



wwPDB EM Validation Summary Report ⓘ

Mar 20, 2024 – 10:41 AM JST

PDB ID : 6LQQ
EMDB ID : EMD-0950
Title : Cryo-EM structure of 90S small subunit preribosomes in transition states (State B)
Authors : Du, Y.; Ye, K.
Deposited on : 2020-01-14
Resolution : 4.10 Å (reported)
Based on initial model : 6LQP

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:

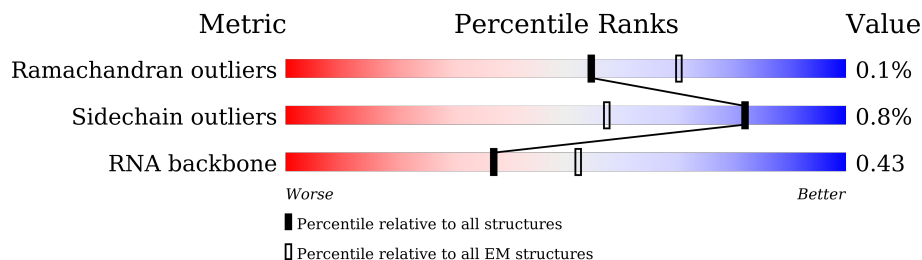
EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

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 4.10 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	SC	255	
5	SF	261	
6	SG	225	
7	SH	236	
8	SI	190	

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Mol	Chain	Length	Quality of chain
9	SJ	200	42% 81% 17%
10	SK	197	8% 86% 13%
11	SM	156	58% 77% 21%
12	SO	151	9% 87% 11%
13	SP	137	18% 85% 14%
14	SR	143	6% 87% 13%
15	SX	130	11% 96% ..
16	SY	145	8% 70% 29%
17	SZ	135	15% 74% 24%
18	Sc	82	11% 96% ..
19	Sd	67	16% 94% 6%
20	3B	327	7% 73% 27%
20	3C	327	64% 68% 31%
21	3D	504	12% 72% 27%
22	3E	511	40% 83% 16%
23	3F	573	14% 78% 21%
24	3G	126	22% 93% ..
24	3H	126	8% 94% ..
25	A4	776	61% 84% 15%
26	A5	643	37% 79% 20%
27	A8	713	77% 76% 23%
28	A9	575	22% 22% 78%
29	AE	1769	65% 86% 13%
30	AF	513	80% 95% ..
31	AG	896	70% 91% 8%

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Mol	Chain	Length	Quality of chain
32	B1	923	7% 89% 10%
33	B2	943	17% 88% 10%
34	B3	817	34% 89% 7%
35	B8	594	14% 80% 20%
36	BE	939	9% 91% 8%
37	B6	440	25% 84% 15%
38	5B	214	28% 72%
39	5C	554	20% 95%
40	5D	250	42% 65% 33%
41	5E	593	9% 34% 66%
42	5F	183	97%
43	5G	290	19% 96%
44	5H	610	12% 88%
45	5I	489	93% 6%
46	5J	217	35% 70% 30%
47	5K	189	11% 92% 7%
48	RA	707	24% 47% 52%
49	RB	357	15% 36% 62%
50	RC	316	45% 88% 12%
51	RD	1729	18% 18% 82%
52	RE	1237	51% 86% 13%
53	RF	297	53% 79% 19%
54	RG	252	85% 84% 14%
54	RH	252	90% 90% 9%
55	RJ	1183	10% 66% 33%

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Mol	Chain	Length	Quality of chain
56	RK	367	
57	RL	1056	
57	RM	1056	
58	RN	810	
59	RO	552	
60	RP	2493	
61	RQ	899	
62	RS	483	
63	RT	326	
64	RV	346	
65	RY	534	
66	X1	347	

2 Entry composition

There are 69 unique types of molecules in this entry. The entry contains 226161 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	375	8009	3578	1426	2630	375	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	SA	1323	28210	12608	5022	9257	1323	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	SC	230	1830	1156	335	335	4	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	SF	229	1815	1161	331	320	3	0	0

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	SH	167	1327	834	256	235	2	0	0

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	SJ	166	1324	824	262	236	2	0	0

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	SM	123	997	641	189	164	3	0	0

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

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

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

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

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

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

- Molecule 15 is a protein called 40S ribosomal protein S22-B.

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

- Molecule 16 is a protein called 40S ribosomal protein S23-A.

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

- Molecule 17 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	SZ	102	Total	C	N	O	0	0
			809	517	148	144		

- Molecule 18 is a protein called 40S ribosomal protein S27-A.

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

- Molecule 19 is a protein called 40S ribosomal protein S28-A.

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

- Molecule 20 is a protein called rRNA 2'-O-methyltransferase fibrillar.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	3B	240	Total	C	N	O	S	0	0
			1865	1184	333	338	10		
20	3C	225	Total	C	N	O	S	0	0
			1763	1120	316	317	10		

- Molecule 21 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	3D	369	2848	1811	489	540	8	0	0

- Molecule 22 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	3E	431	3028	1888	543	588	9	0	0

- Molecule 23 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	3F	454	3643	2315	638	680	10	0	0

- Molecule 24 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	3G	121	916	583	158	171	4	0	0
24	3H	121	916	583	158	171	4	0	0

- Molecule 25 is a protein called U3 small nucleolar RNA-associated protein 4.

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

- Molecule 26 is a protein called U3 small nucleolar RNA-associated protein 5.

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

- Molecule 27 is a protein called U3 small nucleolar RNA-associated protein 8.

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

- Molecule 28 is a protein called U3 small nucleolar RNA-associated protein 9.

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

- Molecule 29 is a protein called U3 small nucleolar RNA-associated protein 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	AE	1534	9955	6242	1771	1923	19	0	0

- Molecule 30 is a protein called U3 small nucleolar RNA-associated protein 15.

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

- Molecule 31 is a protein called NET1-associated nuclear protein 1.

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

- Molecule 32 is a protein called Periodic tryptophan protein 2.

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

- Molecule 33 is a protein called U3 small nucleolar RNA-associated protein 12.

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

- Molecule 34 is a protein called U3 small nucleolar RNA-associated protein 13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	B3	757	5919	3769	993	1130	27	0	0

- Molecule 35 is a protein called U3 small nucleolar RNA-associated protein 18.

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

- Molecule 36 is a protein called U3 small nucleolar RNA-associated protein 21.

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

- Molecule 37 is a protein called U3 small nucleolar RNA-associated protein 6.

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

- Molecule 38 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
38	5B	60	495	310	101	84	0	0

- Molecule 39 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	5C	535	4237	2656	762	807	12	0	0

- Molecule 40 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	5D	167	1396	862	266	263	5	0	0

- Molecule 41 is a protein called U3 small nucleolar RNA-associated protein MPP10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	5E	204	1647	1021	294	328	4	0	0

- Molecule 42 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	5F	182	1530	967	287	269	7	0	0

- Molecule 43 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	5G	282	2296	1441	430	418	7	0	0

- Molecule 44 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	5H	74	596	373	122	101		0	0

- Molecule 45 is a protein called Protein SOF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	5I	461	3765	2354	686	709	16	0	0

- Molecule 46 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	5J	151	1280	807	240	228	5	0	0

- Molecule 47 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	5K	175	1403	896	256	241	10	0	0

- Molecule 48 is a protein called Ribosome biogenesis protein ENP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	RA	338	2709	1713	463	524	9	0	0

- Molecule 49 is a protein called U3 small nucleolar ribonucleoprotein protein LCP5.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	RB	134	Total	C	N	O	S	0	0
			1108	664	227	214	3		

- Molecule 50 is a protein called KRR1 small subunit processome component.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	RC	278	Total	C	N	O	S	0	0
			2207	1408	391	395	13		

- Molecule 51 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	RD	316	Total	C	N	O	S	0	0
			2412	1541	414	452	5		

- Molecule 52 is a protein called U3 small nucleolar RNA-associated protein 22.

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

- Molecule 53 is a protein called Ribosomal RNA-processing protein 7.

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

- Molecule 54 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

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

- Molecule 55 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	RJ	796	Total	C	N	O	S	0	0
			6379	4086	1136	1128	29		

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

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

- Molecule 57 is a protein called RNA cytidine acetyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	RL	805	4539	2760	885	887	7	0	0
57	RM	766	3779	2247	766	766		0	0

- Molecule 58 is a protein called Nucleolar complex protein 14.

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

- Molecule 59 is a protein called Nucleolar complex protein 4.

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

- Molecule 60 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	RP	2108	12171	7483	2291	2381	16	0	0

- Molecule 61 is a protein called U3 small nucleolar RNA-associated protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	RQ	226	1651	1023	313	313	2	0	0

- Molecule 62 is a protein called Essential nuclear protein 1.

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

- Molecule 63 is a protein called Pno1.

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

- Molecule 64 is a protein called Protein FAF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	RV	190	1448	891	290	264	3	0	0

- Molecule 65 is a protein called Protein BFR2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
65	RY	37	299	191	48	60	0	0

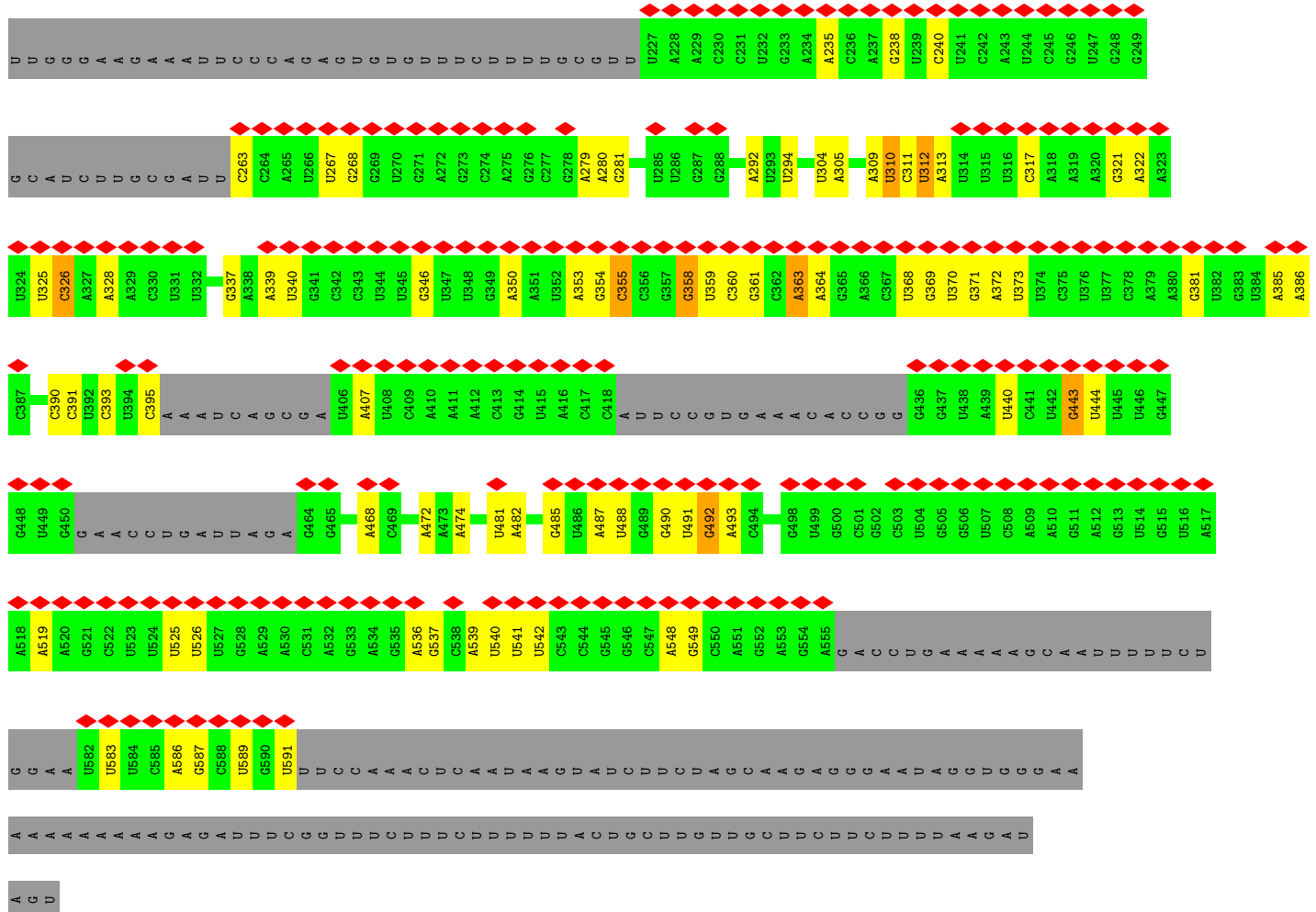
- Molecule 66 is a protein called Unassigned helices.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
66	X1	75	375	225	75	75	0	0

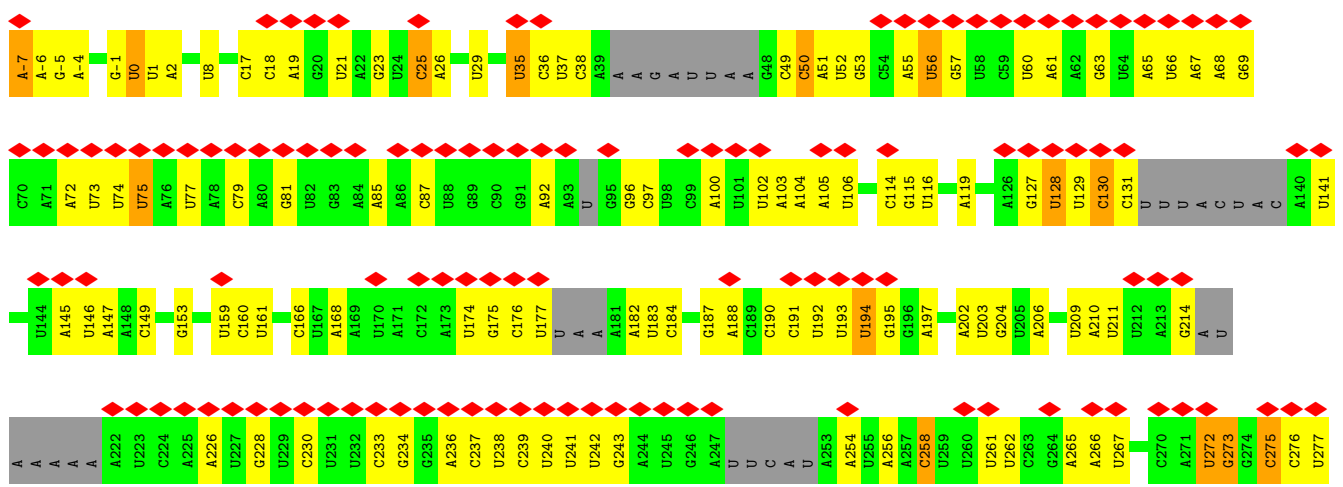
- Molecule 67 is ZINC ION (three-letter code: ZN) (formula: Zn).

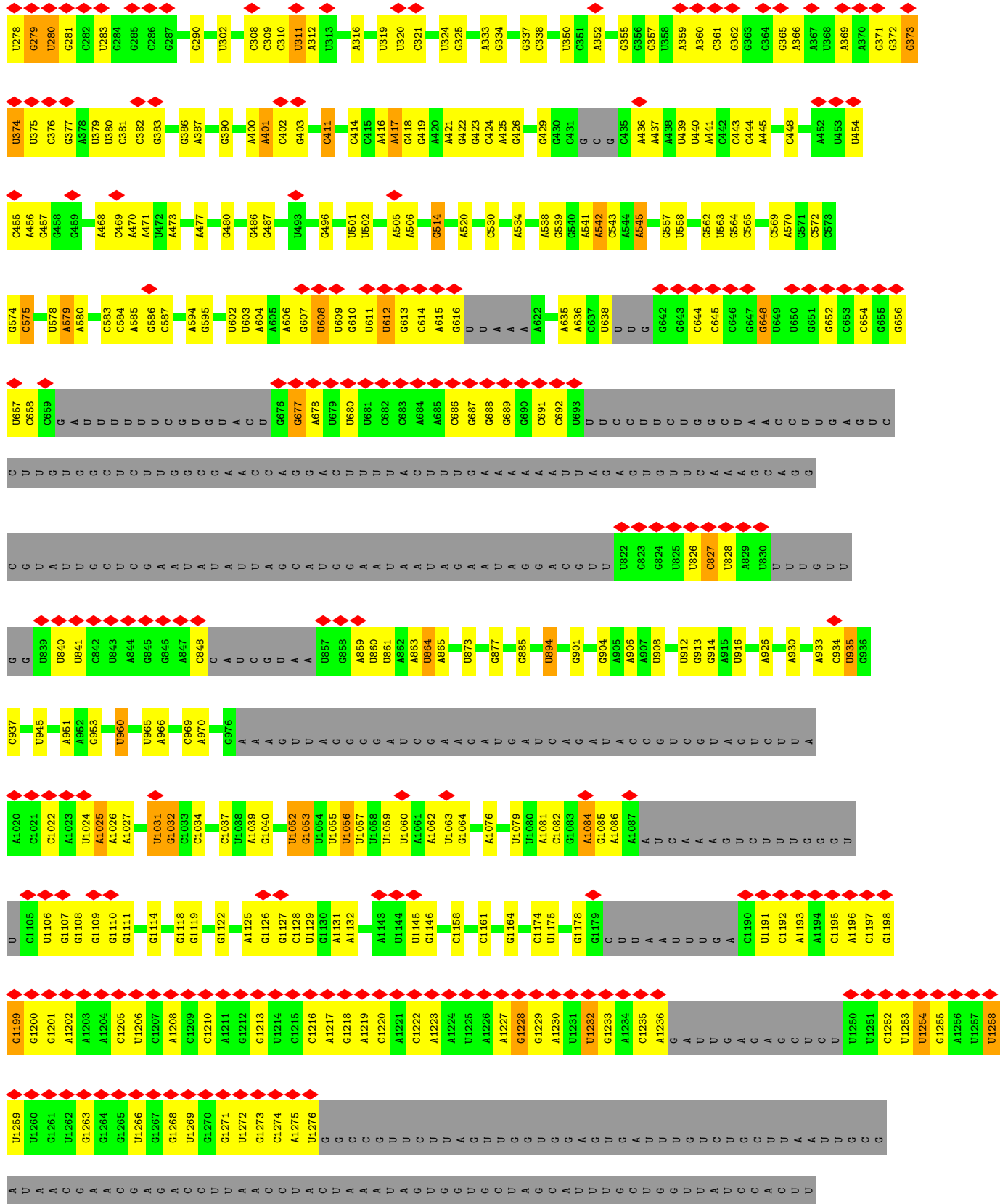
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
67	Sc	1	1	1	0
67	5K	1	1	1	0

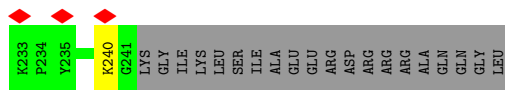
- Molecule 68 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).



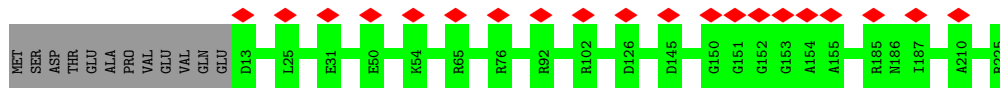
• Molecule 3: 18S pre-rRNA



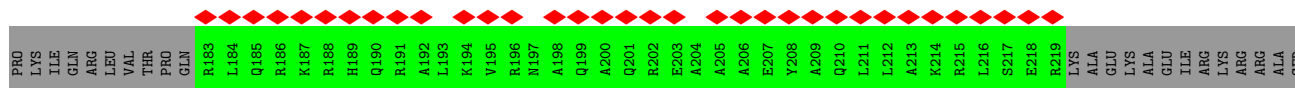
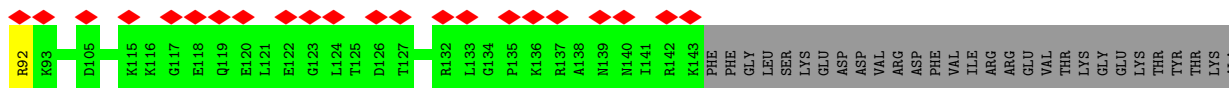
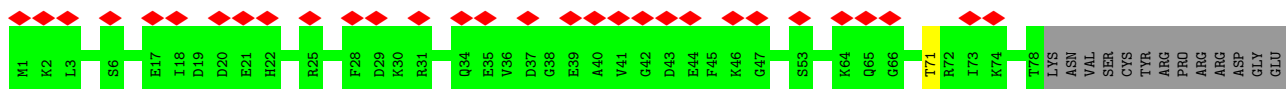




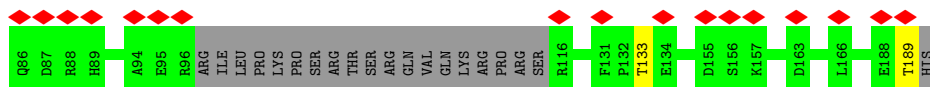
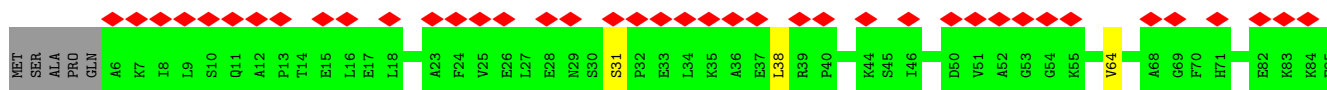
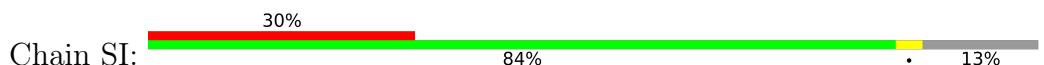
• Molecule 6: 40S ribosomal protein S5



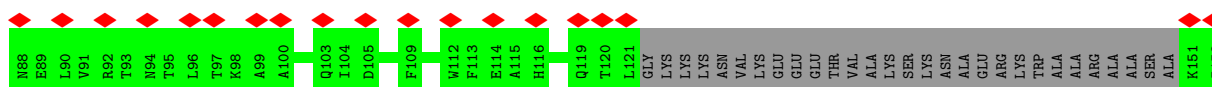
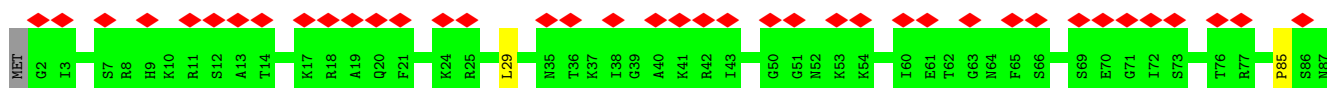
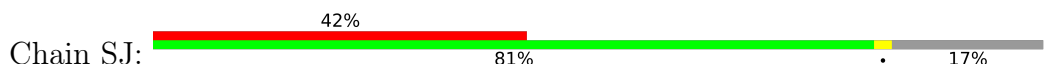
• Molecule 7: 40S ribosomal protein S6-A



• Molecule 8: 40S ribosomal protein S7-A

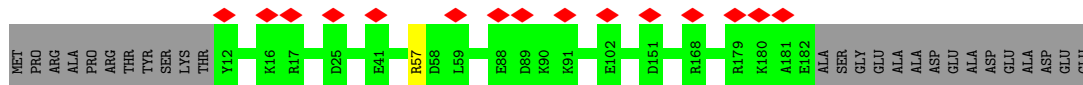
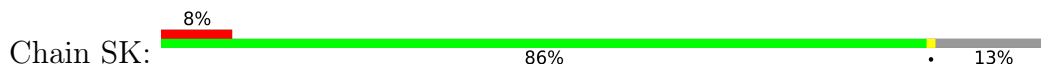


• Molecule 9: 40S ribosomal protein S8-A

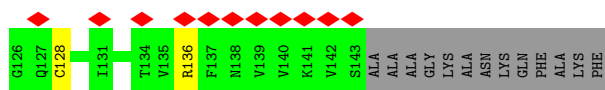
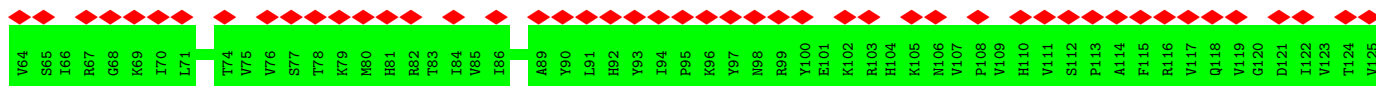
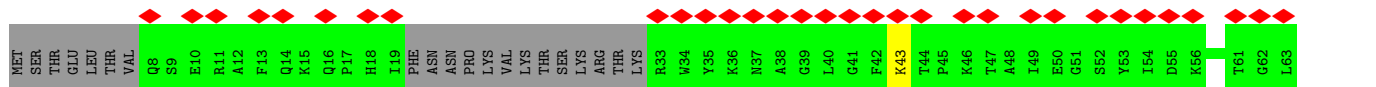
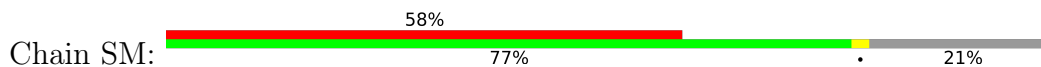




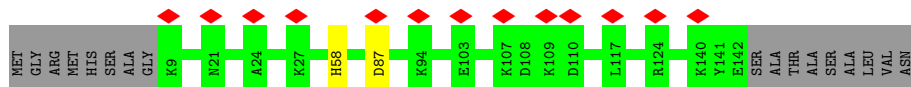
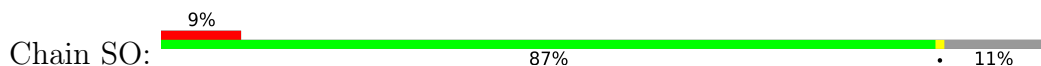
• Molecule 10: 40S ribosomal protein S9-A



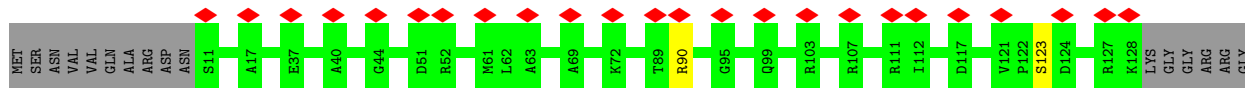
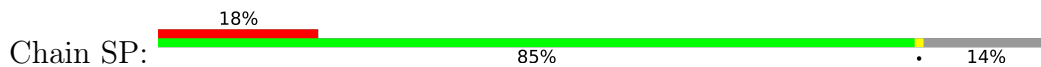
• Molecule 11: 40S ribosomal protein S11-A



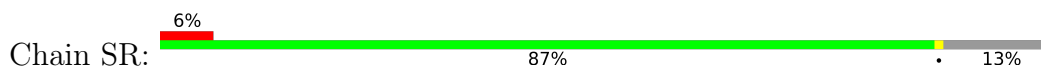
• Molecule 12: 40S ribosomal protein S13

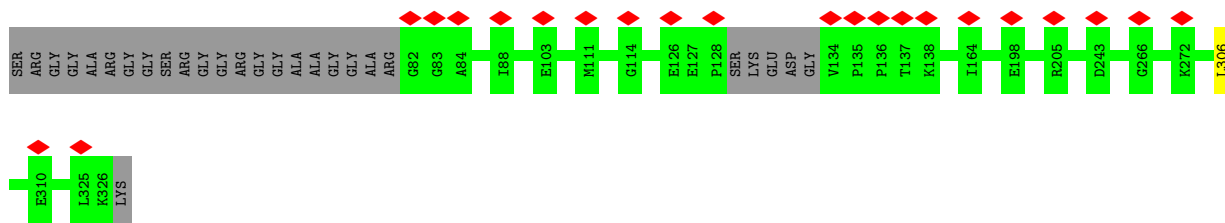


• Molecule 13: 40S ribosomal protein S14-A

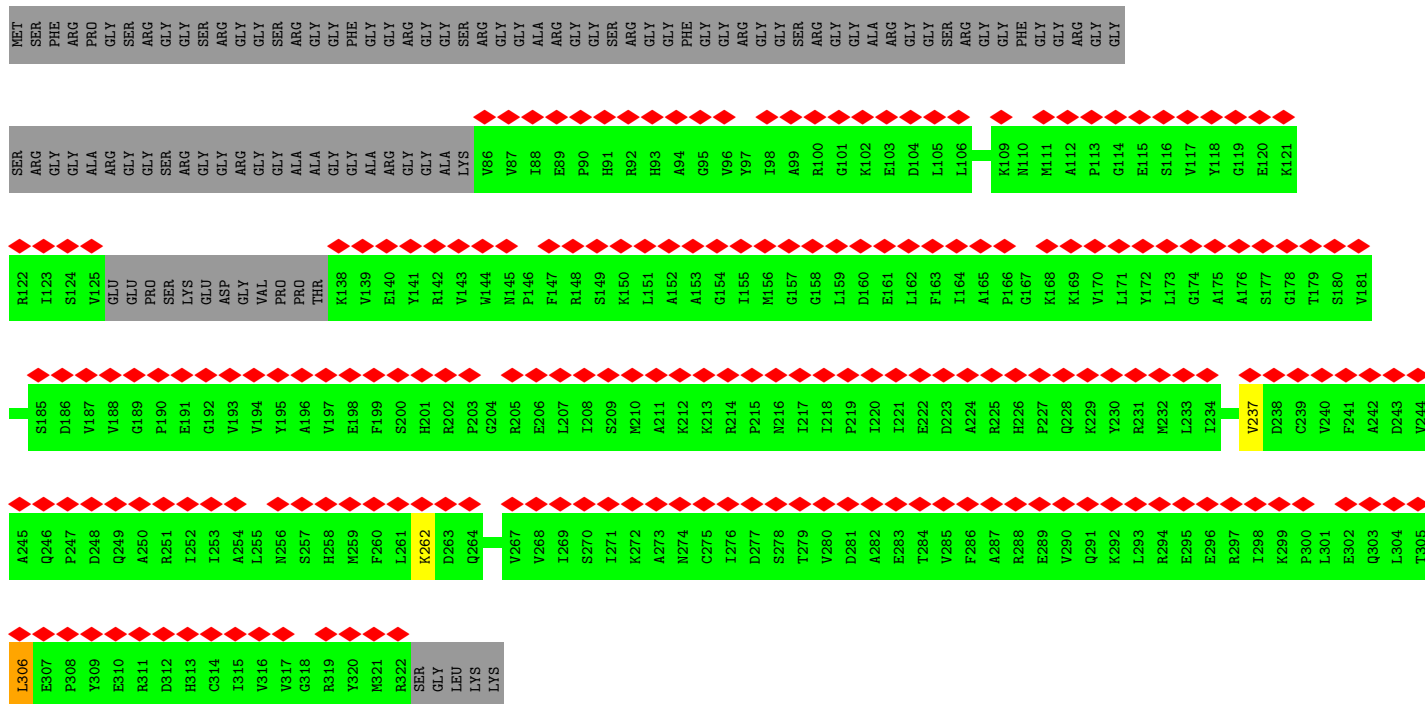


• Molecule 14: 40S ribosomal protein S16-A

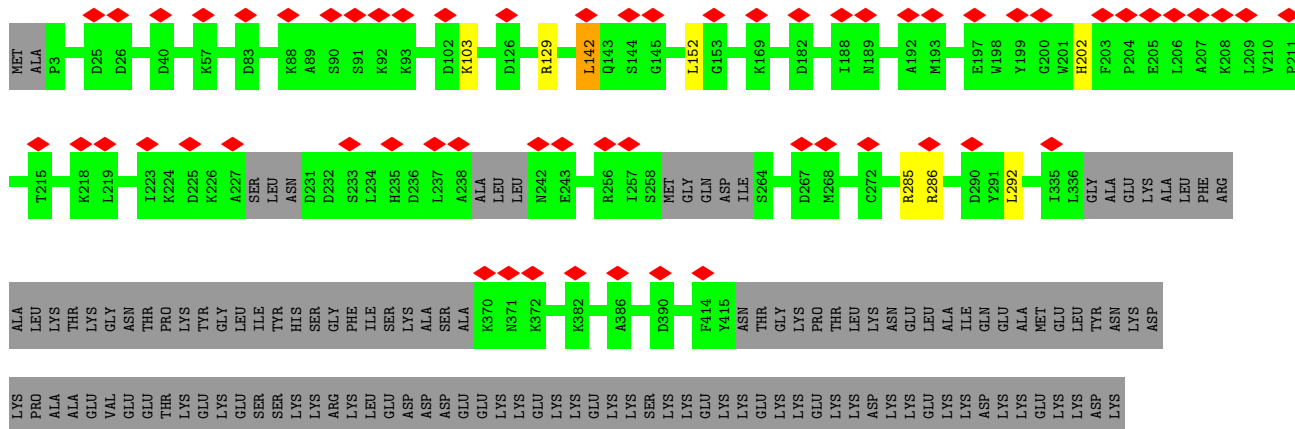
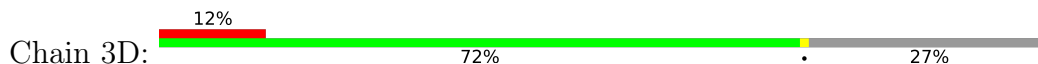




• Molecule 20: rRNA 2'-O-methyltransferase fibrillar

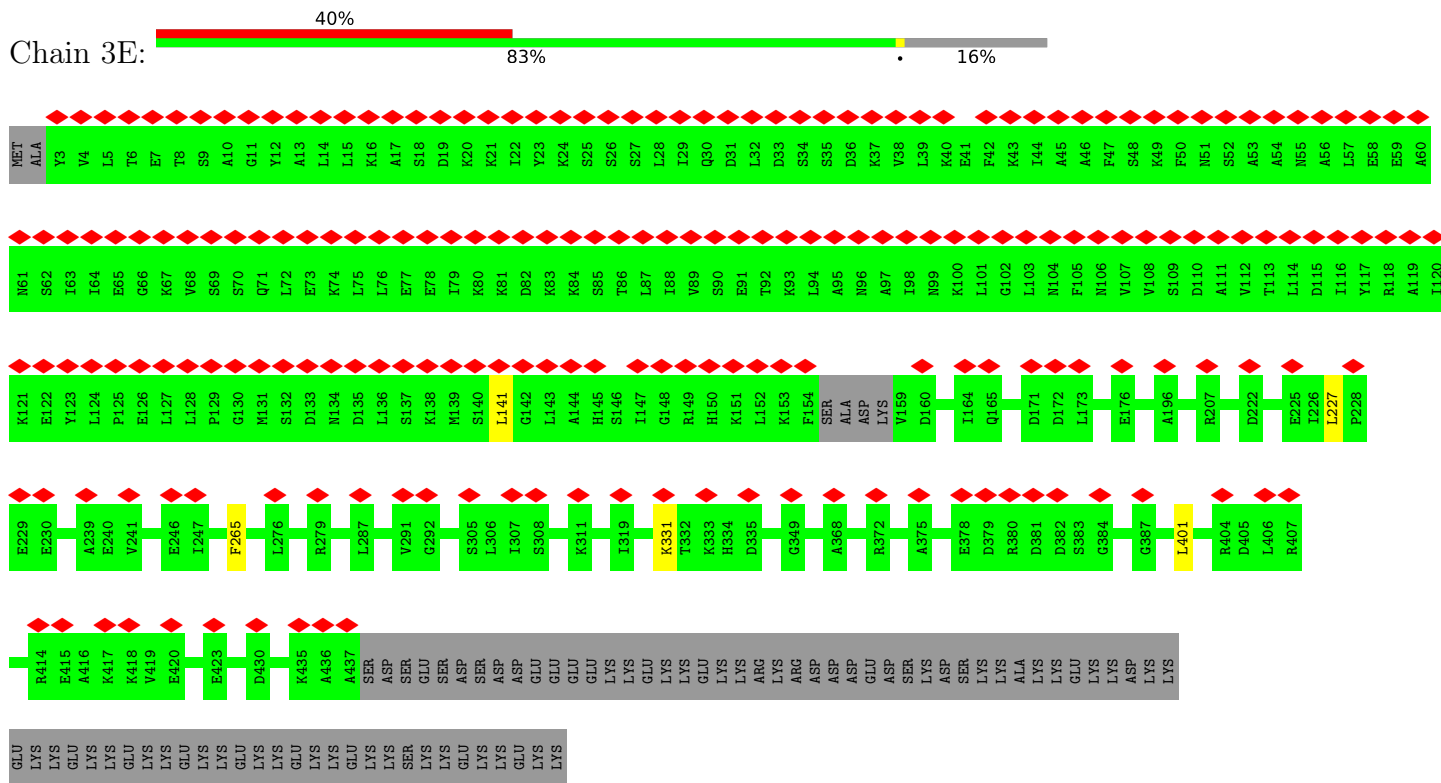


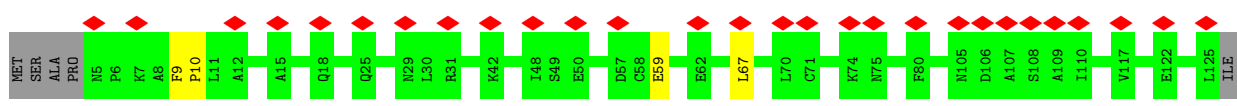
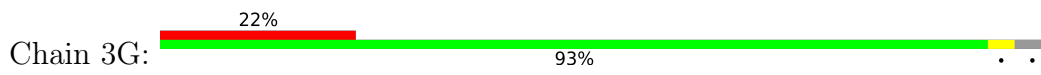
• Molecule 21: Nucleolar protein 56



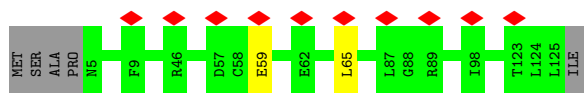
LYS
LYS
LYS
SER
LYS
ASP

• Molecule 22: Nucleolar protein 58

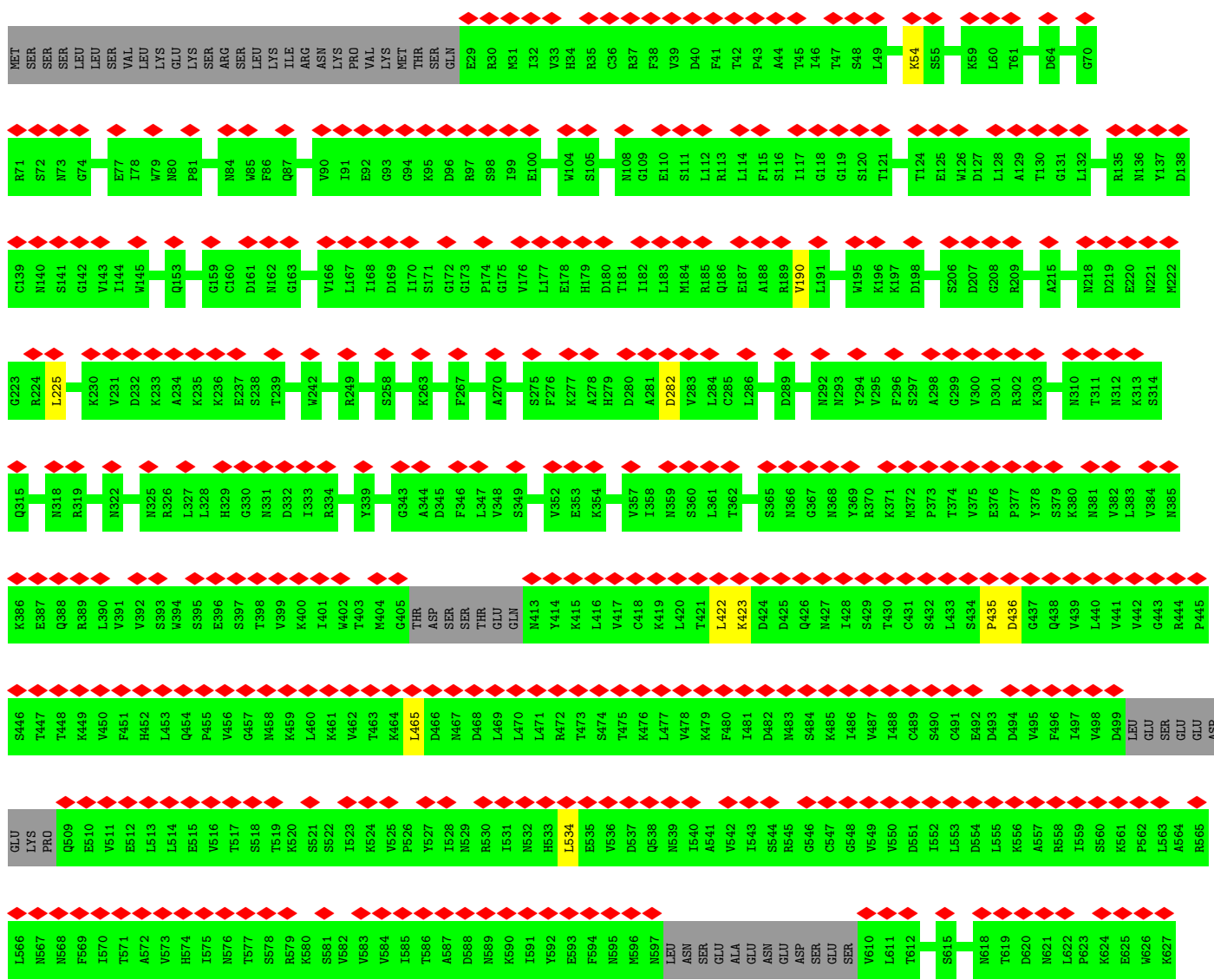
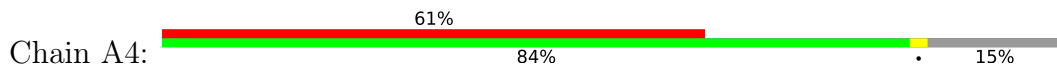




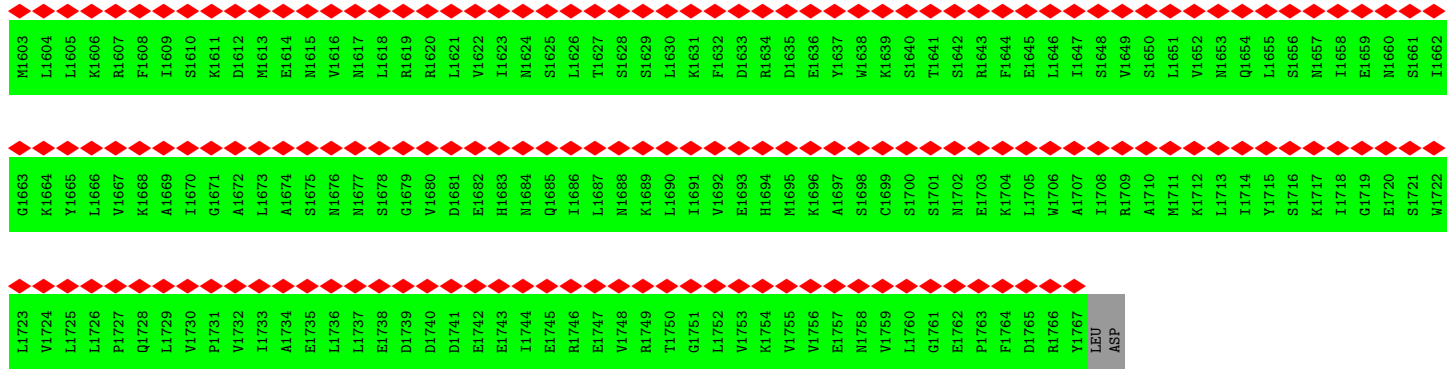
• Molecule 24: 13 kDa ribonucleoprotein-associated protein



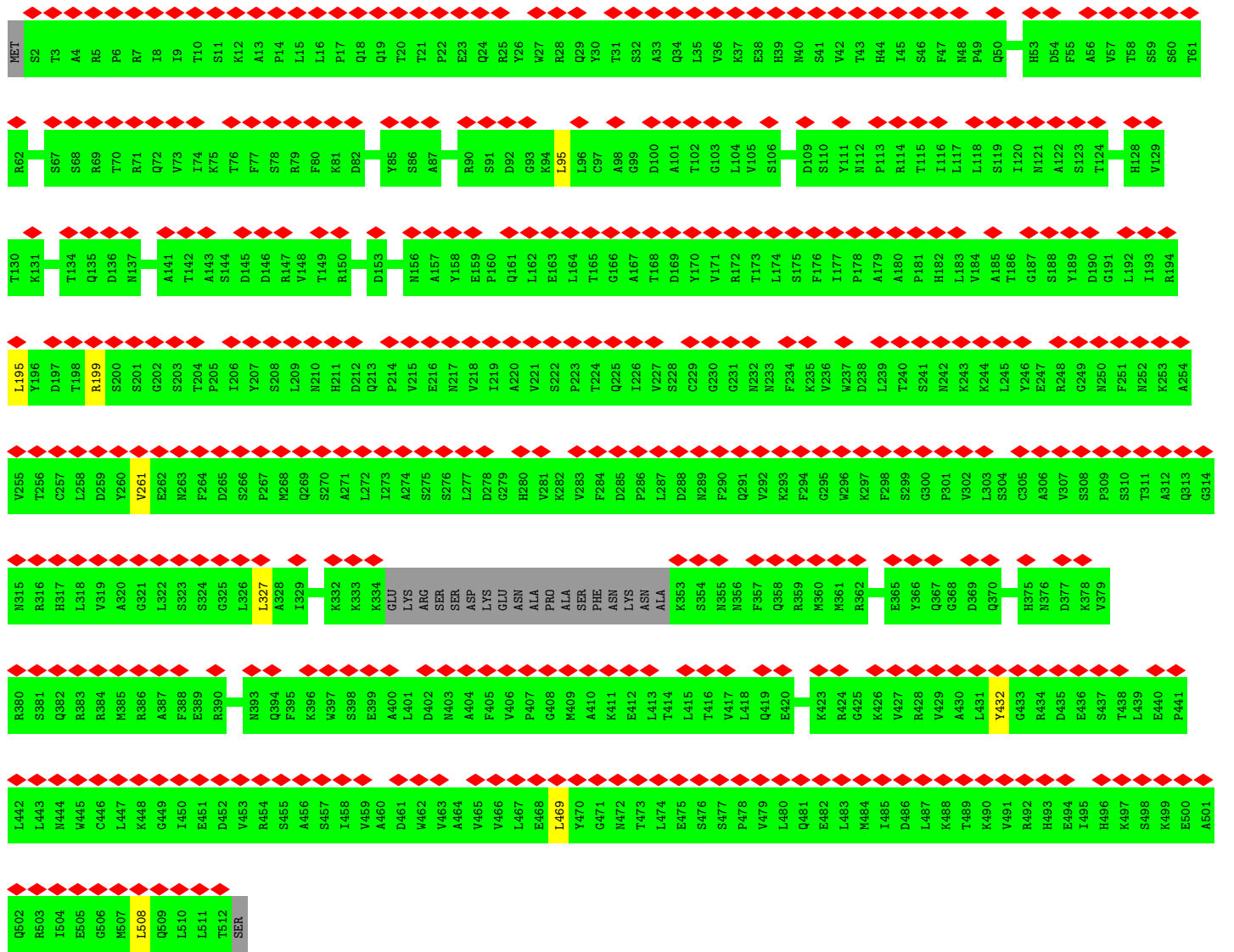
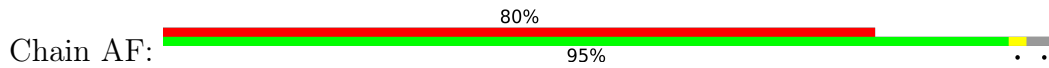
• Molecule 25: U3 small nucleolar RNA-associated protein 4



V1543	S1483	L1423	G1363	V1303	V1243	PHE	ASN	G1063	K1003	L943	LEU	ARG
F1544	T1484	H1424	V1364	V1304	D1244	GLY	PHE	E1064	E1004	V944	ASP	ARG
R1545	V1485	V1425	K1365	I1305	E1245	THR	SER	E1065	E1005	I945	GLN	ARG
P1546	E1486	I1426	S1366	S1306	F1246	LEU	SER	R1066	M1006	G946	ASP	R827
L1547	E1487	F1427	I1367	Q1307	N1247	GLY	PHE	L1067	PHE	S947	ASP	S828
F1548	I1488	F1428	A1368	I1308	N1248	VAL	LEU	L1068	LEU	L948	LEU	S829
V1549	D1489	S1429	F1369	I1309	A1249	LEU	THR	L1069	LEU	ALA	LEU	T830
I1550	K1490	R1430	Y1370	L1310	V1250	PHE	THR	F1070	LEU	THR	LEU	S831
L1551	K1491	E1431	P1371	N1311	F1251	PHE	THR	F1071	SER	ALA	LEU	T832
V1552	S1492	V1432	K1372	T1312	P1252	ILE	ASN	I1071	PHE	SER	SER	K833
R1553	A1493	D1433	I1373	M1313	L1253	SER	THR	LYS	THR	E954	ASP	N833
M1554	T1494	S1434	V1374	T1314	L1254	ALA	ALA	ALA	THR	V955	ASP	A834
S1555	S1495	S1435	P1375	A1315	S1255	LEU	LEU	LEU	ALA	V956	LEU	F835
F1556	Q1496	I1436	P1376	L1316	L1256	GLU	PHE	VAL	LEU	E896	LEU	L836
D1557	S1497	R1437	S1377	L1317	S1257	ILE	ASN	ASP	ASP	L957	LEU	K837
G1558	P1498	L1438	I1378	S1318	T1258	LYS	LYS	LEU	V1020	H958	LEU	E838
E1559	I1499	S1439	K1379	K1319	M1259	THR	THR	H1080	F1021	S959	SER	E839
G1560	F1500	V1440	L1380	I1320	E1260	C1203	GLU	V1081	R1022	V960	CYS	V840
V1561	F1501	I1441	F1381	GLY	D1261	S1202	THR	N1082	H1023	N961	THR	SER
T1562	K1502	S1442	D1382	LYS	I1262	I1204	GLU	M1082	R1024	P962	LEU	GLM
M1563	L1503	L1443	A1383	LEU	R1263	I1205	THR	E1083	R1025	F963	LEU	LEU
A1564	L1504	I1444	S1384	LEU	Y1264	S1206	ASP	E1084	R1026	F964	THR	ALA
G1565	L1505	I1445	L1385	GLU	R1265	Q1207	GLN	L1085	V1027	T965	ILE	GLU
I1566	S1506	E1446	L1386	G1326	H1265	E1208	D1150	S1086	K1027	F966	THR	HIS
T1567	L1507	N1447	D1387	S1327	L1266	N1209	Y1151	G1087	L1028	N967	LEU	LEU
E1568	F1508	I1448	A1388	I1328	T1267	E1210	Y1152	L1088	F1029	G968	ARG	ARG
T1569	E1509	D1449	S1389	L1329	L1268	E1211	D1153	L1089	S1030	N969	LEU	LYS
E1570	F1510	L1450	M1390	T1330	V1269	A1212	L1154	D1090	T1031	ALA	LEU	LEU
R1571	R1511	K1451	P1391	Q1331	I1270	D1214	R1155	D1091	I1032	ALA	LEU	LEU
L1572	S1512	E1452	K1392	L1333	G1271	D1215	R1156	L1092	ILE	HIS	LEU	THR
L1573	I1513	V1453	K1393	T1334	K1272	E1216	L1157	L1093	LYS	SER	LEU	THR
A1574	S1514	L1454	E1394	L1335	F1273	E1216	L1158	D1093	THR	ALA	LEU	LEU
F1575	S1515	K1455	Q1395	L1336	F1274	SER	L1159	I1094	PRO	ASP	LEU	GLU
F1576	F1516	V1456	L1396	A1336	E1275	LEU	K1161	I1095	V1039	ASP	ASP	A857
K1577	D1517	L1457	Q1397	T1337	L1276	SER	L1162	K1096	K1040	GLU	ASP	L858
F1578	M1518	F1458	V1398	E1338	E1277	ASP	Y1163	L1098	A1041	THR	LEU	D859
F1579	M1519	R1459	A1399	K1339	G1278	H1222	Y1164	T1099	A1042	THR	LEU	K860
M1580	T1520	I1460	I1400	V1340	S1279	T1223	V1165	S1100	L1043	LYS	LEU	V861
K1581	I1521	W1461	L1401	S1342	A1281	E1225	L1166	S1101	G1043	VAL	LEU	R862
L1582	S1522	S1462	L1402	M1344	I1282	I1226	LEU	K1102	S1044	VAL	LEU	N863
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E1584	I1524	E1464	F1404	T1345	I1284	E1228	THR	S1103	F1046	THR	LEU	G865
M1585	E1525	I1465	A1405	E1346	V1285	I1229	SER	S1104	F1047	LEU	LEU	S866
L1586	A1526	I1466	G1406	E1347	M1286	I1230	THR	S1105	L1048	VAL	LEU	E867
F1587	S1527	T1467	L1407	V1347	M1287	I1231	THR	K1107	I1049	VAL	LEU	K868
G1588	F1528	S1468	I1408	K1348	N1288	F1231	GLN	P992	P992	P992	LEU	LEU
I1589	M1529	N1469	K1409	I1349	V1289	K1232	GLN	A993	ASN	ASN	THR	PHE
I1590	E1530	D1470	R1410	S1350	M1289	K1233	TWR	L994	SER	SER	LEU	LEU
T1591	I1531	T1471	I1411	S1351	K1290	V1233	SER	I995	SER	I995	LEU	SER
S1592	S1532	V1472	P1412	L1352	V1291	L1234	ALA	K996	ALA	N997	LEU	LEU
Y1593	M1533	A1473	S1413	A1353	L1292	M1235	VAL	S998	L1057	S998	LEU	ASP
F1594	S1534	V1474	F1414	I1354	L1293	R1114	VAL	K999	M1058	K999	LEU	SER
T1595	V1535	S1475	L1415	I1355	D1294	E1295	LEU	G1000	N1059	G1000	LEU	LEU
Y1596	F1536	L1476	M1416	T1356	D1295	M1296	PHE	F1060	F1060	F1060	LEU	LEU
L1597	L1537	F1477	S1417	C1358	M1296	P1297	SER	M1001	M1001	M1001	GLY	LEU
L1598	K1538	L1478	I1418	C1359	M1297	L1298	ASN	K1061	K1061	K1061	VAL	LEU
E1599	M1539	S1479	I1419	Q1360	E1299	L1299	GLY	E1002	E1002	E1002	LEU	THR
M1600	T1540	T1480	L1420	V1361	S1300	V1297	VAL					
V1601	D1541	L1481	D1421	L1362	K1301	S1302	LEU					
D1602	K1542	E1482	V1422	L1362	S1302	S1302	LEU					



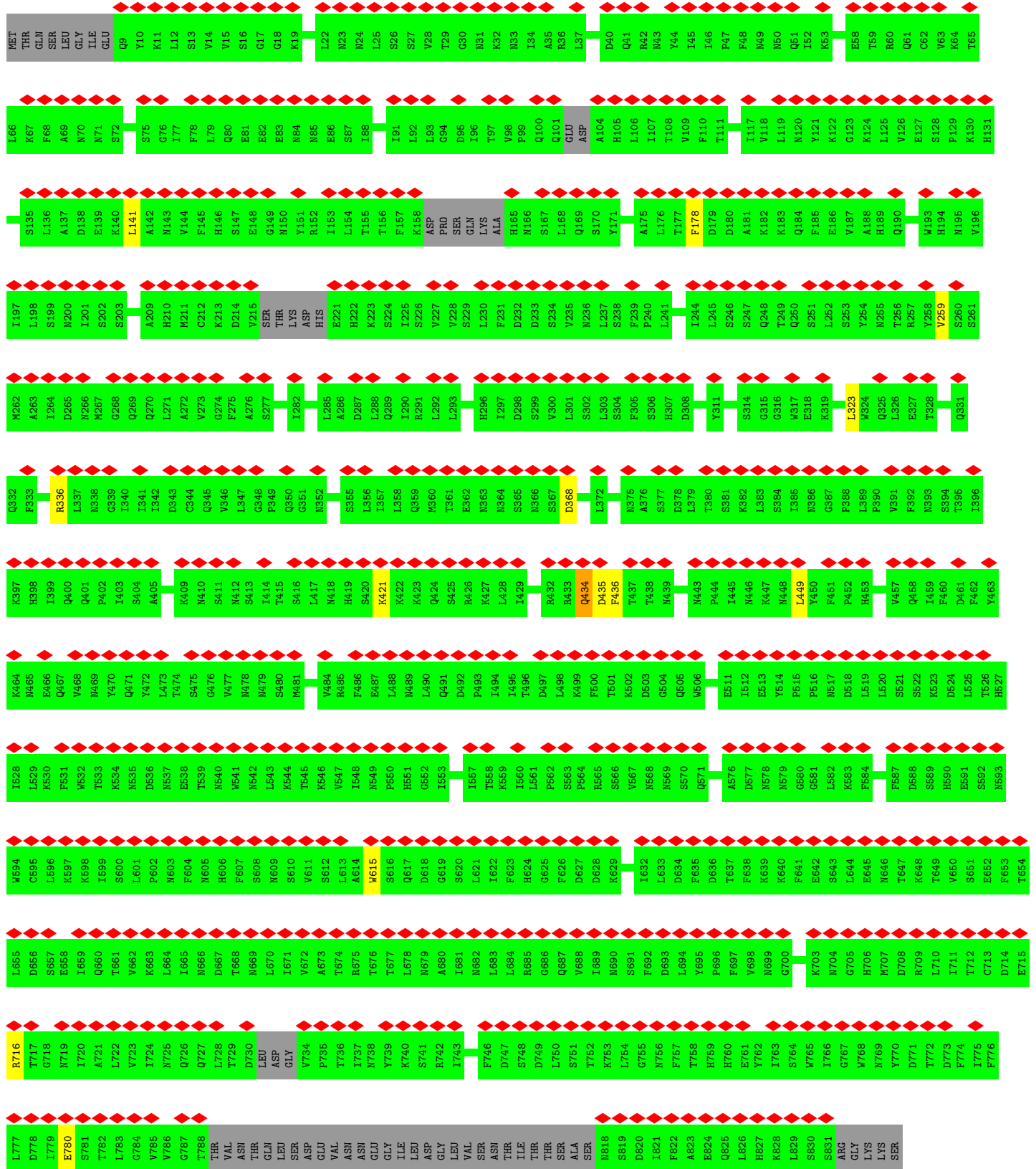
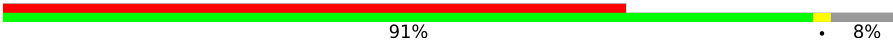
• Molecule 30: U3 small nucleolar RNA-associated protein 15

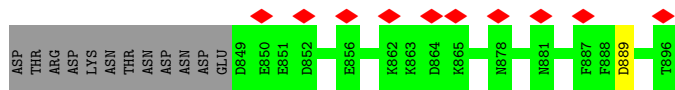


• Molecule 31: NET1-associated nuclear protein 1

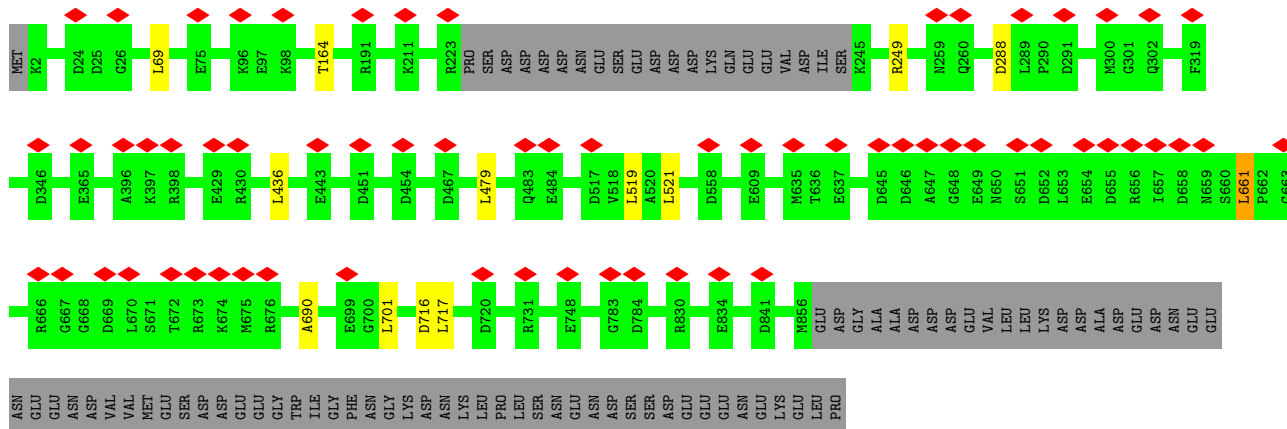
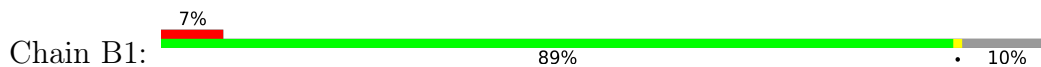
70%

Chain AG:

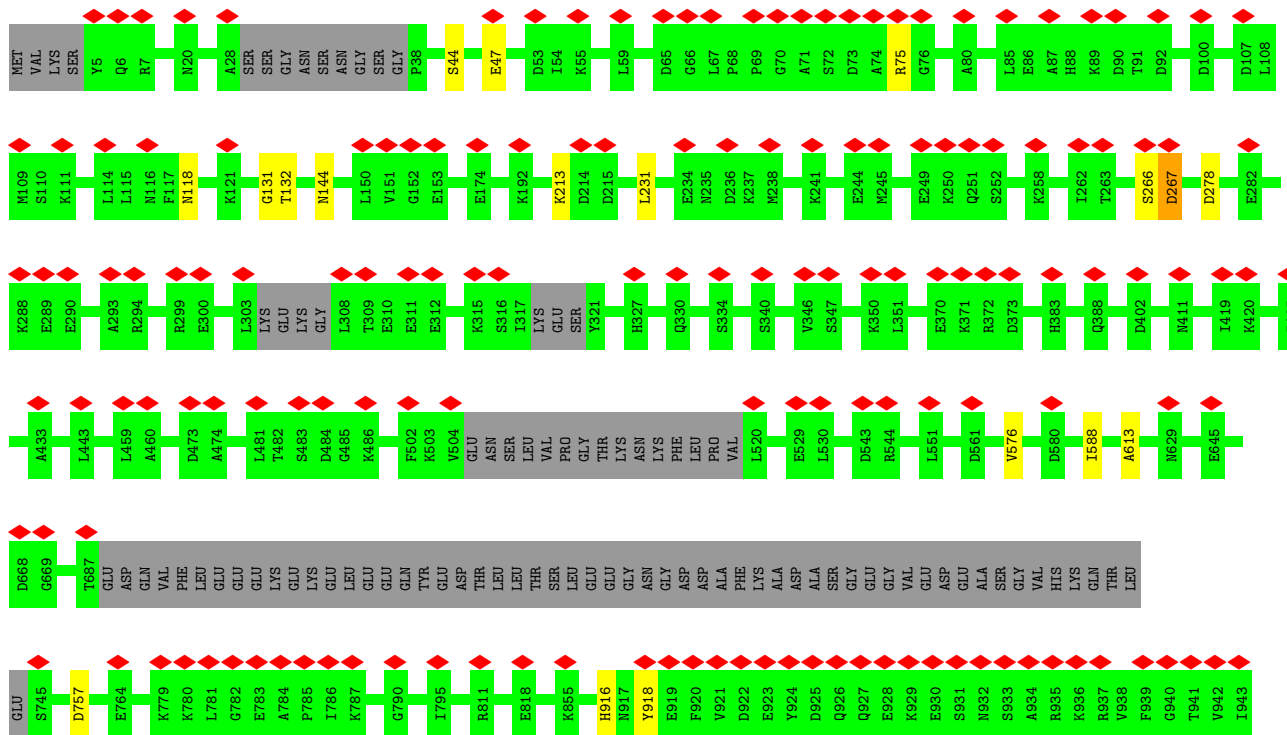
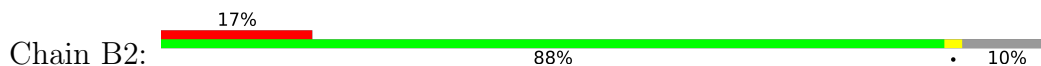




• Molecule 32: Periodic tryptophan protein 2

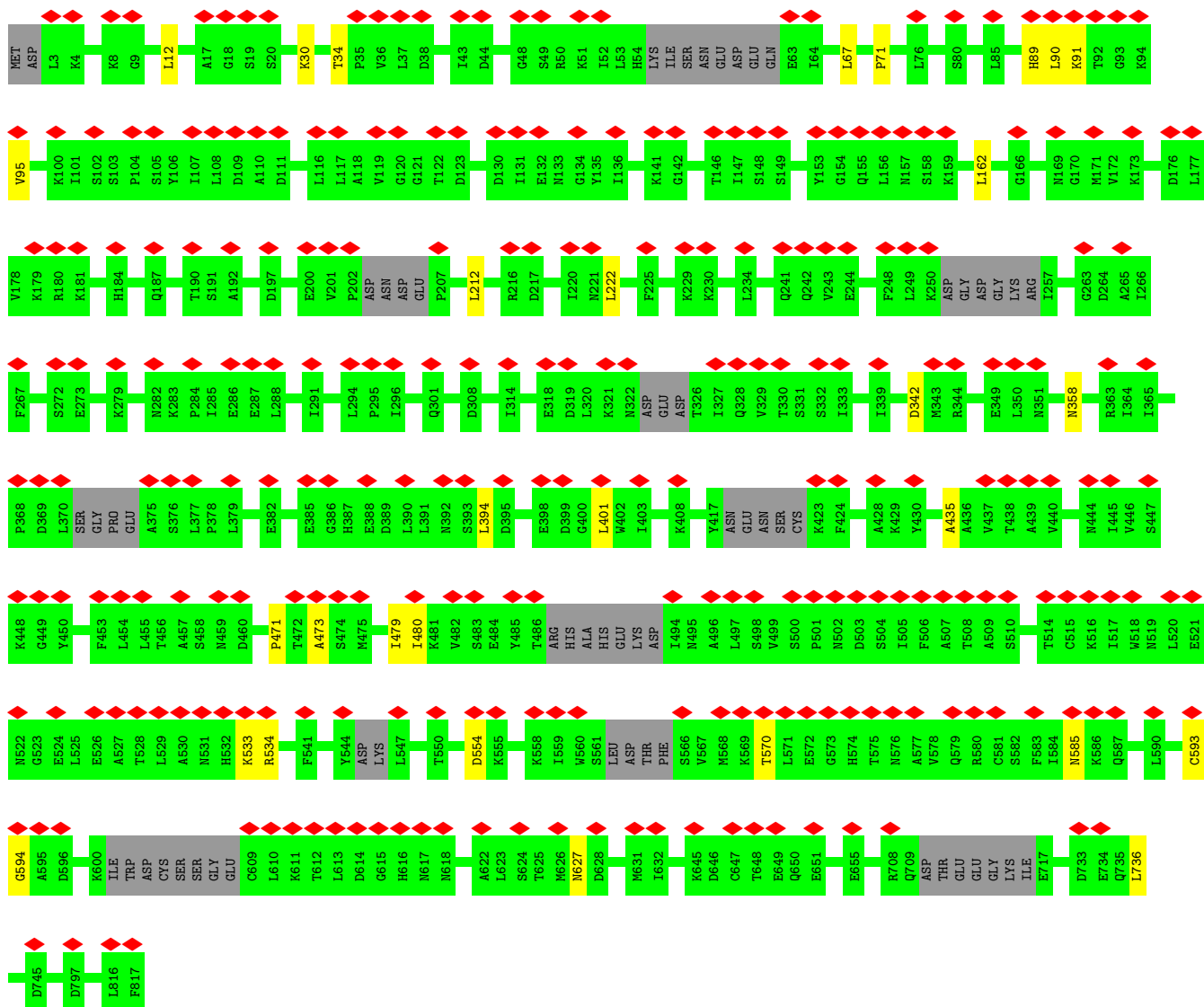


• Molecule 33: U3 small nucleolar RNA-associated protein 12

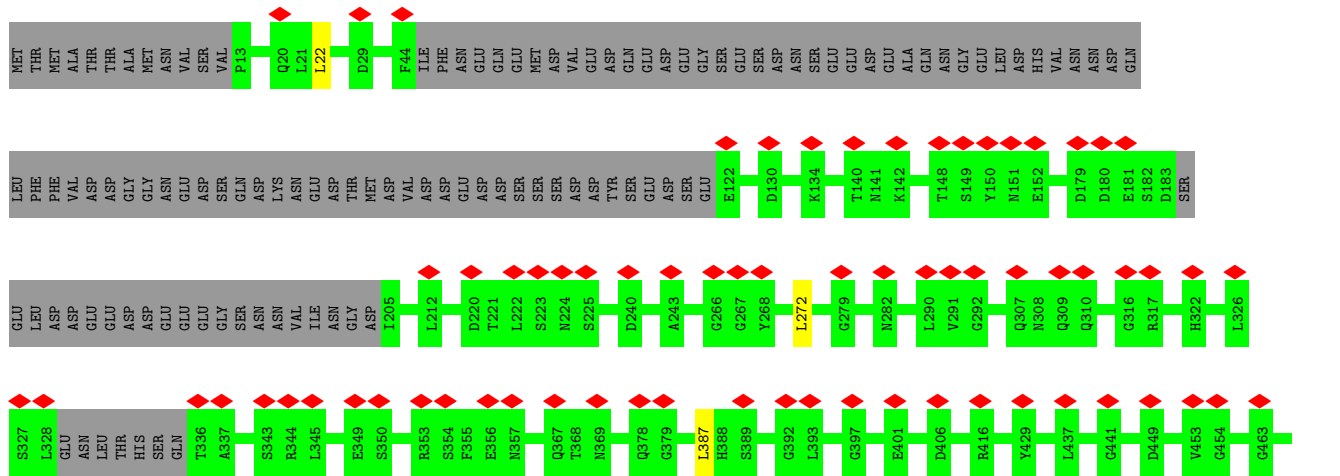
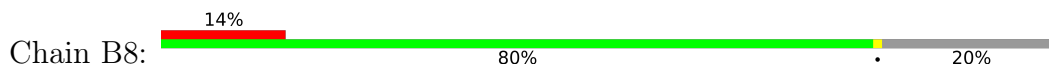


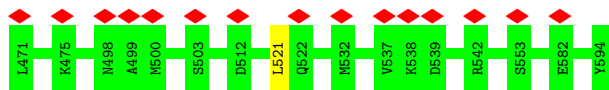
• Molecule 34: U3 small nucleolar RNA-associated protein 13



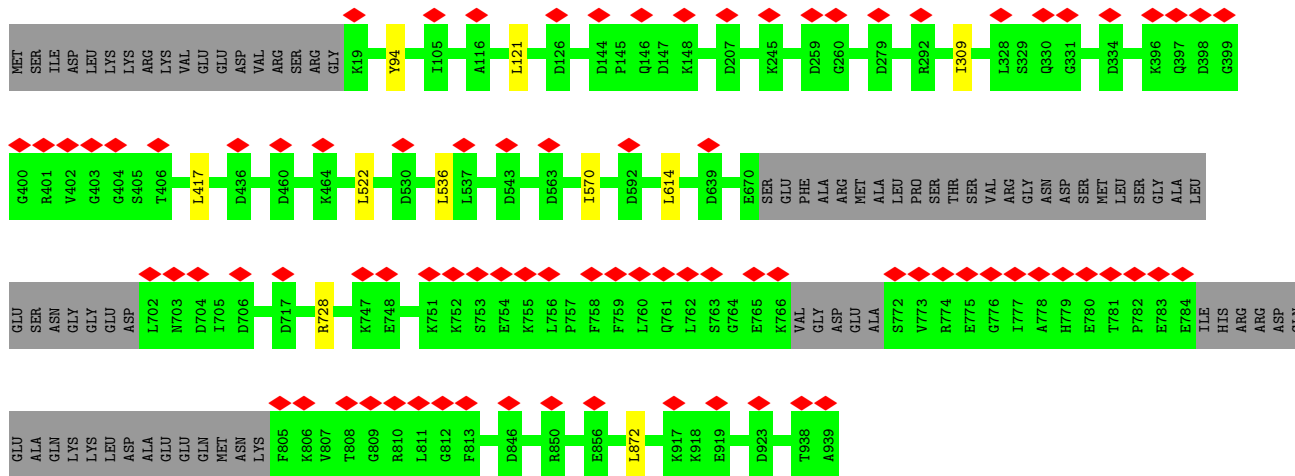
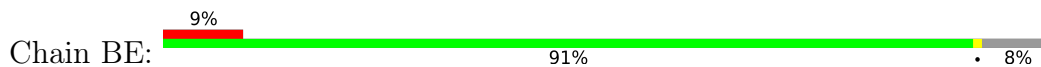


• Molecule 35: U3 small nucleolar RNA-associated protein 18

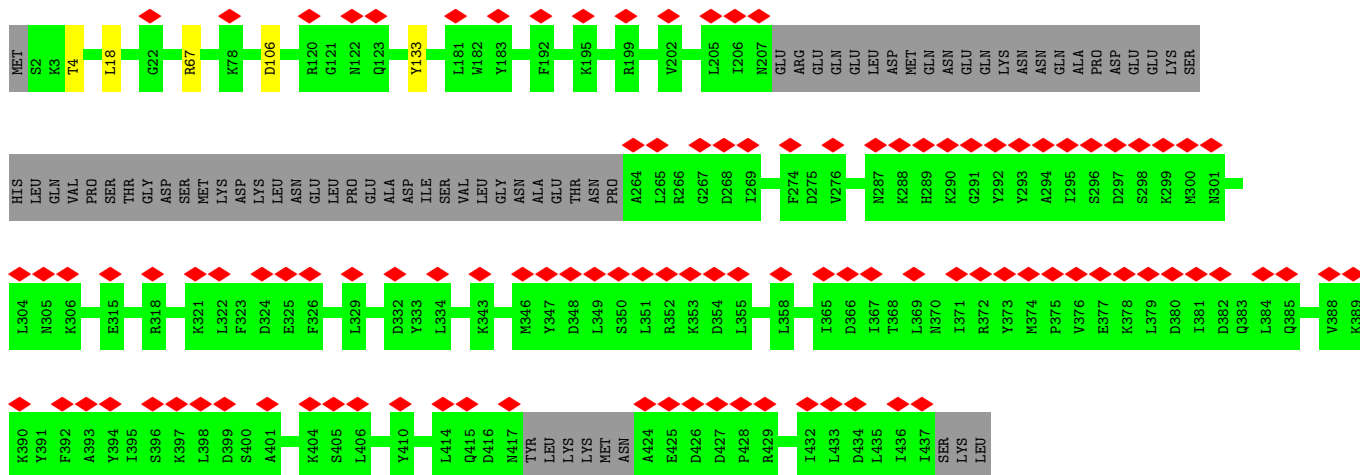
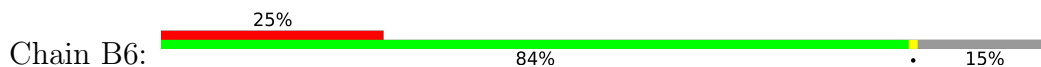




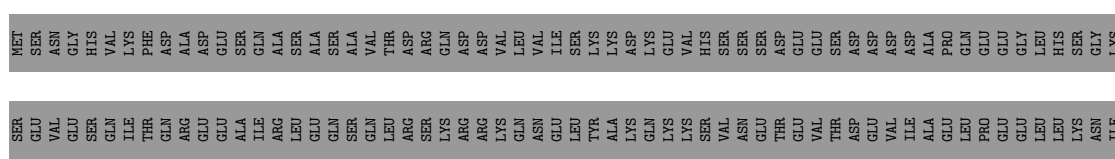
• Molecule 36: U3 small nucleolar RNA-associated protein 21

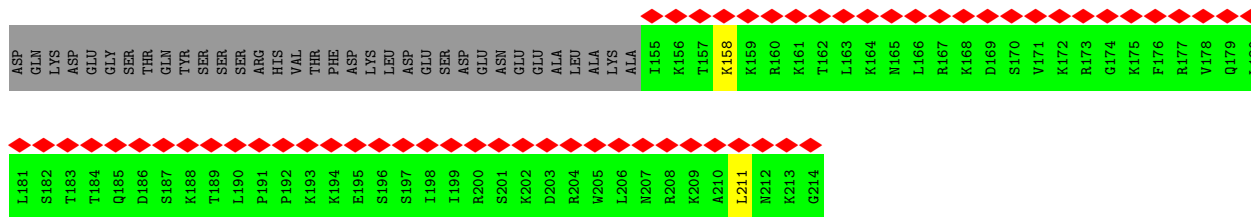


• Molecule 37: U3 small nucleolar RNA-associated protein 6

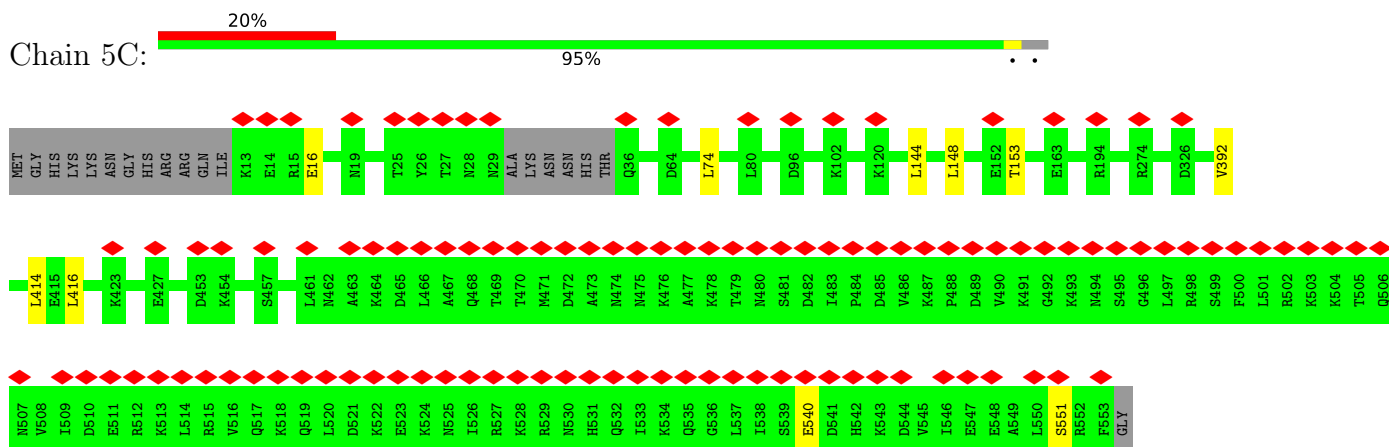


• Molecule 38: Bud site selection protein 21

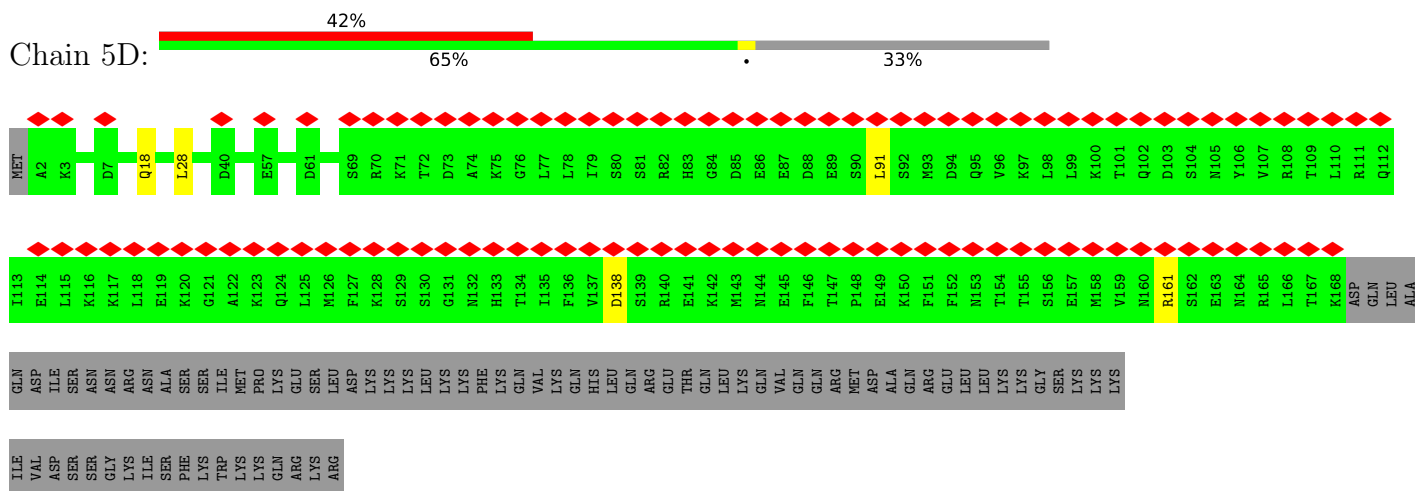




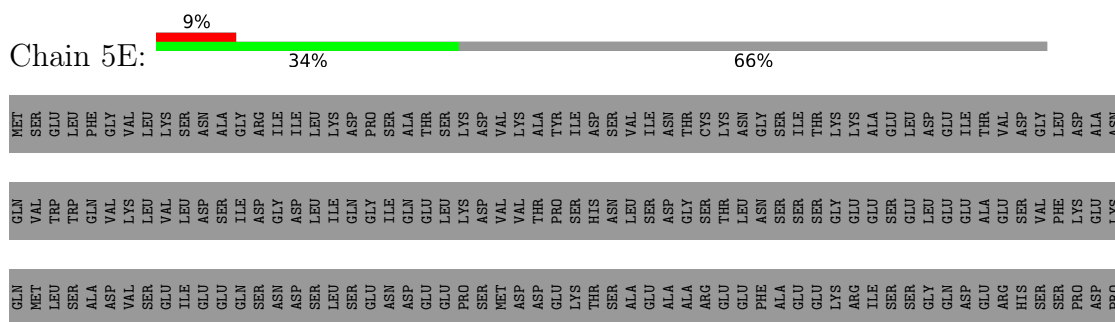
• Molecule 39: U3 small nucleolar RNA-associated protein 7

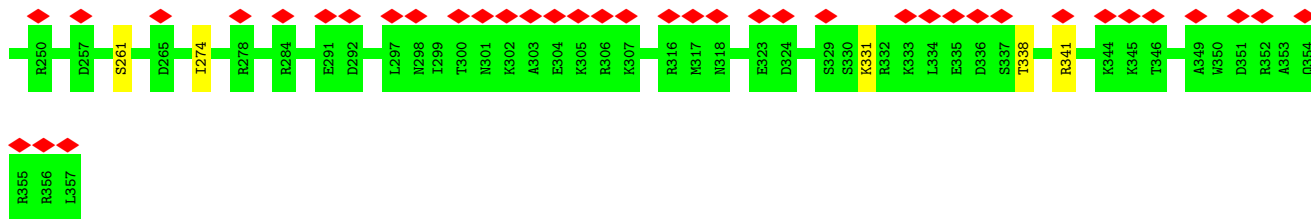


• Molecule 40: U3 small nucleolar RNA-associated protein 11

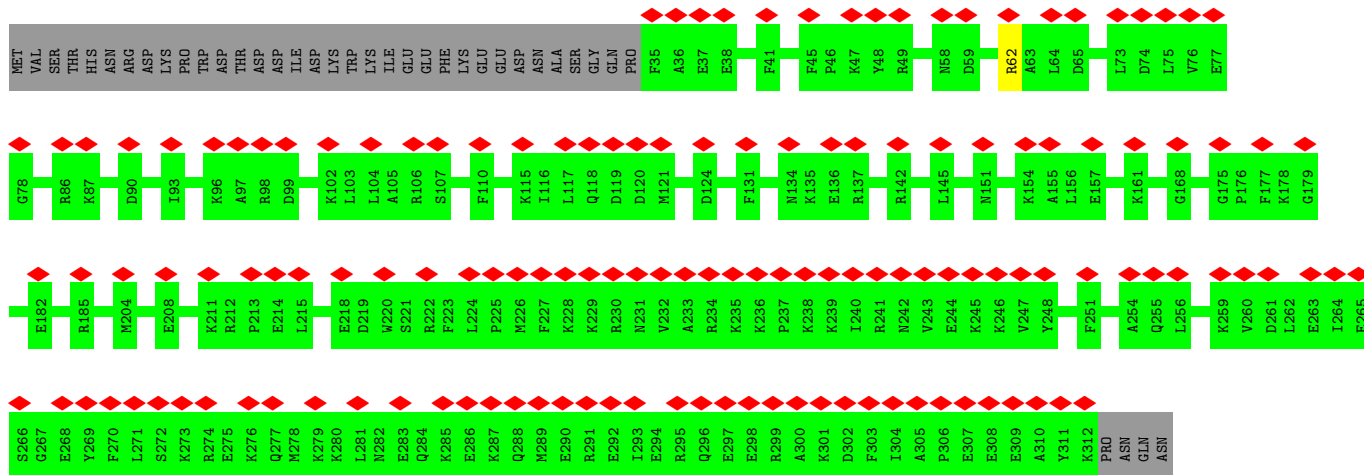
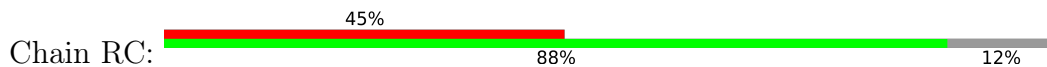


• Molecule 41: U3 small nucleolar RNA-associated protein MPP10

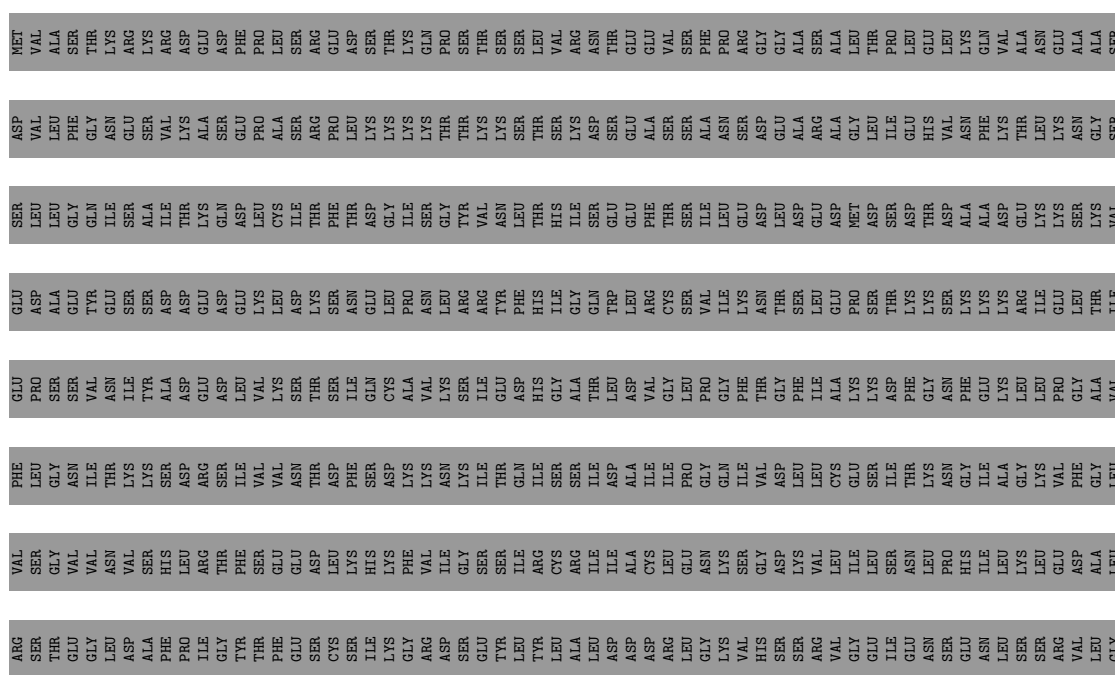


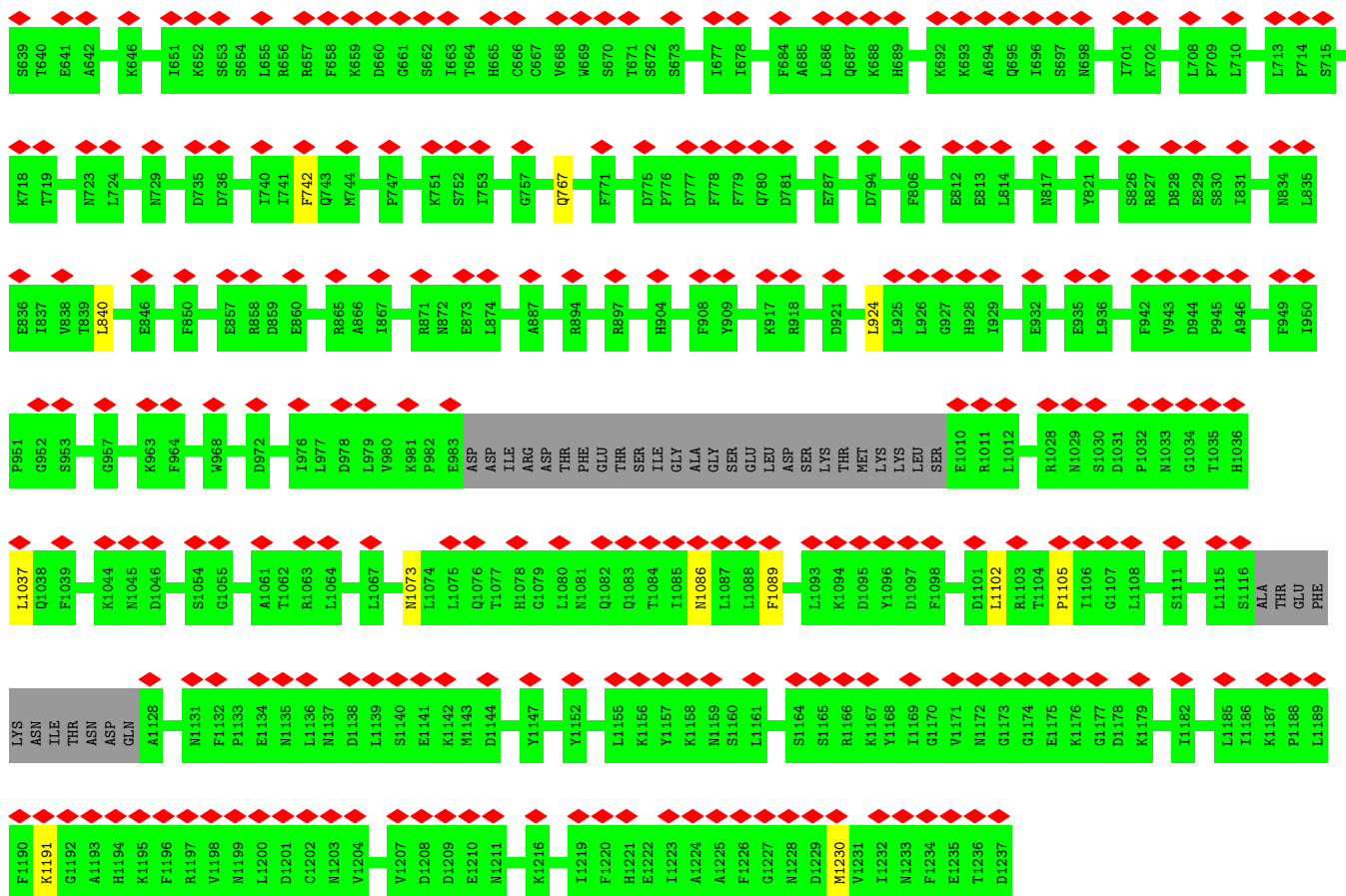


• Molecule 50: KRR1 small subunit processome component

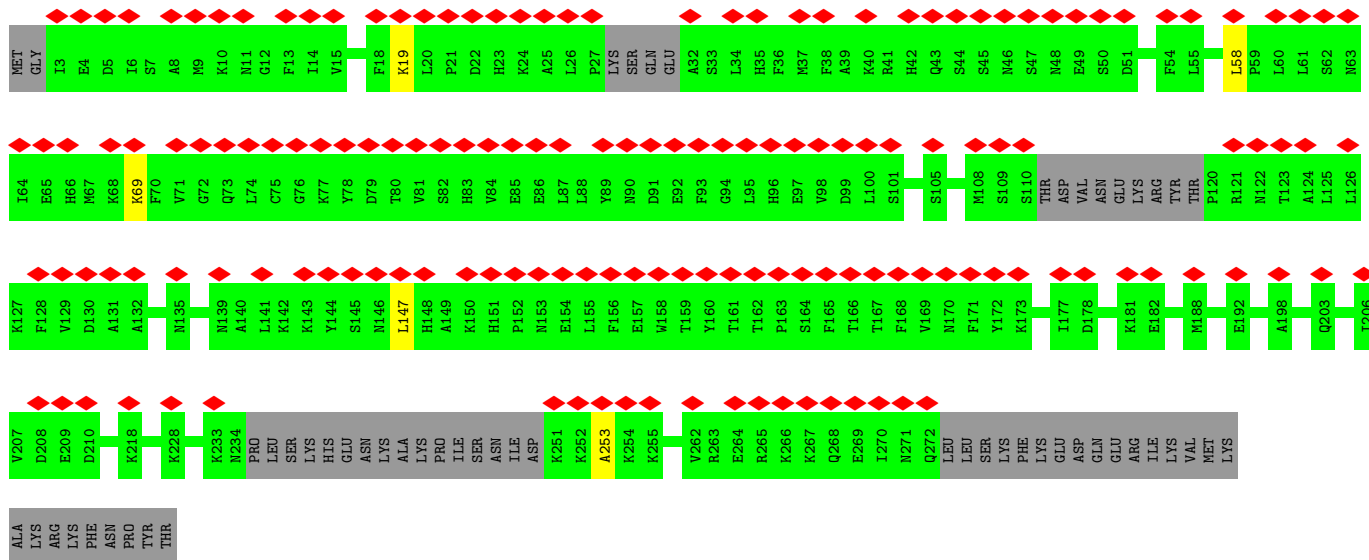
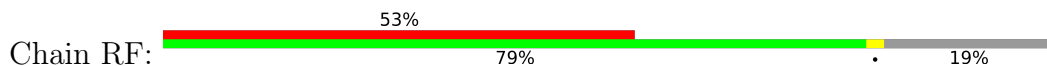


• Molecule 51: rRNA biogenesis protein RRP5

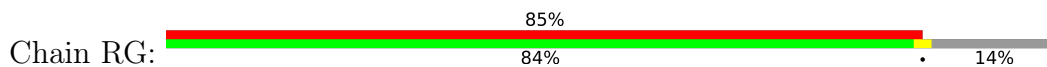


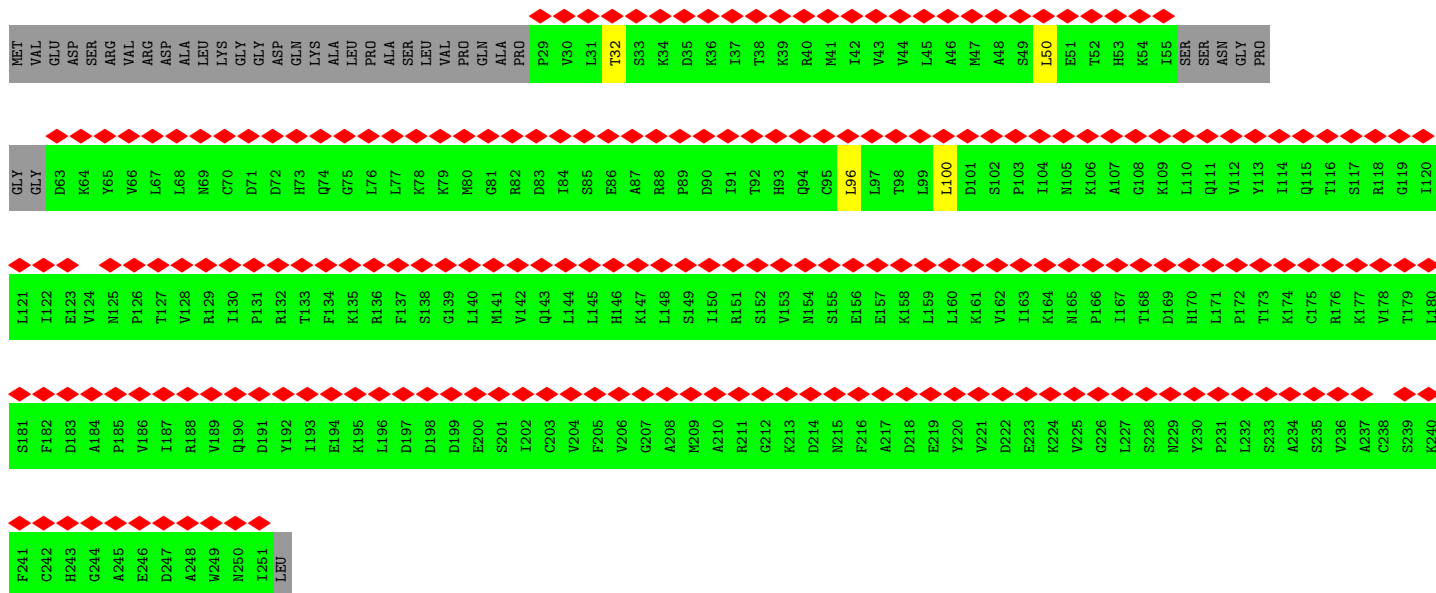


• Molecule 53: Ribosomal RNA-processing protein 7

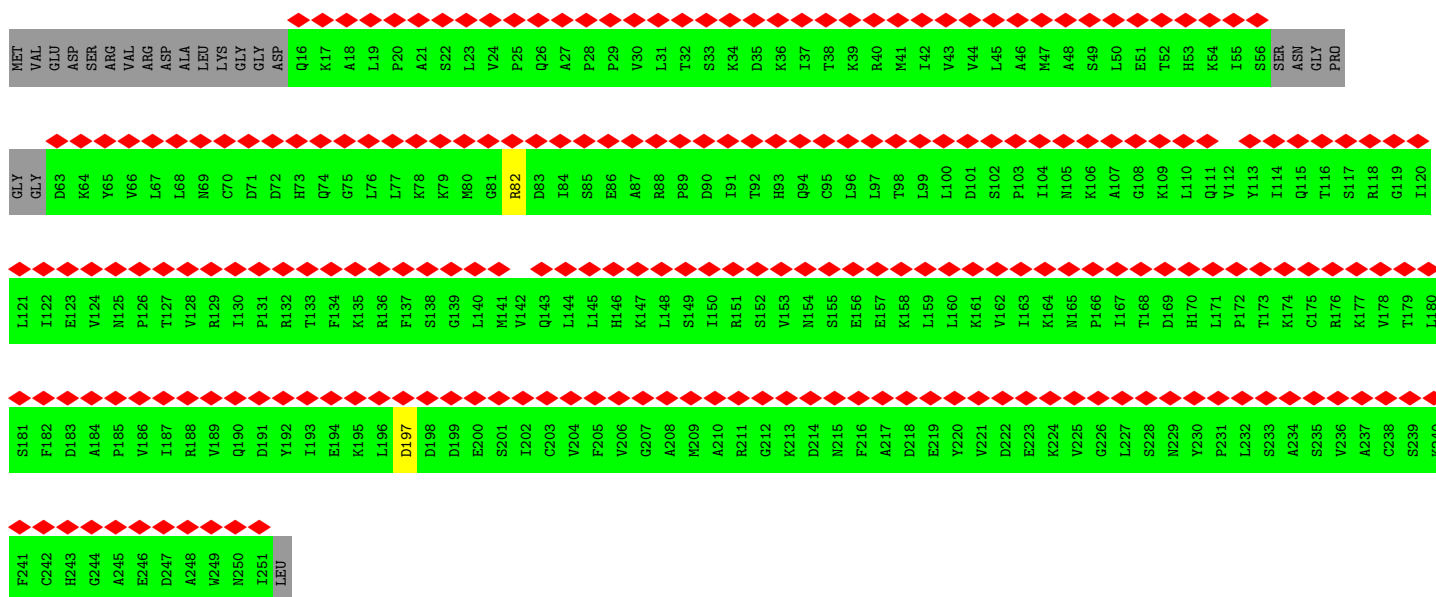


• Molecule 54: Ribosomal RNA small subunit methyltransferase NEP1

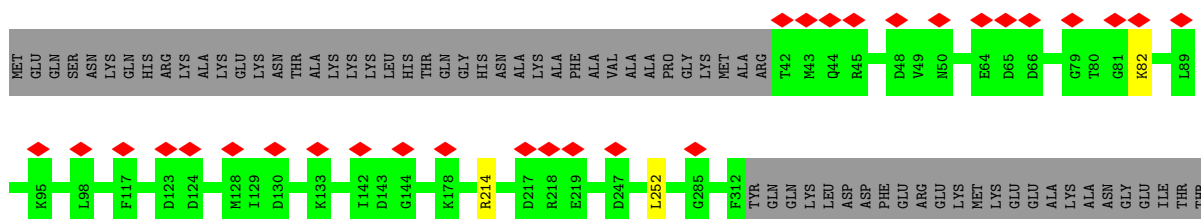


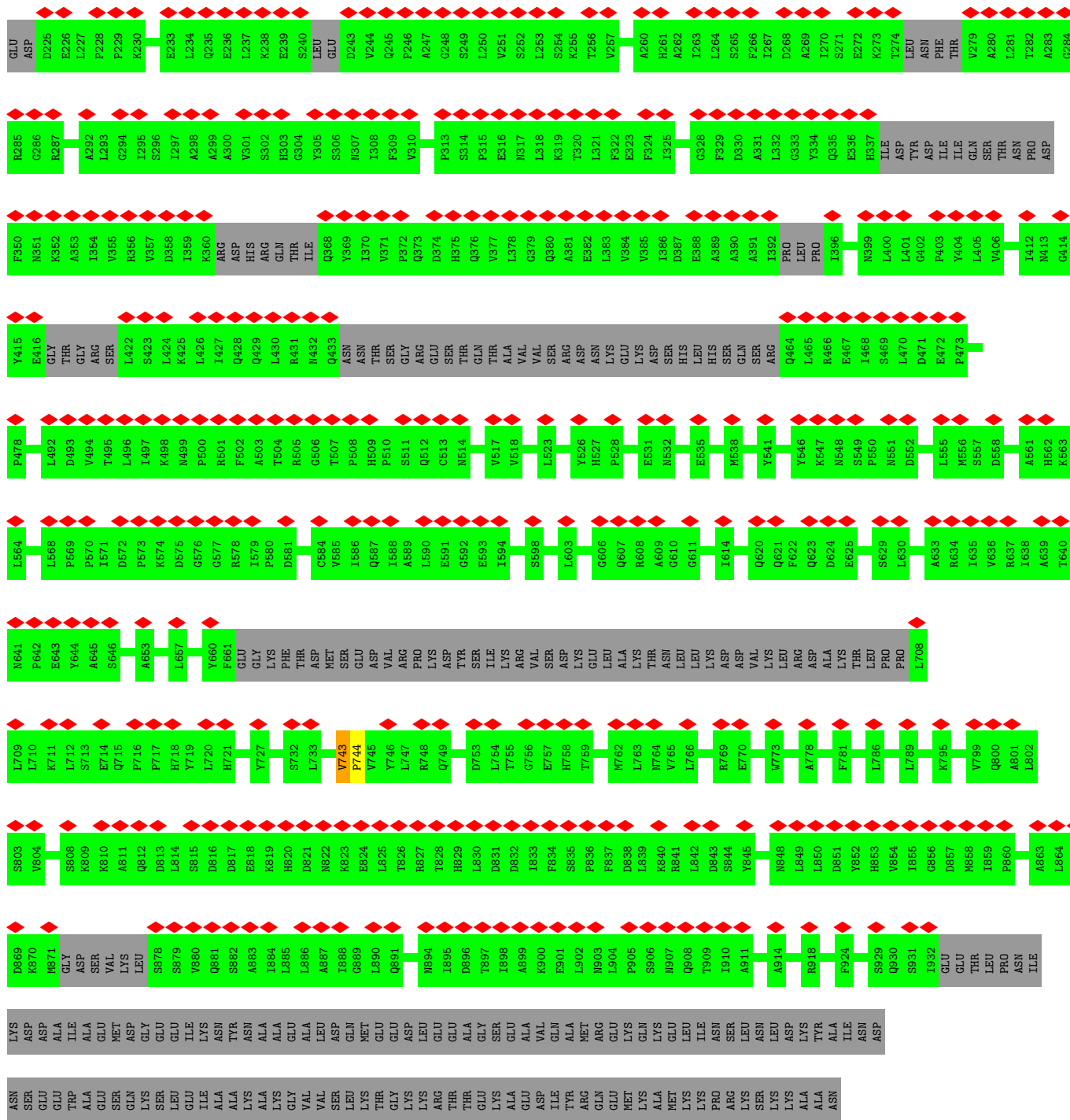


• Molecule 54: Ribosomal RNA small subunit methyltransferase NEP1

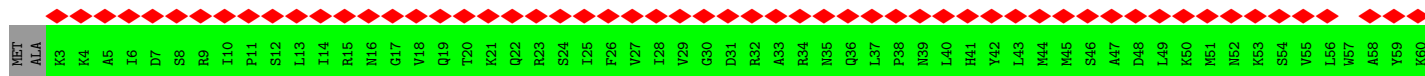
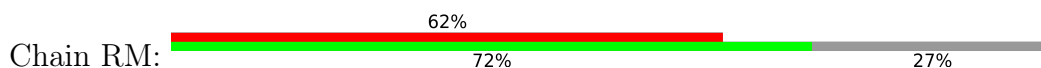


• Molecule 55: Ribosome biogenesis protein BMS1

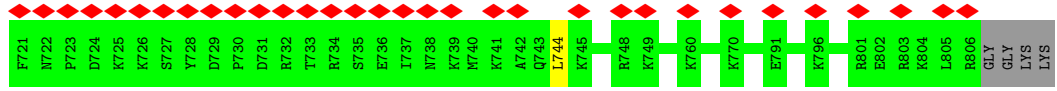




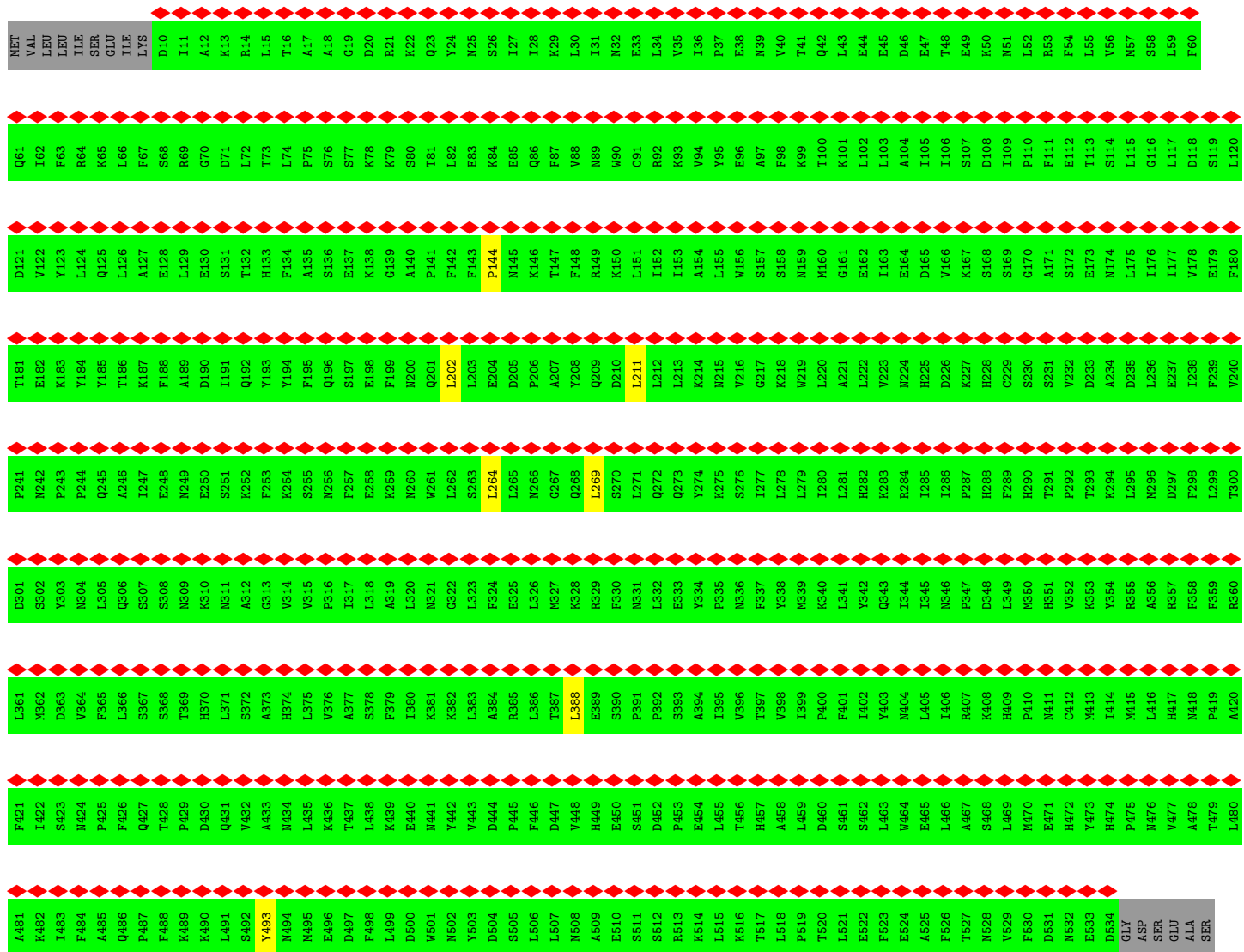
● Molecule 57: RNA cytidine acetyltransferase



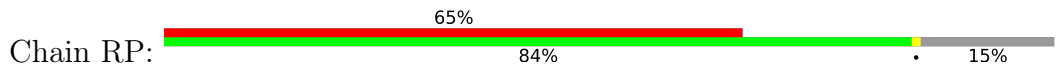
K61	K62	L63	L64	G65	F66	THR	SER	HIS	HIS	ARG	ARG	LYS	LYS	ARG	GLU	ASN	ASN	LYS	ILE	LYS	LYS	LYS	GLY	LYS	ARG	THR	THR	ARG	VAL	VAL	ASN	GLU	MET	D92	P93	F94	E95	S96	F97	I98	S99	N100	Q101	N102	I103	R104	Y105	V106	Y107	Y108	K109	E110	S111	E112	K113	I114	L115	G116	N117	T118	Y119	G120		
M121	C122	I123	L124	Q125	D126	F127	E128	A129	A129	L130	T131	P132	N133	L134	L135	A136	R137	T138	L139	V200	E140	T141	V142	E143	G144	G145	G146	I147	V148	V149	I150	L151	L152	K153	S154	M155	S156	S157	K217	L158	K159	Q160	L161	Y162	T163	M164	T165	E110	E226	P228	P229	V168	H169	A170	R171	Y172	ARG	THR	GLU	ALA	HIS	GLY	ASP	V180
V181	A182	R183	F184	N185	E186	R187	F188	I189	L190	S191	L192	G193	S194	N195	P196	C197	C198	L199	V200	D201	V202	D203	E204	L205	N206	V207	L208	P209	L210	S211	G212	A213	K214	N215	V216	K217	P218	LEU	PRO	ASP	PRO	LYS	GLU	D224	D225	E226	P228	P229	K230	Q231	L232	E233	L234	Q235	E236	L237	K238	E239	SER					
LEU	GLU	D243	V244	Q245	P246	A247	G248	S249	L250	V251	S252	L253	S254	K255	T256	N258	Q259	H261	A262	I263	L264	S265	F266	I267	D268	A269	I270	S271	E272	K273	T274	LEU	ASN	PHE	THR	V279	A280	L281	T282	A283	G284	R285	G286	R287	G288	K289	S290	A291	A292	L293	G294	I295	S296	I297	A298	A299	A300							
V301	S302	H303	G304	Y305	S306	N307	I308	F309	V310	T311	S312	F313	S314	F315	E316	N317	L318	K319	T320	L321	F322	E323	F324	S325	F326	K327	G328	F329	D330	A331	L332	G333	Y334	Q335	K336	H337	ILE	TRP	ASP	ASP	ILE	ILE	GLN	SER	THR	ASN	ASP	PHE	LYS	ALA	I354	V355	R356	V357	D358	I359	K360							
ARG	ASP	HIS	ARG	GLN	THR	ILE	Q368	Y369	I370	V371	P372	Q373	D374	H375	Q376	V377	L378	G379	Q380	A381	E382	L383	V384	V385	I386	D387	E388	A389	A390	A391	I392	PRO	LEU	LEU	I396	V397	K398	N399	L400	L401	G402	P403	Y404	L405	V406	F407	M408	A409	S410	T411	I412	M413	G414	T415	GLY	THR	GLY	ARG						
SER	L422	S423	L424	K425	L426	L427	Q428	Q429	L430	R431	M432	Q433	ASN	ASN	THR	THR	GLY	ARG	GLU	SER	THR	THR	ALA	VAL	VAL	ARG	ASP	ASN	LYS	GLU	ASP	SER	HIS	LEU	HIS	SER	GLN	SER	ARG	GLN	LEU	ARG	E467	I468	S469	L470	D471	E472	P473	I474	R475	Y476	A477	P478	D480									
P481	L482	E483	K484	W485	L486	N487	K488	L489	L490	C491	L492	D493	V494	T495	L496	L497	K498	M499	P500	R501	F502	A503	T504	F505	G506	T507	P508	H509	P510	S511	Q512	C513	N514	L515	F516	V517	V518	N519	R520	D521	F524	S525	V526	H527	P528	V529	S530	E531	N532	F533	L534	E535	K536	M537	M538	A539	L540	Y541						
W542	S543	S544	H545	W546	K547	N548	S549	P550	N551	D552	L553	Q554	M555	M556	S557	D558	A559	P560	A561	H562	K563	L564	F565	U566	P569	F570	D572	P573	A574	D575	G576	G577	A578	I579	P580	D581	L582	L583	C584	V585	I586	Q587	I588	A589	LEU	GLU	G592	E593	L594	S595	K596	E597	S598	V599	R600	N601	S602							
L603	S604	R605	G606	Q607	R608	G610	G611	D612	L613	I614	F615	W616	L617	L618	S619	Q620	Q621	F622	D624	E625	E626	F627	A628	S629	L630	G632	A633	R634	L635	W636	R637	I638	A639	T640	N641	E643	Y644	A645	S646	M647	G648	V649	G650	S651	R652	A653	T654	E655	L656	L657	R658	D659	Y660	F661	GLU									
GLY	LYS	PHE	THR	ASP	MET	SER	GLU	VAL	ARG	PRO	LYS	ASP	TYR	SER	ILE	LYS	ARG	VAL	SER	ASP	LYS	GLU	LEU	ALA	THR	ASN	ASN	LEU	LEU	LYS	ASP	ASP	VAL	LYS	ARG	ALA	E674	Q715	P716	F717	H718	Y719	L720	H721	Y722	L723																		
G724	V725	S726	Y727	G728	L729	T730	T731	S732	P743	W744	W745	R748	Q749	T750	A751	N752	D753	L754	T755	G756	E757	H758	T759	C760	W761	L766	E767	G768	R769	E770	S771	N772	W773	L774	W775	K779	D780	K783	L789	S790	H794	K795	F796	T797	A798	V799	Q800	A801	L802	S803	E806													
S807	K809	K810	A811	Q812	D813	L814	S815	D816	D817	E818	K819	D821	K823	E824	L825	T826	R827	T828	H829	L830	D831	D832	I833	F834	S835	L839	K840	R841	L842	D843	D851	Y852	I855	M858	L859	A863	L864	L865	Y866	K870	GLY	ASP	SER	VAL	LYS	LEU	S878	S879	V880															
Q881	S882	A883	L884	L885	L886	A887	Q891	N894	I895	D896	T897	I898	E901	L902	N903	L904	P905	T909	R918	S921	S929	Q930	S931	I932	L839	GLU	THR	LEU	PRO	ASN	ASN	ILE	LYS	LYS	ASP	ASP	ALA	ALA	ALA	GLU	GLU	GLU	ILE	LYS	ASN	TYR	ALA	ALA	ALA	GLU	ALA													



• Molecule 59: Nucleolar complex protein 4

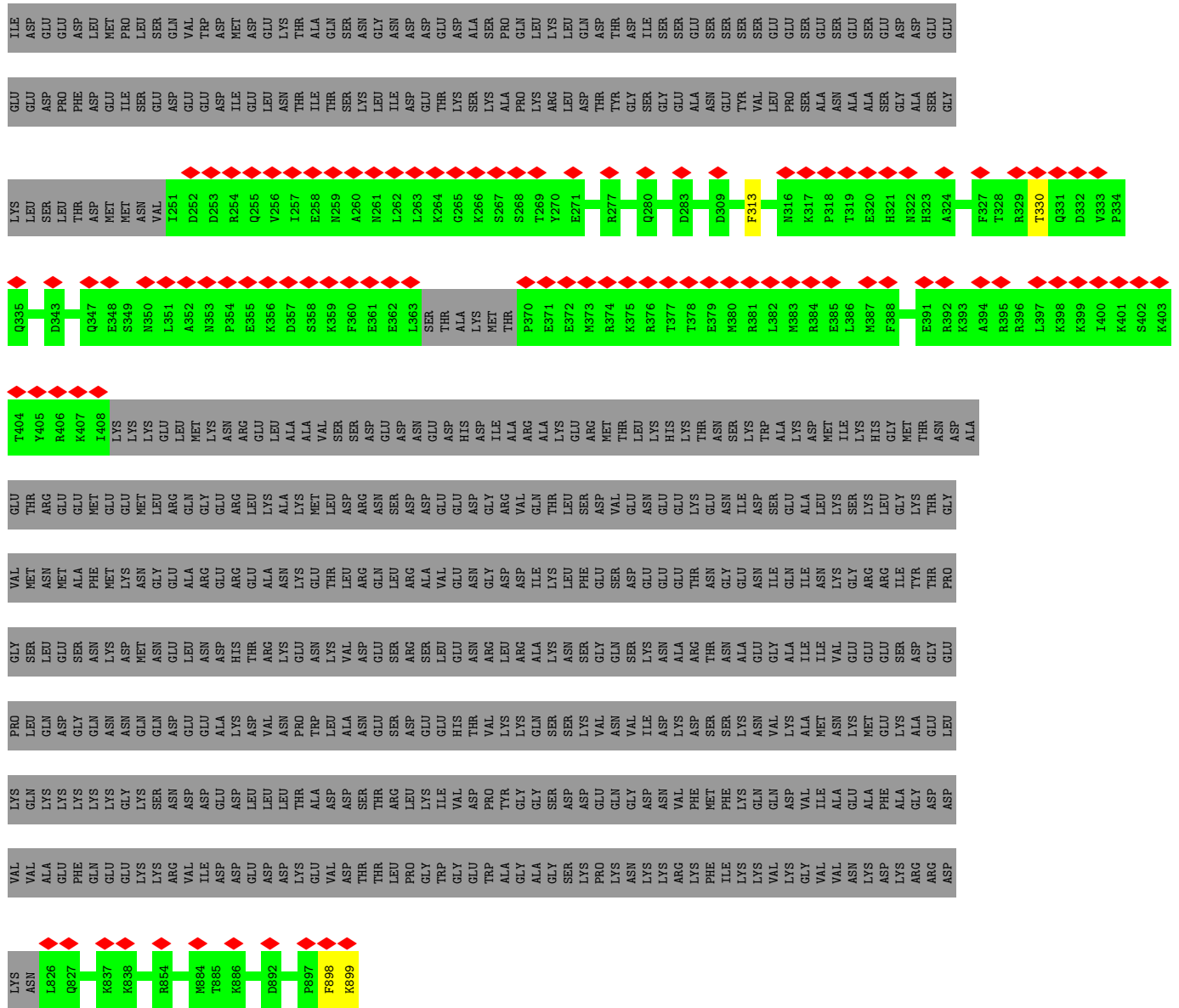


• Molecule 60: U3 small nucleolar RNA-associated protein 20

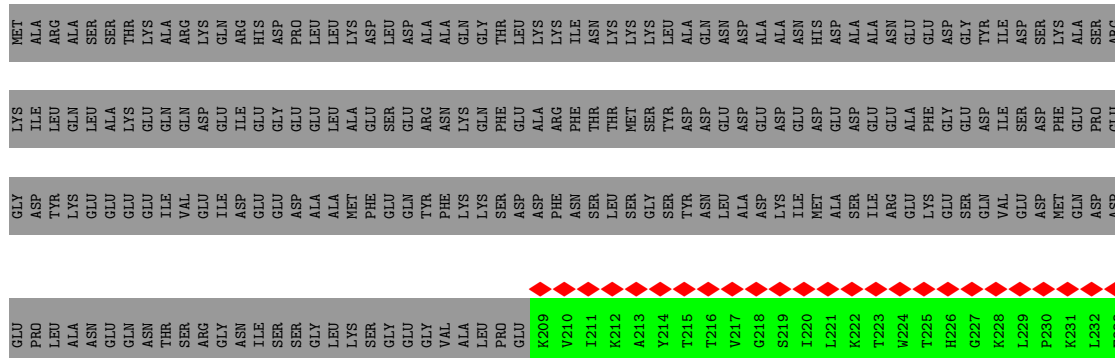


F83	T64	E187	F83	Y125	E126	E127	A128	A67	A68	E69	I70	E71	H72	D73	V74	T76	L77	P78	Q79	I80	L81	Y82	H83	D84	K85	K86	I87	F88	N89	S90	L91	V92	S93	F94	I95	Q104	L107	D108	L109	L110	A111	Q112	F113	C114	H115	D116	L117	G118	P119	D120	F121	L122	K123	F124																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Y125	E126	E127	A128	A67	A68	E69	I70	E71	H72	D73	V74	T76	L77	P78	Q79	I80	L81	Y82	H83	D84	K85	K86	I87	F88	N89	S90	L91	V92	S93	F94	I95	Q104	L107	D108	L109	L110	A111	Q112	F113	C114	H115	D116	L117	G118	P119	D120	F121	L122	K123	F124																																																																																																																																																																																																																																																																																																																																																																																																																																																																
E186	Y187	L188	R189	F190	M191	S192	A193	L194	A195	L196	S197	F198	L199	V200	R201	C202	C203	P204	V205	S206	N207	L208	F209	E210	R213	S214	V215	F216	K218	L219	E220	G221	A222	S223	T224	L228	Y229	E230	G231	L232	L233	I234	T237	E238	S239	M240	L241	E245	T246	L247	H248	S249																																																																																																																																																																																																																																																																																																																																																																																																																																																														
K250	A251	K252	A253	L254	M255	S256	V257	L258	L259	H260	E261	F262	L263	T264	K265	S266	S267	P268	E269	R270	S271	V272	S273	L274	D277	I278	W279	M280	N281	E282	S283	K284	Y285	A286	S287	L288	F289	C290	S291	L292	P293	V294	Y295	E296	V297	M298	Y299	Q300	D301	F302	N303	S304	S305	A306	A307	A308	A309	A310	A311	A312	A313	A314	A315	A316	A317	A318	A319	A320	A321	A322	A323	A324	A325	A326	A327	A328	A329	A330	A331	A332	A333	A334	A335	A336	A337	A338	A339	A340	A341	A342	A343	A344	A345	A346	A347	A348	A349	A350	A351	A352	A353	A354	A355	A356	A357	A358	A359	A360	A361	A362	A363	A364	A365	A366	A367	A368	A369	A370	A371	A372	A373	A374	A375	A376	A377	A378	A379	A380	A381	A382	A383	A384	A385	A386	A387	A388	A389	A390	A391	A392	A393	A394	A395	A396	A397	A398	A399	A400	A401	A402	A403	A404	A405	A406	A407	A408	A409	A410	A411	A412	A413	A414	A415	A416	A417	A418	A419	A420	A421	A422	A423	A424	A425	A426	A427	A428	A429	A430	A431	A432	A433	A434	A435	A436	A437	A438	A439	A440	A441	A442	A443	A444	A445	A446	A447	A448	A449	A450	A451	A452	A453	A454	A455	A456	A457	A458	A459	A460	A461	A462	A463	A464	A465	A466	A467	A468	A469	A470	A471	A472	A473	A474	A475	A476	A477	A478	A479	A480	A481	A482	A483	A484	A485	A486	A487	A488	A489	A490	A491	A492	A493	A494	A495	A496	A497	A498	A499	A500	A501	A502	A503	A504	A505	A506	A507	A508	A509	A510	A511	A512	A513	A514	A515	A516	A517	A518	A519	A520	A521	A522	A523	A524	A525	A526	A527	A528	A529	A530	A531	A532	A533	A534	A535	A536	A537	A538	A539	A540	A541	A542	A543	A544	A545	A546	A547	A548	A549	A550	A551	A552	A553	A554	A555	A556	A557	A558	A559	A560	A561	A562	A563	A564	A565	A566	A567	A568	A569	A570	A571	A572	A573	A574	A575	A576	A577	A578	A579	A580	A581	A582	A583	A584	A585	A586	A587	A588	A589	A590	A591	A592	A593	A594	A595	A596	A597	A598	A599	A600	A601	A602	A603	A604	A605	A606	A607	A608	A609	A610	A611	A612	A613	A614	A615	A616	A617	A618	A619	A620	A621	A622	A623	A624	A625	A626	A627	A628	A629	A630	A631	A632	A633	A634	A635	A636	A637	A638	A639	A640	A641	A642	A643	A644	A645	A646	A647	A648	A649	A650	A651	A652	A653	A654	A655	A656	A657	A658	A659	A660	A661	A662	A663	A664	A665	A666	A667	A668	A669	A670	A671	A672	A673	A674	A675	A676	A677	A678	A679	A680	A681	A682	A683	A684	A685	A686	A687	A688	A689	A690	A691	A692	A693	A694	A695	A696	A697	A698	A699	A700	A701	A702	A703	A704	A705	A706	A707	A708	A709	A710	A711	A712	A713	A714	A715	A716	A717	A718	A719	A720	A721	A722	A723	A724	A725	A726	A727	A728	A729	A730	A731	A732	A733	A734	A735	A736	A737	A738	A739	A740	A741	A742	A743	A744	A745	A746	A747	A748	A749	A750
D893	L896	D899	E900	I901	T902	T903	F904	L905	T906	E907	N908	G909	S910	O911	S912	I913	K914	A915	E916	D917	E918	K919	V920	V921	M922	P923	Y924	I928	R932	A933	Q934	V935	P936	P937	T938	S939	Q940	Q941	K942	R943	S944	R945	K946	A948	V949	I950	S951	V952	L953	P954	N955	I961																																																																																																																																																																																																																																																																																																																																																																																																																																																														

K1749	S1750	Y1751	G1754	E1755	L1756	L1757	A1758	S1759	M1760	Y1692	H1695	Y1696	M1701	H1702	G1703	V1704	L1705	K1706	H1707	S1708	D1709	L1710	D1711	T1712	S1713	M1716	K1719	I1720	E1723	M1724	I1725	F1726	G1727	F1728	A1729	G1730	E1731	E1732	K1733	D1734	S1735	E1736	M1737	Y1738	H1739	T1740	K1741	V1742	K1743	E1744	I1745	K1746	S1747	M1748								
P1611	I1612	A1613	E1614	V1617	M1618	L1619	V1620	L1621	T1624	N1625	D1626	D1627	L1628	T1629	M1630	F1631	P1633	S1634	K1635	F1635	L1636	C1640	Q1641	V1642	L1643	L1644	S1645	K1646	S1647	E1648	L1649	L1650	L1651	D1652	A1653	V1654	R1655	V1656	I1663	I1664	L1665	E1668	Y1669	L1670	V1671	F1672	I1673	T1674	K1675	E1676	A1679	T1680	L1681									
K1682	R1683	G1684	S1685	K1686	I1687	H1688	V1689	L1690	S1691	Y1692	H1695	Y1696	M1701	H1702	G1703	V1704	L1705	K1706	H1707	S1708	D1709	L1710	D1711	T1712	S1713	M1716	K1719	I1720	E1723	M1724	I1725	F1726	G1727	F1728	A1729	G1730	E1731	E1732	K1733	D1734	S1735	E1736	M1737	Y1738	H1739	T1740	K1741	V1742	K1743	E1744	I1745	K1746	S1747	M1748								
I1489	E1490	H1491	V1492	V1493	F1494	S1495	D1496	D1497	E1498	R1499	Y1500	R1501	M1502	I1503	G1504	N1505	E1506	K1507	Q1508	I1509	A1510	I1511	G1512	G1513	Q1516	H1517	M1518	S1519	V1520	Q1522	Y1523	K1524	A1525	L1526	L1527	R1528	R1529	Y1530	I1531	S1532	M1533	L1534	K1535	T1536	F1537	P1538	M1539	Q1540	M1541	K1542	Q1543	A1544	V1545	I1546	P1547	I1548	I1549	VAL				
V1425	K1426	M1427	T1428	K1429	Y1430	F1431	T1432	D1433	D1436	T1439	L1440	L1441	V1442	M1443	G1444	D1445	E1446	A1447	A1448	D1449	PHE	PHE	THR	ASN	VAL	ASN	ASN	HIS	ILE	GLN	LEU	R1461	R1462	Q1463	R1464	A1465	I1466	K1467	E1471	H1472	A1473	H1474	Q1475	L1476	K1477	D1478	M1479	S1480	I1481	S1482	H1483	Y1484	L1485	I1486	P1487	M1488						
THR	ASN	ALA	SER	HIS	ALA	ILE	MET	PHE	ILE	D1376	F1377	L1378	E1380	K1381	P1382	M1383	L1384	M1385	A1386	A1387	S1388	K1389	S1390	I1391	S1392	M1393	L1394	K1395	D1396	I1397	L1398	L1399	P1400	M1401	I1402	R1403	I1404	G1405	L1406	R1407	D1408	S1409	L1410	ASN	ASN	GLY	GLU	GLN	VAL	SER	V1420	L1421	S1422	Y1423	M1424							
V1305	A1306	D1307	L1308	M1309	S1310	V1311	S1312	S1313	S1314	R1315	M1316	H1317	E1318	P1319	D1320	F1321	P1322	ARG	ILE	LEU	SER	THR	PHE	LYS	GLY	LEU	ILE	GLU	ASP	F1270	F1271	F1272	K1273	Y1274	F1275	D1276	E1277	R1278	N1279	L1280	R1281	I1282	S1283	L1284	T1285	E1286	L1287	F1288	I1289	E1290	G1291	L1292	K1293	E1294	E1297	L1298	S1300	I1301	S1302	K1303	L1304	
L1244	K1245	I1246	L1247	K1248	L1249	I1250	F1251	V1252	N1253	Y1254	N1255	C1256	W1258	S1259	D1260	I1261	E1262	E1263	L1264	Y1265	T1266	L1267	I1268	S1269	S1270	F1271	F1272	K1273	Y1274	F1275	D1276	E1277	R1278	N1279	L1280	R1281	I1282	S1283	L1284	T1285	E1286	L1287	F1288	I1289	E1290	G1291	L1292	K1293	E1294	E1297	L1298	S1300	I1301	S1302	K1303	L1304						
S1184	L1185	Y1186	V1187	K1188	L1189	S1190	D1191	S1192	M1193	S1194	I1195	S1196	T1197	M1198	L1199	M1200	L1201	L1202	V1203	S1204	I1205	T1206	E1207	M1208	G1209	F1210	I1211	Q1212	D1213	A1154	H1215	V1216	S1156	I1157	I1158	S1218	R1219	L1220	I1221	S1222	S1223	L1224	I1225	S1226	I1227	L1228	K1229	G1230	V1171	A1113	H1114	N1115	P1116	S1117	L1118	Y1119	C1177	D1239	T1240	Q1241	I1242	I1243
Y1123	Y1124	F1127	A1128	L1129	A1130	T1131	L1132	L1133	M1134	L1135	E1067	F1068	F1073	D1074	W1075	S1076	T1077	S1078	Y1083	A1084	V1085	V1086	V1087	K1088	P1149	I1150	I1151	E1152	A1153	A1154	D1155	S1156	I1157	I1158	N1098	L1099	Q1100	S1103	S1104	L1105	L1109	F1110	Y1111	W1112	A1113	H1114	N1115	P1116	S1117	L1118	Y1119	C1177	D1239	T1240	Q1241	I1242	I1243					
R1055	Q1056	Q1057	K1060	C1061	L1062	S1063	S1064	V1065	F1066	E1067	F1068	F1073	D1074	W1075	S1076	T1077	S1078	Y1083	A1084	V1085	V1086	V1087	K1088	P1149	I1150	I1151	E1152	A1153	A1154	D1155	S1156	I1157	I1158	N1098	L1099	Q1100	S1103	S1104	L1105	L1109	F1110	Y1111	W1112	A1113	H1114	N1115	P1116	S1117	L1118	Y1119	C1177	D1239	T1240	Q1241	I1242	I1243						
F964	H971	Y974	H975	Y976	F977	F978	G979	S986	A989	T990	T993	I994	H995	T998	V1001	N1002	I1003	V1004	M1005	S1006	T1007	H1018	T1019	Y1022	P1025	L1026	S1029	I1030	A1031	M1032	A1033	Y1034	Y1035	V1036	L1037	E1040	S1041	T1042	E1043	E1044	V1045	H1046	L1047	R1048	M1049	M1050	F1121	L1122														



● Molecule 62: Essential nuclear protein 1



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	17924	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	0.126	Depositor
Minimum map value	-0.059	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	597.632, 597.632, 597.632	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.334, 1.334, 1.334	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.90	0/8952	1.09	28/13931 (0.2%)
3	SA	0.71	0/31535	1.16	247/49095 (0.5%)
4	SC	0.47	0/1856	0.73	5/2490 (0.2%)
5	SF	0.35	0/1854	0.66	1/2504 (0.0%)
6	SG	0.53	0/1690	0.64	0/2285
7	SH	0.31	0/1341	0.60	0/1789
8	SI	0.38	0/1341	0.67	1/1806 (0.1%)
9	SJ	0.31	0/1347	0.59	1/1801 (0.1%)
10	SK	0.47	0/1410	0.60	0/1888
11	SM	0.31	0/1020	0.58	0/1374
12	SO	0.45	0/1109	0.62	0/1495
13	SP	0.49	0/879	0.68	0/1186
14	SR	0.58	0/990	0.73	1/1335 (0.1%)
15	SX	0.51	0/1020	0.66	1/1371 (0.1%)
16	SY	0.54	0/798	0.67	1/1065 (0.1%)
17	SZ	0.43	0/822	0.64	0/1103
18	Sc	0.44	0/613	0.65	0/828
19	Sd	0.54	0/499	0.66	0/670
20	3B	0.59	0/1901	0.66	1/2567 (0.0%)
20	3C	0.44	0/1796	0.62	1/2424 (0.0%)
21	3D	0.44	0/2891	0.63	3/3895 (0.1%)
22	3E	0.41	0/3059	0.62	3/4153 (0.1%)
23	3F	0.42	0/3715	0.64	2/5001 (0.0%)
24	3G	0.52	0/928	0.76	1/1262 (0.1%)
24	3H	0.47	0/928	0.69	2/1262 (0.2%)
25	A4	0.47	0/5321	0.66	5/7207 (0.1%)
26	A5	0.48	0/4044	0.68	5/5493 (0.1%)
27	A8	0.30	0/3328	0.61	0/4565
28	A9	0.31	0/951	0.58	1/1287 (0.1%)
29	AE	0.37	0/10049	0.56	6/13737 (0.0%)
30	AF	0.53	0/3993	0.67	4/5413 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	AG	0.47	0/6699	0.65	3/9077 (0.0%)
32	B1	0.64	0/6780	0.68	7/9175 (0.1%)
33	B2	0.43	0/6853	0.67	3/9256 (0.0%)
34	B3	0.39	0/6014	0.69	7/8137 (0.1%)
35	B8	0.58	0/3848	0.66	4/5218 (0.1%)
36	BE	0.57	0/6948	0.66	7/9391 (0.1%)
37	B6	0.45	0/2849	0.58	1/3853 (0.0%)
38	5B	0.34	0/499	0.62	0/659
39	5C	0.58	0/4321	0.68	5/5832 (0.1%)
40	5D	0.51	0/1417	0.67	2/1885 (0.1%)
41	5E	0.47	0/1665	0.64	1/2233 (0.0%)
42	5F	0.66	0/1559	0.73	2/2097 (0.1%)
43	5G	0.56	0/2337	0.66	1/3148 (0.0%)
44	5H	0.52	0/601	0.57	0/789
45	5I	0.61	0/3844	0.66	2/5174 (0.0%)
46	5J	0.42	0/1302	0.54	0/1728
47	5K	0.56	0/1426	0.66	1/1917 (0.1%)
48	RA	0.34	0/2769	0.67	1/3753 (0.0%)
49	RB	0.38	0/1121	0.62	0/1487
50	RC	0.46	0/2245	0.60	0/3021
51	RD	0.31	0/2453	0.63	3/3308 (0.1%)
52	RE	0.38	0/8924	0.63	8/12070 (0.1%)
53	RF	0.34	0/2004	0.63	2/2697 (0.1%)
54	RG	0.39	0/1727	0.68	2/2329 (0.1%)
54	RH	0.42	0/1828	0.61	0/2470
55	RJ	0.50	0/6514	0.60	1/8768 (0.0%)
56	RK	0.44	0/2832	0.65	3/3825 (0.1%)
57	RL	0.29	0/4549	0.50	0/6241
57	RM	0.25	0/3765	0.47	0/5218
58	RN	0.36	0/4591	0.58	2/6187 (0.0%)
59	RO	0.38	0/3849	0.62	5/5261 (0.1%)
60	RP	0.28	0/12225	0.51	5/16812 (0.0%)
61	RQ	0.46	0/1678	0.58	0/2282
62	RS	0.33	0/2104	0.67	1/2854 (0.0%)
63	RT	0.42	0/1379	0.63	1/1853 (0.1%)
64	RV	0.47	0/1456	0.63	2/1937 (0.1%)
65	RY	0.29	0/307	0.51	0/415
All	All	0.52	0/233403	0.77	426/325072 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	SC	0	1
5	SF	0	2
8	SI	0	3
9	SJ	0	1
11	SM	0	1
12	SO	0	1
13	SP	0	1
17	SZ	0	1
18	Sc	0	1
21	3D	0	3
22	3E	0	1
23	3F	0	1
24	3G	0	2
24	3H	0	1
25	A4	0	1
26	A5	0	1
27	A8	0	4
31	AG	0	2
32	B1	0	3
33	B2	0	9
34	B3	0	11
36	BE	0	1
39	5C	0	2
40	5D	0	1
41	5E	0	1
42	5F	0	1
43	5G	0	1
45	5I	0	2
48	RA	0	2
49	RB	0	1
52	RE	0	1
53	RF	0	1
55	RJ	0	2
56	RK	0	1
57	RL	0	1
57	RM	0	1
58	RN	0	1
59	RO	0	1
60	RP	0	3
61	RQ	0	1
64	RV	0	2
All	All	0	78

There are no bond length outliers.

The worst 5 of 426 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	861	U	C2-N1-C1'	10.60	130.42	117.70
3	SA	376	C	N1-C2-O2	10.43	125.16	118.90
3	SA	1174	C	N1-C2-O2	10.35	125.11	118.90
42	5F	13	LEU	CA-CB-CG	10.29	138.96	115.30
3	SA	1034	C	C5-C6-N1	10.00	126.00	121.00

There are no chirality outliers.

5 of 78 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	SC	238	GLU	Peptide
5	SF	193	GLY	Peptide
5	SF	195	ILE	Peptide
8	SI	31	SER	Peptide
8	SI	64	VAL	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	SC	228/255 (89%)	196 (86%)	32 (14%)	0	100	100
5	SF	227/261 (87%)	197 (87%)	29 (13%)	1 (0%)	34	71
6	SG	211/225 (94%)	195 (92%)	16 (8%)	0	100	100
7	SH	161/236 (68%)	143 (89%)	18 (11%)	0	100	100
8	SI	161/190 (85%)	143 (89%)	18 (11%)	0	100	100
9	SJ	162/200 (81%)	140 (86%)	22 (14%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	SK	169/197 (86%)	163 (96%)	6 (4%)	0	100	100
11	SM	119/156 (76%)	103 (87%)	16 (13%)	0	100	100
12	SO	132/151 (87%)	123 (93%)	9 (7%)	0	100	100
13	SP	116/137 (85%)	99 (85%)	16 (14%)	1 (1%)	17	54
14	SR	123/143 (86%)	112 (91%)	11 (9%)	0	100	100
15	SX	125/130 (96%)	119 (95%)	6 (5%)	0	100	100
16	SY	101/145 (70%)	90 (89%)	11 (11%)	0	100	100
17	SZ	100/135 (74%)	87 (87%)	12 (12%)	1 (1%)	15	52
18	Sc	78/82 (95%)	69 (88%)	9 (12%)	0	100	100
19	Sd	61/67 (91%)	57 (93%)	4 (7%)	0	100	100
20	3B	236/327 (72%)	222 (94%)	14 (6%)	0	100	100
20	3C	221/327 (68%)	207 (94%)	14 (6%)	0	100	100
21	3D	359/504 (71%)	346 (96%)	13 (4%)	0	100	100
22	3E	427/511 (84%)	387 (91%)	40 (9%)	0	100	100
23	3F	446/573 (78%)	403 (90%)	42 (9%)	1 (0%)	47	80
24	3G	119/126 (94%)	107 (90%)	11 (9%)	1 (1%)	19	58
24	3H	119/126 (94%)	111 (93%)	8 (7%)	0	100	100
25	A4	648/776 (84%)	590 (91%)	58 (9%)	0	100	100
26	A5	504/643 (78%)	465 (92%)	39 (8%)	0	100	100
27	A8	534/713 (75%)	398 (74%)	134 (25%)	2 (0%)	34	71
28	A9	126/575 (22%)	115 (91%)	11 (9%)	0	100	100
29	AE	1496/1769 (85%)	1367 (91%)	129 (9%)	0	100	100
30	AF	489/513 (95%)	442 (90%)	47 (10%)	0	100	100
31	AG	812/896 (91%)	731 (90%)	80 (10%)	1 (0%)	51	84
32	B1	830/923 (90%)	767 (92%)	63 (8%)	0	100	100
33	B2	839/943 (89%)	749 (89%)	88 (10%)	2 (0%)	47	80
34	B3	733/817 (90%)	606 (83%)	125 (17%)	2 (0%)	41	75
35	B8	469/594 (79%)	439 (94%)	30 (6%)	0	100	100
36	BE	857/939 (91%)	803 (94%)	54 (6%)	0	100	100
37	B6	368/440 (84%)	341 (93%)	27 (7%)	0	100	100
38	5B	58/214 (27%)	55 (95%)	3 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
39	5C	531/554 (96%)	487 (92%)	43 (8%)	1 (0%)	47	80
40	5D	165/250 (66%)	145 (88%)	20 (12%)	0	100	100
41	5E	200/593 (34%)	183 (92%)	16 (8%)	1 (0%)	29	67
42	5F	180/183 (98%)	172 (96%)	8 (4%)	0	100	100
43	5G	278/290 (96%)	256 (92%)	22 (8%)	0	100	100
44	5H	72/610 (12%)	65 (90%)	7 (10%)	0	100	100
45	5I	457/489 (94%)	421 (92%)	36 (8%)	0	100	100
46	5J	147/217 (68%)	136 (92%)	11 (8%)	0	100	100
47	5K	171/189 (90%)	166 (97%)	5 (3%)	0	100	100
48	RA	332/707 (47%)	276 (83%)	56 (17%)	0	100	100
49	RB	132/357 (37%)	117 (89%)	14 (11%)	1 (1%)	19	58
50	RC	276/316 (87%)	259 (94%)	17 (6%)	0	100	100
51	RD	310/1729 (18%)	284 (92%)	23 (7%)	3 (1%)	15	52
52	RE	1067/1237 (86%)	999 (94%)	68 (6%)	0	100	100
53	RF	233/297 (78%)	203 (87%)	30 (13%)	0	100	100
54	RG	212/252 (84%)	182 (86%)	30 (14%)	0	100	100
54	RH	226/252 (90%)	219 (97%)	7 (3%)	0	100	100
55	RJ	784/1183 (66%)	721 (92%)	62 (8%)	1 (0%)	51	84
56	RK	358/367 (98%)	341 (95%)	17 (5%)	0	100	100
57	RL	781/1056 (74%)	664 (85%)	115 (15%)	2 (0%)	41	75
57	RM	738/1056 (70%)	625 (85%)	109 (15%)	4 (0%)	29	67
58	RN	593/810 (73%)	545 (92%)	47 (8%)	1 (0%)	47	80
59	RO	523/552 (95%)	455 (87%)	68 (13%)	0	100	100
60	RP	2042/2493 (82%)	1815 (89%)	226 (11%)	1 (0%)	100	100
61	RQ	220/899 (24%)	199 (90%)	21 (10%)	0	100	100
62	RS	247/483 (51%)	225 (91%)	22 (9%)	0	100	100
63	RT	165/326 (51%)	150 (91%)	15 (9%)	0	100	100
64	RV	184/346 (53%)	165 (90%)	19 (10%)	0	100	100
65	RY	35/534 (7%)	29 (83%)	6 (17%)	0	100	100
All	All	24623/34586 (71%)	22191 (90%)	2405 (10%)	27 (0%)	54	84

5 of 27 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
41	5E	454	VAL
51	RD	1223	PRO
57	RL	744	PRO
57	RM	744	PRO
57	RM	905	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	SC	203/224 (91%)	201 (99%)	2 (1%)	76	85
5	SF	196/222 (88%)	190 (97%)	6 (3%)	40	63
6	SG	180/191 (94%)	180 (100%)	0	100	100
7	SH	139/201 (69%)	137 (99%)	2 (1%)	67	80
8	SI	146/170 (86%)	145 (99%)	1 (1%)	84	90
9	SJ	136/161 (84%)	134 (98%)	2 (2%)	65	79
10	SK	147/166 (89%)	146 (99%)	1 (1%)	84	90
11	SM	110/137 (80%)	108 (98%)	2 (2%)	59	77
12	SO	117/128 (91%)	116 (99%)	1 (1%)	78	87
13	SP	90/105 (86%)	90 (100%)	0	100	100
14	SR	105/119 (88%)	105 (100%)	0	100	100
15	SX	108/111 (97%)	107 (99%)	1 (1%)	78	87
16	SY	85/120 (71%)	84 (99%)	1 (1%)	71	83
17	SZ	85/113 (75%)	85 (100%)	0	100	100
18	Sc	69/71 (97%)	69 (100%)	0	100	100
19	Sd	56/60 (93%)	56 (100%)	0	100	100
20	3B	201/240 (84%)	201 (100%)	0	100	100
20	3C	190/240 (79%)	187 (98%)	3 (2%)	62	78
21	3D	296/435 (68%)	293 (99%)	3 (1%)	76	85
22	3E	262/433 (60%)	261 (100%)	1 (0%)	91	94

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	3F	396/503 (79%)	394 (100%)	2 (0%)	88	93
24	3G	100/104 (96%)	100 (100%)	0	100	100
24	3H	100/104 (96%)	100 (100%)	0	100	100
25	A4	591/713 (83%)	584 (99%)	7 (1%)	71	83
26	A5	433/574 (75%)	432 (100%)	1 (0%)	93	96
27	A8	174/657 (26%)	173 (99%)	1 (1%)	86	92
28	A9	89/533 (17%)	89 (100%)	0	100	100
29	AE	708/1633 (43%)	705 (100%)	3 (0%)	91	94
30	AF	437/454 (96%)	433 (99%)	4 (1%)	78	87
31	AG	750/826 (91%)	740 (99%)	10 (1%)	69	81
32	B1	730/812 (90%)	726 (100%)	4 (0%)	88	93
33	B2	736/832 (88%)	731 (99%)	5 (1%)	84	90
34	B3	665/719 (92%)	655 (98%)	10 (2%)	65	79
35	B8	421/529 (80%)	420 (100%)	1 (0%)	93	96
36	BE	757/819 (92%)	754 (100%)	3 (0%)	91	94
37	B6	251/414 (61%)	247 (98%)	4 (2%)	62	78
38	5B	57/196 (29%)	55 (96%)	2 (4%)	36	61
39	5C	465/480 (97%)	463 (100%)	2 (0%)	91	94
40	5D	156/234 (67%)	154 (99%)	2 (1%)	69	81
41	5E	185/535 (35%)	184 (100%)	1 (0%)	88	93
42	5F	171/172 (99%)	170 (99%)	1 (1%)	86	92
43	5G	251/258 (97%)	249 (99%)	2 (1%)	81	88
44	5H	63/538 (12%)	63 (100%)	0	100	100
45	5I	416/443 (94%)	414 (100%)	2 (0%)	88	93
46	5J	140/200 (70%)	140 (100%)	0	100	100
47	5K	157/169 (93%)	157 (100%)	0	100	100
48	RA	303/636 (48%)	300 (99%)	3 (1%)	76	85
49	RB	117/315 (37%)	114 (97%)	3 (3%)	46	67
50	RC	231/289 (80%)	230 (100%)	1 (0%)	91	94
51	RD	226/1544 (15%)	220 (97%)	6 (3%)	44	66
52	RE	984/1125 (88%)	975 (99%)	9 (1%)	78	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
53	RF	221/274 (81%)	219 (99%)	2 (1%)	78	87
54	RG	195/222 (88%)	193 (99%)	2 (1%)	76	85
54	RH	206/222 (93%)	204 (99%)	2 (1%)	76	85
55	RJ	683/1039 (66%)	676 (99%)	7 (1%)	76	85
56	RK	307/312 (98%)	303 (99%)	4 (1%)	69	81
57	RL	164/934 (18%)	162 (99%)	2 (1%)	71	83
58	RN	422/732 (58%)	422 (100%)	0	100	100
59	RO	329/506 (65%)	328 (100%)	1 (0%)	92	95
60	RP	499/2307 (22%)	493 (99%)	6 (1%)	71	83
61	RQ	148/808 (18%)	145 (98%)	3 (2%)	55	73
62	RS	225/424 (53%)	225 (100%)	0	100	100
63	RT	148/282 (52%)	146 (99%)	2 (1%)	67	80
64	RV	141/304 (46%)	141 (100%)	0	100	100
65	RY	31/482 (6%)	30 (97%)	1 (3%)	39	62
All	All	17900/29855 (60%)	17753 (99%)	147 (1%)	82	88

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

Mol	Chain	Res	Type
53	RF	19	LYS
61	RQ	899	LYS
54	RH	82	ARG
56	RK	335	THR
31	AG	421	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 304 such sidechains are listed below:

Mol	Chain	Res	Type
52	RE	568	ASN
60	RP	1686	GLN
52	RE	1033	ASN
55	RJ	157	ASN
63	RT	218	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	3A	169/333 (50%)	44 (26%)	2 (1%)
2	5A	365/700 (52%)	104 (28%)	7 (1%)
3	SA	1302/1808 (72%)	493 (37%)	19 (1%)
All	All	1836/2841 (64%)	641 (34%)	28 (1%)

5 of 641 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 28 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	SA	372	G
3	SA	1632	C
3	SA	538	A
3	SA	1197	C
3	SA	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 4 ligands modelled in this entry, 3 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
68	GTP	RJ	1201	69	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
68	GTP	RJ	1201	69	-	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)
68	RJ	1201	GTP	C5-C6	-2.47	1.42	1.47
68	RJ	1201	GTP	C8-N7	-2.05	1.31	1.35

There are no bond angle outliers.

There are no chirality outliers.

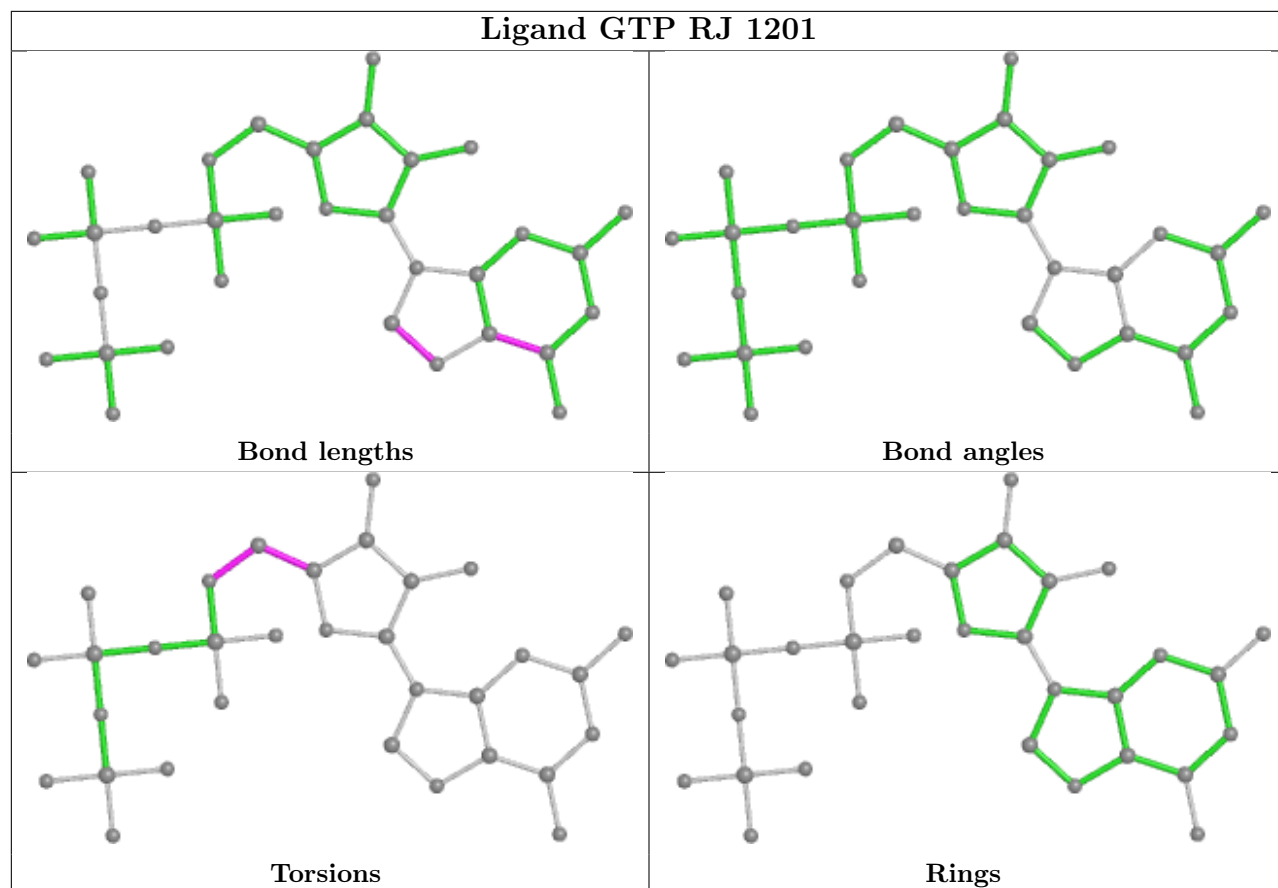
All (3) torsion outliers are listed below:

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

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.

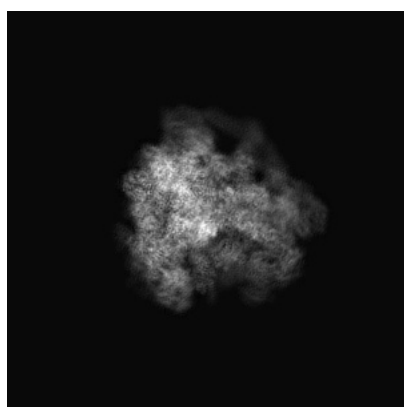
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0950. These allow visual inspection of the internal detail of the map and identification of artifacts.

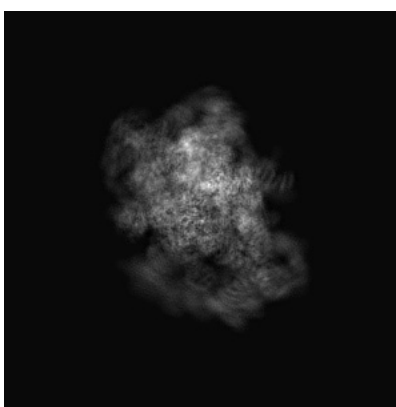
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

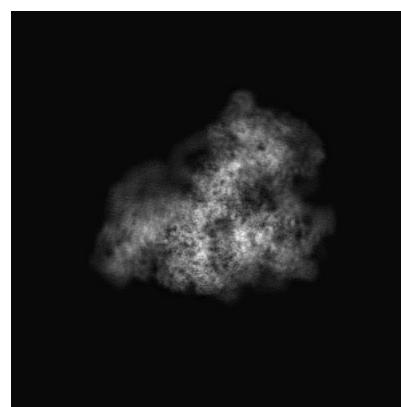
6.1.1 Primary map



X



Y

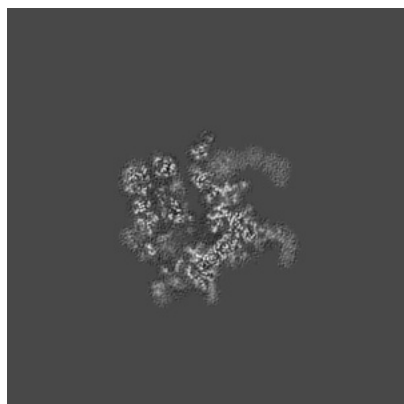


Z

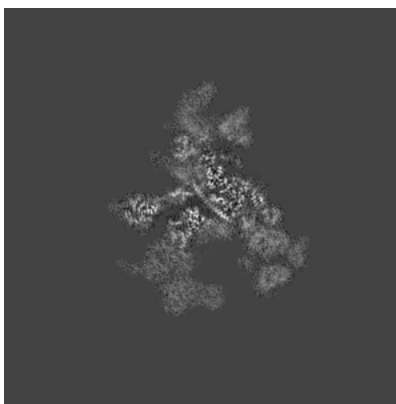
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

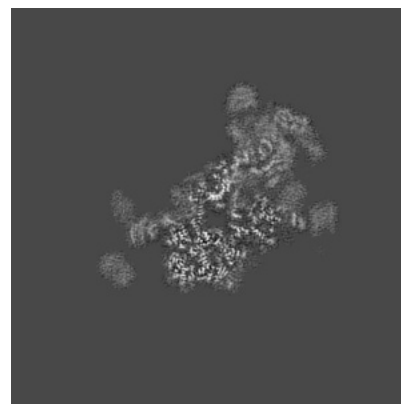
6.2.1 Primary map



X Index: 224



Y Index: 224

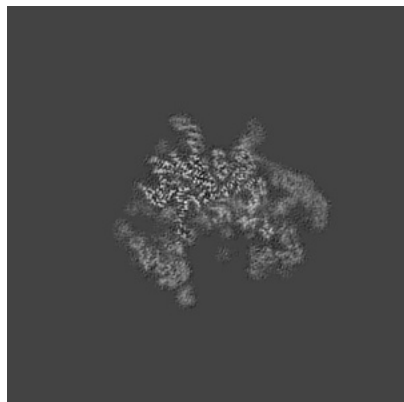


Z Index: 224

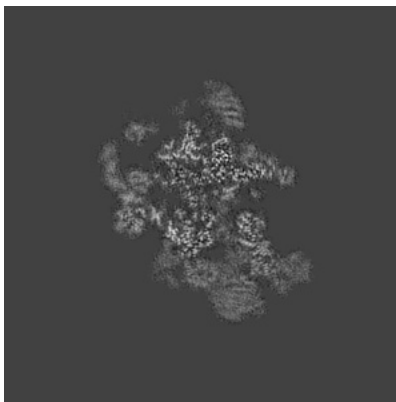
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

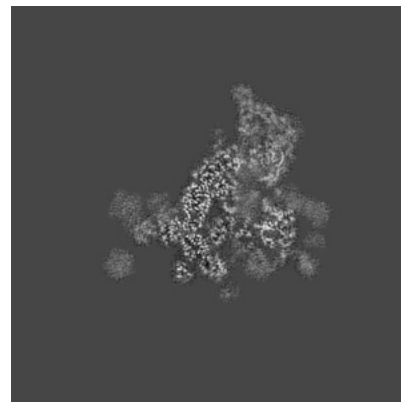
6.3.1 Primary map



X Index: 253



Y Index: 197

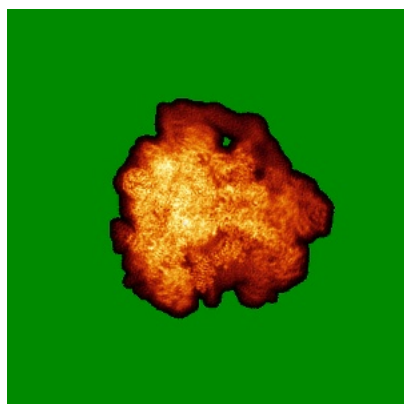


Z Index: 208

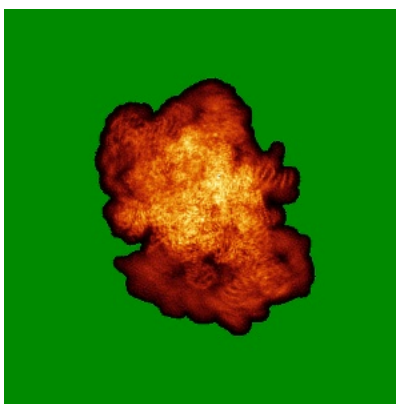
The images above show the largest variance slices of the map in three orthogonal directions.

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

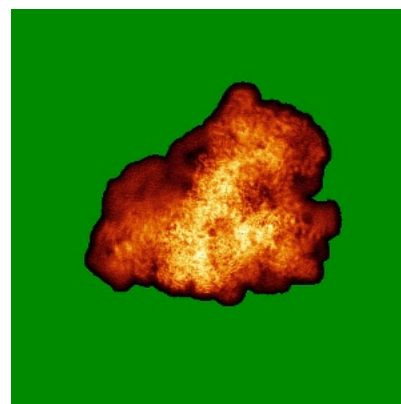
6.4.1 Primary map



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 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

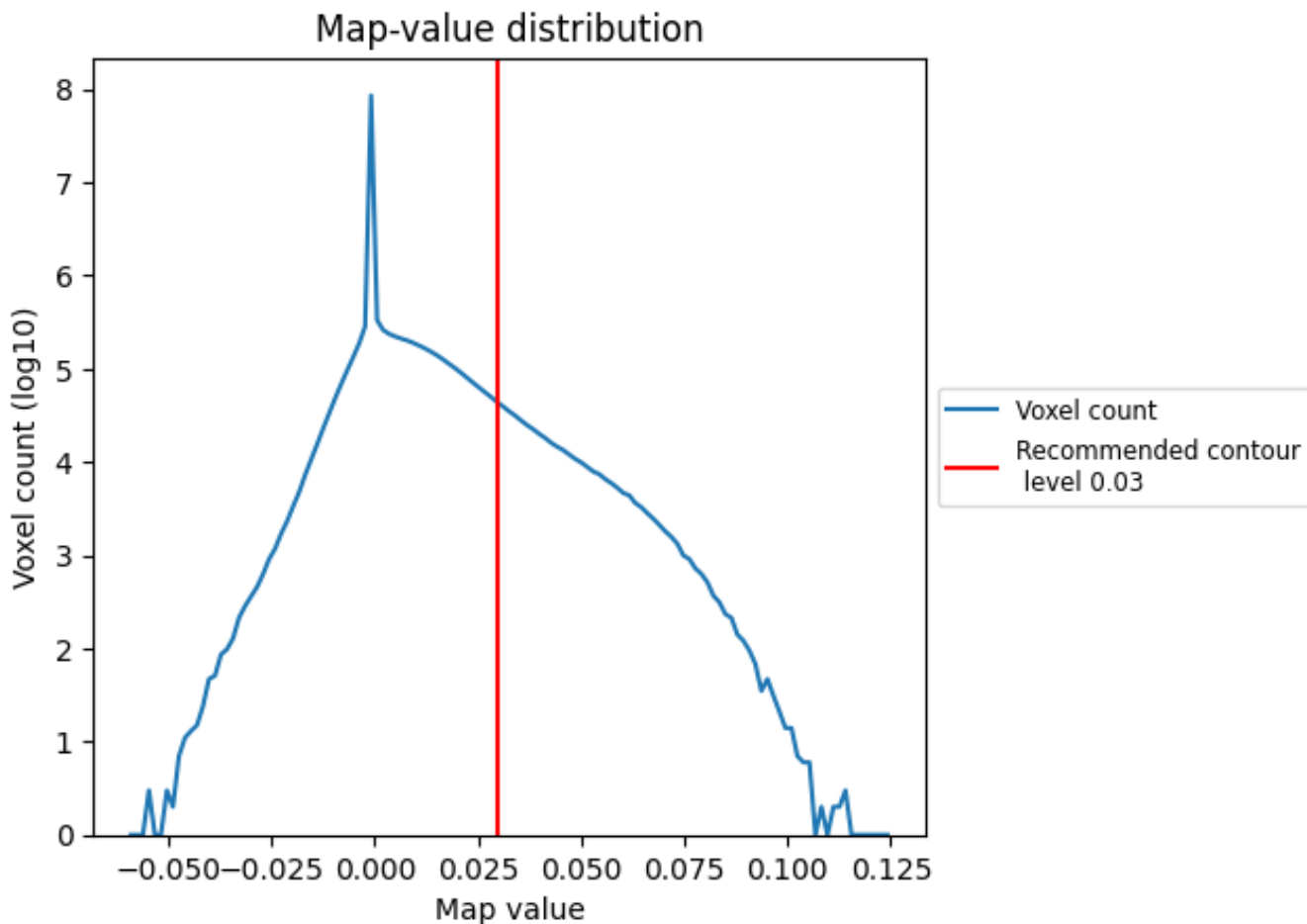
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

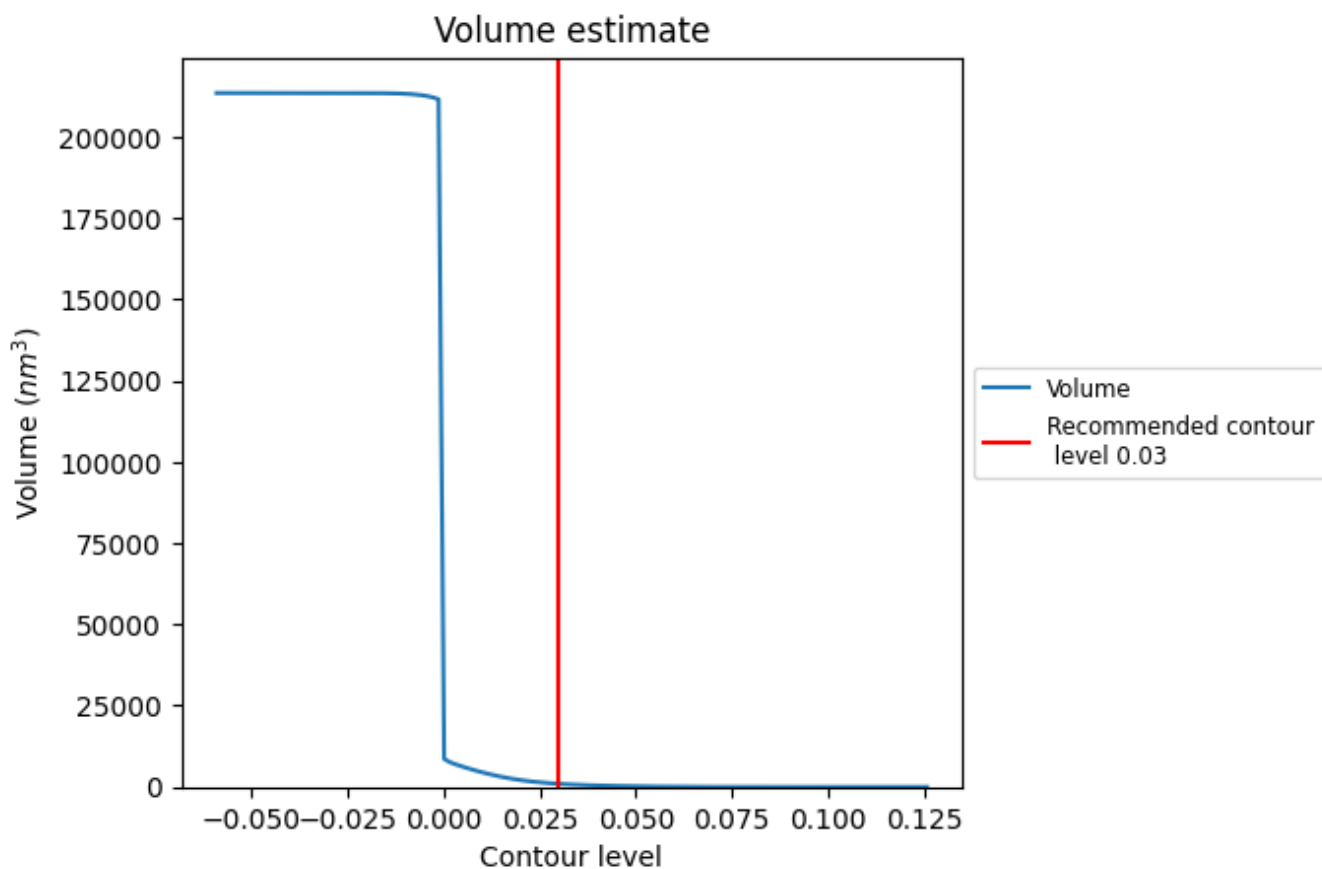
This section contains the results of statistical analysis of the map.

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.

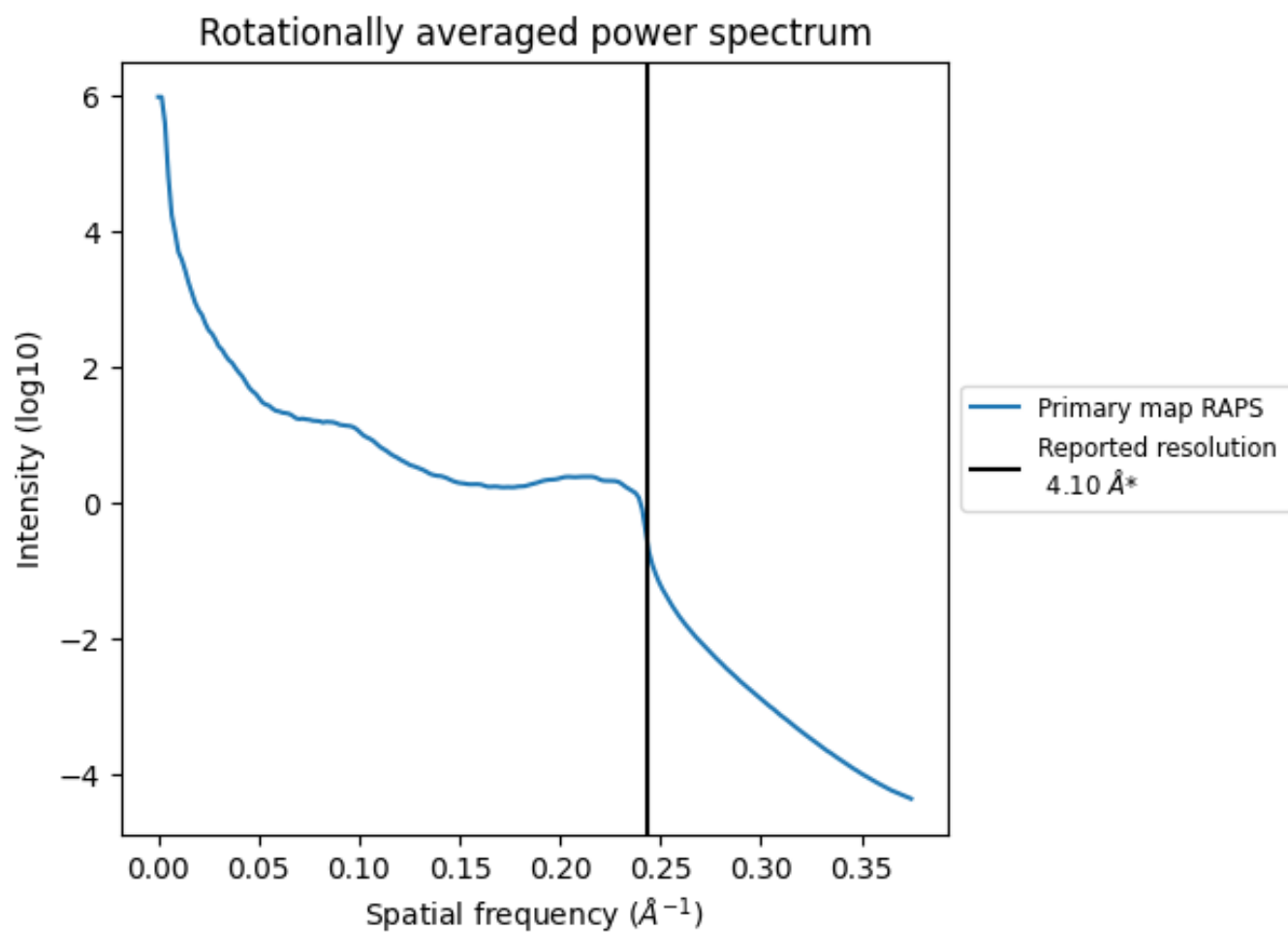
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 963 nm^3 ; this corresponds to an approximate mass of 870 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 0.244\AA^{-1}

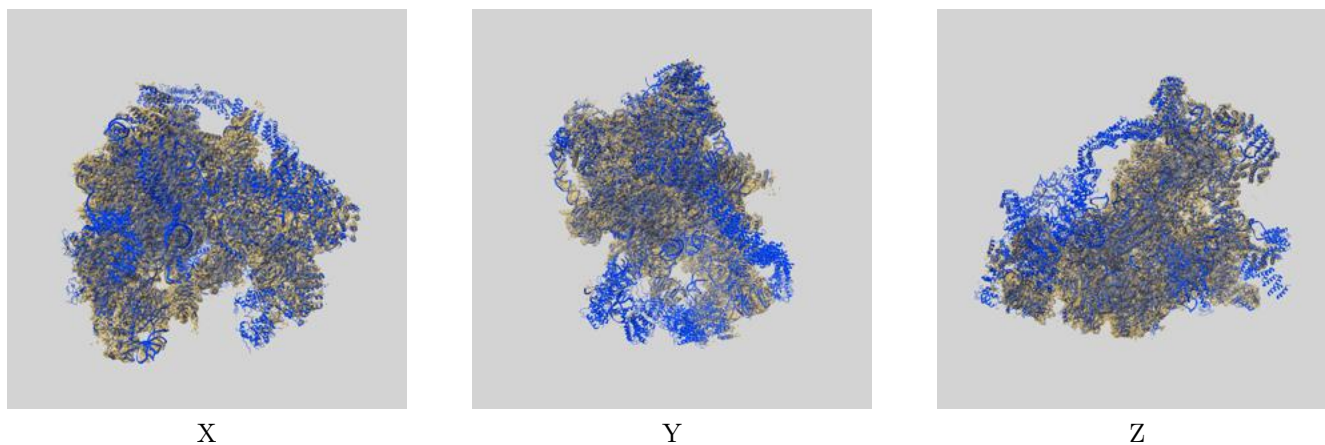
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

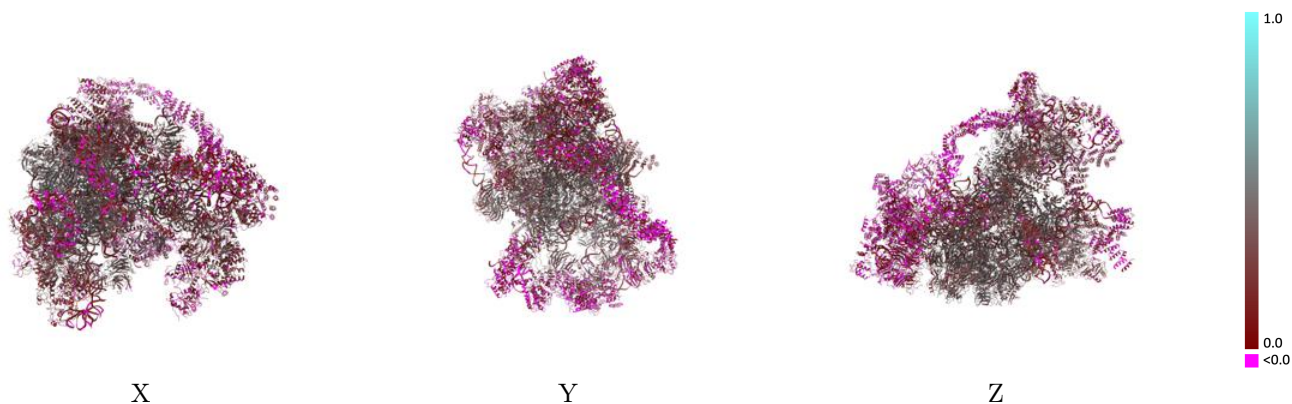
This section contains information regarding the fit between EMDB map EMD-0950 and PDB model 6LQQ. Per-residue inclusion information can be found in section 3 on page 17.

9.1 Map-model overlay [i](#)



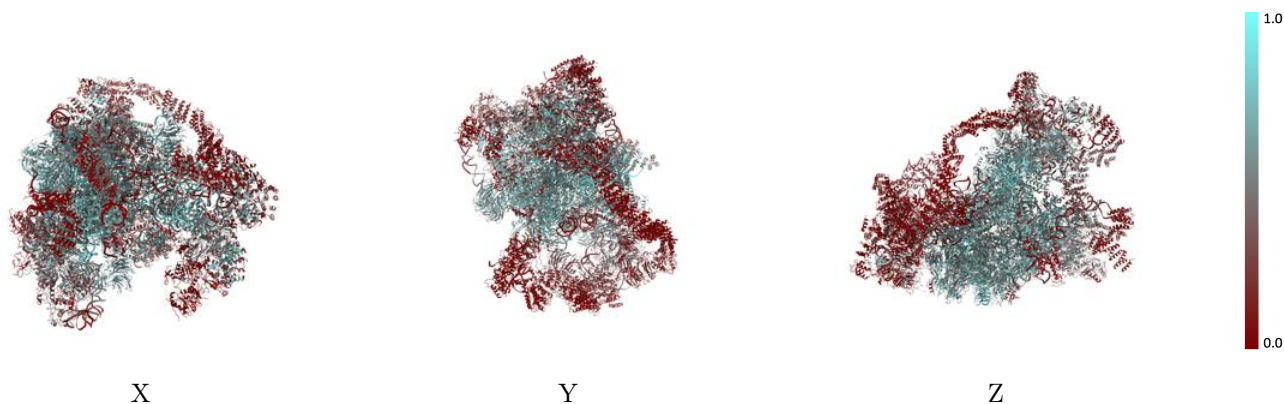
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



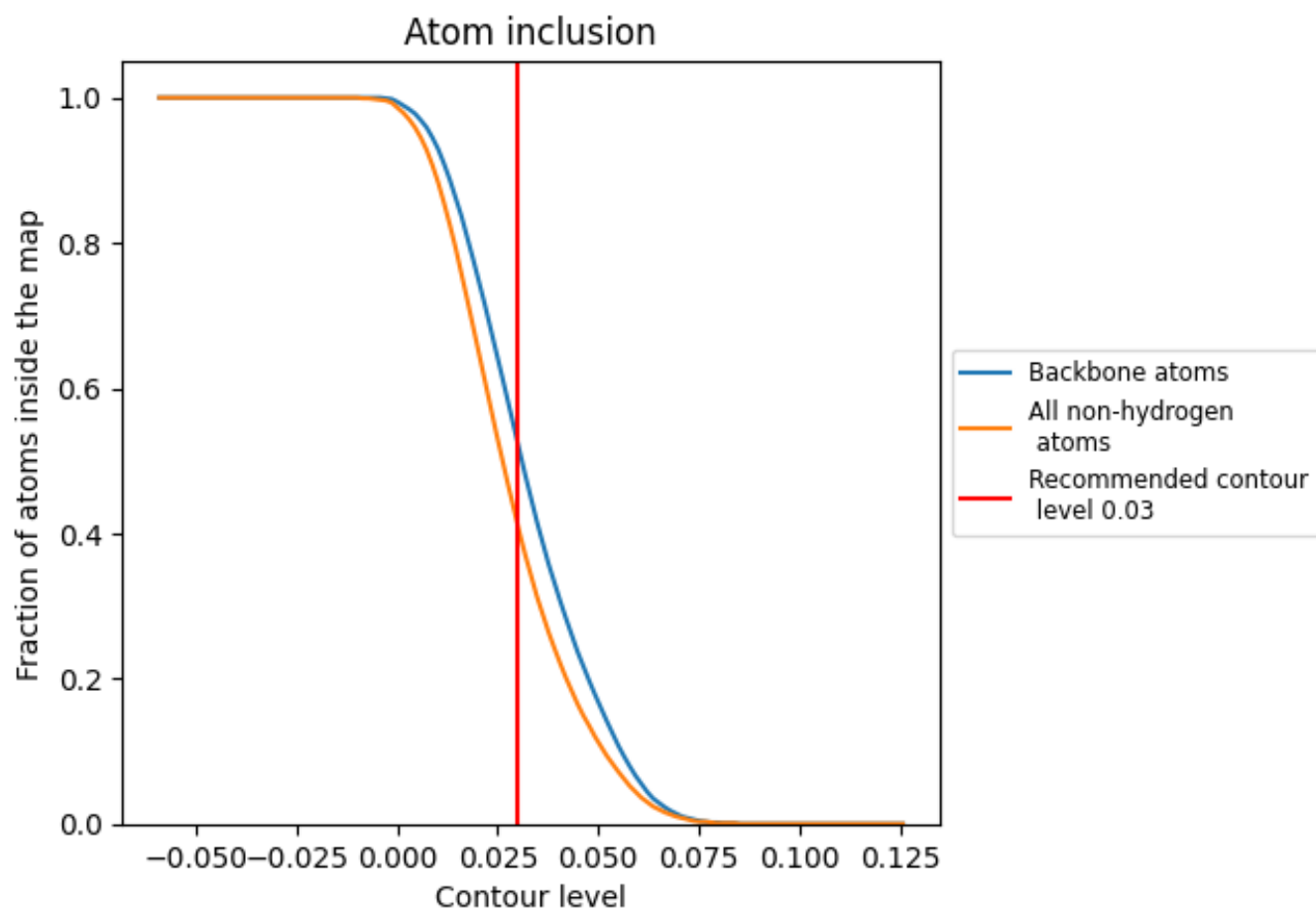
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 52% of all backbone atoms, 41% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4110	 0.2550
3A	 0.6470	 0.2880
3B	 0.6400	 0.3850
3C	 0.1330	 0.1640
3D	 0.5950	 0.3190
3E	 0.4170	 0.2480
3F	 0.5760	 0.3330
3G	 0.5180	 0.2880
3H	 0.6120	 0.3680
5A	 0.2360	 0.2060
5B	 0.0290	 0.1290
5C	 0.5690	 0.3810
5D	 0.2920	 0.2640
5E	 0.5310	 0.3520
5F	 0.6520	 0.3990
5G	 0.5730	 0.3840
5H	 0.6500	 0.3910
5I	 0.6900	 0.4090
5J	 0.3860	 0.2600
5K	 0.6320	 0.4030
A4	 0.2650	 0.1750
A5	 0.4090	 0.2640
A8	 0.0170	 0.0350
A9	 0.0500	 0.0530
AE	 0.2040	 0.1300
AF	 0.1830	 0.1930
AG	 0.2310	 0.1370
B1	 0.6490	 0.4020
B2	 0.5870	 0.3260
B3	 0.4860	 0.2820
B6	 0.5520	 0.2760
B8	 0.5770	 0.3310
BE	 0.6500	 0.3950
RA	 0.4000	 0.2630
RB	 0.4710	 0.2910



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Chain	Atom inclusion	Q-score
RC	 0.3940	 0.3180
RD	 0.0020	 0.0240
RE	 0.3440	 0.2480
RF	 0.2870	 0.2400
RG	 0.0150	 0.1160
RH	 0.0410	 0.1740
RJ	 0.5980	 0.3620
RK	 0.6270	 0.3690
RL	 0.4210	 0.2740
RM	 0.1620	 0.1440
RN	 0.0760	 0.1140
RO	 0.0000	 0.0830
RP	 0.2500	 0.1580
RQ	 0.4550	 0.3130
RS	 0.0020	 0.0210
RT	 0.2210	 0.3060
RV	 0.3570	 0.3440
RY	 0.3040	 0.2060
SA	 0.5390	 0.2470
SC	 0.5380	 0.3630
SF	 0.4940	 0.2910
SG	 0.6060	 0.3600
SH	 0.3660	 0.2430
SI	 0.4620	 0.2910
SJ	 0.3960	 0.2340
SK	 0.6400	 0.3810
SM	 0.2530	 0.1500
SO	 0.5920	 0.3670
SP	 0.5510	 0.3690
SR	 0.6340	 0.3890
SX	 0.5970	 0.3850
SY	 0.6040	 0.4080
SZ	 0.5550	 0.3210
Sc	 0.5900	 0.3860
Sd	 0.5950	 0.3980
X1	 0.0830	 0.1700