



wwPDB EM Validation Summary Report ⓘ

Nov 7, 2022 – 11:56 AM JST

PDB ID : 5H1S
EMDB ID : EMD-9572
Title : Structure of the large subunit of the chloro-ribosome
Authors : Ahmed, T.; Yin, Z.; Bhushan, S.
Deposited on : 2016-10-11
Resolution : 3.50 Å (reported)

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:

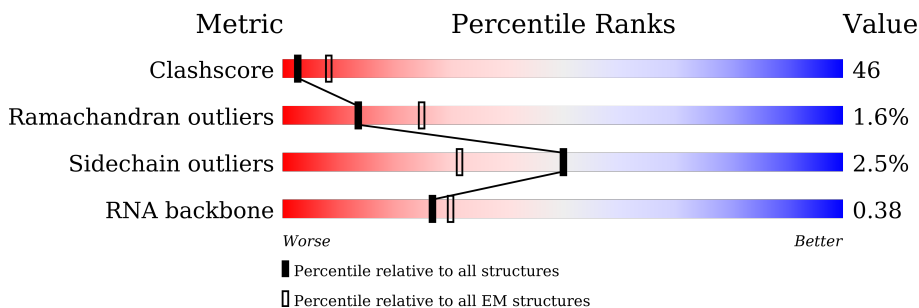
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

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 3.50 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.





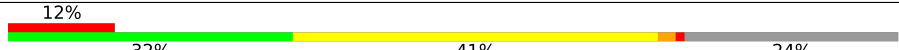
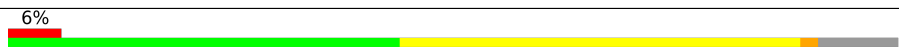
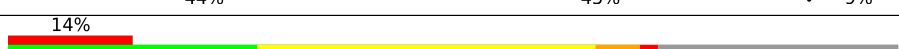
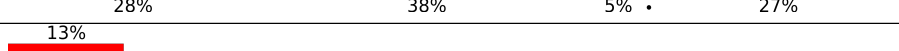
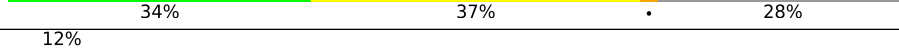
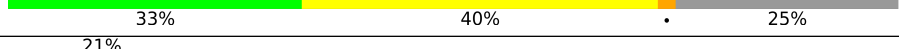
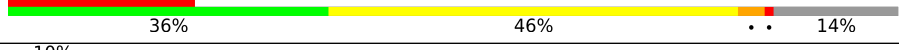
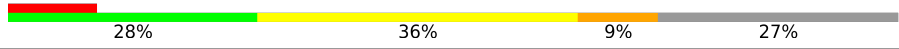

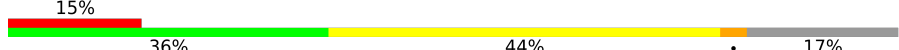
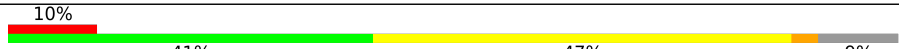


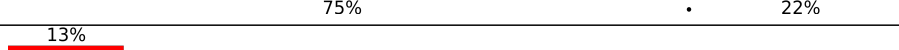

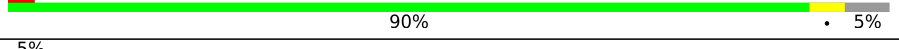
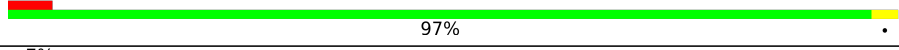





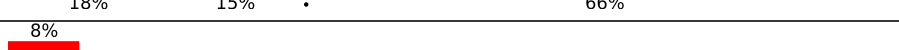
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	A	2810	
2	C	106	
3	B	121	
4	L	191	
5	M	121	
6	N	192	
7	O	135	

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Mol	Chain	Length	Quality of chain
8	P	116	
9	Q	123	
10	R	156	
11	S	127	
12	T	201	
13	U	199	
14	V	122	
15	W	145	
16	X	137	
17	Y	77	
18	Z	109	
19	E	271	
20	b	56	
21	c	65	
22	d	60	
23	e	73	
24	f	37	
25	F	221	
26	G	243	
27	H	220	
28	I	182	
29	J	155	
30	g	142	
31	a	94	
32	h	116	

2 Entry composition [i](#)

There are 32 unique types of molecules in this entry. The entry contains 90825 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 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	2799	60117	26819	11134	19365	2799	0	0

- Molecule 2 is a RNA chain called Spinach chloroplast 4.5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	C	102	2187	977	403	705	102	0	0

- Molecule 3 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	B	117	2500	1116	452	815	117	0	0

- Molecule 4 is a protein called 50S ribosomal protein L13, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	L	147	1184	754	225	202	3	0	0

- Molecule 5 is a protein called 50S ribosomal protein L14, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	M	121	942	588	179	170	5	0	0

- Molecule 6 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	N	177	1342	836	264	236	6	0	0

- Molecule 7 is a protein called 50S ribosomal protein L16, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	O	134	1067	672	217	173	5	0	0

- Molecule 8 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	P	116	944	592	193	155	4	0	0

- Molecule 9 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	Q	120	947	589	183	170	5	0	0

- Molecule 10 is a protein called 50S ribosomal protein L19, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	R	118	953	610	186	156	1	0	0

- Molecule 11 is a protein called 50S ribosomal protein L20, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	S	115	996	633	208	153	2	0	0

- Molecule 12 is a protein called 50S ribosomal protein L21, chloroplastic.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	T	147	1171	759	202	210	0	0

- Molecule 13 is a protein called 50S ribosomal protein L22, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	U	144	1149	731	210	200	8	0	0

- Molecule 14 is a protein called 50S ribosomal protein L23, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	V	92	Total	C	N	O	S	0	0
			740	477	129	132	2		

- Molecule 15 is a protein called 50S ribosomal protein L24, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	W	124	Total	C	N	O	S	0	0
			993	624	187	180	2		

- Molecule 16 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	X	100	Total	C	N	O	S	0	0
			810	511	159	140			

- Molecule 17 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Y	74	Total	C	N	O	S	0	0
			605	385	121	98	1		

- Molecule 18 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	Z	90	Total	C	N	O	S	0	0
			754	470	150	131	3		

- Molecule 19 is a protein called 50S ribosomal protein L2, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	E	247	Total	C	N	O	S	0	0
			1904	1181	390	327	6		

- Molecule 20 is a protein called 50S ribosomal protein L32, chloroplastic.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	b	46	Total	C	N	O	0	0
			378	250	70	58		

- Molecule 21 is a protein called 50S ribosomal protein L33, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	c	51	Total	C	N	O	S	0	0
			415	258	83	70	4		

- Molecule 22 is a protein called 50S ribosomal protein L34, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	d	57	Total	C	N	O	S	0	0
			445	268	103	71	3		

- Molecule 23 is a protein called 50S ribosomal protein L35, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	e	69	Total	C	N	O	S	0	0
			563	353	119	90	1		

- Molecule 24 is a protein called 50S ribosomal protein L36, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	f	37	Total	C	N	O	S	0	0
			304	186	70	44	4		

- Molecule 25 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	F	212	Total	C	N	O	S	0	0
			1620	1025	295	289	11		

- Molecule 26 is a protein called 50S ribosomal protein L4, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	G	210	Total	C	N	O	S	0	0
			1655	1052	308	292	3		

- Molecule 27 is a protein called 50S ribosomal protein L5, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	H	175	Total	C	N	O	S	0	0
			1351	862	233	248	8		

- Molecule 28 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	I	173	Total	C	N	O	S	0	0
			1353	855	249	245	4		

- Molecule 29 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	J	53	Total	C	N	O	S	0	0
			423	280	74	68	1		

- Molecule 30 is a protein called 50S ribosomal protein 5 alpha, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	g	43	Total	C	N	O	S	0	0
			345	218	65	59	3		

- Molecule 31 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	a	38	Total	C	N	O	S	0	0
			300	187	49	62	2		

- Molecule 32 is a protein called 50S ribosomal protein 6, chloroplastic.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	h	46	Total	C	N	O	S	0	0
			368	237	71	59	1		

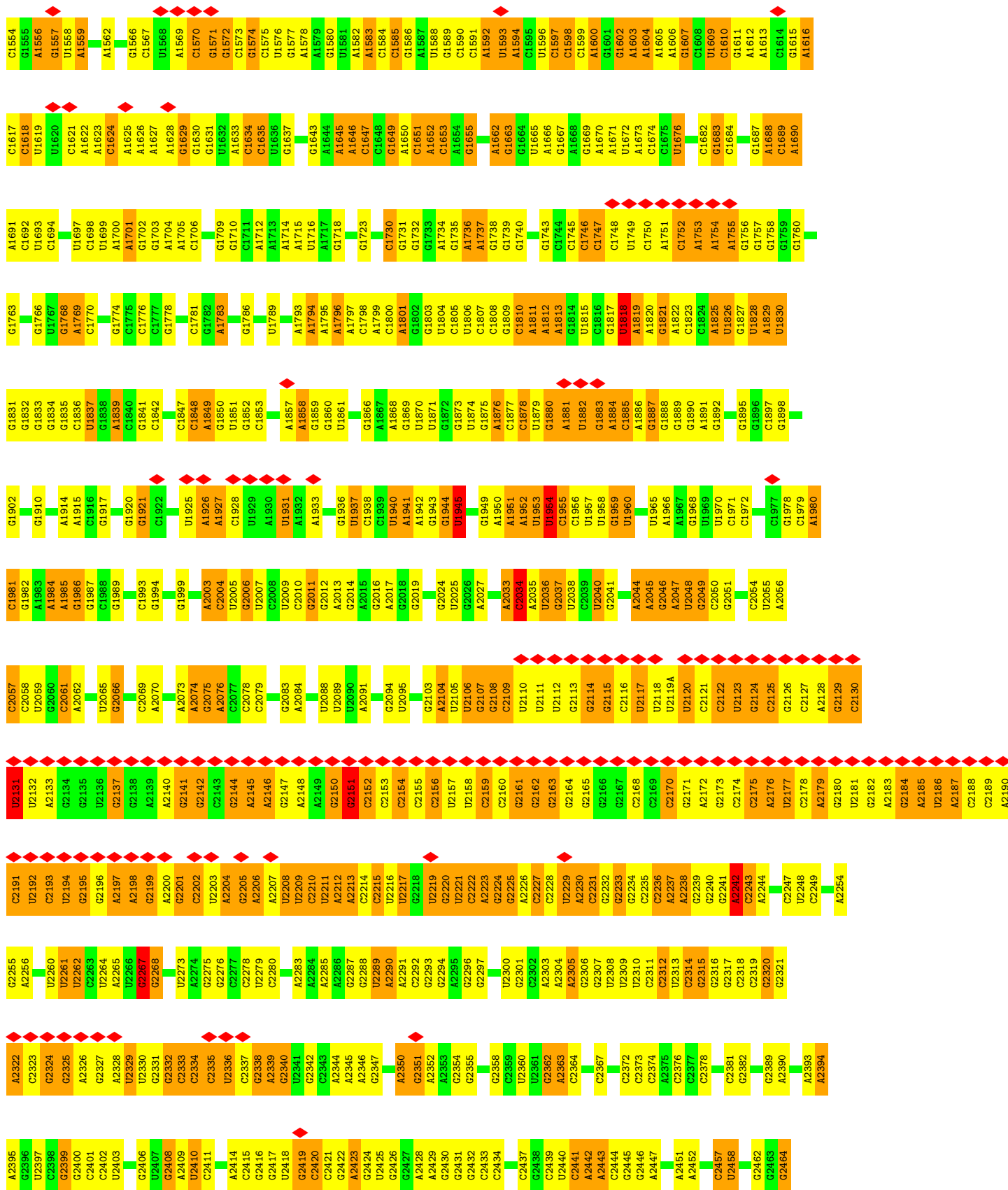
3 Residue-property plots i

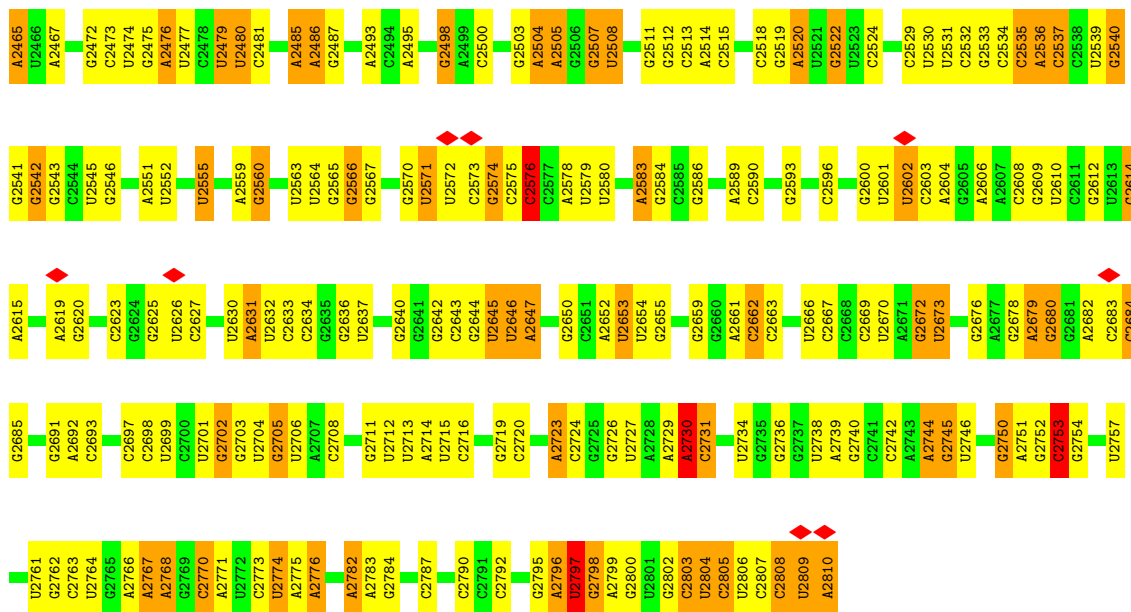
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 23S rRNA

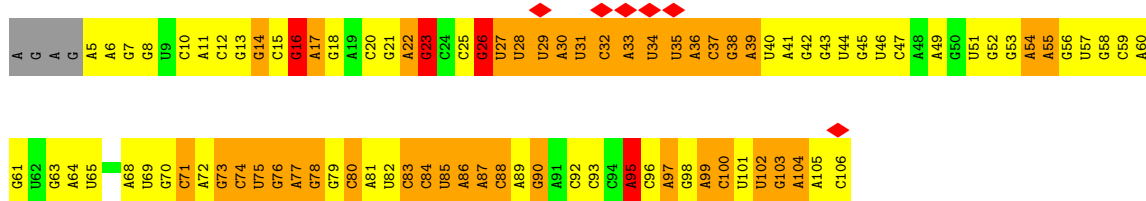


G1494	G1495	A1496	A1497	A1498	G1499	U1500	G1501	A1502	C1503	C1504	C1505	U1506	U1507	U	U	U	U	U	C	A	G1515	G1516	G1517	U1518	A1519	A1520	G1521	A1522	G1523	G1524	G1525	G1526	G1527	U1528	A1529	G1530	A1531	G1532	A1533	A1534	A1535	A1536	U1537	G1538	C1539	C1540	U1541	G1542	G1543	A1544	G1545	G1546	C1547	A1548	A1549	A1550	U1551	U1552	U1553
U1426	A1427	C1428	C1429	C1430	C1431	U1432	U1433	U1434	U1435	U1436	U1437	U1438	G1443	A1444	A1448	C1449	G1450	G1451	A1452	G1453	G1454	G1457	C1458	U1459	A1460	A1461	G1462	U1463	U1464	A1465	G1466	C1467	C1468	G1469	A1470	A1471	A1472	G1473	A1474	U1475	U1476	U1477	U1478	U1479	A1480	U1481	C1482	G1483	U1484	U1485	U1486	C1487	U1488	A1489	G1493				
C1336	U1337	C1338	C1341	A1342	A1343	G1344	G1345	U1346	U1347	G1348	U1350	C1351	C1352	A1353	U1361	U1362	A1363	C1366	U1373	A1374	A1375	U1376	C1379	G1385	A1386	A1387	A1388	G1389	G1390	C1391	G1392	U1393	A1394	C1397	G1398	A1399	U1400	G1401	A1406	C1407	A1408	A1413	U1414	U1415	U1416	U1417	U1418	U1419	A1425										
C1264	G1265	G1266	A1267	A1268	C1269	C1270	G1271	A1272	A1273	U1274	U1275	G1276	G1277	U1278	G1281	U1282	U1283	U1284	G1285	A1286	G1287	U1288	A1289	A1290	C1291	U1292	C1293	A1295	A1296	C1297	U1298	A1305	G1306	A1307	A1308	U1309	C1310	C1311	A1312	U1313	U1314	U1315	C1316	C1317	C1318	C1319	G1320	A1321	A1322	A1323	G1332	U1333	U1334	C1335					
A1192	U1193	G1194	U1195	A1196	A1197	U1198	A1199	A1200	A1201	A1202	C1203	A1204	G1207	G1208	U1209	A1210	G1211	U1219	U1220	U1224	G1225	U1226	U1227	G1231	A1232	G1233	A1234	A1235	A1236	C1237	G1238	G1239	G1240	U1241	G1242	U1245	G1246	A1247	G1248	G1251	C1252	G1253	U1254	U1255	G1256	A1257	A1258	C1259	G1260	A1261	A1262	G1263							
C1128	U1129	C1130	A1131	C1132	U1133	U1134	A1135	U1136	C1137	G1138	A1139	C1141	G1142	C1143	U1144	C1145	U1146	U1147	G1150	G1153	A1154	A1155	U1156	A1157	U1158	U1159	A1160	A1161	C1162	G1163	G1164	U1165	U1166	C1167	U1168	A1169	A1170	G1171	C1172	G1173	U1174	U1175	C1176	U1177	U1178	C1179	C1180	G1181	A1182	U1183	U1184	U1185	U1186	G1187	U1188	G1189			
U1069	G1070	C1071	A1072	G1073	A1074	G1075	U1076	C1077	A1078	G1079	C1080	A1081	U1082	G1083	U1084	A1085	G1086	U1087	U1088	U1089	U1090	G1091	C1092	U1093	U1094	A1095	U1096	C1097	A1097	A1098	G1099	U1100	A1101	G1102	C1103	U1104	A1105	C1106	C1107	C1108	U1109	U1110	G1111	A1112	A1113	A1114	G1115	A1116	G1117	U1118	G1119	C1120	U1121	U1122	A1123	A1124	U1125	A1126	G1127
G1004	G1005	U1006	A1007	A1008	C1009	C1010	A1011	U1012	C1013	G1016	U1017	A1018	U1019	A1020	G1021	U1022	C1023	A1024	G1025	A1028	A1029	G1030	G1031	C1032	G1033	G1034	U1035	U1036	A1037	A1038	A1039	U1040	G1041	A1042	C1043	C1044	U1045	U1046	U1047	G1048	A1049	G1050	U1051	G1052	A1053	A1054	A1055	A1056	A1057	A1060	G1061	G1062	U1063	A1064	U1065	G1066			
C941	U942	C943	C944	A945	A946	A947	U948	A949	A950	C951	A952	G953	G954	G955	G956	U957	C958	A959	A960	G961	G962	U963	C964	G965	G966	G967	C968	A969	G970	U971	G972	A973	G974	A975	C976	G977	A978	U979	G980	G981	G982	G983	G984	A985	U986	A987	A988	G989	C993	A994	G997	U998	U999	G1000	A1001	G1002	A1003		
G879	U880	U881	U882	C883	G884	G885	U886	U887	C888	G889	G890	C892	C893	G894	C895	G896	A897	G898	G899	A900	C905	A906	G907	C909	C901	G902	G903	U904	A905	C906	U907	A908	A909	A910	U911	C912	G913	A914	G915	G916	C917	A918	A919	C920	A921	U922	C923	U924	A927	U928	A929	A932	G933	A934	U935	A936	U937	G938	C940
U814	A815	U816	C817	C818	G819	G820	U821	U822	C823	U824	C825	C828	G829	A830	A831	A832	G836	U837	U838	A839	A840	G841	C842	C843	G844	G845	A846	G850	U851	U852	U853	A854	C855	U856	G857	G858	A859	C860	A861	U862	C863	U864	A865	G866	G867	G868	G869	U870	U871	A872	A873	G874	C875	A876	C877	U878			
G735	G737	A738	C739	U740	U741	G745	C746	G749	A750	C751	U755	U758	G759	A760	A761	G762	A764	A767	G768	C769	G770	U773	U774	A775	G782	U783	U784	A785	G786	G787	G788	G789	U790	G791	A792	A793	A794	U795	G796	C800	U801	C802	G803	A804	A805	C806	C807	A811	G812	C813									
U668	C669	A670	U671	U672	U675	G679	A680	U681	U682	C683	C684	C685	U686	A687	A688	C689	U690	U694	A696	U697	C698	C699	A700	C701	C702	C703	A704	U705	G706	G712	A713	U714	U715	A716	U717	U718	U719	U720	U721	U722	G723	G724	U725	G726	A727	A728	A729	C730	U731	A732	A733	G734	U735						
G607	U608	G609	G610	C611	U612	U613	G614	U615	U616	U617	A618	A619	G620	G621	G622	A623	A624	C625	C626	C627	A628	C629	C630	G631	G632	A633	G634	C635	C636	G637	U638	A639	G640	C641	G642	A643	A644	A645	G648	A649	G650	U651	C652	U653	C654	U655	A656	U657	A658	G659	G660	G661	C662	A663	A664	U665	U666	G667	

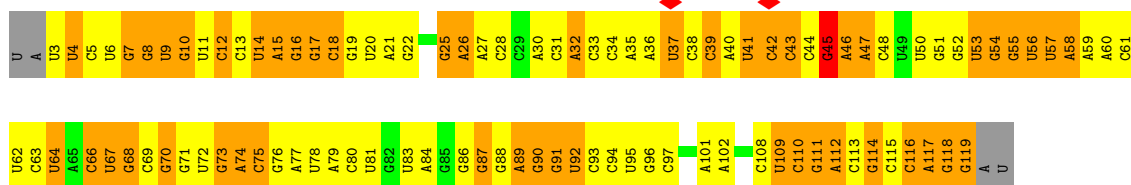




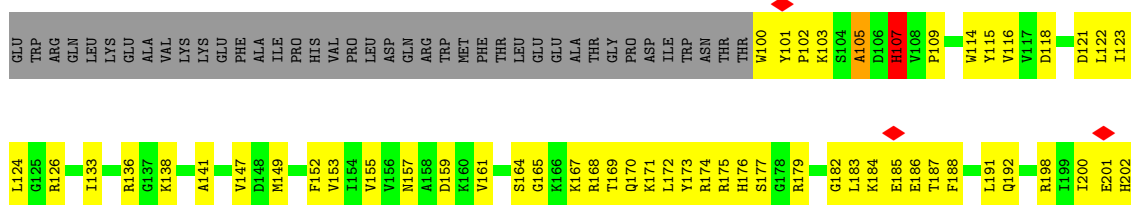
• Molecule 2: Spinach chloroplast 4.5S rRNA



• Molecule 3: 5S rRNA

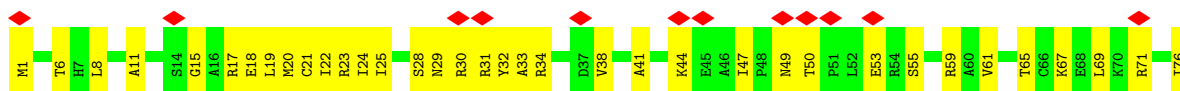


• Molecule 4: 50S ribosomal protein L13, chloroplastic

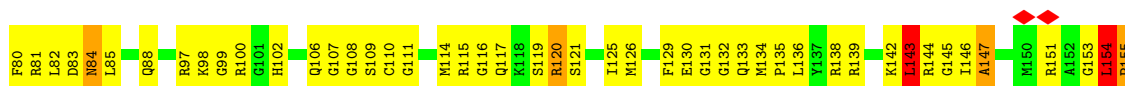




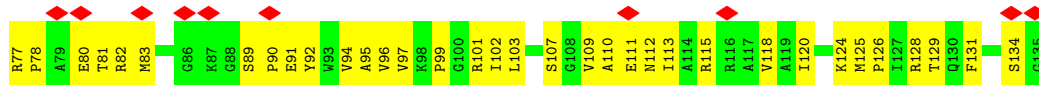
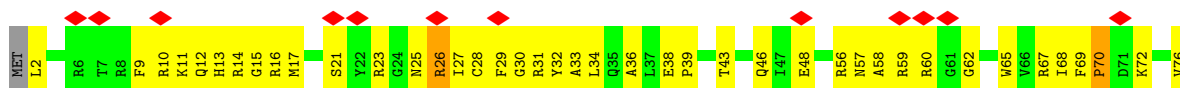
• Molecule 5: 50S ribosomal protein L14, chloroplastic



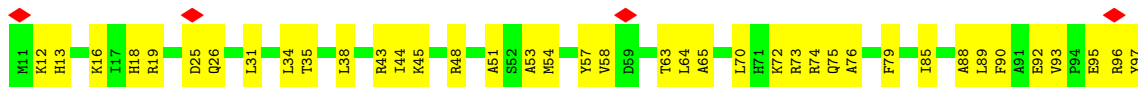
• Molecule 6: 50S ribosomal protein L15

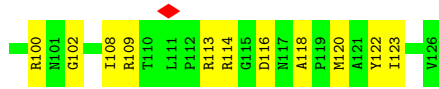


• Molecule 7: 50S ribosomal protein L16, chloroplastic

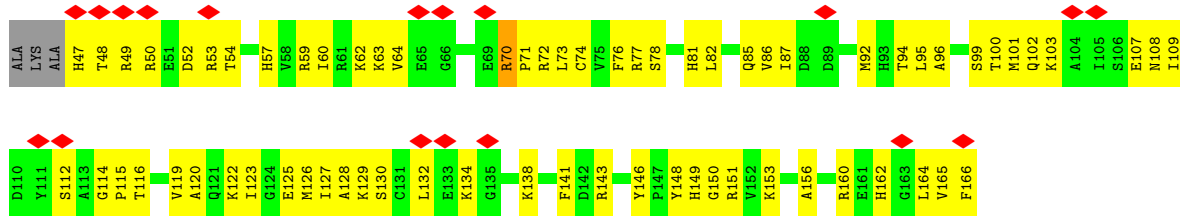
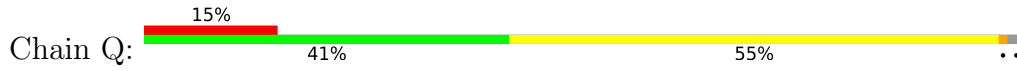


• Molecule 8: 50S ribosomal protein L17

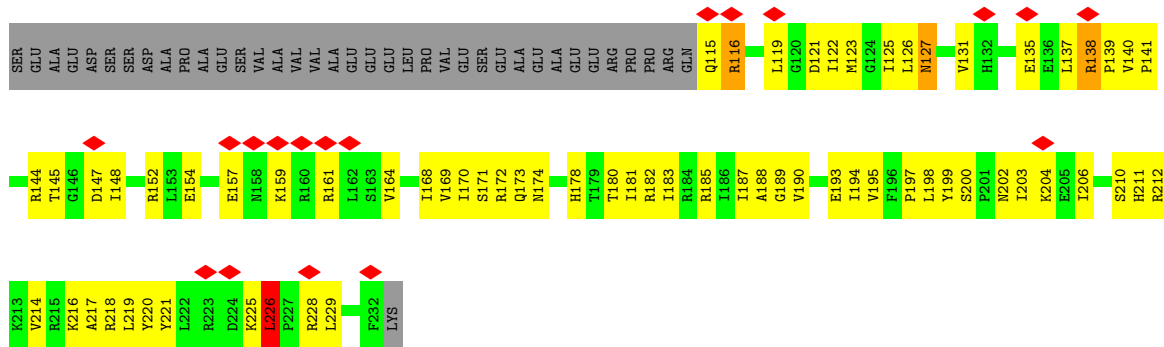




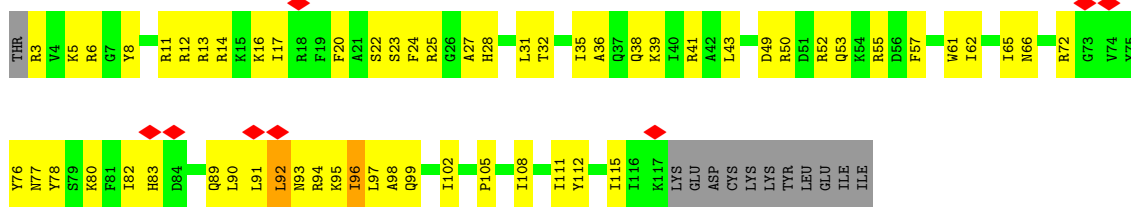
• Molecule 9: 50S ribosomal protein L18



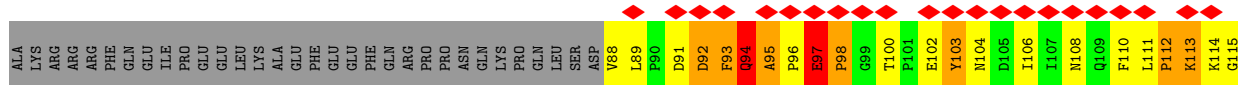
• Molecule 10: 50S ribosomal protein L19, chloroplastic

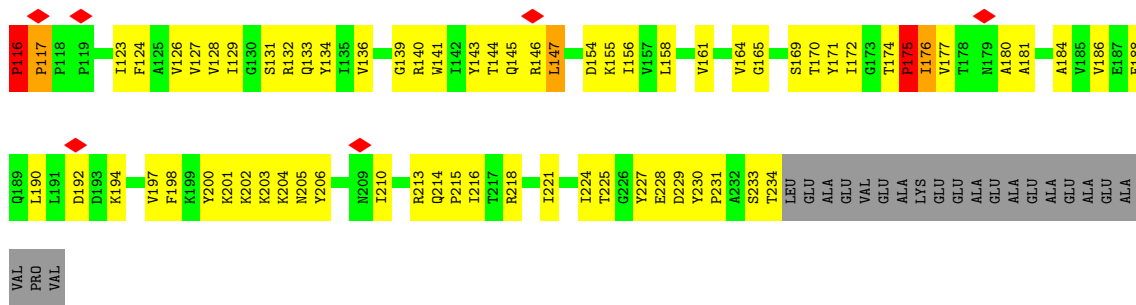


• Molecule 11: 50S ribosomal protein L20, chloroplastic

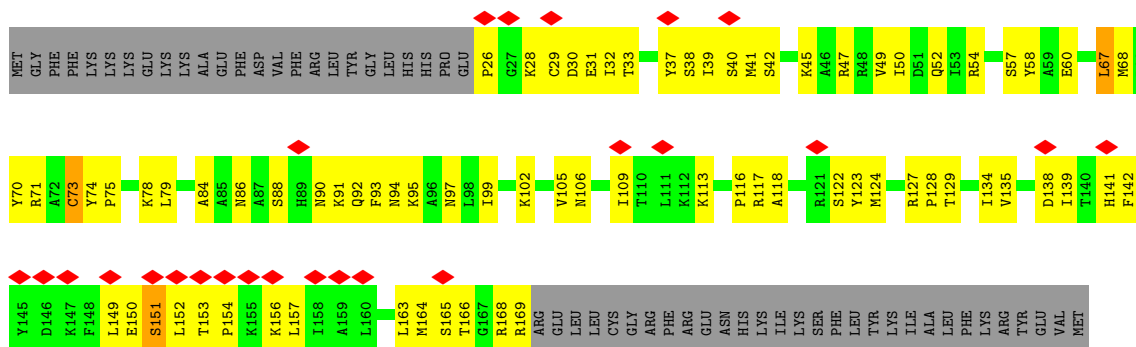


• Molecule 12: 50S ribosomal protein L21, chloroplastic

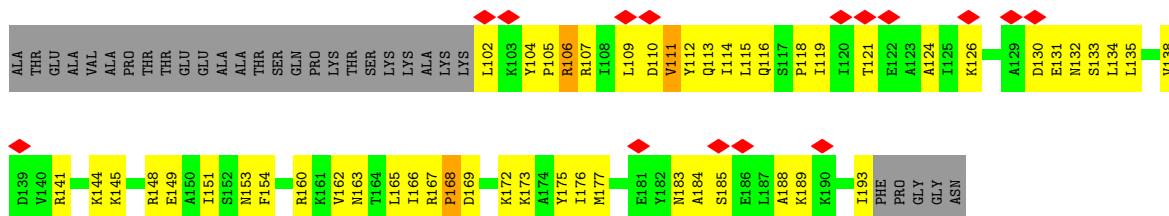




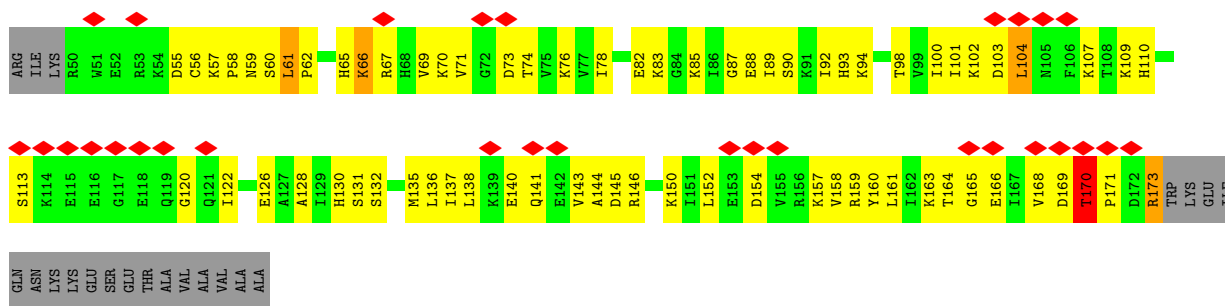
• Molecule 13: 50S ribosomal protein L22, chloroplastic



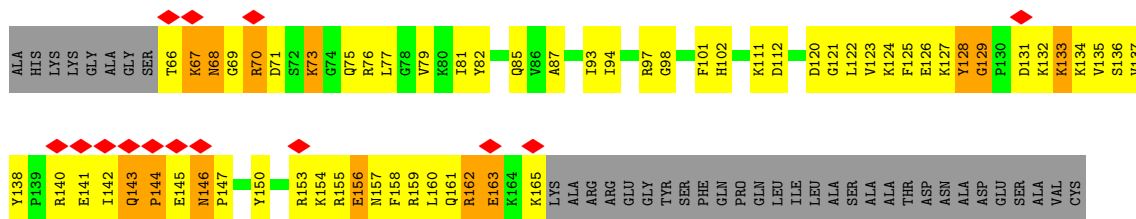
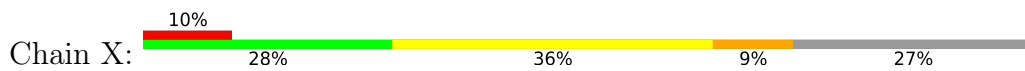
• Molecule 14: 50S ribosomal protein L23, chloroplastic



• Molecule 15: 50S ribosomal protein L24, chloroplastic



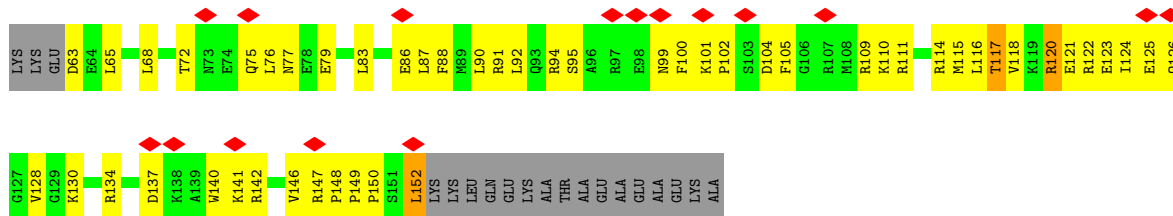
• Molecule 16: 50S ribosomal protein L27



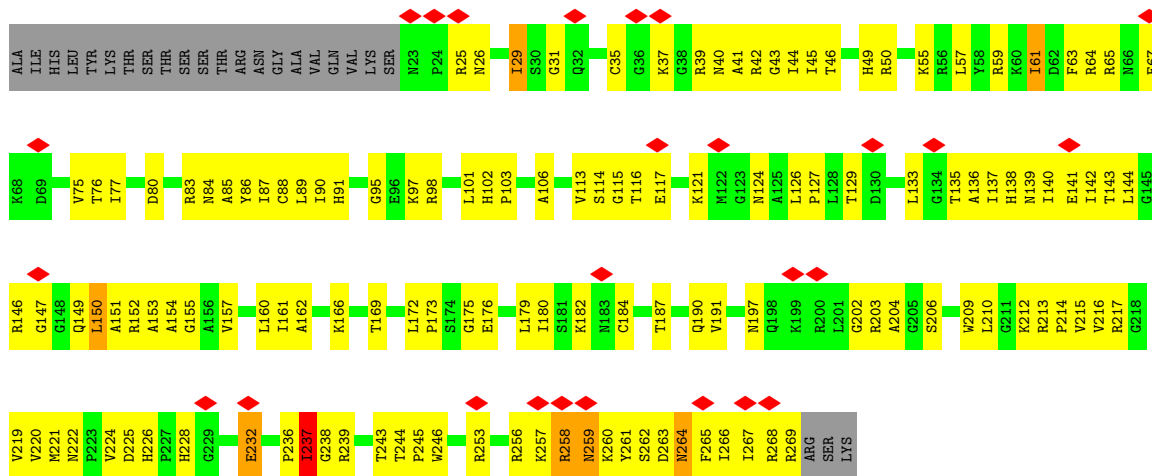
• Molecule 17: 50S ribosomal protein L28



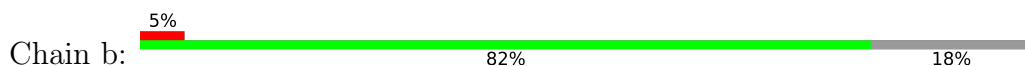
• Molecule 18: 50S ribosomal protein L29



• Molecule 19: 50S ribosomal protein L2, chloroplastic

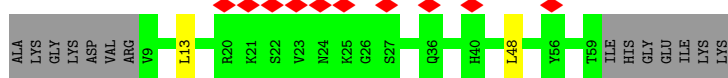
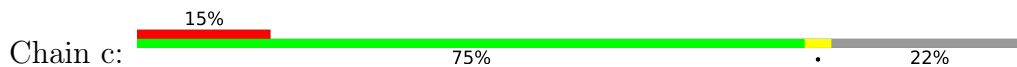


• Molecule 20: 50S ribosomal protein L32, chloroplastic

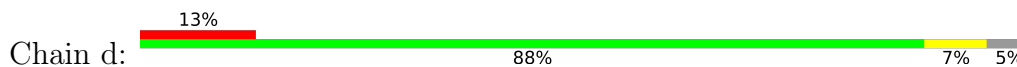




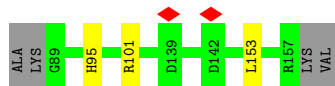
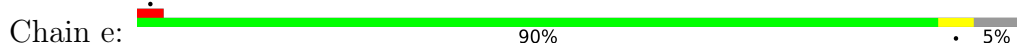
• Molecule 21: 50S ribosomal protein L33, chloroplastic



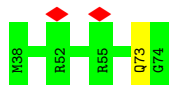
• Molecule 22: 50S ribosomal protein L34, chloroplastic



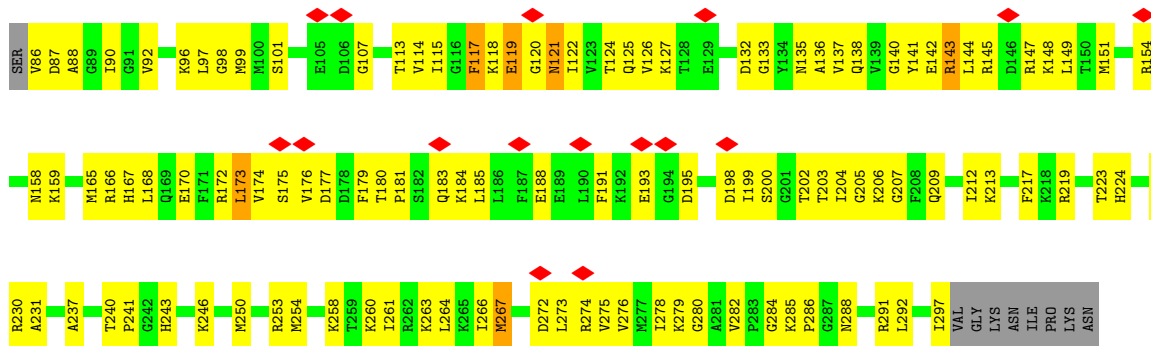
• Molecule 23: 50S ribosomal protein L35, chloroplastic



• Molecule 24: 50S ribosomal protein L36, chloroplastic



• Molecule 25: 50S ribosomal protein L3



• Molecule 26: 50S ribosomal protein L4, chloroplastic

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	174949	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TECNAI ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/\text{\AA}^2$)	26	Depositor
Minimum defocus (nm)	200	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	109375	Depositor
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.928	Depositor
Minimum map value	-0.585	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.028	Depositor
Recommended contour level	0.132	Depositor
Map size (\AA)	399.36, 399.36, 399.36	wwPDB
Map dimensions	312, 312, 312	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.28, 1.28, 1.28	Depositor

5 Model quality i

5.1 Standard geometry i

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	A	0.80	18/67340 (0.0%)	0.94	109/105056 (0.1%)
2	C	3.05	9/2449 (0.4%)	1.30	26/3817 (0.7%)
3	B	0.78	0/2796	0.87	2/4357 (0.0%)
4	L	0.67	0/1212	0.68	1/1634 (0.1%)
5	M	0.60	0/951	0.69	1/1282 (0.1%)
6	N	0.40	0/1361	0.77	3/1806 (0.2%)
7	O	0.63	1/1089 (0.1%)	0.71	1/1461 (0.1%)
8	P	0.63	0/959	0.76	0/1280
9	Q	0.52	0/963	0.67	0/1293
10	R	0.61	0/967	0.79	2/1300 (0.2%)
11	S	0.77	0/1013	0.82	1/1351 (0.1%)
12	T	0.73	0/1199	0.88	3/1633 (0.2%)
13	U	0.60	1/1168 (0.1%)	0.69	0/1566
14	V	0.53	0/749	0.65	0/1006
15	W	0.49	0/1006	0.67	2/1343 (0.1%)
16	X	0.66	0/825	0.80	2/1099 (0.2%)
17	Y	0.65	0/615	0.78	2/819 (0.2%)
18	Z	0.52	0/762	0.71	0/1012
19	E	0.60	0/1938	0.78	1/2603 (0.0%)
20	b	0.72	0/387	0.65	0/513
21	c	0.55	0/422	0.85	1/564 (0.2%)
22	d	0.45	0/447	0.63	0/588
23	e	0.72	0/569	0.82	1/752 (0.1%)
24	f	0.57	0/306	0.78	0/403
25	F	0.66	0/1646	0.74	1/2201 (0.0%)
26	G	0.65	2/1687 (0.1%)	0.78	1/2271 (0.0%)
27	H	0.37	0/1372	0.60	0/1848
28	I	0.49	0/1374	0.63	1/1849 (0.1%)
29	J	0.33	0/427	0.65	0/568
30	g	0.44	0/345	0.85	1/455 (0.2%)
31	a	0.29	0/306	0.60	0/413
32	h	0.70	1/382 (0.3%)	0.81	2/520 (0.4%)
All	All	0.88	32/99032 (0.0%)	0.90	164/148663 (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
9	Q	0	1
10	R	0	1
11	S	0	3
13	U	0	1
19	E	0	3
24	f	0	1
25	F	0	1
26	G	0	2
27	H	0	1
32	h	0	2
All	All	0	16

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	95	A	N3-C4	76.76	1.80	1.34
2	C	95	A	C6-N1	71.09	1.85	1.35
2	C	95	A	C5-C4	50.90	1.74	1.38
2	C	95	A	C2-N3	47.29	1.76	1.33
2	C	95	A	N1-C2	47.04	1.76	1.34

The worst 5 of 164 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	95	A	N1-C2-N3	-28.24	115.18	129.30
2	C	95	A	C2-N3-C4	24.30	122.75	110.60
2	C	95	A	N7-C8-N9	14.45	121.03	113.80
6	N	196	LEU	C-N-CD	-14.44	88.83	120.60
2	C	95	A	C4-C5-N7	-13.30	104.05	110.70

There are no chirality outliers.

5 of 16 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
9	Q	70	ARG	Peptide
10	R	190	VAL	Peptide
11	S	24	PHE	Peptide
11	S	82	ILE	Peptide

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Mol	Chain	Res	Type	Group
11	S	96	ILE	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	A	60117	0	30254	3962	0
2	C	2187	0	1099	306	0
3	B	2500	0	1263	331	0
4	L	1184	0	1221	135	0
5	M	942	0	996	51	0
6	N	1342	0	1413	392	0
7	O	1067	0	1120	103	0
8	P	944	0	1004	68	0
9	Q	947	0	966	87	0
10	R	953	0	1044	80	0
11	S	996	0	1060	122	0
12	T	1171	0	1216	216	0
13	U	1149	0	1220	98	0
14	V	740	0	795	103	0
15	W	993	0	1054	127	0
16	X	810	0	847	185	0
17	Y	605	0	652	51	0
18	Z	754	0	804	99	0
19	E	1904	0	1982	219	0
20	b	378	0	413	0	0
21	c	415	0	434	0	0
22	d	445	0	501	0	0
23	e	563	0	621	0	0
24	f	304	0	342	0	0
25	F	1620	0	1699	174	0
26	G	1655	0	1723	238	0
27	H	1351	0	1407	136	0
28	I	1353	0	1416	90	0
29	J	423	0	488	39	0
30	g	345	0	395	0	0
31	a	300	0	279	0	0
32	h	368	0	386	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	90825	0	60114	6418	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 46.

The worst 5 of 6418 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)
1:A:2351:G:C4	9:Q:64:VAL:HG21	1.27	1.61
2:C:95:A:C5	2:C:95:A:C6	1.79	1.59
16:X:128:TYR:CB	16:X:134:LYS:CD	1.78	1.58
11:S:91:LEU:CD1	12:T:175:PRO:HB3	1.30	1.55
1:A:274:G:C6	1:A:433:C:C6	1.94	1.54

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	L	145/191 (76%)	120 (83%)	21 (14%)	4 (3%)	5	32
5	M	119/121 (98%)	97 (82%)	22 (18%)	0	100	100
6	N	175/192 (91%)	156 (89%)	6 (3%)	13 (7%)	1	11
7	O	132/135 (98%)	107 (81%)	23 (17%)	2 (2%)	10	45
8	P	114/116 (98%)	96 (84%)	18 (16%)	0	100	100
9	Q	118/123 (96%)	99 (84%)	19 (16%)	0	100	100
10	R	116/156 (74%)	89 (77%)	26 (22%)	1 (1%)	17	56
11	S	113/127 (89%)	91 (80%)	22 (20%)	0	100	100
12	T	145/201 (72%)	108 (74%)	28 (19%)	9 (6%)	1	15

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	U	142/199 (71%)	117 (82%)	24 (17%)	1 (1%)	22	61
14	V	90/122 (74%)	79 (88%)	9 (10%)	2 (2%)	6	37
15	W	122/145 (84%)	95 (78%)	25 (20%)	2 (2%)	9	43
16	X	98/137 (72%)	87 (89%)	7 (7%)	4 (4%)	3	23
17	Y	72/77 (94%)	61 (85%)	11 (15%)	0	100	100
18	Z	88/109 (81%)	85 (97%)	3 (3%)	0	100	100
19	E	245/271 (90%)	187 (76%)	57 (23%)	1 (0%)	34	72
20	b	44/56 (79%)	35 (80%)	9 (20%)	0	100	100
21	c	49/65 (75%)	34 (69%)	15 (31%)	0	100	100
22	d	55/60 (92%)	47 (86%)	6 (11%)	2 (4%)	3	26
23	e	67/73 (92%)	50 (75%)	16 (24%)	1 (2%)	10	45
24	f	35/37 (95%)	30 (86%)	5 (14%)	0	100	100
25	F	210/221 (95%)	173 (82%)	37 (18%)	0	100	100
26	G	208/243 (86%)	166 (80%)	40 (19%)	2 (1%)	15	54
27	H	173/220 (79%)	145 (84%)	27 (16%)	1 (1%)	25	64
28	I	171/182 (94%)	142 (83%)	27 (16%)	2 (1%)	13	50
29	J	51/155 (33%)	41 (80%)	9 (18%)	1 (2%)	7	39
30	g	41/142 (29%)	36 (88%)	5 (12%)	0	100	100
31	a	36/94 (38%)	26 (72%)	9 (25%)	1 (3%)	5	32
32	h	44/116 (38%)	31 (70%)	12 (27%)	1 (2%)	6	36
All	All	3218/4086 (79%)	2630 (82%)	538 (17%)	50 (2%)	13	43

5 of 50 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	L	107	HIS
6	N	143	LEU
6	N	147	ALA
6	N	154	LEU
6	N	155	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	L	125/165 (76%)	124 (99%)	1 (1%)	81	91
5	M	101/101 (100%)	101 (100%)	0	100	100
6	N	135/144 (94%)	126 (93%)	9 (7%)	16	48
7	O	107/108 (99%)	107 (100%)	0	100	100
8	P	96/96 (100%)	96 (100%)	0	100	100
9	Q	99/100 (99%)	99 (100%)	0	100	100
10	R	104/135 (77%)	101 (97%)	3 (3%)	42	71
11	S	102/114 (90%)	102 (100%)	0	100	100
12	T	129/174 (74%)	122 (95%)	7 (5%)	22	55
13	U	126/176 (72%)	125 (99%)	1 (1%)	81	91
14	V	81/103 (79%)	80 (99%)	1 (1%)	71	87
15	W	112/129 (87%)	109 (97%)	3 (3%)	44	73
16	X	85/111 (77%)	74 (87%)	11 (13%)	4	22
17	Y	64/67 (96%)	61 (95%)	3 (5%)	26	60
18	Z	83/97 (86%)	79 (95%)	4 (5%)	25	60
19	E	195/216 (90%)	189 (97%)	6 (3%)	40	70
20	b	39/49 (80%)	39 (100%)	0	100	100
21	c	48/59 (81%)	47 (98%)	1 (2%)	53	79
22	d	47/49 (96%)	45 (96%)	2 (4%)	29	62
23	e	59/62 (95%)	58 (98%)	1 (2%)	60	82
24	f	34/34 (100%)	34 (100%)	0	100	100
25	F	174/182 (96%)	170 (98%)	4 (2%)	50	77
26	G	176/205 (86%)	169 (96%)	7 (4%)	31	64
27	H	148/183 (81%)	146 (99%)	2 (1%)	67	85
28	I	147/154 (96%)	147 (100%)	0	100	100
29	J	47/134 (35%)	46 (98%)	1 (2%)	53	79
30	g	39/121 (32%)	39 (100%)	0	100	100
31	a	33/83 (40%)	32 (97%)	1 (3%)	41	71
32	h	40/96 (42%)	40 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	2775/3447 (80%)	2707 (98%)	68 (2%)	50 75

5 of 68 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
26	G	71	ASN
26	G	81	ARG
27	H	188	GLN
15	W	173	ARG
15	W	170	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 63 such sidechains are listed below:

Mol	Chain	Res	Type
15	W	68	HIS
26	G	93	GLN
18	Z	77	ASN
26	G	71	ASN
27	H	90	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	2796/2810 (99%)	962 (34%)	106 (3%)
2	C	101/106 (95%)	45 (44%)	4 (3%)
3	B	116/121 (95%)	54 (46%)	5 (4%)
All	All	3013/3037 (99%)	1061 (35%)	115 (3%)

5 of 1061 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	7	C
1	A	13	A
1	A	22	G
1	A	27	A
1	A	32	U

5 of 115 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	1334	U
3	B	7	G
1	A	1828	U
2	C	35	U
1	A	2536	A

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

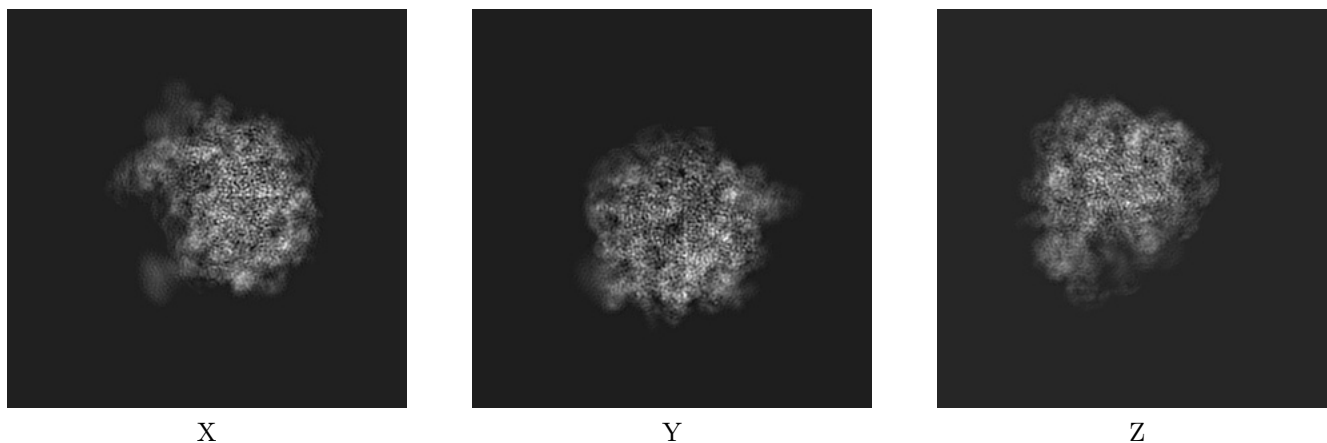
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9572. 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](#)

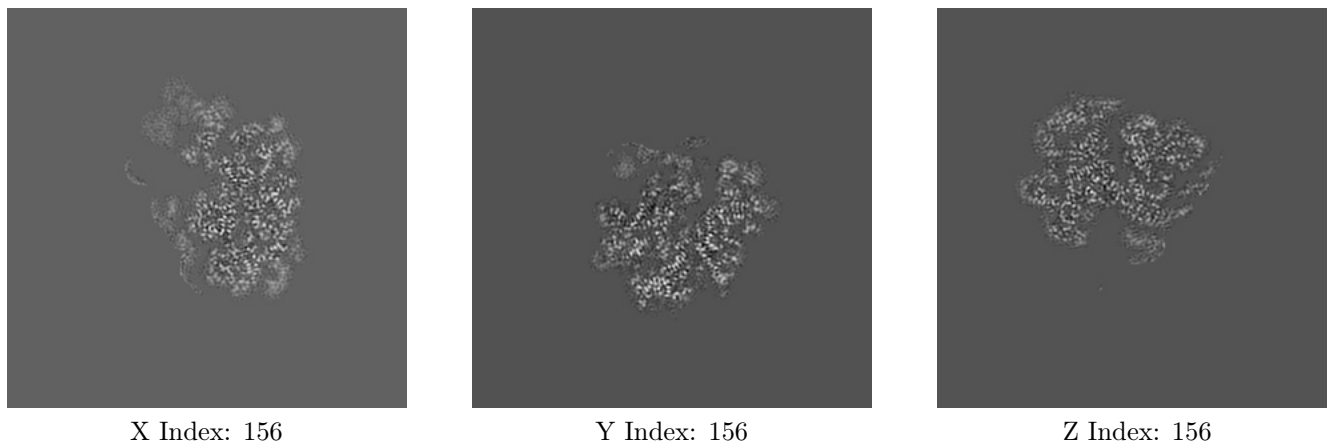
6.1.1 Primary map



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

6.2 Central slices [i](#)

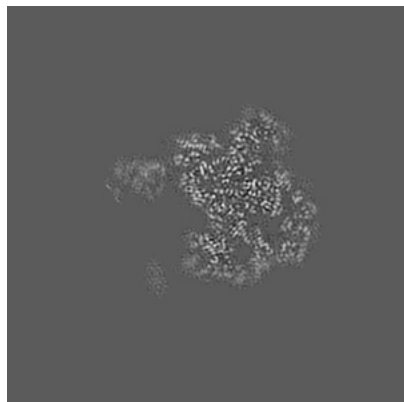
6.2.1 Primary map



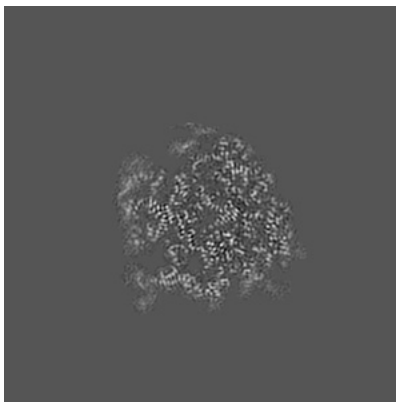
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

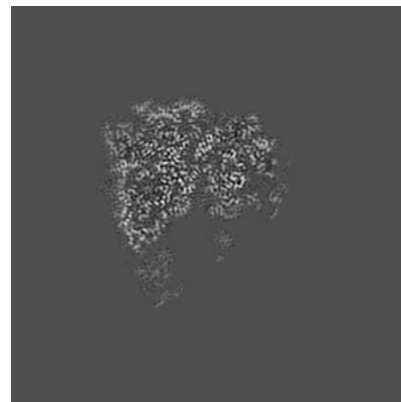
6.3.1 Primary map



X Index: 120



Y Index: 186

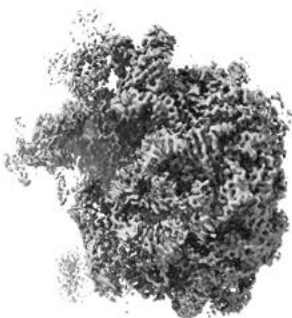


Z Index: 166

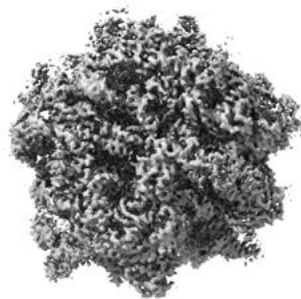
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

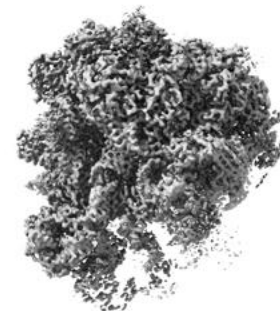
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.132. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

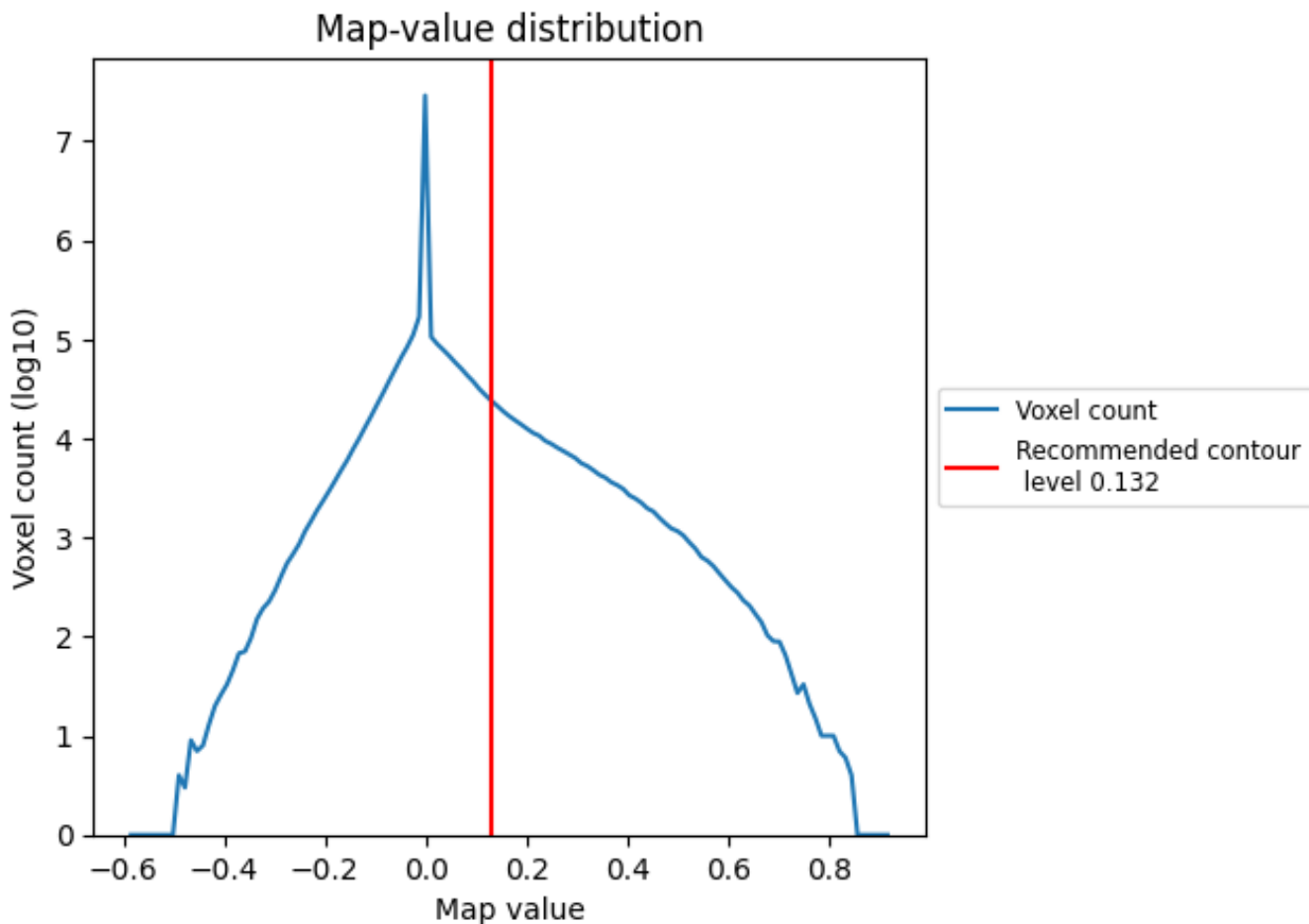
6.5 Mask visualisation

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

7 Map analysis [i](#)

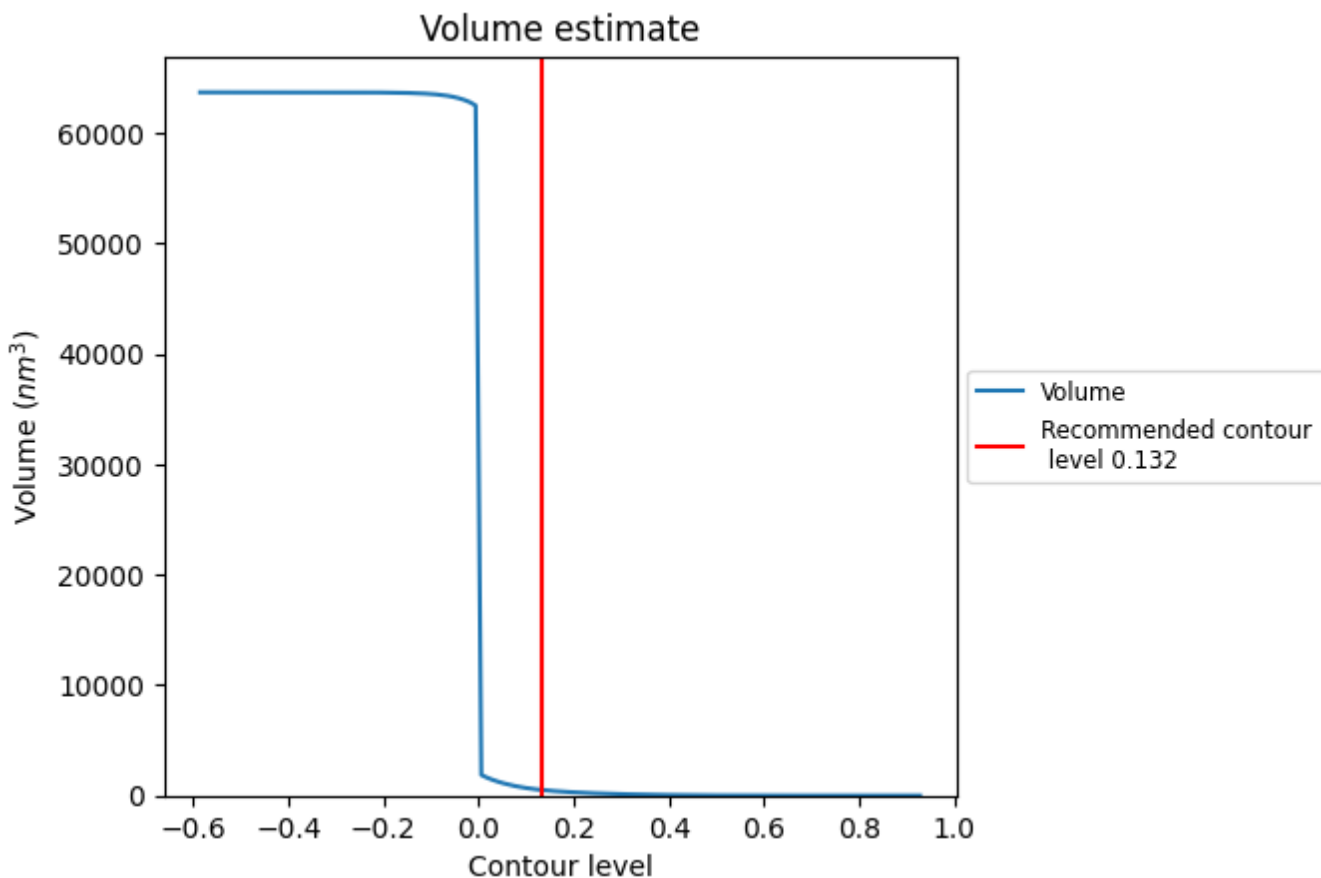
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

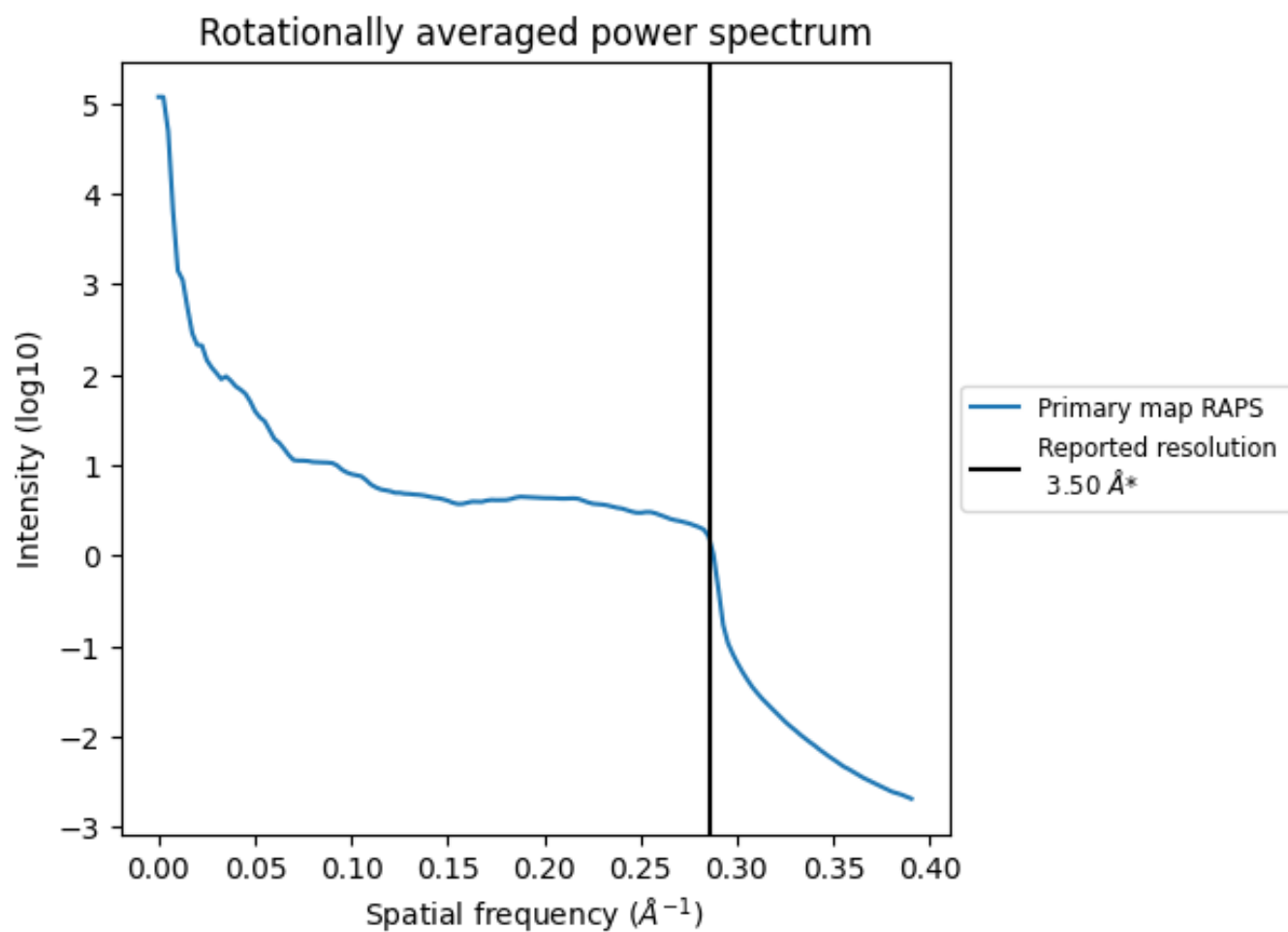
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 516 nm^3 ; this corresponds to an approximate mass of 466 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 0.286 Å⁻¹

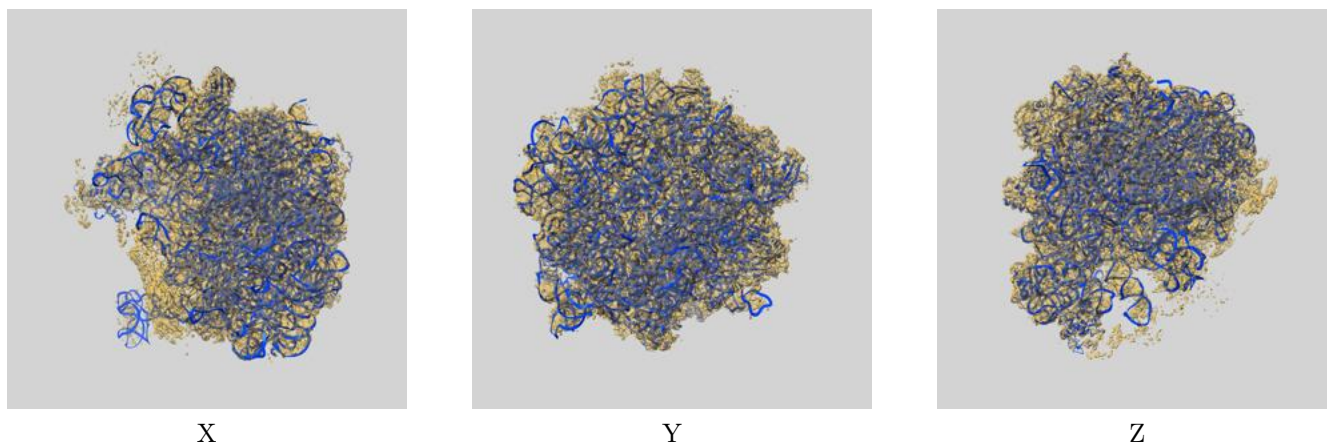
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

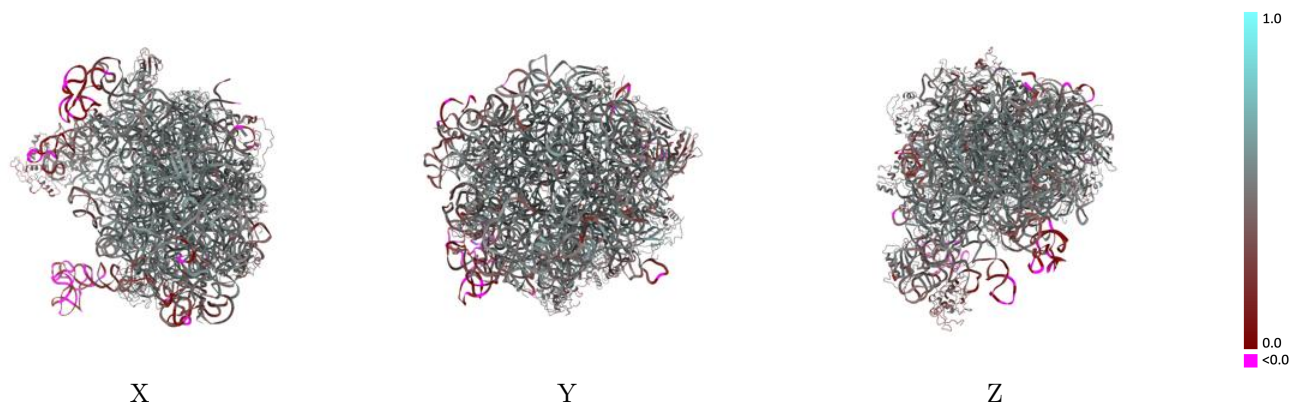
This section contains information regarding the fit between EMDB map EMD-9572 and PDB model 5H1S. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay [i](#)



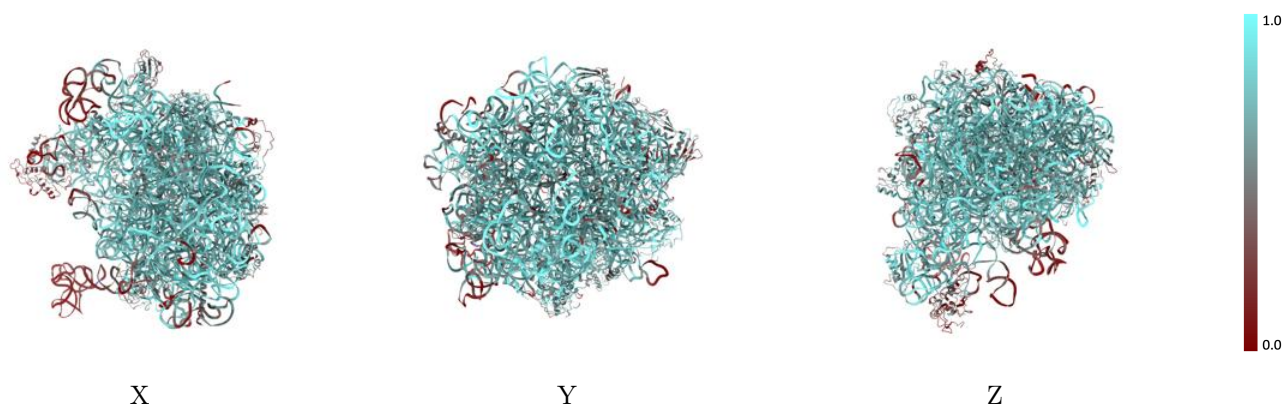
The images above show the 3D surface view of the map at the recommended contour level 0.132 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



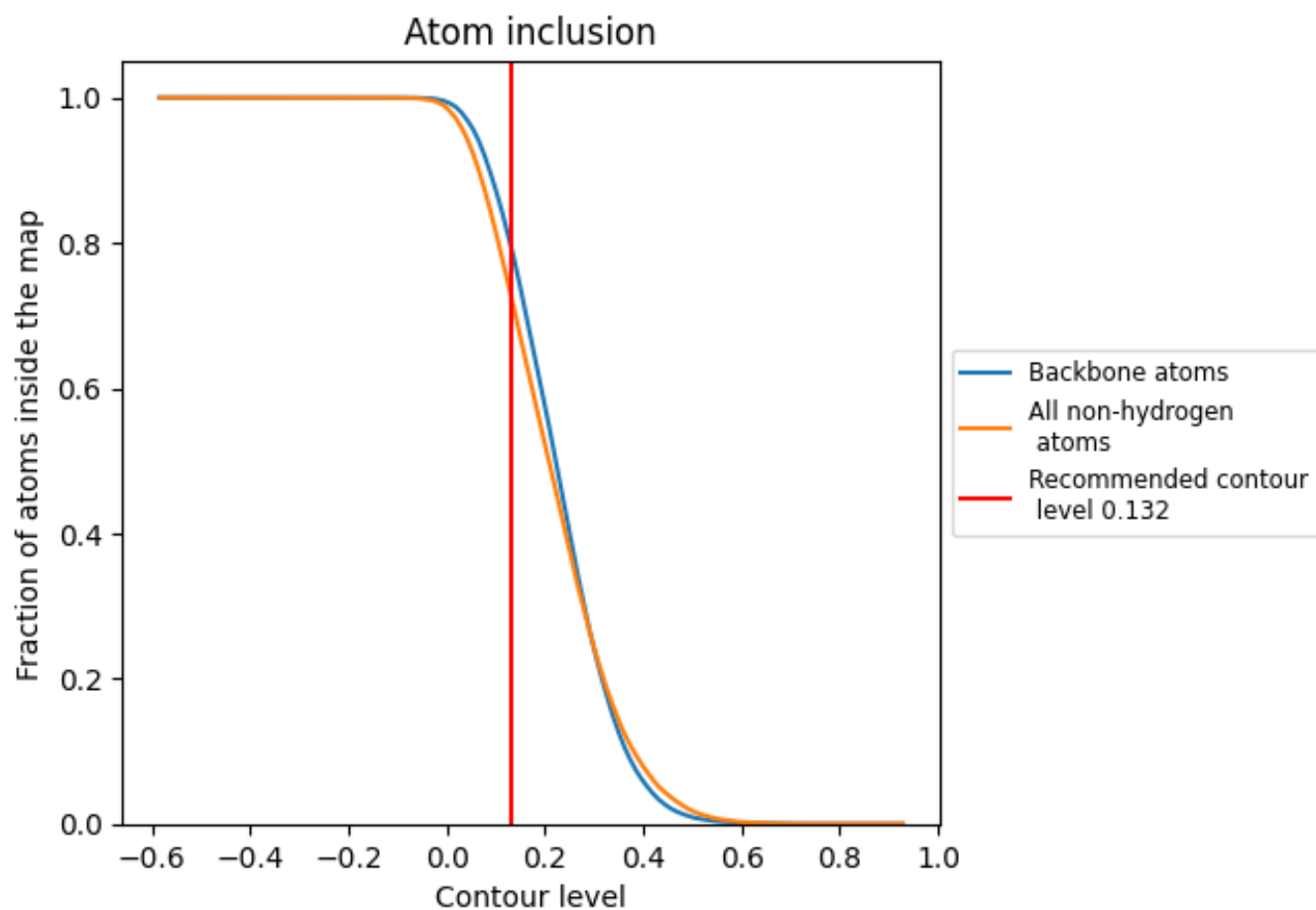
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.132).



































































9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 72% 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 (0.132) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7241	 0.4530
A	 0.7631	 0.4510
B	 0.8056	 0.4300
C	 0.8048	 0.4520
E	 0.6718	 0.4930
F	 0.6857	 0.4970
G	 0.6495	 0.4640
H	 0.2816	 0.3440
I	 0.5668	 0.4240
J	 0.2110	 0.3920
L	 0.7252	 0.5060
M	 0.5963	 0.4760
N	 0.6777	 0.4590
O	 0.6464	 0.4630
P	 0.7127	 0.5020
Q	 0.6235	 0.4310
R	 0.6104	 0.4800
S	 0.7362	 0.4770
T	 0.6274	 0.4750
U	 0.6057	 0.4530
V	 0.5718	 0.4870
W	 0.5732	 0.4400
X	 0.6438	 0.4660
Y	 0.6956	 0.4980
Z	 0.6041	 0.4490
a	 0.1017	 0.2240
b	 0.6793	 0.4930
c	 0.6150	 0.4100
d	 0.6817	 0.5020
e	 0.7362	 0.5200
f	 0.6840	 0.4880
g	 0.5575	 0.4140
h	 0.7255	 0.4920

