



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 06:32 AM UTC

PDB ID : 9N6Z / pdb_00009n6z
EMDB ID : EMD-49079
Title : SSU processome maturation and disassembly, State D
Authors : Buzovetsky, O.; Klinge, S.
Deposited on : 2025-02-05
Resolution : 4.74 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

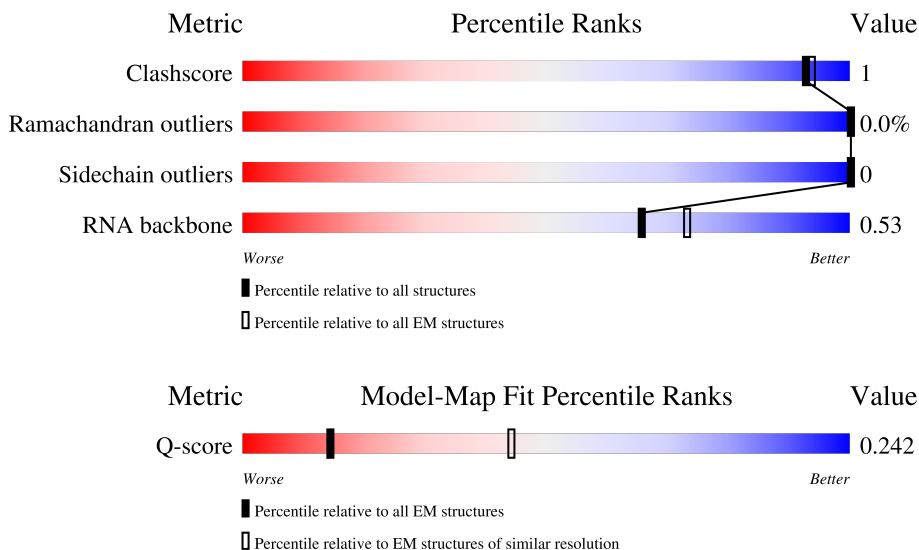
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13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

1 Overall quality at a glance

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

The reported resolution of this entry is 4.74 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	1628 (4.24 - 5.23)

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

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1	L0	700	
2	L1	1808	
3	L2	333	

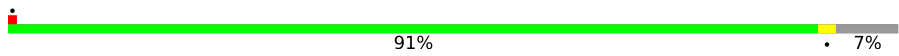




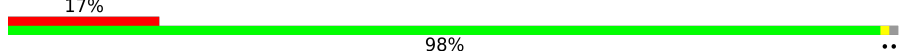





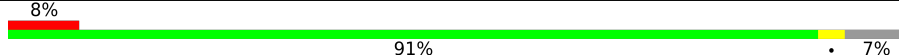
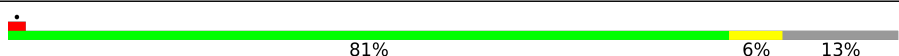
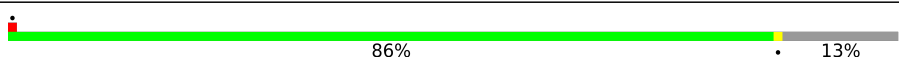
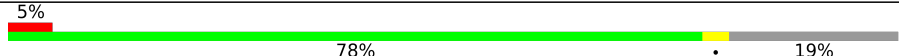
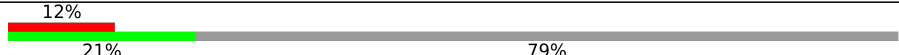
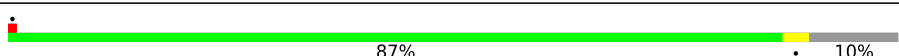

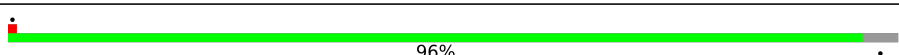
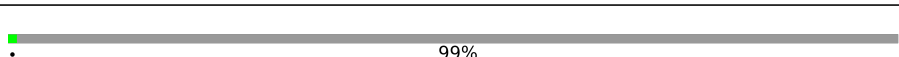
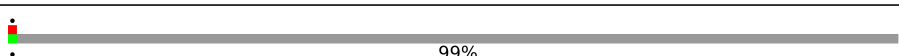



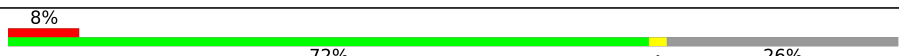
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Mol	Chain	Length	Quality of chain
4	L3	146	66% 65% 34%
5	L4	261	19% 90% 7%
6	L5	225	91% 8%
7	L6	236	5% 86% 13%
8	L7	190	9% 85% 11%
9	L8	200	10% 84% 15%
10	L9	197	84% 13%
11	LC	143	86% 13%
12	LD	156	28% 87% 12%
13	LE	130	95%
14	LF	135	95%
15	LG	67	93% 7%
16	LH	896	88% 10%
17	LI	713	28% 83% 16%
18	LJ	513	19% 91% 7%
19	LK	575	23% 77%
20	LL	643	6% 75% 24%
21	LM	1769	32% 91% 9%
22	LN	776	82% 15%
23	LO	923	10% 85% 13%
24	LP	440	19% 85% 14%
25	LQ	943	86% 13%
26	LR	817	94%
27	LS	594	7% 80% 19%
28	LT	939	86% 12%

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Mol	Chain	Length	Quality of chain
29	LU	489	
30	LV	707	
31	LW	554	
32	LX	1056	
32	LY	1056	
33	LZ	183	
34	NA	593	
35	NB	610	
36	NC	357	
37	ND	214	
38	NE	346	
39	NF	151	
40	NG	137	
41	NH	1237	
42	NI	297	
43	NK	316	
44	NM	255	
45	NN	534	
46	NQ	82	
47	NS	1267	
48	NV	733	
49	OA	1729	
50	SA	504	
51	SB	511	
52	SC	327	

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Mol	Chain	Length	Quality of chain
52	SD	327	53% 69% 29%
53	SE	126	93% •
53	SF	126	6% 94% • •
54	SG	573	22% 79% • 20%
55	SH	367	7% 97% • •
56	SI	1183	5% 66% • 33%
57	SJ	252	50% 84% • 15%
57	SK	252	52% 90% • 9%
58	SL	189	• 77% • 22%
59	SM	290	9% 75% • 24%
60	SP	2493	22% 85% • 14%
61	SQ	217	28% 61% • 38%
62	SR	145	7% 70% • 28%
63	SS	899	11% 26% • 73%
64	ST	810	50% 65% 35%
65	SU	552	89% 97% •
66	SW	274	5% 61% • 34%
67	SY	250	24% 44% • 54%
68	SZ	483	42% 52% • 46%

2 Entry composition

There are 68 unique types of molecules in this entry. The entry contains 157426 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 5'ETS rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	L0	98	2101	939	382	682	98	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	L1	1157	24681	11034	4410	8080	1157	0	0

- Molecule 3 is a RNA chain called U3 snoRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	L2	175	3712	1661	649	1227	175	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
4	L3	97	485	291	97	97	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	L4	244	1221	733	244	244	0	0

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

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

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

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

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

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
8	L7	169	854	516	169	169	0	0

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

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
9	L8	170	843	503	170	170	0	0

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

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
10	L9	171	860	518	171	171	0	0

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

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
11	LC	125	628	378	125	125	0	0

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

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

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
14	LF	130	Total	C	N	O	0	0
			647	387	130	130		

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
16	LH	802	Total	C	N	O	0	0
			4014	2410	802	802		

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

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

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

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

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

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

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

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

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

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

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
23	LO	804	4017	2409	804	804	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
24	LP	380	1906	1146	380	380	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
25	LQ	817	4073	2439	817	817	0	0

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

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
27	LS	480	2409	1449	480	480	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
28	LT	831	4146	2484	831	831	0	0

- Molecule 29 is a protein called Protein SOF1.

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	LV	405	2029	1219	405	405	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	LW	421	2115	1273	421	421	0	0

- Molecule 32 is a protein called RNA cytidine acetyltransferase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	LX	842	4253	2569	842	842	0	0
32	LY	846	4274	2582	846	846	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
33	LZ	181	912	550	181	181	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
34	NA	284	1431	863	284	284	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
35	NB	224	Total	C	N	O	0	0
			1124	676	224	224		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
36	NC	115	Total	C	N	O	0	0
			575	345	115	115		

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

Mol	Chain	Residues	Atoms				AltConf	Trace
37	ND	74	Total	C	N	O	0	0
			374	226	74	74		

- Molecule 38 is a protein called Protein FAF1.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	NE	74	Total	C	N	O	0	0
			372	224	74	74		

- Molecule 39 is a protein called 40S ribosomal protein S13.

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

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

Mol	Chain	Residues	Atoms				AltConf	Trace
40	NG	119	Total	C	N	O	0	0
			592	354	119	119		

- Molecule 41 is a protein called U3 small nucleolar RNA-associated protein 22.

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

- Molecule 42 is a protein called Ribosomal RNA-processing protein 7.

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

- Molecule 43 is a protein called KRR1 small subunit processome component.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	NK	66	Total	C	N	O	0	0
			339	207	66	66		

- Molecule 44 is a protein called Small ribosomal subunit protein eS1A.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	NM	230	Total	C	N	O	0	0
			1149	689	230	230		

- Molecule 45 is a protein called Protein BFR2.

Mol	Chain	Residues	Atoms				AltConf	Trace
45	NN	267	Total	C	N	O	0	0
			1341	807	267	267		

- Molecule 46 is a protein called 40S ribosomal protein S27-A.

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

- Molecule 47 is a protein called Probable ATP-dependent RNA helicase DHR1.

Mol	Chain	Residues	Atoms				AltConf	Trace
47	NS	12	Total	C	N	O	0	0
			60	36	12	12		

- Molecule 48 is a protein called Exosome complex exonuclease RRP6.

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

- Molecule 49 is a protein called rRNA biogenesis protein RRP5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
49	OA	172	858	514	172	172	0	0

- Molecule 50 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
50	SA	385	1924	1154	385	385	0	0

- Molecule 51 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
51	SB	436	2176	1304	436	436	0	0

- Molecule 52 is a protein called rRNA 2'-O-methyltransferase fibrillar.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
52	SC	241	1212	730	241	241	0	0
52	SD	232	1171	707	232	232	0	0

- Molecule 53 is a protein called 13 kDa ribonucleoprotein-associated protein.

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

- Molecule 54 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
54	SG	459	2290	1372	459	459	0	0

- Molecule 55 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

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

- Molecule 56 is a protein called Ribosome biogenesis protein BMS1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
56	SI	795	4014	2424	795	795	0	0

- Molecule 57 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

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

- Molecule 58 is a protein called rRNA-processing protein FCF1.

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

- Molecule 59 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
59	SM	219	1103	665	219	219	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
60	SP	2147	10799	6505	2147	2147	0	0

- Molecule 61 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
61	SQ	135	684	414	135	135	0	0

- Molecule 62 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
62	SR	104	518	310	104	104	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		
63	SS	243	1239	753	243	243	0	0

- Molecule 64 is a protein called Nucleolar complex protein 14.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
64	ST	529	2672	1614	529	529	0	0

- Molecule 65 is a protein called Nucleolar complex protein 4.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
65	SU	534	2712	1644	534	534	0	0

- Molecule 66 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
66	SW	180	907	547	180	180	0	0

- Molecule 67 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
67	SY	115	577	347	115	115	0	0

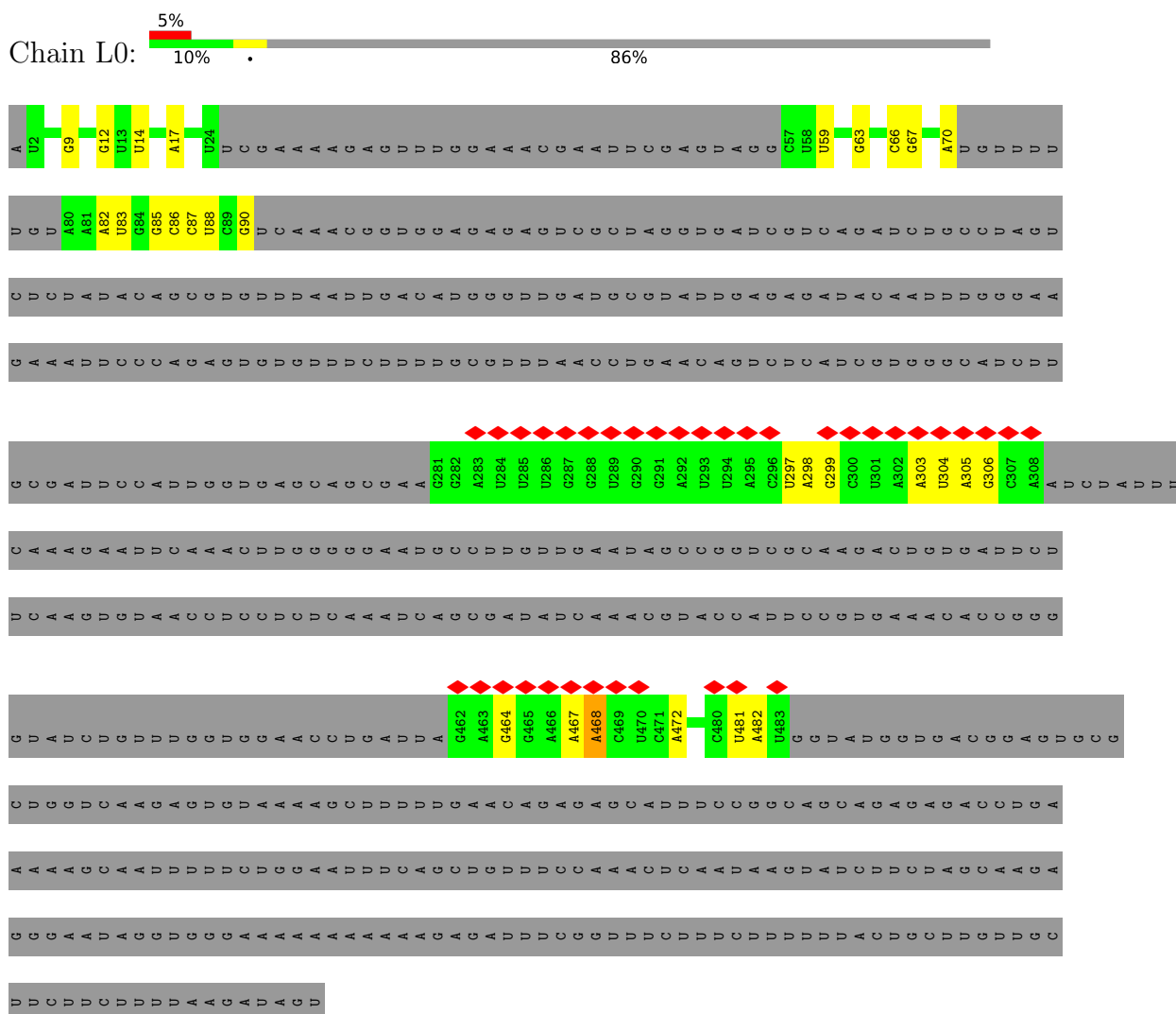
- Molecule 68 is a protein called Essential nuclear protein 1.

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

3 Residue-property plots [i](#)

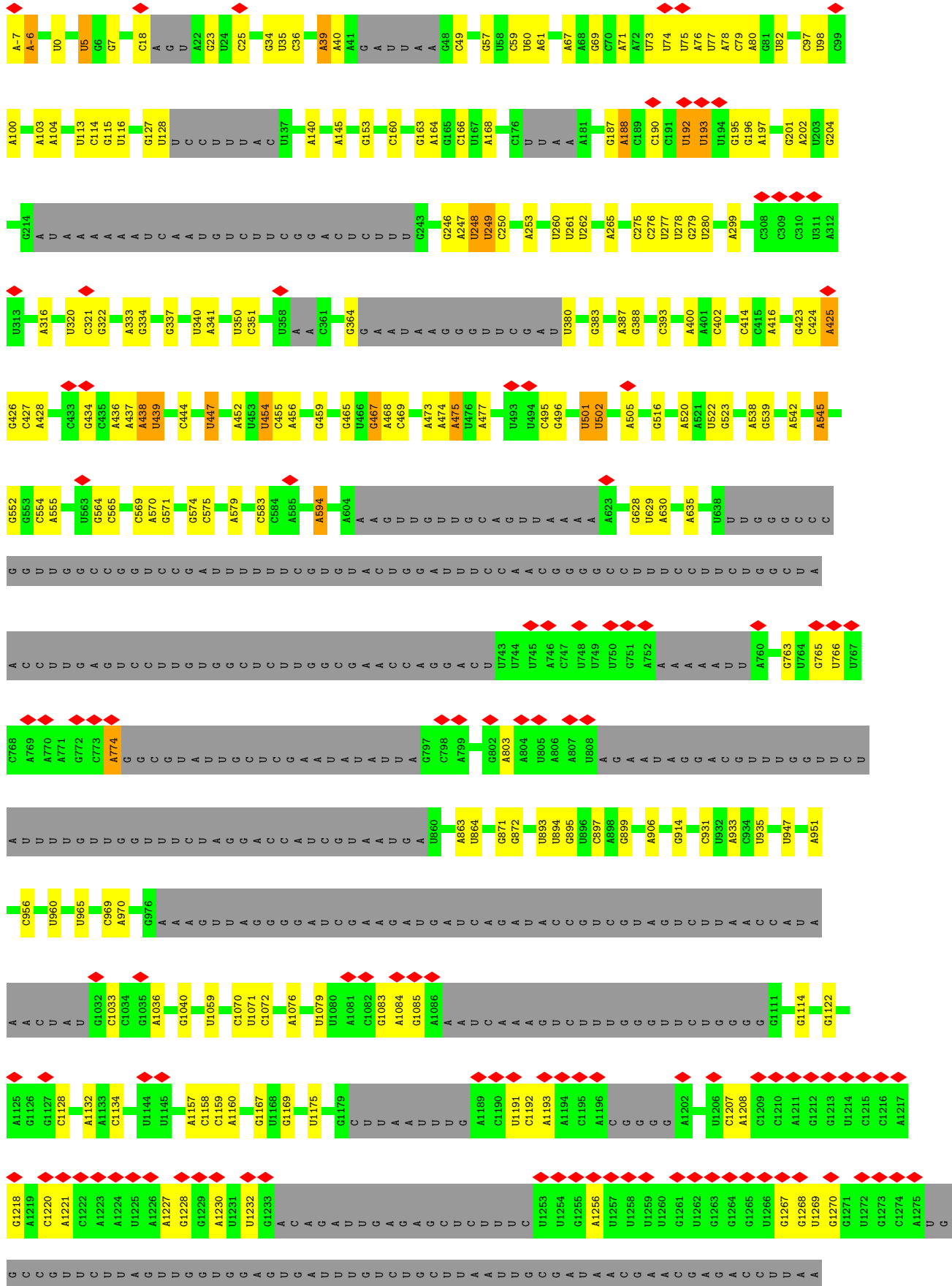
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

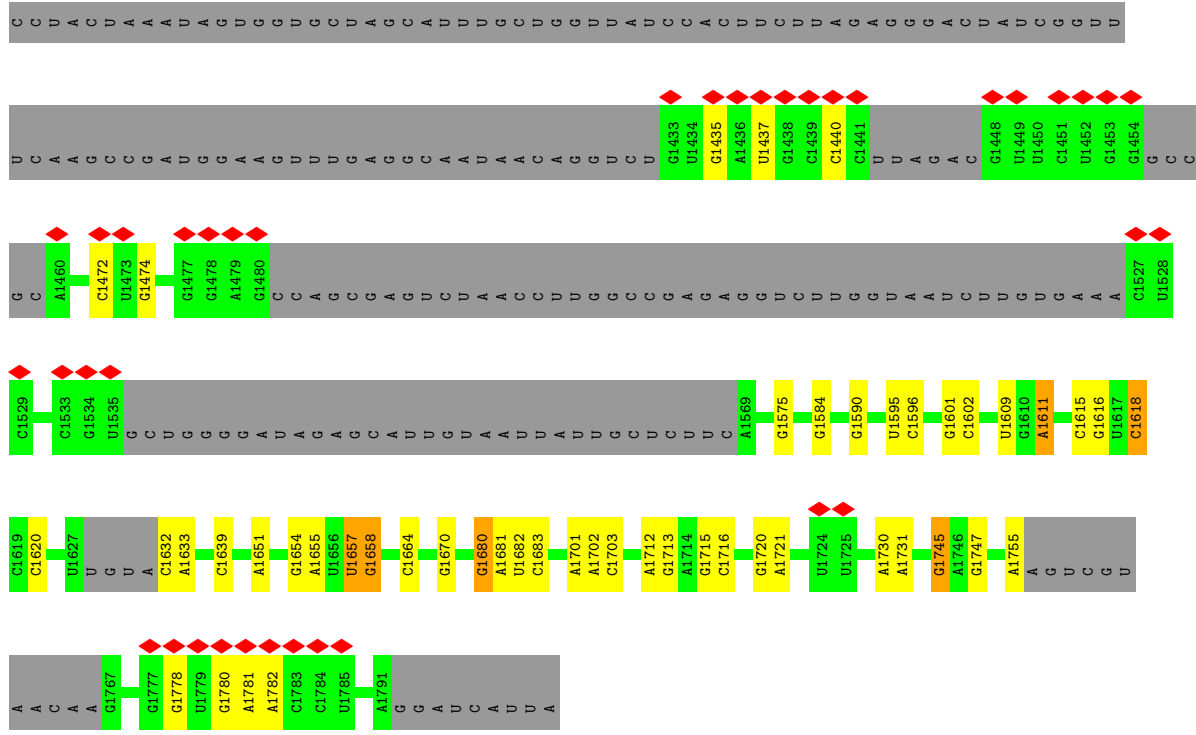
- Molecule 1: 5'ETS rRNA



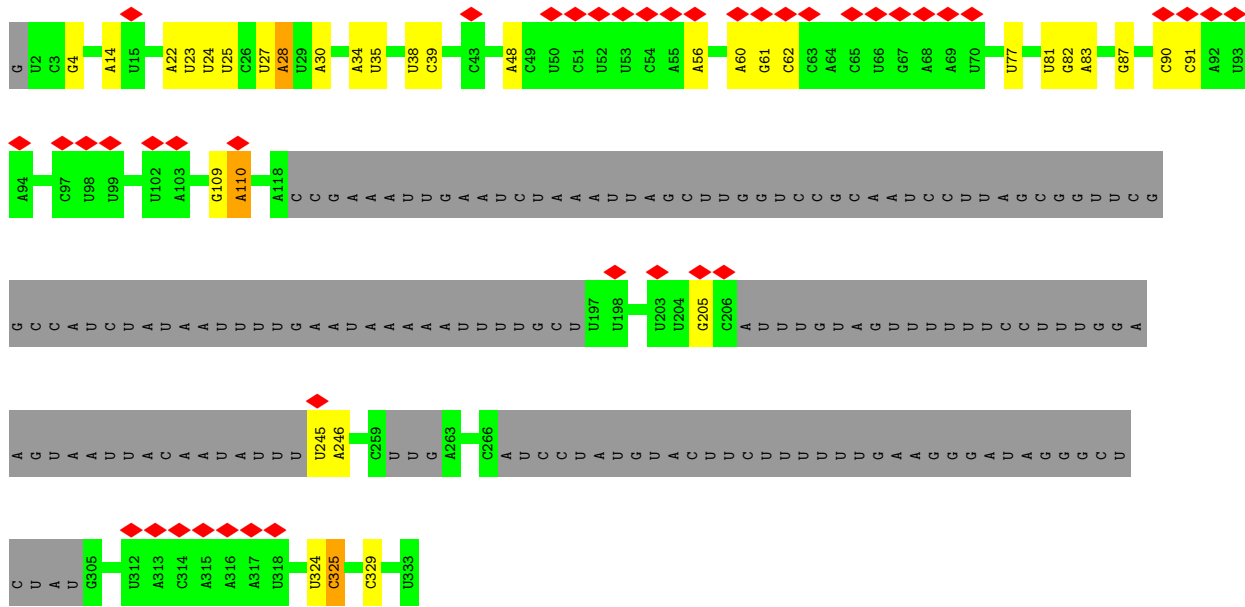
- Molecule 2: 18S rRNA



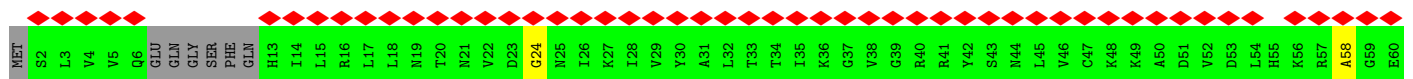


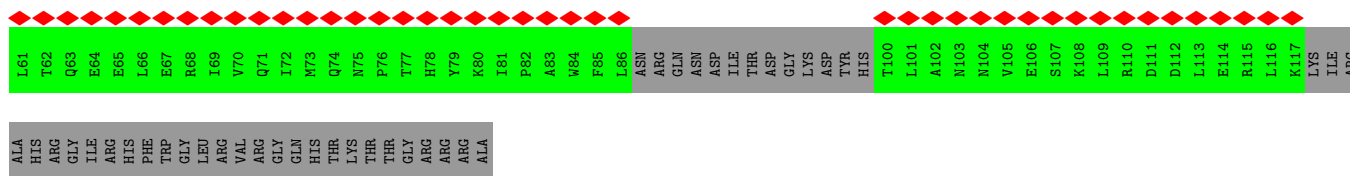


• Molecule 3: U3 snoRNA

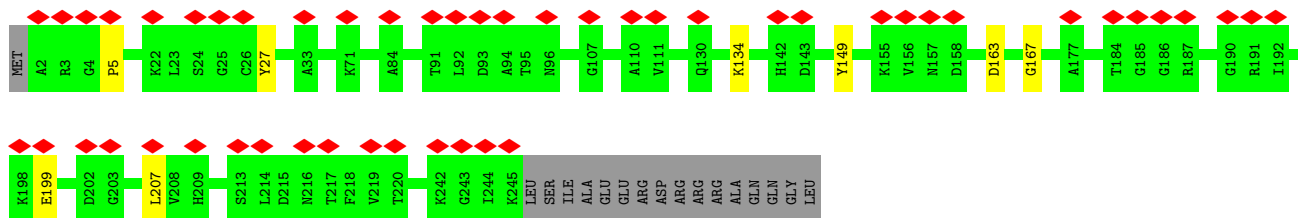
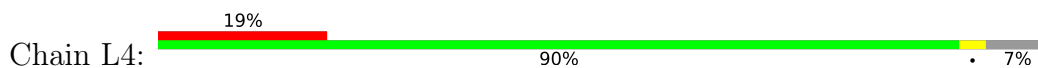


• Molecule 4: 40S ribosomal protein S18-A

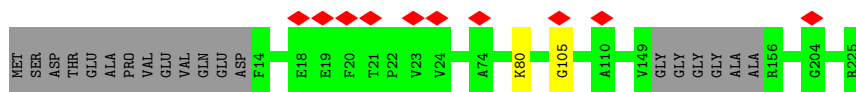
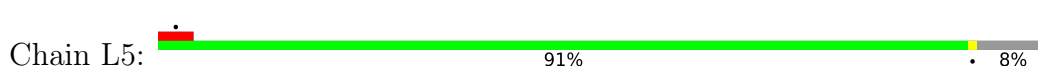




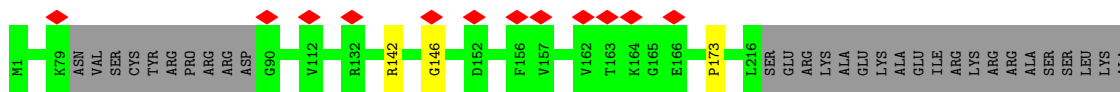
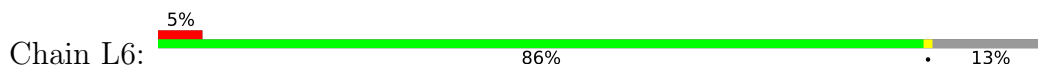
• Molecule 5: 40S ribosomal protein S4-A



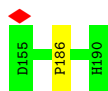
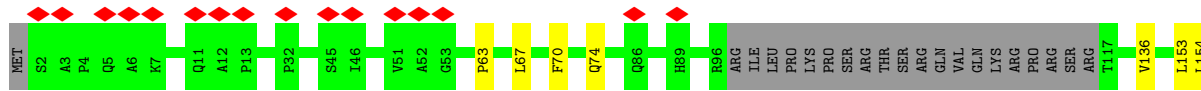
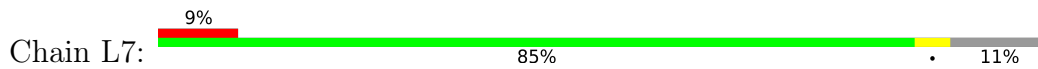
• Molecule 6: 40S ribosomal protein S5



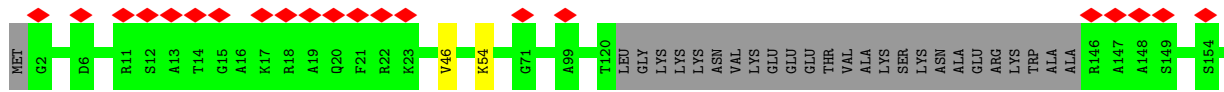
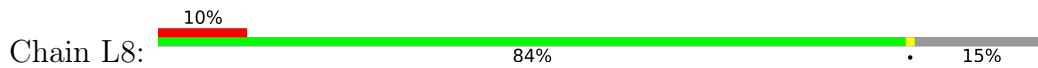
• Molecule 7: 40S ribosomal protein S6-A



• Molecule 8: 40S ribosomal protein S7-A

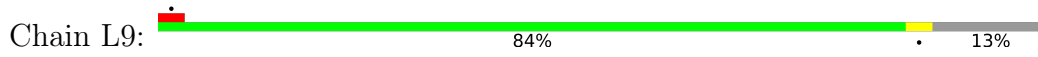


• Molecule 9: 40S ribosomal protein S8-A



L196
THR
ALA
LYS
LYS

- Molecule 10: 40S ribosomal protein S9-A



MET PRO ARG ALA PRO ARG THR SER THR Y12 R23 A26 A31 G35 R90 R91 R92 V96 L97 A98 A178 A181 F182
ALA SER GLY GLU ALA ALA ASP GLU ALA ASP ASP ALA ASP ALA ASP ASP ALA ASP GLU

- Molecule 11: 40S ribosomal protein S16-A



MET SER A3 F46 E50 S76 D120 S121 R122 R123 K127
LYS PHE GLY GLY LYS GLY ALA ARG ARG ARG PHE GLN LYS SER TYR ARG

- Molecule 12: 40S ribosomal protein S11-A



MET SER THR GLU LEU THR V7 Q8 S9 P23 R24 T27 S28 K29 R30 K36 N37 A38 G41 S52 V64 G68 R69 I70 T74 V75 V76 S77 T78 L91 H92 Y93 I94 P95 K96 Y97 N98 R99 Y100 E101 K102 A114 F115 R116 V117 Q118 V119 G120 D121 I122
G126 Q127 C128 F137 V142 S143
ALA ALA ALA GLY LYS ALA ASN LYS GLN PHE ALA LYS PHE

- Molecule 13: 40S ribosomal protein S22-A



MET T2 R3 V25 Q39 S58 V62 I83 G84 T105 K124 Y130

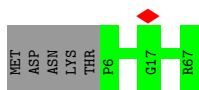
- Molecule 14: 40S ribosomal protein S24-A



MET SER ASP A4 H51 A45 A50 G66 R133
ALA ASP

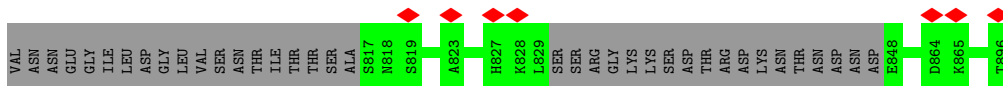
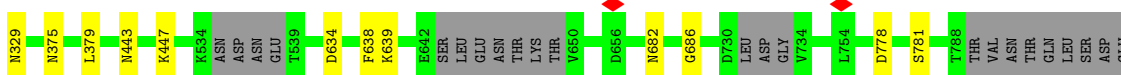
- Molecule 15: 40S ribosomal protein S28-A





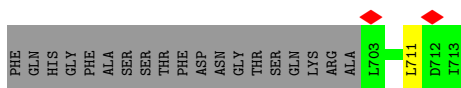
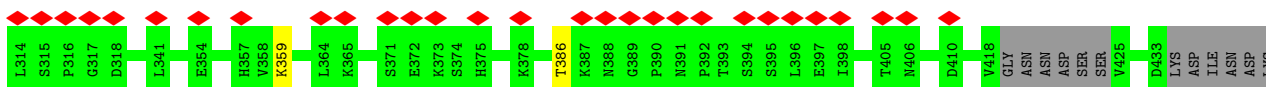
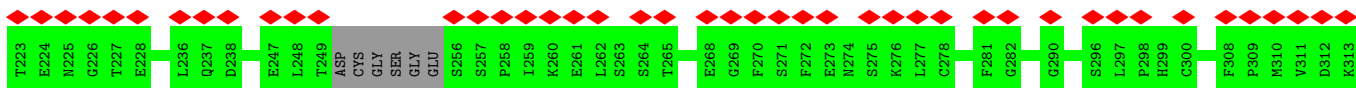
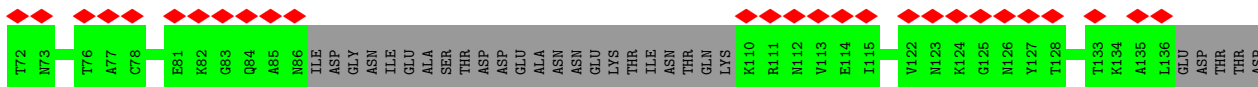
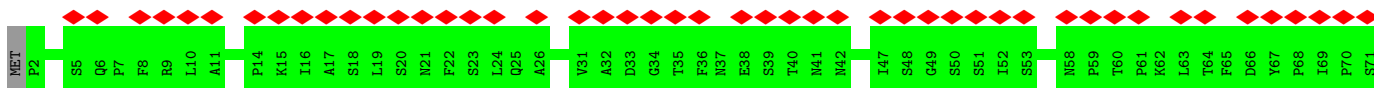
- Molecule 16: NET1-associated nuclear protein 1

Chain LH: 88% 10%

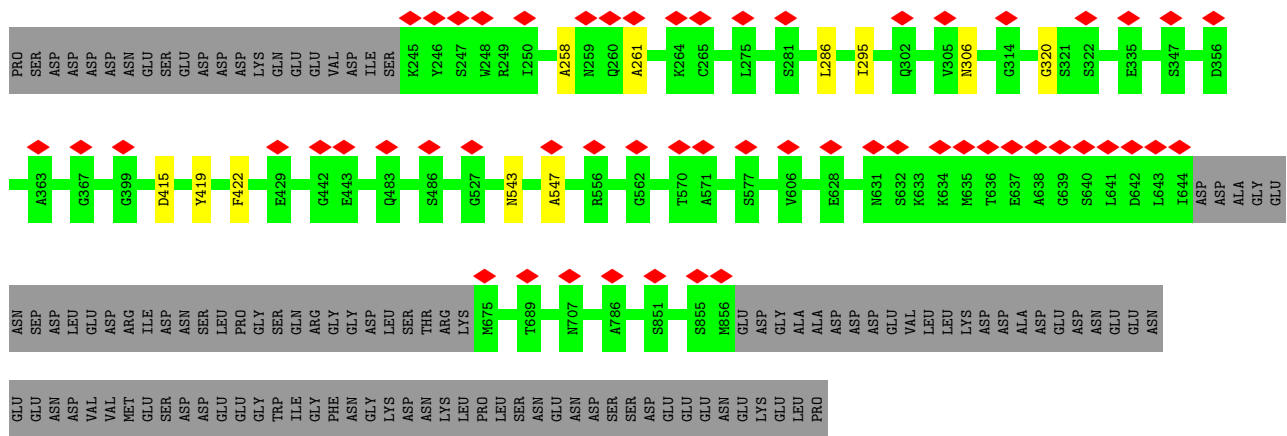


- Molecule 17: U3 small nucleolar RNA-associated protein 8

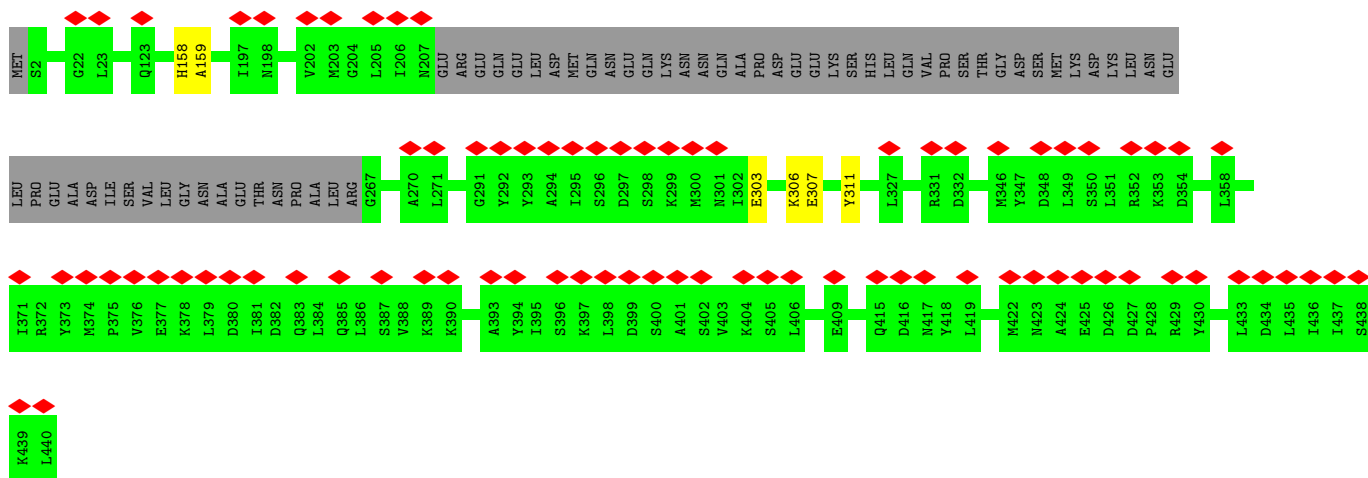
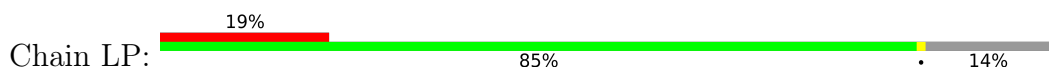
Chain LI: 28% 83% 16%



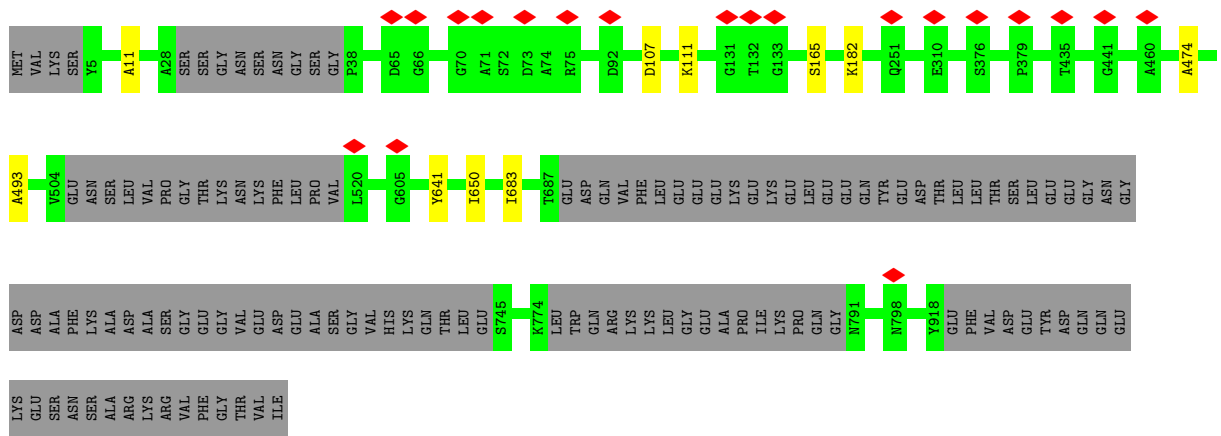
- Molecule 18: U3 small nucleolar RNA-associated protein 15



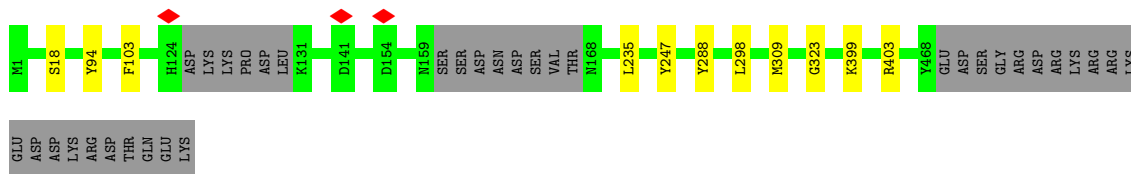
• Molecule 24: U3 small nucleolar RNA-associated protein 6



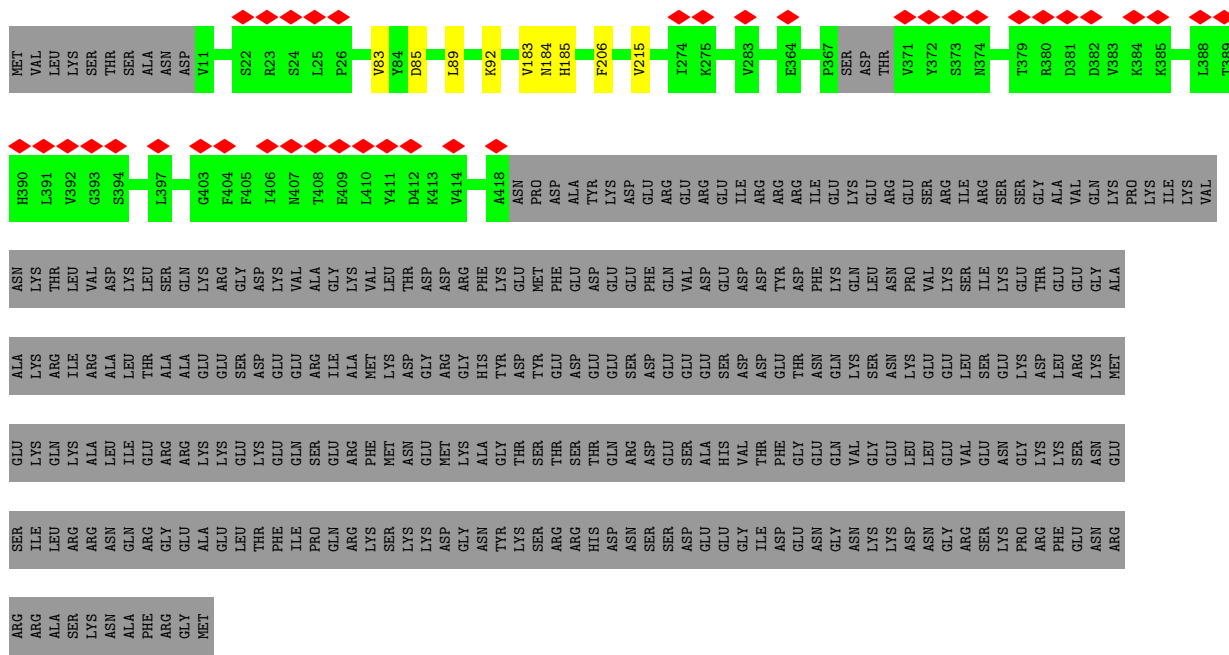
• Molecule 25: U3 small nucleolar RNA-associated protein 12



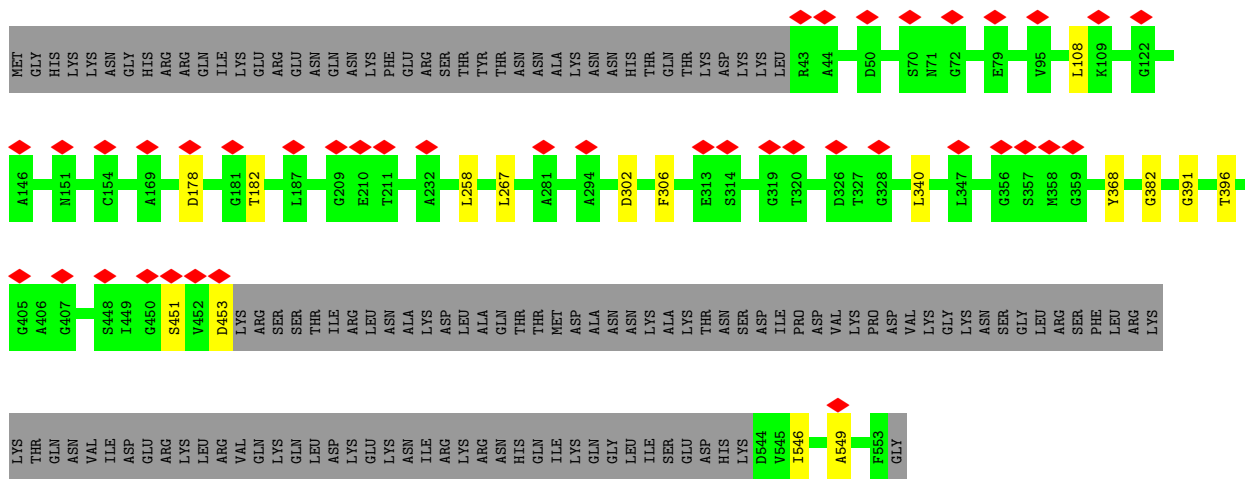
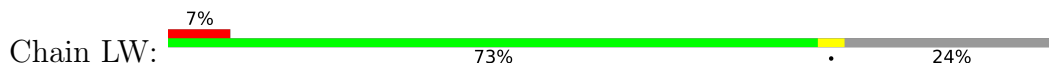
• Molecule 26: U3 small nucleolar RNA-associated protein 13



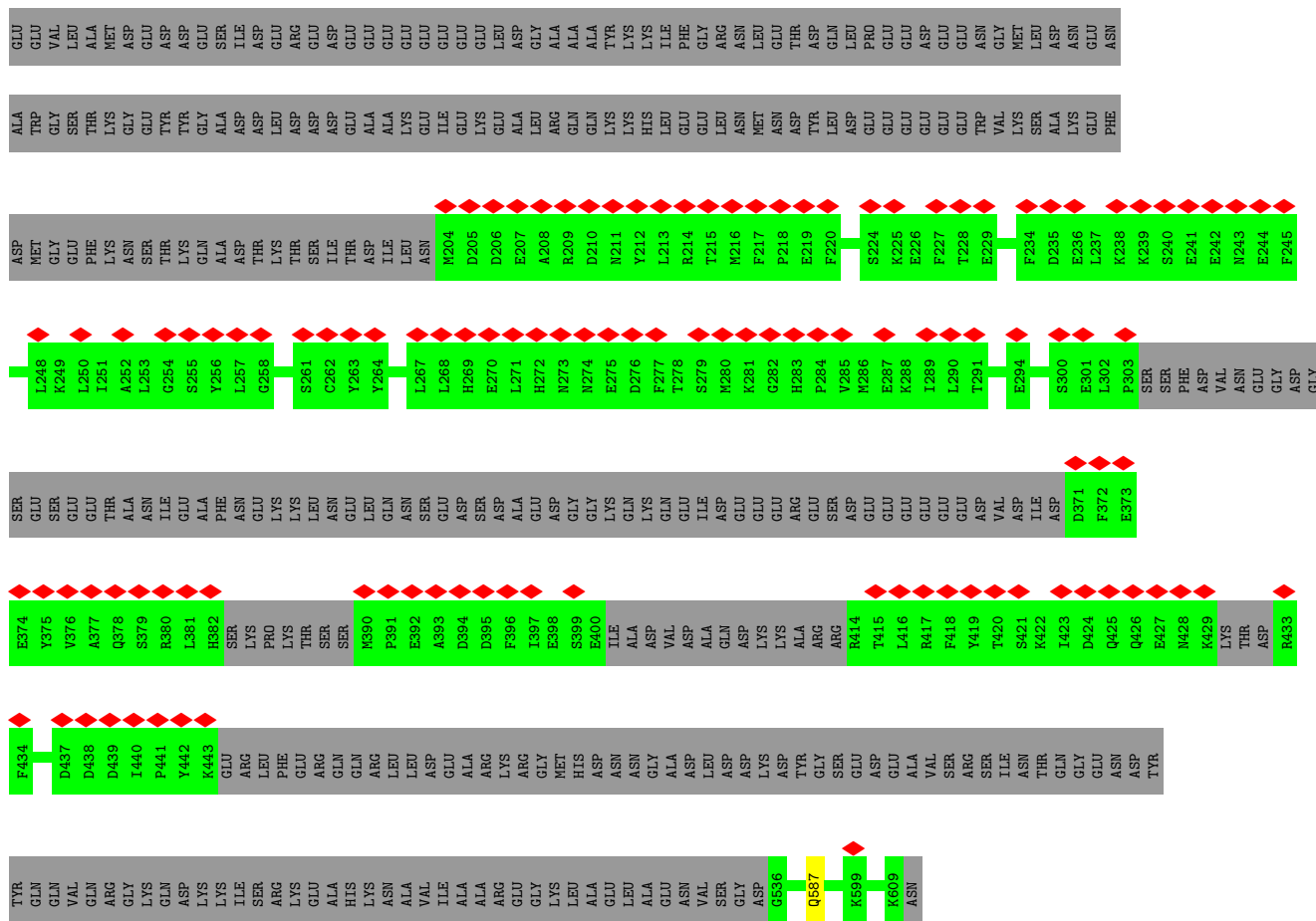
• Molecule 30: Ribosome biogenesis protein ENP2



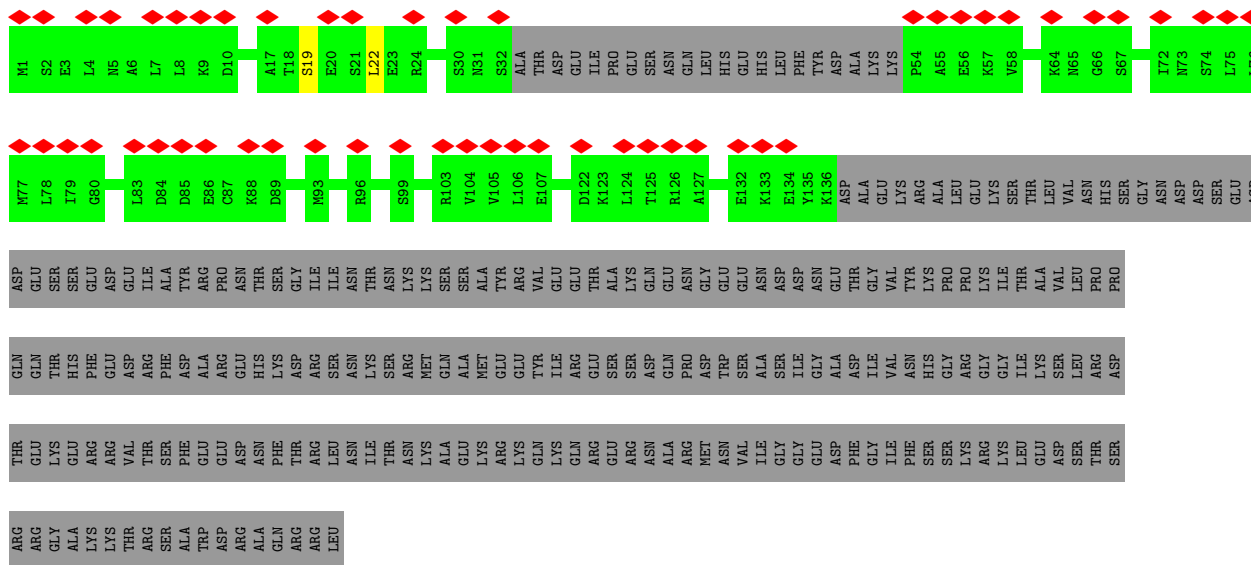
• Molecule 31: U3 small nucleolar RNA-associated protein 7



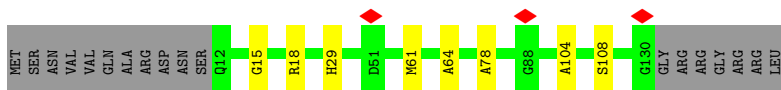
• Molecule 32: RNA cytidine acetyltransferase



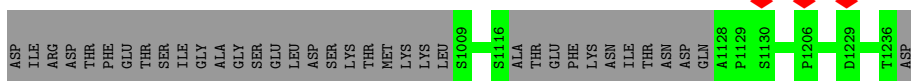
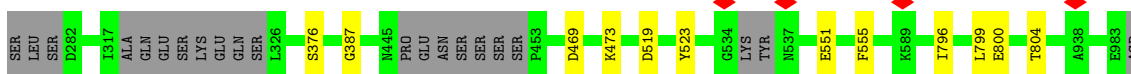
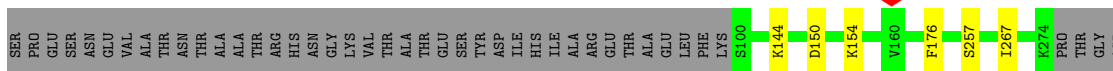
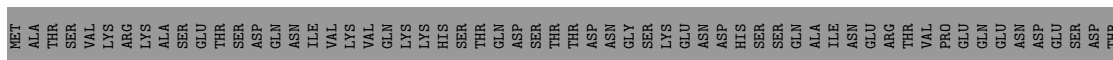
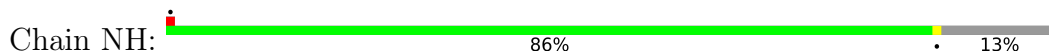
- Molecule 36: U3 small nucleolar ribonucleoprotein protein LCP5



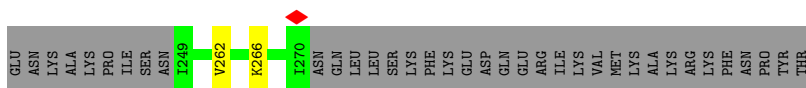
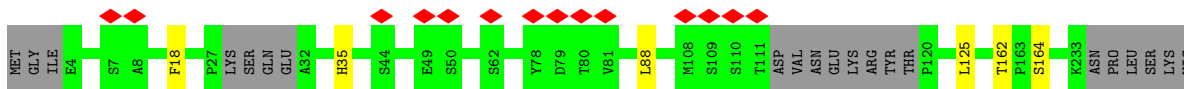
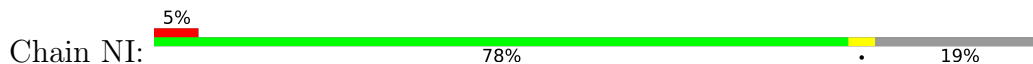
- Molecule 37: Bud site selection protein 21



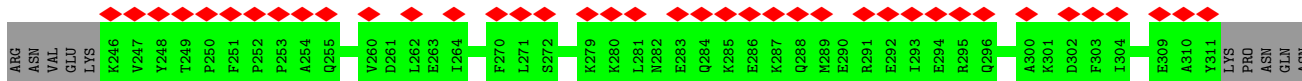
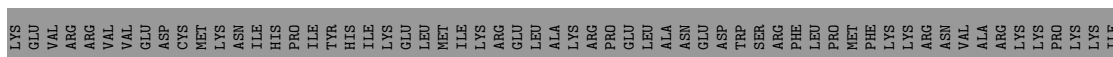
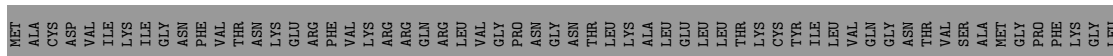
• Molecule 41: U3 small nucleolar RNA-associated protein 22



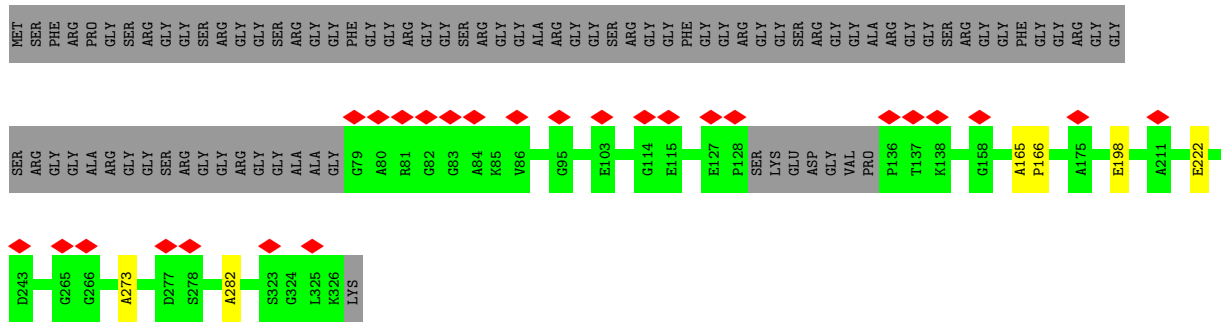
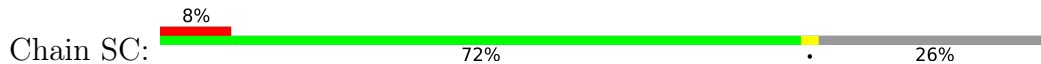
• Molecule 42: Ribosomal RNA-processing protein 7



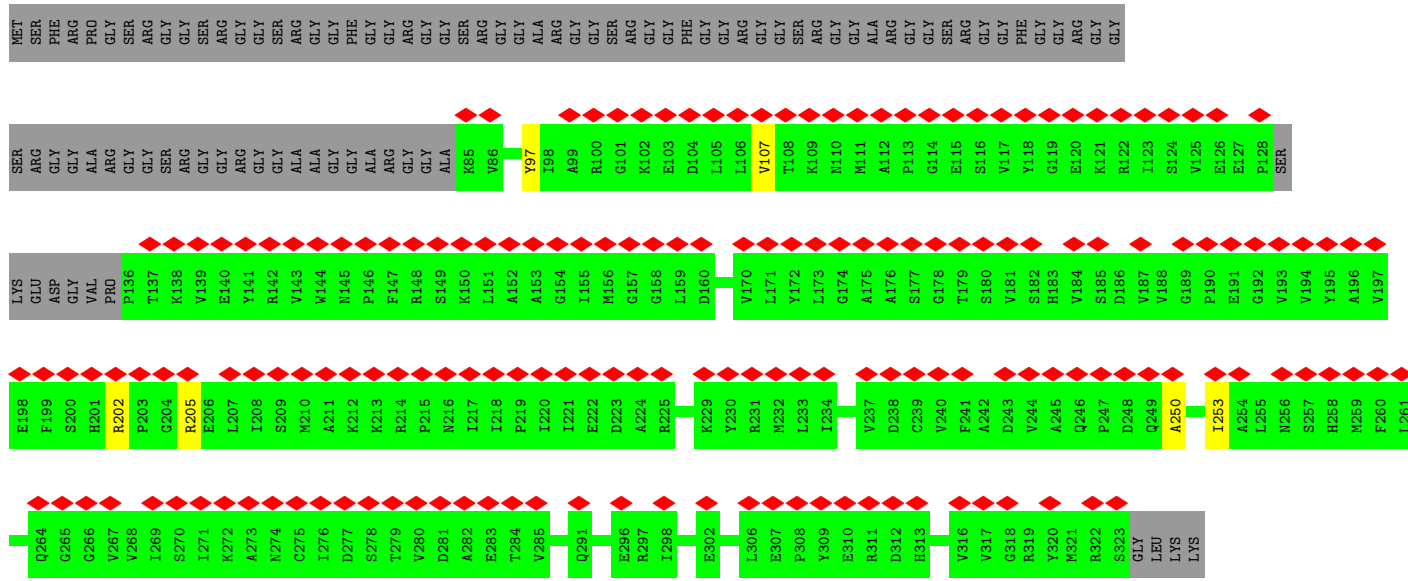
• Molecule 43: KRR1 small subunit processome component



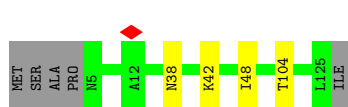
• Molecule 52: rRNA 2'-O-methyltransferase fibrillar



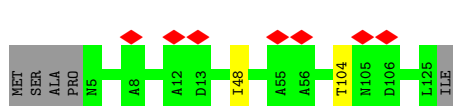
• Molecule 52: rRNA 2'-O-methyltransferase fibrillar



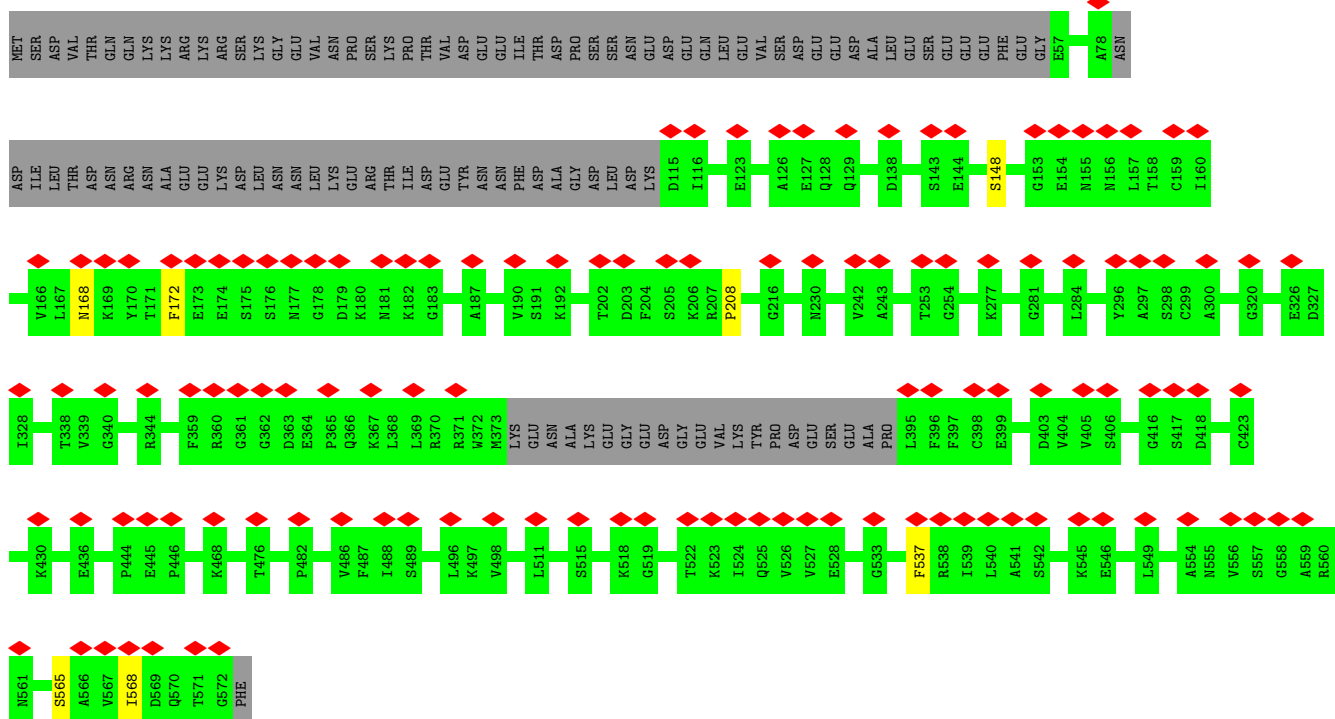
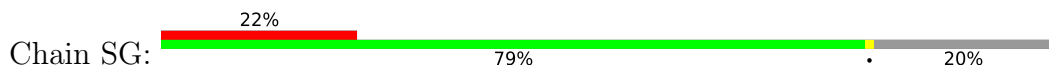
• Molecule 53: 13 kDa ribonucleoprotein-associated protein



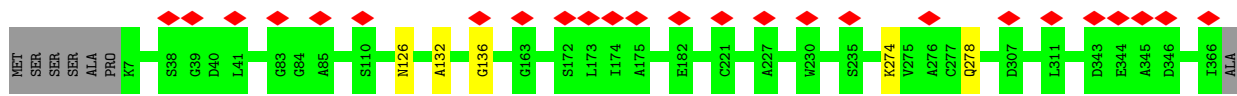
• Molecule 53: 13 kDa ribonucleoprotein-associated protein



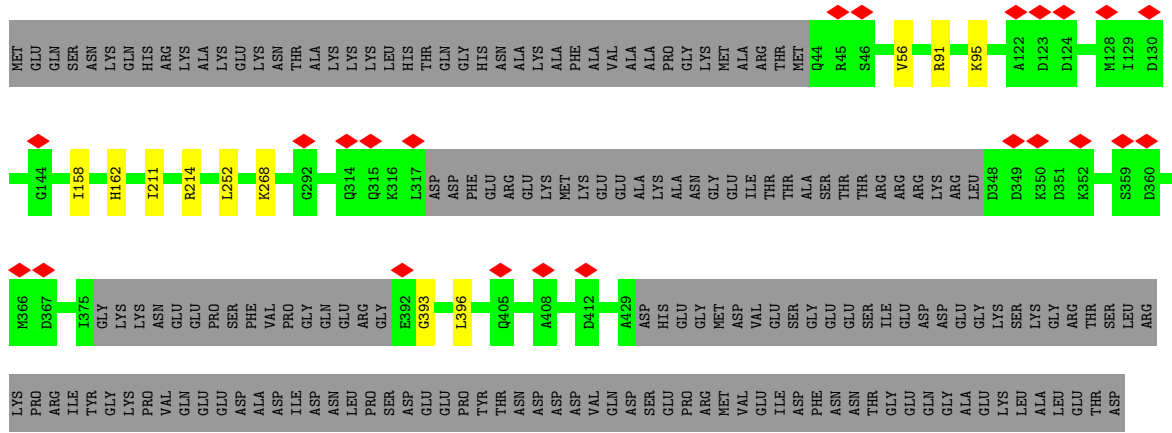
• Molecule 54: Ribosomal RNA-processing protein 9

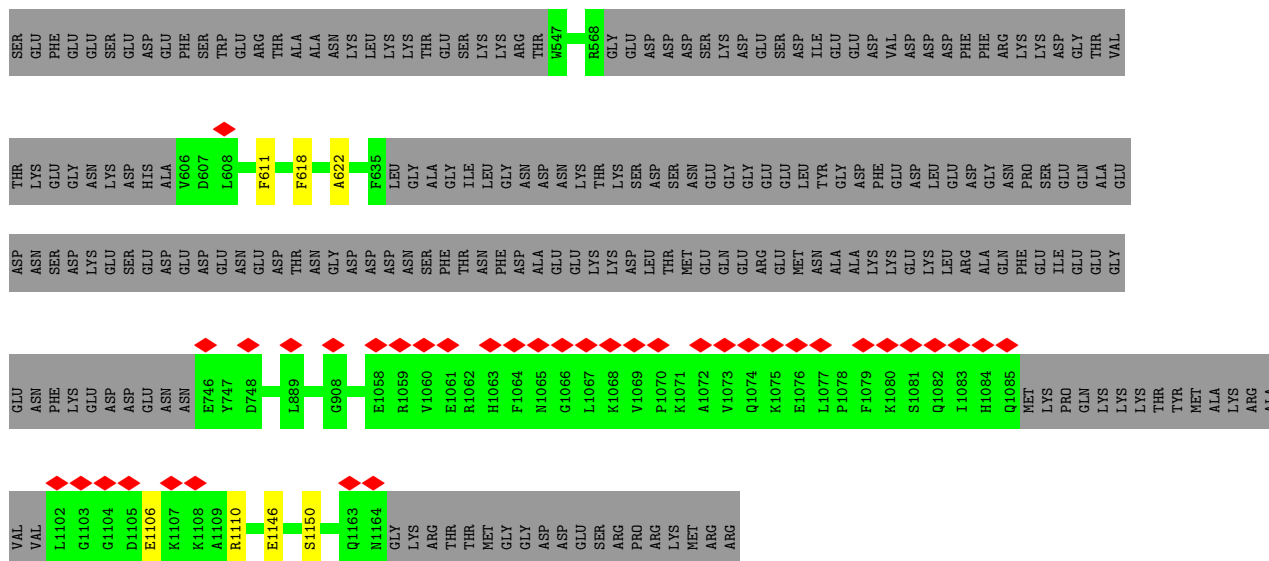


• Molecule 55: RNA 3'-terminal phosphate cyclase-like protein

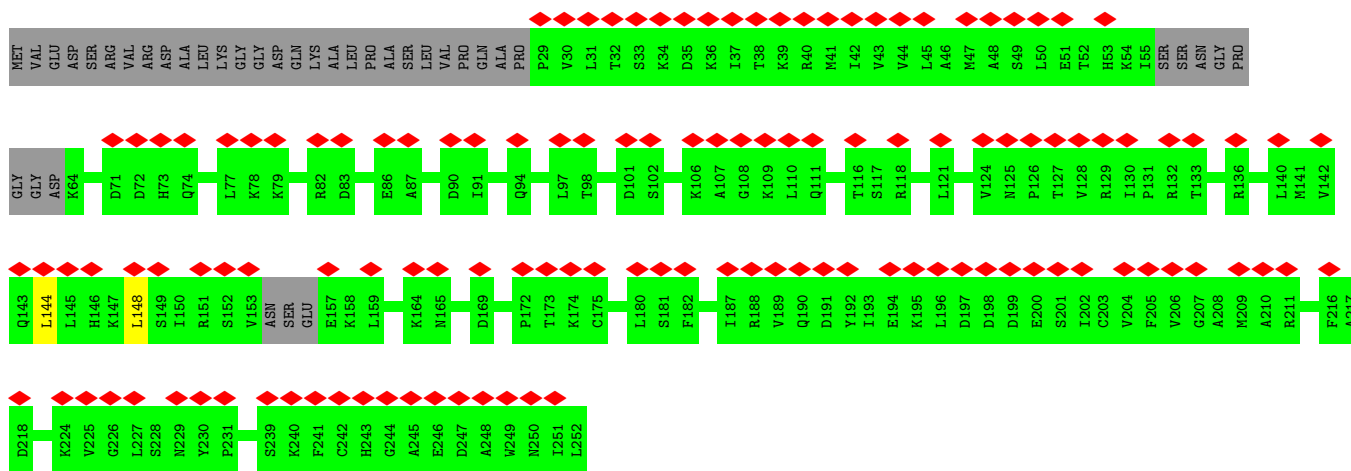
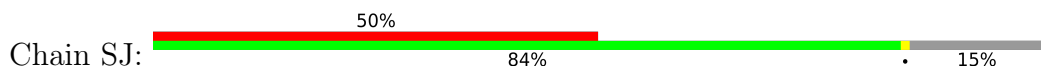


• Molecule 56: Ribosome biogenesis protein BMS1

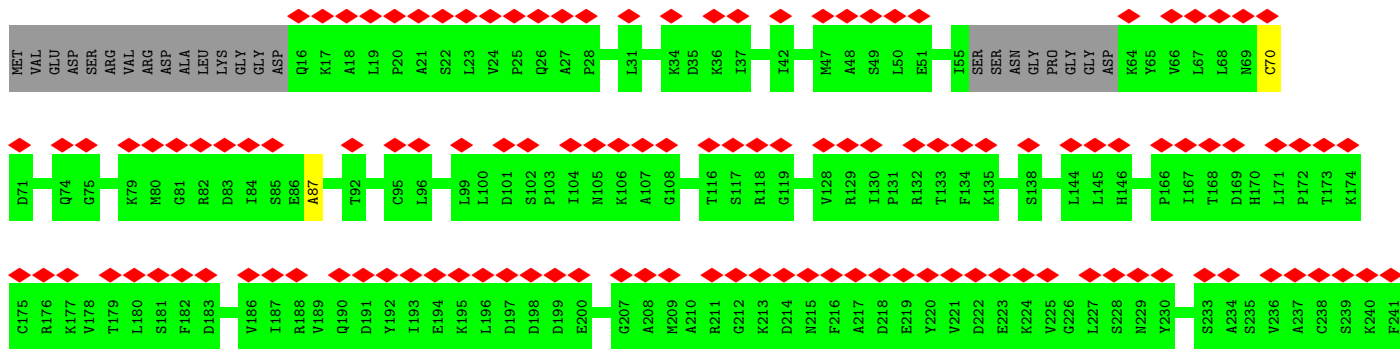
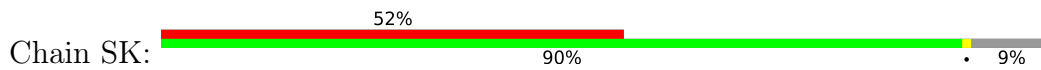


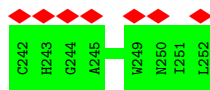


• Molecule 57: Ribosomal RNA small subunit methyltransferase NEP1



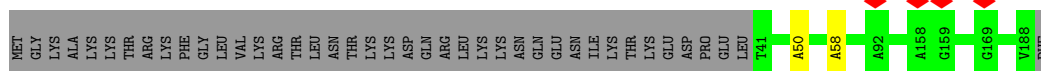
• Molecule 57: Ribosomal RNA small subunit methyltransferase NEP1





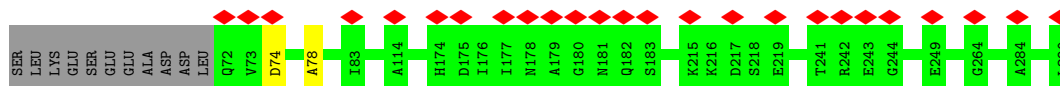
- Molecule 58: rRNA-processing protein FCF1

Chain SL: 77% 22%



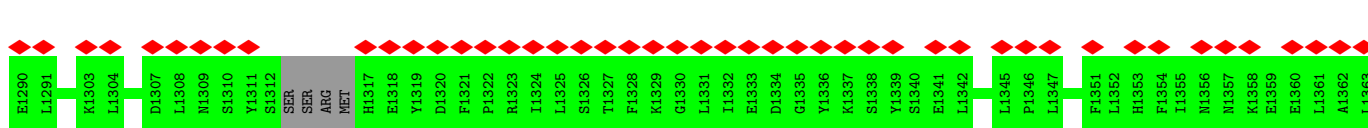
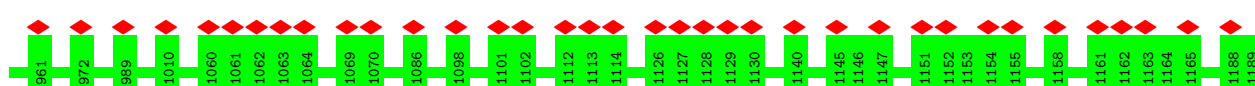
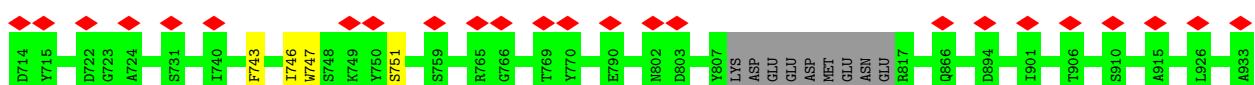
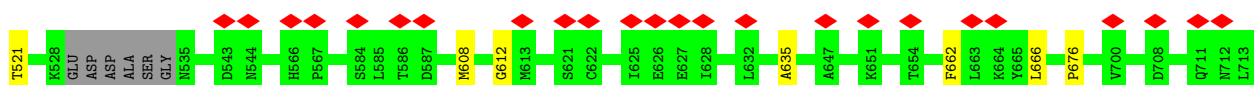
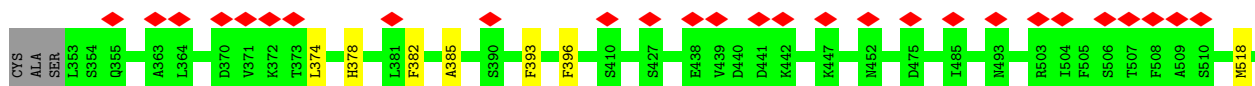
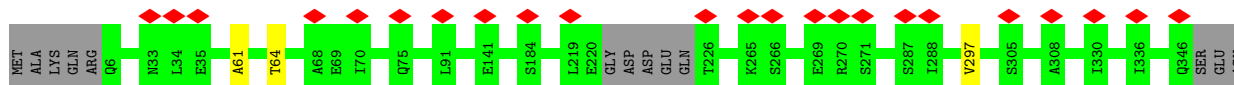
- Molecule 59: U3 small nucleolar ribonucleoprotein protein IMP4

Chain SM: 9% 75% 24%



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

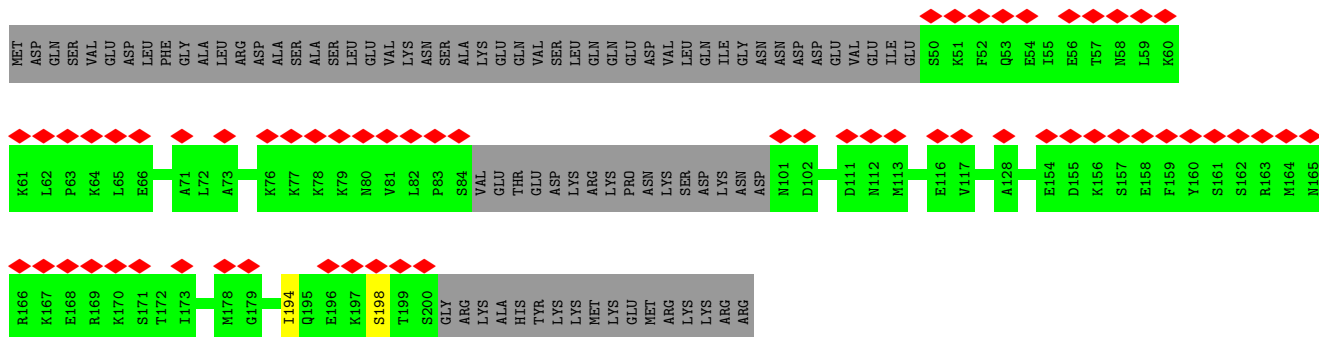
Chain SP: 22% 85% 14%



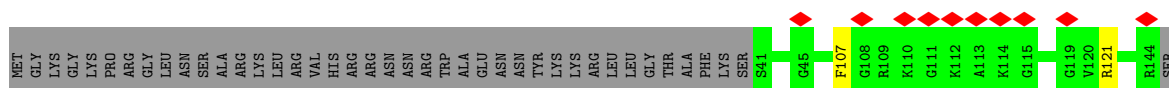
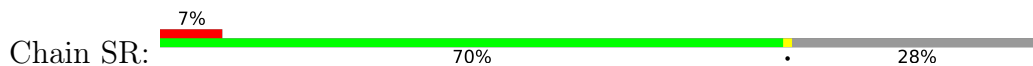
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N1455	H1456	I1457	Q1458	R1462	Q1463	G1470	E1471	H1472	A1473	H1474	Q1475	L1476	L1485	I1486	A1487	M1488	I1489	F1494	S1495	D1496	D1497	E1498	R1499	Y1500	I1503	T1507	Q1508	I1509	A1510	I1511	G1512	G1513	L1514	A1515	Q1516	F1517	M1518	S1532	T1536	K1537	P1538	N1539	Q1540	M1541	K1542	Q1543	A1544	V1545	I1548	V1549		
Q1550	L1551	L1555	I1561	V1562	R1563	ASP	GLY	ALA	GLU	SER	LYS	LEU	THR	LEU	SER	LYS	PHE	PRO	SER	M1578	F1585	L1590	T1593	L1594	S1595	K1596	I1597	G1598	L1599	T1600	E1604	T1605	I1606	I1607	I1608	E1608	V1617	L1621	G1622	L1623	T1624	C1640	Q1641	V1642	L1643	K1646	S1647	M1648	E1649			
D1652	G1659	I1664	L1665	G1666	A1667	E1668	Y1669	L1670	V1671	S1685	Q1686	I1687	K1706	H1707	D1711	I1717	V1718	I1721	M1722	I1725	F1726	G1727	F1728	A1729	G1730	E1731	E1732	K1733	I1734	S1735	E1736	M1737	Y1738	H1739	T1740	I1745	K1746	S1747	D1752	E1755	S1759	M1760	I1761	V1773	K1774	A1775						
L1776	M1778	V1779	R1780	I1781	M1782	L1783	N1784	M1785	Q1786	N1787	K1788	L1789	S1790	E1791	S1804	D1805	S1806	L1818	S1822	E1823	MET	ASN	ASN	SER	PRO	GLN	ILE	LYS	LYS	VAL	ASP	GLN	VAL	ASP	E1841	K1842	E1843	D1844	F1845	F1846	L1847	V1848	N1849	L1850	E1851	S1852	K1853	S1854	Y1855	T1856	I1857	N1858
S1861	L1862	L1863	L1864	T1867	R1882	F1886	L1887	T1888	V1889	S1890	P1897	F1898	L1899	R1900	D1901	S1902	L1903	T1920	L1921	I1922	R1923	L1924	D1925	F1926	S1927	D1928	E1929	K1935	A1938	I1945	K1946	P1949	S1950	T1951	S1952	M1958	K1961	F1962	L1963	S1964	A1965	T1970	D1971	S1972	T1973	L1974						
K1975	D1976	T1977	A1978	L1979	V1986	L1987	P1988	D1989	N1990	M1991	E1992	P1993	S1994	G1997	F1998	A1999	K2004	K2009	H2010	I2011	M2012	L2013	P2014	E2015	D2018	I2019	A2020	E2034	I2035	V2042	Y2043	Y2044	Q2045	D2051	K2054	G2055	R2056	L2057	E2058	K2062	G2075	L2082	T2088	P2092	A2093							
L2094	S2096	K2097	L2098	S2099	S2100	F2111	N2112	D2113	D2114	G2118	M2121	S2127	T2128	M2129	K2132	L2133	V2141	E2142	K2143	Y2144	I2145	A2146	L2149	K2150	Q2151	V2152	D2153	N2154	A2155	S2156	R2163	T2164	Y2165	K2166	V2167	K2170	S2171	T2172	G2173	F2174	E2175	H2176	T2177	T2178	E2179	A2184	I2185	K2186				
R2187	Y2190	I2191	L2192	S2193	D2194	V2197	G2198	S2199	E2200	L2205	V2206	L2210	N2211	T2212	F2213	S2214	S2215	Y2216	M2217	E2218	A2219	T2220	E2221	S2222	VAL	TYR	LYS	HIS	GLY	PHE	LYS	ASP	ILE	TRP	ASP	GLY	ILE	THR	CYS	LEU	LEU	TRP	LYS	HIS	TRP	VAL	GLN	ARG	THR			
VAL	HIS	GLN	LEU	ILE	ALA	ASN	LYS	ASP	LYS	THR	LEU	ASN	GLU	ILE	GLN	TYR	THR	ALA	ILE	ASP	TYR	THR	ALA	VAL	THR	ARG	ILE	LEU	GLY	ILE	TRP	ASP	GLY	ILE	THR	CYS	LEU	LEU	TRP	LYS	HIS	TRP	VAL	GLN	ARG	THR						
PRO	PHE	MET	VAL	ASP	SER	LYS	GLN	THR	GLU	ASP	LEU	LYS	PRO	LEU	TYR	GLY	THR	ALA	THR	ARG	VAL	ALA	ARG	VAL	ASP	ILE	ASP	GLU	GLY	PHE	LYS	ILE	SER	LYS	ILE	TRP	ASP	ALA	ASP	ARG	GLN	SER	ALA	ALA	ALA	ASN	LEU					
ASP	GLU	VAL	ALA	GLU	GLY	LYS	ILE	LEU	LEU	PRO	LEU	TYR	ALA	GLY	TYR	THR	GLU	THR	ALA	VAL	ALA	ASP	VAL	ASP	ILE	ASP	GLU	GLY	LYS	THR	GLN	VAL	VAL	ASP	ASP	PHE	THR	LYS	ILE	VAL	THR	THR	THR	ALA	ALA	ALA	VAL					
LYS	GLN	THR	VAL	LEU	GLU	ARG	ARG	GLU	GLY	ARG	LEU	ALA	VAL	VAL	ASN	ASP	GLU	GLY	GLN	ILE	ARG	GLU	THR	ALA	THR	LEU	SER	ARG	GLU	GLY	ASN	LYS	THR	CYS	LEU	LEU	LEU	TRP	LYS	VAL	ARG	ARG	ARG	ARG	ALA	ALA	ALA					

● Molecule 61: rRNA-processing protein FCF2

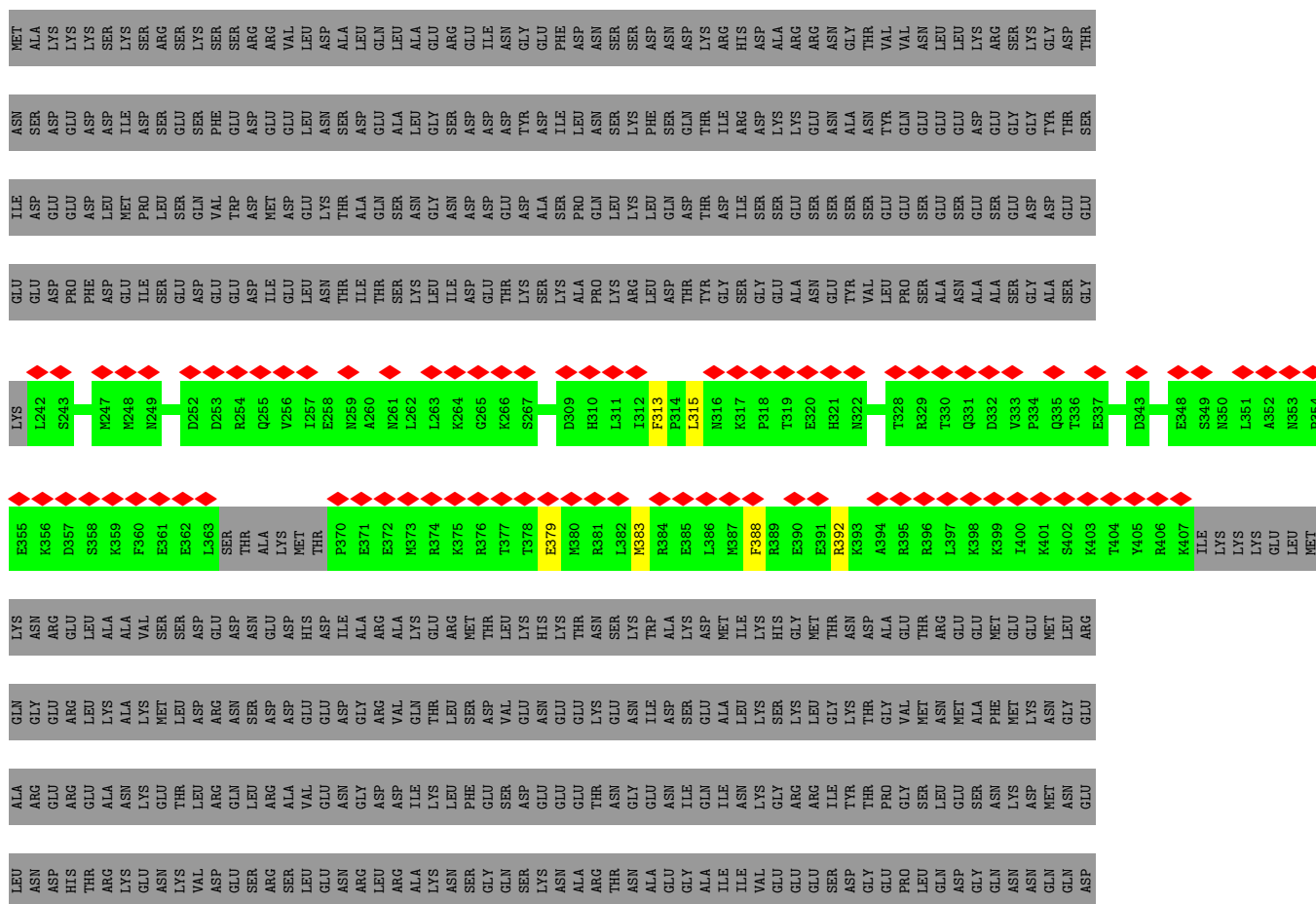


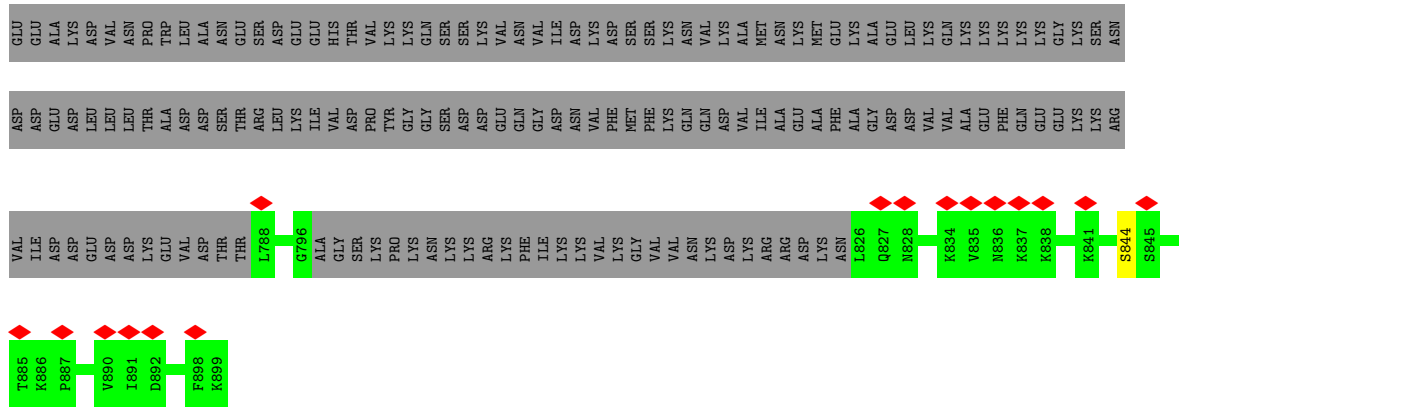


- Molecule 62: 40S ribosomal protein S23-A

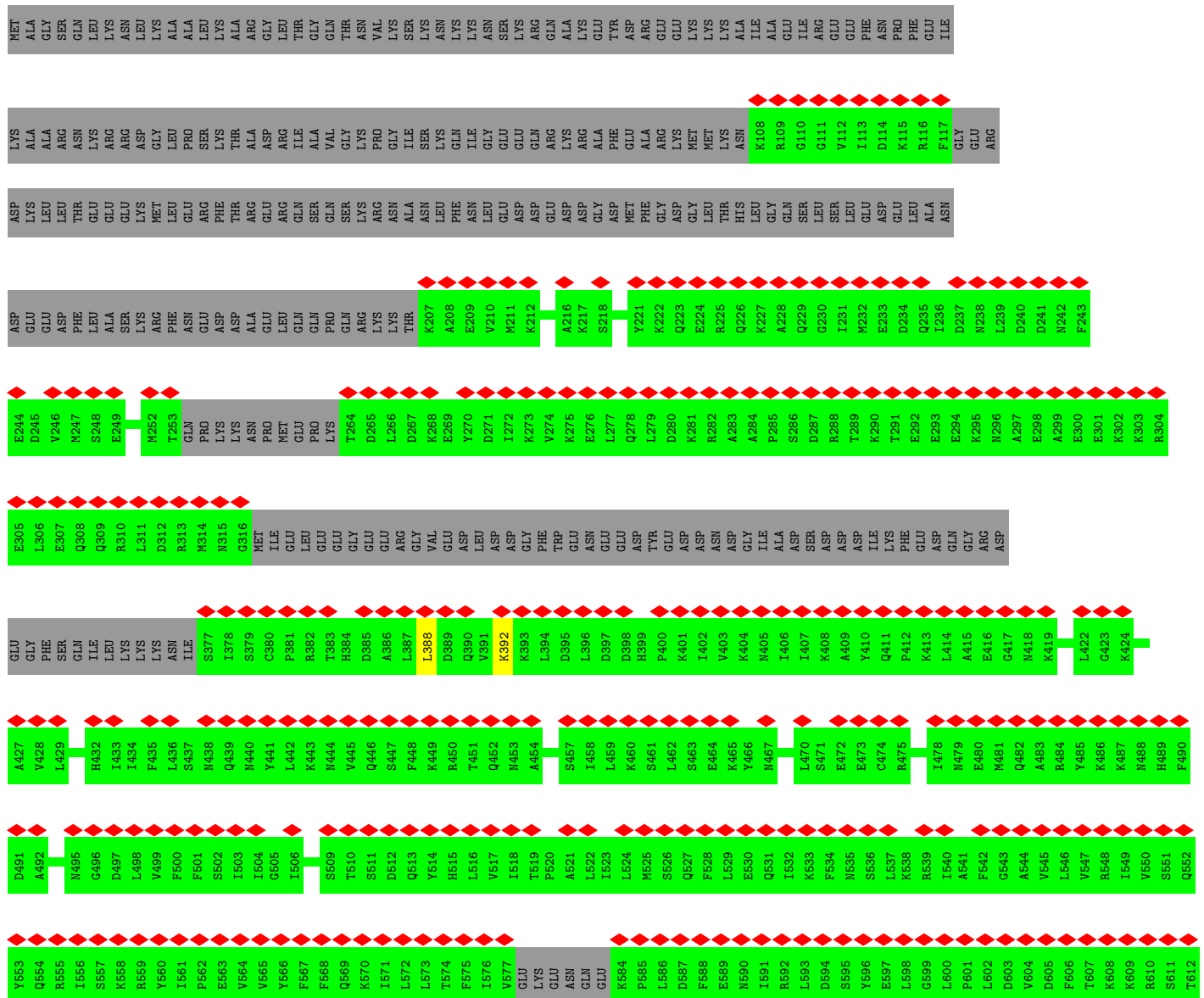


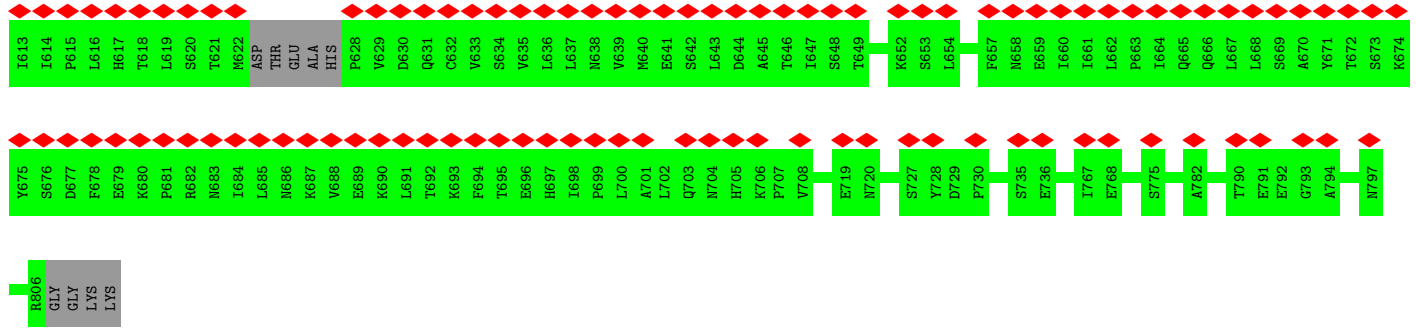
- Molecule 63: U3 small nucleolar RNA-associated protein 14



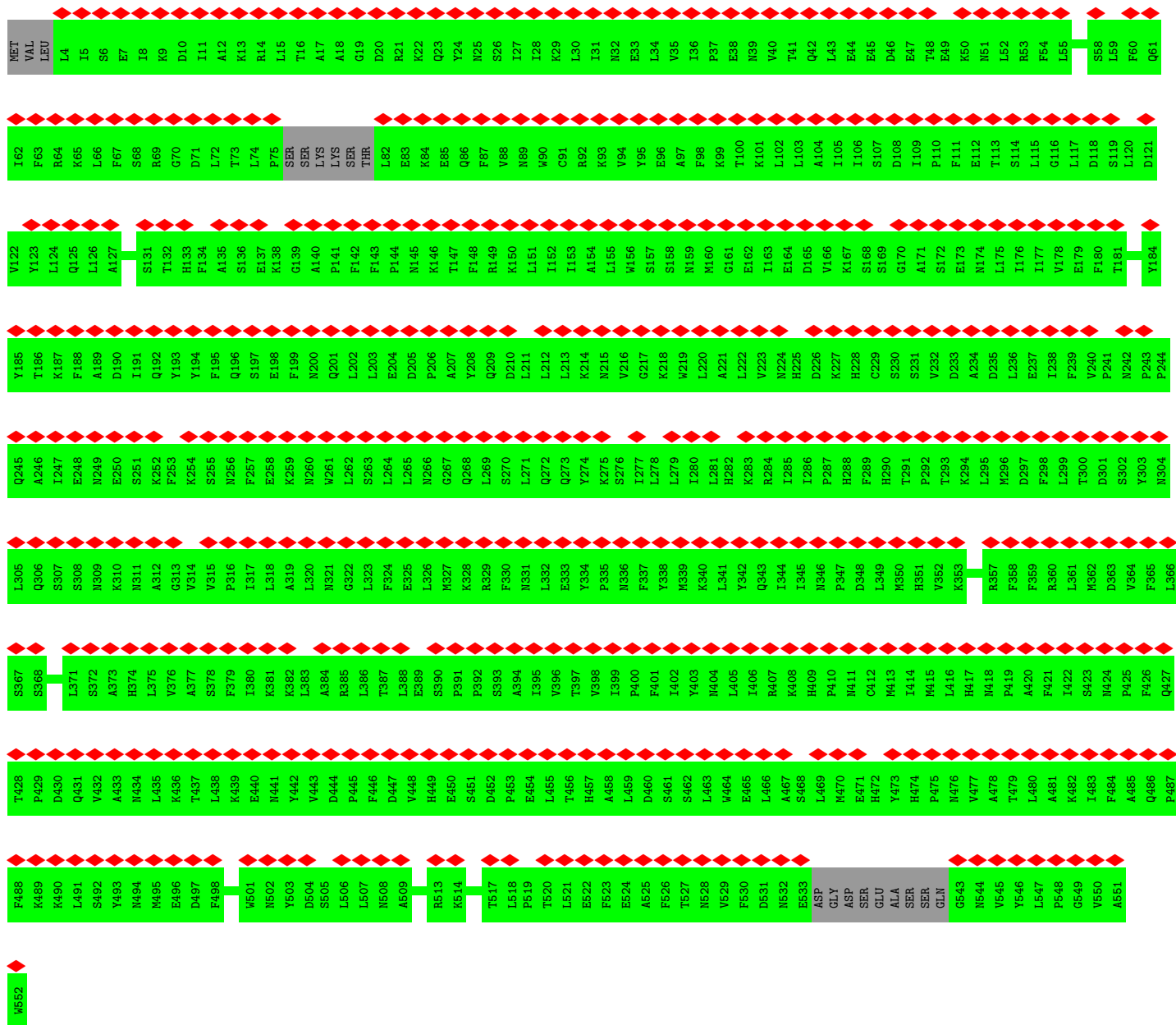
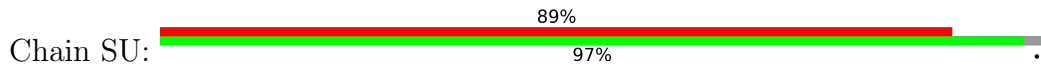


• Molecule 64: Nucleolar complex protein 14





• Molecule 65: Nucleolar complex protein 4



V307	K308	K309	S810	L311	Y312	K313	P314	S315	A316	F317	F318	K319	G320	F323	P324	L325	V326	E327	T328	G329	C330	L337	A338	G339	S340	V341	L342	A343	K344	V347	P348	A349	L350	H351	S352	S353	A354	A355	L356	S357	Y358	L359	L360	T368	T369	V370	F371	I372	K373	I374	L375	L376	D377	K378	K379				
Y380	A381	L382	P383	Y384	Q385	T386	V387	D388	D389	C390	V391	Y392	Y393	F394	M395	R396	F397	R398	I399	L400	ASP	ASP	GLY	S404	M405	G406	E407	D408	A409	T410	R411	V412	L413	F414	V415	I416	W417	H418	K419	A420	F421	L422	T423	F424	A425	Q426	R427	Y428	K429	M430	D431	I432	T433	Q434	D435	Q436	R437	D438	F439
L440	L441	E442	T443	V444	R445	Q446	R447	G448	H449	K450	D451	I452	G453	P454	E455	I456	R457	R458	E459	L460	L461	A462	G463	A464	S465	R466	GLU	PHE	VAL	ASP	PRO	GLN	GLU	ALA	ASN	ASP	ASP	LEU	MET	ILE	ASP	VAL	ASN																

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	12826	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	25000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.639	Depositor
Minimum map value	0.000	Depositor
Average map value	0.090	Depositor
Map value standard deviation	0.199	Depositor
Recommended contour level	0.85	Depositor
Map size (Å)	535.75195, 535.75195, 535.75195	wwPDB
Map dimensions	504, 504, 504	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.063, 1.063, 1.063	Depositor

5 Model quality i

5.1 Standard geometry i

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	L0	0.11	0/2349	0.28	0/3651
2	L1	0.12	0/27591	0.27	2/42941 (0.0%)
3	L2	0.11	0/4143	0.26	0/6440
4	L3	0.12	0/484	0.32	0/672
5	L4	0.50	2/1232 (0.2%)	0.57	3/1719 (0.2%)
6	L5	0.16	0/1046	0.40	0/1464
7	L6	0.15	0/1035	0.34	0/1442
8	L7	0.18	0/860	0.45	0/1203
9	L8	0.13	0/845	0.38	0/1174
10	L9	0.16	0/866	0.39	0/1211
11	LC	0.18	0/633	0.48	0/884
12	LD	0.18	0/700	0.43	0/980
13	LE	0.26	0/642	0.66	1/893 (0.1%)
14	LF	0.17	0/649	0.45	0/904
15	LG	0.17	0/310	0.43	0/430
16	LH	0.15	0/4025	0.41	0/5613
17	LI	0.15	0/3042	0.39	0/4250
18	LJ	0.13	0/2410	0.36	0/3370
19	LK	0.12	0/667	0.31	0/933
20	LL	0.16	0/2448	0.36	0/3415
21	LM	0.12	0/8150	0.32	0/11410
22	LN	0.13	0/3326	0.34	0/4637
23	LO	0.15	0/4035	0.38	0/5634
24	LP	0.14	0/1912	0.33	0/2674
25	LQ	0.12	0/4085	0.34	0/5696
26	LR	0.16	0/3980	0.39	0/5555
27	LS	0.17	1/2419 (0.0%)	0.33	0/3373
28	LT	0.13	0/4167	0.35	0/5814
29	LU	0.15	0/2284	0.39	0/3190
30	LV	0.20	0/2041	0.41	0/2851
31	LW	0.17	0/2134	0.41	0/2982
32	LX	0.19	1/4287 (0.0%)	0.44	2/5997 (0.0%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	LY	0.16	0/4310	0.40	1/6033 (0.0%)
33	LZ	0.15	0/917	0.40	0/1284
34	NA	0.16	0/1433	0.38	2/1995 (0.1%)
35	NB	0.14	0/1126	0.37	0/1566
36	NC	0.15	0/576	0.38	0/801
37	ND	0.14	0/375	0.34	0/523
38	NE	0.10	0/373	0.28	0/516
39	NF	0.17	0/717	0.40	0/1003
40	NG	0.17	0/596	0.36	0/829
41	NH	0.15	0/5489	0.35	0/7686
42	NI	0.17	0/1214	0.42	0/1695
43	NK	0.15	0/343	0.37	0/482
44	NM	0.17	0/1151	0.38	0/1604
45	NN	0.13	0/1343	0.37	0/1873
46	NQ	0.17	0/401	0.44	0/560
47	NS	0.10	0/59	0.36	0/81
48	NV	0.27	0/38	0.50	0/51
49	OA	0.10	0/859	0.28	0/1197
50	SA	0.12	0/1931	0.29	0/2693
51	SB	0.13	0/2183	0.32	0/3049
52	SC	0.18	0/1224	0.42	0/1708
52	SD	0.15	0/1183	0.39	0/1653
53	SE	0.18	0/621	0.41	0/871
53	SF	0.21	0/621	0.45	0/871
54	SG	0.17	0/2301	0.39	1/3208 (0.0%)
55	SH	0.15	0/1817	0.40	0/2536
56	SI	0.15	0/4050	0.40	0/5665
57	SJ	0.11	0/1080	0.31	0/1508
57	SK	0.12	0/1170	0.32	0/1639
58	SL	0.18	0/759	0.41	0/1064
59	SM	0.15	0/1112	0.38	0/1556
60	SP	0.13	0/10851	0.34	0/15191
61	SQ	0.16	0/688	0.39	0/963
62	SR	0.18	0/522	0.50	0/726
63	SS	0.17	0/1250	0.48	0/1751
64	ST	0.12	0/2685	0.31	0/3757
65	SU	0.12	0/2736	0.30	0/3840
66	SW	0.14	0/913	0.36	0/1274
67	SY	0.14	0/577	0.38	0/805
68	SZ	0.13	0/1326	0.31	0/1859
All	All	0.15	4/161717 (0.0%)	0.35	12/231368 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if

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

Mol	Chain	#Chirality outliers	#Planarity outliers
60	SP	0	1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	L4	149	TYR	C-O	10.93	1.28	1.23
5	L4	5	PRO	CG-CD	-10.73	1.14	1.50
32	LX	550	PRO	CG-CD	-6.41	1.28	1.50
27	LS	229	PRO	CA-C	5.12	1.54	1.51

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	L4	5	PRO	N-CD-CG	-12.69	84.16	103.20
5	L4	5	PRO	CA-N-CD	-9.17	99.16	112.00
32	LY	478	PRO	CA-N-CD	-8.96	99.45	112.00
32	LX	550	PRO	N-CD-CG	-8.48	90.47	103.20
54	SG	208	PRO	CA-N-CD	-7.71	101.20	112.00
5	L4	5	PRO	CA-CB-CG	-7.21	90.80	104.50
32	LX	550	PRO	CA-N-CD	-7.16	101.98	112.00
2	L1	82	U	N1-C1'-C2'	6.77	122.16	112.00
2	L1	82	U	O4'-C1'-N1	6.20	117.80	108.50
34	NA	458	PRO	CA-N-CD	-5.45	104.37	112.00
34	NA	458	PRO	N-CD-CG	-5.35	95.18	103.20
13	LE	39	GLN	N-CA-CB	5.01	118.05	110.28

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
60	SP	297	VAL	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	L0	2101	0	1057	6	0
2	L1	24681	0	12449	73	0
3	L2	3712	0	1882	7	0
4	L3	485	0	220	1	0
5	L4	1221	0	609	4	0
6	L5	1040	0	519	2	0
7	L6	1029	0	512	2	0
8	L7	854	0	422	4	0
9	L8	843	0	427	1	0
10	L9	860	0	430	3	0
11	LC	628	0	321	1	0
12	LD	693	0	336	1	0
13	LE	640	0	307	2	0
14	LF	647	0	319	1	0
15	LG	309	0	145	0	0
16	LH	4014	0	1812	10	0
17	LI	3027	0	1390	3	0
18	LJ	2394	0	1161	5	0
19	LK	664	0	299	0	0
20	LL	2440	0	1139	2	0
21	LM	8115	0	3739	6	0
22	LN	3315	0	1518	14	0
23	LO	4017	0	1917	9	0
24	LP	1906	0	838	3	0
25	LQ	4073	0	1902	7	0
26	LR	3962	0	1883	13	0
27	LS	2409	0	1163	4	0
28	LT	4146	0	1977	12	0
29	LU	2274	0	1064	6	0
30	LV	2029	0	947	4	0
31	LW	2115	0	1070	9	0
32	LX	4253	0	2078	8	0
32	LY	4274	0	2096	10	0
33	LZ	912	0	414	1	0
34	NA	1431	0	677	3	0
35	NB	1124	0	524	1	0
36	NC	575	0	274	1	0
37	ND	374	0	169	0	0
38	NE	372	0	178	0	0
39	NF	711	0	360	2	0
40	NG	592	0	323	4	0
41	NH	5443	0	2602	9	0
42	NI	1210	0	565	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
43	NK	339	0	169	0	0
44	NM	1149	0	535	4	0
45	NN	1341	0	623	2	0
46	NQ	398	0	200	0	0
47	NS	60	0	23	0	0
48	NV	39	0	16	0	0
49	OA	858	0	419	1	0
50	SA	1924	0	947	1	0
51	SB	2176	0	1102	1	0
52	SC	1212	0	632	3	0
52	SD	1171	0	604	3	0
53	SE	615	0	331	2	0
53	SF	615	0	331	1	0
54	SG	2290	0	1099	3	0
55	SH	1801	0	897	3	0
56	SI	4014	0	1977	10	0
57	SJ	1074	0	514	1	0
57	SK	1160	0	570	1	0
58	SL	751	0	377	2	0
59	SM	1103	0	538	1	0
60	SP	10799	0	4927	15	0
61	SQ	684	0	319	1	0
62	SR	518	0	262	1	0
63	SS	1239	0	600	5	0
64	ST	2672	0	1243	1	0
65	SU	2712	0	1308	0	0
66	SW	907	0	452	6	0
67	SY	577	0	255	4	0
68	SZ	1314	0	649	5	0
All	All	157426	0	75953	308	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 1.

All (308) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L1:467:G:O2'	2:L1:469:C:OP2	1.99	0.80
2:L1:1632:C:O2'	23:LO:422:PHE:O	2.00	0.78
2:L1:247:A:O2'	12:LD:37:ASN:O	2.04	0.76
32:LY:887:ALA:O	32:LY:892:ARG:N	2.18	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L0:88:U:O2'	27:LS:343:SER:O	2.04	0.75
23:LO:306:ASN:N	23:LO:320:GLY:O	2.20	0.74
2:L1:163:G:OP2	2:L1:163:G:N2	2.22	0.73
2:L1:1615:C:N4	6:L5:80:LYS:O	2.22	0.73
3:L2:39:C:O2'	29:LU:18:SER:O	2.06	0.72
31:LW:451:SER:O	63:SS:844:SER:N	2.25	0.70
62:SR:107:PHE:N	62:SR:121:ARG:O	2.23	0.69
2:L1:545:A:O2'	2:L1:594:A:N6	2.25	0.69
2:L1:555:A:N6	2:L1:571:G:O2'	2.25	0.69
41:NH:376:SER:O	41:NH:387:GLY:N	2.25	0.69
53:SF:48:ILE:O	53:SF:104:THR:N	2.26	0.68
36:NC:19:SER:O	36:NC:22:LEU:N	2.26	0.68
60:SP:393:PHE:O	60:SP:396:PHE:N	2.26	0.68
2:L1:427:C:O2'	2:L1:459:G:N3	2.20	0.68
2:L1:59:C:O4'	2:L1:452:A:O2'	2.11	0.68
2:L1:188:A:N6	2:L1:197:A:O2'	2.27	0.68
23:LO:543:ASN:O	23:LO:547:ALA:N	2.28	0.67
1:L0:303:A:O2'	23:LO:143:ALA:HB3	1.94	0.67
40:NG:61:MET:O	40:NG:64:ALA:N	2.28	0.66
2:L1:246:G:OP1	2:L1:246:G:N2	2.27	0.66
2:L1:1609:U:O2'	6:L5:105:GLY:O	2.06	0.66
2:L1:1220:C:O2'	68:SZ:379:LYS:O	2.14	0.65
26:LR:561:SER:O	26:LR:565:PHE:N	2.29	0.65
2:L1:454:U:OP1	2:L1:455:C:N4	2.31	0.63
52:SC:198:GLU:O	52:SC:222:GLU:N	2.30	0.63
26:LR:313:LEU:O	26:LR:330:THR:N	2.32	0.63
3:L2:82:G:O2'	3:L2:83:A:OP2	2.14	0.63
2:L1:1655:A:N1	2:L1:1745:G:O6	2.32	0.63
2:L1:438:A:O3'	2:L1:465:G:N2	2.31	0.62
32:LY:587:GLN:O	32:LY:636:VAL:N	2.32	0.62
2:L1:474:A:O2'	2:L1:475:A:O5'	2.18	0.62
32:LY:487:ASN:O	32:LY:491:CYS:N	2.32	0.61
2:L1:763:G:N2	2:L1:774:A:N7	2.49	0.61
9:L8:46:VAL:N	9:L8:54:LYS:O	2.34	0.61
52:SD:250:ALA:O	52:SD:253:ILE:N	2.33	0.61
24:LP:307:GLU:O	24:LP:311:TYR:N	2.30	0.60
2:L1:1169:G:N1	2:L1:1575:G:OP2	2.35	0.60
10:L9:31:ALA:O	10:L9:35:GLY:N	2.35	0.60
60:SP:608:MET:O	60:SP:612:GLY:N	2.35	0.60
23:LO:286:LEU:O	23:LO:295:ILE:N	2.35	0.60
18:LJ:372:HIS:O	20:LL:336:ASN:N	2.33	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
44:NM:180:THR:O	44:NM:184:LEU:N	2.30	0.60
41:NH:469:ASP:O	41:NH:473:LYS:N	2.34	0.59
60:SP:743:PHE:O	60:SP:746:ILE:N	2.35	0.59
56:SI:158:ILE:O	56:SI:162:HIS:N	2.36	0.59
2:L1:438:A:H1'	2:L1:465:G:H22	1.66	0.59
56:SI:91:ARG:O	56:SI:95:LYS:N	2.29	0.59
27:LS:365:ASN:O	27:LS:369:ASN:N	2.34	0.58
56:SI:1146:GLU:O	56:SI:1150:SER:N	2.35	0.58
3:L2:23:U:O4	3:L2:28:A:N6	2.36	0.58
16:LH:778:ASP:O	16:LH:781:SER:N	2.36	0.58
3:L2:245:U:O4	3:L2:246:A:N6	2.37	0.57
32:LX:517:VAL:N	32:LX:710:LEU:O	2.36	0.57
32:LX:887:ALA:O	32:LX:892:ARG:N	2.36	0.57
2:L1:897:C:O2'	2:L1:914:G:N2	2.36	0.57
21:LM:778:SER:O	21:LM:782:VAL:N	2.37	0.57
8:L7:70:PHE:O	8:L7:74:GLN:N	2.38	0.57
16:LH:325:GLN:O	16:LH:329:ASN:N	2.38	0.57
31:LW:108:LEU:N	31:LW:396:THR:O	2.36	0.57
28:LT:192:ASN:O	28:LT:196:GLY:N	2.38	0.56
2:L1:628:G:N2	2:L1:629:U:O4	2.38	0.56
25:LQ:107:ASP:O	25:LQ:111:LYS:N	2.38	0.56
26:LR:603:ASP:O	26:LR:607:GLY:N	2.37	0.56
40:NG:18:ARG:N	40:NG:29:HIS:O	2.37	0.56
2:L1:-7:A:O2'	2:L1:-6:A:O5'	2.21	0.56
24:LP:303:GLU:O	24:LP:306:LYS:N	2.38	0.56
2:L1:1755:A:N6	34:NA:504:ASP:O	2.38	0.56
31:LW:453:ASP:N	63:SS:844:SER:O	2.39	0.56
39:NF:31:GLU:O	39:NF:34:ILE:N	2.39	0.55
21:LM:390:LEU:O	21:LM:394:LEU:N	2.38	0.55
26:LR:779:VAL:O	26:LR:783:ASP:N	2.39	0.55
2:L1:1682:U:O2	2:L1:1720:G:N2	2.40	0.55
23:LO:193:TYR:O	23:LO:211:LYS:N	2.39	0.55
2:L1:447:U:O2'	5:L4:27:TYR:O	2.24	0.55
45:NN:227:LEU:O	45:NN:231:ASN:N	2.36	0.55
18:LJ:416:THR:O	18:LJ:420:GLU:N	2.37	0.55
60:SP:1384:LEU:O	60:SP:1388:SER:N	2.40	0.55
55:SH:132:ALA:O	55:SH:136:GLY:N	2.40	0.55
22:LN:363:SER:O	22:LN:367:GLY:N	2.38	0.54
60:SP:662:PHE:O	60:SP:666:LEU:N	2.39	0.54
13:LE:105:THR:N	13:LE:124:LYS:O	2.39	0.54
3:L2:110:A:N6	35:NB:587:GLN:O	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:LF:45:ALA:HB1	14:LF:50:ALA:O	2.07	0.54
28:LT:630:THR:N	28:LT:644:THR:O	2.40	0.54
2:L1:1584:G:N2	2:L1:1611:A:OP2	2.32	0.54
41:NH:796:ILE:O	41:NH:799:LEU:N	2.40	0.54
55:SH:274:LYS:O	55:SH:278:GLN:N	2.41	0.54
56:SI:252:LEU:N	56:SI:268:LYS:O	2.34	0.54
68:SZ:316:ALA:O	68:SZ:320:GLY:N	2.40	0.54
63:SS:388:PHE:O	63:SS:392:ARG:N	2.34	0.54
22:LN:569:PHE:O	22:LN:587:ALA:N	2.41	0.53
28:LT:354:SER:N	28:LT:369:ALA:O	2.38	0.53
33:LZ:33:MET:O	33:LZ:37:HIS:N	2.41	0.53
2:L1:40:A:H62	2:L1:467:G:H21	1.56	0.53
18:LJ:304:SER:O	18:LJ:321:GLY:N	2.37	0.53
29:LU:399:LYS:O	29:LU:403:ARG:N	2.40	0.53
41:NH:551:GLU:O	41:NH:555:PHE:N	2.41	0.53
44:NM:138:PHE:O	44:NM:213:ARG:N	2.40	0.53
21:LM:1594:PHE:O	21:LM:1598:LEU:N	2.42	0.53
31:LW:178:ASP:N	31:LW:182:THR:O	2.40	0.53
1:L0:467:A:N1	1:L0:468:A:N6	2.57	0.53
60:SP:518:MET:O	60:SP:521:THR:N	2.42	0.53
63:SS:379:GLU:O	63:SS:383:MET:N	2.38	0.52
2:L1:956:C:OP1	2:L1:1072:C:O2'	2.24	0.52
2:L1:931:C:O2'	44:NM:118:GLN:O	2.27	0.52
22:LN:199:ASP:O	22:LN:215:ALA:N	2.40	0.52
27:LS:379:GLY:N	27:LS:383:TRP:O	2.36	0.52
32:LX:44:MET:O	32:LX:47:ALA:N	2.43	0.52
32:LX:752:ASN:O	32:LX:756:GLY:N	2.41	0.52
66:SW:241:ARG:O	66:SW:244:ARG:N	2.43	0.52
32:LY:17:GLY:O	32:LY:21:LYS:N	2.44	0.51
2:L1:1670:G:O2'	2:L1:1731:A:N6	2.37	0.51
26:LR:454:LEU:N	26:LR:466:TRP:O	2.44	0.51
29:LU:288:TYR:O	29:LU:298:LEU:N	2.36	0.51
32:LX:424:LEU:O	32:LX:427:ILE:N	2.43	0.51
25:LQ:474:ALA:CB	25:LQ:493:ALA:HB3	2.40	0.51
22:LN:32:ILE:N	22:LN:750:ASN:O	2.40	0.51
60:SP:374:LEU:O	60:SP:378:HIS:N	2.44	0.51
16:LH:682:ASN:O	16:LH:686:GLY:N	2.42	0.51
44:NM:142:PHE:O	44:NM:208:GLN:N	2.42	0.51
28:LT:62:ASP:O	28:LT:66:LEU:N	2.41	0.51
7:L6:142:ARG:O	7:L6:146:GLY:N	2.45	0.50
31:LW:258:LEU:O	31:LW:267:LEU:N	2.43	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L1:434:G:N1	56:SI:56:VAL:O	2.42	0.50
55:SH:126:ASN:O	56:SI:611:PHE:N	2.45	0.50
50:SA:196:LYS:O	50:SA:200:GLY:N	2.45	0.50
57:SK:70:CYS:N	57:SK:87:ALA:O	2.44	0.50
22:LN:214:SER:O	22:LN:223:GLY:N	2.43	0.50
22:LN:554:ASP:O	22:LN:558:ARG:N	2.42	0.50
40:NG:15:GLY:N	40:NG:78:ALA:O	2.42	0.50
2:L1:113:U:O2'	2:L1:115:G:O2'	2.21	0.49
18:LJ:445:TRP:O	18:LJ:449:GLY:N	2.42	0.49
42:NI:262:VAL:O	42:NI:266:LYS:N	2.33	0.49
26:LR:269:LEU:O	26:LR:278:LEU:N	2.45	0.49
28:LT:737:LEU:O	28:LT:741:ARG:N	2.39	0.49
32:LY:752:ASN:O	32:LY:756:GLY:N	2.43	0.49
66:SW:131:ASN:O	66:SW:135:LYS:N	2.45	0.49
20:LL:231:ASP:O	20:LL:249:GLU:N	2.44	0.49
54:SG:148:SER:N	54:SG:565:SER:O	2.45	0.49
56:SI:618:PHE:O	56:SI:622:ALA:N	2.39	0.49
2:L1:67:A:HO2'	2:L1:69:G:P	2.36	0.49
2:L1:630:A:N6	2:L1:969:C:O2'	2.45	0.49
30:LV:83:VAL:O	30:LV:92:LYS:N	2.42	0.49
17:LI:711:LEU:O	22:LN:31:MET:N	2.43	0.49
32:LX:17:GLY:O	32:LX:21:LYS:N	2.46	0.49
26:LR:316:VAL:O	26:LR:320:LEU:N	2.38	0.49
28:LT:935:PHE:O	28:LT:939:ALA:N	2.45	0.49
63:SS:313:PHE:O	63:SS:315:LEU:N	2.46	0.49
28:LT:530:ASP:O	28:LT:534:SER:N	2.46	0.48
58:SL:50:ALA:HB1	58:SL:58:ALA:HB2	1.94	0.48
26:LR:495:ASN:N	26:LR:509:ALA:O	2.41	0.48
56:SI:211:ILE:O	56:SI:214:ARG:N	2.45	0.48
31:LW:340:LEU:O	31:LW:368:TYR:N	2.42	0.48
2:L1:1220:C:OP1	68:SZ:347:VAL:N	2.41	0.48
2:L1:501:U:O2'	2:L1:502:U:OP2	2.26	0.48
11:LC:46:PHE:O	11:LC:50:GLU:N	2.47	0.48
60:SP:61:ALA:O	60:SP:64:THR:N	2.46	0.47
10:L9:23:ARG:O	10:L9:26:ALA:HB3	2.14	0.47
1:L0:297:U:O4	23:LO:136:PHE:N	2.47	0.47
60:SP:747:TRP:O	60:SP:751:SER:N	2.47	0.47
2:L1:574:G:N2	67:SY:14:ARG:O	2.40	0.47
8:L7:136:VAL:N	8:L7:153:LEU:O	2.46	0.47
26:LR:163:LEU:O	26:LR:175:TRP:N	2.47	0.47
2:L1:1160:A:O2'	2:L1:1620:C:N3	2.39	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L1:1680:G:H21	2:L1:1681:A:H61	1.62	0.47
42:NI:162:THR:O	42:NI:164:SER:N	2.47	0.47
60:SP:2129:MET:O	60:SP:2132:LYS:N	2.46	0.47
52:SD:97:TYR:O	52:SD:107:VAL:N	2.46	0.47
56:SI:1106:GLU:O	56:SI:1110:ARG:N	2.48	0.47
2:L1:192:U:H3	2:L1:193:U:HO2'	1.47	0.47
41:NH:519:ASP:O	41:NH:523:TYR:N	2.48	0.47
16:LH:443:ASN:O	16:LH:447:LYS:N	2.42	0.46
16:LH:284:SER:O	16:LH:288:LEU:N	2.47	0.46
2:L1:1681:A:N6	2:L1:1720:G:C6	2.83	0.46
30:LV:183:VAL:O	30:LV:185:HIS:N	2.49	0.46
41:NH:144:LYS:O	41:NH:176:PHE:N	2.42	0.46
64:ST:388:LEU:O	64:ST:392:LYS:N	2.49	0.46
28:LT:92:ALA:O	28:LT:99:GLY:N	2.44	0.46
58:SL:50:ALA:HB1	58:SL:58:ALA:CB	2.46	0.46
2:L1:192:U:N3	2:L1:193:U:O2'	2.41	0.46
41:NH:150:ASP:O	41:NH:154:LYS:N	2.49	0.46
32:LY:482:ILE:O	32:LY:486:LEU:N	2.39	0.46
2:L1:40:A:H62	2:L1:467:G:N2	2.14	0.45
2:L1:5:U:O2	2:L1:7:G:N2	2.50	0.45
2:L1:350:U:OP1	2:L1:351:C:O2'	2.22	0.45
2:L1:78:A:O2'	7:L6:173:PRO:O	2.35	0.45
66:SW:213:LYS:O	66:SW:216:ILE:N	2.49	0.45
56:SI:393:GLY:O	56:SI:396:LEU:N	2.49	0.45
28:LT:589:THR:N	28:LT:603:ALA:O	2.49	0.45
66:SW:109:LEU:O	66:SW:113:TRP:N	2.50	0.45
2:L1:1657:U:OP1	2:L1:1658:G:O2'	2.22	0.45
22:LN:648:PHE:O	22:LN:655:SER:N	2.44	0.45
5:L4:199:GLU:N	5:L4:207:LEU:O	2.47	0.44
16:LH:325:GLN:O	16:LH:329:ASN:CA	2.66	0.44
8:L7:63:PRO:O	8:L7:67:LEU:N	2.46	0.44
21:LM:332:ILE:O	21:LM:336:LEU:N	2.47	0.44
61:SQ:194:ILE:O	61:SQ:198:SER:N	2.42	0.44
2:L1:253:A:OP1	5:L4:134:LYS:N	2.49	0.44
21:LM:559:ASN:N	21:LM:597:HIS:O	2.47	0.44
13:LE:25:VAL:O	13:LE:62:VAL:HA	2.18	0.44
16:LH:634:ASP:O	16:LH:638:PHE:N	2.51	0.44
2:L1:1680:G:H21	2:L1:1681:A:N6	2.16	0.44
29:LU:309:MET:N	29:LU:323:GLY:O	2.48	0.44
54:SG:168:ASN:O	54:SG:172:PHE:N	2.49	0.44
2:L1:36:C:N4	2:L1:473:A:H61	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:L1:569:C:H2'	2:L1:570:A:O4'	2.18	0.44
18:LJ:238:ASP:O	18:LJ:242:ASN:N	2.50	0.44
26:LR:392:ASN:N	26:LR:406:ALA:O	2.50	0.44
1:L0:12:G:O2'	1:L0:70:A:N1	2.47	0.44
2:L1:49:C:OP2	2:L1:425:A:N6	2.43	0.44
2:L1:454:U:O2'	2:L1:455:C:O4'	2.34	0.44
27:LS:365:ASN:N	27:LS:370:SER:O	2.45	0.44
25:LQ:474:ALA:HB3	25:LQ:493:ALA:HB3	2.00	0.43
49:OA:1574:ALA:O	49:OA:1578:GLY:N	2.50	0.43
16:LH:94:GLY:N	16:LH:106:LEU:O	2.48	0.43
16:LH:375:ASN:O	16:LH:379:LEU:N	2.45	0.43
26:LR:309:GLN:O	26:LR:335:GLY:N	2.47	0.43
2:L1:574:G:N1	67:SY:14:ARG:O	2.50	0.43
24:LP:158:HIS:O	24:LP:159:ALA:HB3	2.18	0.43
22:LN:347:LEU:N	22:LN:359:ASN:O	2.41	0.43
67:SY:149:GLU:O	67:SY:153:ASN:N	2.51	0.43
2:L1:1157:A:N6	2:L1:1618:C:O2	2.52	0.43
60:SP:382:PHE:O	60:SP:385:ALA:HB3	2.18	0.43
2:L1:248:U:O2'	2:L1:249:U:OP1	2.30	0.43
10:L9:178:ALA:O	10:L9:181:ALA:N	2.51	0.43
32:LX:899:ALA:HB1	32:LX:904:LEU:O	2.19	0.43
32:LY:144:GLY:N	32:LY:475:ARG:O	2.47	0.43
32:LY:517:VAL:N	32:LY:710:LEU:O	2.44	0.43
2:L1:439:U:P	2:L1:465:G:H21	2.42	0.43
8:L7:154:LEU:O	8:L7:186:PRO:HD2	2.18	0.43
2:L1:1221:A:H5''	68:SZ:381:ALA:HB2	1.99	0.43
21:LM:963:ILE:O	21:LM:967:MET:N	2.50	0.43
25:LQ:641:TYR:O	25:LQ:650:ILE:N	2.48	0.43
28:LT:444:ASP:O	28:LT:448:LYS:N	2.49	0.43
51:SB:2:ALA:HB3	51:SB:17:ALA:HB3	2.00	0.43
23:LO:415:ASP:O	23:LO:419:TYR:N	2.51	0.42
26:LR:362:LEU:N	26:LR:384:TYR:O	2.40	0.42
41:NH:257:SER:O	41:NH:267:ILE:N	2.43	0.42
66:SW:99:ILE:O	66:SW:137:VAL:N	2.47	0.42
3:L2:22:A:N7	3:L2:27:U:O2'	2.48	0.42
2:L1:522:U:H2'	2:L1:523:G:O4'	2.19	0.42
16:LH:634:ASP:N	16:LH:639:LYS:O	2.49	0.42
2:L1:97:C:H2'	2:L1:98:U:C6	2.55	0.42
29:LU:94:TYR:O	29:LU:103:PHE:N	2.50	0.42
32:LY:502:PHE:O	32:LY:506:GLY:N	2.52	0.42
34:NA:428:GLU:O	34:NA:432:LYS:N	2.47	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
39:NF:72:MET:O	39:NF:76:LYS:N	2.40	0.42
57:SJ:144:LEU:O	57:SJ:148:LEU:N	2.52	0.42
60:SP:635:ALA:HB1	60:SP:676:PRO:HG2	2.01	0.42
29:LU:235:LEU:O	29:LU:247:TYR:N	2.50	0.42
22:LN:541:ALA:O	22:LN:553:LEU:N	2.43	0.42
2:L1:364:G:H22	2:L1:380:U:H3	1.68	0.42
25:LQ:165:SER:O	25:LQ:182:LYS:N	2.47	0.42
2:L1:39:A:N6	2:L1:467:G:O6	2.52	0.42
2:L1:248:U:HO2'	2:L1:249:U:P	2.43	0.42
2:L1:79:C:H2'	2:L1:80:A:O4'	2.20	0.41
2:L1:554:C:O2	67:SY:13:HIS:N	2.42	0.41
32:LX:743:VAL:N	32:LX:763:LEU:O	2.40	0.41
2:L1:871:G:H2'	2:L1:872:G:C8	2.55	0.41
5:L4:163:ASP:O	5:L4:167:GLY:N	2.47	0.41
22:LN:314:SER:O	22:LN:318:ASN:N	2.53	0.41
23:LO:258:ALA:HB1	23:LO:261:ALA:HB3	2.02	0.41
54:SG:537:PHE:N	54:SG:568:ILE:O	2.49	0.41
59:SM:74:ASP:O	59:SM:78:ALA:N	2.49	0.41
60:SP:1241:GLN:O	60:SP:1245:LYS:N	2.52	0.41
3:L2:325:C:H4'	3:L2:325:C:OP1	2.20	0.41
41:NH:800:GLU:O	41:NH:804:THR:N	2.38	0.41
2:L1:1681:A:H2'	2:L1:1682:U:O4'	2.19	0.41
28:LT:738:ASP:O	28:LT:742:LYS:N	2.44	0.41
31:LW:382:GLY:O	31:LW:391:GLY:N	2.52	0.41
40:NG:104:ALA:O	40:NG:108:SER:N	2.48	0.41
60:SP:2058:GLU:O	60:SP:2062:LYS:N	2.53	0.41
34:NA:507:ILE:O	34:NA:515:MET:N	2.53	0.41
60:SP:1196:SER:O	60:SP:1200:ASN:N	2.51	0.41
66:SW:117:TYR:N	66:SW:118:PRO:CD	2.83	0.41
2:L1:1169:G:O2'	2:L1:1575:G:O6	2.34	0.41
4:L3:24:GLY:HA2	4:L3:58:ALA:HB3	2.02	0.41
22:LN:127:ASP:O	22:LN:131:GLY:N	2.45	0.41
52:SC:165:ALA:HB1	52:SC:166:PRO:HD2	2.03	0.41
2:L1:1712:A:H2'	2:L1:1713:G:H8	1.85	0.41
26:LR:519:ASN:O	26:LR:523:GLY:N	2.50	0.41
45:NN:337:MET:O	45:NN:340:THR:N	2.54	0.41
68:SZ:220:ILE:O	68:SZ:224:TRP:N	2.54	0.41
2:L1:1071:U:H2'	2:L1:1072:C:C6	2.56	0.41
22:LN:125:GLU:O	22:LN:134:LEU:N	2.53	0.41
52:SC:273:ALA:HB1	52:SC:282:ALA:HA	2.02	0.41
2:L1:1730:A:HO2'	2:L1:1731:A:H8	1.69	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:LI:359:LYS:N	17:LI:386:THR:O	2.54	0.40
30:LV:206:PHE:O	30:LV:215:VAL:N	2.53	0.40
31:LW:546:ILE:O	31:LW:549:ALA:N	2.54	0.40
42:NI:18:PHE:N	42:NI:35:HIS:O	2.54	0.40
25:LQ:474:ALA:HB1	25:LQ:493:ALA:HB3	2.02	0.40
32:LY:899:ALA:HB1	32:LY:904:LEU:O	2.21	0.40
1:L0:299:G:H21	28:LT:45:GLY:HA3	1.86	0.40
2:L1:894:U:H2'	2:L1:895:G:C8	2.56	0.40
22:LN:210:ILE:N	22:LN:229:MET:O	2.46	0.40
25:LQ:11:ALA:N	25:LQ:683:ILE:O	2.48	0.40
52:SD:202:ARG:O	52:SD:205:ARG:N	2.55	0.40
53:SE:38:ASN:O	53:SE:42:LYS:N	2.47	0.40
53:SE:48:ILE:O	53:SE:104:THR:N	2.46	0.40
31:LW:302:ASP:O	31:LW:306:PHE:N	2.54	0.40
17:LI:604:LYS:O	17:LI:607:VAL:N	2.52	0.40
30:LV:85:ASP:O	30:LV:89:LEU:N	2.55	0.40
42:NI:88:LEU:N	42:NI:125:LEU:O	2.54	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	L3	91/146 (62%)	90 (99%)	1 (1%)	0	100	100
5	L4	242/261 (93%)	241 (100%)	1 (0%)	0	100	100
6	L5	202/225 (90%)	194 (96%)	8 (4%)	0	100	100
7	L6	202/236 (86%)	199 (98%)	3 (2%)	0	100	100
8	L7	165/190 (87%)	161 (98%)	4 (2%)	0	100	100
9	L8	166/200 (83%)	160 (96%)	6 (4%)	0	100	100
10	L9	169/197 (86%)	169 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
11	LC	123/143 (86%)	121 (98%)	2 (2%)	0	100	100
12	LD	135/156 (86%)	133 (98%)	2 (2%)	0	100	100
13	LE	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
14	LF	128/135 (95%)	124 (97%)	4 (3%)	0	100	100
15	LG	60/67 (90%)	60 (100%)	0	0	100	100
16	LH	782/896 (87%)	763 (98%)	19 (2%)	0	100	100
17	LI	582/713 (82%)	575 (99%)	7 (1%)	0	100	100
18	LJ	470/513 (92%)	462 (98%)	8 (2%)	0	100	100
19	LK	130/575 (23%)	130 (100%)	0	0	100	100
20	LL	475/643 (74%)	462 (97%)	13 (3%)	0	100	100
21	LM	1597/1769 (90%)	1574 (99%)	23 (1%)	0	100	100
22	LN	649/776 (84%)	633 (98%)	16 (2%)	0	100	100
23	LO	798/923 (86%)	779 (98%)	19 (2%)	0	100	100
24	LP	376/440 (86%)	371 (99%)	5 (1%)	0	100	100
25	LQ	807/943 (86%)	794 (98%)	13 (2%)	0	100	100
26	LR	785/817 (96%)	764 (97%)	21 (3%)	0	100	100
27	LS	469/594 (79%)	456 (97%)	13 (3%)	0	100	100
28	LT	825/939 (88%)	808 (98%)	17 (2%)	0	100	100
29	LU	448/489 (92%)	434 (97%)	14 (3%)	0	100	100
30	LV	401/707 (57%)	390 (97%)	10 (2%)	1 (0%)	43	78
31	LW	417/554 (75%)	402 (96%)	15 (4%)	0	100	100
32	LX	826/1056 (78%)	809 (98%)	17 (2%)	0	100	100
32	LY	834/1056 (79%)	817 (98%)	17 (2%)	0	100	100
33	LZ	179/183 (98%)	174 (97%)	5 (3%)	0	100	100
34	NA	268/593 (45%)	267 (100%)	1 (0%)	0	100	100
35	NB	212/610 (35%)	212 (100%)	0	0	100	100
36	NC	111/357 (31%)	107 (96%)	4 (4%)	0	100	100
37	ND	70/214 (33%)	69 (99%)	1 (1%)	0	100	100
38	NE	68/346 (20%)	68 (100%)	0	0	100	100
39	NF	139/151 (92%)	139 (100%)	0	0	100	100
40	NG	117/137 (85%)	115 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
41	NH	1063/1237 (86%)	1041 (98%)	22 (2%)	0	100	100
42	NI	232/297 (78%)	224 (97%)	8 (3%)	0	100	100
43	NK	64/316 (20%)	63 (98%)	1 (2%)	0	100	100
44	NM	224/255 (88%)	219 (98%)	5 (2%)	0	100	100
45	NN	257/534 (48%)	253 (98%)	4 (2%)	0	100	100
46	NQ	77/82 (94%)	76 (99%)	1 (1%)	0	100	100
47	NS	10/1267 (1%)	10 (100%)	0	0	100	100
48	NV	6/733 (1%)	6 (100%)	0	0	100	100
49	OA	168/1729 (10%)	167 (99%)	1 (1%)	0	100	100
50	SA	379/504 (75%)	376 (99%)	3 (1%)	0	100	100
51	SB	434/511 (85%)	427 (98%)	7 (2%)	0	100	100
52	SC	237/327 (72%)	229 (97%)	8 (3%)	0	100	100
52	SD	228/327 (70%)	226 (99%)	2 (1%)	0	100	100
53	SE	119/126 (94%)	115 (97%)	4 (3%)	0	100	100
53	SF	119/126 (94%)	114 (96%)	5 (4%)	0	100	100
54	SG	453/573 (79%)	439 (97%)	14 (3%)	0	100	100
55	SH	358/367 (98%)	349 (98%)	9 (2%)	0	100	100
56	SI	781/1183 (66%)	768 (98%)	13 (2%)	0	100	100
57	SJ	207/252 (82%)	205 (99%)	2 (1%)	0	100	100
57	SK	225/252 (89%)	222 (99%)	3 (1%)	0	100	100
58	SL	146/189 (77%)	142 (97%)	4 (3%)	0	100	100
59	SM	217/290 (75%)	214 (99%)	3 (1%)	0	100	100
60	SP	2129/2493 (85%)	2096 (98%)	33 (2%)	0	100	100
61	SQ	131/217 (60%)	122 (93%)	9 (7%)	0	100	100
62	SR	102/145 (70%)	98 (96%)	4 (4%)	0	100	100
63	SS	235/899 (26%)	227 (97%)	8 (3%)	0	100	100
64	ST	517/810 (64%)	511 (99%)	6 (1%)	0	100	100
65	SU	528/552 (96%)	525 (99%)	3 (1%)	0	100	100
66	SW	174/274 (64%)	170 (98%)	4 (2%)	0	100	100
67	SY	111/250 (44%)	108 (97%)	3 (3%)	0	100	100
68	SZ	255/483 (53%)	251 (98%)	4 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	24831/36680 (68%)	24341 (98%)	489 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
30	LV	184	ASN

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	L3	2/129 (2%)	2 (100%)	0	100	100
5	L4	12/222 (5%)	12 (100%)	0	100	100
6	L5	8/191 (4%)	8 (100%)	0	100	100
7	L6	8/201 (4%)	8 (100%)	0	100	100
8	L7	8/170 (5%)	8 (100%)	0	100	100
9	L8	4/161 (2%)	4 (100%)	0	100	100
10	L9	7/166 (4%)	7 (100%)	0	100	100
11	LC	6/119 (5%)	6 (100%)	0	100	100
12	LD	8/137 (6%)	8 (100%)	0	100	100
13	LE	3/111 (3%)	3 (100%)	0	100	100
14	LF	3/113 (3%)	3 (100%)	0	100	100
15	LG	2/60 (3%)	2 (100%)	0	100	100
16	LH	21/826 (2%)	21 (100%)	0	100	100
17	LI	24/657 (4%)	24 (100%)	0	100	100
18	LJ	19/454 (4%)	19 (100%)	0	100	100
19	LK	4/533 (1%)	4 (100%)	0	100	100
20	LL	14/574 (2%)	14 (100%)	0	100	100
21	LM	43/1633 (3%)	43 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
22	LN	18/713 (2%)	18 (100%)	0	100	100
23	LO	21/811 (3%)	21 (100%)	0	100	100
24	LP	8/414 (2%)	8 (100%)	0	100	100
25	LQ	17/832 (2%)	17 (100%)	0	100	100
26	LR	22/719 (3%)	22 (100%)	0	100	100
27	LS	21/528 (4%)	21 (100%)	0	100	100
28	LT	24/819 (3%)	24 (100%)	0	100	100
29	LU	13/443 (3%)	13 (100%)	0	100	100
30	LV	14/636 (2%)	14 (100%)	0	100	100
31	LW	21/480 (4%)	21 (100%)	0	100	100
32	LX	42/934 (4%)	42 (100%)	0	100	100
32	LY	42/934 (4%)	42 (100%)	0	100	100
33	LZ	6/172 (4%)	6 (100%)	0	100	100
34	NA	10/535 (2%)	10 (100%)	0	100	100
35	NB	8/538 (2%)	8 (100%)	0	100	100
36	NC	3/315 (1%)	3 (100%)	0	100	100
37	ND	3/196 (2%)	3 (100%)	0	100	100
38	NE	4/304 (1%)	4 (100%)	0	100	100
39	NF	7/128 (6%)	7 (100%)	0	100	100
40	NG	5/105 (5%)	5 (100%)	0	100	100
41	NH	53/1125 (5%)	53 (100%)	0	100	100
42	NI	8/274 (3%)	8 (100%)	0	100	100
43	NK	5/289 (2%)	5 (100%)	0	100	100
44	NM	5/224 (2%)	5 (100%)	0	100	100
45	NN	7/482 (2%)	7 (100%)	0	100	100
46	NQ	4/71 (6%)	4 (100%)	0	100	100
49	OA	3/1544 (0%)	3 (100%)	0	100	100
50	SA	10/435 (2%)	10 (100%)	0	100	100
51	SB	8/433 (2%)	8 (100%)	0	100	100
52	SC	14/240 (6%)	14 (100%)	0	100	100
52	SD	14/240 (6%)	14 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
53	SE	7/104 (7%)	7 (100%)	0	100	100
53	SF	7/104 (7%)	7 (100%)	0	100	100
54	SG	14/503 (3%)	14 (100%)	0	100	100
55	SH	17/312 (5%)	17 (100%)	0	100	100
56	SI	43/1039 (4%)	43 (100%)	0	100	100
57	SJ	9/222 (4%)	9 (100%)	0	100	100
57	SK	12/222 (5%)	12 (100%)	0	100	100
58	SL	9/169 (5%)	9 (100%)	0	100	100
59	SM	10/258 (4%)	10 (100%)	0	100	100
60	SP	61/2307 (3%)	61 (100%)	0	100	100
61	SQ	6/200 (3%)	6 (100%)	0	100	100
62	SR	5/120 (4%)	5 (100%)	0	100	100
63	SS	15/808 (2%)	15 (100%)	0	100	100
64	ST	19/732 (3%)	19 (100%)	0	100	100
65	SU	27/506 (5%)	27 (100%)	0	100	100
66	SW	9/238 (4%)	9 (100%)	0	100	100
67	SY	2/234 (1%)	2 (100%)	0	100	100
68	SZ	14/424 (3%)	14 (100%)	0	100	100
All	All	922/30872 (3%)	922 (100%)	0	100	100

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

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

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L0	93/700 (13%)	22 (23%)	0
2	L1	1132/1808 (62%)	192 (16%)	1 (0%)
3	L2	170/333 (51%)	25 (14%)	0
All	All	1395/2841 (49%)	239 (17%)	1 (0%)

All (239) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L0	9	G
1	L0	14	U
1	L0	17	A
1	L0	59	U
1	L0	63	G
1	L0	66	C
1	L0	67	G
1	L0	82	A
1	L0	83	U
1	L0	85	G
1	L0	86	C
1	L0	87	C
1	L0	90	G
1	L0	298	A
1	L0	304	U
1	L0	305	A
1	L0	306	G
1	L0	464	G
1	L0	468	A
1	L0	472	A
1	L0	481	U
1	L0	482	A
2	L1	-6	A
2	L1	0	U
2	L1	5	U
2	L1	18	C
2	L1	23	G
2	L1	25	C
2	L1	34	G
2	L1	35	U
2	L1	39	A
2	L1	57	G
2	L1	60	U
2	L1	61	A
2	L1	71	A
2	L1	73	U
2	L1	74	U
2	L1	75	U
2	L1	76	A
2	L1	77	U
2	L1	100	A
2	L1	103	A
2	L1	104	A

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Mol	Chain	Res	Type
2	L1	114	C
2	L1	116	U
2	L1	127	G
2	L1	128	U
2	L1	140	A
2	L1	145	A
2	L1	153	G
2	L1	160	C
2	L1	164	A
2	L1	166	C
2	L1	168	A
2	L1	187	G
2	L1	188	A
2	L1	190	C
2	L1	192	U
2	L1	193	U
2	L1	195	G
2	L1	196	G
2	L1	201	G
2	L1	202	A
2	L1	204	G
2	L1	249	U
2	L1	250	C
2	L1	260	U
2	L1	261	U
2	L1	262	U
2	L1	265	A
2	L1	275	C
2	L1	276	C
2	L1	277	U
2	L1	278	U
2	L1	279	G
2	L1	280	U
2	L1	299	A
2	L1	316	A
2	L1	320	U
2	L1	321	C
2	L1	322	G
2	L1	333	A
2	L1	334	G
2	L1	337	G
2	L1	340	U

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Mol	Chain	Res	Type
2	L1	341	A
2	L1	383	G
2	L1	387	A
2	L1	388	G
2	L1	393	C
2	L1	400	A
2	L1	402	C
2	L1	414	C
2	L1	416	A
2	L1	423	G
2	L1	424	C
2	L1	425	A
2	L1	426	G
2	L1	428	A
2	L1	436	A
2	L1	437	A
2	L1	438	A
2	L1	439	U
2	L1	444	C
2	L1	447	U
2	L1	454	U
2	L1	456	A
2	L1	467	G
2	L1	468	A
2	L1	475	A
2	L1	477	A
2	L1	495	C
2	L1	496	G
2	L1	501	U
2	L1	502	U
2	L1	505	A
2	L1	516	G
2	L1	520	A
2	L1	538	A
2	L1	539	G
2	L1	542	A
2	L1	545	A
2	L1	552	G
2	L1	564	G
2	L1	565	C
2	L1	575	C
2	L1	579	A

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Mol	Chain	Res	Type
2	L1	583	C
2	L1	594	A
2	L1	635	A
2	L1	765	G
2	L1	766	U
2	L1	774	A
2	L1	803	A
2	L1	863	A
2	L1	864	U
2	L1	893	U
2	L1	899	G
2	L1	906	A
2	L1	933	A
2	L1	935	U
2	L1	947	U
2	L1	951	A
2	L1	960	U
2	L1	965	U
2	L1	970	A
2	L1	1033	C
2	L1	1036	A
2	L1	1040	G
2	L1	1059	U
2	L1	1070	C
2	L1	1076	A
2	L1	1079	U
2	L1	1083	G
2	L1	1084	A
2	L1	1085	G
2	L1	1114	G
2	L1	1122	G
2	L1	1128	C
2	L1	1132	A
2	L1	1134	C
2	L1	1158	C
2	L1	1159	C
2	L1	1167	G
2	L1	1175	U
2	L1	1191	U
2	L1	1192	C
2	L1	1193	A
2	L1	1207	C

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Mol	Chain	Res	Type
2	L1	1208	A
2	L1	1218	G
2	L1	1227	A
2	L1	1228	G
2	L1	1230	A
2	L1	1232	U
2	L1	1256	A
2	L1	1267	G
2	L1	1268	G
2	L1	1269	U
2	L1	1270	G
2	L1	1435	G
2	L1	1437	U
2	L1	1440	C
2	L1	1472	C
2	L1	1474	G
2	L1	1590	G
2	L1	1595	U
2	L1	1596	C
2	L1	1601	G
2	L1	1602	C
2	L1	1611	A
2	L1	1616	G
2	L1	1618	C
2	L1	1633	A
2	L1	1639	C
2	L1	1651	A
2	L1	1654	G
2	L1	1657	U
2	L1	1658	G
2	L1	1664	C
2	L1	1680	G
2	L1	1683	C
2	L1	1701	A
2	L1	1702	A
2	L1	1703	C
2	L1	1715	G
2	L1	1716	C
2	L1	1721	A
2	L1	1745	G
2	L1	1747	G
2	L1	1778	G

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Mol	Chain	Res	Type
2	L1	1780	G
2	L1	1781	A
2	L1	1782	A
3	L2	4	G
3	L2	14	A
3	L2	24	U
3	L2	25	U
3	L2	28	A
3	L2	30	A
3	L2	34	A
3	L2	35	U
3	L2	38	U
3	L2	48	A
3	L2	56	A
3	L2	60	A
3	L2	61	G
3	L2	62	C
3	L2	77	U
3	L2	81	U
3	L2	87	G
3	L2	90	C
3	L2	91	C
3	L2	109	G
3	L2	110	A
3	L2	205	G
3	L2	324	U
3	L2	325	C
3	L2	329	C

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	L1	248	U

5.4 Non-standard residues in protein, DNA, RNA chains

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
27	SEP	LS	128	27	3,4,10	0.68	0	2,4,14	0.86	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
27	SEP	LS	128	27	-	1/1/2/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

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

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

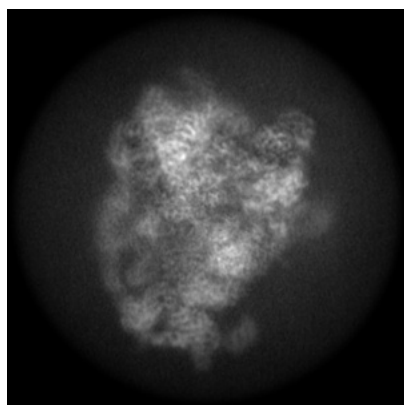
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-49079. These allow visual inspection of the internal detail of the map and identification of artifacts.

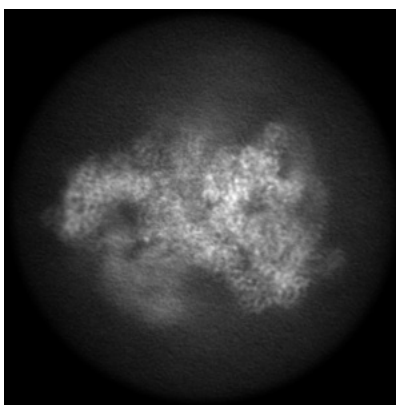
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

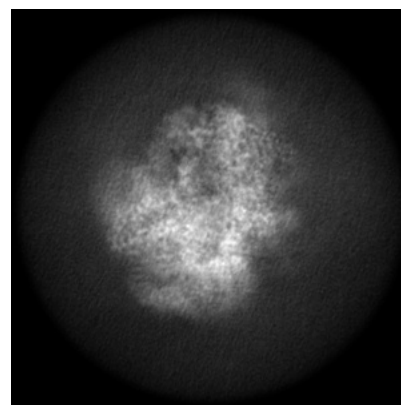
6.1.1 Primary map



X



Y

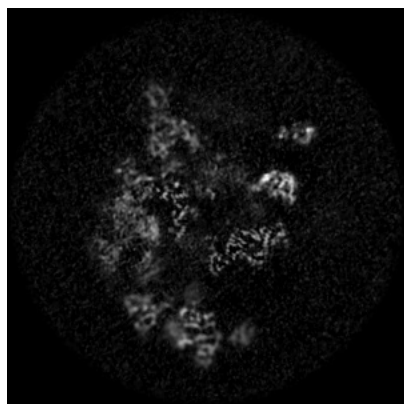


Z

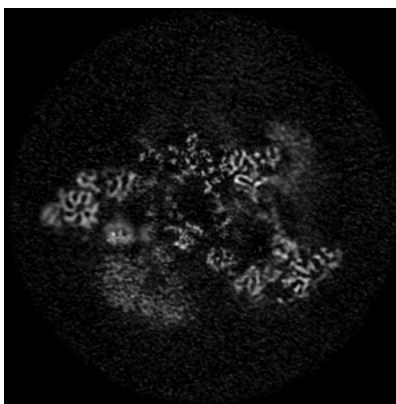
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

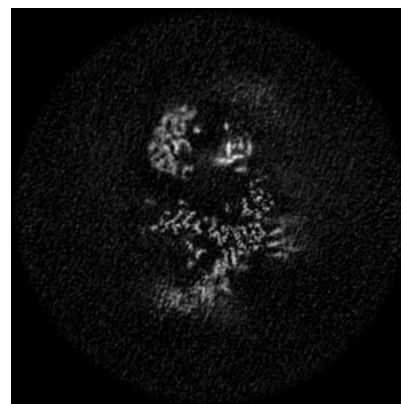
6.2.1 Primary map



X Index: 252



Y Index: 252

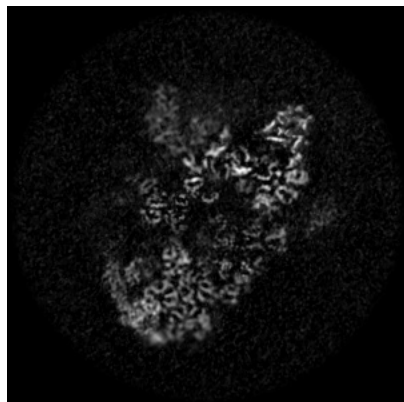


Z Index: 252

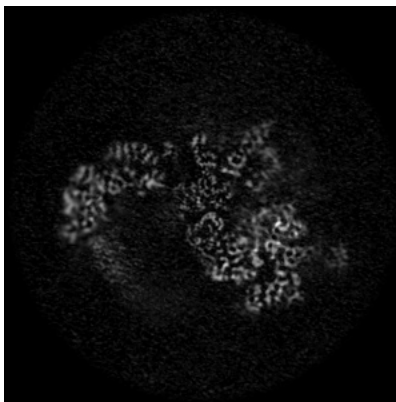
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

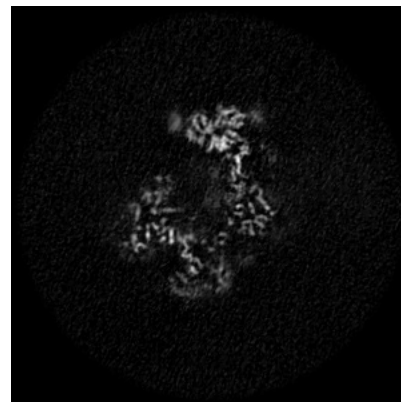
6.3.1 Primary map



X Index: 280



Y Index: 223

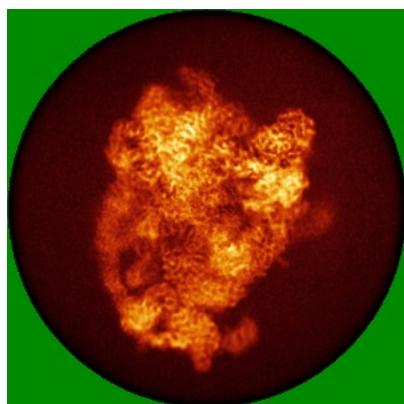


Z Index: 292

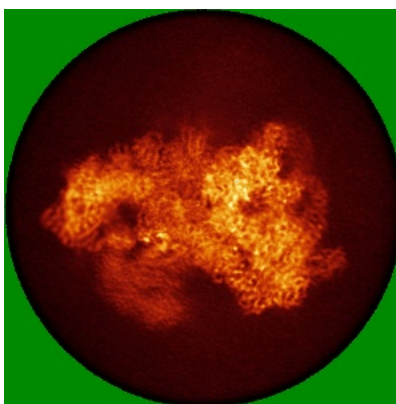
The images above show the largest variance slices of the map in three orthogonal directions.

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

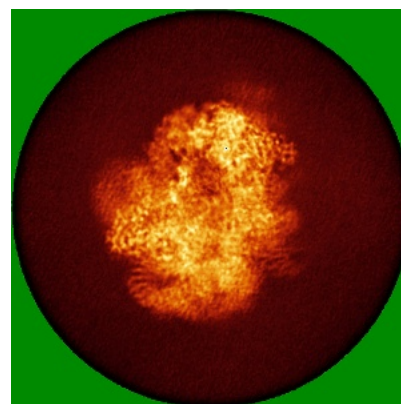
6.4.1 Primary map



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

This section was not generated.

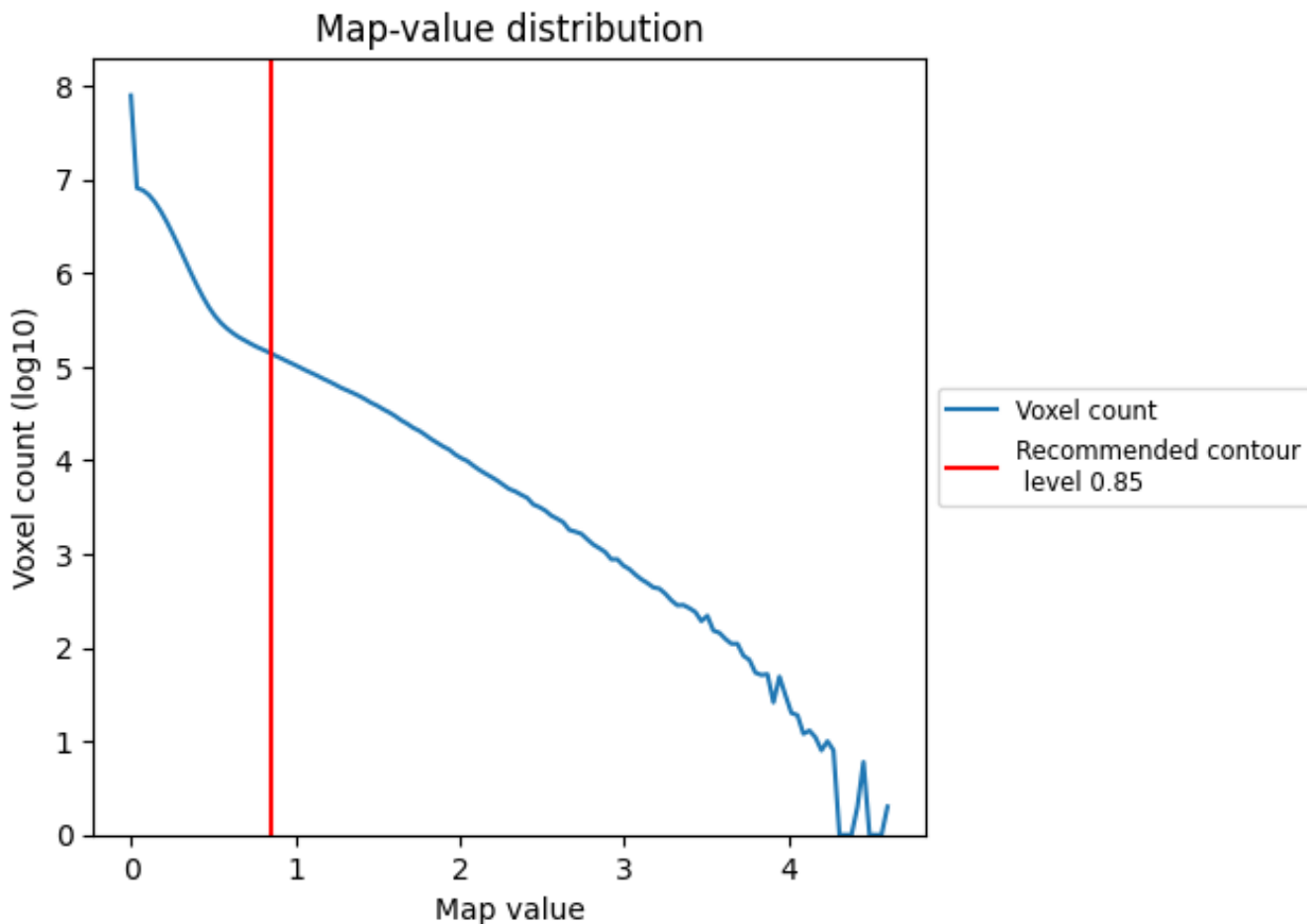
6.6 Mask visualisation

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

7 Map analysis [i](#)

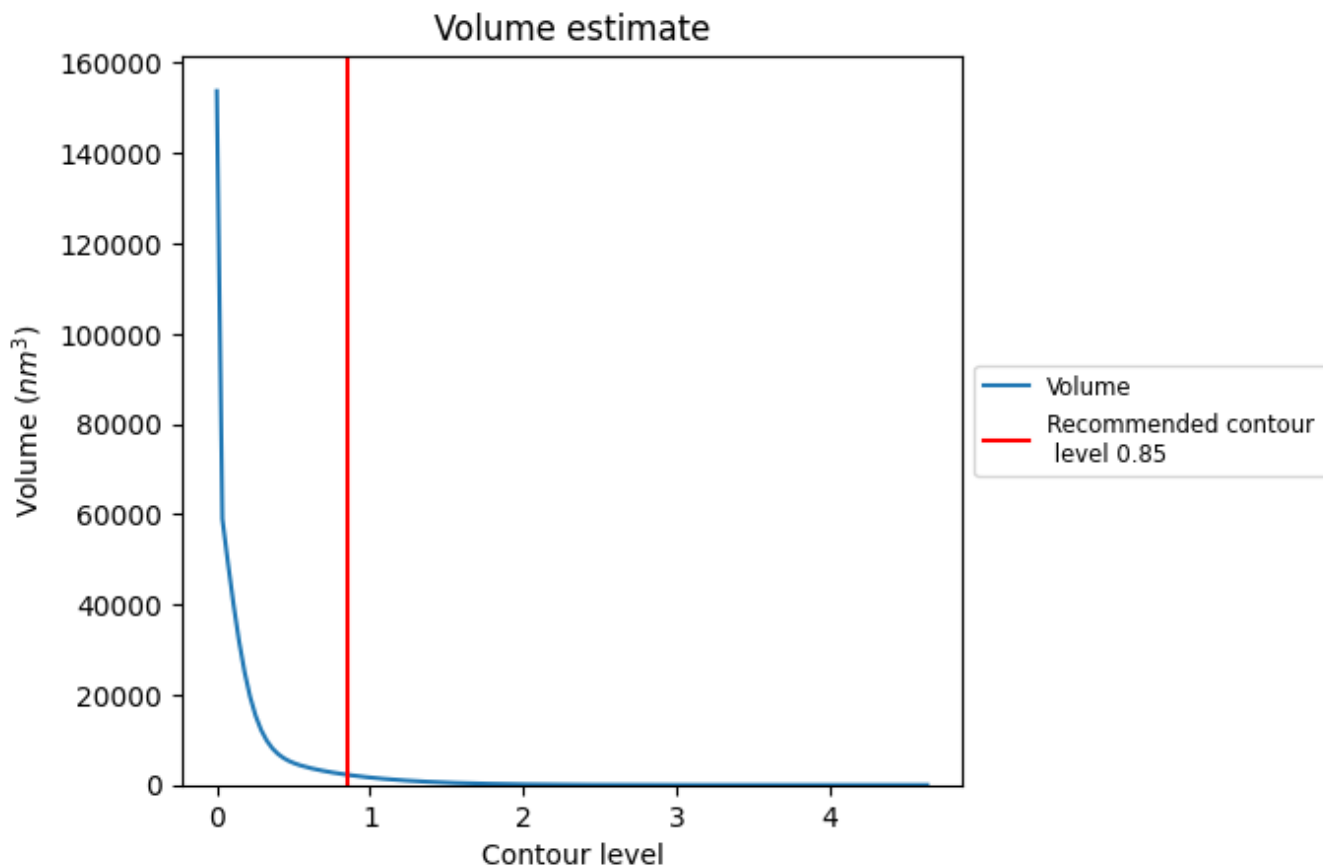
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

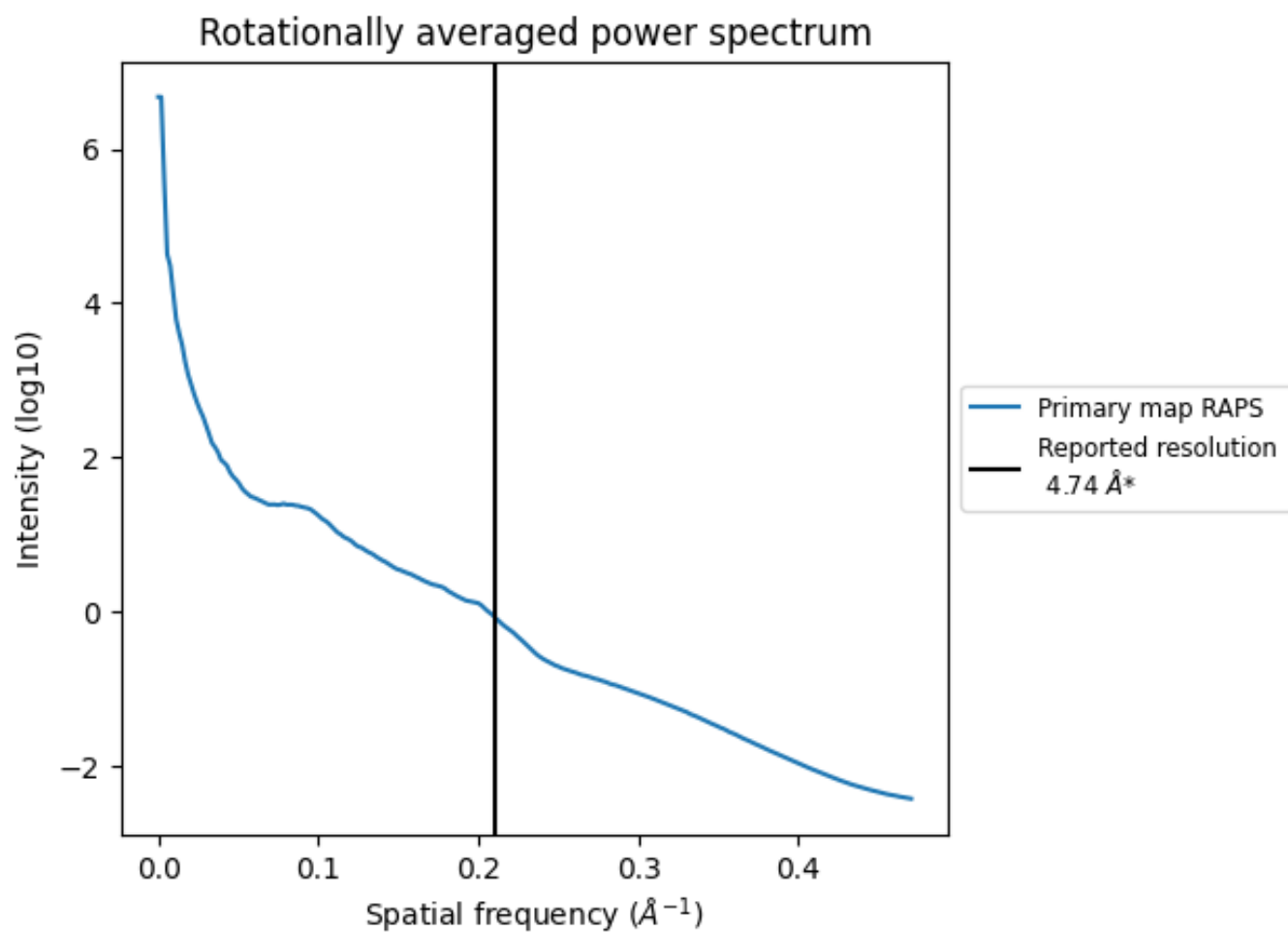
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2268 nm³; this corresponds to an approximate mass of 2049 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 0.211 Å⁻¹

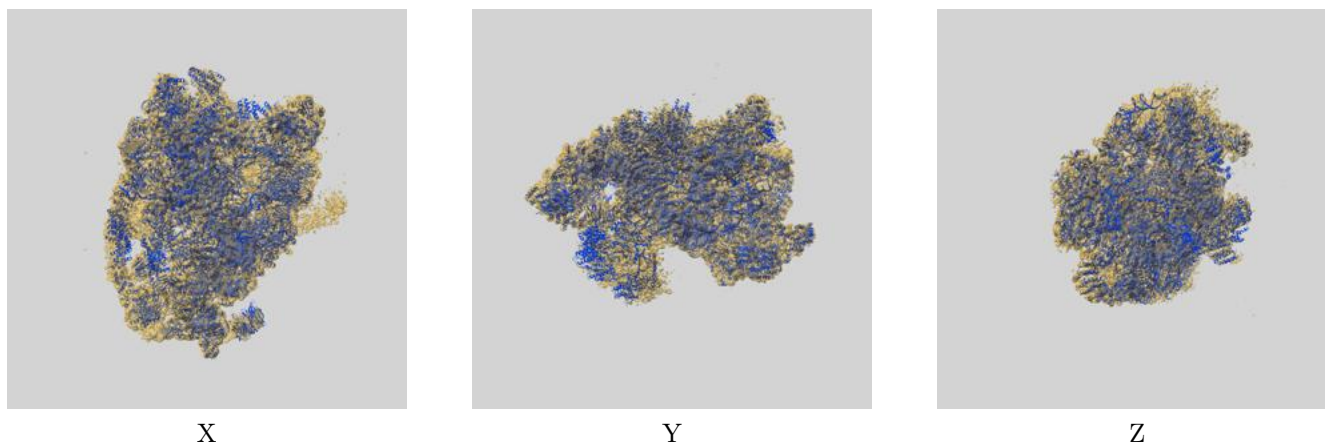
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

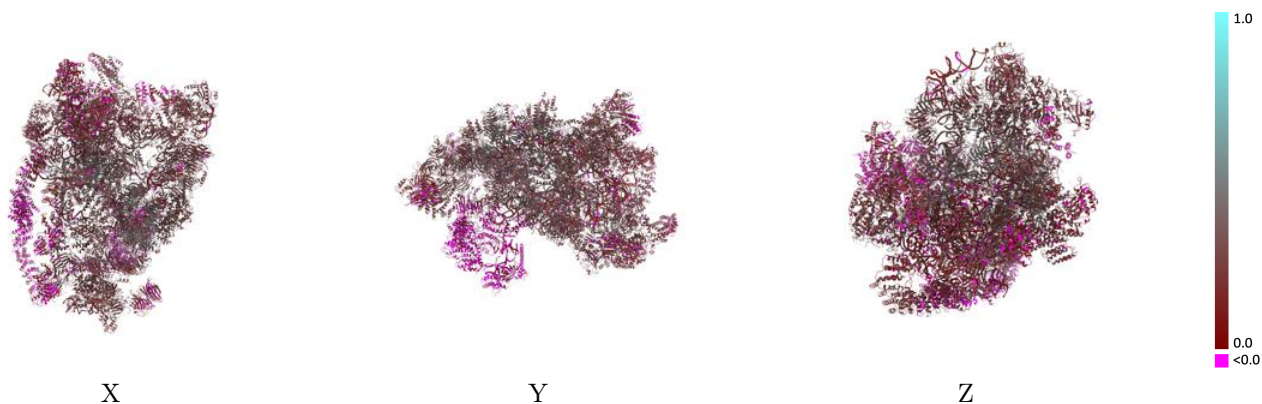
This section contains information regarding the fit between EMDB map EMD-49079 and PDB model 9N6Z. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



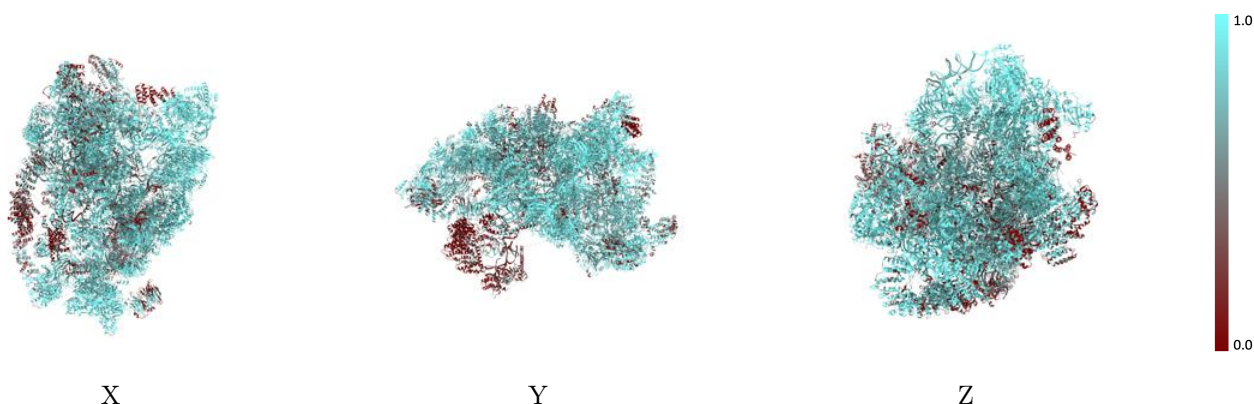
The images above show the 3D surface view of the map at the recommended contour level 0.85 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



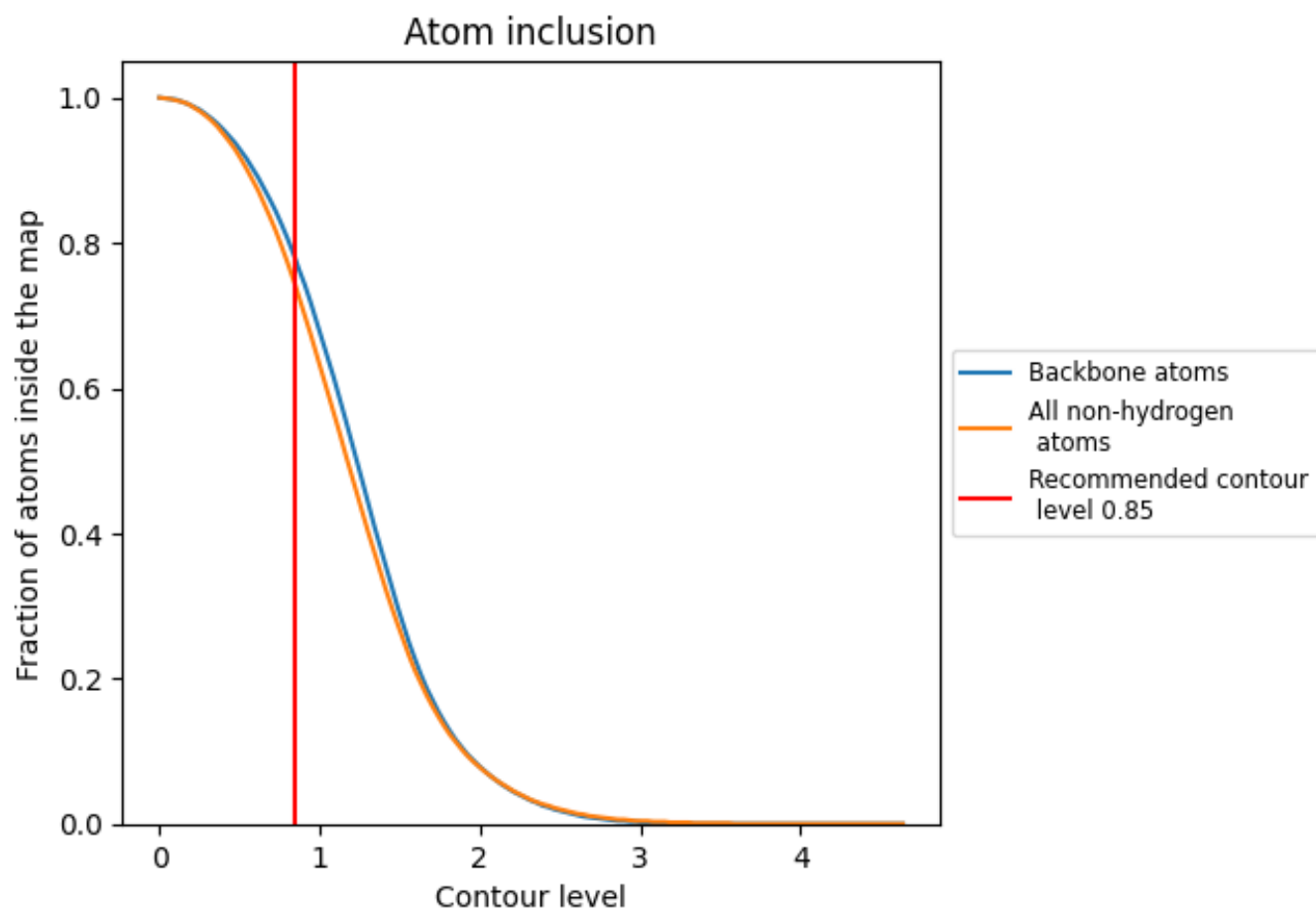
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.85).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 78% of all backbone atoms, 74% 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 (0.85) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7400	 0.2420
L0	 0.6150	 0.1860
L1	 0.7870	 0.2220
L2	 0.6490	 0.2100
L3	 0.0140	 0.0100
L4	 0.7450	 0.2270
L5	 0.8750	 0.3100
L6	 0.9120	 0.2360
L7	 0.8310	 0.2540
L8	 0.8330	 0.1870
L9	 0.8420	 0.3500
LC	 0.8420	 0.3820
LD	 0.6650	 0.1560
LE	 0.8870	 0.3030
LF	 0.9410	 0.2720
LG	 0.9030	 0.3860
LH	 0.9290	 0.2910
LI	 0.6370	 0.1920
LJ	 0.7530	 0.1560
LK	 0.9350	 0.2750
LL	 0.8720	 0.2820
LM	 0.6040	 0.1410
LN	 0.9200	 0.2470
LO	 0.7920	 0.3690
LP	 0.7170	 0.2870
LQ	 0.9180	 0.3180
LR	 0.9740	 0.2960
LS	 0.8160	 0.3010
LT	 0.8570	 0.3860
LU	 0.9190	 0.3440
LV	 0.8700	 0.2520
LW	 0.7670	 0.3610
LX	 0.8810	 0.2630
LY	 0.7650	 0.2130
LZ	 0.7180	 0.3610



Continued on next page...

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Chain	Atom inclusion	Q-score
NA	0.5820	0.2520
NB	0.4290	0.1050
NC	0.5270	0.1800
ND	0.0270	0.0940
NE	0.1530	0.1590
NF	0.8550	0.2830
NG	0.9390	0.3110
NH	0.9430	0.2940
NI	0.8600	0.2630
NK	0.4250	0.2090
NM	0.9500	0.3440
NN	0.6090	0.1930
NQ	0.9170	0.2840
NS	0.7330	0.1290
NV	0.0510	0.0550
OA	0.0960	0.1160
SA	0.8060	0.3260
SB	0.6870	0.2470
SC	0.7860	0.3910
SD	0.2670	0.1360
SE	0.8960	0.2840
SF	0.7930	0.3730
SG	0.6730	0.2520
SH	0.8110	0.3680
SI	0.8420	0.3480
SJ	0.3980	0.0330
SK	0.4190	0.0620
SL	0.8460	0.4070
SM	0.7550	0.3940
SP	0.7100	0.2010
SQ	0.4960	0.3030
SR	0.7740	0.4170
SS	0.5160	0.2640
ST	0.2410	0.0260
SU	0.1080	0.0030
SW	0.9040	0.2390
SY	0.4190	0.2410
SZ	0.2400	0.0000