



## wwPDB EM Validation Summary Report ⓘ

Mar 13, 2024 – 01:57 PM JST

PDB ID : 3J8G  
EMDB ID : EMD-6149  
Title : Electron cryo-microscopy structure of EngA bound with the 50S ribosomal subunit  
Authors : Zhang, X.; Yan, K.; Zhang, Y.; Li, N.; Ma, C.; Li, Z.; Zhang, Y.; Feng, B.; Liu, J.; Sun, Y.; Xu, Y.; Lei, J.; Gao, N.  
Deposited on : 2014-10-24  
Resolution : 5.00 Å (reported)  
Based on initial models : 2HJG, 2WWQ

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev70  
MolProbity : 4.02b-467  
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

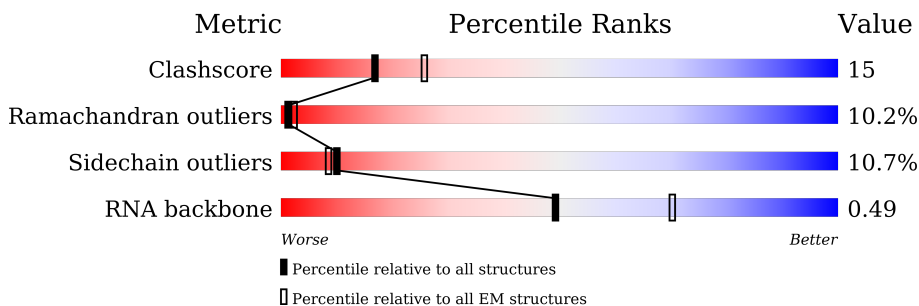
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 5.00 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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	117	
2	B	2903	
3	0	78	
4	K	123	
5	L	144	
6	1	63	
7	M	136	

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Mol	Chain	Length	Quality of chain
8	N	127	23% 53% 33% 6% 6%
9	O	117	39% 59% 27% 9% ..
10	P	115	32% 48% 31% 17% ..
11	Q	118	42% 52% 25% 19% ..
12	R	103	45% 47% 39% 13% .
13	S	110	45% 53% 39% 6% .
14	D	209	24% 53% 34% 9% .
15	T	100	30% 46% 29% 15% . 7%
16	2	59	46% 46% 46% 7% .
17	U	104	51% 60% 28% 7% 5%
18	W	94	24% 60% 32% 6% .
19	X	490	51% 48% 29% 5% . 15%
20	E	201	49% 52% 32% 12% .
21	Y	85	42% 35% 39% 14% 5% 7%
22	3	57	28% 49% 32% 14% ..
23	5	234	77% 59% 30% 8% .
24	6	46	26% 46% 41% 13%
25	7	65	48% 49% 32% 14% ..
26	8	38	18% 47% 42% 8% .
27	C	273	23% 50% 33% 13% ..
28	F	179	45% 47% 38% 13% ..
29	G	177	20% 53% 34% 8% ..
30	H	149	85% 65% 27% 7% .
31	I	142	94% 71% 23% ...
32	J	142	38% 49% 34% 13% .

## 2 Entry composition

There are 32 unique types of molecules in this entry. The entry contains 94855 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 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	115	2455	1097	451	795	112	0	0

- Molecule 2 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	2874	61689	27523	11353	19941	2872	0	0

- Molecule 3 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	0	77	625	388	129	106	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	K	121	931	582	179	164	6	0	0

- Molecule 5 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	L	143	1045	649	206	189	1	0	0

- Molecule 6 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	1	63	509	313	99	95	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	M	136	1074	686	205	177	6	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	N	120	960	593	196	166	5	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	O	116	892	552	178	162	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	P	114	917	574	179	163	1	0	0

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

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	Q	117	947	604	192	151	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	R	103	816	516	153	145	2	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	S	110	857	532	166	156	3	0	0

- Molecule 14 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	D	209	Total	C	N	O	S	0	0
			1565	979	288	294	4		

- Molecule 15 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	T	93	Total	C	N	O	S	0	0
			738	466	139	131	2		

- Molecule 16 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	2	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 17 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	U	99	Total	C	N	O	0	0
			755	479	140	136		

- Molecule 18 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	W	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 19 is a protein called GTPase Der.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	X	418	Total	C	N	O	S	0	0
			3280	2074	582	610	14		

- Molecule 20 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	E	201	Total	C	N	O	S	0	0
			1552	974	283	290	5		

- Molecule 21 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Y	79	Total	C	N	O	S	0	0
			596	367	120	108	1		

- Molecule 22 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	3	56	Total	C	N	O	S	0	0
			444	269	94	80	1		

- Molecule 23 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	5	234	Total	C	N	O	S	0	0
			1733	1081	315	330	7		

- Molecule 24 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	6	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 25 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	7	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 26 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	8	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 27 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	C	271	Total	C	N	O	S	0	0
			2082	1288	423	364	7		

- Molecule 28 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	F	178	1420	905	251	258	6	0	0

- Molecule 29 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	G	175	1316	827	242	245	2	0	0

- Molecule 30 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	H	149	1111	699	197	214	1	0	0

- Molecule 31 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	I	141	1032	651	179	196	6	0	0

- Molecule 32 is a protein called 50S ribosomal protein L13.

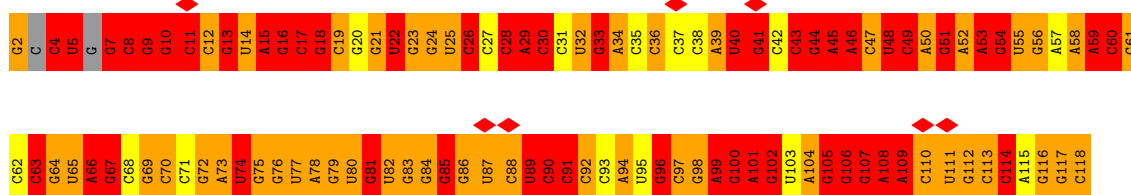
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	J	142	1129	714	212	199	4	0	0



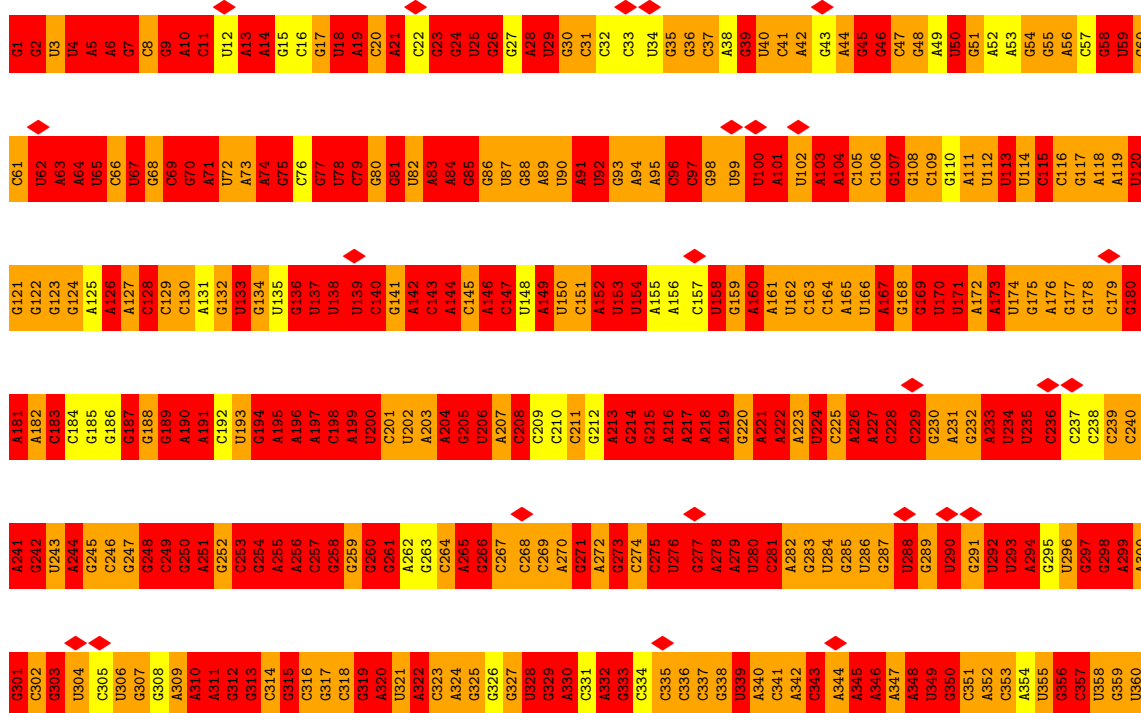
### 3 Residue-property plots

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: 5S rRNA



- Molecule 2: 23S rRNA



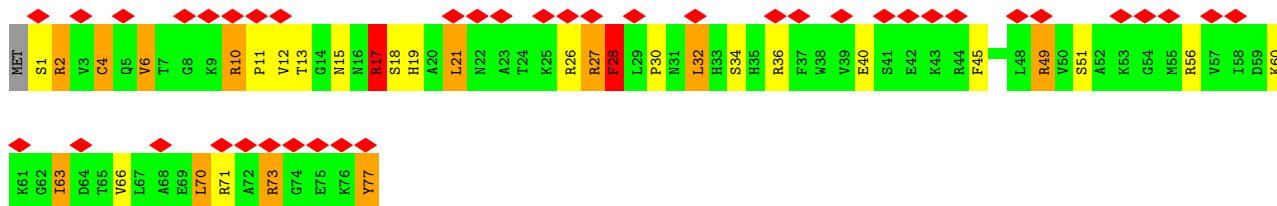
U1141	U1142	A1143	A1144	C1145	C1146	A1147	G1148	A1088	A1089	A1090	G1091	C1092	C1093	U1094	A1095	A1096	U1097	A1098	G1099	C1100	U1101	A1155	A1156	G1157	C1158	U1159	G1160	C1161	G1162	G1163	C1164	A1165	G1166	C1167	G1168	A1169	C1170	G1171	C1172	U1173	U1174	A1175	U1176	G1177	C1178	G1179	U1180	U1181	G1182	U1183	U1184	G1185	G1186	U1187	U1188	A1189	G1190	G1191	C1192	G1193	A1194	G1195	C1196	G1197	U1198	U1199	G1138	C1140											
U1081	U1082	U1083	A1084	A1085	A1086	G1087	A1088	A1089	A1090	G1091	C1092	C1093	U1094	A1095	A1096	U1097	A1098	G1099	C1100	U1101	A1155	A1156	G1157	C1158	U1159	G1160	C1161	G1162	G1163	C1164	A1165	G1166	C1167	G1168	A1169	C1170	G1171	C1172	U1173	U1174	A1175	U1176	G1177	C1178	G1179	U1180	U1181	G1182	U1183	U1184	G1185	G1186	U1187	U1188	A1189	G1190	G1191	C1192	G1193	A1194	G1195	C1196	G1197	U1198	U1199	G1138	C1140												
A1021	G1022	U1023	U1024	G1025	G1026	A1027	A1028	A1029	C1030	G1031	A1032	U1033	G1034	U1035	G1036	G1037	G1038	A1039	A1040	G1041	C1042	C1043	C1044	C1045	A1046	G1047	A1048	C1049	U1050	A1051	G1052	A1053	C1054	A1055	G1056	A1057	U1058	G1059	A1060	U1061	G1062	G1063	C1064	U1065	A1066	A1067	G1068	A1069	A1070	U1071	U1072	G1073	U1074	U1075	C1076	A1077	U1078	C1079	A1080																				
C901	C902	C903	C904	A905	U906	G907	C908	G909	A910	U911	C912	U913	G914	C915	G916	A917	A918	U919	A920	C921	C922	A923	G924	A925	G926	A927	A928	U929	G930	U931	U932	U933	A934	U935	A936	C937	G938	G939	G940	A941	G942	A943	C944	A945	C946	A947	C948	G949	C950	C951	G952	G953	A954	U955	G956	C957	U958	A959	A960																				
G841	U842	G843	A844	A845	U846	U847	C848	A849	U850	U851	C852	U853	G854	C855	G856	A857	A858	G859	A860	U861	C862	A863	G864	C865	A866	C867	U868	C869	U870	C871	C872	A873	C874	U875	U876	A877	C878	G879	A880	U881	C882	A883	U884	A885	U886	C887	U888	A889	U890	C891	C892	G893	C894	A895	C896	A897	C898	U899	A1000	A1001	G1002	G1003	U1004	C1005	G1006	C1007	A1008	A1009	U1010	G1011	U1012	C1013	A1014	U1015	G1016	U1017	U1018	U1019	A1020
G801	A602	A603	G604	C605	U606	U607	A608	A609	C610	C611	G612	A613	A614	U615	G616	C617	G618	U619	G620	A621	G622	C623	C624	G625	A626	A627	G628	G629	G630	C631	A632	A633	C634	A635	G636	A637	G638	U639	C640	U641	U642	A643	A644	C645	U646	U647	G648	G649	C650	U651	A652	U653	U654	A655	C656	U657	U658	A659	C660																				
A541	C542	G543	C544	U545	U546	A547	G548	A549	C550	G551	U552	G553	U554	G555	A556	C557	G558	U559	G560	C561	U562	A563	C564	C565	G566	U567	U568	U569	C570	U571	A572	U573	A574	A575	U576	U577	G578	C579	U580	C581	G582	G583	C584	G585	A586	C587	U588	U589	A590	C591	A592	U593	U594	C595	U596	C597	U598	A599	G600																				
A481	A482	A483	C484	C485	C486	C487	G488	A489	C490	U491	A492	G493	A494	G495	A496	A497	G498	U499	G500	A501	A502	A503	A504	A505	G506	U507	A508	C509	C510	U511	G512	A513	A514	A515	C516	C517	G518	U519	G520	A521	C522	G523	G524	U525	A526	C527	U528	A529	G530	C531	A532	U533	U534	G535	G536	C537	U538	A539	C540																				
A421	A422	A423	G424	G425	C426	U427	A428	A429	C430	U431	A432	C433	U434	C435	C436	U437	G438	A439	G440	U441	A442	A443	A444	C445	C446	A447	U448	A449	U450	U451	C452	A453	A454	C455	A457	U458	U459	A460	C461	G462	G463	U464	G465	A466	G467	G468	A469	A470	A471	A472	G473	G474	A475	C476	G477	A478	A479	A480																					
G361	A362	G363	C364	U365	C366	G367	A368	U369	G370	A371	G372	U373	A374	G375	G376	G377	C378	G379	G380	G381	A382	C383	A384	C385	G386	U387	C388	G389	U390	A391	C392	U393	C394	U395	G396	U397	C398	U399	G400	A401	A402	U403	A404	U405	G406	G407	G408	G409	G410	G411	A412	C413	A414	A415	U416	C417	U418	U419	C420																				

A1981	G1201	G1261	A1921	G1381	G1441	G1501	C1561	U1621	G1681	C1741	A1801	G	G1921	A1981
U1982	G1202	A1262	A1321	G1382	U1442	A1502	U1562	G1622	U1682	U1742	A1802	G	G1922	G2002
G1983	U1203	U1263	C1323	A1383	U1443	A1503	U1563	G1623	U1683	G1743	A1803	G	U1923	C2003
G1984	A1204	U1264	A1324	A1384	G1444	A1504	C1564	G1624	G1684	A1744	C1804	U	U1924	A2003
C1985	A1205	A1265	U1325	A1385	G1445	A1505	C1565	C1625	C1685	A1745	A1805	U	C1925	G2004
C1986	G1206	G1266	U1326	A1386	C1446	U1506	A1566	G1626	C1686	U1746	A1806	U	C1926	A2005
A1987	C1207	U1267	A1327	A1387	C1447	C1507	G1567	G1627	C1687	U1747	G1807	G	U1927	C2006
G1988	A1208	A1268	U1328	G1388	U1448	A1508	U1568	G1628	U1688	C1748	A1808	C	A1928	U2007
G1989	U1209	A1269	U1329	A1389	G1449	A1509	A1569	G1629	A1689	A1749	A1809	C	A1927	A2008
C1990	G1210	C1270	C1330	U1390	G1450	A1510	A1570	G1630	A1690	G1750	A1810	C	A1928	C2009
U1991	G1211	A1271	G1331	U1391	G1451	G1511	A1571	G1631	C1691	U1751	G1811	A	G1929	A1998
G1992	G1212	A1272	A1332	A1392	A1452	U1512	A1572	U1632	U1692	C1752	G1812	A	G1930	G1992
U1993	A1213	U1273	G1333	A1393	G1453	U1513	G1573	G1633	U1693	G1753	G1813	C	U1931	U1993
C1994	A1214	A1274	G1334	U1394	C1454	G1514	C1574	A1634	C1694	A1754	G1814	C	U1932	C1994
U1995	A1215	A1275	C1335	A1395	G1455	A1515	C1575	A1635	G1695	G1755	A1815	G	A1933	U1995
C1996	G1216	U1276	G1336	U1396	G1456	G1516	U1576	G1636	G1696	A1756	A1816	A	G1934	C1996
C1997	U1217	C1277	G1338	U1397	U1457	G1518	C1578	C1638	A1698	U1758	A1818	A	U1935	A1998
A1998	G1218	G1280	U1340	C1398	U1458	U1519	A1579	C1639	G1699	A1759	A1819	U	G1936	C1999
C2000	U1219	U1281	U1341	U1400	G1459	U1520	A1580	A1640	A1700	C1760	A1820	U	A1937	C2000
C2001	G1220	G1282	G1342	G1401	U1460	G1521	G1581	C1641	A1701	C1761	A1821	C	A1938	U2001
A2003	C1221	U1282	A1343	U1402	C1461	U1522	C1582	G1642	G1702	A1762	G1822	U	A1939	A2003
G2004	U1222	G1283	G1344	A1403	C1462	U1523	C1583	G1643	G1703	G1763	G1823	U	U1940	G2004
A2005	A1224	A1284	C1345	C1404	G1464	G1524	U1584	G1644	C1704	U1764	G1824	G	U1941	A2005
C2006	U1225	U1285	U1346	U1405	G1465	A1525	C1585	G1645	C1705	G1765	G1825	A	C1942	C2006
U2007	G1226	A1286	G1347	U1406	U1466	C1526	C1586	C1646	G1706	G1766	G1826	U	U1943	U2007
C2008	A1287	U1287	C1348	G1407	U1467	G1527	G1587	U1647	G1707	G1767	G1827	C	C1944	C2008
A2009	G1288	G1288	A1349	A1408	U1468	A1528	C1588	G1648	C1708	C1768	G1828	C	C1942	A2009
G2010	C1290	C1290	C1350	A1409	U1469	G1529	U1589	G1649	U1709	U1769	A1829	U	U1943	G2010
U2011	C1291	C1291	U1351	G1410	A1470	G1530	A1590	C1650	A1710	C1770	G1830	U	U1944	U2011
G2012	A1230	U1292	U1352	U1411	G1471	C1531	A1591	G1651	A1711	C1771	G1831	U	U1945	A1989
A2013	G1231	C1292	U1353	A1413	C1472	A1532	C1592	G1652	U1712	A1772	G1832	U	U1946	G2012
A2014	U1232	C1293	A1354	U1414	G1473	G1533	C1593	G1653	A1713	U1773	G1833	U	U1947	A2013
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G2018	G1235	G1296	U1357	G1417	U1476	C1536	A1596	U1657	U1716	U1776	C1836	U	U1949	U2017
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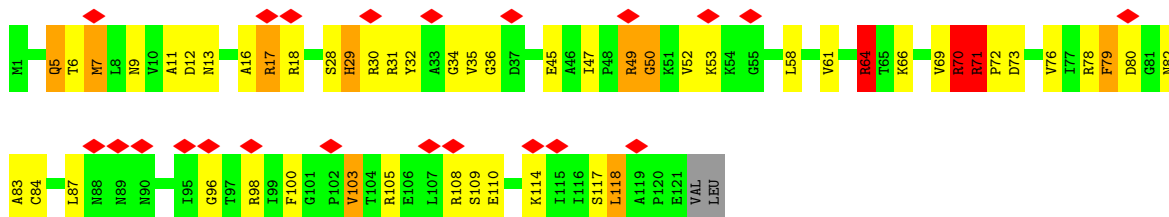
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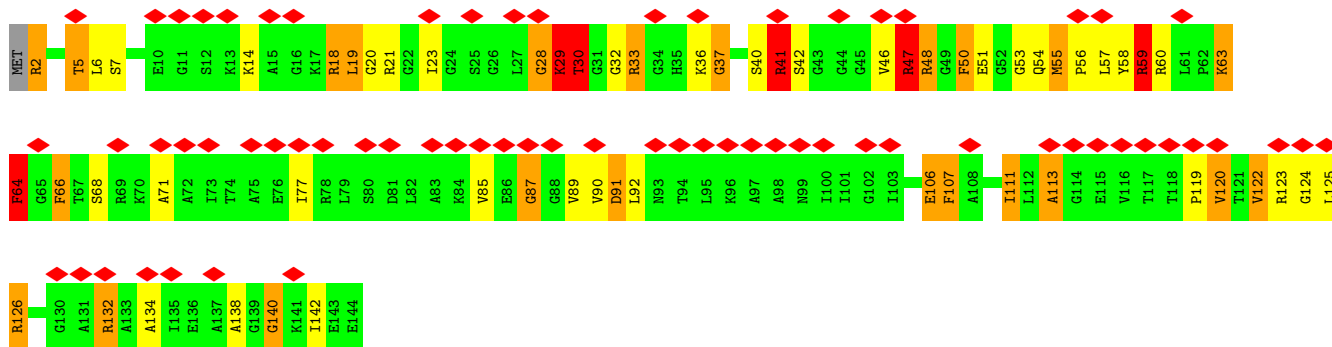
• Molecule 3: 50S ribosomal protein L28



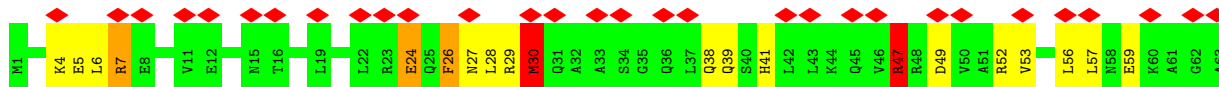
• Molecule 4: 50S ribosomal protein L14



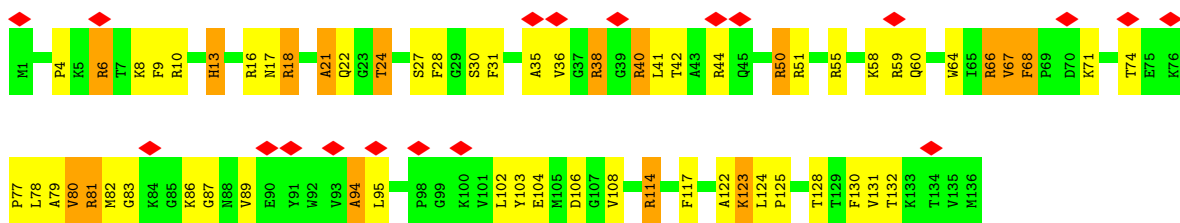
• Molecule 5: 50S ribosomal protein L15



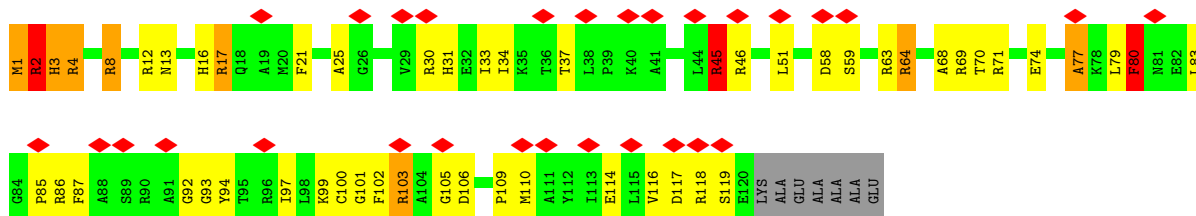
• Molecule 6: 50S ribosomal protein L29



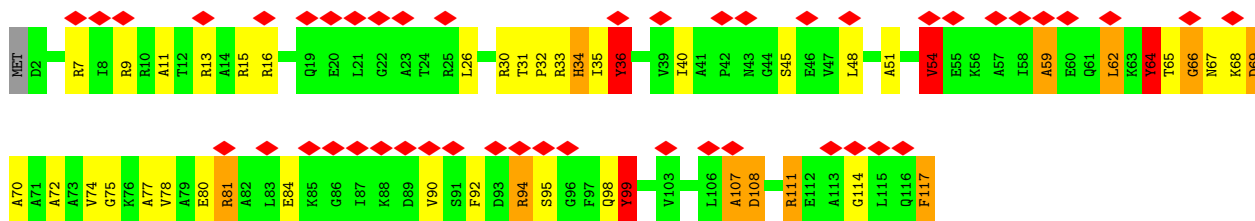
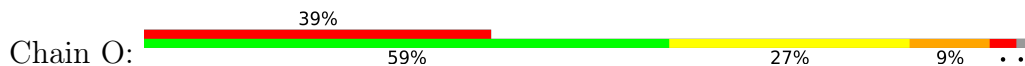
• Molecule 7: 50S ribosomal protein L16



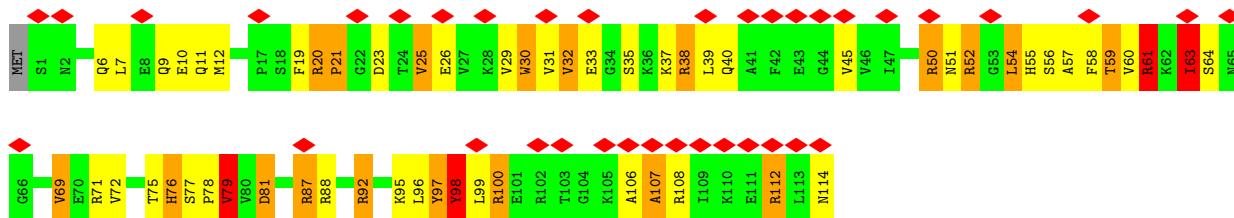
• Molecule 8: 50S ribosomal protein L17



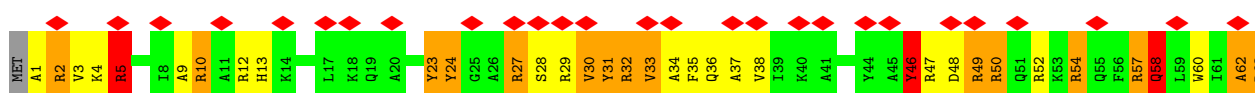
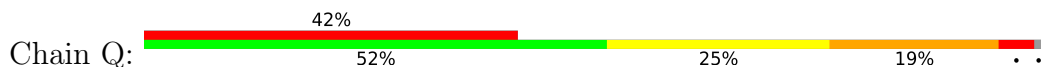
• Molecule 9: 50S ribosomal protein L18

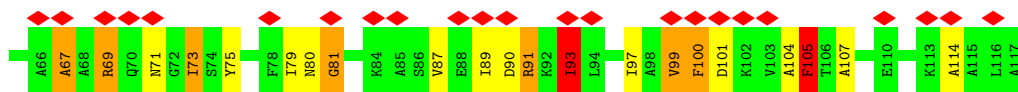


• Molecule 10: 50S ribosomal protein L19

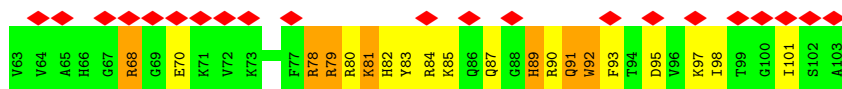
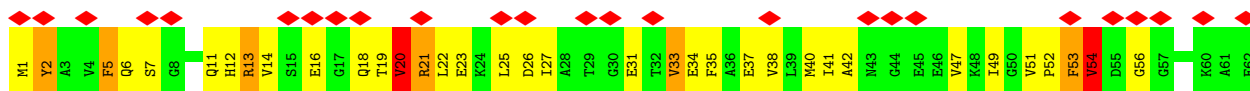
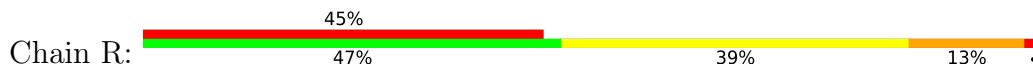


• Molecule 11: 50S ribosomal protein L20

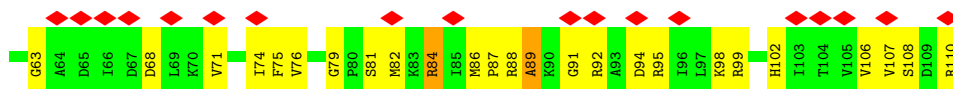
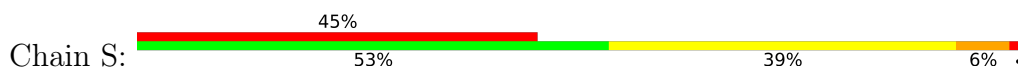




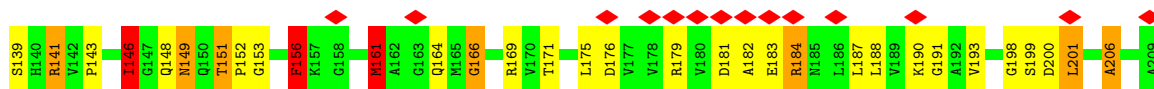
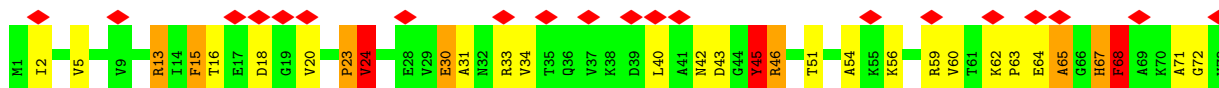
- Molecule 12: 50S ribosomal protein L21



- Molecule 13: 50S ribosomal protein L22

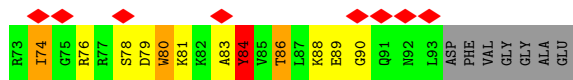


- Molecule 14: 50S ribosomal protein L3

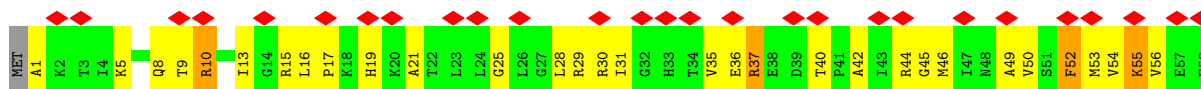


- Molecule 15: 50S ribosomal protein L23

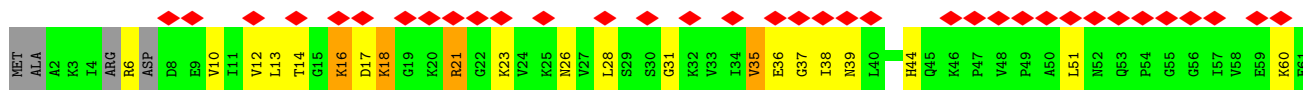




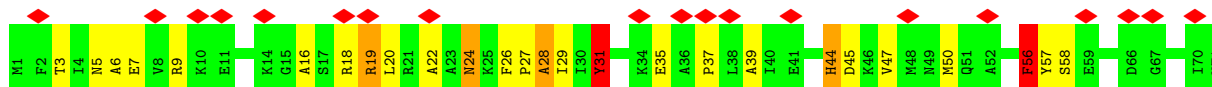
• Molecule 16: 50S ribosomal protein L30



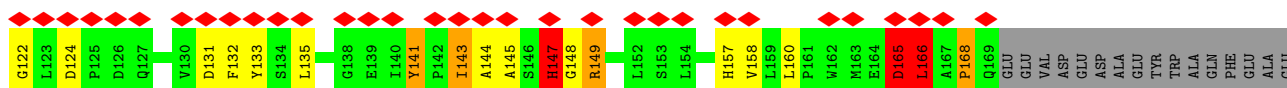
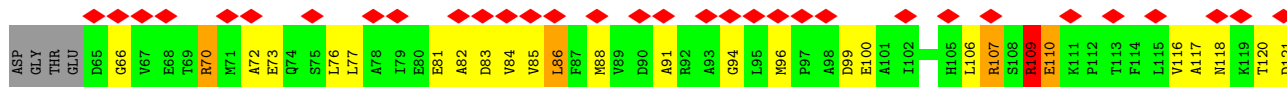
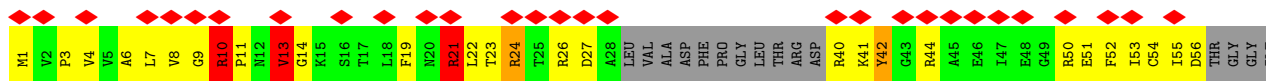
• Molecule 17: 50S ribosomal protein L24



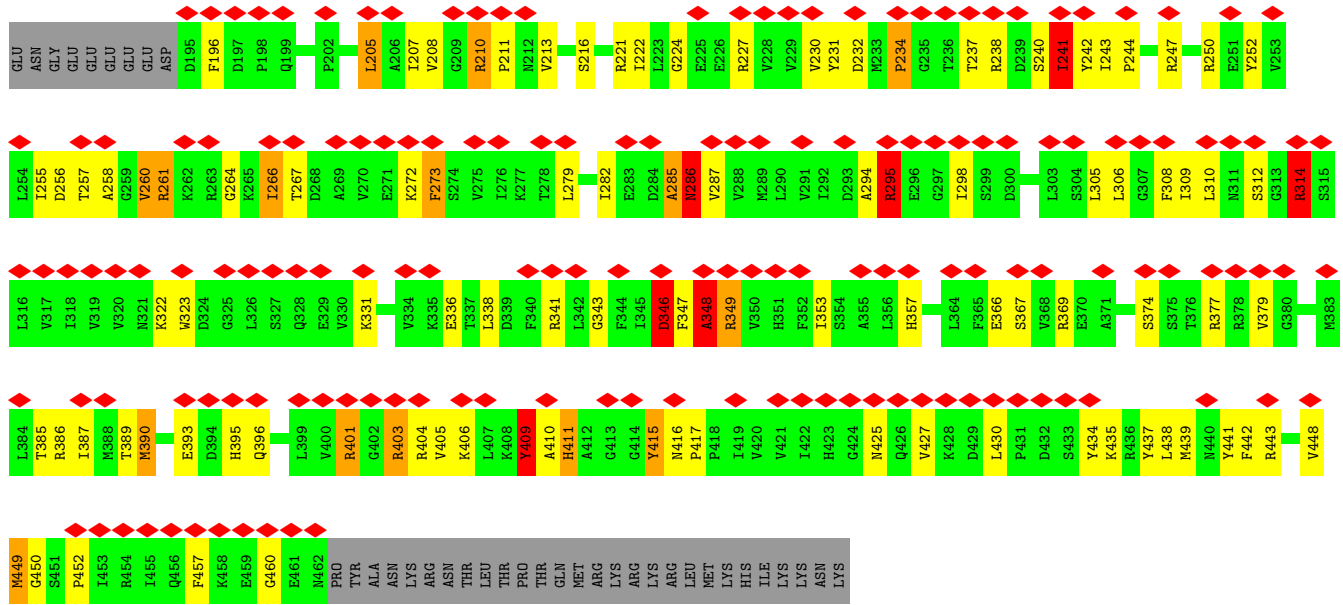
• Molecule 18: 50S ribosomal protein L25



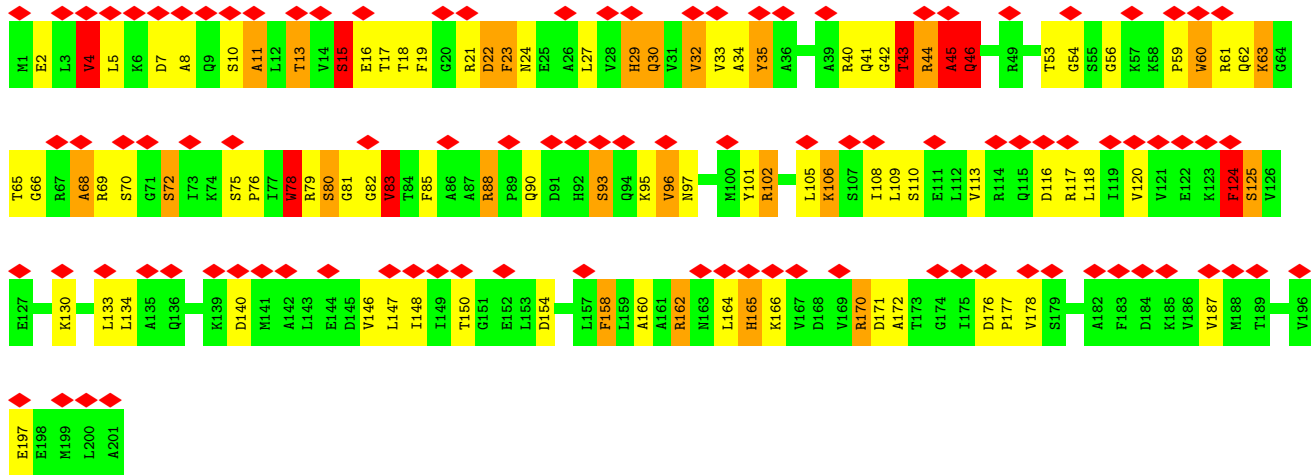
• Molecule 19: GTPase Der



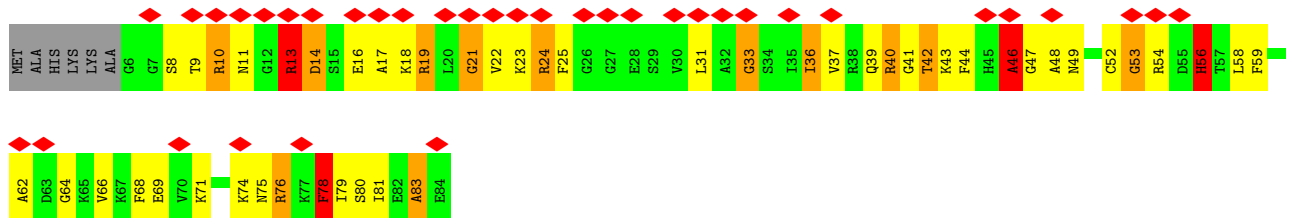




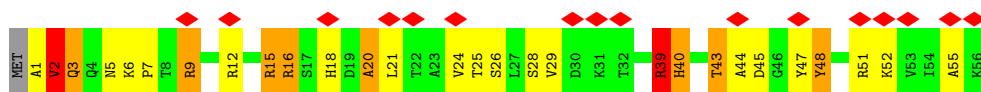
• Molecule 20: 50S ribosomal protein L4



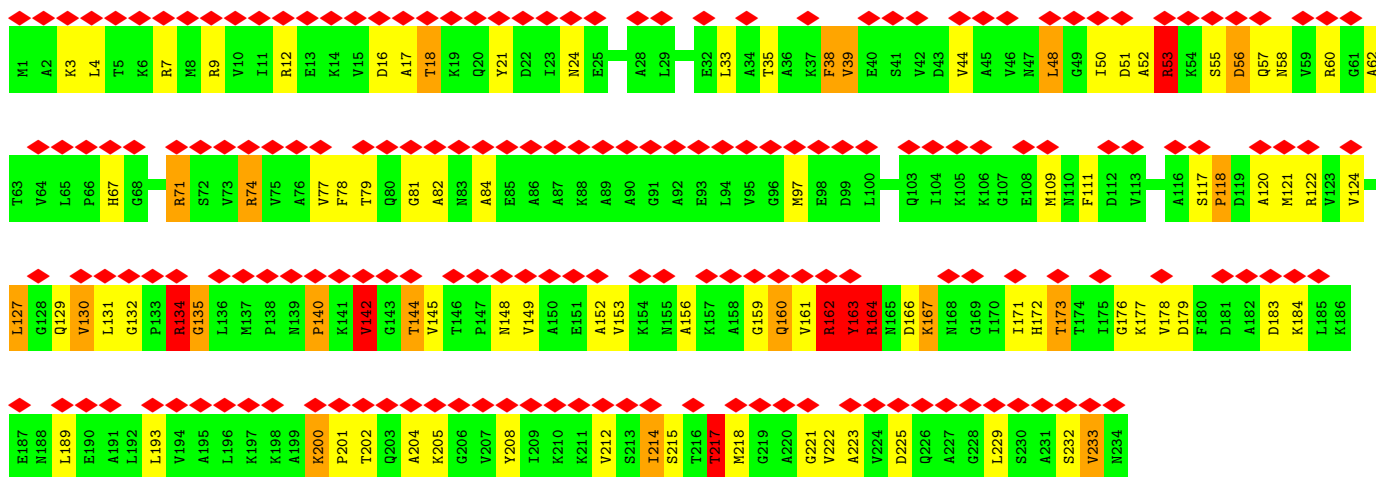
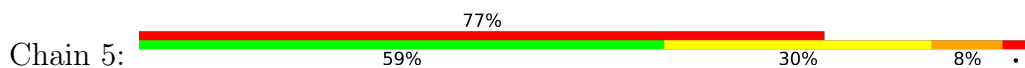
• Molecule 21: 50S ribosomal protein L27



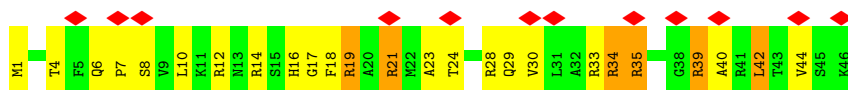
• Molecule 22: 50S ribosomal protein L32



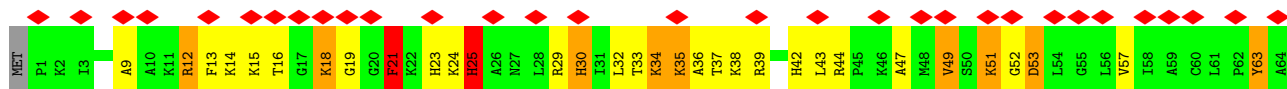
• Molecule 23: 50S ribosomal protein L1



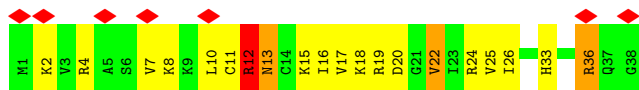
• Molecule 24: 50S ribosomal protein L34



• Molecule 25: 50S ribosomal protein L35

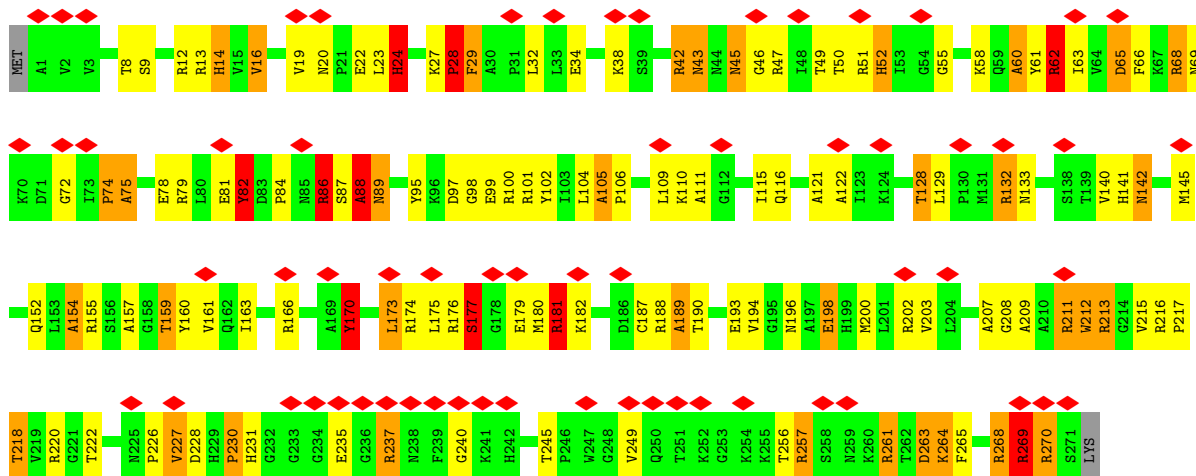


• Molecule 26: 50S ribosomal protein L36

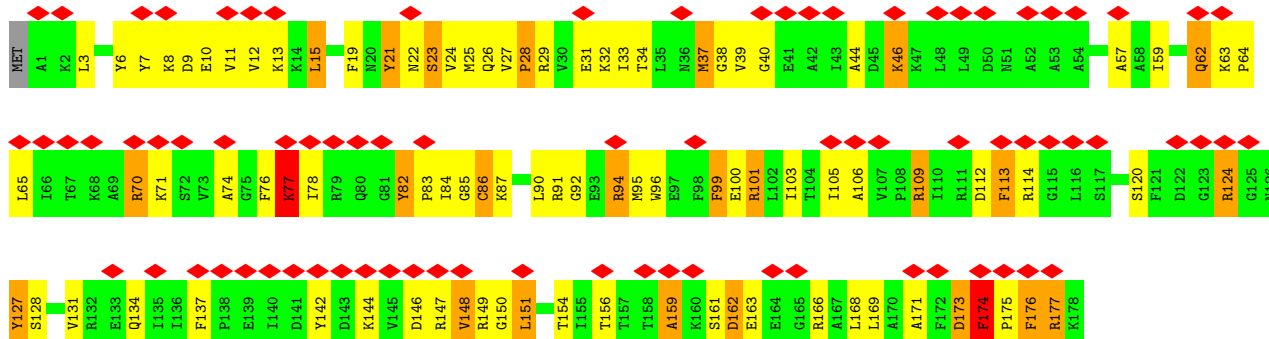


• Molecule 27: 50S ribosomal protein L2

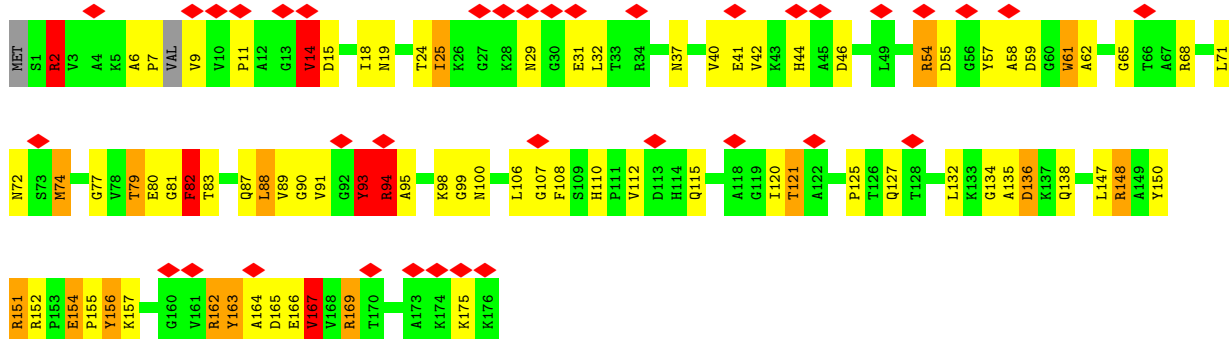




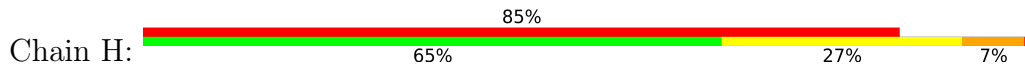
• Molecule 28: 50S ribosomal protein L5



• Molecule 29: 50S ribosomal protein L6

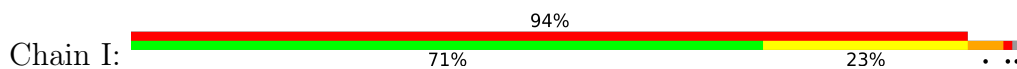


• Molecule 30: 50S ribosomal protein L9

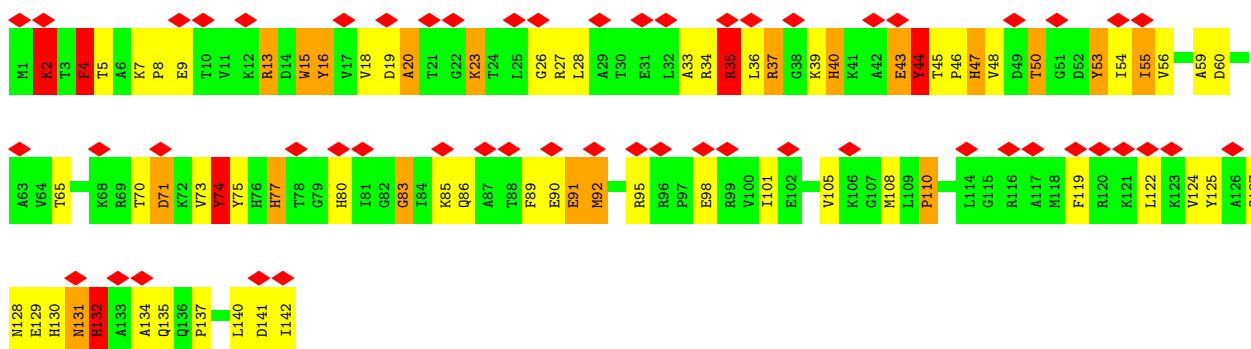




• Molecule 31: 50S ribosomal protein L11



• Molecule 32: 50S ribosomal protein L13



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	189614	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	Not provided	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	Not provided	
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI EAGLE (4k x 4k)	Depositor
Maximum map value	0.232	Depositor
Minimum map value	-0.093	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.045	Depositor
Map size ( $\text{\AA}$ )	373.088, 373.088, 373.088	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.1659, 1.1659, 1.1659	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	3.57	414/2744 (15.1%)	3.75	637/4276 (14.9%)
2	B	3.66	11120/69092 (16.1%)	3.80	17069/107787 (15.8%)
3	0	1.89	7/635 (1.1%)	2.19	18/848 (2.1%)
4	K	1.72	6/940 (0.6%)	2.04	23/1258 (1.8%)
5	L	1.89	18/1054 (1.7%)	2.13	35/1403 (2.5%)
6	1	1.66	2/510 (0.4%)	1.81	4/677 (0.6%)
7	M	1.78	7/1093 (0.6%)	2.07	34/1460 (2.3%)
8	N	1.83	10/973 (1.0%)	2.11	35/1301 (2.7%)
9	O	1.84	12/902 (1.3%)	2.08	26/1209 (2.2%)
10	P	1.83	13/929 (1.4%)	2.13	26/1242 (2.1%)
11	Q	1.81	9/960 (0.9%)	2.35	47/1278 (3.7%)
12	R	1.75	4/829 (0.5%)	2.09	26/1107 (2.3%)
13	S	1.83	9/864 (1.0%)	2.06	22/1156 (1.9%)
14	D	1.81	19/1586 (1.2%)	2.12	48/2134 (2.2%)
15	T	1.88	7/744 (0.9%)	2.05	24/994 (2.4%)
16	2	1.84	8/453 (1.8%)	2.15	14/605 (2.3%)
17	U	1.71	2/761 (0.3%)	1.94	13/1013 (1.3%)
18	W	1.74	5/766 (0.7%)	2.12	22/1025 (2.1%)
19	X	1.73	26/3334 (0.8%)	2.01	98/4502 (2.2%)
20	E	1.83	25/1571 (1.6%)	2.01	44/2113 (2.1%)
21	Y	1.84	8/603 (1.3%)	2.19	20/797 (2.5%)
22	3	1.85	2/450 (0.4%)	2.17	18/599 (3.0%)
23	5	1.68	18/1748 (1.0%)	1.99	52/2355 (2.2%)
24	6	1.97	5/380 (1.3%)	2.15	17/498 (3.4%)
25	7	1.82	6/513 (1.2%)	2.15	14/676 (2.1%)
26	8	1.72	3/303 (1.0%)	2.04	3/397 (0.8%)
27	C	1.87	34/2121 (1.6%)	2.07	66/2852 (2.3%)
28	F	1.75	16/1444 (1.1%)	2.21	59/1937 (3.0%)
29	G	1.77	12/1335 (0.9%)	2.13	40/1803 (2.2%)
30	H	1.71	8/1122 (0.7%)	1.87	17/1515 (1.1%)
31	I	1.65	5/1046 (0.5%)	1.92	28/1410 (2.0%)
32	J	1.79	12/1152 (1.0%)	2.02	36/1551 (2.3%)
All	All	3.21	11852/102957 (11.5%)	3.42	18635/153778 (12.1%)

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
1	A	0	69
2	B	0	1764
3	0	0	5
4	K	0	4
5	L	0	10
6	1	0	6
7	M	0	9
8	N	0	4
9	O	0	5
10	P	0	7
11	Q	0	11
12	R	0	8
13	S	0	3
14	D	0	11
15	T	0	3
16	2	0	4
17	U	0	4
18	W	0	2
19	X	0	25
20	E	0	7
21	Y	0	6
22	3	0	4
23	5	0	7
24	6	0	3
25	7	0	3
26	8	0	1
27	C	0	11
28	F	0	6
29	G	0	9
30	H	0	9
31	I	0	3
32	J	0	9
All	All	0	2032

The worst 5 of 11852 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	159	G	N7-C5	-23.28	1.25	1.39
2	B	1674	G	N7-C5	-21.28	1.26	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	770	G	N7-C5	-20.77	1.26	1.39
2	B	1626	A	N7-C5	-20.30	1.27	1.39
2	B	1641	A	N7-C5	-19.84	1.27	1.39

The worst 5 of 18635 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1784	A	N1-C6-N6	27.35	135.01	118.60
2	B	319	G	N1-C6-O6	25.96	135.47	119.90
2	B	332	A	N1-C6-N6	25.93	134.16	118.60
2	B	909	A	N1-C6-N6	25.56	133.93	118.60
2	B	2270	A	N1-C6-N6	25.05	133.63	118.60

There are no chirality outliers.

5 of 2032 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2	G	Sidechain
1	A	4	C	Sidechain
1	A	5	U	Sidechain
1	A	7	G	Sidechain
1	A	8	C	Sidechain

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2455	0	1253	65	0
2	B	61689	0	30889	2037	0
3	0	625	0	655	7	0
4	K	931	0	1003	12	0
5	L	1045	0	1117	16	0
6	1	509	0	543	8	0
7	M	1074	0	1157	17	0
8	N	960	0	1000	14	0
9	O	892	0	923	10	0
10	P	917	0	965	26	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
11	Q	947	0	1022	16	0
12	R	816	0	839	13	0
13	S	857	0	922	18	0
14	D	1565	0	1616	24	0
15	T	738	0	807	9	0
16	2	449	0	491	4	0
17	U	755	0	807	6	0
18	W	753	0	780	11	0
19	X	3280	0	3334	47	0
20	E	1552	0	1619	27	0
21	Y	596	0	610	14	0
22	3	444	0	461	7	0
23	5	1733	0	1824	19	0
24	6	377	0	418	4	0
25	7	504	0	574	8	0
26	8	302	0	343	8	0
27	C	2082	0	2157	31	0
28	F	1420	0	1460	18	0
29	G	1316	0	1364	15	0
30	H	1111	0	1148	13	0
31	I	1032	0	1088	3	0
32	J	1129	0	1162	30	0
All	All	94855	0	64351	2462	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 15.

The worst 5 of 2462 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)
19:X:347:PHE:CD2	19:X:449:MET:CG	2.00	1.45
19:X:347:PHE:CD2	19:X:449:MET:HG2	1.49	1.26
19:X:347:PHE:CD2	19:X:449:MET:HG3	1.84	0.97
19:X:449:MET:HA	19:X:449:MET:CE	1.97	0.94
19:X:347:PHE:HD2	19:X:449:MET:HG2	0.77	0.90

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	
3	0	75/78 (96%)	54 (72%)	11 (15%)	10 (13%)	0	4
4	K	119/123 (97%)	84 (71%)	21 (18%)	14 (12%)	0	6
5	L	141/144 (98%)	108 (77%)	23 (16%)	10 (7%)	1	16
6	1	61/63 (97%)	49 (80%)	12 (20%)	0	100	100
7	M	134/136 (98%)	97 (72%)	18 (13%)	19 (14%)	0	4
8	N	118/127 (93%)	91 (77%)	20 (17%)	7 (6%)	1	19
9	O	114/117 (97%)	96 (84%)	12 (10%)	6 (5%)	2	21
10	P	112/115 (97%)	81 (72%)	18 (16%)	13 (12%)	0	6
11	Q	115/118 (98%)	87 (76%)	17 (15%)	11 (10%)	0	10
12	R	101/103 (98%)	71 (70%)	23 (23%)	7 (7%)	1	16
13	S	108/110 (98%)	83 (77%)	16 (15%)	9 (8%)	1	13
14	D	207/209 (99%)	143 (69%)	42 (20%)	22 (11%)	0	8
15	T	91/100 (91%)	58 (64%)	17 (19%)	16 (18%)	0	3
16	2	56/59 (95%)	46 (82%)	7 (12%)	3 (5%)	2	21
17	U	94/104 (90%)	66 (70%)	16 (17%)	12 (13%)	0	5
18	W	92/94 (98%)	77 (84%)	10 (11%)	5 (5%)	2	21
19	X	410/490 (84%)	329 (80%)	46 (11%)	35 (8%)	1	12
20	E	199/201 (99%)	145 (73%)	28 (14%)	26 (13%)	0	4
21	Y	77/85 (91%)	43 (56%)	15 (20%)	19 (25%)	0	1
22	3	54/57 (95%)	36 (67%)	10 (18%)	8 (15%)	0	4
23	5	232/234 (99%)	185 (80%)	23 (10%)	24 (10%)	0	9
24	6	44/46 (96%)	33 (75%)	7 (16%)	4 (9%)	1	12
25	7	62/65 (95%)	44 (71%)	11 (18%)	7 (11%)	0	7
26	8	36/38 (95%)	26 (72%)	6 (17%)	4 (11%)	0	8
27	C	269/273 (98%)	201 (75%)	35 (13%)	33 (12%)	0	5

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	F	176/179 (98%)	119 (68%)	41 (23%)	16 (9%)	1	12
29	G	171/177 (97%)	128 (75%)	26 (15%)	17 (10%)	0	10
30	H	147/149 (99%)	109 (74%)	25 (17%)	13 (9%)	1	12
31	I	139/142 (98%)	114 (82%)	16 (12%)	9 (6%)	1	18
32	J	140/142 (99%)	102 (73%)	21 (15%)	17 (12%)	0	6
All	All	3894/4078 (96%)	2905 (75%)	593 (15%)	396 (10%)	1	9

5 of 396 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	0	15	ASN
3	0	28	PHE
3	0	70	LEU
5	L	29	LYS
5	L	41	ARG

### 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	
3	0	67/68 (98%)	62 (92%)	5 (8%)	13	39
4	K	102/104 (98%)	92 (90%)	10 (10%)	8	28
5	L	102/103 (99%)	89 (87%)	13 (13%)	4	20
6	1	55/55 (100%)	50 (91%)	5 (9%)	9	31
7	M	109/109 (100%)	105 (96%)	4 (4%)	34	58
8	N	100/103 (97%)	93 (93%)	7 (7%)	15	41
9	O	86/87 (99%)	73 (85%)	13 (15%)	3	16
10	P	99/100 (99%)	87 (88%)	12 (12%)	5	22
11	Q	89/90 (99%)	81 (91%)	8 (9%)	9	32
12	R	84/84 (100%)	69 (82%)	15 (18%)	2	11
13	S	93/93 (100%)	88 (95%)	5 (5%)	22	49

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	D	164/164 (100%)	143 (87%)	21 (13%)	4	20
15	T	80/84 (95%)	69 (86%)	11 (14%)	3	19
16	2	48/49 (98%)	44 (92%)	4 (8%)	11	36
17	U	81/85 (95%)	72 (89%)	9 (11%)	6	24
18	W	78/78 (100%)	71 (91%)	7 (9%)	9	32
19	X	357/419 (85%)	324 (91%)	33 (9%)	9	31
20	E	165/165 (100%)	152 (92%)	13 (8%)	12	38
21	Y	59/63 (94%)	55 (93%)	4 (7%)	16	42
22	3	47/48 (98%)	40 (85%)	7 (15%)	3	16
23	5	181/181 (100%)	158 (87%)	23 (13%)	4	20
24	6	38/38 (100%)	35 (92%)	3 (8%)	12	38
25	7	51/52 (98%)	44 (86%)	7 (14%)	3	19
26	8	34/34 (100%)	31 (91%)	3 (9%)	10	33
27	C	216/218 (99%)	190 (88%)	26 (12%)	5	22
28	F	149/150 (99%)	131 (88%)	18 (12%)	5	22
29	G	136/138 (99%)	115 (85%)	21 (15%)	2	15
30	H	114/114 (100%)	105 (92%)	9 (8%)	12	38
31	I	109/110 (99%)	100 (92%)	9 (8%)	11	36
32	J	116/116 (100%)	99 (85%)	17 (15%)	3	16
All	All	3209/3302 (97%)	2867 (89%)	342 (11%)	10	26

5 of 342 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
24	6	34	ARG
29	G	14	VAL
25	7	37	THR
27	C	213	ARG
29	G	120	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 68 such sidechains are listed below:

Mol	Chain	Res	Type
29	G	110	HIS

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Mol	Chain	Res	Type
30	H	128	HIS
32	J	86	GLN
14	D	136	ASN
14	D	134	HIS

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	112/117 (95%)	20 (17%)	4 (3%)
2	B	2873/2903 (98%)	580 (20%)	122 (4%)
All	All	2985/3020 (98%)	600 (20%)	126 (4%)

5 of 600 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	9	G
1	A	13	G
1	A	14	U
1	A	15	A
1	A	16	G

5 of 126 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	1284	A
2	B	2402	U
2	B	1730	C
2	B	2336	A
2	B	2601	C

## 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.

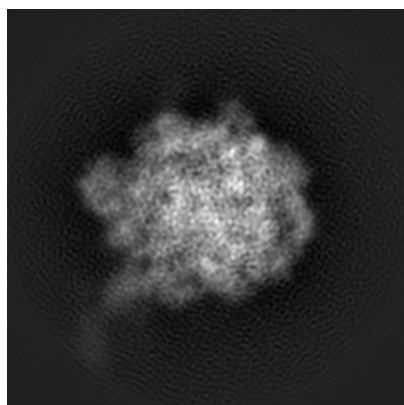
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6149. These allow visual inspection of the internal detail of the map and identification of artifacts.

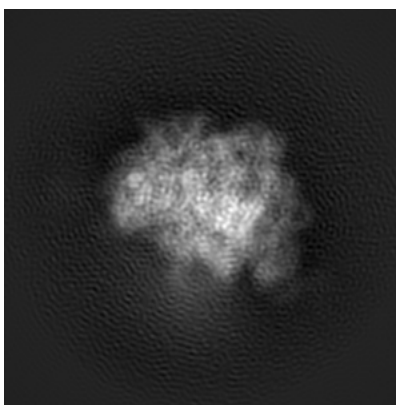
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

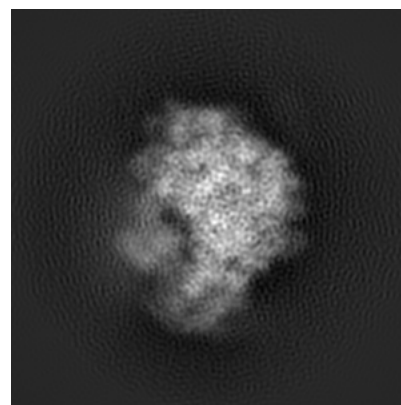
#### 6.1.1 Primary map



X



Y

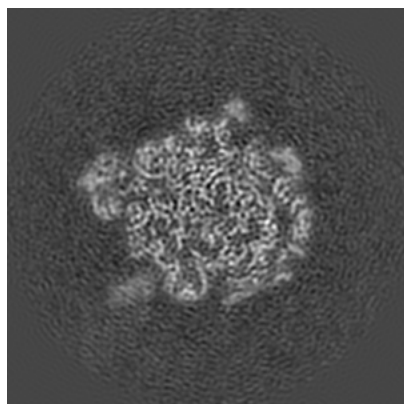


Z

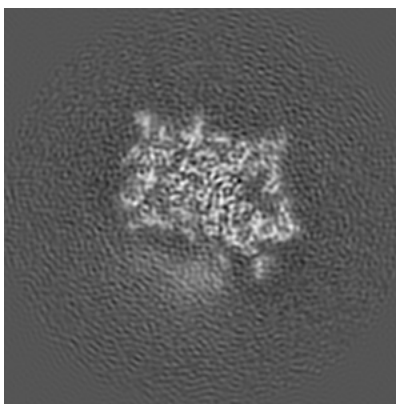
The images above show the map projected in three orthogonal directions.

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

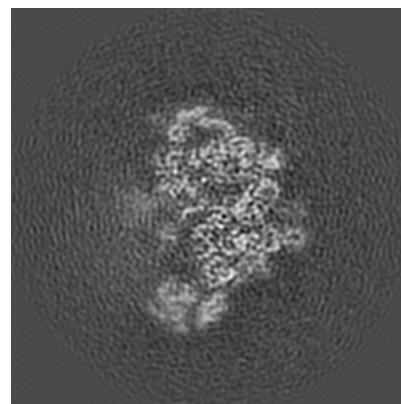
#### 6.2.1 Primary map



X Index: 160



Y Index: 160



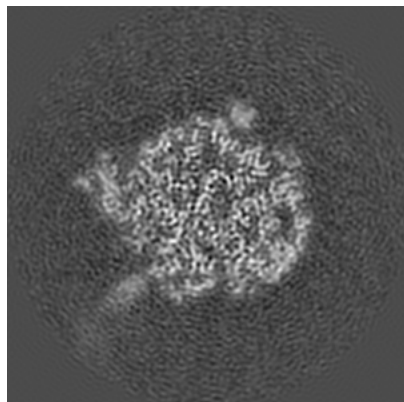
Z Index: 160



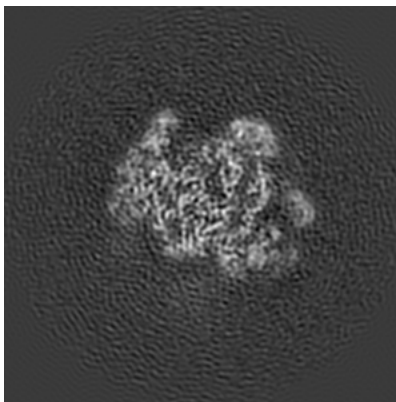
The images above show central slices of the map in three orthogonal directions.

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

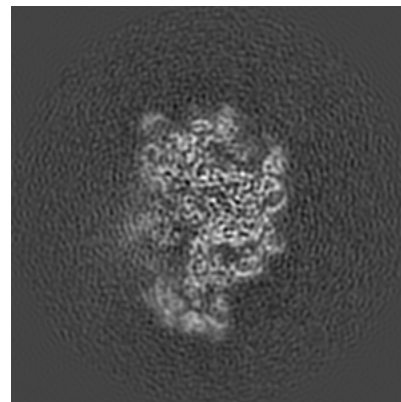
### 6.3.1 Primary map



X Index: 166



Y Index: 181

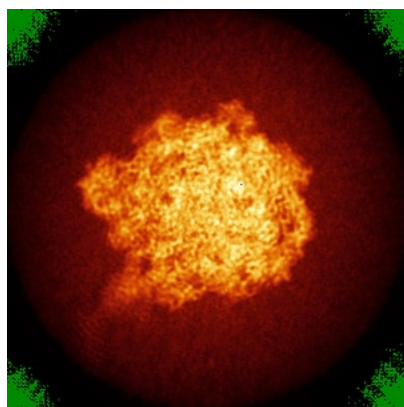


Z Index: 176

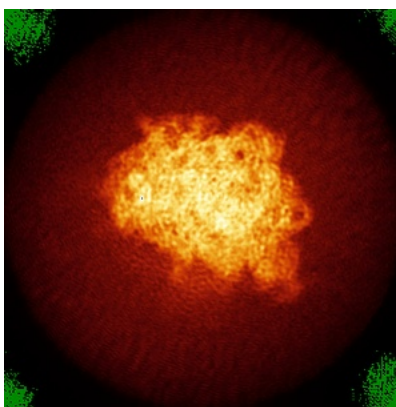
The images above show the largest variance slices of the map in three orthogonal directions.

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

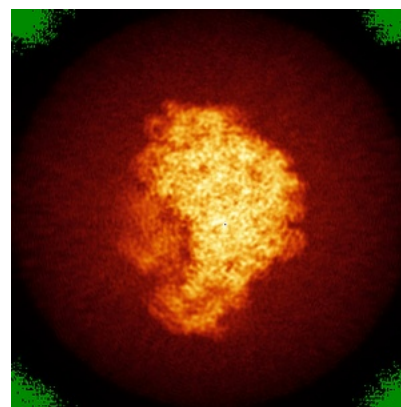
### 6.4.1 Primary map



X



Y



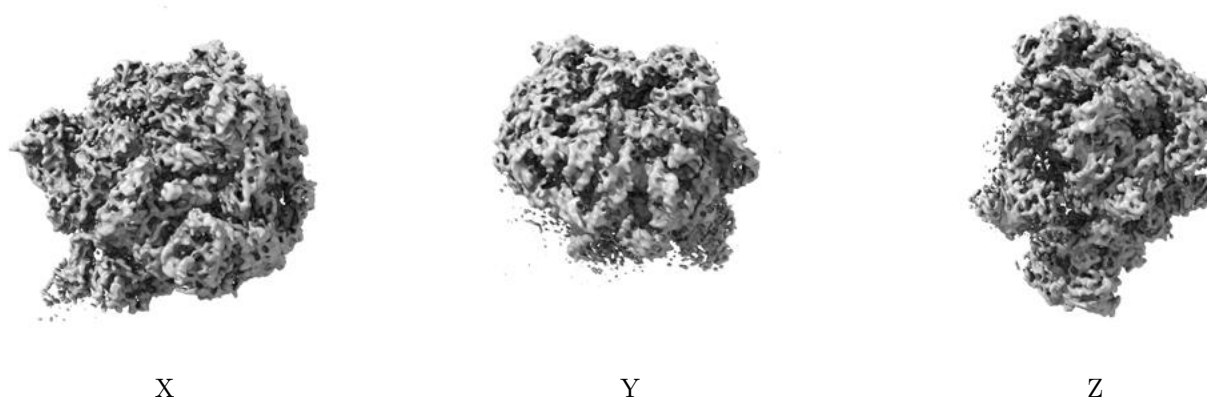
Z

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

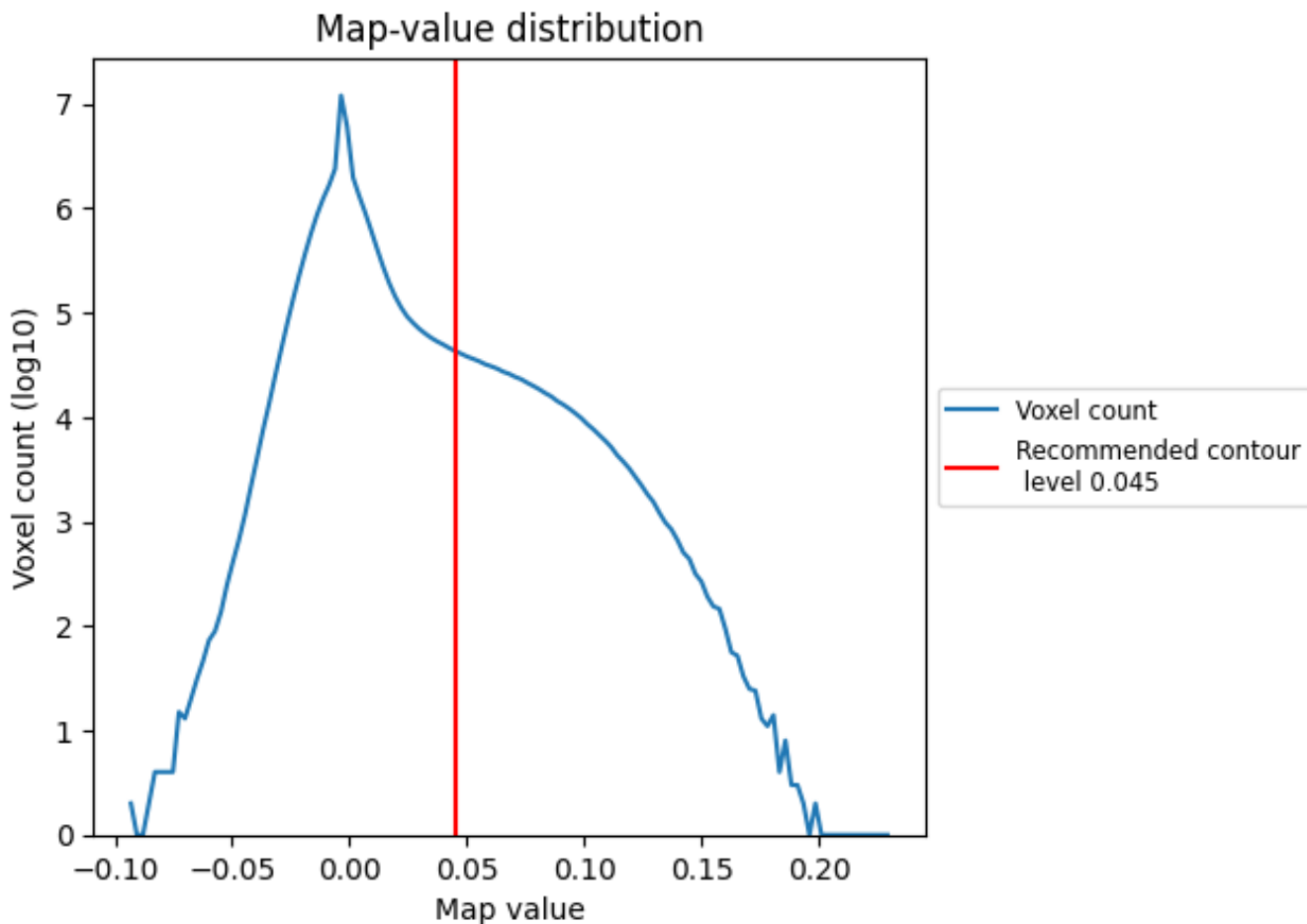
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

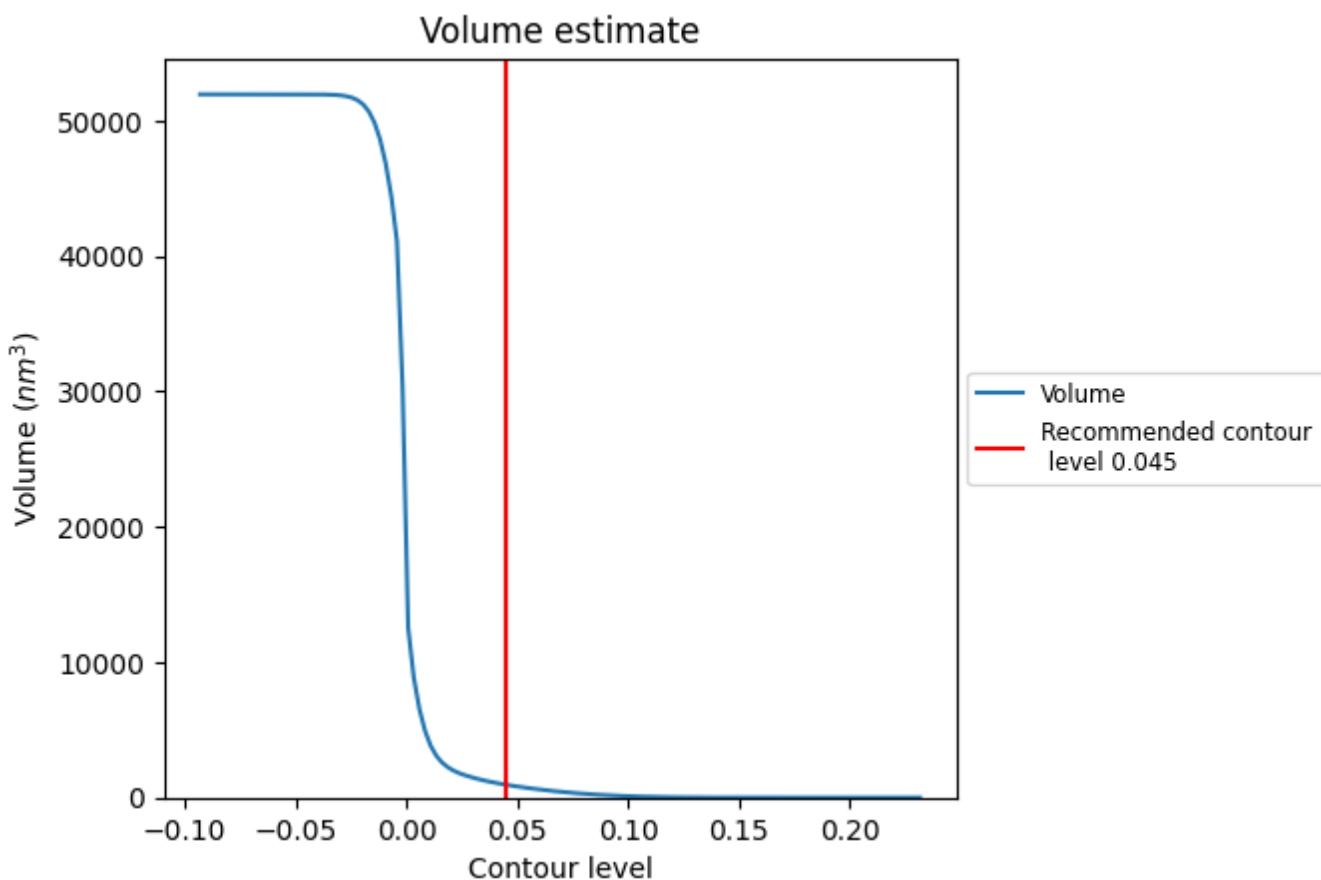
This section contains the results of statistical analysis of the map.

### 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.

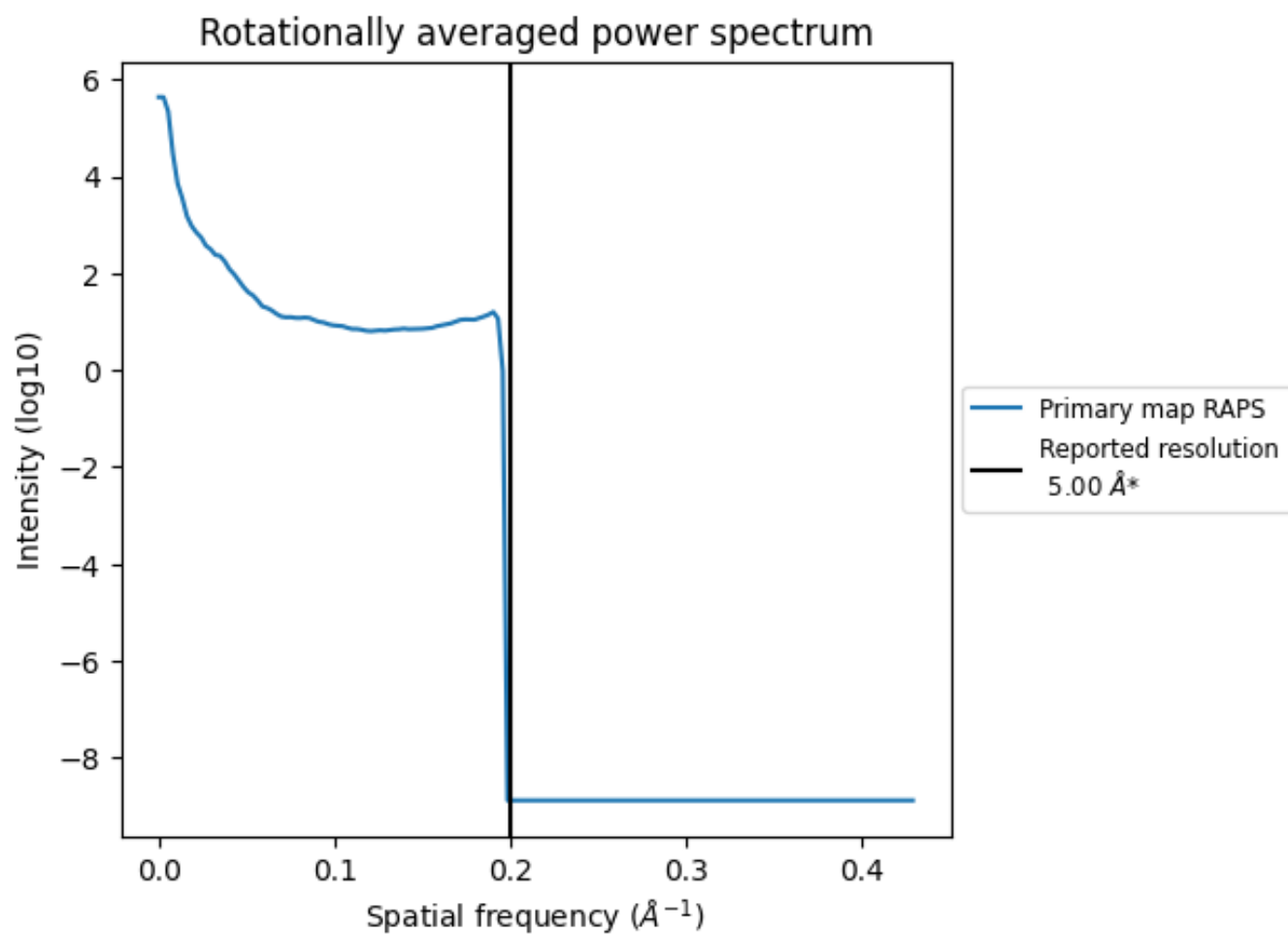
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 946  $\text{nm}^3$ ; this corresponds to an approximate mass of 854 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](#)

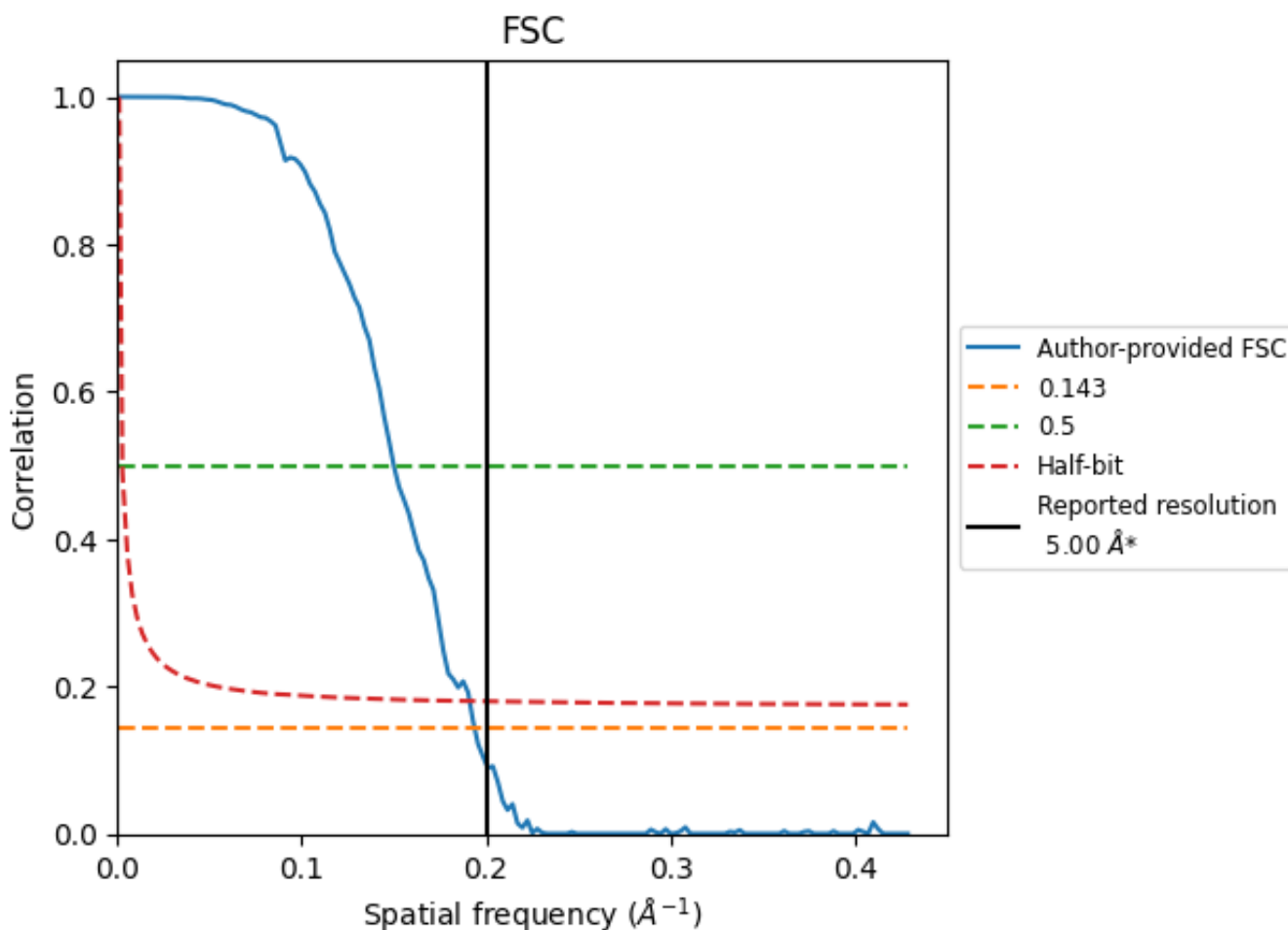


\*Reported resolution corresponds to spatial frequency of 0.200 Å<sup>-1</sup>

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.200 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

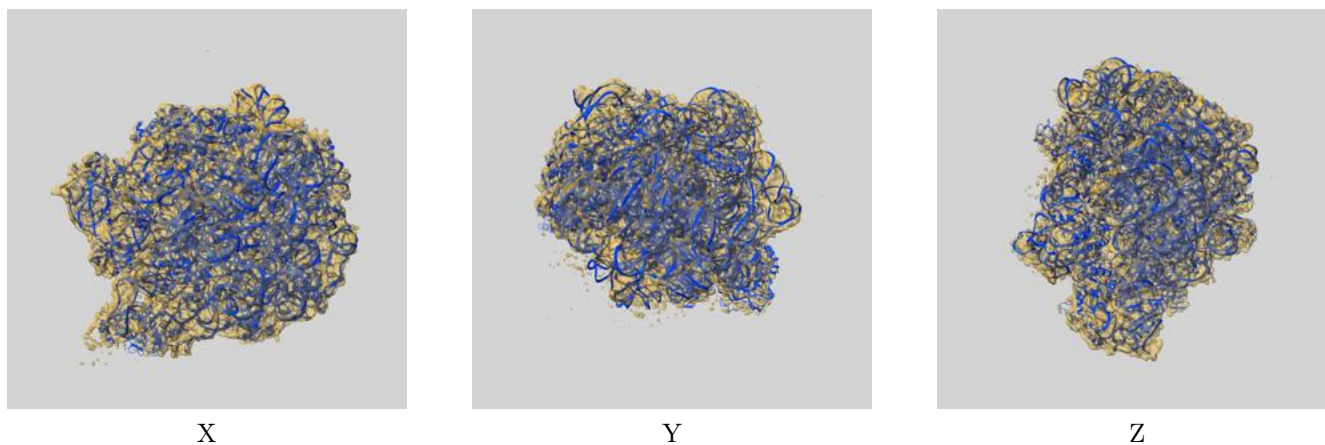
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	5.00	-	-
Author-provided FSC curve	5.16	6.67	5.23
Unmasked-calculated*	-	-	-

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

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

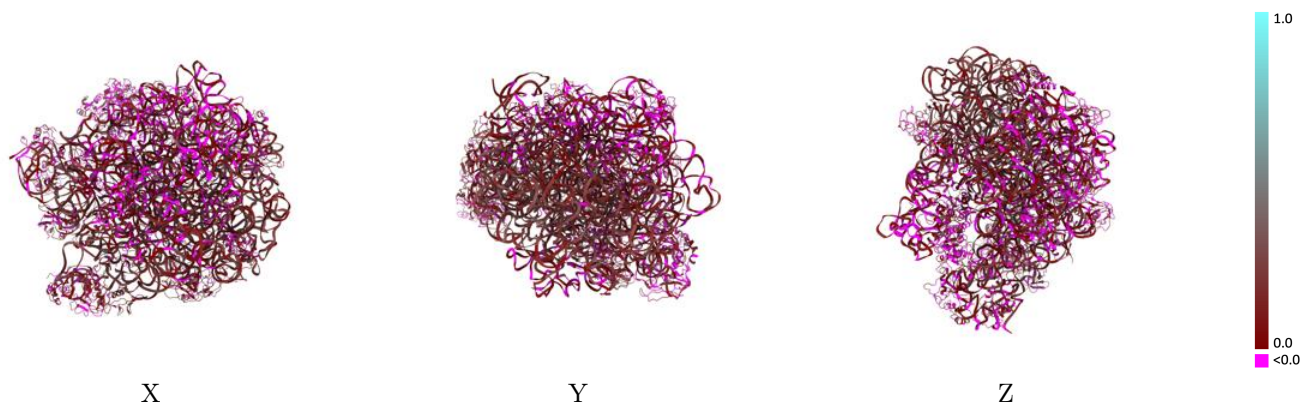
This section contains information regarding the fit between EMDB map EMD-6149 and PDB model 3J8G. Per-residue inclusion information can be found in section 3 on page 9.

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



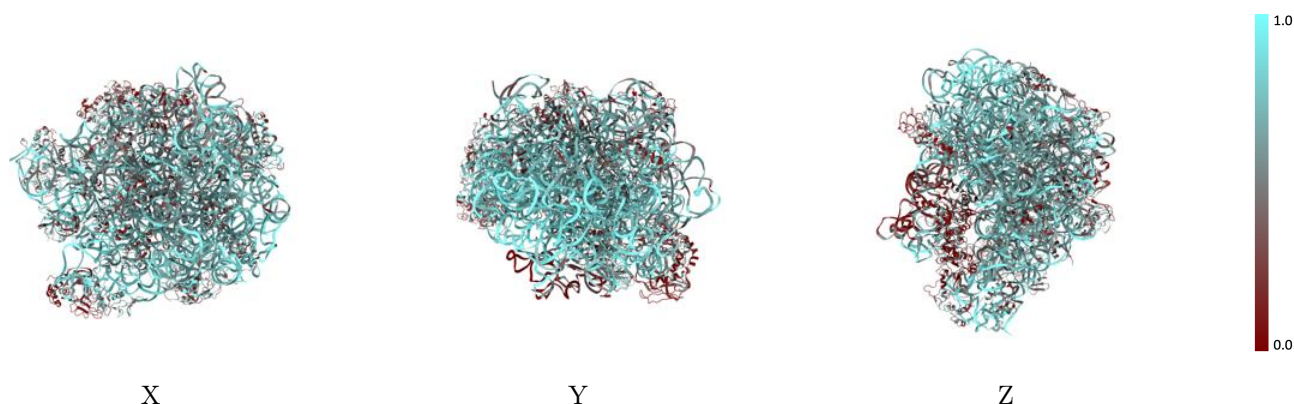
The images above show the 3D surface view of the map at the recommended contour level 0.045 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

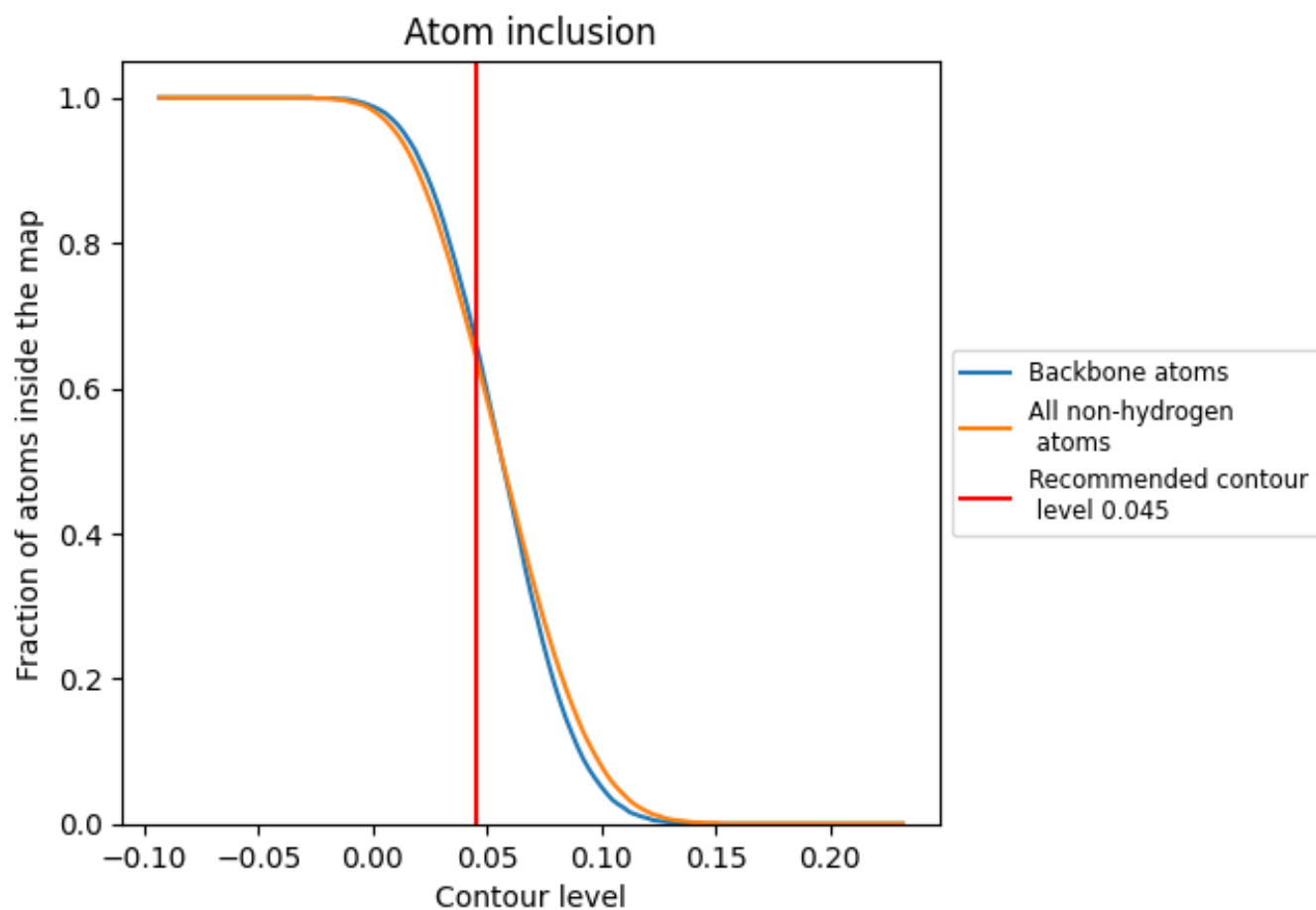
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.045).





































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 66% of all backbone atoms, 65% 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 (0.045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6460	 0.1310
0	 0.4330	 0.0960
1	 0.4370	 0.0650
2	 0.4600	 0.0490
3	 0.5190	 0.1010
5	 0.2170	 0.0350
6	 0.5320	 0.1150
7	 0.4440	 0.0550
8	 0.6370	 0.1510
A	 0.7770	 0.1370
B	 0.7330	 0.1480
C	 0.5890	 0.1510
D	 0.6000	 0.1610
E	 0.4220	 0.0490
F	 0.4560	 0.0680
G	 0.6020	 0.1610
H	 0.1650	 0.0600
I	 0.0460	 0.0270
J	 0.5010	 0.1070
K	 0.6060	 0.1510
L	 0.4460	 0.0560
M	 0.6140	 0.1780
N	 0.6190	 0.1280
O	 0.5280	 0.0920
P	 0.5610	 0.1610
Q	 0.5000	 0.0650
R	 0.4560	 0.0500
S	 0.4400	 0.0580
T	 0.5250	 0.1040
U	 0.4280	 0.0400
W	 0.5580	 0.1540
X	 0.3430	 0.0850
Y	 0.4840	 0.0580

