



wwPDB EM Validation Summary Report ⓘ

Mar 20, 2024 – 09:01 AM JST

PDB ID : 6LQV
EMDB ID : EMD-0955
Title : Cryo-EM structure of 90S small subunit preribosomes in transition states (State C1)
Authors : Du, Y.; Ye, K.
Deposited on : 2020-01-14
Resolution : 4.80 Å (reported)
Based on initial model : 6LQR

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

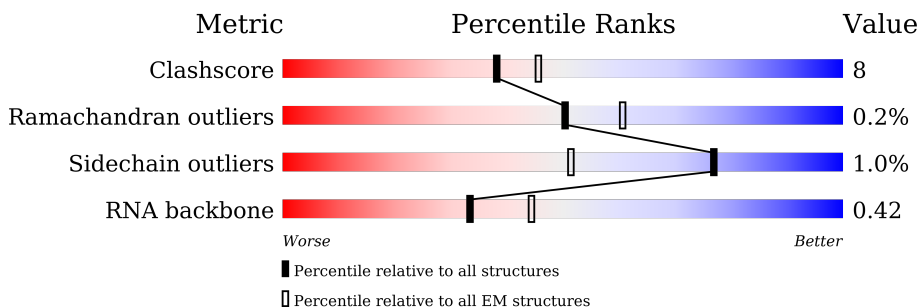
EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry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

1 Overall quality at a glance

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

The reported resolution of this entry is 4.80 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	3A	333	
2	5A	700	
3	SA	1808	
4	SF	261	
5	SG	225	
6	SH	236	
7	SJ	200	

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Mol	Chain	Length	Quality of chain
8	SK	197	8% 76% 11% 13%
9	SM	156	32% 53% 26% 21%
10	SR	143	71% 16% 13%
11	SY	145	10% 63% 7% 29%
12	SZ	135	10% 59% 15% 24%
13	Sd	67	7% 94% 6%
14	3B	327	11% 61% 13% 27%
14	3C	327	41% 51% 17% 31%
15	3D	504	9% 60% 13% 27%
16	3E	511	35% 67% 17% 16%
17	3F	573	7% 61% 18% 21%
18	3G	126	28% 80% 16%
18	3H	126	76% 19% 1%
19	A4	776	43% 65% 19% 15%
20	A5	643	31% 65% 14% 20%
21	A8	713	56% 62% 10% 25%
22	A9	575	16% 17% 5% 78%
23	AE	1769	63% 77% 9% 13%
24	AF	513	53% 75% 21%
25	AG	896	47% 71% 20% 8%
26	B1	923	9% 70% 15% 14%
27	B2	943	15% 66% 21% 13%
28	B3	817	72% 66% 25% 7%
29	B8	594	10% 66% 14% 20%
30	BE	939	6% 73% 14% 13%

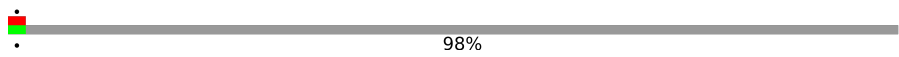
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Mol	Chain	Length	Quality of chain
31	B6	440	18% 75% 10% 15%
32	5B	214	27% 21% 6% 72%
33	5C	554	6% 59% 14% 26%
34	5D	250	42% 54% 13% 33%
35	5E	593	5% 19% 11% 67%
36	5F	183	63% 37%
37	5G	290	10% 57% 18% 24%
38	5H	610	11% 88%
39	5I	489	14% 73% 21% 6%
40	5J	217	38% 57% 12% 30%
41	5K	189	13% 79% 14% 7%
42	RA	707	25% 35% 12% 52%
43	RB	357	14% 27% 10% 62%
44	RG	252	81% 62% 24% 14%
44	RH	252	78% 72% 19% 9%
45	RJ	1183	7% 54% 13% 33%
46	RK	367	9% 75% 22%
47	RL	1056	37% 71% 5% 24%
47	RM	1056	61% 71% 27%
48	RN	810	67% 61% 13% 25%
49	RO	552	95% 82% 13% 5%
50	RP	2493	58% 59% 38%
51	RQ	899	13% 13% 85%
52	RS	483	51% 36% 15% 48%
53	RY	534	6% 6% 93%

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Mol	Chain	Length	Quality of chain
54	X1	347	 98%

2 Entry composition

There are 57 unique types of molecules in this entry. The entry contains 181752 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called U3 snoRNA.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	5A	171	3668	1637	666	1194	171	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	SA	950	20256	9055	3612	6639	950	0	0

- Molecule 4 is a protein called 40S ribosomal protein S4-A.

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

- Molecule 5 is a protein called 40S ribosomal protein S5.

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

- Molecule 6 is a protein called 40S ribosomal protein S6-A.

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

- Molecule 7 is a protein called 40S ribosomal protein S8-A.

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

- Molecule 8 is a protein called 40S ribosomal protein S9-A.

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

- Molecule 9 is a protein called 40S ribosomal protein S11-A.

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

- Molecule 10 is a protein called 40S ribosomal protein S16-A.

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

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

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

- Molecule 12 is a protein called 40S ribosomal protein S24-A.

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

- Molecule 13 is a protein called 40S ribosomal protein S28-A.

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

- Molecule 14 is a protein called rRNA 2'-O-methyltransferase fibrillar.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	3B	240	Total	C	N	O	S	0	0
			1865	1184	333	338	10		
14	3C	225	Total	C	N	O	S	0	0
			1763	1120	316	317	10		

- Molecule 15 is a protein called Nucleolar protein 56.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	3D	369	Total	C	N	O	S	0	0
			2848	1811	489	540	8		

- Molecule 16 is a protein called Nucleolar protein 58.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	3E	431	Total	C	N	O	S	0	0
			3028	1888	543	588	9		

- Molecule 17 is a protein called Ribosomal RNA-processing protein 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	3F	454	Total	C	N	O	S	0	0
			3643	2315	638	680	10		

- Molecule 18 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	3G	121	Total	C	N	O	S	0	0
			916	583	158	171	4		
18	3H	121	Total	C	N	O	S	0	0
			916	583	158	171	4		

- Molecule 19 is a protein called U3 small nucleolar RNA-associated protein 4.

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

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

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

- Molecule 21 is a protein called U3 small nucleolar RNA-associated protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	A8	532	3229	2008	592	626	3	0	0

- Molecule 22 is a protein called U3 small nucleolar RNA-associated protein 9.

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

- Molecule 23 is a protein called U3 small nucleolar RNA-associated protein 10.

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

- Molecule 24 is a protein called U3 small nucleolar RNA-associated protein 15.

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

- Molecule 25 is a protein called NET1-associated nuclear protein 1.

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

- Molecule 26 is a protein called Periodic tryptophan protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	B1	793	6331	4046	1085	1182	18	0	0

- Molecule 27 is a protein called U3 small nucleolar RNA-associated protein 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	B2	825	6502	4156	1096	1223	27	0	0

- Molecule 28 is a protein called U3 small nucleolar RNA-associated protein 13.

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

- Molecule 29 is a protein called U3 small nucleolar RNA-associated protein 18.

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

- Molecule 30 is a protein called U3 small nucleolar RNA-associated protein 21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	BE	820	6450	4090	1114	1225	21	0	0

- Molecule 31 is a protein called U3 small nucleolar RNA-associated protein 6.

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

- Molecule 32 is a protein called Bud site selection protein 21.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
32	5B	60	495	310	101	84	0	0

- Molecule 33 is a protein called U3 small nucleolar RNA-associated protein 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	5C	409	3198	2020	559	608	11	0	0

- Molecule 34 is a protein called U3 small nucleolar RNA-associated protein 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	5D	167	1396	862	266	263	5	0	0

- Molecule 35 is a protein called U3 small nucleolar RNA-associated protein MPP10.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	5E	193	Total	C	N	O	S	0	0
			1564	970	280	310	4		

- Molecule 36 is a protein called U3 small nucleolar ribonucleoprotein protein IMP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	5F	182	Total	C	N	O	S	0	0
			1530	967	287	269	7		

- Molecule 37 is a protein called U3 small nucleolar ribonucleoprotein protein IMP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	5G	219	Total	C	N	O	S	0	0
			1756	1107	325	318	6		

- Molecule 38 is a protein called Something about silencing protein 10.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	5H	74	Total	C	N	O	0	0
			596	373	122	101		

- Molecule 39 is a protein called Protein SOF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	5I	461	Total	C	N	O	S	0	0
			3765	2354	686	709	16		

- Molecule 40 is a protein called rRNA-processing protein FCF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	5J	151	Total	C	N	O	S	0	0
			1280	807	240	228	5		

- Molecule 41 is a protein called rRNA-processing protein FCF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	5K	175	Total	C	N	O	S	0	0
			1403	896	256	241	10		

- Molecule 42 is a protein called Ribosome biogenesis protein ENP2.

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

- Molecule 43 is a protein called U3 small nucleolar ribonucleoprotein protein LCP5.

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

- Molecule 44 is a protein called Ribosomal RNA small subunit methyltransferase NEP1.

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

- Molecule 45 is a protein called Ribosome biogenesis protein BMS1.

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

- Molecule 46 is a protein called RNA 3'-terminal phosphate cyclase-like protein.

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

- Molecule 47 is a protein called RNA cytidine acetyltransferase.

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

- Molecule 48 is a protein called Nucleolar complex protein 14.

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

- Molecule 49 is a protein called Nucleolar complex protein 4.

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

- Molecule 50 is a protein called U3 small nucleolar RNA-associated protein 20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	RP	1554	8510	5201	1624	1679	6	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	RQ	138	974	598	183	192	1	0	0

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

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

- Molecule 53 is a protein called Protein BFR2.

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

- Molecule 54 is a protein called Unassigned helices.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
54	X1	8	40	24	8	8	0	0

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

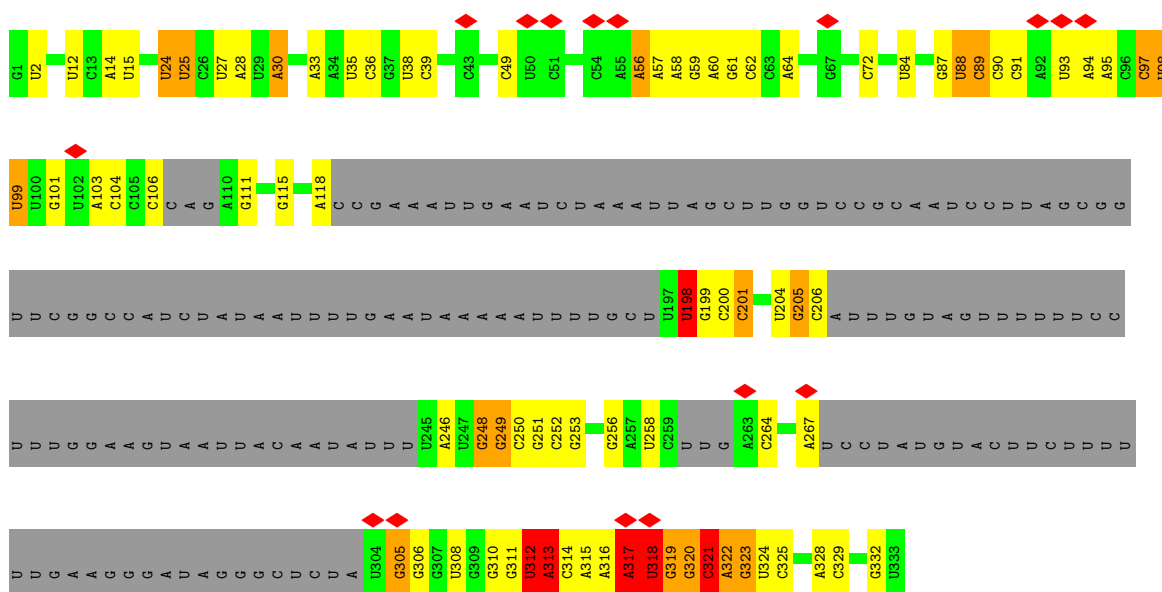
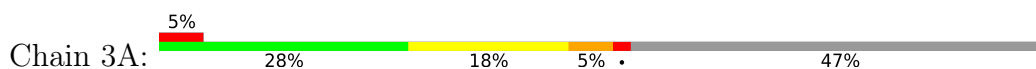
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
55	5K	1	1	1	0

- Molecule 56 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula:

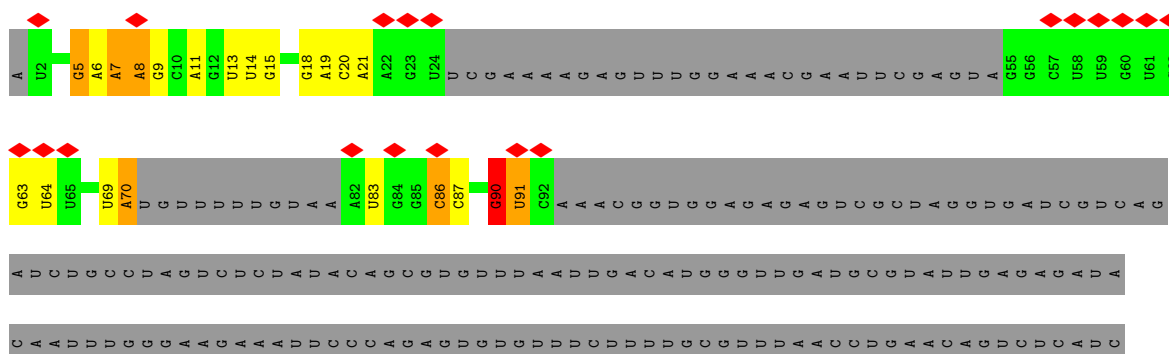
3 Residue-property plots [i](#)

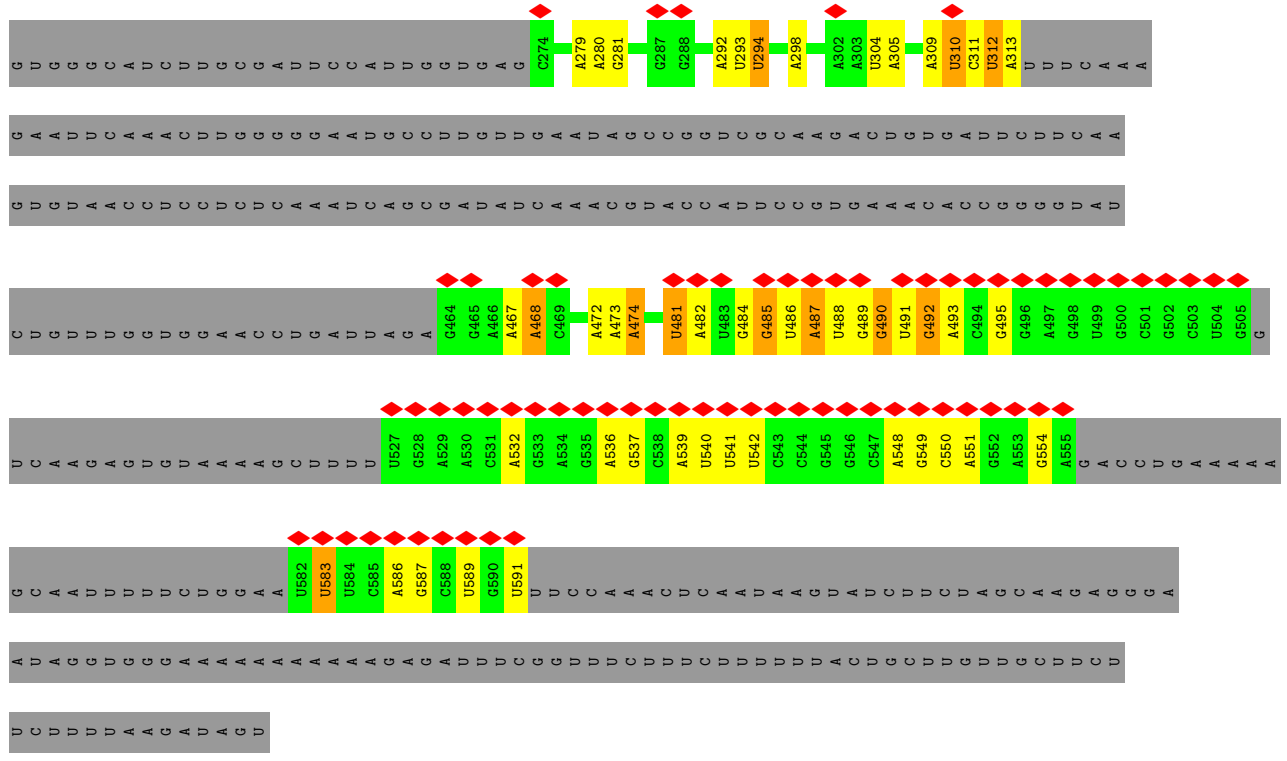
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: U3 snoRNA

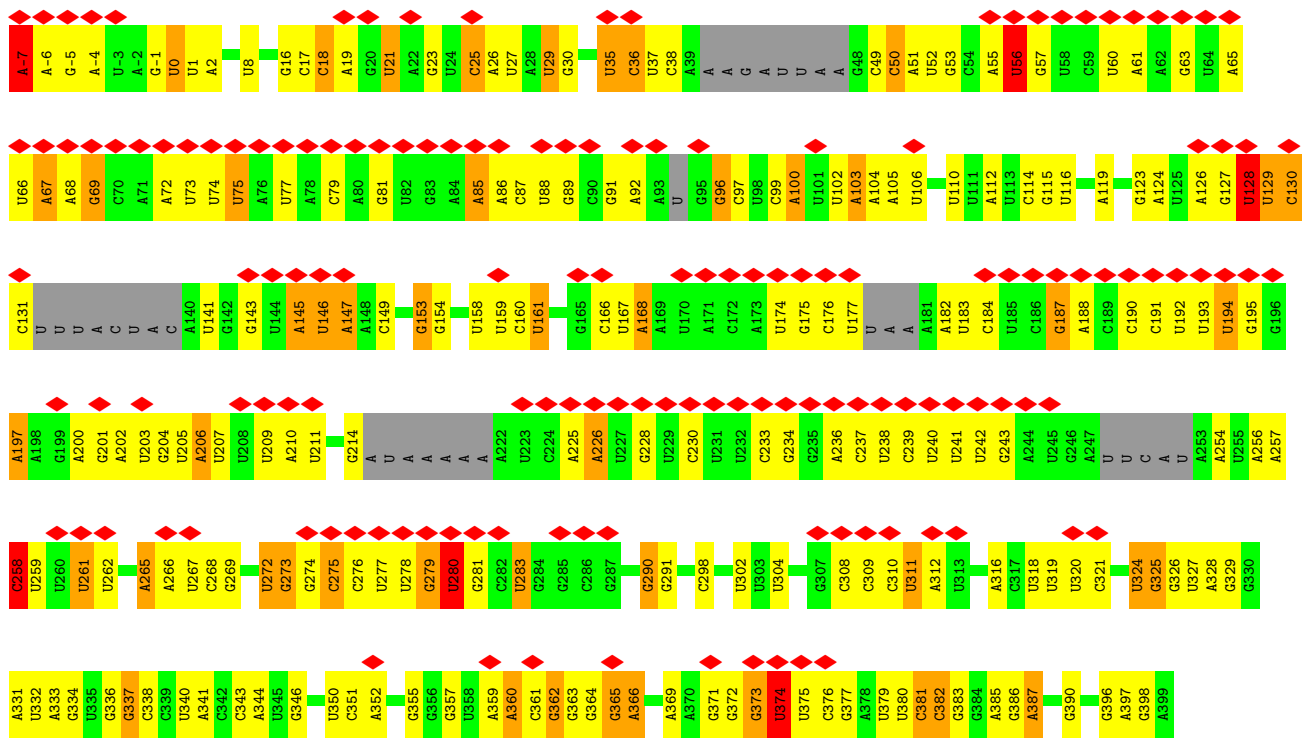


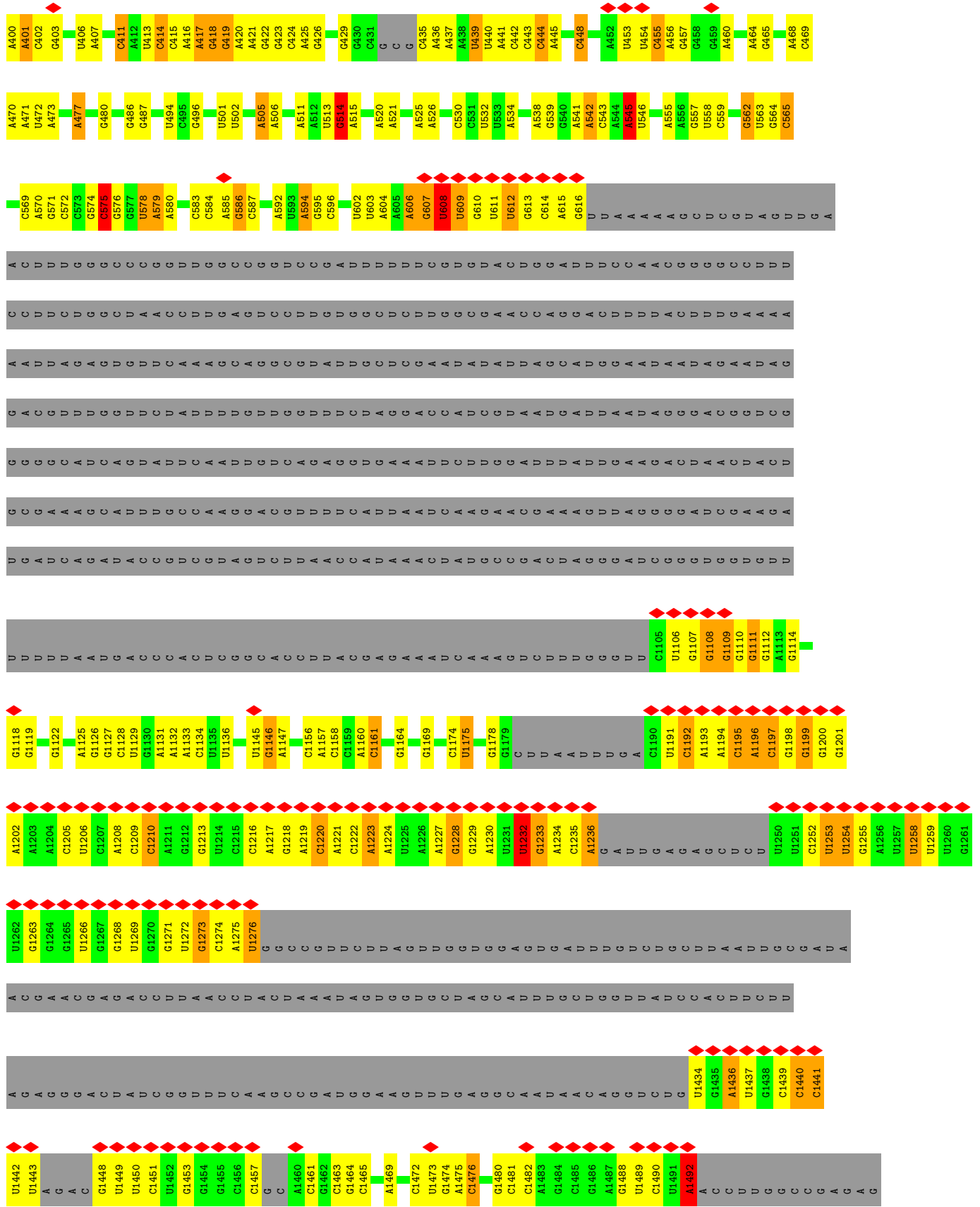
- Molecule 2: 5' ETS

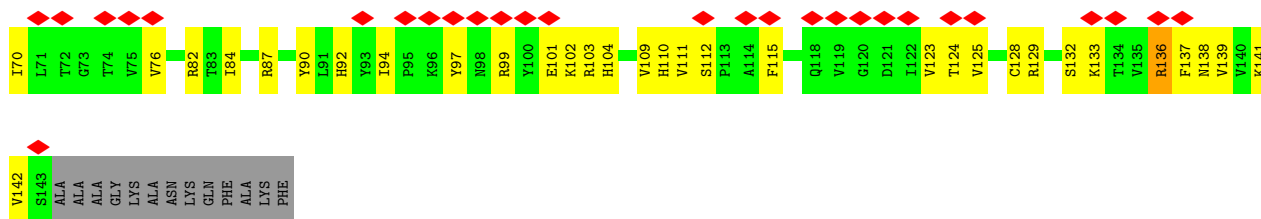




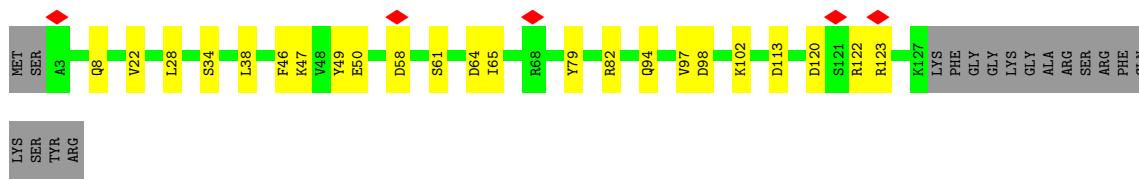
• Molecule 3: 18S pre-rRNA



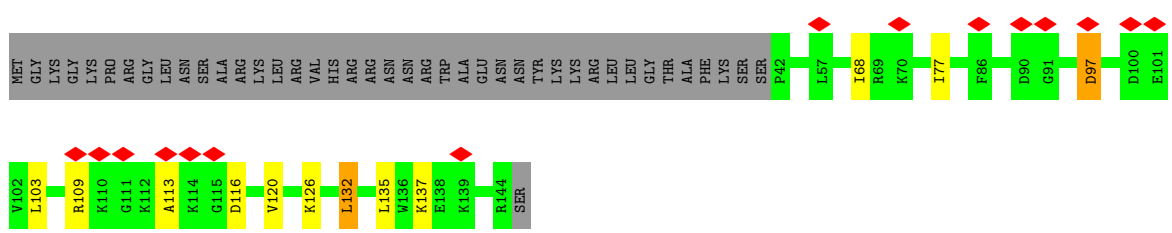




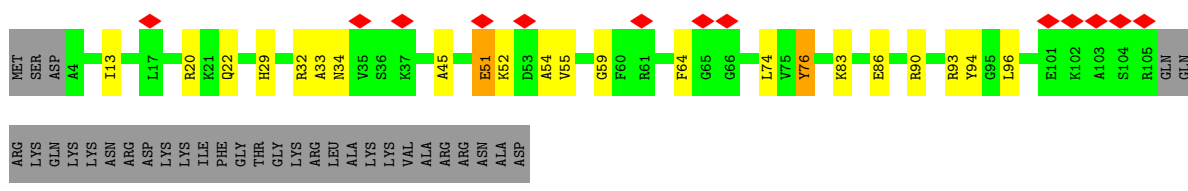
• Molecule 10: 40S ribosomal protein S16-A



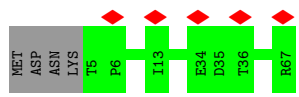
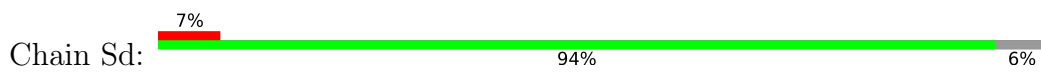
• Molecule 11: 40S ribosomal protein S23-A



• Molecule 12: 40S ribosomal protein S24-A

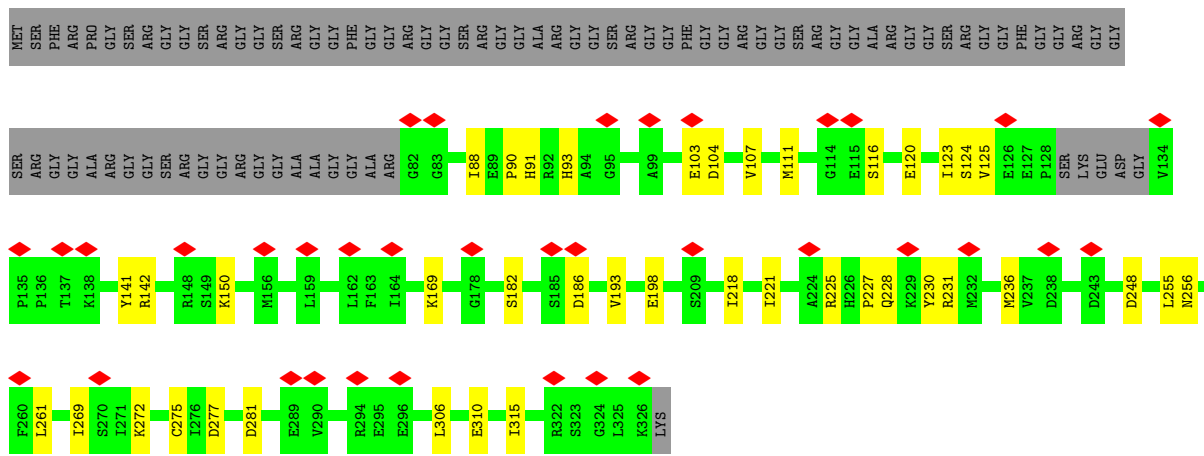


• Molecule 13: 40S ribosomal protein S28-A

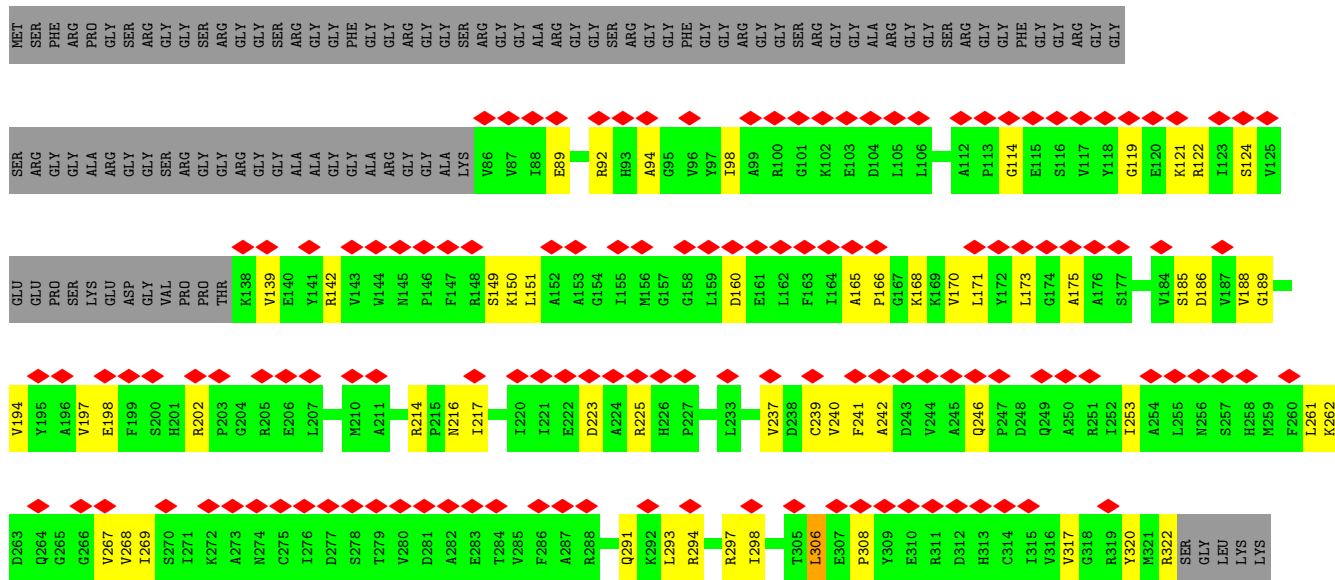
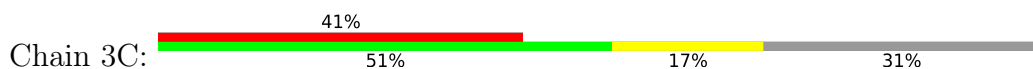


• Molecule 14: rRNA 2'-O-methyltransferase fibrillar

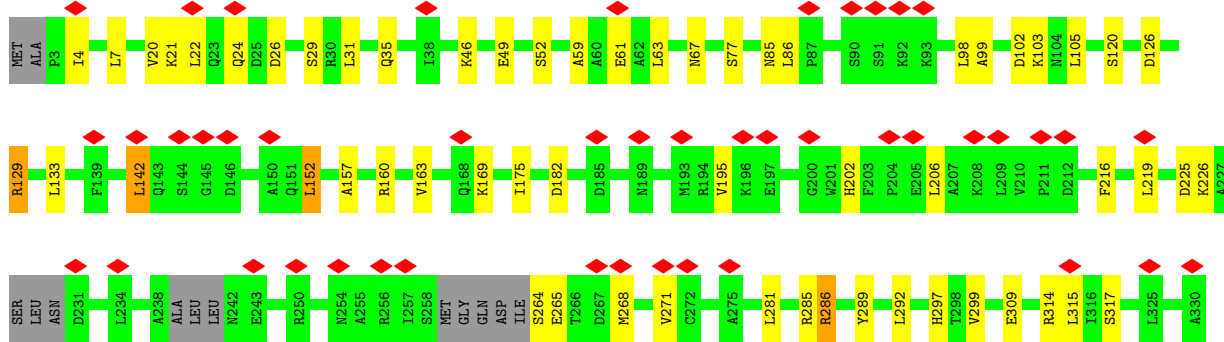


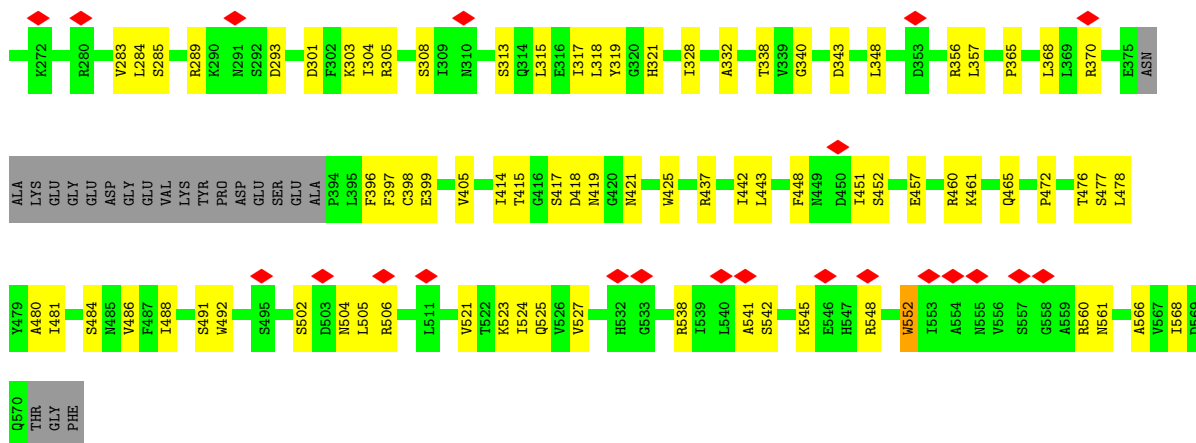


• Molecule 14: rRNA 2'-O-methyltransferase fibrillar

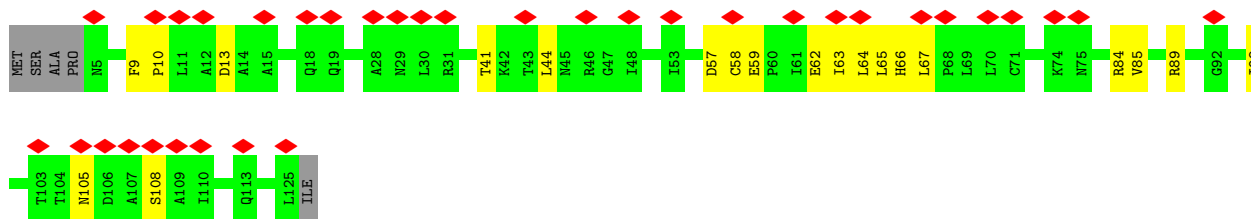
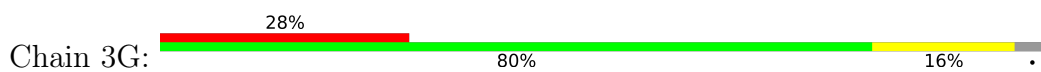


• Molecule 15: Nucleolar protein 56

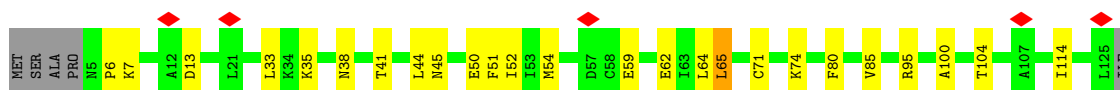
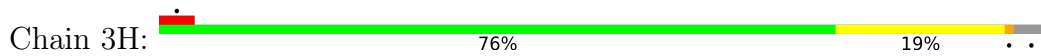




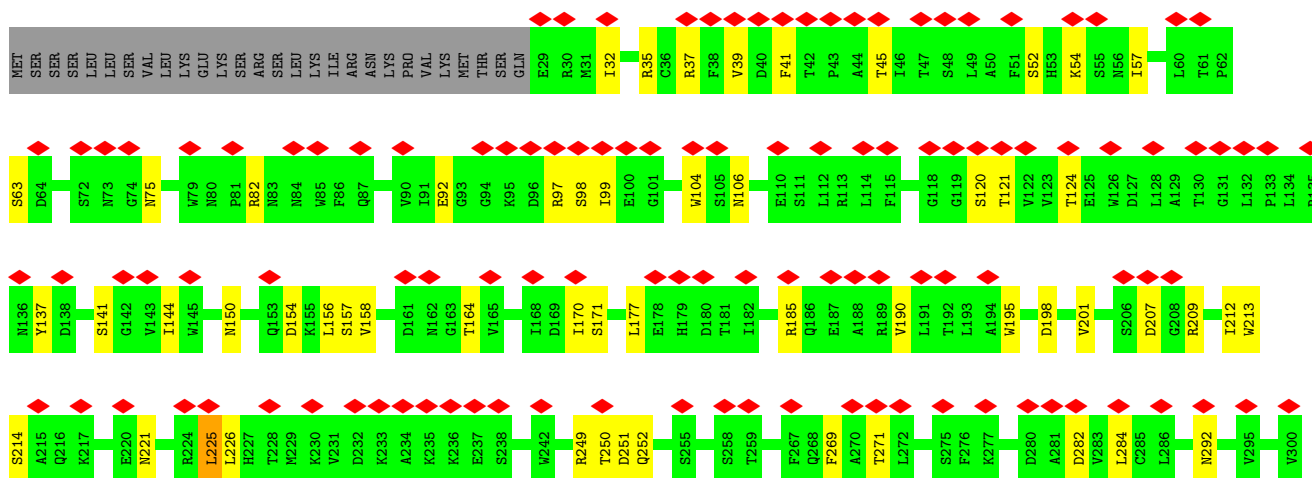
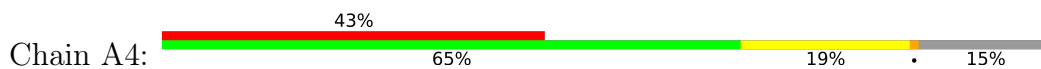
• Molecule 18: 13 kDa ribonucleoprotein-associated protein

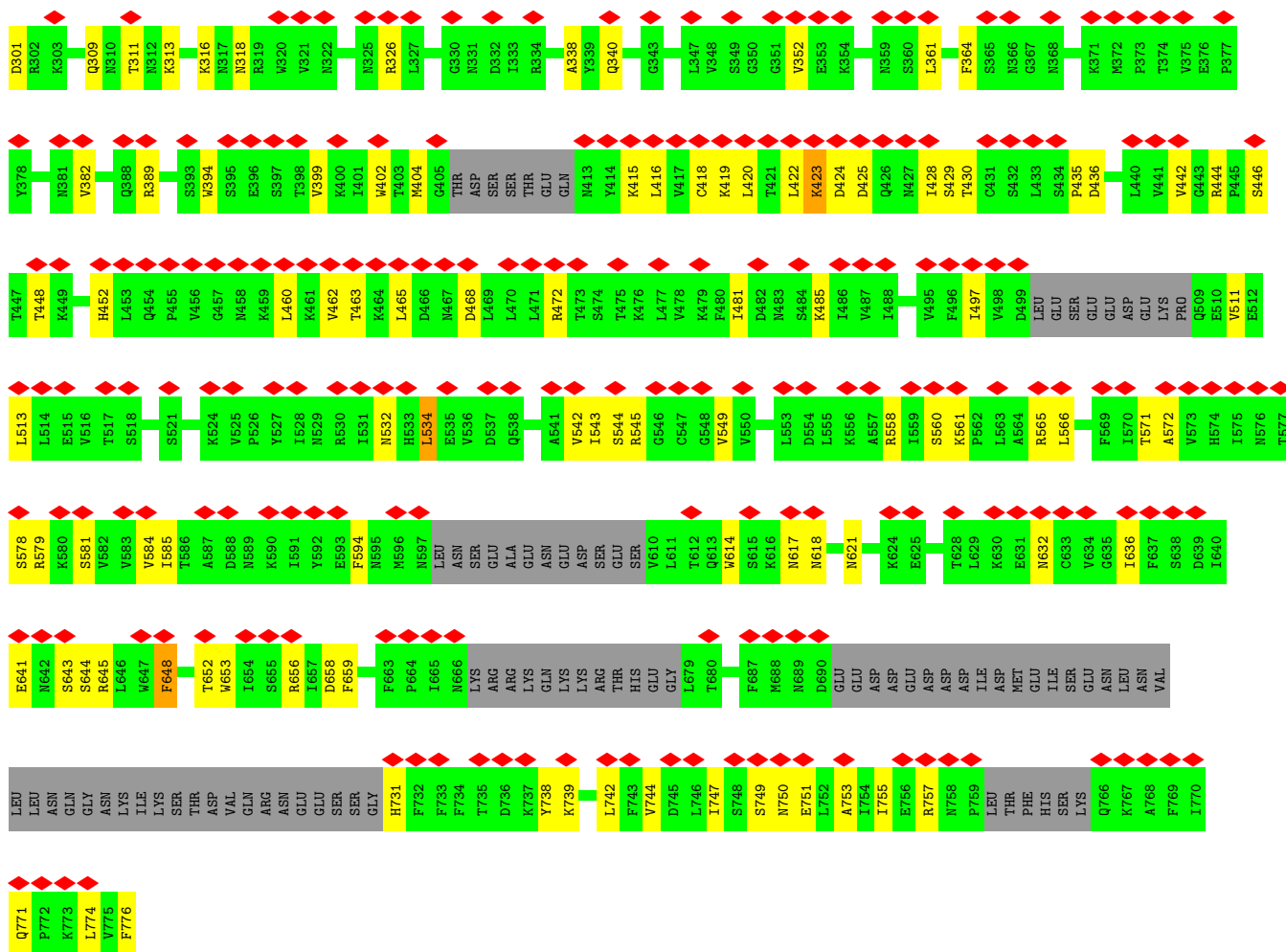


• Molecule 18: 13 kDa ribonucleoprotein-associated protein

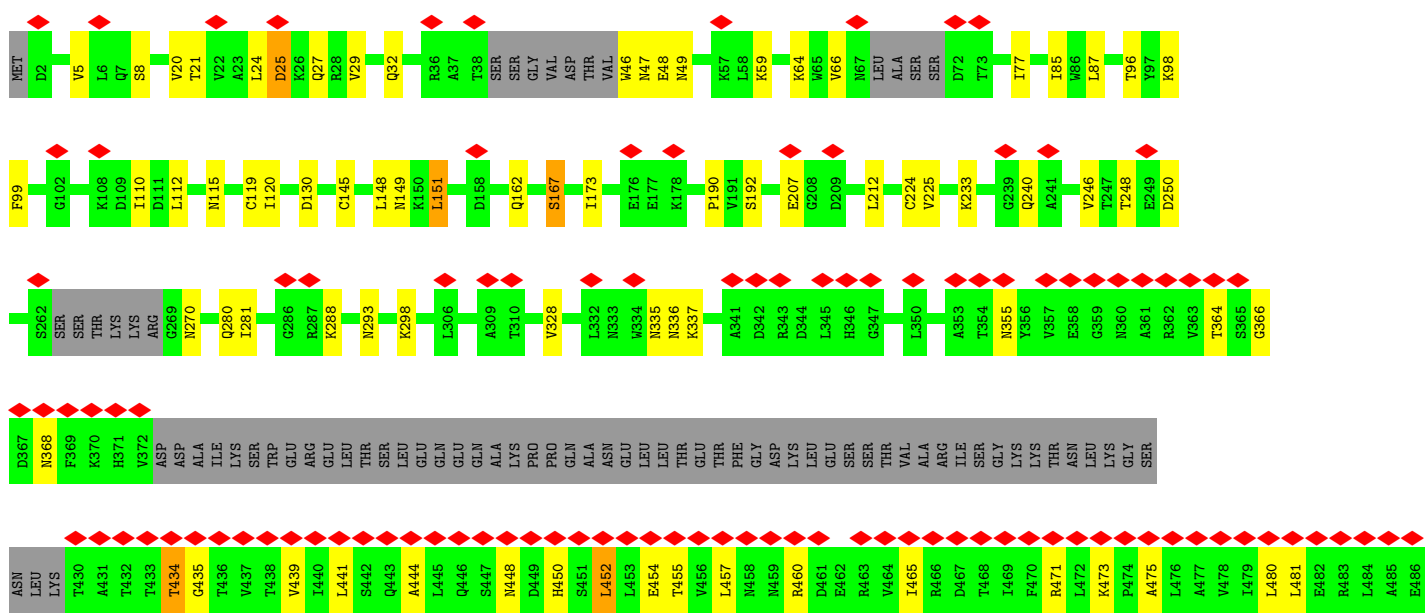


• Molecule 19: U3 small nucleolar RNA-associated protein 4



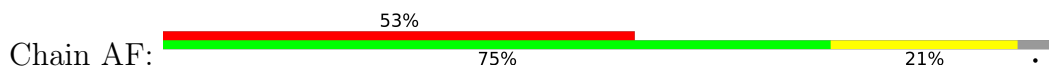


● Molecule 20: U3 small nucleolar RNA-associated protein 5

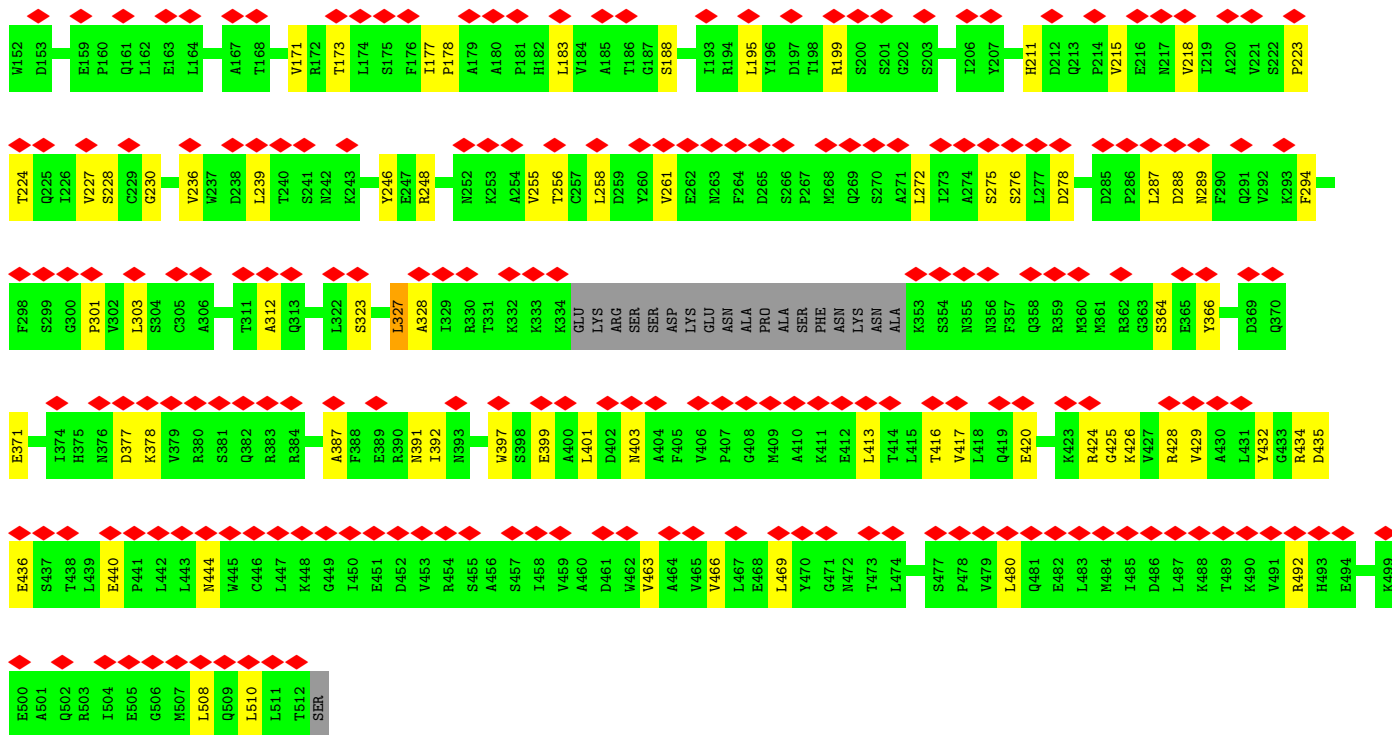


SEK	D1172	K1173	K1174	L1175	L1176	R1177	L1178	L1179	R1180	GLU	GLU	PHE	GLY	THR	LEU	LEU	GLY	VAL	LEU	PHE	PHE	ILE	ASN	SEK	V1197	E1198	L1199	T1200	F1201	S1202	C1203	T1204	T1205	S1206	Q1207	E1208	N1209	E1210	E1211	A1212	D1213	D1214	S1215	E1216	T1217	LEU	SEK	ASP	H1222	T1223	T1224	E1225	I1226	K1227	E1228	I1229	L1230			
F1231	K1232	V1233	L1234	G1235	V1236	V1237	LEU	GLN	ILE	LEU	PRO	V1243	D1244	E1245	F1246	V1247	N1248	A1249	V1250	L1251	P1252	L1253	L1254	S1255	T1256	S1257	T1258	N1259	E1260	K1261	I1262	R1263	Y1264	H1265	L1266	S1267	L1268	V1269	I1270	Q1331	A1332	L1333	T1334	L1335	A1336	T1337	E1338	K1339	V1340	S1341	S1342	L1343	M1344	T1345	E1346	V1347	I1348	M1349	S1350	
V1291	L1292	L1293	D1294	M1295	M1296	P1297	L1298	E1299	S1300	K1301	S1302	V1303	V1304	I1305	S1306	Q1307	V1308	I1309	L1310	M1311	T1312	M1313	T1314	A1315	L1316	V1317	S1318	K1319	V1320	GLY	LYS	LYS	LEU	GLU	G1326	S1327	I1328	L1329	T1330	Q1331	A1332	L1333	T1334	L1335	A1336	T1337	E1338	K1339	V1340	S1341	S1342	L1343	M1344	T1345	E1346	V1347	I1348	M1349	S1350	
S1351	L1352	A1353	L1354	I1355	T1356	M1357	C1358	I1359	Q1360	V1361	L1362	G1363	V1364	K1365	S1366	I1367	A1368	F1369	Y1370	E1431	P1371	K1372	I1373	V1374	P1375	P1376	S1377	I1378	K1379	L1380	F1381	A1382	A1383	S1384	L1385	A1386	D1387	S1388	S1389	N1390	P1391	L1392	K1393	E1394	Q1395	L1396	Q1397	V1398	A1399	I1400	L1401	L1402	L1403	F1404	A1405	G1406	L1407	I1408	K1409	R1410
I1411	P1412	S1413	F1414	L1415	M1416	S1417	N1418	I1419	L1420	D1421	V1422	L1423	H1424	V1425	I1426	F1427	A1428	S1429	R1430	E1431	V1432	D1433	S1434	V1435	I1436	R1437	L1438	A1439	V1440	I1441	S1442	L1443	I1444	I1445	E1446	L1447	I1448	D1449	L1450	K1451	E1452	V1453	L1454	L1455	V1456	L1457	F1458	R1459	I1460	W1461	L1462	T1463	E1464	I1465	A1466	T1467	S1468	N1469	D1470	
T1471	V1472	A1473	V1474	S1475	L1476	F1477	L1478	S1479	T1480	L1481	E1482	S1483	L1484	V1485	E1486	M1487	I1488	D1489	K1490	L1491	S1492	A1493	T1494	S1495	Q1496	S1497	P1498	I1499	F1500	K1502	L1503	L1504	L1505	S1506	L1507	F1508	E1509	F1510	R1511	S1512	I1513	S1514	S1515	F1516	V1517	M1518	M1519	I1520	I1521	S1522	R1523	E1524	E1525	A1526	V1527	S1528	H1529	I1530		
I1531	S1532	M1533	S1534	Y1535	Y1536	L1537	K1538	M1539	M1540	D1541	K1542	F1543	R1544	R1545	P1546	L1547	F1548	V1549	I1550	L1551	V1552	R1553	W1554	A1555	F1556	D1557	G1558	E1559	V1560	T1562	M1563	A1564	G1565	I1566	T1567	E1568	T1569	E1570	R1571	L1572	L1573	A1574	F1575	V1576	K1577	F1578	F1579	M1580	K1581	L1582	Q1583	E1584	M1585	L1586	R1587	I1588	I1589	I1590		
T1591	S1592	Y1593	F1594	T1595	Y1596	L1597	L1598	E1599	P1600	V1601	D1602	M1603	L1604	L1605	K1606	P1607	F1608	I1609	S1610	K1611	D1612	M1613	E1614	A1615	V1616	M1617	L1618	R1619	R1620	L1621	V1622	I1623	M1624	S1625	L1626	T1627	S1628	S1629	L1630	K1631	F1632	D1633	L1634	P1635	E1636	Y1637	W1638	K1639	S1640	T1641	S1642	R1643	F1644	E1645	L1646	I1647	S1648	V1649	S1650	
L1651	V1652	N1653	Q1654	L1655	S1656	M1657	I1658	E1659	M1660	S1661	I1662	G1663	K1664	Y1665	L1666	V1667	K1668	A1669	I1670	G1671	A1672	L1673	A1674	S1675	M1676	N1677	S1678	G1679	L1680	D1681	E1682	H1683	M1684	Q1685	I1686	L1687	M1688	K1689	L1690	I1691	V1692	E1693	H1694	M1695	K1696	A1697	M1698	C1699	S1700	S1701	M1702	E1703	K1704	L1705	W1706	A1707	I1708	R1709	A1710	
M1711	K1712	L1713	I1714	Y1715	S1716	L1717	I1718	E1719	G1720	S1721	W1722	L1723	V1724	L1725	L1726	P1727	Q1728	L1729	V1730	P1731	V1732	I1733	A1734	E1735	L1736	L1737	E1738	D1739	L1740	D1741	E1742	E1743	H1744	E1745	R1746	E1747	V1748	A1749	T1750	G1751	L1752	V1753	K1754	V1755	V1756	E1757	M1758	V1759	L1760	G1761	E1762	P1763	F1764	D1765	R1766	Y1767	LEU	ASP		

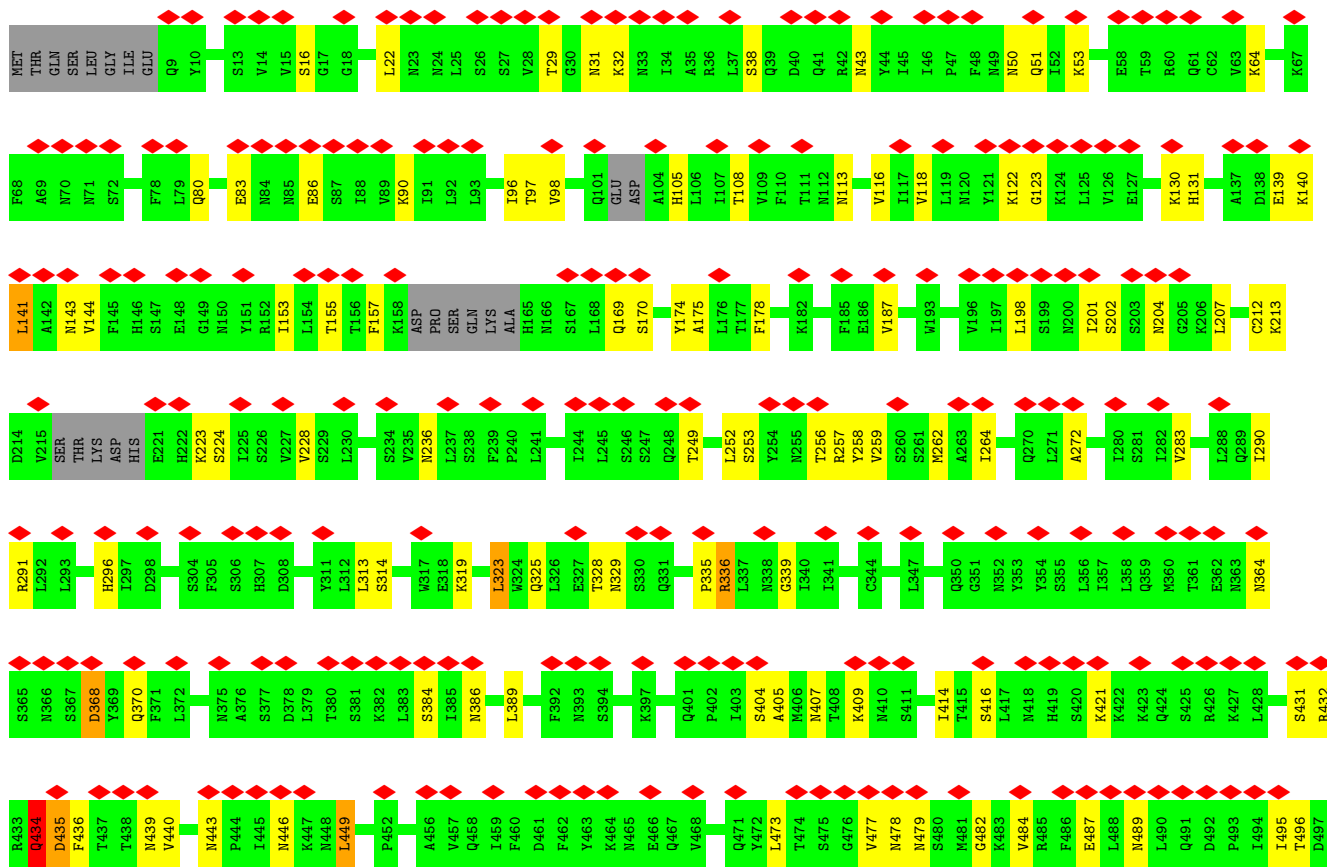
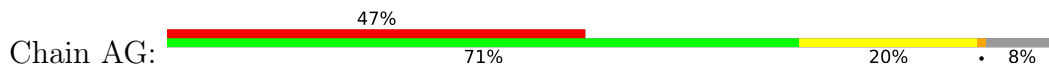
• Molecule 24: U3 small nucleolar RNA-associated protein 15

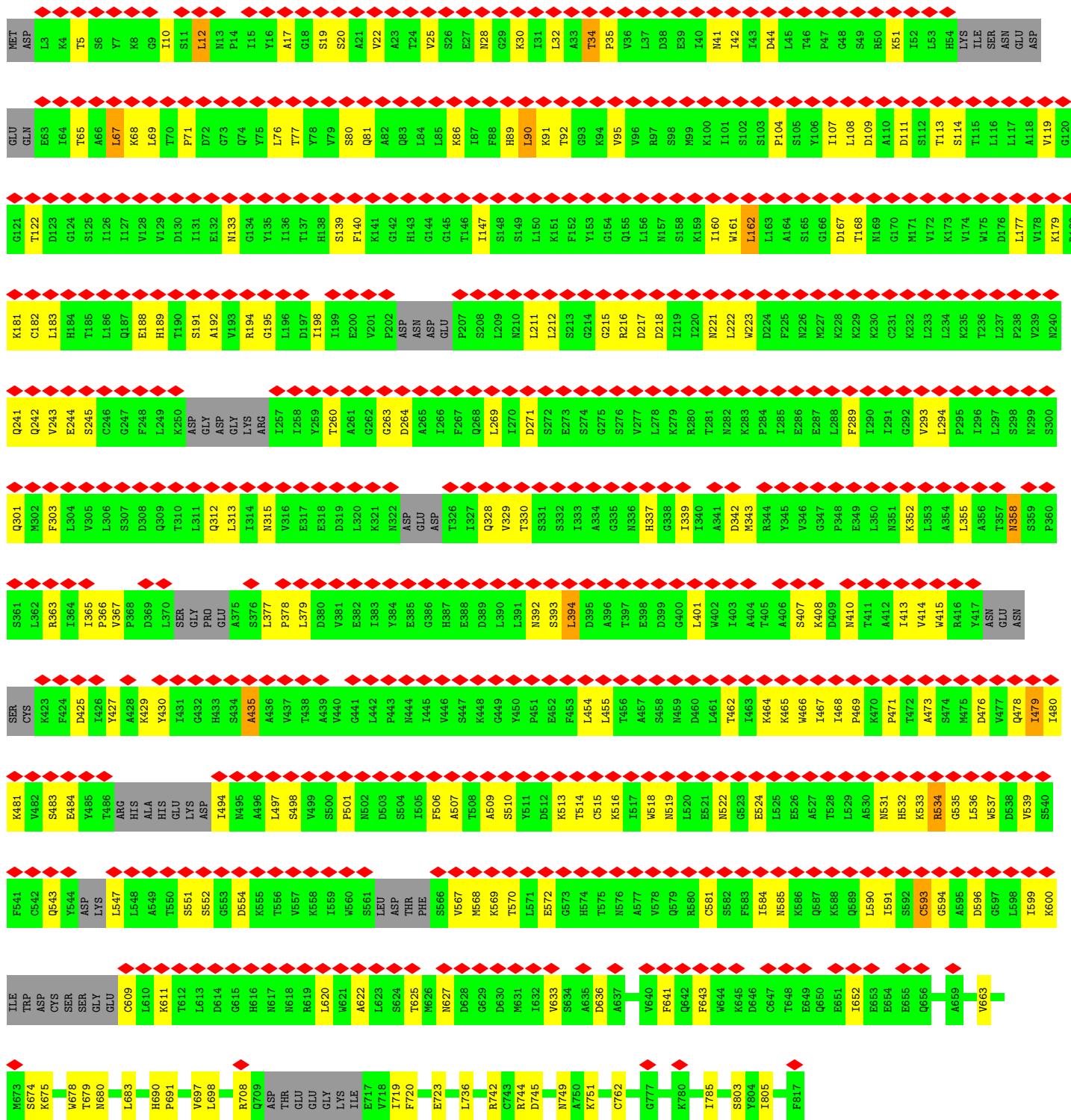


MET	S2	T3	A4	R5	P6	R7	I8	I9	T10	S11	K12	A13	P14	L15	L16	P17	Q18	Q19	T20	T21	Q24	R28	T31	S32	A33	Q34	L35	V36	K37	E38	H39	N40	S41	V42	T43	S46	F47	N48	P49	O50	H51	P52	V55	V56	E1757	M1758	V1759	T1760	G1761	E1762	P1763	F1764	D1765	R1766	Y1767	LEU	ASP
K75	R79	F80	K81	S86	A87	S91	L95	L96	C97	A98	D100	A101	T102	G103	L104	V105	S106	Y111	M112	P113	R114	T115	L116	L117	L118	S119	I120	M121	A122	S123	H128	V129	H133	T134	Q135	D136	N137	K138	I139	L140	A141	T142	A143	S144	R147	V148	T149	R150	L151								



• Molecule 25: NET1-associated nuclear protein 1



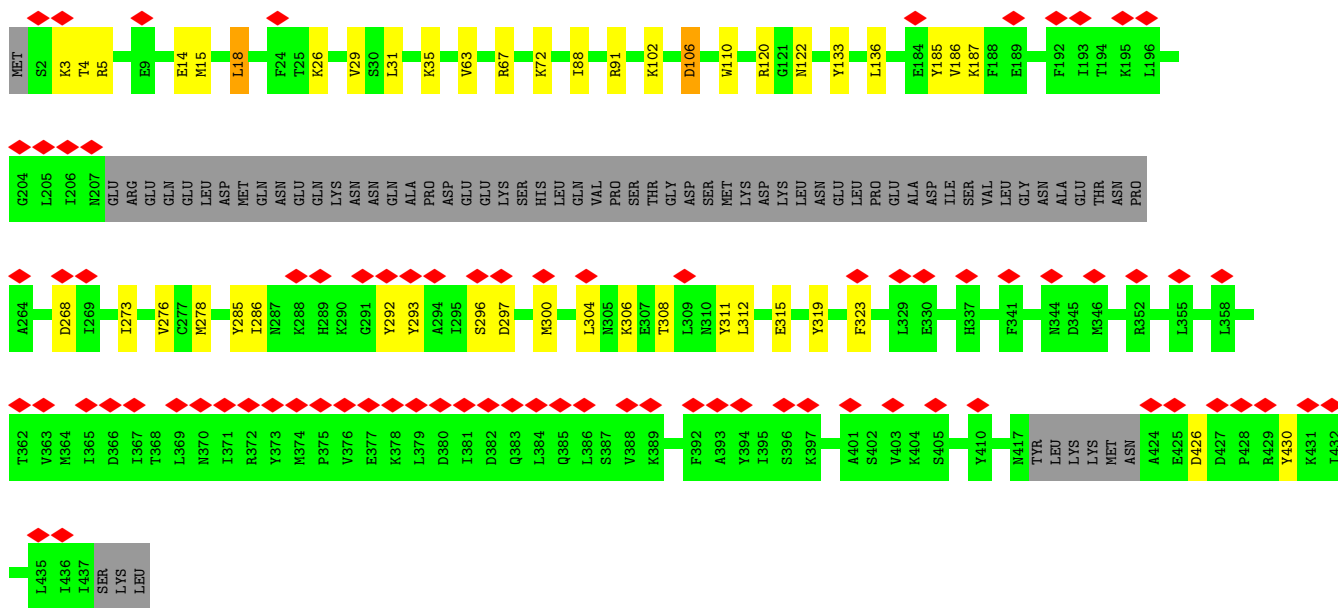
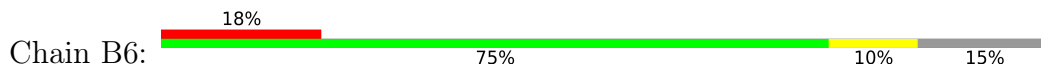


• Molecule 29: U3 small nucleolar RNA-associated protein 18

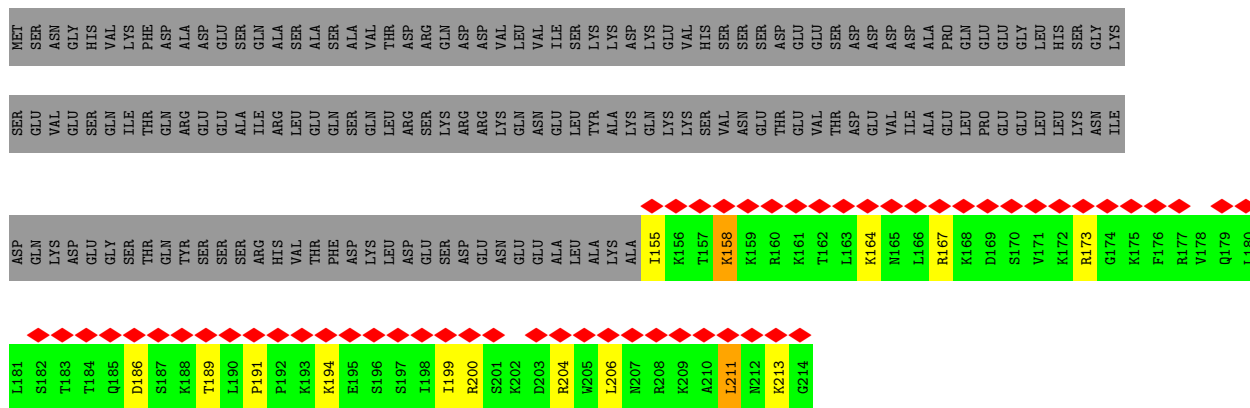


MET	THR	MET	ALA	THR	THR	ALA	ALA	MET	ASN	VAL	VAL	P13	L22	F27	E35	K39	D43	F44	ILE	PHE	ASN	GLU	GLN	GLU	GLU	MET	ASP	VAL	GLU	ASP	GLN	GLU	GLU	GLY	N749	A750	K751	C762	G777	F785	F841	Q842	F843	W844	K845	Y804	I805	T848	E849	Q850	E851	I652	E853	E854	E855	Q856	A659	V663
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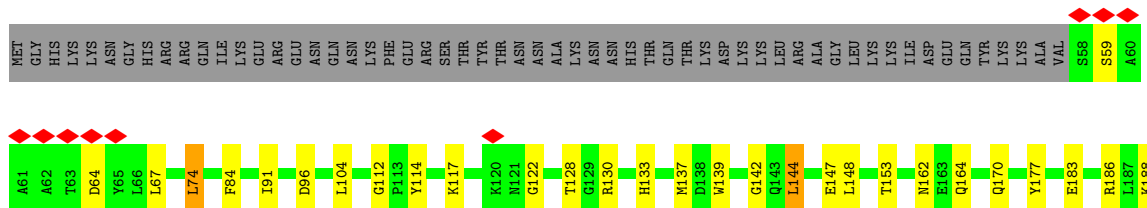
• Molecule 31: U3 small nucleolar RNA-associated protein 6

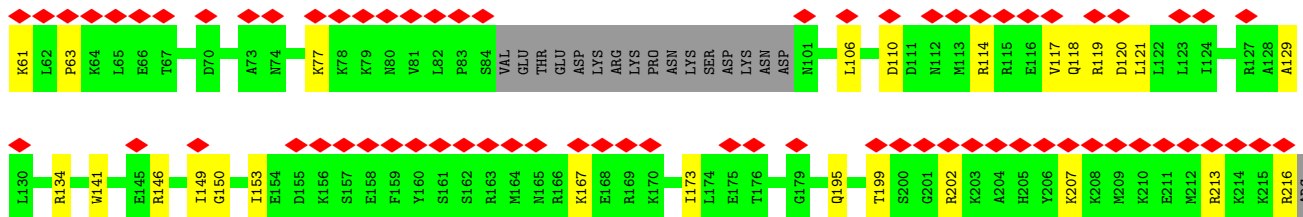


• Molecule 32: Bud site selection protein 21

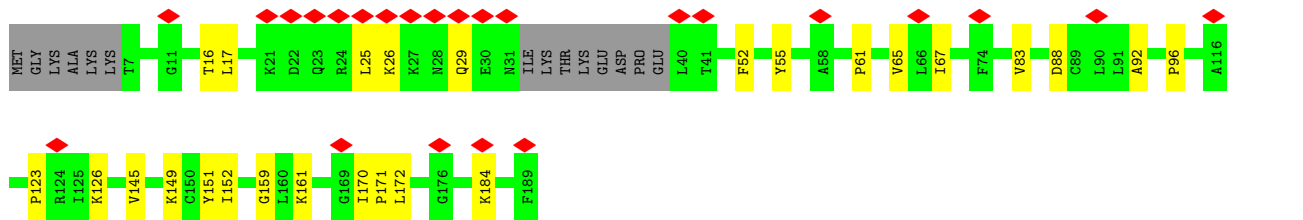
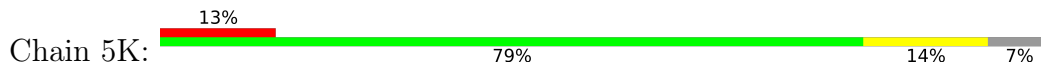


• Molecule 33: U3 small nucleolar RNA-associated protein 7

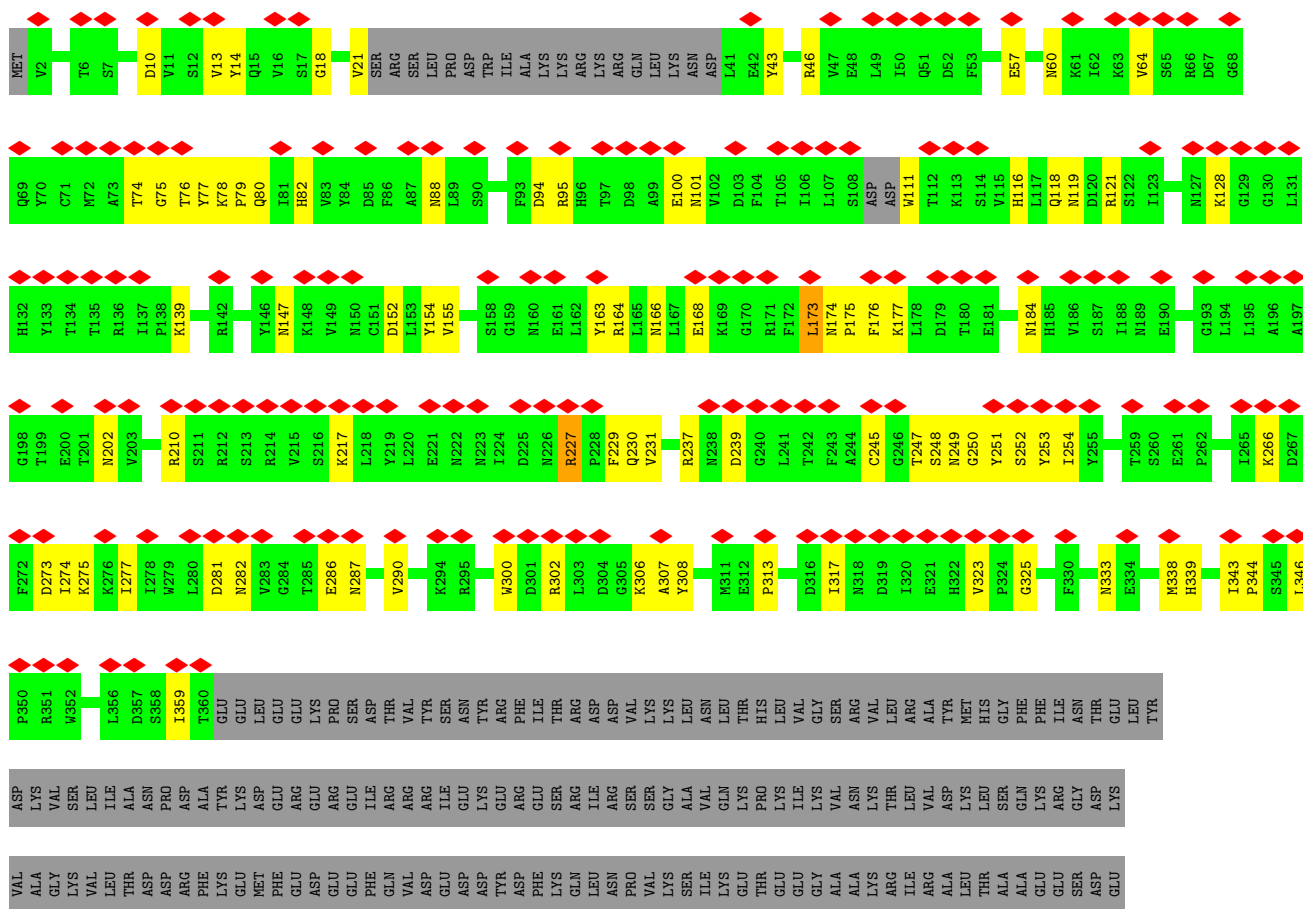
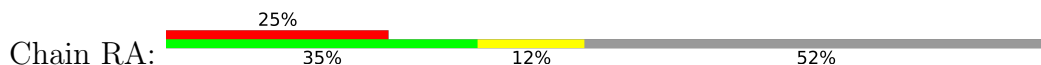


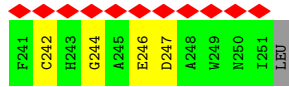


• Molecule 41: rRNA-processing protein FCF1

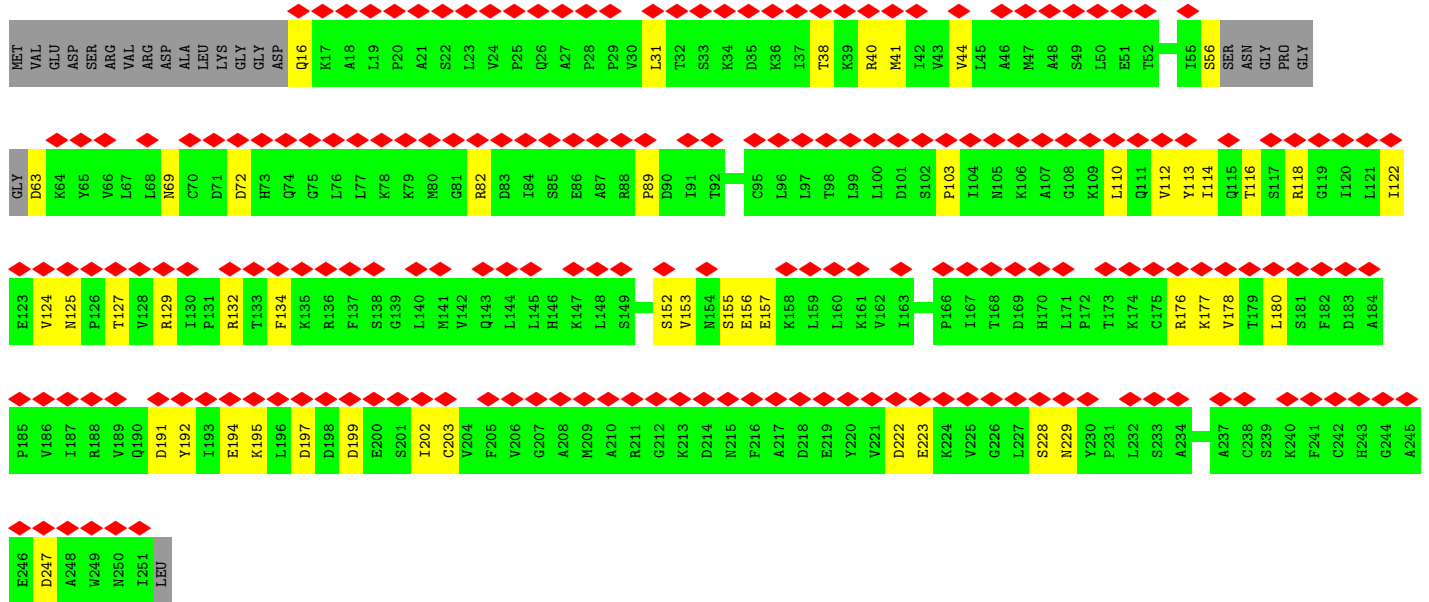
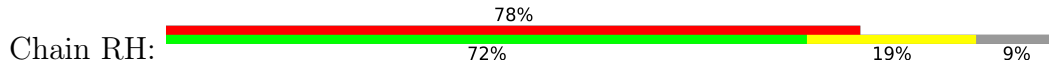


• Molecule 42: Ribosome biogenesis protein ENP2

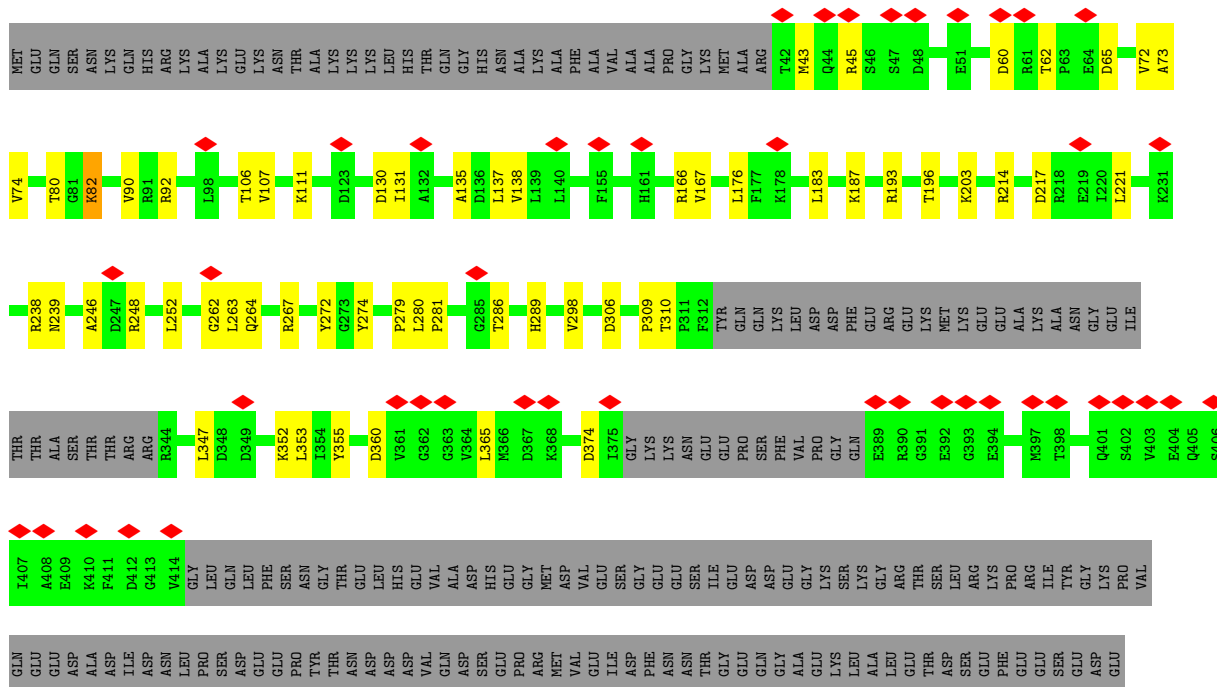




• Molecule 44: Ribosomal RNA small subunit methyltransferase NEP1

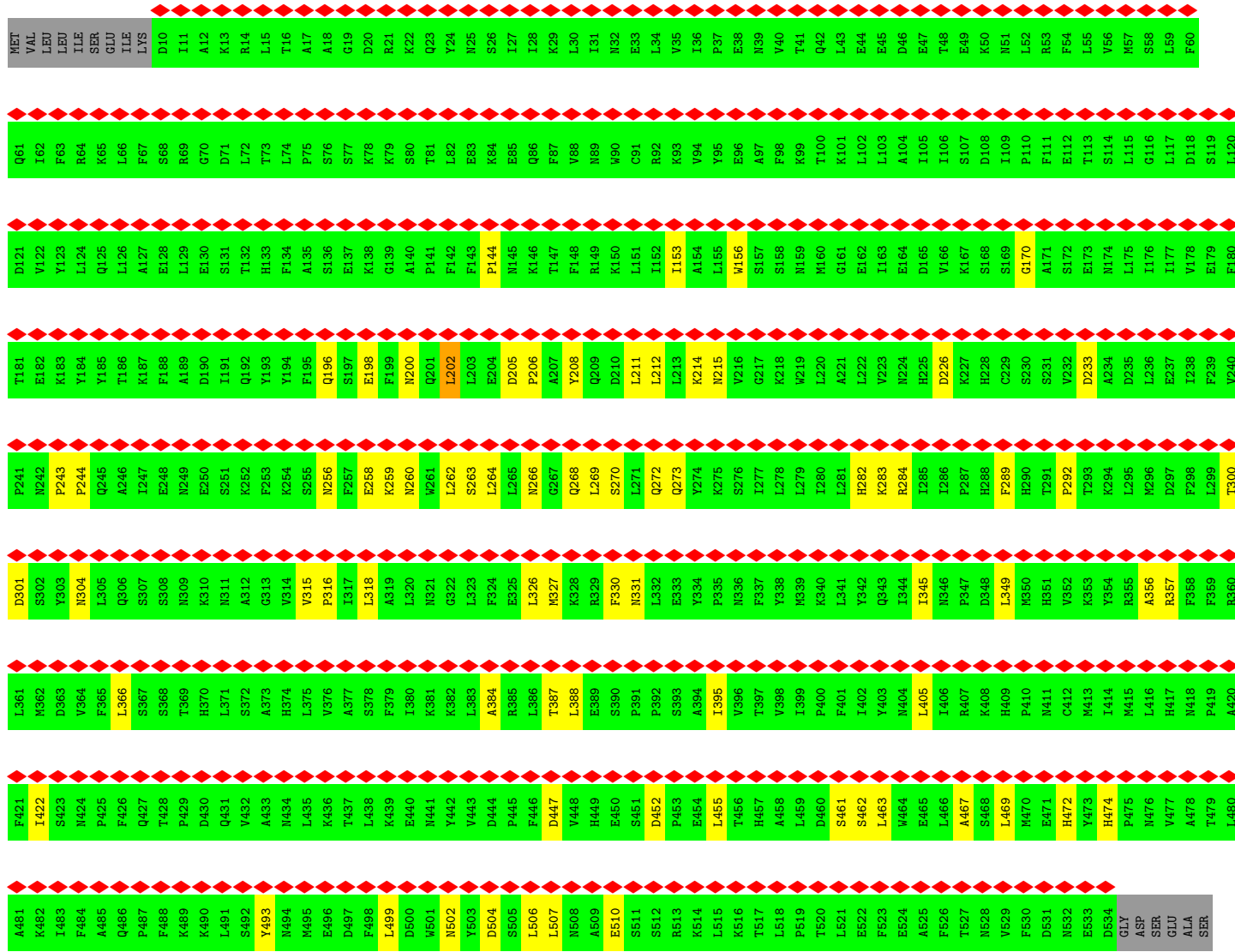
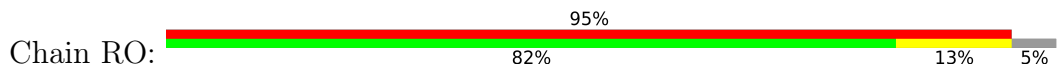


• Molecule 45: Ribosome biogenesis protein BMS1





● Molecule 49: Nucleolar complex protein 4



SER
GLN
GLY
ASN
VAL
GLN
TYR
LEU
PRO
GLY
VAL
ALA
TRP

● Molecule 50: U3 small nucleolar RNA-associated protein 20



MET	ALA	LYS	GLN	ARG	GLN	THR	THR	LYS	SER	SER	S18	F19	K20	A21	R22	I23	D24	D25	L26	K27	I28	E29	F30	A31	ARG	ASN	LEU	GLU	LYS	VAL	HIS	ASP	TYR	VAL	GLU	SER	S45	H46	F47	L48	A49	S50	F51	D52	Q53	Q54	A55	E56	I57	N58	L59	S60																																																														
A61	K62	F63	T64	E65	F66	A67	A68	E69	I70	E71	H72	V73	W74	Q75	T76	L77	P78	K79	I80	L81	H83	D84	K85	K86	I87	F88	N89	S90	L91	V92	S93	F94	I95	N96	F97	H98	D99	E100	F101	S102	L103	Q104	P105	L106	L107	D108	L109	L110	A111	Q112	F113	C114	H115	D116	L117	D120	F121																																																									
L122	K123	F124	Y125	E126	E127	A128	I129	K130	T131	L132	I133	M134	A135	L136	D137	L138	A139	I140	E141	F142	S144	S145	N146	V147	F148	E149	W150	G151	F152	M153	C154	L155	A156	I158	F159	K160	Y161	L162	S163	K164	F165	L166	V167	K168	K169	L170	V171	T172	T173	C174	D175	L176	L177	I178	L180	L181																																																										
S182	H183	S184	K185	E186	Y187	L188	S189	R190	F191	S192	A193	E194	A195	L196	S197	F198	L199	V200	R201	K202	C203	P204	V205	S206	N207	E210	F211	V212	R213	S214	V215	F216	E217	L219	K218	L219	E220	F159	H98	ASP	GLY	ASP	GLU	GLN	THR	ASN	L228	Y229	E230	G231	L232	L233	I234	L235	F236	T237	E238	S239	M240	T241	D301	F302	N303																																																			
Q244	E245	T246	H248	S249	K250	A251	K252	A253	I254	M255	S256	V257	L258	L259	H260	E261	A262	L263	T264	K265	S266	S267	P268	E269	R270	S271	V272	S273	L274	L275	S276	D277	I278	W279	M280	N281	I282	S283	K284	Y285	A286	S287	L288	E289	S290	L291	L292	P293	V294	Y295	E296	V297	M298	Q300	D301	F302	N303																																																									
D304	S305	LEU	ASP	ALA	THR	ILE	ASP	R313	I314	L315	K316	V317	L318	T319	T320	I321	V322	F323	S324	E325	SER	GLY	ARG	LYS	I330	P331	D332	W333	N334	K335	I336	T337	I338	L339	I340	E341	R342	I343	M344	SER	GLN	SER	GLU	ASN	CYS	ALA	SER	L353	S354	Q355	D356	K357	V358	A359	F360	L361	F362	A363	L364	F365	I366	N368	S369	D370	V371	K372	T373	L374	T375	L376	H378	Q379	K380	L381	F382	N383	T387	N388	I389	S390	D391	C392	F393	L394	E395	F396	F397	Q398	F399	A400	L401	R402	L403	S404	Y405	E406	R407	V408	F409	S410	F411	ASN	GLY	LEU	LYS	PHE	LEU	L419	F420	L421	K422	K423	M424	W425
L364	F365	I366	N368	S369	D370	V371	K372	T373	L374	T375	L376	H378	Q379	K380	L381	F382	N383	T387	N388	I389	S390	D391	C392	F393	L394	E395	F396	F397	Q398	F399	A400	L401	R402	L403	S404	Y405	E406	R407	V408	F409	S410	F411	ASN	GLY	LEU	LYS	PHE	LEU	L419	F420	L421	K422	K423	M424	W425																																																											
Q426	S427	Q428	G429	K430	K431	I432	A433	L434	F435	F436	L437	E438	V439	D440	D441	K442	P443	E444	L445	Q446	V448	R449	E450	V451	M452	F453	P454	E455	E456	F457	I458	L459	S460	I461	R462	D463	F464	F465	V466	T467	A468	E469	M471	D472	S473	M474	D475	L476	F477	E478	I479	TYR	TRP	ARG	ALA	ILE	I485																																																									
F486	K487	Y488	S489	K490	L491	Q492	M493	T494	E495	I496	I497	ILE	PRO	LEU	LEU	E502	R503	I504	F505	S506	T507	F508	A509	S510	P511	D512	N513	F514	T515	K516	ASP	MET	VAL	G520	T521	L522	L523	K524	I525	Y526	R527	K528	E529	D530	D531	A532	S533	GLY	ASN	ASN	LEU	L538	K539	T540	I541	L542	D543	N544	Y545																																																							
E546	N547	Y548	K549	E550	S551	L552	ASN	PHE	LEU	ARG	G557	W558	N559	K560	L561	V562	S563	N564	L565	H566	P567	S568	E569	S570	L571	K572	G573	L574	M575	S576	H577	Y578	P579	S580	L581	L582	L583	S584	L585	T586	D587	N588	F589	M590	L591	P592	D593	G594	K595	I596	R597	GLU	THR	LEU	GLU	LEU	MET	K605																																																								
T606	L607	M608	I609	L610	Q611	G612	M613	Q614	V615	P616	D617	L618	L619	S620	S621	C622	M623	V624	I625	E626	E627	I628	P629	L630	T631	L632	Q633	N634	A635	R636	D637	L638	T639	I640	R641	I642	K643	ASN	VAL	GLY	ALA	PHE	GLY	LYS	T652	K653	T654	D655	K656	L657	V658	S659	S660	F661	F662	L663	K664	V665																																																								
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696	W697	K698	L699	V700	L701	S702	F703	I704	K705	L706	P707	D708	E709	N710	Q711	N712	L713	D714	Y715	Y716	Q717	S660	F661	F662	L663	K664	V665																																																									
L666	F667	G668	L669	L670	T671	V672	R673	F674	S675	P676	V677	W678	N679	G680	V681	F682	D683	T684	L685	P686	N687	V688	Y689	T690	L691	D692	E693	A694	L695	V696</																																																																																				

R1468	L1469	G1470	E1471	H1472	A1473	H1474	Q1475	L1476	K1477	D1478	M1479	S1480	I1481	S1482	H1483	Y1484	L1485	M1486	P1487	M1488	I1489	E1490	H1491	V1492	V1493	F1494	S1495	S1496	M1497	A1498	I1499	Y1500	M1501	M1502	I1503	G1504	D1505	E1506	E1507	T1508	I1509	A1510	I1511	G1512	G1513	L1514	A1515	Q1516	H1517	M1518	S1519	M1520	N1521	Q1522	Y1523	K1524	A1525	L1526	L1527		
D1408	S1409	L1410	E1411	H1412	V1413	GLN	SER	GLU	TYR	VAL	SER	V1420	L1421	S1422	Y1423	M1424	V1425	K1426	M1427	T1428	K1429	Y1430	F1431	D1432	D1433	F1434	E1435	D1436	M1437	A1438	I1439	L1440	M1441	Y1442	M1443	G1444	D1445	E1446	E1447	A1448	D1449	PHE	PHE	THR	ASN	ASN	VAL	HIS	ILE	GLN	LEU	HIS	R1461	R1462	Q1463	R1464	A1465	I1466	K1467		
F1288	I1289	E1290	L1291	G1292	R1293	K1294	V1295	P1296	E1297	L1298	E1299	S1300	I1301	S1302	K1303	L1304	V1305	A1306	D1307	L1308	M1309	S1310	Y1311	S1312	S1313	S1314	R1315	M1316	H1317	E1318	Y1319	D1320	F1321	P1322	ARG	ILE	LEU	SER	THR	PHE	LYS	GLY	LEU	ILE	GLU	ASP	TYR	LYS	SER	TYR	M1401	N1402	R1403	I1404	G1405	L1406	PRO	LEU			
L1228	K1229	G1230	K1231	L1232	K1233	K1234	L1235	Q1236	E1237	N1238	D1239	T1240	Q1241	K1242	I1243	L1244	K1245	I1246	L1247	K1248	L1249	I1250	V1251	F1252	N1253	Y1254	N1255	C1256	S1257	W1258	S1259	D1260	I1261	E1262	E1263	L1264	Y1265	T1266	T1267	I1268	M1269	S1270	L1271	F1272	K1273	T1274	F1275	D1276	E1277	Y1278	N1279	L1280	R1281	Y1282	S1283	L1284	T1285	E1286	L1287		
L1108	F1109	L1110	Y1111	M1112	A1113	H1114	M1115	P1116	S1117	L1118	Y1119	Q1120	L1121	L1122	Y1123	M1124	D1125	E1126	F1127	A1128	T1129	A1130	T1131	A1132	L1133	M1134	D1135	T1136	I1137	S1138	M1139	Q1140	H1141	V1142	K1143	A1144	A1145	V1146	I1147	P1148	G1149	I1150	I1151	E1152	A1153	A1154	D1155	S1156	I1157	I1158	R1159	M1160	P1161	V1162	N1163	D1164	L1165	H1166	Y1167		
L1047	R1048	K1049	M1050	A1051	S1052	N1053	L1054	R1055	Q1056	Q1057	G1058	L1059	K1060	C1061	L1062	S1063	F1066	E1067	F1068	V1069	G1070	M1071	T1072	F1073	D1074	W1075	S1076	T1077	S1078	M1079	E1080	D1081	I1082	L1083	A1084	V1085	L1086	V1087	K1088	P1089	R1090	I1091	S1092	L1093	F1094	S1095	D1096	E1097	N1098	L1099	Q1100	Q1101	P1102	S1103	S1104	L1105	L1106	R1107			
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838	F839	K839	N840	I841	K842	N843	V844	Y845	S846
N980	G909	S910	Q911	S912	I913	K914	A915	E916	M955	D917	L957	L958	G959	F798	F799	V800	Y801	N802	D803	F804	K805	T806	Y807	K808	D809	E810	E811	D812	L813	A814	N815	E816	R817	V818	I819	T820	G821	S822	W823	T824	E825	V826	D827	R828	N829	L832	K833	T834	L835	S836	F837	K838									

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	9421	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.094	Depositor
Minimum map value	-0.047	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.022	Depositor
Map size (Å)	597.632, 597.632, 597.632	wwPDB
Map dimensions	448, 448, 448	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.334, 1.334, 1.334	Depositor

5 Model quality i

5.1 Standard geometry i

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	3A	0.91	0/4141	1.25	38/6433 (0.6%)
2	5A	0.83	0/4101	1.09	13/6380 (0.2%)
3	SA	0.69	0/22644	1.15	167/35249 (0.5%)
4	SF	0.35	0/1854	0.66	1/2504 (0.0%)
5	SG	0.53	0/1690	0.64	0/2285
6	SH	0.31	0/1341	0.60	0/1789
7	SJ	0.31	0/1347	0.59	1/1801 (0.1%)
8	SK	0.47	0/1410	0.60	0/1888
9	SM	0.31	0/1020	0.58	0/1374
10	SR	0.58	0/990	0.73	1/1335 (0.1%)
11	SY	0.54	0/798	0.67	1/1065 (0.1%)
12	SZ	0.43	0/822	0.64	0/1103
13	Sd	0.54	0/499	0.66	0/670
14	3B	0.59	0/1901	0.66	1/2567 (0.0%)
14	3C	0.44	0/1796	0.62	1/2424 (0.0%)
15	3D	0.44	0/2891	0.63	3/3895 (0.1%)
16	3E	0.41	0/3059	0.62	3/4153 (0.1%)
17	3F	0.42	0/3715	0.64	2/5001 (0.0%)
18	3G	0.52	0/928	0.76	1/1262 (0.1%)
18	3H	0.47	0/928	0.69	2/1262 (0.2%)
19	A4	0.47	0/5321	0.66	5/7207 (0.1%)
20	A5	0.48	0/4044	0.68	5/5493 (0.1%)
21	A8	0.34	0/3249	0.71	10/4454 (0.2%)
22	A9	0.31	0/951	0.58	1/1287 (0.1%)
23	AE	0.37	0/10049	0.56	6/13737 (0.0%)
24	AF	0.53	0/3993	0.67	4/5413 (0.1%)
25	AG	0.47	0/6699	0.65	3/9077 (0.0%)
26	B1	0.64	0/6474	0.68	7/8763 (0.1%)
27	B2	0.43	0/6628	0.67	3/8954 (0.0%)
28	B3	0.39	0/6014	0.69	7/8137 (0.1%)
29	B8	0.58	0/3848	0.66	4/5218 (0.1%)
30	BE	0.58	0/6580	0.66	7/8901 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
31	B6	0.45	0/2849	0.58	1/3853 (0.0%)
32	5B	0.34	0/499	0.62	0/659
33	5C	0.63	0/3274	0.70	5/4442 (0.1%)
34	5D	0.51	0/1417	0.67	2/1885 (0.1%)
35	5E	0.39	0/1580	0.73	3/2115 (0.1%)
36	5F	0.38	0/1559	0.69	1/2097 (0.0%)
37	5G	0.39	0/1792	0.72	2/2425 (0.1%)
38	5H	0.52	0/601	0.57	0/789
39	5I	0.61	0/3844	0.66	2/5174 (0.0%)
40	5J	0.42	0/1302	0.55	0/1728
41	5K	0.56	0/1426	0.66	1/1917 (0.1%)
42	RA	0.34	0/2769	0.67	1/3753 (0.0%)
43	RB	0.38	0/1121	0.62	0/1487
44	RG	0.39	0/1727	0.68	2/2329 (0.1%)
44	RH	0.42	0/1828	0.61	0/2470
45	RJ	0.50	0/6514	0.61	1/8768 (0.0%)
46	RK	0.44	0/2832	0.65	3/3825 (0.1%)
47	RL	0.29	0/4549	0.50	0/6241
47	RM	0.25	0/3765	0.47	0/5218
48	RN	0.36	0/4591	0.58	2/6187 (0.0%)
49	RO	0.38	0/3849	0.62	5/5261 (0.1%)
50	RP	0.26	0/8541	0.49	2/11805 (0.0%)
51	RQ	0.46	0/985	0.57	0/1339
52	RS	0.33	0/2104	0.67	1/2854 (0.0%)
53	RY	0.29	0/307	0.51	0/415
All	All	0.51	0/187350	0.76	331/260117 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
4	SF	0	2
7	SJ	0	1
9	SM	0	1
12	SZ	0	1
15	3D	0	3
16	3E	0	1
17	3F	0	1
18	3G	0	2
18	3H	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
19	A4	0	1
20	A5	0	1
21	A8	0	2
25	AG	0	2
26	B1	0	2
27	B2	0	8
28	B3	0	11
30	BE	0	1
34	5D	0	1
37	5G	0	2
39	5I	0	2
42	RA	0	2
43	RB	0	1
45	RJ	0	2
46	RK	0	1
47	RL	0	1
47	RM	0	1
48	RN	0	1
49	RO	0	1
50	RP	0	2
All	All	0	58

There are no bond length outliers.

The worst 5 of 331 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	3A	321	C	N1-C1'-C2'	-10.80	99.96	114.00
3	SA	376	C	N1-C2-O2	10.43	125.16	118.90
3	SA	1174	C	N1-C2-O2	10.35	125.11	118.90
1	3A	104	C	C5-C6-N1	9.71	125.86	121.00
20	A5	25	ASP	CB-CG-OD1	9.52	126.87	118.30

There are no chirality outliers.

5 of 58 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	SF	193	GLY	Peptide
4	SF	195	ILE	Peptide
7	SJ	85	PRO	Peptide
9	SM	128	CYS	Peptide
12	SZ	76	TYR	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	3A	3711	0	1882	57	0
2	5A	3668	0	1845	35	0
3	SA	20256	0	10219	193	0
4	SF	1815	0	1870	45	0
5	SG	1669	0	1724	18	0
6	SH	1327	0	1403	28	0
7	SJ	1324	0	1344	48	0
8	SK	1388	0	1467	31	0
9	SM	997	0	1048	35	0
10	SR	973	0	1029	19	0
11	SY	786	0	843	8	0
12	SZ	809	0	842	15	0
13	Sd	497	0	535	0	0
14	3B	1865	0	1910	29	0
14	3C	1763	0	1805	42	0
15	3D	2848	0	2815	46	0
16	3E	3028	0	2813	59	0
17	3F	3643	0	3654	79	0
18	3G	916	0	964	11	0
18	3H	916	0	964	24	0
19	A4	5226	0	5199	95	0
20	A5	3976	0	3919	60	0
21	A8	3229	0	2281	130	0
22	A9	939	0	898	45	0
23	AE	9955	0	7968	102	0
24	AF	3911	0	3906	74	0
25	AG	6570	0	6473	140	0
26	B1	6331	0	6236	140	0
27	B2	6502	0	6493	121	0
28	B3	5919	0	6007	134	0
29	B8	3764	0	3757	58	0
30	BE	6450	0	6420	94	0
31	B6	2800	0	2517	32	0
32	5B	495	0	561	12	0
33	5C	3198	0	3157	57	0
34	5D	1396	0	1407	47	0
35	5E	1564	0	1592	165	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
36	5F	1530	0	1572	79	0
37	5G	1756	0	1765	56	0
38	5H	596	0	661	7	0
39	5I	3765	0	3714	67	0
40	5J	1280	0	1331	23	0
41	5K	1403	0	1484	16	0
42	RA	2709	0	2622	63	0
43	RB	1108	0	1087	25	0
44	RG	1701	0	1767	40	0
44	RH	1799	0	1872	29	0
45	RJ	6379	0	6506	138	0
46	RK	2781	0	2878	49	0
47	RL	4539	0	2874	28	0
47	RM	3779	0	1650	8	0
48	RN	4529	0	4262	82	0
49	RO	3766	0	3269	47	0
50	RP	8510	0	4744	43	0
51	RQ	974	0	802	15	0
52	RS	2051	0	2096	53	0
53	RY	299	0	275	6	0
54	X1	40	0	10	0	0
55	5K	1	0	0	0	0
56	RJ	32	0	12	1	0
57	RJ	1	0	0	0	0
All	All	181752	0	157020	2686	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

The worst 5 of 2686 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:A8:596:LYS:HE3	21:A8:637:LEU:CD2	1.25	1.58
26:B1:382:THR:O	35:5E:481:PRO:HB3	1.40	1.22
21:A8:596:LYS:HE3	21:A8:637:LEU:HD23	1.23	1.21
35:5E:366:GLU:OE2	37:5G:247:ILE:HG21	1.40	1.19
21:A8:443:CYS:HA	25:AG:728:LEU:HD13	1.25	1.19

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	SF	227/261 (87%)	197 (87%)	29 (13%)	1 (0%)	34	72
5	SG	211/225 (94%)	195 (92%)	16 (8%)	0	100	100
6	SH	161/236 (68%)	143 (89%)	18 (11%)	0	100	100
7	SJ	162/200 (81%)	140 (86%)	22 (14%)	0	100	100
8	SK	169/197 (86%)	163 (96%)	6 (4%)	0	100	100
9	SM	119/156 (76%)	103 (87%)	16 (13%)	0	100	100
10	SR	123/143 (86%)	112 (91%)	11 (9%)	0	100	100
11	SY	101/145 (70%)	90 (89%)	11 (11%)	0	100	100
12	SZ	100/135 (74%)	87 (87%)	12 (12%)	1 (1%)	15	53
13	Sd	61/67 (91%)	57 (93%)	4 (7%)	0	100	100
14	3B	236/327 (72%)	222 (94%)	14 (6%)	0	100	100
14	3C	221/327 (68%)	207 (94%)	14 (6%)	0	100	100
15	3D	359/504 (71%)	346 (96%)	13 (4%)	0	100	100
16	3E	427/511 (84%)	387 (91%)	40 (9%)	0	100	100
17	3F	446/573 (78%)	403 (90%)	42 (9%)	1 (0%)	47	81
18	3G	119/126 (94%)	107 (90%)	11 (9%)	1 (1%)	19	59
18	3H	119/126 (94%)	111 (93%)	8 (7%)	0	100	100
19	A4	648/776 (84%)	590 (91%)	58 (9%)	0	100	100
20	A5	504/643 (78%)	465 (92%)	39 (8%)	0	100	100
21	A8	516/713 (72%)	397 (77%)	107 (21%)	12 (2%)	6	36
22	A9	126/575 (22%)	115 (91%)	11 (9%)	0	100	100
23	AE	1496/1769 (85%)	1367 (91%)	129 (9%)	0	100	100
24	AF	489/513 (95%)	442 (90%)	47 (10%)	0	100	100
25	AG	812/896 (91%)	731 (90%)	80 (10%)	1 (0%)	51	85
26	B1	787/923 (85%)	732 (93%)	55 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	B2	813/943 (86%)	724 (89%)	87 (11%)	2 (0%)	47	81
28	B3	733/817 (90%)	606 (83%)	125 (17%)	2 (0%)	41	76
29	B8	469/594 (79%)	439 (94%)	30 (6%)	0	100	100
30	BE	814/939 (87%)	765 (94%)	49 (6%)	0	100	100
31	B6	368/440 (84%)	341 (93%)	27 (7%)	0	100	100
32	5B	58/214 (27%)	55 (95%)	3 (5%)	0	100	100
33	5C	407/554 (74%)	377 (93%)	30 (7%)	0	100	100
34	5D	165/250 (66%)	145 (88%)	20 (12%)	0	100	100
35	5E	187/593 (32%)	175 (94%)	10 (5%)	2 (1%)	14	51
36	5F	180/183 (98%)	164 (91%)	16 (9%)	0	100	100
37	5G	217/290 (75%)	203 (94%)	14 (6%)	0	100	100
38	5H	72/610 (12%)	65 (90%)	7 (10%)	0	100	100
39	5I	457/489 (94%)	421 (92%)	36 (8%)	0	100	100
40	5J	147/217 (68%)	136 (92%)	11 (8%)	0	100	100
41	5K	171/189 (90%)	166 (97%)	5 (3%)	0	100	100
42	RA	332/707 (47%)	276 (83%)	56 (17%)	0	100	100
43	RB	132/357 (37%)	117 (89%)	14 (11%)	1 (1%)	19	59
44	RG	212/252 (84%)	182 (86%)	30 (14%)	0	100	100
44	RH	226/252 (90%)	219 (97%)	7 (3%)	0	100	100
45	RJ	784/1183 (66%)	721 (92%)	62 (8%)	1 (0%)	51	85
46	RK	358/367 (98%)	341 (95%)	17 (5%)	0	100	100
47	RL	781/1056 (74%)	664 (85%)	115 (15%)	2 (0%)	41	76
47	RM	738/1056 (70%)	625 (85%)	109 (15%)	4 (0%)	29	68
48	RN	593/810 (73%)	545 (92%)	47 (8%)	1 (0%)	47	81
49	RO	523/552 (95%)	455 (87%)	68 (13%)	0	100	100
50	RP	1516/2493 (61%)	1336 (88%)	180 (12%)	0	100	100
51	RQ	132/899 (15%)	126 (96%)	6 (4%)	0	100	100
52	RS	247/483 (51%)	225 (91%)	22 (9%)	0	100	100
53	RY	35/534 (7%)	29 (83%)	6 (17%)	0	100	100
All	All	20606/29390 (70%)	18552 (90%)	2022 (10%)	32 (0%)	50	81

5 of 32 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
21	A8	258	PRO
21	A8	309	PRO
21	A8	325	PRO
21	A8	390	PRO
21	A8	392	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	SF	196/222 (88%)	190 (97%)	6 (3%)	40	62
5	SG	180/191 (94%)	180 (100%)	0	100	100
6	SH	139/201 (69%)	137 (99%)	2 (1%)	67	81
7	SJ	136/161 (84%)	134 (98%)	2 (2%)	65	80
8	SK	147/166 (89%)	146 (99%)	1 (1%)	84	90
9	SM	110/137 (80%)	108 (98%)	2 (2%)	59	77
10	SR	105/119 (88%)	105 (100%)	0	100	100
11	SY	85/120 (71%)	84 (99%)	1 (1%)	71	84
12	SZ	85/113 (75%)	85 (100%)	0	100	100
13	Sd	56/60 (93%)	56 (100%)	0	100	100
14	3B	201/240 (84%)	201 (100%)	0	100	100
14	3C	190/240 (79%)	187 (98%)	3 (2%)	62	79
15	3D	296/435 (68%)	293 (99%)	3 (1%)	76	86
16	3E	262/433 (60%)	261 (100%)	1 (0%)	91	94
17	3F	396/503 (79%)	394 (100%)	2 (0%)	88	93
18	3G	100/104 (96%)	100 (100%)	0	100	100
18	3H	100/104 (96%)	100 (100%)	0	100	100
19	A4	591/713 (83%)	584 (99%)	7 (1%)	71	84
20	A5	433/574 (75%)	432 (100%)	1 (0%)	93	96
21	A8	174/657 (26%)	164 (94%)	10 (6%)	20	47

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
22	A9	89/533 (17%)	88 (99%)	1 (1%)	73	85
23	AE	708/1633 (43%)	705 (100%)	3 (0%)	91	94
24	AF	437/454 (96%)	433 (99%)	4 (1%)	78	87
25	AG	750/826 (91%)	740 (99%)	10 (1%)	69	82
26	B1	696/812 (86%)	691 (99%)	5 (1%)	84	90
27	B2	712/832 (86%)	707 (99%)	5 (1%)	84	90
28	B3	665/719 (92%)	655 (98%)	10 (2%)	65	80
29	B8	421/529 (80%)	420 (100%)	1 (0%)	93	96
30	BE	718/819 (88%)	714 (99%)	4 (1%)	86	92
31	B6	251/414 (61%)	247 (98%)	4 (2%)	62	79
32	5B	57/196 (29%)	55 (96%)	2 (4%)	36	60
33	5C	349/480 (73%)	347 (99%)	2 (1%)	86	92
34	5D	156/234 (67%)	154 (99%)	2 (1%)	69	82
35	5E	175/535 (33%)	162 (93%)	13 (7%)	13	40
36	5F	171/172 (99%)	169 (99%)	2 (1%)	71	84
37	5G	194/258 (75%)	190 (98%)	4 (2%)	53	72
38	5H	63/538 (12%)	63 (100%)	0	100	100
39	5I	416/443 (94%)	414 (100%)	2 (0%)	88	93
40	5J	140/200 (70%)	140 (100%)	0	100	100
41	5K	157/169 (93%)	157 (100%)	0	100	100
42	RA	303/636 (48%)	300 (99%)	3 (1%)	76	86
43	RB	117/315 (37%)	114 (97%)	3 (3%)	46	67
44	RG	195/222 (88%)	193 (99%)	2 (1%)	76	86
44	RH	206/222 (93%)	204 (99%)	2 (1%)	76	86
45	RJ	683/1039 (66%)	676 (99%)	7 (1%)	76	86
46	RK	307/312 (98%)	303 (99%)	4 (1%)	69	82
47	RL	164/934 (18%)	162 (99%)	2 (1%)	71	84
48	RN	422/732 (58%)	421 (100%)	1 (0%)	93	96
49	RO	329/506 (65%)	328 (100%)	1 (0%)	92	95
50	RP	224/2307 (10%)	222 (99%)	2 (1%)	78	87
51	RQ	81/808 (10%)	80 (99%)	1 (1%)	71	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
52	RS	225/424 (53%)	225 (100%)	0	100	100
53	RY	31/482 (6%)	30 (97%)	1 (3%)	39	61
All	All	14594/25228 (58%)	14450 (99%)	144 (1%)	77	86

5 of 144 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
42	RA	76	THR
53	RY	487	ASP
43	RB	338	THR
45	RJ	1128	LYS
24	AF	508	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 248 such sidechains are listed below:

Mol	Chain	Res	Type
27	B2	524	HIS
47	RL	75	ASN
30	BE	163	GLN
46	RK	334	ASN
49	RO	343	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	3A	169/333 (50%)	55 (32%)	8 (4%)
2	5A	164/700 (23%)	51 (31%)	4 (2%)
3	SA	935/1808 (51%)	373 (39%)	16 (1%)
All	All	1268/2841 (44%)	479 (37%)	28 (2%)

5 of 479 RNA backbone outliers are listed below:

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

5 of 28 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	SA	56	U
3	SA	1632	C
3	SA	372	G
3	SA	1197	C
3	SA	272	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 2 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
56	GTP	RJ	1201	57	26,34,34	0.94	2 (7%)	32,54,54	0.92	0

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

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

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
56	RJ	1201	GTP	C5-C6	-2.47	1.42	1.47
56	RJ	1201	GTP	C8-N7	-2.05	1.31	1.35

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

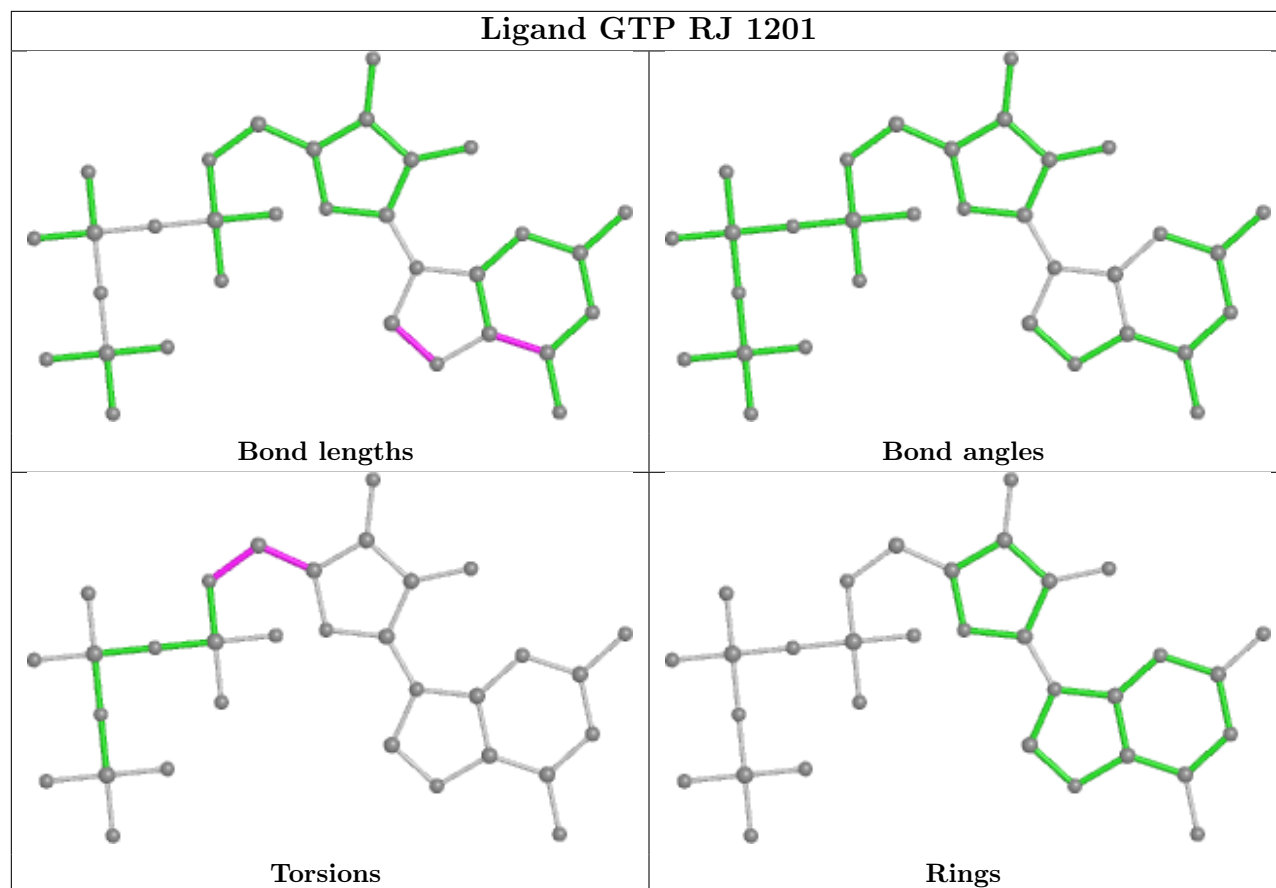
Mol	Chain	Res	Type	Atoms
56	RJ	1201	GTP	O4'-C4'-C5'-O5'
56	RJ	1201	GTP	C3'-C4'-C5'-O5'
56	RJ	1201	GTP	C4'-C5'-O5'-PA

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
56	RJ	1201	GTP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

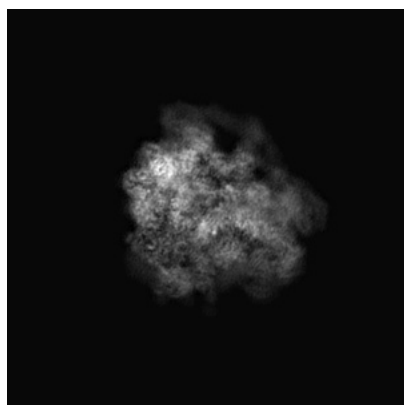
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-0955. These allow visual inspection of the internal detail of the map and identification of artifacts.

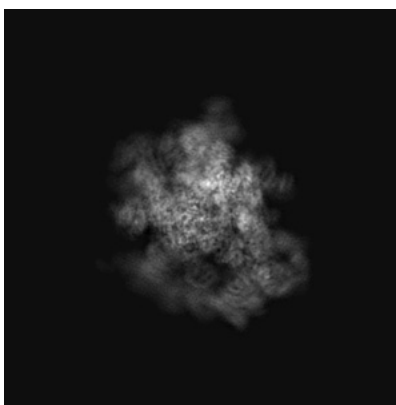
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

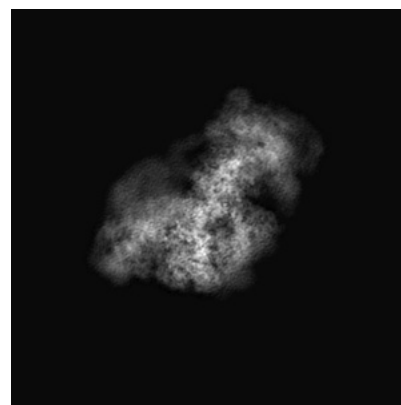
6.1.1 Primary map



X



Y

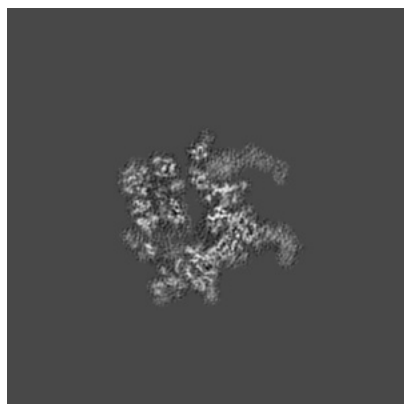


Z

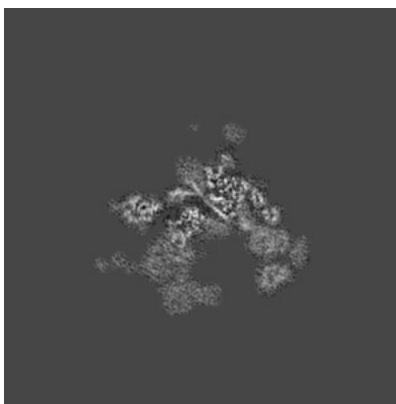
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

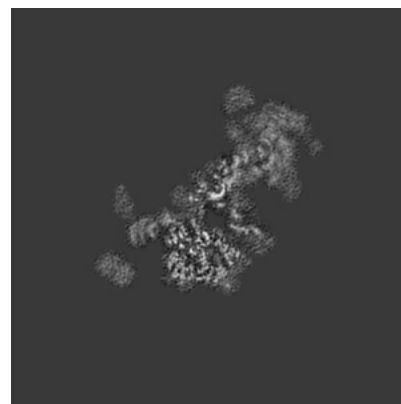
6.2.1 Primary map



X Index: 224



Y Index: 224

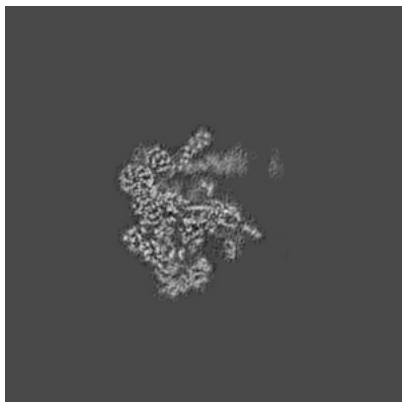


Z Index: 224

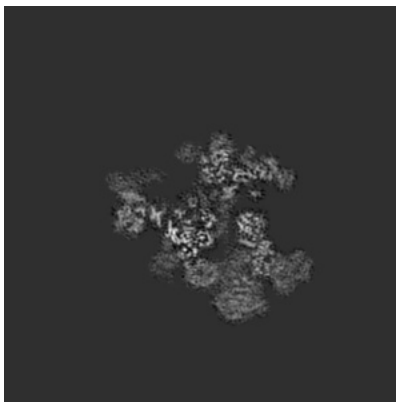
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

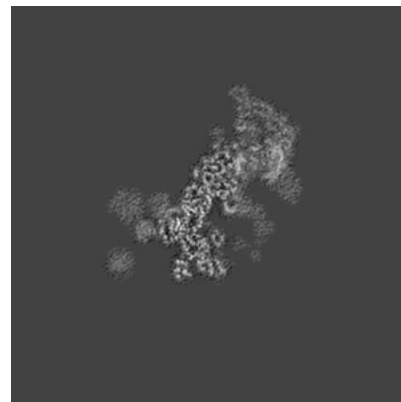
6.3.1 Primary map



X Index: 212



Y Index: 197

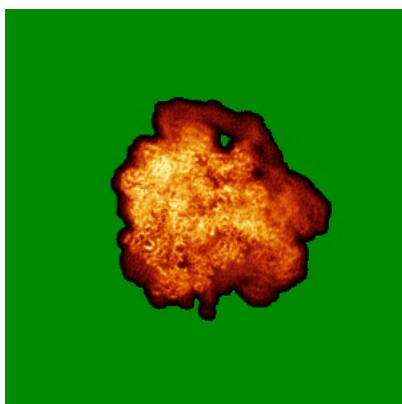


Z Index: 206

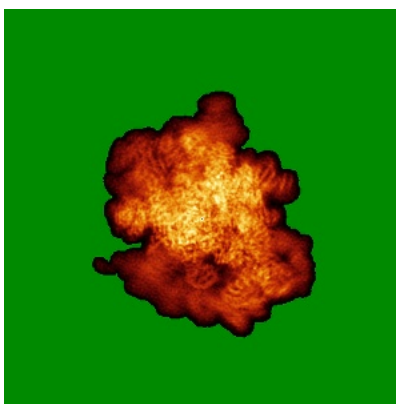
The images above show the largest variance slices of the map in three orthogonal directions.

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

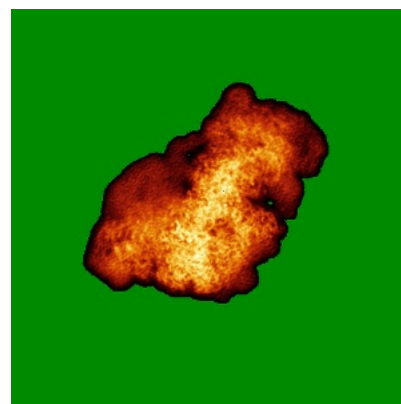
6.4.1 Primary map



X



Y

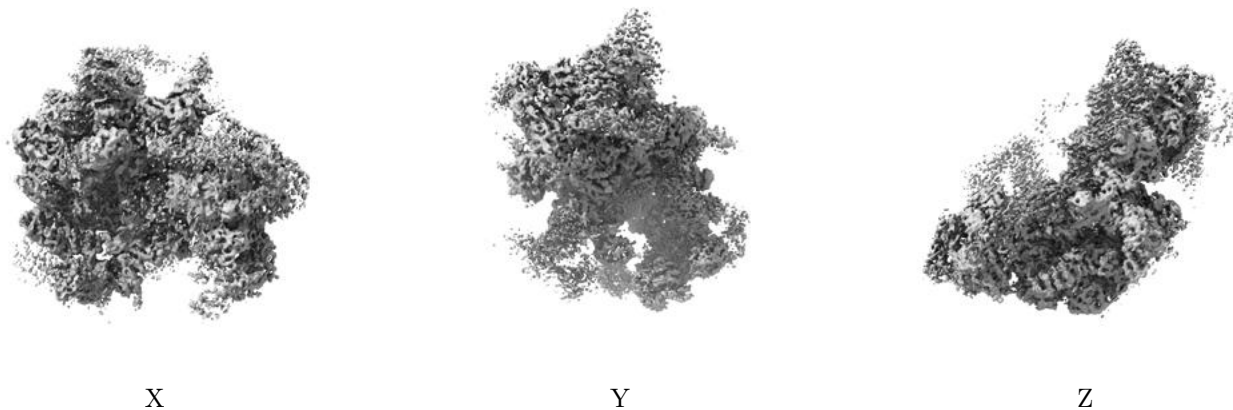


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.022. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

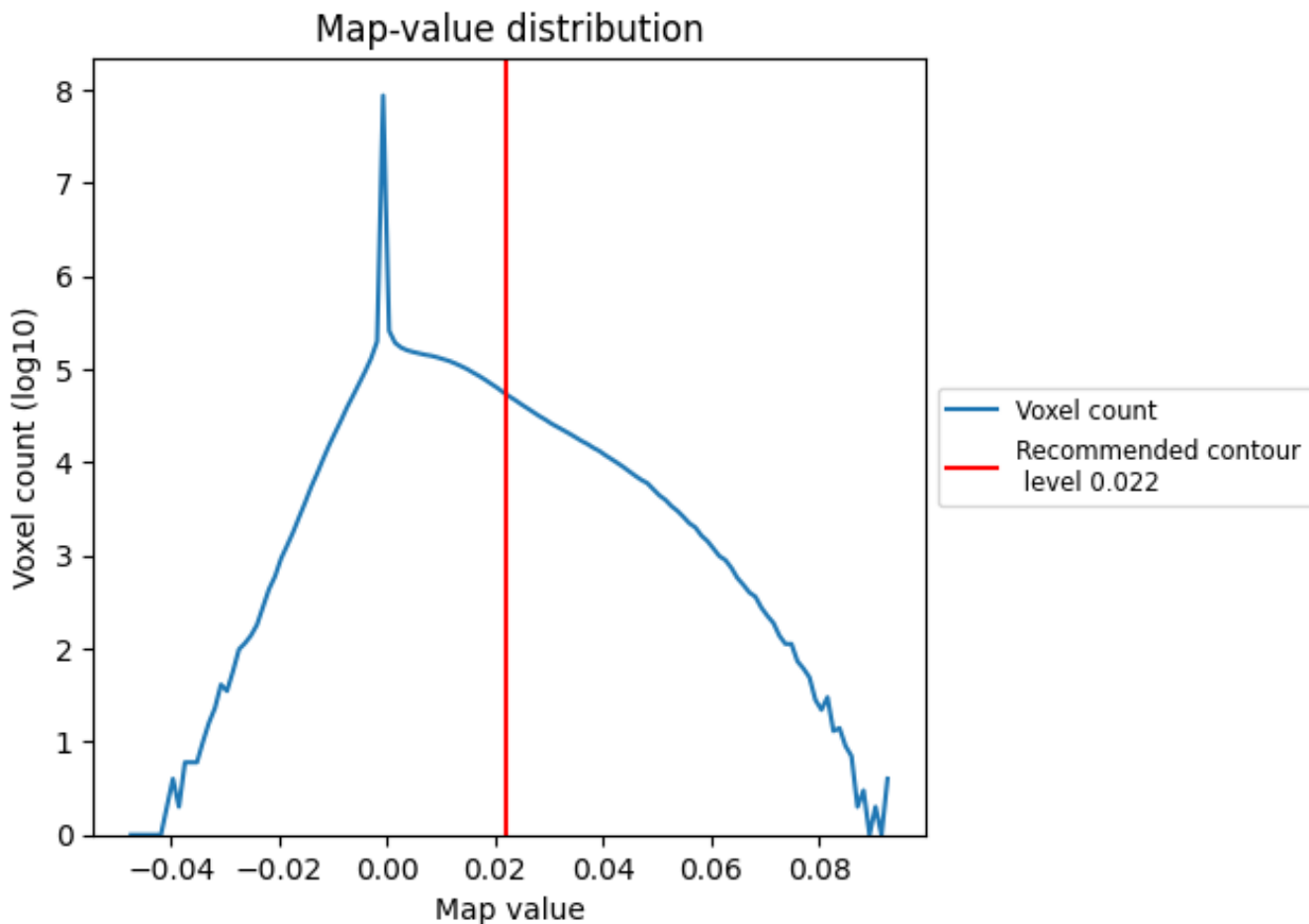
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

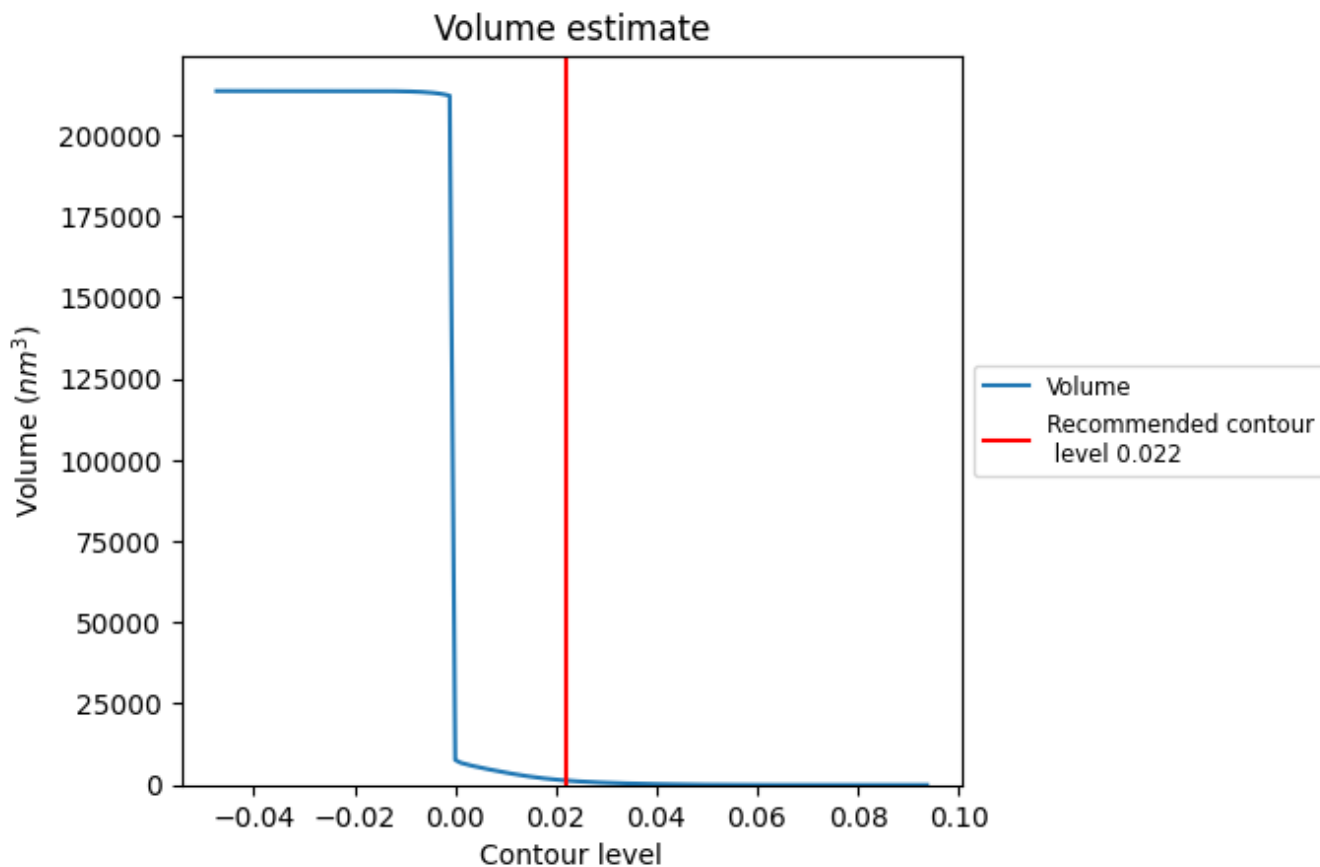
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

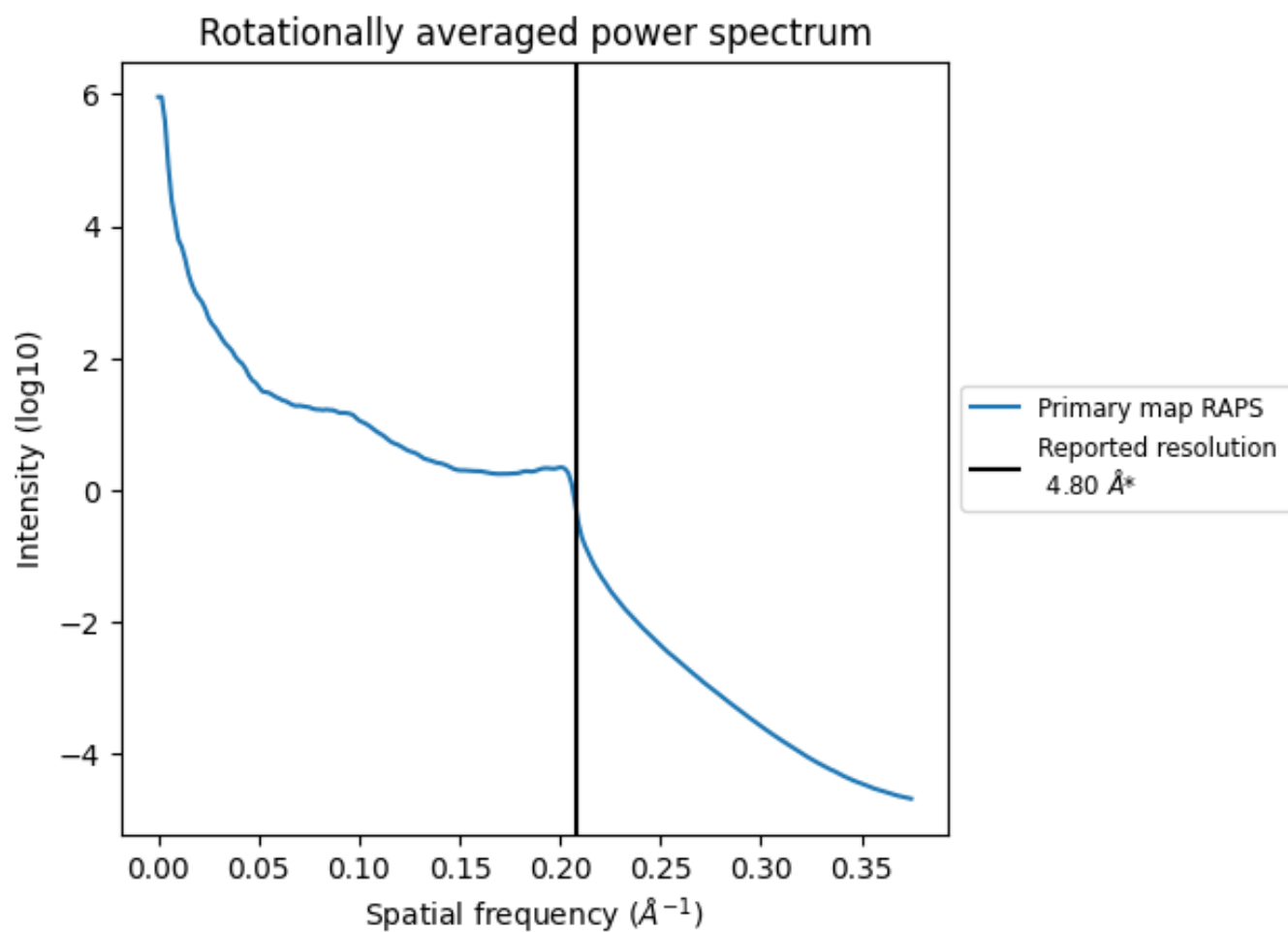
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1377 nm³; this corresponds to an approximate mass of 1244 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 0.208\AA^{-1}

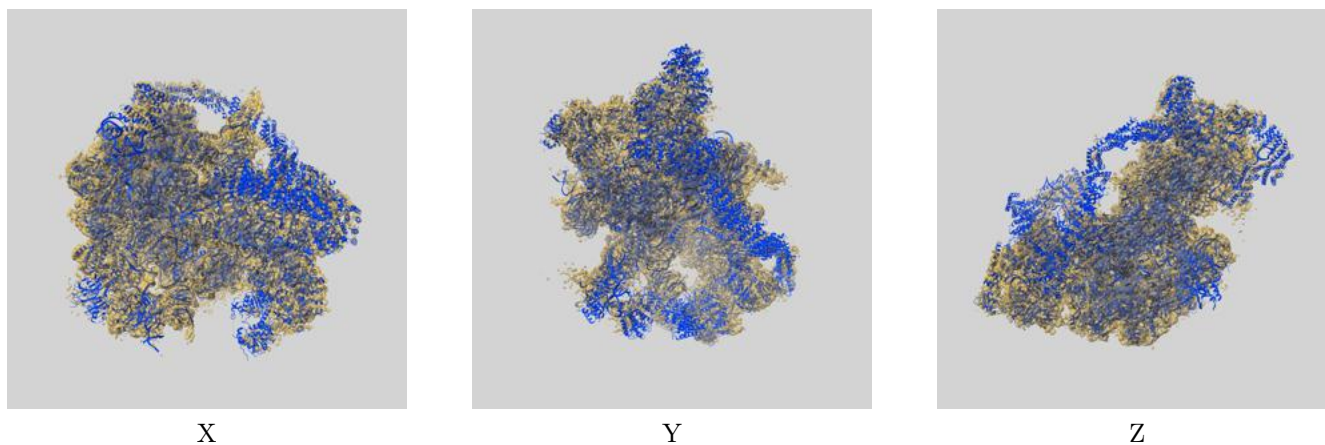
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

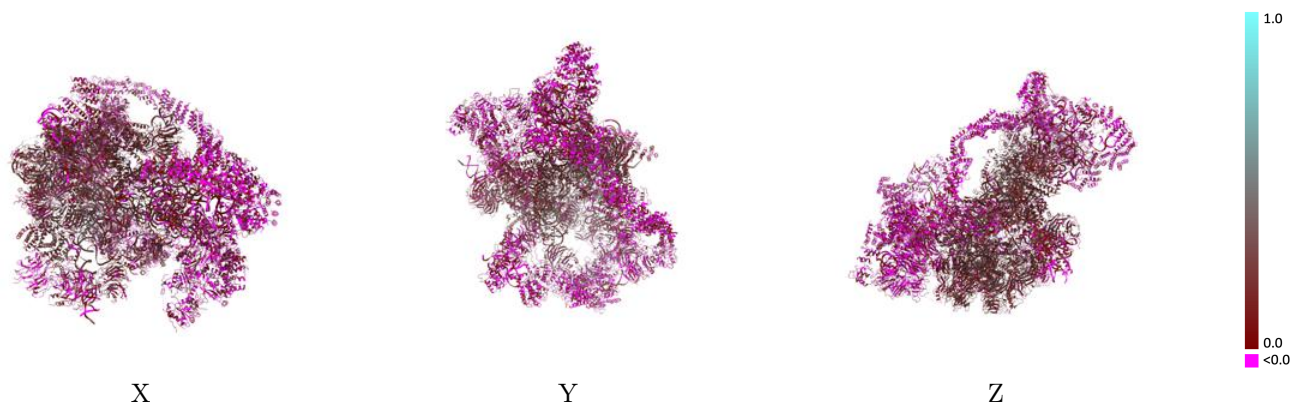
This section contains information regarding the fit between EMDB map EMD-0955 and PDB model 6LQV. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



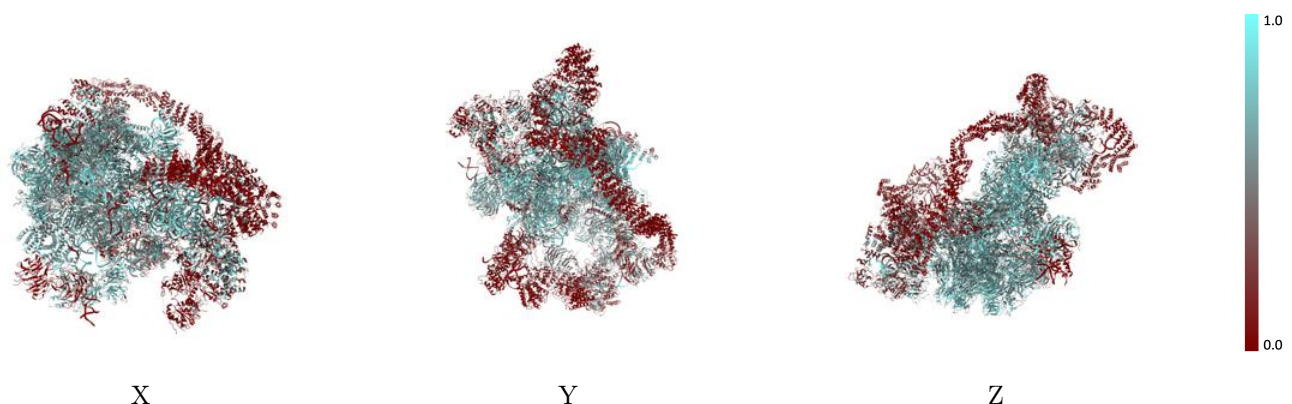
The images above show the 3D surface view of the map at the recommended contour level 0.022 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



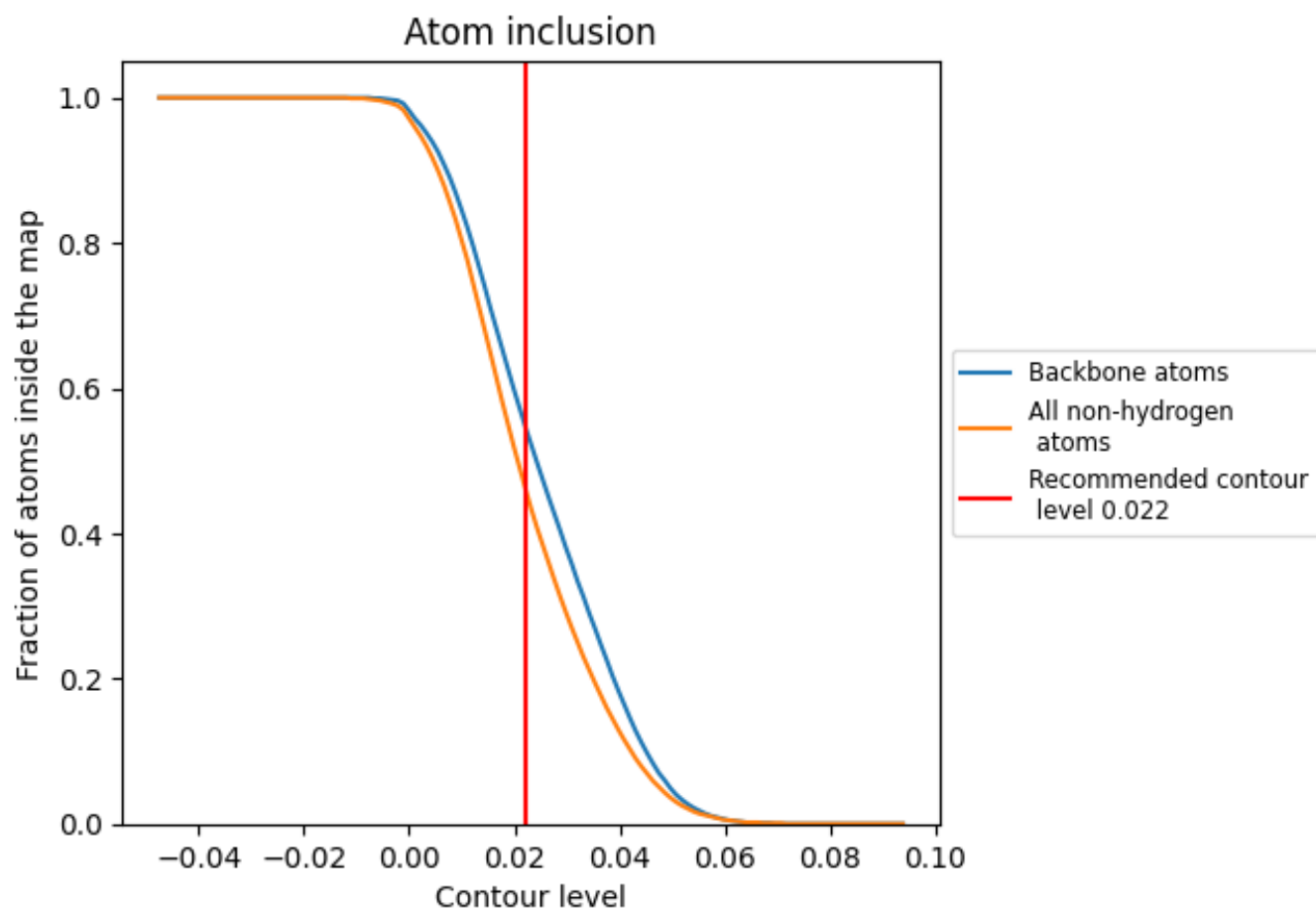
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.022).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 55% of all backbone atoms, 46% 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 (0.022) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.4640	 0.1300
3A	 0.7750	 0.2060
3B	 0.6390	 0.2150
3C	 0.3490	 0.0730
3D	 0.6490	 0.2060
3E	 0.5020	 0.1390
3F	 0.6880	 0.2280
3G	 0.5760	 0.1250
3H	 0.6750	 0.2540
5A	 0.4030	 0.0860
5B	 0.0600	 0.0360
5C	 0.6710	 0.2430
5D	 0.2860	 0.0990
5E	 0.6220	 0.2160
5F	 0.6690	 0.2490
5G	 0.6530	 0.2350
5H	 0.6660	 0.2450
5I	 0.6430	 0.2000
5J	 0.3570	 0.1150
5K	 0.5970	 0.2210
A4	 0.4140	 0.0400
A5	 0.4860	 0.1360
A8	 0.2720	 0.0490
A9	 0.2530	 0.0090
AE	 0.2430	 0.0890
AF	 0.3850	 0.0850
AG	 0.4180	 0.0280
B1	 0.6840	 0.2210
B2	 0.6530	 0.1650
B3	 0.2010	 0.0520
B6	 0.5890	 0.1660
B8	 0.6510	 0.1760
BE	 0.7130	 0.2240
RA	 0.3970	 0.0330
RB	 0.4760	 0.1580



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Chain	Atom inclusion	Q-score
RG	 0.1070	 0.0470
RH	 0.1620	 0.0610
RJ	 0.6610	 0.2200
RK	 0.6830	 0.2240
RL	 0.4770	 0.1490
RM	 0.1670	 0.0470
RN	 0.1120	 0.0520
RO	 0.0070	 0.0120
RP	 0.0920	 0.0270
RQ	 0.1560	 0.0700
RS	 0.0530	 0.0280
RY	 0.1300	 -0.0200
SA	 0.5860	 0.1420
SF	 0.5530	 0.1410
SG	 0.6650	 0.2440
SH	 0.3660	 0.0530
SJ	 0.4500	 0.0380
SK	 0.6560	 0.2280
SM	 0.4840	 0.0430
SR	 0.6910	 0.2420
SY	 0.6250	 0.2260
SZ	 0.6200	 0.2110
Sd	 0.6960	 0.2790
X1	 0.4250	 0.1700