



wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 07:21 am GMT

PDB ID : 4V8M
EMDB ID : EMD-2239
Title : High-resolution cryo-electron microscopy structure of the Trypanosoma brucei ribosome
Authors : Hashem, Y.; des Georges, A.; Fu, J.; Buss, S.N.; Jossinet, F.; Jobe, A.; Zhang, Q.; Liao, H.Y.; Grassucci, R.A.; Bajaj, C.; Westhof, E.; Madison-Antenucci, S.; Frank, J.
Deposited on : 2012-12-09
Resolution : 5.57 Å (reported)
Based on initial models : 3IZ7, 3IZ9, 3U5I, 3U5H, 4A19, 3U5D, 4A1A, 3U5E, 3U5F, 3U5G, 3U5B, 4A1B, 4A1C, 4A18, 3U5C, 4A17, 4A1E, 2XZN, 4A1D, 3IZR, 2XZM, 3IZ6

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

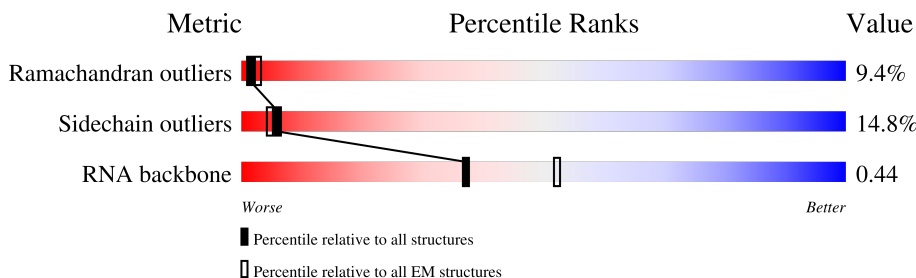
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 5.57 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	A0	256	<div style="display: flex; justify-content: space-between;"> 30% 55% 22% 7% • 14% </div>
2	A1	273	<div style="display: flex; justify-content: space-between;"> 24% 58% 26% 5% • 9% </div>
3	A2	190	<div style="display: flex; justify-content: space-between;"> 62% 69% 18% 10% •• </div>
4	A3	250	<div style="display: flex; justify-content: space-between;"> 25% 64% 26% 8% • </div>
5	A4	202	<div style="display: flex; justify-content: space-between;"> 17% 52% 29% 11% • 5% </div>
6	A5	220	<div style="display: flex; justify-content: space-between;"> 35% 60% 20% 6% • 11% </div>
7	A6	190	<div style="display: flex; justify-content: space-between;"> 17% 61% 25% 9% •• </div>
8	A7	318	<div style="display: flex; justify-content: space-between;"> 68% 74% 21% •• </div>

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Mol	Chain	Length	Quality of chain
9	A8	57	60% 54% 14% 26%
10	A9	153	35% 33% 7% 57%
11	AC	277	13% 47% 19% 6% 26%
12	AD	172	38% 39% 16% 5% 40%
13	AE	174	57% 57% 24% 8% 8%
14	AF	144	83% 74% 8% 16%
15	AG	151	34% 58% 27% 7% 7%
16	AH	144	47% 61% 20% 5% 12%
17	AI	152	60% 68% 14% 5% 12%
18	AJ	130	38% 68% 25% 5%
19	AK	149	65% 66% 23% 7%
20	AL	142	27% 61% 25% 11%
21	AM	153	66% 67% 22% 10%
22	AO	167	32% 62% 19% 7% 11%
23	AP	266	17% 55% 22% 7% 16%
24	AQ	117	48% 66% 14% 9% 10%
25	AR	194	9% 22% 13% 6% 58%
26	AS	143	50% 72% 20% 7%
27	AT	137	20% 53% 28% 9% 6%
28	AU	113	43% 57% 18% 24%
29	AV	111	68% 58% 24% 5% 9%
30	AW	86	16% 58% 27% 12%
31	AX	214	55% 70% 22%
32	AY	66	33% 56% 27% 14%
33	AZ	103	25% 48% 16% 34%

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Mol	Chain	Length	Quality of chain
34	BA	1847	
35	BB	1465	
36	BC	169	
37	BD	119	
38	BE	210	
39	BF	73	
40	BG	182	
41	BH	135	
42	BI	193	
43	BJ	214	
44	BK	213	
45	BL	194	
46	BM	164	
47	BN	218	
48	BO	222	
49	BP	189	
50	BQ	221	
51	BR	166	
52	BS	179	
53	BT	260	
54	BU	159	
55	BV	130	
56	BW	139	
57	BX	164	
58	BY	125	

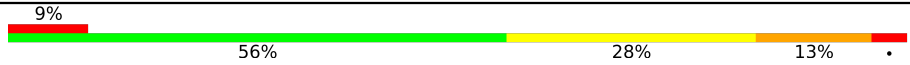
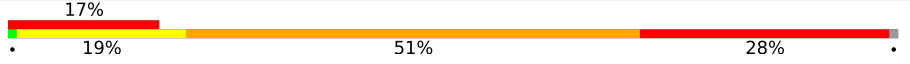
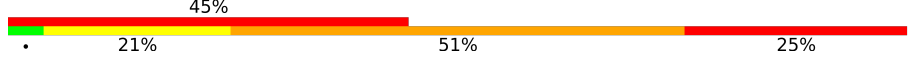
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Mol	Chain	Length	Quality of chain
59	BZ	143	9% 56% 23% 6% 13%
60	Ba	133	20% 56% 30% 13%
61	Bb	145	23% 58% 29% 12%
62	Bc	146	10% 43% 34% 15%
63	Bd	71	31% 59% 27% 11%
64	Be	260	27% 45% 20% 6% 28%
65	Bf	429	28% 55% 30% 10%
66	Bg	105	5% 61% 25% 5% 9%
67	Bh	188	29% 59% 27% 13%
68	Bi	132	35% 63% 23% 11%
69	Bj	170	45% 62% 19% 11% 5%
70	Bk	127	14% 32% 22% 9% 34%
71	Bl	149	28% 42% 22% 9% 5% 22%
72	Bm	109	17% 50% 34% 9% 5%
73	Bn	84	15% 49% 33% 14%
74	Bo	93	24% 46% 38% 13%
75	Bp	82	11% 59% 34% 5%
76	Bq	51	31% 53% 27% 14%
77	Br	374	16% 54% 32% 11%
78	Bs	128	5% 25% 12% 59%
79	Bt	106	17% 61% 24% 13%
80	Bu	308	16% 58% 28% 8%
81	Bv	192	14% 53% 19% 9% 18%
82	Bw	257	23% 62% 27% 8%
83	Bx	276	18% 57% 22% 7% 13%

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Mol	Chain	Length	Quality of chain
84	By	189	
85	AA	2251	
86	AB	73	

2 Entry composition [i](#)

There are 86 unique types of molecules in this entry. The entry contains 232955 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 40S RIBOSOMAL PROTEIN S3A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A0	219	1782	1124	337	313	8	0	1

- Molecule 2 is a protein called 40S RIBOSOMAL PROTEIN S4, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A1	248	1940	1232	360	339	9	0	1

- Molecule 3 is a protein called 40S RIBOSOMAL PROTEIN S5, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	A2	187	1484	928	286	265	5	0	0

- Molecule 4 is a protein called 40S RIBOSOMAL PROTEIN S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	A3	250	2003	1243	415	341	4	0	0

- Molecule 5 is a protein called RIBOSOMAL PROTEIN S7, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A4	192	1592	1014	310	263	5	0	1

- Molecule 6 is a protein called 40S RIBOSOMAL PROTEIN S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	A5	195	1551	975	315	259	2	0	1

- Molecule 7 is a protein called 40S RIBOSOMAL PROTEIN S9, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	A6	187	1518	951	307	253	7	0	1

- Molecule 8 is a protein called GUANINE NUCLEOTIDE-BINDING PROTEIN BETA SUBUNIT-LIKE PROTEIN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	A7	315	2412	1508	429	462	13	0	1

- Molecule 9 is a protein called RIBOSOMAL PROTEIN S29, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	A8	42	334	204	69	57	4	0	0

- Molecule 10 is a protein called UBIQUITIN/RIBOSOMAL PROTEIN S27A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	A9	66	530	330	102	91	7	0	1

- Molecule 11 is a protein called 40S RIBOSOMAL PROTEIN SA, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	AC	204	1620	1034	293	282	11	0	1

- Molecule 12 is a protein called 40S RIBOSOMAL PROTEIN S10, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	AD	104	853	553	148	147	5	0	1

- Molecule 13 is a protein called 40S RIBOSOMAL PROTEINS S11, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	AE	160	1300	812	262	220	6	0	0

- Molecule 14 is a protein called 40S RIBOSOMAL PROTEIN S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	AF	121	940	578	169	184	9	0	0

- Molecule 15 is a protein called 40S RIBOSOMAL PROTEIN S13, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	AG	141	1148	724	227	190	7	0	0

- Molecule 16 is a protein called 40S RIBOSOMAL PROTEIN S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	AH	126	922	572	167	174	9	0	1

- Molecule 17 is a protein called 40S RIBOSOMAL PROTEIN S15, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	AI	134	1074	679	211	181	3	0	1

- Molecule 18 is a protein called 40S RIBOSOMAL PROTEIN S15A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	AJ	129	1018	645	191	174	8	0	0

- Molecule 19 is a protein called 40S RIBOSOMAL PROTEIN S16, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	AK	148	1190	757	225	205	3	0	0

- Molecule 20 is a protein called 40S RIBOSOMAL PROTEIN S17, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	AL	127	1021	641	198	177	5	0	1

- Molecule 21 is a protein called 40S RIBOSOMAL PROTEIN S18, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	AM	153	1229	764	244	215	6	0	0

- Molecule 22 is a protein called RIBOSOMAL PROTEIN S19, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	AO	149	1181	746	230	196	9	0	0

- Molecule 23 is a protein called 40S RIBOSOMAL PROTEIN S2, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	AP	224	1731	1103	309	310	9	0	1

- Molecule 24 is a protein called RIBOSOMAL PROTEIN S20, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	AQ	105	827	522	153	149	3	0	1

- Molecule 25 is a protein called 40S RIBOSOMAL PROTEIN S21, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	AR	81	603	374	108	118	3	0	1

- Molecule 26 is a protein called 40S RIBOSOMAL PROTEIN S23, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	AS	142	1116	706	219	189	2	0	0

- Molecule 27 is a protein called 40S RIBOSOMAL PROTEIN S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	AT	131	1050	666	206	174	4	0	0

- Molecule 28 is a protein called 40S RIBOSOMAL PROTEIN S25, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	AU	86	Total	C	N	O	S	0	1
			673	427	127	114	5		

- Molecule 29 is a protein called RIBOSOMAL PROTEIN S26, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	AV	101	Total	C	N	O	S	0	1
			809	498	172	131	8		

- Molecule 30 is a protein called 40S RIBOSOMAL PROTEIN S27, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	AW	83	Total	C	N	O	S	0	1
			636	396	120	111	9		

- Molecule 31 is a protein called 40S RIBOSOMAL PROTEIN S3, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	AX	206	Total	C	N	O	S	0	1
			1628	1020	307	289	12		

- Molecule 32 is a protein called 40S RIBOSOMAL PROTEIN S30, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	AY	65	Total	C	N	O	S	0	0
			514	322	107	84	1		

- Molecule 33 is a protein called 40S RIBOSOMAL PROTEIN S33, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	AZ	68	Total	C	N	O	S	0	0
			526	315	107	100	4		

- Molecule 34 is a RNA chain called ALPHA CHAIN OF THE LARGE RIBOSOMAL SUB-UNIT 28S RRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	BA	1847	Total	C	N	O	P	0	0
			39395	17589	7008	12952	1846		

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BA	?	-	C	deletion	GB X14553
BA	?	-	U	deletion	GB X14553
BA	?	-	U	deletion	GB X14553
BA	?	-	C	deletion	GB X14553
BA	?	-	C	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	C	deletion	GB X14553
BA	?	-	C	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	U	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	?	-	G	deletion	GB X14553
BA	799	A	-	insertion	GB X14553

- Molecule 35 is a RNA chain called BETA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT 28S RRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
35	BB	1465	31164	13918	5476	10306	1464	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BB	484	G	-	insertion	GB X14553
BB	485	U	-	insertion	GB X14553
BB	486	G	-	insertion	GB X14553
BB	487	A	-	insertion	GB X14553

- Molecule 36 is a RNA chain called 5.8S RRNA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
36	BC	169	3584	1604	629	1183	168	0	0

- Molecule 37 is a RNA chain called 5S RRNA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
37	BD	119	2533	1131	449	835	118	0	0

- Molecule 38 is a RNA chain called SHORT RRNA-I OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
38	BE	210	4441	1986	768	1478	209	0	0

- Molecule 39 is a RNA chain called SHORT RRNA-II OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
39	BF	73	1521	682	247	520	72	0	0

- Molecule 40 is a RNA chain called SHORT RRNA-III OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
40	BG	182	3896	1737	706	1272	181	0	0

- Molecule 41 is a RNA chain called SHORT RRNA-IV OF THE LARGE RIBOSOMAL SUBUNIT.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
41	BH	135	2867	1280	502	951	134	0	0

- Molecule 42 is a protein called 60S RIBOSOMAL PROTEIN L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	BI	192	1527	956	315	248	8	0	0

- Molecule 43 is a protein called RIBOSOMAL PROTEIN.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	BJ	214	1717	1086	308	307	16	0	0

- Molecule 44 is a protein called 60S RIBOSOMAL PROTEIN L10, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	BK	212	1725	1086	338	287	14	0	0

- Molecule 45 is a protein called 60S RIBOSOMAL PROTEIN L11, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	BL	170	1363	859	258	239	7	0	1

- Molecule 46 is a protein called 60S RIBOSOMAL PROTEIN L12, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	BM	139	1022	642	187	188	5	0	1

- Molecule 47 is a protein called 60S RIBOSOMAL PROTEIN L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	BN	216	1762	1097	366	292	7	0	1

- Molecule 48 is a protein called 60S RIBOSOMAL PROTEIN L13A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	BO	201	1627	1035	323	262	7	0	1

- Molecule 49 is a protein called PROBABLE 60S RIBOSOMAL PROTEIN L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	BP	184	1484	934	299	247	4	0	1

- Molecule 50 is a protein called RIBOSOMAL PROTEIN L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	BQ	203	1716	1077	370	264	5	0	0

- Molecule 51 is a protein called 60S RIBOSOMAL PROTEIN L17, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	BR	155	1245	782	247	208	8	0	1

- Molecule 52 is a protein called 60S RIBOSOMAL PROTEIN L18A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	BS	179	1473	931	290	244	8	0	0

- Molecule 53 is a protein called 60S RIBOSOMAL PROTEIN L19, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	BT	200	1672	1025	366	273	8	0	1

- Molecule 54 is a protein called 60S RIBOSOMAL PROTEIN L21E, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	BU	158	1260	802	246	206	6	0	0

- Molecule 55 is a protein called 60S RIBOSOMAL PROTEIN L22, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	BV	104	863	558	152	150	3	0	1

- Molecule 56 is a protein called 60S RIBOSOMAL PROTEIN L23, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	BW	138	1042	659	198	180	5	0	0

- Molecule 57 is a protein called 60S RIBOSOMAL PROTEIN L23A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	BX	121	990	629	186	173	2	0	0

- Molecule 58 is a protein called 60S RIBOSOMAL PROTEIN L24, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	BY	100	Total	C	N	O	S	0	0
			836	530	171	130	5		

- Molecule 59 is a protein called 60S RIBOSOMAL PROTEIN L26, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	BZ	125	Total	C	N	O	S	0	1
			1008	623	213	167	5		

- Molecule 60 is a protein called 60S RIBOSOMAL PROTEIN L27, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	Ba	132	Total	C	N	O	S	0	0
			1091	691	222	175	3		

- Molecule 61 is a protein called 60S RIBOSOMAL PROTEIN L27A.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	Bb	144	Total	C	N	O	S	0	0
			1137	717	228	186	6		

- Molecule 62 is a protein called 60S RIBOSOMAL PROTEIN L28, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	Bc	141	Total	C	N	O	S	0	1
			1129	704	226	191	8		

- Molecule 63 is a protein called 60S RIBOSOMAL PROTEIN L29, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	Bd	70	Total	C	N	O	S	0	0
			571	349	128	93	1		

- Molecule 64 is a protein called 60S RIBOSOMAL PROTEIN L2, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	Be	186	Total	C	N	O	S	0	1
			1390	859	284	237	10		

- Molecule 65 is a protein called RIBOSOMAL PROTEIN L3, MITOCHONDRIAL, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	Bf	414	3317	2084	661	559	13	0	1

- Molecule 66 is a protein called 60S RIBOSOMAL PROTEIN L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	Bg	96	735	457	132	141	5	0	0

- Molecule 67 is a protein called 60S RIBOSOMAL SUBUNIT PROTEIN L31, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	Bh	188	1526	961	309	250	6	0	0

- Molecule 68 is a protein called 60S RIBOSOMAL PROTEIN L32, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	Bi	129	1054	664	215	171	4	0	1

- Molecule 69 is a protein called 60S RIBOSOMAL PROTEIN L34, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	Bj	162	1293	801	286	202	4	0	1

- Molecule 70 is a protein called 60S RIBOSOMAL PROTEIN L35, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	Bk	84	719	448	161	108	2	0	0

- Molecule 71 is a protein called 60S RIBOSOMAL PROTEIN L35A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	Bl	116	936	589	189	155	3	0	0

- Molecule 72 is a protein called RIBOSOMAL PROTEIN L36, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	Bm	107	Total	C	N	O	S	0	1
			849	530	178	139	2		

- Molecule 73 is a protein called RIBOSOMAL PROTEIN L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	Bn	83	Total	C	N	O	S	0	0
			699	425	161	107	6		

- Molecule 74 is a protein called 60S RIBOSOMAL PROTEIN L37A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	Bo	92	Total	C	N	O	S	0	1
			715	442	148	119	6		

- Molecule 75 is a protein called 60S RIBOSOMAL PROTEIN L38, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	Bp	81	Total	C	N	O	S	0	0
			656	411	130	111	4		

- Molecule 76 is a protein called 60S RIBOSOMAL PROTEIN L39, PUTATIVE.

Mol	Chain	Residues	Atoms				AltConf	Trace
76	Bq	50	Total	C	N	O	0	0
			457	297	98	62		

- Molecule 77 is a protein called 60S RIBOSOMAL PROTEIN L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	Br	368	Total	C	N	O	S	0	1
			2883	1802	576	488	17		

- Molecule 78 is a protein called UBIQUITIN-60S RIBOSOMAL PROTEIN L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	Bs	52	Total	C	N	O	S	0	0
			427	265	88	67	7		

- Molecule 79 is a protein called 60S RIBOSOMAL PROTEIN L44.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Bt	105	Total	C	N	O	S	0	0
			866	547	170	144	5		

- Molecule 80 is a protein called 60S RIBOSOMAL PROTEIN L5, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	Bu	299	Total	C	N	O	S	0	1
			2354	1485	447	416	6		

- Molecule 81 is a protein called 60S RIBOSOMAL PROTEIN L6, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	Bv	158	Total	C	N	O	S	0	1
			1222	776	228	215	3		

- Molecule 82 is a protein called 60S RIBOSOMAL PROTEIN L7, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	Bw	257	Total	C	N	O	S	0	0
			2066	1316	394	345	11		

- Molecule 83 is a protein called 60S RIBOSOMAL PROTEIN L7A, PUTATIVE.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	Bx	240	Total	C	N	O	S	0	0
			1908	1198	375	329	6		

- Molecule 84 is a protein called 60S RIBOSOMAL PROTEIN L9, PUTATIVE.

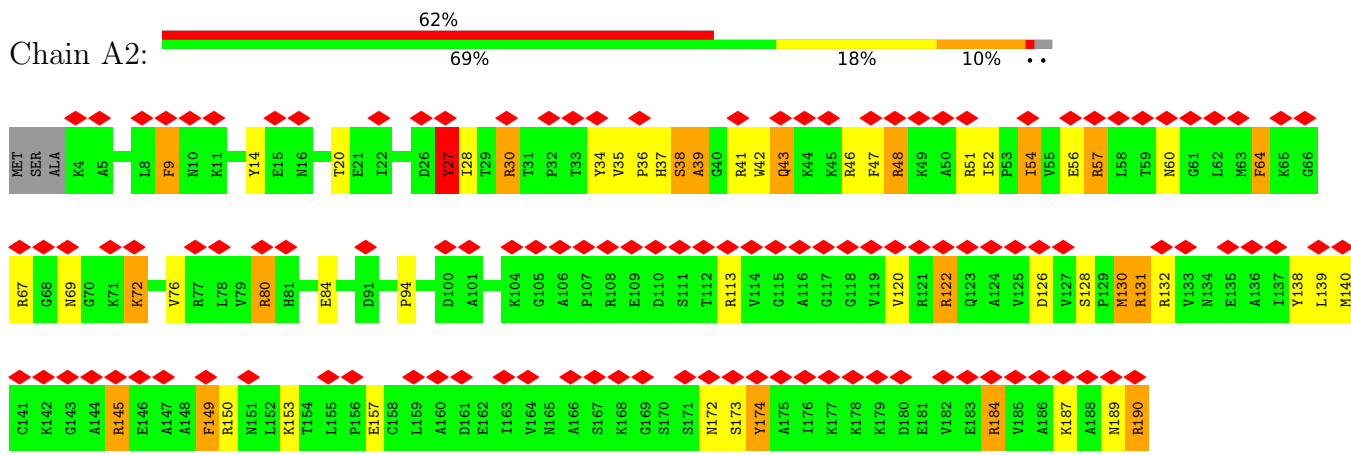
Mol	Chain	Residues	Atoms					AltConf	Trace
84	By	189	Total	C	N	O	S	0	0
			1540	975	284	277	4		

- Molecule 85 is a RNA chain called 18S RRNA OF THE SMALL RIBOSOMAL SUBUNIT.

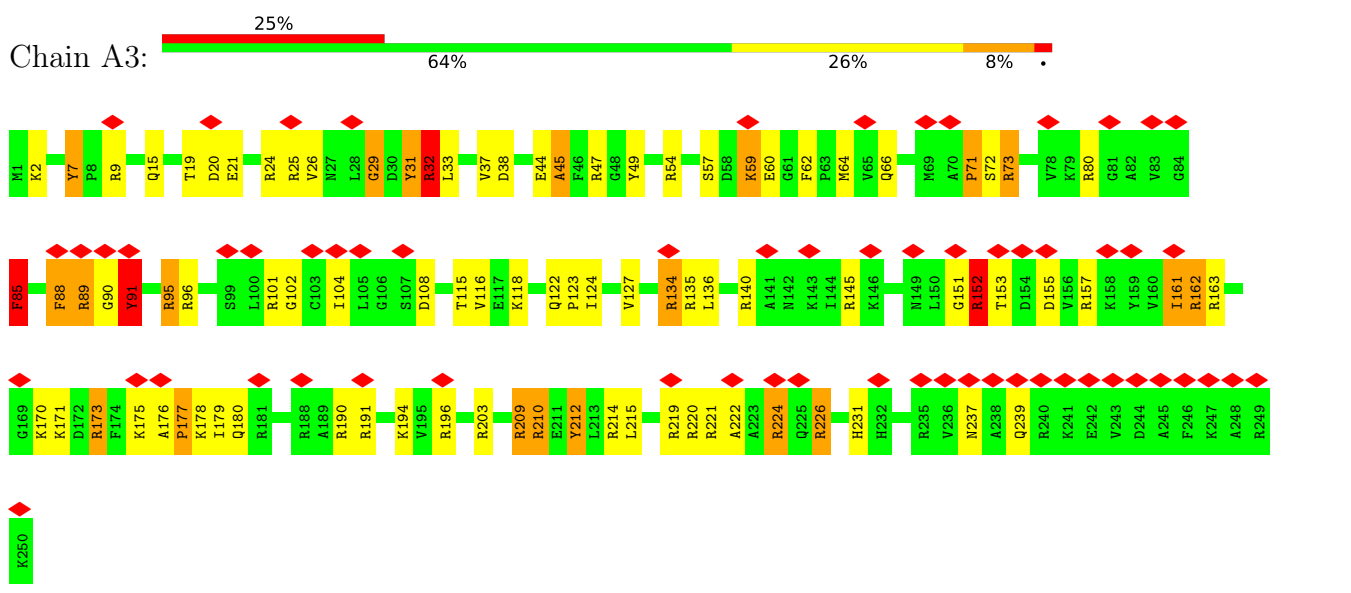
Mol	Chain	Residues	Atoms					AltConf	Trace
85	AA	2227	Total	C	N	O	P	0	0
			47370	21162	8354	15629	2225		

- Molecule 86 is a RNA chain called E-SITE TRNA.

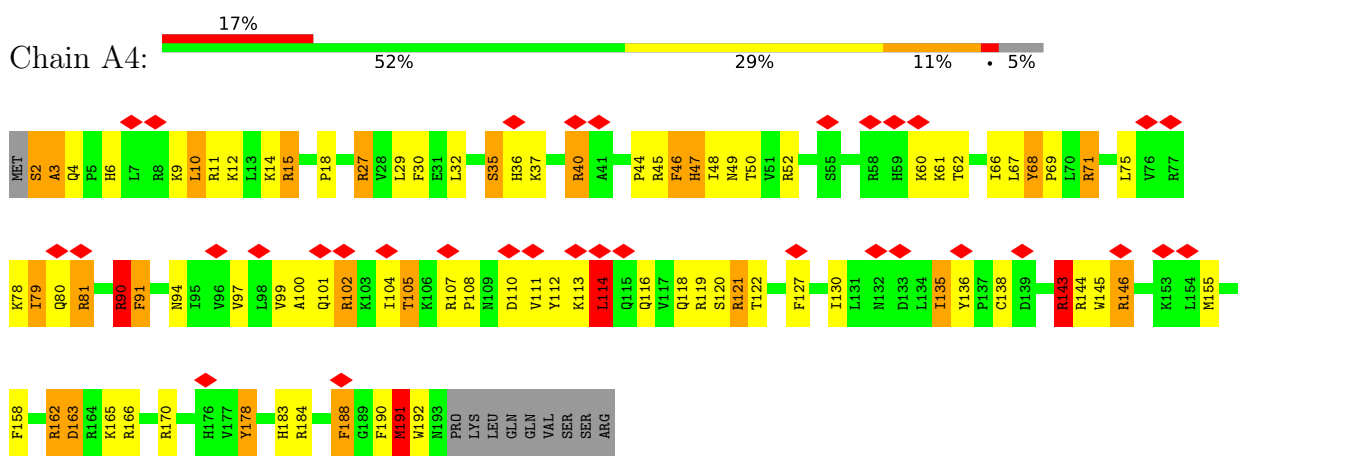
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
86	AB	73	1557	695	279	511	72	0	0



• Molecule 4: 40S RIBOSOMAL PROTEIN S6

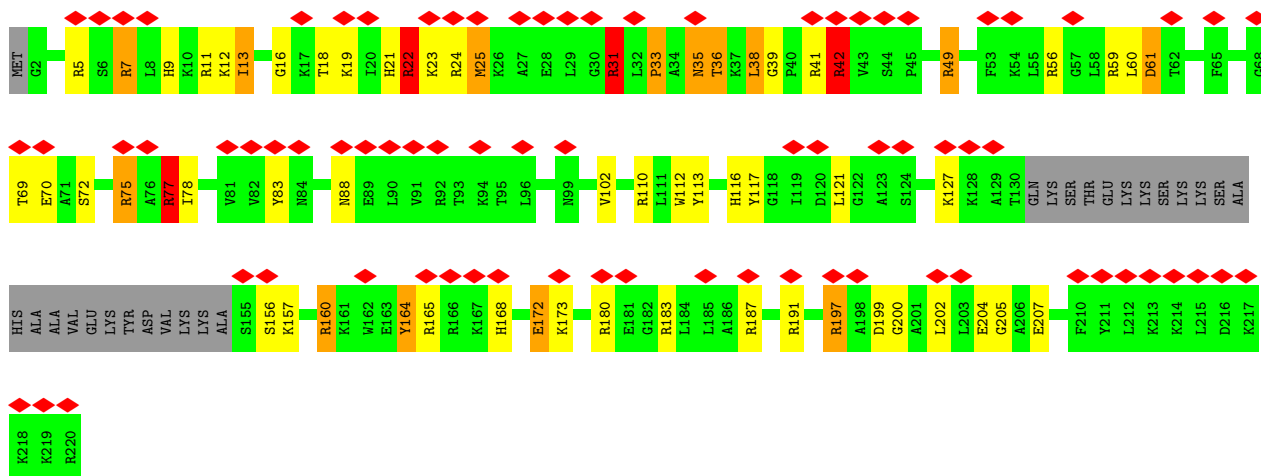


• Molecule 5: RIBOSOMAL PROTEIN S7, PUTATIVE

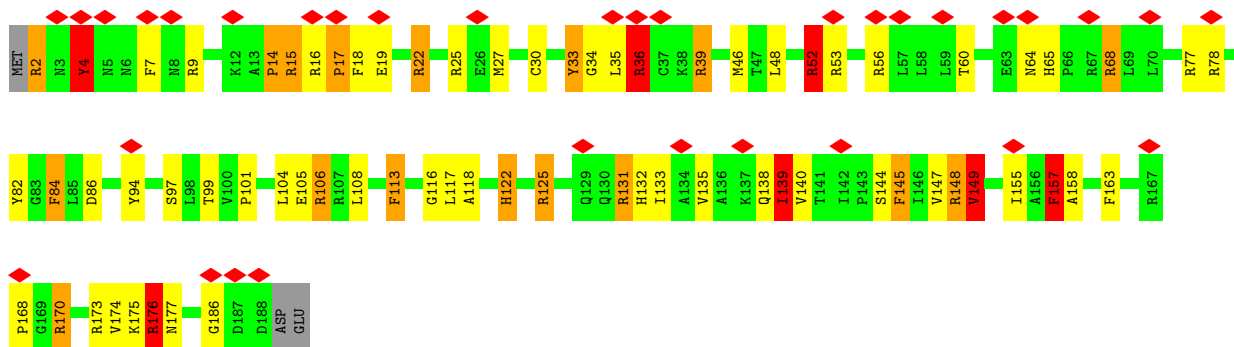


• Molecule 6: 40S RIBOSOMAL PROTEIN S8

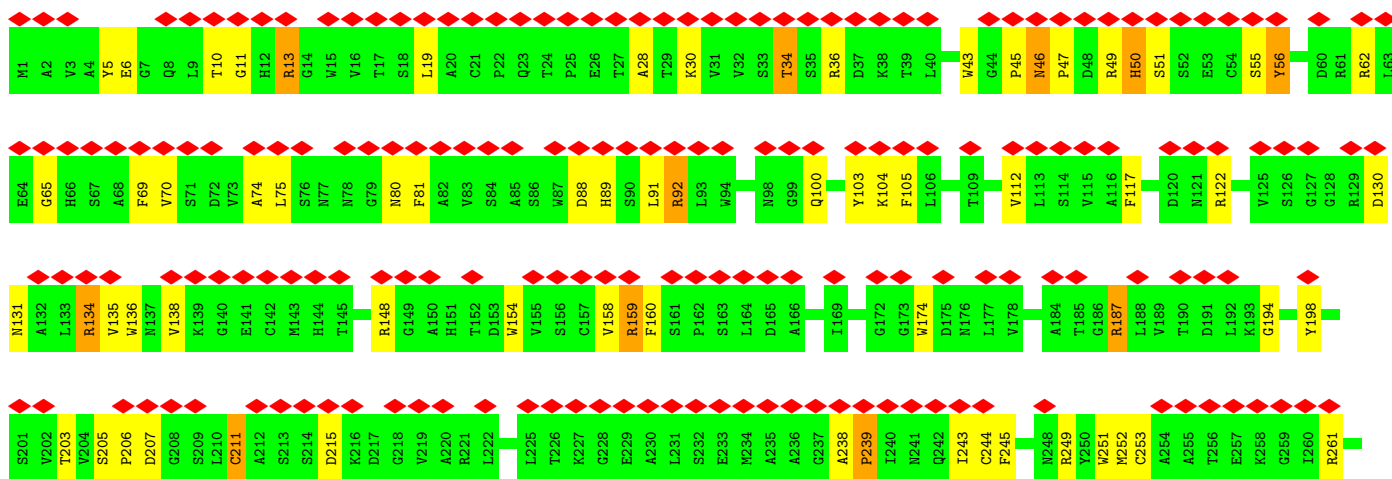
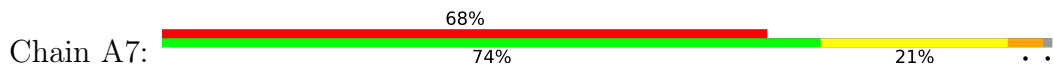


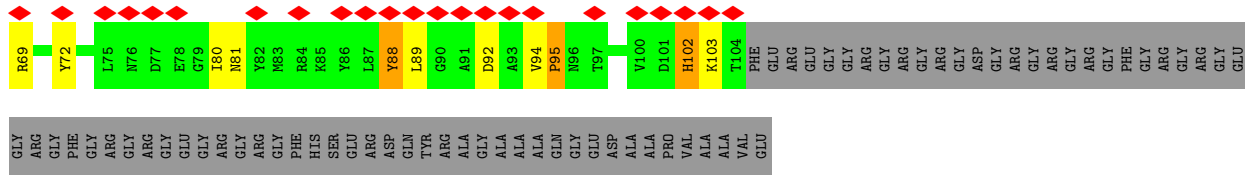


• Molecule 7: 40S RIBOSOMAL PROTEIN S9, PUTATIVE

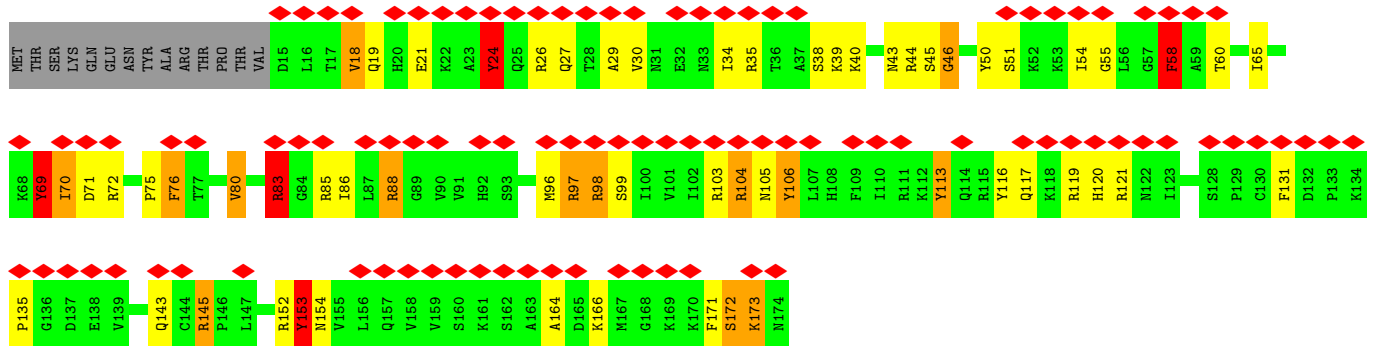


• Molecule 8: GUANINE NUCLEOTIDE-BINDING PROTEIN BETA SUBUNIT-LIKE PROTEIN

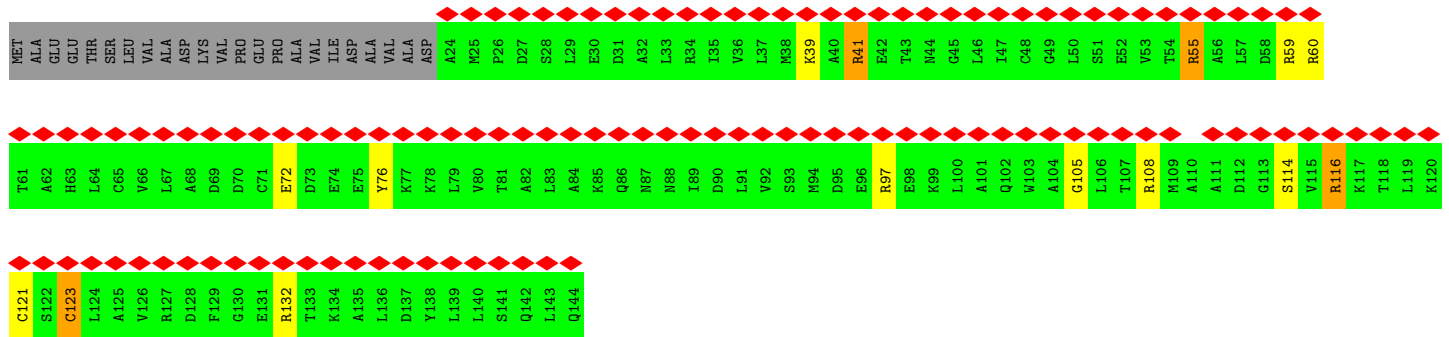
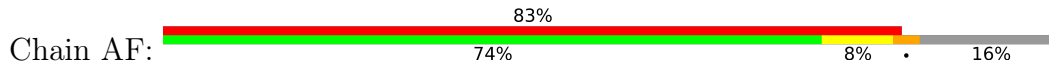




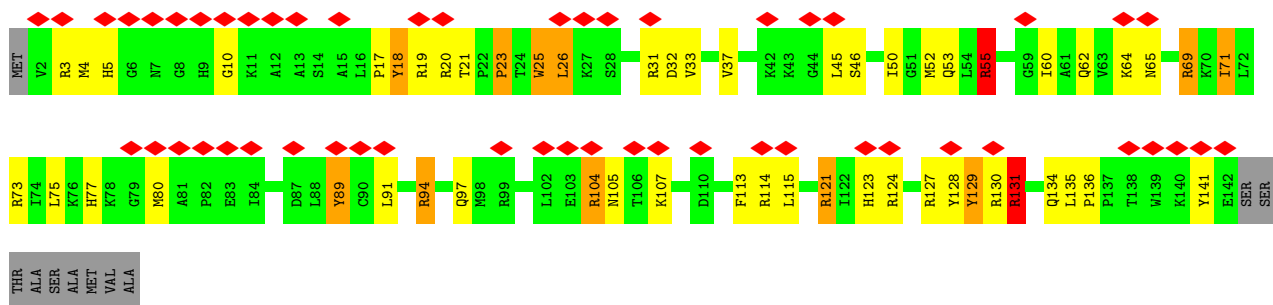
• Molecule 13: 40S RIBOSOMAL PROTEINS S11, PUTATIVE



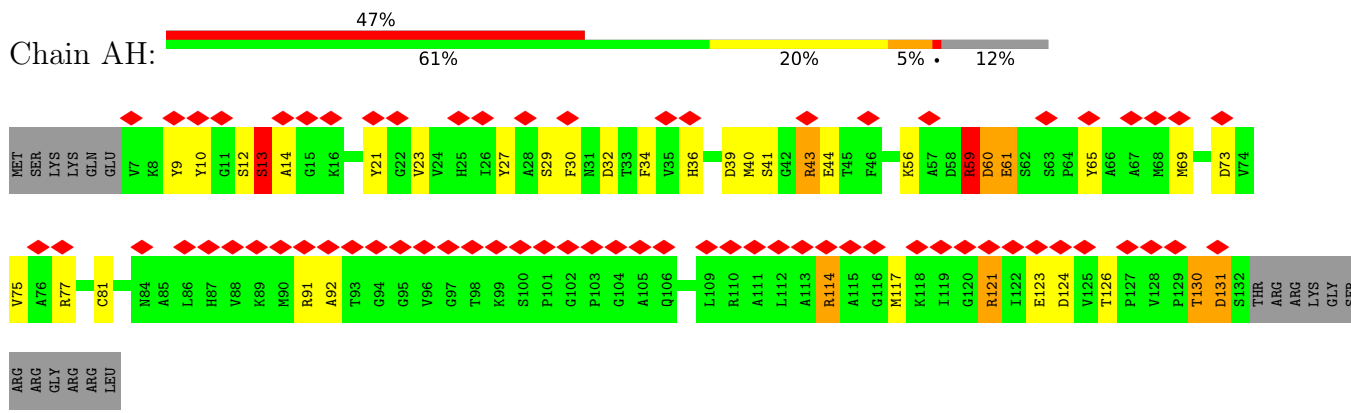
• Molecule 14: 40S RIBOSOMAL PROTEIN S12



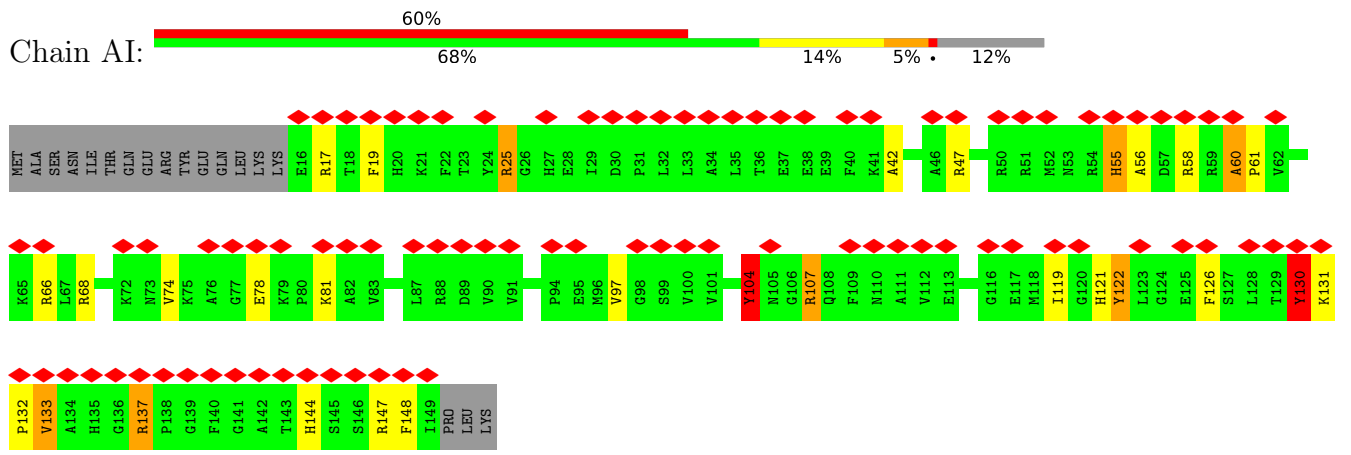
• Molecule 15: 40S RIBOSOMAL PROTEIN S13, PUTATIVE



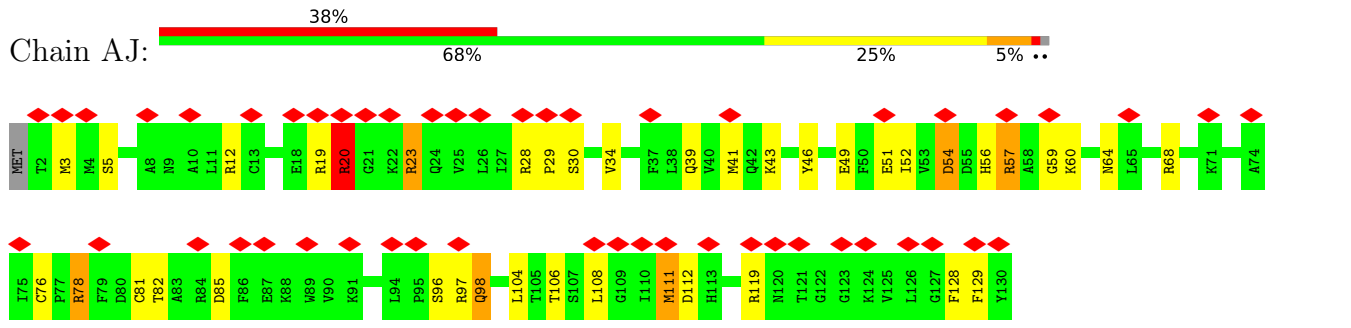
• Molecule 16: 40S RIBOSOMAL PROTEIN S14



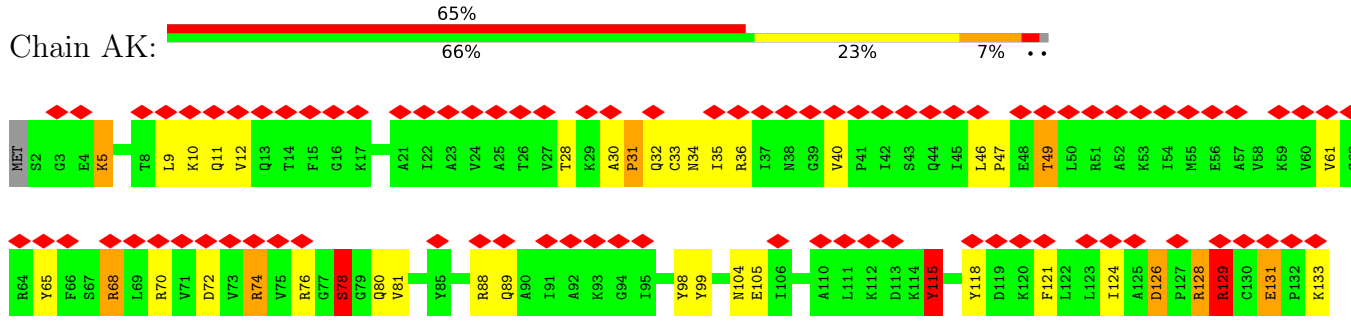
• Molecule 17: 40S RIBOSOMAL PROTEIN S15, PUTATIVE

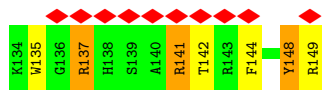


• Molecule 18: 40S RIBOSOMAL PROTEIN S15A, PUTATIVE

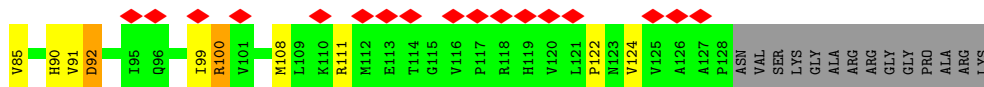
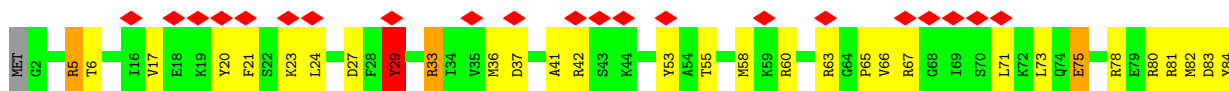


• Molecule 19: 40S RIBOSOMAL PROTEIN S16, PUTATIVE

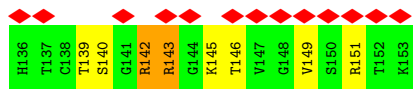
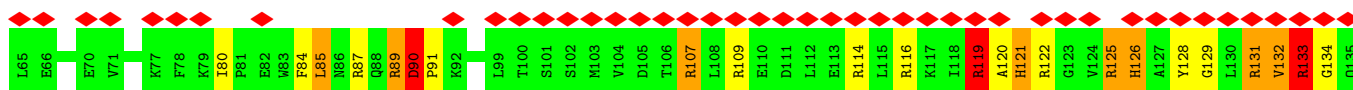
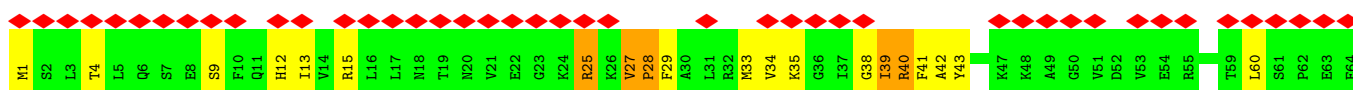




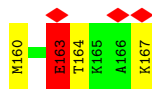
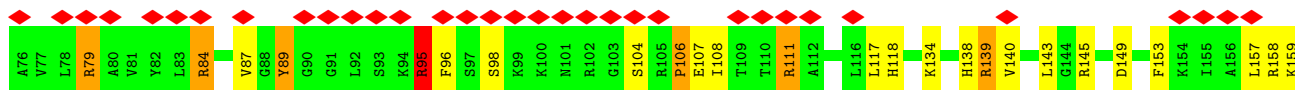
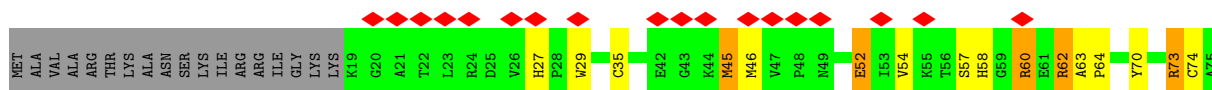
• Molecule 20: 40S RIBOSOMAL PROTEIN S17, PUTATIVE



• Molecule 21: 40S RIBOSOMAL PROTEIN S18, PUTATIVE

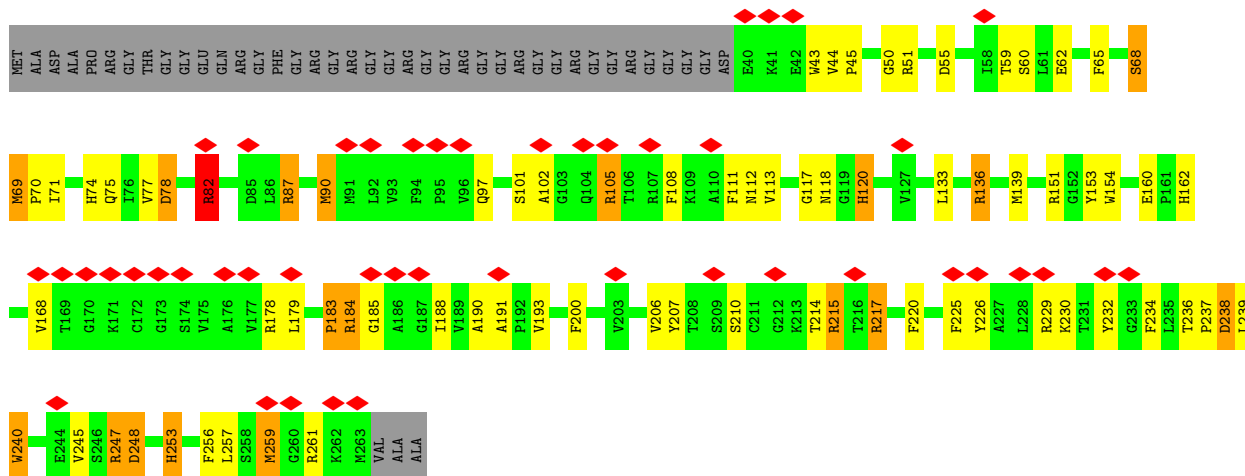


• Molecule 22: RIBOSOMAL PROTEIN S19, PUTATIVE

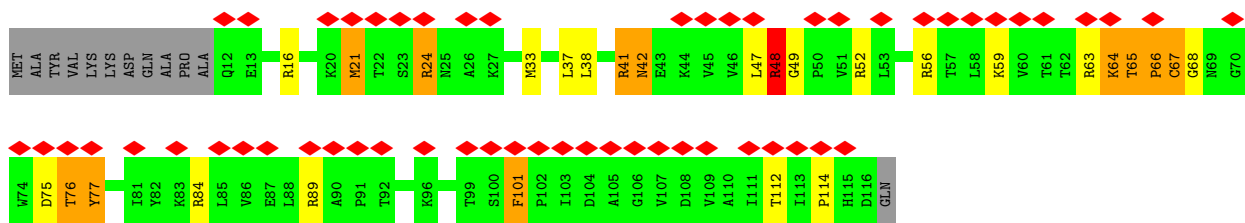


• Molecule 23: 40S RIBOSOMAL PROTEIN S2, PUTATIVE

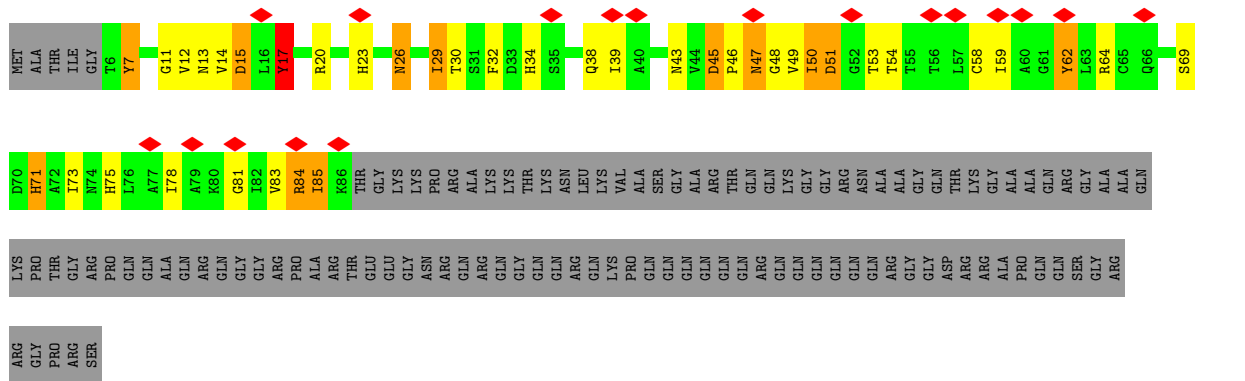
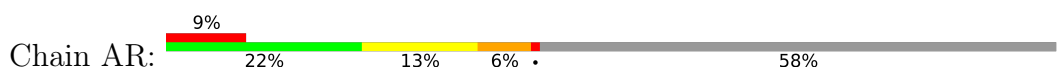




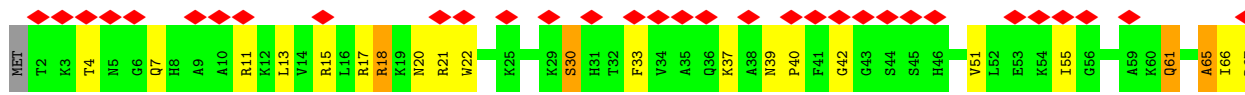
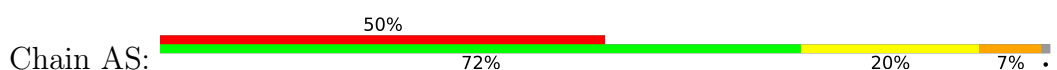
● Molecule 24: RIBOSOMAL PROTEIN S20, PUTATIVE

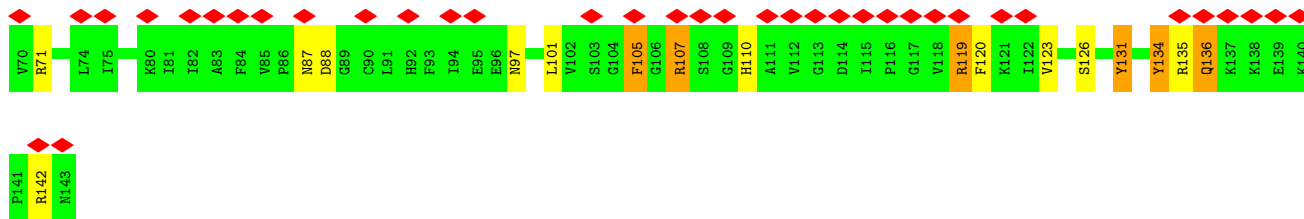


● Molecule 25: 40S RIBOSOMAL PROTEIN S21, PUTATIVE

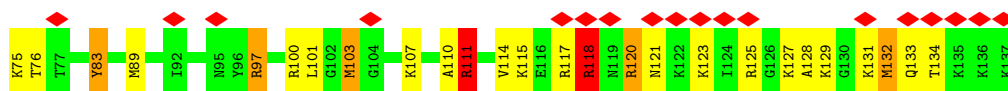
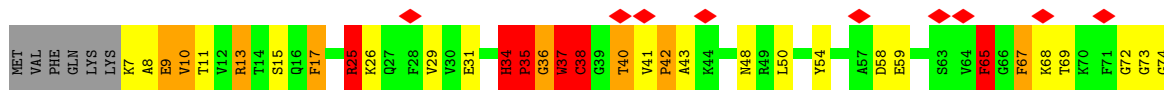


● Molecule 26: 40S RIBOSOMAL PROTEIN S23, PUTATIVE

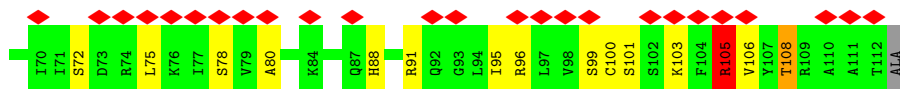
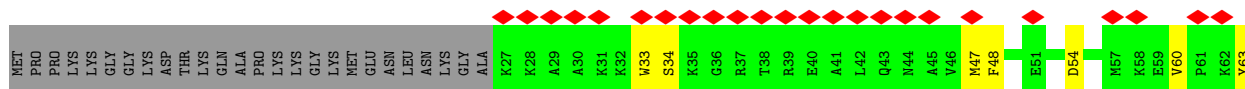




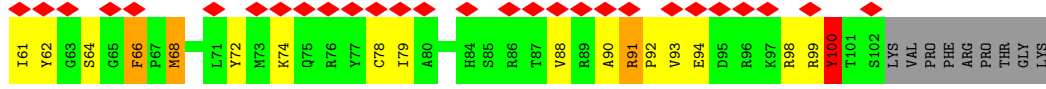
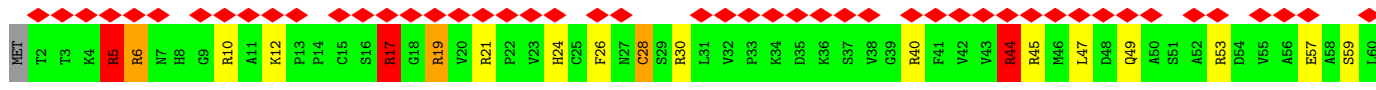
• Molecule 27: 40S RIBOSOMAL PROTEIN S24



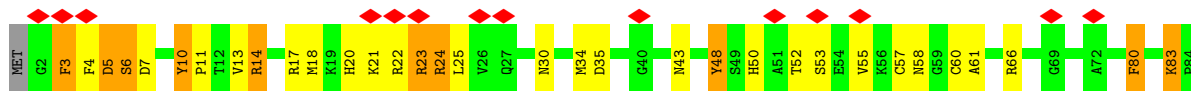
• Molecule 28: 40S RIBOSOMAL PROTEIN S25, PUTATIVE



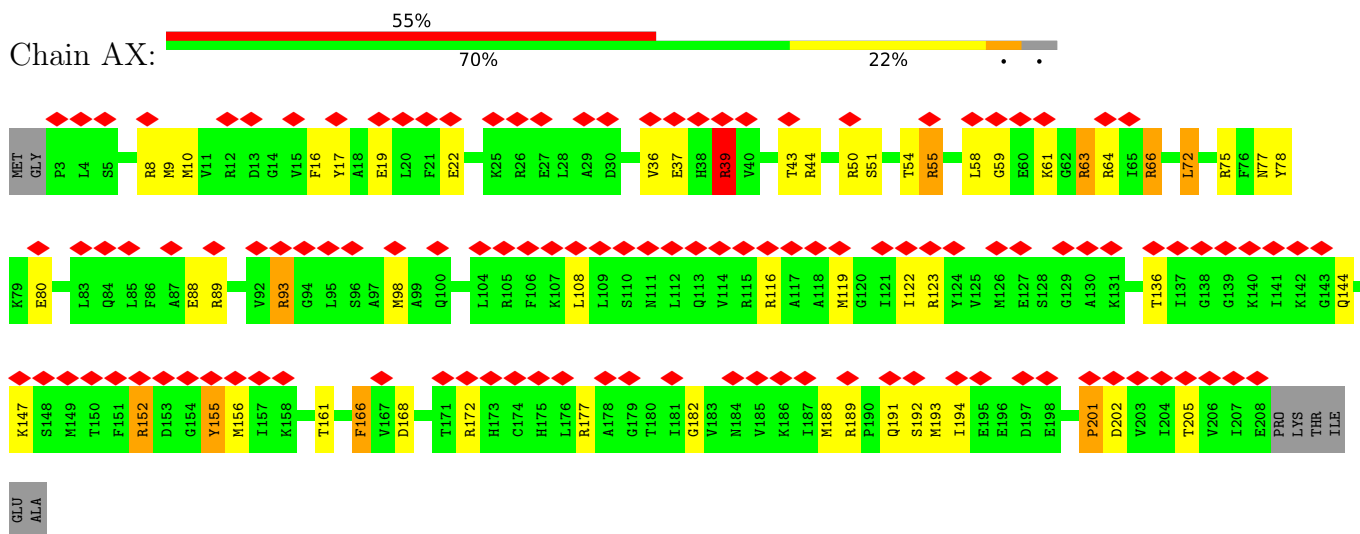
• Molecule 29: RIBOSOMAL PROTEIN S26, PUTATIVE



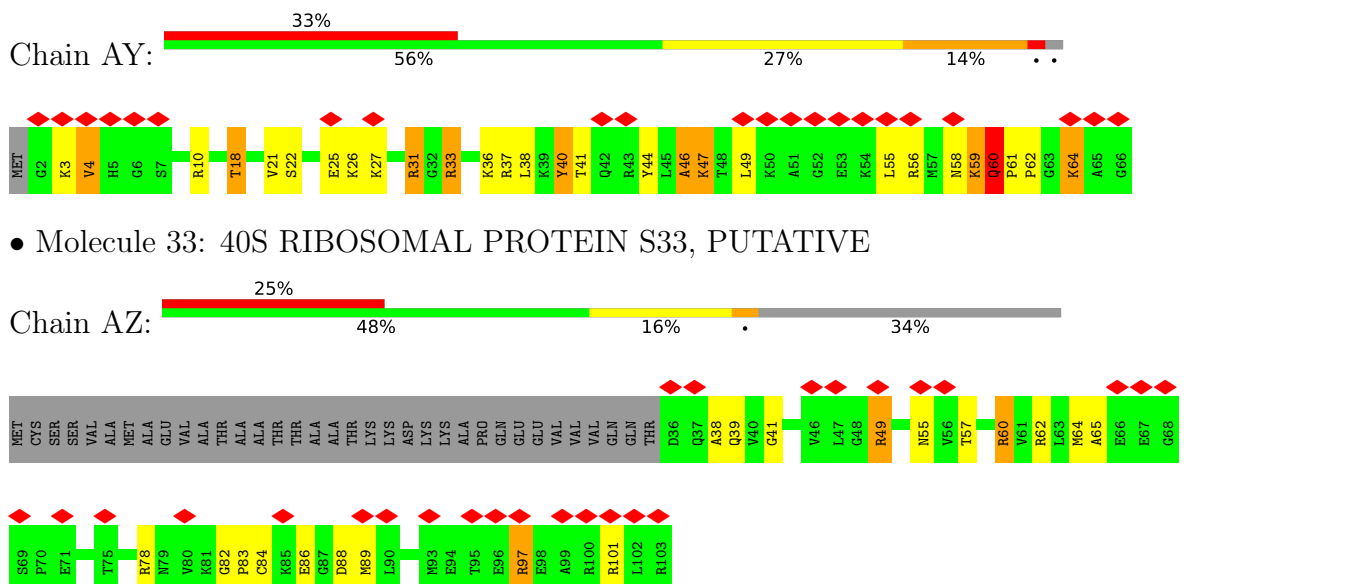
• Molecule 30: 40S RIBOSOMAL PROTEIN S27, PUTATIVE



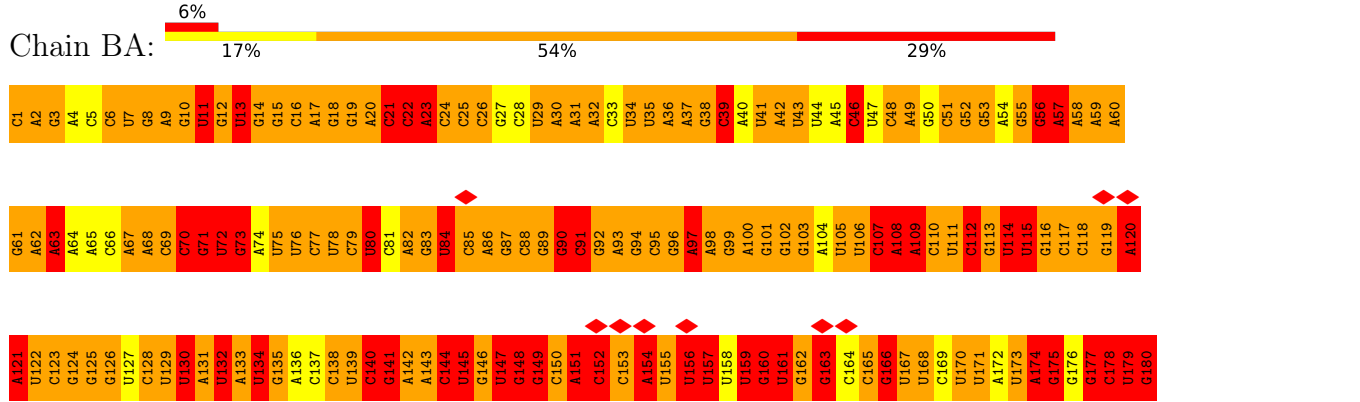
• Molecule 31: 40S RIBOSOMAL PROTEIN S3, PUTATIVE



• Molecule 32: 40S RIBOSOMAL PROTEIN S30, PUTATIVE



• Molecule 33: 40S RIBOSOMAL PROTEIN S33, PUTATIVE



• Molecule 34: ALPHA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT 28S RRNA



U1.021	C1.022	G1.023	A1.024	A1.025	C1.026	C1.027	A1.028	C1.029	G1.030	U1.031	C1.032	G1.033	U1.034	A1.035	G1.036	C1.037	U1.038	C1.039	G1.040	U1.041	A1.042	C1.043	U1.044	C1.045	G1.046	U1.047	U1.048	G1.049	A1.050	A1.051	U1.052	C1.053	U1.054	U1.055	U1.056	C1.057	C1.058	U1.059	C1.060	A1.061	G1.062	A1.064	U1.065	U1.066	G1.067	C1.068	U1.069	G1.070	G1.071	U1.072	C1.073	A1.074	U1.075	U1.076	G1.077	U1.078	C1.079	U1.080											
C961	U962	G963	U964	A965	G966	C967	G968	A969	U970	U971	G972	U973	G974	A975	G976	U977	U978	G979	C980	A981	A982	A983	U984	C985	C986	C987	U988	U989	C990	A991	C992	A993	A994	U995	U996	U997	U998	G999	C1000	G1001	U1002	A1003	U1004	C1005	G1006	G1007	A1008	G1009	C1010	G1011	A1012	A1013	C1014	U1015	U1016	C1017	U1018	C1019	A1020										
C841	U842	G843	U844	A845	U846	U847	U848	G849	U850	C851	C852	A853	A854	C855	G856	C857	C858	A859	U860	C861	C862	C863	G864	C865	C866	C867	C868	C869	C870	C871	C872	C873	C874	C875	C876	C877	C878	C879	C880	C881	C882	C883	C884	C885	C886	C887	C888	C889	C890	C891	C892	C893	C894	C895	C896	C897	C898	C899	A900										
U781	C782	U783	C784	U785	U786	A787	C788	U789	G790	U791	A792	A793	G794	G795	G796	A797	G798	A799	C800	U801	C802	U803	G804	A805	U806	U807	U808	U809	A810	C811	C812	C813	C814	C815	C816	C817	C818	C819	C820	C821	U822	G823	C824	C825	C826	A827	U828	U829	U830	U831	C832	U833	C834	U835	U836	U837	U838	U839	U840										
G721	A722	C723	U724	C725	U726	G727	A728	C729	U730	C731	A732	G733	G734	A735	G736	U737	C738	A739	A740	U841	A741	C742	A743	G744	A745	C746	G747	C748	G749	C750	A751	A752	G753	G754	G755	A756	G757	G758	A759	G760	U761	A762	U763	G764	U765	A766	U767	G768	U769	G770	A771	G772	C773	G774	U775	C776	U777	U778	U779	U780									
C661	U662	U663	U664	C665	C666	U667	G668	G669	U670	C671	G672	U673	G674	C675	G676	U677	C678	U679	C680	C681	A682	C683	G684	C685	U686	G687	U688	U689	C690	A691	U692	U693	G694	A695	A696	A697	U698	G699	C700	U701	U702	U703	G704	C705	C706	C707	C708	C709	A710	C711	C712	C713	G714	U715	C716	U717	U718	G719	A720										
A601	G602	C603	U604	G605	G606	C607	G608	G609	A610	U611	U612	A613	A614	A615	A616	C617	C618	U619	C620	C621	G622	U623	G624	U625	U626	U627	U628	U629	U630	U631	U632	U633	U634	U635	U636	U637	U638	U639	U640	U641	U642	U643	C644	U645	C646	U647	C648	A649	C650	U651	G652	U653	U654	U655	U656	C657	U658	U659	C660										
C541	A542	A543	U544	U545	U546	C547	G548	A549	U550	U551	U552	C553	A554	C555	U556	A557	C558	U559	U560	U561	C562	C563	U564	U565	C566	U567	U568	U569	U570	C571	C572	G573	G574	U575	C576	U577	C578	U579	C580	U581	U582	U583	C584	C585	U586	U587	C588	A589	U590	U591	C592	C593	C594	G595	C596	U597	U598	U599	G600										
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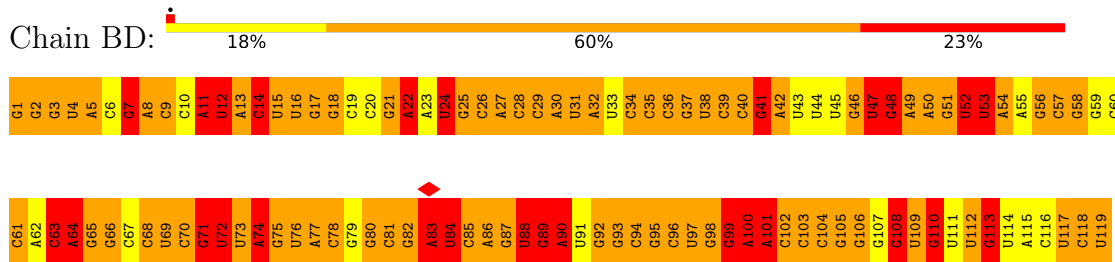
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• Molecule 35: BETA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT 28S RRNA

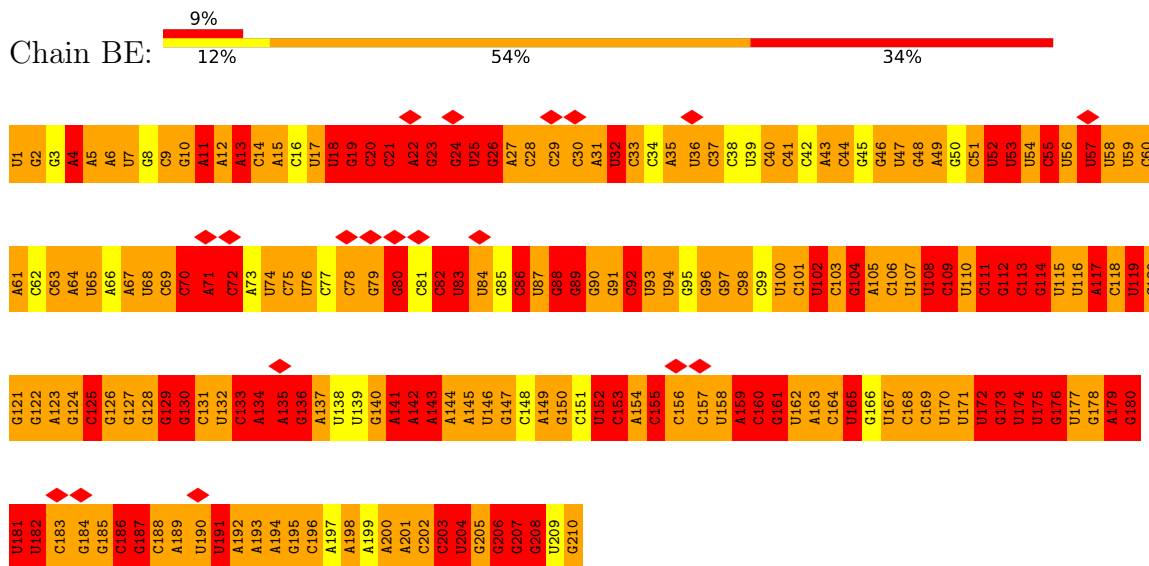


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C3	A63	G123	C266	G326	G386	U446	G506	U666	A686	G746	C746	G806	U866	U906	U966
C4	A64	G124	C267	U527	G387	C447	G507	U667	G687	G747	A747	G807	U867	U907	U967
A5	A65	G125	C268	G328	C388	G448	A508	A668	A688	A748	A748	A808	U868	U908	U968
A6	G66	C126	G269	C449	C389	C449	A509	A669	A689	A749	A749	A809	U869	U909	U969
C7	A67	U127	A269	U529	G390	A450	A510	A570	A630	A630	G750	G810	U870	U910	U970
U8	G68	C128	A270	U530	G391	A451	A511	A571	A631	G631	A751	G811	U871	U911	U971
G9	A69	U129	G270	A451	G392	A452	C512	G572	G632	G632	A752	G812	U872	U912	U972
C10	A70	G130	C271	U531	G393	C453	G513	C573	C633	C633	A753	G813	U873	U913	U973
A11	A71	A131	C272	U532	A394	U454	G514	C574	A634	A634	A754	G814	U874	U914	U974
G12	G72	G132	C273	C333	C395	G455	C515	C575	A635	A635	A755	G815	U875	U915	U975
A13	G73	G133	G274	G334	C396	A456	G516	A576	G636	G636	A756	G816	U876	U916	U976
C14	U74	G134	U274	C335	C397	U457	G517	U577	G637	G637	A757	G817	U877	U917	U977
C15	A75	A335	A275	C336	A399	U458	G518	G578	G638	G638	A758	G818	U878	U918	U978
G16	A76	A136	U276	U536	A399	U459	A519	A579	A639	A639	A759	G819	U879	U919	U979
A17	A77	A137	C277	U537	C400	U460	G520	A580	A640	A640	A760	G820	U880	U920	U980
U18	C78	A138	C277	U537	C401	U461	G521	A581	C641	C641	A761	G821	U881	U921	U981
C19	U79	G139	U278	C338	G402	U462	A522	G582	G642	G642	A762	G822	U882	U922	U982
U20	C80	U140	A279	C339	U403	U463	A523	G583	G643	G643	A763	G823	U883	U923	U983
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A22	G82	G142	C281	U341	U405	C465	U525	U585	C705	C705	A765	G825	U885	U925	U985
U23	G83	G143	U281	U341	A406	A466	A526	U586	U646	U646	A766	G826	U886	U926	U986
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A25	A85	G145	A283	U343	U408	U468	G528	A588	G648	G648	A768	G828	U888	U928	U988
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C32	C92	A151	C288	U349	U415	U475	U535	C595	U655	U655	A775	G835	U895	U935	U995
A33	A93	G152	U289	U350	A417	A476	U536	C596	U656	U656	A776	G836	U896	U936	U996
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C37	U97	G155	U293	C353	C421	U481	U541	U601	G661	G661	A780	G840	U900	U940	U1000
G38	A98	G156	C293	G353	C422	U482	U542	G602	G662	G662	A781	G841	U901	U941	U1001
C39	G99	C157	G294	C354	C423	U483	A543	U603	G663	G663	A782	G842	U902	U942	U1002
U40	A100	U101	U300	A361	U424	C484	C544	U604	A664	A664	A783	G843	U903	U943	U1003
A41	U101	C158	G296	A362	C425	U485	C545	C605	A665	A665	A784	G844	U904	U944	U1004
A42	G102	C159	G296	C357	A426	U486	C546	C606	A666	A666	A785	G845	U905	U945	U1005
A44	C103	G160	U297	U357	A427	U487	A547	C607	A667	A667	A786	G846	U906	U946	U1006
C43	G104	A160	G298	A359	U428	U488	A548	A608	A668	A668	A787	G847	U907	U947	U1007
A45	U105	G161	C299	C360	C429	G488	A549	G609	A669	A669	A788	G848	U908	U948	U1008
U46	A106	U162	U300	A361	A430	A489	U549	U610	A670	A670	A789	G849	U909	U949	U1009
C47	G107	C163	U301	A362	A431	G490	U550	U611	A671	A671	A790	G850	U910	U950	U1010
A48	U109	U164	G301	A363	C432	U491	C551	A612	A672	A672	A791	G851	U911	U951	U1011
A49	C110	C165	U302	U364	C433	U492	C552	C613	C673	C673	A792	G852	U912	U952	U1012
A50	G111	G166	U303	U365	C434	U493	U553	C614	C674	C674	A793	G853	U913	U953	U1013
U51	G112	U168	U304	U366	A435	C494	C554	U615	G675	G675	A794	G854	U914	U954	U1014
G52	C113	C167	U305	C367	A436	U495	G555	A616	U676	U676	A795	G855	U915	U955	U1015
C53	U114	U169	U306	C368	C437	C496	U556	U617	G677	G677	A796	G856	U916	U956	U1016
A54	A115	G169	U307	C369	C438	C497	U557	U618	U678	U678	A797	G857	U917	U957	U1017
C55	G116	C253	A307	A370	G439	G498	U558	A619	U679	U679	A798	G858	U918	U958	U1018
U56	A117	G255	C371	A371	G440	A999	U559	G620	G680	G680	A799	G859	U919	U959	U1019
G57	U118	C256	U372	A372	U442	C500	C560	G621	G681	G681	A800	G860	U920	U960	U1020
U58	C119	A255	C373	U373	U443	U501	C561	G622	G682	G682	A801	G861	U921	U961	U1021
A59	G119	C261	U310	C374	A374	U510	C562	A623	U683	U683	A802	G862	U922	U962	U1022
G58	U119	G256	C311	G375	A375	U511	C563	G503			A803	G863	U923	U963	U1023
U59	C120	C262	U312	A376	A377	U512	C564								
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			U314	A378	A378	U514	C566								
			C313	A379	A379	U515	C567								
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			U316	A382	A382	U518	C570								
			C317	U382	U382	U519	C571								
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			C319	G320	G320	U521	C573								
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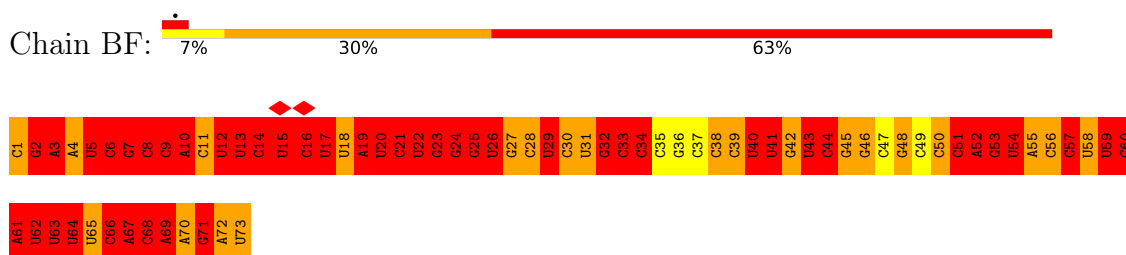
● Molecule 37: 5S RRNA CHAIN OF THE LARGE RIBOSOMAL SUBUNIT



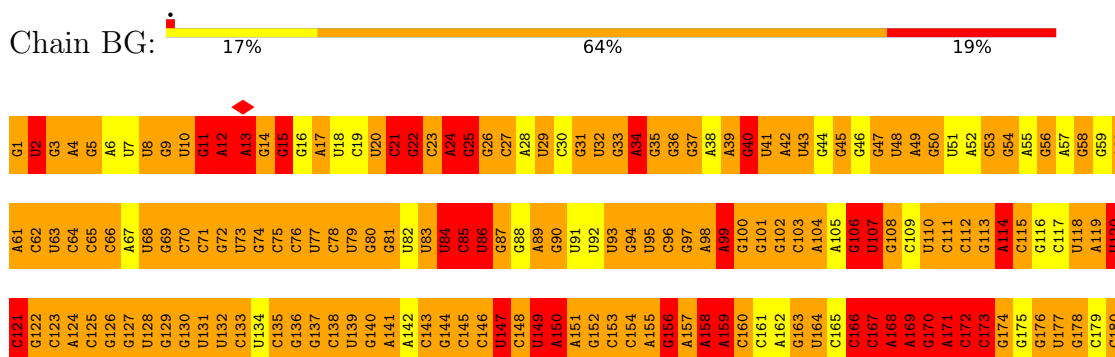
● Molecule 38: SHORT RRNA-I OF THE LARGE RIBOSOMAL SUBUNIT



● Molecule 39: SHORT RRNA-II OF THE LARGE RIBOSOMAL SUBUNIT

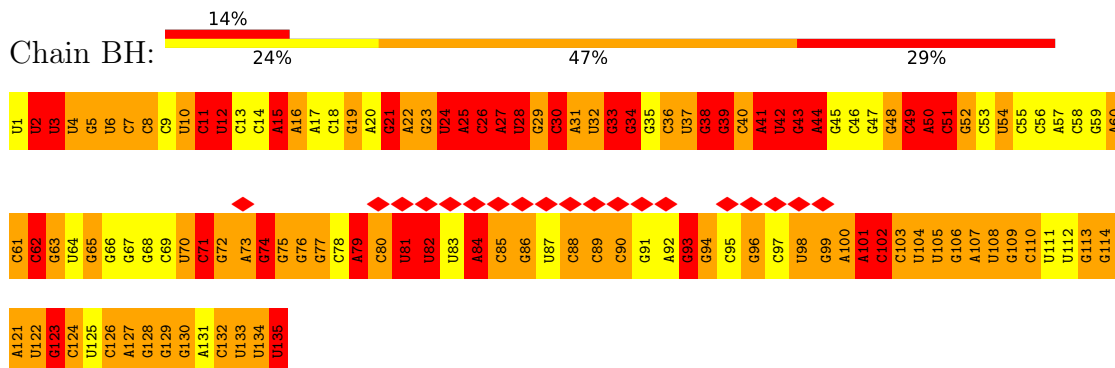


● Molecule 40: SHORT RRNA-III OF THE LARGE RIBOSOMAL SUBUNIT

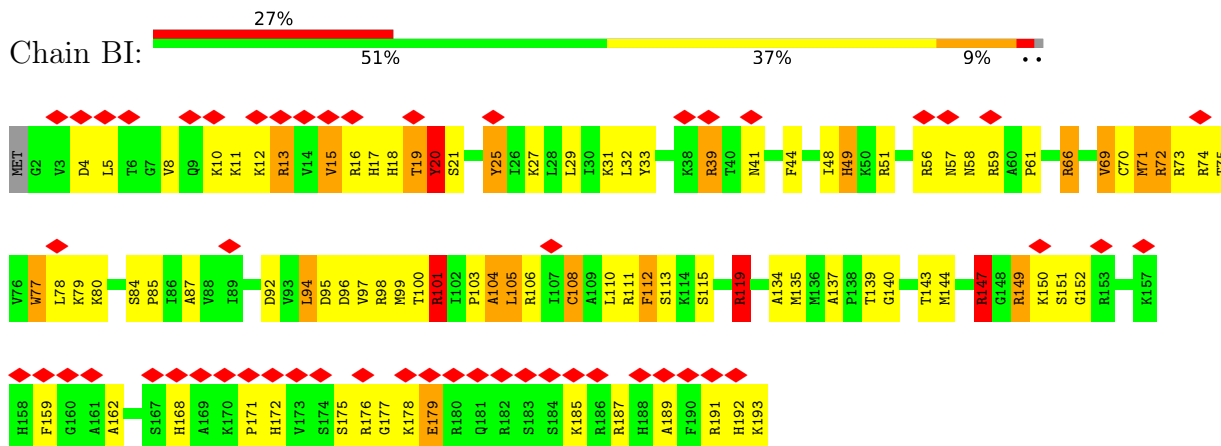


C181
G182

• Molecule 41: SHORT RRNA-IV OF THE LARGE RIBOSOMAL SUBUNIT



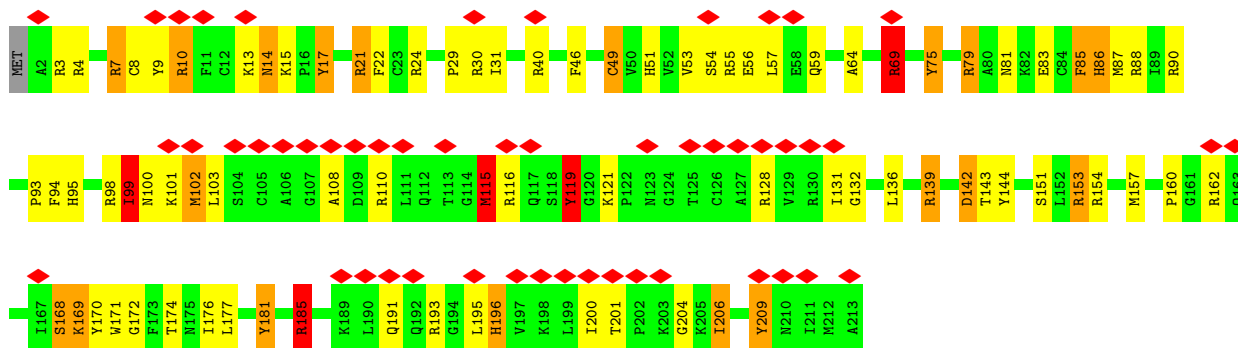
• Molecule 42: 60S RIBOSOMAL PROTEIN L18



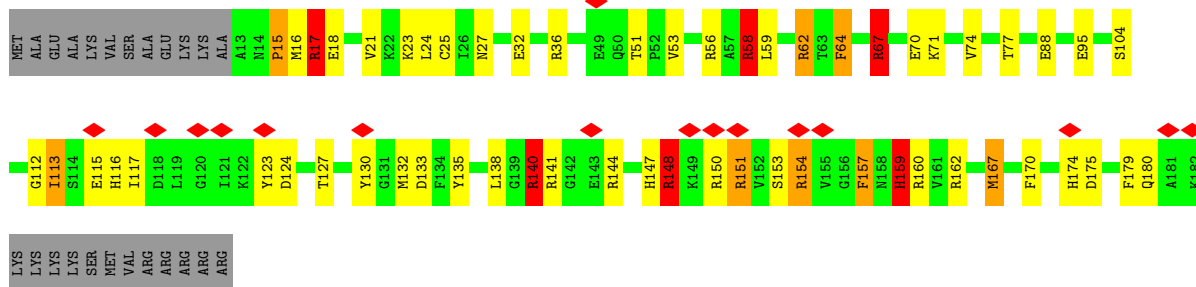
• Molecule 43: RIBOSOMAL PROTEIN



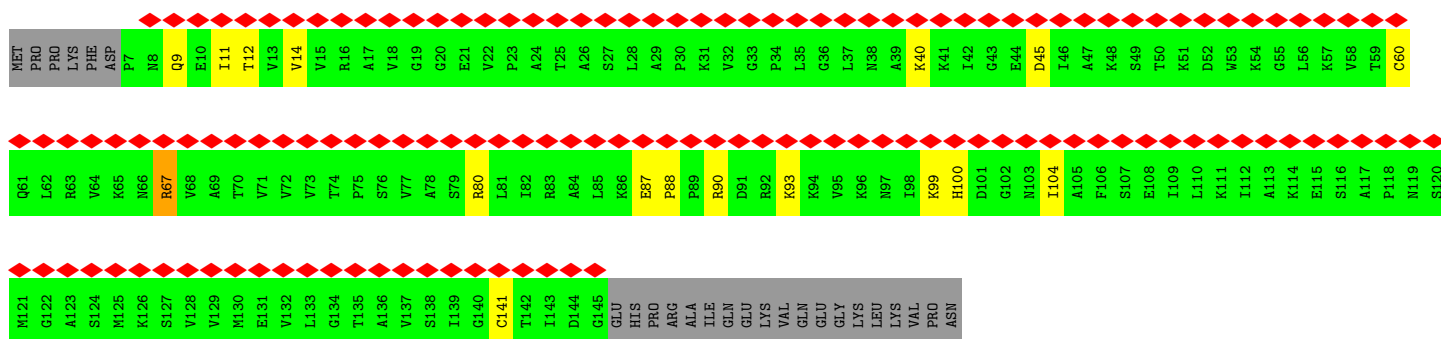
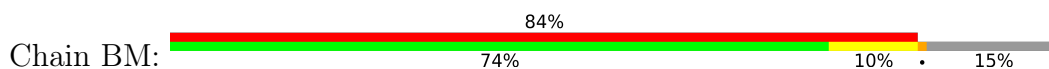
• Molecule 44: 60S RIBOSOMAL PROTEIN L10, PUTATIVE



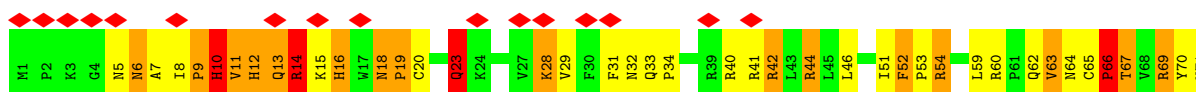
• Molecule 45: 60S RIBOSOMAL PROTEIN L11, PUTATIVE

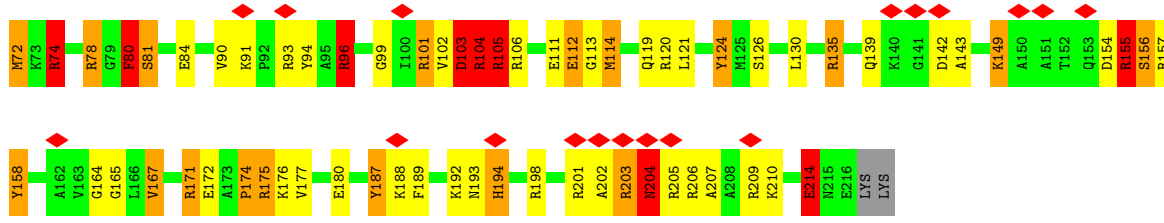


• Molecule 46: 60S RIBOSOMAL PROTEIN L12, PUTATIVE

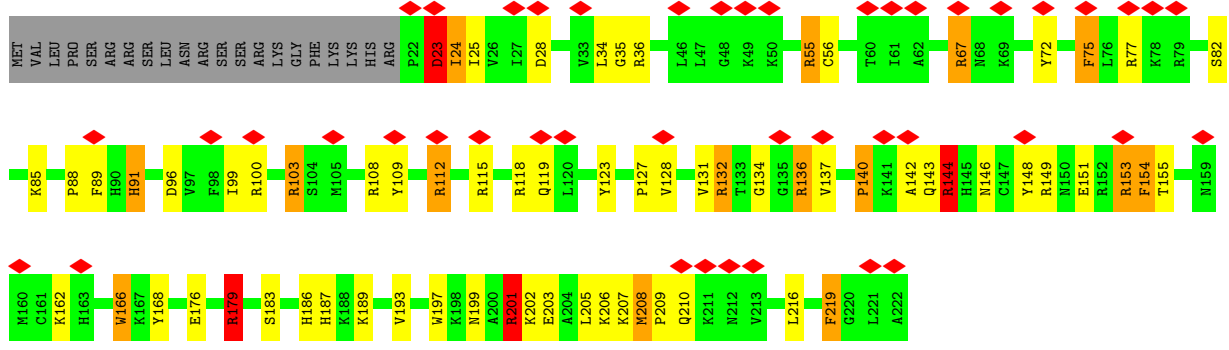


• Molecule 47: 60S RIBOSOMAL PROTEIN L13

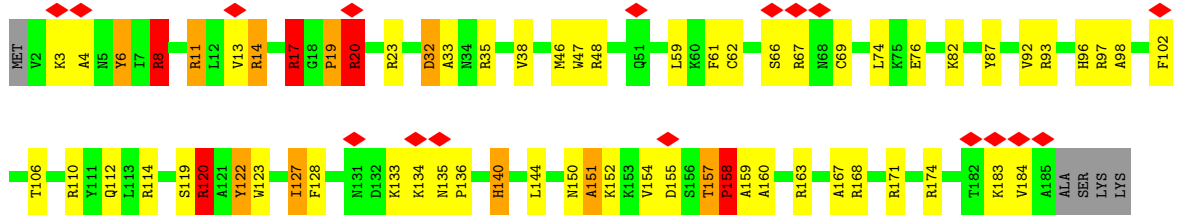




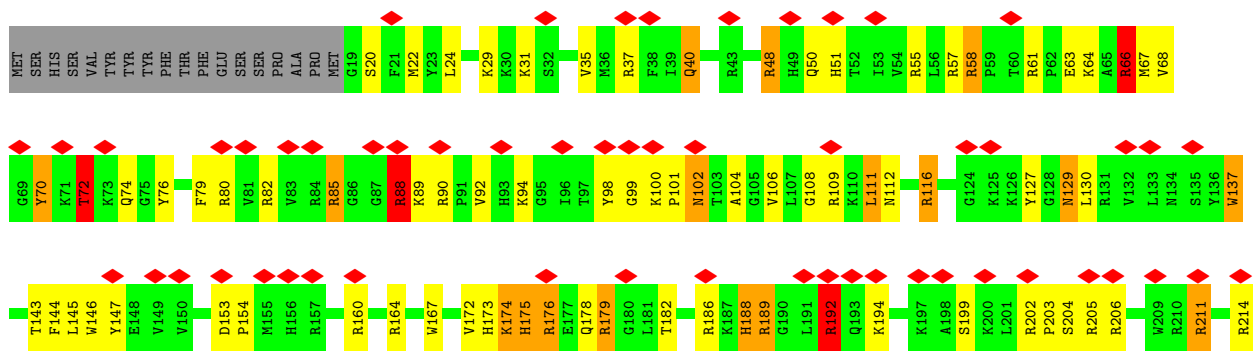
• Molecule 48: 60S RIBOSOMAL PROTEIN L13A, PUTATIVE

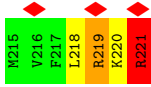


• Molecule 49: PROBABLE 60S RIBOSOMAL PROTEIN L14

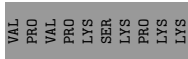
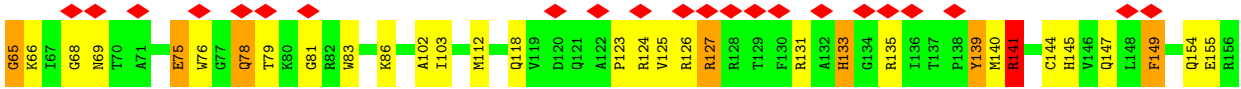
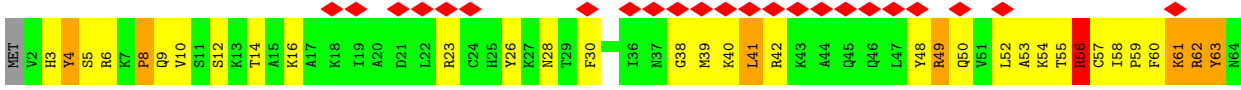


• Molecule 50: RIBOSOMAL PROTEIN L15

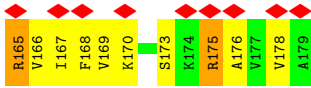
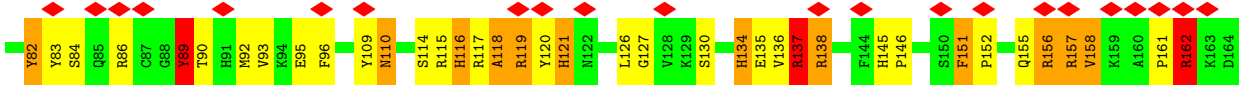
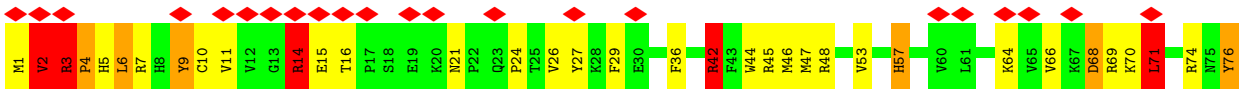




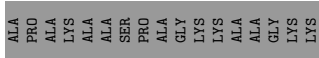
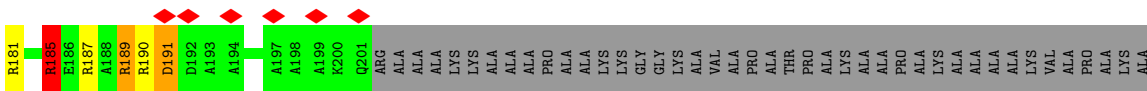
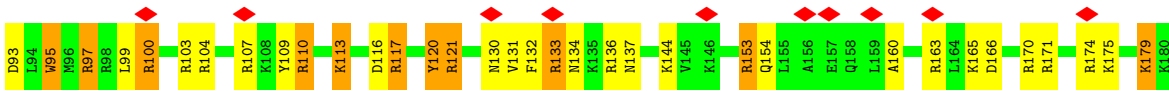
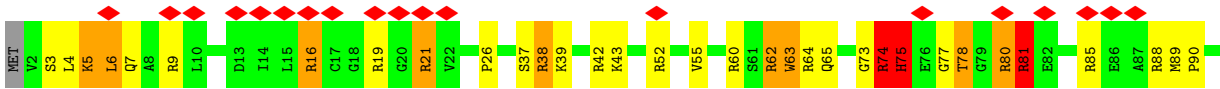
- Molecule 51: 60S RIBOSOMAL PROTEIN L17, PUTATIVE



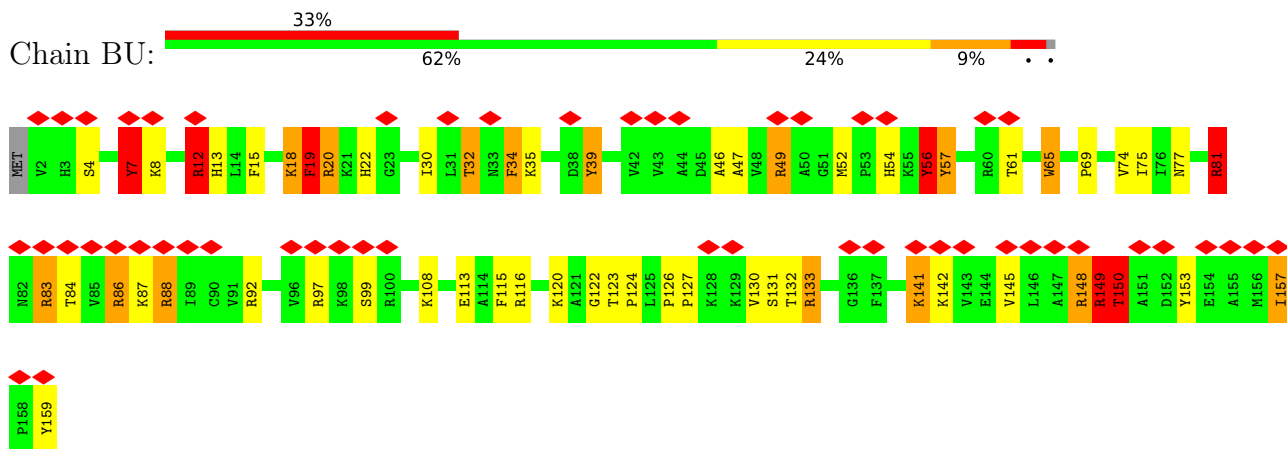
- Molecule 52: 60S RIBOSOMAL PROTEIN L18A



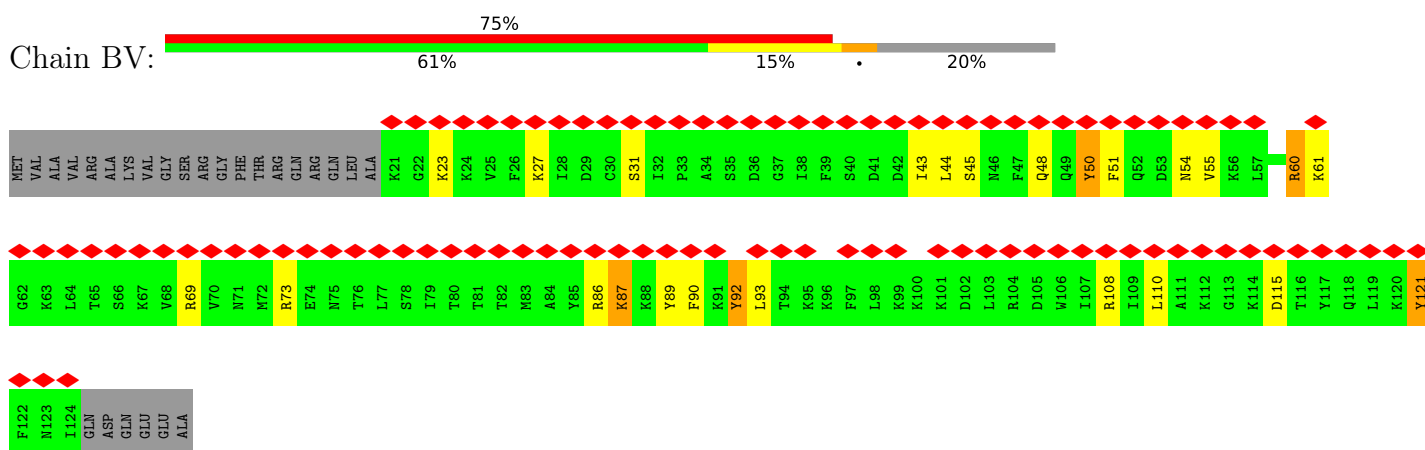
- Molecule 53: 60S RIBOSOMAL PROTEIN L19, PUTATIVE



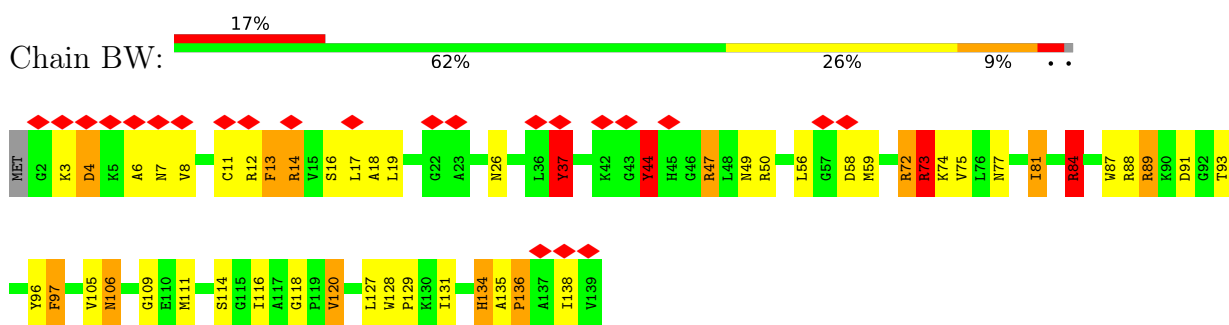
- Molecule 54: 60S RIBOSOMAL PROTEIN L21E, PUTATIVE



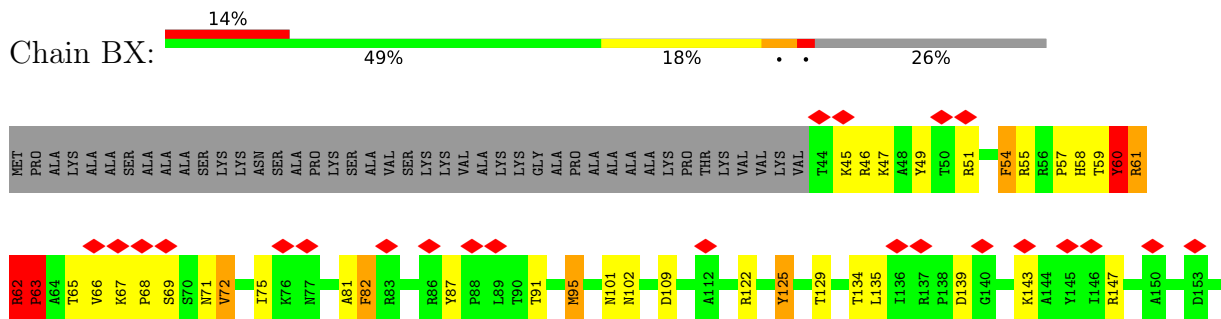
• Molecule 55: 60S RIBOSOMAL PROTEIN L22, PUTATIVE

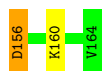


• Molecule 56: 60S RIBOSOMAL PROTEIN L23, PUTATIVE

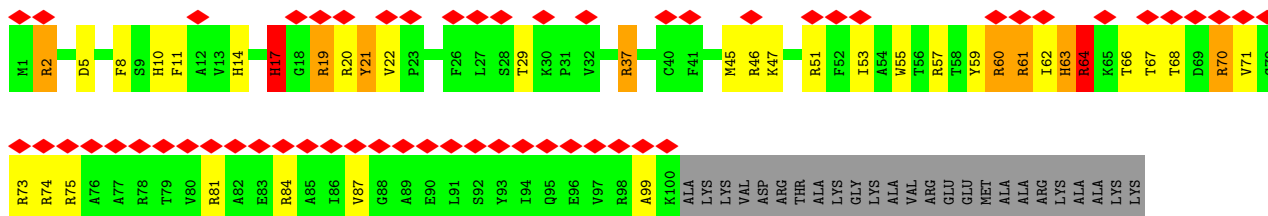


• Molecule 57: 60S RIBOSOMAL PROTEIN L23A

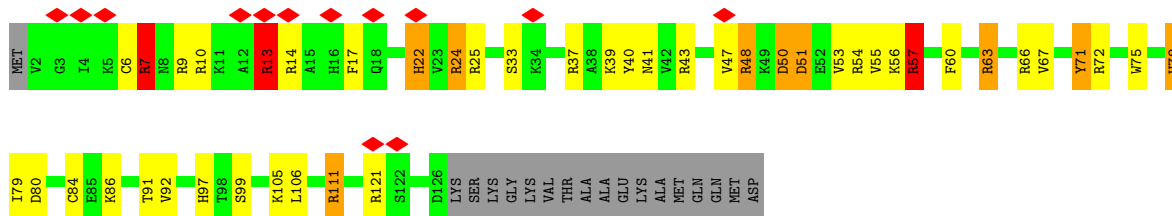




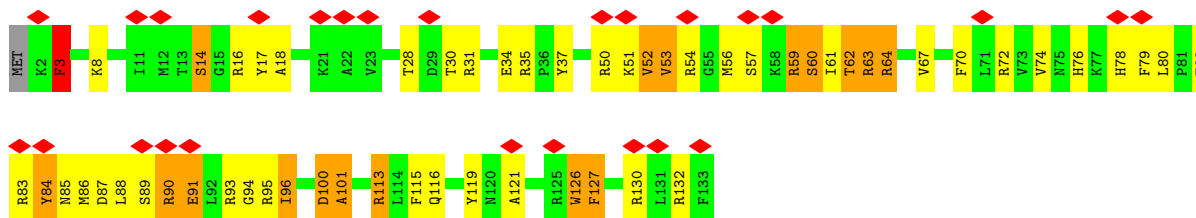
- Molecule 58: 60S RIBOSOMAL PROTEIN L24, PUTATIVE



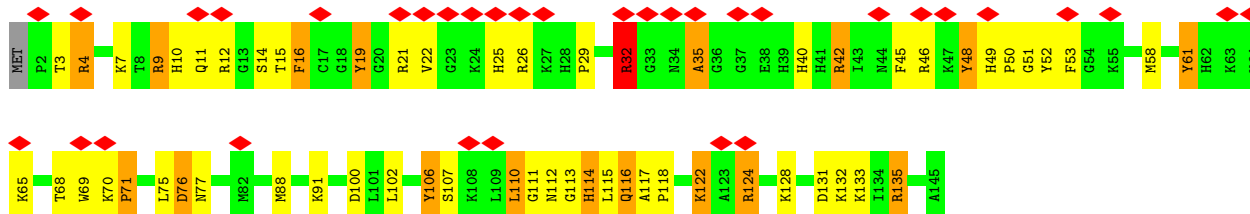
- Molecule 59: 60S RIBOSOMAL PROTEIN L26, PUTATIVE



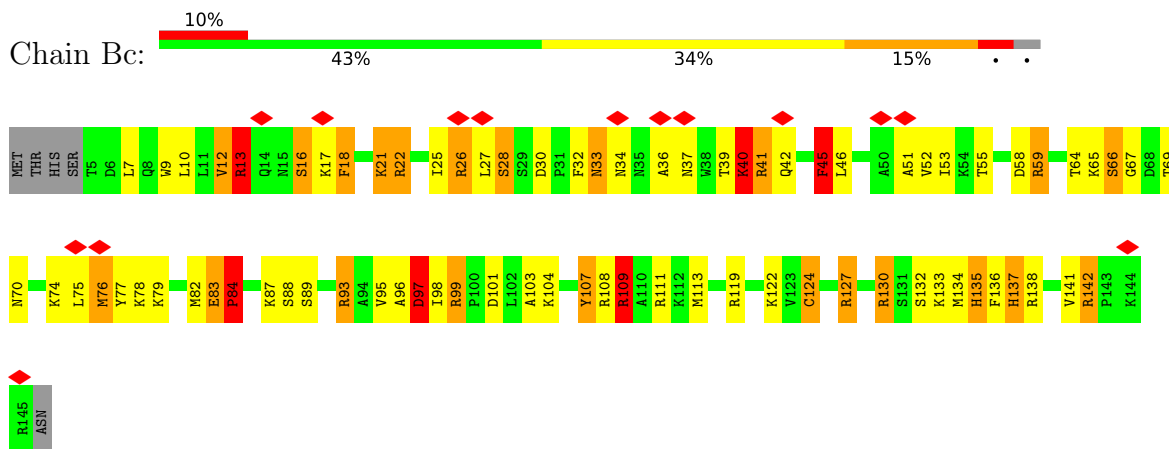
- Molecule 60: 60S RIBOSOMAL PROTEIN L27, PUTATIVE



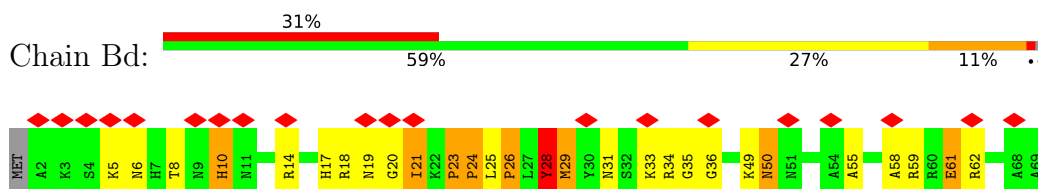
- Molecule 61: 60S RIBOSOMAL PROTEIN L27A



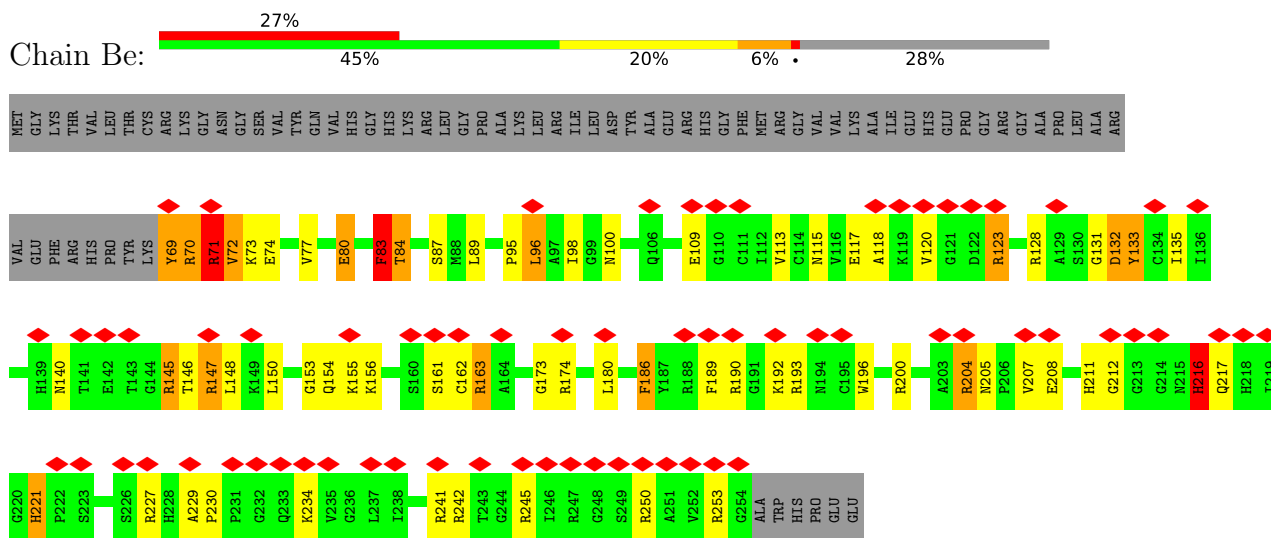
- Molecule 62: 60S RIBOSOMAL PROTEIN L28, PUTATIVE



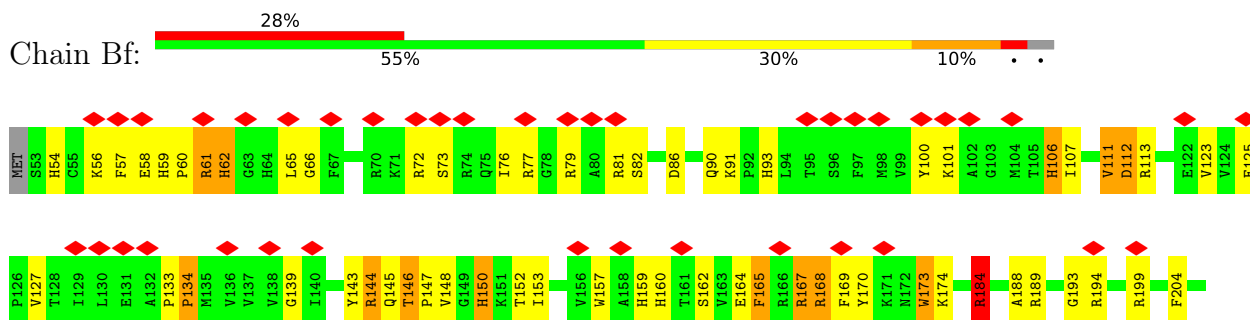
• Molecule 63: 60S RIBOSOMAL PROTEIN L29, PUTATIVE

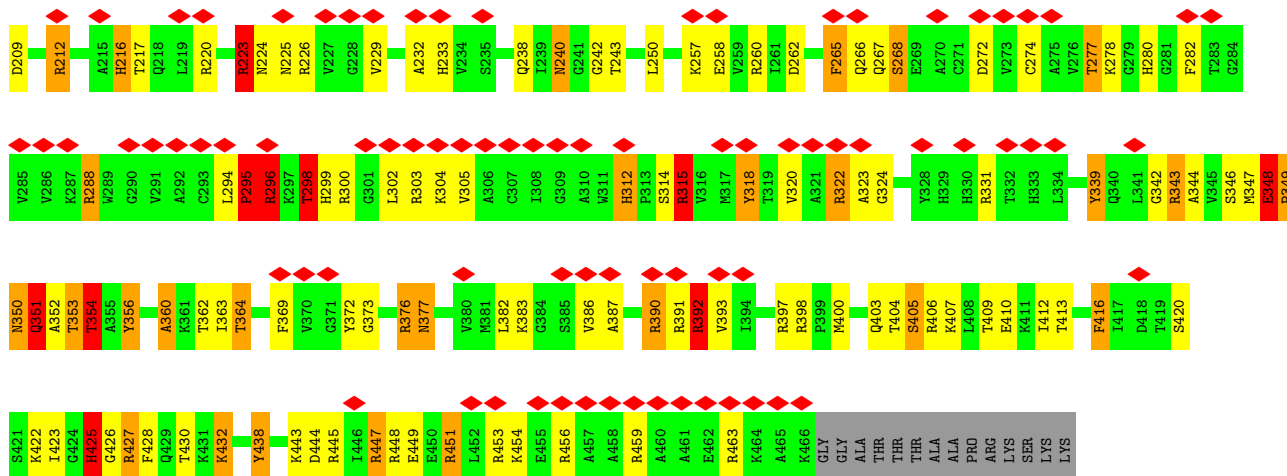


• Molecule 64: 60S RIBOSOMAL PROTEIN L2, PUTATIVE

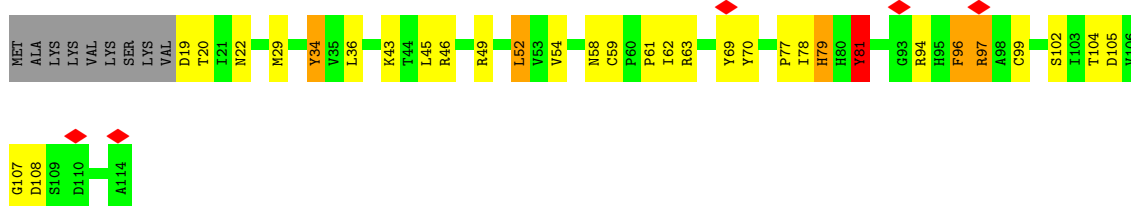


• Molecule 65: RIBOSOMAL PROTEIN L3, MITOCHONDRIAL, PUTATIVE

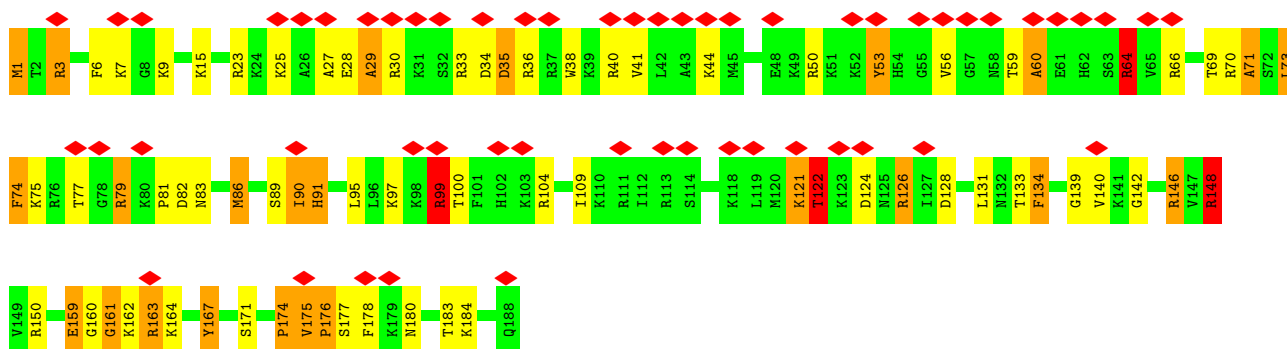




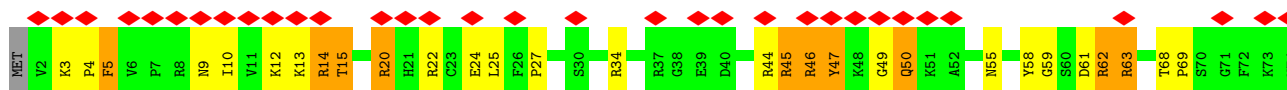
• Molecule 66: 60S RIBOSOMAL PROTEIN L30

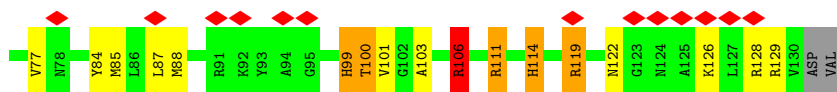


• Molecule 67: 60S RIBOSOMAL SUBUNIT PROTEIN L31, PUTATIVE

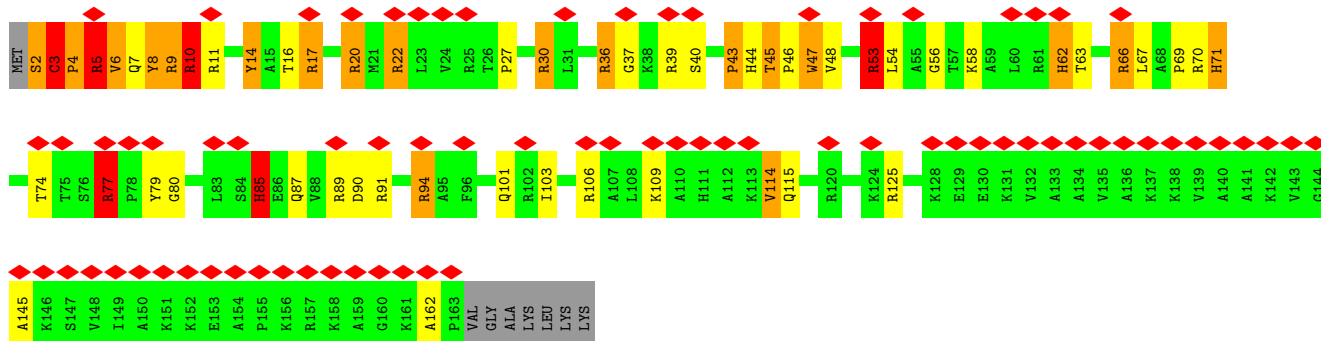


• Molecule 68: 60S RIBOSOMAL PROTEIN L32, PUTATIVE

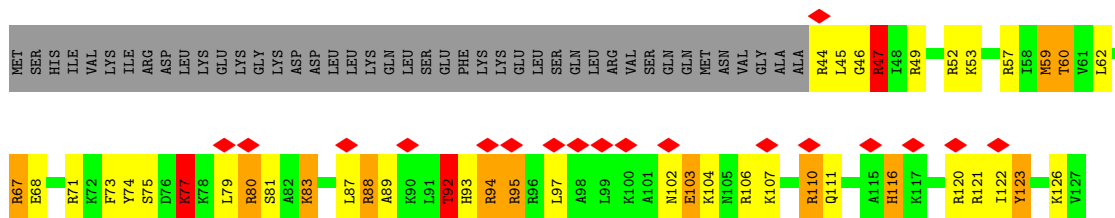
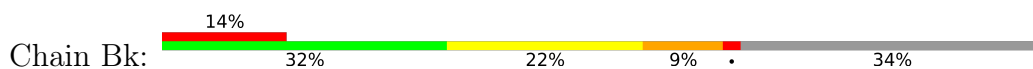




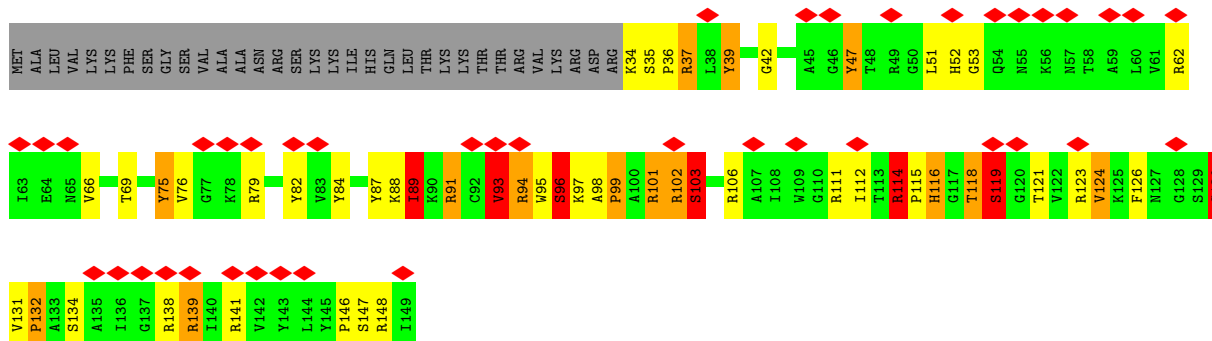
• Molecule 69: 60S RIBOSOMAL PROTEIN L34, PUTATIVE



• Molecule 70: 60S RIBOSOMAL PROTEIN L35, PUTATIVE

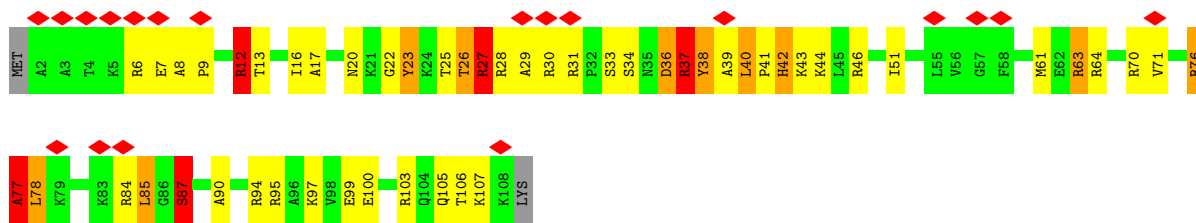


• Molecule 71: 60S RIBOSOMAL PROTEIN L35A, PUTATIVE

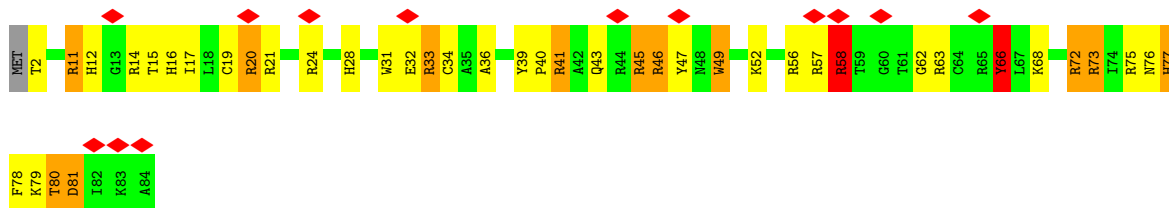


• Molecule 72: RIBOSOMAL PROTEIN L36, PUTATIVE

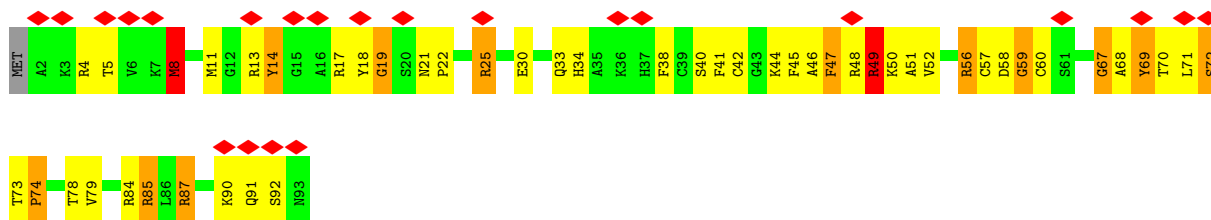




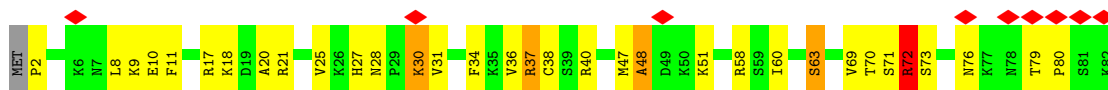
• Molecule 73: RIBOSOMAL PROTEIN L37



• Molecule 74: 60S RIBOSOMAL PROTEIN L37A, PUTATIVE



• Molecule 75: 60S RIBOSOMAL PROTEIN L38, PUTATIVE

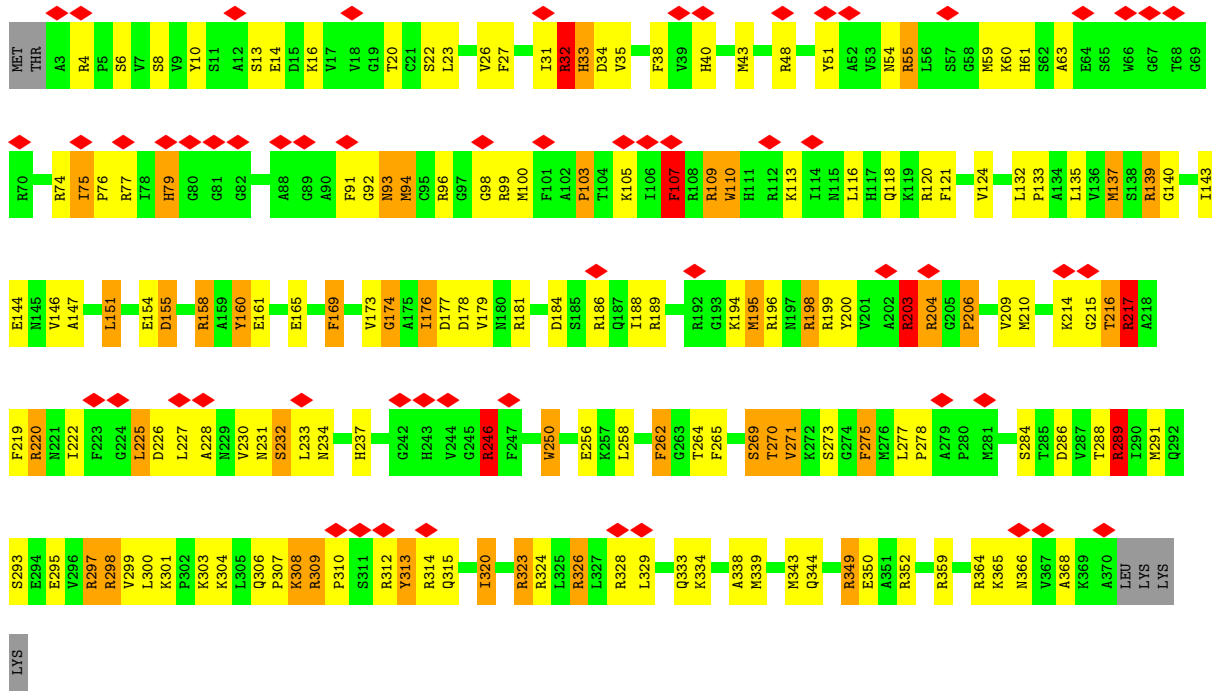


• Molecule 76: 60S RIBOSOMAL PROTEIN L39, PUTATIVE

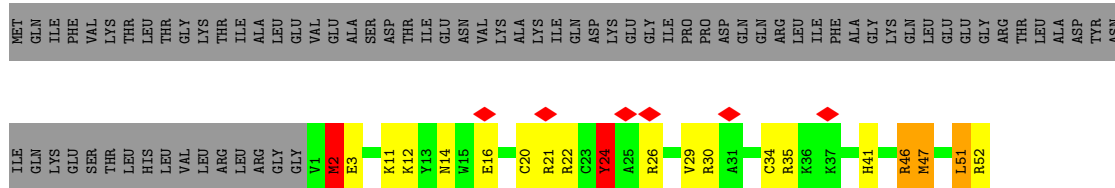


• Molecule 77: 60S RIBOSOMAL PROTEIN L4

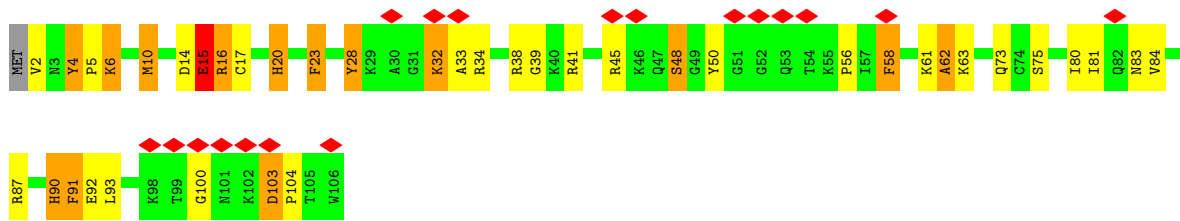




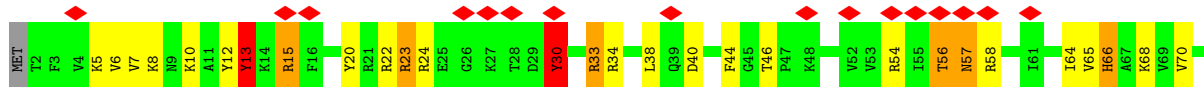
• Molecule 78: UBIQUITIN-60S RIBOSOMAL PROTEIN L40

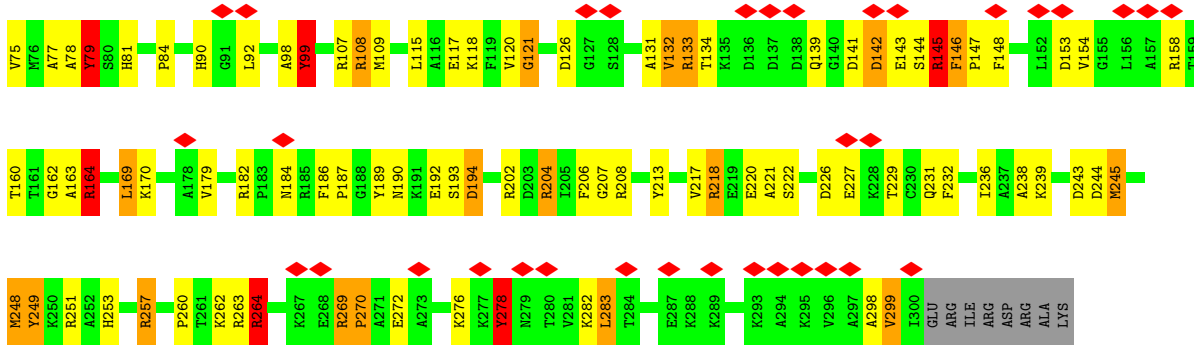


• Molecule 79: 60S RIBOSOMAL PROTEIN L44

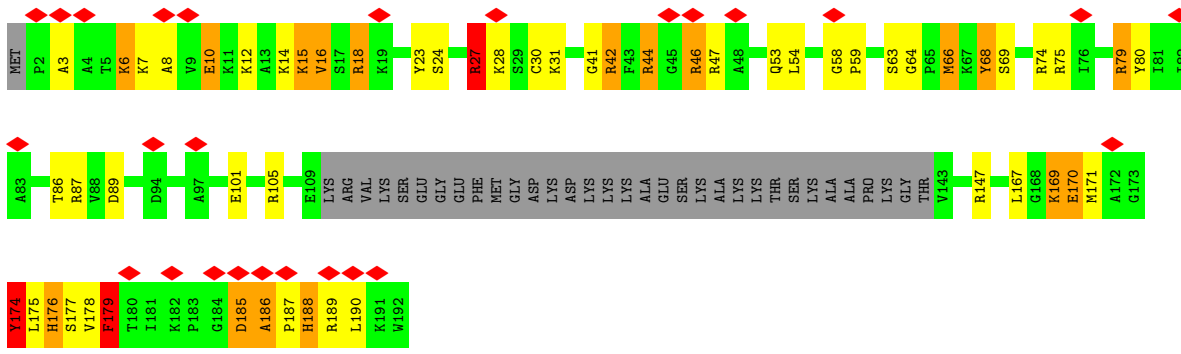


• Molecule 80: 60S RIBOSOMAL PROTEIN L5, PUTATIVE

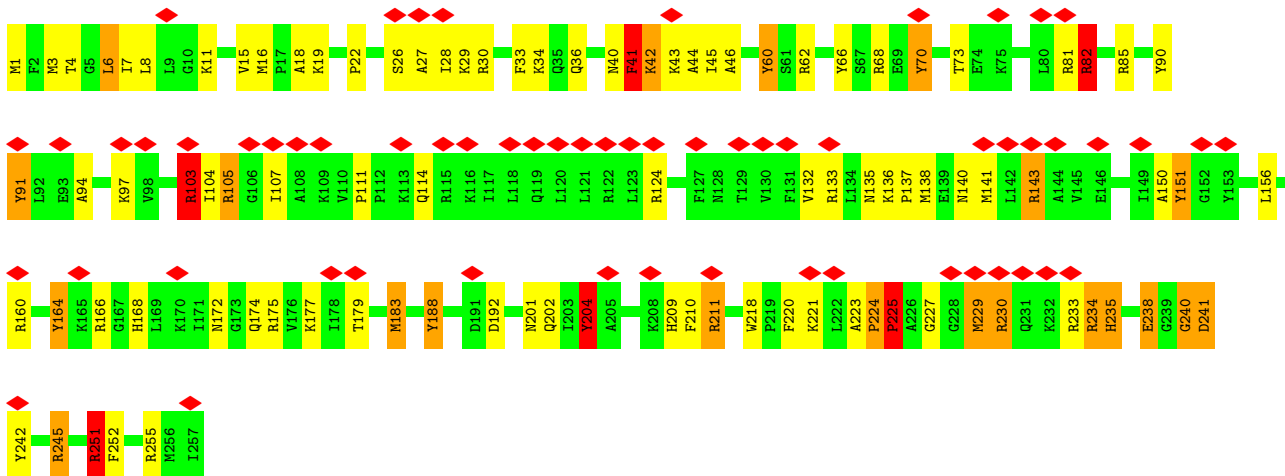




• Molecule 81: 60S RIBOSOMAL PROTEIN L6, PUTATIVE

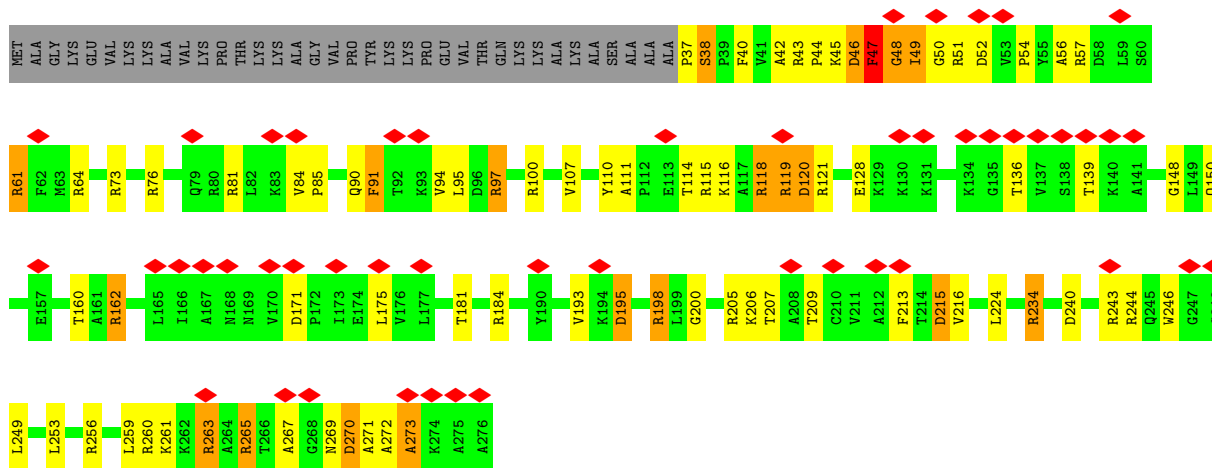


• Molecule 82: 60S RIBOSOMAL PROTEIN L7, PUTATIVE

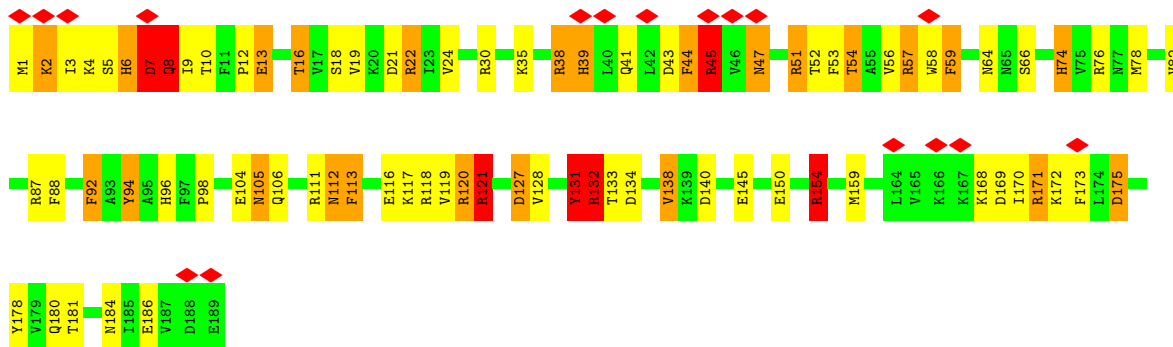


• Molecule 83: 60S RIBOSOMAL PROTEIN L7A, PUTATIVE

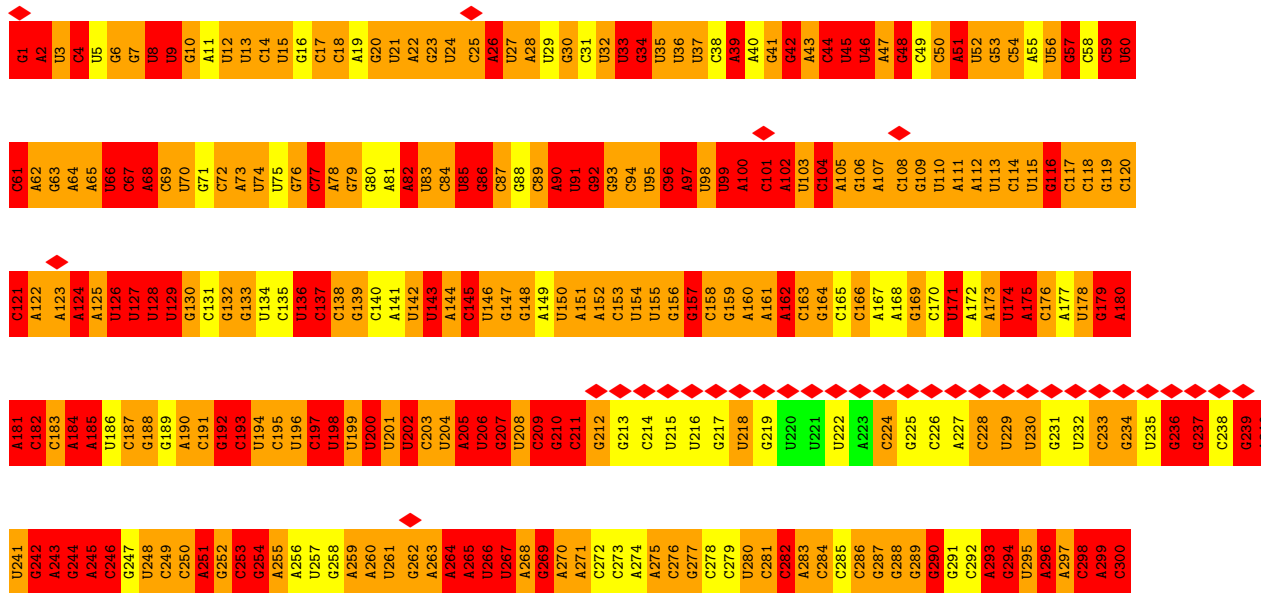




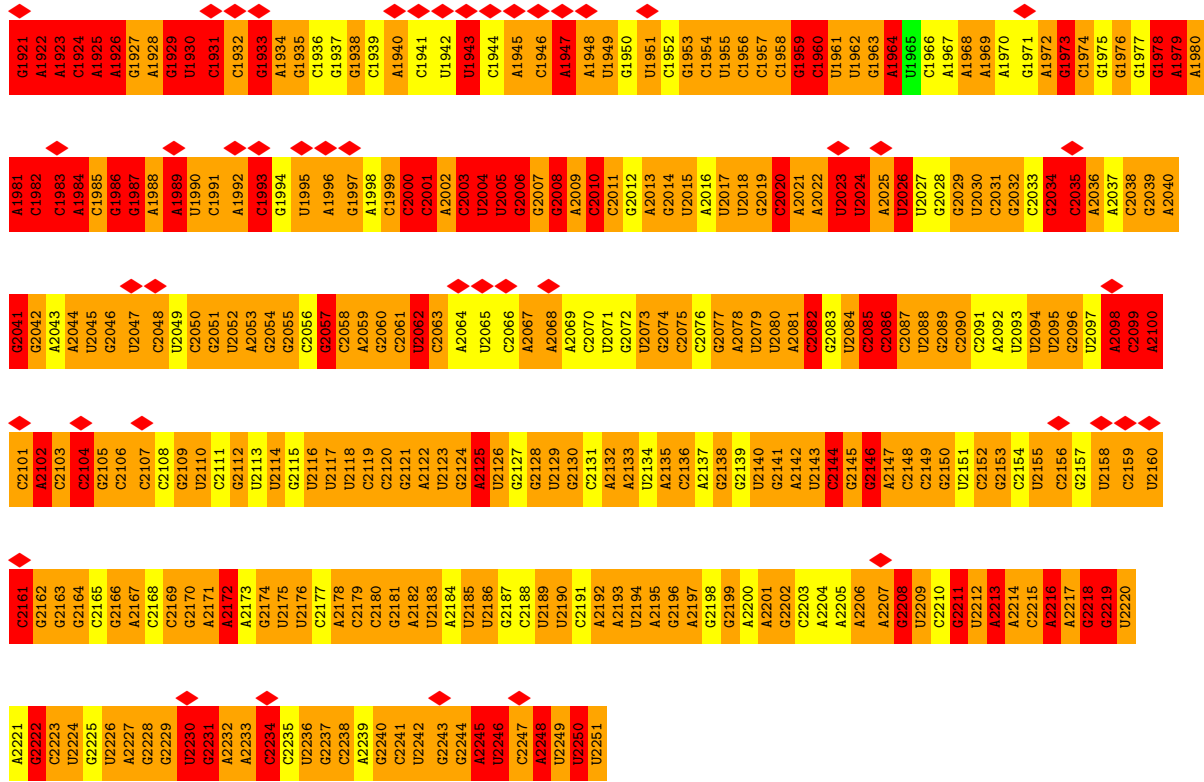
• Molecule 84: 60S RIBOSOMAL PROTEIN L9, PUTATIVE



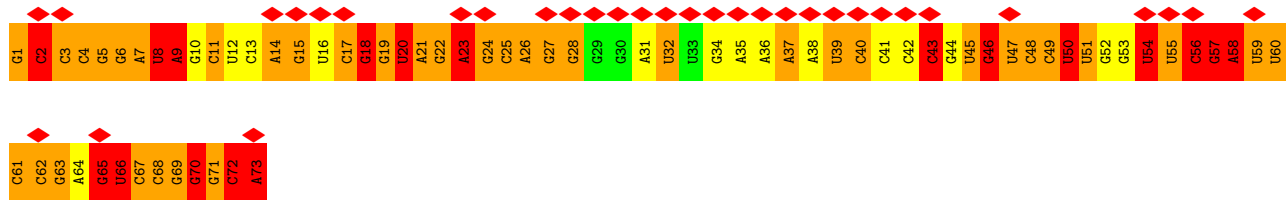
• Molecule 85: 18S RRNA OF THE SMALL RIBOSOMAL SUBUNIT



U1801	A1861	U1802	C1862	U1803	A1863	U1804	G1864	A1805	C1865	A1806	A1866	U1807	G1867	G1808	G1868	U1809	G1869	C1810	U1870	C1811	U1871	C1812	G1872	C1813	U1873	A1874	U1814	A1875	C1815	U1816	C1876	U1817	A1888	C1818	C1878	U1819	C1879	C1820	C1880	C1881	U1882	C1883	A1884	A1885	G1886	U1887	U1888	C1889	U1891	C1892	G1893	C1894	U1835	C1895	U1836	G1896	U1837	A1897	C1838	U1839	A1899	C1900	G1841	U1901	C1842	U1902	A1843	G1903	C1904	U1844	A1905	C1906	G1845	U1846	G1847	G1848	A1849	C1909	G1850	A1851	U1910	C1852	U1911	G1853	U1854	C1913	U1914	A1855	C1915	U1856	G1857	U1918	C1858	U1919	A1859	A1920
G1681	U1682	U1683	U1684	C1625	U1626	U1687	U1688	U1689	A1690	U1691	U1692	C1693	U1694	U1695	C1696	A1697	U1698	C1700	G1701	A1702	U1703	C1704	G1705	U1706	G1707	U1708	U1709	C1710	C1711	G1712	A1713	U1714	C1715	U1716	G1717	C1718	U1719	C1720	A1721	U1722	U1723	U1724	G1725	U1726	U1727	C1728	U1729	C1730	G1731	U1732	G1733	A1734	U1735	U1736	G	U	C	U1678	U1679	U1680																																				
A1501	U1502	A1503	U1504	U1505	U1506	G1507	A1508	C1509	U1510	A1511	U1512	U1513	A1514	A1515	U1516	C1517	U1518	A1519	U1520	A1521	U1522	A1523	G1524	C1525	U1526	U1527	U1528	A1529	U1530	U1531	G1532	U1533	A1534	C1535	U1536	A1537	U1538	U1539	A1540	U1541	A1542	C1543	U1544	U1545	G1546	U1547	A1548	U1549	C1550	U1551	U1552	G1553	C1554	U1555	U1556	U1557	U1558	U1559	A1560																																					
G1441	U1442	U1443	U1444	U1445	U1446	U1447	U1448	C1449	U1450	U1451	C1452	U1453	U1454	A1455	U1456	C1457	U1458	A1459	U1460	A1461	A1462	A1463	G1464	U1465	U1466	U1467	U1468	U1469	A1470	G1471	U1472	U1473	U1474	U1475	C1476	A1477	U1478	U1479	C1480	U1481	C1482	A1483	U1484	U1485	G1486	U1487	U1488	A1489	A1490	U1491	U1492	A1493	G1494	U1495	U1496	U1497	U1498	U1499	A1500																																					
A1201	G1202	G1203	A1204	U1205	C1206	U1207	C1208	U1209	A1210	U1211	U1212	C1213	U1214	A1215	U1216	U1217	C1218	A1219	U1220	G1221	A1222	G1223	C1224	U1225	A1226	U1227	C1228	U1229	A1230	G1231	U1232	G1233	U1234	G1235	U1236	U1237	U1238	C1239	A1240	U1241	A1242	C1243	U1244	A1245	U1246	A1247	U1248	U1249	G1250	A1251	U1252	G1253	U1254	C1255	U1256	U1257	U1258	U1259	A1260																																					
U1321	C1322	G1323	U1324	C1325	U1326	C1327	U1328	U1329	U1330	G1331	U1332	G1333	C1334	C1335	U1336	U1337	C1338	C1339	C1340	U1341	U1342	C1343	G1344	U1345	C1346	U1347	C1348	A1349	U1350	U1351	U1352	A1353	C1354	U1355	U1356	U1357	U1358	C1359	U1360	A1361	U1362	U1363	U1364	U1365	A1366	C1367	G1368	C1369	U1370	C1371	C1372	A1373	U1374	U1375	U1376	C1377	U1378	A1379	U1380																																					
C1381	A1382	C1383	U1384	C1385	U1386	C1387	G1388	U1389	U1390	U1391	C1392	C1393	C1394	U1395	C1396	U1397	U1398	U1399	U1400	G1401	A1402	G1403	U1404	U1405	U1406	C1407	U1408	U1409	C1410	C1411	U1412	G1413	G1414	U1415	U1416	U1417	U1418	U1419	U1420	U1421	A1422	C1423	U1424	G1425	U1426	A1427	U1428	U1429	A1430	U1431	C1432	C1433	U1434	U1435	U1436	U1437	C1438	A1439	U1440																																					
U1261	A1262	G1263	U1264	C1265	U1266	A1267	C1268	U1269	C1270	U1271	G1272	C1273	U1274	A1275	U1276	C1277	U1278	A1279	U1280	G1281	A1282	C1283	U1284	C1285	C1286	U1287	A1288	U1289	G1290	A1291	U1292	U1293	U1294	G1295	U1296	U1297	U1298	A1299	U1300	C1301	A1302	U1303	C1304	A1305	U1306	U1307	G1308	U1309	G1310	U1311	G1312	C1313	C1314	U1315	G1316	U1317	U1318	U1319	G1320																																					
G1171	A1172	G1173	U1174	A1175	C1176	G1177	A1178	U1179	C1180	U1181	A1182	C1183	U1184	A1185	C1186	U1187	A1188	U1189	G1190	C1191	G1192	A1193	U1194	U1195	C1196	U1197	U1198	C1199	A1200																																																																			



• Molecule 86: E-SITE TRNA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	164000	Depositor
Resolution determination method	Not provided	
CTF correction method	PHASE-FLIPPING	Depositor
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	25	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	59000	Depositor
Image detector	KODAK SO-163 FILM	Depositor
Maximum map value	483783.781	Depositor
Minimum map value	-202702.703	Depositor
Average map value	7679.429	Depositor
Map value standard deviation	33729.660	Depositor
Recommended contour level	108000.0	Depositor
Map size (\AA)	391.31, 391.31, 391.31	wwPDB
Map dimensions	359, 359, 359	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.09, 1.09, 1.09	Depositor

5 Model quality i

5.1 Standard geometry i

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	A0	1.19	2/1808 (0.1%)	1.83	45/2432 (1.9%)
2	A1	1.37	5/1973 (0.3%)	1.90	53/2657 (2.0%)
3	A2	1.08	0/1507	1.76	36/2027 (1.8%)
4	A3	1.32	1/2026 (0.0%)	1.92	53/2699 (2.0%)
5	A4	1.33	2/1623 (0.1%)	2.04	60/2185 (2.7%)
6	A5	1.42	6/1574 (0.4%)	1.83	36/2100 (1.7%)
7	A6	1.38	3/1548 (0.2%)	1.95	44/2076 (2.1%)
8	A7	1.06	0/2471	1.64	33/3368 (1.0%)
9	A8	1.09	0/337	1.68	4/445 (0.9%)
10	A9	0.91	0/542	1.55	8/722 (1.1%)
11	AC	1.41	1/1655 (0.1%)	1.76	29/2240 (1.3%)
12	AD	1.02	0/877	1.60	13/1182 (1.1%)
13	AE	1.32	4/1324 (0.3%)	1.83	29/1771 (1.6%)
14	AF	0.76	0/946	1.36	11/1270 (0.9%)
15	AG	1.45	2/1170 (0.2%)	1.93	41/1567 (2.6%)
16	AH	1.24	0/937	1.77	21/1263 (1.7%)
17	AI	0.92	0/1098	1.64	15/1473 (1.0%)
18	AJ	1.29	0/1035	1.78	13/1386 (0.9%)
19	AK	1.06	0/1211	1.77	24/1625 (1.5%)
20	AL	1.24	1/1033 (0.1%)	1.91	27/1380 (2.0%)
21	AM	1.05	0/1247	1.76	29/1666 (1.7%)
22	AO	1.08	0/1206	1.81	23/1613 (1.4%)
23	AP	1.40	1/1766 (0.1%)	1.83	37/2383 (1.6%)
24	AQ	1.11	0/839	1.77	23/1139 (2.0%)
25	AR	1.52	3/612 (0.5%)	1.96	26/835 (3.1%)
26	AS	1.22	0/1137	1.73	27/1520 (1.8%)
27	AT	1.17	2/1065 (0.2%)	1.99	30/1411 (2.1%)
28	AU	1.00	0/681	1.54	6/907 (0.7%)
29	AV	1.17	0/825	1.95	19/1105 (1.7%)
30	AW	1.37	1/648 (0.2%)	1.84	14/868 (1.6%)
31	AX	1.11	2/1649 (0.1%)	1.71	35/2203 (1.6%)
32	AY	1.22	0/521	1.83	9/685 (1.3%)
33	AZ	1.20	1/527 (0.2%)	1.77	13/702 (1.9%)
34	BA	4.08	8852/44057 (20.1%)	3.34	8033/68678 (11.7%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	BB	3.66	5797/34826 (16.6%)	2.99	5090/54269 (9.4%)
36	BC	4.32	938/4004 (23.4%)	3.24	674/6235 (10.8%)
37	BD	4.09	601/2830 (21.2%)	3.33	521/4410 (11.8%)
38	BE	3.90	902/4956 (18.2%)	3.64	1067/7716 (13.8%)
39	BF	3.69	277/1691 (16.4%)	3.64	354/2627 (13.5%)
40	BG	4.34	1057/4358 (24.3%)	3.41	840/6797 (12.4%)
41	BH	3.79	548/3201 (17.1%)	3.52	652/4987 (13.1%)
42	BI	1.47	4/1553 (0.3%)	2.04	64/2070 (3.1%)
43	BJ	0.72	0/1743	1.28	12/2339 (0.5%)
44	BK	1.40	3/1760 (0.2%)	1.89	45/2359 (1.9%)
45	BL	1.33	1/1385 (0.1%)	1.80	33/1851 (1.8%)
46	BM	0.67	0/1033	1.21	1/1394 (0.1%)
47	BN	2.40	4/1793 (0.2%)	2.18	80/2392 (3.3%)
48	BO	1.46	2/1655 (0.1%)	1.84	44/2214 (2.0%)
49	BP	1.48	3/1506 (0.2%)	1.97	45/2014 (2.2%)
50	BQ	1.52	1/1755 (0.1%)	1.84	42/2346 (1.8%)
51	BR	1.39	1/1270 (0.1%)	1.99	39/1705 (2.3%)
52	BS	1.36	3/1508 (0.2%)	2.06	54/2028 (2.7%)
53	BT	1.45	1/1689 (0.1%)	1.97	65/2232 (2.9%)
54	BU	1.35	1/1290 (0.1%)	1.89	39/1734 (2.2%)
55	BV	0.96	0/878	1.57	13/1169 (1.1%)
56	BW	1.44	5/1059 (0.5%)	2.00	32/1424 (2.2%)
57	BX	1.56	4/1007 (0.4%)	1.97	35/1353 (2.6%)
58	BY	1.28	1/857 (0.1%)	1.82	26/1150 (2.3%)
59	BZ	1.44	3/1021 (0.3%)	2.07	43/1362 (3.2%)
60	Ba	1.40	0/1111	1.95	31/1479 (2.1%)
61	Bb	1.35	4/1165 (0.3%)	1.92	34/1554 (2.2%)
62	Bc	2.50	3/1145 (0.3%)	2.20	62/1528 (4.1%)
63	Bd	1.21	2/582 (0.3%)	1.98	22/777 (2.8%)
64	Be	1.50	7/1416 (0.5%)	1.91	38/1905 (2.0%)
65	Bf	1.43	8/3387 (0.2%)	1.99	129/4548 (2.8%)
66	Bg	1.75	3/745 (0.4%)	2.09	23/1005 (2.3%)
67	Bh	1.27	4/1551 (0.3%)	2.00	56/2059 (2.7%)
68	Bi	1.39	2/1076 (0.2%)	1.91	30/1439 (2.1%)
69	Bj	1.24	3/1312 (0.2%)	1.85	34/1743 (2.0%)
70	Bk	1.46	0/726	2.06	31/957 (3.2%)
71	Bl	1.44	4/958 (0.4%)	2.05	35/1290 (2.7%)
72	Bm	1.54	1/859 (0.1%)	1.97	29/1141 (2.5%)
73	Bn	1.60	1/713 (0.1%)	2.01	28/949 (3.0%)
74	Bo	1.70	8/727 (1.1%)	1.88	26/968 (2.7%)
75	Bp	1.50	1/666 (0.2%)	1.87	15/885 (1.7%)
76	Bq	1.31	1/471 (0.2%)	1.71	9/626 (1.4%)
77	Br	1.46	5/2937 (0.2%)	1.98	106/3943 (2.7%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
78	Bs	1.40	1/433 (0.2%)	1.86	12/572 (2.1%)
79	Bt	1.36	1/883 (0.1%)	1.87	24/1170 (2.1%)
80	Bu	1.30	1/2397 (0.0%)	1.88	65/3219 (2.0%)
81	Bv	1.30	1/1242 (0.1%)	1.84	29/1667 (1.7%)
82	Bw	1.44	2/2105 (0.1%)	1.91	49/2823 (1.7%)
83	Bx	1.48	5/1936 (0.3%)	1.85	38/2603 (1.5%)
84	By	1.32	1/1561 (0.1%)	1.95	62/2098 (3.0%)
85	AA	3.42	7237/52940 (13.7%)	3.10	8226/82489 (10.0%)
86	AB	2.36	80/1740 (4.6%)	2.66	188/2712 (6.9%)
All	All	3.06	26432/250887 (10.5%)	2.80	28260/369909 (7.6%)

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
1	A0	0	19
2	A1	0	18
3	A2	0	11
4	A3	0	23
5	A4	0	27
6	A5	0	23
7	A6	0	26
8	A7	0	17
9	A8	0	4
10	A9	0	4
11	AC	0	21
12	AD	0	10
13	AE	0	25
14	AF	0	6
15	AG	0	17
16	AH	0	8
17	AI	0	10
18	AJ	0	11
19	AK	0	20
20	AL	0	6
21	AM	0	18
22	AO	0	17
23	AP	0	14
24	AQ	0	7
25	AR	0	12

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Mol	Chain	#Chirality outliers	#Planarity outliers
26	AS	0	7
27	AT	0	27
28	AU	0	7
29	AV	0	13
30	AW	0	13
31	AX	0	10
32	AY	0	13
33	AZ	0	3
34	BA	0	1404
35	BB	0	967
36	BC	0	128
37	BD	0	89
38	BE	0	169
39	BF	0	61
40	BG	0	144
41	BH	0	87
42	BI	0	19
43	BJ	0	7
44	BK	0	26
45	BL	0	15
47	BN	1	31
48	BO	0	21
49	BP	0	24
50	BQ	0	28
51	BR	0	21
52	BS	0	21
53	BT	0	24
54	BU	0	21
55	BV	0	6
56	BW	0	10
57	BX	0	7
58	BY	0	15
59	BZ	0	12
60	Ba	0	20
61	Bb	0	15
62	Bc	0	27
63	Bd	0	10
64	Be	0	21
65	Bf	0	48
66	Bg	0	8
67	Bh	0	23
68	Bi	0	13

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Mol	Chain	#Chirality outliers	#Planarity outliers
69	Bj	1	23
70	Bk	0	12
71	Bl	0	23
72	Bm	0	16
73	Bn	0	14
74	Bo	0	12
75	Bp	0	6
76	Bq	0	9
77	Br	0	46
78	Bs	0	5
79	Bt	0	13
80	Bu	0	34
81	Bv	0	22
82	Bw	0	32
83	Bx	0	19
84	By	1	27
85	AA	0	1567
86	AB	0	45
All	All	3	5934

The worst 5 of 26432 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
85	AA	469	G	C5-C4	80.15	1.94	1.38
47	BN	7	ALA	CA-C	79.39	3.59	1.52
34	BA	743	A	N9-C4	74.20	1.82	1.37
62	Bc	78	LYS	CD-CE	69.91	3.26	1.51
34	BA	214	A	C6-N1	57.25	1.75	1.35

The worst 5 of 28260 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
85	AA	469	G	N9-C4-C5	-49.23	85.71	105.40
39	BF	32	G	P-O3'-C3'	41.15	169.07	119.70
35	BB	1212	C	C6-N1-C2	-40.14	104.24	120.30
85	AA	769	C	C6-N1-C2	-39.18	104.63	120.30
34	BA	692	U	P-O3'-C3'	38.13	165.46	119.70

All (3) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
47	BN	66	PRO	CA

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Mol	Chain	Res	Type	Atom
69	Bj	5	ARG	CA
84	By	7	ASP	CA

5 of 5934 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A0	103	HIS	Sidechain
1	A0	41	ARG	Sidechain
1	A0	43	PHE	Sidechain
1	A0	64	ARG	Sidechain
1	A0	83	TYR	Sidechain

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	A0	217/256 (85%)	180 (83%)	22 (10%)	15 (7%)	1	14
2	A1	246/273 (90%)	189 (77%)	38 (15%)	19 (8%)	1	13
3	A2	185/190 (97%)	159 (86%)	17 (9%)	9 (5%)	2	20
4	A3	248/250 (99%)	204 (82%)	24 (10%)	20 (8%)	1	12
5	A4	190/202 (94%)	148 (78%)	24 (13%)	18 (10%)	0	10
6	A5	191/220 (87%)	158 (83%)	18 (9%)	15 (8%)	1	12
7	A6	185/190 (97%)	135 (73%)	30 (16%)	20 (11%)	0	8
8	A7	313/318 (98%)	256 (82%)	39 (12%)	18 (6%)	1	18
9	A8	40/57 (70%)	34 (85%)	3 (8%)	3 (8%)	1	13
10	A9	64/153 (42%)	50 (78%)	9 (14%)	5 (8%)	1	13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	AC	202/277 (73%)	162 (80%)	25 (12%)	15 (7%)	1	13
12	AD	102/172 (59%)	79 (78%)	9 (9%)	14 (14%)	0	4
13	AE	158/174 (91%)	126 (80%)	12 (8%)	20 (13%)	0	5
14	AF	119/144 (83%)	105 (88%)	11 (9%)	3 (2%)	5	32
15	AG	139/151 (92%)	120 (86%)	12 (9%)	7 (5%)	2	20
16	AH	124/144 (86%)	99 (80%)	14 (11%)	11 (9%)	1	11
17	AI	132/152 (87%)	100 (76%)	21 (16%)	11 (8%)	1	12
18	AJ	127/130 (98%)	114 (90%)	7 (6%)	6 (5%)	2	21
19	AK	146/149 (98%)	118 (81%)	18 (12%)	10 (7%)	1	15
20	AL	125/142 (88%)	94 (75%)	19 (15%)	12 (10%)	0	9
21	AM	151/153 (99%)	114 (76%)	16 (11%)	21 (14%)	0	4
22	AO	147/167 (88%)	128 (87%)	10 (7%)	9 (6%)	1	16
23	AP	222/266 (84%)	171 (77%)	29 (13%)	22 (10%)	0	9
24	AQ	103/117 (88%)	86 (84%)	10 (10%)	7 (7%)	1	15
25	AR	79/194 (41%)	59 (75%)	12 (15%)	8 (10%)	0	9
26	AS	140/143 (98%)	111 (79%)	18 (13%)	11 (8%)	1	12
27	AT	129/137 (94%)	100 (78%)	15 (12%)	14 (11%)	0	8
28	AU	84/113 (74%)	66 (79%)	12 (14%)	6 (7%)	1	14
29	AV	99/111 (89%)	64 (65%)	20 (20%)	15 (15%)	0	4
30	AW	81/86 (94%)	61 (75%)	11 (14%)	9 (11%)	0	7
31	AX	204/214 (95%)	176 (86%)	17 (8%)	11 (5%)	2	19
32	AY	63/66 (96%)	46 (73%)	8 (13%)	9 (14%)	0	4
33	AZ	66/103 (64%)	56 (85%)	7 (11%)	3 (4%)	2	22
42	BI	190/193 (98%)	126 (66%)	37 (20%)	27 (14%)	0	4
43	BJ	212/214 (99%)	186 (88%)	20 (9%)	6 (3%)	5	30
44	BK	210/213 (99%)	161 (77%)	26 (12%)	23 (11%)	0	7
45	BL	168/194 (87%)	134 (80%)	21 (12%)	13 (8%)	1	13
46	BM	137/164 (84%)	103 (75%)	25 (18%)	9 (7%)	1	15
47	BN	214/218 (98%)	158 (74%)	20 (9%)	36 (17%)	0	3
48	BO	199/222 (90%)	164 (82%)	21 (11%)	14 (7%)	1	14
49	BP	182/189 (96%)	149 (82%)	19 (10%)	14 (8%)	1	13

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	BQ	201/221 (91%)	160 (80%)	21 (10%)	20 (10%)	0	9
51	BR	153/166 (92%)	121 (79%)	21 (14%)	11 (7%)	1	14
52	BS	177/179 (99%)	133 (75%)	15 (8%)	29 (16%)	0	3
53	BT	198/260 (76%)	168 (85%)	20 (10%)	10 (5%)	2	19
54	BU	156/159 (98%)	118 (76%)	19 (12%)	19 (12%)	0	5
55	BV	102/130 (78%)	84 (82%)	13 (13%)	5 (5%)	2	20
56	BW	136/139 (98%)	103 (76%)	18 (13%)	15 (11%)	0	7
57	BX	119/164 (73%)	97 (82%)	9 (8%)	13 (11%)	0	8
58	BY	98/125 (78%)	81 (83%)	9 (9%)	8 (8%)	1	12
59	BZ	123/143 (86%)	104 (85%)	12 (10%)	7 (6%)	1	18
60	Ba	130/133 (98%)	93 (72%)	21 (16%)	16 (12%)	0	5
61	Bb	142/145 (98%)	108 (76%)	19 (13%)	15 (11%)	0	8
62	Bc	139/146 (95%)	103 (74%)	18 (13%)	18 (13%)	0	5
63	Bd	68/71 (96%)	50 (74%)	8 (12%)	10 (15%)	0	4
64	Be	184/260 (71%)	135 (73%)	32 (17%)	17 (9%)	1	10
65	Bf	412/429 (96%)	296 (72%)	66 (16%)	50 (12%)	0	5
66	Bg	94/105 (90%)	88 (94%)	5 (5%)	1 (1%)	14	51
67	Bh	186/188 (99%)	155 (83%)	13 (7%)	18 (10%)	0	9
68	Bi	127/132 (96%)	98 (77%)	18 (14%)	11 (9%)	1	11
69	Bj	160/170 (94%)	123 (77%)	22 (14%)	15 (9%)	0	10
70	Bk	82/127 (65%)	56 (68%)	14 (17%)	12 (15%)	0	4
71	Bl	114/149 (76%)	84 (74%)	10 (9%)	20 (18%)	0	3
72	Bm	105/109 (96%)	79 (75%)	8 (8%)	18 (17%)	0	3
73	Bn	81/84 (96%)	56 (69%)	15 (18%)	10 (12%)	0	5
74	Bo	90/93 (97%)	71 (79%)	6 (7%)	13 (14%)	0	4
75	Bp	79/82 (96%)	59 (75%)	10 (13%)	10 (13%)	0	5
76	Bq	48/51 (94%)	34 (71%)	6 (12%)	8 (17%)	0	3
77	Br	366/374 (98%)	274 (75%)	56 (15%)	36 (10%)	0	9
78	Bs	50/128 (39%)	44 (88%)	4 (8%)	2 (4%)	3	23
79	Bt	103/106 (97%)	75 (73%)	16 (16%)	12 (12%)	0	6
80	Bu	297/308 (96%)	216 (73%)	46 (16%)	35 (12%)	0	6

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
81	Bv	154/192 (80%)	114 (74%)	25 (16%)	15 (10%)	0	9
82	Bw	255/257 (99%)	200 (78%)	33 (13%)	22 (9%)	1	11
83	Bx	238/276 (86%)	188 (79%)	26 (11%)	24 (10%)	0	9
84	By	187/189 (99%)	155 (83%)	15 (8%)	17 (9%)	1	11
All	All	11687/13211 (88%)	9172 (78%)	1415 (12%)	1100 (9%)	1	10

5 of 1100 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A0	37	ASN
1	A0	119	TRP
1	A0	145	THR
1	A0	212	LEU
1	A0	225	PHE

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A0	189/218 (87%)	159 (84%)	30 (16%)	2	14
2	A1	209/231 (90%)	172 (82%)	37 (18%)	2	11
3	A2	158/160 (99%)	132 (84%)	26 (16%)	2	13
4	A3	207/207 (100%)	174 (84%)	33 (16%)	2	14
5	A4	176/187 (94%)	144 (82%)	32 (18%)	1	10
6	A5	158/180 (88%)	140 (89%)	18 (11%)	5	23
7	A6	162/166 (98%)	137 (85%)	25 (15%)	2	15
8	A7	264/267 (99%)	232 (88%)	32 (12%)	5	21
9	A8	36/49 (74%)	32 (89%)	4 (11%)	6	24
10	A9	57/126 (45%)	52 (91%)	5 (9%)	10	33
11	AC	179/243 (74%)	143 (80%)	36 (20%)	1	8
12	AD	92/131 (70%)	81 (88%)	11 (12%)	5	21

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
13	AE	143/156 (92%)	126 (88%)	17 (12%)	5	21
14	AF	102/120 (85%)	99 (97%)	3 (3%)	42	64
15	AG	124/131 (95%)	110 (89%)	14 (11%)	6	23
16	AH	95/112 (85%)	83 (87%)	12 (13%)	4	20
17	AI	110/128 (86%)	102 (93%)	8 (7%)	14	40
18	AJ	108/109 (99%)	90 (83%)	18 (17%)	2	13
19	AK	123/124 (99%)	105 (85%)	18 (15%)	3	16
20	AL	111/122 (91%)	101 (91%)	10 (9%)	9	32
21	AM	133/133 (100%)	121 (91%)	12 (9%)	9	32
22	AO	123/137 (90%)	107 (87%)	16 (13%)	4	19
23	AP	185/204 (91%)	154 (83%)	31 (17%)	2	12
24	AQ	94/104 (90%)	84 (89%)	10 (11%)	6	25
25	AR	66/150 (44%)	55 (83%)	11 (17%)	2	13
26	AS	117/118 (99%)	105 (90%)	12 (10%)	7	26
27	AT	110/116 (95%)	82 (74%)	28 (26%)	0	4
28	AU	73/94 (78%)	67 (92%)	6 (8%)	11	36
29	AV	87/97 (90%)	74 (85%)	13 (15%)	3	16
30	AW	71/75 (95%)	58 (82%)	13 (18%)	1	10
31	AX	173/180 (96%)	155 (90%)	18 (10%)	7	26
32	AY	52/53 (98%)	41 (79%)	11 (21%)	1	6
33	AZ	57/84 (68%)	52 (91%)	5 (9%)	10	33
42	BI	164/165 (99%)	140 (85%)	24 (15%)	3	16
43	BJ	201/201 (100%)	189 (94%)	12 (6%)	19	46
44	BK	184/185 (100%)	154 (84%)	30 (16%)	2	13
45	BL	146/167 (87%)	120 (82%)	26 (18%)	2	11
46	BM	114/137 (83%)	106 (93%)	8 (7%)	15	41
47	BN	185/188 (98%)	142 (77%)	43 (23%)	1	5
48	BO	175/195 (90%)	150 (86%)	25 (14%)	3	17
49	BP	156/160 (98%)	139 (89%)	17 (11%)	6	24
50	BQ	176/193 (91%)	147 (84%)	29 (16%)	2	13
51	BR	132/144 (92%)	106 (80%)	26 (20%)	1	8

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
52	BS	160/160 (100%)	130 (81%)	30 (19%)	1	9
53	BT	170/198 (86%)	144 (85%)	26 (15%)	2	15
54	BU	133/134 (99%)	115 (86%)	18 (14%)	4	18
55	BV	95/116 (82%)	85 (90%)	10 (10%)	7	26
56	BW	107/108 (99%)	86 (80%)	21 (20%)	1	8
57	BX	108/136 (79%)	97 (90%)	11 (10%)	7	26
58	BY	85/102 (83%)	78 (92%)	7 (8%)	11	36
59	BZ	110/125 (88%)	98 (89%)	12 (11%)	6	24
60	Ba	116/117 (99%)	100 (86%)	16 (14%)	3	18
61	Bb	115/116 (99%)	95 (83%)	20 (17%)	2	11
62	Bc	124/130 (95%)	95 (77%)	29 (23%)	1	5
63	Bd	58/59 (98%)	54 (93%)	4 (7%)	15	42
64	Be	145/204 (71%)	122 (84%)	23 (16%)	2	14
65	Bf	349/360 (97%)	305 (87%)	44 (13%)	4	20
66	Bg	84/92 (91%)	72 (86%)	12 (14%)	3	17
67	Bh	162/162 (100%)	136 (84%)	26 (16%)	2	14
68	Bi	113/117 (97%)	96 (85%)	17 (15%)	3	16
69	Bj	130/137 (95%)	105 (81%)	25 (19%)	1	9
70	Bk	75/114 (66%)	60 (80%)	15 (20%)	1	8
71	Bl	97/126 (77%)	81 (84%)	16 (16%)	2	13
72	Bm	87/90 (97%)	72 (83%)	15 (17%)	2	12
73	Bn	70/71 (99%)	55 (79%)	15 (21%)	1	6
74	Bo	74/76 (97%)	59 (80%)	15 (20%)	1	7
75	Bp	76/77 (99%)	68 (90%)	8 (10%)	7	26
76	Bq	46/47 (98%)	35 (76%)	11 (24%)	0	4
77	Br	304/310 (98%)	251 (83%)	53 (17%)	2	11
78	Bs	46/111 (41%)	38 (83%)	8 (17%)	2	11
79	Bt	94/95 (99%)	83 (88%)	11 (12%)	5	22
80	Bu	238/247 (96%)	199 (84%)	39 (16%)	2	13
81	Bv	132/160 (82%)	112 (85%)	20 (15%)	3	15
82	Bw	213/213 (100%)	176 (83%)	37 (17%)	2	11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
83	Bx	203/229 (89%)	173 (85%)	30 (15%)	3 16
84	By	172/172 (100%)	138 (80%)	34 (20%)	1 8
All	All	10068/11158 (90%)	8575 (85%)	1493 (15%)	6 16

5 of 1493 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
57	BX	134	THR
69	Bj	27	PRO
60	Ba	31	ARG
57	BX	109	ASP
64	Be	241	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 164 such sidechains are listed below:

Mol	Chain	Res	Type
64	Be	216	HIS
77	Br	145	ASN
65	Bf	160	HIS
69	Bj	62	HIS
80	Bu	39	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
34	BA	1846/1847 (99%)	616 (33%)	225 (12%)
35	BB	1464/1465 (99%)	460 (31%)	143 (9%)
36	BC	169/169 (100%)	46 (27%)	20 (11%)
37	BD	118/119 (99%)	31 (26%)	9 (7%)
38	BE	209/210 (99%)	78 (37%)	27 (12%)
39	BF	73/73 (100%)	48 (65%)	23 (31%)
40	BG	181/182 (99%)	40 (22%)	8 (4%)
41	BH	134/135 (99%)	49 (36%)	16 (11%)
85	AA	2226/2251 (98%)	767 (34%)	312 (14%)
86	AB	72/73 (98%)	30 (41%)	7 (9%)
All	All	6492/6524 (99%)	2165 (33%)	790 (12%)

5 of 2165 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
34	BA	11	U
34	BA	13	U
34	BA	22	C
34	BA	23	A
34	BA	37	A

5 of 790 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
41	BH	62	C
85	AA	687	G
85	AA	33	U
41	BH	42	U
85	AA	326	C

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
34	BA	3
40	BG	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	BA	546:U	O3'	547:C	P	2.11
1	BA	557:U	O3'	558:C	P	1.87
1	BA	547:C	O3'	548:G	P	1.78
1	BG	24:A	O3'	25:G	P	1.39
1	BG	9:G	O3'	10:U	P	1.37

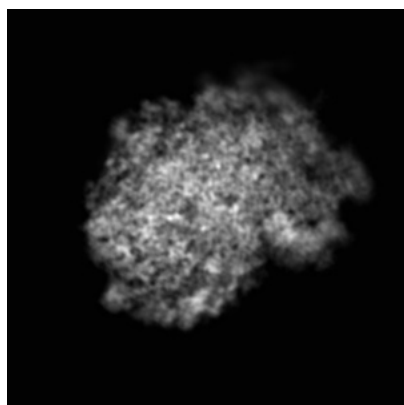
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-2239. These allow visual inspection of the internal detail of the map and identification of artifacts.

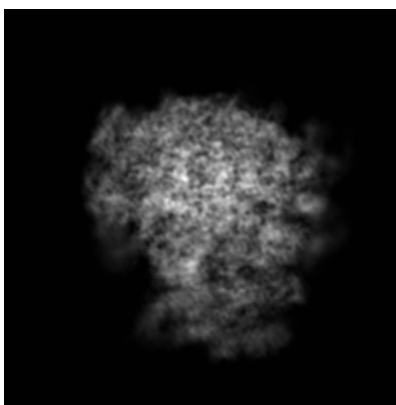
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

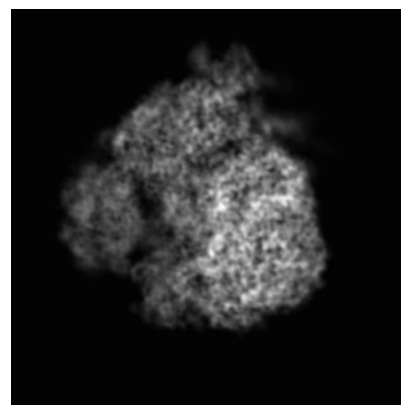
6.1.1 Primary map



X



Y

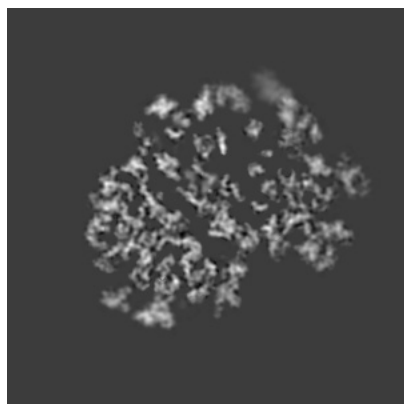


Z

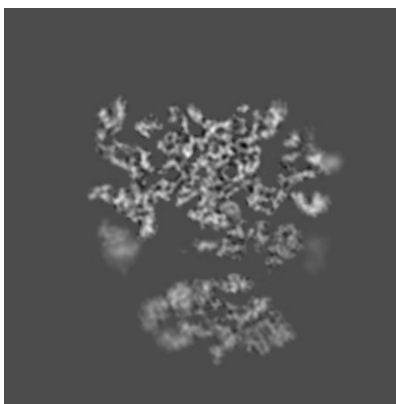
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

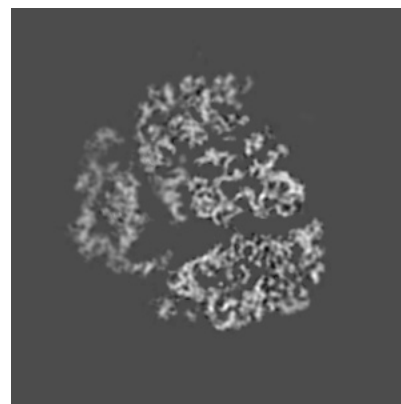
6.2.1 Primary map



X Index: 179



Y Index: 179

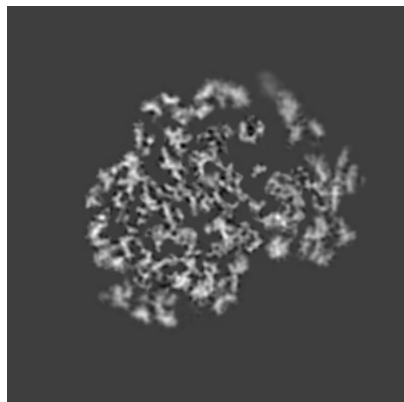


Z Index: 179

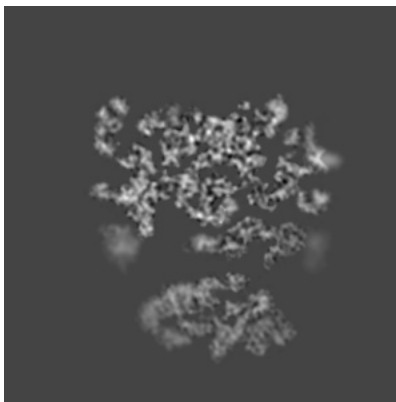
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

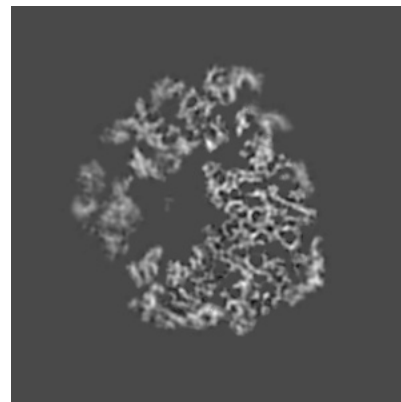
6.3.1 Primary map



X Index: 184



Y Index: 182

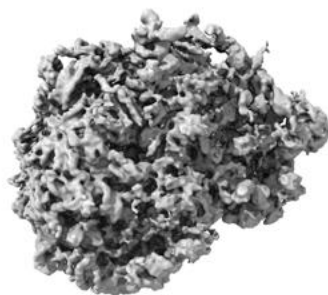


Z Index: 161

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

6.4 Orthogonal surface views [i](#)

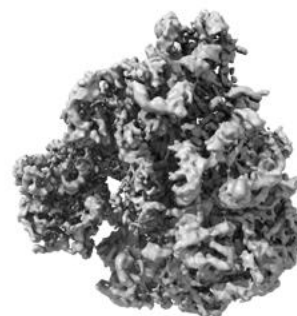
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 108000.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

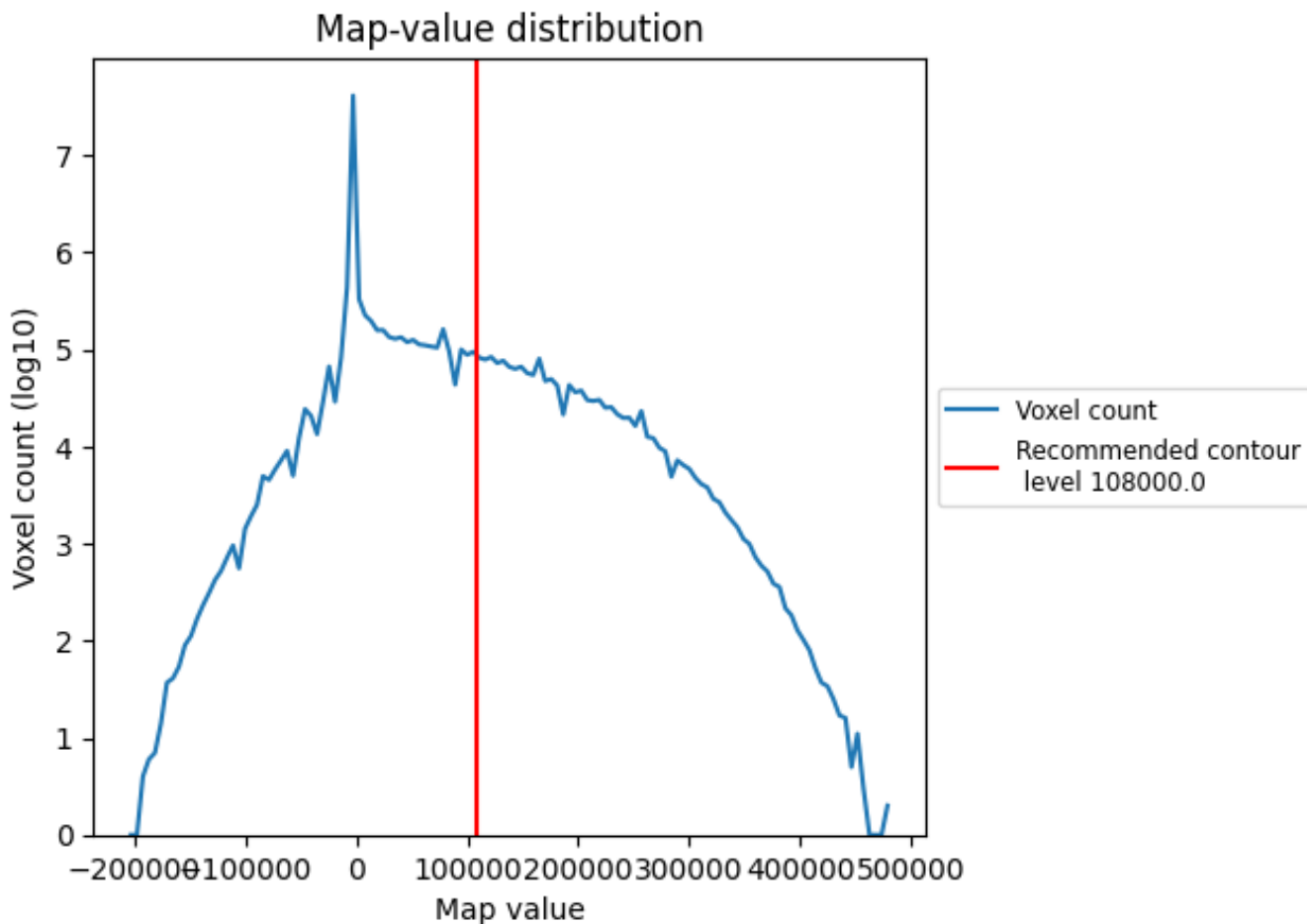
6.5 Mask visualisation

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

7 Map analysis [i](#)

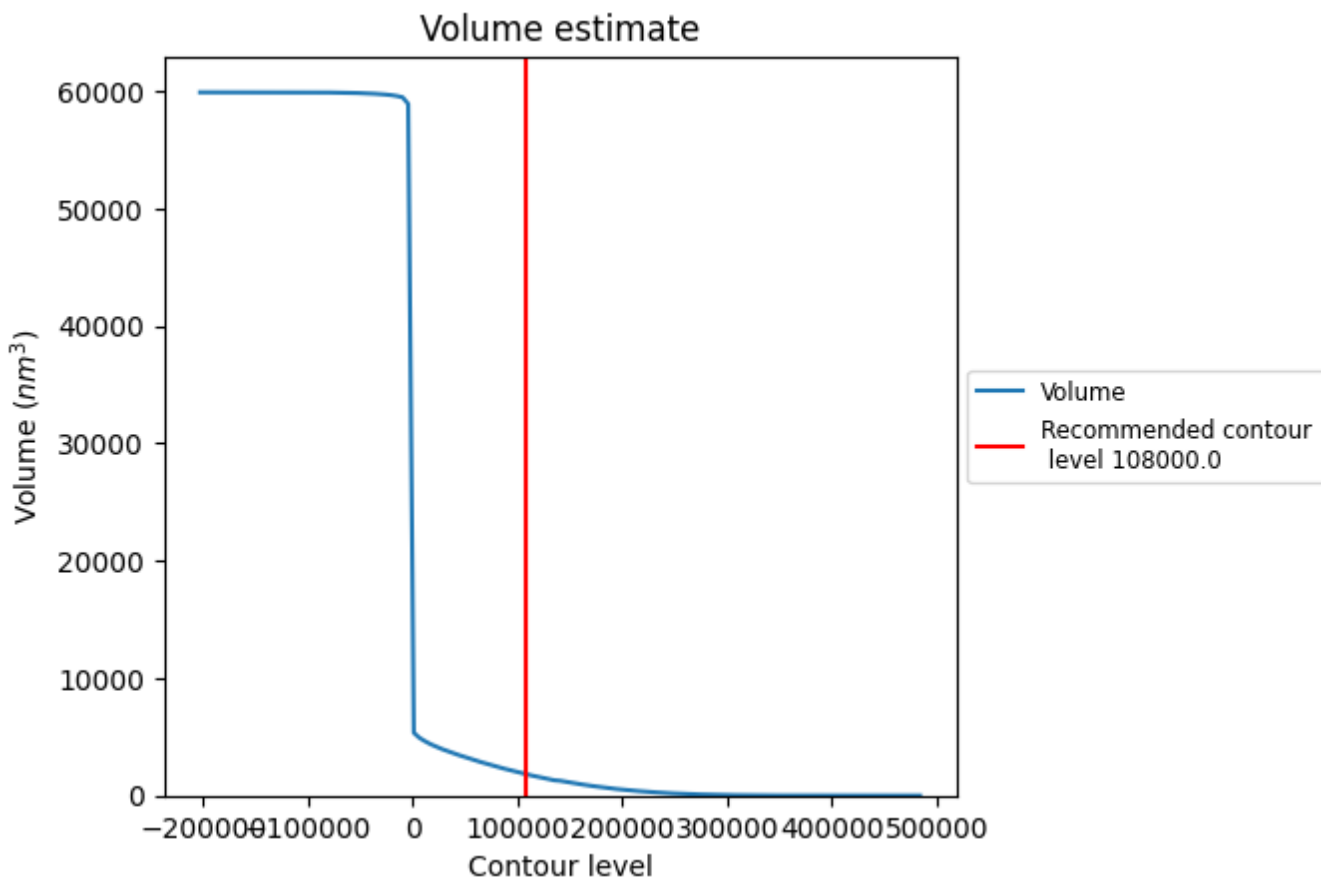
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

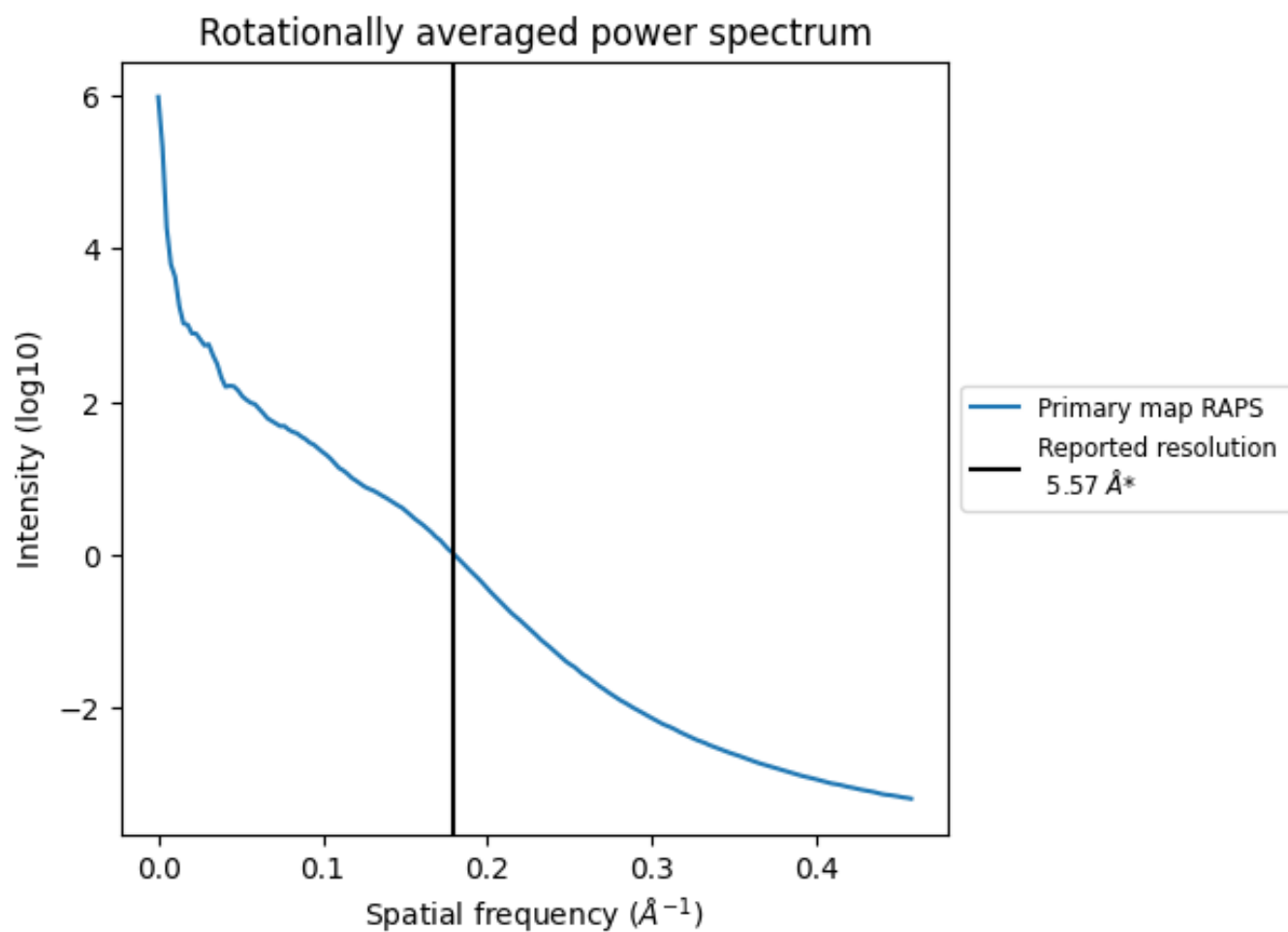
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1820 nm³; this corresponds to an approximate mass of 1644 kDa.

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

7.3 Rotationally averaged power spectrum [i](#)

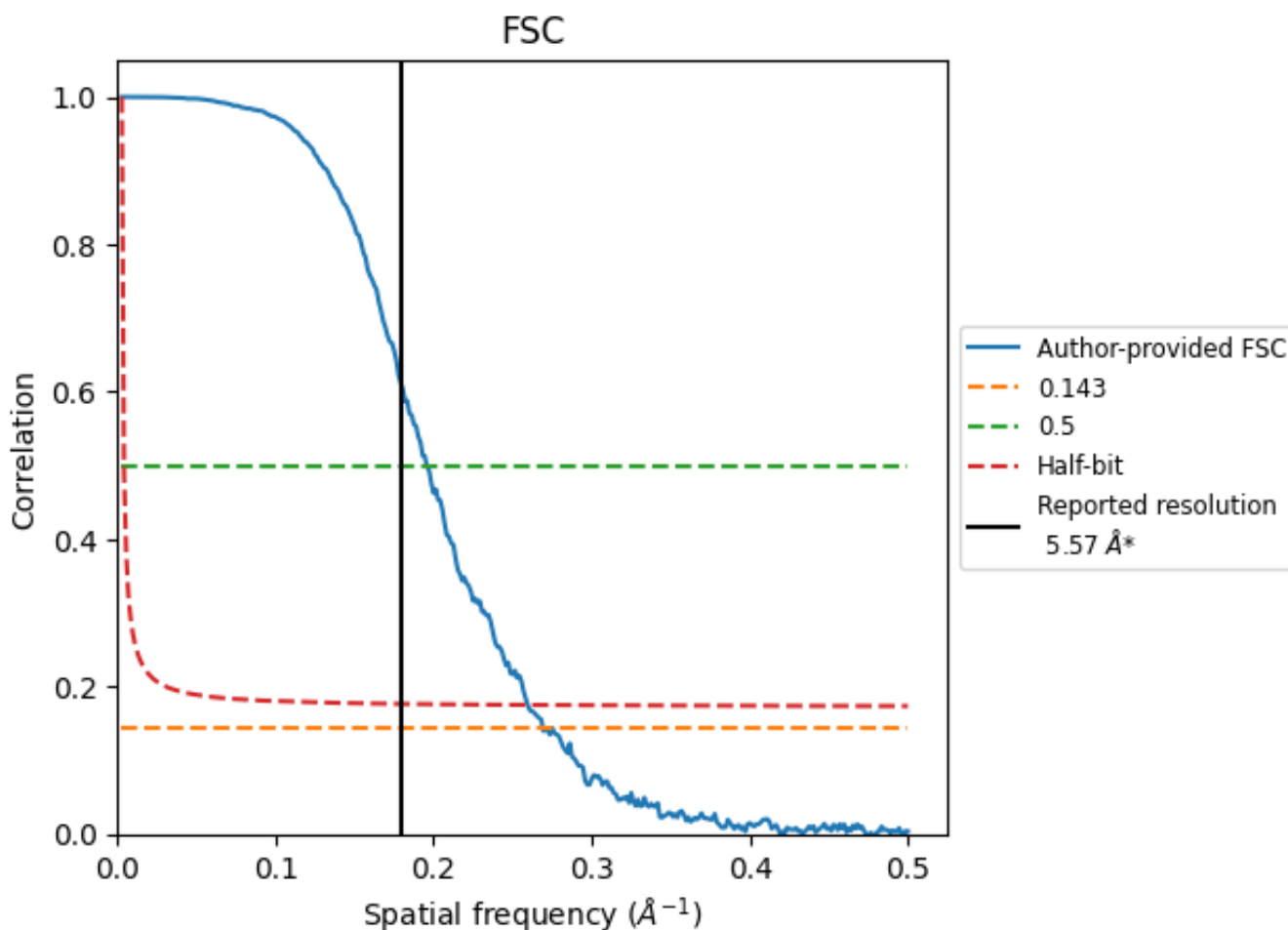


*Reported resolution corresponds to spatial frequency of 0.180 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.180 Å⁻¹

8.2 Resolution estimates [i](#)

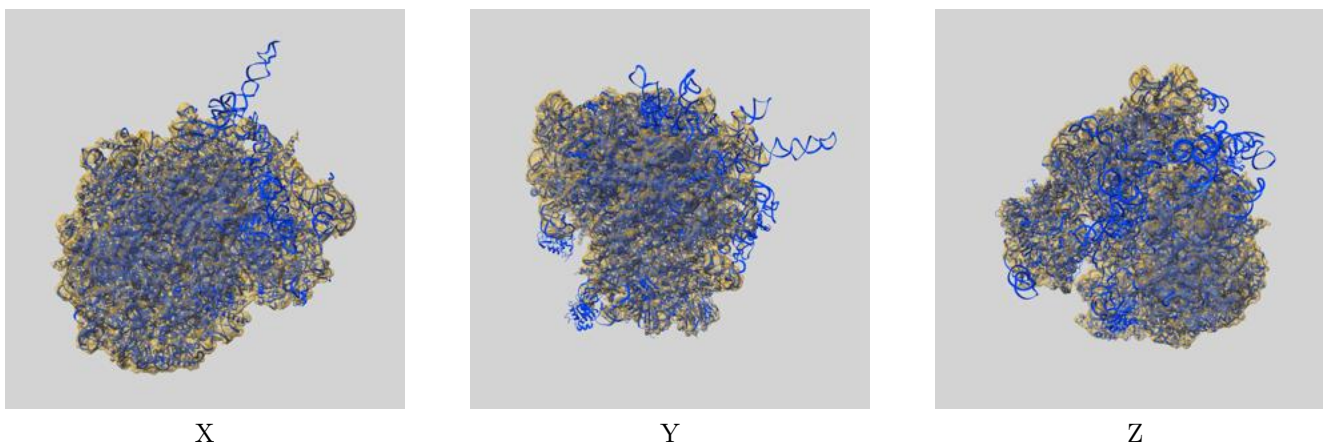
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	3.72	5.11	3.85
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

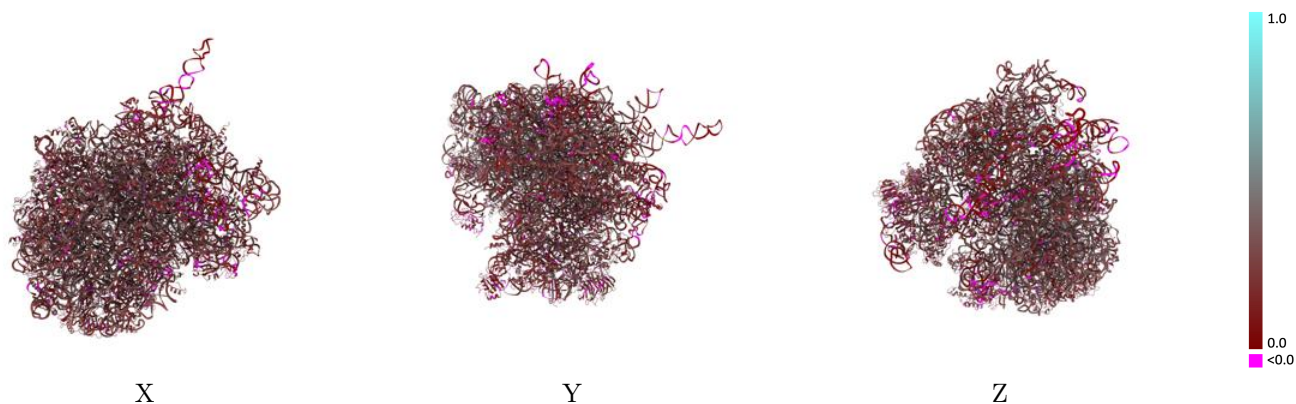
This section contains information regarding the fit between EMDB map EMD-2239 and PDB model 4V8M. Per-residue inclusion information can be found in section 3 on page 21.

9.1 Map-model overlay [i](#)



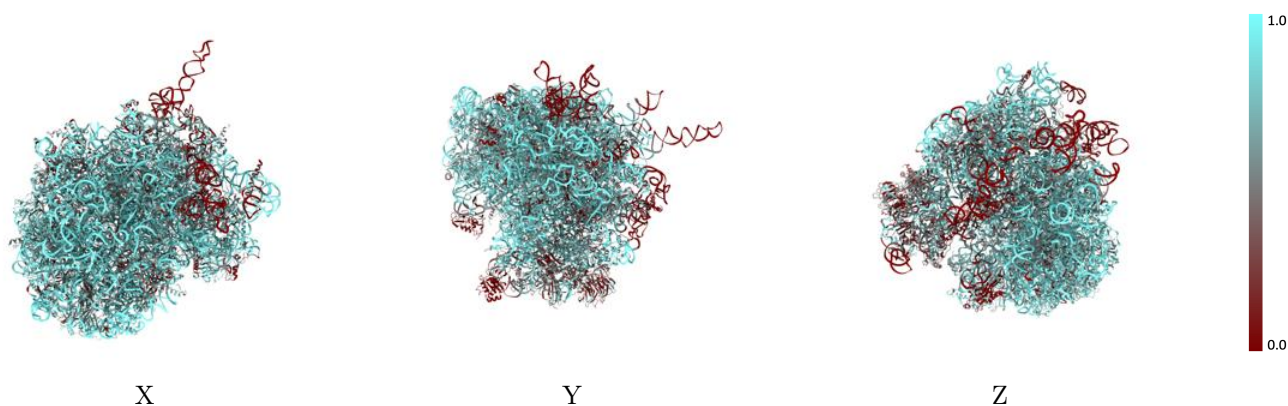
The images above show the 3D surface view of the map at the recommended contour level 108000.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



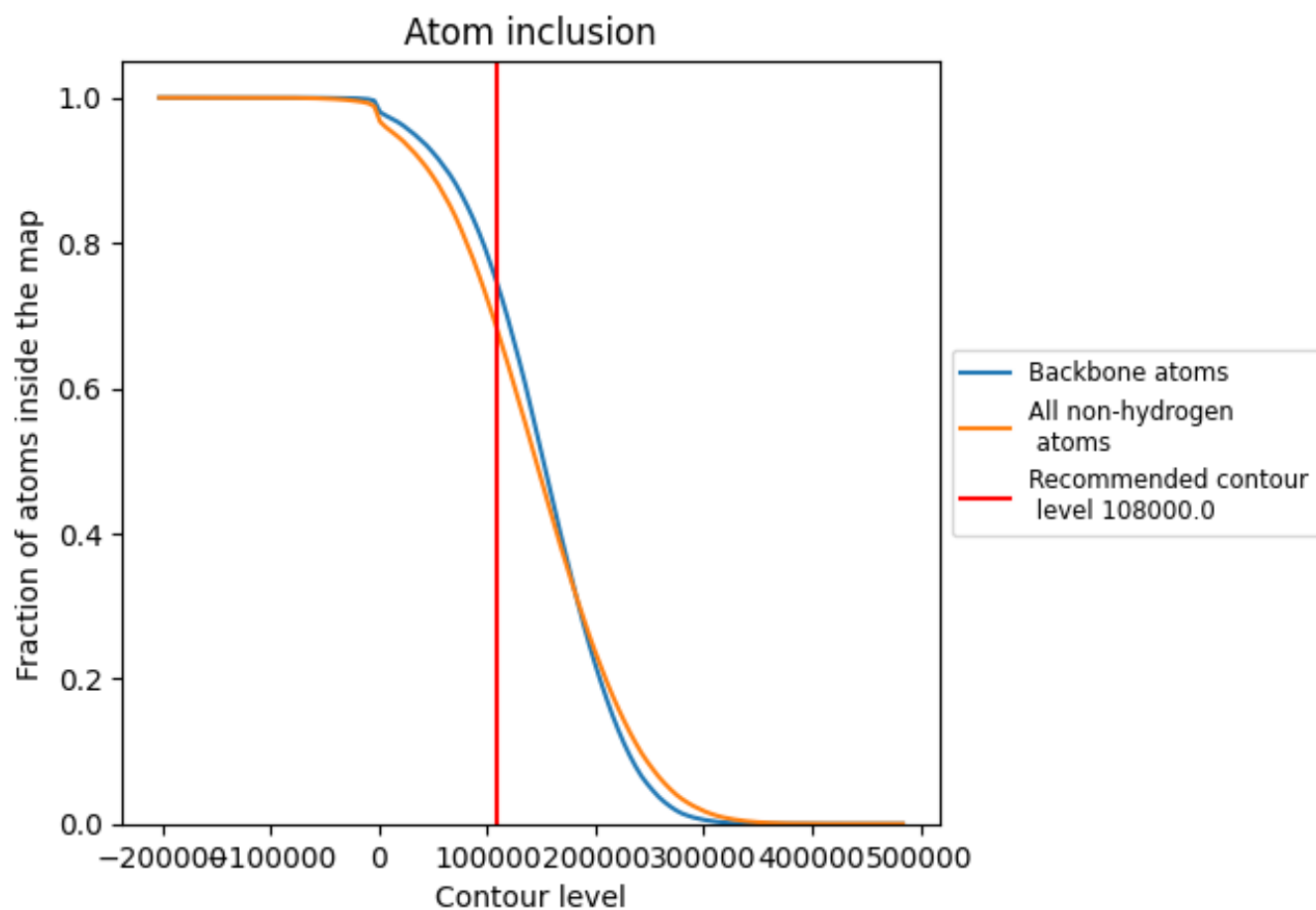
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (108000.0).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 75% of all backbone atoms, 69% 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 (108000.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6863	 0.2390
A0	 0.5174	 0.2360
A1	 0.5981	 0.2390
A2	 0.3426	 0.1910
A3	 0.6077	 0.2070
A4	 0.6130	 0.2320
A5	 0.4736	 0.2180
A6	 0.6724	 0.2270
A7	 0.2999	 0.1870
A8	 0.1981	 0.1170
A9	 0.1857	 0.1310
AA	 0.7338	 0.2390
AB	 0.4695	 0.1630
AC	 0.6378	 0.2440
AD	 0.3257	 0.1670
AE	 0.3731	 0.2080
AF	 0.0098	 0.1110
AG	 0.5167	 0.2330
AH	 0.3732	 0.1990
AI	 0.2750	 0.1480
AJ	 0.4702	 0.2300
AK	 0.3244	 0.2000
AL	 0.5288	 0.2220
AM	 0.2884	 0.1420
AO	 0.4987	 0.1980
AP	 0.6318	 0.2360
AQ	 0.3772	 0.1720
AR	 0.6532	 0.2550
AS	 0.4018	 0.1980
AT	 0.6468	 0.2000
AU	 0.3201	 0.1280
AV	 0.2263	 0.2090
AW	 0.6462	 0.2790
AX	 0.3665	 0.1860
AY	 0.5460	 0.1940























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Chain	Atom inclusion	Q-score
AZ	0.4486	0.2050
BA	0.8611	0.2760
BB	0.7684	0.2580
BC	0.9191	0.3090
BD	0.9507	0.2740
BE	0.8331	0.2680
BF	0.8679	0.2620
BG	0.9363	0.2990
BH	0.7890	0.2190
BI	0.5580	0.2150
BJ	0.0018	0.0520
BK	0.6167	0.2440
BL	0.7254	0.2310
BM	0.0060	0.0470
BN	0.6692	0.2310
BO	0.5958	0.2140
BP	0.7164	0.2300
BQ	0.5561	0.2370
BR	0.5828	0.2270
BS	0.5435	0.2280
BT	0.6369	0.2260
BU	0.5078	0.2240
BV	0.0746	0.0940
BW	0.6441	0.2610
BX	0.6058	0.2500
BY	0.3597	0.1320
BZ	0.6918	0.2300
Ba	0.5796	0.2450
Bb	0.5892	0.2360
Bc	0.7571	0.2500
Bd	0.5273	0.1590
Be	0.4993	0.2320
Bf	0.5474	0.2240
Bg	0.7184	0.2600
Bh	0.5854	0.2040
Bi	0.4596	0.2010
Bj	0.4197	0.1440
Bk	0.6270	0.2390
Bl	0.5118	0.2040
Bm	0.6442	0.2360
Bn	0.6377	0.2130
Bo	0.5415	0.2050

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Chain	Atom inclusion	Q-score
Bp	 0.7114	 0.2480
Bq	 0.5520	 0.2320
Br	 0.6446	 0.2410
Bs	 0.6415	 0.2440
Bt	 0.6608	 0.2570
Bu	 0.6818	 0.2240
Bv	 0.6583	 0.2470
Bw	 0.5991	 0.2310
Bx	 0.6086	 0.2340
By	 0.7460	 0.2370