



wwPDB EM Validation Summary Report ⓘ

May 14, 2026 – 03:33 PM EDT

PDB ID : 9N72 / pdb_00009n72
EMDB ID : EMD-49082
Title : SSU processome maturation and disassembly, State F
Authors : Buzovetsky, O.; Klinge, S.
Deposited on : 2025-02-05
Resolution : 5.94 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

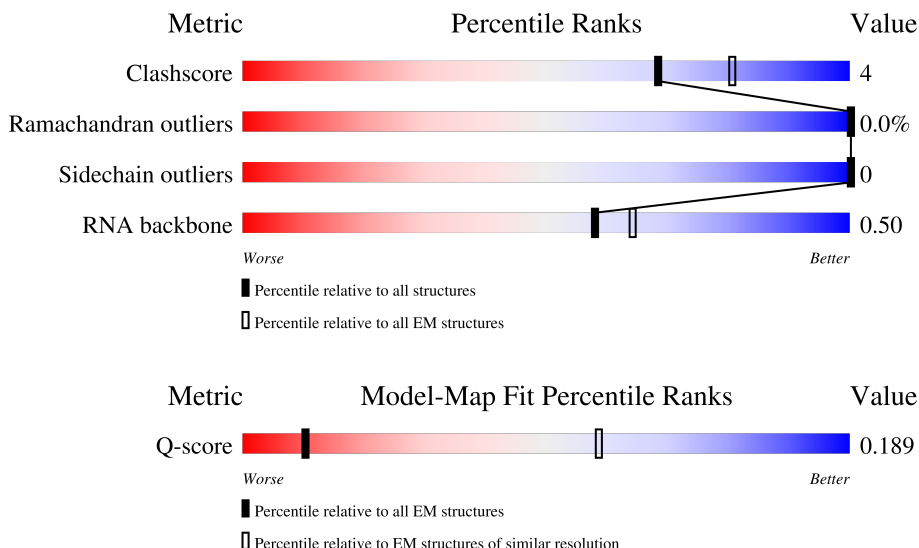
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 5.94 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	472 (5.44 - 6.43)

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

Mol	Chain	Length	Quality of chain
1	L0	700	
2	L1	1810	
3	L2	333	

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Mol	Chain	Length	Quality of chain
4	L3	146	
5	L4	261	
6	L5	225	
7	L6	236	
8	L7	190	
9	L8	200	
10	L9	197	
11	LC	143	
12	LD	156	
13	LE	130	
14	LF	135	
15	LG	67	
16	LH	896	
17	LI	713	
18	LJ	513	
19	LK	575	
20	LL	643	
21	LM	1769	
22	LN	776	
23	LO	923	
24	LP	440	
25	LQ	943	
26	LR	817	
27	LS	594	
28	LT	939	

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Mol	Chain	Length	Quality of chain
29	LU	489	
30	LV	707	
31	LW	554	
32	LX	1056	
32	LY	1056	
33	LZ	183	
34	NA	593	
35	NB	610	
36	NC	357	
37	ND	214	
38	NF	151	
39	NG	137	
40	NH	1237	
41	NI	297	
42	NM	255	
43	NN	534	
44	NP	144	
45	NQ	82	
46	NS	1267	
47	NV	733	
48	OA	1729	
49	OH	143	
50	OU	152	
51	SA	504	
52	SB	511	

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Mol	Chain	Length	Quality of chain
53	SC	327	
53	SD	327	
54	SE	126	
54	SF	126	
55	SG	573	
56	SH	367	
57	SI	1183	
58	SJ	252	
58	SK	252	
59	SL	189	
60	SM	290	
61	SP	2493	
62	SQ	217	
63	SR	145	
64	SS	899	
65	ST	810	
66	SU	552	
67	SW	274	
68	SY	250	
69	SZ	483	

2 Entry composition

There are 69 unique types of molecules in this entry. The entry contains 162433 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 5'ETS rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	L0	64	Total	C	N	O	P	0	0
			1370	612	247	447	64		

- Molecule 2 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	L1	1272	Total	C	N	O	P	0	0
			27142	12133	4851	8886	1272		

- Molecule 3 is a RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	L2	155	Total	C	N	O	P	0	0
			3289	1471	573	1090	155		

- Molecule 4 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	L3	106	Total	C	N	O	0	0
			529	317	106	106		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
5	L4	234	Total	C	N	O	0	0
			1172	704	234	234		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
6	L5	206	Total	C	N	O	0	0
			1040	628	206	206		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
7	L6	206	Total	C	N	O	0	0
			1029	617	206	206		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
8	L7	178	Total	C	N	O	0	0
			903	547	178	178		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
9	L8	171	Total	C	N	O	0	0
			848	506	171	171		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
10	L9	181	Total	C	N	O	0	0
			914	552	181	181		

- Molecule 11 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
11	LC	128	Total	C	N	O	0	0
			642	386	128	128		

- Molecule 12 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
12	LD	137	Total	C	N	O	0	0
			693	419	137	137		

- Molecule 13 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	LE	129	Total	C	N	O	0	0
			640	382	129	129		

- Molecule 14 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	LF	97	Total	C	N	O	0	0
			484	290	97	97		

- Molecule 15 is a protein called 40S ribosomal protein S28-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
15	LG	62	Total	C	N	O	0	0
			309	185	62	62		

- Molecule 16 is a protein called NET1-associated nuclear protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	LH	806	Total	C	N	O	0	0
			4034	2422	806	806		

- Molecule 17 is a protein called U3 small nucleolar RNA-associated protein 8.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	LI	600	Total	C	N	O	0	0
			3027	1827	600	600		

- Molecule 18 is a protein called U3 small nucleolar RNA-associated protein 15.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	LJ	476	Total	C	N	O	0	0
			2394	1442	476	476		

- Molecule 19 is a protein called U3 small nucleolar RNA-associated protein 9.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	LK	132	Total	C	N	O	0	0
			664	400	132	132		

- Molecule 20 is a protein called U3 small nucleolar RNA-associated protein 5.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	LL	487	Total	C	N	O	0	0
			2440	1466	487	487		

- Molecule 21 is a protein called U3 small nucleolar RNA-associated protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	LM	1613	Total	C	N	O	0	0
			8115	4889	1613	1613		

- Molecule 22 is a protein called U3 small nucleolar RNA-associated protein 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	LN	663	Total	C	N	O	0	0
			3315	1989	663	663		

- Molecule 23 is a protein called Periodic tryptophan protein 2.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	LO	792	Total	C	N	O	0	0
			3958	2374	792	792		

- Molecule 24 is a protein called U3 small nucleolar RNA-associated protein 6.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	LP	379	Total	C	N	O	0	0
			1901	1143	379	379		

- Molecule 25 is a protein called U3 small nucleolar RNA-associated protein 12.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	LQ	815	Total	C	N	O	0	0
			4063	2433	815	815		

- Molecule 26 is a protein called U3 small nucleolar RNA-associated protein 13.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	LR	793	Total	C	N	O	0	0
			3962	2376	793	793		

- Molecule 27 is a protein called U3 small nucleolar RNA-associated protein 18.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	LS	454	Total	C	N	O	0	0
			2279	1371	454	454		

- Molecule 28 is a protein called U3 small nucleolar RNA-associated protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	LT	871	Total	C	N	O	0	0
			4347	2605	871	871		

- Molecule 29 is a protein called Protein SOF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	LU	454	Total	C	N	O	0	0
			2274	1366	454	454		

- Molecule 30 is a protein called Ribosome biogenesis protein ENP2.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	LV	357	Total	C	N	O	0	0
			1791	1077	357	357		

- Molecule 31 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	LW	459	Total	C	N	O	0	0
			2304	1386	459	459		

- Molecule 32 is a protein called RNA cytidine acetyltransferase.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	LX	852	Total	C	N	O	0	0
			4302	2598	852	852		
32	LY	846	Total	C	N	O	0	0
			4274	2582	846	846		

- Molecule 33 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	LZ	160	Total	C	N	O	0	0
			808	488	160	160		

- Molecule 34 is a protein called U3 small nucleolar RNA-associated protein MPP10.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	NA	296	Total	C	N	O	0	0
			1491	899	296	296		

- Molecule 35 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	NB	231	Total	C	N	O	0	0
			1159	697	231	231		

- Molecule 36 is a protein called U3 small nucleolar ribonucleoprotein protein LCP5.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	NC	135	Total	C	N	O	0	0
			669	399	135	135		

- Molecule 37 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	ND	59	Total	C	N	O	0	0
			297	179	59	59		

- Molecule 38 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	NF	141	Total	C	N	O	0	0
			711	429	141	141		

- Molecule 39 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
39	NG	127	Total	C	N	O	0	0
			630	376	127	127		

- Molecule 40 is a protein called U3 small nucleolar RNA-associated protein 22.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	NH	1077	Total	C	N	O	0	0
			5443	3289	1077	1077		

- Molecule 41 is a protein called Ribosomal RNA-processing protein 7.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	NI	240	Total	C	N	O	0	0
			1210	730	240	240		

- Molecule 42 is a protein called Small ribosomal subunit protein eS1A.

Mol	Chain	Residues	Atoms				AltConf	Trace
42	NM	237	Total	C	N	O	0	0
			1183	709	237	237		

- Molecule 43 is a protein called Protein BFR2.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	NN	43	Total	C	N	O	0	0
			215	129	43	43		

- Molecule 44 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	NP	134	Total	C	N	O	0	0
			666	398	134	134		

- Molecule 45 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
45	NQ	79	Total	C	N	O	0	0
			398	240	79	79		

- Molecule 46 is a protein called Probable ATP-dependent RNA helicase DHR1.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	NS	844	Total	C	N	O	0	0
			4268	2580	844	844		

- Molecule 47 is a protein called Exosome complex exonuclease RRP6.

Mol	Chain	Residues	Atoms				AltConf	Trace
47	NV	8	Total	C	N	O	0	0
			39	23	8	8		

- Molecule 48 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms				AltConf	Trace
48	OA	14	Total	C	N	O	0	0
			69	41	14	14		

- Molecule 49 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms				AltConf	Trace
49	OH	120	Total	C	N	O	0	0
			594	354	120	120		

- Molecule 50 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms				AltConf	Trace
50	OU	56	Total	C	N	O	0	0
			278	166	56	56		

- Molecule 51 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms				AltConf	Trace
51	SA	384	Total	C	N	O	1	0
			1924	1154	385	385		

- Molecule 52 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms				AltConf	Trace
52	SB	433	Total	C	N	O	0	0
			2161	1295	433	433		

- Molecule 53 is a protein called rRNA 2'-O-methyltransferase fibrillarin.

Mol	Chain	Residues	Atoms				AltConf	Trace
53	SC	238	Total	C	N	O	0	0
			1198	722	238	238		
53	SD	238	Total	C	N	O	0	0
			1198	722	238	238		

- Molecule 54 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
54	SE	121	Total	C	N	O	0	0
			615	373	121	121		
54	SF	121	Total	C	N	O	0	0
			615	373	121	121		

- Molecule 55 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	SG	453	Total	C	N	O	0	0
			2260	1354	453	453		

- Molecule 56 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
56	SH	360	Total	C	N	O	0	0
			1801	1081	360	360		

- Molecule 57 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms				AltConf	Trace
57	SI	797	Total	C	N	O	0	0
			4024	2430	797	797		

- Molecule 58 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

Mol	Chain	Residues	Atoms				AltConf	Trace
58	SJ	213	Total	C	N	O	0	0
			1074	648	213	213		
58	SK	229	Total	C	N	O	0	0
			1160	702	229	229		

- Molecule 59 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
59	SL	148	Total	C	N	O	0	0
			751	455	148	148		

- Molecule 60 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms				AltConf	Trace
60	SM	247	Total	C	N	O	0	0
			1243	749	247	247		

- Molecule 61 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms				AltConf	Trace
61	SP	2156	Total	C	N	O	0	0
			10847	6535	2156	2156		

- Molecule 62 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms				AltConf	Trace
62	SQ	117	Total	C	N	O	0	0
			592	358	117	117		

- Molecule 63 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
63	SR	95	Total	C	N	O	0	0
			476	286	95	95		

- Molecule 64 is a protein called U3 small nucleolar RNA-associated protein 14.

Mol	Chain	Residues	Atoms				AltConf	Trace
64	SS	225	Total	C	N	O	1	0
			1145	695	225	225		

- Molecule 65 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms				AltConf	Trace
65	ST	603	Total	C	N	O	0	0
			3041	1835	603	603		

- Molecule 66 is a protein called Nucleolar complex protein 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
66	SU	532	Total	C	N	O	0	0
			2703	1639	532	532		

- Molecule 67 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms				AltConf	Trace
67	SW	219	Total	C	N	O	0	0
			1104	666	219	219		

- Molecule 68 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms				AltConf	Trace
68	SY	122	Total	C	N	O	0	0
			611	367	122	122		

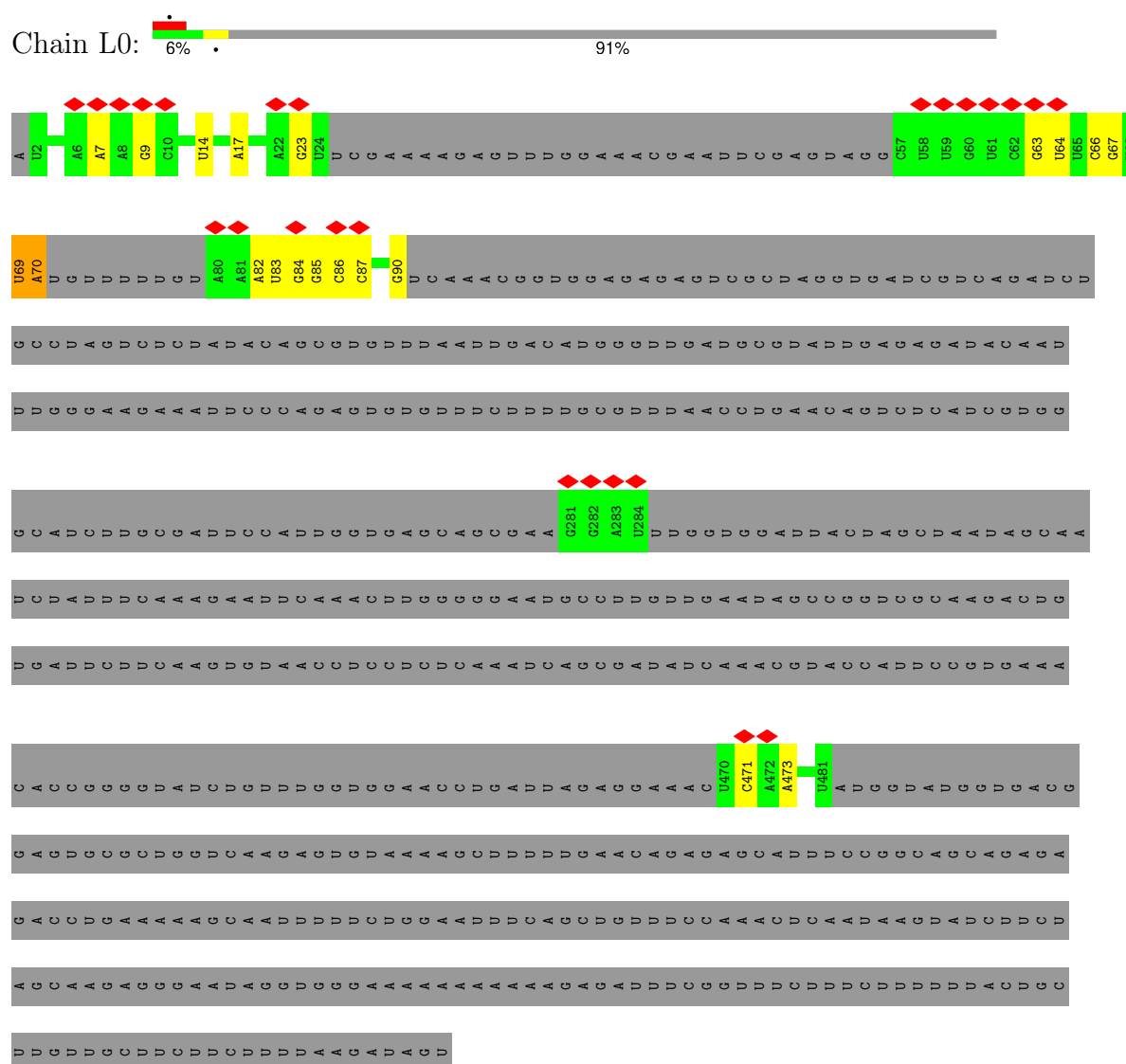
- Molecule 69 is a protein called Essential nuclear protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
69	SZ	259	Total	C	N	O	0	0
			1314	796	259	259		

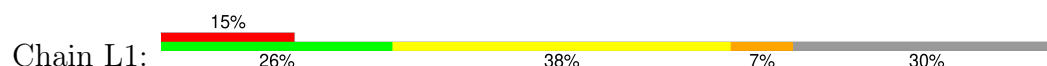
3 Residue-property plots [i](#)

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.

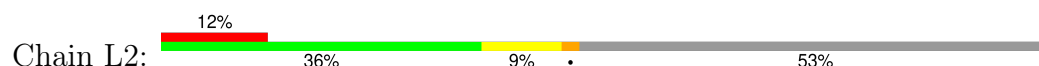
• Molecule 1: 5'ETS rRNA



• Molecule 2: 18S rRNA



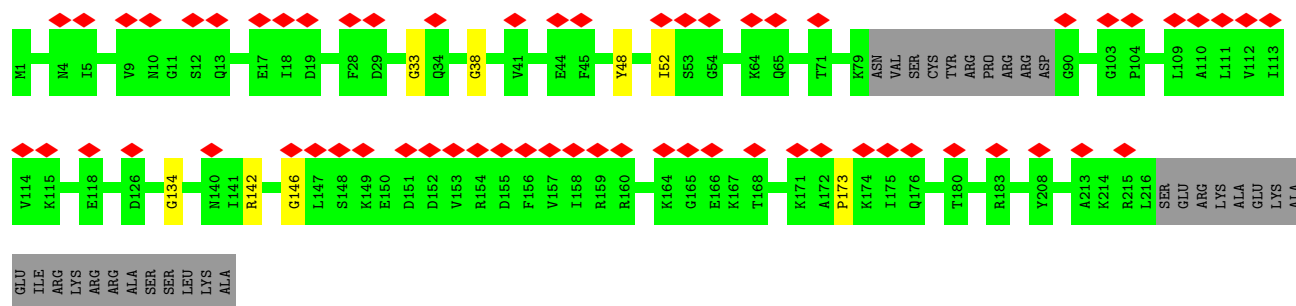






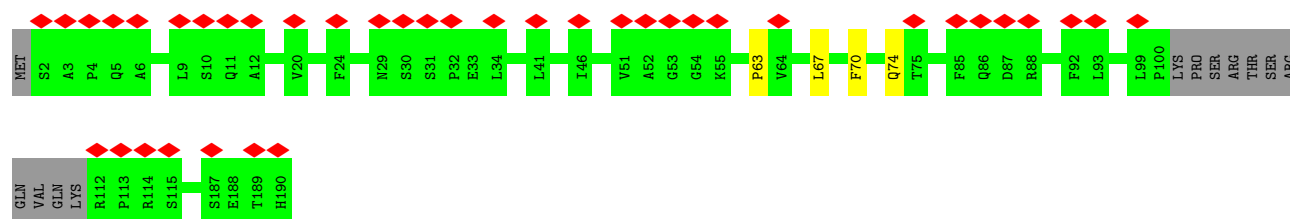
• Molecule 7: 40S ribosomal protein S6-A

Chain L6: 26% 84% 13%



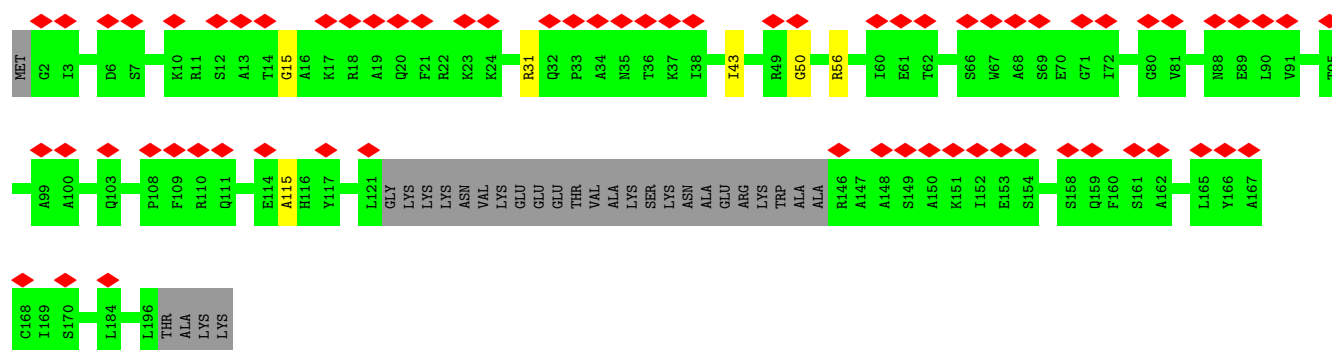
• Molecule 8: 40S ribosomal protein S7-A

Chain L7: 21% 92% 6%



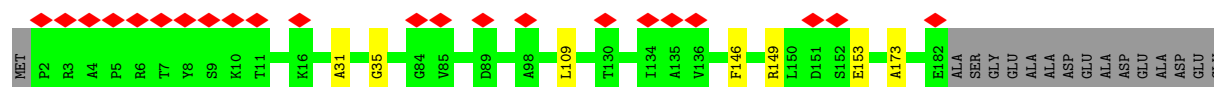
• Molecule 9: 40S ribosomal protein S8-A

Chain L8: 34% 82% 14%

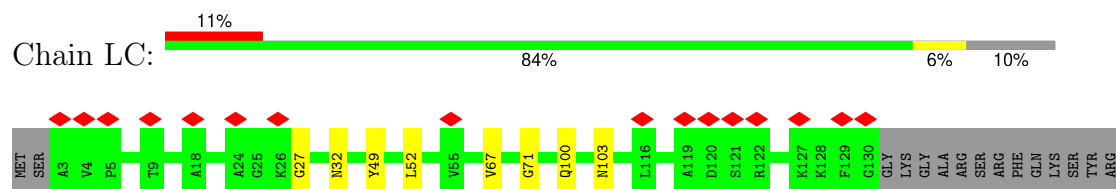


• Molecule 10: 40S ribosomal protein S9-A

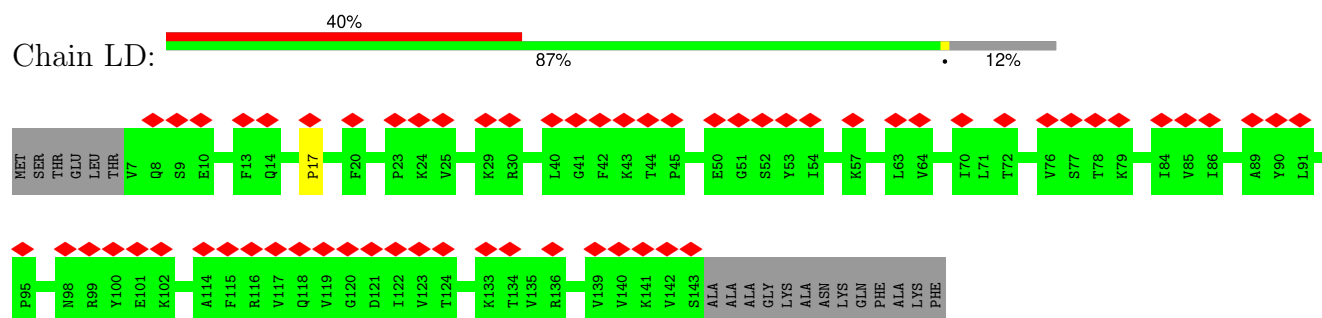
Chain L9: 11% 88% 8%



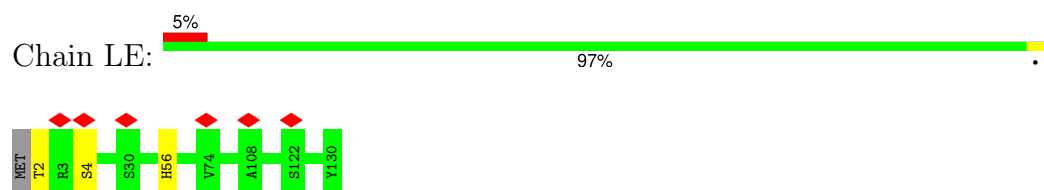
- Molecule 11: 40S ribosomal protein S16-A



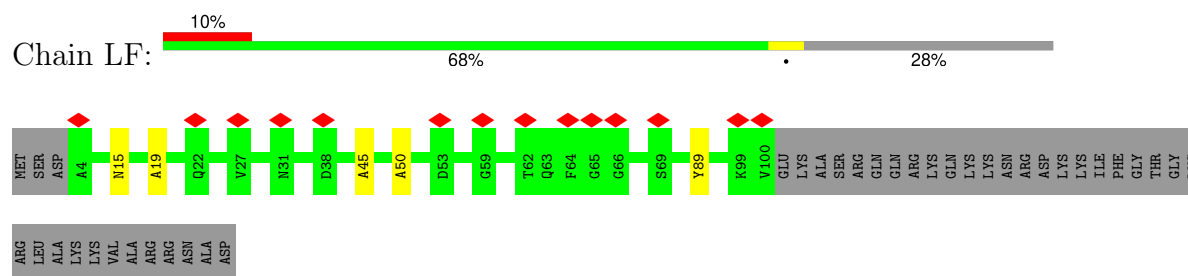
- Molecule 12: 40S ribosomal protein S11-A



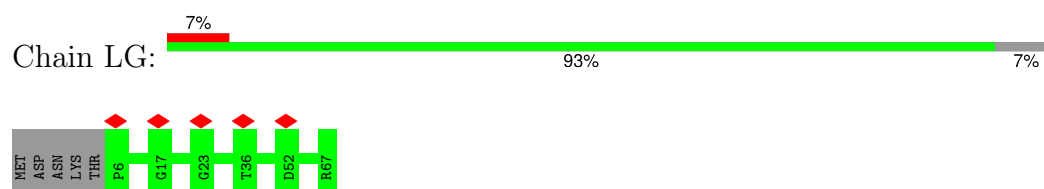
- Molecule 13: 40S ribosomal protein S22-A



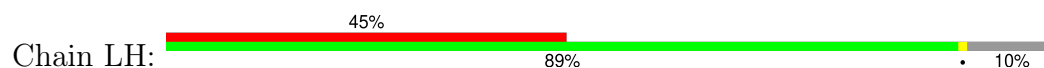
- Molecule 14: 40S ribosomal protein S24-A

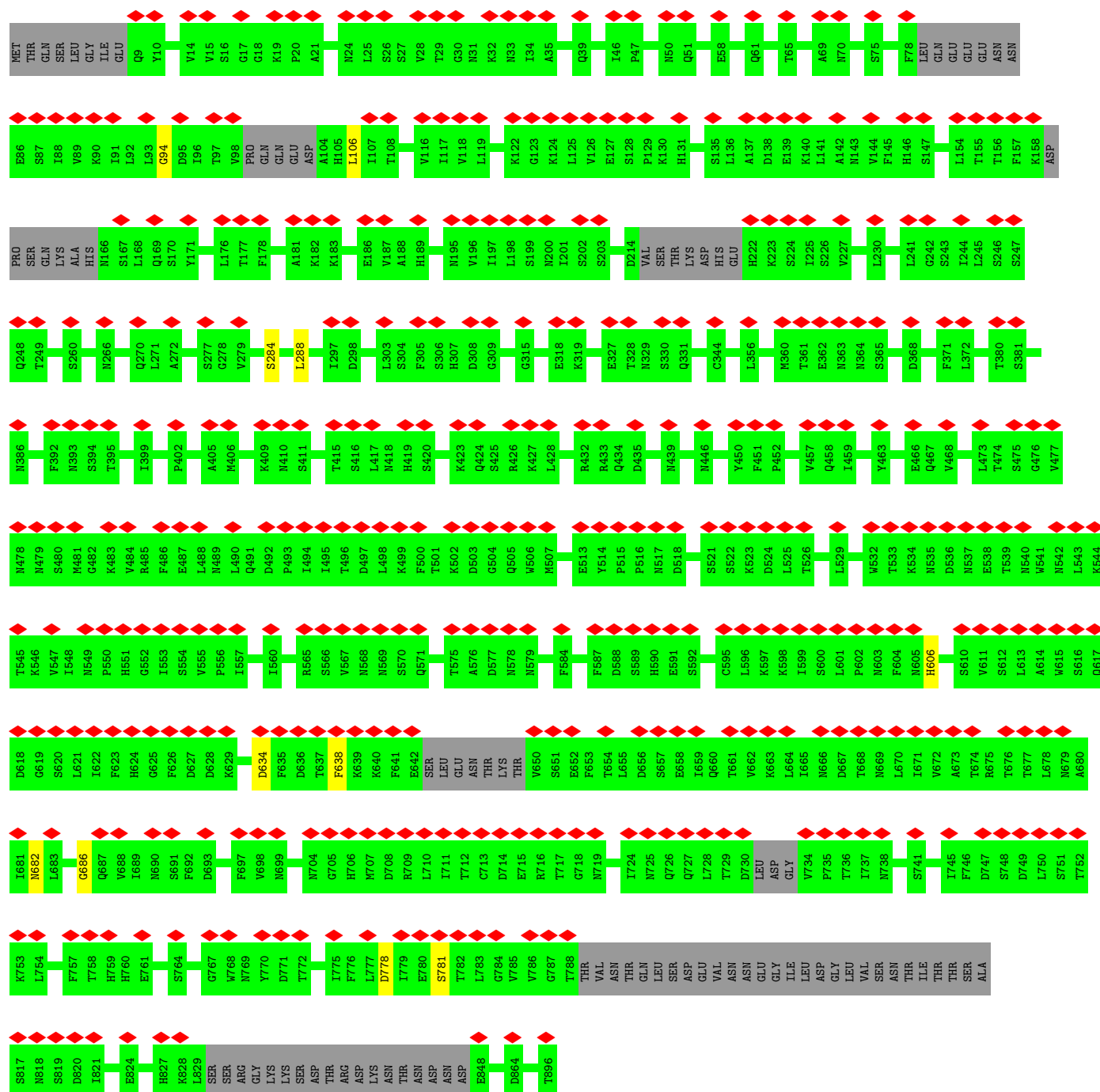


- Molecule 15: 40S ribosomal protein S28-A

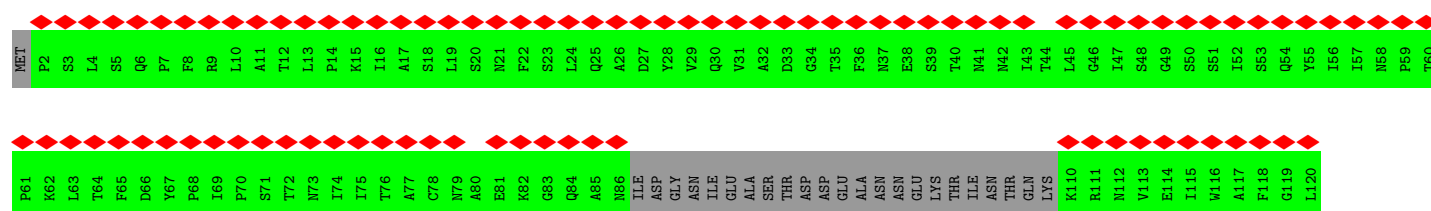
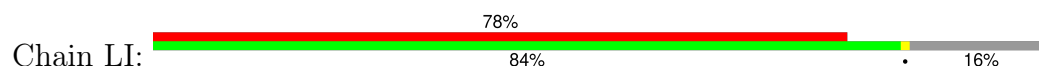


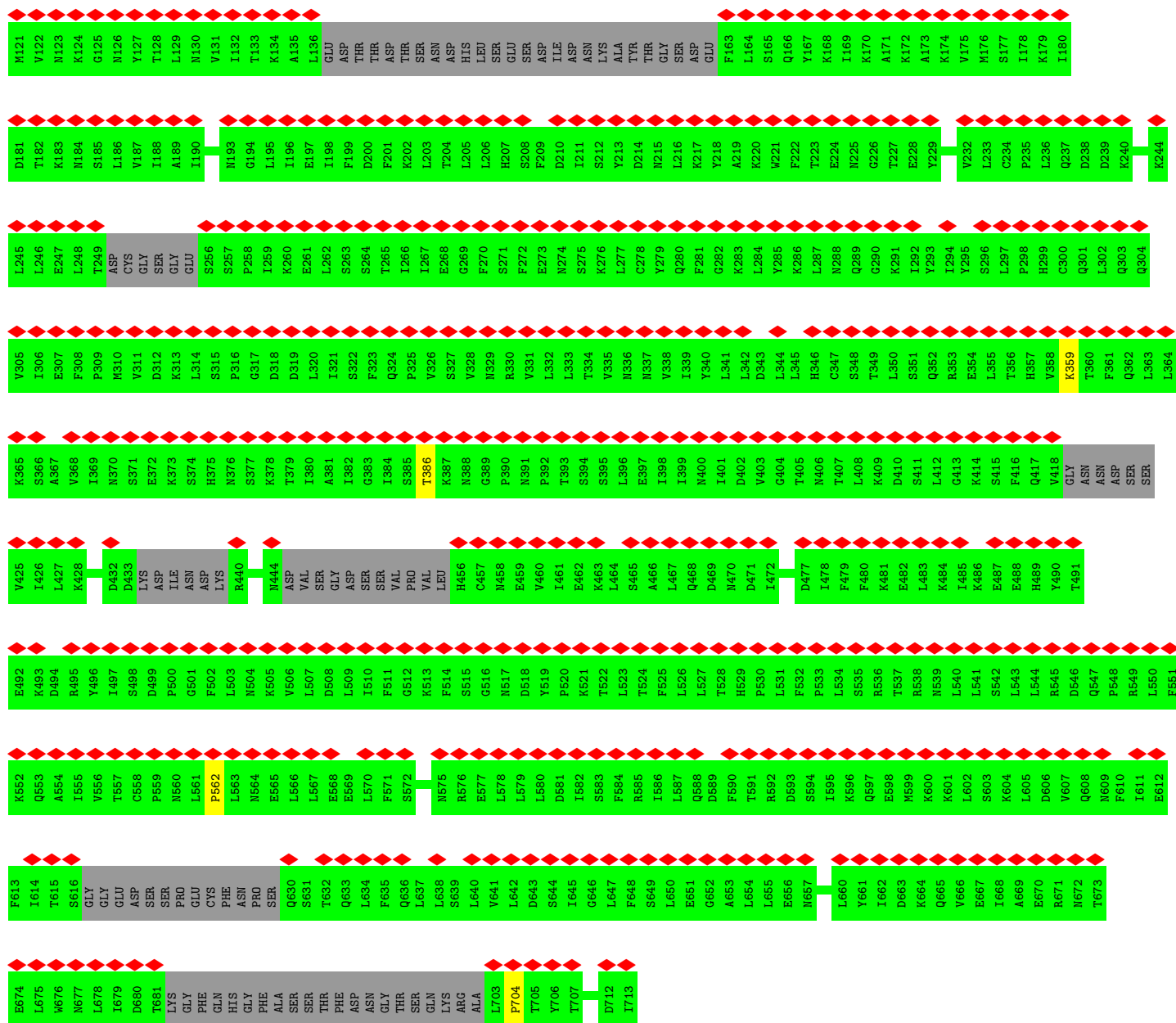
- Molecule 16: NET1-associated nuclear protein 1



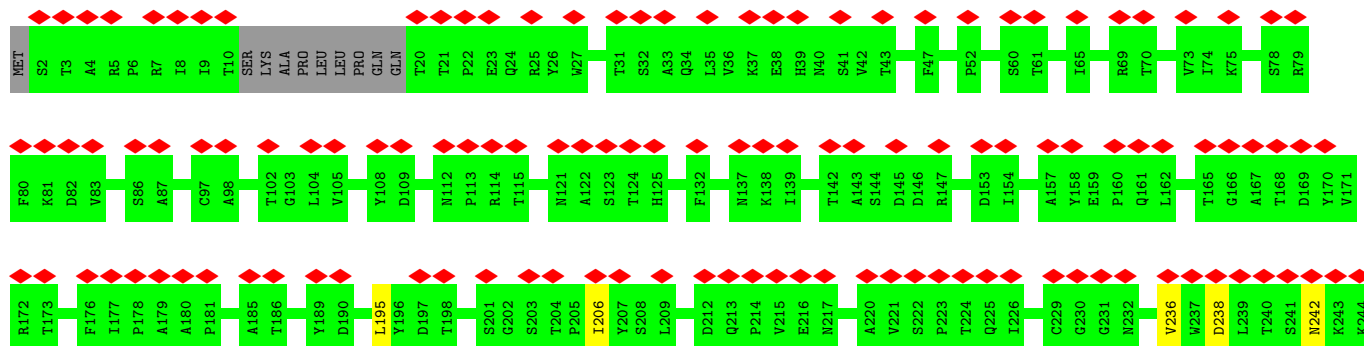
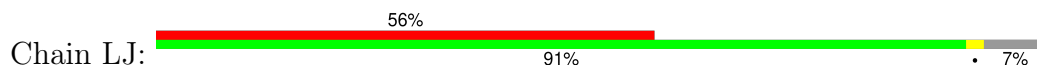


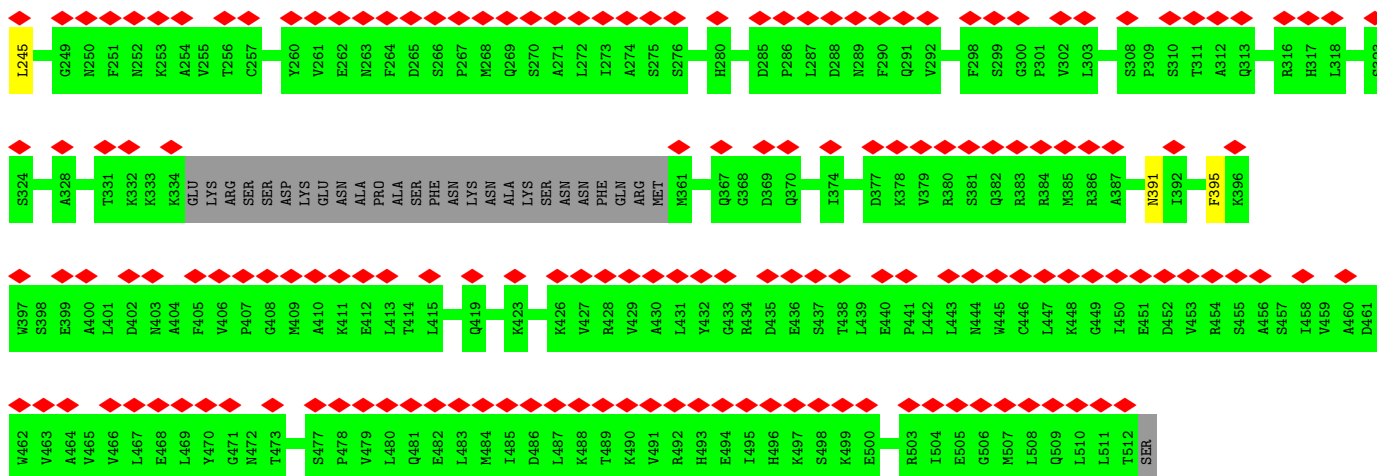
• Molecule 17: U3 small nucleolar RNA-associated protein 8



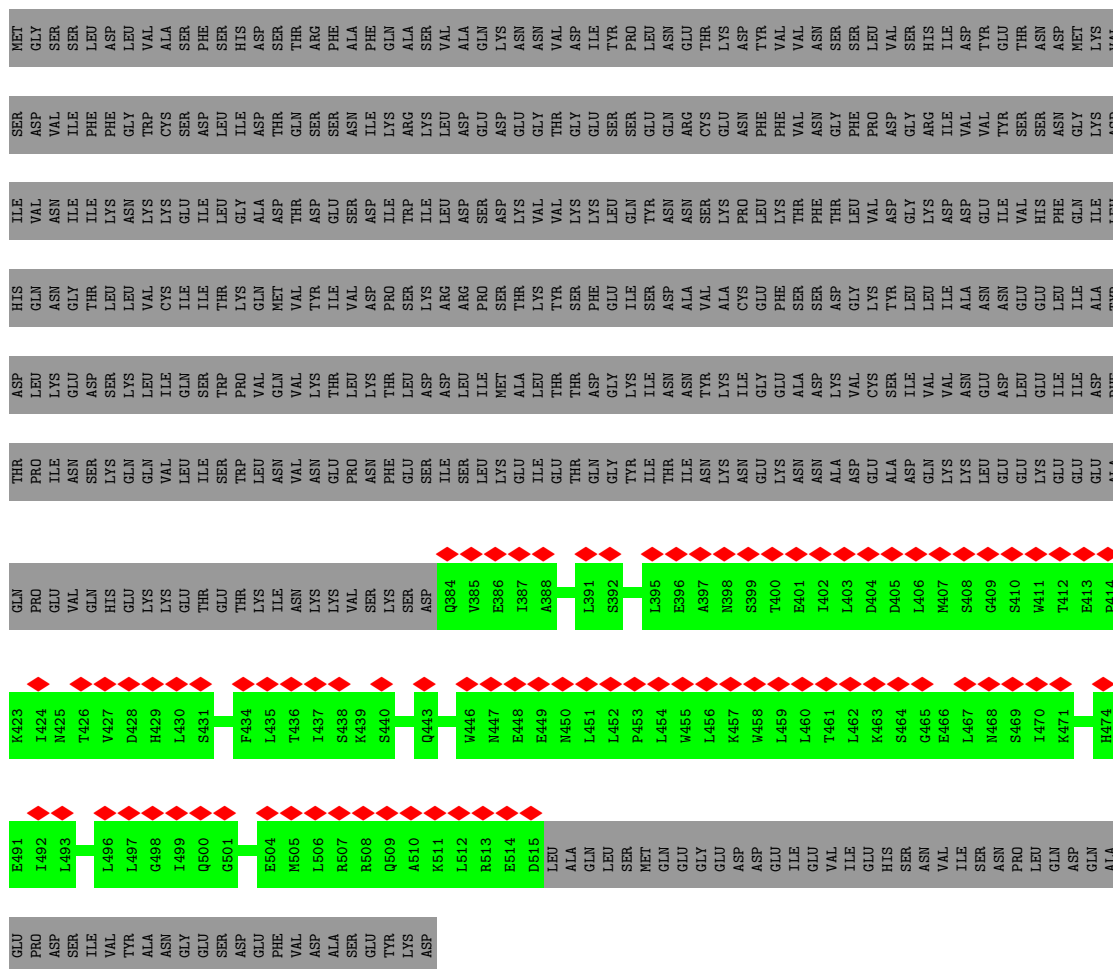


• Molecule 18: U3 small nucleolar RNA-associated protein 15

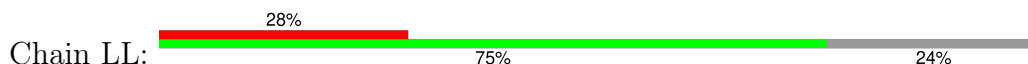




- Molecule 19: U3 small nucleolar RNA-associated protein 9

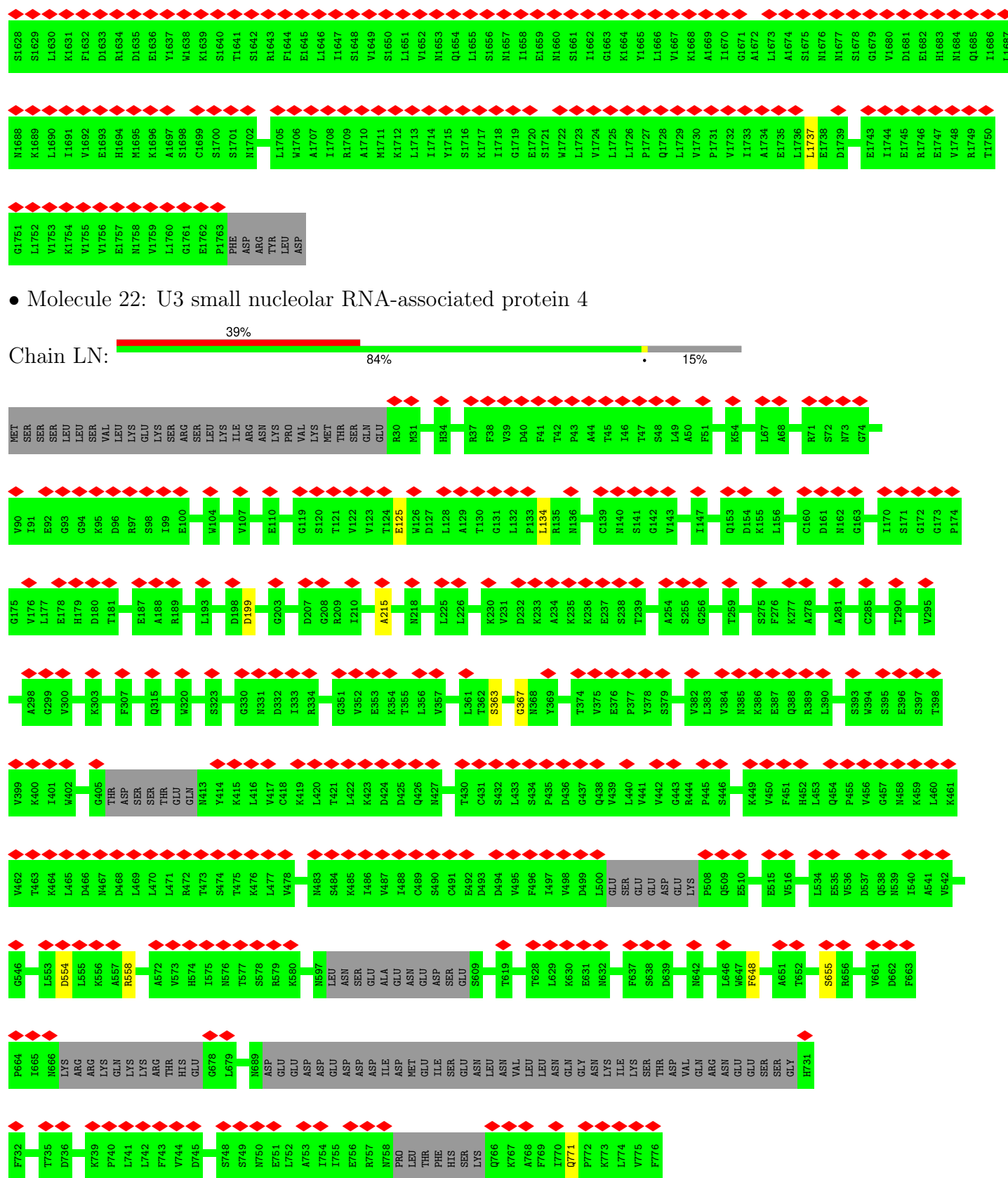


- Molecule 20: U3 small nucleolar RNA-associated protein 5



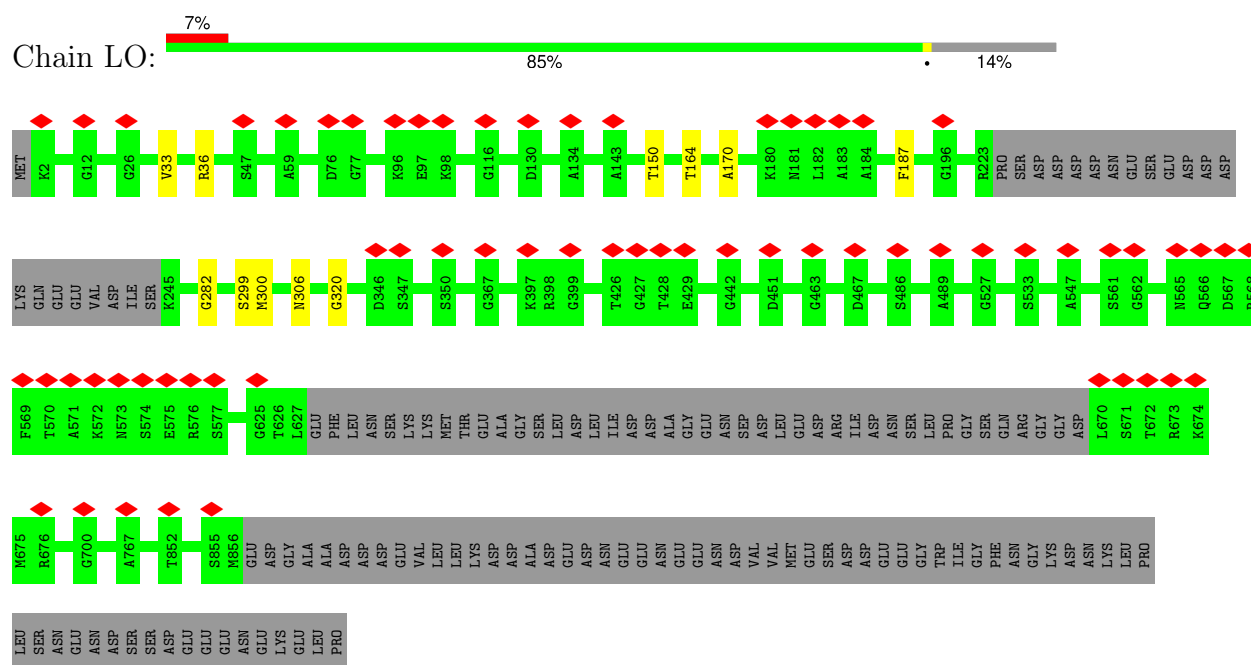


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T1569	E1569	F1508	N1447	D1387	S1327	T1267	GLN	T1147	S1086	F966	S900	L942	ASP	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
E1570	E1570	F1509	I1448	S1388	I1328	T1268	ASN	ASP	N1089	M967	L903	L943	GLU	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
R1571	E1571	F1510	D1449	S1389	L1329	V1269	GLU	ASP	D1090	G968	N904	L944	THR	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
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E1585	E1585	I1524	L1463	L1403	S1343	I1284		L1164	SER	V982	E921	L958	LYS	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
E1586	E1586	E1525	E1464	F1404	M1344	I1284		L1165	SER	V983	E922	L959	GLU	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
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V1596	E1596	V1535	V1474	F1414	L1354	D1294		L1175	PHE	E993	E932	L969	PHE	L876	S876	L874	T872	F871	L870	K868	E967	S866	G865	V864	N863	R862	V861	K860	L858	A857	E856	I853	T852	R849	L848	H847	LEU	ALA	LEU	GLN	SER	VAL	GLU	LYS
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• Molecule 22: U3 small nucleolar RNA-associated protein 4

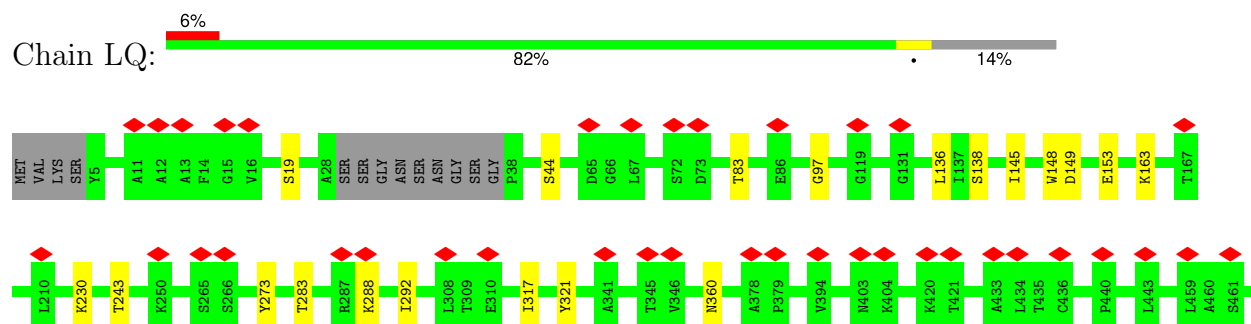
• Molecule 23: Periodic tryptophan protein 2

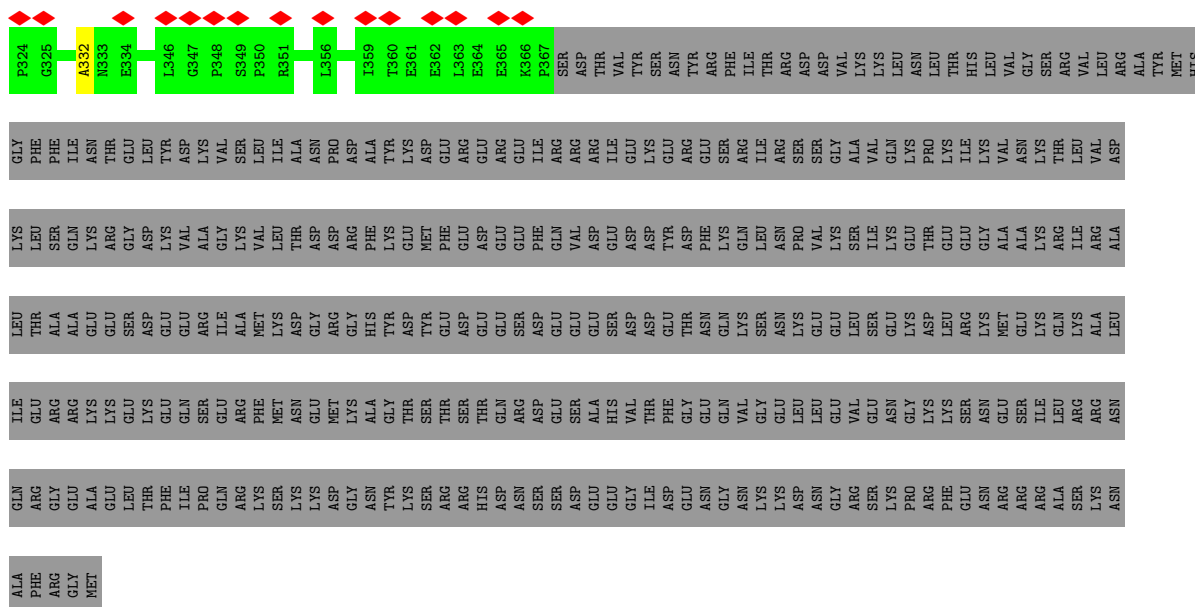


- Molecule 24: U3 small nucleolar RNA-associated protein 6

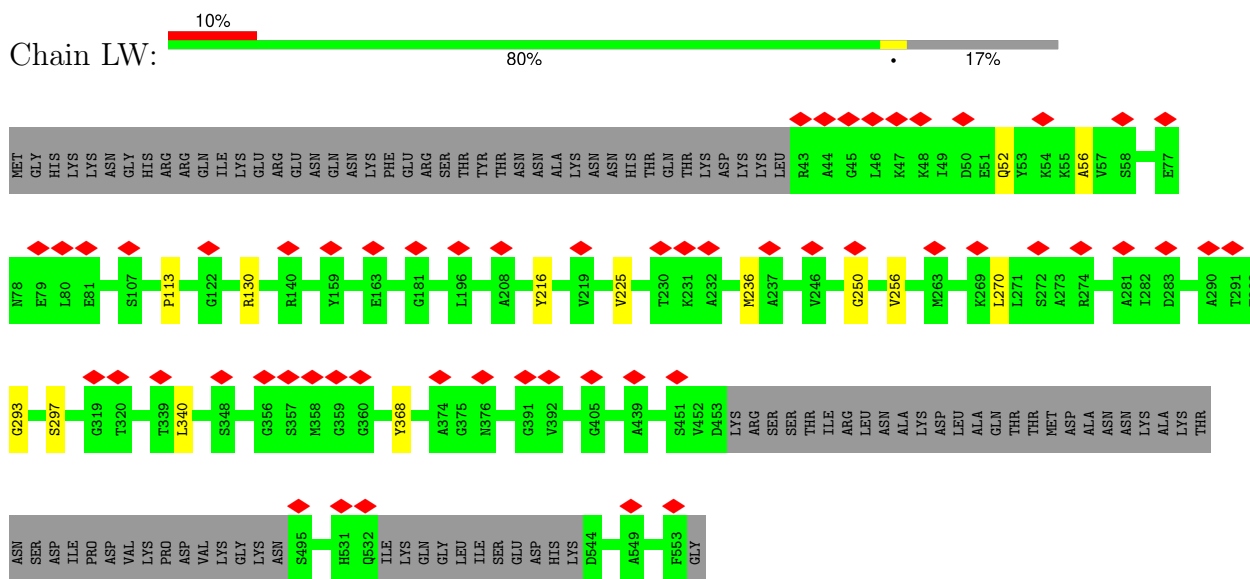


- Molecule 25: U3 small nucleolar RNA-associated protein 12

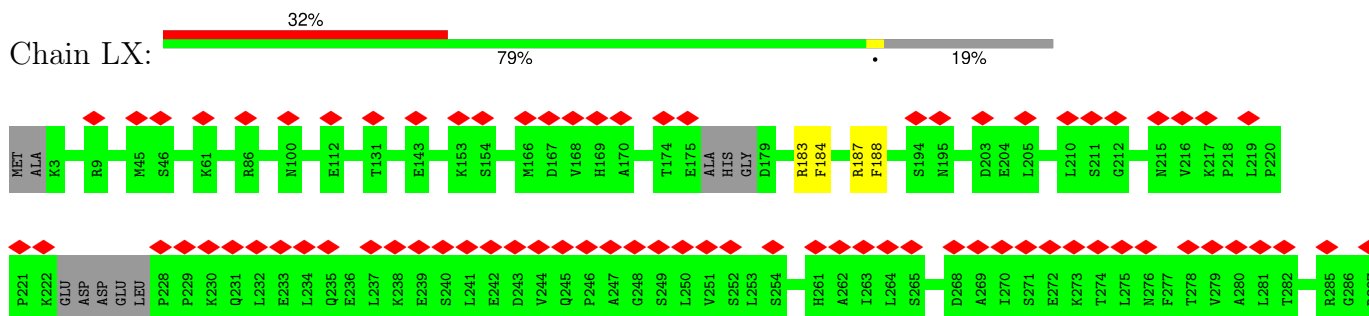


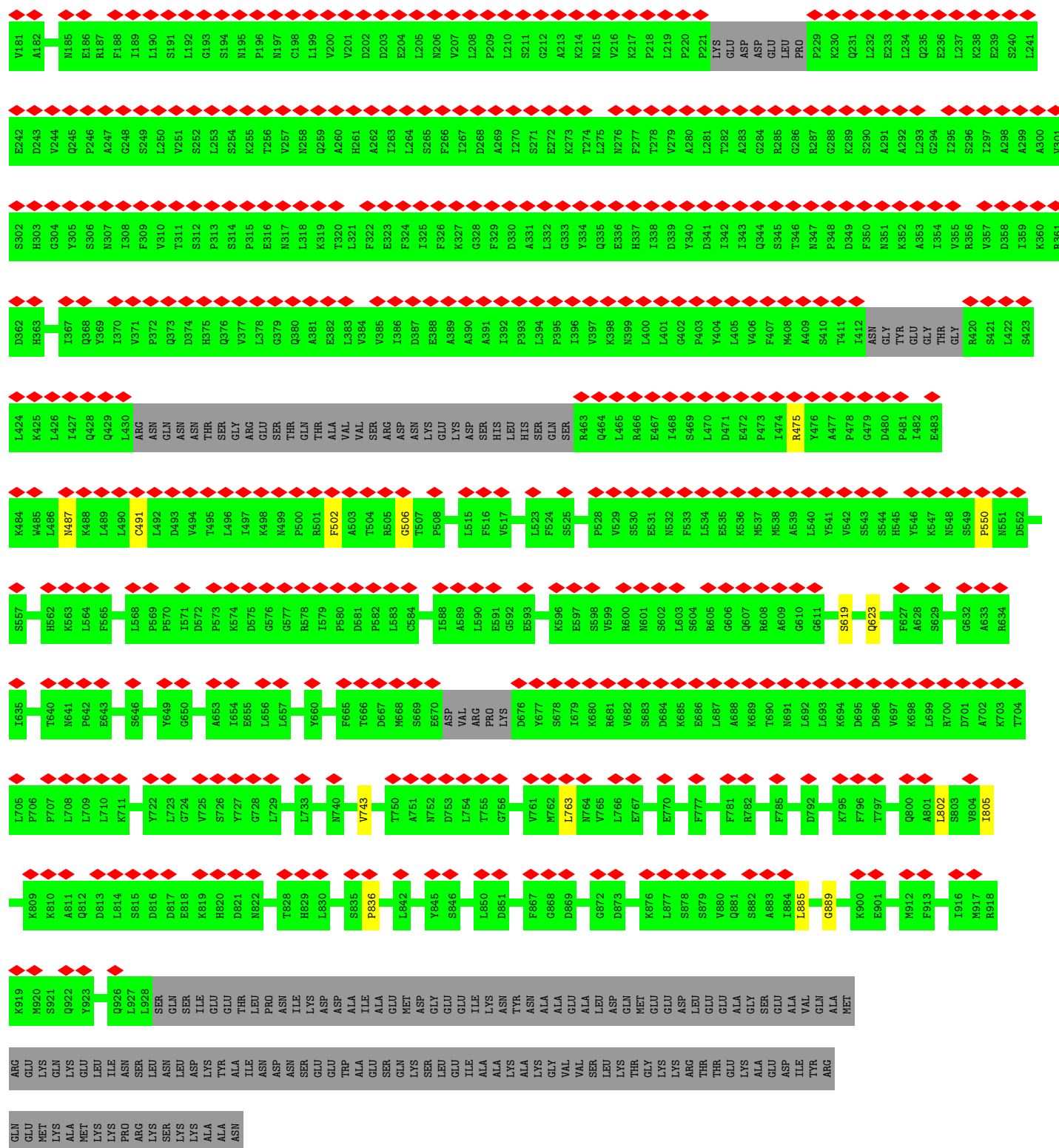


- Molecule 31: U3 small nucleolar RNA-associated protein 7

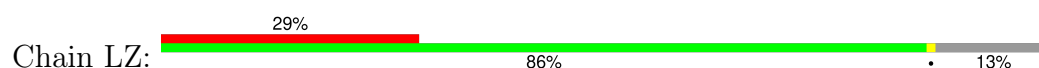


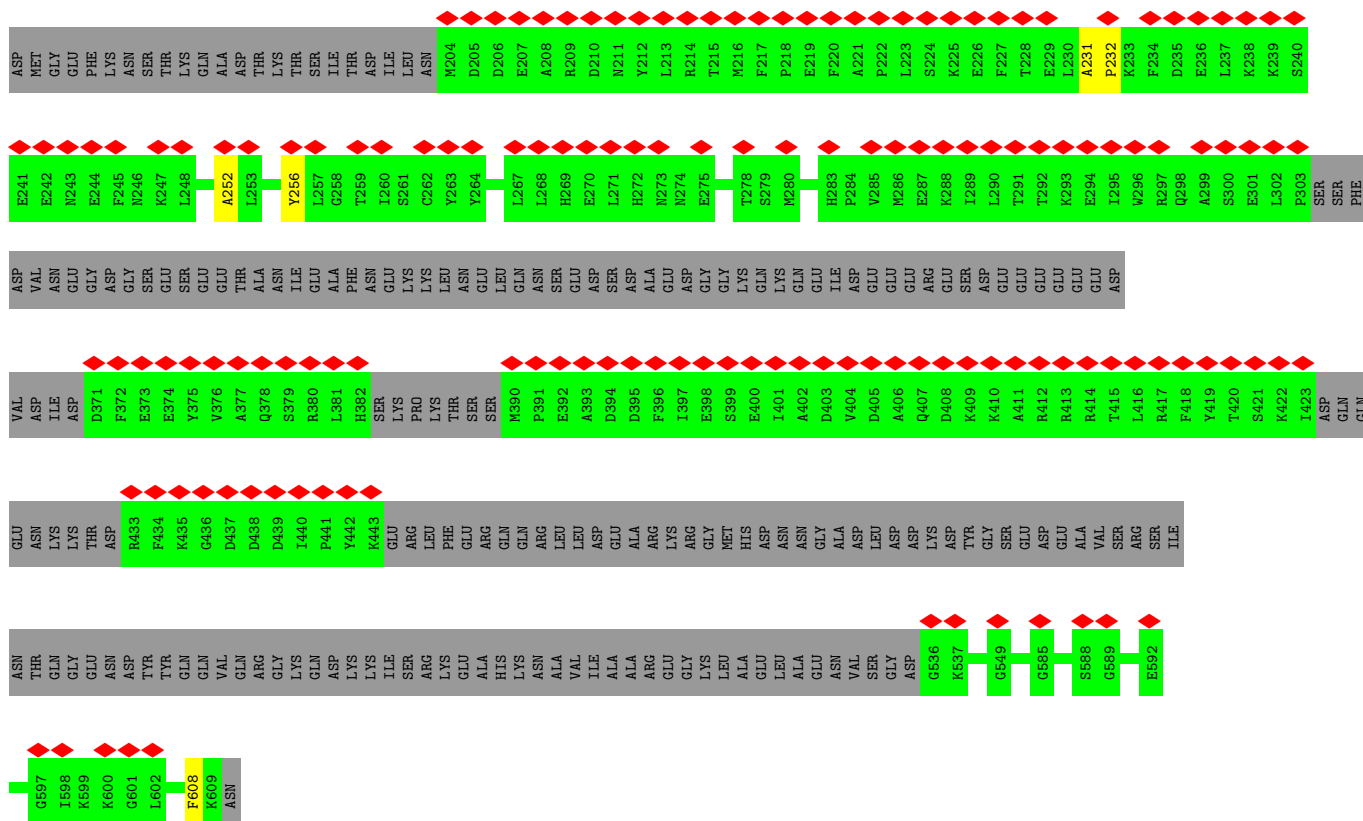
- Molecule 32: RNA cytidine acetyltransferase



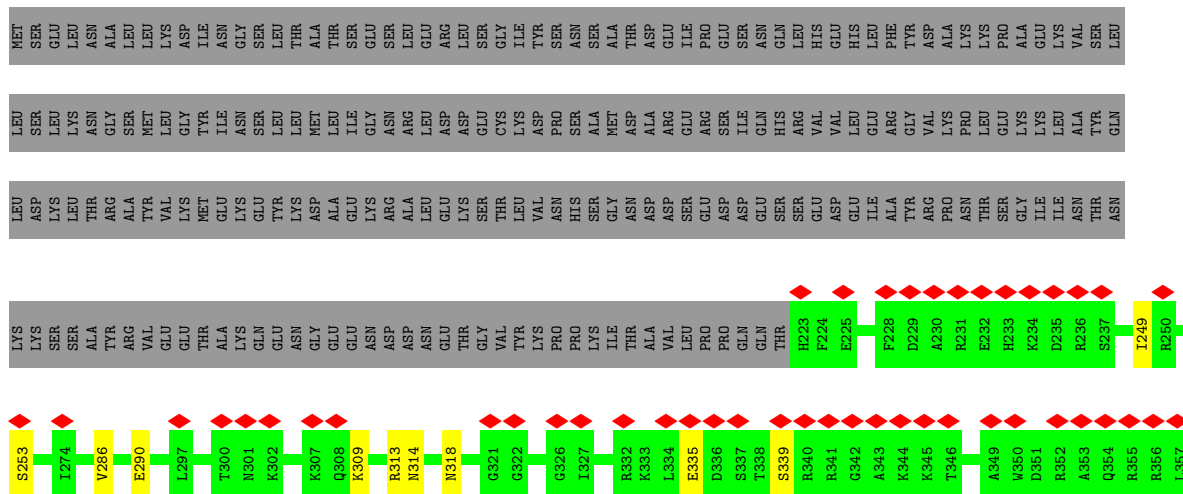


● Molecule 33: U3 small nucleolar ribonucleoprotein protein IMP3

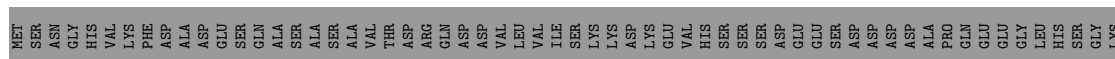




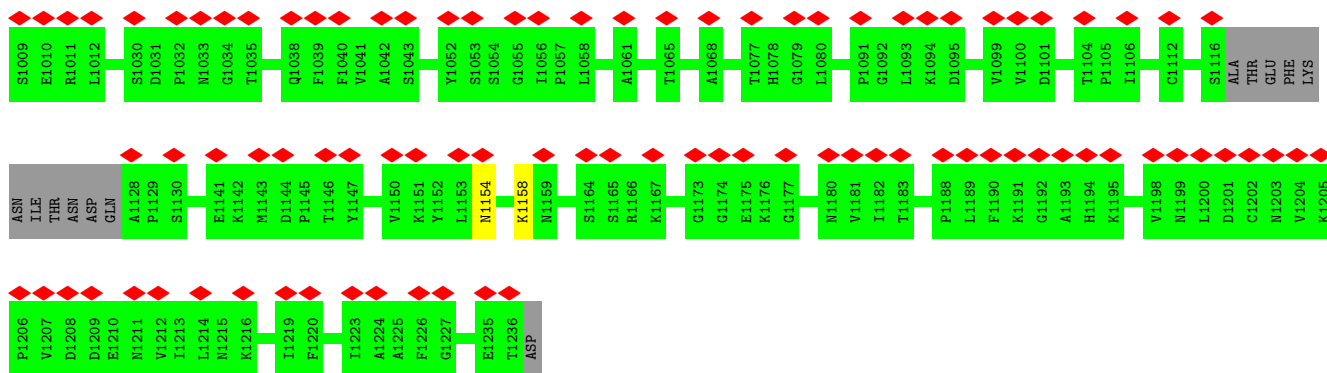
- Molecule 36: U3 small nucleolar ribonucleoprotein protein LCP5



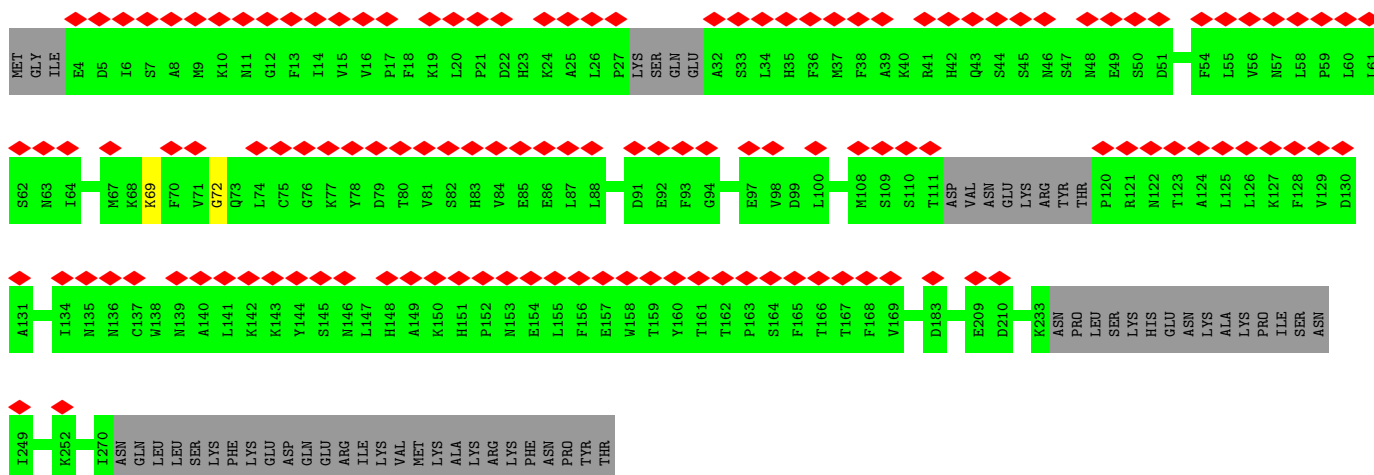
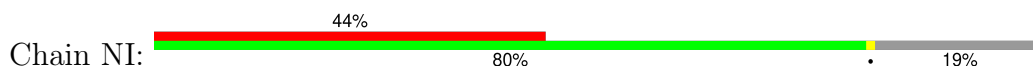
- Molecule 37: Bud site selection protein 21



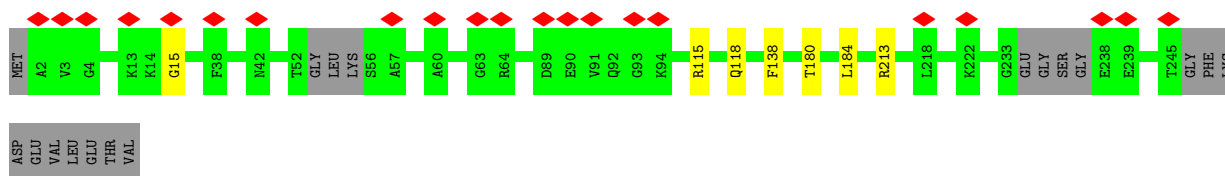




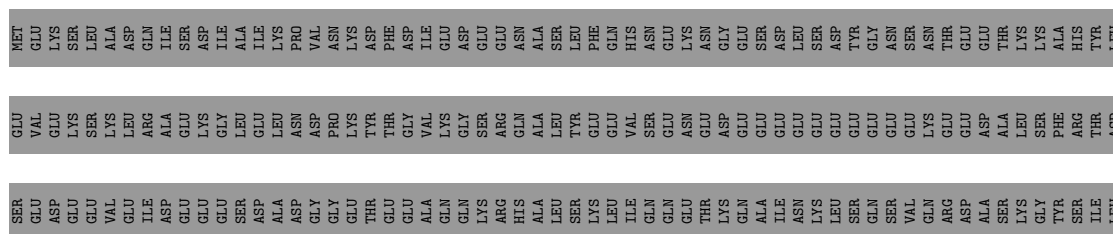
- Molecule 41: Ribosomal RNA-processing protein 7



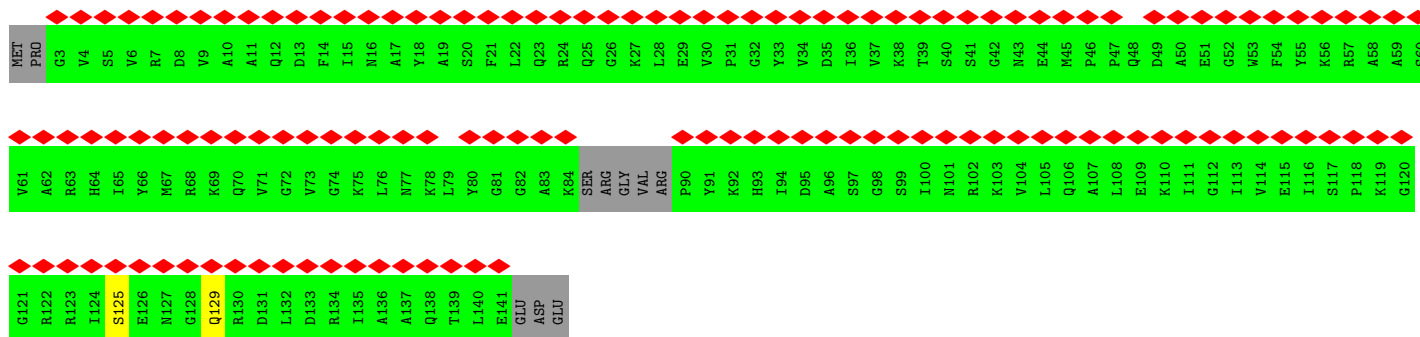
- Molecule 42: Small ribosomal subunit protein eS1A



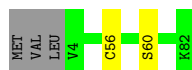
- Molecule 43: Protein BFR2



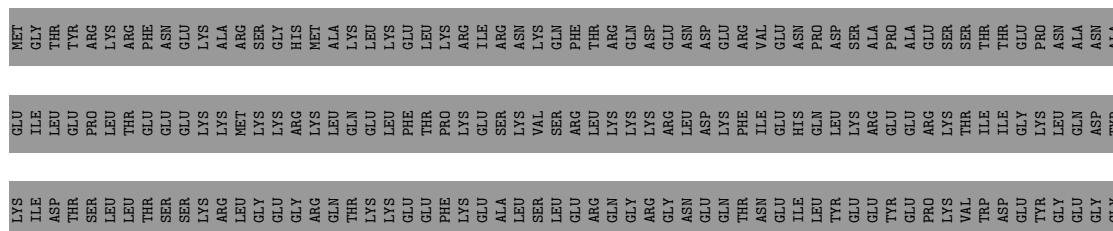
- Molecule 44: 40S ribosomal protein S19-A

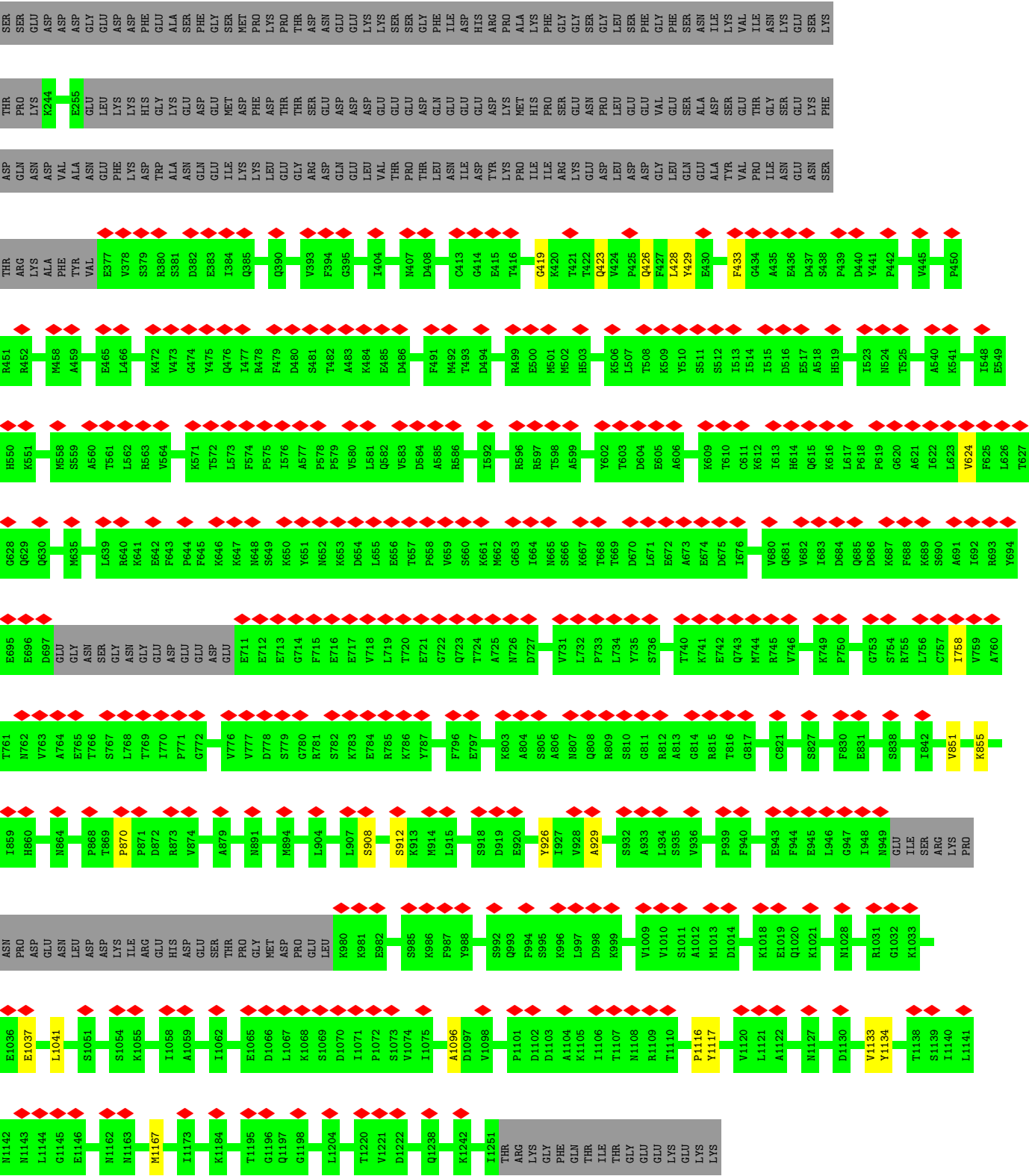


- Molecule 45: 40S ribosomal protein S27-A



- Molecule 46: Probable ATP-dependent RNA helicase DHR1





• Molecule 47: Exosome complex exonuclease RRP6

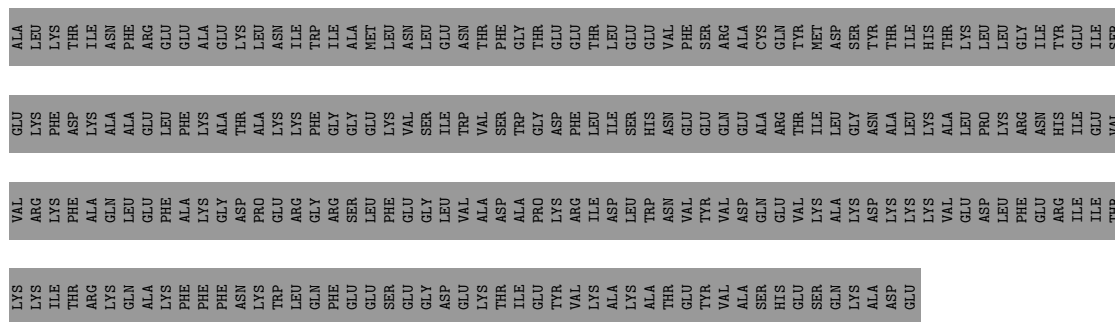


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PRO									
ALA									
ALA									

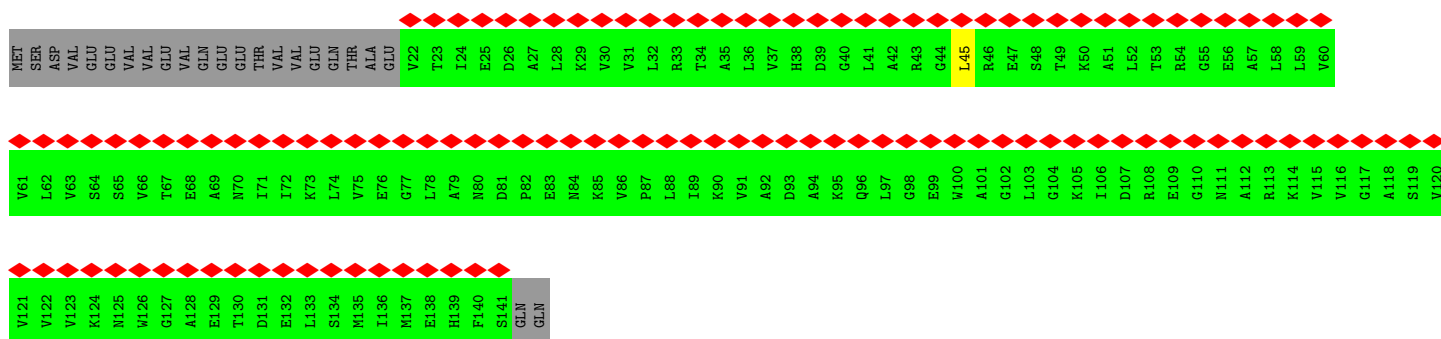
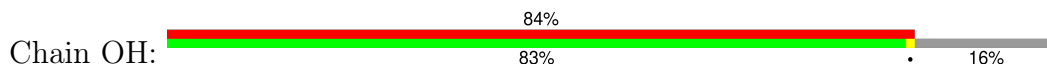
Chain OA: 99%

[illegible]

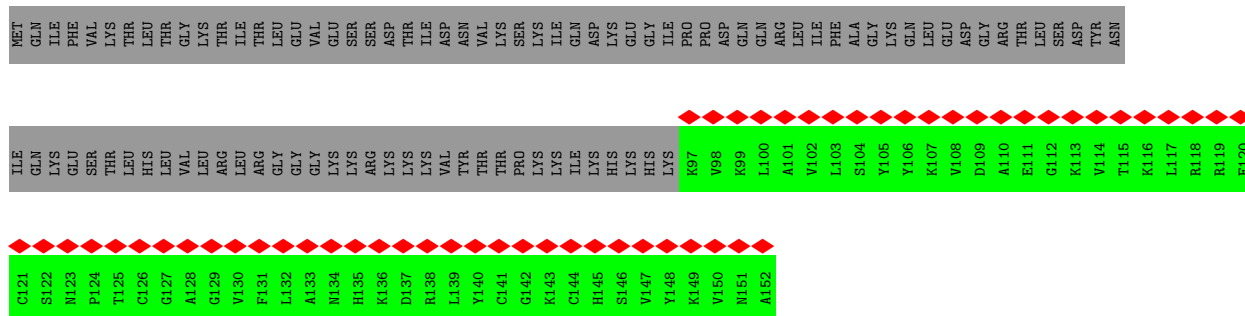




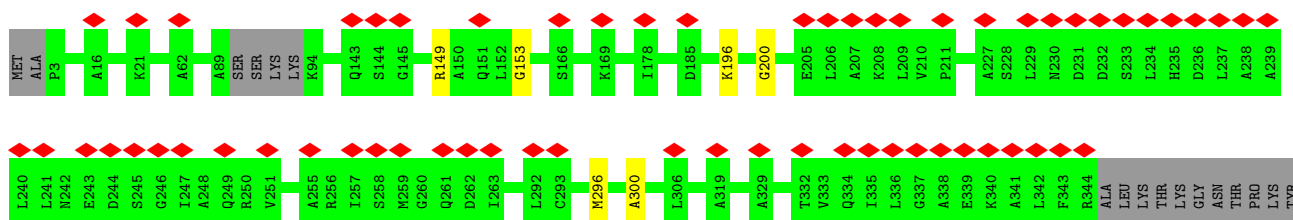
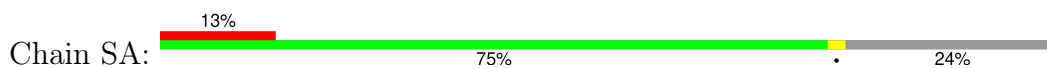
- Molecule 49: 40S ribosomal protein S12



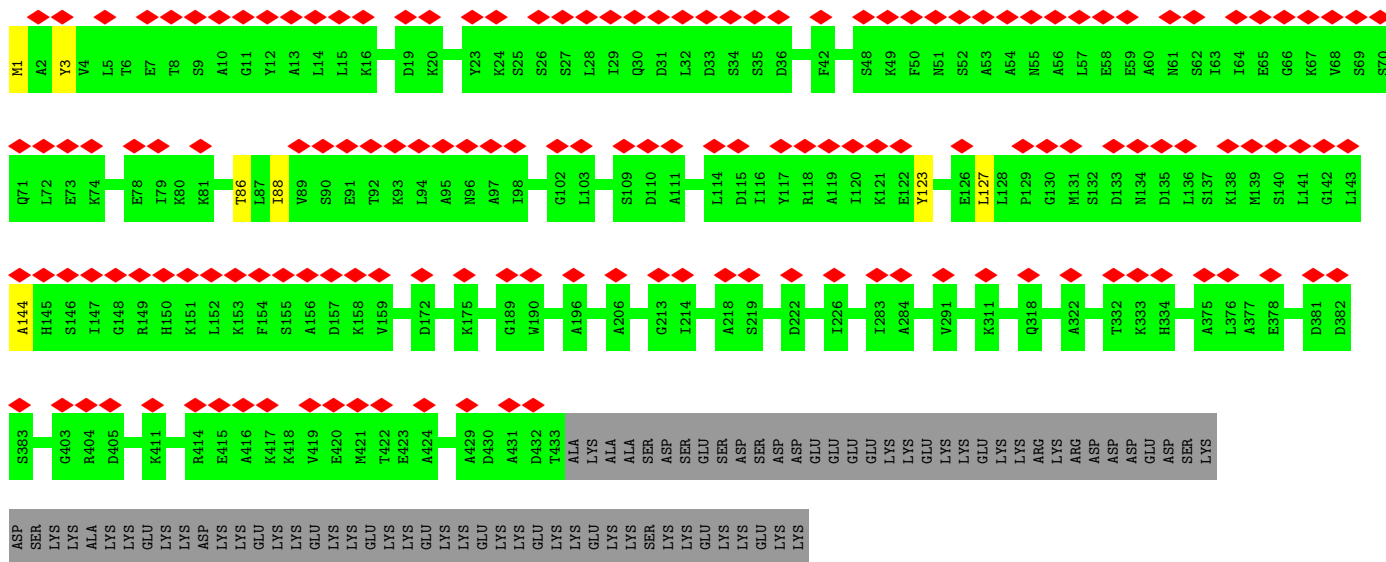
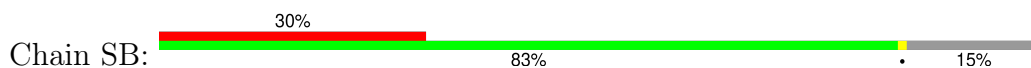
- Molecule 50: Ubiquitin-40S ribosomal protein S31



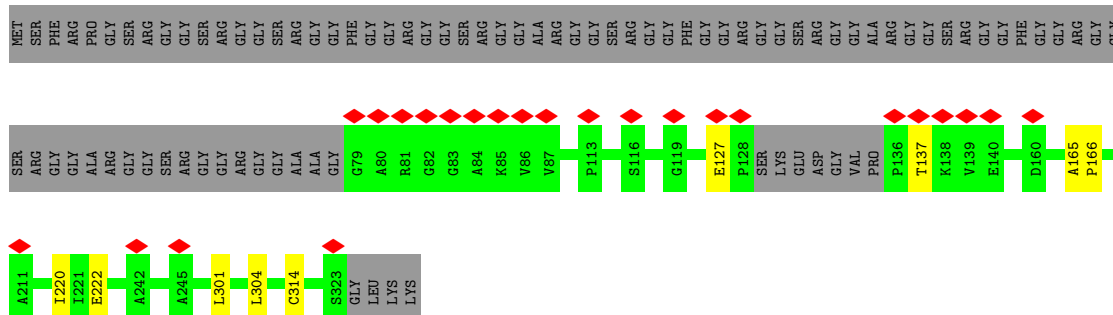
- Molecule 51: Nucleolar protein 56



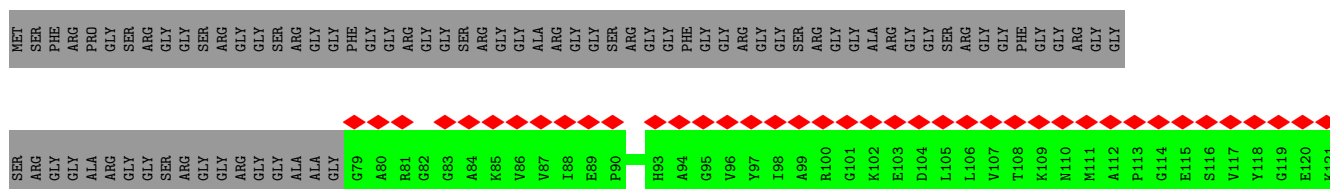
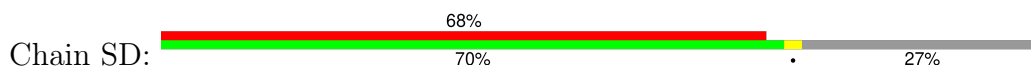
- Molecule 52: Nucleolar protein 58

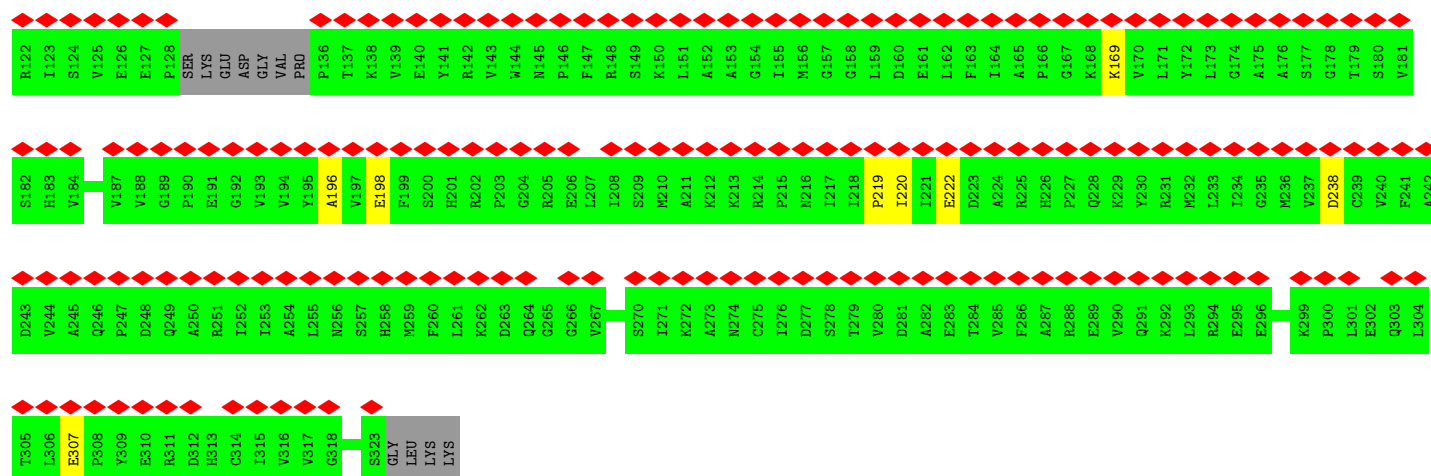


- Molecule 53: rRNA 2'-O-methyltransferase fibrillar

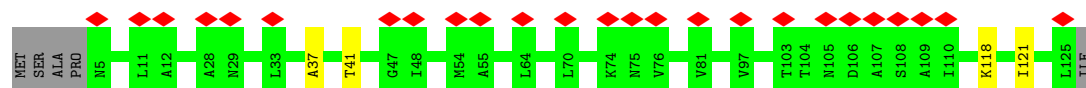


- Molecule 53: rRNA 2'-O-methyltransferase fibrillar

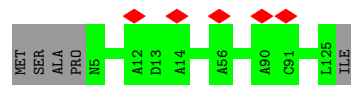




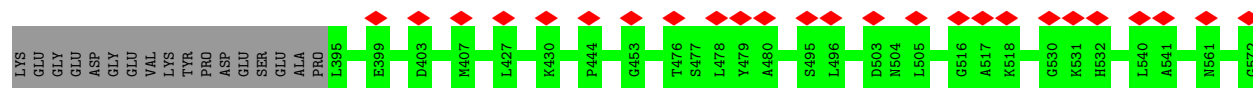
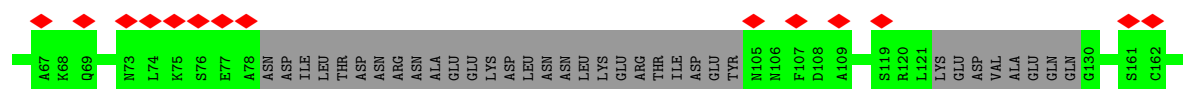
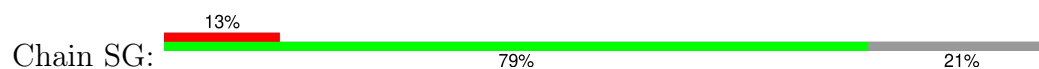
- Molecule 54: 13 kDa ribonucleoprotein-associated protein



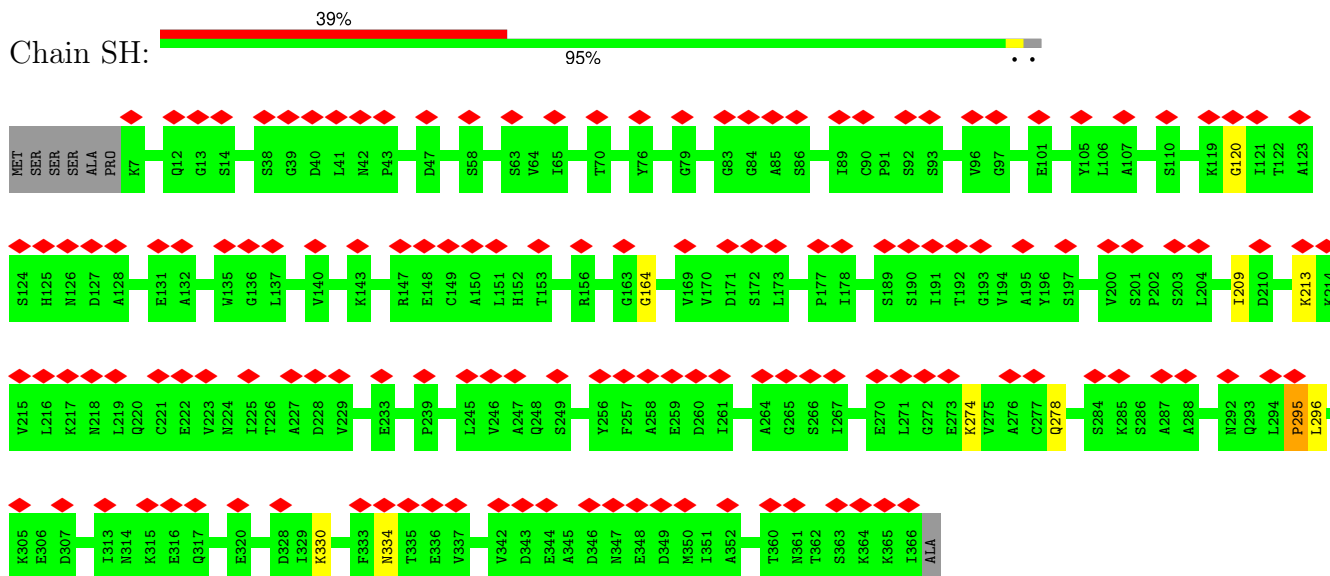
- Molecule 54: 13 kDa ribonucleoprotein-associated protein



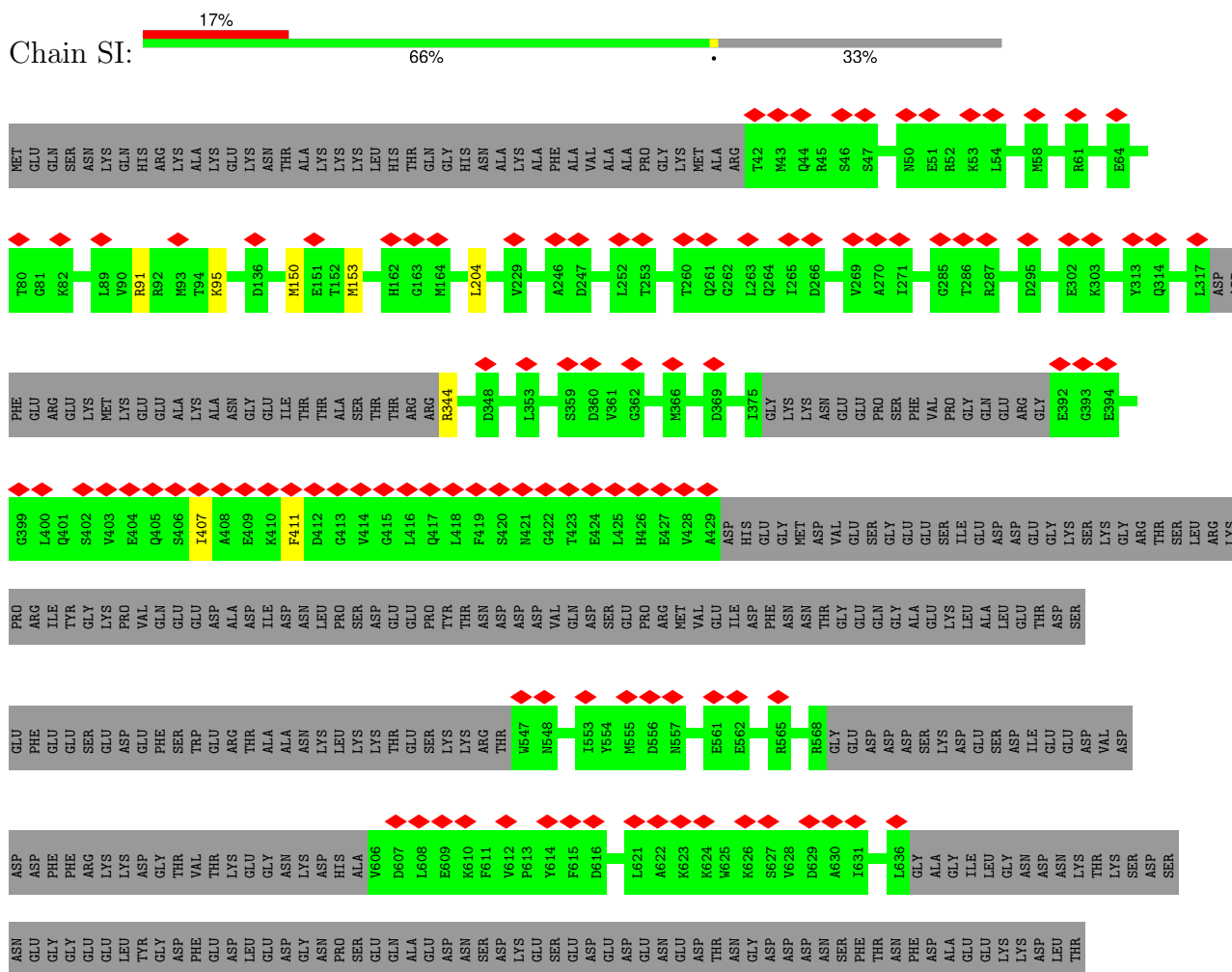
- Molecule 55: Ribosomal RNA-processing protein 9

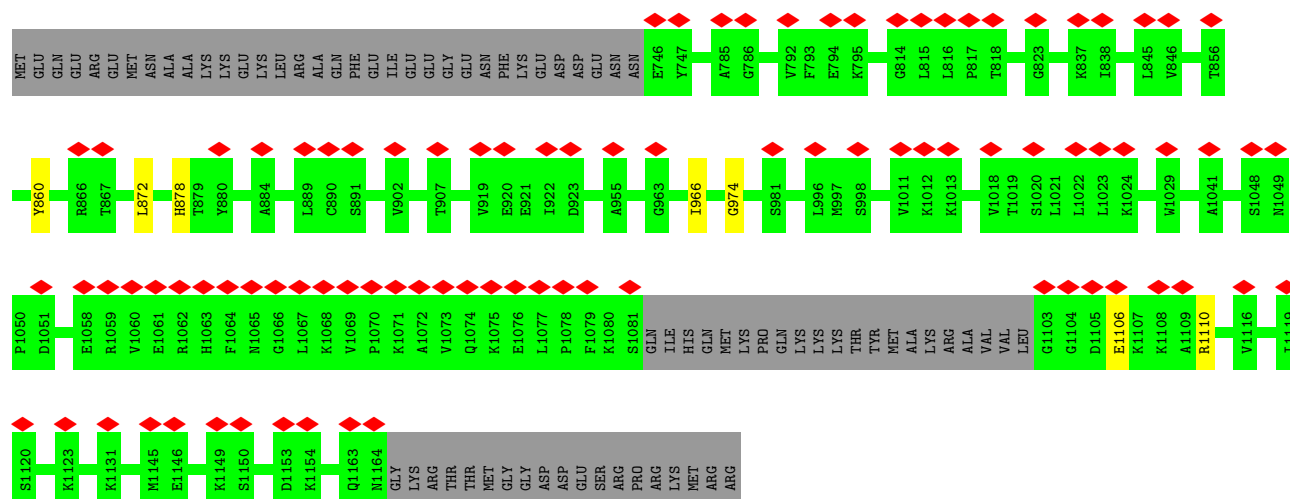


- Chain SH:

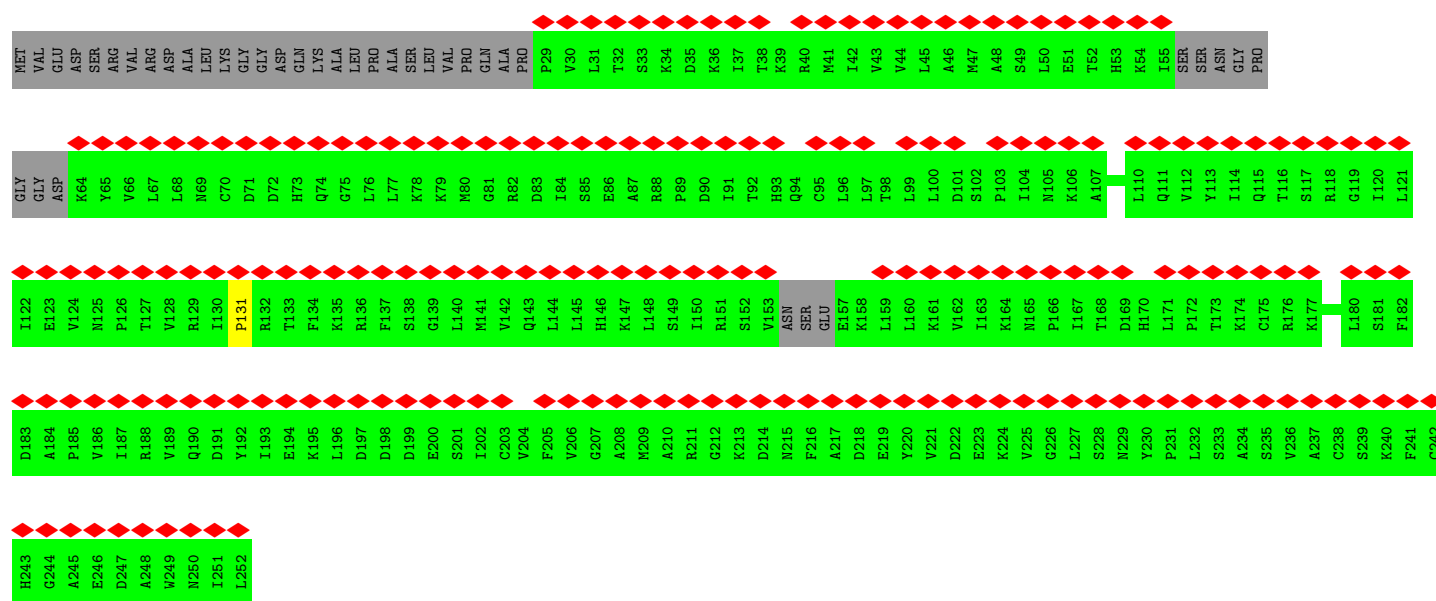
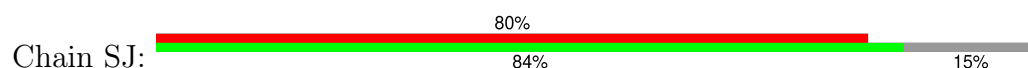


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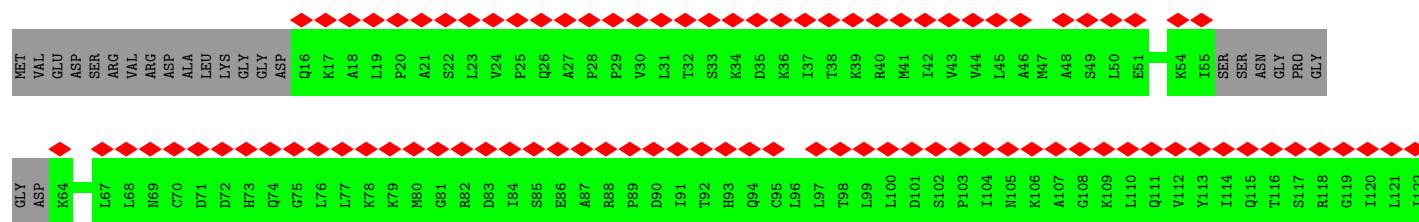
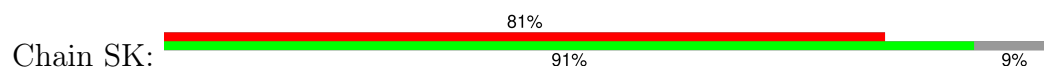


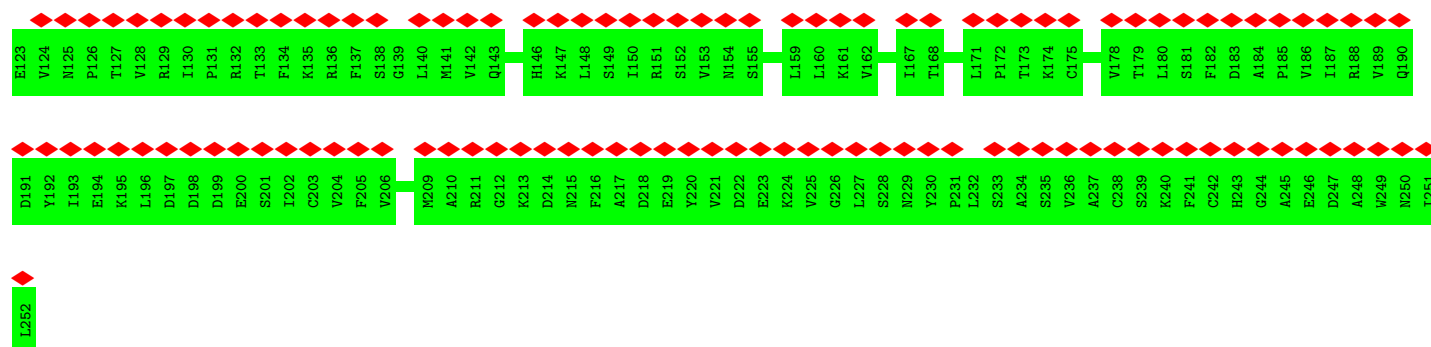


- Molecule 58: Ribosomal RNA small subunit methyltransferase NEP1

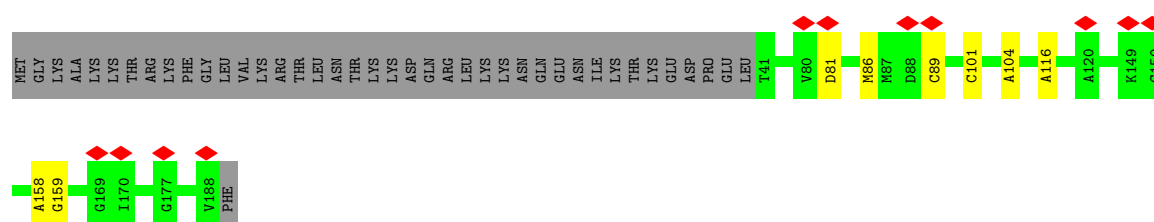
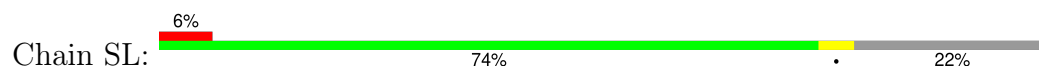


- Molecule 58: Ribosomal RNA small subunit methyltransferase NEP1

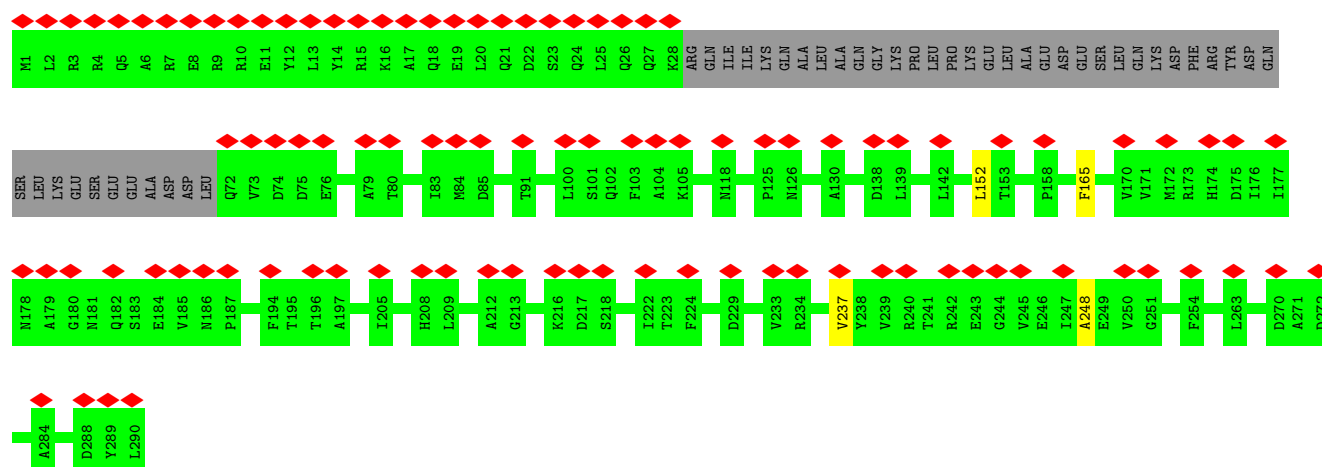
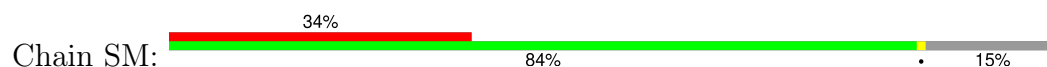




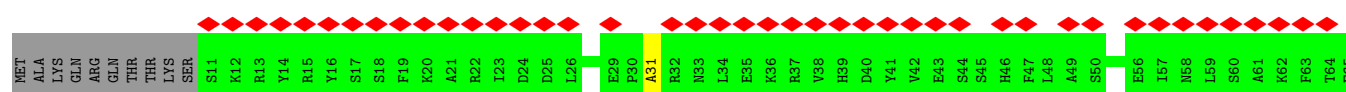
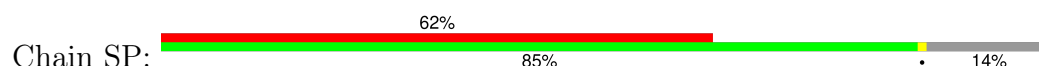
- Molecule 59: rRNA-processing protein FCF1



- Molecule 60: U3 small nucleolar ribonucleoprotein protein IMP4

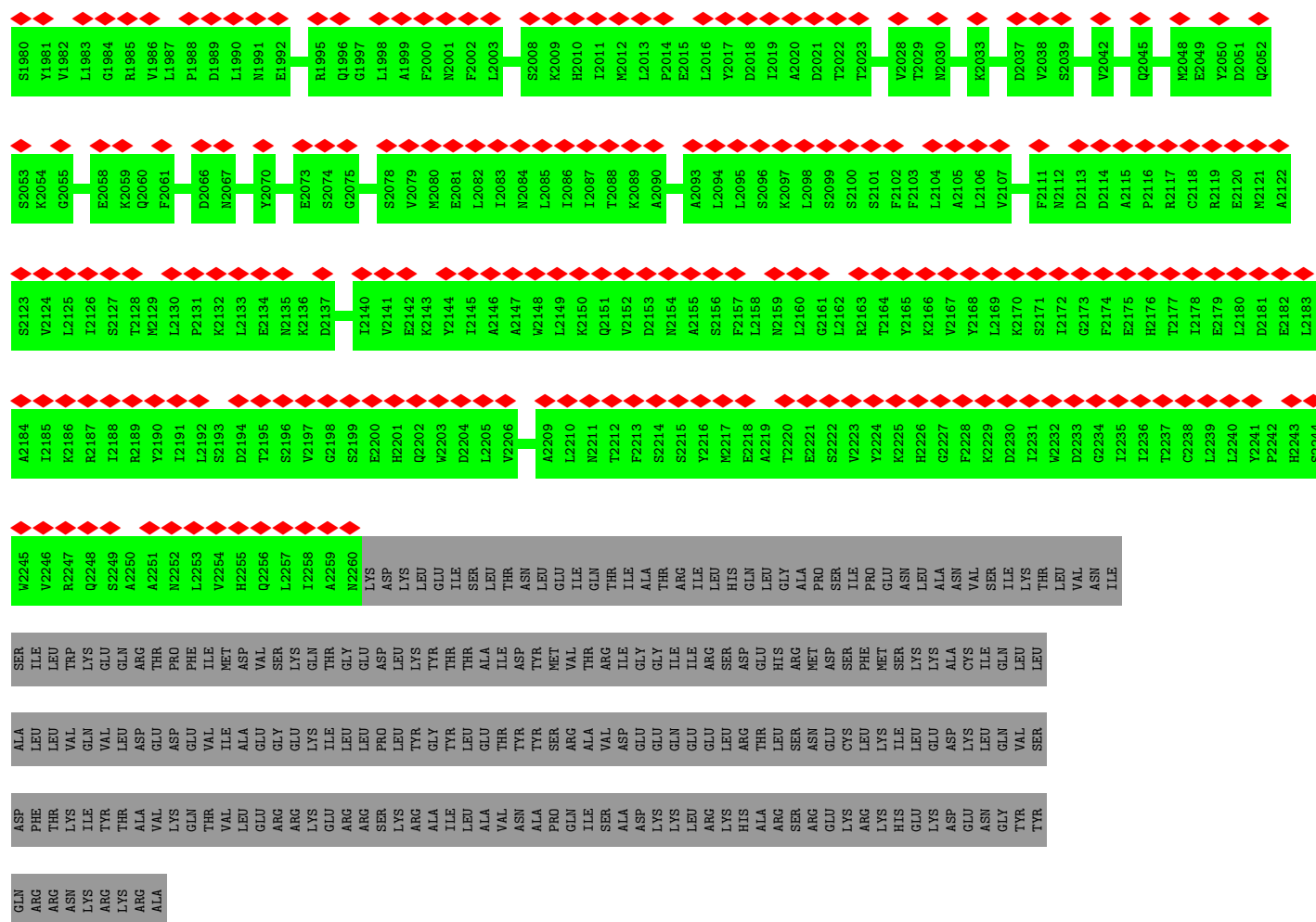


- Molecule 61: U3 small nucleolar RNA-associated protein 20

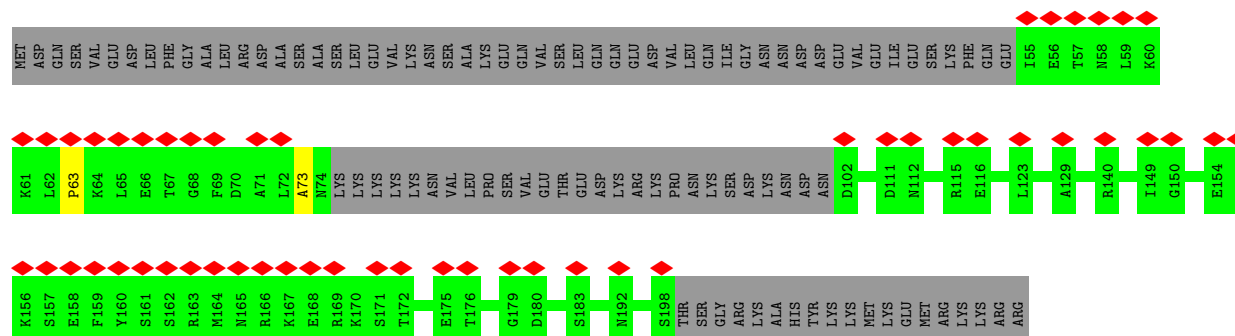


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H851	D852	H853	L854	L857	L858	G859	S860	R861	K867	L868	A869	L870	D871	A872	L873	L874	P879	K883	Y884	R885	D886	N887	L888	K889	L892	D893	D894	T895	L896	F897	K898	D899	E900	I901	T902	T903	F904	L905	T906	E907	N908	G909	S910	Q911	S912	I913	K914	A915	E916	D917	K919	V920										
L779	K780	V781	H782	L783	S784	I785	P786	Q787	E790	N791	H792	F793	I796	A797	V800	Y801	N802	D803	F804	K805	T806	L807	LYS	ASP	GLU	GLU	ASP	GLU	ASN	R817	V818	W823	V826	D827	R828	N829	W830	F831	L832	K837	F838	K839	N840	I841	N842	N843	V844	Y845	S846	A847	T848											
Y716	Q717	P718	L719	L720	E721	D722	G723	A724	N725	K726	V727	L728	V729	D730	S731	V734	R735	L736	R737	D738	T739	I740	D741	T742	F743	S744	H745	I746	W747	S748	K749	Y750	S751	T752	Q753	N754	T755	S756	I757	L758	S759	T760	T761	I762	E763	R764	R765	G766	N767	T768	T769	Y770	F771	I772	L773	Q777	A778					
K643	G646	A647	G650	K651	T652	K653	T654	D655	K656	L657	V658	S659	L663	L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	T679	G680	V681	F682	D683	T684	L685	P686	N687	V688	F689	T690	K691	D692	E693	A694	V696	T700	F707	D708	E709	N710	Q711	N712	L713	D714	Y715											
F505	S506	T507	F508	A509	S510	P511	D512	N513	F514	D517	M518	V519	E520	G520	T521	L522	L523	K524	L525	Y526	K528	GLU	ASP	ASP	ALA	SER	N535	N536	L537	L538	K539	T540	D543	N544	Y545	E546	N547	Y548	K549	E550	S551	L552	N553	F554	L555	R556	V562	S563	N564	L565	H566	P567	S568	E569								
K442	P443	E444	L445	Q446	K447	V448	R449	E450	V451	M452	F453	P454	E455	E456	F457	L458	L459	S460	I461	R462	D463	F464	F465	V466	A468	E469	I470	N471	D472	S473	N474	D475	L476	F477	E478	I479	Y480	Y481	R482	A483	I484	I485	F486	K487	Y488	S489	K490	L491	Q492	M493	T494	I497	I498	P499	L500	L501	E502					
L381	F382	A385	L386	T387	N388	I389	S390	D391	C392	F393	L394	E395	F396	F397	Q398	F399	A400	L401	R402	L403	S404	E406	R407	V408	F409	S410	F411	N412	CYS	ALA	SER	L353	S354	Q355	D356	F477	Q418	K357	V358	F420	A359	F360	L361	K423	F362	A363	L364	F365	I366	S369	D370	V371	K372	T373	L374	T375	L376	F377	H378	Q379	K380	D441
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L1122	L1123	Y1124	D1125	E1126	F1127	A1128	T1129	A1130	L1133	M1134	D1135	T1136	I1137	S1138	N1139	Q1140	H1141	V1142	A1145	V1146	I1147	G1148	P1149	I1150	I1151	D1155	S1156	I1157	I1158	N1159	N1160	P1161	V1162	N1163	D1164	D1165	H1166	V1167	V1168	D1169	L1170	V1171	I1174	C1175	T1176	S1177	C1178	L1179	K1180	I1181	L1182	P1183	S1184	L1185				
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L1308	N1309	S1310	Y1311	SER	SER	ARG	MET	H1317	E1318	Y1319	D1320	F1321	P1322	N1323	I1324	L1325	S1326	T1327	F1328	K1329	G1330	L1331	I1332	E1333	D1334	G1335	Y1336	K1337	S1338	E1341	L1342	E1343	W1344	L1345	P1346	L1347	L1348	F1349	T1350	F1351	L1352	H1353	F1354	I1355	N1356	M1357	K1358	E1359	E1360	L1361	A1362	L1363	R1364	T1365	N1366	A1367	S1368	
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GLU	SER	LYS	LEU	T1571	L1572	S1573	K1574	F1575	P1576	S1577	N1578	L1579	D1580	E1581	P1582	S1583	I1586	K1587	Q1588	E1589	L1590	Y1591	P1592	T1593	L1594	S1595	L1598	G1599	T1600	R1601	D1602	D1603	E1604	T1605	I1606	I1607	E1608	R1609	E1614	A1615	L1616	V1617	N1618	I1619	V1620	L1621	G1622	L1623	T1624	N1625	D1626	D1627	N1630	F1631	L1632			
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SER	THR	THR	ILE	N1858	S1859	N1860	S1861	L1862	T1867	L1868	K1869	K1870	F1871	A1872	L1873	D1874	L1875	L1876	L1877	N1878	V1879	I1880	T1881	R1882	H1883	R1884	S1885	F1886	L1887	T1888	V1889	S1890	H1891	L1892	E1893	I1896	P1897	F1898	L1899	R1900	D1901	S1902	L1903	L1904	S1905	E1906	N1907	H1908	Q1909	V1910	S1972	L1973	L1974	K1975	D1976	T1977	A1978	L1979

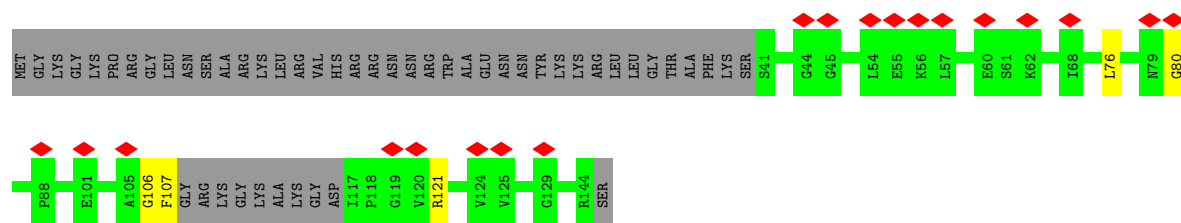


- Molecule 62: rRNA-processing protein FCF2

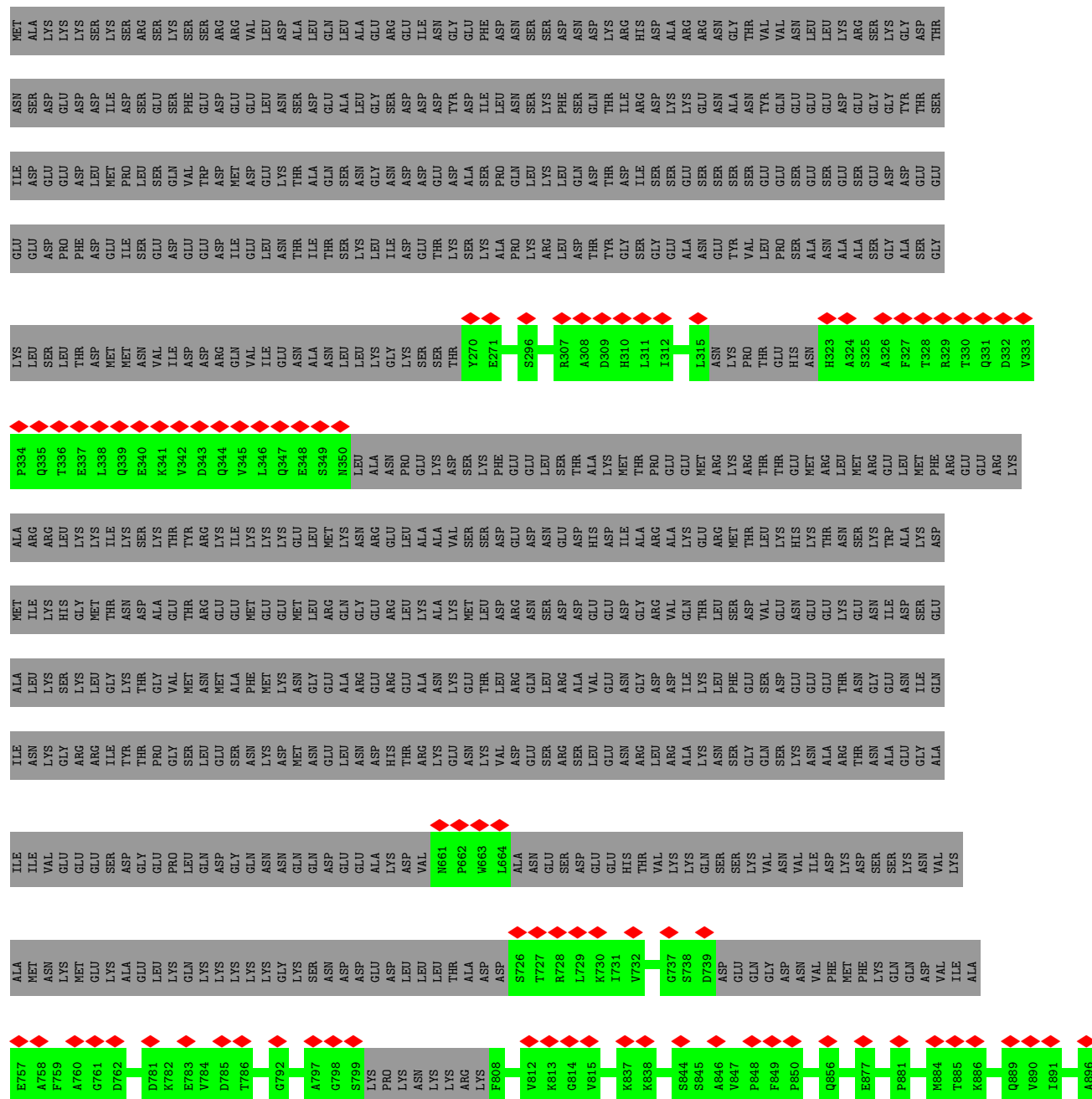


- Molecule 63: 40S ribosomal protein S23-A





• Molecule 64: U3 small nucleolar RNA-associated protein 14

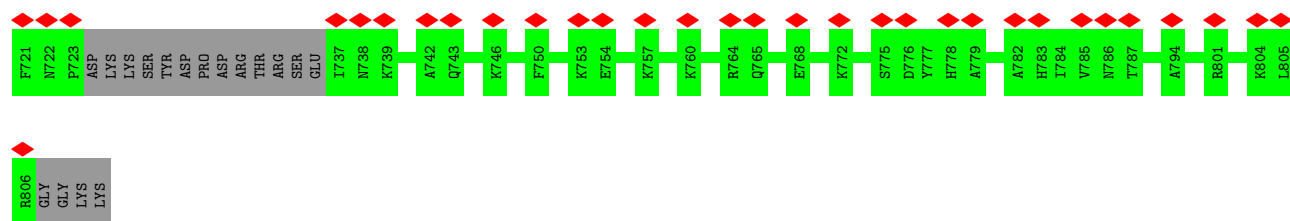


P897
PHE
LYS

• Molecule 65: Nucleolar complex protein 14

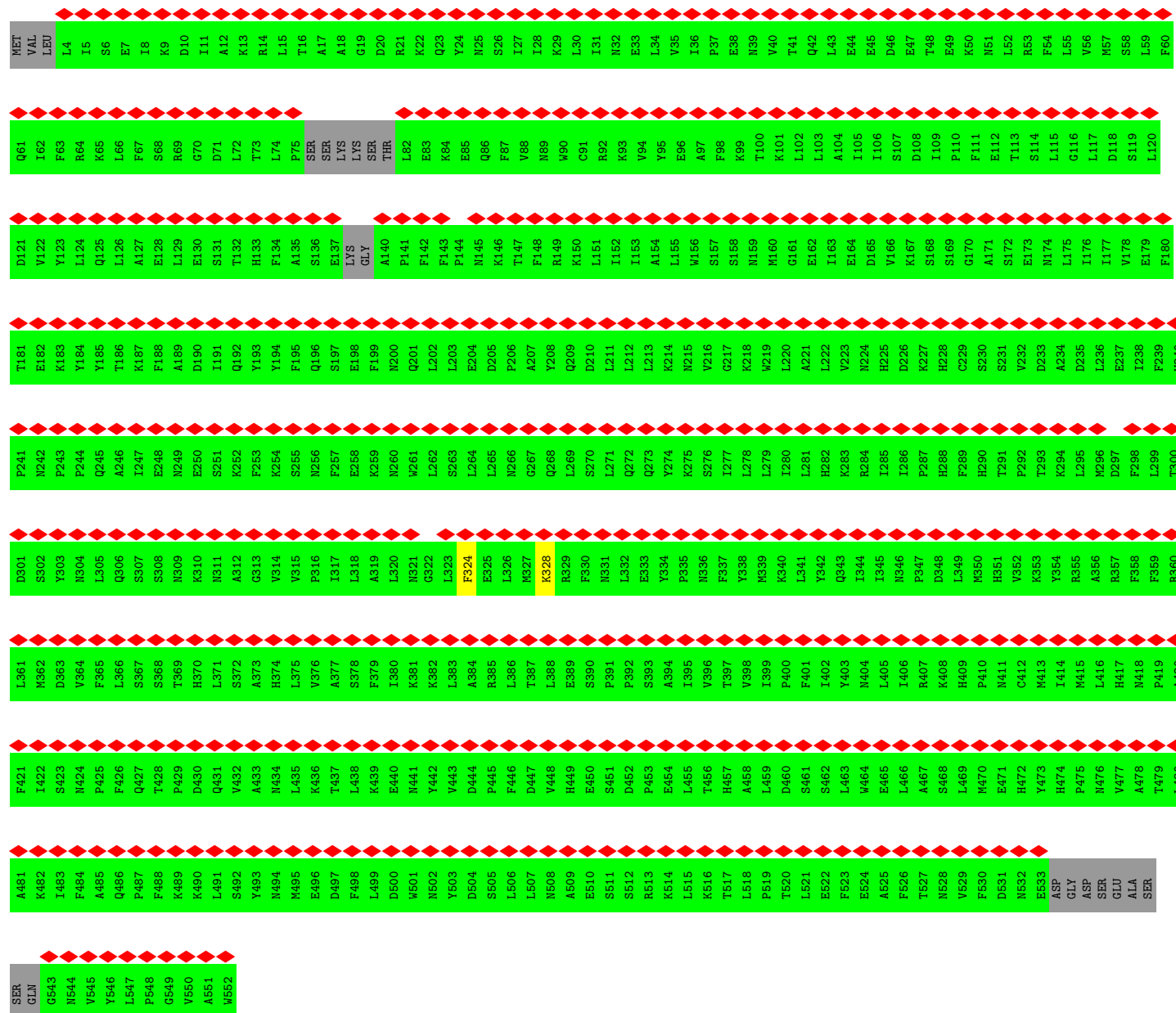
Chain ST: 

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A541	F542	G543	A544	V545	L546	V547	R548	I549	V550	S551	Q552	Y553	Q554	R555	I556	S557	K558	R559	Y560	I561	P562	E563	V564	V565	Y566	F567	F568	Q569	K570	I571	L572	L573	T574	F575	I576	V577	GLU	LYS	GLU	ASN	GLN	K584	P585	L586	D587	F588	E589	N590	I591	R592	L593	D594	S595	Y596	E597	L598	G599	L600				
M481	Q482	A483	R484	Y485	K486	K487	N488	H489	F490	D491	A492	L493	S494	N495	G496	D497	L498	V499	F500	F501	S502	I503	I504	G505	I506	L507	F508	S509	T510	S511	D512	Q513	Y514	H515	L516	V517	I518	T519	P520	A521	L522	I523	L524	M525	S526	Q527	F528	L529	E530	Q531	I532	K533	F534	N535	S536	L537	K538	R539	I540			
K421	L422	G423	K424	F425	T426	A427	V428	L429	R430	R431	H432	I433	I434	F435	L436	S437	N438	Q439	N440	Y441	L442	K443	N444	V445	Q446	S447	F448	K449	R450	T451	Q452	N453	L455	I456	H399	S457	I458	L459	K460	S461	L462	S463	E464	K465	Y466	N467	R468	E469	L470	S471	E472	E473	C474	R475	D476	Y477	I478	N479	E480			
E301	K302	K303	R304	E305	L306	E307	Q308	Q309	R310	L311	D312	R313	M314	N315	G316	M317	I318	E319	L320	GLU	GLU	GLY	GLU	E325	R326	G327	V328	E329	D330	D332	D333	G334	F335	W336	E337	N338	GLU	GLU	ASP	TYR	ASP	ASP	ASN	ASP	GLY	ILE	ALA	ASP	SER	ASP	ASP	ASP	ASP	ASP								
D241	N242	F243	E244	D245	V246	M247	S248	E249	L250	M251	M252	T253	Q254	P255	K256	K257	ASN	PRO	MET	GLU	P262	K263	T264	D265	L266	D267	K268	E269	D270	D271	I272	K273	V274	K275	E276	L277	Q278	D280	K281	R282	A283	A284	P285	S286	D287	R288	T289	K290	T291	E292	E293	E294	K295	N296	E297	A298	E300					
ASP	GLU	GLU	ASP	PHE	LEU	ALA	SER	SER	LYS	ASP	ASP	ALA	GLU	LEU	GLN	PRO	GLN	ARG	LYS	LYS	THR	K207	A208	E209	V210	M211	K212	E213	V214	I215	A216	K217	S218	K219	F220	Y221	K222	Q223	E224	R225	Q226	K227	A228	Q229	G230	T231	M232	E233	D234	Q235	I236	D237	N238	L239	D240							
LYS	ALA	ALA	ARG	ASN	LYS	GLU	ARG	GLY	LEU	PRO	SER	THR	ALA	ASP	ILE	ASN	V81	G82	K83	P84	G85	I86	S87	K88	Q89	I90	ASP	GLU	ASP	GLY	ASP	E93	Q94	R95	K96	R97	A98	PHE	GLU	ALA	ARG	LYS	MET	LYS	ASN	K108	R109	G110	G111	V112	I113	D114	K115	R116	F117	GLY	GLU	ARG				



• Molecule 66: Nucleolar complex protein 4

Chain SU: 96%



• Molecule 67: Pre-rRNA-processing protein PNO1

Chain SW: 13% 79% 20%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	6227	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	25000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	5.102	Depositor
Minimum map value	0.000	Depositor
Average map value	0.112	Depositor
Map value standard deviation	0.203	Depositor
Recommended contour level	1	Depositor
Map size (Å)	535.75195, 535.75195, 535.75195	wwPDB
Map dimensions	504, 504, 504	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.063, 1.063, 1.063	Depositor

5 Model quality

5.1 Standard geometry

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

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	L0	0.12	0/1529	0.33	0/2372
2	L1	0.07	0/30348	0.21	0/47245
3	L2	0.09	0/3669	0.24	0/5700
4	L3	0.15	0/529	0.37	0/736
5	L4	0.14	0/1182	0.39	0/1650
6	L5	0.18	0/1046	0.43	0/1464
7	L6	0.16	0/1035	0.39	0/1442
8	L7	0.18	0/911	0.46	0/1276
9	L8	0.14	0/850	0.34	0/1181
10	L9	0.22	0/922	0.53	0/1290
11	LC	0.21	0/647	0.52	0/903
12	LD	0.15	0/700	0.36	0/980
13	LE	0.20	0/642	0.51	0/893
14	LF	0.17	0/486	0.49	0/677
15	LG	0.14	0/310	0.36	0/430
16	LH	0.15	0/4046	0.40	0/5644
17	LI	0.32	2/3042 (0.1%)	0.53	6/4250 (0.1%)
18	LJ	0.17	0/2410	0.43	0/3370
19	LK	0.17	0/667	0.37	0/933
20	LL	0.16	0/2448	0.38	0/3415
21	LM	0.13	0/8150	0.33	2/11410 (0.0%)
22	LN	0.14	0/3326	0.35	0/4637
23	LO	0.14	0/3976	0.36	0/5552
24	LP	0.13	0/1907	0.34	0/2667
25	LQ	0.18	0/4075	0.46	0/5682
26	LR	0.14	0/3980	0.35	0/5555
27	LS	0.14	0/2288	0.37	0/3188
28	LT	0.14	0/4367	0.37	0/6091
29	LU	0.16	0/2284	0.40	0/3190
30	LV	0.17	0/1804	0.40	0/2522
31	LW	0.16	0/2322	0.40	0/3243
32	LX	0.15	0/4337	0.39	2/6068 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	LY	0.23	1/4310 (0.0%)	0.44	5/6033 (0.1%)
33	LZ	0.18	0/812	0.47	0/1136
34	NA	0.15	0/1492	0.39	0/2075
35	NB	0.14	0/1162	0.37	0/1618
36	NC	0.24	0/669	0.54	0/931
37	ND	0.14	0/298	0.35	0/416
38	NF	0.15	0/717	0.35	0/1003
39	NG	0.13	0/634	0.33	0/881
40	NH	0.13	0/5489	0.33	0/7686
41	NI	0.14	0/1214	0.34	0/1695
42	NM	0.14	0/1185	0.35	0/1651
43	NN	0.16	0/216	0.43	0/300
44	NP	0.13	0/669	0.32	0/928
45	NQ	0.15	0/401	0.44	0/560
46	NS	0.15	0/4309	0.39	0/6037
47	NV	0.15	0/38	0.42	0/51
48	OA	0.13	0/68	0.42	0/93
49	OH	0.09	0/595	0.27	0/827
50	OU	0.09	0/278	0.26	0/386
51	SA	0.18	0/1931	0.36	0/2693
52	SB	0.12	0/2168	0.31	0/3028
53	SC	0.16	0/1210	0.43	0/1689
53	SD	0.16	0/1210	0.39	0/1689
54	SE	0.17	0/621	0.44	0/871
54	SF	0.19	0/621	0.44	0/871
55	SG	0.15	0/2263	0.37	0/3150
56	SH	0.18	0/1817	0.46	1/2536 (0.0%)
57	SI	0.16	0/4060	0.39	0/5679
58	SJ	0.13	0/1080	0.34	0/1508
58	SK	0.13	0/1170	0.33	0/1639
59	SL	0.23	0/759	0.52	0/1064
60	SM	0.15	0/1251	0.41	0/1749
61	SP	0.18	1/10900 (0.0%)	0.39	3/15259 (0.0%)
62	SQ	0.57	2/595 (0.3%)	0.73	3/832 (0.4%)
63	SR	0.20	0/479	0.52	0/666
64	SS	0.19	0/1150	0.48	0/1604
65	ST	0.12	0/3052	0.31	0/4260
66	SU	0.12	0/2726	0.33	0/3825
67	SW	0.24	0/1111	0.52	2/1550 (0.1%)
68	SY	0.18	0/609	0.47	0/846
69	SZ	0.12	0/1326	0.33	0/1859
All	All	0.15	6/166900 (0.0%)	0.36	24/238830 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
16	LH	0	1
22	LN	0	1
28	LT	0	1
46	NS	0	1
59	SL	0	1
All	All	0	5

The worst 5 of 6 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	LI	562	PRO	CG-CD	-11.96	1.10	1.50
61	SP	567	PRO	CG-CD	-11.86	1.10	1.50
62	SQ	63	PRO	CG-CD	-11.55	1.11	1.50
32	LY	550	PRO	CG-CD	-9.83	1.17	1.50
17	LI	704	PRO	CG-CD	-7.00	1.26	1.50

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
61	SP	567	PRO	N-CD-CG	-15.04	80.65	103.20
17	LI	562	PRO	N-CD-CG	-15.01	80.68	103.20
32	LY	550	PRO	N-CD-CG	-13.00	83.70	103.20
62	SQ	63	PRO	N-CD-CG	-12.43	84.56	103.20
62	SQ	63	PRO	CA-N-CD	-9.98	98.02	112.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
16	LH	606	HIS	Peptide
22	LN	771	GLN	Peptide
28	LT	261	SER	Peptide
46	NS	870	PRO	Peptide
59	SL	81	ASP	Peptide

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	L0	1370	0	692	1	0
2	L1	27142	0	13680	645	0
3	L2	3289	0	1667	12	0
4	L3	529	0	240	0	0
5	L4	1172	0	578	1	0
6	L5	1040	0	519	1	0
7	L6	1029	0	512	5	0
8	L7	903	0	450	2	0
9	L8	848	0	429	5	0
10	L9	914	0	464	4	0
11	LC	642	0	328	5	0
12	LD	693	0	336	1	0
13	LE	640	0	307	3	0
14	LF	484	0	242	3	0
15	LG	309	0	145	0	0
16	LH	4034	0	1821	5	0
17	LI	3027	0	1390	1	0
18	LJ	2394	0	1161	4	0
19	LK	664	0	299	0	0
20	LL	2440	0	1139	1	0
21	LM	8115	0	3739	10	0
22	LN	3315	0	1518	5	0
23	LO	3958	0	1889	6	0
24	LP	1901	0	836	3	0
25	LQ	4063	0	1898	22	0
26	LR	3962	0	1883	6	0
27	LS	2279	0	1110	5	0
28	LT	4347	0	2073	9	0
29	LU	2274	0	1064	5	0
30	LV	1791	0	844	3	0
31	LW	2304	0	1146	7	0
32	LX	4302	0	2100	10	0
32	LY	4274	0	2096	7	0
33	LZ	808	0	370	1	0
34	NA	1491	0	701	6	0
35	NB	1159	0	548	3	0
36	NC	669	0	309	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
37	ND	297	0	132	1	0
38	NF	711	0	360	1	0
39	NG	630	0	341	2	0
40	NH	5443	0	2602	5	0
41	NI	1210	0	565	1	0
42	NM	1183	0	553	5	0
43	NN	215	0	111	0	0
44	NP	666	0	345	1	0
45	NQ	398	0	200	1	0
46	NS	4268	0	2083	11	0
47	NV	39	0	16	0	0
48	OA	69	0	34	0	0
49	OH	594	0	298	1	0
50	OU	278	0	135	0	0
51	SA	1924	0	946	4	0
52	SB	2161	0	1090	4	0
53	SC	1198	0	625	6	0
53	SD	1198	0	625	5	0
54	SE	615	0	331	2	0
54	SF	615	0	331	0	0
55	SG	2260	0	1085	1	0
56	SH	1801	0	897	5	0
57	SI	4024	0	1981	9	0
58	SJ	1074	0	514	1	0
58	SK	1160	0	570	0	0
59	SL	751	0	377	7	0
60	SM	1243	0	602	2	0
61	SP	10847	0	4961	13	0
62	SQ	592	0	278	1	0
63	SR	476	0	237	3	0
64	SS	1145	0	565	0	0
65	ST	3041	0	1430	3	0
66	SU	2703	0	1302	1	0
67	SW	1104	0	544	1	0
68	SY	611	0	265	3	0
69	SZ	1314	0	649	2	0
All	All	162433	0	78503	870	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

The worst 5 of 870 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L1:192:U:H3	2:L1:193:U:HO2'	1.17	0.89
2:L1:453:U:H2'	2:L1:454:U:H5''	1.60	0.84
3:L2:38:U:O2'	3:L2:39:C:OP2	1.96	0.83
2:L1:194:U:H2'	2:L1:195:G:H5'	1.62	0.80
2:L1:34:G:H5'	2:L1:35:U:H5''	1.64	0.79

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	L3	102/146 (70%)	101 (99%)	1 (1%)	0	100	100
5	L4	232/261 (89%)	230 (99%)	2 (1%)	0	100	100
6	L5	202/225 (90%)	196 (97%)	6 (3%)	0	100	100
7	L6	202/236 (86%)	200 (99%)	2 (1%)	0	100	100
8	L7	174/190 (92%)	172 (99%)	2 (1%)	0	100	100
9	L8	167/200 (84%)	164 (98%)	3 (2%)	0	100	100
10	L9	179/197 (91%)	175 (98%)	4 (2%)	0	100	100
11	LC	126/143 (88%)	122 (97%)	4 (3%)	0	100	100
12	LD	135/156 (86%)	133 (98%)	2 (2%)	0	100	100
13	LE	127/130 (98%)	124 (98%)	3 (2%)	0	100	100
14	LF	95/135 (70%)	90 (95%)	5 (5%)	0	100	100
15	LG	60/67 (90%)	59 (98%)	1 (2%)	0	100	100
16	LH	788/896 (88%)	766 (97%)	22 (3%)	0	100	100
17	LI	582/713 (82%)	574 (99%)	8 (1%)	0	100	100
18	LJ	470/513 (92%)	463 (98%)	7 (2%)	0	100	100
19	LK	130/575 (23%)	130 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
20	LL	475/643 (74%)	461 (97%)	14 (3%)	0	100	100
21	LM	1597/1769 (90%)	1572 (98%)	25 (2%)	0	100	100
22	LN	649/776 (84%)	635 (98%)	14 (2%)	0	100	100
23	LO	786/923 (85%)	770 (98%)	16 (2%)	0	100	100
24	LP	375/440 (85%)	369 (98%)	6 (2%)	0	100	100
25	LQ	805/943 (85%)	785 (98%)	19 (2%)	1 (0%)	48	83
26	LR	785/817 (96%)	768 (98%)	17 (2%)	0	100	100
27	LS	441/594 (74%)	433 (98%)	8 (2%)	0	100	100
28	LT	861/939 (92%)	846 (98%)	15 (2%)	0	100	100
29	LU	448/489 (92%)	438 (98%)	10 (2%)	0	100	100
30	LV	355/707 (50%)	347 (98%)	8 (2%)	0	100	100
31	LW	453/554 (82%)	442 (98%)	11 (2%)	0	100	100
32	LX	838/1056 (79%)	824 (98%)	14 (2%)	0	100	100
32	LY	834/1056 (79%)	823 (99%)	11 (1%)	0	100	100
33	LZ	156/183 (85%)	155 (99%)	1 (1%)	0	100	100
34	NA	278/593 (47%)	278 (100%)	0	0	100	100
35	NB	221/610 (36%)	217 (98%)	4 (2%)	0	100	100
36	NC	133/357 (37%)	123 (92%)	10 (8%)	0	100	100
37	ND	57/214 (27%)	57 (100%)	0	0	100	100
38	NF	139/151 (92%)	138 (99%)	1 (1%)	0	100	100
39	NG	125/137 (91%)	122 (98%)	3 (2%)	0	100	100
40	NH	1063/1237 (86%)	1049 (99%)	14 (1%)	0	100	100
41	NI	232/297 (78%)	226 (97%)	6 (3%)	0	100	100
42	NM	231/255 (91%)	227 (98%)	4 (2%)	0	100	100
43	NN	41/534 (8%)	41 (100%)	0	0	100	100
44	NP	130/144 (90%)	127 (98%)	3 (2%)	0	100	100
45	NQ	77/82 (94%)	75 (97%)	2 (3%)	0	100	100
46	NS	836/1267 (66%)	820 (98%)	16 (2%)	0	100	100
47	NV	6/733 (1%)	6 (100%)	0	0	100	100
48	OA	12/1729 (1%)	12 (100%)	0	0	100	100
49	OH	118/143 (82%)	118 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	OU	54/152 (36%)	54 (100%)	0	0	100	100
51	SA	379/504 (75%)	369 (97%)	10 (3%)	0	100	100
52	SB	431/511 (84%)	423 (98%)	8 (2%)	0	100	100
53	SC	234/327 (72%)	228 (97%)	6 (3%)	0	100	100
53	SD	234/327 (72%)	229 (98%)	5 (2%)	0	100	100
54	SE	119/126 (94%)	117 (98%)	2 (2%)	0	100	100
54	SF	119/126 (94%)	116 (98%)	3 (2%)	0	100	100
55	SG	442/573 (77%)	432 (98%)	10 (2%)	0	100	100
56	SH	358/367 (98%)	346 (97%)	12 (3%)	0	100	100
57	SI	783/1183 (66%)	764 (98%)	19 (2%)	0	100	100
58	SJ	207/252 (82%)	201 (97%)	6 (3%)	0	100	100
58	SK	225/252 (89%)	223 (99%)	2 (1%)	0	100	100
59	SL	146/189 (77%)	140 (96%)	6 (4%)	0	100	100
60	SM	243/290 (84%)	238 (98%)	5 (2%)	0	100	100
61	SP	2136/2493 (86%)	2112 (99%)	24 (1%)	0	100	100
62	SQ	113/217 (52%)	112 (99%)	1 (1%)	0	100	100
63	SR	91/145 (63%)	89 (98%)	2 (2%)	0	100	100
64	SS	213/899 (24%)	207 (97%)	6 (3%)	0	100	100
65	ST	581/810 (72%)	574 (99%)	7 (1%)	0	100	100
66	SU	524/552 (95%)	522 (100%)	2 (0%)	0	100	100
67	SW	211/274 (77%)	206 (98%)	5 (2%)	0	100	100
68	SY	114/250 (46%)	111 (97%)	3 (3%)	0	100	100
69	SZ	255/483 (53%)	252 (99%)	3 (1%)	0	100	100
All	All	25540/36457 (70%)	25068 (98%)	471 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
25	LQ	360	ASN

5.3.2 Protein sidechains ⓘ

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

entries.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	L3	2/129 (2%)	2 (100%)	0	100	100
5	L4	11/222 (5%)	11 (100%)	0	100	100
6	L5	8/191 (4%)	8 (100%)	0	100	100
7	L6	8/201 (4%)	8 (100%)	0	100	100
8	L7	10/170 (6%)	10 (100%)	0	100	100
9	L8	4/161 (2%)	4 (100%)	0	100	100
10	L9	9/166 (5%)	9 (100%)	0	100	100
11	LC	6/119 (5%)	6 (100%)	0	100	100
12	LD	8/137 (6%)	8 (100%)	0	100	100
13	LE	3/111 (3%)	3 (100%)	0	100	100
14	LF	3/113 (3%)	3 (100%)	0	100	100
15	LG	2/60 (3%)	2 (100%)	0	100	100
16	LH	21/826 (2%)	21 (100%)	0	100	100
17	LI	24/657 (4%)	24 (100%)	0	100	100
18	LJ	19/454 (4%)	19 (100%)	0	100	100
19	LK	4/533 (1%)	4 (100%)	0	100	100
20	LL	14/574 (2%)	14 (100%)	0	100	100
21	LM	43/1633 (3%)	43 (100%)	0	100	100
22	LN	18/713 (2%)	18 (100%)	0	100	100
23	LO	21/811 (3%)	21 (100%)	0	100	100
24	LP	8/414 (2%)	8 (100%)	0	100	100
25	LQ	17/832 (2%)	17 (100%)	0	100	100
26	LR	22/719 (3%)	22 (100%)	0	100	100
27	LS	21/528 (4%)	21 (100%)	0	100	100
28	LT	25/819 (3%)	25 (100%)	0	100	100
29	LU	13/443 (3%)	13 (100%)	0	100	100
30	LV	14/636 (2%)	14 (100%)	0	100	100
31	LW	21/480 (4%)	21 (100%)	0	100	100
32	LX	42/934 (4%)	42 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
32	LY	42/934 (4%)	42 (100%)	0	100	100
33	LZ	6/172 (4%)	6 (100%)	0	100	100
34	NA	10/535 (2%)	10 (100%)	0	100	100
35	NB	8/538 (2%)	8 (100%)	0	100	100
36	NC	1/315 (0%)	1 (100%)	0	100	100
37	ND	2/196 (1%)	2 (100%)	0	100	100
38	NF	7/128 (6%)	7 (100%)	0	100	100
39	NG	5/105 (5%)	5 (100%)	0	100	100
40	NH	53/1125 (5%)	53 (100%)	0	100	100
41	NI	8/274 (3%)	8 (100%)	0	100	100
42	NM	5/224 (2%)	5 (100%)	0	100	100
43	NN	2/482 (0%)	2 (100%)	0	100	100
44	NP	5/116 (4%)	5 (100%)	0	100	100
45	NQ	4/71 (6%)	4 (100%)	0	100	100
46	NS	45/1140 (4%)	45 (100%)	0	100	100
49	OH	2/119 (2%)	2 (100%)	0	100	100
50	OU	1/135 (1%)	1 (100%)	0	100	100
51	SA	10/435 (2%)	10 (100%)	0	100	100
52	SB	8/433 (2%)	8 (100%)	0	100	100
53	SC	14/240 (6%)	14 (100%)	0	100	100
53	SD	14/240 (6%)	14 (100%)	0	100	100
54	SE	7/104 (7%)	7 (100%)	0	100	100
54	SF	7/104 (7%)	7 (100%)	0	100	100
55	SG	14/502 (3%)	14 (100%)	0	100	100
56	SH	17/312 (5%)	17 (100%)	0	100	100
57	SI	43/1039 (4%)	43 (100%)	0	100	100
58	SJ	9/222 (4%)	9 (100%)	0	100	100
58	SK	12/222 (5%)	12 (100%)	0	100	100
59	SL	9/169 (5%)	9 (100%)	0	100	100
60	SM	10/258 (4%)	10 (100%)	0	100	100
61	SP	63/2307 (3%)	63 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
62	SQ	5/200 (2%)	5 (100%)	0	100	100
63	SR	5/120 (4%)	5 (100%)	0	100	100
64	SS	14/807 (2%)	14 (100%)	0	100	100
65	ST	22/732 (3%)	22 (100%)	0	100	100
66	SU	27/506 (5%)	27 (100%)	0	100	100
67	SW	11/238 (5%)	11 (100%)	0	100	100
68	SY	2/234 (1%)	2 (100%)	0	100	100
69	SZ	14/424 (3%)	14 (100%)	0	100	100
All	All	964/30243 (3%)	964 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L0	59/700 (8%)	20 (33%)	1 (1%)
2	L1	1249/1810 (69%)	227 (18%)	4 (0%)
3	L2	149/333 (44%)	22 (14%)	0
All	All	1457/2843 (51%)	269 (18%)	5 (0%)

5 of 269 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L0	7	A
1	L0	9	G
1	L0	14	U
1	L0	17	A
1	L0	23	G

All (5) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	L0	69	U
2	L1	320	U
2	L1	494	U

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Mol	Chain	Res	Type
2	L1	1568	C
2	L1	1600	A

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

3 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\# Z > 2$
64	SEP	SS	738	64	3,4,10	0.70	0	2,4,14	0.74	0
27	SEP	LS	128	27	3,4,10	0.65	0	2,4,14	0.78	0
55	SEP	SG	50	55	3,4,10	0.64	0	2,4,14	0.85	0

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
64	SEP	SS	738	64	-	0/1/2/10	-
27	SEP	LS	128	27	-	1/1/2/10	-
55	SEP	SG	50	55	-	0/1/2/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
27	LS	128	SEP	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

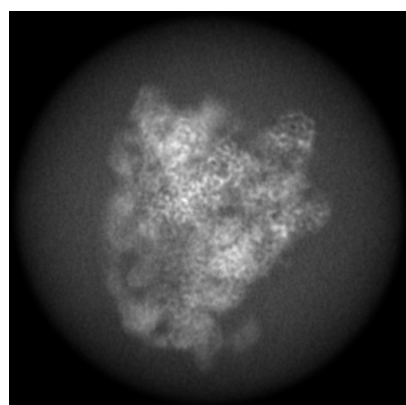
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-49082. These allow visual inspection of the internal detail of the map and identification of artifacts.

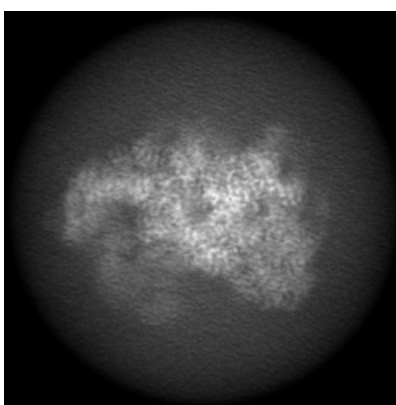
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

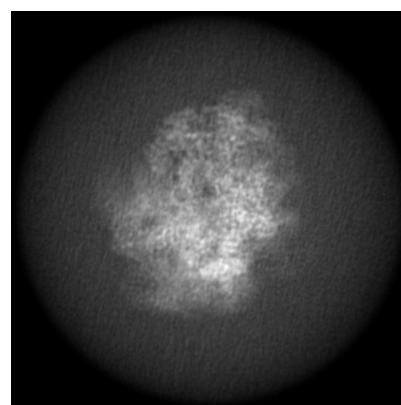
6.1.1 Primary map



X



Y

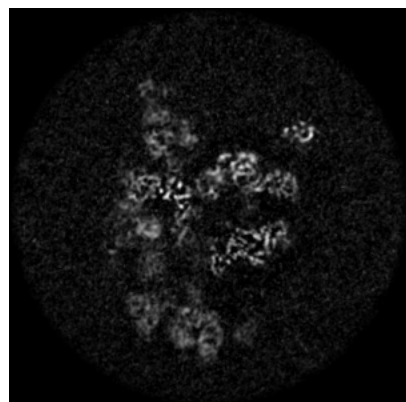


Z

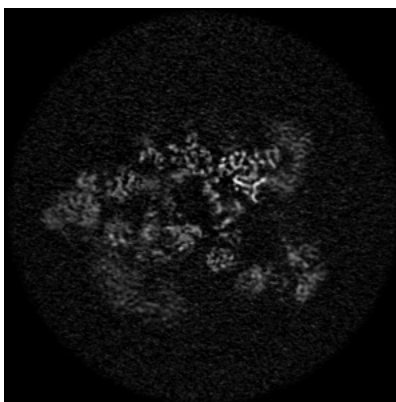
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

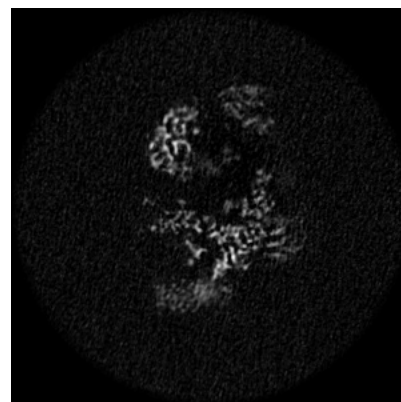
6.2.1 Primary map



X Index: 252



Y Index: 252

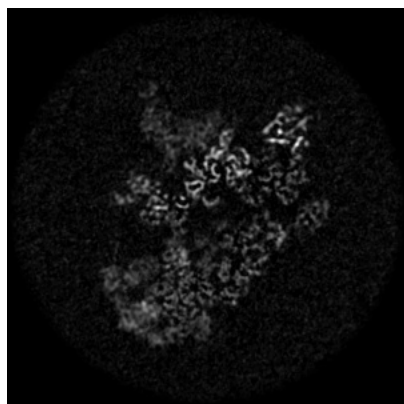


Z Index: 252

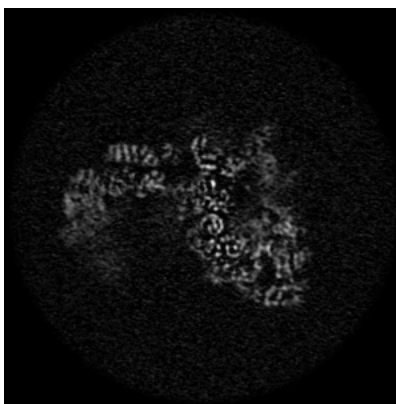
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

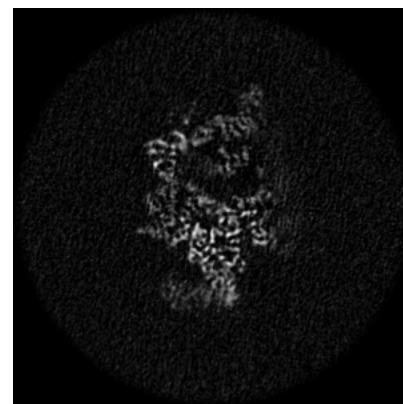
6.3.1 Primary map



X Index: 279



Y Index: 222

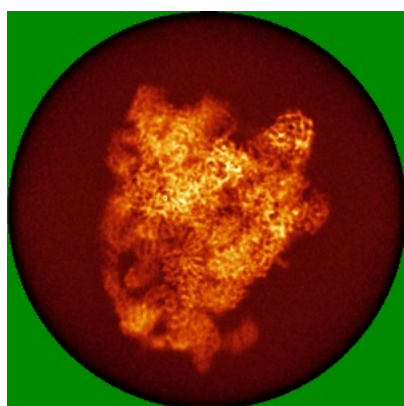


Z Index: 265

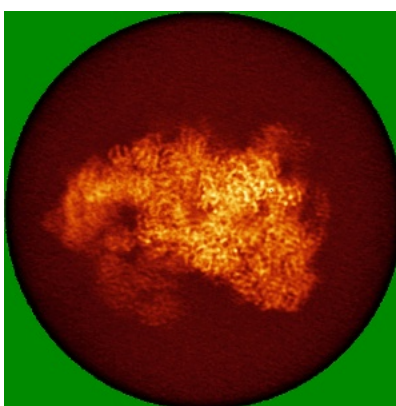
The images above show the largest variance slices of the map in three orthogonal directions.

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

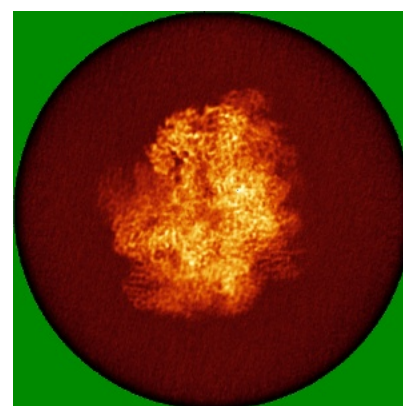
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 1.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

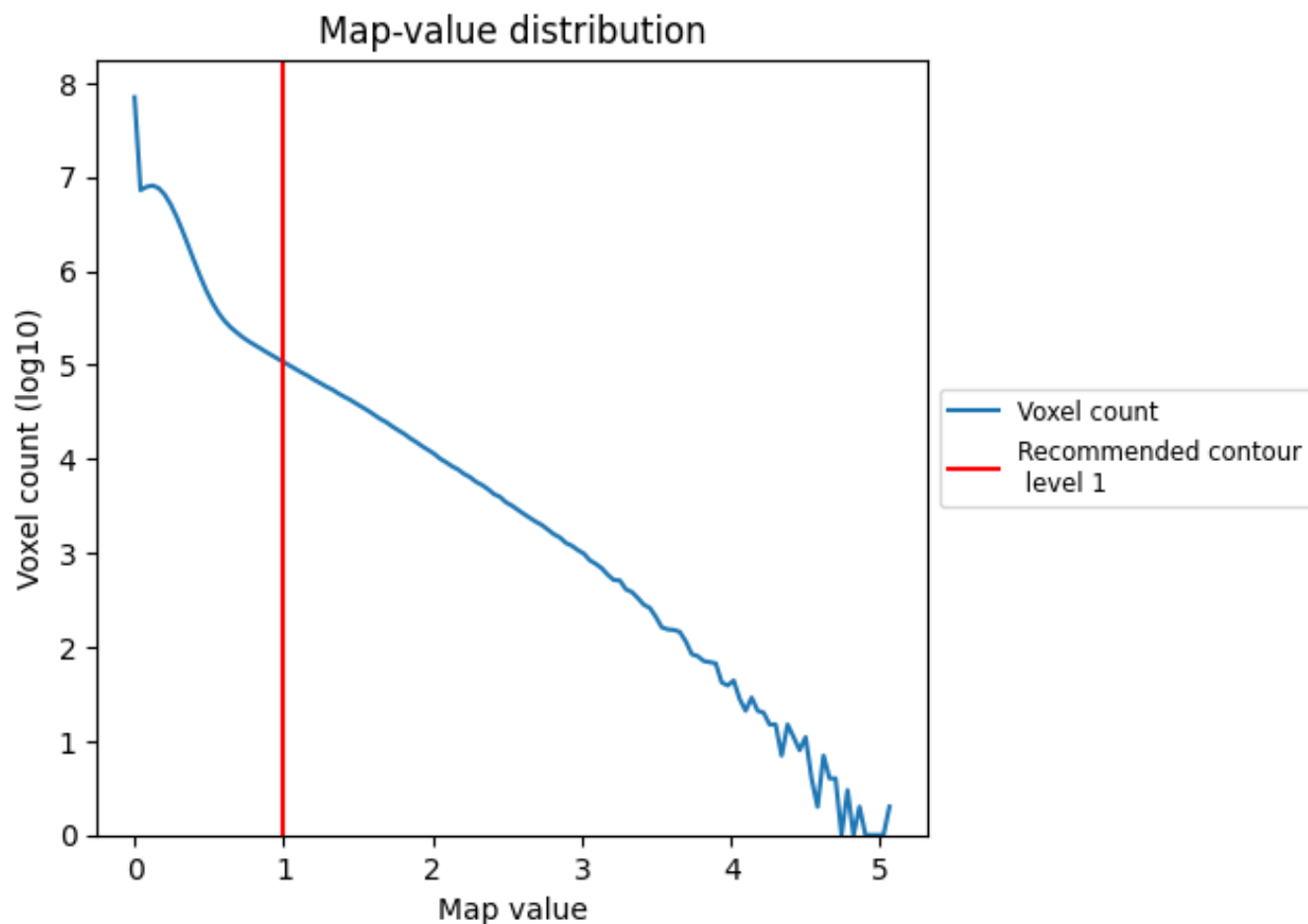
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

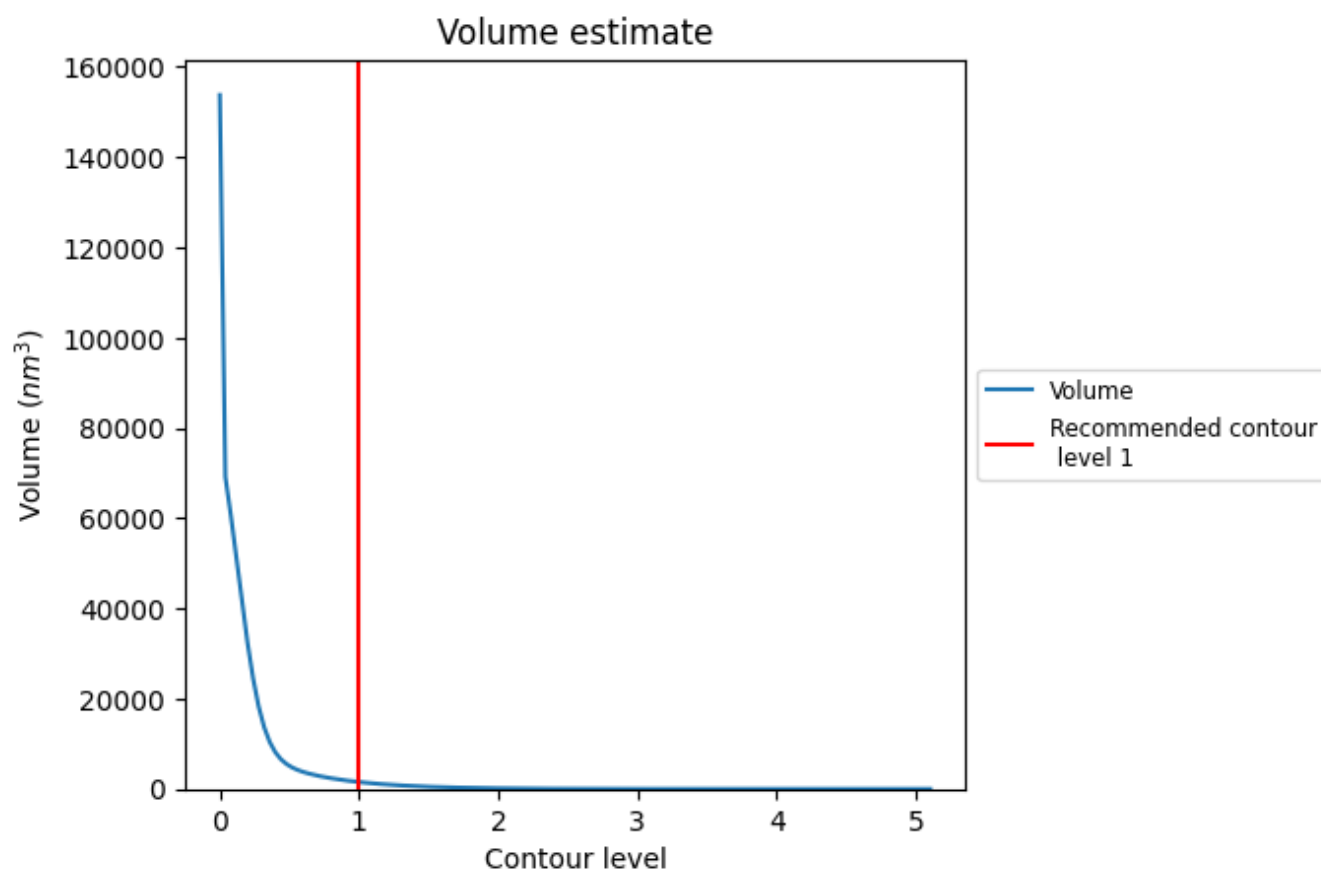
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

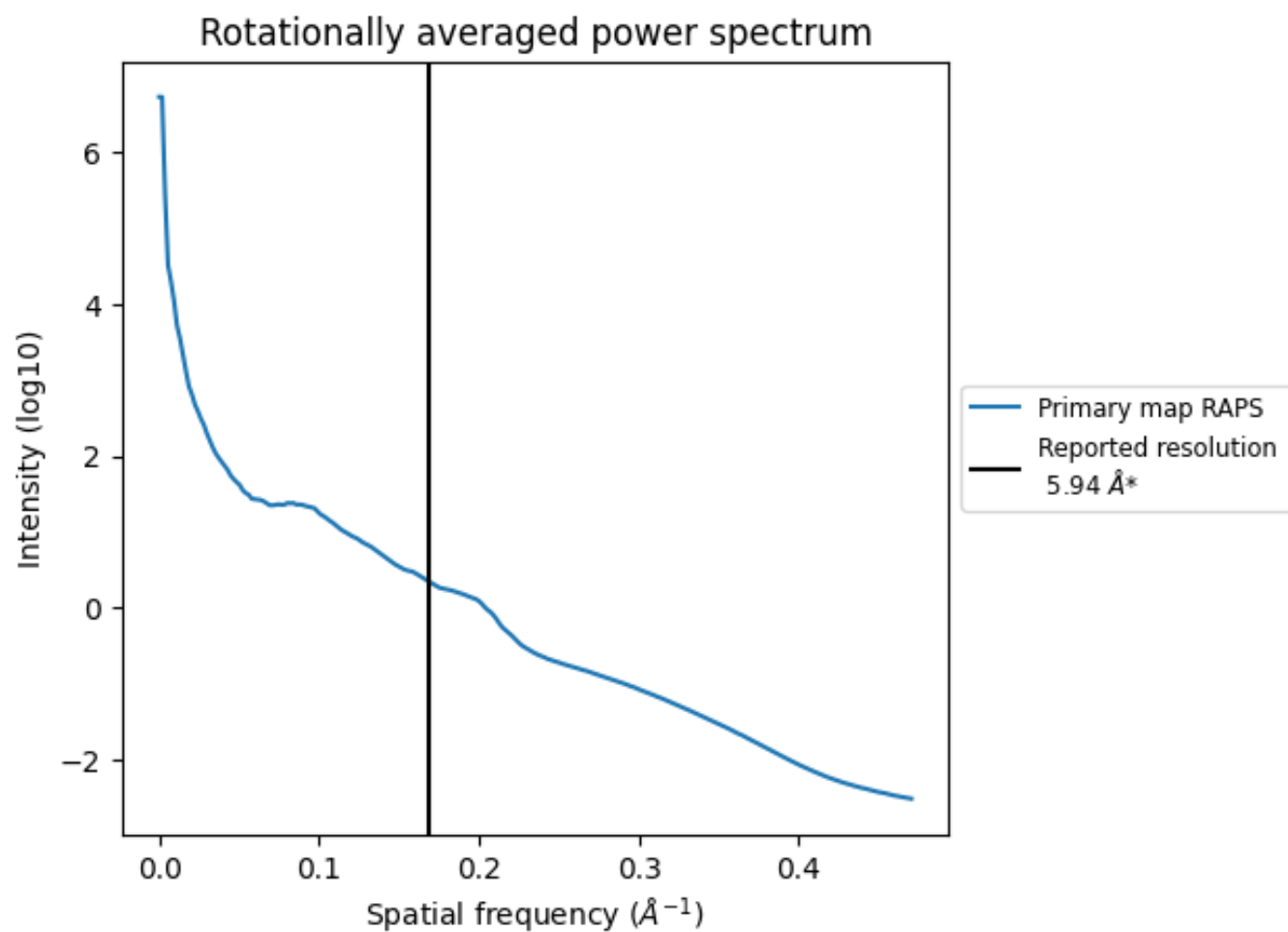
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1535 nm³; this corresponds to an approximate mass of 1386 kDa.

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

7.3 Rotationally averaged power spectrum ⓘ



*Reported resolution corresponds to spatial frequency of 0.168 Å⁻¹

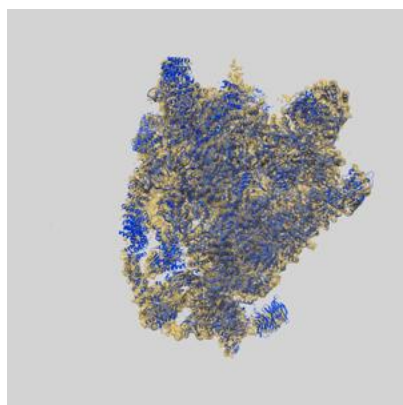
8 Fourier-Shell correlation

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

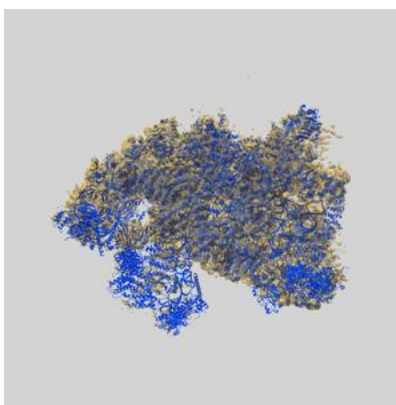
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-49082 and PDB model 9N72. Per-residue inclusion information can be found in [section 3](#) on [page 16](#).

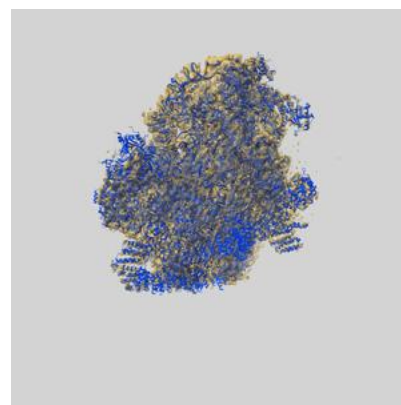
9.1 Map-model overlay [i](#)



X



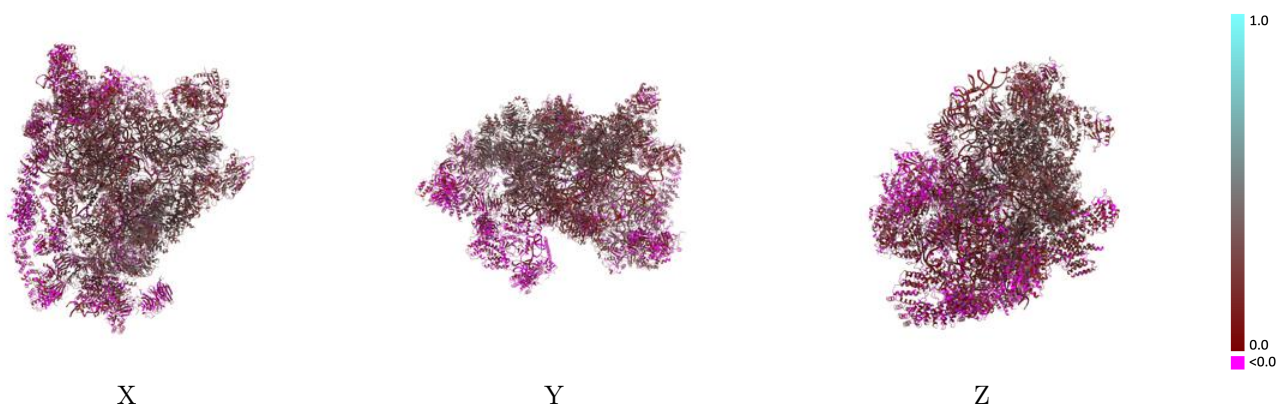
Y



Z

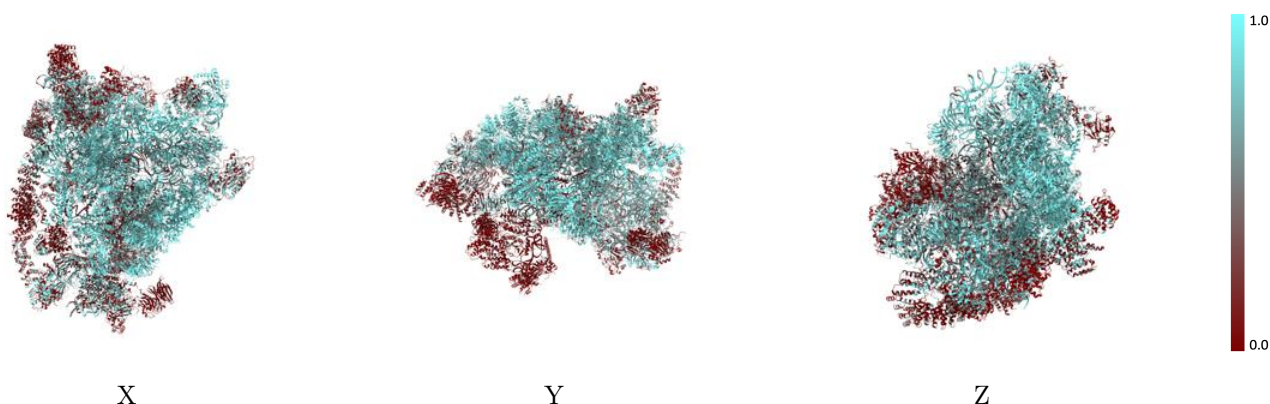
The images above show the 3D surface view of the map at the recommended contour level 1.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



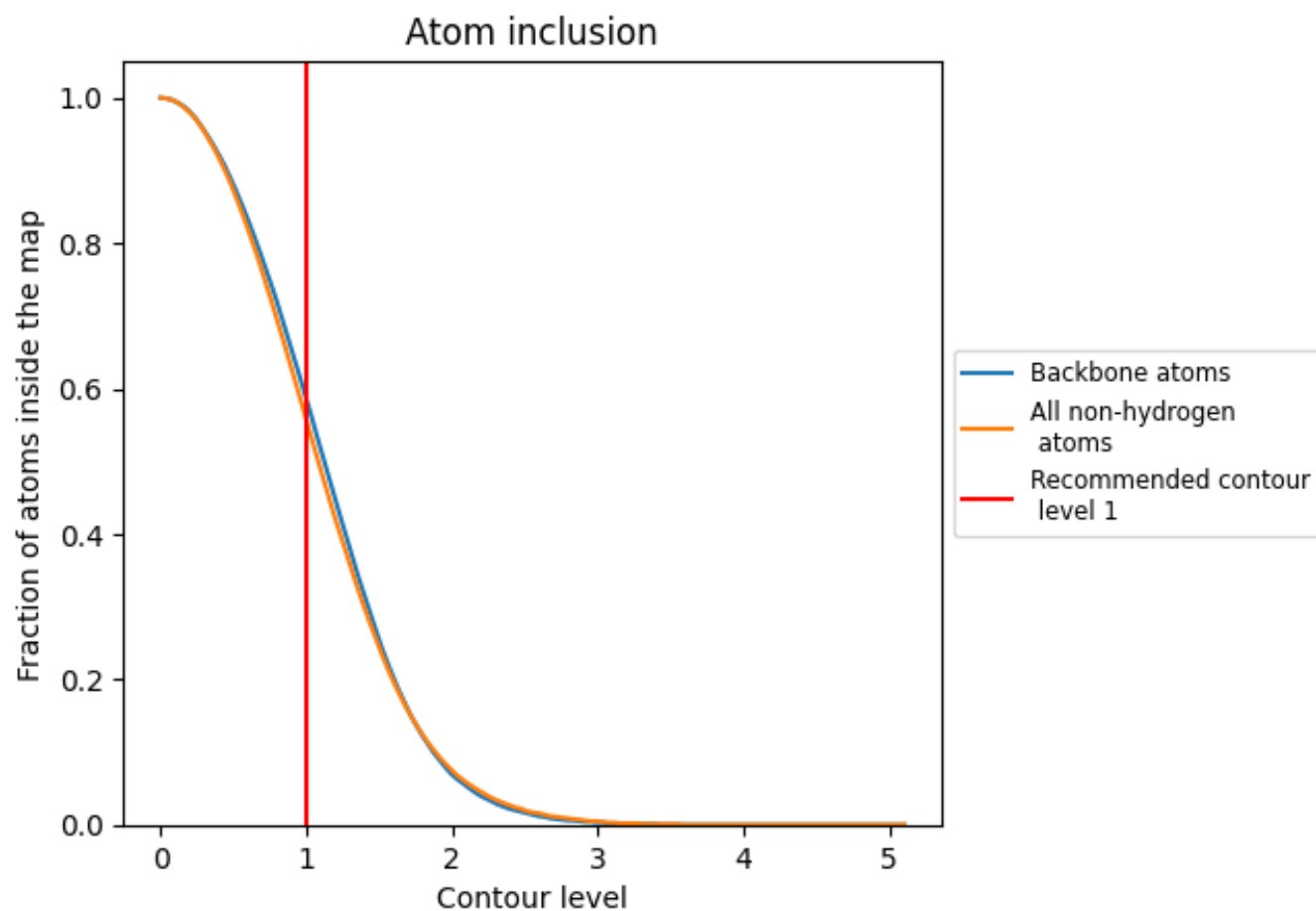
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (1).

9.4 Atom inclusion [i](#)



At the recommended contour level, 59% of all backbone atoms, 56% 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 (1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5560	 0.1890
L0	 0.5470	 0.1160
L1	 0.6730	 0.1750
L2	 0.6410	 0.1710
L3	 0.0170	 0.1030
L4	 0.7160	 0.1730
L5	 0.8460	 0.3110
L6	 0.6710	 0.1830
L7	 0.7340	 0.2230
L8	 0.5680	 0.1350
L9	 0.7830	 0.2400
LC	 0.7880	 0.3070
LD	 0.5320	 0.1300
LE	 0.8640	 0.2890
LF	 0.8370	 0.2090
LG	 0.8030	 0.3410
LH	 0.4850	 0.1660
LI	 0.0900	 0.0410
LJ	 0.3890	 0.1460
LK	 0.2290	 0.0930
LL	 0.5710	 0.2450
LM	 0.3620	 0.0910
LN	 0.5240	 0.1730
LO	 0.8250	 0.3510
LP	 0.6350	 0.2400
LQ	 0.8500	 0.2290
LR	 0.7640	 0.2930
LS	 0.7470	 0.3140
LT	 0.8420	 0.3370
LU	 0.8880	 0.3000
LV	 0.6080	 0.1340
LW	 0.7670	 0.3120
LX	 0.5600	 0.1750
LY	 0.2760	 0.0790
LZ	 0.6360	 0.2410



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Chain	Atom inclusion	Q-score
NA	 0.5400	 0.2160
NB	 0.3200	 0.1120
NC	 0.6140	 0.2170
ND	 0.0000	 0.0210
NF	 0.9040	 0.2790
NG	 0.7030	 0.3360
NH	 0.7200	 0.2590
NI	 0.4550	 0.2290
NM	 0.7990	 0.3440
NN	 0.5020	 0.1540
NP	 0.0350	 0.0980
NQ	 0.8840	 0.2640
NS	 0.5210	 0.2450
NV	 0.1030	 -0.1090
OA	 0.0000	 0.0600
OH	 0.0000	 -0.0320
OU	 0.0000	 -0.0450
SA	 0.7460	 0.2560
SB	 0.5810	 0.2140
SC	 0.7810	 0.2980
SD	 0.0940	 0.0750
SE	 0.6910	 0.2530
SF	 0.8460	 0.2680
SG	 0.7780	 0.2310
SH	 0.5480	 0.2130
SI	 0.6750	 0.2550
SJ	 0.0640	 0.0390
SK	 0.1140	 0.0540
SL	 0.8440	 0.2980
SM	 0.5530	 0.2290
SP	 0.2950	 0.1190
SQ	 0.4800	 0.2410
SR	 0.7230	 0.2360
SS	 0.5560	 0.2650
ST	 0.0880	 0.0380
SU	 0.0140	 0.0180
SW	 0.7340	 0.3270
SY	 0.1980	 0.1540
SZ	 0.0200	 -0.0060