



Full wwPDB EM Validation Report ⓘ

Nov 3, 2024 – 03:46 AM EST

PDB ID : 6XIJ
EMDB ID : EMD-22193
Title : Escherichia coli transcription-translation complex A (TTC-A) containing an
24 nt long mRNA spacer, NusG, and fMet-tRNAs at E-site and P-site
Authors : Molodtsov, V.; Wang, C.; Su, M.; Ebright, R.H.
Deposited on : 2020-06-20
Resolution : 8.00 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:

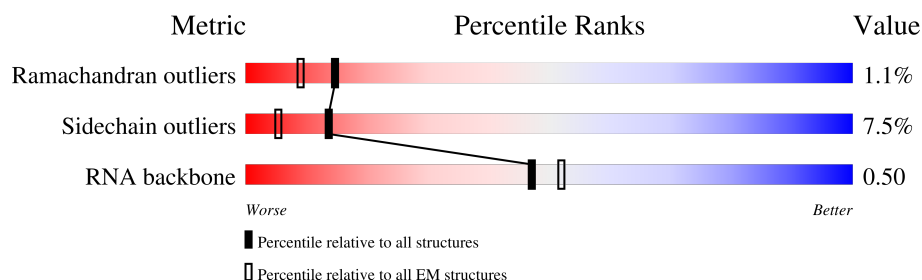
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

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 8.00 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>36%</div> <div>93%</div> <div>7%</div> </div>
2	1	110	<div> <div>36%</div> <div>93%</div> <div>7%</div> </div>
3	2	100	<div> <div>41%</div> <div>89%</div> <div>5%</div> <div>6%</div> </div>
4	3	104	<div> <div>30%</div> <div>91%</div> <div>8%</div> </div>
5	4	94	<div> <div>33%</div> <div>96%</div> </div>
6	5	36	<div> <div>58%</div> <div>47%</div> <div>17%</div> <div>36%</div> </div>
7	6	36	<div> <div>69%</div> <div>64%</div> <div>11%</div> <div>25%</div> </div>
8	7	33	<div> <div>42%</div> <div>24%</div> <div>39%</div> <div>33%</div> </div>

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Mol	Chain	Length	Quality of chain
9	9	165	
10	A	76	
10	B	76	
11	AA	1342	
12	AB	181	
13	AC	329	
13	AD	329	
14	AE	1407	
15	C	75	
16	D	1542	
17	E	87	
18	F	71	
19	G	241	
20	H	557	
21	I	233	
22	J	206	
23	K	167	
24	L	135	
25	M	179	
26	N	130	
27	O	130	
28	P	103	
29	Q	129	
30	R	124	
31	S	101	

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Mol	Chain	Length	Quality of chain
32	T	89	
33	U	82	
34	V	84	
35	W	92	
36	X	118	
37	Y	142	
38	Z	121	
39	a	2904	
40	b	85	
41	c	78	
42	d	120	
43	e	63	
44	f	59	
45	g	70	
46	h	273	
47	i	57	
48	j	209	
49	k	55	
50	l	201	
51	m	46	
52	n	179	
53	o	65	
54	p	177	
55	q	38	
56	r	149	

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Mol	Chain	Length	Quality of chain
57	s	142	<div> <div>44%</div> <div>96%</div> <div>.</div> </div>
58	t	123	<div> <div>73%</div> <div>95%</div> <div>5%</div> </div>
59	u	144	<div> <div>46%</div> <div>96%</div> <div>.</div> </div>
60	v	136	<div> <div>46%</div> <div>96%</div> <div>.</div> </div>
61	w	127	<div> <div>24%</div> <div>87%</div> <div>6%</div> <div>6%</div> </div>
62	x	117	<div> <div>43%</div> <div>94%</div> <div>5%</div> <div>.</div> </div>
63	y	115	<div> <div>66%</div> <div>95%</div> <div>.</div> <div>.</div> </div>
64	z	118	<div> <div>30%</div> <div>96%</div> <div>.</div> <div>.</div> </div>

2 Entry composition

There are 66 unique types of molecules in this entry. The entry contains 300463 atoms, of which 124723 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
			847	259	305	89	167	27		

- Molecule 8 is a RNA chain called mRNA with 24 nt long spacer.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	7	22	Total	C	H	N	O	P	0	0
			564	208	97	74	163	22		

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

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

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

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

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

Mol	Chain	Residues	Atoms						AltConf	Trace
11	AA	1322	Total	C	H	N	O	S	0	0
			20851	6539	10426	1817	2026	43		

- Molecule 12 is a protein called Transcription termination/antitermination protein NusG.

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

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

Mol	Chain	Residues	Atoms						AltConf	Trace
13	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
13	AD	228	Total	C	H	N	O	S	0	0
			3556	1100	1789	312	349	6		

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

Mol	Chain	Residues	Atoms						AltConf	Trace
14	AE	1335	Total	C	H	N	O	S	0	0
			21000	6526	10612	1854	1958	50		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AE	1384	VAL	MET	conflict	UNP A0A4S1NBU2

- 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 protein called 50S ribosomal protein L11.

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

- Molecule 38 is a protein called 50S ribosomal protein L7/L12.

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

- Molecule 39 is a RNA chain called 23S rRNA.

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

There is a discrepancy between the modelled and reference sequences:

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

- Molecule 40 is a protein called 50S ribosomal protein L27.

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

- Molecule 41 is a protein called 50S ribosomal protein L28.

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

- Molecule 42 is a RNA chain called 5S rRNA.

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

- Molecule 43 is a protein called 50S ribosomal protein L29.

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

- Molecule 44 is a protein called 50S ribosomal protein L30.

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

- Molecule 45 is a protein called 50S ribosomal protein L31.

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

- Molecule 46 is a protein called 50S ribosomal protein L2.

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

- Molecule 47 is a protein called 50S ribosomal protein L32.

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

- Molecule 48 is a protein called 50S ribosomal protein L3.

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

- Molecule 49 is a protein called 50S ribosomal protein L33.

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

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

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

- Molecule 51 is a protein called 50S ribosomal protein L34.

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

- Molecule 52 is a protein called 50S ribosomal protein L5.

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

- Molecule 53 is a protein called 50S ribosomal protein L35.

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

- Molecule 54 is a protein called 50S ribosomal protein L6.

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

- Molecule 55 is a protein called 50S ribosomal protein L36.

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

- Molecule 56 is a protein called 50S ribosomal protein L9.

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

- Molecule 57 is a protein called 50S ribosomal protein L13.

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

- Molecule 58 is a protein called 50S ribosomal protein L14.

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

- Molecule 59 is a protein called 50S ribosomal protein L15.

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

- Molecule 60 is a protein called 50S ribosomal protein L16.

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

- Molecule 61 is a protein called 50S ribosomal protein L17.

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

- Molecule 62 is a protein called 50S ribosomal protein L18.

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

- Molecule 63 is a protein called 50S ribosomal protein L19.

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

- Molecule 64 is a protein called 50S ribosomal protein L20.

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

- Molecule 65 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

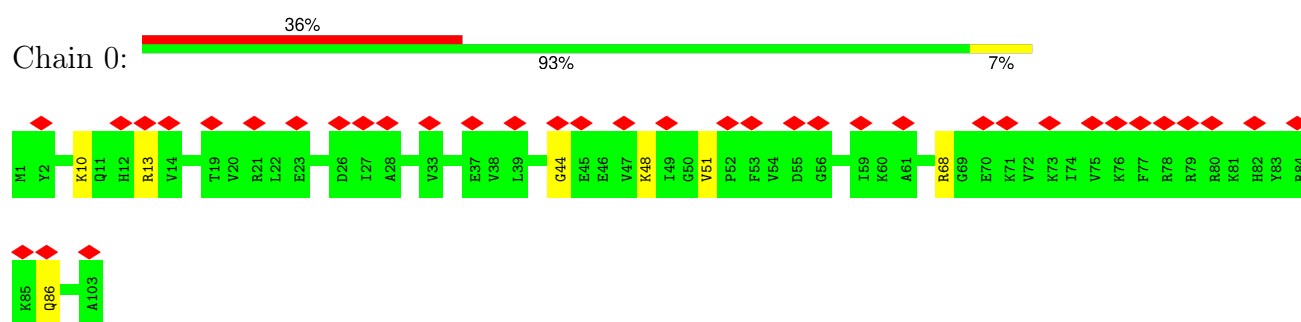
- Molecule 66 is ZINC ION (three-letter code: ZN) (formula: Zn).

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

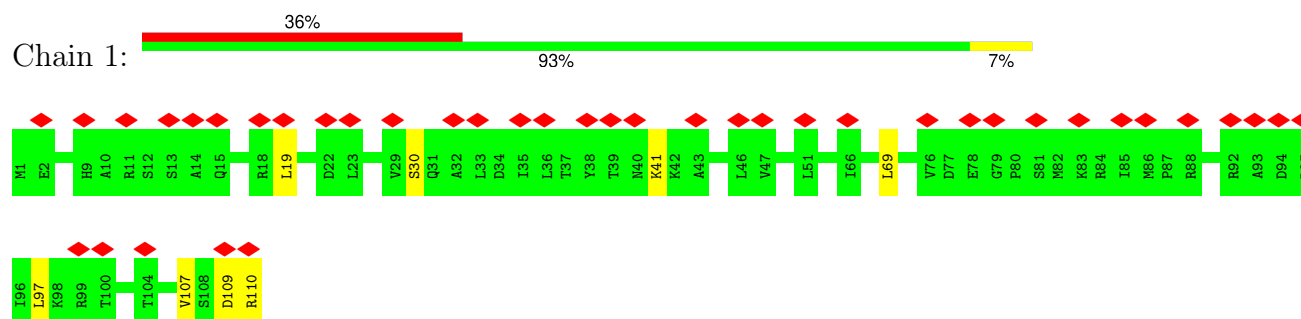
3 Residue-property plots [i](#)

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

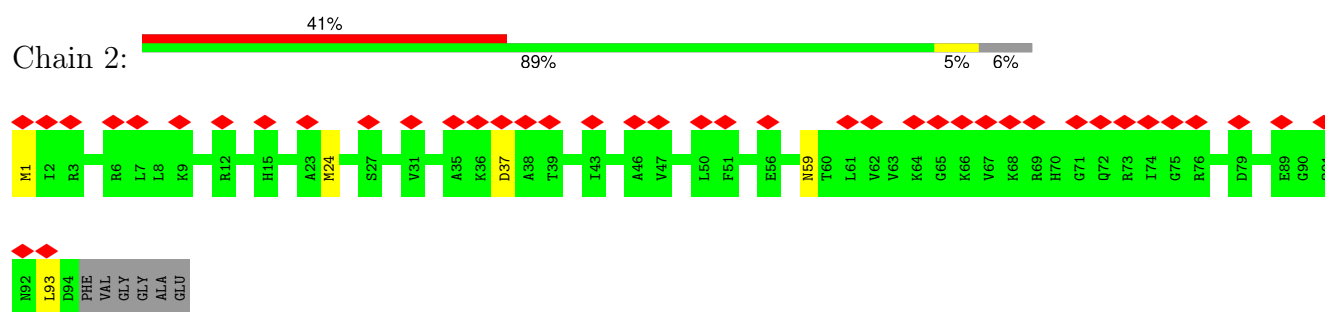
- Molecule 1: 50S ribosomal protein L21



- Molecule 2: 50S ribosomal protein L22



- Molecule 3: 50S ribosomal protein L23

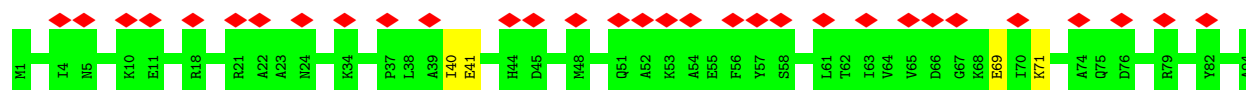


- Molecule 4: 50S ribosomal protein L24

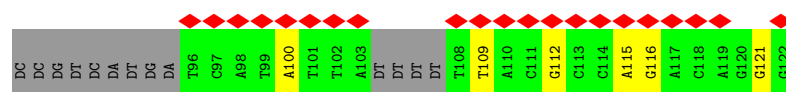




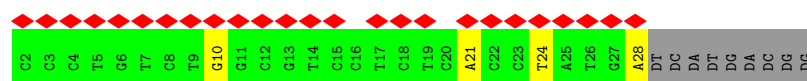
- Molecule 5: 50S ribosomal protein L25



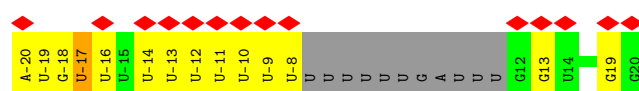
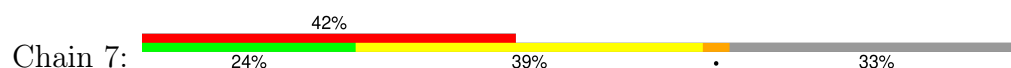
- Molecule 6: NT DNA



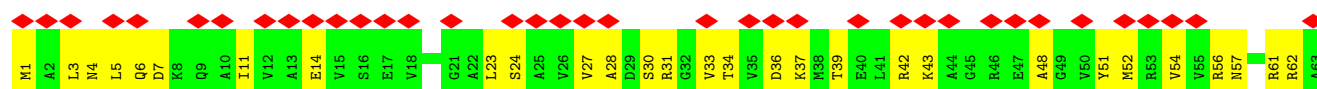
- Molecule 7: T DNA



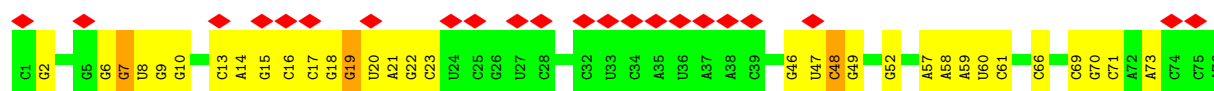
- Molecule 8: mRNA with 24 nt long spacer



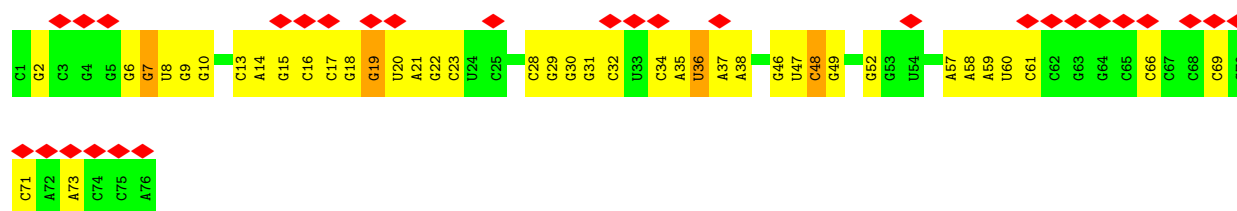
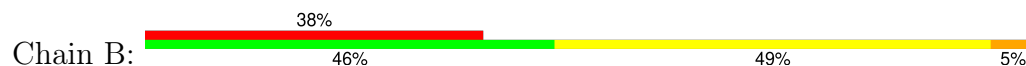
- Molecule 9: 50S ribosomal protein L10



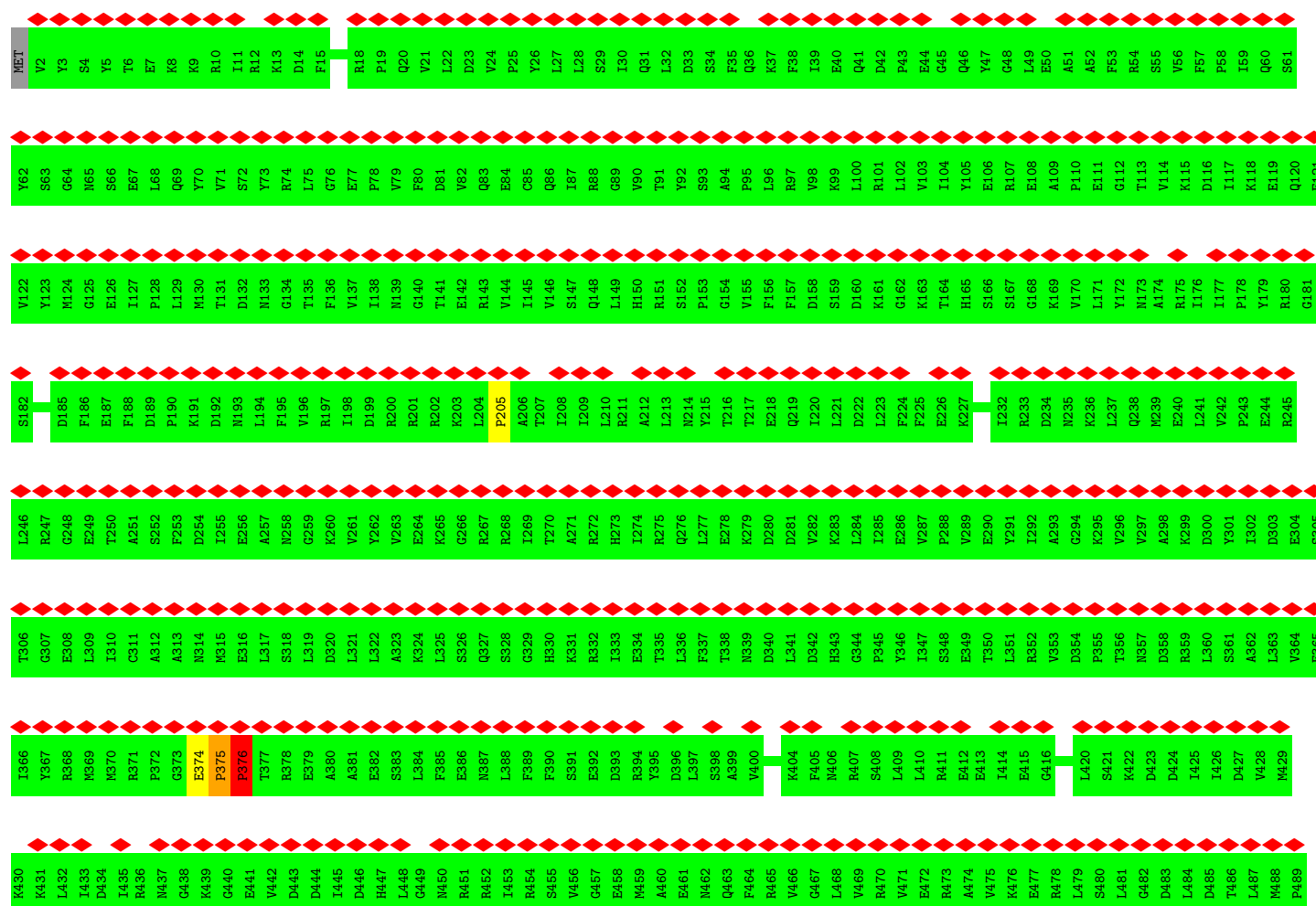
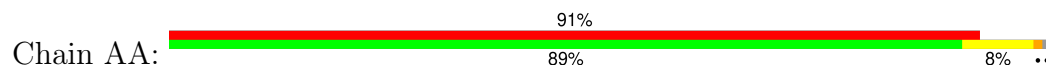
- Molecule 10: E-site and P-site tRNA (fMet)



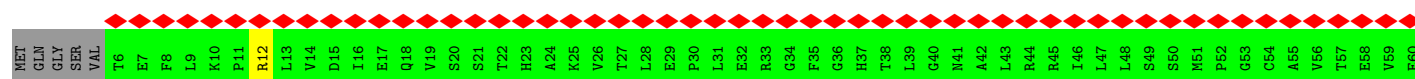
• Molecule 10: E-site and P-site tRNA (fMet)

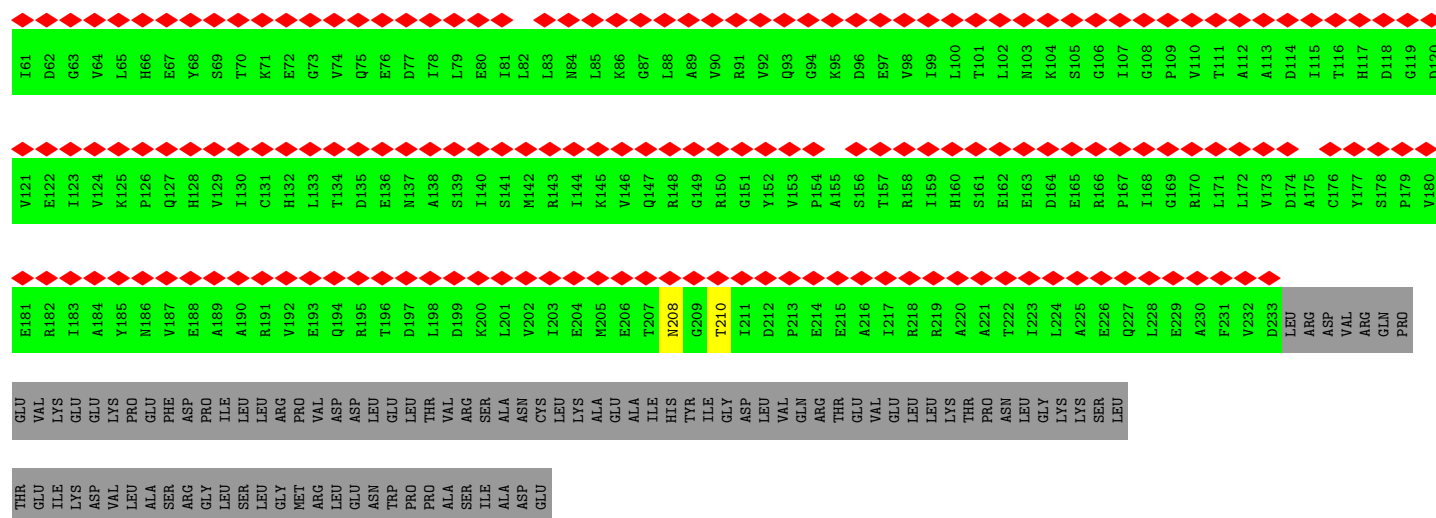


• Molecule 11: DNA-directed RNA polymerase subunit beta

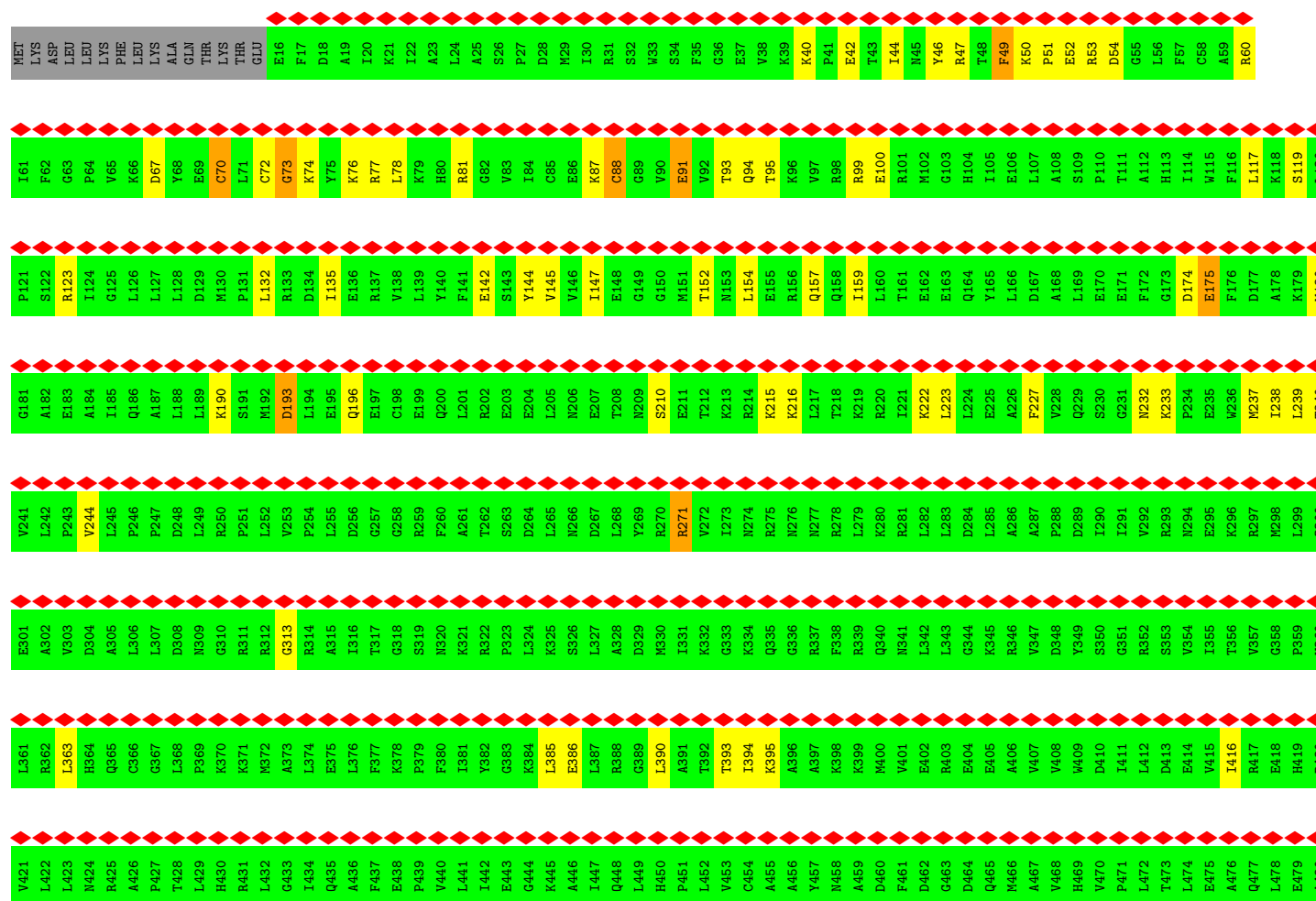
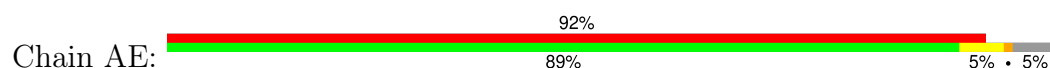




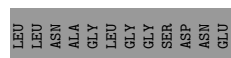
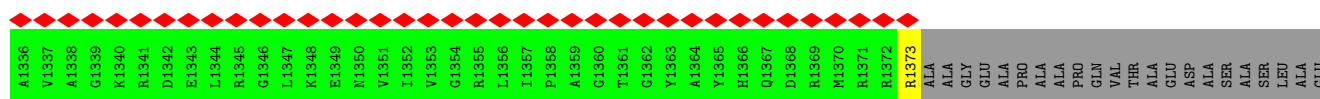
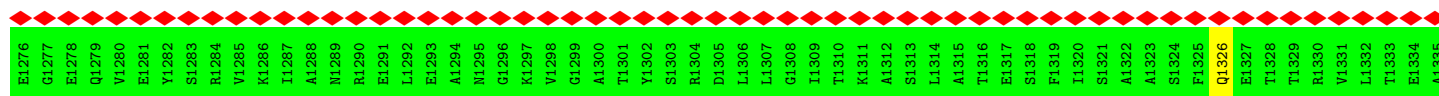




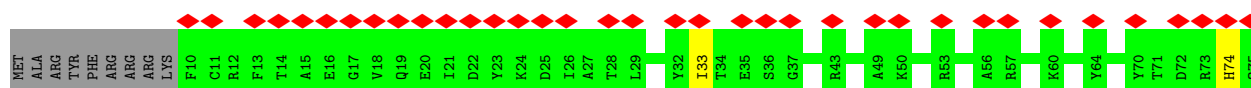
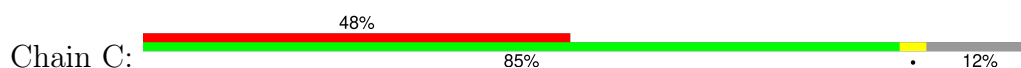
• Molecule 14: DNA-directed RNA polymerase subunit beta'



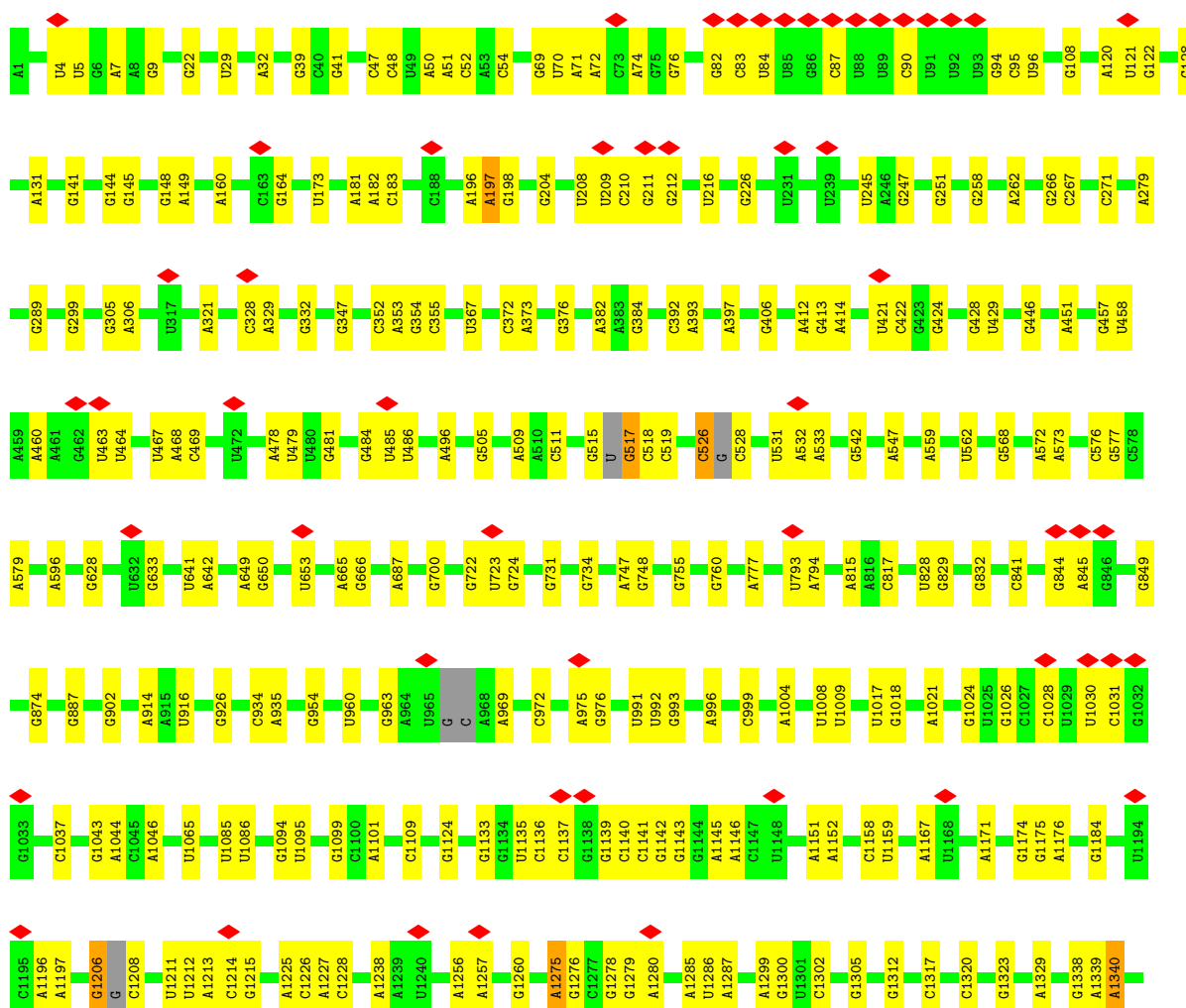
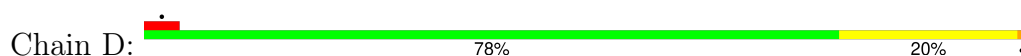
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P1217	A1157	A1097	F1037	G916	A854	S793	G729	I664	S602	A542	A482
H1218	E1158	Q1098	T1038	V917	D855	S793	G729	Q665	K603	A542	L483
D1219	I1159	Y1099	D1039	I918	I856	Y795	R731	E666	M604	L544	M484
I1220	S1160	F1100	M1040	A919	L857	L796	G732	Q667	L605	H545	M485
L1221	G1161	L1101	I1041	A920	V858	T797	S733	F668	N606	A546	S486
R1222	I1162	P1102	D1042	E981	P859	T797	S733	Q669	T607	R547	T487
L1223	V1163	G1103	G1043	S922	R860	R799	A735	S670	C608	V548	N488
R1224	S1164	K1044	Q1044	I923	N861	R799	Q736	G671	Y609	K549	N489
G1225	F1165	A1105	T1045	G924	T862	V801	I737	L672	R610	V550	I490
V1226	I1166	I1106	I1046	E925	L863	D802	R738	V673	I611	I552	S492
H1227	K1167	V1107	T1047	P926	L864	V803	Q739	T674	L612	I552	L491
A1228	E1168	Q1108	R1048	G927	H865	A804	L740	A675	G613	T553	P493
V1229	T1169	L1109	Q1049	T928	E866	Q805	A741	G676	L614	E554	A494
T1230	K1170	E1110	Q1050	Q929	Q867	D806		E677	K615	Y555	N495
R1231	G1171	D1111	T1051	L930	Q868	L807		R678	P616	E556	G496
Y1232	K1172	G1112	E1052	T931	Q869	V808	G745	Y679	T617	K557	E497
I1233	R1173	V1113	L1053	N932	D870	V809	L746	N680	V618	D558	P498
M1234	R1174	Q1114	T1054	M932	L871	T810	M747	K681	I619	A559	I499
V1235	L1175	I1115	G1055	R933	L872	E811	A748	V682	F620	N560	I500
E1236	V1176	S1116	L1056	THR	E873	D812	A621	I683	G561	G561	V501
V1237	I1177	S1117	S1057	PHE	E874	D813	K749	D684	D622	E562	P502
Q1238	T1178	G1118	S1058	HIS	N875	C814	G752	W686	Q623	L563	S503
D1239	P1179	D1119	L1059	GLY	S876	G815	G753	A687	I624	V564	Q504
V1240	V1180	T1120	V1060	GLY	V877	T816	I754	A688	M625	A565	D505
Y1241	D1181	L1121	G1000	ALA	D878	H817	I755	A689	Y626	K566	V506
L1242	G1182	A1122	L1062	SER	A879	E818	I755	N690	T627	V567	V507
L1243	S1183	R1123	V1002	ARG	V880	G819	E756	D691	G628	S568	L508
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G1245	P1185	P1125	A1004	ALA	V882	M821	P758	V693	A630	K570	L510
V1246	Y1186	Q1126	E1066	GLU	R883	M822	I759	S694	Y631	D571	Y511
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I1248	E1188	SER	T1068	S949	V885	Q824	R764		A633	T573	M513
M1249	M1189	GLY	A1069	Q951	V886	V825		M698	R634	V574	T514
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H1252	K1192	ASP	K1071	N954	D891	G828	V769	Q702	A637	A577	C517
I1253	W1193	ILE	A1012	K955	F892	G829	L770		S638	I578	V518
E1254	R1194	THR	D1073	G1013	S956	D830	Q771	V706	S639	L579	N519
V1255	Q1195	G1137	L1074	G1014	G993	V831	Y772	I707	G640	V580	A520
I1256	L1196	L1138	P1075	S957	V894	K832	F773	N708	I641	M581	K521
V1257	P1197	V1257	P1076	I958	C995	E833	T773	R709	D642	I582	G522
L1258	V1198	P1139	A1077	K959	A896	E833	S775	D710	D643	V583	E523
Q1259	F1199	R1140	L1078	L960		P834	T776	G711	G644	P584	G524
V1260	E1200	V1141	K1079	S961	Y899	L835	H777	Q712	M644	K585	M525
L1261	G1201	A1142	I1080	N962	G900	R836	G778	E713	V645	K585	M525
R1262	D1201	D1143	V1081	V963	R901	D837	A779	E714	I646	G586	V526
K1263	E1202	P1022	D1082	K964	D902	R838	R780	K715	P647	L587	L527
R1203	L1145	H1023	A1083	S965	L903	V839	K781	Q716	E648	P588	T528
A1264	V1204	T1024	Q1084	V966	A904	L840	G782	V717	K649	V589	G529
T1265	E1205	M1025	Q1085	V967	R905	G941	L783	S718	K650	S590	P530
I1266	E1206	P1026	L1086	P967	G906	R842	G782	F719	H651	I591	K531
V1267	R1206	P1027	V1027	N968	G906	R842	A784	F719	V592	I591	E532
G1207	D1207	R1148	I1028	S969	H907	V843	D785	N720	I653	N593	A533
N1208	P1150	T1029	T1028	S970	I908	E846	T786	S721	I654	Q594	E534
A1269	K1151	I1030	I1089	G971	I909		A787	I722		A595	R535
G1270	I1210	E1030	K972	N910	N910	D847	L788	Y723	A657	L596	L536
S1271	S1211	V1031	I1090	K911	K911	V848	K789	M724	E658	G597	Y537
T1272	D1212	P1153	S1032	G912	G912	L849	T790	M725	A659	K598	R538
D1273	G1213	A1154	G1033	E913	E913	K950	A791		E660	K599	S539
F1274	L1214	F1034	F1034	E913	A914	P851			V661	A600	G540
L1275	E1215	V1035	V1035			G852					

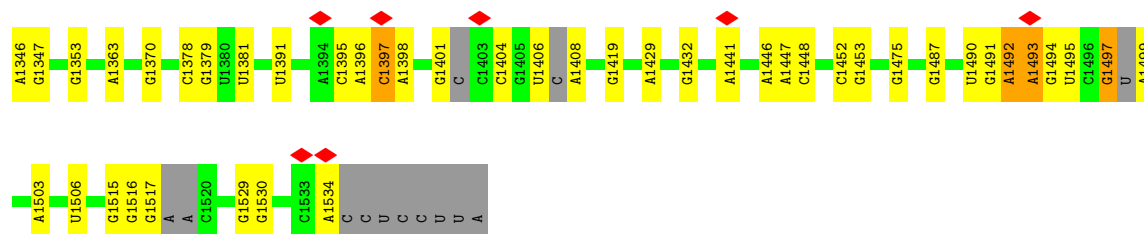


• Molecule 15: 30S ribosomal protein S18

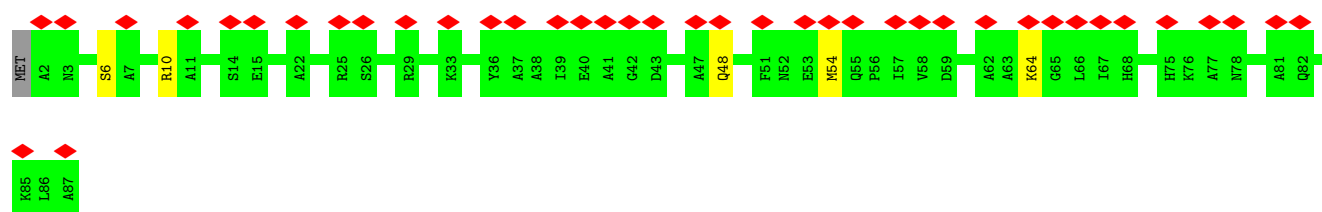
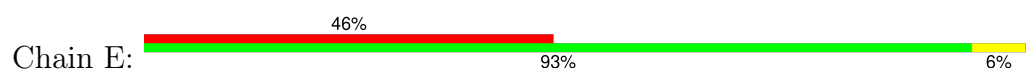


• Molecule 16: 16S rRNA





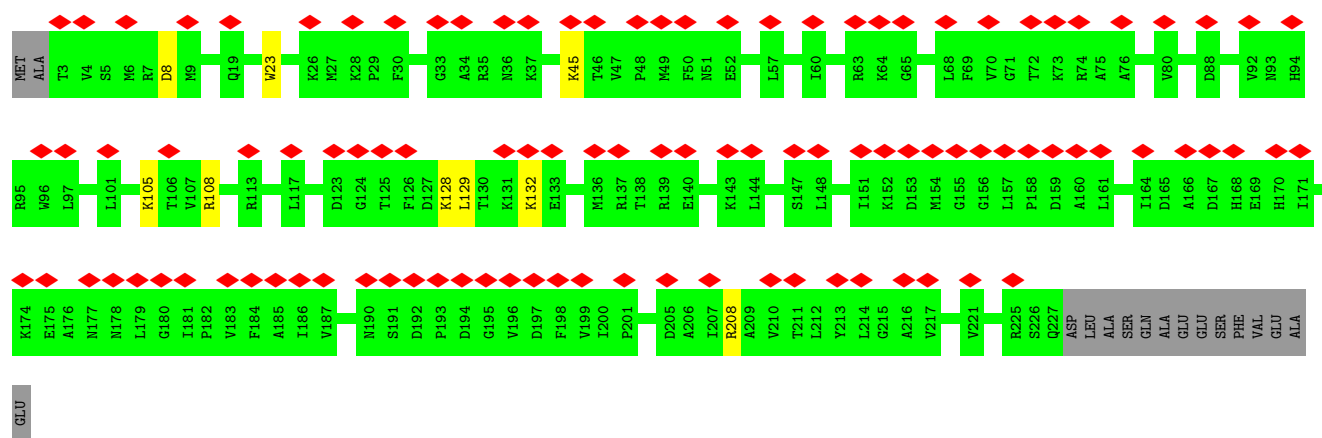
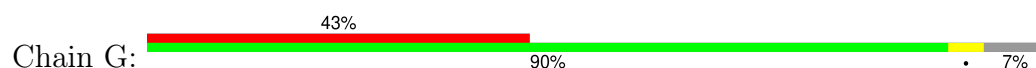
• Molecule 17: 30S ribosomal protein S20



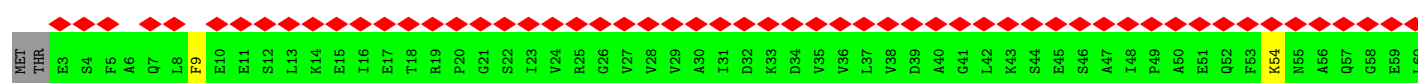
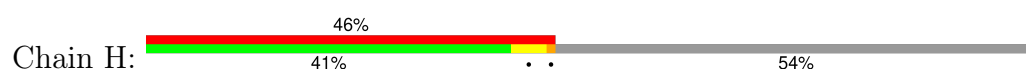
• Molecule 18: 30S ribosomal protein S21

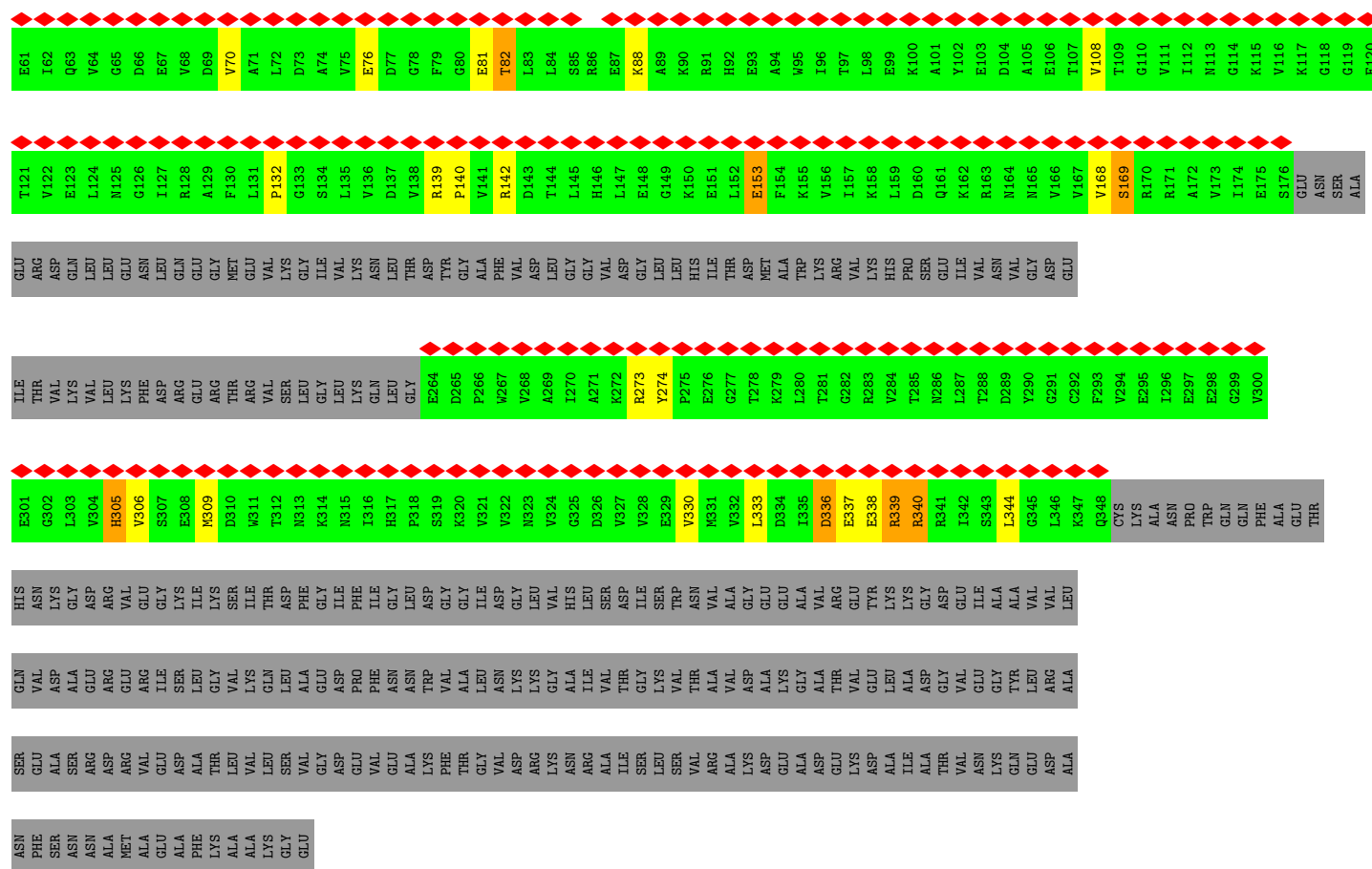


• Molecule 19: 30S ribosomal protein S2

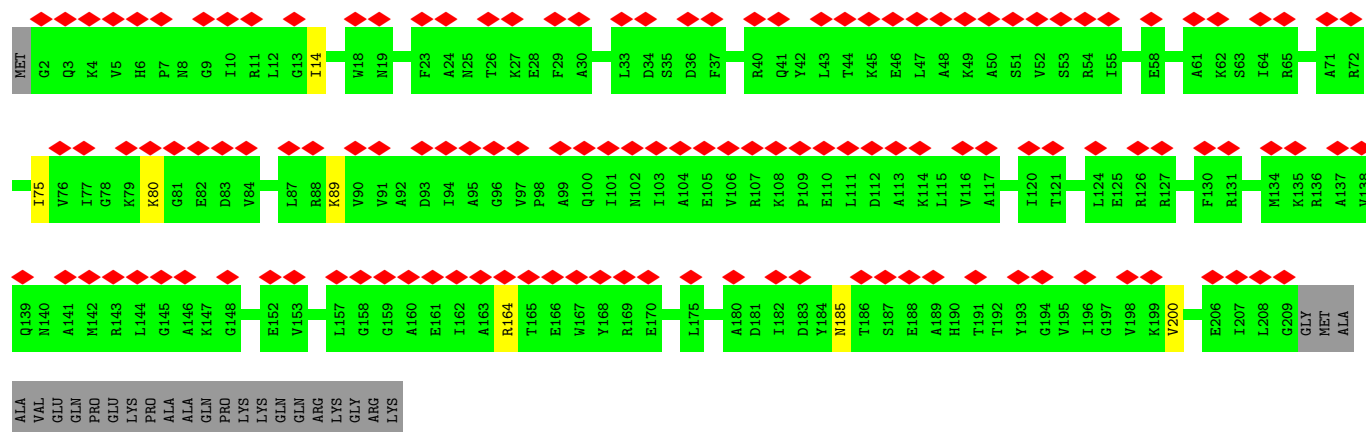
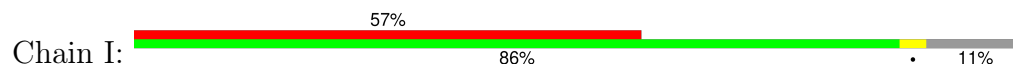


• Molecule 20: 30S ribosomal protein S1



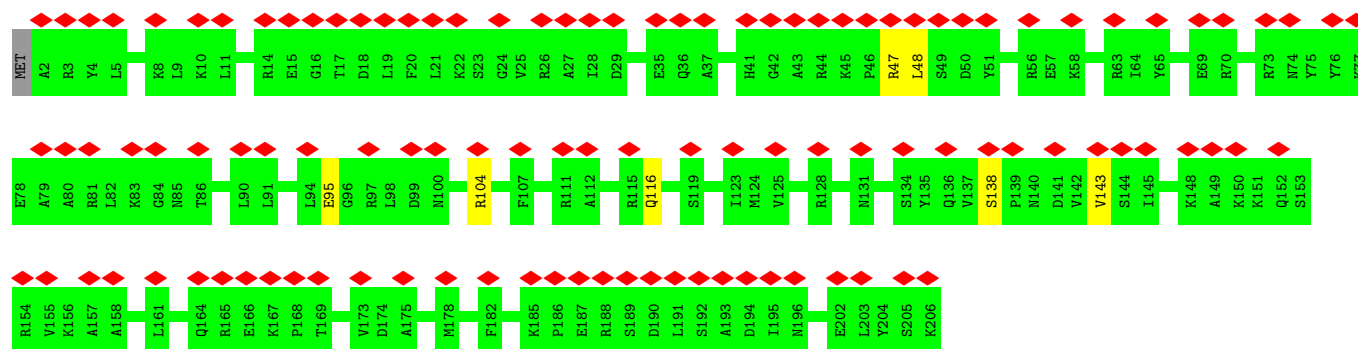


• Molecule 21: 30S ribosomal protein S3



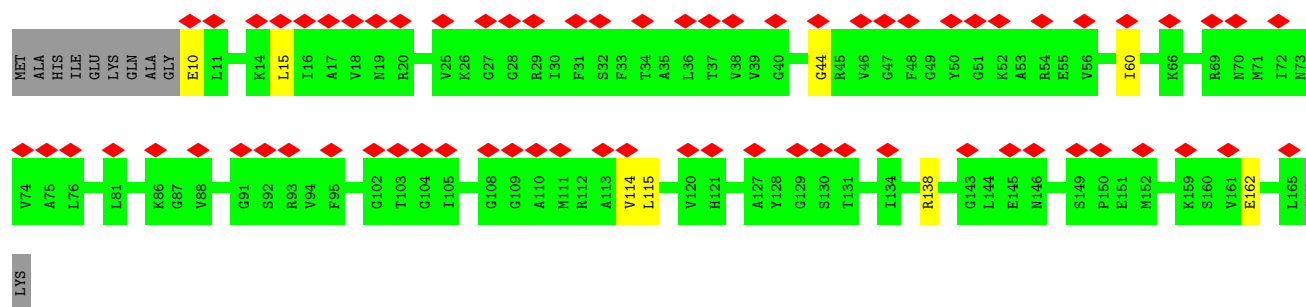
• Molecule 22: 30S ribosomal protein S4





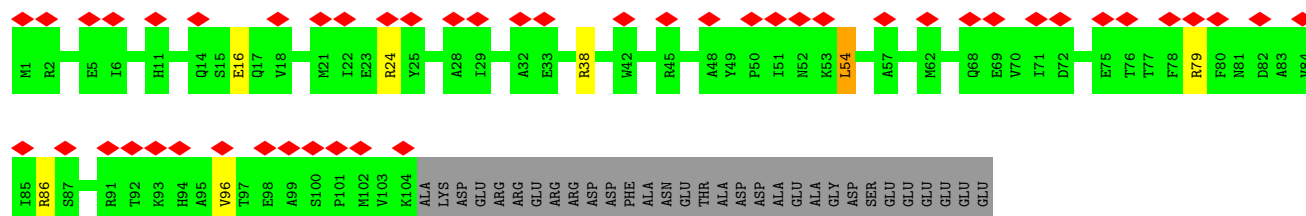
- Molecule 23: 30S ribosomal protein S5

Chain K:



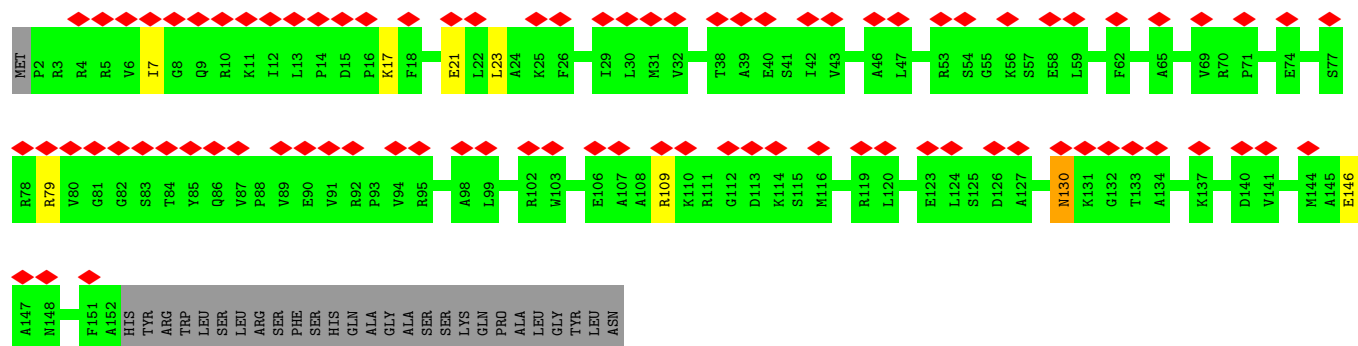
- Molecule 24: 30S ribosomal protein S6

Chain L:

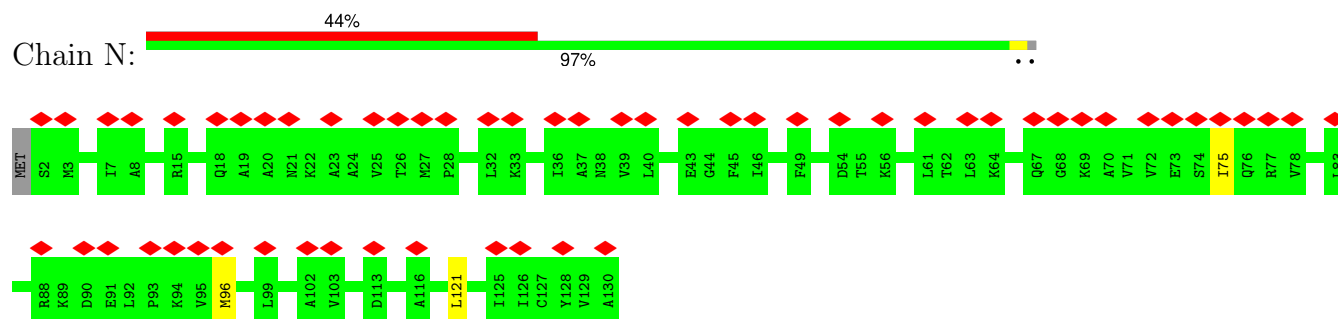


- Molecule 25: 30S ribosomal protein S7

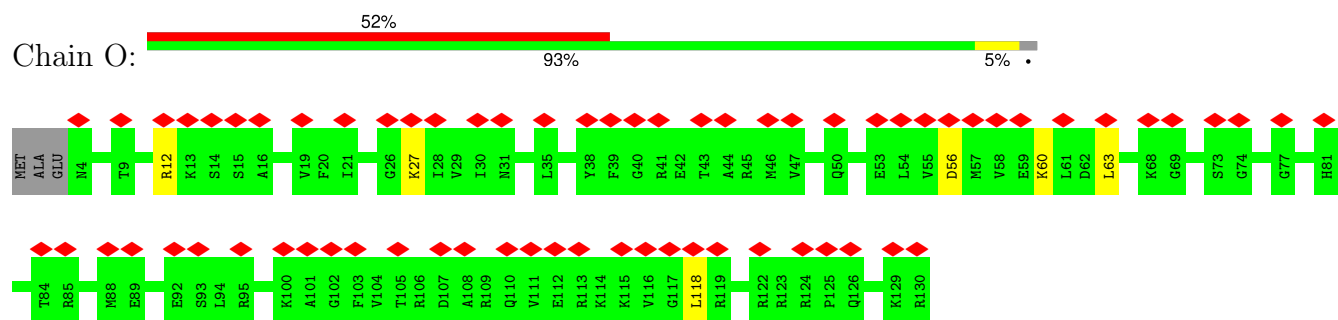
Chain M:



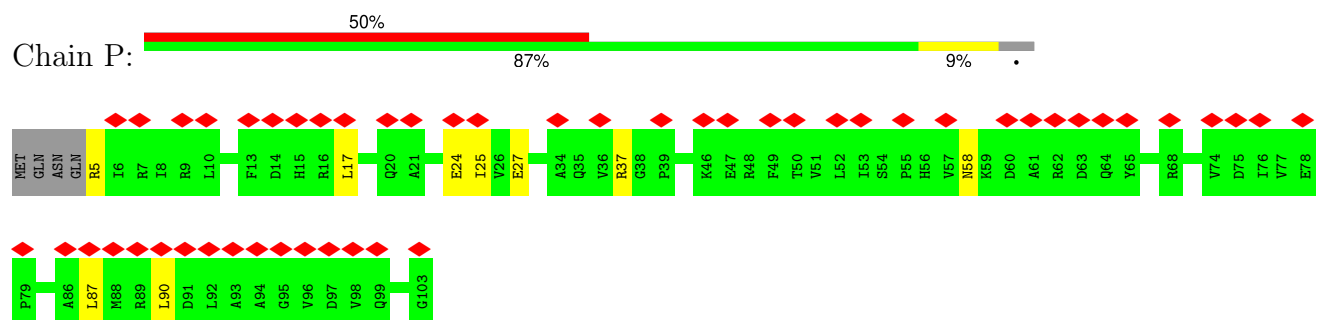
- Molecule 26: 30S ribosomal protein S8



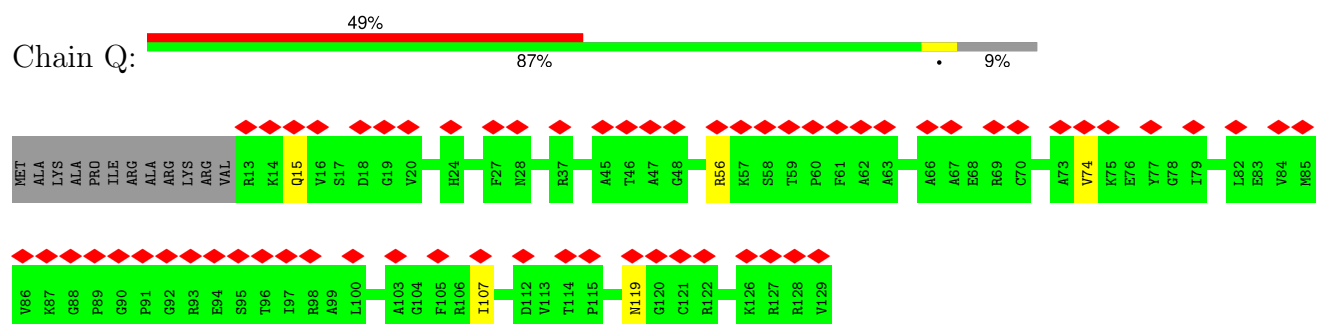
- Molecule 27: 30S ribosomal protein S9



- Molecule 28: 30S ribosomal protein S10

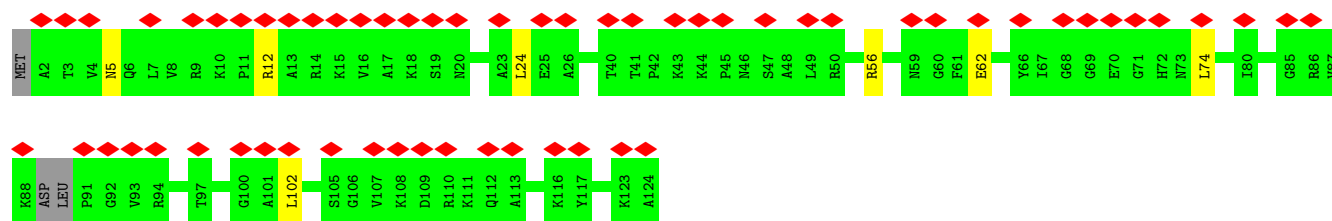


- Molecule 29: 30S ribosomal protein S11

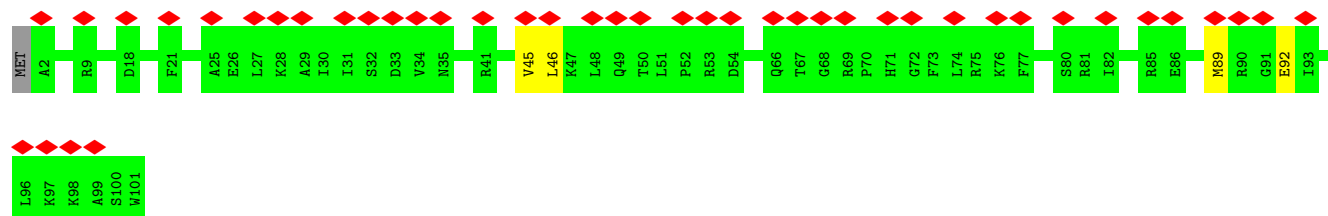
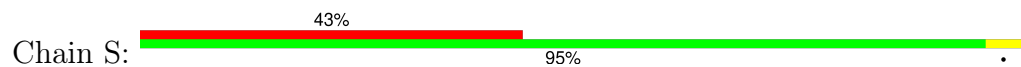


- Molecule 30: 30S ribosomal protein S12

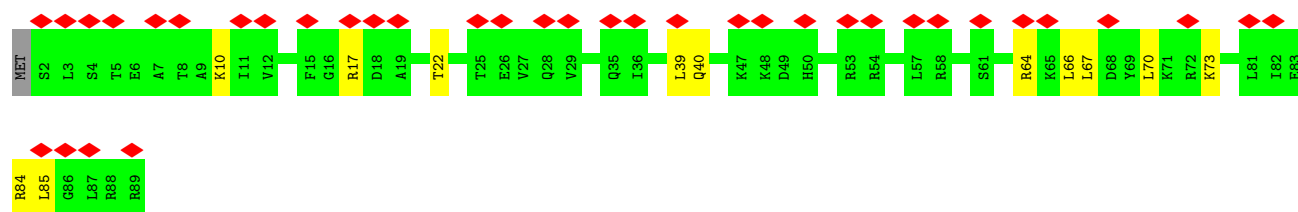
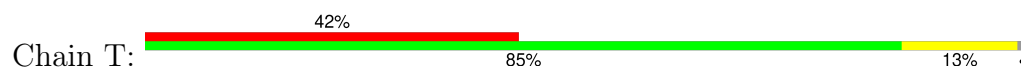




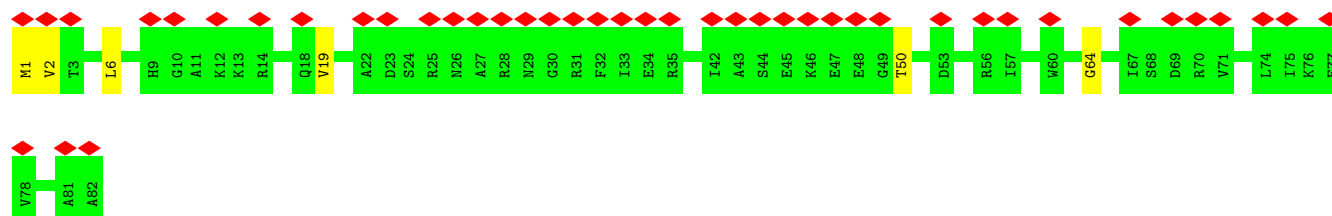
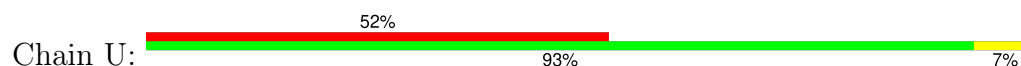
• Molecule 31: 30S ribosomal protein S14



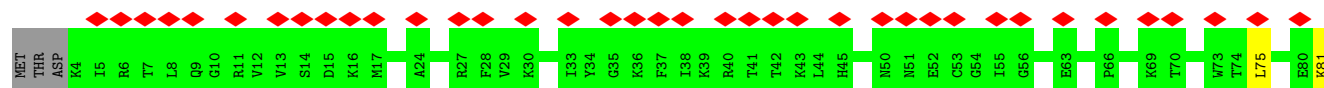
• Molecule 32: 30S ribosomal protein S15



• Molecule 33: 30S ribosomal protein S16

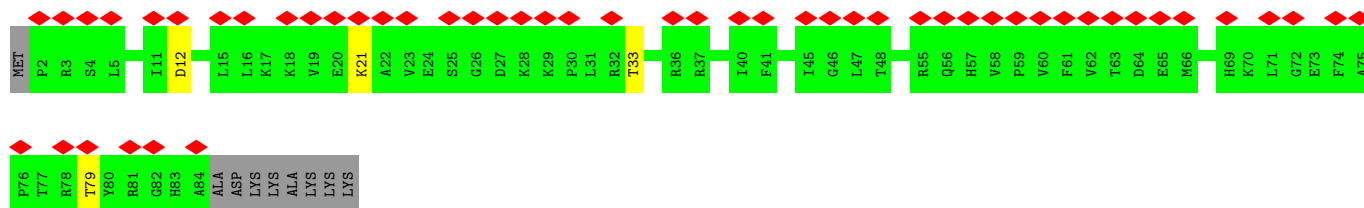
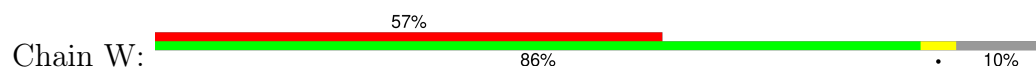


• Molecule 34: 30S ribosomal protein S17

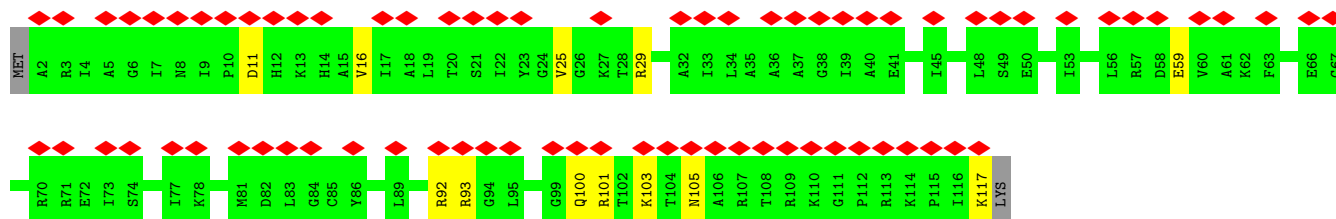
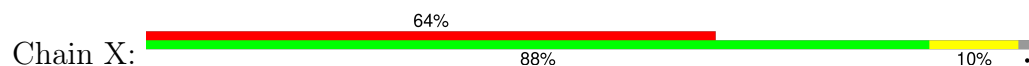




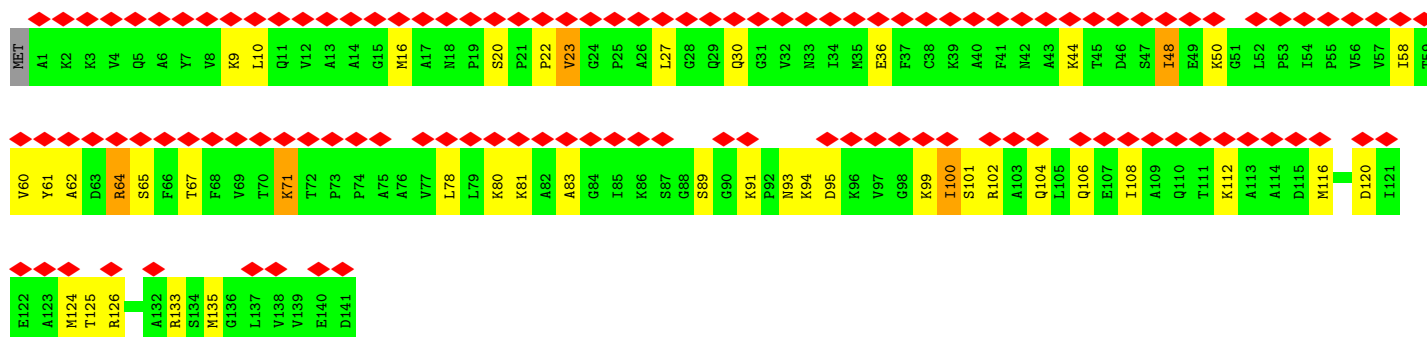
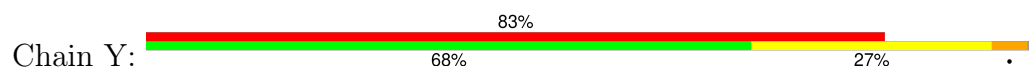
- Molecule 35: 30S ribosomal protein S19



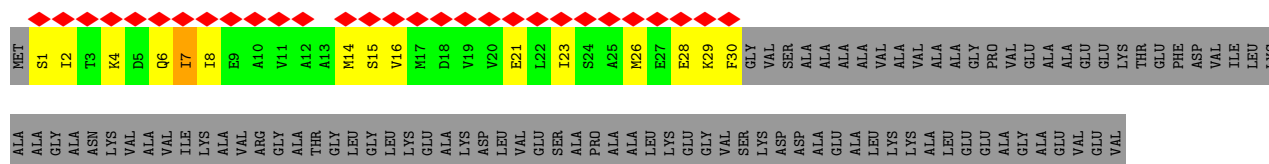
- Molecule 36: 30S ribosomal protein S13



- Molecule 37: 50S ribosomal protein L11



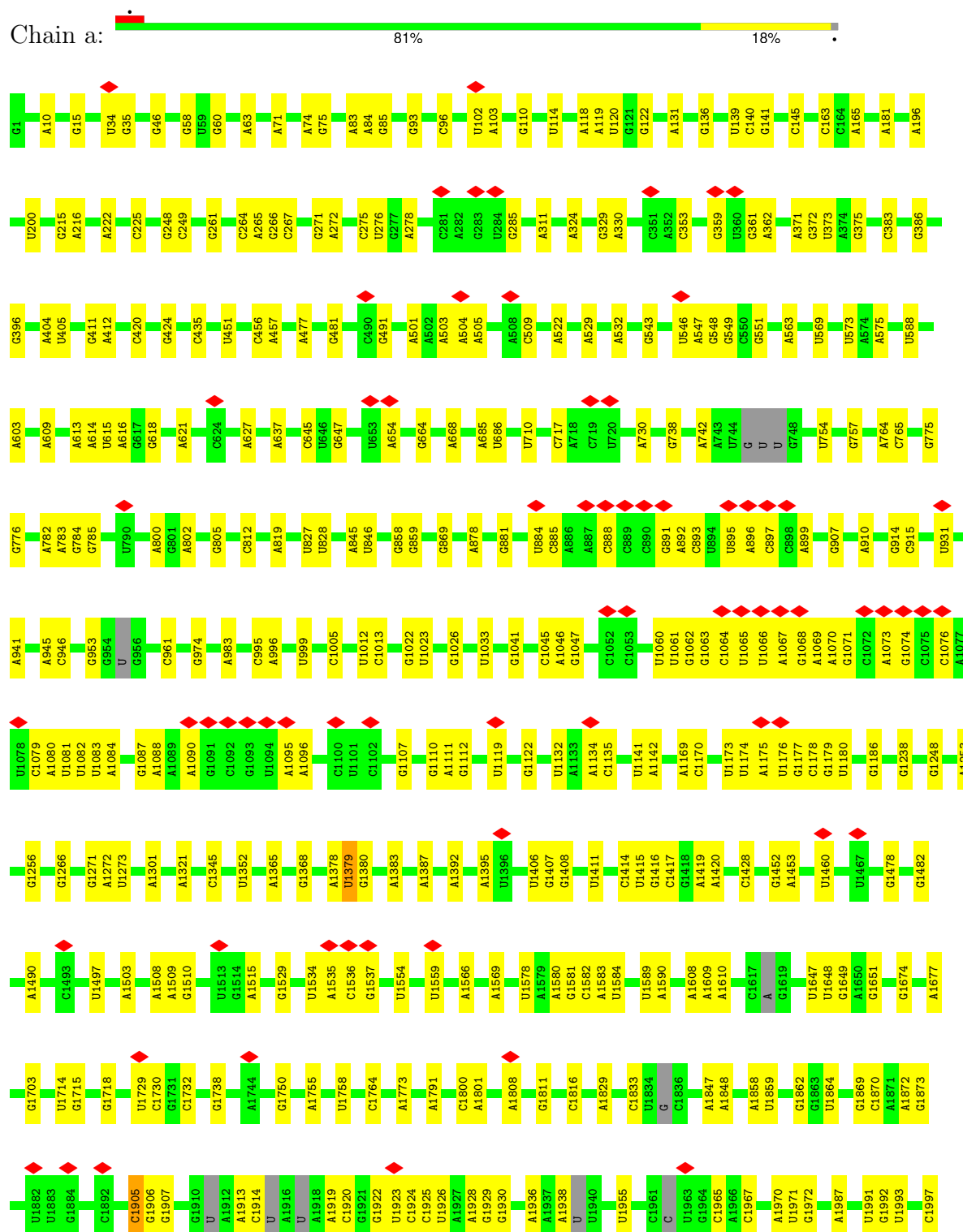
- Molecule 38: 50S ribosomal protein L7/L12

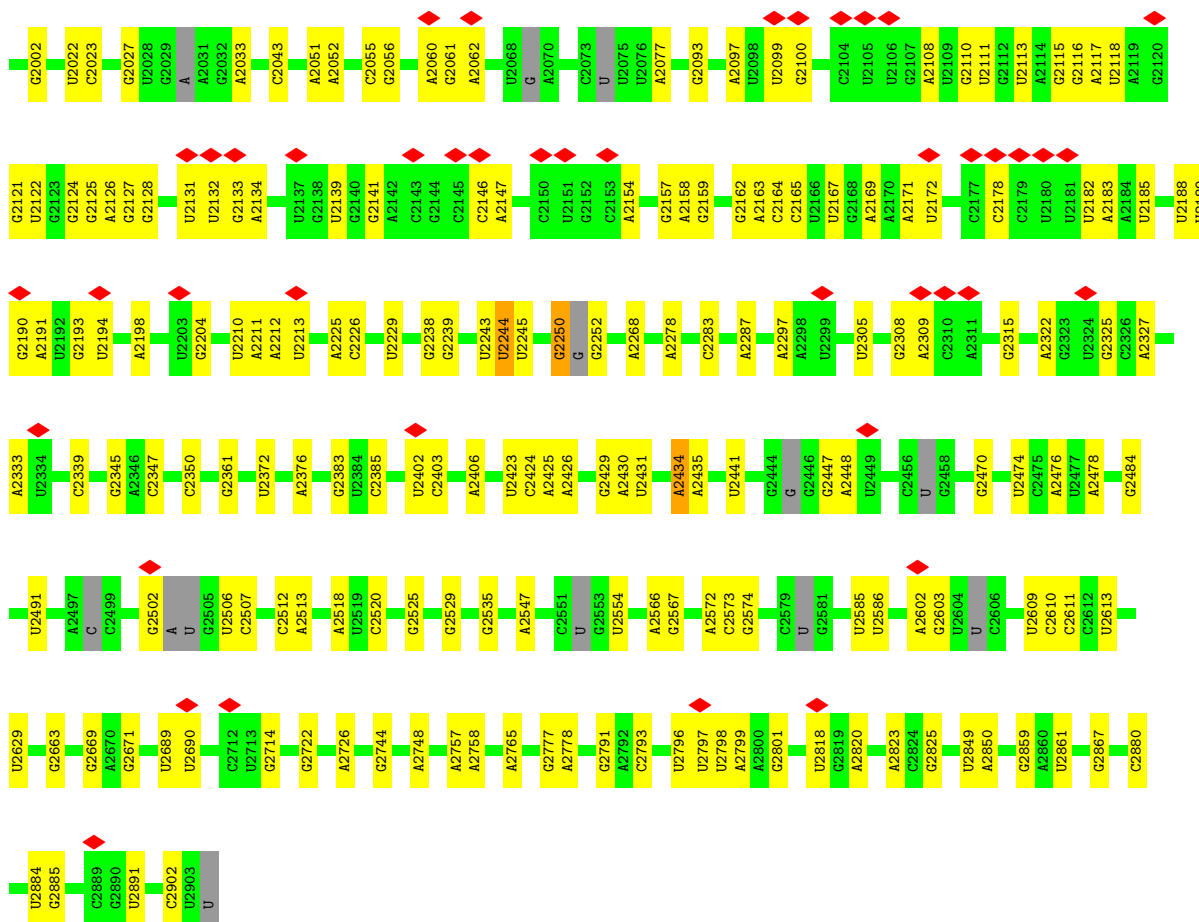


LYS

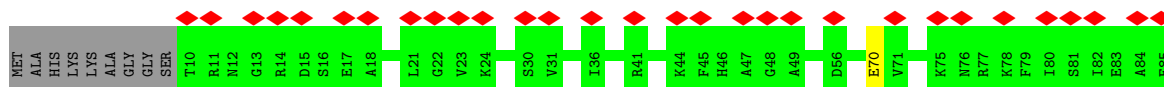
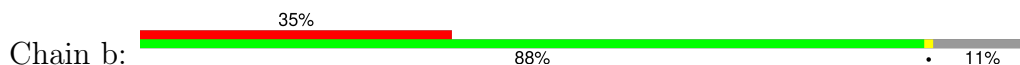
• Molecule 39: 23S rRNA

Chain a:

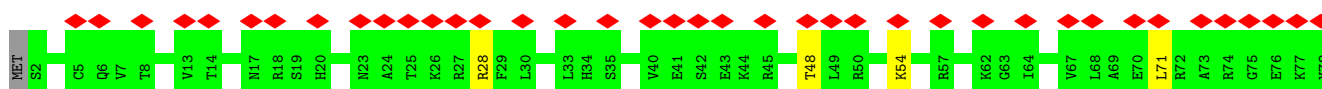




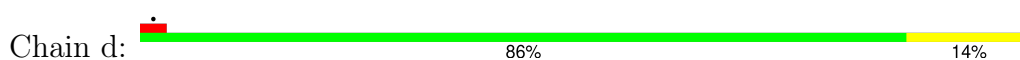
- Molecule 40: 50S ribosomal protein L27



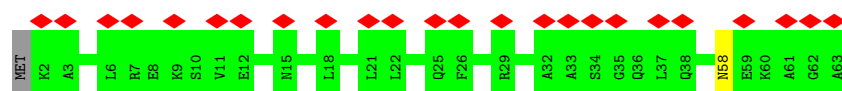
- Molecule 41: 50S ribosomal protein L28



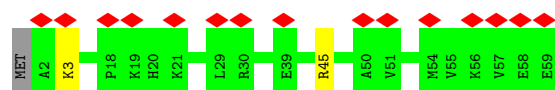
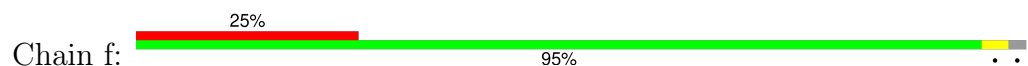
- Molecule 42: 5S rRNA



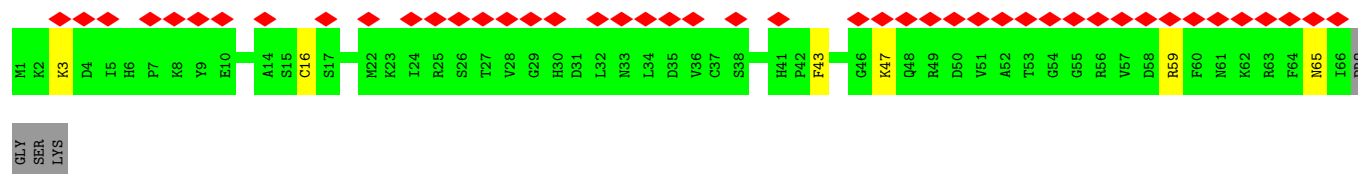
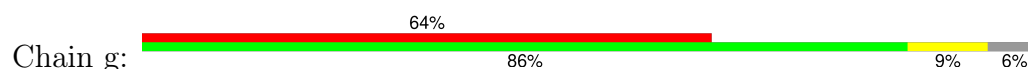
- Molecule 43: 50S ribosomal protein L29



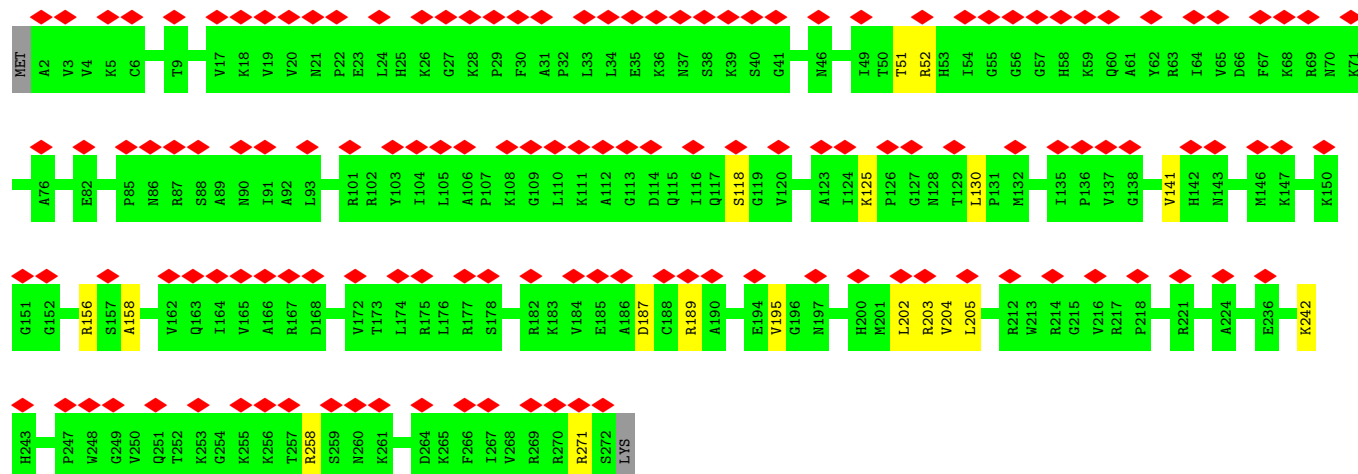
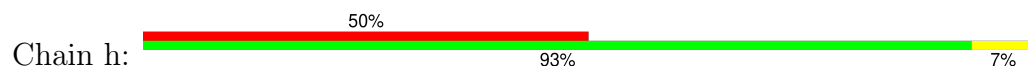
- Molecule 44: 50S ribosomal protein L30



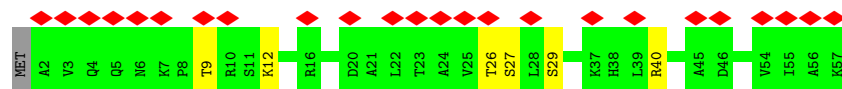
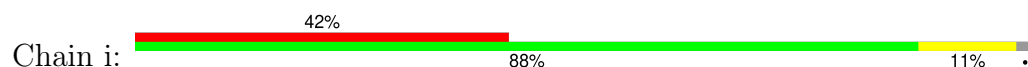
- Molecule 45: 50S ribosomal protein L31



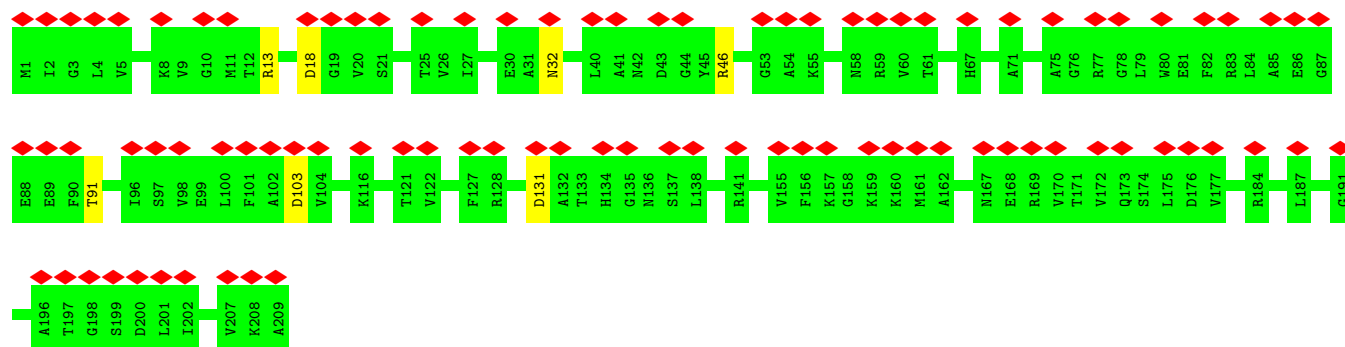
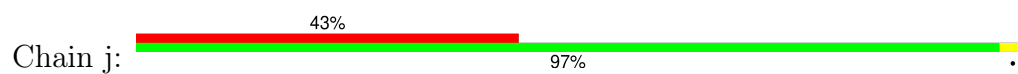
- Molecule 46: 50S ribosomal protein L2



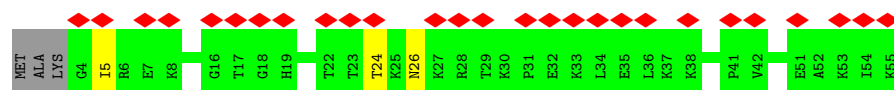
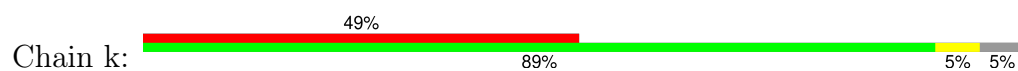
- Molecule 47: 50S ribosomal protein L32



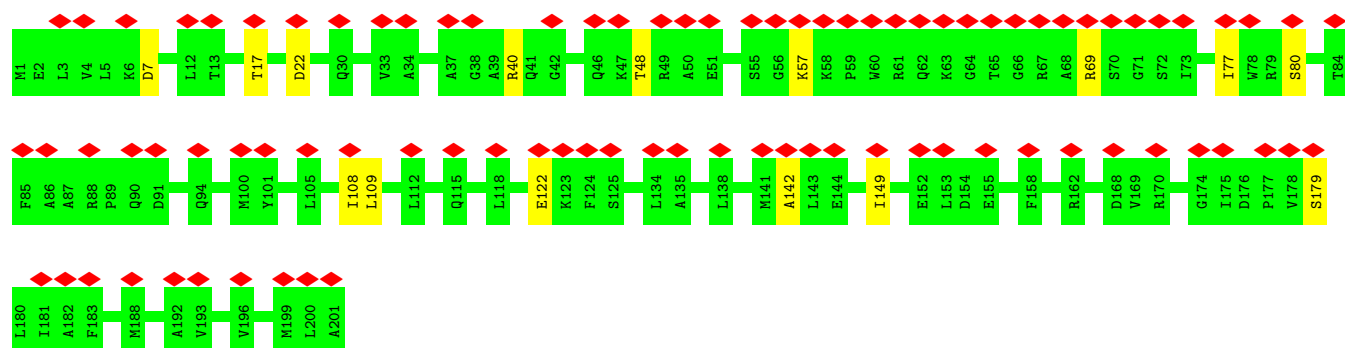
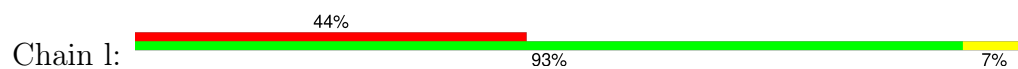
- Molecule 48: 50S ribosomal protein L3



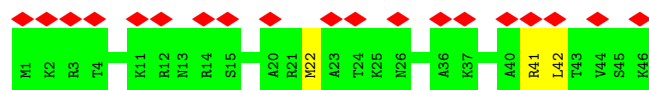
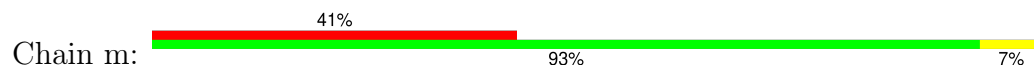
- Molecule 49: 50S ribosomal protein L33



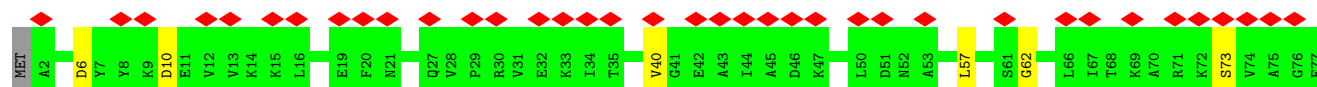
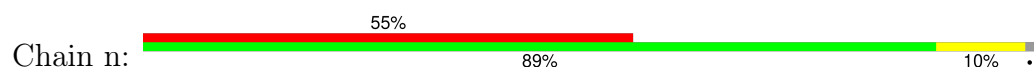
- Molecule 50: 50S ribosomal protein L4

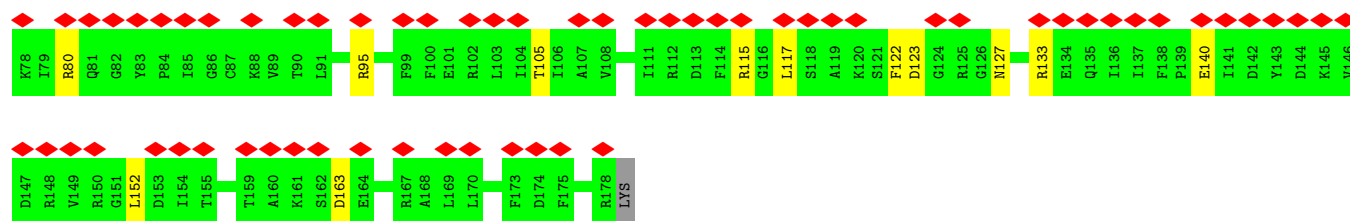


- Molecule 51: 50S ribosomal protein L34

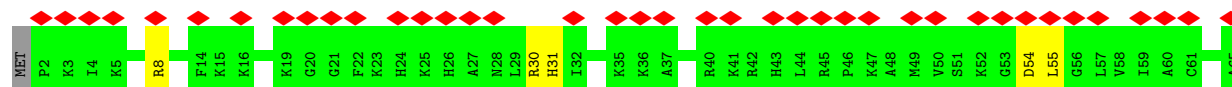
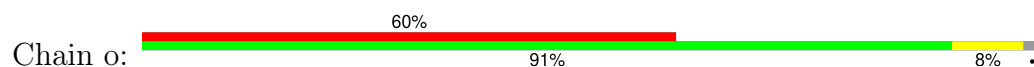


- Molecule 52: 50S ribosomal protein L5

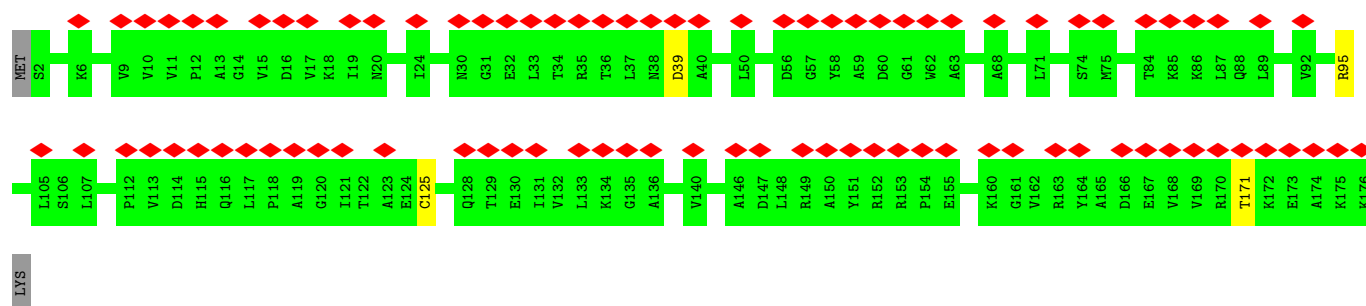




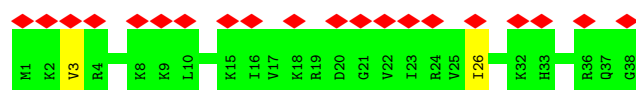
• Molecule 53: 50S ribosomal protein L35



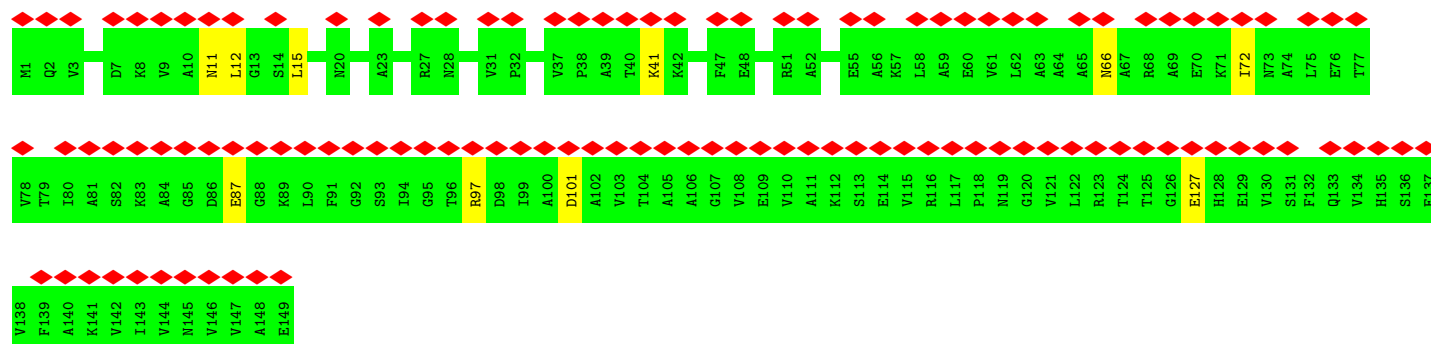
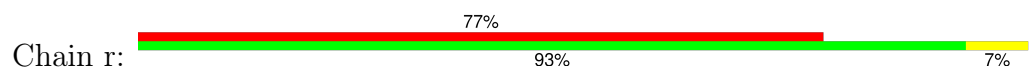
• Molecule 54: 50S ribosomal protein L6



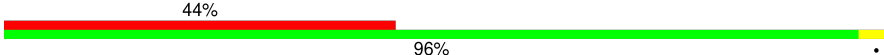
• Molecule 55: 50S ribosomal protein L36

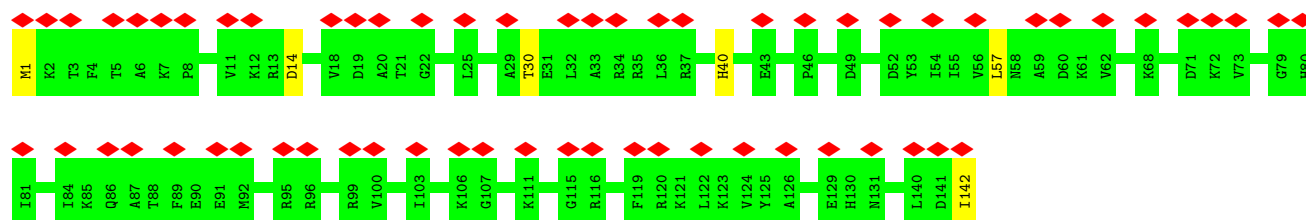


• Molecule 56: 50S ribosomal protein L9



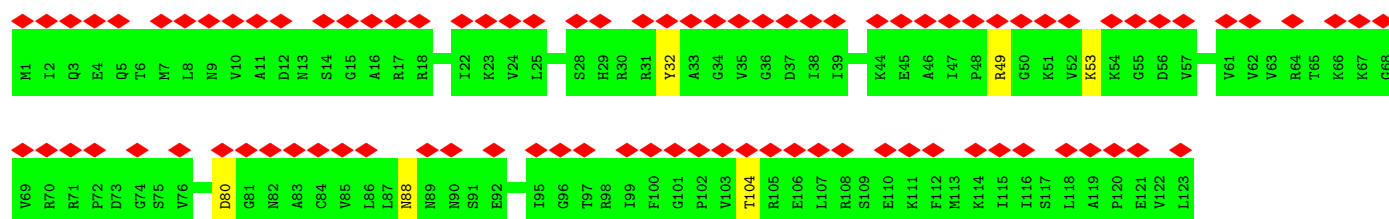
- Molecule 57: 50S ribosomal protein L13

Chain s: 



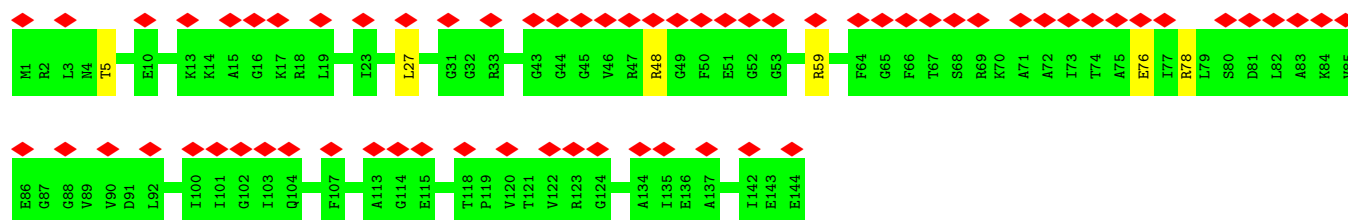
- Molecule 58: 50S ribosomal protein L14

Chain t: 



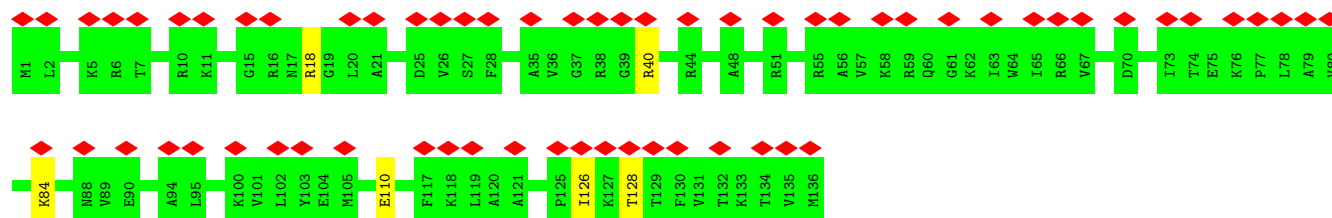
- Molecule 59: 50S ribosomal protein L15

Chain u: 




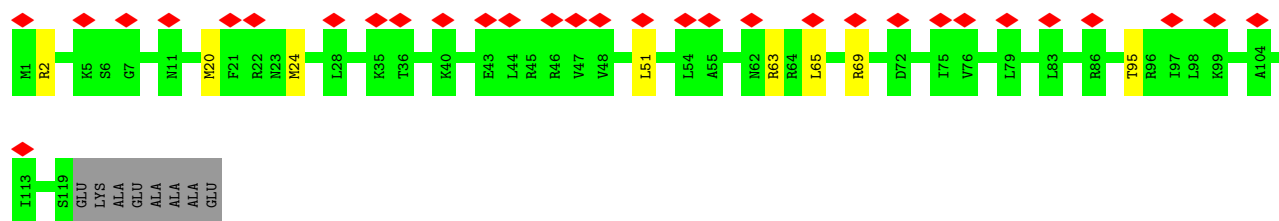
- Molecule 60: 50S ribosomal protein L16

Chain v: 



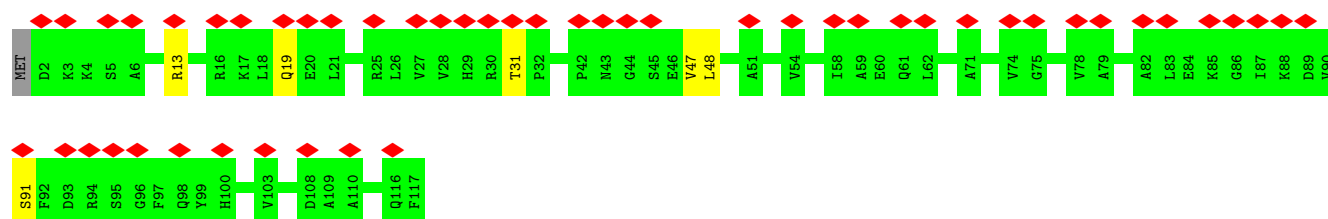
- Molecule 61: 50S ribosomal protein L17

Chain w: 



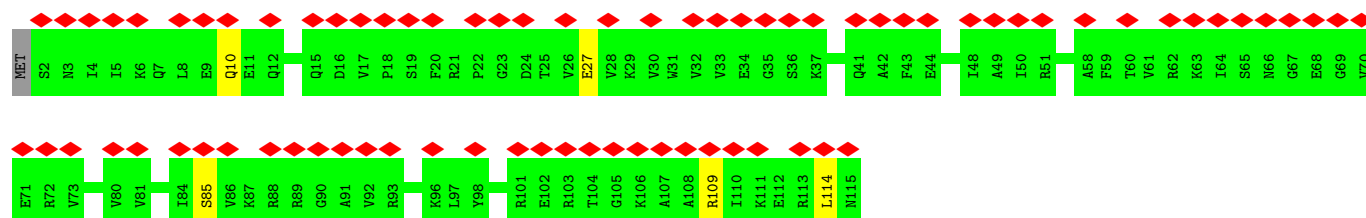
- Molecule 62: 50S ribosomal protein L18

Chain x: 43% 94% 5%



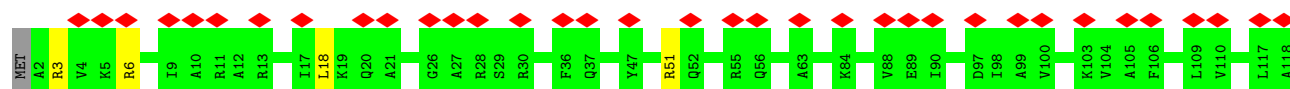
- Molecule 63: 50S ribosomal protein L19

Chain y: 66% 95%



- Molecule 64: 50S ribosomal protein L20

Chain z: 30% 96%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	4000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	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	0.029	Depositor
Minimum map value	-0.014	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.009	Depositor
Map size (Å)	532.48, 532.48, 532.48	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: MG, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	0	0.38	0/829	0.67	0/1107
2	1	0.49	0/864	0.82	0/1156
3	2	0.42	0/752	0.71	0/1005
4	3	0.35	0/796	0.67	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	1.12	4/603 (0.7%)	0.97	0/926
8	7	0.67	2/519 (0.4%)	0.99	3/804 (0.4%)
9	9	0.79	2/1131 (0.2%)	0.64	1/1524 (0.1%)
10	A	0.39	0/1810	0.75	1/2821 (0.0%)
10	B	0.46	1/1810 (0.1%)	0.86	7/2821 (0.2%)
11	AA	0.59	2/10591 (0.0%)	0.75	15/14289 (0.1%)
12	AB	0.43	0/808	0.60	0/1088
13	AC	0.48	0/1808	0.62	1/2450 (0.0%)
13	AD	0.39	0/1789	0.56	0/2425
14	AE	0.52	3/10545 (0.0%)	0.66	5/14236 (0.0%)
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	0.86	0/895
18	F	0.56	0/597	0.87	0/792
19	G	0.49	0/1791	0.71	0/2413
20	H	0.54	1/1746 (0.1%)	1.03	12/2382 (0.5%)
21	I	0.44	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	0.69	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	0.36	0/952	0.74	0/1274

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	S	0.49	0/817	0.78	0/1088
32	T	0.53	0/722	0.86	0/964
33	U	0.44	0/659	0.78	0/884
34	V	0.34	0/657	0.61	0/881
35	W	0.38	0/680	0.62	0/915
36	X	0.49	0/909	0.87	0/1215
37	Y	0.67	0/1046	0.58	0/1410
38	Z	0.69	0/227	0.57	0/304
39	a	0.38	3/69247 (0.0%)	0.72	18/107985 (0.0%)
40	b	0.39	0/589	0.70	0/779
41	c	0.48	0/635	0.81	1/848 (0.1%)
42	d	0.29	0/2872	0.69	0/4478
43	e	0.54	0/502	0.83	0/667
44	f	0.45	0/452	0.78	0/605
45	g	0.43	0/531	0.68	0/709
46	h	0.39	0/2121	0.78	0/2852
47	i	0.40	0/450	0.79	0/599
48	j	0.44	0/1586	0.69	0/2134
49	k	0.35	0/433	0.65	0/576
50	l	0.46	0/1571	0.77	0/2113
51	m	0.53	0/380	0.99	0/498
52	n	0.49	0/1434	0.88	3/1926 (0.2%)
53	o	0.46	0/513	0.83	0/676
54	p	0.39	0/1333	0.67	0/1805
55	q	0.37	0/303	0.77	0/397
56	r	0.43	0/1122	0.69	0/1515
57	s	0.50	0/1152	0.75	0/1551
58	t	0.41	0/955	0.78	0/1279
59	u	0.40	0/1062	0.76	0/1413
60	v	0.47	0/1093	0.82	0/1460
61	w	0.52	0/964	0.87	0/1289
62	x	0.46	0/902	0.81	0/1209
63	y	0.41	0/929	0.73	1/1242 (0.1%)
64	z	0.60	0/960	0.91	1/1278 (0.1%)
All	All	0.43	34/188952 (0.0%)	0.74	103/278480 (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
10	A	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
10	B	0	2
11	AA	0	10
14	AE	0	5
20	H	0	3
36	X	0	1
All	All	0	23

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	9	130	PRO	N-CA	13.73	1.70	1.47
16	D	1516	G	O3'-P	-13.37	1.45	1.61
16	D	1339	A	O3'-P	10.52	1.73	1.61
11	AA	374	GLU	C-N	10.46	1.54	1.34
14	AE	88	CYS	CB-SG	-10.17	1.65	1.82
6	5	109	DT	O3'-P	8.66	1.71	1.61
16	D	145	G	O3'-P	8.44	1.71	1.61
7	6	10	DG	C1'-N9	-8.29	1.35	1.47
16	D	196	A	O3'-P	8.29	1.71	1.61
11	AA	850	ILE	N-CA	-8.21	1.29	1.46
16	D	1275	A	O3'-P	7.76	1.70	1.61
39	a	2434	A	O3'-P	7.59	1.70	1.61
20	H	169	SER	N-CA	7.52	1.61	1.46
16	D	1515	G	O3'-P	-7.30	1.52	1.61
6	5	121	DG	C1'-N9	-7.24	1.37	1.47
8	7	19	G	C1'-N9	-7.17	1.36	1.46
16	D	1395	C	O3'-P	7.16	1.69	1.61
16	D	1490	U	O3'-P	6.83	1.69	1.61
8	7	-19	U	C1'-N1	6.82	1.58	1.48
6	5	112	DG	C1'-N9	-6.73	1.37	1.47
16	D	1492	A	O3'-P	6.60	1.69	1.61
39	a	1905	C	O3'-P	6.59	1.69	1.61
39	a	2167	U	O3'-P	6.55	1.69	1.61
6	5	100	DA	C1'-N9	-6.53	1.38	1.47
7	6	21	DA	C1'-N9	-6.42	1.38	1.47
14	AE	93	THR	CA-C	6.22	1.69	1.52
9	9	129	LEU	C-N	6.11	1.45	1.34
6	5	116	DG	C1'-N9	-6.07	1.38	1.47
6	5	115	DA	C1'-N9	-5.96	1.39	1.47
14	AE	70	CYS	CA-CB	-5.82	1.41	1.53
7	6	28	DA	C1'-N9	-5.73	1.39	1.47
10	B	36	U	O3'-P	5.70	1.68	1.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	D	1397	C	O3'-P	5.65	1.68	1.61
7	6	24	DT	C1'-N1	5.28	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'	-19.03	96.86	119.70
16	D	1516	G	O3'-P-O5'	13.79	130.21	104.00
11	AA	1250	SER	C-N-CA	11.14	149.55	121.70
39	a	2252	G	N9-C1'-C2'	-10.95	99.76	114.00
16	D	1401	G	N9-C1'-C2'	-10.70	100.09	114.00
52	n	73	SER	N-CA-CB	-10.63	94.56	110.50
16	D	1499	A	N9-C1'-C2'	-10.29	100.62	114.00
16	D	528	C	N1-C1'-C2'	-10.21	100.72	114.00
20	H	169	SER	N-CA-C	9.96	137.91	111.00
16	D	1339	A	P-O3'-C3'	9.89	131.57	119.70
10	B	29	G	N9-C1'-C2'	-9.75	101.28	112.00
10	B	28	C	P-O3'-C3'	9.62	131.24	119.70
14	AE	271	ARG	NE-CZ-NH2	-9.38	115.61	120.30
16	D	196	A	P-O3'-C3'	9.37	130.94	119.70
11	AA	375	PRO	CA-N-CD	-9.26	98.53	111.50
16	D	526	C	N1-C1'-C2'	-8.79	102.33	112.00
20	H	88	LYS	C-N-CA	8.75	143.57	121.70
39	a	2167	U	P-O3'-C3'	8.58	129.99	119.70
16	D	1208	C	N1-C1'-C2'	-8.54	102.60	112.00
16	D	1206	G	N9-C1'-C2'	-8.41	102.75	112.00
11	AA	995	ASP	O-C-N	-8.24	109.51	122.70
9	9	130	PRO	CA-N-CD	-8.23	99.97	111.50
39	a	2434	A	P-O3'-C3'	8.21	129.55	119.70
11	AA	376	PRO	N-CA-CB	-8.05	93.64	103.30
16	D	1406	U	N1-C1'-C2'	-7.79	103.43	112.00
39	a	1905	C	P-O3'-C3'	7.66	128.89	119.70
16	D	1275	A	P-O3'-C3'	7.61	128.83	119.70
16	D	1490	U	P-O3'-C3'	7.53	128.73	119.70
16	D	1492	A	P-O3'-C3'	7.53	128.73	119.70
20	H	305	HIS	N-CA-C	7.42	131.04	111.00
10	B	29	G	C3'-C2'-O2'	7.36	134.63	113.30
8	7	-20	A	OP2-P-O3'	7.18	121.00	105.20
16	D	1206	G	C4'-C3'-O3'	7.16	127.32	113.00
16	D	1493	A	C2'-C3'-O3'	7.11	125.14	109.50
10	B	35	A	P-O3'-C3'	7.11	128.23	119.70
39	a	2245	U	N1-C1'-C2'	-7.07	104.22	112.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	D	145	G	P-O3'-C3'	7.06	128.17	119.70
16	D	1516	G	OP1-P-O3'	-7.00	89.80	105.20
16	D	1395	C	P-O3'-C3'	6.95	128.04	119.70
11	AA	855	PRO	N-CA-CB	-6.85	95.07	102.60
8	7	-20	A	O3'-P-O5'	-6.81	91.06	104.00
52	n	73	SER	CB-CA-C	6.72	122.88	110.10
11	AA	995	ASP	CA-C-N	6.71	131.97	117.20
16	D	1515	G	O3'-P-O5'	-6.69	91.30	104.00
16	D	1401	G	C4'-C3'-O3'	6.62	126.23	113.00
39	a	2250	G	C4'-C3'-O3'	-6.60	95.54	109.40
39	a	1379	U	C2'-C3'-O3'	6.57	124.21	113.70
39	a	2243	U	N1-C1'-C2'	-6.56	104.78	112.00
16	D	1515	G	P-O3'-C3'	6.52	127.52	119.70
20	H	339	ARG	C-N-CA	6.49	137.91	121.70
11	AA	935	THR	CA-CB-OG1	-6.47	95.42	109.00
16	D	1408	A	N9-C1'-C2'	-6.41	104.95	112.00
16	D	515	G	N9-C1'-C2'	-6.41	104.95	112.00
16	D	1497	G	N9-C1'-C2'	-6.40	104.96	112.00
10	B	34	C	P-O3'-C3'	6.38	127.36	119.70
6	5	109	DT	P-O3'-C3'	6.33	127.30	119.70
13	AC	117	HIS	CB-CA-C	-6.22	97.97	110.40
11	AA	849	GLU	C-N-CA	6.12	137.01	121.70
11	AA	1004	ASP	CB-CA-C	5.98	122.37	110.40
20	H	140	PRO	N-CA-CB	5.97	110.47	103.30
11	AA	943	LYS	CA-C-O	-5.94	107.62	120.10
20	H	330	VAL	N-CA-C	5.92	126.97	111.00
10	B	29	G	P-O3'-C3'	5.90	126.78	119.70
20	H	336	ASP	CB-CA-C	-5.89	98.63	110.40
11	AA	727	VAL	N-CA-C	-5.88	95.11	111.00
39	a	754	U	N1-C1'-C2'	5.87	121.64	114.00
11	AA	943	LYS	CA-C-N	5.86	130.09	117.20
20	H	132	PRO	N-CA-CB	5.80	110.26	103.30
20	H	168	VAL	C-N-CA	5.80	136.19	121.70
14	AE	903	LEU	C-N-CA	5.76	136.11	121.70
16	D	517	G	C5'-C4'-C3'	5.73	125.17	116.00
20	H	344	LEU	CA-CB-CG	5.68	128.35	115.30
52	n	127	ASN	CB-CA-C	5.64	121.68	110.40
39	a	2244	U	C1'-C2'-O2'	-5.63	93.72	110.60
24	L	54	LEU	CA-CB-CG	5.59	128.16	115.30
14	AE	363	LEU	CA-CB-CG	5.58	128.13	115.30
11	AA	1233	LEU	CA-CB-CG	5.46	127.86	115.30
39	a	783	A	C4'-C3'-O3'	5.44	123.89	113.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
41	c	28	ARG	NE-CZ-NH2	-5.38	117.61	120.30
4	3	22	ARG	NE-CZ-NH1	5.37	122.99	120.30
16	D	1397	C	P-O3'-C3'	5.35	126.12	119.70
63	y	109	ARG	NE-CZ-NH2	5.33	122.97	120.30
16	D	1340	A	C5'-C4'-C3'	5.30	124.49	116.00
11	AA	728	ASP	N-CA-C	5.27	125.23	111.00
4	3	22	ARG	NE-CZ-NH2	-5.25	117.67	120.30
39	a	742	A	C8-N9-C1'	-5.21	118.32	127.70
16	D	1340	A	C5'-C4'-O4'	5.20	115.34	109.10
39	a	404	A	C2'-C3'-O3'	5.19	122.00	113.70
20	H	169	SER	N-CA-CB	-5.17	102.74	110.50
11	AA	817	LEU	CB-CG-CD2	-5.15	102.24	111.00
39	a	2244	U	C4'-C3'-O3'	5.15	123.30	113.00
39	a	742	A	C4-N9-C1'	5.11	135.50	126.30
8	7	-17	U	C2'-C3'-O3'	5.10	121.86	113.70
39	a	2252	G	C4'-C3'-O3'	5.09	123.19	113.00
64	z	6	ARG	NE-CZ-NH2	5.09	122.84	120.30
16	D	197	A	C2'-C3'-O3'	5.09	121.84	113.70
10	B	48	C	N1-C1'-C2'	5.08	120.61	114.00
10	A	48	C	N1-C1'-C2'	5.06	120.58	114.00
14	AE	807	LEU	CB-CG-CD2	-5.06	102.40	111.00
39	a	1141	U	N1-C1'-C2'	5.04	120.56	114.00
14	AE	73	GLY	N-CA-C	5.04	125.69	113.10
39	a	2243	U	C4'-C3'-O3'	5.02	123.04	113.00
20	H	153	GLU	N-CA-C	-5.01	97.47	111.00

There are no chirality outliers.

All (23) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
10	A	19	G	Sidechain
10	A	7	G	Sidechain
11	AA	1134	GLN	Peptide
11	AA	1157	GLN	Peptide
11	AA	1158	LYS	Peptide
11	AA	205	PRO	Peptide
11	AA	594	VAL	Peptide
11	AA	595	THR	Peptide
11	AA	596	ASP	Mainchain
11	AA	696	ASP	Peptide
11	AA	746	ALA	Peptide
11	AA	853	ASP	Mainchain

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Mol	Chain	Res	Type	Group
14	AE	1184	ASP	Peptide
14	AE	1326	GLN	Peptide
14	AE	313	GLY	Peptide
14	AE	416	ILE	Peptide
14	AE	804	ALA	Peptide
10	B	19	G	Sidechain
10	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	92/100 (92%)	90 (98%)	2 (2%)	0	100	100
4	3	101/104 (97%)	96 (95%)	4 (4%)	1 (1%)	13	49
5	4	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
9	9	146/165 (88%)	95 (65%)	37 (25%)	14 (10%)	0	7
11	AA	1318/1342 (98%)	1149 (87%)	137 (10%)	32 (2%)	5	27
12	AB	94/181 (52%)	88 (94%)	6 (6%)	0	100	100
13	AC	228/329 (69%)	215 (94%)	11 (5%)	2 (1%)	14	52
13	AD	226/329 (69%)	213 (94%)	12 (5%)	1 (0%)	30	68

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
14	AE	1329/1407 (94%)	1200 (90%)	120 (9%)	9 (1%)	19	57
15	C	64/75 (85%)	63 (98%)	1 (2%)	0	100	100
17	E	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
18	F	68/71 (96%)	68 (100%)	0	0	100	100
19	G	223/241 (92%)	210 (94%)	13 (6%)	0	100	100
20	H	255/557 (46%)	188 (74%)	55 (22%)	12 (5%)	2	16
21	I	206/233 (88%)	196 (95%)	9 (4%)	1 (0%)	25	64
22	J	203/206 (98%)	198 (98%)	5 (2%)	0	100	100
23	K	154/167 (92%)	146 (95%)	7 (4%)	1 (1%)	22	60
24	L	102/135 (76%)	97 (95%)	4 (4%)	1 (1%)	13	49
25	M	149/179 (83%)	144 (97%)	4 (3%)	1 (1%)	19	57
26	N	127/130 (98%)	121 (95%)	5 (4%)	1 (1%)	16	55
27	O	125/130 (96%)	115 (92%)	9 (7%)	1 (1%)	16	55
28	P	97/103 (94%)	88 (91%)	8 (8%)	1 (1%)	13	49
29	Q	115/129 (89%)	104 (90%)	9 (8%)	2 (2%)	7	37
30	R	117/124 (94%)	116 (99%)	1 (1%)	0	100	100
31	S	98/101 (97%)	97 (99%)	1 (1%)	0	100	100
32	T	86/89 (97%)	82 (95%)	4 (5%)	0	100	100
33	U	80/82 (98%)	75 (94%)	4 (5%)	1 (1%)	10	43
34	V	78/84 (93%)	74 (95%)	4 (5%)	0	100	100
35	W	81/92 (88%)	78 (96%)	3 (4%)	0	100	100
36	X	114/118 (97%)	107 (94%)	5 (4%)	2 (2%)	7	35
37	Y	139/142 (98%)	102 (73%)	25 (18%)	12 (9%)	0	9
38	Z	28/121 (23%)	19 (68%)	7 (25%)	2 (7%)	1	11
40	b	74/85 (87%)	69 (93%)	5 (7%)	0	100	100
41	c	75/78 (96%)	72 (96%)	3 (4%)	0	100	100
43	e	60/63 (95%)	57 (95%)	3 (5%)	0	100	100
44	f	56/59 (95%)	53 (95%)	3 (5%)	0	100	100
45	g	64/70 (91%)	63 (98%)	1 (2%)	0	100	100
46	h	269/273 (98%)	259 (96%)	9 (3%)	1 (0%)	30	68
47	i	54/57 (95%)	51 (94%)	3 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	j	207/209 (99%)	198 (96%)	9 (4%)	0	100	100
49	k	50/55 (91%)	50 (100%)	0	0	100	100
50	l	199/201 (99%)	190 (96%)	8 (4%)	1 (0%)	25	64
51	m	44/46 (96%)	43 (98%)	1 (2%)	0	100	100
52	n	175/179 (98%)	162 (93%)	11 (6%)	2 (1%)	12	47
53	o	62/65 (95%)	59 (95%)	3 (5%)	0	100	100
54	p	173/177 (98%)	161 (93%)	12 (7%)	0	100	100
55	q	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
56	r	147/149 (99%)	136 (92%)	11 (8%)	0	100	100
57	s	140/142 (99%)	135 (96%)	5 (4%)	0	100	100
58	t	121/123 (98%)	111 (92%)	10 (8%)	0	100	100
59	u	142/144 (99%)	135 (95%)	7 (5%)	0	100	100
60	v	134/136 (98%)	129 (96%)	5 (4%)	0	100	100
61	w	117/127 (92%)	107 (92%)	10 (8%)	0	100	100
62	x	114/117 (97%)	108 (95%)	6 (5%)	0	100	100
63	y	112/115 (97%)	105 (94%)	7 (6%)	0	100	100
64	z	115/118 (98%)	110 (96%)	4 (4%)	1 (1%)	14	52
All	All	9368/10486 (89%)	8607 (92%)	658 (7%)	103 (1%)	15	47

All (103) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
9	9	88	HIS
11	AA	596	ASP
11	AA	853	ASP
11	AA	859	GLU
11	AA	862	LEU
11	AA	873	ILE
11	AA	937	ASP
11	AA	993	PRO
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
37	Y	48	ILE
9	9	33	VAL
9	9	119	PRO
11	AA	375	PRO
11	AA	856	ASN
11	AA	870	ILE
11	AA	940	GLU
11	AA	985	GLU
11	AA	1003	THR
11	AA	1158	LYS
14	AE	175	GLU
20	H	108	VAL
20	H	309	MET
20	H	333	LEU
37	Y	93	ASN
46	h	158	ALA
50	l	142	ALA
64	z	3	ARG
9	9	48	ALA
9	9	91	ALA
9	9	118	ILE
9	9	130	PRO
11	AA	376	PRO
11	AA	723	VAL
11	AA	728	ASP
11	AA	935	THR
11	AA	980	VAL
11	AA	1005	GLU
11	AA	1045	GLY
13	AC	164	ASP
13	AC	165	GLU
14	AE	51	PRO
14	AE	805	GLN
20	H	76	GLU
20	H	142	ARG
25	M	130	ASN
28	P	58	ASN
29	Q	119	ASN
37	Y	20	SER
37	Y	64	ARG
37	Y	106	GLN

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Mol	Chain	Res	Type
9	9	69	PHE
9	9	73	LYS
9	9	108	VAL
9	9	129	LEU
9	9	133	GLU
11	AA	850	ILE
11	AA	943	LYS
11	AA	995	ASP
14	AE	174	ASP
14	AE	193	ASP
20	H	82	THR
21	I	80	LYS
36	X	105	ASN
37	Y	83	ALA
38	Z	21	GLU
52	n	40	VAL
9	9	28	ALA
11	AA	917	SER
11	AA	991	LYS
11	AA	997	TRP
11	AA	1044	PRO
14	AE	91	GLU
20	H	70	VAL
37	Y	22	PRO
37	Y	71	LYS
37	Y	89	SER
38	Z	7	ILE
4	3	39	ILE
13	AD	210	THR
14	AE	49	PHE
14	AE	73	GLY
14	AE	904	ALA
37	Y	62	ALA
24	L	96	VAL
37	Y	23	VAL
37	Y	100	ILE
1	0	44	GLY
11	AA	697	LYS
11	AA	1159	VAL
11	AA	1317	PRO
23	K	44	GLY
29	Q	74	VAL

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Mol	Chain	Res	Type
33	U	64	GLY
9	9	54	VAL
52	n	62	GLY
11	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%)	85 (91%)	8 (9%)	8	26
3	2	81/84 (96%)	76 (94%)	5 (6%)	15	36
4	3	84/85 (99%)	78 (93%)	6 (7%)	12	32
5	4	78/78 (100%)	74 (95%)	4 (5%)	20	41
9	9	112/123 (91%)	65 (58%)	47 (42%)	0	0
11	AA	1140/1157 (98%)	1039 (91%)	101 (9%)	8	25
12	AB	86/158 (54%)	84 (98%)	2 (2%)	45	64
13	AC	198/286 (69%)	182 (92%)	16 (8%)	9	28
13	AD	196/286 (68%)	194 (99%)	2 (1%)	73	82
14	AE	1120/1168 (96%)	1051 (94%)	69 (6%)	15	36
15	C	57/65 (88%)	55 (96%)	2 (4%)	31	51
17	E	65/66 (98%)	60 (92%)	5 (8%)	10	30
18	F	60/61 (98%)	57 (95%)	3 (5%)	20	41
19	G	187/199 (94%)	178 (95%)	9 (5%)	21	43
20	H	137/461 (30%)	128 (93%)	9 (7%)	14	34
21	I	171/190 (90%)	165 (96%)	6 (4%)	31	51
22	J	172/173 (99%)	165 (96%)	7 (4%)	26	47
23	K	119/126 (94%)	112 (94%)	7 (6%)	16	37
24	L	91/116 (78%)	85 (93%)	6 (7%)	14	34

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
25	M	124/147 (84%)	116 (94%)	8 (6%)	14	35
26	N	104/105 (99%)	102 (98%)	2 (2%)	52	69
27	O	105/107 (98%)	100 (95%)	5 (5%)	21	43
28	P	86/90 (96%)	78 (91%)	8 (9%)	7	23
29	Q	90/99 (91%)	87 (97%)	3 (3%)	33	52
30	R	101/104 (97%)	94 (93%)	7 (7%)	13	33
31	S	83/84 (99%)	79 (95%)	4 (5%)	21	43
32	T	76/77 (99%)	64 (84%)	12 (16%)	2	10
33	U	65/65 (100%)	60 (92%)	5 (8%)	10	30
34	V	74/78 (95%)	72 (97%)	2 (3%)	40	58
35	W	72/79 (91%)	68 (94%)	4 (6%)	17	38
36	X	94/96 (98%)	85 (90%)	9 (10%)	7	22
37	Y	109/110 (99%)	72 (66%)	37 (34%)	0	1
38	Z	26/85 (31%)	12 (46%)	14 (54%)	0	0
40	b	58/63 (92%)	57 (98%)	1 (2%)	56	72
41	c	67/68 (98%)	64 (96%)	3 (4%)	23	45
43	e	54/55 (98%)	53 (98%)	1 (2%)	52	69
44	f	48/49 (98%)	46 (96%)	2 (4%)	25	46
45	g	59/62 (95%)	53 (90%)	6 (10%)	6	20
46	h	216/218 (99%)	199 (92%)	17 (8%)	10	29
47	i	47/48 (98%)	41 (87%)	6 (13%)	3	14
48	j	164/164 (100%)	157 (96%)	7 (4%)	25	46
49	k	47/49 (96%)	44 (94%)	3 (6%)	14	35
50	l	165/165 (100%)	151 (92%)	14 (8%)	8	27
51	m	38/38 (100%)	35 (92%)	3 (8%)	10	29
52	n	148/150 (99%)	134 (90%)	14 (10%)	7	22
53	o	51/52 (98%)	46 (90%)	5 (10%)	6	21
54	p	136/138 (99%)	132 (97%)	4 (3%)	37	56
55	q	34/34 (100%)	32 (94%)	2 (6%)	16	37
56	r	114/114 (100%)	104 (91%)	10 (9%)	8	25
57	s	116/116 (100%)	110 (95%)	6 (5%)	19	40

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
58	t	104/104 (100%)	98 (94%)	6 (6%)	17	38
59	u	103/103 (100%)	97 (94%)	6 (6%)	17	38
60	v	109/109 (100%)	103 (94%)	6 (6%)	18	39
61	w	99/103 (96%)	91 (92%)	8 (8%)	9	28
62	x	86/87 (99%)	80 (93%)	6 (7%)	12	32
63	y	99/100 (99%)	95 (96%)	4 (4%)	27	47
64	z	89/90 (99%)	87 (98%)	2 (2%)	47	65
All	All	7791/8664 (90%)	7209 (92%)	582 (8%)	14	31

All (582) 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	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
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

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Mol	Chain	Res	Type
5	4	71	LYS
9	9	1	MET
9	9	3	LEU
9	9	4	ASN
9	9	5	LEU
9	9	6	GLN
9	9	7	ASP
9	9	11	ILE
9	9	14	GLU
9	9	23	LEU
9	9	24	SER
9	9	27	VAL
9	9	30	SER
9	9	31	ARG
9	9	34	THR
9	9	36	ASP
9	9	37	LYS
9	9	39	THR
9	9	42	ARG
9	9	43	LYS
9	9	51	TYR
9	9	52	MET
9	9	56	ARG
9	9	57	ASN
9	9	61	ARG
9	9	62	ARG
9	9	69	PHE
9	9	70	GLU
9	9	71	CYS
9	9	72	LEU
9	9	81	LEU
9	9	86	MET
9	9	94	ARG
9	9	96	PHE
9	9	98	GLU
9	9	106	PHE
9	9	107	GLU
9	9	109	LYS
9	9	113	PHE
9	9	117	LEU
9	9	122	GLN
9	9	123	ILE

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Mol	Chain	Res	Type
9	9	125	ARG
9	9	133	GLU
9	9	134	GLU
9	9	138	ARG
9	9	142	THR
9	9	143	MET
11	AA	376	PRO
11	AA	723	VAL
11	AA	728	ASP
11	AA	731	ARG
11	AA	752	ASN
11	AA	817	LEU
11	AA	840	SER
11	AA	844	LYS
11	AA	845	LEU
11	AA	851	THR
11	AA	854	ILE
11	AA	855	PRO
11	AA	857	VAL
11	AA	862	LEU
11	AA	864	LYS
11	AA	865	LEU
11	AA	866	ASP
11	AA	867	GLU
11	AA	868	SER
11	AA	871	VAL
11	AA	873	ILE
11	AA	876	GLU
11	AA	884	VAL
11	AA	886	LYS
11	AA	890	LYS
11	AA	912	ASP
11	AA	913	VAL
11	AA	914	LYS
11	AA	918	LEU
11	AA	933	VAL
11	AA	936	ARG
11	AA	939	VAL
11	AA	941	LYS
11	AA	943	LYS
11	AA	944	ARG
11	AA	949	GLU

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Mol	Chain	Res	Type
11	AA	950	GLU
11	AA	951	MET
11	AA	952	GLN
11	AA	953	LEU
11	AA	954	LYS
11	AA	955	GLN
11	AA	957	LYS
11	AA	958	LYS
11	AA	959	ASP
11	AA	960	LEU
11	AA	962	GLU
11	AA	963	GLU
11	AA	964	LEU
11	AA	965	GLN
11	AA	967	LEU
11	AA	968	GLU
11	AA	971	LEU
11	AA	973	SER
11	AA	974	ARG
11	AA	979	LEU
11	AA	980	VAL
11	AA	985	GLU
11	AA	988	LYS
11	AA	989	LEU
11	AA	991	LYS
11	AA	992	LEU
11	AA	994	ARG
11	AA	995	ASP
11	AA	997	TRP
11	AA	998	LEU
11	AA	999	GLU
11	AA	1002	LEU
11	AA	1005	GLU
11	AA	1006	GLU
11	AA	1007	LYS
11	AA	1008	GLN
11	AA	1009	ASN
11	AA	1010	GLN
11	AA	1013	GLN
11	AA	1019	ASP
11	AA	1020	GLU
11	AA	1022	LYS

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Mol	Chain	Res	Type
11	AA	1023	HIS
11	AA	1024	GLU
11	AA	1025	PHE
11	AA	1026	GLU
11	AA	1027	LYS
11	AA	1029	LEU
11	AA	1032	LYS
11	AA	1034	ARG
11	AA	1035	LYS
11	AA	1038	GLN
11	AA	1041	ASP
11	AA	1042	LEU
11	AA	1046	VAL
11	AA	1047	LEU
11	AA	1048	LYS
11	AA	1151	LEU
11	AA	1159	VAL
11	AA	1250	SER
11	AA	1252	SER
11	AA	1253	LEU
11	AA	1254	VAL
11	AA	1256	GLN
11	AA	1259	LEU
12	AB	21	ARG
12	AB	47	GLU
13	AC	12	ARG
13	AC	62	ASP
13	AC	65	LEU
13	AC	72	GLU
13	AC	91	ARG
13	AC	134	THR
13	AC	158	ARG
13	AC	159	ILE
13	AC	160	HIS
13	AC	162	GLU
13	AC	163	GLU
13	AC	165	GLU
13	AC	166	ARG
13	AC	168	ILE
13	AC	170	ARG
13	AC	171	LEU
13	AD	12	ARG

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Mol	Chain	Res	Type
13	AD	208	ASN
14	AE	40	LYS
14	AE	42	GLU
14	AE	44	ILE
14	AE	46	TYR
14	AE	47	ARG
14	AE	49	PHE
14	AE	50	LYS
14	AE	52	GLU
14	AE	53	ARG
14	AE	54	ASP
14	AE	60	ARG
14	AE	67	ASP
14	AE	70	CYS
14	AE	72	CYS
14	AE	74	LYS
14	AE	76	LYS
14	AE	77	ARG
14	AE	78	LEU
14	AE	81	ARG
14	AE	87	LYS
14	AE	88	CYS
14	AE	91	GLU
14	AE	94	GLN
14	AE	95	THR
14	AE	99	ARG
14	AE	100	GLU
14	AE	117	LEU
14	AE	119	SER
14	AE	123	ARG
14	AE	132	LEU
14	AE	135	ILE
14	AE	142	GLU
14	AE	144	TYR
14	AE	145	VAL
14	AE	147	ILE
14	AE	152	THR
14	AE	154	LEU
14	AE	157	GLN
14	AE	159	ILE
14	AE	175	GLU
14	AE	180	MET

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Mol	Chain	Res	Type
14	AE	190	LYS
14	AE	193	ASP
14	AE	196	GLN
14	AE	210	SER
14	AE	215	LYS
14	AE	216	LYS
14	AE	222	LYS
14	AE	223	LEU
14	AE	227	PHE
14	AE	232	ASN
14	AE	233	LYS
14	AE	237	MET
14	AE	238	ILE
14	AE	239	LEU
14	AE	240	THR
14	AE	244	VAL
14	AE	271	ARG
14	AE	385	LEU
14	AE	386	GLU
14	AE	390	LEU
14	AE	393	THR
14	AE	394	ILE
14	AE	395	LYS
14	AE	514	THR
14	AE	709	ARG
14	AE	836	ARG
14	AE	1172	LYS
14	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
19	G	8	ASP
19	G	23	TRP
19	G	45	LYS
19	G	105	LYS

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Mol	Chain	Res	Type
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
24	L	79	ARG
24	L	86	ARG
25	M	7	ILE
25	M	17	LYS

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Mol	Chain	Res	Type
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
32	T	39	LEU
32	T	40	GLN
32	T	64	ARG
32	T	66	LEU

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Mol	Chain	Res	Type
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
33	U	50	THR
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
37	Y	9	LYS
37	Y	10	LEU
37	Y	16	MET
37	Y	23	VAL
37	Y	27	LEU
37	Y	30	GLN
37	Y	36	GLU
37	Y	44	LYS
37	Y	48	ILE
37	Y	50	LYS
37	Y	58	ILE
37	Y	60	VAL
37	Y	61	TYR
37	Y	64	ARG
37	Y	65	SER
37	Y	67	THR
37	Y	71	LYS

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Mol	Chain	Res	Type
37	Y	78	LEU
37	Y	80	LYS
37	Y	81	LYS
37	Y	91	LYS
37	Y	94	LYS
37	Y	95	ASP
37	Y	99	LYS
37	Y	100	ILE
37	Y	101	SER
37	Y	102	ARG
37	Y	104	GLN
37	Y	108	ILE
37	Y	112	LYS
37	Y	116	MET
37	Y	120	ASP
37	Y	124	MET
37	Y	125	THR
37	Y	126	ARG
37	Y	133	ARG
37	Y	135	MET
38	Z	1	SER
38	Z	2	ILE
38	Z	4	LYS
38	Z	6	GLN
38	Z	7	ILE
38	Z	8	ILE
38	Z	14	MET
38	Z	15	SER
38	Z	16	VAL
38	Z	23	ILE
38	Z	26	MET
38	Z	28	GLU
38	Z	29	LYS
38	Z	30	PHE
40	b	70	GLU
41	c	48	THR
41	c	54	LYS
41	c	71	LEU
43	e	58	ASN
44	f	3	LYS
44	f	45	ARG
45	g	3	LYS

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Mol	Chain	Res	Type
45	g	16	CYS
45	g	43	PHE
45	g	47	LYS
45	g	59	ARG
45	g	65	ASN
46	h	51	THR
46	h	52	ARG
46	h	118	SER
46	h	125	LYS
46	h	130	LEU
46	h	141	VAL
46	h	156	ARG
46	h	187	ASP
46	h	189	ARG
46	h	195	VAL
46	h	202	LEU
46	h	203	ARG
46	h	204	VAL
46	h	205	LEU
46	h	242	LYS
46	h	258	ARG
46	h	271	ARG
47	i	9	THR
47	i	12	LYS
47	i	26	THR
47	i	27	SER
47	i	29	SER
47	i	40	ARG
48	j	13	ARG
48	j	18	ASP
48	j	32	ASN
48	j	46	ARG
48	j	91	THR
48	j	103	ASP
48	j	131	ASP
49	k	5	ILE
49	k	24	THR
49	k	26	ASN
50	l	7	ASP
50	l	17	THR
50	l	22	ASP
50	l	40	ARG

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Mol	Chain	Res	Type
50	l	48	THR
50	l	57	LYS
50	l	69	ARG
50	l	77	ILE
50	l	80	SER
50	l	108	ILE
50	l	109	LEU
50	l	122	GLU
50	l	149	ILE
50	l	179	SER
51	m	22	MET
51	m	41	ARG
51	m	42	LEU
52	n	6	ASP
52	n	10	ASP
52	n	57	LEU
52	n	80	ARG
52	n	95	ARG
52	n	105	THR
52	n	115	ARG
52	n	117	LEU
52	n	122	PHE
52	n	123	ASP
52	n	133	ARG
52	n	140	GLU
52	n	152	LEU
52	n	163	ASP
53	o	8	ARG
53	o	30	ARG
53	o	31	HIS
53	o	54	ASP
53	o	55	LEU
54	p	39	ASP
54	p	95	ARG
54	p	125	CYS
54	p	171	THR
55	q	3	VAL
55	q	26	ILE
56	r	11	ASN
56	r	12	LEU
56	r	15	LEU
56	r	41	LYS

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Mol	Chain	Res	Type
56	r	66	ASN
56	r	72	ILE
56	r	87	GLU
56	r	97	ARG
56	r	101	ASP
56	r	127	GLU
57	s	1	MET
57	s	14	ASP
57	s	30	THR
57	s	40	HIS
57	s	57	LEU
57	s	142	ILE
58	t	32	TYR
58	t	49	ARG
58	t	53	LYS
58	t	80	ASP
58	t	88	ASN
58	t	104	THR
59	u	5	THR
59	u	27	LEU
59	u	48	ARG
59	u	59	ARG
59	u	76	GLU
59	u	78	ARG
60	v	18	ARG
60	v	40	ARG
60	v	84	LYS
60	v	110	GLU
60	v	126	ILE
60	v	128	THR
61	w	2	ARG
61	w	20	MET
61	w	24	MET
61	w	51	LEU
61	w	63	ARG
61	w	65	LEU
61	w	69	ARG
61	w	95	THR
62	x	13	ARG
62	x	19	GLN
62	x	31	THR
62	x	47	VAL

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Mol	Chain	Res	Type
62	x	48	LEU
62	x	91	SER
63	y	10	GLN
63	y	27	GLU
63	y	85	SER
63	y	114	LEU
64	z	18	LEU
64	z	51	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
9	9	103	ASN
11	AA	1236	ASN
19	G	18	HIS
23	K	70	ASN
32	T	40	GLN
36	X	105	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
10	A	75/76 (98%)	29 (38%)	6 (8%)
10	B	75/76 (98%)	35 (46%)	6 (8%)
16	D	1515/1542 (98%)	288 (19%)	35 (2%)
39	a	2859/2904 (98%)	533 (18%)	0
42	d	119/120 (99%)	17 (14%)	0
8	7	20/33 (60%)	11 (55%)	3 (15%)
All	All	4663/4751 (98%)	913 (19%)	50 (1%)

All (913) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	7	-18	G
8	7	-17	U
8	7	-16	U
8	7	-14	U
8	7	-13	U
8	7	-12	U
8	7	-11	U

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

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Mol	Chain	Res	Type
10	B	17	C
10	B	18	G
10	B	19	G
10	B	20	U
10	B	21	A
10	B	22	G
10	B	23	C
10	B	30	G
10	B	31	G
10	B	32	C
10	B	36	U
10	B	37	A
10	B	38	A
10	B	46	G
10	B	47	U
10	B	48	C
10	B	49	G
10	B	52	G
10	B	57	A
10	B	58	A
10	B	59	A
10	B	61	C
10	B	66	C
10	B	69	C
10	B	71	C
10	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

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Mol	Chain	Res	Type
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
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	258	G
16	D	262	A
16	D	266	G

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Mol	Chain	Res	Type
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
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

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Mol	Chain	Res	Type
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
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

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Mol	Chain	Res	Type
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
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

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Mol	Chain	Res	Type
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
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

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Mol	Chain	Res	Type
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
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

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Mol	Chain	Res	Type
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
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
39	a	10	A
39	a	15	G
39	a	34	U
39	a	35	G
39	a	46	G
39	a	58	G
39	a	60	G
39	a	63	A
39	a	71	A
39	a	74	A
39	a	75	G
39	a	83	A
39	a	84	A
39	a	85	G
39	a	93	G
39	a	96	C
39	a	102	U
39	a	103	A
39	a	110	G
39	a	114	U
39	a	118	A
39	a	119	A

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Mol	Chain	Res	Type
39	a	120	U
39	a	122	G
39	a	131	A
39	a	136	G
39	a	139	U
39	a	140	C
39	a	141	G
39	a	145	C
39	a	163	C
39	a	165	A
39	a	181	A
39	a	196	A
39	a	200	U
39	a	215	G
39	a	216	A
39	a	222	A
39	a	225	C
39	a	248	G
39	a	249	C
39	a	261	G
39	a	264	C
39	a	265	A
39	a	266	G
39	a	267	C
39	a	271	G
39	a	272	A
39	a	275	C
39	a	276	U
39	a	278	A
39	a	285	G
39	a	311	A
39	a	324	A
39	a	329	G
39	a	330	A
39	a	353	C
39	a	359	G
39	a	361	G
39	a	362	A
39	a	371	A
39	a	372	G
39	a	373	U
39	a	375	G

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Mol	Chain	Res	Type
39	a	383	C
39	a	386	G
39	a	396	G
39	a	405	U
39	a	411	G
39	a	412	A
39	a	420	C
39	a	424	G
39	a	435	C
39	a	451	U
39	a	456	C
39	a	457	A
39	a	477	A
39	a	481	G
39	a	491	G
39	a	501	A
39	a	503	A
39	a	504	A
39	a	505	A
39	a	509	C
39	a	522	A
39	a	529	A
39	a	532	A
39	a	543	G
39	a	546	U
39	a	547	A
39	a	548	G
39	a	549	G
39	a	551	G
39	a	563	A
39	a	569	U
39	a	573	U
39	a	575	A
39	a	588	U
39	a	603	A
39	a	609	A
39	a	613	A
39	a	614	A
39	a	615	U
39	a	616	A
39	a	618	G
39	a	621	A

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Mol	Chain	Res	Type
39	a	627	A
39	a	637	A
39	a	645	C
39	a	647	G
39	a	654	A
39	a	664	G
39	a	668	A
39	a	685	A
39	a	686	U
39	a	710	U
39	a	717	C
39	a	730	A
39	a	738	G
39	a	757	G
39	a	764	A
39	a	765	C
39	a	775	G
39	a	776	G
39	a	782	A
39	a	784	G
39	a	785	G
39	a	800	A
39	a	802	A
39	a	805	G
39	a	812	C
39	a	819	A
39	a	827	U
39	a	828	U
39	a	845	A
39	a	846	U
39	a	858	G
39	a	859	G
39	a	869	G
39	a	878	A
39	a	881	G
39	a	884	U
39	a	885	C
39	a	888	C
39	a	891	G
39	a	892	A
39	a	893	C
39	a	895	U

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Mol	Chain	Res	Type
39	a	896	A
39	a	897	C
39	a	899	A
39	a	907	G
39	a	910	A
39	a	914	G
39	a	915	C
39	a	931	U
39	a	941	A
39	a	945	A
39	a	946	C
39	a	953	G
39	a	961	C
39	a	974	G
39	a	983	A
39	a	995	C
39	a	996	A
39	a	999	U
39	a	1005	C
39	a	1012	U
39	a	1013	C
39	a	1022	G
39	a	1023	U
39	a	1026	G
39	a	1033	U
39	a	1041	G
39	a	1045	C
39	a	1046	A
39	a	1047	G
39	a	1060	U
39	a	1061	U
39	a	1062	G
39	a	1063	G
39	a	1064	C
39	a	1065	U
39	a	1066	U
39	a	1067	A
39	a	1068	G
39	a	1069	A
39	a	1070	A
39	a	1071	G
39	a	1073	A

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Mol	Chain	Res	Type
39	a	1074	G
39	a	1076	C
39	a	1079	C
39	a	1080	A
39	a	1081	U
39	a	1082	U
39	a	1083	U
39	a	1084	A
39	a	1087	G
39	a	1088	A
39	a	1090	A
39	a	1095	A
39	a	1096	A
39	a	1107	G
39	a	1110	G
39	a	1111	A
39	a	1112	G
39	a	1119	U
39	a	1122	G
39	a	1132	U
39	a	1134	A
39	a	1135	C
39	a	1142	A
39	a	1169	A
39	a	1170	C
39	a	1173	U
39	a	1174	U
39	a	1175	A
39	a	1176	U
39	a	1177	G
39	a	1178	C
39	a	1179	G
39	a	1180	U
39	a	1186	G
39	a	1238	G
39	a	1248	G
39	a	1253	A
39	a	1256	G
39	a	1266	G
39	a	1271	G
39	a	1272	A
39	a	1273	U

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Mol	Chain	Res	Type
39	a	1301	A
39	a	1321	A
39	a	1345	C
39	a	1352	U
39	a	1365	A
39	a	1368	G
39	a	1378	A
39	a	1379	U
39	a	1380	G
39	a	1383	A
39	a	1387	A
39	a	1392	A
39	a	1395	A
39	a	1406	U
39	a	1407	G
39	a	1408	G
39	a	1411	U
39	a	1414	C
39	a	1415	U
39	a	1416	G
39	a	1417	C
39	a	1419	A
39	a	1420	A
39	a	1428	C
39	a	1452	G
39	a	1453	A
39	a	1460	U
39	a	1478	G
39	a	1482	G
39	a	1490	A
39	a	1497	U
39	a	1503	A
39	a	1508	A
39	a	1509	A
39	a	1510	G
39	a	1515	A
39	a	1529	G
39	a	1534	U
39	a	1535	A
39	a	1536	C
39	a	1537	G
39	a	1554	U

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Mol	Chain	Res	Type
39	a	1559	U
39	a	1566	A
39	a	1569	A
39	a	1578	U
39	a	1580	A
39	a	1581	G
39	a	1582	C
39	a	1583	A
39	a	1584	U
39	a	1589	U
39	a	1590	A
39	a	1608	A
39	a	1609	A
39	a	1610	A
39	a	1647	U
39	a	1648	U
39	a	1649	G
39	a	1651	G
39	a	1674	G
39	a	1677	A
39	a	1703	G
39	a	1714	U
39	a	1715	G
39	a	1718	G
39	a	1729	U
39	a	1730	C
39	a	1732	C
39	a	1738	G
39	a	1750	G
39	a	1755	A
39	a	1758	U
39	a	1764	C
39	a	1773	A
39	a	1791	A
39	a	1800	C
39	a	1801	A
39	a	1808	A
39	a	1811	G
39	a	1816	C
39	a	1829	A
39	a	1833	C
39	a	1847	A

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Mol	Chain	Res	Type
39	a	1848	A
39	a	1858	A
39	a	1859	U
39	a	1862	G
39	a	1864	U
39	a	1869	G
39	a	1870	C
39	a	1872	A
39	a	1873	G
39	a	1905	C
39	a	1906	G
39	a	1907	G
39	a	1913	A
39	a	1914	C
39	a	1919	A
39	a	1920	C
39	a	1922	G
39	a	1923	U
39	a	1924	C
39	a	1925	C
39	a	1926	U
39	a	1928	A
39	a	1929	G
39	a	1930	G
39	a	1936	A
39	a	1938	A
39	a	1955	U
39	a	1965	C
39	a	1967	C
39	a	1970	A
39	a	1971	U
39	a	1972	G
39	a	1987	A
39	a	1991	U
39	a	1992	G
39	a	1993	U
39	a	1997	C
39	a	2002	G
39	a	2022	U
39	a	2023	C
39	a	2027	G
39	a	2033	A

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Mol	Chain	Res	Type
39	a	2043	C
39	a	2051	A
39	a	2052	A
39	a	2055	C
39	a	2056	G
39	a	2060	A
39	a	2061	G
39	a	2062	A
39	a	2077	A
39	a	2093	G
39	a	2097	A
39	a	2099	U
39	a	2100	G
39	a	2108	A
39	a	2110	G
39	a	2111	U
39	a	2113	U
39	a	2115	G
39	a	2116	G
39	a	2117	A
39	a	2118	U
39	a	2121	G
39	a	2122	U
39	a	2124	G
39	a	2125	G
39	a	2126	A
39	a	2127	G
39	a	2128	G
39	a	2131	U
39	a	2132	U
39	a	2133	G
39	a	2134	A
39	a	2139	U
39	a	2141	G
39	a	2146	C
39	a	2147	A
39	a	2154	A
39	a	2157	G
39	a	2158	A
39	a	2159	G
39	a	2162	G
39	a	2163	A

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Mol	Chain	Res	Type
39	a	2164	C
39	a	2165	C
39	a	2169	A
39	a	2171	A
39	a	2172	U
39	a	2178	C
39	a	2182	U
39	a	2183	A
39	a	2185	U
39	a	2188	U
39	a	2189	U
39	a	2190	G
39	a	2191	A
39	a	2193	G
39	a	2194	U
39	a	2198	A
39	a	2204	G
39	a	2210	U
39	a	2211	A
39	a	2212	A
39	a	2213	U
39	a	2225	A
39	a	2226	C
39	a	2229	U
39	a	2238	G
39	a	2239	G
39	a	2244	U
39	a	2250	G
39	a	2268	A
39	a	2278	A
39	a	2283	C
39	a	2287	A
39	a	2297	A
39	a	2305	U
39	a	2308	G
39	a	2309	A
39	a	2315	G
39	a	2322	A
39	a	2325	G
39	a	2327	A
39	a	2333	A
39	a	2339	C

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Mol	Chain	Res	Type
39	a	2345	G
39	a	2347	C
39	a	2350	C
39	a	2361	G
39	a	2372	U
39	a	2376	A
39	a	2383	G
39	a	2385	C
39	a	2402	U
39	a	2403	C
39	a	2406	A
39	a	2423	U
39	a	2424	C
39	a	2425	A
39	a	2426	A
39	a	2429	G
39	a	2430	A
39	a	2431	U
39	a	2434	A
39	a	2435	A
39	a	2441	U
39	a	2447	G
39	a	2448	A
39	a	2470	G
39	a	2474	U
39	a	2476	A
39	a	2478	A
39	a	2484	G
39	a	2491	U
39	a	2502	G
39	a	2506	U
39	a	2507	C
39	a	2512	C
39	a	2513	A
39	a	2518	A
39	a	2520	C
39	a	2525	G
39	a	2529	G
39	a	2535	G
39	a	2547	A
39	a	2554	U
39	a	2566	A

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Mol	Chain	Res	Type
39	a	2567	G
39	a	2572	A
39	a	2573	C
39	a	2574	G
39	a	2585	U
39	a	2586	U
39	a	2602	A
39	a	2603	G
39	a	2609	U
39	a	2610	C
39	a	2611	C
39	a	2613	U
39	a	2629	U
39	a	2663	G
39	a	2669	G
39	a	2671	G
39	a	2689	U
39	a	2690	U
39	a	2714	G
39	a	2722	G
39	a	2726	A
39	a	2744	G
39	a	2748	A
39	a	2757	A
39	a	2758	A
39	a	2765	A
39	a	2777	G
39	a	2778	A
39	a	2791	G
39	a	2793	C
39	a	2796	U
39	a	2797	U
39	a	2798	U
39	a	2799	A
39	a	2801	G
39	a	2818	U
39	a	2820	A
39	a	2823	A
39	a	2825	G
39	a	2849	U
39	a	2850	A
39	a	2859	G

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Mol	Chain	Res	Type
39	a	2861	U
39	a	2867	G
39	a	2880	C
39	a	2884	U
39	a	2885	G
39	a	2891	U
39	a	2902	C
42	d	2	G
42	d	9	G
42	d	13	G
42	d	16	G
42	d	17	C
42	d	35	C
42	d	36	C
42	d	45	A
42	d	51	G
42	d	56	G
42	d	64	G
42	d	66	A
42	d	88	C
42	d	89	U
42	d	90	C
42	d	99	A
42	d	109	A

All (50) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
8	7	-17	U
8	7	-14	U
8	7	-11	U
10	A	6	G
10	A	7	G
10	A	9	G
10	A	22	G
10	A	60	U
10	A	70	G
10	B	6	G
10	B	7	G
10	B	9	G
10	B	22	G
10	B	37	A

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Mol	Chain	Res	Type
10	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
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 ⓘ

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

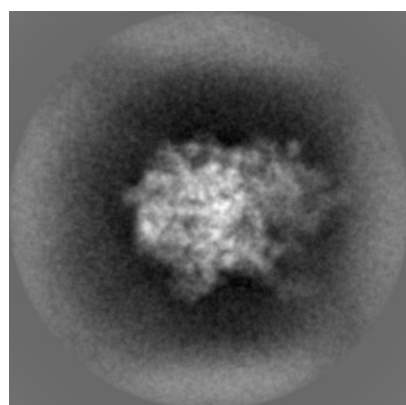
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-22193. These allow visual inspection of the internal detail of the map and identification of artifacts.

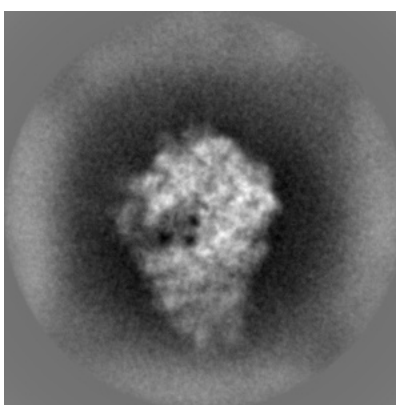
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

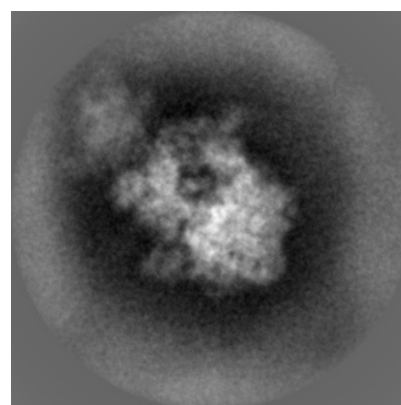
6.1.1 Primary map



X



Y

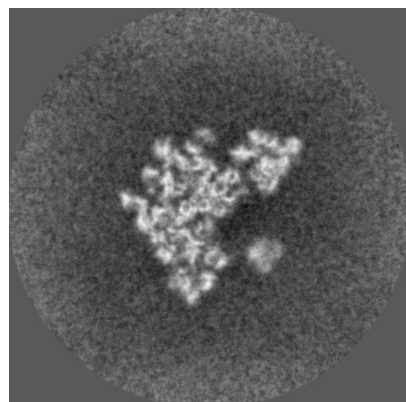


Z

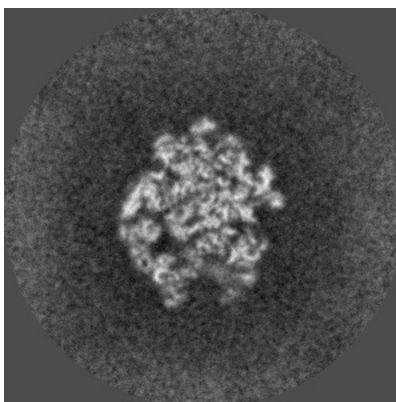
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

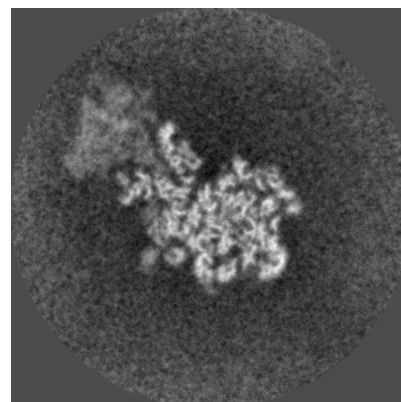
6.2.1 Primary map



X Index: 256



Y Index: 256

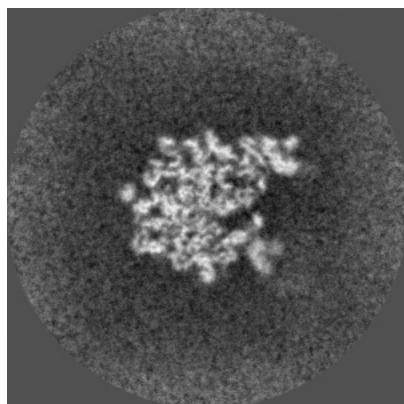


Z Index: 256

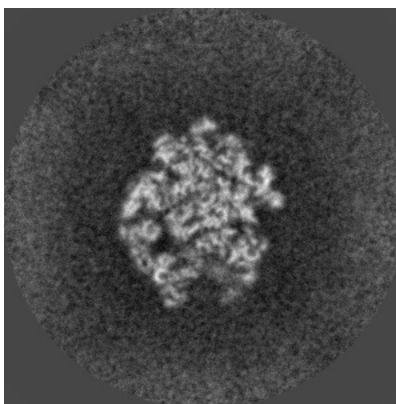
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

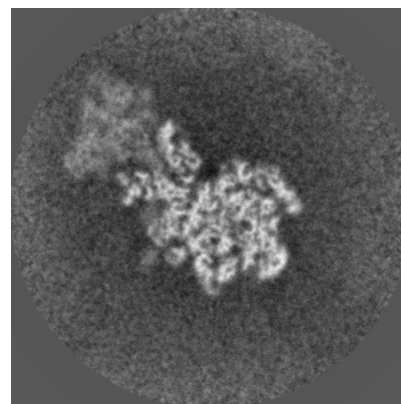
6.3.1 Primary map



X Index: 272



Y Index: 257

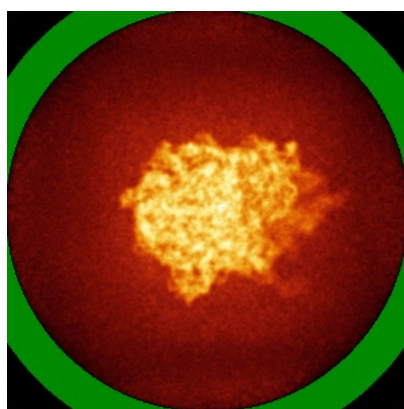


Z Index: 258

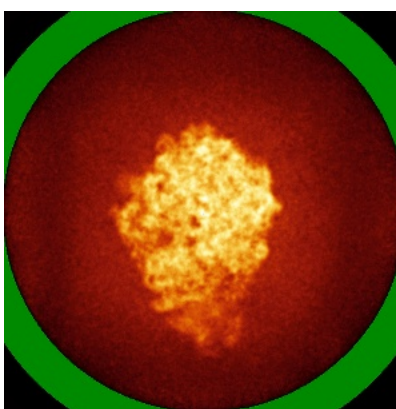
The images above show the largest variance slices of the map in three orthogonal directions.

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

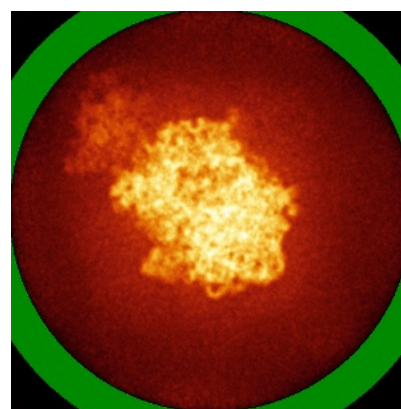
6.4.1 Primary map



X



Y

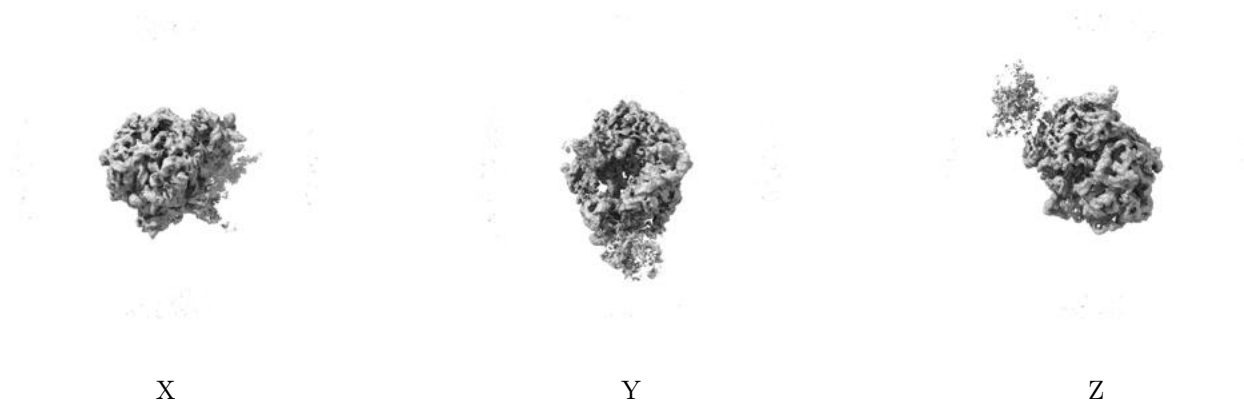


Z

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 [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.009. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

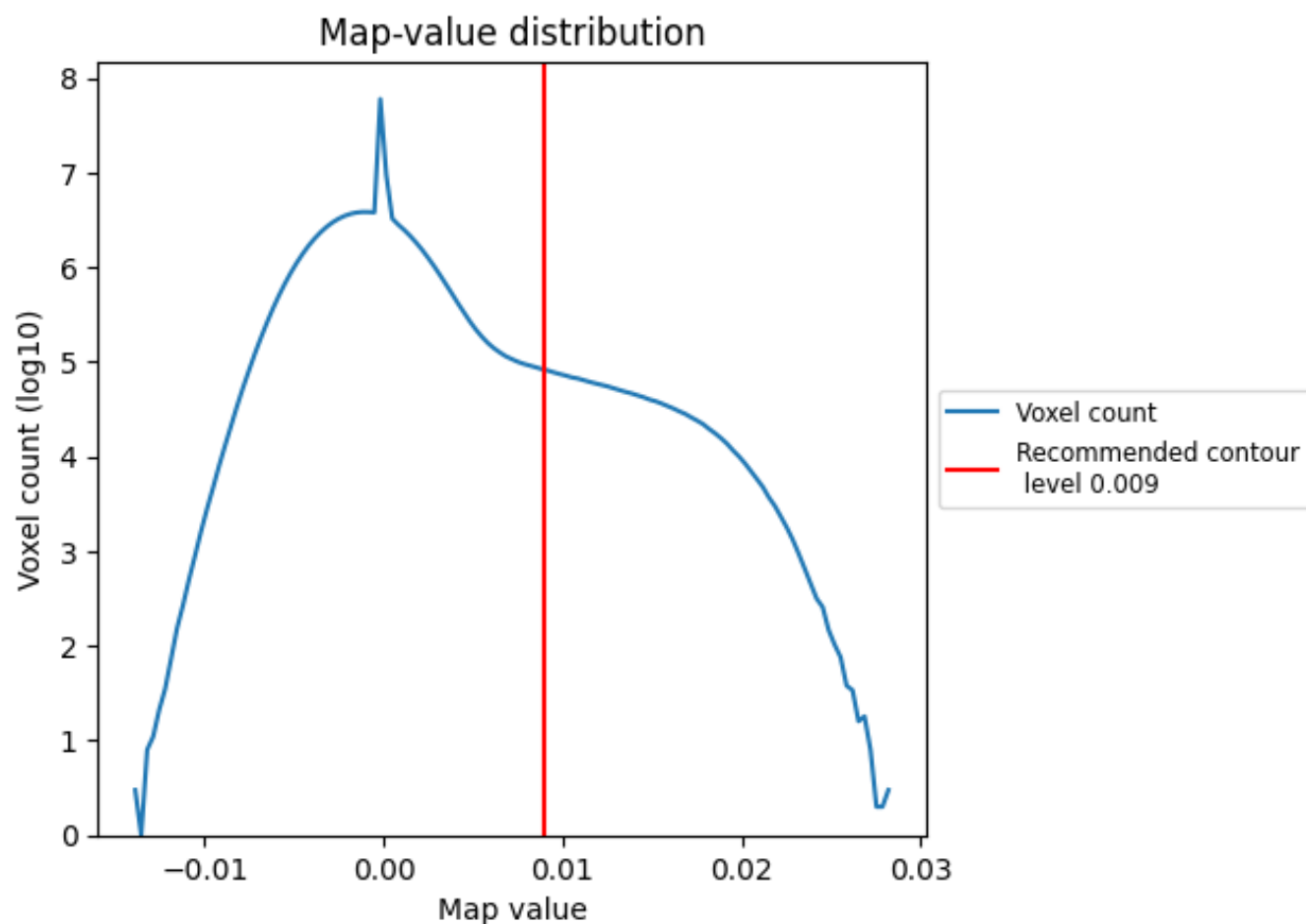
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

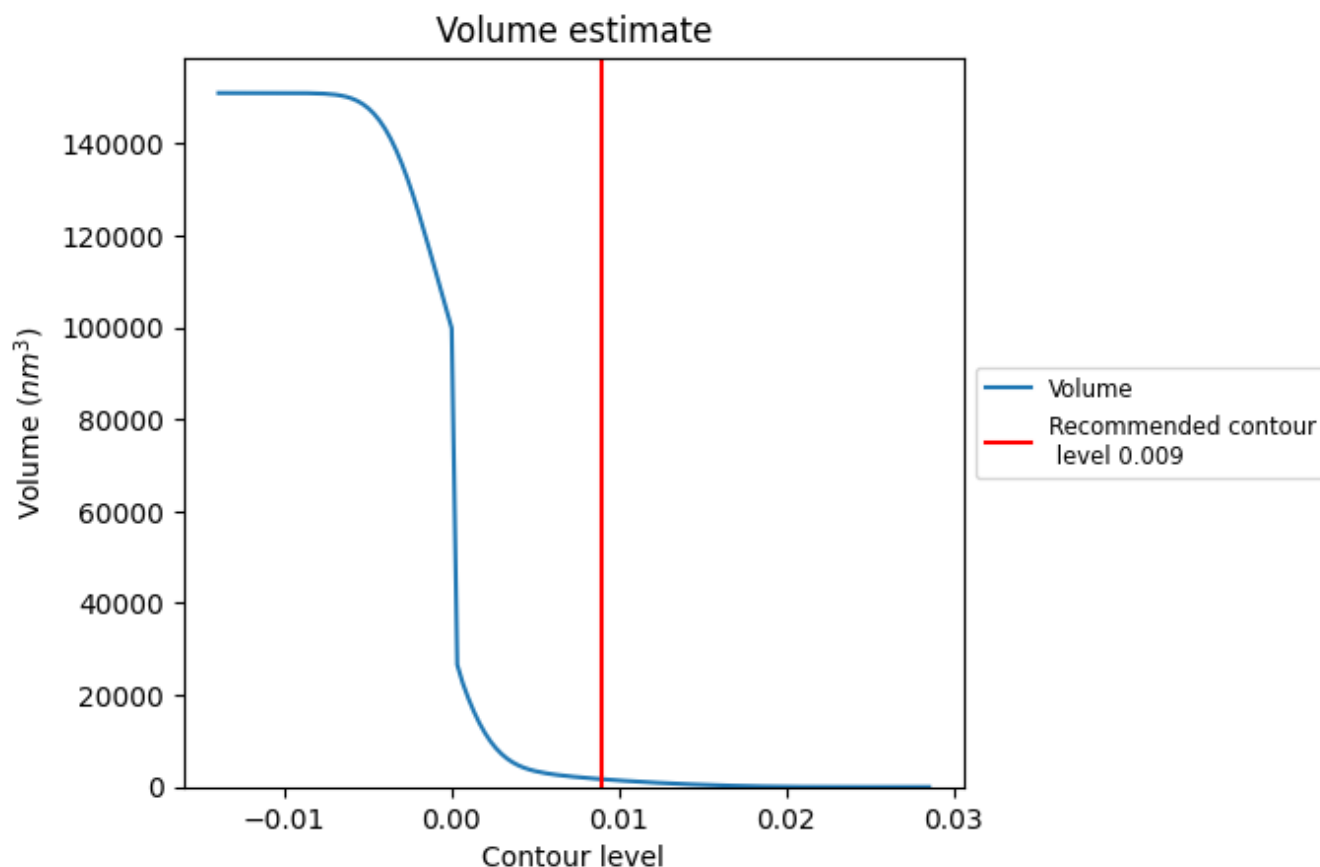
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

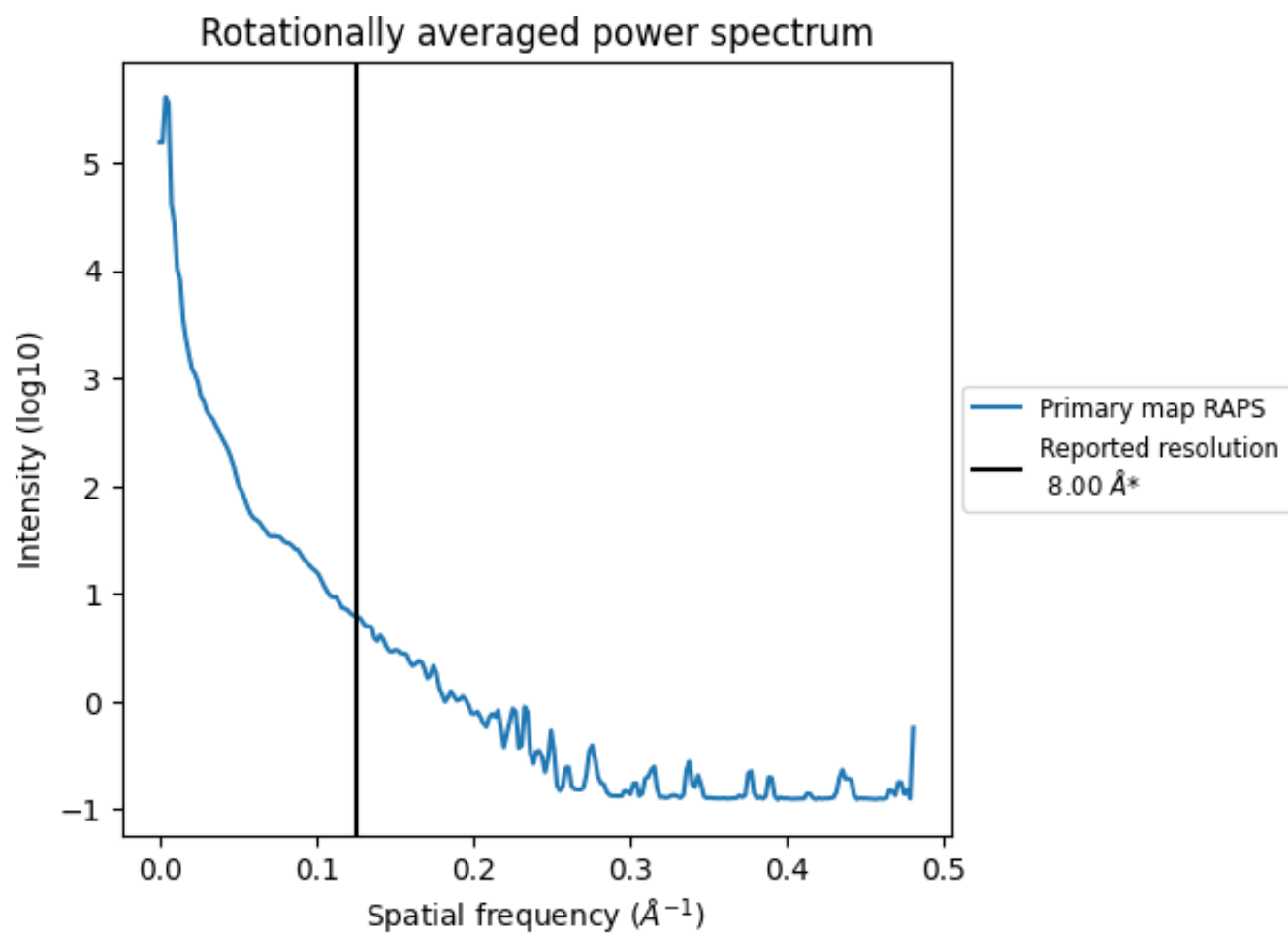
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1692 nm³; this corresponds to an approximate mass of 1529 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.125 Å⁻¹

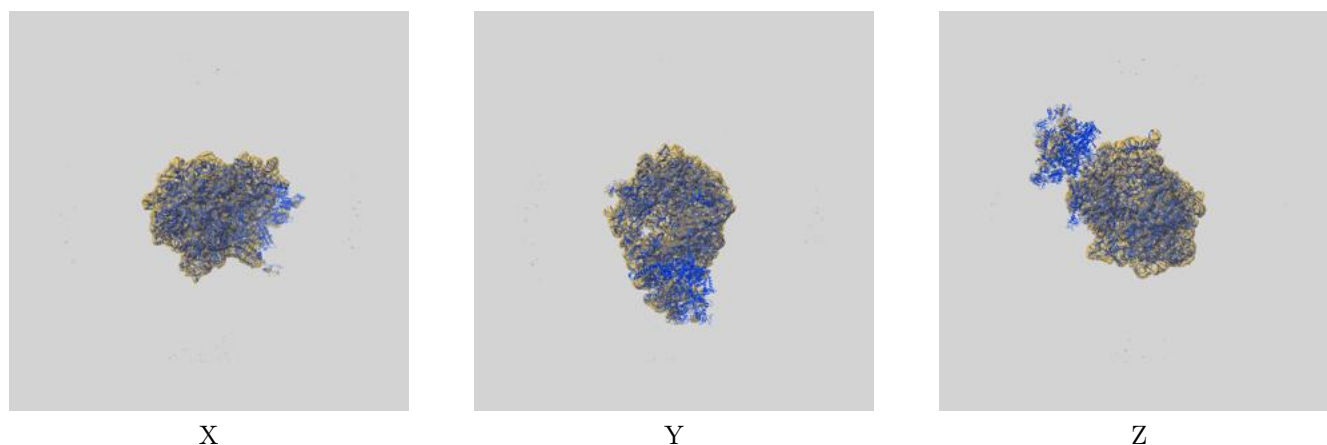
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

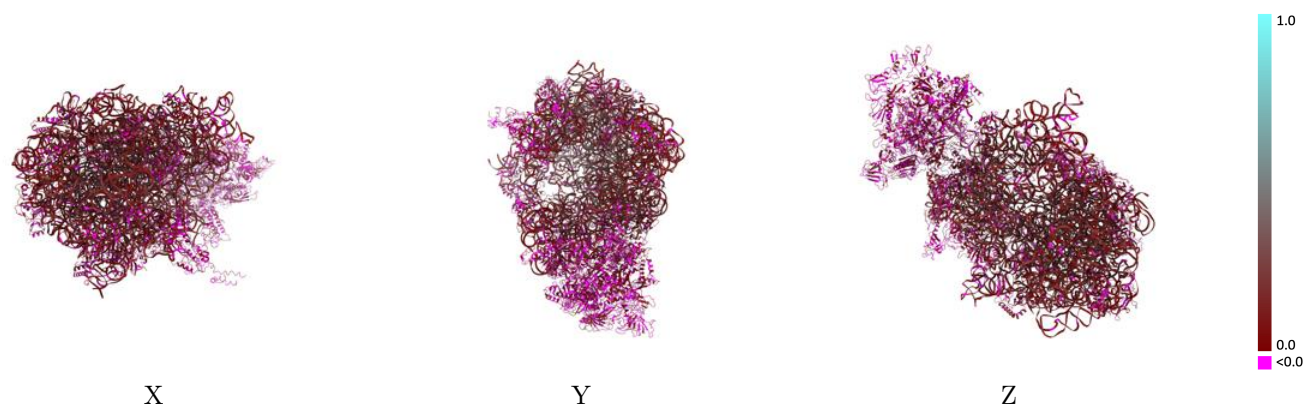
This section contains information regarding the fit between EMDB map EMD-22193 and PDB model 6XIJ. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



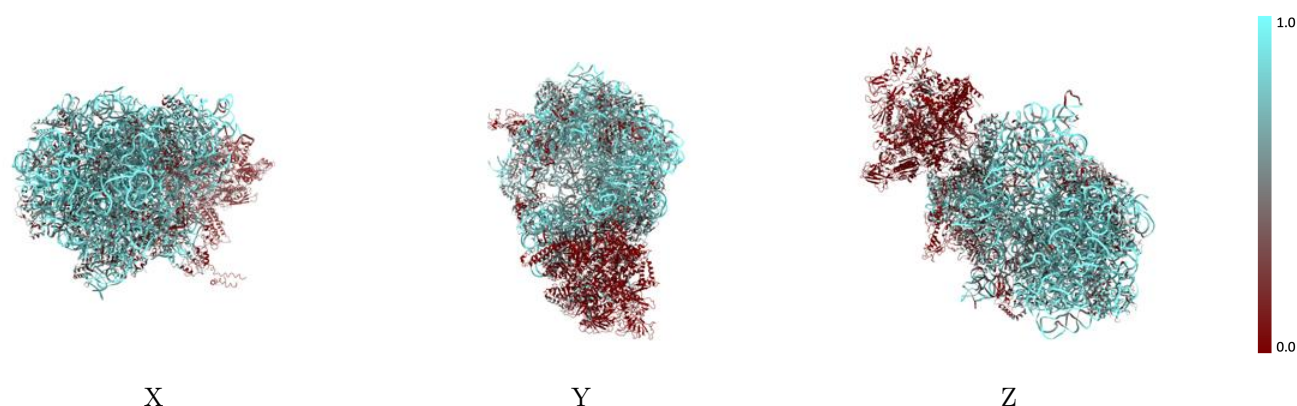
The images above show the 3D surface view of the map at the recommended contour level 0.009 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



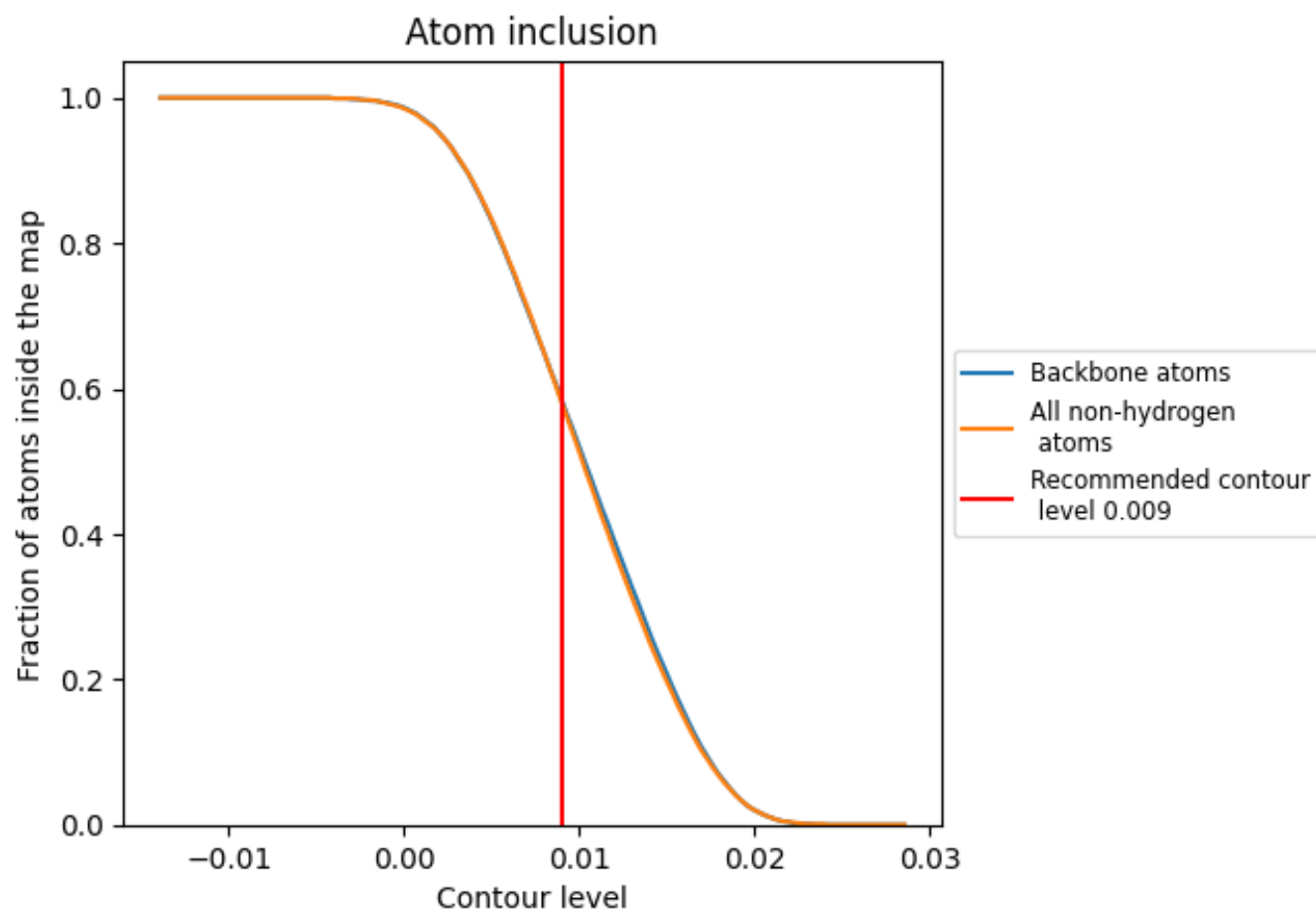
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.009).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 58% of all backbone atoms, 58% 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 (0.009) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5810	 0.1280
0	 0.5510	 0.1000
1	 0.5060	 0.1330
2	 0.4400	 0.0890
3	 0.5790	 0.0730
4	 0.5800	 0.1160
5	 0.1210	 0.0280
6	 0.1400	 0.1000
7	 0.2590	 0.0880
9	 0.2290	 0.0370
A	 0.5560	 0.1330
AA	 0.0860	 0.0410
AB	 0.0000	 0.0390
AC	 0.0320	 0.0410
AD	 0.0160	 0.0600
AE	 0.0400	 0.0400
B	 0.5320	 0.0790
C	 0.3500	 0.1010
D	 0.8240	 0.1720
E	 0.4850	 0.0870
F	 0.2930	 0.1420
G	 0.4350	 0.1050
H	 0.0090	 0.0250
I	 0.3280	 0.1090
J	 0.3930	 0.1010
K	 0.4500	 0.1640
L	 0.4100	 0.1070
M	 0.3790	 0.1060
N	 0.4760	 0.1400
O	 0.4550	 0.0520
P	 0.3900	 0.0860
Q	 0.3750	 0.1120
R	 0.3970	 0.1660
S	 0.4830	 0.0840
T	 0.4620	 0.1180



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Chain	Atom inclusion	Q-score
U	 0.4160	 0.0850
V	 0.4050	 0.1160
W	 0.3310	 0.0430
X	 0.3330	 0.0750
Y	 0.1480	 0.0260
Z	 0.0440	 -0.0080
a	 0.8350	 0.1690
b	 0.4810	 0.0860
c	 0.4340	 0.1150
d	 0.8100	 0.1230
e	 0.5730	 0.0600
f	 0.5640	 0.1240
g	 0.2740	 0.0540
h	 0.4110	 0.1200
i	 0.5370	 0.1230
j	 0.4830	 0.0970
k	 0.4040	 0.0760
l	 0.4730	 0.1080
m	 0.4960	 0.1650
n	 0.3960	 0.0630
o	 0.3320	 0.0950
p	 0.3920	 0.0600
q	 0.3730	 0.0550
r	 0.2230	 0.0860
s	 0.4820	 0.1030
t	 0.2540	 0.1020
u	 0.4560	 0.1060
v	 0.4300	 0.1080
w	 0.5850	 0.0980
x	 0.5050	 0.0500
y	 0.3040	 0.0980
z	 0.5670	 0.1230