wwPDB EM Validation Summary Report (i)

May 20, 2024 – 02:19 AM JST

PDB ID	:	7D4I
EMDB ID	:	EMD-30574
Title	:	Cryo-EM structure of 90S small ribosomal precursors complex with the DEAH-box RNA helicase Dhr1 (State F)
Authors	:	Du, Y.; Zhang, J.; An, W.; Ye, K.
Deposited on	:	2020-09-24
Resolution	:	4.00 Å(reported)
Based on initial model	:	6LQS

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 (i) 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 (i)) were used in the production of this report:

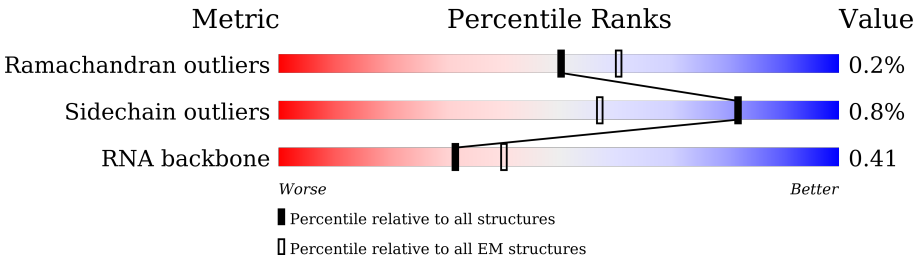
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 4.00 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	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	3A	333	9% 38% 24% · 35%
2	5A	700	8% 10% 6% 83%
3	SA	1812	18% 43% 28% · 26%
4	SC	255	10% 92% · 5%
5	SF	261	19% 93% · 5%
6	SG	225	10% 94% · 5%
7	SH	236	54% 73% · 23%
8	SI	190	29% 84% · · 13%

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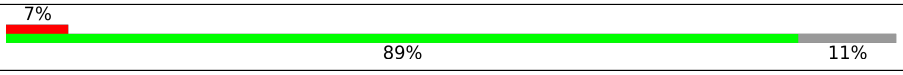
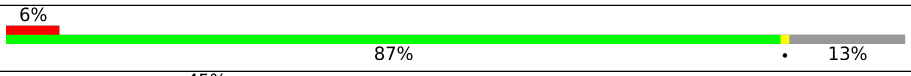
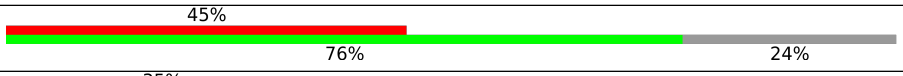
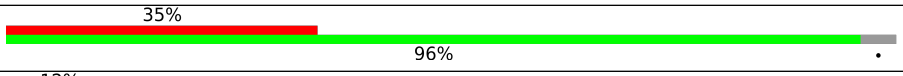
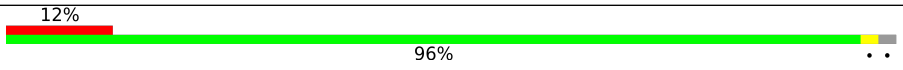
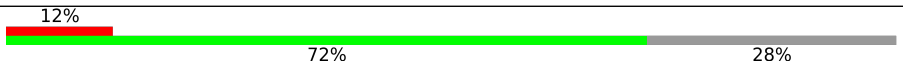
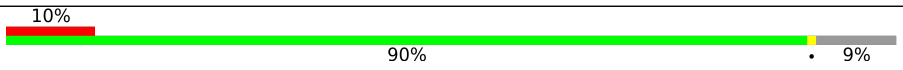
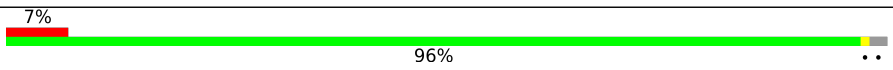
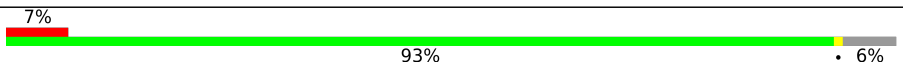
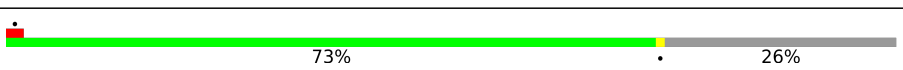
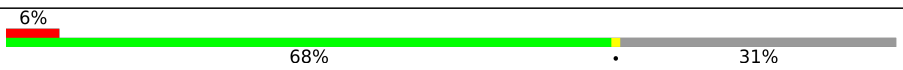
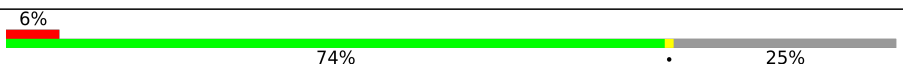
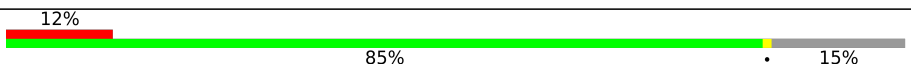
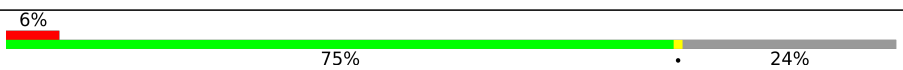
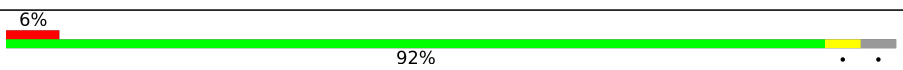
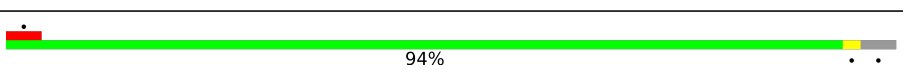
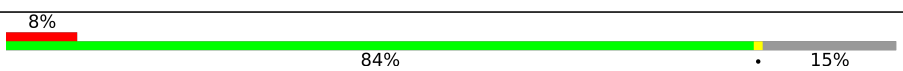
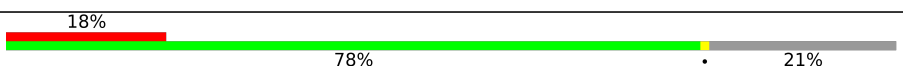
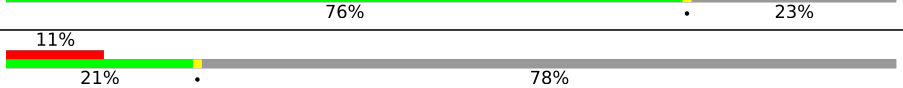
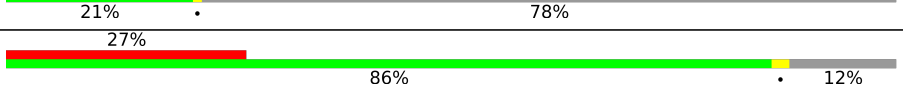
Mol	Chain	Length	Quality of chain
9	SJ	200	
10	SK	197	
11	SM	156	
12	SO	151	
13	SP	137	
14	SR	143	
15	ST	146	
16	SU	144	
17	SX	130	
18	SY	145	
19	SZ	135	
20	Sc	82	
21	Sd	67	
22	3B	327	
22	3C	327	
23	3D	504	
24	3E	511	
25	3F	573	
26	3G	126	
26	3H	126	
27	A4	776	
28	A5	643	
29	A8	713	
30	A9	575	
31	AE	1769	

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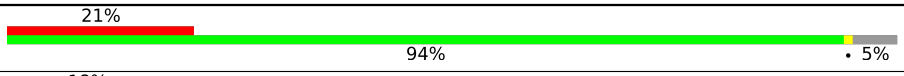
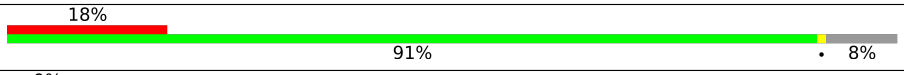
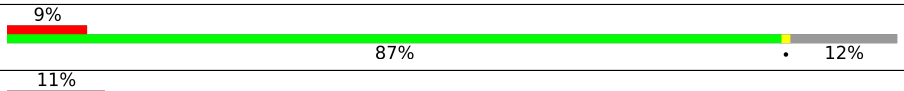
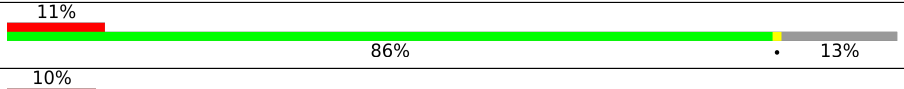
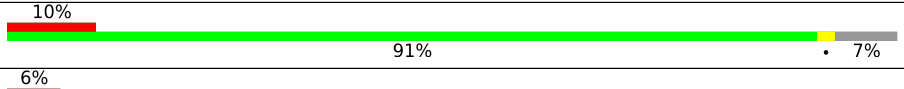
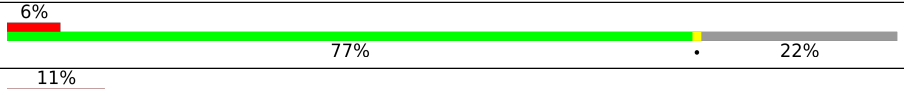
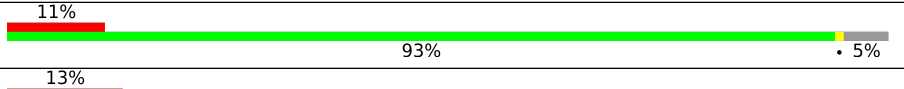
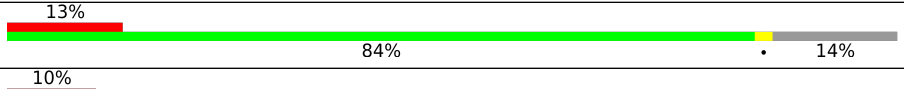
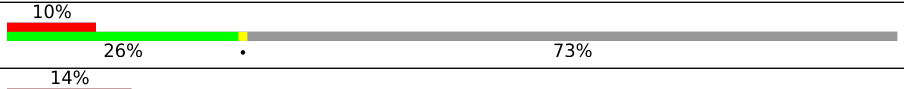
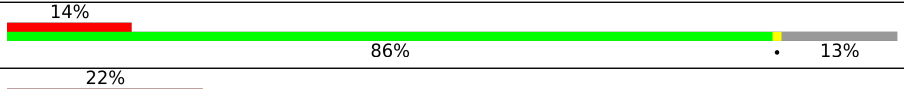
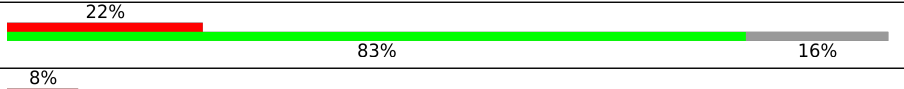
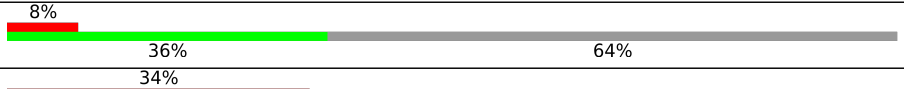
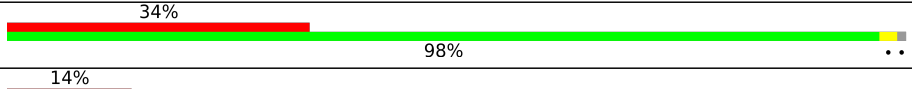
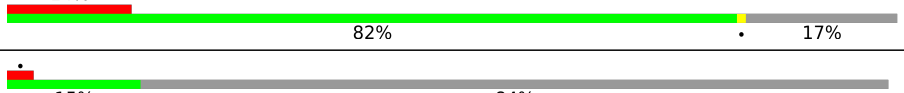
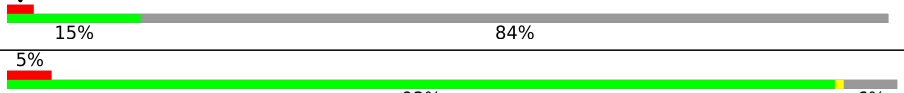
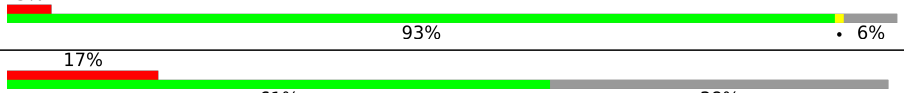
Mol	Chain	Length	Quality of chain
32	AF	513	
33	AG	896	
34	B1	900	
35	B2	943	
36	B3	817	
37	B8	594	
38	BE	939	
39	B6	440	
40	5B	214	
41	5C	554	
42	5D	250	
43	5E	593	
44	5F	183	
45	5G	290	
46	5H	610	
47	5I	489	
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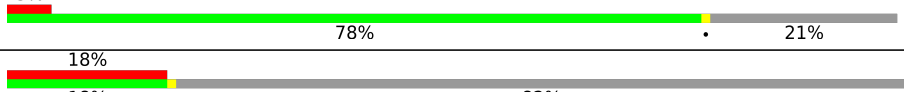
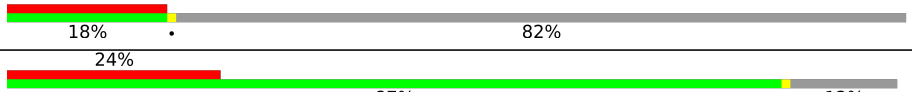
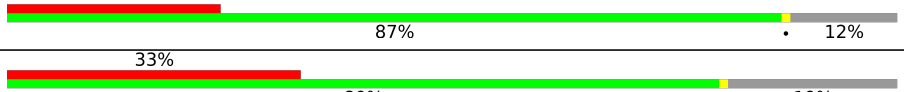
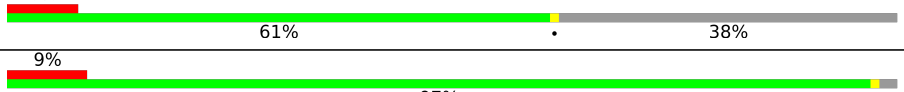
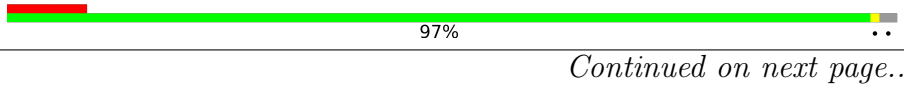
49	5K	189	
50	RD	1729	
51	RE	1237	
52	RF	297	
53	RG	252	
53	RH	252	
54	RJ	1183	
55	RK	367	

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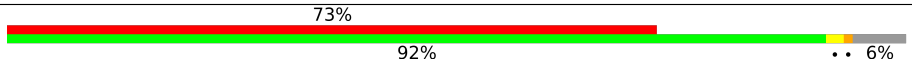
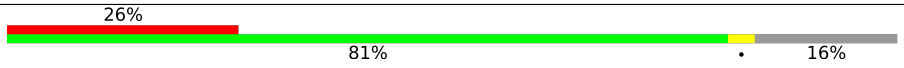
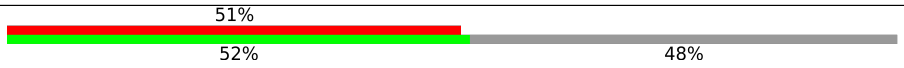
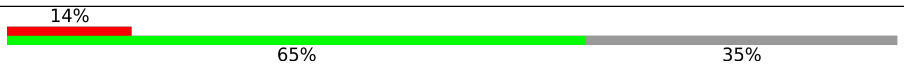
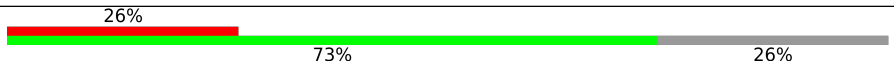
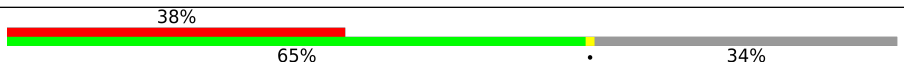
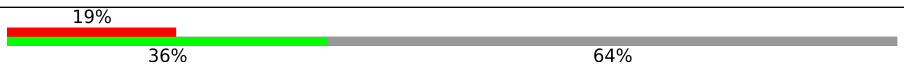
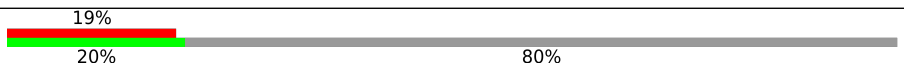
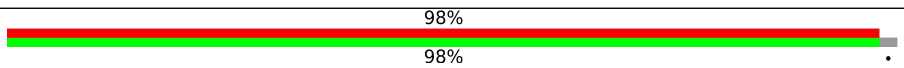
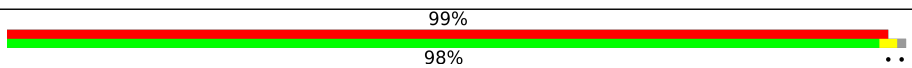
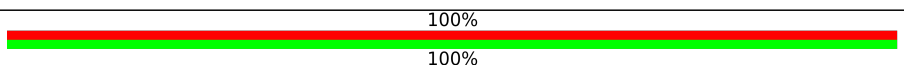
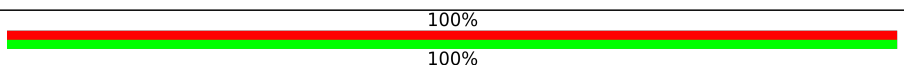
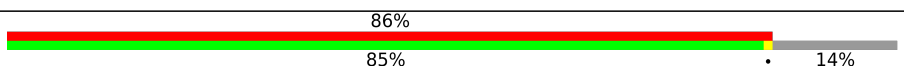
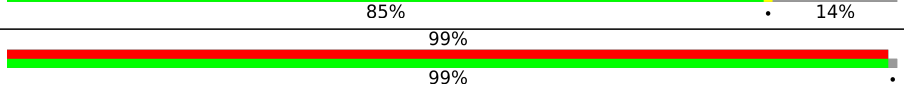
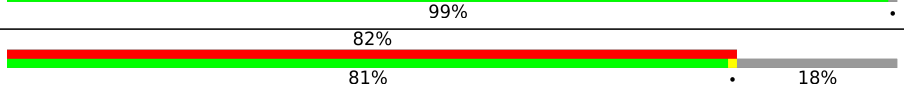
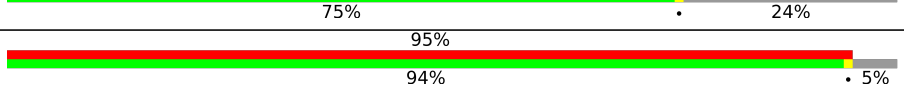
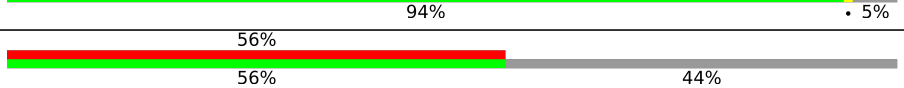
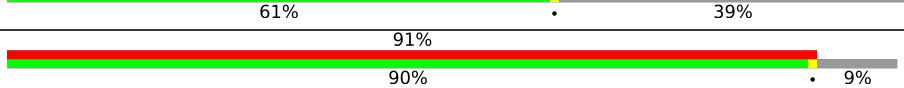
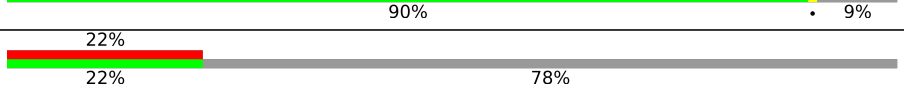
Mol	Chain	Length	Quality of chain
56	RN	810	
57	RO	552	
58	RP	2493	
59	RQ	899	
60	RS	480	
61	RT	326	
62	RW	206	
63	RZ	1267	
64	X1	611	
65	X2	694	
66	R5	305	
67	R1	246	
68	R3	394	
69	R6	223	
70	R2	265	
71	M3	250	
72	R0	240	
73	r4	359	
74	C4	292	
75	R4	1001	
76	r6	733	
77	R7	184	
78	M4	1073	
79	M6	186	

2 Entry composition (i)

There are 83 unique types of molecules in this entry. The entry contains 253642 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 RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	3A	216	4570	2044	784	1526	216	0	0

- Molecule 2 is a RNA chain called 5' ETS.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	5A	118	2536	1131	467	820	118	0	0

- Molecule 3 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	SA	1337	28478	12732	5036	9373	1337	0	0

- Molecule 4 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	SC	242	1923	1214	356	349	4	0	0

- Molecule 5 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	SF	247	1915	1223	351	338	3	0	0

- Molecule 6 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	SG	213	1669	1045	307	314	3	0	0

- Molecule 7 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	SH	182	Total	C	N	O	S	0	0
			1456	916	273	266	1		

- Molecule 8 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	SI	165	Total	C	N	O	0	0
			1321	853	226	242		

- Molecule 9 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	SJ	148	Total	C	N	O	S	0	0
			1181	739	228	212	2		

- Molecule 10 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	SK	174	Total	C	N	O	S	0	0
			1410	892	272	245	1		

- Molecule 11 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	SM	137	Total	C	N	O	S	0	0
			1113	715	212	183	3		

- Molecule 12 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	SO	134	Total	C	N	O	S	0	0
			1087	698	202	186	1		

- Molecule 13 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	SP	116	Total	C	N	O	S	0	0
			848	524	158	163	3		

- Molecule 14 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	SR	125	Total 973	C 625	N 174	O 174	0	0

- Molecule 15 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	ST	111	Total 902	C 568	N 171	O 161	S 2	0	0

- Molecule 16 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	SU	138	Total 1075	C 673	N 203	O 197	S 2	0	0

- Molecule 17 is a protein called 40S ribosomal protein S22-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	SX	127	Total 1003	C 640	N 183	O 177	S 3	0	0

- Molecule 18 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	SY	104	Total 792	C 506	N 145	O 139	S 2	0	0

- Molecule 19 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	SZ	123	Total 986	C 626	N 188	O 172	0	0

- Molecule 20 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	Sc	80	Total 603	C 377	N 109	O 112	S 5	0	0

- Molecule 21 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Sd	63	Total	C	N	O	S	0	0
			497	306	99	91	1		

- Molecule 22 is a protein called rRNA 2'-O-methyltransferase fibrillarin.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	3B	242	Total	C	N	O	S	0	0
			1878	1190	338	340	10		
22	3C	224	Total	C	N	O	S	0	0
			1754	1114	314	316	10		

- Molecule 23 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	3D	378	Total	C	N	O	S	0	0
			2974	1886	511	568	9		

- Molecule 24 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	3E	435	Total	C	N	O	S	0	0
			3056	1904	548	595	9		

- Molecule 25 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	3F	437	Total	C	N	O	S	0	0
			3498	2227	609	652	10		

- Molecule 26 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	3G	121	Total	C	N	O	S	0	0
			916	583	158	171	4		
26	3H	121	Total	C	N	O	S	0	0
			916	583	158	171	4		

- Molecule 27 is a protein called U3 small nucleolar RNA-associated protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	A4	657	Total	C	N	O	S	0	0
			5187	3286	902	978	21		

- Molecule 28 is a protein called U3 small nucleolar RNA-associated protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	A5	511	Total	C	N	O	S	0	0
			3953	2507	682	751	13		

- Molecule 29 is a protein called U3 small nucleolar RNA-associated protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	A8	548	Total	C	N	O	S	0	0
			3307	2054	608	642	3		

- Molecule 30 is a protein called U3 small nucleolar RNA-associated protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	A9	128	Total	C	N	O	S	0	0
			939	594	173	170	2		

- Molecule 31 is a protein called U3 small nucleolar RNA-associated protein 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	AE	1552	Total	C	N	O	S	0	0
			10262	6453	1810	1979	20		

- Molecule 32 is a protein called U3 small nucleolar RNA-associated protein 15.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	AF	487	Total	C	N	O	S	0	0
			3860	2431	692	725	12		

- Molecule 33 is a protein called NET1-associated nuclear protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	AG	825	Total	C	N	O	S	0	0
			6565	4178	1110	1258	19		

- Molecule 34 is a protein called Periodic tryptophan protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	B1	791	Total	C	N	O	S	0	0
			6316	4037	1082	1179	18		

- Molecule 35 is a protein called U3 small nucleolar RNA-associated protein 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	B2	824	Total	C	N	O	S	0	0
			6497	4153	1095	1222	27		

- Molecule 36 is a protein called U3 small nucleolar RNA-associated protein 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	B3	757	Total	C	N	O	S	0	0
			5906	3763	993	1123	27		

- Molecule 37 is a protein called U3 small nucleolar RNA-associated protein 18.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	B8	463	Total	C	N	O	S	0	0
			3648	2314	640	684	10		

- Molecule 38 is a protein called U3 small nucleolar RNA-associated protein 21.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	BE	890	Total	C	N	O	S	0	0
			6876	4356	1191	1308	21		

- Molecule 39 is a protein called U3 small nucleolar RNA-associated protein 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	B6	377	Total	C	N	O	S	0	0
			3077	1984	529	549	15		

- Molecule 40 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	5B	58	Total	C	N	O	0	0
			482	302	98	82		

- Molecule 41 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	5C	482	Total	C	N	O	S	0	0
			3825	2409	684	721	11		

- Molecule 42 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	5D	209	Total	C	N	O	S	0	0
			1778	1111	344	317	6		

- Molecule 43 is a protein called U3 small nucleolar RNA-associated protein MPP10.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	5E	213	Total	C	N	O	S	0	0
			1728	1072	304	348	4		

- Molecule 44 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	5F	182	Total	C	N	O	S	0	0
			1530	967	287	269	7		

- Molecule 45 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	5G	241	Total	C	N	O	S	0	0
			1956	1228	368	353	7		

- Molecule 46 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	5H	95	Total	C	N	O	0	0
			700	435	143	122		

- Molecule 47 is a protein called Protein SOF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	5I	461	Total	C	N	O	S	0	0
			3765	2354	686	709	16		

- Molecule 48 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	5J	134	Total	C	N	O	S	0	0
			1127	712	205	207	3		

- Molecule 49 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	5K	150	Total	C	N	O	S	0	0
			1190	765	212	203	10		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
5K	138	ASN	ASP	variant	UNP Q05498

- Molecule 50 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	RD	316	Total	C	N	O	S	0	0
			2413	1541	415	452	5		

- Molecule 51 is a protein called U3 small nucleolar RNA-associated protein 22.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	RE	1090	Total	C	N	O	S	0	0
			8805	5720	1452	1609	24		

- Molecule 52 is a protein called Ribosomal RNA-processing protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	RF	241	Total	C	N	O	S	0	0
			1963	1253	335	367	8		

- Molecule 53 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	RG	216	Total	C	N	O	S	0	0
			1701	1079	296	315	11		
53	RH	230	Total	C	N	O	S	0	0
			1799	1142	313	333	11		

- Molecule 54 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	RJ	738	Total	C	N	O	S	0	0
			5994	3851	1063	1054	26		

- Molecule 55 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	RK	360	Total	C	N	O	S	0	0
			2781	1781	473	516	11		

- Molecule 56 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	RN	584	Total	C	N	O	S	0	0
			4459	2819	800	827	13		

- Molecule 57 is a protein called Nucleolar complex protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	RO	520	Total	C	N	O	S	0	0
			3741	2397	641	691	12		

- Molecule 58 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	RP	2084	Total	C	N	O	S	0	0
			12263	7556	2298	2392	17		

- Molecule 59 is a protein called U3 small nucleolar RNA-associated protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	RQ	339	Total	C	N	O	S	0	0
			2408	1484	456	466	2		

- Molecule 60 is a protein called Essential nuclear protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	RS	251	Total	C	N	O	S	0	0
			2051	1340	349	359	3		

- Molecule 61 is a protein called Pno1.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	RT	213	Total	C	N	O	S	0	0
			1652	1051	300	297	4		

- Molecule 62 is a protein called Regulator of rDNA transcription protein 14.

Mol	Chain	Residues	Atoms				AltConf	Trace
62	RW	153	Total	C	N	O	0	0
			762	456	153	153		

- Molecule 63 is a protein called Probable ATP-dependent RNA helicase DHR1.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	RZ	838	Total	C	N	O	S	1	0
			6598	4212	1145	1206	35		

- Molecule 64 is a protein called Unassigned peptides 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
64	X1	221	Total	C	N	O	0	0
			1105	663	221	221		

- Molecule 65 is a protein called Unassigned peptides 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
65	X2	141	Total	C	N	O	0	0
			705	423	141	141		

- Molecule 66 is a protein called Exosome complex component RRP45.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	R5	299	Total	C	N	O	S	0	0
			2304	1444	393	451	16		

- Molecule 67 is a protein called Exosome complex component SKI6.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	R1	244	Total	C	N	O	S	0	0
			1886	1177	335	366	8		

- Molecule 68 is a protein called Exosome complex component RRP43.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	R3	339	Total	C	N	O	S	1	0
			2588	1640	441	497	10		

- Molecule 69 is a protein called Exosome complex component RRP46.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	R6	223	Total	C	N	O	S	1	0
			1701	1072	285	334	10		

- Molecule 70 is a protein called Exosome complex component RRP42.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	R2	265	Total	C	N	O	S	1	0
			2035	1299	334	397	5		

- Molecule 71 is a protein called Exosome complex component MTR3.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	M3	215	Total	C	N	O	S	0	0
			1639	1024	273	332	10		

- Molecule 72 is a protein called Exosome complex component RRP40.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	R0	237	Total	C	N	O	S	0	0
			1792	1143	295	344	10		

- Molecule 73 is a protein called Exosome complex component RRP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	r4	293	Total	C	N	O	S	0	0
			2236	1393	403	428	12		

- Molecule 74 is a protein called Exosome complex component CSL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	C4	222	Total	C	N	O	S	0	0
			1653	1034	287	325	7		

- Molecule 75 is a protein called Exosome complex exonuclease DIS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	R4	948	Total	C	N	O	S	0	0
			7430	4693	1308	1394	35		

- Molecule 76 is a protein called Exosome complex exonuclease RRP6.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	r6	414	Total	C	N	O	S	0	0
			2517	1544	469	498	6		

- Molecule 77 is a protein called Exosome complex protein LRP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	R7	113	Total	C	N	O	S	0	0
			894	565	151	174	4		

- Molecule 78 is a protein called ATP-dependent RNA helicase DOB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	M4	978	Total	C	N	O	S	0	0
			7626	4871	1294	1419	42		

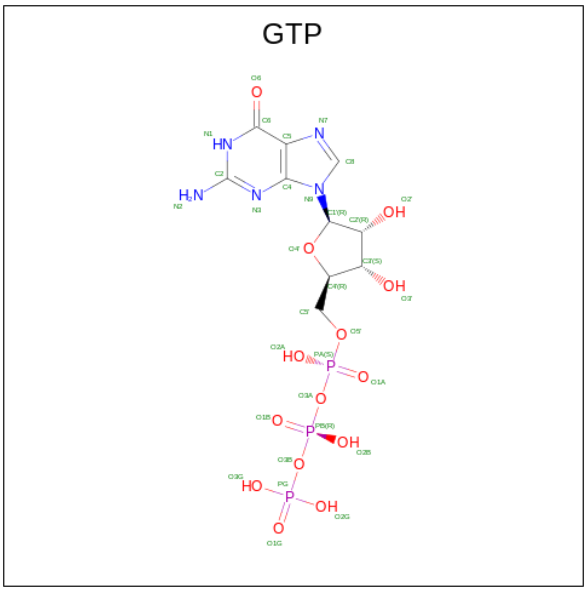
- Molecule 79 is a protein called M-phase phosphoprotein 6 homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
79	M6	40	Total	C	N	O	0	0
			275	170	51	54		

- Molecule 80 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
80	Sc	1	Total	Zn	0
			1	1	
80	5K	1	Total	Zn	0
			1	1	

- Molecule 81 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).

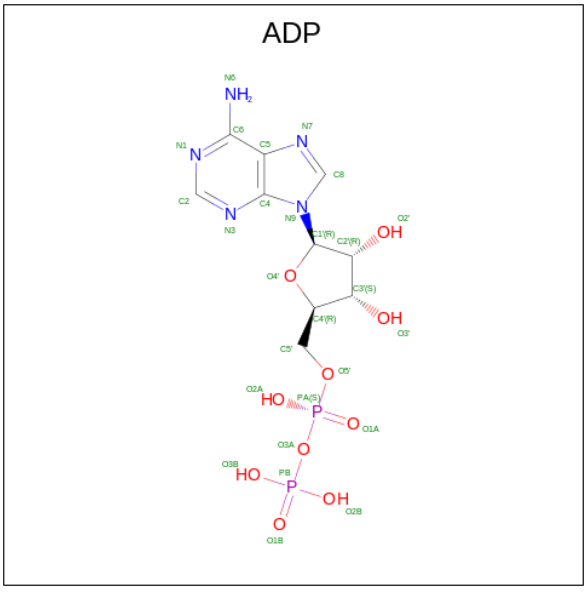


Mol	Chain	Residues	Atoms					AltConf
81	RJ	1	Total	C	N	O	P	0
			32	10	5	14	3	

- Molecule 82 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
82	RJ	1	Total	Mg	0
			1	1	

- Molecule 83 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).



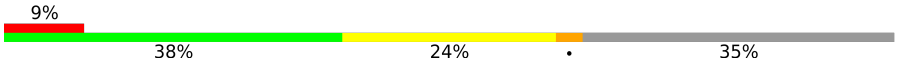
Mol	Chain	Residues	Atoms					AltConf
83	RZ	1	Total	C	N	O	P	0
			27	10	5	10	2	

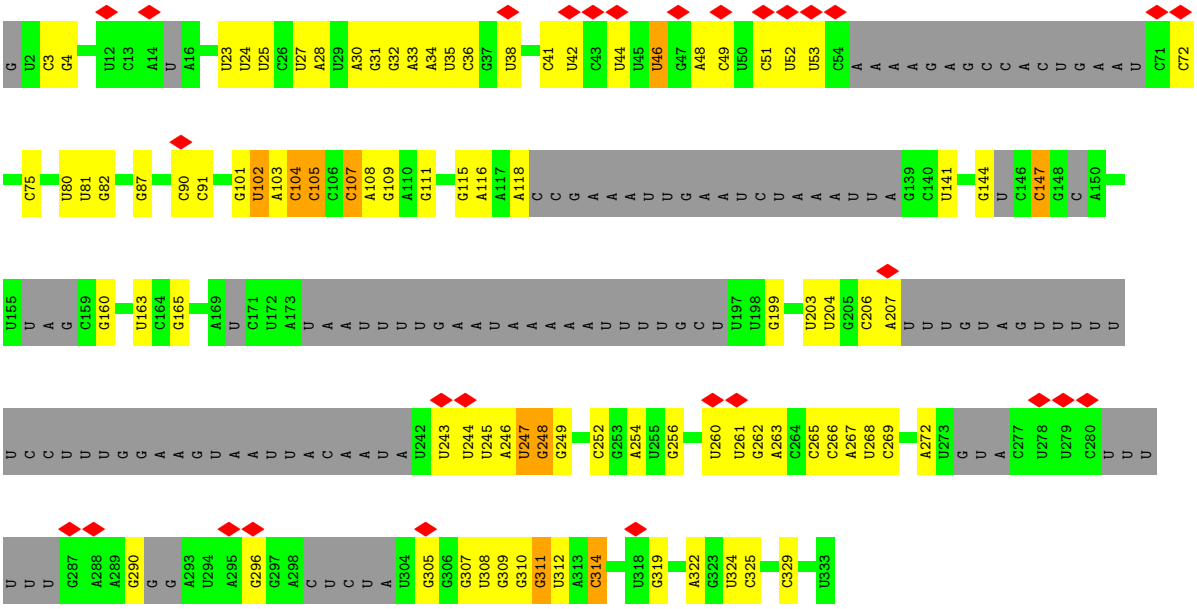
3 Residue-property plots (i)

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

• Molecule 1: U3 snoRNA

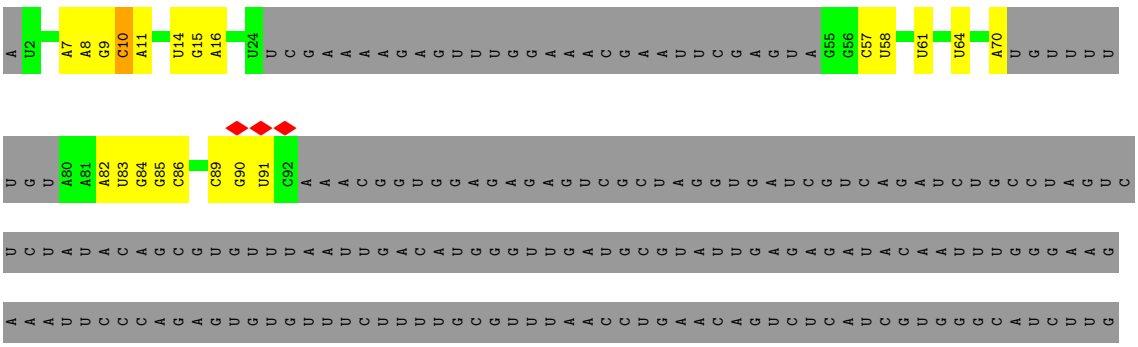
Chain 3A:

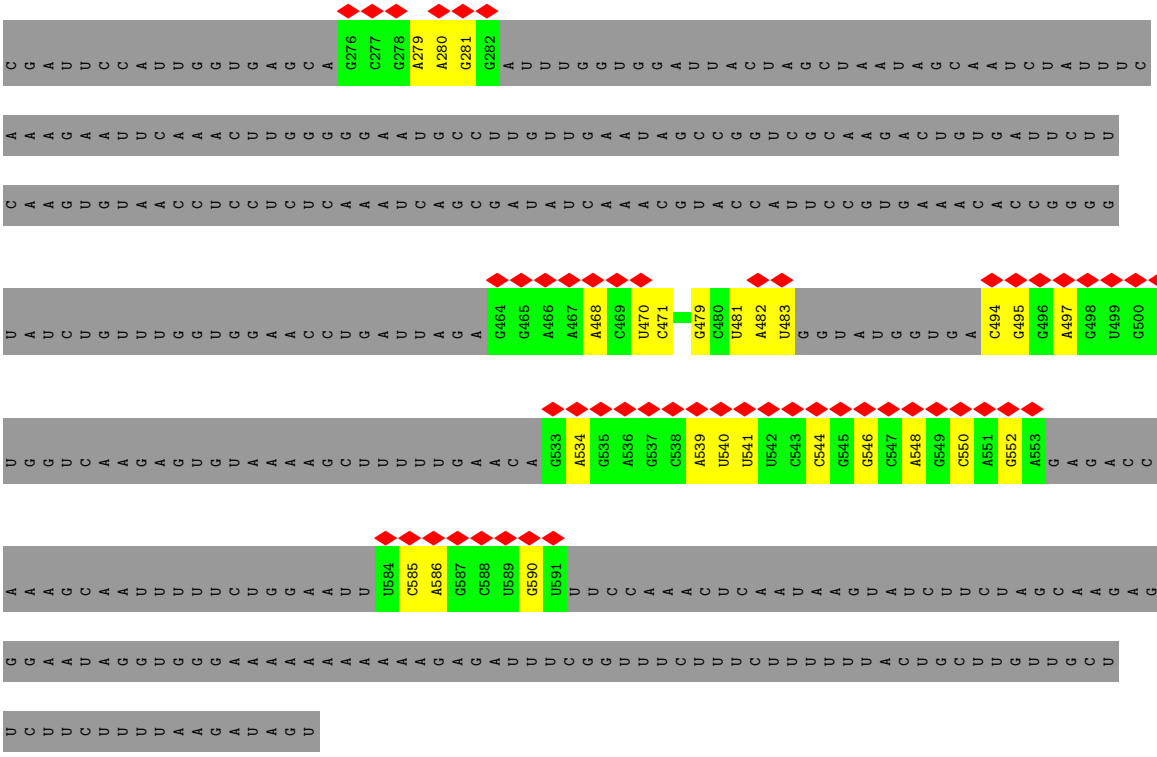




• Molecule 2: 5' ETS

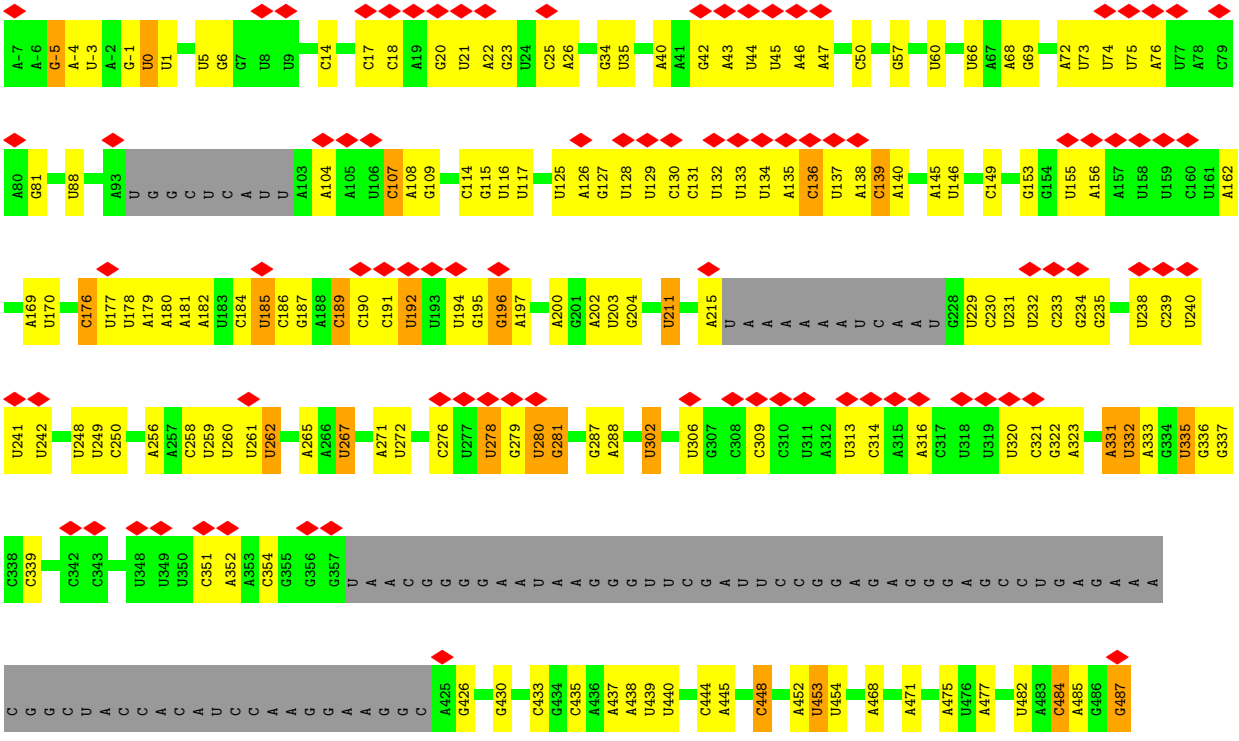
Chain 5A:

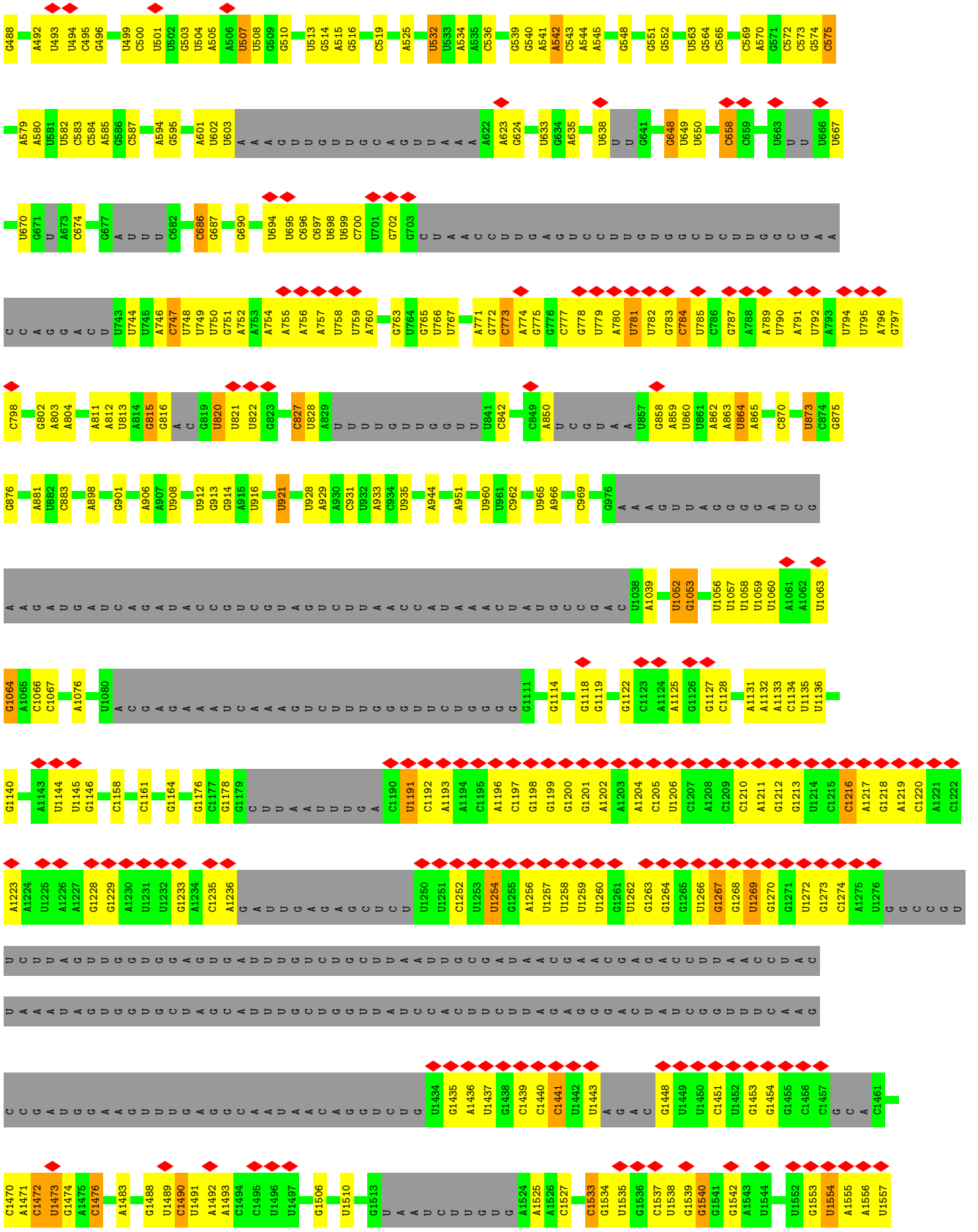


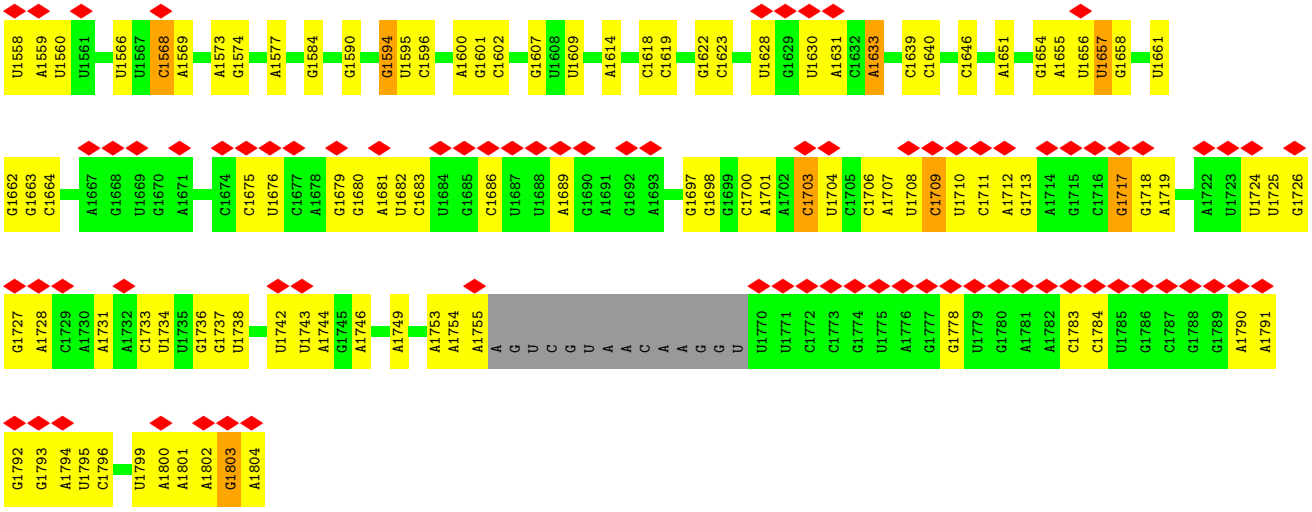


• Molecule 3: 18S rRNA

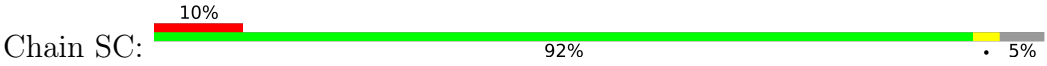
Chain SA:

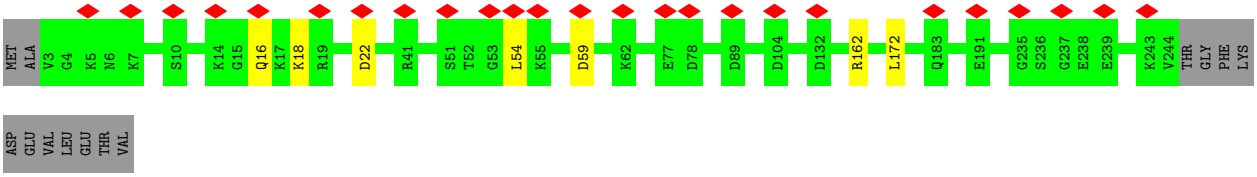




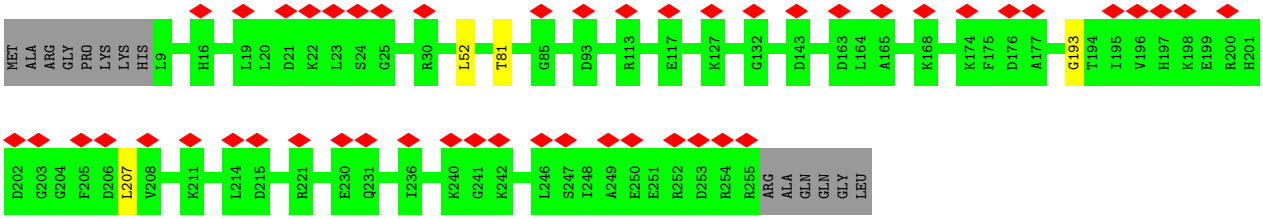


• Molecule 4: 40S ribosomal protein S1-A

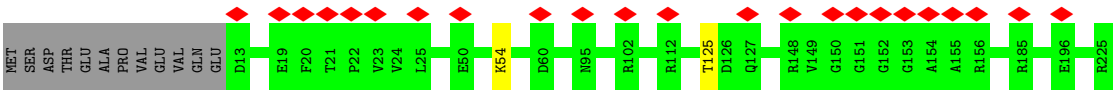




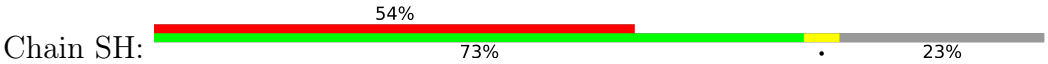
• Molecule 5: 40S ribosomal protein S4-A

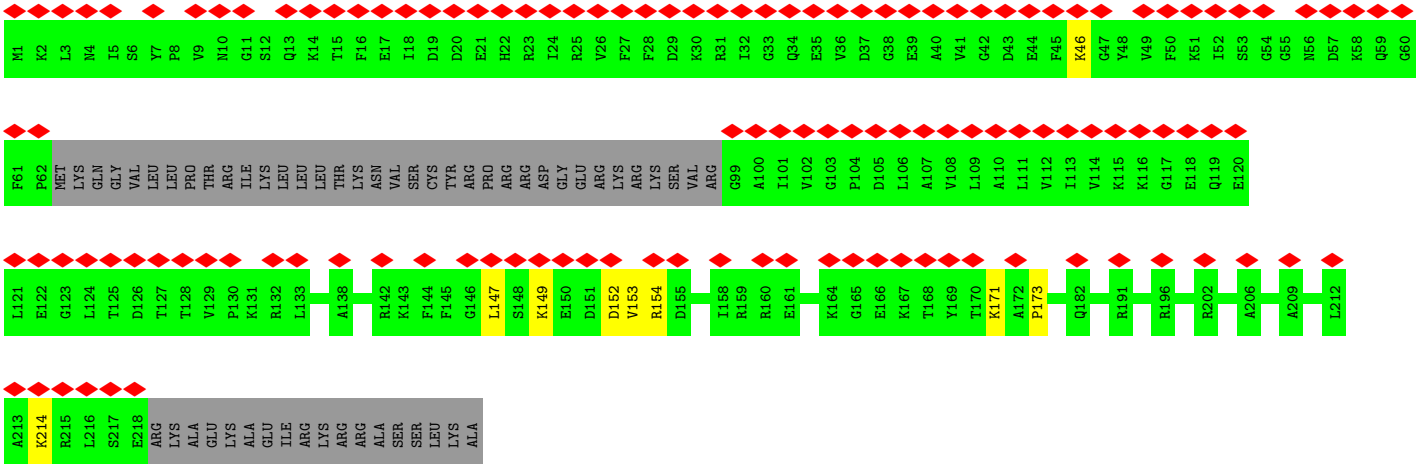


• Molecule 6: 40S ribosomal protein S5



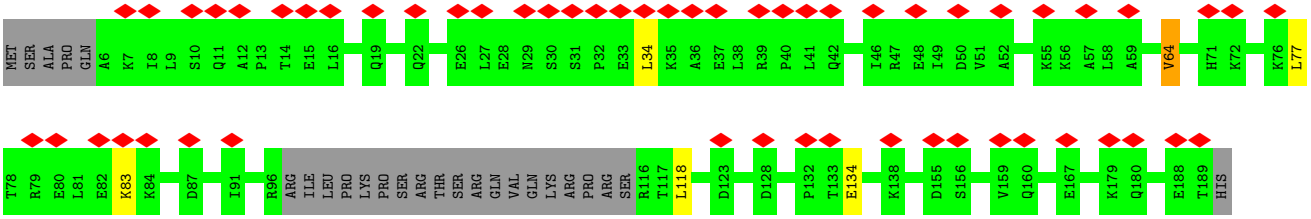
• Molecule 7: 40S ribosomal protein S6-A





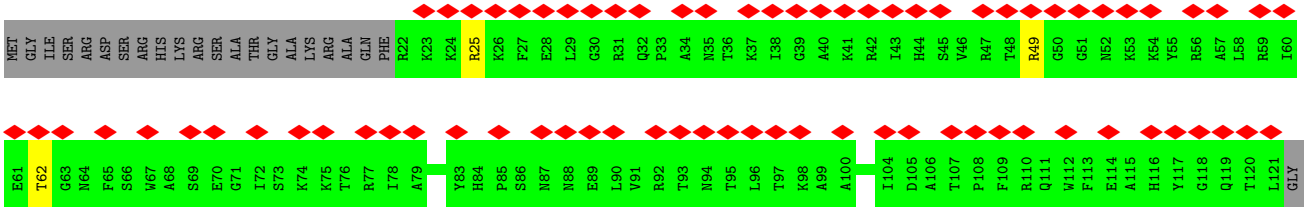
• Molecule 8: 40S ribosomal protein S7-A

Chain SI:



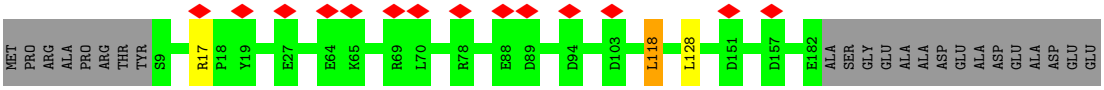
• Molecule 9: 40S ribosomal protein S8-A

Chain SJ:



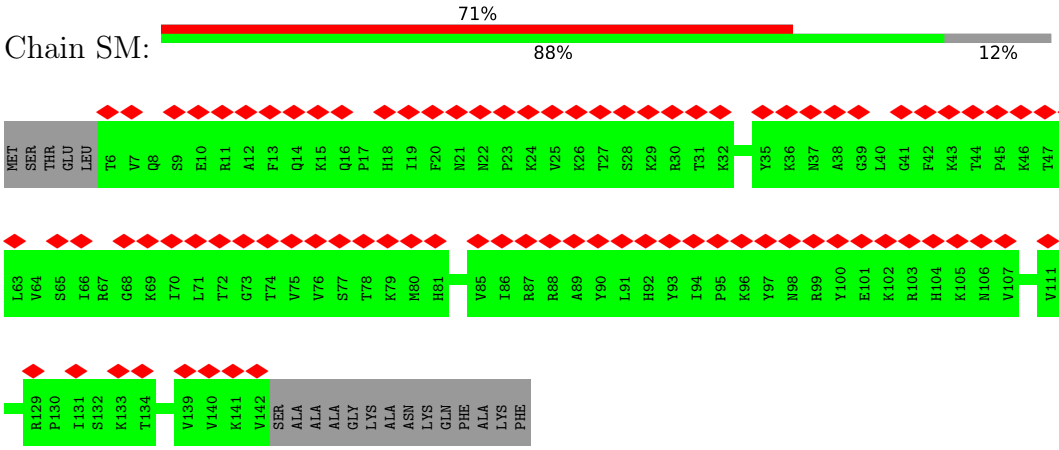
• Molecule 10: 40S ribosomal protein S9-A

Chain SK:



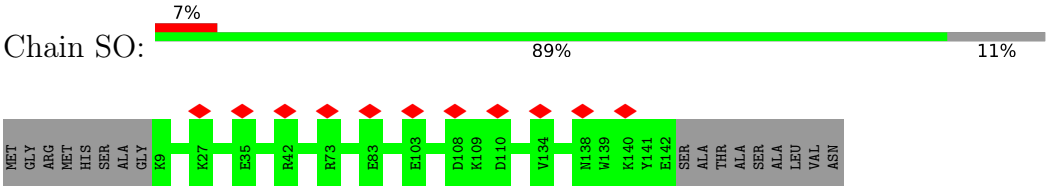
• Molecule 11: 40S ribosomal protein S11-A

Chain SM:



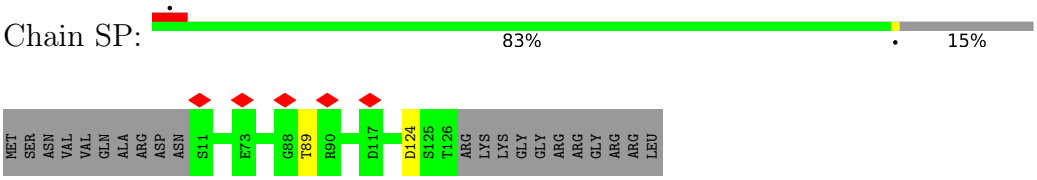
• Molecule 12: 40S ribosomal protein S13

Chain SO:



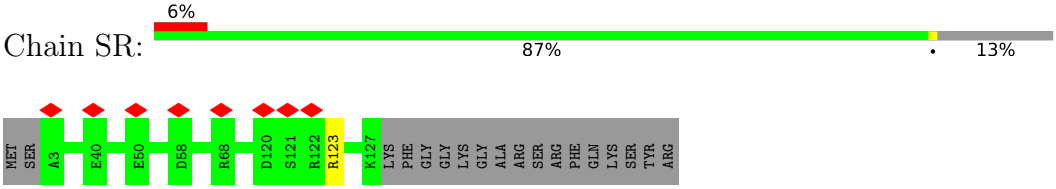
• Molecule 13: 40S ribosomal protein S14-A

Chain SP:



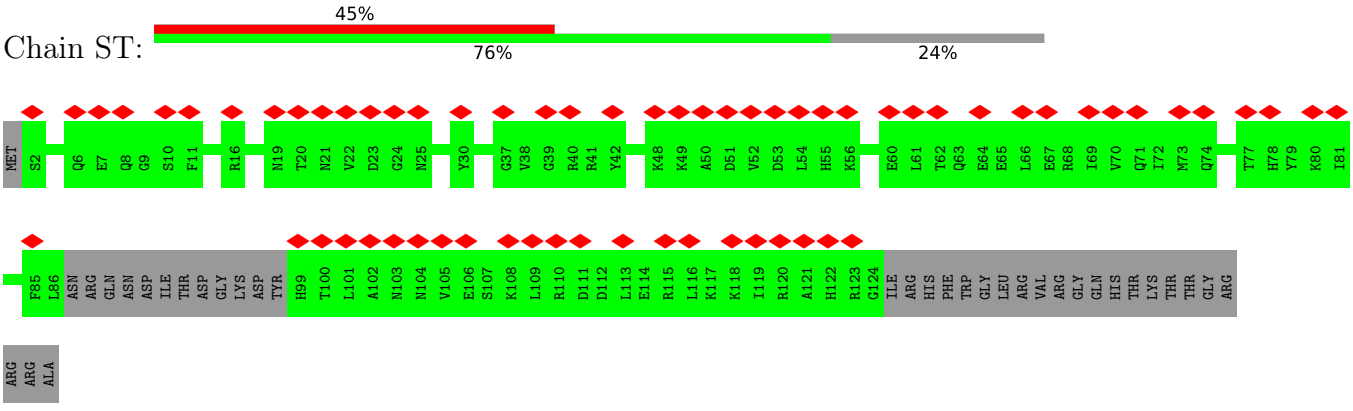
• Molecule 14: 40S ribosomal protein S16-A

Chain SR:



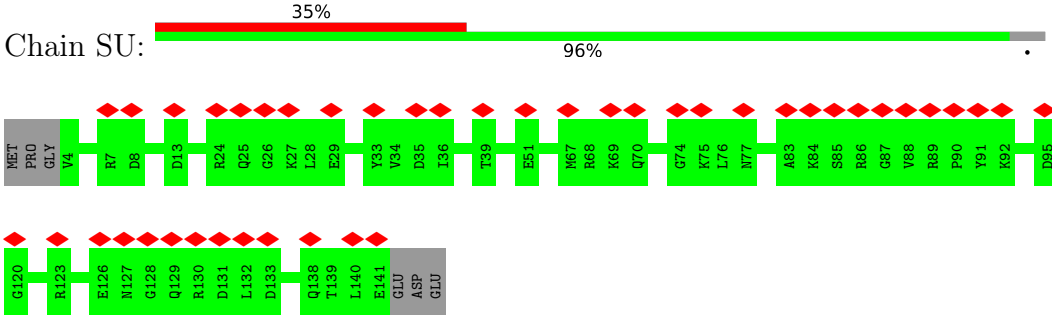
• Molecule 15: 40S ribosomal protein S18-A

Chain ST:



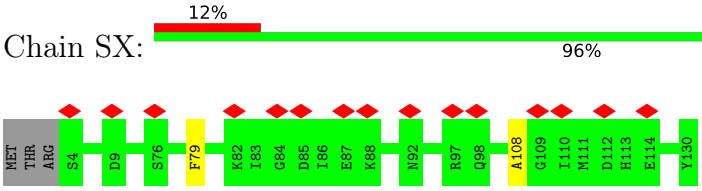
• Molecule 16: 40S ribosomal protein S19-A

Chain SU:



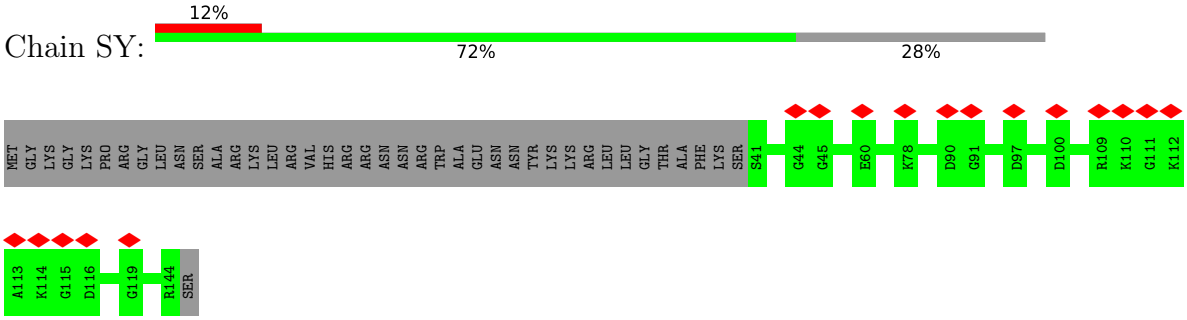
• Molecule 17: 40S ribosomal protein S22-B

Chain SX:



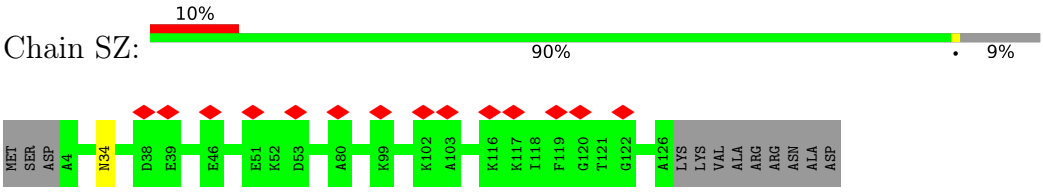
• Molecule 18: 40S ribosomal protein S23-A

Chain SY:



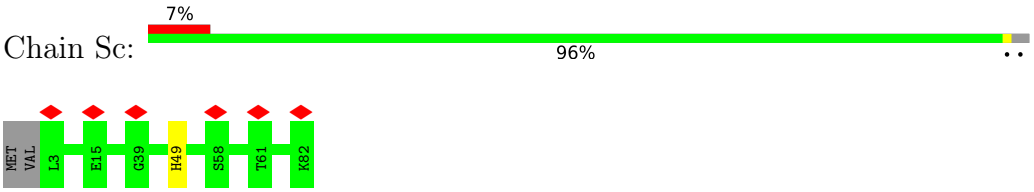
• Molecule 19: 40S ribosomal protein S24-A

Chain SZ:



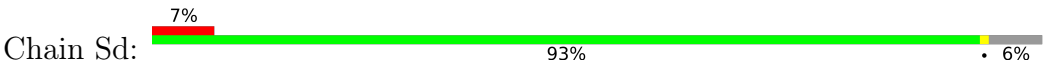
• Molecule 20: 40S ribosomal protein S27-A

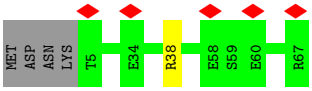
Chain Sc:



• Molecule 21: 40S ribosomal protein S28-A

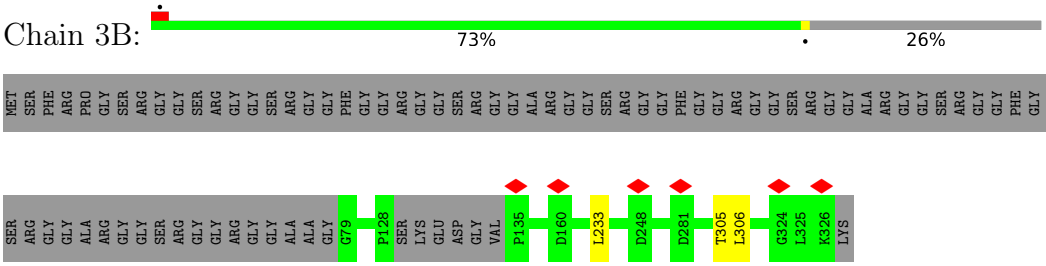
Chain Sd:





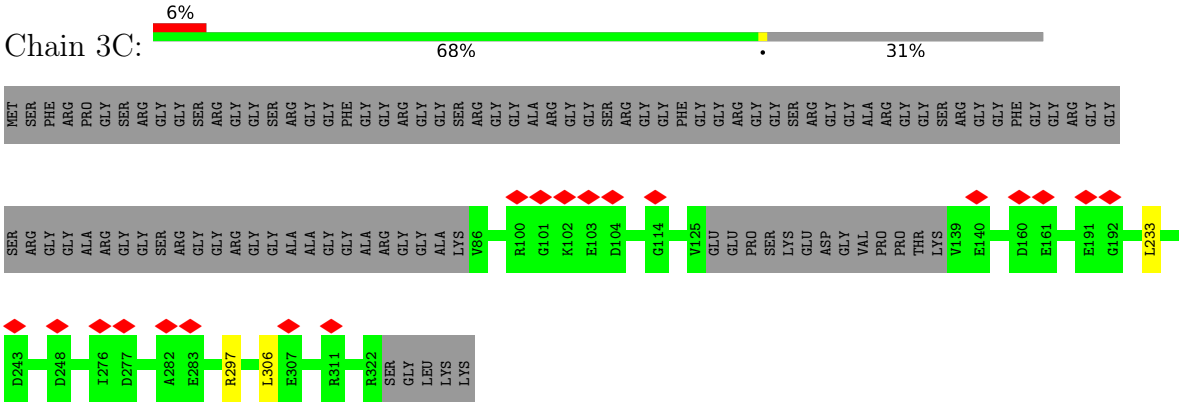
• Molecule 22: rRNA 2'-O-methyltransferase fibrillarin

Chain 3B:



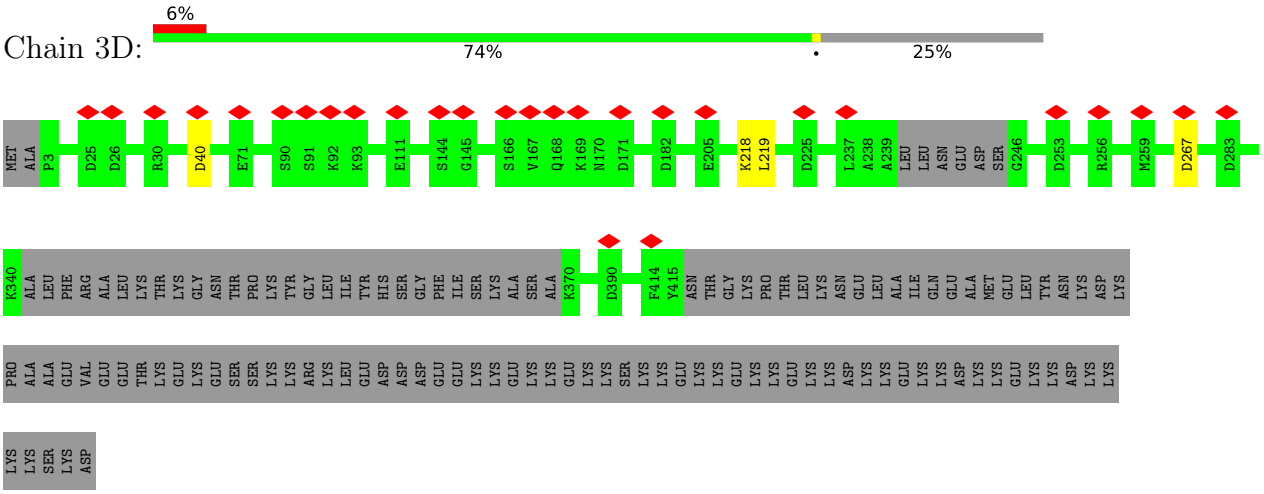
• Molecule 22: rRNA 2'-O-methyltransferase fibrillarin

Chain 3C:



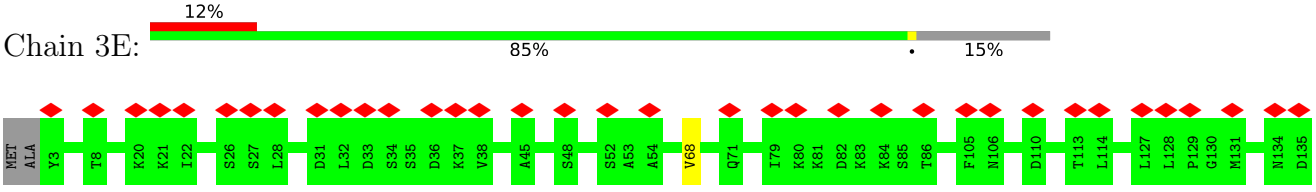
• Molecule 23: Nucleolar protein 56

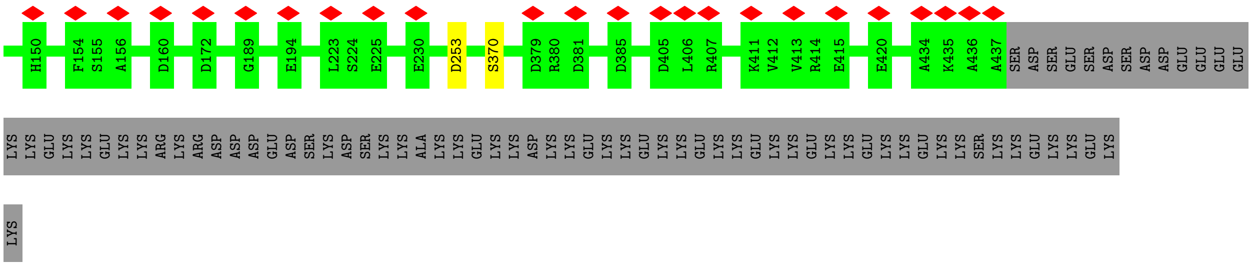
Chain 3D:



• Molecule 24: Nucleolar protein 58

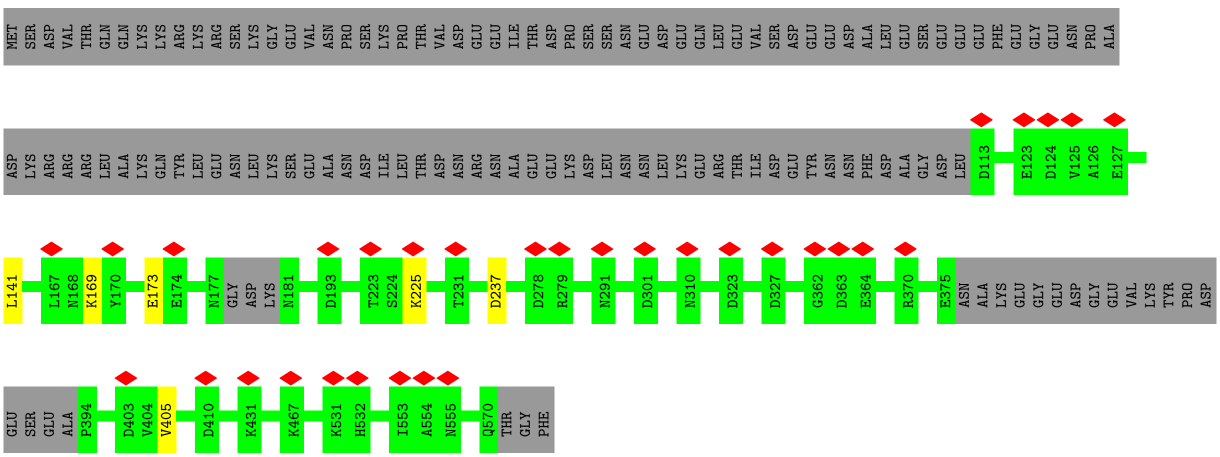
Chain 3E:





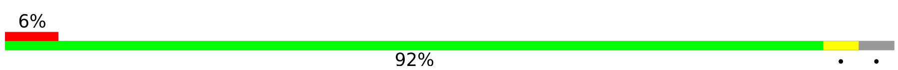
- Molecule 25: Ribosomal RNA-processing protein 9

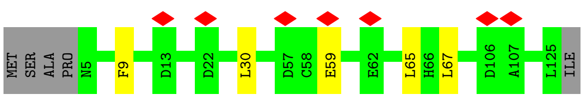
Chain 3F:



- Molecule 26: 13 kDa ribonucleoprotein-associated protein

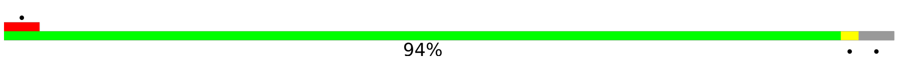
Chain 3G:

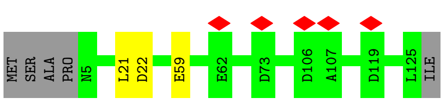




- Molecule 26: 13 kDa ribonucleoprotein-associated protein

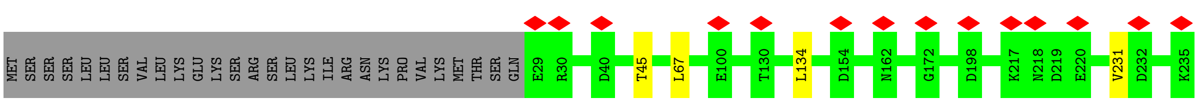
Chain 3H:

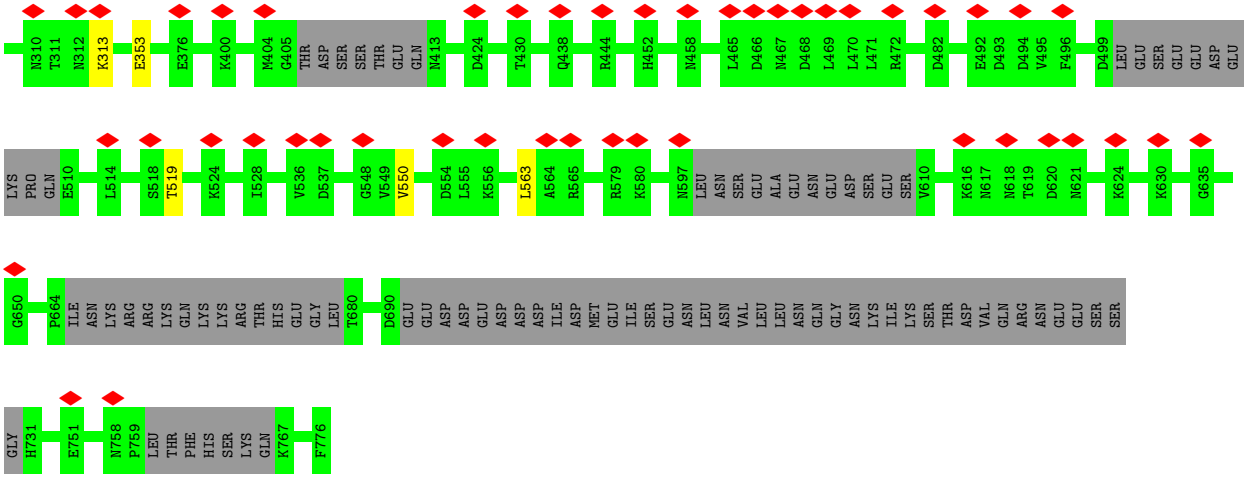




- Molecule 27: U3 small nucleolar RNA-associated protein 4

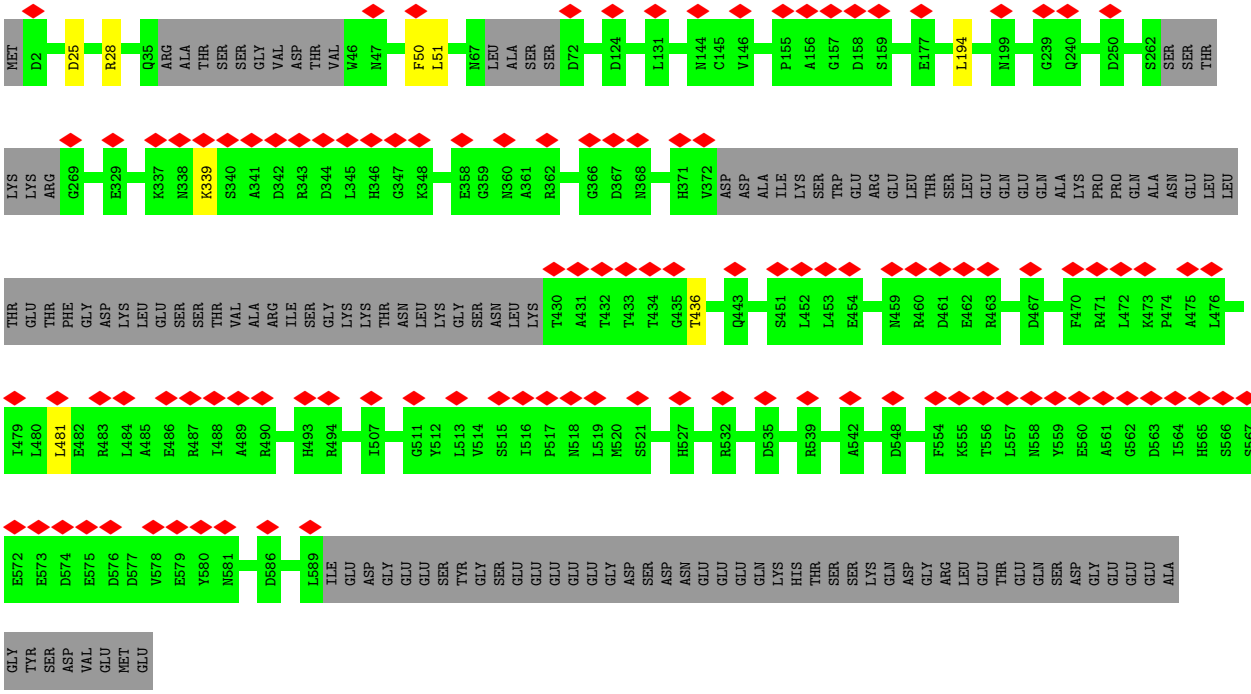
Chain A4:





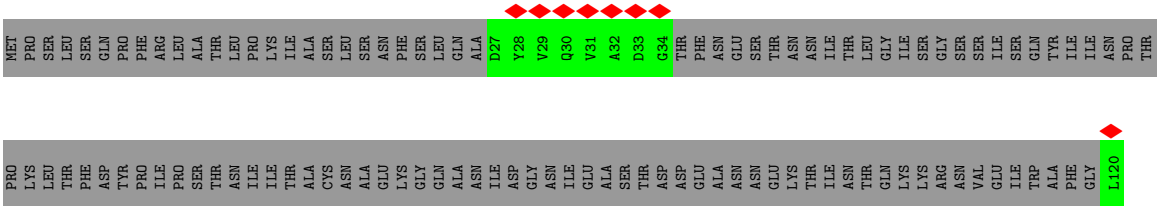
• Molecule 28: U3 small nucleolar RNA-associated protein 5

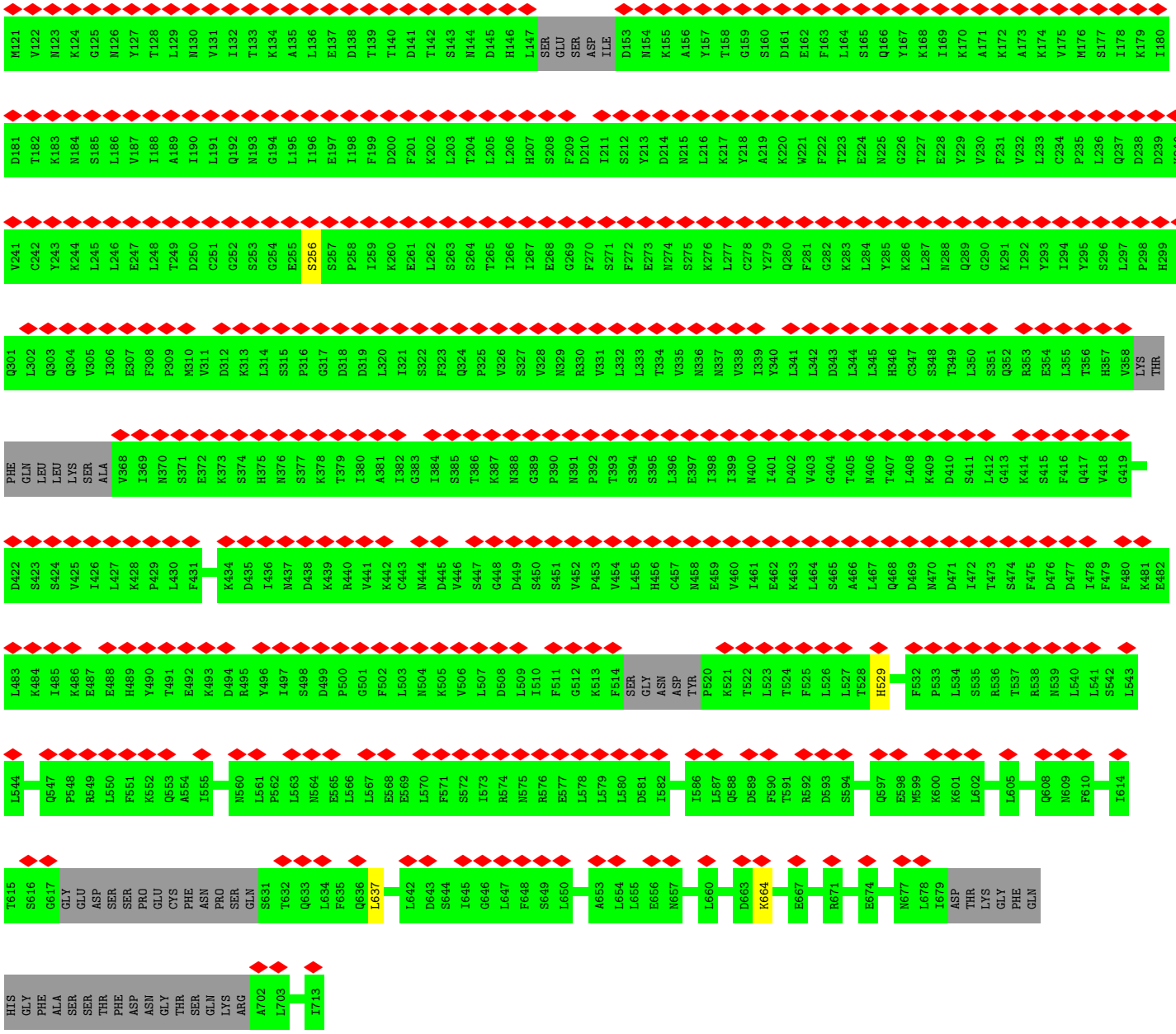
Chain A5:



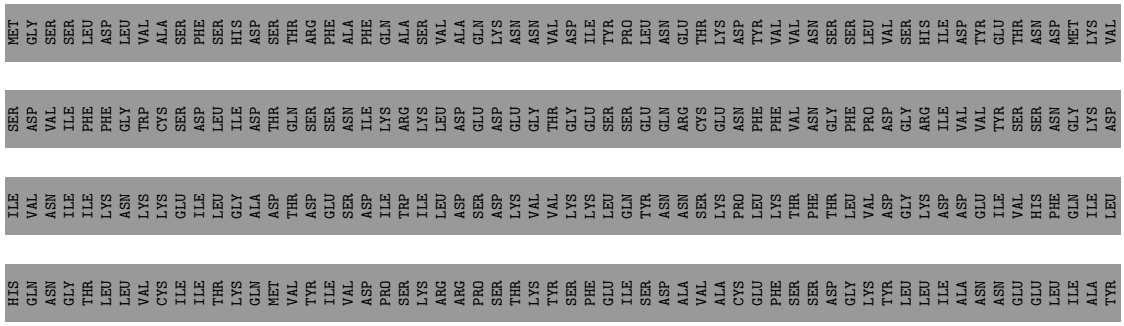
• Molecule 29: U3 small nucleolar RNA-associated protein 8

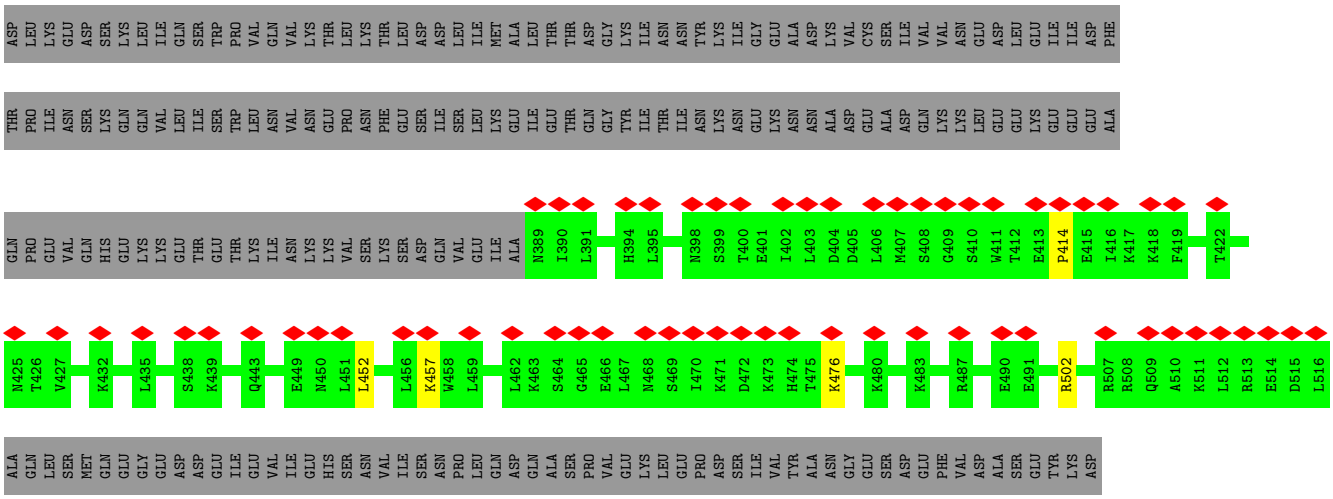
Chain A8:





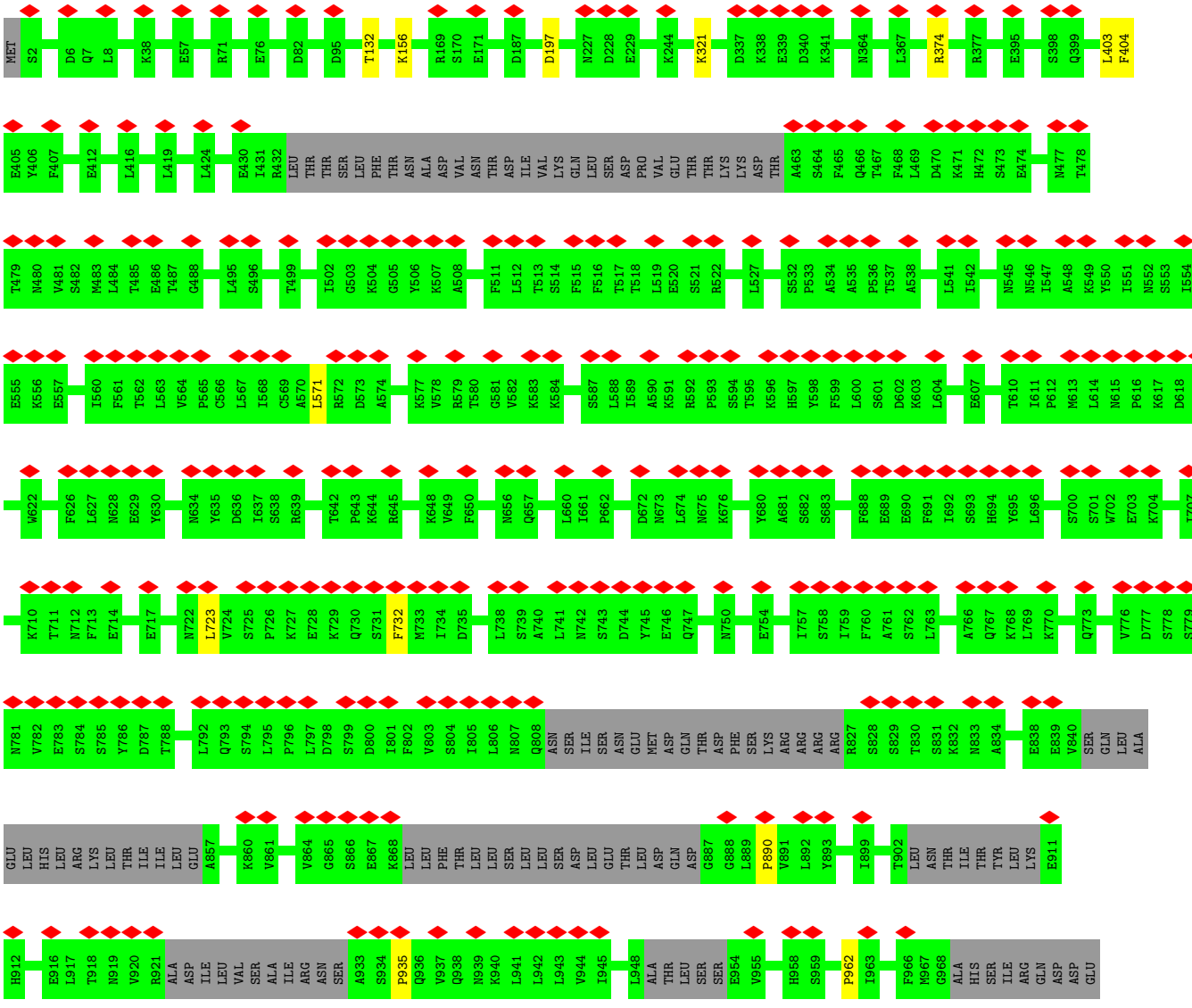
• Molecule 30: U3 small nucleolar RNA-associated protein 9

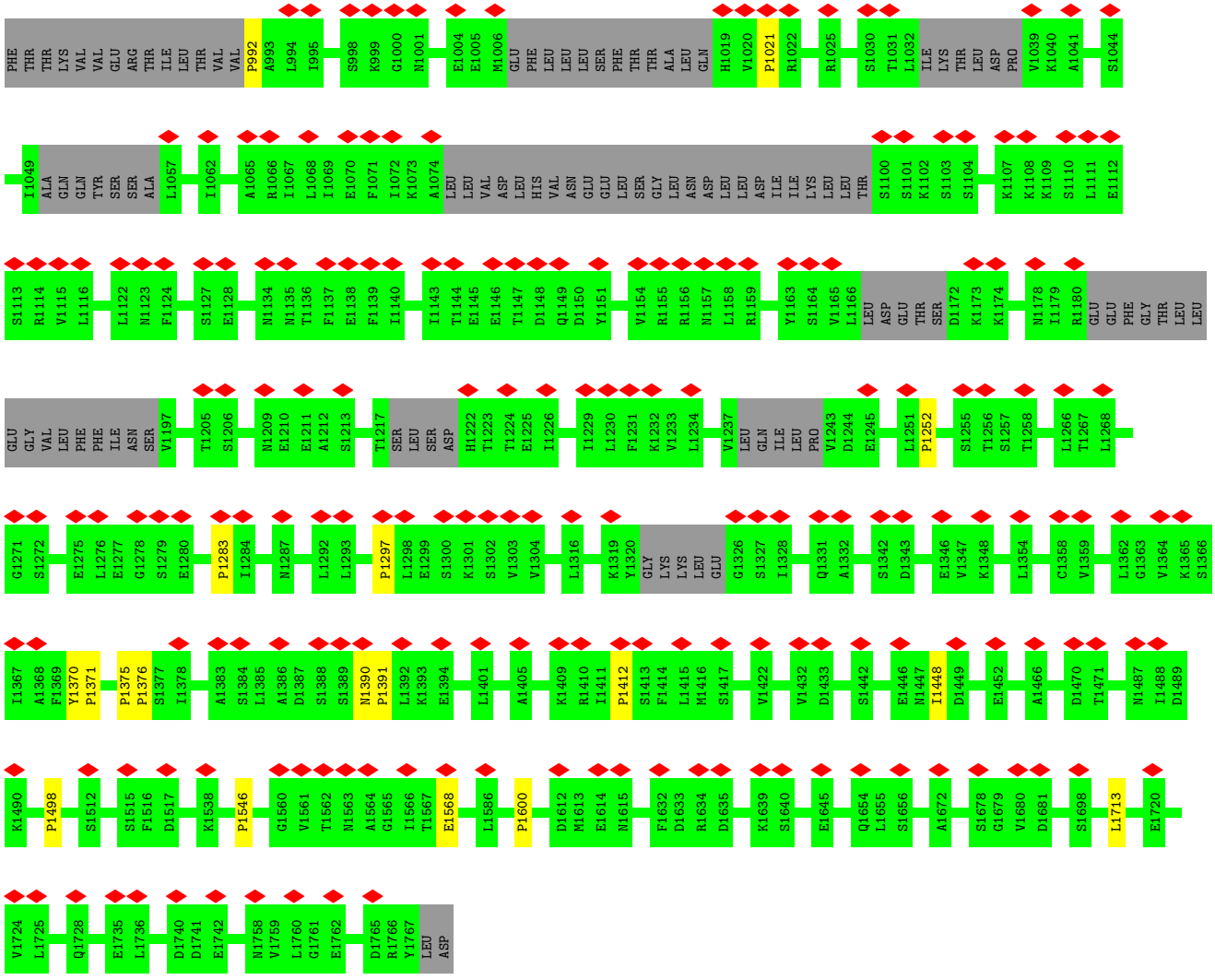




• Molecule 31: U3 small nucleolar RNA-associated protein 10

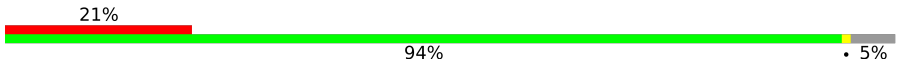
Chain AE:

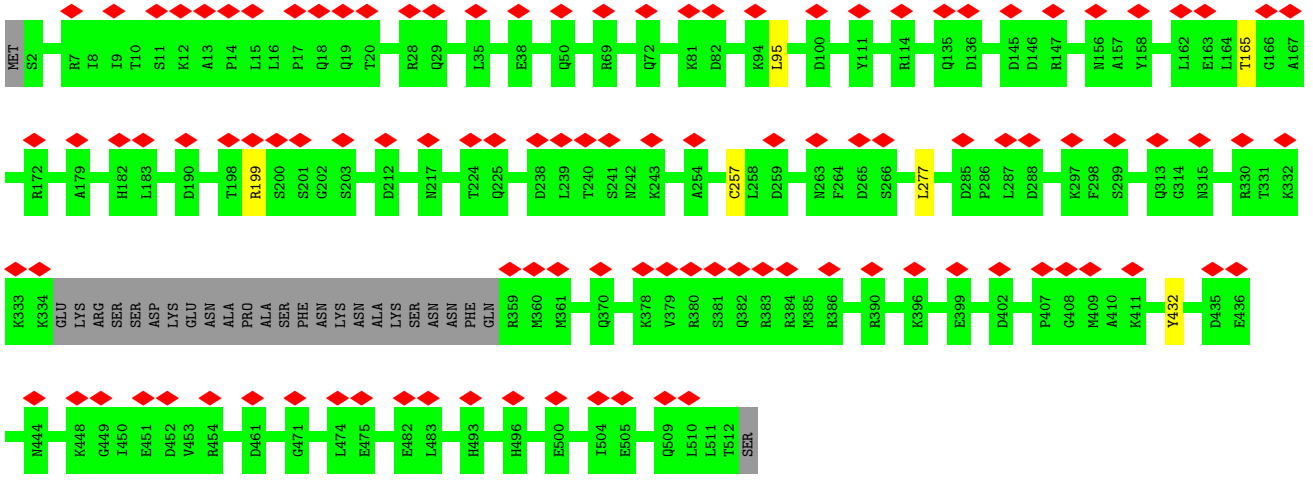




• Molecule 32: U3 small nucleolar RNA-associated protein 15

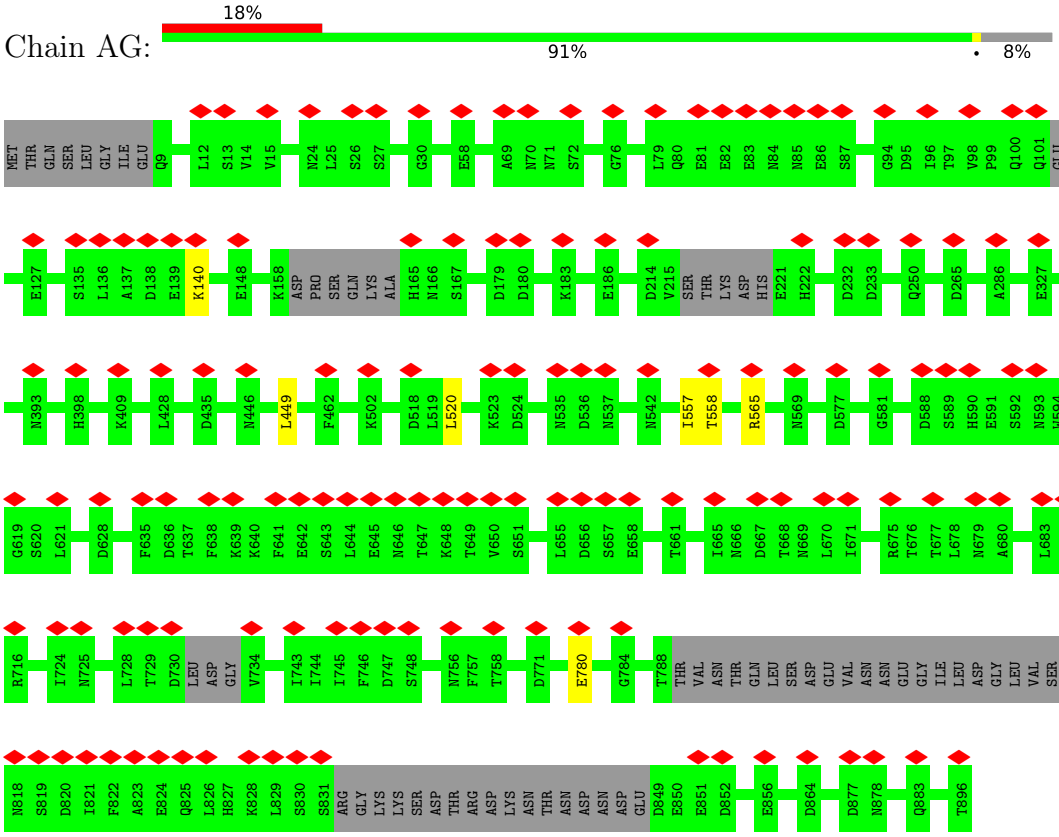
Chain AF:





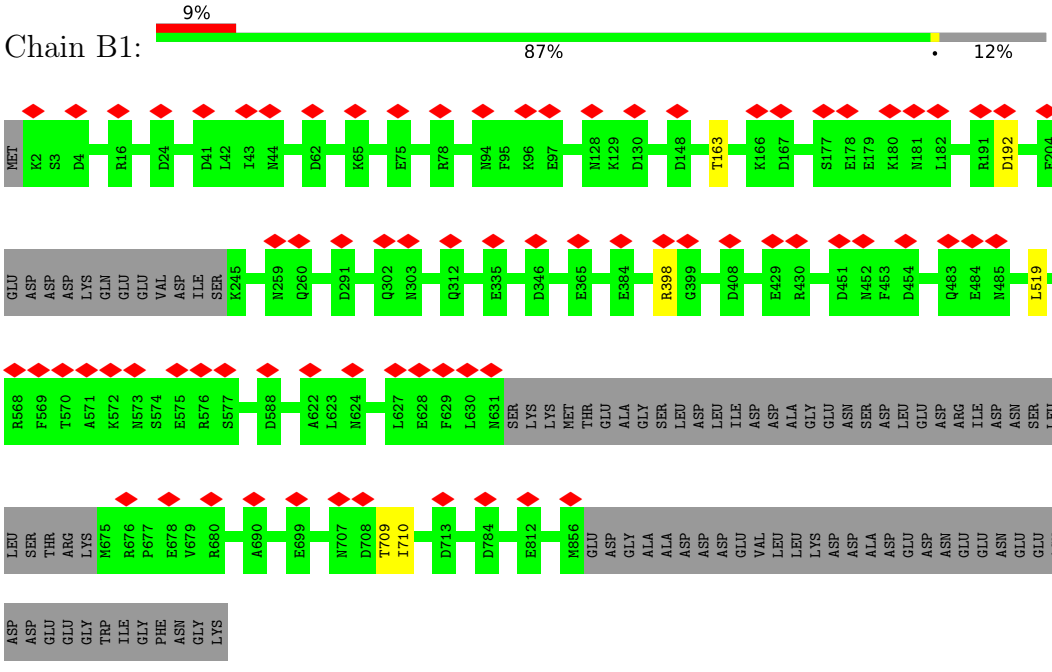
• Molecule 33: NET1-associated nuclear protein 1

Chain AG:



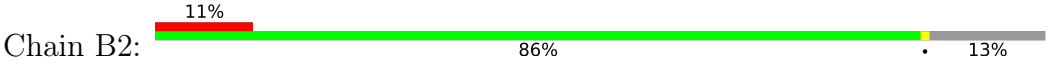
• Molecule 34: Periodic tryptophan protein 2

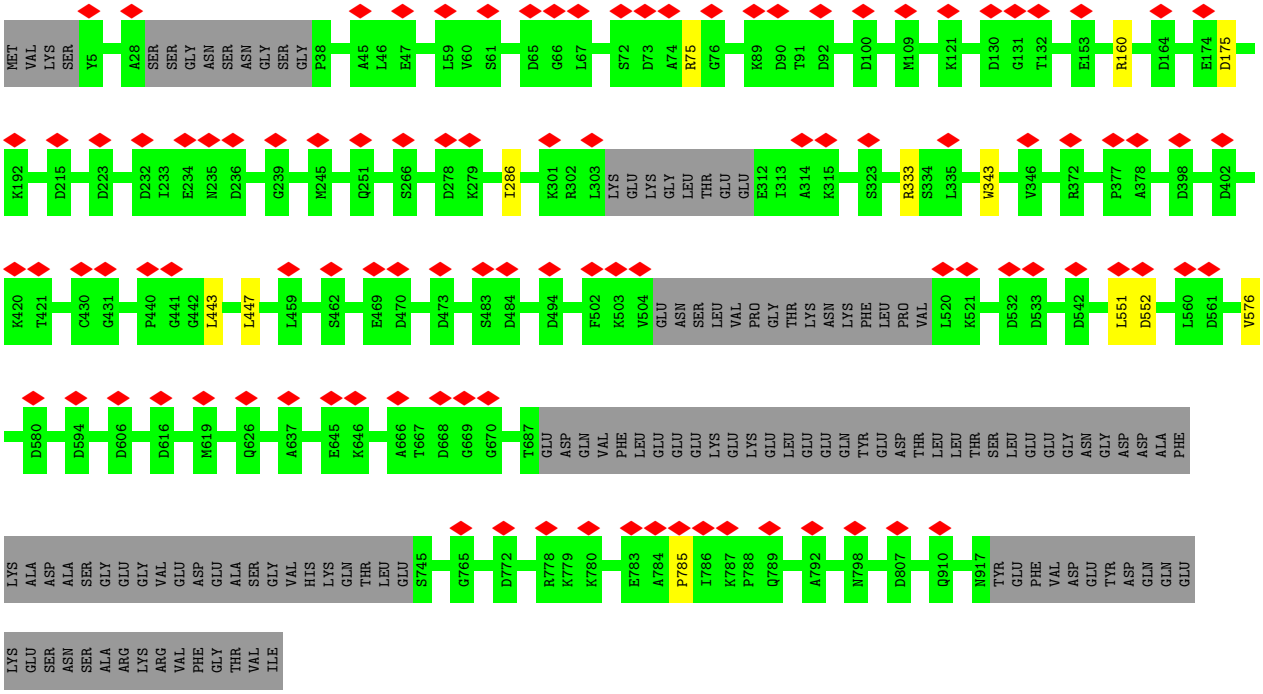
Chain B1:

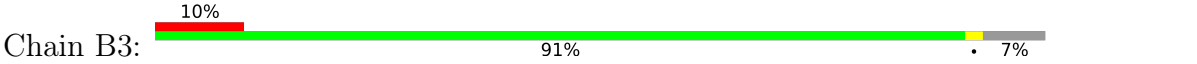


• Molecule 35: U3 small nucleolar RNA-associated protein 12

Chain B2:

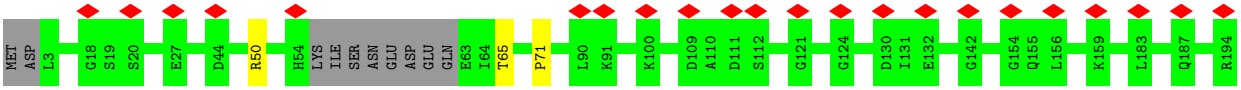


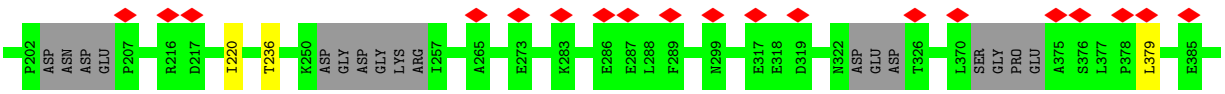


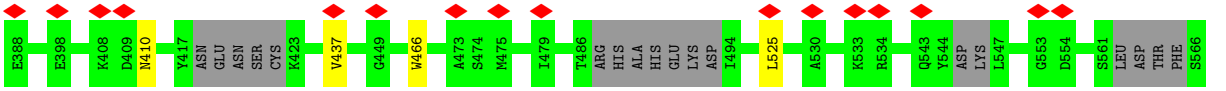


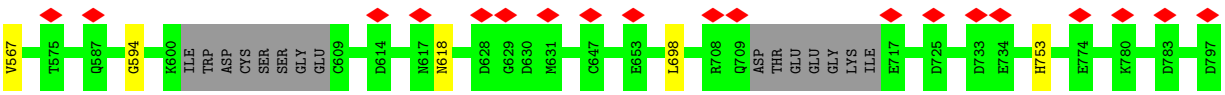
• Molecule 36: U3 small nucleolar RNA-associated protein 13

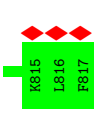
Chain B3:





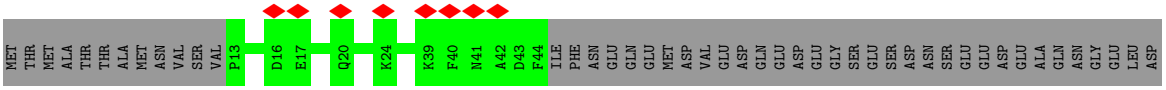


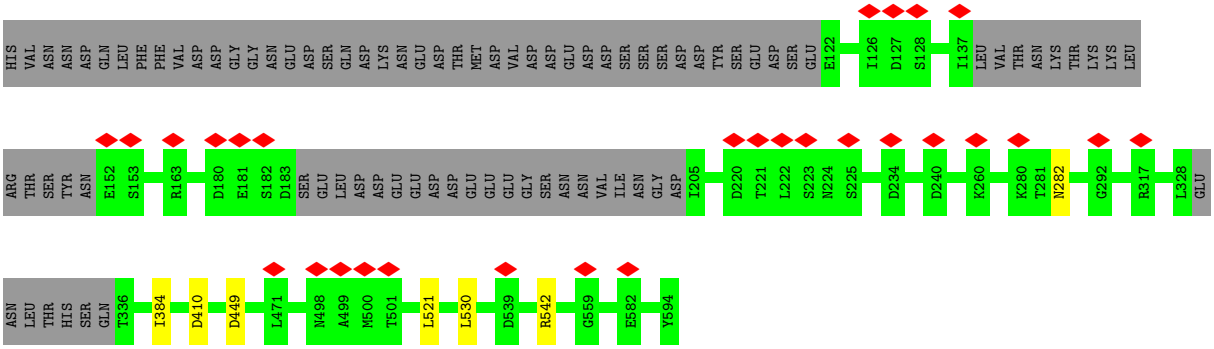




• Molecule 37: U3 small nucleolar RNA-associated protein 18

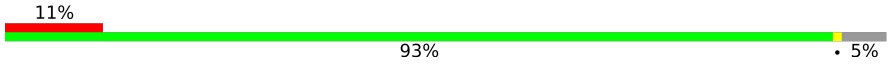
Chain B8:

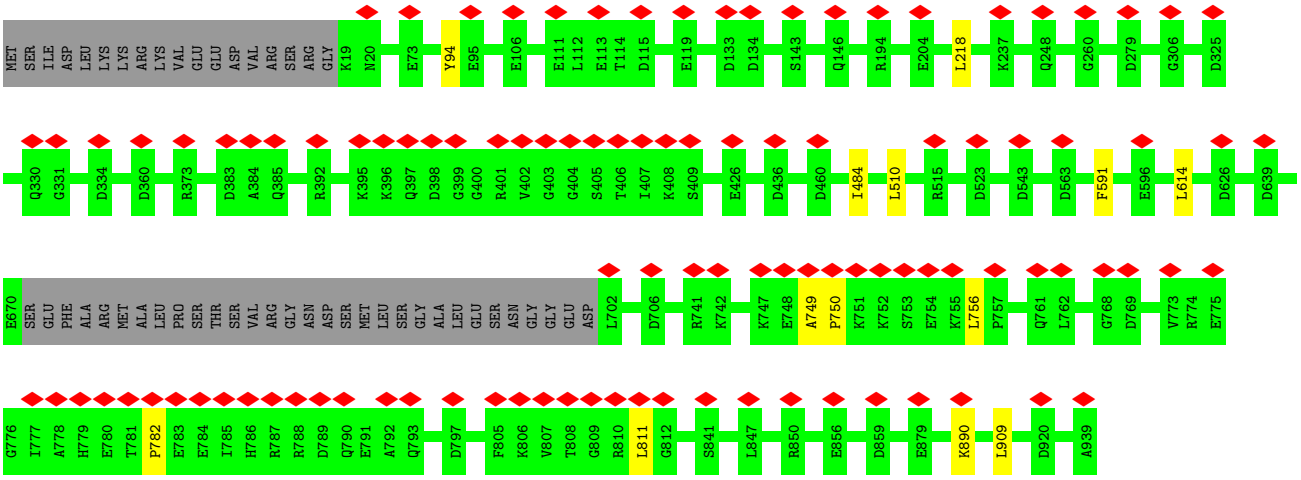




• Molecule 38: U3 small nucleolar RNA-associated protein 21

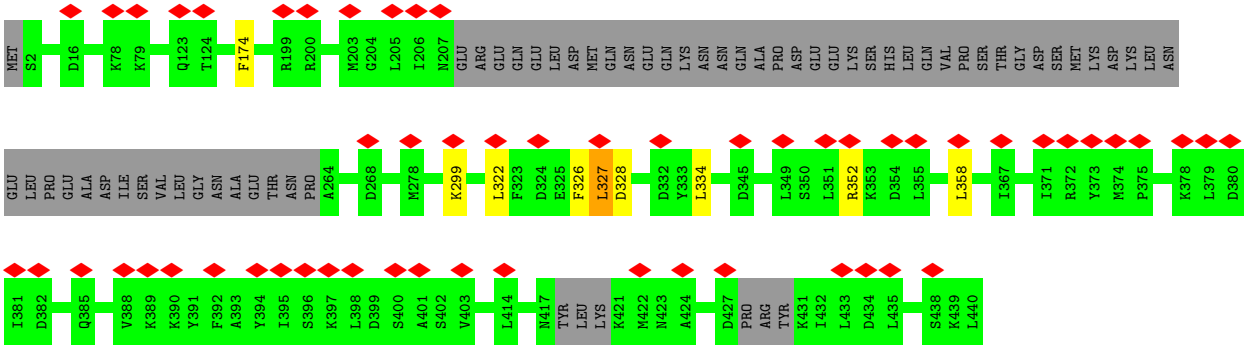
Chain BE:





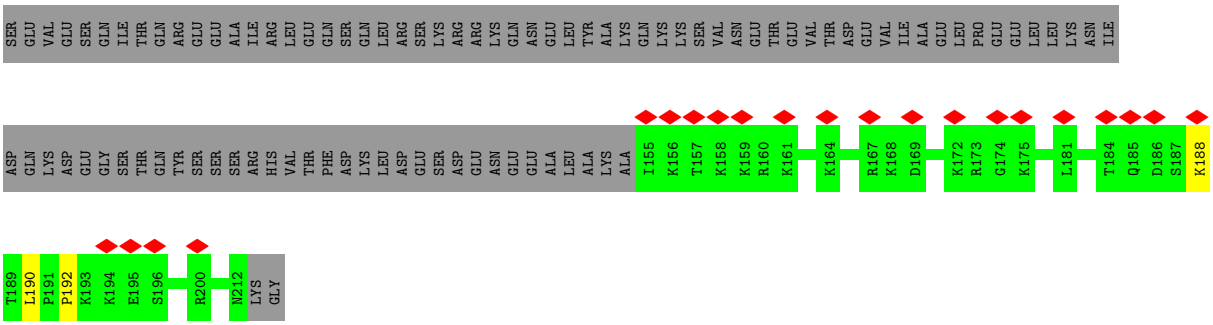
• Molecule 39: U3 small nucleolar RNA-associated protein 6

Chain B6:

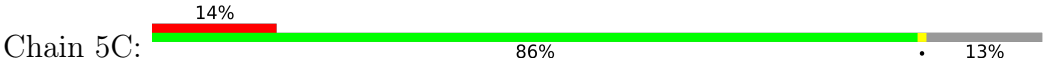


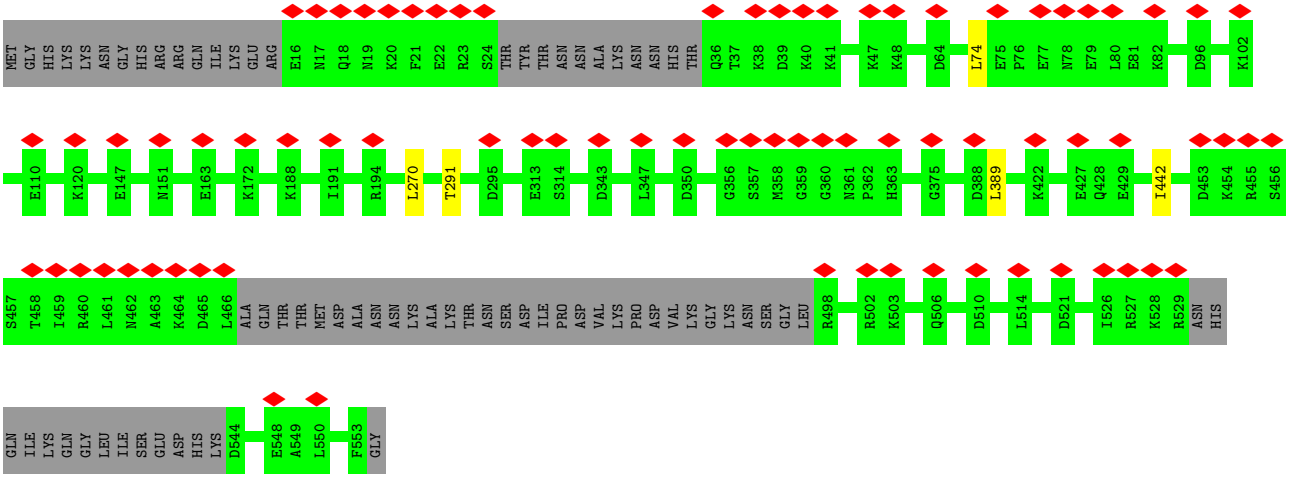
• Molecule 40: Bud site selection protein 21

Chain 5B:

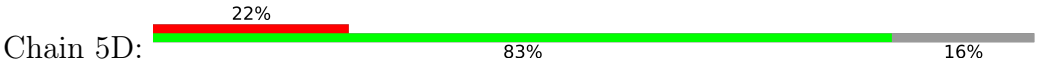


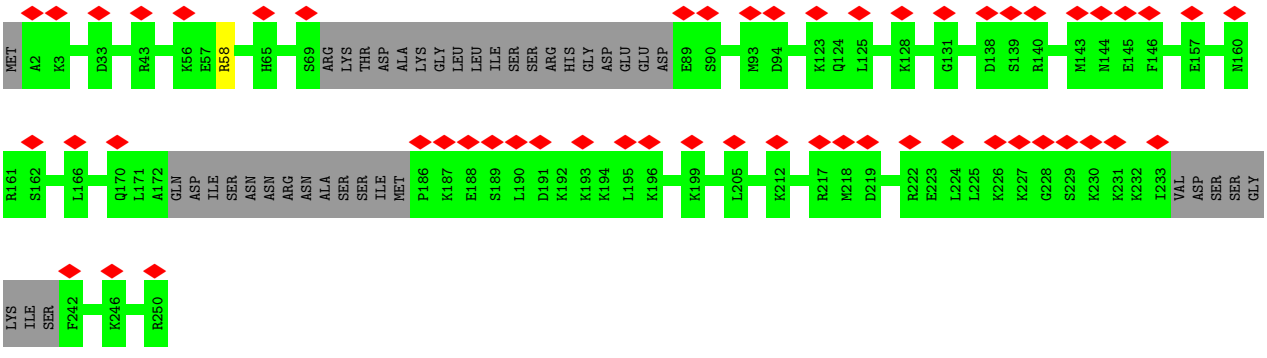
• Molecule 41: U3 small nucleolar RNA-associated protein 7



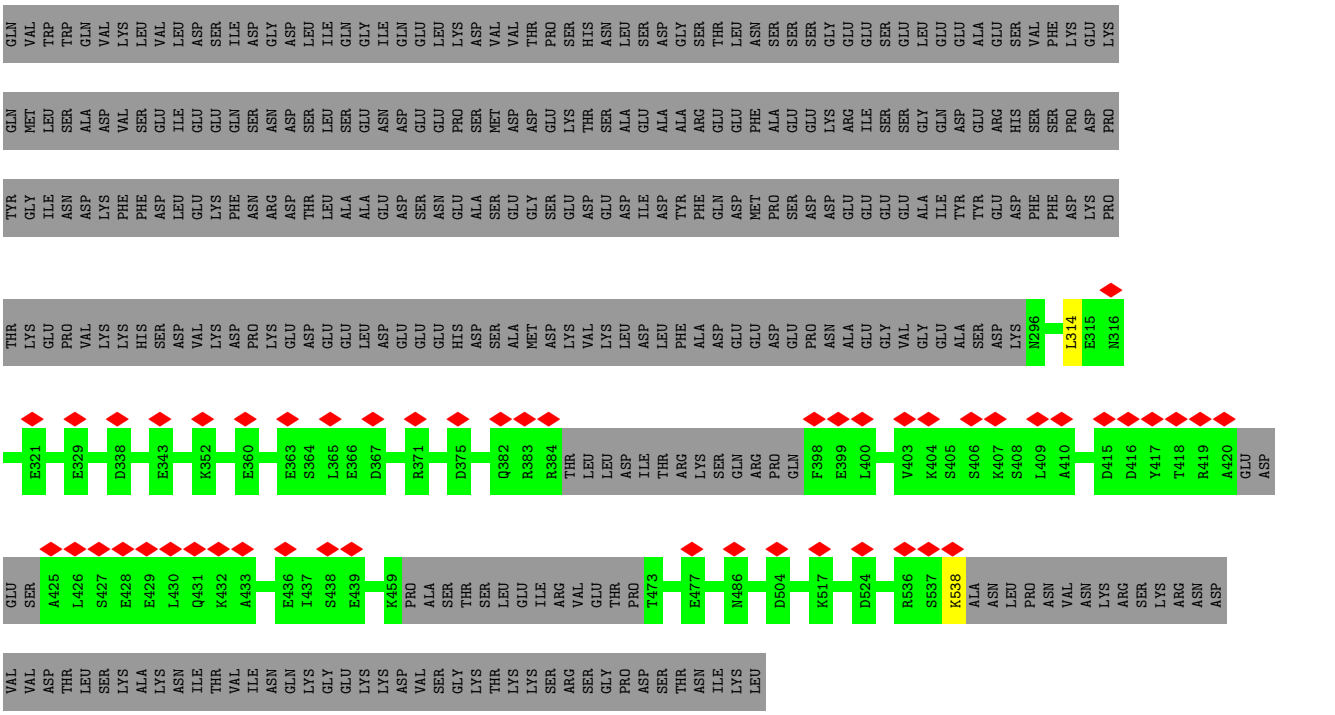


• Molecule 42: U3 small nucleolar RNA-associated protein 11



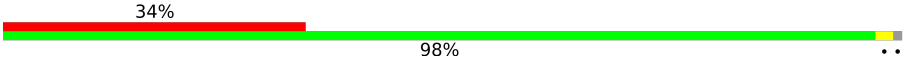


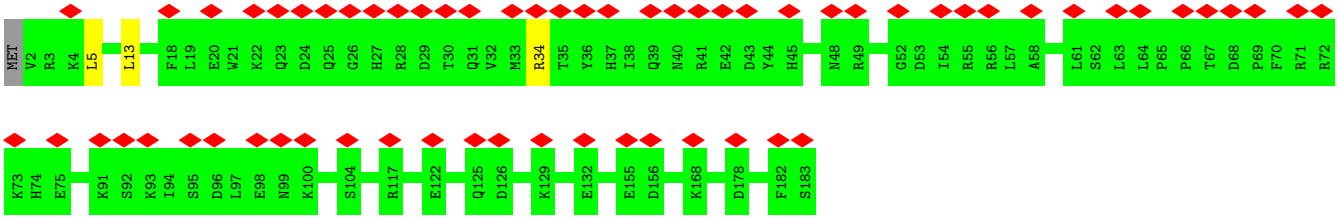
• Molecule 43: U3 small nucleolar RNA-associated protein MPP10



• Molecule 44: U3 small nucleolar ribonucleoprotein protein IMP3

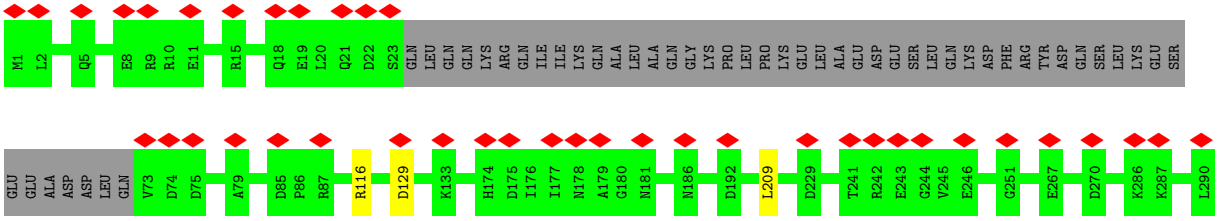
Chain 5F:





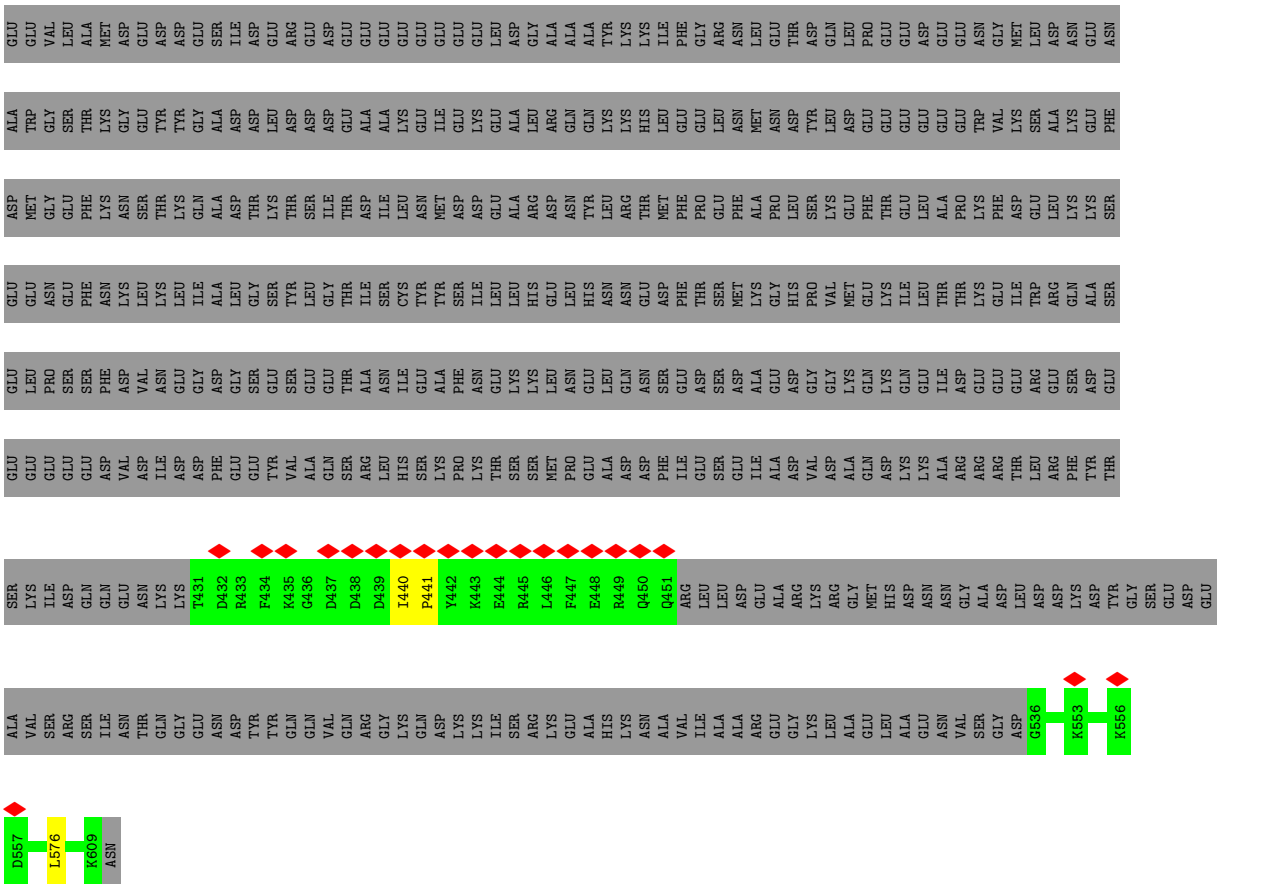
• Molecule 45: U3 small nucleolar ribonucleoprotein protein IMP4

Chain 5G:

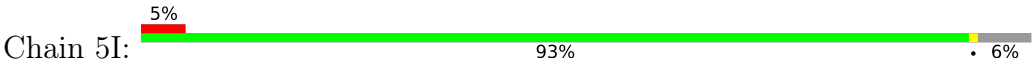


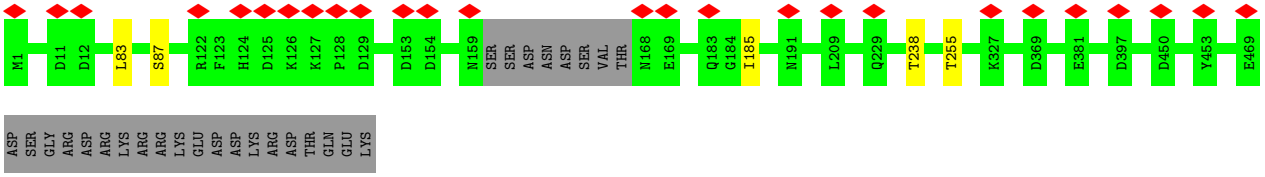
• Molecule 46: Something about silencing protein 10

Chain 5H:

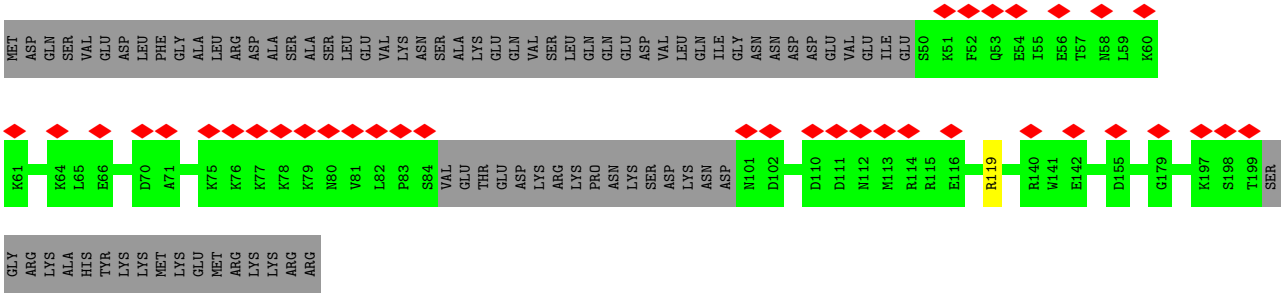


• Molecule 47: Protein SOF1



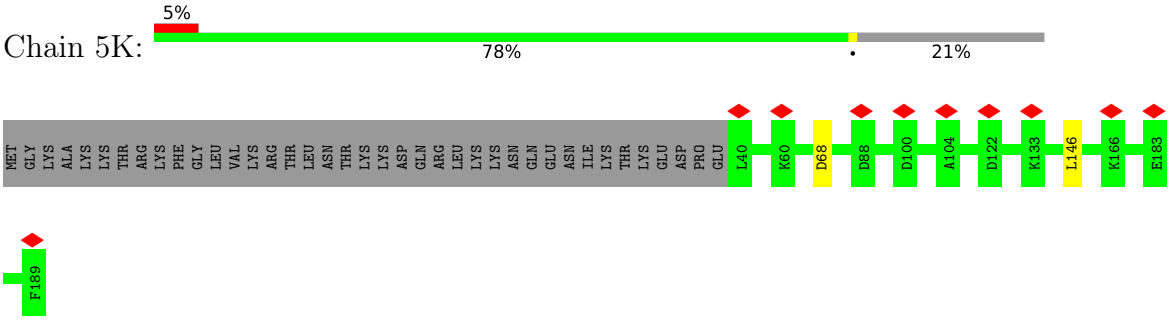


• Molecule 48: rRNA-processing protein FCF2



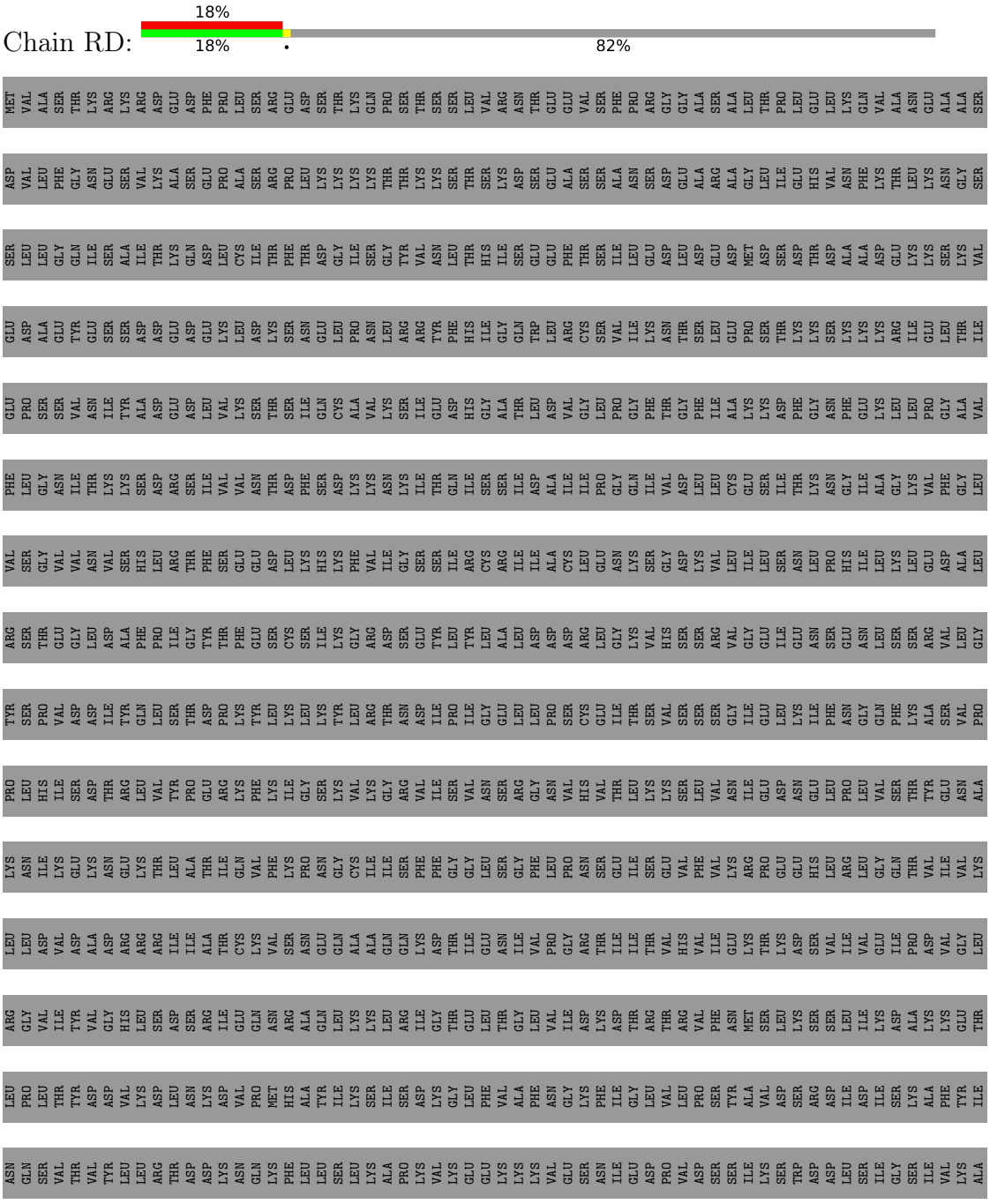
• Molecule 49: rRNA-processing protein FCF1

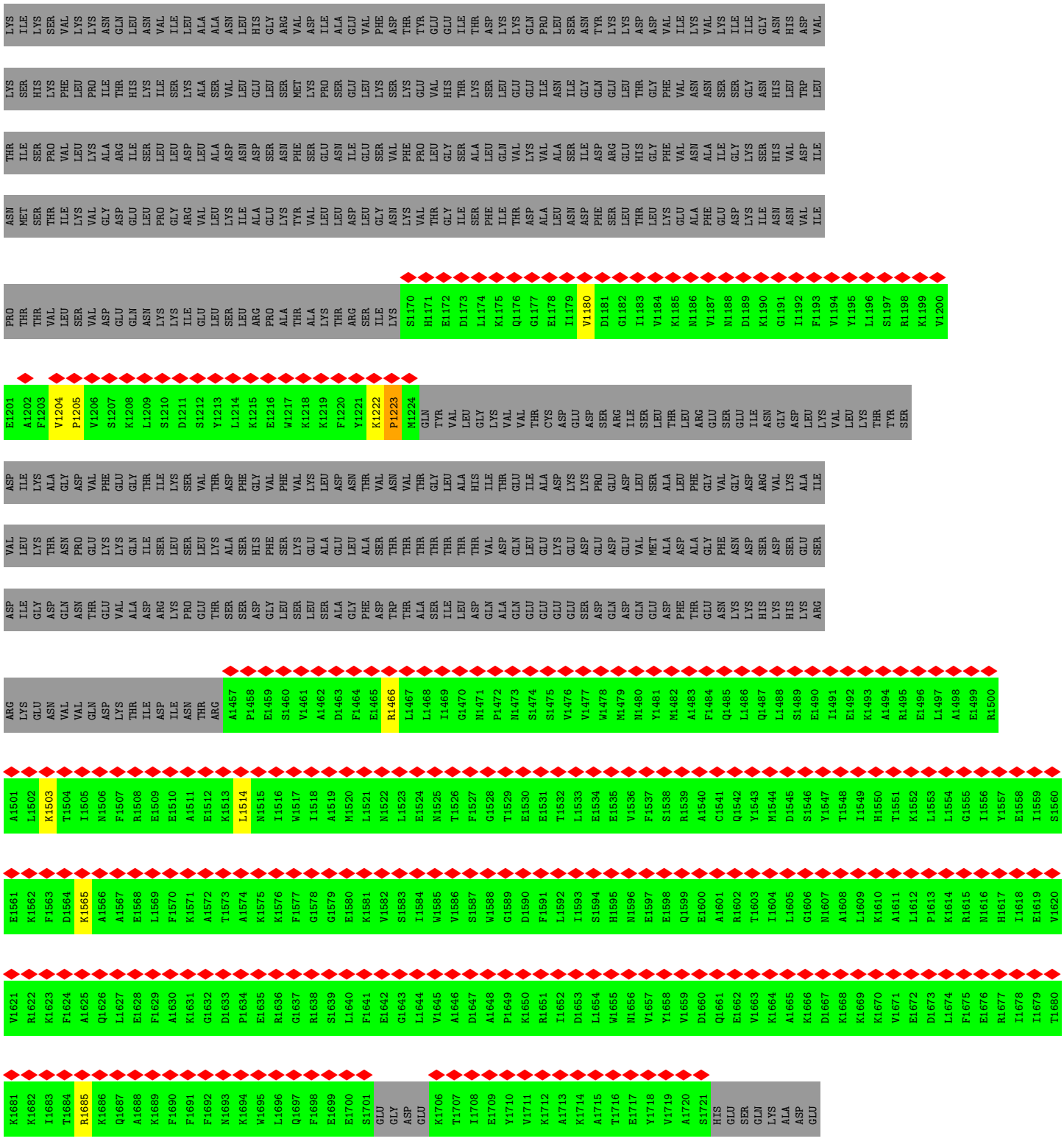
Chain 5K:



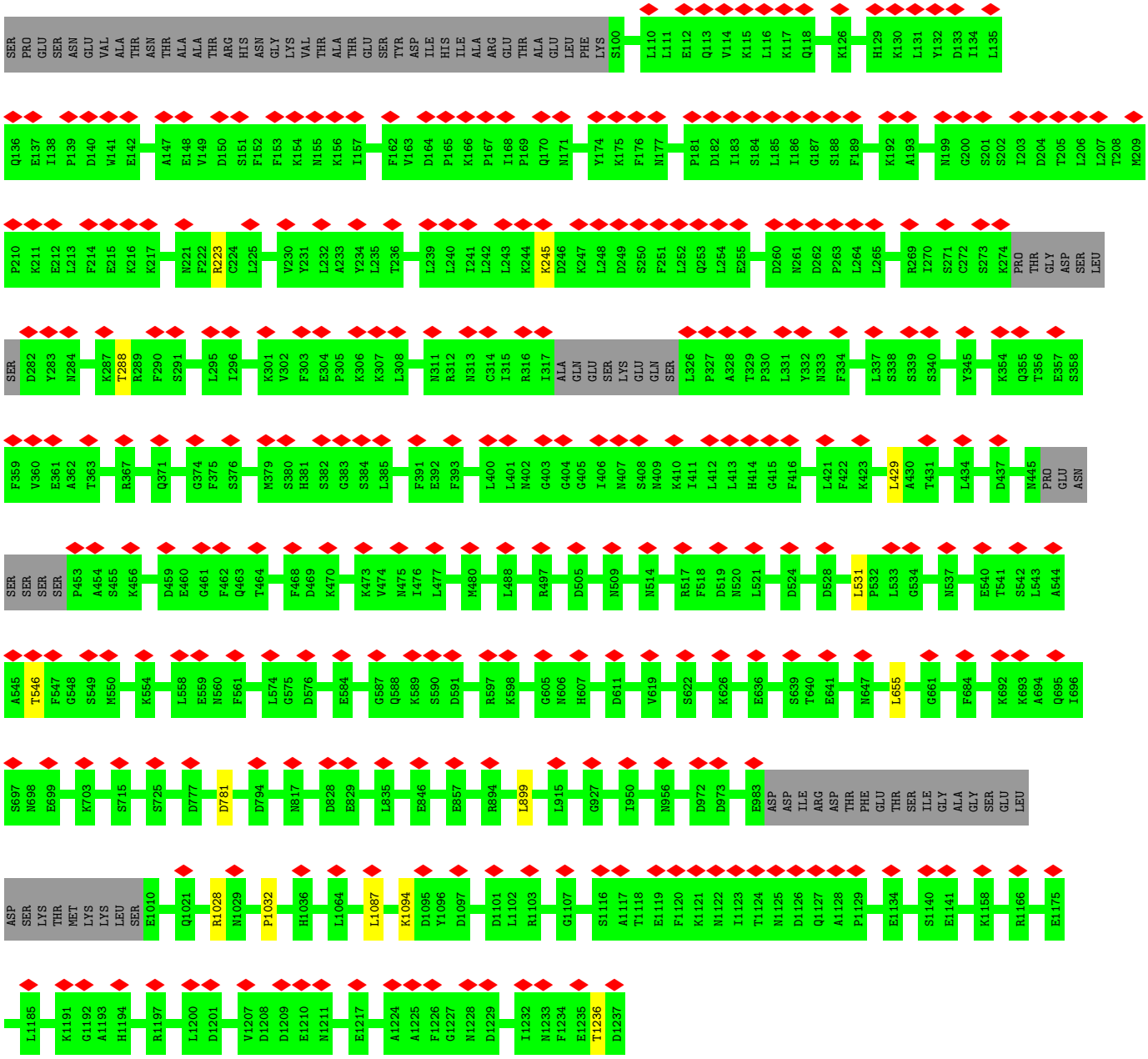
• Molecule 50: rRNA biogenesis protein RRP5

Chain RD:



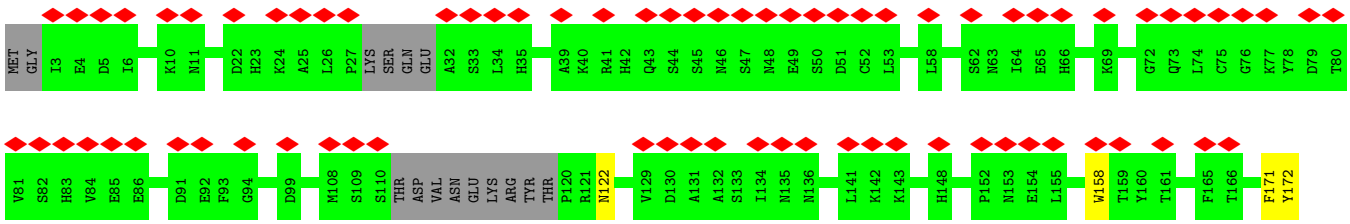


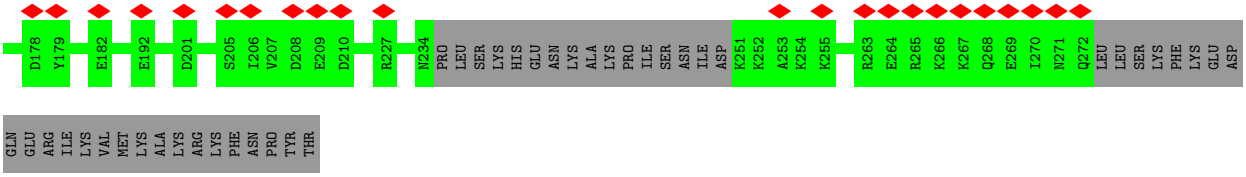
• Molecule 51: U3 small nucleolar RNA-associated protein 22



• Molecule 52: Ribosomal RNA-processing protein 7

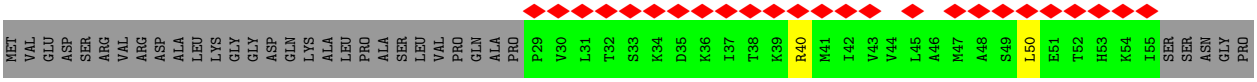
Chain RF:

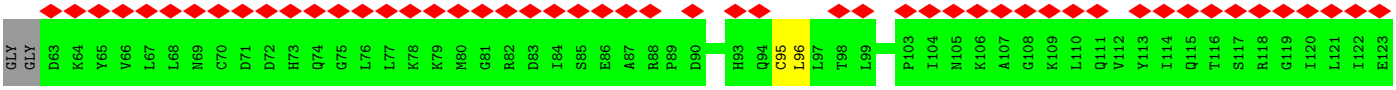


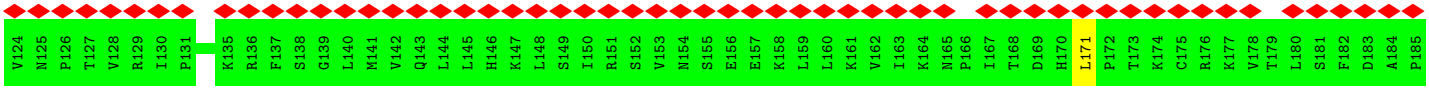


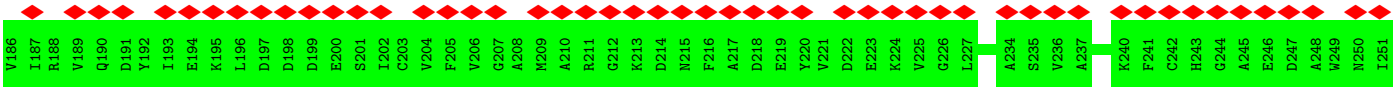
• Molecule 53: Ribosomal RNA small subunit methyltransferase NEP1

Chain RG:



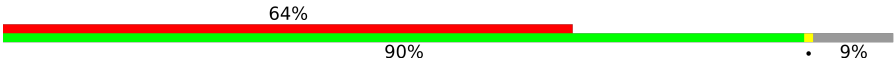


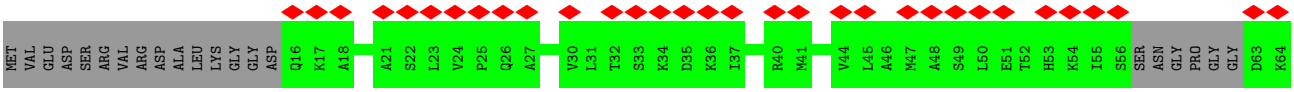


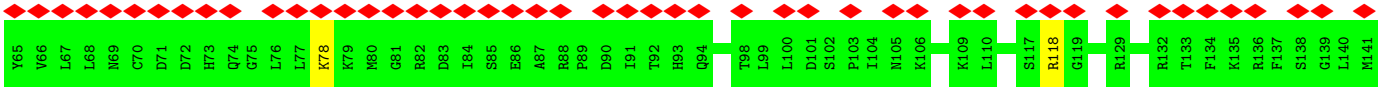


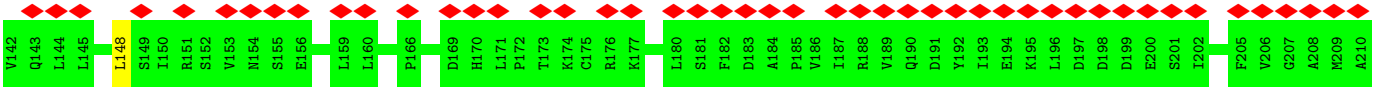
• Molecule 53: Ribosomal RNA small subunit methyltransferase NEP1

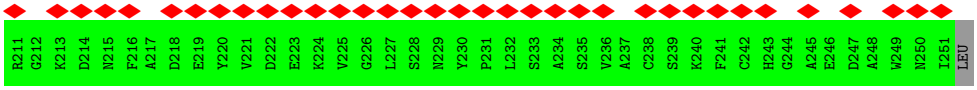
Chain RH:





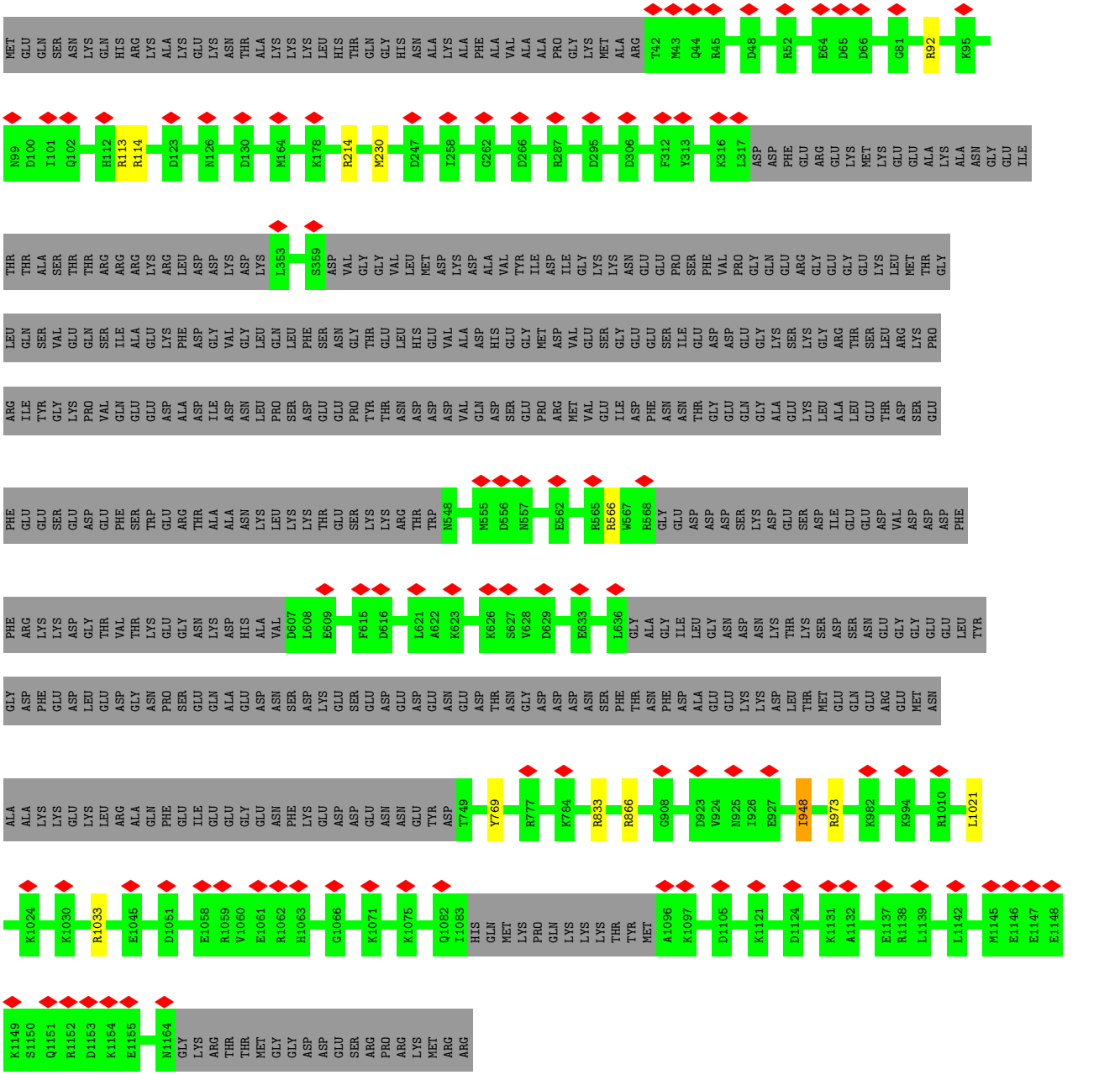






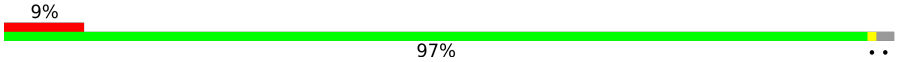
• Molecule 54: Ribosome biogenesis protein BMS1

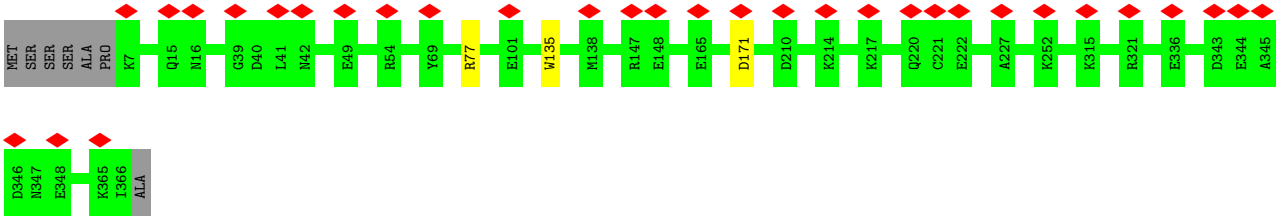
Chain RJ:



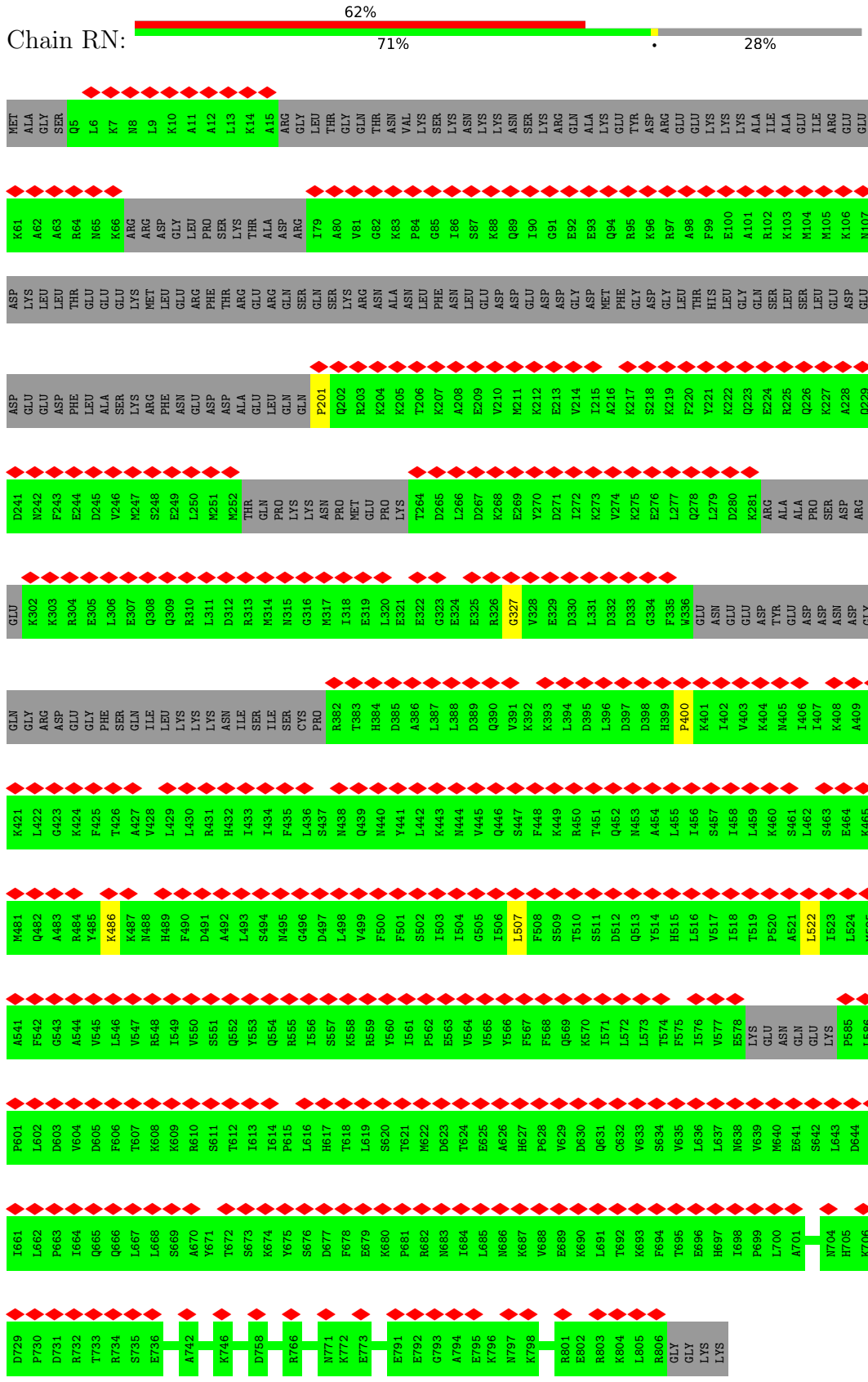
• Molecule 55: RNA 3'-terminal phosphate cyclase-like protein

Chain RK:



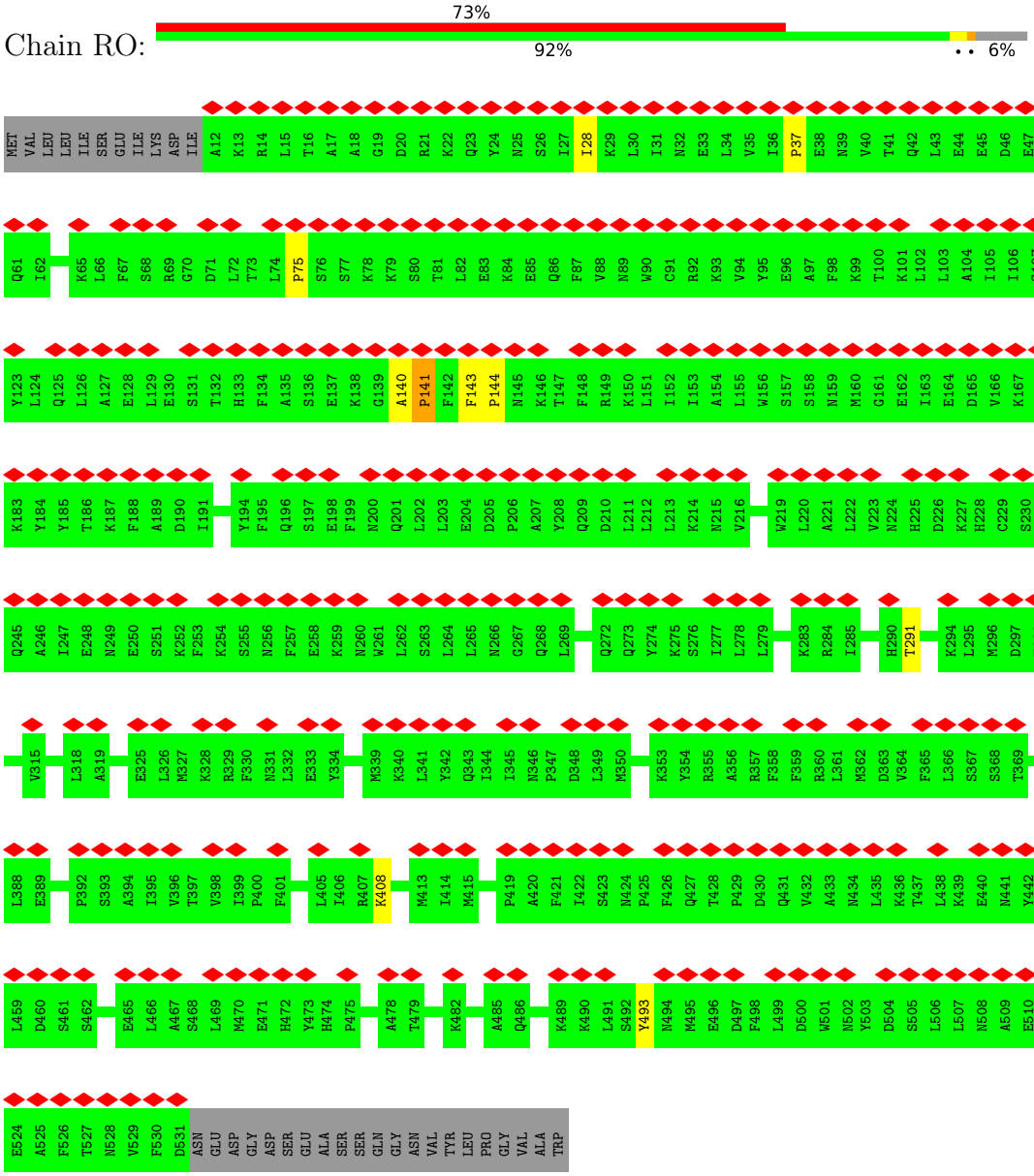


• Molecule 56: Nucleolar complex protein 14



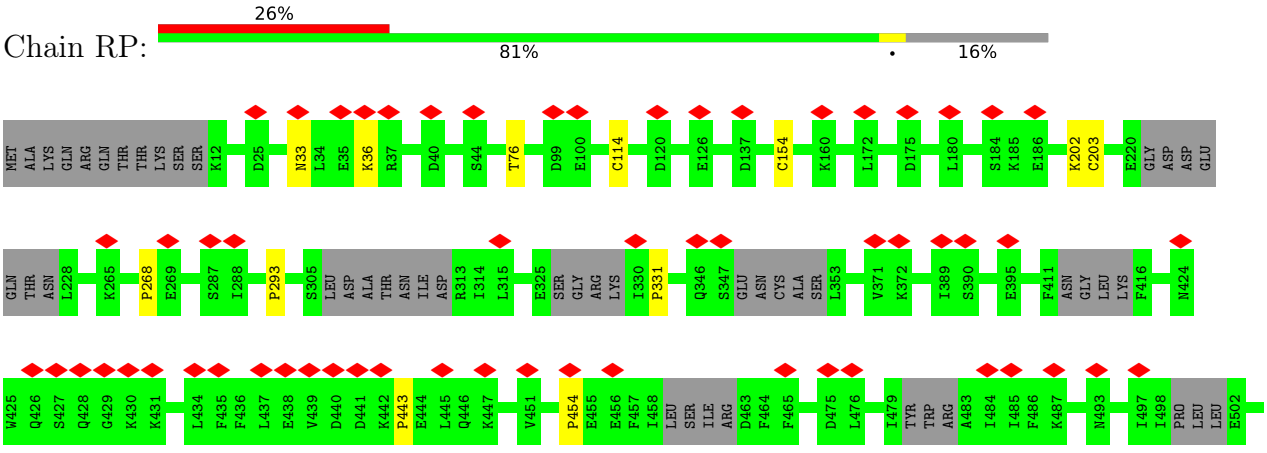
• Molecule 57: Nucleolar complex protein 4

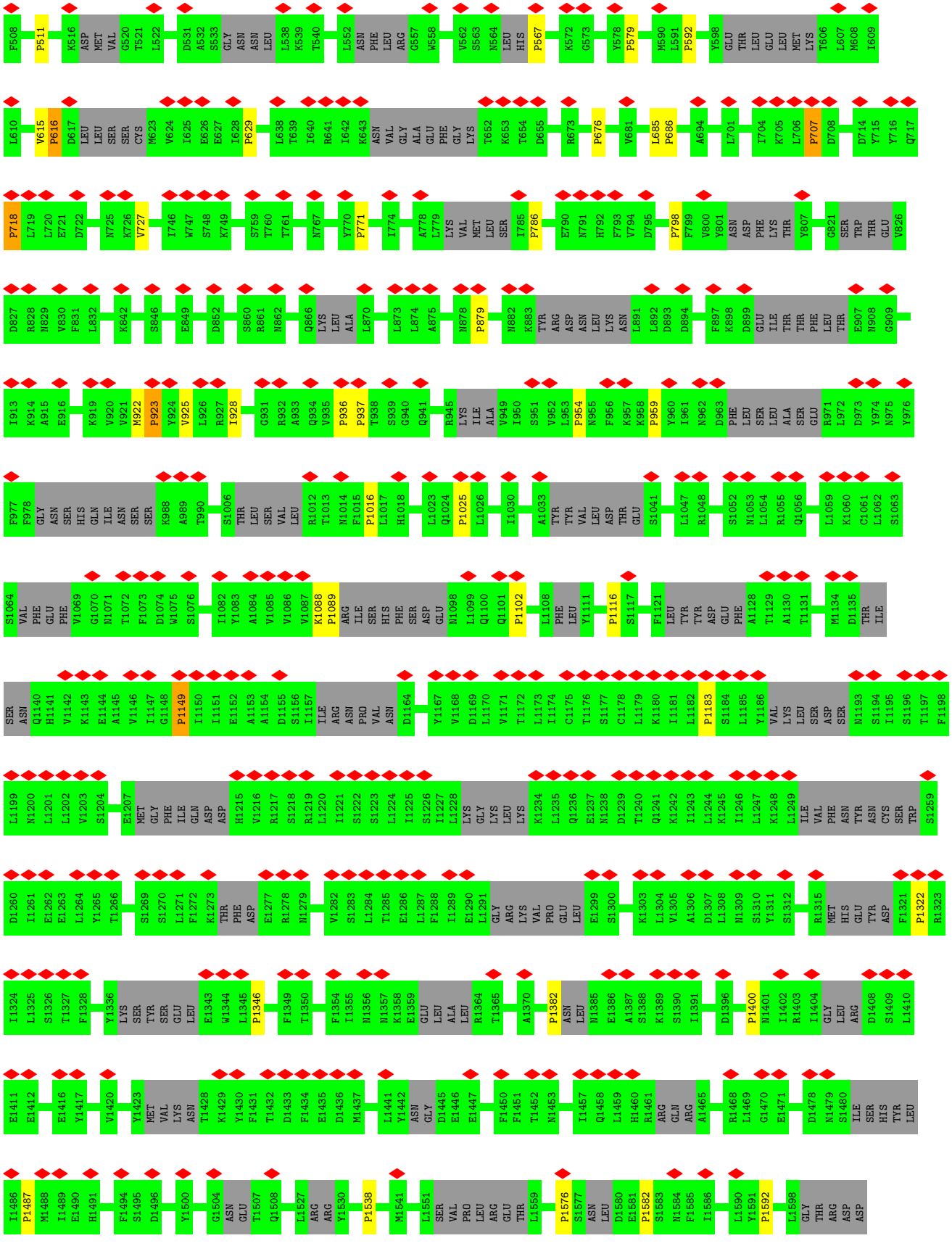
Chain RO:



• Molecule 58: U3 small nucleolar RNA-associated protein 20

Chain RP:

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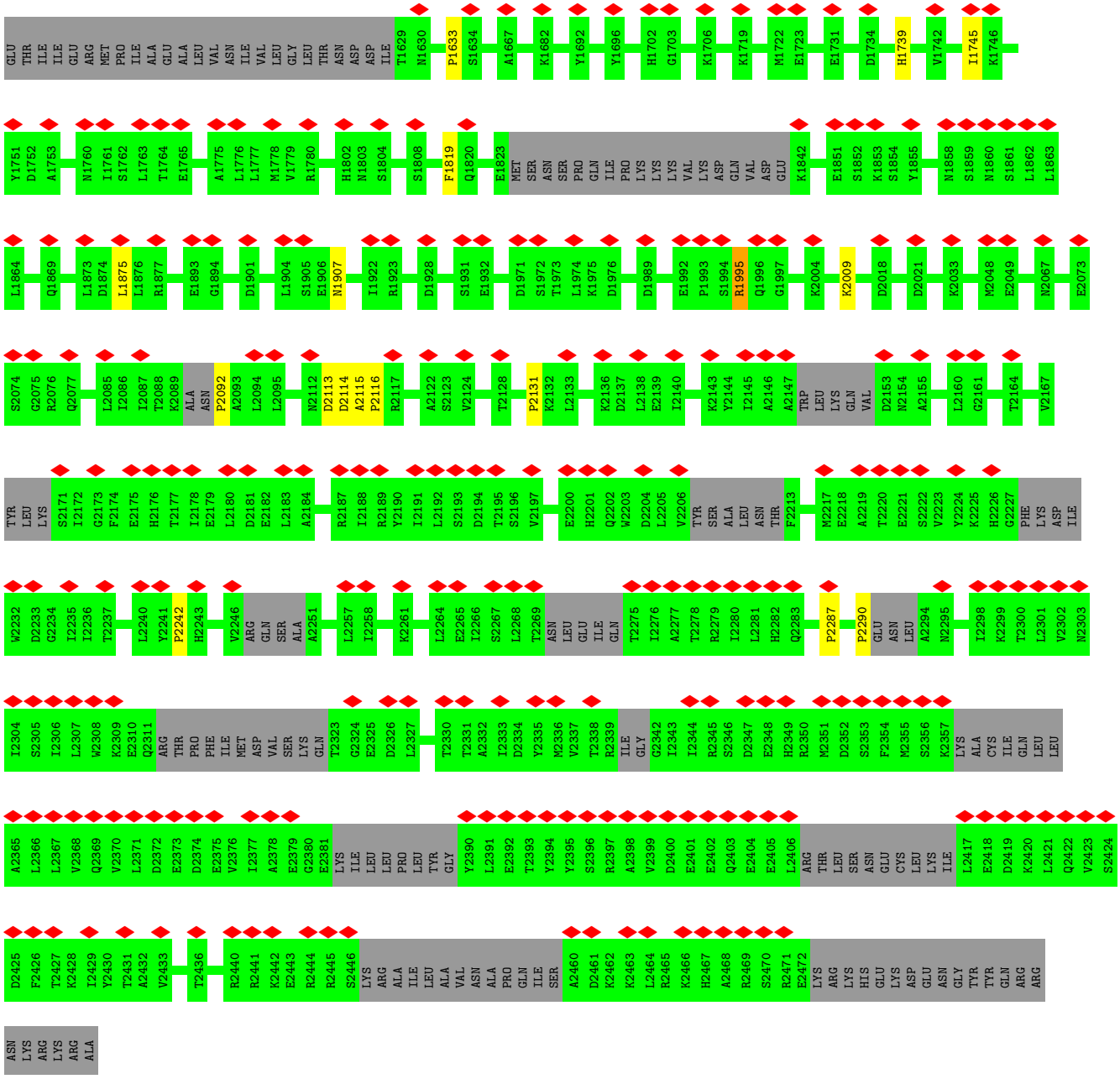
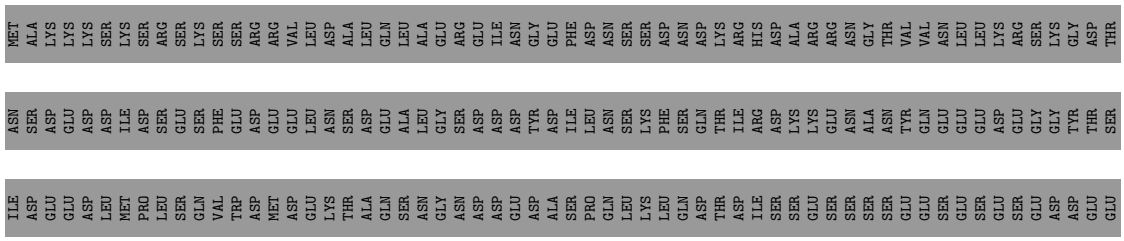
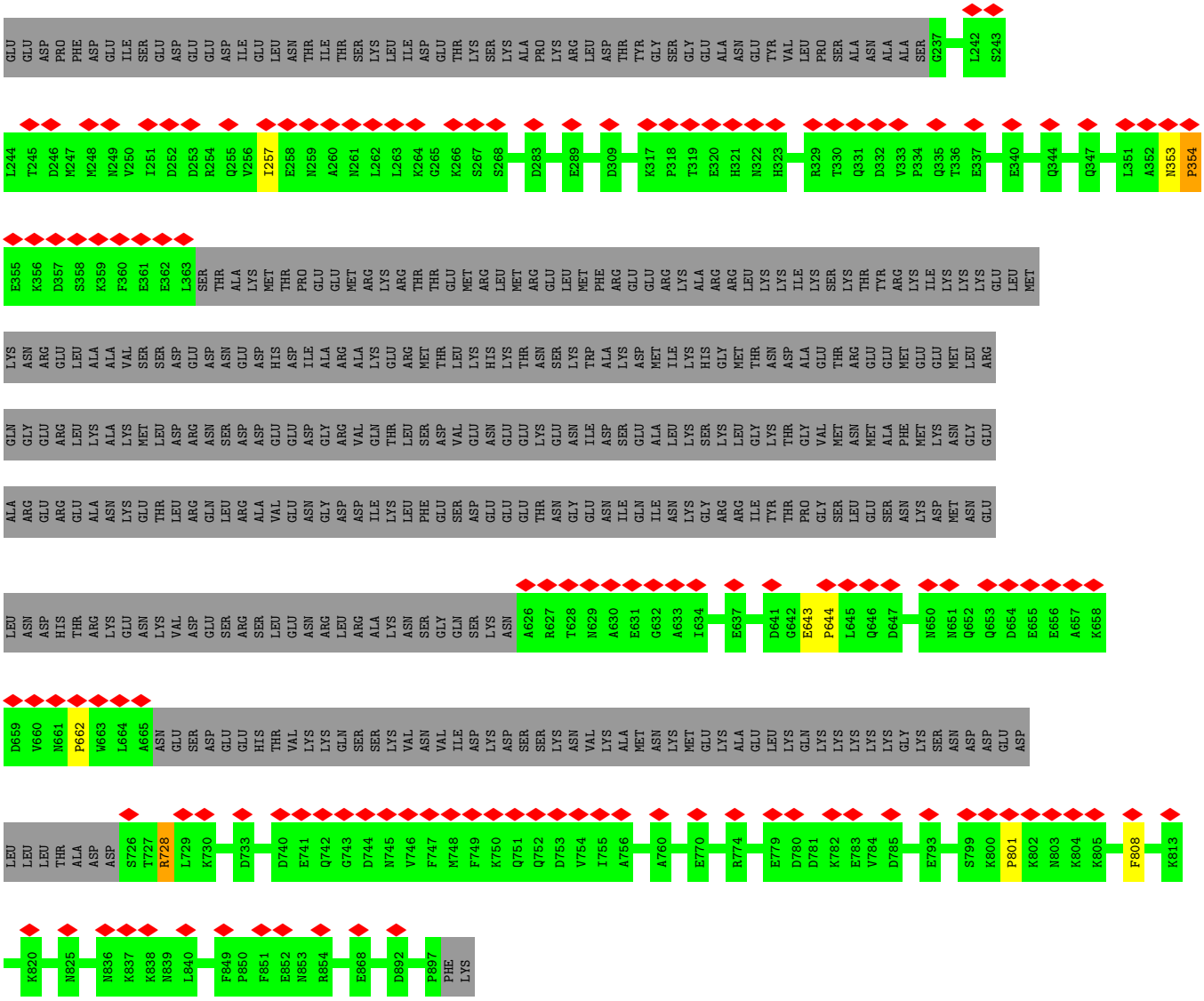
L610 V615 P616 D617 LEU LEU LEU SER SER CYS M623 V624 I625 E626 E627 I628 P629 L638 T639 I640 R641 I642 K643 ASN VAL GLY ALA GLU PHE GLY LYS T652 K653 T654 D655 R673 P676 V681 L685 P686 A694 L701 I704 K705 L706 P707 D708 D714 Y715 Y716 Q717
P718 L719 L720 E721 D722 N725 K726 V727 I746 W747 S748 K749 S759 T760 T761 N767 Y770 P771 I774 A778 L779 LYS VAL MET LEU SER I785 P786 E790 N791 H792 F793 V794 D795 P798 F799 V800 Y801 ASN ASP PHE LYS THR Y807 G821 SER TRP THR GLU V826
D827 R828 N829 V830 F831 L832 K842 S846 E849 D852 S860 R861 N862 Q866 LYS LEU ALA L870 L873 L874 A875 N878 P879 N882 K883 TYR ARG ASP ASN LEU LYS ASN L891 L892 D893 D894 F897 K898 D899 GLU ILE THR THR PHE LEU THR E907 N908 G909
I913 K914 A915 E916 K919 V920 V921 M922 P923 Y924 V925 L926 R927 I928 G931 R932 A933 Q934 V935 P936 P937 T938 S939 G940 Q941 R945 LYS ILE ALA V949 I950 S951 V952 L953 P954 N955 F956 K957 K958 P959 Y960 I961 N962 D963 PHE LEU SER LEU ALA SER GLU R971 L972 D973 Y974 N975 Y976
F977 F978 GLY ASN SER HIS GLN ILE ASN SER SER K988 A989 T990 S1006 THR LEU SER VAL LEU R1012 T1013 N1014 F1015 P1016 L1017 H1018 L1023 Q1024 P1025 L1026 I1030 A1033 TYR TYR VAL LEU ASP THR GLU S1041 L1047 R1048 S1052 N1053 L1054 R1055 Q1056 L1059 K1060 C1061 L1062 S1063
S1064 VAL PHE GLU PHE V1069 G1070 N1071 T1072 F1073 D1074 W1075 S1076 I1082 Y1083 A1084 V1085 V1086 V1087 K1088 P1089 ARG ILE SER HIS PHE SER ASP GLU N1098 L1099 Q1100 Q1101 P1102 L1108 PHE LEU Y1111 P1116 S1117 F1121 LEU TYR TYR ASP GLU PHE A1128 T1129 A1130 T1131 M1134 D1135 THR ILE
SER ASN Q1140 H1141 V1142 K1143 E1144 A1145 V1146 I1147 G1148 P1149 I1150 I1151 E1152 A1153 A1154 D1155 S1156 I1157 ILE ARG ASN PRO VAL ASN D1164 Y1167 V1168 D1169 L1170 V1171 T1172 L1173 I1174 C1175 T1176 S1177 C1178 L1179 K1180 I1181 L1182 P1183 S1184 L1185 Y1186 VAL LYS LEU SER ASP SER N1193 S1194 I1195 S1196 T1197 F1198
L1199 N1200 L1201 L1202 V1203 S1204 E1207 MET GLY PHE ILE GLN ASP ASP H1215 V1216 R1217 S1218 R1219 L1220 I1221 S1222 S1223 L1224 I1225 S1226 I1227 L1228 LYS GLY LYS LEU LYS K1234 L1235 Q1236 E1237 N1238 D1239 T1240 Q1241 K1242 I1243 L1244 K1245 I1246 L1247 K1248 L1249 ILE VAL PHE ASN TYR ASN CYS SER TRP S1259
D1260 I1261 E1262 E1263 L1264 Y1265 T1266 S1269 S1270 L1271 F1272 K1273 THR PHE ASP E1277 R1278 N1279 V1282 S1283 L1284 T1285 E1286 L1287 F1288 I1289 E1290 L1291 GLY ARG LYS VAL PRO GLU LEU E1299 S1300 K1303 L1304 V1305 A1306 D1307 L1308 N1309 S1310 Y1311 S1312 R1315 MET HIS GLU TYR ASP F1321 P1322 R1323
I1324 L1325 S1326 T1327 F1328 Y1336 LYS SER TYR SER GLU LEU E1343 W1344 L1345 P1346 F1349 T1350 F1354 I1355 N1356 N1357 K1358 E1359 GLU LEU ALA LEU R1364 T1365 A1370 P1382 ASN LEU N1385 E1386 A1387 S1388 K1389 S1390 I1391 D1396 P1400 N1401 I1402 R1403 I1404 GLY LEU ARG D1408 S1409 L1410
E1411 E1412 E1416 Y1417 V1420 Y1423 MET VAL LYS ASN T1428 K1429 Y1430 F1431 T1432 D1433 F1434 E1435 D1436 M1437 L1441 Y1442 ASN GLY D1445 E1446 E1447 F1450 F1451 T1452 N1453 I1457 Q1458 L1459 H1460 R1461 ARG GLN ARG A1465 R1468 L1469 G1470 E1471 D1478 N1479 S1480 ILE SER HIS TYR LEU
I1486 P1487 M1488 I1489 E1490 H1491 F1494 S1495 D1496 Y1500 G1504 ASN GLU T1507 Q1508 L1527 ARG ARG Y1530 P1538 M1541 L1551 SER VAL PRO LEU ARG GLU THR L1559 P1576 S1577 ASN LEU D1580 E1581 P1582 S1583 N1584 F1585 I1586 L1590 Y1591 P1592 L1598 GLY THR ARG ASP ASP



• Molecule 59: U3 small nucleolar RNA-associated protein 14

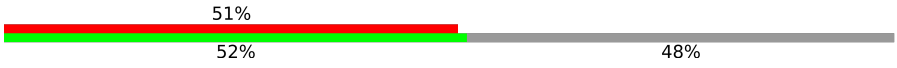
Chain RQ:

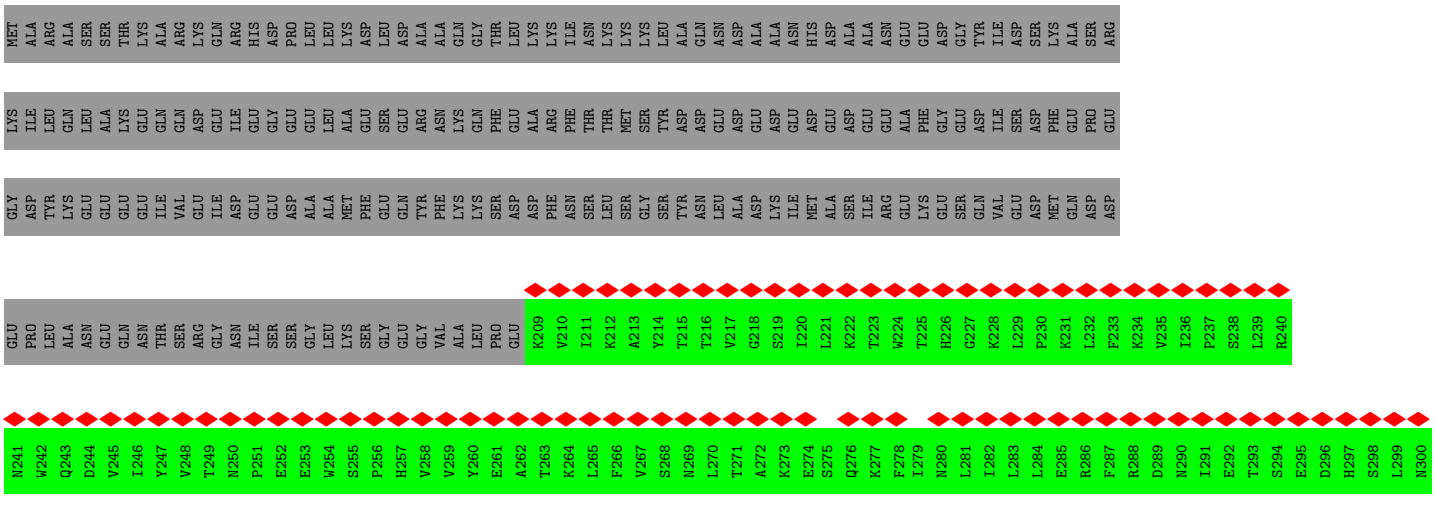


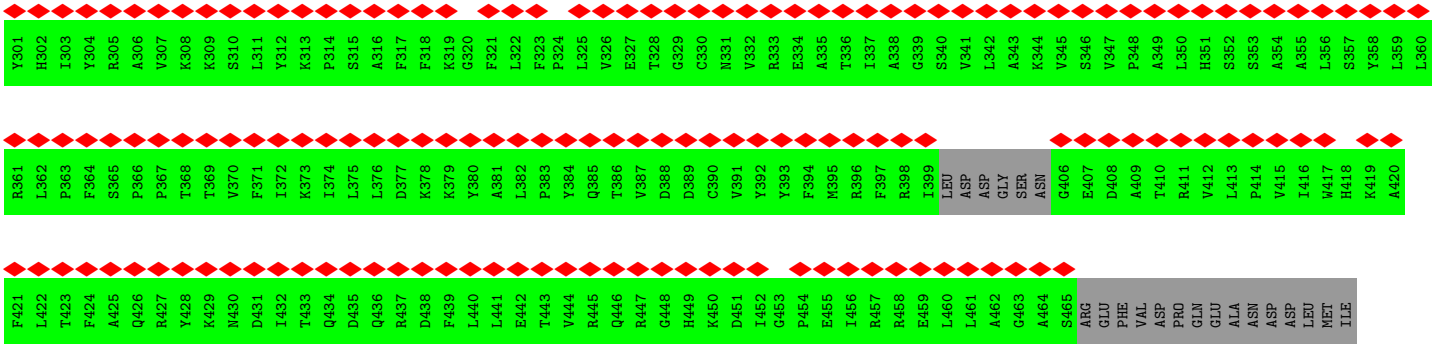


• Molecule 60: Essential nuclear protein 1

Chain RS:

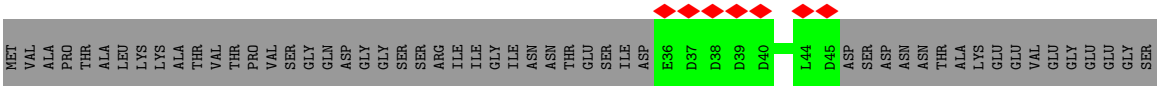


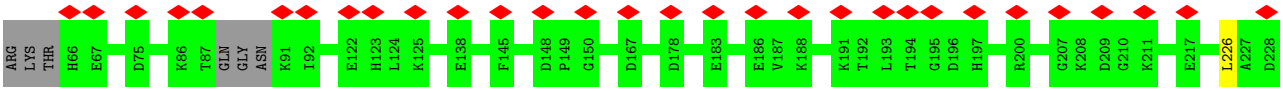


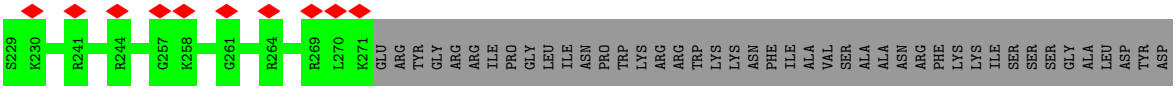


• Molecule 61: Pno1

Chain RT:

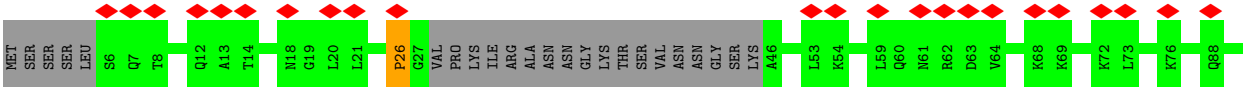


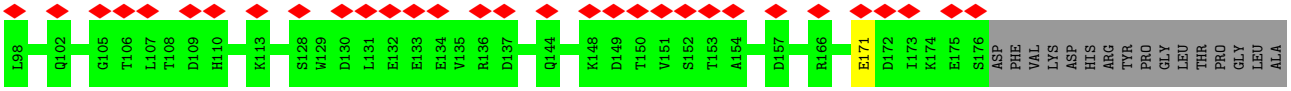




• Molecule 62: Regulator of rDNA transcription protein 14

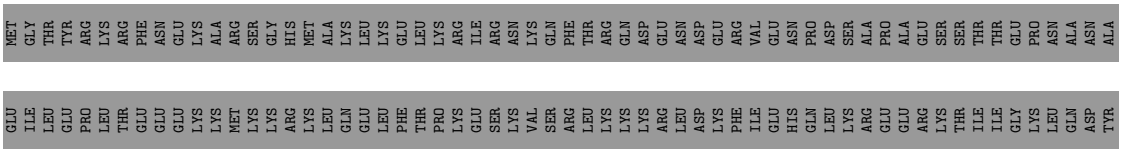
Chain RW:

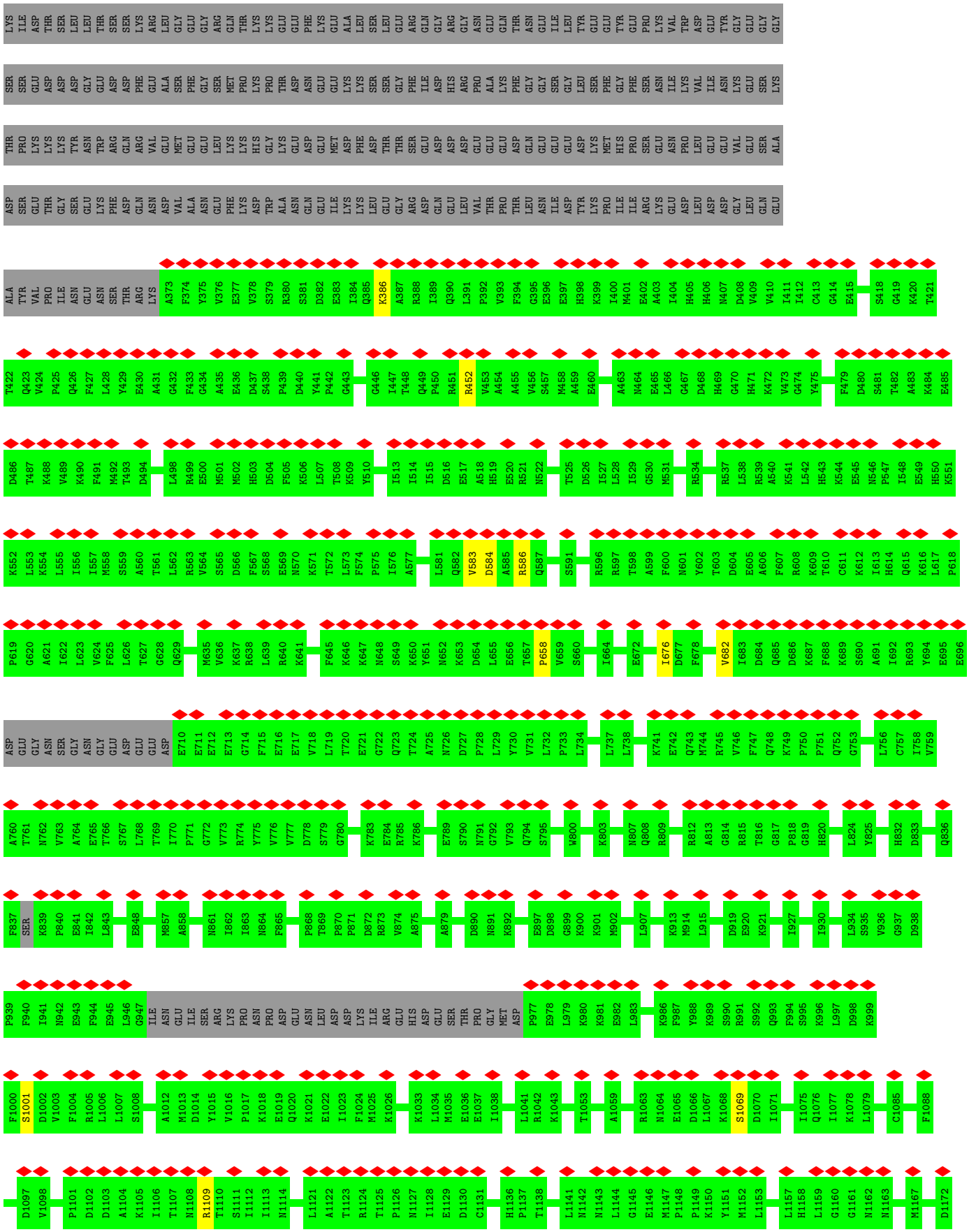


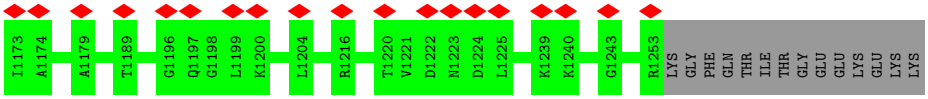


• Molecule 63: Probable ATP-dependent RNA helicase DHR1

Chain RZ:

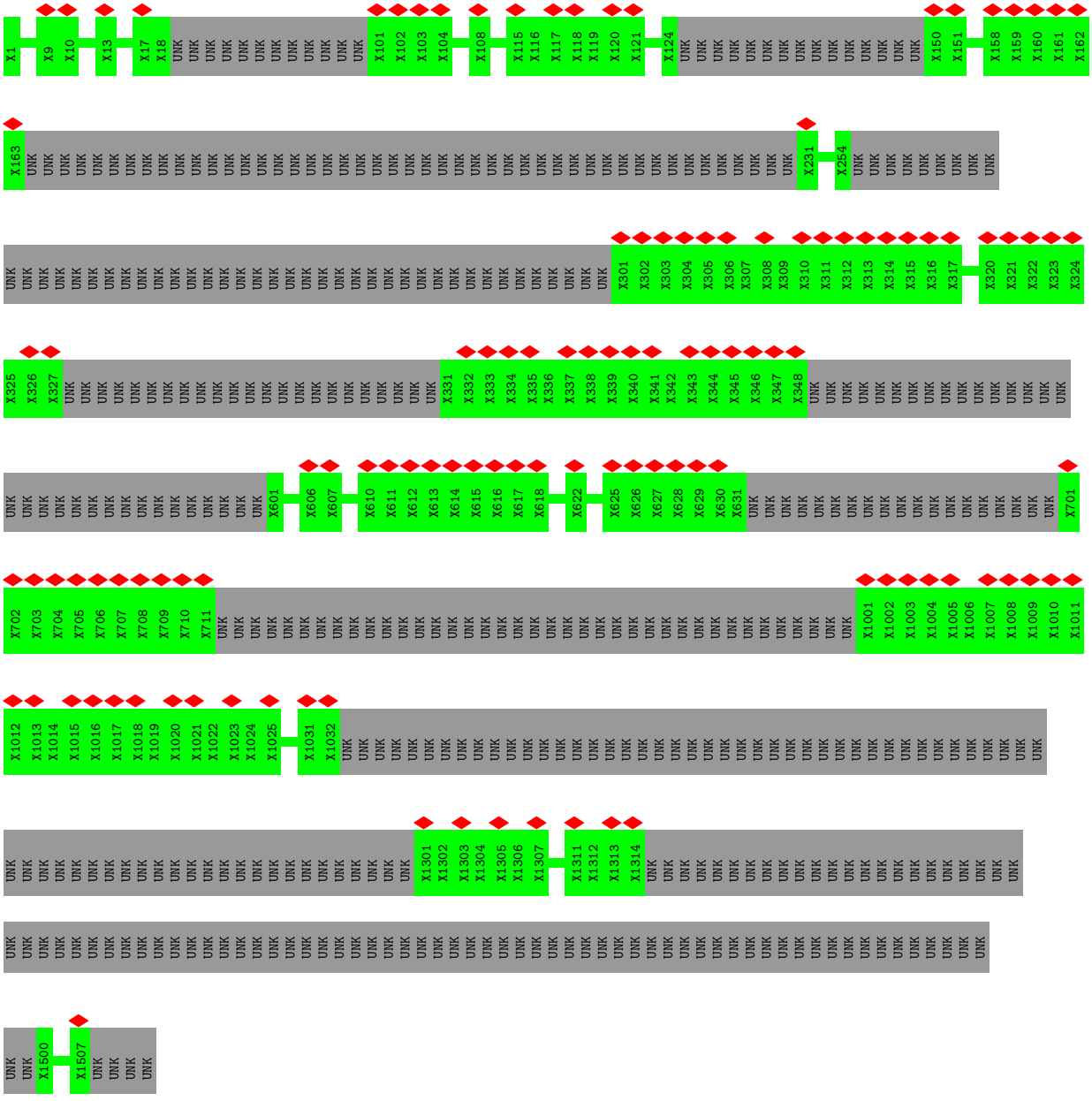






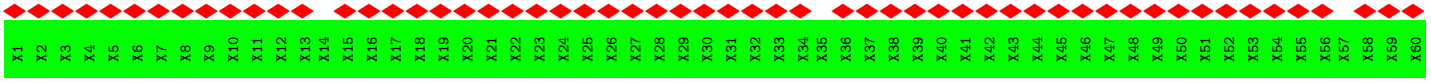
• Molecule 64: Unassigned peptides 1

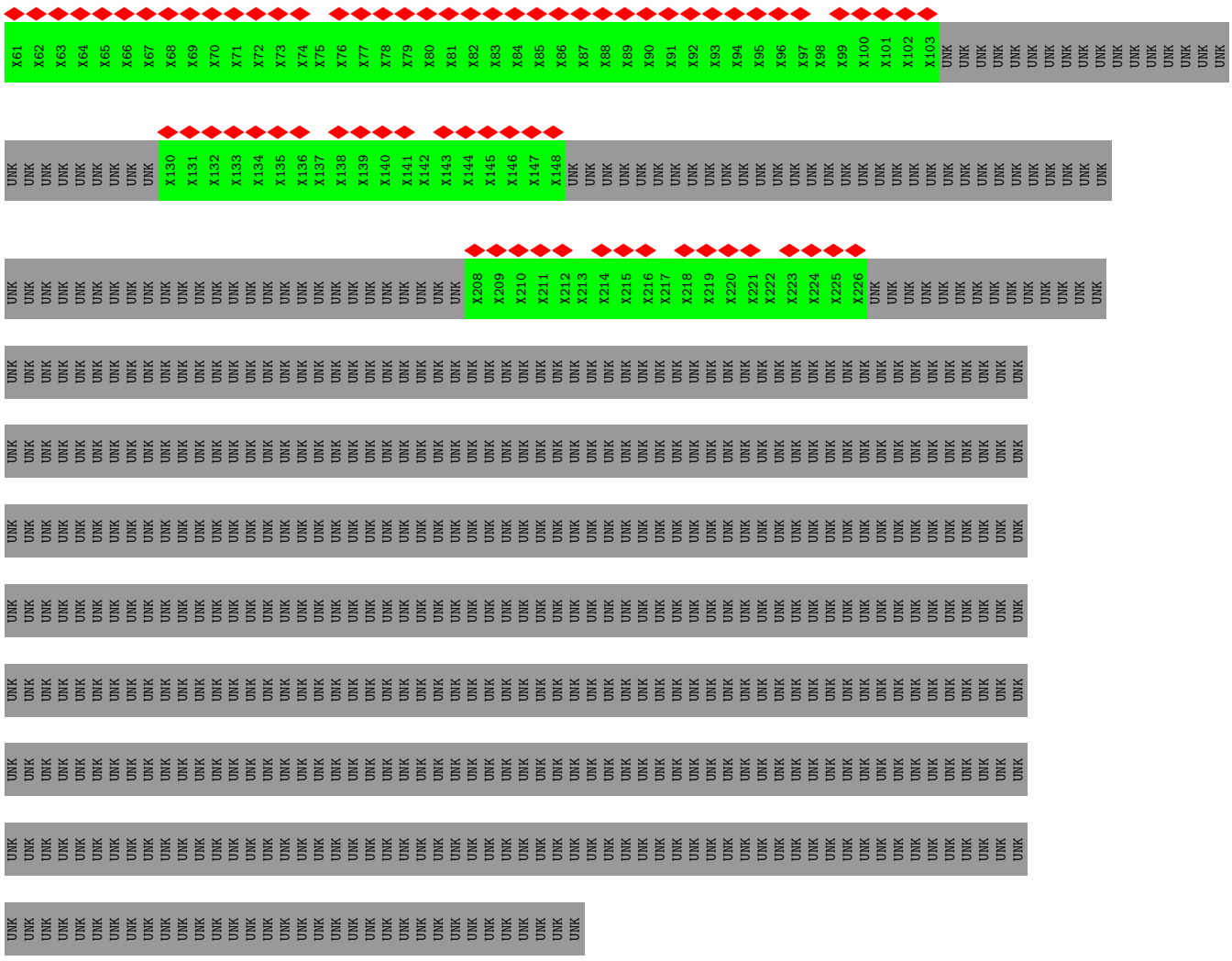
Chain X1:



• Molecule 65: Unassigned peptides 2

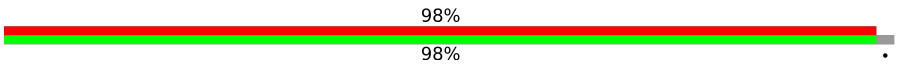
Chain X2:

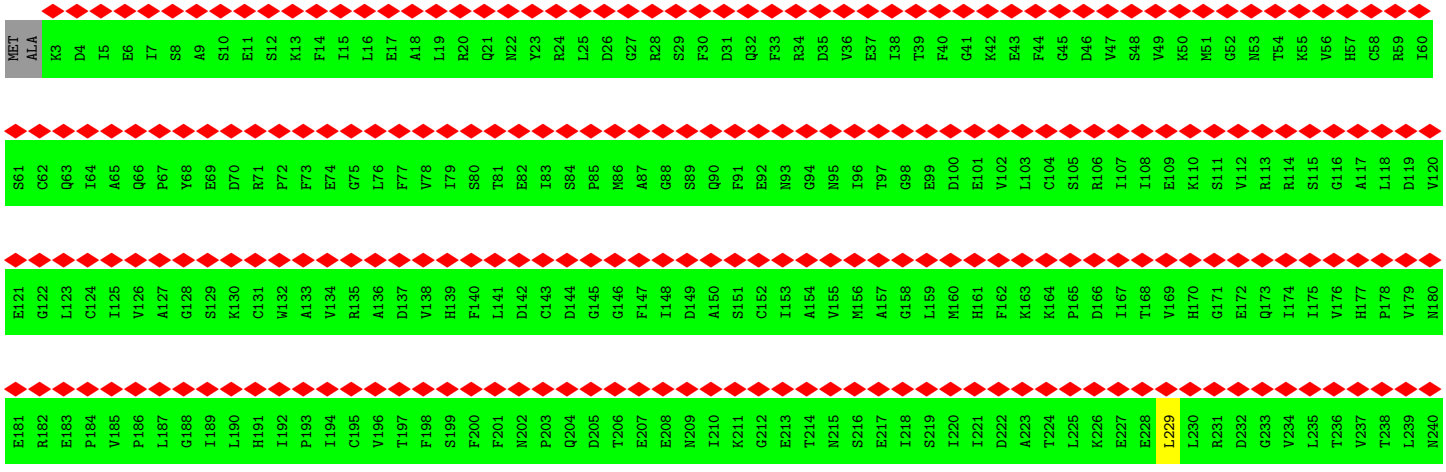




• Molecule 66: Exosome complex component RRP45

Chain R5:





K241 N242 R243 E244 V245 V246 Q247 V248 S249 K250 A251 G252 G253 L254 P255 M256 D257 A258 L259 T260 L261 M262 K263 C264 C265 H266 E267 A268 Y269 S270 I271 I272 E273 K274 I275 T276 D277 Q278 I279 L280 Q281 L282 L283 K284 E285 D286 S287 E288 K289 R290 N291 K292 Y293 A294 A295 M296 L297 T298 S299 E300

N301 ALA ARG GLU ILE

• Molecule 67: Exosome complex component SKI6

Chain R1: 99% 98%

M1 S2 R3 L4 E5 I6 Y7 S8 P9 E10 G11 L12 R13 L14 D15 G16 R17 R18 W19 N20 E21 L22 R23 R24 F25 E26 S27 S28 I29 N30 T31 H32 P33 H34 A35 A36 D37 G38 S39 S40 Y41 M42 E43 Q44 G45 N46 M47 K48 I49 I50 T51 L52 V53 K54 G55 P56 K57 E58 P59 R60

L61 K62 S63 Q64 M65 D66 T67 S68 K69 A70 L71 L72 N73 V74 S75 V76 N77 I78 T79 K80 F81 S82 K83 F84 E85 R86 S87 K88 S89 S90 H91 K92 N93 E94 R95 R96 V97 L98 E99 I100 Q101 T102 S103 L104 V105 R106 M107 F108 E109 K110 N111 V112 M113 L114 N115 I116 Y117 P118 R119 T120

V121 I122 D123 I124 E125 I126 H127 V128 L129 E130 Q131 D132 G133 G134 I135 M136 G137 S138 L139 I140 N141 G142 I143 T144 L145 A146 L147 I148 D149 A150 G151 I152 S153 M154 F155 D156 Y157 I158 S159 G160 I161 S162 V163 G164 L165 Y166 D167 T168 T169 P170 L171 L172 D173 T174 N175 S176 L177 E178 E179 N180

A181 M182 S183 T184 V185 T186 L187 G188 V189 V190 G191 K192 S193 E194 K195 L196 S197 L198 L199 L200 V201 E202 D203 K204 I205 P206 L207 D208 R209 L210 E211 N212 V213 L214 A215 I216 G217 I218 A219 G220 A221 H222 R223 V224 R225 D226 L227 M228 D229 E230 E231 L232 R233 K234 H235 A236 Q237 K238 R239 V240

S241 N242 A243 S244 ALA ARG

• Molecule 68: Exosome complex component RRP43

Chain R3: 86% 84% 14%

MET ALA GLU SER THR THR LEU E8 T9 I10 E11 I12 H13 P14 I15 T16 F17 P18 P19 E20 V21 L22 A23 R24 I25 S26 P27 E28 L29 S30 L31 Q32 R33 H34 L35 S36 L37 G38 I39 R40 P41 C42 L43 R44 K45 Y46 E47 E48 F49 R50 D51 V52 A53 I54 E55 N56 N57 T58 L59 S60

R61 Y62 A63 D64 A65 G66 N67 I68 D69 T70 K71 N72 N73 I74 L75 G76 S77 N78 V79 L80 K81 S82 G83 K84 T85 I86 V87 I88 T89 S90 I91 T92 G93 G94 I95 I96 E97 E98 T99 SER ALA ALA ILE LYS ASP LEU ASP ASP PHE GLY GLU GLU GLU LEU PHE GLU VAL THR LYS GLU

E121 D122 I123 I124 A125 N126 Y127 A128 S129 V130 Y131 P132 V133 V134 E135 V136 E137 R138 G139 R140 V141 G142 A143 C144 T145 D146 E147 E148 M149 T150 I151 S152 Q153 K154 L155 H156 D157 S158 I159 L160 H161 S162 R163 I164 L165 P166 K167 K168 A169 L170 K171 V172 K173 A174 G175 V176 R177 S178 A179 N180

E181 D182 G183 T184 F185 S186 V187 L188 Y189 P190 D191 E192 L193 GLU ASP ASP THR LEU ASN GLU THR ASN LEU LYS MET K206 R207 K208 W209 S210 Y211 V212 L213 Y214 A215 K216 I217 V218 V219 L220 S221 R222 T223 G224 P225 V226 F227 D228 L229 C230 W231 N232 S233 L234 M235 Y236 A237 L238 Q239 S240

V241 K242 L243 P244 R245 A246 F247 I248 D249 E250 R251 A252 S253 D254 L255 R256 M257 T258 I259 R260 T261 R262 G263 R264 S265 A266 T267 I268 R269 E270 T271 Y272 E273 I274 I275 C276 D277 Q278 T279 K280 S281 V282 P283 L284 M285 I286 N287 A288 K289 N290 I291 A292 F293 A294 S295 N296 Y297 G298 I299 V300

E301 L302 D303 P304 E305 C306 Q307 L308 Q309 N310 SER ASP ASN SER GLU GLU GLU GLU VAL ASP ILE ASP MET ASP LYS L326 N327 T328 V329 L330 I331 A332 D333 L334 D335 T336 E337 A338 E339 E340 T341 S342 I343 H344 S345 T346 I347 S348 I349 L350 A351 A352 P353 S354 G355 N356 Y357 K358 Q359 L360

T361 L362 V363 G364 G365 G366 A367 K368 I369 T370 P371 E372 M373 I374 K375 R376 S377 L378 L379 L380 S381 R382 V383 R384 A385 D386 D387 L388 S389 T390 R391 F392 N393 I394

• Molecule 69: Exosome complex component RRP46

Chain R6:

M1 S2 V3 Q4 A5 E6 I7 G8 I9 L10 D11 H12 V13 D14 G15 S16 S17 E18 F19 V20 S21 Q22 D23 T24 K25 V26 I27 C28 S29 V30 T31 G32 P33 I34 E35 P36 K37 A38 R39 Q40 E41 L42 P43 T44 Q45 L46 A47 L48 E49 I50 I51 V52 R53 P54 A55 K56 G57 V58 A59 T60

T61 R62 E63 K64 V65 L66 E67 D68 K69 L70 R71 A72 V73 L74 T75 P76 L77 I78 T79 R80 H81 C82 Y83 P84 R85 Q86 L87 C88 Q89 I90 T91 C92 Q93 I94 L95 E96 S97 G98 E99 D100 E101 A102 E103 F104 S105 L106 R107 E108 L109 S110 C111 C112 I113 N114 A115 A116 F117 L118 A119 L120

V121 D122 A123 G124 I125 A126 L127 N128 S129 M130 C131 A132 S133 I134 P135 I136 A137 I138 I139 K140 D141 T142 S143 D144 I145 I146 V147 D148 P149 T150 A151 E152 Q153 L154 K155 I156 S157 L158 S159 V160 H161 T162 L163 A164 L165 E166 F167 V168 N169 G170 G171 K172 V173 V174 K175 N176 V177 L178 L179 L180

D181 S182 N183 G184 D185 F186 N187 E188 D189 Q190 L191 F192 S193 L194 L195 E196 L197 G198 E199 Q200 K201 C202 Q203 E204 L205 V206 T207 N208 I209 R210 R211 I212 I213 Q214 D215 N216 I217 S218 P219 R220 L221 V222 V223

• Molecule 70: Exosome complex component RRP42

Chain R2:

M1 S2 L3 S4 V5 A6 E7 K8 S9 Y10 L11 Y12 D13 S14 L15 A16 S17 T18 P19 S20 I21 R22 P23 D24 G25 R26 L27 P28 H29 Q30 F31 R32 P33 I34 E35 I36 F37 T38 D39 F40 L41 P42 S43 S44 N45 G46 S47 S48 R49 I50 I51 A52 S53 D54 G55 S56 E57 C58 I59 V60

S61 I62 K63 S64 K65 V66 V67 D68 H69 H70 V71 E72 N73 E74 L75 L76 Q77 V78 D79 V80 D81 I82 A83 G84 Q85 R86 D87 D88 A89 L90 V91 E92 E93 T94 I95 T96 S97 L98 L99 N100 K101 V102 L103 K104 S105 G106 S107 G108 V109 D110 S111 S112 K113 L114 Q115 L116 T117 K118 K119 Y120

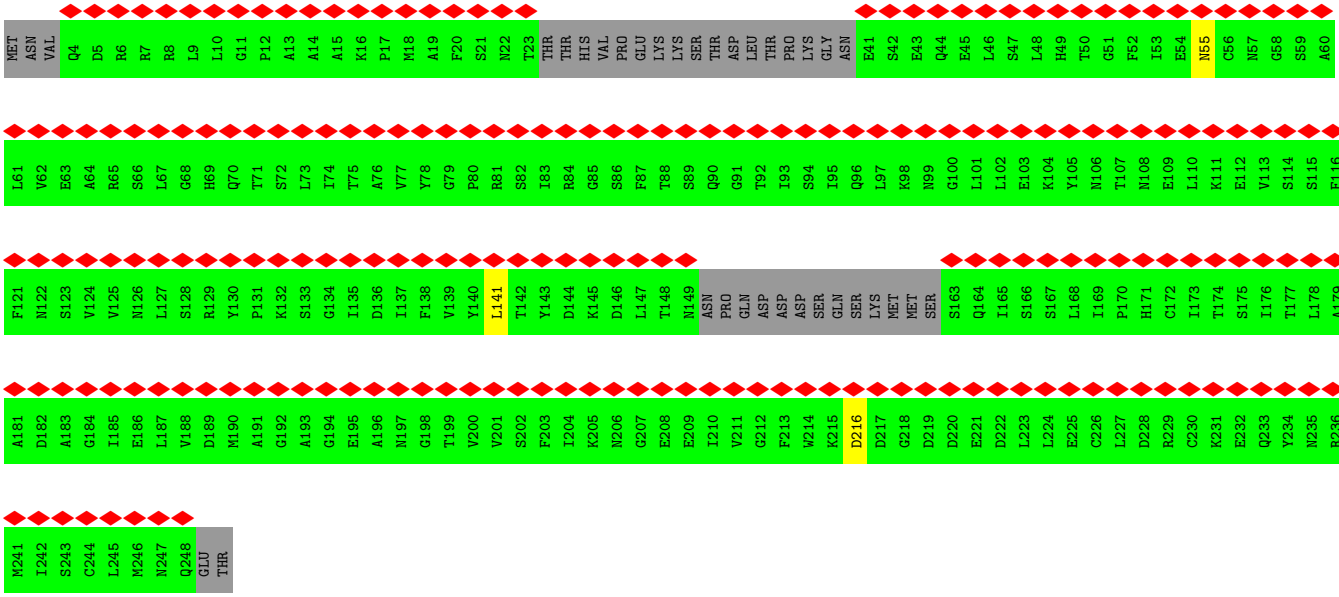
S121 F122 K123 I124 F125 V126 D127 V128 L129 V130 I131 S132 S133 H134 S135 H136 P137 V138 S139 L140 I141 S142 F143 A144 I145 Y146 S147 A148 L149 N150 S151 T152 Y153 L154 P155 K156 L157 I158 S159 A160 F161 D162 D163 L164 E165 V166 E167 E168 L169 P170 T171 F172 H173 D174 Y175 D176 M177 V178 K179 L180

D181 I182 N183 P184 P185 L186 V187 F188 I189 L190 A191 V192 V193 G194 N195 N196 M197 L198 L199 D200 P201 A202 A203 N204 E205 S206 E207 V208 A209 N210 N211 G212 L213 I214 I215 S216 W217 S218 N219 G220 K221 I222 T223 S224 P225 I226 R227 S228 V229 A230 L231 N232 D233 S234 N235 V236 K237 S238 F239 K240

P241 H242 L243 L244 K245 Q246 G247 L248 A249 M250 V251 E252 K253 Y254 A255 P256 D257 V258 V259 R260 S261 L262 E263 N264 L265

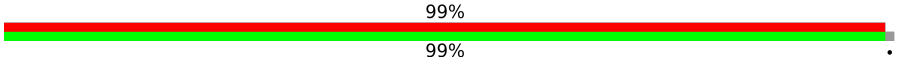
• Molecule 71: Exosome complex component MTR3

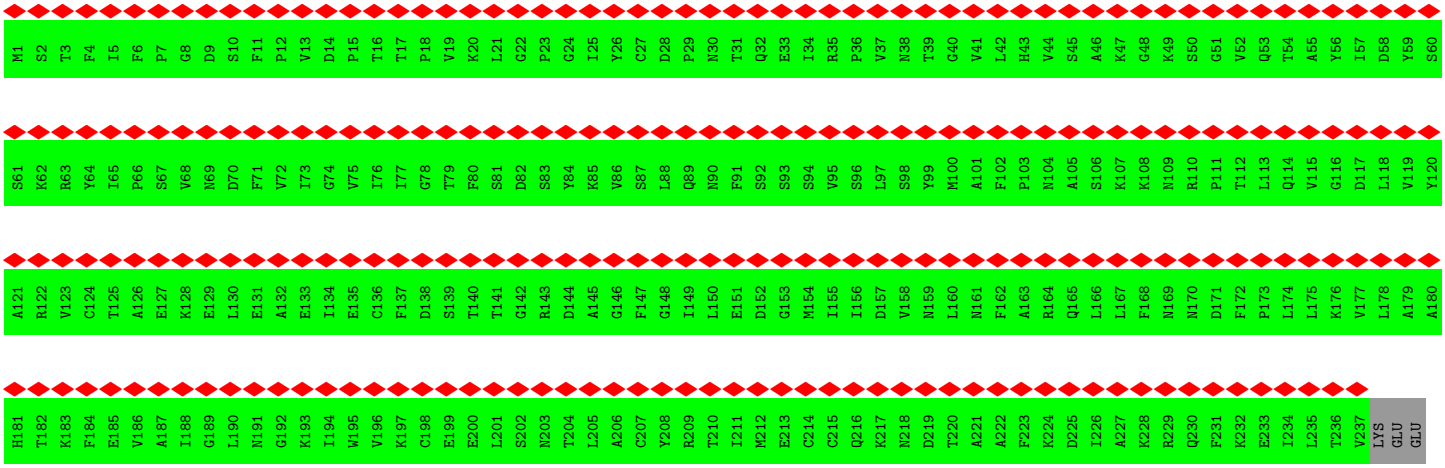
Chain M3:



• Molecule 72: Exosome complex component RRP40

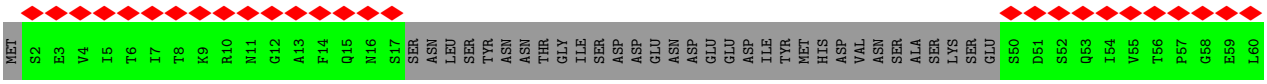
Chain R0:

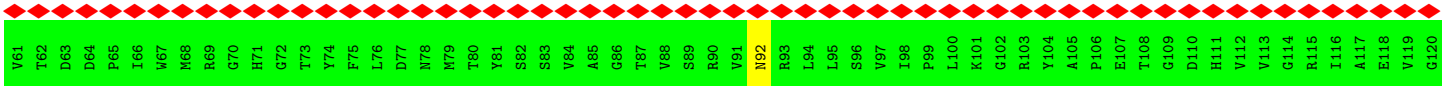


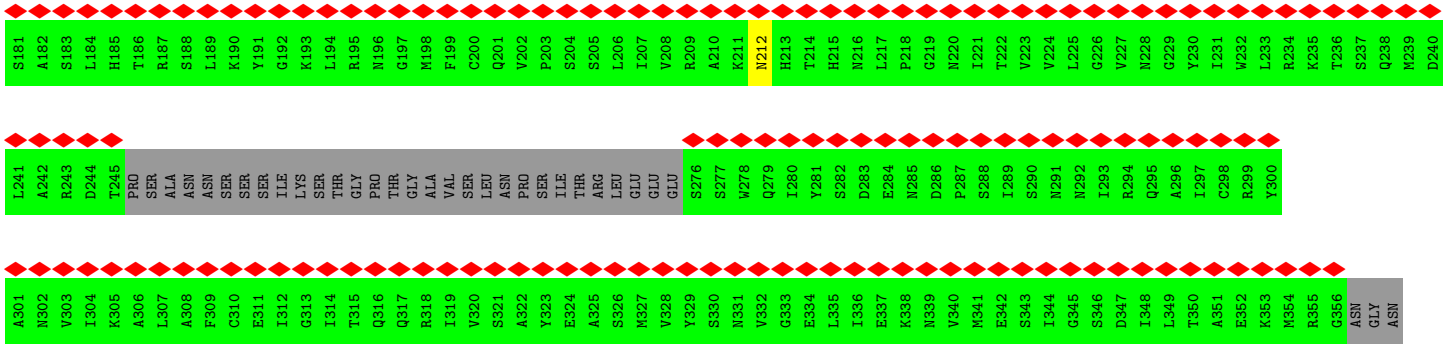


• Molecule 73: Exosome complex component RRP4

Chain r4:

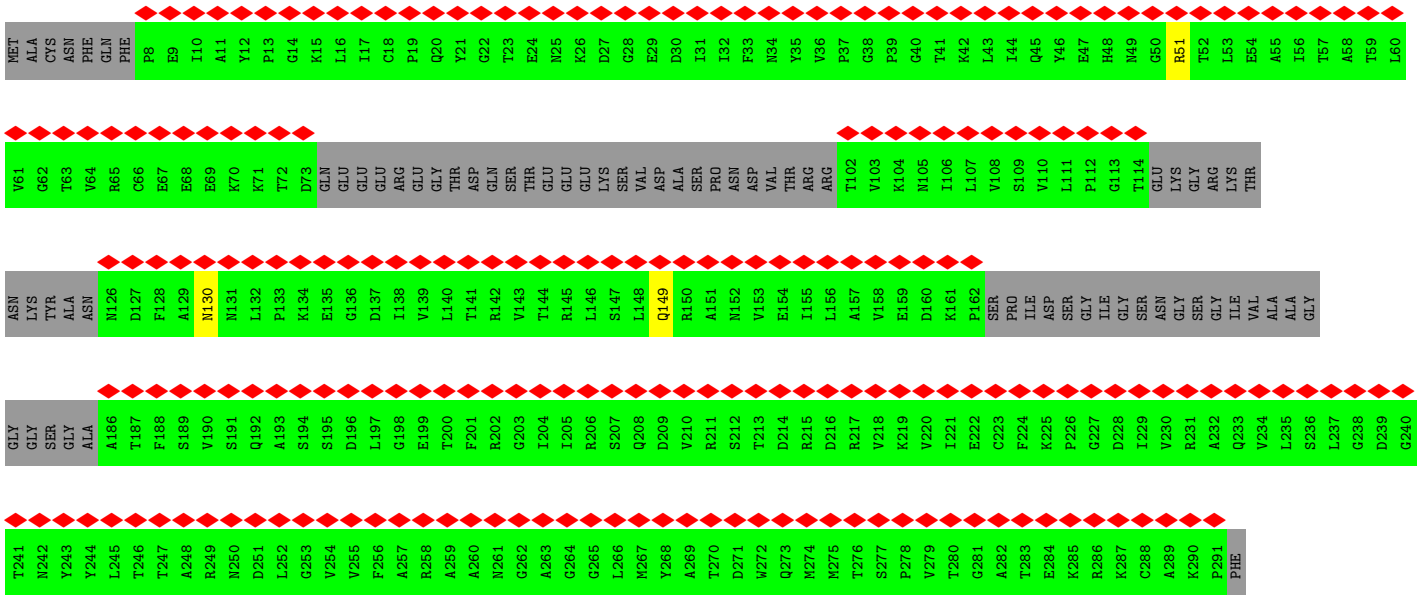






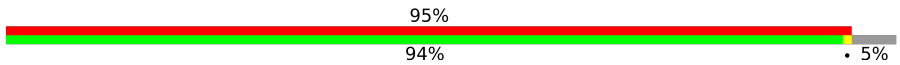
• Molecule 74: Exosome complex component CSL4

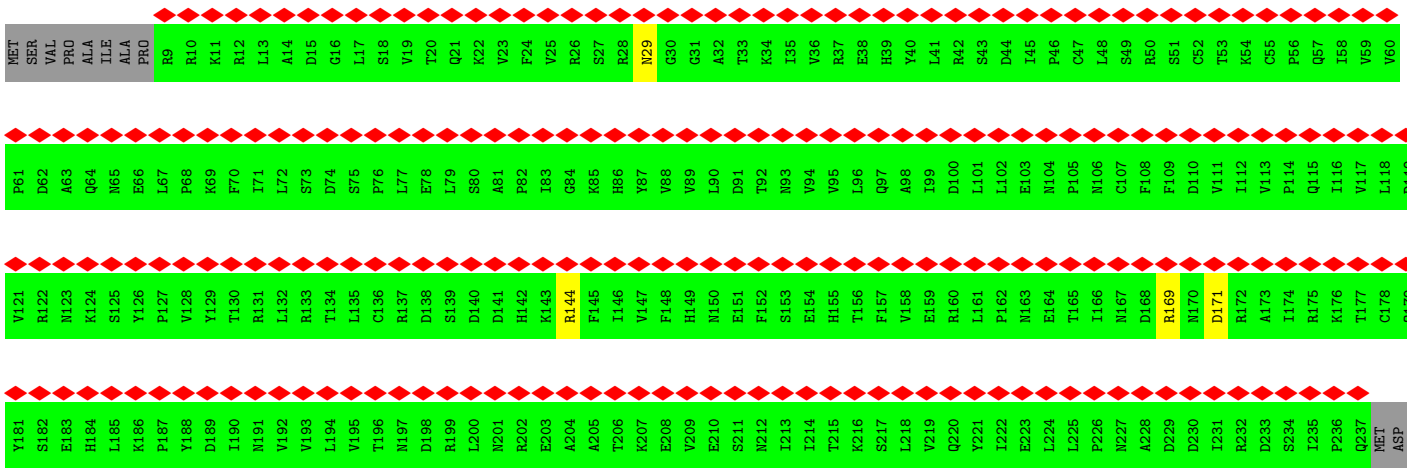
Chain C4:

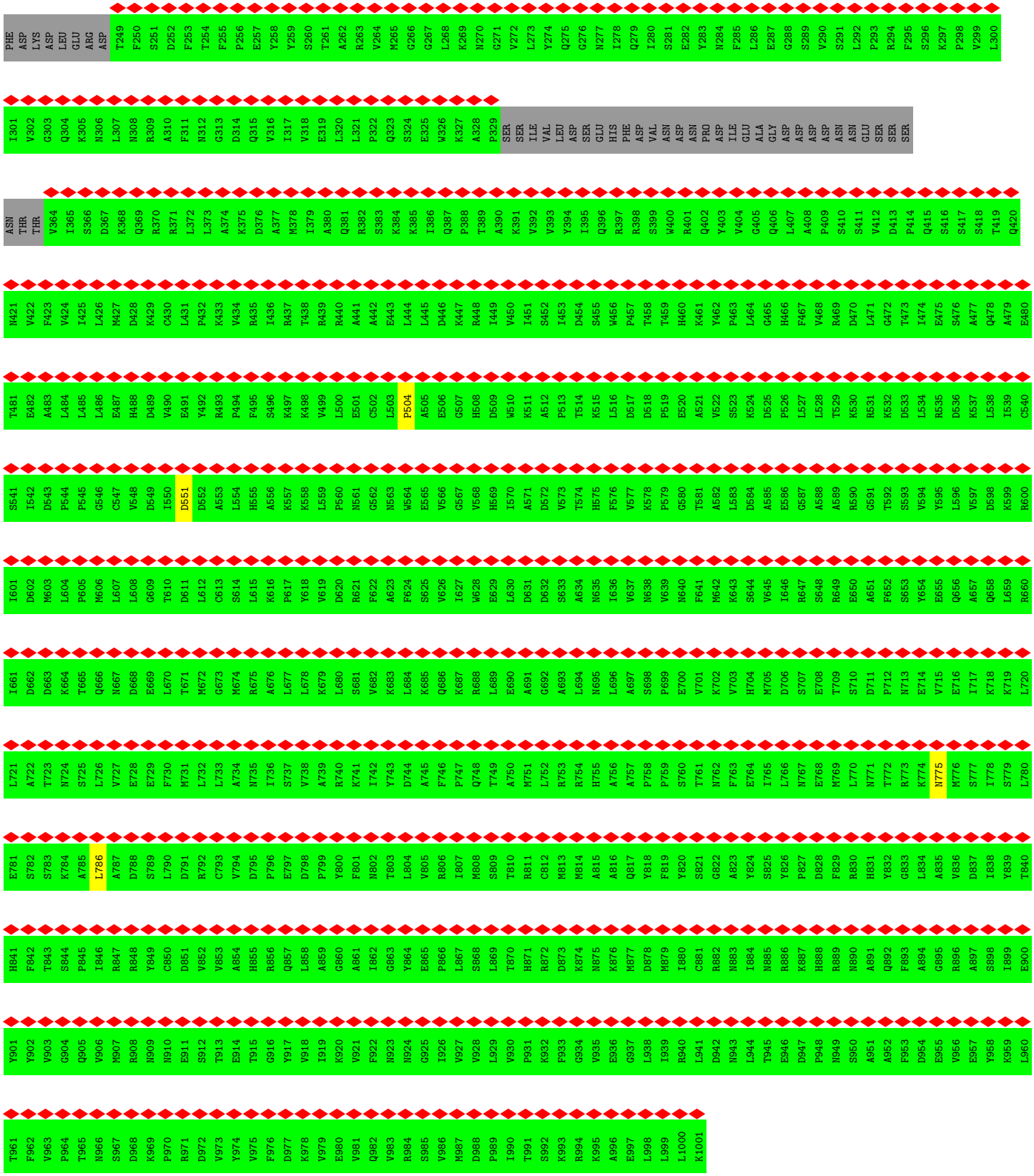


• Molecule 75: Exosome complex exonuclease DIS3

Chain R4:

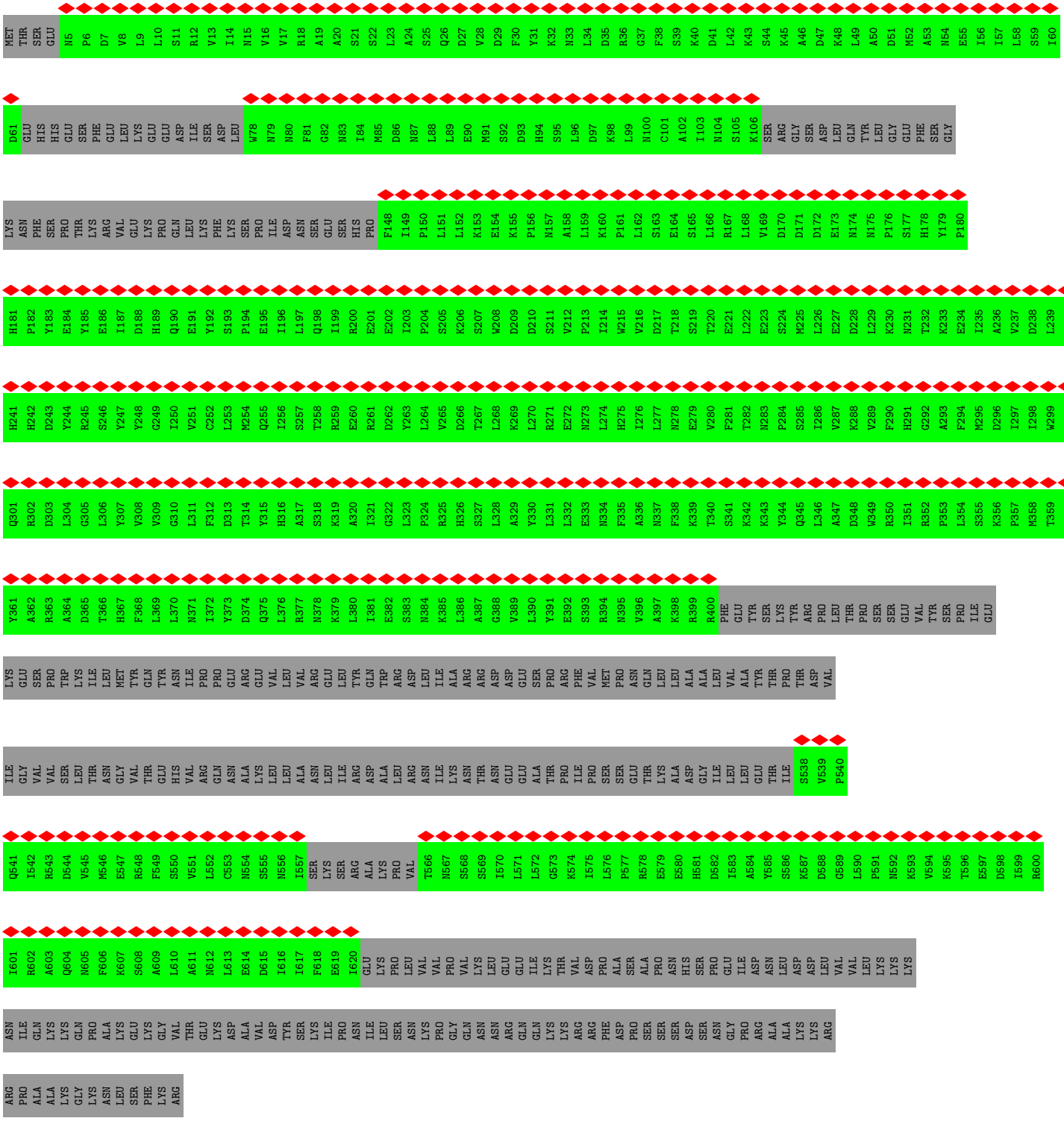






• Molecule 76: Exosome complex exonuclease RRP6

Chain r6:



• Molecule 77: Exosome complex protein LRP1

Chain R7:

MET GLU ASP ILE E5 K6 I7 K8 P9 Y10 V11 R12 S13 F14 S15 K16 A17 L18 D19 E20 L21 K22 P23 E24 I25 E26 K27 L28 T29 S30 K31 S32 L33 D34 E35 Q36 L37 L38 L39 L40 S41 D42 E43 R44 A45 K46 L47 E48 L49 I50 N51 R52 Y53 A54 Y55 V56 L57 S58 S59 L60

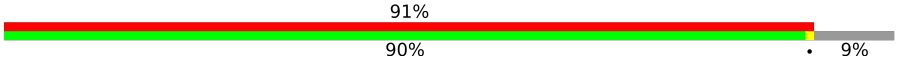
M61 F62 A63 N64 M65 K66 V67 L68 G69 V70 K71 D72 M73 S74 P75 I76 L77 G78 E79 L80 K81 R82 V83 K84 S85 Y86 M87 D88 K89 A90 K91 Q92 Y93 D94 N95 R96 I97 T98 K99 S100 N101 E102 K103 S104 Q105 A106 E107 Q108 E109 K110 A111 K112 N113 I114 I115 S116 N117 VAL LEU ASP

GLY ASN LYS ASN GLN PHE GLU PRO SER ILE SER ARG SER ASN PHE GLN GLY LYS HIS THR LYS PHE GLU ASN ASP GLU LEU ALA GLU SER THR THR THR LYS ILE ILE ASP SER THR ASP HIS ILE ARG LYS ALA SER SER LYS LYS SER LYS ARG LEU ASP LYS VAL GLY LYS LYS LYS

GLY GLY LYS LYS

• Molecule 78: ATP-dependent RNA helicase DOB1

Chain M4:



MET ASP SER T4 D5 L6 F7 D8 V9 F10 E11 E12 T13 P14 V15 E16 L17 PRO THR ASP SER ASN GLY GLU LYS ASN ALA ASP THR ASN VAL GLY ASP THR PRO ASP HIS THR GLN ASP LYS LYS HIS GLY LEU GLU GLU GLU LYS GLU GLU HIS GLU GLU ASN ASN SER GLU ASN LYS

LYS ILE LYS SER ASN LYS SER LYS THR GLU ASP LYS ASN LYS LYS VAL VAL VAL PRO V80 L81 A82 D83 S84 F85 E86 Q87 E88 A89 S90 R91 E92 V93 D94 A95 S96 K97 G98 L99 T100 N101 S102 E103 T104 L105 Q106 V107 E108 Q109 D110 G111 K112 V113 R114 L115 S116 H117 Q118 V119 R120

H121 Q122 V123 A124 L125 P126 P127 N128 Y129 D130 Y131 T132 P133 I134 A135 E136 H137 K138 R139 V140 N141 E142 A143 R144 T145 Y146 P147 F148 T149 L150 D151 P152 F153 Q154 D155 T156 A157 I158 S159 C160 I161 D162 R163 G164 E165 S166 V167 L168 V169 S170 A171 H172 T173 S174 A175 G176 K177 T178 V179 V180

A181 E182 Y183 A184 I185 A186 Q187 S188 L189 K190 N191 K192 Q193 R194 V195 I196 Y197 T198 S199 P200 I201 K202 A203 L204 S205 N206 Q207 K208 Y209 R210 E211 L212 L213 A214 E215 F216 G217 D218 Y219 G220 L221 M222 T223 G224 D225 I226 T227 I228 N229 P230 D231 A232 G233 C234 L235 Y236 M237 T238 T239 E240

I241 L242 R243 S244 M245 L246 Y247 R248 G249 S250 E251 V252 M253 R254 E255 V256 A257 W258 V259 I260 F261 D262 E263 V264 H265 Y266 M267 R268 D269 K270 E271 R272 G273 V274 V275 W276 E277 E278 T279 I280 I281 L282 L283 P284 D285 K286 V287 R288 Y289 V290 F291 L292 S293 A294 T295 I296 P297 N298 A299 M300

E301 F302 A303 E304 W305 I306 C307 K308 I309 H310 S311 Q312 P313 C314 H315 I316 V317 Y318 T319 N320 F321 R322 P323 T324 P325 L326 Q327 H328 Y329 L330 F331 P332 A333 H334 G335 D336 G337 I338 Y339 L340 V341 V342 D343 E344 K345 S346 T347 F348 R349 E350 E351 N352 F353 Q354 K355 A356 M357 A358 S359 I360

S361 ASN GLN ILE GLY ASP ASP PRO ASN SER THR ASP SER ARG GLY LYS LYS GLY GLN THR TYR LYS GLY GLY SER ALA LYS GLY ASP ALA LYS G392 D393 I394 Y395 K396 I397 V398 K399 M400 I401 W402 K403 K404 K405 Y406 N407 P408 V409 I410 V411 F412 S413 F414 S415 K416 R417 D418 C419 E420

E421 L422 A423 L424 K425 M426 S427 K428 L429 D430 F431 N432 S433 D434 D435 E436 K437 E438 A439 L440 T441 K442 I443 F444 N445 N446 A447 I448 A449 L450 L451 P452 E453 T454 D455 R456 E457 L458 P459 Q460 I461 K462 H463 I464 L465 P466 L467 L468 R469 R470 G471 I472 G473 I474 H475 H476 S477 G478 L479 L480

P481 I482 L483 K484 E485 V486 I487 E488 I489 L490 F491 Q492 E493 G494 F495 L496 K497 V498 L499 F500 A501 T502 E503 T504 F505 S506 I507 G508 L509 N510 W511 P512 A513 K514 T515 V516 V517 F518 T519 S520 V521 R522 K523 W524 D525 G526 Q527 Q528 F529 R530 W531 V532 S533 G534 G535 E536 Y537 I538 Q539 M540

S541 G542 R543 A544 G545 R546 R547 G548 L549 D550 D551 R552 G553 I554 V555 I556 M557 M558 I559 D560 E561 K562 M563 E564 P565 Q566 V567 A568 K569 G570 M571 V572 K573 G574 Q575 A576 D577 R578 L579 D580 S581 A582 F583 H584 L585 G586 Y587 N588 M589 I590 L591 N592 L593 M594 R595 V596 E597 G598 I599 S600

P601 E602 F603 M604 L605 E606 H607 S608 F609 F610 Q611 F612 Q613 N614 V615 I616 S617 V618 P619 V620 M621 E622 K623 K624 L625 A626 E627 L628 K629 K630 D631 F632 D633 G634 I635 E636 V637 E638 D639 E640 E641 N642 V643 K644 E645 Y646 H647 E648 I649 E650 Q651 A652 I653 K654 G655 Y656 R657 E658 D659 V660

R661 Q662 V663 V664 T665 H666 P667 A668 N669 A670 L671 S672 F673 L674 Q675 P676 G677 R678 L679 V680 E681 I682 S683 V684 N685 G686 K687 D688 N689 Y690 G691 W692 G693 A694 V695 V696 D697 F698 A699 K700 R701 I702 N703 K704 R705 N706 P707 S708 A709 V710 Y711 T712 D713 H714 E715 S716 Y717 I718 V719 N720

V721 V722 V723 N724 T725 M726 Y727 I728 D729 S730 P731 V732 N733 L734 L735 K736 P737 F738 N739 P740 T741 L742 P743 E744 G745 I746 R747 P748 A749 E750 E751 G752 E753 K754 S755 I756 C757 A758 V759 I760 P761 I762 T763 L764 D765 S766 I767 K768 S769 I770 G771 N772 L773 R774 L775 Y776 M777 P778 K779 D780

I781 R782 A783 S784 G785 Q786 K787 E788 T789 V790 G791 K792 S793 L794 R795 E796 V797 N798 R799 R800 F801 P802 D803 G804 I805 P806 V807 L808 D809 P810 V811 K812 N813 M814 K815 I816 E817 D818 E819 D820 F821 L822 K823 L824 M825 K826 K827 I828 D829 V830 L831 N832 T833 K834 L835 S836 S837 N838 P839 L840

T841 N842 S843 M844 R845 L846 E847 E848 L849 Y850 G851 K852 Y853 S854 R855 K856 H857 D858 L859 H860 E861 D862 M863 K864 Q865 L866 K867 R868 K869 I870 S871 E872 S873 Q874 A875 V876 I877 Q878 L879 D880 D881 L882 R883 R884 R885 K886 R887 V888 L889 R890 R891 L892 G893 F894 C895 T896 P897 N898 D899 I900

I901 E902 L903 K904 G905 R906 V907 A908 C909 E910 I911 S912 S913 G914 D915 E916 L917 L918 L919 T920 E921 L922 I923 F924 N925 G926 N927 F928 N929 E930 L931 K932 P933 E934 Q935 A936 A937 A938 L939 L940 S941 C942 F943 A944 F945 Q946 E947 R948 C949 K950 E951 A952 P953 R954 L955 K956 P957 E958 L959 A960

E961 P962 L963 K964 A965 M966 R967 E968 I969 A970 A971 K972 I973 A974 K975 I976 M977 K978 D979 S980 K981 I982 E983 V984 V985 E986 K987 D988 Y989 V990 E991 S992 F993 R994 H995 E996 L997 M998 E999 V1000 V1001 Y1002 E1003 W1004 C1005 R1006 G1007 A1008 T1009 F1010 T1011 Q1012 I1013 C1014 K1015 M1016 T1017 D1018 V1019 Y1020

E1021 G1022 S1023 L1024 I1025 R1026 M1027 F1028 K1029 R1030 L1031 E1032 E1033 L1034 V1035 K1036 E1037 L1038 V1039 D1040 V1041 A1042 N1043 T1044 I1045 G1046 N1047 S1048 S1049 L1050 K1051 E1052 K1053 M1054 E1055 A1056 V1057 L1058 K1059 L1060 I1061 H1062 R1063 D1064 I1065 V1066 S1067 A1068 G1069 S1070 L1071 Y1072 L1073

• Molecule 79: M-phase phosphoprotein 6 homolog

Chain M6: 22% 22% 78%

M1 S2 A3 N4 N5 G6 V7 T8 G9 K10 L11 SER SER ARG VAL MET ASN MET LYS PHE MET LYS PHE GLY LYS THR ASP ASP GLU GLU SER SER ASN SER ASN THR PRO SER ASN ILE ASN SER ASP VAL GLU PRO ILE GLU GLN LYS GLY LYS LEU PHE GLY LEU ASP ASP SER ALA

TRP ASP LEU ASN SER TYR LYS ASP ASP LEU LYS LYS ILE SER GLY LYS GLU LYS LYS LYS VAL LYS ARG VAL VAL TYR LYS LYS ARG P90 N91 L92 I93 I94 S95 N96 V97 G98 Y99 S100 E101 L102 R103 K104 P105 E106 G107 V108 I109 S110 G111 R112 K113 T114 F115 G116 D117 N118 SER ASP

ASP SER GLY SER ARG LYS ARG LYS PHE ASP GLU GLY GLU GLN ASN GLU ASP GLU LYS ARG ASP ALA LYS ASP LYS GLU PHE THR GLY SER GLN ASP ASP GLY GLU ASP GLU TYR ASP LEU ASP LYS LEU PHE LYS ASP SER ILE LYS LYS LYS THR ASN HIS ASN GLY LYS ASN LYS

ASN ARG ASN SER LYS LYS

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	219545	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.120	Depositor
Minimum map value	-0.072	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.025	Depositor
Map size (Å)	531.19995, 531.19995, 531.19995	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.3279998, 1.3279998, 1.3279998	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

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	3A	0.61	0/5088	1.20	47/7888 (0.6%)
2	5A	0.44	0/2833	1.13	12/4401 (0.3%)
3	SA	0.56	0/31829	1.17	228/49545 (0.5%)
4	SC	0.39	0/1949	0.66	2/2609 (0.1%)
5	SF	0.37	0/1954	0.65	1/2640 (0.0%)
6	SG	0.38	0/1690	0.61	0/2285
7	SH	0.29	0/1476	0.56	1/1975 (0.1%)
8	SI	0.36	0/1341	0.76	3/1806 (0.2%)
9	SJ	0.30	0/1202	0.58	0/1610
10	SK	0.41	0/1432	0.65	2/1917 (0.1%)
11	SM	0.29	0/1139	0.52	0/1535
12	SO	0.37	0/1109	0.57	0/1495
13	SP	0.37	0/859	0.63	0/1161
14	SR	0.46	0/990	0.63	0/1335
15	ST	0.30	0/914	0.59	0/1229
16	SU	0.34	0/1092	0.55	0/1466
17	SX	0.39	0/1020	0.64	0/1371
18	SY	0.40	0/804	0.57	0/1074
19	SZ	0.44	0/1000	0.66	0/1334
20	Sc	0.38	0/613	0.62	0/828
21	Sd	0.41	0/499	0.60	0/670
22	3B	0.50	0/1914	0.66	1/2582 (0.0%)
22	3C	0.41	0/1787	0.66	2/2413 (0.1%)
23	3D	0.41	0/3020	0.60	2/4066 (0.0%)
24	3E	0.37	0/3088	0.61	1/4193 (0.0%)
25	3F	0.45	0/3569	0.62	0/4806
26	3G	0.42	0/928	0.74	2/1262 (0.2%)
26	3H	0.46	0/928	0.74	2/1262 (0.2%)
27	A4	0.41	0/5282	0.65	2/7154 (0.0%)
28	A5	0.37	0/4021	0.65	4/5462 (0.1%)
29	A8	0.27	0/3328	0.59	2/4565 (0.0%)
30	A9	0.28	0/951	0.65	2/1287 (0.2%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
31	AE	0.33	0/10367	0.57	18/14163 (0.1%)
32	AF	0.33	0/3941	0.59	1/5344 (0.0%)
33	AG	0.36	0/6694	0.62	4/9070 (0.0%)
34	B1	0.43	0/6459	0.63	0/8744
35	B2	0.38	0/6624	0.65	3/8950 (0.0%)
36	B3	0.37	0/6001	0.66	3/8120 (0.0%)
37	B8	0.44	0/3730	0.63	3/5058 (0.1%)
38	BE	0.42	0/7012	0.63	5/9493 (0.1%)
39	B6	0.40	0/3138	0.60	2/4226 (0.0%)
40	5B	0.32	0/486	0.71	1/643 (0.2%)
41	5C	0.40	0/3902	0.61	3/5265 (0.1%)
42	5D	0.34	0/1801	0.57	0/2379
43	5E	0.34	0/1745	0.62	1/2335 (0.0%)
44	5F	0.37	0/1559	0.60	0/2097
45	5G	0.42	0/1993	0.65	2/2689 (0.1%)
46	5H	0.40	0/704	0.59	1/931 (0.1%)
47	5I	0.49	0/3844	0.61	0/5174
48	5J	0.37	0/1147	0.56	0/1531
49	5K	0.44	0/1213	0.63	1/1638 (0.1%)
50	RD	0.30	0/2454	0.56	3/3310 (0.1%)
51	RE	0.34	0/9015	0.58	4/12195 (0.0%)
52	RF	0.32	0/2004	0.62	0/2697
53	RG	0.27	0/1727	0.62	2/2329 (0.1%)
53	RH	0.32	0/1828	0.61	1/2470 (0.0%)
54	RJ	0.41	0/6126	0.59	1/8247 (0.0%)
55	RK	0.38	0/2832	0.61	0/3825
56	RN	0.30	0/4521	0.58	5/6083 (0.1%)
57	RO	0.29	0/3824	0.59	6/5226 (0.1%)
58	RP	0.31	0/12292	0.58	48/16822 (0.3%)
59	RQ	0.35	0/2443	0.62	4/3317 (0.1%)
60	RS	0.30	0/2104	0.58	0/2854
61	RT	0.34	0/1679	0.63	1/2261 (0.0%)
62	RW	0.30	0/760	0.46	1/1059 (0.1%)
63	RZ	0.31	0/6730	0.58	1/9088 (0.0%)
66	R5	0.57	0/2340	0.64	1/3161 (0.0%)
67	R1	0.54	0/1910	0.68	0/2579
68	R3	0.50	0/2628	0.69	2/3569 (0.1%)
69	R6	0.54	0/1722	0.70	0/2339
70	R2	0.51	0/2077	0.69	0/2828
71	M3	0.53	0/1661	0.65	0/2243
72	R0	0.55	0/1828	0.68	0/2486
73	r4	0.52	0/2269	0.66	0/3066
74	C4	0.48	0/1676	0.66	0/2277

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
75	R4	0.42	0/7575	0.61	3/10290 (0.0%)
76	r6	0.35	0/2540	0.51	0/3497
77	R7	0.39	0/903	0.58	0/1210
78	M4	0.49	0/7772	0.66	3/10521 (0.0%)
79	M6	0.43	0/277	0.66	0/371
All	All	0.42	0/259526	0.74	450/359296 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	SC	0	2
5	SF	0	1
7	SH	0	2
8	SI	0	2
14	SR	0	1
17	SX	0	1
19	SZ	0	1
20	Sc	0	1
25	3F	0	3
26	3G	0	2
26	3H	0	1
27	A4	0	1
28	A5	0	2
29	A8	0	2
33	AG	0	4
34	B1	0	2
35	B2	0	2
36	B3	0	7
38	BE	0	3
39	B6	0	2
40	5B	0	1
46	5H	0	1
47	5I	0	2
49	5K	0	1
51	RE	0	2
52	RF	0	1
54	RJ	0	1
56	RN	0	1
57	RO	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
58	RP	0	9
59	RQ	0	1
62	RW	0	1
63	RZ	0	2
67	R1	0	1
68	R3	0	3
69	R6	0	1
70	R2	0	1
71	M3	0	2
73	r4	0	1
74	C4	0	1
75	R4	0	1
78	M4	0	3
All	All	0	81

There are no bond length outliers.

The worst 5 of 450 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	5A	494	C	C2-N1-C1'	14.08	134.28	118.80
3	SA	185	U	C2-N1-C1'	10.48	130.27	117.70
1	3A	269	C	C2-N1-C1'	10.38	130.22	118.80
3	SA	185	U	N1-C2-O2	10.12	129.88	122.80
3	SA	1473	U	C2-N1-C1'	10.10	129.82	117.70

There are no chirality outliers.

5 of 81 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	SC	16	GLN	Peptide
4	SC	18	LYS	Peptide
5	SF	207	LEU	Peptide
7	SH	147	LEU	Peptide
7	SH	152	ASP	Peptide

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	
4	SC	240/255 (94%)	210 (88%)	30 (12%)	0	100	100
5	SF	245/261 (94%)	198 (81%)	47 (19%)	0	100	100
6	SG	211/225 (94%)	194 (92%)	17 (8%)	0	100	100
7	SH	178/236 (75%)	159 (89%)	15 (8%)	4 (2%)	6	37
8	SI	161/190 (85%)	137 (85%)	24 (15%)	0	100	100
9	SJ	144/200 (72%)	126 (88%)	18 (12%)	0	100	100
10	SK	172/197 (87%)	154 (90%)	17 (10%)	1 (1%)	25	63
11	SM	135/156 (86%)	117 (87%)	18 (13%)	0	100	100
12	SO	132/151 (87%)	123 (93%)	9 (7%)	0	100	100
13	SP	114/137 (83%)	96 (84%)	18 (16%)	0	100	100
14	SR	123/143 (86%)	110 (89%)	13 (11%)	0	100	100
15	ST	107/146 (73%)	91 (85%)	16 (15%)	0	100	100
16	SU	136/144 (94%)	123 (90%)	13 (10%)	0	100	100
17	SX	125/130 (96%)	114 (91%)	11 (9%)	0	100	100
18	SY	102/145 (70%)	88 (86%)	14 (14%)	0	100	100
19	SZ	121/135 (90%)	106 (88%)	15 (12%)	0	100	100
20	Sc	78/82 (95%)	66 (85%)	12 (15%)	0	100	100
21	Sd	61/67 (91%)	56 (92%)	5 (8%)	0	100	100
22	3B	238/327 (73%)	215 (90%)	23 (10%)	0	100	100
22	3C	220/327 (67%)	200 (91%)	20 (9%)	0	100	100
23	3D	372/504 (74%)	342 (92%)	30 (8%)	0	100	100
24	3E	433/511 (85%)	392 (90%)	40 (9%)	1 (0%)	47	79
25	3F	431/573 (75%)	394 (91%)	37 (9%)	0	100	100
26	3G	119/126 (94%)	114 (96%)	5 (4%)	0	100	100
26	3H	119/126 (94%)	110 (92%)	9 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	A4	643/776 (83%)	568 (88%)	75 (12%)	0	100	100
28	A5	501/643 (78%)	447 (89%)	52 (10%)	2 (0%)	34	71
29	A8	534/713 (75%)	407 (76%)	127 (24%)	0	100	100
30	A9	126/575 (22%)	111 (88%)	15 (12%)	0	100	100
31	AE	1516/1769 (86%)	1374 (91%)	138 (9%)	4 (0%)	41	75
32	AF	483/513 (94%)	440 (91%)	43 (9%)	0	100	100
33	AG	811/896 (90%)	726 (90%)	84 (10%)	1 (0%)	51	84
34	B1	785/900 (87%)	709 (90%)	75 (10%)	1 (0%)	51	84
35	B2	814/943 (86%)	716 (88%)	98 (12%)	0	100	100
36	B3	733/817 (90%)	585 (80%)	147 (20%)	1 (0%)	51	84
37	B8	453/594 (76%)	397 (88%)	56 (12%)	0	100	100
38	BE	886/939 (94%)	804 (91%)	81 (9%)	1 (0%)	51	84
39	B6	369/440 (84%)	341 (92%)	26 (7%)	2 (0%)	29	67
40	5B	56/214 (26%)	51 (91%)	5 (9%)	0	100	100
41	5C	474/554 (86%)	424 (90%)	50 (10%)	0	100	100
42	5D	201/250 (80%)	175 (87%)	26 (13%)	0	100	100
43	5E	205/593 (35%)	187 (91%)	18 (9%)	0	100	100
44	5F	180/183 (98%)	169 (94%)	11 (6%)	0	100	100
45	5G	237/290 (82%)	215 (91%)	22 (9%)	0	100	100
46	5H	91/610 (15%)	81 (89%)	9 (10%)	1 (1%)	14	51
47	5I	457/489 (94%)	413 (90%)	44 (10%)	0	100	100
48	5J	130/217 (60%)	117 (90%)	13 (10%)	0	100	100
49	5K	148/189 (78%)	134 (90%)	14 (10%)	0	100	100
50	RD	310/1729 (18%)	281 (91%)	25 (8%)	4 (1%)	12	48
51	RE	1080/1237 (87%)	998 (92%)	81 (8%)	1 (0%)	51	84
52	RF	233/297 (78%)	205 (88%)	26 (11%)	2 (1%)	17	55
53	RG	212/252 (84%)	191 (90%)	21 (10%)	0	100	100
53	RH	226/252 (90%)	207 (92%)	19 (8%)	0	100	100
54	RJ	726/1183 (61%)	670 (92%)	56 (8%)	0	100	100
55	RK	358/367 (98%)	332 (93%)	26 (7%)	0	100	100
56	RN	568/810 (70%)	513 (90%)	55 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
57	RO	518/552 (94%)	462 (89%)	50 (10%)	6 (1%)	13 49
58	RP	1948/2493 (78%)	1778 (91%)	156 (8%)	14 (1%)	22 61
59	RQ	333/899 (37%)	287 (86%)	42 (13%)	4 (1%)	13 49
60	RS	247/480 (52%)	224 (91%)	23 (9%)	0	100 100
61	RT	207/326 (64%)	188 (91%)	19 (9%)	0	100 100
62	RW	149/206 (72%)	135 (91%)	13 (9%)	1 (1%)	22 61
63	RZ	831/1267 (66%)	737 (89%)	91 (11%)	3 (0%)	34 71
66	R5	297/305 (97%)	275 (93%)	22 (7%)	0	100 100
67	R1	242/246 (98%)	224 (93%)	18 (7%)	0	100 100
68	R3	332/394 (84%)	304 (92%)	27 (8%)	1 (0%)	41 75
69	R6	222/223 (100%)	209 (94%)	13 (6%)	0	100 100
70	R2	264/265 (100%)	250 (95%)	14 (5%)	0	100 100
71	M3	209/250 (84%)	192 (92%)	17 (8%)	0	100 100
72	R0	235/240 (98%)	216 (92%)	19 (8%)	0	100 100
73	r4	287/359 (80%)	263 (92%)	24 (8%)	0	100 100
74	C4	214/292 (73%)	198 (92%)	16 (8%)	0	100 100
75	R4	942/1001 (94%)	875 (93%)	67 (7%)	0	100 100
76	r6	404/733 (55%)	367 (91%)	37 (9%)	0	100 100
77	R7	111/184 (60%)	108 (97%)	3 (3%)	0	100 100
78	M4	972/1073 (91%)	908 (93%)	64 (7%)	0	100 100
79	M6	36/186 (19%)	32 (89%)	4 (11%)	0	100 100
All	All	28063/37702 (74%)	25255 (90%)	2753 (10%)	55 (0%)	50 79

5 of 55 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
28	A5	569	PRO
50	RD	1223	PRO
57	RO	141	PRO
57	RO	519	PRO
58	RP	707	PRO

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
4	SC	213/224 (95%)	210 (99%)	3 (1%)	67 81
5	SF	199/222 (90%)	197 (99%)	2 (1%)	76 86
6	SG	180/191 (94%)	178 (99%)	2 (1%)	73 85
7	SH	153/201 (76%)	151 (99%)	2 (1%)	69 82
8	SI	146/170 (86%)	144 (99%)	2 (1%)	67 81
9	SJ	122/161 (76%)	118 (97%)	4 (3%)	38 62
10	SK	150/166 (90%)	149 (99%)	1 (1%)	84 90
11	SM	124/137 (90%)	124 (100%)	0	100 100
12	SO	117/128 (91%)	117 (100%)	0	100 100
13	SP	88/105 (84%)	86 (98%)	2 (2%)	50 70
14	SR	105/119 (88%)	105 (100%)	0	100 100
15	ST	99/129 (77%)	99 (100%)	0	100 100
16	SU	111/116 (96%)	111 (100%)	0	100 100
17	SX	108/111 (97%)	107 (99%)	1 (1%)	78 88
18	SY	86/120 (72%)	86 (100%)	0	100 100
19	SZ	103/113 (91%)	103 (100%)	0	100 100
20	Sc	69/71 (97%)	69 (100%)	0	100 100
21	Sd	56/60 (93%)	55 (98%)	1 (2%)	59 77
22	3B	201/240 (84%)	199 (99%)	2 (1%)	76 86
22	3C	189/240 (79%)	188 (100%)	1 (0%)	88 93
23	3D	322/435 (74%)	320 (99%)	2 (1%)	86 92
24	3E	265/433 (61%)	264 (100%)	1 (0%)	91 94
25	3F	382/503 (76%)	379 (99%)	3 (1%)	81 89
26	3G	100/104 (96%)	99 (99%)	1 (1%)	76 86
26	3H	100/104 (96%)	100 (100%)	0	100 100
27	A4	587/713 (82%)	581 (99%)	6 (1%)	76 86

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
28	A5	431/574 (75%)	428 (99%)	3 (1%)	84 90
29	A8	174/657 (26%)	173 (99%)	1 (1%)	86 92
30	A9	89/533 (17%)	86 (97%)	3 (3%)	37 61
31	AE	770/1633 (47%)	761 (99%)	9 (1%)	71 84
32	AF	431/454 (95%)	426 (99%)	5 (1%)	71 84
33	AG	750/826 (91%)	748 (100%)	2 (0%)	92 95
34	B1	694/789 (88%)	691 (100%)	3 (0%)	91 94
35	B2	712/832 (86%)	705 (99%)	7 (1%)	76 86
36	B3	659/719 (92%)	655 (99%)	4 (1%)	86 92
37	B8	407/529 (77%)	403 (99%)	4 (1%)	76 86
38	BE	741/819 (90%)	737 (100%)	4 (0%)	88 93
39	B6	323/414 (78%)	319 (99%)	4 (1%)	71 84
40	5B	56/196 (29%)	55 (98%)	1 (2%)	59 77
41	5C	418/480 (87%)	416 (100%)	2 (0%)	88 93
42	5D	198/234 (85%)	197 (100%)	1 (0%)	88 93
43	5E	193/535 (36%)	192 (100%)	1 (0%)	88 93
44	5F	171/172 (99%)	168 (98%)	3 (2%)	59 77
45	5G	214/258 (83%)	213 (100%)	1 (0%)	88 93
46	5H	63/538 (12%)	63 (100%)	0	100 100
47	5I	416/443 (94%)	413 (99%)	3 (1%)	84 90
48	5J	124/200 (62%)	123 (99%)	1 (1%)	81 89
49	5K	133/169 (79%)	133 (100%)	0	100 100
50	RD	226/1544 (15%)	222 (98%)	4 (2%)	59 77
51	RE	994/1125 (88%)	987 (99%)	7 (1%)	84 90
52	RF	221/274 (81%)	220 (100%)	1 (0%)	88 93
53	RG	195/222 (88%)	192 (98%)	3 (2%)	65 80
53	RH	206/222 (93%)	204 (99%)	2 (1%)	76 86
54	RJ	654/1039 (63%)	642 (98%)	12 (2%)	59 77
55	RK	307/312 (98%)	304 (99%)	3 (1%)	76 86
56	RN	435/732 (59%)	431 (99%)	4 (1%)	78 88
57	RO	329/506 (65%)	327 (99%)	2 (1%)	86 92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
58	RP	556/2307 (24%)	550 (99%)	6 (1%)	73 85
59	RQ	206/808 (26%)	204 (99%)	2 (1%)	76 86
60	RS	225/421 (53%)	225 (100%)	0	100 100
61	RT	178/282 (63%)	178 (100%)	0	100 100
63	RZ	717/1140 (63%)	712 (99%)	5 (1%)	84 90
66	R5	255/266 (96%)	255 (100%)	0	100 100
67	R1	210/218 (96%)	207 (99%)	3 (1%)	67 81
68	R3	282/349 (81%)	281 (100%)	1 (0%)	91 94
69	R6	196/197 (100%)	196 (100%)	0	100 100
70	R2	237/240 (99%)	237 (100%)	0	100 100
71	M3	181/219 (83%)	180 (99%)	1 (1%)	86 92
72	R0	194/209 (93%)	194 (100%)	0	100 100
73	r4	243/311 (78%)	242 (100%)	1 (0%)	91 94
74	C4	174/240 (72%)	172 (99%)	2 (1%)	73 85
75	R4	812/901 (90%)	808 (100%)	4 (0%)	88 93
76	r6	150/671 (22%)	150 (100%)	0	100 100
77	R7	99/168 (59%)	98 (99%)	1 (1%)	76 86
78	M4	810/953 (85%)	804 (99%)	6 (1%)	84 90
79	M6	25/168 (15%)	25 (100%)	0	100 100
All	All	21859/33364 (66%)	21691 (99%)	168 (1%)	82 89

5 of 168 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
54	RJ	92	ARG
59	RQ	808	PHE
54	RJ	230	MET
56	RN	116	ARG
67	R1	86	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 291 such sidechains are listed below:

Mol	Chain	Res	Type
57	RO	472	HIS

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Mol	Chain	Res	Type
78	M4	832	ASN
59	RQ	876	GLN
70	R2	183	ASN
34	B1	128	ASN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	3A	202/333 (60%)	78 (38%)	4 (1%)
2	5A	110/700 (15%)	42 (38%)	0
3	SA	1315/1812 (72%)	510 (38%)	20 (1%)
All	All	1627/2845 (57%)	630 (38%)	24 (1%)

5 of 630 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	3A	3	C
1	3A	4	G
1	3A	23	U
1	3A	24	U
1	3A	25	U

5 of 24 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	SA	773	C
3	SA	1063	U
3	SA	1052	U
3	SA	1490	C
3	SA	136	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)

Of 5 ligands modelled in this entry, 3 are monoatomic - leaving 2 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
83	ADP	RZ	1301	-	24,29,29	0.96	1 (4%)	29,45,45	1.37	4 (13%)
81	GTP	RJ	1201	82	26,34,34	1.20	1 (3%)	32,54,54	1.70	7 (21%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
83	ADP	RZ	1301	-	-	4/12/32/32	0/3/3/3
81	GTP	RJ	1201	82	-	5/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
81	RJ	1201	GTP	C5-C6	-4.23	1.38	1.47
83	RZ	1301	ADP	C5-C4	2.45	1.47	1.40

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
81	RJ	1201	GTP	PA-O3A-PB	-4.49	117.41	132.83
81	RJ	1201	GTP	PB-O3B-PG	-4.12	118.69	132.83
83	RZ	1301	ADP	N3-C2-N1	-3.40	123.36	128.68
81	RJ	1201	GTP	C5-C6-N1	3.36	119.88	113.95
81	RJ	1201	GTP	C8-N7-C5	3.10	108.89	102.99

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

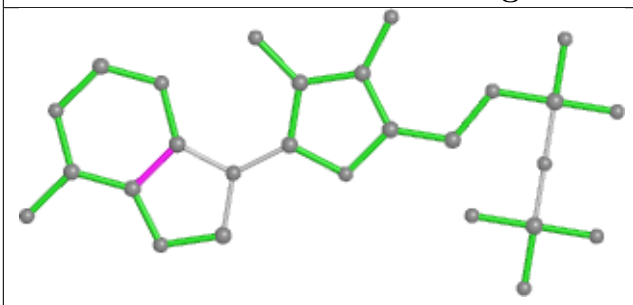
Mol	Chain	Res	Type	Atoms
83	RZ	1301	ADP	C5'-O5'-PA-O2A
83	RZ	1301	ADP	C5'-O5'-PA-O3A
81	RJ	1201	GTP	O4'-C4'-C5'-O5'
81	RJ	1201	GTP	C3'-C4'-C5'-O5'
81	RJ	1201	GTP	PA-O3A-PB-O2B

There are no ring outliers.

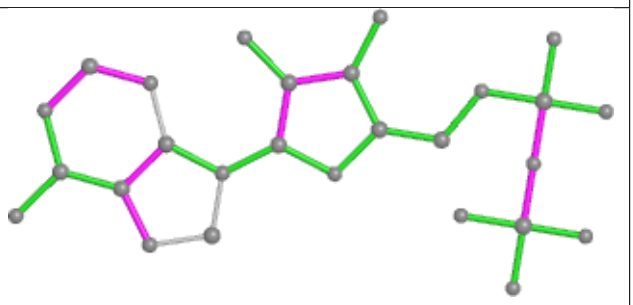
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

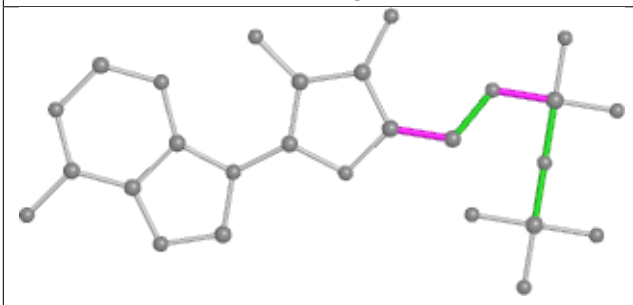
Ligand ADP RZ 1301



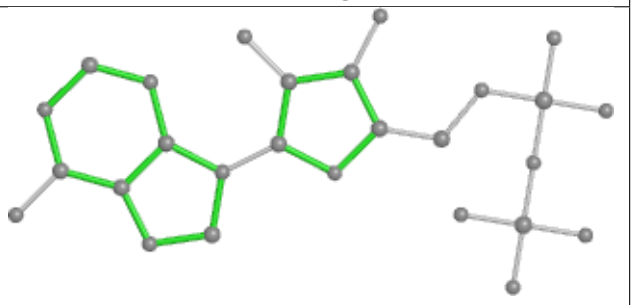
Bond lengths



Bond angles

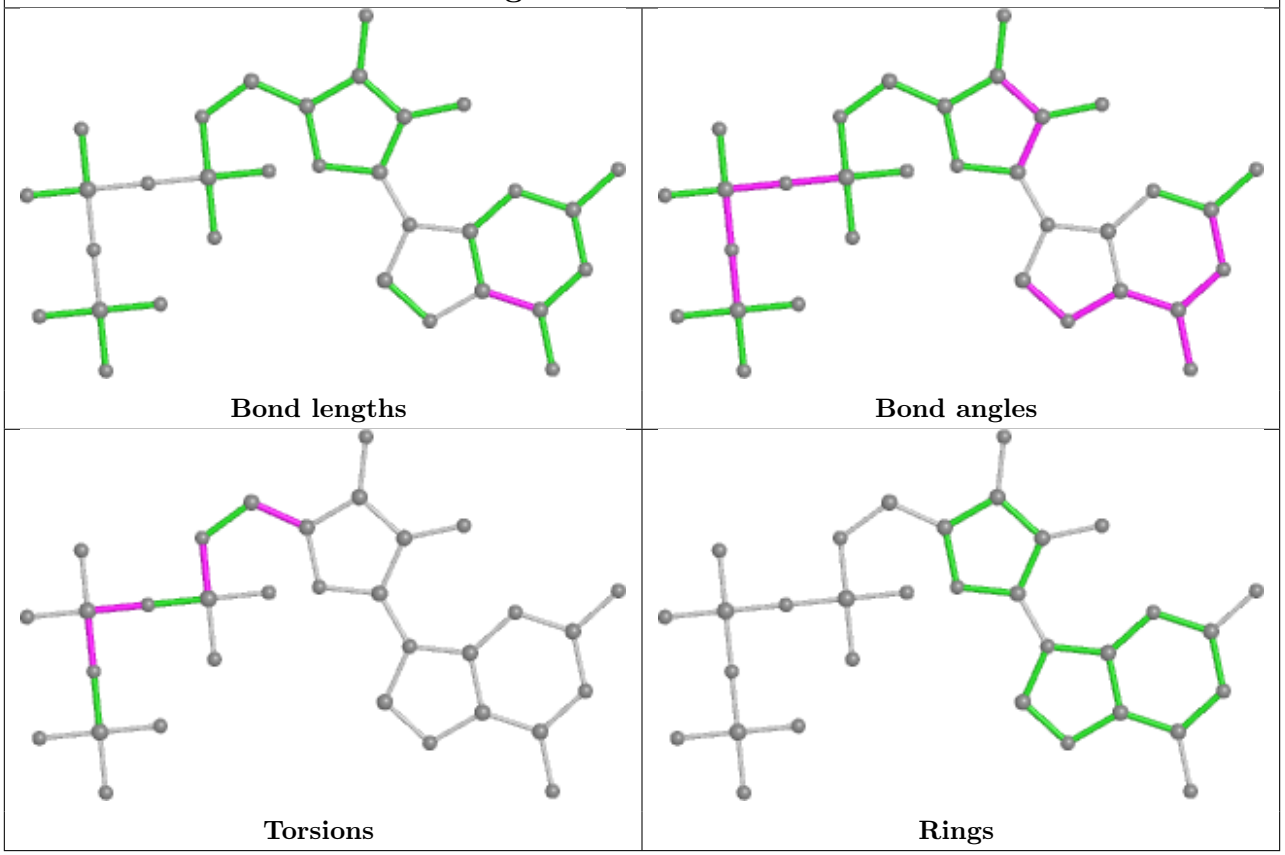


Torsions



Rings

Ligand GTP RJ 1201



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

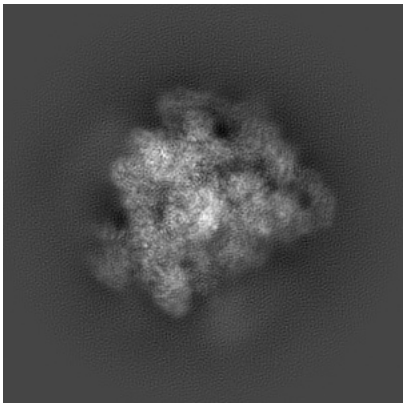
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-30574. These allow visual inspection of the internal detail of the map and identification of artifacts.

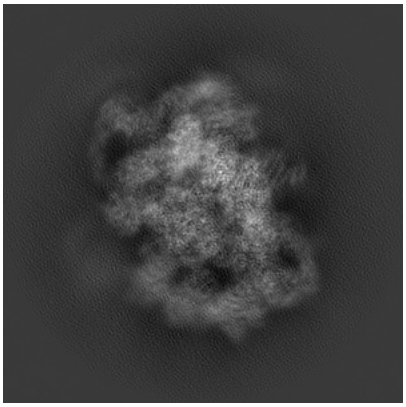
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

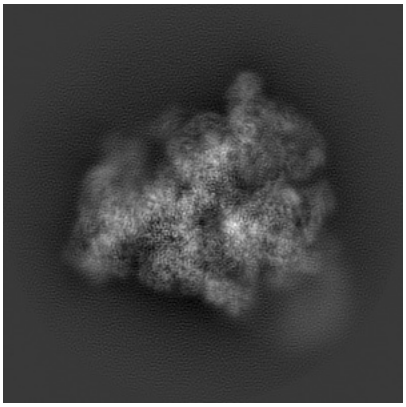
6.1.1 Primary map



X



Y

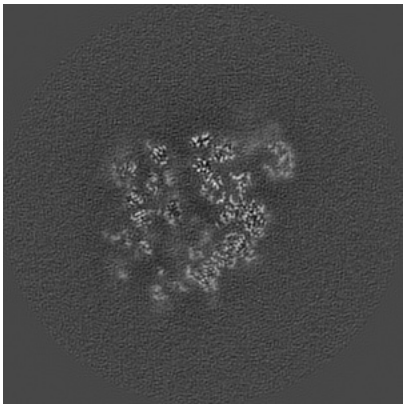


Z

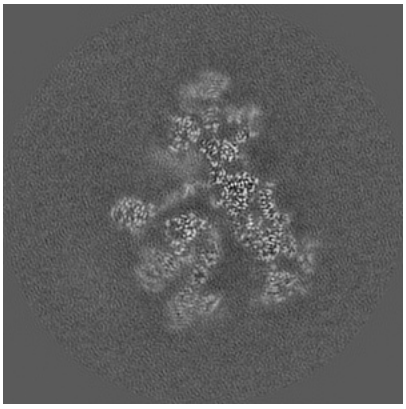
The images above show the map projected in three orthogonal directions.

6.2 Central slices

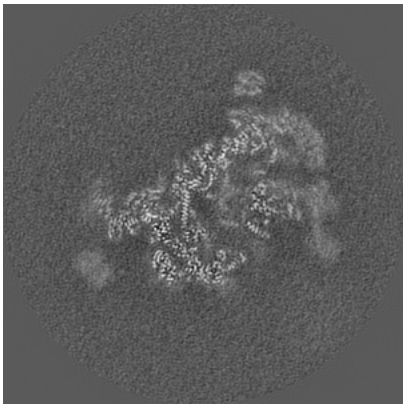
6.2.1 Primary map



X Index: 200



Y Index: 200

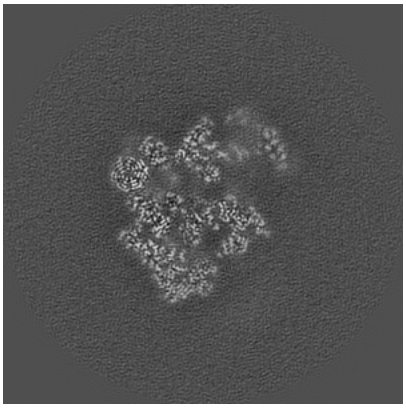


Z Index: 200

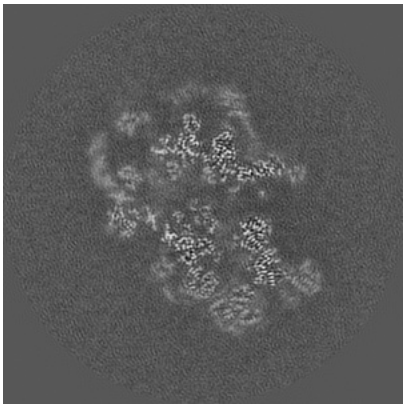
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

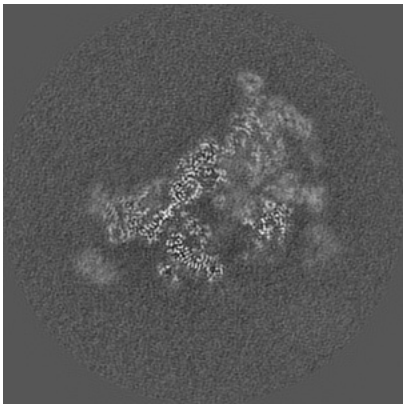
6.3.1 Primary map



X Index: 186



Y Index: 178

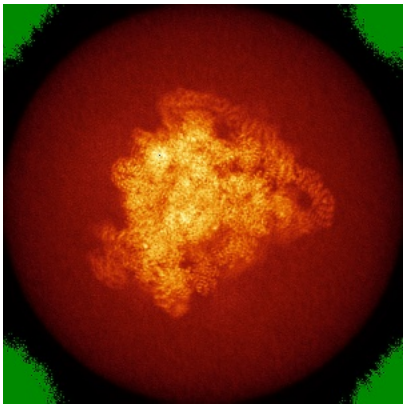


Z Index: 192

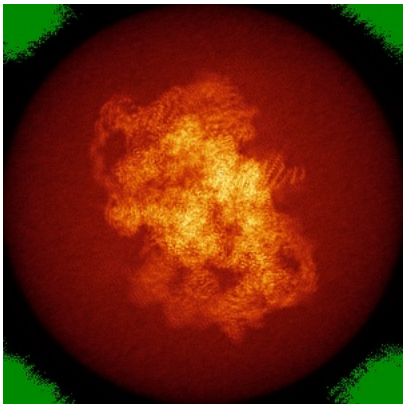
The images above show the largest variance slices of the map in three orthogonal directions.

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

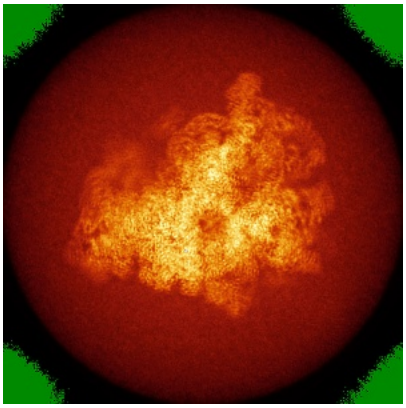
6.4.1 Primary map



X



Y

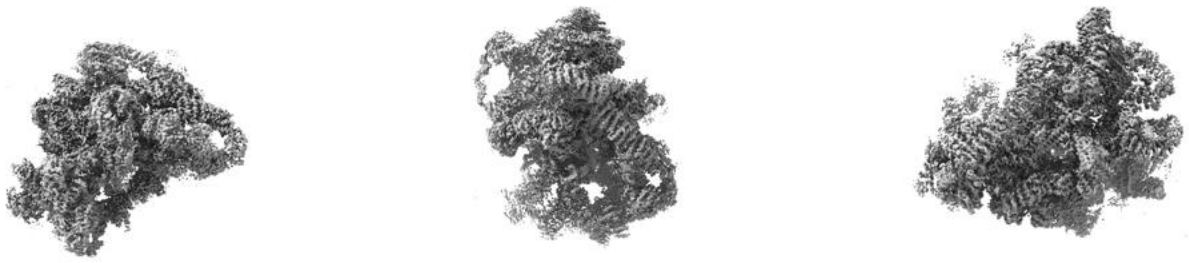


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

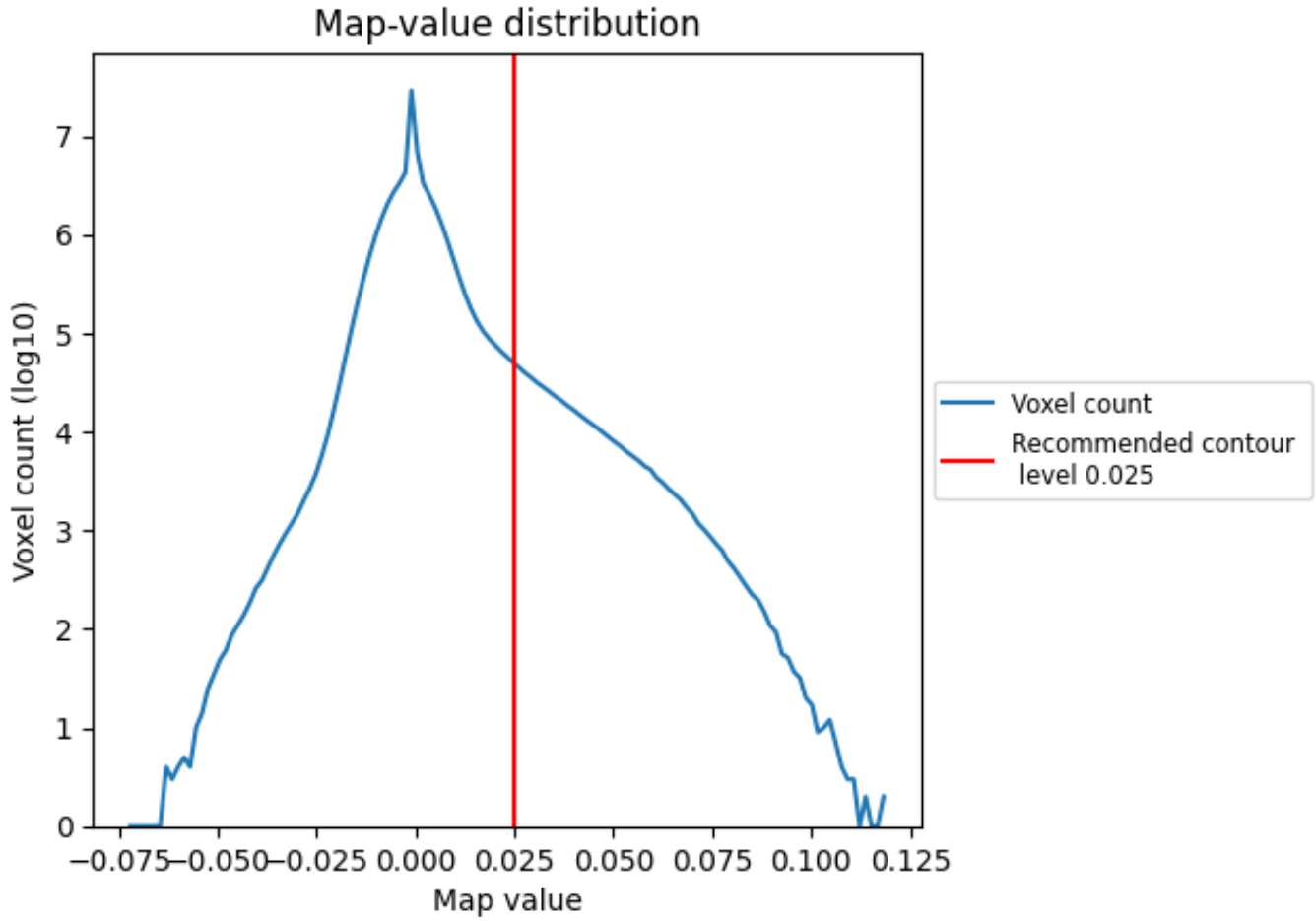
6.6 Mask visualisation (i)

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

7 Map analysis

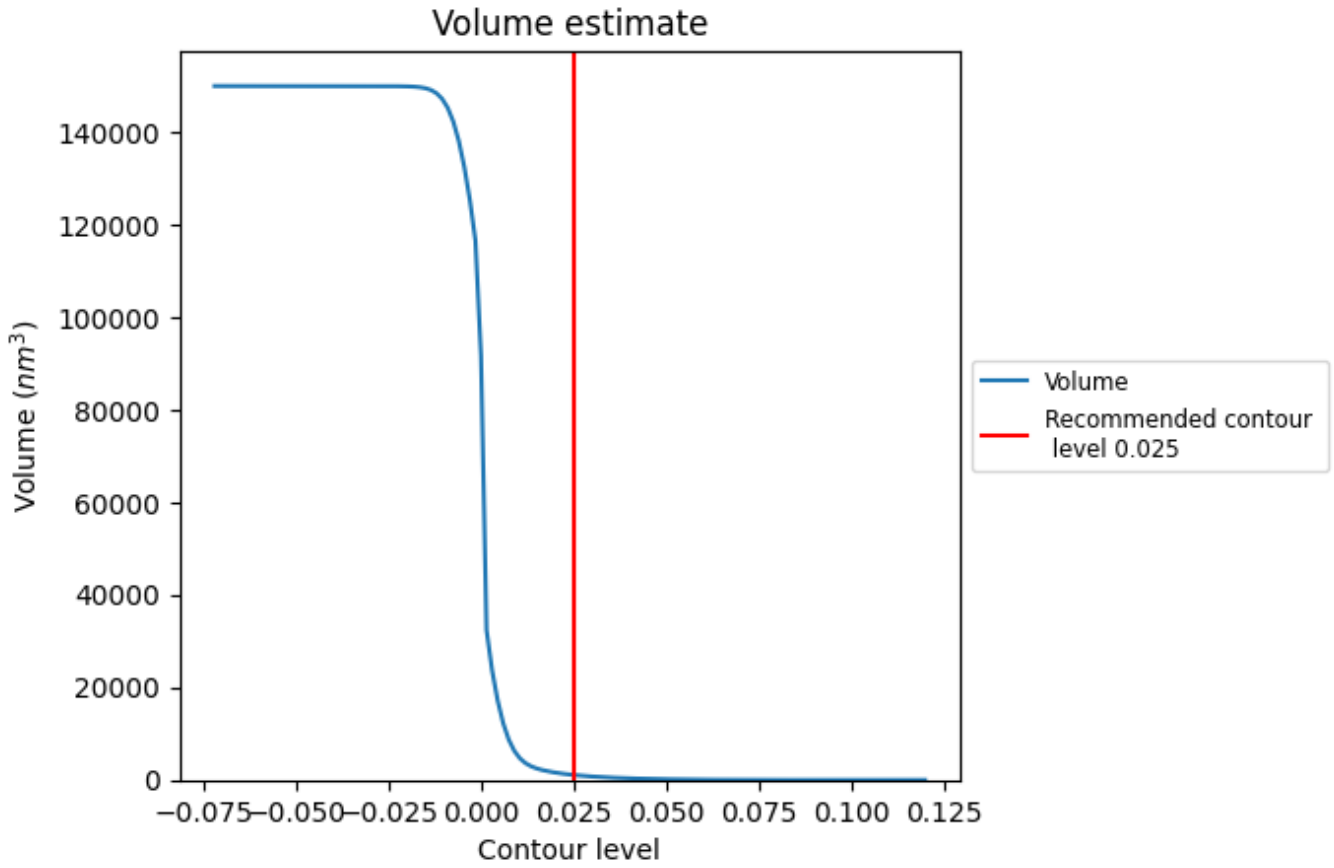
This section contains the results of statistical analysis of the map.

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.

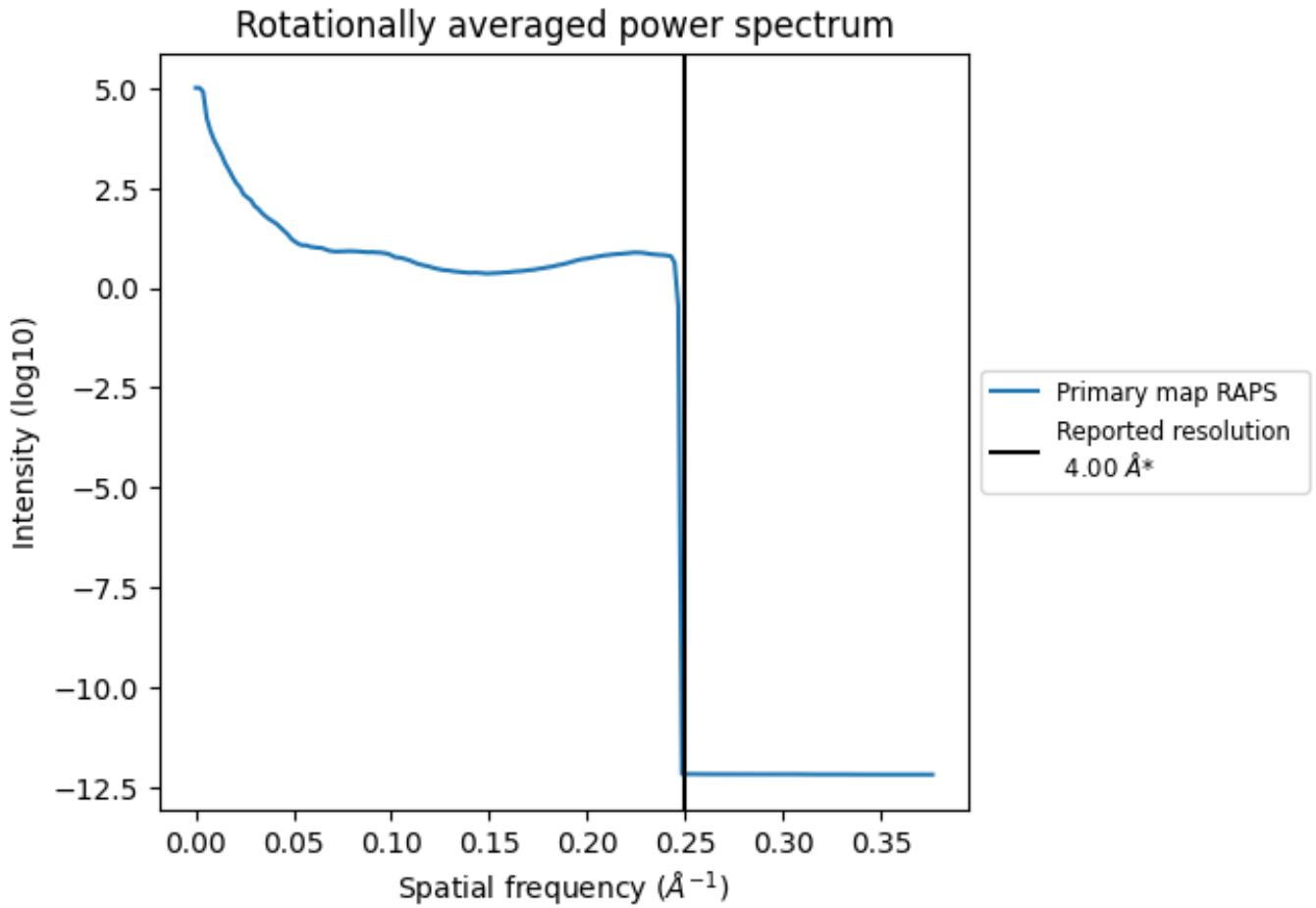
7.2 Volume estimate (i)



The volume at the recommended contour level is 1074 nm^3; this corresponds to an approximate mass of 970 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 0.250 Å^{-1}

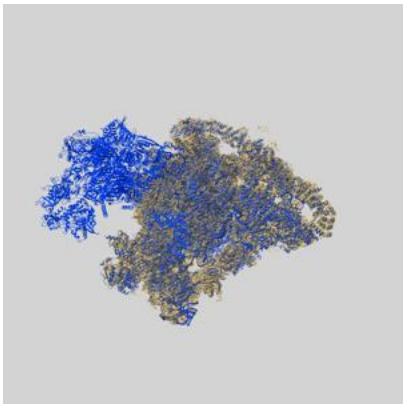
8 Fourier-Shell correlation

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

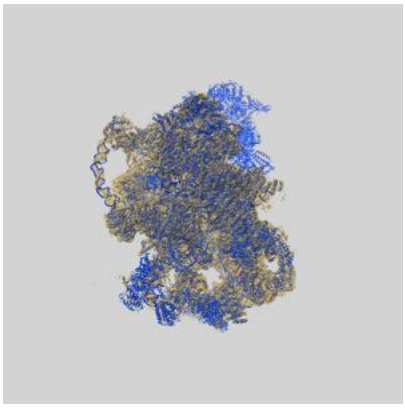
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-30574 and PDB model 7D4I. Per-residue inclusion information can be found in section 3 on page 20.

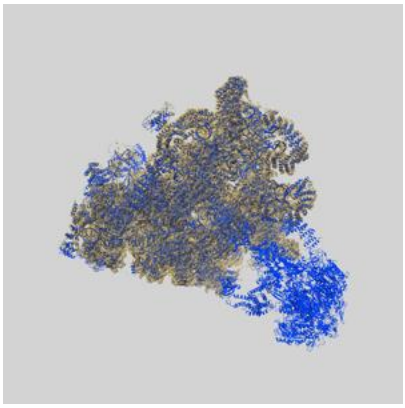
9.1 Map-model overlay



X



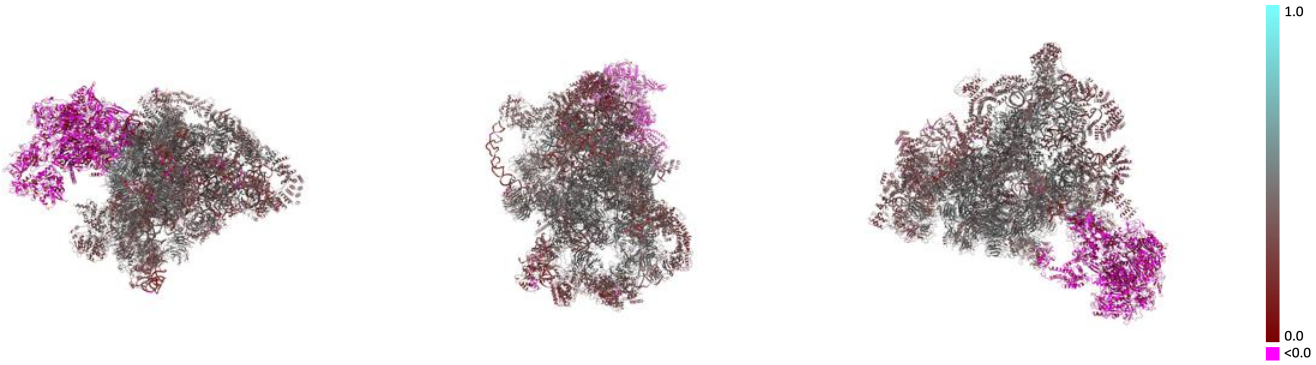
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.025 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

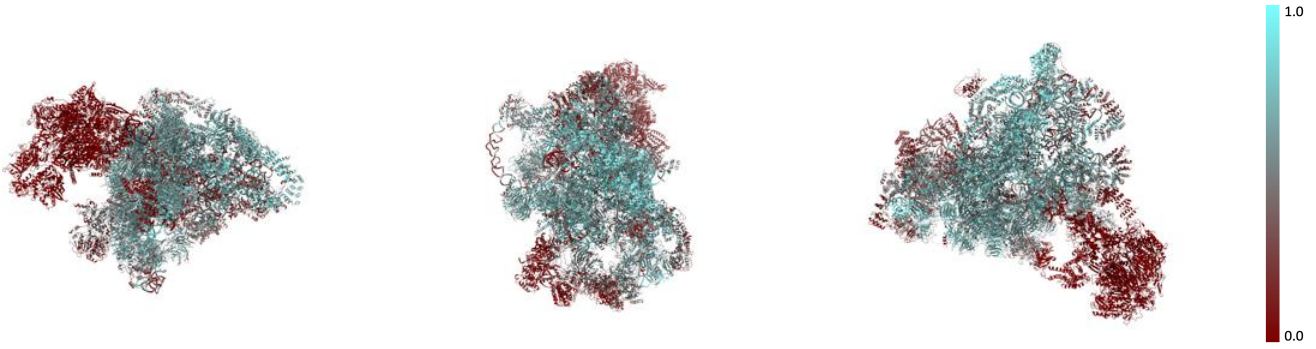
9.2 Q-score mapped to coordinate model



X Y Z

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

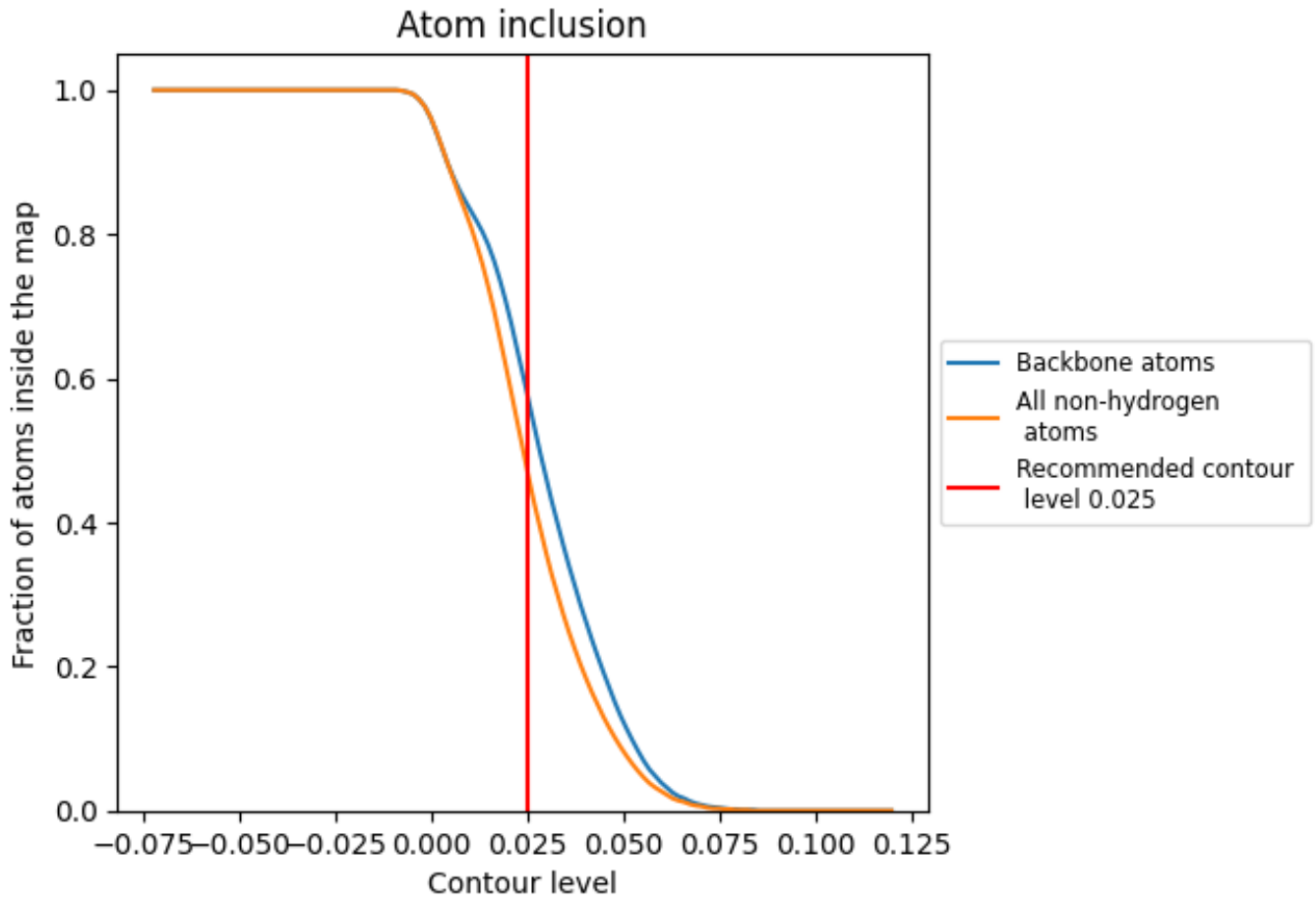
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.025).

9.4 Atom inclusion (i)



At the recommended contour level, 58% of all backbone atoms, 47% 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 (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.4720	0.3390
3A	0.6880	0.3800
3B	0.7030	0.4820
3C	0.6510	0.4460
3D	0.6820	0.4450
3E	0.6470	0.4270
3F	0.6890	0.4600
3G	0.6460	0.4550
3H	0.6860	0.4620
5A	0.4290	0.2980
5B	0.4730	0.4040
5C	0.6100	0.4530
5D	0.5590	0.4350
5E	0.5350	0.4230
5F	0.4980	0.4190
5G	0.6040	0.4540
5H	0.6420	0.4620
5I	0.7000	0.4760
5J	0.5670	0.4540
5K	0.6690	0.4760
A4	0.6530	0.4270
A5	0.5790	0.4240
A8	0.1930	0.3060
A9	0.4450	0.3310
AE	0.5490	0.3640
AF	0.5390	0.4190
AG	0.5810	0.4120
B1	0.6430	0.4640
B2	0.6440	0.4170
B3	0.6320	0.4210
B6	0.6330	0.4130
B8	0.6830	0.4570
BE	0.6630	0.4540
C4	0.0000	0.0140
M3	0.0000	0.0020

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Chain	Atom inclusion	Q-score
M4	0.0000	0.0070
M6	0.0000	-0.0180
R0	0.0000	0.0240
R1	0.0000	-0.0040
R2	0.0000	-0.0020
R3	0.0000	-0.0050
R4	0.0000	-0.0040
R5	0.0000	-0.0020
R6	0.0000	0.0200
R7	0.0000	-0.0180
RD	0.0440	0.2830
RE	0.5240	0.3780
RF	0.4600	0.3590
RG	0.1550	0.3120
RH	0.2780	0.3730
RJ	0.6410	0.4430
RK	0.6320	0.4350
RN	0.1620	0.3150
RO	0.2540	0.3260
RP	0.5770	0.3540
RQ	0.4820	0.4150
RS	0.0670	0.2420
RT	0.5490	0.4390
RW	0.5620	0.3770
RZ	0.3570	0.3490
SA	0.6220	0.3510
SC	0.6420	0.4550
SF	0.5580	0.4330
SG	0.6220	0.4540
SH	0.2820	0.3650
SI	0.4950	0.3850
SJ	0.2730	0.3480
SK	0.6780	0.4600
SM	0.1890	0.3280
SO	0.6660	0.4340
SP	0.6450	0.4560
SR	0.6690	0.4730
ST	0.3580	0.3880
SU	0.4630	0.4250
SX	0.6490	0.4510
SY	0.6180	0.4530
SZ	0.6590	0.4520

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Chain	Atom inclusion	Q-score
Sc	0.6710	0.4620
Sd	0.6620	0.4830
X1	0.4410	0.3940
X2	0.1570	0.3330
r4	0.0000	0.0010
r6	0.0000	0.0010