



wwPDB EM Validation Summary Report ⓘ

May 20, 2024 – 01:16 AM JST

PDB ID : 7D5S
EMDB ID : EMD-30584
Title : Cryo-EM structure of 90S preribosome with inactive Utp24 (state A2)
Authors : Du, Y.; Zhang, J.; An, W.; Ye, K.
Deposited on : 2020-09-28
Resolution : 4.60 Å (reported)
Based on initial model : 6LQU

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:

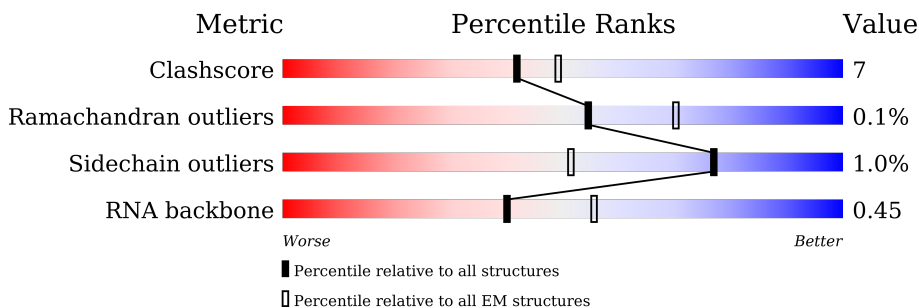
EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.60 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	3A	333	
2	5A	700	
3	SA	1808	
4	SG	225	
5	SK	197	
6	SN	143	
7	SO	151	

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Mol	Chain	Length	Quality of chain
8	SP	137	86% 62% 23% 14%
9	SR	143	14% 73% 14% 13%
10	ST	146	55% 64% 16% 20%
11	SY	145	48% 63% 6% 29%
12	Sd	67	21% 94% 6%
13	3B	327	22% 60% 13% 27%
13	3C	327	15% 51% 17% 31%
14	3D	504	19% 61% 12% 27%
15	3E	511	18% 66% 17% 16%
16	3F	573	44% 55% 16% 29%
17	3G	126	13% 80% 16%
17	3H	126	42% 77% 18%
18	A4	776	10% 66% 19% 15%
19	A5	643	10% 65% 14% 20%
20	A8	713	38% 68% 8% 23%
21	A9	575	18% 78%
22	AE	1769	16% 29% 8% 63%
23	AF	513	10% 75% 21%
24	AG	896	11% 71% 20% 8%
25	B1	923	12% 76% 14% 10%
26	B2	943	22% 68% 21% 10%
27	B3	817	64% 66% 24% 8%
28	B8	594	6% 66% 13% 20%
29	BE	939	9% 78% 14% 8%
30	B6	440	33% 75% 10% 15%

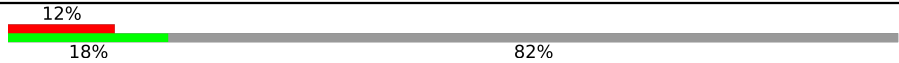
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Mol	Chain	Length	Quality of chain
31	5B	214	8% 20% 7% 72%
32	5C	554	28% 75% 18% 7%
33	5D	250	22% 82% 12% 6%
34	5E	593	11% 28% 6% 66%
35	5F	183	21% 80% 19% ..
36	5G	290	38% 79% 19% .
37	5H	610	10% 20% . 78%
38	5I	489	24% 71% 23% 6%
39	5J	217	33% 59% 11% 30%
40	5K	189	46% 77% 15% 7%
41	RC	316	55% 44% 11% 45%
42	RD	1729	15% 15% . 85%
43	RE	1237	87% 66% 20% . 13%
44	RF	297	59% 44% 13% . 41%
45	RG	252	44% 62% 24% 14%
45	RH	252	37% 71% 20% 9%
46	RI	274	16% 73% 19% 8%
47	RJ	1183	18% 49% 12% 38%
48	RK	367	36% 74% 23% ..
49	RN	810	42% 62% 13% 25%
50	RO	552	26% 82% 13% 5%
51	RQ	899	17% 18% . 78%
52	RS	483	49% 36% 16% 48%
53	RT	326	21% 43% 9% 48%
54	RW	206	24% 29% . 69%

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Mol	Chain	Length	Quality of chain
55	X1	347	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a red segment on the left labeled '12%', a green segment in the middle labeled '18%', and a grey segment on the right labeled '82%'. The total length of the bar represents 100%.</p>

2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 179154 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	3A	175	3711	1661	648	1227	175	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	5A	523	11163	4988	1984	3668	523	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	SA	859	18356	8201	3302	5994	859	0	0

- Molecule 4 is a protein called 40S ribosomal protein S5.

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

- Molecule 5 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	SK	171	1388	879	268	240	1	0	0

- Molecule 6 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	SN	119	865	545	151	167	2	0	0

- Molecule 7 is a protein called 40S ribosomal protein S13.

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

- Molecule 8 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	SP	118	868	536	164	165	3	0	0

- Molecule 9 is a protein called 40S ribosomal protein S16-A.

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

- Molecule 10 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	ST	117	964	610	184	168	2	0	0

- Molecule 11 is a protein called 40S ribosomal protein S23-A.

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

- Molecule 12 is a protein called 40S ribosomal protein S28-A.

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

- Molecule 13 is a protein called rRNA 2'-O-methyltransferase fibrillar.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	3B	240	1865	1184	333	338	10	0	0
13	3C	225	1763	1120	316	317	10	0	0

- Molecule 14 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	3D	369	2848	1811	489	540	8	0	0

- Molecule 15 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	3E	431	3028	1888	543	588	9	0	0

- Molecule 16 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	3F	406	3248	2075	566	597	10	0	0

- Molecule 17 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	3G	121	916	583	158	171	4	0	0
17	3H	121	916	583	158	171	4	0	0

- Molecule 18 is a protein called U3 small nucleolar RNA-associated protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	A4	662	5226	3309	910	986	21	0	0

- Molecule 19 is a protein called U3 small nucleolar RNA-associated protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	A5	514	3976	2520	688	755	13	0	0

- Molecule 20 is a protein called U3 small nucleolar RNA-associated protein 8.

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

- Molecule 21 is a protein called U3 small nucleolar RNA-associated protein 9.

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

- Molecule 22 is a protein called U3 small nucleolar RNA-associated protein 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	AE	649	5181	3355	849	960	17	0	0

- Molecule 23 is a protein called U3 small nucleolar RNA-associated protein 15.

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

- Molecule 24 is a protein called NET1-associated nuclear protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	AG	826	6570	4181	1111	1259	19	0	0

- Molecule 25 is a protein called Periodic tryptophan protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	B1	834	6635	4223	1140	1253	19	0	0

- Molecule 26 is a protein called U3 small nucleolar RNA-associated protein 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	B2	851	6723	4294	1133	1269	27	0	0

- Molecule 27 is a protein called U3 small nucleolar RNA-associated protein 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	B3	752	5882	3746	987	1122	27	0	0

- Molecule 28 is a protein called U3 small nucleolar RNA-associated protein 18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	B8	477	3764	2387	662	705	10	0	0

- Molecule 29 is a protein called U3 small nucleolar RNA-associated protein 21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	BE	865	6810	4322	1175	1292	21	0	0

- Molecule 30 is a protein called U3 small nucleolar RNA-associated protein 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	B6	374	2800	1782	501	505	12	0	0

- Molecule 31 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	5B	60	495	310	101	84	0	0

- Molecule 32 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	5C	516	4084	2561	736	775	12	0	0

- Molecule 33 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	5D	235	1972	1226	380	359	7	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	5E	204	1647	1021	294	328	4	0	0

- Molecule 35 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	5F	182	Total	C	N	O	S	0	0
			1530	967	287	269	7		

- Molecule 36 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	5G	282	Total	C	N	O	S	0	0
			2296	1441	430	418	7		

- Molecule 37 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	5H	136	Total	C	N	O	0	0
			1065	658	211	196		

- Molecule 38 is a protein called Protein SOF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	5I	461	Total	C	N	O	S	0	0
			3765	2354	686	709	16		

- Molecule 39 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	5J	151	Total	C	N	O	S	0	0
			1280	807	240	228	5		

- Molecule 40 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	5K	175	Total	C	N	O	S	0	0
			1403	896	256	241	10		

- Molecule 41 is a protein called KRR1 small subunit processome component.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	RC	175	Total	C	N	O	S	0	0
			1410	903	252	245	10		

- Molecule 42 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
42	RD	265	1314	784	265	265	0	0

- Molecule 43 is a protein called U3 small nucleolar RNA-associated protein 22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	RE	1079	8716	5666	1437	1589	24	0	0

- Molecule 44 is a protein called Ribosomal RNA-processing protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	RF	174	1404	905	230	261	8	0	0

- Molecule 45 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

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

- Molecule 46 is a protein called Ribosome biogenesis protein UTP30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	RI	252	2045	1309	362	366	8	0	0

- Molecule 47 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	RJ	732	5953	3829	1057	1041	26	0	0

- Molecule 48 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

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

- Molecule 49 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	RN	607	Total	C	N	O	S	0	0
			4529	2861	820	837	11		

- Molecule 50 is a protein called Nucleolar complex protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	RO	525	Total	C	N	O	S	0	0
			3766	2412	646	696	12		

- Molecule 51 is a protein called U3 small nucleolar RNA-associated protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	RQ	194	Total	C	N	O	S	0	0
			1436	892	270	272	2		

- Molecule 52 is a protein called Essential nuclear protein 1.

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

- Molecule 53 is a protein called Pno1.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	RT	171	Total	C	N	O	S	0	0
			1357	864	249	240	4		

- Molecule 54 is a protein called Regulator of rDNA transcription protein 14.

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

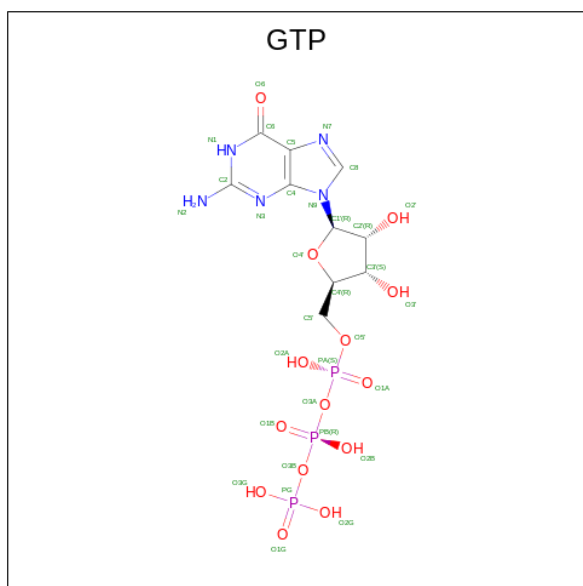
- Molecule 55 is a protein called Unassigned peptides 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	X1	61	Total	C	N	O	0	0
			305	183	61	61		

- Molecule 56 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
56	5K	1	Total	Zn	0
			1	1	

- Molecule 57 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



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

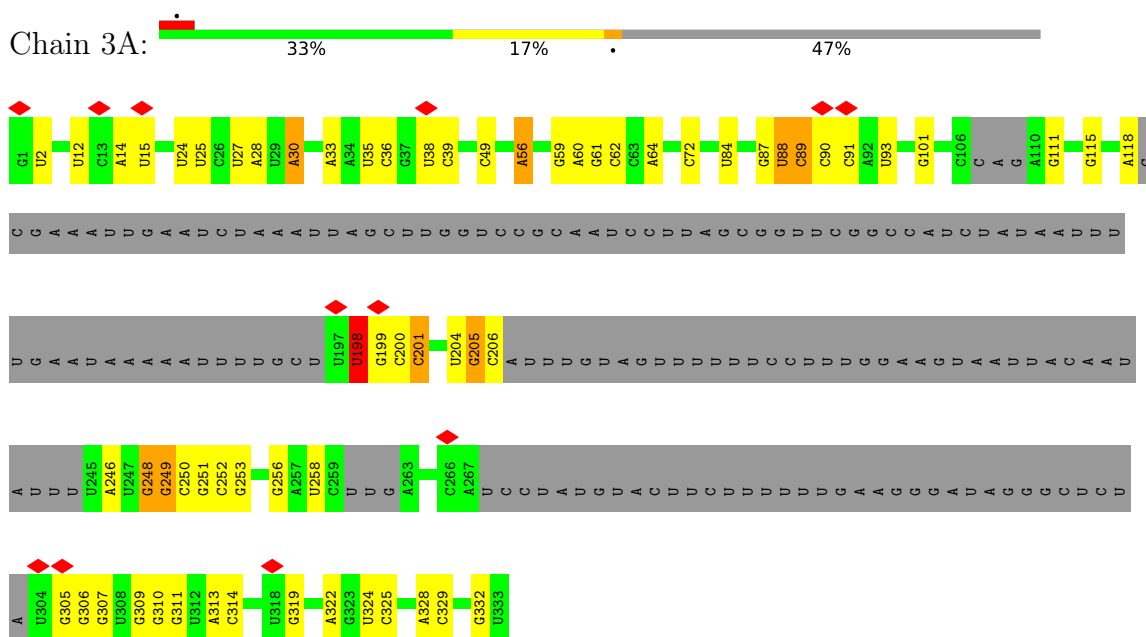
- Molecule 58 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

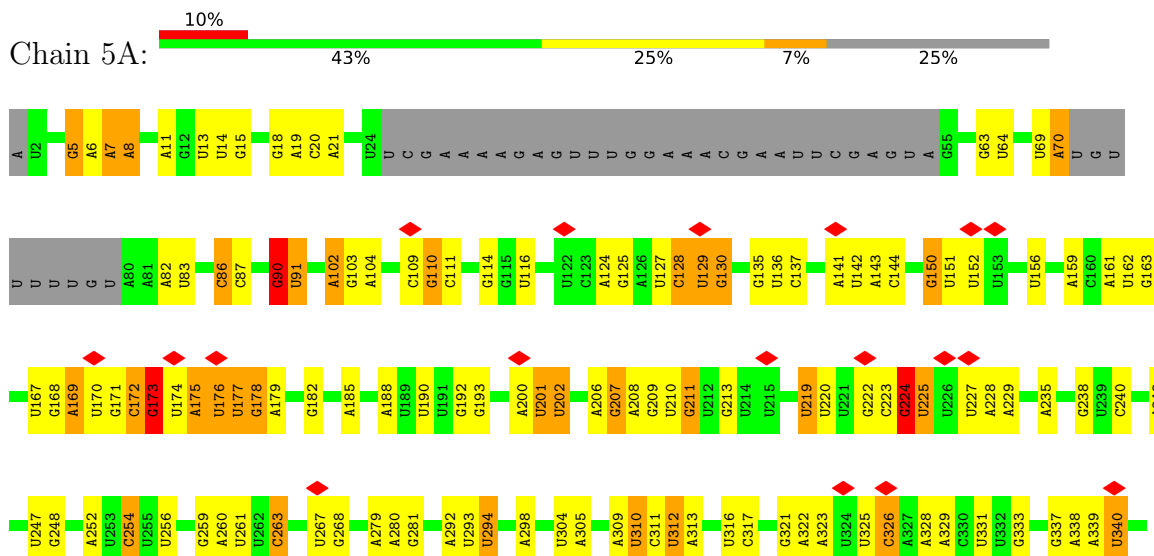
3 Residue-property plots [i](#)

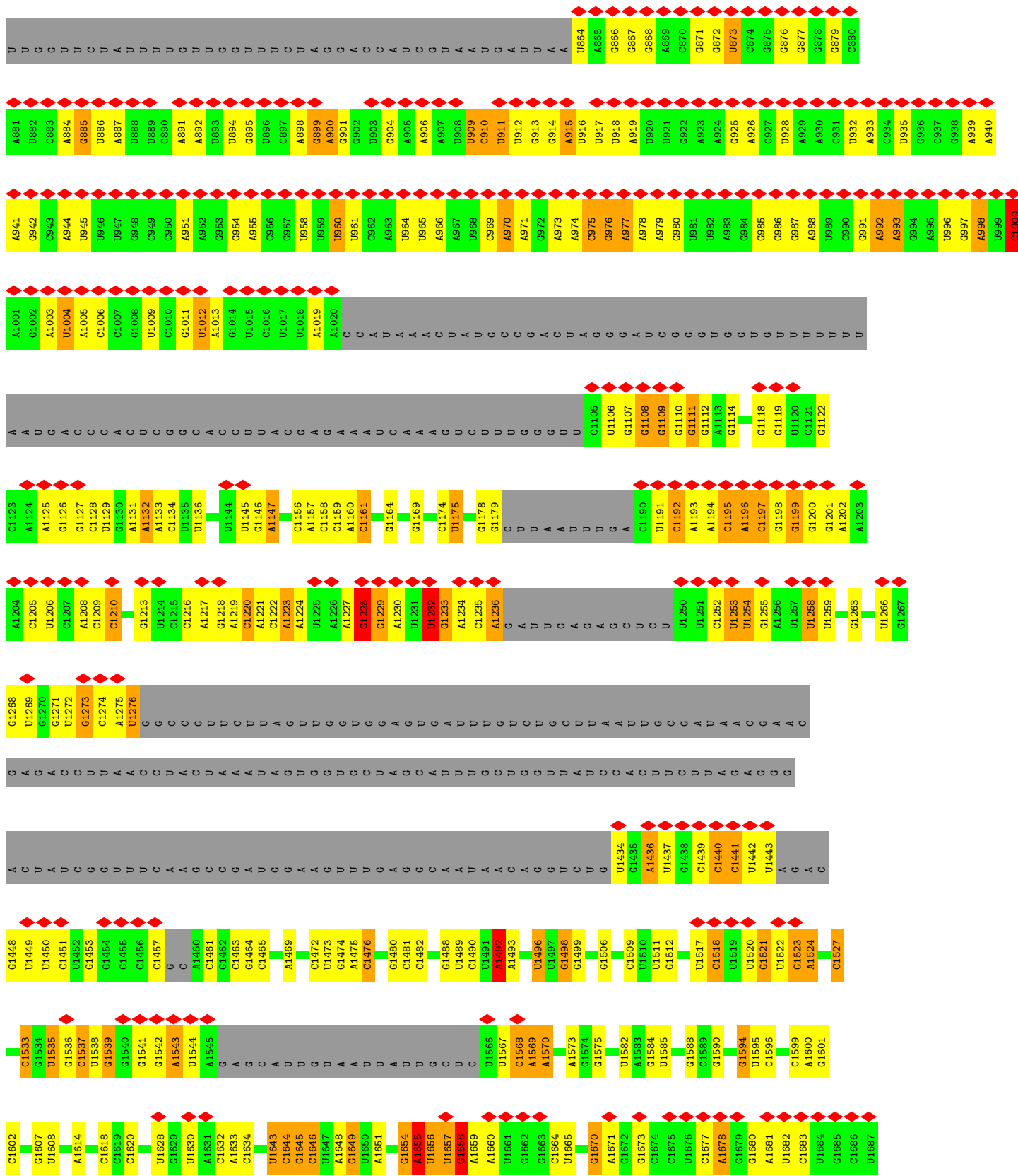
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

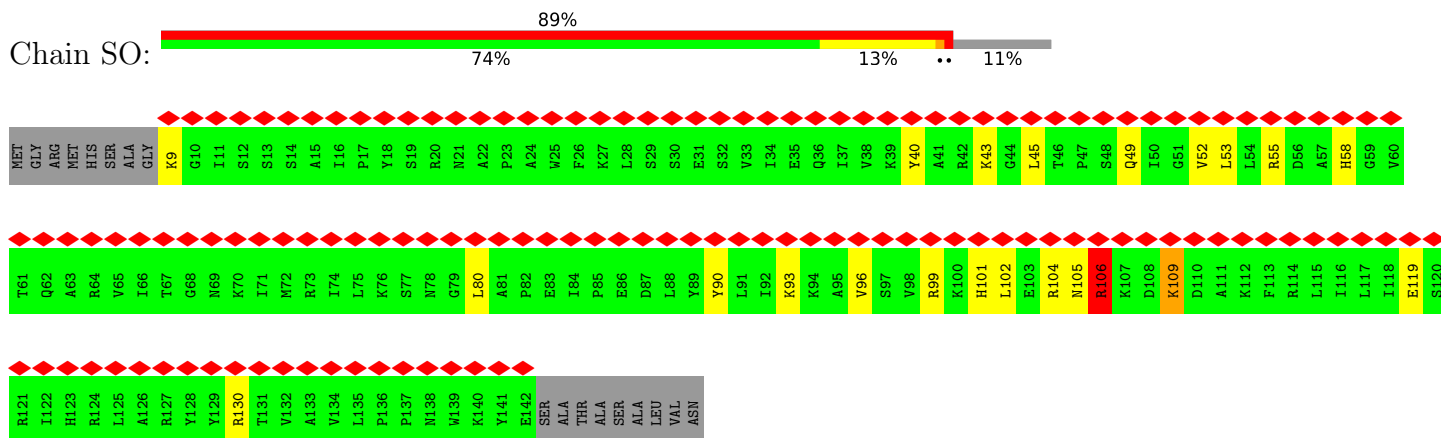
- Molecule 1: U3 snoRNA



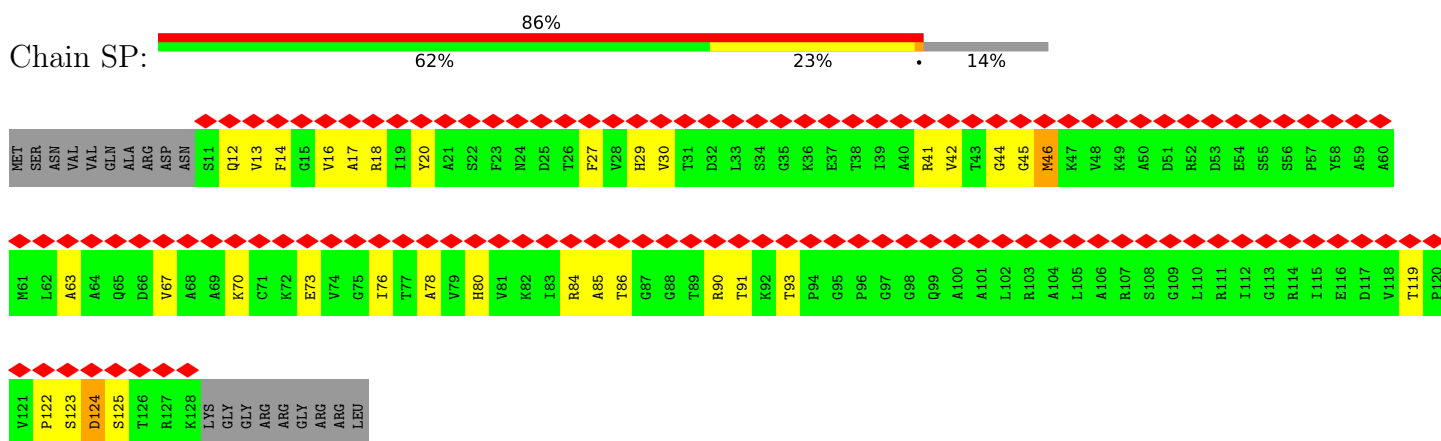
- Molecule 2: 5' ETS



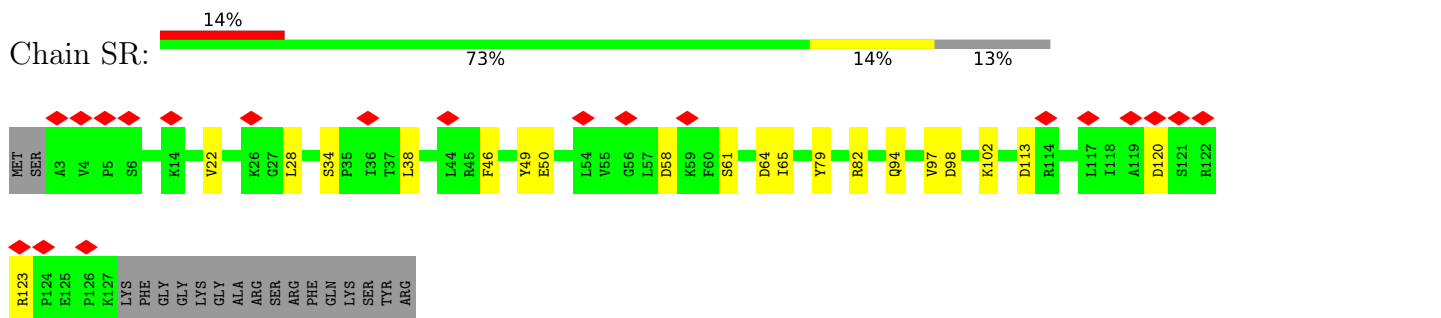




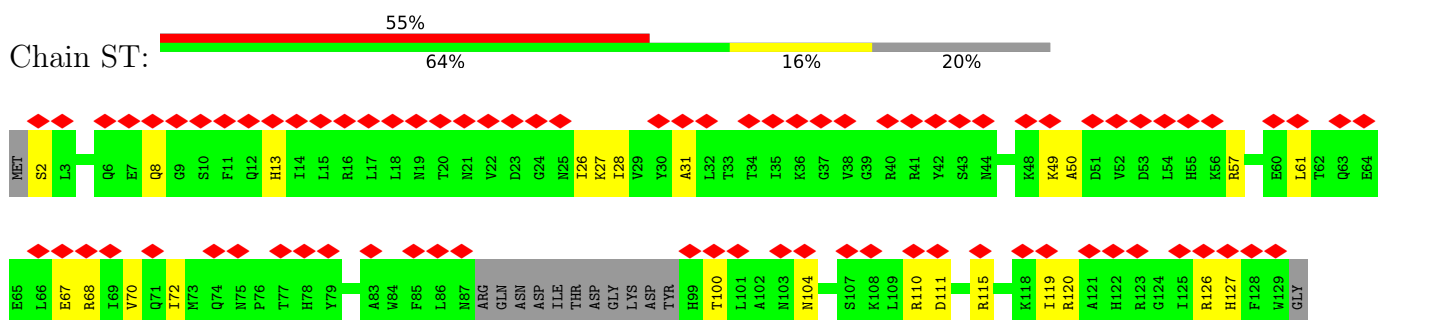
• Molecule 8: 40S ribosomal protein S14-A



• Molecule 9: 40S ribosomal protein S16-A

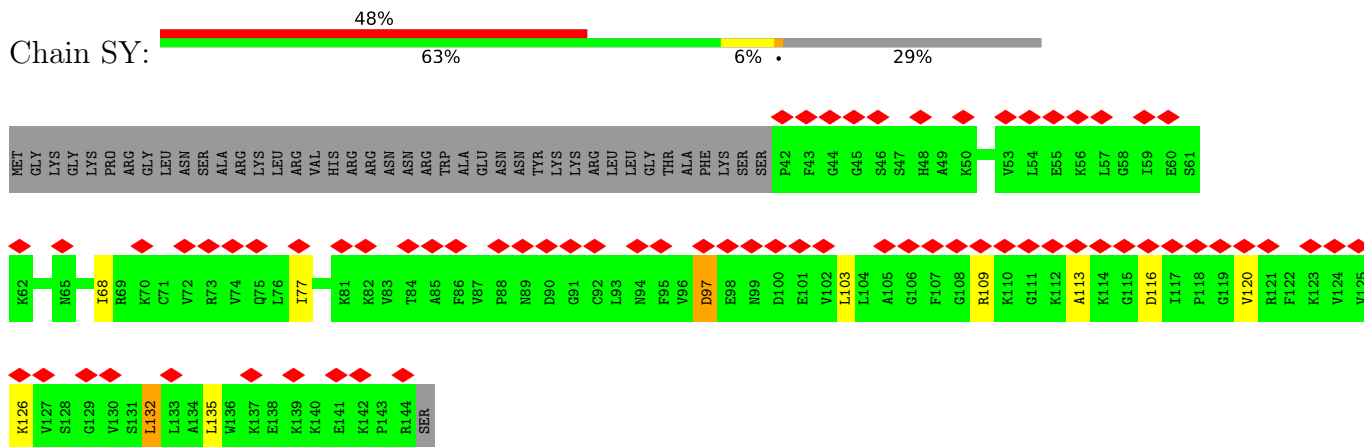


• Molecule 10: 40S ribosomal protein S18-A

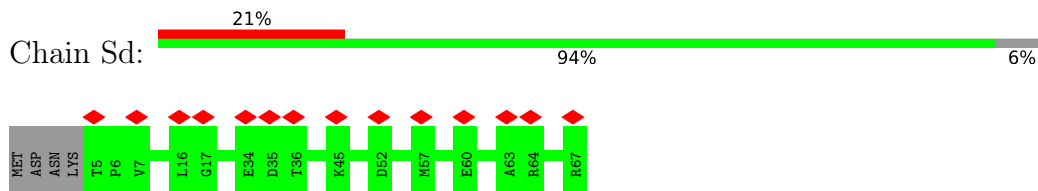


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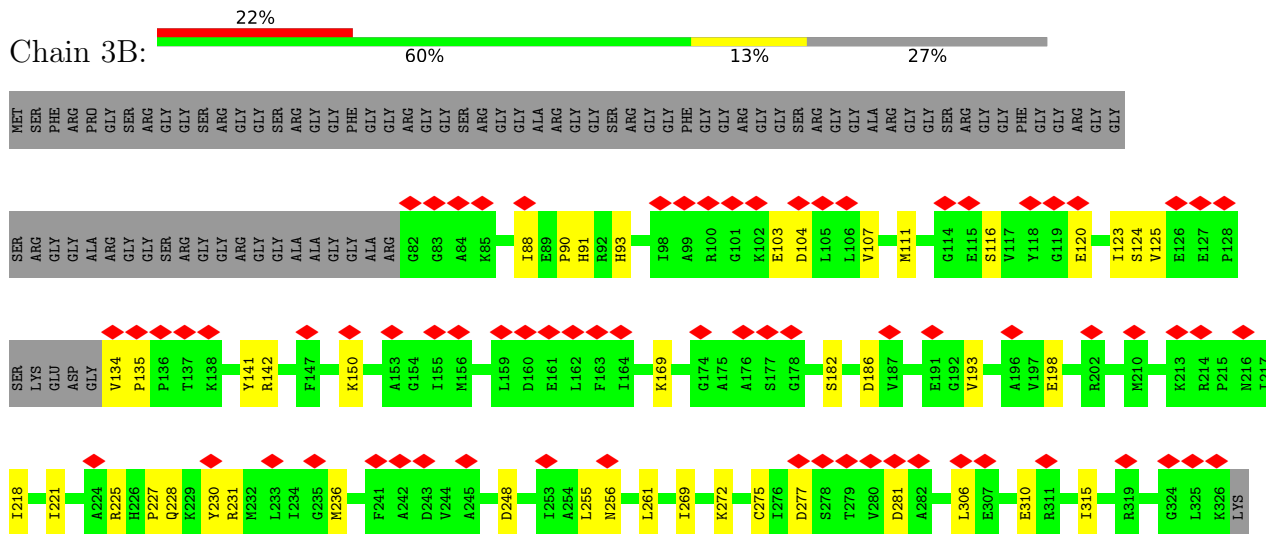
• Molecule 11: 40S ribosomal protein S23-A



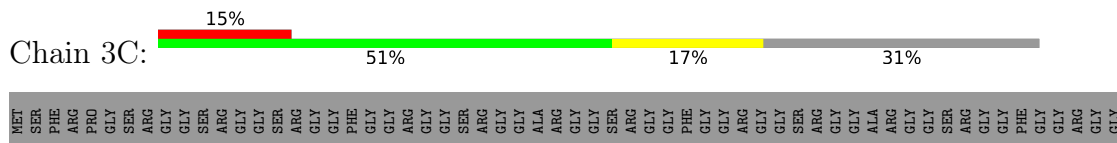
• Molecule 12: 40S ribosomal protein S28-A

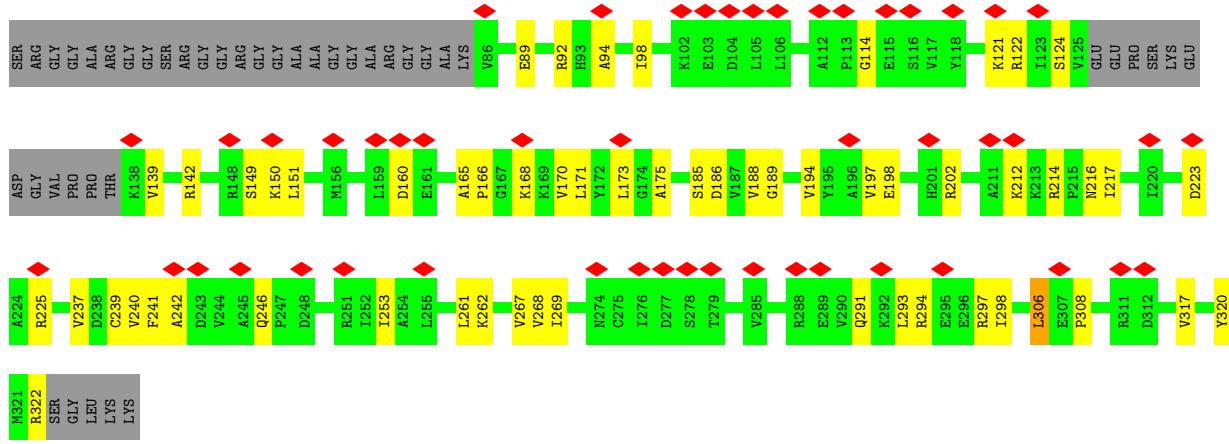


• Molecule 13: rRNA 2'-O-methyltransferase fibrillar

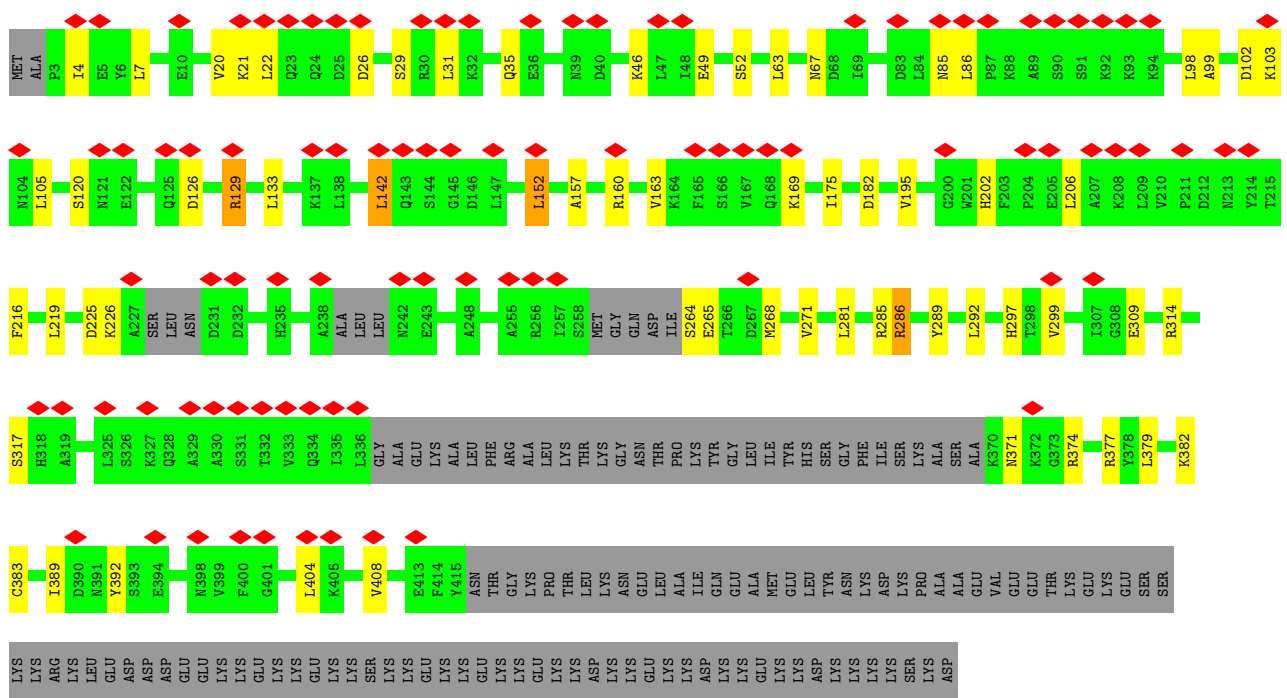


• Molecule 13: rRNA 2'-O-methyltransferase fibrillar

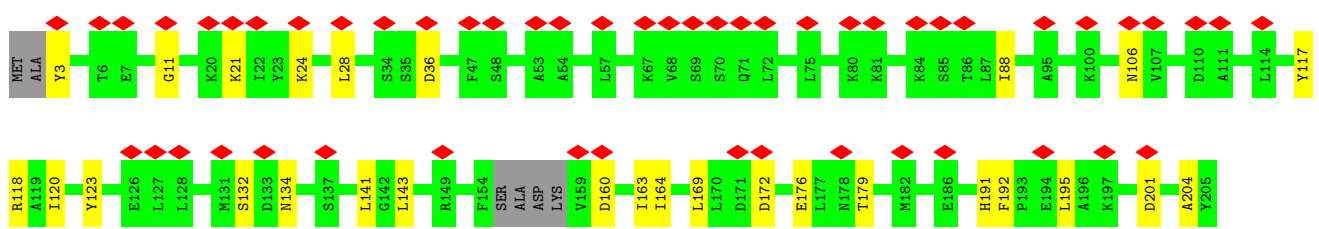


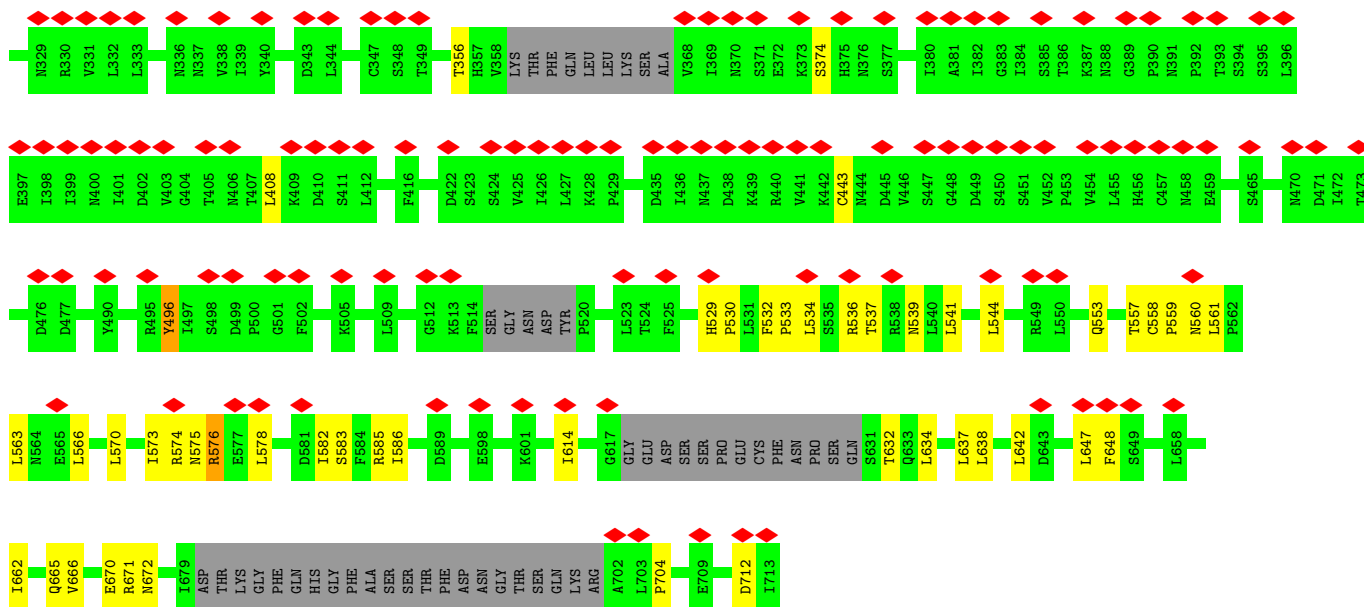


• Molecule 14: Nucleolar protein 56

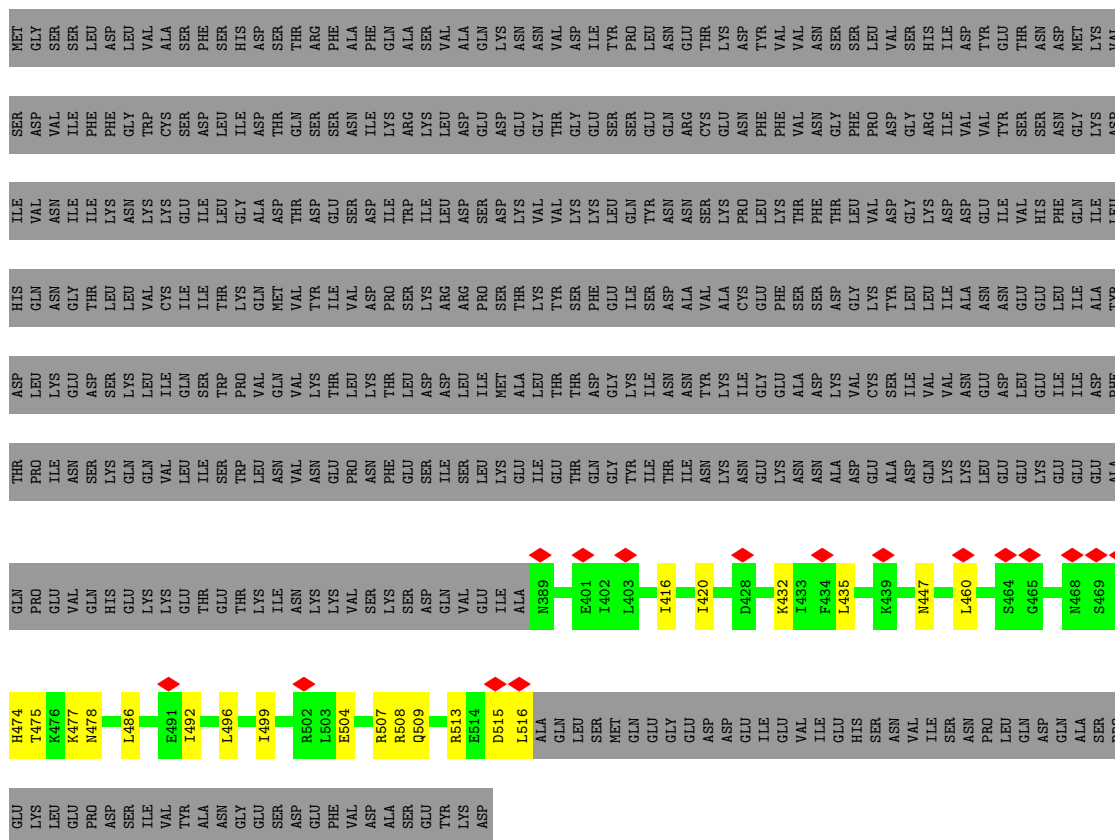


• Molecule 15: Nucleolar protein 58





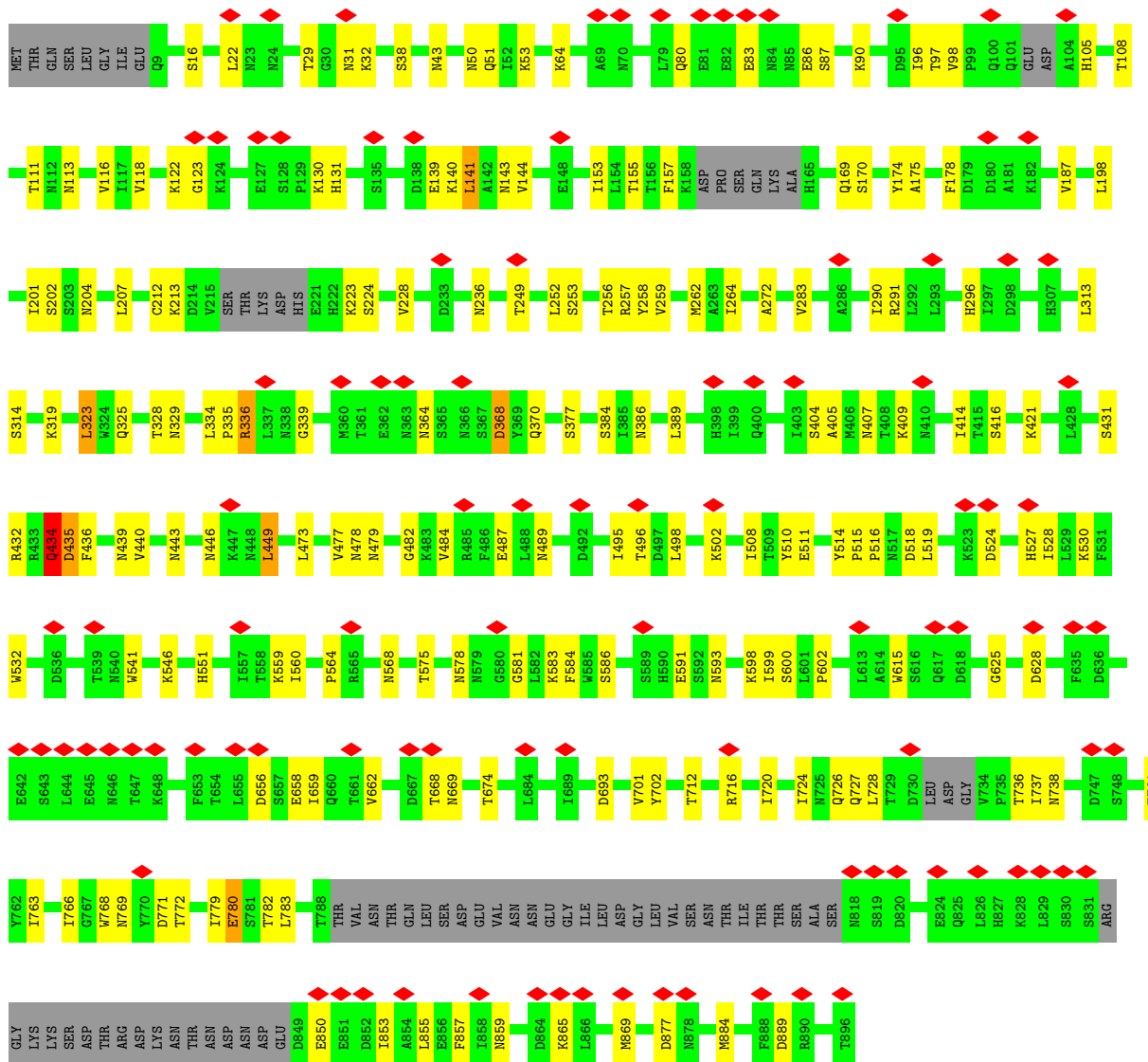
• Molecule 21: U3 small nucleolar RNA-associated protein 9



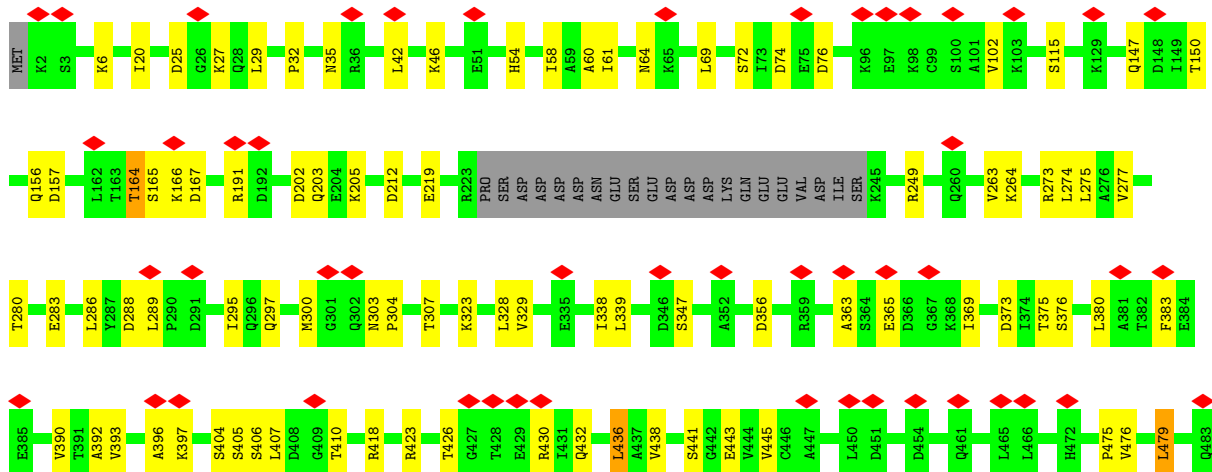
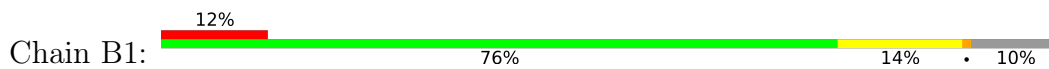
• Molecule 22: U3 small nucleolar RNA-associated protein 10

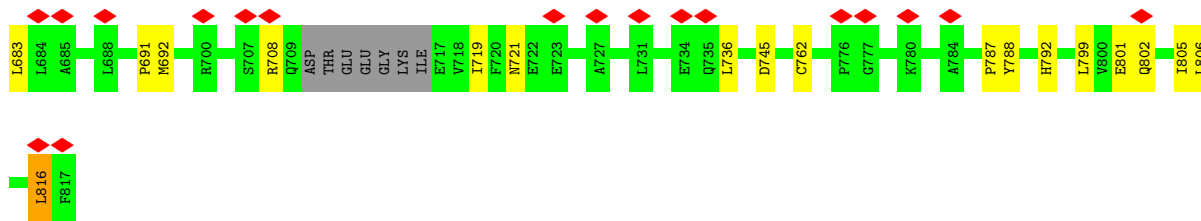


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ASN	GLY	GLU	GLY	VAL	LEU	ARG	LEU	GLU	P643	K583	I523	A463	I393	A785	L141	S2
PHE	GLU	GLU	GLY	VAL	LEU	ARG	ASN	LYS	K644	K584	T524	S464	L394	N285	M141	L8
GLU	GLU	GLU	GLY	VAL	LEU	ARG	ALA	CYS	R645	I585	F525	F465	E395	D287	A9	Q10
GLU	GLU	GLU	GLY	VAL	LEU	ARG	GLN	ILE	R646	I586	L526	Q466	D396	A288	V11	A12
VAL	LEU	LEU	GLY	VAL	LEU	SER	LYS	ALA	E647	S587	L527	F467	K397	I150	S13	M14
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	K648	I588	RE28	F468	S398	R150	S13	M14
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	V649	I589	V529	L469	Q399	L152	A12	A12
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	PHE	F650	A590	T530	D470	L400	S153	M14	M14
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	HIS	L651	K591	T531	K471	E402	I154	K23	K23
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	PHE	R652	R592	S532	H472	L403	G310	R24	R24
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	PHE	F653	P593	P633	S473	F404	R169	R25	R25
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ARG	K654	S594	A534	E474	E405	S170	Q26	Q26
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ARG	A655	T595	A535	L475	Y406	E171	K27	K27
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	R656	K596	P636	L476	F407	E171	S32	S32
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	VAL	Q657	H597	T537	H477	I408	D187	L33	L33
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	L659	F599	A538	T478	N411	D187	I34	I34
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	VAL	R660	F599	L539	T479	N411	L196	Y35	Y35
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	L661	F600	K540	H480	N414	T205	A40	A40
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THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ALA	N673	P612	N552	K492	SER	Q233	I91	I91
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	L674	N613	S553	K493	LEU	L238	L94	L94
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	N675	L614	I554	V494	PHE	L238	L94	L94
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASP	R676	N615	E555	L495	THR	I241	D95	D95
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THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ALA	ALA	I621	I560	E500	ASP	I255	W109	W109
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THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ARG	SER	L623	L563	G503	THR	L261	L111	L111
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ARG	SER	S624	V564	K504	VAL	L261	L111	L111
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ILE	SER	G625	P665	G505	VAL	L261	L111	L111
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ILE	SER	P626	P665	G505	VAL	L261	L111	L111
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	PHE	L627	C566	Y506	SER	F264	T114	T114
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ILE	GLU	L627	C566	Y506	SER	F264	T114	T114
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	PHE	GLU	L627	L567	K507	VAL	A267	H115	H115
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	PHE	PHE	N628	I568	A508	VAL	A267	H115	H115
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ALA	ILE	E629	C569	S509	THR	K271	R123	R123
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ILE	ILE	N630	C569	S509	THR	K271	R123	R123
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	HIS	HIS	V631	A570	S510	THR	K272	M131	M131
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	TYR	TYR	T632	L571	F511	THR	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	GLU	GLU	E633	R572	L512	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ASN	ASN	N634	A574	S514	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	ARG	ARG	V635	S575	F515	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	D636	I576	F516	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	I637	I576	F516	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	S638	K577	T517	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	R639	V578	T518	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	I640	R579	L519	LYS	T273	L132	L132
THR	LEU	LEU	GLY	VAL	LEU	THR	LEU	SER	SER	L641	T580	E520	LYS	T273	L132	L132
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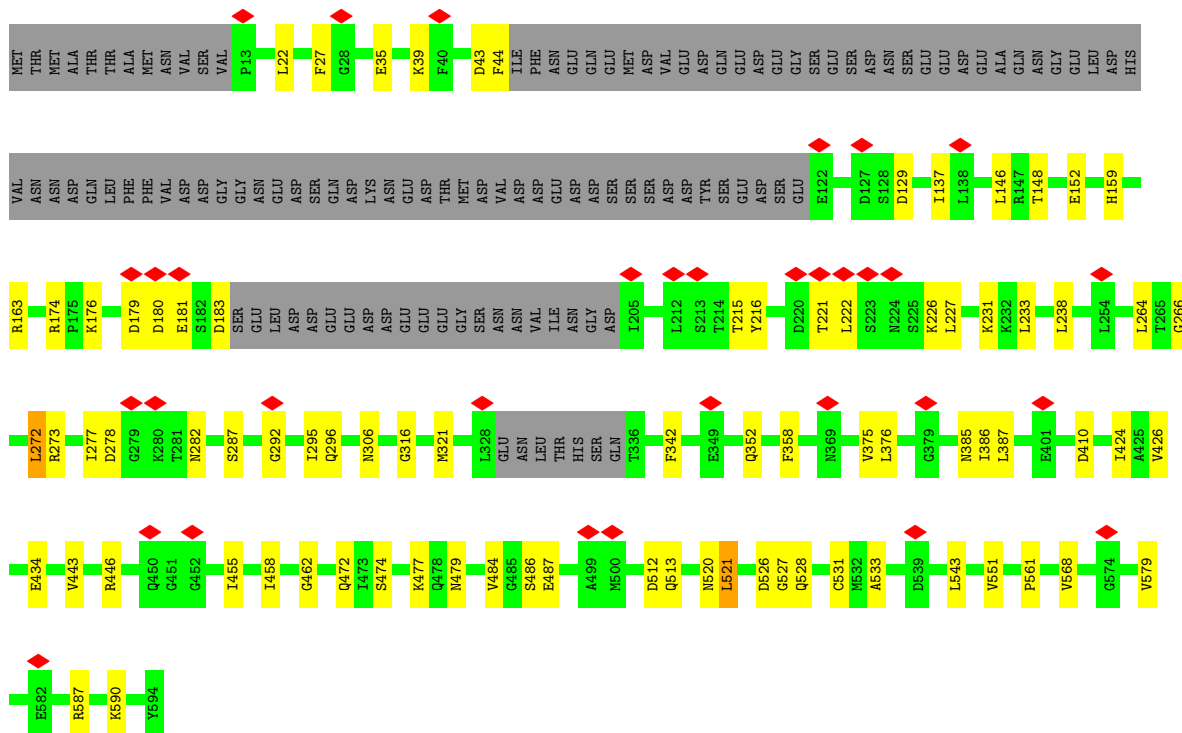


• Molecule 25: Periodic tryptophan protein 2

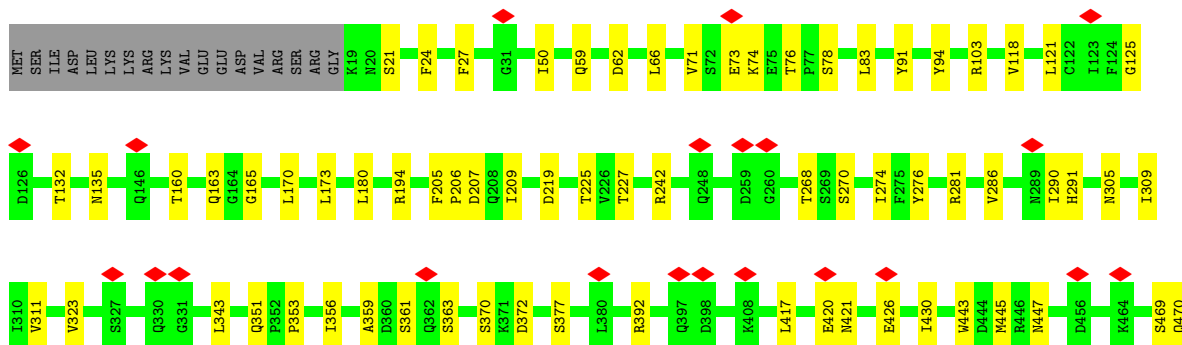
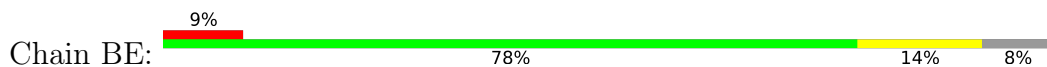


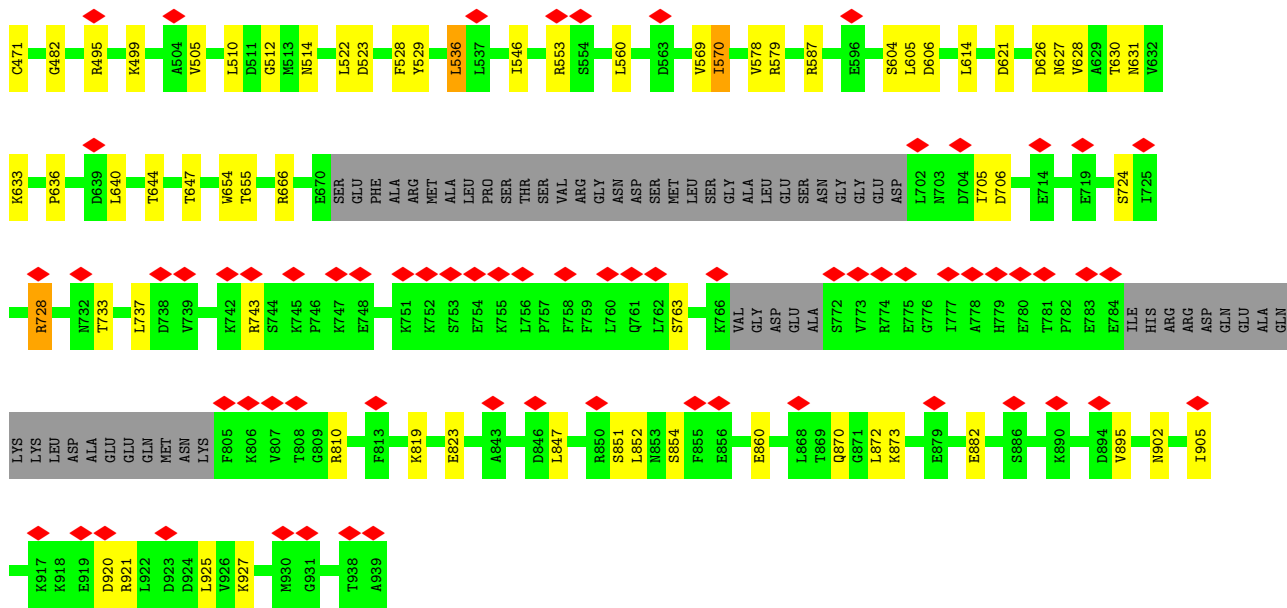


• Molecule 28: U3 small nucleolar RNA-associated protein 18

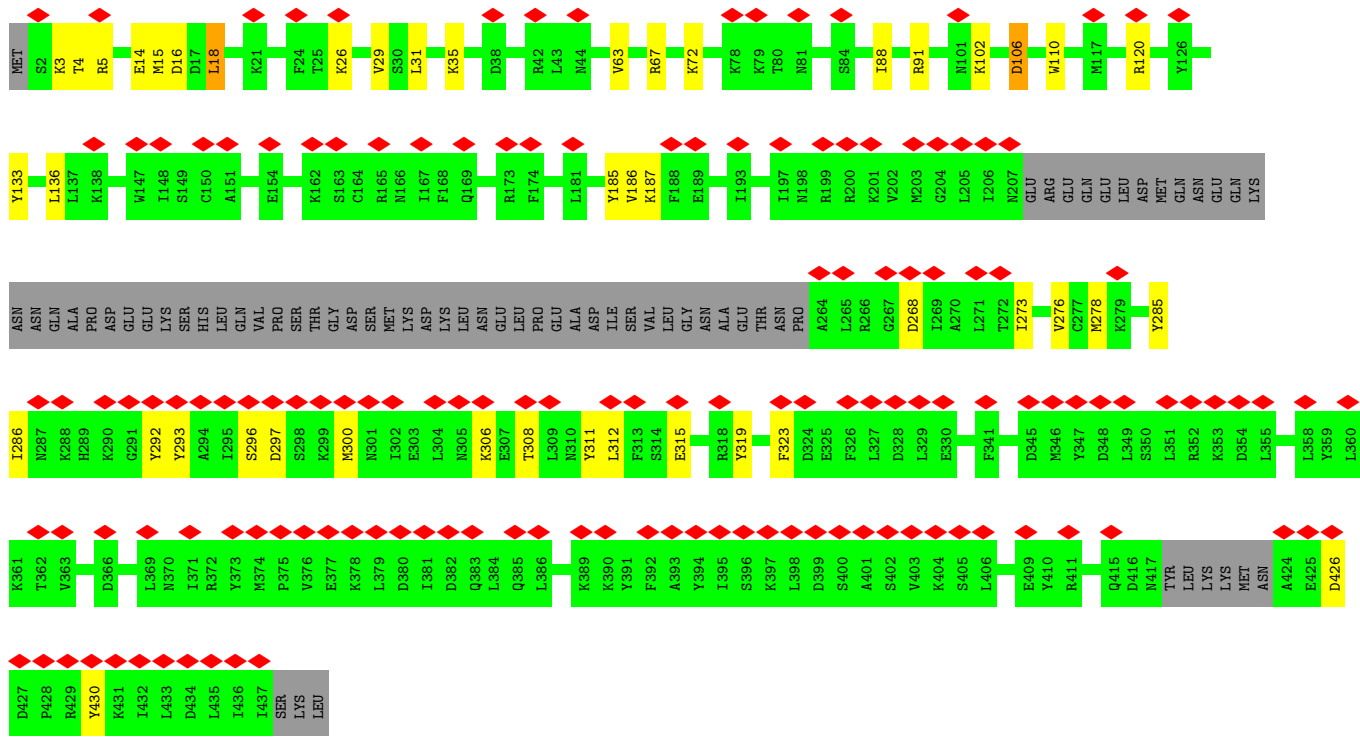
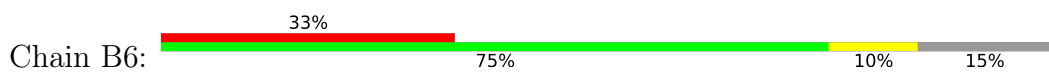


• Molecule 29: U3 small nucleolar RNA-associated protein 21

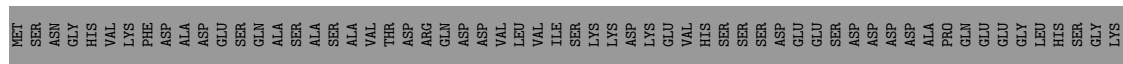


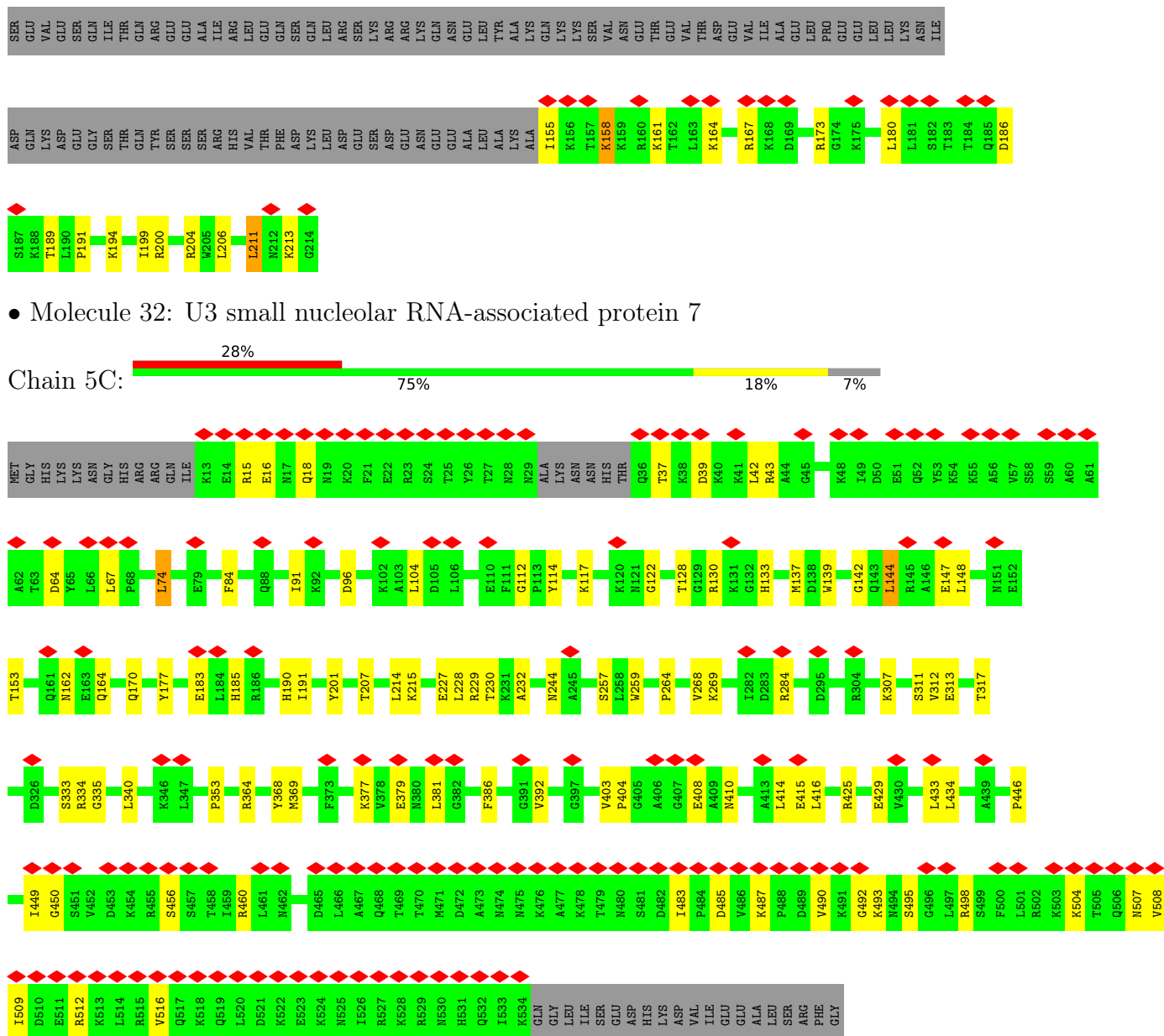


• Molecule 30: U3 small nucleolar RNA-associated protein 6



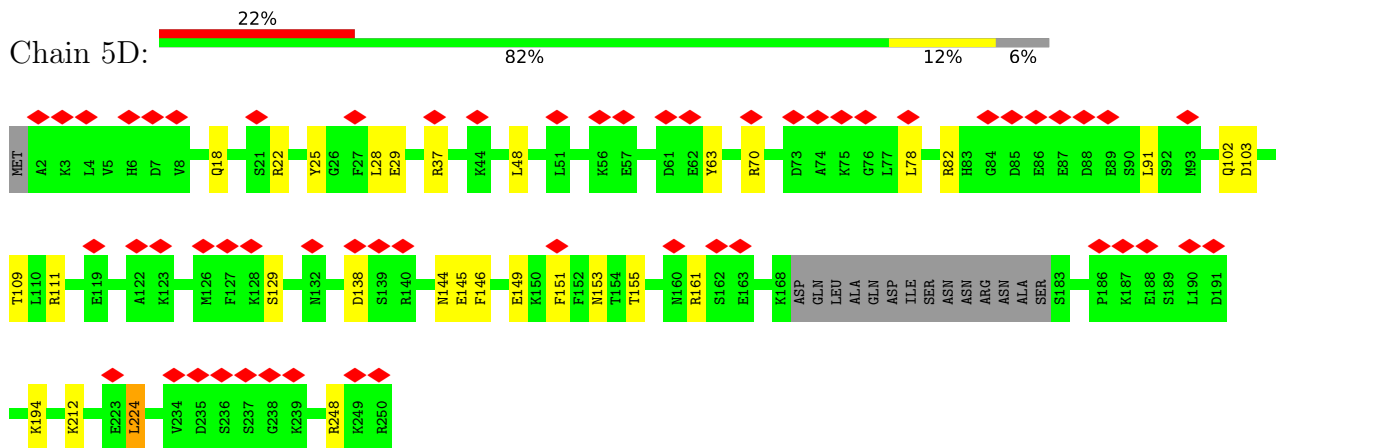
• Molecule 31: Bud site selection protein 21



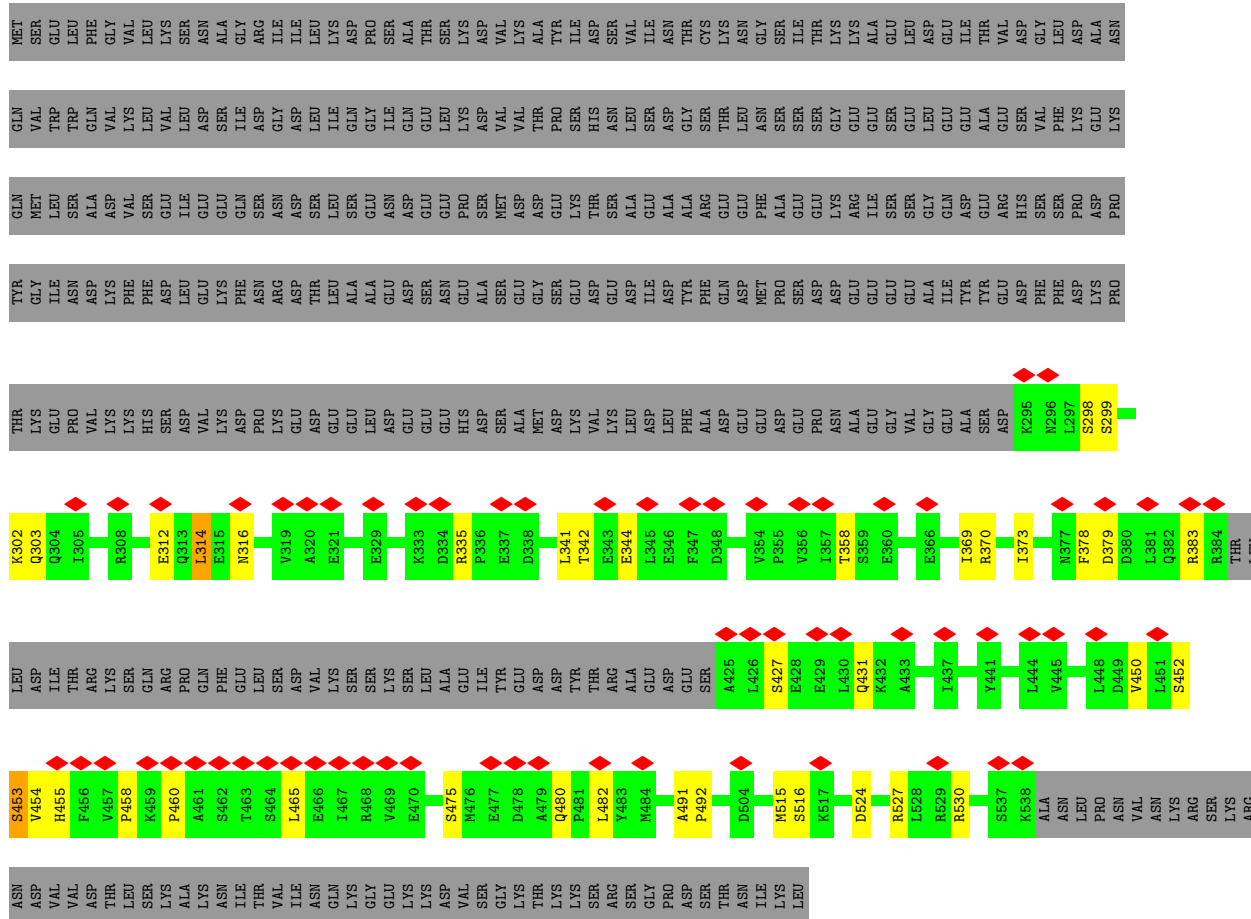


- Molecule 32: U3 small nucleolar RNA-associated protein 7

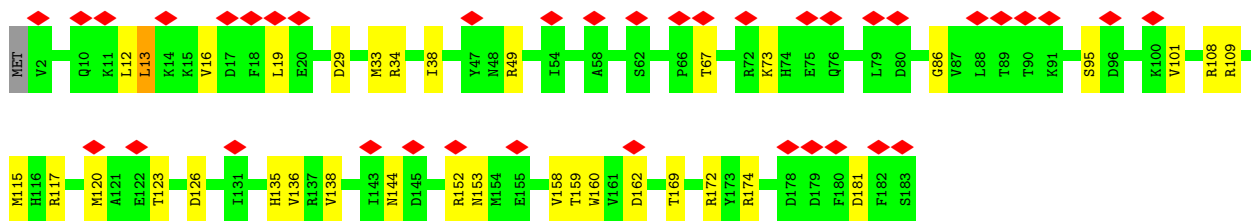
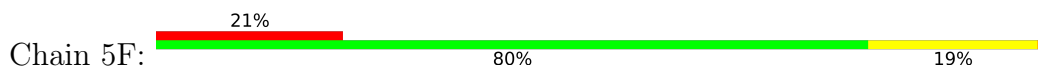
- Molecule 33: U3 small nucleolar RNA-associated protein 11



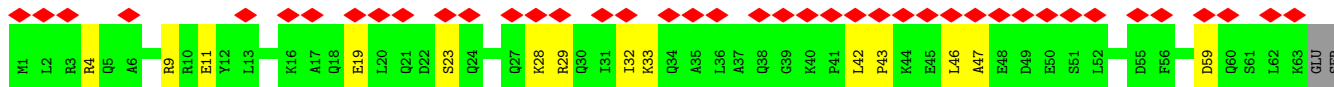
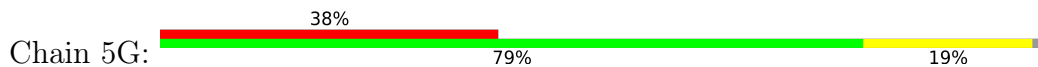
• Molecule 34: U3 small nucleolar RNA-associated protein MPP10

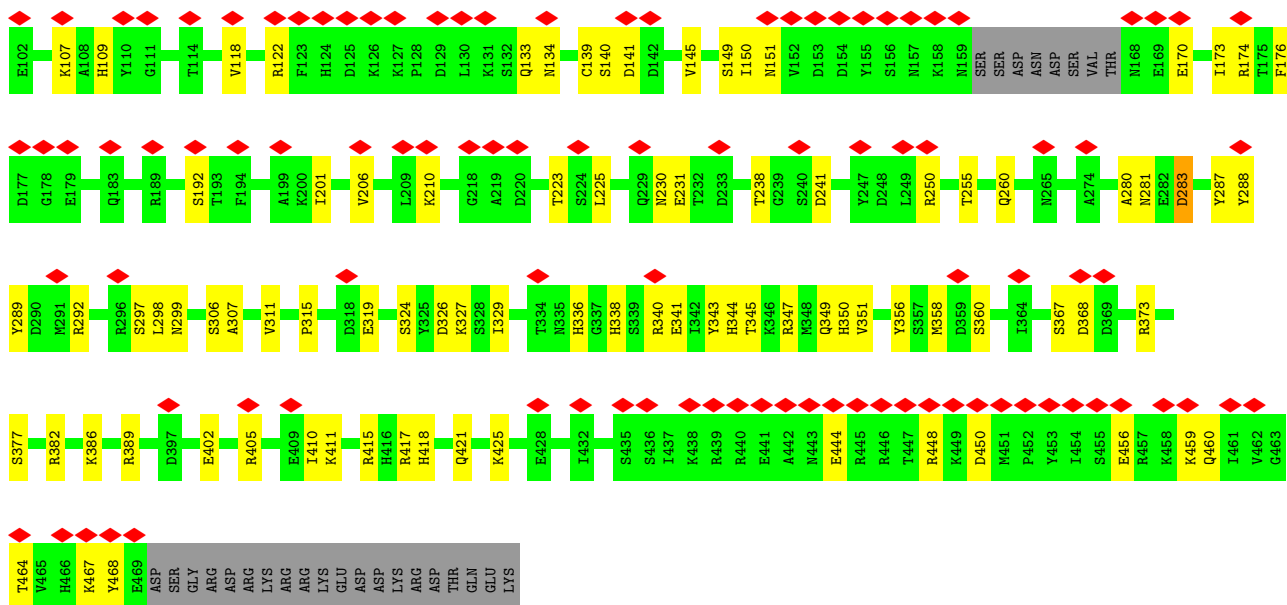


• Molecule 35: U3 small nucleolar ribonucleoprotein protein IMP3

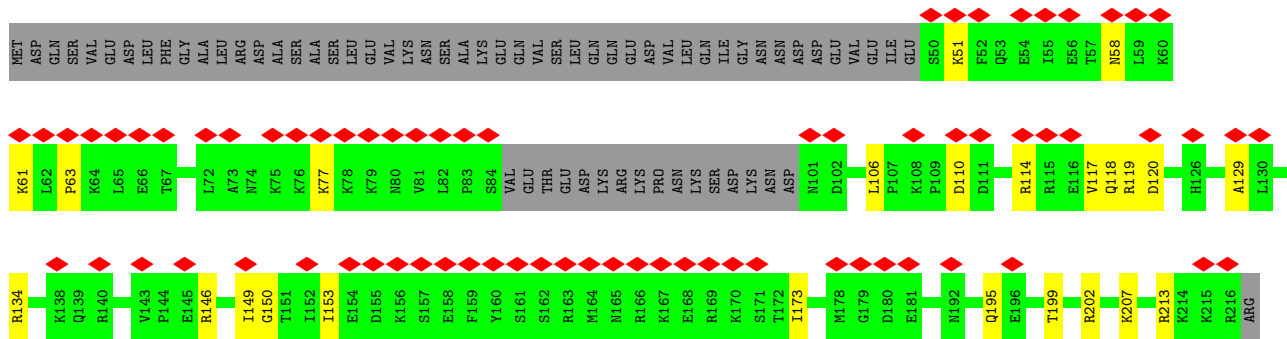


• Molecule 36: U3 small nucleolar ribonucleoprotein protein IMP4

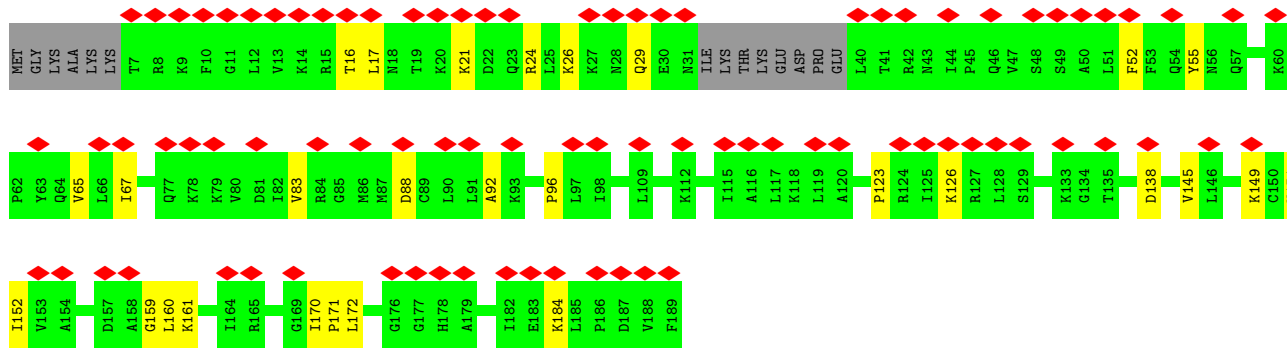
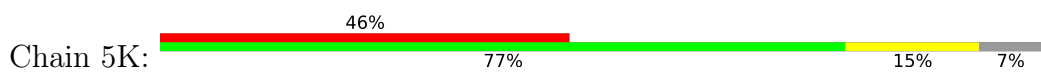




• Molecule 39: rRNA-processing protein FCF2



• Molecule 40: rRNA-processing protein FCF1



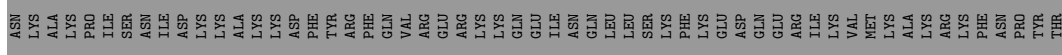
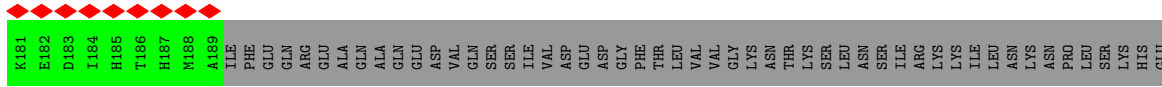
• Molecule 41: KRR1 small subunit processome component

V721	V722	N723	L724	S725	S726	F727	F728	N729	L730	K731	K732	S733	F734	D735	D736	L737	Y738	K739	I740	I741	F742	Q743	M744	K745	L746	P747	L748	S749	V750	K751	S752	I753	L754	P755	V756	G757	S758	A759	F760	R761	Y762	T763	S764	L765	C766	Q767	P768	V769	P770	F771	A772	Y773	S774	D775	P776	I777	F778	F779	Q780	
D781	V782	I783	L784	E785	F786	E787	T788	S789	P790	K791	V792	D793	D794	E795	I796	T797	S798	L799	E800	K801	A802	K803	T804	A805	F806	L807	L808	K809	I810	Q811	E812	E813	E814	S815	A816	N817	S818	S819	T820	R821	R822	S823	F824	F825	C826	R827	D828	E829	S830	I831	P832	Y833	N834	L835	E836	I837	F838	T839	L840	
N841	I842	L843	T844	P845	E846	G847	Y848	G849	F850	K851	F852	R853	V854	L855	T856	E857	R858	D859	E860	I861	L862	Y863	L864	R865	A866	I867	A868	N869	A870	R871	N872	E873	L874	S875	S876	E877	L878	E879	A880	T881	R882	F883	L884	F885	F886	A887	K888	Y889	S890	I891	S892	F893	R894	H895	T896	R897	F898	L899	E900	
N901	I902	S903	H904	S905	Y906	Q907	F908	Y909	S910	P911	V912	R913	R914	L915	F916	K917	R918	W919	L920	D921	S922	H923	L924	L925	L926	G927	H928	I929	T930	D931	E932	L933	A934	S935	K936	I937	A938	I939	K940	P941	F942	V943	D944	P945	A946	P947	Y948	F949	I950	S951	G952	S953	L954	E955	N956	G957	L959	K960		
V961	L962	K963	F964	I965	S966	Q967	W968	W969	W970	K971	D972	D973	P974	L975	I976	L977	D978	L979	V980	K981	P982	E983	ASP	ASP	I985	ARG	ASP	THR	PHE	GLU	THR	THR	SER	ILE	GLY	ALA	GLY	SER	GLU	LEU	ASP	SER	THR	THR	LYS	LYS	LEU	SER	LEU	E1010	R1011	L1012	T1013	L1014	A1015	Q1016	P1017	K1018	G1019	L1020
Q1021	M1022	M1023	F1024	T1025	M1026	L1027	R1028	M1029	S1030	D1031	P1032	M1033	G1034	T1035	H1036	L1037	Q1038	F1039	F1040	V1041	A1042	S1043	K1044	M1045	D1046	P1047	S1048	G1049	L1050	L1051	Y1052	S1053	S1054	G1055	I1056	P1057	L1058	P1059	I1060	A1061	T1062	R1063	L1064	T1065	A1066	L1067	A1068	M1069	V1070	A1071	V1072	M1073	L1074	L1075	Q1076	T1077	H1078	G1079	L1080	
M1081	Q1082	Q1083	T1084	I1085	M1086	L1087	L1088	F1089	T1090	P1091	G1092	K1094	D1095	Y1096	D1097	F1098	V1099	V1100	D1101	L1102	R1103	T1104	I1105	I1106	G1107	K1108	L1109	S1110	S1111	C1112	G1113	L1114	L1115	S1116	ALA	THR	GLU	PHE	LYS	ASN	ILE	THR	ASN	ASP	GLN	A1128	P1129	S1130	F1132	P1133	E1134	N1135	L1136	N1137	D1138	L1139	S1140			
E1141	K1142	M1143	D1144	P1145	T1146	Y1147	Q1148	L1149	V1150	K1151	Y1152	L1153	M1154	L1155	K1156	Y1157	K1158	M1159	S1160	L1161	L1162	L1163	S1164	S1165	L1166	K1167	Y1168	I1169	G1170	V1171	M1172	G1173	G1174	E1175	K1176	G1177	D1178	K1179	M1180	V1181	I1182	T1183	G1184	L1185	I1186	K1187	P1188	L1189	F1190	K1191	G1192	A1193	H1194	K1195	F1196	R1197	V1198	M1199	L1200	
D1201	C1202	M1203	V1204	K1205	P1206	V1207	D1208	D1209	E1210	M1211	V1212	L1213	L1214	M1215	K1216	E1217	A1218	I1219	F1220	H1221	E1222	I1223	A1224	A1225	F1226	G1227	M1228	D1229	M1230	V1231	I1232	N1233	F1234	E1235	T1236	D1237																								

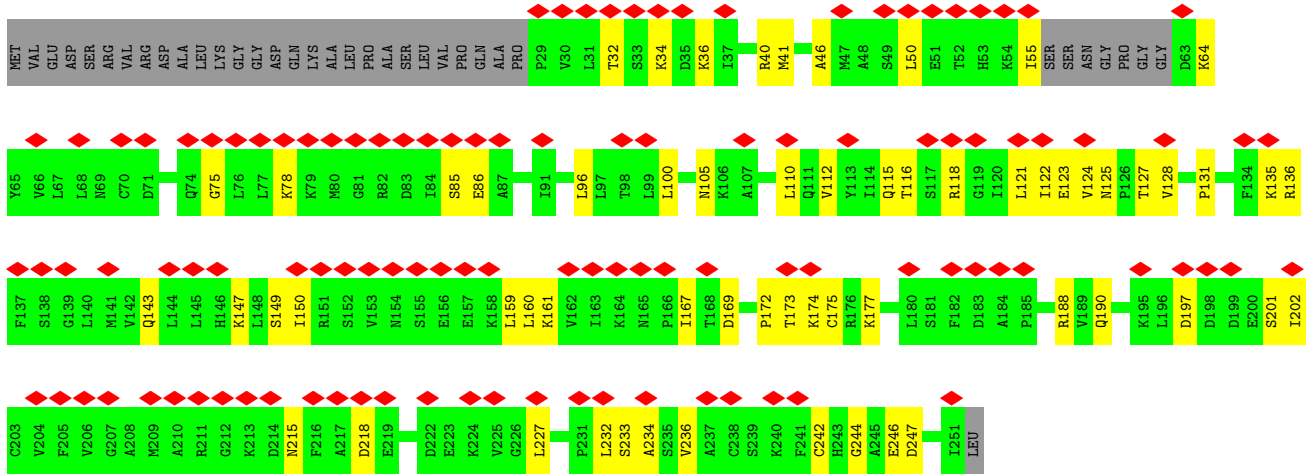
• Molecule 44: Ribosomal RNA-processing protein 7



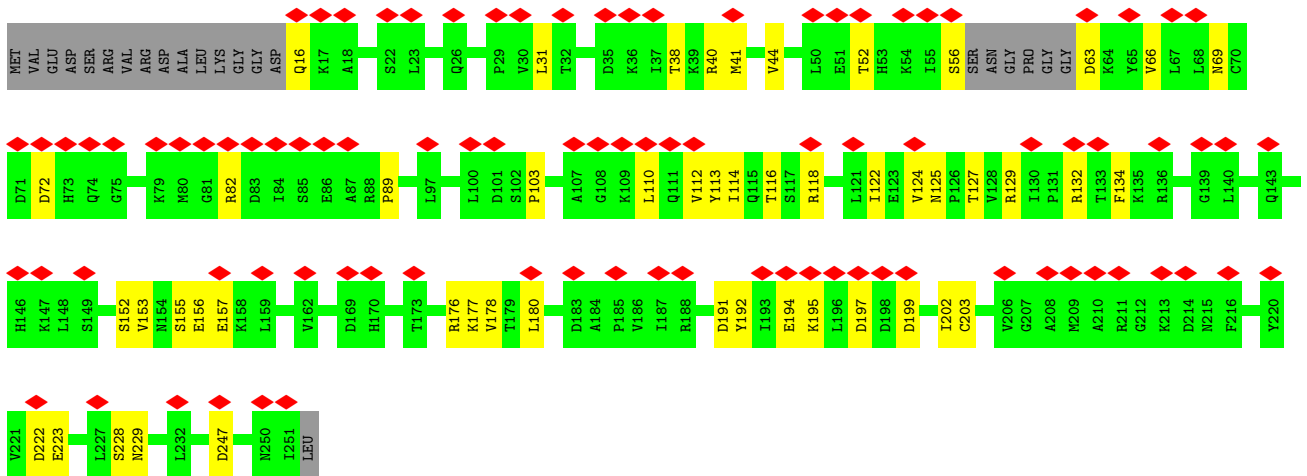
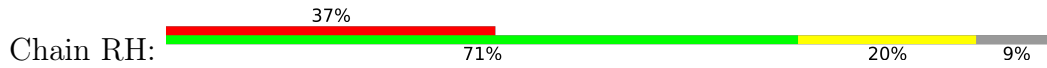
MET	GLY	I3	E4	D5	I6	S7	A8	M9	K10	M11	G12	F13	I14	V15	V16	P17	F18	K19	L20	P21	D22	H23	K24	A25	L26	P27	LYS	SER	SER	GLN	GLU	A32	S33	L34	H35	F36	M37	F38	A39	K40	R41	H42	Q43	S44	S45	N46	S47	N48	E49	S50	D51	C52	L53	F54	GLU	LYS	ARG	N57	L58	P59	L60
L61	S62	N63	T64	E65	H66	M67	K68	D69	F70	M71	G72	Q73	L74	C75	G76	K77	Y78	D79	T80	V81	S82	H83	V84	E85	L86	E86	L87	L88	Y89	N90	D91	E92	F93	G94	L95	H96	E97	V98	D99	L100	S101	A102	L103	T104	S105	D106	L107	M108	S109	S110	THR	ASP	VAL	ASN	GLU	LYS	ARG	TYR	THR	P120	
R121	N122	T123	A124	L125	L126	K127	F128	V129	D130	A131	A132	S133	L134	M135	N136	C137	W138	M139	A140	L141	K142	K143	Y144	S145	N146	L147	H148	A149	K150	H151	P152	M153	E154	L155	F156	E157	L158	T159	V160	T161	T162	P163	S164	F165	L166	T167	F168	V169	N170	F171	Y172	K173	P174	L175	D176	I177	D178	Y179	L180		



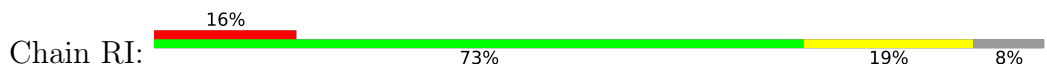
- Molecule 45: Ribosomal RNA small subunit methyltransferase NEP1

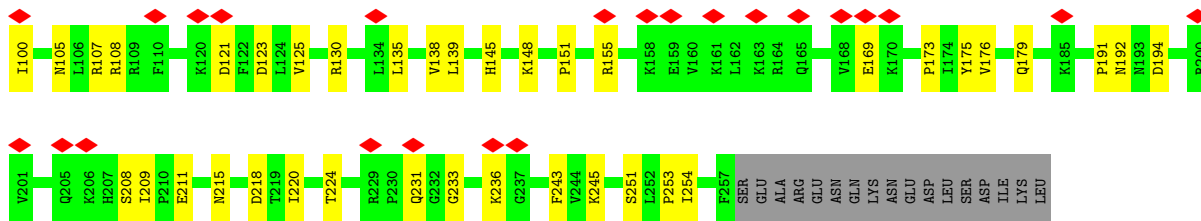


- Molecule 45: Ribosomal RNA small subunit methyltransferase NEP1

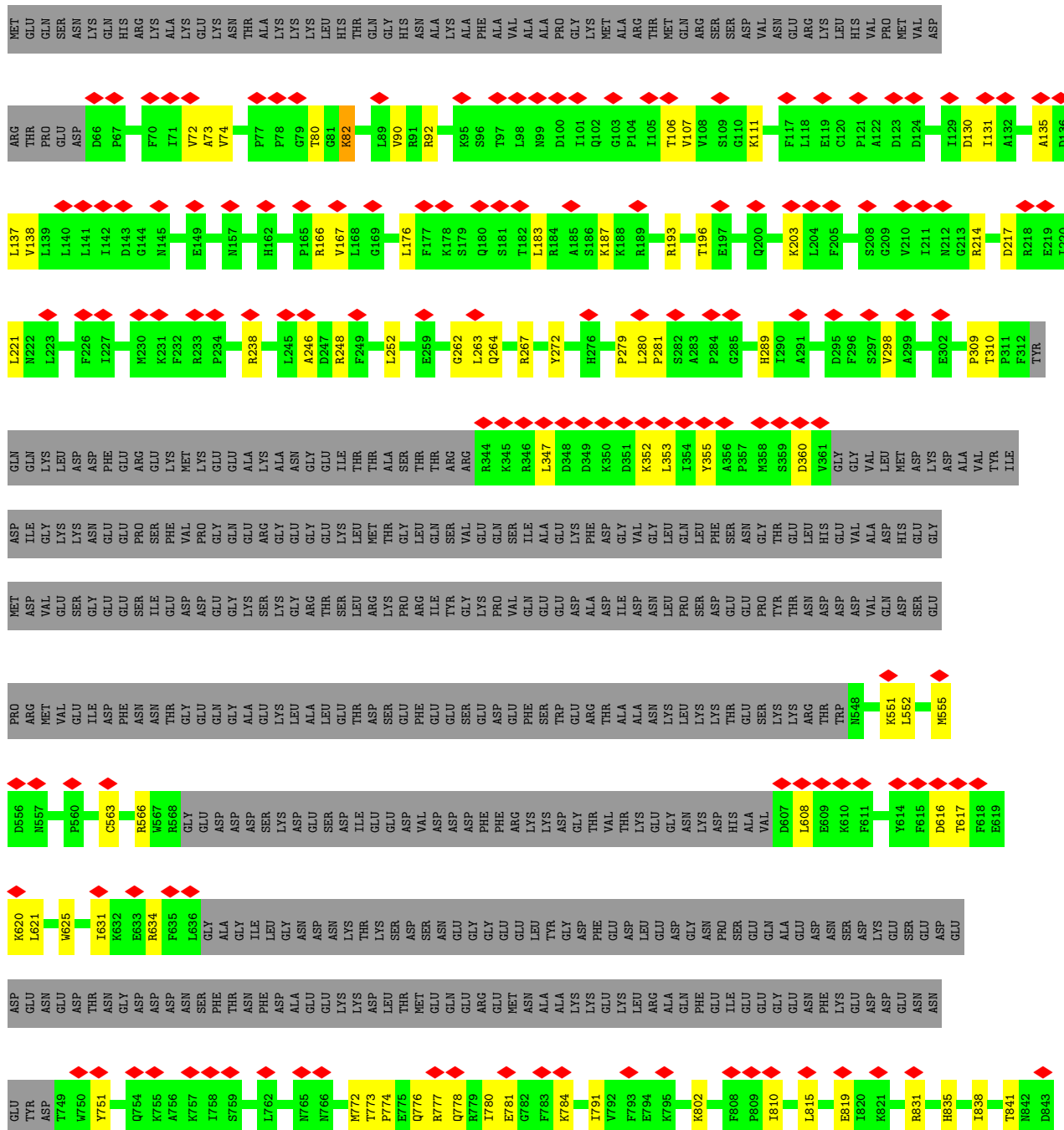


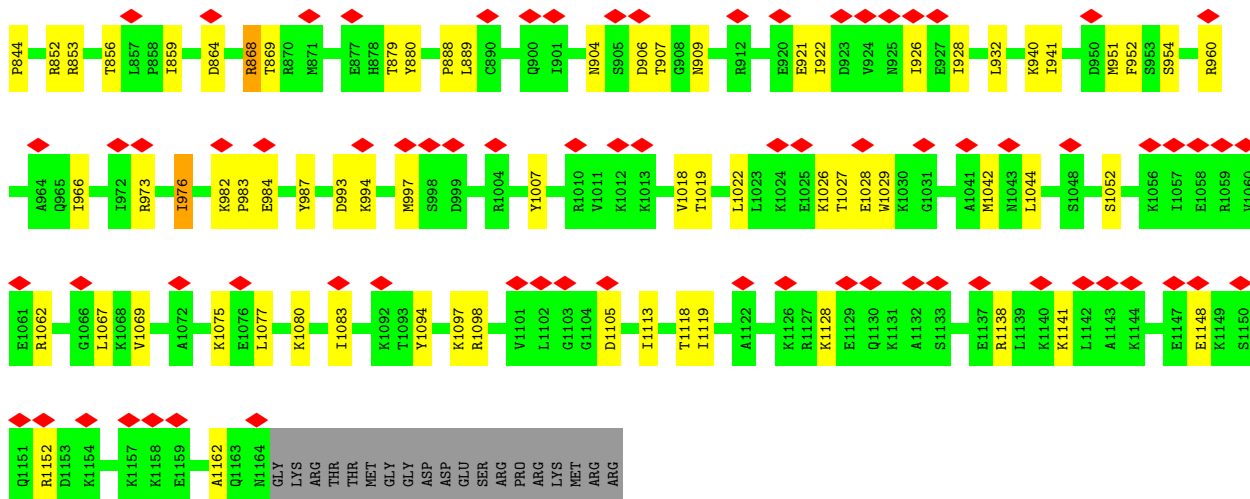
- Molecule 46: Ribosome biogenesis protein UTP30



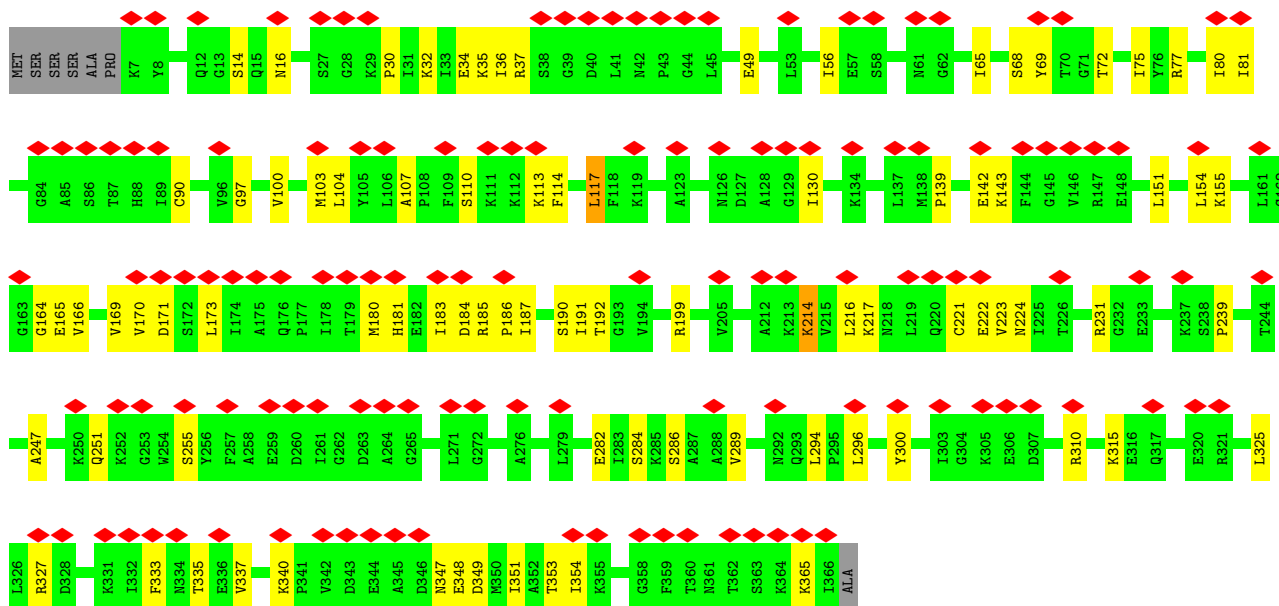
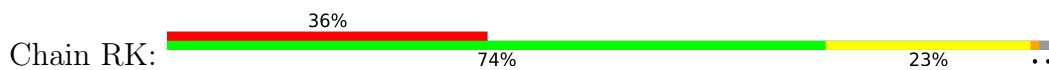


• Molecule 47: Ribosome biogenesis protein BMS1

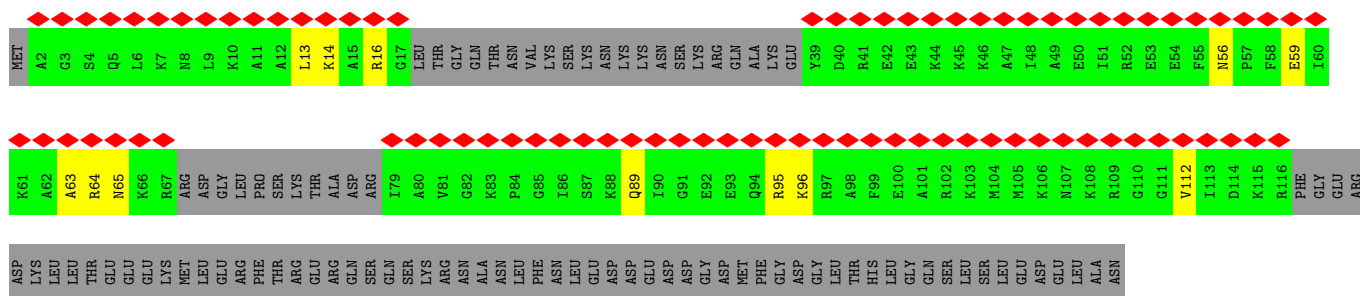
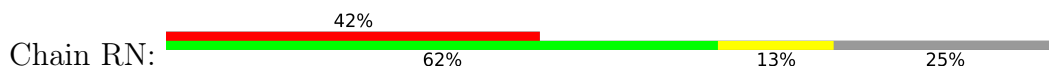


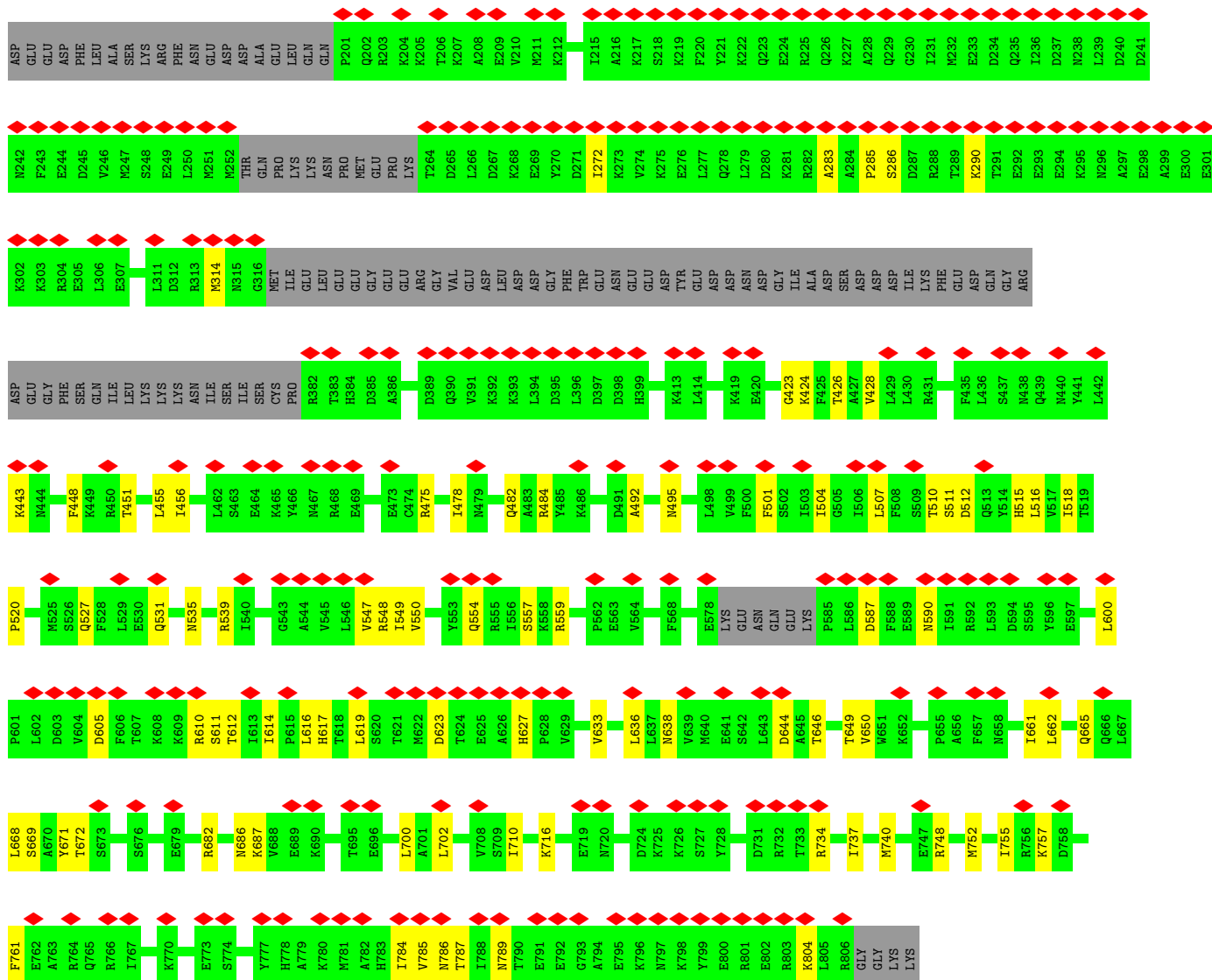


• Molecule 48: RNA 3'-terminal phosphate cyclase-like protein

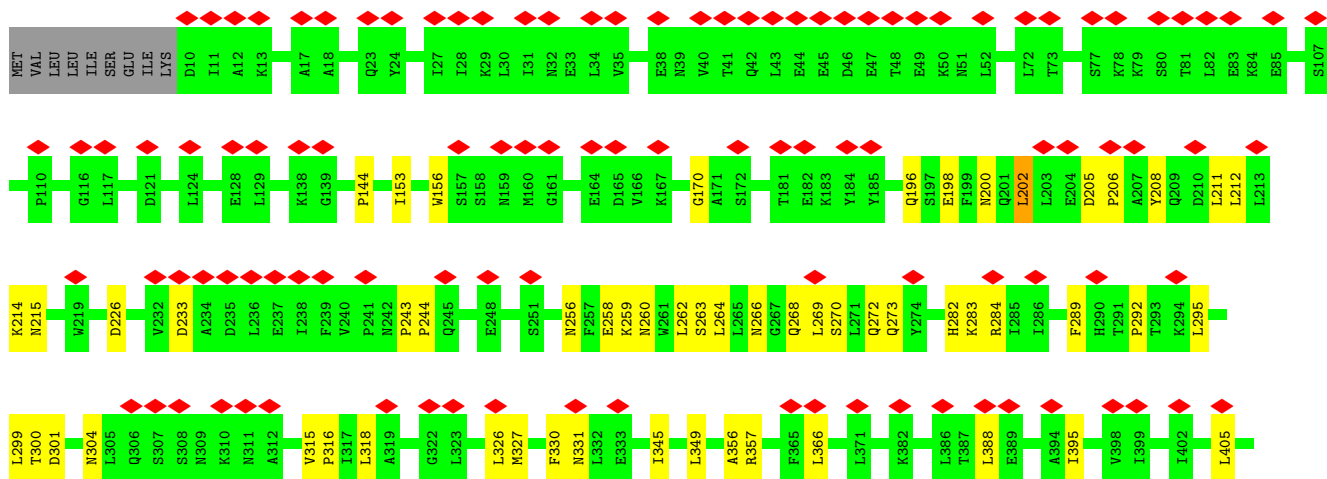
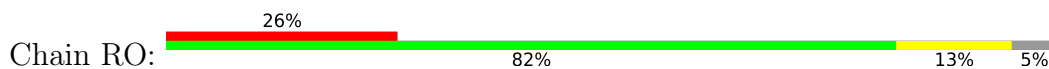


• Molecule 49: Nucleolar complex protein 14





● Molecule 50: Nucleolar complex protein 4



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	40111	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.055	Depositor
Minimum map value	-0.026	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.016	Depositor
Map size (Å)	531.19995, 531.19995, 531.19995	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.3279998, 1.3279998, 1.3279998	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: 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	3A	0.92	0/4141	1.17	24/6433 (0.4%)
2	5A	0.84	0/12485	1.11	50/19449 (0.3%)
3	SA	0.71	0/20532	1.15	138/31980 (0.4%)
4	SG	0.53	0/1690	0.64	0/2285
5	SK	0.47	0/1410	0.60	0/1888
6	SN	0.32	0/873	0.73	1/1185 (0.1%)
7	SO	0.35	0/1109	0.66	1/1495 (0.1%)
8	SP	0.36	0/879	0.75	1/1186 (0.1%)
9	SR	0.58	0/990	0.73	1/1335 (0.1%)
10	ST	0.38	0/980	0.63	0/1319
11	SY	0.54	0/798	0.67	1/1065 (0.1%)
12	Sd	0.54	0/499	0.66	0/670
13	3B	0.59	0/1901	0.66	1/2567 (0.0%)
13	3C	0.44	0/1796	0.62	1/2424 (0.0%)
14	3D	0.44	0/2891	0.63	3/3895 (0.1%)
15	3E	0.41	0/3059	0.62	3/4153 (0.1%)
16	3F	0.43	0/3317	0.64	2/4469 (0.0%)
17	3G	0.52	0/928	0.76	1/1262 (0.1%)
17	3H	0.47	0/928	0.69	2/1262 (0.2%)
18	A4	0.47	0/5321	0.66	5/7207 (0.1%)
19	A5	0.48	0/4044	0.68	5/5493 (0.1%)
20	A8	0.30	0/3328	0.61	0/4565
21	A9	0.31	0/951	0.58	1/1287 (0.1%)
22	AE	0.45	0/5274	0.64	6/7142 (0.1%)
23	AF	0.53	0/3993	0.67	4/5413 (0.1%)
24	AG	0.47	0/6699	0.65	3/9077 (0.0%)
25	B1	0.64	0/6780	0.68	7/9175 (0.1%)
26	B2	0.43	0/6853	0.67	3/9256 (0.0%)
27	B3	0.34	0/5977	0.73	7/8087 (0.1%)
28	B8	0.58	0/3848	0.66	4/5218 (0.1%)
29	BE	0.57	0/6948	0.66	7/9391 (0.1%)
30	B6	0.45	0/2849	0.58	1/3853 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	5B	0.34	0/499	0.62	0/659
32	5C	0.59	0/4166	0.68	5/5624 (0.1%)
33	5D	0.50	0/1998	0.66	3/2644 (0.1%)
34	5E	0.48	0/1665	0.64	1/2233 (0.0%)
35	5F	0.67	0/1559	0.73	2/2097 (0.1%)
36	5G	0.57	0/2337	0.66	1/3148 (0.0%)
37	5H	0.45	0/1074	0.56	0/1422
38	5I	0.61	0/3844	0.67	2/5174 (0.0%)
39	5J	0.42	0/1302	0.54	0/1728
40	5K	0.56	0/1426	0.67	1/1917 (0.1%)
41	RC	0.36	0/1432	0.64	0/1926
42	RD	0.27	0/1313	0.41	0/1830
43	RE	0.32	0/8924	0.67	9/12070 (0.1%)
44	RF	0.32	0/1441	0.69	2/1951 (0.1%)
45	RG	0.39	0/1727	0.68	2/2329 (0.1%)
45	RH	0.42	0/1828	0.61	0/2470
46	RI	0.46	0/2080	0.65	0/2797
47	RJ	0.51	0/6085	0.61	1/8186 (0.0%)
48	RK	0.44	0/2832	0.65	3/3825 (0.1%)
49	RN	0.36	0/4591	0.58	1/6187 (0.0%)
50	RO	0.38	0/3849	0.62	5/5261 (0.1%)
51	RQ	0.48	0/1459	0.58	0/1981
52	RS	0.33	0/2104	0.67	1/2854 (0.0%)
53	RT	0.42	0/1379	0.63	1/1853 (0.1%)
54	RW	0.34	0/385	0.50	0/529
All	All	0.55	0/185370	0.79	323/258181 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
7	SO	0	1
10	ST	0	1
14	3D	0	3
15	3E	0	1
16	3F	0	1
17	3G	0	2
17	3H	0	1
18	A4	0	2
19	A5	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
20	A8	0	4
24	AG	0	2
25	B1	0	3
26	B2	0	9
27	B3	0	7
29	BE	0	1
33	5D	0	1
34	5E	0	1
35	5F	0	1
36	5G	0	1
38	5I	0	2
43	RE	0	2
47	RJ	0	2
48	RK	0	1
49	RN	0	1
50	RO	0	1
51	RQ	0	1
All	All	0	53

There are no bond length outliers.

The worst 5 of 323 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
3	SA	1174	C	N1-C2-O2	10.37	125.12	118.90
35	5F	13	LEU	CA-CB-CG	10.29	138.97	115.30
19	A5	25	ASP	CB-CG-OD1	9.52	126.86	118.30
17	3G	67	LEU	CA-CB-CG	9.35	136.81	115.30
3	SA	1000	C	N1-C2-O2	9.32	124.49	118.90

There are no chirality outliers.

5 of 53 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
14	3D	142	LEU	Peptide
14	3D	202	HIS	Peptide
14	3D	286	ARG	Peptide
7	SO	58	HIS	Peptide
10	ST	13	HIS	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	3A	3711	0	1882	19	0
2	5A	11163	0	5611	80	0
3	SA	18356	0	9246	200	0
4	SG	1669	0	1724	18	0
5	SK	1388	0	1467	12	0
6	SN	865	0	874	15	0
7	SO	1087	0	1152	23	0
8	SP	868	0	894	26	0
9	SR	973	0	1029	13	0
10	ST	964	0	991	17	0
11	SY	786	0	843	7	0
12	Sd	497	0	535	0	0
13	3B	1865	0	1910	29	0
13	3C	1763	0	1805	35	0
14	3D	2848	0	2815	42	0
15	3E	3028	0	2813	60	0
16	3F	3248	0	3274	56	0
17	3G	916	0	964	11	0
17	3H	916	0	964	23	0
18	A4	5226	0	5199	94	0
19	A5	3976	0	3919	57	0
20	A8	3307	0	2316	40	0
21	A9	939	0	898	17	0
22	AE	5181	0	5373	84	0
23	AF	3911	0	3906	71	0
24	AG	6570	0	6473	125	0
25	B1	6635	0	6525	93	0
26	B2	6723	0	6698	131	0
27	B3	5882	0	5964	143	0
28	B8	3764	0	3757	58	0
29	BE	6810	0	6787	89	0
30	B6	2800	0	2517	30	0
31	5B	495	0	561	14	0
32	5C	4084	0	4092	73	0
33	5D	1972	0	2054	25	0
34	5E	1647	0	1678	31	0
35	5F	1530	0	1572	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
36	5G	2296	0	2325	38	0
37	5H	1065	0	1097	16	0
38	5I	3765	0	3714	71	0
39	5J	1280	0	1331	20	0
40	5K	1403	0	1484	19	0
41	RC	1410	0	1503	40	0
42	RD	1314	0	610	21	0
43	RE	8716	0	8828	159	0
44	RF	1404	0	1364	25	0
45	RG	1701	0	1767	39	0
45	RH	1799	0	1872	33	0
46	RI	2045	0	2162	36	0
47	RJ	5953	0	6152	95	0
48	RK	2781	0	2878	52	0
49	RN	4529	0	4262	65	0
50	RO	3766	0	3269	48	0
51	RQ	1436	0	1280	28	0
52	RS	2051	0	2096	54	0
53	RT	1357	0	1426	17	0
54	RW	381	0	255	4	0
55	X1	305	0	73	0	0
56	5K	1	0	0	0	0
57	RJ	32	0	12	1	0
58	RJ	1	0	0	0	0
All	All	179154	0	160842	2432	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 7.

The worst 5 of 2432 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)
42:RD:1487:GLN:O	43:RE:411:ILE:HG23	1.40	1.18
27:B3:12:LEU:HD23	27:B3:377:LEU:HB2	1.23	1.17
8:SP:42:VAL:HG12	8:SP:67:VAL:HG23	1.31	1.12
8:SP:42:VAL:CG1	8:SP:67:VAL:HG23	1.82	1.09
27:B3:12:LEU:CB	27:B3:377:LEU:HD12	1.84	1.07

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	SG	211/225 (94%)	195 (92%)	16 (8%)	0	100	100
5	SK	169/197 (86%)	163 (96%)	6 (4%)	0	100	100
6	SN	117/143 (82%)	89 (76%)	28 (24%)	0	100	100
7	SO	132/151 (87%)	121 (92%)	10 (8%)	1 (1%)	19	60
8	SP	116/137 (85%)	100 (86%)	15 (13%)	1 (1%)	17	56
9	SR	123/143 (86%)	112 (91%)	11 (9%)	0	100	100
10	ST	113/146 (77%)	103 (91%)	10 (9%)	0	100	100
11	SY	101/145 (70%)	90 (89%)	11 (11%)	0	100	100
12	Sd	61/67 (91%)	57 (93%)	4 (7%)	0	100	100
13	3B	236/327 (72%)	222 (94%)	14 (6%)	0	100	100
13	3C	221/327 (68%)	207 (94%)	14 (6%)	0	100	100
14	3D	359/504 (71%)	346 (96%)	13 (4%)	0	100	100
15	3E	427/511 (84%)	387 (91%)	40 (9%)	0	100	100
16	3F	400/573 (70%)	362 (90%)	37 (9%)	1 (0%)	41	76
17	3G	119/126 (94%)	107 (90%)	11 (9%)	1 (1%)	19	60
17	3H	119/126 (94%)	111 (93%)	8 (7%)	0	100	100
18	A4	648/776 (84%)	591 (91%)	57 (9%)	0	100	100
19	A5	504/643 (78%)	465 (92%)	39 (8%)	0	100	100
20	A8	534/713 (75%)	398 (74%)	134 (25%)	2 (0%)	34	72
21	A9	126/575 (22%)	115 (91%)	11 (9%)	0	100	100
22	AE	645/1769 (36%)	595 (92%)	50 (8%)	0	100	100
23	AF	489/513 (95%)	442 (90%)	47 (10%)	0	100	100
24	AG	812/896 (91%)	732 (90%)	79 (10%)	1 (0%)	51	85
25	B1	830/923 (90%)	767 (92%)	63 (8%)	0	100	100
26	B2	839/943 (89%)	748 (89%)	89 (11%)	2 (0%)	47	81

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	B3	728/817 (89%)	595 (82%)	131 (18%)	2 (0%)	41	76
28	B8	469/594 (79%)	438 (93%)	31 (7%)	0	100	100
29	BE	857/939 (91%)	803 (94%)	54 (6%)	0	100	100
30	B6	368/440 (84%)	341 (93%)	27 (7%)	0	100	100
31	5B	58/214 (27%)	55 (95%)	3 (5%)	0	100	100
32	5C	512/554 (92%)	474 (93%)	37 (7%)	1 (0%)	47	81
33	5D	231/250 (92%)	205 (89%)	26 (11%)	0	100	100
34	5E	200/593 (34%)	183 (92%)	16 (8%)	1 (0%)	29	68
35	5F	180/183 (98%)	172 (96%)	8 (4%)	0	100	100
36	5G	278/290 (96%)	256 (92%)	22 (8%)	0	100	100
37	5H	132/610 (22%)	123 (93%)	9 (7%)	0	100	100
38	5I	457/489 (94%)	421 (92%)	36 (8%)	0	100	100
39	5J	147/217 (68%)	136 (92%)	11 (8%)	0	100	100
40	5K	171/189 (90%)	166 (97%)	5 (3%)	0	100	100
41	RC	173/316 (55%)	169 (98%)	4 (2%)	0	100	100
42	RD	263/1729 (15%)	254 (97%)	9 (3%)	0	100	100
43	RE	1067/1237 (86%)	998 (94%)	69 (6%)	0	100	100
44	RF	168/297 (57%)	145 (86%)	23 (14%)	0	100	100
45	RG	212/252 (84%)	182 (86%)	30 (14%)	0	100	100
45	RH	226/252 (90%)	219 (97%)	7 (3%)	0	100	100
46	RI	250/274 (91%)	233 (93%)	17 (7%)	0	100	100
47	RJ	722/1183 (61%)	670 (93%)	51 (7%)	1 (0%)	51	85
48	RK	358/367 (98%)	341 (95%)	17 (5%)	0	100	100
49	RN	593/810 (73%)	545 (92%)	47 (8%)	1 (0%)	47	81
50	RO	523/552 (95%)	455 (87%)	68 (13%)	0	100	100
51	RQ	188/899 (21%)	177 (94%)	11 (6%)	0	100	100
52	RS	247/483 (51%)	225 (91%)	22 (9%)	0	100	100
53	RT	165/326 (51%)	150 (91%)	15 (9%)	0	100	100
54	RW	59/206 (29%)	54 (92%)	5 (8%)	0	100	100
All	All	18453/27161 (68%)	16810 (91%)	1628 (9%)	15 (0%)	54	85

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
34	5E	454	VAL
7	SO	106	ARG
8	SP	45	GLY
47	RJ	82	LYS
20	A8	309	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	SG	180/191 (94%)	180 (100%)	0	100	100
5	SK	147/166 (89%)	146 (99%)	1 (1%)	84	90
6	SN	88/119 (74%)	86 (98%)	2 (2%)	50	70
7	SO	117/128 (91%)	114 (97%)	3 (3%)	46	67
8	SP	90/105 (86%)	89 (99%)	1 (1%)	73	85
9	SR	105/119 (88%)	105 (100%)	0	100	100
10	ST	105/129 (81%)	104 (99%)	1 (1%)	76	86
11	SY	85/120 (71%)	84 (99%)	1 (1%)	71	84
12	Sd	56/60 (93%)	56 (100%)	0	100	100
13	3B	201/240 (84%)	201 (100%)	0	100	100
13	3C	190/240 (79%)	187 (98%)	3 (2%)	62	79
14	3D	296/435 (68%)	293 (99%)	3 (1%)	76	86
15	3E	262/433 (60%)	261 (100%)	1 (0%)	91	94
16	3F	354/503 (70%)	352 (99%)	2 (1%)	86	92
17	3G	100/104 (96%)	100 (100%)	0	100	100
17	3H	100/104 (96%)	100 (100%)	0	100	100
18	A4	591/713 (83%)	584 (99%)	7 (1%)	71	84
19	A5	433/574 (75%)	432 (100%)	1 (0%)	93	96
20	A8	174/657 (26%)	173 (99%)	1 (1%)	86	92
21	A9	89/533 (17%)	89 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
22	AE	589/1633 (36%)	587 (100%)	2 (0%)	92	95
23	AF	437/454 (96%)	433 (99%)	4 (1%)	78	87
24	AG	750/826 (91%)	740 (99%)	10 (1%)	69	82
25	B1	730/812 (90%)	726 (100%)	4 (0%)	88	93
26	B2	736/832 (88%)	730 (99%)	6 (1%)	81	89
27	B3	660/719 (92%)	640 (97%)	20 (3%)	41	63
28	B8	421/529 (80%)	420 (100%)	1 (0%)	93	96
29	BE	757/819 (92%)	754 (100%)	3 (0%)	91	94
30	B6	251/414 (61%)	247 (98%)	4 (2%)	62	79
31	5B	57/196 (29%)	55 (96%)	2 (4%)	36	60
32	5C	448/480 (93%)	445 (99%)	3 (1%)	84	90
33	5D	221/234 (94%)	219 (99%)	2 (1%)	78	87
34	5E	185/535 (35%)	184 (100%)	1 (0%)	88	93
35	5F	171/172 (99%)	170 (99%)	1 (1%)	86	92
36	5G	251/258 (97%)	249 (99%)	2 (1%)	81	89
37	5H	107/538 (20%)	107 (100%)	0	100	100
38	5I	416/443 (94%)	414 (100%)	2 (0%)	88	93
39	5J	140/200 (70%)	140 (100%)	0	100	100
40	5K	157/169 (93%)	157 (100%)	0	100	100
41	RC	158/289 (55%)	156 (99%)	2 (1%)	69	82
43	RE	984/1125 (88%)	960 (98%)	24 (2%)	49	69
44	RF	159/274 (58%)	153 (96%)	6 (4%)	33	58
45	RG	195/222 (88%)	193 (99%)	2 (1%)	76	86
45	RH	206/222 (93%)	204 (99%)	2 (1%)	76	86
46	RI	235/256 (92%)	235 (100%)	0	100	100
47	RJ	648/1039 (62%)	641 (99%)	7 (1%)	73	85
48	RK	307/312 (98%)	303 (99%)	4 (1%)	69	82
49	RN	422/732 (58%)	422 (100%)	0	100	100
50	RO	329/506 (65%)	328 (100%)	1 (0%)	92	95
51	RQ	132/808 (16%)	129 (98%)	3 (2%)	50	70
52	RS	225/424 (53%)	225 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
53	RT	148/282 (52%)	146 (99%)	2 (1%)	67	81
54	RW	22/192 (12%)	22 (100%)	0	100	100
All	All	15417/22619 (68%)	15270 (99%)	147 (1%)	77	86

5 of 147 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
43	RE	1086	ASN
51	RQ	898	PHE
43	RE	1233	ASN
47	RJ	214	ARG
26	B2	75	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 263 such sidechains are listed below:

Mol	Chain	Res	Type
47	RJ	157	ASN
48	RK	334	ASN
53	RT	127	GLN
25	B1	201	HIS
25	B1	92	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	3A	169/333 (50%)	44 (26%)	2 (1%)
2	5A	518/700 (74%)	161 (31%)	11 (2%)
3	SA	848/1808 (46%)	299 (35%)	20 (2%)
All	All	1535/2841 (54%)	504 (32%)	33 (2%)

5 of 504 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	3A	2	U
1	3A	14	A
1	3A	15	U
1	3A	24	U
1	3A	25	U

5 of 33 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	SA	1632	C
3	SA	1654	G
3	SA	1749	A
2	5A	536	A
2	5A	492	G

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 3 ligands modelled in this entry, 2 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
57	GTP	RJ	1201	58	26,34,34	0.94	2 (7%)	32,54,54	0.92	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
57	GTP	RJ	1201	58	-	3/18/38/38	0/3/3/3

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
57	RJ	1201	GTP	C5-C6	-2.46	1.42	1.47
57	RJ	1201	GTP	C8-N7	-2.02	1.31	1.35

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

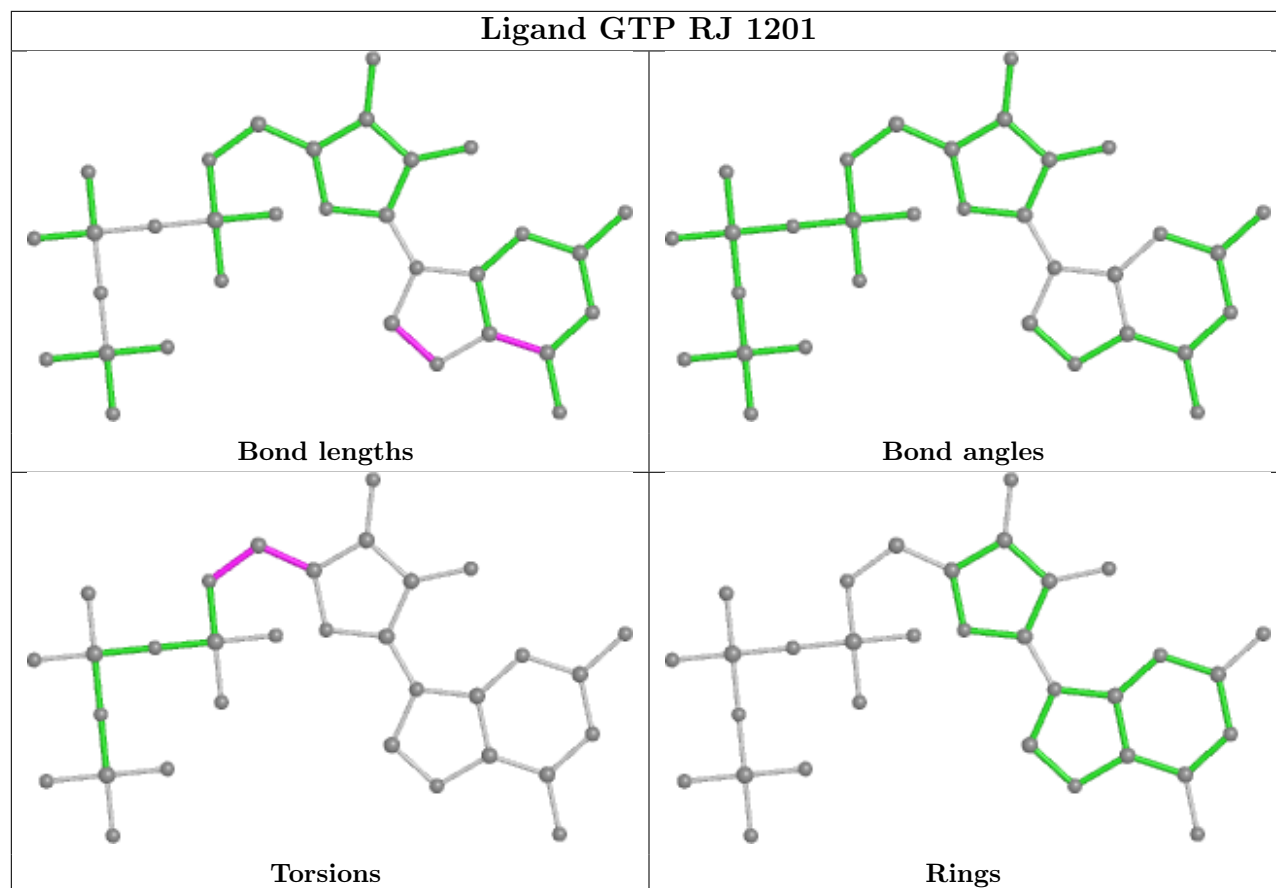
Mol	Chain	Res	Type	Atoms
57	RJ	1201	GTP	O4'-C4'-C5'-O5'
57	RJ	1201	GTP	C3'-C4'-C5'-O5'
57	RJ	1201	GTP	C4'-C5'-O5'-PA

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
57	RJ	1201	GTP	1	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.

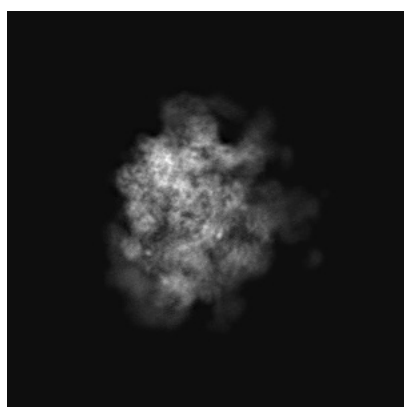
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-30584. These allow visual inspection of the internal detail of the map and identification of artifacts.

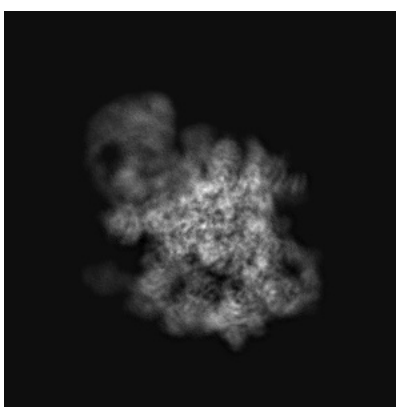
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

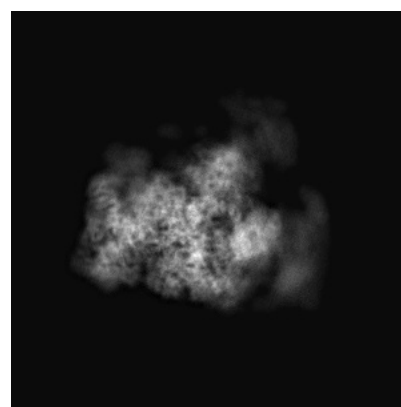
6.1.1 Primary map



X



Y

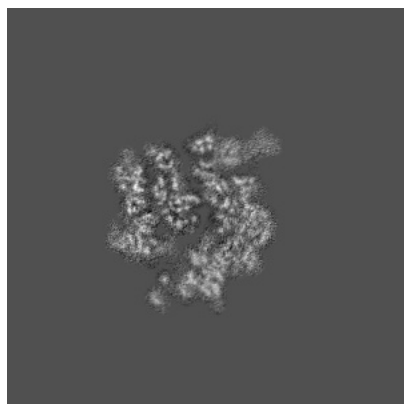


Z

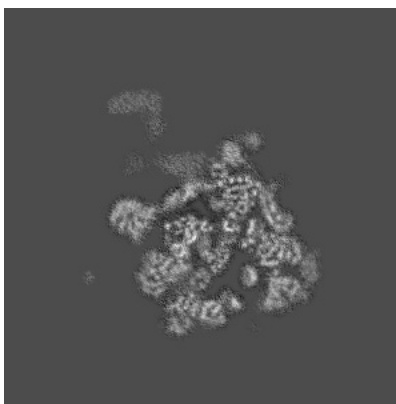
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

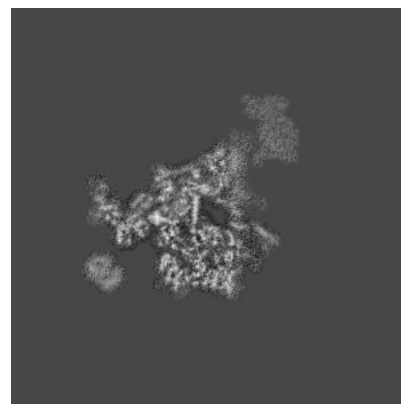
6.2.1 Primary map



X Index: 200



Y Index: 200

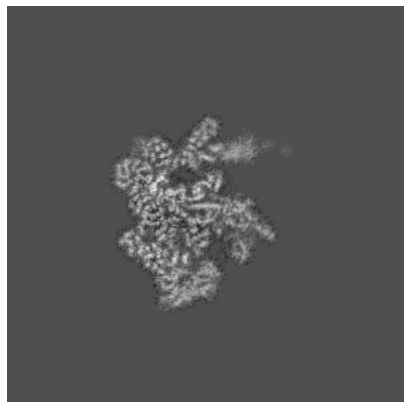


Z Index: 200

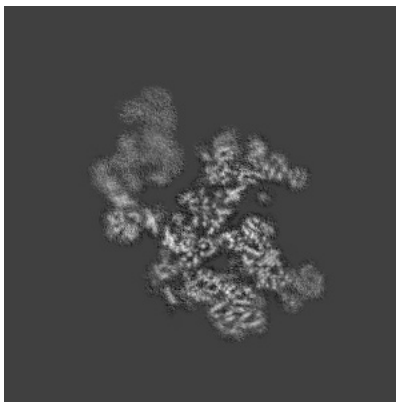
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [\(i\)](#)

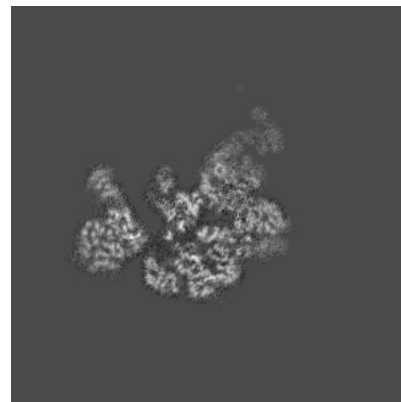
6.3.1 Primary map



X Index: 184



Y Index: 177

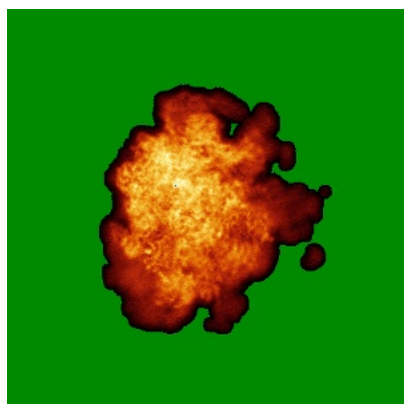


Z Index: 222

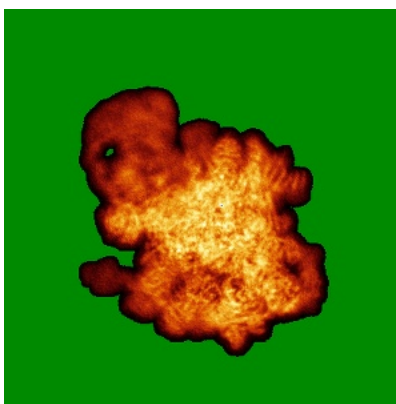
The images above show the largest variance slices of the map in three orthogonal directions.

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

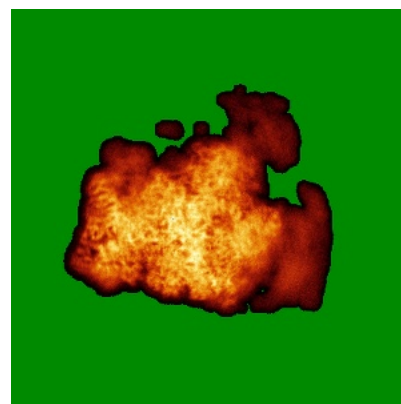
6.4.1 Primary map



X



Y

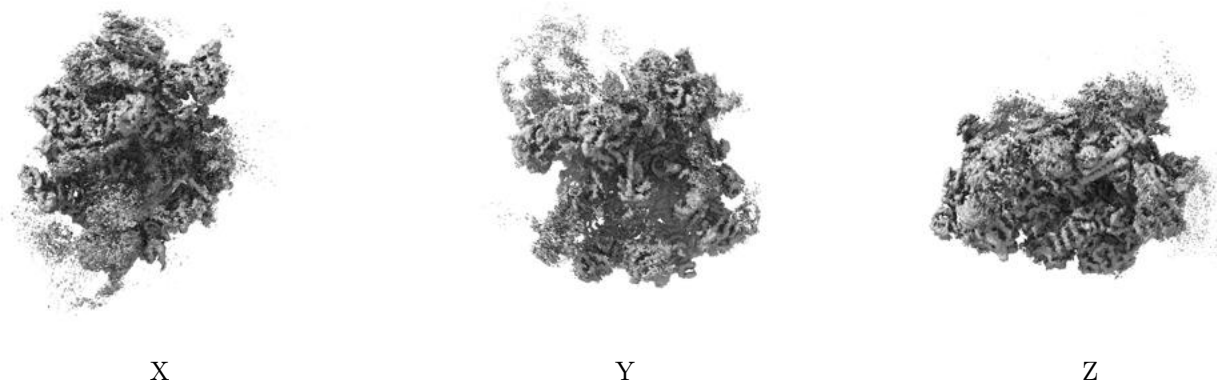


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.016. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

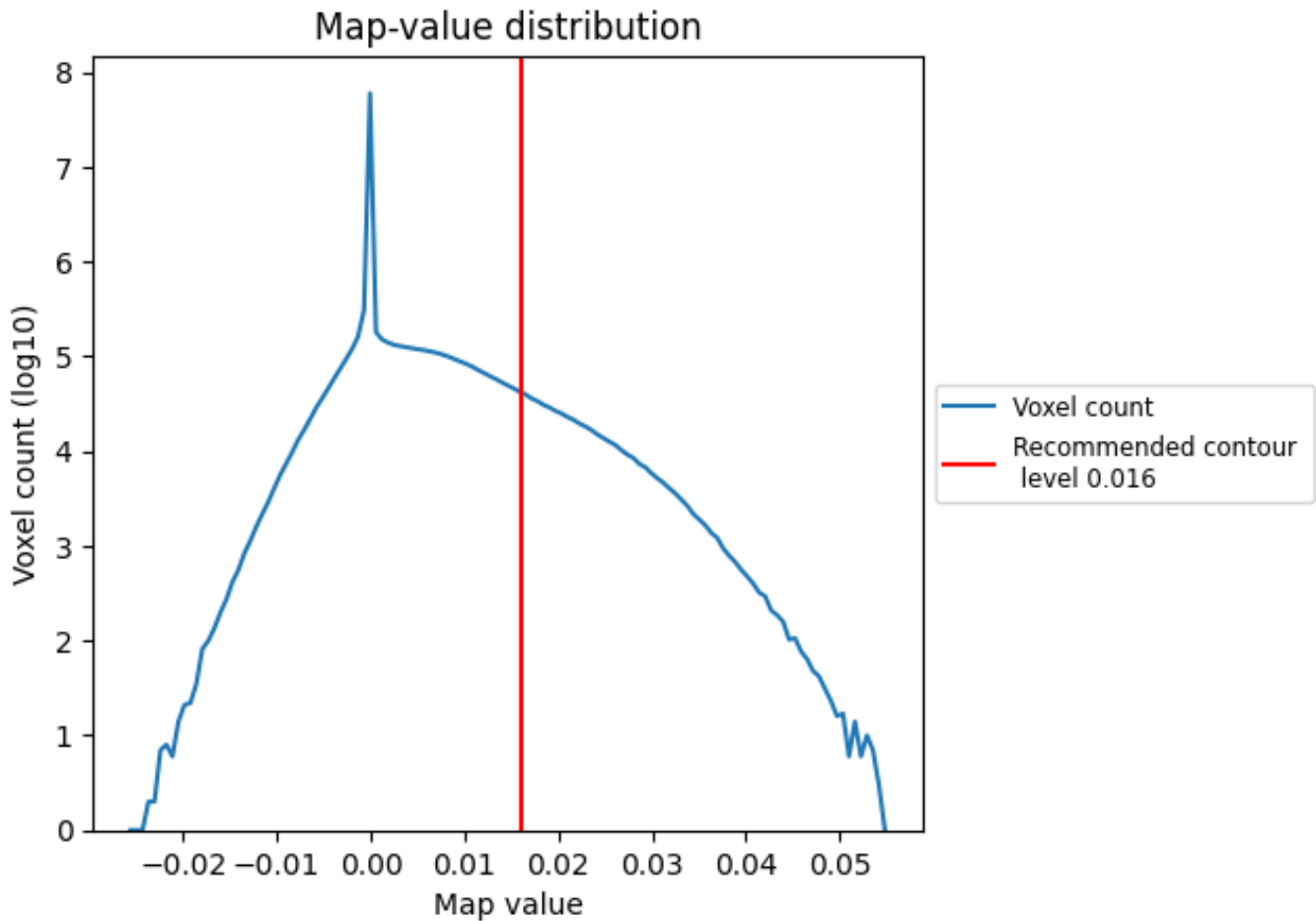
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

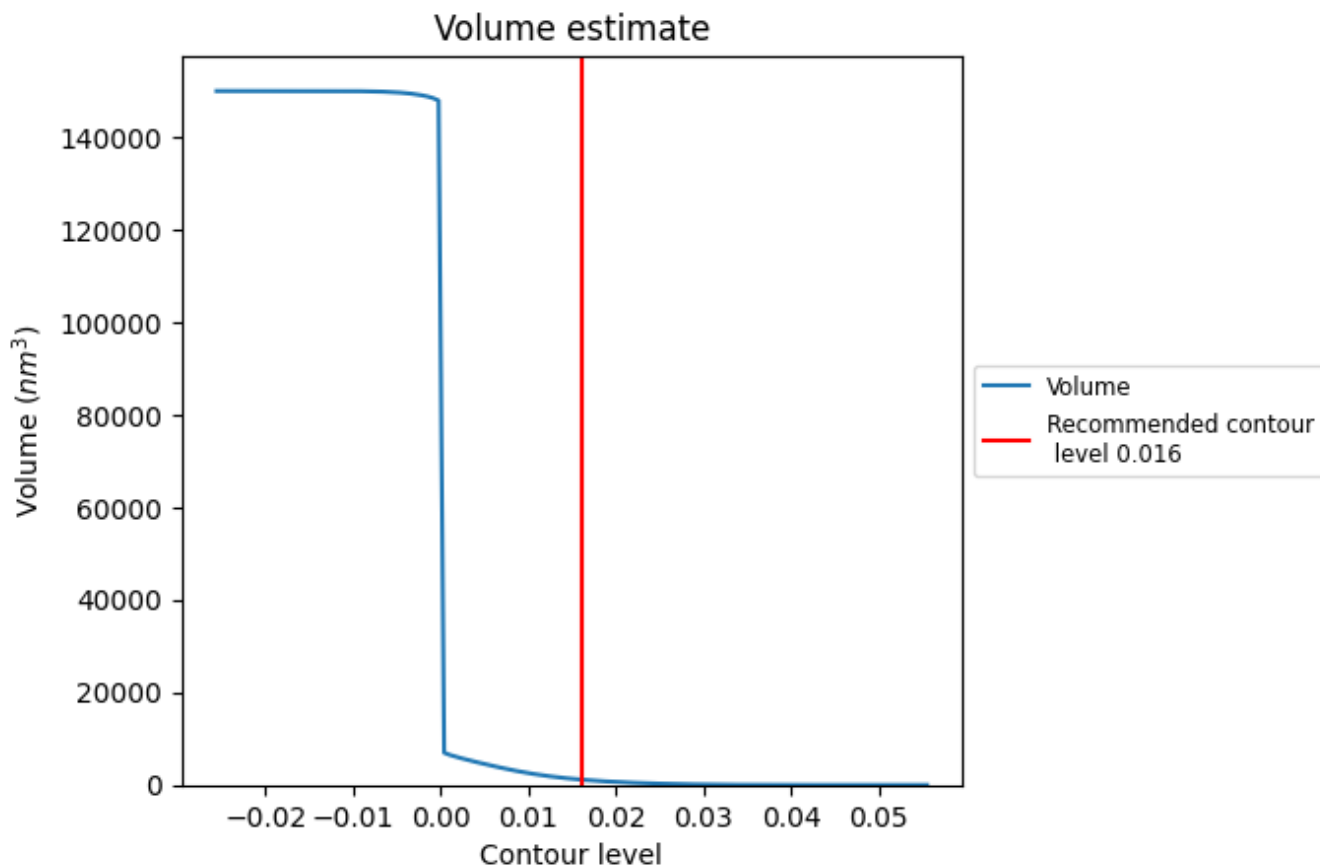
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

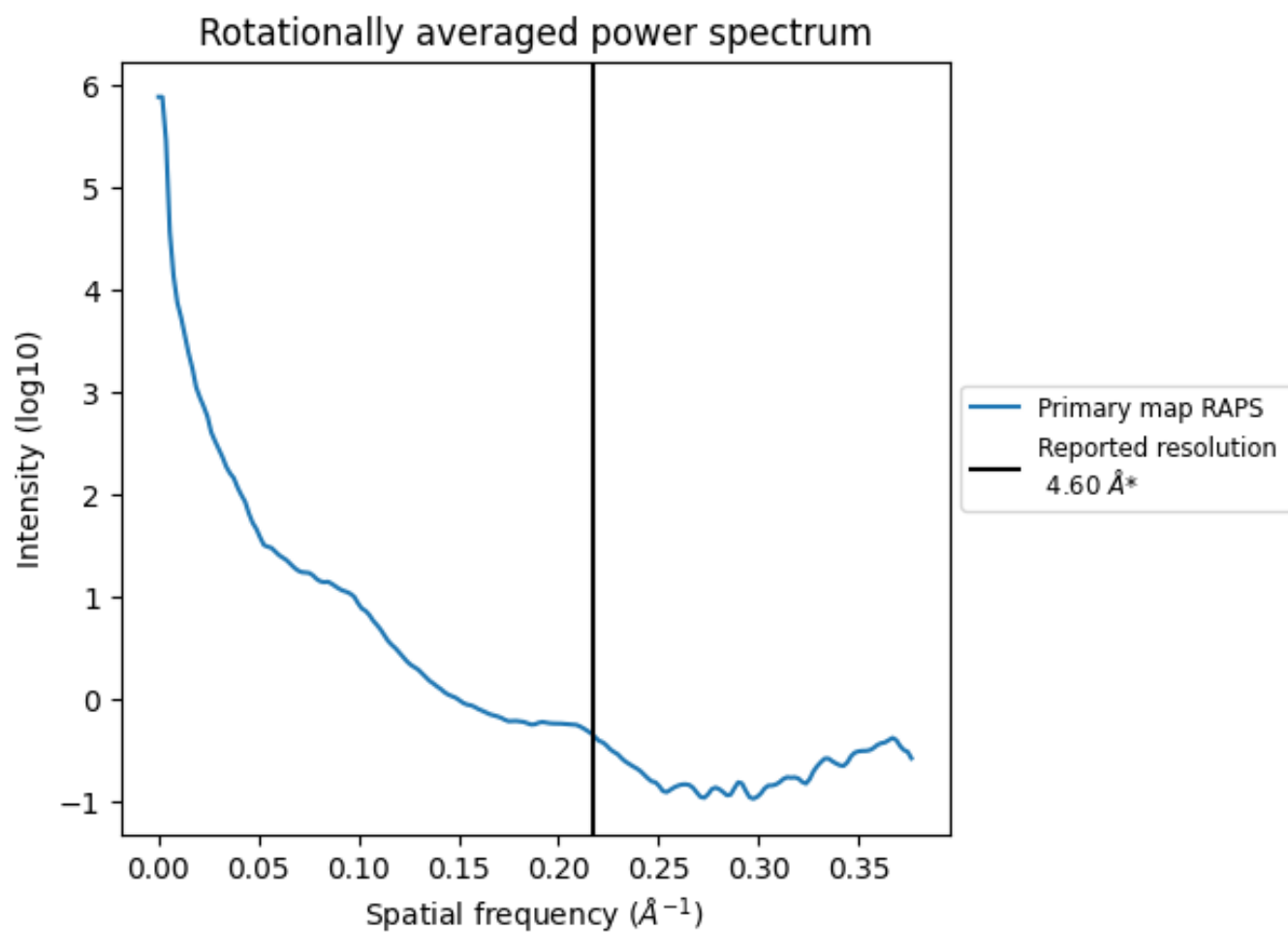
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1155 nm^3 ; this corresponds to an approximate mass of 1044 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

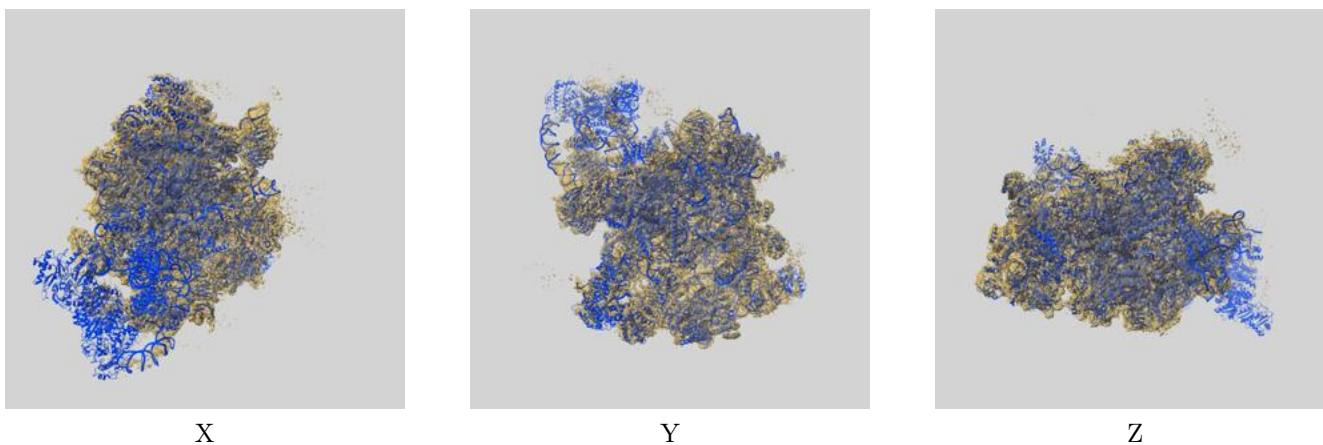
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

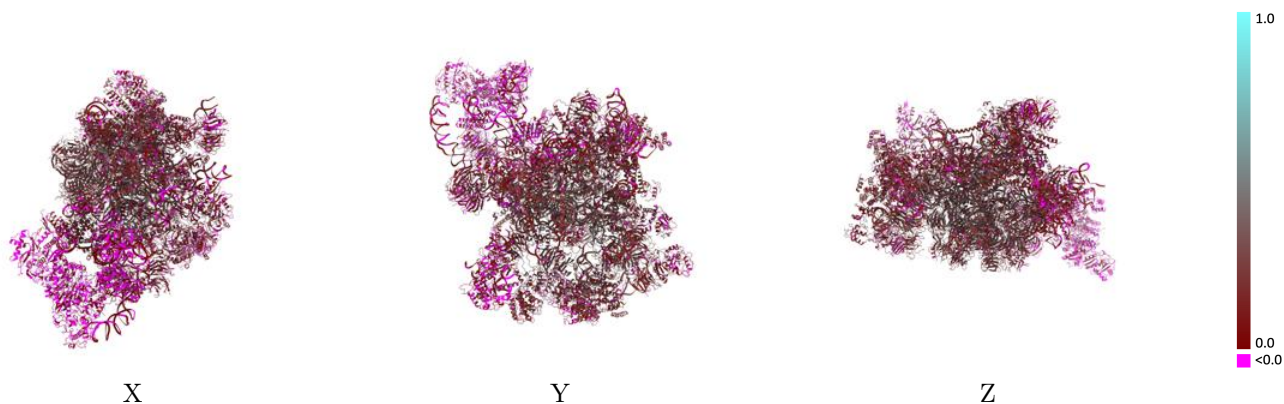
This section contains information regarding the fit between EMDB map EMD-30584 and PDB model 7D5S. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



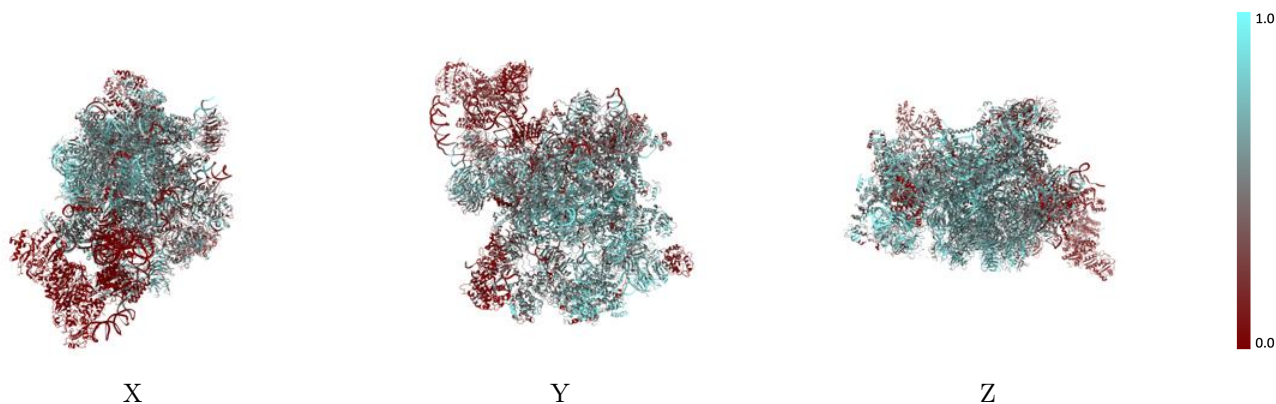
The images above show the 3D surface view of the map at the recommended contour level 0.016 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



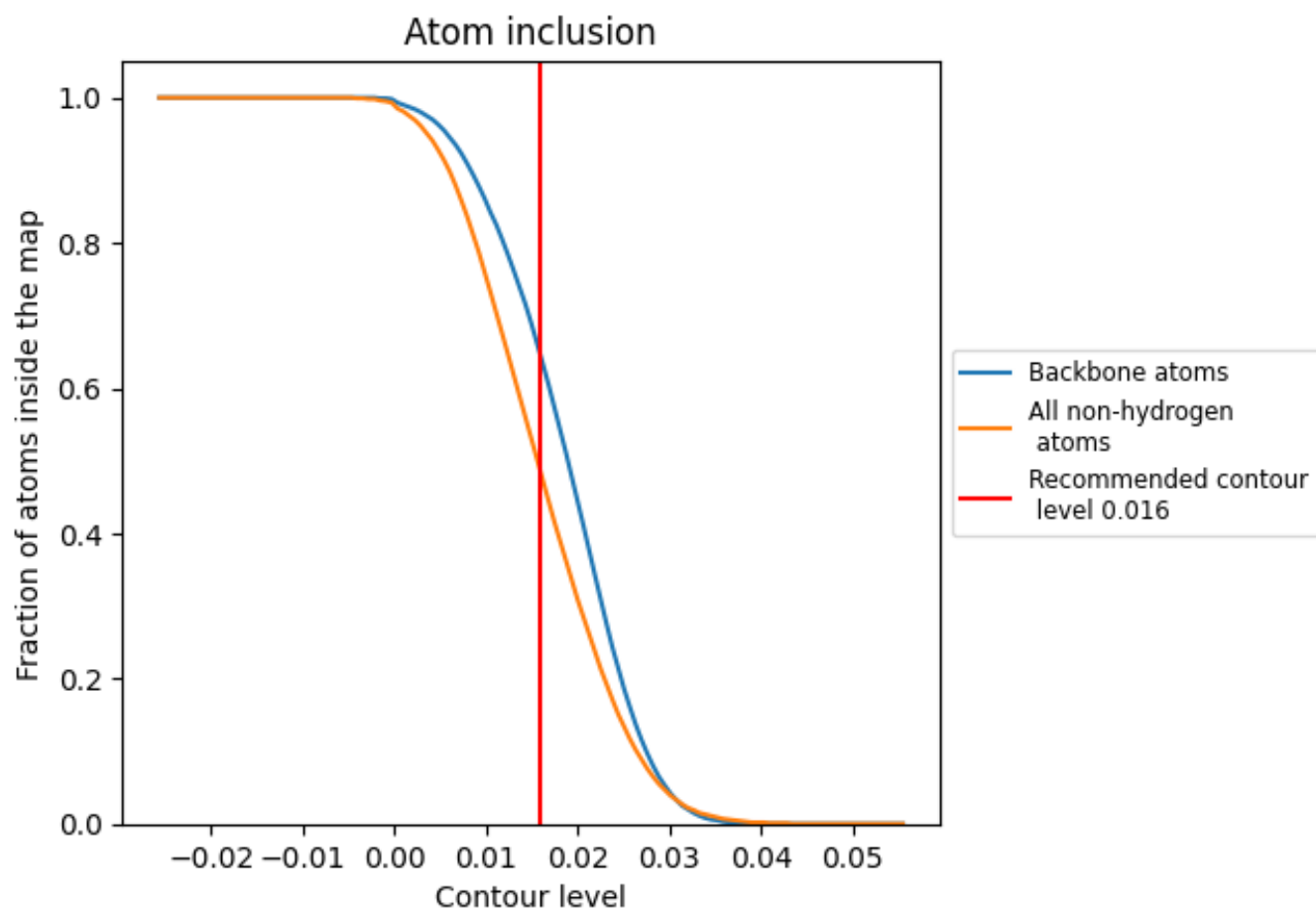
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.016).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 64% of all backbone atoms, 48% 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 (0.016) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4820	 0.1810
3A	 0.7750	 0.2400
3B	 0.5190	 0.2300
3C	 0.5630	 0.2000
3D	 0.5420	 0.1850
3E	 0.5950	 0.2150
3F	 0.3600	 0.1270
3G	 0.6170	 0.2850
3H	 0.4440	 0.2030
5A	 0.7380	 0.2250
5B	 0.5020	 0.1960
5C	 0.5190	 0.2300
5D	 0.5620	 0.2480
5E	 0.4920	 0.2040
5F	 0.5780	 0.2600
5G	 0.4710	 0.2230
5H	 0.4360	 0.1930
5I	 0.5640	 0.1830
5J	 0.3770	 0.1950
5K	 0.4330	 0.1940
A4	 0.6490	 0.2330
A5	 0.6400	 0.2520
A8	 0.4600	 0.1310
A9	 0.6130	 0.2000
AE	 0.3960	 0.1900
AF	 0.6420	 0.2690
AG	 0.6370	 0.2400
B1	 0.6170	 0.2730
B2	 0.5790	 0.1620
B3	 0.2620	 0.0760
B6	 0.4860	 0.1650
B8	 0.6630	 0.2900
BE	 0.6510	 0.2670
RC	 0.0180	 0.0130
RD	 0.0380	 0.0320



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Chain	Atom inclusion	Q-score
RE	 0.0030	 0.0090
RF	 0.0000	 -0.0220
RG	 0.3780	 0.1680
RH	 0.4420	 0.2090
RI	 0.5760	 0.2190
RJ	 0.5170	 0.1940
RK	 0.4680	 0.1600
RN	 0.3660	 0.1580
RO	 0.5490	 0.1940
RQ	 0.2300	 0.1500
RS	 0.1150	 0.0550
RT	 0.4890	 0.1240
RW	 0.2090	 0.1480
SA	 0.4460	 0.1350
SG	 0.5980	 0.2850
SK	 0.3330	 0.1550
SN	 0.0090	 0.0370
SO	 0.0060	 -0.0100
SP	 0.0110	 0.0160
SR	 0.5680	 0.3000
ST	 0.2810	 0.1720
SY	 0.2990	 0.1390
Sd	 0.5740	 0.2920
X1	 0.3110	 0.1720