Full wwPDB EM Validation Report

Nov 2, 2024 – 04:09 pm GMT

PDB ID	:	6T59
EMDB ID	:	EMD-10380
Title	:	Structure of rabbit 80S ribosome translating beta-tubulin in complex with tetratricopeptide protein 5 and nascent chain-associated complex
Authors	:	Lin, Z.; Gasic, I.; Chandrasekaran, V.; Peters, N.; Shao, S.; Ramakrishnan, V.; Mitchison, T.J.; Hegde, R.S.
Deposited on	:	2019-10-15
Resolution	:	3.11 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 (i) 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 (i)) were used in the production of this report:

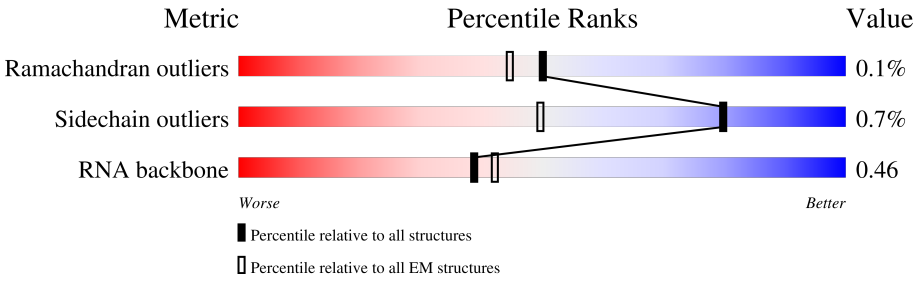
EMDB validation analysis	:	0.0.1.dev113
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.11 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	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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 <=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	A3	257	85% 96%
2	B3	403	79% 97%
3	C3	425	68% 84% 15%
4	D3	297	70% 99%
5	E3	291	62% 73% 26%
6	F3	247	75% 91% 9%
7	G3	319	57% 73% 27%
8	H3	192	84% 99%

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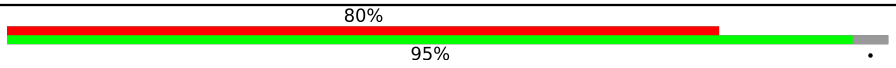
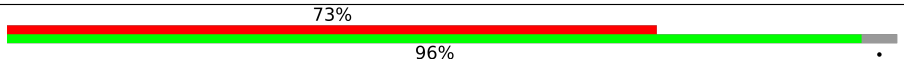
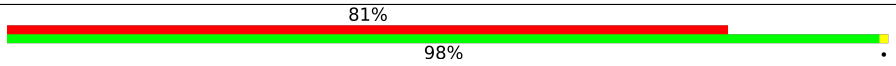
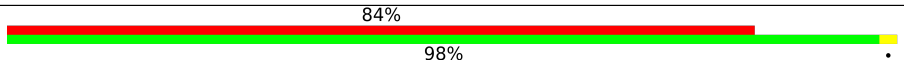
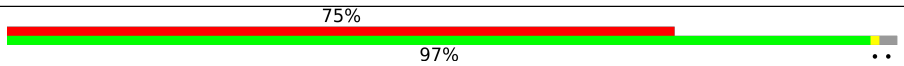
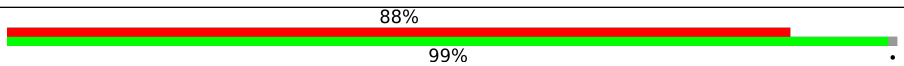
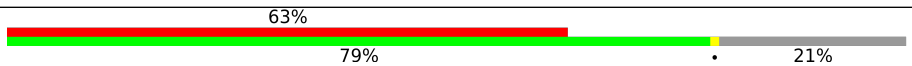
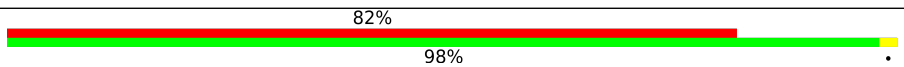
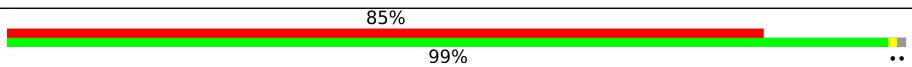
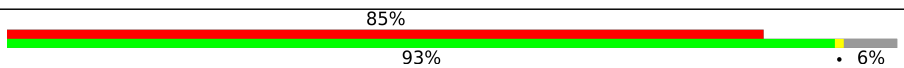
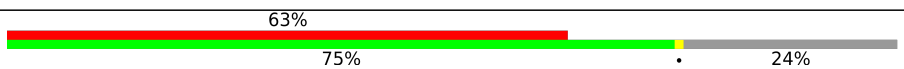
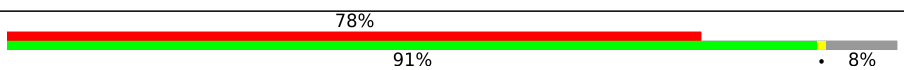
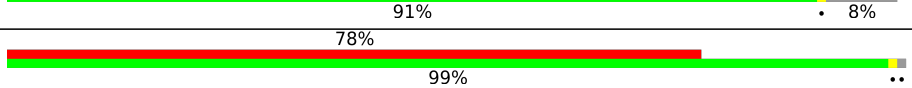
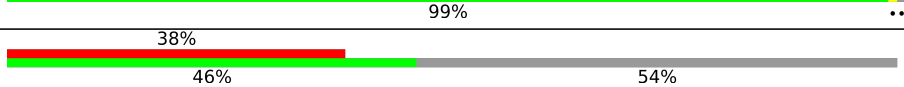
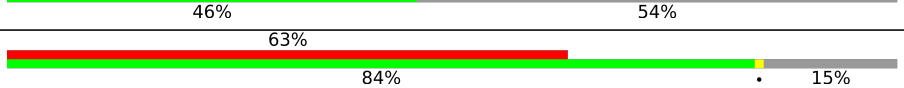
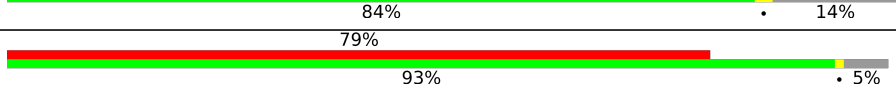
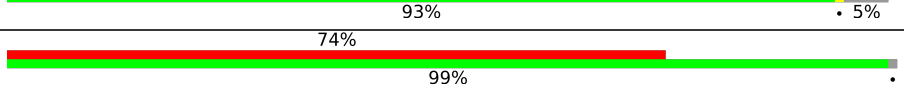
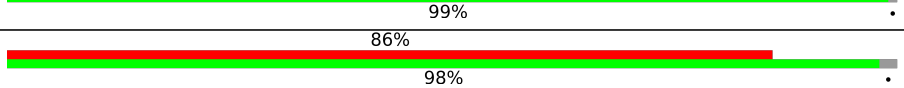
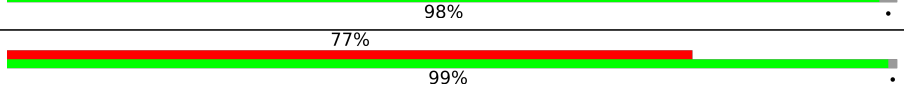
Mol	Chain	Length	Quality of chain
9	I3	214	
10	J3	178	
11	L3	211	
12	M3	218	
13	N3	204	
14	O3	203	
15	P3	184	
16	Q3	188	
17	R3	196	
18	S3	176	
19	T3	160	
20	U3	128	
21	V3	140	
22	W3	157	
23	X3	156	
24	Y3	145	
25	Z3	136	
26	a3	148	
27	b3	226	
28	c3	115	
29	d3	125	
30	e3	135	
31	f3	110	
32	g3	116	
33	h3	123	

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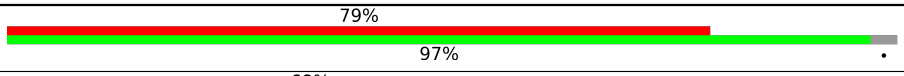
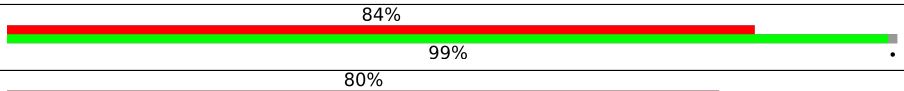
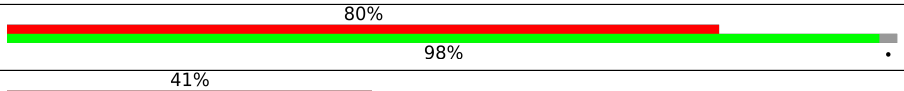
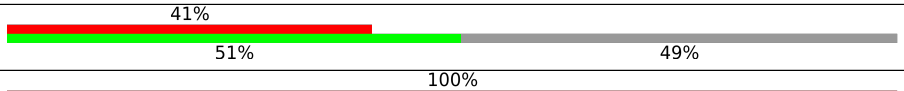
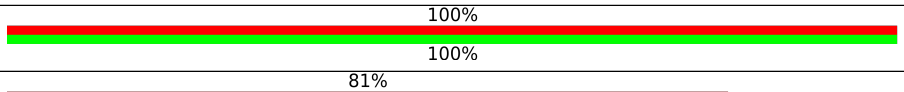
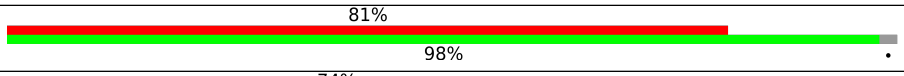
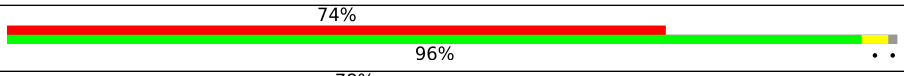
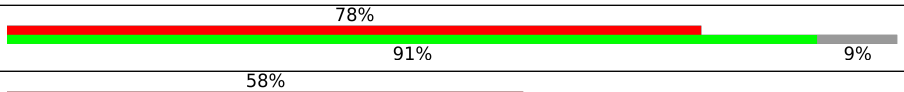
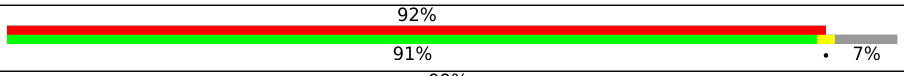
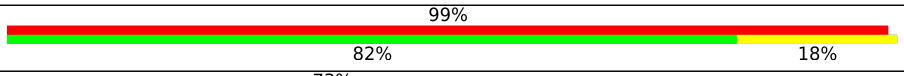
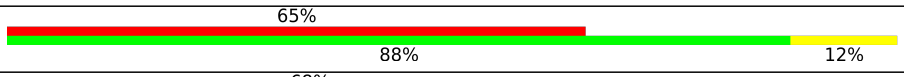
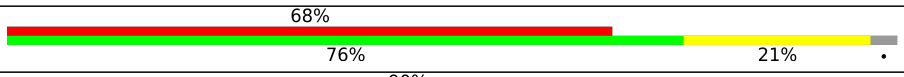
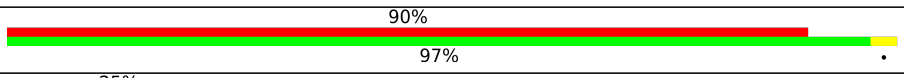
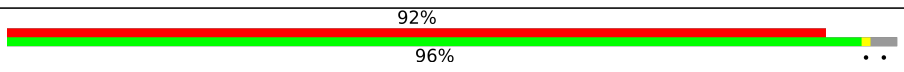
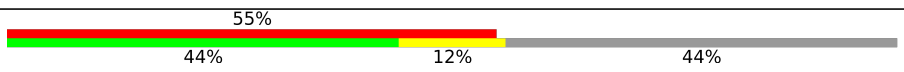
Mol	Chain	Length	Quality of chain
34	i3	105	
35	j3	97	
36	k3	70	
37	l3	51	
38	m3	102	
39	n3	25	
40	o3	106	
41	p3	92	
42	r3	137	
43	s3	318	
44	t3	165	
45	23	76	
46	54	3543	
47	74	120	
48	84	156	
49	NI	29	
50	NA	215	
51	NB	206	
52	TT	440	
53	1	64	

2 Entry composition

There are 55 unique types of molecules in this entry. The entry contains 143047 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A3	248	1898	1189	389	314	6	0	0

- Molecule 2 is a protein called uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B3	394	3172	2020	597	542	13	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B3	1	MET	-	initiating methionine	UNP G1TL06

- Molecule 3 is a protein called uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C3	362	2883	1812	577	480	14	0	0

- Molecule 4 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D3	293	2391	1512	438	427	14	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D3	1	MET	-	initiating methionine	UNP G1SYJ6

- Molecule 5 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E3	216	Total	C	N	O	S	0	0
			1729	1115	329	282	3		

- Molecule 6 is a protein called Ul30.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F3	225	Total	C	N	O	S	0	0
			1875	1205	358	303	9		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F3	61	ARG	GLY	conflict	UNP G1TUB1
F3	93	ARG	GLY	conflict	UNP G1TUB1
F3	131	MET	VAL	conflict	UNP G1TUB1
F3	153	ILE	VAL	conflict	UNP G1TUB1

- Molecule 7 is a protein called eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G3	233	Total	C	N	O	S	0	0
			1879	1199	361	315	4		

- Molecule 8 is a protein called uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H3	190	Total	C	N	O	S	0	0
			1516	954	284	272	6		

- Molecule 9 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I3	205	Total	C	N	O	S	0	0
			1664	1056	321	274	13		

- Molecule 10 is a protein called Ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J3	170	Total	C	N	O	S	0	0
			1362	861	254	241	6		

- Molecule 11 is a protein called eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L3	210	Total	C	N	O	S	0	0
			1702	1065	354	279	4		

- Molecule 12 is a protein called Ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M3	138	Total	C	N	O	S	0	0
			1137	727	221	182	7		

- Molecule 13 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N3	203	Total	C	N	O	S	0	0
			1701	1072	359	266	4		

- Molecule 14 is a protein called uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O3	199	Total	C	N	O	S	0	0
			1630	1051	319	255	5		

- Molecule 15 is a protein called uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P3	153	Total	C	N	O	S	0	0
			1242	777	241	215	9		

- Molecule 16 is a protein called eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q3	187	Total	C	N	O	S	0	0
			1514	946	315	249	4		

- Molecule 17 is a protein called eL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	R3	155	Total	C	N	O	S	0	0
			1294	808	278	199	9		

- Molecule 18 is a protein called eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S3	176	Total	C	N	O	S	0	0
			1462	930	285	236	11		

- Molecule 19 is a protein called eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	T3	159	Total	C	N	O	S	0	0
			1298	823	252	217	6		

- Molecule 20 is a protein called eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	U3	102	Total	C	N	O	S	0	0
			834	534	146	152	2		

- Molecule 21 is a protein called Ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V3	131	Total	C	N	O	S	0	0
			979	618	184	172	5		

- Molecule 22 is a protein called eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W3	63	Total	C	N	O	S	0	0
			528	337	103	85	3		

- Molecule 23 is a protein called uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X3	118	Total	C	N	O	S	0	0
			967	618	181	167	1		

- Molecule 24 is a protein called Ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y3	134	Total	C	N	O	S	0	0
			1115	700	226	186	3		

- Molecule 25 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z3	135	Total	C	N	O	S	0	0
			1107	714	208	182	3		

- Molecule 26 is a protein called uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	a3	147	Total	C	N	O	S	0	0
			1162	734	239	185	4		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a3	1	MET	-	initiating methionine	UNP G1SNY0

- Molecule 27 is a protein called eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b3	104	Total	C	N	O	S	0	0
			848	527	189	129	3		

- Molecule 28 is a protein called eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	c3	98	Total	C	N	O	S	0	0
			761	481	134	140	6		

- Molecule 29 is a protein called eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d3	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 30 is a protein called eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	e3	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 31 is a protein called eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	f3	109	Total	C	N	O	S	0	0
			876	555	174	143	4		

- Molecule 32 is a protein called eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	g3	114	Total	C	N	O	S	0	0
			906	566	187	147	6		

- Molecule 33 is a protein called uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	h3	122	Total	C	N	O	S	0	0
			1013	640	204	168	1		

- Molecule 34 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	i3	102	Total	C	N	O	S	0	0
			830	520	176	129	5		

- Molecule 35 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	j3	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 36 is a protein called eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	k3	69	Total	C	N	O	S	0	0
			569	366	103	99	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k3	24	LYS	ASN	conflict	UNP G1U001

- Molecule 37 is a protein called eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l3	50	Total	C	N	O	S	0	0
			447	286	96	64	1		

- Molecule 38 is a protein called eL40.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	m3	52	Total	C	N	O	S	0	0
			429	266	90	67	6		

- Molecule 39 is a protein called 60s ribosomal protein l41.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	n3	25	Total	C	N	O	S	0	0
			239	145	64	27	3		

- Molecule 40 is a protein called eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	o3	104	Total	C	N	O	S	0	0
			851	533	174	138	6		

- Molecule 41 is a protein called eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	p3	91	Total	C	N	O	S	0	0
			708	445	136	120	7		

- Molecule 42 is a protein called eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	r3	124	Total	C	N	O	S	0	0
			994	616	205	167	6		

- Molecule 43 is a protein called uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	s3	196	Total	C	N	O	S	0	0
			1507	959	263	276	9		

- Molecule 44 is a protein called Ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	t3	153	Total	C	N	O	S	0	0
			1160	722	218	217	3		

- Molecule 45 is a RNA chain called P-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	23	76	Total	C	N	O	P	0	0
			1616	723	291	527	75		

- Molecule 46 is a RNA chain called 28S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	54	3543	Total	C	N	O	P	0	0
			75972	33833	13910	24686	3543		

- Molecule 47 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	74	120	Total	C	N	O	P	0	0
			2558	1141	456	842	119		

- Molecule 48 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	84	151	Total	C	N	O	P	0	0
			3208	1432	564	1062	150		

- Molecule 49 is a protein called Nascent polypeptide-associated complex subunit alpha N-terminal region.

Mol	Chain	Residues	Atoms				AltConf	Trace
49	NI	29	Total	C	N	O	0	0
			150	92	29	29		

- Molecule 50 is a protein called Nascent polypeptide-associated complex subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	NA	54	Total	C	N	O	S	0	0
			420	270	71	78	1		

- Molecule 51 is a protein called Transcription factor BTF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	NB	58	Total 444	C 278	N 76	O 88	S 2	0	0

- Molecule 52 is a protein called Tetratricopeptide repeat protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	TT	426	Total 3337	C 2097	N 580	O 647	S 13	0	0

- Molecule 53 is a protein called Tubulin Beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	1	36	Total 292	C 184	N 51	O 55	S 2	0	0

- Molecule 54 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	P3	2	Total 2	Mg 2	0
54	V3	1	Total 1	Mg 1	0
54	a3	1	Total 1	Mg 1	0
54	g3	1	Total 1	Mg 1	0
54	j3	1	Total 1	Mg 1	0
54	54	201	Total 201	Mg 201	0
54	74	7	Total 7	Mg 7	0
54	84	6	Total 6	Mg 6	0

- Molecule 55 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
55	g3	1	Total 1	Zn 1	0
55	j3	1	Total 1	Zn 1	0

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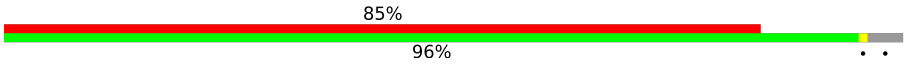
Mol	Chain	Residues	Atoms		AltConf
55	m3	1	Total 1	Zn 1	0
55	o3	1	Total 1	Zn 1	0
55	p3	1	Total 1	Zn 1	0

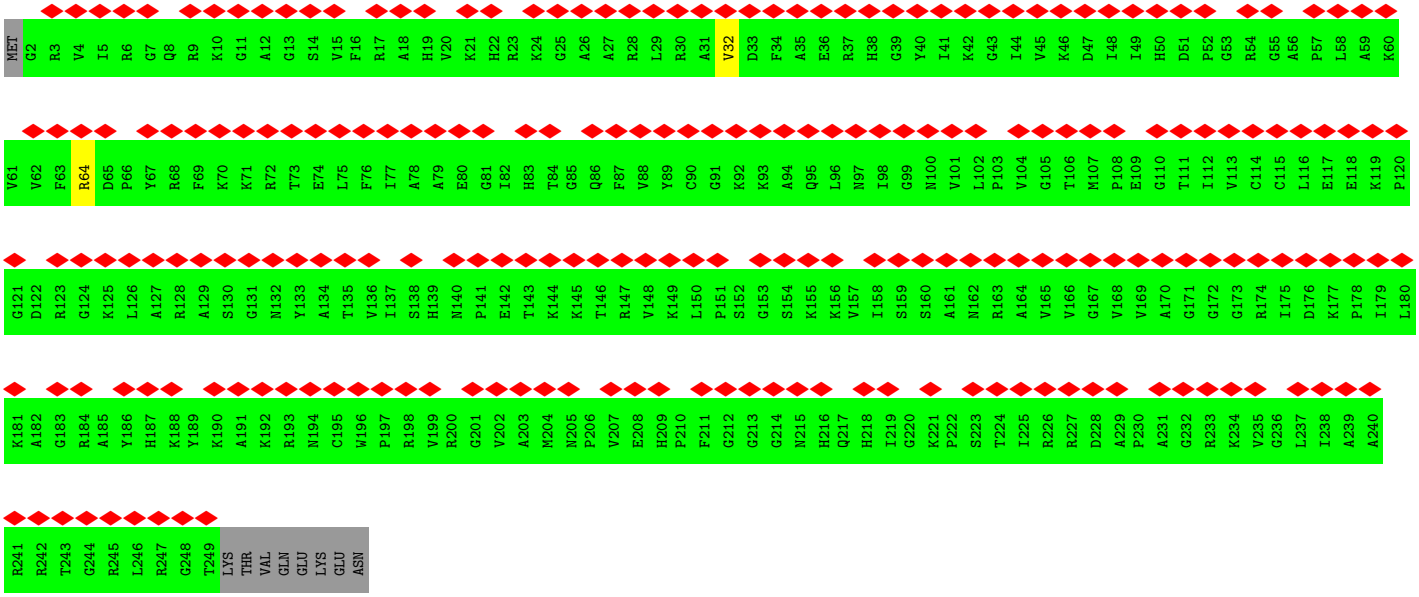
3 Residue-property plots (i)

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: Ribosomal protein L8

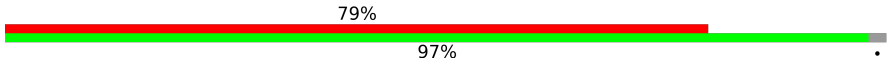
Chain A3:

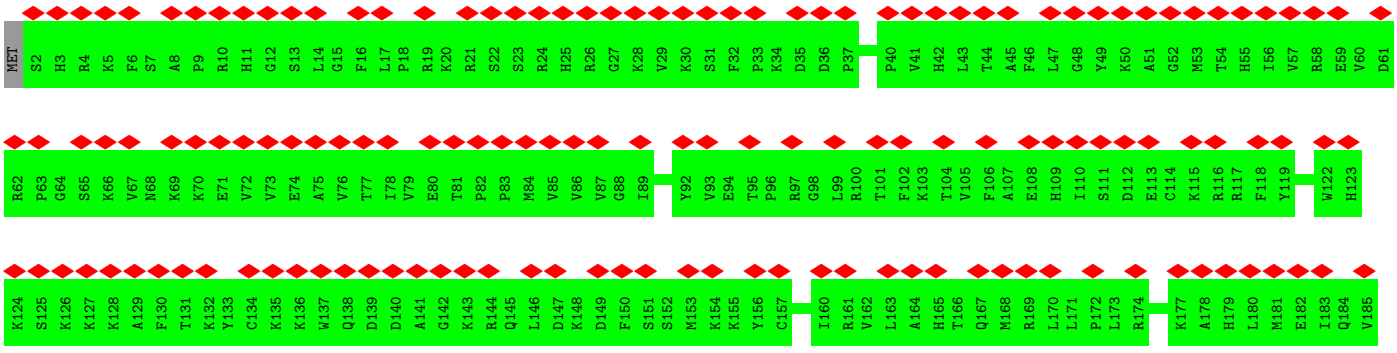


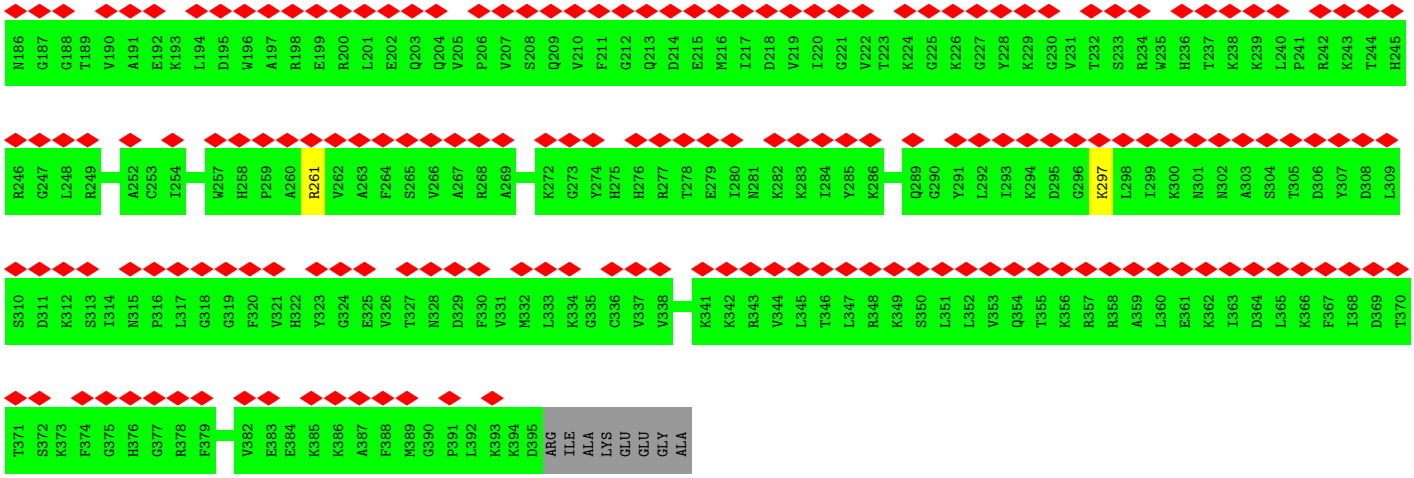


• Molecule 2: uL3

Chain B3:

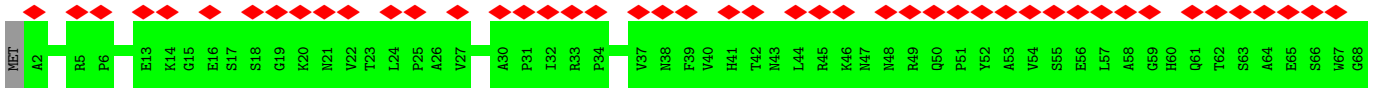






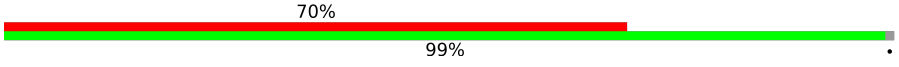
• Molecule 3: uL4

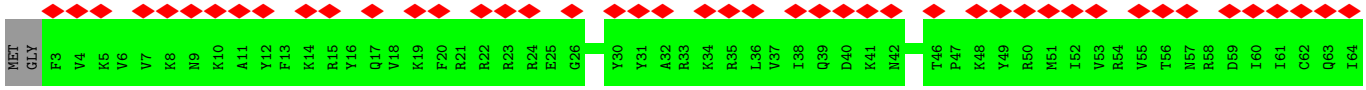
Chain C3:

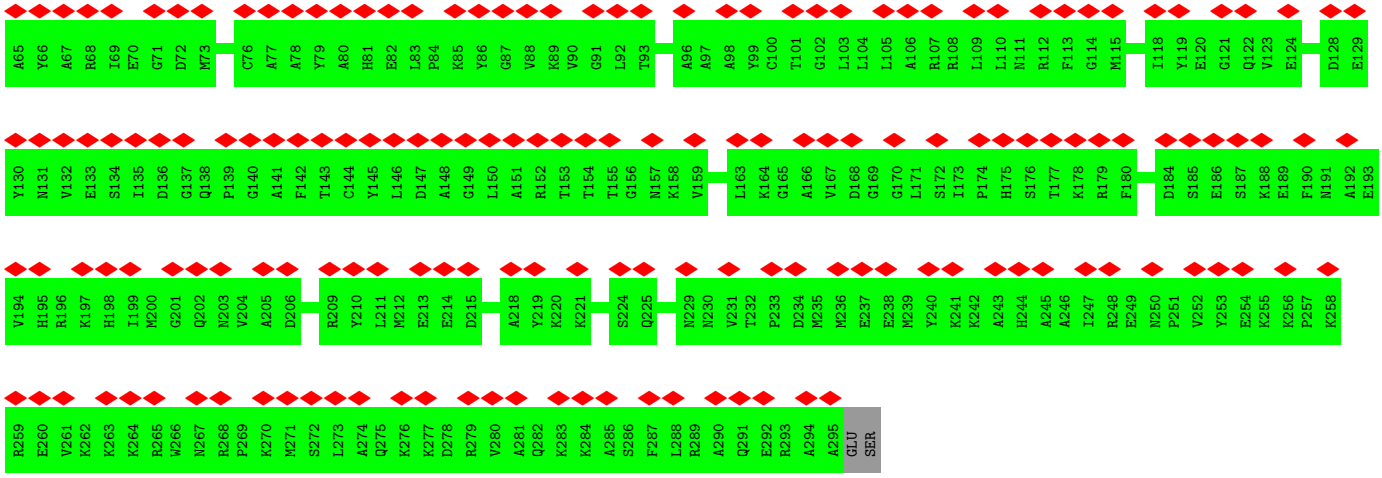


• Molecule 4: 60S ribosomal protein L5

Chain D3:

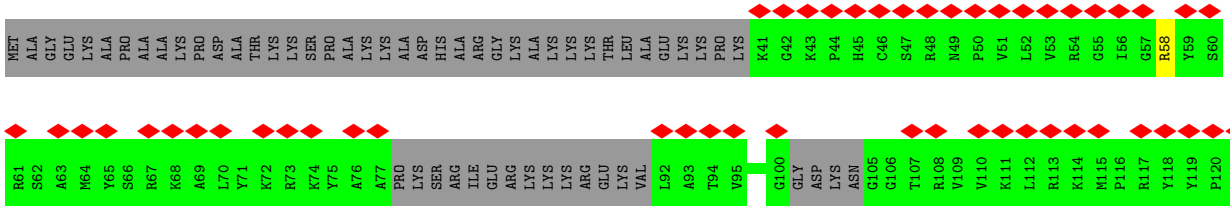






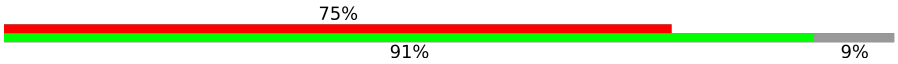
• Molecule 5: 60S ribosomal protein L6

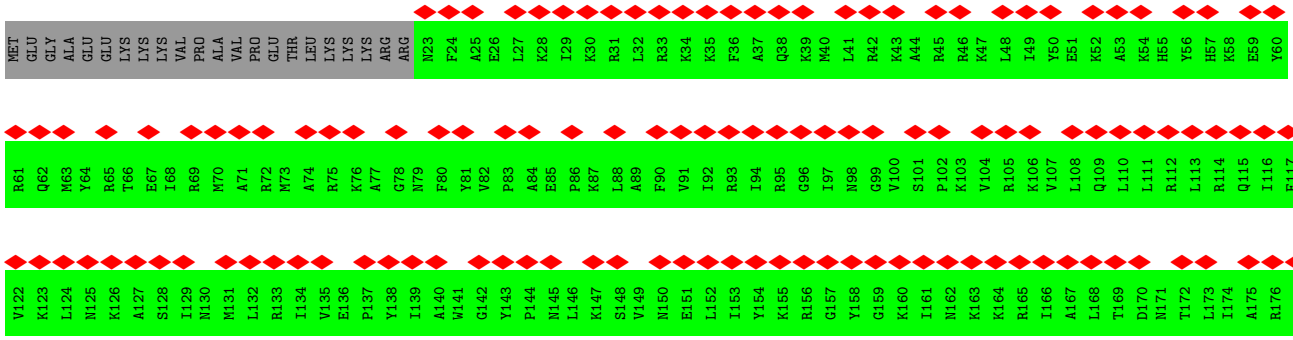
Chain E3:



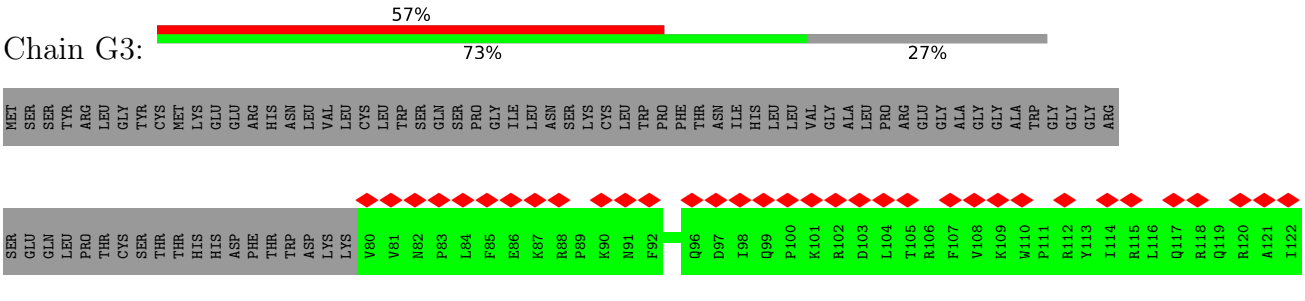
• Molecule 6: Ul30

Chain F3:

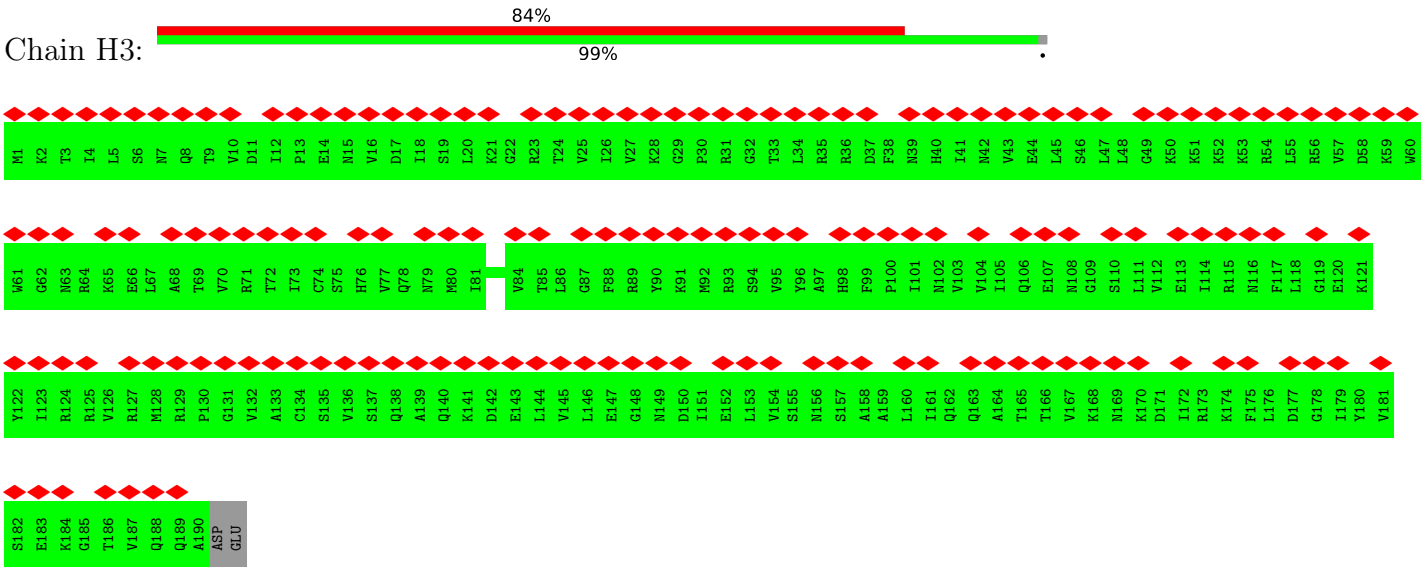




• Molecule 7: eL8

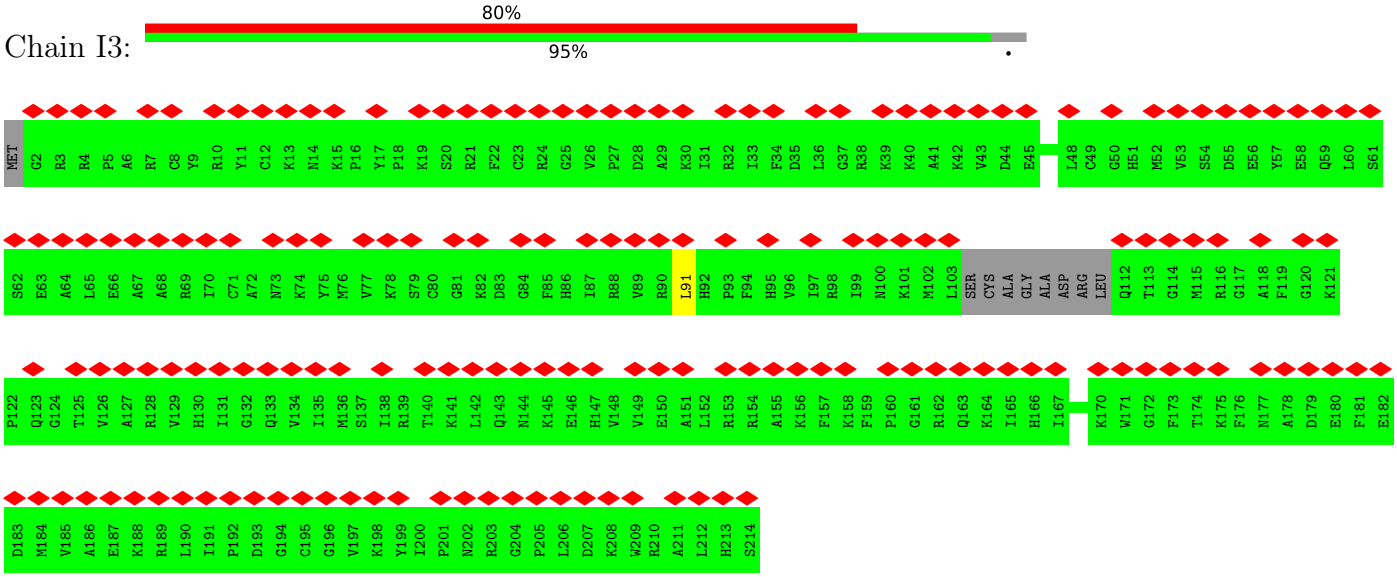


• Molecule 8: uL6



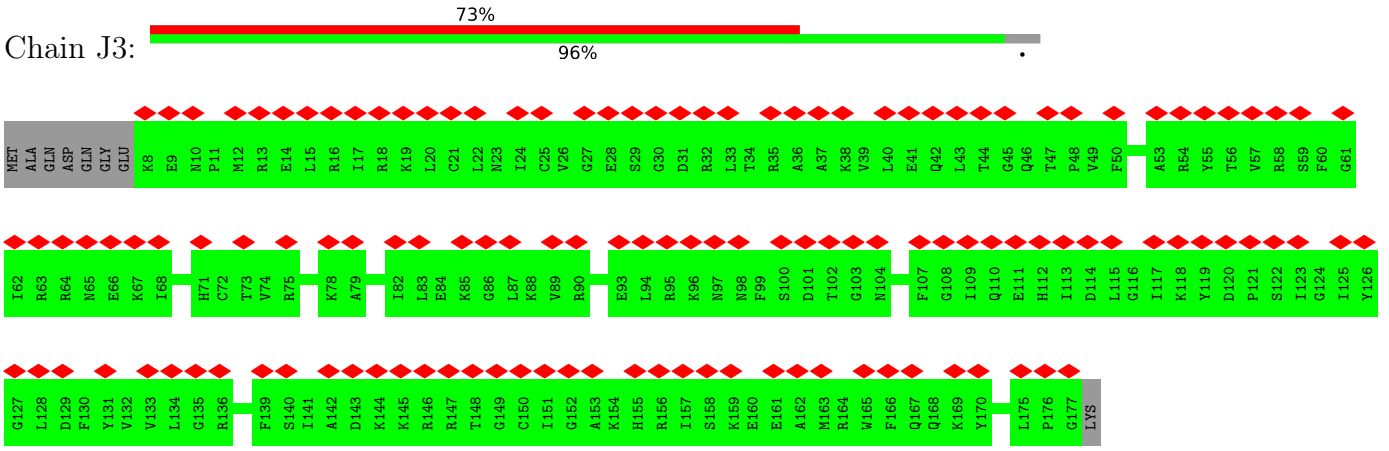
• Molecule 9: 60S ribosomal protein L10

Chain I3:



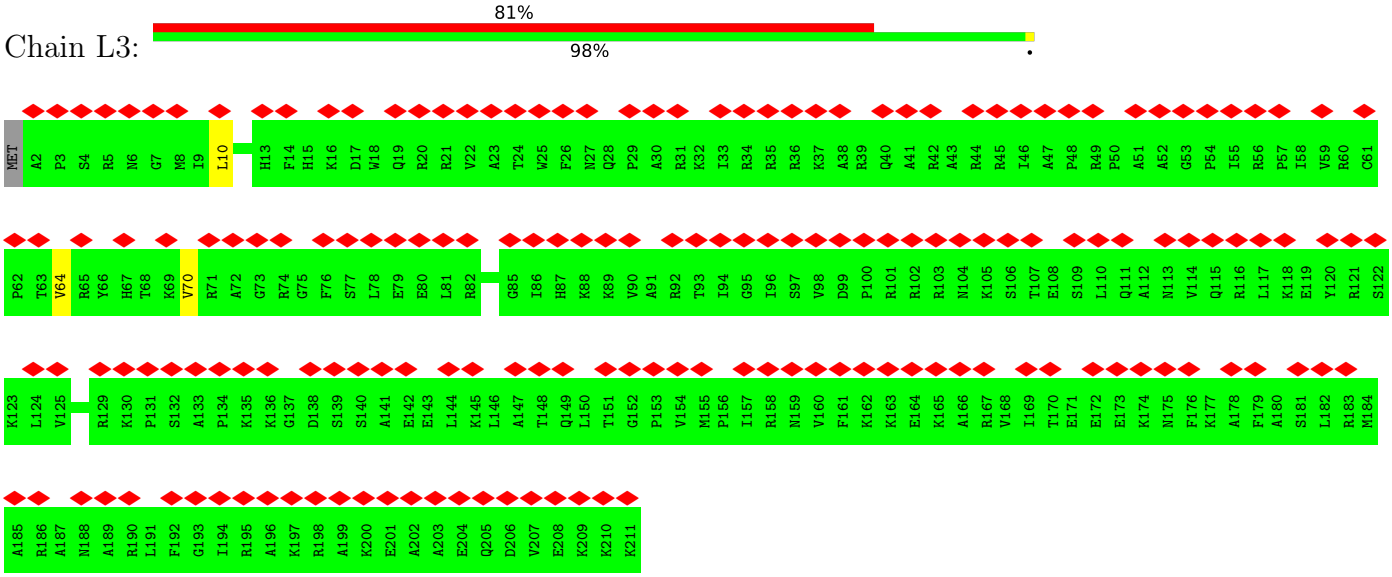
• Molecule 10: Ribosomal protein L11

Chain J3:



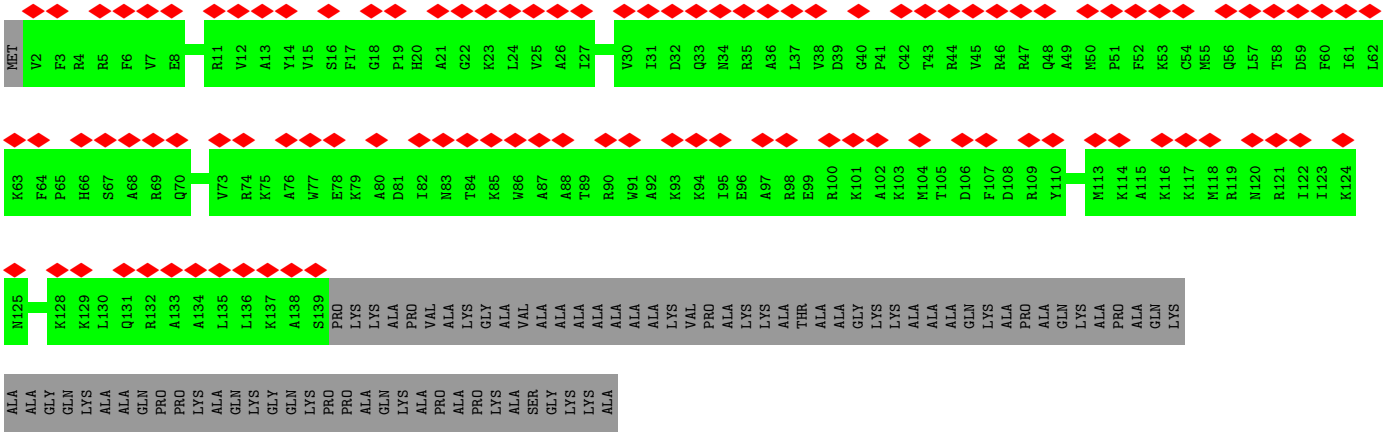
• Molecule 11: eL13

Chain L3:



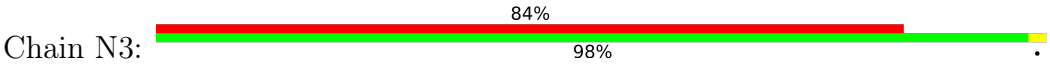
• Molecule 12: Ribosomal protein L14

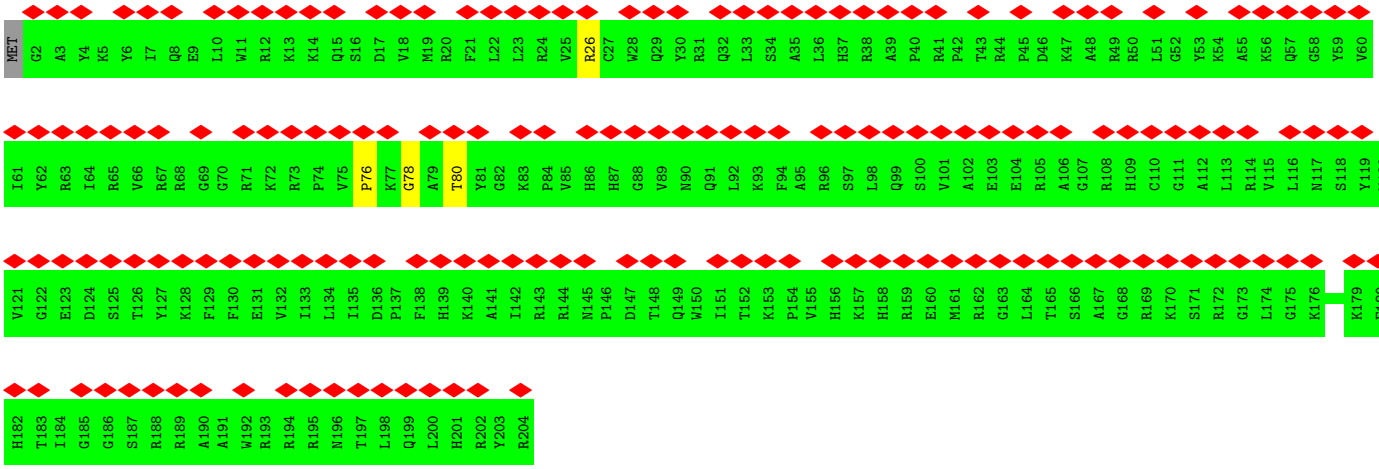
Chain M3:



• Molecule 13: Ribosomal protein L15

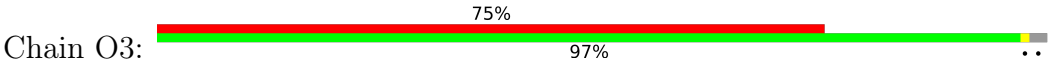
Chain N3:

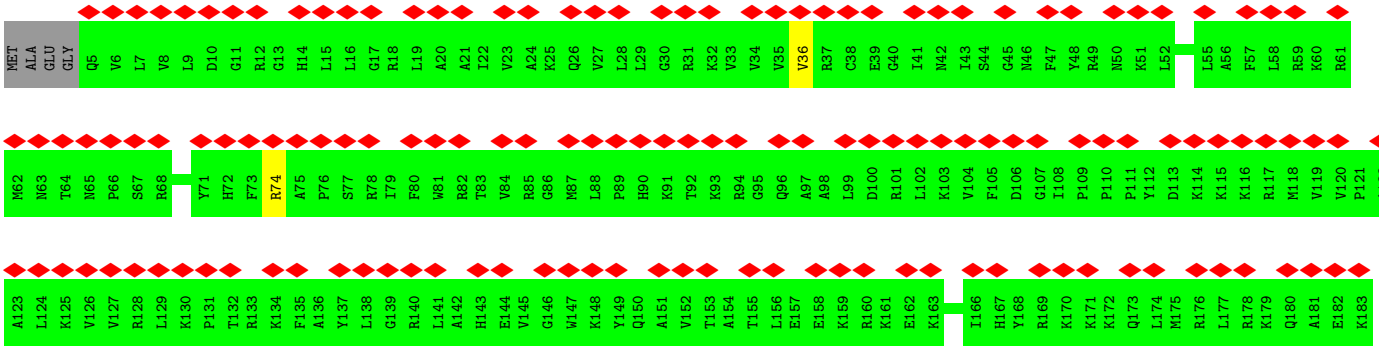


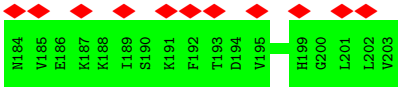


• Molecule 14: uL13

Chain O3:

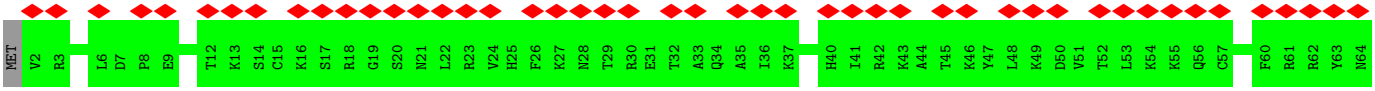


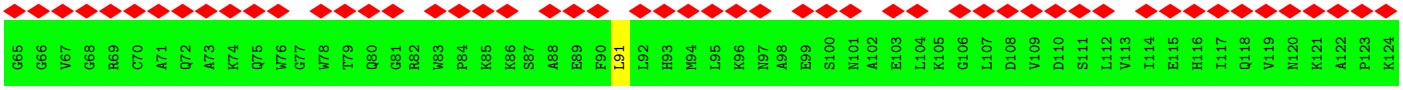


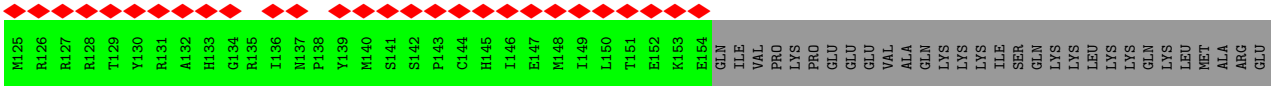


• Molecule 15: uL22

Chain P3:

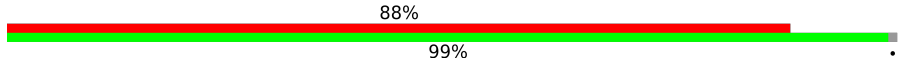


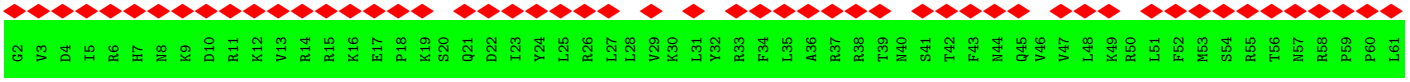


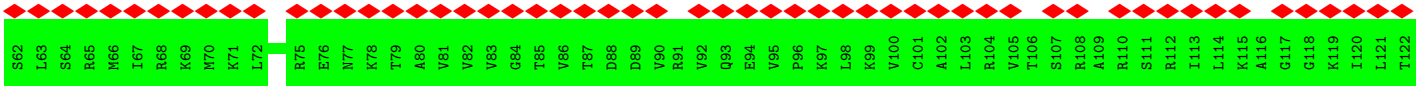


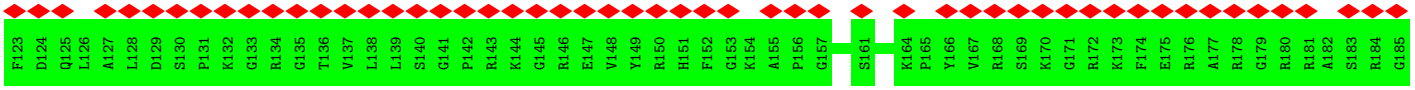
• Molecule 16: eL18

Chain Q3:



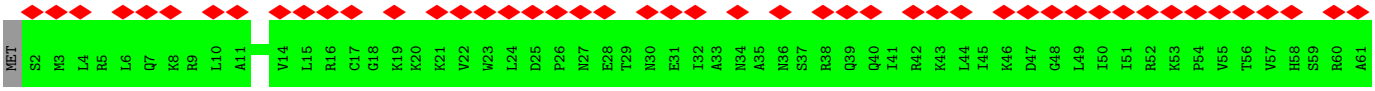


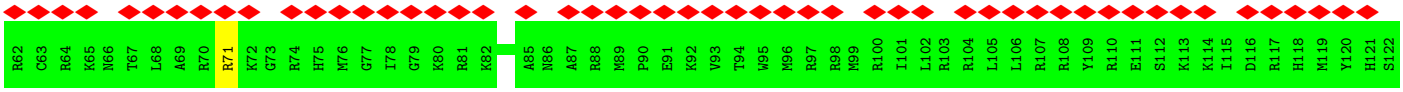


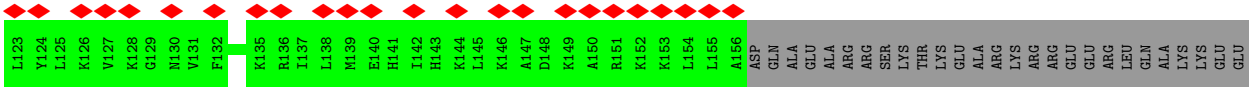


• Molecule 17: eL19

Chain R3:

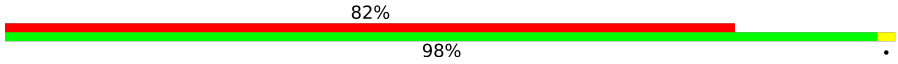


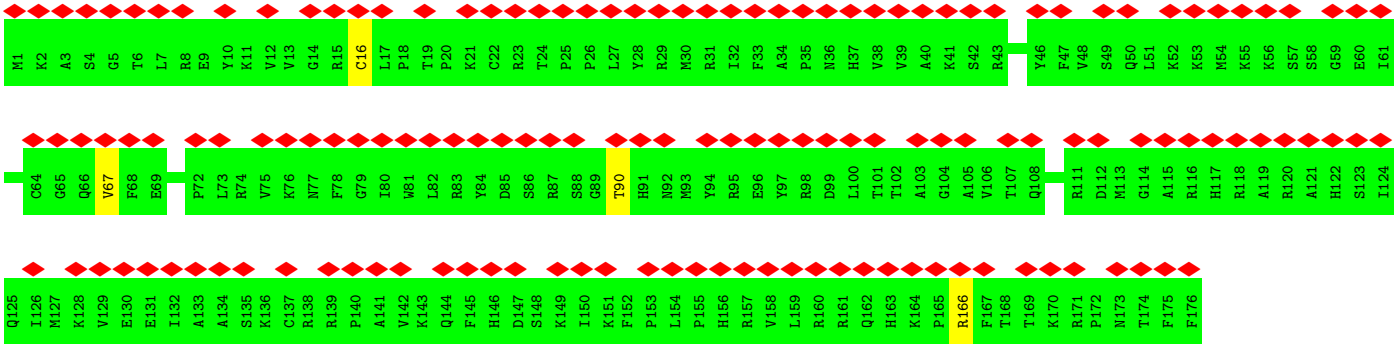




• Molecule 18: eL20

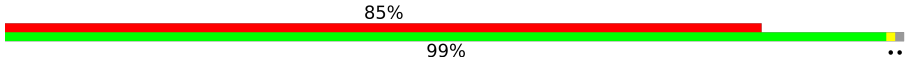
Chain S3:

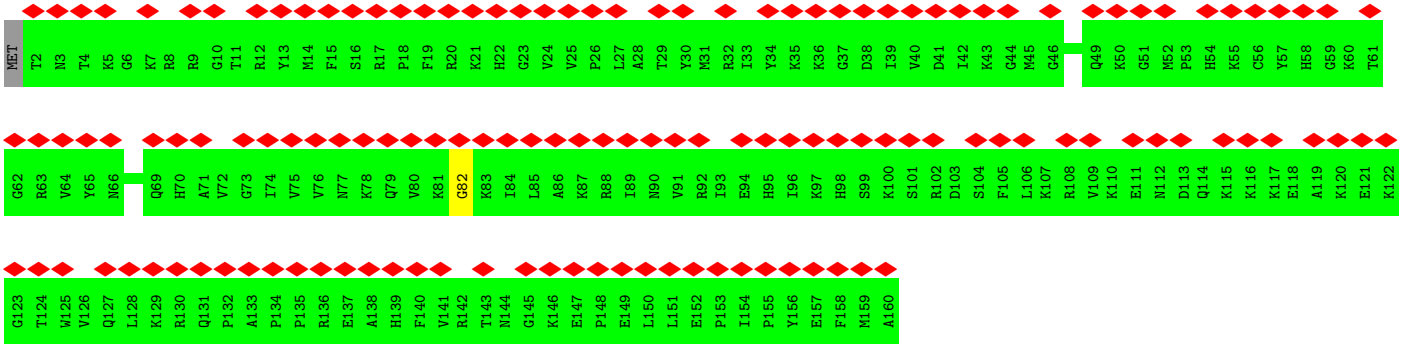




• Molecule 19: eL21

Chain T3:



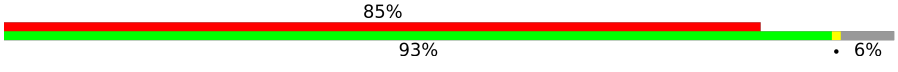


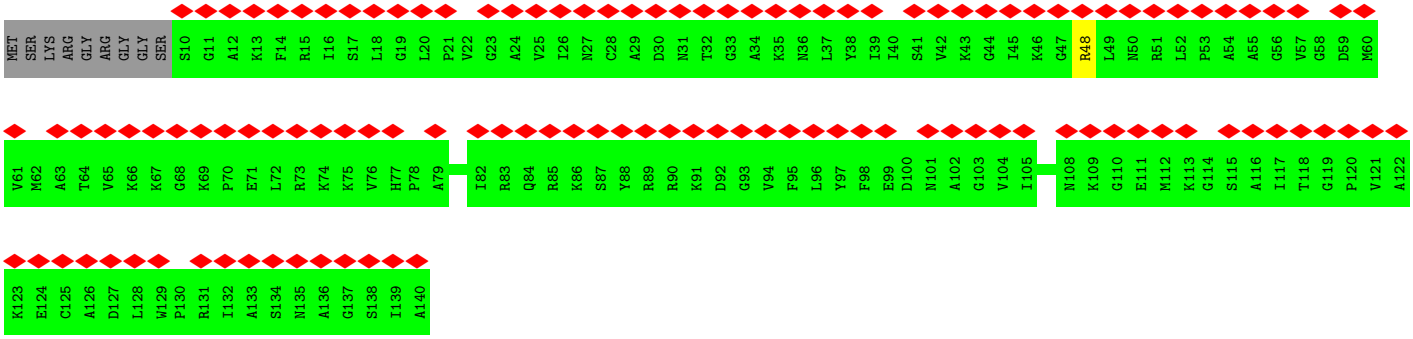
• Molecule 20: eL22

Chain U3:

• Molecule 21: Ribosomal protein L23

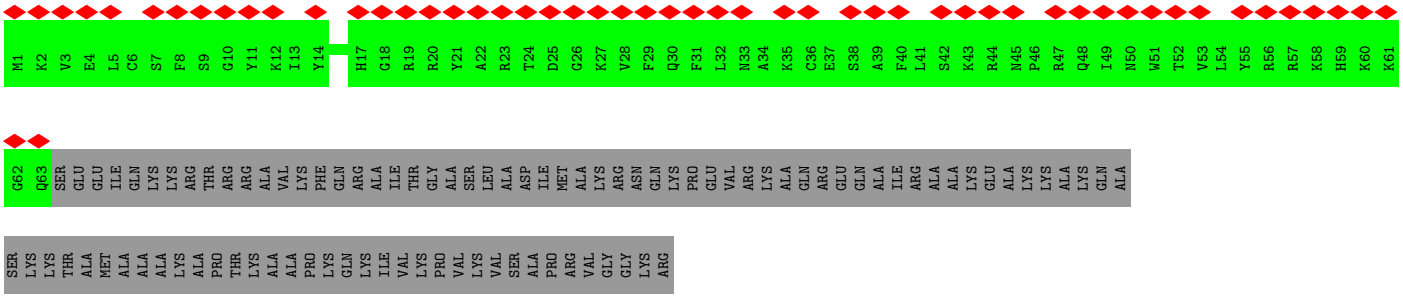
Chain V3:





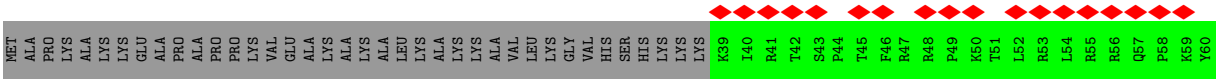
• Molecule 22: eL24

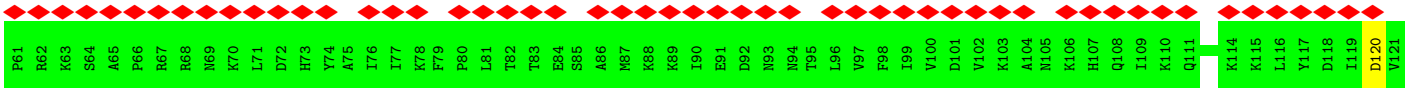
Chain W3:



• Molecule 23: uL23

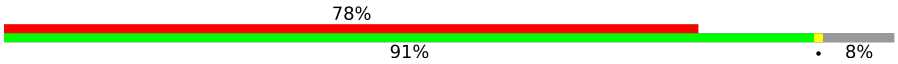
Chain X3:

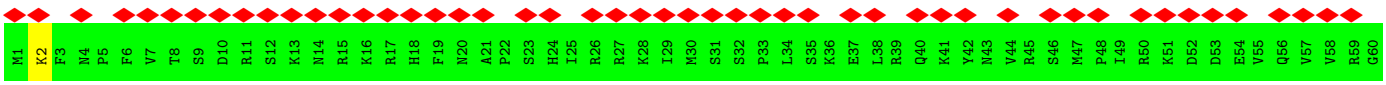


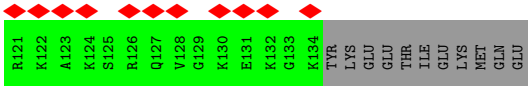


• Molecule 24: Ribosomal protein L26

Chain Y3:

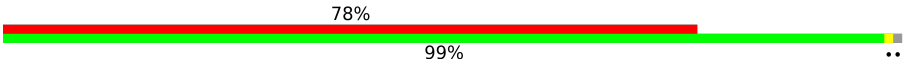


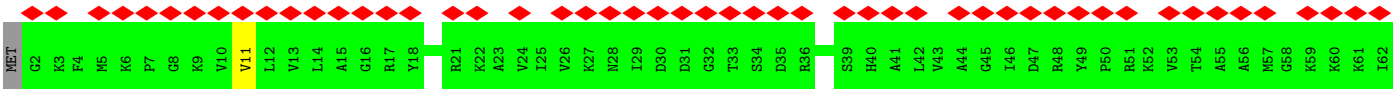


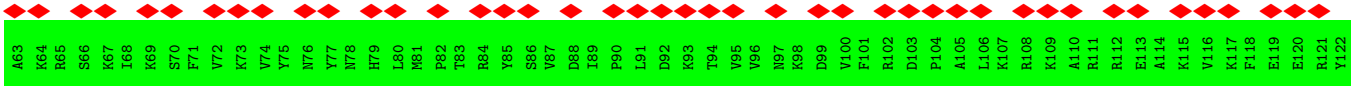


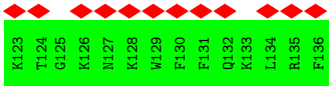
• Molecule 25: 60S ribosomal protein L27

Chain Z3:



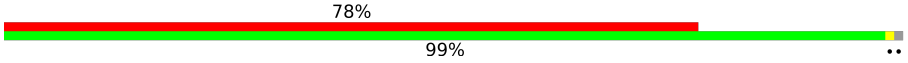


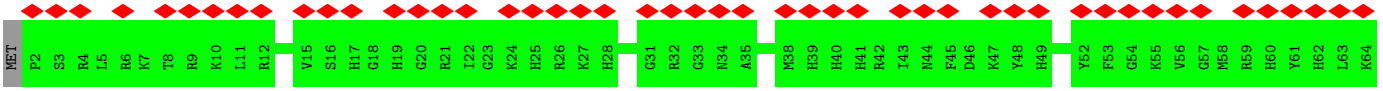


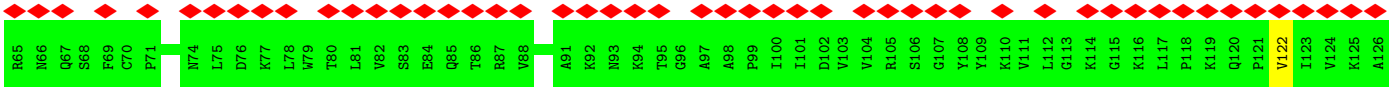


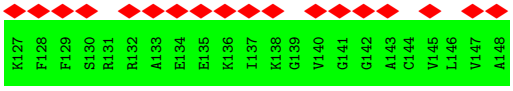
• Molecule 26: uL15

Chain a3:



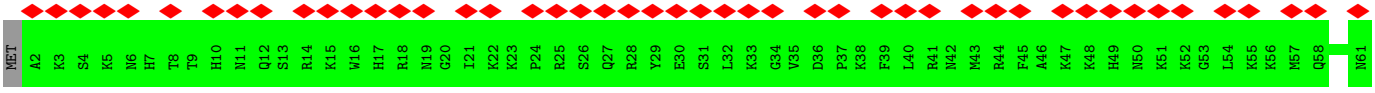


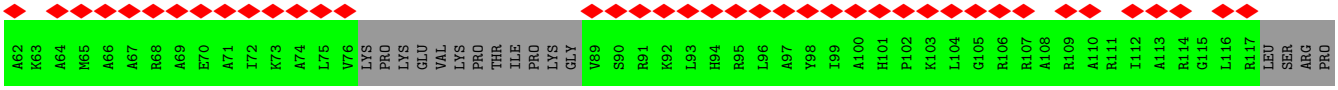


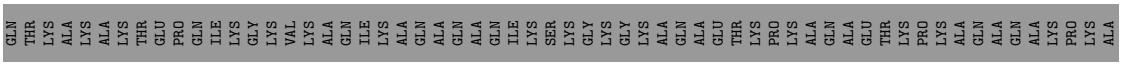


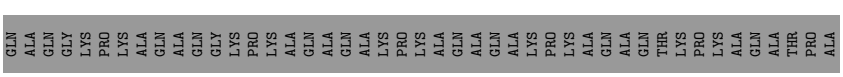
• Molecule 27: eL29

Chain b3:







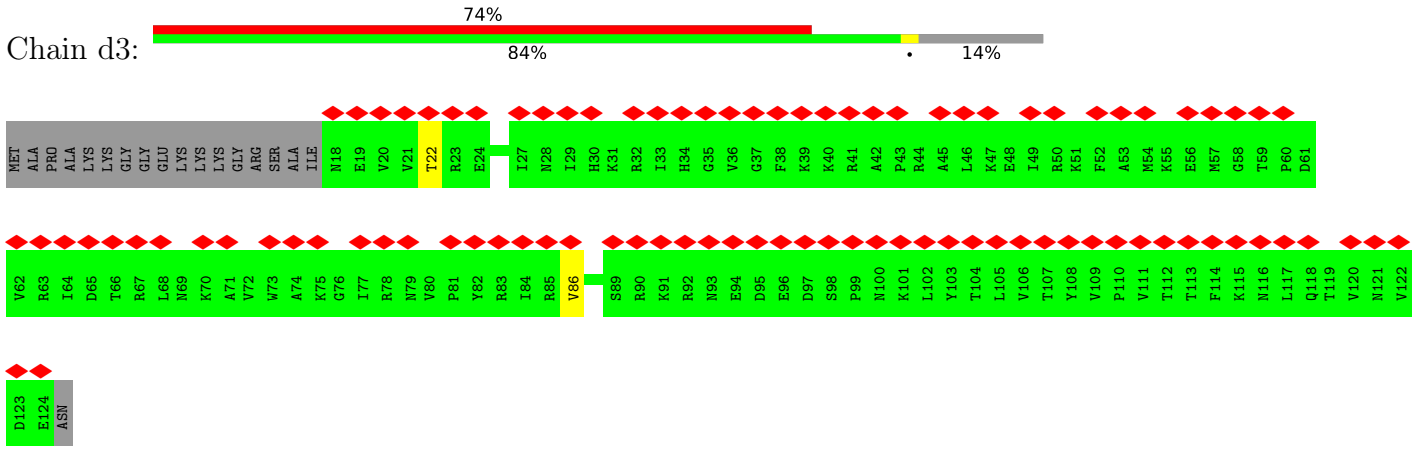


• Molecule 28: eL30

Chain c3:

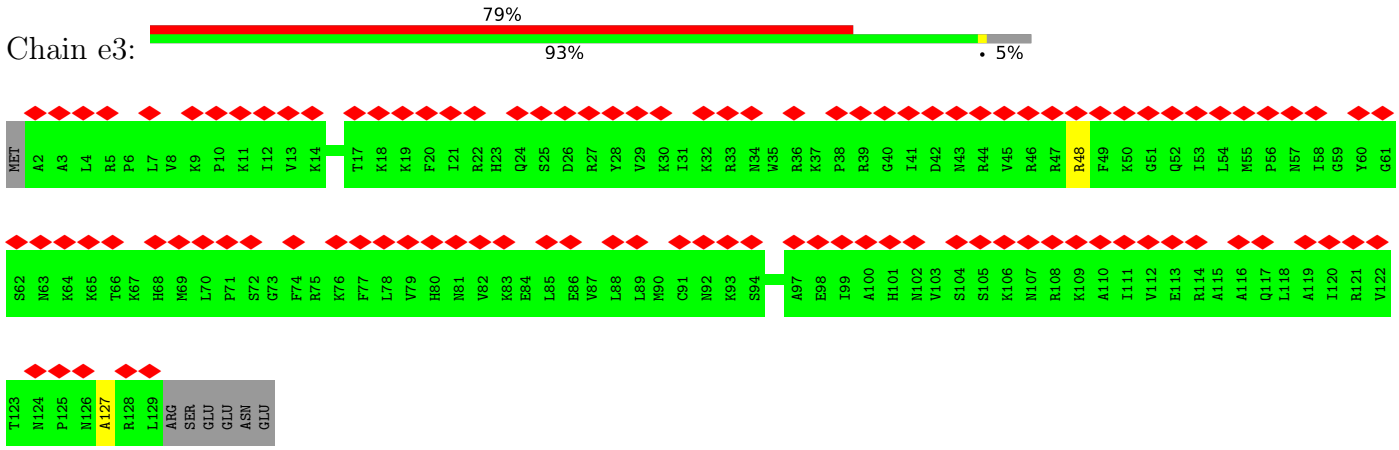
• Molecule 29: eL31

Chain d3:



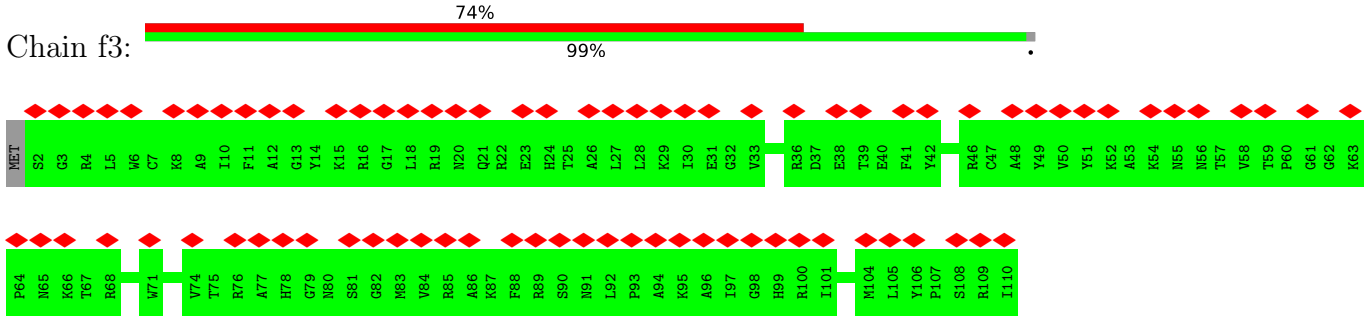
• Molecule 30: eL32

Chain e3:



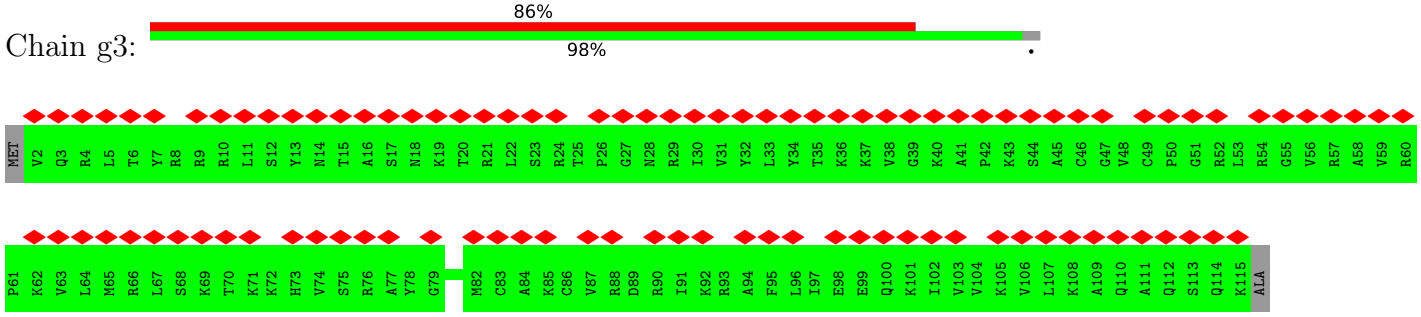
• Molecule 31: eL33

Chain f3:



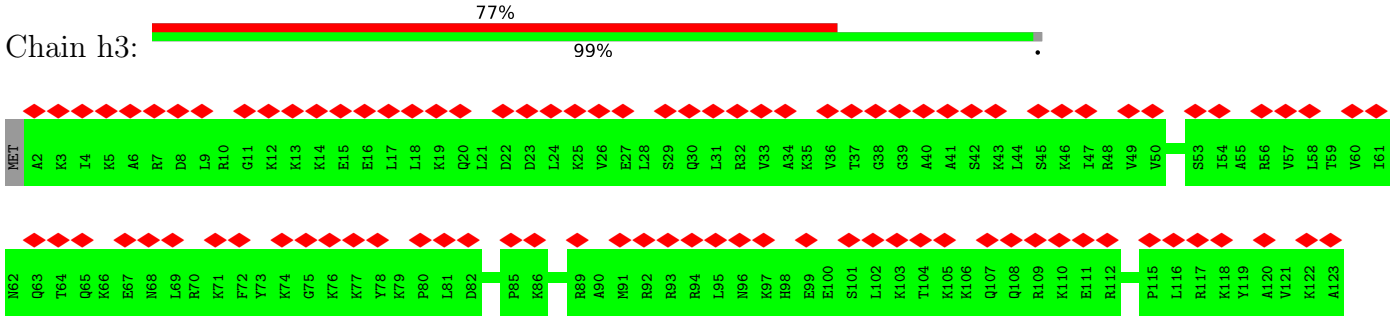
• Molecule 32: eL34

Chain g3:



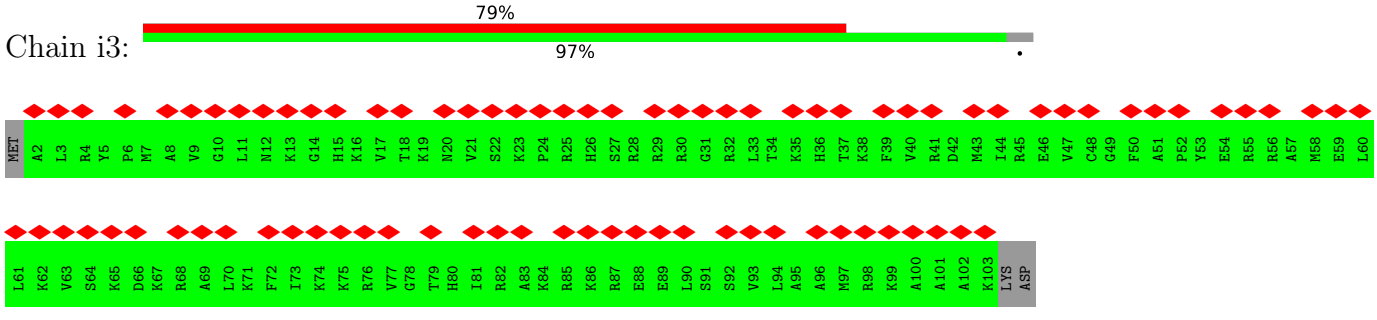
• Molecule 33: uL29

Chain h3:



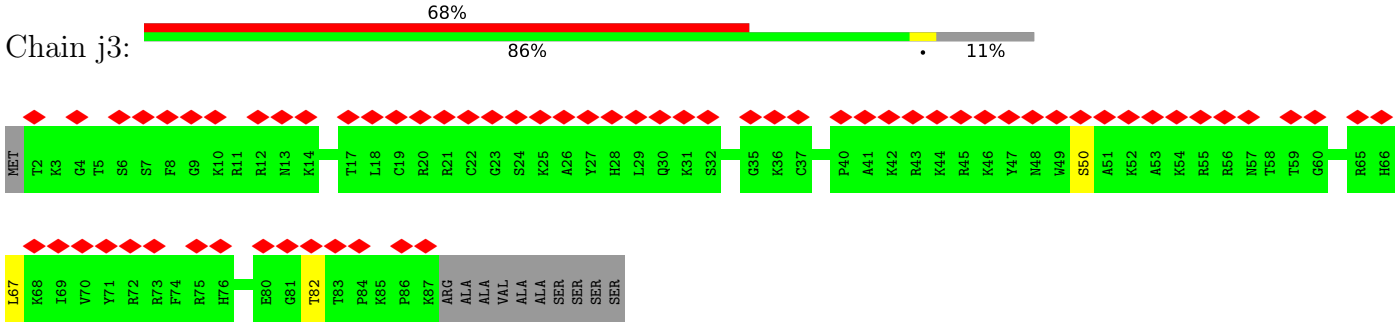
• Molecule 34: 60S ribosomal protein L36

Chain i3:



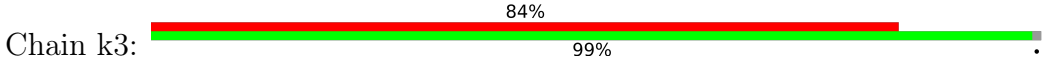
• Molecule 35: Ribosomal protein L37

Chain j3:



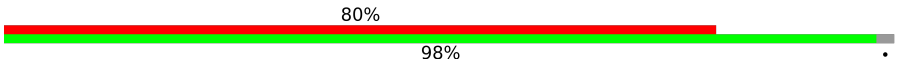
• Molecule 36: eL38

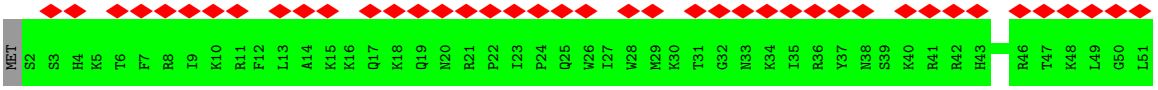
Chain k3:



• Molecule 37: eL39

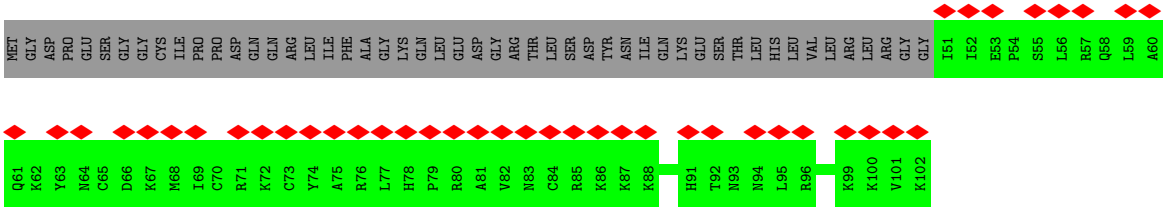
Chain l3:





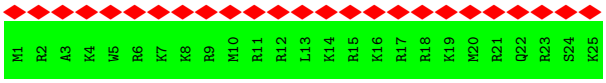
• Molecule 38: eL40

Chain m3:



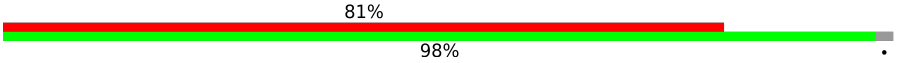
• Molecule 39: 60s ribosomal protein l41

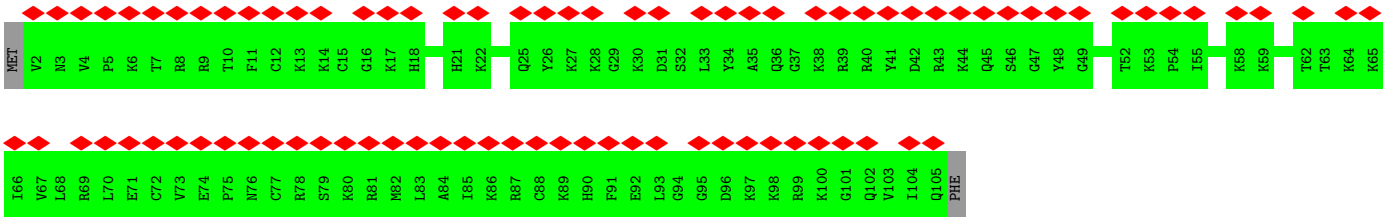
Chain n3:



• Molecule 40: eL42

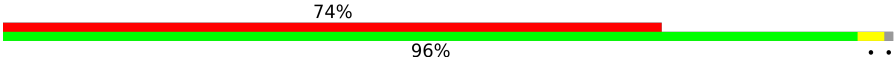
Chain o3:

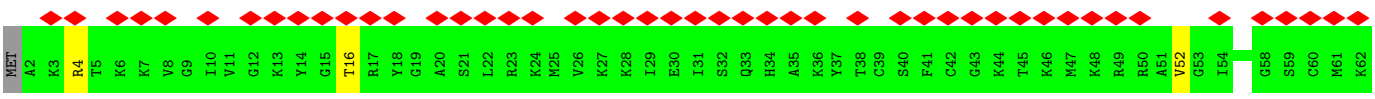


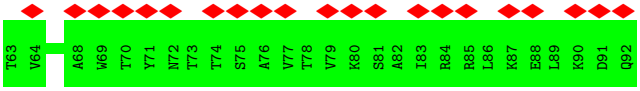


• Molecule 41: eL43

Chain p3:

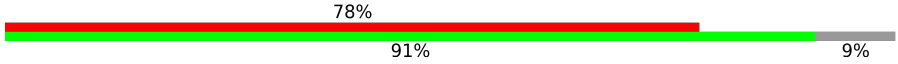


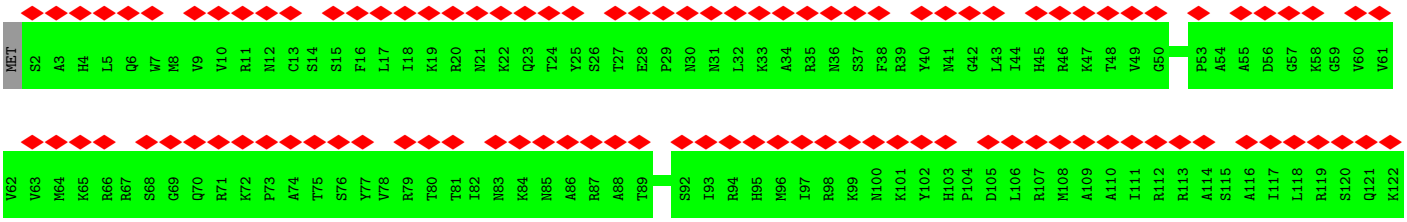




• Molecule 42: eL28

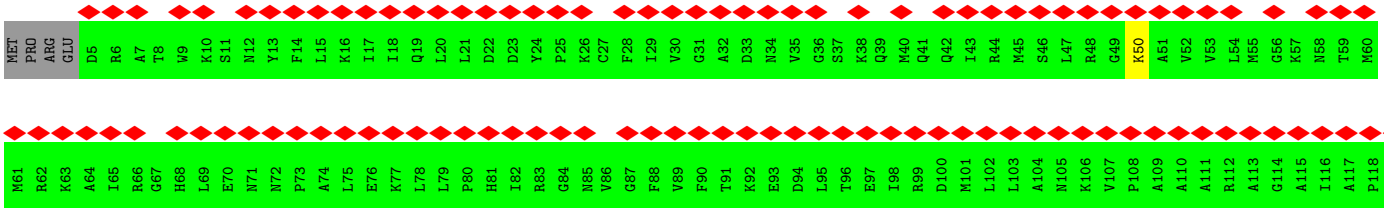
Chain r3:





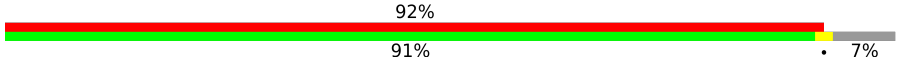
• Molecule 43: uL10

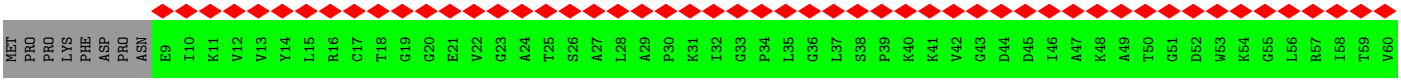
Chain s3:

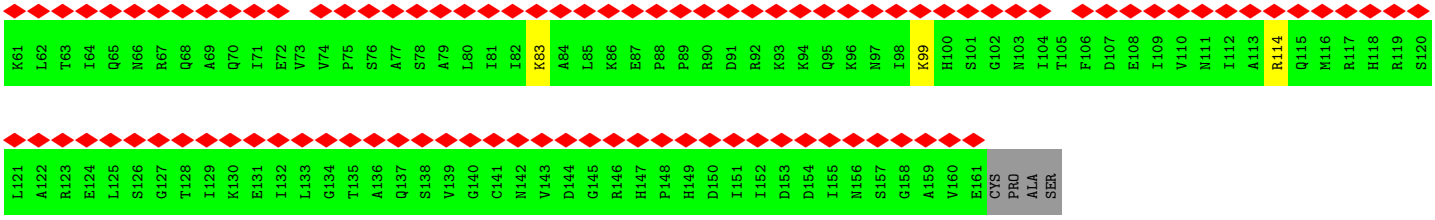


• Molecule 44: Ribosomal protein L12

Chain t3:

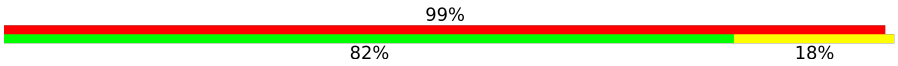






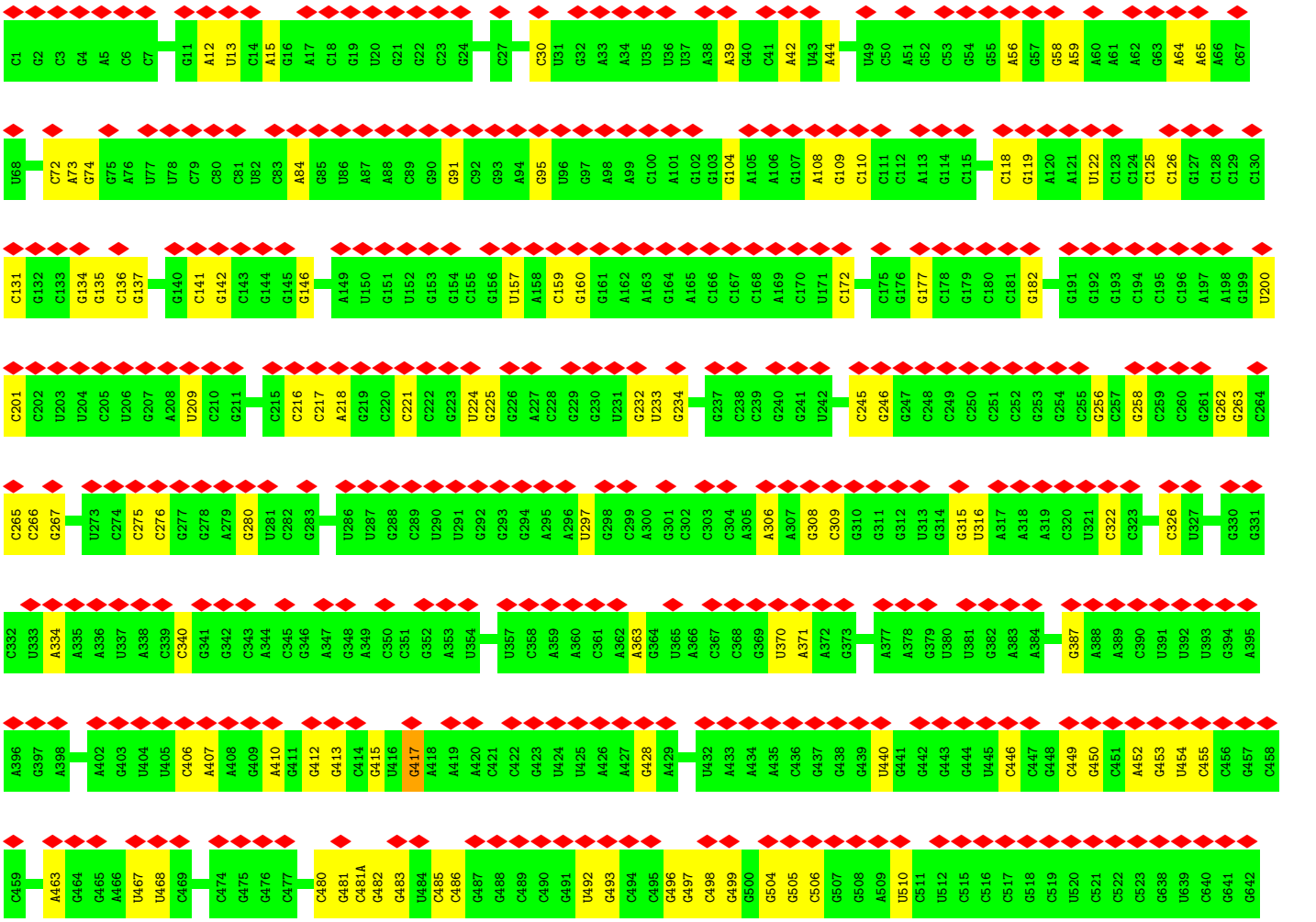
• Molecule 45: P-site tRNA

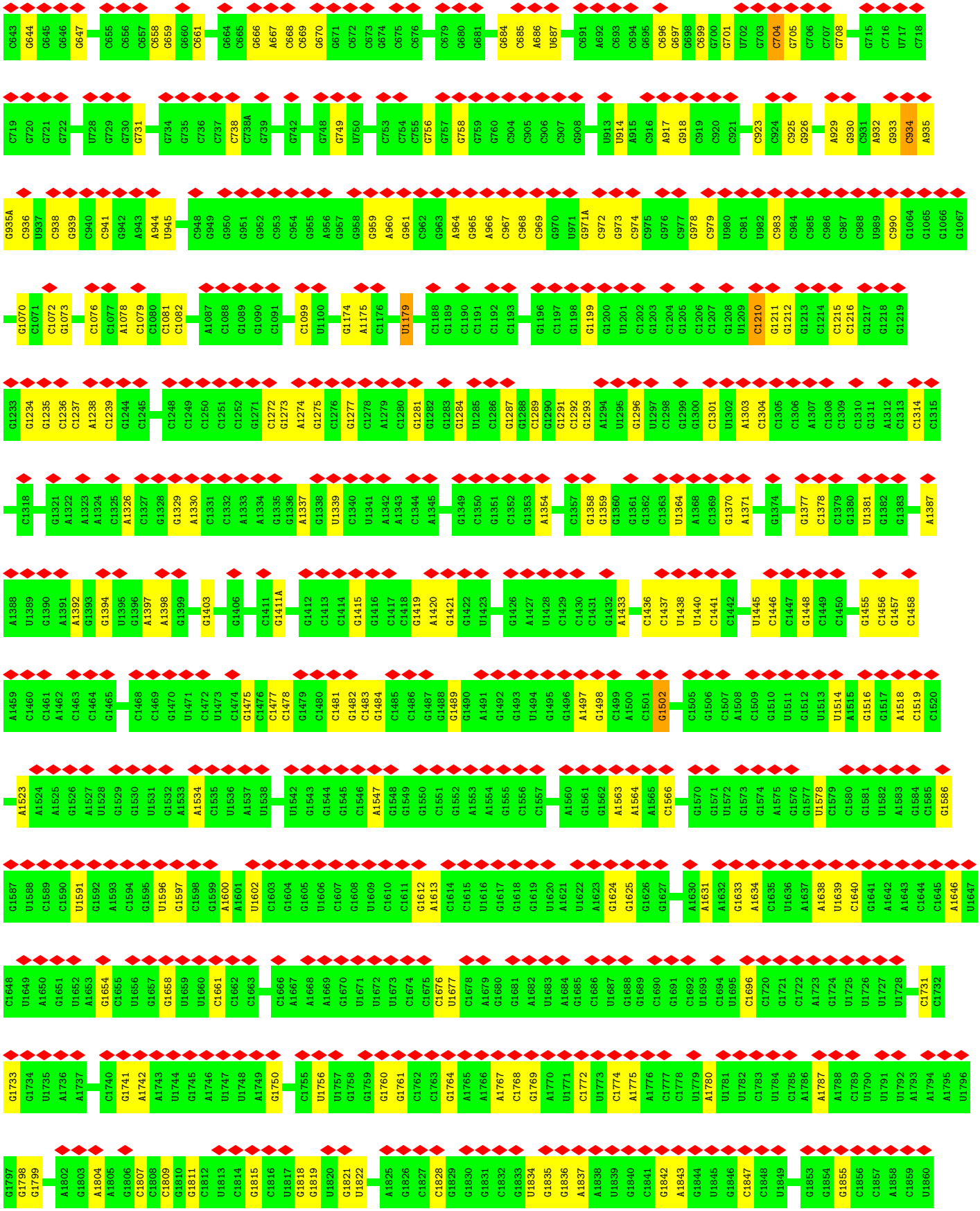
Chain 23:



• Molecule 46: 28S ribosomal RNA

Chain 54:

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C719 G720 G721 G722 U728 G729 G730 G731 G734 G735 C736 C737 C738 C738A G739 G742 G748 G749 U750 C753 C754 C755 G756 G757 G758 G759 G760 C904 C905 C906 C907 G908 U913 U914 A915 C916 A917 G918 C919 C920 C921 C923 C924 C925 G926 A929 G930 C931 A932 G933 C934 A935
G935A C936 U937 C938 G939 C940 C941 G942 A943 A944 U945 C948 G949 G950 G951 G952 C953 C954 G955 A956 G957 G958 G959 A960 G961 C962 G963 A964 G965 A966 C967 C968 C969 G970 U971 G971A C972 G973 C974 C975 G976 C977 G978 C979 U980 C981 U982 C983 C984 C985 C986 C987 C988 U989 C990 G1064 G1065 G1066 G1067
G1070 C1071 C1072 G1073 C1076 C1077 A1078 C1079 C1080 C1081 C1082 A1087 C1088 G1089 G1090 C1091 C1099 U1100 G1174 A1175 C1176 U1179 C1188 G1189 C1190 C1191 C1192 C1193 G1196 C1197 G1198 G1199 G1200 U1201 C1202 G1203 C1204 G1205 C1206 C1207 G1208 U1209 C1210 G1211 G1212 G1213 C1214 C1215 C1216 G1217 G1218 G1219
G1233 G1234 G1235 C1236 C1237 A1238 C1239 G1244 C1245 C1248 C1249 C1250 C1251 C1252 G1271 C1272 G1273 A1274 G1275 C1276 G1277 C1278 A1279 C1280 G1281 G1282 G1283 G1284 U1285 C1286 G1287 G1288 C1289 G1290 G1291 C1292 G1293 A1294 U1295 G1296 U1297 C1298 G1299 G1300 C1301 U1302 A1303 C1304 C1305 C1306 A1307 C1308 C1309 C1310 G1311 A1312 C1313 C1314 C1315
C1318 G1321 A1322 A1323 A1324 C1325 A1326 C1327 G1328 G1329 A1330 C1331 C1332 A1333 A1334 G1335 G1336 A1337 G1338 U1339 C1340 U1341 A1342 A1343 C1344 A1345 G1349 C1350 G1351 C1352 G1353 A1354 C1357 G1358 G1359 G1360 G1361 G1362 C1363 U1364 A1368 C1369 G1370 A1371 G1374 G1377 C1378 C1379 G1380 U1381 G1382 G1383 A1387
A1388 U1389 G1390 A1391 A1392 G1393 G1394 U1395 G1396 A1397 A1398 G1399 G1403 G1406 C1411 G1411A G1412 C1413 C1414 G1415 G1416 C1417 C1418 G1419 A1420 G1421 G1422 U1423 G1426 A1427 U1428 C1429 C1430 C1431 G1432 A1433 C1436 C1437 U1438 U1440 C1441 C1442 U1445 C1446 C1447 G1448 C1449 C1450 G1455 C1456 G1457 C1458
A1459 C1460 C1461 A1462 C1463 C1464 G1465 C1468 C1469 G1470 U1471 C1472 U1473 C1474 G1475 C1476 C1477 C1478 G1479 C1480 C1481 G1482 C1483 G1484 C1485 C1486 G1487 C1488 G1489 G1490 A1491 G1492 G1493 U1494 G1495 G1496 A1497 G1498 C1499 A1500 C1501 G1502 C1505 G1506 C1507 A1508 C1509 C1510 U1511 G1512 U1513 U1514 A1515 G1516 G1517 A1518 C1519 C1520
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C1648 U1649 A1650 G1651 U1652 A1653 G1654 C1655 U1656 G1657 G1658 U1659 U1660 C1661 C1662 C1663 C1666 A1667 A1668 A1669 G1670 U1671 U1672 U1673 C1674 C1675 C1676 U1677 C1678 A1679 G1680 G1681 A1682 U1683 A1684 G1685 C1686 U1687 G1688 G1689 C1690 G1691 C1692 U1693 C1694 U1695 C1696 C1720 G1721 C1722 A1723 G1724 U1725 U1726 U1727 U1728 C1731 C1732
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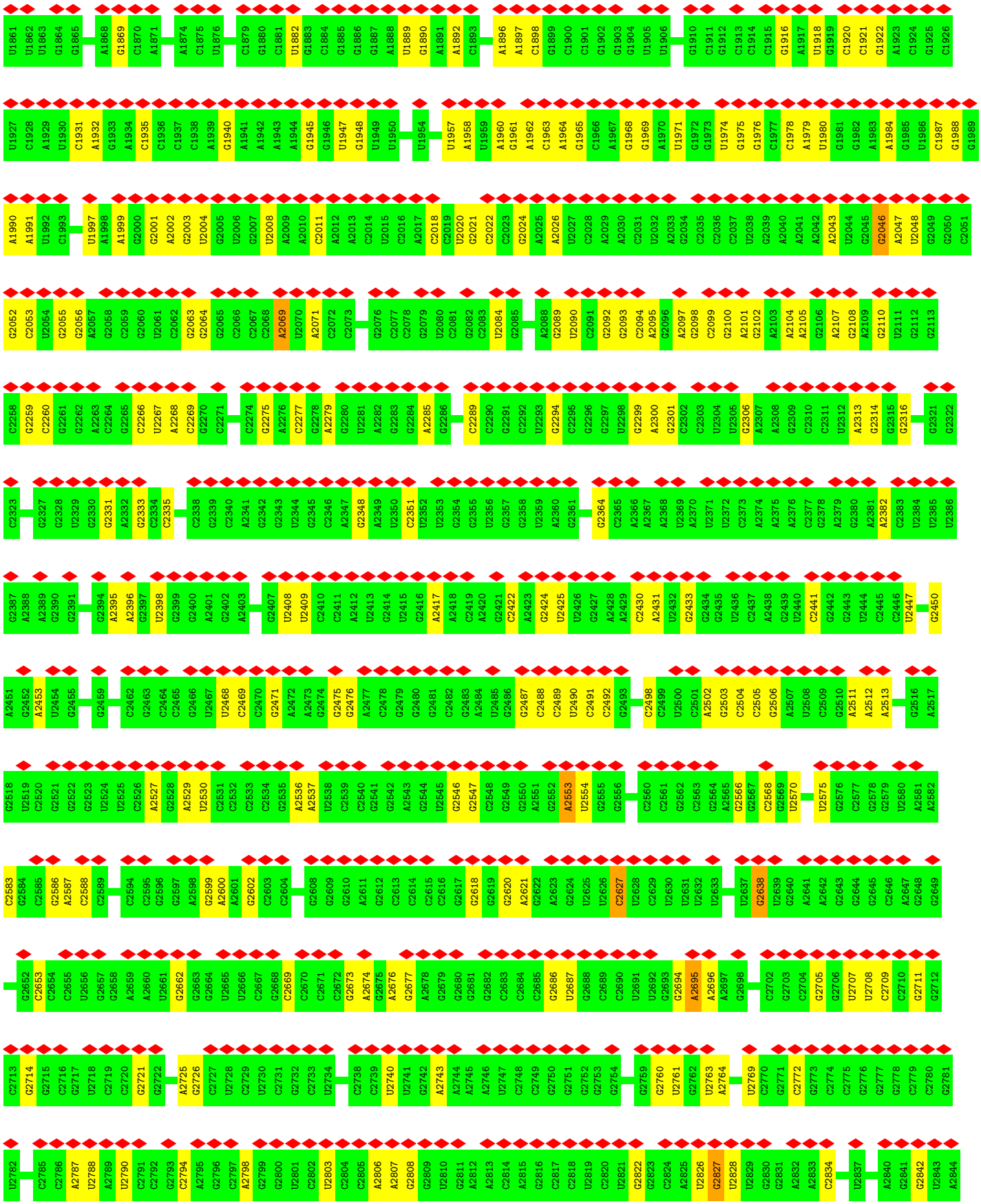
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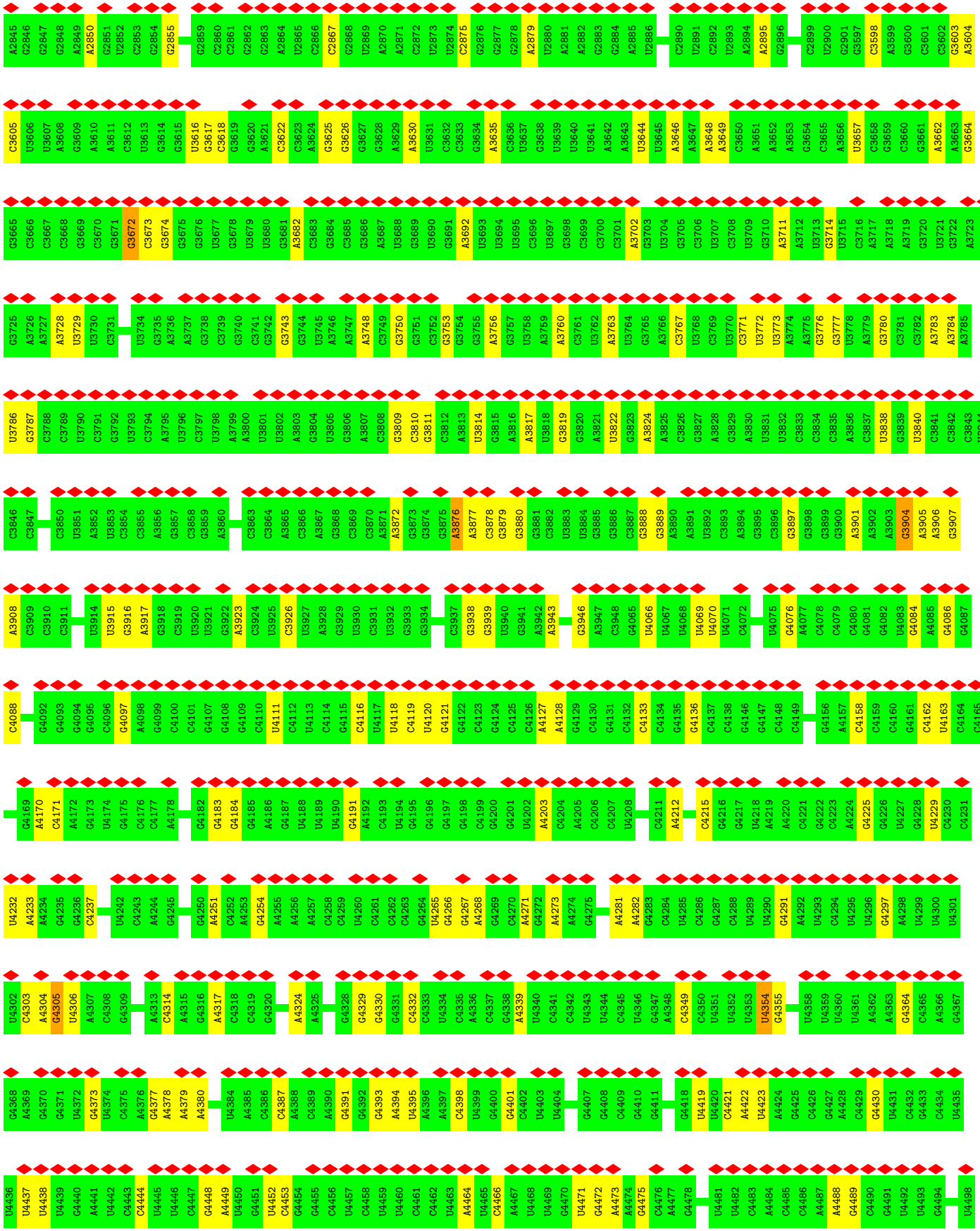
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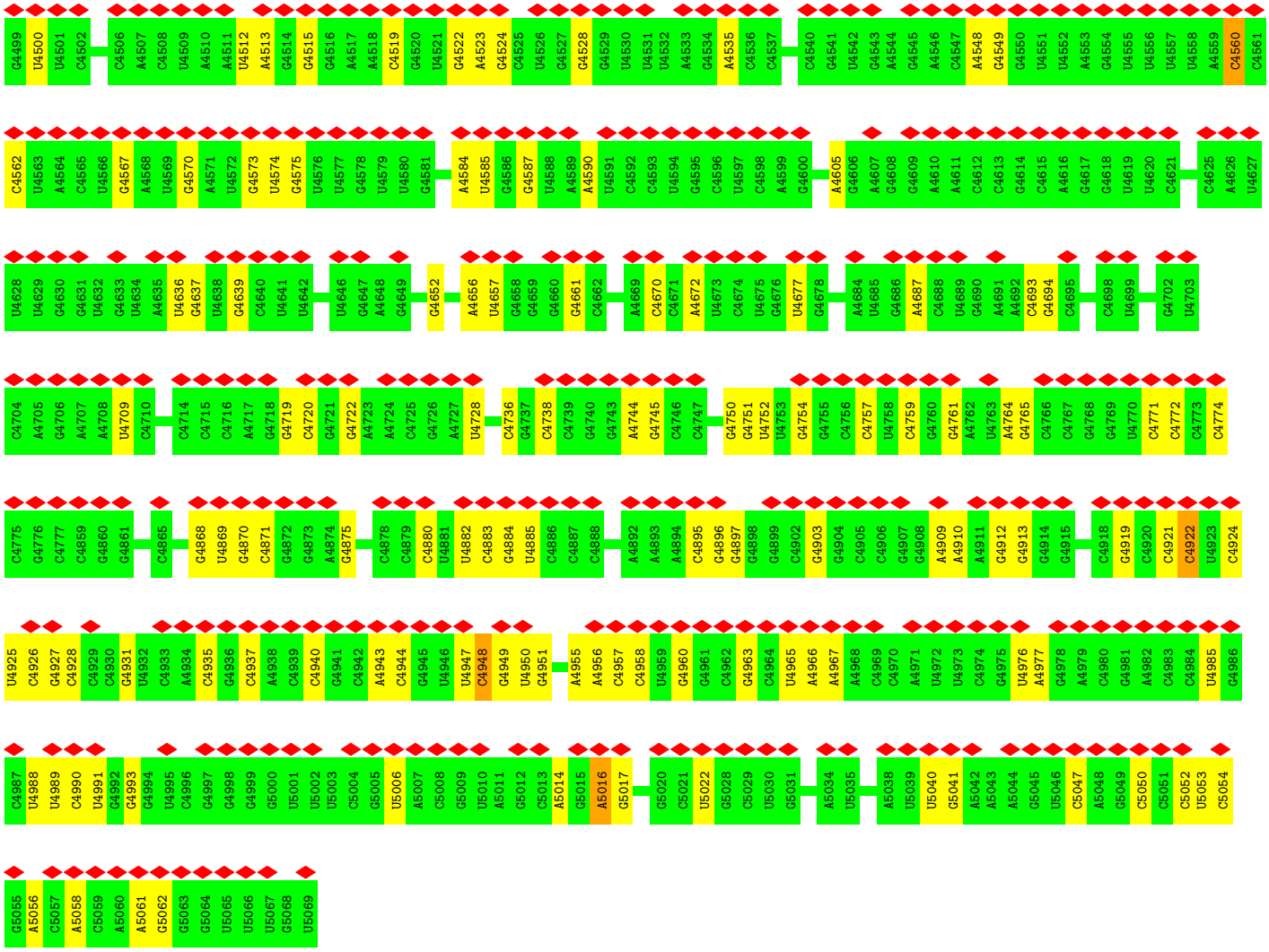
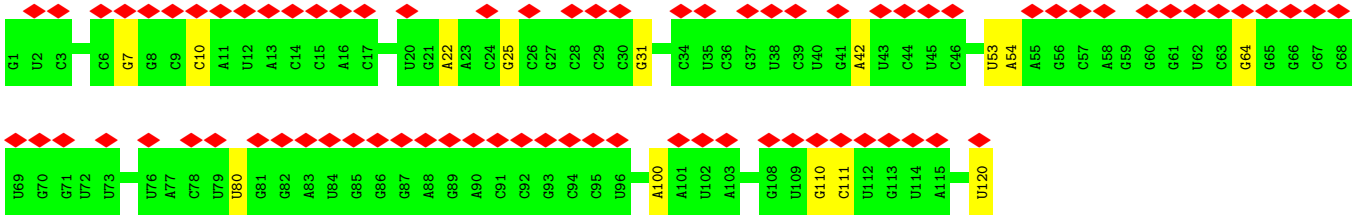


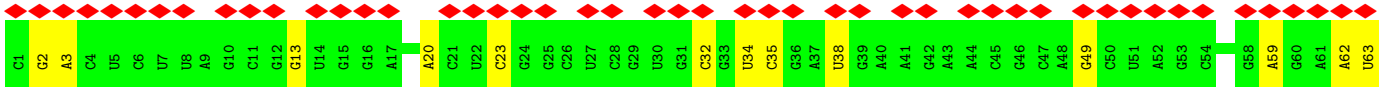
• Molecule 47: 5S ribosomal RNA

Chain 74:

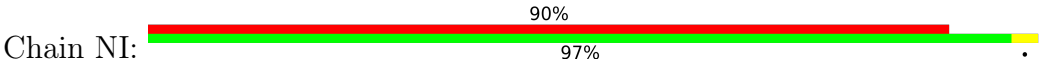


• Molecule 48: 5.8S ribosomal RNA

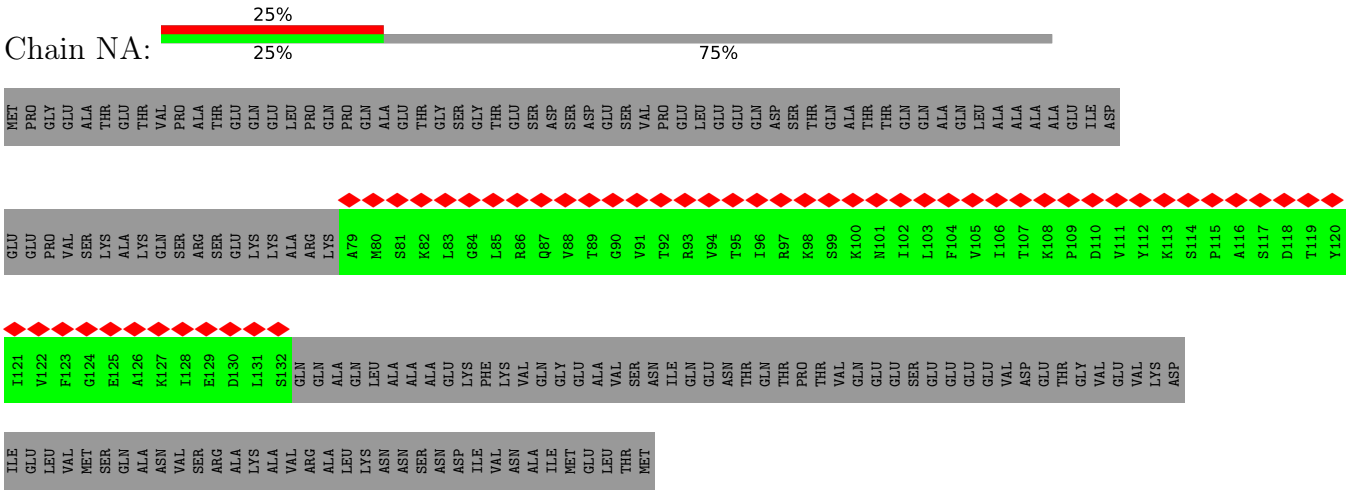
Chain 84:



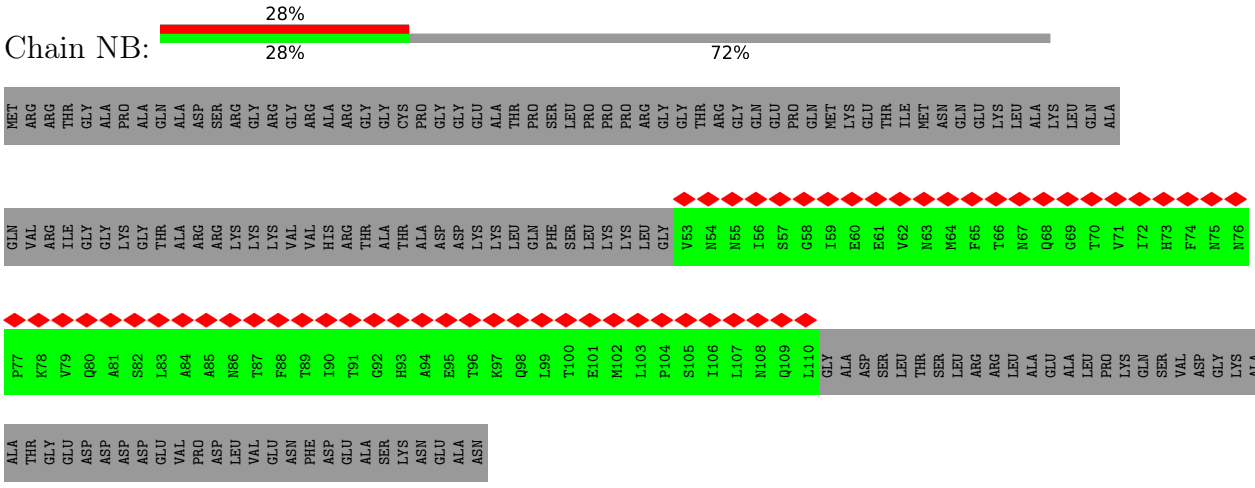
• Molecule 49: Nascent polypeptide-associated complex subunit alpha N-terminal region



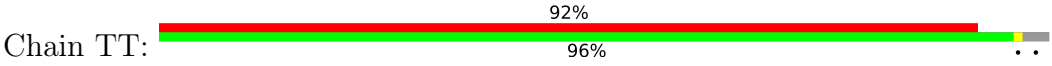
• Molecule 50: Nascent polypeptide-associated complex subunit alpha

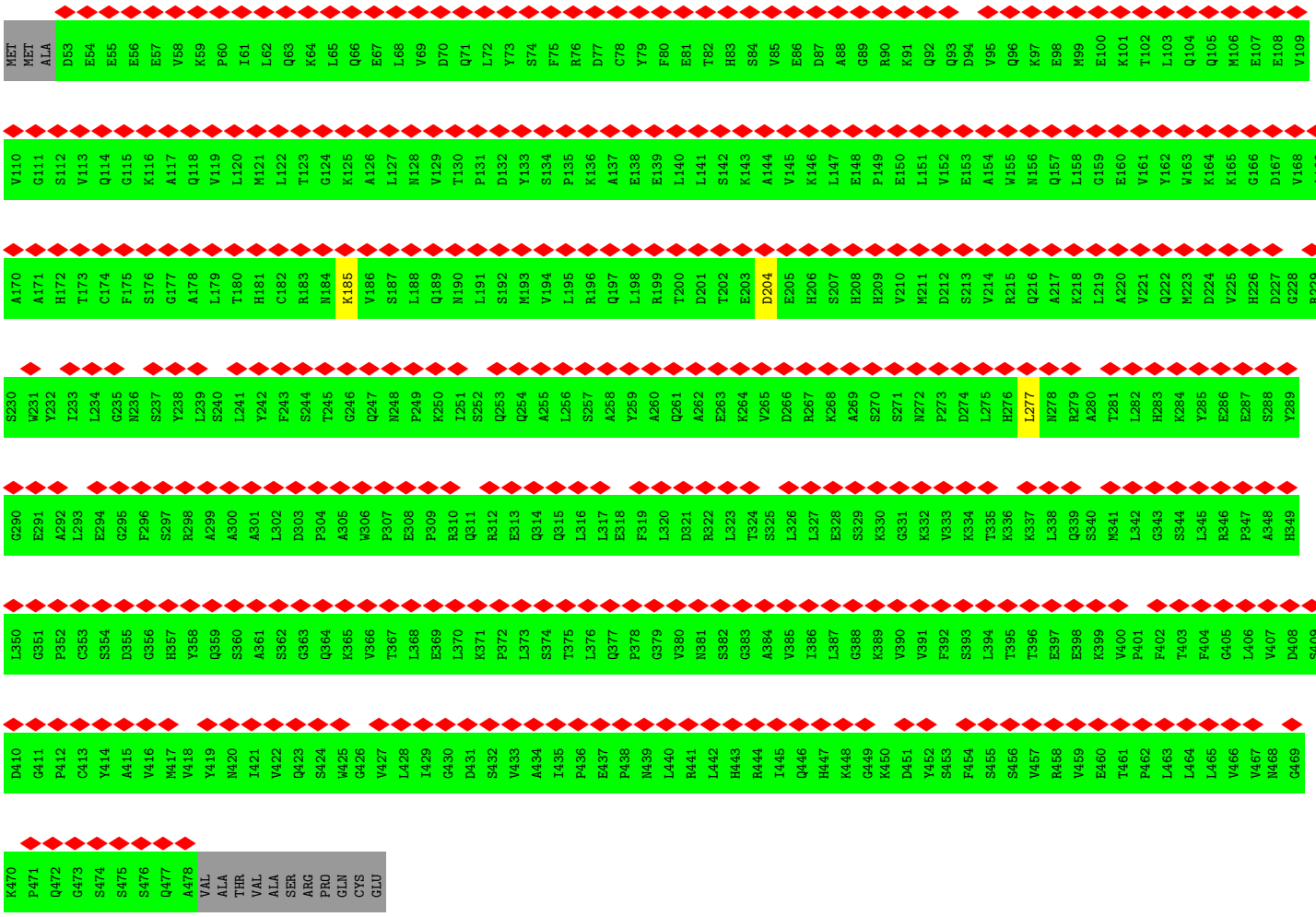


• Molecule 51: Transcription factor BTF3



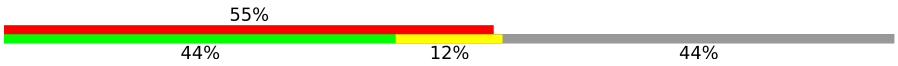
• Molecule 52: Tetratricopeptide repeat protein 5





• Molecule 53: Tubulin Beta

Chain 1:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	49626	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 ($e^-/Å^2$)	48.36	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.694	Depositor
Minimum map value	-0.371	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.08	Depositor
Map size (Å)	532.0, 532.0, 532.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.33, 1.33, 1.33	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 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	A3	0.63	0/1936	0.55	0/2596
2	B3	0.63	0/3240	0.56	0/4339
3	C3	0.61	0/2937	0.56	1/3946 (0.0%)
4	D3	0.60	0/2437	0.49	0/3264
5	E3	0.53	0/1762	0.55	0/2362
6	F3	0.66	0/1911	0.50	0/2549
7	G3	0.51	0/1910	0.50	0/2569
8	H3	0.54	0/1535	0.54	0/2063
9	I3	0.60	0/1702	0.53	1/2272 (0.0%)
10	J3	0.46	0/1385	0.52	0/1852
11	L3	0.54	0/1733	0.50	0/2316
12	M3	0.59	0/1158	0.49	0/1547
13	N3	0.70	0/1746	0.55	0/2338
14	O3	0.66	1/1662 (0.1%)	0.55	0/2222
15	P3	0.63	0/1268	0.55	1/1700 (0.1%)
16	Q3	0.64	0/1538	0.56	0/2054
17	R3	0.51	0/1310	0.52	0/1734
18	S3	0.69	0/1501	0.56	1/2012 (0.0%)
19	T3	0.64	0/1326	0.52	0/1770
20	U3	0.52	0/848	0.55	0/1138
21	V3	0.60	0/993	0.55	0/1332
22	W3	0.61	0/541	0.50	0/720
23	X3	0.54	0/984	0.50	0/1323
24	Y3	0.59	0/1132	0.52	0/1504
25	Z3	0.57	0/1130	0.52	0/1507
26	a3	0.68	0/1191	0.55	0/1590
27	b3	0.45	0/861	0.47	0/1138
28	c3	0.56	0/771	0.52	0/1034
29	d3	0.60	0/903	0.52	0/1216
30	e3	0.64	0/1071	0.57	0/1429
31	f3	0.73	0/895	0.61	0/1198
32	g3	0.59	0/916	0.55	0/1220

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	h3	0.52	0/1021	0.48	0/1348
34	i3	0.46	0/841	0.48	0/1112
35	j3	0.70	1/720 (0.1%)	0.56	0/952
36	k3	0.51	0/575	0.53	0/761
37	l3	0.62	0/459	0.55	0/608
38	m3	0.57	0/435	0.59	0/575
39	n3	0.28	0/240	0.43	0/305
40	o3	0.57	0/864	0.51	0/1140
41	p3	0.59	0/718	0.53	0/953
42	r3	0.61	0/1010	0.57	0/1354
43	s3	0.29	0/1530	0.49	0/2064
44	t3	0.27	0/1174	0.52	0/1582
45	23	0.41	0/1805	0.83	1/2809 (0.0%)
46	54	1.24	10/84976 (0.0%)	0.93	64/132520 (0.0%)
47	74	1.24	0/2858	0.87	0/4455
48	84	1.22	0/3581	0.87	0/5577
49	NI	0.31	0/150	0.63	0/209
50	NA	0.28	0/425	0.53	0/572
51	NB	0.28	0/450	0.52	0/612
52	TT	0.30	0/3402	0.46	0/4603
53	1	0.47	0/295	0.57	0/394
All	All	1.02	12/153762 (0.0%)	0.80	69/226359 (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
13	N3	0	2

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	54	1890	G	N9-C4	-7.84	1.31	1.38
46	54	978	G	N9-C4	-6.37	1.32	1.38
35	j3	50	SER	CA-CB	-6.22	1.43	1.52
46	54	1896	A	N9-C4	-6.03	1.34	1.37
46	54	1337	A	N9-C4	-5.72	1.34	1.37
46	54	2285	A	N9-C4	-5.41	1.34	1.37
14	O3	74	ARG	C-N	-5.37	1.21	1.34
46	54	2638	G	N9-C4	-5.36	1.33	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
46	54	978	G	N3-C4	-5.27	1.31	1.35
46	54	2069	A	N9-C4	-5.21	1.34	1.37
46	54	3872	A	N9-C4	-5.07	1.34	1.37
46	54	1646	A	N9-C4	-5.03	1.34	1.37

All (69) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	54	1890	G	N3-C4-C5	9.26	133.23	128.60
46	54	978	G	N3-C4-C5	8.94	133.07	128.60
46	54	1890	G	N3-C4-N9	-8.64	120.81	126.00
46	54	2638	G	N3-C4-N9	-8.53	120.88	126.00
46	54	2638	G	N3-C4-C5	8.28	132.74	128.60
46	54	4354	U	C2-N1-C1'	8.24	127.59	117.70
9	I3	91	LEU	C-N-CA	-7.46	103.04	121.70
46	54	2694	G	C4-C5-N7	7.40	113.76	110.80
46	54	978	G	C2-N3-C4	-7.33	108.24	111.90
46	54	978	G	N3-C4-N9	-7.05	121.77	126.00
46	54	1639	U	C2-N1-C1'	7.03	126.14	117.70
46	54	4922	C	O5'-P-OP1	-7.03	99.38	105.70
46	54	4303	C	C6-N1-C2	-6.77	117.59	120.30
46	54	217	C	N1-C2-O2	6.67	122.90	118.90
46	54	1502	G	C4-C5-N7	6.30	113.32	110.80
46	54	2638	G	C2-N3-C4	-6.27	108.77	111.90
46	54	4305	G	C8-N9-C4	-6.25	103.90	106.40
46	54	3672	G	N3-C4-C5	6.15	131.68	128.60
46	54	4303	C	N3-C2-O2	-6.08	117.64	121.90
46	54	1210	C	C2-N1-C1'	6.07	125.47	118.80
3	C3	150	LEU	CA-CB-CG	-6.04	101.42	115.30
46	54	1639	U	N3-C2-O2	-6.02	117.98	122.20
46	54	978	G	N3-C2-N2	-5.97	115.72	119.90
46	54	1210	C	N1-C2-O2	5.93	122.46	118.90
46	54	2806	A	O4'-C1'-N9	5.85	112.88	108.20
46	54	3771	C	C5-C6-N1	5.82	123.91	121.00
46	54	4354	U	C5-C6-N1	5.77	125.59	122.70
46	54	4423	U	C2-N1-C1'	5.76	124.62	117.70
46	54	1890	G	C5-N7-C8	-5.69	101.45	104.30
46	54	1639	U	N1-C2-O2	5.66	126.76	122.80
18	S3	16	CYS	C-N-CA	-5.63	107.63	121.70
46	54	2694	G	C5-N7-C8	-5.62	101.49	104.30
46	54	1179	U	C2-N1-C1'	5.61	124.44	117.70
46	54	1381	U	N3-C2-O2	-5.59	118.29	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
46	54	4560	C	N3-C2-O2	-5.57	118.00	121.90
46	54	3672	G	C2-N3-C4	-5.52	109.14	111.90
46	54	4354	U	C6-N1-C1'	-5.52	113.47	121.20
46	54	934	C	N1-C2-O2	5.50	122.20	118.90
46	54	1179	U	N1-C2-O2	5.48	126.64	122.80
46	54	1890	G	C2-N3-C4	-5.48	109.16	111.90
15	P3	91	LEU	CA-CB-CG	5.41	127.74	115.30
46	54	4948	C	C2-N1-C1'	5.41	124.75	118.80
46	54	4880	C	C2-N1-C1'	5.36	124.70	118.80
46	54	1179	U	N3-C2-O2	-5.36	118.45	122.20
46	54	2046	G	P-O3'-C3'	5.30	126.07	119.70
46	54	1277	G	N3-C4-N9	-5.29	122.83	126.00
46	54	217	C	N3-C2-O2	-5.28	118.20	121.90
46	54	3876	A	P-O3'-C3'	5.26	126.01	119.70
46	54	217	C	C2-N1-C1'	5.26	124.58	118.80
46	54	2627	C	N3-C2-O2	-5.24	118.23	121.90
46	54	2471	G	N3-C4-C5	5.21	131.21	128.60
46	54	2638	G	N3-C2-N2	-5.20	116.26	119.90
46	54	3904	G	P-O3'-C3'	5.20	125.94	119.70
46	54	4948	C	N3-C2-O2	-5.17	118.28	121.90
46	54	2695	A	P-O3'-C3'	5.15	125.88	119.70
46	54	1277	G	N3-C4-C5	5.15	131.17	128.60
46	54	1339	U	O5'-P-OP1	-5.14	101.07	105.70
46	54	4354	U	OP2-P-O3'	5.12	116.47	105.20
46	54	417	G	O4'-C1'-N9	5.11	112.29	108.20
46	54	1210	C	N3-C2-O2	-5.11	118.33	121.90
45	23	20	U	C2-N1-C1'	5.07	123.79	117.70
46	54	5016	A	C2-N3-C4	-5.07	108.07	110.60
46	54	2827	G	C4-N9-C1'	5.06	133.08	126.50
46	54	4774	C	C5-C6-N1	5.05	123.53	121.00
46	54	974	C	N3-C2-O2	-5.04	118.37	121.90
46	54	2627	C	N1-C2-O2	5.04	121.92	118.90
46	54	4869	U	C2-N1-C1'	5.03	123.73	117.70
46	54	2553	A	O4'-C1'-N9	5.02	112.22	108.20
46	54	704	C	P-O3'-C3'	5.02	125.72	119.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
13	N3	76	PRO	Peptide
13	N3	78	GLY	Peptide

5.2 Too-close contacts

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

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A3	246/257 (96%)	218 (89%)	28 (11%)	0	100	100
2	B3	392/403 (97%)	358 (91%)	34 (9%)	0	100	100
3	C3	360/425 (85%)	331 (92%)	29 (8%)	0	100	100
4	D3	291/297 (98%)	265 (91%)	26 (9%)	0	100	100
5	E3	208/291 (72%)	185 (89%)	23 (11%)	0	100	100
6	F3	223/247 (90%)	206 (92%)	17 (8%)	0	100	100
7	G3	229/319 (72%)	212 (93%)	17 (7%)	0	100	100
8	H3	188/192 (98%)	176 (94%)	12 (6%)	0	100	100
9	I3	201/214 (94%)	181 (90%)	20 (10%)	0	100	100
10	J3	168/178 (94%)	155 (92%)	13 (8%)	0	100	100
11	L3	208/211 (99%)	193 (93%)	14 (7%)	1 (0%)	25	56
12	M3	136/218 (62%)	125 (92%)	11 (8%)	0	100	100
13	N3	201/204 (98%)	185 (92%)	16 (8%)	0	100	100
14	O3	197/203 (97%)	185 (94%)	12 (6%)	0	100	100
15	P3	151/184 (82%)	142 (94%)	9 (6%)	0	100	100
16	Q3	185/188 (98%)	170 (92%)	15 (8%)	0	100	100
17	R3	153/196 (78%)	142 (93%)	11 (7%)	0	100	100
18	S3	174/176 (99%)	158 (91%)	15 (9%)	1 (1%)	22	52
19	T3	157/160 (98%)	138 (88%)	18 (12%)	1 (1%)	22	52
20	U3	100/128 (78%)	89 (89%)	11 (11%)	0	100	100
21	V3	129/140 (92%)	119 (92%)	10 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
22	W3	61/157 (39%)	54 (88%)	7 (12%)	0	100	100
23	X3	116/156 (74%)	104 (90%)	12 (10%)	0	100	100
24	Y3	132/145 (91%)	122 (92%)	10 (8%)	0	100	100
25	Z3	133/136 (98%)	122 (92%)	11 (8%)	0	100	100
26	a3	145/148 (98%)	131 (90%)	14 (10%)	0	100	100
27	b3	100/226 (44%)	94 (94%)	6 (6%)	0	100	100
28	c3	96/115 (84%)	91 (95%)	5 (5%)	0	100	100
29	d3	105/125 (84%)	92 (88%)	13 (12%)	0	100	100
30	e3	126/135 (93%)	118 (94%)	7 (6%)	1 (1%)	16	46
31	f3	107/110 (97%)	98 (92%)	9 (8%)	0	100	100
32	g3	112/116 (97%)	106 (95%)	6 (5%)	0	100	100
33	h3	120/123 (98%)	114 (95%)	6 (5%)	0	100	100
34	i3	100/105 (95%)	94 (94%)	6 (6%)	0	100	100
35	j3	84/97 (87%)	80 (95%)	4 (5%)	0	100	100
36	k3	67/70 (96%)	63 (94%)	4 (6%)	0	100	100
37	l3	48/51 (94%)	38 (79%)	10 (21%)	0	100	100
38	m3	50/102 (49%)	46 (92%)	4 (8%)	0	100	100
39	n3	23/25 (92%)	23 (100%)	0	0	100	100
40	o3	102/106 (96%)	90 (88%)	12 (12%)	0	100	100
41	p3	89/92 (97%)	83 (93%)	6 (7%)	0	100	100
42	r3	122/137 (89%)	111 (91%)	11 (9%)	0	100	100
43	s3	194/318 (61%)	167 (86%)	27 (14%)	0	100	100
44	t3	151/165 (92%)	121 (80%)	30 (20%)	0	100	100
49	NI	27/29 (93%)	15 (56%)	11 (41%)	1 (4%)	2	14
50	NA	52/215 (24%)	42 (81%)	10 (19%)	0	100	100
51	NB	56/206 (27%)	50 (89%)	6 (11%)	0	100	100
52	TT	424/440 (96%)	395 (93%)	29 (7%)	0	100	100
53	1	32/64 (50%)	17 (53%)	13 (41%)	2 (6%)	1	6
All	All	7271/8745 (83%)	6614 (91%)	650 (9%)	7 (0%)	50	78

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
53	1	4	ILE
11	L3	64	VAL
18	S3	166	ARG
30	e3	127	ALA
49	NI	20	ALA
19	T3	82	GLY
53	1	5	VAL

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A3	190/199 (96%)	188 (99%)	2 (1%)	70 83
2	B3	342/348 (98%)	340 (99%)	2 (1%)	84 91
3	C3	302/347 (87%)	300 (99%)	2 (1%)	81 90
4	D3	247/250 (99%)	247 (100%)	0	100 100
5	E3	190/251 (76%)	187 (98%)	3 (2%)	58 77
6	F3	196/215 (91%)	196 (100%)	0	100 100
7	G3	200/272 (74%)	200 (100%)	0	100 100
8	H3	169/171 (99%)	169 (100%)	0	100 100
9	I3	175/181 (97%)	175 (100%)	0	100 100
10	J3	143/149 (96%)	143 (100%)	0	100 100
11	L3	175/176 (99%)	173 (99%)	2 (1%)	70 83
12	M3	117/161 (73%)	117 (100%)	0	100 100
13	N3	171/172 (99%)	169 (99%)	2 (1%)	67 82
14	O3	171/173 (99%)	170 (99%)	1 (1%)	84 91
15	P3	134/163 (82%)	134 (100%)	0	100 100
16	Q3	164/164 (100%)	164 (100%)	0	100 100
17	R3	138/175 (79%)	137 (99%)	1 (1%)	81 90
18	S3	157/157 (100%)	155 (99%)	2 (1%)	65 80
19	T3	139/140 (99%)	139 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
20	U3	92/114 (81%)	92 (100%)	0	100 100
21	V3	101/107 (94%)	100 (99%)	1 (1%)	73 85
22	W3	55/126 (44%)	55 (100%)	0	100 100
23	X3	106/134 (79%)	105 (99%)	1 (1%)	75 87
24	Y3	124/135 (92%)	122 (98%)	2 (2%)	58 77
25	Z3	117/118 (99%)	116 (99%)	1 (1%)	75 87
26	a3	119/120 (99%)	118 (99%)	1 (1%)	79 89
27	b3	84/172 (49%)	84 (100%)	0	100 100
28	c3	84/98 (86%)	83 (99%)	1 (1%)	67 82
29	d3	98/110 (89%)	96 (98%)	2 (2%)	50 72
30	e3	114/121 (94%)	113 (99%)	1 (1%)	75 87
31	f3	88/89 (99%)	88 (100%)	0	100 100
32	g3	98/99 (99%)	98 (100%)	0	100 100
33	h3	109/110 (99%)	109 (100%)	0	100 100
34	i3	86/89 (97%)	86 (100%)	0	100 100
35	j3	73/80 (91%)	71 (97%)	2 (3%)	40 65
36	k3	64/65 (98%)	64 (100%)	0	100 100
37	l3	47/48 (98%)	47 (100%)	0	100 100
38	m3	48/90 (53%)	48 (100%)	0	100 100
39	n3	24/24 (100%)	24 (100%)	0	100 100
40	o3	92/94 (98%)	92 (100%)	0	100 100
41	p3	74/75 (99%)	71 (96%)	3 (4%)	26 55
42	r3	108/121 (89%)	108 (100%)	0	100 100
43	s3	164/258 (64%)	161 (98%)	3 (2%)	54 75
44	t3	126/137 (92%)	123 (98%)	3 (2%)	44 68
49	NI	2/2 (100%)	2 (100%)	0	100 100
50	NA	48/183 (26%)	48 (100%)	0	100 100
51	NB	51/165 (31%)	51 (100%)	0	100 100
52	TT	370/381 (97%)	367 (99%)	3 (1%)	79 89
53	1	32/53 (60%)	26 (81%)	6 (19%)	1 5
All	All	6318/7382 (86%)	6271 (99%)	47 (1%)	80 90

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A3	32	VAL
1	A3	64	ARG
2	B3	261	ARG
2	B3	297	LYS
3	C3	95	MET
3	C3	188	ARG
5	E3	58	ARG
5	E3	289	LEU
5	E3	291	PHE
11	L3	10	LEU
11	L3	70	VAL
13	N3	26	ARG
13	N3	80	THR
14	O3	36	VAL
17	R3	71	ARG
18	S3	67	VAL
18	S3	90	THR
21	V3	48	ARG
23	X3	120	ASP
24	Y3	2	LYS
24	Y3	79	VAL
25	Z3	11	VAL
26	a3	122	VAL
28	c3	17	ARG
29	d3	22	THR
29	d3	86	VAL
30	e3	48	ARG
35	j3	67	LEU
35	j3	82	THR
41	p3	4	ARG
41	p3	16	THR
41	p3	52	VAL
43	s3	50	LYS
43	s3	157	ASP
43	s3	166	LYS
44	t3	83	LYS
44	t3	99	LYS
44	t3	114	ARG
52	TT	185	LYS
52	TT	204	ASP
52	TT	277	LEU
53	1	1	MET

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Mol	Chain	Res	Type
53	1	2	ARG
53	1	3	GLU
53	1	6	HIS
53	1	8	GLN
53	1	49	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (96) such sidechains are listed below:

Mol	Chain	Res	Type
1	A3	194	ASN
2	B3	3	HIS
2	B3	315	ASN
2	B3	354	GLN
3	C3	119	GLN
3	C3	198	ASN
3	C3	215	ASN
4	D3	131	ASN
4	D3	175	HIS
5	E3	45	HIS
5	E3	193	HIS
5	E3	214	HIS
5	E3	253	GLN
5	E3	287	HIS
6	F3	57	HIS
6	F3	79	ASN
6	F3	199	HIS
7	G3	91	ASN
7	G3	99	GLN
7	G3	138	GLN
7	G3	147	GLN
7	G3	194	ASN
7	G3	206	GLN
7	G3	248	HIS
9	I3	59	GLN
9	I3	73	ASN
10	J3	42	GLN
10	J3	97	ASN
10	J3	104	ASN
11	L3	111	GLN
11	L3	113	ASN
11	L3	115	GLN
11	L3	149	GLN

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Mol	Chain	Res	Type
11	L3	188	ASN
12	M3	20	HIS
13	N3	37	HIS
13	N3	87	HIS
13	N3	99	GLN
13	N3	196	ASN
13	N3	199	GLN
14	O3	63	ASN
14	O3	180	GLN
14	O3	184	ASN
15	P3	25	HIS
15	P3	56	GLN
15	P3	116	HIS
15	P3	118	GLN
15	P3	120	ASN
16	Q3	8	ASN
16	Q3	44	ASN
16	Q3	57	ASN
16	Q3	160	HIS
17	R3	7	GLN
17	R3	39	GLN
17	R3	58	HIS
17	R3	86	ASN
17	R3	130	ASN
18	S3	37	HIS
18	S3	91	HIS
18	S3	92	ASN
18	S3	125	GLN
18	S3	163	HIS
19	T3	95	HIS
19	T3	114	GLN
20	U3	105	ASN
22	W3	50	ASN
23	X3	93	ASN
23	X3	105	ASN
26	a3	120	GLN
27	b3	49	HIS
27	b3	50	ASN
27	b3	61	ASN
27	b3	101	HIS
29	d3	116	ASN
30	e3	52	GLN

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Mol	Chain	Res	Type
32	g3	114	GLN
33	h3	63	GLN
33	h3	108	GLN
34	i3	26	HIS
34	i3	36	HIS
35	j3	28	HIS
35	j3	76	HIS
37	l3	25	GLN
42	r3	45	HIS
42	r3	103	HIS
43	s3	42	GLN
43	s3	58	ASN
43	s3	72	ASN
52	TT	128	ASN
52	TT	157	GLN
52	TT	197	GLN
52	TT	209	HIS
52	TT	276	HIS
52	TT	278	ASN
52	TT	443	HIS
53	1	8	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
45	23	74/76 (97%)	13 (17%)	0
46	54	3516/3543 (99%)	822 (23%)	58 (1%)
47	74	119/120 (99%)	14 (11%)	0
48	84	149/156 (95%)	32 (21%)	1 (0%)
All	All	3858/3895 (99%)	881 (22%)	59 (1%)

All (881) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
45	23	9	A
45	23	13	U
45	23	16	C
45	23	19	G
45	23	20(A)	U
45	23	21	A
45	23	24	A

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Mol	Chain	Res	Type
45	23	39	G
45	23	46	G
45	23	47	U
45	23	56	C
45	23	67	G
45	23	75	C
46	54	12	A
46	54	13	U
46	54	15	A
46	54	30	C
46	54	39	A
46	54	42	A
46	54	44	A
46	54	56	A
46	54	58	G
46	54	59	A
46	54	64	A
46	54	65	A
46	54	72	C
46	54	73	A
46	54	74	G
46	54	84	A
46	54	91	G
46	54	95	G
46	54	104	G
46	54	108	A
46	54	109	G
46	54	110	C
46	54	118	C
46	54	119	G
46	54	122	U
46	54	126	C
46	54	131	C
46	54	134	G
46	54	135	G
46	54	136	C
46	54	137	G
46	54	141	C
46	54	142	G
46	54	146	G
46	54	157	U
46	54	159	C

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Mol	Chain	Res	Type
46	54	160	G
46	54	172	C
46	54	177	G
46	54	182	G
46	54	200	U
46	54	201	C
46	54	209	U
46	54	216	C
46	54	218	A
46	54	221	C
46	54	224	U
46	54	225	G
46	54	232	G
46	54	233	U
46	54	234	G
46	54	246	G
46	54	256	G
46	54	258	G
46	54	262	G
46	54	263	G
46	54	265	C
46	54	266	C
46	54	267	G
46	54	276	C
46	54	280	G
46	54	297	U
46	54	306	A
46	54	308	G
46	54	309	C
46	54	315	G
46	54	316	U
46	54	322	C
46	54	326	C
46	54	334	A
46	54	340	C
46	54	363	A
46	54	370	U
46	54	371	A
46	54	387	G
46	54	407	A
46	54	410	A
46	54	412	G

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Mol	Chain	Res	Type
46	54	413	G
46	54	415	G
46	54	417	G
46	54	428	G
46	54	440	U
46	54	446	C
46	54	449	C
46	54	450	G
46	54	452	A
46	54	453	G
46	54	454	U
46	54	455	C
46	54	463	A
46	54	467	U
46	54	468	U
46	54	481	G
46	54	481(A)	C
46	54	482	G
46	54	483	G
46	54	485	C
46	54	486	C
46	54	492	U
46	54	493	G
46	54	496	G
46	54	497	G
46	54	498	C
46	54	499	G
46	54	505	G
46	54	506	C
46	54	510	U
46	54	644	G
46	54	647	G
46	54	658	C
46	54	659	G
46	54	661	C
46	54	666	G
46	54	667	A
46	54	668	C
46	54	669	C
46	54	670	G
46	54	685	C
46	54	686	A

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Mol	Chain	Res	Type
46	54	687	U
46	54	696	C
46	54	697	G
46	54	699	C
46	54	701	G
46	54	704	C
46	54	705	G
46	54	708	G
46	54	731	G
46	54	738	C
46	54	749	G
46	54	756	G
46	54	758	G
46	54	914	U
46	54	917	A
46	54	918	G
46	54	923	C
46	54	925	C
46	54	926	G
46	54	929	A
46	54	930	G
46	54	932	A
46	54	933	G
46	54	934	C
46	54	935	A
46	54	935(A)	G
46	54	936	C
46	54	938	C
46	54	939	G
46	54	941	C
46	54	944	A
46	54	945	U
46	54	959	G
46	54	960	A
46	54	961	G
46	54	964	A
46	54	965	G
46	54	966	A
46	54	967	C
46	54	968	C
46	54	969	C
46	54	971(A)	G

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Mol	Chain	Res	Type
46	54	972	C
46	54	973	G
46	54	979	C
46	54	983	C
46	54	990	C
46	54	1070	G
46	54	1072	C
46	54	1073	G
46	54	1076	C
46	54	1078	A
46	54	1079	C
46	54	1081	C
46	54	1082	C
46	54	1099	C
46	54	1175	A
46	54	1179	U
46	54	1199	G
46	54	1210	C
46	54	1211	G
46	54	1212	G
46	54	1215	C
46	54	1216	C
46	54	1234	G
46	54	1235	G
46	54	1236	C
46	54	1237	C
46	54	1238	A
46	54	1239	C
46	54	1272	C
46	54	1273	G
46	54	1274	A
46	54	1275	G
46	54	1281	G
46	54	1284	G
46	54	1287	G
46	54	1289	C
46	54	1291	G
46	54	1292	C
46	54	1293	G
46	54	1296	G
46	54	1301	C
46	54	1303	A

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Mol	Chain	Res	Type
46	54	1304	C
46	54	1314	C
46	54	1326	A
46	54	1330	A
46	54	1354	A
46	54	1358	G
46	54	1359	G
46	54	1364	U
46	54	1370	G
46	54	1371	A
46	54	1377	G
46	54	1378	C
46	54	1387	A
46	54	1392	A
46	54	1394	G
46	54	1397	A
46	54	1398	A
46	54	1403	G
46	54	1411(A)	G
46	54	1415	G
46	54	1419	G
46	54	1420	A
46	54	1421	G
46	54	1433	A
46	54	1436	C
46	54	1437	C
46	54	1438	U
46	54	1440	U
46	54	1441	C
46	54	1445	U
46	54	1446	C
46	54	1448	G
46	54	1456	C
46	54	1457	G
46	54	1458	C
46	54	1475	G
46	54	1478	C
46	54	1481	C
46	54	1482	G
46	54	1483	C
46	54	1484	G
46	54	1489	G

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Mol	Chain	Res	Type
46	54	1497	A
46	54	1498	G
46	54	1502	G
46	54	1514	U
46	54	1516	G
46	54	1518	A
46	54	1519	C
46	54	1523	A
46	54	1534	A
46	54	1547	A
46	54	1563	A
46	54	1564	A
46	54	1566	C
46	54	1578	U
46	54	1586	G
46	54	1591	U
46	54	1596	U
46	54	1597	G
46	54	1600	A
46	54	1602	U
46	54	1612	G
46	54	1613	A
46	54	1624	G
46	54	1625	G
46	54	1631	A
46	54	1633	G
46	54	1634	A
46	54	1638	A
46	54	1640	C
46	54	1654	G
46	54	1658	G
46	54	1661	C
46	54	1676	C
46	54	1677	U
46	54	1696	C
46	54	1731	C
46	54	1733	G
46	54	1741	G
46	54	1742	A
46	54	1750	G
46	54	1756	U
46	54	1760	G

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Mol	Chain	Res	Type
46	54	1761	G
46	54	1764	G
46	54	1767	A
46	54	1768	C
46	54	1769	G
46	54	1772	C
46	54	1774	C
46	54	1775	A
46	54	1780	A
46	54	1787	A
46	54	1798	G
46	54	1799	G
46	54	1804	A
46	54	1807	C
46	54	1809	C
46	54	1811	G
46	54	1815	G
46	54	1818	G
46	54	1819	G
46	54	1821	G
46	54	1822	U
46	54	1828	C
46	54	1834	U
46	54	1835	G
46	54	1836	G
46	54	1837	A
46	54	1842	G
46	54	1843	A
46	54	1847	C
46	54	1855	G
46	54	1869	G
46	54	1882	U
46	54	1889	U
46	54	1892	A
46	54	1897	A
46	54	1898	C
46	54	1916	G
46	54	1918	U
46	54	1920	C
46	54	1921	C
46	54	1922	G
46	54	1931	C

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Mol	Chain	Res	Type
46	54	1932	A
46	54	1935	C
46	54	1940	G
46	54	1945	G
46	54	1947	U
46	54	1948	G
46	54	1957	U
46	54	1958	A
46	54	1960	A
46	54	1961	G
46	54	1962	A
46	54	1963	C
46	54	1964	A
46	54	1965	G
46	54	1968	G
46	54	1969	G
46	54	1971	U
46	54	1974	U
46	54	1975	G
46	54	1976	G
46	54	1978	C
46	54	1979	A
46	54	1980	U
46	54	1984	A
46	54	1987	C
46	54	1988	G
46	54	1990	A
46	54	1991	A
46	54	1997	U
46	54	1999	A
46	54	2001	G
46	54	2002	A
46	54	2003	G
46	54	2004	U
46	54	2008	U
46	54	2011	C
46	54	2018	C
46	54	2020	U
46	54	2021	G
46	54	2022	C
46	54	2024	G
46	54	2026	A

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Mol	Chain	Res	Type
46	54	2043	A
46	54	2046	G
46	54	2047	A
46	54	2048	U
46	54	2052	G
46	54	2053	C
46	54	2055	G
46	54	2056	G
46	54	2063	G
46	54	2064	G
46	54	2069	A
46	54	2071	A
46	54	2084	U
46	54	2090	U
46	54	2092	G
46	54	2093	G
46	54	2094	C
46	54	2095	A
46	54	2097	A
46	54	2098	G
46	54	2099	C
46	54	2100	G
46	54	2101	A
46	54	2102	G
46	54	2104	A
46	54	2105	A
46	54	2107	A
46	54	2108	G
46	54	2110	G
46	54	2259	G
46	54	2260	C
46	54	2267	U
46	54	2268	A
46	54	2269	C
46	54	2275	G
46	54	2277	C
46	54	2279	A
46	54	2289	C
46	54	2294	G
46	54	2299	G
46	54	2300	A
46	54	2301	G

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Mol	Chain	Res	Type
46	54	2306	G
46	54	2313	A
46	54	2314	G
46	54	2316	G
46	54	2331	G
46	54	2333	G
46	54	2335	C
46	54	2348	G
46	54	2351	C
46	54	2364	G
46	54	2382	A
46	54	2395	A
46	54	2396	A
46	54	2398	U
46	54	2408	U
46	54	2409	U
46	54	2417	A
46	54	2422	C
46	54	2424	G
46	54	2425	U
46	54	2430	C
46	54	2431	A
46	54	2433	G
46	54	2441	C
46	54	2447	U
46	54	2450	G
46	54	2453	A
46	54	2469	C
46	54	2475	G
46	54	2476	G
46	54	2487	G
46	54	2488	C
46	54	2489	C
46	54	2490	U
46	54	2491	C
46	54	2492	C
46	54	2498	C
46	54	2503	G
46	54	2504	C
46	54	2505	C
46	54	2506	G
46	54	2511	A

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Mol	Chain	Res	Type
46	54	2512	A
46	54	2513	A
46	54	2527	A
46	54	2529	A
46	54	2530	U
46	54	2536	A
46	54	2537	A
46	54	2546	G
46	54	2547	G
46	54	2553	A
46	54	2554	U
46	54	2566	G
46	54	2568	C
46	54	2570	U
46	54	2575	U
46	54	2583	C
46	54	2586	G
46	54	2587	A
46	54	2588	C
46	54	2599	G
46	54	2600	A
46	54	2602	G
46	54	2618	G
46	54	2620	G
46	54	2621	A
46	54	2627	C
46	54	2638	G
46	54	2653	C
46	54	2662	G
46	54	2669	C
46	54	2673	G
46	54	2674	A
46	54	2676	A
46	54	2677	G
46	54	2686	G
46	54	2687	U
46	54	2695	A
46	54	2696	A
46	54	2705	G
46	54	2707	U
46	54	2708	U
46	54	2709	C

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Mol	Chain	Res	Type
46	54	2711	G
46	54	2714	G
46	54	2721	G
46	54	2725	A
46	54	2726	G
46	54	2740	U
46	54	2743	A
46	54	2760	G
46	54	2761	U
46	54	2763	U
46	54	2764	A
46	54	2769	U
46	54	2772	C
46	54	2787	A
46	54	2788	U
46	54	2790	U
46	54	2794	C
46	54	2798	A
46	54	2803	U
46	54	2807	A
46	54	2808	G
46	54	2822	G
46	54	2826	U
46	54	2827	G
46	54	2828	U
46	54	2834	C
46	54	2842	G
46	54	2850	A
46	54	2855	G
46	54	2867	C
46	54	2875	C
46	54	2879	A
46	54	2895	A
46	54	3598	C
46	54	3603	G
46	54	3604	A
46	54	3605	C
46	54	3616	U
46	54	3617	G
46	54	3618	C
46	54	3622	C
46	54	3625	G

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Mol	Chain	Res	Type
46	54	3626	G
46	54	3630	A
46	54	3635	A
46	54	3644	U
46	54	3646	A
46	54	3648	A
46	54	3649	A
46	54	3657	U
46	54	3662	A
46	54	3664	G
46	54	3672	G
46	54	3673	C
46	54	3674	G
46	54	3682	A
46	54	3692	A
46	54	3702	A
46	54	3711	A
46	54	3714	G
46	54	3728	A
46	54	3729	U
46	54	3743	G
46	54	3748	A
46	54	3750	G
46	54	3753	G
46	54	3756	A
46	54	3760	A
46	54	3763	A
46	54	3767	C
46	54	3772	U
46	54	3773	U
46	54	3776	G
46	54	3777	G
46	54	3780	G
46	54	3783	A
46	54	3784	A
46	54	3786	U
46	54	3787	G
46	54	3809	G
46	54	3810	C
46	54	3811	G
46	54	3814	U
46	54	3817	A

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Mol	Chain	Res	Type
46	54	3819	G
46	54	3822	U
46	54	3824	A
46	54	3838	U
46	54	3840	U
46	54	3876	A
46	54	3877	A
46	54	3878	C
46	54	3879	G
46	54	3880	G
46	54	3889	G
46	54	3897	G
46	54	3901	A
46	54	3905	A
46	54	3906	A
46	54	3907	G
46	54	3908	A
46	54	3915	U
46	54	3916	G
46	54	3917	A
46	54	3923	A
46	54	3926	C
46	54	3938	G
46	54	3939	G
46	54	3943	A
46	54	3946	G
46	54	4066	U
46	54	4069	U
46	54	4070	U
46	54	4076	G
46	54	4084	G
46	54	4086	G
46	54	4088	C
46	54	4097	G
46	54	4111	U
46	54	4116	C
46	54	4118	U
46	54	4119	C
46	54	4120	U
46	54	4121	G
46	54	4127	A
46	54	4128	A

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Mol	Chain	Res	Type
46	54	4133	C
46	54	4136	G
46	54	4158	C
46	54	4162	C
46	54	4163	U
46	54	4166	G
46	54	4170	A
46	54	4171	C
46	54	4183	G
46	54	4184	G
46	54	4191	G
46	54	4203	A
46	54	4212	A
46	54	4215	C
46	54	4225	G
46	54	4229	U
46	54	4233	A
46	54	4237	C
46	54	4251	A
46	54	4254	G
46	54	4265	U
46	54	4266	G
46	54	4267	G
46	54	4268	A
46	54	4271	A
46	54	4273	A
46	54	4281	A
46	54	4282	A
46	54	4291	G
46	54	4297	G
46	54	4304	A
46	54	4305	G
46	54	4306	U
46	54	4314	C
46	54	4317	A
46	54	4324	A
46	54	4329	G
46	54	4330	G
46	54	4332	C
46	54	4339	A
46	54	4349	C
46	54	4354	U

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Mol	Chain	Res	Type
46	54	4355	G
46	54	4364	G
46	54	4373	G
46	54	4377	G
46	54	4378	A
46	54	4379	A
46	54	4380	A
46	54	4387	C
46	54	4391	G
46	54	4393	G
46	54	4394	A
46	54	4395	U
46	54	4398	C
46	54	4401	G
46	54	4419	U
46	54	4421	C
46	54	4422	A
46	54	4430	G
46	54	4437	U
46	54	4438	U
46	54	4444	C
46	54	4448	G
46	54	4449	A
46	54	4452	U
46	54	4453	C
46	54	4464	A
46	54	4466	C
46	54	4471	U
46	54	4472	G
46	54	4473	A
46	54	4475	G
46	54	4488	A
46	54	4489	G
46	54	4500	U
46	54	4512	U
46	54	4513	A
46	54	4515	G
46	54	4519	C
46	54	4522	G
46	54	4523	A
46	54	4524	G
46	54	4528	G

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Mol	Chain	Res	Type
46	54	4535	A
46	54	4548	A
46	54	4549	G
46	54	4560	C
46	54	4562	C
46	54	4567	G
46	54	4570	G
46	54	4573	G
46	54	4574	U
46	54	4575	G
46	54	4584	A
46	54	4585	U
46	54	4587	G
46	54	4590	A
46	54	4605	A
46	54	4636	U
46	54	4637	G
46	54	4639	G
46	54	4652	G
46	54	4656	A
46	54	4657	U
46	54	4661	G
46	54	4670	C
46	54	4672	A
46	54	4677	U
46	54	4687	A
46	54	4693	C
46	54	4694	G
46	54	4709	U
46	54	4719	G
46	54	4720	C
46	54	4722	G
46	54	4728	U
46	54	4736	C
46	54	4738	C
46	54	4744	A
46	54	4745	G
46	54	4750	G
46	54	4751	G
46	54	4752	U
46	54	4754	G
46	54	4757	C

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Mol	Chain	Res	Type
46	54	4759	C
46	54	4761	G
46	54	4764	A
46	54	4765	G
46	54	4771	C
46	54	4772	C
46	54	4868	G
46	54	4870	G
46	54	4871	C
46	54	4875	G
46	54	4882	U
46	54	4883	C
46	54	4885	U
46	54	4895	C
46	54	4896	G
46	54	4897	G
46	54	4903	G
46	54	4909	A
46	54	4910	A
46	54	4912	G
46	54	4913	G
46	54	4919	G
46	54	4921	C
46	54	4922	C
46	54	4924	C
46	54	4925	U
46	54	4926	C
46	54	4927	G
46	54	4928	C
46	54	4931	G
46	54	4935	C
46	54	4937	C
46	54	4940	C
46	54	4943	A
46	54	4944	C
46	54	4948	C
46	54	4949	G
46	54	4950	U
46	54	4951	G
46	54	4955	A
46	54	4956	A
46	54	4957	C

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Mol	Chain	Res	Type
46	54	4958	C
46	54	4960	G
46	54	4963	G
46	54	4965	U
46	54	4966	A
46	54	4967	A
46	54	4976	U
46	54	4977	A
46	54	4985	U
46	54	4988	U
46	54	4989	U
46	54	4990	C
46	54	4991	U
46	54	4993	G
46	54	5006	U
46	54	5014	A
46	54	5016	A
46	54	5017	G
46	54	5022	U
46	54	5040	U
46	54	5041	G
46	54	5047	C
46	54	5050	C
46	54	5052	C
46	54	5053	U
46	54	5054	C
46	54	5056	A
46	54	5058	A
46	54	5061	A
46	54	5062	G
47	74	7	G
47	74	10	C
47	74	22	A
47	74	25	G
47	74	31	G
47	74	42	A
47	74	53	U
47	74	54	A
47	74	64	G
47	74	80	U
47	74	100	A
47	74	110	G

Continued on next page...

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Mol	Chain	Res	Type
47	74	111	C
47	74	120	U
48	84	2	G
48	84	3	A
48	84	13	G
48	84	20	A
48	84	23	C
48	84	32	C
48	84	34	U
48	84	35	C
48	84	38	U
48	84	49	G
48	84	59	A
48	84	62	A
48	84	63	U
48	84	75	G
48	84	79	G
48	84	86	U
48	84	87	G
48	84	103	A
48	84	105	C
48	84	106	G
48	84	109	C
48	84	110	U
48	84	111	U
48	84	112	G
48	84	114	G
48	84	123	U
48	84	125	C
48	84	126	C
48	84	127	U
48	84	128	C
48	84	153	C
48	84	156	U

All (59) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
46	54	12	A
46	54	125	C
46	54	134	G
46	54	245	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
46	54	265	C
46	54	275	C
46	54	406	C
46	54	449	C
46	54	480	C
46	54	485	C
46	54	498	C
46	54	504	G
46	54	684	G
46	54	685	C
46	54	696	C
46	54	704	C
46	54	935(A)	G
46	54	959	G
46	54	971(A)	G
46	54	1072	C
46	54	1174	G
46	54	1211	G
46	54	1236	C
46	54	1238	A
46	54	1329	G
46	54	1370	G
46	54	1440	U
46	54	1445	U
46	54	1455	G
46	54	1477	C
46	54	1482	G
46	54	1633	G
46	54	1818	G
46	54	2046	G
46	54	2089	G
46	54	2266	C
46	54	2468	U
46	54	2488	C
46	54	2502	A
46	54	2546	G
46	54	2695	A
46	54	3603	G
46	54	3625	G
46	54	3876	A
46	54	3888	G
46	54	3904	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
46	54	4119	C
46	54	4170	A
46	54	4232	U
46	54	4354	U
46	54	4378	A
46	54	4448	G
46	54	4719	G
46	54	4884	G
46	54	4921	C
46	54	4925	U
46	54	4947	U
46	54	4989	U
48	84	124	U

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 225 ligands modelled in this entry, 225 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
46	54	27
45	23	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	54	2113:G	O3'	2258:C	P	40.63
1	54	1252:C	O3'	1271:G	P	37.10
1	54	1219:G	O3'	1233:G	P	19.39
1	54	3948:C	O3'	4065:G	P	18.92
1	54	4138:C	O3'	4146:G	P	18.16
1	54	990:C	O3'	1064:G	P	17.76
1	54	1696:C	O3'	1720:C	P	16.65
1	54	523:C	O3'	638:G	P	16.27
1	54	5022:U	O3'	5028:G	P	16.12
1	54	4777:C	O3'	4859:C	P	16.01
1	54	1406(C):G	O3'	1411:C	P	15.31
1	54	4101:C	O3'	4107:G	P	15.18
1	54	1364:U	O3'	1368:A	P	13.95
1	54	760:G	O3'	904:C	P	13.79
1	54	2901:G	O3'	3597:G	P	12.37
1	54	182:G	O3'	189:G	P	12.34
1	54	1180:C	O3'	1183:C	P	9.50
1	54	4729:A	O3'	4735:G	P	9.38
1	54	1100:U	O3'	1168:G	P	8.14
1	54	512:U	O3'	515:C	P	7.49
1	54	500:G	O3'	504:G	P	6.25
1	23	16:C	O3'	18:G	P	5.32
1	54	4740:G	O3'	4743:G	P	5.30
1	54	170:C	O3'	171:U	P	4.95
1	54	1239:C	O3'	1244:G	P	4.92
1	54	5020:G	O3'	5021:C	P	3.70
1	54	4899:G	O3'	4902:C	P	3.31
1	54	751:G	O3'	752:G	P	3.15

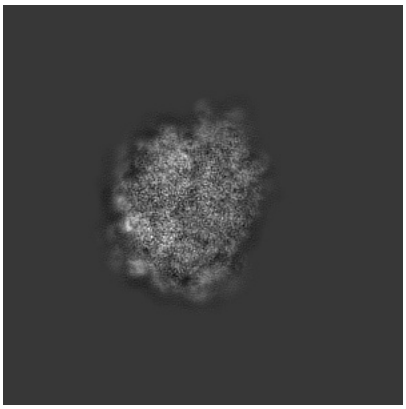
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-10380. These allow visual inspection of the internal detail of the map and identification of artifacts.

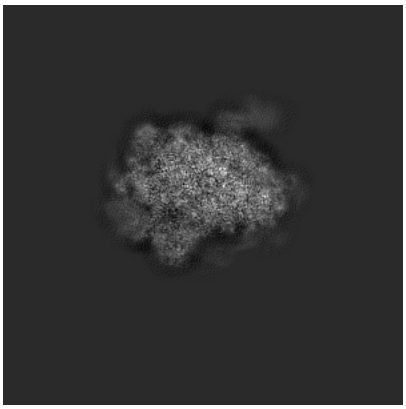
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

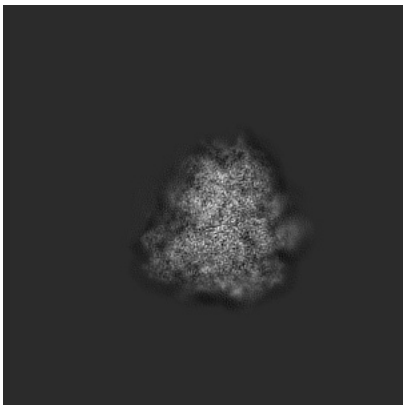
6.1.1 Primary map



X

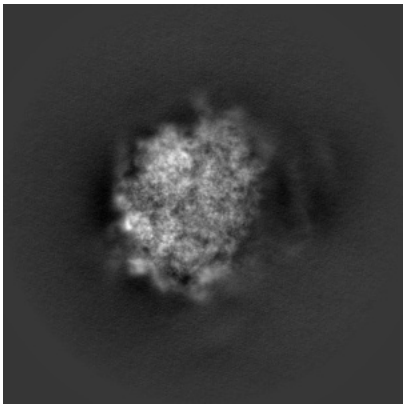


Y

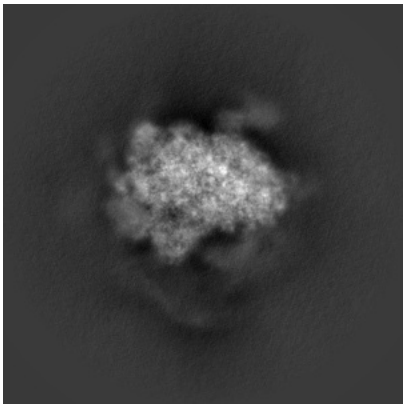


Z

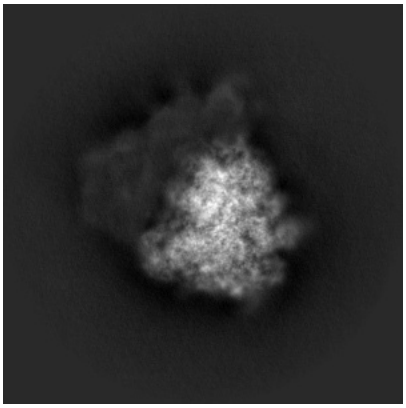
6.1.2 Raw map



X



Y

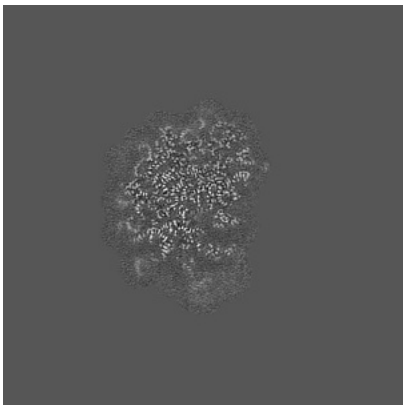


Z

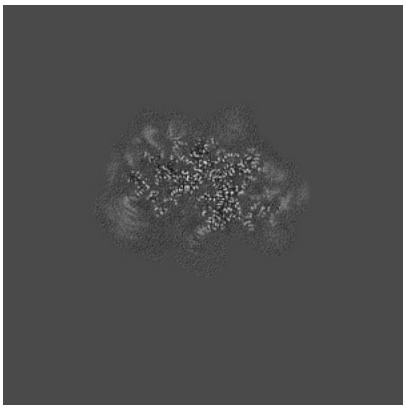
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

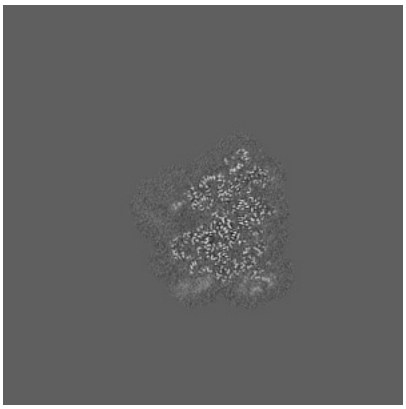
6.2.1 Primary map



X Index: 200

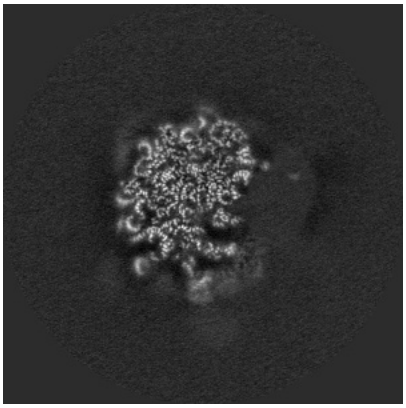


Y Index: 200

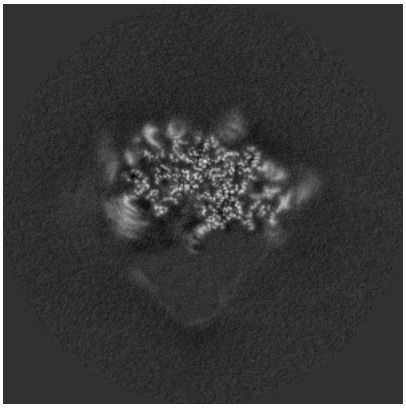


Z Index: 200

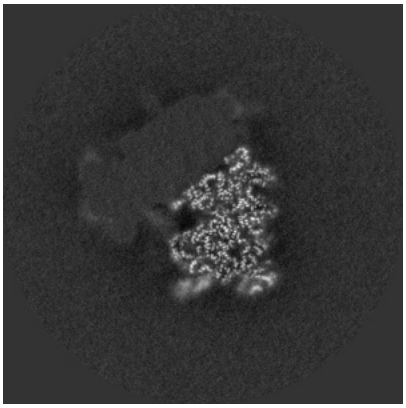
6.2.2 Raw map



X Index: 200



Y Index: 200

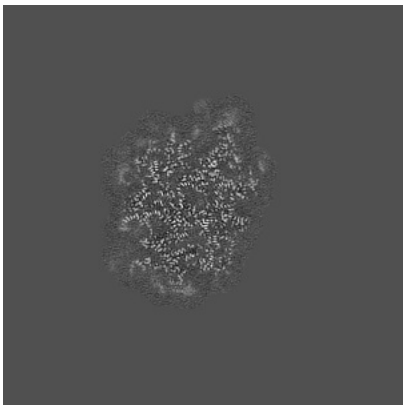


Z Index: 200

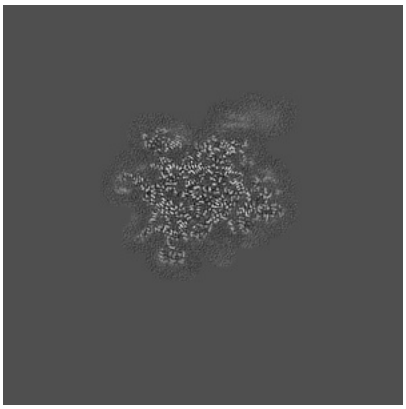
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

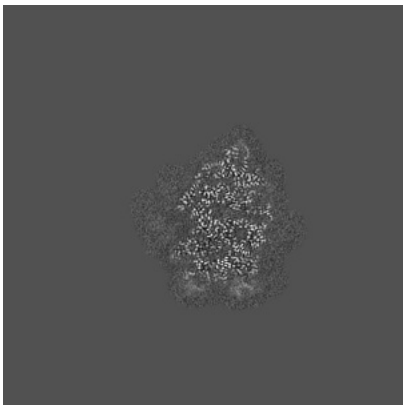
6.3.1 Primary map



X Index: 218

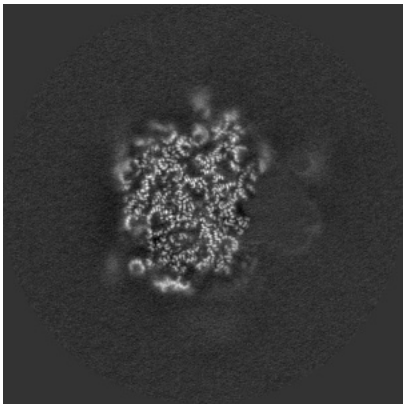


Y Index: 161

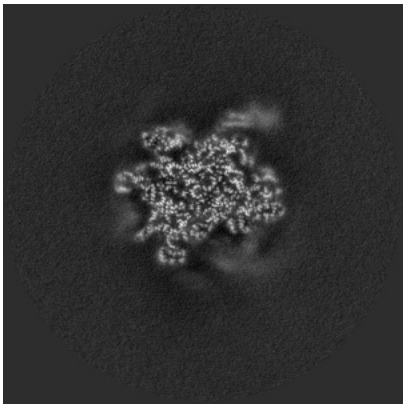


Z Index: 208

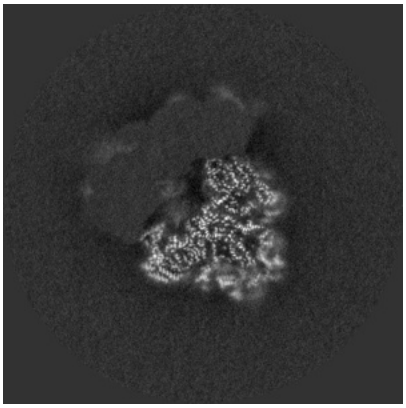
6.3.2 Raw map



X Index: 215



Y Index: 161

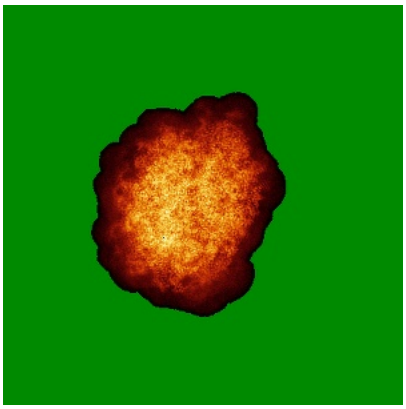


Z Index: 176

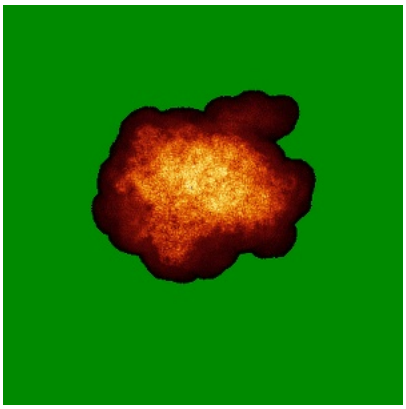
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

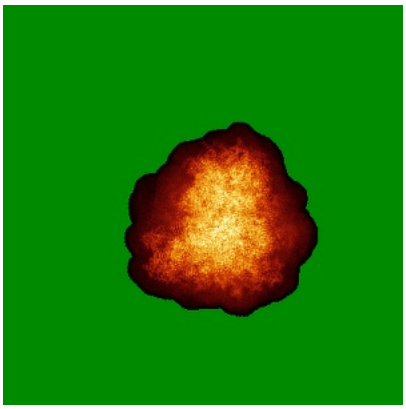
6.4.1 Primary map



X

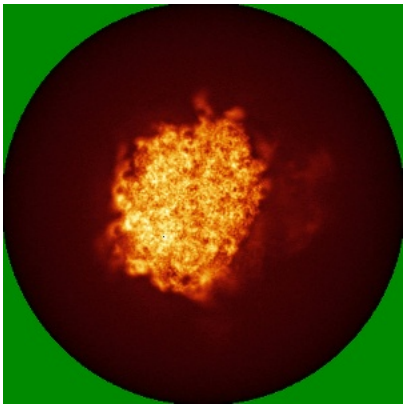


Y

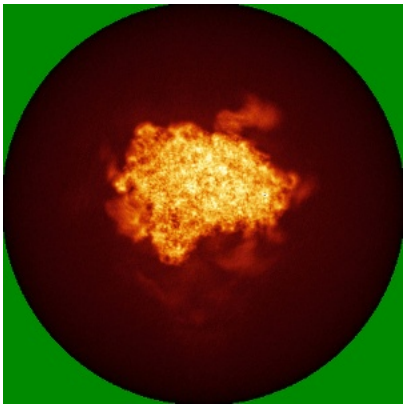


Z

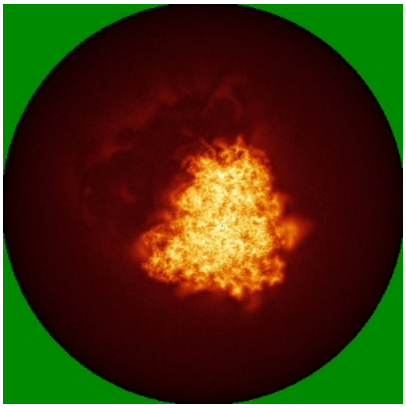
6.4.2 Raw map



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

6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

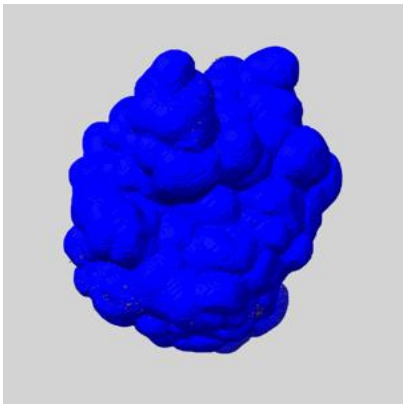
6.6 Mask visualisation (i)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

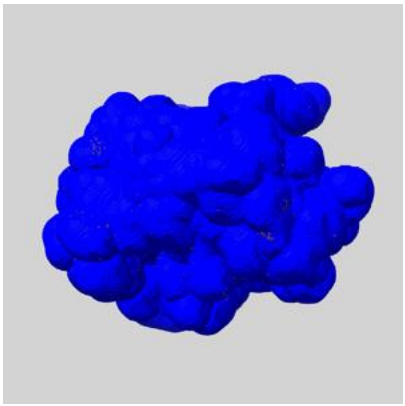
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

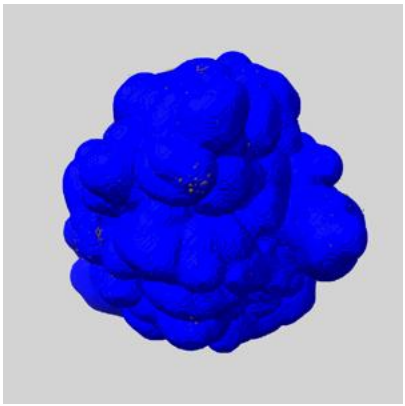
6.6.1 emd_10380_msk_1.map (i)



X



Y

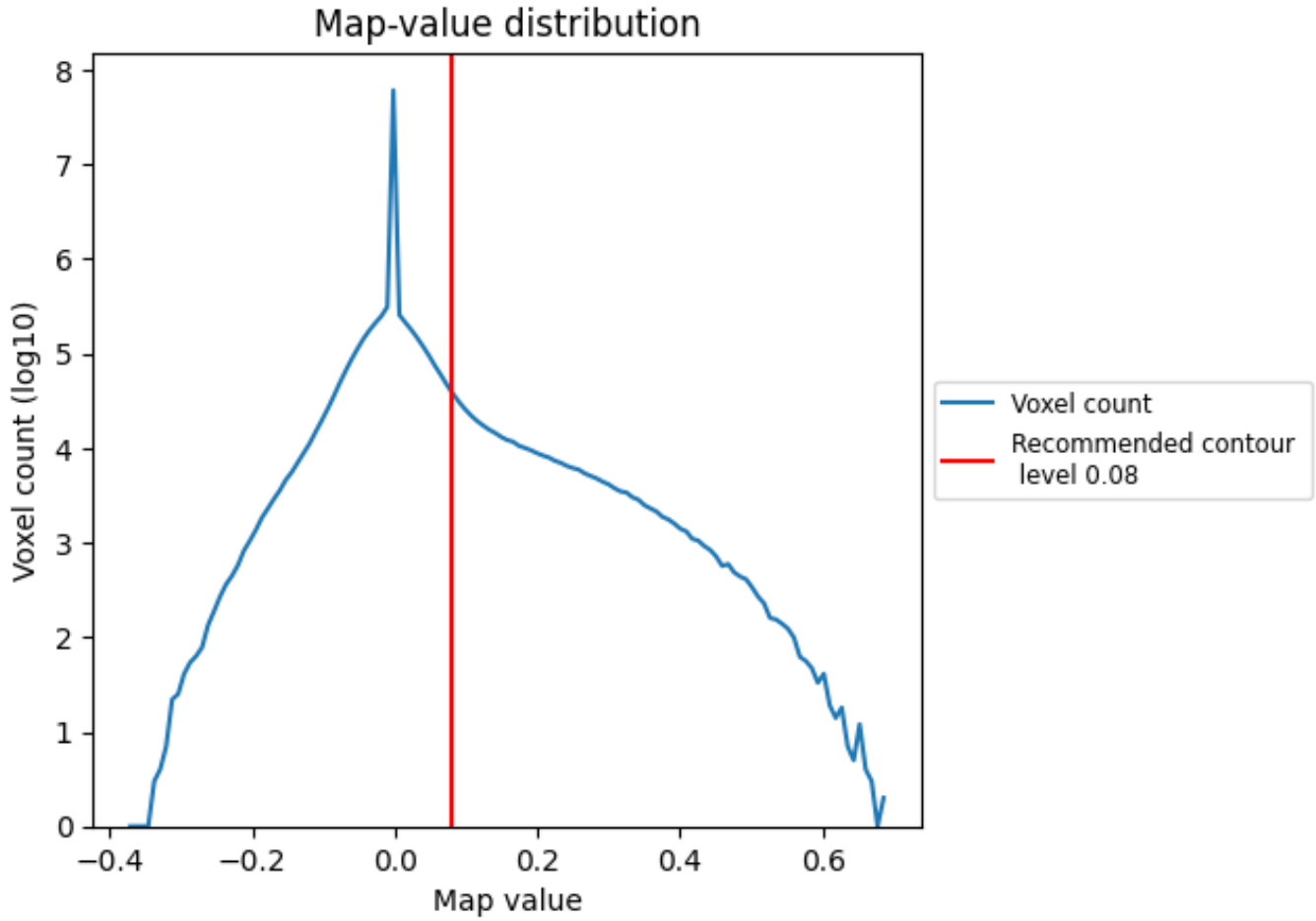


Z

7 Map analysis

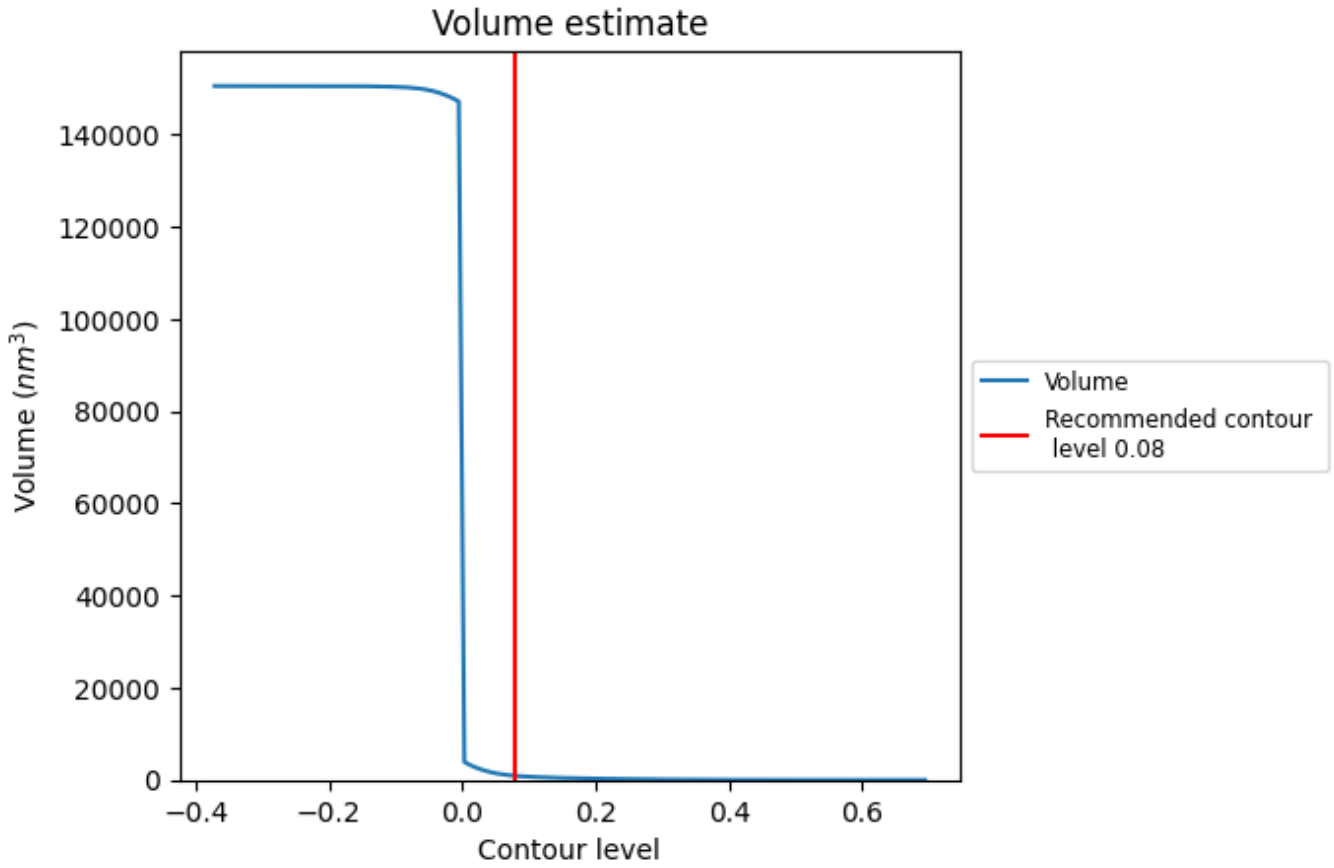
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

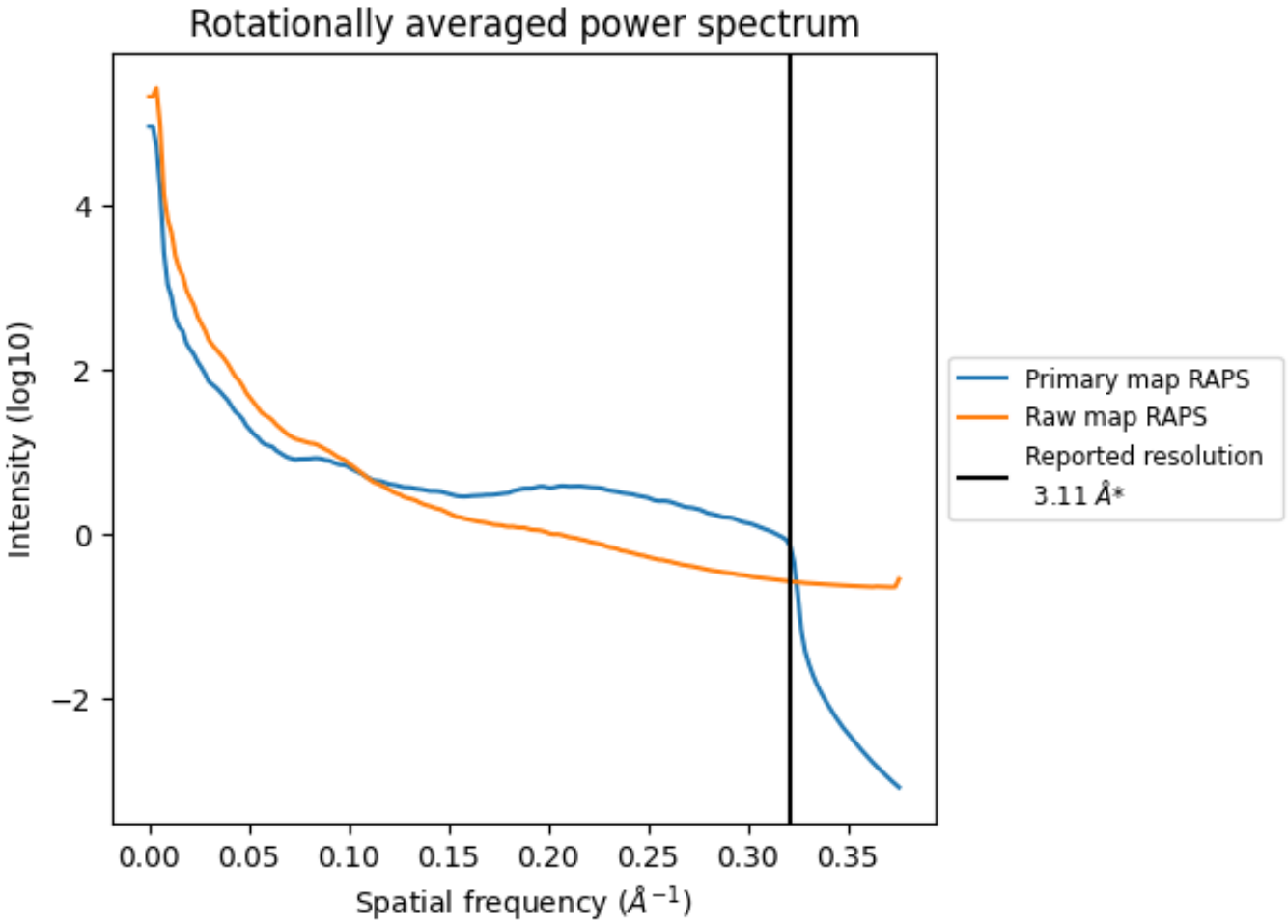
7.2 Volume estimate



The volume at the recommended contour level is 897 nm^3; this corresponds to an approximate mass of 810 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)

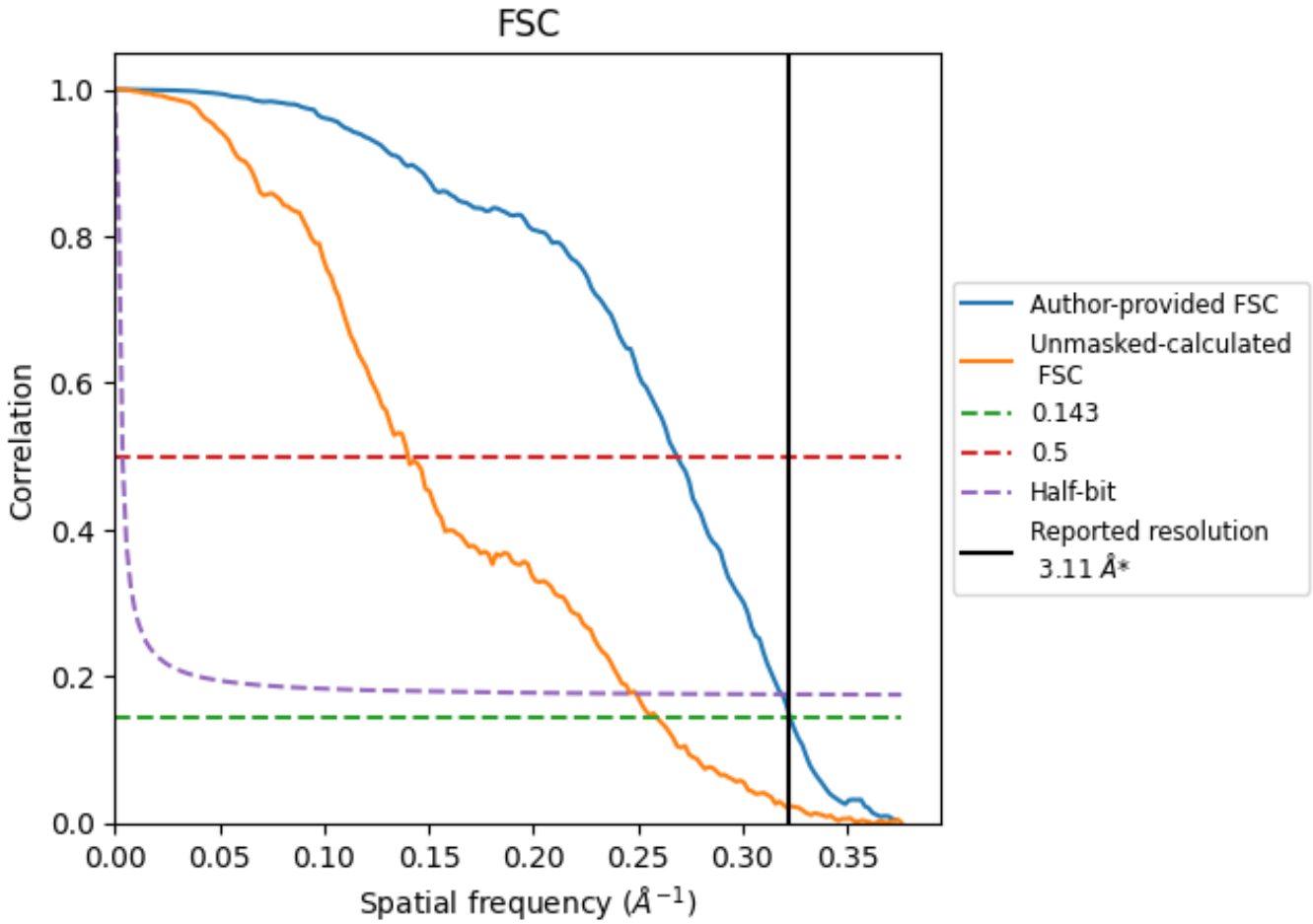


*Reported resolution corresponds to spatial frequency of 0.322 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.322 Å^{-1}

8.2 Resolution estimates (i)

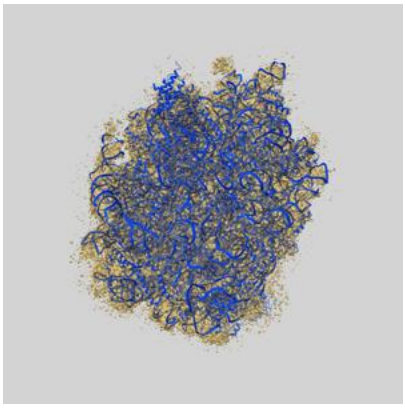
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.11	-	-
Author-provided FSC curve	3.10	3.72	3.14
Unmasked-calculated*	3.86	7.14	4.02

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.86 differs from the reported value 3.11 by more than 10 %

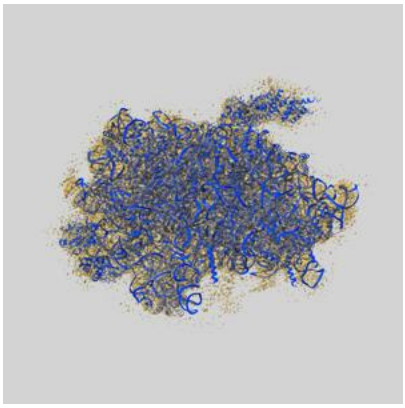
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-10380 and PDB model 6T59. Per-residue inclusion information can be found in section 3 on page 15.

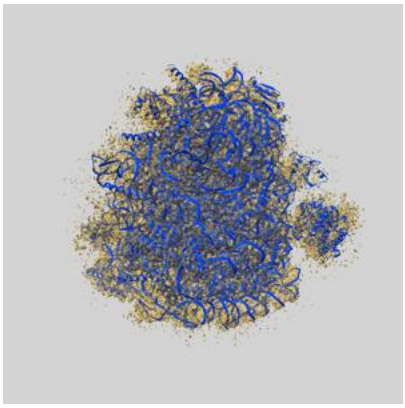
9.1 Map-model overlay



X



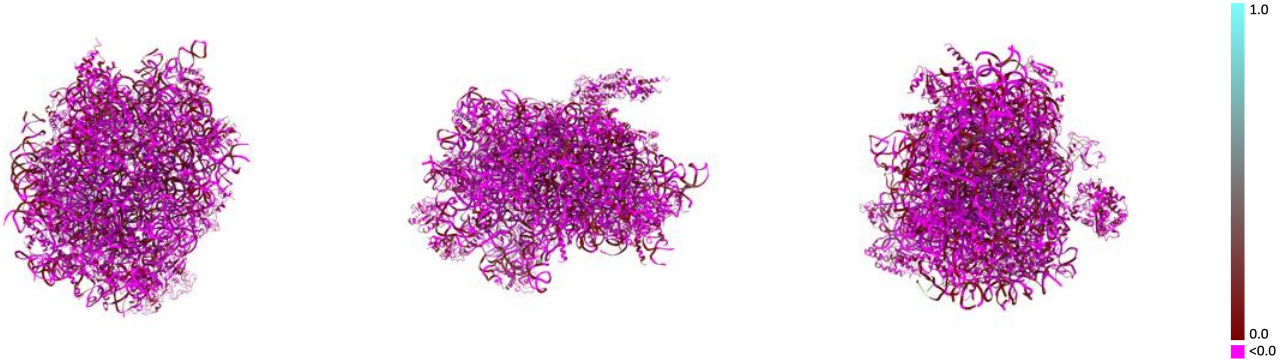
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.08 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.

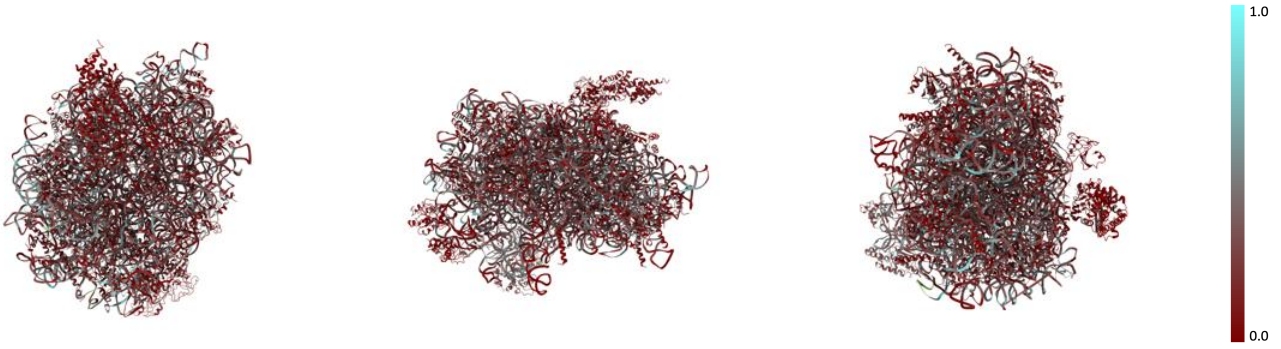
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

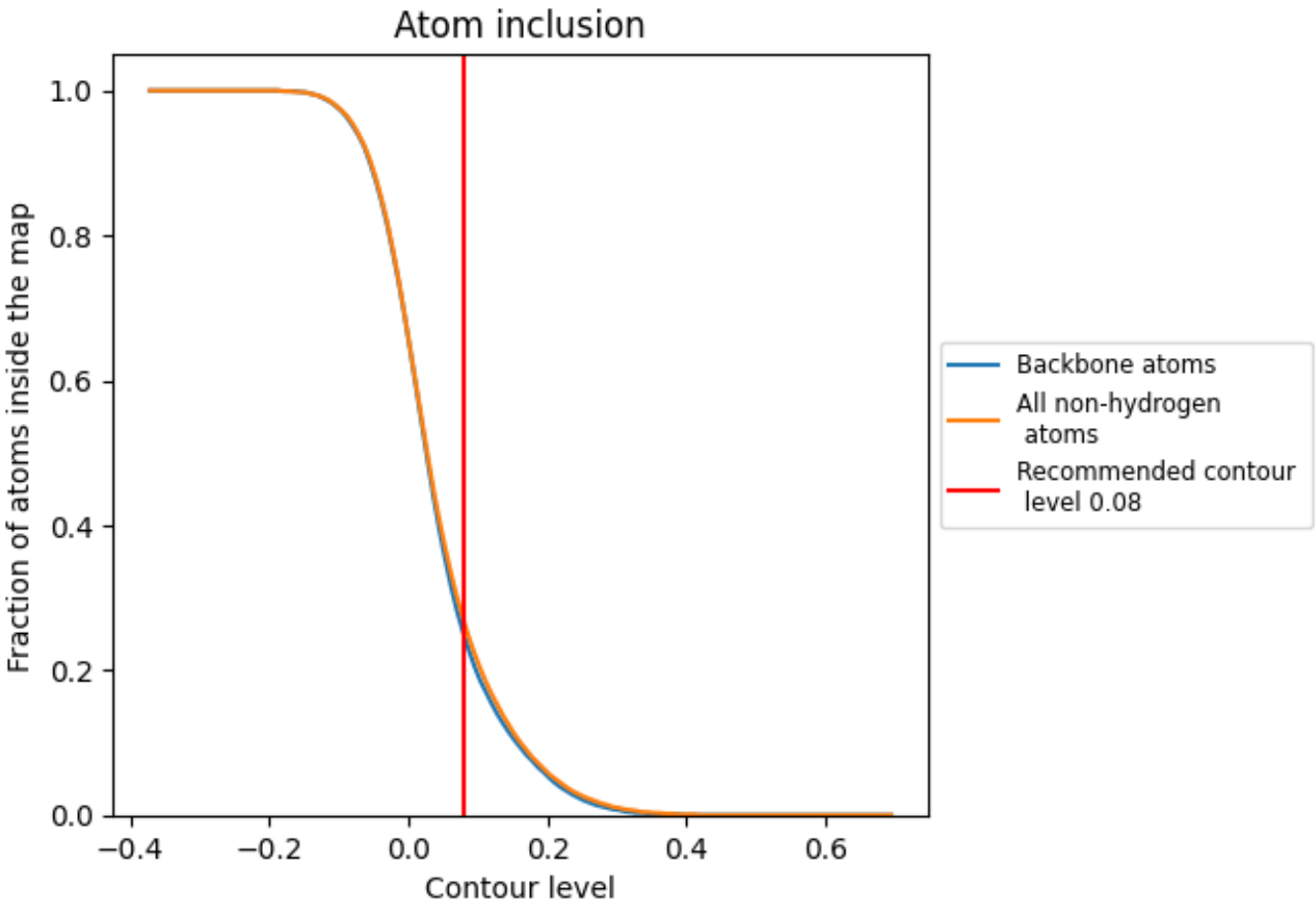
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.08).

9.4 Atom inclusion (i)



At the recommended contour level, 25% of all backbone atoms, 27% 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 (0.08) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.2670	-0.0680
1	0.0460	0.0020
23	0.0730	-0.0110
54	0.3170	-0.0600
74	0.3820	-0.1130
84	0.3300	-0.0320
A3	0.1850	-0.1380
B3	0.2070	-0.0910
C3	0.2270	-0.0980
D3	0.2970	-0.0630
E3	0.2210	-0.0940
F3	0.2230	-0.1080
G3	0.2170	-0.0680
H3	0.1930	-0.0940
I3	0.2320	-0.0920
J3	0.2410	-0.0470
L3	0.2320	-0.0770
M3	0.2550	-0.1010
N3	0.2200	-0.1120
NA	0.0560	0.0400
NB	0.0220	0.0230
NI	0.1530	-0.1020
O3	0.2320	-0.0910
P3	0.1900	-0.1070
Q3	0.1930	-0.1340
R3	0.2200	-0.0660
S3	0.2570	-0.0880
T3	0.2250	-0.1000
TT	0.0900	-0.0270
U3	0.1740	-0.0630
V3	0.1680	-0.1160
W3	0.1850	-0.0880
X3	0.1820	-0.0520
Y3	0.1860	-0.0900
Z3	0.2130	-0.0630

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Chain	Atom inclusion	Q-score
a3	0.2390	-0.1140
b3	0.1890	-0.0920
c3	0.2510	-0.0690
d3	0.1770	-0.0770
e3	0.1940	-0.1160
f3	0.2200	-0.1000
g3	0.1850	-0.0740
h3	0.2060	-0.0630
i3	0.2410	-0.0720
j3	0.2370	-0.0720
k3	0.1690	-0.0380
l3	0.2180	-0.0780
m3	0.2020	-0.1270
n3	0.0320	-0.0910
o3	0.1900	-0.1030
p3	0.2470	-0.0540
r3	0.1910	-0.1180
s3	0.0700	-0.0170
t3	0.0580	0.0140