



wwPDB EM Validation Summary Report ⓘ

Mar 28, 2026 – 11:16 AM UTC

PDB ID : 8VUP / pdb_00008vup
EMDB ID : EMD-43535
Title : E. coli 70S ribosome with unmodified tRNA^{Pro}(GGG) in the e^{*}/E conformation on a slippery CCC-C codon
Authors : Kimbrough, E.M.; Dunham, C.M.; Nguyen, H.A.
Deposited on : 2024-01-29
Resolution : 3.40 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.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

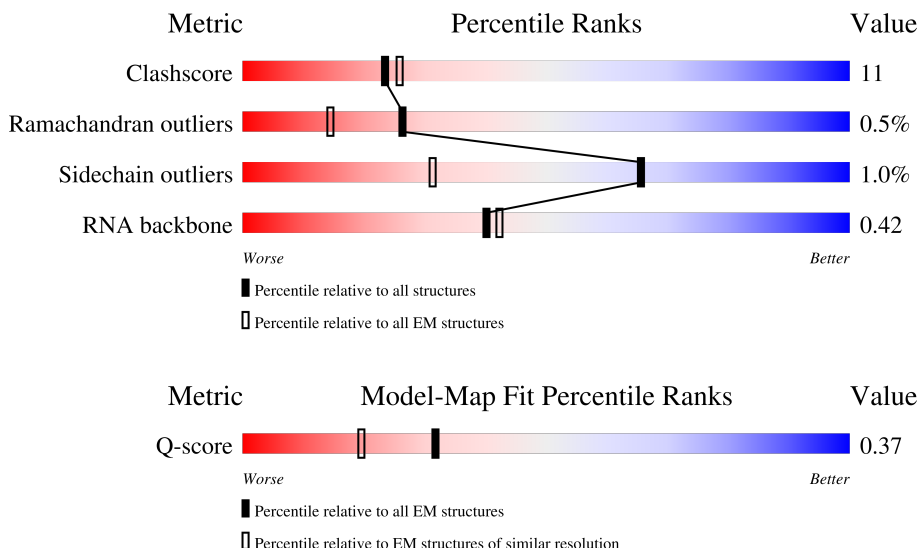
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 Å.

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




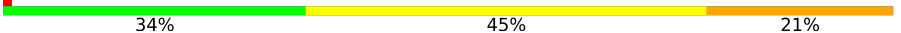
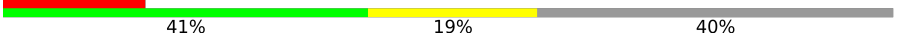






















Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
RNA backbone	8273	3508	-
Q-score	-	25397	14717 (2.90 - 3.90)

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	1	2903	 51% 40% 9% 6%
2	2	1539	 42% 45% 12% 6%
3	3	120	 59% 34% 7%




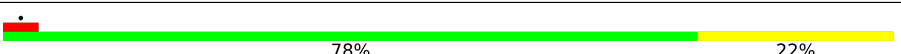
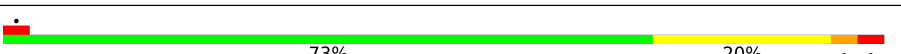
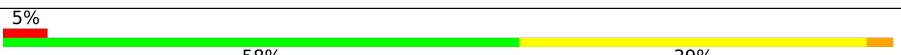
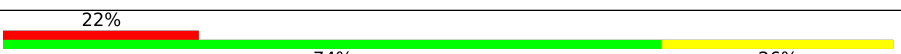
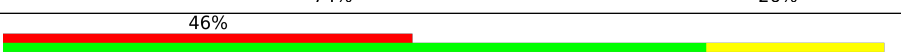

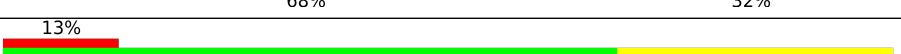
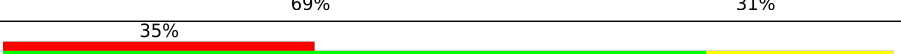
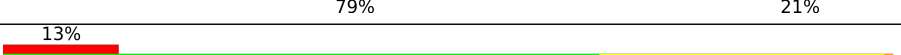
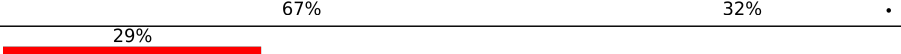
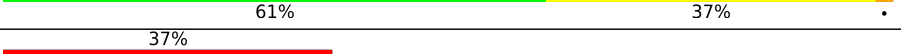





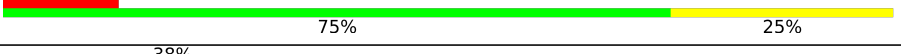

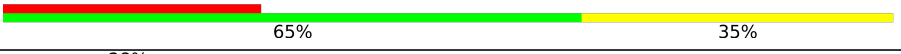



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Mol	Chain	Length	Quality of chain
4	4	18	
5	5	77	
6	A	223	
7	B	271	
8	C	209	
9	D	201	
10	E	177	
11	F	176	
12	G	149	
13	J	142	
14	K	122	
15	L	143	
16	M	136	
17	N	120	
18	O	116	
19	P	114	
20	Q	117	
21	R	103	
22	S	110	
23	T	93	
24	U	102	
25	V	94	
26	W	75	
27	X	77	
28	Y	63	

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Mol	Chain	Length	Quality of chain
29	Z	58	
30	b	56	
31	c	50	
32	d	46	
33	e	64	
34	f	38	
35	h	206	
36	i	205	
37	j	157	
38	k	100	
39	l	151	
40	m	129	
41	n	127	
42	o	98	
43	p	116	
44	q	123	
45	r	114	
46	s	100	
47	t	88	
48	u	82	
49	v	80	
50	w	65	
51	x	79	
52	y	85	
53	z	65	

2 Entry composition [i](#)

There are 55 unique types of molecules in this entry. The entry contains 143655 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 ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	1	2903	Total	C	N	O	P	0	0
			62317	27801	11468	20146	2902		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
1	747	C	U	variant	GB 1036415628

- Molecule 2 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	2	1539	Total	C	N	O	P	0	0
			33012	14725	6052	10697	1538		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
3	3	120	Total	C	N	O	P	0	0
			2568	1145	471	833	119		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
3	120	A	U	conflict	GB 1370526515

- Molecule 4 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	4	4	Total	C	N	O	P	0	0
			80	36	12	28	4		

- Molecule 5 is a RNA chain called tRNA^{ProL} (GGG).

Mol	Chain	Residues	Atoms					AltConf	Trace
5	5	77	Total	C	N	O	P	0	0
			1648	733	297	541	77		

- Molecule 6 is a protein called Large ribosomal subunit protein uL1.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	A	134	Total	C	N	O	S	0	0
			1027	645	186	194	2		

- Molecule 7 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	B	271	Total	C	N	O	S	0	0
			2083	1288	423	365	7		

- Molecule 8 is a protein called 50S ribosomal protein L3.

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

- Molecule 9 is a protein called 50S ribosomal protein L4.

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

- Molecule 10 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	E	177	Total	C	N	O	S	0	0
			1411	899	249	257	6		

- Molecule 11 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	F	176	Total	C	N	O	S	0	0
			1323	832	243	246	2		

- Molecule 12 is a protein called Large ribosomal subunit protein bL9.

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

- Molecule 13 is a protein called 50S ribosomal protein L13.

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

- Molecule 14 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	K	122	Total	C	N	O	S	0	0
			939	587	180	166	6		

- Molecule 15 is a protein called 50S ribosomal protein L15.

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

- Molecule 16 is a protein called 50S ribosomal protein L16.

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

- Molecule 17 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	N	120	Total	C	N	O	S	0	0
			961	593	196	167	5		

- Molecule 18 is a protein called 50S ribosomal protein L18.

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

- Molecule 19 is a protein called 50S ribosomal protein L19.

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

- Molecule 20 is a protein called Large ribosomal subunit protein bL20.

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

- Molecule 21 is a protein called Ribosomal protein L21.

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

- Molecule 22 is a protein called 50S ribosomal protein L22.

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

- Molecule 23 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	T	93	Total	C	N	O	S	0	0
			739	466	139	132	2		

- Molecule 24 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	U	102	Total	C	N	O	S	0	0
			780	492	146	142			

- Molecule 25 is a protein called 50S ribosomal protein L25.

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

- Molecule 26 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	W	75	Total	C	N	O	S	0	0
			575	356	116	102	1		

- Molecule 27 is a protein called 50S ribosomal protein L28.

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

- Molecule 28 is a protein called 50S ribosomal protein L29.

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

- Molecule 29 is a protein called 50S ribosomal protein L30.

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

- Molecule 30 is a protein called 50S ribosomal protein L32.

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

- Molecule 31 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	c	50	Total	C	N	O	0	0
			410	263	75	72		

- Molecule 32 is a protein called 50S ribosomal protein L34.

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

- Molecule 33 is a protein called 50S ribosomal protein L35.

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

- Molecule 34 is a protein called 50S ribosomal protein L36.

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

- Molecule 35 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	h	206	Total	C	N	O	S	0	0
			1625	1028	305	289	3		

- Molecule 36 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	i	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 37 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	j	157	Total	C	N	O	S	0	0
			1157	719	218	214	6		

- Molecule 38 is a protein called 30S ribosomal protein S6, non-modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	k	100	Total	C	N	O	S	0	0
			818	515	148	149	6		

- Molecule 39 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	l	151	Total	C	N	O	S	0	0
			1182	735	227	216	4		

- Molecule 40 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	m	129	Total	C	N	O	S	0	0
			979	616	173	184	6		

- Molecule 41 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	n	127	Total	C	N	O	S	0	0
			1022	634	206	179	3		

- Molecule 42 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	o	98	Total	C	N	O	S	0	0
			787	493	150	143	1		

- Molecule 43 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	p	116	Total	C	N	O	S	0	0
			870	535	173	159	3		

- Molecule 44 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	q	123	Total	C	N	O	S	0	0
			955	590	196	165	4		

- Molecule 45 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	r	114	Total	C	N	O	S	0	0
			884	546	178	157	3		

- Molecule 46 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	s	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 47 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	t	88	Total	C	N	O	S	0	0
			714	439	144	130	1		

- Molecule 48 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	u	82	Total	C	N	O	S	0	0
			649	406	128	114	1		

- Molecule 49 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	v	80	Total	C	N	O	S	0	0
			649	411	121	114	3		

- Molecule 50 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	w	65	Total	C	N	O	S	0	0
			536	339	100	96	1		

- Molecule 51 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	x	79	Total	C	N	O	S	0	0
			638	408	120	108	2		

- Molecule 52 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	y	85	Total	C	N	O	S	0	0
			665	411	137	114	3		

- Molecule 53 is a protein called Small ribosomal subunit protein bS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	z	65	Total	C	N	O	S	0	0
			545	335	117	92	1		

- Molecule 54 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	1	202	Total 202	Mg 202	0
54	2	29	Total 29	Mg 29	0
54	3	4	Total 4	Mg 4	0
54	B	1	Total 1	Mg 1	0
54	E	1	Total 1	Mg 1	0
54	Q	1	Total 1	Mg 1	0
54	b	1	Total 1	Mg 1	0

- Molecule 55 is water.

Mol	Chain	Residues	Atoms		AltConf
55	1	103	Total 103	O 103	0
55	2	279	Total 279	O 279	0
55	3	2	Total 2	O 2	0
55	4	1	Total 1	O 1	0
55	5	2	Total 2	O 2	0
55	A	13	Total 13	O 13	0
55	C	1	Total 1	O 1	0
55	D	2	Total 2	O 2	0
55	E	5	Total 5	O 5	0
55	F	2	Total 2	O 2	0
55	G	10	Total 10	O 10	0
55	M	1	Total 1	O 1	0
55	P	1	Total 1	O 1	0

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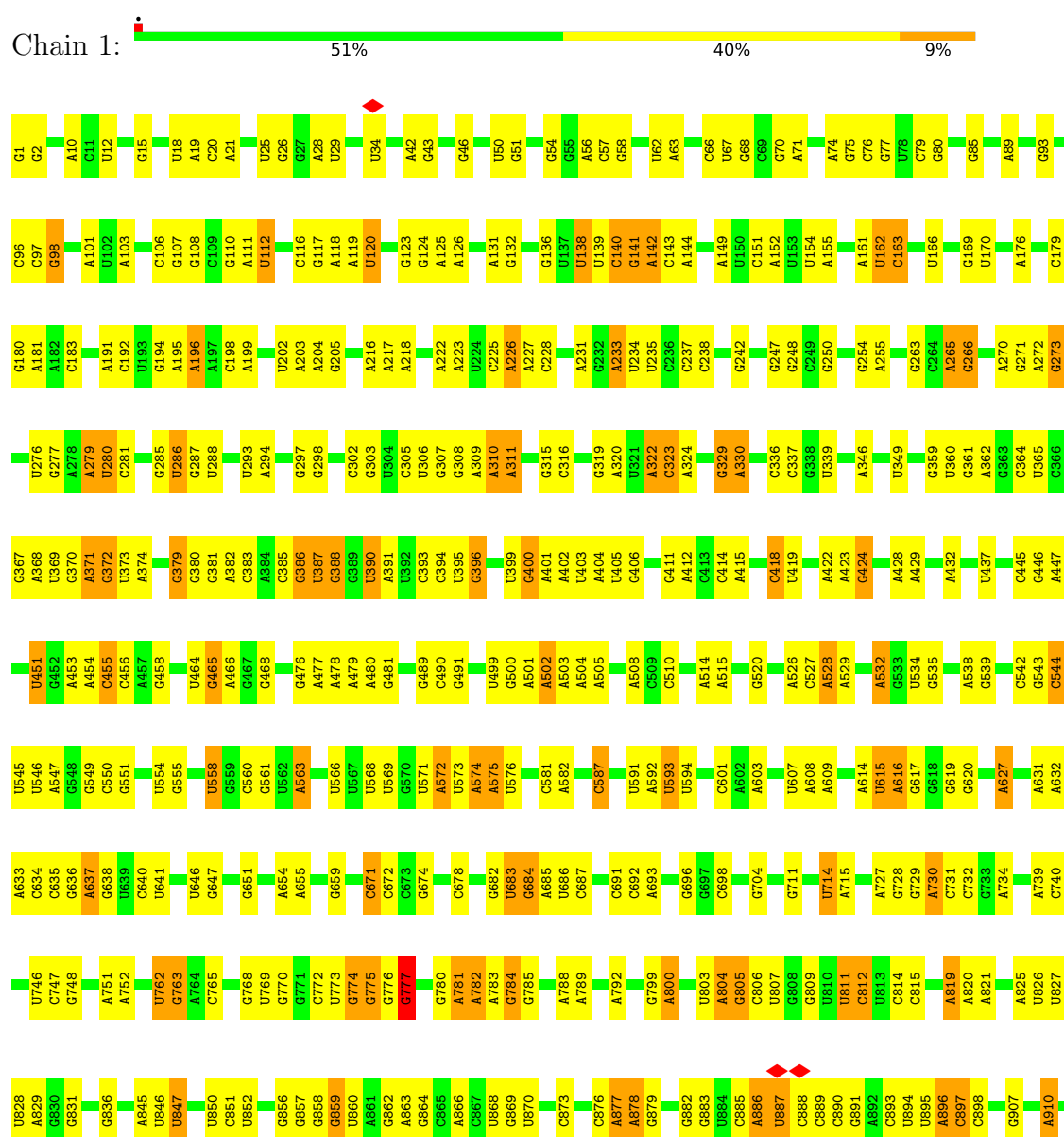
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Mol	Chain	Residues	Atoms		AltConf
55	c	1	Total 1	O 1	0
55	h	10	Total 10	O 10	0
55	i	11	Total 11	O 11	0
55	j	1	Total 1	O 1	0
55	k	9	Total 9	O 9	0
55	l	21	Total 21	O 21	0
55	m	9	Total 9	O 9	0
55	n	9	Total 9	O 9	0
55	o	11	Total 11	O 11	0
55	p	4	Total 4	O 4	0
55	q	5	Total 5	O 5	0
55	r	8	Total 8	O 8	0
55	s	1	Total 1	O 1	0
55	t	3	Total 3	O 3	0
55	u	8	Total 8	O 8	0
55	v	4	Total 4	O 4	0
55	w	8	Total 8	O 8	0
55	x	4	Total 4	O 4	0
55	z	3	Total 3	O 3	0

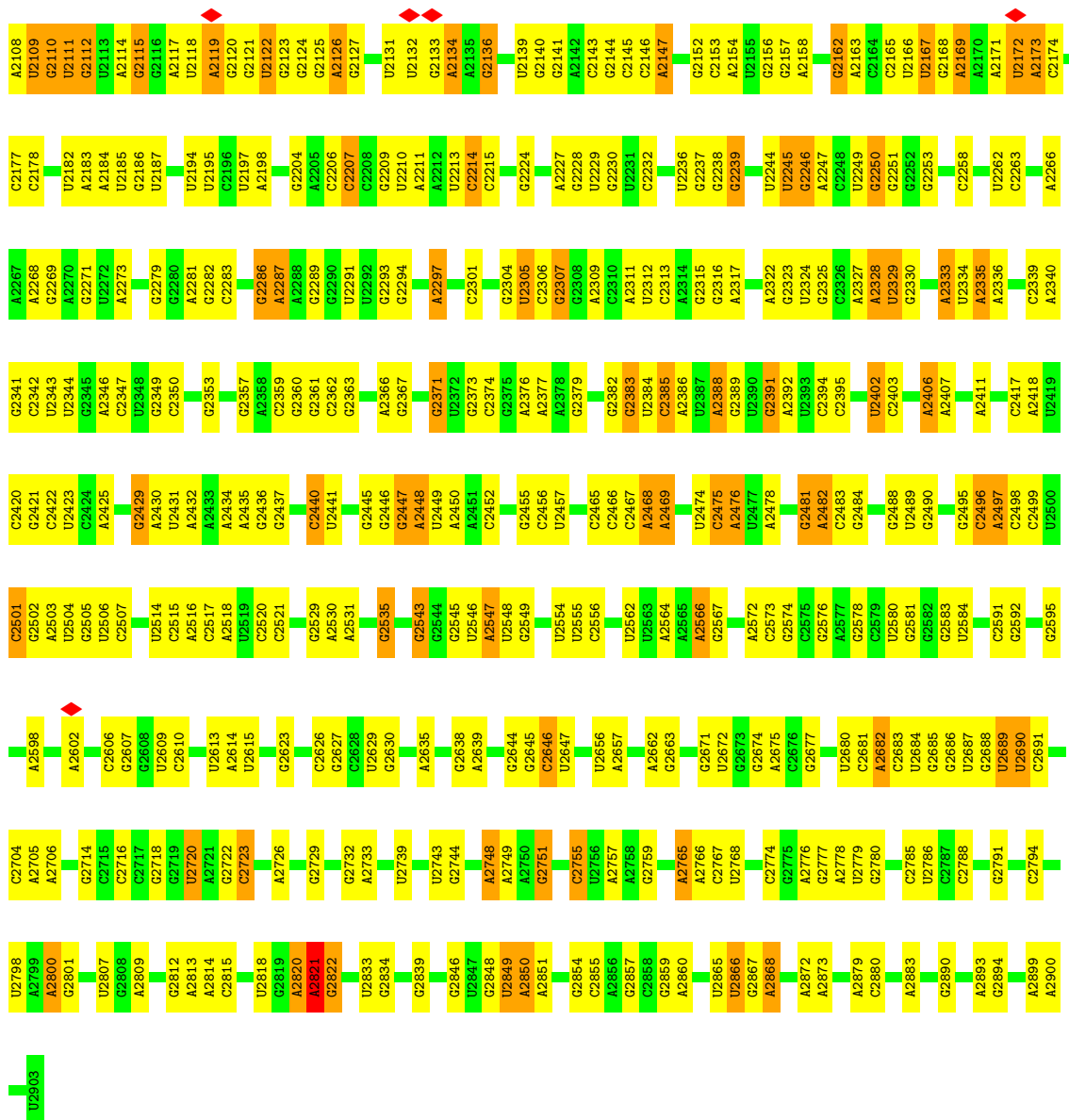
3 Residue-property plots

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.

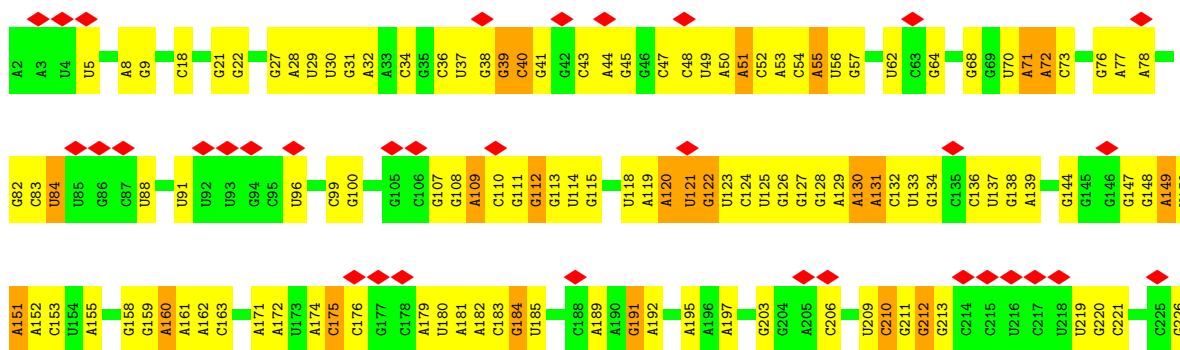
• Molecule 1: 23S ribosomal RNA

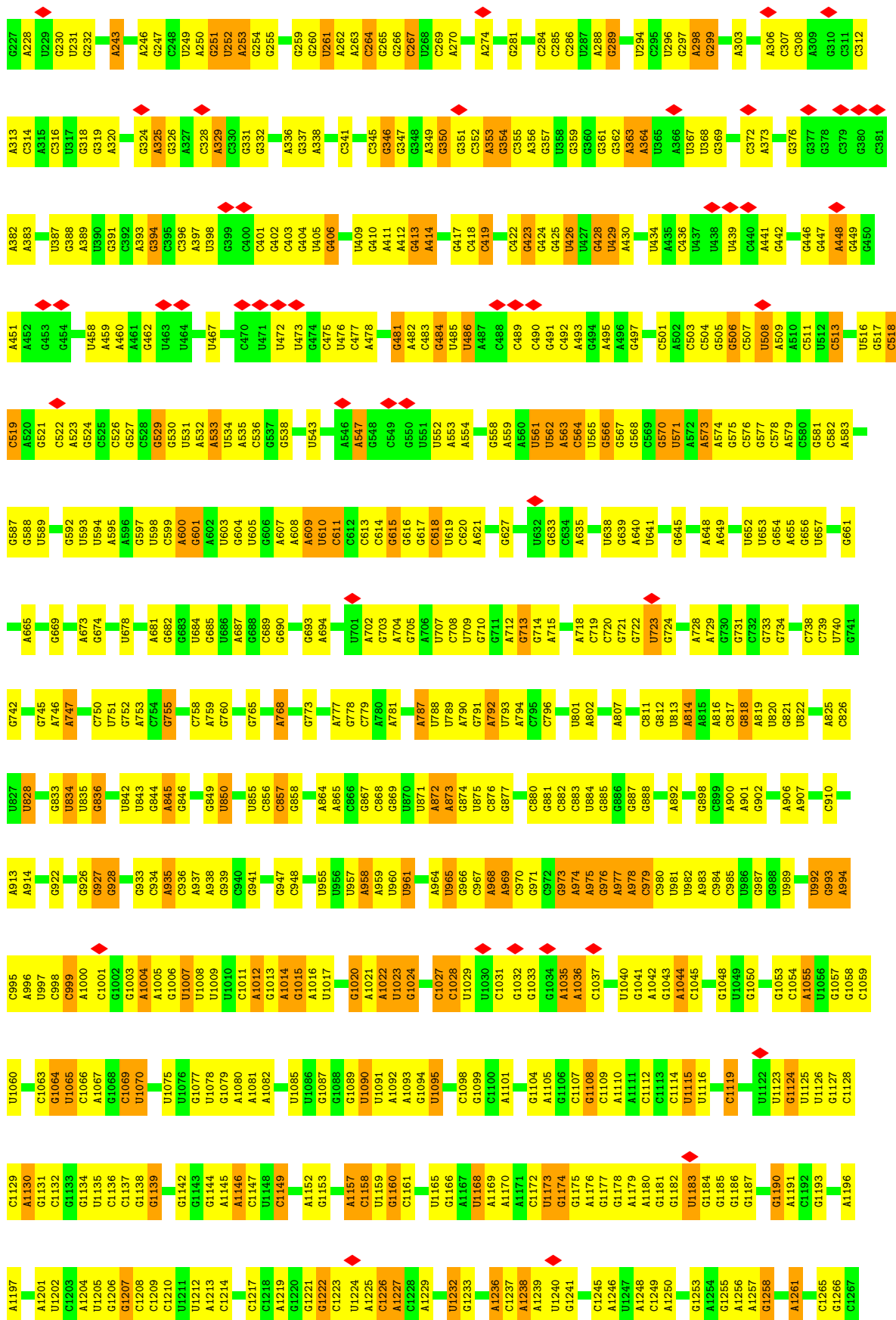


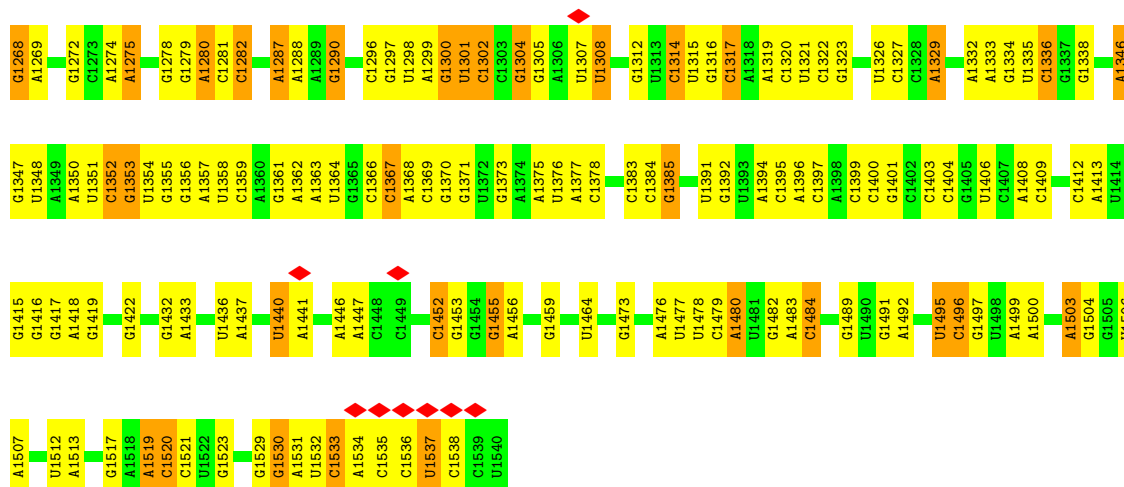
A2033	A1937	A1745	G1661	A1570	G1477	U1396	U1316	A1287	G914
U2034	A1938	A1749	U1662	A1571	G1478	U1397	G1317	G1238	C915
C2035	U1939	G1750	G1663	C1574	U1481	C1398	U1318	G1239	G916
C2036	U1940	U1751	A1664	C1575	U1482	U1400	A1322	A1240	A917
A2037	C1941	G1752	A1665	G1483	G1483	G1401	C1323	U1081	U918
G2038	C1942	G1753	G1667	G1581	G1490	U1402	G1324	U1082	U919
U2039	U1943	A1754	A1668	C1582	A1490	A1403	A1246	A1083	C922
C2043	G1948	A1755	A1669	A1583	U1496	C1404	A1247	C1005	
C2044		G1756	A1670	A1584	A1497	A1405	G1325	A1084	C922
G2045	U1955	A1757	U1671	C1585	U1497	U1406	U1248	A1085	U931
G2046	U1956	G1758	A1672	A1588	C1498	U1406	G1326	A1086	U932
C2047	C1947	U1759	G1673	A1593	C1498	C1330	G1327	G1087	A933
G2048	C1955	C1760	G1674	U1594	A1499	A1415	A1328	A1088	U934
G1959	U1960	G1845	C1675	A1596	G1500	G1416	A1329	A1089	U935
C2050	A1960	G1846	G1675	A1597	U1506	C1417	C1330	A1090	C936
A2051		C1764	G1681	A1598	U1507	A1420	G1331	G1012	A936
A2052	G1964	G1767	G1682	A1599	C1507	A1421	G1332	G1016	
C2055	G1966	C1768	U1683	A1603	A1508	G1423	G1338	A1021	G940
G2056	C1967	A1772	G1684	A1607	A1509	G1424	G1341	G1093	A941
A2060	U1969	A1773	C1685	C1608	U1513	G1425	A1342	G1094	A942
G2061	A1970	U1774	C1686	A1616	G1514	G1426	G1343	G1095	A943
A2062	U1971	A1780	G1687	C1617	A1515	A1427	A1344	A1096	C944
C2063	U1972	U1781	U1688	A1618	G1516	G1428	C1345	A1097	A945
G1973	G1973		U1689	C1612	U1519	G1429	A1346	A1098	C946
C1974	C1974	A1784	A1698	G1613	U1520	G1430	G1347	U1033	A947
C2065	G1975	A1785	G1699	A1616	U1521	A1431	C1348	A1039	C948
C2066	U1976	U1788	C1700	C1617	A1522	G1432	C1349	G1040	
G2067	A1977	C1788	A1701	A1618	U1523	A1433	C1351	G1041	G954
U2068	G1980	A1789	G1702	A1626	G1524	A1434	A1353	G1042	U955
C2069	U1980	C1790	A1705	A1626	A1528	C1437	A1354	C1045	G956
A2071	A1981	U1791	C1706	G1627	A1528	U1438	G1355	A1046	C957
C2072	U1982	C1792	U1707	G1628	U1532	C1447	G1356	A1047	A959
C2073	U1991	G1793	A1710	A1630	C1532	G1448	C1357	A1048	C961
U2074	U1991	C1795	G1711	A1636	C1533	G1449	U1371	A1049	
U2075	U1995	U1796	U1712	A1636	U1534	G1450	A1360	A1050	
U2076	C1904	G1797	A1713	U1636	A1535	C1451	U1374	C1053	G964
A2077	C1905	U1798	U1714	A1639	C1536	G1452	A1365	G1125	C965
C2078	U1997	G1799	G1715	A1640	U1542	A1453	U1370	A1054	G966
U2079	A1998	C1800	U1715	A1640	G1542	C1454	G1371	G1055	U967
A2080	C2000	A1801	G1723	A1643	A1544	G1455	A1374	G1056	C968
A2081	A2009	A1802	G1724	C1644	A1551	U1457	G1374	A1057	G969
A2082	G2012	A1803	U1725	G1645	A1552	U1458	U1379	U1058	U970
G2083	A2013	C1804	C1726	C1646	A1552	U1458	G1380	U1059	A972
A2090	A2014	A1805	C1727	U1647	G1555	C1461	A1383	G1063	G974
C2091	A2015	A1808	C1728	A1649	C1558	G1465	U1386	G1064	G976
U2092	U2016	A1809	U1729	A1650	U1559	U1466	G1387	U1065	A980
A2095		A1810	G1731	A1651	G1560	U1467	A1387	U1066	A981
U2098	U2022	A1811	C1732	G1652	C1561	U1468	G1388	A1067	C982
U2099	C2023	C1816	G1733	A1654	U1562	A1469	G1389	G1068	A983
G2100	U2028	U1817	G1734	A1654	U1563	A1470	U1390	A1069	A984
U2105	C2029	U1818	U1735	U1657	U1563	G1473	U1391	A1070	
U2106	A2031	U1819	G1737	C1658	A1566	U1474	A1392	G1071	A988
G2107	G2032	U1820	A1738	G1659	G1567	U1475	A1393	C1072	G989
		G1823	U1739	G1660	U1569	U1476	U1394	A1073	A990
							A1395	G1074	C991
								C1075	



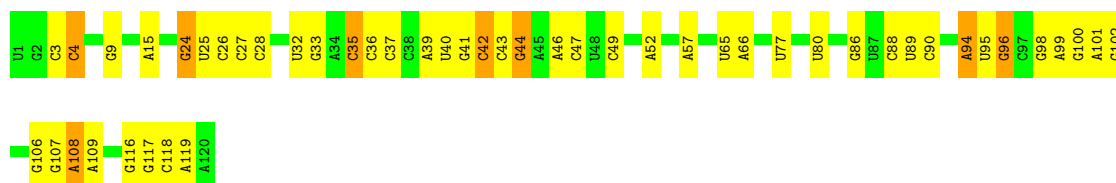
• Molecule 2: 16S ribosomal RNA



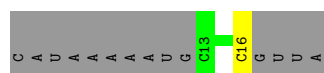




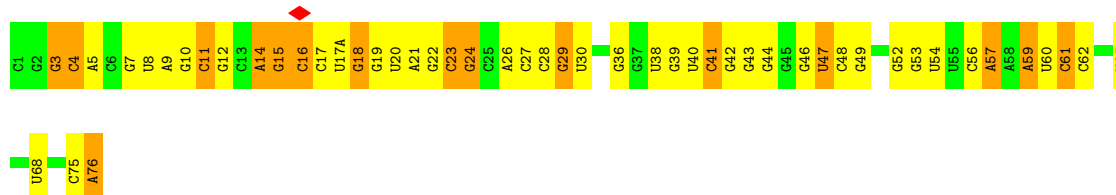
• Molecule 3: 5S ribosomal RNA



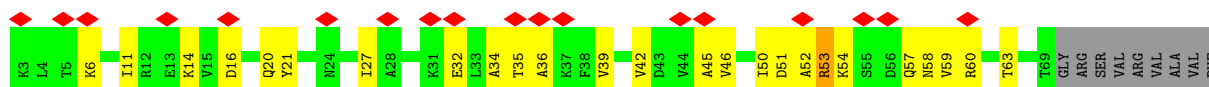
• Molecule 4: mRNA

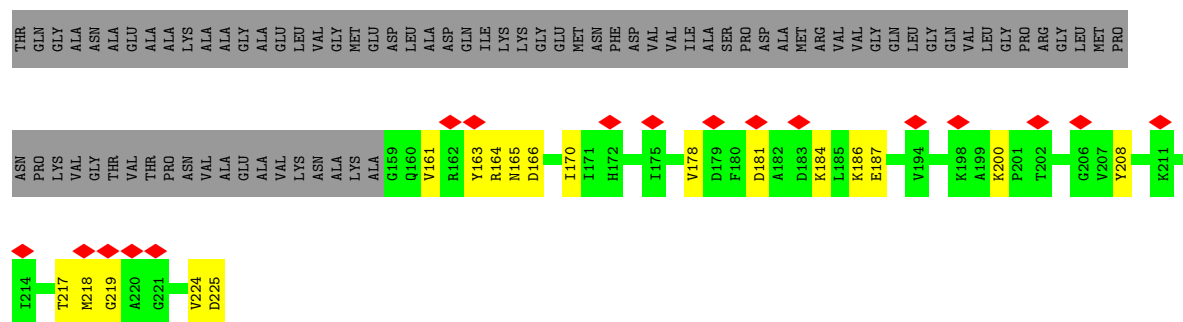


• Molecule 5: tRNA^{ProL} (GGG)

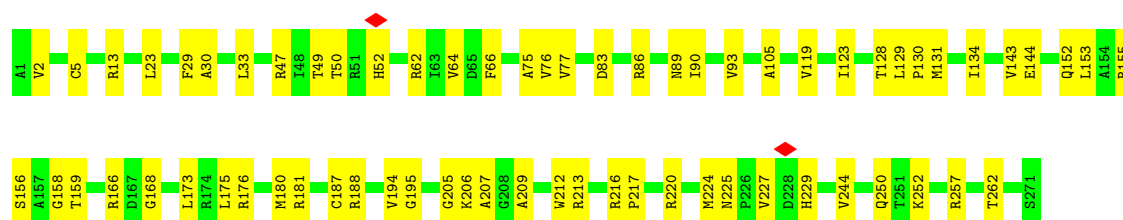
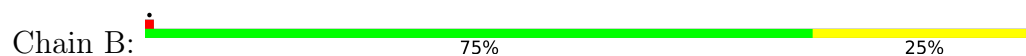


• Molecule 6: Large ribosomal subunit protein uL1

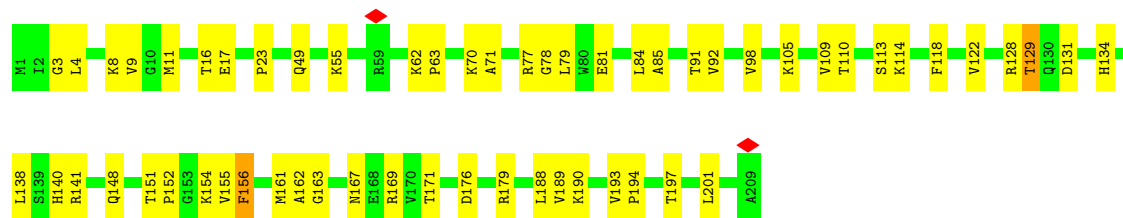




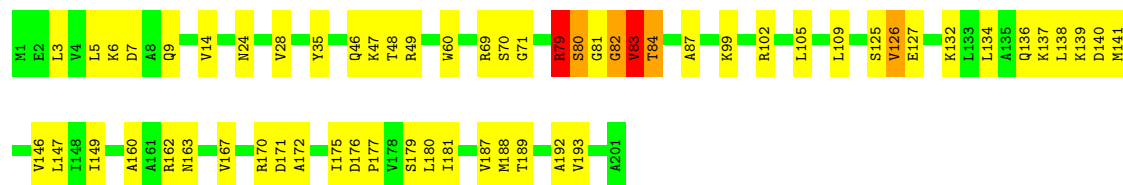
• Molecule 7: 50S ribosomal protein L2



• Molecule 8: 50S ribosomal protein L3

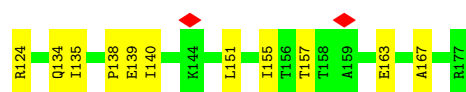


• Molecule 9: 50S ribosomal protein L4



• Molecule 10: 50S ribosomal protein L5





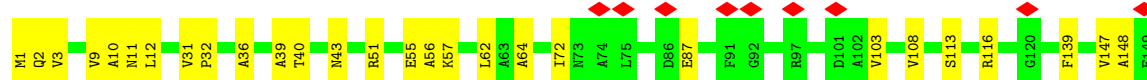
- Molecule 11: Large ribosomal subunit protein uL6

Chain F: 74% 26%



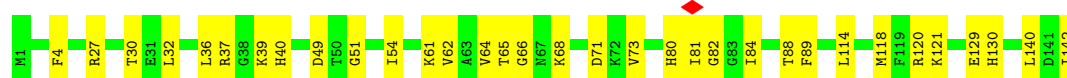
- Molecule 12: Large ribosomal subunit protein bL9

Chain G: 6% 81% 19%



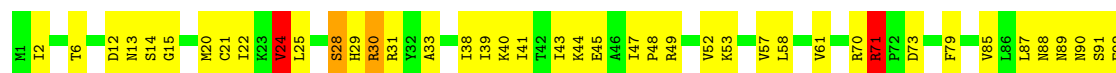
- Molecule 13: 50S ribosomal protein L13

Chain J: 77% 23%



- Molecule 14: 50S ribosomal protein L14

Chain K: 58% 39% ..




- Molecule 15: 50S ribosomal protein L15

Chain L: 66% 32% ..



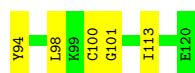
- Molecule 16: 50S ribosomal protein L16

Chain M:  78% 21%



- Molecule 17: Large ribosomal subunit protein bL17

Chain N:  64% 35%




- Molecule 18: 50S ribosomal protein L18

Chain O:  74% 25%



- Molecule 19: 50S ribosomal protein L19

Chain P:  78% 22%




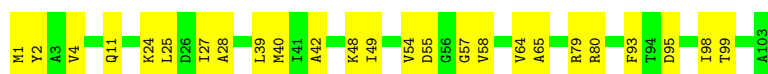
- Molecule 20: Large ribosomal subunit protein bL20

Chain Q:  73% 26%



- Molecule 21: Ribosomal protein L21

Chain R:  76% 24%

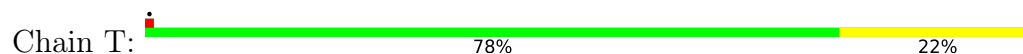


- Molecule 22: 50S ribosomal protein L22

Chain S:  75% 23%



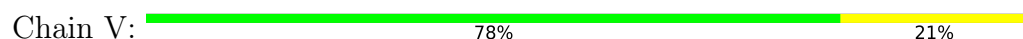
- Molecule 23: Large ribosomal subunit protein uL23



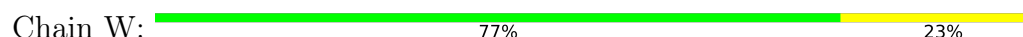
- Molecule 24: Large ribosomal subunit protein uL24



- Molecule 25: 50S ribosomal protein L25



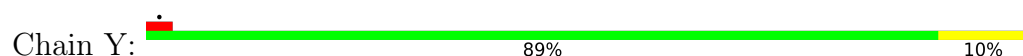
- Molecule 26: 50S ribosomal protein L27




- Molecule 27: 50S ribosomal protein L28

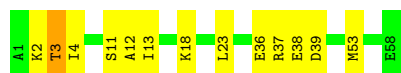


- Molecule 28: 50S ribosomal protein L29



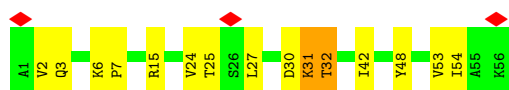
- Molecule 29: 50S ribosomal protein L30

Chain Z:  78% 21% .




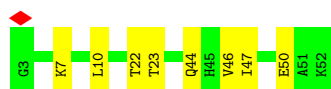
- Molecule 30: 50S ribosomal protein L32

Chain b:  5% 73% 23% .




- Molecule 31: 50S ribosomal protein L33

Chain c:  84% 16%



- Molecule 32: 50S ribosomal protein L34

Chain d:  78% 22%



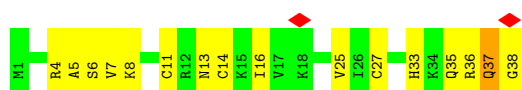
- Molecule 33: 50S ribosomal protein L35

Chain e:  73% 20% . .




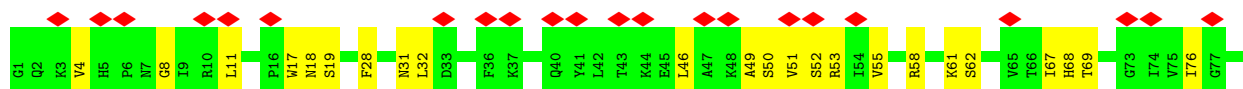
- Molecule 34: 50S ribosomal protein L36

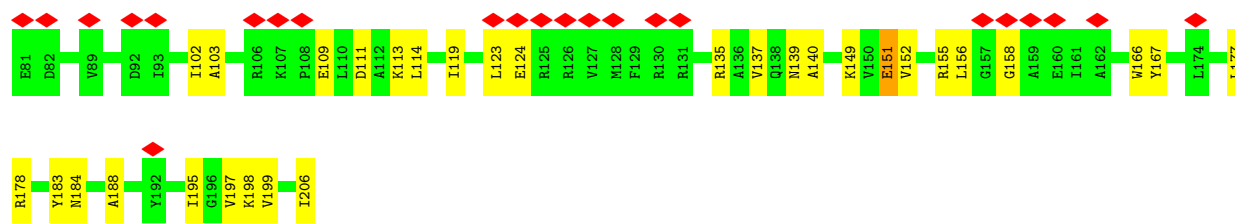
Chain f:  5% 58% 39% .



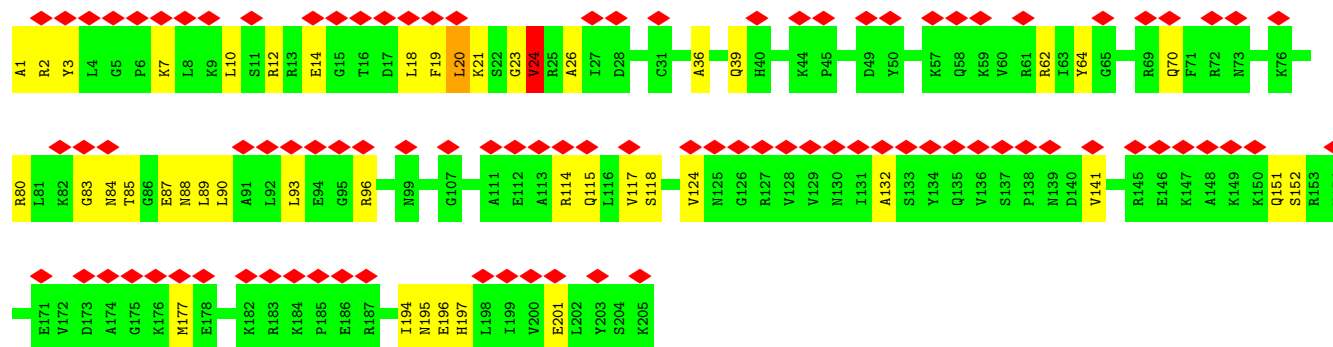
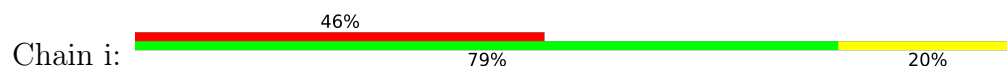
- Molecule 35: Small ribosomal subunit protein uS3

Chain h:  22% 74% 26%

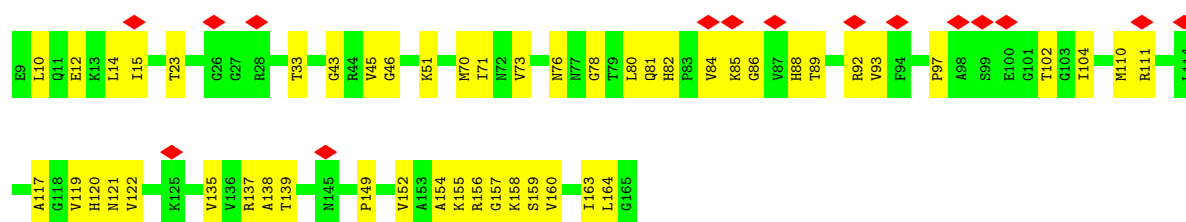




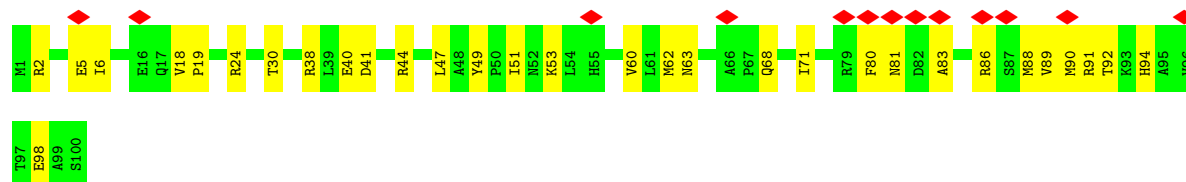
• Molecule 36: 30S ribosomal protein S4



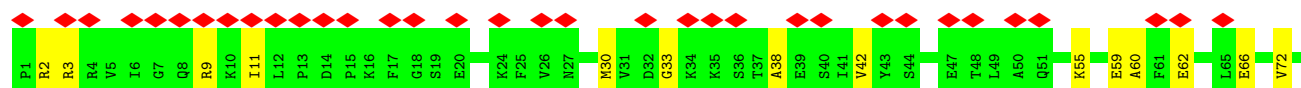
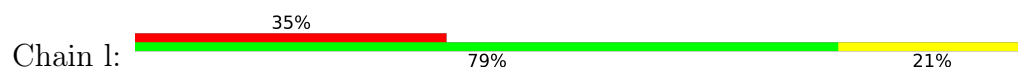
• Molecule 37: 30S ribosomal protein S5

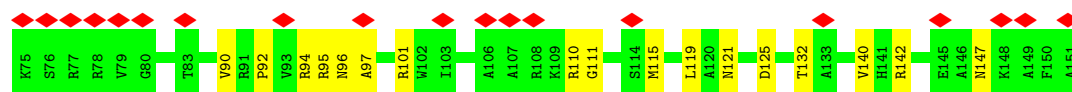


• Molecule 38: 30S ribosomal protein S6, non-modified isoform

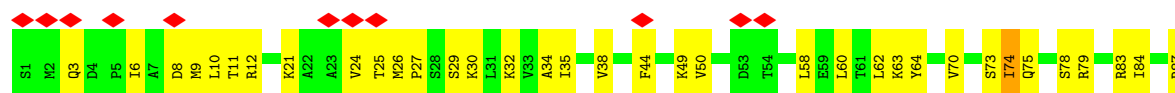


• Molecule 39: 30S ribosomal protein S7





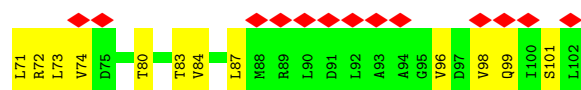
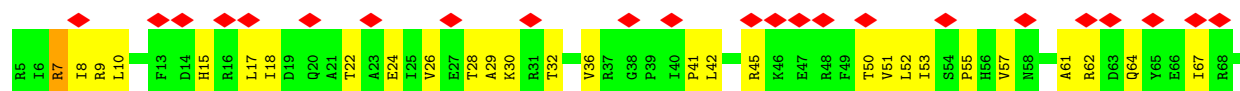
- Molecule 40: 30S ribosomal protein S8



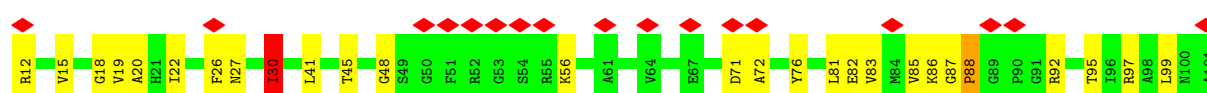
- Molecule 41: Small ribosomal subunit protein uS9



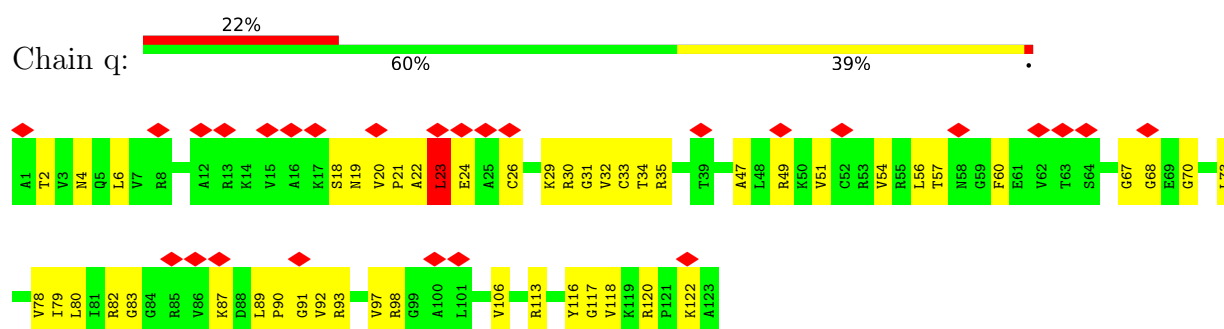
- Molecule 42: 30S ribosomal protein S10



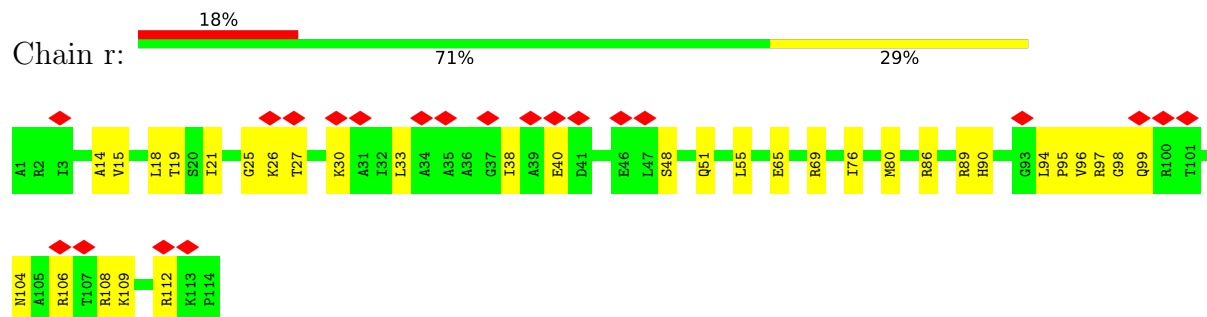
- Molecule 43: Small ribosomal subunit protein uS11



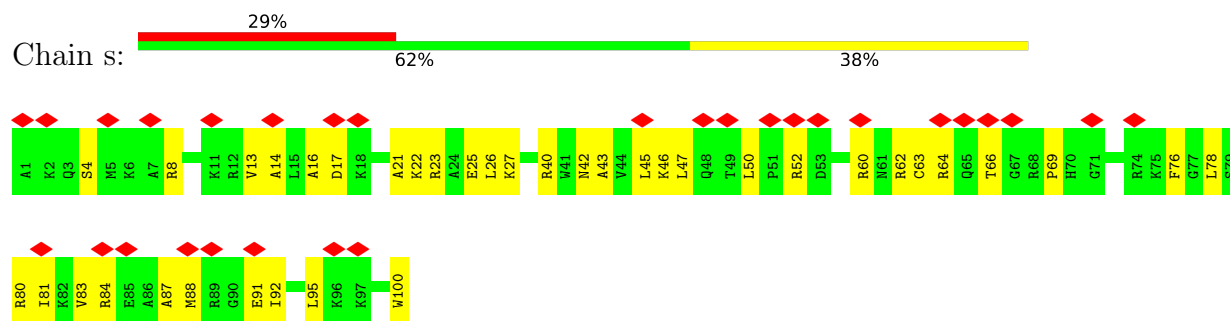
- Molecule 44: Small ribosomal subunit protein uS12



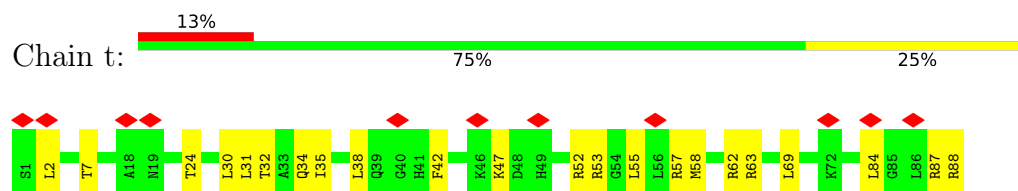
- Molecule 45: 30S ribosomal protein S13



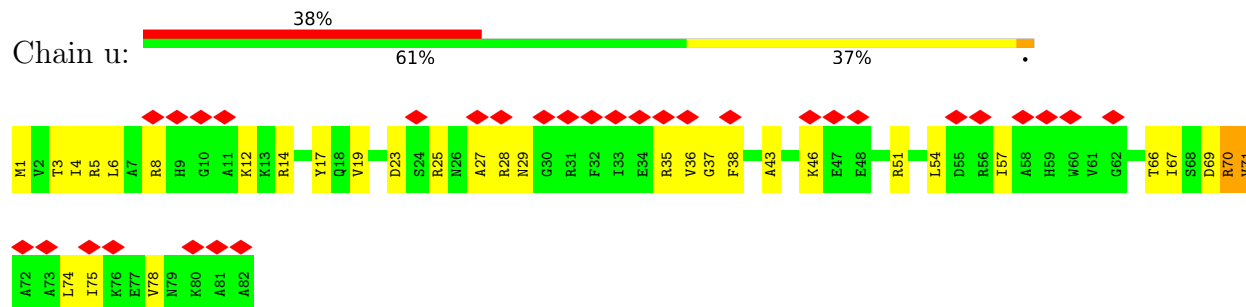
- Molecule 46: Small ribosomal subunit protein uS14



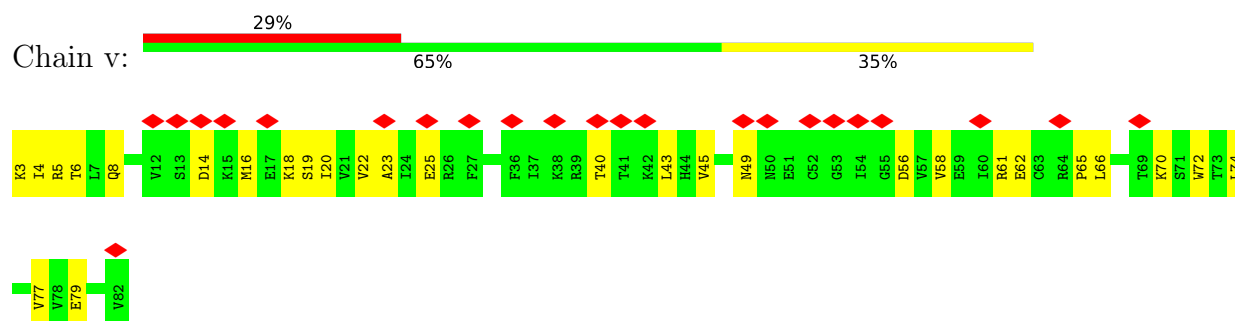
- Molecule 47: 30S ribosomal protein S15



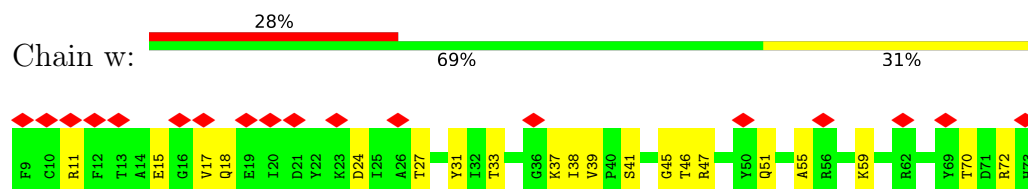
- Molecule 48: 30S ribosomal protein S16



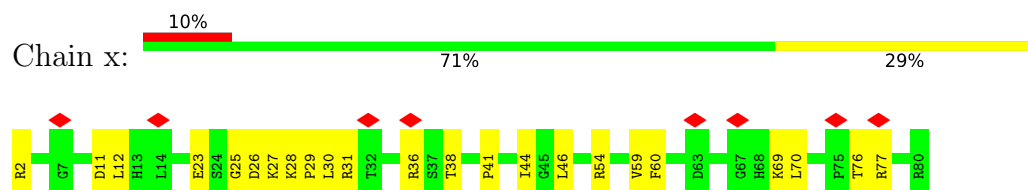
- Molecule 49: 30S ribosomal protein S17



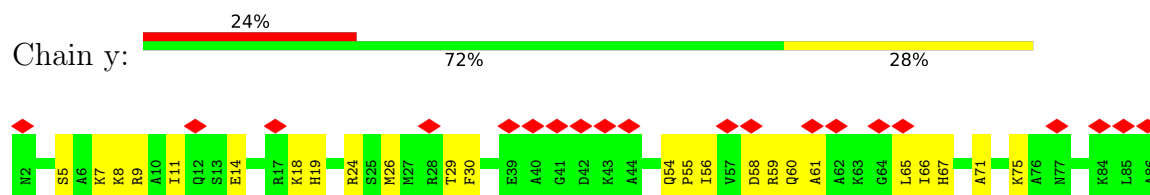
- Molecule 50: 30S ribosomal protein S18



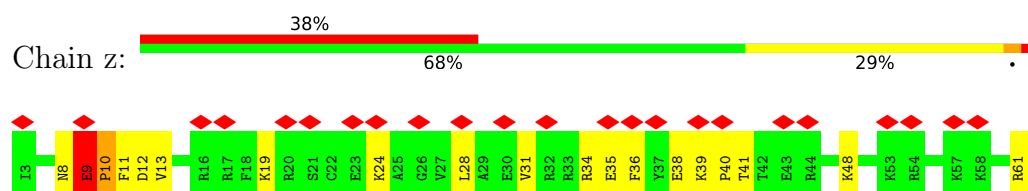
- Molecule 51: 30S ribosomal protein S19



- Molecule 52: 30S ribosomal protein S20



- Molecule 53: Small ribosomal subunit protein bS21



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	44717	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	56.07	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.027	Depositor
Minimum map value	-0.015	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.0027	Depositor
Map size (\AA)	547.3792, 547.3792, 547.3792	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.0691, 1.0691, 1.0691	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	1	0.28	0/69796	0.39	15/108888 (0.0%)
2	2	0.22	0/36963	0.38	2/57662 (0.0%)
3	3	0.21	0/2872	0.28	0/4479
4	4	0.25	0/87	0.51	0/132
5	5	0.39	0/1841	0.69	3/2870 (0.1%)
6	A	0.22	0/1034	0.58	1/1387 (0.1%)
7	B	0.45	0/2122	0.57	0/2852
8	C	0.56	2/1586 (0.1%)	0.59	2/2134 (0.1%)
9	D	0.65	0/1571	0.62	3/2113 (0.1%)
10	E	0.44	0/1435	0.59	2/1926 (0.1%)
11	F	0.41	0/1343	0.52	0/1816
12	G	0.21	0/1122	0.41	0/1515
13	J	0.46	1/1152 (0.1%)	0.50	1/1551 (0.1%)
14	K	0.55	0/948	0.76	4/1268 (0.3%)
15	L	0.82	3/1054 (0.3%)	0.85	4/1403 (0.3%)
16	M	0.46	0/1093	0.57	1/1460 (0.1%)
17	N	0.64	2/974 (0.2%)	0.64	1/1301 (0.1%)
18	O	0.56	0/902	0.76	4/1209 (0.3%)
19	P	0.33	0/929	0.46	0/1242
20	Q	0.79	2/960 (0.2%)	0.62	2/1278 (0.2%)
21	R	0.35	0/829	0.46	0/1107
22	S	0.77	4/864 (0.5%)	0.65	4/1156 (0.3%)
23	T	0.43	0/745	0.55	0/994
24	U	0.52	1/788 (0.1%)	0.55	0/1051
25	V	0.34	0/766	0.44	0/1025
26	W	0.34	0/582	0.42	0/769
27	X	0.71	0/635	0.71	2/848 (0.2%)
28	Y	0.46	0/510	0.61	2/677 (0.3%)
29	Z	0.44	0/453	0.59	0/605
30	b	0.51	0/450	0.69	1/599 (0.2%)
31	c	0.30	0/417	0.40	0/554
32	d	0.43	0/380	0.55	0/498

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	e	0.62	0/513	0.84	4/676 (0.6%)
34	f	0.33	0/303	0.53	0/397
35	h	0.36	0/1652	0.49	1/2225 (0.0%)
36	i	0.31	0/1665	0.57	3/2227 (0.1%)
37	j	0.33	0/1170	0.55	1/1573 (0.1%)
38	k	0.22	0/836	0.46	0/1128
39	l	0.24	0/1196	0.46	0/1602
40	m	0.30	0/989	0.55	0/1326
41	n	0.32	0/1034	0.67	4/1375 (0.3%)
42	o	0.27	0/797	0.53	2/1077 (0.2%)
43	p	0.40	0/886	0.77	4/1195 (0.3%)
44	q	0.39	0/969	0.58	1/1300 (0.1%)
45	r	0.21	0/893	0.46	0/1193
46	s	0.21	0/817	0.43	0/1088
47	t	0.23	0/722	0.40	0/964
48	u	0.42	0/659	0.77	5/884 (0.6%)
49	v	0.20	0/658	0.48	0/881
50	w	0.21	0/545	0.38	0/731
51	x	0.17	0/653	0.42	0/877
52	y	0.45	0/671	0.54	0/888
53	z	0.33	0/551	0.65	1/728 (0.1%)
All	All	0.33	15/155382 (0.0%)	0.44	80/232704 (0.0%)

The worst 5 of 15 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	L	38	GLN	CA-C	-6.55	1.44	1.52
20	Q	45	ALA	CA-C	-6.51	1.44	1.52
8	C	128	ARG	CA-C	-6.48	1.45	1.52
17	N	82	GLU	CA-C	-6.30	1.47	1.52
20	Q	47	ARG	CA-C	-6.22	1.44	1.52

The worst 5 of 80 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	1780	A	C2'-C3'-O3'	11.41	126.62	109.50
6	A	53	ARG	N-CA-C	-11.27	100.31	112.93
15	L	5	THR	N-CA-C	10.74	124.06	111.71
48	u	69	ASP	N-CA-C	9.68	121.43	111.07
37	j	155	LYS	N-CA-C	9.56	121.30	111.07

There are no chirality outliers.

There are no planarity outliers.

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	1	62317	0	31346	836	0
2	2	33012	0	16618	617	0
3	3	2568	0	1303	29	0
4	4	80	0	45	0	0
5	5	1648	0	834	18	0
6	A	1027	0	1092	39	0
7	B	2083	0	2157	58	0
8	C	1565	0	1616	47	0
9	D	1552	0	1619	44	0
10	E	1411	0	1447	49	0
11	F	1323	0	1374	30	0
12	G	1111	0	1148	21	0
13	J	1129	0	1162	26	0
14	K	939	0	1012	38	0
15	L	1045	0	1117	35	0
16	M	1074	0	1157	25	0
17	N	961	0	1000	29	0
18	O	892	0	923	20	0
19	P	917	0	965	21	0
20	Q	947	0	1022	24	0
21	R	816	0	839	19	0
22	S	857	0	922	21	0
23	T	739	0	807	16	0
24	U	780	0	834	18	0
25	V	753	0	780	19	0
26	W	575	0	592	11	0
27	X	625	0	655	31	0
28	Y	509	0	543	3	0
29	Z	449	0	491	11	0
30	b	444	0	461	15	0
31	c	410	0	440	5	0
32	d	377	0	418	10	0
33	e	504	0	574	16	0
34	f	302	0	343	11	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
35	h	1625	0	1699	41	0
36	i	1643	0	1710	39	0
37	j	1157	0	1199	49	0
38	k	818	0	808	33	0
39	l	1182	0	1240	35	0
40	m	979	0	1034	45	0
41	n	1022	0	1070	45	0
42	o	787	0	828	37	0
43	p	870	0	878	32	0
44	q	955	0	1019	55	0
45	r	884	0	944	39	0
46	s	805	0	847	40	0
47	t	714	0	737	17	0
48	u	649	0	666	24	0
49	v	649	0	691	26	0
50	w	536	0	552	18	0
51	x	638	0	665	23	0
52	y	665	0	714	17	0
53	z	545	0	579	16	0
54	1	202	0	0	0	0
54	2	29	0	0	0	0
54	3	4	0	0	0	0
54	B	1	0	0	0	0
54	E	1	0	0	0	0
54	Q	1	0	0	0	0
54	b	1	0	0	0	0
55	1	103	0	0	21	0
55	2	279	0	0	86	0
55	3	2	0	0	0	0
55	4	1	0	0	0	0
55	5	2	0	0	0	0
55	A	13	0	0	9	0
55	C	1	0	0	2	0
55	D	2	0	0	1	0
55	E	5	0	0	0	0
55	F	2	0	0	0	0
55	G	10	0	0	2	0
55	M	1	0	0	2	0
55	P	1	0	0	1	0
55	c	1	0	0	0	0
55	h	10	0	0	6	0
55	i	11	0	0	9	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
55	j	1	0	0	1	0
55	k	9	0	0	14	0
55	l	21	0	0	12	0
55	m	9	0	0	4	0
55	n	9	0	0	3	0
55	o	11	0	0	11	0
55	p	4	0	0	1	0
55	q	5	0	0	1	0
55	r	8	0	0	7	0
55	s	1	0	0	0	0
55	t	3	0	0	1	0
55	u	8	0	0	1	0
55	v	4	0	0	4	0
55	w	8	0	0	3	0
55	x	4	0	0	4	0
55	z	3	0	0	0	0
All	All	143655	0	95536	2536	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 11.

The worst 5 of 2536 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)
10:E:19:PHE:CZ	10:E:167:ALA:HB2	1.60	1.36
2:2:99:C:H4'	55:2:1921:HOH:O	1.33	1.29
2:2:1336:C:H5''	55:2:1859:HOH:O	1.29	1.23
2:2:1336:C:H4'	55:2:1759:HOH:O	1.44	1.17
55:2:1761:HOH:O	50:w:15:GLU:HG2	1.44	1.17

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	
6	A	130/223 (58%)	122 (94%)	8 (6%)	0	100	100
7	B	269/271 (99%)	223 (83%)	45 (17%)	1 (0%)	30	59
8	C	207/209 (99%)	177 (86%)	28 (14%)	2 (1%)	12	40
9	D	199/201 (99%)	167 (84%)	29 (15%)	3 (2%)	8	30
10	E	175/177 (99%)	150 (86%)	25 (14%)	0	100	100
11	F	174/176 (99%)	162 (93%)	11 (6%)	1 (1%)	21	50
12	G	147/149 (99%)	138 (94%)	9 (6%)	0	100	100
13	J	140/142 (99%)	121 (86%)	18 (13%)	1 (1%)	18	47
14	K	120/122 (98%)	101 (84%)	17 (14%)	2 (2%)	7	28
15	L	141/143 (99%)	111 (79%)	26 (18%)	4 (3%)	4	19
16	M	134/136 (98%)	115 (86%)	17 (13%)	2 (2%)	8	30
17	N	118/120 (98%)	96 (81%)	22 (19%)	0	100	100
18	O	114/116 (98%)	103 (90%)	11 (10%)	0	100	100
19	P	112/114 (98%)	102 (91%)	10 (9%)	0	100	100
20	Q	115/117 (98%)	107 (93%)	8 (7%)	0	100	100
21	R	101/103 (98%)	89 (88%)	12 (12%)	0	100	100
22	S	108/110 (98%)	95 (88%)	13 (12%)	0	100	100
23	T	91/93 (98%)	80 (88%)	11 (12%)	0	100	100
24	U	100/102 (98%)	87 (87%)	13 (13%)	0	100	100
25	V	92/94 (98%)	83 (90%)	8 (9%)	1 (1%)	11	38
26	W	73/75 (97%)	63 (86%)	10 (14%)	0	100	100
27	X	75/77 (97%)	64 (85%)	10 (13%)	1 (1%)	9	33
28	Y	61/63 (97%)	57 (93%)	4 (7%)	0	100	100
29	Z	56/58 (97%)	54 (96%)	2 (4%)	0	100	100
30	b	54/56 (96%)	47 (87%)	7 (13%)	0	100	100
31	c	48/50 (96%)	45 (94%)	3 (6%)	0	100	100
32	d	44/46 (96%)	38 (86%)	6 (14%)	0	100	100
33	e	62/64 (97%)	52 (84%)	8 (13%)	2 (3%)	3	17
34	f	36/38 (95%)	28 (78%)	7 (19%)	1 (3%)	4	19
35	h	204/206 (99%)	187 (92%)	17 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
36	i	203/205 (99%)	182 (90%)	21 (10%)	0	100	100
37	j	155/157 (99%)	134 (86%)	20 (13%)	1 (1%)	21	50
38	k	98/100 (98%)	86 (88%)	12 (12%)	0	100	100
39	l	149/151 (99%)	144 (97%)	5 (3%)	0	100	100
40	m	127/129 (98%)	111 (87%)	16 (13%)	0	100	100
41	n	125/127 (98%)	112 (90%)	13 (10%)	0	100	100
42	o	96/98 (98%)	77 (80%)	19 (20%)	0	100	100
43	p	114/116 (98%)	99 (87%)	13 (11%)	2 (2%)	6	26
44	q	121/123 (98%)	93 (77%)	27 (22%)	1 (1%)	16	44
45	r	112/114 (98%)	97 (87%)	15 (13%)	0	100	100
46	s	98/100 (98%)	90 (92%)	8 (8%)	0	100	100
47	t	86/88 (98%)	77 (90%)	9 (10%)	0	100	100
48	u	80/82 (98%)	71 (89%)	9 (11%)	0	100	100
49	v	78/80 (98%)	60 (77%)	18 (23%)	0	100	100
50	w	63/65 (97%)	59 (94%)	4 (6%)	0	100	100
51	x	77/79 (98%)	64 (83%)	12 (16%)	1 (1%)	9	33
52	y	83/85 (98%)	78 (94%)	5 (6%)	0	100	100
53	z	63/65 (97%)	47 (75%)	14 (22%)	2 (3%)	3	17
All	All	5428/5615 (97%)	4745 (87%)	655 (12%)	28 (0%)	26	54

5 of 28 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
14	K	25	LEU
16	M	27	SER
33	e	27	ASN
53	z	9	GLU
7	B	5	CYS

5.3.2 Protein sidechains ⓘ

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	
6	A	110/174 (63%)	109 (99%)	1 (1%)	70	76
7	B	216/216 (100%)	214 (99%)	2 (1%)	70	76
8	C	164/164 (100%)	163 (99%)	1 (1%)	78	80
9	D	165/165 (100%)	161 (98%)	4 (2%)	43	62
10	E	148/148 (100%)	147 (99%)	1 (1%)	76	78
11	F	137/137 (100%)	134 (98%)	3 (2%)	45	63
12	G	114/114 (100%)	114 (100%)	0	100	100
13	J	116/116 (100%)	116 (100%)	0	100	100
14	K	103/103 (100%)	101 (98%)	2 (2%)	50	66
15	L	102/102 (100%)	101 (99%)	1 (1%)	68	75
16	M	109/109 (100%)	108 (99%)	1 (1%)	70	76
17	N	100/100 (100%)	100 (100%)	0	100	100
18	O	86/86 (100%)	85 (99%)	1 (1%)	63	72
19	P	99/99 (100%)	99 (100%)	0	100	100
20	Q	89/89 (100%)	89 (100%)	0	100	100
21	R	84/84 (100%)	83 (99%)	1 (1%)	63	72
22	S	93/93 (100%)	92 (99%)	1 (1%)	65	74
23	T	80/80 (100%)	80 (100%)	0	100	100
24	U	83/83 (100%)	82 (99%)	1 (1%)	63	72
25	V	78/78 (100%)	78 (100%)	0	100	100
26	W	57/57 (100%)	57 (100%)	0	100	100
27	X	67/67 (100%)	64 (96%)	3 (4%)	24	51
28	Y	55/55 (100%)	54 (98%)	1 (2%)	51	67
29	Z	48/48 (100%)	47 (98%)	1 (2%)	47	64
30	b	47/47 (100%)	46 (98%)	1 (2%)	47	64
31	c	45/45 (100%)	45 (100%)	0	100	100
32	d	38/38 (100%)	38 (100%)	0	100	100
33	e	51/51 (100%)	47 (92%)	4 (8%)	11	37
34	f	34/34 (100%)	34 (100%)	0	100	100
35	h	170/170 (100%)	168 (99%)	2 (1%)	63	72
36	i	172/172 (100%)	169 (98%)	3 (2%)	53	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	j	119/119 (100%)	119 (100%)	0	100	100
38	k	87/87 (100%)	87 (100%)	0	100	100
39	l	124/124 (100%)	124 (100%)	0	100	100
40	m	104/104 (100%)	102 (98%)	2 (2%)	50	66
41	n	105/105 (100%)	102 (97%)	3 (3%)	37	60
42	o	86/86 (100%)	86 (100%)	0	100	100
43	p	89/89 (100%)	87 (98%)	2 (2%)	45	63
44	q	103/103 (100%)	103 (100%)	0	100	100
45	r	92/92 (100%)	92 (100%)	0	100	100
46	s	83/83 (100%)	83 (100%)	0	100	100
47	t	76/76 (100%)	76 (100%)	0	100	100
48	u	65/65 (100%)	64 (98%)	1 (2%)	57	69
49	v	74/74 (100%)	74 (100%)	0	100	100
50	w	56/56 (100%)	56 (100%)	0	100	100
51	x	70/70 (100%)	70 (100%)	0	100	100
52	y	65/65 (100%)	65 (100%)	0	100	100
53	z	55/55 (100%)	54 (98%)	1 (2%)	51	67
All	All	4513/4577 (99%)	4469 (99%)	44 (1%)	65	75

5 of 44 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
33	e	32	LEU
40	m	74	ILE
33	e	33	THR
36	i	19	PHE
41	n	54	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 56 such sidechains are listed below:

Mol	Chain	Res	Type
26	W	8	ASN
51	x	13	HIS
32	d	26	ASN
50	w	73	HIS

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Mol	Chain	Res	Type
44	q	45	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	2902/2903 (99%)	621 (21%)	32 (1%)
2	2	1538/1539 (99%)	401 (26%)	16 (1%)
3	3	119/120 (99%)	16 (13%)	0
4	4	3/18 (16%)	1 (33%)	0
5	5	76/77 (98%)	41 (53%)	5 (6%)
All	All	4638/4657 (99%)	1080 (23%)	53 (1%)

5 of 1080 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	10	A
1	1	12	U
1	1	15	G
1	1	34	U
1	1	42	A

5 of 53 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	1	2468	A
2	2	55	A
5	5	47	U
1	1	2481	G
2	2	30	U

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 239 ligands modelled in this entry, 239 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

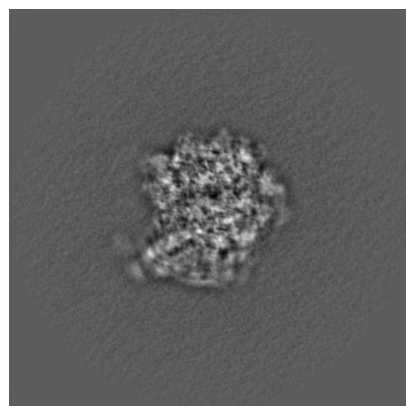
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43535. These allow visual inspection of the internal detail of the map and identification of artifacts.

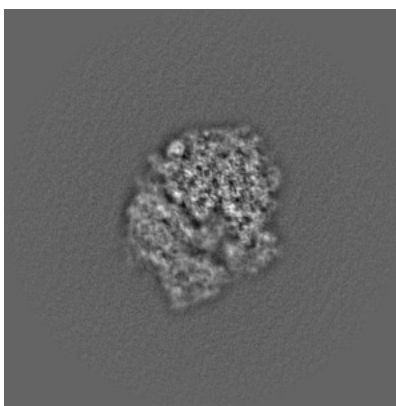
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

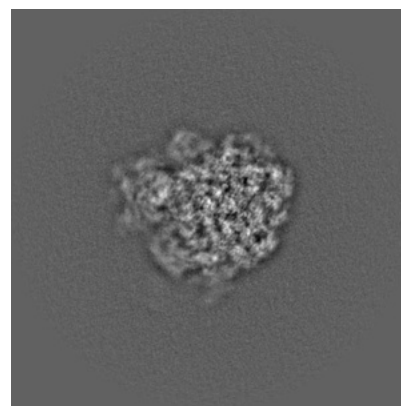
6.1.1 Primary map



X

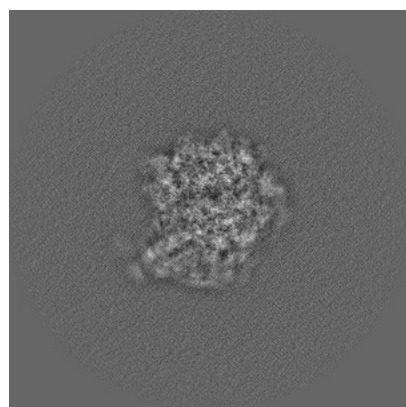


Y

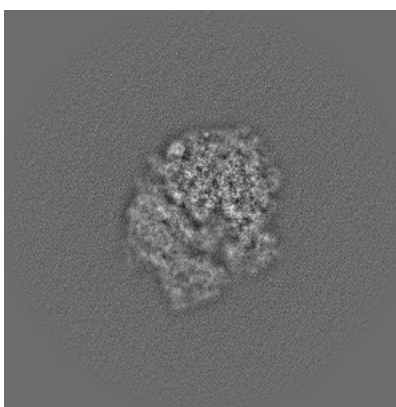


Z

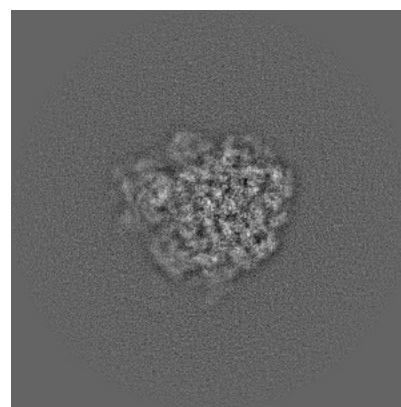
6.1.2 Raw map



X



Y

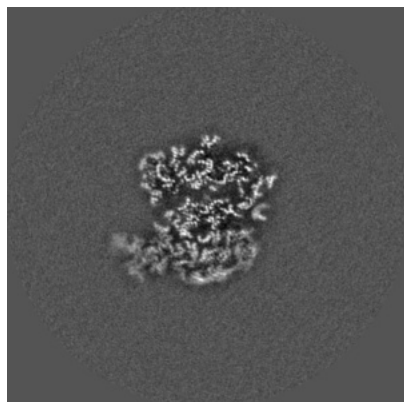


Z

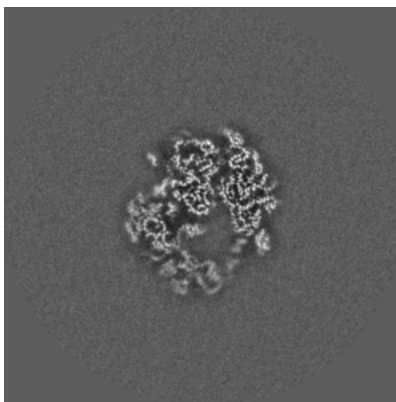
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

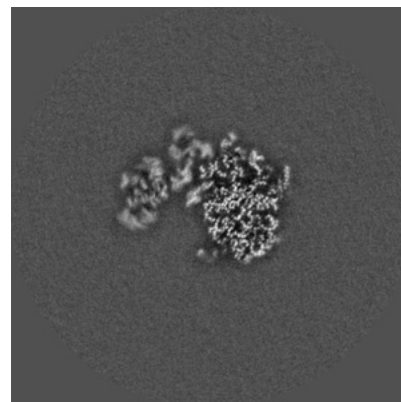
6.2.1 Primary map



X Index: 256

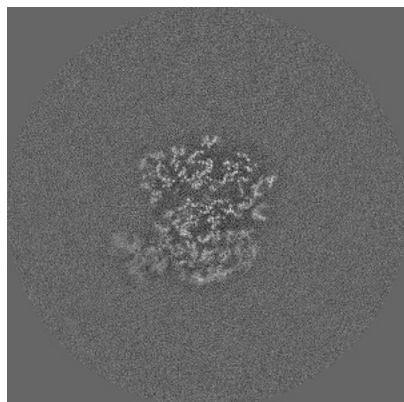


Y Index: 256

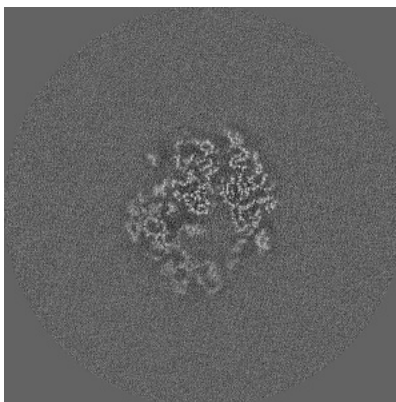


Z Index: 256

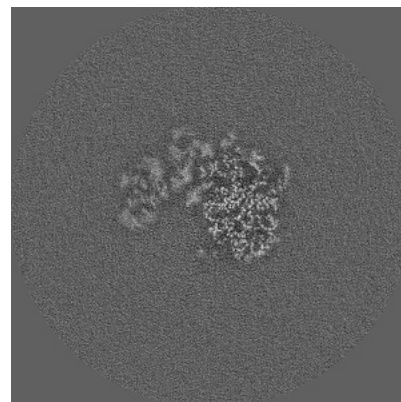
6.2.2 Raw map



X Index: 256



Y Index: 256

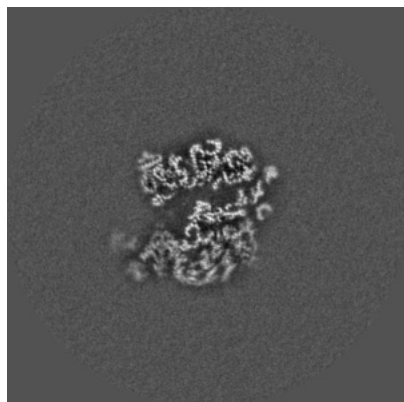


Z Index: 256

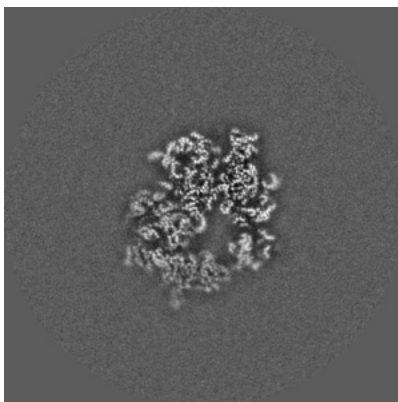
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

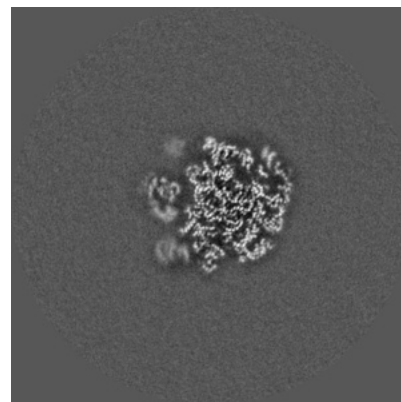
6.3.1 Primary map



X Index: 250

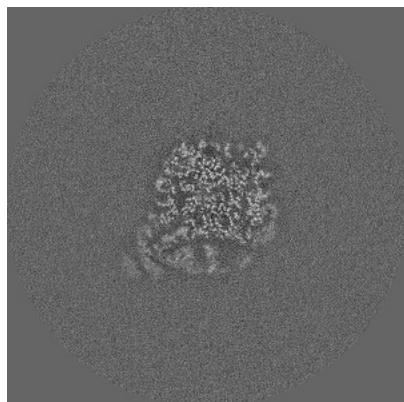


Y Index: 267

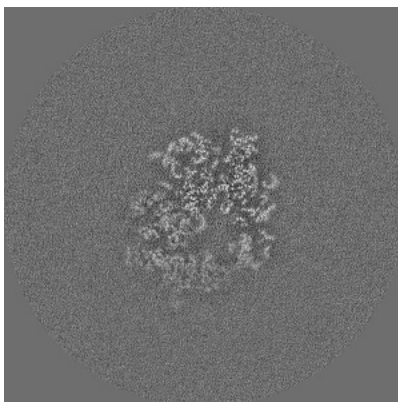


Z Index: 294

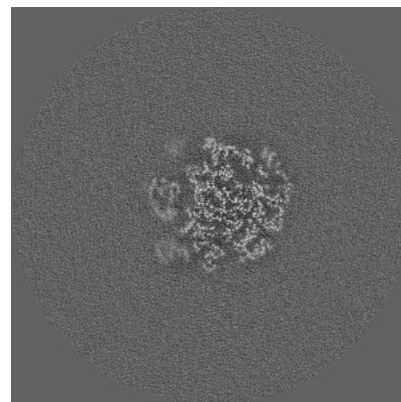
6.3.2 Raw map



X Index: 273



Y Index: 267

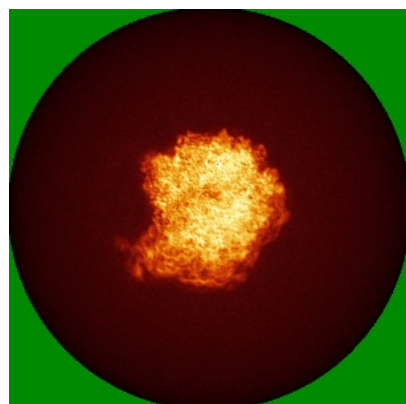


Z Index: 294

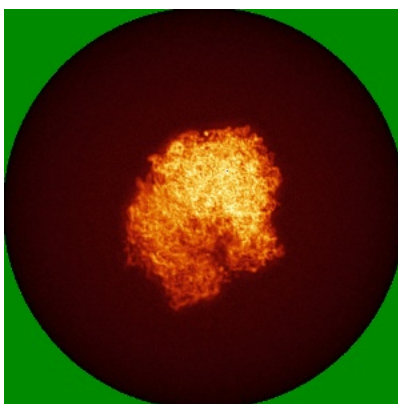
The images above show the largest variance slices of the map in three orthogonal directions.

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

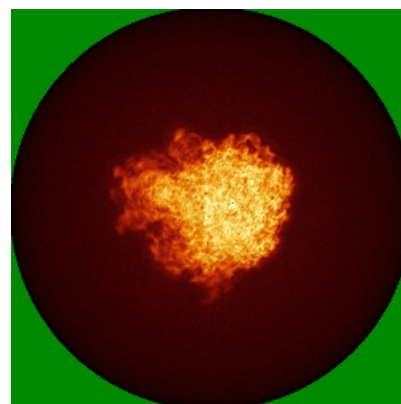
6.4.1 Primary map



X

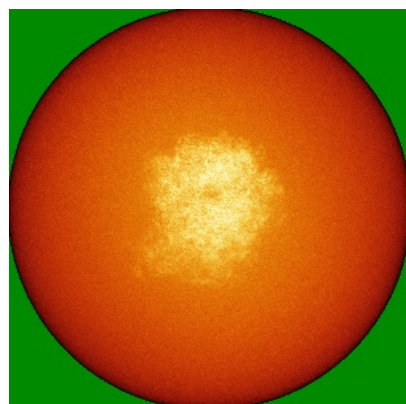


Y

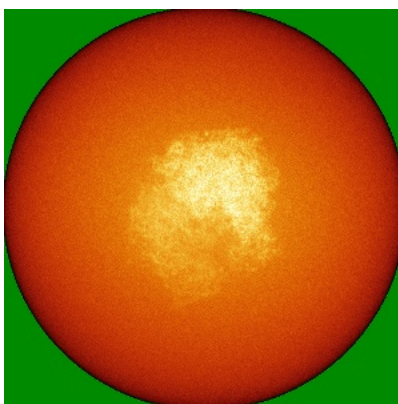


Z

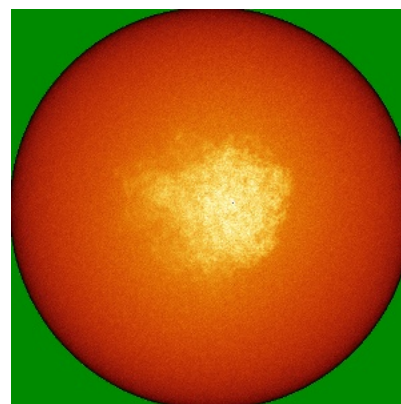
6.4.2 Raw map



X



Y

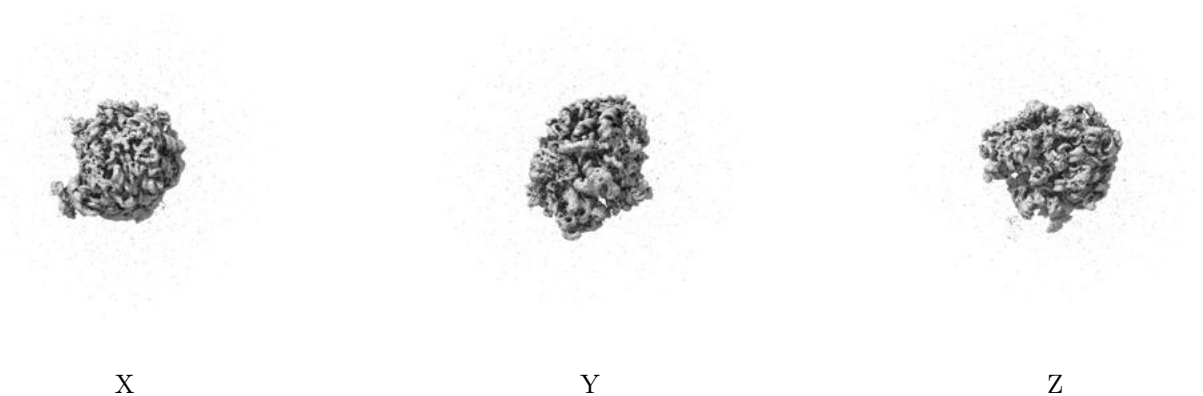


Z

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

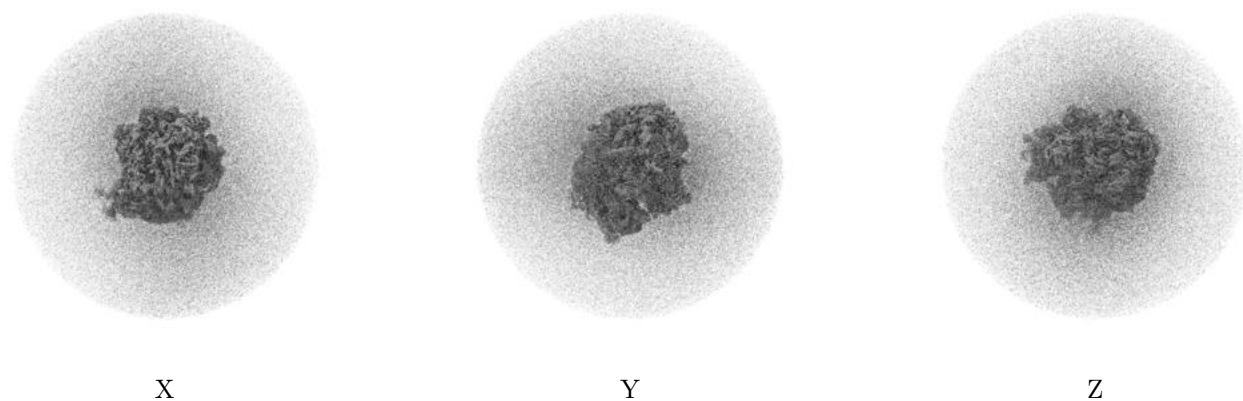
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.0027. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

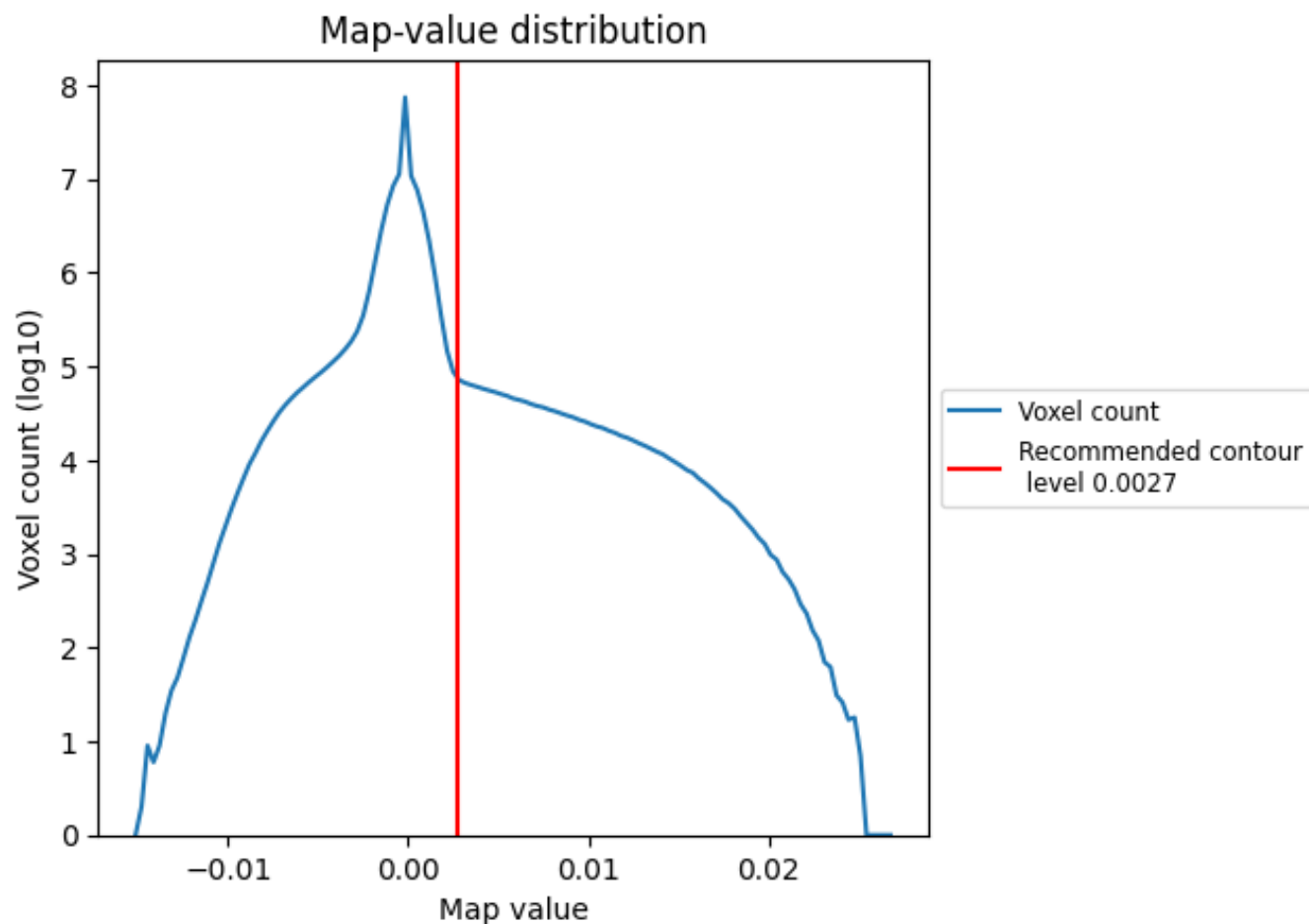
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

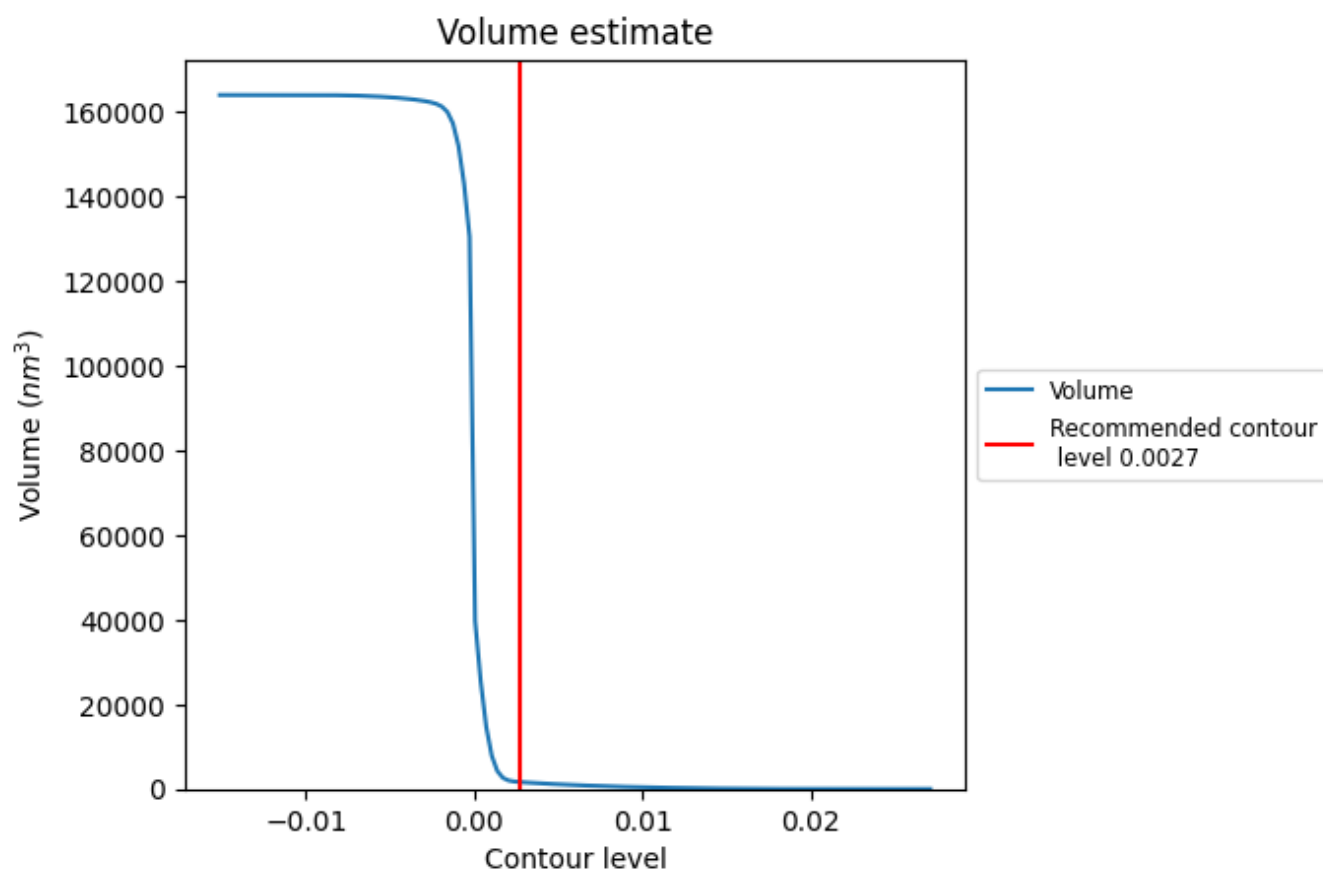
This section contains the results of statistical analysis of the map.

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.

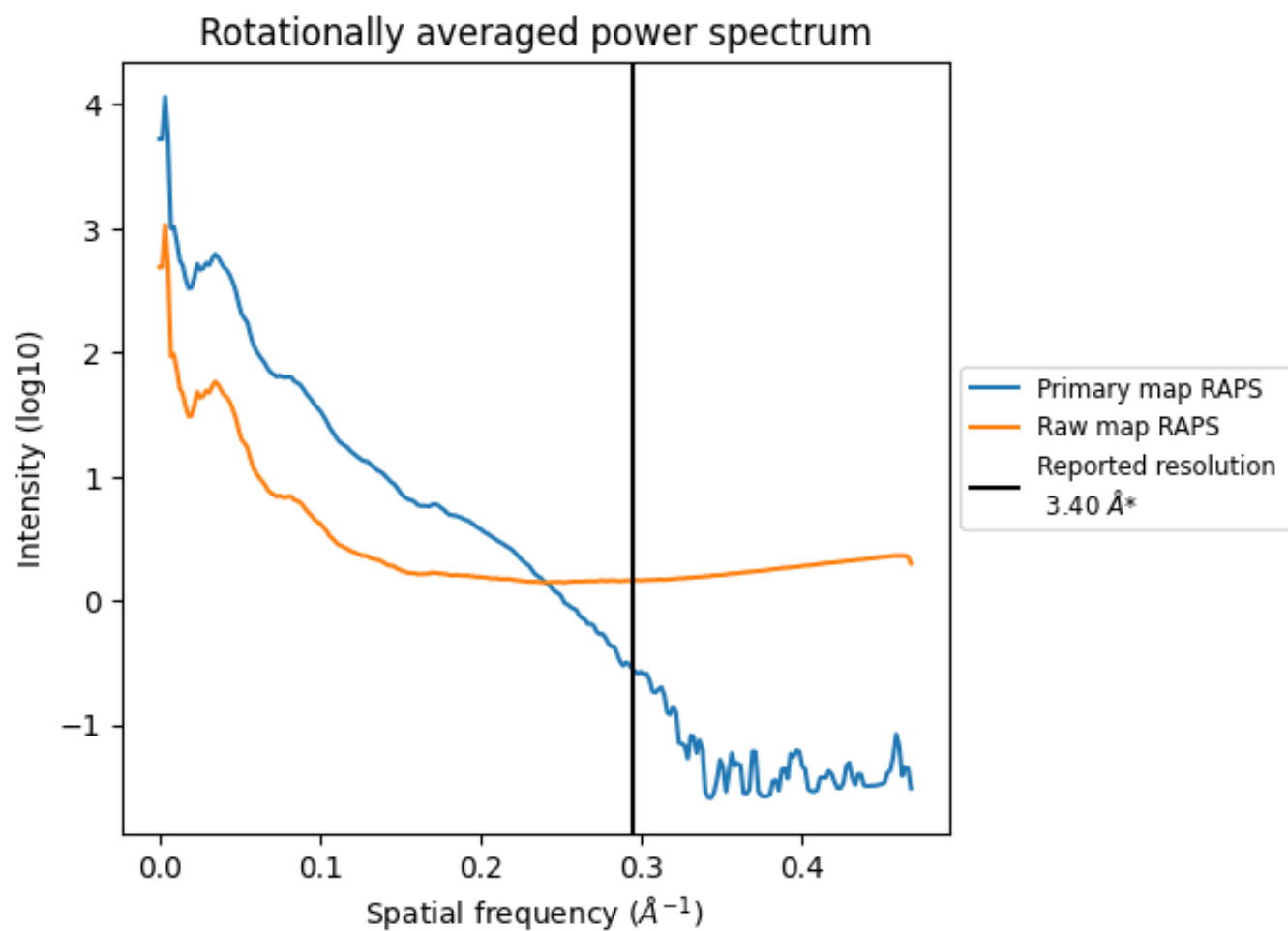
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1633 nm³; this corresponds to an approximate mass of 1475 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 ⓘ

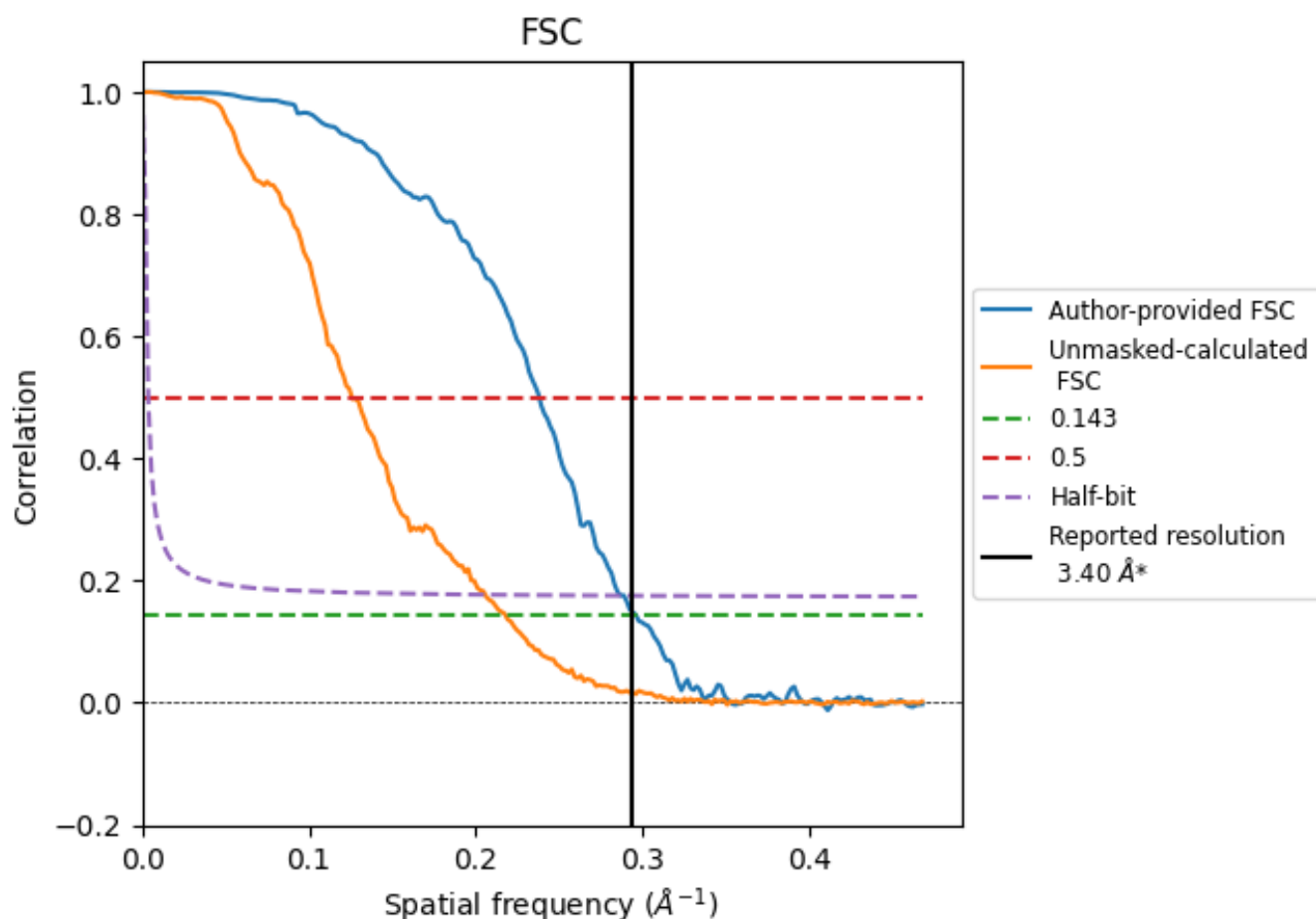


*Reported resolution corresponds to spatial frequency of 0.294 Å⁻¹

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 0.294 \AA^{-1}

8.2 Resolution estimates [i](#)

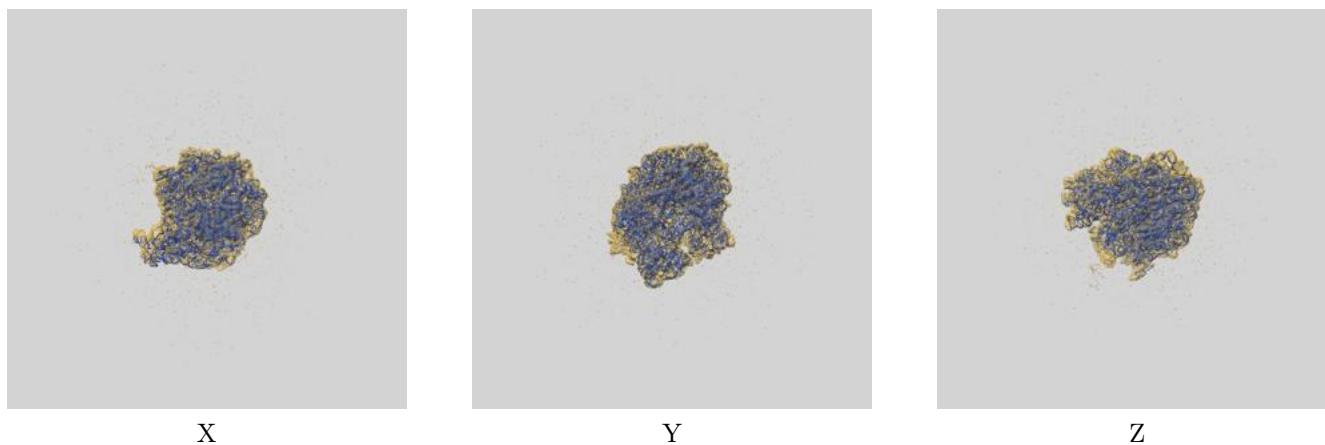
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.38	4.20	3.46
Unmasked-calculated*	4.59	7.95	4.86

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.59 differs from the reported value 3.4 by more than 10 %

9 Map-model fit [i](#)

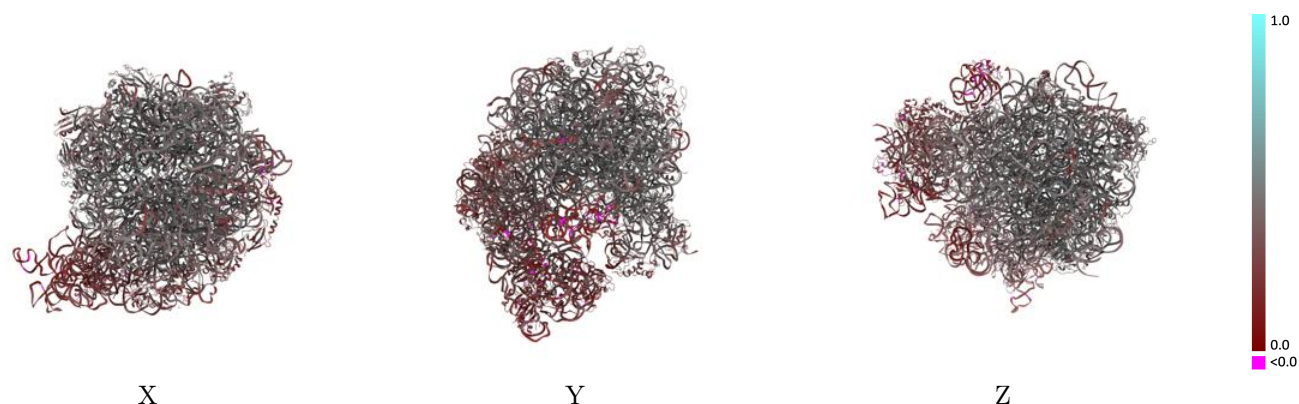
This section contains information regarding the fit between EMDB map EMD-43535 and PDB model 8VUP. Per-residue inclusion information can be found in section 3 on page 15.

9.1 Map-model overlay [i](#)



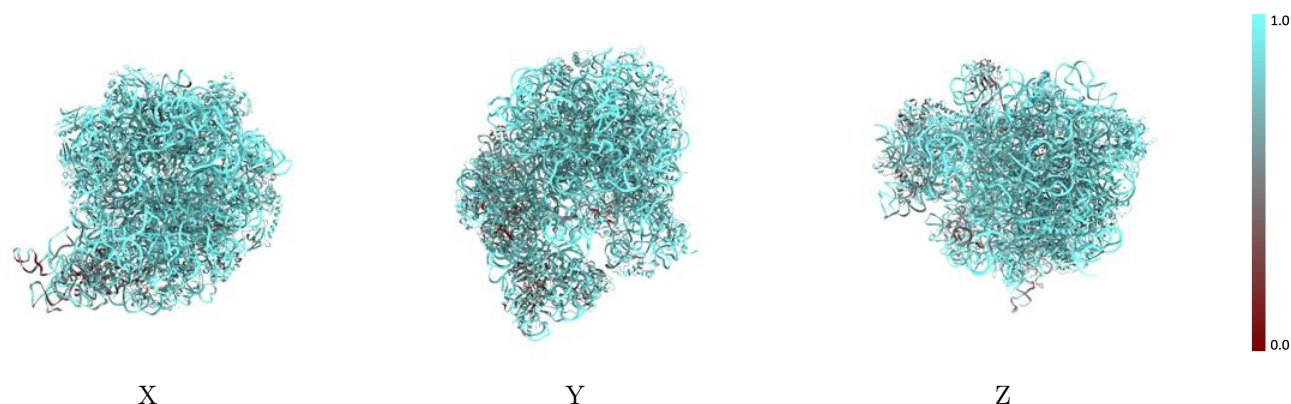
The images above show the 3D surface view of the map at the recommended contour level 0.0027 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



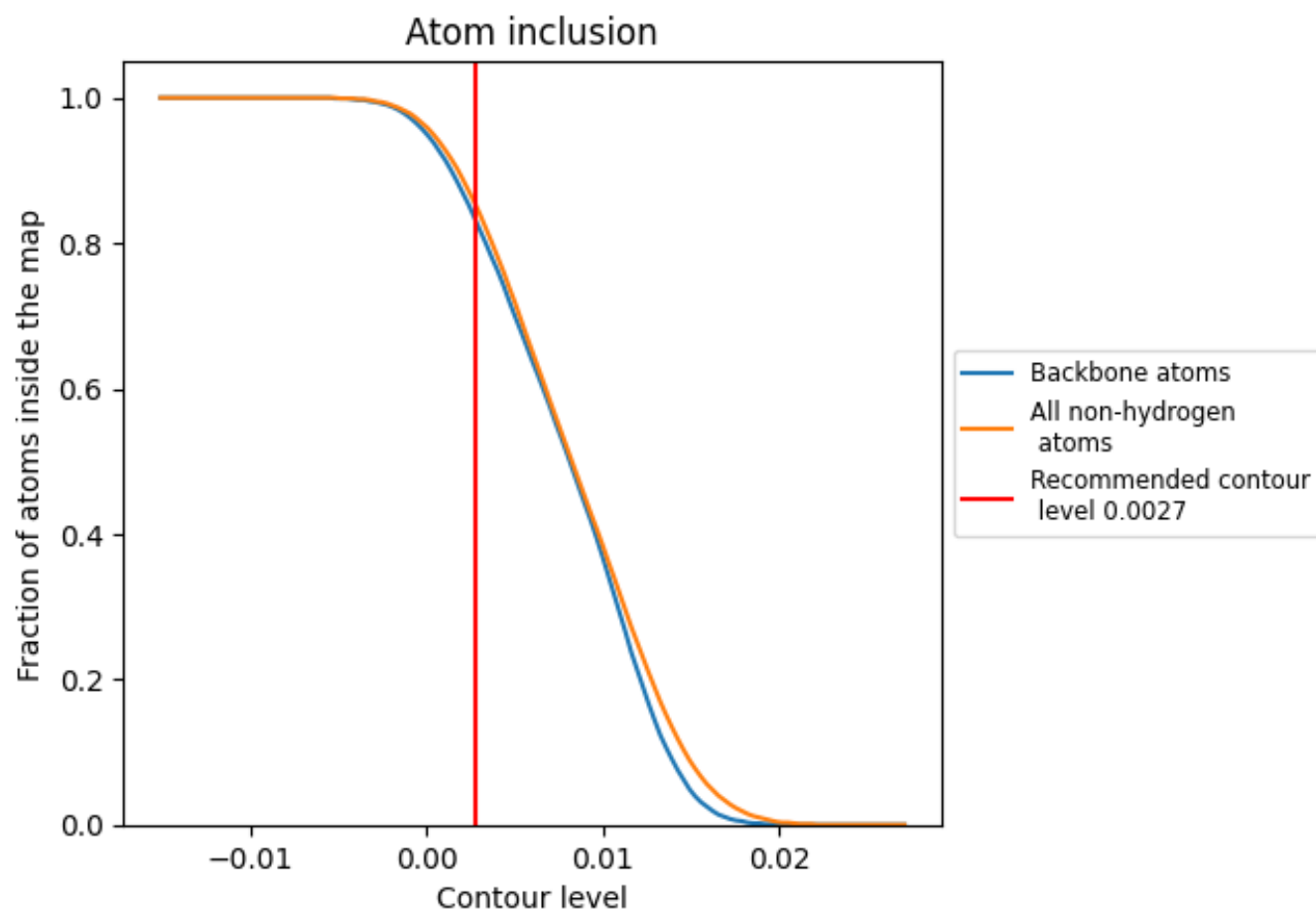
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0027).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 86% 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 (0.0027) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8560	 0.3700
1	 0.9530	 0.4270
2	 0.8250	 0.2980
3	 0.9740	 0.4140
4	 0.8250	 0.2840
5	 0.9650	 0.3630
A	 0.6110	 0.1640
B	 0.8020	 0.4540
C	 0.8130	 0.4370
D	 0.8350	 0.4190
E	 0.7950	 0.3120
F	 0.8650	 0.3670
G	 0.8100	 0.2910
J	 0.8210	 0.4280
K	 0.8100	 0.4360
L	 0.8050	 0.4430
M	 0.8250	 0.4250
N	 0.8020	 0.4270
O	 0.8270	 0.3760
P	 0.8290	 0.4170
Q	 0.8010	 0.4180
R	 0.8580	 0.4270
S	 0.8110	 0.4350
T	 0.7790	 0.4010
U	 0.8490	 0.4040
V	 0.8700	 0.3990
W	 0.8190	 0.4530
X	 0.8090	 0.4180
Y	 0.8050	 0.3420
Z	 0.8700	 0.4150
b	 0.8230	 0.4320
c	 0.8560	 0.4200
d	 0.7580	 0.4460
e	 0.7330	 0.4520
f	 0.6950	 0.4090



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Chain	Atom inclusion	Q-score
h	 0.6410	 0.2290
i	 0.4560	 0.2190
j	 0.7530	 0.3080
k	 0.7240	 0.2870
l	 0.5580	 0.1880
m	 0.7380	 0.2960
n	 0.6190	 0.2400
o	 0.5420	 0.2200
p	 0.6500	 0.3190
q	 0.6290	 0.2120
r	 0.6830	 0.2070
s	 0.5970	 0.2380
t	 0.7260	 0.2910
u	 0.5330	 0.2600
v	 0.6540	 0.2470
w	 0.6270	 0.2990
x	 0.7090	 0.2740
y	 0.6150	 0.2180
z	 0.5190	 0.2730