wwPDB EM Validation Summary Report

Jan 24, 2023 – 07:39 PM EST

PDB ID	:	4V6U
EMDB ID	:	EMD-2009
Title	:	Promiscuous behavior of proteins in archaeal ribosomes revealed by cryo-EM: implications for evolution of eukaryotic ribosomes
Authors	:	Armache, J.-P.; Anger, A.M.; Marquez, V.; Frankenberg, S.; Froehlich, T.; Villa, E.; Berninghausen, O.; Thomm, M.; Arnold, G.J.; Beckmann, R.; Wilson, D.N.
Deposited on	:	2012-08-09
Resolution	:	6.60 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The 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:

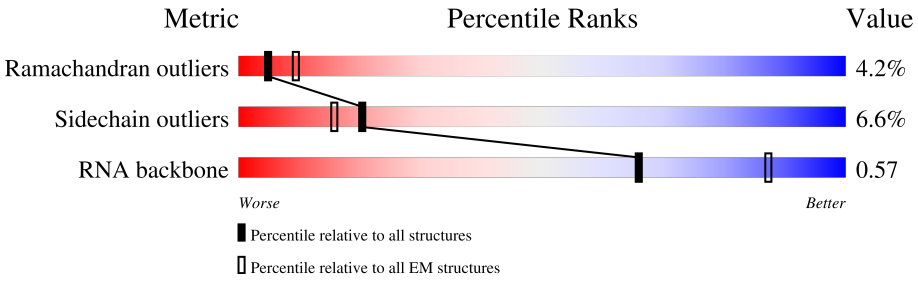
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 6.60 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 <=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	AQ	158	32% 72% 25% ·
2	AK	135	79% 72% 23% 5%
3	AI	130	42% 82% 15% · ·
4	AG	125	50% 63% 24% 10% ·
5	AW	63	27% 76% 21% ·
6	AC	210	46% 68% 17% · 11%
7	AB	202	45% 70% 25% ·
8	AR	113	44% 69% 29% ·

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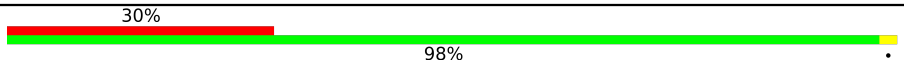
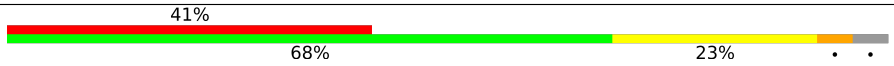
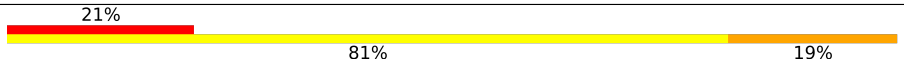
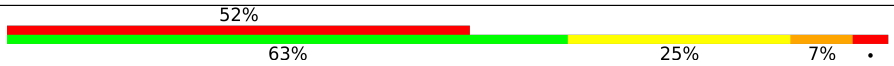
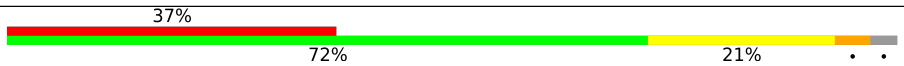
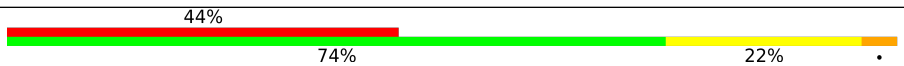
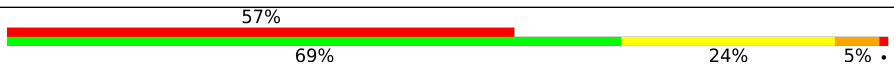
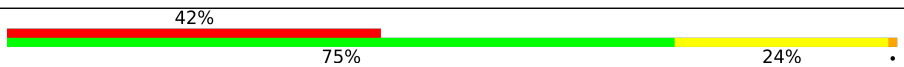
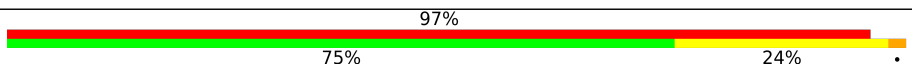
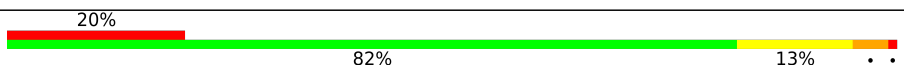
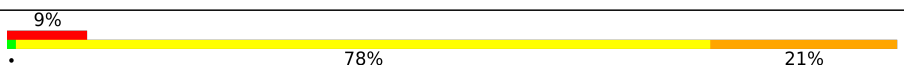
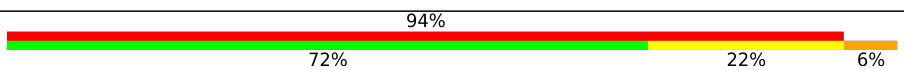
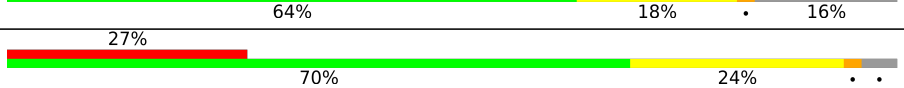
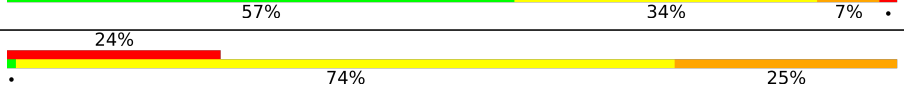
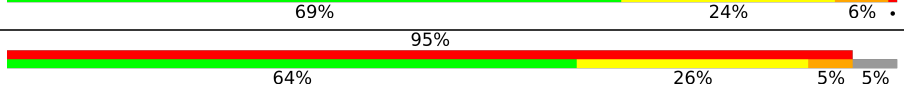
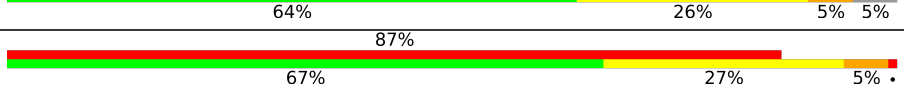
Mol	Chain	Length	Quality of chain
9	A9	57	
10	AD	180	
11	A1	77	
12	AN	147	
13	AX	71	
14	AM	137	
15	AE	243	
16	AJ	127	
17	AO	148	
18	AF	236	
19	AS	67	
20	A3	123	
20	B4	123	
20	BG	123	
21	A2	1495	
22	AY	50	
23	AT	132	
24	AA	198	
25	AH	215	
26	AP	56	
27	A0	76	
28	AV	99	
28	B6	99	
29	AL	102	
30	AU	150	

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Mol	Chain	Length	Quality of chain
31	BY	155	42% 68% 23% 8%
32	BO	203	39% 65% 25% 7%
33	BC	365	45% 70% 23%
34	B5	83	24% 65% 27% 5%
34	BK	83	35% 69% 25%
35	BL	147	54% 73% 16% 7%
36	Bf	51	67% 49% 25% 18% 8%
37	BU	121	44% 70% 27%
38	Bb	130	48% 62% 25% 10%
39	Be	62	68% 55% 29% 16%
40	BE	186	40% 80% 15% 5%
41	Ba	95	29% 62% 22% 9% 5%
42	BT	86	34% 73% 21%
43	Bk	339	53% 48% 11% 37%
44	BW	72	18% 69% 26%
45	Bi	83	31% 80% 8% 5% 6%
46	BA	216	81% 73% 23%
47	BI	142	41% 74% 24%
48	BR	97	53% 66% 25% 7%
49	BQ	150	42% 67% 26% 7%
50	BV	66	42% 70% 27%
51	Bj	94	52% 47% 29% 15% 10%
52	BB	239	41% 75% 18% 7%
53	BD	255	46% 70% 25%
54	BF	184	20% 73% 23%

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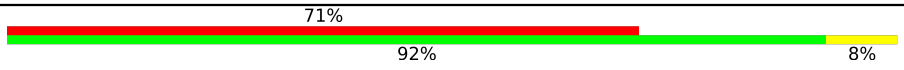
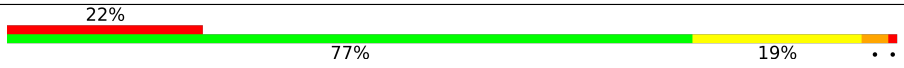
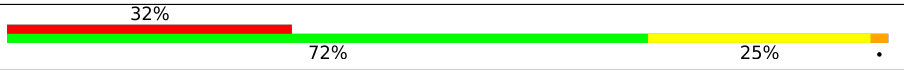
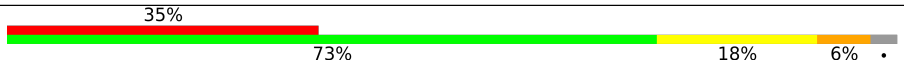
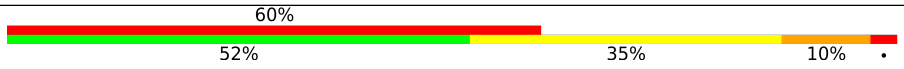
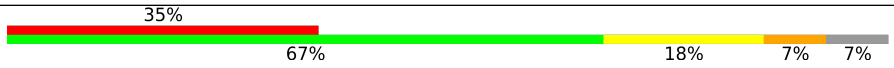
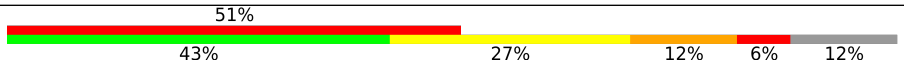
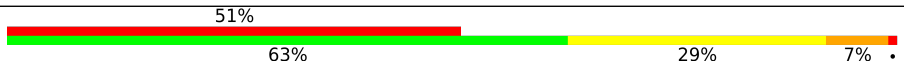
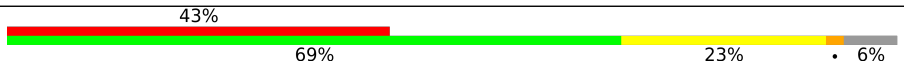
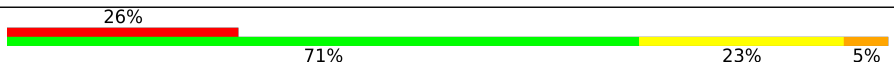
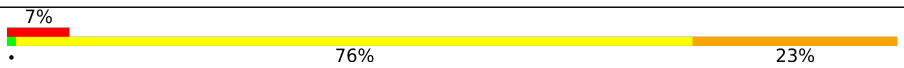
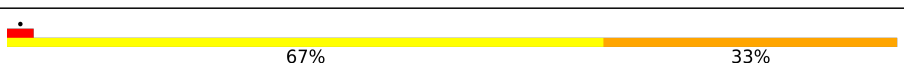
Mol	Chain	Length	Quality of chain
55	Bh	24	
56	BH	164	
57	BZ	99	
58	BP	120	
59	BM	194	
60	BS	155	
61	Bd	89	
62	BN	181	
63	Bg	51	
64	Bc	87	
65	BJ	141	
66	Bl	77	
67	B1	3049	
68	B3	126	

2 Entry composition (i)

There are 68 unique types of molecules in this entry. The entry contains 173979 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 30S ribosomal protein S15P/S13e.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	AQ	158	1310	834	250	221	5	0	0

- Molecule 2 is a protein called 30S ribosomal protein S9P.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	AK	135	1072	671	205	190	6	0	0

- Molecule 3 is a protein called 30S ribosomal protein S8P.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	AI	129	1028	668	178	180	2	0	0

- Molecule 4 is a protein called 30S ribosomal protein S6e.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	AG	125	984	623	180	179	2	0	0

- Molecule 5 is a protein called 30S ribosomal protein S27e.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	AW	63	478	306	85	81	6	0	0

- Molecule 6 is a protein called 30S ribosomal protein S3P.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	AC	186	1459	933	271	251	4	0	0

- Molecule 7 is a protein called 30S ribosomal protein S2P.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	AB	202	Total	C	N	O	S	0	0
			1623	1046	282	290	5		

- Molecule 8 is a protein called 30S ribosomal protein S17P.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	AR	113	Total	C	N	O	S	0	0
			934	592	177	160	5		

- Molecule 9 is a protein called unknown 30S ribosomal protein SX.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	A9	57	Total	C	N	O	0	0
			286	171	57	58		

- Molecule 10 is a protein called 30S ribosomal protein S4P.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	AD	172	Total	C	N	O	S	0	0
			1434	902	273	255	4		

- Molecule 11 is a RNA chain called E-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	A1	77	Total	C	N	O	P	0	0
			1649	734	303	535	77		

- Molecule 12 is a protein called 30S ribosomal protein S12P.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	AN	145	Total	C	N	O	S	0	0
			1140	722	222	193	3		

- Molecule 13 is a protein called 30S ribosomal protein S28e.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	AX	71	Total	C	N	O	S	0	0
			568	345	115	107	1		

- Molecule 14 is a protein called 30S ribosomal protein S11P.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	AM	133	Total	C	N	O	S	0	0
			1004	623	200	179	2		

- Molecule 15 is a protein called 30S ribosomal protein S4e.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	AE	241	Total	C	N	O	S	0	0
			1976	1277	355	339	5		

- Molecule 16 is a protein called 30S ribosomal protein S8e.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	AJ	127	Total	C	N	O	S	0	0
			1004	622	207	174	1		

- Molecule 17 is a protein called 30S ribosomal protein S13P.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	AO	148	Total	C	N	O	S	0	0
			1189	746	237	200	6		

- Molecule 18 is a protein called 30S ribosomal protein S5P.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	AF	217	Total	C	N	O	S	0	0
			1716	1084	319	305	8		

- Molecule 19 is a protein called 30S ribosomal protein S17e.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	AS	67	Total	C	N	O	S	0	0
			556	353	105	95	3		

- Molecule 20 is a protein called 50S ribosomal protein L7Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	A3	123	Total	C	N	O	S	0	0
			939	599	155	181	4		
20	BG	123	Total	C	N	O	S	0	0
			939	599	155	181	4		
20	B4	123	Total	C	N	O	S	0	0
			939	599	155	181	4		

- Molecule 21 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	A2	1495	Total	C	N	O	P	0	0
			32135	14297	5954	10389	1495		

- Molecule 22 is a protein called 30S ribosomal protein S27ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	AY	50	Total	C	N	O	S	0	0
			409	262	75	66	6		

- Molecule 23 is a protein called 30S ribosomal protein S19P.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	AT	111	Total	C	N	O	S	0	0
			923	594	173	150	6		

- Molecule 24 is a protein called 30S ribosomal protein S3Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	AA	190	Total	C	N	O	S	0	0
			1559	1007	273	274	5		

- Molecule 25 is a protein called 30S ribosomal protein S7P.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	AH	215	Total	C	N	O	S	0	0
			1736	1100	326	302	8		

- Molecule 26 is a protein called 30S ribosomal protein S14P type Z.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	AP	56	Total	C	N	O	S	0	0
			462	292	95	69	6		

- Molecule 27 is a RNA chain called P-tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	A0	76	Total	C	N	O	P	0	0
			1625	722	291	536	76		

- Molecule 28 is a protein called 30S ribosomal protein S24e.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	AV	99	Total	C	N	O	S	0	0
			823	532	134	154	3		
28	B6	94	Total	C	N	O	S	0	0
			782	508	127	144	3		

- Molecule 29 is a protein called 30S ribosomal protein S10P.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	AL	102	Total	C	N	O	S	0	0
			822	507	159	152	4		

- Molecule 30 is a protein called SSU ribosomal protein S19E.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	AU	144	Total	C	N	O	S	0	0
			1175	758	212	204	1		

- Molecule 31 is a protein called 50S ribosomal protein L30P.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	BY	155	Total	C	N	O	S	0	0
			1243	788	235	213	7		

- Molecule 32 is a protein called 50S ribosomal protein L18P.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	BO	197	Total	C	N	O	S	0	0
			1597	1021	299	274	3		

- Molecule 33 is a protein called 50S ribosomal protein L3P.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	BC	365	Total	C	N	O	S	0	0
			2912	1870	527	500	15		

- Molecule 34 is a protein called 50S ribosomal protein L14e.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	B5	81	Total	C	N	O	S	0	0
			614	386	119	108	1		
34	BK	81	Total	C	N	O	S	0	0
			614	386	119	108	1		

- Molecule 35 is a protein called 50S ribosomal protein L15P.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	BL	147	Total	C	N	O	S	0	0
			1154	727	227	195	5		

- Molecule 36 is a protein called 50S ribosomal protein L39e.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	Bf	51	Total	C	N	O	S	0	0
			445	284	98	62	1		

- Molecule 37 is a protein called 50S ribosomal protein L24P.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	BU	121	Total	C	N	O	S	0	0
			1008	637	195	172	4		

- Molecule 38 is a protein called 50S ribosomal protein L32e.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Bb	127	Total	C	N	O	S	0	0
			1074	689	217	167	1		

- Molecule 39 is a protein called 50S ribosomal protein L37e.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	Be	62	Total	C	N	O	S	0	0
			506	312	111	78	5		

- Molecule 40 is a protein called 50S ribosomal protein L5P.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	BE	186	Total	C	N	O	S	0	0
			1489	937	278	265	9		

- Molecule 41 is a protein called 50S ribosomal protein L31e.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	Ba	90	Total	C	N	O	0	0
			746	483	138	125		

- Molecule 42 is a protein called 50S ribosomal protein L23P.

Mol	Chain	Residues	Atoms				AltConf	Trace
42	BT	84	Total	C	N	O	0	0
			680	440	118	122		

- Molecule 43 is a protein called Acidic ribosomal protein P0 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Bk	212	Total	C	N	O	S	0	0
			1632	1051	272	303	6		

- Molecule 44 is a protein called 50S ribosomal protein L29P.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	BW	72	Total	C	N	O	S	0	0
			594	369	115	106	4		

- Molecule 45 is a protein called 50S ribosomal protein L37Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Bi	78	Total	C	N	O	S	0	0
			590	368	122	95	5		

- Molecule 46 is a protein called 50S ribosomal protein L1P.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	BA	216	Total	C	N	O	S	0	0
			1677	1068	300	304	5		

- Molecule 47 is a protein called 50S ribosomal protein L13P.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	BI	142	Total	C	N	O	S	0	0
			1150	737	215	195	3		

- Molecule 48 is a protein called 50S ribosomal protein L21e.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	BR	95	Total	C	N	O	S	0	0
			787	501	160	125	1		

- Molecule 49 is a protein called 50S ribosomal protein L19e.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	BQ	150	Total	C	N	O	S	0	0
			1256	794	255	202	5		

- Molecule 50 is a protein called 50S ribosomal protein L24e.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	BV	66	Total	C	N	O	S	0	0
			555	351	106	91	7		

- Molecule 51 is a protein called 50S ribosomal protein L44E.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	Bj	94	Total	C	N	O	S	0	0
			787	499	161	122	5		

- Molecule 52 is a protein called 50S ribosomal protein L2P.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	BB	239	Total	C	N	O	S	0	0
			1838	1169	347	317	5		

- Molecule 53 is a protein called 50S ribosomal protein L4P.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	BD	255	Total	C	N	O	S	0	0
			2026	1288	391	342	5		

- Molecule 54 is a protein called 50S ribosomal protein L6P.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	BF	184	Total	C	N	O	S	0	0
			1476	956	252	266	2		

- Molecule 55 is a protein called 50S ribosomal protein L41e.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	Bh	24	Total	C	N	O	S	0	0
			230	147	54	28	1		

- Molecule 56 is a protein called 50S ribosomal protein L11P.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	BH	134	Total	C	N	O	S	0	0
			988	635	164	183	6		

- Molecule 57 is a protein called 50S ribosomal protein L30e.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	BZ	99	Total	C	N	O	S	0	0
			754	489	121	142	2		

- Molecule 58 is a protein called 50S ribosomal protein L18e.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	BP	120	Total	C	N	O	S	0	0
			966	606	186	171	3		

- Molecule 59 is a protein called 50S ribosomal protein L15e.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	BM	194	Total	C	N	O	S	0	0
			1595	1020	316	253	6		

- Molecule 60 is a protein called 50S ribosomal protein L22P.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	BS	150	Total	C	N	O	S	0	0
			1200	764	230	202	4		

- Molecule 61 is a protein called 50S ribosomal protein L34e.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	Bd	89	Total	C	N	O	S	0	0
			740	463	158	108	11		

- Molecule 62 is a protein called 50S ribosomal protein L10e.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	BN	168	Total	C	N	O	S	0	0
			1378	872	268	232	6		

- Molecule 63 is a protein called 50S ribosomal protein L40e.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	Bg	45	Total	C	N	O	S	0	0
			371	236	76	55	4		

- Molecule 64 is a protein called 50S ribosomal protein L35Ae.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	Bc	87	Total	C	N	O	S	0	0
			685	434	132	117	2		

- Molecule 65 is a protein called 50S ribosomal protein L14P.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	BJ	132	Total	C	N	O	S	0	0
			1014	631	204	176	3		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
66	Bl	77	Total	C	N	O	S	0	0
			659	425	118	115	1		

- Molecule 67 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	B1	3049	Total	C	N	O	P	0	0
			65577	29172	12191	21165	3049		

- Molecule 68 is a RNA chain called 5S rRNA.

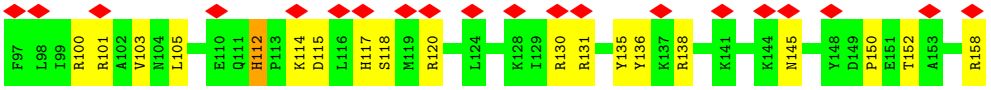
Mol	Chain	Residues	Atoms					AltConf	Trace
68	B3	126	Total	C	N	O	P	0	0
			2694	1199	492	877	126		

3 Residue-property plots (i)

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

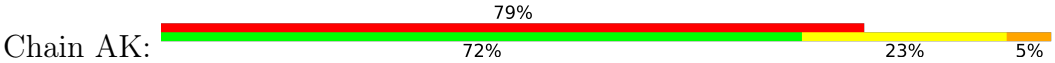
• Molecule 1: 30S ribosomal protein S15P/S13e

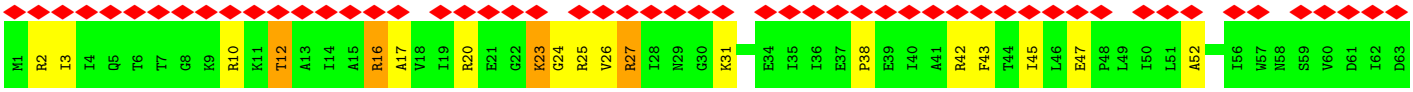
Chain AQ:

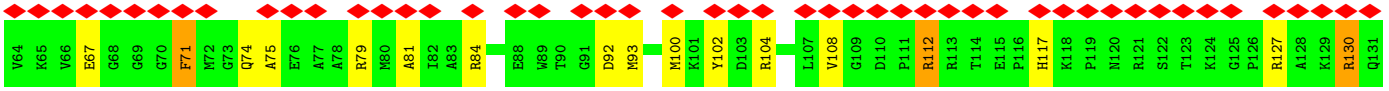


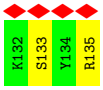
• Molecule 2: 30S ribosomal protein S9P

Chain AK:



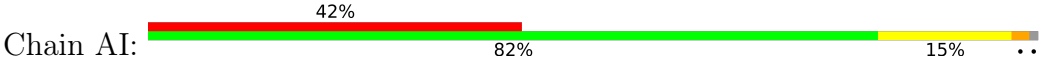


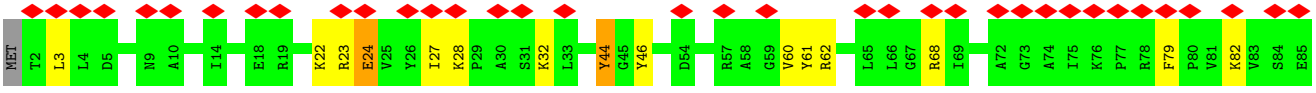


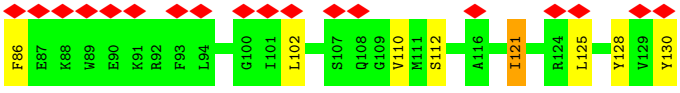


• Molecule 3: 30S ribosomal protein S8P

Chain AI:

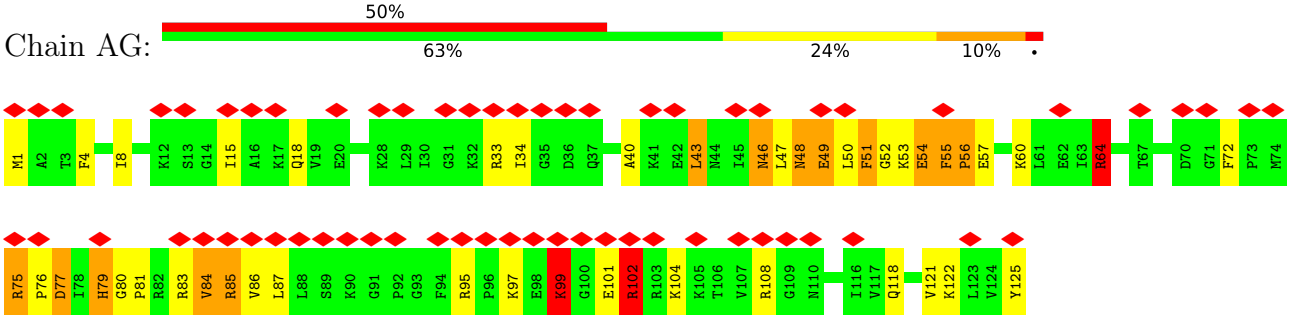






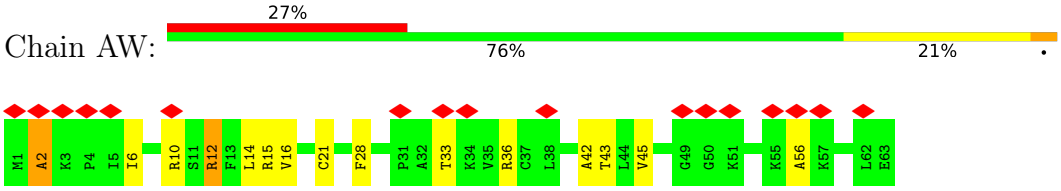
• Molecule 4: 30S ribosomal protein S6e

Chain AG:



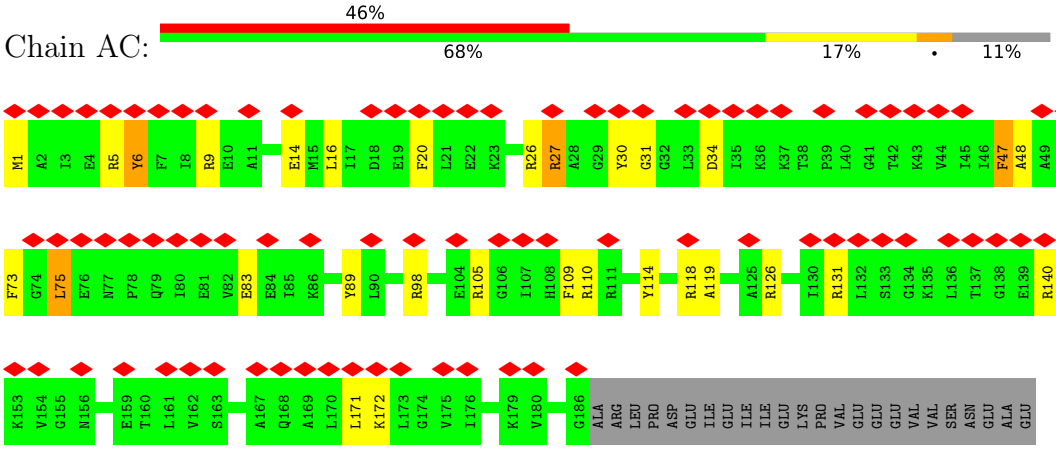
• Molecule 5: 30S ribosomal protein S27e

Chain AW:



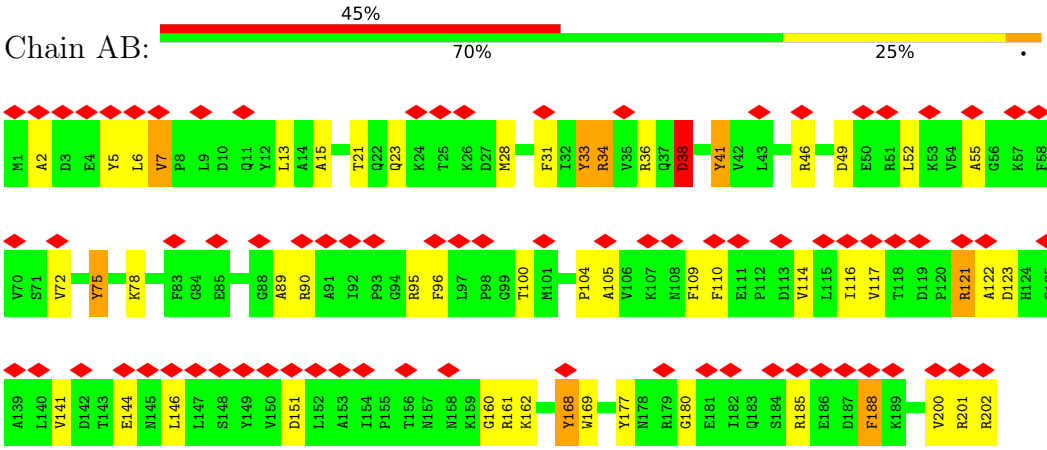
• Molecule 6: 30S ribosomal protein S3P

Chain AC:



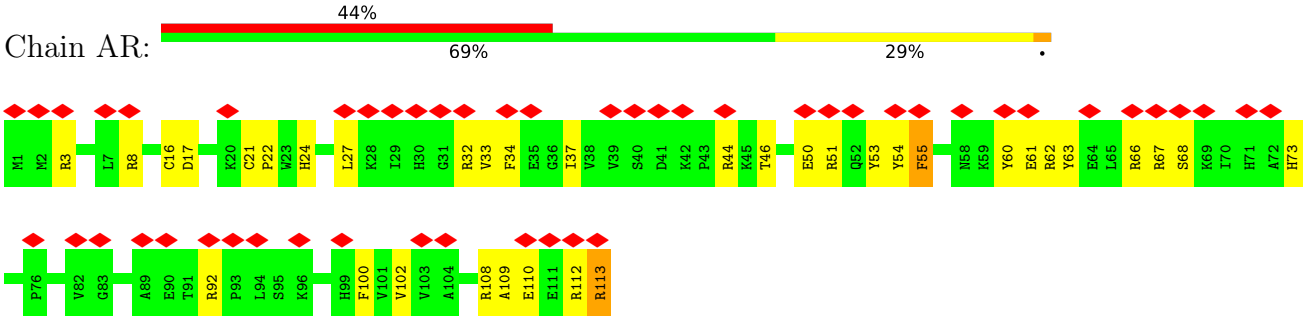
• Molecule 7: 30S ribosomal protein S2P

Chain AB:



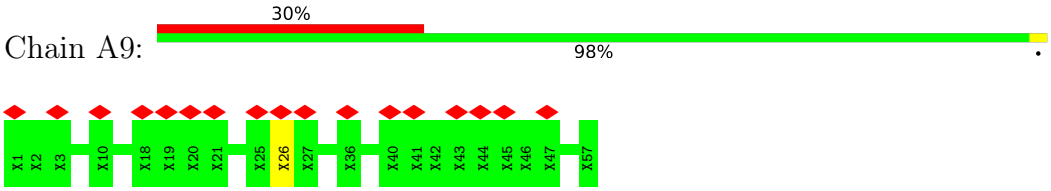
• Molecule 8: 30S ribosomal protein S17P

Chain AR:



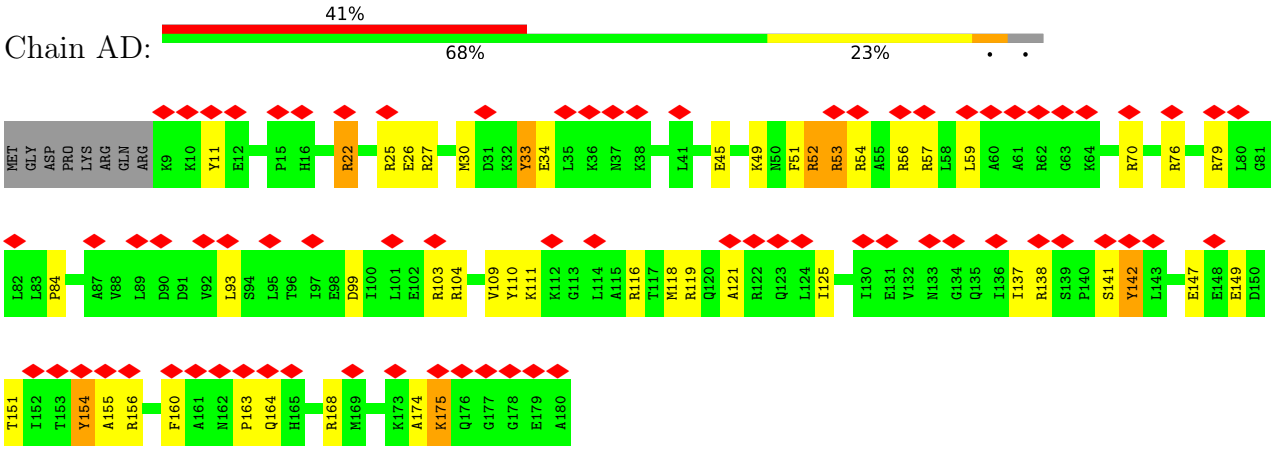
• Molecule 9: unknown 30S ribosomal protein SX

Chain A9:



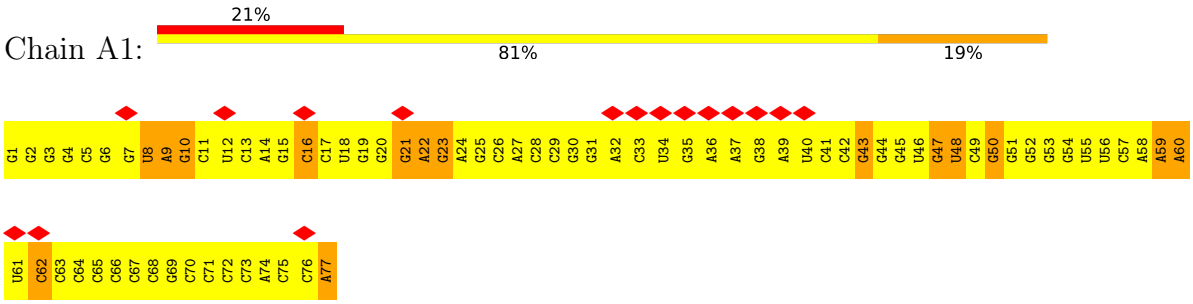
• Molecule 10: 30S ribosomal protein S4P

Chain AD:



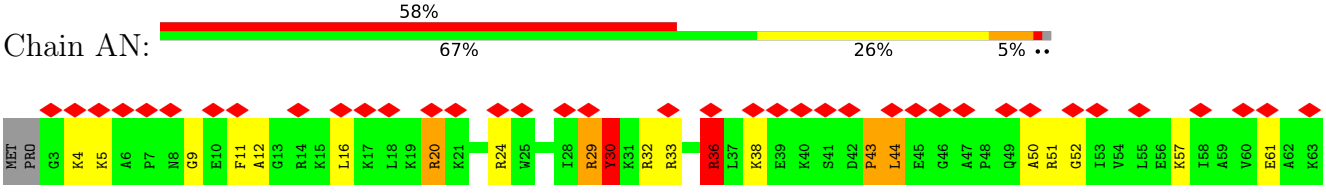
• Molecule 11: E-tRNA

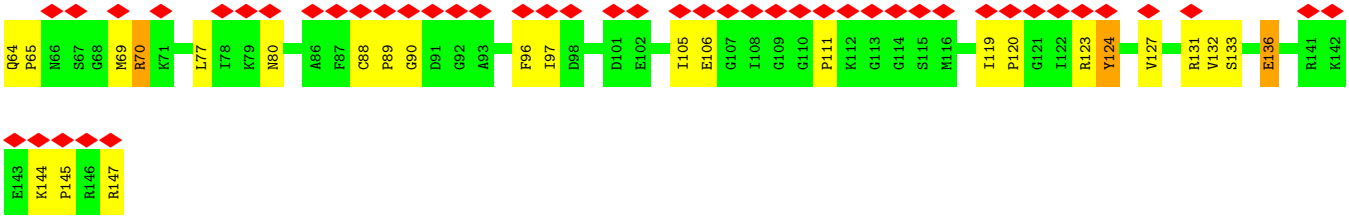
Chain A1:



• Molecule 12: 30S ribosomal protein S12P

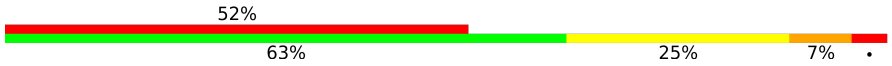
Chain AN:

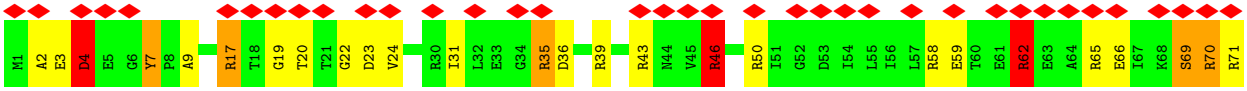




• Molecule 13: 30S ribosomal protein S28e

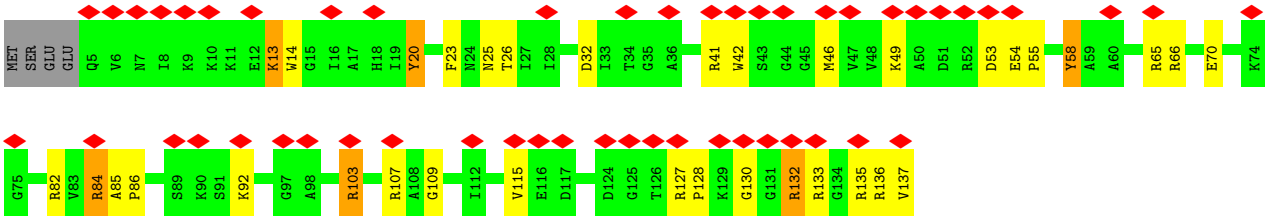
Chain AX:





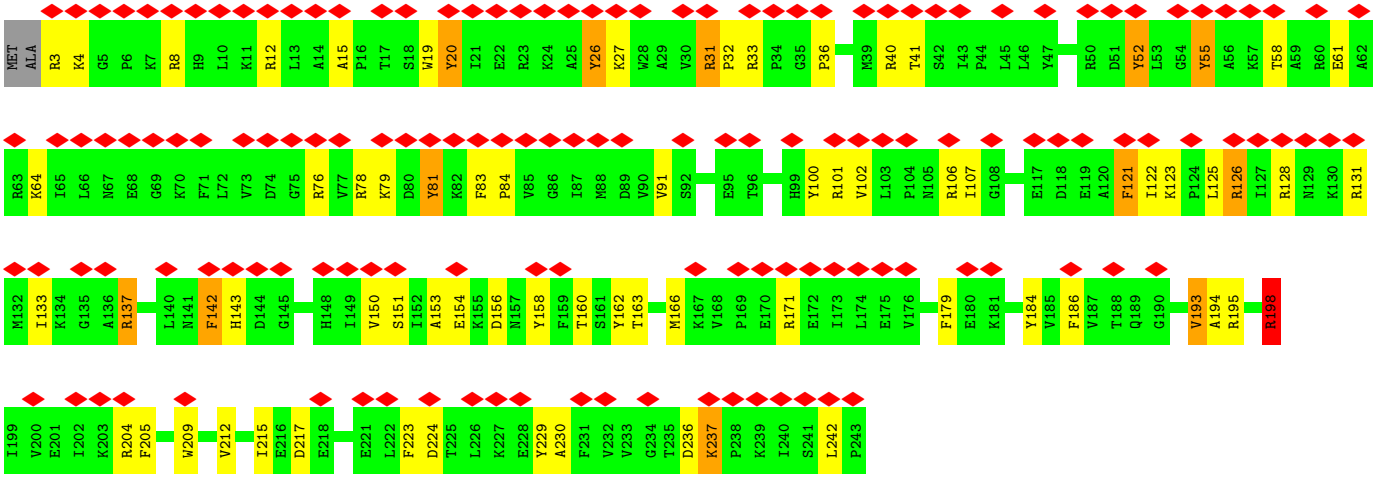
• Molecule 14: 30S ribosomal protein S11P

Chain AM:



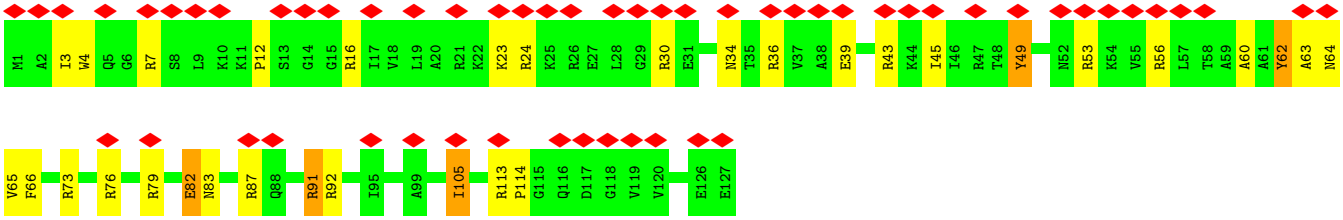
• Molecule 15: 30S ribosomal protein S4e

Chain AE:



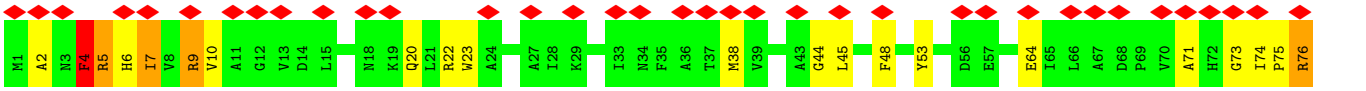
• Molecule 16: 30S ribosomal protein S8e

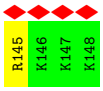
Chain AJ:



• Molecule 17: 30S ribosomal protein S13P

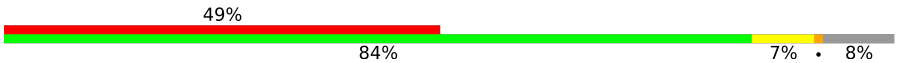
Chain AO:

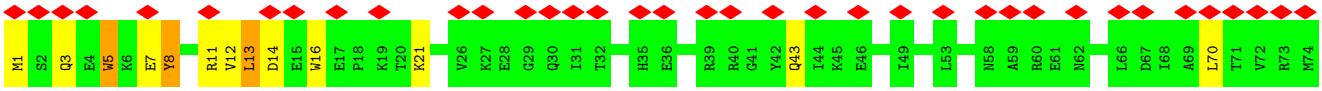


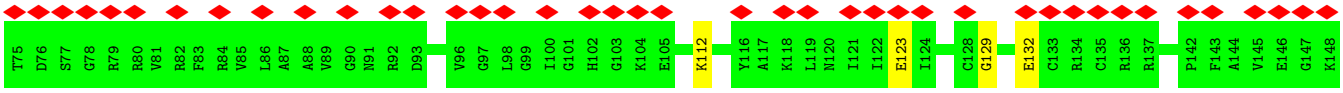


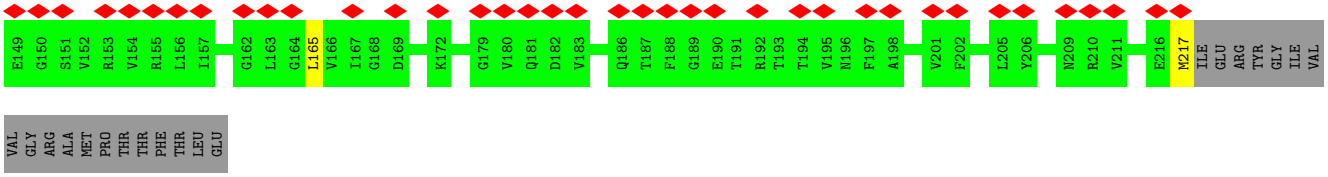
• Molecule 18: 30S ribosomal protein S5P

Chain AF:



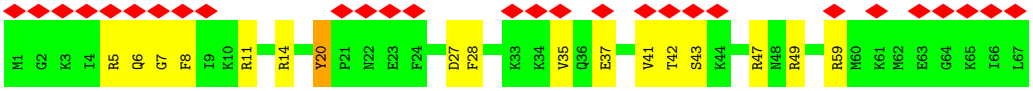






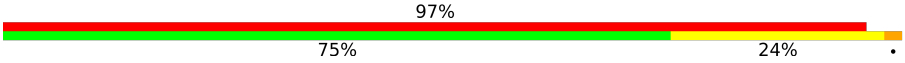
• Molecule 19: 30S ribosomal protein S17e

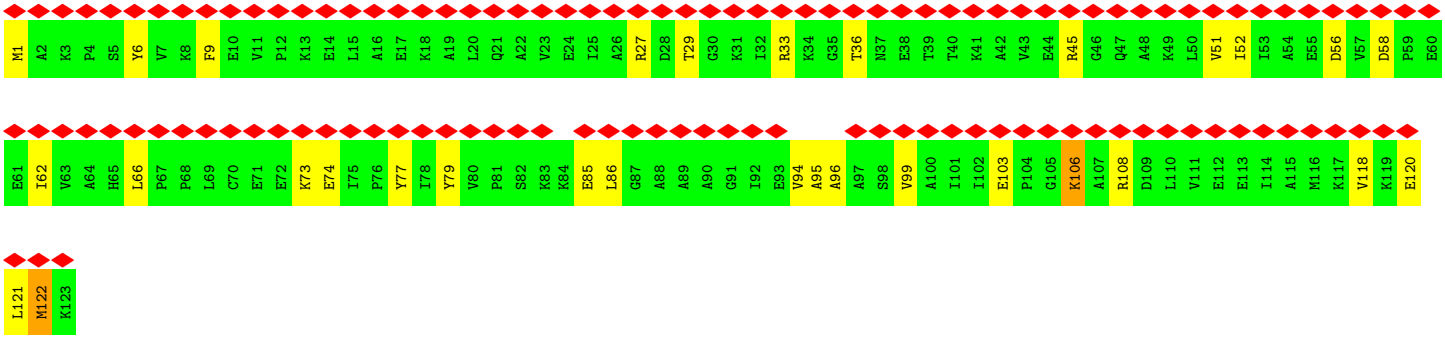
Chain AS:



• Molecule 20: 50S ribosomal protein L7Ae

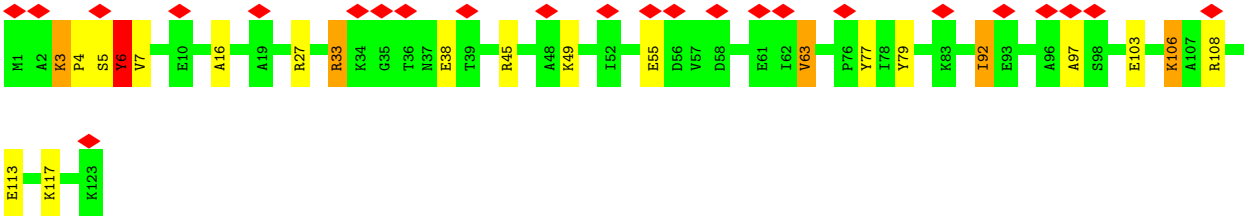
Chain A3:





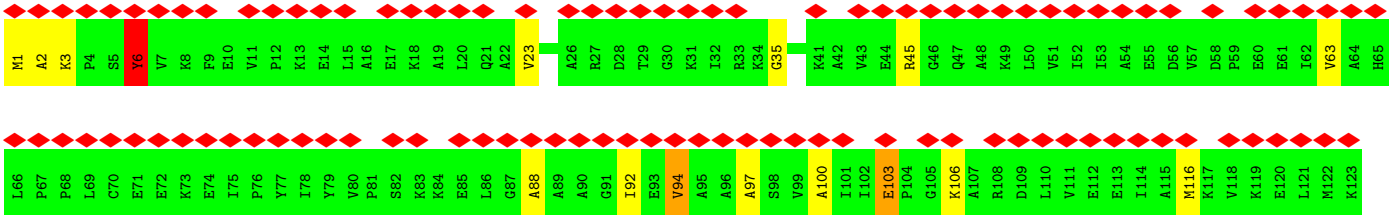
• Molecule 20: 50S ribosomal protein L7Ae

Chain BG:



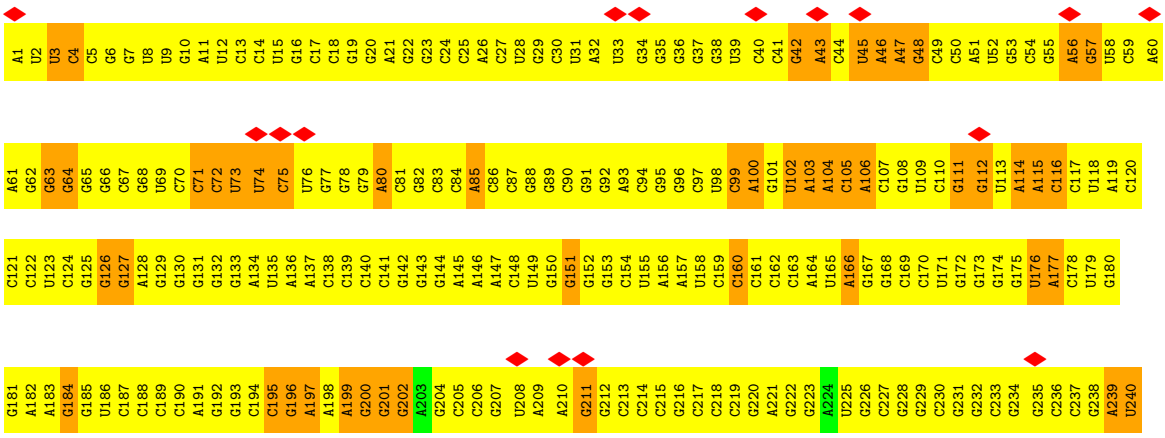
• Molecule 20: 50S ribosomal protein L7Ae

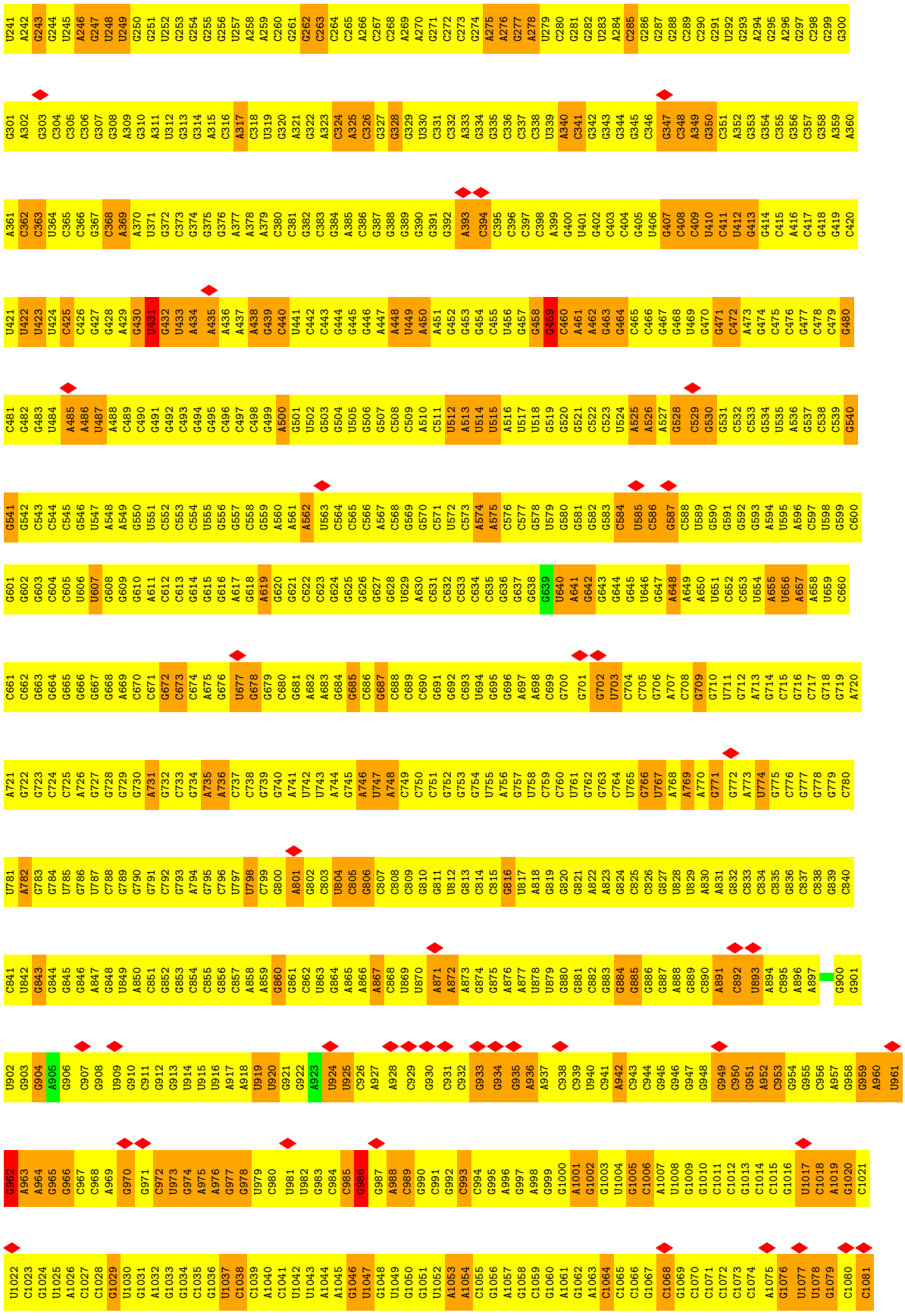
Chain B4:



• Molecule 21: 16S rRNA

Chain A2:

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A361 C362 C363 U364 C365 C366 G367 C368 A369 A370 U371 G372 C373 G374 G375 G376 A377 A378 A379 C380 C381 G382 C383 G384 A385 C386 G387 G388 G389 G390 G391 G392 A393 C394 C395 C396 C397 C398 A399 G400 U401 G402 C403 C404 G405 U406 G407 C408 C409 U410 C411 U412 G413 G414 C415 A416 C417 G418 G419 C420
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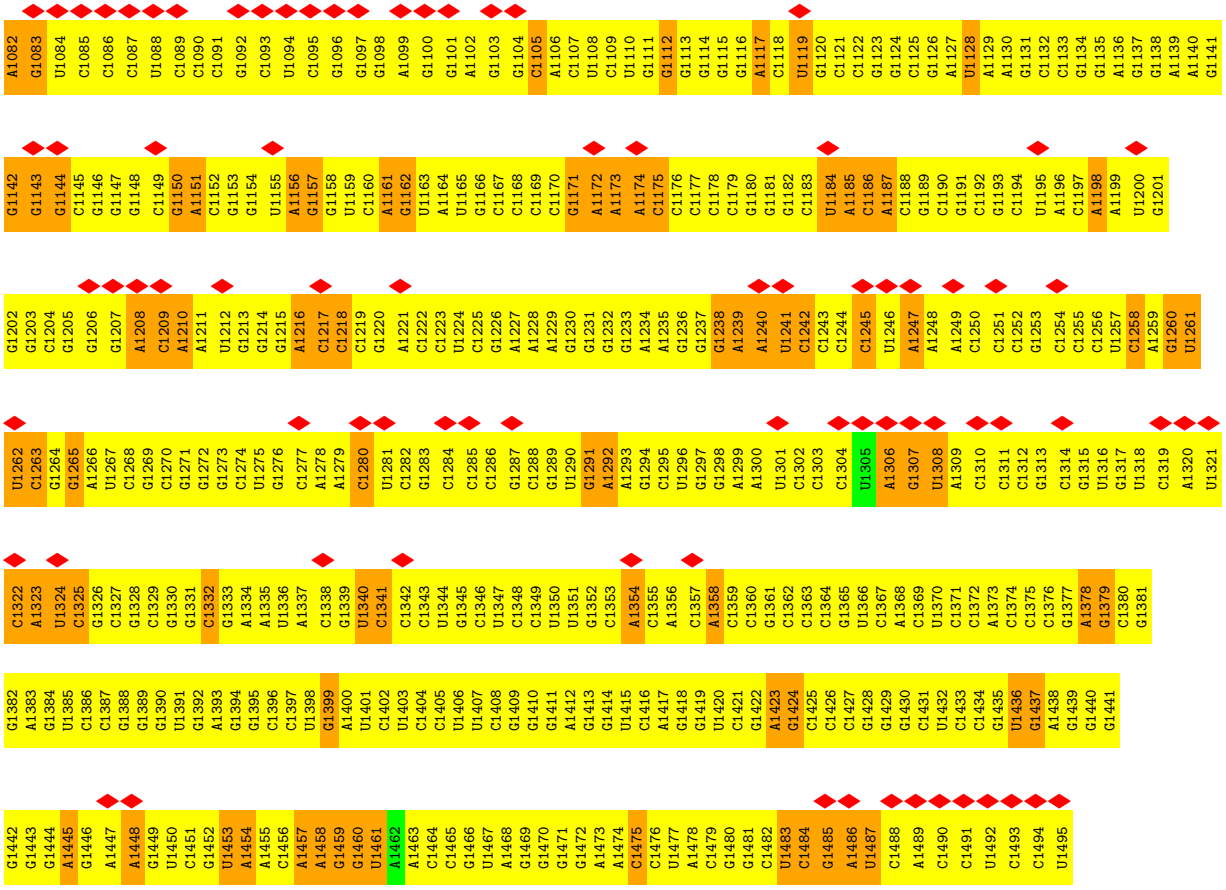
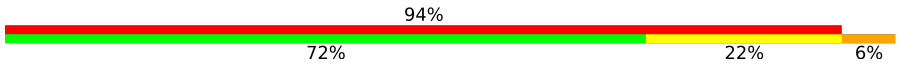
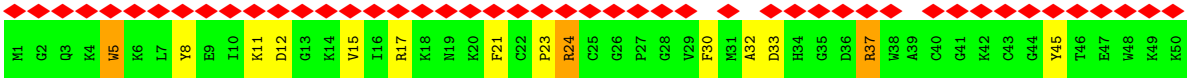


• Molecule 22: 30S ribosomal protein S27ae

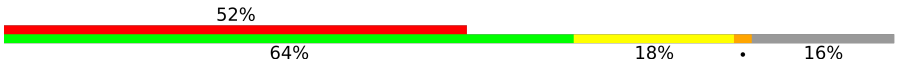
Chain AY:

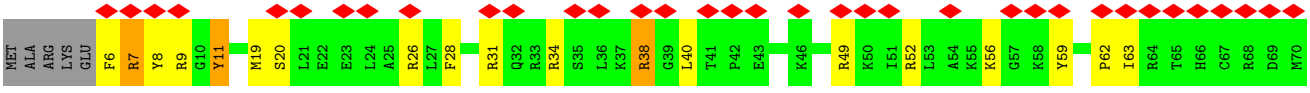


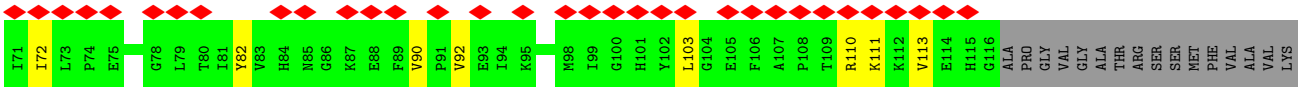


• Molecule 23: 30S ribosomal protein S19P

Chain AT:

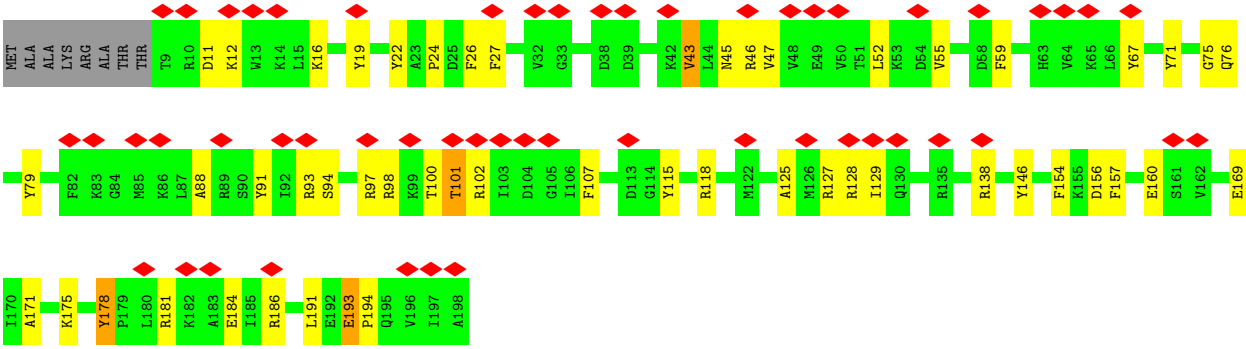




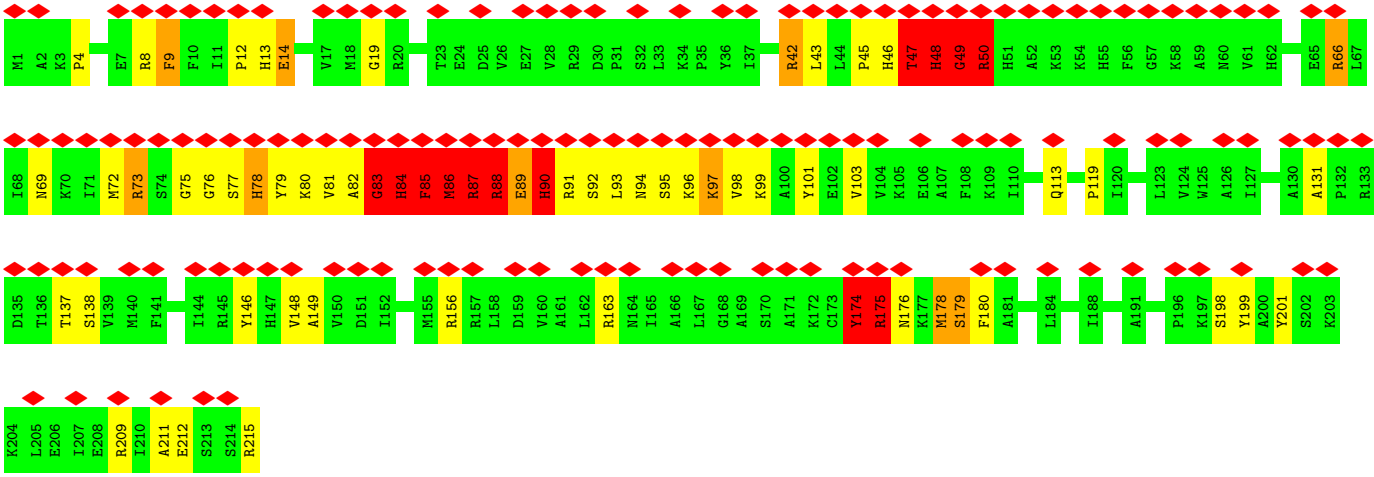


• Molecule 24: 30S ribosomal protein S3Ae

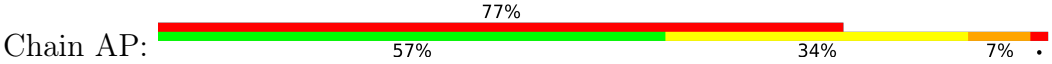
Chain AA:



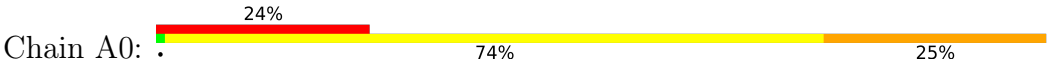
• Molecule 25: 30S ribosomal protein S7P

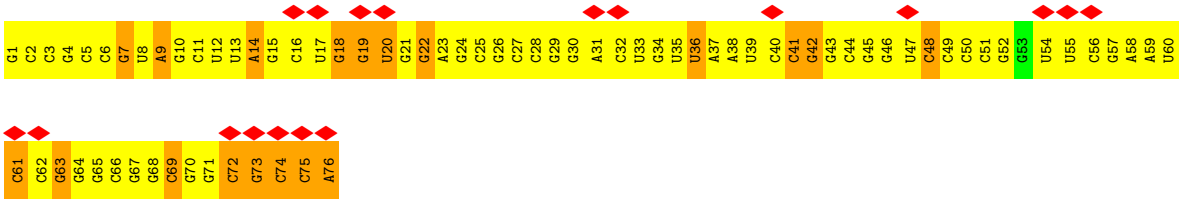


• Molecule 26: 30S ribosomal protein S14P type Z



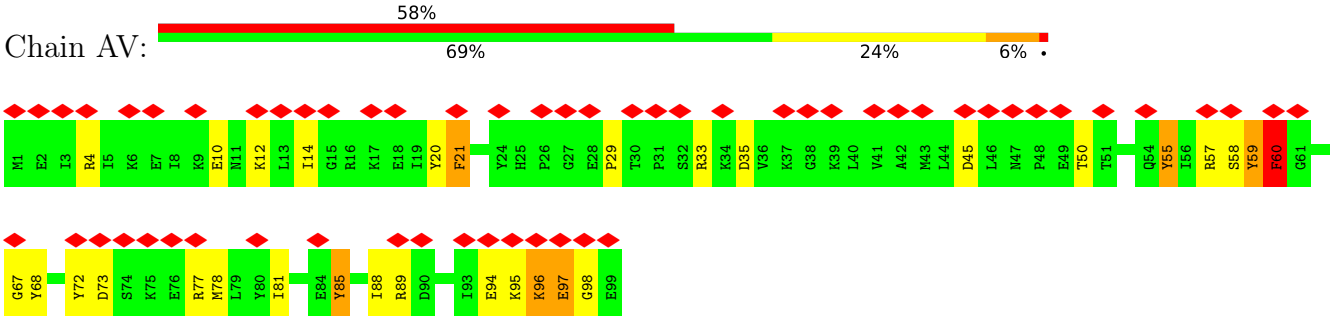
• Molecule 27: P-tRNA





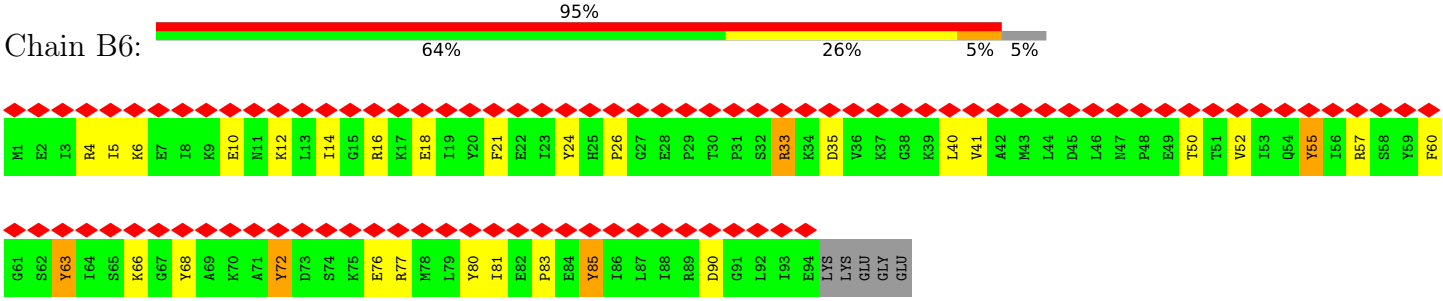
• Molecule 28: 30S ribosomal protein S24e

Chain AV:



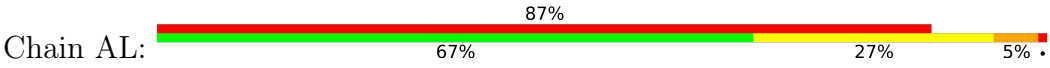
• Molecule 28: 30S ribosomal protein S24e

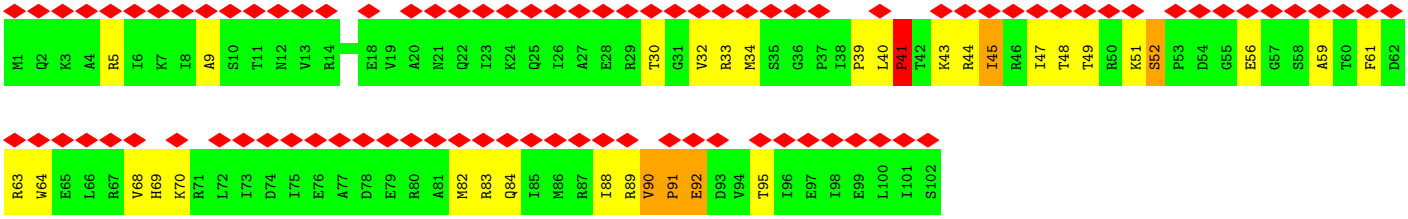
Chain B6:



• Molecule 29: 30S ribosomal protein S10P

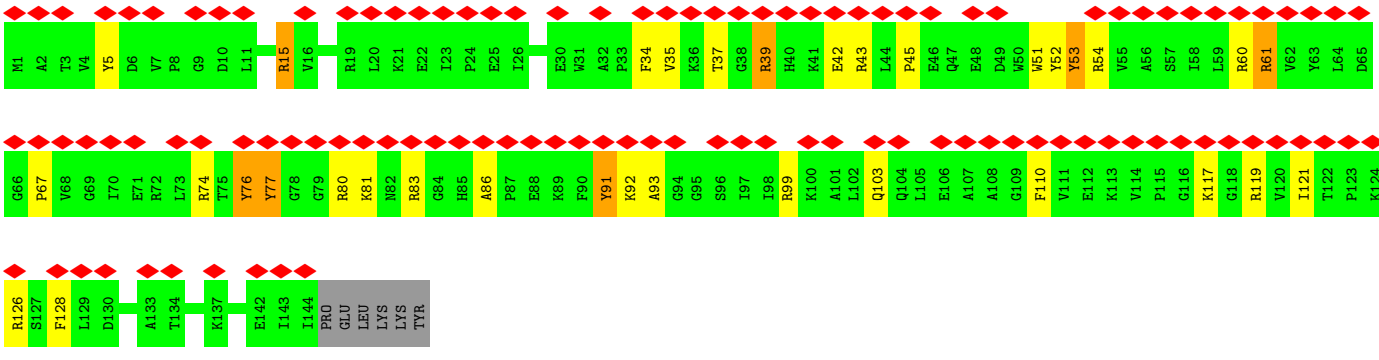
Chain AL:





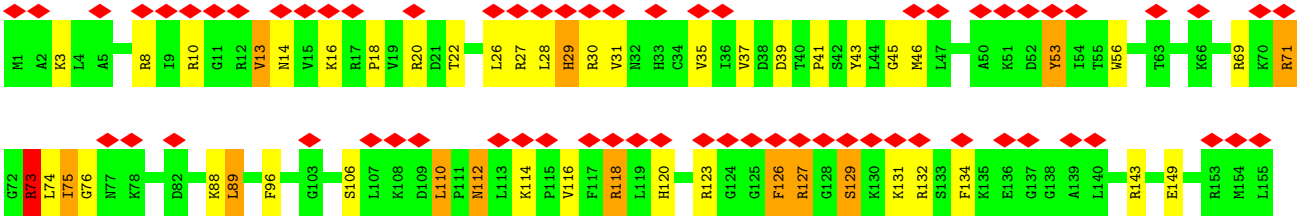
• Molecule 30: SSU ribosomal protein S19E

Chain AU:



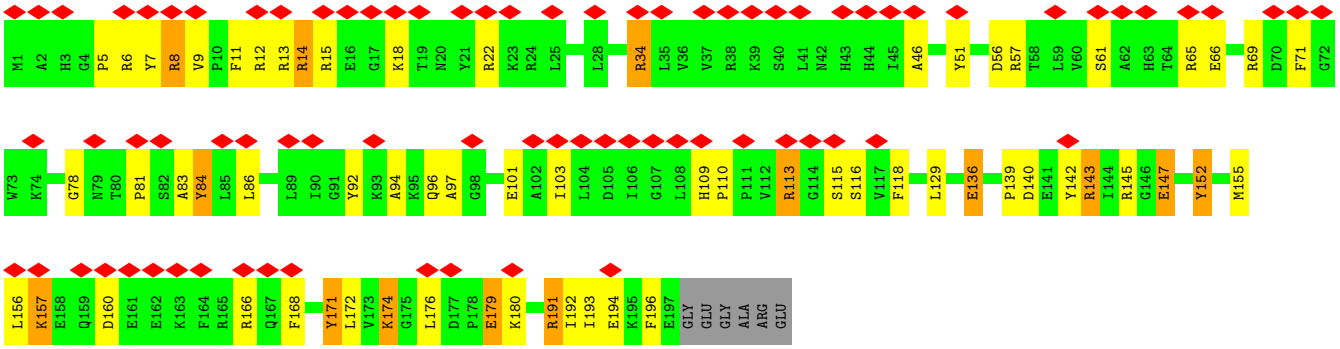
• Molecule 31: 50S ribosomal protein L30P

Chain BY:



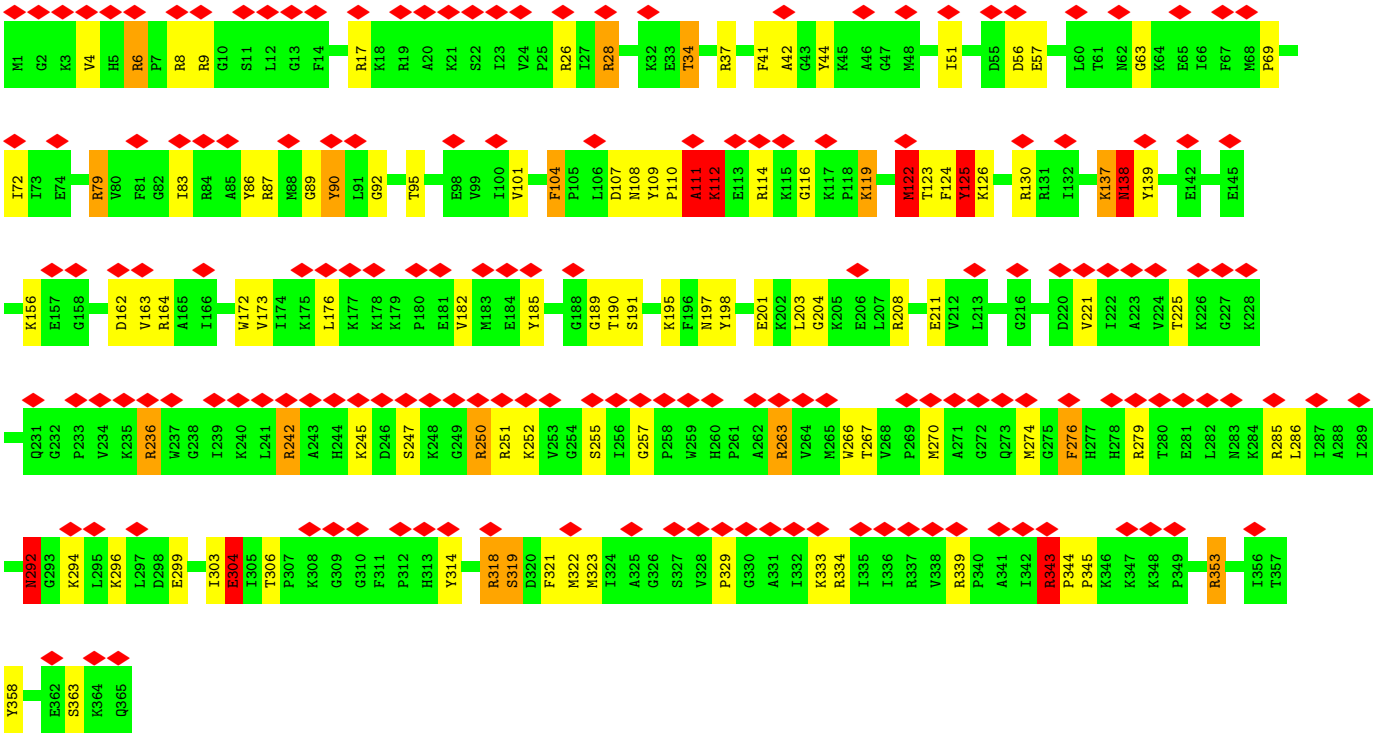
• Molecule 32: 50S ribosomal protein L18P

Chain BO:



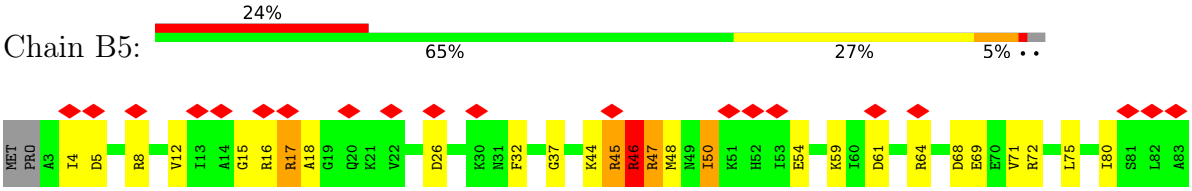
• Molecule 33: 50S ribosomal protein L3P

Chain BC:



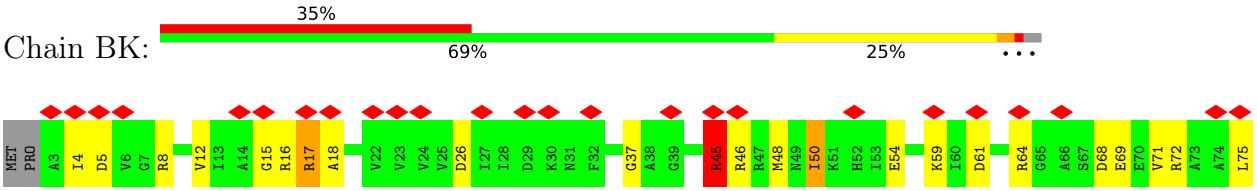
• Molecule 34: 50S ribosomal protein L14e

Chain B5:



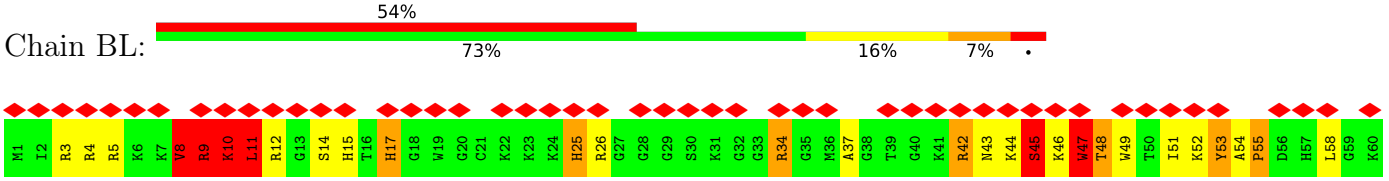
• Molecule 34: 50S ribosomal protein L14e

Chain BK:



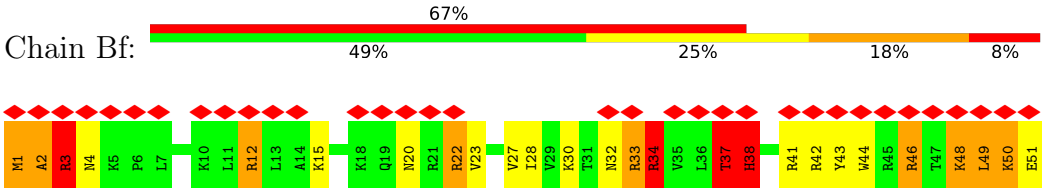
• Molecule 35: 50S ribosomal protein L15P

Chain BL:



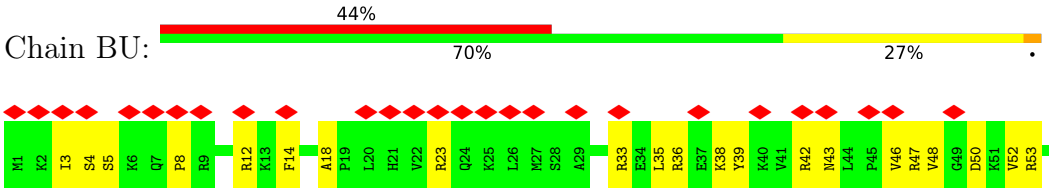
• Molecule 36: 50S ribosomal protein L39e

Chain Bf:



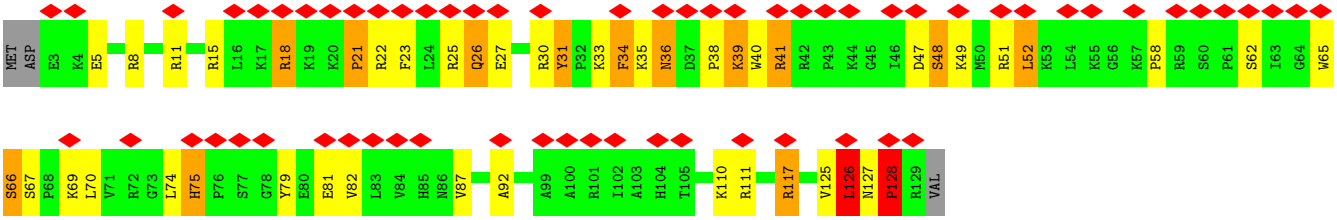
• Molecule 37: 50S ribosomal protein L24P

Chain BU:

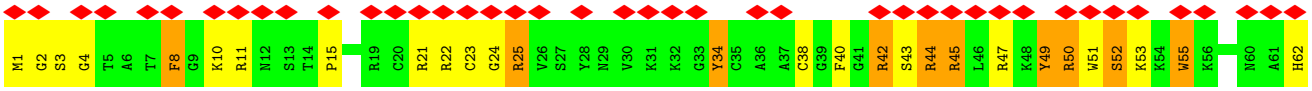


• Molecule 38: 50S ribosomal protein L32e

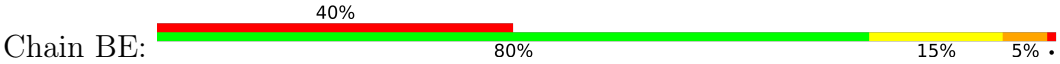
Chain Bb:

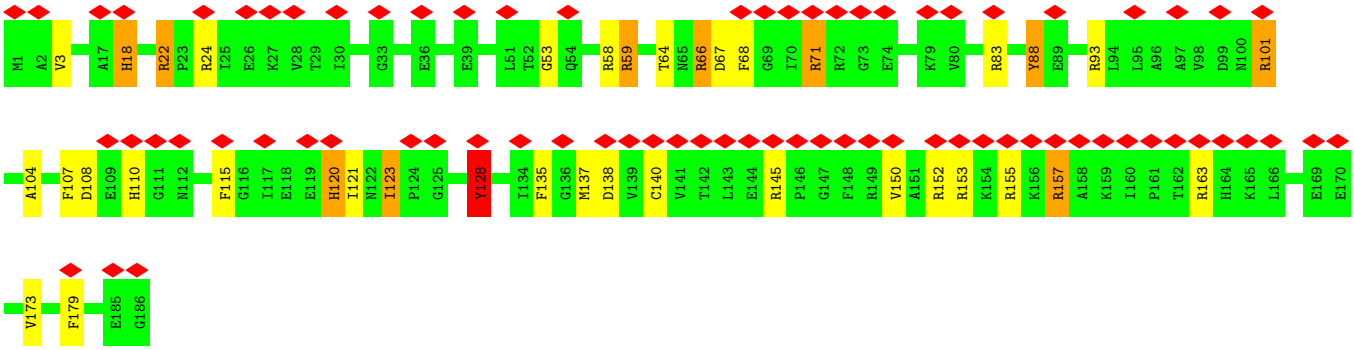


• Molecule 39: 50S ribosomal protein L37e

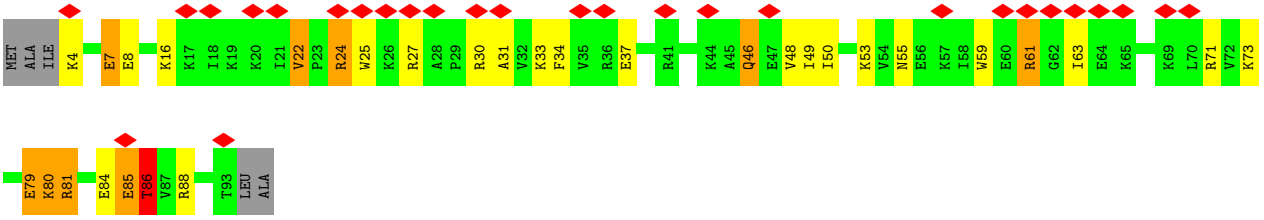


• Molecule 40: 50S ribosomal protein L5P

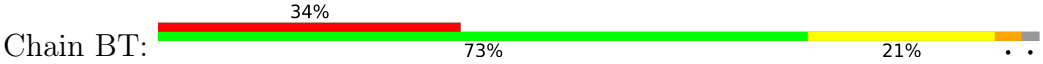


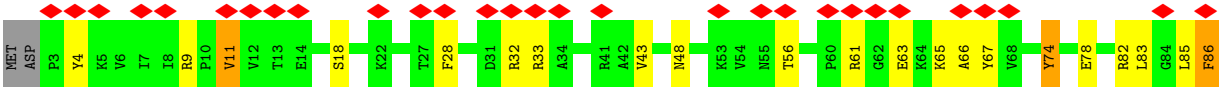


• Molecule 41: 50S ribosomal protein L31e



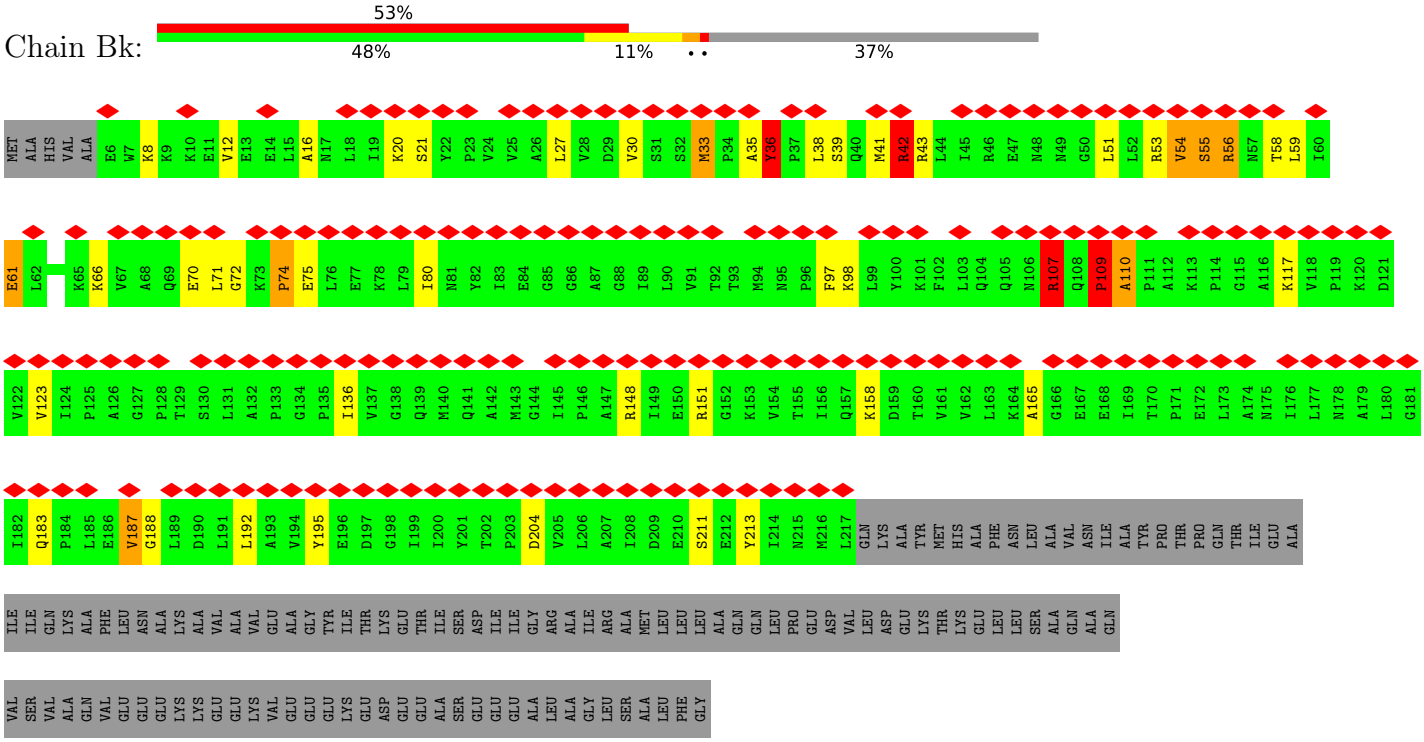
• Molecule 42: 50S ribosomal protein L23P





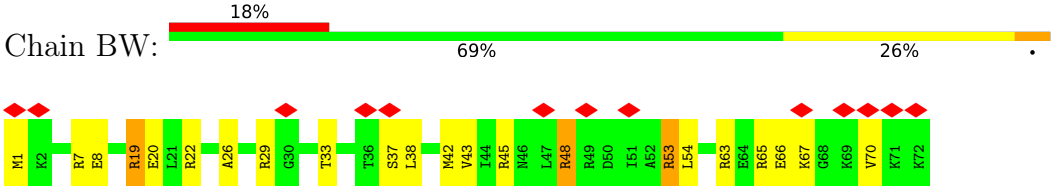
• Molecule 43: Acidic ribosomal protein P0 homolog

Chain Bk:



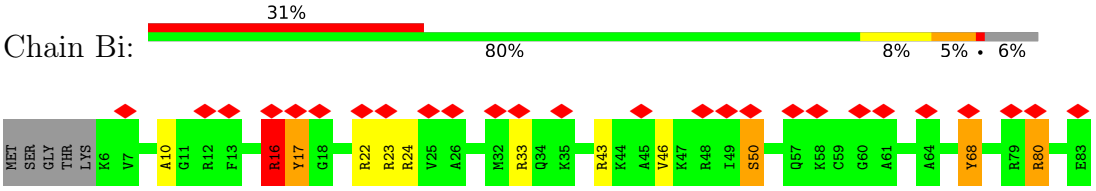
• Molecule 44: 50S ribosomal protein L29P

Chain BW:



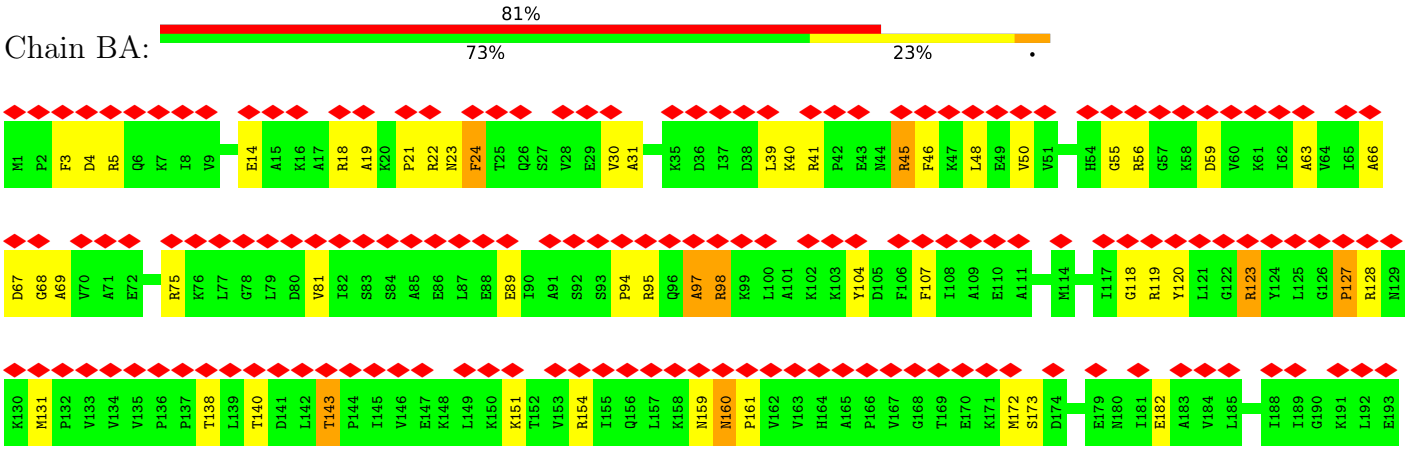
• Molecule 45: 50S ribosomal protein L37Ae

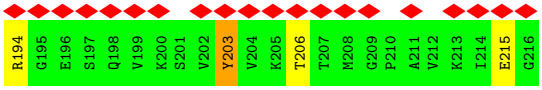
Chain Bi:



• Molecule 46: 50S ribosomal protein L1P

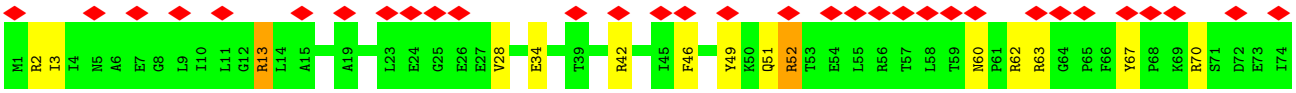
Chain BA:

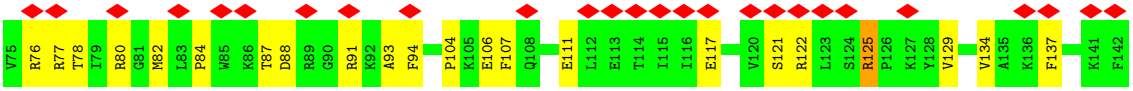




• Molecule 47: 50S ribosomal protein L13P

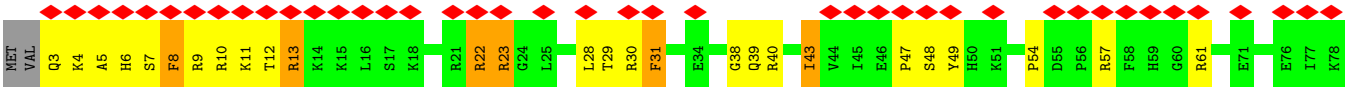
Chain BI:

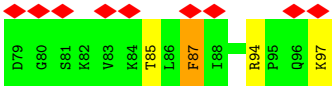




• Molecule 48: 50S ribosomal protein L21e

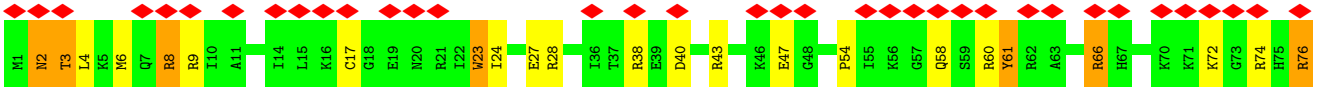
Chain BR:

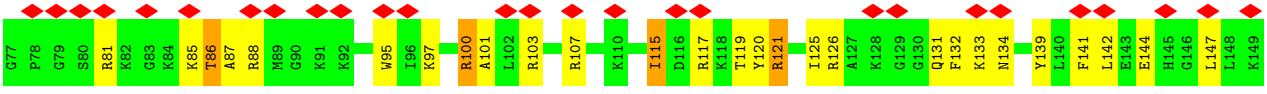




• Molecule 49: 50S ribosomal protein L19e

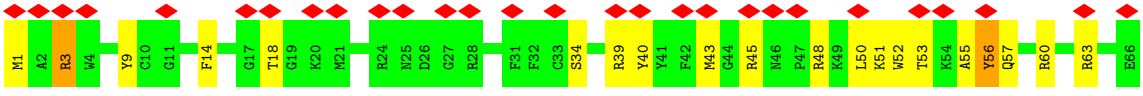
Chain BQ:





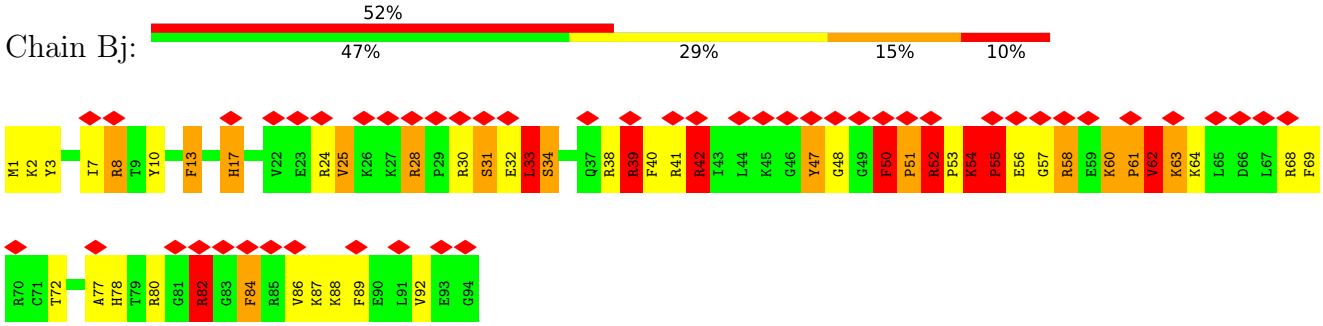
• Molecule 50: 50S ribosomal protein L24e

Chain BV:



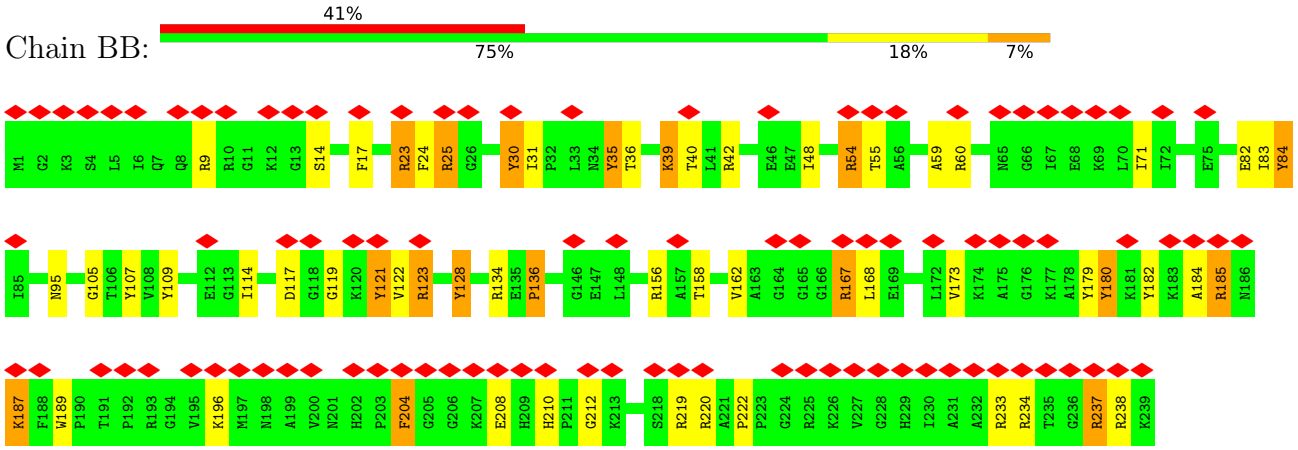
• Molecule 51: 50S ribosomal protein L44E

Chain Bj:



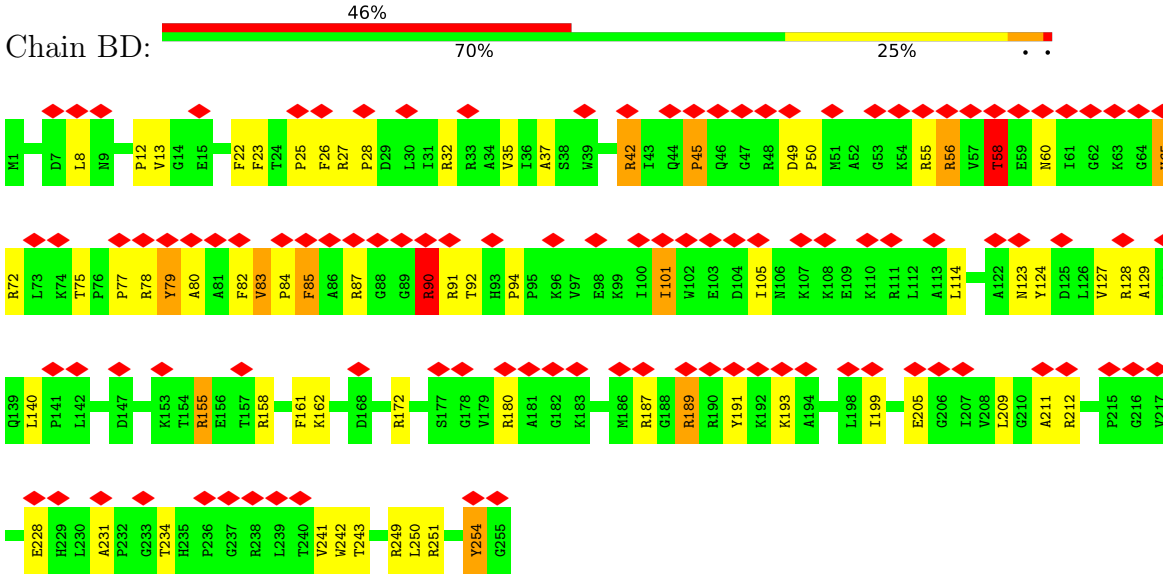
• Molecule 52: 50S ribosomal protein L2P

Chain BB:



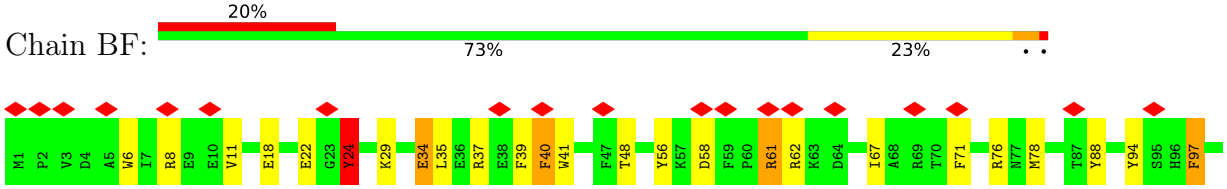
• Molecule 53: 50S ribosomal protein L4P

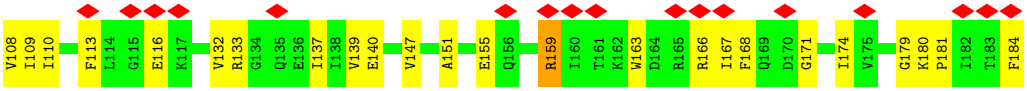
Chain BD:



• Molecule 54: 50S ribosomal protein L6P

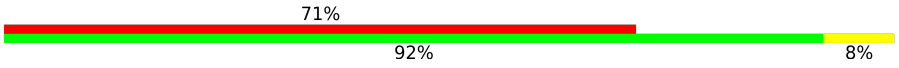
Chain BF:

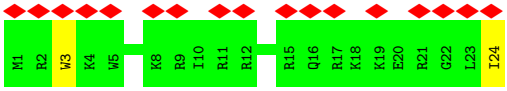




• Molecule 55: 50S ribosomal protein L41e

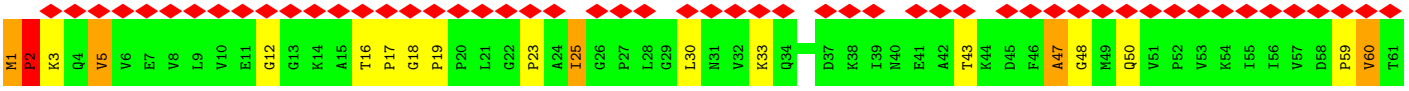
Chain Bh:

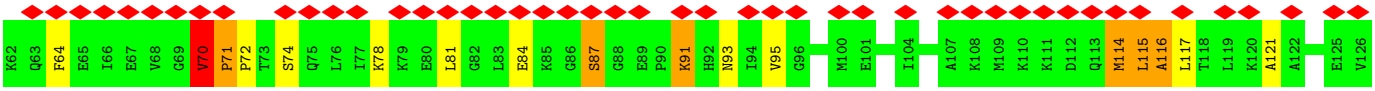


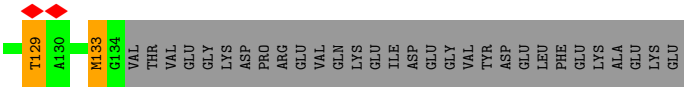


• Molecule 56: 50S ribosomal protein L11P

Chain BH:

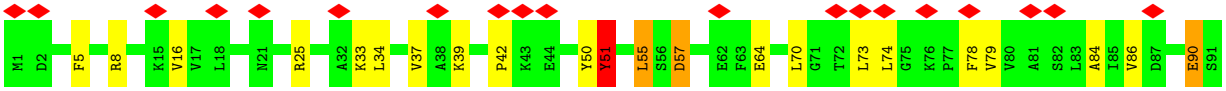


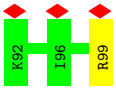




• Molecule 57: 50S ribosomal protein L30e

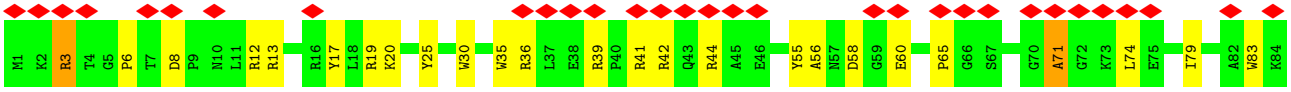
Chain BZ:

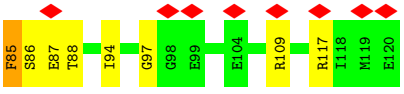




• Molecule 58: 50S ribosomal protein L18e

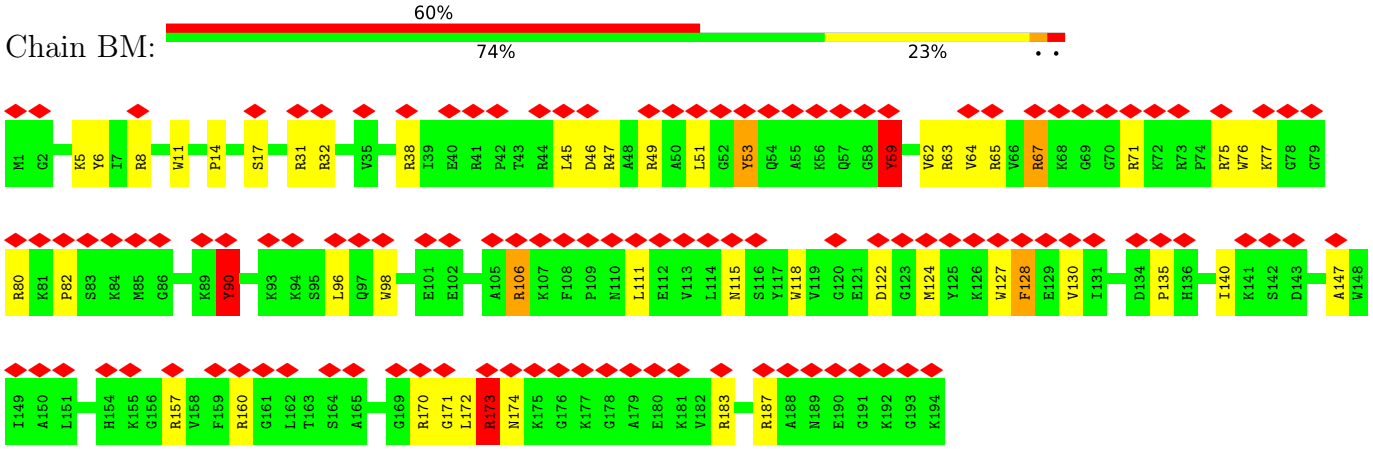
Chain BP:





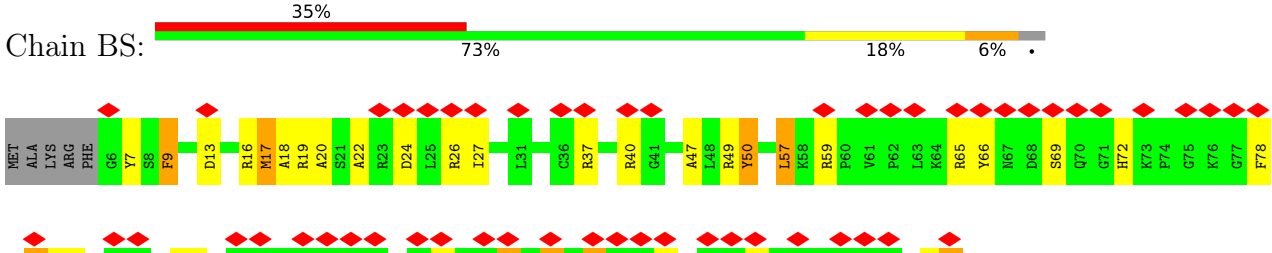
• Molecule 59: 50S ribosomal protein L15e

Chain BM:



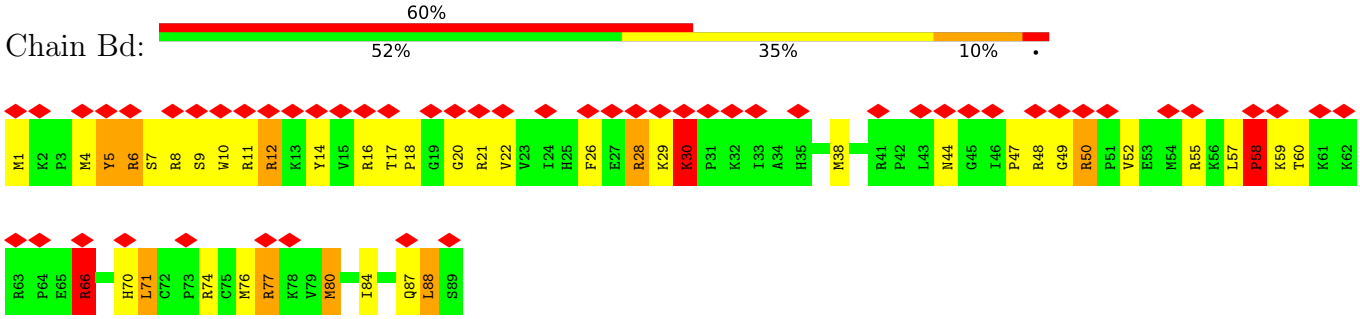
• Molecule 60: 50S ribosomal protein L22P

Chain BS:



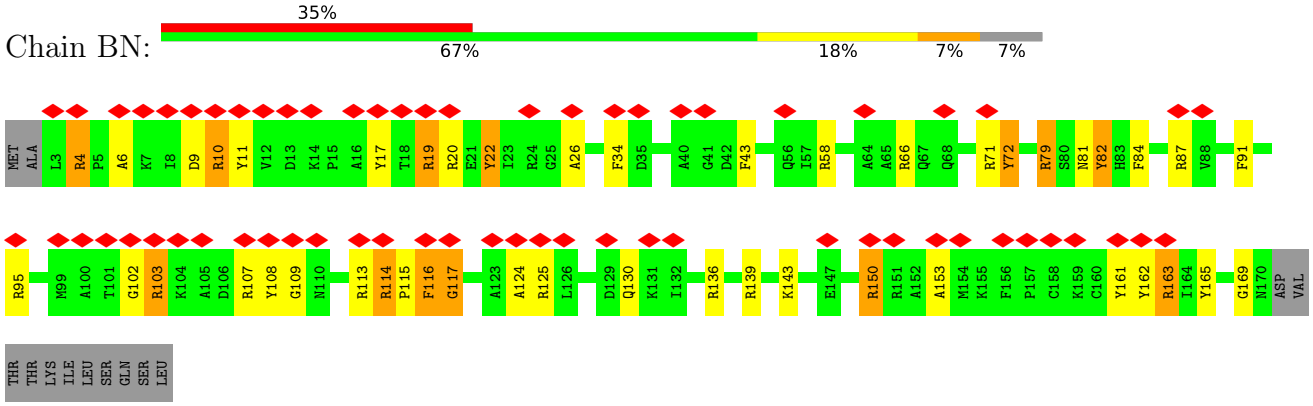
• Molecule 61: 50S ribosomal protein L34e

Chain Bd:



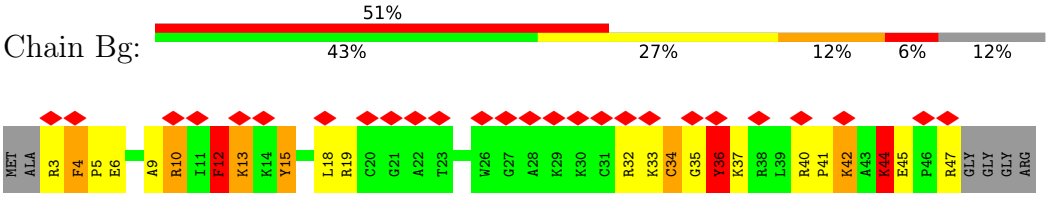
• Molecule 62: 50S ribosomal protein L10e

Chain BN:



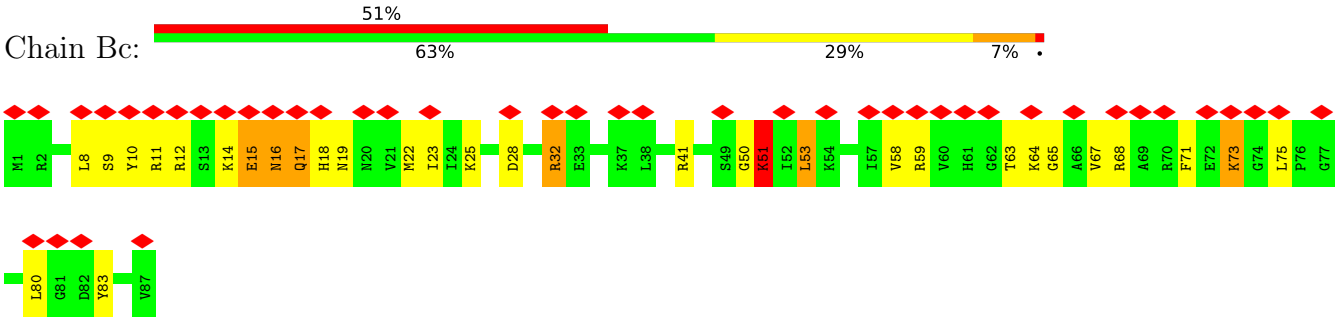
• Molecule 63: 50S ribosomal protein L40e

Chain Bg:



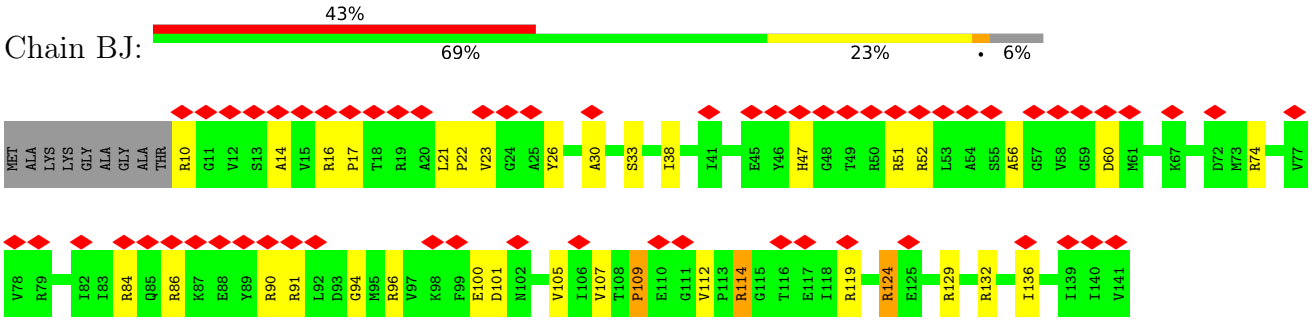
• Molecule 64: 50S ribosomal protein L35Ae

Chain Bc:



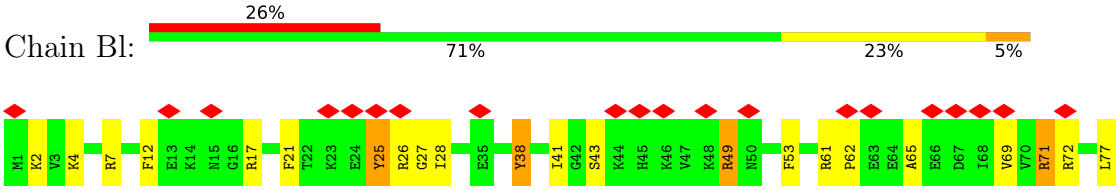
• Molecule 65: 50S ribosomal protein L14P

Chain BJ:



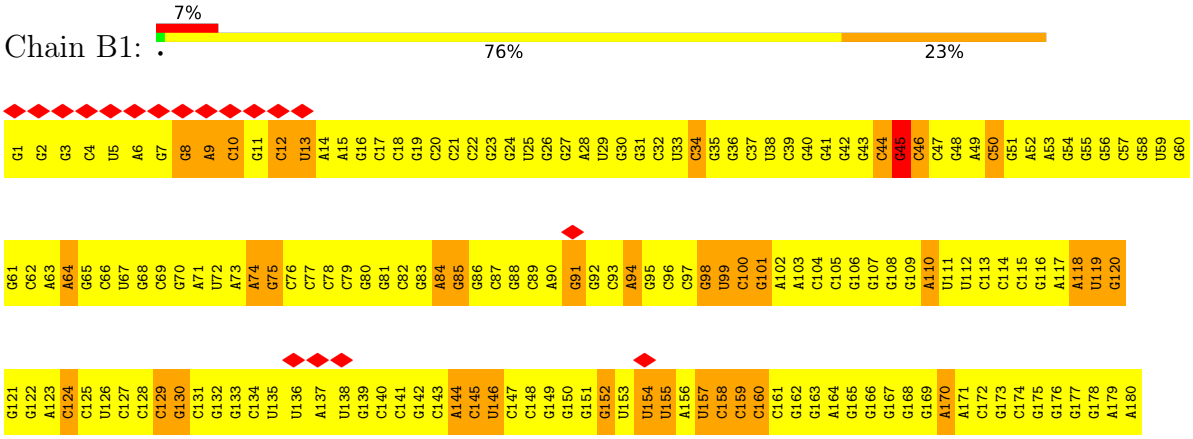
• Molecule 66: 50S ribosomal protein LX

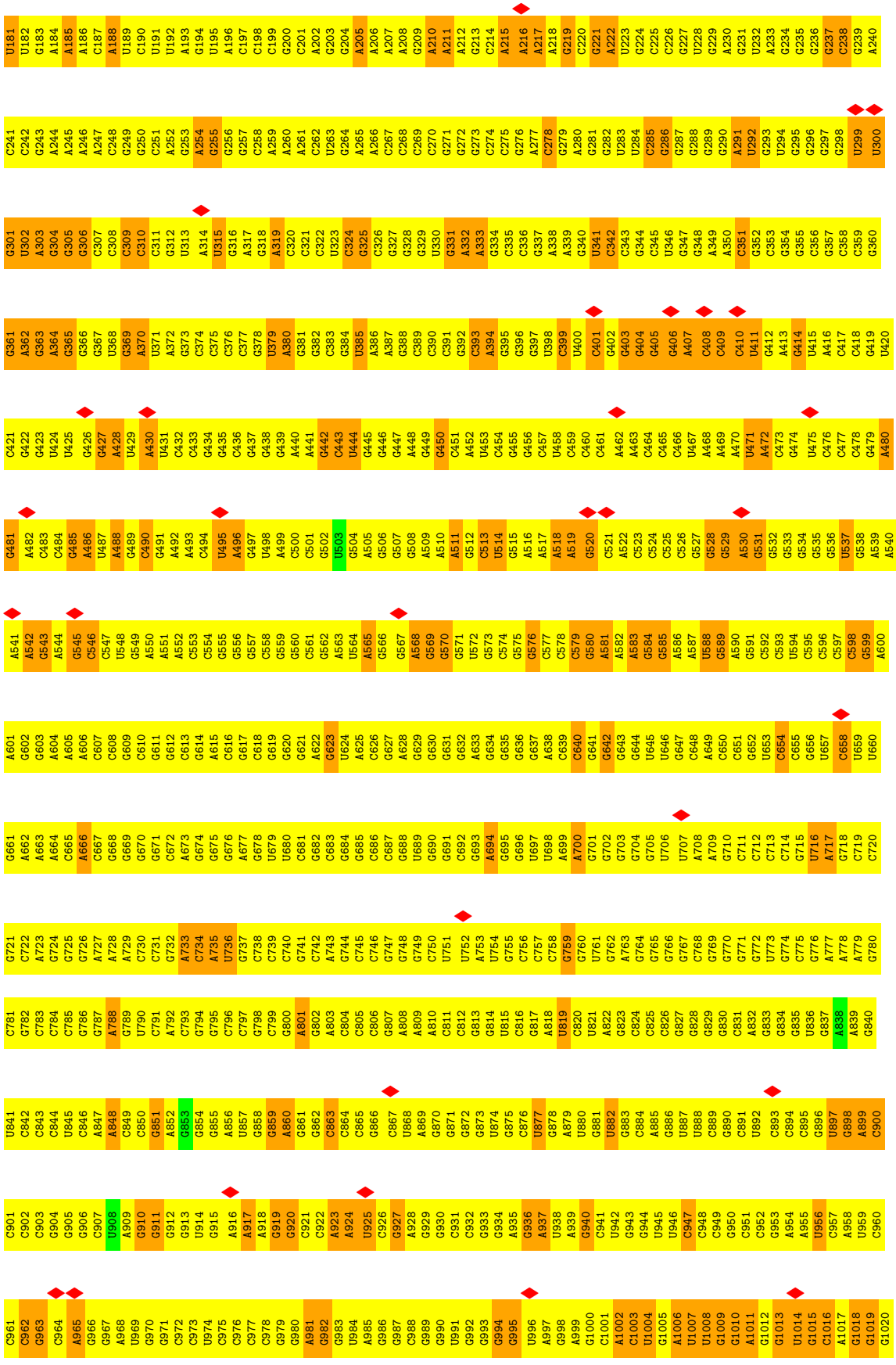
Chain Bl:

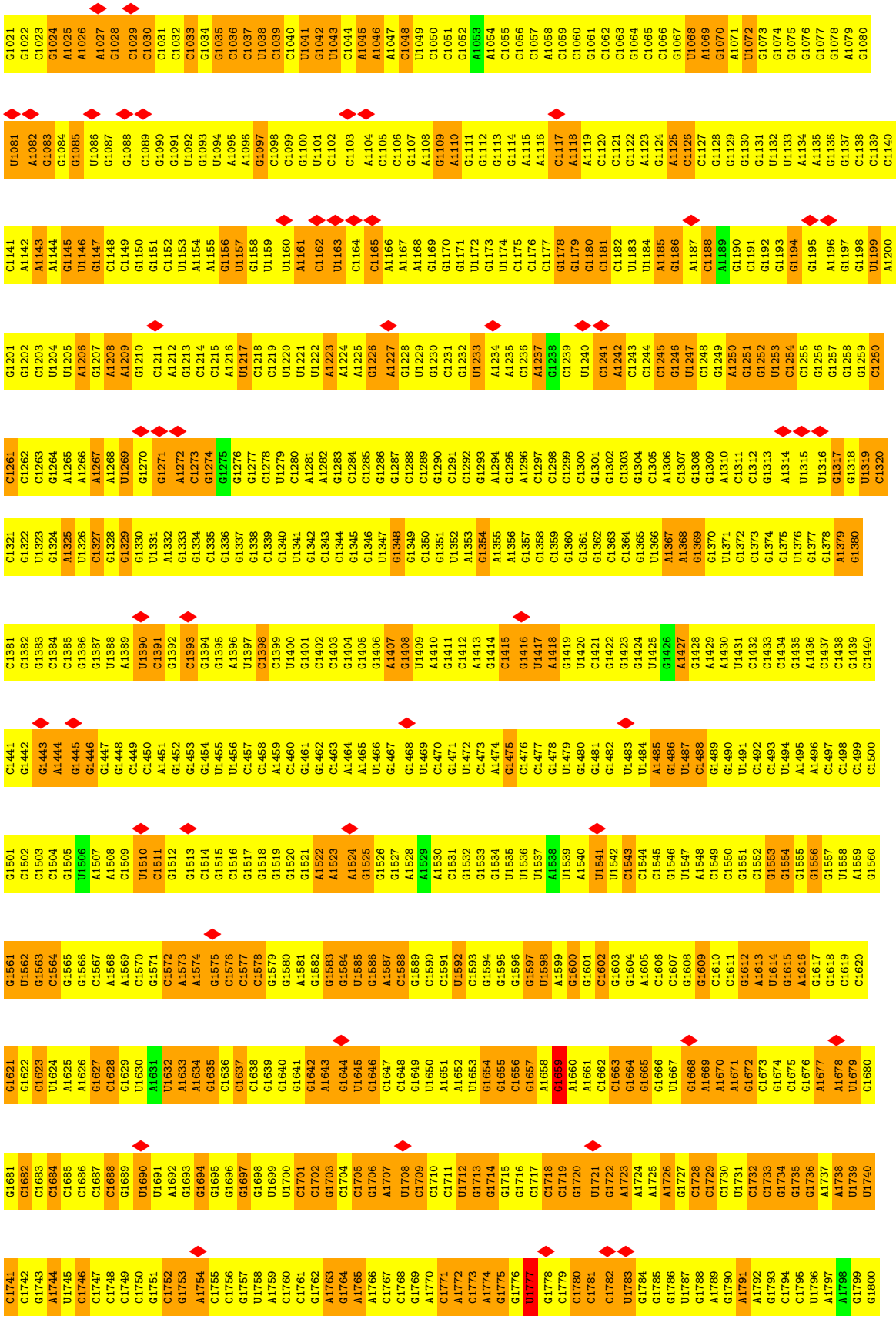


• Molecule 67: 23S rRNA

Chain B1:



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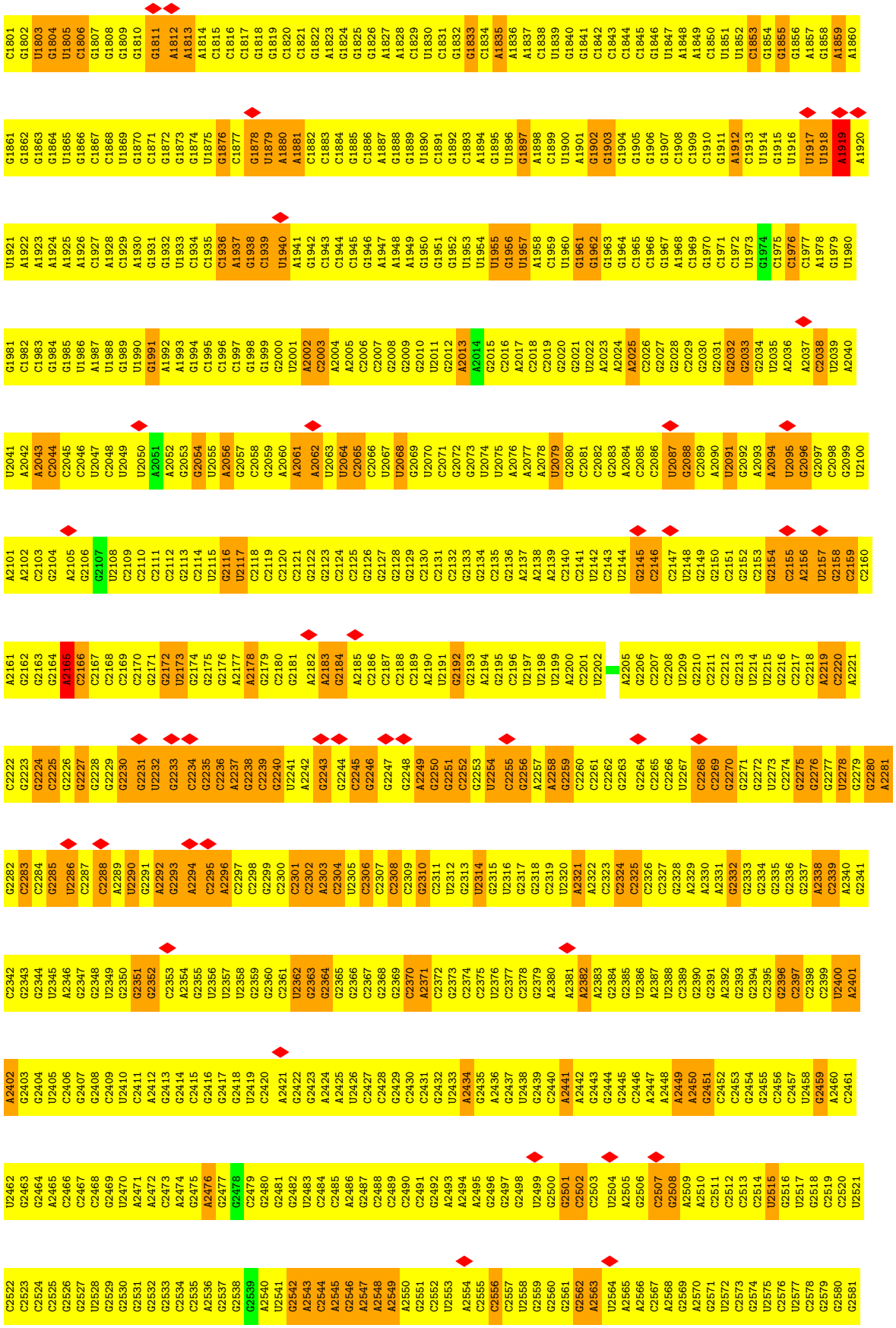
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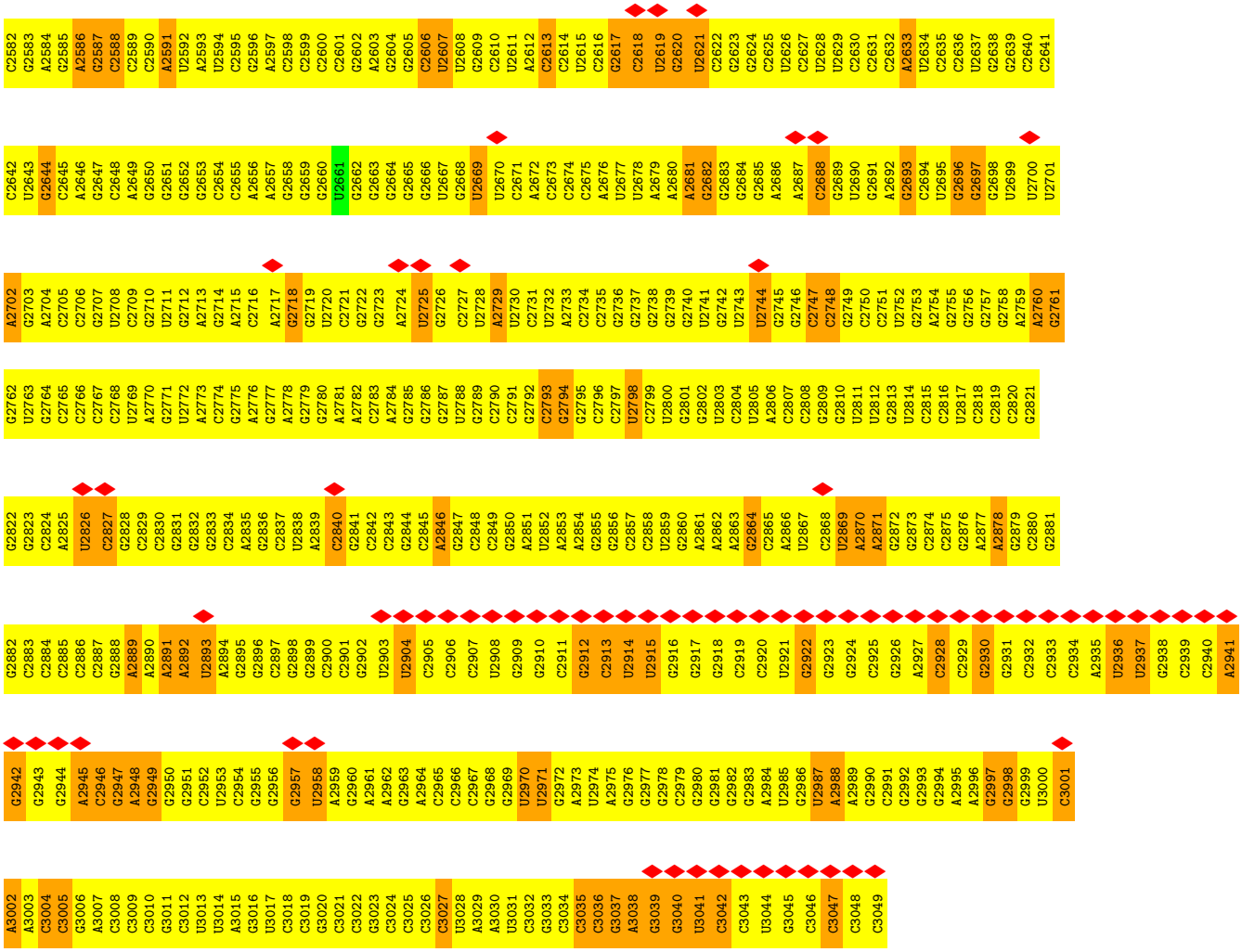
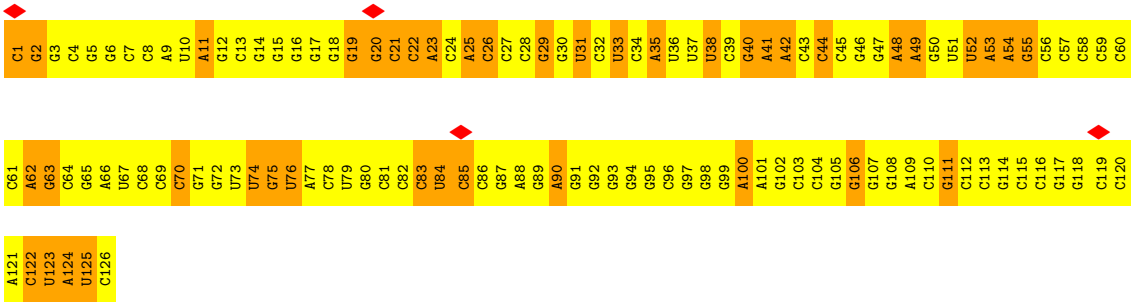
U2041 A2042 A2043 C2044 C2045 C2046 U2047 C2048 U2049 U2050 A2051 A2052 G2053 G2054 U2055 A2056 G2057 C2058 G2059 A2060 A2061 A2062 U2063 U2064 C2065 C2066 U2067 U2068 G2069 U2070 C2071 G2072 G2073 U2074 U2075 A2076 A2077 A2078 U2079 G2080 C2081 C2082 G2083 A2084 C2085 C2086 U2087 G2088 C2089 A2090 U2091 G2092 A2093 A2094 U2095 G2096 G2097 C2098 G2099 U2100
A2101 A2102 C2103 G2104 A2105 G2106 G2107 U2108 C2109 C2110 C2111 C2112 G2113 C2114 U2115 G2116 U2117 C2118 C2119 C2120 C2121 G2122 G2123 G2124 C2125 G2126 C2127 G2128 G2129 C2130 C2131 C2132 C2133 G2134 C2135 C2136 A2137 A2138 A2139 C2140 C2141 U2142 C2143 U2144 G2145 C2146 C2147 U2148 G2149 G2150 C2151 G2152 C2153 G2154 C2155 A2156 U2157 G2158 C2159 C2160
A2161 G2162 G2163 G2164 A2165 C2166 C2167 C2168 C2169 C2170 G2171 G2172 U2173 G2174 G2175 G2176 A2177 A2178 G2179 C2180 G2181 A2182 A2183 G2184 A2185 C2186 C2187 C2188 C2189 A2190 U2191 G2192 G2193 A2194 G2195 C2196 U2197 U2198 U2199 A2200 C2201 U2202 A2205 G2206 C2207 C2208 U2209 G2210 C2211 C2212 G2213 U2214 U2215 G2216 C2217 C2218 A2219 C2220 A2221
C2222 G2223 G2224 C2225 G2226 G2227 G2228 G2229 G2230 G2231 U2232 G2233 C2234 G2235 C2236 A2237 G2238 G2239 G2240 U2241 A2242 G2243 G2244 C2245 G2246 G2247 G2248 A2249 G2250 G2251 C2252 G2253 U2254 C2255 G2256 A2257 A2258 G2259 C2260 C2261 C2262 G2263 G2264 C2265 C2266 U2267 C2268 C2269 C2270 G2271 G2272 U2273 C2274 G2275 G2276 G2277 U2278 G2279 G2280 A2281
G2282 C2283 C2284 G2285 U2286 C2287 C2288 A2289 U2290 G2291 A2292 G2293 A2294 C2295 A2296 C2297 C2298 G2299 C2300 C2301 C2302 A2303 C2304 U2305 C2306 C2307 C2308 C2309 G2310 C2311 U2312 G2313 U2314 G2315 U2316 G2317 G2318 C2319 U2320 A2321 A2322 C2323 C2324 C2325 C2326 C2327 G2328 A2329 A2330 A2331 G2332 G2333 G2334 G2335 G2336 G2337 A2338 C2339 A2340 G2341
C2342 G2343 G2344 U2345 A2346 G2347 G2348 U2349 G2350 G2351 G2352 C2353 A2354 G2355 U2356 U2357 U2358 G2359 G2360 C2361 U2362 G2363 G2364 G2365 G2366 C2367 G2368 G2369 C2370 A2371 C2372 G2373 C2374 C2375 U2376 C2377 C2378 G2379 A2380 A2381 A2382 A2383 G2384 G2385 U2386 A2387 U2388 C2389 G2390 G2391 A2392 G2393 G2394 C2395 G2396 C2397 C2398 C2399 U2400 A2401
A2402 G2403 G2404 U2405 C2406 G2407 G2408 C2409 U2410 C2411 A2412 G2413 G2414 C2415 G2416 G2417 G2418 U2419 C2420 A2421 G2422 G2423 G2424 A2425 U2426 C2427 C2428 G2429 C2430 C2431 G2432 U2433 A2434 G2435 A2436 G2437 U2438 G2439 C2440 A2441 A2442 G2443 G2444 G2445 C2446 A2447 A2448 A2449 A2450 G2451 C2452 C2453 C2454 G2455 C2456 C2457 U2458 G2459 A2460 C2461
U2462 G2463 G2464 A2465 C2466 C2467 C2468 G2469 U2470 A2471 A2472 C2473 A2474 G2475 A2476 G2477 G2478 C2479 G2480 G2481 G2482 U2483 C2484 C2485 A2486 G2487 C2488 C2489 C2490 C2491 G2492 A2493 A2494 A2495 G2496 G2497 G2498 U2499 G2500 G2501 C2502 C2503 U2504 A2505 G2506 C2507 G2508 A2509 A2510 C2511 C2512 C2513 C2514 U2515 C2516 U2517 G2518 C2519 C2520 U2521
C2522 G2523 C2524 C2525 G2526 G2527 U2528 G2529 G2530 G2531 G2532 G2533 C2534 C2535 A2536 G2537 G2538 C2539 A2540 U2541 G2542 A2543 C2544 A2545 G2546 A2547 A2548 A2549 A2550 C2551 C2552 U2553 A2554 C2555 C2556 C2557 U2558 C2559 G2560 G2561 G2562 A2563 U2564 A2565 A2566 C2567 A2568 G2569 A2570 G2571 U2572 C2573 G2574 U2575 C2576 U2577 C2578 G2579 G2580 G2581



• Molecule 68: 5S rRNA

Chain B3:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	10000	Depositor
Resolution determination method	FSC 0.5 CUT-OFF	Depositor
CTF correction method	Wiener Filter	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	25	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3600	Depositor
Magnification	75000	Depositor
Image detector	TVIPS TEMCAM-F416 (4k x 4k)	Depositor
Maximum map value	0.745	Depositor
Minimum map value	-0.497	Depositor
Average map value	0.004	Depositor
Map value standard deviation	0.040	Depositor
Recommended contour level	0.13	Depositor
Map size (Å)	455.4, 455.4, 455.4	wwPDB
Map dimensions	368, 368, 368	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.2375, 1.2375, 1.2375	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	AQ	1.71	11/1338 (0.8%)	1.93	30/1797 (1.7%)
2	AK	1.74	12/1088 (1.1%)	2.01	32/1455 (2.2%)
3	AI	1.54	5/1049 (0.5%)	1.70	9/1408 (0.6%)
4	AG	1.48	3/999 (0.3%)	1.97	31/1337 (2.3%)
5	AW	1.76	3/485 (0.6%)	1.86	11/651 (1.7%)
6	AC	1.81	19/1480 (1.3%)	1.99	34/1985 (1.7%)
7	AB	1.79	18/1654 (1.1%)	2.06	51/2233 (2.3%)
8	AR	1.83	14/956 (1.5%)	2.07	35/1287 (2.7%)
10	AD	1.73	15/1457 (1.0%)	1.93	36/1953 (1.8%)
11	A1	3.43	155/1843 (8.4%)	2.59	167/2873 (5.8%)
12	AN	1.58	12/1156 (1.0%)	1.95	31/1535 (2.0%)
13	AX	1.92	9/570 (1.6%)	2.14	19/760 (2.5%)
14	AM	1.71	11/1022 (1.1%)	1.98	27/1375 (2.0%)
15	AE	1.80	28/2025 (1.4%)	2.16	66/2732 (2.4%)
16	AJ	1.85	16/1013 (1.6%)	2.04	20/1349 (1.5%)
17	AO	1.88	16/1208 (1.3%)	2.11	39/1619 (2.4%)
18	AF	1.23	5/1745 (0.3%)	1.38	18/2350 (0.8%)
19	AS	1.71	8/562 (1.4%)	1.86	14/744 (1.9%)
20	A3	1.67	7/951 (0.7%)	1.95	24/1281 (1.9%)
20	B4	1.41	2/951 (0.2%)	1.64	11/1281 (0.9%)
20	BG	1.34	0/951	1.79	21/1281 (1.6%)
21	A2	3.29	2781/35966 (7.7%)	2.59	3540/56138 (6.3%)
22	AY	1.72	4/421 (1.0%)	1.85	8/558 (1.4%)
23	AT	1.81	7/942 (0.7%)	1.95	24/1257 (1.9%)
24	AA	1.71	13/1585 (0.8%)	2.12	53/2124 (2.5%)
25	AH	1.62	20/1773 (1.1%)	2.11	75/2381 (3.1%)
26	AP	1.87	6/471 (1.3%)	2.06	15/620 (2.4%)
27	A0	3.33	158/1814 (8.7%)	2.51	182/2828 (6.4%)
28	AV	1.57	7/839 (0.8%)	1.75	17/1122 (1.5%)
28	B6	1.73	9/798 (1.1%)	2.09	32/1071 (3.0%)
29	AL	1.52	3/830 (0.4%)	2.03	28/1113 (2.5%)
30	AU	1.79	14/1203 (1.2%)	2.05	29/1621 (1.8%)
31	BY	1.73	13/1262 (1.0%)	2.04	31/1687 (1.8%)
32	BO	1.85	29/1635 (1.8%)	1.96	37/2196 (1.7%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
33	BC	1.72	27/2978 (0.9%)	2.06	96/4003 (2.4%)
34	B5	1.76	7/618 (1.1%)	2.12	24/829 (2.9%)
34	BK	1.80	8/618 (1.3%)	1.98	19/829 (2.3%)
35	BL	1.71	13/1175 (1.1%)	2.07	46/1563 (2.9%)
36	Bf	1.94	13/453 (2.9%)	2.75	38/603 (6.3%)
37	BU	1.77	16/1024 (1.6%)	2.05	29/1365 (2.1%)
38	Bb	1.77	12/1099 (1.1%)	2.14	36/1466 (2.5%)
39	Be	1.82	10/517 (1.9%)	2.11	19/681 (2.8%)
40	BE	1.72	12/1513 (0.8%)	1.99	39/2026 (1.9%)
41	Ba	1.61	1/760 (0.1%)	2.04	30/1019 (2.9%)
42	BT	1.66	5/689 (0.7%)	1.97	19/924 (2.1%)
43	Bk	1.48	8/1659 (0.5%)	1.82	44/2253 (2.0%)
44	BW	1.85	13/595 (2.2%)	2.02	19/784 (2.4%)
45	Bi	1.57	0/599	1.85	16/798 (2.0%)
46	BA	1.73	23/1702 (1.4%)	1.98	46/2293 (2.0%)
47	BI	1.80	18/1168 (1.5%)	1.96	30/1561 (1.9%)
48	BR	1.65	4/808 (0.5%)	1.92	22/1080 (2.0%)
49	BQ	1.69	15/1272 (1.2%)	2.17	43/1676 (2.6%)
50	BV	1.67	3/570 (0.5%)	2.07	23/758 (3.0%)
51	Bj	1.75	6/805 (0.7%)	2.36	51/1064 (4.8%)
52	BB	1.77	19/1883 (1.0%)	2.08	56/2540 (2.2%)
53	BD	1.81	25/2068 (1.2%)	1.99	57/2787 (2.0%)
54	BF	1.74	13/1507 (0.9%)	2.01	44/2033 (2.2%)
55	Bh	1.34	2/233 (0.9%)	1.11	3/301 (1.0%)
56	BH	1.46	5/1001 (0.5%)	1.88	31/1351 (2.3%)
57	BZ	1.69	6/764 (0.8%)	1.99	20/1028 (1.9%)
58	BP	1.89	12/980 (1.2%)	1.97	24/1313 (1.8%)
59	BM	1.84	23/1634 (1.4%)	1.97	35/2179 (1.6%)
60	BS	1.76	7/1226 (0.6%)	2.16	38/1649 (2.3%)
61	Bd	1.60	5/758 (0.7%)	2.22	41/1007 (4.1%)
62	BN	1.86	16/1409 (1.1%)	2.09	51/1890 (2.7%)
63	Bg	1.58	2/380 (0.5%)	2.02	17/504 (3.4%)
64	Bc	1.67	6/694 (0.9%)	2.12	30/926 (3.2%)
65	BJ	1.88	14/1027 (1.4%)	1.95	24/1385 (1.7%)
66	Bl	1.81	7/669 (1.0%)	1.92	15/884 (1.7%)
67	B1	3.31	5858/73410 (8.0%)	2.59	7158/114595 (6.2%)
68	B3	3.47	234/3010 (7.8%)	2.74	322/4693 (6.9%)
All	All	2.81	9901/187317 (5.3%)	2.41	13452/276642 (4.9%)

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	AQ	0	7
2	AK	0	4
3	AI	0	5
4	AG	1	9
5	AW	0	2
6	AC	0	11
7	AB	0	6
8	AR	0	3
9	A9	0	1
10	AD	0	6
12	AN	0	10
13	AX	0	7
14	AM	0	2
15	AE	0	11
16	AJ	0	4
17	AO	0	11
18	AF	0	1
19	AS	0	1
20	B4	0	1
20	BG	0	3
21	A2	1	7
22	AY	0	4
23	AT	0	5
24	AA	0	2
25	AH	4	21
26	AP	0	6
28	AV	0	10
28	B6	0	2
29	AL	1	5
30	AU	0	6
31	BY	0	7
32	BO	0	11
33	BC	0	18
34	B5	1	3
34	BK	1	1
35	BL	3	12
36	Bf	0	13
37	BU	0	3
38	Bb	0	10
39	Be	1	12
40	BE	0	6
41	Ba	0	7
42	BT	0	3

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Mol	Chain	#Chirality outliers	#Planarity outliers
43	Bk	0	10
44	BW	0	2
45	Bi	0	4
46	BA	0	4
47	BI	0	3
48	BR	0	6
49	BQ	3	10
50	BV	1	4
51	Bj	1	18
52	BB	0	16
53	BD	0	8
54	BF	0	8
56	BH	1	9
57	BZ	0	1
58	BP	0	2
59	BM	0	7
60	BS	0	7
61	Bd	1	7
62	BN	0	8
63	Bg	1	4
64	Bc	1	7
65	BJ	0	3
66	Bl	0	3
67	B1	0	12
All	All	22	442

The worst 5 of 9901 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
67	B1	1565	G	O4'-C1'	51.72	2.08	1.41
67	B1	2507	C	O4'-C1'	37.95	1.91	1.41
67	B1	1570	C	O4'-C1'	37.84	1.90	1.41
67	B1	1642	G	C2'-C1'	35.02	1.91	1.53
21	A2	85	A	C2'-C1'	34.42	1.91	1.53

The worst 5 of 13452 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
67	B1	2363	G	O4'-C1'-N9	44.16	143.53	108.20
67	B1	1754	A	O4'-C1'-N9	36.92	137.74	108.20
21	A2	1207	G	O4'-C1'-N9	31.50	133.40	108.20
11	A1	49	C	O4'-C1'-N1	30.68	132.75	108.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
67	B1	2174	G	O4'-C1'-N9	30.40	132.52	108.20

5 of 22 chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	AG	53	LYS	CA
21	A2	1317	G	C1'
25	AH	85	PHE	CA
25	AH	86	MET	CA
25	AH	87	ARG	CA

5 of 442 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AQ	28	TYR	Sidechain
1	AQ	3	ARG	Sidechain
1	AQ	58	TYR	Sidechain
1	AQ	68	ASP	Peptide
1	AQ	74	ARG	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	AQ	156/158 (99%)	139 (89%)	8 (5%)	9 (6%)	1 18
2	AK	133/135 (98%)	119 (90%)	12 (9%)	2 (2%)	10 46
3	AI	127/130 (98%)	121 (95%)	4 (3%)	2 (2%)	9 44
4	AG	123/125 (98%)	103 (84%)	11 (9%)	9 (7%)	1 14

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	AW	61/63 (97%)	55 (90%)	4 (7%)	2 (3%)	4	26
6	AC	184/210 (88%)	175 (95%)	6 (3%)	3 (2%)	9	44
7	AB	200/202 (99%)	177 (88%)	19 (10%)	4 (2%)	7	38
8	AR	111/113 (98%)	100 (90%)	9 (8%)	2 (2%)	8	40
10	AD	170/180 (94%)	151 (89%)	14 (8%)	5 (3%)	4	29
12	AN	143/147 (97%)	129 (90%)	8 (6%)	6 (4%)	3	22
13	AX	69/71 (97%)	59 (86%)	4 (6%)	6 (9%)	1	11
14	AM	131/137 (96%)	118 (90%)	8 (6%)	5 (4%)	3	24
15	AE	239/243 (98%)	210 (88%)	23 (10%)	6 (2%)	5	32
16	AJ	125/127 (98%)	101 (81%)	18 (14%)	6 (5%)	2	21
17	AO	146/148 (99%)	122 (84%)	15 (10%)	9 (6%)	1	17
18	AF	215/236 (91%)	191 (89%)	22 (10%)	2 (1%)	17	57
19	AS	65/67 (97%)	64 (98%)	0	1 (2%)	10	46
20	A3	121/123 (98%)	105 (87%)	8 (7%)	8 (7%)	1	15
20	B4	121/123 (98%)	113 (93%)	6 (5%)	2 (2%)	9	42
20	BG	121/123 (98%)	109 (90%)	8 (7%)	4 (3%)	4	26
22	AY	48/50 (96%)	43 (90%)	3 (6%)	2 (4%)	3	22
23	AT	109/132 (83%)	98 (90%)	9 (8%)	2 (2%)	8	40
24	AA	188/198 (95%)	170 (90%)	12 (6%)	6 (3%)	4	26
25	AH	213/215 (99%)	181 (85%)	14 (7%)	18 (8%)	1	11
26	AP	54/56 (96%)	43 (80%)	8 (15%)	3 (6%)	2	18
28	AV	97/99 (98%)	86 (89%)	6 (6%)	5 (5%)	2	19
28	B6	92/99 (93%)	84 (91%)	4 (4%)	4 (4%)	2	22
29	AL	100/102 (98%)	92 (92%)	1 (1%)	7 (7%)	1	14
30	AU	142/150 (95%)	134 (94%)	5 (4%)	3 (2%)	7	36
31	BY	153/155 (99%)	143 (94%)	5 (3%)	5 (3%)	4	26
32	BO	195/203 (96%)	164 (84%)	17 (9%)	14 (7%)	1	14
33	BC	363/365 (100%)	303 (84%)	34 (9%)	26 (7%)	1	14
34	B5	79/83 (95%)	69 (87%)	5 (6%)	5 (6%)	1	16
34	BK	79/83 (95%)	68 (86%)	6 (8%)	5 (6%)	1	16
35	BL	145/147 (99%)	128 (88%)	8 (6%)	9 (6%)	1	17

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
36	Bf	49/51 (96%)	37 (76%)	8 (16%)	4 (8%)	1 12
37	BU	119/121 (98%)	113 (95%)	3 (2%)	3 (2%)	5 32
38	Bb	125/130 (96%)	102 (82%)	13 (10%)	10 (8%)	1 12
39	Be	60/62 (97%)	45 (75%)	11 (18%)	4 (7%)	1 15
40	BE	184/186 (99%)	170 (92%)	8 (4%)	6 (3%)	4 26
41	Ba	88/95 (93%)	74 (84%)	7 (8%)	7 (8%)	1 12
42	BT	82/86 (95%)	78 (95%)	3 (4%)	1 (1%)	13 50
43	Bk	210/339 (62%)	187 (89%)	12 (6%)	11 (5%)	2 19
44	BW	70/72 (97%)	70 (100%)	0	0	100 100
45	Bi	76/83 (92%)	70 (92%)	6 (8%)	0	100 100
46	BA	214/216 (99%)	190 (89%)	12 (6%)	12 (6%)	2 18
47	BI	140/142 (99%)	129 (92%)	7 (5%)	4 (3%)	4 29
48	BR	93/97 (96%)	85 (91%)	6 (6%)	2 (2%)	6 35
49	BQ	148/150 (99%)	141 (95%)	4 (3%)	3 (2%)	7 38
50	BV	64/66 (97%)	63 (98%)	1 (2%)	0	100 100
51	Bj	92/94 (98%)	71 (77%)	8 (9%)	13 (14%)	0 4
52	BB	237/239 (99%)	213 (90%)	17 (7%)	7 (3%)	4 28
53	BD	253/255 (99%)	218 (86%)	21 (8%)	14 (6%)	2 19
54	BF	182/184 (99%)	169 (93%)	13 (7%)	0	100 100
55	Bh	22/24 (92%)	21 (96%)	1 (4%)	0	100 100
56	BH	132/164 (80%)	108 (82%)	14 (11%)	10 (8%)	1 13
57	BZ	97/99 (98%)	84 (87%)	7 (7%)	6 (6%)	1 17
58	BP	118/120 (98%)	102 (86%)	13 (11%)	3 (2%)	5 32
59	BM	192/194 (99%)	173 (90%)	17 (9%)	2 (1%)	15 54
60	BS	148/155 (96%)	137 (93%)	8 (5%)	3 (2%)	7 38
61	Bd	87/89 (98%)	78 (90%)	6 (7%)	3 (3%)	3 26
62	BN	166/181 (92%)	137 (82%)	20 (12%)	9 (5%)	2 19
63	Bg	43/51 (84%)	31 (72%)	3 (7%)	9 (21%)	0 2
64	Bc	85/87 (98%)	74 (87%)	7 (8%)	4 (5%)	2 21
65	BJ	130/141 (92%)	124 (95%)	4 (3%)	2 (2%)	10 46
66	Bl	75/77 (97%)	69 (92%)	4 (5%)	2 (3%)	5 31

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	8599/9048 (95%)	7630 (89%)	608 (7%)	361 (4%)	5 22

5 of 361 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	AQ	78	ILE
2	AK	133	SER
3	AI	121	ILE
4	AG	48	ASN
4	AG	50	LEU

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	AQ	143/143 (100%)	138 (96%)	5 (4%)	36 59
2	AK	111/111 (100%)	105 (95%)	6 (5%)	22 47
3	AI	107/108 (99%)	100 (94%)	7 (6%)	17 42
4	AG	108/108 (100%)	88 (82%)	20 (18%)	1 10
5	AW	54/54 (100%)	52 (96%)	2 (4%)	34 58
6	AC	145/167 (87%)	143 (99%)	2 (1%)	67 80
7	AB	173/173 (100%)	164 (95%)	9 (5%)	23 48
8	AR	102/102 (100%)	101 (99%)	1 (1%)	76 86
10	AD	153/160 (96%)	147 (96%)	6 (4%)	32 56
12	AN	118/121 (98%)	104 (88%)	14 (12%)	5 20
13	AX	60/60 (100%)	55 (92%)	5 (8%)	11 34
14	AM	100/104 (96%)	94 (94%)	6 (6%)	19 44
15	AE	212/213 (100%)	198 (93%)	14 (7%)	16 41
16	AJ	103/103 (100%)	98 (95%)	5 (5%)	25 50
17	AO	122/122 (100%)	119 (98%)	3 (2%)	47 68
18	AF	181/197 (92%)	176 (97%)	5 (3%)	43 65

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
19	AS	61/61 (100%)	61 (100%)	0	100 100
20	A3	99/99 (100%)	95 (96%)	4 (4%)	31 55
20	B4	99/99 (100%)	95 (96%)	4 (4%)	31 55
20	BG	99/99 (100%)	92 (93%)	7 (7%)	14 39
22	AY	41/41 (100%)	39 (95%)	2 (5%)	25 50
23	AT	99/114 (87%)	99 (100%)	0	100 100
24	AA	166/171 (97%)	163 (98%)	3 (2%)	59 77
25	AH	184/184 (100%)	166 (90%)	18 (10%)	8 27
26	AP	46/46 (100%)	39 (85%)	7 (15%)	3 15
28	AV	89/89 (100%)	81 (91%)	8 (9%)	9 30
28	B6	85/89 (96%)	78 (92%)	7 (8%)	11 34
29	AL	91/91 (100%)	82 (90%)	9 (10%)	8 26
30	AU	121/127 (95%)	114 (94%)	7 (6%)	20 45
31	BY	133/133 (100%)	112 (84%)	21 (16%)	2 14
32	BO	166/169 (98%)	157 (95%)	9 (5%)	22 47
33	BC	312/312 (100%)	293 (94%)	19 (6%)	18 44
34	B5	64/66 (97%)	60 (94%)	4 (6%)	18 43
34	BK	64/66 (97%)	62 (97%)	2 (3%)	40 62
35	BL	117/117 (100%)	102 (87%)	15 (13%)	4 19
36	Bf	47/47 (100%)	40 (85%)	7 (15%)	3 15
37	BU	110/110 (100%)	106 (96%)	4 (4%)	35 59
38	Bb	114/117 (97%)	105 (92%)	9 (8%)	12 36
39	Be	51/51 (100%)	46 (90%)	5 (10%)	8 27
40	BE	158/158 (100%)	152 (96%)	6 (4%)	33 57
41	Ba	80/83 (96%)	71 (89%)	9 (11%)	6 21
42	BT	75/77 (97%)	72 (96%)	3 (4%)	31 55
43	Bk	179/280 (64%)	159 (89%)	20 (11%)	6 22
44	BW	66/66 (100%)	63 (96%)	3 (4%)	27 52
45	Bi	57/61 (93%)	55 (96%)	2 (4%)	36 59
46	BA	182/182 (100%)	174 (96%)	8 (4%)	28 53
47	BI	122/122 (100%)	119 (98%)	3 (2%)	47 68

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
48	BR	85/87 (98%)	75 (88%)	10 (12%)	5 20
49	BQ	130/130 (100%)	121 (93%)	9 (7%)	15 40
50	BV	56/56 (100%)	54 (96%)	2 (4%)	35 59
51	Bj	82/83 (99%)	65 (79%)	17 (21%)	1 7
52	BB	189/189 (100%)	180 (95%)	9 (5%)	25 51
53	BD	213/213 (100%)	197 (92%)	16 (8%)	13 38
54	BF	156/156 (100%)	150 (96%)	6 (4%)	33 57
55	Bh	23/23 (100%)	23 (100%)	0	100 100
56	BH	110/137 (80%)	96 (87%)	14 (13%)	4 19
57	BZ	80/80 (100%)	73 (91%)	7 (9%)	10 31
58	BP	101/101 (100%)	98 (97%)	3 (3%)	41 63
59	BM	162/162 (100%)	152 (94%)	10 (6%)	18 43
60	BS	126/130 (97%)	121 (96%)	5 (4%)	31 55
61	Bd	81/81 (100%)	66 (82%)	15 (18%)	1 10
62	BN	140/152 (92%)	138 (99%)	2 (1%)	67 80
63	Bg	37/39 (95%)	29 (78%)	8 (22%)	1 6
64	Bc	74/74 (100%)	65 (88%)	9 (12%)	5 20
65	BJ	104/108 (96%)	99 (95%)	5 (5%)	25 51
66	Bl	72/72 (100%)	68 (94%)	4 (6%)	21 46
All	All	7390/7646 (97%)	6904 (93%)	486 (7%)	20 41

5 of 486 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
35	BL	47	TRP
61	Bd	30	LYS
43	Bk	56	ARG
60	BS	155	ARG
64	Bc	51	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 65 such sidechains are listed below:

Mol	Chain	Res	Type
28	B6	11	ASN

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Mol	Chain	Res	Type
59	BM	25	GLN
25	AH	69	ASN
25	AH	48	HIS
61	Bd	25	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	A1	76/77 (98%)	15 (19%)	3 (3%)
21	A2	1494/1495 (99%)	260 (17%)	118 (7%)
27	A0	75/76 (98%)	18 (24%)	3 (4%)
67	B1	3047/3049 (99%)	603 (19%)	194 (6%)
68	B3	126/126 (100%)	35 (27%)	13 (10%)
All	All	4818/4823 (99%)	931 (19%)	331 (6%)

5 of 931 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	A1	8	U
11	A1	9	A
11	A1	10	G
11	A1	16	C
11	A1	21	G

5 of 331 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
67	B1	1665	G
67	B1	2507	C
67	B1	1734	G
67	B1	2043	A
67	B1	2805	U

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

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
67	B1	1
56	BH	1
53	BD	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B1	2506:G	O3'	2507:C	P	1.83
1	BH	18:GLY	C	19:PRO	N	1.19
1	BD	91:ARG	C	92:THR	N	0.93

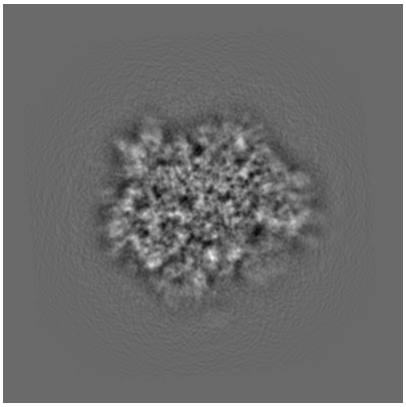
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-2009. These allow visual inspection of the internal detail of the map and identification of artifacts.

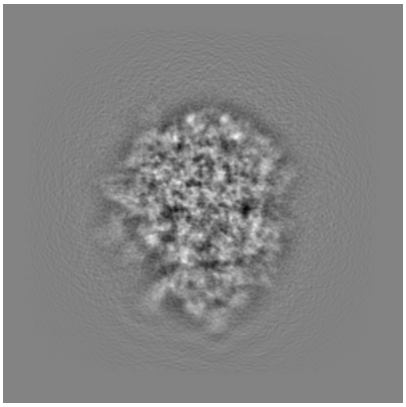
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

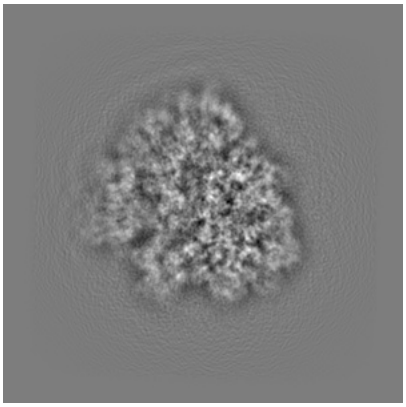
6.1.1 Primary map



X



Y

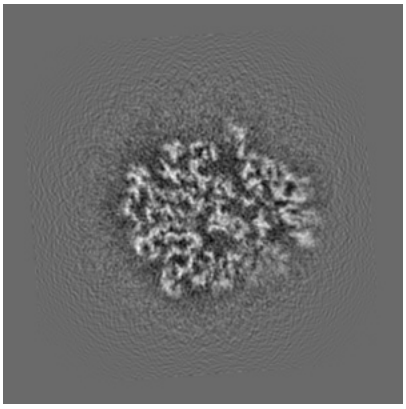


Z

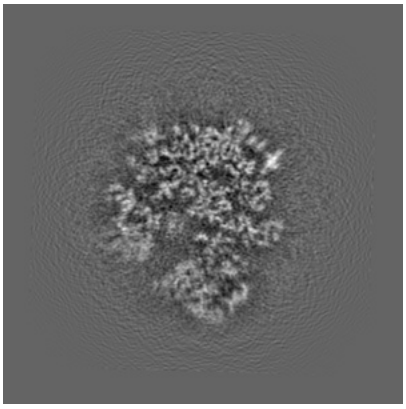
The images above show the map projected in three orthogonal directions.

6.2 Central slices

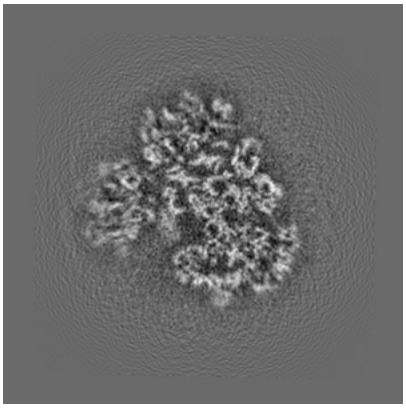
6.2.1 Primary map



X Index: 184



Y Index: 184

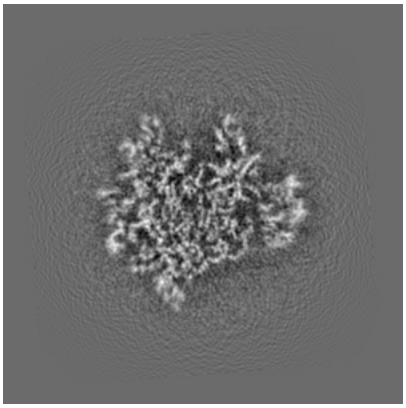


Z Index: 184

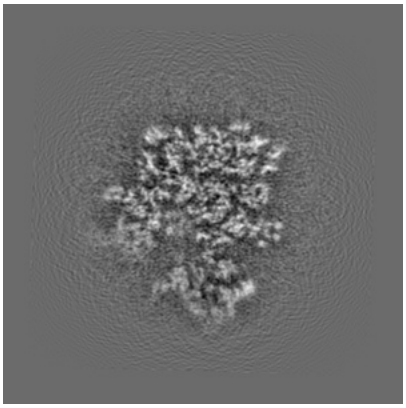
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

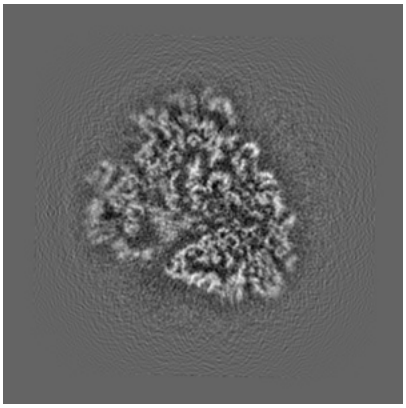
6.3.1 Primary map



X Index: 207



Y Index: 187



Z Index: 178

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

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.13. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

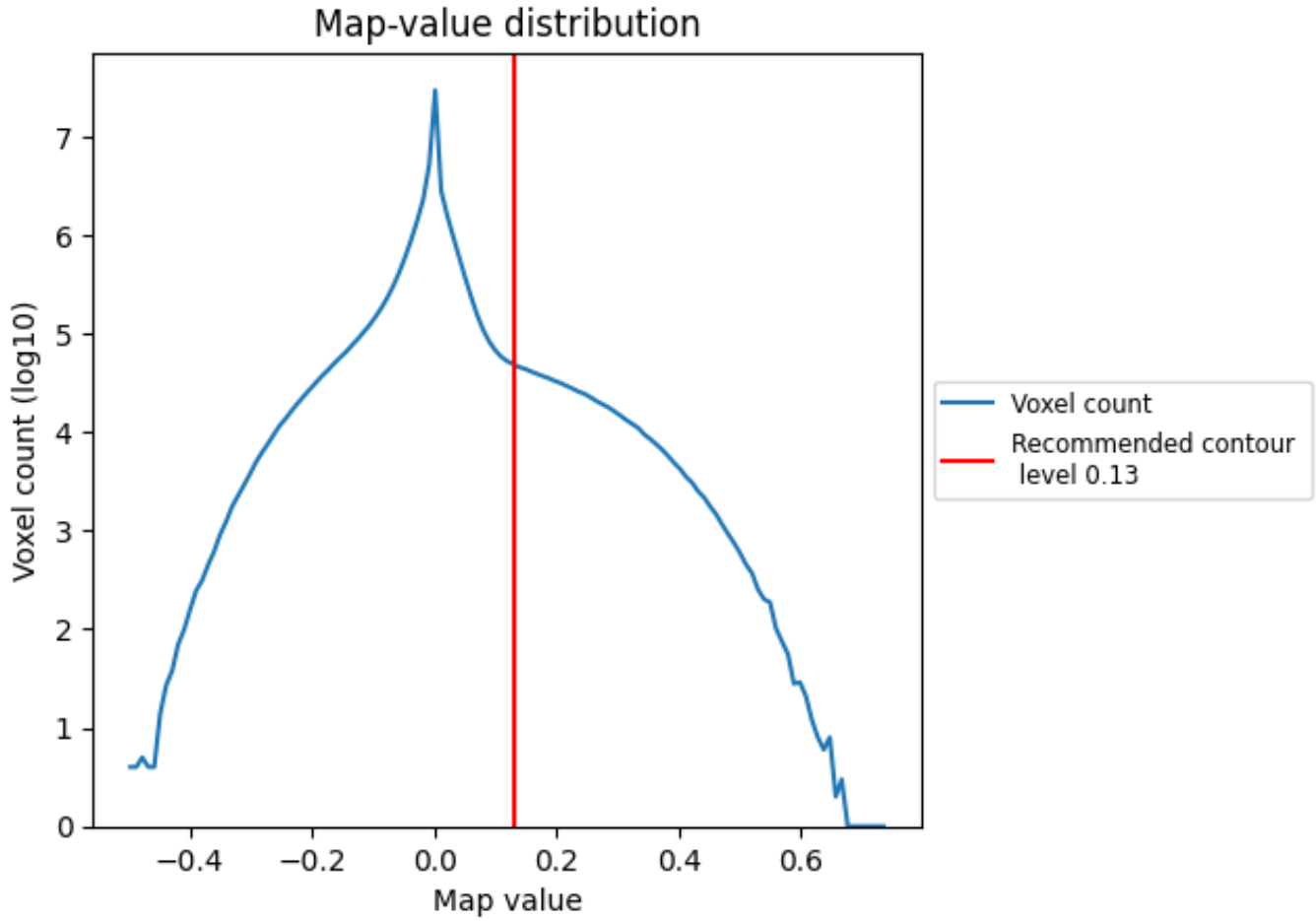
6.5 Mask visualisation (i)

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

7 Map analysis

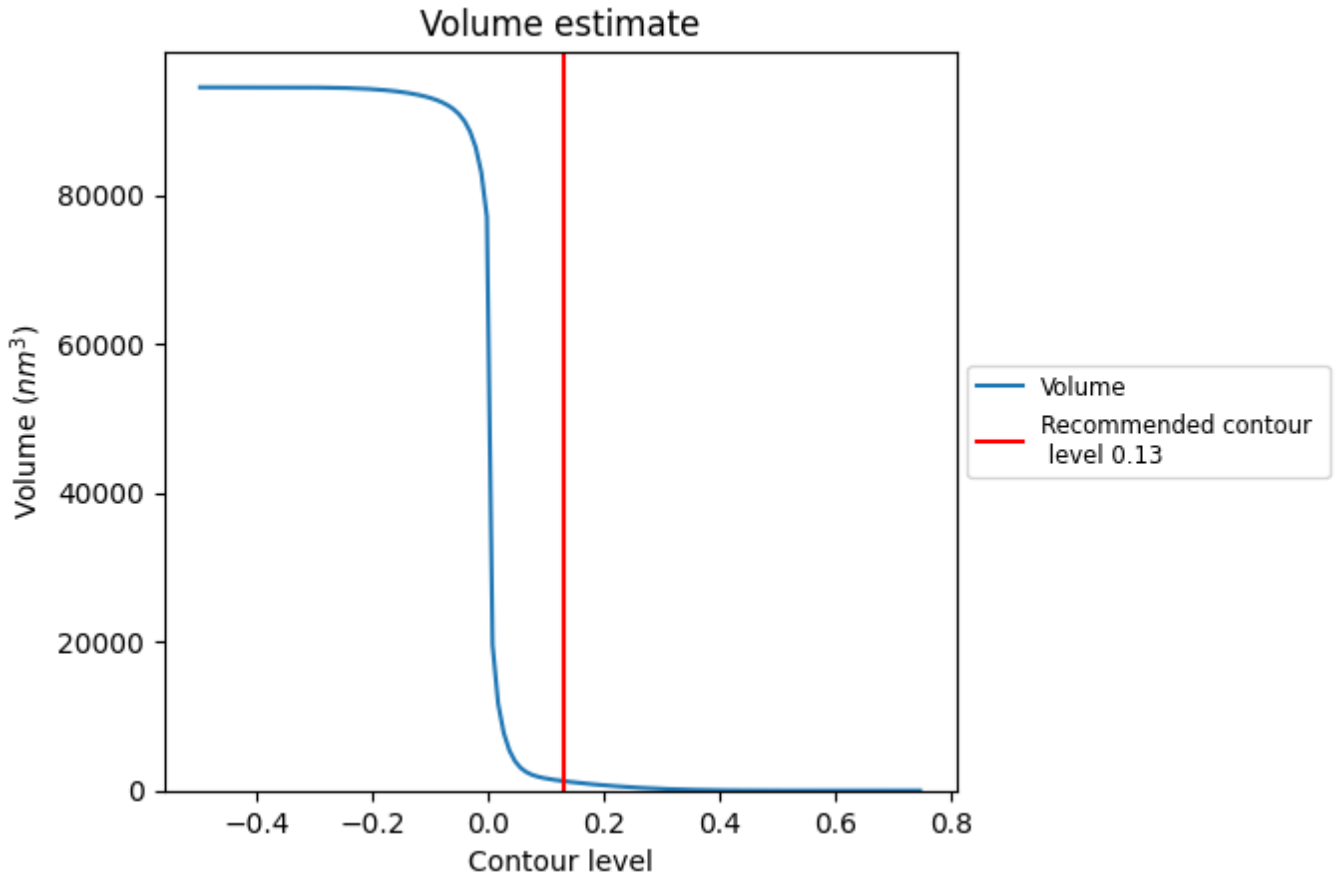
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

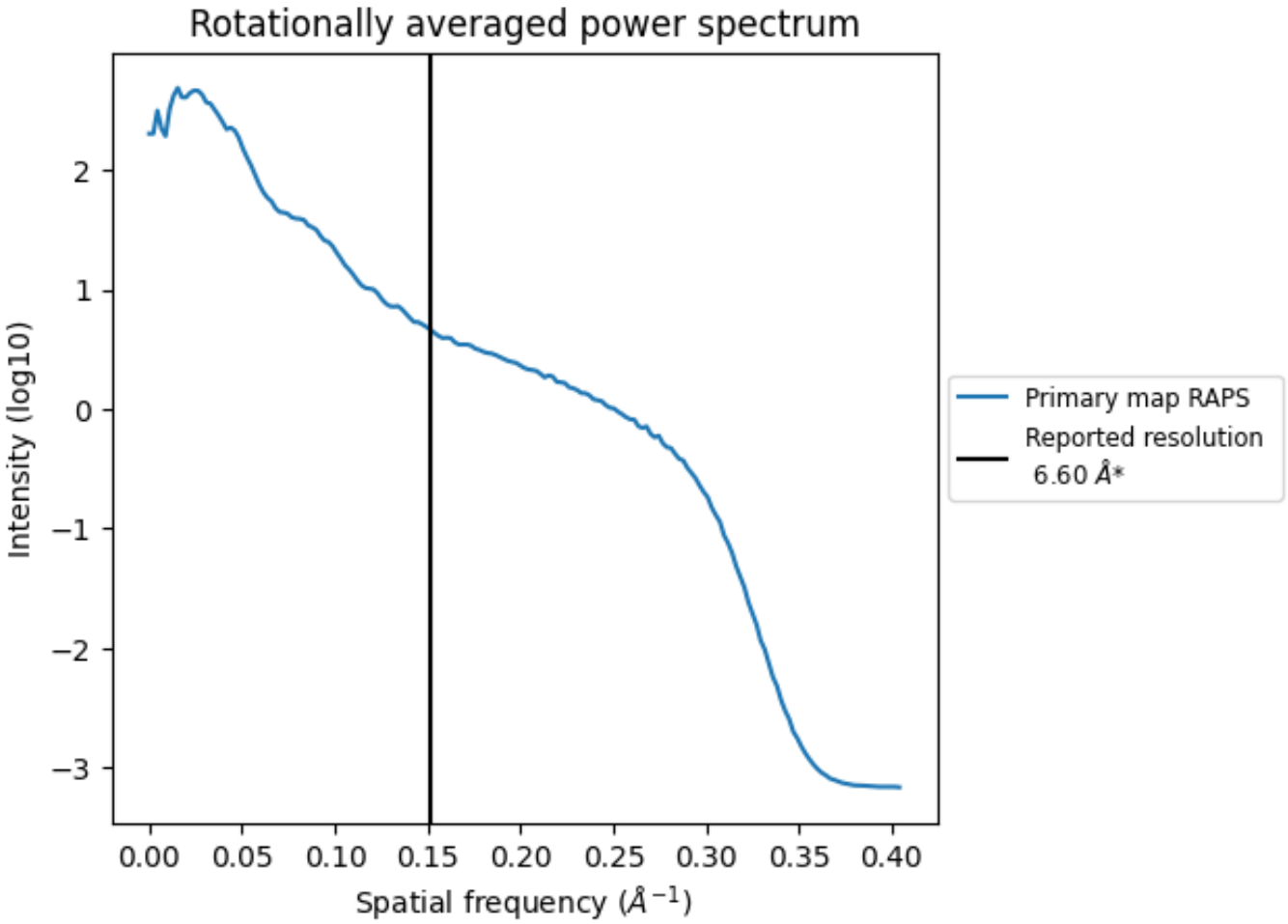
7.2 Volume estimate (i)



The volume at the recommended contour level is 1275 nm^3; this corresponds to an approximate mass of 1152 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 0.152 Å^{-1}

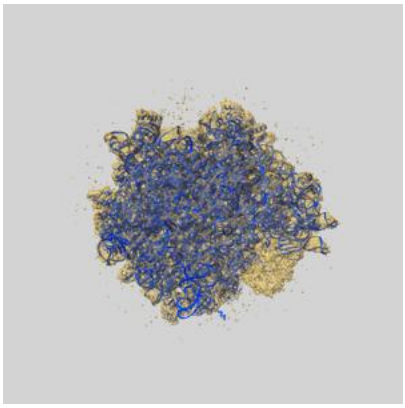
8 Fourier-Shell correlation (i)

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

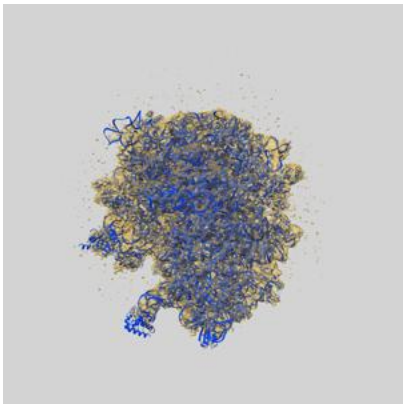
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-2009 and PDB model 4V6U. Per-residue inclusion information can be found in section 3 on page 16.

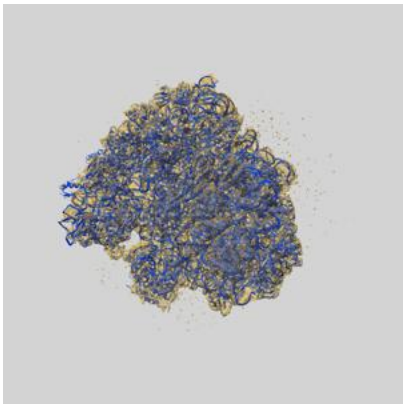
9.1 Map-model overlay



X



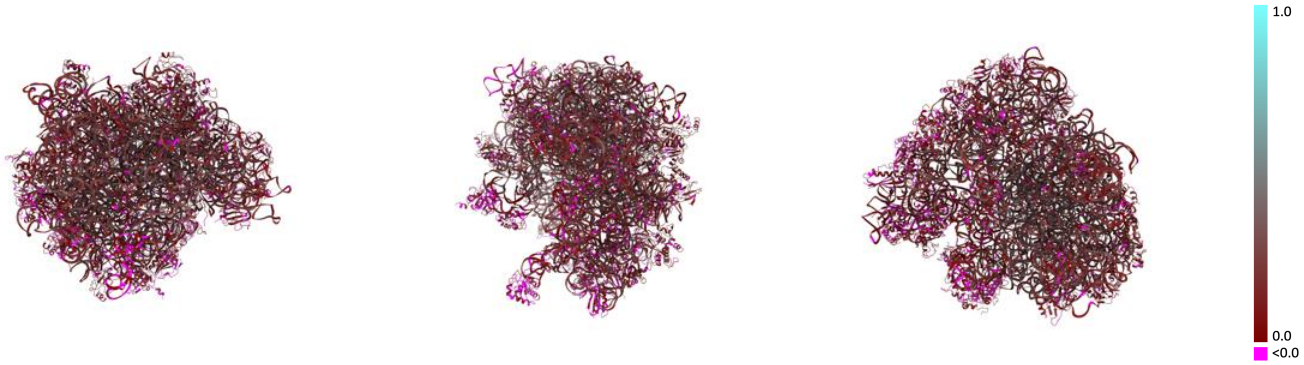
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.13 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.

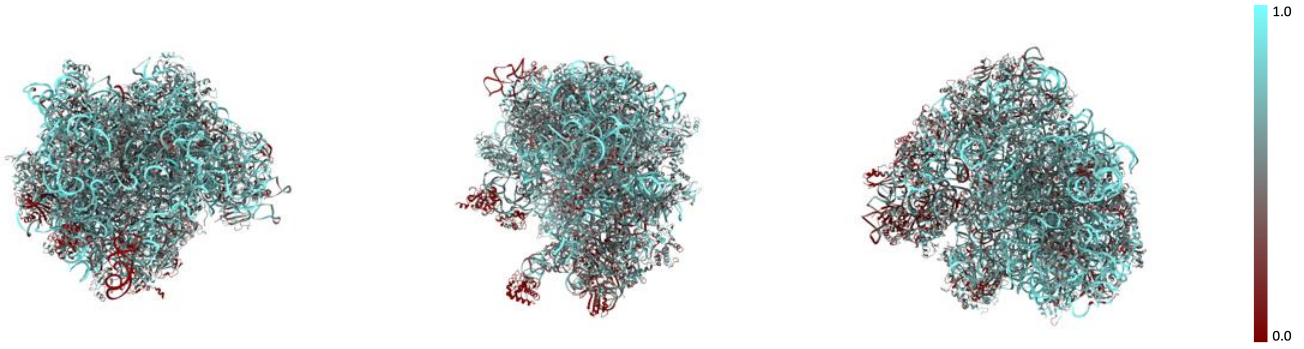
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

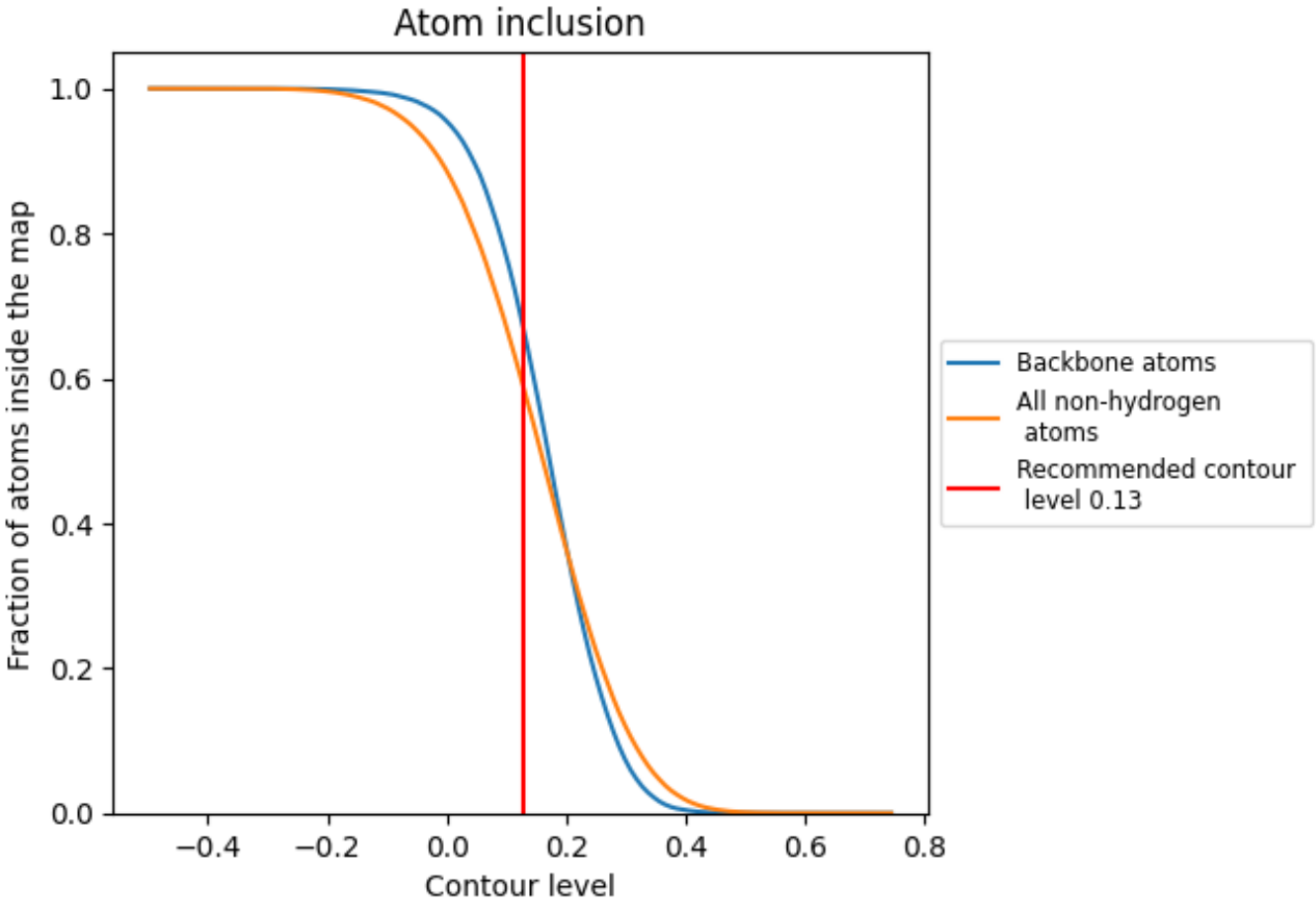
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.13).

9.4 Atom inclusion (i)



At the recommended contour level, 66% of all backbone atoms, 58% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.13) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5849	0.1970
A0	0.5348	0.1690
A1	0.5731	0.1410
A2	0.6951	0.2250
A3	0.0388	0.0200
A9	0.6783	0.2060
AA	0.5368	0.1380
AB	0.4356	0.1460
AC	0.4006	0.1390
AD	0.4182	0.1260
AE	0.3493	0.1190
AF	0.3928	0.1500
AG	0.3915	0.0820
AH	0.2889	0.0810
AI	0.4307	0.1390
AJ	0.4062	0.1520
AK	0.1950	0.1020
AL	0.1400	0.0710
AM	0.4444	0.1560
AN	0.3731	0.1420
AO	0.3785	0.1050
AP	0.2358	0.0950
AQ	0.4921	0.1430
AR	0.4237	0.1750
AS	0.4262	0.1170
AT	0.3557	0.0990
AU	0.2278	0.0850
AV	0.3491	0.1020
AW	0.5255	0.1240
AX	0.3956	0.1410
AY	0.0980	0.0320
B1	0.7262	0.2500
B3	0.7984	0.2180
B4	0.1961	0.1010
B5	0.5635	0.1560

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Chain	Atom inclusion	Q-score
B6	0.0171	0.0390
BA	0.2176	0.0480
BB	0.4494	0.2180
BC	0.4304	0.1680
BD	0.4160	0.1590
BE	0.4775	0.1130
BF	0.5643	0.1920
BG	0.5603	0.1520
BH	0.2308	0.0610
BI	0.4295	0.1670
BJ	0.4342	0.2070
BK	0.5251	0.1440
BL	0.3961	0.1390
BM	0.3396	0.1790
BN	0.4502	0.1800
BO	0.4606	0.1510
BP	0.4882	0.1710
BQ	0.4513	0.1440
BR	0.3653	0.1810
BS	0.4527	0.1730
BT	0.4692	0.1790
BU	0.4496	0.1560
BV	0.4302	0.1440
BW	0.5401	0.1570
BY	0.4660	0.1800
BZ	0.5685	0.1650
Ba	0.4979	0.1790
Bb	0.3983	0.1540
Bc	0.3919	0.1610
Bd	0.3206	0.1200
Be	0.2931	0.1250
Bf	0.3294	0.1430
Bg	0.3672	0.1280
Bh	0.3318	0.0850
Bi	0.5062	0.2030
Bj	0.3952	0.1330
Bk	0.1443	0.0340
Bl	0.5093	0.1590