



wwPDB EM Validation Summary Report ⓘ

Dec 18, 2022 – 04:45 pm GMT

PDB ID : 7AJT
EMDB ID : EMD-11807
Title : Cryo-EM structure of the 90S-exosome super-complex (state Pre-A1-exosome)
Authors : Cheng, J.; Lau, B.; Flemming, D.; Venuta, G.L.; Berninghausen, O.; Beckmann, R.; Hurt, E.
Deposited on : 2020-09-29
Resolution : 4.60 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

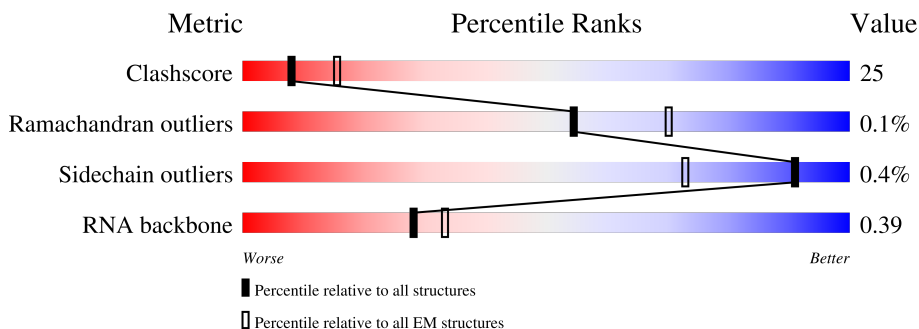
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.3

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 4.60 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	CA	327	
1	CB	327	
2	DA	255	
3	JA	1056	
3	JB	1056	
4	UA	923	
5	UB	810	

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Mol	Chain	Length	Quality of chain
6	UC	610	14% 7% 79%
7	UD	776	36% 50% 13%
8	UE	643	37% 36% 26%
9	UF	440	33% 34% 33%
10	UG	554	55% 41% ..
11	UH	713	43% 18% 38%
12	UI	575	5% 13% 82%
13	UJ	1769	29% 34% 37%
14	UK	250	41% 55% ..
15	UL	943	44% 45% 11%
16	UM	817	41% 51% • 7%
17	UN	899	10% 6% 84%
18	UO	513	42% 53% ..
19	UP	214	11% 16% 72%
20	UQ	896	43% 49% 7%
21	UR	594	41% 40% 19%
22	US	552	55% 34% 11%
23	UT	2493	48% 42% 10%
24	UU	939	50% 41% 10%
25	UV	1237	43% 44% 13%
26	UX	189	57% 35% 8%
27	UZ	274	43% 47% 10%
28	CD	504	41% 34% 25%
29	CE	511	41% 44% • 15%
30	CF	126	60% 37% •


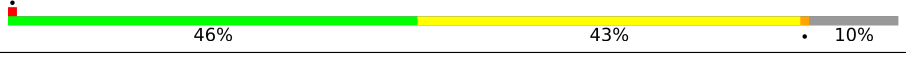


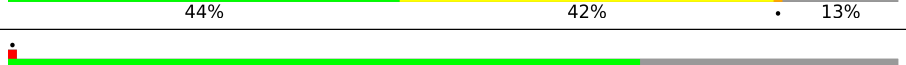

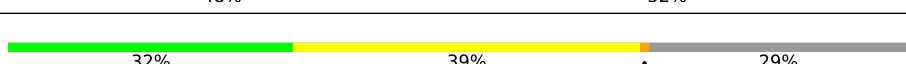
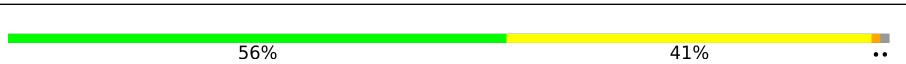
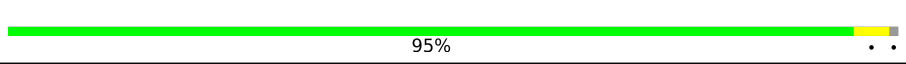
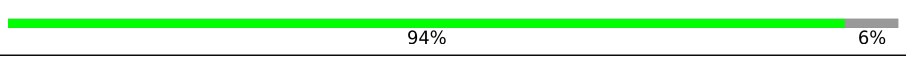
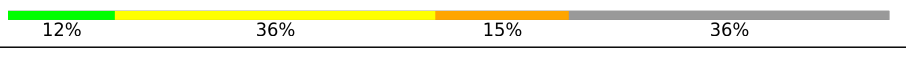
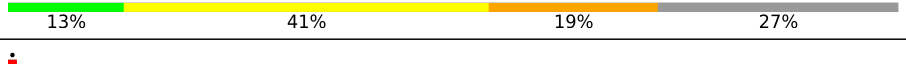

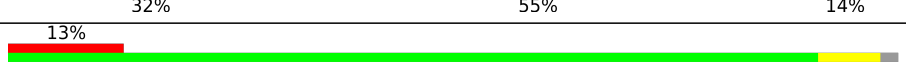
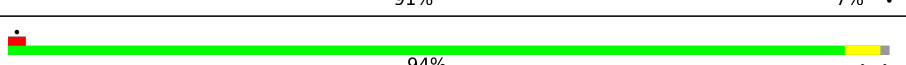

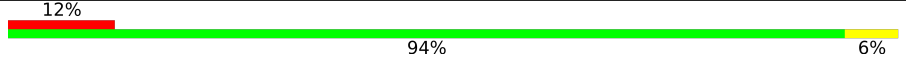
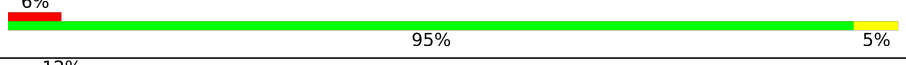

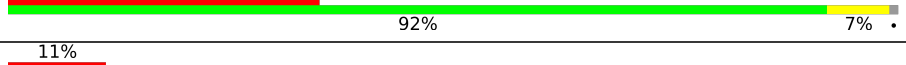


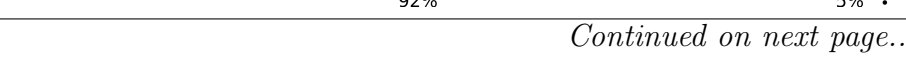


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Mol	Chain	Length	Quality of chain
30	CG	126	50% 46%
31	CH	573	39% 42% 19%
32	CI	183	50% 49%
33	CJ	290	52% 44%
34	CK	593	19% 15% 65%
35	CL	1183	33% 33% 34%
36	CM	367	53% 45%
37	CN	297	41% 37% 22%
38	JC	707	17% 33% 50%
39	JF	252	40% 46% 14%
39	JG	252	50% 41% 9%
40	JH	483	53% 46%
41	JI	1729	15% 85%
42	JJ	274	35% 32% 34%
43	JK	534	5% 92%
44	JM	217	36% 25% 38%
45	JN	346	36% 18% 46%
46	JO	316	46% 27% 27%
47	JP	489	49% 45% 6%
48	JQ	206	26% 5% 69%
49	DE	261	43% 51% 6%
50	DF	225	45% 49% 5%
51	DG	236	42% 50% 8%
52	DH	190	44% 53%
53	DI	200	48% 40% 12%

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Mol	Chain	Length	Quality of chain
54	DJ	197	 58% 36% 6%
55	DL	156	 46% 43% 10%
56	DN	151	 49% 50% 1%
57	DO	137	 56% 30% 12%
58	DQ	143	 44% 42% 13%
59	DS	146	 71% 29%
60	DW	130	 48% 52% 1%
61	DX	145	 32% 39% 29%
62	DY	135	 56% 41% 1%
63	Db	82	 95% 1% 1%
64	Dc	67	 94% 6%
65	D2	700	 12% 36% 15% 36%
66	D3	1808	 13% 41% 19% 27%
67	D4	333	 15% 39% 15% 31%
68	EA	22	 9% 32% 55% 14%
69	EB	305	 13% 91% 7%
70	EC	246	 94% 1% 1%
71	ED	394	 6% 73% 7% 20%
72	EE	223	 12% 94% 6%
73	EF	267	 6% 95% 5%
74	EG	250	 12% 83% 14%
75	EH	240	 35% 92% 7%
76	EI	359	 11% 77% 8% 18%
77	EJ	292	 31% 68% 8% 24%
78	EK	1001	 42% 92% 5%

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Mol	Chain	Length	Quality of chain
79	EN	1073	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into four segments: a red segment (35%), a green segment (79%), a yellow segment (10%), and a grey segment (10%). The percentages are labeled above each segment.</p>

2 Entry composition [i](#)

There are 82 unique types of molecules in this entry. The entry contains 256149 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called rRNA 2'-O-methyltransferase fibrillarin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	CA	242	Total	C	N	O	S	0	0
			1881	1193	338	340	10		
1	CB	228	Total	C	N	O	S	0	0
			1782	1131	320	321	10		

- Molecule 2 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	DA	240	Total	C	N	O	S	0	0
			1912	1209	354	345	4		

- Molecule 3 is a protein called RNA cytidine acetyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	JA	812	Total	C	N	O	S	0	0
			5916	3745	1044	1102	25		
3	JB	835	Total	C	N	O		0	0
			4132	2462	835	835			

- Molecule 4 is a protein called Periodic tryptophan protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	UA	834	Total	C	N	O	S	0	0
			6635	4223	1140	1253	19		

- Molecule 5 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	UB	507	Total	C	N	O	S	0	0
			3734	2367	663	695	9		

- Molecule 6 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	UC	128	1026	633	204	189	0	0

- Molecule 7 is a protein called U3 small nucleolar RNA-associated protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	UD	675	5361	3395	929	1015	22	0	0

- Molecule 8 is a protein called U3 small nucleolar RNA-associated protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	UE	475	3772	2400	649	710	13	0	0

- Molecule 9 is a protein called U3 small nucleolar RNA-associated protein 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	UF	293	2487	1605	435	434	13	0	0

- Molecule 10 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	UG	533	4218	2646	758	802	12	0	0

- Molecule 11 is a protein called U3 small nucleolar RNA-associated protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	UH	442	2701	1680	494	524	3	0	0

- Molecule 12 is a protein called U3 small nucleolar RNA-associated protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	UI	104	860	556	152	150	2	0	0

- Molecule 13 is a protein called U3 small nucleolar RNA-associated protein 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	UJ	1116	8961	5802	1468	1666	25	0	0

- Molecule 14 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	UK	242	2021	1254	389	371	7	0	0

- Molecule 15 is a protein called U3 small nucleolar RNA-associated protein 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	UL	842	6726	4303	1129	1267	27	0	0

- Molecule 16 is a protein called U3 small nucleolar RNA-associated protein 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	UM	762	5969	3785	1007	1149	28	0	0

- Molecule 17 is a protein called U3 small nucleolar RNA-associated protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	UN	147	1227	765	233	227	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	UO	493	3911	2462	702	735	12	0	0

- Molecule 19 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
19	UP	60	495	310	101	84	0	0

- Molecule 20 is a protein called NET1-associated nuclear protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	UQ	832	6662	4236	1124	1283	19	0	0

- Molecule 21 is a protein called U3 small nucleolar RNA-associated protein 18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	UR	482	3799	2405	669	715	10	0	0

- Molecule 22 is a protein called Nucleolar complex protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	US	494	3622	2326	617	667	12	0	0

- Molecule 23 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	UT	2255	17290	11076	2927	3235	52	0	0

- Molecule 24 is a protein called U3 small nucleolar RNA-associated protein 21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	UU	848	6678	4241	1149	1267	21	0	0

- Molecule 25 is a protein called U3 small nucleolar RNA-associated protein 22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	UV	1081	8736	5681	1440	1591	24	0	0

- Molecule 26 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	UX	174	1395	890	255	240	10	0	0

- Molecule 27 is a protein called Ribosome biogenesis protein UTP30.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	UZ	247	Total	C	N	O	S	0	0
			2006	1284	356	358	8		

- Molecule 28 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	CD	380	Total	C	N	O	S	0	0
			2994	1898	513	574	9		

- Molecule 29 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	CE	435	Total	C	N	O	S	0	0
			3325	2093	571	653	8		

- Molecule 30 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	CF	123	Total	C	N	O	S	0	0
			931	594	160	173	4		
30	CG	123	Total	C	N	O	S	0	0
			928	591	160	173	4		

- Molecule 31 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	CH	465	Total	C	N	O	S	0	0
			3725	2365	653	697	10		

- Molecule 32 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	CI	182	Total	C	N	O	S	0	0
			1530	967	287	269	7		

- Molecule 33 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	CJ	282	Total	C	N	O	S	0	0
			2296	1441	430	418	7		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
34	CK	207	Total	C	N	O	S	0	0
			1667	1034	297	332	4		

- Molecule 35 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	CL	781	Total	C	N	O	S	0	0
			6332	4063	1122	1117	30		

- Molecule 36 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

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

- Molecule 37 is a protein called Ribosomal RNA-processing protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	CN	232	Total	C	N	O	S	0	0
			1893	1213	322	351	7		

- Molecule 38 is a protein called Ribosome biogenesis protein ENP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	JC	354	Total	C	N	O	S	0	0
			2845	1795	489	552	9		

- Molecule 39 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	JF	216	Total	C	N	O	S	0	0
			1701	1079	296	315	11		
39	JG	230	Total	C	N	O	S	0	0
			1799	1142	313	333	11		

- Molecule 40 is a protein called Essential nuclear protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
40	JH	261	Total	C	N	O	0	0
			1295	773	261	261		

- Molecule 41 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	JI	265	Total	C	N	O	0	0
			1314	784	265	265		

- Molecule 42 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	JJ	182	Total	C	N	O	S	0	0
			1442	923	259	256	4		

- Molecule 43 is a protein called Protein BFR2.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	JK	42	Total	C	N	O	0	0
			334	213	54	67		

- Molecule 44 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	JM	135	Total	C	N	O	S	0	0
			1137	721	211	201	4		

- Molecule 45 is a protein called Protein FAF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	JN	186	Total	C	N	O	S	0	0
			1428	879	287	259	3		

- Molecule 46 is a protein called KRR1 small subunit processome component.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	JO	230	Total	C	N	O	S	0	0
			1876	1203	330	332	11		

- Molecule 47 is a protein called Protein SOF1.

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

- Molecule 48 is a protein called Regulator of rDNA transcription protein 14.

Mol	Chain	Residues	Atoms				AltConf	Trace
48	JQ	63	Total	C	N	O	0	0
			381	234	69	78		

- Molecule 49 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	DE	245	Total	C	N	O	S	0	0
			1944	1245	360	336	3		

- Molecule 50 is a protein called 40S ribosomal protein S5.

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

- Molecule 51 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	DG	218	Total	C	N	O	S	0	0
			1755	1102	337	313	3		

- Molecule 52 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
52	DH	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 53 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	DI	177	Total	C	N	O	S	0	0
			1399	869	279	249	2		

- Molecule 54 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	DJ	185	Total	C	N	O	S	0	0
			1494	943	289	261	1		

- Molecule 55 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	DL	140	Total	C	N	O	S	0	0
			1129	724	215	187	3		

- Molecule 56 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	DN	150	Total	C	N	O	S	0	0
			1192	759	224	207	2		

- Molecule 57 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	DO	120	Total	C	N	O	S	0	0
			881	544	167	167	3		

- Molecule 58 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
58	DQ	125	Total	C	N	O	0	0
			973	625	174	174		

- Molecule 59 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
59	DS	104	Total	C	N	O	0	0
			516	308	104	104		

- Molecule 60 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	DW	129	Total	C	N	O	S	0	0
			1021	650	188	180	3		

- Molecule 61 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	DX	103	Total	C	N	O	S	0	0
			786	503	144	137	2		

- Molecule 62 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
62	DY	134	Total	C	N	O	0	0
			1073	676	208	189		

- Molecule 63 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	Db	81	Total	C	N	O	S	0	0
			610	382	110	113	5		

- Molecule 64 is a protein called 40S ribosomal protein S28-A.

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

- Molecule 65 is a RNA chain called 5'ETS RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	D2	446	Total	C	N	O	P	0	0
			9508	4250	1682	3130	446		

- Molecule 66 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	D3	1327	Total	C	N	O	P	0	0
			28287	12644	5022	9294	1327		

- Molecule 67 is a RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	D4	230	Total	C	N	O	P	0	0
			4869	2180	841	1618	230		

- Molecule 68 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	EA	22	Total	C	N	O	P	0	0
			366	161	43	140	22		

- Molecule 69 is a protein called Exosome complex component RRP45.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
69	EB	299	1475	877	299	299	0	0

- Molecule 70 is a protein called Exosome complex component SKI6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
70	EC	244	1204	716	244	244	0	0

- Molecule 71 is a protein called Exosome complex component RRP43.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
71	ED	317	1571	937	317	317	1	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
ED	363	MET	VAL	conflict	UNP P25359

- Molecule 72 is a protein called Exosome complex component RRP46.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
72	EE	223	1107	661	223	223	1	0

- Molecule 73 is a protein called Exosome complex component RRP42.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
73	EF	267	1326	792	267	267	1	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
EF	-1	GLY	-	expression tag	UNP Q12277
EF	0	HIS	-	expression tag	UNP Q12277
EF	138	ILE	VAL	conflict	UNP Q12277

- Molecule 74 is a protein called Exosome complex component MTR3.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
74	EG	215	1058	628	215	215	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
EG	75	SER	THR	conflict	UNP P48240

- Molecule 75 is a protein called Exosome complex component RRP40.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
75	EH	237	1170	696	237	237	0	0

- Molecule 76 is a protein called Exosome complex component RRP4.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
76	EI	293	1440	854	293	293	0	0

- Molecule 77 is a protein called Exosome complex component CSL4.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
77	EJ	222	1091	647	222	222	0	0

- Molecule 78 is a protein called Exosome complex exonuclease DIS3.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
78	EK	970	4818	2878	970	970	1	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
EK	171	ASN	ASP	conflict	UNP Q08162
EK	551	ASN	ASP	conflict	UNP Q08162

- Molecule 79 is a protein called ATP-dependent RNA helicase DOB1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
79	EN	964	4767	2842	964	961	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
EN	80	MET	VAL	conflict	UNP P47047

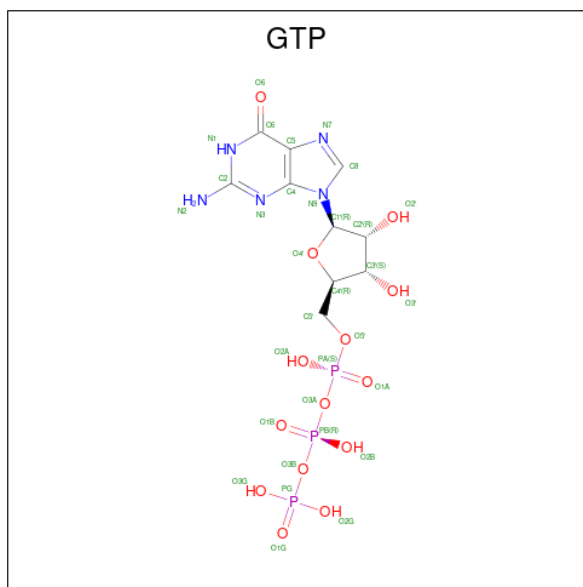
- Molecule 80 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
80	UX	1	Total	Zn	0
			1	1	
80	Db	1	Total	Zn	0
			1	1	
80	EK	1	Total	Zn	0
			1	1	

- Molecule 81 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
81	UX	1	Total	Mg	0
			1	1	
81	CL	1	Total	Mg	0
			1	1	
81	EK	1	Total	Mg	0
			1	1	

- Molecule 82 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).

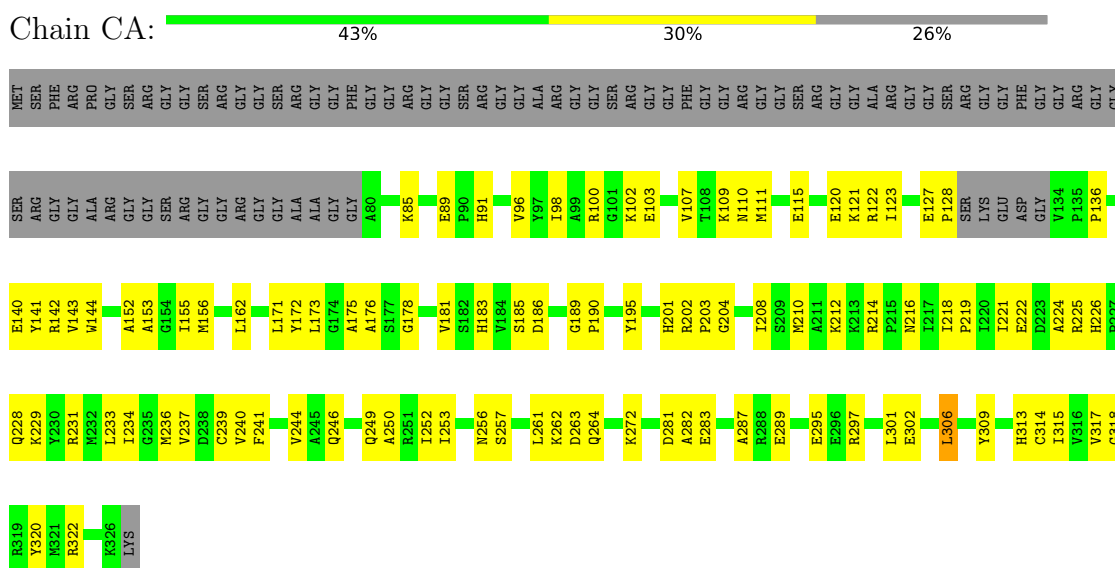


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
82	CL	1	32	10	5	14	3	0

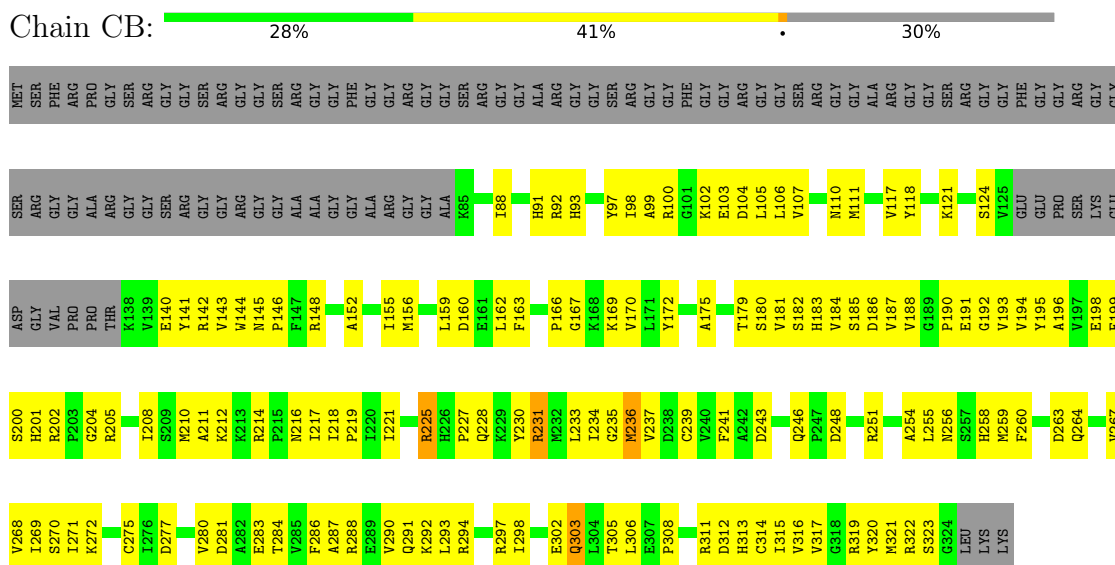
3 Residue-property plots

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.

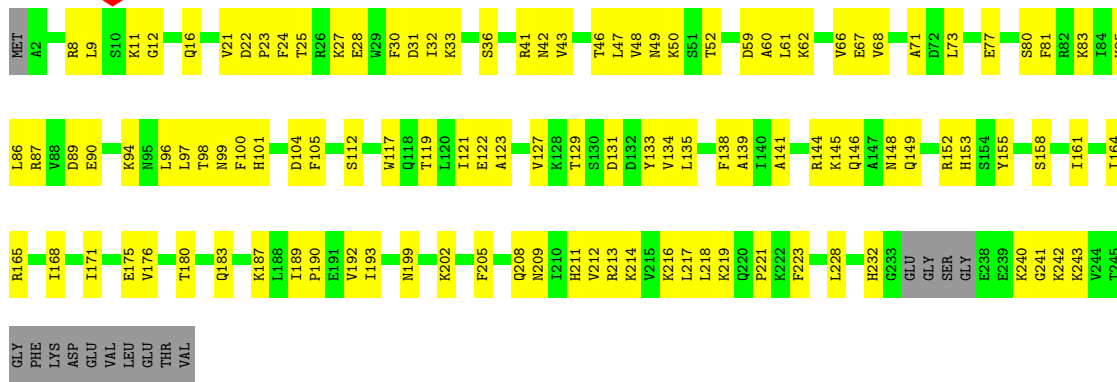
- Molecule 1: rRNA 2'-O-methyltransferase fibrillarlin



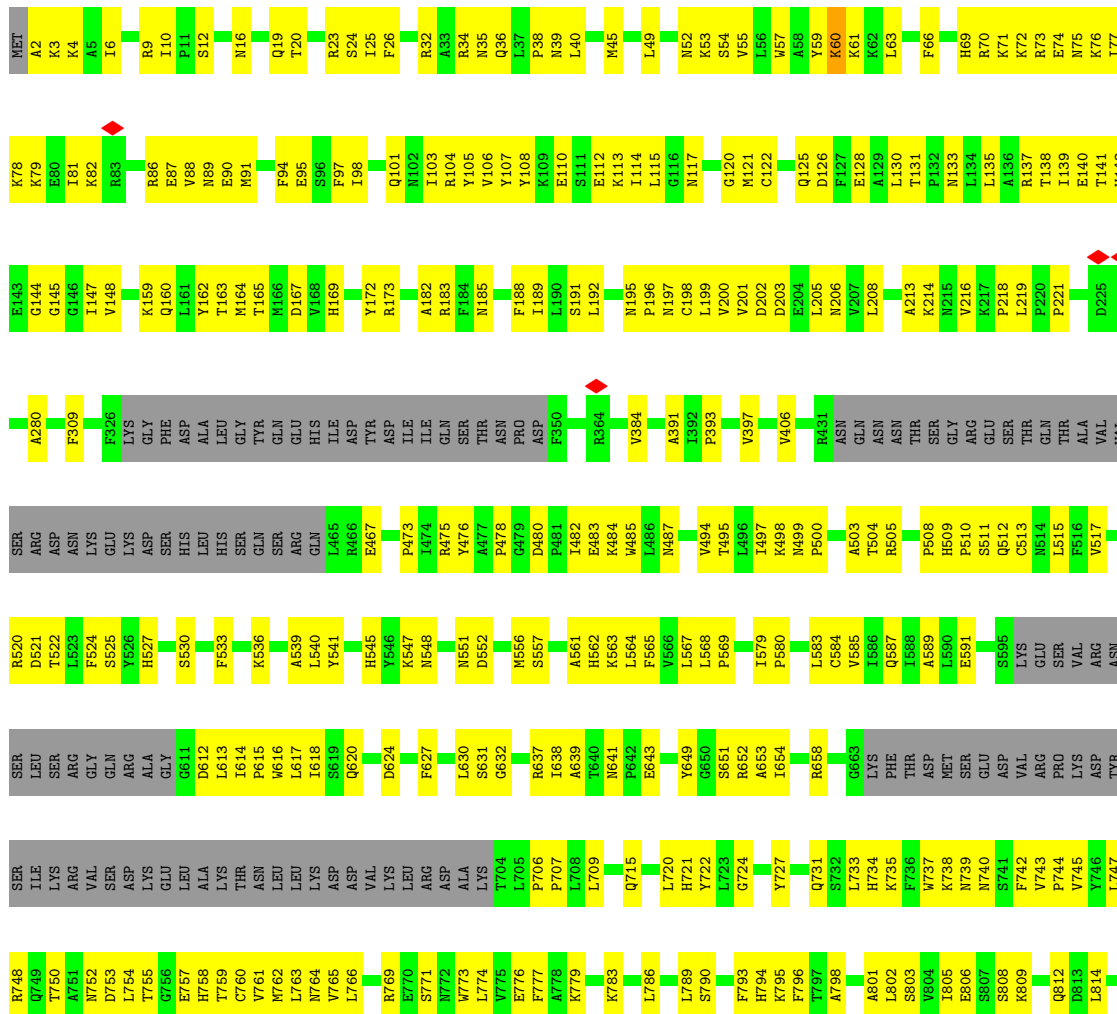
- Molecule 1: rRNA 2'-O-methyltransferase fibrillarlin

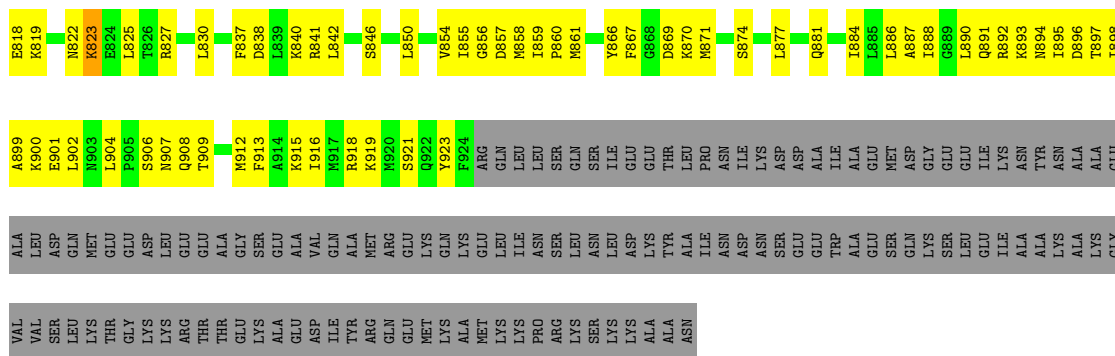


• Molecule 2: 40S ribosomal protein S1-A

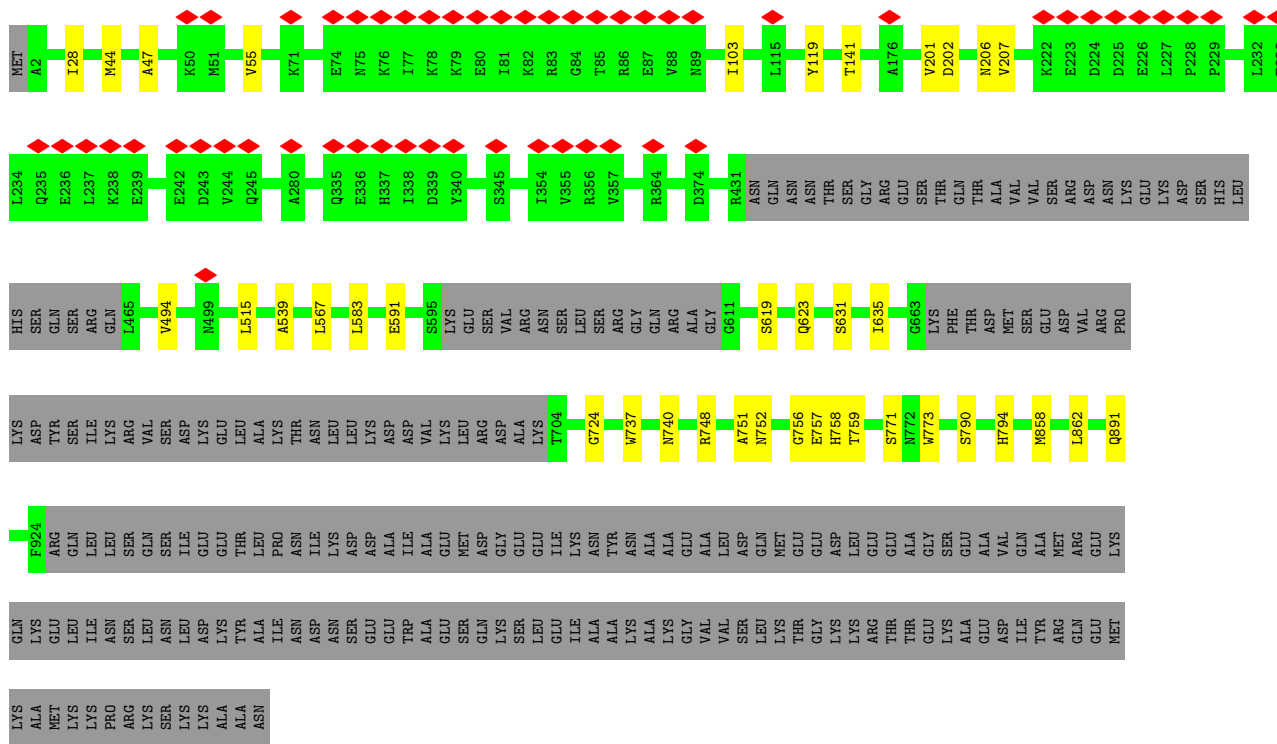


• Molecule 3: RNA cytidine acetyltransferase

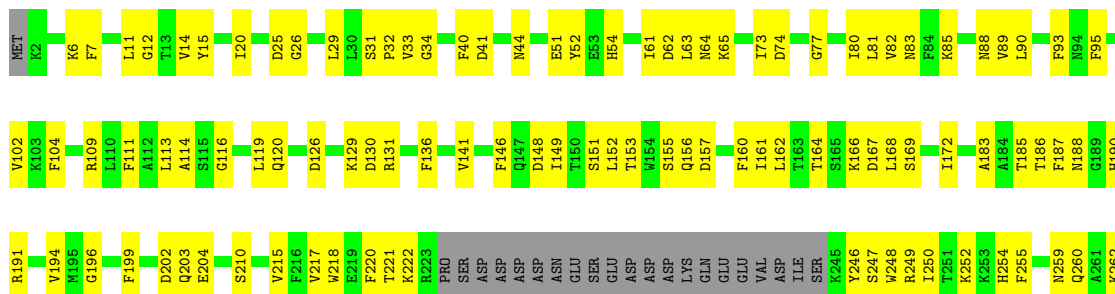


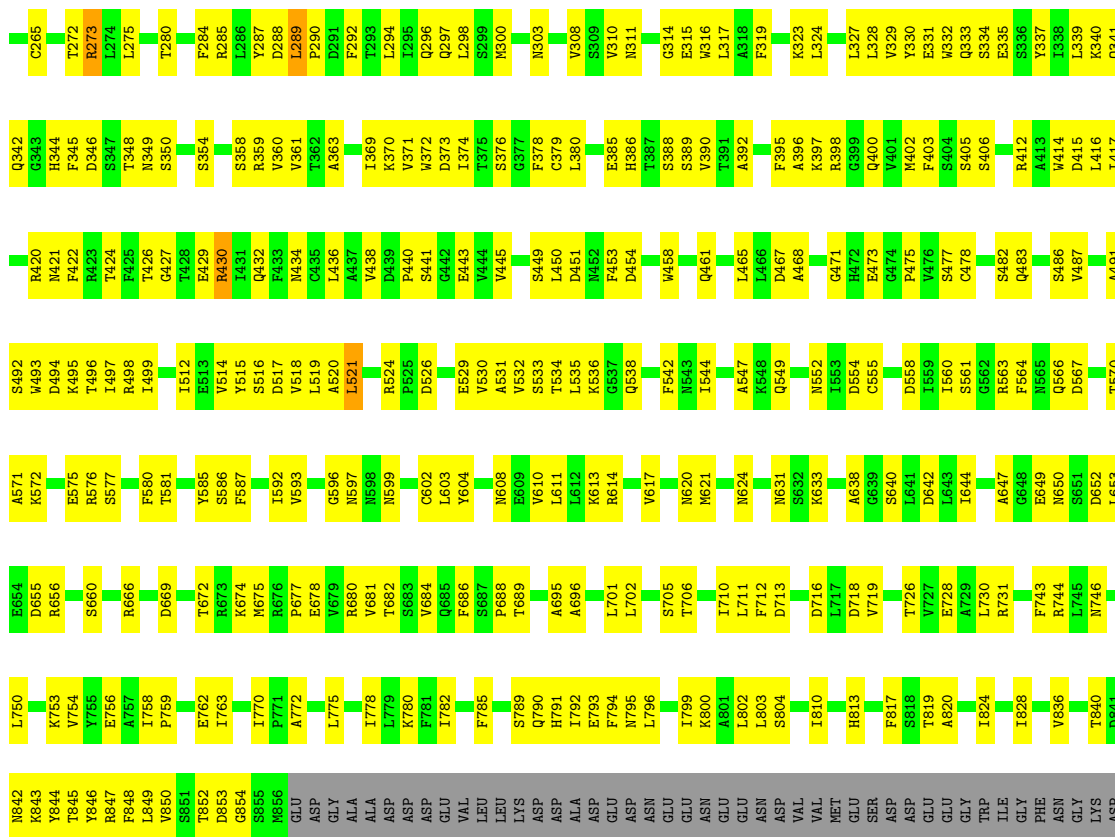


• Molecule 3: RNA cytidine acetyltransferase



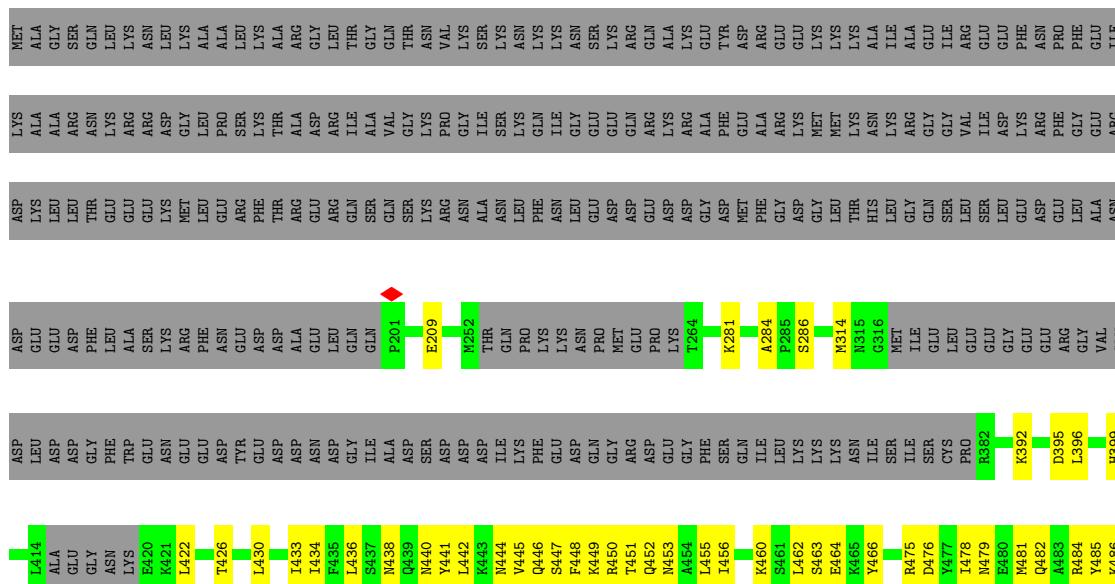
• Molecule 4: Periodic tryptophan protein 2

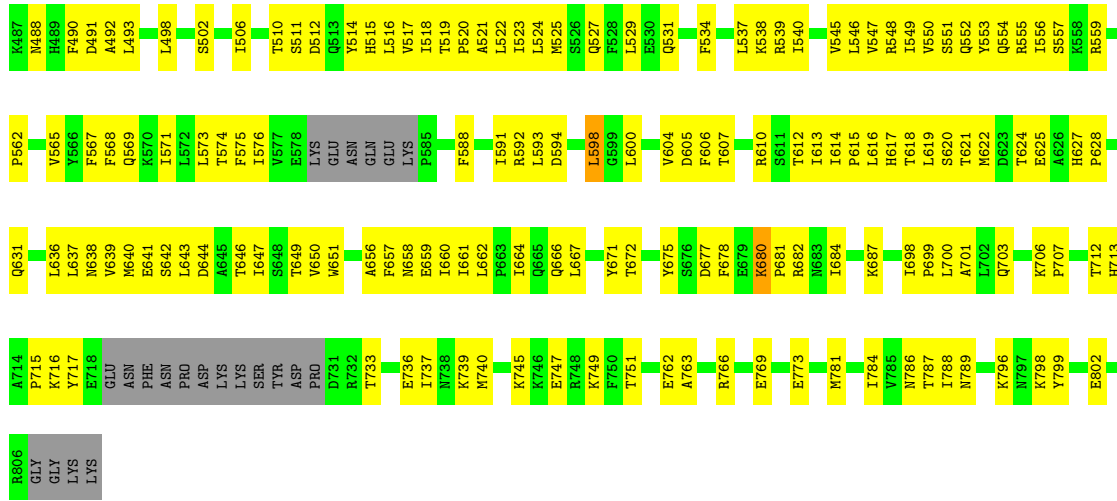




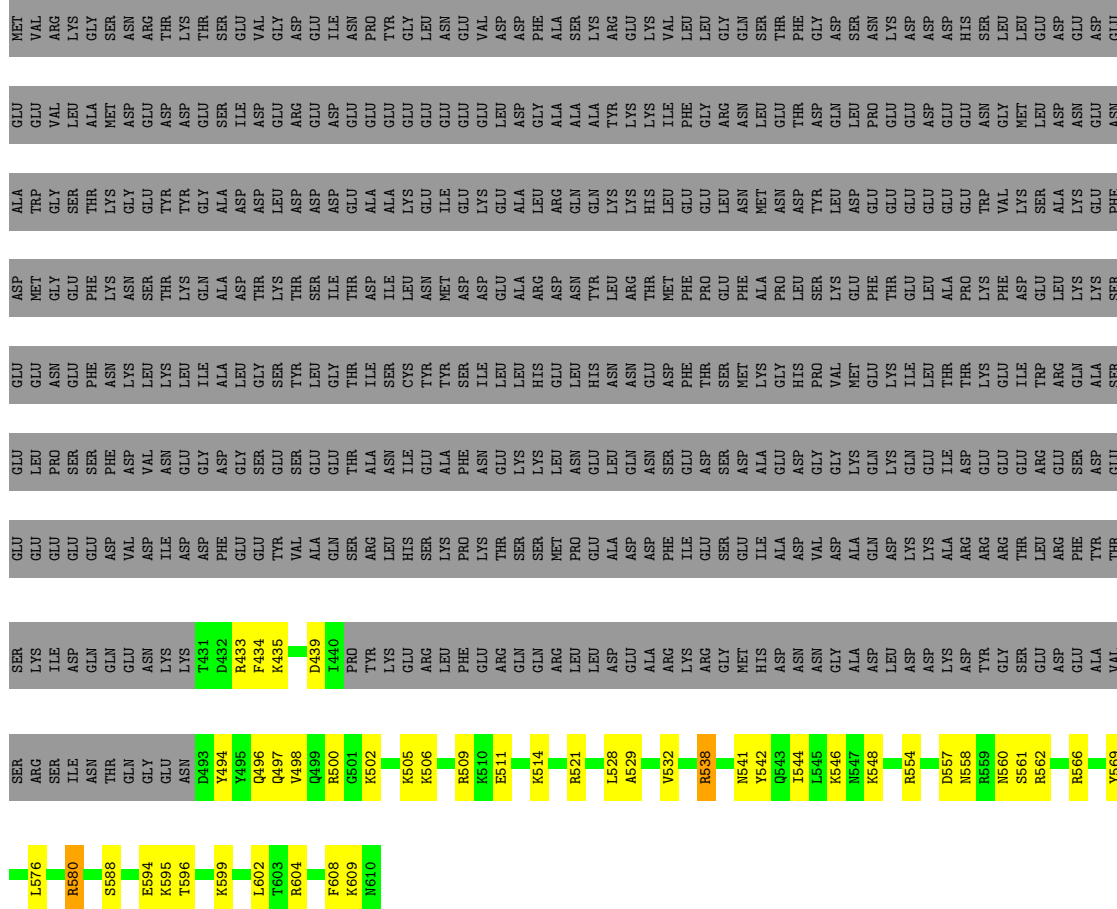
Molecule 5: Nucleolar complex protein 14

Chain UB: 38% 24% 37%





● Molecule 6: Something about silencing protein 10



● Molecule 7: U3 small nucleolar RNA-associated protein 4

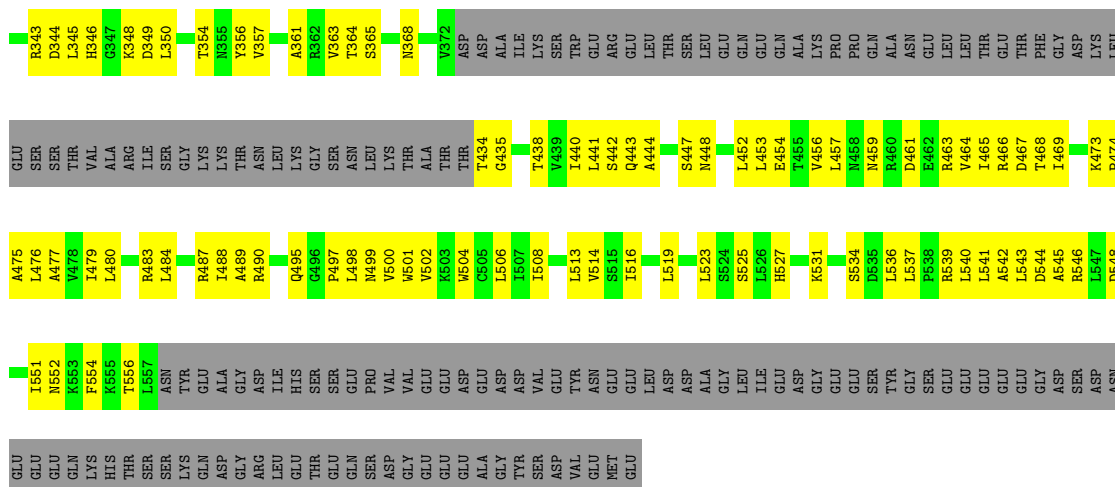


MET	SER	LEU	LEU	LEU	VAL	SER	LEU	GLU	LYS	LYS	ARG	ARG	ASN	LYS	PRO	VAL	LYS	LYS	LYS	THR	SER	GLN	E29	R30	M31	I32	V33	H34	R35	C36	R37	D40	F41	T42	P43	A44	T45	I46	I47	S48	L49	A50	F51	H52	S53	K54	S55	N56	I57	P62	S63	D64																			
L65	R66	L67	A68	I69	I76	E77	I78	W79	N80	P81	R82	N83	N84	W85	F86	Q87	E88	I91	E92	K95	D96	R97	E100	G101	C103	I104	S105	N106	L112	R113	L114	F115	S116	G118	G119	S120	T121	V122	E125	W126	D127	G131	L132	L136	K137	I138	C139	N140	S141																						
G142	V143	I144	W145	Q146	I147	S148	I149	M150	D151	S152	K155	L156	S157	V158	G159	D161	M162	G163	T164	V165	V166	L167	I168	D169	I170	P174	L177	E178	H179	L183	M184	R185	Q186	E187	A188	R189	V190	L191	T192	L193	W195	K196	K197	D198	D199	L202	G203	C204	C205	I210	R211																				
I212	W213	A214	S215	Q216	K217	E220	L225	D226	L226	H227	K230	V231	D232	K233	E237	L240	V241	W242	Y246	R249	T250	D251	Q252	I253	D257	S261	K263	F264	W265	D266	F267	Q268	A270	T271	L272	N273	Q274	K277	D282	V283	L284	C285	T288	D289	T290	D291																									
R292	N293	Y294	Z295	F296	S297	A298	G299	V300	D301	R302	K303	I304	F305	Q306	S308	Q309	N310	T311	N312	Q315	K316	N317	N318	R319	W320	V321	K322	R326	L327	L328	H329	G330	N331	D332	I333	R334	A335	I336	C337	A338	Y339	Q340	S341	K342	G343	L347	V348	S349	G350	G351	V352	E353	K354	L422	T421	L420	L421	L422	T421	K423											
N359	S360	T361	T362	S363	F364	S365	N366	V367	D368	K369	R370	K371	M372	P373	T374	V375	E376	F377	Y378	N381	V382	L383	V384	N385	W386	V387	W388	S389	W389	S390	T391	V392	V393	L400	M404	G405	THR	ASP	SER	SER	THR	GLU	GLN	M413	Y414	K415	C418	C419	L420	Y421	L422	K423																			
Q426	M427	I428	L433	S434	P435	D436	Q437	Q438	V439	W441	V442	G443	R444	T448	K449	V450	F451	H452	L453	P455	L460	K464	L465	D466	M467	D468	L469	L470	L471	S474	T475	K476	L477	V478	K479	F480	L481	K485	L486	V487	L488	C489	S490	D493	D494	V495	N496	F497	V498																						
D499	L500	GLU	SER	GLU	ASP	GLU	LYS	P508	Q509	E510	V511	E512	V516	T517	S518	S519	S522	V525	V527	I528	N529	I531	N532	H533	L534	E535	V536	D537	V542	I543	S544	R545	O546	C547	O548	V549	V550	D551	I552	R558	I559	S560	S561	P562	L563	A564	R565	L566	N567	M568	F569																				
I570	T571	A572	V573	H574	I575	S576	S577	S578	R579	K580	S581	V582	V583	V584	T586	F587	F588	Y589	F591	Y592	F593	F594	N595	N596	S600	ALA	GLU	ASN	SER	E608	S609	V610	L611	O613	V614	S615	K616	N618	E625	V626	L629	K630	F631	N632	G635	G636	G637	S638	F639	S638	S639	S640																			
D639	N642	S643	S644	R645	L646	W647	F648	W649	I654	S655	R656	I657	D660	N666	LYS	ARG	ARG	LYS	GLN	LYS	LYS	ARG	THR	HIS	GLU	GLU	GLU	GLU	A678	L679	T682	S685	N686	F687	N688	N689	ASP	GLU	GLU	ASP	ASP	GLU	ASP	ASP	ASP	ALA	THR	THR	THR	VAL	W46	E48	L51	V52	L53	E54	V60	W65	N67	ALA	ALA	SER	D72	T73	A75	G79	M80	N81	N82	G83	E84
LEU	LEU	ASN	GLN	GLY	ASN	LYS	ILE	LYS	LYS	THR	ASP	VAL	GLN	ASN	ASN	GLU	SER	SER	GLY	H731	F732	F733	F734	T735	K739	P740	L741	L742	F743	V744	I747	E751	L752	A753	I755	F756	R757	N758	F759	L760	T761	H763	S764	K765	K767	A768	F769	K773	L774	V775	F776																				

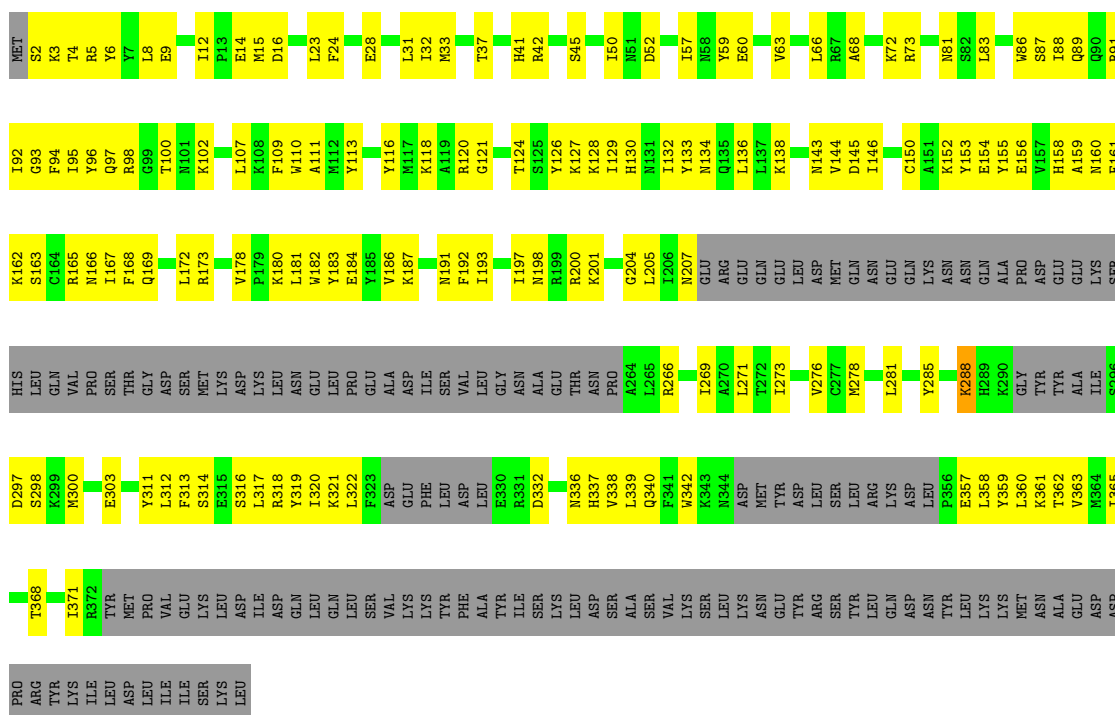
● Molecule 8: U3 small nucleolar RNA-associated protein 5



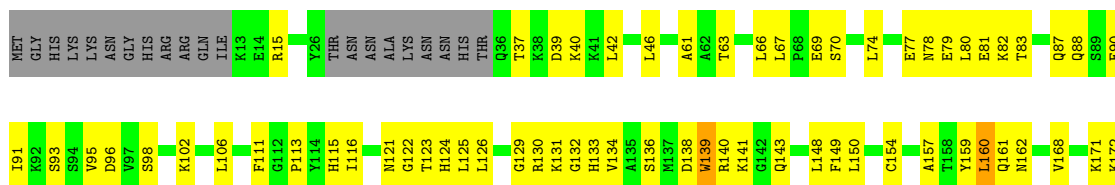
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I85	W86	L87	Y88	S89	V90	L91	A92	N93	S94	V95	T96	Y97	K98	F99	N103	I107	K108	D109	I110	I111	I112	N115	Q116	L117	W118	C119	I120	D121	S122	I123	F126	Y127	Q128	F129	D130	L131	L136	L137	Q138	H139	F140	I142	N143	N144	C145	L148	K149	L150	L151	T152	L153	V154
Q162	L163	L164	V165	S89	A166	S167	H168	L172	K178	Y181	M182	F184	S189	P190	I191	T198	I281	N199	E200	F201	D209	R210	F211	L212	N213	V214	Y215	D216	I217	H218	S219	T222	L226	V227	A228	I232	K233	E234	S238	S243	S246	T247	V248	T247	N336							
L253	E254	P255	F256	P259	L260	V261	S262	SER	SER	THR	LYS	LYS	G269	N270	K277	K278	Q280	I281	V282	S283	K284	D285	G286	R287	K288	V289	P290	I291	Y292	N293	L300	L301	W305	L306	Q307	M311	P312	Y313	L317	Q318	Y319	R320	I322	N324	E325	V328	N336					



• Molecule 9: U3 small nucleolar RNA-associated protein 6



• Molecule 10: U3 small nucleolar RNA-associated protein 7



Y173	P266	K377	T470	R552
Y177	L267	V378	M471	F563
D178	V268	E379	N475	G554
H179	K269	N380	N476	
E180	L270	F383	K477	
G181	R274	V384	K478	
T182	G276	P385	T479	
E183	P276	F386	D482	
L184	D283	E387	I483	
L187	R284	D388	A484	
	S285	L389	D485	
	G286	V392	V486	
	Y287	G393	K493	
	Y288	H394	N494	
	M289	Q395	N494	
	A290	T396	L497	
	T291	G397	R498	
	T292	I398	R502	
	Y293	T399	F508	
	D295	M400	V508	
	G209	L401	E511	
	E210	I402	R512	
	T211	D302	R515	
	G212	I303	V516	
	W213	R304	A409	
	L214	L309	N410	
	K215	P318	N410	
	H217	G319	N410	
	D218	T280	K518	
	V219	N321	Q519	
	S220	L324	L520	
	E227	S225	D521	
	L228	L329	K522	
	R229	S333	E523	
	T230	R334	R527	
	Q240	G335	K528	
	N244	P336	N530	
	A245	H337	H531	
	V246	L345	G532	
	M247	L345	I533	
	H248	N447	K534	
	S252	S348	I538	
	V256	G349	S539	
	S257	D350	H542	
	L258	S351	K543	
	W259	M358	D544	
	S260	M357	V545	
	P261	R364	S71	
	S262	F373	T72	
	M263	A467	A77	
	P264	Q468	A80	
	E265	T469		

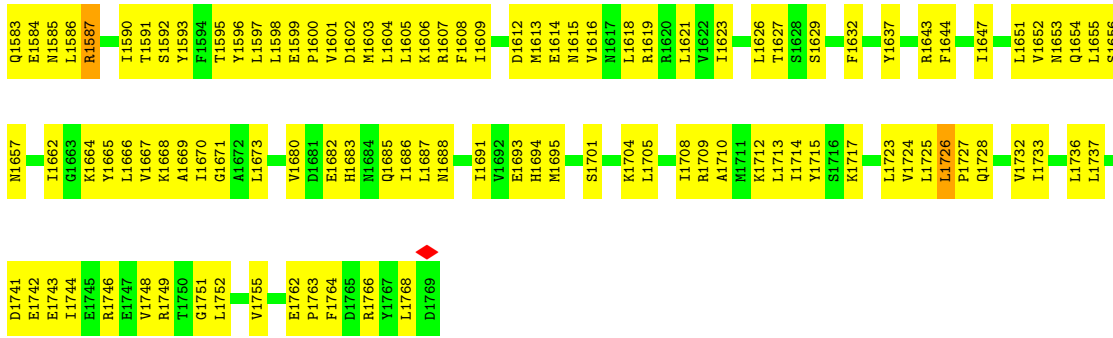
- Molecule 11: U3 small nucleolar RNA-associated protein 8

Chain UH: 43% 18% 38%

MET	G63	G254	ILE	ARG	PRO	L566	S639	Y176
PRO	G85	P257	ALA	VAL	GLY	L567	L640	Y716
SER	L85	S258	ILE	CYS	GLY	E568	D643	Y720
LEU	A85	I259	ILE	LYS	ILE	E569	S644	I723
SER	D88	F272	THR	ASP	VAL	S572	I645	
GLN	A93	Q280	LYS	ASP	VAL	I573	G646	
PRO	SER	L302	LYS	GLY	VAL	R574	L647	
PHE	THR	Q303	ASN	GLY	SER	N575	F648	
ARG	THR	L304	ASN	GLY	ASP	R576	S649	
ARG	ALA	Q304	PRO	SER	ASP	E577	L650	
LYS	ALA	I294	ASN	SER	THR	L578	E651	
LYS	ALA	Y295	PRO	VAL	PRO	G652	G652	
LEU	ALA	V300	THR	PRO	LYS	I582	L655	
SER	ASN	L302	SER	VAL	PHE	R655	L655	
SER	ASN	Q303	LEU	VAL	LEU	R656	E656	
ASN	ASN	Q304	LEU	HIS	GLY	I586	N657	
LYS	LYS	V305	LEU	CYS	ASN	L587	L658	
ILE	THR	F308	ILE	ASN	ASP	Q658	T659	
ILE	ASN	P309	ILE	GLU	TYR	R659	L660	
ASN	ASN	K310	ASN	VAL	VAL	P620	K664	
PHE	THR	K310	ILE	ILE	VAL	K521	Q665	
PHE	THR	V311	THR	ASP	GLU	T522	S694	
SER	GLN	D312	VAL	ASP	VAL	L523	V666	
LEU	LYS	K313	LYS	LYS	LEU	T524	E667	
GLN	LYS	L314	GLY	LEU	SER	F525	I668	
ALA	ARG	S315	THR	SER	ALA	L526	A669	
ALA	ASN	L320	ASN	VAL	ALA	L527	E670	
D27	VAL	L321	THR	VAL	VAL	T528	R671	
V31	GLU	A32	LEU	THR	LEU	K601	K601	
A32	ILE	ASP	LYS	GLN	GLN	P530	T673	
ASP	TRP	GLY	ASP	ASP	ASN	L531	E674	
GLY	ALA	PHE	GLY	ASP	ASP	F532	K604	
THR	ALA	GLY	LEU	LYS	ILE	P533	L605	
THR	THR	L120	PHE	THR	THR	L534	D606	
ASN	GLY	L147	GLY	PHE	LEU	S535	F610	
ASN	ASN	SER	THR	ASP	LEU	R536	I614	
ASN	ASN	K168	LEU	ASP	LEU	T537	L614	
ASN	ASN	T182	LEU	VAL	ASP	L541	G617	
ILE	ILE	S185	SER	GLY	PHE	S542	GLY	
ILE	ILE	F201	ASP	GLY	THR	L543	GLU	
GLY	GLY	L206	LEU	LEU	PHE	L544	ASP	
GLY	GLY	V232	ASP	VAL	GLY	R545	SER	
S50	S50	D235	PRO	LYS	LYS	ASP	PRU	
Y55	Y55	Q237	ILE	ASP	THR	P548	PHE	
I56	I56	L236	LEU	PHE	THR	R549	GLU	
S71	S71	L236	LEU	ASP	THR	L550	CYS	
T72	T72	F236	LEU	GLY	THR	F551	PHE	
A77	A77	Q237	ASP	THR	THR	K552	ASN	
A80	A80	L237	LYS	ASP	THR	Q553	PRU	
		L237	LYS	ASP	THR	C558	GLN	
		L237	LYS	ASP	THR	L561	GLY	
		L237	LYS	ASP	THR	P562	THR	
		L237	LYS	ASP	THR	L634	SER	
		L237	LYS	ASP	THR	F635	GLN	
		L237	LYS	ASP	THR	Q636	LYS	
		L237	LYS	ASP	THR	L637	ARG	
		L237	LYS	ASP	THR	A712	ARG	

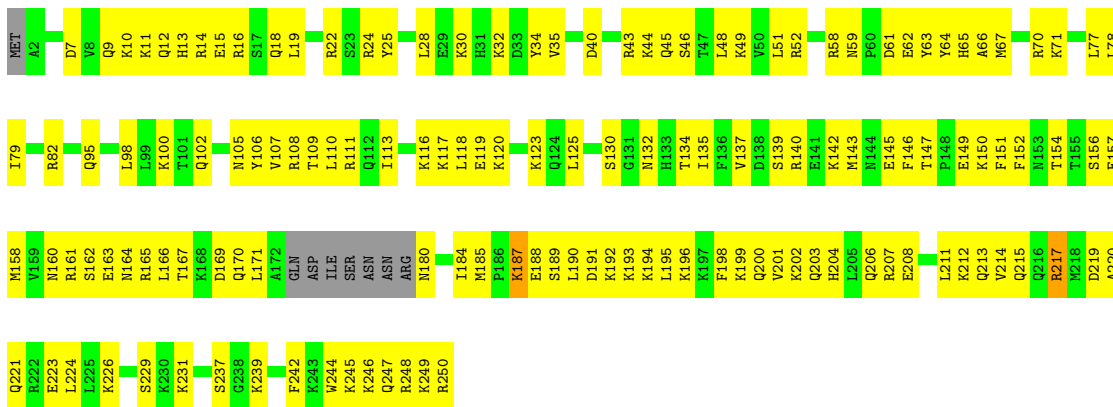
- Molecule 12: U3 small nucleolar RNA-associated protein 9

Chain UI: 5% 13% 82%



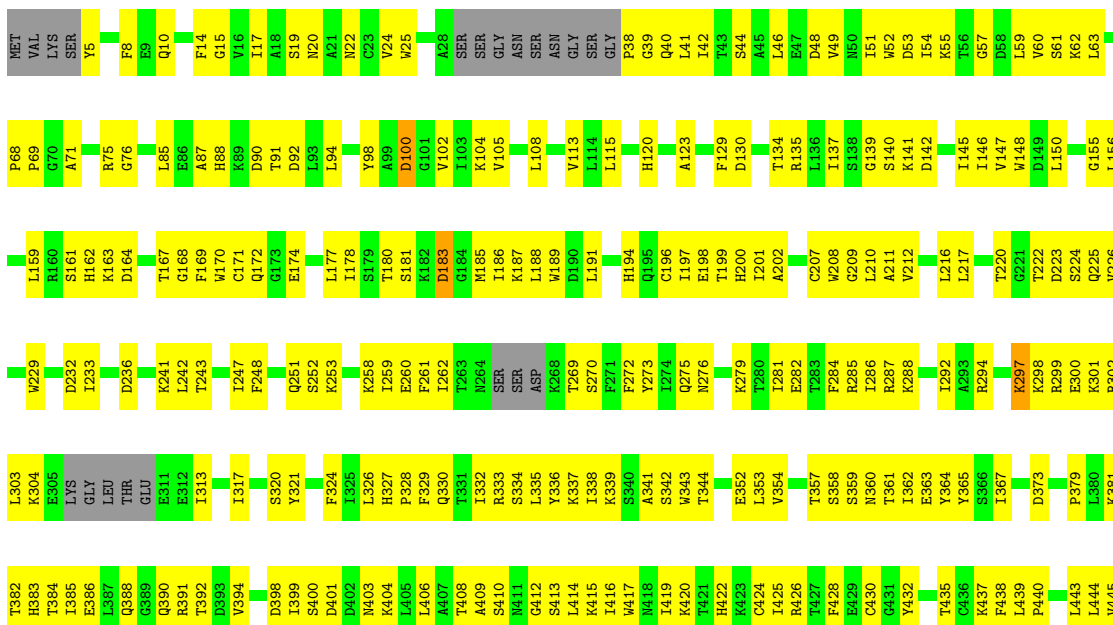
● Molecule 14: U3 small nucleolar RNA-associated protein 11

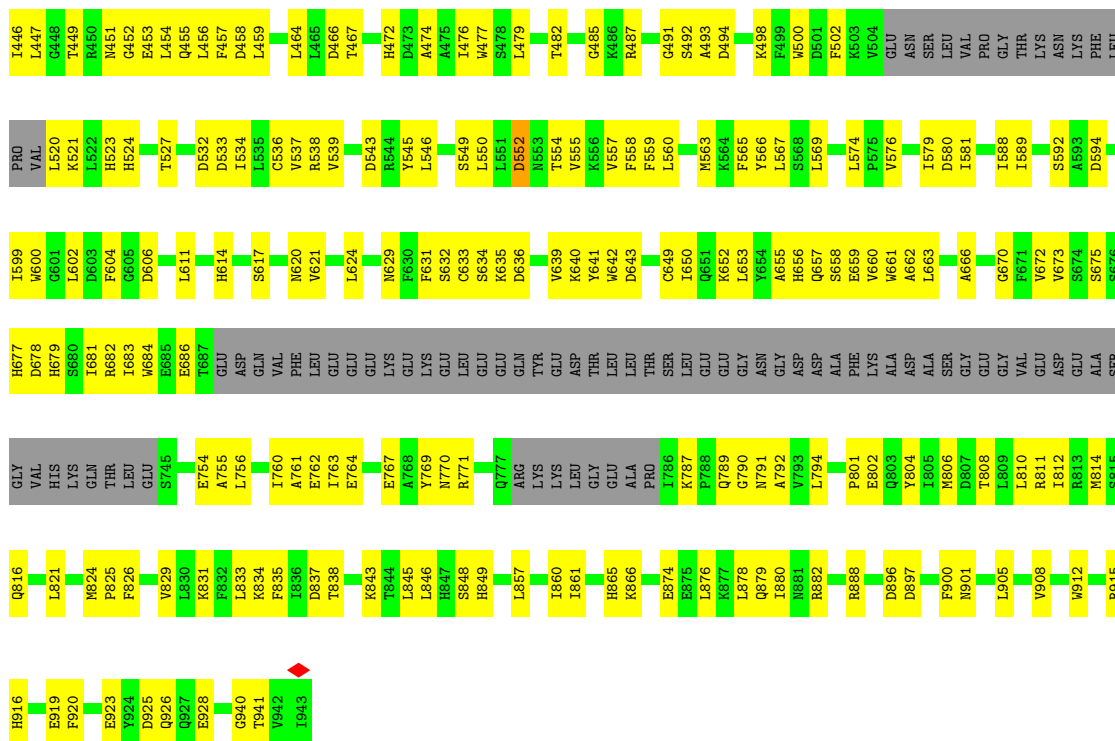
Chain UK: 41% 55% ..



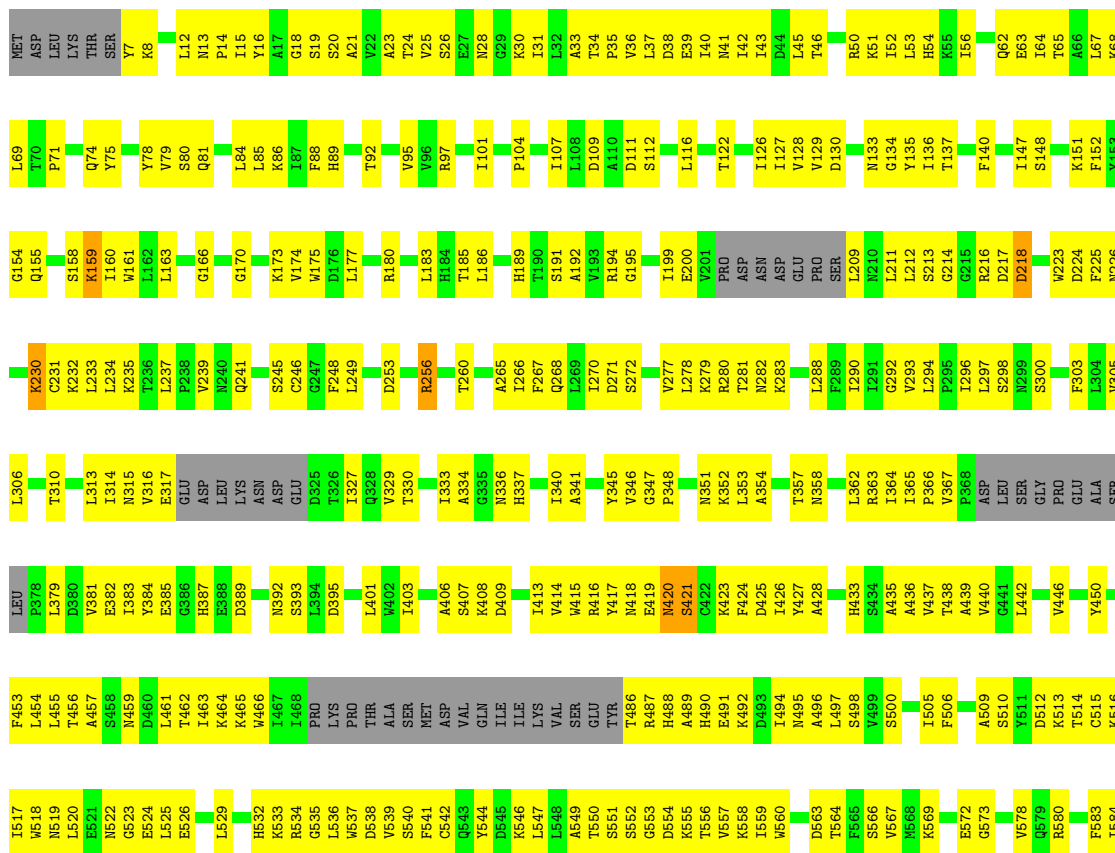
● Molecule 15: U3 small nucleolar RNA-associated protein 12

Chain UL: 44% 45% 11%





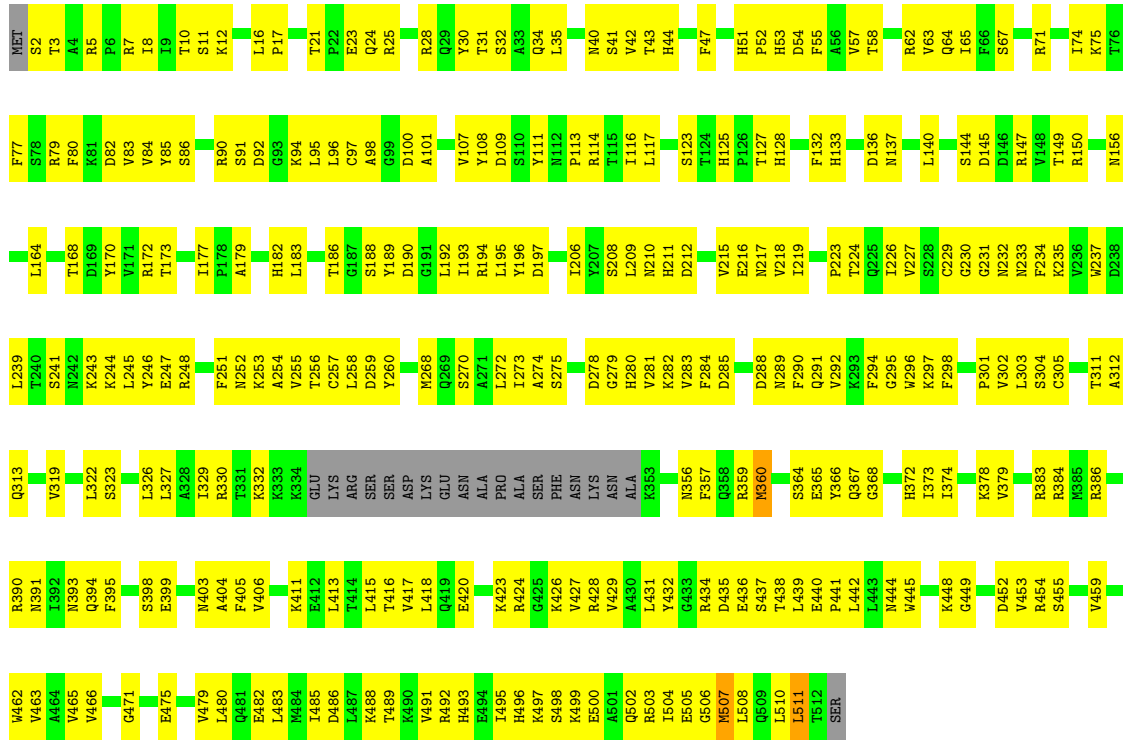
● Molecule 16: U3 small nucleolar RNA-associated protein 13





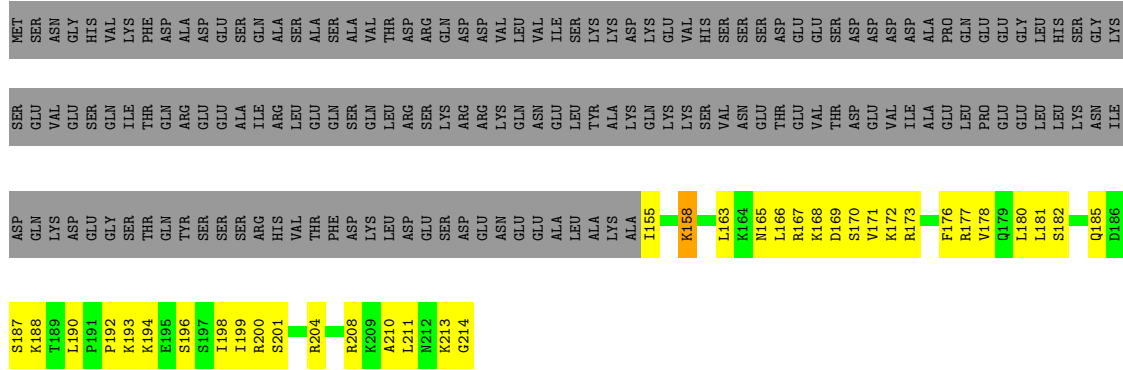
● Molecule 18: U3 small nucleolar RNA-associated protein 15

Chain UO: 42% 53%



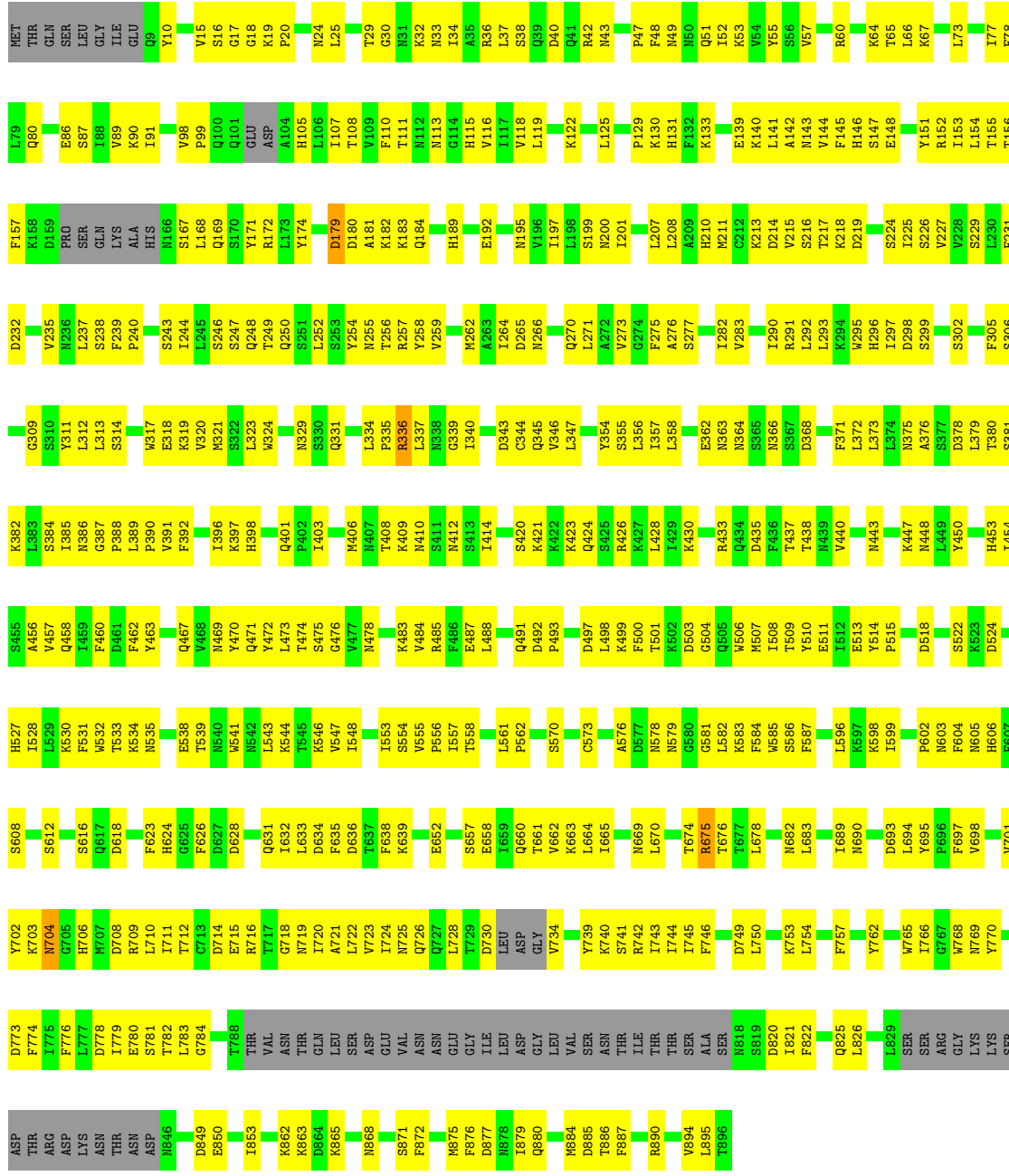
● Molecule 19: Bud site selection protein 21

Chain UP: 11% 16% 72%

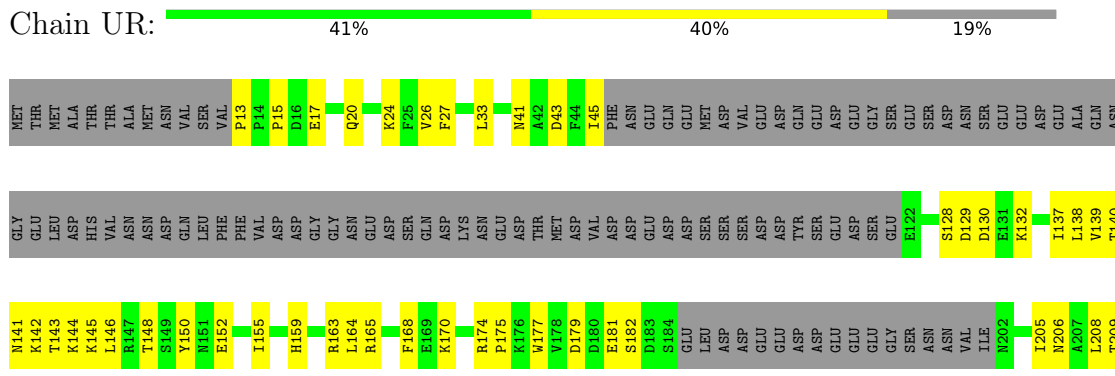


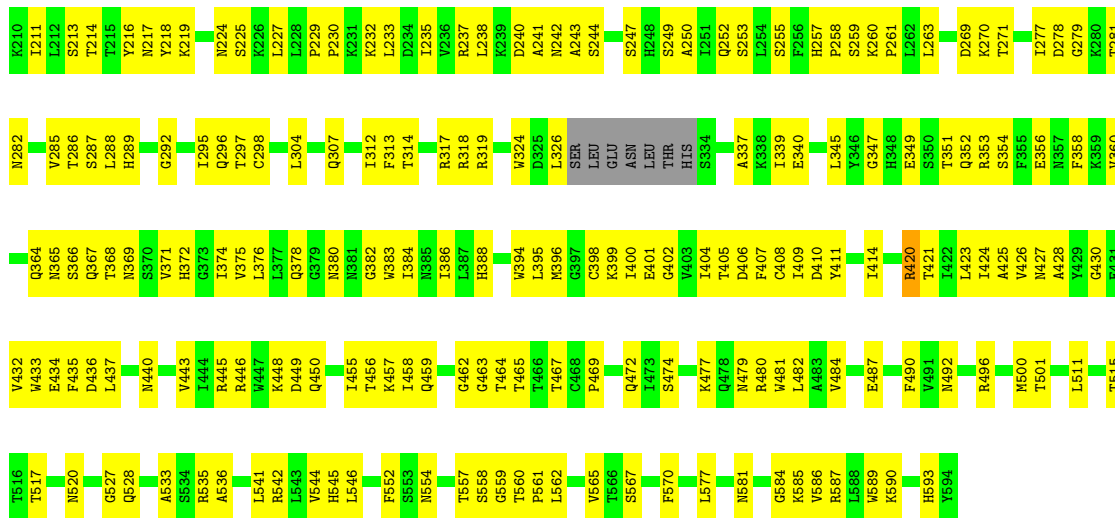
● Molecule 20: NET1-associated nuclear protein 1

Chain UQ: 43% 49% 7%

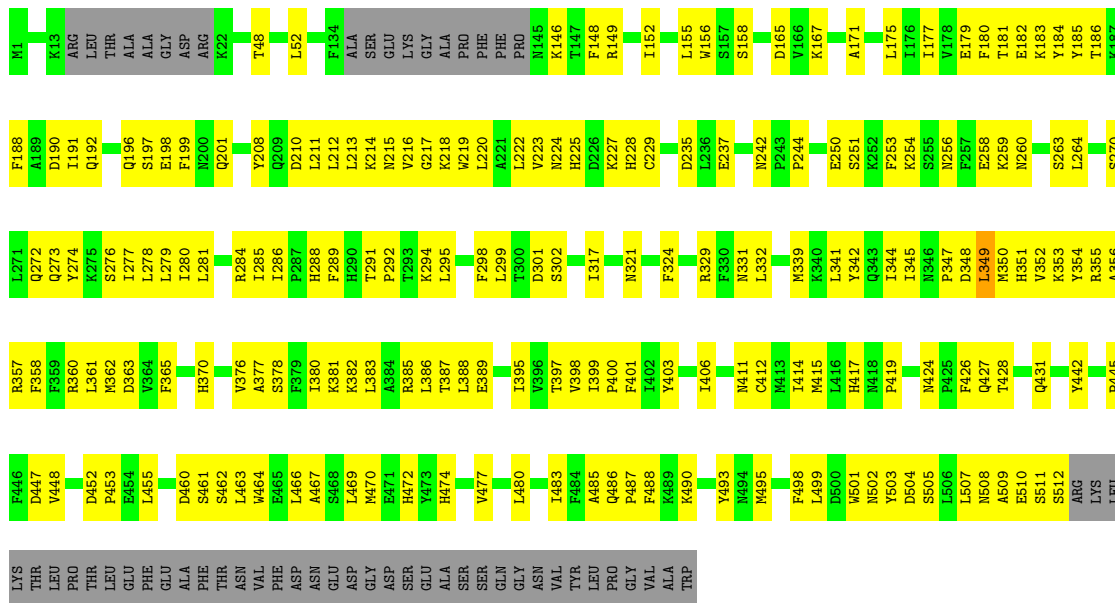


• Molecule 21: U3 small nucleolar RNA-associated protein 18

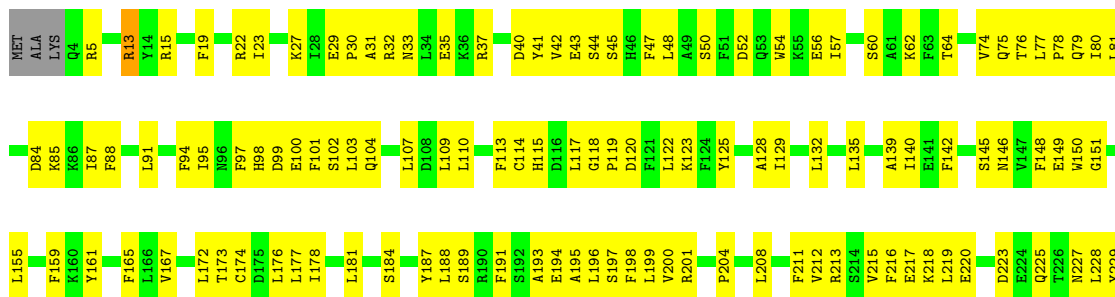




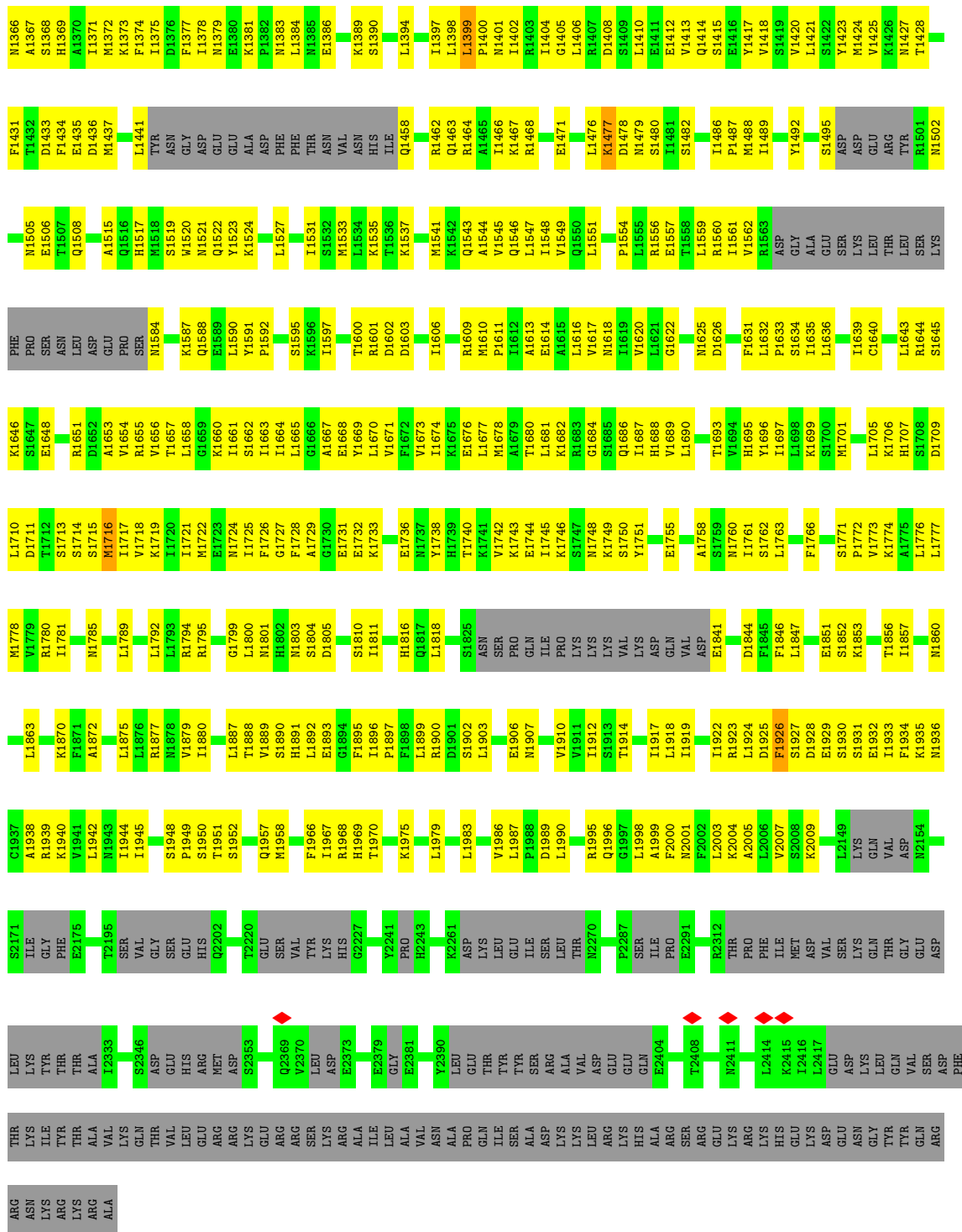
● Molecule 22: Nucleolar complex protein 4



● Molecule 23: U3 small nucleolar RNA-associated protein 20



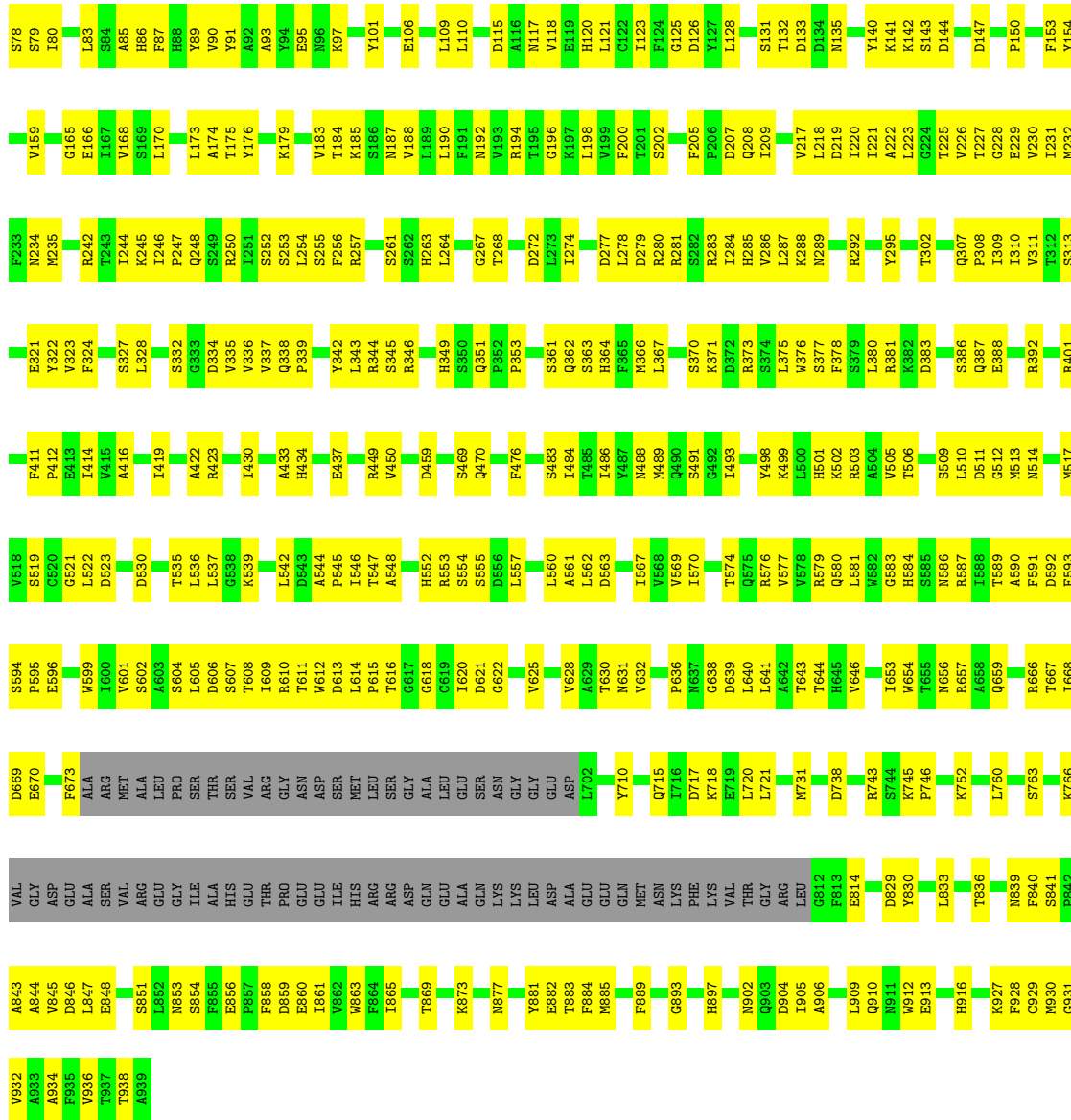
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I1289	R1217	E1126	R1055	D973	T902	F831	N755	V681	T606	Y526	F457	S374	Y299	L233
G1292	S1218	F1127	Q1056	Y974	T903	L832	F756	F682	L607	R527	I458	L374	Q300	I234
V1295	R1219	A1130	Q1057	F977	L905	F838	I757	D683	L610	K528	S460	L386	N303	L235
P1296	L1220	G1058	G1058	F978	L906	K839	I758	N687	P616	ASP	I461	D391	L306	F236
E1297	L1059	L1059	L1059	G979	S910	N840	F759	V688	D617	ALA	R462	C992	L306	T237
L1298	K1060	S981	K1060	N880	S910	I841	I760	V689	D618	ALA	D463	G992	L306	E238
I1301	S1063	H1141	S1063	H982	R914	V844	T761	F689	L685	N535	R393	T309	I309	T241
V1305	V1065	K1143	V1065	S986	D917	V845	E763	K691	S620	F396	R313	L314	I314	S242
L1308	F1066	E1144	F1066	S987	E918	V846	E764	K691	S621	I315	L315	L316	L316	T243
M1309	E1067	A1145	E1067	K988	K919	E849	P771	L695	M623	L537	F397	K316	K316	T246
N1309	F1068	R995	F1068	A999	V920	L850	I772	V696	V624	R539	Q998	V317	V317	L247
M1312	V1069	T990	V1069	T990	V921	D852	I773	V697	V624	T540	F399	L318	L318	H248
S1312	T1072	R991	T1072	R991	N922	H853	I774	K698	E626	L541	R402	T319	T319	S249
S1313	F1073	K992	F1073	K992	F923	L854	R775	L699	E627	L542	R403	T320	T320	K250
S1314	D1074	T993	D1074	T993	Y924	M855	N776	V700	T631	I479	S404	I321	I321	K251
R1315	S1078	I995	S1078	I995	V925	V856	Q777	L761	L682	M481	Y405	V322	V322	K252
M1316	M1079	R996	M1079	R996	R927	L858	V781	S702	Q633	A482	E406	F323	F323	A253
D1320	M1079	M997	M1079	M997	R927	L858	M782	F703	N634	A483	R407	R407	R407	I254
S1326	I1082	G998	I1082	G998	F929	S860	E790	K705	A635	I484	V408	E325	E325	M255
K1329	Y1083	F1000	Y1083	F1000	F930	R861	S784	L706	D637	I485	S326	G327	G327	S256
I1332	V1087	N1001	V1087	N1001	Q934	M862	I785	F707	L638	L552	M412	R328	R328	V257
E1333	K1088	M1002	K1088	M1002	V935	T863	F786	D708	R641	M553	G413	R329	R329	L258
G1334	P1089	I1003	P1089	I1003	R937	D864	Q787	D708	R642	F554	L414	I330	I330	L259
D1334	R1090	V1004	R1090	V1004	F937	V865	E790	Q711	I642	L555	R415	I330	I330	H260
G1335	I1091	N1005	I1091	N1005	T938	K867	D714	D714	K643	R556	F416	D332	D332	E261
M1258	F1094	S1006	F1094	S1006	S939	L868	D795	Y715	V645	G557	L417	W333	W333	L263
I1261	D1096	L1007	D1096	L1007	G940	R869	I796	P718	E648	M560	K422	I336	I336	K264
E1262	E1097	S1008	E1097	S1008	Q941	L870	A797	L719	F649	E495	T337	T337	T337	K265
Y1265	V1098	L1010	V1098	L1010	R943	L873	F798	L819	G650	L561	I340	I340	I340	S267
I1268	Q1100	R1011	Q1100	R1011	S944	L874	F799	G723	K651	I498	I343	I343	I343	P268
S1269	Q1101	L1012	Q1101	L1012	R945	A875	Y801	A794	T652	P499	L343	L343	L343	E269
L1270	P1102	T1013	P1102	T1013	K946	T876	M802	N725	K653	L500	L434	L434	L434	R270
L1271	S1103	F1015	L1271	F1015	Q947	R877	D803	K726	T654	P567	P435	P435	P435	S271
F1272	S1104	P1016	F1272	P1016	A948	M878	F804	L728	D655	E502	F436	F436	F436	V272
K1273	L1105	L1017	K1273	L1017	V949	L881	LYS	L736	K656	R503	L437	L437	L437	S273
T1274	L1106	H1018	T1274	H1018	S951	L881	THR	L740	L657	F508	E438	E438	E438	L274
F1275	L1107	T1019	F1275	T1019	V952	T884	TYR	D790	V658	A509	V439	V439	V439	L275
L1185	R1106	N1020	L1185	N1020	F953	R885	LYS	S731	S659	A509	D440	D440	D440	S276
Y1186	L1108	S1021	Y1186	L1108	P954	D886	ASP	S732	T586	S510	D441	D441	D441	D277
K1188	L1108	V1022	K1188	L1108	N955	N887	GLU	V733	F662	P511	K442	K442	K442	L278
L1189	Y1111	Q1024	L1189	Y1111	F956	L888	ASP	V734	M588	D512	P443	P443	P443	W279
SER	M1112	L1027	SER	M1112	K957	K889	MET	L736	L666	M513	E444	E444	E444	M280
D1191	M1112	I1027	D1191	M1112	K958	N890	GLU	L740	P592	F514	L445	L445	L445	N281
S1194	M1112	Y1028	S1194	M1112	F959	L891	ASN	I740	D593	T615	Q446	Q446	Q446	I282
F1198	L1118	Y1028	F1198	L1118	V960	L892	GLU	L670	L689	K516	K447	K447	K447	I288
L1199	Y1119	A1033	L1199	Y1119	I961	L892	GLU	L670	L689	M517	V448	V448	V448	L291
W1200	Q1120	Y1085	W1200	Q1120	F964	D894	VAL	I746	T671	M518	R449	R449	R449	L292
L1201	M1122	I1036	L1201	M1122	S969	D894	I747	S748	F672	V519	E450	E450	E450	P293
L1202	L1122	V1036	L1202	L1122	S969	F897	THR	S748	F674	M521	M452	M452	M452	V294
S1204	F1121	I1036	S1204	F1121	S989	R899	THR	K749	S675	L522	P453	P453	P453	L295
L1205	G1209	V1036	L1205	G1209	R971	E900	GLY	S822	V677	L603	P454	P454	P454	E296
T1206	Y1123	I1036	T1206	Y1123	R971	E900	GLY	S822	V677	M604	K524	K524	K524	V297
E1207	Y1123	I1036	E1207	Y1123	R971	E900	GLY	S822	V677					
L1284	F1286	L1287	L1284	F1286	L1287	E1287								
I1352	L1352	L1287	I1352	L1352	L1287	E1287								
I1355	M1356	K1358	I1355	M1356	K1358	K1358								
N1357	R1281	V1282	N1357	R1281	V1282	V1282								
K1358	I1282	S1283	K1358	I1282	S1283	S1283								
A1362	L1284	M1208	A1362	L1284	M1208	M1208								
L1363	I1286	G1209	L1363	I1286	G1209	G1209								
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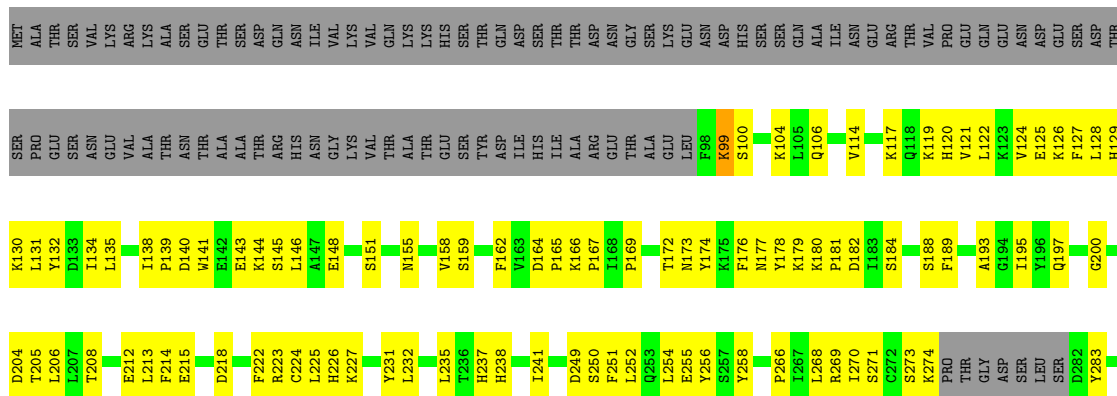
- Molecule 24: U3 small nuclear RNA-associated protein 21

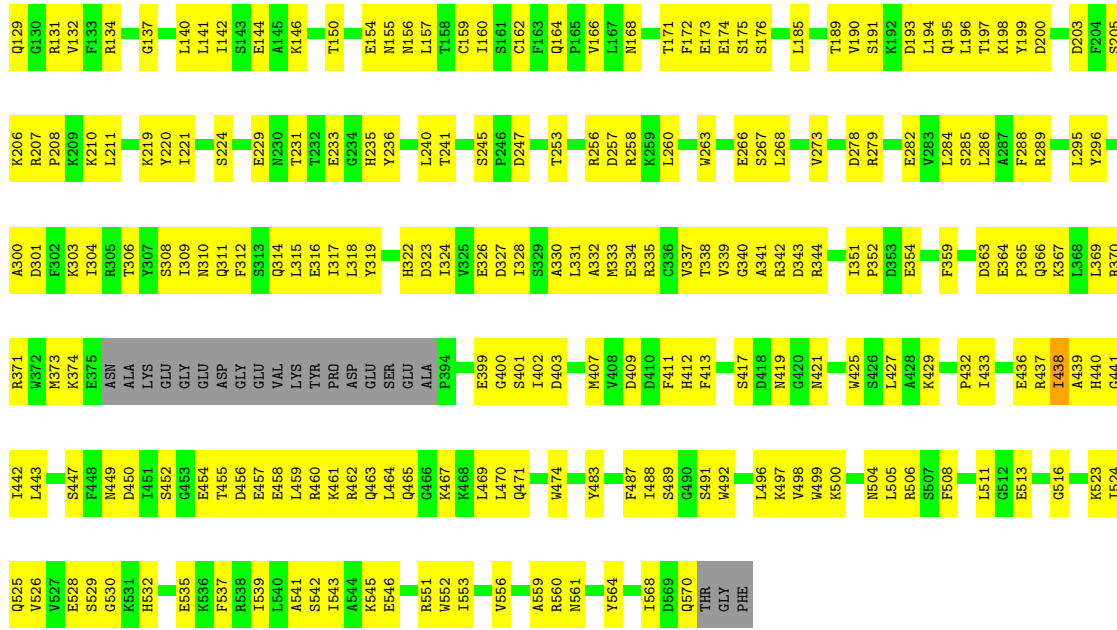
Chain UU: 50% 41% 10%





• Molecule 25: U3 small nucleolar RNA-associated protein 22

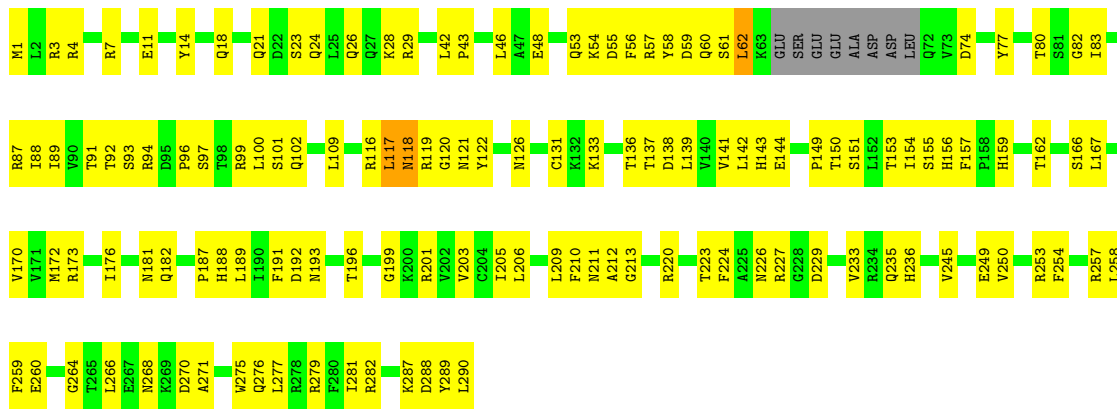




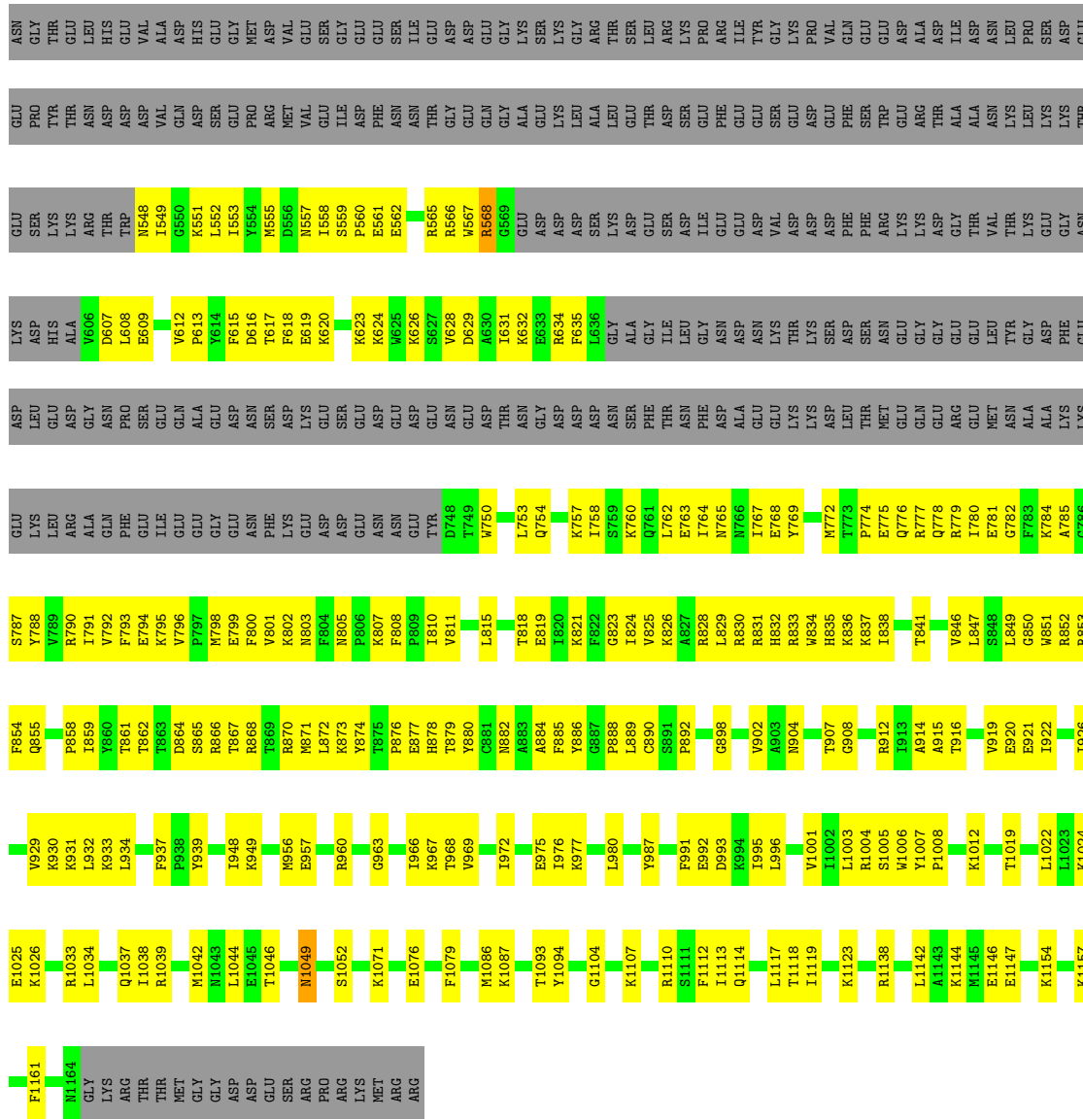
• Molecule 32: U3 small nucleolar ribonucleoprotein protein IMP3



• Molecule 33: U3 small nucleolar ribonucleoprotein protein IMP4

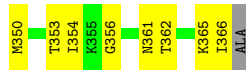


• Molecule 34: U3 small nucleolar RNA-associated protein MPP10

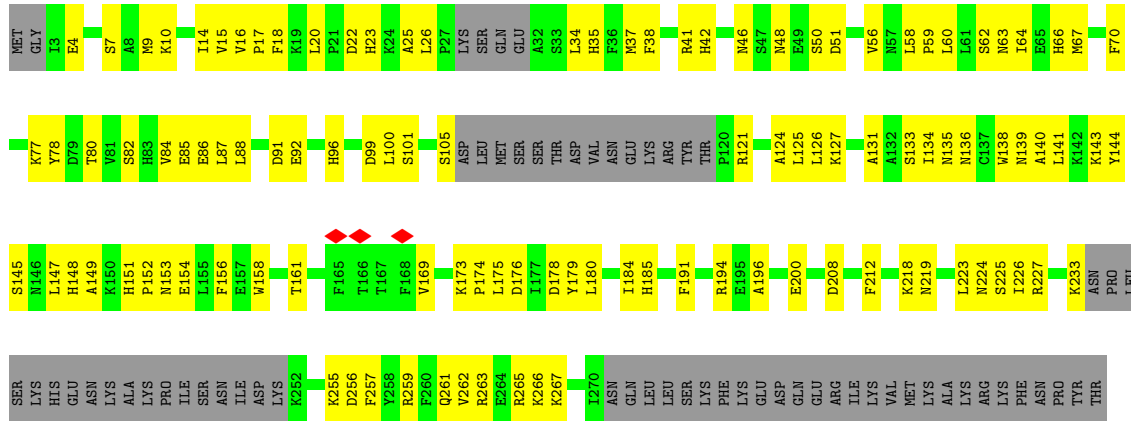


● Molecule 36: RNA 3'-terminal phosphate cyclase-like protein

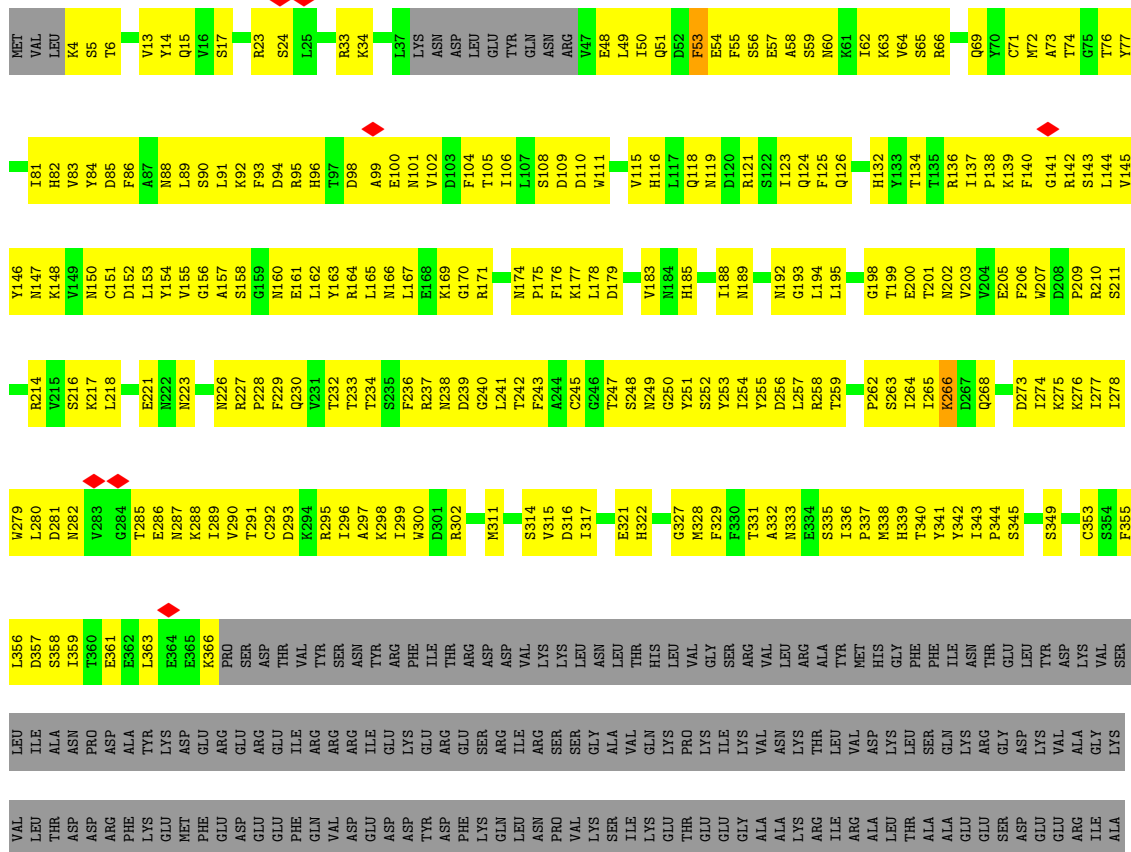


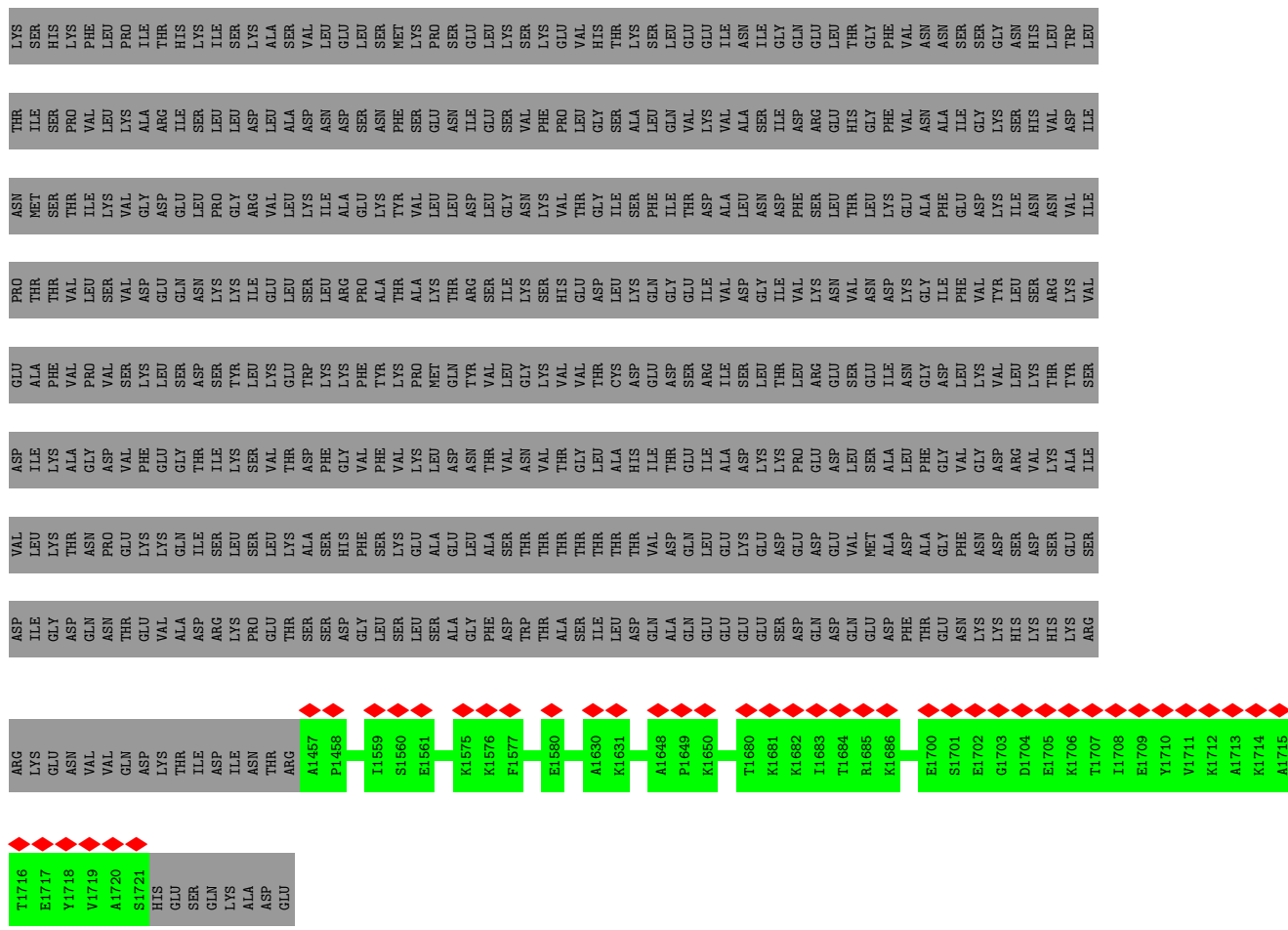


• Molecule 37: Ribosomal RNA-processing protein 7

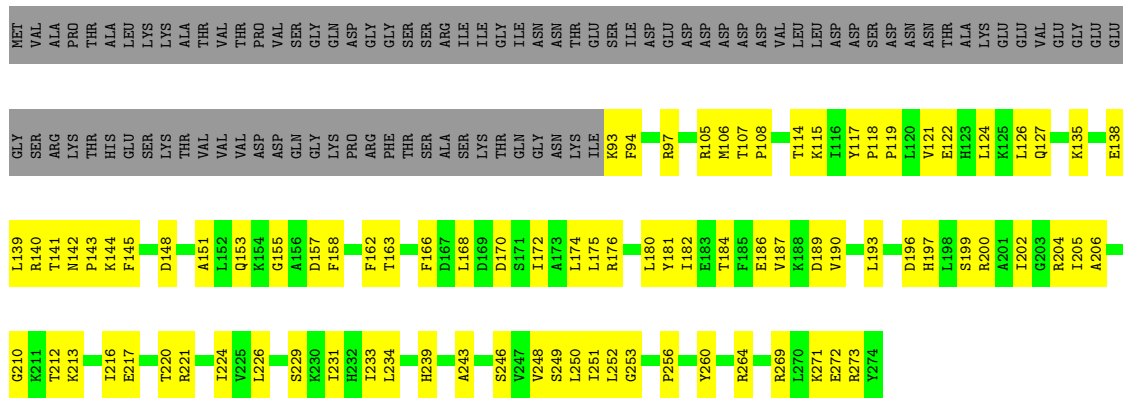
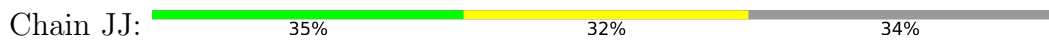


• Molecule 38: Ribosome biogenesis protein ENP2

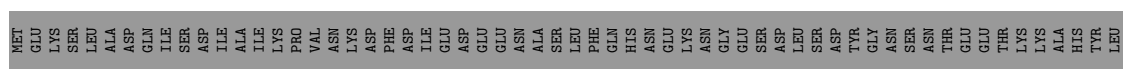




● Molecule 42: Pre-rRNA-processing protein PNO1

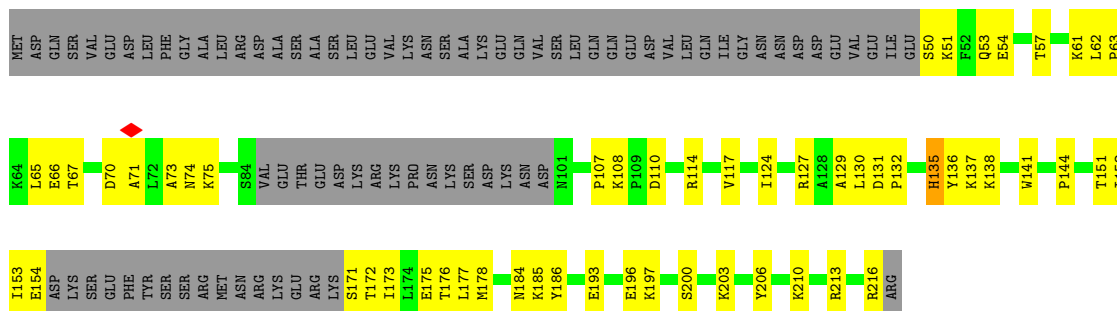
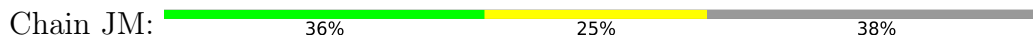


● Molecule 43: Protein BFR2

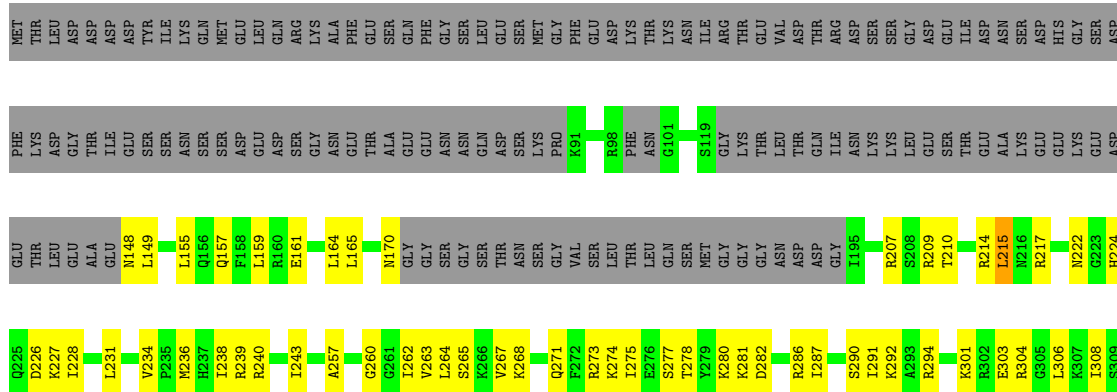
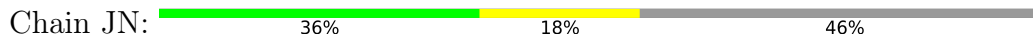


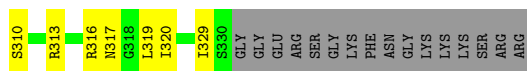


• Molecule 44: rRNA-processing protein FCF2

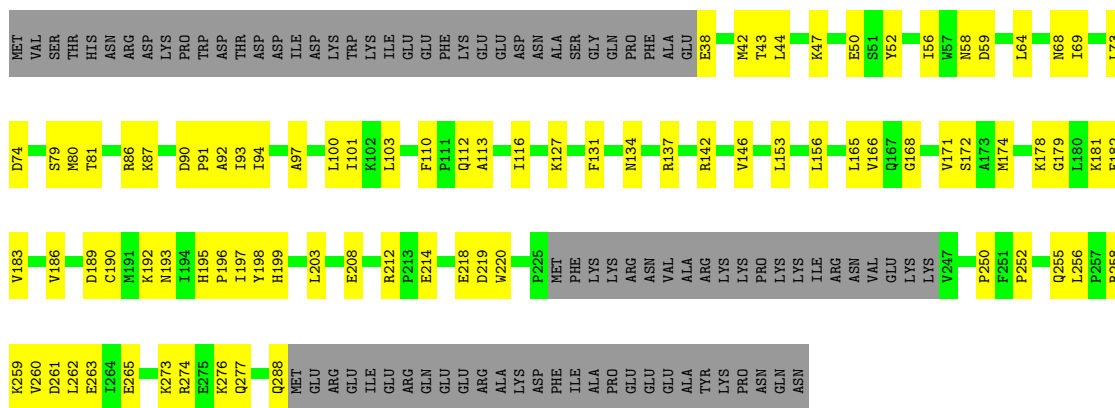


• Molecule 45: Protein FAF1

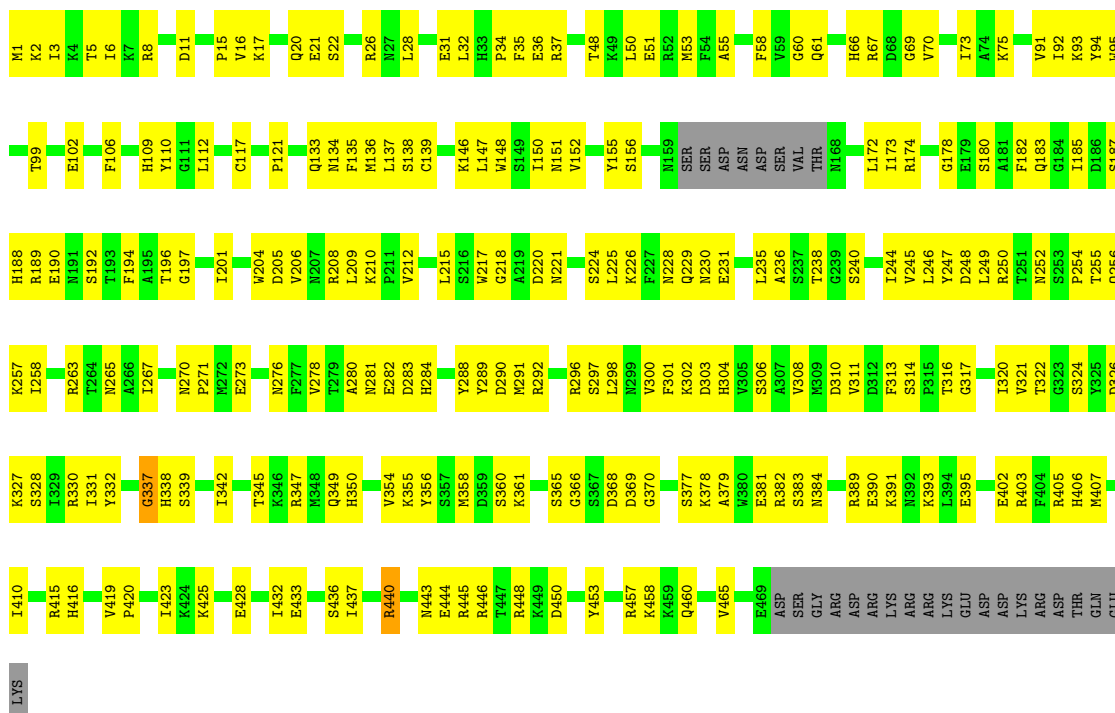




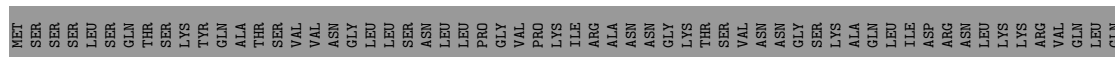
• Molecule 46: KRR1 small subunit processome component

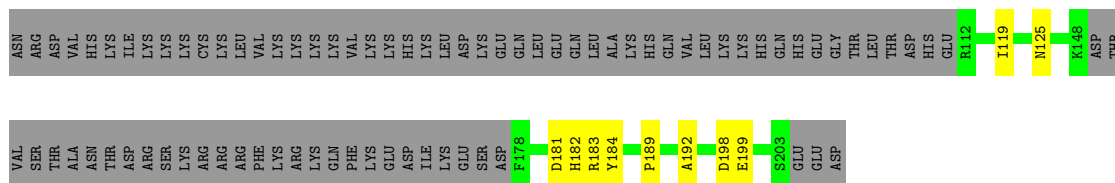


• Molecule 47: Protein SOF1

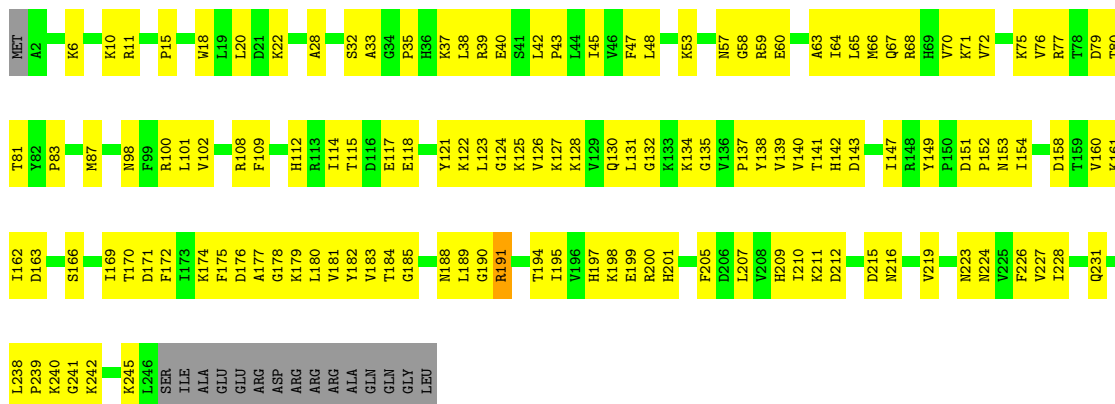


• Molecule 48: Regulator of rDNA transcription protein 14

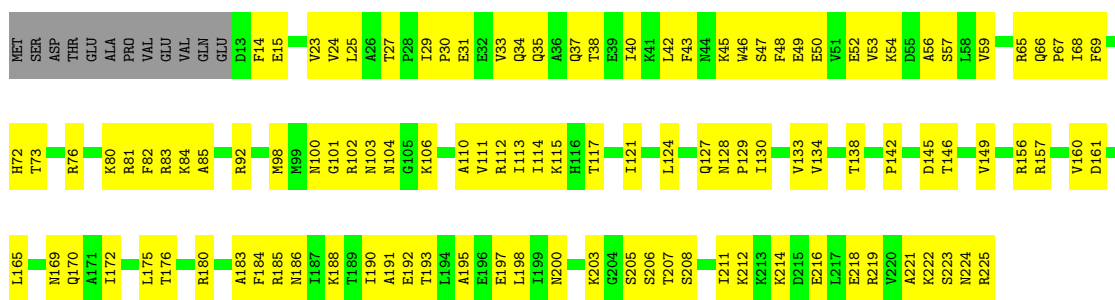




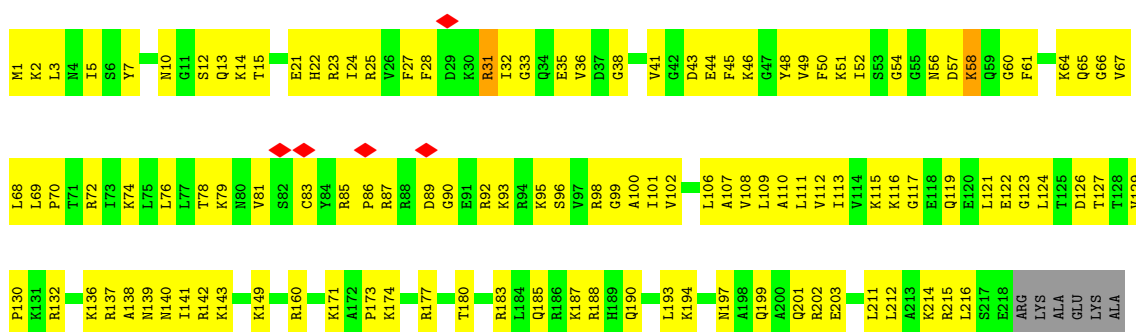
• Molecule 49: 40S ribosomal protein S4-A



• Molecule 50: 40S ribosomal protein S5

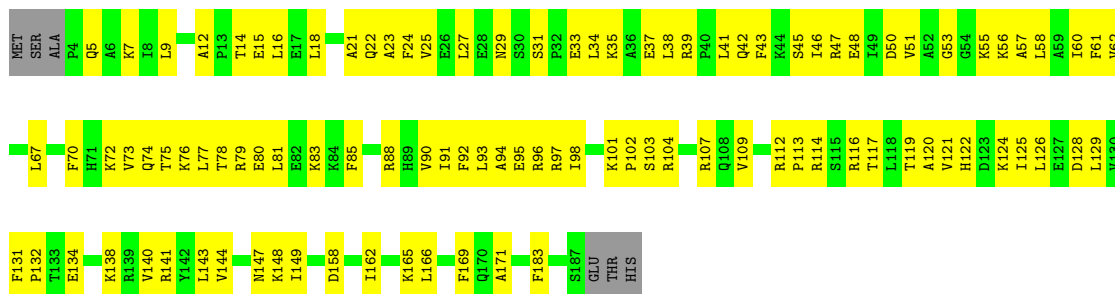


• Molecule 51: 40S ribosomal protein S6-A

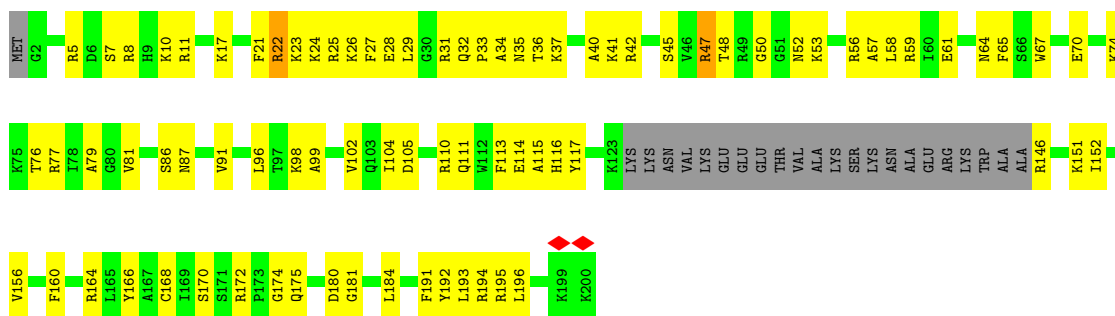


GLU
ILE
ARG
LYS
ARG
ARG
ALA
SER
SER
LEU
LYS
ALA

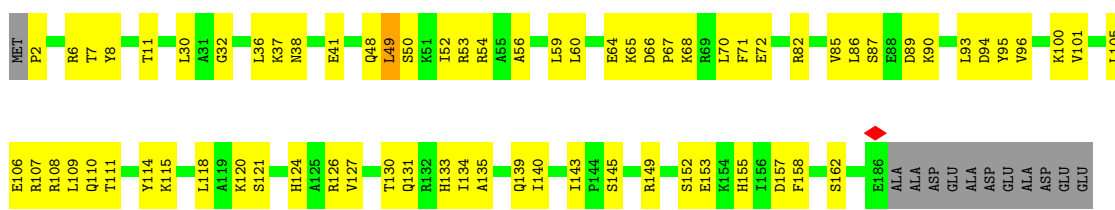
• Molecule 52: 40S ribosomal protein S7-A



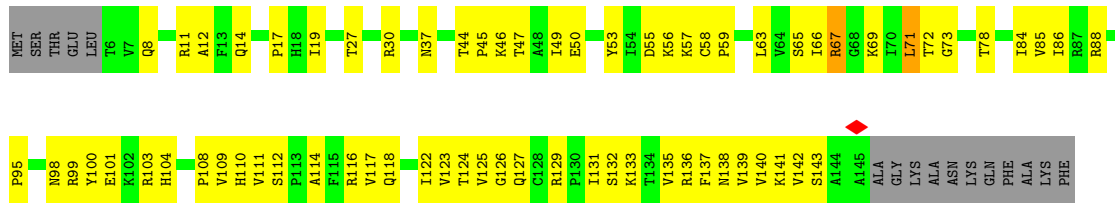
• Molecule 53: 40S ribosomal protein S8-A



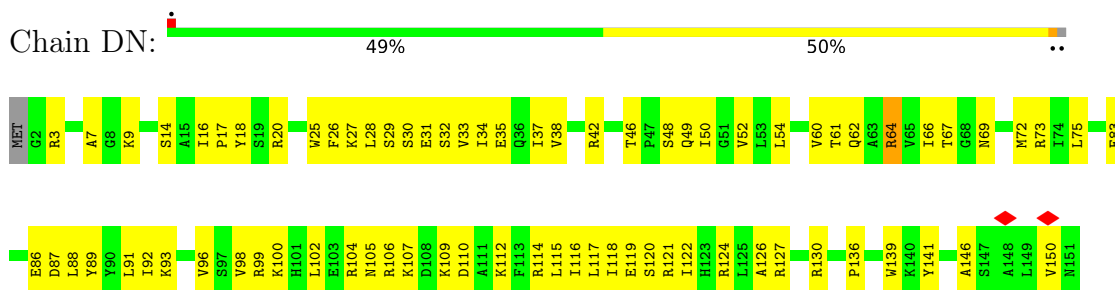
• Molecule 54: 40S ribosomal protein S9-A



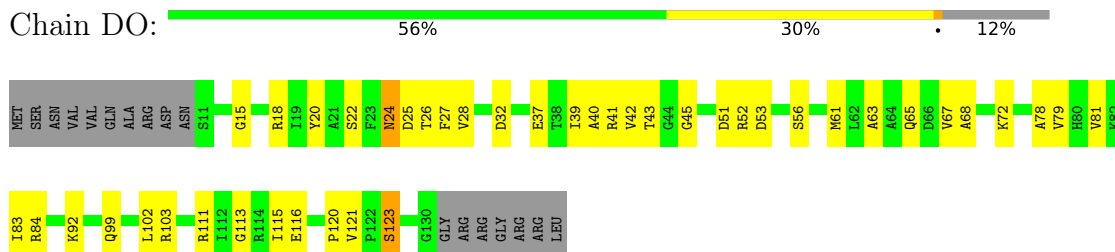
• Molecule 55: 40S ribosomal protein S11-A



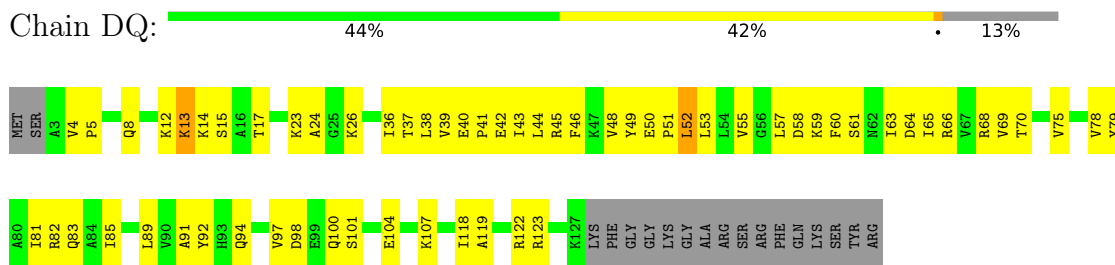
• Molecule 56: 40S ribosomal protein S13



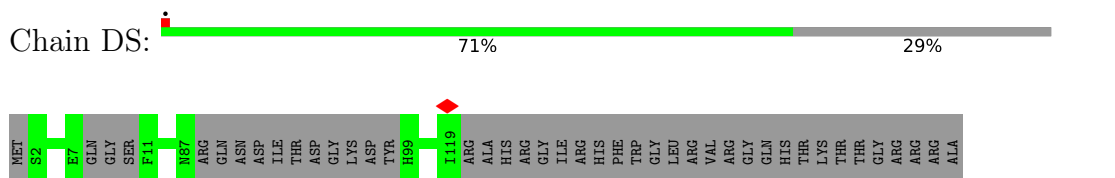
• Molecule 57: 40S ribosomal protein S14-A



• Molecule 58: 40S ribosomal protein S16-A



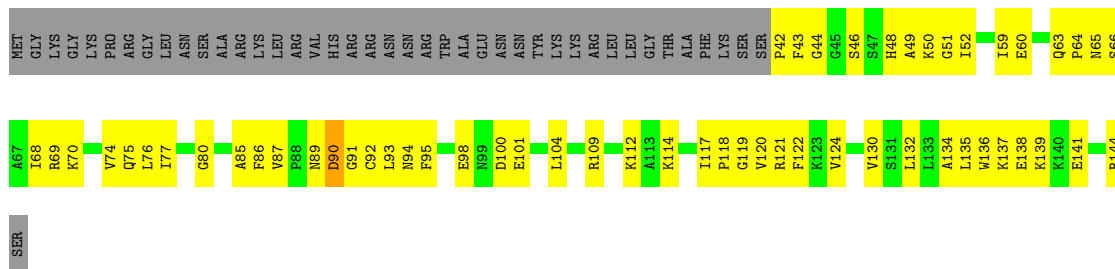
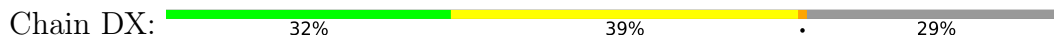
• Molecule 59: 40S ribosomal protein S18-A



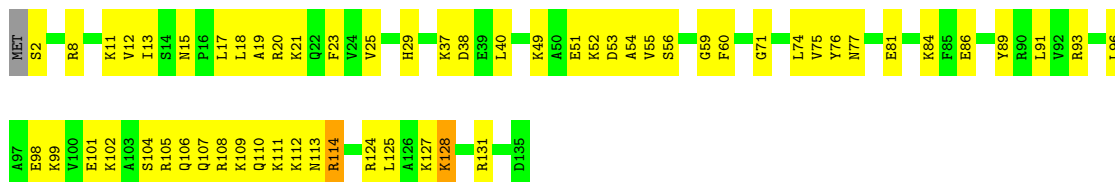
• Molecule 60: 40S ribosomal protein S22-A



• Molecule 61: 40S ribosomal protein S23-A



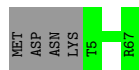
- Molecule 62: 40S ribosomal protein S24-A



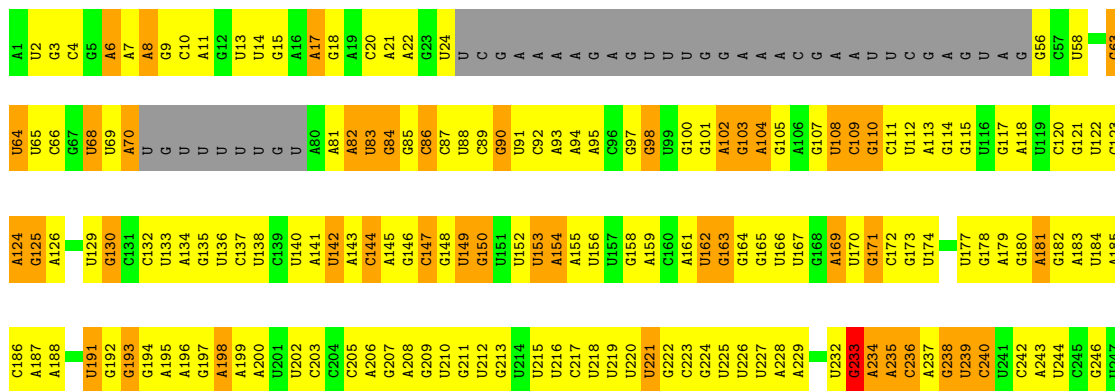
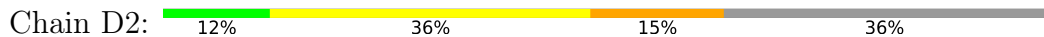
- Molecule 63: 40S ribosomal protein S27-A

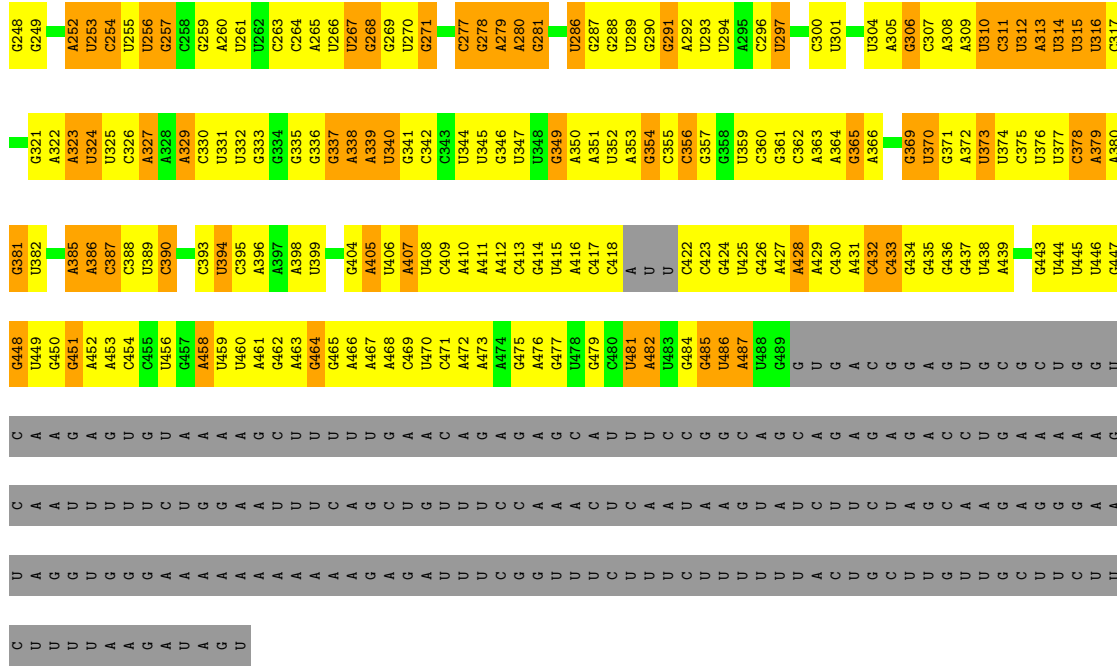


- Molecule 64: 40S ribosomal protein S28-A

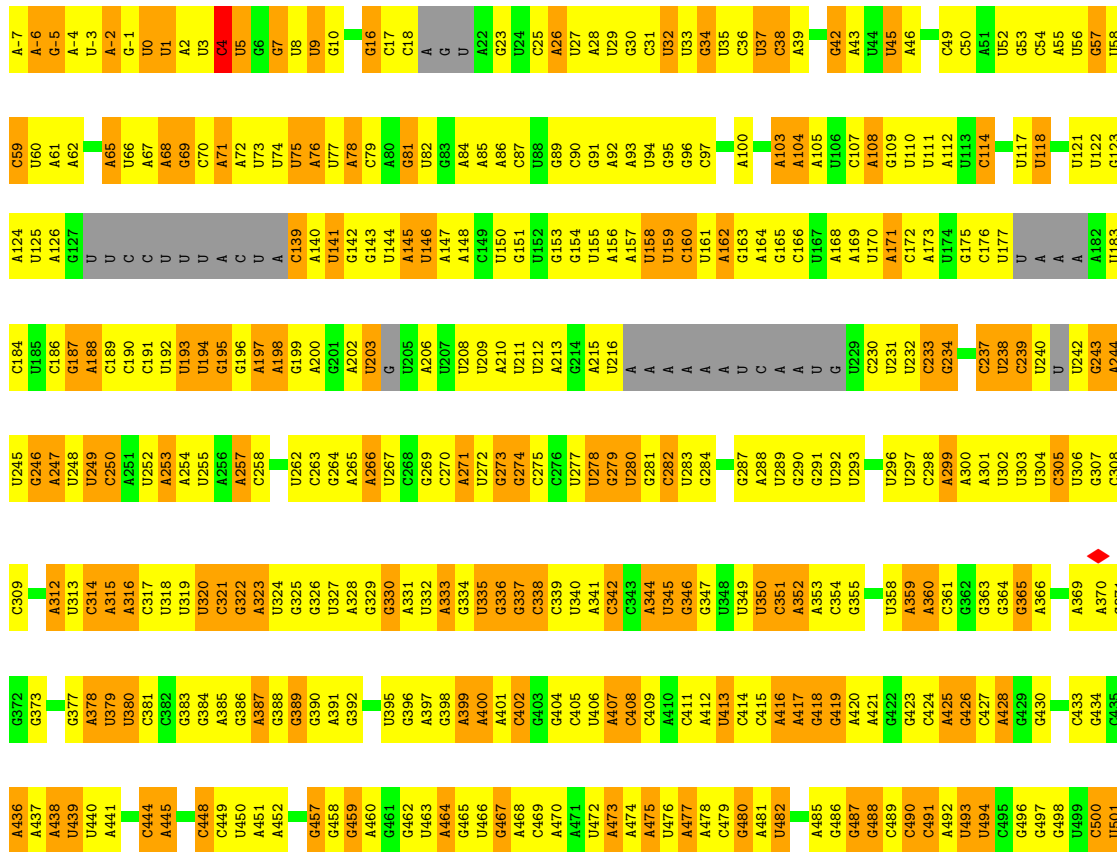
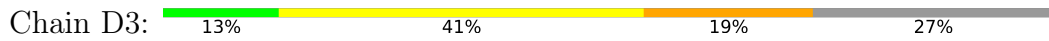


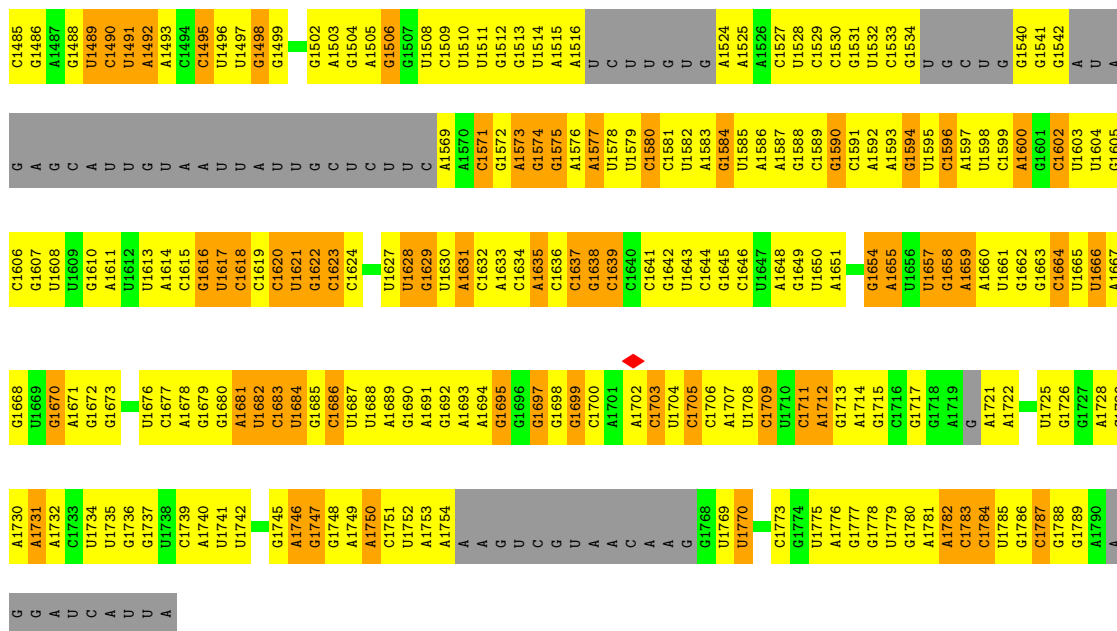
- Molecule 65: 5'ETS RNA



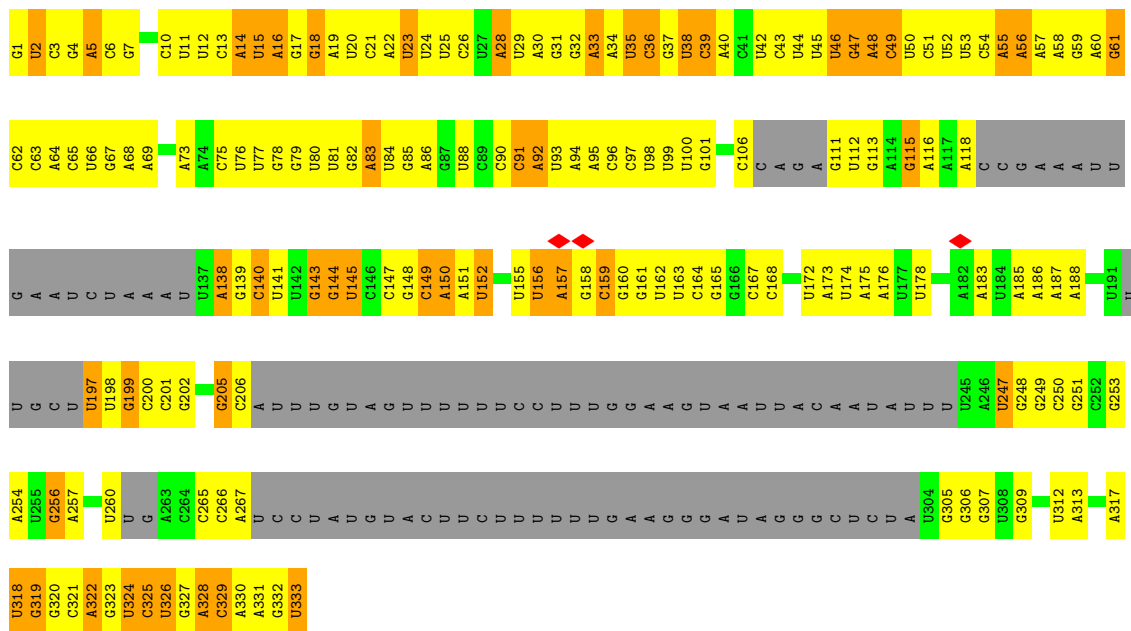


● Molecule 66: 18S rRNA

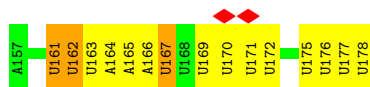




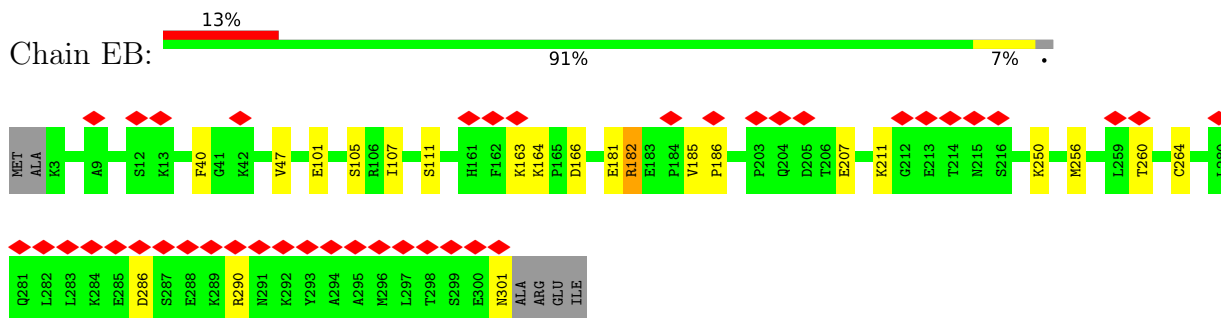
• Molecule 67: U3 snoRNA



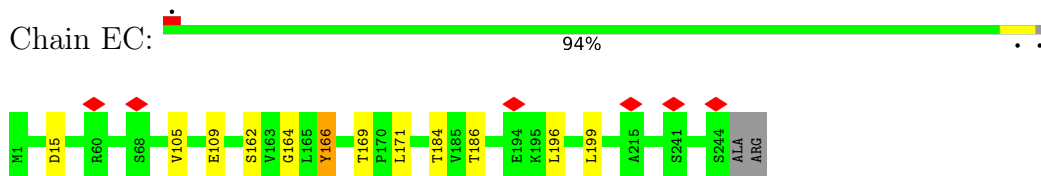
• Molecule 68: RNA



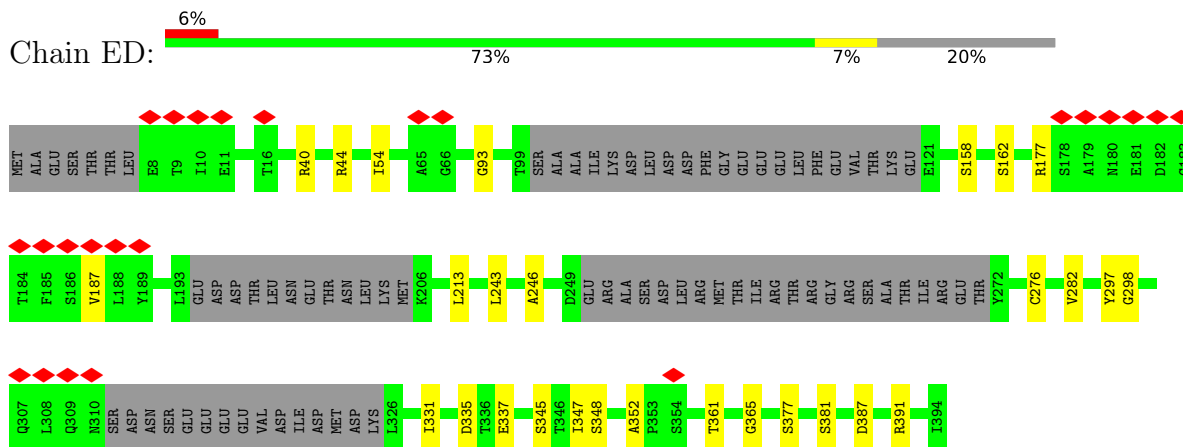
• Molecule 69: Exosome complex component RRP45



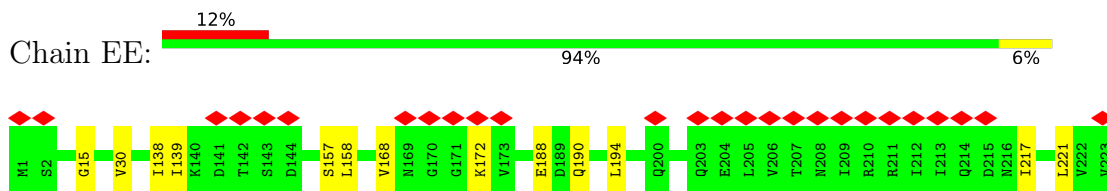
• Molecule 70: Exosome complex component SKI6



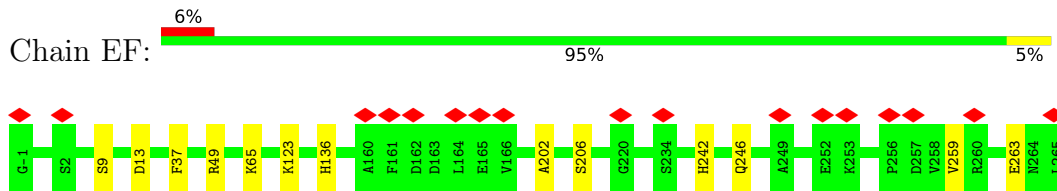
• Molecule 71: Exosome complex component RRP43



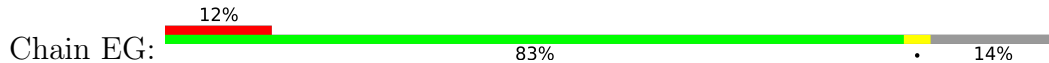
• Molecule 72: Exosome complex component RRP46

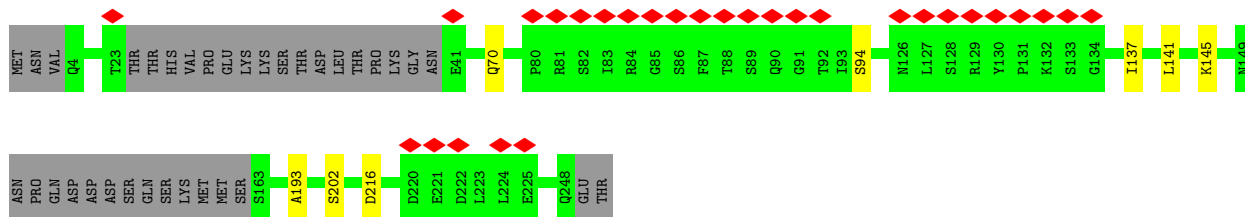


• Molecule 73: Exosome complex component RRP42

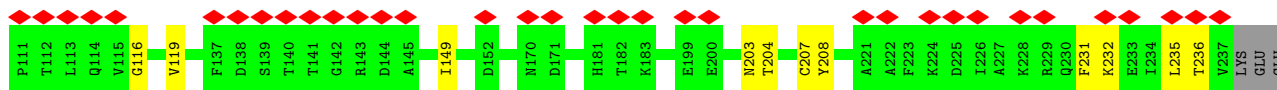
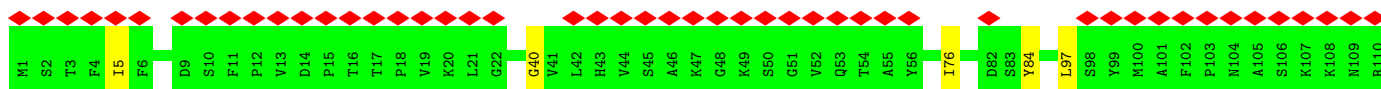


• Molecule 74: Exosome complex component MTR3

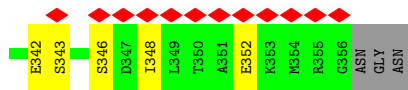
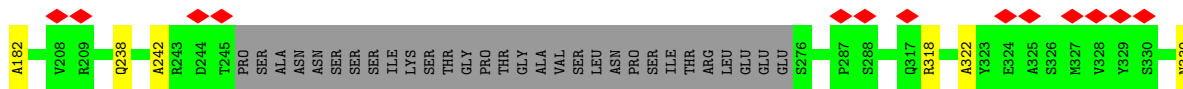
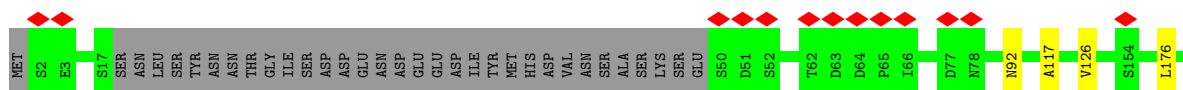
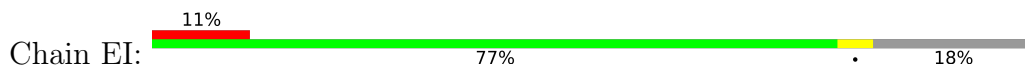




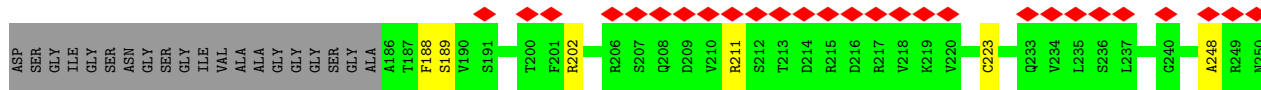
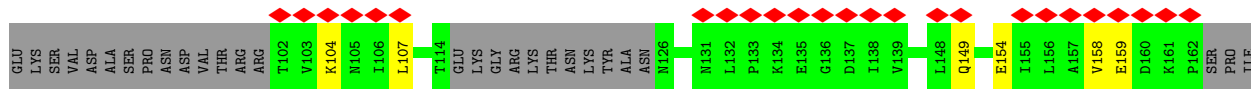
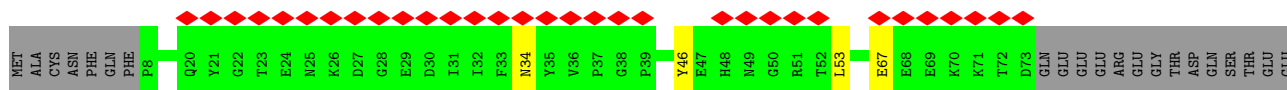
• Molecule 75: Exosome complex component RRP40



• Molecule 76: Exosome complex component RRP4

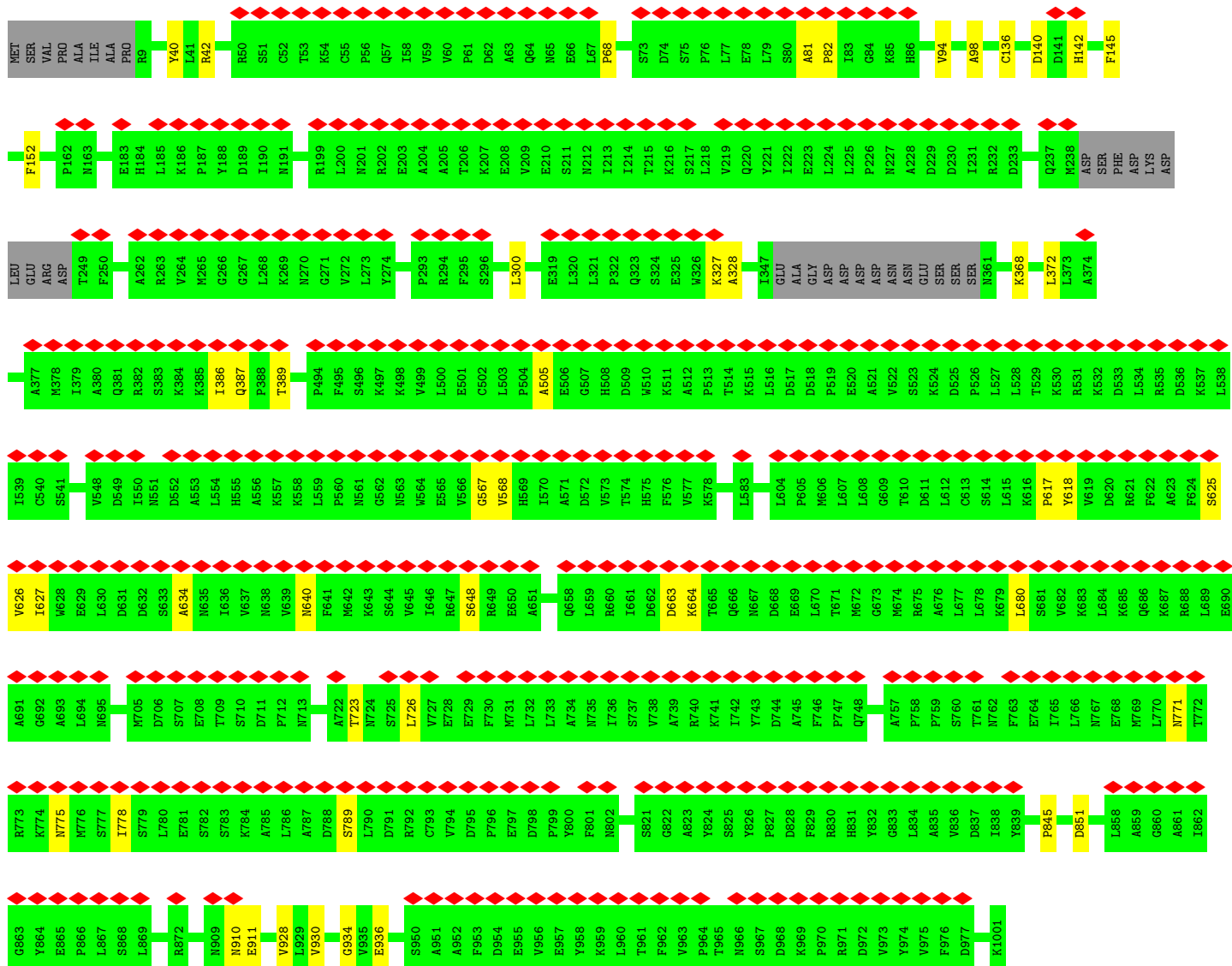
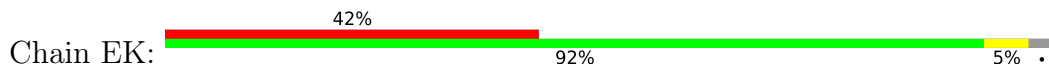


• Molecule 77: Exosome complex component CSL4

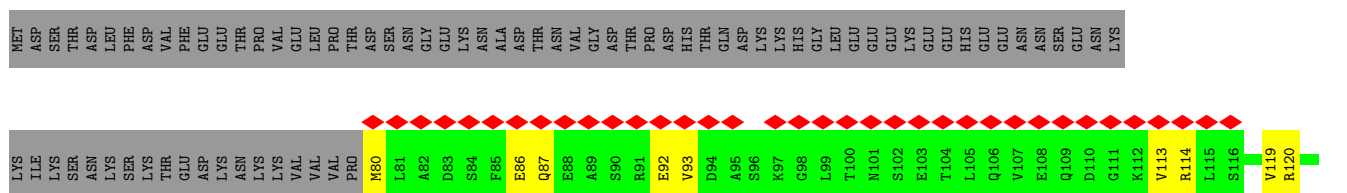
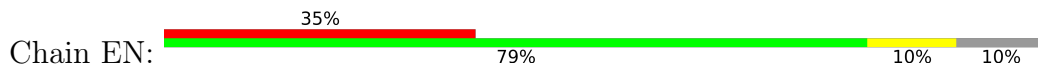


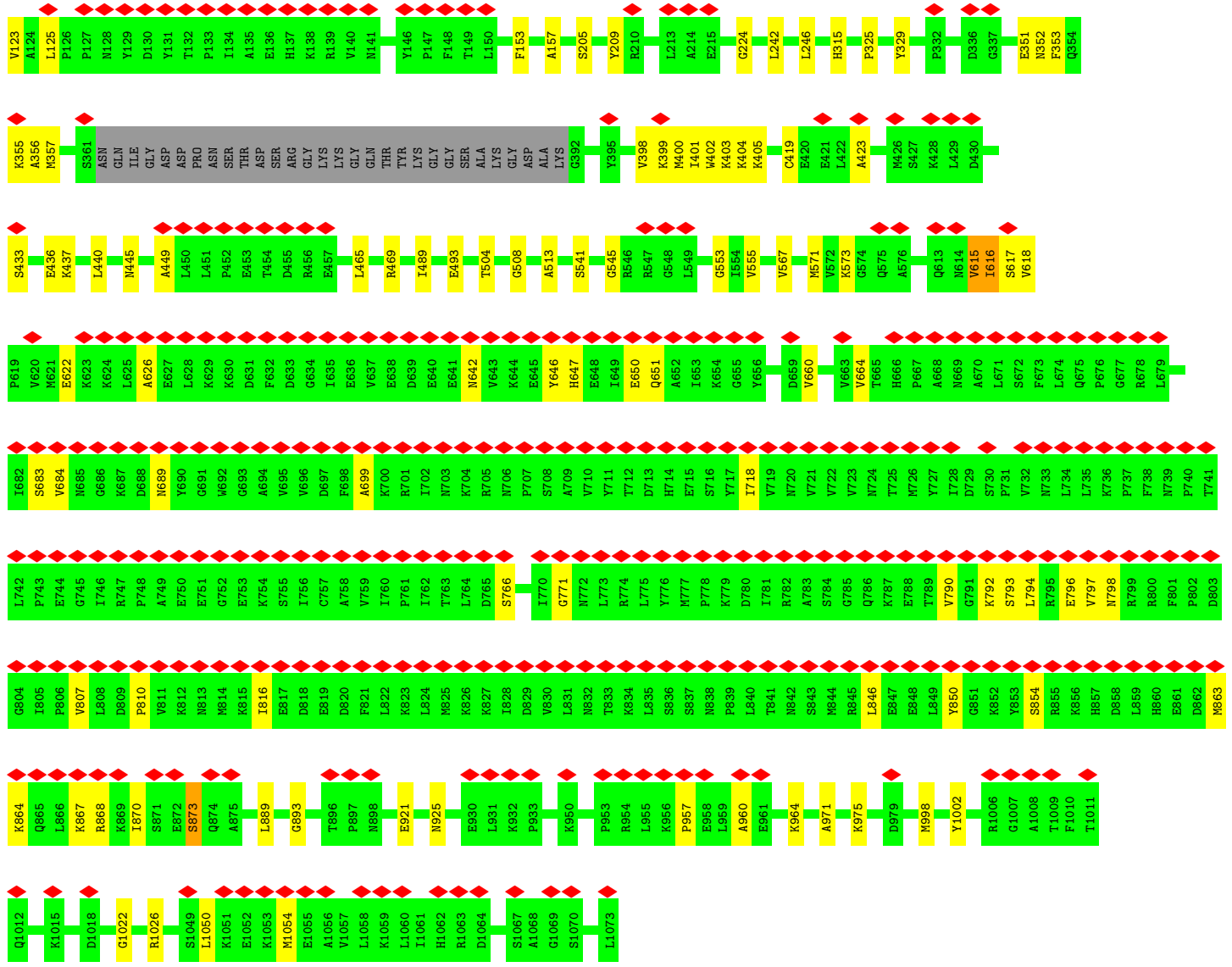


• Molecule 78: Exosome complex exonuclease DIS3



• Molecule 79: ATP-dependent RNA helicase DOB1





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	6024	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 ($e^-/\text{\AA}^2$)	44	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.259	Depositor
Minimum map value	-0.204	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	571.86, 571.86, 571.86	wwPDB
Map dimensions	540, 540, 540	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.059, 1.059, 1.059	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: MG, GTP, ZN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	CA	0.66	0/1917	0.66	1/2588 (0.0%)
1	CB	0.40	0/1815	0.61	1/2448 (0.0%)
2	DA	0.43	0/1937	0.59	0/2593
3	JA	0.28	0/6021	0.50	0/8176
3	JB	0.24	0/4128	0.41	0/5747
4	UA	0.52	0/6780	0.62	2/9175 (0.0%)
5	UB	0.31	0/3787	0.50	1/5126 (0.0%)
6	UC	0.52	0/1034	0.63	1/1365 (0.1%)
7	UD	0.39	0/5461	0.57	0/7395
8	UE	0.37	0/3840	0.57	0/5208
9	UF	0.45	0/2538	0.56	0/3405
10	UG	0.62	2/4302 (0.0%)	0.68	2/5805 (0.0%)
11	UH	0.28	0/2716	0.51	0/3721
12	UI	0.28	0/875	0.59	1/1176 (0.1%)
13	UJ	0.35	0/9111	0.52	1/12323 (0.0%)
14	UK	0.51	0/2047	0.65	1/2711 (0.0%)
15	UL	0.34	0/6857	0.56	1/9253 (0.0%)
16	UM	0.33	0/6070	0.56	0/8216
17	UN	0.53	0/1252	0.66	0/1688
18	UO	0.40	0/3993	0.58	3/5413 (0.1%)
19	UP	0.32	0/499	0.56	0/659
20	UQ	0.37	0/6794	0.55	1/9203 (0.0%)
21	UR	0.50	0/3883	0.61	0/5265
22	US	0.33	0/3703	0.53	1/5053 (0.0%)
23	UT	0.29	0/17584	0.49	1/23824 (0.0%)
24	UU	0.46	0/6815	0.58	1/9213 (0.0%)
25	UV	0.31	0/8945	0.48	0/12097
26	UX	0.64	0/1418	0.70	0/1906
27	UZ	0.36	0/2041	0.54	0/2745
28	CD	0.44	0/3041	0.57	0/4098
29	CE	0.40	0/3362	0.59	1/4533 (0.0%)
30	CF	0.46	0/944	0.63	0/1284

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
30	CG	0.52	0/941	0.66	0/1281
31	CH	0.39	0/3798	0.55	0/5113
32	CI	0.76	0/1559	0.77	1/2097 (0.0%)
33	CJ	0.57	0/2337	0.68	1/3148 (0.0%)
34	CK	0.44	0/1685	0.63	0/2261
35	CL	0.47	0/6471	0.61	0/8708
36	CM	0.34	0/2832	0.53	0/3825
37	CN	0.30	0/1934	0.48	0/2604
38	JC	0.29	0/2908	0.52	0/3938
39	JF	0.31	0/1727	0.53	0/2329
39	JG	0.37	0/1828	0.58	0/2470
40	JH	0.23	0/1293	0.35	0/1801
41	JI	0.23	0/1313	0.36	0/1830
42	JJ	0.31	0/1469	0.55	0/1980
43	JK	0.29	0/342	0.45	0/462
44	JM	0.46	0/1156	0.59	0/1536
45	JN	0.52	0/1435	0.63	1/1907 (0.1%)
46	JO	0.45	0/1910	0.58	0/2569
47	JP	0.67	0/3844	0.72	0/5174
48	JQ	0.32	0/385	0.52	0/529
49	DE	0.33	0/1985	0.53	0/2675
50	DF	0.47	0/1690	0.59	0/2285
51	DG	0.29	0/1779	0.49	0/2379
52	DH	0.35	0/1506	0.54	0/2028
53	DI	0.28	0/1422	0.49	0/1899
54	DJ	0.54	0/1519	0.67	1/2035 (0.0%)
55	DL	0.26	0/1155	0.50	1/1557 (0.1%)
56	DN	0.41	0/1215	0.58	0/1638
57	DO	0.41	0/892	0.56	0/1202
58	DQ	0.67	0/990	0.70	1/1335 (0.1%)
59	DS	0.24	0/513	0.40	0/711
60	DW	0.56	0/1038	0.66	0/1395
61	DX	0.51	0/798	0.65	0/1065
62	DY	0.40	0/1087	0.60	1/1449 (0.1%)
63	Db	0.45	0/620	0.66	1/838 (0.1%)
64	Dc	0.45	0/499	0.68	0/670
65	D2	0.76	0/10633	0.94	11/16564 (0.1%)
66	D3	0.67	0/31617	0.89	16/49213 (0.0%)
67	D4	0.76	1/5432 (0.0%)	0.90	2/8439 (0.0%)
68	EA	0.77	0/405	1.53	6/625 (1.0%)
69	EB	0.47	0/1474	0.57	0/2050
70	EC	0.47	0/1203	0.58	0/1673
71	ED	0.43	0/1569	0.61	0/2179

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
72	EE	0.46	0/1109	0.61	0/1545
73	EF	0.42	0/1328	0.60	0/1851
74	EG	0.45	0/1055	0.59	0/1462
75	EH	0.44	0/1169	0.64	0/1626
76	EI	0.44	0/1437	0.62	0/1992
77	EJ	0.40	0/1087	0.62	0/1504
78	EK	0.39	0/4818	0.57	0/6720
79	EN	0.40	0/4765	0.58	0/6636
All	All	0.48	3/264486 (0.0%)	0.65	63/368214 (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
2	DA	0	1
3	JA	0	1
4	UA	0	1
6	UC	0	1
9	UF	0	1
11	UH	0	3
15	UL	0	2
16	UM	0	3
20	UQ	0	1
21	UR	0	1
23	UT	0	2
30	CG	0	1
31	CH	0	1
33	CJ	0	1
34	CK	0	1
38	JC	0	1
44	JM	0	1
47	JP	0	3
56	DN	0	1
57	DO	0	1
58	DQ	0	1
63	Db	0	1
70	EC	0	1
71	ED	0	3
72	EE	0	1
73	EF	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
74	EG	0	2
76	EI	0	1
77	EJ	0	1
79	EN	0	3
All	All	0	43

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	UG	139	TRP	CB-CG	-5.96	1.39	1.50
67	D4	197	U	C1'-N1	5.53	1.57	1.48
10	UG	213	TRP	CB-CG	-5.39	1.40	1.50

The worst 5 of 63 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
68	EA	167	U	N1-C2-O2	13.96	132.57	122.80
68	EA	167	U	N3-C2-O2	-11.26	114.32	122.20
68	EA	167	U	C2-N1-C1'	11.18	131.12	117.70
24	UU	143	SER	C-N-CA	10.16	147.09	121.70
68	EA	167	U	C6-N1-C1'	-8.20	109.72	121.20

There are no chirality outliers.

5 of 43 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	DA	104	ASP	Peptide
3	JA	739	ASN	Peptide
4	UA	289	LEU	Peptide
6	UC	580	ARG	Peptide
9	UF	45	SER	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.

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	CA	1881	0	1928	99	0
1	CB	1782	0	1826	149	0
2	DA	1912	0	2023	113	0
3	JA	5916	0	5463	317	0
3	JB	4132	0	1819	21	0
4	UA	6635	0	6525	334	0
5	UB	3734	0	3432	169	0
6	UC	1026	0	1080	58	0
7	UD	5361	0	5364	358	0
8	UE	3772	0	3806	203	0
9	UF	2487	0	2533	147	0
10	UG	4218	0	4223	231	0
11	UH	2701	0	1951	127	0
12	UI	860	0	922	79	0
13	UJ	8961	0	9273	525	0
14	UK	2021	0	2098	165	0
15	UL	6726	0	6764	390	0
16	UM	5969	0	6006	388	0
17	UN	1227	0	1223	68	0
18	UO	3911	0	3906	273	0
19	UP	495	0	561	51	0
20	UQ	6662	0	6588	394	0
21	UR	3799	0	3783	237	0
22	US	3622	0	3214	181	0
23	UT	17290	0	16616	924	0
24	UU	6678	0	6651	339	0
25	UV	8736	0	8850	468	0
26	UX	1395	0	1473	70	0
27	UZ	2006	0	2118	117	0
28	CD	2994	0	3018	166	0
29	CE	3325	0	3414	215	0
30	CF	931	0	983	47	0
30	CG	928	0	976	71	0
31	CH	3725	0	3746	220	0
32	CI	1530	0	1572	99	0
33	CJ	2296	0	2325	133	0
34	CK	1667	0	1701	98	0
35	CL	6332	0	6515	416	0
36	CM	2781	0	2878	140	0
37	CN	1893	0	1875	100	0
38	JC	2845	0	2761	234	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
39	JF	1701	0	1767	102	0
39	JG	1799	0	1872	106	0
40	JH	1295	0	570	4	0
41	JI	1314	0	610	0	0
42	JJ	1442	0	1513	72	0
43	JK	334	0	313	24	0
44	JM	1137	0	1188	52	0
45	JN	1428	0	1425	67	0
46	JO	1876	0	1968	76	0
47	JP	3765	0	3714	232	0
48	JQ	381	0	255	12	0
49	DE	1944	0	2030	126	0
50	DF	1669	0	1724	110	0
51	DG	1755	0	1846	119	0
52	DH	1481	0	1572	102	0
53	DI	1399	0	1431	94	0
54	DJ	1494	0	1573	69	0
55	DL	1129	0	1196	65	0
56	DN	1192	0	1255	79	0
57	DO	881	0	910	40	0
58	DQ	973	0	1029	69	0
59	DS	516	0	222	0	0
60	DW	1021	0	1060	73	0
61	DX	786	0	843	69	0
62	DY	1073	0	1132	63	0
63	Db	610	0	630	0	0
64	Dc	497	0	535	0	0
65	D2	9508	0	4781	404	0
66	D3	28287	0	14261	1182	0
67	D4	4869	0	2468	191	0
68	EA	366	0	184	1	0
69	EB	1475	0	658	13	0
70	EC	1204	0	530	9	0
71	ED	1571	0	699	12	0
72	EE	1107	0	499	6	0
73	EF	1326	0	580	6	0
74	EG	1058	0	478	3	0
75	EH	1170	0	528	8	0
76	EI	1440	0	648	7	0
77	EJ	1091	0	500	12	0
78	EK	4818	0	2108	32	0
79	EN	4767	0	2109	59	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
80	Db	1	0	0	0	0
80	EK	1	0	0	0	0
80	UX	1	0	0	0	0
81	CL	1	0	0	0	0
81	EK	1	0	0	0	0
81	UX	1	0	0	0	0
82	CL	32	0	12	2	0
All	All	256149	0	219009	11280	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 25.

The worst 5 of 11280 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)
24:UU:228:GLY:CA	24:UU:246:ILE:O	1.81	1.28
11:UH:341:LEU:HA	11:UH:358:VAL:O	1.15	1.27
4:UA:77:GLY:HA3	4:UA:95:PHE:O	1.33	1.24
24:UU:228:GLY:HA3	24:UU:246:ILE:O	1.04	1.18
16:UM:30:LYS:HA	16:UM:45:LEU:O	1.42	1.18

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	CA	238/327 (73%)	207 (87%)	31 (13%)	0	100	100
1	CB	224/327 (68%)	201 (90%)	23 (10%)	0	100	100
2	DA	236/255 (92%)	212 (90%)	24 (10%)	0	100	100
3	JA	802/1056 (76%)	734 (92%)	68 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	JB	827/1056 (78%)	770 (93%)	57 (7%)	0	100	100
4	UA	830/923 (90%)	733 (88%)	97 (12%)	0	100	100
5	UB	495/810 (61%)	465 (94%)	30 (6%)	0	100	100
6	UC	124/610 (20%)	112 (90%)	12 (10%)	0	100	100
7	UD	663/776 (85%)	575 (87%)	88 (13%)	0	100	100
8	UE	465/643 (72%)	419 (90%)	46 (10%)	0	100	100
9	UF	283/440 (64%)	273 (96%)	10 (4%)	0	100	100
10	UG	529/554 (96%)	461 (87%)	68 (13%)	0	100	100
11	UH	426/713 (60%)	375 (88%)	46 (11%)	5 (1%)	13	50
12	UI	100/575 (17%)	98 (98%)	2 (2%)	0	100	100
13	UJ	1092/1769 (62%)	1031 (94%)	61 (6%)	0	100	100
14	UK	238/250 (95%)	214 (90%)	24 (10%)	0	100	100
15	UL	828/943 (88%)	733 (88%)	95 (12%)	0	100	100
16	UM	750/817 (92%)	662 (88%)	87 (12%)	1 (0%)	51	85
17	UN	143/899 (16%)	124 (87%)	19 (13%)	0	100	100
18	UO	489/513 (95%)	432 (88%)	57 (12%)	0	100	100
19	UP	58/214 (27%)	54 (93%)	4 (7%)	0	100	100
20	UQ	820/896 (92%)	735 (90%)	85 (10%)	0	100	100
21	UR	474/594 (80%)	424 (90%)	50 (10%)	0	100	100
22	US	488/552 (88%)	440 (90%)	48 (10%)	0	100	100
23	UT	2213/2493 (89%)	2072 (94%)	141 (6%)	0	100	100
24	UU	842/939 (90%)	755 (90%)	87 (10%)	0	100	100
25	UV	1069/1237 (86%)	1018 (95%)	51 (5%)	0	100	100
26	UX	170/189 (90%)	150 (88%)	20 (12%)	0	100	100
27	UZ	245/274 (89%)	225 (92%)	20 (8%)	0	100	100
28	CD	376/504 (75%)	344 (92%)	32 (8%)	0	100	100
29	CE	431/511 (84%)	393 (91%)	38 (9%)	0	100	100
30	CF	121/126 (96%)	109 (90%)	12 (10%)	0	100	100
30	CG	121/126 (96%)	112 (93%)	9 (7%)	0	100	100
31	CH	459/573 (80%)	401 (87%)	57 (12%)	1 (0%)	47	81
32	CI	180/183 (98%)	157 (87%)	23 (13%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
33	CJ	278/290 (96%)	242 (87%)	36 (13%)	0	100	100
34	CK	203/593 (34%)	184 (91%)	18 (9%)	1 (0%)	29	68
35	CL	771/1183 (65%)	716 (93%)	54 (7%)	1 (0%)	51	85
36	CM	358/367 (98%)	335 (94%)	23 (6%)	0	100	100
37	CN	224/297 (75%)	211 (94%)	13 (6%)	0	100	100
38	JC	350/707 (50%)	316 (90%)	34 (10%)	0	100	100
39	JF	212/252 (84%)	203 (96%)	9 (4%)	0	100	100
39	JG	226/252 (90%)	217 (96%)	9 (4%)	0	100	100
40	JH	257/483 (53%)	243 (95%)	14 (5%)	0	100	100
41	JI	263/1729 (15%)	257 (98%)	6 (2%)	0	100	100
42	JJ	180/274 (66%)	172 (96%)	8 (4%)	0	100	100
43	JK	40/534 (8%)	31 (78%)	9 (22%)	0	100	100
44	JM	129/217 (59%)	121 (94%)	8 (6%)	0	100	100
45	JN	178/346 (51%)	160 (90%)	18 (10%)	0	100	100
46	JO	226/316 (72%)	214 (95%)	12 (5%)	0	100	100
47	JP	457/489 (94%)	392 (86%)	65 (14%)	0	100	100
48	JQ	59/206 (29%)	53 (90%)	6 (10%)	0	100	100
49	DE	243/261 (93%)	218 (90%)	25 (10%)	0	100	100
50	DF	211/225 (94%)	189 (90%)	22 (10%)	0	100	100
51	DG	216/236 (92%)	203 (94%)	13 (6%)	0	100	100
52	DH	182/190 (96%)	165 (91%)	17 (9%)	0	100	100
53	DI	173/200 (86%)	160 (92%)	13 (8%)	0	100	100
54	DJ	183/197 (93%)	154 (84%)	29 (16%)	0	100	100
55	DL	138/156 (88%)	124 (90%)	14 (10%)	0	100	100
56	DN	148/151 (98%)	140 (95%)	8 (5%)	0	100	100
57	DO	118/137 (86%)	107 (91%)	11 (9%)	0	100	100
58	DQ	123/143 (86%)	109 (89%)	14 (11%)	0	100	100
59	DS	98/146 (67%)	91 (93%)	7 (7%)	0	100	100
60	DW	127/130 (98%)	110 (87%)	17 (13%)	0	100	100
61	DX	101/145 (70%)	79 (78%)	21 (21%)	1 (1%)	15	54
62	DY	132/135 (98%)	121 (92%)	11 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
63	Db	79/82 (96%)	67 (85%)	12 (15%)	0	100	100
64	Dc	61/67 (91%)	53 (87%)	8 (13%)	0	100	100
69	EB	297/305 (97%)	274 (92%)	21 (7%)	2 (1%)	22	62
70	EC	242/246 (98%)	225 (93%)	17 (7%)	0	100	100
71	ED	308/394 (78%)	283 (92%)	24 (8%)	1 (0%)	41	76
72	EE	222/223 (100%)	209 (94%)	13 (6%)	0	100	100
73	EF	266/267 (100%)	252 (95%)	14 (5%)	0	100	100
74	EG	209/250 (84%)	192 (92%)	17 (8%)	0	100	100
75	EH	235/240 (98%)	216 (92%)	19 (8%)	0	100	100
76	EI	287/359 (80%)	263 (92%)	24 (8%)	0	100	100
77	EJ	214/292 (73%)	198 (92%)	16 (8%)	0	100	100
78	EK	965/1001 (96%)	939 (97%)	25 (3%)	1 (0%)	51	85
79	EN	960/1073 (90%)	890 (93%)	66 (7%)	4 (0%)	34	72
All	All	28798/39453 (73%)	26318 (91%)	2462 (8%)	18 (0%)	54	85

5 of 18 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	UH	258	PRO
31	CH	438	ILE
34	CK	454	VAL
79	EN	615	VAL
79	EN	617	SER

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	CA	202/240 (84%)	202 (100%)	0	100	100
1	CB	192/240 (80%)	189 (98%)	3 (2%)	62	79
2	DA	212/224 (95%)	212 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	JA	555/934 (59%)	553 (100%)	2 (0%)	91	94
4	UA	730/812 (90%)	728 (100%)	2 (0%)	92	95
5	UB	344/732 (47%)	343 (100%)	1 (0%)	92	95
6	UC	107/538 (20%)	107 (100%)	0	100	100
7	UD	615/713 (86%)	612 (100%)	3 (0%)	88	93
8	UE	428/574 (75%)	428 (100%)	0	100	100
9	UF	277/414 (67%)	275 (99%)	2 (1%)	84	90
10	UG	462/480 (96%)	461 (100%)	1 (0%)	93	96
11	UH	152/657 (23%)	151 (99%)	1 (1%)	84	90
12	UI	99/533 (19%)	98 (99%)	1 (1%)	76	86
13	UJ	1031/1633 (63%)	1025 (99%)	6 (1%)	86	92
14	UK	226/234 (97%)	225 (100%)	1 (0%)	91	94
15	UL	747/832 (90%)	746 (100%)	1 (0%)	93	96
16	UM	668/719 (93%)	665 (100%)	3 (0%)	91	94
17	UN	137/808 (17%)	137 (100%)	0	100	100
18	UO	437/454 (96%)	437 (100%)	0	100	100
19	UP	57/196 (29%)	56 (98%)	1 (2%)	59	77
20	UQ	769/826 (93%)	766 (100%)	3 (0%)	91	94
21	UR	425/529 (80%)	424 (100%)	1 (0%)	93	96
22	US	332/506 (66%)	332 (100%)	0	100	100
23	UT	1787/2307 (78%)	1780 (100%)	7 (0%)	91	94
24	UU	743/819 (91%)	743 (100%)	0	100	100
25	UV	986/1125 (88%)	982 (100%)	4 (0%)	91	94
26	UX	156/169 (92%)	156 (100%)	0	100	100
27	UZ	230/256 (90%)	230 (100%)	0	100	100
28	CD	326/435 (75%)	326 (100%)	0	100	100
29	CE	353/433 (82%)	350 (99%)	3 (1%)	81	89
30	CF	102/104 (98%)	102 (100%)	0	100	100
30	CG	101/104 (97%)	100 (99%)	1 (1%)	76	86
31	CH	406/503 (81%)	405 (100%)	1 (0%)	93	96
32	CI	171/172 (99%)	171 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	CJ	251/258 (97%)	250 (100%)	1 (0%)	91	94
34	CK	187/535 (35%)	186 (100%)	1 (0%)	88	93
35	CL	690/1039 (66%)	679 (98%)	11 (2%)	62	79
36	CM	307/312 (98%)	306 (100%)	1 (0%)	92	95
37	CN	212/274 (77%)	212 (100%)	0	100	100
38	JC	318/636 (50%)	316 (99%)	2 (1%)	86	92
39	JF	195/222 (88%)	194 (100%)	1 (0%)	88	93
39	JG	206/222 (93%)	206 (100%)	0	100	100
42	JJ	158/238 (66%)	157 (99%)	1 (1%)	86	92
43	JK	35/482 (7%)	35 (100%)	0	100	100
44	JM	124/200 (62%)	123 (99%)	1 (1%)	81	89
45	JN	141/304 (46%)	141 (100%)	0	100	100
46	JO	210/289 (73%)	210 (100%)	0	100	100
47	JP	416/443 (94%)	415 (100%)	1 (0%)	93	96
48	JQ	22/192 (12%)	22 (100%)	0	100	100
49	DE	209/222 (94%)	206 (99%)	3 (1%)	67	81
50	DF	180/191 (94%)	180 (100%)	0	100	100
51	DG	187/201 (93%)	183 (98%)	4 (2%)	53	72
52	DH	165/170 (97%)	165 (100%)	0	100	100
53	DI	142/161 (88%)	139 (98%)	3 (2%)	53	72
54	DJ	158/166 (95%)	158 (100%)	0	100	100
55	DL	125/137 (91%)	124 (99%)	1 (1%)	81	89
56	DN	127/128 (99%)	126 (99%)	1 (1%)	81	89
57	DO	91/105 (87%)	90 (99%)	1 (1%)	73	85
58	DQ	105/119 (88%)	105 (100%)	0	100	100
60	DW	110/111 (99%)	110 (100%)	0	100	100
61	DX	85/120 (71%)	85 (100%)	0	100	100
62	DY	112/113 (99%)	111 (99%)	1 (1%)	78	87
63	Db	70/71 (99%)	69 (99%)	1 (1%)	67	81
64	Dc	56/60 (93%)	56 (100%)	0	100	100
All	All	19959/27976 (71%)	19876 (100%)	83 (0%)	91	94

5 of 83 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
35	CL	366	MET
51	DG	31	ARG
35	CL	624	LYS
42	JJ	144	LYS
53	DI	22	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 161 such sidechains are listed below:

Mol	Chain	Res	Type
28	CD	287	GLN
50	DF	103	ASN
31	CH	164	GLN
35	CL	835	HIS
53	DI	87	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
65	D2	443/700 (63%)	140 (31%)	4 (0%)
66	D3	1303/1808 (72%)	498 (38%)	26 (1%)
67	D4	223/333 (66%)	72 (32%)	4 (1%)
68	EA	21/22 (95%)	15 (71%)	0
All	All	1990/2863 (69%)	725 (36%)	34 (1%)

5 of 725 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
65	D2	6	A
65	D2	8	A
65	D2	14	U
65	D2	15	G
65	D2	17	A

5 of 34 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
66	D3	1638	G
66	D3	1657	U
67	D4	157	A

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Mol	Chain	Res	Type
66	D3	500	C
66	D3	417	A

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 7 ligands modelled in this entry, 6 are monoatomic - leaving 1 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
82	GTP	CL	2001	81	26,34,34	0.92	1 (3%)	32,54,54	1.49	5 (15%)

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
82	GTP	CL	2001	81	-	7/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
82	CL	2001	GTP	C6-N1	-2.49	1.34	1.37

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
82	CL	2001	GTP	PB-O3B-PG	-3.53	120.73	132.83
82	CL	2001	GTP	PA-O3A-PB	-3.32	121.42	132.83
82	CL	2001	GTP	C3'-C2'-C1'	3.21	105.81	100.98
82	CL	2001	GTP	C8-N7-C5	2.39	107.54	102.99
82	CL	2001	GTP	C5-C6-N1	2.32	118.05	113.95

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

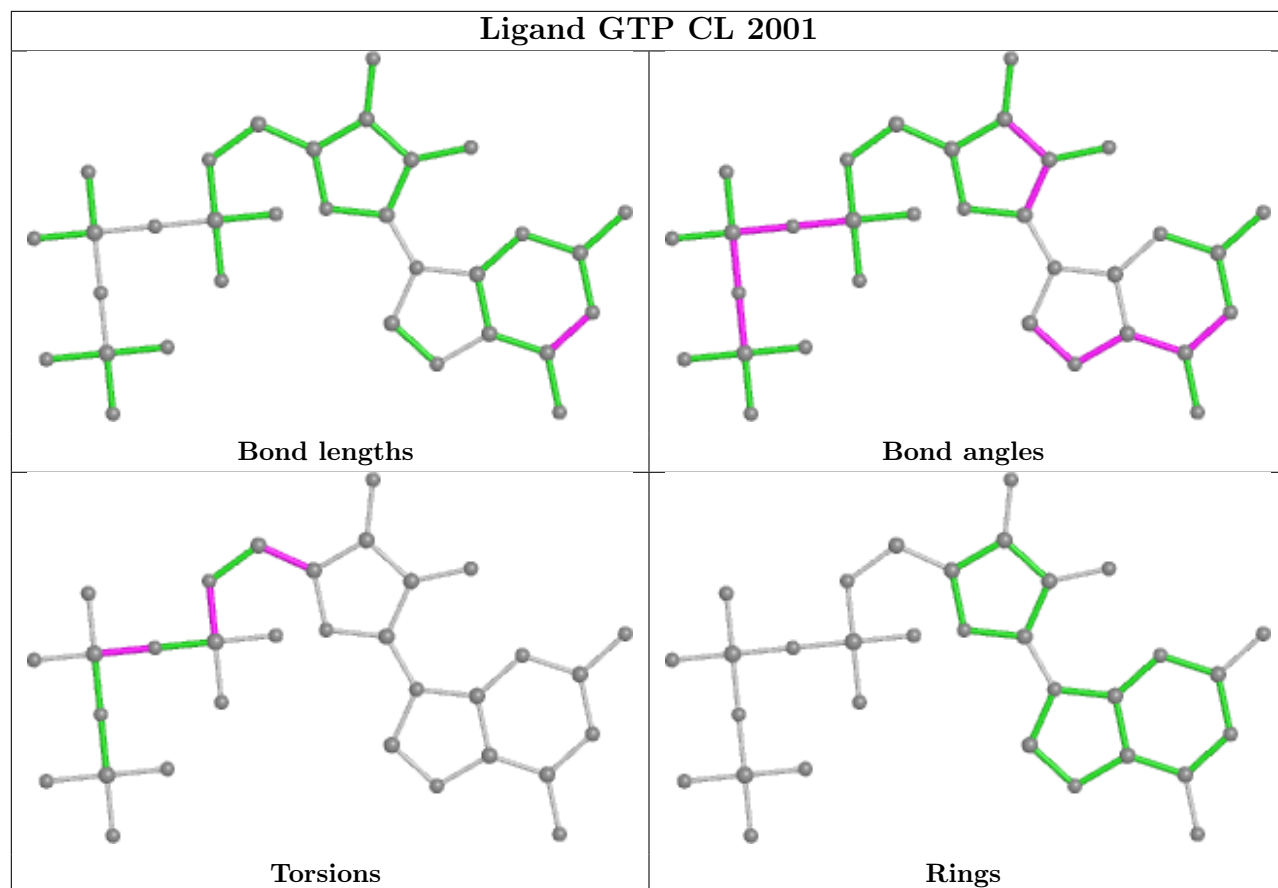
Mol	Chain	Res	Type	Atoms
82	CL	2001	GTP	C5'-O5'-PA-O1A
82	CL	2001	GTP	C3'-C4'-C5'-O5'
82	CL	2001	GTP	O4'-C4'-C5'-O5'
82	CL	2001	GTP	C5'-O5'-PA-O3A
82	CL	2001	GTP	C5'-O5'-PA-O2A

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
82	CL	2001	GTP	2	0

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 than 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.



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.

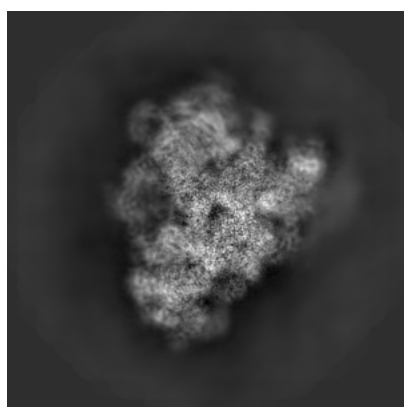
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11807. These allow visual inspection of the internal detail of the map and identification of artifacts.

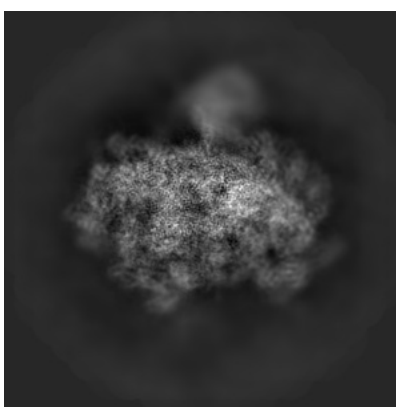
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

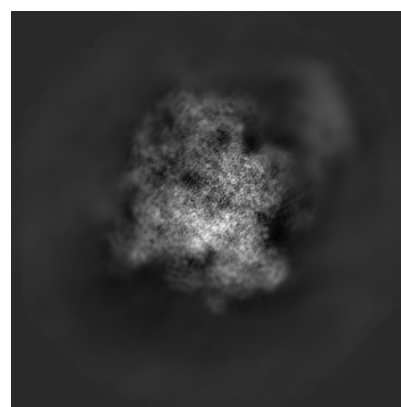
6.1.1 Primary map



X



Y

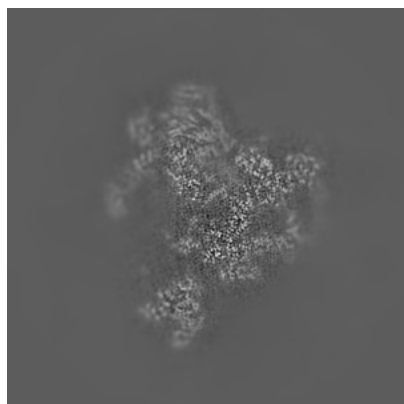


Z

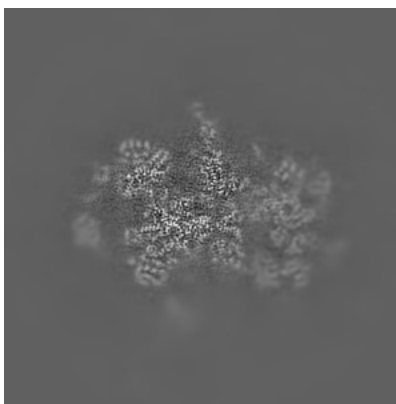
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

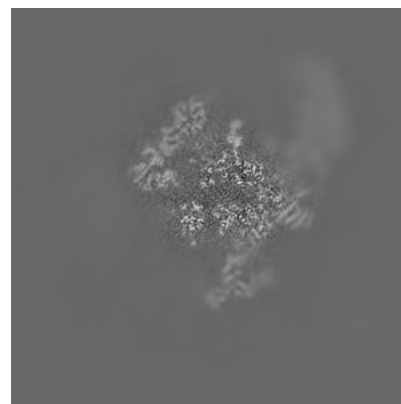
6.2.1 Primary map



X Index: 270



Y Index: 270

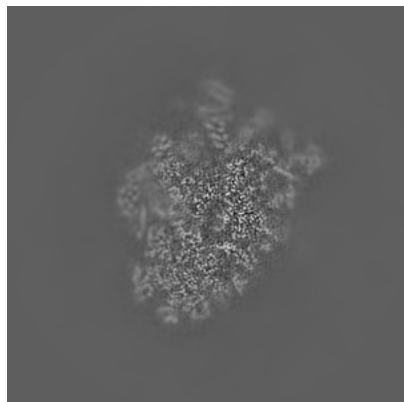


Z Index: 270

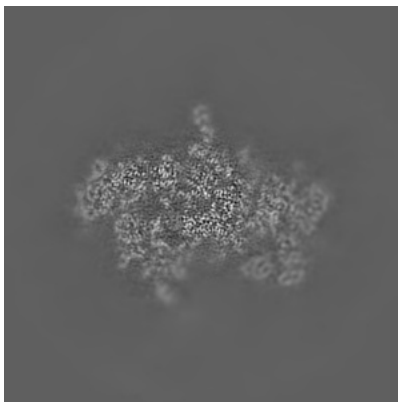
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

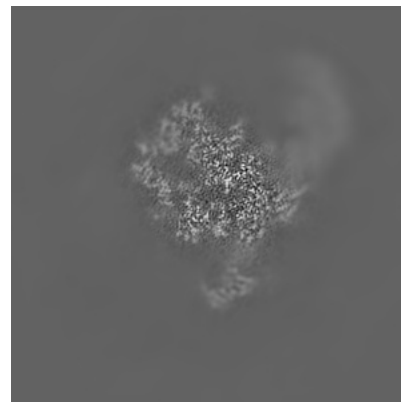
6.3.1 Primary map



X Index: 310



Y Index: 252



Z Index: 279

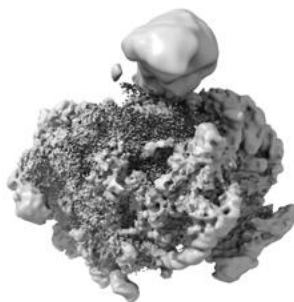
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

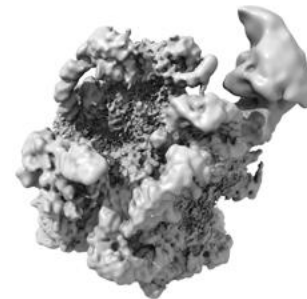
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

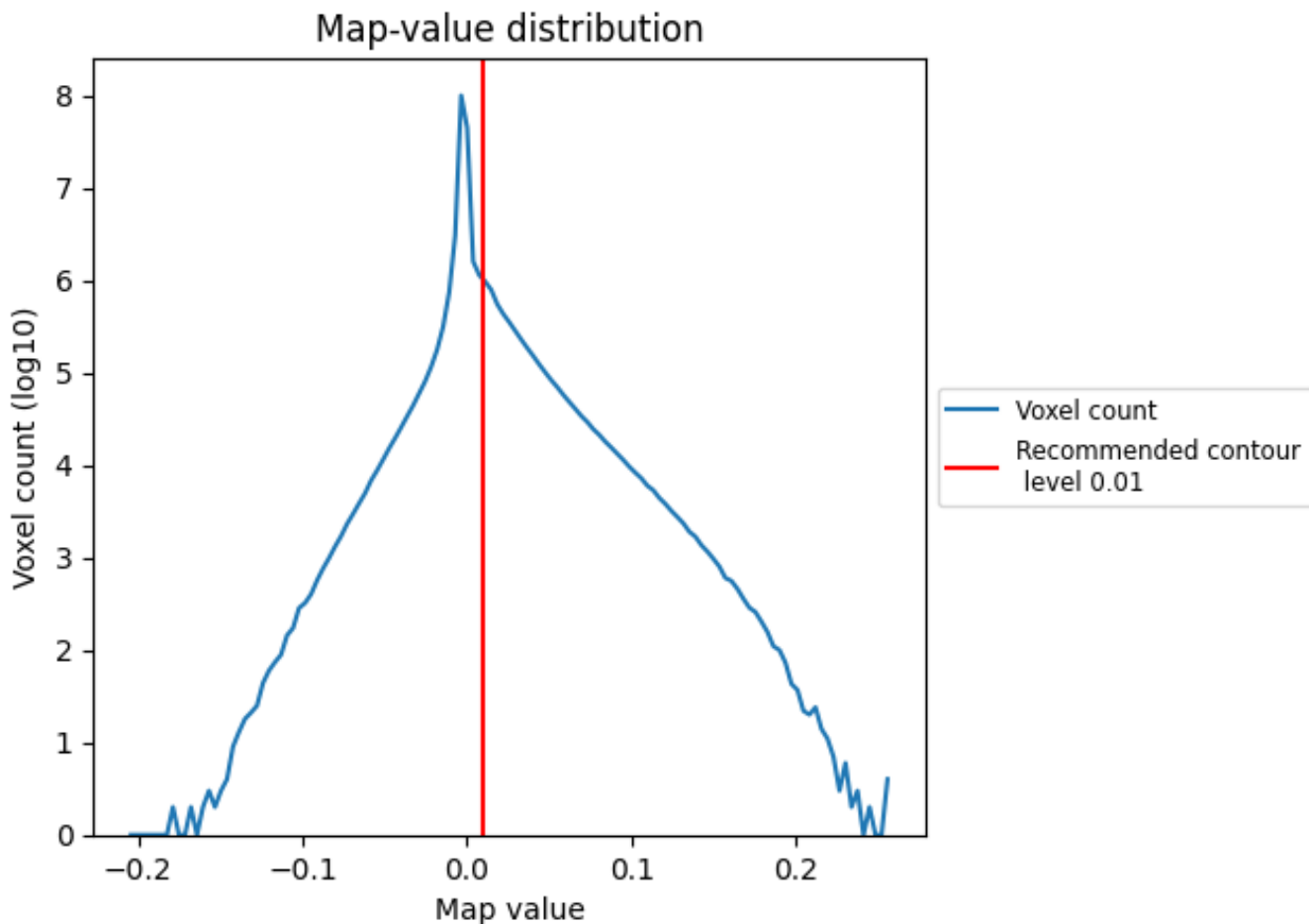
6.5 Mask visualisation

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

7 Map analysis [i](#)

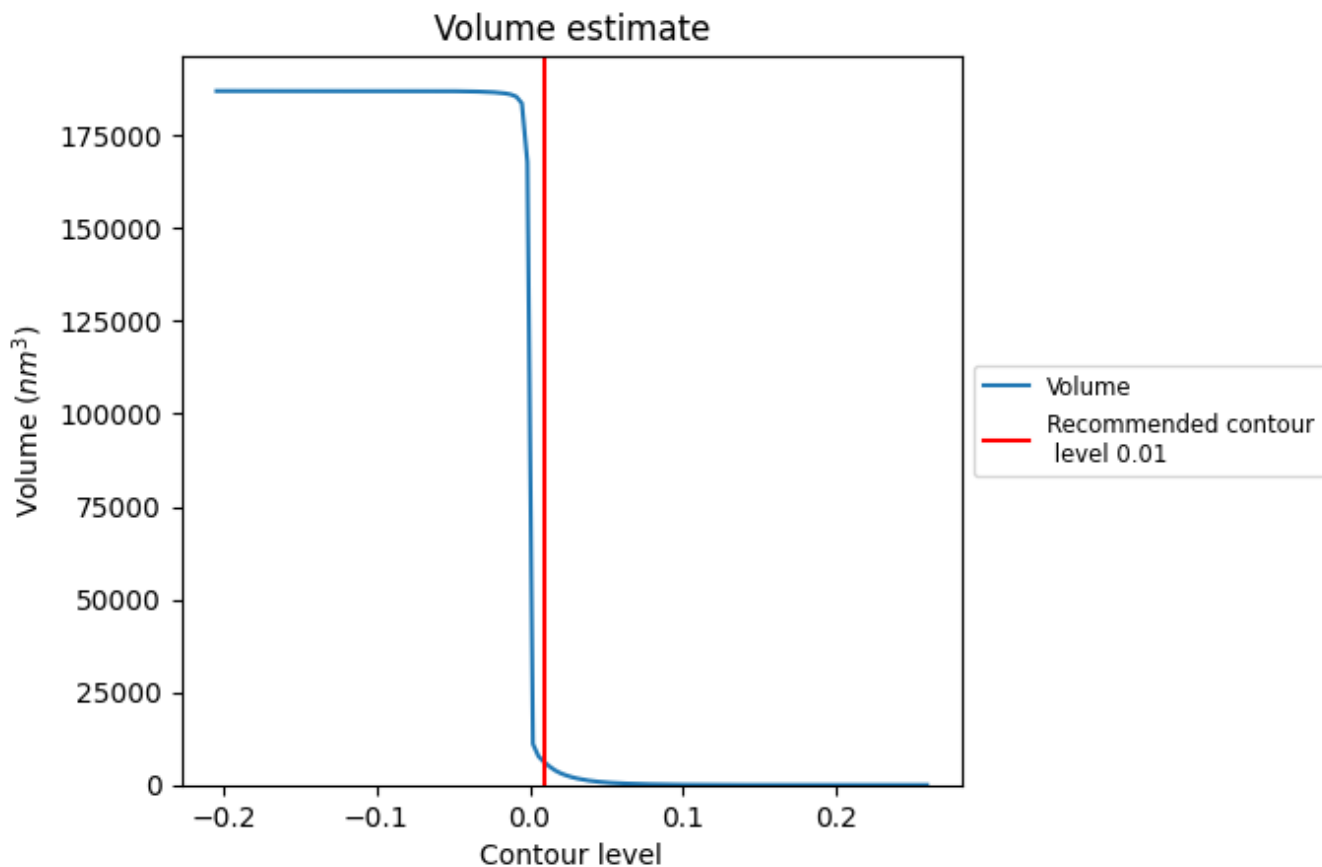
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

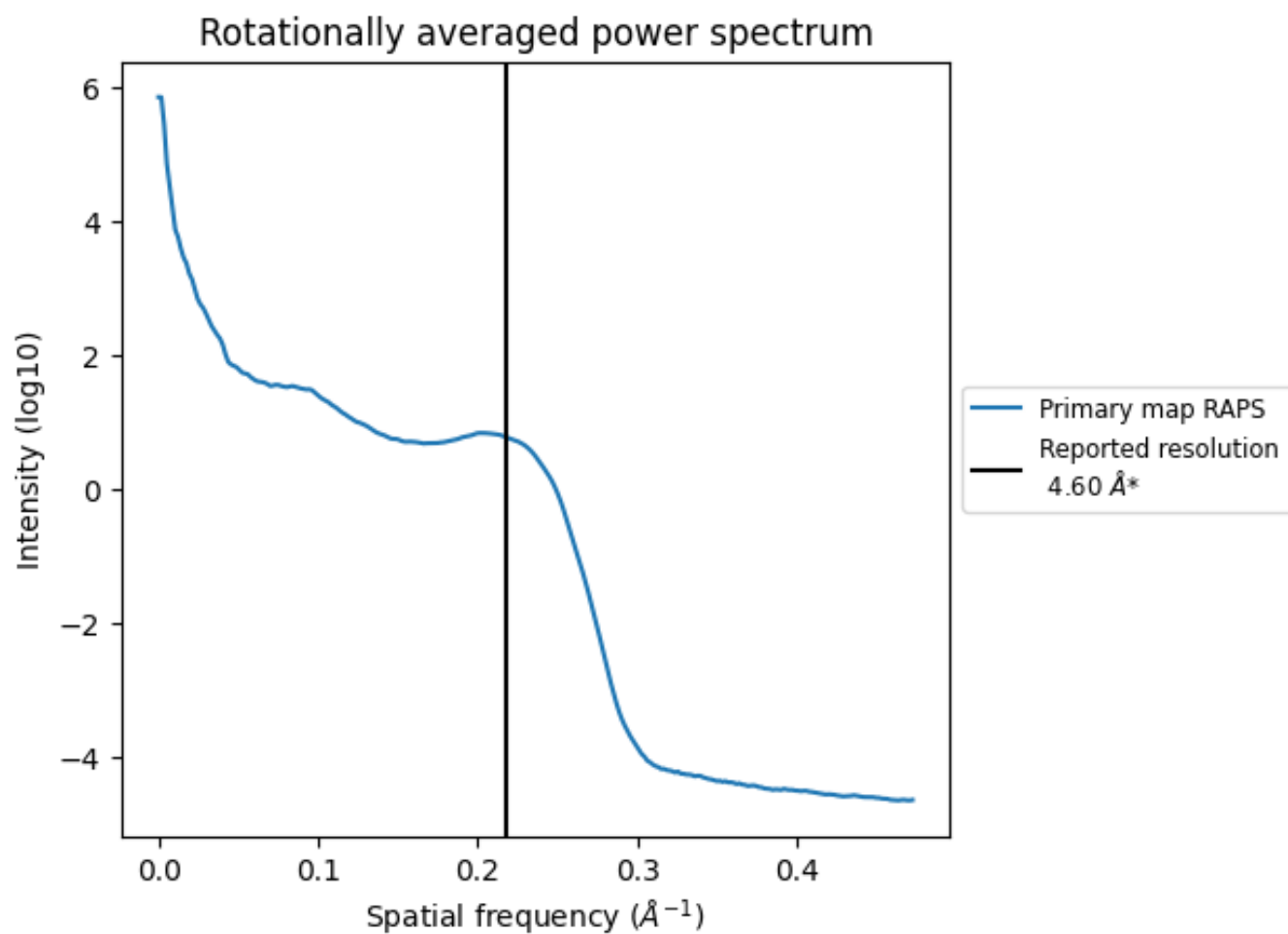
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 5975 nm³; this corresponds to an approximate mass of 5397 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](#)

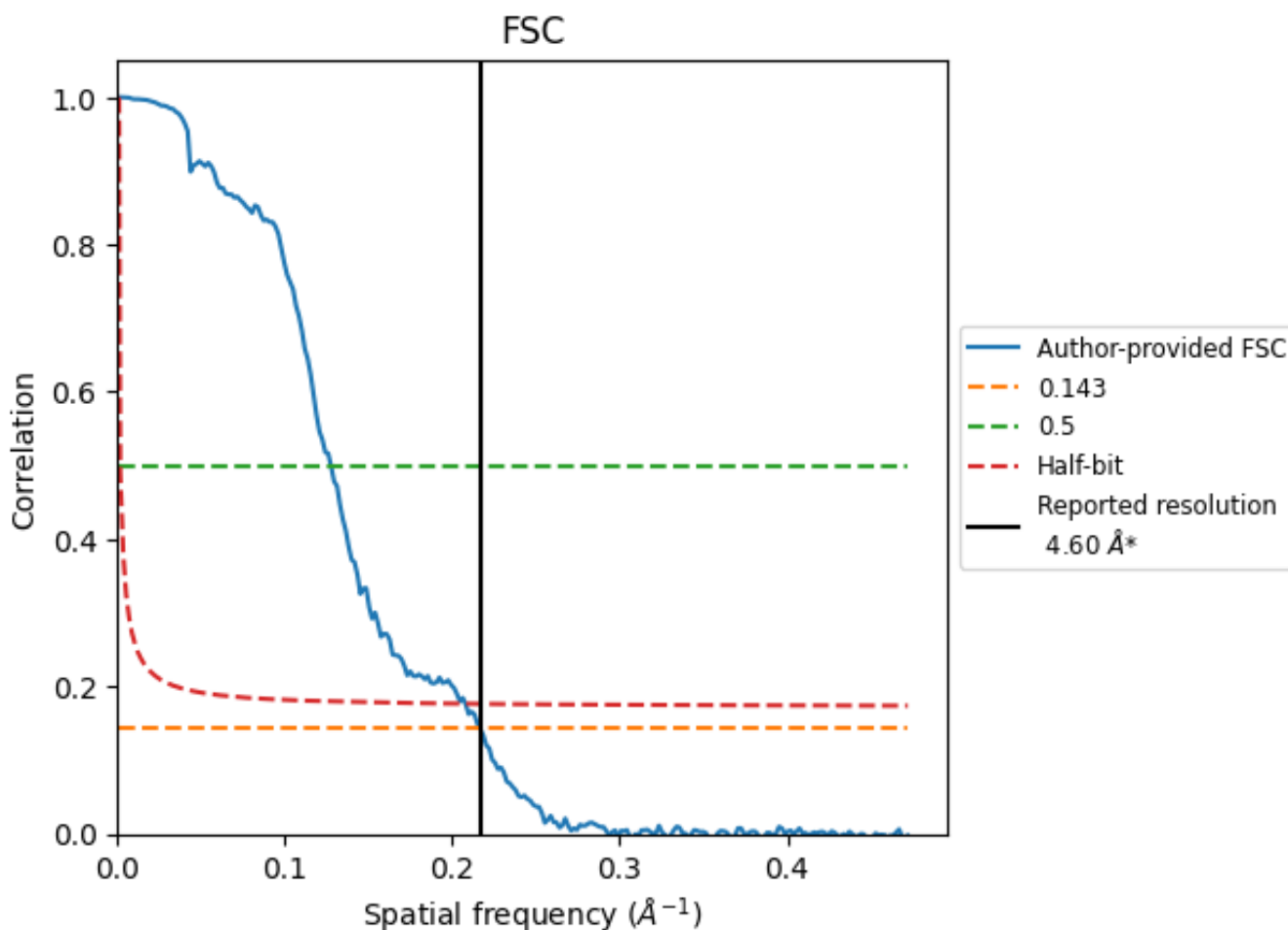


*Reported resolution corresponds to spatial frequency of 0.217 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.217 Å⁻¹

8.2 Resolution estimates [i](#)

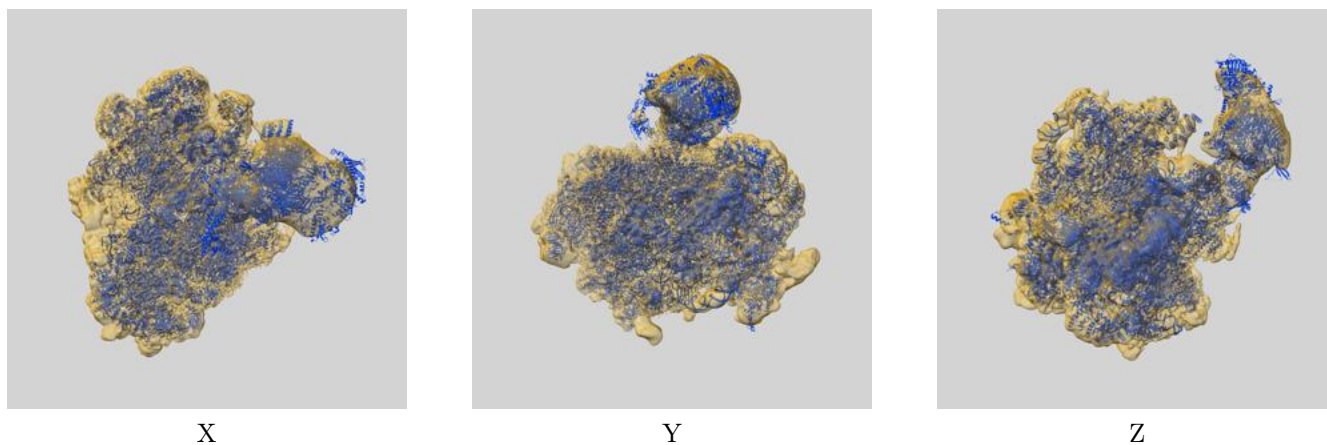
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.60	-	-
Author-provided FSC curve	4.62	7.84	4.81
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

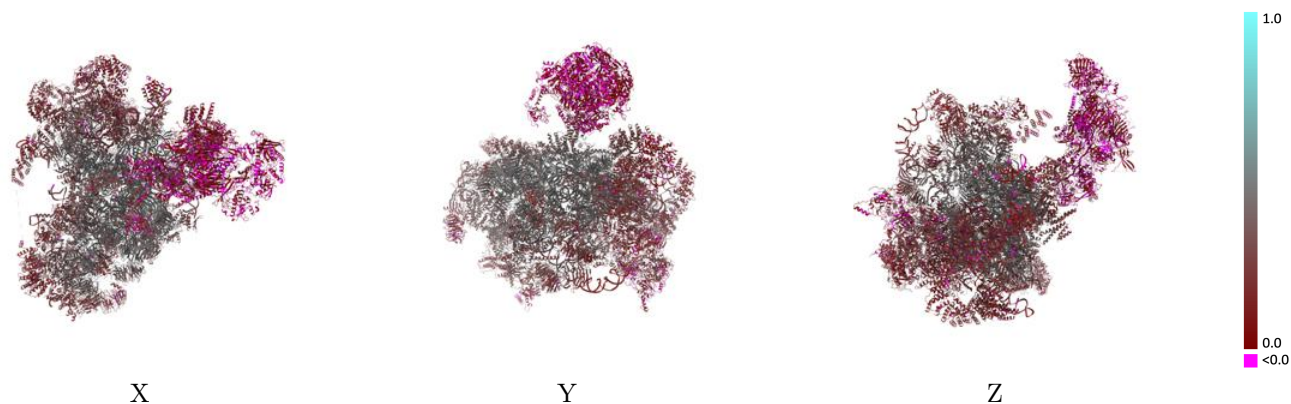
This section contains information regarding the fit between EMDB map EMD-11807 and PDB model 7AJT. Per-residue inclusion information can be found in section 3 on page 21.

9.1 Map-model overlay [i](#)



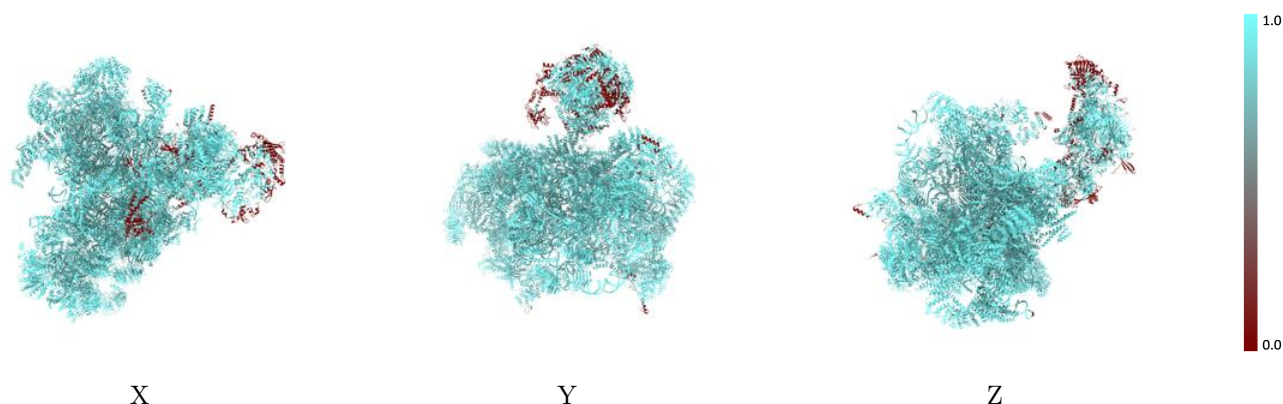
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



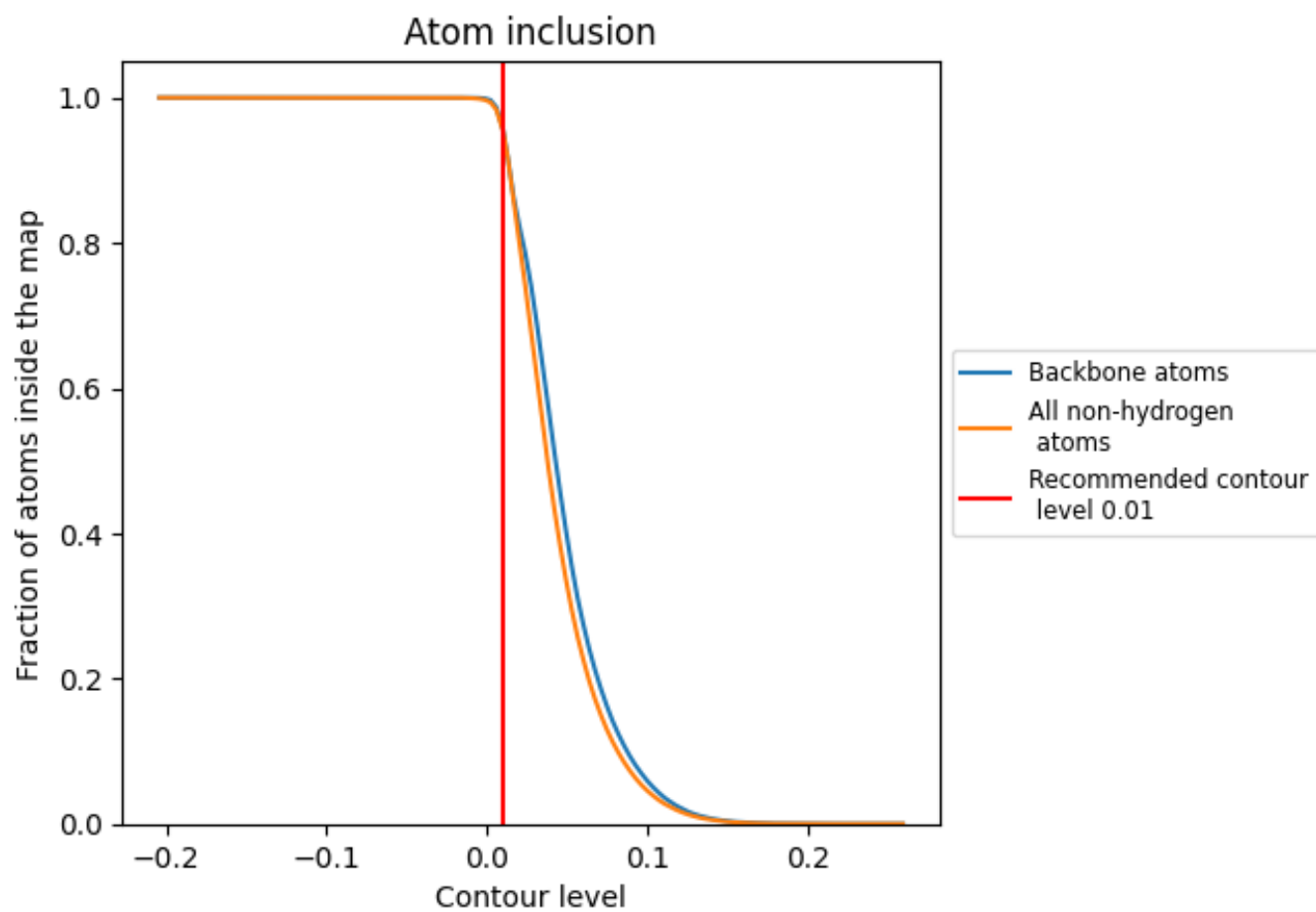
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.01).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 95% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9539	 0.3080
CA	 0.9744	 0.4780
CB	 0.9638	 0.3530
CD	 0.9759	 0.3780
CE	 0.9710	 0.3380
CF	 0.9684	 0.4410
CG	 0.9651	 0.4290
CH	 0.9843	 0.3800
CI	 0.9818	 0.5020
CJ	 0.9736	 0.4640
CK	 0.9712	 0.4120
CL	 0.9712	 0.3950
CM	 0.9762	 0.3510
CN	 0.9727	 0.2290
D2	 0.9950	 0.3830
D3	 0.9838	 0.3300
D4	 0.9739	 0.3570
DA	 0.9665	 0.4030
DE	 0.9631	 0.3290
DF	 0.9822	 0.4290
DG	 0.9618	 0.2000
DH	 0.9532	 0.3050
DI	 0.9681	 0.2110
DJ	 0.9577	 0.4480
DL	 0.9581	 0.2070
DN	 0.9628	 0.3770
DO	 0.9744	 0.4170
DQ	 0.9727	 0.4730
DS	 0.9864	 0.3270
DW	 0.9699	 0.4610
DX	 0.9755	 0.4450
DY	 0.9712	 0.3820
Db	 0.9850	 0.4420
Dc	 0.9748	 0.4500
EA	 0.9180	 0.0410

















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Chain	Atom inclusion	Q-score
EB	 0.8549	 0.0250
EC	 0.9635	 0.0340
ED	 0.9197	 0.0480
EE	 0.8914	 0.0310
EF	 0.9320	 0.0460
EG	 0.8686	 0.0230
EH	 0.6402	 0.0500
EI	 0.8715	 0.0500
EJ	 0.5885	 0.0360
EK	 0.5681	 0.0340
EN	 0.6115	 0.0570
JA	 0.9596	 0.1970
JB	 0.9276	 0.1730
JC	 0.9336	 0.1790
JF	 0.9797	 0.2710
JG	 0.9622	 0.3670
JH	 0.9514	 0.1210
JI	 0.8143	 0.1750
JJ	 0.9709	 0.2930
JK	 0.9360	 0.1590
JM	 0.9720	 0.4140
JN	 0.9733	 0.4460
JO	 0.9722	 0.4170
JP	 0.9744	 0.4840
JQ	 0.9894	 0.3430
UA	 0.9811	 0.4650
UB	 0.9859	 0.2670
UC	 0.9709	 0.4160
UD	 0.9818	 0.3340
UE	 0.9782	 0.3730
UF	 0.9790	 0.3530
UG	 0.9807	 0.4670
UH	 0.9892	 0.1870
UI	 0.9775	 0.2160
UJ	 0.9703	 0.2600
UK	 0.9737	 0.4070
UL	 0.9817	 0.3270
UM	 0.9740	 0.2870
UN	 0.9591	 0.4230
UO	 0.9759	 0.3790
UP	 0.9771	 0.3200
UQ	 0.9819	 0.3440

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Chain	Atom inclusion	Q-score
UR	 0.9834	 0.4350
US	 0.9808	 0.2890
UT	 0.9746	 0.2090
UU	 0.9788	 0.4300
UV	 0.9753	 0.2370
UX	 0.9729	 0.4970
UZ	 0.9817	 0.3500