



## Full wwPDB EM Validation Report ⓘ

Mar 20, 2024 – 04:51 AM JST

PDB ID : 6KE6  
EMDB ID : EMD-9964  
Title : 3.4 angstrom cryo-EM structure of yeast 90S small subunit preribosome  
Authors : Du, Y.; Ye, K.; An, W.  
Deposited on : 2019-07-03  
Resolution : 3.40 Å(reported)  
Based on initial models : 5WYJ, 5WLC

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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:

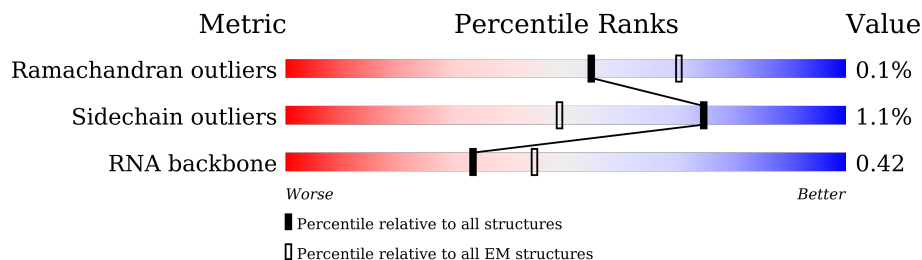
EMDB validation analysis : 0.0.1.dev70  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
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 3.40 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  $\geq 3$ , 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	1807	
4	SC	255	
5	SF	261	
6	SG	225	
7	SH	236	
8	SI	190	

*Continued on next page...*

Continued from previous page...

Mol	Chain	Length	Quality of chain
9	SJ	200	78% 82% 17%
10	SK	197	85% 13%
11	SM	156	72% 78% 21%
12	SN	143	83% 83% 17%
13	SO	151	87% 11%
14	SP	137	84% 14%
15	SR	143	87% 13%
16	ST	146	51% 77% 23%
17	SX	130	98%
18	SY	145	70% 29%
19	SZ	135	24% 73% 24%
20	Sc	82	96%
21	Sd	67	94% 6%
22	3B	327	72% 27%
22	3C	327	14% 69% 31%
23	3D	504	71% 27%
24	3E	511	17% 83% 16%
25	3F	573	9% 74% 24%
26	3G	126	91%
26	3H	126	95%
27	A4	776	10% 84% 15%
28	A5	643	8% 79% 20%
29	A8	713	64% 76% 23%
30	A9	575	14% 22% 78%
31	AE	1769	23% 43% 56%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
32	AF	513	94%
33	AG	896	91% 8%
34	B1	923	88% 10%
35	B2	943	88% 10%
36	B3	817	90% 7%
37	B8	594	78% 20%
38	BE	939	90% 8%
39	B6	440	83% 15%
40	5B	214	28% 72%
41	5C	554	94%
42	5D	250	92% 6%
43	5E	593	33% 66%
44	5F	183	97%
45	5G	290	96%
46	5H	610	22% 78%
47	5I	489	92% 6%
48	5J	217	66% 34%
49	5K	189	90% 7%
50	RA	707	48% 52%
51	RB	357	37% 62%
52	RC	316	88% 12%
53	RE	1237	86% 13%
54	RF	297	78% 19%
55	RG	252	85% 14%
55	RH	252	90% 9%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
56	RI	274	90% 7% 8%
57	RJ	1183	67% 7% 33%
58	RK	367	98% 7%
59	RL	1056	72% 76% 24%
59	RM	1056	72% 72% 28%
60	RN	810	49% 72% 28%
61	RO	552	46% 94% 5%
62	RP	2493	78% 82% 18%
63	RQ	899	10% 25% 75%
64	RS	483	52% 51% 48%
65	RT	326	5% 51% 48%
66	RV	346	9% 54% 45%
67	X1	347	25% 37% 63%

## 2 Entry composition [i](#)

There are 70 unique types of molecules in this entry. The entry contains 224791 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	522	11143	4979	1982	3660	522	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	SA	1310	27940	12487	4981	9162	1310	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	219	1751	1109	321	317	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	112	879	562	155	160	2	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
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 S12.

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

- Molecule 13 is a protein called 40S ribosomal protein S13.

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

- Molecule 14 is a protein called 40S ribosomal protein S14-A.

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

- Molecule 15 is a protein called 40S ribosomal protein S16-A.

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

- Molecule 16 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	ST	113	918	578	174	164	2	0	0

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

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

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

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

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

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

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

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

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



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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
22	3B	240	Total	C	N	O	S	0	0
			1865	1184	333	338	10		
22	3C	225	Total	C	N	O	S	0	0
			1763	1120	316	317	10		

- Molecule 23 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	3D	369	Total	C	N	O	S	0	0
			2848	1811	489	540	8		

- Molecule 24 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	3E	431	Total	C	N	O	S	0	0
			3028	1888	543	588	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
25	3F	434	Total	C	N	O	S	0	0
			3473	2211	603	649	10		

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

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

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	AE	777	6197	3998	1014	1166	19	0	0

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
40	5B	60	495	310	101	84	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	5C	535	4237	2656	762	807	12	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
42	5D	235	Total	C	N	O	S	0	0
			1972	1226	380	359	7		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
43	5E	204	Total	C	N	O	S	0	0
			1647	1021	294	328	4		

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

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
45	5G	282	Total	C	N	O	S	0	0
			2296	1441	430	418	7		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
46	5H	136	Total	C	N	O	0	0
			1065	658	211	196		

- Molecule 47 is a protein called Protein SOF1.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
48	5J	144	Total	C	N	O	S	0	0
			1219	769	230	215	5		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	5K	175	1403	896	256	241	10	0	0

- Molecule 50 is a protein called Ribosome biogenesis protein ENP2.

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

- Molecule 51 is a protein called U3 small nucleolar ribonucleoprotein protein LCP5.

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

- Molecule 52 is a protein called KRR1 small subunit processome component.

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

- Molecule 53 is a protein called U3 small nucleolar RNA-associated protein 22.

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

- Molecule 54 is a protein called Ribosomal RNA-processing protein 7.

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

- Molecule 55 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

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

- Molecule 56 is a protein called Ribosome biogenesis protein UTP30.

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

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

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

- Molecule 58 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

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

- Molecule 59 is a protein called RNA cytidine acetyltransferase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	RL	805	4539	2760	885	887	7	0	0
59	RM	765	3774	2244	765	765		0	0

- Molecule 60 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	RN	587	4363	2758	791	803	11	0	0

- Molecule 61 is a protein called Nucleolar complex protein 4.

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

- Molecule 62 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms				AltConf	Trace	
			Total	C	N	O			
62	RP	2052	10202	6098	2052	2052		0	0

- Molecule 63 is a protein called U3 small nucleolar RNA-associated protein 14.

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

- Molecule 64 is a protein called Essential nuclear protein 1.

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

- Molecule 65 is a protein called Pre-rRNA-processing protein PNO1.

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

- Molecule 66 is a protein called Protein FAF1.

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

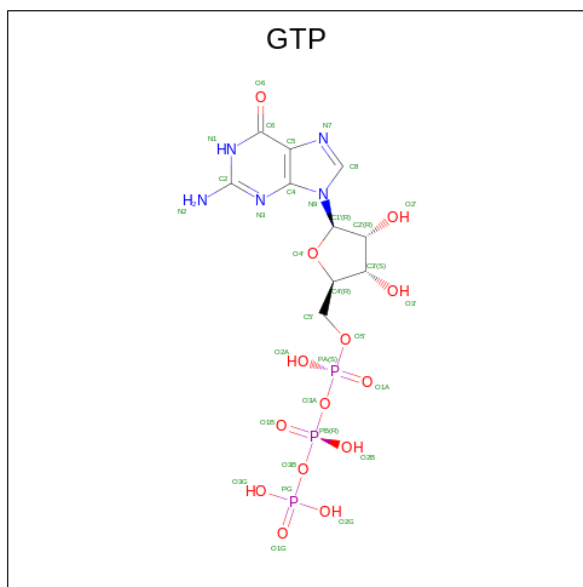
- Molecule 67 is a protein called Unassigned helices.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
67	X1	127	635	381	127	127	0	0

- Molecule 68 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
68	Sc	1	1	1	0
68	5K	1	1	1	0

- Molecule 69 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>14</sub>P<sub>3</sub>).



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

- Molecule 70 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

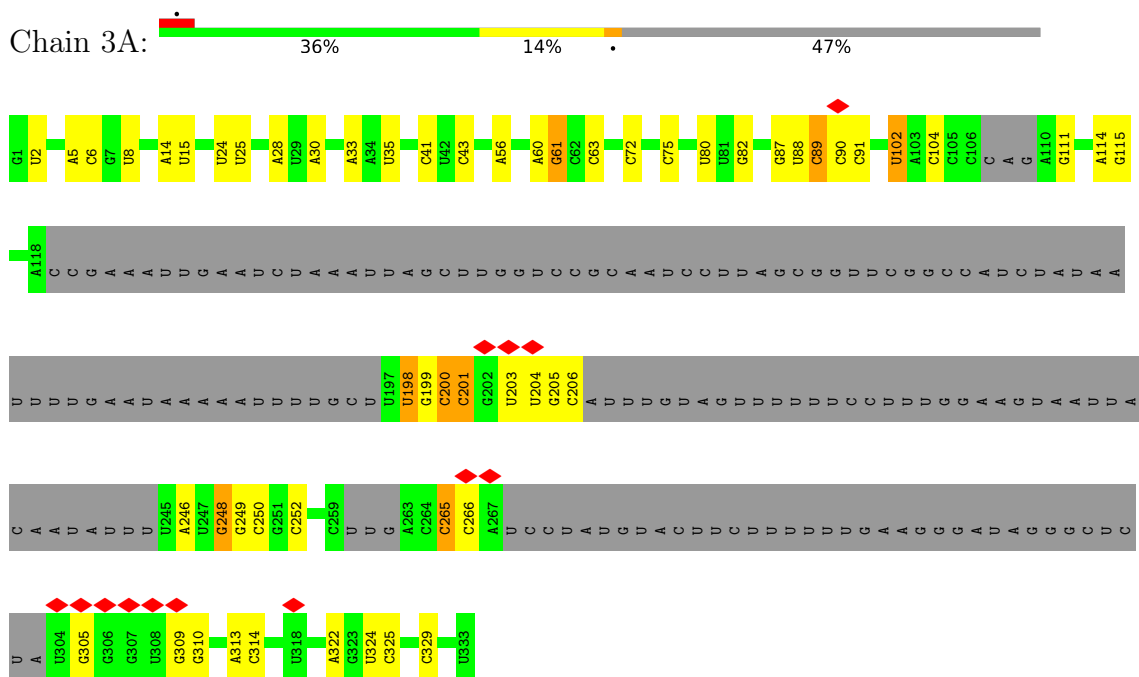
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
70	RJ	1	1	1	0



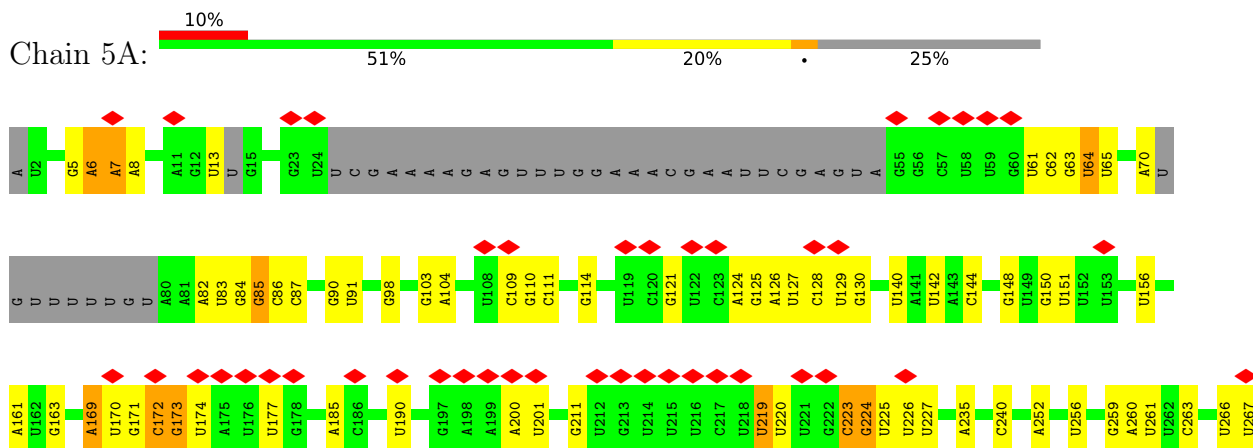
### 3 Residue-property plots [i](#)

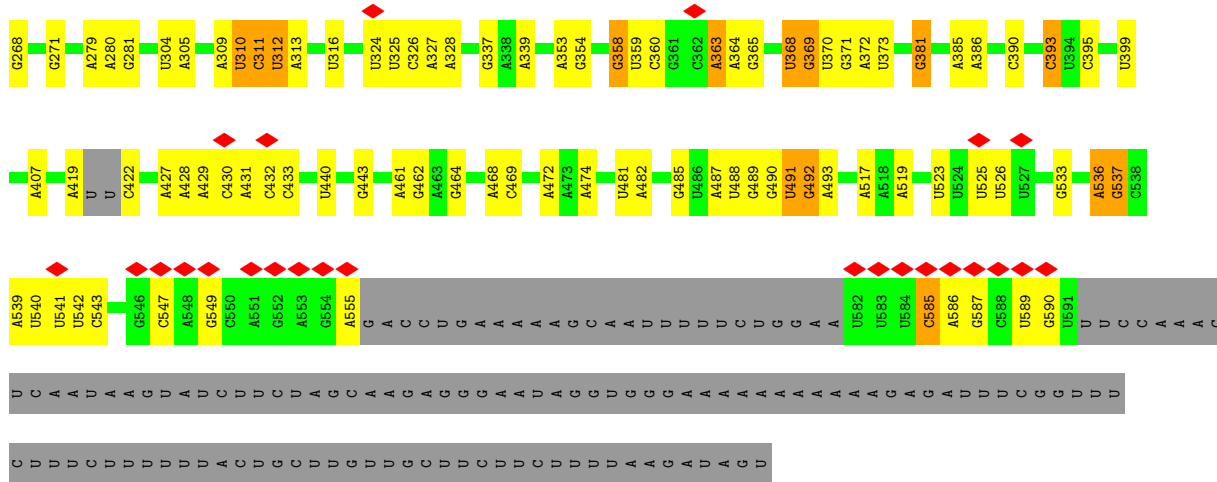
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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

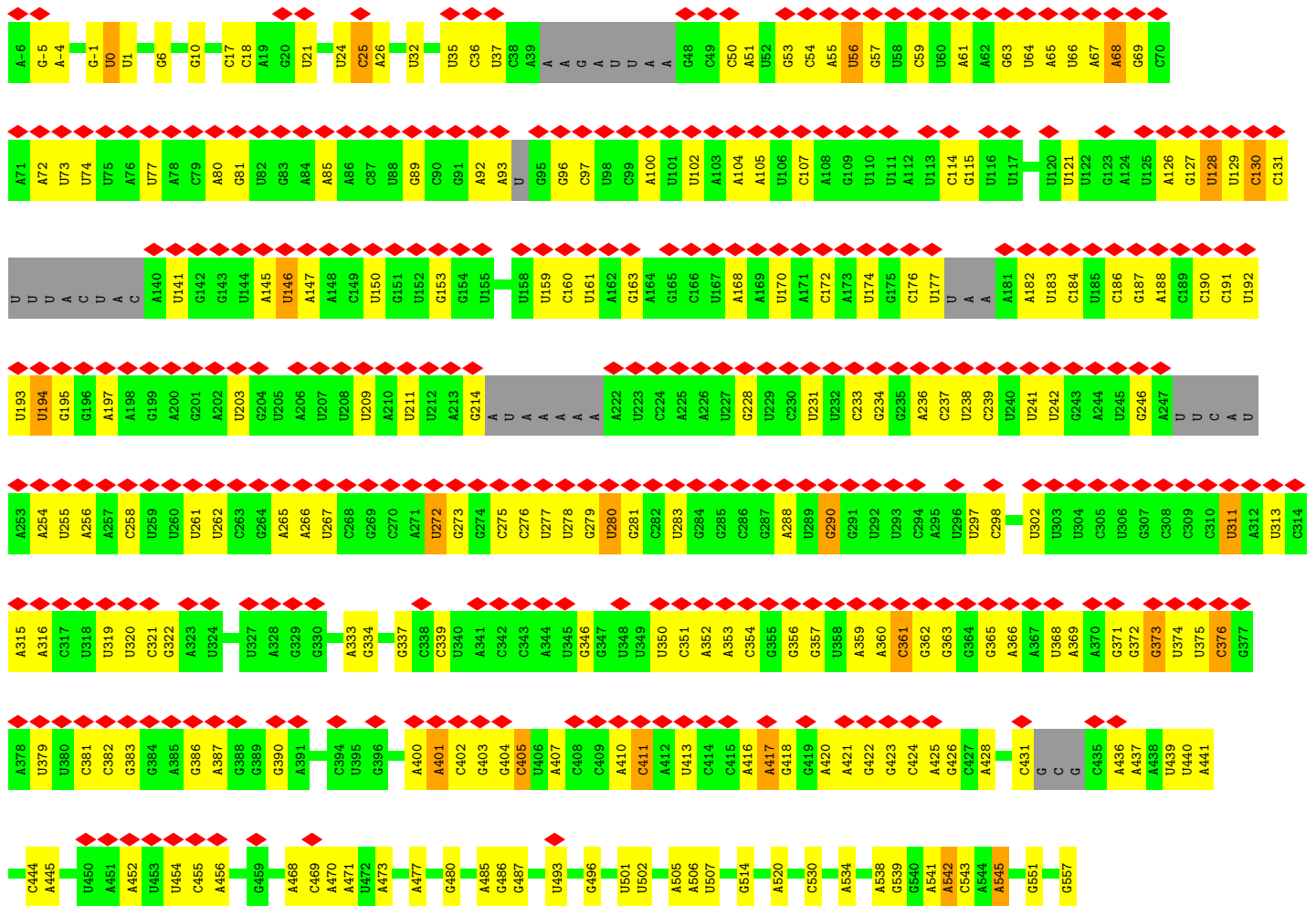


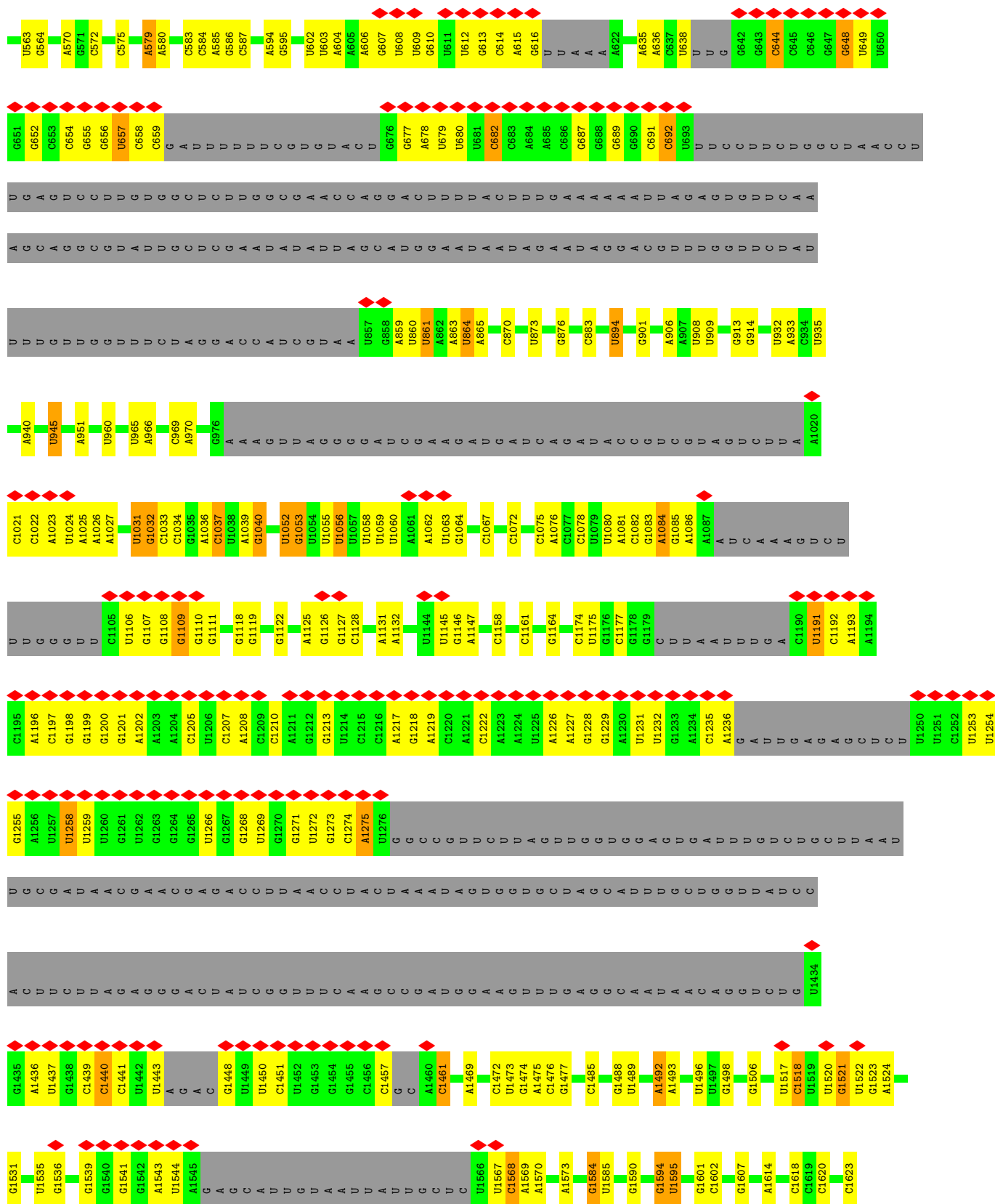
- Molecule 2: 5' ETS

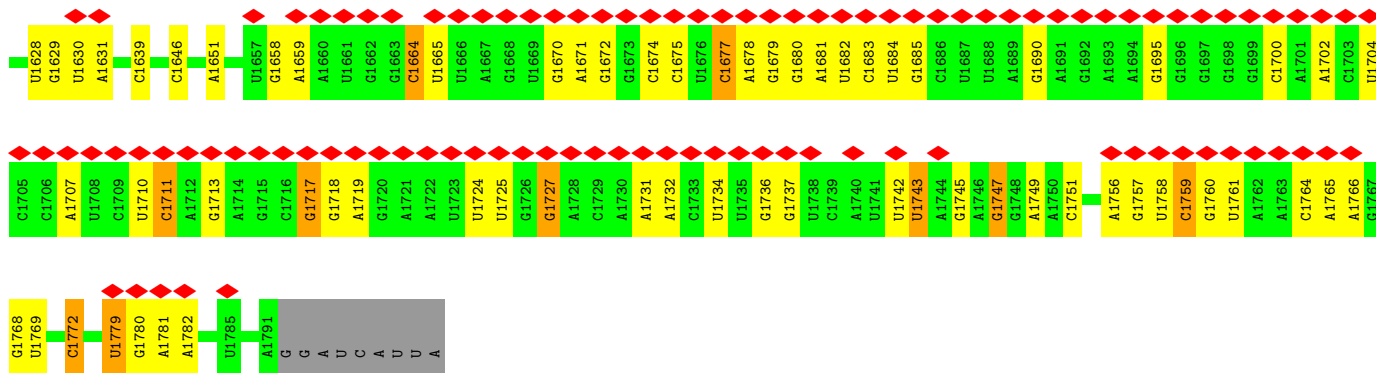




• Molecule 3: 18S rRNA

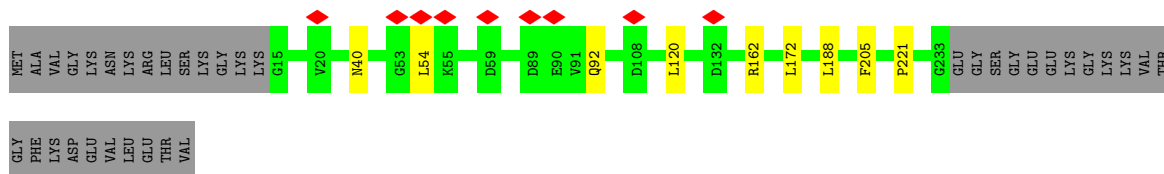






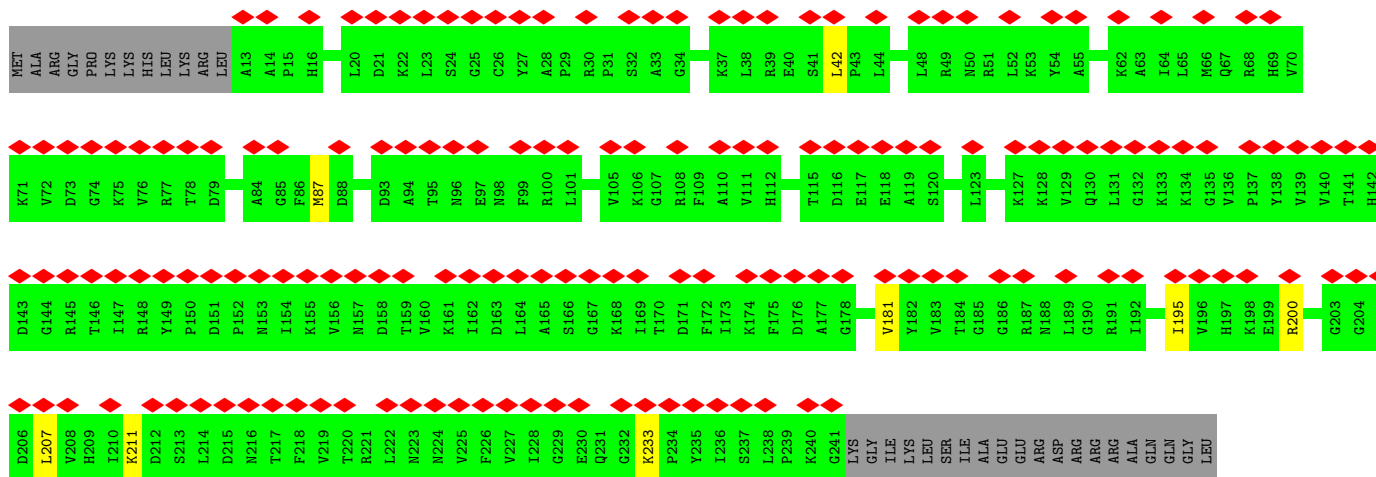
• Molecule 4: 40S ribosomal protein S1-A

Chain SC: 82% 14%



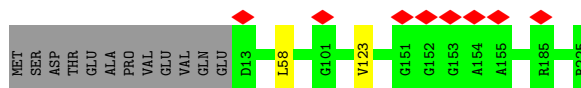
• Molecule 5: 40S ribosomal protein S4-A

Chain SF: 62% 85% 12%

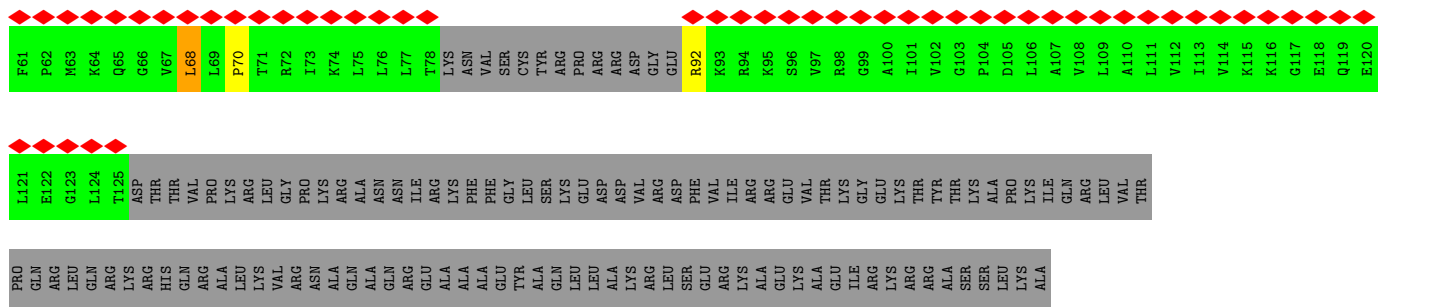
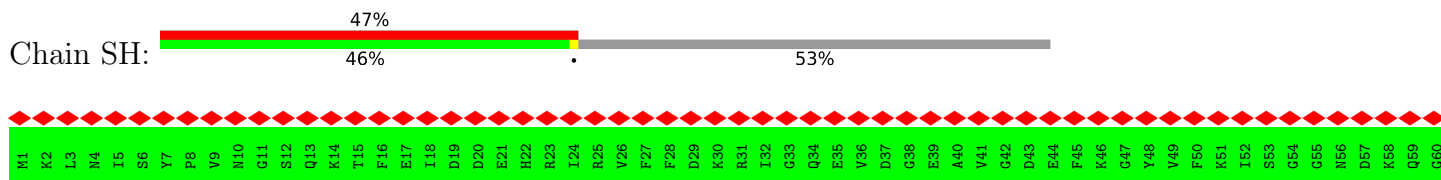


• Molecule 6: 40S ribosomal protein S5

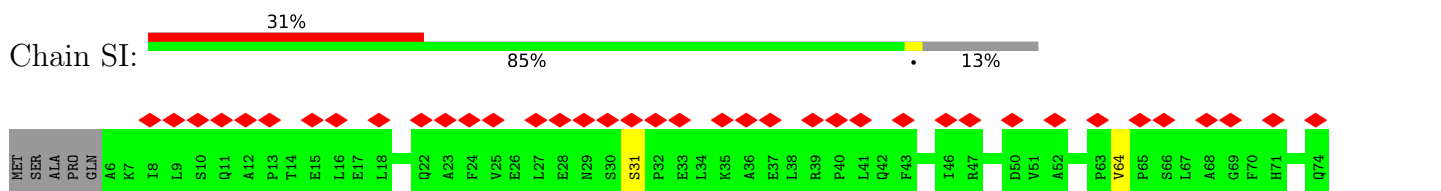
Chain SG: 94% 5%



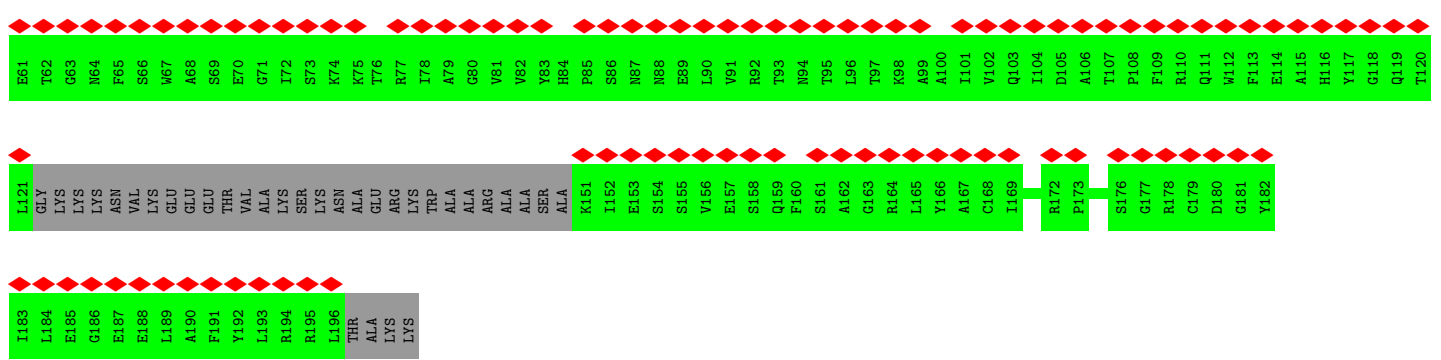
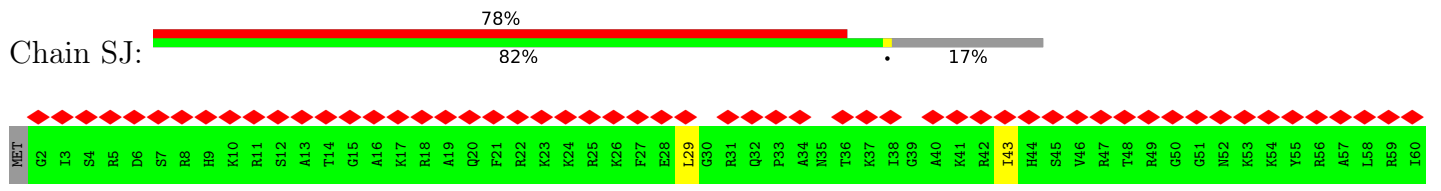
• Molecule 7: 40S ribosomal protein S6-A



• Molecule 8: 40S ribosomal protein S7-A

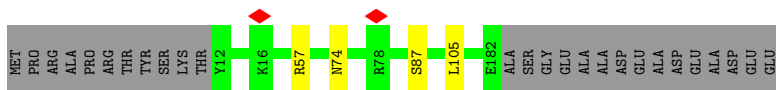


• Molecule 9: 40S ribosomal protein S8-A

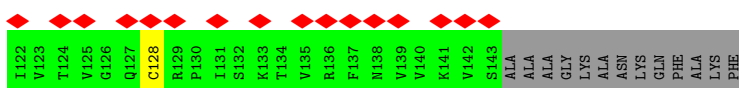
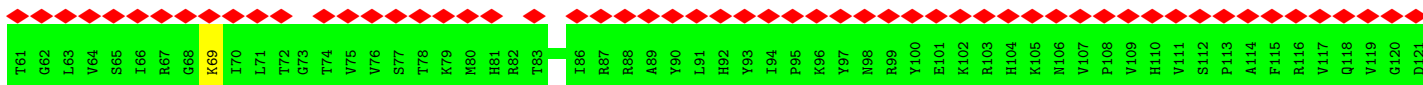
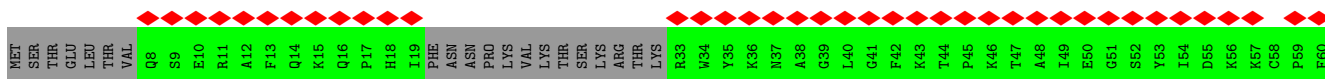
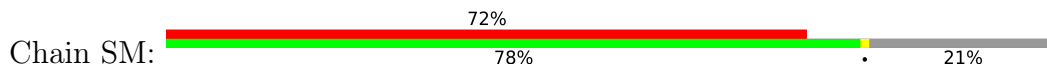


• Molecule 10: 40S ribosomal protein S9-A

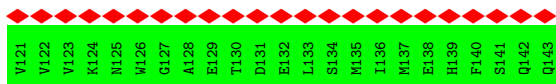
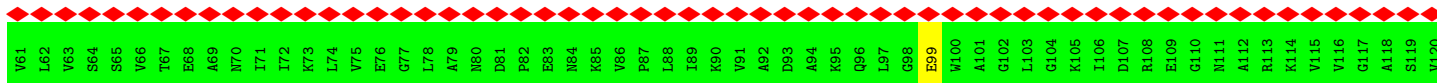
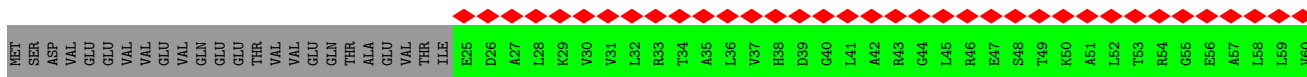
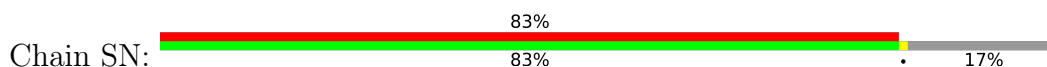




- Molecule 11: 40S ribosomal protein S11-A



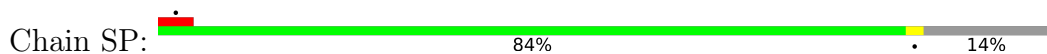
- Molecule 12: 40S ribosomal protein S12



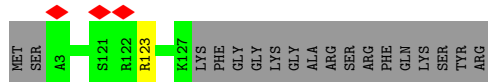
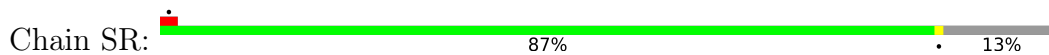
- Molecule 13: 40S ribosomal protein S13



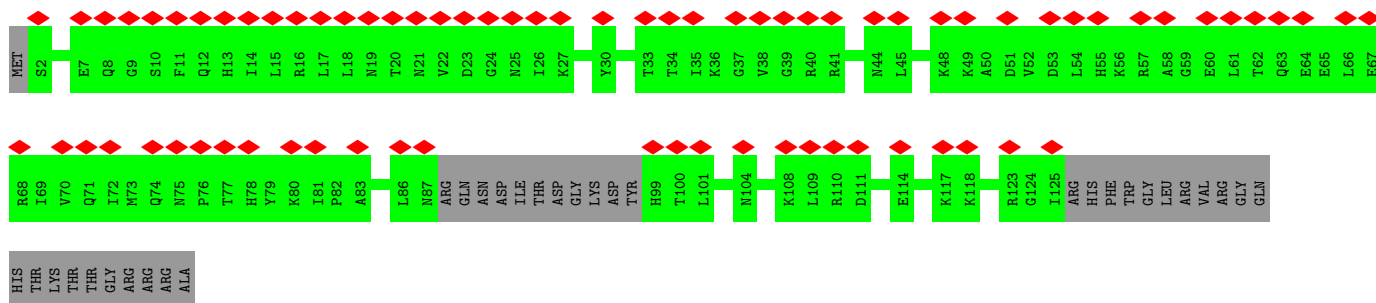
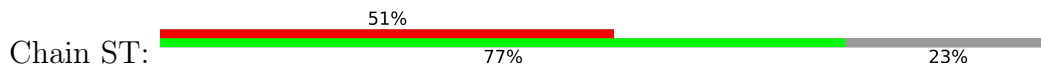
- Molecule 14: 40S ribosomal protein S14-A



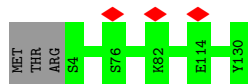
- Molecule 15: 40S ribosomal protein S16-A



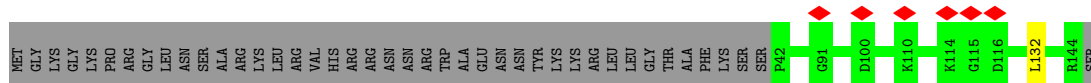
- Molecule 16: 40S ribosomal protein S18-A



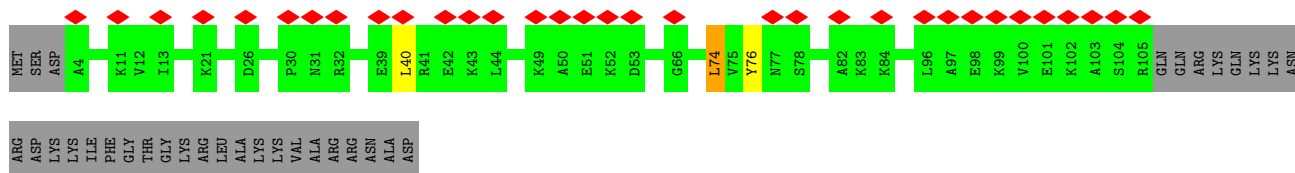
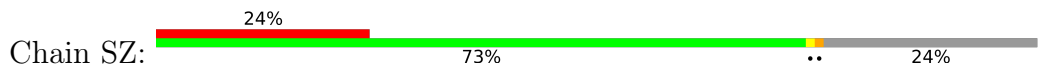
- Molecule 17: 40S ribosomal protein S22-B



- Molecule 18: 40S ribosomal protein S23-A



- Molecule 19: 40S ribosomal protein S24-A



- Molecule 20: 40S ribosomal protein S27-A



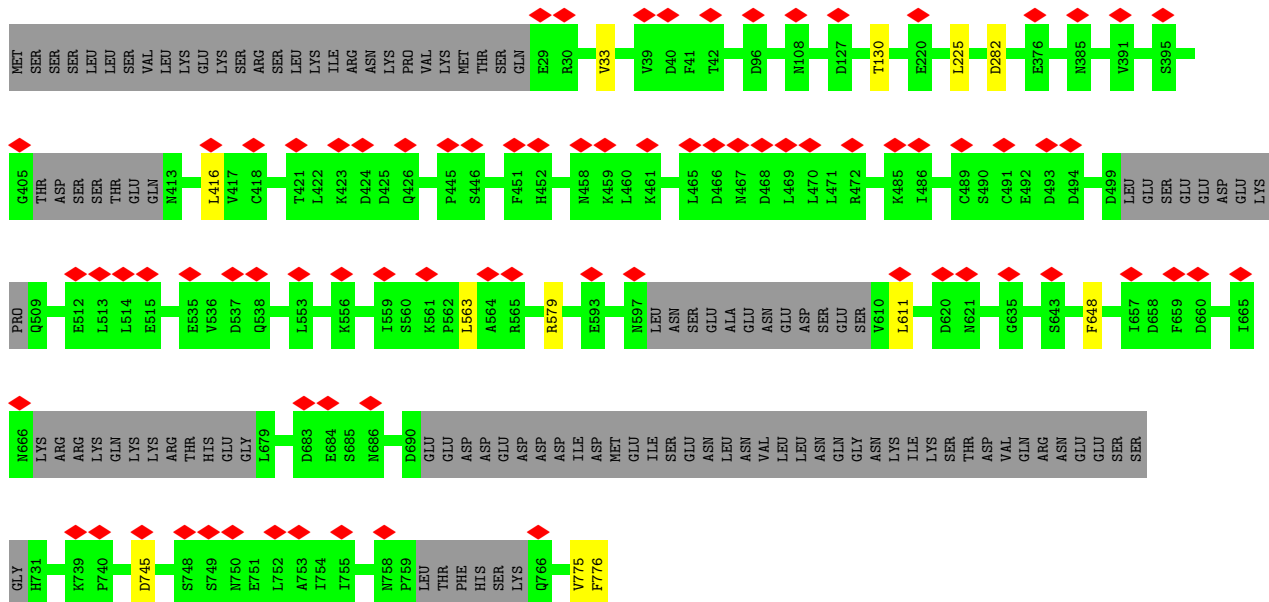
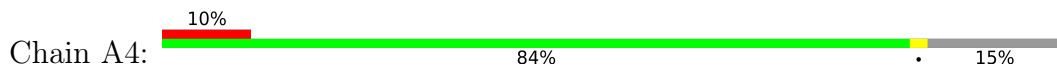




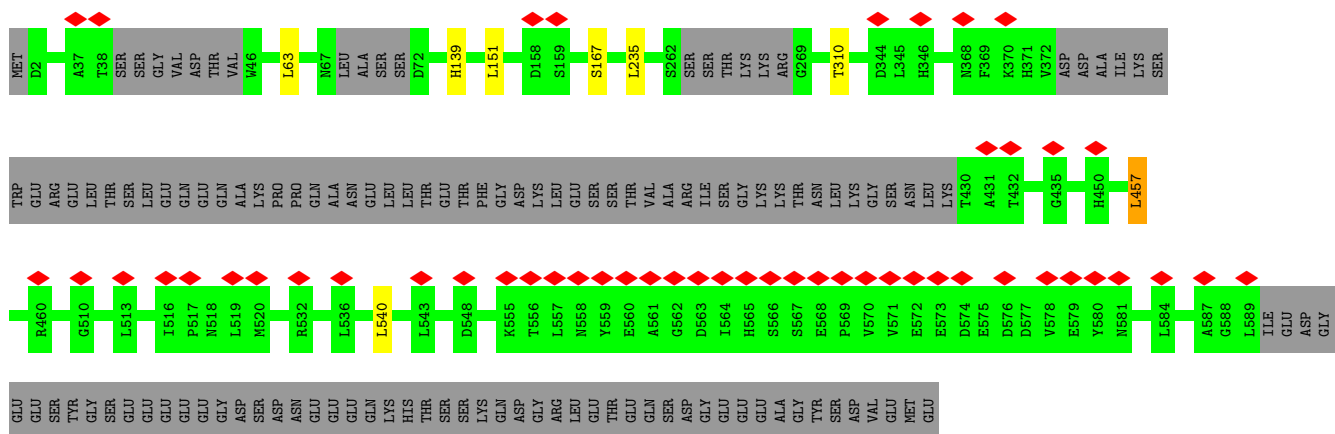
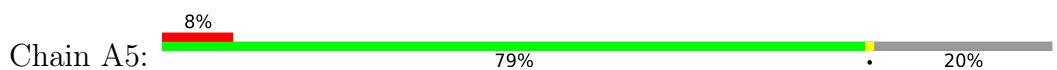




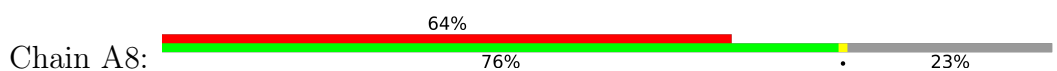
• Molecule 27: U3 small nucleolar RNA-associated protein 4



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



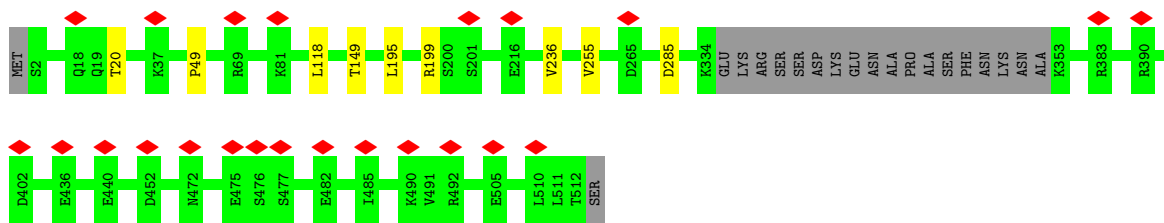
• Molecule 29: U3 small nucleolar RNA-associated protein 8



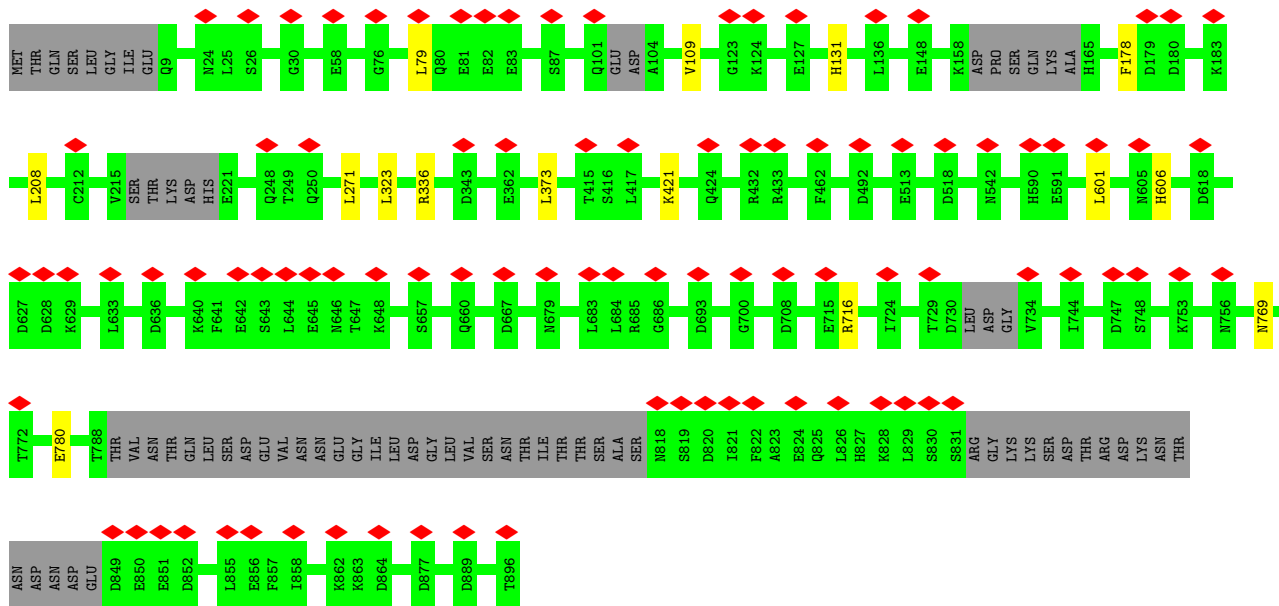
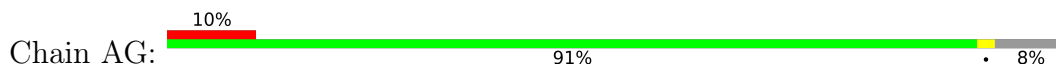




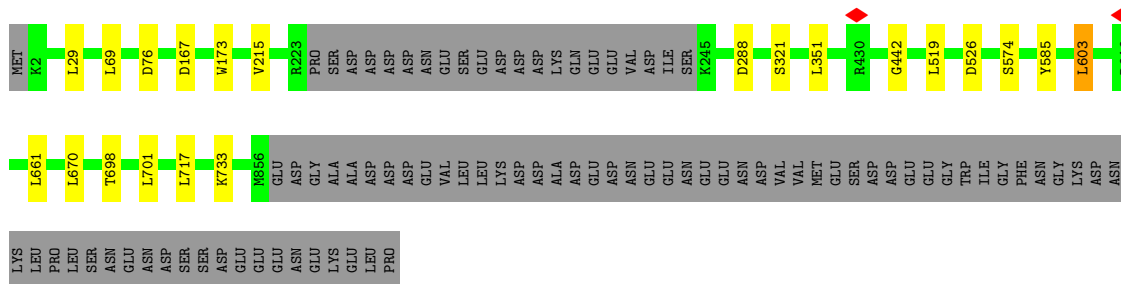
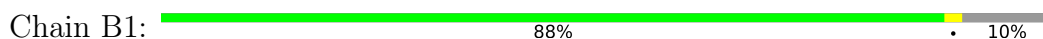




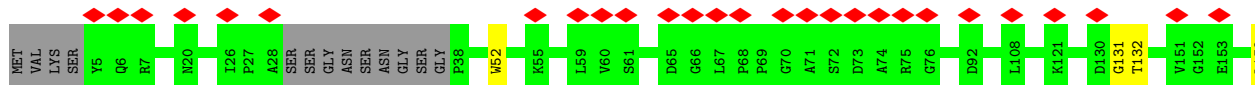
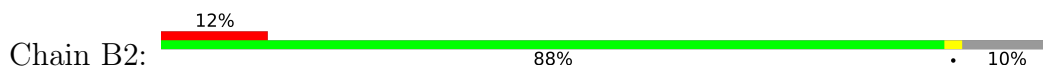
• Molecule 33: NET1-associated nuclear protein 1

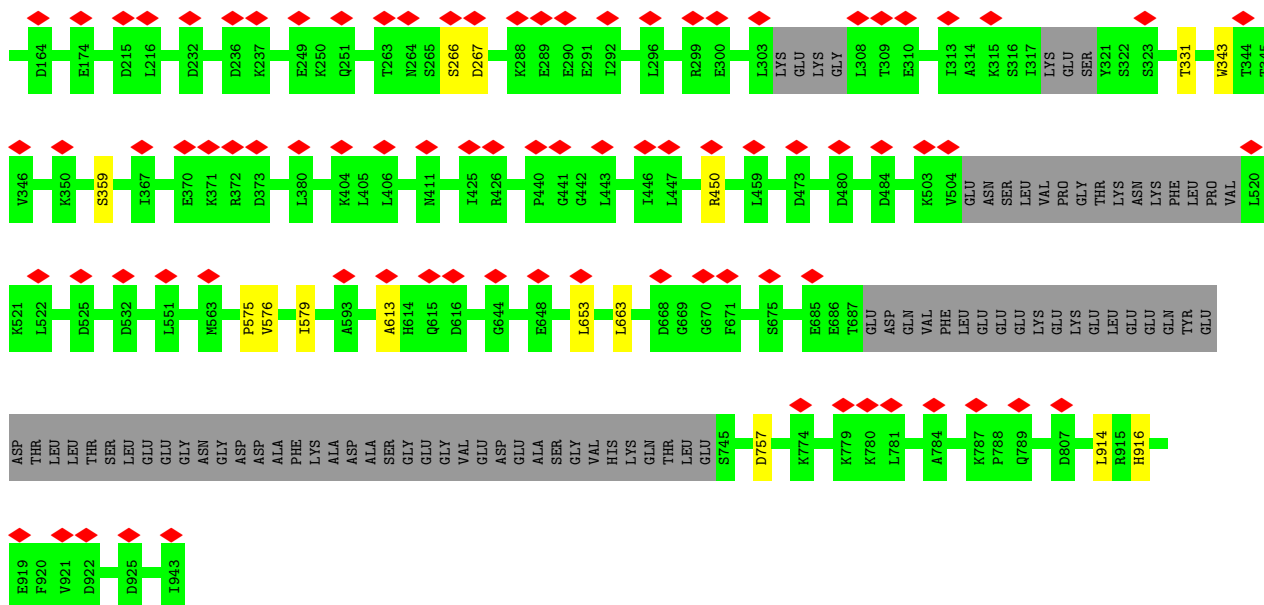


• Molecule 34: Periodic tryptophan protein 2



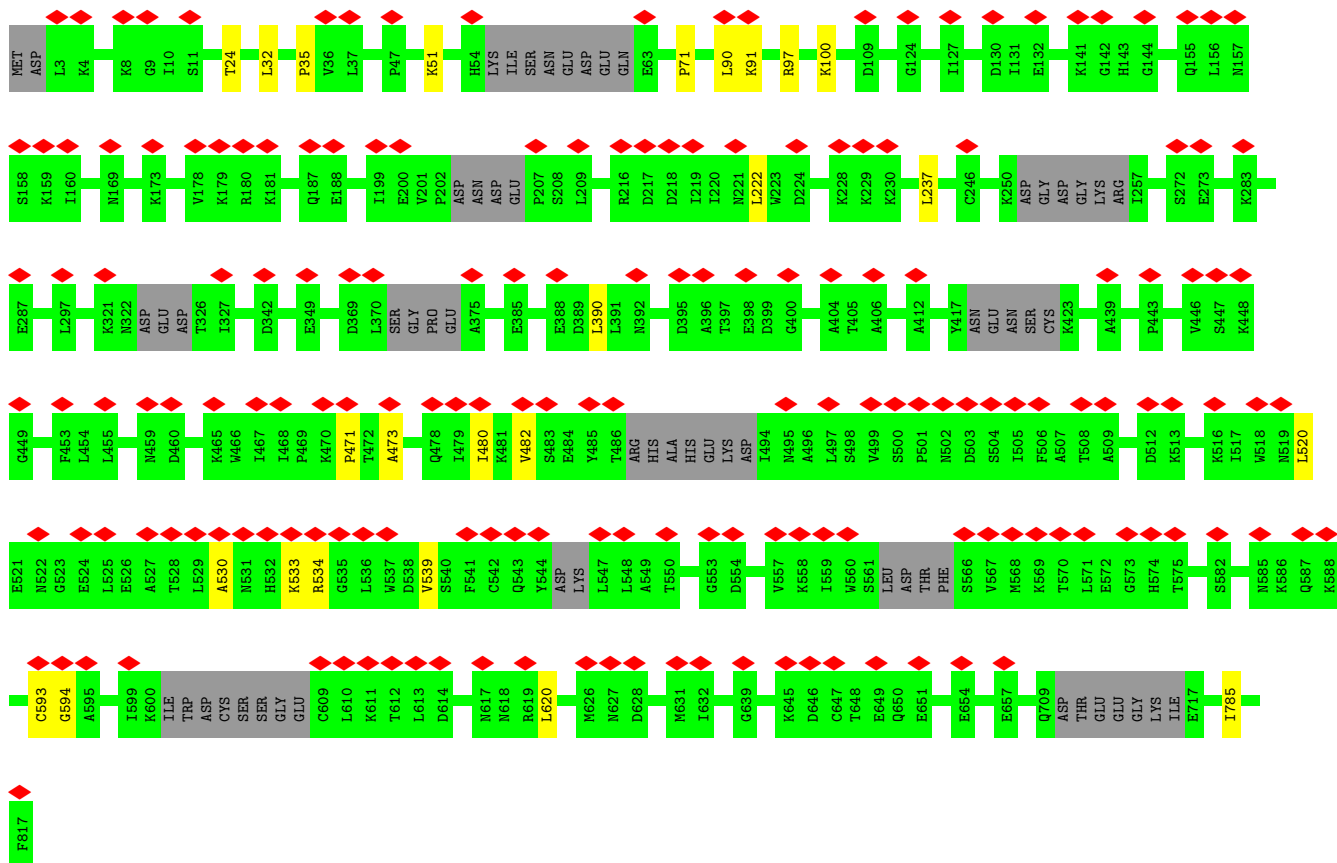
• Molecule 35: U3 small nucleolar RNA-associated protein 12





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

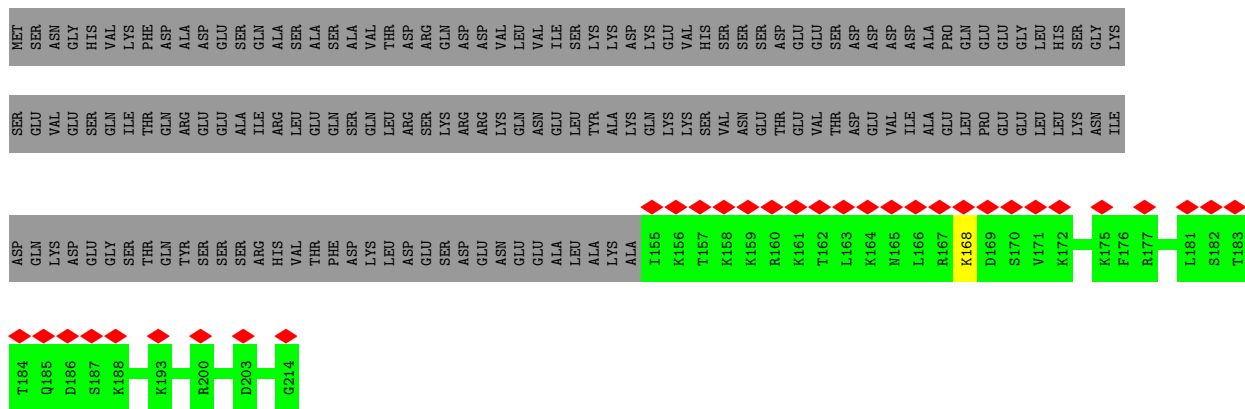
Chain B3:  22%  90%  7%



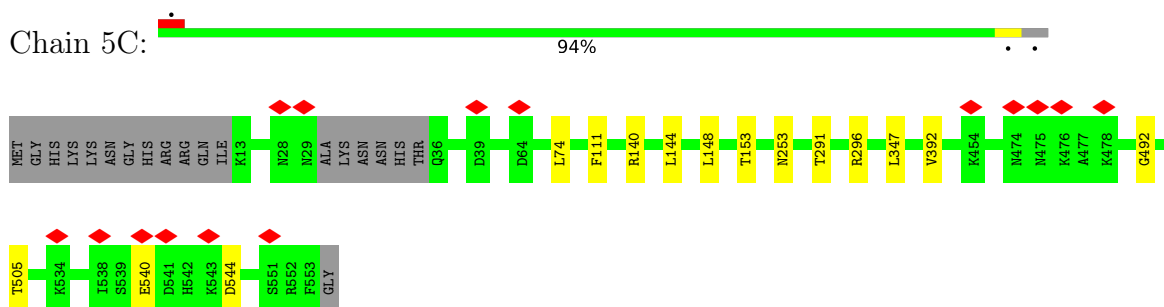
- Molecule 37: U3 small nucleolar RNA-associated protein 18



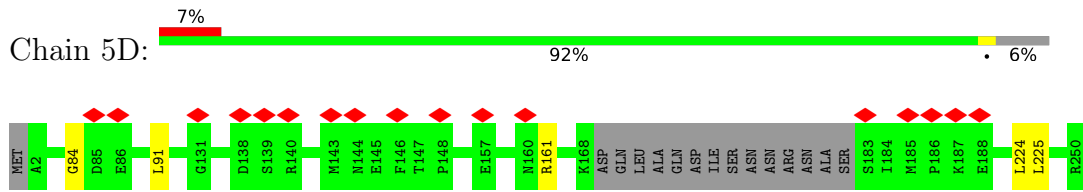




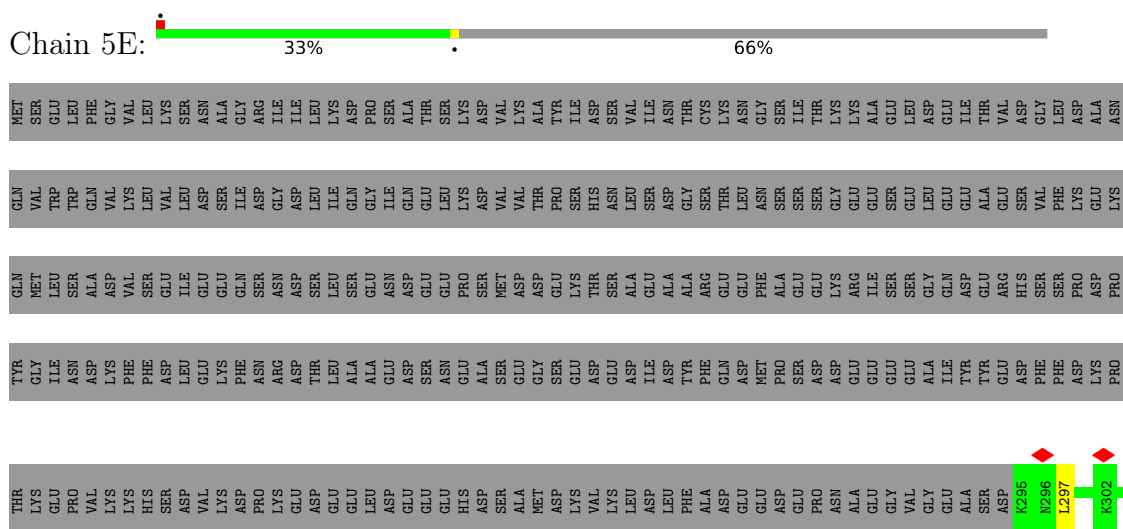
• Molecule 41: U3 small nucleolar RNA-associated protein 7



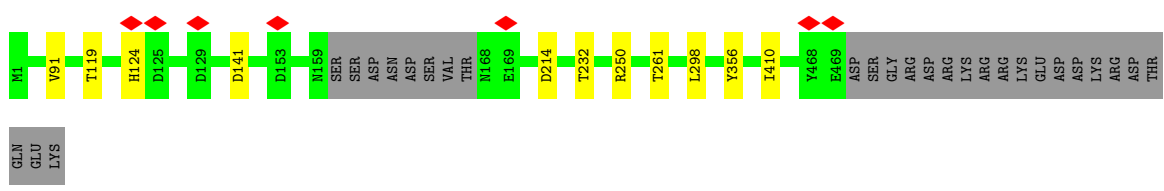
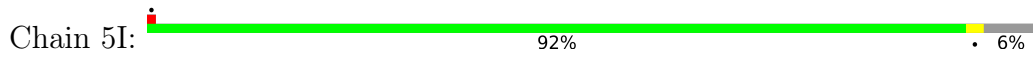
• Molecule 42: U3 small nucleolar RNA-associated protein 11



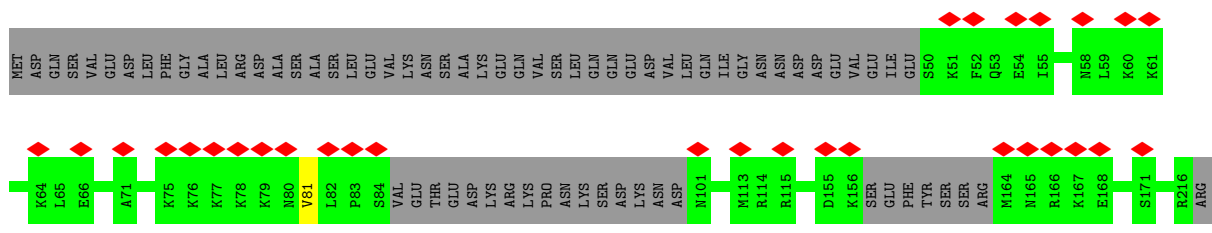
• Molecule 43: U3 small nucleolar RNA-associated protein MPP10



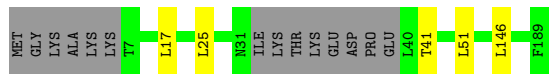
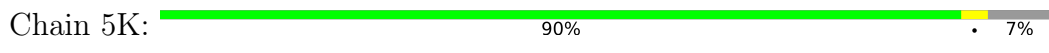




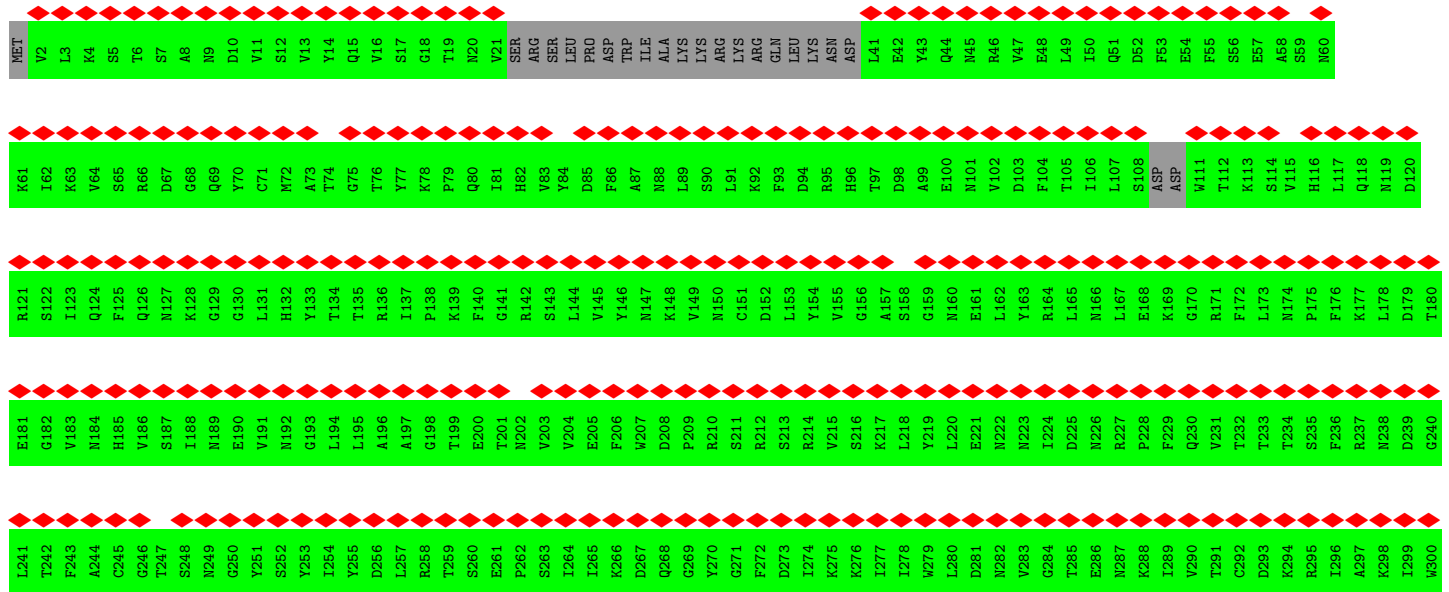
• Molecule 48: rRNA-processing protein FCF2



• Molecule 49: rRNA-processing protein FCF1



• Molecule 50: Ribosome biogenesis protein ENP2



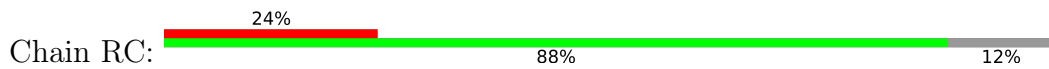
D301	D302	L303	D304	G305	K306	A307	Y308	A309	S310	M311	E312	P313	S314	V315	D316	I317	N318	D319	I320	E321	H322	V323	P324	G325	T326	G327	M328	F329	F330	T331	A332	N333	E334	S335	I336	P337	M338	H339	T340	Y341	Y342	I343	P344	S345	L346	G347	P348	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360						
GLY	GLY	GLY	GLY	LYS	PRO	SER	THR	THR	THR	ASN	TYR	GLU	PHE	ILE	ARG	ASP	VAL	GLY	LYS	LEU	ASN	LEU	HIS	LEU	VAL	GLY	ILE	SER	VAL	LEU	ALA	ASP	HIS	GLY	PHE	PHE	ILE	ASN	THR	GLY	LEU	TYR	VAL	LYS	VAL	GLY	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360
ASP	ALA	TYR	LYS	GLY	ARG	GLU	ARG	ILE	ARG	ARG	ILE	GLU	GLY	GLU	GLU	GLY	ILE	GLY	SER	GLY	ALA	LEU	VAL	LYS	PRO	ILE	LYS	GLY	ALA	ASN	LEU	ASP	HIS	LEU	SER	ALA	GLN	SER	GLY	VAL	VAL	ALA	GLY	VAL	LYS	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360	
ARG	PHE	LYS	GLY	MET	PHE	ASP	GLU	PHE	VAL	ARG	GLU	GLY	THR	THR	PHE	LYS	GLN	ASN	PRO	VAL	LYS	SER	GLY	THR	ALA	ALA	GLY	GLY	ALA	ASN	LEU	ARG	LYS	THR	ALA	ALA	ARG	ALA	GLN	GLY	VAL	VAL	ALA	GLY	VAL	LYS	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360
GLY	HIS	TYR	ASP	TYR	GLY	ASP	GLU	ASP	GLU	GLU	SER	GLY	THR	THR	GLY	ASN	GLN	LYS	ASN	GLY	LEU	LEU	GLY	LYS	ASP	LEU	LEU	LEU	LEU	GLY	ARG	LYS	GLY	ALA	ALA	ARG	ALA	ARG	GLY	GLY	VAL	VAL	ALA	GLY	VAL	LYS	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360
LYS	ALA	THR	THR	THR	THR	THR	ASP	ASP	GLU	ALA	HIS	THR	THR	THR	GLY	ASN	GLN	LYS	ASN	LEU	LEU	VAL	GLY	LYS	LYS	LYS	LEU	LEU	LEU	LEU	ALA	LYS	ARG	LYS	ARG	ALA	GLY	GLY	GLY	VAL	VAL	ALA	GLY	VAL	LYS	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360	
GLY	ASN	TYR	LYS	ARG	ARG	HIS	ASP	ASN	SER	GLY	GLU	GLY	ILE	THR	GLU	ASN	GLY	LYS	ASP	ASN	GLY	ARG	PHE	ARG	ARG	ARG	ALA	ALA	ALA	LYS	SER	GLY	ASN	ASN	ALA	PHE	ARG	ARG	GLY	GLY	VAL	VAL	ALA	GLY	VAL	LYS	VAL	LEU	ILE	ALA	ASP	ASN	PRO	S349	P350	R351	M352	C353	S354	F355	L356	D357	S358	I359	T360

● Molecule 51: U3 small nucleolar ribonucleoprotein protein LCP5



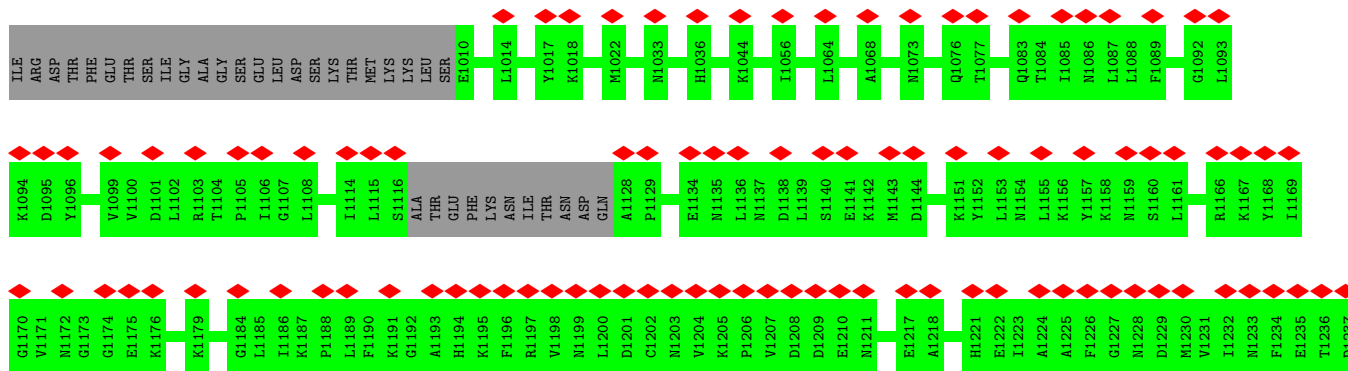
MET	SER	GLU	LEU	ALA	LEU	LEU	LYS	ILE	ASN	GLY	SER	THR	THR	SER	GLU	SER	SER	GLY	ILE	TYR	LYS	PRO	SER	ASN	ASP	ALA	ASP	THR	ASP	ILE	PRO	GLY	SER	HIS	VAL	GLY	HIS	HIS	LEU	LEU	PHE	ARG	TYR	GLY	VAL	ASP	ALA	LYS	PRO	LYS	VAL	LEU	SER	LEU
LEU	SER	LEU	LYS	ASN	GLY	MET	SER	ILE	ASN	GLY	SER	THR	THR	SER	GLU	SER	SER	GLY	ILE	TYR	LYS	PRO	SER	ASN	ASP	ALA	ASP	THR	ASP	ILE	PRO	GLY	SER	HIS	VAL	GLY	HIS	HIS	LEU	LEU	PHE	ARG	TYR	GLY	VAL	ASP	ALA	LYS	PRO	LYS	VAL	LEU	SER	LEU
LEU	ASP	LYS	THR	ARG	ALA	TYR	VAL	LYS	GLY	LYS	GLY	TYR	THR	ALA	ALA	LYS	THR	THR	VAL	LYS	VAL	ASN	ASN	HIS	SER	GLY	VAL	ASP	ASP	GLY	ASP	GLY	THR	HIS	ASP	ASP	ILE	ILE	GLY	LEU	ALA	ALA	ARG	TYR	GLY	VAL	PRO	ASN	PRO	LYS	VAL	LEU	SER	LEU
LYS	LYS	SER	ALA	THR	ARG	VAL	VAL	GLY	ALA	LYS	ASN	THR	THR	ALA	ALA	LYS	ASN	VAL	TYR	LYS	VAL	ASN	ASN	PRO	LYS	ILE	THR	ALA	VAL	VAL	PRO	PRO	GLN	THR	HIS	F224	E225	D226	R227	F228	D229	A230	R231	E232	H233	K234	D235	E247	D254					

● Molecule 52: KRR1 small subunit processome component

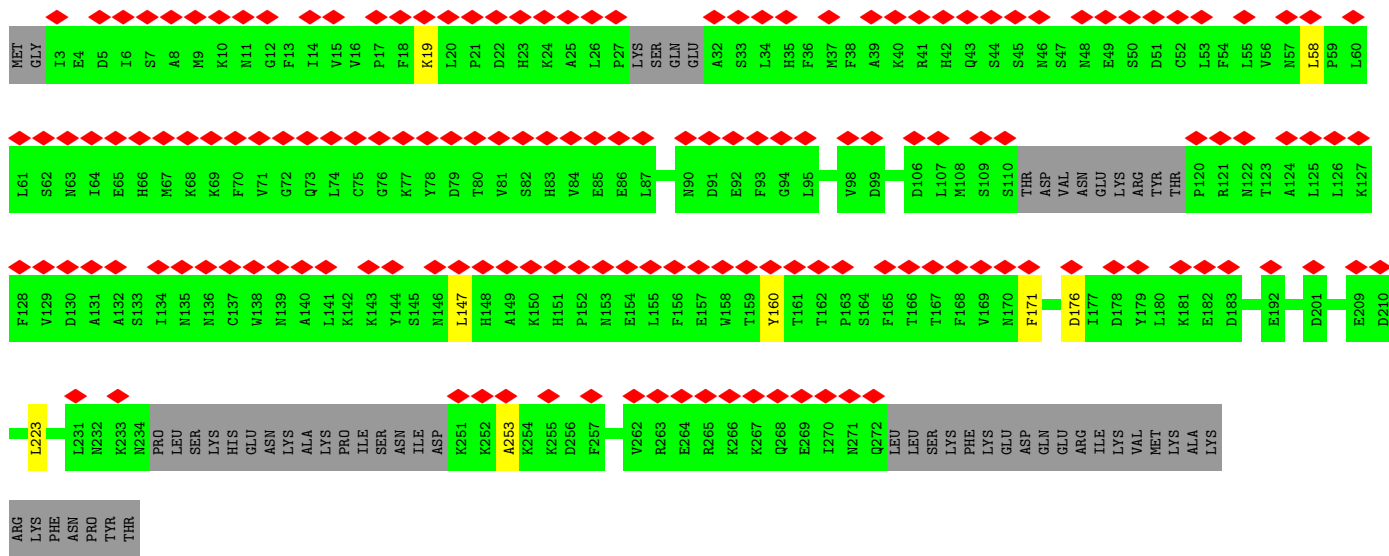
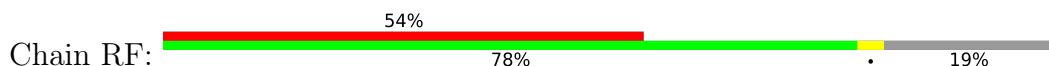


MET	VAL	THR	HIS	ASN	ARG	ASP	TRP	THR	ASP	ASP	ILE	LYS	TRP	LYS	ILE	GLY	GLU	PHE	LYS	GLY	GLU	ASP	ALA	SER	GLY	GLN	PRO	F35	A36	E37	R62	R207	F213	W226	F227	K228	K229	R230	M231	V232	A233	R234	K235	K236	P237	K238	K239	I240	R241						
M242	V243	E244	K245	K246	V247	L256	K259	V260	D261	L262	E263	I264	E265	E266	Y269	F270	L271	S272	K273	R274	E276	K278	Q277	H278	K279	L281	N282	E283	Q284	K285	E286	K287	Q288	M289	E290	R291	E292	I293	E294	R295	Q296	E297	E298	R299	A300	K301	D302	F303	I304	A305	P306	E307	E308	E309	A310

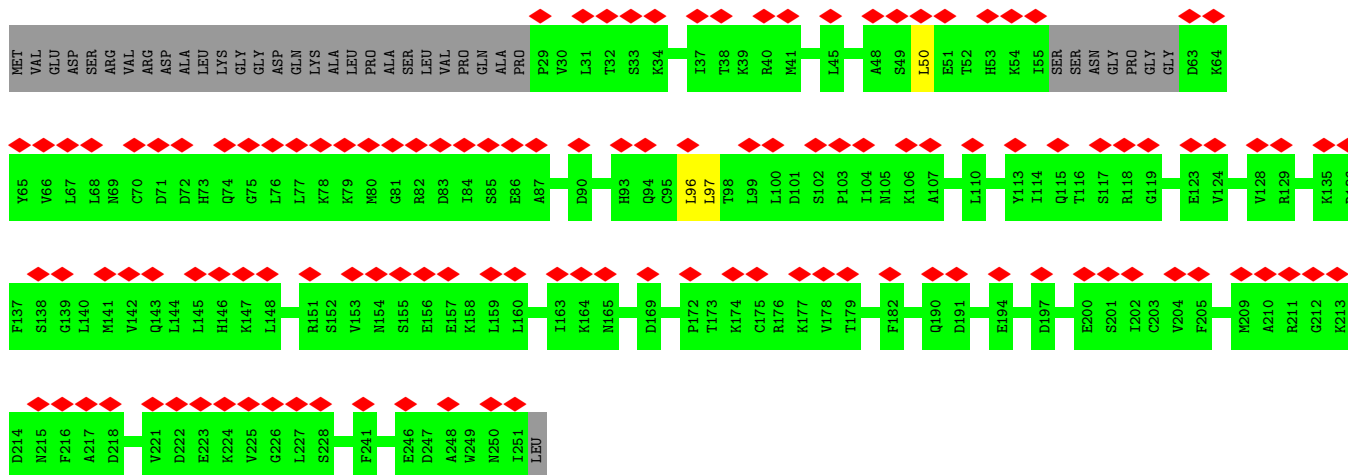
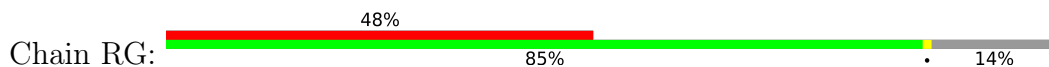




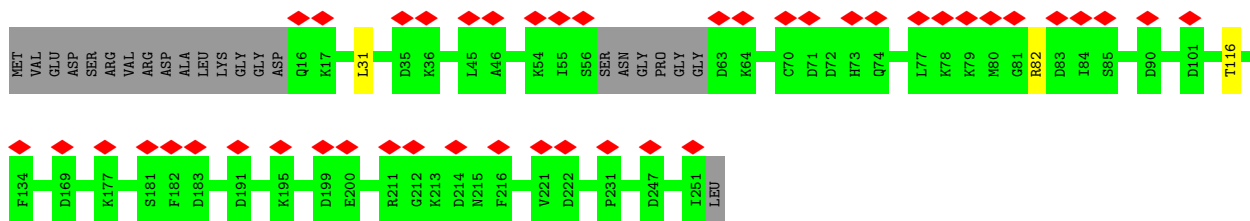
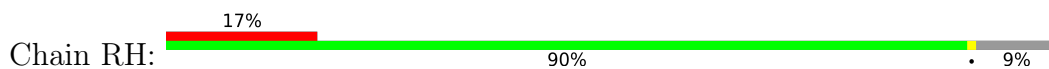
• Molecule 54: Ribosomal RNA-processing protein 7



• Molecule 55: Ribosomal RNA small subunit methyltransferase NEP1



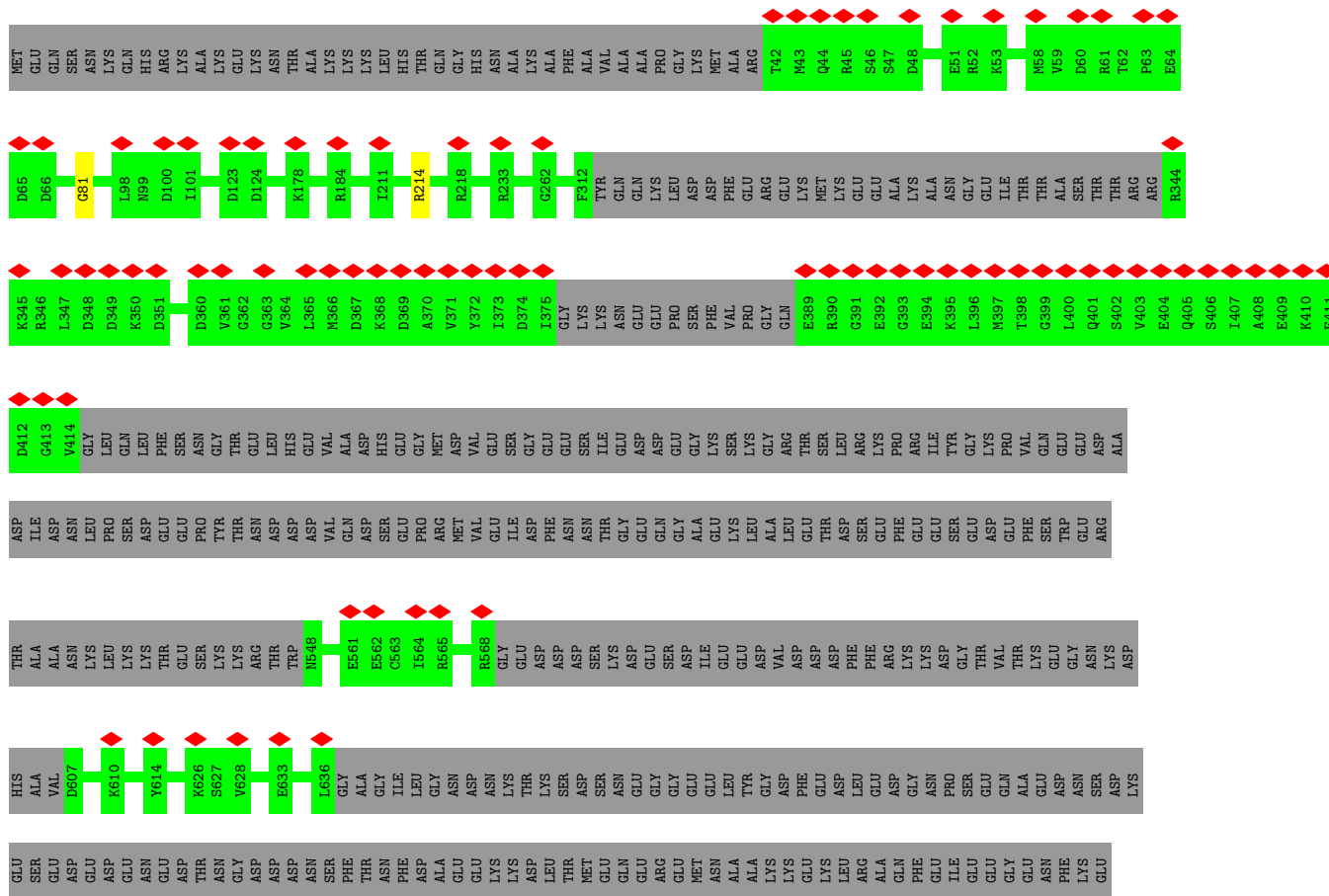
● Molecule 55: Ribosomal RNA small subunit methyltransferase NEP1

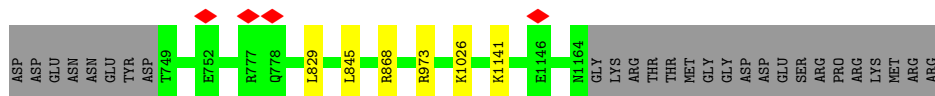


● Molecule 56: Ribosome biogenesis protein UTP30



● Molecule 57: Ribosome biogenesis protein BMS1

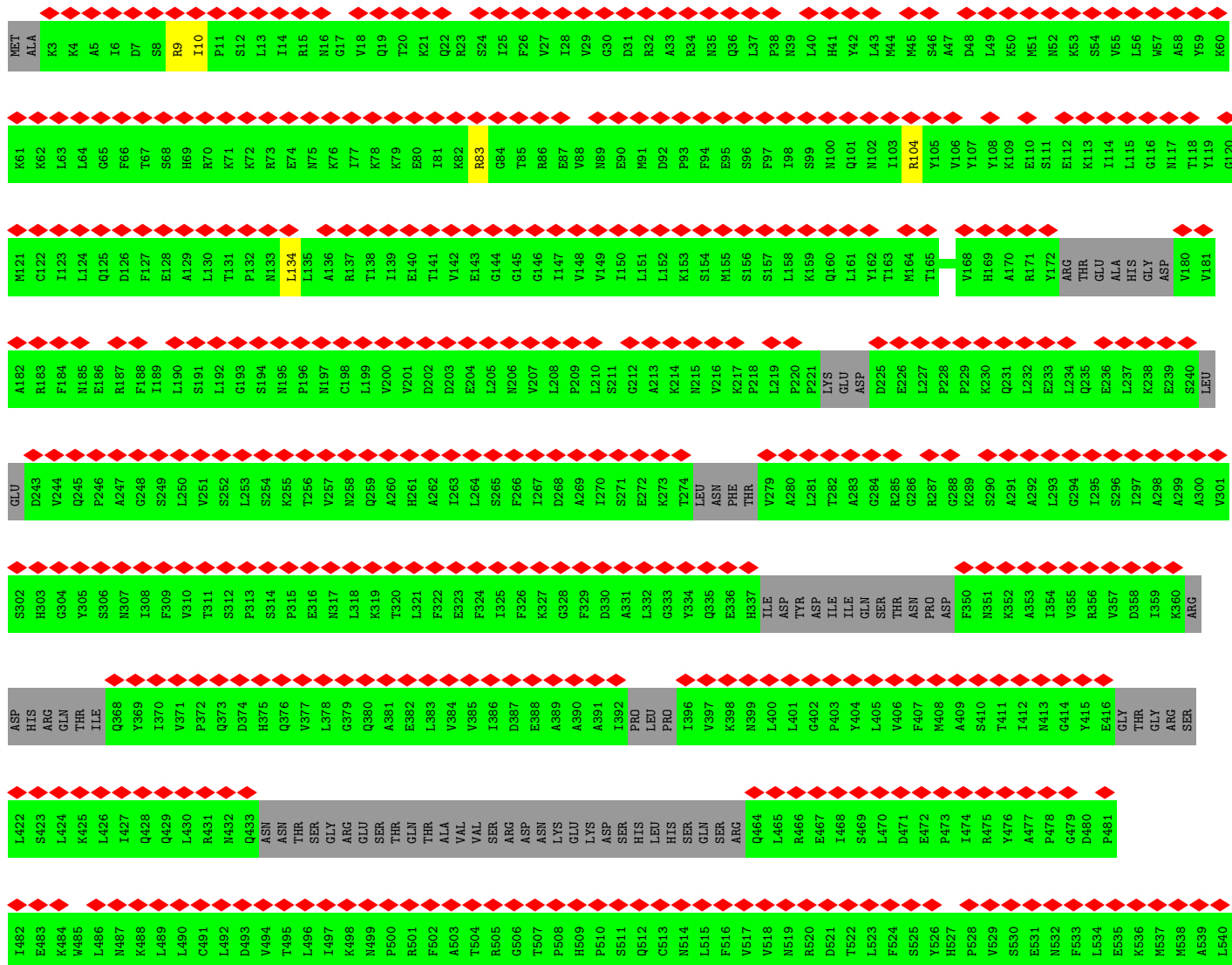
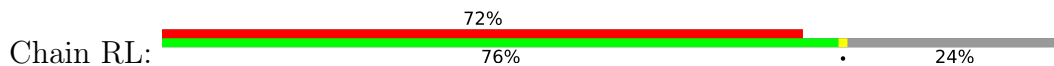




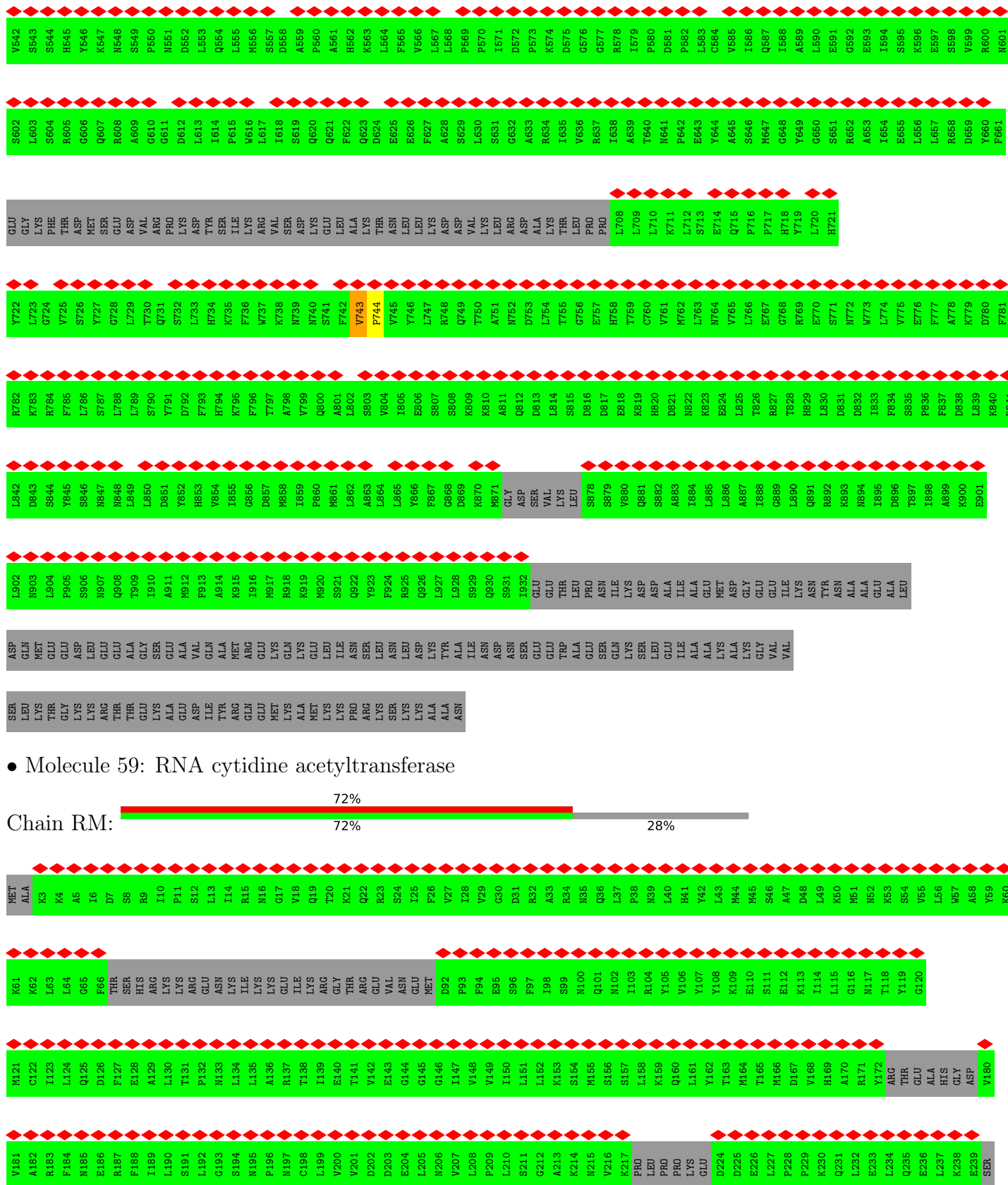
• Molecule 58: RNA 3'-terminal phosphate cyclase-like protein



• Molecule 59: RNA cytidine acetyltransferase

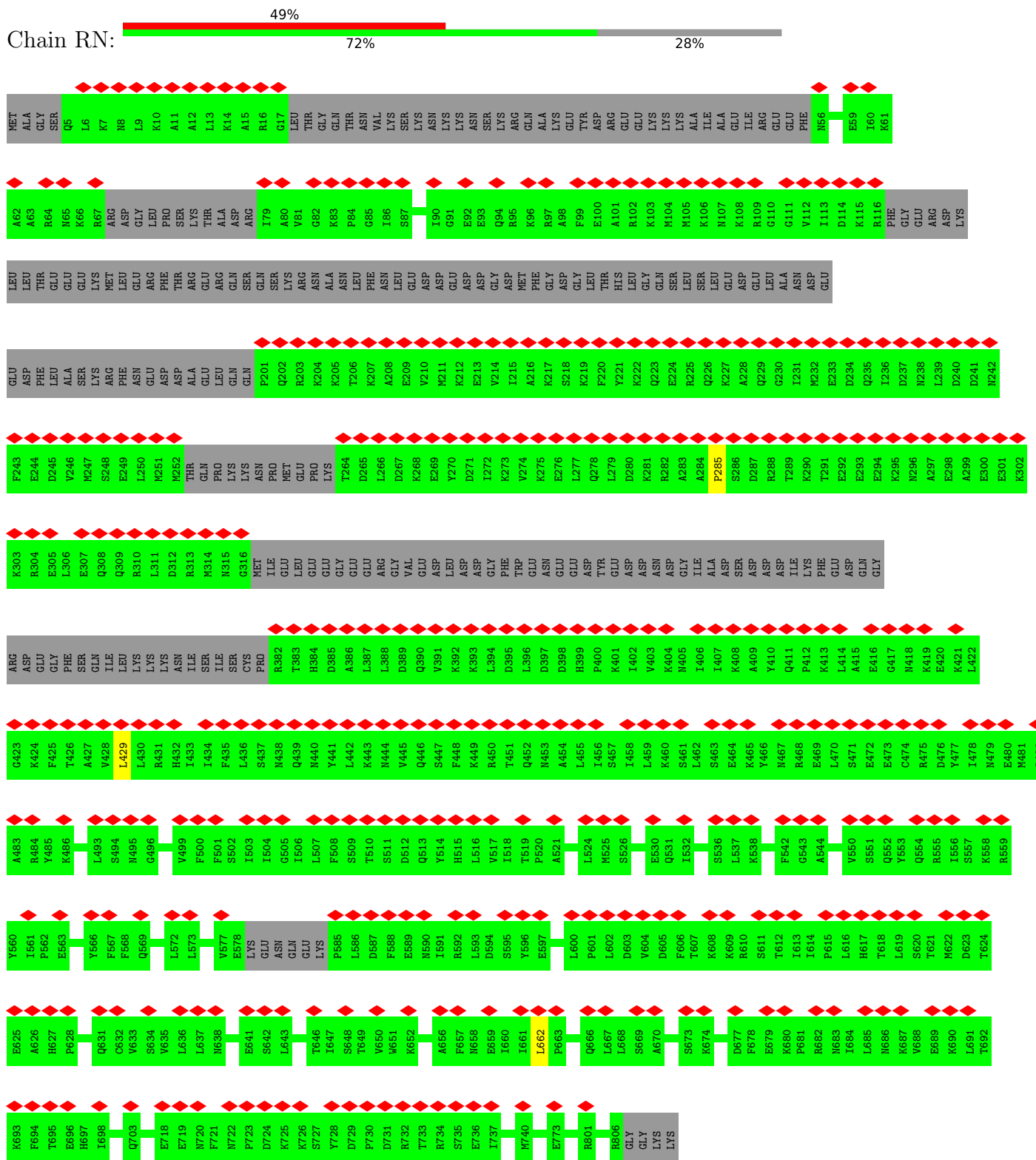




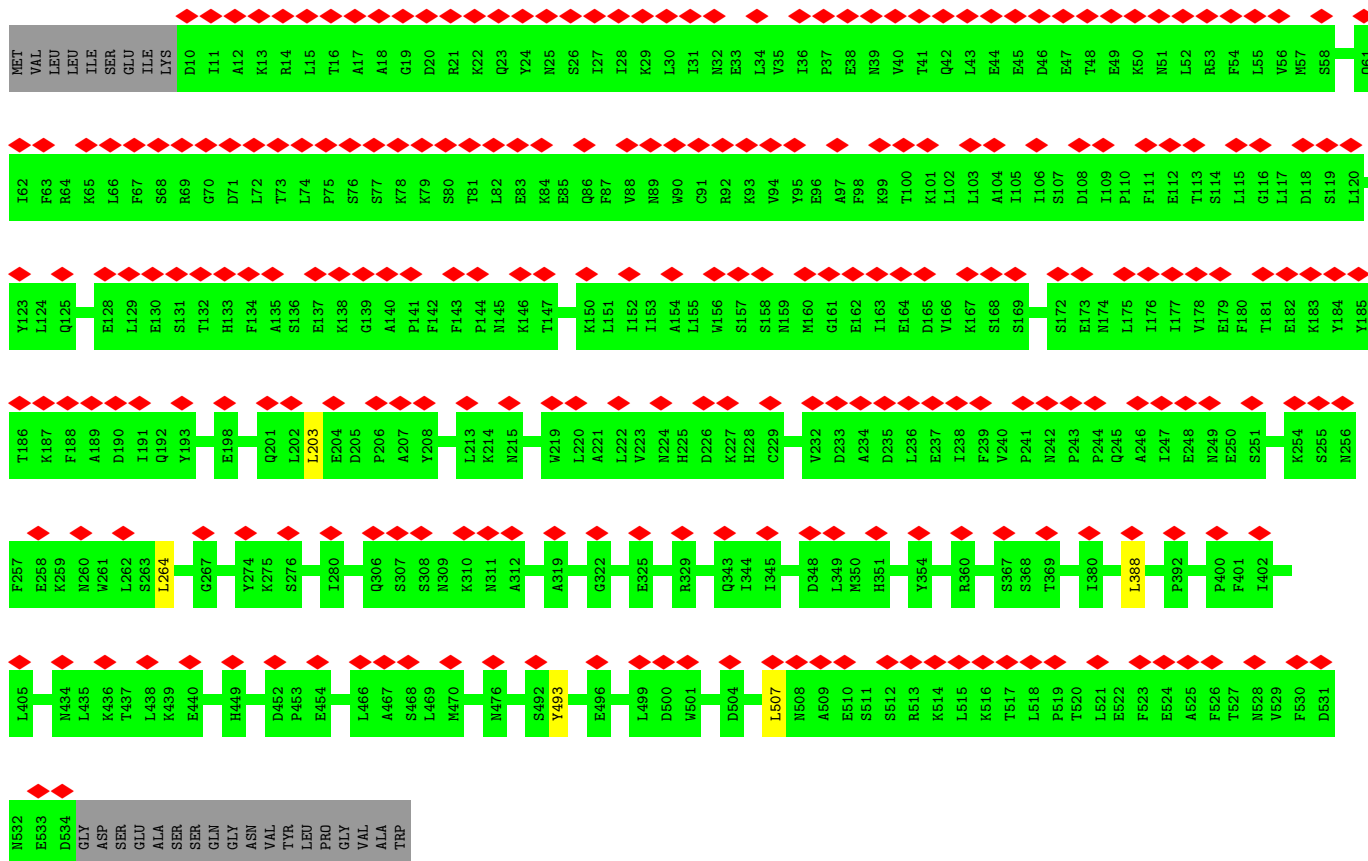


LEU	D243	D244	Q245	P246	A247	G248	S249	L250	V251	S252	L253	S254	K255	V256	V257	N258	Q259	A260	H261	A262	I263	L264	S265	F266	I267	D268	A269	L270	S271	E272	K273	T274	LEU	V279	A280	L281	T282	A283	G284	R285	G286	R287	G288	K289	S290	A291	A292	L293	G294	I295	S296	I297	A298	A299	A300				
V301	S302	H303	G304	Y305	N307	I308	F309	V310	T311	S312	P313	S314	P315	E316	N317	L318	K319	T320	L321	F322	E323	F324	I325	F326	K327	G328	F329	A330	A331	L332	G333	Y334	Q335	K336	H337	I338	A339	G402	P403	Y404	L405	V406	F407	M408	A409	S410	T411	I412	N413	G414	T415	V355	R356	V357	D358	I359	A360		
ARG	ASP	HIS	GLN	THR	ILE	Q368	Y369	V371	P372	Q373	D374	H375	Q376	V377	L378	G379	Q380	A381	E382	L383	V384	V385	I386	D387	E388	K327	A389	A390	A391	I392	P393	LEU	I396	V397	K398	N399	L400	L401	G402	P403	Y404	L405	V406	F407	M408	A409	S410	T411	I412	N413	G414	T415	V355	R356	V357	D358	I359	A360	
SER	L422	S423	L424	K425	L426	I427	Q428	Q429	L430	K431	M432	Q433	ASN	ASN	THR	GLY	ARG	GLU	THR	THR	THR	VAL	VAL	ARG	ASP	ASN	LVS	LVS	LVS	LVS	HIS	LEU	HIS	SER	GLN	ARG	GLN	LEU	ARG	E467	I468	S469	D470	L471	E472	P473	I474	R475	Y476	A477	G478	D480							
P481	I482	E483	K484	W485	L486	M487	K488	L489	L490	C491	L492	D493	V494	T495	L496	I497	K498	M499	P500	R501	F502	A503	T504	R505	G506	T507	P508	H509	P510	S511	Q512	C513	N514	C515	L516	F516	V517	V518	N519	R520	D521	T522	L523	F524	S525	Y526	H527	P528	V529	S530	E531	N532	F533	L534	E535	K536	M537	A539	L540
Y541	V542	S543	S544	H545	Y546	K547	N548	S549	P550	M551	D552	L553	Q554	L555	M556	S557	D558	A559	P560	H561	E562	K563	L564	F565	V566	L567	L568	P569	P570	I571	D572	P573	K574	D575	G576	G577	R578	I579	P580	D581	P582	L583	C584	V585	I586	Q587	I588	A589	GLU	G592	E593	I594	S595	K596	E597	S598	V599	R600	
M601	S602	L603	S604	R605	G606	Q607	R608	A609	G610	G611	D612	L613	L614	P615	M616	L617	L618	S619	Q620	Q621	F622	Q623	D624	E625	E626	F627	A628	S629	L630	S631	G632	A633	R634	I635	V636	R637	L638	A639	T640	M641	P642	E643	Y644	A645	S646	M647	G648	Y649	G650	S651	R652	A653	L654	E655	L656	L657	D658	D659	V660
F661	GLU	GLY	LVS	PHE	THR	ASP	THR	GLU	VAL	PRP	LVS	THR	ILE	ARG	VAL	SER	THR	ASP	GLU	ALA	LVS	THR	ASN	LEU	LEU	LVS	ASP	VAL	LVS	LEU	ARG	ASP	ALA	LVS	THR	LEU	PRP	L708	L709	L710	K711	L712	S713	E714	Q715	P716	I717	H718	Y719	L720									
H721	Y722	L723	G724	W725	S726	Y727	G728	L729	T730	Q731	S732	L733	H734	K735	F736	W737	K738	M739	N740	S741	F742	V743	P744	W745	Y746	L747	R748	Q749	T750	A751	N752	D753	L754	T755	G756	E757	H758	T759	C760	V761	M762	L763	N764	V765	L766	E767	G768	R769	E770	S771	N772	W773	L774	V775	E776	F777	K778	D780	
F781	R782	K783	S844	F784	L786	S787	L788	L789	S790	Y791	D792	F793	H794	K795	F796	T797	M798	I859	P860	H861	S862	A863	L864	L865	Y866	F867	G868	D869	K870	A871	D872	L873	L874	S875	D876	E877	K878	H879	H880	D881	A882	A883	I884	L885	L886	A887	T888	T889	L890	L891	D892	L893	F834	S835	F836	F837	D838	L839	K840
R841	L842	D843	S844	F784	L786	S787	L788	L789	S790	Y791	D792	F793	H794	K795	F796	T797	M798	I859	P860	H861	S862	A863	L864	L865	Y866	F867	G868	D869	K870	A871	D872	L873	L874	S875	D876	E877	K878	H879	H880	D881	A882	A883	I884	L885	L886	A887	T888	T889	L890	L891	D892	L893	F834	S835	F836	F837	D838	L839	K840
E901	L902	H903	L904	P905	S906	R907	Q908	T909	I910	A911	H912	F913	A914	K915	I916	H917	R918	K919	N920	S921	Q922	F923	F924	R925	Q926	L927	L928	S929	Q930	S931	I932	GLU	GLY	SER	THR	THR	LEU	PRO	ASN	ILE	ASP	ASP	ALA	ALA	ALA	GLU	GLY	GLY	GLY	VAL									
VAL	SER	LEU	THR	GLY	LVS	ARG	THR	THR	GLU	LVS	ALA	ASP	ILE	ALA	ARG	GLN	LVS	LVS	GLN	PRO	ARG	LVS	SER	LEU	LEU	ASP	LVS	ALA	ALA	ASN	GLU	GLY	THR	TRP	GLU	GLU	GLU	GLN	LVS	SER	LEU	GLU	GLU	GLY	GLY	VAL													

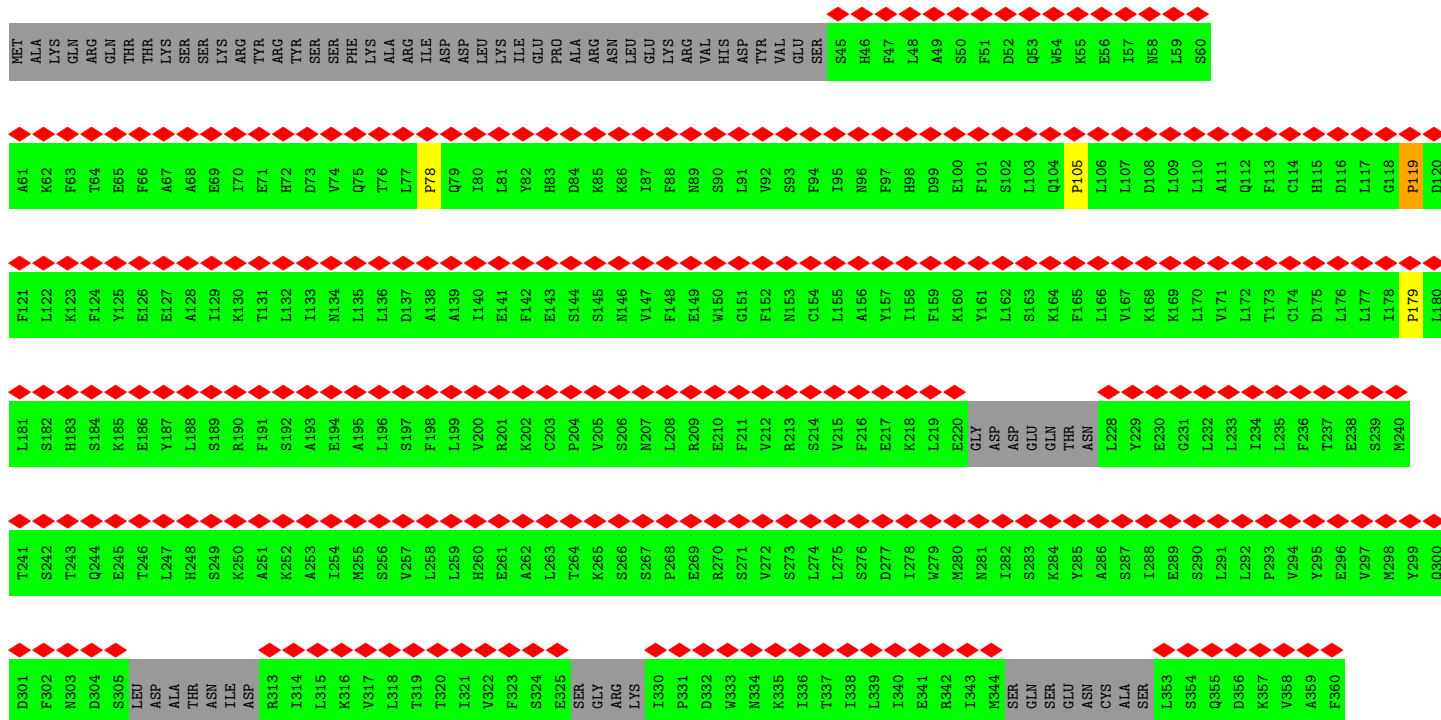
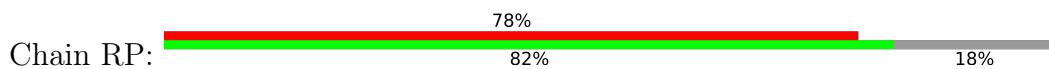
• Molecule 60: Nucleolar complex protein 14



● Molecule 61: Nucleolar complex protein 4

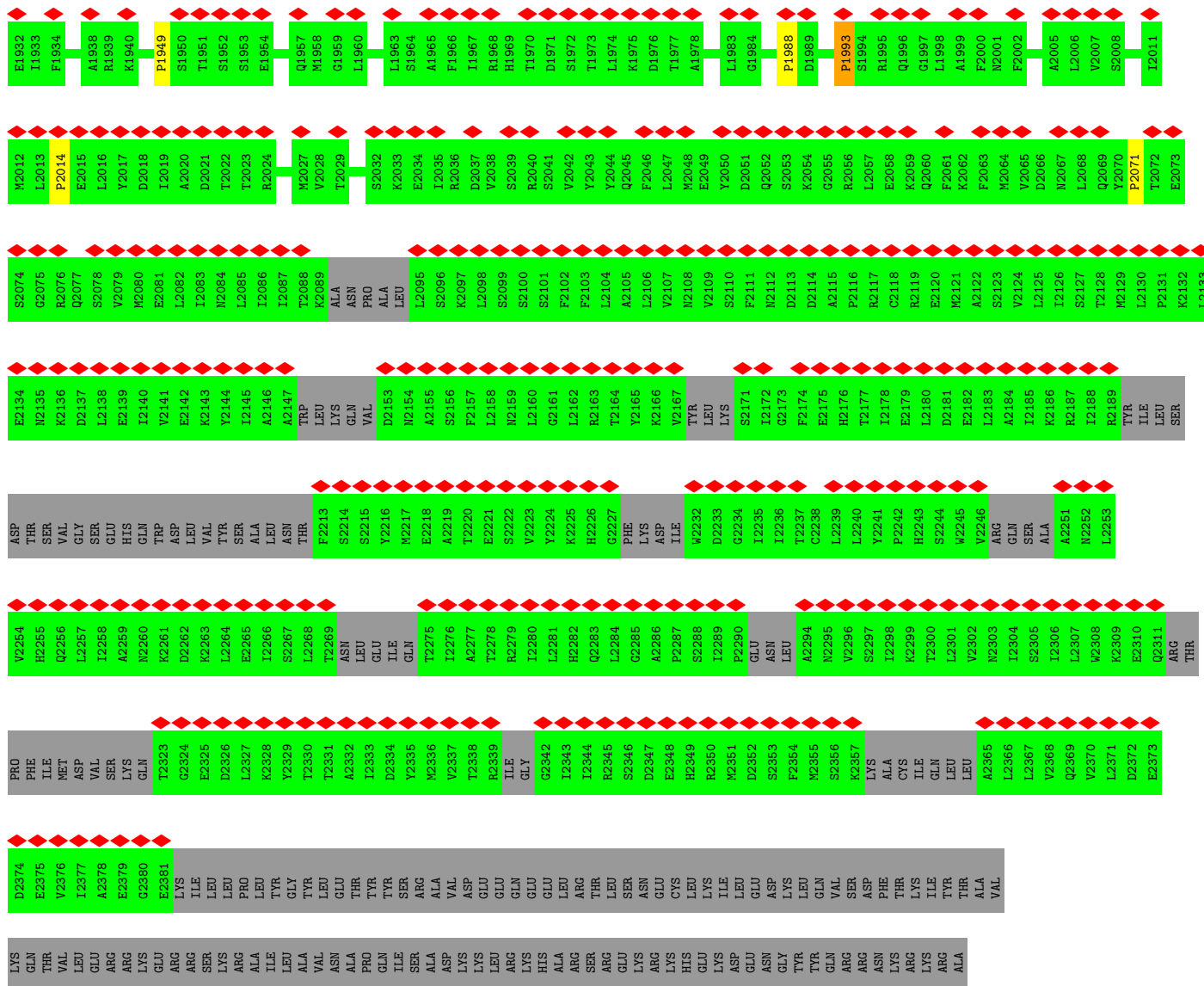


• Molecule 62: U3 small nucleolar RNA-associated protein 20

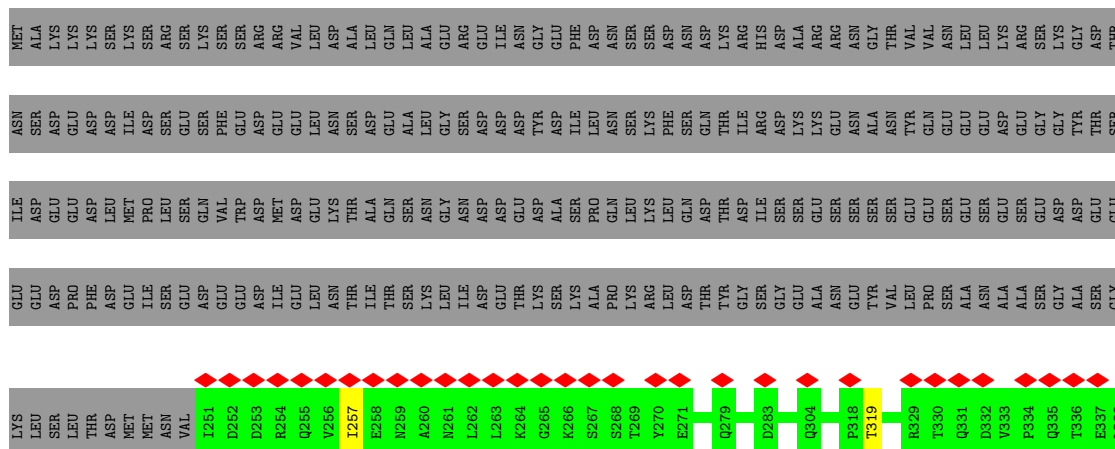


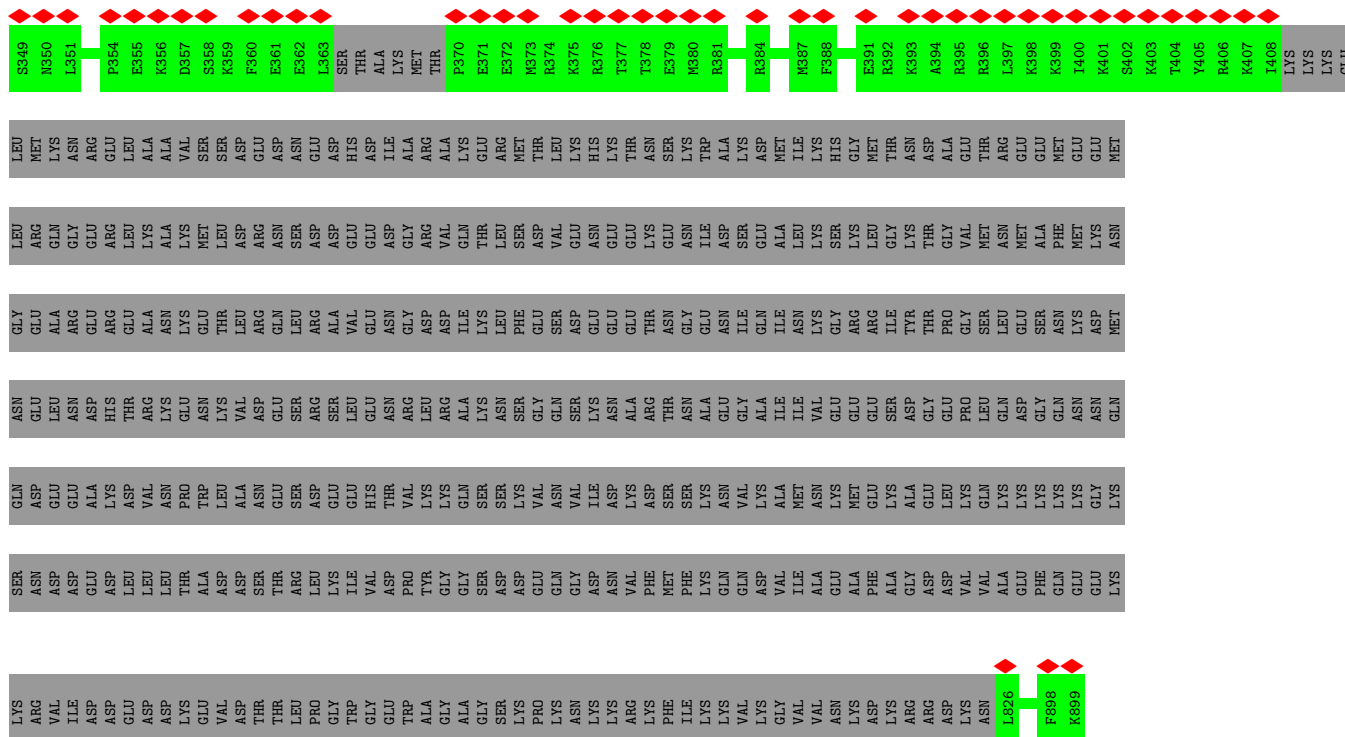
D1081	I1082	Y1083	A1084	V1085	V1086	V1087	K1088	P1089	S1029	I1090	I1091	S1092	F1093	F1094	S1095	D1096	E1097	L1098	L1099	Q1100	P1101	S1102	S1103	S1104	L1105	L1106	R1107	L1108	F1109	L1110	Y1111	M1112	A1113	N1114	N1115	P1116	S1117	L1118	Y1119	Q1120	F1121	L1122	Y1123	Y1124	D1125	L1126	F1127	A1128	T1129	A1130	T1131	A1132	L1133	D1134	D1135	T1136	I1137	N1138	Q1140
I961	N962	D963	F964	L965	S966	L967	A968	S969	E970	R971	L972	D973	D974	N975	Y976	F977	F978	G979	N980	S981	S1041	T1042	E1043	E1044	V1045	S986	S987	K988	T990	L991	K992	T993	I994	R995	R996	M997	T998	G999	F1000	V1001	I1002	I1003	V1004	N1005	S1006	T1007	L1008	S1009	V1010	L1011	R1012	T1013	D1014	V1015	P1016	L1017	H1018	T1019	N1020
I841	K842	N843	V844	Y845	S846	A847	T848	E849	L850	H851	D852	H853	L854	H855	V856	L857	L858	G859	S860	R861	N862	T863	D864	K865	V866	K867	L868	A869	L870	D871	A872	L873	L874	A875	Y876	K877	N878	P879	T880	L881	N882	K883	Y884	R885	D886	N887	L888	K889	N890	L891	L892	D893	D894	T895	L896	F897	K898	D899	E900
T901	T902	T903	F904	L905	T906	E907	N908	G909	S910	Q911	S912	S913	K914	A915	E916	D917	E918	K919	V920	V921	N922	P923	Y924	Y925	L926	R927	I928	F929	F930	G931	R932	A933	Q934	Y935	P936	P937	T938	S939	Q940	Q941	K942	R943	S944	R945	K946	T947	A948	Y949	S951	V952	L953	P954	N955	F956	K957	X958	P959	Y960	
V781	M782	L783	S784	I785	P786	Q787	V788	A789	E790	M791	H792	F793	V794	D795	I796	A797	P798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	M813	E814	N815	E816	R817	V818	I819	T820	G821	S822	M823	T824	E825	V826	D827	R828	N829	V831	L832	K833	T834	L835	S836	K837	F838	K839	N840	
F662	L663	K664	Y665	L666	F667	G668	L669	L670	Q671	S672	R673	V674	S675	P676	V677	M678	T679	G680	V681	F682	D683	T684	L685	E686	P687	M688	V689	L690	T691	K692	G693	A694	L695	V696	M697	L698	L699	V700	L701	S702	F703	I704	K705	L706	F707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	L718	L719	L720	
LEU	GLU	LEU	MET	K605	T606	M608	I609	L610	Q611	G612	M613	Q614	V615	P616	D617	L618	S619	S620	S621	C622	M623	V624	I625	E626	E627	I628	P629	L630	T631	L632	Q633	M634	A635	R636	D637	L638	T639	I640	R641	I642	K643	ASN	VAL	GLY	ALA	GLU	PHE	GLY	LYS	T652	K653	T654	D655	K656	L657	V658	S659	S660	
I541	L542	D543	N544	Y545	E546	N547	Y548	K549	E550	S551	L552	ASN	PHE	LEU	ARG	G557	W558	N559	K560	L561	V562	S563	N564	L565	H566	P567	S568	E569	S570	L571	K572	G573	L574	M575	S576	H577	Y578	P579	S580	L581	L582	L583	S584	L585	T586	D587	M588	F589	M590	L591	P592	D593	G594	K595	I596	R597	Y598	GLU	THR
TRP	ARG	ALA	ILE	I485	F486	K487	Y488	S489	K490	L491	Q492	N493	T494	E495	I496	I497	ILE	PRO	LEU	LEU	E502	R503	I504	F505	S506	T507	F508	A509	S510	P511	D512	N513	F514	T515	K516	ASP	MET	VAL	G520	T521	L522	L523	K524	I525	Y526	R527	K528	E529	D530	D531	A532	S533	GLY	ASN	ASN	LEU	L538	K539	T540
L361	F362	A363	L364	F365	I366	R367	N368	S369	D370	V371	K372	T373	L374	T375	L376	F377	H378	Q379	K380	L381	F382	N383	Y384	A385	L386	T387	N388	I389	S390	D391	C392	F393	L394	E395	F396	F397	Q398	F399	A400	L401	L402	L403	S404	Y405	E406	R407	V408	F409	S410	F411	ASN	GLY	LEU	LYS	PHE	LEU	L419	F420	
L421	K422	K423	N424	W425	Q426	S427	Q428	G429	K430	K431	I432	A433	L434	F435	F436	L437	E438	V439	D440	D441	K442	P443	E444	L445	Q446	K447	V448	R449	E450	V451	N452	F453	P454	E455	E456	F457	F458	L459	S460	I461	R462	D463	F464	F465	Y466	T467	A468	E469	I470	N471	D472	S473	N474	D475	L476	F477	E478	I479	TYR

H1141	V1142	K1143	E1144	A1145	V1146	I1147	G1148	F1149	I1150	I1151	E1152	A1153	A1154	D1155	S1156	I1157	I1158	R1159	M1160	P1161	M1162	M1163	D1164	D1165	H1166	V1167	V1168	D1169	L1170	V1171	T1172	L1173	I1174	C1175	T1176	S1177	C1178	L1179	K1180	I1181	L1182	F1183	S1184	L1185	L1186	V1187	K1188	L1189	S1190	D1191	M1192	M1193	S1194	I1195	S1196	F1197	L1198	L1199	M1200
L1201	L1202	S1203	L1204	I1205	T1206	E1207	M1208	K1209	F1210	I1211	Q1212	D1213	D1214	H1215	V1216	R1217	S1218	R1219	L1220	I1221	S1222	S1223	L1224	I1225	S1226	I1227	L1228	K1229	G1230	K1231	L1232	K1233	K1234	L1235	Q1236	E1237	M1238	D1239	T1240	Q1241	L1242	I1243	L1244	L1245	I1246	L1247	K1248	L1249	S1250	V1251	F1252	M1253	S1254	N1255	C1256	S1257	W1258	L1259	D1260
I1261	E1262	E1263	L1264	Y1265	T1266	L1267	I1268	S1269	S1270	L1271	F1272	K1273	T1274	F1275	D1276	E1277	R1278	M1279	L1280	M1281	V1282	S1283	L1284	I1285	E1286	L1287	F1288	L1289	E1290	L1291	G1292	K1293	M1294	V1295	P1296	E1297	L1298	E1299	S1300	I1301	S1302	K1303	L1304	V1305	A1306	D1307	L1308	M1309	L1310	Y1311	S1312	S1313	L1314	R1315	M1316	E1317	Y1318	D1320	
F1321	P1322	ARG	ILE	LEU	SER	THR	PHE	LYS	GLY	ILE	ASP	GLY	TYR	LYS	SER	GLN	LEU	LEU	TRP	PRO	LEU	LEU	PHE	PHE	HIS	PHE	ASN	ASN	LYS	GLU	GLU	LEU	ALA	LEU	ARG	THR	ASN	ALA	SER	HIS	ALA	ILE	MET	LYS	PHE	ILE	D1376	F1377	I1378	M1379	E1380								
K1381	P1382	M1383	L1384	M1385	E1386	A1387	S1388	K1389	S1390	I1391	S1392	M1393	L1394	K1395	D1396	I1397	L1398	L1399	P1400	M1401	V1402	R1403	I1404	PHE	L1405	L1406	R1407	D1408	S1409	L1410	E1411	E1412	V1413	GLN	SER	GLU	TYR	VAL	SER	V1420	L1421	Y1423	M1424	V1425	K1426	M1427	T1428	K1429	Y1430	F1431	D1432	D1433	F1434	E1435	D1436	M1437	A1438	L1439	L1440
L1441	Y1442	M1443	G1444	D1445	E1446	A1447	A1448	L1449	PHE	THR	ASN	VAL	ASN	HIS	ILE	GLN	HIS	R1461	M1462	Q1463	M1464	A1465	I1466	K1467	M1468	L1469	G1470	E1471	H1472	A1473	H1474	Q1475	L1476	K1477	D1478	M1479	S1480	I1481	H1482	Y1484	Q1485	I1486	P1487	M1488	L1489	E1490	H1491	Y1492	V1493	F1494	S1495	D1496	D1497	E1498	R1499	Y1500			
R1501	M1502	I1503	G1504	M1505	E1506	T1507	Q1508	I1509	A1510	I1511	G1512	G1513	L1514	A1515	Q1516	H1517	M1518	S1519	M1520	M1521	Q1522	Y1523	K1524	A1525	L1526	L1527	R1528	R1529	H1530	I1531	S1532	M1533	L1534	K1535	T1536	K1537	P1538	M1539	Q1540	M1541	K1542	Q1543	I1544	P1545	Q1546	L1547	VAL	GLN	LEU	SER	VAL	M1558	L1559	R1560					
I1561	V1562	R1563	D1564	G1565	A1566	E1567	S1568	K1569	L1570	T1571	L1572	S1573	K1574	F1575	P1576	ASN	LEU	ASP	GLU	PRO	SER	ASN	PHE	ILE	LYS	GLN	GLU	TYR	THR	THR	LEU	LYS	ILE	GLY	THR	ARG	ASP	ASP	GLU	THR	ILE	ILE	E1608	R1609	M1610	P1611	I1612	A1613	E1614	A1615	L1616	V1617	M1618	I1619	V1620				
L1621	G1622	L1623	T1624	D1625	D1626	D1627	I1628	T1629	M1630	F1631	L1632	P1633	S1634	I1635	L1636	T1637	M1638	I1639	C1640	Q1641	L1642	L1643	R1644	S1645	K1646	S1647	E1648	E1649	L1650	R1651	D1652	L1653	V1654	R1655	V1656	L1658	G1659	K1660	I1661	S1662	I1663	I1664	L1665	G1666	A1667	E1668	Y1669	L1670	V1671	F1672	V1673	I1674	K1675	E1676	L1677	M1678	A1679	T1680	
L1681	K1682	R1683	G1684	S1685	Q1686	L1687	H1688	V1689	L1690	S1691	T1692	T1693	V1694	H1695	Y1696	I1697	L1698	K1699	S1700	M1701	H1702	G1703	I1704	L1705	K1706	H1707	S1708	D1709	L1710	D1711	T1712	S1713	S1714	M1715	M1716	I1717	V1718	M1719	I1720	I1721	M1722	E1723	M1724	I1725	F1726	G1727	F1728	A1729	G1730	E1731	E1732	K1733	D1734	S1735	E1736	M1737	Y1738	H1739	T1740
K1741	V1742	K1743	E1744	I1745	K1746	K1749	S1750	Y1751	D1752	A1753	G1754	E1755	I1756	L1757	A1758	S1759	M1760	I1761	S1762	L1763	T1764	E1765	F1766	G1767	T1768	L1769	L1770	S1771	P1772	L1773	K1774	A1775	M1778	V1779	R1780	I1781	M1782	L1783	R1784	N1787	K1788	L1789	S1790	E1791	L1792	L1793	R1794	R1795	Y1796	L1797	L1798	G1799	L1800	M1801	H1802	M1803			
S1804	E1807	S1808	E1809	S1810	K1813	F1814	C1815	L1816	Q1817	L1818	F1819	Q1820	E1821	S1822	E1823	MET	SER	ASN	SER	GLN	PRO	ILE	PRO	LYS	LYS	VAL	LYS	ASP	VAL	ASP	GLU	GLU	ASP	PHE	LEU	VAL	ASN	LEU	GLU	SER	LYS	SER	THR	THR	ILE	ASN	SER	S1861	L1862	L1863	L1864	M1865							
S1866	T1867	L1868	F1871	A1872	L1873	D1874	M1878	V1879	I1880	T1881	M1882	H1883	M1884	S1885	F1886	L1887	T1888	V1889	S1890	H1891	L1892	E1893	G1894	P1897	F1898	R1899	L1900	D1901	S1902	L1903	L1904	S1905	E1906	M1907	E1908	V1911	I1912	L1915	R1916	I1917	L1918	I1919	T1920	L1921	I1922	R1923	L1924	D1925	F1926	S1927	D1928	E1929	S1930	S1931					

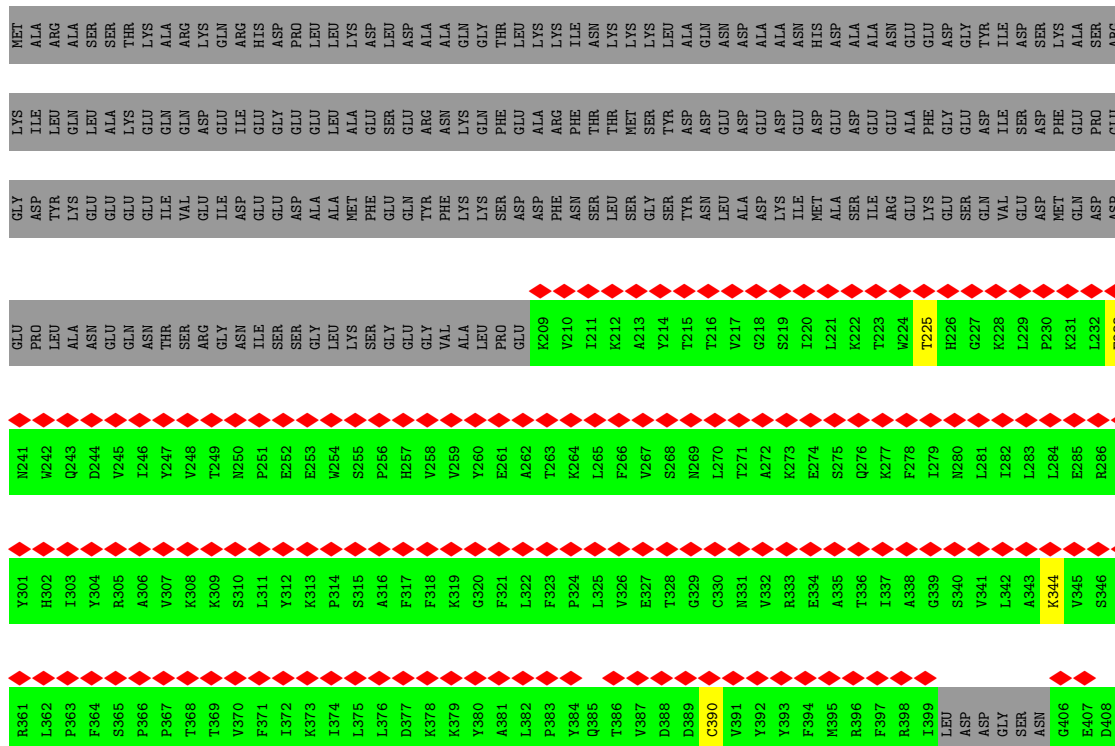


● Molecule 63: U3 small nucleolar RNA-associated protein 14

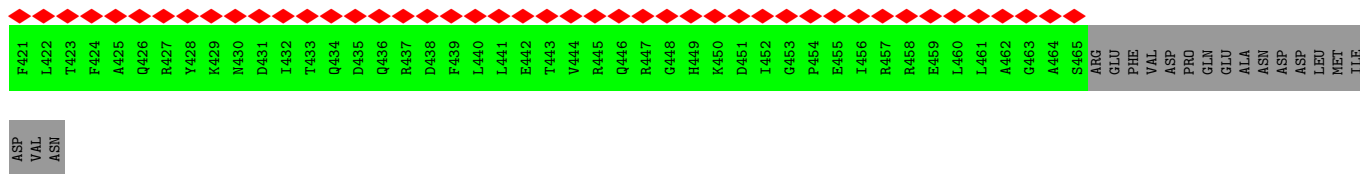




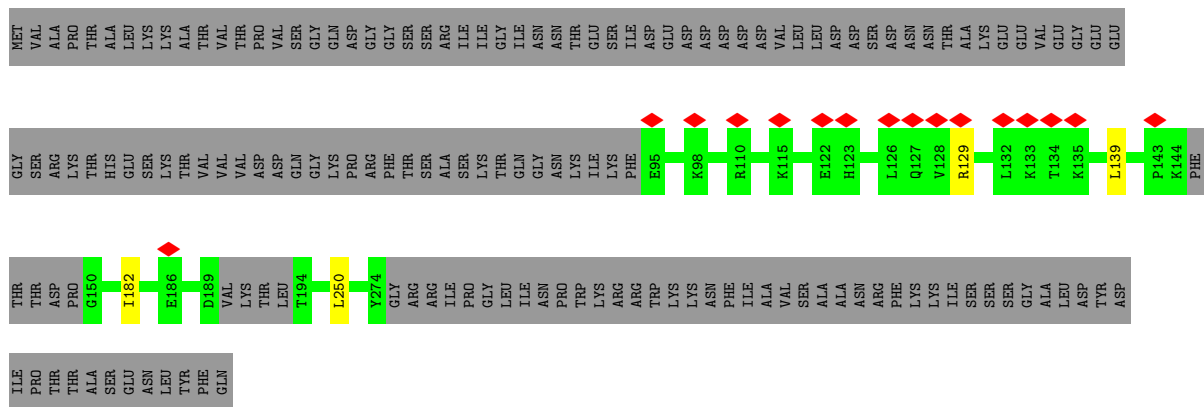
• Molecule 64: Essential nuclear protein 1



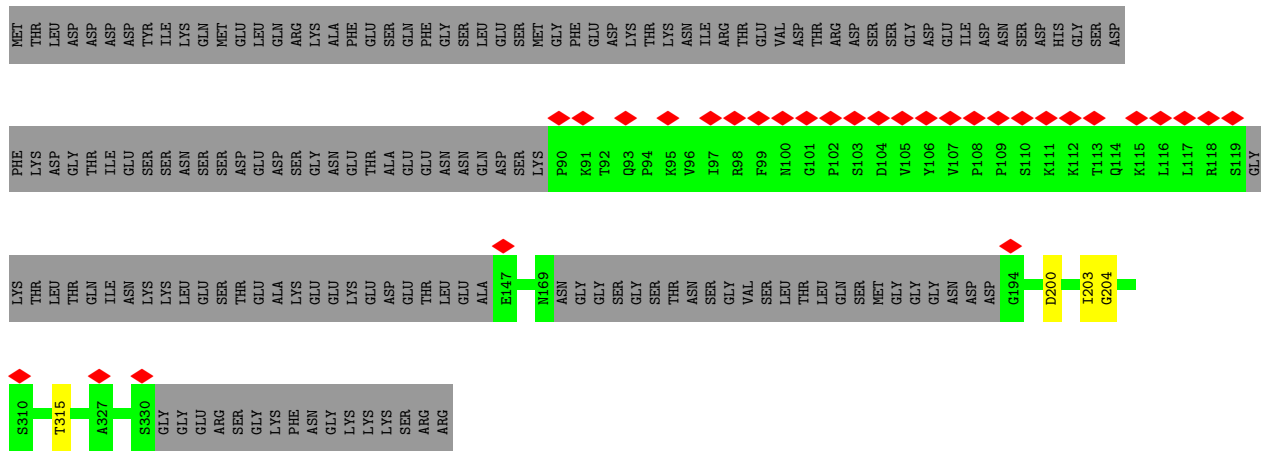




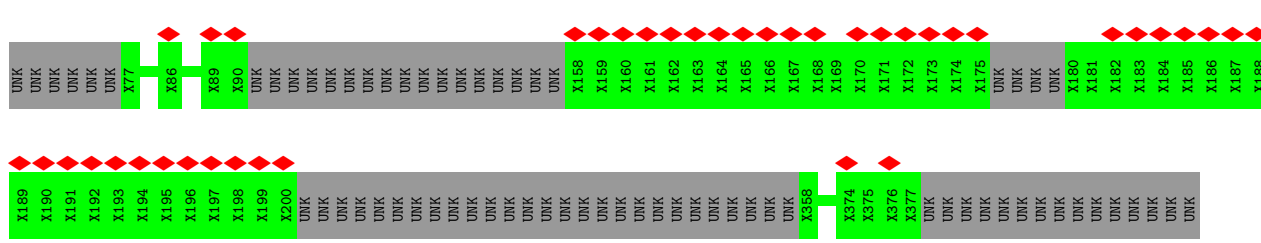
• Molecule 65: Pre-rRNA-processing protein PNO1

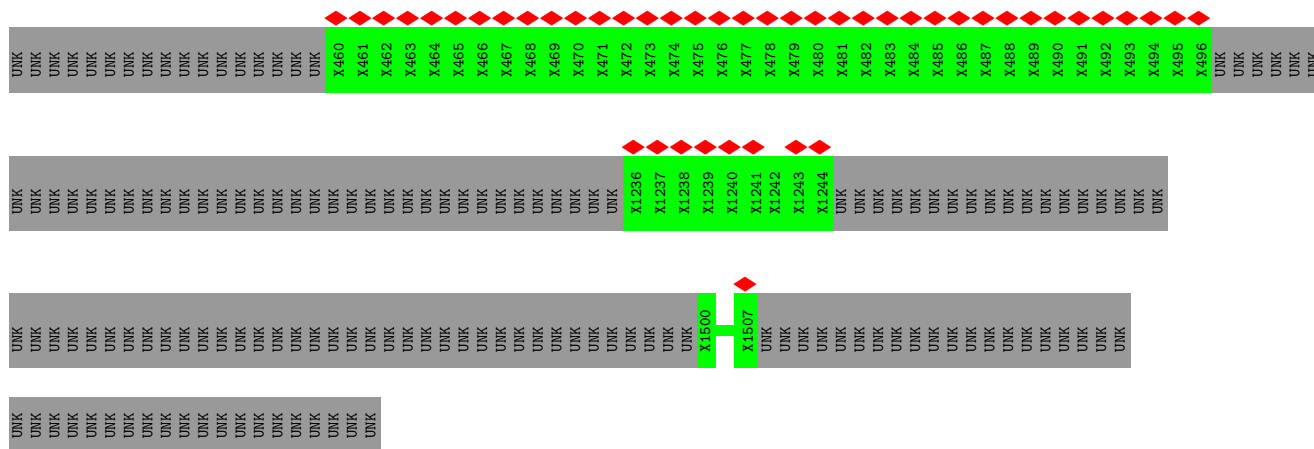


• Molecule 66: Protein FAF1



• Molecule 67: Unassigned helices





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	121139	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	25000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.130	Depositor
Minimum map value	-0.073	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.016	Depositor
Map size (Å)	542.72, 542.72, 542.72	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	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	1.23	0/4141	1.27	34/6433 (0.5%)
2	5A	1.10	0/12462	1.20	78/19411 (0.4%)
3	SA	0.85	0/31237	1.22	263/48637 (0.5%)
4	SC	0.56	0/1777	0.77	4/2388 (0.2%)
5	SF	0.35	0/1854	0.69	2/2504 (0.1%)
6	SG	0.67	0/1690	0.65	0/2285
7	SH	0.36	0/890	0.67	1/1189 (0.1%)
8	SI	0.43	0/1341	0.70	0/1806
9	SJ	0.33	0/1347	0.59	1/1801 (0.1%)
10	SK	0.62	0/1410	0.66	1/1888 (0.1%)
11	SM	0.36	0/1020	0.63	0/1374
12	SN	0.29	0/873	0.66	0/1185
13	SO	0.50	0/1109	0.65	0/1495
14	SP	0.55	0/879	0.66	0/1186
15	SR	0.84	0/990	0.79	2/1335 (0.1%)
16	ST	0.37	0/930	0.64	0/1251
17	SX	0.63	0/1020	0.69	0/1371
18	SY	0.65	0/798	0.74	1/1065 (0.1%)
19	SZ	0.42	0/822	0.69	2/1103 (0.2%)
20	Sc	0.51	0/613	0.68	0/828
21	Sd	0.71	0/499	0.71	0/670
22	3B	0.81	0/1901	0.74	1/2567 (0.0%)
22	3C	0.46	0/1796	0.64	1/2424 (0.0%)
23	3D	0.55	0/2891	0.67	5/3895 (0.1%)
24	3E	0.50	0/3059	0.65	2/4153 (0.0%)
25	3F	0.47	0/3544	0.68	2/4775 (0.0%)
26	3G	0.67	0/928	0.77	2/1262 (0.2%)
26	3H	0.56	0/928	0.71	0/1262
27	A4	0.49	0/5321	0.68	4/7207 (0.1%)
28	A5	0.57	0/4044	0.70	4/5493 (0.1%)
29	A8	0.30	0/3328	0.64	1/4565 (0.0%)
30	A9	0.32	0/951	0.61	0/1287

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
31	AE	0.48	0/6308	0.67	3/8543 (0.0%)
32	AF	0.54	0/3993	0.68	3/5413 (0.1%)
33	AG	0.46	0/6699	0.66	5/9077 (0.1%)
34	B1	0.87	0/6780	0.75	6/9175 (0.1%)
35	B2	0.45	0/6853	0.69	2/9256 (0.0%)
36	B3	0.45	0/6014	0.72	5/8137 (0.1%)
37	B8	0.72	0/3848	0.71	4/5218 (0.1%)
38	BE	0.75	0/6948	0.70	7/9391 (0.1%)
39	B6	0.53	0/2849	0.60	2/3853 (0.1%)
40	5B	0.36	0/499	0.66	0/659
41	5C	0.79	0/4321	0.72	3/5832 (0.1%)
42	5D	0.67	0/1998	0.71	2/2644 (0.1%)
43	5E	0.58	0/1665	0.66	1/2233 (0.0%)
44	5F	0.96	0/1559	0.85	3/2097 (0.1%)
45	5G	0.72	0/2337	0.71	3/3148 (0.1%)
46	5H	0.57	0/1074	0.58	0/1422
47	5I	0.80	0/3844	0.72	1/5174 (0.0%)
48	5J	0.58	0/1238	0.62	1/1641 (0.1%)
49	5K	0.76	0/1426	0.74	1/1917 (0.1%)
50	RA	0.35	0/2769	0.66	0/3753
51	RB	0.40	0/1121	0.65	0/1487
52	RC	0.55	0/2245	0.63	0/3021
53	RE	0.39	0/8924	0.64	5/12070 (0.0%)
54	RF	0.37	0/2004	0.66	3/2697 (0.1%)
55	RG	0.36	0/1727	0.71	2/2329 (0.1%)
55	RH	0.43	0/1828	0.64	0/2470
56	RI	0.54	0/2080	0.67	0/2797
57	RJ	0.60	0/6514	0.63	2/8768 (0.0%)
58	RK	0.45	0/2832	0.65	0/3825
59	RL	0.29	0/4549	0.52	0/6241
59	RM	0.25	0/3760	0.47	0/5211
60	RN	0.37	0/4423	0.61	2/5965 (0.0%)
61	RO	0.38	0/3849	0.62	2/5261 (0.0%)
62	RP	0.25	0/10172	0.46	11/14158 (0.1%)
63	RQ	0.52	0/1678	0.61	0/2282
64	RS	0.34	0/2104	0.69	1/2854 (0.0%)
65	RT	0.42	0/1379	0.62	1/1853 (0.1%)
66	RV	0.60	0/1456	0.69	2/1937 (0.1%)
All	All	0.65	0/232060	0.82	494/323904 (0.2%)

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	1
6	SG	0	1
7	SH	0	1
8	SI	0	2
11	SM	0	1
12	SN	0	1
13	SO	0	1
14	SP	0	1
19	SZ	0	1
20	Sc	0	1
22	3B	0	1
23	3D	0	1
24	3E	0	2
26	3G	0	3
26	3H	0	1
28	A5	0	2
29	A8	0	4
33	AG	0	3
34	B1	0	3
35	B2	0	9
36	B3	0	8
37	B8	0	3
38	BE	0	3
39	B6	0	1
41	5C	0	3
42	5D	0	1
43	5E	0	1
44	5F	0	1
47	5I	0	1
49	5K	0	2
51	RB	0	1
53	RE	0	1
54	RF	0	1
56	RI	0	1
57	RJ	0	2
59	RL	0	1
59	RM	0	1
62	RP	0	1
63	RQ	0	1
66	RV	0	1
All	All	0	76

There are no bond length outliers.

All (494) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
44	5F	13	LEU	CA-CB-CG	10.94	140.47	115.30
3	SA	1034	C	C5-C6-N1	10.38	126.19	121.00
3	SA	1254	U	C2-N1-C1'	10.13	129.85	117.70
2	5A	312	U	O4'-C1'-N1	9.96	116.17	108.20
2	5A	310	U	N3-C2-O2	-9.45	115.59	122.20
3	SA	1451	C	N1-C2-O2	9.36	124.51	118.90
23	3D	283	ASP	CB-CG-OD1	9.26	126.64	118.30
3	SA	1451	C	N3-C2-O2	-9.26	115.42	121.90
2	5A	312	U	P-O3'-C3'	8.84	130.31	119.70
3	SA	1254	U	N1-C2-O2	8.78	128.95	122.80
3	SA	945	U	C5-C6-N1	8.63	127.01	122.70
3	SA	1174	C	N1-C2-O2	8.60	124.06	118.90
4	SC	54	LEU	CA-CB-CG	8.59	135.05	115.30
3	SA	864	U	N1-C2-O2	8.50	128.75	122.80
26	3G	65	LEU	CA-CB-CG	8.47	134.78	115.30
3	SA	864	U	N3-C2-O2	-8.37	116.34	122.20
53	RE	924	LEU	CA-CB-CG	8.35	134.51	115.30
3	SA	864	U	C2-N1-C1'	8.18	127.52	117.70
1	3A	72	C	C6-N1-C2	-8.18	117.03	120.30
1	3A	200	C	N1-C2-O2	8.10	123.76	118.90
2	5A	310	U	N1-C2-O2	8.00	128.40	122.80
3	SA	607	G	C4-N9-C1'	7.97	136.86	126.50
1	3A	89	C	C6-N1-C2	-7.95	117.12	120.30
3	SA	1034	C	C6-N1-C2	-7.91	117.14	120.30
2	5A	399	U	C5-C6-N1	7.91	126.65	122.70
3	SA	1518	C	N1-C2-O2	7.90	123.64	118.90
66	RV	200	ASP	CB-CG-OD1	7.86	125.37	118.30
3	SA	1269	U	N1-C2-O2	7.82	128.27	122.80
3	SA	1258	U	N1-C2-O2	7.77	128.24	122.80
1	3A	89	C	C2-N1-C1'	7.72	127.29	118.80
22	3B	306	LEU	CA-CB-CG	7.71	133.03	115.30
3	SA	172	C	N1-C2-O2	7.70	123.52	118.90
3	SA	354	C	C5-C6-N1	7.70	124.85	121.00
3	SA	1258	U	N3-C2-O2	-7.64	116.85	122.20
1	3A	72	C	C5-C6-N1	7.64	124.82	121.00
35	B2	757	ASP	CB-CG-OD1	7.63	125.17	118.30
3	SA	1177	C	C5-C6-N1	7.62	124.81	121.00
2	5A	523	U	C5-C6-N1	7.59	126.49	122.70
3	SA	1174	C	N3-C2-O2	-7.57	116.60	121.90
1	3A	75	C	C5-C6-N1	7.54	124.77	121.00

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	1665	U	N3-C2-O2	-7.52	116.94	122.20
2	5A	85	G	C5-C6-O6	-7.49	124.10	128.60
2	5A	173	G	P-O3'-C3'	7.49	128.69	119.70
3	SA	1441	C	C2-N1-C1'	7.49	127.04	118.80
2	5A	312	U	C2-N1-C1'	-7.48	108.72	117.70
3	SA	161	U	N3-C2-O2	-7.46	116.98	122.20
19	SZ	74	LEU	CA-CB-CG	7.45	132.43	115.30
3	SA	1760	G	N3-C4-N9	7.43	130.46	126.00
3	SA	405	C	C6-N1-C2	-7.42	117.33	120.30
3	SA	405	C	C2-N1-C1'	7.40	126.94	118.80
3	SA	1674	C	C5-C6-N1	7.35	124.67	121.00
3	SA	1174	C	C2-N1-C1'	7.34	126.87	118.80
15	SR	123	ARG	C-N-CD	-7.33	104.48	120.60
2	5A	219	U	C5-C6-N1	7.33	126.36	122.70
3	SA	172	C	N3-C2-O2	-7.31	116.78	121.90
3	SA	1175	U	N1-C2-O2	7.31	127.92	122.80
3	SA	1760	G	N3-C4-C5	-7.27	124.97	128.60
3	SA	1269	U	C2-N1-C1'	7.26	126.42	117.70
7	SH	68	LEU	CA-CB-CG	7.23	131.94	115.30
3	SA	883	C	C5-C6-N1	7.23	124.62	121.00
38	BE	536	LEU	CA-CB-CG	7.22	131.91	115.30
3	SA	644	C	C5-C6-N1	7.21	124.61	121.00
3	SA	1568	C	N1-C2-O2	7.20	123.22	118.90
60	RN	662	LEU	CA-CB-CG	7.19	131.84	115.30
3	SA	357	G	N3-C4-N9	-7.18	121.69	126.00
3	SA	381	C	N3-C2-O2	-7.17	116.89	121.90
3	SA	1440	C	N1-C2-O2	7.16	123.20	118.90
3	SA	1674	C	C6-N1-C2	-7.15	117.44	120.30
2	5A	111	C	C2-N1-C1'	7.15	126.67	118.80
3	SA	1254	U	C6-N1-C1'	-7.13	111.21	121.20
3	SA	1518	C	C2-N1-C1'	7.10	126.61	118.80
3	SA	258	C	N1-C2-O2	7.10	123.16	118.90
33	AG	601	LEU	CA-CB-CG	7.10	131.62	115.30
2	5A	111	C	C6-N1-C2	-7.08	117.47	120.30
2	5A	61	U	N3-C2-O2	-7.08	117.25	122.20
3	SA	1711	C	N3-C2-O2	-7.06	116.96	121.90
3	SA	405	C	C5-C6-N1	7.03	124.51	121.00
3	SA	1518	C	N3-C2-O2	-7.02	116.98	121.90
2	5A	91	U	C5-C6-N1	7.01	126.20	122.70
3	SA	381	C	N1-C2-O2	7.00	123.10	118.90
3	SA	883	C	C6-N1-C2	-6.98	117.51	120.30
3	SA	1126	G	C4-N9-C1'	6.97	135.56	126.50

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	3D	142	LEU	CA-CB-CG	6.96	131.30	115.30
3	SA	361	C	N1-C2-O2	6.94	123.06	118.90
3	SA	1254	U	N3-C2-O2	-6.93	117.35	122.20
3	SA	128	U	C2-N1-C1'	6.90	125.98	117.70
41	5C	74	LEU	CA-CB-CG	6.90	131.17	115.30
3	SA	272	U	P-O3'-C3'	6.88	127.96	119.70
3	SA	161	U	N1-C2-O2	6.88	127.61	122.80
1	3A	200	C	C2-N1-C1'	6.87	126.36	118.80
1	3A	201	C	N1-C2-O2	6.85	123.01	118.90
2	5A	219	U	C2-N1-C1'	6.85	125.92	117.70
28	A5	540	LEU	CA-CB-CG	6.83	131.02	115.30
3	SA	1584	G	C4-N9-C1'	-6.82	117.64	126.50
3	SA	579	A	P-O3'-C3'	6.82	127.88	119.70
3	SA	679	U	C5-C6-N1	6.80	126.10	122.70
41	5C	144	LEU	CA-CB-CG	6.79	130.93	115.30
34	B1	701	LEU	CA-CB-CG	6.79	130.92	115.30
3	SA	1175	U	N3-C2-O2	-6.79	117.45	122.20
3	SA	1053	G	O5'-P-OP1	-6.79	99.59	105.70
1	3A	43	C	C5-C6-N1	6.77	124.39	121.00
3	SA	298	C	C5-C6-N1	6.77	124.39	121.00
3	SA	1664	C	C5-C6-N1	6.76	124.38	121.00
2	5A	90	G	C8-N9-C1'	6.73	135.75	127.00
3	SA	607	G	C8-N9-C1'	-6.73	118.25	127.00
2	5A	358	G	P-O3'-C3'	6.72	127.77	119.70
24	3E	141	LEU	CA-CB-CG	6.72	130.75	115.30
2	5A	252	A	C2-N3-C4	6.72	113.96	110.60
2	5A	172	C	N1-C2-O2	6.69	122.91	118.90
2	5A	399	U	C2-N1-C1'	6.68	125.72	117.70
3	SA	1072	C	C5-C6-N1	6.68	124.34	121.00
3	SA	1258	U	C2-N1-C1'	6.65	125.68	117.70
3	SA	1664	C	C2-N1-C1'	6.64	126.11	118.80
3	SA	1646	C	N1-C2-O2	6.64	122.88	118.90
3	SA	1772	C	C2-N1-C1'	6.64	126.10	118.80
3	SA	258	C	C2-N1-C1'	6.63	126.10	118.80
3	SA	354	C	C6-N1-C2	-6.63	117.65	120.30
3	SA	368	U	C5-C6-N1	6.61	126.01	122.70
3	SA	1441	C	C5-C6-N1	6.61	124.30	121.00
3	SA	1451	C	C6-N1-C2	-6.60	117.66	120.30
2	5A	61	U	N1-C2-O2	6.58	127.41	122.80
44	5F	61	LEU	CA-CB-CG	6.57	130.41	115.30
3	SA	1664	C	C6-N1-C2	-6.57	117.67	120.30
3	SA	607	G	N3-C4-C5	-6.56	125.32	128.60

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	861	U	C2-N1-C1'	6.56	125.57	117.70
19	SZ	40	LEU	CB-CG-CD1	-6.54	99.87	111.00
3	SA	894	U	N1-C2-O2	6.54	127.38	122.80
3	SA	107	C	C6-N1-C2	-6.54	117.68	120.30
3	SA	64	U	C5-C6-N1	6.54	125.97	122.70
3	SA	514	G	N7-C8-N9	6.53	116.36	113.10
2	5A	90	G	C4-N9-C1'	-6.52	118.03	126.50
3	SA	1174	C	C6-N1-C2	-6.51	117.69	120.30
3	SA	1772	C	N1-C2-O2	6.51	122.81	118.90
3	SA	1441	C	C6-N1-C2	-6.51	117.70	120.30
2	5A	90	G	O4'-C1'-N9	6.50	113.40	108.20
3	SA	1126	G	N3-C4-N9	6.48	129.89	126.00
1	3A	63	C	C5-C6-N1	6.44	124.22	121.00
2	5A	85	G	C4-C5-N7	6.43	113.37	110.80
28	A5	457	LEU	CA-CB-CG	6.43	130.09	115.30
3	SA	1055	U	N1-C2-O2	6.42	127.30	122.80
3	SA	1254	U	C5-C6-N1	6.42	125.91	122.70
53	RE	303	PHE	C-N-CA	6.42	137.76	121.70
3	SA	401	A	P-O3'-C3'	6.42	127.40	119.70
3	SA	1084	A	P-O3'-C3'	6.42	127.40	119.70
3	SA	1760	G	C4-N9-C1'	6.42	134.84	126.50
62	RP	1949	PRO	N-CA-CB	6.40	110.98	103.30
55	RG	50	LEU	CA-CB-CG	6.39	130.00	115.30
26	3G	67	LEU	CA-CB-CG	6.39	130.00	115.30
24	3E	401	LEU	CA-CB-CG	6.37	129.95	115.30
3	SA	1031	U	P-O3'-C3'	6.36	127.33	119.70
37	B8	521	LEU	CA-CB-CG	6.36	129.92	115.30
3	SA	290	G	C4-N9-C1'	6.35	134.76	126.50
3	SA	1620	C	N3-C2-O2	-6.35	117.46	121.90
3	SA	1677	C	N1-C2-O2	6.34	122.71	118.90
3	SA	607	G	N3-C4-N9	6.34	129.80	126.00
3	SA	1585	U	C5-C6-N1	6.34	125.87	122.70
22	3C	306	LEU	CA-CB-CG	6.34	129.87	115.30
3	SA	56	U	P-O3'-C3'	6.33	127.30	119.70
1	3A	75	C	C6-N1-C2	-6.33	117.77	120.30
3	SA	657	U	N1-C2-O2	6.32	127.22	122.80
28	A5	151	LEU	CA-CB-CG	6.31	129.81	115.30
41	5C	148	LEU	CA-CB-CG	6.31	129.81	115.30
3	SA	514	G	C8-N9-C4	-6.30	103.88	106.40
3	SA	1056	U	N1-C2-O2	6.30	127.21	122.80
4	SC	172	LEU	CA-CB-CG	6.30	129.79	115.30
4	SC	120	LEU	CA-CB-CG	6.27	129.73	115.30

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	5A	422	C	C2-N1-C1'	6.27	125.70	118.80
1	3A	198	U	P-O3'-C3'	6.25	127.20	119.70
3	SA	1126	G	C8-N9-C1'	-6.25	118.88	127.00
31	AE	315	LEU	CA-CB-CG	6.24	129.65	115.30
34	B1	717	LEU	CA-CB-CG	6.24	129.65	115.30
3	SA	373	G	C4-N9-C1'	6.23	134.60	126.50
1	3A	201	C	C5-C6-N1	6.23	124.11	121.00
3	SA	107	C	C5-C6-N1	6.22	124.11	121.00
2	5A	111	C	C5-C6-N1	6.21	124.10	121.00
3	SA	357	G	C5-C6-O6	6.20	132.32	128.60
48	5J	81	VAL	C-N-CA	6.20	137.20	121.70
3	SA	1033	C	O4'-C1'-N1	6.19	113.15	108.20
3	SA	1665	U	N1-C2-O2	6.19	127.13	122.80
2	5A	390	C	C5-C6-N1	6.18	124.09	121.00
3	SA	1055	U	C2-N1-C1'	6.18	125.11	117.70
27	A4	563	LEU	CA-CB-CG	6.17	129.50	115.30
45	5G	152	LEU	CA-CB-CG	6.16	129.47	115.30
1	3A	102	U	N3-C2-O2	-6.15	117.89	122.20
3	SA	873	U	N3-C2-O2	-6.15	117.89	122.20
3	SA	368	U	C5-C4-O4	-6.15	122.21	125.90
37	B8	22	LEU	CA-CB-CG	6.14	129.43	115.30
3	SA	1584	G	C8-N9-C1'	6.14	134.98	127.00
1	3A	248	G	P-O3'-C3'	6.14	127.07	119.70
3	SA	1052	U	O4'-C1'-N1	6.13	113.11	108.20
3	SA	417	A	P-O3'-C3'	6.12	127.04	119.70
2	5A	263	C	C5-C6-N1	6.11	124.06	121.00
3	SA	1269	U	N3-C2-O2	-6.11	117.93	122.20
2	5A	312	U	OP1-P-O3'	6.08	118.59	105.20
42	5D	224	LEU	CB-CG-CD2	-6.08	100.67	111.00
3	SA	648	G	C4-N9-C1'	6.06	134.38	126.50
3	SA	1760	G	C2-N3-C4	6.05	114.93	111.90
3	SA	530	C	N1-C2-O2	6.04	122.53	118.90
38	BE	522	LEU	CA-CB-CG	6.04	129.20	115.30
33	AG	323	LEU	CA-CB-CG	6.04	129.19	115.30
3	SA	1711	C	N1-C2-O2	6.03	122.52	118.90
38	BE	614	LEU	CA-CB-CG	6.03	129.17	115.30
2	5A	368	U	P-O3'-C3'	6.02	126.93	119.70
2	5A	7	A	O4'-C1'-N9	6.01	113.01	108.20
9	SJ	29	LEU	CA-CB-CG	5.99	129.08	115.30
23	3D	292	LEU	CA-CB-CG	5.99	129.07	115.30
1	3A	248	G	OP1-P-O3'	5.98	118.37	105.20
3	SA	1620	C	N1-C2-O2	5.97	122.48	118.90

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	1568	C	N3-C2-O2	-5.97	117.72	121.90
2	5A	312	U	N1-C1'-C2'	5.97	121.75	114.00
34	B1	603	LEU	CA-CB-CG	5.96	129.02	115.30
3	SA	1072	C	C6-N1-C2	-5.95	117.92	120.30
2	5A	172	C	P-O3'-C3'	5.93	126.82	119.70
18	SY	132	LEU	CA-CB-CG	5.93	128.95	115.30
3	SA	290	G	N3-C4-N9	5.93	129.56	126.00
3	SA	1439	C	C5-C6-N1	5.93	123.97	121.00
3	SA	311	U	C2-N1-C1'	5.93	124.81	117.70
27	A4	611	LEU	CA-CB-CG	5.92	128.93	115.30
1	3A	201	C	C2-N1-C1'	5.92	125.31	118.80
2	5A	219	U	N1-C2-O2	5.90	126.93	122.80
61	RO	388	LEU	CA-CB-CG	5.90	128.87	115.30
2	5A	393	C	O5'-P-OP1	-5.89	100.40	105.70
3	SA	1078	C	C5-C6-N1	5.88	123.94	121.00
3	SA	1080	U	N3-C2-O2	-5.87	118.09	122.20
25	3F	348	LEU	CA-CB-CG	5.87	128.80	115.30
2	5A	369	G	O5'-P-OP1	-5.86	100.43	105.70
38	BE	417	LEU	CA-CB-CG	5.86	128.77	115.30
1	3A	89	C	C5-C6-N1	5.85	123.93	121.00
3	SA	1769	U	N3-C2-O2	-5.85	118.10	122.20
3	SA	361	C	C2-N1-C1'	5.85	125.24	118.80
1	3A	102	U	N1-C2-O2	5.85	126.89	122.80
3	SA	280	U	N1-C2-O2	5.85	126.89	122.80
3	SA	280	U	C2-N1-C1'	5.84	124.71	117.70
3	SA	1177	C	C6-N1-C2	-5.84	117.97	120.30
34	B1	69	LEU	CA-CB-CG	5.83	128.72	115.30
2	5A	90	G	N9-C4-C5	5.82	107.73	105.40
3	SA	298	C	C6-N1-C2	-5.82	117.97	120.30
1	3A	61	G	C2-N3-C4	5.82	114.81	111.90
2	5A	311	C	O4'-C1'-N1	5.80	112.84	108.20
3	SA	1760	G	P-O3'-C3'	5.80	126.66	119.70
27	A4	416	LEU	CA-CB-CG	5.80	128.64	115.30
65	RT	250	LEU	CA-CB-CG	5.80	128.64	115.30
3	SA	657	U	C2-N1-C1'	5.80	124.66	117.70
1	3A	201	C	C6-N1-C2	-5.79	117.98	120.30
36	B3	620	LEU	CA-CB-CG	5.79	128.62	115.30
3	SA	1439	C	C6-N1-C2	-5.77	117.99	120.30
5	SF	42	LEU	CA-CB-CG	5.76	128.56	115.30
3	SA	1585	U	C2-N1-C1'	5.76	124.61	117.70
3	SA	1521	G	P-O3'-C3'	5.76	126.61	119.70
3	SA	1594	G	O4'-C1'-N9	5.76	112.81	108.20

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	909	U	N3-C2-O2	-5.75	118.17	122.20
1	3A	203	U	N1-C2-O2	5.75	126.82	122.80
3	SA	290	G	N3-C4-C5	-5.74	125.73	128.60
3	SA	545	A	O4'-C1'-N9	5.74	112.79	108.20
3	SA	1646	C	C5-C6-N1	5.74	123.87	121.00
27	A4	225	LEU	CA-CB-CG	5.74	128.50	115.30
3	SA	1191	U	N1-C2-O2	5.74	126.82	122.80
3	SA	1083	G	C4-N9-C1'	5.74	133.96	126.50
2	5A	65	U	N3-C2-O2	-5.72	118.20	122.20
62	RP	2071	PRO	N-CA-CB	5.72	110.16	103.30
45	5G	13	LEU	CA-CB-CG	5.72	128.45	115.30
62	RP	78	PRO	N-CA-CB	5.71	110.16	103.30
3	SA	1037	C	C6-N1-C2	-5.71	118.02	120.30
3	SA	965	U	C2-N1-C1'	5.71	124.55	117.70
44	5F	67	THR	C-N-CA	-5.70	107.45	121.70
3	SA	1769	U	N1-C2-O2	5.70	126.79	122.80
3	SA	1675	C	N1-C2-O2	5.69	122.32	118.90
2	5A	390	C	C6-N1-C2	-5.68	118.03	120.30
3	SA	1759	C	C6-N1-C2	-5.68	118.03	120.30
3	SA	1760	G	C8-N9-C1'	-5.68	119.61	127.00
3	SA	657	U	N3-C2-O2	-5.68	118.22	122.20
3	SA	945	U	C6-N1-C2	-5.67	117.60	121.00
3	SA	1594	G	P-O3'-C3'	5.67	126.51	119.70
2	5A	543	C	C6-N1-C2	-5.67	118.03	120.30
3	SA	542	A	P-O3'-C3'	5.67	126.50	119.70
3	SA	1053	G	C8-N9-C4	-5.67	104.13	106.40
3	SA	1440	C	C2-N1-C1'	5.66	125.03	118.80
57	RJ	845	LEU	CA-CB-CG	5.66	128.31	115.30
2	5A	312	U	C6-N1-C1'	5.66	129.12	121.20
54	RF	58	LEU	CA-CB-CG	5.65	128.30	115.30
3	SA	870	C	C6-N1-C2	-5.65	118.04	120.30
3	SA	1222	C	C5-C6-N1	5.65	123.82	121.00
3	SA	1743	U	C2-N1-C1'	5.64	124.47	117.70
3	SA	1078	C	C6-N1-C2	-5.64	118.05	120.30
62	RP	2014	PRO	N-CA-CB	5.63	110.06	103.30
2	5A	537	G	N3-C4-N9	5.63	129.38	126.00
3	SA	1275	A	C2-N3-C4	5.63	113.42	110.60
62	RP	179	PRO	N-CA-CB	5.63	110.06	103.30
39	B6	18	LEU	CA-CB-CG	5.63	128.25	115.30
3	SA	128	U	N1-C2-O2	5.62	126.74	122.80
3	SA	1665	U	C2-N1-C1'	5.62	124.44	117.70
62	RP	119	PRO	N-CA-CB	5.62	110.04	103.30

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	1734	U	N3-C2-O2	-5.62	118.27	122.20
34	B1	29	LEU	CA-CB-CG	5.62	128.22	115.30
37	B8	164	LEU	CA-CB-CG	5.61	128.21	115.30
32	AF	195	LEU	CA-CB-CG	5.61	128.20	115.30
3	SA	1037	C	N1-C2-O2	5.61	122.26	118.90
62	RP	1988	PRO	N-CA-CB	5.61	110.03	103.30
1	3A	89	C	N1-C2-O2	5.60	122.26	118.90
3	SA	405	C	N1-C2-O2	5.60	122.26	118.90
3	SA	894	U	N3-C2-O2	-5.60	118.28	122.20
43	5E	314	LEU	CA-CB-CG	5.60	128.17	115.30
3	SA	311	U	N1-C2-O2	5.59	126.71	122.80
3	SA	607	G	C2-N3-C4	5.59	114.69	111.90
2	5A	492	G	P-O3'-C3'	5.58	126.39	119.70
2	5A	7	A	C8-N9-C4	-5.57	103.57	105.80
3	SA	373	G	N3-C4-C5	-5.57	125.82	128.60
62	RP	105	PRO	N-CA-CB	5.56	109.98	103.30
1	3A	203	U	N3-C2-O2	-5.56	118.31	122.20
3	SA	1440	C	N3-C2-O2	-5.56	118.01	121.90
3	SA	0	U	P-O3'-C3'	5.56	126.37	119.70
3	SA	302	U	N3-C2-O2	-5.56	118.31	122.20
3	SA	1595	U	O5'-P-OP1	-5.55	100.70	105.70
1	3A	200	C	C6-N1-C1'	-5.55	114.14	120.80
3	SA	655	G	N3-C4-N9	-5.55	122.67	126.00
3	SA	1585	U	N1-C2-O2	5.55	126.69	122.80
3	SA	411	C	C6-N1-C2	-5.55	118.08	120.30
3	SA	161	U	C2-N1-C1'	5.54	124.35	117.70
3	SA	1067	C	C6-N1-C2	-5.54	118.08	120.30
34	B1	585	TYR	CB-CG-CD2	-5.54	117.67	121.00
3	SA	1584	G	N3-C4-N9	-5.54	122.68	126.00
3	SA	1772	C	C5-C6-N1	5.54	123.77	121.00
3	SA	50	C	C2-N1-C1'	5.53	124.88	118.80
38	BE	557	LEU	CA-CB-CG	5.53	128.02	115.30
2	5A	263	C	C6-N1-C2	-5.53	118.09	120.30
54	RF	147	LEU	CA-CB-CG	5.53	128.01	115.30
37	B8	328	LEU	CA-CB-CG	5.52	128.00	115.30
2	5A	491	U	N1-C2-O2	5.52	126.67	122.80
3	SA	1034	C	C2-N1-C1'	5.52	124.88	118.80
3	SA	35	U	N1-C2-O2	5.52	126.66	122.80
3	SA	908	U	N3-C2-O2	-5.52	118.34	122.20
3	SA	1717	G	C4-N9-C1'	5.52	133.68	126.50
2	5A	585	C	C6-N1-C2	-5.52	118.09	120.30
3	SA	692	C	N1-C2-O2	5.51	122.21	118.90

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	5A	252	A	N7-C8-N9	5.51	116.56	113.80
10	SK	105	LEU	CA-CB-CG	5.51	127.97	115.30
23	3D	152	LEU	CA-CB-CG	5.51	127.97	115.30
2	5A	537	G	C4-N9-C1'	5.50	133.66	126.50
3	SA	1191	U	C2-N1-C1'	5.50	124.31	117.70
3	SA	361	C	C6-N1-C2	-5.50	118.10	120.30
3	SA	194	U	C2-N1-C1'	5.50	124.30	117.70
3	SA	1083	G	N7-C8-N9	5.50	115.85	113.10
31	AE	94	LEU	CA-CB-CG	5.49	127.93	115.30
3	SA	894	U	C5-C6-N1	5.49	125.44	122.70
3	SA	1055	U	N3-C2-O2	-5.49	118.36	122.20
2	5A	263	C	C2-N1-C1'	5.47	124.82	118.80
3	SA	1053	G	N9-C4-C5	5.47	107.59	105.40
2	5A	252	A	C4-N9-C1'	5.46	136.13	126.30
3	SA	373	G	N3-C4-N9	5.45	129.27	126.00
3	SA	1779	U	N3-C2-O2	-5.45	118.39	122.20
3	SA	194	U	N1-C2-O2	5.44	126.61	122.80
3	SA	147	A	C2-N3-C4	5.43	113.32	110.60
62	RP	1772	PRO	N-CA-CB	5.43	109.82	103.30
3	SA	413	U	C5-C6-N1	5.43	125.41	122.70
29	A8	563	LEU	CA-CB-CG	5.42	127.77	115.30
35	B2	914	LEU	CA-CB-CG	5.42	127.77	115.30
3	SA	280	U	N3-C2-O2	-5.41	118.41	122.20
3	SA	361	C	C5-C6-N1	5.41	123.71	121.00
3	SA	150	U	N3-C2-O2	-5.41	118.41	122.20
3	SA	1476	C	C2-N1-C1'	5.41	124.75	118.80
3	SA	1109	G	C8-N9-C4	5.40	108.56	106.40
1	3A	6	C	C6-N1-C2	-5.40	118.14	120.30
3	SA	1034	C	N1-C2-O2	5.40	122.14	118.90
36	B3	471	PRO	C-N-CA	5.40	135.20	121.70
3	SA	1032	G	N3-C4-N9	5.40	129.24	126.00
2	5A	252	A	N3-C4-N9	5.40	131.72	127.40
2	5A	381	G	C4-C5-N7	5.39	112.96	110.80
62	RP	1993	PRO	N-CA-CB	5.39	109.77	103.30
3	SA	1056	U	N3-C2-O2	-5.38	118.43	122.20
3	SA	864	U	C6-N1-C1'	-5.38	113.67	121.20
3	SA	530	C	N3-C2-O2	-5.38	118.14	121.90
2	5A	85	G	N1-C6-O6	5.38	123.12	119.90
33	AG	373	LEU	CA-CB-CG	5.37	127.64	115.30
3	SA	682	C	N1-C2-O2	5.36	122.12	118.90
3	SA	873	U	N1-C2-O2	5.36	126.55	122.80
32	AF	118	LEU	CA-CB-CG	5.36	127.63	115.30

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	SA	32	U	N3-C2-O2	-5.36	118.45	122.20
3	SA	1646	C	C2-N1-C1'	5.35	124.69	118.80
3	SA	357	G	N9-C4-C5	5.35	107.54	105.40
2	5A	523	U	C6-N1-C2	-5.35	117.79	121.00
2	5A	363	A	P-O3'-C3'	5.34	126.11	119.70
3	SA	1704	U	N1-C2-O2	5.34	126.53	122.80
2	5A	84	G	C4-N9-C1'	5.33	133.43	126.50
2	5A	65	U	N1-C2-O2	5.33	126.53	122.80
1	3A	43	C	C6-N1-C2	-5.32	118.17	120.30
2	5A	6	A	O4'-C1'-N9	5.32	112.46	108.20
2	5A	543	C	C5-C6-N1	5.32	123.66	121.00
3	SA	644	C	C6-N1-C2	-5.32	118.17	120.30
3	SA	1231	U	N3-C2-O2	-5.32	118.48	122.20
2	5A	90	G	N3-C4-N9	-5.32	122.81	126.00
3	SA	346	G	N3-C4-N9	5.31	129.19	126.00
3	SA	1476	C	N1-C2-O2	5.30	122.08	118.90
3	SA	1747	G	C4-N9-C1'	5.30	133.39	126.50
38	BE	834	LEU	CA-CB-CG	-5.30	103.11	115.30
62	RP	1897	PRO	N-CA-CB	5.30	109.66	103.30
57	RJ	829	LEU	CA-CB-CG	5.29	127.46	115.30
3	SA	290	G	C8-N9-C1'	-5.28	120.13	127.00
64	RS	299	LEU	CA-CB-CG	5.28	127.45	115.30
3	SA	1269	U	C6-N1-C1'	-5.28	113.81	121.20
66	RV	204	GLY	N-CA-C	5.28	126.29	113.10
2	5A	85	G	C6-C5-N7	-5.27	127.24	130.40
3	SA	311	U	N3-C2-O2	-5.27	118.51	122.20
2	5A	173	G	OP1-P-O3'	5.26	116.78	105.20
2	5A	169	A	P-O3'-C3'	5.26	126.01	119.70
3	SA	894	U	C2-N1-C1'	5.26	124.01	117.70
49	5K	146	LEU	CA-CB-CG	5.26	127.40	115.30
54	RF	223	LEU	CA-CB-CG	5.26	127.39	115.30
3	SA	1174	C	C5-C6-N1	5.26	123.63	121.00
4	SC	188	LEU	CA-CB-CG	5.26	127.39	115.30
3	SA	648	G	C8-N9-C1'	-5.26	120.17	127.00
53	RE	248	LEU	CA-CB-CG	5.25	127.38	115.30
42	5D	225	LEU	CA-CB-CG	5.25	127.37	115.30
2	5A	98	G	C4-N9-C1'	5.24	133.31	126.50
53	RE	396	LEU	CA-CB-CG	5.24	127.36	115.30
23	3D	184	LEU	CA-CB-CG	5.24	127.35	115.30
3	SA	1759	C	C5-C6-N1	5.23	123.62	121.00
3	SA	1040	G	N9-C4-C5	-5.23	103.31	105.40
3	SA	1451	C	C5-C6-N1	5.23	123.61	121.00

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
25	3F	318	LEU	CA-CB-CG	5.23	127.33	115.30
28	A5	63	LEU	CA-CB-CG	5.23	127.33	115.30
31	AE	756	LEU	CA-CB-CG	5.23	127.32	115.30
2	5A	61	U	C2-N1-C1'	5.22	123.97	117.70
33	AG	208	LEU	CA-CB-CG	5.22	127.31	115.30
36	B3	237	LEU	CB-CG-CD2	-5.22	102.12	111.00
3	SA	209	U	N3-C2-O2	-5.22	118.55	122.20
3	SA	121	U	N3-C2-O2	-5.21	118.55	122.20
47	5I	298	LEU	CA-CB-CG	5.21	127.29	115.30
3	SA	1492	A	C4-N9-C1'	5.21	135.68	126.30
2	5A	90	G	C6-C5-N7	5.20	133.52	130.40
2	5A	223	C	N1-C2-O2	5.20	122.02	118.90
3	SA	130	C	N1-C2-O2	5.20	122.02	118.90
3	SA	258	C	N3-C2-O2	-5.20	118.26	121.90
39	B6	23	LEU	CA-CB-CG	5.19	127.24	115.30
3	SA	1779	U	N1-C2-O2	5.19	126.43	122.80
3	SA	908	U	N1-C2-O2	5.18	126.43	122.80
45	5G	209	LEU	CA-CB-CG	5.18	127.22	115.30
3	SA	1518	C	C6-N1-C1'	-5.17	114.59	120.80
1	3A	89	C	N3-C2-O2	-5.17	118.28	121.90
2	5A	536	A	P-O3'-C3'	5.17	125.91	119.70
61	RO	264	LEU	CA-CB-CG	5.17	127.19	115.30
3	SA	146	U	O4'-C1'-N1	5.16	112.33	108.20
32	AF	285	ASP	CB-CG-OD1	5.16	122.94	118.30
3	SA	1461	C	C5-C6-N1	5.16	123.58	121.00
3	SA	357	G	C8-N9-C1'	5.16	133.70	127.00
2	5A	64	U	N3-C2-O2	-5.15	118.59	122.20
2	5A	537	G	C8-N9-C1'	-5.15	120.31	127.00
60	RN	429	LEU	CA-CB-CG	5.14	127.13	115.30
3	SA	692	C	N3-C2-O2	-5.14	118.30	121.90
3	SA	68	A	OP2-P-O3'	5.14	116.50	105.20
3	SA	1161	C	C2-N1-C1'	5.13	124.45	118.80
3	SA	1084	A	OP1-P-O3'	5.13	116.49	105.20
1	3A	61	G	C5-C6-N1	5.12	114.06	111.50
1	3A	250	C	N1-C2-O2	5.12	121.97	118.90
5	SF	87	MET	CA-CB-CG	5.12	122.01	113.30
2	5A	121	G	N7-C8-N9	5.12	115.66	113.10
1	3A	80	U	C2-N1-C1'	5.11	123.84	117.70
3	SA	302	U	C2-N1-C1'	5.11	123.83	117.70
3	SA	1743	U	C6-N1-C1'	-5.10	114.06	121.20
2	5A	252	A	N3-C4-C5	-5.10	123.23	126.80
3	SA	353	A	N1-C6-N6	-5.10	115.54	118.60

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	3A	8	U	N3-C2-O2	-5.09	118.64	122.20
3	SA	1585	U	N3-C2-O2	-5.09	118.64	122.20
2	5A	310	U	C6-N1-C2	-5.08	117.95	121.00
3	SA	1623	C	C6-N1-C2	-5.07	118.27	120.30
3	SA	275	C	N1-C2-O2	5.07	121.94	118.90
2	5A	224	G	P-O3'-C3'	5.07	125.78	119.70
3	SA	376	C	N1-C2-O2	5.07	121.94	118.90
3	SA	258	C	C5-C6-N1	5.07	123.53	121.00
15	SR	123	ARG	C-N-CA	5.07	143.27	122.00
2	5A	90	G	N1-C6-O6	-5.06	116.86	119.90
3	SA	945	U	C2-N1-C1'	5.06	123.77	117.70
1	3A	41	C	C5-C6-N1	5.06	123.53	121.00
3	SA	909	U	N1-C2-O2	5.06	126.34	122.80
3	SA	1646	C	C6-N1-C2	-5.06	118.28	120.30
3	SA	25	C	N1-C2-O2	5.05	121.93	118.90
3	SA	297	U	N3-C2-O2	-5.05	118.66	122.20
3	SA	150	U	N1-C2-O2	5.05	126.34	122.80
2	5A	585	C	C2-N1-C1'	5.05	124.36	118.80
53	RE	243	LEU	CA-CB-CG	5.05	126.92	115.30
3	SA	363	G	N3-C2-N2	5.04	123.43	119.90
3	SA	1727	G	N3-C4-N9	-5.04	122.97	126.00
38	BE	121	LEU	CA-CB-CG	5.03	126.88	115.30
3	SA	346	G	C4-N9-C1'	5.03	133.04	126.50
36	B3	390	LEU	CA-CB-CG	5.03	126.87	115.30
36	B3	237	LEU	CA-CB-CG	5.03	126.87	115.30
55	RG	96	LEU	CA-CB-CG	5.03	126.86	115.30
3	SA	373	G	C8-N9-C1'	-5.02	120.47	127.00
1	3A	265	C	N1-C2-O2	5.02	121.91	118.90
3	SA	357	G	N1-C6-O6	-5.02	116.89	119.90
3	SA	1568	C	C2-N1-C1'	5.02	124.32	118.80
33	AG	79	LEU	CA-CB-CG	5.01	126.83	115.30
3	SA	186	C	C5-C6-N1	5.01	123.51	121.00
3	SA	130	C	C2-N1-C1'	5.01	124.31	118.80
3	SA	1448	G	N3-C4-N9	-5.01	122.99	126.00

There are no chirality outliers.

All (76) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
22	3B	176	ALA	Peptide
23	3D	142	LEU	Peptide
24	3E	228	PRO	Peptide

Continued on next page...

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>Group</b>
24	3E	36	ASP	Peptide
26	3G	59	GLU	Peptide
26	3G	64	LEU	Peptide
26	3G	9	PHE	Peptide
26	3H	59	GLU	Peptide
41	5C	111	PHE	Peptide
41	5C	140	ARG	Peptide
41	5C	540	GLU	Peptide
42	5D	84	GLY	Peptide
43	5E	453	SER	Peptide
44	5F	101	VAL	Peptide
47	5I	141	ASP	Peptide
49	5K	25	LEU	Peptide
49	5K	51	LEU	Peptide
28	A5	167	SER	Peptide
28	A5	457	LEU	Peptide
29	A8	257	SER	Peptide
29	A8	266	ILE	Peptide
29	A8	529	HIS	Peptide
29	A8	599	MET	Peptide
33	AG	178	PHE	Peptide
33	AG	769	ASN	Peptide
33	AG	780	GLU	Peptide
34	B1	288	ASP	Peptide
34	B1	661	LEU	Peptide
34	B1	733	LYS	Peptide
35	B2	131	GLY	Peptide
35	B2	266	SER	Peptide
35	B2	267	ASP	Peptide
35	B2	359	SER	Peptide
35	B2	52	TRP	Peptide
35	B2	575	PRO	Peptide
35	B2	613	ALA	Peptide
35	B2	653	LEU	Peptide
35	B2	916	HIS	Peptide
36	B3	35	PRO	Peptide
36	B3	473	ALA	Peptide
36	B3	480	ILE	Peptide
36	B3	530	ALA	Peptide
36	B3	593	CYS	Peptide
36	B3	594	GLY	Peptide
36	B3	785	ILE	Peptide

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Group
36	B3	90	LEU	Peptide
39	B6	354	ASP	Peptide
37	B8	366	SER	Peptide
37	B8	438	ASN	Peptide
37	B8	501	THR	Peptide
38	BE	173	LEU	Peptide
38	BE	899	ASN	Peptide
38	BE	94	TYR	Peptide
51	RB	273	GLY	Peptide
53	RE	767	GLN	Peptide
54	RF	253	ALA	Peptide
56	RI	50	ARG	Peptide
57	RJ	1026	LYS	Peptide
57	RJ	81	GLY	Peptide
59	RL	743	VAL	Peptide
59	RM	743	VAL	Peptide
62	RP	1907	ASN	Peptide
63	RQ	257	ILE	Peptide
66	RV	203	ILE	Peptide
4	SC	40	ASN	Peptide
5	SF	195	ILE	Peptide
6	SG	58	LEU	Peptide
7	SH	68	LEU	Peptide
8	SI	31	SER	Peptide
8	SI	64	VAL	Peptide
11	SM	128	CYS	Peptide
12	SN	99	GLU	Peptide
13	SO	24	ALA	Peptide
14	SP	90	ARG	Peptide
19	SZ	76	TYR	Peptide
20	Sc	74	SER	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	217/255 (85%)	186 (86%)	30 (14%)	1 (0%)	29	61
5	SF	227/261 (87%)	192 (85%)	35 (15%)	0	100	100
6	SG	211/225 (94%)	197 (93%)	14 (7%)	0	100	100
7	SH	108/236 (46%)	98 (91%)	9 (8%)	1 (1%)	17	49
8	SI	161/190 (85%)	139 (86%)	22 (14%)	0	100	100
9	SJ	162/200 (81%)	141 (87%)	21 (13%)	0	100	100
10	SK	169/197 (86%)	163 (96%)	6 (4%)	0	100	100
11	SM	119/156 (76%)	99 (83%)	20 (17%)	0	100	100
12	SN	117/143 (82%)	96 (82%)	21 (18%)	0	100	100
13	SO	132/151 (87%)	125 (95%)	7 (5%)	0	100	100
14	SP	116/137 (85%)	102 (88%)	14 (12%)	0	100	100
15	SR	123/143 (86%)	113 (92%)	10 (8%)	0	100	100
16	ST	109/146 (75%)	100 (92%)	9 (8%)	0	100	100
17	SX	125/130 (96%)	115 (92%)	10 (8%)	0	100	100
18	SY	101/145 (70%)	91 (90%)	10 (10%)	0	100	100
19	SZ	100/135 (74%)	86 (86%)	14 (14%)	0	100	100
20	Sc	78/82 (95%)	68 (87%)	10 (13%)	0	100	100
21	Sd	61/67 (91%)	55 (90%)	6 (10%)	0	100	100
22	3B	236/327 (72%)	222 (94%)	14 (6%)	0	100	100
22	3C	221/327 (68%)	203 (92%)	18 (8%)	0	100	100
23	3D	359/504 (71%)	344 (96%)	15 (4%)	0	100	100
24	3E	427/511 (84%)	394 (92%)	33 (8%)	0	100	100
25	3F	428/573 (75%)	384 (90%)	43 (10%)	1 (0%)	47	78
26	3G	119/126 (94%)	109 (92%)	9 (8%)	1 (1%)	19	51
26	3H	119/126 (94%)	110 (92%)	9 (8%)	0	100	100
27	A4	648/776 (84%)	576 (89%)	72 (11%)	0	100	100
28	A5	504/643 (78%)	460 (91%)	44 (9%)	0	100	100
29	A8	534/713 (75%)	407 (76%)	124 (23%)	3 (1%)	25	57
30	A9	126/575 (22%)	119 (94%)	7 (6%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
31	AE	773/1769 (44%)	710 (92%)	63 (8%)	0	100	100
32	AF	489/513 (95%)	437 (89%)	51 (10%)	1 (0%)	47	78
33	AG	812/896 (91%)	730 (90%)	82 (10%)	0	100	100
34	B1	830/923 (90%)	752 (91%)	76 (9%)	2 (0%)	47	78
35	B2	839/943 (89%)	750 (89%)	88 (10%)	1 (0%)	51	82
36	B3	733/817 (90%)	599 (82%)	132 (18%)	2 (0%)	41	72
37	B8	469/594 (79%)	423 (90%)	46 (10%)	0	100	100
38	BE	857/939 (91%)	792 (92%)	65 (8%)	0	100	100
39	B6	368/440 (84%)	337 (92%)	31 (8%)	0	100	100
40	5B	58/214 (27%)	55 (95%)	3 (5%)	0	100	100
41	5C	531/554 (96%)	472 (89%)	58 (11%)	1 (0%)	47	78
42	5D	231/250 (92%)	204 (88%)	27 (12%)	0	100	100
43	5E	200/593 (34%)	187 (94%)	11 (6%)	2 (1%)	15	46
44	5F	180/183 (98%)	169 (94%)	11 (6%)	0	100	100
45	5G	278/290 (96%)	249 (90%)	29 (10%)	0	100	100
46	5H	132/610 (22%)	121 (92%)	11 (8%)	0	100	100
47	5I	457/489 (94%)	420 (92%)	37 (8%)	0	100	100
48	5J	138/217 (64%)	129 (94%)	9 (6%)	0	100	100
49	5K	171/189 (90%)	160 (94%)	11 (6%)	0	100	100
50	RA	332/707 (47%)	287 (86%)	45 (14%)	0	100	100
51	RB	132/357 (37%)	116 (88%)	16 (12%)	0	100	100
52	RC	276/316 (87%)	260 (94%)	16 (6%)	0	100	100
53	RE	1067/1237 (86%)	984 (92%)	83 (8%)	0	100	100
54	RF	233/297 (78%)	214 (92%)	19 (8%)	0	100	100
55	RG	212/252 (84%)	186 (88%)	26 (12%)	0	100	100
55	RH	226/252 (90%)	212 (94%)	14 (6%)	0	100	100
56	RI	250/274 (91%)	228 (91%)	22 (9%)	0	100	100
57	RJ	784/1183 (66%)	723 (92%)	61 (8%)	0	100	100
58	RK	358/367 (98%)	335 (94%)	23 (6%)	0	100	100
59	RL	781/1056 (74%)	670 (86%)	109 (14%)	2 (0%)	41	72
59	RM	737/1056 (70%)	640 (87%)	93 (13%)	4 (0%)	29	61

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
60	RN	573/810 (71%)	524 (91%)	48 (8%)	1 (0%)	47	78
61	RO	523/552 (95%)	457 (87%)	66 (13%)	0	100	100
62	RP	1992/2493 (80%)	1801 (90%)	189 (10%)	2 (0%)	51	82
63	RQ	220/899 (24%)	197 (90%)	23 (10%)	0	100	100
64	RS	247/483 (51%)	223 (90%)	23 (9%)	1 (0%)	34	67
65	RT	165/326 (51%)	151 (92%)	14 (8%)	0	100	100
66	RV	184/346 (53%)	168 (91%)	16 (9%)	0	100	100
All	All	23995/32886 (73%)	21566 (90%)	2403 (10%)	26 (0%)	54	82

All (26) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
43	5E	454	VAL
59	RL	744	PRO
59	RM	744	PRO
62	RP	119	PRO
29	A8	309	PRO
36	B3	91	LYS
59	RM	905	PRO
62	RP	1993	PRO
34	B1	670	LEU
43	5E	460	PRO
59	RM	904	LEU
60	RN	285	PRO
25	3F	552	TRP
29	A8	308	PHE
34	B1	442	GLY
35	B2	132	THR
41	5C	492	GLY
36	B3	71	PRO
59	RL	743	VAL
59	RM	743	VAL
32	AF	49	PRO
64	RS	414	PRO
4	SC	221	PRO
7	SH	70	PRO
26	3G	10	PRO
29	A8	267	ILE

### 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	195/224 (87%)	192 (98%)	3 (2%)	65	82
5	SF	196/222 (88%)	191 (97%)	5 (3%)	46	72
6	SG	180/191 (94%)	179 (99%)	1 (1%)	86	94
7	SH	95/201 (47%)	94 (99%)	1 (1%)	73	86
8	SI	146/170 (86%)	144 (99%)	2 (1%)	67	83
9	SJ	136/161 (84%)	135 (99%)	1 (1%)	84	92
10	SK	147/166 (89%)	144 (98%)	3 (2%)	55	77
11	SM	110/137 (80%)	109 (99%)	1 (1%)	78	90
12	SN	88/119 (74%)	88 (100%)	0	100	100
13	SO	117/128 (91%)	115 (98%)	2 (2%)	60	80
14	SP	90/105 (86%)	88 (98%)	2 (2%)	52	75
15	SR	105/119 (88%)	105 (100%)	0	100	100
16	ST	101/129 (78%)	101 (100%)	0	100	100
17	SX	108/111 (97%)	108 (100%)	0	100	100
18	SY	85/120 (71%)	85 (100%)	0	100	100
19	SZ	85/113 (75%)	84 (99%)	1 (1%)	71	85
20	Sc	69/71 (97%)	69 (100%)	0	100	100
21	Sd	56/60 (93%)	56 (100%)	0	100	100
22	3B	201/240 (84%)	200 (100%)	1 (0%)	88	94
22	3C	190/240 (79%)	190 (100%)	0	100	100
23	3D	296/435 (68%)	292 (99%)	4 (1%)	67	83
24	3E	262/433 (60%)	260 (99%)	2 (1%)	81	91
25	3F	378/503 (75%)	373 (99%)	5 (1%)	69	84
26	3G	100/104 (96%)	99 (99%)	1 (1%)	76	88
26	3H	100/104 (96%)	100 (100%)	0	100	100
27	A4	591/713 (83%)	583 (99%)	8 (1%)	67	83

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
28	A5	433/574 (75%)	430 (99%)	3 (1%)	84	92
29	A8	174/657 (26%)	173 (99%)	1 (1%)	86	94
30	A9	89/533 (17%)	89 (100%)	0	100	100
31	AE	708/1633 (43%)	700 (99%)	8 (1%)	73	86
32	AF	437/454 (96%)	432 (99%)	5 (1%)	73	86
33	AG	750/826 (91%)	743 (99%)	7 (1%)	78	90
34	B1	730/812 (90%)	719 (98%)	11 (2%)	65	82
35	B2	736/832 (88%)	729 (99%)	7 (1%)	76	88
36	B3	665/719 (92%)	654 (98%)	11 (2%)	60	80
37	B8	421/529 (80%)	417 (99%)	4 (1%)	76	88
38	BE	757/819 (92%)	748 (99%)	9 (1%)	71	85
39	B6	251/414 (61%)	246 (98%)	5 (2%)	55	77
40	5B	57/196 (29%)	56 (98%)	1 (2%)	59	79
41	5C	465/480 (97%)	457 (98%)	8 (2%)	60	80
42	5D	221/234 (94%)	219 (99%)	2 (1%)	78	90
43	5E	185/535 (35%)	183 (99%)	2 (1%)	73	86
44	5F	171/172 (99%)	171 (100%)	0	100	100
45	5G	251/258 (97%)	249 (99%)	2 (1%)	81	91
46	5H	107/538 (20%)	106 (99%)	1 (1%)	78	90
47	5I	416/443 (94%)	407 (98%)	9 (2%)	52	75
48	5J	133/200 (66%)	133 (100%)	0	100	100
49	5K	157/169 (93%)	155 (99%)	2 (1%)	69	84
50	RA	303/636 (48%)	303 (100%)	0	100	100
51	RB	117/315 (37%)	115 (98%)	2 (2%)	60	80
52	RC	231/289 (80%)	230 (100%)	1 (0%)	91	95
53	RE	984/1125 (88%)	975 (99%)	9 (1%)	78	90
54	RF	221/274 (81%)	217 (98%)	4 (2%)	59	79
55	RG	195/222 (88%)	194 (100%)	1 (0%)	88	94
55	RH	206/222 (93%)	203 (98%)	3 (2%)	65	82
56	RI	235/256 (92%)	231 (98%)	4 (2%)	60	80
57	RJ	683/1039 (66%)	679 (99%)	4 (1%)	86	94

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
58	RK	307/312 (98%)	305 (99%)	2 (1%)	84	92
59	RL	164/934 (18%)	159 (97%)	5 (3%)	41	68
60	RN	406/732 (56%)	406 (100%)	0	100	100
61	RO	329/506 (65%)	326 (99%)	3 (1%)	78	90
63	RQ	148/808 (18%)	147 (99%)	1 (1%)	84	92
64	RS	225/424 (53%)	221 (98%)	4 (2%)	59	79
65	RT	148/282 (52%)	145 (98%)	3 (2%)	55	77
66	RV	141/304 (46%)	140 (99%)	1 (1%)	84	92
All	All	17584/26026 (68%)	17396 (99%)	188 (1%)	74	86

All (188) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	SC	92	GLN
4	SC	162	ARG
4	SC	205	PHE
5	SF	181	VAL
5	SF	200	ARG
5	SF	207	LEU
5	SF	211	LYS
5	SF	233	LYS
6	SG	123	VAL
7	SH	92	ARG
8	SI	159	VAL
8	SI	189	THR
9	SJ	43	ILE
10	SK	57	ARG
10	SK	74	ASN
10	SK	87	SER
11	SM	69	LYS
13	SO	58	HIS
13	SO	135	LEU
14	SP	86	THR
14	SP	117	ASP
19	SZ	74	LEU
22	3B	120	GLU
23	3D	10	GLU
23	3D	48	ILE
23	3D	103	LYS

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
23	3D	285	ARG
24	3E	265	PHE
24	3E	371	LEU
25	3F	223	THR
25	3F	293	ASP
25	3F	370	ARG
25	3F	418	ASP
25	3F	506	ARG
26	3G	67	LEU
27	A4	33	VAL
27	A4	130	THR
27	A4	282	ASP
27	A4	579	ARG
27	A4	648	PHE
27	A4	745	ASP
27	A4	775	VAL
27	A4	776	PHE
28	A5	139	HIS
28	A5	235	LEU
28	A5	310	THR
29	A8	576	ARG
31	AE	147	VAL
31	AE	253	CYS
31	AE	264	PHE
31	AE	366	ILE
31	AE	396	ASP
31	AE	485	THR
31	AE	515	PHE
31	AE	713	PHE
32	AF	20	THR
32	AF	149	THR
32	AF	199	ARG
32	AF	236	VAL
32	AF	255	VAL
33	AG	109	VAL
33	AG	131	HIS
33	AG	271	LEU
33	AG	336	ARG
33	AG	421	LYS
33	AG	606	HIS
33	AG	716	ARG
34	B1	76	ASP

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
34	B1	167	ASP
34	B1	173	TRP
34	B1	215	VAL
34	B1	321	SER
34	B1	351	LEU
34	B1	519	LEU
34	B1	526	ASP
34	B1	574	SER
34	B1	603	LEU
34	B1	698	THR
35	B2	159	LEU
35	B2	331	THR
35	B2	343	TRP
35	B2	450	ARG
35	B2	576	VAL
35	B2	579	ILE
35	B2	663	LEU
36	B3	24	THR
36	B3	32	LEU
36	B3	51	LYS
36	B3	97	ARG
36	B3	100	LYS
36	B3	222	LEU
36	B3	482	VAL
36	B3	520	LEU
36	B3	533	LYS
36	B3	534	ARG
36	B3	539	VAL
37	B8	272	LEU
37	B8	344	ARG
37	B8	406	ASP
37	B8	546	LEU
38	BE	207	ASP
38	BE	209	ILE
38	BE	312	THR
38	BE	470	GLN
38	BE	494	LEU
38	BE	570	ILE
38	BE	713	LEU
38	BE	813	PHE
38	BE	899	ASN
39	B6	23	LEU

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
39	B6	34	LYS
39	B6	67	ARG
39	B6	133	TYR
39	B6	297	ASP
40	5B	168	LYS
41	5C	153	THR
41	5C	253	ASN
41	5C	291	THR
41	5C	296	ARG
41	5C	347	LEU
41	5C	392	VAL
41	5C	505	THR
41	5C	544	ASP
42	5D	91	LEU
42	5D	161	ARG
43	5E	297	LEU
43	5E	330	VAL
45	5G	176	ILE
45	5G	223	THR
46	5H	579	VAL
47	5I	91	VAL
47	5I	119	THR
47	5I	124	HIS
47	5I	214	ASP
47	5I	232	THR
47	5I	250	ARG
47	5I	261	THR
47	5I	356	TYR
47	5I	410	ILE
49	5K	17	LEU
49	5K	41	THR
51	RB	306	ARG
51	RB	341	ARG
52	RC	62	ARG
53	RE	223	ARG
53	RE	227	LYS
53	RE	232	LEU
53	RE	245	LYS
53	RE	285	PHE
53	RE	289	ARG
53	RE	595	THR
53	RE	840	LEU

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
53	RE	976	ILE
54	RF	19	LYS
54	RF	160	TYR
54	RF	171	PHE
54	RF	176	ASP
55	RG	97	LEU
55	RH	31	LEU
55	RH	82	ARG
55	RH	116	THR
56	RI	17	LEU
56	RI	30	LEU
56	RI	170	LYS
56	RI	171	CYS
57	RJ	214	ARG
57	RJ	868	ARG
57	RJ	973	ARG
57	RJ	1141	LYS
58	RK	213	LYS
58	RK	214	LYS
59	RL	9	ARG
59	RL	10	ILE
59	RL	83	ARG
59	RL	104	ARG
59	RL	134	LEU
61	RO	203	LEU
61	RO	493	TYR
61	RO	507	LEU
63	RQ	319	THR
64	RS	225	THR
64	RS	233	PHE
64	RS	344	LYS
64	RS	390	CYS
65	RT	129	ARG
65	RT	139	LEU
65	RT	182	ILE
66	RV	315	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (285) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	SC	101	HIS
4	SC	118	GLN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	SC	183	GLN
5	SF	153	ASN
5	SF	188	ASN
5	SF	224	ASN
6	SG	86	GLN
6	SG	104	ASN
6	SG	127	GLN
6	SG	131	GLN
6	SG	169	ASN
6	SG	186	ASN
7	SH	59	GLN
8	SI	74	GLN
9	SJ	64	ASN
9	SJ	103	GLN
11	SM	92	HIS
11	SM	98	ASN
11	SM	106	ASN
12	SN	38	HIS
12	SN	96	GLN
13	SO	49	GLN
13	SO	58	HIS
15	SR	74	HIS
16	ST	21	ASN
16	ST	44	ASN
17	SX	16	ASN
19	SZ	29	HIS
19	SZ	77	ASN
22	3B	258	HIS
22	3C	145	ASN
23	3D	172	ASN
23	3D	183	GLN
23	3D	302	ASN
23	3D	381	ASN
24	3E	191	HIS
24	3E	254	ASN
24	3E	256	ASN
24	3E	286	ASN
24	3E	289	GLN
24	3E	396	ASN
24	3E	400	GLN
25	3F	226	HIS
25	3F	485	ASN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
25	3F	525	GLN
26	3G	29	ASN
26	3G	38	ASN
26	3H	18	GLN
26	3H	45	ASN
26	3H	66	HIS
27	A4	53	HIS
27	A4	140	ASN
27	A4	273	ASN
27	A4	274	GLN
27	A4	279	HIS
27	A4	292	ASN
27	A4	317	ASN
27	A4	452	HIS
27	A4	529	ASN
27	A4	589	ASN
27	A4	621	ASN
27	A4	632	ASN
27	A4	642	ASN
28	A5	103	ASN
28	A5	133	GLN
28	A5	213	ASN
28	A5	302	ASN
28	A5	308	ASN
28	A5	316	ASN
28	A5	324	ASN
28	A5	509	HIS
29	A8	553	GLN
29	A8	609	ASN
30	A9	443	GLN
30	A9	444	ASN
30	A9	474	HIS
30	A9	478	ASN
31	AE	7	GLN
31	AE	51	ASN
31	AE	141	ASN
31	AE	166	ASN
31	AE	202	HIS
31	AE	219	ASN
31	AE	224	ASN
31	AE	309	GLN
31	AE	480	ASN

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
31	AE	559	ASN
31	AE	709	ASN
31	AE	773	GLN
31	AE	774	ASN
32	AF	24	GLN
32	AF	44	HIS
32	AF	48	ASN
32	AF	64	GLN
32	AF	72	GLN
32	AF	133	HIS
32	AF	217	ASN
32	AF	250	ASN
32	AF	280	HIS
32	AF	289	ASN
32	AF	391	ASN
32	AF	403	ASN
32	AF	481	GLN
32	AF	502	GLN
33	AG	9	GLN
33	AG	169	GLN
33	AG	190	GLN
33	AG	398	HIS
33	AG	424	GLN
33	AG	489	ASN
33	AG	535	ASN
33	AG	624	HIS
33	AG	660	GLN
33	AG	669	ASN
33	AG	759	HIS
33	AG	760	HIS
34	B1	91	HIS
34	B1	142	HIS
34	B1	190	HIS
34	B1	201	HIS
34	B1	302	GLN
34	B1	303	ASN
34	B1	349	ASN
34	B1	386	HIS
34	B1	452	ASN
34	B1	456	HIS
34	B1	650	ASN
34	B1	691	ASN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
34	B1	795	ASN
34	B1	813	HIS
34	B1	837	ASN
34	B1	842	ASN
35	B2	128	GLN
35	B2	172	GLN
35	B2	264	ASN
35	B2	276	ASN
35	B2	524	HIS
35	B2	596	ASN
35	B2	657	GLN
35	B2	677	HIS
35	B2	770	ASN
35	B2	798	ASN
35	B2	856	ASN
35	B2	879	GLN
36	B3	143	HIS
36	B3	301	GLN
36	B3	328	GLN
36	B3	392	ASN
36	B3	502	ASN
36	B3	519	ASN
36	B3	616	HIS
36	B3	767	HIS
36	B3	792	HIS
36	B3	802	GLN
37	B8	41	ASN
37	B8	159	HIS
37	B8	162	ASN
37	B8	282	ASN
37	B8	283	HIS
37	B8	308	ASN
37	B8	352	GLN
37	B8	472	GLN
37	B8	492	ASN
38	BE	20	ASN
38	BE	67	HIS
38	BE	203	ASN
38	BE	447	ASN
38	BE	481	ASN
38	BE	501	HIS
38	BE	903	GLN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
39	B6	90	GLN
39	B6	115	ASN
40	5B	207	ASN
41	5C	101	ASN
41	5C	124	HIS
41	5C	133	HIS
41	5C	164	GLN
41	5C	170	GLN
41	5C	400	ASN
41	5C	468	GLN
41	5C	480	ASN
41	5C	507	ASN
42	5D	144	ASN
42	5D	221	GLN
43	5E	526	ASN
44	5F	27	HIS
44	5F	39	GLN
44	5F	59	ASN
44	5F	135	HIS
45	5G	18	GLN
45	5G	143	HIS
45	5G	159	HIS
45	5G	208	HIS
46	5H	515	ASN
47	5I	46	ASN
47	5I	76	ASN
47	5I	202	HIS
47	5I	207	ASN
47	5I	260	GLN
47	5I	284	HIS
47	5I	371	ASN
47	5I	392	ASN
47	5I	406	HIS
48	5J	126	HIS
48	5J	184	ASN
48	5J	192	ASN
48	5J	195	GLN
49	5K	43	ASN
50	RA	101	ASN
50	RA	118	GLN
51	RB	301	ASN
51	RB	314	ASN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
52	RC	149	ASN
52	RC	151	ASN
52	RC	284	GLN
53	RE	197	GLN
53	RE	221	ASN
53	RE	293	ASN
53	RE	371	GLN
53	RE	414	HIS
53	RE	439	HIS
53	RE	520	ASN
53	RE	607	HIS
53	RE	634	HIS
53	RE	665	HIS
53	RE	834	ASN
53	RE	841	ASN
53	RE	901	ASN
53	RE	1159	ASN
53	RE	1180	ASN
54	RF	23	HIS
55	RG	105	ASN
55	RG	125	ASN
55	RG	170	HIS
55	RG	190	GLN
55	RG	215	ASN
55	RH	69	ASN
56	RI	52	ASN
56	RI	186	ASN
56	RI	192	ASN
56	RI	221	ASN
57	RJ	126	ASN
57	RJ	162	HIS
57	RJ	239	ASN
57	RJ	289	HIS
57	RJ	776	GLN
57	RJ	778	GLN
57	RJ	944	ASN
58	RK	16	ASN
58	RK	88	HIS
58	RK	167	HIS
58	RK	317	GLN
59	RL	16	ASN
59	RL	75	ASN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
59	RL	89	ASN
60	RN	452	GLN
60	RN	482	GLN
60	RN	527	GLN
60	RN	569	GLN
60	RN	738	ASN
60	RN	771	ASN
60	RN	797	ASN
61	RO	228	HIS
61	RO	256	ASN
61	RO	268	GLN
61	RO	273	GLN
61	RO	290	HIS
61	RO	304	ASN
61	RO	309	ASN
61	RO	343	GLN
61	RO	346	ASN
61	RO	370	HIS
61	RO	472	HIS
63	RQ	310	HIS
63	RQ	321	HIS
63	RQ	331	GLN
63	RQ	832	ASN
63	RQ	839	ASN
64	RS	302	HIS
64	RS	385	GLN
65	RT	111	ASN
65	RT	218	ASN
65	RT	232	HIS
66	RV	224	HIS
66	RV	225	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	3A	169/333 (50%)	46 (27%)	2 (1%)
2	5A	516/700 (73%)	146 (28%)	10 (1%)
3	SA	1290/1807 (71%)	461 (35%)	16 (1%)
All	All	1975/2840 (69%)	653 (33%)	28 (1%)

All (653) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	3A	2	U
1	3A	5	A
1	3A	14	A
1	3A	15	U
1	3A	24	U
1	3A	25	U
1	3A	28	A
1	3A	30	A
1	3A	33	A
1	3A	35	U
1	3A	56	A
1	3A	60	A
1	3A	61	G
1	3A	82	G
1	3A	87	G
1	3A	88	U
1	3A	89	C
1	3A	90	C
1	3A	91	C
1	3A	102	U
1	3A	104	C
1	3A	111	G
1	3A	114	A
1	3A	115	G
1	3A	198	U
1	3A	199	G
1	3A	200	C
1	3A	201	C
1	3A	204	U
1	3A	205	G
1	3A	206	C
1	3A	246	A
1	3A	248	G
1	3A	249	G
1	3A	252	C
1	3A	265	C
1	3A	266	C
1	3A	305	G
1	3A	309	G
1	3A	310	G
1	3A	313	A
1	3A	314	C
1	3A	322	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	3A	324	U
1	3A	325	C
1	3A	329	C
2	5A	5	G
2	5A	6	A
2	5A	7	A
2	5A	8	A
2	5A	13	U
2	5A	62	C
2	5A	63	G
2	5A	64	U
2	5A	70	A
2	5A	82	A
2	5A	83	U
2	5A	85	G
2	5A	86	C
2	5A	87	C
2	5A	103	G
2	5A	104	A
2	5A	109	C
2	5A	110	G
2	5A	114	G
2	5A	124	A
2	5A	125	G
2	5A	126	A
2	5A	127	U
2	5A	128	C
2	5A	129	U
2	5A	130	G
2	5A	140	U
2	5A	142	U
2	5A	144	C
2	5A	148	G
2	5A	150	G
2	5A	151	U
2	5A	156	U
2	5A	161	A
2	5A	163	G
2	5A	169	A
2	5A	170	U
2	5A	171	G
2	5A	172	C

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	5A	173	G
2	5A	174	U
2	5A	177	U
2	5A	185	A
2	5A	190	U
2	5A	200	A
2	5A	201	U
2	5A	211	G
2	5A	219	U
2	5A	220	U
2	5A	223	C
2	5A	224	G
2	5A	225	U
2	5A	226	U
2	5A	227	U
2	5A	235	A
2	5A	240	C
2	5A	256	U
2	5A	259	G
2	5A	260	A
2	5A	261	U
2	5A	266	U
2	5A	267	U
2	5A	268	G
2	5A	271	G
2	5A	279	A
2	5A	280	A
2	5A	281	G
2	5A	304	U
2	5A	305	A
2	5A	309	A
2	5A	310	U
2	5A	311	C
2	5A	312	U
2	5A	313	A
2	5A	316	U
2	5A	324	U
2	5A	325	U
2	5A	326	C
2	5A	327	A
2	5A	328	A
2	5A	337	G

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	5A	339	A
2	5A	353	A
2	5A	354	G
2	5A	359	U
2	5A	360	C
2	5A	363	A
2	5A	364	A
2	5A	365	G
2	5A	368	U
2	5A	369	G
2	5A	370	U
2	5A	371	G
2	5A	372	A
2	5A	373	U
2	5A	381	G
2	5A	385	A
2	5A	386	A
2	5A	393	C
2	5A	395	C
2	5A	407	A
2	5A	419	A
2	5A	427	A
2	5A	428	A
2	5A	429	A
2	5A	430	C
2	5A	431	A
2	5A	432	C
2	5A	433	C
2	5A	440	U
2	5A	443	G
2	5A	461	A
2	5A	462	G
2	5A	464	G
2	5A	468	A
2	5A	469	C
2	5A	472	A
2	5A	474	A
2	5A	481	U
2	5A	482	A
2	5A	485	G
2	5A	487	A
2	5A	488	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	5A	489	G
2	5A	490	G
2	5A	491	U
2	5A	493	A
2	5A	517	A
2	5A	519	A
2	5A	525	U
2	5A	526	U
2	5A	533	G
2	5A	536	A
2	5A	537	G
2	5A	539	A
2	5A	540	U
2	5A	541	U
2	5A	542	U
2	5A	547	C
2	5A	549	G
2	5A	555	A
2	5A	585	C
2	5A	586	A
2	5A	587	G
2	5A	589	U
2	5A	590	G
3	SA	-5	G
3	SA	-4	A
3	SA	-1	G
3	SA	0	U
3	SA	1	U
3	SA	6	G
3	SA	10	G
3	SA	17	C
3	SA	18	C
3	SA	21	U
3	SA	24	U
3	SA	25	C
3	SA	26	A
3	SA	36	C
3	SA	37	U
3	SA	51	A
3	SA	53	G
3	SA	54	C
3	SA	55	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	56	U
3	SA	57	G
3	SA	59	C
3	SA	61	A
3	SA	63	G
3	SA	65	A
3	SA	66	U
3	SA	67	A
3	SA	68	A
3	SA	69	G
3	SA	72	A
3	SA	73	U
3	SA	74	U
3	SA	77	U
3	SA	80	A
3	SA	81	G
3	SA	85	A
3	SA	89	G
3	SA	92	A
3	SA	93	A
3	SA	96	G
3	SA	97	C
3	SA	100	A
3	SA	102	U
3	SA	104	A
3	SA	105	A
3	SA	114	C
3	SA	115	G
3	SA	126	A
3	SA	127	G
3	SA	128	U
3	SA	129	U
3	SA	130	C
3	SA	131	C
3	SA	141	U
3	SA	145	A
3	SA	146	U
3	SA	153	G
3	SA	159	U
3	SA	160	C
3	SA	163	G
3	SA	168	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	170	U
3	SA	174	U
3	SA	176	C
3	SA	177	U
3	SA	182	A
3	SA	183	U
3	SA	184	C
3	SA	187	G
3	SA	188	A
3	SA	190	C
3	SA	191	C
3	SA	192	U
3	SA	193	U
3	SA	194	U
3	SA	195	G
3	SA	197	A
3	SA	203	U
3	SA	211	U
3	SA	214	G
3	SA	228	G
3	SA	231	U
3	SA	233	C
3	SA	234	G
3	SA	236	A
3	SA	237	C
3	SA	238	U
3	SA	239	C
3	SA	241	U
3	SA	242	U
3	SA	246	G
3	SA	254	A
3	SA	255	U
3	SA	256	A
3	SA	261	U
3	SA	262	U
3	SA	265	A
3	SA	266	A
3	SA	267	U
3	SA	272	U
3	SA	273	G
3	SA	276	C
3	SA	277	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	278	U
3	SA	279	G
3	SA	280	U
3	SA	281	G
3	SA	283	U
3	SA	288	A
3	SA	290	G
3	SA	311	U
3	SA	313	U
3	SA	315	A
3	SA	316	A
3	SA	319	U
3	SA	320	U
3	SA	321	C
3	SA	322	G
3	SA	333	A
3	SA	334	G
3	SA	337	G
3	SA	339	C
3	SA	350	U
3	SA	351	C
3	SA	352	A
3	SA	356	G
3	SA	359	A
3	SA	360	A
3	SA	361	C
3	SA	362	G
3	SA	365	G
3	SA	366	A
3	SA	369	A
3	SA	371	G
3	SA	373	G
3	SA	374	U
3	SA	375	U
3	SA	376	C
3	SA	379	U
3	SA	382	C
3	SA	383	G
3	SA	386	G
3	SA	387	A
3	SA	390	G
3	SA	400	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	401	A
3	SA	402	C
3	SA	403	G
3	SA	404	G
3	SA	405	C
3	SA	407	A
3	SA	410	A
3	SA	411	C
3	SA	416	A
3	SA	418	G
3	SA	420	A
3	SA	421	A
3	SA	422	G
3	SA	423	G
3	SA	424	C
3	SA	425	A
3	SA	426	G
3	SA	428	A
3	SA	431	C
3	SA	436	A
3	SA	437	A
3	SA	439	U
3	SA	440	U
3	SA	441	A
3	SA	444	C
3	SA	445	A
3	SA	452	A
3	SA	454	U
3	SA	455	C
3	SA	456	A
3	SA	468	A
3	SA	469	C
3	SA	470	A
3	SA	471	A
3	SA	473	A
3	SA	477	A
3	SA	480	G
3	SA	485	A
3	SA	486	G
3	SA	487	G
3	SA	493	U
3	SA	496	G

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	501	U
3	SA	502	U
3	SA	505	A
3	SA	506	A
3	SA	507	U
3	SA	520	A
3	SA	534	A
3	SA	538	A
3	SA	539	G
3	SA	541	A
3	SA	542	A
3	SA	543	C
3	SA	545	A
3	SA	551	G
3	SA	557	G
3	SA	563	U
3	SA	564	G
3	SA	570	A
3	SA	572	C
3	SA	575	C
3	SA	579	A
3	SA	580	A
3	SA	583	C
3	SA	584	C
3	SA	585	A
3	SA	586	G
3	SA	587	C
3	SA	594	A
3	SA	595	G
3	SA	603	U
3	SA	604	A
3	SA	606	A
3	SA	608	U
3	SA	609	U
3	SA	610	G
3	SA	612	U
3	SA	613	G
3	SA	614	C
3	SA	615	A
3	SA	616	G
3	SA	635	A
3	SA	636	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	638	U
3	SA	644	C
3	SA	648	G
3	SA	649	U
3	SA	652	G
3	SA	654	C
3	SA	656	G
3	SA	657	U
3	SA	658	C
3	SA	659	C
3	SA	677	G
3	SA	678	A
3	SA	680	U
3	SA	682	C
3	SA	687	G
3	SA	689	G
3	SA	691	C
3	SA	692	C
3	SA	859	A
3	SA	860	U
3	SA	861	U
3	SA	863	A
3	SA	864	U
3	SA	865	A
3	SA	876	G
3	SA	894	U
3	SA	901	G
3	SA	906	A
3	SA	913	G
3	SA	914	G
3	SA	932	U
3	SA	933	A
3	SA	935	U
3	SA	940	A
3	SA	945	U
3	SA	951	A
3	SA	960	U
3	SA	966	A
3	SA	969	C
3	SA	970	A
3	SA	1021	C
3	SA	1022	C

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	1023	A
3	SA	1024	U
3	SA	1025	A
3	SA	1026	A
3	SA	1027	A
3	SA	1031	U
3	SA	1032	G
3	SA	1036	A
3	SA	1037	C
3	SA	1039	A
3	SA	1040	G
3	SA	1052	U
3	SA	1053	G
3	SA	1056	U
3	SA	1058	U
3	SA	1059	U
3	SA	1060	U
3	SA	1062	A
3	SA	1063	U
3	SA	1064	G
3	SA	1075	C
3	SA	1076	A
3	SA	1081	A
3	SA	1082	C
3	SA	1084	A
3	SA	1085	G
3	SA	1086	A
3	SA	1106	U
3	SA	1107	G
3	SA	1108	G
3	SA	1109	G
3	SA	1110	G
3	SA	1111	G
3	SA	1118	G
3	SA	1119	G
3	SA	1122	G
3	SA	1125	A
3	SA	1127	G
3	SA	1128	C
3	SA	1131	A
3	SA	1132	A
3	SA	1145	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	1146	G
3	SA	1147	A
3	SA	1158	C
3	SA	1164	G
3	SA	1191	U
3	SA	1192	C
3	SA	1193	A
3	SA	1196	A
3	SA	1197	C
3	SA	1198	G
3	SA	1199	G
3	SA	1200	G
3	SA	1201	G
3	SA	1202	A
3	SA	1205	C
3	SA	1207	C
3	SA	1208	A
3	SA	1210	C
3	SA	1213	G
3	SA	1217	A
3	SA	1218	G
3	SA	1219	A
3	SA	1226	A
3	SA	1227	A
3	SA	1228	G
3	SA	1229	G
3	SA	1232	U
3	SA	1235	C
3	SA	1236	A
3	SA	1253	U
3	SA	1255	G
3	SA	1258	U
3	SA	1259	U
3	SA	1266	U
3	SA	1268	G
3	SA	1271	G
3	SA	1272	U
3	SA	1273	G
3	SA	1274	C
3	SA	1275	A
3	SA	1436	A
3	SA	1437	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	1440	C
3	SA	1443	U
3	SA	1450	U
3	SA	1457	C
3	SA	1461	C
3	SA	1469	A
3	SA	1472	C
3	SA	1473	U
3	SA	1474	G
3	SA	1475	A
3	SA	1477	G
3	SA	1485	C
3	SA	1488	G
3	SA	1489	U
3	SA	1492	A
3	SA	1493	A
3	SA	1496	U
3	SA	1498	G
3	SA	1506	G
3	SA	1517	U
3	SA	1518	C
3	SA	1520	U
3	SA	1521	G
3	SA	1522	U
3	SA	1523	G
3	SA	1524	A
3	SA	1531	G
3	SA	1535	U
3	SA	1536	G
3	SA	1539	G
3	SA	1541	G
3	SA	1543	A
3	SA	1544	U
3	SA	1567	U
3	SA	1568	C
3	SA	1569	A
3	SA	1570	A
3	SA	1573	A
3	SA	1584	G
3	SA	1590	G
3	SA	1594	G
3	SA	1595	U

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	1601	G
3	SA	1602	C
3	SA	1607	G
3	SA	1614	A
3	SA	1618	C
3	SA	1628	U
3	SA	1629	G
3	SA	1630	U
3	SA	1631	A
3	SA	1639	C
3	SA	1651	A
3	SA	1658	G
3	SA	1659	A
3	SA	1664	C
3	SA	1670	G
3	SA	1671	A
3	SA	1672	G
3	SA	1677	C
3	SA	1678	A
3	SA	1679	G
3	SA	1680	G
3	SA	1681	A
3	SA	1682	U
3	SA	1683	C
3	SA	1684	U
3	SA	1685	G
3	SA	1690	G
3	SA	1695	G
3	SA	1700	C
3	SA	1702	A
3	SA	1707	A
3	SA	1710	U
3	SA	1711	C
3	SA	1713	G
3	SA	1717	G
3	SA	1718	G
3	SA	1719	A
3	SA	1724	U
3	SA	1725	U
3	SA	1727	G
3	SA	1731	A
3	SA	1732	A

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	SA	1736	G
3	SA	1737	G
3	SA	1742	U
3	SA	1743	U
3	SA	1745	G
3	SA	1747	G
3	SA	1749	A
3	SA	1751	C
3	SA	1756	A
3	SA	1757	G
3	SA	1758	U
3	SA	1759	C
3	SA	1761	U
3	SA	1764	C
3	SA	1765	A
3	SA	1766	A
3	SA	1768	G
3	SA	1772	C
3	SA	1779	U
3	SA	1780	G
3	SA	1781	A
3	SA	1782	A

All (28) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	3A	198	U
1	3A	248	G
2	5A	169	A
2	5A	172	C
2	5A	173	G
2	5A	224	G
2	5A	312	U
2	5A	358	G
2	5A	363	A
2	5A	368	U
2	5A	492	G
2	5A	536	A
3	SA	0	U
3	SA	56	U
3	SA	68	A
3	SA	272	U

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
3	SA	372	G
3	SA	401	A
3	SA	417	A
3	SA	538	A
3	SA	542	A
3	SA	579	A
3	SA	602	U
3	SA	1031	U
3	SA	1052	U
3	SA	1084	A
3	SA	1521	G
3	SA	1594	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 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	$\# Z  > 2$
69	GTP	RJ	1201	70	26,34,34	1.23	1 (3%)	32,54,54	1.65	6 (18%)

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
69	GTP	RJ	1201	70	-	2/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
69	RJ	1201	GTP	C5-C6	-4.38	1.38	1.47

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
69	RJ	1201	GTP	PA-O3A-PB	-4.27	118.18	132.83
69	RJ	1201	GTP	PB-O3B-PG	-3.72	120.06	132.83
69	RJ	1201	GTP	C5-C6-N1	3.41	119.98	113.95
69	RJ	1201	GTP	C8-N7-C5	3.09	108.88	102.99
69	RJ	1201	GTP	C2-N1-C6	-3.06	119.46	125.10
69	RJ	1201	GTP	O6-C6-C5	-2.05	120.36	124.37

There are no chirality outliers.

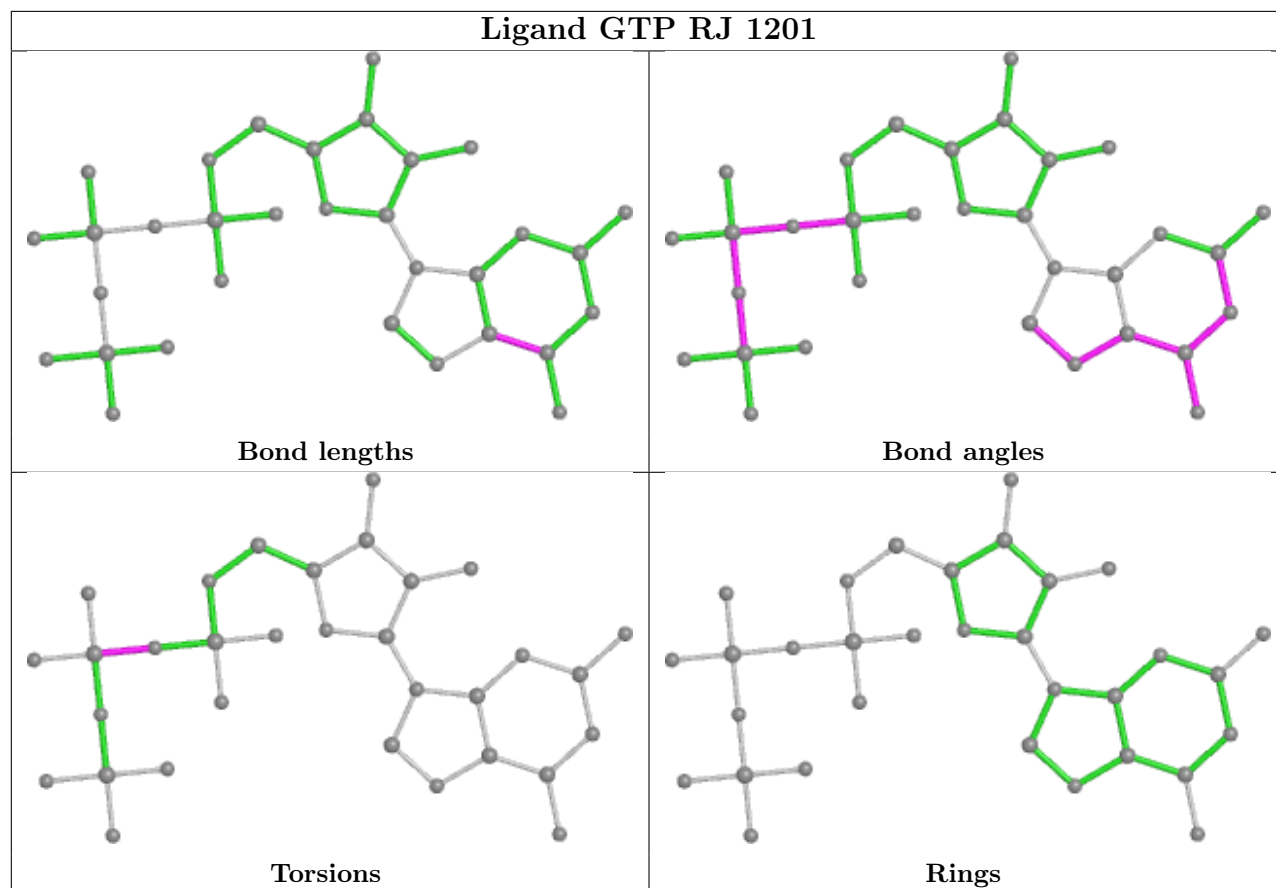
All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
69	RJ	1201	GTP	PA-O3A-PB-O2B
69	RJ	1201	GTP	PA-O3A-PB-O1B

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.



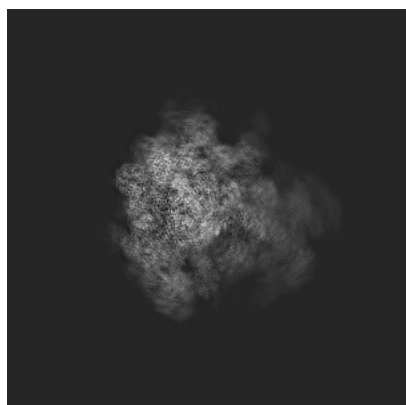
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9964. These allow visual inspection of the internal detail of the map and identification of artifacts.

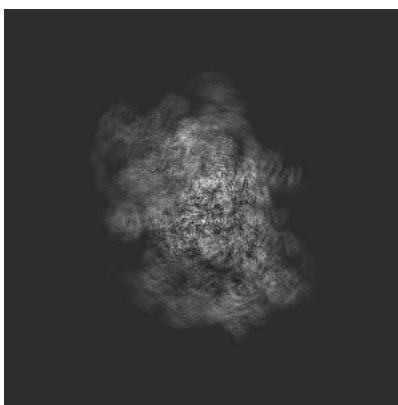
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

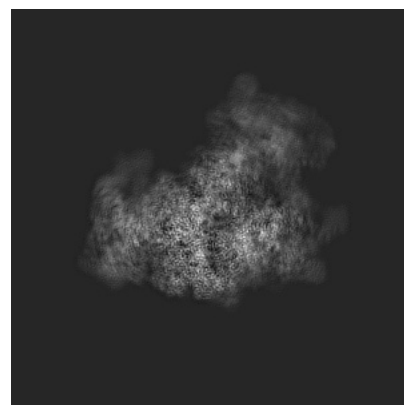
#### 6.1.1 Primary map



X



Y

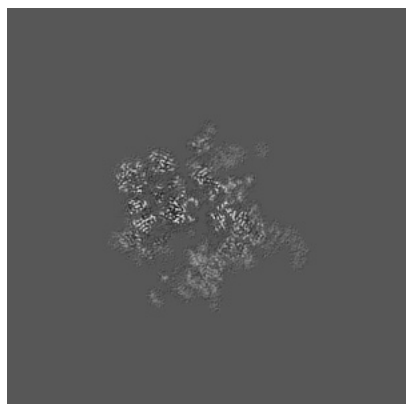


Z

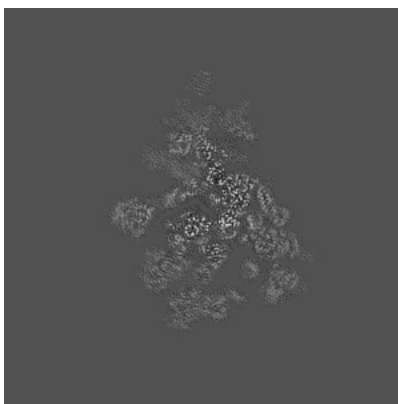
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

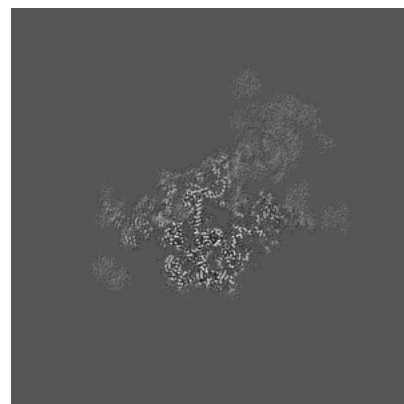
#### 6.2.1 Primary map



X Index: 256



Y Index: 256

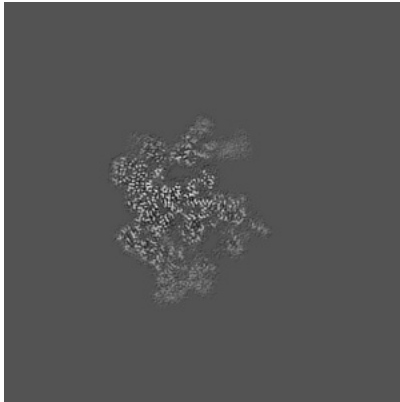


Z Index: 256

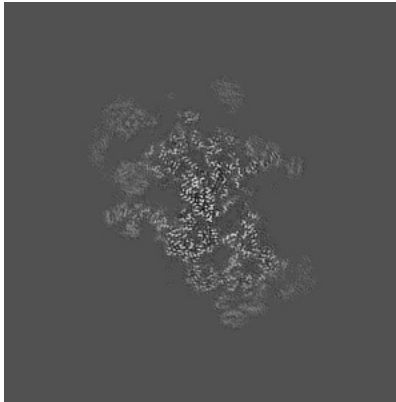
The images above show central slices of the map in three orthogonal directions.

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

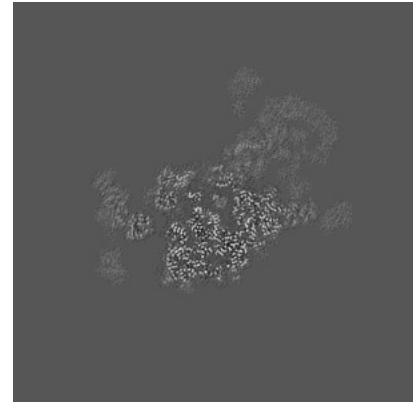
### 6.3.1 Primary map



X Index: 240



Y Index: 216

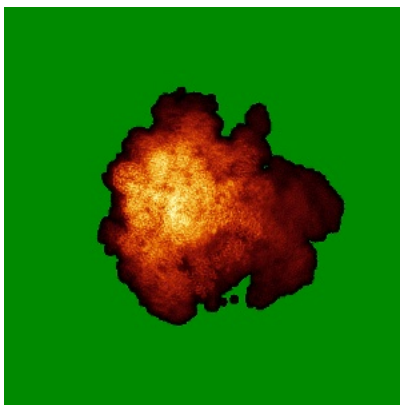


Z Index: 267

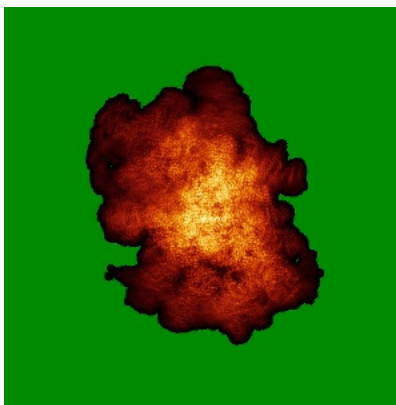
The images above show the largest variance slices of the map in three orthogonal directions.

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

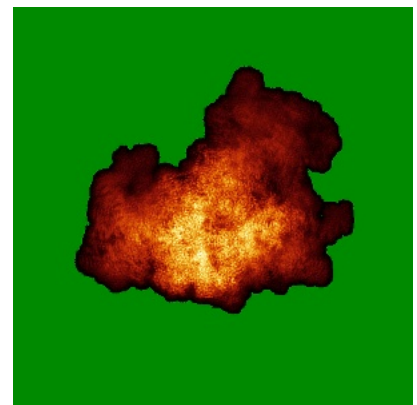
### 6.4.1 Primary map



X



Y



Z

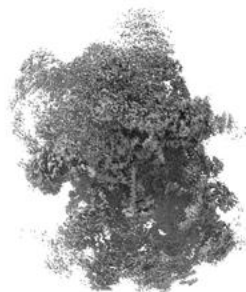
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views [i](#)

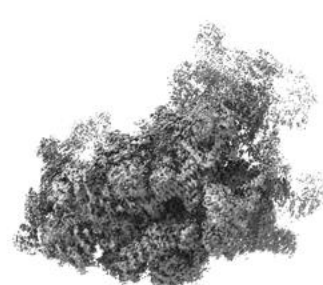
### 6.5.1 Primary map



X



Y



Z

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

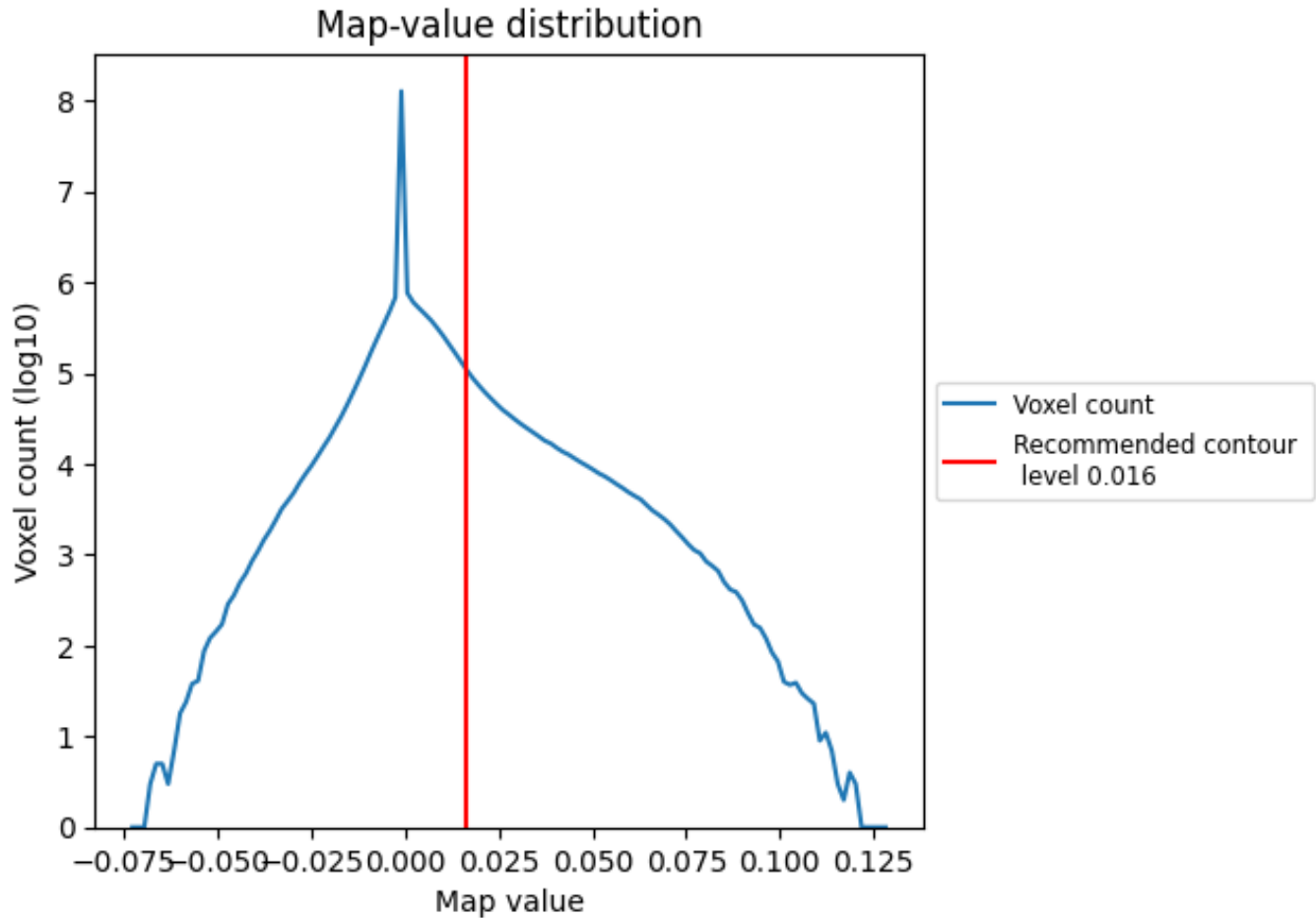
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

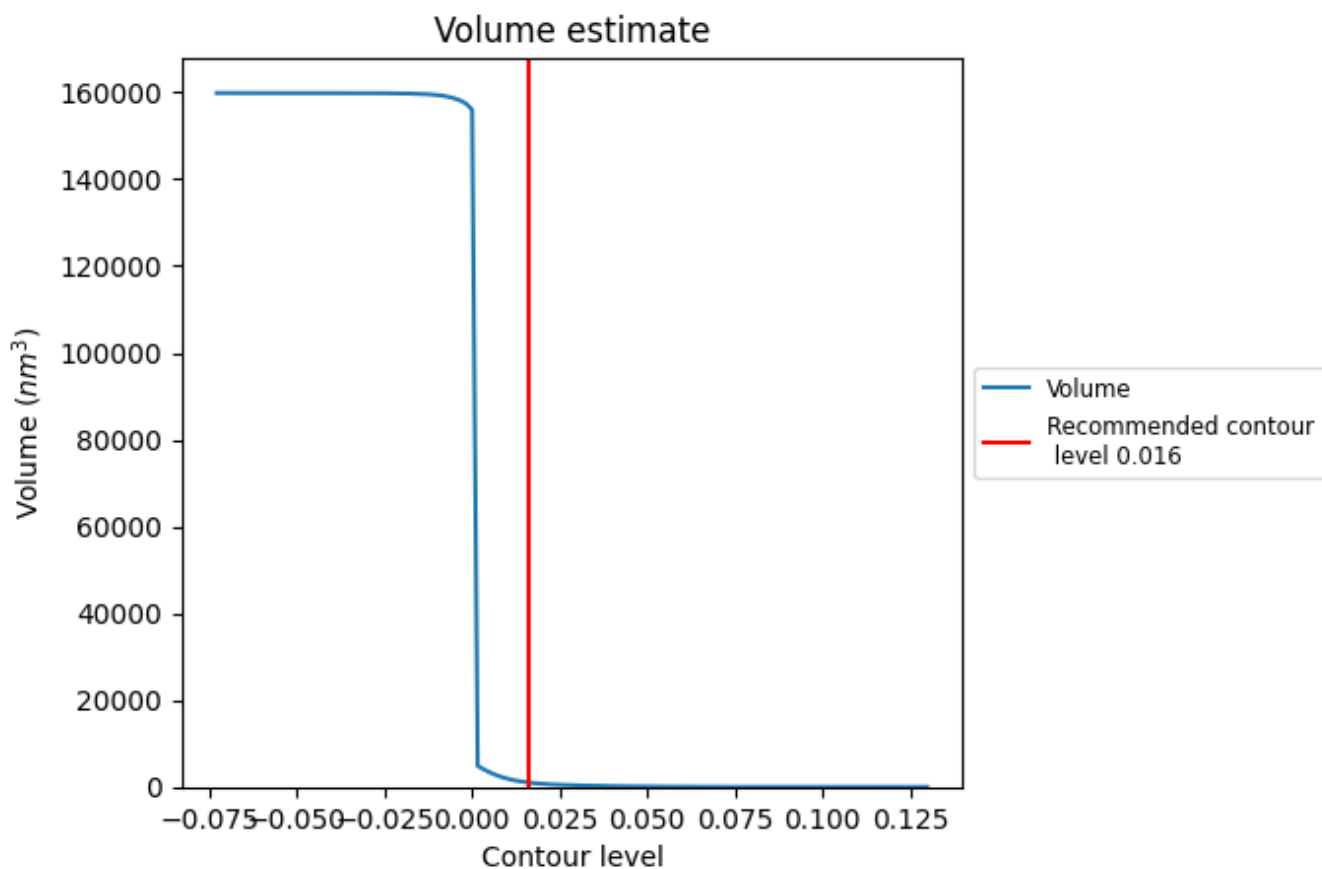
This section contains the results of statistical analysis of the map.

### 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.

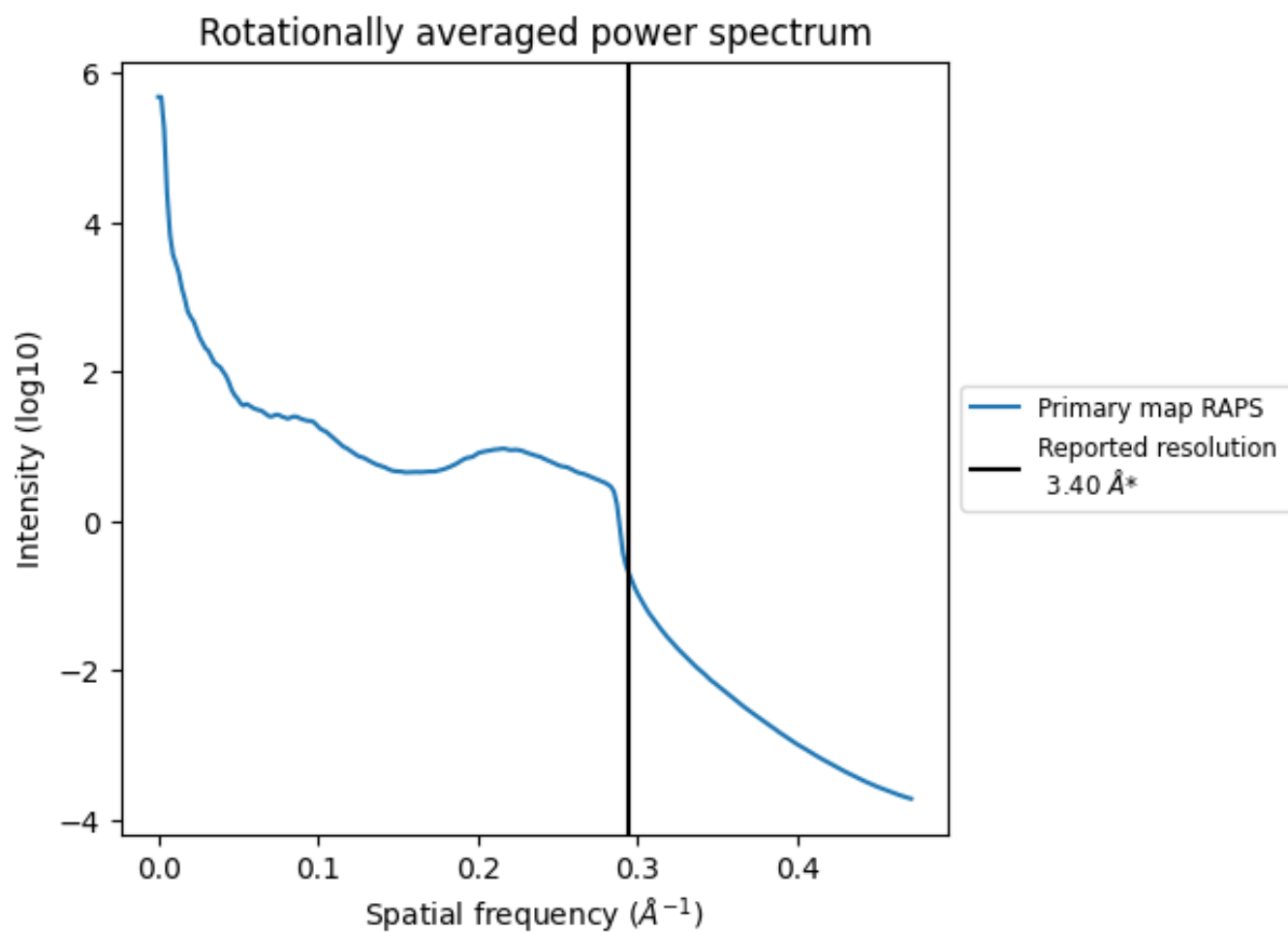
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1022 nm<sup>3</sup>; this corresponds to an approximate mass of 923 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](#)

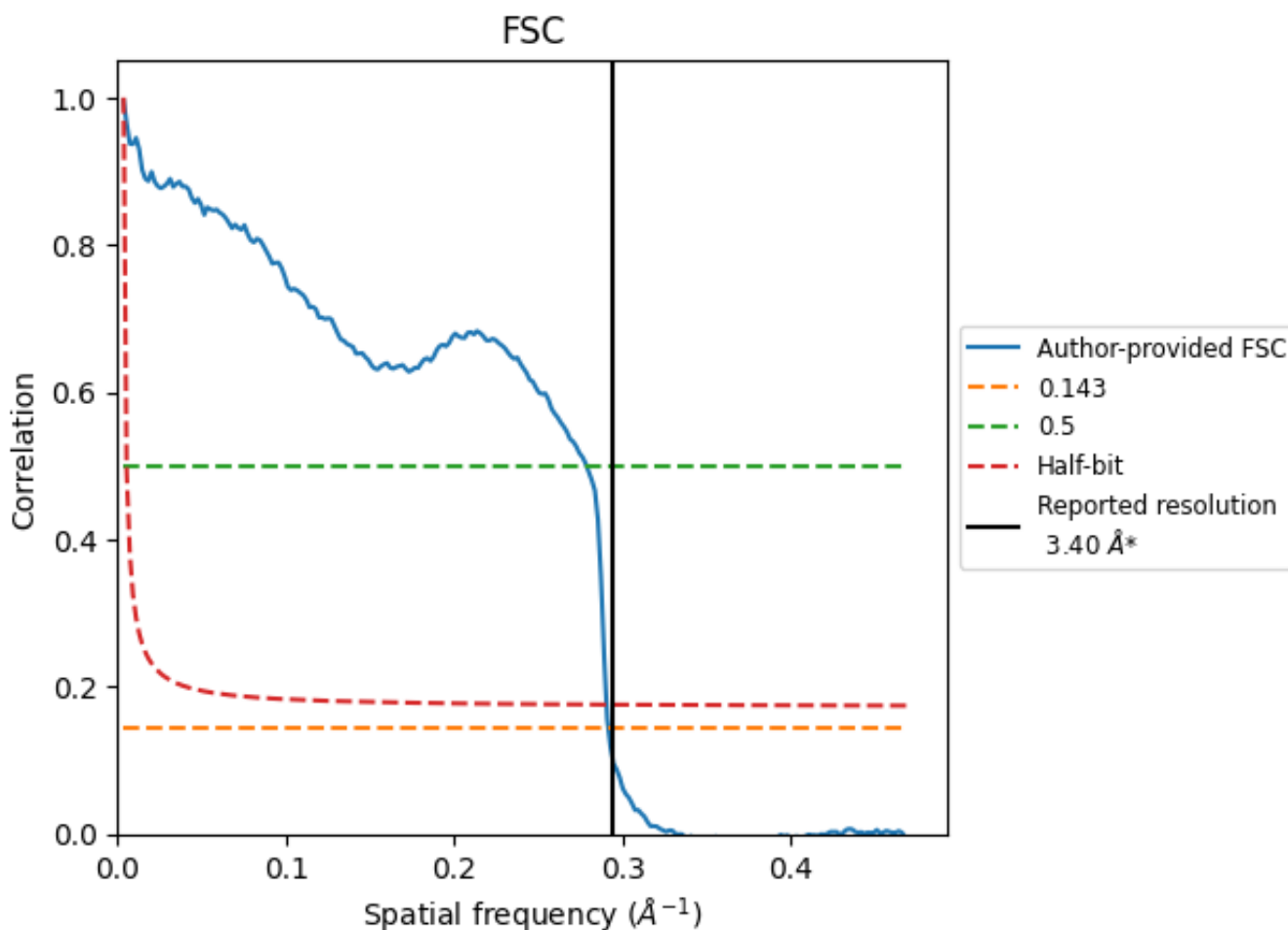


\*Reported resolution corresponds to spatial frequency of  $0.294 \text{\AA}^{-1}$

## 8 Fourier-Shell correlation [\(i\)](#)

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

### 8.1 FSC [\(i\)](#)



\*Reported resolution corresponds to spatial frequency of 0.294 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.43	3.59	3.44
Unmasked-calculated*	-	-	-

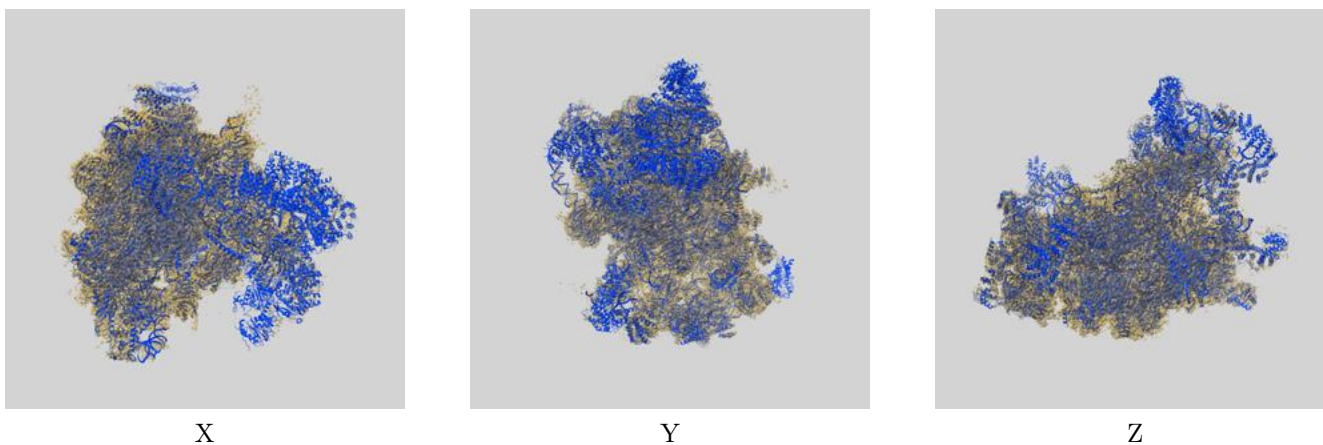
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.



## 9 Map-model fit [i](#)

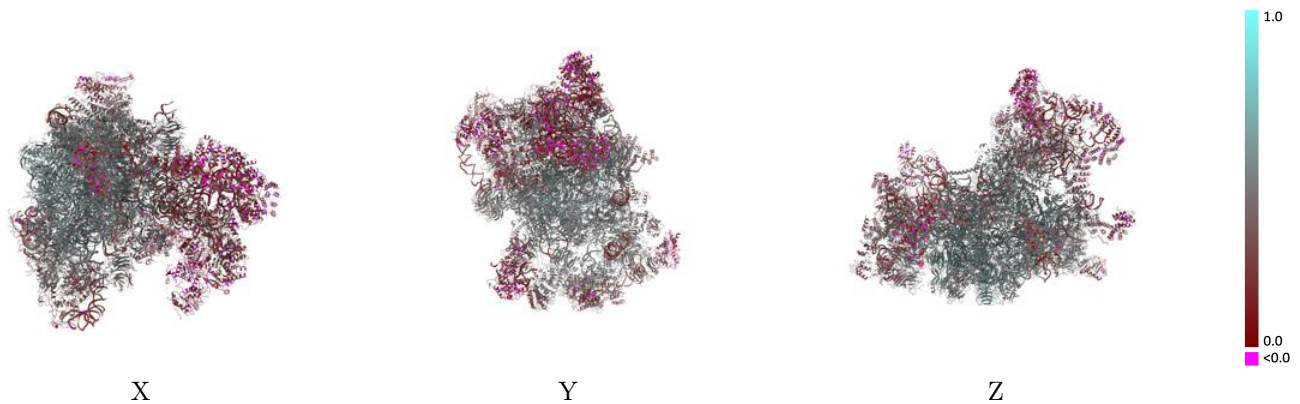
This section contains information regarding the fit between EMDB map EMD-9964 and PDB model 6KE6. Per-residue inclusion information can be found in section 3 on page 17.

### 9.1 Map-model overlay [i](#)



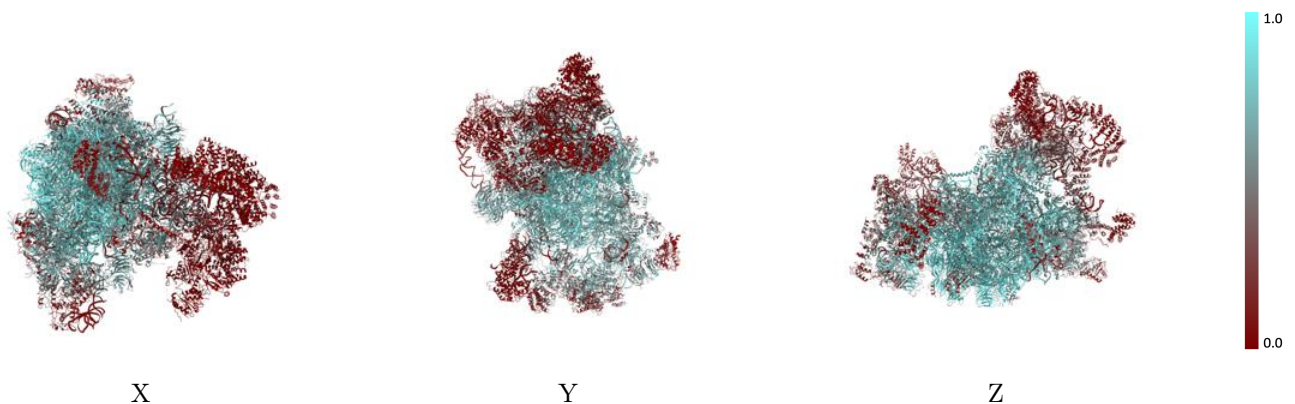
The images above show the 3D surface view of the map at the recommended contour level 0.016 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



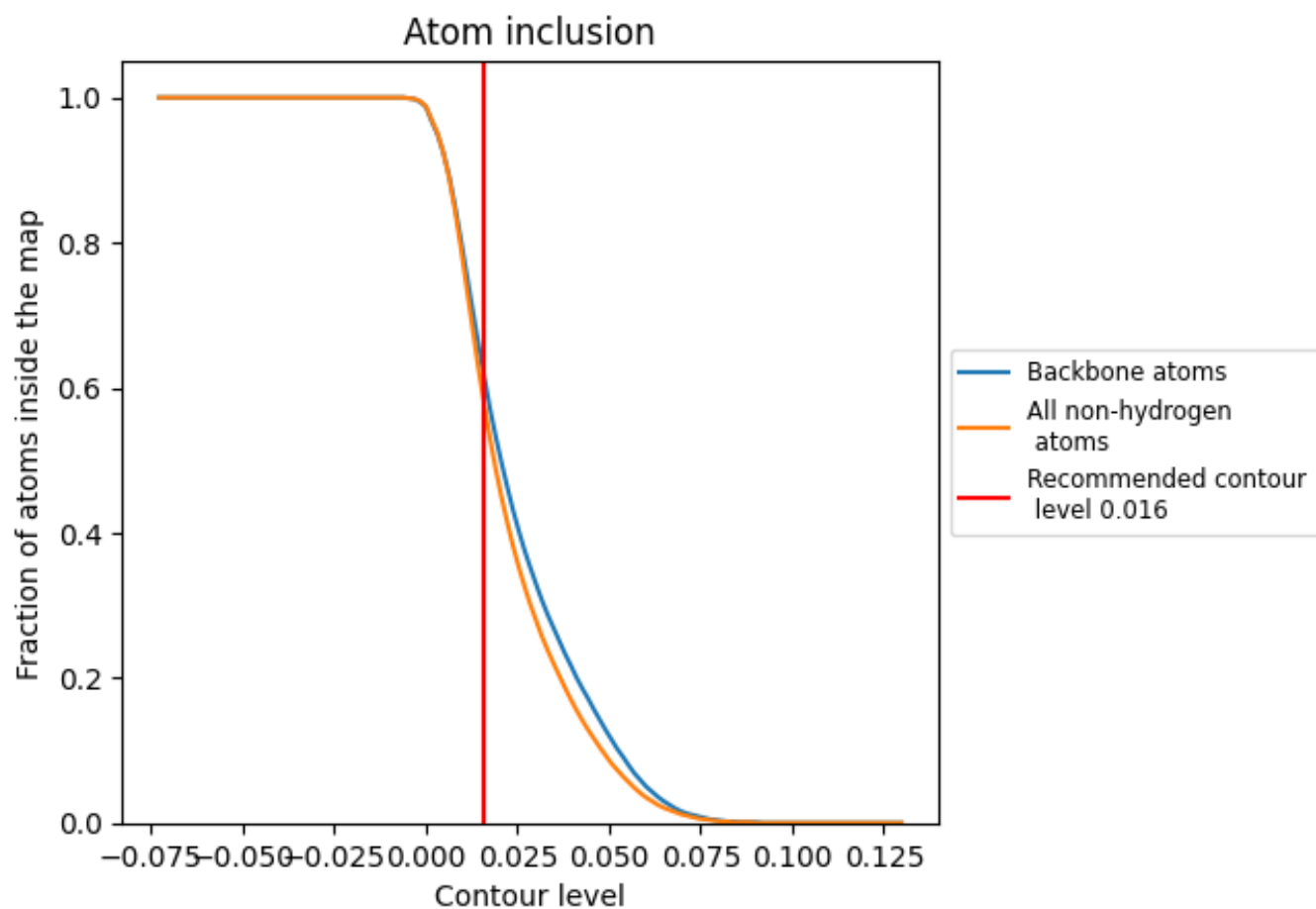
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 61% of all backbone atoms, 57% 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	 0.5740	 0.4270
3A	 0.8270	 0.4550
3B	 0.8620	 0.5570
3C	 0.5800	 0.4410
3D	 0.7370	 0.4890
3E	 0.6830	 0.4590
3F	 0.6610	 0.4530
3G	 0.8340	 0.5450
3H	 0.7580	 0.5110
5A	 0.7640	 0.4290
5B	 0.4040	 0.3970
5C	 0.8460	 0.5510
5D	 0.7550	 0.5110
5E	 0.7530	 0.5240
5F	 0.8870	 0.5690
5G	 0.8110	 0.5500
5H	 0.7230	 0.5000
5I	 0.8630	 0.5500
5J	 0.6630	 0.4970
5K	 0.8570	 0.5580
A4	 0.6830	 0.4510
A5	 0.7530	 0.4910
A8	 0.2280	 0.3060
A9	 0.3970	 0.3630
AE	 0.3780	 0.3480
AF	 0.7590	 0.5060
AG	 0.6910	 0.4690
B1	 0.8810	 0.5590
B2	 0.6660	 0.4520
B3	 0.5920	 0.4230
B6	 0.6690	 0.4400
B8	 0.8480	 0.5430
BE	 0.8700	 0.5550
RA	 0.0960	 0.2760
RB	 0.4640	 0.4280



*Continued on next page...*

Continued from previous page...

Chain	Atom inclusion	Q-score
RC	0.6170	0.4820
RE	0.3870	0.4000
RF	0.2960	0.3630
RG	0.3630	0.3870
RH	0.5720	0.4780
RI	0.7660	0.4930
RJ	0.7420	0.5030
RK	0.6830	0.4860
RL	0.1200	0.3130
RM	0.0190	0.1970
RN	0.3310	0.3780
RO	0.4480	0.3860
RP	0.0910	0.2260
RQ	0.5790	0.4680
RS	0.0370	0.2090
RT	0.6790	0.4800
RV	0.7190	0.5180
SA	0.5130	0.3620
SC	0.7480	0.5170
SF	0.2900	0.3660
SG	0.8170	0.5350
SH	0.0940	0.3450
SI	0.5210	0.4250
SJ	0.1430	0.2790
SK	0.8060	0.5300
SM	0.1530	0.2840
SN	0.0050	0.1060
SO	0.7580	0.5080
SP	0.7590	0.5120
SR	0.8490	0.5530
ST	0.3320	0.4150
SX	0.7840	0.5300
SY	0.7750	0.5270
SZ	0.4900	0.4280
Sc	0.7680	0.5200
Sd	0.8410	0.5500
X1	0.3290	0.3770