Full wwPDB EM Validation Report ⓘ

Apr 6, 2026 – 11:25 PM UTC

PDB ID	:	9XFK / pdb_00009xfk
EMDB ID	:	EMD-66639
Title	:	In situ structure of bacterial 50S ribosomes
Authors	:	Wu, F.; Naschberger, A.
Deposited on	:	2025-10-29
Resolution	:	2.98 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ 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:

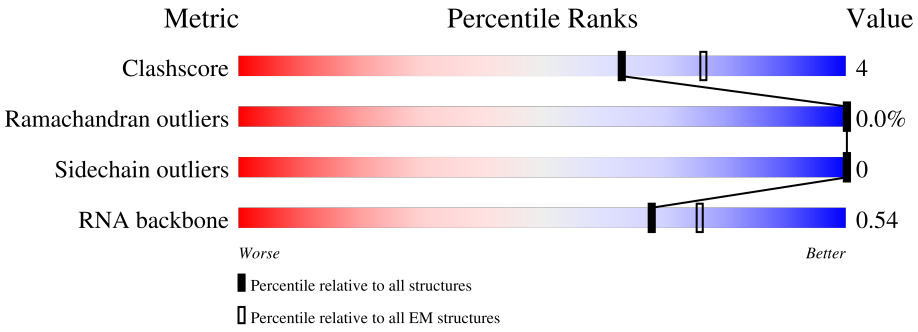
EMDB validation analysis	:	0.0.1.dev132
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

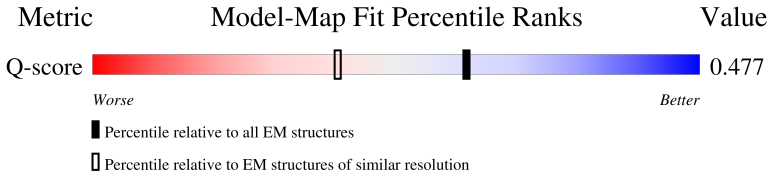
1 Overall quality at a glance

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

The reported resolution of this entry is 2.98 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	13236 (2.48 - 3.48)

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

Mol	Chain	Length	Quality of chain
1	I	2904	43% 74% 22% .
2	J	118	86% 70% 27% .
3	K	271	70% 86% 14%

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Mol	Chain	Length	Quality of chain
4	L	209	57% 90% 10%
5	M	201	75% 90% 10%
6	N	177	100% 85% 15%
7	O	176	100% 85% 15%
8	P	149	100% 87% 13%
9	Q	134	100% 78% 22%
10	R	142	54% 91% 9%
11	S	122	86% 89% 11%
12	T	144	69% 88% 12%
13	U	136	91% 93% 7%
14	V	120	40% 90% 10%
15	W	116	100% 80% 20%
16	X	114	87% 91% 9%
17	Y	117	44% 95% 5%
18	Z	103	83% 87% 13%
19	a	110	49% 94% 6%
20	b	93	96% 90% 10%
21	c	102	100% 85% 14%
22	d	94	100% 80% 20%
23	e	75	92% 93% 7%
24	f	77	81% 94% 6%
25	g	62	100% 81% 19%
26	h	58	78% 90% 10%
27	i	56	57% 86% 14%
28	j	50	100% 80% 20%

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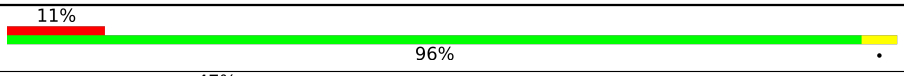
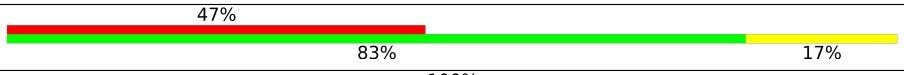
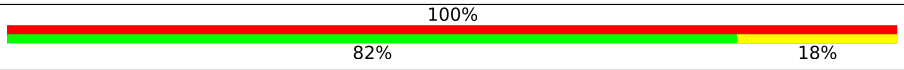
Mol	Chain	Length	Quality of chain
29	k	46	
30	l	64	
31	m	38	

2 Entry composition (i)

There are 35 unique types of molecules in this entry. The entry contains 150936 atoms, of which 59918 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
1	I	2898	93464	27768	31235	11448	20115	2898	0	0

- Molecule 2 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	P		
2	J	118	3810	1126	1281	464	821	118	0	0

- Molecule 3 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	K	271	4235	1288	2152	423	365	7	0	0

- Molecule 4 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	L	209	3182	979	1617	288	294	4	0	0

- Molecule 5 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	M	201	3170	974	1618	283	290	5	0	0

- Molecule 6 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
6	N	177	2855	899	1444	249	257	6	0	0

- Molecule 7 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	O	176	Total	C	H	N	O	S	0	0
			2694	832	1371	243	246	2		

- Molecule 8 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	P	149	Total	C	H	N	O	S	0	0
			2258	699	1148	197	213	1		

- Molecule 9 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	Q	134	Total	C	H	N	O	S	0	0
			2007	619	1028	169	185	6		

- Molecule 10 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	R	142	Total	C	H	N	O	S	0	0
			2291	714	1162	212	199	4		

- Molecule 11 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	S	122	Total	C	H	N	O	S	0	0
			1950	587	1012	180	165	6		

- Molecule 12 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	T	144	Total	C	H	N	O	S	0	0
			2182	654	1129	207	190	2		

- Molecule 13 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	U	136	Total	C	H	N	O	S	0	0
			2222	686	1147	205	178	6		

- Molecule 14 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms						AltConf	Trace
14	V	120	Total	C	H	N	O	S	0	0
			1960	593	1000	196	166	5		

- Molecule 15 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	W	116	Total	C	H	N	O	0	0
			1815	552	923	178	162		

- Molecule 16 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms						AltConf	Trace
16	X	114	Total	C	H	N	O	S	0	0
			1879	574	962	179	163	1		

- Molecule 17 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Y	117	Total	C	H	N	O	0	0
			1967	604	1020	192	151		

- Molecule 18 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms						AltConf	Trace
18	Z	103	Total	C	H	N	O	S	0	0
			1655	516	839	153	145	2		

- Molecule 19 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms						AltConf	Trace
19	a	110	Total	C	H	N	O	S	0	0
			1779	532	922	166	156	3		

- Molecule 20 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms						AltConf	Trace
20	b	93	Total	C	H	N	O	S	0	0
			1546	466	807	139	132	2		

- Molecule 21 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	c	102	Total	C	H	N	O	0	0
			1611	492	831	146	142		

- Molecule 22 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms						AltConf	Trace
22	d	94	Total	C	H	N	O	S	0	0
			1533	479	780	137	134	3		

- Molecule 23 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms						AltConf	Trace
23	e	75	Total	C	H	N	O	S	0	0
			1167	356	592	116	102	1		

- Molecule 24 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms						AltConf	Trace
24	f	77	Total	C	H	N	O	S	0	0
			1277	388	652	129	106	2		

- Molecule 25 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms						AltConf	Trace
25	g	62	Total	C	H	N	O	S	0	0
			1032	308	531	98	94	1		

- Molecule 26 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms						AltConf	Trace
26	h	58	Total	C	H	N	O	S	0	0
			937	281	488	87	79	2		

- Molecule 27 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms						AltConf	Trace
27	i	56	Total	C	H	N	O	S	0	0
			902	269	458	94	80	1		

- Molecule 28 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	j	50	Total	C	H	N	O	0	0
			848	263	439	75	71		

- Molecule 29 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms						AltConf	Trace
29	k	46	Total	C	H	N	O	S	0	0
			795	228	418	90	57	2		

- Molecule 30 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms						AltConf	Trace
30	l	64	Total	C	H	N	O	S	0	0
			1076	323	572	105	74	2		

- Molecule 31 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms						AltConf	Trace
31	m	38	Total	C	H	N	O	S	0	0
			642	185	340	65	48	4		

- Molecule 32 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
32	I	161	Total	Mg	0
			161	161	
32	J	1	Total	Mg	0
			1	1	
32	K	2	Total	Mg	0
			2	2	
32	L	1	Total	Mg	0
			1	1	
32	k	1	Total	Mg	0
			1	1	

- Molecule 33 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		AltConf
33	K	1	Total	Na	0
			1	1	

- Molecule 34 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
34	m	1	Total	Zn	0
			1	1	

- Molecule 35 is water.

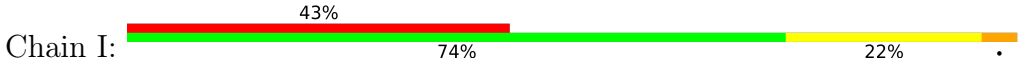
Mol	Chain	Residues	Atoms		AltConf
35	I	27	Total	O	0
			27	27	

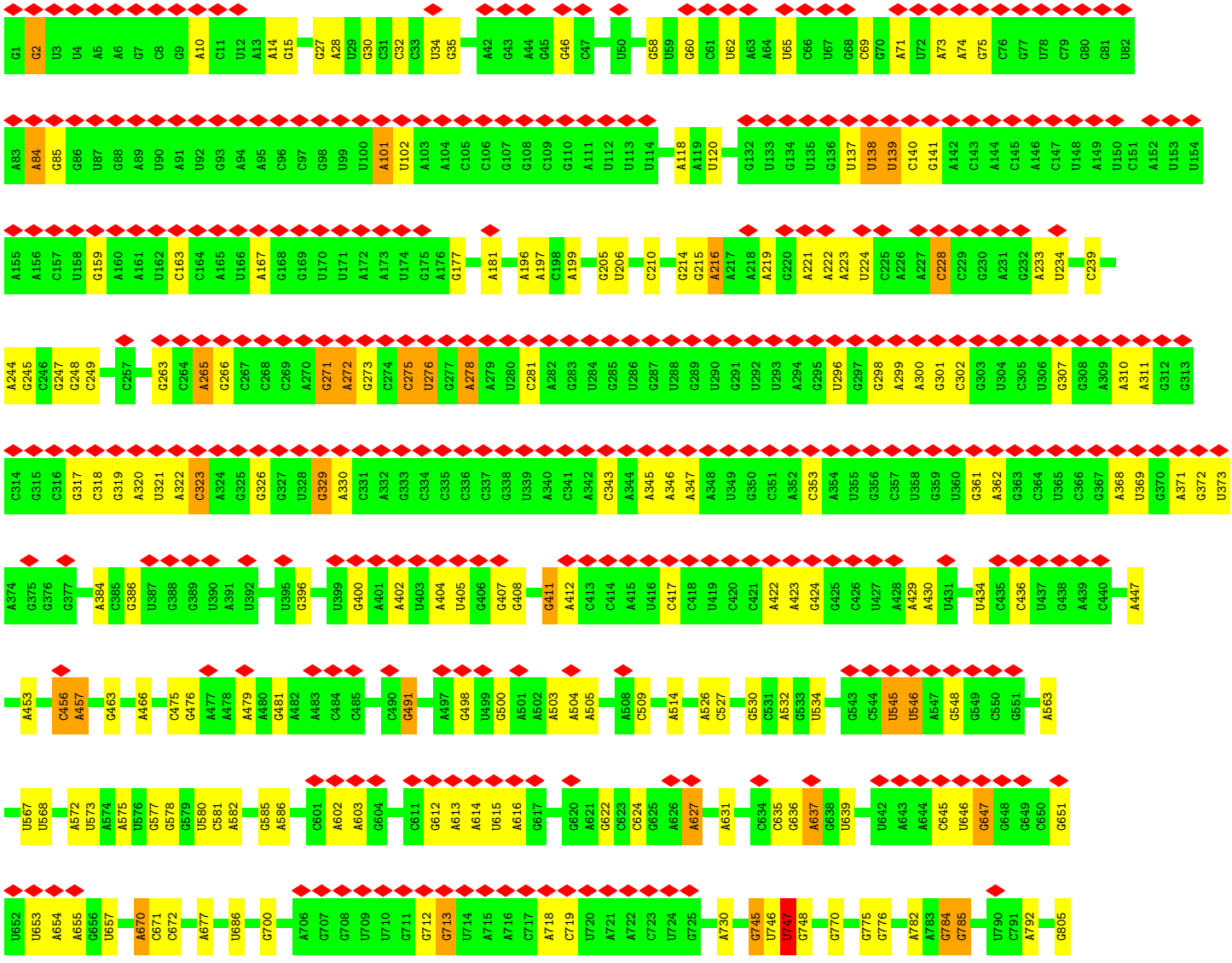
3 Residue-property plots (i)

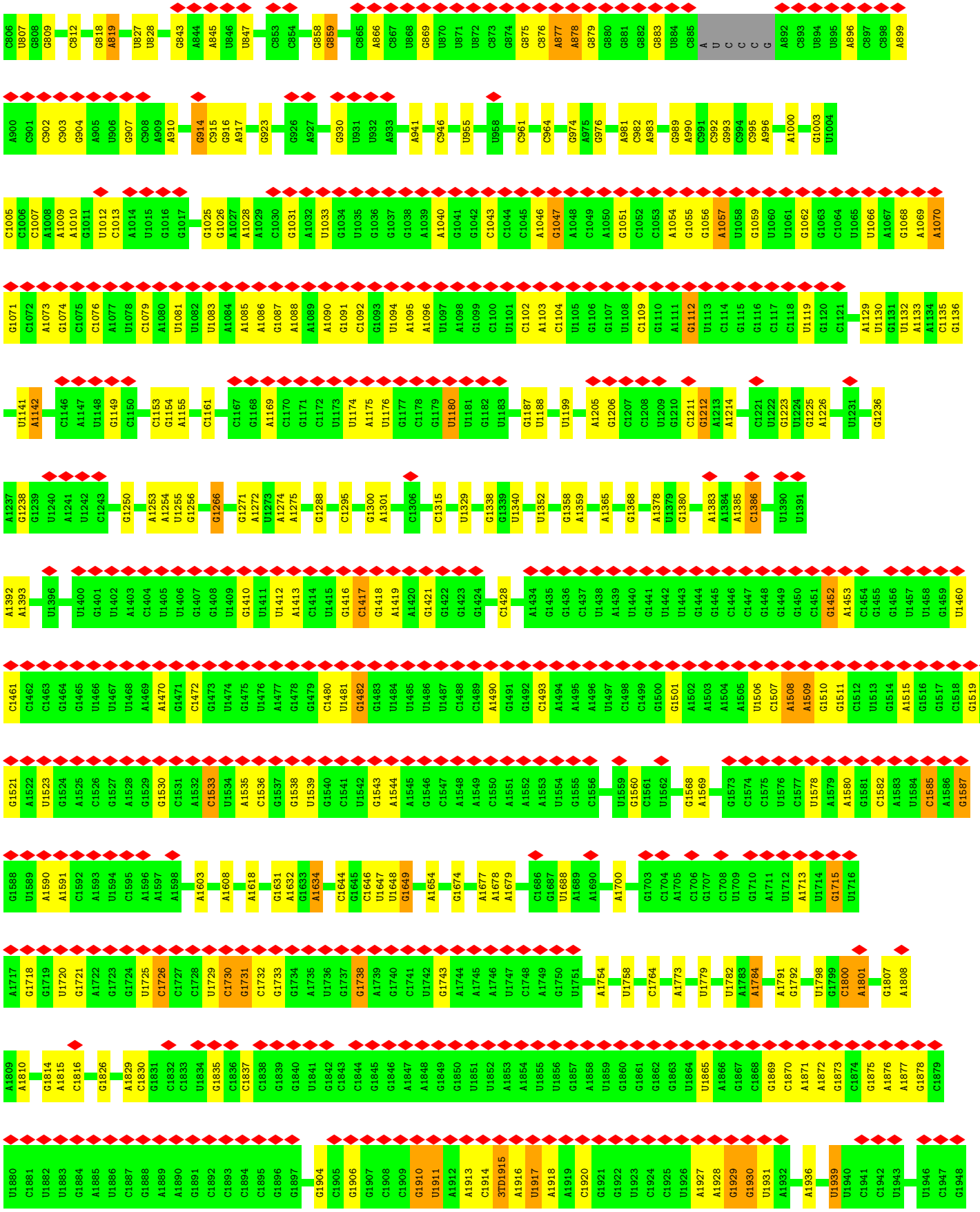
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 23S rRNA

Chain I:



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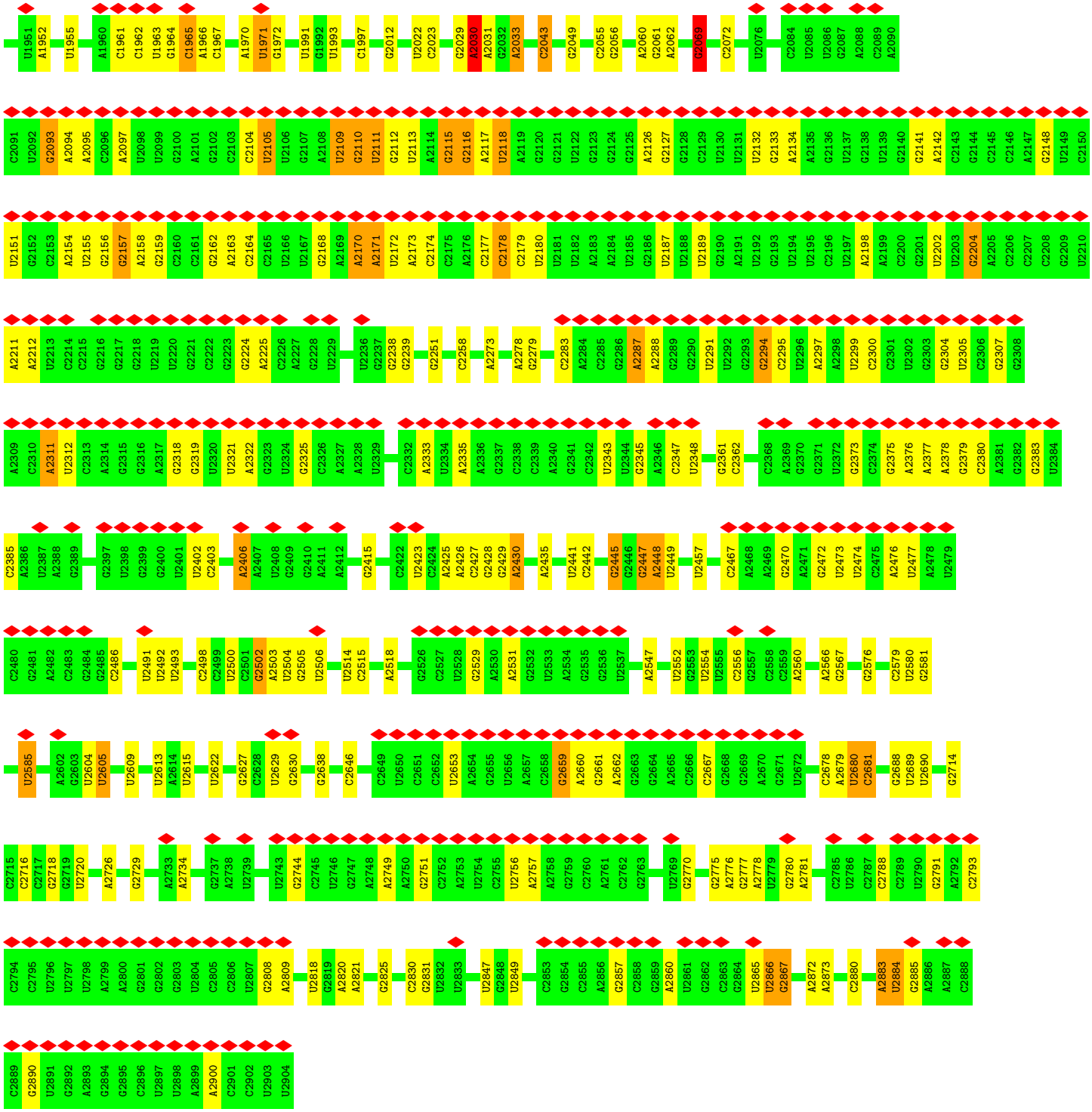
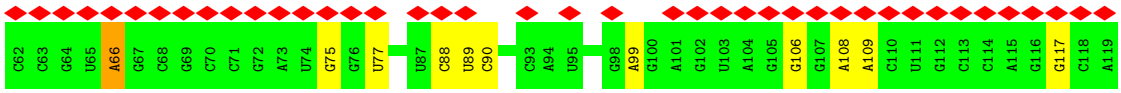
A900 C901 C902 C903 G904 A905 U906 G907 C908 A909 A910 G914 C915 G916 A917 G923 G926 A927 G930 U931 U932 A933 A941 C946 U955 U958 C961 C964 G974 A975 G976 A981 C982 A983 G989 A990 C991 C992 G993 C994 C995 A996 A1000 G1003 U1004
C1005 C1006 C1007 A1008 A1009 A1010 G1011 U1012 C1013 A1014 U1015 G1016 G1017 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 A1050 G1051 C1052 C1053 A1054 G1055 G1056 A1057 U1058 G1059 U1060 U1061 G1062 C1063 C1064 U1065 U1066 A1067 G1068 A1069 A1070
G1071 C1072 A1073 G1074 C1075 C1076 A1077 U1078 C1079 A1080 U1081 U1082 U1083 A1084 A1085 A1086 G1087 A1088 A1089 A1090 G1091 C1092 G1093 U1094 A1095 A1096 U1097 A1098 G1099 C1100 U1101 C1102 A1103 C1104 U1105 G1106 G1107 U1108 C1109 G1110 A1111 C1112 U1113 C1114 G1115 G1116 C1117 C1118 U1119 G1120 C1121 A1129 U1130 G1131 U1132 A1133 A1134 C1135 G1136
U1141 A1142 C1146 A1147 U1148 G1149 C1150 C1153 G1154 A1155 C1161 C1167 G1168 A1169 C1170 G1171 C1172 U1173 U1174 A1175 U1176 G1177 C1178 G1179 U1180 U1181 G1182 U1183 G1187 U1188 U1199 A1205 G1206 C1207 C1208 U1209 G1210 C1211 G1212 A1213 A1214 C1221 U1222 G1223 U1224 G1225 A1226 U1231 G1236
A1237 G1238 G1239 U1240 A1241 U1242 C1243 G1250 A1253 A1254 U1255 G1256 G1266 G1271 A1272 U1273 A1274 A1275 G1288 C1295 G1300 A1301 C1306 C1315 U1329 G1338 G1339 U1340 U1352 G1358 A1359 A1365 G1368 A1378 U1379 G1380 A1383 A1384 A1385 C1386 U1390 U1391
A1392 A1393 U1396 U1400 G1401 U1402 A1403 C1404 U1405 U1406 G1407 G1408 U1409 G1410 U1411 U1412 A1413 C1414 U1415 G1416 C1417 G1418 A1419 A1420 G1421 G1422 G1423 G1424 C1428 A1434 G1435 G1436 C1437 U1438 A1439 U1440 G1441 U1442 U1443 G1444 G1445 C1446 C1447 G1448 G1449 G1450 C1451 G1452 A1453 C1454 G1455 G1456 U1457 U1458 G1459 U1460
C1461 C1462 C1463 G1464 G1465 U1466 U1467 U1468 A1469 A1470 G1471 C1472 G1473 U1474 G1475 U1476 A1477 G1478 G1479 C1480 U1481 G1482 G1483 U1484 U1485 U1486 U1487 C1488 C1489 A1490 G1491 G1492 C1493 A1494 A1495 A1496 U1497 C1498 C1499 G1500 G1501 A1502 A1503 A1504 A1505 U1506 C1507 A1508 A1509 G1510 G1511 C1512 U1513 G1514 A1515 G1516 G1517 C1518 G1519 U1520
G1521 A1522 U1523 G1524 A1525 C1526 G1527 A1528 G1529 G1530 C1531 A1532 C1533 U1534 A1535 C1536 G1537 G1538 U1539 G1540 C1541 U1542 G1543 A1544 A1545 G1546 C1547 A1548 A1549 C1550 A1551 A1552 A1553 U1554 G1555 C1556 U1559 G1560 C1561 U1562 G1568 A1569 G1573 C1574 C1575 U1576 C1577 U1578 A1579 A1580 G1581 C1582 A1583 U1584 C1585 A1586 G1587
G1588 U1589 A1590 A1591 C1592 A1593 U1594 C1595 A1596 A1597 A1598 A1603 A1608 A1618 G1631 A1632 G1633 A1634 C1644 G1645 C1646 U1647 U1648 G1649 A1654 G1674 A1677 A1678 A1679 C1686 G1687 U1688 A1689 A1690 A1700 G1703 C1704 A1705 C1706 G1707 C1708 U1709 G1710 A1711 U1712 A1713 U1714 G1715 U1716
A1717 G1718 G1719 U1720 G1721 A1722 G1723 G1724 U1725 C1726 C1727 C1728 U1729 C1730 G1731 C1732 G1733 G1734 A1735 U1736 G1737 G1738 A1739 G1740 C1741 U1742 G1743 A1744 A1745 A1746 U1747 C1748 A1749 G1750 U1751 A1754 U1758 C1764 A1773 U1779 U1782 A1783 A1784 A1791 G1792 U1798 G1799 C1800 A1801 G1807 A1808
A1809 A1810 G1814 A1815 C1816 G1826 A1829 C1830 G1831 C1832 C1833 U1834 G1835 C1836 C1837 C1838 G1839 G1840 U1841 G1842 C1843 C1844 G1845 G1846 A1847 A1848 G1849 G1850 U1851 U1852 A1853 A1854 U1855 U1856 G1857 A1858 U1859 G1860 G1861 G1862 G1863 U1864 U1865 A1866 G1867 C1868 G1869 C1870 A1871 A1872 G1873 C1874 G1875 A1876 A1877 G1878 C1879
U1880 C1881 U1882 U1883 G1884 A1885 U1886 C1887 G1888 A1889 A1890 G1891 C1892 C1893 C1894 C1895 G1896 G1897 G1904 C1905 G1906 G1907 C1908 C1909 G1910 U1911 A1912 A1913 C1914 3TD1915 A1916 U1917 A1918 A1919 C1920 G1921 G1922 U1923 C1924 C1925 U1926 A1927 A1928 G1929 G1930 U1931 A1932 A1936 U1939 U1940 C1941 C1942 U1943 U1946 C1947 G1948

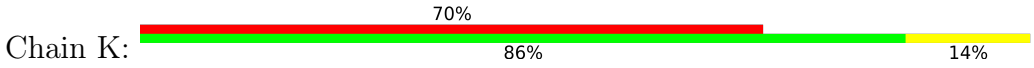


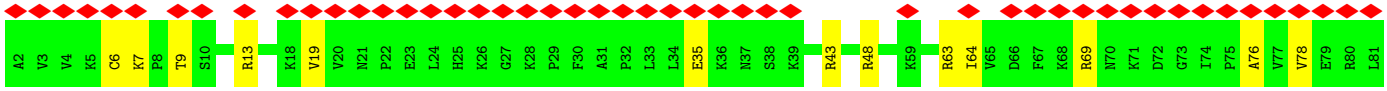
• Molecule 2: 5S rRNA

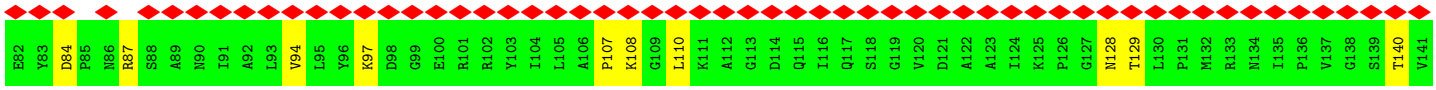
Chain J:

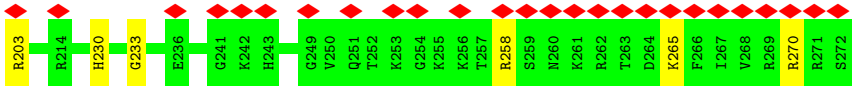


• Molecule 3: Large ribosomal subunit protein uL2

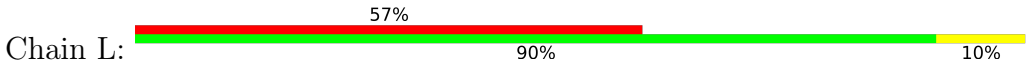


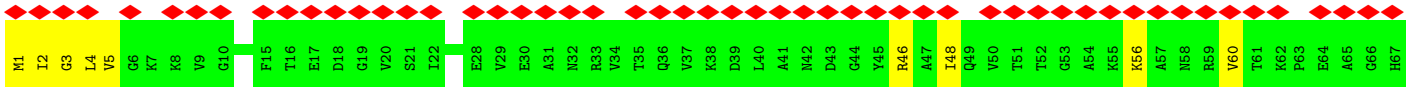


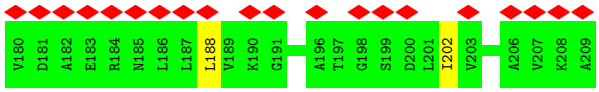




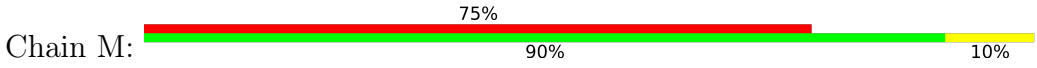
• Molecule 4: Large ribosomal subunit protein uL3

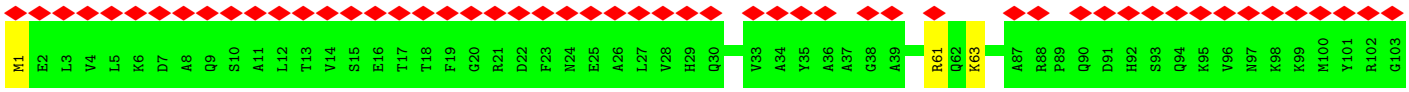


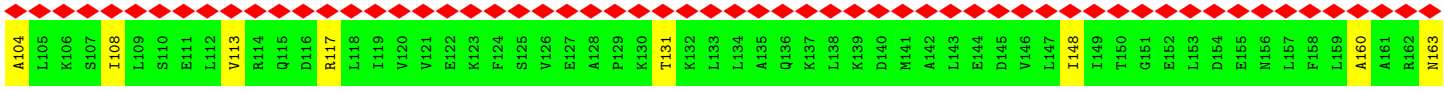




• Molecule 5: 50S ribosomal protein L4







L164 H165 K166 V167 D168 V169 R170 D171 A172 T173 G174 I175 D176 P177 V178 S179 L180 I181 A182 F183 D184 K185 V186 V187 M188 T189 A190 D191 A192 V193 K194 Q195 V196 E197 E198 M199 L200 A201

• Molecule 6: 50S ribosomal protein L5

Chain N:

A2 K3 L4 H5 D6 Y7 Y8 K9 D10 E11 V12 V13 K14 K15 L16 M17 T18 E19 F20 N21 Y22 N23 S24 V25 M26 Q27 V28 P29 R30 V31 E32 K33 I34 T35 L36 N37 M38 G39 V40 G41 E42 A43 I44 A45 D46 K47 K48 L49 L50 D51 N52 A53 A54 A55 D56 L57 A58 A59 I60 S61

G62 Q63 K64 P65 L66 I67 T68 K69 A70 R71 K72 S73 V74 A75 G76 F77 K78 I79 R80 Q81 G82 Y83 P84 I85 G86 C87 K88 V89 T90 L91 R92 G93 E94 R95 M96 W97 E98 F99 F100 E101 R102 L103 I104 T105 I106 A107 V108 P109 R110 I111 R112 D113 F114 R115 G116 L117 S118 A119 K120 S121

F122 D123 G124 R125 G126 N127 Y128 S129 M130 G131 V132 R133 E134 Q135 I136 I137 F138 P139 E140 I141 D142 Y143 D144 K145 V146 D147 R148 V149 R150 G151 L152 D153 I154 T155 I156 T157 T158 T159 A160 K161 S162 D163 E164 E165 G166 R167 A168 L169 L170 A171 A172 F173 D174 F175 P176 F177 R178

• Molecule 7: Large ribosomal subunit protein uL6

Chain O:

S2 R3 V4 A5 K6 A7 P8 V9 V10 V11 P12 A13 G14 V15 D16 V17 K18 I19 N20 G21 Q22 V23 I24 T25 I26 K27 G28 K29 M30 G31 E32 L33 T34 R35 T36 L37 N38 D39 A40 V41 E42 V43 K44 H45 A46 D47 N48 T49 L50 T51 F52 G53 P54 R55 D56 G57 Y58 A59 D60 G61

W62 A63 Q64 A65 G66 T67 A68 R69 A70 L71 L72 N73 S74 M75 V76 I77 G78 V79 T80 E81 G82 F83 T84 K85 K86 L87 Q88 L89 V90 G91 V92 G93 Y94 R95 A96 A97 V98 K99 G100 N101 V102 I103 N104 L105 S106 L107 G108 F109 S110 H111 P112 V113 D114 H115 Q116 L117 P118 A119 G120 I121

T122 A123 E124 C125 P126 T127 Q128 T129 E130 I131 V132 L133 K134 G135 A136 D137 K138 Q139 V140 I141 G142 Q143 V144 A145 A146 D147 L148 R149 A150 Y151 R152 R153 P154 E155 P156 Y157 K158 G159 K160 G161 V162 R163 Y164 A165 D166 E167 V168 V169 R170 T171 K172 E173 A174 K175 K176 K177

• Molecule 8: 50S ribosomal protein L9

Chain P:

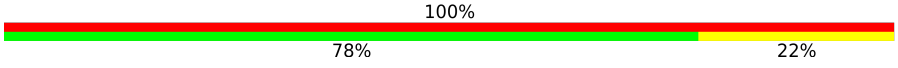
M1 Q2 V3 I4 L5 L6 D7 K8 V9 A10 N11 L12 G13 S14 L15 G16 D17 Q18 V19 N20 V21 K22 A23 G24 Y25 A26 R27 N28 F29 L30 V31 P32 Q33 G34 K35 A36 V37 P38 A39 T40 K41 K42 N43 I44 E45 F46 F47 E48 A49 R50 R51 A52 E53 L54 E55 A56 K57 L58 A59 E60

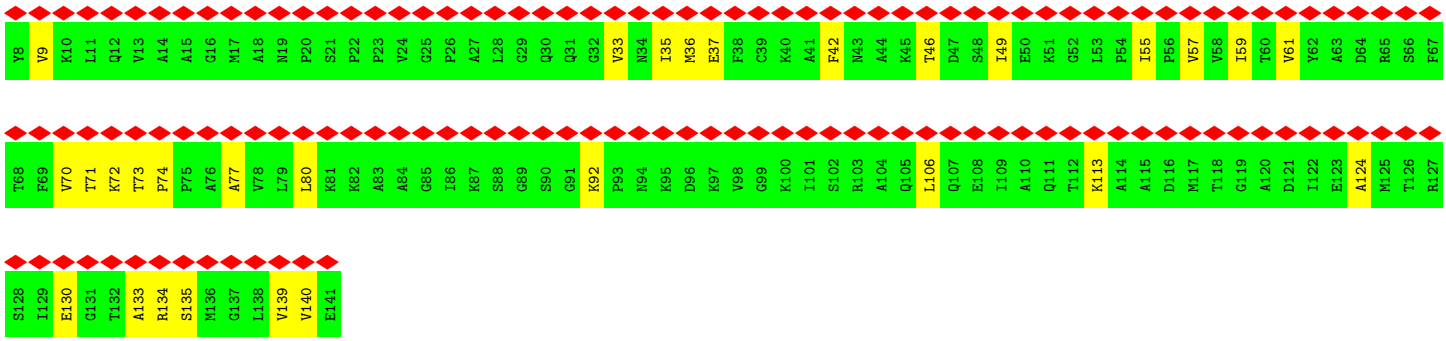
V61 L62 A63 A64 A65 N66 A67 R68 A69 E70 K71 I72 N73 A74 L75 E76 T77 V78 T79 I80 A81 S82 K83 A84 G85 D86 E87 G88 K89 L90 F91 G92 S93 I94 G95 T96 R97 D98 I99 A100 D101 A102 V103 T104 A105 A106 G107 V108 E109 V110 A111 K112 S113 E114 V115 R116 L117 P118 N119 G120

V121 L122 R123 T124 T125 G126 E127 H128 E129 V130 S131 F132 Q133 V134 H135 S136 E137 V138 F139 A140 K141 V142 I143 V144 N145 V146 V147 A148 E149

• Molecule 9: 50S ribosomal protein L11

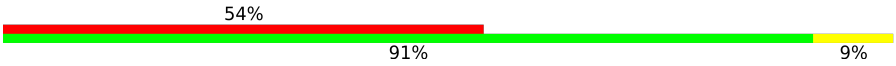
Chain Q:

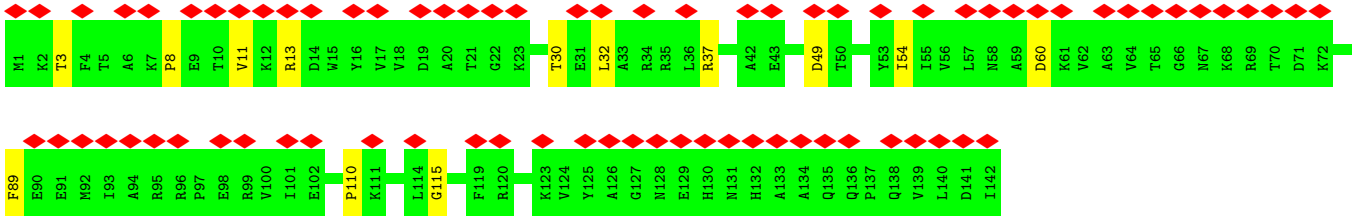




• Molecule 10: 50S ribosomal protein L13

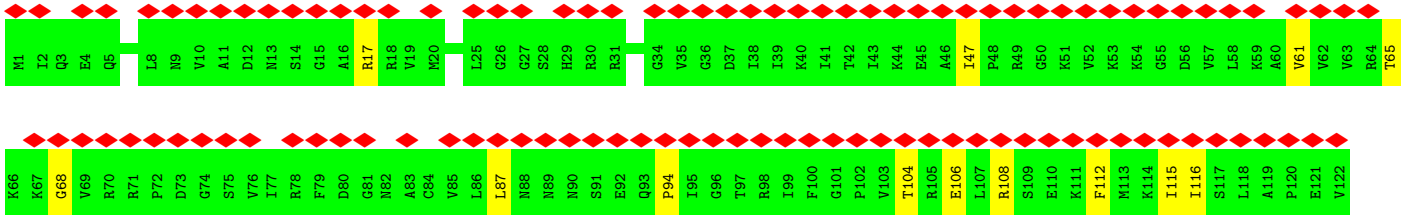
Chain R:





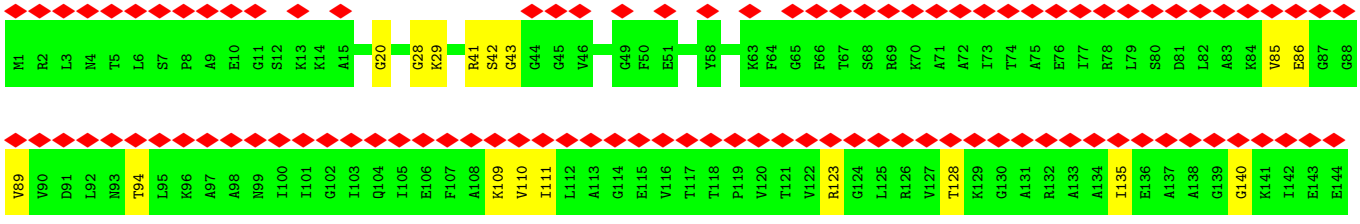
• Molecule 11: Large ribosomal subunit protein uL14

Chain S:



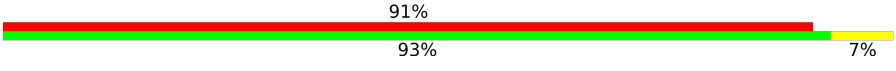
• Molecule 12: 50S ribosomal protein L15

Chain T:



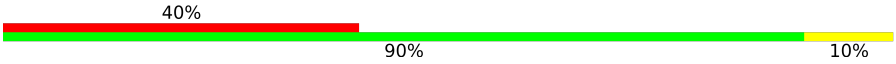
• Molecule 13: Large ribosomal subunit protein uL16

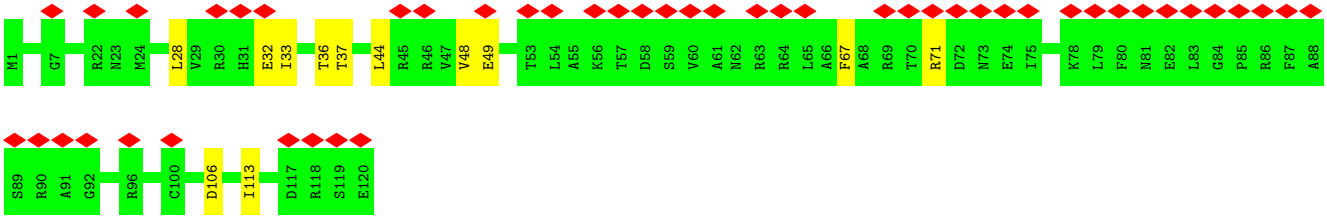
Chain U:



• Molecule 14: Large ribosomal subunit protein bL17

Chain V:



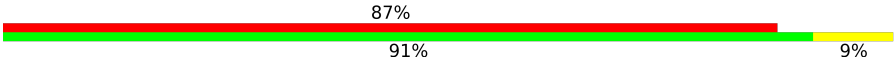


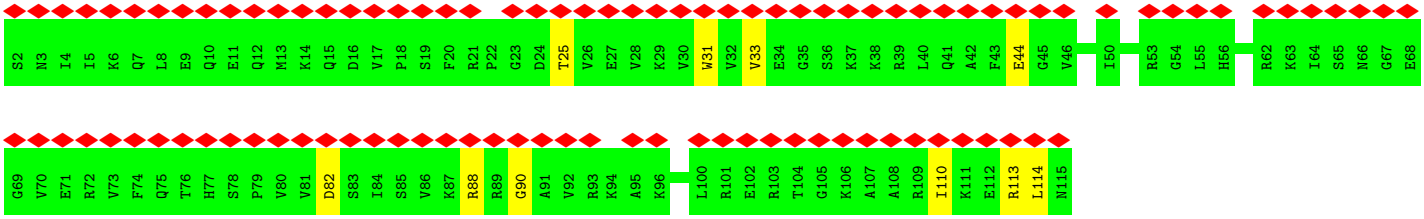
• Molecule 15: 50S ribosomal protein L18

Chain W:

• Molecule 16: 50S ribosomal protein L19

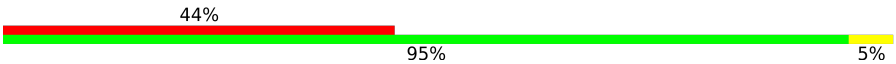
Chain X:

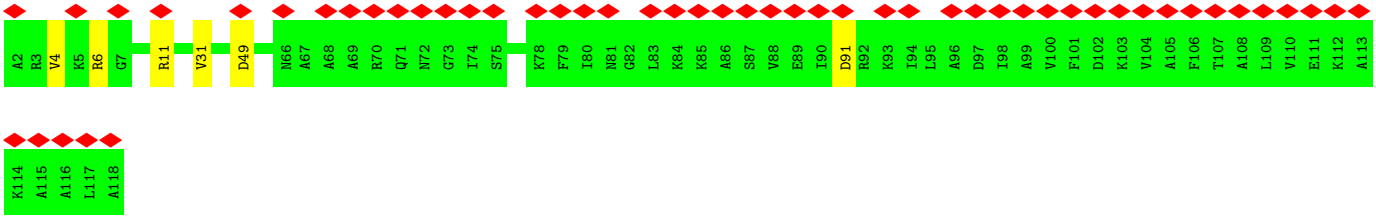




• Molecule 17: 50S ribosomal protein L20

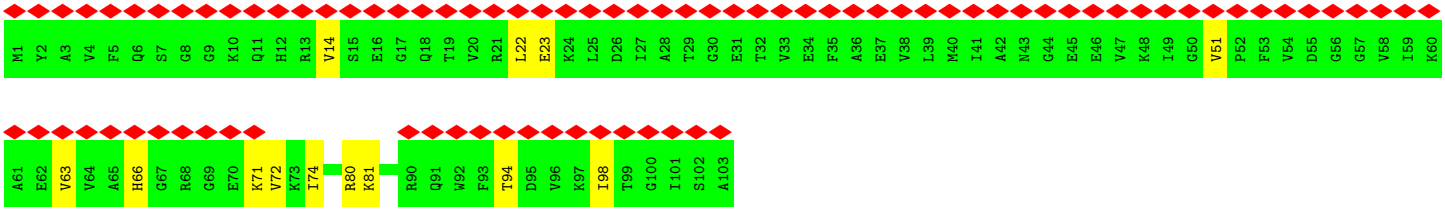
Chain Y:





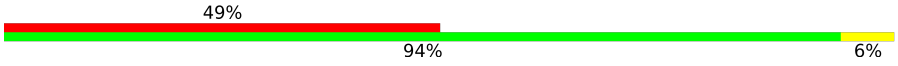
• Molecule 18: 50S ribosomal protein L21

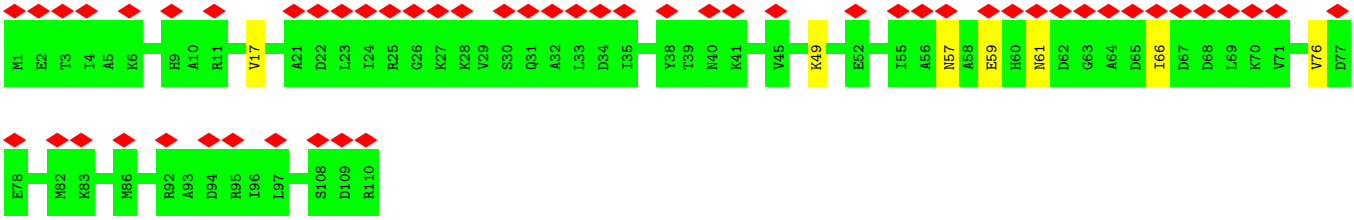
Chain Z:



• Molecule 19: 50S ribosomal protein L22

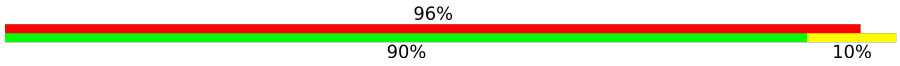
Chain a:





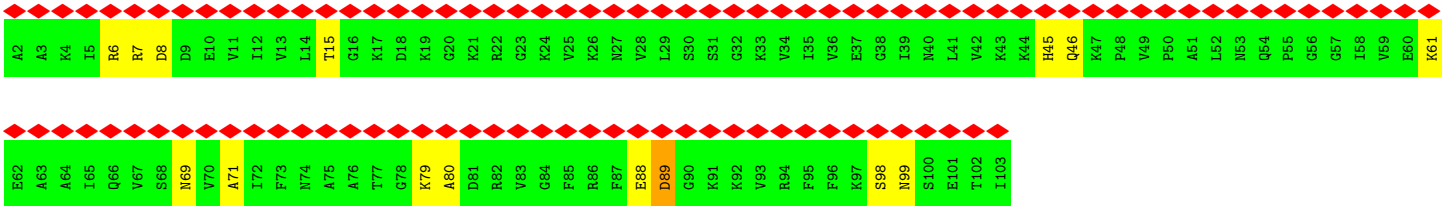
• Molecule 20: 50S ribosomal protein L23

Chain b:



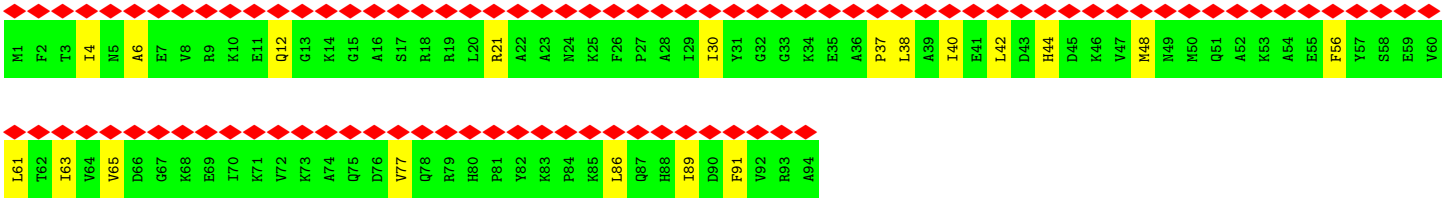
• Molecule 21: Large ribosomal subunit protein uL24

Chain c:



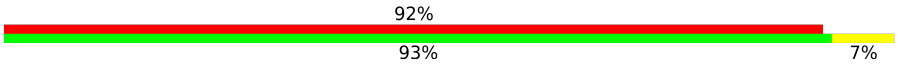
• Molecule 22: 50S ribosomal protein L25

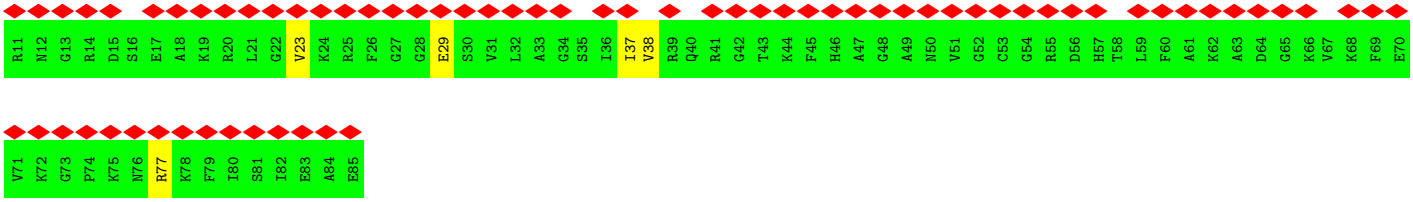
Chain d:



• Molecule 23: 50S ribosomal protein L27

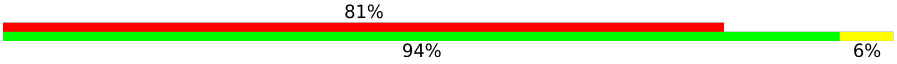
Chain e:

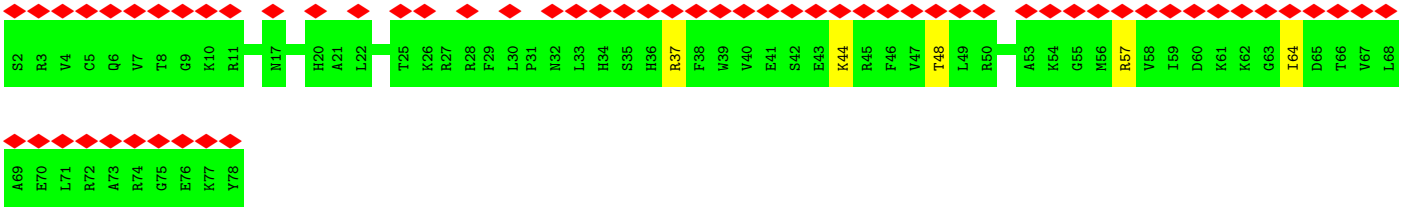




• Molecule 24: 50S ribosomal protein L28

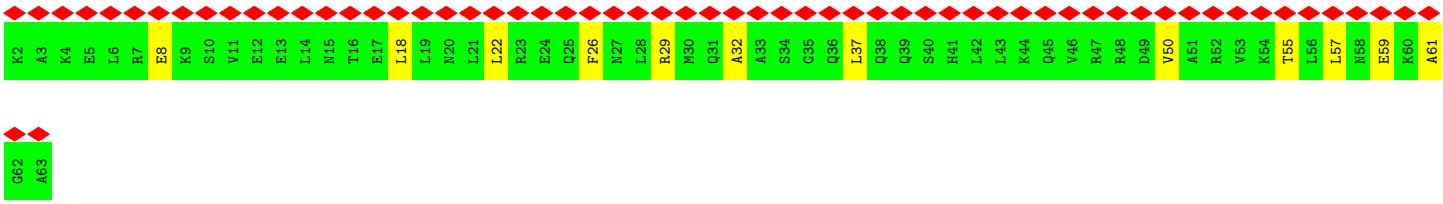
Chain f:





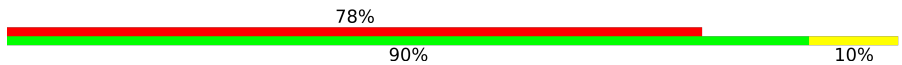
• Molecule 25: 50S ribosomal protein L29

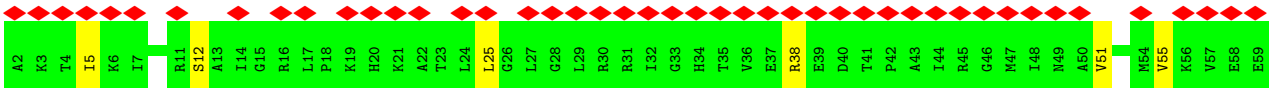
Chain g:



• Molecule 26: 50S ribosomal protein L30

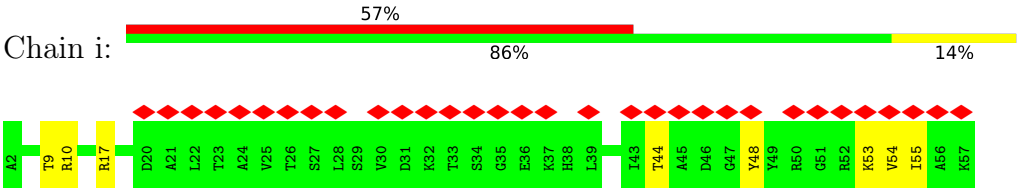
Chain h:





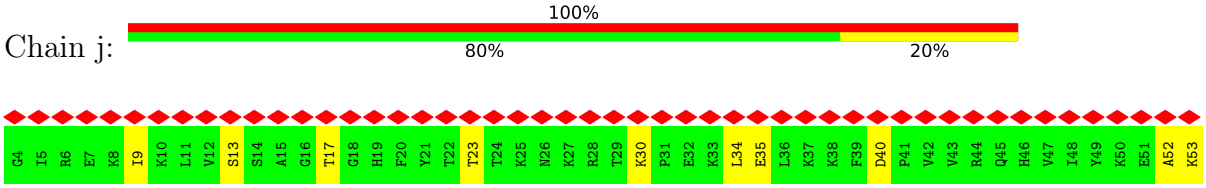
• Molecule 27: Large ribosomal subunit protein bL32

Chain i:



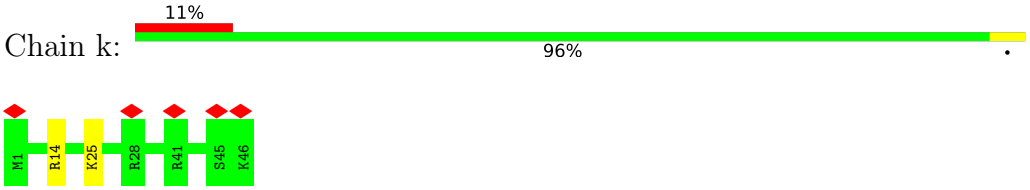
• Molecule 28: 50S ribosomal protein L33

Chain j:



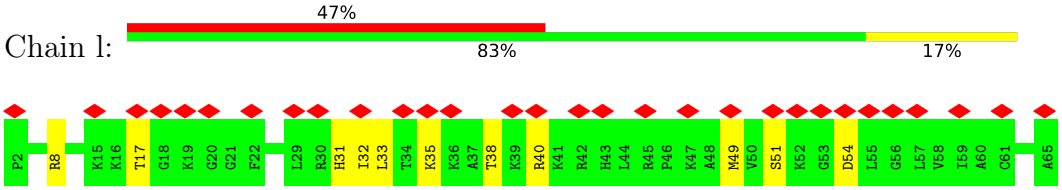
• Molecule 29: 50S ribosomal protein L34

Chain k:



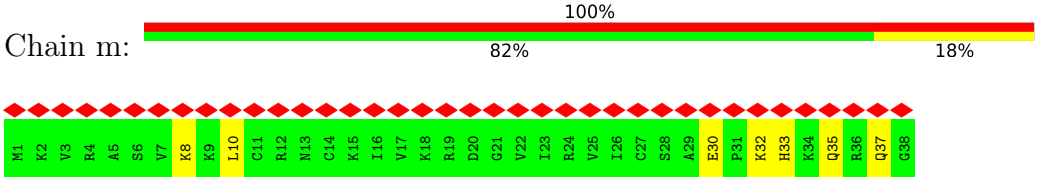
• Molecule 30: 50S ribosomal protein L35

Chain l:



• Molecule 31: 50S ribosomal protein L36

Chain m:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	48610	Depositor
Resolution determination method	FSC 0.33 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	0.017	Depositor
Minimum map value	-0.019	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.005	Depositor
Map size (Å)	364.5, 364.5, 364.5	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.729, 0.729, 0.729	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: G7M, OMC, 2MG, H2U, NA, 4D4, ZN, 3TD, MG, 2MA, 5MU, OMU, 6MZ, OMG, 1MG, 5MC, PSU

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	I	0.12	0/69121	0.20	0/107828
2	J	0.09	0/2828	0.17	0/4410
3	K	0.10	0/2122	0.27	0/2852
4	L	0.12	0/1586	0.29	0/2134
5	M	0.10	0/1571	0.23	0/2113
6	N	0.09	0/1435	0.23	0/1926
7	O	0.09	0/1343	0.25	0/1816
8	P	0.08	0/1121	0.23	0/1515
9	Q	0.11	0/993	0.30	0/1341
10	R	0.10	0/1152	0.23	0/1551
11	S	0.09	0/947	0.26	0/1268
12	T	0.10	0/1062	0.25	0/1413
13	U	0.13	0/1081	0.26	0/1443
14	V	0.10	0/973	0.25	0/1301
15	W	0.08	0/902	0.24	0/1209
16	X	0.08	0/929	0.22	0/1242
17	Y	0.12	0/960	0.24	0/1278
18	Z	0.11	0/829	0.24	0/1107
19	a	0.11	0/864	0.26	0/1156
20	b	0.08	0/745	0.22	0/994
21	c	0.08	0/788	0.26	0/1051
22	d	0.10	0/766	0.24	0/1025
23	e	0.12	0/582	0.25	0/769
24	f	0.10	0/635	0.23	0/848
25	g	0.08	0/502	0.22	0/667
26	h	0.09	0/453	0.23	0/605
27	i	0.11	0/450	0.25	0/599
28	j	0.11	0/416	0.31	0/554
29	k	0.12	0/380	0.25	0/498
30	l	0.11	0/513	0.24	0/676
31	m	0.10	0/303	0.28	0/397

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
All	All	0.12	0/98352	0.21	0/147586

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	I	62229	31235	31316	290	0
2	J	2529	1281	1281	14	0
3	K	2083	2152	2154	25	0
4	L	1565	1617	1616	13	0
5	M	1552	1618	1618	13	0
6	N	1411	1444	1444	16	0
7	O	1323	1371	1371	15	0
8	P	1110	1148	1148	14	0
9	Q	979	1028	1028	20	0
10	R	1129	1162	1162	9	0
11	S	938	1012	1012	8	0
12	T	1053	1129	1129	14	0
13	U	1075	1147	1154	8	0
14	V	960	1000	1000	8	0
15	W	892	923	923	18	0
16	X	917	962	962	6	0
17	Y	947	1020	1019	6	0
18	Z	816	839	839	11	0
19	a	857	922	922	4	0
20	b	739	807	807	6	0
21	c	780	831	831	13	0
22	d	753	780	780	13	0
23	e	575	592	592	4	0
24	f	625	652	652	4	0
25	g	501	531	531	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
26	h	449	488	488	4	0
27	i	444	458	458	5	0
28	j	409	439	440	7	0
29	k	377	418	418	2	0
30	l	504	572	572	7	0
31	m	302	340	340	6	0
32	I	161	0	0	0	0
32	J	1	0	0	0	0
32	K	2	0	0	0	0
32	L	1	0	0	0	0
32	k	1	0	0	0	0
33	K	1	0	0	0	0
34	m	1	0	0	0	0
35	I	27	0	0	1	0
All	All	91018	59918	60007	525	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 4.

All (525) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:1939:5MU:C4	1:I:1939:5MU:C5	1.79	1.70
1:I:747:5MU:C5	1:I:747:5MU:C4	1.79	1.62
1:I:2069:G7M:N2	1:I:2442:C:O2	2.06	0.88
1:I:1582:C:O2'	1:I:1585:C:N4	2.14	0.80
1:I:2134:A:N6	1:I:2157:G:O2'	2.15	0.80
1:I:2857:G:N2	1:I:2860:A:OP2	2.15	0.79
1:I:245:G:O2'	1:I:384:A:N1	2.15	0.79
1:I:2304:G:N2	1:I:2312:U:O4	2.16	0.79
1:I:2718:G:O2'	1:I:2847:U:OP1	1.99	0.79
2:J:29:A:O2'	2:J:58:A:N1	2.15	0.79
1:I:2375:G:N2	1:I:2378:A:OP2	2.15	0.79
1:I:210:C:OP1	29:k:25:LYS:NZ	2.15	0.78
1:I:2659:G:O2'	1:I:2662:A:N6	2.17	0.78
1:I:278:A:N1	1:I:361:G:O2'	2.16	0.77
1:I:875:G:O6	1:I:902:C:N4	2.16	0.77
1:I:1472:C:O2	1:I:1519:G:N2	2.17	0.77
1:I:1055:G:N2	1:I:1104:C:O2	2.17	0.76
1:I:635:C:O2'	1:I:639:U:OP1	2.02	0.76
1:I:1087:G:N2	1:I:1090:A:OP1	2.20	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:2170:A:O2'	1:I:2171:A:OP2	2.05	0.75
1:I:500:G:N1	1:I:503:A:OP2	2.19	0.75
1:I:329:G:OP2	21:c:69:ASN:ND2	2.19	0.74
1:I:1826:G:O2'	1:I:1971:U:OP2	2.04	0.73
2:J:40:U:N3	2:J:44:G:OP2	2.21	0.73
1:I:411:G:OP2	1:I:2406:A:O2'	2.07	0.73
1:I:1730:C:O2'	1:I:1731:G:O5'	2.07	0.72
22:d:77:VAL:HG21	22:d:86:LEU:HD22	1.72	0.72
1:I:534:U:O2'	17:Y:49:ASP:OD2	2.08	0.72
1:I:582:A:OP1	17:Y:11:ARG:NH2	2.21	0.72
3:K:69:ARG:NH1	3:K:129:THR:OG1	2.22	0.72
1:I:1378:A:O2'	1:I:1380:G:OP2	2.08	0.71
1:I:434:U:O2'	1:I:436:C:N4	2.20	0.71
1:I:2202:U:O2'	1:I:2204:G:OP1	2.02	0.71
1:I:2751:G:OP1	1:I:2751:G:N2	2.18	0.71
1:I:876:C:OP2	1:I:877:A:N6	2.23	0.71
1:I:1417:C:O5'	1:I:1587:G:N2	2.24	0.71
1:I:1649:G:O2'	14:V:106:ASP:OD2	2.05	0.70
1:I:2473:U:OP1	1:I:2529:G:N2	2.25	0.70
2:J:75:G:OP1	22:d:12:GLN:NE2	2.24	0.70
1:I:637:A:N1	1:I:651:G:O2'	2.23	0.70
1:I:69:C:O2	1:I:73:A:O2'	2.09	0.70
1:I:792:A:N3	1:I:2072:C:O2'	2.25	0.69
1:I:300:A:O2'	1:I:318:C:O2	2.10	0.69
1:I:2788:C:O2'	1:I:2809:A:N3	2.22	0.69
8:P:58:LEU:HD12	8:P:61:VAL:HB	1.74	0.68
1:I:1169:A:N6	1:I:1180:U:O4	2.20	0.68
1:I:930:G:H1'	26:h:25:LEU:HD21	1.73	0.68
1:I:2376:A:N3	15:W:111:ARG:NH2	2.41	0.68
1:I:177:G:OP2	1:I:177:G:N2	2.23	0.67
1:I:2808:G:O2'	1:I:2890:G:O6	2.12	0.67
15:W:39:VAL:HG11	15:W:87:ILE:HG21	1.77	0.66
1:I:475:C:O2	1:I:479:A:N6	2.24	0.65
1:I:1266:G:O2'	1:I:2012:G:O6	2.14	0.65
1:I:1009:A:N3	1:I:1153:C:O2'	2.28	0.65
1:I:1936:A:OP2	1:I:1961:C:N4	2.30	0.65
16:X:25:THR:HG22	16:X:44:GLU:OE2	1.96	0.65
2:J:13:G:O2'	2:J:15:A:OP2	2.13	0.65
1:I:866:A:O4'	1:I:914:G:N2	2.30	0.64
1:I:302:C:O5'	21:c:79:LYS:NZ	2.21	0.64
1:I:993:G:N2	1:I:1161:C:O2	2.17	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:85:G:O4'	21:c:7:ARG:NH2	2.31	0.63
1:I:1798:U:OP2	3:K:270:ARG:NH2	2.31	0.63
1:I:2627:G:O2'	1:I:2781:A:N1	2.24	0.63
15:W:30:ARG:HA	15:W:35:ILE:HD12	1.79	0.63
28:j:9:ILE:N	28:j:23:THR:O	2.30	0.62
1:I:1800:C:OP1	3:K:258:ARG:NH1	2.33	0.62
1:I:2659:G:N2	1:I:2662:A:OP2	2.32	0.62
2:J:30:C:O2'	6:N:26:MET:SD	2.56	0.62
1:I:2576:G:O2'	1:I:2579:C:OP2	2.17	0.62
1:I:2653:U:O2	1:I:2667:C:N4	2.31	0.62
18:Z:51:VAL:O	18:Z:51:VAL:HG13	2.00	0.62
1:I:578:G:OP1	1:I:1255:U:O2'	2.18	0.62
1:I:463:G:N2	1:I:466:A:OP2	2.29	0.62
1:I:1482:G:N3	1:I:1509:A:N6	2.48	0.62
5:M:197:GLU:O	5:M:201:ALA:N	2.32	0.61
1:I:2307:G:N1	1:I:2311:A:N7	2.48	0.61
1:I:1003:G:O2'	1:I:1010:A:N1	2.25	0.61
4:L:85:ALA:N	4:L:88:GLU:OE2	2.33	0.61
18:Z:22:LEU:HD12	18:Z:23:GLU:O	2.00	0.61
20:b:50:LEU:HD23	25:g:26:PHE:CZ	2.35	0.61
1:I:2291:U:OP1	1:I:2380:C:O2'	2.18	0.61
3:K:6:CYS:SG	3:K:13:ARG:NH2	2.74	0.61
25:g:57:LEU:O	25:g:61:ALA:N	2.34	0.61
1:I:301:G:O4'	1:I:317:G:N2	2.34	0.60
2:J:77:U:OP1	22:d:21:ARG:NH1	2.34	0.60
1:I:2295:C:OP2	15:W:9:ARG:NH1	2.34	0.60
15:W:31:THR:OG1	15:W:34:HIS:O	2.18	0.60
1:I:2287:A:OP1	28:j:30:LYS:NZ	2.35	0.60
1:I:2627:G:N2	1:I:2777:G:OP2	2.34	0.60
1:I:2472:G:N2	1:I:2477:U:OP1	2.31	0.60
1:I:2865:U:OP2	1:I:2866:U:O2'	2.14	0.60
1:I:1929:G:O2'	1:I:1930:G:OP2	2.13	0.59
25:g:55:THR:HG22	25:g:59:GLU:OE2	2.02	0.59
1:I:1754:A:N1	1:I:2716:C:O2'	2.29	0.59
3:K:140:THR:HG23	3:K:161:TYR:CD2	2.37	0.59
8:P:38:PRO:O	8:P:43:ASN:ND2	2.36	0.59
1:I:228:C:N3	1:I:417:C:O2'	2.29	0.59
1:I:476:G:N1	1:I:479:A:OP2	2.34	0.59
12:T:135:ILE:O	12:T:140:GLY:N	2.35	0.59
20:b:8:LEU:O	25:g:29:ARG:NH2	2.34	0.59
1:I:219:A:N3	1:I:234:U:O2'	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:2502:G:N7	35:I:3204:HOH:O	2.32	0.59
28:j:17:THR:OG1	28:j:40:ASP:OD2	2.20	0.59
1:I:1066:U:N3	1:I:1069:A:OP2	2.32	0.58
1:I:1275:A:N1	1:I:1295:C:O2'	2.33	0.58
1:I:299:A:N1	1:I:322:A:O2'	2.36	0.58
9:Q:9:VAL:O	9:Q:9:VAL:HG13	2.03	0.58
11:S:61:VAL:HB	11:S:87:LEU:HD11	1.84	0.58
1:I:624:C:O2'	1:I:657:U:OP1	2.21	0.58
1:I:568:U:H1'	1:I:2030:6MZ:H9C1	1.85	0.58
14:V:44:LEU:HD23	14:V:113:ILE:HD13	1.86	0.58
22:d:56:PHE:O	22:d:61:LEU:HD21	2.04	0.58
1:I:2224:G:OP1	3:K:265:LYS:NZ	2.29	0.57
16:X:90:GLY:O	16:X:113:ARG:NH1	2.37	0.57
1:I:713:G:C2'	1:I:718:A:H61	2.18	0.57
21:c:46:GLN:OE1	21:c:61:LYS:NZ	2.37	0.57
4:L:3:GLY:O	4:L:4:LEU:HD12	2.04	0.57
1:I:2109:U:O2'	1:I:2110:G:OP1	2.18	0.57
1:I:321:U:H5"	5:M:131:THR:HG23	1.87	0.57
1:I:65:U:O2'	1:I:456:C:N3	2.37	0.56
1:I:514:A:N3	1:I:581:C:O2'	2.33	0.56
1:I:2749:A:OP1	7:O:2:SER:N	2.38	0.56
4:L:46:ARG:HG2	4:L:84:LEU:HD12	1.87	0.56
1:I:1315:C:O2'	1:I:1392:A:N3	2.36	0.56
2:J:49:C:OP1	15:W:102:ARG:N	2.39	0.56
6:N:117:LEU:HD23	6:N:176:PRO:HG2	1.87	0.56
1:I:138:U:O2'	1:I:139:U:O5'	2.24	0.56
1:I:2531:A:N1	1:I:2659:G:O2'	2.39	0.56
4:L:48:ILE:HG23	4:L:84:LEU:HD11	1.86	0.56
11:S:94:PRO:HG3	11:S:115:ILE:HG23	1.88	0.56
1:I:275:C:O2'	1:I:276:U:OP1	2.23	0.56
1:I:700:G:O2'	1:I:1632:A:N3	2.34	0.56
1:I:989:G:OP2	26:h:12:SER:OG	2.24	0.56
1:I:1418:G:H2'	1:I:1580:A:H61	1.71	0.56
1:I:2:G:O6	1:I:2900:A:N6	2.39	0.56
1:I:903:C:N4	1:I:904:G:O6	2.39	0.56
1:I:1028:A:N3	1:I:2486:C:O2'	2.26	0.55
1:I:631:A:N3	1:I:2415:G:O2'	2.30	0.55
1:I:1085:A:O2'	1:I:1104:C:O2'	2.20	0.55
1:I:1070:A:N6	1:I:1096:A:O2'	2.35	0.55
1:I:302:C:P	21:c:79:LYS:HZ1	2.28	0.55
1:I:859:G:O2'	1:I:916:G:O6	2.21	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:2830:C:O2'	1:I:2883:A:N1	2.36	0.55
5:M:131:THR:HG22	5:M:160:ALA:HA	1.88	0.55
8:P:40:THR:HG22	8:P:40:THR:O	2.07	0.55
12:T:135:ILE:HG22	12:T:140:GLY:HA3	1.88	0.55
1:I:1417:C:C4'	1:I:1587:G:H21	2.20	0.54
1:I:2477:U:O4	31:m:10:LEU:HD22	2.07	0.54
5:M:1:MET:HE1	5:M:113:VAL:HG11	1.89	0.54
5:M:61:ARG:NE	5:M:63:LYS:O	2.39	0.54
1:I:1059:G:OP1	9:Q:73:THR:OG1	2.25	0.54
1:I:1801:A:OP2	3:K:150:LYS:NZ	2.39	0.54
6:N:71:ARG:HD2	6:N:71:ARG:O	2.06	0.54
1:I:995:C:O2	10:R:3:THR:OG1	2.22	0.54
7:O:72:LEU:O	7:O:76:VAL:HG23	2.08	0.54
5:M:175:ILE:HD13	5:M:196:VAL:HG12	1.89	0.54
15:W:19:GLN:NE2	15:W:42:PRO:O	2.39	0.54
1:I:713:G:N2	1:I:719:C:N3	2.55	0.53
9:Q:77:ALA:HA	9:Q:80:LEU:HD12	1.90	0.53
13:U:26:VAL:HG22	13:U:104:GLU:OE2	2.09	0.53
1:I:2117:A:O2'	1:I:2118:U:OP2	2.20	0.53
1:I:2287:A:O2'	1:I:2288:A:O5'	2.25	0.53
8:P:85:GLY:N	8:P:89:LYS:O	2.41	0.53
1:I:745:1MG:O2'	1:I:748:G:O2'	2.25	0.53
4:L:1:MET:HE3	4:L:2:ILE:HG12	1.90	0.53
1:I:453:A:N3	1:I:457:A:O2'	2.41	0.53
1:I:586:A:N1	1:I:809:G:O2'	2.35	0.53
1:I:770:G:O3'	29:k:14:ARG:NH1	2.42	0.53
1:I:2294:G:OP1	15:W:98:GLN:NE2	2.38	0.53
14:V:67:PHE:O	14:V:71:ARG:N	2.39	0.53
21:c:88:GLU:O	21:c:89:ASP:C	2.52	0.53
1:I:1043:C:O2	1:I:1112:G:N2	2.20	0.52
15:W:31:THR:O	15:W:102:ARG:NH2	2.35	0.52
1:I:1199:U:H1'	17:Y:4:VAL:HG22	1.91	0.52
1:I:1917:PSU:O5'	1:I:1917:PSU:H6	1.91	0.52
1:I:1031:G:N3	31:m:37:GLN:NE2	2.52	0.52
1:I:1869:G:N2	1:I:1872:A:OP2	2.43	0.52
11:S:65:THR:HG23	11:S:68:GLY:H	1.74	0.52
22:d:4:ILE:HB	22:d:63:ILE:HG22	1.91	0.52
1:I:1481:U:O2	1:I:1511:G:N2	2.42	0.52
1:I:1865:U:O2'	1:I:1875:G:N2	2.43	0.52
1:I:2581:G:OP2	1:I:2581:G:N2	2.42	0.52
1:I:1223:G:N1	1:I:1226:A:OP2	2.39	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:1904:G:O2'	1:I:1928:A:N1	2.39	0.52
3:K:108:LYS:N	3:K:194:GLU:O	2.43	0.52
3:K:128:ASN:O	3:K:192:LEU:N	2.41	0.52
6:N:46:ASP:OD1	6:N:47:LYS:N	2.43	0.51
5:M:117:ARG:NH2	5:M:183:PHE:O	2.44	0.51
1:I:1338:G:O2'	1:I:1393:A:N1	2.40	0.51
6:N:160:ALA:HB1	6:N:165:GLU:HG3	1.91	0.51
15:W:60:GLU:OE1	15:W:60:GLU:N	2.43	0.51
1:I:784:G:H5'	1:I:785:G:OP1	2.11	0.51
9:Q:57:VAL:HG22	9:Q:72:LYS:HB3	1.92	0.51
7:O:94:TYR:CD2	7:O:107:LEU:HD22	2.46	0.51
1:I:307:G:N2	1:I:310:A:OP2	2.44	0.51
15:W:4:LYS:O	15:W:8:ILE:HD12	2.11	0.51
1:I:1288:G:OP2	1:I:1288:G:N2	2.40	0.51
2:J:25:U:O2	2:J:117:G:O2'	2.29	0.51
11:S:112:PHE:HB3	11:S:115:ILE:HD11	1.93	0.51
1:I:239:C:O2'	1:I:622:G:O2'	2.24	0.50
1:I:875:G:N1	1:I:902:C:N3	2.53	0.50
1:I:2258:C:O2'	1:I:2427:C:OP2	2.25	0.50
13:U:26:VAL:HG13	13:U:104:GLU:OE1	2.11	0.50
22:d:6:ALA:HB3	22:d:65:VAL:HG12	1.94	0.50
1:I:568:U:O4	18:Z:81:LYS:NZ	2.44	0.50
1:I:1779:U:OP2	1:I:1784:A:N6	2.31	0.50
1:I:138:U:O2'	1:I:139:U:P	2.70	0.50
1:I:1007:C:OP1	10:R:37:ARG:NH1	2.43	0.50
5:M:189:THR:OG1	5:M:191:ASP:OD1	2.14	0.50
13:U:53:MET:HE1	13:U:103:TYR:CD2	2.46	0.50
1:I:2109:U:N3	1:I:2180:U:O4	2.45	0.50
1:I:223:A:N1	1:I:407:G:O2'	2.41	0.50
1:I:299:A:N3	1:I:319:G:O2'	2.44	0.50
10:R:13:ARG:NH2	10:R:49:ASP:O	2.42	0.50
11:S:108:ARG:CZ	11:S:116:ILE:HD12	2.42	0.50
1:I:1211:C:O2'	1:I:1212:G:OP1	2.29	0.50
2:J:51:G:O6	2:J:52:A:N6	2.45	0.50
1:I:2467:C:OP1	31:m:8:LYS:NZ	2.42	0.49
2:J:14:U:O4'	2:J:106:G:N2	2.45	0.49
11:S:104:THR:OG1	11:S:106:GLU:OE1	2.24	0.49
22:d:44:HIS:CE1	22:d:48:MET:HE2	2.47	0.49
1:I:1631:G:N2	1:I:1634:A:OP2	2.29	0.49
1:I:2756:U:H4'	1:I:2757:A:OP1	2.12	0.49
1:I:1129:A:O2'	1:I:2515:C:O2	2.29	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:b:87:LEU:HD13	20:b:90:GLY:O	2.13	0.49
1:I:1807:G:N2	1:I:1810:A:OP2	2.40	0.49
8:P:3:VAL:HG12	8:P:38:PRO:HA	1.94	0.49
28:j:13:SER:OG	28:j:40:ASP:OD2	2.24	0.49
1:I:1056:G:N1	1:I:1102:C:OP2	2.38	0.49
1:I:298:G:O2'	1:I:322:A:N1	2.42	0.49
1:I:1005:C:O2'	10:R:30:THR:HG21	2.13	0.49
24:f:44:LYS:O	24:f:44:LYS:HG2	2.13	0.49
1:I:2029:G:N1	1:I:2033:A:OP2	2.36	0.49
1:I:2831:G:O2'	1:I:2884:U:OP1	2.27	0.49
1:I:346:A:H2'	1:I:347:A:O4'	2.12	0.48
1:I:2278:A:OP1	13:U:10:ARG:NH1	2.46	0.48
1:I:2680:U:O2'	1:I:2681:C:P	2.70	0.48
5:M:188:MET:HE1	5:M:196:VAL:HG21	1.95	0.48
6:N:119:ALA:O	6:N:167:ARG:NH1	2.46	0.48
7:O:77:ILE:O	7:O:81:GLU:N	2.44	0.48
14:V:28:LEU:HD23	14:V:48:VAL:HG11	1.95	0.48
28:j:35:GLU:OE1	28:j:35:GLU:N	2.43	0.48
27:i:53:LYS:NZ	27:i:55:ILE:O	2.36	0.48
1:I:1910:G:H1	1:I:1920:C:H42	1.59	0.48
1:I:2177:C:N4	1:I:2178:C:N3	2.61	0.48
4:L:133:THR:O	4:L:134:HIS:HB2	2.13	0.48
6:N:38:MET:HB3	6:N:57:LEU:HD11	1.95	0.48
7:O:154:PRO:HB3	7:O:169:VAL:HG21	1.96	0.48
9:Q:42:PHE:CZ	9:Q:55:ILE:HG23	2.49	0.48
1:I:1837:C:O2'	1:I:1927:A:N3	2.40	0.48
1:I:2343:U:HO2'	1:I:2373:G:HO2'	1.50	0.48
11:S:108:ARG:NH1	11:S:116:ILE:HD12	2.28	0.48
1:I:580:U:O3'	17:Y:31:VAL:HG13	2.14	0.48
6:N:57:LEU:HA	6:N:60:ILE:HD12	1.96	0.48
9:Q:134:ARG:HG2	9:Q:139:VAL:HG22	1.94	0.48
12:T:20:GLY:HA2	12:T:28:GLY:O	2.13	0.48
1:I:2156:G:O6	1:I:2157:G:N2	2.47	0.47
25:g:18:LEU:HD11	25:g:50:VAL:HG13	1.94	0.47
1:I:964:C:O2'	1:I:2273:A:N3	2.47	0.47
30:l:32:ILE:HG22	30:l:35:LYS:HG2	1.95	0.47
2:J:66:A:O4'	2:J:108:A:N6	2.47	0.47
1:I:807:U:OP2	12:T:41:ARG:NH2	2.44	0.47
6:N:20:PHE:O	6:N:21:ASN:OD1	2.32	0.47
1:I:2430:A:N3	1:I:2430:A:H2'	2.29	0.47
3:K:84:ASP:OD2	3:K:87:ARG:NE	2.41	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:T:85:VAL:HG22	12:T:86:GLU:N	2.30	0.47
31:m:33:HIS:O	31:m:35:GLN:NE2	2.47	0.47
1:I:323:C:O2	1:I:323:C:O4'	2.33	0.47
1:I:498:G:O2'	21:c:45:HIS:NE2	2.44	0.47
1:I:2638:G:O2'	1:I:2775:G:N2	2.43	0.47
3:K:19:VAL:HG23	3:K:203:ARG:HG2	1.96	0.47
10:R:8:PRO:O	10:R:11:VAL:HG22	2.14	0.47
1:I:263:G:O2'	1:I:429:A:N3	2.48	0.47
1:I:271:G:H4'	1:I:272:A:OP1	2.15	0.47
1:I:577:G:O2'	1:I:1254:A:OP1	2.33	0.47
1:I:1094:U:O2'	1:I:1095:A:OP1	2.31	0.47
21:c:7:ARG:HG3	21:c:8:ASP:OD1	2.14	0.47
25:g:8:GLU:OE1	25:g:8:GLU:N	2.45	0.47
25:g:18:LEU:HG	25:g:22:LEU:HD12	1.97	0.47
1:I:2447:G:H1'	1:I:2448:A:OP2	2.15	0.47
4:L:56:LYS:O	4:L:60:VAL:HG23	2.15	0.47
20:b:6:ARG:O	20:b:10:VAL:HG23	2.15	0.47
1:I:1877:A:H2'	1:I:1878:G:O4'	2.15	0.47
9:Q:106:LEU:HD12	9:Q:140:VAL:HG12	1.97	0.47
1:I:1501:G:O2'	3:K:97:LYS:NZ	2.46	0.46
3:K:107:PRO:HD2	3:K:110:LEU:HD22	1.97	0.46
22:d:77:VAL:HG23	22:d:89:ILE:HG12	1.97	0.46
1:I:572:A:OP2	18:Z:80:ARG:NH2	2.48	0.46
1:I:819:A:OP2	1:I:1187:G:N2	2.36	0.46
1:I:923:G:H4'	23:e:29:GLU:OE1	2.15	0.46
2:J:34:A:N3	2:J:36:C:N4	2.63	0.46
9:Q:59:ILE:O	9:Q:59:ILE:HG13	2.15	0.46
1:I:2375:G:O2'	1:I:2377:A:N7	2.28	0.46
25:g:32:ALA:HB2	25:g:37:LEU:HD23	1.97	0.46
1:I:1508:A:O2'	1:I:1509:A:O4'	2.33	0.46
22:d:77:VAL:CG2	22:d:86:LEU:HD22	2.43	0.46
1:I:1721:G:H2'	1:I:1738:G:H22	1.80	0.46
19:a:17:VAL:HG12	19:a:76:VAL:HG21	1.97	0.46
1:I:320:A:N3	5:M:163:ASN:ND2	2.64	0.46
1:I:491:G:O6	19:a:49:LYS:NZ	2.43	0.46
1:I:1062:G:N2	9:Q:135:SER:OG	2.48	0.46
1:I:1965:C:OP1	1:I:1966:A:O2'	2.28	0.46
13:U:78:LEU:HD23	13:U:79:ALA:HB2	1.97	0.46
16:X:88:ARG:NH1	16:X:110:ILE:O	2.46	0.46
1:I:1814:G:OP2	1:I:1815:A:O2'	2.15	0.46
9:Q:33:VAL:CG2	9:Q:61:VAL:HG21	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:Q:92:LYS:O	9:Q:92:LYS:HG3	2.16	0.46
20:b:39:THR:HG23	20:b:42:GLU:H	1.81	0.46
1:I:585:G:N7	17:Y:6:ARG:NH2	2.63	0.46
5:M:148:ILE:HB	5:M:169:VAL:HG22	1.98	0.46
1:I:1568:G:OP2	3:K:63:ARG:NH2	2.49	0.45
1:I:2362:C:OP1	30:l:40:ARG:NH2	2.46	0.45
3:K:76:ALA:HB1	3:K:94:VAL:HG22	1.98	0.45
18:Z:63:VAL:HG13	18:Z:94:THR:CG2	2.46	0.45
1:I:878:A:N6	1:I:899:A:O2'	2.49	0.45
1:I:1223:G:N2	1:I:1226:A:OP2	2.45	0.45
1:I:1481:U:H2'	1:I:1482:G:O3'	2.16	0.45
19:a:59:GLU:OE2	19:a:66:ILE:HD11	2.15	0.45
1:I:58:G:O2'	1:I:73:A:N1	2.44	0.45
1:I:197:A:N6	1:I:2430:A:O2'	2.50	0.45
21:c:98:SER:O	21:c:99:ASN:CG	2.60	0.45
22:d:42:LEU:HD11	22:d:91:PHE:CE2	2.52	0.45
1:I:818:G:N1	1:I:1188:U:OP2	2.33	0.45
9:Q:35:ILE:HG23	9:Q:36:MET:N	2.31	0.45
7:O:17:VAL:HG11	7:O:50:LEU:HD11	1.99	0.45
21:c:71:ALA:HB3	21:c:80:ALA:HB1	1.99	0.45
27:i:9:THR:HG22	27:i:10:ARG:N	2.32	0.45
27:i:54:VAL:HG23	27:i:55:ILE:HG12	1.99	0.45
1:I:545:U:H2'	1:I:546:U:H4'	1.99	0.45
16:X:31:TRP:NE1	16:X:82:ASP:OD1	2.50	0.45
8:P:88:GLY:O	8:P:125:THR:OG1	2.21	0.45
3:K:7:LYS:O	3:K:9:THR:N	2.48	0.45
9:Q:46:THR:HA	9:Q:49:ILE:HD12	1.98	0.45
14:V:36:THR:HG22	14:V:37:THR:N	2.32	0.45
1:I:527:C:N4	1:I:2777:G:O2'	2.41	0.45
1:I:1452:G:H2'	1:I:1452:G:N3	2.32	0.45
6:N:108:VAL:O	6:N:111:ILE:HD12	2.17	0.45
15:W:67:ASN:OD1	15:W:70:ALA:N	2.47	0.45
3:K:155:ALA:HB2	3:K:162:VAL:HG23	1.98	0.44
4:L:5:VAL:HG22	4:L:202:ILE:HG12	1.99	0.44
7:O:37:LEU:HD12	7:O:68:ALA:HB2	1.99	0.44
1:I:1688:U:O2'	1:I:1700:A:N7	2.46	0.44
3:K:35:GLU:HG3	3:K:64:ILE:HD11	1.98	0.44
6:N:25:VAL:O	6:N:28:VAL:HG12	2.17	0.44
26:h:5:ILE:N	26:h:38:ARG:O	2.44	0.44
31:m:30:GLU:OE1	31:m:32:LYS:HB2	2.17	0.44
1:I:60:G:O2'	1:I:62:U:OP2	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:1911:PSU:HN3	1:I:1918:A:H2'	1.83	0.44
1:I:2333:A:OP1	23:e:77:ARG:NH2	2.50	0.44
10:R:32:LEU:CD2	10:R:54:ILE:HG21	2.46	0.44
13:U:53:MET:HE2	13:U:117:PHE:CD1	2.52	0.44
1:I:84:A:OP1	21:c:6:ARG:NH2	2.50	0.44
1:I:1507:C:O2'	1:I:1508:A:OP1	2.30	0.44
1:I:1916:A:C5	1:I:1917:PSU:C2	3.05	0.44
6:N:136:ILE:H	6:N:136:ILE:HD12	1.82	0.44
20:b:11:LEU:H	20:b:11:LEU:HD23	1.82	0.44
1:I:636:G:C2	12:T:111:ILE:HD12	2.53	0.44
8:P:48:GLU:O	8:P:52:ALA:N	2.31	0.44
12:T:89:VAL:HG23	12:T:94:THR:HG21	2.00	0.44
1:I:27:G:O2'	1:I:28:A:OP2	2.34	0.44
1:I:875:G:N2	1:I:903:C:O2	2.51	0.44
1:I:2348:U:OP1	30:l:38:THR:HG21	2.17	0.44
1:I:2734:A:N6	1:I:2770:G:O2'	2.44	0.44
1:I:2104:C:H3'	1:I:2105:U:O4'	2.18	0.44
2:J:55:U:O2	2:J:57:A:N6	2.51	0.44
6:N:31:VAL:O	6:N:96:MET:HE1	2.17	0.44
1:I:2299:U:H2'	1:I:2300:C:O4'	2.18	0.44
3:K:187:ASP:OD1	3:K:187:ASP:O	2.36	0.44
1:I:2661:G:H2'	1:I:2662:A:O4'	2.18	0.43
7:O:138:LYS:HA	7:O:141:ILE:HG22	1.98	0.43
1:I:310:A:H5"	21:c:15:THR:HG23	2.00	0.43
1:I:992:C:H4'	18:Z:74:ILE:HD13	2.01	0.43
1:I:1871:A:O2'	1:I:1872:A:N7	2.46	0.43
4:L:46:ARG:NH2	4:L:85:ALA:O	2.48	0.43
8:P:103:VAL:HG11	8:P:132:PHE:HZ	1.83	0.43
8:P:103:VAL:HG22	8:P:103:VAL:O	2.18	0.43
1:I:30:G:O2'	1:I:1214:A:N3	2.50	0.43
1:I:221:A:N1	1:I:265:A:O2'	2.47	0.43
1:I:402:A:N1	1:I:422:A:N6	2.66	0.43
1:I:1225:G:OP1	18:Z:71:LYS:NZ	2.50	0.43
1:I:2447:G:O2'	1:I:2500:U:OP2	2.33	0.43
7:O:90:VAL:O	7:O:161:GLY:N	2.51	0.43
24:f:37:ARG:HA	24:f:48:THR:HA	2.00	0.43
1:I:272:A:H2'	1:I:273:G:C8	2.54	0.43
1:I:1533:C:O2	1:I:1539:U:N3	2.50	0.43
1:I:1074:G:OP1	1:I:2474:U:O2'	2.25	0.43
17:Y:91:ASP:OD1	17:Y:91:ASP:C	2.60	0.43
1:I:224:U:OP2	1:I:408:G:N2	2.38	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:646:U:H3'	1:I:647:G:C5'	2.48	0.43
3:K:128:ASN:HB2	3:K:192:LEU:HD12	2.01	0.43
8:P:37:VAL:HG22	8:P:38:PRO:HD2	1.99	0.43
16:X:33:VAL:HG13	16:X:33:VAL:O	2.19	0.43
1:I:545:U:H2'	1:I:546:U:O3'	2.19	0.43
1:I:981:A:OP2	1:I:982:C:N4	2.41	0.43
1:I:1081:U:H4'	9:Q:124:ALA:HB1	2.00	0.43
4:L:96:ILE:HG23	4:L:100:LEU:HD13	2.00	0.43
23:e:37:ILE:HG22	23:e:38:VAL:HG13	2.01	0.43
1:I:159:G:O2'	1:I:167:A:N6	2.45	0.43
1:I:526:A:O2'	1:I:2043:C:O2'	2.32	0.43
10:R:60:ASP:OD1	10:R:60:ASP:N	2.46	0.43
15:W:94:ARG:O	15:W:95:SER:OG	2.31	0.43
1:I:373:U:O2'	1:I:423:A:N3	2.38	0.43
1:I:2622:U:O2'	1:I:2825:G:N7	2.51	0.43
4:L:179:ARG:HB3	4:L:188:LEU:HD12	2.00	0.43
9:Q:139:VAL:HG12	9:Q:140:VAL:N	2.34	0.43
1:I:247:G:OP2	1:I:249:C:N4	2.46	0.42
1:I:1385:A:H4'	1:I:1386:C:OP1	2.18	0.42
14:V:33:ILE:O	14:V:33:ILE:HG23	2.19	0.42
1:I:205:G:HO2'	1:I:206:U:P	2.41	0.42
1:I:2680:U:O2'	1:I:2681:C:O5'	2.38	0.42
7:O:37:LEU:HD12	7:O:68:ALA:CB	2.49	0.42
13:U:78:LEU:HD23	13:U:79:ALA:N	2.34	0.42
1:I:713:G:H2'	1:I:718:A:H61	1.83	0.42
1:I:1410:G:O6	1:I:1591:A:N6	2.51	0.42
1:I:1715:G:HO2'	1:I:1743:G:H1	1.66	0.42
1:I:1718:G:O6	1:I:1743:G:N2	2.53	0.42
1:I:1952:A:N3	1:I:2560:A:O2'	2.53	0.42
8:P:6:LEU:HD13	8:P:37:VAL:HG12	2.01	0.42
10:R:110:PRO:O	10:R:115:GLY:HA3	2.20	0.42
1:I:612:G:O2'	1:I:616:A:N6	2.43	0.42
1:I:2477:U:C4	31:m:10:LEU:HD22	2.55	0.42
6:N:74:VAL:HG11	6:N:77:PHE:CD2	2.55	0.42
1:I:368:A:H2'	1:I:369:U:O4'	2.20	0.42
1:I:1070:A:N7	1:I:1096:A:O2'	2.48	0.42
1:I:1470:A:N6	1:I:1521:G:O2'	2.39	0.42
1:I:1725:U:H2'	1:I:1726:C:O4'	2.19	0.42
1:I:2111:U:N3	1:I:2118:U:OP2	2.52	0.42
6:N:4:LEU:HD13	6:N:100:PHE:CD2	2.55	0.42
9:Q:74:PRO:O	9:Q:113:LYS:NZ	2.51	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:1274:A:N1	1:I:1644:C:O2'	2.48	0.42
1:I:2688:G:N1	1:I:2720:U:OP2	2.31	0.42
8:P:31:VAL:N	8:P:32:PRO:HD2	2.35	0.42
1:I:1266:G:OP2	27:i:17:ARG:NE	2.36	0.42
3:K:157:SER:HB3	3:K:160:THR:HG21	2.01	0.42
12:T:110:VAL:O	12:T:128:THR:HG23	2.19	0.42
18:Z:72:VAL:O	18:Z:72:VAL:HG23	2.20	0.42
21:c:99:ASN:C	21:c:99:ASN:OD1	2.62	0.42
28:j:34:LEU:HB3	28:j:52:ALA:CB	2.50	0.42
28:j:52:ALA:O	28:j:53:LYS:C	2.62	0.42
1:I:672:C:OP2	12:T:42:SER:OG	2.36	0.42
1:I:1000:A:H62	1:I:1154:G:H2'	1.83	0.42
1:I:2093:G:H2'	1:I:2094:A:O4'	2.20	0.42
1:I:2154:A:H2'	1:I:2155:U:O4'	2.20	0.42
4:L:98:VAL:HG22	4:L:98:VAL:O	2.20	0.42
9:Q:36:MET:SD	9:Q:37:GLU:N	2.93	0.42
9:Q:130:GLU:HA	9:Q:133:ALA:HB3	2.02	0.42
30:l:31:HIS:C	30:l:33:LEU:HD12	2.44	0.42
30:l:51:SER:OG	30:l:54:ASP:OD2	2.36	0.42
1:I:567:U:OP2	12:T:29:LYS:NZ	2.40	0.41
1:I:602:A:O2'	1:I:655:A:N1	2.51	0.41
1:I:627:A:C5	12:T:111:ILE:HD11	2.55	0.41
1:I:2318:G:O6	1:I:2319:G:N1	2.53	0.41
1:I:2585:U:O2	1:I:2585:U:O4'	2.37	0.41
7:O:152:ARG:O	7:O:153:ARG:C	2.62	0.41
18:Z:63:VAL:HG11	18:Z:66:HIS:CE1	2.55	0.41
23:e:23:VAL:HA	23:e:38:VAL:HG12	2.02	0.41
1:I:271:G:C4'	1:I:272:A:OP1	2.68	0.41
1:I:1678:A:H2'	1:I:1679:A:O4'	2.21	0.41
1:I:2115:G:H2'	1:I:2116:G:H5'	2.03	0.41
5:M:104:ALA:O	5:M:108:ILE:N	2.52	0.41
7:O:89:LEU:HD22	7:O:96:ALA:HB2	2.02	0.41
14:V:48:VAL:HG23	14:V:49:GLU:N	2.36	0.41
15:W:106:LEU:O	15:W:106:LEU:HD23	2.21	0.41
30:l:17:THR:HG21	30:l:49:MET:HE1	2.02	0.41
1:I:2474:U:O4	1:I:2529:G:N2	2.53	0.41
3:K:43:ARG:HA	3:K:48:ARG:O	2.20	0.41
15:W:8:ILE:HD12	15:W:8:ILE:H	1.84	0.41
22:d:30:ILE:O	22:d:37:PRO:HA	2.20	0.41
27:i:44:THR:OG1	27:i:48:TYR:N	2.53	0.41
1:I:1730:C:O2'	1:I:1731:G:P	2.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:O:10:VAL:O	7:O:10:VAL:HG13	2.21	0.41
12:T:109:LYS:HE2	12:T:128:THR:HG22	2.03	0.41
14:V:28:LEU:O	14:V:32:GLU:N	2.46	0.41
22:d:37:PRO:C	22:d:38:LEU:HD12	2.46	0.41
1:I:400:G:N7	24:f:57:ARG:NH2	2.61	0.41
9:Q:70:VAL:HG22	9:Q:71:THR:N	2.35	0.41
15:W:35:ILE:HG22	15:W:53:THR:HG23	2.02	0.41
18:Z:14:VAL:HB	18:Z:98:ILE:HD13	2.02	0.41
26:h:51:VAL:O	26:h:55:VAL:HG22	2.21	0.41
1:I:101:A:N3	1:I:101:A:H2'	2.34	0.41
1:I:545:U:H2'	1:I:546:U:C4'	2.51	0.41
3:K:78:VAL:HG21	3:K:110:LEU:HD11	2.03	0.41
24:f:64:ILE:HD12	24:f:64:ILE:H	1.86	0.41
1:I:244:A:OP2	30:l:8:ARG:NH2	2.40	0.41
1:I:545:U:O2	1:I:545:U:H3'	2.21	0.41
1:I:1480:C:H2'	1:I:1481:U:O4'	2.20	0.41
1:I:1654:A:O2'	4:L:118:PHE:O	2.37	0.41
1:I:1720:U:H2'	1:I:1721:G:O4'	2.21	0.41
1:I:1729:U:H2'	1:I:1730:C:OP1	2.21	0.41
1:I:2678:C:H2'	1:I:2679:A:O4'	2.21	0.41
6:N:136:ILE:HG22	6:N:136:ILE:O	2.20	0.41
8:P:80:ILE:O	8:P:147:VAL:HG23	2.20	0.41
15:W:78:VAL:HG13	15:W:79:ALA:N	2.35	0.41
1:I:1068:G:H21	1:I:1096:A:H5"	1.86	0.41
1:I:1412:U:O4	1:I:1413:A:N6	2.53	0.41
2:J:53:A:H2'	2:J:54:G:O4'	2.20	0.41
11:S:17:ARG:NH1	11:S:47:ILE:HG22	2.36	0.41
12:T:89:VAL:HG11	12:T:123:ARG:NH1	2.35	0.41
1:I:32:C:N4	1:I:447:A:OP2	2.54	0.40
1:I:214:G:O2'	1:I:216:A:O2'	2.32	0.40
1:I:670:A:H3'	12:T:43:GLY:CA	2.51	0.40
1:I:1792:G:O2'	1:I:1830:C:OP1	2.35	0.40
1:I:2866:U:H4'	1:I:2867:G:O5'	2.20	0.40
16:X:114:LEU:H	16:X:114:LEU:HD23	1.85	0.40
1:I:1590:A:H2'	1:I:1591:A:C8	2.56	0.40
7:O:97:ALA:O	7:O:103:ILE:HD12	2.21	0.40
8:P:6:LEU:CD1	8:P:37:VAL:HG12	2.51	0.40
9:Q:55:ILE:HG23	9:Q:55:ILE:O	2.21	0.40
18:Z:51:VAL:O	18:Z:51:VAL:CG1	2.69	0.40
1:I:1047:G:O2'	1:I:1109:C:N4	2.55	0.40
5:M:191:ASP:OD1	5:M:192:ALA:N	2.54	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:d:40:ILE:HD12	22:d:42:LEU:HD21	2.04	0.40
1:I:1056:G:H1'	1:I:1103:A:H61	1.87	0.40
1:I:2514:U:H2'	1:I:2515:C:C6	2.57	0.40
10:R:89:PHE:CD1	10:R:89:PHE:C	2.99	0.40
13:U:58:LYS:HG3	13:U:58:LYS:O	2.22	0.40
15:W:106:LEU:HD23	15:W:106:LEU:C	2.47	0.40
1:I:976:G:O2'	1:I:1155:A:O2'	2.36	0.40
1:I:1057:A:N6	1:I:1086:A:O2'	2.54	0.40
1:I:1141:U:O2	1:I:1142:A:N6	2.55	0.40
1:I:1417:C:C5'	1:I:1587:G:H21	2.34	0.40
3:K:187:ASP:OD1	3:K:187:ASP:C	2.64	0.40
3:K:230:HIS:O	3:K:233:GLY:N	2.55	0.40
7:O:5:ALA:HB2	7:O:66:GLY:N	2.37	0.40
19:a:57:ASN:O	19:a:61:ASN:N	2.51	0.40

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	K	269/271 (99%)	262 (97%)	7 (3%)	0	100	100
4	L	207/209 (99%)	200 (97%)	7 (3%)	0	100	100
5	M	199/201 (99%)	197 (99%)	2 (1%)	0	100	100
6	N	175/177 (99%)	170 (97%)	5 (3%)	0	100	100
7	O	174/176 (99%)	165 (95%)	9 (5%)	0	100	100
8	P	147/149 (99%)	144 (98%)	3 (2%)	0	100	100
9	Q	132/134 (98%)	126 (96%)	6 (4%)	0	100	100
10	R	140/142 (99%)	138 (99%)	2 (1%)	0	100	100
11	S	120/122 (98%)	118 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
12	T	142/144 (99%)	140 (99%)	2 (1%)	0	100	100
13	U	133/136 (98%)	133 (100%)	0	0	100	100
14	V	118/120 (98%)	117 (99%)	1 (1%)	0	100	100
15	W	114/116 (98%)	114 (100%)	0	0	100	100
16	X	112/114 (98%)	111 (99%)	1 (1%)	0	100	100
17	Y	115/117 (98%)	114 (99%)	1 (1%)	0	100	100
18	Z	101/103 (98%)	100 (99%)	1 (1%)	0	100	100
19	a	108/110 (98%)	107 (99%)	1 (1%)	0	100	100
20	b	91/93 (98%)	88 (97%)	3 (3%)	0	100	100
21	c	100/102 (98%)	96 (96%)	3 (3%)	1 (1%)	12	42
22	d	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
23	e	73/75 (97%)	71 (97%)	2 (3%)	0	100	100
24	f	75/77 (97%)	71 (95%)	4 (5%)	0	100	100
25	g	60/62 (97%)	59 (98%)	1 (2%)	0	100	100
26	h	56/58 (97%)	56 (100%)	0	0	100	100
27	i	54/56 (96%)	54 (100%)	0	0	100	100
28	j	48/50 (96%)	45 (94%)	3 (6%)	0	100	100
29	k	44/46 (96%)	44 (100%)	0	0	100	100
30	l	62/64 (97%)	61 (98%)	1 (2%)	0	100	100
31	m	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
All	All	3297/3356 (98%)	3227 (98%)	69 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
21	c	89	ASP

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	K	216/216 (100%)	216 (100%)	0	100	100
4	L	164/164 (100%)	164 (100%)	0	100	100
5	M	165/165 (100%)	165 (100%)	0	100	100
6	N	148/148 (100%)	148 (100%)	0	100	100
7	O	137/137 (100%)	137 (100%)	0	100	100
8	P	114/114 (100%)	114 (100%)	0	100	100
9	Q	104/104 (100%)	104 (100%)	0	100	100
10	R	116/116 (100%)	116 (100%)	0	100	100
11	S	103/103 (100%)	103 (100%)	0	100	100
12	T	103/103 (100%)	103 (100%)	0	100	100
13	U	108/108 (100%)	108 (100%)	0	100	100
14	V	100/100 (100%)	100 (100%)	0	100	100
15	W	86/86 (100%)	86 (100%)	0	100	100
16	X	99/99 (100%)	99 (100%)	0	100	100
17	Y	89/89 (100%)	89 (100%)	0	100	100
18	Z	84/84 (100%)	84 (100%)	0	100	100
19	a	93/93 (100%)	93 (100%)	0	100	100
20	b	80/80 (100%)	80 (100%)	0	100	100
21	c	83/83 (100%)	83 (100%)	0	100	100
22	d	78/78 (100%)	78 (100%)	0	100	100
23	e	57/57 (100%)	57 (100%)	0	100	100
24	f	67/67 (100%)	67 (100%)	0	100	100
25	g	54/54 (100%)	54 (100%)	0	100	100
26	h	48/48 (100%)	48 (100%)	0	100	100
27	i	47/47 (100%)	47 (100%)	0	100	100
28	j	45/45 (100%)	45 (100%)	0	100	100
29	k	38/38 (100%)	38 (100%)	0	100	100
30	l	51/51 (100%)	51 (100%)	0	100	100
31	m	34/34 (100%)	34 (100%)	0	100	100
All	All	2711/2711 (100%)	2711 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29)

such sidechains are listed below:

Mol	Chain	Res	Type
3	K	90	ASN
3	K	143	ASN
3	K	153	GLN
5	M	163	ASN
6	N	5	HIS
6	N	63	GLN
6	N	135	GLN
7	O	45	HIS
7	O	73	ASN
7	O	128	GLN
8	P	66	ASN
9	Q	43	ASN
10	R	136	GLN
12	T	38	GLN
15	W	29	HIS
15	W	100	HIS
16	X	56	HIS
16	X	66	ASN
16	X	77	HIS
17	Y	72	ASN
19	a	9	HIS
22	d	5	ASN
22	d	49	ASN
23	e	46	HIS
25	g	15	ASN
25	g	31	GLN
25	g	41	HIS
26	h	20	HIS
26	h	49	ASN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	I	2896/2904 (99%)	385 (13%)	17 (0%)
2	J	117/118 (99%)	14 (11%)	0
All	All	3013/3022 (99%)	399 (13%)	17 (0%)

All (399) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	I	2	G

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Mol	Chain	Res	Type
1	I	10	A
1	I	14	A
1	I	15	G
1	I	34	U
1	I	35	G
1	I	46	G
1	I	71	A
1	I	74	A
1	I	75	G
1	I	84	A
1	I	101	A
1	I	102	U
1	I	118	A
1	I	120	U
1	I	137	U
1	I	139	U
1	I	140	C
1	I	141	G
1	I	163	C
1	I	181	A
1	I	196	A
1	I	199	A
1	I	215	G
1	I	216	A
1	I	222	A
1	I	228	C
1	I	233	A
1	I	248	G
1	I	265	A
1	I	266	G
1	I	272	A
1	I	275	C
1	I	276	U
1	I	278	A
1	I	281	C
1	I	296	U
1	I	311	A
1	I	323	C
1	I	326	G
1	I	329	G
1	I	330	A
1	I	343	C

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Mol	Chain	Res	Type
1	I	345	A
1	I	353	C
1	I	362	A
1	I	371	A
1	I	372	G
1	I	386	G
1	I	396	G
1	I	405	U
1	I	411	G
1	I	412	A
1	I	424	G
1	I	430	A
1	I	456	C
1	I	457	A
1	I	481	G
1	I	491	G
1	I	504	A
1	I	505	A
1	I	509	C
1	I	530	G
1	I	532	A
1	I	545	U
1	I	546	U
1	I	548	G
1	I	563	A
1	I	573	U
1	I	575	A
1	I	603	A
1	I	613	A
1	I	614	A
1	I	615	U
1	I	627	A
1	I	637	A
1	I	645	C
1	I	647	G
1	I	653	U
1	I	654	A
1	I	671	C
1	I	677	A
1	I	686	U
1	I	712	G
1	I	713	G

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Mol	Chain	Res	Type
1	I	730	A
1	I	747	5MU
1	I	775	G
1	I	776	G
1	I	782	A
1	I	784	G
1	I	785	G
1	I	805	G
1	I	812	C
1	I	819	A
1	I	827	U
1	I	828	U
1	I	843	G
1	I	845	A
1	I	847	U
1	I	858	G
1	I	859	G
1	I	869	G
1	I	877	A
1	I	878	A
1	I	879	G
1	I	883	G
1	I	896	A
1	I	907	G
1	I	910	A
1	I	914	G
1	I	915	C
1	I	917	A
1	I	941	A
1	I	946	C
1	I	961	C
1	I	974	G
1	I	983	A
1	I	990	A
1	I	996	A
1	I	1012	U
1	I	1013	C
1	I	1025	G
1	I	1026	G
1	I	1033	U
1	I	1040	A
1	I	1046	A

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Mol	Chain	Res	Type
1	I	1047	G
1	I	1051	G
1	I	1054	A
1	I	1057	A
1	I	1070	A
1	I	1071	G
1	I	1073	A
1	I	1076	C
1	I	1079	C
1	I	1083	U
1	I	1088	A
1	I	1091	G
1	I	1092	C
1	I	1112	G
1	I	1119	U
1	I	1130	U
1	I	1132	U
1	I	1133	A
1	I	1135	C
1	I	1136	G
1	I	1142	A
1	I	1149	G
1	I	1174	U
1	I	1175	A
1	I	1176	U
1	I	1180	U
1	I	1205	A
1	I	1206	G
1	I	1212	G
1	I	1236	G
1	I	1238	G
1	I	1250	G
1	I	1253	A
1	I	1256	G
1	I	1266	G
1	I	1271	G
1	I	1272	A
1	I	1300	G
1	I	1301	A
1	I	1329	U
1	I	1340	U
1	I	1352	U

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Mol	Chain	Res	Type
1	I	1359	A
1	I	1365	A
1	I	1368	G
1	I	1383	A
1	I	1386	C
1	I	1416	G
1	I	1417	C
1	I	1419	A
1	I	1421	G
1	I	1428	C
1	I	1452	G
1	I	1453	A
1	I	1460	U
1	I	1461	C
1	I	1482	G
1	I	1490	A
1	I	1493	C
1	I	1506	U
1	I	1508	A
1	I	1509	A
1	I	1510	G
1	I	1515	A
1	I	1523	U
1	I	1530	G
1	I	1533	C
1	I	1535	A
1	I	1536	C
1	I	1538	G
1	I	1544	A
1	I	1560	G
1	I	1569	A
1	I	1578	U
1	I	1585	C
1	I	1587	G
1	I	1603	A
1	I	1608	A
1	I	1634	A
1	I	1646	C
1	I	1647	U
1	I	1648	U
1	I	1649	G
1	I	1674	G

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Mol	Chain	Res	Type
1	I	1677	A
1	I	1713	A
1	I	1715	G
1	I	1726	C
1	I	1730	C
1	I	1731	G
1	I	1732	C
1	I	1733	G
1	I	1738	G
1	I	1758	U
1	I	1764	C
1	I	1773	A
1	I	1782	U
1	I	1784	A
1	I	1791	A
1	I	1800	C
1	I	1801	A
1	I	1808	A
1	I	1816	C
1	I	1829	A
1	I	1870	C
1	I	1873	G
1	I	1876	A
1	I	1906	G
1	I	1910	G
1	I	1913	A
1	I	1914	C
1	I	1915	3TD
1	I	1929	G
1	I	1930	G
1	I	1931	U
1	I	1955	U
1	I	1963	U
1	I	1964	G
1	I	1965	C
1	I	1967	C
1	I	1970	A
1	I	1971	U
1	I	1972	G
1	I	1991	U
1	I	1993	U
1	I	1997	C

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Mol	Chain	Res	Type
1	I	2022	U
1	I	2023	C
1	I	2030	6MZ
1	I	2031	A
1	I	2033	A
1	I	2043	C
1	I	2049	G
1	I	2055	C
1	I	2056	G
1	I	2060	A
1	I	2061	G
1	I	2062	A
1	I	2069	G7M
1	I	2093	G
1	I	2095	A
1	I	2097	A
1	I	2105	U
1	I	2110	G
1	I	2111	U
1	I	2112	G
1	I	2113	U
1	I	2115	G
1	I	2116	G
1	I	2118	U
1	I	2126	A
1	I	2127	G
1	I	2132	U
1	I	2133	G
1	I	2141	G
1	I	2142	A
1	I	2148	G
1	I	2151	U
1	I	2157	G
1	I	2158	A
1	I	2159	G
1	I	2162	G
1	I	2163	A
1	I	2164	C
1	I	2168	G
1	I	2170	A
1	I	2171	A
1	I	2172	U

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Mol	Chain	Res	Type
1	I	2173	A
1	I	2174	C
1	I	2178	C
1	I	2179	C
1	I	2187	U
1	I	2189	U
1	I	2198	A
1	I	2204	G
1	I	2211	A
1	I	2212	A
1	I	2225	A
1	I	2238	G
1	I	2239	G
1	I	2279	G
1	I	2283	C
1	I	2287	A
1	I	2294	G
1	I	2297	A
1	I	2305	U
1	I	2311	A
1	I	2321	U
1	I	2322	A
1	I	2325	G
1	I	2335	A
1	I	2345	G
1	I	2347	C
1	I	2361	G
1	I	2379	G
1	I	2383	G
1	I	2385	C
1	I	2402	U
1	I	2403	C
1	I	2406	A
1	I	2423	U
1	I	2425	A
1	I	2426	A
1	I	2428	G
1	I	2429	G
1	I	2430	A
1	I	2435	A
1	I	2441	U
1	I	2445	2MG

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Mol	Chain	Res	Type
1	I	2448	A
1	I	2470	G
1	I	2476	A
1	I	2491	U
1	I	2492	U
1	I	2493	U
1	I	2502	G
1	I	2505	G
1	I	2506	U
1	I	2518	A
1	I	2547	A
1	I	2554	U
1	I	2556	C
1	I	2566	A
1	I	2567	G
1	I	2585	U
1	I	2605	PSU
1	I	2609	U
1	I	2613	U
1	I	2615	U
1	I	2629	U
1	I	2630	G
1	I	2646	C
1	I	2659	G
1	I	2660	A
1	I	2681	C
1	I	2689	U
1	I	2690	U
1	I	2714	G
1	I	2726	A
1	I	2729	G
1	I	2744	G
1	I	2776	A
1	I	2778	A
1	I	2780	G
1	I	2791	G
1	I	2793	C
1	I	2818	U
1	I	2820	A
1	I	2821	A
1	I	2849	U
1	I	2867	G

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Mol	Chain	Res	Type
1	I	2872	A
1	I	2873	A
1	I	2880	C
1	I	2883	A
1	I	2884	U
1	I	2885	G
2	J	13	G
2	J	17	C
2	J	24	G
2	J	32	U
2	J	33	G
2	J	35	C
2	J	36	C
2	J	56	G
2	J	66	A
2	J	88	C
2	J	89	U
2	J	90	C
2	J	99	A
2	J	109	A

All (17) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	I	138	U
1	I	271	G
1	I	275	C
1	I	404	A
1	I	504	A
1	I	670	A
1	I	784	G
1	I	1358	G
1	I	1543	G
1	I	1730	C
1	I	1930	G
1	I	2109	U
1	I	2162	G
1	I	2425	A
1	I	2447	G
1	I	2680	U
1	I	2866	U

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

25 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
1	1MG	I	745	1	23,26,27	2.92	8 (34%)	33,39,42	2.73	8 (24%)
1	OMC	I	2498	32,1	19,22,23	3.21	8 (42%)	25,31,34	0.72	0
1	PSU	I	746	1	18,21,22	4.29	6 (33%)	21,30,33	1.79	5 (23%)
13	4D4	U	81	13	9,11,12	2.56	2 (22%)	7,13,15	0.80	0
1	2MA	I	2503	32,1	22,25,26	3.80	8 (36%)	32,37,40	2.34	8 (25%)
1	PSU	I	955	1	18,21,22	4.24	6 (33%)	21,30,33	2.04	6 (28%)
1	2MG	I	2445	1	23,26,27	2.86	8 (34%)	33,38,41	2.32	12 (36%)
1	OMU	I	2552	1	19,22,23	3.28	8 (42%)	25,31,34	1.85	5 (20%)
1	5MC	I	1962	1	19,22,23	4.05	9 (47%)	26,32,35	1.02	1 (3%)
1	PSU	I	1917	1	18,21,22	0.94	1 (5%)	21,30,33	0.58	0
1	OMG	I	2251	1	23,26,27	2.99	8 (34%)	32,38,41	2.17	10 (31%)
1	PSU	I	1911	1	18,21,22	4.35	6 (33%)	21,30,33	2.04	6 (28%)
1	PSU	I	2604	1	18,21,22	4.26	7 (38%)	21,30,33	2.03	6 (28%)
1	PSU	I	2605	1	18,21,22	4.26	7 (38%)	21,30,33	2.01	6 (28%)
1	6MZ	I	1618	1	22,25,26	3.21	4 (18%)	29,36,39	2.30	11 (37%)
1	5MU	I	1939	1	19,22,23	7.34	8 (42%)	27,32,35	3.39	10 (37%)
1	PSU	I	2457	1	18,21,22	4.21	6 (33%)	21,30,33	2.07	6 (28%)
1	2MG	I	1835	1	23,26,27	2.95	7 (30%)	33,38,41	2.28	12 (36%)
1	H2U	I	2449	1	18,21,22	3.08	5 (27%)	19,30,33	1.48	4 (21%)
1	6MZ	I	2030	1	22,25,26	3.19	4 (18%)	29,36,39	2.35	13 (44%)
1	5MU	I	747	1	19,22,23	7.31	8 (42%)	27,32,35	3.47	10 (37%)
1	G7M	I	2069	1	23,26,27	2.96	8 (34%)	34,39,42	2.75	10 (29%)
1	PSU	I	2504	32,1	18,21,22	4.28	6 (33%)	21,30,33	2.03	5 (23%)
1	PSU	I	2580	1	18,21,22	4.23	7 (38%)	21,30,33	2.08	6 (28%)
1	3TD	I	1915	1	19,22,23	4.29	7 (36%)	23,32,35	1.65	2 (8%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	1MG	I	745	1	-	0/7/25/26	0/3/3/3
1	OMC	I	2498	32,1	-	0/9/27/28	0/2/2/2
1	PSU	I	746	1	-	0/7/25/26	0/2/2/2
13	4D4	U	81	13	-	2/11/12/14	-
1	2MA	I	2503	32,1	-	2/7/25/26	0/3/3/3
1	PSU	I	955	1	-	0/7/25/26	0/2/2/2
1	2MG	I	2445	1	-	2/9/27/28	0/3/3/3
1	OMU	I	2552	1	-	1/9/27/28	0/2/2/2
1	5MC	I	1962	1	-	0/7/25/26	0/2/2/2
1	PSU	I	1917	1	-	0/7/25/26	0/2/2/2
1	OMG	I	2251	1	-	0/9/27/28	0/3/3/3
1	PSU	I	1911	1	-	2/7/25/26	0/2/2/2
1	PSU	I	2604	1	-	0/7/25/26	0/2/2/2
1	PSU	I	2605	1	-	2/7/25/26	0/2/2/2
1	6MZ	I	1618	1	-	1/9/27/28	0/3/3/3
1	5MU	I	1939	1	-	0/7/25/26	0/2/2/2
1	PSU	I	2457	1	-	0/7/25/26	0/2/2/2
1	2MG	I	1835	1	-	0/9/27/28	0/3/3/3
1	H2U	I	2449	1	-	0/7/38/39	0/2/2/2
1	6MZ	I	2030	1	-	2/9/27/28	0/3/3/3
1	5MU	I	747	1	-	0/7/25/26	0/2/2/2
1	G7M	I	2069	1	-	2/7/25/26	0/3/3/3
1	PSU	I	2504	32,1	-	2/7/25/26	0/2/2/2
1	PSU	I	2580	1	-	0/7/25/26	0/2/2/2
1	3TD	I	1915	1	-	3/7/25/26	0/2/2/2

All (162) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	1939	5MU	C4-C5	21.49	1.79	1.44
1	I	747	5MU	C4-C5	21.46	1.79	1.44
1	I	1939	5MU	C6-N1	15.60	1.64	1.38
1	I	747	5MU	C6-N1	15.48	1.64	1.38
1	I	1618	6MZ	C6-N6	13.26	1.49	1.34
1	I	2030	6MZ	C6-N6	13.07	1.49	1.34
1	I	1915	3TD	C6-C5	13.03	1.49	1.35
1	I	747	5MU	C6-C5	-11.98	1.15	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	1939	5MU	C6-C5	-11.97	1.15	1.34
1	I	1911	PSU	C6-C5	11.82	1.48	1.35
1	I	746	PSU	C6-C5	11.70	1.48	1.35
1	I	2503	2MA	C4-N3	11.67	1.49	1.34
1	I	1939	5MU	C4-N3	-11.53	1.17	1.38
1	I	2605	PSU	C6-C5	11.52	1.48	1.35
1	I	2504	PSU	C6-C5	11.51	1.48	1.35
1	I	2604	PSU	C6-C5	11.50	1.48	1.35
1	I	747	5MU	C4-N3	-11.47	1.17	1.38
1	I	955	PSU	C6-C5	11.45	1.48	1.35
1	I	2580	PSU	C6-C5	11.40	1.47	1.35
1	I	2457	PSU	C6-C5	11.34	1.47	1.35
1	I	1911	PSU	C2-N1	9.88	1.49	1.36
1	I	2504	PSU	C2-N1	9.83	1.49	1.36
1	I	746	PSU	C2-N1	9.77	1.49	1.36
1	I	2604	PSU	C2-N1	9.77	1.49	1.36
1	I	955	PSU	C2-N1	9.73	1.49	1.36
1	I	2605	PSU	C2-N1	9.72	1.49	1.36
1	I	2580	PSU	C2-N1	9.71	1.49	1.36
1	I	1962	5MC	C6-C5	9.69	1.50	1.34
1	I	2457	PSU	C2-N1	9.67	1.49	1.36
1	I	1915	3TD	C2-N1	9.56	1.49	1.37
1	I	2449	H2U	C2-N1	9.34	1.48	1.35
1	I	745	1MG	C2-N3	7.92	1.46	1.33
1	I	2552	OMU	C2-N1	7.91	1.50	1.38
1	I	2251	OMG	C4-N3	7.73	1.51	1.34
1	I	1962	5MC	C4-N3	7.37	1.45	1.34
1	I	1835	2MG	C2-N3	7.31	1.45	1.32
1	I	2069	G7M	C4-N3	7.26	1.50	1.34
1	I	2503	2MA	C2-N3	7.18	1.46	1.34
1	I	2552	OMU	C2-N3	7.02	1.50	1.38
1	I	1962	5MC	C5-C4	7.01	1.49	1.44
1	I	2445	2MG	C2-N3	6.99	1.45	1.32
1	I	1835	2MG	C4-N3	6.94	1.50	1.34
1	I	1911	PSU	C2-N3	6.92	1.48	1.37
1	I	2251	OMG	C2-N2	6.79	1.50	1.34
1	I	2498	OMC	C2-N3	6.75	1.49	1.36
1	I	2445	2MG	C4-N3	6.74	1.49	1.34
1	I	2504	PSU	C2-N3	6.73	1.48	1.37
1	I	2604	PSU	C2-N3	6.70	1.48	1.37
1	I	955	PSU	C2-N3	6.65	1.48	1.37
1	I	746	PSU	C2-N3	6.64	1.48	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	2605	PSU	C2-N3	6.63	1.48	1.37
1	I	2449	H2U	C2-N3	6.59	1.49	1.38
1	I	2457	PSU	C2-N3	6.58	1.48	1.37
1	I	2580	PSU	C2-N3	6.56	1.48	1.37
1	I	2069	G7M	C2-N2	6.56	1.49	1.34
1	I	745	1MG	C4-N3	6.55	1.49	1.34
1	I	2498	OMC	C6-C5	6.52	1.50	1.35
1	I	745	1MG	C2-N2	6.45	1.45	1.34
1	I	1962	5MC	C2-N3	6.38	1.49	1.36
13	U	81	4D4	CZ-NE	6.34	1.45	1.33
1	I	2503	2MA	C6-N1	6.12	1.43	1.35
1	I	1835	2MG	C2-N2	6.05	1.46	1.33
1	I	2552	OMU	C6-C5	6.03	1.49	1.35
1	I	2251	OMG	C2-N3	5.99	1.47	1.33
1	I	2503	2MA	C2-N1	5.99	1.44	1.34
1	I	2445	2MG	C2-N2	5.81	1.45	1.33
1	I	2498	OMC	C4-N4	5.78	1.47	1.33
1	I	1915	3TD	C6-N1	5.77	1.45	1.36
1	I	2069	G7M	C2-N3	5.43	1.46	1.33
1	I	1835	2MG	C2-N1	5.40	1.45	1.36
1	I	2498	OMC	C4-N3	5.34	1.45	1.34
1	I	2069	G7M	C5-N7	-5.31	1.33	1.39
1	I	1915	3TD	C2-N3	5.24	1.49	1.38
1	I	2445	2MG	C2-N1	5.15	1.44	1.36
1	I	2449	H2U	C4-N3	5.10	1.46	1.37
1	I	1911	PSU	C6-N1	4.80	1.44	1.36
1	I	1962	5MC	C6-N1	4.76	1.46	1.38
1	I	746	PSU	C6-N1	4.73	1.44	1.36
1	I	2504	PSU	C6-N1	4.68	1.44	1.36
1	I	955	PSU	C6-N1	4.65	1.43	1.36
1	I	2604	PSU	C6-N1	4.65	1.43	1.36
1	I	2498	OMC	C2-N1	4.63	1.49	1.40
1	I	1962	5MC	C2-N1	4.62	1.49	1.40
1	I	2605	PSU	C6-N1	4.60	1.43	1.36
1	I	2580	PSU	C6-N1	4.59	1.43	1.36
1	I	2457	PSU	C6-N1	4.56	1.43	1.36
1	I	2552	OMU	C4-N3	4.40	1.46	1.38
1	I	2503	2MA	C5-C6	4.40	1.53	1.41
1	I	1962	5MC	C4-N4	4.28	1.45	1.34
1	I	1911	PSU	C4-N3	4.23	1.46	1.38
1	I	2251	OMG	O6-C6	-4.21	1.15	1.23
1	I	2251	OMG	C6-N1	4.17	1.46	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	2504	PSU	C4-N3	4.15	1.46	1.38
1	I	2605	PSU	C4-N3	4.14	1.46	1.38
1	I	746	PSU	C4-N3	4.12	1.46	1.38
1	I	2604	PSU	C4-N3	4.11	1.46	1.38
1	I	2069	G7M	C5-C6	4.03	1.54	1.43
1	I	955	PSU	C4-N3	4.03	1.46	1.38
1	I	2580	PSU	C4-N3	4.00	1.46	1.38
1	I	747	5MU	C2-N3	4.00	1.44	1.38
1	I	2457	PSU	C4-N3	4.00	1.46	1.38
1	I	1939	5MU	C2-N3	3.95	1.44	1.38
1	I	745	1MG	C2-N1	3.82	1.44	1.37
1	I	2030	6MZ	C5-C4	-3.67	1.32	1.39
1	I	1917	PSU	C6-C5	3.64	1.39	1.35
1	I	2030	6MZ	C5-N7	-3.64	1.32	1.39
1	I	1618	6MZ	C8-N9	-3.62	1.31	1.37
1	I	2030	6MZ	C8-N9	-3.61	1.31	1.37
1	I	1618	6MZ	C5-C4	-3.58	1.32	1.39
1	I	1939	5MU	C2-N1	3.52	1.44	1.38
1	I	1618	6MZ	C5-N7	-3.46	1.32	1.39
1	I	2503	2MA	C6-N6	-3.43	1.25	1.34
1	I	2552	OMU	O4-C4	-3.43	1.17	1.24
1	I	2498	OMC	C6-N1	3.31	1.46	1.38
1	I	747	5MU	C2-N1	3.26	1.43	1.38
1	I	745	1MG	C5-C6	3.16	1.53	1.45
1	I	1915	3TD	C4-N3	3.14	1.47	1.40
13	U	81	4D4	CZ-NH1	3.09	1.45	1.34
1	I	2503	2MA	C5-N7	-3.07	1.33	1.39
1	I	2552	OMU	C5-C4	2.82	1.49	1.43
1	I	2552	OMU	C6-N1	2.82	1.44	1.38
1	I	2552	OMU	O2-C2	-2.81	1.18	1.23
1	I	745	1MG	C5-N7	-2.78	1.33	1.39
1	I	2069	G7M	C2-N1	2.75	1.44	1.37
1	I	2069	G7M	O6-C6	-2.75	1.18	1.23
1	I	2069	G7M	C6-N1	2.75	1.44	1.38
1	I	2251	OMG	C5-C6	2.74	1.54	1.44
1	I	2251	OMG	C5-N7	-2.70	1.33	1.39
1	I	2445	2MG	C5-N7	-2.67	1.33	1.39
1	I	747	5MU	O4-C4	-2.62	1.18	1.23
1	I	1835	2MG	C5-N7	-2.61	1.33	1.39
1	I	1835	2MG	C5-C6	2.58	1.54	1.44
1	I	1939	5MU	O4-C4	-2.56	1.18	1.23
1	I	2445	2MG	C5-C6	2.51	1.53	1.44

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	1915	3TD	O2-C2	-2.51	1.18	1.23
1	I	2498	OMC	C5-C4	2.50	1.48	1.42
1	I	747	5MU	O2-C2	-2.45	1.18	1.23
1	I	1939	5MU	O2-C2	-2.44	1.18	1.23
1	I	1835	2MG	C6-N1	2.41	1.43	1.38
1	I	2449	H2U	O2-C2	-2.41	1.18	1.23
1	I	2251	OMG	C2-N1	2.38	1.43	1.37
1	I	2498	OMC	O2-C2	-2.37	1.19	1.23
1	I	2503	2MA	C4-N9	-2.36	1.32	1.37
1	I	1962	5MC	O2-C2	-2.35	1.19	1.23
1	I	2504	PSU	O4-C4	-2.35	1.19	1.23
1	I	2580	PSU	O4-C4	-2.35	1.19	1.23
1	I	2605	PSU	O4-C4	-2.34	1.19	1.23
1	I	1962	5MC	CM5-C5	2.33	1.56	1.50
1	I	955	PSU	O4-C4	-2.32	1.19	1.23
1	I	2457	PSU	O4-C4	-2.32	1.19	1.23
1	I	2445	2MG	C6-N1	2.32	1.43	1.38
1	I	2604	PSU	O4-C4	-2.31	1.19	1.23
1	I	746	PSU	O4-C4	-2.26	1.19	1.23
1	I	745	1MG	C4-N9	-2.12	1.32	1.38
1	I	745	1MG	O6-C6	-2.12	1.18	1.23
1	I	1911	PSU	O4-C4	-2.09	1.19	1.23
1	I	2605	PSU	O4'-C1'	-2.09	1.41	1.43
1	I	2445	2MG	O6-C6	-2.09	1.19	1.23
1	I	2449	H2U	O4-C4	-2.07	1.19	1.23
1	I	2580	PSU	O4'-C1'	-2.07	1.41	1.43
1	I	1915	3TD	O4-C4	-2.05	1.18	1.23
1	I	2604	PSU	O4'-C1'	-2.01	1.41	1.43

All (162) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	I	1939	5MU	C5-C4-N3	10.12	124.12	115.32
1	I	747	5MU	C5-C4-N3	10.10	124.10	115.32
1	I	745	1MG	C1'-N9-C8	-9.29	100.35	126.73
1	I	747	5MU	C5-C6-N1	-8.38	114.21	123.31
1	I	1939	5MU	C5-C6-N1	-8.23	114.37	123.31
1	I	745	1MG	C1'-N9-C4	8.16	150.59	126.49
1	I	747	5MU	C4-N3-C2	-7.11	118.02	127.34
1	I	1939	5MU	C4-N3-C2	-6.95	118.22	127.34
1	I	2069	G7M	C1'-N9-C4	6.80	146.58	126.49
1	I	2069	G7M	CN7-N7-C5	6.73	135.19	126.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	I	1835	2MG	C2-N3-C4	6.40	120.01	112.00
1	I	2503	2MA	C5-C4-N3	-6.35	120.49	127.18
1	I	2069	G7M	C1'-N9-C8	-6.33	105.37	126.74
1	I	2445	2MG	C2-N3-C4	6.20	119.76	112.00
1	I	2552	OMU	C4-N3-C2	-5.80	119.42	126.61
1	I	2503	2MA	N9-C8-N7	-5.62	105.97	113.94
1	I	2030	6MZ	N1-C2-N3	-5.47	120.30	128.58
1	I	1618	6MZ	N1-C2-N3	-5.47	120.30	128.58
1	I	2069	G7M	CN7-N7-C8	-5.41	116.60	124.79
1	I	2503	2MA	N3-C4-N9	5.26	133.67	126.99
1	I	1915	3TD	N1-C2-N3	5.15	119.88	116.13
1	I	1618	6MZ	C5-C4-N3	-5.08	119.72	126.72
1	I	1835	2MG	C5-C4-N3	-5.03	120.38	128.39
1	I	2251	OMG	C5-C4-N3	-5.03	120.38	128.39
1	I	2503	2MA	C4-N9-C8	5.00	110.98	105.74
1	I	2457	PSU	C4-N3-C2	-4.97	119.52	126.37
1	I	2580	PSU	C4-N3-C2	-4.97	119.53	126.37
1	I	2030	6MZ	C5-C4-N3	-4.95	119.91	126.72
1	I	2504	PSU	C4-N3-C2	-4.91	119.61	126.37
1	I	747	5MU	N3-C2-N1	4.87	121.23	114.89
1	I	745	1MG	C5-C4-N3	-4.84	120.68	128.39
1	I	955	PSU	C4-N3-C2	-4.84	119.71	126.37
1	I	2445	2MG	C5-C4-N3	-4.82	120.72	128.39
1	I	2604	PSU	C4-N3-C2	-4.81	119.75	126.37
1	I	1939	5MU	N3-C2-N1	4.79	121.12	114.89
1	I	2251	OMG	C1'-N9-C4	-4.78	112.38	126.49
1	I	2605	PSU	C4-N3-C2	-4.75	119.83	126.37
1	I	2580	PSU	N1-C2-N3	4.65	120.07	115.17
1	I	2445	2MG	N1-C2-N2	4.61	121.27	116.56
1	I	2457	PSU	N1-C2-N3	4.61	120.03	115.17
1	I	1911	PSU	C4-N3-C2	-4.60	120.03	126.37
1	I	955	PSU	N1-C2-N3	4.57	119.99	115.17
1	I	747	5MU	C5M-C5-C6	-4.54	116.70	122.85
1	I	1911	PSU	N1-C2-N3	4.54	119.96	115.17
1	I	2251	OMG	C2-N3-C4	4.53	120.10	112.30
1	I	2504	PSU	N1-C2-N3	4.53	119.94	115.17
1	I	2604	PSU	N1-C2-N3	4.52	119.93	115.17
1	I	2605	PSU	N1-C2-N3	4.51	119.92	115.17
1	I	746	PSU	C4-N3-C2	-4.51	120.16	126.37
1	I	2069	G7M	C2-N3-C4	4.39	119.86	112.30
1	I	1915	3TD	C4-N3-C2	-4.27	120.09	124.61
1	I	1939	5MU	C5M-C5-C6	-4.23	117.12	122.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	I	2030	6MZ	N9-C8-N7	-4.20	107.98	113.94
1	I	2251	OMG	C1'-N9-C8	4.18	138.61	126.73
1	I	2445	2MG	C2-N1-C6	-4.18	119.50	124.55
1	I	746	PSU	N1-C2-N3	4.14	119.54	115.17
1	I	1618	6MZ	N9-C8-N7	-4.14	108.07	113.94
1	I	1618	6MZ	C4-C5-C6	4.07	120.16	116.78
1	I	2552	OMU	N3-C2-N1	4.05	120.16	114.89
1	I	2069	G7M	C5-C6-N1	4.02	120.15	111.84
1	I	1835	2MG	C2-N1-C6	-4.00	119.72	124.55
1	I	2069	G7M	C5-C4-N3	-3.92	120.75	128.15
1	I	2030	6MZ	C4-C5-C6	3.91	120.03	116.78
1	I	747	5MU	O4-C4-C5	-3.85	120.52	124.92
1	I	1939	5MU	O4-C4-C5	-3.76	120.61	124.92
1	I	2552	OMU	C5-C4-N3	3.73	120.02	114.80
1	I	2030	6MZ	C9-N6-C6	-3.68	119.44	122.85
1	I	2069	G7M	O6-C6-C5	-3.66	119.85	128.01
1	I	747	5MU	C6-C5-C4	3.63	121.01	118.02
1	I	1911	PSU	C6-C5-C4	3.61	120.61	118.17
1	I	1835	2MG	C1'-N9-C8	-3.59	116.54	126.73
1	I	745	1MG	C2-N3-C4	3.57	120.01	111.98
1	I	1911	PSU	C6-N1-C2	-3.55	119.40	122.69
1	I	1835	2MG	N1-C2-N2	3.50	120.14	116.56
1	I	1939	5MU	C6-C5-C4	3.50	120.91	118.02
1	I	2605	PSU	C6-N1-C2	-3.40	119.53	122.69
1	I	2604	PSU	C6-C5-C4	3.39	120.46	118.17
1	I	2445	2MG	N9-C8-N7	-3.35	107.18	113.40
1	I	2504	PSU	C6-C5-C4	3.33	120.42	118.17
1	I	1618	6MZ	C2-N3-C4	3.33	119.96	111.83
1	I	2503	2MA	C5-N7-C8	3.31	108.66	103.45
1	I	955	PSU	C6-C5-C4	3.31	120.41	118.17
1	I	2580	PSU	C6-N1-C2	-3.30	119.62	122.69
1	I	2030	6MZ	C2-N3-C4	3.30	119.89	111.83
1	I	1835	2MG	N9-C8-N7	-3.28	107.32	113.40
1	I	747	5MU	C5M-C5-C4	3.28	122.28	118.78
1	I	745	1MG	N9-C8-N7	-3.28	107.32	113.40
1	I	955	PSU	C6-N1-C2	-3.28	119.65	122.69
1	I	1962	5MC	C5-C6-N1	-3.26	119.77	123.31
1	I	2457	PSU	C6-N1-C2	-3.26	119.67	122.69
1	I	2504	PSU	C6-N1-C2	-3.24	119.68	122.69
1	I	2449	H2U	N3-C2-N1	3.24	119.90	116.65
1	I	2251	OMG	N9-C8-N7	-3.23	107.40	113.40
1	I	2604	PSU	C6-N1-C2	-3.23	119.69	122.69

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	I	746	PSU	C6-N1-C2	-3.22	119.70	122.69
1	I	2251	OMG	N9-C4-N3	3.18	132.32	125.95
1	I	2457	PSU	C6-C5-C4	3.17	120.31	118.17
1	I	2580	PSU	C6-C5-C4	3.16	120.30	118.17
1	I	2445	2MG	C1'-N9-C8	-3.15	117.79	126.73
1	I	2449	H2U	C5-C4-N3	3.14	120.03	116.69
1	I	1835	2MG	N9-C4-N3	3.12	132.18	125.95
1	I	2251	OMG	C2-N1-C6	-3.11	119.47	125.11
1	I	2605	PSU	C6-C5-C4	3.09	120.26	118.17
1	I	2069	G7M	C2-N1-C6	-3.09	119.51	125.11
1	I	2503	2MA	N3-C2-N1	-3.08	120.33	125.77
1	I	1618	6MZ	N3-C4-N9	3.07	132.38	127.17
1	I	1939	5MU	C5M-C5-C4	2.99	121.97	118.78
1	I	747	5MU	O2-C2-N1	-2.97	118.93	122.80
1	I	2552	OMU	O4-C4-C5	-2.93	120.11	125.16
1	I	745	1MG	N9-C4-N3	2.92	131.80	125.95
1	I	2457	PSU	O2-C2-N1	-2.91	119.78	122.79
1	I	2449	H2U	C5-C6-N1	2.89	120.27	111.52
1	I	2605	PSU	O2-C2-N1	-2.88	119.82	122.79
1	I	2030	6MZ	N3-C4-N9	2.87	132.05	127.17
1	I	955	PSU	O2-C2-N1	-2.82	119.89	122.79
1	I	2030	6MZ	C5-N7-C8	2.81	107.86	103.45
1	I	1618	6MZ	C5-N7-C8	2.79	107.84	103.45
1	I	745	1MG	C5-C6-N1	2.78	120.16	115.02
1	I	2580	PSU	O2-C2-N1	-2.76	119.94	122.79
1	I	2449	H2U	O2-C2-N1	-2.73	119.83	123.10
1	I	2604	PSU	O2-C2-N1	-2.72	119.98	122.79
1	I	2030	6MZ	C4-N9-C1'	-2.71	120.30	126.63
1	I	1835	2MG	C1'-N9-C4	2.70	134.47	126.49
1	I	2251	OMG	C5-C6-N1	2.68	120.08	113.25
1	I	2504	PSU	O2-C2-N1	-2.67	120.03	122.79
1	I	2445	2MG	N9-C4-N3	2.66	131.27	125.95
1	I	2445	2MG	C5-C6-N1	2.65	120.00	113.25
1	I	1911	PSU	O2-C2-N1	-2.64	120.07	122.79
1	I	2445	2MG	CM2-N2-C2	-2.64	117.99	123.65
1	I	1835	2MG	C5-C6-N1	2.62	119.92	113.25
1	I	1618	6MZ	C9-N6-C6	-2.60	120.44	122.85
1	I	1939	5MU	O4-C4-N3	-2.58	115.27	120.11
1	I	747	5MU	O4-C4-N3	-2.52	115.38	120.11
1	I	2251	OMG	O6-C6-C5	-2.50	119.94	126.53
1	I	746	PSU	O2-C2-N1	-2.47	120.24	122.79
1	I	746	PSU	C6-C5-C4	2.45	119.83	118.17

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	I	2069	G7M	N9-C4-N3	2.45	130.85	125.95
1	I	1835	2MG	O6-C6-C5	-2.44	120.10	126.53
1	I	2580	PSU	O4'-C1'-C2'	2.41	108.49	105.15
1	I	1618	6MZ	C4-N9-C1'	-2.38	121.07	126.63
1	I	2445	2MG	O6-C6-C5	-2.37	120.27	126.53
1	I	2445	2MG	C1'-N9-C4	2.33	133.37	126.49
1	I	2503	2MA	N6-C6-N1	2.32	120.16	117.03
1	I	1939	5MU	O2-C2-N1	-2.32	119.78	122.80
1	I	2445	2MG	C8-N7-C5	2.27	108.30	104.26
1	I	1835	2MG	C8-N7-C5	2.27	108.30	104.26
1	I	1911	PSU	O4'-C1'-C2'	2.24	108.25	105.15
1	I	1618	6MZ	C4-N9-C8	2.22	108.06	105.74
1	I	2604	PSU	O4'-C1'-C2'	2.21	108.21	105.15
1	I	2251	OMG	C8-N7-C5	2.21	108.19	104.26
1	I	2552	OMU	O2-C2-N1	-2.20	119.94	122.80
1	I	2457	PSU	O4'-C1'-C2'	2.19	108.19	105.15
1	I	1835	2MG	N1-C2-N3	-2.17	120.03	123.68
1	I	745	1MG	C8-N7-C5	2.16	108.12	104.26
1	I	2030	6MZ	C4-C5-N7	-2.16	108.11	110.58
1	I	2030	6MZ	C4-N9-C8	2.15	108.00	105.74
1	I	1618	6MZ	C4-C5-N7	-2.14	108.13	110.58
1	I	2503	2MA	C6-C5-C4	2.08	120.02	117.18
1	I	2030	6MZ	C1'-N9-C8	2.08	131.71	127.09
1	I	955	PSU	O4'-C1'-C2'	2.06	108.01	105.15
1	I	2030	6MZ	C5-C4-N9	2.05	108.05	105.81
1	I	2605	PSU	O4'-C1'-C2'	2.03	107.96	105.15

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	I	1915	3TD	O4'-C4'-C5'-O5'
1	I	1915	3TD	C3'-C4'-C5'-O5'
1	I	2030	6MZ	O4'-C4'-C5'-O5'
1	I	2030	6MZ	C3'-C4'-C5'-O5'
1	I	2445	2MG	C3'-C4'-C5'-O5'
1	I	2605	PSU	C3'-C4'-C5'-O5'
1	I	1911	PSU	C3'-C4'-C5'-O5'
1	I	1911	PSU	O4'-C4'-C5'-O5'
1	I	2445	2MG	O4'-C4'-C5'-O5'
1	I	2605	PSU	O4'-C4'-C5'-O5'
1	I	2503	2MA	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
1	I	2503	2MA	C3'-C4'-C5'-O5'
1	I	2504	PSU	O4'-C4'-C5'-O5'
13	U	81	4D4	NE-CD-CG-CB
1	I	1915	3TD	O4'-C1'-C5-C4
1	I	2069	G7M	C4'-C5'-O5'-P
1	I	2069	G7M	O4'-C4'-C5'-O5'
1	I	2552	OMU	C3'-C2'-O2'-CM2
13	U	81	4D4	O-C-CA-CB
1	I	2504	PSU	C3'-C4'-C5'-O5'
1	I	1618	6MZ	C3'-C4'-C5'-O5'

There are no ring outliers.

7 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	I	745	1MG	1	0
1	I	1917	PSU	2	0
1	I	1911	PSU	1	0
1	I	1939	5MU	1	0
1	I	2030	6MZ	1	0
1	I	747	5MU	1	0
1	I	2069	G7M	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 168 ligands modelled in this entry, 168 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

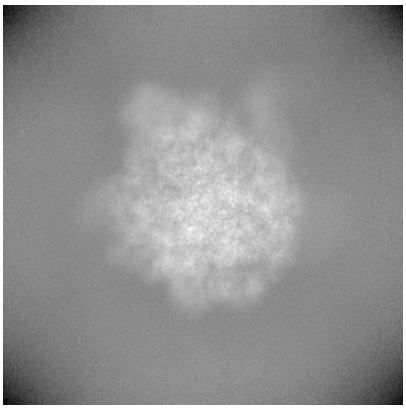
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-66639. These allow visual inspection of the internal detail of the map and identification of artifacts.

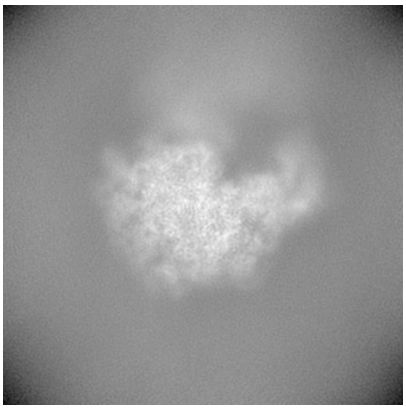
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

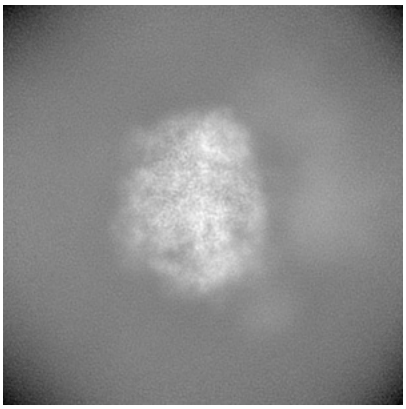
6.1.1 Primary map



X

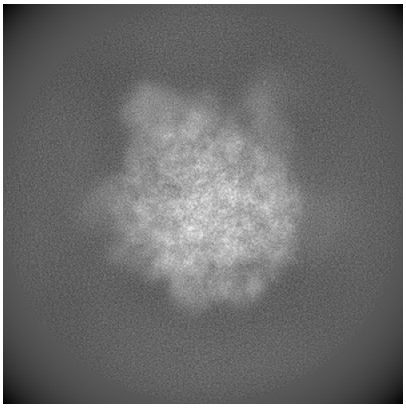


Y

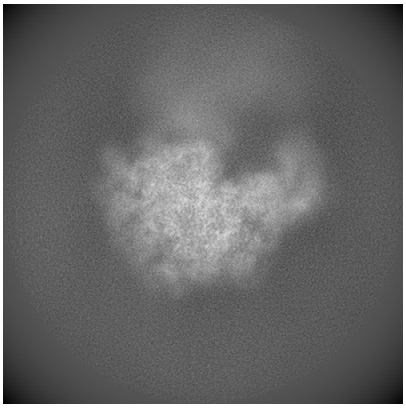


Z

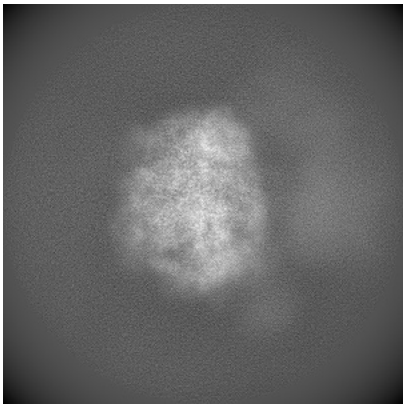
6.1.2 Raw map



X



Y

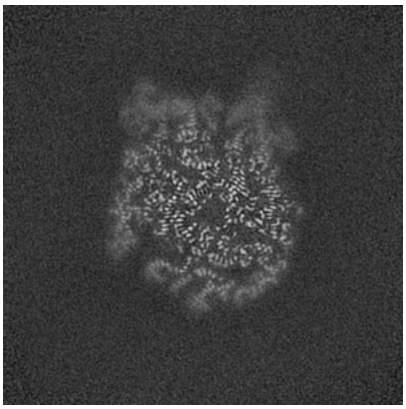


Z

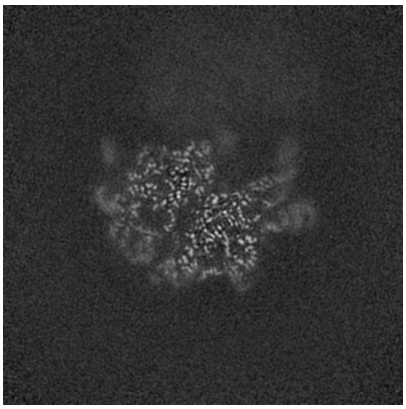
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

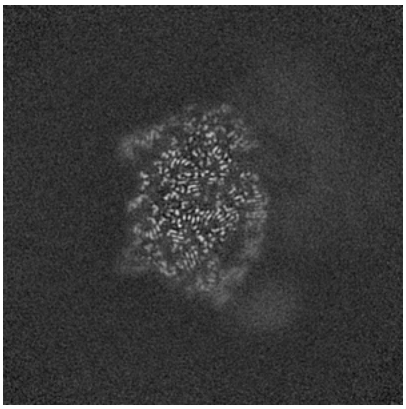
6.2.1 Primary map



X Index: 250

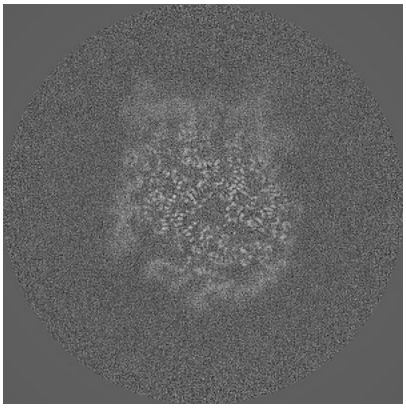


Y Index: 250

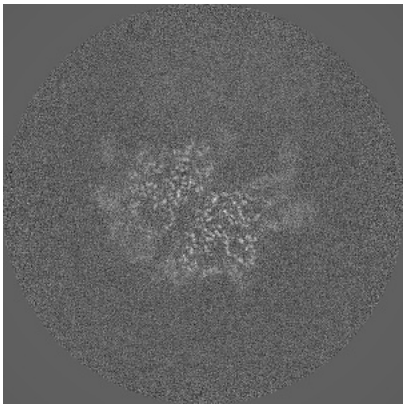


Z Index: 250

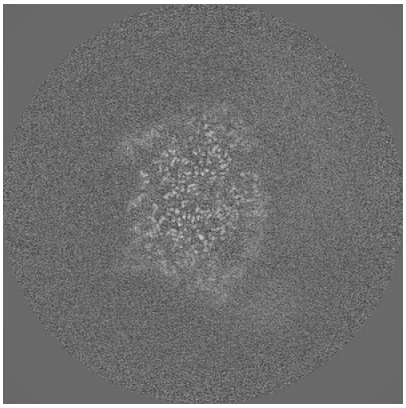
6.2.2 Raw map



X Index: 250



Y Index: 250

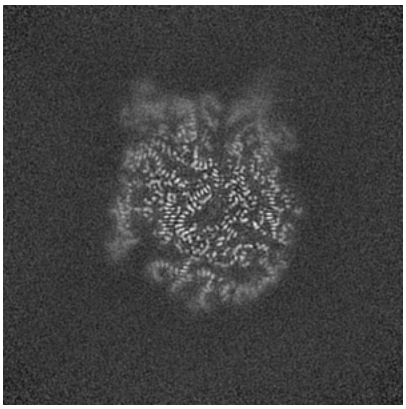


Z Index: 250

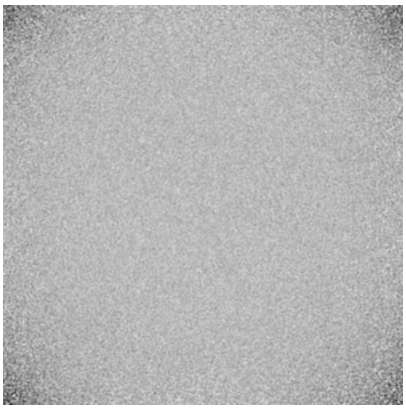
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

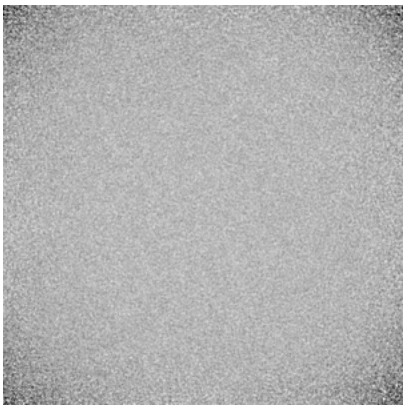
6.3.1 Primary map



X Index: 248

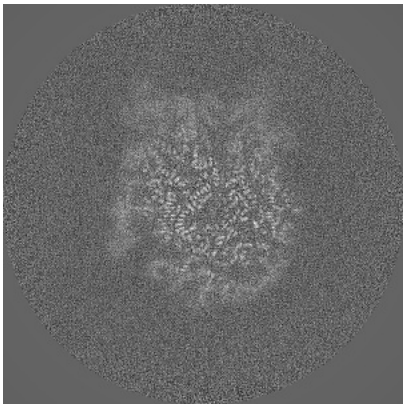


Y Index: 0

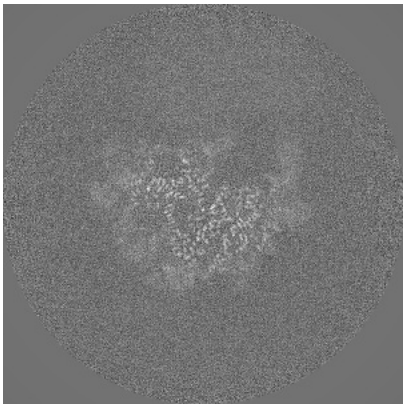


Z Index: 0

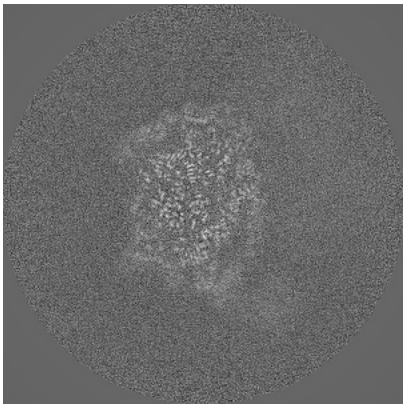
6.3.2 Raw map



X Index: 248



Y Index: 243

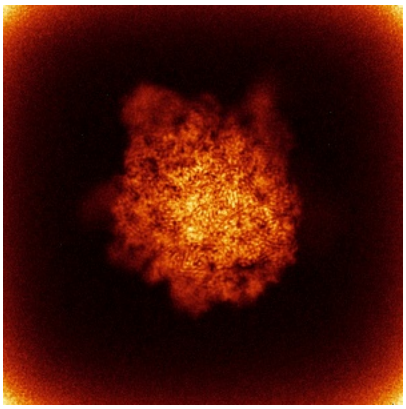


Z Index: 254

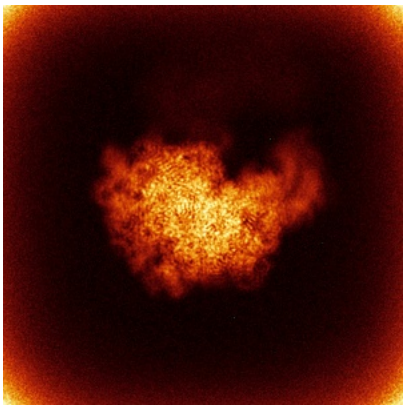
The images above show the largest variance slices of the map in three orthogonal directions.

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

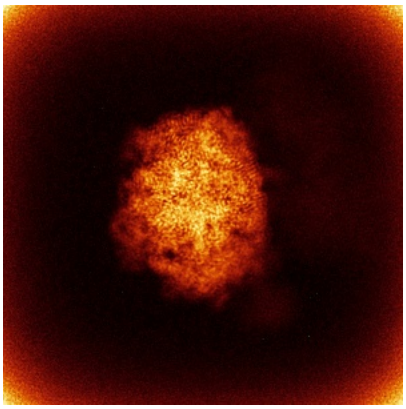
6.4.1 Primary map



X

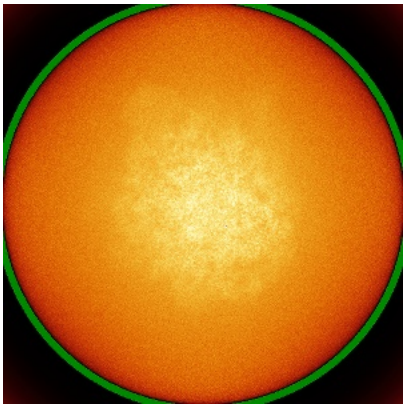


Y

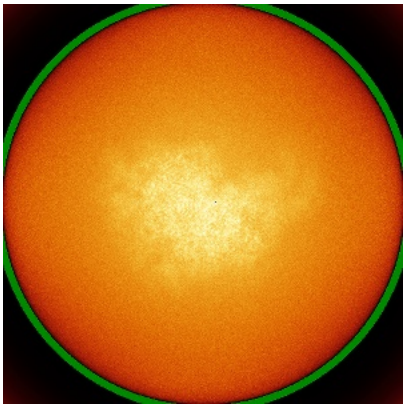


Z

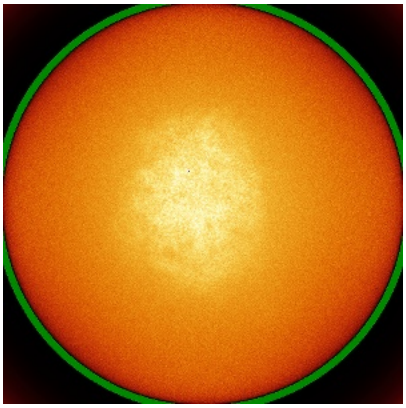
6.4.2 Raw map



X



Y



Z

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

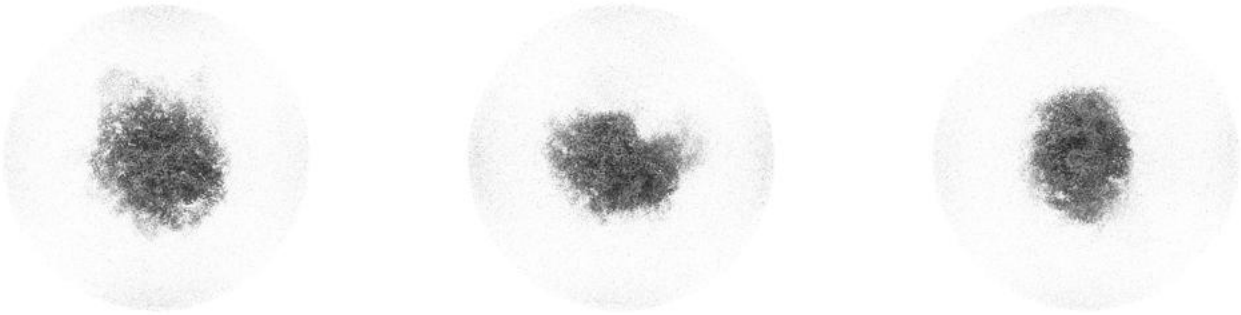
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.005. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

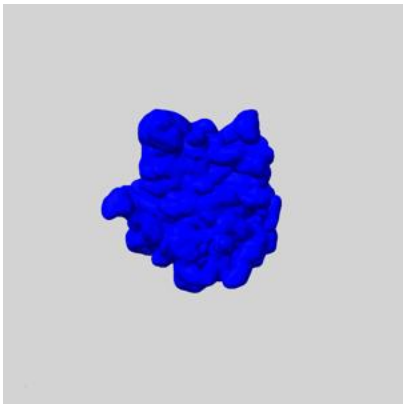
6.6 Mask visualisation (i)

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

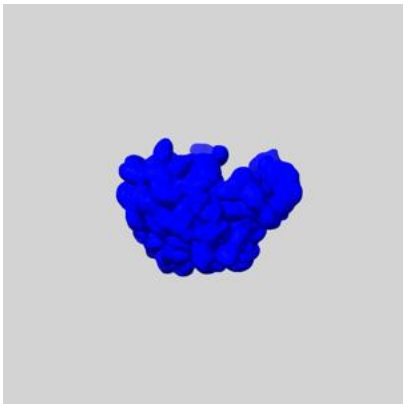
A mask typically either:

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

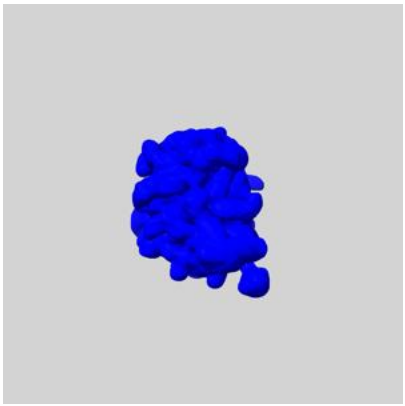
6.6.1 emd_66639_msk_1.map (i)



X



Y

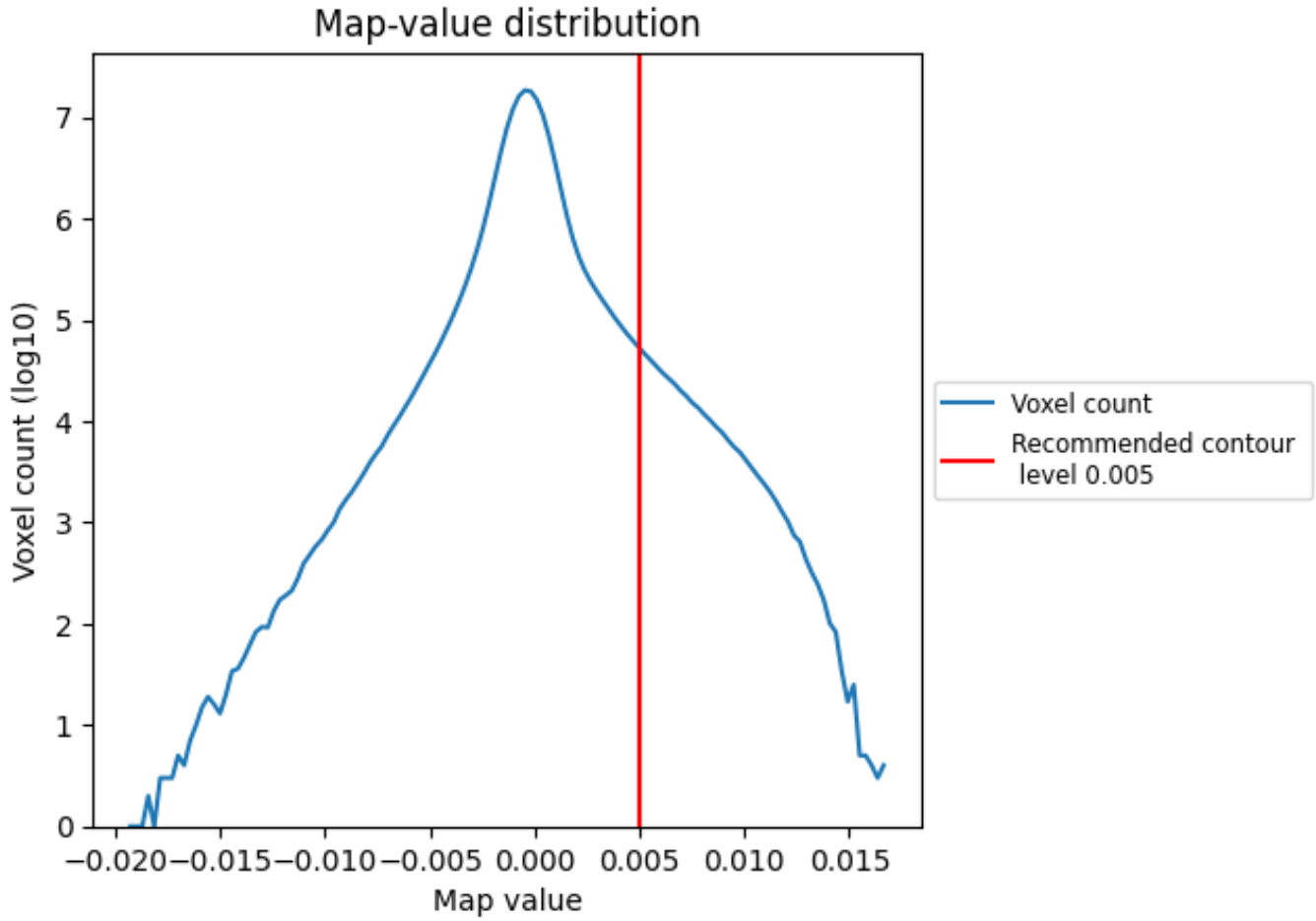


Z

7 Map analysis

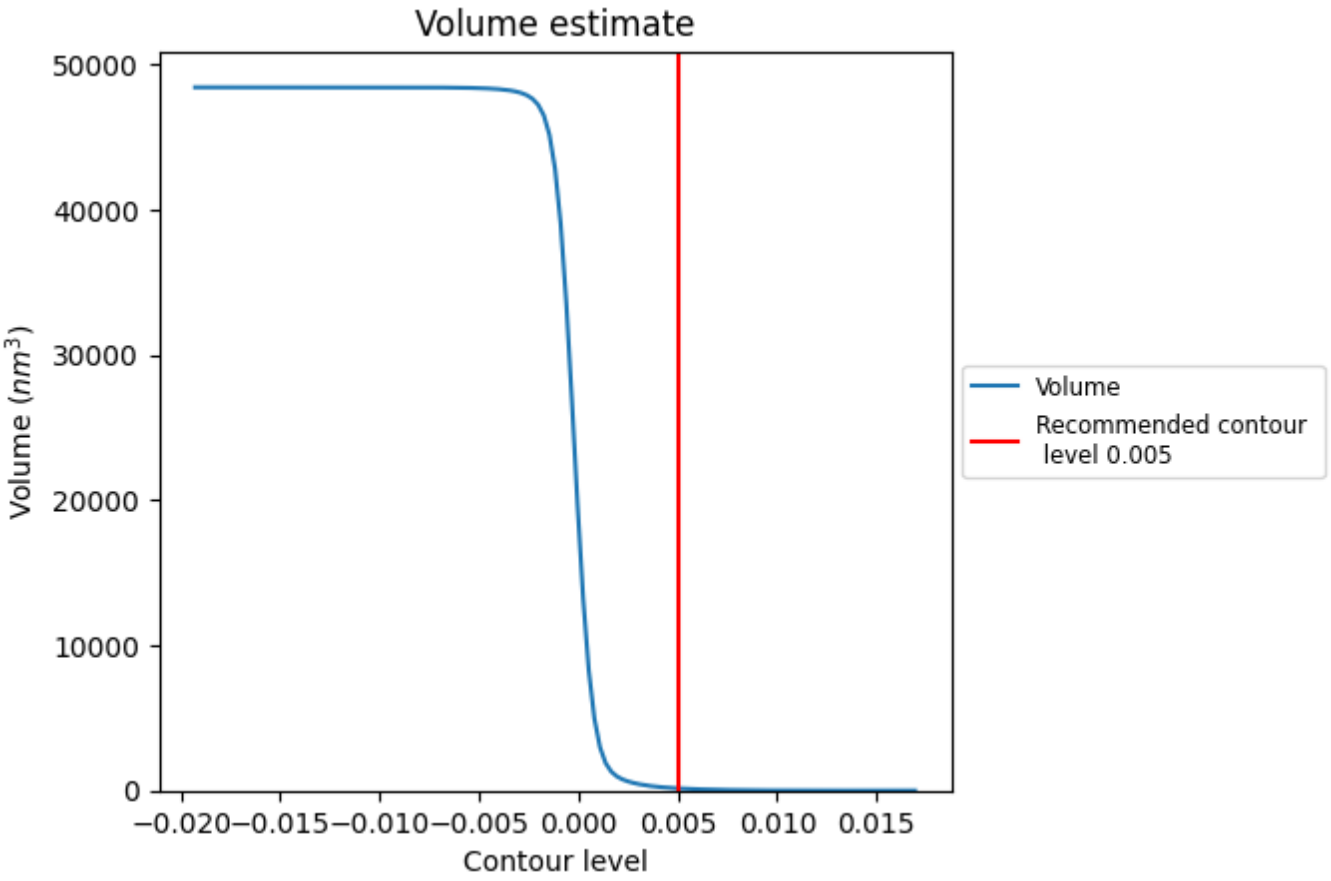
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

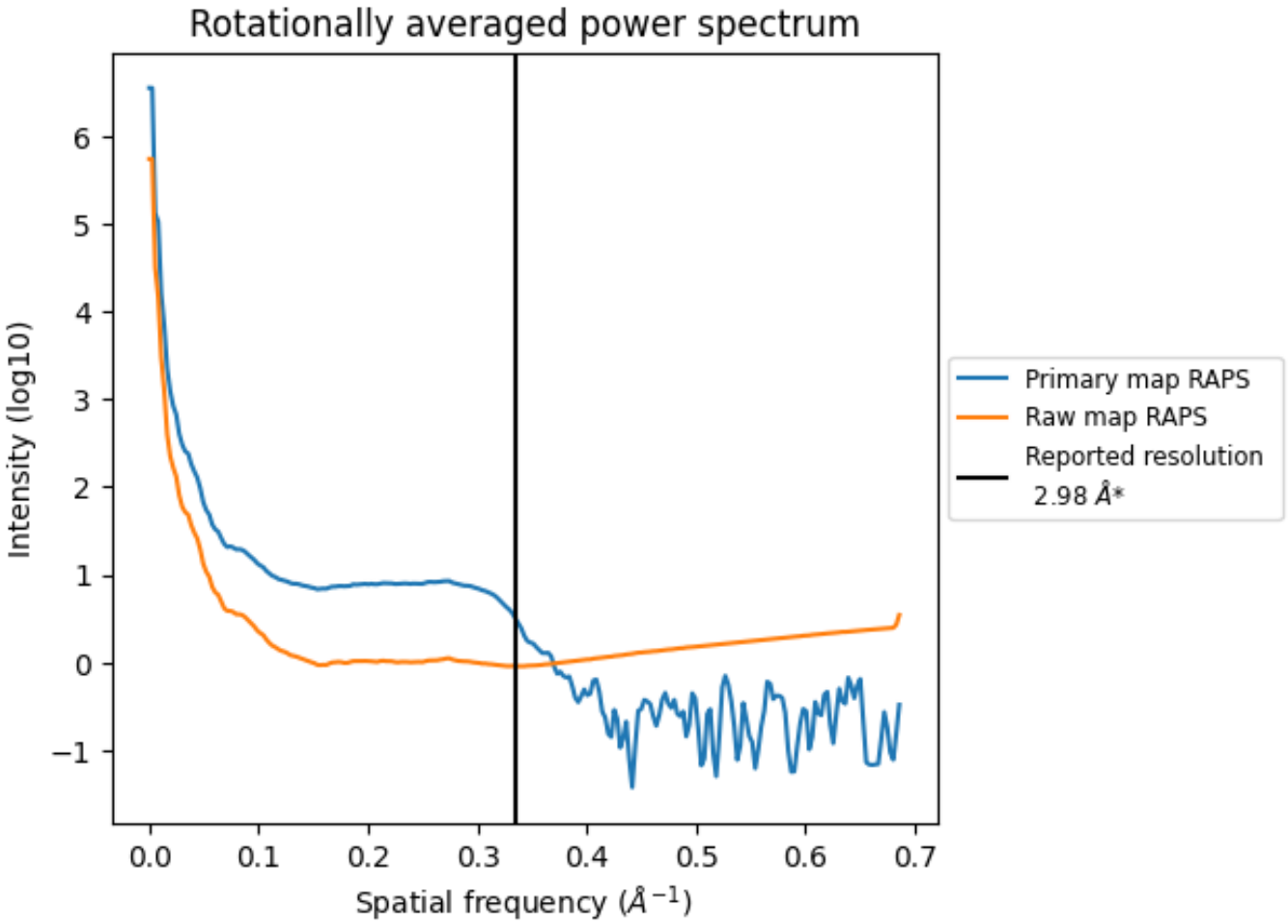
7.2 Volume estimate



The volume at the recommended contour level is 151 nm^3; this corresponds to an approximate mass of 137 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)

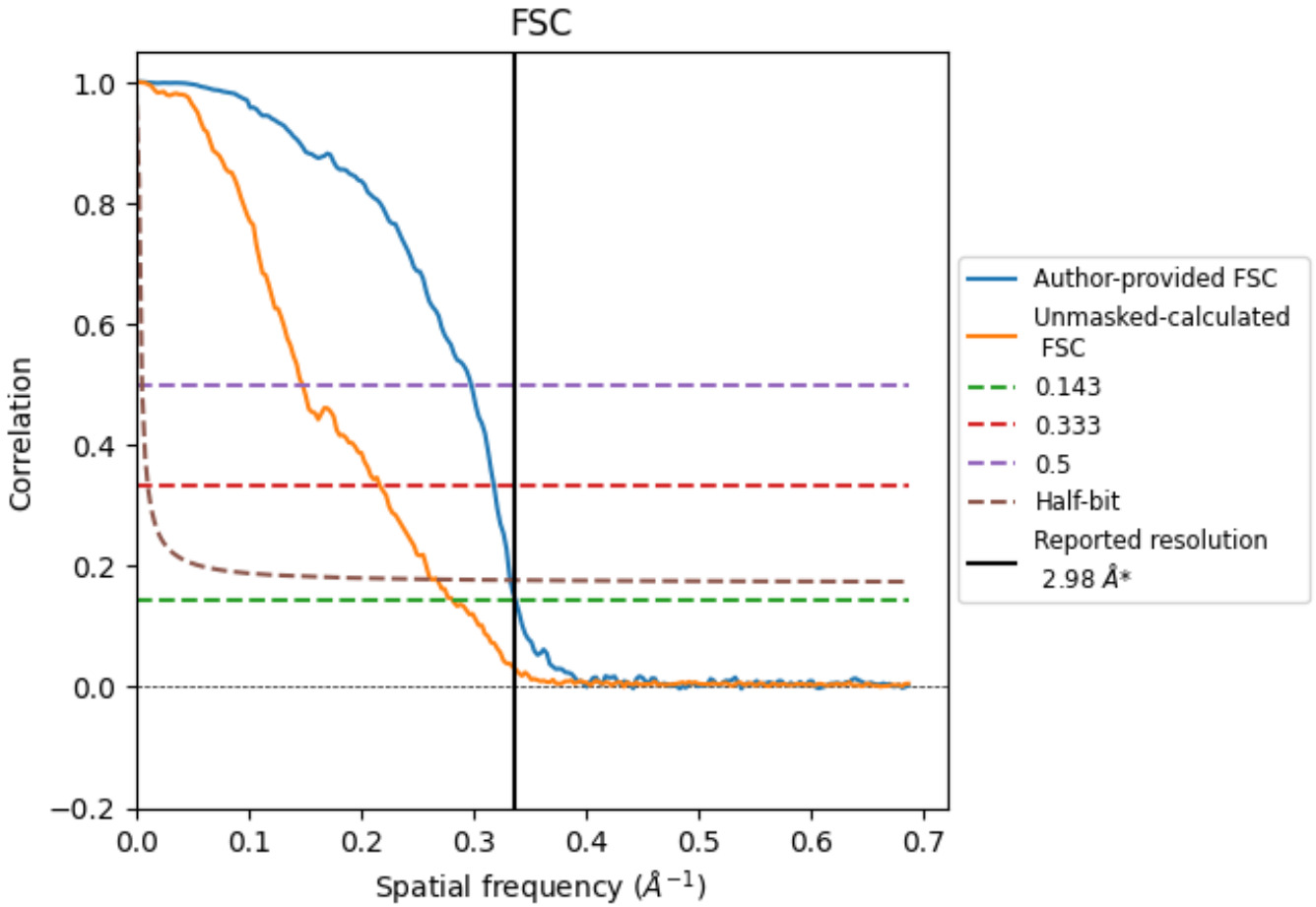


*Reported resolution corresponds to spatial frequency of 0.336 Å^{-1}

8 Fourier-Shell correlation

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

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.336 Å^{-1}

8.2 Resolution estimates (i)

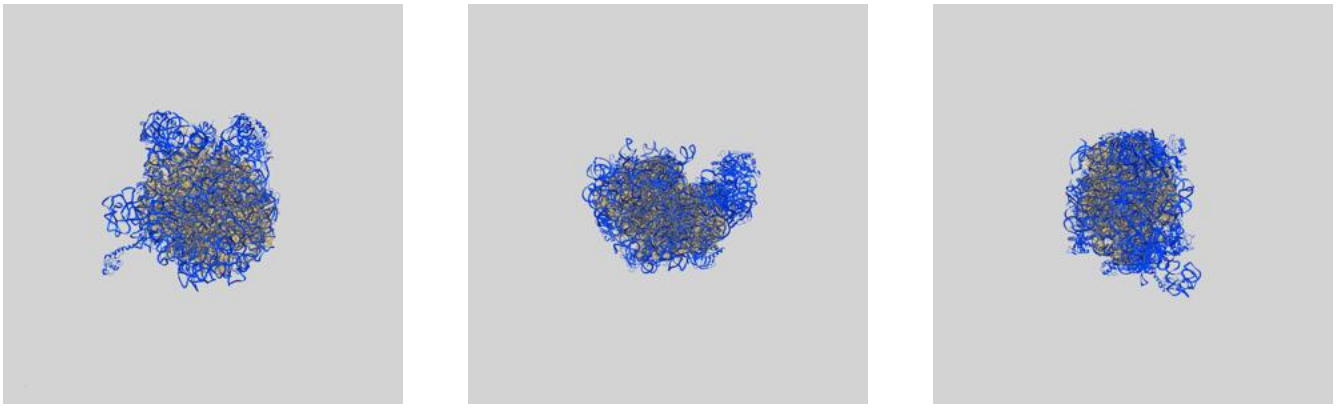
Resolution estimate (Å)	Estimation criterion (FSC cut-off)			
	0.143	0.5	Half-bit	0.333
Reported by author	-	-	-	2.98
Author-provided FSC curve	2.96	3.36	3.01	3.14
Unmasked-calculated*	3.55	6.76	3.81	4.62

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.33 CUT-OFF 4.62 differs from the reported value 2.98 by more than 10 %

9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-66639 and PDB model 9XFK. Per-residue inclusion information can be found in section 3 on page 11.

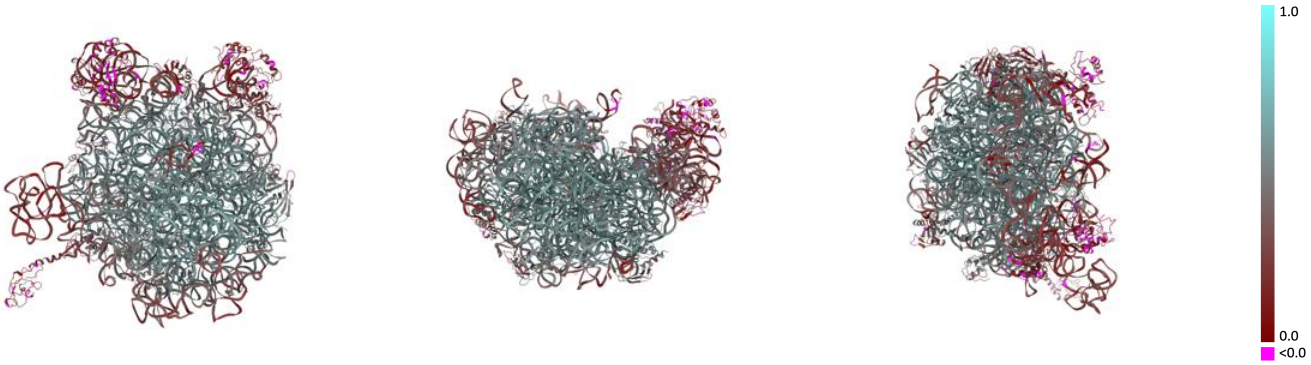
9.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.005 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

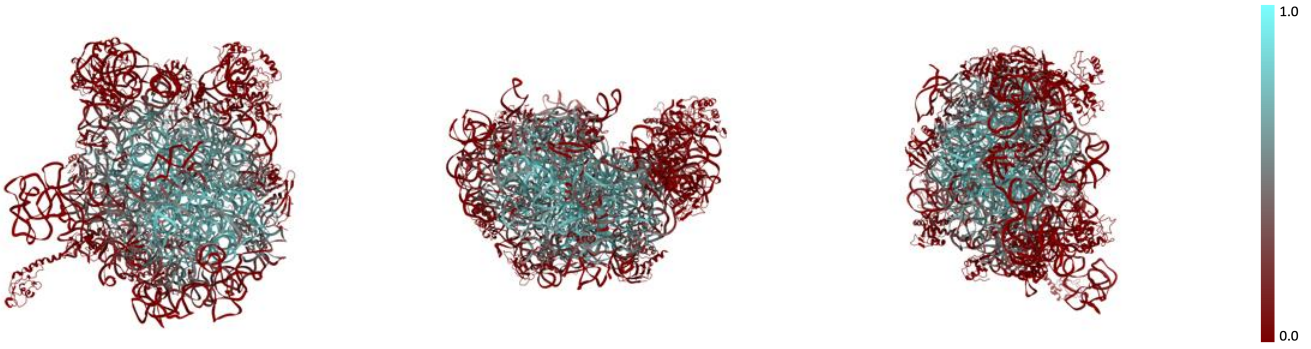
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

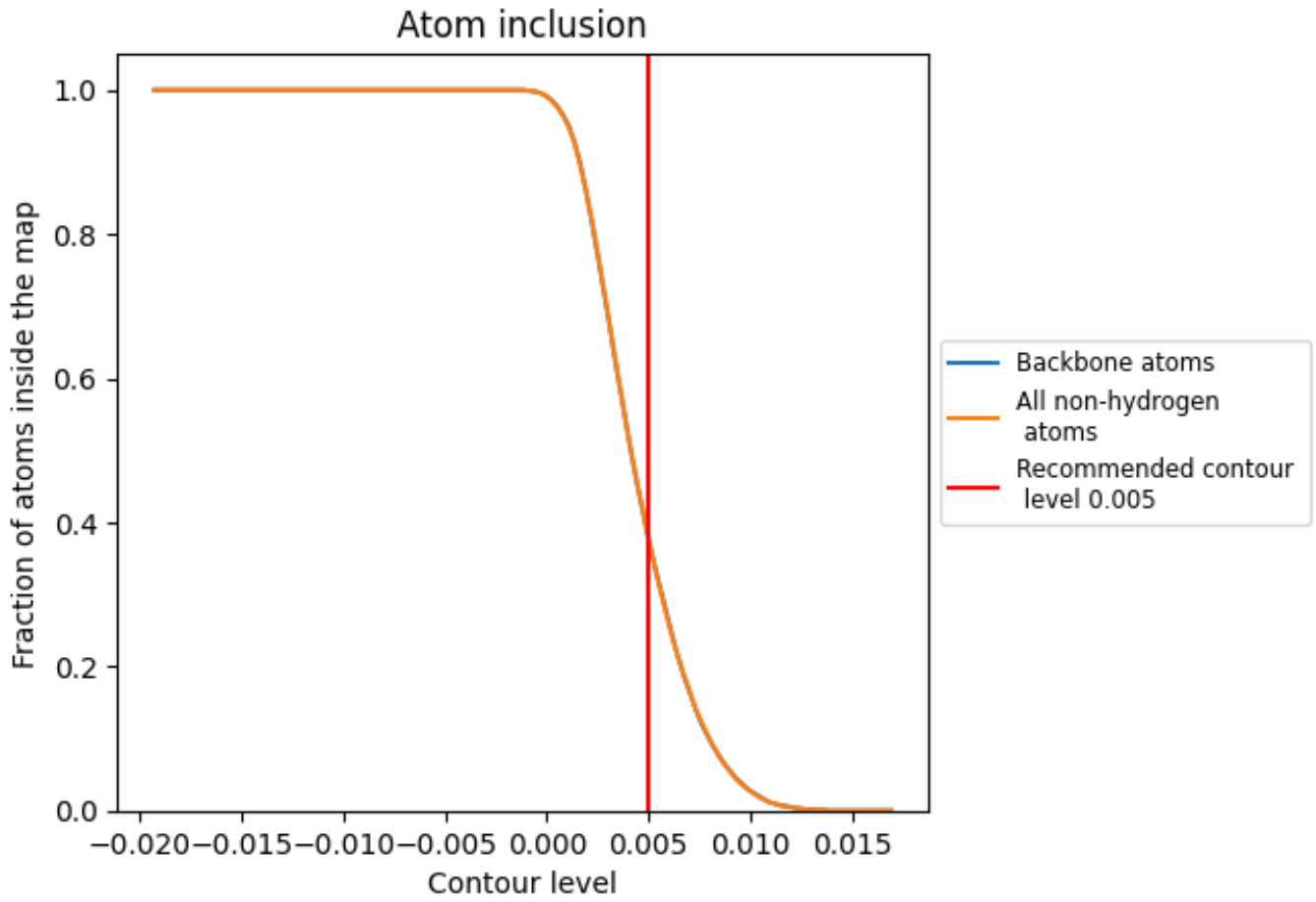
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.005).

9.4 Atom inclusion (i)



At the recommended contour level, 38% of all backbone atoms, 38% 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 (0.005) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.3770	0.4770
I	0.4700	0.5060
J	0.1170	0.3080
K	0.2470	0.5240
L	0.3380	0.5490
M	0.1900	0.4340
N	0.0000	0.1250
O	0.0000	0.2470
P	0.0000	0.1850
Q	0.0000	0.1430
R	0.3660	0.5570
S	0.1580	0.5020
T	0.2490	0.5190
U	0.1460	0.4630
V	0.4650	0.5690
W	0.0000	0.2030
X	0.1540	0.4850
Y	0.4630	0.5650
Z	0.1660	0.4770
a	0.3960	0.5650
b	0.1190	0.4820
c	0.0000	0.3480
d	0.0010	0.2990
e	0.1730	0.4930
f	0.1580	0.4970
g	0.0040	0.3450
h	0.2720	0.5240
i	0.3550	0.5560
j	0.0220	0.3650
k	0.6120	0.6080
l	0.4300	0.5730
m	0.0170	0.4350