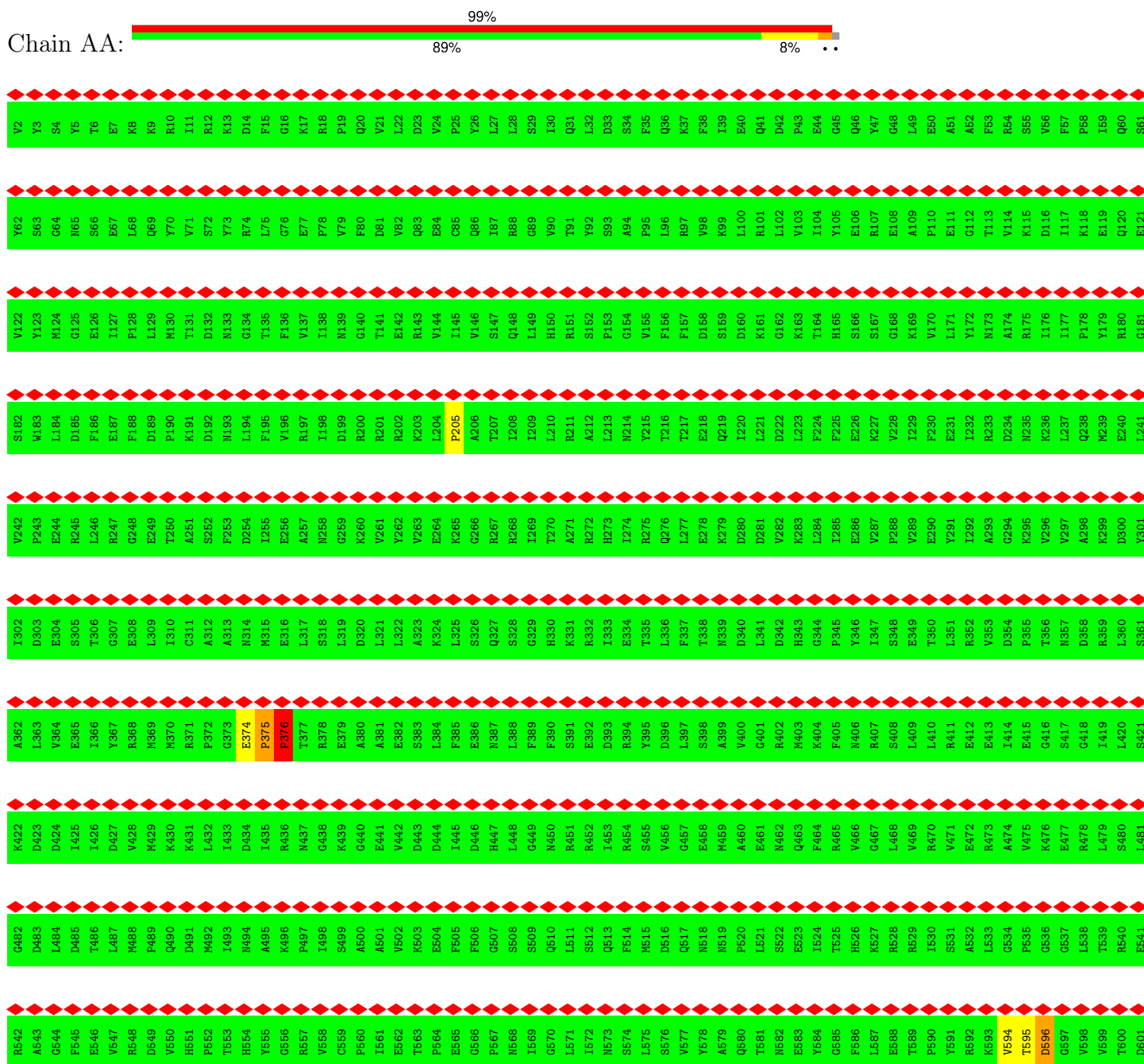
• Molecule 9: E-site and P-site tRNA (fMet)



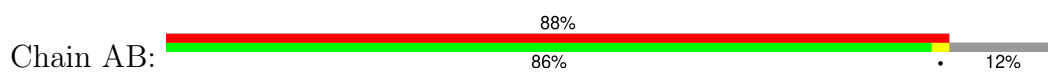
- Molecule 9: E-site and P-site tRNA (fMet)



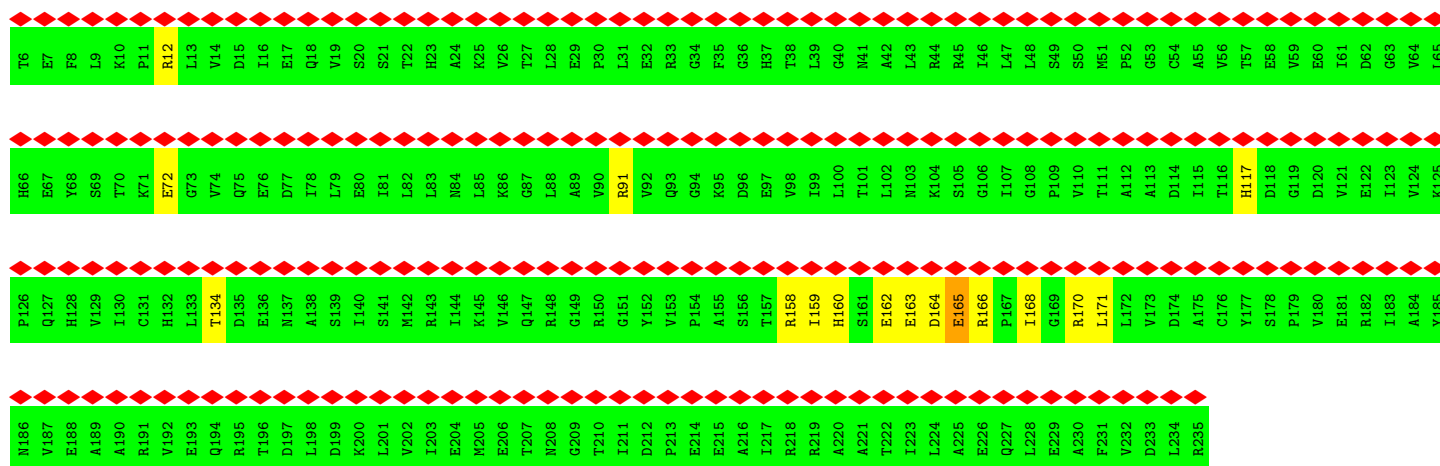
- Molecule 10: DNA-directed RNA polymerase subunit beta



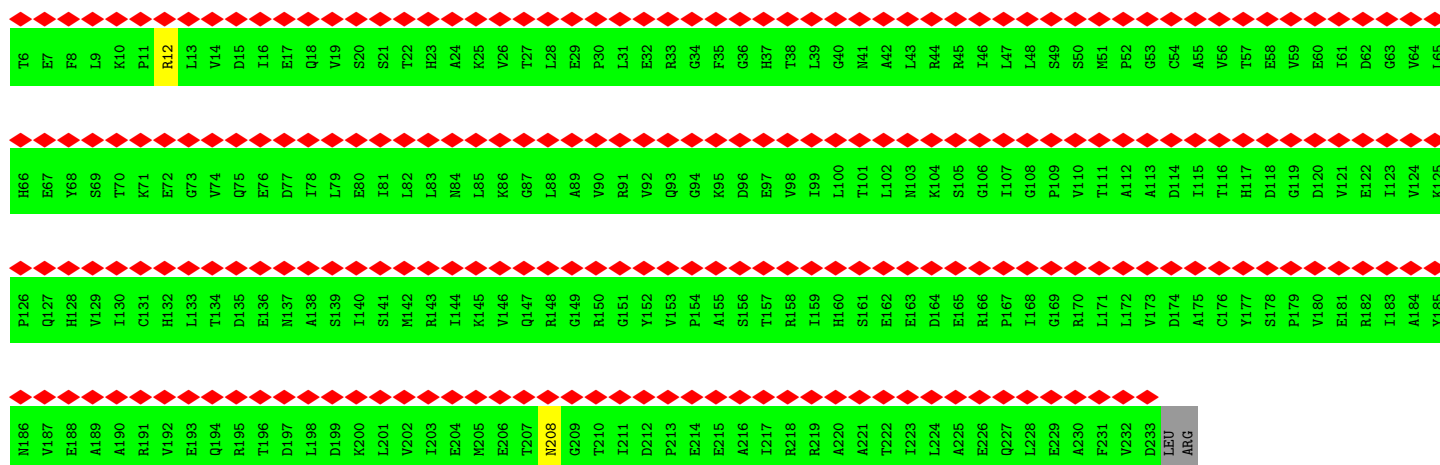
- Molecule 11: Transcription termination/antitermination protein NusG



- Molecule 12: DNA-directed RNA polymerase subunit alpha



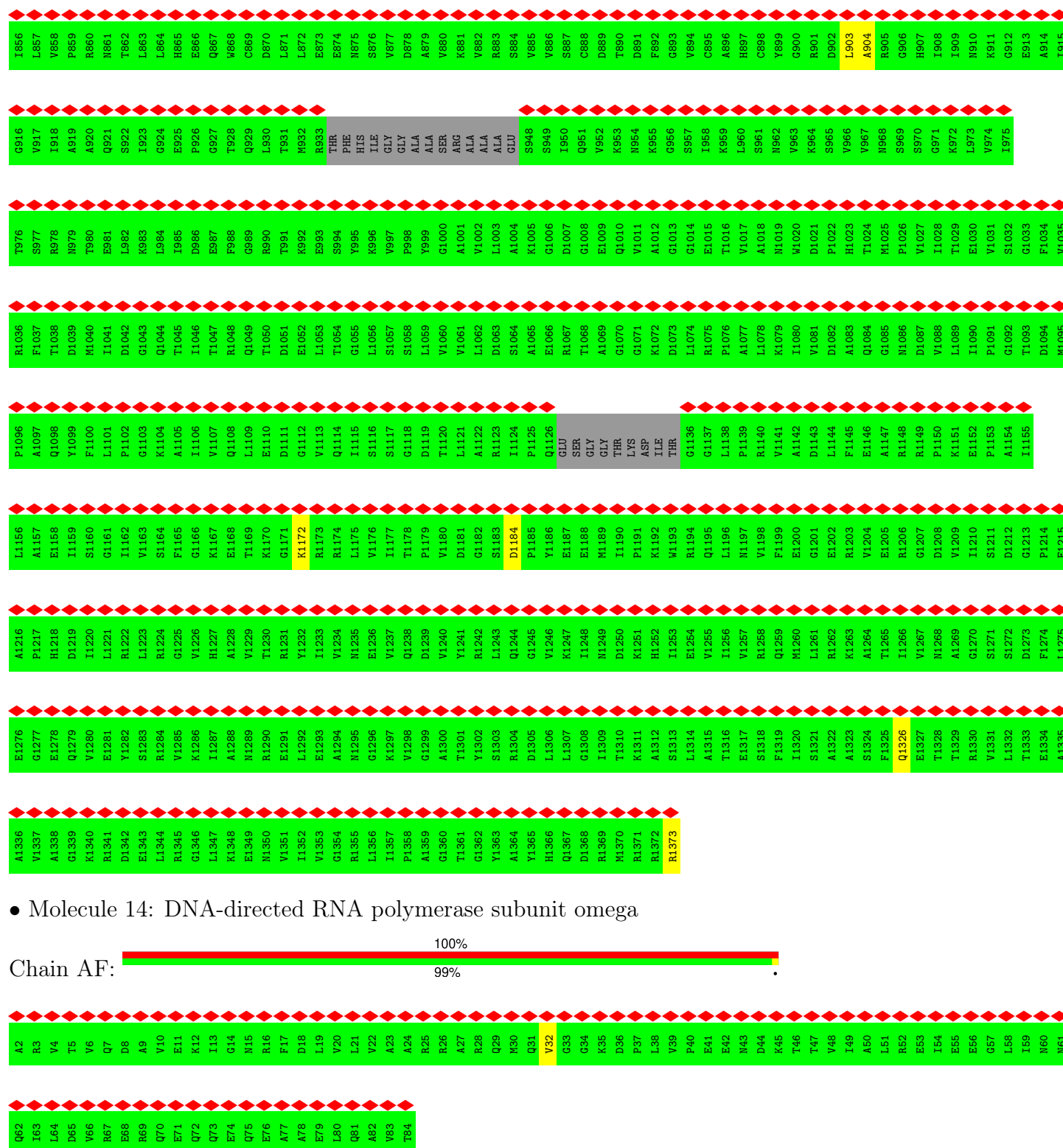
- Molecule 12: DNA-directed RNA polymerase subunit alpha

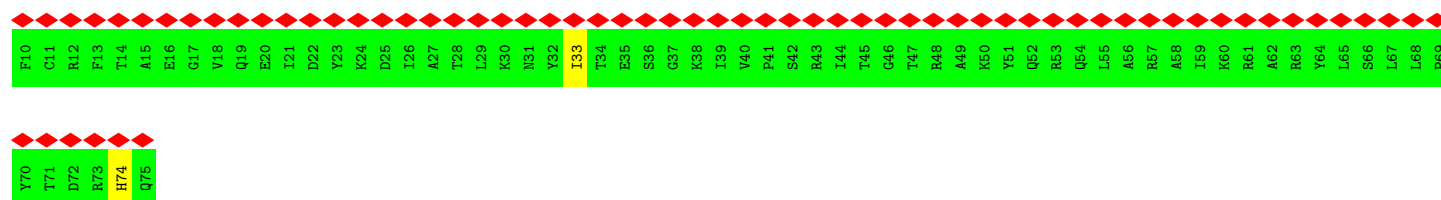


- Molecule 13: DNA-directed RNA polymerase subunit



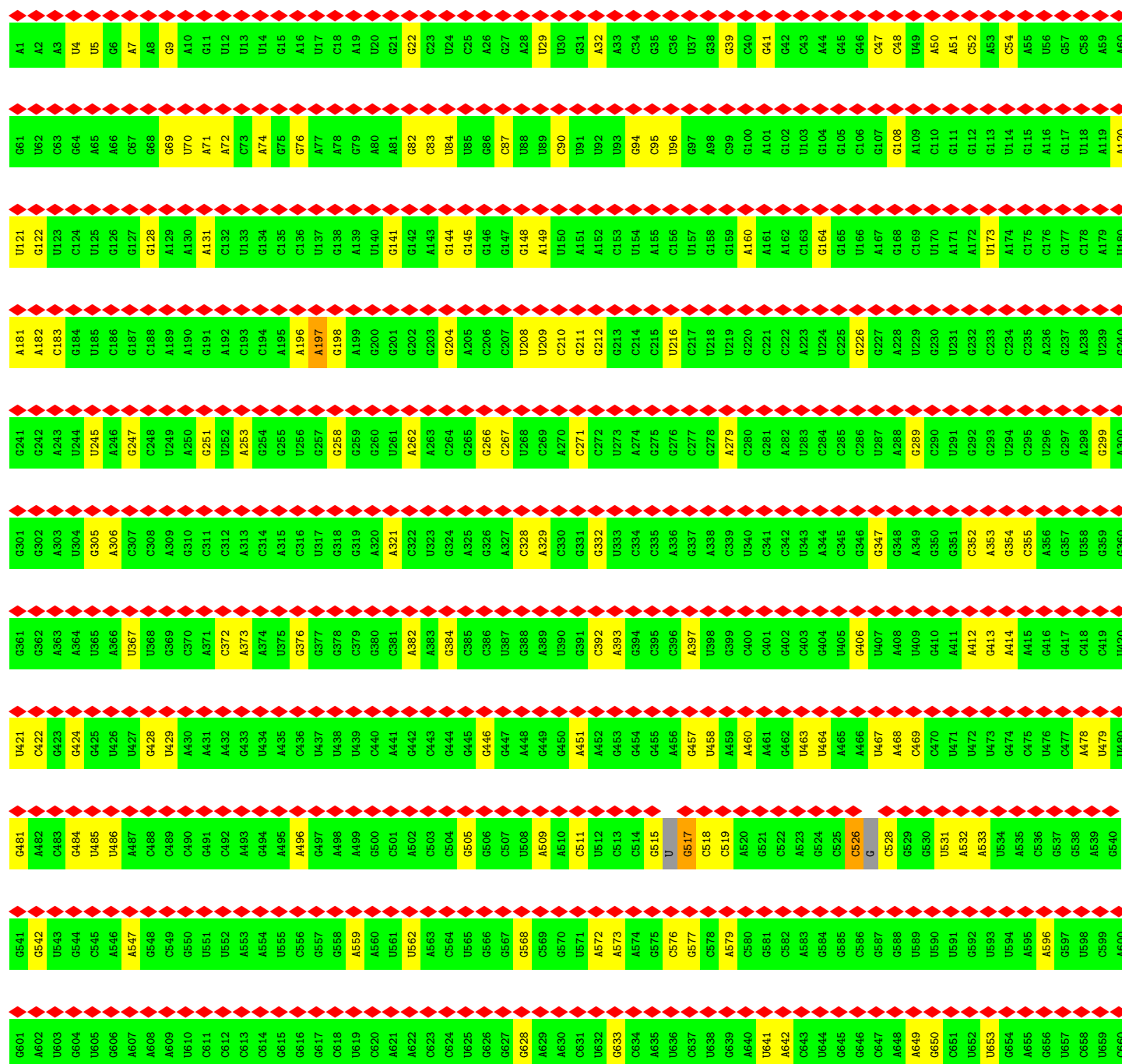
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P616	T617	V618	I619	N620	A621	D622	Q623	I624	M625	Y626	T627	G628	F629	A630	Y631	A632	A633	R634	S635	G636	A637	S638	V639	G640	I641	D642	D643	M644	V645	I646	P647	E648	K649	K650	H651	E652	I653	I654	S655	E656	A657	E658	A659	E660	E661	A662	E663	I664	Q665	E666	Q667	F668	Q669	S670	G671	L672	V673	T674	A675
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K76	R77	L78	K79	H80	R81	G82	V83	I84	C85	E86	K87	C88	G89	V90	E91	V92	T93	Q94	T95	R96	V97	R98	R99	E100	R101	M102	G103	H104	I105	E106	L107	A108	S109	P110	T111	A112	R113	D114	W115	F116	L117	K118	S119	L120	P121	S122	R123	T124	G125	L126	L127	L128	D129	M130	P131	L132	R133	D134	T135





● Molecule 16: 16S rRNA

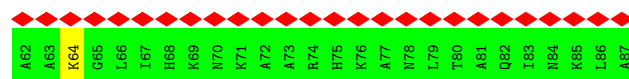
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C1383	A663	U723	C783	U843	G903	G963	U1023	U1083	G1143	C1203	C1263	G1323	C1383
C1384	G664	G724	A784	G844	U904	A964	G1024	G1084	G1144	U1204	U1264	A1324	C1384
G1385	G665	G725	G785	G845	U905	U965	U1025	U1085	A1145	U1205	G1265	C1325	G1385
G1386	G666	G726	G786	G846	A906	C	U1026	U1086	A1146	G1206	G1266	U1326	G1386
G1387	G667	G727	A787	G847	A907	C	C1027	G1087	C1147	G1207	C1267	U1327	G1387
C1388	G668	A728	U788	C848	A908	A968	C1028	G1088	U1148	C1208	G1268	C1328	C1388
C1389	G669	A729	U789	G849	A909	A969	U1029	G1089	C1149	C1209	A1269	A1329	C1389
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G1392	U672	C732	U792	G852	C912	C972	G1032	A1092	A1152	U1212	G1272	A1332	G1392
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A1394	G674	G734	A794	U854	A914	A974	G1034	G1094	G1154	C1214	A1274	G1334	A1394
C1395	A675	C735	C795	U855	A915	A975	A1035	U1095	A1155	G1215	A1275	U1335	C1395
A1396	A676	C736	C796	C856	U916	G976	A1036	C1096	G1156	A1216	G1276	C1336	A1396
C1397	U677	C737	C797	C857	G917	A977	C1037	C1097	A1157	C1217	C1277	G1337	C1397
A1398	U678	C738	U798	C858	A918	A978	G1038	C1098	C1158	C1218	G1278	A1338	A1398
G1399	C679	C739	G799	G859	A919	C979	G1039	G1099	U1159	A1219	G1279	A1339	G1399
C1400	C680	U740	G800	A860	U920	C980	U1040	C1100	G1160	G1220	A1280	A1340	C1400
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G1405	G685	G745	C805	A865	G925	C985	C1045	A1105	U1165	A1225	A1285	U1345	G1405
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A1408	G688	G748	C808	C868	G928	U988	G1048	G1108	U1168	C1228	A1288	U1348	A1408
C1409	C689	A749	G809	C869	G929	U989	U1049	C1109	A1169	A1229	A1289	A1349	C1409
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C1411	G691	U751	C811	U871	C931	U991	C1051	A1111	A1171	G1231	U1291	U1351	C1411
C1412	U692	G752	G812	A872	C932	U992	G1052	C1112	G1172	U1232	C1292	G1352	C1412
A1413	G693	A753	U813	C873	G933	G993	G1053	C1113	U1173	G1233	C1293	G1353	A1413
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G1422	U701	G761	G821	G881	G941	C1001	G1061	U1121	G1181	G1241	U1301	G1361	G1422
G1423	A702	U762	U822	C882	G942	G1002	U1062	U1122	G1182	G1242	C1302	A1362	G1423
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G1426	G705	G765	A825	G885	G945	A1005	U1065	U1125	G1185	C1245	A1305	G1365	G1426
C1427	A706	A766	C826	G886	A946	G1006	C1066	U1126	G1186	A1246	U1306	G1366	C1427
A1428	U707	A767	U827	G887	G947	U1008	A1067	G1127	G1187	U1247	U1307	C1367	A1428
A1429	C708	A768	U828	G888	C948	U1009	G1068	C1128	A1188	C1248	U1308	A1368	A1429
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A1431	G710	C770	G830	G890	U950	C1011	U1070	A1130	G1190	A1250	C1310	G1370	A1431
G1432	G711	G771	A831	U891	G951	A1012	C1071	G1131	A1191	A1251	A1311	G1371	G1432
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G1435	A714	G774	G834	G894	U954	G1015	G1074	G1134	U1194	A1254	C1314	A1374	G1435
U1436	A715	G775	U835	G895	U955	A1016	U1075	U1135	C1195	G1255	U1315	A1375	U1436
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G1439	A718	A778	G838	G898	U958	G1018	U1078	G1138	G1198	G1258	A1318	C1378	G1439
C1440	C719	C779	C839	C899	A959	A1019	G1079	G1139	U1199	C1259	A1319	G1379	C1440
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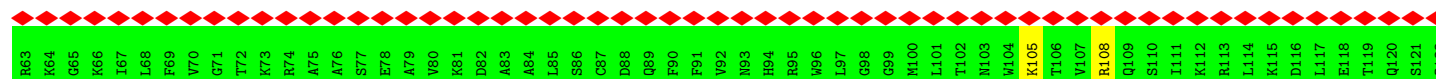
• Molecule 17: 30S ribosomal protein S20



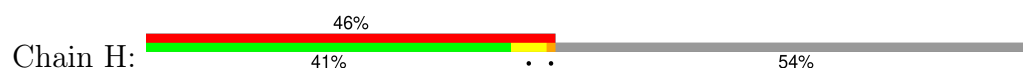
• Molecule 18: 30S ribosomal protein S21

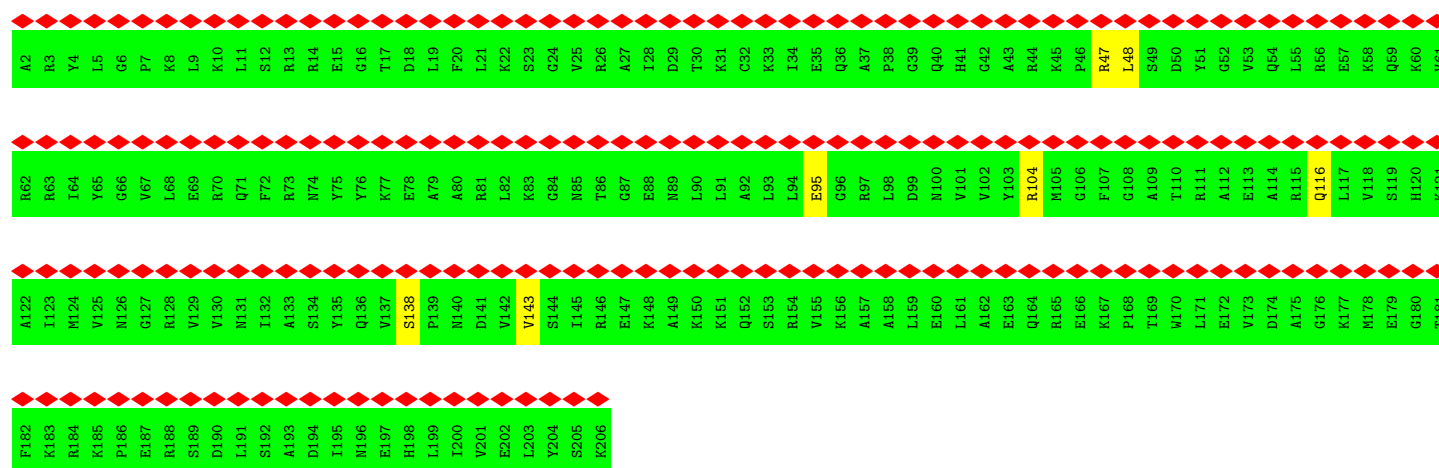


• Molecule 19: 30S ribosomal protein S2

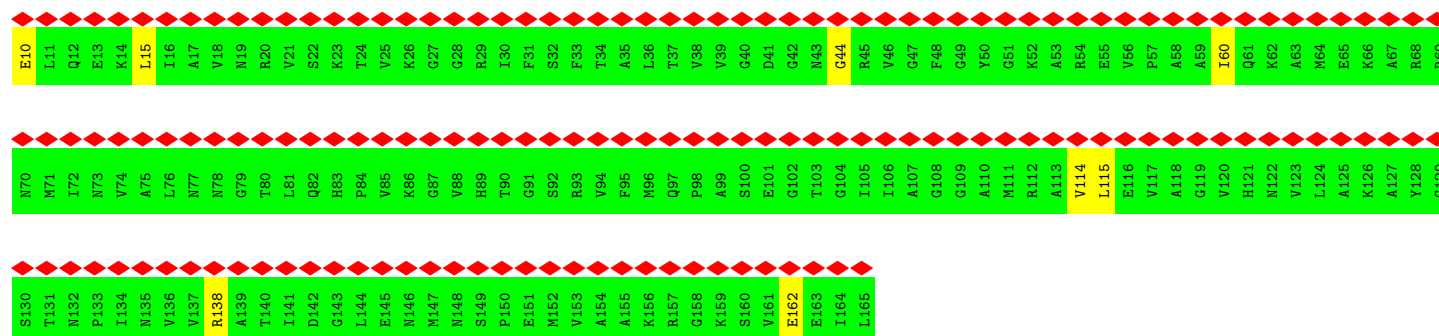


• Molecule 20: 30S ribosomal protein S1





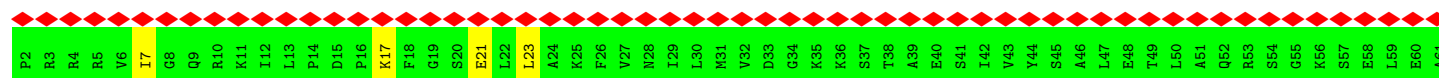
• Molecule 23: 30S ribosomal protein S5

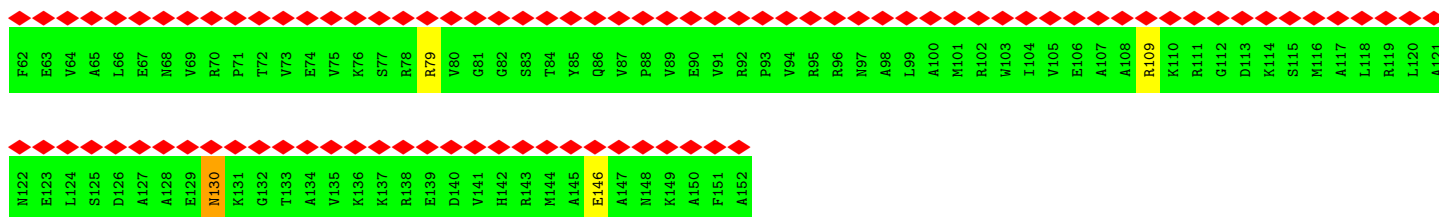


• Molecule 24: 30S ribosomal protein S6

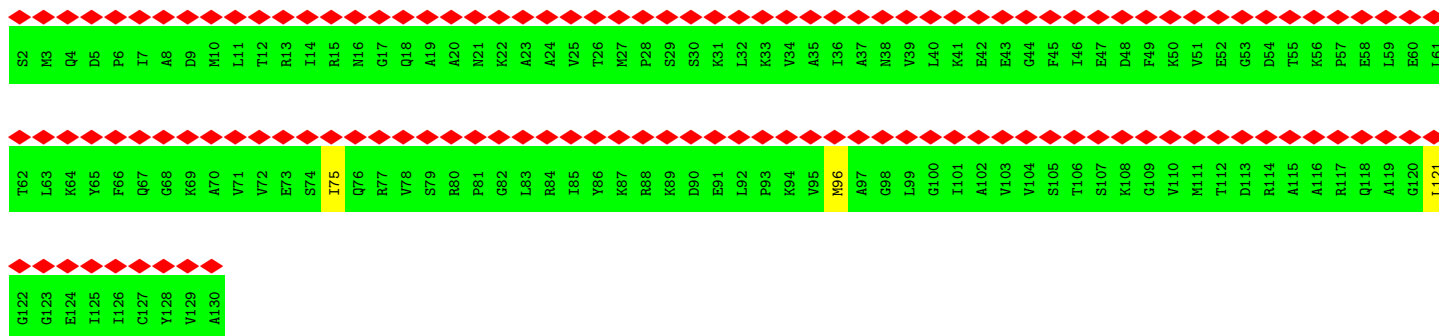


• Molecule 25: 30S ribosomal protein S7





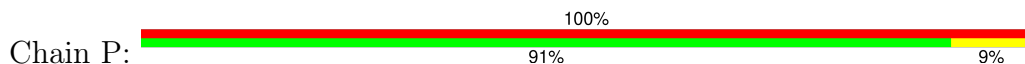
• Molecule 26: 30S ribosomal protein S8



• Molecule 27: 30S ribosomal protein S9



• Molecule 28: 30S ribosomal protein S10

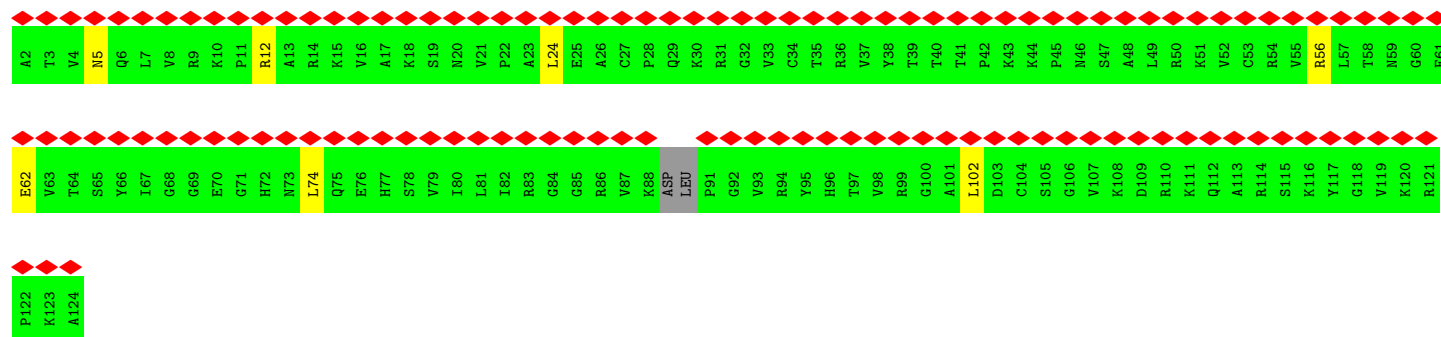


• Molecule 29: 30S ribosomal protein S11

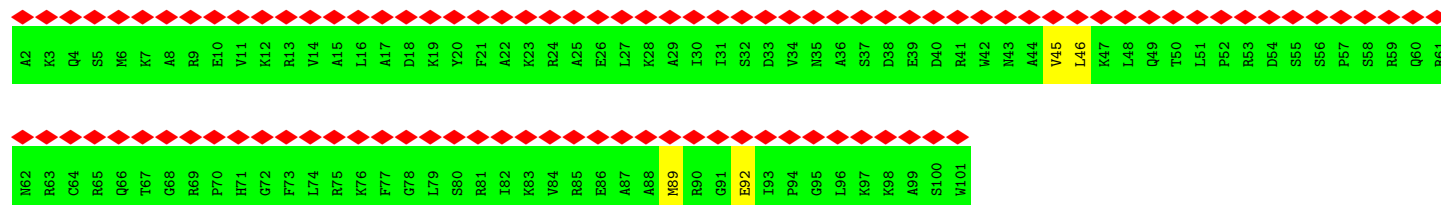




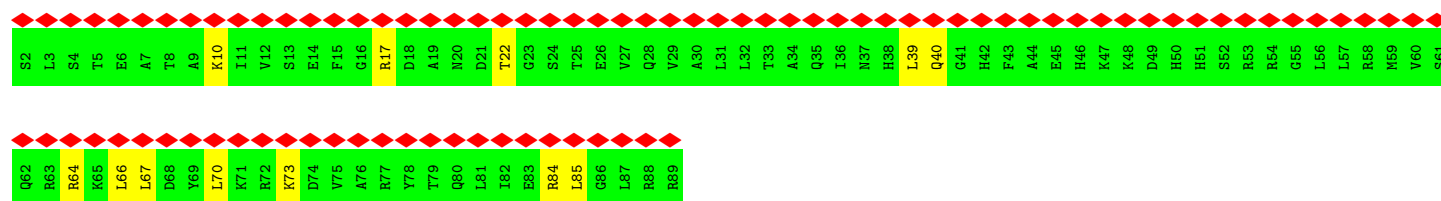
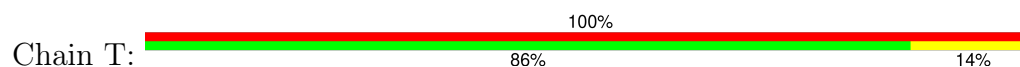
• Molecule 30: 30S ribosomal protein S12



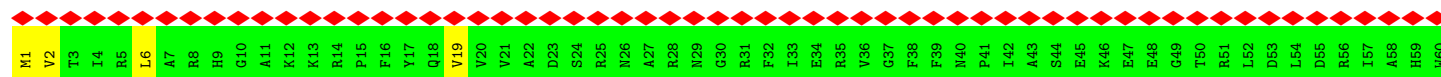
• Molecule 31: 30S ribosomal protein S14



• Molecule 32: 30S ribosomal protein S15

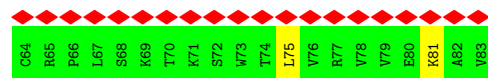
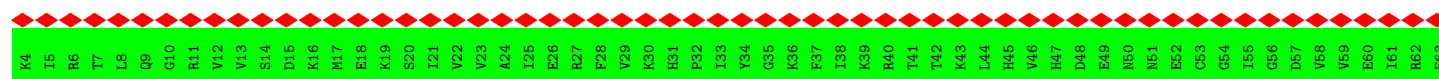


• Molecule 33: 30S ribosomal protein S16

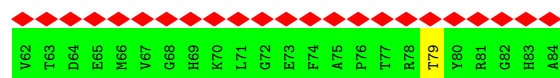




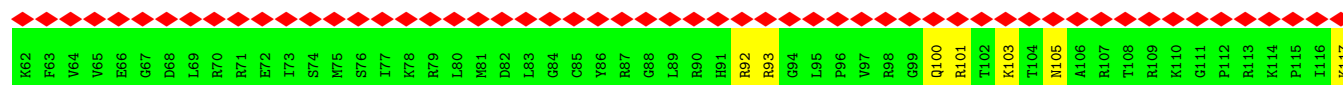
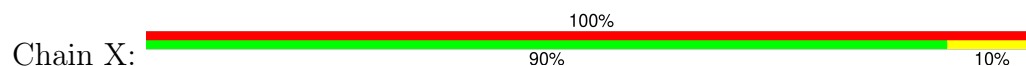
• Molecule 34: 30S ribosomal protein S17



• Molecule 35: 30S ribosomal protein S19



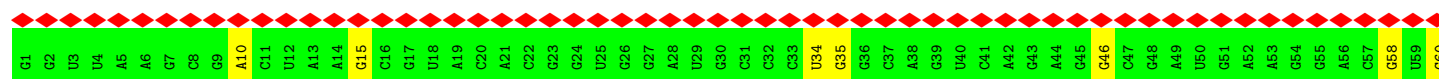
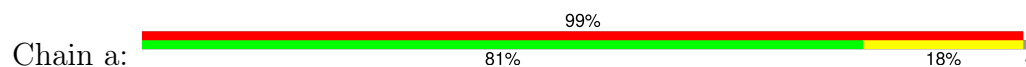
• Molecule 36: 30S ribosomal protein S13



• Molecule 37: mRNA in the ribosomal RNA entrance pore



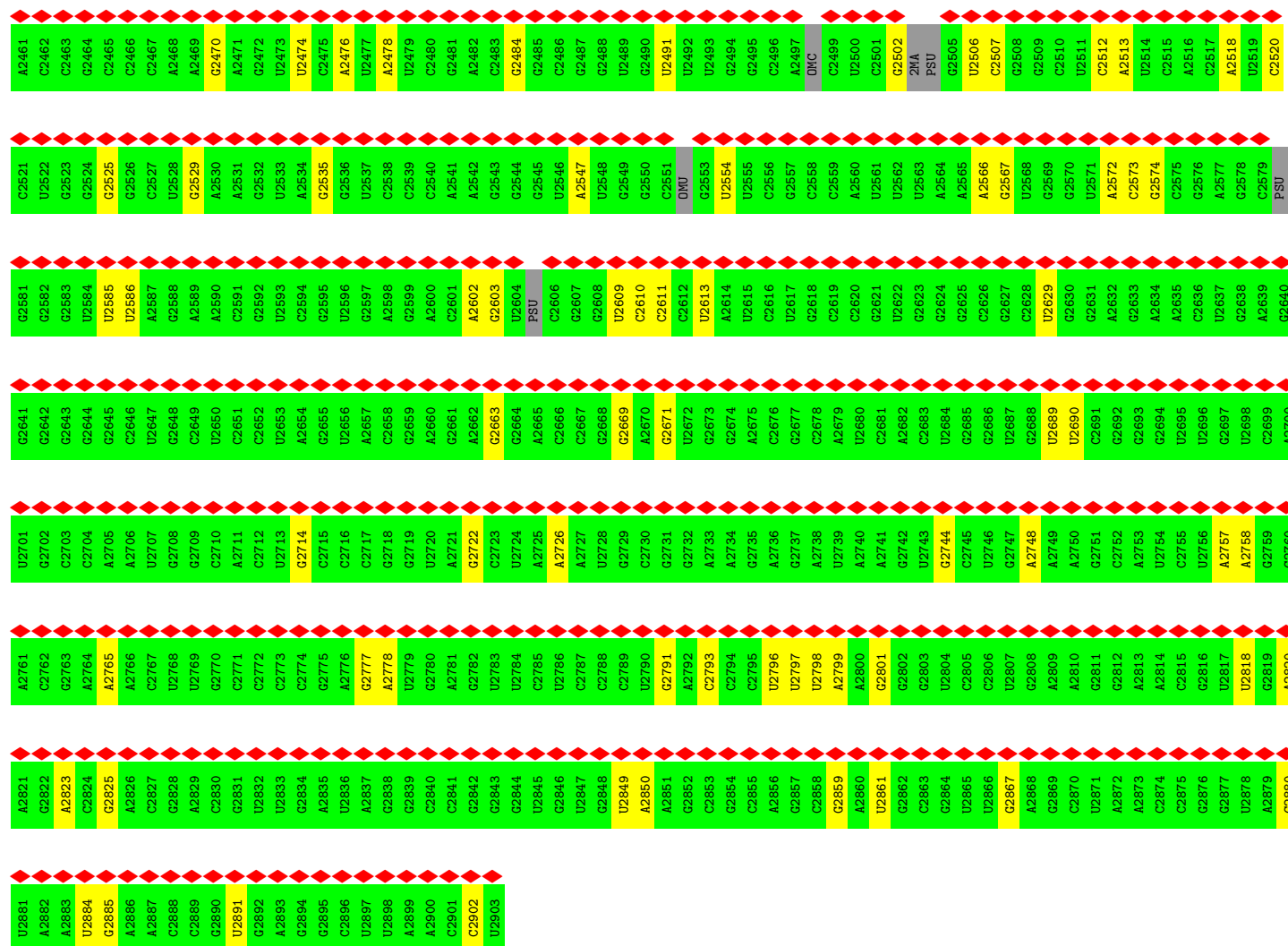
• Molecule 38: 23S rRNA



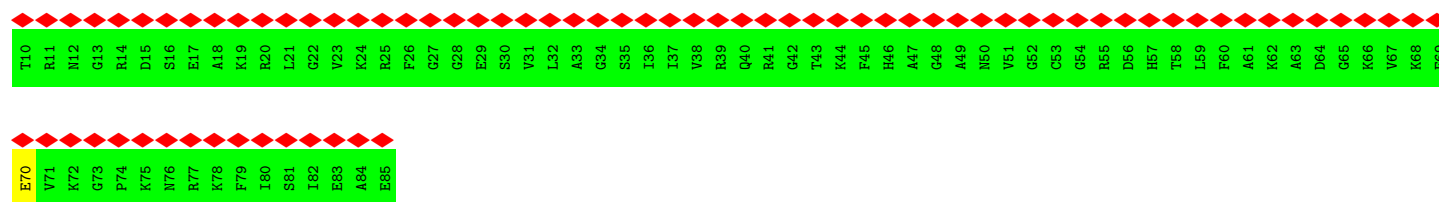
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G121	U122	A123	G124	A125	G126	A127	G128	C129	G130	A131	G132	U133	G134	U135	G136	U137	U138	U139	C140	G141	A142	C143	A144	C145	G146	C147	U148	A149	C150	C151	A152	U153	U154	A155	A156	C157	G158	U159	A160	A161	U162	C163	A164	A165	U166	A167	G168	G169	U170	U171	A172	A173	U174	G175	A176	G177	A178	A179	U180
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G2221	C2222	G2223	G2224	A2225	C2226	A2227	G2228	U2229	G2230	U2231	C2232	G2233	G2234	G2235	U2236	G2237	G2238	G2239	U2240	A2241	G2242	U2243	U2244	U2245	G2246	A2247	C2248	U2249	G2250	DMG	G2253	C2254	G2255	G2256	U2257	C2258	U2259	C2260	C2261	U2262	C2263	C2264	U2265	A2266	A2267	A2268	G2269	U2270	G2271	U2272	A2273	A2274	C2275	G2276	G2277	A2278	G2279	G2280																																
C2161	G2162	A2163	C2164	C2165	U2166	U2167	G2168	A2169	A2170	A2171	U2172	A2173	C2174	C2175	A2176	C2177	C2178	C2179	U2180	U2181	U2182	A2183	A2184	U2185	G2186	U2187	U2188	U2189	G2190	A2191	U2192	G2193	U2194	U2195	C2196	U2197	A2198	A2199	C2200	G2201	U2202	U2203	G2204	A2205	C2206	C2207	C2208	G2209	U2210	A2211	G2212	U2213	C2214	C2215	G2216	G2217	U2218	U2219	U2220																															
A2101	G2102	C2103	C2104	U2105	U2106	G2107	A2108	U2109	G2110	U2111	G2112	U2113	A2114	G2115	G2116	A2117	U2118	A2119	G2120	G2121	U2122	G2123	G2124	G2125	A2126	G2127	G2128	C2129	U2130	U2131	U2132	G2133	A2134	U2075	U2076	A2077	C2078	U2079	A2080	U2081	A2082	G2083	C2084	U2085	U2086	G2087	A2088	C2089	A2090	C2091	U2092	G2093	A2094	A2095	C2096	A2097	U2098	U2099	G2100																															
A1981	U1982	G1983	G1984	C1985	C1986	A1987	G1988	G1989	C1990	U1991	G1992	U1993	C1994	U1995	C1996	C1997	A1998	C1999	C2000	C2001	G2002	A2003	G2004	A2005	C2006	U2007	C2008	A2009	G2010	U2011	G2012	A2013	A2014	A2015	U2016	U2017	G2018	A2019	A2020	C2021	U2022	C2023	G2024	C2025	U2026	G2027	U2028	G2029	6MZ	A2031	A2032	A2033	U2034	G2035	C2036	A2037	G2038	U2039	G2040																															
G1921	G1922	U1923	C1924	C1925	U1926	A1927	A1928	G1929	G1930	U1931	A1932	G1933	C1934	G1935	A1936	A1937	A1938	5MG	U1940	C1941	C1942	U1943	U1944	G1945	U1946	C1947	G1948	G1949	G1950	U1951	A1952	A1953	G1954	U1955	U1956	C1957	C1958	G1959	A1960	C1961	5MC	U1963	G1964	C1965	A1966	C1967	G1968	A1969	A1970	U1971	G1972	G1973	C1974	G1975	U1976	A1977	A1978	U1979	G1980																															
G1861	G1862	U1863	U1864	U1865	A1866	G1867	C1868	G1869	C1870	A1871	A1872	G1873	C1874	G1875	A1876	A1877	G1878	C1879	U1880	C1881	U1882	U1883	G1884	A1885	U1886	C1887	G1888	A1889	G1890	G1891	C1892	C1893	C1894	C1895	G1896	G1897	C1898	A1899	A1900	A1901	C1902	G1903	G1904	C1905	G1906	G1907	C1908	C1909	G1910	PSU	A1912	A1913	C1914	3TD	A1916	PSU	A1918	A1919	C1920																															
A1801	A1802	C1803	C1804	A1805	C1806	G1807	A1808	A1809	A1810	G1811	U1812	G1813	G1814	A1815	C1816	G1817	U1818	A1819	U1820	A1821	C1822	G1823	G1824	U1825	G1826	G1827	G1828	A1829	C1830	G1831	C1832	C1833	U1834	2MG	C1836	C1837	C1838	G1839	G1840	U1841	G1842	C1843	C1844	G1845	G1846	A1847	A1848	G1849	G1850	U1851	U1852	A1853	A1854	U1855	U1856	G1857	A1858	U1859	G1860																															
C1741	U1742	G1743	A1744	A1745	A1746	U1747	C1748	A1749	G1750	U1751	C1752	G1753	A1754	A1755	G1756	A1757	U1758	A1759	C1760	A1761	A1762	G1763	C1764	U1765	G1766	G1767	C1768	U1769	G1770	C1771	A1772	C1773	C1774	U1775	G1776	U1777	U1778	G1719	U1780	G1721	U1782	G1723	A1784	U1785	A1786	A1787	C1788	U1789	C1790	A1791	G1792	G1793	A1794	C1795	U1796	G1797	U1798	G1799	C1800																															
G1681	G1682	U1683	G1684	C1685	C1686	G1687	U1688	A1689	A1690	C1691	U1692	G1693	C1694	A1695	G1696	G1697	A1698	G1699	A1700	A1701	A1762	G1703	C1704	U1705	G1706	G1707	C1708	U1709	G1710	C1711	U1712	A1713	C1774	U1714	G1715	U1716	U1717	U1718	G1719	U1720	G1721	U1782	G1723	A1784	U1725	C1726	G1727	C1728	U1729	C1730	G1731	C1732	G1733	G1734	C1735	U1736	G1737	G1738	A1739	G1740																														



• Molecule 39: 50S ribosomal protein L27

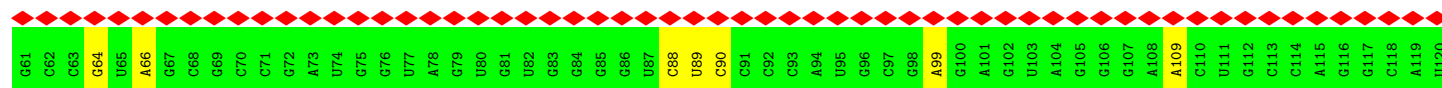
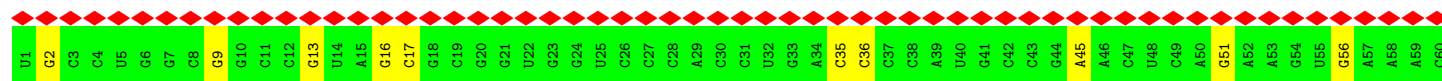
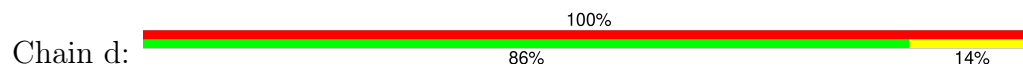


• Molecule 40: 50S ribosomal protein L28

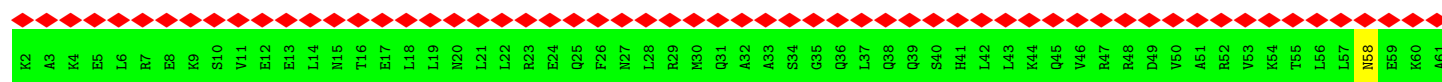




• Molecule 41: 5S rRNA



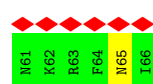
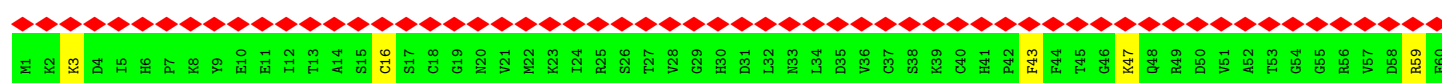
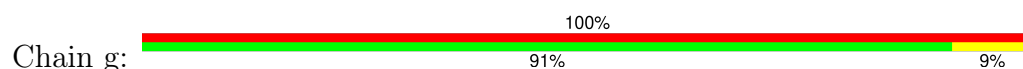
• Molecule 42: 50S ribosomal protein L29



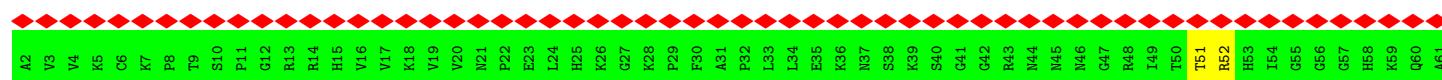
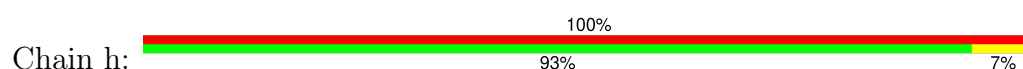
• Molecule 43: 50S ribosomal protein L30

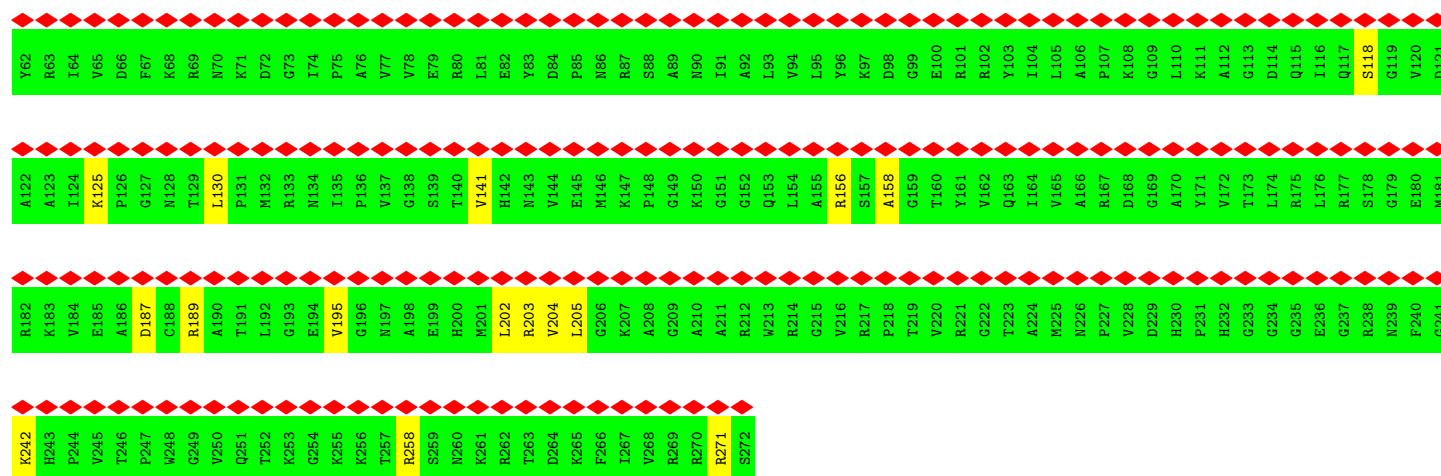


• Molecule 44: 50S ribosomal protein L31

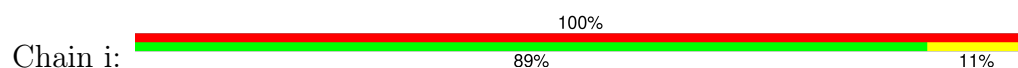


• Molecule 45: 50S ribosomal protein L2

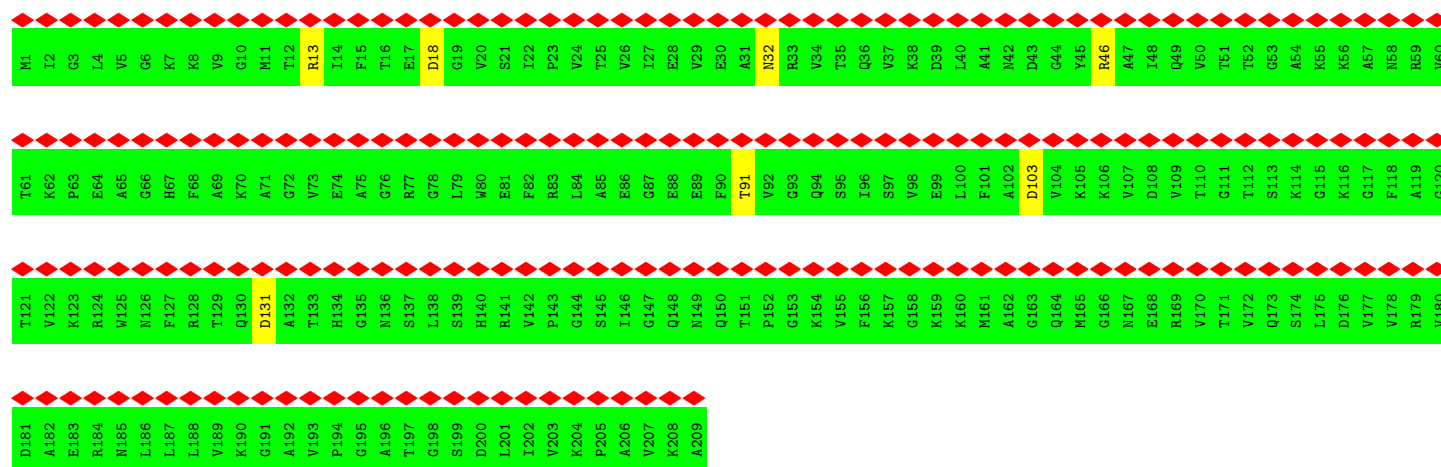




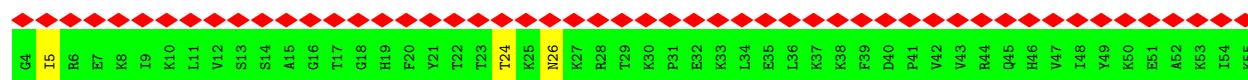
• Molecule 46: 50S ribosomal protein L32



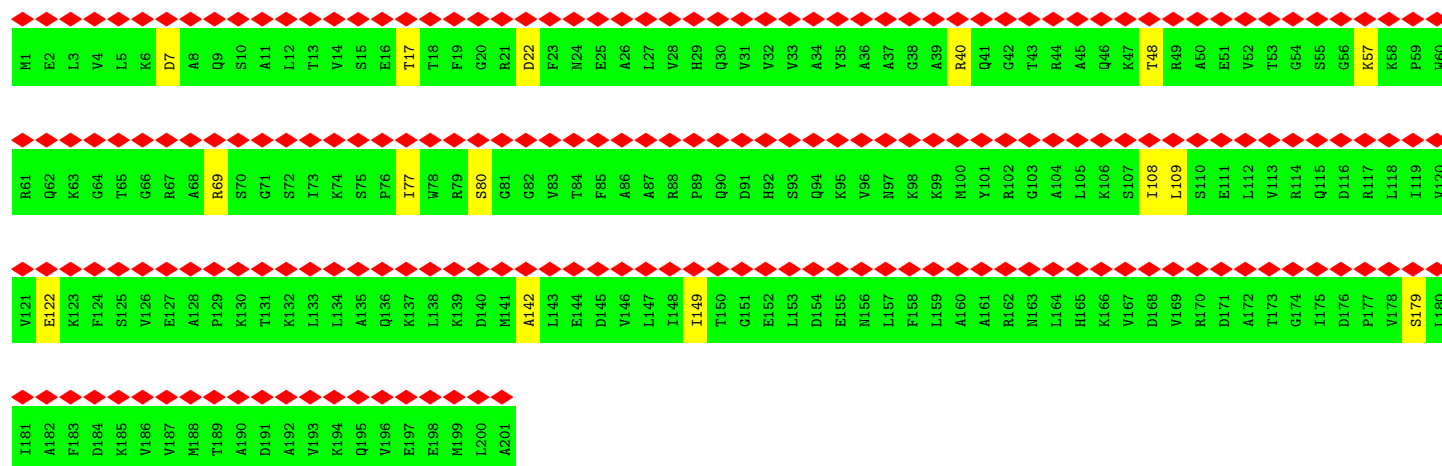
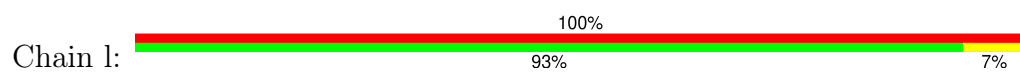
• Molecule 47: 50S ribosomal protein L3



• Molecule 48: 50S ribosomal protein L33



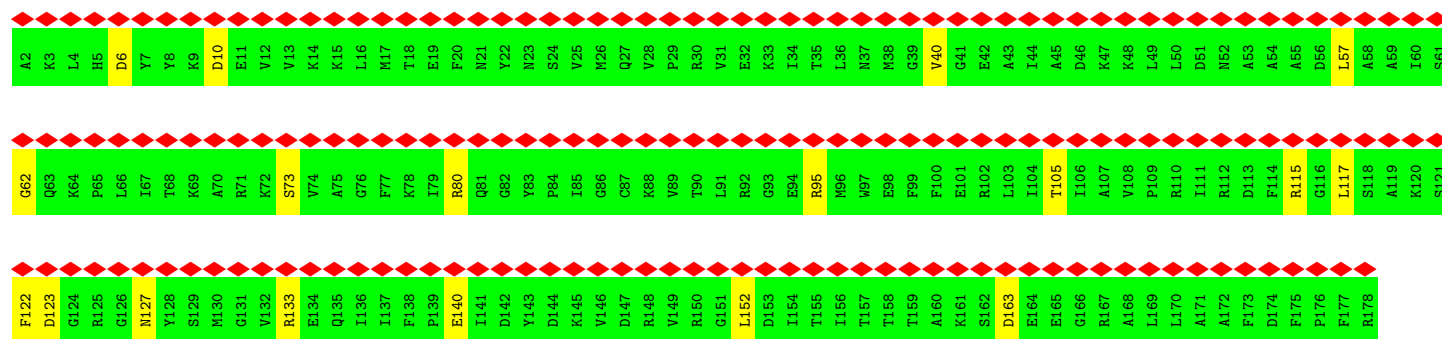
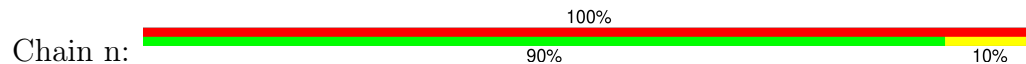
• Molecule 49: 50S ribosomal protein L4



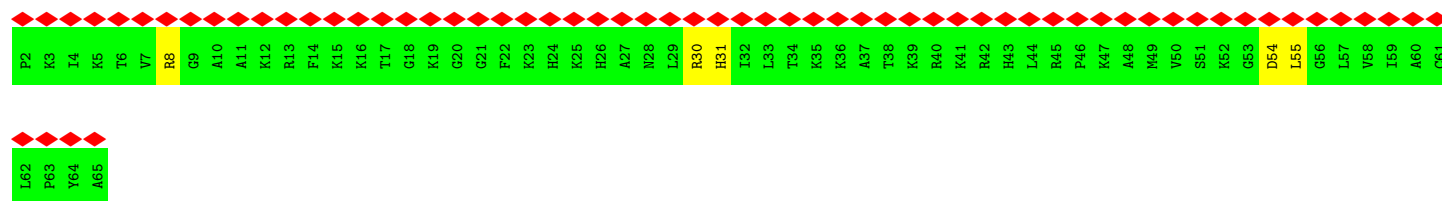
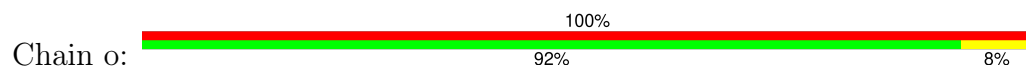
• Molecule 50: 50S ribosomal protein L34



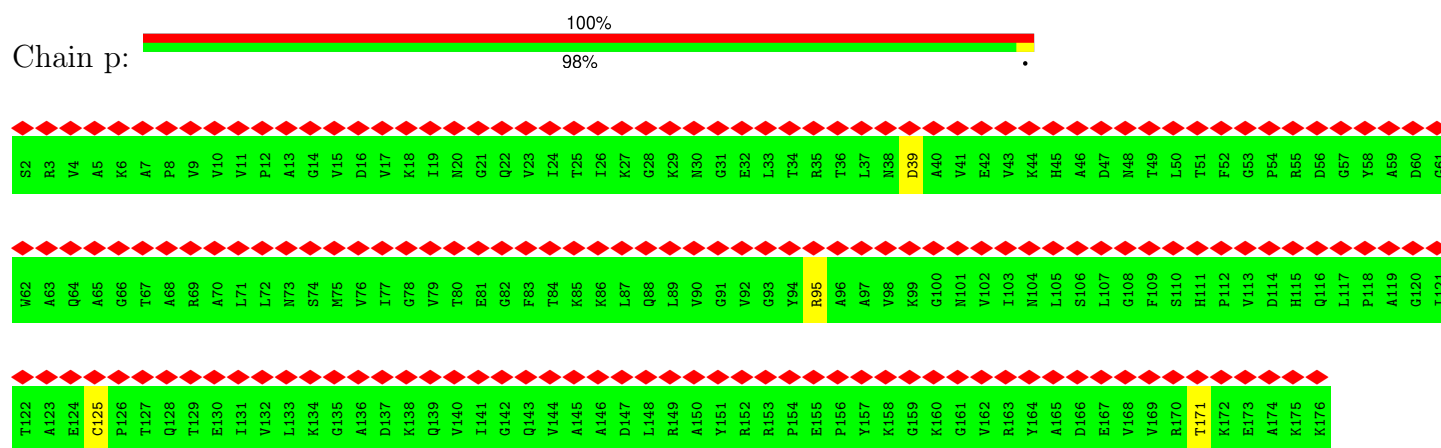
• Molecule 51: 50S ribosomal protein L5



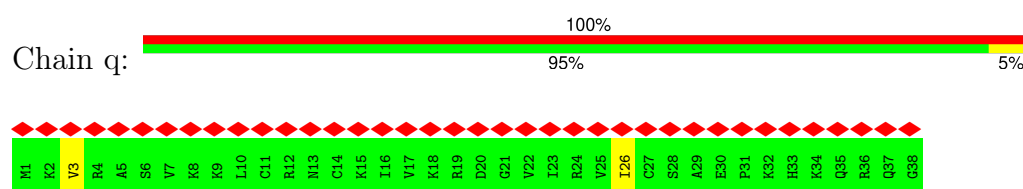
• Molecule 52: 50S ribosomal protein L35



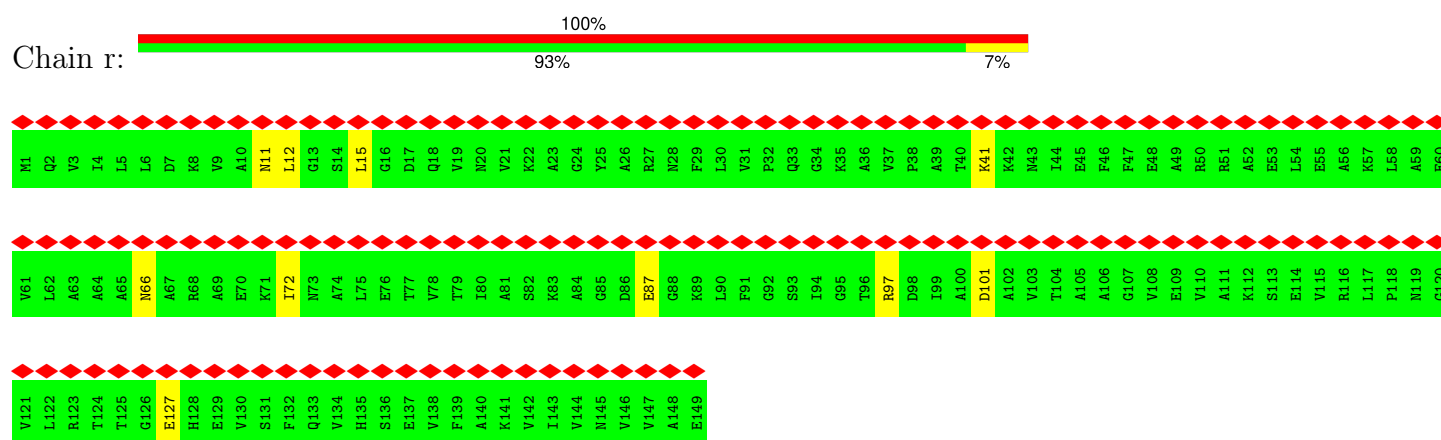
• Molecule 53: 50S ribosomal protein L6



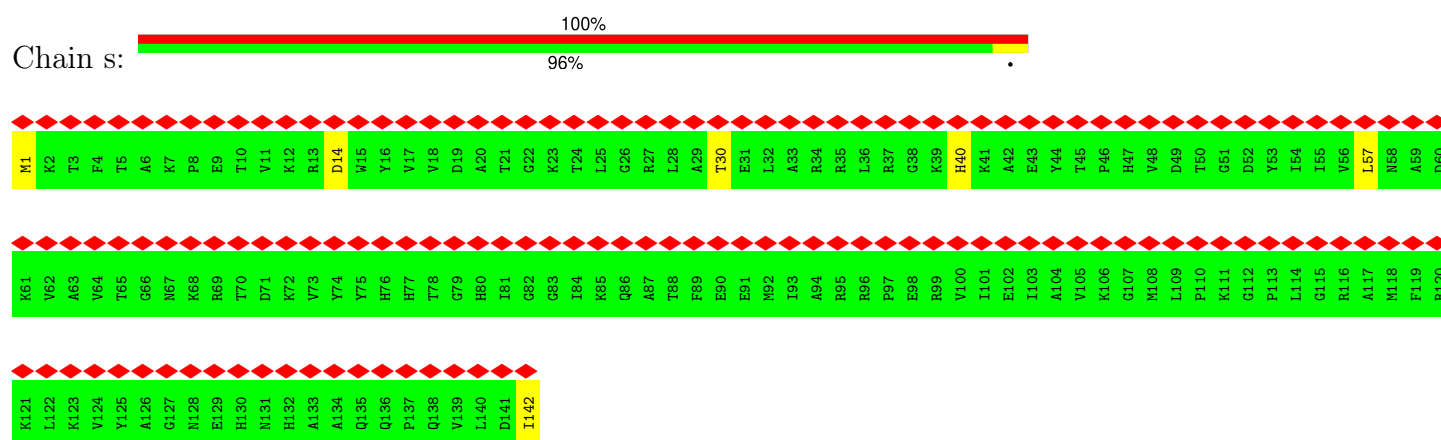
• Molecule 54: 50S ribosomal protein L36



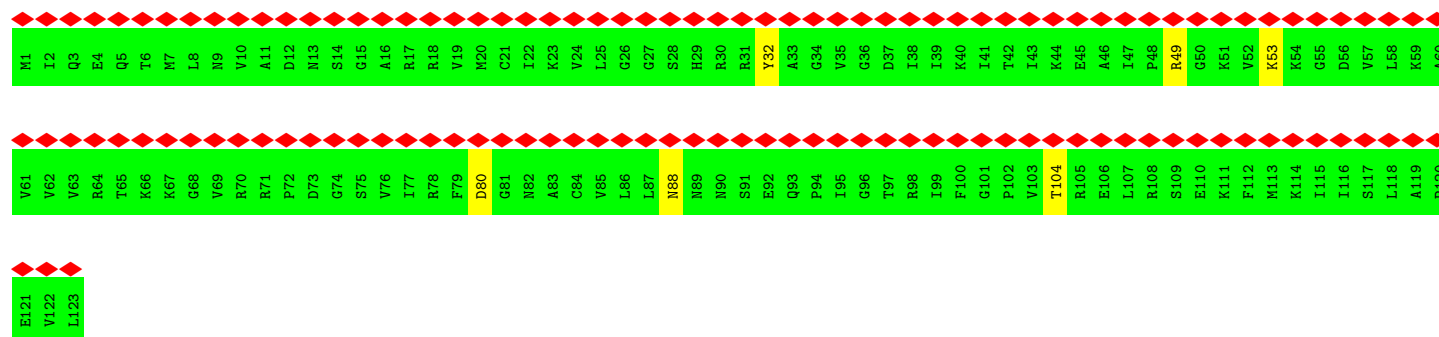
• Molecule 55: 50S ribosomal protein L9



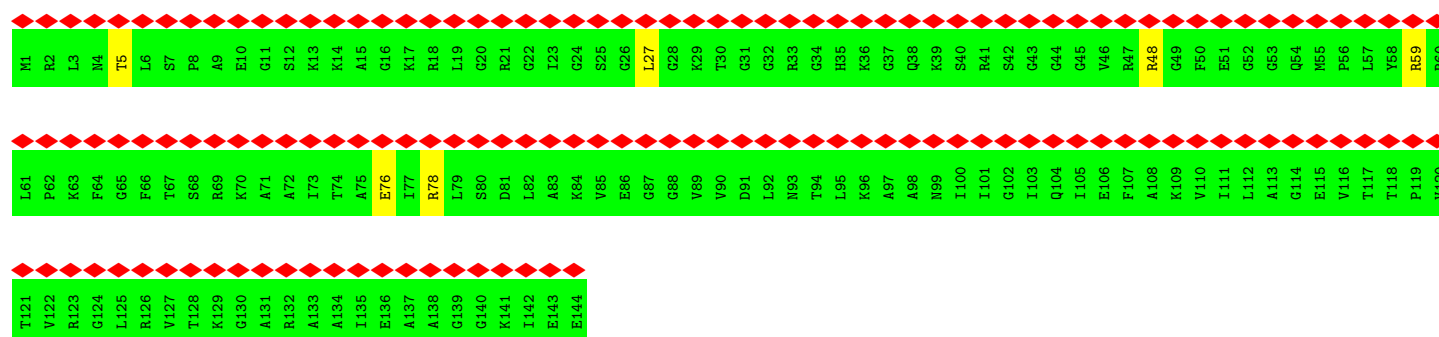
• Molecule 56: 50S ribosomal protein L13



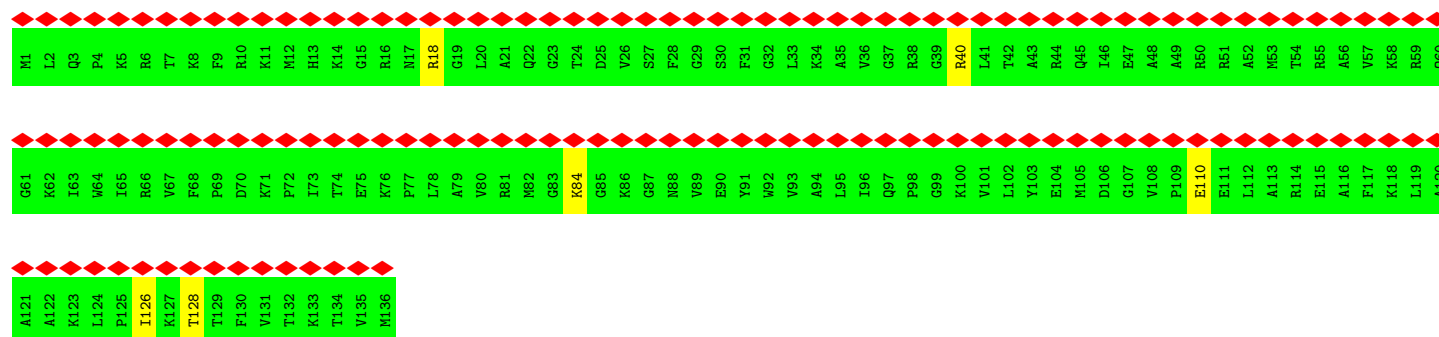
• Molecule 57: 50S ribosomal protein L14



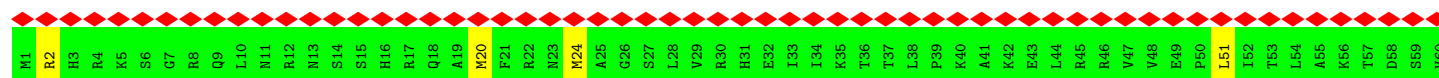
• Molecule 58: 50S ribosomal protein L15

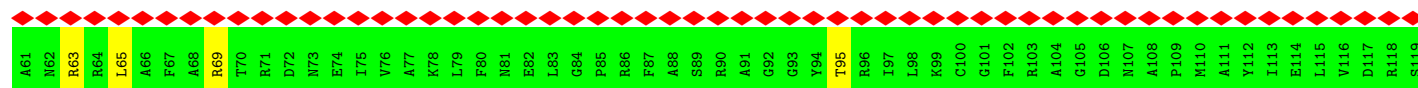


• Molecule 59: 50S ribosomal protein L16



• Molecule 60: 50S ribosomal protein L17

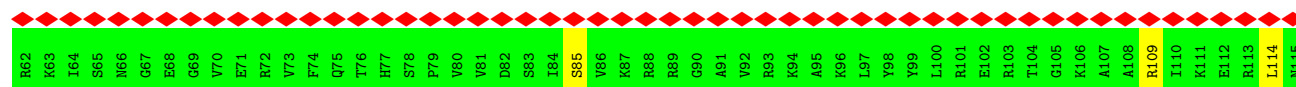




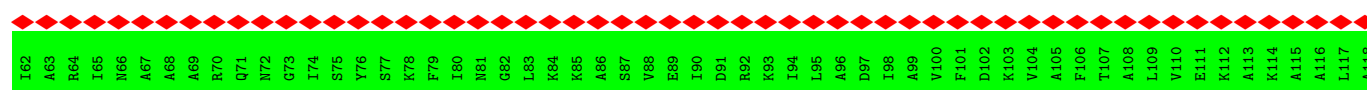
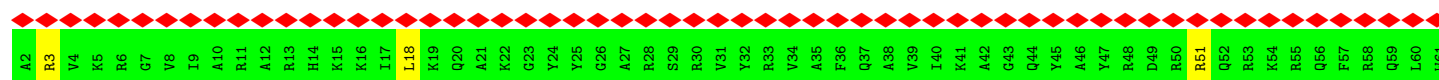
• Molecule 61: 50S ribosomal protein L18



• Molecule 62: 50S ribosomal protein L19



• Molecule 63: 50S ribosomal protein L20



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	5979	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.080	Depositor
Minimum map value	-0.020	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.5	Depositor
Map size (Å)	564.48, 564.48, 564.48	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.016, 2.016, 2.016	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	0.38	0/829	0.67	0/1107
2	1	0.48	0/864	0.83	0/1156
3	2	0.42	0/752	0.71	0/1005
4	3	0.35	0/796	0.66	2/1062 (0.2%)
5	4	0.40	0/766	0.68	0/1025
6	5	1.13	6/528 (1.1%)	0.97	1/810 (0.1%)
7	6	1.11	4/603 (0.7%)	0.97	0/926
8	7	0.95	4/388 (1.0%)	1.04	0/604
9	A	0.39	0/1810	0.75	1/2821 (0.0%)
9	B	0.46	1/1810 (0.1%)	0.86	7/2821 (0.2%)
10	AA	0.58	2/10591 (0.0%)	0.77	19/14289 (0.1%)
11	AB	0.43	0/808	0.59	0/1088
12	AC	0.47	0/1808	0.61	1/2450 (0.0%)
12	AD	0.39	0/1789	0.56	0/2425
13	AE	0.52	3/10545 (0.0%)	0.66	5/14236 (0.0%)
14	AF	0.47	0/657	0.67	0/886
15	C	0.48	0/553	0.83	0/743
16	D	0.34	10/36610 (0.0%)	0.74	30/57091 (0.1%)
17	E	0.57	0/675	0.85	0/895
18	F	0.56	0/597	0.87	0/792
19	G	0.49	0/1791	0.71	0/2413
20	H	0.55	1/1746 (0.1%)	1.03	13/2382 (0.5%)
21	I	0.43	0/1663	0.71	0/2241
22	J	0.47	0/1665	0.73	0/2227
23	K	0.45	0/1165	0.75	0/1568
24	L	0.43	0/867	0.75	1/1171 (0.1%)
25	M	0.50	0/1195	0.81	0/1602
26	N	0.41	0/989	0.70	0/1326
27	O	0.43	0/1034	0.75	0/1375
28	P	0.43	0/800	0.75	0/1082
29	Q	0.40	0/893	0.70	0/1205
30	R	0.35	0/952	0.74	0/1274

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	S	0.49	0/817	0.79	0/1088
32	T	0.53	0/722	0.86	0/964
33	U	0.44	0/659	0.79	0/884
34	V	0.34	0/657	0.62	0/881
35	W	0.38	0/680	0.62	0/915
36	X	0.49	0/909	0.87	0/1215
37	Y	0.26	0/65	0.74	0/98
38	a	0.39	3/69247 (0.0%)	0.72	18/107985 (0.0%)
39	b	0.39	0/589	0.70	0/779
40	c	0.48	0/635	0.81	1/848 (0.1%)
41	d	0.30	0/2872	0.70	0/4478
42	e	0.54	0/502	0.83	0/667
43	f	0.45	0/452	0.78	0/605
44	g	0.43	0/531	0.68	0/709
45	h	0.39	0/2121	0.78	0/2852
46	i	0.40	0/450	0.79	0/599
47	j	0.44	0/1586	0.70	0/2134
48	k	0.35	0/433	0.65	0/576
49	l	0.46	0/1571	0.77	0/2113
50	m	0.53	0/380	0.99	0/498
51	n	0.49	0/1434	0.88	3/1926 (0.2%)
52	o	0.45	0/513	0.83	0/676
53	p	0.39	0/1333	0.67	0/1805
54	q	0.37	0/303	0.77	0/397
55	r	0.44	0/1122	0.69	0/1515
56	s	0.50	0/1152	0.75	0/1551
57	t	0.41	0/955	0.78	0/1279
58	u	0.40	0/1062	0.76	0/1413
59	v	0.47	0/1093	0.82	0/1460
60	w	0.52	0/964	0.87	0/1289
61	x	0.46	0/902	0.81	0/1209
62	y	0.41	0/929	0.72	1/1242 (0.1%)
63	z	0.60	0/960	0.91	0/1278
All	All	0.43	34/187139 (0.0%)	0.74	103/276026 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
9	A	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
9	B	0	2
10	AA	0	12
13	AE	0	5
14	AF	0	1
20	H	0	3
36	X	0	1
All	All	0	26

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	D	1516	G	O3'-P	-13.47	1.45	1.61
16	D	1339	A	O3'-P	10.59	1.73	1.61
10	AA	374	GLU	C-N	10.38	1.53	1.34
13	AE	88	CYS	CB-SG	-10.14	1.65	1.82
6	5	109	DT	O3'-P	8.59	1.71	1.61
16	D	145	G	O3'-P	8.54	1.71	1.61
16	D	196	A	O3'-P	8.35	1.71	1.61
7	6	10	DG	C1'-N9	-8.23	1.35	1.47
10	AA	850	ILE	N-CA	-8.19	1.29	1.46
16	D	1275	A	O3'-P	7.74	1.70	1.61
20	H	169	SER	N-CA	7.49	1.61	1.46
38	a	2434	A	O3'-P	7.47	1.70	1.61
6	5	121	DG	C1'-N9	-7.33	1.36	1.47
16	D	1515	G	O3'-P	-7.30	1.52	1.61
16	D	1395	C	O3'-P	7.18	1.69	1.61
16	D	1490	U	O3'-P	6.88	1.69	1.61
8	7	69	G	C1'-N9	-6.69	1.37	1.46
6	5	112	DG	C1'-N9	-6.67	1.38	1.47
38	a	1905	C	O3'-P	6.60	1.69	1.61
16	D	1492	A	O3'-P	6.55	1.69	1.61
6	5	100	DA	C1'-N9	-6.54	1.38	1.47
38	a	2167	U	O3'-P	6.49	1.69	1.61
7	6	21	DA	C1'-N9	-6.44	1.38	1.47
13	AE	93	THR	CA-C	6.25	1.69	1.52
8	7	59	U	C1'-N1	6.10	1.57	1.48
6	5	116	DG	C1'-N9	-6.03	1.38	1.47
6	5	115	DA	C1'-N9	-5.91	1.39	1.47
13	AE	70	CYS	CA-CB	-5.83	1.41	1.53
16	D	1397	C	O3'-P	5.81	1.68	1.61
8	7	60	U	C1'-N1	5.71	1.57	1.48
9	B	36	U	O3'-P	5.71	1.68	1.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	6	28	DA	C1'-N9	-5.70	1.39	1.47
8	7	64	U	C1'-N1	5.39	1.56	1.48
7	6	24	DT	C1'-N1	5.23	1.56	1.49

All (103) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	D	1516	G	P-O3'-C3'	-18.97	96.94	119.70
16	D	1516	G	O3'-P-O5'	13.77	130.17	104.00
10	AA	1007	LYS	O-C-N	-13.02	101.87	122.70
10	AA	1250	SER	C-N-CA	11.20	149.69	121.70
38	a	2252	G	N9-C1'-C2'	-10.97	99.74	114.00
16	D	1401	G	N9-C1'-C2'	-10.72	100.06	114.00
51	n	73	SER	N-CA-CB	-10.64	94.54	110.50
10	AA	1008	GLN	CB-CA-C	10.27	130.94	110.40
16	D	1499	A	N9-C1'-C2'	-10.25	100.68	114.00
16	D	528	C	N1-C1'-C2'	-10.22	100.72	114.00
20	H	169	SER	N-CA-C	9.96	137.90	111.00
16	D	1339	A	P-O3'-C3'	9.83	131.50	119.70
9	B	29	G	N9-C1'-C2'	-9.81	101.21	112.00
9	B	28	C	P-O3'-C3'	9.57	131.19	119.70
10	AA	375	PRO	CA-N-CD	-9.34	98.42	111.50
16	D	196	A	P-O3'-C3'	9.30	130.86	119.70
13	AE	271	ARG	NE-CZ-NH2	-9.23	115.68	120.30
16	D	526	C	N1-C1'-C2'	-8.84	102.28	112.00
20	H	88	LYS	C-N-CA	8.75	143.58	121.70
38	a	2167	U	P-O3'-C3'	8.60	130.02	119.70
16	D	1208	C	N1-C1'-C2'	-8.54	102.60	112.00
10	AA	1007	LYS	CA-C-N	8.51	135.92	117.20
16	D	1206	G	N9-C1'-C2'	-8.30	102.87	112.00
38	a	2434	A	P-O3'-C3'	8.27	129.62	119.70
10	AA	995	ASP	O-C-N	-8.22	109.55	122.70
10	AA	376	PRO	N-CA-CB	-7.99	93.72	103.30
16	D	1406	U	N1-C1'-C2'	-7.79	103.43	112.00
16	D	1275	A	P-O3'-C3'	7.67	128.90	119.70
38	a	1905	C	P-O3'-C3'	7.67	128.90	119.70
16	D	1492	A	P-O3'-C3'	7.58	128.79	119.70
16	D	1490	U	P-O3'-C3'	7.57	128.78	119.70
20	H	305	HIS	N-CA-C	7.41	131.01	111.00
9	B	29	G	C3'-C2'-O2'	7.36	134.63	113.30
10	AA	1010	GLN	N-CA-CB	-7.26	97.53	110.60
9	B	35	A	P-O3'-C3'	7.17	128.30	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	D	1206	G	C4'-C3'-O3'	7.16	127.33	113.00
16	D	1493	A	C2'-C3'-O3'	7.08	125.09	109.50
38	a	2245	U	N1-C1'-C2'	-7.06	104.23	112.00
16	D	145	G	P-O3'-C3'	7.03	128.14	119.70
16	D	1516	G	OP1-P-O3'	-6.98	89.83	105.20
16	D	1395	C	P-O3'-C3'	6.96	128.06	119.70
10	AA	1010	GLN	CB-CA-C	6.96	124.33	110.40
10	AA	855	PRO	N-CA-CB	-6.95	94.95	102.60
51	n	73	SER	CB-CA-C	6.69	122.81	110.10
10	AA	995	ASP	CA-C-N	6.68	131.90	117.20
16	D	1515	G	O3'-P-O5'	-6.64	91.39	104.00
16	D	1401	G	C4'-C3'-O3'	6.61	126.23	113.00
38	a	1379	U	C2'-C3'-O3'	6.59	124.24	113.70
38	a	2250	G	C4'-C3'-O3'	-6.57	95.60	109.40
38	a	2243	U	N1-C1'-C2'	-6.52	104.83	112.00
20	H	339	ARG	C-N-CA	6.50	137.95	121.70
16	D	1515	G	P-O3'-C3'	6.48	127.47	119.70
10	AA	935	THR	CA-CB-OG1	-6.46	95.44	109.00
16	D	1408	A	N9-C1'-C2'	-6.46	104.90	112.00
16	D	515	G	N9-C1'-C2'	-6.43	104.92	112.00
9	B	34	C	P-O3'-C3'	6.40	127.38	119.70
16	D	1497	G	N9-C1'-C2'	-6.39	104.97	112.00
6	5	109	DT	P-O3'-C3'	6.37	127.34	119.70
10	AA	869	GLY	CA-C-O	-6.36	109.15	120.60
12	AC	117	HIS	CB-CA-C	-6.25	97.91	110.40
10	AA	849	GLU	C-N-CA	6.11	136.98	121.70
20	H	140	PRO	N-CA-CB	6.02	110.52	103.30
9	B	29	G	P-O3'-C3'	5.94	126.82	119.70
20	H	330	VAL	N-CA-C	5.91	126.96	111.00
10	AA	727	VAL	N-CA-C	-5.91	95.05	111.00
38	a	754	U	N1-C1'-C2'	5.86	121.62	114.00
20	H	336	ASP	CB-CA-C	-5.86	98.68	110.40
20	H	168	VAL	C-N-CA	5.79	136.18	121.70
20	H	132	PRO	N-CA-CB	5.77	110.22	103.30
16	D	517	G	C5'-C4'-C3'	5.75	125.20	116.00
13	AE	903	LEU	C-N-CA	5.75	136.07	121.70
38	a	2244	U	C1'-C2'-O2'	-5.66	93.61	110.60
51	n	127	ASN	CB-CA-C	5.65	121.70	110.40
20	H	344	LEU	CA-CB-CG	5.63	128.25	115.30
24	L	54	LEU	CA-CB-CG	5.61	128.20	115.30
13	AE	363	LEU	CA-CB-CG	5.56	128.09	115.30
38	a	783	A	C4'-C3'-O3'	5.43	123.86	113.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	AA	1233	LEU	CA-CB-CG	5.43	127.78	115.30
16	D	1397	C	P-O3'-C3'	5.39	126.17	119.70
16	D	1340	A	C5'-C4'-C3'	5.34	124.54	116.00
4	3	22	ARG	NE-CZ-NH1	5.31	122.95	120.30
10	AA	728	ASP	N-CA-C	5.26	125.21	111.00
16	D	1340	A	C5'-C4'-O4'	5.25	115.39	109.10
38	a	404	A	C2'-C3'-O3'	5.24	122.08	113.70
38	a	742	A	C8-N9-C1'	-5.24	118.27	127.70
20	H	169	SER	N-CA-CB	-5.21	102.69	110.50
4	3	22	ARG	NE-CZ-NH2	-5.20	117.70	120.30
62	y	109	ARG	NE-CZ-NH2	5.19	122.90	120.30
10	AA	817	LEU	CB-CG-CD2	-5.17	102.22	111.00
38	a	2244	U	C4'-C3'-O3'	5.16	123.31	113.00
40	c	28	ARG	NE-CZ-NH2	-5.15	117.73	120.30
10	AA	1009	ASN	CB-CA-C	5.11	120.61	110.40
9	B	48	C	N1-C1'-C2'	5.10	120.63	114.00
38	a	2252	G	C4'-C3'-O3'	5.10	123.20	113.00
13	AE	807	LEU	CB-CG-CD2	-5.07	102.38	111.00
38	a	742	A	C4-N9-C1'	5.07	135.42	126.30
9	A	48	C	N1-C1'-C2'	5.04	120.55	114.00
13	AE	73	GLY	N-CA-C	5.03	125.67	113.10
16	D	197	A	C2'-C3'-O3'	5.03	121.75	113.70
38	a	375	G	C2'-C3'-O3'	5.03	121.75	113.70
38	a	1141	U	N1-C1'-C2'	5.01	120.52	114.00
20	H	153	GLU	N-CA-C	-5.01	97.47	111.00
20	H	332	VAL	N-CA-C	5.00	124.51	111.00

There are no chirality outliers.

All (26) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	A	19	G	Sidechain
9	A	7	G	Sidechain
10	AA	1007	LYS	Mainchain
10	AA	1134	GLN	Peptide
10	AA	1157	GLN	Peptide
10	AA	1158	LYS	Peptide
10	AA	205	PRO	Peptide
10	AA	594	VAL	Peptide
10	AA	595	THR	Peptide
10	AA	596	ASP	Mainchain
10	AA	696	ASP	Peptide

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Mol	Chain	Res	Type	Group
10	AA	746	ALA	Peptide
10	AA	853	ASP	Mainchain
10	AA	859	GLU	Mainchain
13	AE	1184	ASP	Peptide
13	AE	1326	GLN	Peptide
13	AE	313	GLY	Peptide
13	AE	416	ILE	Peptide
13	AE	804	ALA	Peptide
14	AF	32	VAL	Peptide
9	B	19	G	Sidechain
9	B	7	G	Sidechain
20	H	274	TYR	Peptide
20	H	81	GLU	Peptide
20	H	82	THR	Peptide
36	X	100	GLN	Mainchain

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	
1	0	101/103 (98%)	97 (96%)	3 (3%)	1 (1%)	13	49
2	1	108/110 (98%)	104 (96%)	4 (4%)	0	100	100
3	2	92/94 (98%)	90 (98%)	2 (2%)	0	100	100
4	3	101/103 (98%)	96 (95%)	4 (4%)	1 (1%)	13	49
5	4	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
10	AA	1318/1341 (98%)	1145 (87%)	140 (11%)	33 (2%)	4	26
11	AB	94/112 (84%)	88 (94%)	6 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
12	AC	228/230 (99%)	214 (94%)	12 (5%)	2 (1%)	14	52
12	AD	226/230 (98%)	212 (94%)	14 (6%)	0	100	100
13	AE	1329/1358 (98%)	1198 (90%)	122 (9%)	9 (1%)	19	57
14	AF	81/83 (98%)	74 (91%)	7 (9%)	0	100	100
15	C	64/66 (97%)	63 (98%)	1 (2%)	0	100	100
17	E	84/86 (98%)	83 (99%)	1 (1%)	0	100	100
18	F	68/70 (97%)	68 (100%)	0	0	100	100
19	G	223/225 (99%)	210 (94%)	13 (6%)	0	100	100
20	H	255/557 (46%)	189 (74%)	54 (21%)	12 (5%)	2	16
21	I	206/208 (99%)	196 (95%)	9 (4%)	1 (0%)	25	64
22	J	203/205 (99%)	198 (98%)	5 (2%)	0	100	100
23	K	154/156 (99%)	146 (95%)	7 (4%)	1 (1%)	22	60
24	L	102/104 (98%)	97 (95%)	4 (4%)	1 (1%)	13	49
25	M	149/151 (99%)	144 (97%)	4 (3%)	1 (1%)	19	57
26	N	127/129 (98%)	121 (95%)	5 (4%)	1 (1%)	16	55
27	O	125/127 (98%)	115 (92%)	9 (7%)	1 (1%)	16	55
28	P	97/99 (98%)	88 (91%)	8 (8%)	1 (1%)	13	49
29	Q	115/117 (98%)	104 (90%)	9 (8%)	2 (2%)	7	37
30	R	117/123 (95%)	116 (99%)	1 (1%)	0	100	100
31	S	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
32	T	86/88 (98%)	82 (95%)	4 (5%)	0	100	100
33	U	80/82 (98%)	75 (94%)	4 (5%)	1 (1%)	10	43
34	V	78/80 (98%)	74 (95%)	4 (5%)	0	100	100
35	W	81/83 (98%)	78 (96%)	3 (4%)	0	100	100
36	X	114/116 (98%)	107 (94%)	5 (4%)	2 (2%)	7	35
39	b	74/76 (97%)	69 (93%)	5 (7%)	0	100	100
40	c	75/77 (97%)	72 (96%)	3 (4%)	0	100	100
42	e	60/62 (97%)	57 (95%)	3 (5%)	0	100	100
43	f	56/58 (97%)	53 (95%)	3 (5%)	0	100	100
44	g	64/66 (97%)	63 (98%)	1 (2%)	0	100	100
45	h	269/271 (99%)	259 (96%)	9 (3%)	1 (0%)	30	68

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
46	i	54/56 (96%)	51 (94%)	3 (6%)	0	100	100
47	j	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
48	k	50/52 (96%)	50 (100%)	0	0	100	100
49	l	199/201 (99%)	190 (96%)	8 (4%)	1 (0%)	25	64
50	m	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
51	n	175/177 (99%)	162 (93%)	11 (6%)	2 (1%)	12	47
52	o	62/64 (97%)	59 (95%)	3 (5%)	0	100	100
53	p	173/175 (99%)	161 (93%)	12 (7%)	0	100	100
54	q	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
55	r	147/149 (99%)	136 (92%)	11 (8%)	0	100	100
56	s	140/142 (99%)	135 (96%)	5 (4%)	0	100	100
57	t	121/123 (98%)	111 (92%)	10 (8%)	0	100	100
58	u	142/144 (99%)	135 (95%)	7 (5%)	0	100	100
59	v	134/136 (98%)	129 (96%)	5 (4%)	0	100	100
60	w	117/119 (98%)	107 (92%)	10 (8%)	0	100	100
61	x	114/116 (98%)	108 (95%)	6 (5%)	0	100	100
62	y	112/114 (98%)	105 (94%)	7 (6%)	0	100	100
63	z	115/117 (98%)	110 (96%)	4 (4%)	1 (1%)	14	52
All	All	9136/9618 (95%)	8457 (93%)	604 (7%)	75 (1%)	19	55

All (75) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	AA	596	ASP
10	AA	853	ASP
10	AA	859	GLU
10	AA	862	LEU
10	AA	937	ASP
10	AA	993	PRO
10	AA	1010	GLN
20	H	139	ARG
20	H	153	GLU
20	H	169	SER
20	H	306	VAL
20	H	340	ARG
27	O	56	ASP

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Mol	Chain	Res	Type
36	X	103	LYS
10	AA	375	PRO
10	AA	856	ASN
10	AA	870	ILE
10	AA	873	ILE
10	AA	985	GLU
10	AA	1005	GLU
10	AA	1158	LYS
13	AE	175	GLU
20	H	108	VAL
20	H	309	MET
20	H	333	LEU
45	h	158	ALA
49	l	142	ALA
63	z	3	ARG
10	AA	376	PRO
10	AA	723	VAL
10	AA	728	ASP
10	AA	935	THR
10	AA	980	VAL
10	AA	1045	GLY
12	AC	164	ASP
12	AC	165	GLU
13	AE	51	PRO
13	AE	805	GLN
20	H	76	GLU
20	H	142	ARG
25	M	130	ASN
28	P	58	ASN
29	Q	119	ASN
10	AA	850	ILE
10	AA	940	GLU
10	AA	941	LYS
10	AA	943	LYS
10	AA	991	LYS
10	AA	995	ASP
13	AE	174	ASP
13	AE	193	ASP
21	I	80	LYS
36	X	105	ASN
51	n	40	VAL
10	AA	917	SER

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Mol	Chain	Res	Type
10	AA	1003	THR
10	AA	1044	PRO
13	AE	91	GLU
20	H	70	VAL
20	H	82	THR
4	3	39	ILE
13	AE	49	PHE
13	AE	73	GLY
13	AE	904	ALA
24	L	96	VAL
1	0	44	GLY
10	AA	697	LYS
10	AA	1159	VAL
23	K	44	GLY
10	AA	1317	PRO
29	Q	74	VAL
33	U	64	GLY
51	n	62	GLY
10	AA	933	VAL
26	N	75	ILE

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%)	78 (93%)	6 (7%)	12	32
2	1	93/93 (100%)	84 (90%)	9 (10%)	6	22
3	2	81/81 (100%)	76 (94%)	5 (6%)	15	36
4	3	84/84 (100%)	78 (93%)	6 (7%)	12	32
5	4	78/78 (100%)	74 (95%)	4 (5%)	20	41
10	AA	1140/1156 (99%)	1043 (92%)	97 (8%)	8	27
11	AB	86/98 (88%)	84 (98%)	2 (2%)	45	64
12	AC	198/198 (100%)	184 (93%)	14 (7%)	12	32

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
12	AD	196/198 (99%)	194 (99%)	2 (1%)	73	82
13	AE	1120/1134 (99%)	1051 (94%)	69 (6%)	15	36
14	AF	70/70 (100%)	70 (100%)	0	100	100
15	C	57/57 (100%)	55 (96%)	2 (4%)	31	51
17	E	65/65 (100%)	60 (92%)	5 (8%)	10	30
18	F	60/60 (100%)	57 (95%)	3 (5%)	20	41
19	G	187/187 (100%)	178 (95%)	9 (5%)	21	43
20	H	137/461 (30%)	128 (93%)	9 (7%)	14	34
21	I	171/171 (100%)	165 (96%)	6 (4%)	31	51
22	J	172/172 (100%)	165 (96%)	7 (4%)	26	47
23	K	119/119 (100%)	112 (94%)	7 (6%)	16	37
24	L	91/91 (100%)	85 (93%)	6 (7%)	14	34
25	M	124/124 (100%)	116 (94%)	8 (6%)	14	35
26	N	104/104 (100%)	102 (98%)	2 (2%)	52	69
27	O	105/105 (100%)	100 (95%)	5 (5%)	21	43
28	P	86/86 (100%)	78 (91%)	8 (9%)	7	23
29	Q	90/90 (100%)	87 (97%)	3 (3%)	33	52
30	R	101/103 (98%)	94 (93%)	7 (7%)	13	33
31	S	83/83 (100%)	79 (95%)	4 (5%)	21	43
32	T	76/76 (100%)	64 (84%)	12 (16%)	2	10
33	U	65/65 (100%)	61 (94%)	4 (6%)	15	36
34	V	74/74 (100%)	72 (97%)	2 (3%)	40	58
35	W	72/72 (100%)	68 (94%)	4 (6%)	17	38
36	X	94/94 (100%)	85 (90%)	9 (10%)	7	22
39	b	58/58 (100%)	57 (98%)	1 (2%)	56	72
40	c	67/67 (100%)	64 (96%)	3 (4%)	23	45
42	e	54/54 (100%)	53 (98%)	1 (2%)	52	69
43	f	48/48 (100%)	46 (96%)	2 (4%)	25	46
44	g	59/59 (100%)	53 (90%)	6 (10%)	6	20
45	h	216/216 (100%)	199 (92%)	17 (8%)	10	29
46	i	47/47 (100%)	41 (87%)	6 (13%)	3	14

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
47	j	164/164 (100%)	157 (96%)	7 (4%)	25	46
48	k	47/47 (100%)	44 (94%)	3 (6%)	14	35
49	l	165/165 (100%)	151 (92%)	14 (8%)	8	27
50	m	38/38 (100%)	35 (92%)	3 (8%)	10	29
51	n	148/148 (100%)	134 (90%)	14 (10%)	7	22
52	o	51/51 (100%)	46 (90%)	5 (10%)	6	21
53	p	136/136 (100%)	132 (97%)	4 (3%)	37	56
54	q	34/34 (100%)	32 (94%)	2 (6%)	16	37
55	r	114/114 (100%)	104 (91%)	10 (9%)	8	25
56	s	116/116 (100%)	110 (95%)	6 (5%)	19	40
57	t	104/104 (100%)	98 (94%)	6 (6%)	17	38
58	u	103/103 (100%)	97 (94%)	6 (6%)	17	38
59	v	109/109 (100%)	103 (94%)	6 (6%)	18	39
60	w	99/99 (100%)	91 (92%)	8 (8%)	9	28
61	x	86/86 (100%)	80 (93%)	6 (7%)	12	32
62	y	99/99 (100%)	95 (96%)	4 (4%)	27	47
63	z	89/89 (100%)	87 (98%)	2 (2%)	47	65
All	All	7614/7984 (95%)	7136 (94%)	478 (6%)	17	36

All (478) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	10	LYS
1	0	13	ARG
1	0	48	LYS
1	0	51	VAL
1	0	68	ARG
1	0	86	GLN
2	1	7	HIS
2	1	19	LEU
2	1	30	SER
2	1	41	LYS
2	1	69	LEU
2	1	97	LEU
2	1	107	VAL
2	1	109	ASP

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Mol	Chain	Res	Type
2	1	110	ARG
3	2	1	MET
3	2	24	MET
3	2	37	ASP
3	2	59	ASN
3	2	93	LEU
4	3	52	LEU
4	3	68	SER
4	3	72	ILE
4	3	89	ASP
4	3	99	ASN
4	3	101	GLU
5	4	40	ILE
5	4	41	GLU
5	4	69	GLU
5	4	71	LYS
10	AA	376	PRO
10	AA	723	VAL
10	AA	728	ASP
10	AA	731	ARG
10	AA	752	ASN
10	AA	817	LEU
10	AA	840	SER
10	AA	844	LYS
10	AA	845	LEU
10	AA	851	THR
10	AA	854	ILE
10	AA	855	PRO
10	AA	857	VAL
10	AA	862	LEU
10	AA	864	LYS
10	AA	866	ASP
10	AA	867	GLU
10	AA	868	SER
10	AA	871	VAL
10	AA	872	TYR
10	AA	873	ILE
10	AA	884	VAL
10	AA	886	LYS
10	AA	890	LYS
10	AA	911	SER
10	AA	914	LYS

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Mol	Chain	Res	Type
10	AA	918	LEU
10	AA	933	VAL
10	AA	936	ARG
10	AA	939	VAL
10	AA	941	LYS
10	AA	942	ASP
10	AA	943	LYS
10	AA	944	ARG
10	AA	949	GLU
10	AA	950	GLU
10	AA	951	MET
10	AA	952	GLN
10	AA	953	LEU
10	AA	954	LYS
10	AA	955	GLN
10	AA	957	LYS
10	AA	958	LYS
10	AA	959	ASP
10	AA	960	LEU
10	AA	962	GLU
10	AA	963	GLU
10	AA	964	LEU
10	AA	965	GLN
10	AA	967	LEU
10	AA	968	GLU
10	AA	971	LEU
10	AA	973	SER
10	AA	974	ARG
10	AA	979	LEU
10	AA	980	VAL
10	AA	985	GLU
10	AA	988	LYS
10	AA	989	LEU
10	AA	991	LYS
10	AA	992	LEU
10	AA	994	ARG
10	AA	995	ASP
10	AA	997	TRP
10	AA	999	GLU
10	AA	1004	ASP
10	AA	1005	GLU
10	AA	1007	LYS

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Mol	Chain	Res	Type
10	AA	1010	GLN
10	AA	1013	GLN
10	AA	1019	ASP
10	AA	1020	GLU
10	AA	1022	LYS
10	AA	1023	HIS
10	AA	1024	GLU
10	AA	1025	PHE
10	AA	1026	GLU
10	AA	1027	LYS
10	AA	1029	LEU
10	AA	1030	GLU
10	AA	1032	LYS
10	AA	1034	ARG
10	AA	1035	LYS
10	AA	1038	GLN
10	AA	1041	ASP
10	AA	1042	LEU
10	AA	1046	VAL
10	AA	1047	LEU
10	AA	1048	LYS
10	AA	1151	LEU
10	AA	1159	VAL
10	AA	1250	SER
10	AA	1252	SER
10	AA	1253	LEU
10	AA	1254	VAL
10	AA	1256	GLN
10	AA	1259	LEU
11	AB	21	ARG
11	AB	47	GLU
12	AC	12	ARG
12	AC	72	GLU
12	AC	91	ARG
12	AC	134	THR
12	AC	158	ARG
12	AC	159	ILE
12	AC	160	HIS
12	AC	162	GLU
12	AC	163	GLU
12	AC	165	GLU
12	AC	166	ARG

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Mol	Chain	Res	Type
12	AC	168	ILE
12	AC	170	ARG
12	AC	171	LEU
12	AD	12	ARG
12	AD	208	ASN
13	AE	40	LYS
13	AE	42	GLU
13	AE	44	ILE
13	AE	46	TYR
13	AE	47	ARG
13	AE	49	PHE
13	AE	50	LYS
13	AE	52	GLU
13	AE	53	ARG
13	AE	54	ASP
13	AE	60	ARG
13	AE	67	ASP
13	AE	70	CYS
13	AE	72	CYS
13	AE	74	LYS
13	AE	76	LYS
13	AE	77	ARG
13	AE	78	LEU
13	AE	81	ARG
13	AE	87	LYS
13	AE	88	CYS
13	AE	91	GLU
13	AE	94	GLN
13	AE	95	THR
13	AE	99	ARG
13	AE	100	GLU
13	AE	117	LEU
13	AE	119	SER
13	AE	123	ARG
13	AE	132	LEU
13	AE	135	ILE
13	AE	142	GLU
13	AE	144	TYR
13	AE	145	VAL
13	AE	147	ILE
13	AE	152	THR
13	AE	154	LEU

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Mol	Chain	Res	Type
13	AE	157	GLN
13	AE	159	ILE
13	AE	175	GLU
13	AE	180	MET
13	AE	190	LYS
13	AE	193	ASP
13	AE	196	GLN
13	AE	210	SER
13	AE	215	LYS
13	AE	216	LYS
13	AE	222	LYS
13	AE	223	LEU
13	AE	227	PHE
13	AE	232	ASN
13	AE	233	LYS
13	AE	237	MET
13	AE	238	ILE
13	AE	239	LEU
13	AE	240	THR
13	AE	244	VAL
13	AE	271	ARG
13	AE	385	LEU
13	AE	386	GLU
13	AE	390	LEU
13	AE	393	THR
13	AE	394	ILE
13	AE	395	LYS
13	AE	514	THR
13	AE	709	ARG
13	AE	836	ARG
13	AE	1172	LYS
13	AE	1373	ARG
15	C	33	ILE
15	C	74	HIS
17	E	6	SER
17	E	10	ARG
17	E	48	GLN
17	E	54	MET
17	E	64	LYS
18	F	34	ARG
18	F	62	ARG
18	F	67	ARG

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Mol	Chain	Res	Type
19	G	8	ASP
19	G	23	TRP
19	G	45	LYS
19	G	105	LYS
19	G	108	ARG
19	G	128	LYS
19	G	129	LEU
19	G	132	LYS
19	G	208	ARG
20	H	9	PHE
20	H	54	LYS
20	H	273	ARG
20	H	305	HIS
20	H	336	ASP
20	H	337	GLU
20	H	338	GLU
20	H	339	ARG
20	H	340	ARG
21	I	14	ILE
21	I	75	ILE
21	I	89	LYS
21	I	164	ARG
21	I	185	ASN
21	I	200	VAL
22	J	47	ARG
22	J	48	LEU
22	J	95	GLU
22	J	104	ARG
22	J	116	GLN
22	J	138	SER
22	J	143	VAL
23	K	10	GLU
23	K	15	LEU
23	K	60	ILE
23	K	114	VAL
23	K	115	LEU
23	K	138	ARG
23	K	162	GLU
24	L	16	GLU
24	L	24	ARG
24	L	38	ARG
24	L	54	LEU

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Mol	Chain	Res	Type
24	L	79	ARG
24	L	86	ARG
25	M	7	ILE
25	M	17	LYS
25	M	21	GLU
25	M	23	LEU
25	M	79	ARG
25	M	109	ARG
25	M	130	ASN
25	M	146	GLU
26	N	96	MET
26	N	121	LEU
27	O	12	ARG
27	O	27	LYS
27	O	60	LYS
27	O	63	LEU
27	O	118	LEU
28	P	5	ARG
28	P	17	LEU
28	P	24	GLU
28	P	25	ILE
28	P	27	GLU
28	P	37	ARG
28	P	87	LEU
28	P	90	LEU
29	Q	15	GLN
29	Q	56	ARG
29	Q	107	ILE
30	R	5	ASN
30	R	12	ARG
30	R	24	LEU
30	R	56	ARG
30	R	62	GLU
30	R	74	LEU
30	R	102	LEU
31	S	45	VAL
31	S	46	LEU
31	S	89	MET
31	S	92	GLU
32	T	10	LYS
32	T	17	ARG
32	T	22	THR

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Mol	Chain	Res	Type
32	T	39	LEU
32	T	40	GLN
32	T	64	ARG
32	T	66	LEU
32	T	67	LEU
32	T	70	LEU
32	T	73	LYS
32	T	84	ARG
32	T	85	LEU
33	U	1	MET
33	U	2	VAL
33	U	6	LEU
33	U	19	VAL
34	V	75	LEU
34	V	81	LYS
35	W	12	ASP
35	W	21	LYS
35	W	33	THR
35	W	79	THR
36	X	11	ASP
36	X	16	VAL
36	X	25	VAL
36	X	29	ARG
36	X	59	GLU
36	X	92	ARG
36	X	93	ARG
36	X	101	ARG
36	X	117	LYS
39	b	70	GLU
40	c	48	THR
40	c	54	LYS
40	c	71	LEU
42	e	58	ASN
43	f	3	LYS
43	f	45	ARG
44	g	3	LYS
44	g	16	CYS
44	g	43	PHE
44	g	47	LYS
44	g	59	ARG
44	g	65	ASN
45	h	51	THR

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Mol	Chain	Res	Type
45	h	52	ARG
45	h	118	SER
45	h	125	LYS
45	h	130	LEU
45	h	141	VAL
45	h	156	ARG
45	h	187	ASP
45	h	189	ARG
45	h	195	VAL
45	h	202	LEU
45	h	203	ARG
45	h	204	VAL
45	h	205	LEU
45	h	242	LYS
45	h	258	ARG
45	h	271	ARG
46	i	9	THR
46	i	12	LYS
46	i	26	THR
46	i	27	SER
46	i	29	SER
46	i	40	ARG
47	j	13	ARG
47	j	18	ASP
47	j	32	ASN
47	j	46	ARG
47	j	91	THR
47	j	103	ASP
47	j	131	ASP
48	k	5	ILE
48	k	24	THR
48	k	26	ASN
49	l	7	ASP
49	l	17	THR
49	l	22	ASP
49	l	40	ARG
49	l	48	THR
49	l	57	LYS
49	l	69	ARG
49	l	77	ILE
49	l	80	SER
49	l	108	ILE

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Mol	Chain	Res	Type
49	l	109	LEU
49	l	122	GLU
49	l	149	ILE
49	l	179	SER
50	m	22	MET
50	m	41	ARG
50	m	42	LEU
51	n	6	ASP
51	n	10	ASP
51	n	57	LEU
51	n	80	ARG
51	n	95	ARG
51	n	105	THR
51	n	115	ARG
51	n	117	LEU
51	n	122	PHE
51	n	123	ASP
51	n	133	ARG
51	n	140	GLU
51	n	152	LEU
51	n	163	ASP
52	o	8	ARG
52	o	30	ARG
52	o	31	HIS
52	o	54	ASP
52	o	55	LEU
53	p	39	ASP
53	p	95	ARG
53	p	125	CYS
53	p	171	THR
54	q	3	VAL
54	q	26	ILE
55	r	11	ASN
55	r	12	LEU
55	r	15	LEU
55	r	41	LYS
55	r	66	ASN
55	r	72	ILE
55	r	87	GLU
55	r	97	ARG
55	r	101	ASP
55	r	127	GLU

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Mol	Chain	Res	Type
56	s	1	MET
56	s	14	ASP
56	s	30	THR
56	s	40	HIS
56	s	57	LEU
56	s	142	ILE
57	t	32	TYR
57	t	49	ARG
57	t	53	LYS
57	t	80	ASP
57	t	88	ASN
57	t	104	THR
58	u	5	THR
58	u	27	LEU
58	u	48	ARG
58	u	59	ARG
58	u	76	GLU
58	u	78	ARG
59	v	18	ARG
59	v	40	ARG
59	v	84	LYS
59	v	110	GLU
59	v	126	ILE
59	v	128	THR
60	w	2	ARG
60	w	20	MET
60	w	24	MET
60	w	51	LEU
60	w	63	ARG
60	w	65	LEU
60	w	69	ARG
60	w	95	THR
61	x	13	ARG
61	x	19	GLN
61	x	31	THR
61	x	47	VAL
61	x	48	LEU
61	x	91	SER
62	y	10	GLN
62	y	27	GLU
62	y	85	SER
62	y	114	LEU

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Mol	Chain	Res	Type
63	z	18	LEU
63	z	51	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
10	AA	1010	GLN
10	AA	1013	GLN
19	G	18	HIS
36	X	105	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	D	1515/1542 (98%)	289 (19%)	35 (2%)
37	Y	2/3 (66%)	2 (100%)	0
38	a	2859/2903 (98%)	531 (18%)	0
41	d	119/120 (99%)	17 (14%)	0
8	7	15/16 (93%)	7 (46%)	0
9	A	75/76 (98%)	29 (38%)	6 (8%)
9	B	75/76 (98%)	35 (46%)	6 (8%)
All	All	4660/4736 (98%)	910 (19%)	47 (1%)

All (910) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	7	56	U
8	7	57	G
8	7	58	A
8	7	59	U
8	7	60	U
8	7	62	G
8	7	63	G
9	A	2	G
9	A	6	G
9	A	7	G
9	A	8	U
9	A	10	G
9	A	13	C
9	A	14	A

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Mol	Chain	Res	Type
9	A	15	G
9	A	16	C
9	A	17	C
9	A	18	G
9	A	19	G
9	A	20	U
9	A	21	A
9	A	22	G
9	A	23	C
9	A	46	G
9	A	47	U
9	A	48	C
9	A	49	G
9	A	52	G
9	A	57	A
9	A	58	A
9	A	59	A
9	A	61	C
9	A	66	C
9	A	69	C
9	A	71	C
9	A	73	A
9	B	2	G
9	B	6	G
9	B	7	G
9	B	8	U
9	B	10	G
9	B	13	C
9	B	14	A
9	B	15	G
9	B	16	C
9	B	17	C
9	B	18	G
9	B	19	G
9	B	20	U
9	B	21	A
9	B	22	G
9	B	23	C
9	B	30	G
9	B	31	G
9	B	32	C
9	B	36	U

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Mol	Chain	Res	Type
9	B	37	A
9	B	38	A
9	B	46	G
9	B	47	U
9	B	48	C
9	B	49	G
9	B	52	G
9	B	57	A
9	B	58	A
9	B	59	A
9	B	61	C
9	B	66	C
9	B	69	C
9	B	71	C
9	B	73	A
16	D	4	U
16	D	5	U
16	D	9	G
16	D	22	G
16	D	29	U
16	D	32	A
16	D	39	G
16	D	41	G
16	D	47	C
16	D	48	C
16	D	50	A
16	D	51	A
16	D	52	C
16	D	54	C
16	D	69	G
16	D	70	U
16	D	71	A
16	D	72	A
16	D	74	A
16	D	76	G
16	D	82	G
16	D	83	C
16	D	84	U
16	D	87	C
16	D	90	C
16	D	94	G
16	D	95	C

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Mol	Chain	Res	Type
16	D	96	U
16	D	108	G
16	D	120	A
16	D	122	G
16	D	128	G
16	D	131	A
16	D	141	G
16	D	144	G
16	D	148	G
16	D	149	A
16	D	160	A
16	D	164	G
16	D	173	U
16	D	181	A
16	D	182	A
16	D	197	A
16	D	198	G
16	D	204	G
16	D	208	U
16	D	209	U
16	D	210	C
16	D	211	G
16	D	212	G
16	D	216	U
16	D	226	G
16	D	245	U
16	D	247	G
16	D	251	G
16	D	253	A
16	D	258	G
16	D	262	A
16	D	266	G
16	D	267	C
16	D	271	C
16	D	279	A
16	D	289	G
16	D	299	G
16	D	306	A
16	D	321	A
16	D	328	C
16	D	329	A
16	D	332	G

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Mol	Chain	Res	Type
16	D	347	G
16	D	352	C
16	D	353	A
16	D	354	G
16	D	355	C
16	D	367	U
16	D	372	C
16	D	373	A
16	D	376	G
16	D	382	A
16	D	384	G
16	D	392	C
16	D	393	A
16	D	397	A
16	D	406	G
16	D	412	A
16	D	413	G
16	D	414	A
16	D	421	U
16	D	422	C
16	D	424	G
16	D	429	U
16	D	446	G
16	D	451	A
16	D	457	G
16	D	458	U
16	D	460	A
16	D	463	U
16	D	464	U
16	D	467	U
16	D	468	A
16	D	469	C
16	D	478	A
16	D	479	U
16	D	481	G
16	D	484	G
16	D	485	U
16	D	486	U
16	D	505	G
16	D	509	A
16	D	511	C
16	D	518	C

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Mol	Chain	Res	Type
16	D	519	C
16	D	526	C
16	D	531	U
16	D	532	A
16	D	533	A
16	D	542	G
16	D	547	A
16	D	559	A
16	D	562	U
16	D	568	G
16	D	572	A
16	D	573	A
16	D	576	C
16	D	577	G
16	D	579	A
16	D	596	A
16	D	628	G
16	D	633	G
16	D	642	A
16	D	649	A
16	D	650	G
16	D	653	U
16	D	665	A
16	D	666	G
16	D	687	A
16	D	700	G
16	D	723	U
16	D	724	G
16	D	731	G
16	D	734	G
16	D	747	A
16	D	748	G
16	D	755	G
16	D	760	G
16	D	777	A
16	D	793	U
16	D	794	A
16	D	815	A
16	D	817	C
16	D	828	U
16	D	829	G
16	D	832	G

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Mol	Chain	Res	Type
16	D	841	C
16	D	844	G
16	D	845	A
16	D	849	G
16	D	874	G
16	D	887	G
16	D	902	G
16	D	914	A
16	D	916	U
16	D	926	G
16	D	934	C
16	D	935	A
16	D	954	G
16	D	960	U
16	D	963	G
16	D	969	A
16	D	972	C
16	D	975	A
16	D	976	G
16	D	991	U
16	D	992	U
16	D	993	G
16	D	996	A
16	D	999	C
16	D	1004	A
16	D	1008	U
16	D	1009	U
16	D	1017	U
16	D	1018	G
16	D	1021	A
16	D	1024	G
16	D	1026	G
16	D	1028	C
16	D	1030	U
16	D	1031	C
16	D	1037	C
16	D	1043	G
16	D	1044	A
16	D	1046	A
16	D	1065	U
16	D	1085	U
16	D	1086	U

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Mol	Chain	Res	Type
16	D	1094	G
16	D	1095	U
16	D	1099	G
16	D	1101	A
16	D	1124	G
16	D	1133	G
16	D	1135	U
16	D	1136	C
16	D	1137	C
16	D	1139	G
16	D	1140	C
16	D	1141	C
16	D	1142	G
16	D	1143	G
16	D	1145	A
16	D	1146	A
16	D	1151	A
16	D	1152	A
16	D	1158	C
16	D	1159	U
16	D	1167	A
16	D	1171	A
16	D	1174	G
16	D	1175	G
16	D	1176	A
16	D	1184	G
16	D	1196	A
16	D	1197	A
16	D	1206	G
16	D	1211	U
16	D	1212	U
16	D	1213	A
16	D	1214	C
16	D	1215	G
16	D	1226	C
16	D	1227	A
16	D	1228	C
16	D	1238	A
16	D	1256	A
16	D	1257	A
16	D	1260	G
16	D	1275	A

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Mol	Chain	Res	Type
16	D	1276	G
16	D	1278	G
16	D	1279	G
16	D	1280	A
16	D	1285	A
16	D	1286	U
16	D	1287	A
16	D	1299	A
16	D	1300	G
16	D	1302	C
16	D	1305	G
16	D	1312	G
16	D	1317	C
16	D	1320	C
16	D	1323	G
16	D	1329	A
16	D	1338	G
16	D	1340	A
16	D	1346	A
16	D	1347	G
16	D	1353	G
16	D	1363	A
16	D	1370	G
16	D	1378	C
16	D	1379	G
16	D	1381	U
16	D	1391	U
16	D	1396	A
16	D	1397	C
16	D	1398	A
16	D	1404	C
16	D	1419	G
16	D	1429	A
16	D	1441	A
16	D	1446	A
16	D	1447	A
16	D	1448	C
16	D	1452	C
16	D	1453	G
16	D	1475	G
16	D	1487	G
16	D	1492	A

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Mol	Chain	Res	Type
16	D	1493	A
16	D	1494	G
16	D	1495	U
16	D	1497	G
16	D	1503	A
16	D	1506	U
16	D	1517	G
16	D	1529	G
16	D	1530	G
16	D	1534	A
37	Y	72	U
37	Y	73	U
38	a	10	A
38	a	15	G
38	a	34	U
38	a	35	G
38	a	46	G
38	a	58	G
38	a	60	G
38	a	63	A
38	a	71	A
38	a	74	A
38	a	75	G
38	a	83	A
38	a	84	A
38	a	85	G
38	a	93	G
38	a	96	C
38	a	102	U
38	a	103	A
38	a	110	G
38	a	114	U
38	a	118	A
38	a	119	A
38	a	120	U
38	a	122	G
38	a	131	A
38	a	136	G
38	a	139	U
38	a	140	C
38	a	141	G
38	a	145	C

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Mol	Chain	Res	Type
38	a	163	C
38	a	165	A
38	a	181	A
38	a	196	A
38	a	200	U
38	a	215	G
38	a	216	A
38	a	222	A
38	a	225	C
38	a	248	G
38	a	249	C
38	a	261	G
38	a	264	C
38	a	265	A
38	a	266	G
38	a	267	C
38	a	271	G
38	a	272	A
38	a	275	C
38	a	276	U
38	a	278	A
38	a	285	G
38	a	311	A
38	a	324	A
38	a	329	G
38	a	330	A
38	a	353	C
38	a	359	G
38	a	361	G
38	a	362	A
38	a	371	A
38	a	372	G
38	a	373	U
38	a	375	G
38	a	383	C
38	a	386	G
38	a	396	G
38	a	405	U
38	a	411	G
38	a	412	A
38	a	420	C
38	a	424	G

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Mol	Chain	Res	Type
38	a	435	C
38	a	451	U
38	a	456	C
38	a	457	A
38	a	477	A
38	a	481	G
38	a	491	G
38	a	501	A
38	a	503	A
38	a	504	A
38	a	505	A
38	a	509	C
38	a	522	A
38	a	529	A
38	a	532	A
38	a	543	G
38	a	546	U
38	a	547	A
38	a	548	G
38	a	549	G
38	a	551	G
38	a	563	A
38	a	569	U
38	a	573	U
38	a	575	A
38	a	588	U
38	a	603	A
38	a	609	A
38	a	613	A
38	a	614	A
38	a	615	U
38	a	616	A
38	a	618	G
38	a	621	A
38	a	627	A
38	a	637	A
38	a	645	C
38	a	647	G
38	a	654	A
38	a	664	G
38	a	668	A
38	a	685	A

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Mol	Chain	Res	Type
38	a	686	U
38	a	710	U
38	a	717	C
38	a	730	A
38	a	738	G
38	a	757	G
38	a	764	A
38	a	765	C
38	a	775	G
38	a	776	G
38	a	782	A
38	a	784	G
38	a	785	G
38	a	800	A
38	a	802	A
38	a	805	G
38	a	812	C
38	a	819	A
38	a	827	U
38	a	828	U
38	a	845	A
38	a	846	U
38	a	858	G
38	a	859	G
38	a	869	G
38	a	878	A
38	a	881	G
38	a	884	U
38	a	885	C
38	a	888	C
38	a	891	G
38	a	892	A
38	a	893	C
38	a	895	U
38	a	896	A
38	a	897	C
38	a	899	A
38	a	907	G
38	a	910	A
38	a	914	G
38	a	915	C
38	a	931	U

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Mol	Chain	Res	Type
38	a	941	A
38	a	945	A
38	a	946	C
38	a	953	G
38	a	961	C
38	a	974	G
38	a	983	A
38	a	995	C
38	a	996	A
38	a	999	U
38	a	1005	C
38	a	1012	U
38	a	1013	C
38	a	1022	G
38	a	1023	U
38	a	1026	G
38	a	1033	U
38	a	1041	G
38	a	1045	C
38	a	1046	A
38	a	1047	G
38	a	1060	U
38	a	1061	U
38	a	1062	G
38	a	1063	G
38	a	1064	C
38	a	1065	U
38	a	1066	U
38	a	1067	A
38	a	1068	G
38	a	1069	A
38	a	1070	A
38	a	1071	G
38	a	1073	A
38	a	1074	G
38	a	1076	C
38	a	1079	C
38	a	1080	A
38	a	1081	U
38	a	1082	U
38	a	1083	U
38	a	1084	A

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Mol	Chain	Res	Type
38	a	1087	G
38	a	1088	A
38	a	1090	A
38	a	1095	A
38	a	1096	A
38	a	1107	G
38	a	1110	G
38	a	1111	A
38	a	1112	G
38	a	1119	U
38	a	1122	G
38	a	1132	U
38	a	1134	A
38	a	1135	C
38	a	1142	A
38	a	1169	A
38	a	1170	C
38	a	1173	U
38	a	1174	U
38	a	1175	A
38	a	1176	U
38	a	1177	G
38	a	1178	C
38	a	1179	G
38	a	1180	U
38	a	1186	G
38	a	1238	G
38	a	1248	G
38	a	1253	A
38	a	1256	G
38	a	1266	G
38	a	1271	G
38	a	1272	A
38	a	1273	U
38	a	1301	A
38	a	1321	A
38	a	1345	C
38	a	1352	U
38	a	1365	A
38	a	1368	G
38	a	1378	A
38	a	1379	U

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Mol	Chain	Res	Type
38	a	1380	G
38	a	1383	A
38	a	1387	A
38	a	1395	A
38	a	1406	U
38	a	1407	G
38	a	1408	G
38	a	1411	U
38	a	1414	C
38	a	1415	U
38	a	1416	G
38	a	1417	C
38	a	1419	A
38	a	1420	A
38	a	1428	C
38	a	1452	G
38	a	1453	A
38	a	1460	U
38	a	1478	G
38	a	1482	G
38	a	1490	A
38	a	1497	U
38	a	1503	A
38	a	1508	A
38	a	1509	A
38	a	1510	G
38	a	1515	A
38	a	1529	G
38	a	1534	U
38	a	1535	A
38	a	1536	C
38	a	1537	G
38	a	1554	U
38	a	1559	U
38	a	1566	A
38	a	1569	A
38	a	1578	U
38	a	1580	A
38	a	1581	G
38	a	1582	C
38	a	1583	A
38	a	1584	U

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Mol	Chain	Res	Type
38	a	1589	U
38	a	1590	A
38	a	1608	A
38	a	1609	A
38	a	1610	A
38	a	1647	U
38	a	1648	U
38	a	1649	G
38	a	1651	G
38	a	1674	G
38	a	1677	A
38	a	1703	G
38	a	1714	U
38	a	1715	G
38	a	1718	G
38	a	1729	U
38	a	1730	C
38	a	1732	C
38	a	1738	G
38	a	1750	G
38	a	1755	A
38	a	1758	U
38	a	1764	C
38	a	1773	A
38	a	1791	A
38	a	1800	C
38	a	1801	A
38	a	1808	A
38	a	1811	G
38	a	1816	C
38	a	1829	A
38	a	1833	C
38	a	1847	A
38	a	1848	A
38	a	1858	A
38	a	1859	U
38	a	1862	G
38	a	1864	U
38	a	1869	G
38	a	1870	C
38	a	1872	A
38	a	1873	G

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Mol	Chain	Res	Type
38	a	1905	C
38	a	1906	G
38	a	1907	G
38	a	1913	A
38	a	1914	C
38	a	1919	A
38	a	1920	C
38	a	1922	G
38	a	1923	U
38	a	1924	C
38	a	1925	C
38	a	1926	U
38	a	1928	A
38	a	1929	G
38	a	1930	G
38	a	1936	A
38	a	1938	A
38	a	1955	U
38	a	1965	C
38	a	1967	C
38	a	1970	A
38	a	1971	U
38	a	1972	G
38	a	1987	A
38	a	1991	U
38	a	1992	G
38	a	1993	U
38	a	1997	C
38	a	2002	G
38	a	2022	U
38	a	2023	C
38	a	2027	G
38	a	2033	A
38	a	2043	C
38	a	2051	A
38	a	2052	A
38	a	2055	C
38	a	2056	G
38	a	2060	A
38	a	2061	G
38	a	2062	A
38	a	2077	A

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Mol	Chain	Res	Type
38	a	2097	A
38	a	2099	U
38	a	2100	G
38	a	2108	A
38	a	2110	G
38	a	2111	U
38	a	2113	U
38	a	2115	G
38	a	2116	G
38	a	2117	A
38	a	2118	U
38	a	2121	G
38	a	2122	U
38	a	2124	G
38	a	2125	G
38	a	2126	A
38	a	2127	G
38	a	2128	G
38	a	2131	U
38	a	2132	U
38	a	2133	G
38	a	2134	A
38	a	2139	U
38	a	2141	G
38	a	2146	C
38	a	2147	A
38	a	2154	A
38	a	2157	G
38	a	2158	A
38	a	2159	G
38	a	2162	G
38	a	2163	A
38	a	2164	C
38	a	2165	C
38	a	2169	A
38	a	2171	A
38	a	2172	U
38	a	2178	C
38	a	2182	U
38	a	2183	A
38	a	2185	U
38	a	2188	U

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Mol	Chain	Res	Type
38	a	2189	U
38	a	2190	G
38	a	2191	A
38	a	2193	G
38	a	2194	U
38	a	2198	A
38	a	2204	G
38	a	2210	U
38	a	2211	A
38	a	2212	A
38	a	2213	U
38	a	2225	A
38	a	2226	C
38	a	2229	U
38	a	2238	G
38	a	2239	G
38	a	2244	U
38	a	2250	G
38	a	2268	A
38	a	2278	A
38	a	2283	C
38	a	2287	A
38	a	2297	A
38	a	2305	U
38	a	2308	G
38	a	2309	A
38	a	2315	G
38	a	2322	A
38	a	2325	G
38	a	2327	A
38	a	2333	A
38	a	2339	C
38	a	2345	G
38	a	2347	C
38	a	2350	C
38	a	2361	G
38	a	2372	U
38	a	2376	A
38	a	2383	G
38	a	2385	C
38	a	2402	U
38	a	2403	C

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Mol	Chain	Res	Type
38	a	2406	A
38	a	2423	U
38	a	2424	C
38	a	2425	A
38	a	2426	A
38	a	2429	G
38	a	2430	A
38	a	2431	U
38	a	2434	A
38	a	2435	A
38	a	2441	U
38	a	2447	G
38	a	2448	A
38	a	2470	G
38	a	2474	U
38	a	2476	A
38	a	2478	A
38	a	2484	G
38	a	2491	U
38	a	2502	G
38	a	2506	U
38	a	2507	C
38	a	2512	C
38	a	2513	A
38	a	2518	A
38	a	2520	C
38	a	2525	G
38	a	2529	G
38	a	2535	G
38	a	2547	A
38	a	2554	U
38	a	2566	A
38	a	2567	G
38	a	2572	A
38	a	2573	C
38	a	2574	G
38	a	2585	U
38	a	2586	U
38	a	2602	A
38	a	2603	G
38	a	2609	U
38	a	2610	C

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Mol	Chain	Res	Type
38	a	2611	C
38	a	2613	U
38	a	2629	U
38	a	2663	G
38	a	2669	G
38	a	2671	G
38	a	2689	U
38	a	2690	U
38	a	2714	G
38	a	2722	G
38	a	2726	A
38	a	2744	G
38	a	2748	A
38	a	2757	A
38	a	2758	A
38	a	2765	A
38	a	2777	G
38	a	2778	A
38	a	2791	G
38	a	2793	C
38	a	2796	U
38	a	2797	U
38	a	2798	U
38	a	2799	A
38	a	2801	G
38	a	2818	U
38	a	2820	A
38	a	2823	A
38	a	2825	G
38	a	2849	U
38	a	2850	A
38	a	2859	G
38	a	2861	U
38	a	2867	G
38	a	2880	C
38	a	2884	U
38	a	2885	G
38	a	2891	U
38	a	2902	C
41	d	2	G
41	d	9	G
41	d	13	G

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Mol	Chain	Res	Type
41	d	16	G
41	d	17	C
41	d	35	C
41	d	36	C
41	d	45	A
41	d	51	G
41	d	56	G
41	d	64	G
41	d	66	A
41	d	88	C
41	d	89	U
41	d	90	C
41	d	99	A
41	d	109	A

All (47) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
9	A	6	G
9	A	7	G
9	A	9	G
9	A	22	G
9	A	60	U
9	A	70	G
9	B	6	G
9	B	7	G
9	B	9	G
9	B	22	G
9	B	37	A
9	B	60	U
16	D	7	A
16	D	70	U
16	D	121	U
16	D	181	A
16	D	183	C
16	D	197	A
16	D	209	U
16	D	305	G
16	D	328	C
16	D	428	G
16	D	496	A
16	D	517	G

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Mol	Chain	Res	Type
16	D	531	U
16	D	532	A
16	D	562	U
16	D	641	U
16	D	722	G
16	D	793	U
16	D	991	U
16	D	992	U
16	D	1109	C
16	D	1145	A
16	D	1196	A
16	D	1211	U
16	D	1212	U
16	D	1213	A
16	D	1214	C
16	D	1225	A
16	D	1299	A
16	D	1396	A
16	D	1432	G
16	D	1447	A
16	D	1491	G
16	D	1492	A
16	D	1493	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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

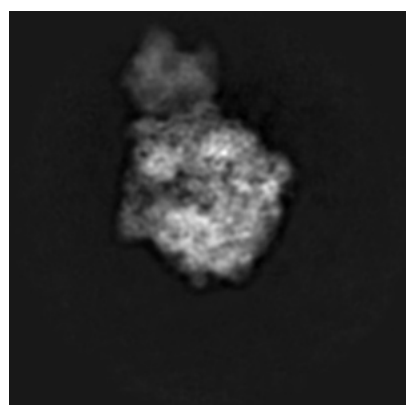
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-21486. These allow visual inspection of the internal detail of the map and identification of artifacts.

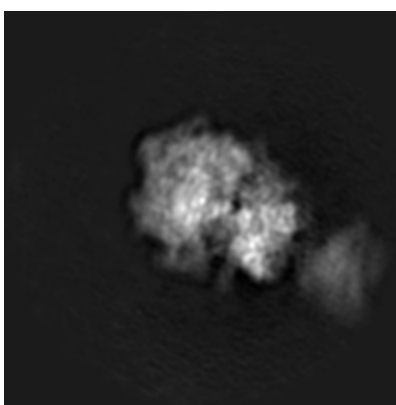
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

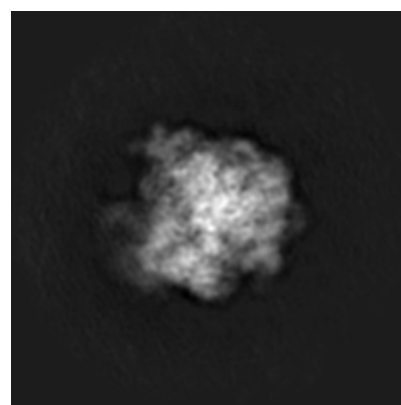
6.1.1 Primary map



X



Y

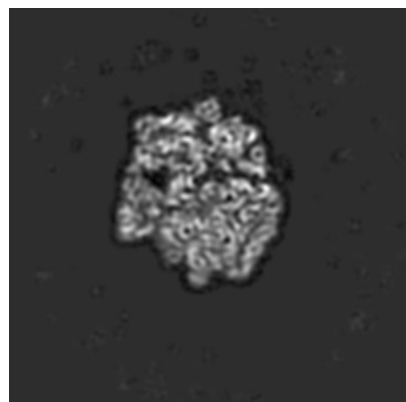


Z

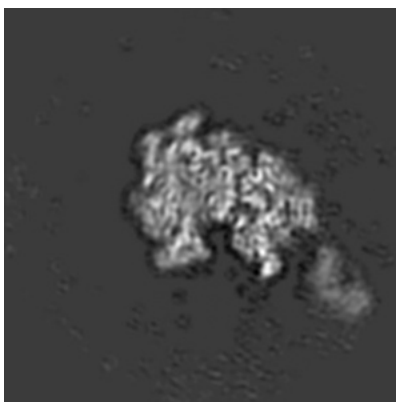
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

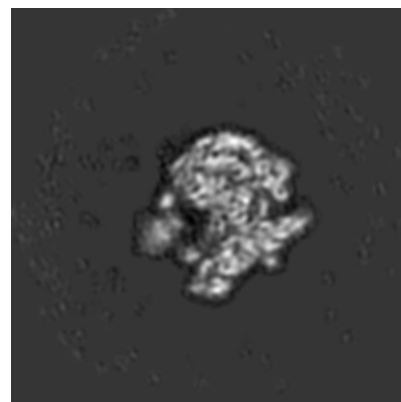
6.2.1 Primary map



X Index: 140



Y Index: 140

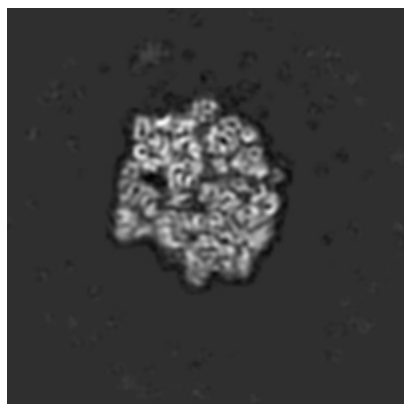


Z Index: 140

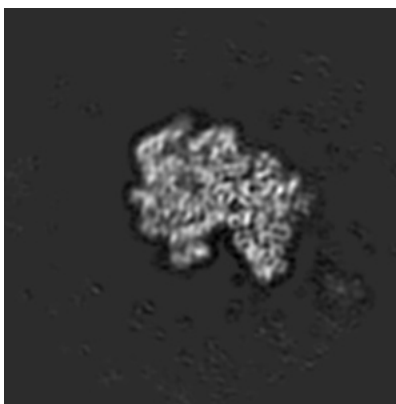
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

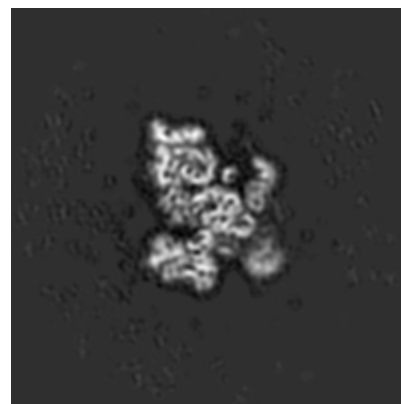
6.3.1 Primary map



X Index: 137



Y Index: 147

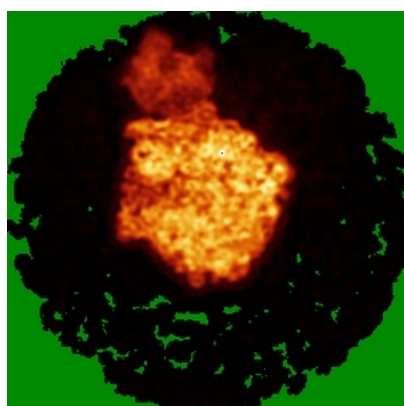


Z Index: 169

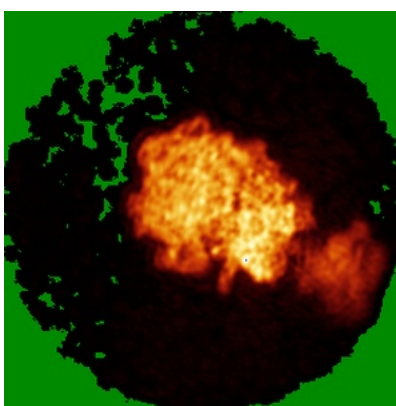
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

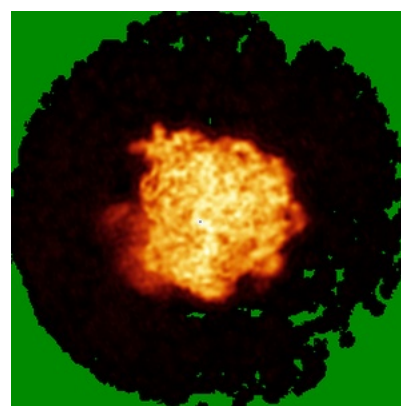
6.4.1 Primary map



X



Y



Z

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 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

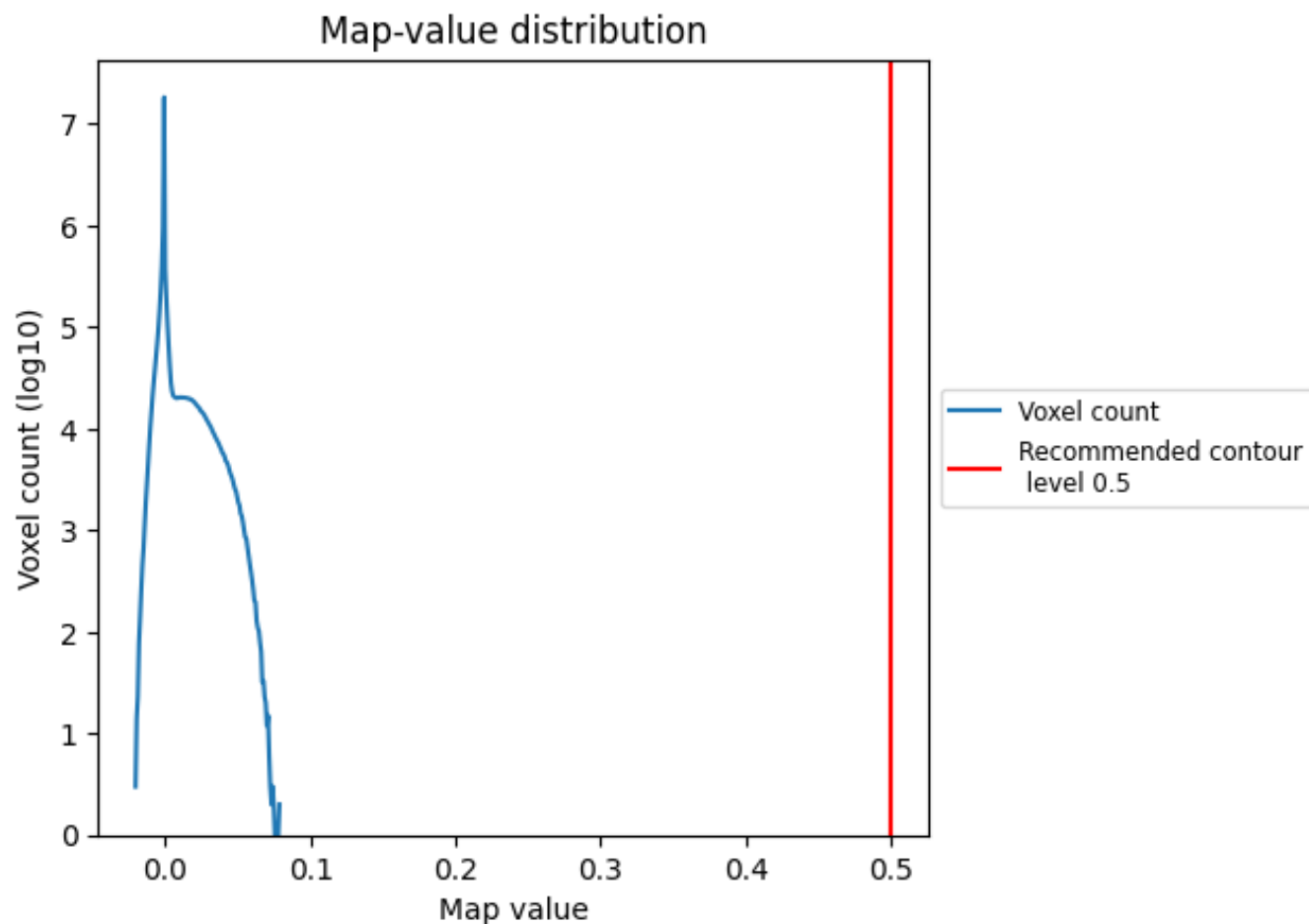
6.6 Mask visualisation

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

7 Map analysis [i](#)

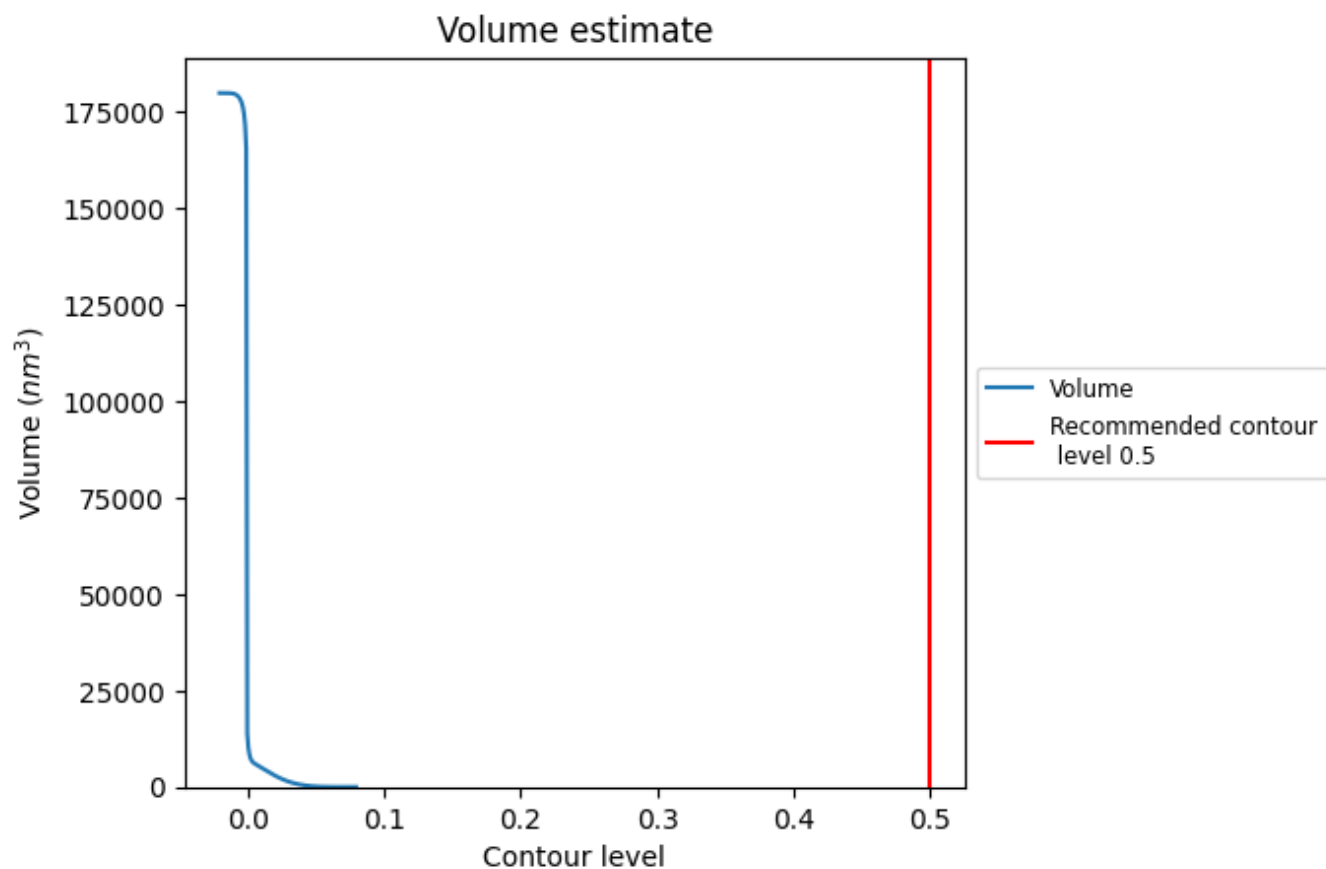
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



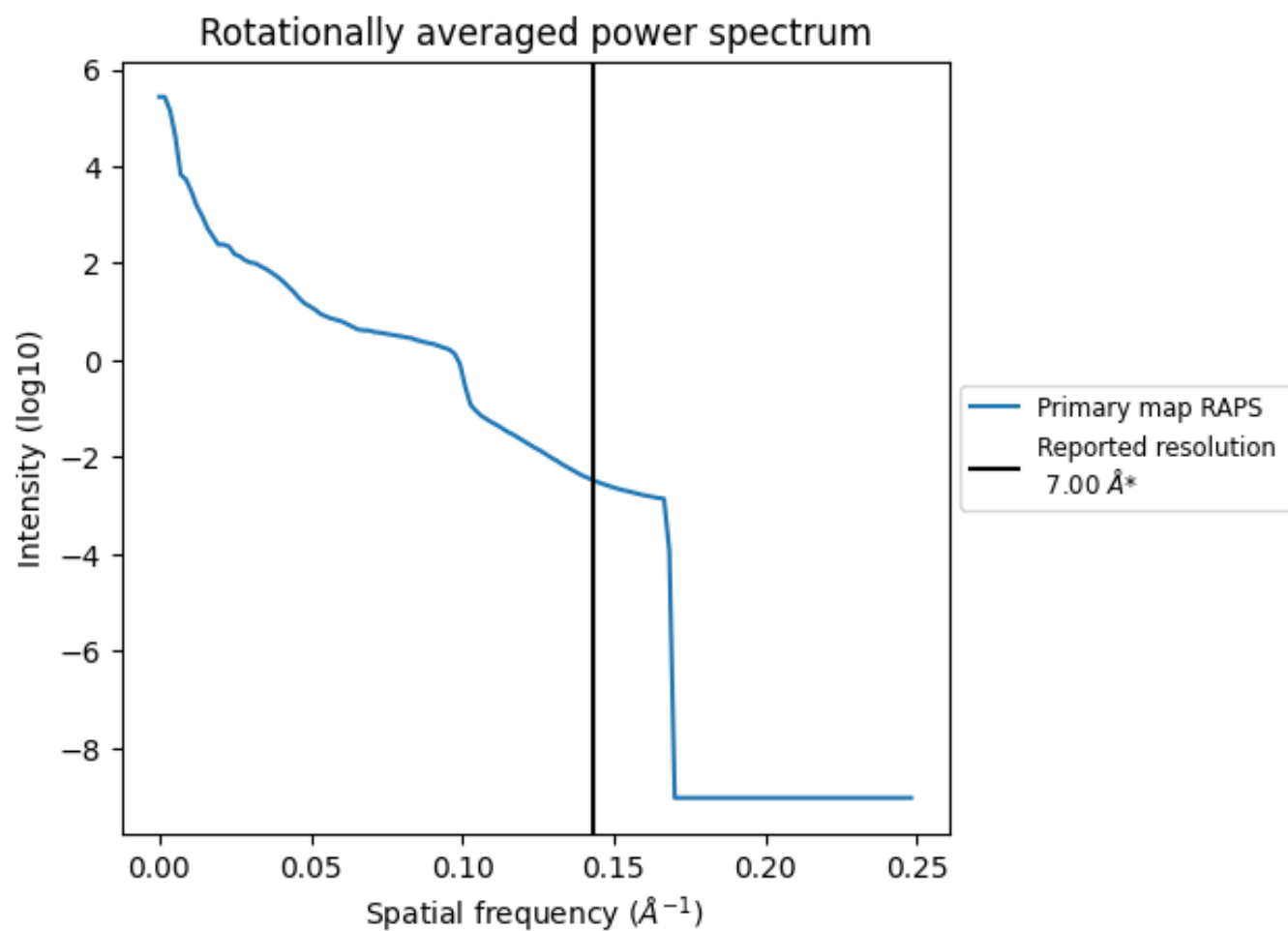
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2 Volume estimate [i](#)



The volume 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 0.143 Å⁻¹

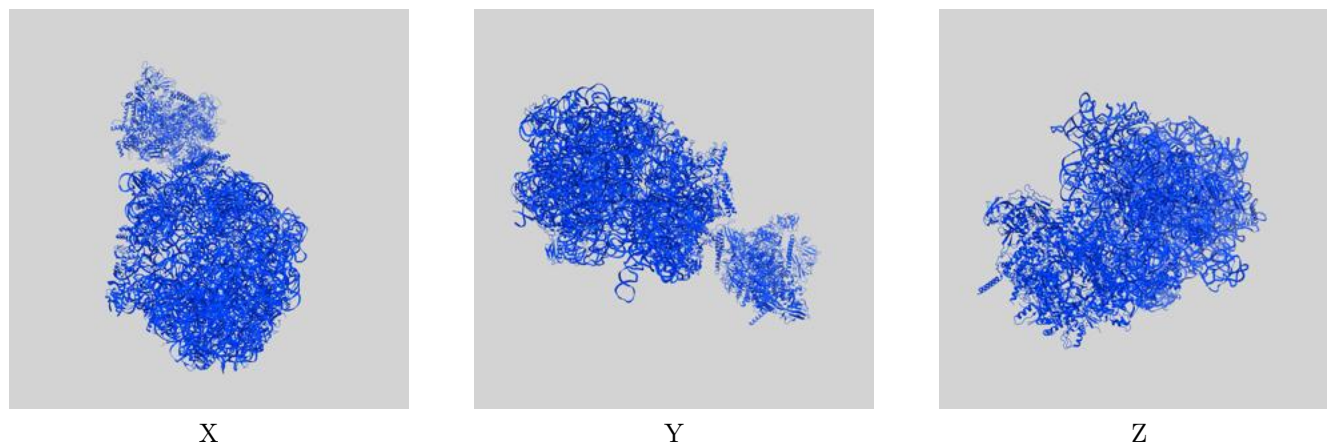
8 Fourier-Shell correlation ⓘ

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

9 Map-model fit [i](#)

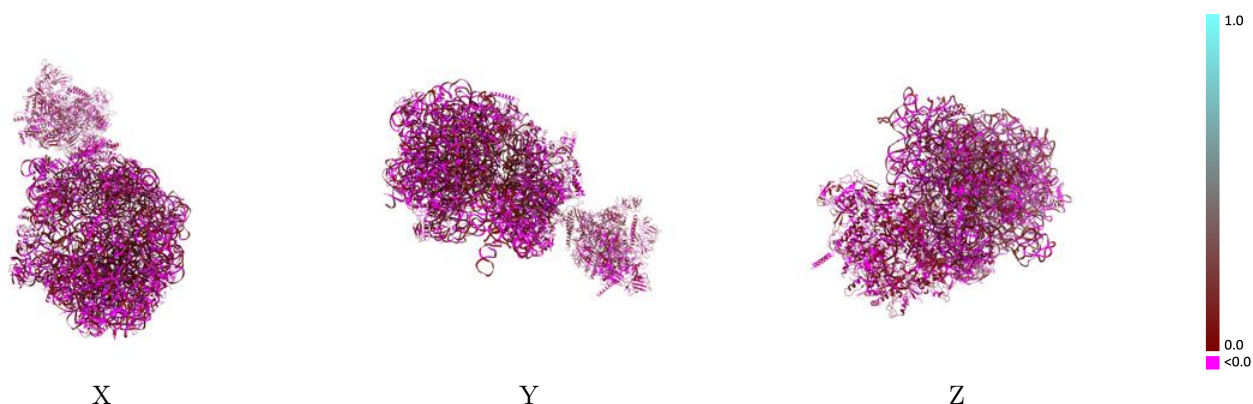
This section contains information regarding the fit between EMDB map EMD-21486 and PDB model 6VZ7. Per-residue inclusion information can be found in section [3](#) on page [16](#).

9.1 Map-model overlay [i](#)



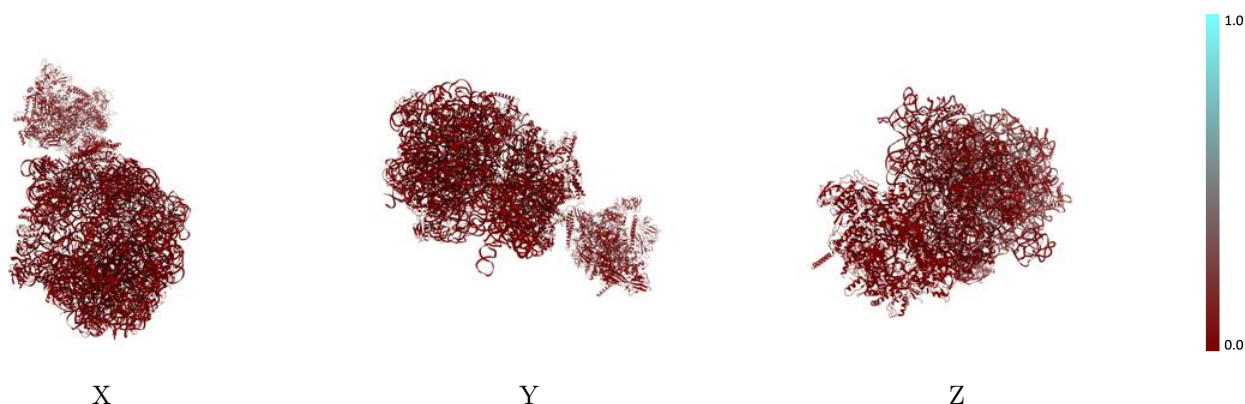
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



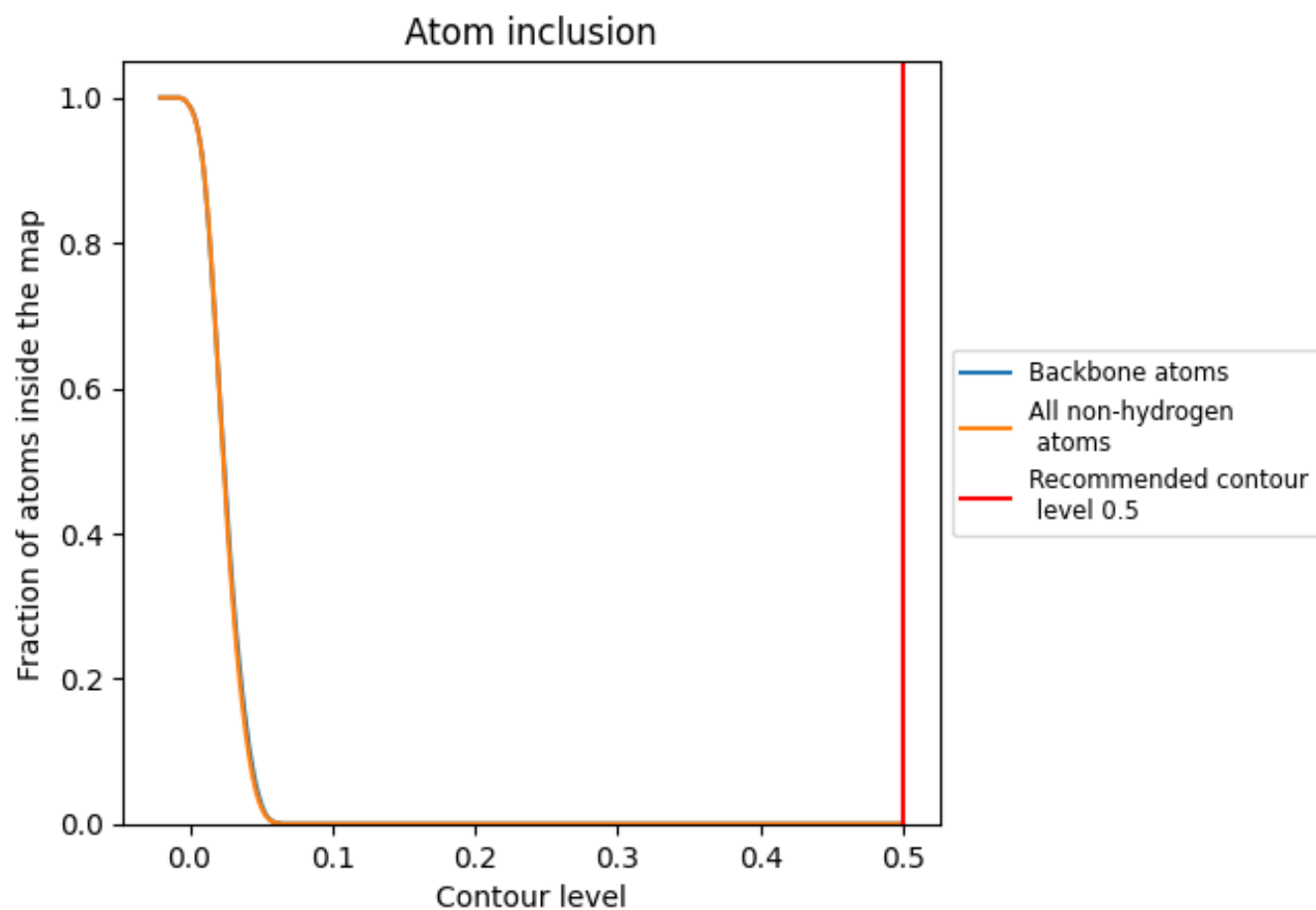
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.5).

9.4 Atom inclusion [i](#)



At the recommended contour level, 0% of all backbone atoms, 0% 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 (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.0000	0.0300
0	0.0000	0.0020
1	0.0000	0.0080
2	0.0000	-0.0330
3	0.0000	-0.0130
4	0.0000	-0.0030
5	0.0000	0.0950
6	0.0000	0.0900
7	0.0000	0.0580
A	0.0000	0.0900
AA	0.0000	0.0590
AB	0.0000	-0.0250
AC	0.0000	0.0180
AD	0.0000	-0.0080
AE	0.0000	0.0240
AF	0.0000	0.0100
B	0.0000	0.0390
C	0.0000	-0.0340
D	0.0000	0.0480
E	0.0000	-0.0150
F	0.0000	0.0690
G	0.0000	-0.0150
H	0.0000	0.0120
I	0.0000	-0.0090
J	0.0000	-0.0300
K	0.0000	0.0230
L	0.0000	0.0250
M	0.0000	-0.0080
N	0.0000	-0.0380
O	0.0000	-0.0220
P	0.0000	0.0170
Q	0.0000	0.0100
R	0.0000	0.0630
S	0.0000	-0.0070
T	0.0000	0.0160



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Chain	Atom inclusion	Q-score
U	 0.0000	 -0.0240
V	 0.0000	 0.0350
W	 0.0000	 -0.0100
X	 0.0000	 -0.0140
Y	 0.0000	 0.1350
a	 0.0000	 0.0430
b	 0.0000	 -0.0530
c	 0.0000	 0.0060
d	 0.0000	 0.0100
e	 0.0000	 -0.0190
f	 0.0000	 -0.0020
g	 0.0000	 0.0100
h	 0.0000	 0.0360
i	 0.0000	 -0.0340
j	 0.0000	 -0.0180
k	 0.0000	 -0.0000
l	 0.0000	 -0.0020
m	 0.0000	 -0.0210
n	 0.0000	 0.0070
o	 0.0000	 -0.0420
p	 0.0000	 0.0130
q	 0.0000	 -0.0130
r	 0.0000	 -0.0370
s	 0.0000	 -0.0310
t	 0.0000	 0.0190
u	 0.0000	 -0.0080
v	 0.0000	 0.0330
w	 0.0000	 -0.0340
x	 0.0000	 -0.0130
y	 0.0000	 -0.0280
z	 0.0000	 -0.0350