



Full wwPDB EM Validation Report ⓘ

Jan 16, 2025 – 01:23 am GMT

PDB ID : 9H3Z
EMDB ID : EMD-51843
Title : mature 50S subunit
Authors : Lauer, S.; Nikolay, R.; Spahn, C.M.T.
Deposited on : 2024-10-17
Resolution : 2.98 Å (reported)
Based on initial model : 8RPY

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:

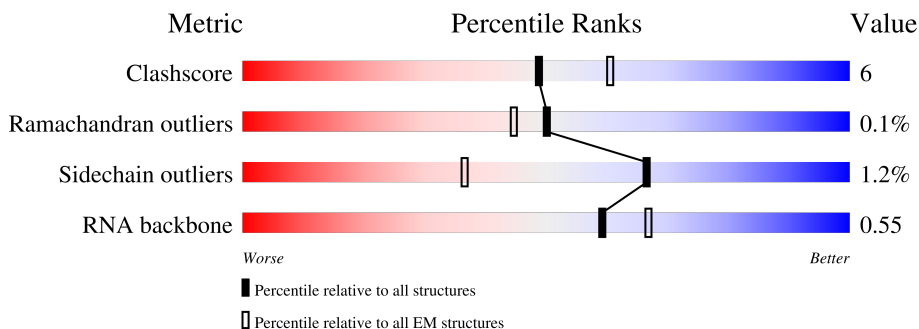
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

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.







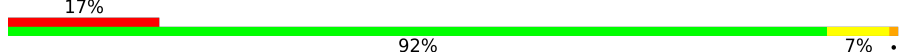

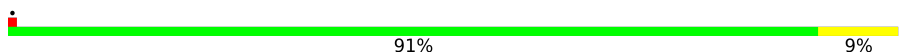




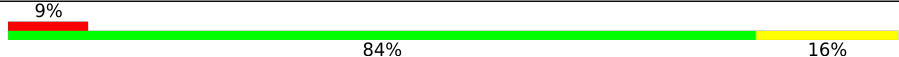
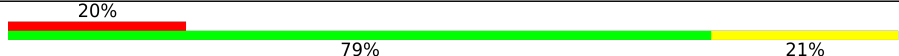

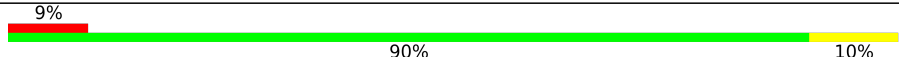

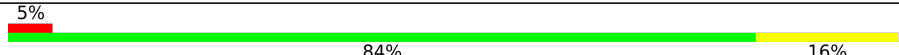
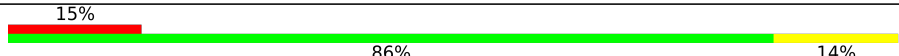
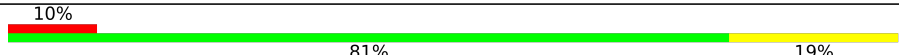
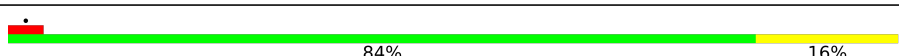
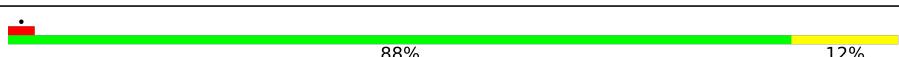


Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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

Mol	Chain	Length	Quality of chain
1	0	56	5% (poor fit), 82% (0-1 outliers), 16% (2-3 outliers), . (4+ outliers)
2	1	50	38% (poor fit), 92% (0-1 outliers), 8% (2-3 outliers)
3	2	46	. (poor fit), 89% (0-1 outliers), 9% (2-3 outliers), . (4+ outliers)
4	3	64	. (poor fit), 78% (0-1 outliers), 20% (2-3 outliers), . (4+ outliers)
5	4	38	. (poor fit), 84% (0-1 outliers), 16% (2-3 outliers)
6	A	2904	5% (poor fit), 65% (0-1 outliers), 30% (2-3 outliers), 5% (4+ outliers)
7	B	120	. (poor fit), 69% (0-1 outliers), 25% (2-3 outliers), 6% (4+ outliers)

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Mol	Chain	Length	Quality of chain
8	C	271	 86% 14%
9	D	209	 7% 87% 13%
10	E	201	 13% 76% 24%
11	F	177	 33% 79% 19%
12	G	176	 17% 92% 7%
13	H	149	 71% 89% 11%
14	J	142	 91% 9%
15	K	122	 20% 89% 11%
16	L	143	 15% 78% 22%
17	M	136	 88% 12%
18	N	120	 84% 15%
19	O	116	 9% 84% 16%
20	P	114	 20% 79% 21%
21	Q	117	 76% 24%
22	R	103	 9% 90% 10%
23	S	110	 82% 17%
24	T	93	 5% 84% 16%
25	U	102	 15% 86% 14%
26	V	94	 10% 81% 19%
27	W	75	 84% 16%
28	X	77	 88% 12%
29	Y	63	 11% 86% 14%
30	Z	58	 81% 17%

2 Entry composition [i](#)

There are 30 unique types of molecules in this entry. The entry contains 89946 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Large ribosomal subunit protein bL32.

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

- Molecule 2 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	1	50	409	263	75	71	0	0

- Molecule 3 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	46	377	228	90	57	2	0	0

- Molecule 4 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	64	504	323	105	74	2	0	0

- Molecule 5 is a protein called Large ribosomal subunit protein bL36A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	38	302	185	65	48	4	0	0

- Molecule 6 is a RNA chain called 23S ribosomal rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	A	2900	62281	27783	11461	20136	2901	1	0

- Molecule 7 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	B	120	2572	1145	471	836	120	0	0

- Molecule 8 is a protein called Large ribosomal subunit protein uL2.

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

- Molecule 9 is a protein called 50S ribosomal protein L3.

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

- Molecule 10 is a protein called Large ribosomal subunit protein uL4.

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

- Molecule 11 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	177	1410	899	249	256	6	0	0

- Molecule 12 is a protein called Large ribosomal subunit protein uL6.

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

- Molecule 13 is a protein called Large ribosomal subunit protein bL9.

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

- Molecule 14 is a protein called Large ribosomal subunit protein uL13.

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

- Molecule 15 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	K	122	938	587	180	165	6	0	0

- Molecule 16 is a protein called Large ribosomal subunit protein uL15.

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

- Molecule 17 is a protein called 50S ribosomal protein L16.

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

- Molecule 18 is a protein called Large ribosomal subunit protein bL17.

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

- Molecule 19 is a protein called Large ribosomal subunit protein uL18.

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

- Molecule 20 is a protein called Large ribosomal subunit protein bL19.

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

- Molecule 21 is a protein called Large ribosomal subunit protein bL20.

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

- Molecule 22 is a protein called Large ribosomal subunit protein bL21.

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

- Molecule 23 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	S	110	Total	C	N	O	S	1	0
			868	538	170	157	3		

- Molecule 24 is a protein called Large ribosomal subunit protein uL23.

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

- Molecule 25 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	U	102	Total	C	N	O	0	0
			779	492	146	141		

- Molecule 26 is a protein called Large ribosomal subunit protein bL25.

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

- Molecule 27 is a protein called Large ribosomal subunit protein bL27.

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

- Molecule 28 is a protein called Large ribosomal subunit protein bL28.

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

- Molecule 29 is a protein called Large ribosomal subunit protein uL29.

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

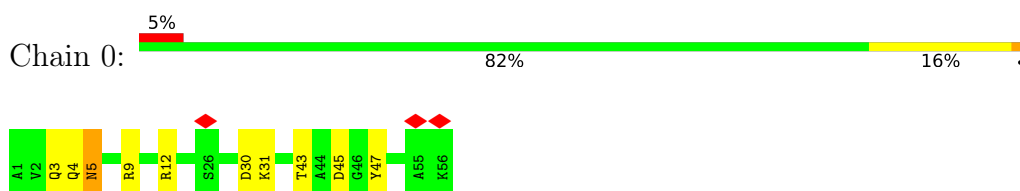
- Molecule 30 is a protein called Large ribosomal subunit protein uL30.

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

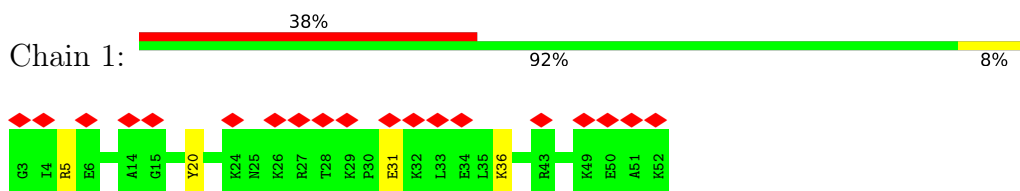
3 Residue-property plots [i](#)

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.

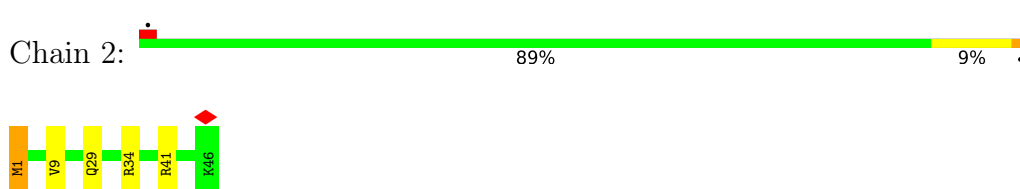
- Molecule 1: Large ribosomal subunit protein bL32



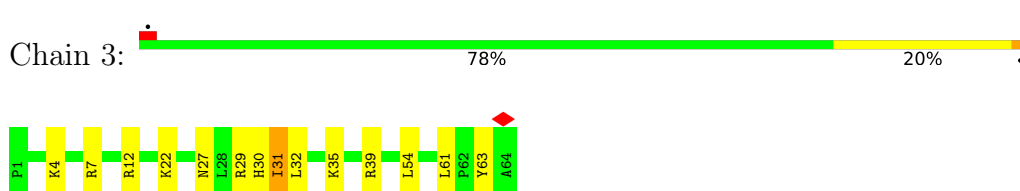
- Molecule 2: Large ribosomal subunit protein bL33



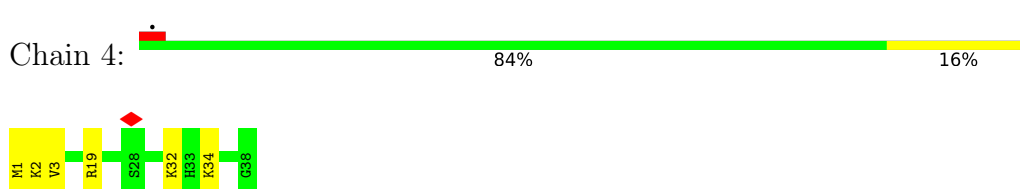
- Molecule 3: Large ribosomal subunit protein bL34



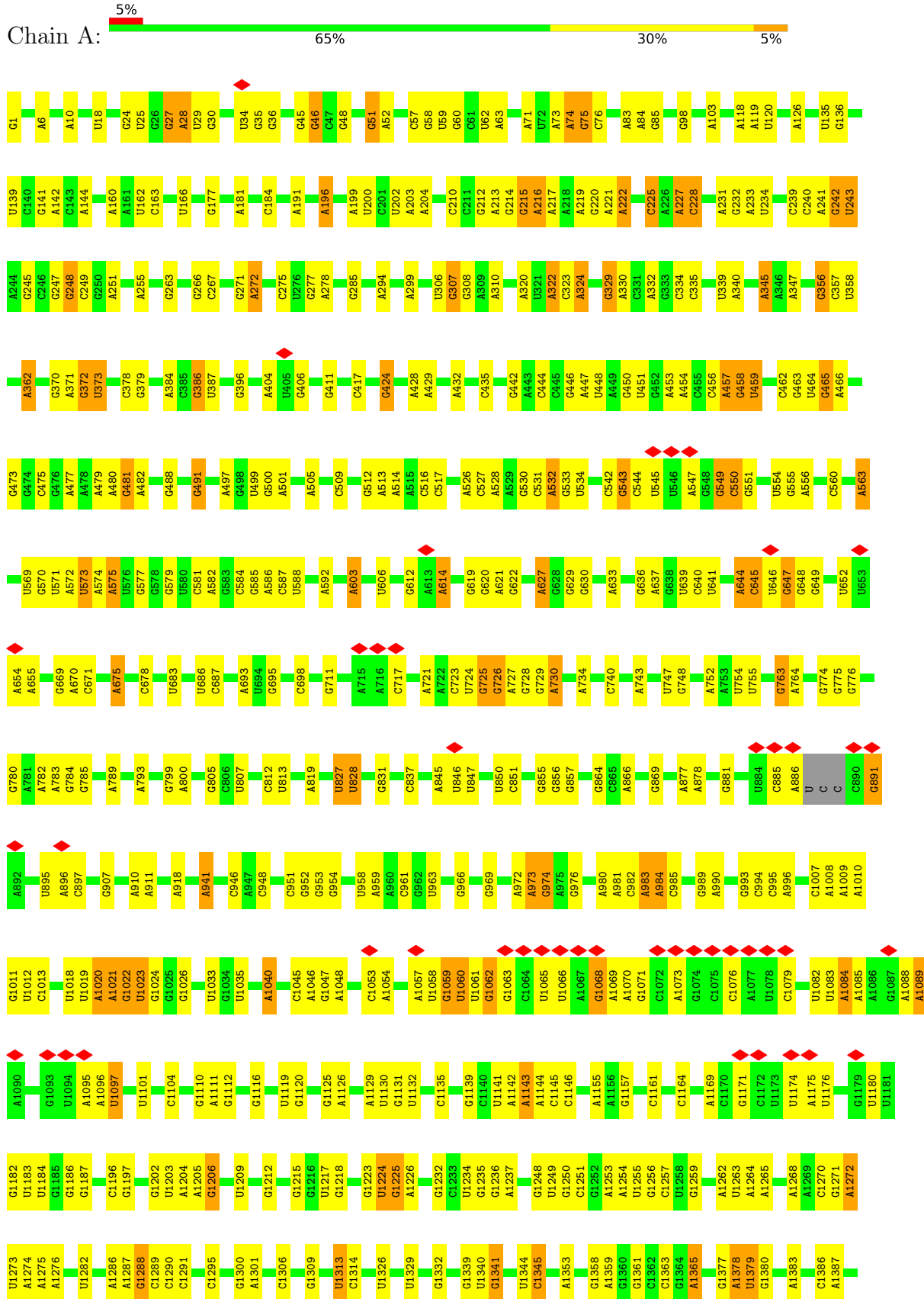
- Molecule 4: Large ribosomal subunit protein bL35



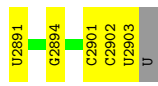
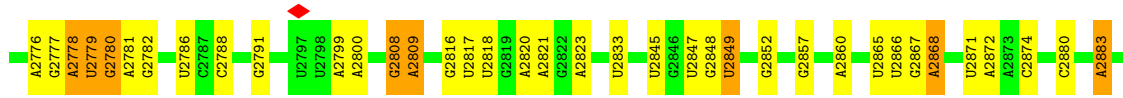
- Molecule 5: Large ribosomal subunit protein bL36A



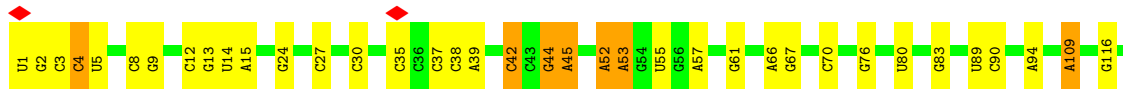
• Molecule 6: 23S ribosomal rRNA



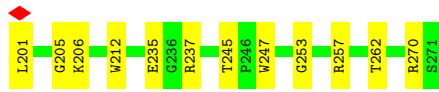
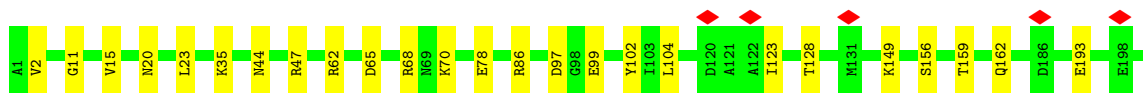
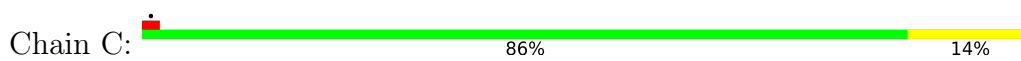
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G1537	G1543	A1544	A1545	G1546	C1550	U1559	A1560	G1563	C1564	C1565	A1566	G1567	G1568	A1569	C1574	U1578	U1584	C1585	A1608	G1622	A1634	C1638	G1645	C1646	U1647	U1648	G1649	A1654	G1659	U1662	G1663	A1664	A1665	G1666	G1667	A1668	A1669	C1670	G1674	G1681	G1682	U1683						
G1684	C1685	C1686	U1687	U1688	G1696	G1697	A1699	A1700	A1701	G1702	G1703	C1704	A1705	U1712	U1713	U1714	G1715	U1720	G1721	G1724	U1729	C1730	G1731	C1732	G1733	G1734	U1735	G1737	G1738	A1739	A1744	A1754	A1755	G1756	A1757	C1764	U1769	G1770	C1771	A1772	A1773	G1776	U1779	A1780	U1781	U1782		
A1783	A1784	A1785	A1786	C1788	A1789	A1790	A1791	A1794	G1797	U1798	G1799	C1800	A1801	A1802	A1808	A1809	U1812	C1816	G1817	U1818	A1819	U1820	G1826	U1827	G1828	A1829	C1833	U1834	G1835	C1836	C1837	C1843	G1857	A1858	U1864	U1865	A1866	G1869	C1870	A1871	A1872	A1901	G1906	G1907				
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G2107	A2108	U2109	G2110	U2111	G2112	U2113	A2114	A2115	G2116	A2117	U2118	A2119	G2120	G2121	U2122	G2123	G2124	G2125	A2126	G2127	G2128	C2129	U2130	U2131	U2132	C2133	A2134	A2135	G2136	U2137	U2138	U2139	G2140	C2143	G2144	G2238	G2239	U2243	G2250	G2251	C2258	A2266	A2267	G2271	A2274	G2279		
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C2283	A2284	C2285	U2286	A2287	U2291	U2296	A2297	U2305	A2309	U2321	U2324	G2325	C2326	A2327	G2330	A2333	U2334	A2335	U2336	G2337	U2343	U2344	G2345	A2346	C2347	U2348	G2349	C2350	G2351	G2357	G2360	G2361	C2362	G2363	C2364	G2365	A2369	G2373	C2374	G2375	A2376	A2377	G2379					
G2383	U2384	C2385	A2386	U2387	A2392	U2393	C2394	G2395	G2396	U2402	C2403	U2404	A2407	G2410	U2419	G2422	U2423	A2424	A2425	A2426	C2427	G2428	G2429	A2430	U2431	A2432	A2433	A2434	A2435	A2439	C2440	U2441	C2442	G2443	G2444	G2445	G2446	U2447	A2448	A2451	G2454	U2457	G2464	A2468	A2469	U2473		
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A2679	A2682	U2687	G2688	U2689	C2691	G2692	U2698	C2699	A2700	C2704	A2705	A2706	U2707	G2708	U2709	C2710	G2714	C2717	G2718	G2719	U2720	A2721	U2613	A2614	U2615	G2618	C2619	C2620	G2732	A2733	U2739	U2743	G2744	G2747	A2748	A2749	A2750	G2751	C2755	U2756	A2757	C2762	G2763	A2764	A2765			



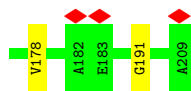
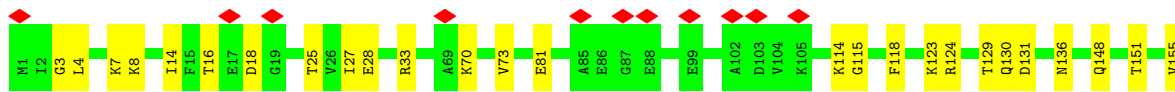
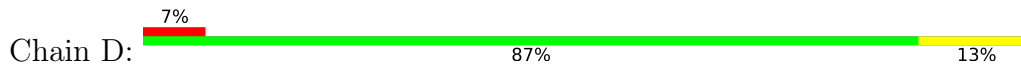
• Molecule 7: 5S ribosomal RNA



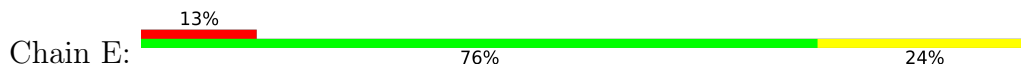
• Molecule 8: Large ribosomal subunit protein uL2

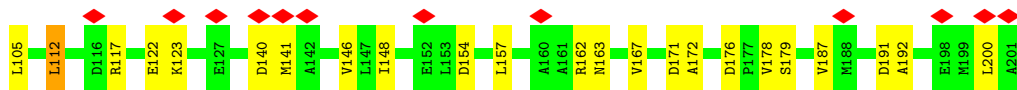


• Molecule 9: 50S ribosomal protein L3

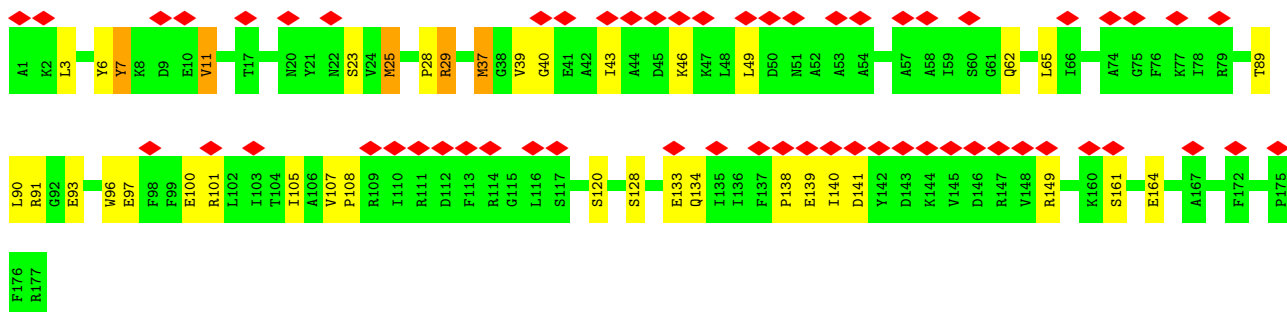
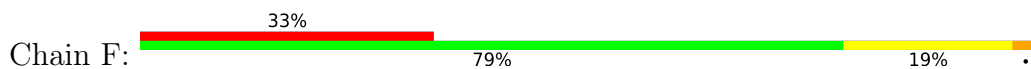


• Molecule 10: Large ribosomal subunit protein uL4

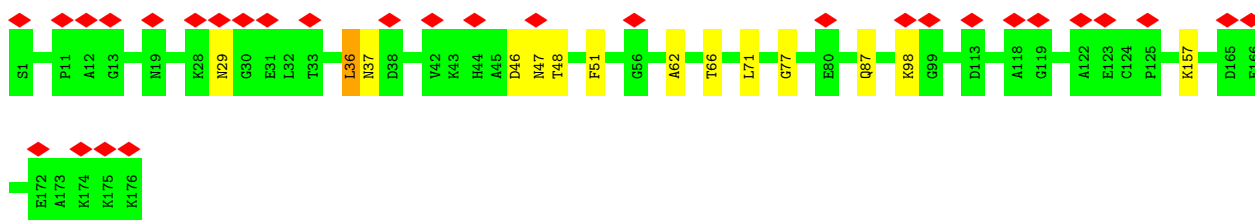
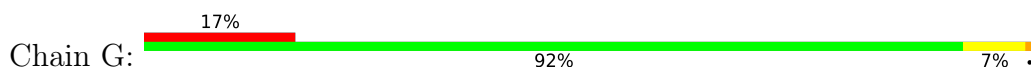




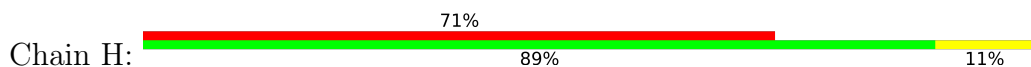
- Molecule 11: Large ribosomal subunit protein uL5



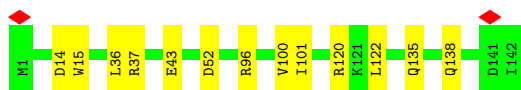
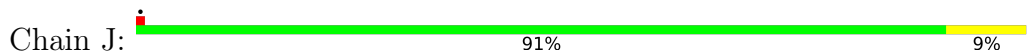
- Molecule 12: Large ribosomal subunit protein uL6



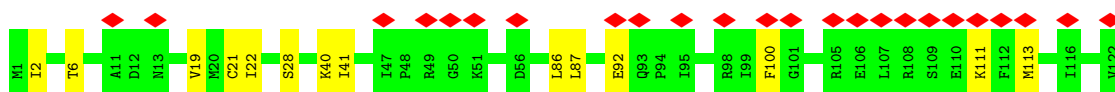
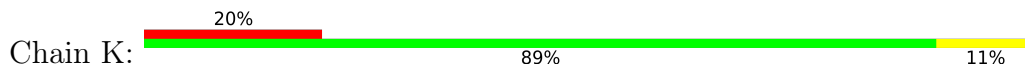
- Molecule 13: Large ribosomal subunit protein bL9



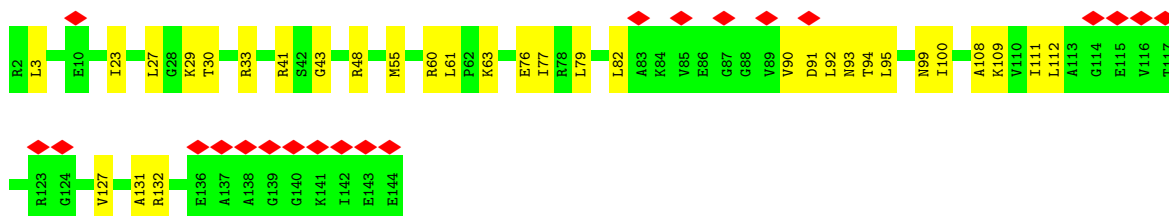
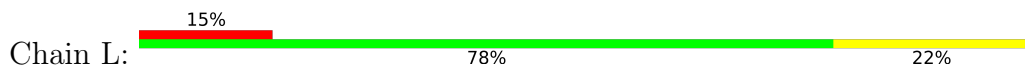
- Molecule 14: Large ribosomal subunit protein uL13



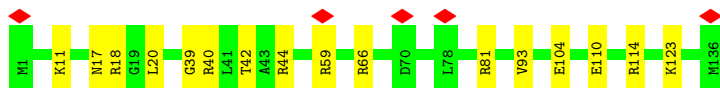
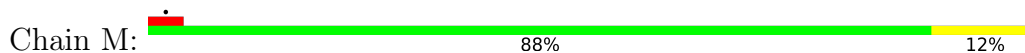
- Molecule 15: Large ribosomal subunit protein uL14



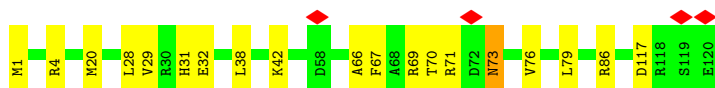
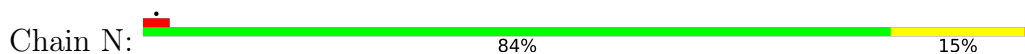
- Molecule 16: Large ribosomal subunit protein uL15



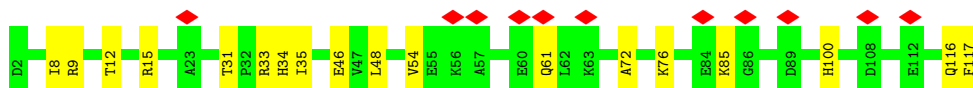
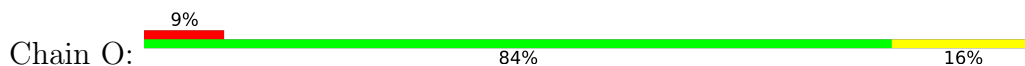
- Molecule 17: 50S ribosomal protein L16



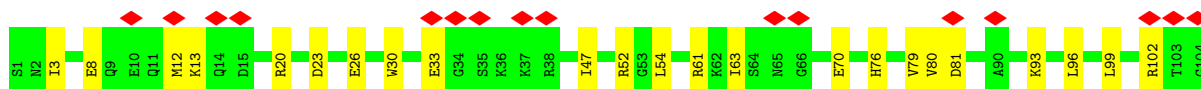
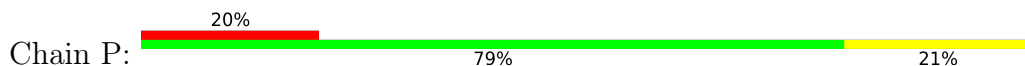
- Molecule 18: Large ribosomal subunit protein bL17

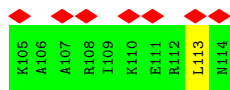


- Molecule 19: Large ribosomal subunit protein uL18

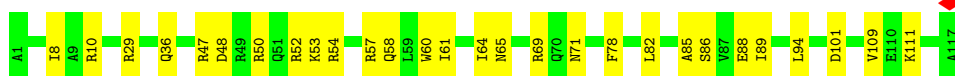
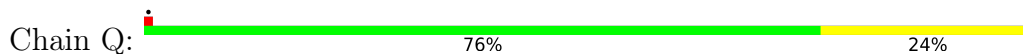


- Molecule 20: Large ribosomal subunit protein bL19

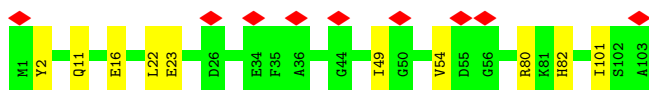
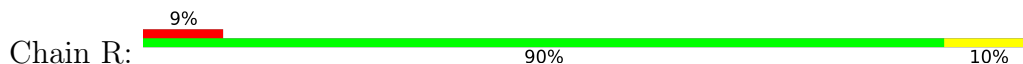




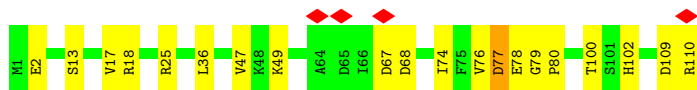
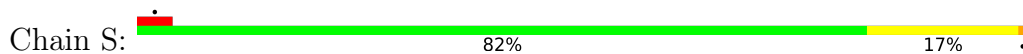
- Molecule 21: Large ribosomal subunit protein bL20



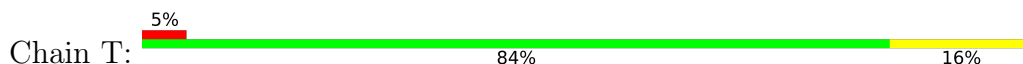
- Molecule 22: Large ribosomal subunit protein bL21



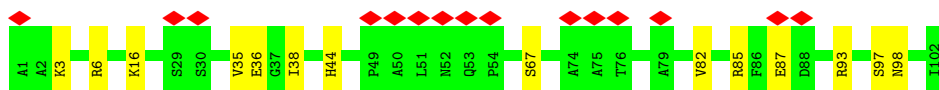
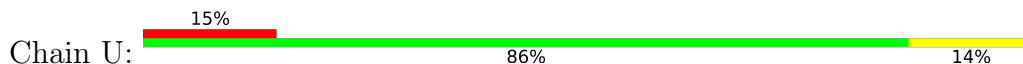
- Molecule 23: Large ribosomal subunit protein uL22



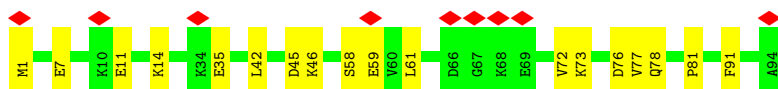
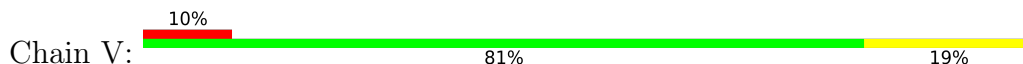
- Molecule 24: Large ribosomal subunit protein uL23



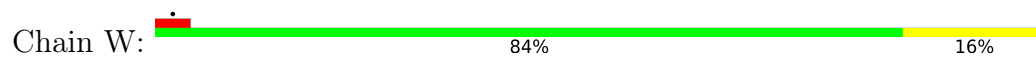
- Molecule 25: Large ribosomal subunit protein uL24



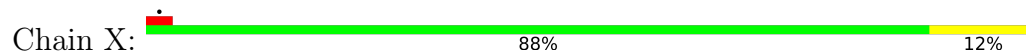
- Molecule 26: Large ribosomal subunit protein bL25



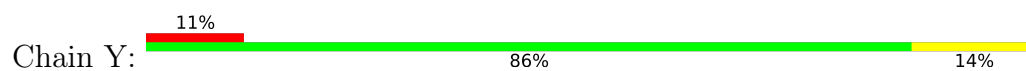
- Molecule 27: Large ribosomal subunit protein bL27



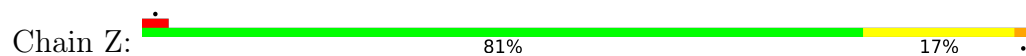
- Molecule 28: Large ribosomal subunit protein bL28



- Molecule 29: Large ribosomal subunit protein uL29



- Molecule 30: Large ribosomal subunit protein uL30



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	80374	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.575	Depositor
Minimum map value	-0.980	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.110	Depositor
Recommended contour level	0.44	Depositor
Map size (Å)	424.0, 424.0, 424.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4133333, 1.4133333, 1.4133333	Depositor

5 Model quality i

5.1 Standard geometry i

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	0	0.23	0/450	0.54	0/599
2	1	0.24	0/416	0.48	0/554
3	2	0.25	0/380	0.64	0/498
4	3	0.23	0/513	0.52	0/676
5	4	0.26	0/303	0.56	0/397
6	A	0.15	1/69755 (0.0%)	0.72	8/108820 (0.0%)
7	B	0.24	1/2876 (0.0%)	0.70	0/4483
8	C	0.24	0/2121	0.55	0/2852
9	D	0.24	0/1586	0.50	0/2134
10	E	0.24	0/1571	0.48	0/2113
11	F	0.25	0/1434	0.53	0/1926
12	G	0.24	0/1343	0.48	0/1816
13	H	0.24	0/1122	0.48	0/1515
14	J	0.24	0/1152	0.49	0/1551
15	K	0.24	0/947	0.55	0/1268
16	L	0.25	0/1054	0.57	0/1403
17	M	0.25	0/1093	0.54	0/1460
18	N	0.25	0/973	0.59	0/1301
19	O	0.24	0/902	0.53	0/1209
20	P	0.25	0/929	0.54	0/1242
21	Q	0.24	0/960	0.52	0/1278
22	R	0.25	0/829	0.53	0/1107
23	S	0.23	0/875	0.52	0/1170
24	T	0.23	0/744	0.49	0/994
25	U	0.25	0/787	0.51	0/1051
26	V	0.25	0/766	0.48	0/1025
27	W	0.24	0/582	0.53	0/769
28	X	0.24	0/635	0.57	0/848
29	Y	0.24	0/510	0.49	0/677
30	Z	0.24	0/453	0.54	0/605
All	All	0.18	2/98061 (0.0%)	0.68	8/147341 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	A	1	G	OP3-P	-10.57	1.48	1.61
7	B	1	U	OP3-P	-10.54	1.48	1.61

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	A	1913	A	OP1-P-O3'	-10.67	81.72	105.20
6	A	1913	A	OP2-P-O3'	-10.07	83.05	105.20
6	A	1914	C	OP1-P-OP2	7.09	130.23	119.60
6	A	2474	U	C2-N1-C1'	5.73	124.57	117.70
6	A	2321	U	C2-N1-C1'	5.57	124.38	117.70
6	A	62	U	C2-N1-C1'	5.49	124.29	117.70
6	A	1313	U	C2-N1-C1'	5.14	123.87	117.70
6	A	2704	C	N1-C2-O2	5.04	121.92	118.90

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	0	444	0	461	7	0
2	1	409	0	440	4	0
3	2	377	0	418	4	0
4	3	504	0	574	12	0
5	4	302	0	343	6	0
6	A	62281	0	31323	517	0
7	B	2572	0	1302	22	0
8	C	2082	0	2157	30	0
9	D	1565	0	1616	20	0
10	E	1552	0	1619	35	0
11	F	1410	0	1447	29	0
12	G	1323	0	1374	10	0
13	H	1111	0	1148	13	0
14	J	1129	0	1162	9	0
15	K	938	0	1012	10	0
16	L	1045	0	1117	28	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
17	M	1074	0	1157	11	0
18	N	960	0	1000	14	0
19	O	892	0	923	14	0
20	P	917	0	965	16	0
21	Q	947	0	1022	24	0
22	R	816	0	839	8	0
23	S	868	0	934	15	0
24	T	738	0	807	11	0
25	U	779	0	834	11	0
26	V	753	0	780	15	0
27	W	575	0	592	10	0
28	X	625	0	655	8	0
29	Y	509	0	543	6	0
30	Z	449	0	491	10	0
All	All	89946	0	59055	786	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 6.

All (786) 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)
6:A:727:A:OP2	6:A:1431:A:O2'	1.88	0.91
6:A:177:G:OP2	6:A:177:G:N2	2.05	0.89
16:L:93:ASN:O	16:L:94:THR:OG1	1.91	0.88
6:A:1837:C:O2'	6:A:1927:A:N3	2.05	0.87
6:A:2343:U:HO2'	6:A:2373:G:HO2'	1.13	0.87
6:A:2258:C:O2'	6:A:2427:C:OP2	1.92	0.87
6:A:959:A:N3	6:A:2457:U:O2'	2.09	0.85
6:A:2576:G:O2'	6:A:2579:C:OP2	1.93	0.85
6:A:1681:G:OP2	6:A:1757:A:N6	2.09	0.85
6:A:1798:U:O2'	6:A:1802:A:N3	2.10	0.85
6:A:948:C:O2	6:A:984:A:O2'	1.96	0.84
6:A:1843:C:O2'	8:C:253:GLY:O	1.96	0.84
6:A:2522:U:O2'	6:A:2647:U:OP1	1.93	0.84
6:A:1447:C:O2'	6:A:1544:A:N3	2.09	0.83
6:A:2530:A:OP2	6:A:2535:G:N2	2.11	0.83
6:A:2377:A:O2'	19:O:117:PHE:O	1.95	0.83
7:B:5:U:OP1	7:B:61:G:O2'	1.97	0.83
6:A:1826:G:O2'	6:A:1971:U:OP2	1.97	0.82
6:A:612:G:N2	6:A:614:A:O2'	2.12	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:275:C:O2	6:A:362:A:N6	2.12	0.82
6:A:1942:C:OP2	6:A:1943:U:O2'	1.96	0.82
6:A:1962:C:O2'	6:A:1964:G:OP2	1.97	0.82
6:A:227:A:O2'	6:A:228:C:O5'	1.97	0.82
2:1:5:ARG:NH1	6:A:2285:C:OP2	2.13	0.81
6:A:463:G:N2	6:A:466:A:OP2	2.14	0.81
6:A:994:C:OP1	21:Q:52:ARG:NH2	2.13	0.81
6:A:2326:C:O2'	6:A:2327:A:OP1	1.98	0.80
16:L:55:MET:O	16:L:60:ARG:NH1	2.14	0.80
6:A:1184:U:OP1	30:Z:29:ARG:NE	2.14	0.80
6:A:698:C:O2'	6:A:734:A:N6	2.14	0.80
6:A:572:A:OP2	22:R:80:ARG:NH2	2.15	0.80
6:A:2144:G:O2'	6:A:2147:A:N1	2.15	0.80
6:A:234:U:O4	6:A:263:G:N2	2.15	0.79
6:A:200:U:O2	6:A:386:G:N2	2.15	0.79
6:A:2645:G:OP2	6:A:2645:G:N2	2.13	0.79
6:A:2857:G:N2	6:A:2860:A:OP2	2.14	0.79
17:M:66:ARG:NH1	17:M:104:GLU:OE2	2.15	0.79
1:0:4:GLN:OE1	6:A:2056:G:O2'	2.00	0.79
6:A:1779:U:OP2	6:A:1784:A:N6	2.16	0.79
6:A:1801:A:OP2	8:C:149:LYS:NZ	2.15	0.79
6:A:1907:G:O6	6:A:1924:C:N4	2.16	0.78
6:A:1754:A:O2'	20:P:102:ARG:NH2	2.17	0.78
26:V:11:GLU:N	26:V:11:GLU:OE1	2.17	0.78
6:A:1953:A:O2'	6:A:2559:C:O2	2.00	0.78
6:A:2061:G:OP2	10:E:63:LYS:NZ	2.16	0.78
6:A:675:A:N3	6:A:2443:C:O2'	2.16	0.78
6:A:2079:U:O2'	28:X:22:ASN:OD1	2.01	0.78
6:A:191:A:O2'	6:A:678:C:O2	2.00	0.77
2:1:20:TYR:HH	6:A:2347:C:HO2'	1.32	0.77
18:N:86:ARG:NH2	18:N:117:ASP:OD2	2.16	0.77
4:3:31:ILE:O	4:3:35:LYS:NZ	2.17	0.77
26:V:58:SER:OG	26:V:59:GLU:OE1	2.03	0.77
12:G:29:ASN:ND2	12:G:77:GLY:O	2.18	0.77
6:A:807:U:OP2	16:L:41:ARG:NH2	2.18	0.76
6:A:989:G:OP2	30:Z:11:SER:OG	2.03	0.76
6:A:320:A:N3	10:E:163:ASN:ND2	2.33	0.76
6:A:1257:C:OP1	10:E:67:ARG:NE	2.19	0.76
6:A:57:C:O2'	24:T:36:LYS:NZ	2.19	0.75
6:A:2387:U:O2'	27:W:37:ARG:NH2	2.19	0.75
6:A:2816:G:N3	6:A:2883:A:O2'	2.19	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:570:G:O4'	6:A:983:A:N6	2.20	0.75
7:B:14:U:OP2	7:B:70:C:O2'	2.04	0.75
6:A:1668:A:N3	6:A:1670:C:N4	2.34	0.75
6:A:2595:G:O2'	6:A:2597:G:O6	2.03	0.75
6:A:2006:C:O2'	6:A:2823:A:N3	2.18	0.74
6:A:2115:G:N2	6:A:2118:U:OP2	2.19	0.74
6:A:2063:C:N4	6:A:2501:C:O2	2.21	0.74
6:A:76:C:OP1	29:Y:48:ARG:NH1	2.21	0.74
21:Q:101:ASP:OD2	22:R:2:TYR:OH	2.04	0.74
6:A:248:G:O2'	6:A:2432:A:OP1	2.04	0.74
6:A:725:G:O2'	6:A:726:G:O4'	2.04	0.74
6:A:2469:A:N6	6:A:2481:G:O2'	2.21	0.74
6:A:2646:C:OP2	6:A:2732:G:O2'	2.06	0.74
3:2:34:ARG:NH2	3:2:41:ARG:O	2.21	0.73
6:A:542:C:N4	6:A:543:G:O6	2.20	0.73
22:R:11:GLN:N	22:R:11:GLN:OE1	2.21	0.73
5:4:19:ARG:NE	6:A:2756:U:OP2	2.20	0.73
6:A:2564:A:O2'	6:A:2565:A:O4'	2.01	0.73
6:A:647:G:N2	6:A:2350:C:O2'	2.21	0.73
6:A:958:U:OP1	17:M:40:ARG:NH2	2.21	0.73
16:L:77:ILE:HD11	16:L:108:ALA:HB1	1.71	0.73
11:F:25:MET:O	11:F:29:ARG:NH1	2.22	0.72
6:A:1936:A:OP2	6:A:1962:C:N4	2.22	0.72
6:A:240:C:OP2	6:A:241:A:O2'	2.03	0.72
6:A:2821:A:OP2	9:D:115:GLY:N	2.22	0.72
19:O:8:ILE:O	19:O:12:THR:HG23	1.89	0.72
6:A:1724:G:O6	6:A:1737:G:N2	2.23	0.72
6:A:1209:U:O2'	6:A:1237:A:N1	2.20	0.71
6:A:603:A:N6	6:A:655:A:O4'	2.23	0.71
6:A:1834:U:O2'	6:A:1970:A:OP2	2.08	0.71
6:A:372:G:O2'	6:A:373:U:O5'	2.09	0.71
6:A:2865:U:OP2	6:A:2866:U:O2'	2.06	0.71
6:A:249:C:OP2	6:A:2394:C:O2'	2.05	0.71
6:A:2251:G:OP1	17:M:81:ARG:NH1	2.23	0.71
8:C:156:SER:HG	8:C:159:THR:HG1	1.27	0.71
6:A:1248:G:OP1	10:E:44:ARG:NH1	2.24	0.71
6:A:807:U:O2'	6:A:2060:A:N1	2.22	0.70
6:A:571:U:O2'	6:A:573:U:OP2	2.08	0.70
6:A:963:U:O4'	6:A:2250:G:N2	2.24	0.70
6:A:1062:G:O2'	6:A:1063:G:O4'	2.06	0.70
6:A:1638:C:O2	6:A:2698:U:O2'	2.09	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:C:70:LYS:NZ	8:C:99:GLU:OE2	2.25	0.70
6:A:621:A:OP2	16:L:99:ASN:ND2	2.25	0.70
6:A:1048:A:OP2	6:A:1110:G:N2	2.24	0.70
4:3:39:ARG:NH2	6:A:2362:C:OP1	2.25	0.70
26:V:45:ASP:OD1	26:V:46:LYS:N	2.25	0.70
6:A:227:A:HO2'	6:A:228:C:P	2.15	0.70
7:B:76:G:O2'	26:V:78:GLN:OE1	2.09	0.70
6:A:18:U:O2'	6:A:554:U:OP1	2.10	0.69
6:A:584:C:N4	6:A:585:G:O6	2.25	0.69
6:A:219:A:N3	6:A:234:U:O2'	2.25	0.69
11:F:134:GLN:NE2	11:F:149:ARG:O	2.25	0.69
6:A:1264:A:OP2	6:A:1265:A:O2'	2.08	0.69
1:0:5:ASN:ND2	6:A:2022:U:O4	2.24	0.69
6:A:2705:A:O2'	6:A:2852:G:OP1	2.09	0.69
19:O:31:THR:OG1	19:O:33:ARG:O	2.10	0.69
6:A:1125:G:OP2	6:A:1126:A:O2'	2.10	0.69
6:A:1129:A:O2'	6:A:2515:C:O2	2.10	0.69
6:A:1817:G:OP1	8:C:86:ARG:NH2	2.26	0.69
13:H:113:SER:O	13:H:116:ARG:NH1	2.25	0.69
6:A:1019:U:OP1	6:A:1035:U:O2'	2.07	0.68
6:A:1682:G:OP2	6:A:1699:G:N2	2.26	0.68
6:A:1869:G:N2	6:A:1872:A:OP2	2.26	0.68
20:P:30:TRP:NE1	20:P:81:ASP:OD2	2.26	0.68
6:A:514:A:N3	6:A:581:C:O2'	2.26	0.68
6:A:1218:G:N1	6:A:1232:G:N7	2.41	0.68
6:A:2786:U:OP1	9:D:70:LYS:NZ	2.26	0.68
6:A:743:A:O2'	6:A:1659:G:OP1	2.09	0.68
6:A:1654:A:O2'	9:D:118:PHE:O	2.11	0.68
6:A:2788:C:O2'	6:A:2809:A:N3	2.24	0.68
21:Q:57:ARG:HE	21:Q:61:ILE:HD11	1.59	0.68
6:A:28:A:HO2'	6:A:582:A:HO2'	1.42	0.68
6:A:1528:A:OP2	6:A:1543:G:N2	2.27	0.68
6:A:1696:G:N2	6:A:1977:A:O2'	2.22	0.68
11:F:89:THR:OG1	11:F:91:ARG:NH2	2.27	0.68
6:A:1340:U:OP1	24:T:19:LYS:NZ	2.27	0.67
6:A:1712:U:OP2	6:A:1713:A:O2'	2.02	0.67
6:A:2199:A:OP1	28:X:36:ARG:NH2	2.27	0.67
4:3:4:LYS:O	16:L:48:ARG:NH1	2.27	0.67
3:2:29:GLN:NE2	6:A:210:C:OP1	2.28	0.67
6:A:1568:G:OP2	8:C:62:ARG:NH2	2.28	0.67
6:A:2595:G:N2	6:A:2598:A:OP2	2.25	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:S:25:ARG:NH1	23:S:74:ILE:O	2.28	0.67
6:A:1363:C:O2'	6:A:1809:A:N3	2.26	0.66
6:A:1021:A:H61	6:A:1142:A:H61	1.43	0.66
6:A:1721:G:O2'	6:A:1739:A:N6	2.28	0.66
6:A:488:G:O3'	23:S:49:LYS:NZ	2.28	0.66
6:A:2659:G:N2	6:A:2662:A:OP2	2.29	0.66
6:A:1536:C:O2'	6:A:1537:G:N2	2.29	0.66
6:A:1007:C:OP1	14:J:37:ARG:NH1	2.29	0.66
6:A:693:A:O2'	6:A:1353:A:N3	2.26	0.66
30:Z:46:MET:O	30:Z:50:VAL:HG22	1.95	0.66
11:F:133:GLU:OE1	11:F:133:GLU:N	2.29	0.65
10:E:97:ASN:OD1	10:E:98:LYS:N	2.29	0.65
6:A:482:A:O2'	6:A:497:A:N1	2.27	0.65
6:A:969:G:N2	6:A:984:A:O2'	2.28	0.65
6:A:1217:U:O2	6:A:1232:G:O6	2.14	0.65
10:E:46:GLN:O	10:E:88:ARG:NH2	2.29	0.65
6:A:1801:A:N6	6:A:2201:G:O2'	2.30	0.65
16:L:76:GLU:OE1	16:L:76:GLU:N	2.29	0.65
23:S:18:ARG:NH1	23:S:76:VAL:O	2.30	0.65
7:B:80:U:O4	26:V:14:LYS:NZ	2.30	0.64
6:A:569:U:O2'	6:A:983:A:N1	2.26	0.64
6:A:1929:G:OP2	6:A:1929:G:N2	2.31	0.64
7:B:27:C:OP1	19:O:34:HIS:NE2	2.31	0.64
6:A:517:C:O2'	23:S:18:ARG:NH2	2.31	0.64
29:Y:8:GLU:N	29:Y:8:GLU:OE1	2.31	0.64
6:A:24:G:O2'	23:S:77:ASP:OD2	2.11	0.64
6:A:587:C:O2	16:L:33:ARG:NH2	2.31	0.64
13:H:7:ASP:OD1	13:H:8:LYS:N	2.30	0.64
6:A:563:A:N3	21:Q:36:GLN:NE2	2.46	0.63
6:A:2594:C:N4	6:A:2595:G:O6	2.31	0.63
8:C:257:ARG:NH2	8:C:262:THR:OG1	2.31	0.63
30:Z:18:LYS:O	30:Z:22:THR:HG23	1.98	0.63
6:A:1223:G:N2	6:A:1226:A:OP2	2.28	0.63
10:E:148:ILE:HG21	10:E:157:LEU:HD21	1.80	0.63
19:O:48:LEU:O	19:O:85:LYS:NZ	2.30	0.63
6:A:475:C:O2	6:A:479:A:N6	2.31	0.63
6:A:577:G:O2'	6:A:1254:A:OP1	2.16	0.63
6:A:881:G:O6	6:A:895:U:O2	2.16	0.63
11:F:7:TYR:OH	11:F:28:PRO:O	2.16	0.63
26:V:76:ASP:OD1	26:V:77:VAL:N	2.31	0.63
6:A:534:U:O2'	21:Q:48:ASP:OD2	2.05	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:850:U:O2'	30:Z:22:THR:HG22	1.99	0.63
6:A:1550:C:OP1	6:A:1720:U:O2'	2.08	0.63
10:E:1:MET:N	10:E:14:VAL:O	2.32	0.63
6:A:271:G:O2'	6:A:272:A:OP2	2.13	0.62
6:A:1697:G:OP2	6:A:1698:A:O2'	2.13	0.62
6:A:2707:U:O2	18:N:71:ARG:NH2	2.32	0.62
13:H:109:GLU:N	13:H:109:GLU:OE1	2.32	0.62
26:V:35:GLU:N	26:V:35:GLU:OE1	2.32	0.62
6:A:918:A:N3	7:B:80:U:O2'	2.31	0.62
6:A:2291:U:O2'	6:A:2374:C:O2	2.17	0.62
6:A:1798:U:OP2	8:C:270:ARG:NH2	2.33	0.62
6:A:83:A:O2'	6:A:103:A:N6	2.33	0.61
6:A:1060:U:O2'	6:A:1071:G:OP1	2.17	0.61
1:0:9:ARG:NH2	6:A:516:C:OP1	2.33	0.61
12:G:46:ASP:O	12:G:47:ASN:ND2	2.33	0.61
6:A:345:A:N3	6:A:347:A:N6	2.47	0.61
6:A:1203:U:OP2	6:A:1204:A:O2'	2.13	0.61
6:A:1426:G:OP2	6:A:1427:A:O2'	2.11	0.61
6:A:2047:C:O2'	6:A:2823:A:N1	2.33	0.61
6:A:966:G:H4'	6:A:2271:G:H22	1.64	0.61
6:A:1454:C:N4	18:N:73:ASN:OD1	2.33	0.61
11:F:161:SER:N	11:F:164:GLU:OE2	2.34	0.61
6:A:1021:A:N6	6:A:1142:A:H61	1.98	0.60
9:D:148:GLN:OE1	9:D:148:GLN:N	2.34	0.60
28:X:40:GLU:OE1	28:X:40:GLU:N	2.34	0.60
7:B:42:C:C5	11:F:65:LEU:HD13	2.36	0.60
6:A:36:G:N3	6:A:450:G:O2'	2.34	0.60
6:A:2817:U:OP1	18:N:42:LYS:NZ	2.29	0.60
3:2:1:MET:SD	3:2:1:MET:N	2.66	0.60
26:V:58:SER:O	26:V:73:LYS:NZ	2.35	0.60
6:A:1007:C:OP2	6:A:1008:A:O2'	2.12	0.60
6:A:1864:U:OP1	6:A:2410:G:O2'	2.19	0.60
21:Q:88:GLU:N	21:Q:88:GLU:OE1	2.34	0.60
6:A:372:G:O6	28:X:56:ARG:NH2	2.34	0.60
6:A:2439:A:O2'	6:A:2600:A:OP1	2.18	0.60
9:D:131:ASP:O	9:D:136:ASN:ND2	2.34	0.60
6:A:754:U:O2'	6:A:1272:A:N1	2.35	0.59
6:A:1771:C:O2'	6:A:1786:A:O4'	2.18	0.59
24:T:13:ALA:O	24:T:33:LYS:N	2.35	0.59
7:B:52:A:O2'	7:B:53:A:OP2	2.17	0.59
6:A:2032:G:OP2	6:A:2454:G:O2'	2.13	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:2090:A:N6	6:A:2230:G:O6	2.35	0.59
1:O:12:ARG:NH2	6:A:517:C:OP1	2.35	0.59
6:A:203:A:OP2	6:A:204:A:O2'	2.13	0.59
6:A:372:G:HO2'	6:A:373:U:P	2.25	0.59
29:Y:5:GLU:OE1	29:Y:5:GLU:N	2.36	0.59
6:A:160:A:N3	6:A:2208:C:O2'	2.33	0.59
6:A:648:G:O2'	6:A:2351:G:OP1	2.13	0.59
18:N:29:VAL:HG21	18:N:79:LEU:HD11	1.82	0.59
23:S:79:GLY:N	23:S:100:THR:O	2.35	0.59
13:H:135:HIS:HB3	13:H:138:VAL:HG12	1.85	0.59
4:3:63:TYR:OH	6:A:592:A:O2'	2.19	0.59
6:A:606:U:OP1	10:E:97:ASN:ND2	2.36	0.59
6:A:1130:U:N3	6:A:2025:C:OP1	2.35	0.59
6:A:2566:A:N1	15:K:28:SER:OG	2.35	0.59
6:A:2747:G:O2'	12:G:66:THR:HG22	2.03	0.58
9:D:16:THR:OG1	9:D:18:ASP:OD1	2.16	0.58
11:F:120:SER:OG	11:F:128:SER:O	2.22	0.58
26:V:1:MET:SD	26:V:1:MET:N	2.77	0.58
6:A:239:C:O2'	6:A:622:G:O2'	2.12	0.58
11:F:93:GLU:OE1	11:F:93:GLU:N	2.37	0.58
6:A:726:G:O5'	6:A:1432:G:O2'	2.21	0.58
6:A:2032:G:N2	9:D:151:THR:OG1	2.37	0.58
23:S:2:GLU:OE1	23:S:2:GLU:N	2.36	0.58
23:S:78:GLU:OE1	23:S:78:GLU:N	2.37	0.58
6:A:442:G:N2	10:E:43:THR:O	2.33	0.58
6:A:855:G:N2	27:W:25:GLU:OE2	2.37	0.58
21:Q:101:ASP:N	21:Q:101:ASP:OD1	2.36	0.58
27:W:37:ARG:O	27:W:53:HIS:ND1	2.33	0.58
6:A:644:A:O2'	6:A:645:C:O5'	2.14	0.58
10:E:49:ARG:NH2	10:E:72:SER:OG	2.36	0.58
6:A:1068:G:N2	6:A:1095:A:O2'	2.36	0.58
23:S:77:ASP:O	23:S:102:HIS:N	2.35	0.58
10:E:122:GLU:OE1	10:E:123:LYS:N	2.37	0.58
5:4:1:MET:SD	5:4:34:LYS:NZ	2.77	0.57
6:A:2324:U:O2'	6:A:2337:G:OP1	2.21	0.57
11:F:37:MET:SD	11:F:37:MET:N	2.77	0.57
16:L:93:ASN:C	16:L:94:THR:HG1	1.99	0.57
6:A:324:A:N6	6:A:339:U:O4'	2.37	0.57
6:A:1040:A:N6	6:A:1116:G:O6	2.37	0.57
6:A:629:G:N3	6:A:639:U:O2'	2.38	0.57
6:A:2580:U:O2'	6:A:2581:G:O4'	2.20	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:37:C:O2	19:O:100:HIS:NE2	2.37	0.57
8:C:235:GLU:N	8:C:235:GLU:OE1	2.37	0.57
11:F:97:GLU:OE1	11:F:101:ARG:NE	2.37	0.57
25:U:3:LYS:O	25:U:93:ARG:NH1	2.37	0.57
8:C:99:GLU:N	8:C:99:GLU:OE1	2.37	0.57
24:T:54:GLU:OE1	24:T:54:GLU:N	2.37	0.57
16:L:95:LEU:HD11	16:L:100:ILE:HD11	1.85	0.57
6:A:85:G:OP1	25:U:6:ARG:N	2.37	0.57
4:3:30:HIS:NE2	6:A:2392:A:OP2	2.37	0.57
10:E:176:ASP:N	10:E:176:ASP:OD1	2.35	0.57
6:A:2692:G:N3	6:A:2847:U:O2'	2.38	0.56
30:Z:57:GLU:N	30:Z:57:GLU:OE1	2.38	0.56
6:A:340:A:O2'	10:E:162:ARG:NH2	2.38	0.56
6:A:586:A:OP2	6:A:1251:C:N4	2.38	0.56
6:A:1999:C:OP1	9:D:123:LYS:NZ	2.38	0.56
17:M:20:LEU:HD21	26:V:81:PRO:HG2	1.87	0.56
10:E:154:ASP:OD1	10:E:154:ASP:N	2.38	0.56
11:F:62:GLN:OE1	11:F:62:GLN:N	2.38	0.56
12:G:87:GLN:OE1	12:G:87:GLN:N	2.39	0.56
6:A:527:C:OP2	6:A:2779:U:N3	2.35	0.56
11:F:7:TYR:HA	11:F:11:VAL:HG12	1.88	0.56
27:W:7:ARG:O	27:W:10:ARG:NH1	2.38	0.56
21:Q:85:ALA:O	21:Q:86:SER:OG	2.21	0.55
6:A:560:C:O2	21:Q:47:ARG:NH2	2.39	0.55
6:A:627:A:C5	16:L:111:ILE:HD11	2.40	0.55
26:V:61:LEU:N	26:V:72:VAL:O	2.39	0.55
4:3:32:LEU:HD22	6:A:2419:U:OP2	2.06	0.55
6:A:911:A:N6	17:M:11:LYS:O	2.39	0.55
6:A:2637:U:O4	6:A:2776:A:N7	2.40	0.55
9:D:25:THR:OG1	9:D:191:GLY:O	2.14	0.55
2:1:31:GLU:OE1	2:1:31:GLU:N	2.39	0.55
6:A:372:G:H3'	28:X:57:VAL:HG12	1.89	0.55
6:A:1353:A:OP2	6:A:1377:G:N1	2.36	0.55
6:A:1361:G:HO2'	6:A:2215:C:HO2'	1.48	0.55
6:A:329:G:O6	25:U:16:LYS:N	2.39	0.55
6:A:793:A:OP2	6:A:2071:A:O2'	2.25	0.55
6:A:1205:A:O2'	6:A:1206:G:OP1	2.22	0.55
6:A:1326:U:HO2'	6:A:2010:G:HO2'	1.53	0.55
25:U:85:ARG:NE	25:U:87:GLU:OE2	2.40	0.55
6:A:84:A:N1	6:A:98:G:O2'	2.31	0.54
6:A:2451:A:OP1	6:A:2497:A:N6	2.39	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:O:116:GLN:OE1	19:O:116:GLN:N	2.39	0.54
8:C:78:GLU:N	8:C:78:GLU:OE1	2.40	0.54
6:A:976:G:O2'	6:A:1155:A:O2'	2.14	0.54
6:A:2349:G:O6	6:A:2369:A:N6	2.40	0.54
6:A:2776:A:O2'	6:A:2782:G:N7	2.37	0.54
6:A:184:C:O2'	6:A:217:A:N3	2.41	0.54
6:A:2509:G:N1	6:A:2580:U:O4	2.41	0.54
13:H:2:GLN:N	13:H:2:GLN:OE1	2.39	0.54
14:J:138:GLN:OE1	14:J:138:GLN:N	2.37	0.54
20:P:13:LYS:NZ	20:P:76:HIS:O	2.41	0.54
6:A:222:A:H61	6:A:232:G:H1'	1.71	0.54
4:3:12:ARG:NE	16:L:61:LEU:O	2.40	0.54
6:A:954:G:O2'	6:A:2274:A:N1	2.38	0.54
6:A:1666:G:H4'	15:K:6:THR:HG23	1.89	0.54
6:A:2133:G:N2	6:A:2157:G:O6	2.41	0.54
6:A:48:G:H22	6:A:177:G:P	2.31	0.54
6:A:1084:A:N6	6:A:1085:A:N1	2.56	0.54
6:A:1341:G:OP1	6:A:1397:U:N3	2.40	0.54
6:A:245:G:O2'	6:A:384:A:N1	2.37	0.54
6:A:1999:C:O2	6:A:2687:U:O2'	2.23	0.54
6:A:462:C:N4	6:A:463:G:O6	2.41	0.54
6:A:1018:U:O3'	6:A:1120:G:N2	2.41	0.54
6:A:2468:A:O2'	6:A:2469:A:O4'	2.25	0.54
6:A:2618:G:H21	9:D:155:VAL:HG21	1.73	0.54
20:P:33:GLU:N	20:P:33:GLU:OE1	2.40	0.54
4:3:63:TYR:HH	6:A:592:A:HO2'	1.48	0.53
6:A:2075:U:O2'	6:A:2077:A:OP2	2.15	0.53
6:A:1662:U:O2'	6:A:2687:U:OP1	2.24	0.53
6:A:2099:U:O2'	6:A:2100:G:O5'	2.20	0.53
6:A:2751:G:OP1	6:A:2751:G:N2	2.37	0.53
6:A:2848:G:OP1	20:P:93:LYS:NZ	2.40	0.53
6:A:448:U:O4'	10:E:79:ARG:NE	2.41	0.53
6:A:1779:U:O2	6:A:1783:A:N6	2.41	0.53
6:A:1048:A:O2'	6:A:1112:G:N2	2.41	0.53
16:L:91:ASP:OD1	16:L:92:LEU:N	2.41	0.53
6:A:6:A:N3	14:J:135:GLN:NE2	2.56	0.53
6:A:575:A:OP2	6:A:2055:C:N4	2.42	0.53
6:A:453:A:N3	6:A:457:A:O2'	2.42	0.53
27:W:11:ASP:OD1	27:W:12:SER:N	2.40	0.53
6:A:1951:U:O2'	6:A:1953:A:N7	2.36	0.53
6:A:2077:A:N3	6:A:2434:A:O2'	2.40	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:2506[A]:U:OP2	6:A:2576:G:N1	2.39	0.53
4:3:7:ARG:NH1	6:A:243:U:OP1	2.42	0.53
6:A:799:G:OP2	6:A:800:A:O2'	2.22	0.53
10:E:32:VAL:HG23	10:E:178:VAL:HG22	1.89	0.53
27:W:25:GLU:N	27:W:25:GLU:OE1	2.42	0.53
6:A:370:G:O2'	6:A:424:G:OP1	2.25	0.52
11:F:139:GLU:OE1	11:F:139:GLU:N	2.40	0.52
6:A:2628:C:O2'	6:A:2782:G:OP1	2.22	0.52
20:P:12:MET:HB2	20:P:54:LEU:HD11	1.91	0.52
6:A:630:G:N2	6:A:633:A:OP2	2.41	0.52
6:A:2250:G:O2'	6:A:2496:C:OP1	2.27	0.52
10:E:140:ASP:OD1	10:E:141:MET:N	2.42	0.52
26:V:72:VAL:HG21	26:V:91:PHE:HB3	1.91	0.52
6:A:212:G:H2'	6:A:213:A:C8	2.45	0.52
6:A:972:A:OP2	6:A:973:A:O2'	2.17	0.52
6:A:1020:A:HI1'	6:A:1021:A:OP2	2.09	0.52
11:F:134:GLN:N	11:F:134:GLN:OE1	2.42	0.52
6:A:477:A:N6	6:A:501:A:OP1	2.43	0.52
6:A:966:G:O4'	6:A:2267:A:N6	2.43	0.52
10:E:146:VAL:HG21	10:E:187:VAL:HG13	1.90	0.52
6:A:981:A:OP2	6:A:982:C:N4	2.37	0.52
20:P:26:GLU:N	20:P:26:GLU:OE1	2.43	0.52
26:V:7:GLU:N	26:V:7:GLU:OE1	2.42	0.52
20:P:47:ILE:HG22	20:P:99:LEU:HD12	1.91	0.52
6:A:974:G:O4'	6:A:990:A:N6	2.43	0.52
6:A:2468:A:P	6:A:2476:A:H61	2.33	0.52
14:J:14:ASP:OD1	14:J:15:TRP:N	2.43	0.52
29:Y:24:GLU:HA	29:Y:28:LEU:HD23	1.92	0.52
22:R:22:LEU:HD12	22:R:23:GLU:O	2.10	0.52
6:A:28:A:O2'	6:A:582:A:O2'	2.17	0.51
16:L:29:LYS:O	16:L:30:THR:OG1	2.17	0.51
6:A:45:G:N7	6:A:215:G:O2'	2.43	0.51
10:E:171:ASP:OD1	10:E:172:ALA:N	2.41	0.51
23:S:18:ARG:NH2	23:S:78:GLU:OE2	2.43	0.51
1:0:43:THR:OG1	1:0:45:ASP:OD1	2.18	0.51
6:A:59:U:O2'	6:A:74:A:OP2	2.19	0.51
10:E:48:THR:O	10:E:52:VAL:HG23	2.11	0.51
6:A:774:G:OP1	8:C:47:ARG:NH1	2.44	0.51
23:S:109:ASP:OD1	23:S:110:ARG:N	2.43	0.51
5:4:2:LYS:NZ	6:A:2478:A:OP2	2.42	0.51
6:A:574:A:N6	6:A:2034:U:OP1	2.41	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:P:79:VAL:HG13	20:P:80:VAL:HG13	1.93	0.51
21:Q:8:ILE:HD12	21:Q:8:ILE:H	1.76	0.51
6:A:1131:G:O2'	6:A:2025:C:O2'	2.22	0.51
6:A:1255:U:O4'	6:A:2502:G:N2	2.43	0.51
6:A:1447:C:N4	6:A:1448:G:O6	2.43	0.51
6:A:2637:U:H3	6:A:2776:A:H62	1.57	0.51
6:A:335:C:O2'	25:U:67:SER:O	2.25	0.51
16:L:82:LEU:O	16:L:82:LEU:HD23	2.11	0.51
6:A:1155:A:O3'	21:Q:54:ARG:NH2	2.44	0.50
6:A:378:C:N4	6:A:379:G:O6	2.44	0.50
16:L:79:LEU:HD21	16:L:131:ALA:HB1	1.93	0.50
6:A:2076:U:OP2	6:A:2238:G:N2	2.41	0.50
6:A:1141:U:O2	6:A:1142:A:N6	2.44	0.50
6:A:1361:G:O2'	6:A:2215:C:O2'	2.20	0.50
6:A:1567:G:O2'	8:C:62:ARG:NH2	2.45	0.50
6:A:1733:G:C2	6:A:1734:G:N7	2.79	0.50
6:A:2638:G:O2'	6:A:2778:A:N6	2.44	0.50
6:A:308:G:O2'	6:A:329:G:N2	2.45	0.50
6:A:951:C:N4	6:A:952:G:O6	2.44	0.50
7:B:52:A:O2'	7:B:53:A:P	2.70	0.50
19:O:61:GLN:OE1	19:O:61:GLN:N	2.44	0.50
7:B:8:C:OP1	19:O:15:ARG:NH2	2.45	0.49
10:E:191:ASP:OD1	10:E:192:ALA:N	2.45	0.49
23:S:67:ASP:OD1	23:S:68:ASP:N	2.45	0.49
6:A:481:G:OP2	25:U:44:HIS:N	2.39	0.49
6:A:724:U:C2'	6:A:725:G:O5'	2.60	0.49
6:A:1018:U:O2'	6:A:1120:G:N2	2.36	0.49
6:A:1022:G:H4'	6:A:1023:U:O5'	2.12	0.49
6:A:1664:A:H61	6:A:1996:C:N4	2.10	0.49
6:A:2743:U:OP2	6:A:2755:C:N4	2.45	0.49
6:A:549:G:HO2'	6:A:550:C:P	2.36	0.49
6:A:837:C:N3	6:A:941:A:N6	2.61	0.49
6:A:1275:A:N1	6:A:1295:C:O2'	2.37	0.49
6:A:2808:G:O2'	6:A:2809:A:N7	2.45	0.49
6:A:644:A:HO2'	6:A:645:C:P	2.33	0.49
6:A:2577:A:O4'	6:A:2612:C:N4	2.45	0.49
8:C:245:THR:HG23	8:C:247:TRP:H	1.77	0.49
6:A:1282:U:O4	6:A:1286:A:N7	2.45	0.49
6:A:2330:G:H21	27:W:38:GLY:HA2	1.76	0.49
8:C:123:ILE:O	8:C:123:ILE:HG22	2.11	0.49
6:A:220:G:N1	6:A:428:A:OP2	2.44	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:S:80:PRO:O	23:S:100:THR:OG1	2.28	0.49
6:A:451:U:O2	6:A:453:A:N6	2.46	0.49
15:K:22:ILE:HD11	15:K:40:LYS:HG2	1.95	0.49
6:A:1288:G:OP2	6:A:1288:G:N2	2.33	0.49
30:Z:4:ILE:HD11	30:Z:56:VAL:CG2	2.42	0.49
6:A:994:C:OP2	21:Q:53:LYS:NZ	2.45	0.49
6:A:2474:U:H2'	6:A:2474:U:O2	2.12	0.49
11:F:25:MET:SD	11:F:25:MET:N	2.84	0.49
11:F:90:LEU:HD23	11:F:90:LEU:H	1.77	0.49
15:K:19:VAL:HG11	15:K:41:ILE:HD12	1.94	0.49
6:A:864:G:H21	6:A:866:A:H62	1.61	0.48
6:A:1794:A:N6	6:A:1826:G:O6	2.45	0.48
9:D:3:GLY:C	9:D:4:LEU:HD12	2.34	0.48
6:A:357:C:C2	6:A:358:U:C5	3.01	0.48
6:A:513:A:N3	21:Q:10:ARG:NH2	2.59	0.48
6:A:1787:A:OP1	8:C:237:ARG:NH2	2.46	0.48
18:N:67:PHE:HA	18:N:76:VAL:HG11	1.94	0.48
8:C:20:ASN:O	8:C:23:LEU:HD22	2.12	0.48
6:A:1270:C:N4	6:A:1648:U:O4	2.47	0.48
7:B:38:C:O4'	19:O:100:HIS:NE2	2.46	0.48
14:J:36:LEU:HD21	14:J:122:LEU:HD13	1.95	0.48
17:M:110:GLU:OE2	17:M:114:ARG:NE	2.47	0.48
21:Q:65:ASN:OD1	21:Q:69:ARG:NE	2.45	0.48
25:U:3:LYS:NZ	25:U:82:VAL:O	2.46	0.48
6:A:549:G:O2'	6:A:550:C:P	2.72	0.48
6:A:1275:A:O2'	6:A:1645:G:N3	2.46	0.48
6:A:27:G:O2'	6:A:28:A:OP2	2.24	0.48
6:A:2723:C:OP1	9:D:114:LYS:NZ	2.39	0.48
13:H:12:LEU:H	13:H:12:LEU:HD23	1.79	0.48
6:A:225:C:N3	6:A:231:A:N6	2.61	0.48
6:A:1276:A:N6	6:A:1645:G:O6	2.46	0.48
6:A:1638:C:OP1	6:A:2710:C:O2'	2.32	0.48
20:P:8:GLU:HB2	20:P:54:LEU:HD13	1.95	0.48
6:A:2581:G:N2	6:A:2581:G:OP2	2.47	0.48
10:E:176:ASP:OD1	10:E:179:SER:OG	2.12	0.48
16:L:82:LEU:HD23	16:L:90:VAL:HG21	1.96	0.48
6:A:2720:U:C2	6:A:2721:A:C8	3.01	0.48
8:C:193:GLU:N	8:C:193:GLU:OE1	2.46	0.48
9:D:8:LYS:HA	9:D:27:ILE:HD12	1.96	0.48
6:A:2699:C:N4	6:A:2700:A:H62	2.12	0.48
7:B:83:G:O6	7:B:94:A:N6	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:1289:C:C2	6:A:1290:C:C5	3.02	0.47
6:A:532:A:N7	6:A:2021:C:O2'	2.40	0.47
26:V:59:GLU:OE1	26:V:59:GLU:N	2.43	0.47
6:A:1288:G:OP1	6:A:1289:C:N4	2.47	0.47
6:A:1754:A:N6	6:A:2717:C:O4'	2.46	0.47
6:A:1654:A:OP2	18:N:1:MET:N	2.43	0.47
6:A:1997:C:O5'	9:D:129:THR:OG1	2.25	0.47
6:A:2679:A:N6	6:A:2729:G:O6	2.48	0.47
7:B:15:A:N3	7:B:109:A:N6	2.61	0.47
8:C:15:VAL:HG22	8:C:205:GLY:HA3	1.95	0.47
20:P:61:ARG:NH1	20:P:70:GLU:OE2	2.42	0.47
6:A:641:U:O2'	6:A:2350:C:OP1	2.17	0.47
6:A:729:G:O4'	8:C:206:LYS:NZ	2.39	0.47
6:A:1857:G:HO2'	6:A:1858:A:H8	1.55	0.47
16:L:82:LEU:CD2	16:L:90:VAL:HG21	2.44	0.47
6:A:555:G:HO2'	6:A:556:A:H8	1.60	0.47
13:H:17:ASP:OD1	13:H:18:GLN:N	2.48	0.47
24:T:37:ASP:OD1	24:T:38:ALA:N	2.47	0.47
6:A:727:A:H2'	6:A:728:G:O4'	2.15	0.47
7:B:45:A:O4'	11:F:91:ARG:NH1	2.48	0.47
6:A:299:A:N6	6:A:322:A:O2'	2.45	0.46
6:A:1202:G:O2'	16:L:3:LEU:HD21	2.14	0.46
6:A:2286:G:N2	6:A:2344:U:O2	2.48	0.46
6:A:2484:G:OP2	17:M:44:ARG:NH2	2.47	0.46
25:U:36:GLU:O	25:U:38:ILE:HD12	2.14	0.46
6:A:2655:G:O2'	6:A:2656:U:O5'	2.33	0.46
27:W:17:LEU:HD21	27:W:37:ARG:HD3	1.98	0.46
4:3:27:ASN:ND2	6:A:2361:G:O3'	2.48	0.46
6:A:1339:G:OP1	24:T:82:LYS:NZ	2.49	0.46
6:A:2652:C:H2'	6:A:2653:U:O4'	2.16	0.46
9:D:14:ILE:HD13	9:D:178:VAL:CG1	2.45	0.46
18:N:66:ALA:O	18:N:69:ARG:O	2.33	0.46
5:4:3:VAL:HG12	5:4:3:VAL:O	2.14	0.46
6:A:780:G:O2'	6:A:783:A:N6	2.42	0.46
10:E:31:VAL:HG21	10:E:104:ALA:CB	2.45	0.46
6:A:671:C:OP1	16:L:43:GLY:N	2.42	0.46
6:A:1432:G:H2'	6:A:1433:A:C8	2.49	0.46
10:E:27:LEU:HD13	10:E:100:MET:CE	2.46	0.46
15:K:92:GLU:OE1	15:K:92:GLU:N	2.45	0.46
6:A:2620:C:O2'	9:D:124:ARG:NH1	2.44	0.46
21:Q:71:ASN:OD1	21:Q:109:VAL:HG11	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:18:U:OP1	21:Q:29:ARG:NH1	2.42	0.46
6:A:1290:C:C2	6:A:1291:C:C5	3.04	0.46
6:A:1812:U:O2'	8:C:44:ASN:N	2.46	0.46
6:A:2484:G:O2'	17:M:123:LYS:O	2.34	0.46
7:B:116:G:H4'	19:O:54:VAL:HG12	1.98	0.46
11:F:3:LEU:HD21	11:F:96:TRP:HB3	1.97	0.46
11:F:105:ILE:HD12	11:F:138:PRO:HG2	1.97	0.46
6:A:1734:G:C2	6:A:1735:A:N7	2.84	0.46
6:A:24:G:C2	6:A:25:U:C5	3.04	0.46
6:A:969:G:H22	6:A:984:A:HO2'	1.61	0.46
6:A:2564:A:C2	6:A:2647:U:H4'	2.51	0.46
8:C:104:LEU:H	8:C:104:LEU:HD12	1.81	0.46
15:K:2:ILE:HG23	15:K:6:THR:HG21	1.98	0.46
21:Q:89:ILE:HD12	21:Q:94:LEU:HD21	1.98	0.46
6:A:723:C:C2	6:A:724:U:C5	3.03	0.46
8:C:65:ASP:N	8:C:102:TYR:O	2.45	0.46
10:E:105:LEU:HD23	10:E:200:LEU:HD21	1.97	0.46
17:M:17:ASN:ND2	17:M:39:GLY:O	2.48	0.46
6:A:1344:U:H3'	6:A:1345:C:H5'	1.98	0.45
24:T:7:LEU:O	24:T:10:VAL:HG12	2.16	0.45
1:0:3:GLN:NE2	6:A:1263:U:O2'	2.42	0.45
5:4:1:MET:N	6:A:2526:G:N3	2.64	0.45
6:A:1497:U:OP2	6:A:1498:C:N4	2.42	0.45
6:A:1022:G:H1'	6:A:1023:U:OP2	2.16	0.45
6:A:2777:G:OP2	6:A:2781:A:O2'	2.24	0.45
6:A:29:U:C2	6:A:30:G:C8	3.05	0.45
6:A:51:G:HO2'	6:A:52:A:P	2.39	0.45
6:A:728:G:O2'	6:A:730:A:O4'	2.31	0.45
6:A:1205:A:HO2'	6:A:1206:G:P	2.39	0.45
6:A:2848:G:O2'	6:A:2868:A:N6	2.47	0.45
6:A:166:U:O2'	28:X:44:ARG:NH1	2.50	0.45
6:A:1141:U:H4'	6:A:1142:A:O4'	2.16	0.45
6:A:1378:A:C4'	6:A:1379:U:OP1	2.65	0.45
6:A:2552:U:O2'	6:A:2553:G:N7	2.41	0.45
25:U:35:VAL:HB	25:U:38:ILE:HD13	1.99	0.45
6:A:1378:A:O2'	6:A:1380:G:OP2	2.29	0.45
10:E:148:ILE:N	10:E:148:ILE:HD12	2.32	0.45
15:K:21:CYS:HA	15:K:41:ILE:HG22	1.99	0.45
16:L:127:VAL:HG23	16:L:131:ALA:HB3	1.97	0.45
6:A:729:G:O2'	6:A:763:G:H4'	2.17	0.45
6:A:2120:G:N1	6:A:2121:G:O6	2.50	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:2506[B]:U:OP2	6:A:2576:G:N2	2.44	0.45
11:F:3:LEU:HD22	11:F:100:GLU:HG2	1.98	0.45
15:K:113:MET:SD	15:K:113:MET:N	2.90	0.45
18:N:38:LEU:HD11	18:N:42:LYS:HZ1	1.81	0.45
22:R:16:GLU:OE2	22:R:101:ILE:N	2.49	0.45
6:A:639:U:C2	6:A:640:C:C5	3.05	0.45
6:A:526:A:O2'	6:A:2043:C:O2	2.27	0.45
6:A:2552:U:H3'	6:A:2552:U:O2	2.17	0.45
6:A:48:G:N2	6:A:177:G:OP2	2.50	0.45
6:A:1224:U:H4'	6:A:1225:G:OP1	2.17	0.45
6:A:1272:A:O2'	6:A:1274:A:OP1	2.35	0.45
6:A:1702:G:C6	6:A:1703:G:N7	2.85	0.45
16:L:77:ILE:HD12	16:L:109:LYS:O	2.17	0.45
21:Q:78:PHE:CE2	21:Q:82:LEU:HD11	2.52	0.45
6:A:1058:U:H2'	6:A:1059:G:C4	2.52	0.44
6:A:1425:G:H2'	6:A:1426:G:O4'	2.17	0.44
6:A:2849:U:O4	20:P:20:ARG:NH1	2.50	0.44
7:B:39:A:C2	7:B:44:G:C2	3.05	0.44
6:A:554:U:H2'	6:A:555:G:O4'	2.17	0.44
6:A:1769:U:O2	6:A:1983:G:O6	2.35	0.44
6:A:1827:U:OP1	6:A:1971:U:O2'	2.35	0.44
12:G:36:LEU:HD23	12:G:37:ASN:H	1.83	0.44
6:A:144:A:H4'	24:T:2:ILE:HD11	1.99	0.44
6:A:247:G:N2	6:A:251:A:OP2	2.49	0.44
6:A:724:U:H2'	6:A:725:G:O5'	2.16	0.44
6:A:1663:G:O2'	6:A:1664:A:O5'	2.32	0.44
22:R:82:HIS:ND1	22:R:82:HIS:O	2.50	0.44
6:A:58:G:O2'	6:A:73:A:N1	2.45	0.44
6:A:1161:C:O2'	22:R:23:GLU:OE2	2.31	0.44
6:A:1477:A:N6	6:A:1514:G:O2'	2.49	0.44
6:A:2756:U:H4'	6:A:2757:A:OP1	2.17	0.44
2:1:20:TYR:OH	6:A:2347:C:O2'	2.13	0.44
6:A:442:G:O4'	10:E:41:GLN:NE2	2.51	0.44
6:A:725:G:H2'	6:A:726:G:C4	2.52	0.44
6:A:1129:A:N6	6:A:2491:U:OP1	2.50	0.44
6:A:2050:C:H2'	6:A:2051:A:O4'	2.17	0.44
8:C:11:GLY:O	8:C:15:VAL:HG23	2.18	0.44
10:E:31:VAL:HG21	10:E:104:ALA:HB2	1.99	0.44
12:G:36:LEU:HD23	12:G:37:ASN:N	2.33	0.44
6:A:636:G:N2	16:L:111:ILE:HD12	2.33	0.44
6:A:1142:A:C4	6:A:1144:A:N7	2.86	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:213:A:H2'	6:A:214:G:C8	2.52	0.44
6:A:754:U:C2	6:A:755:U:C5	3.06	0.44
6:A:1071:G:N3	6:A:1089:A:O2'	2.47	0.44
6:A:1737:G:O3'	6:A:1738:G:O4'	2.35	0.44
6:A:1790:C:H2'	6:A:1791:A:C8	2.53	0.44
13:H:122:LEU:O	13:H:122:LEU:HD12	2.18	0.44
23:S:13:SER:O	23:S:17:VAL:HG23	2.18	0.44
6:A:216:A:C8	6:A:432:A:N6	2.86	0.44
6:A:579:G:C6	6:A:1262:A:N6	2.86	0.44
6:A:640:C:N4	6:A:649:G:O6	2.50	0.44
6:A:1145:C:C2	6:A:1146:C:C5	3.05	0.44
10:E:7:ASP:OD1	10:E:8:ALA:N	2.46	0.44
10:E:112:LEU:HD13	10:E:117:ARG:HB2	1.98	0.44
19:O:46:GLU:OE1	19:O:46:GLU:N	2.51	0.44
6:A:549:G:C2'	6:A:550:C:O5'	2.66	0.44
6:A:851:C:O2'	30:Z:42:ALA:O	2.35	0.44
6:A:1313:U:O2'	6:A:1332:G:O4'	2.34	0.44
11:F:107:VAL:N	11:F:108:PRO:CD	2.81	0.44
21:Q:89:ILE:CD1	21:Q:94:LEU:HD21	2.48	0.44
6:A:1139:G:O2'	6:A:1143:A:N1	2.46	0.43
6:A:1797:G:HO2'	6:A:1798:U:H5'	1.83	0.43
6:A:2780:G:OP2	14:J:120:ARG:NE	2.51	0.43
8:C:2:VAL:HG21	8:C:201:LEU:HG	1.99	0.43
10:E:27:LEU:HD13	10:E:100:MET:HE2	1.99	0.43
25:U:97:SER:O	25:U:98:ASN:OD1	2.36	0.43
6:A:582:A:N6	6:A:1259:G:O6	2.51	0.43
6:A:1164:C:O2'	6:A:1224:U:C4	2.72	0.43
6:A:2296:U:OP2	19:O:9:ARG:NH2	2.51	0.43
6:A:2375:G:N1	6:A:2379:G:O6	2.51	0.43
8:C:68:ARG:NH1	8:C:128:THR:OG1	2.51	0.43
6:A:447:A:N1	6:A:454:A:O2'	2.41	0.43
6:A:2093:G:O2'	6:A:2198:A:N1	2.47	0.43
6:A:2357:G:OP1	27:W:16:ARG:NE	2.44	0.43
6:A:2700:A:N6	6:A:2708:G:O6	2.52	0.43
11:F:23:SER:OG	11:F:25:MET:SD	2.76	0.43
21:Q:111:LYS:NZ	22:R:49:ILE:O	2.39	0.43
6:A:1264:A:O5'	6:A:1265:A:H2'	2.19	0.43
6:A:1688:U:O2'	6:A:1700:A:N7	2.39	0.43
6:A:2058:A:H61	6:A:2611:C:N4	2.16	0.43
11:F:140:ILE:N	11:F:140:ILE:HD12	2.33	0.43
13:H:121:VAL:HG12	13:H:121:VAL:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:22:LYS:NZ	6:A:630:G:OP1	2.41	0.43
6:A:723:C:N3	6:A:724:U:C5	2.86	0.43
6:A:2089:C:N4	6:A:2090:A:H62	2.17	0.43
15:K:92:GLU:OE2	15:K:111:LYS:NZ	2.34	0.43
6:A:28:A:C5	6:A:29:U:C5	3.07	0.43
6:A:372:G:O2'	6:A:373:U:P	2.74	0.43
6:A:627:A:N6	16:L:112:LEU:HD21	2.34	0.43
15:K:86:LEU:O	15:K:87:LEU:HD12	2.18	0.43
28:X:64:ASP:OD1	28:X:65:THR:N	2.52	0.43
14:J:52:ASP:OD1	14:J:52:ASP:N	2.51	0.43
6:A:645:C:H2'	6:A:647:G:C8	2.53	0.43
6:A:711:G:C6	6:A:721:A:C6	3.07	0.43
6:A:952:G:OP1	17:M:18:ARG:NH1	2.52	0.43
6:A:2243:U:O2'	6:A:2434:A:N1	2.41	0.43
6:A:2749:A:OP2	6:A:2750:A:O2'	2.20	0.43
6:A:2845:U:O3'	20:P:52:ARG:NH1	2.51	0.43
12:G:62:ALA:O	12:G:66:THR:HG23	2.18	0.43
6:A:488:G:H22	6:A:491:G:H5''	1.84	0.43
6:A:1287:A:C2'	6:A:1288:G:O5'	2.67	0.43
6:A:1287:A:N6	6:A:1649:G:O2'	2.52	0.43
6:A:1995:U:OP2	6:A:1996:C:O2'	2.30	0.43
6:A:2874:C:OP1	18:N:4:ARG:NE	2.49	0.43
8:C:97:ASP:OD1	8:C:97:ASP:N	2.51	0.43
10:E:148:ILE:HD13	10:E:167:VAL:HG23	2.01	0.43
17:M:42:THR:HG22	17:M:93:VAL:HG12	1.99	0.43
6:A:332:A:HO2'	6:A:334:C:P	2.42	0.43
6:A:442:G:C6	6:A:444:C:N4	2.87	0.43
6:A:570:G:C1'	6:A:983:A:N6	2.82	0.43
6:A:1068:G:H2'	6:A:1069:A:O4'	2.19	0.43
6:A:2117:A:N1	6:A:2170:A:N6	2.64	0.43
7:B:55:U:O2'	11:F:25:MET:SD	2.73	0.43
6:A:29:U:O2	6:A:1215:G:O2'	2.37	0.42
6:A:458:G:O2'	6:A:459:U:P	2.77	0.42
6:A:543:G:O6	6:A:551:G:O6	2.36	0.42
7:B:42:C:C4	11:F:65:LEU:HD22	2.54	0.42
29:Y:19:LEU:O	29:Y:19:LEU:HD23	2.19	0.42
6:A:1197:G:N2	6:A:1249:U:O2'	2.52	0.42
6:A:1353:A:O3'	8:C:35:LYS:NZ	2.50	0.42
6:A:2506[A]:U:OP2	6:A:2576:G:N2	2.51	0.42
25:U:98:ASN:O	25:U:98:ASN:CG	2.58	0.42
6:A:1684:G:C6	6:A:1705:A:N6	2.87	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:1686:C:N4	6:A:1703:G:O6	2.53	0.42
9:D:7:LYS:N	9:D:28:GLU:O	2.42	0.42
11:F:43:ILE:HD12	11:F:43:ILE:N	2.35	0.42
6:A:1663:G:O6	6:A:1998:A:N6	2.52	0.42
6:A:2528:U:O2'	6:A:2530:A:OP1	2.10	0.42
23:S:36:LEU:HD22	23:S:47:VAL:CG1	2.49	0.42
27:W:33:ILE:HD11	27:W:78:ILE:HD11	2.00	0.42
3:2:9:VAL:HG12	6:A:1309:G:OP1	2.19	0.42
13:H:5:LEU:HD12	13:H:5:LEU:N	2.34	0.42
6:A:827:U:OP2	6:A:828:U:N3	2.53	0.42
6:A:1009:A:OP1	21:Q:58:GLN:NE2	2.53	0.42
6:A:1425:G:N2	6:A:1574:C:C4	2.88	0.42
6:A:1992:G:N2	6:A:1996:C:O2'	2.48	0.42
6:A:2202:U:O2'	6:A:2204:G:OP1	2.32	0.42
10:E:97:ASN:HB3	10:E:100:MET:HG2	2.01	0.42
13:H:99:ILE:O	13:H:103:VAL:HG23	2.19	0.42
29:Y:42:LEU:HD13	29:Y:45:GLN:OE1	2.20	0.42
20:P:3:ILE:N	20:P:3:ILE:HD12	2.35	0.42
21:Q:60:TRP:O	21:Q:64:ILE:HG12	2.20	0.42
30:Z:4:ILE:HD11	30:Z:56:VAL:HG21	2.01	0.42
6:A:379:G:C6	6:A:396:G:O6	2.73	0.42
6:A:1788:C:C2	6:A:1789:A:C8	3.07	0.42
6:A:2487:G:C2	6:A:2488:G:C5	3.08	0.42
30:Z:50:VAL:O	30:Z:54:VAL:HG22	2.19	0.42
6:A:2028:U:O4	6:A:2033:A:N7	2.53	0.42
7:B:2:G:H2'	7:B:3:C:C6	2.55	0.42
8:C:156:SER:OG	8:C:159:THR:OG1	2.06	0.42
24:T:37:ASP:O	24:T:81:LYS:NZ	2.50	0.42
6:A:1268:A:H1'	6:A:2013:A:H61	1.85	0.42
6:A:1386:C:H2'	6:A:1387:A:C8	2.55	0.42
6:A:1466:U:O3'	6:A:1546:G:O2'	2.37	0.42
6:A:2635:A:O2'	9:D:81:GLU:OE1	2.37	0.42
4:3:29:ARG:NH2	16:L:63:LYS:O	2.52	0.41
6:A:619:G:O5'	6:A:620:G:N2	2.53	0.41
7:B:3:C:H3'	7:B:4:C:H5''	2.02	0.41
7:B:30:C:H1'	7:B:57:A:H61	1.85	0.41
6:A:619:G:H3'	6:A:620:G:H21	1.85	0.41
6:A:1186:G:H2'	6:A:1187:G:O4'	2.20	0.41
14:J:43:GLU:N	14:J:43:GLU:OE1	2.53	0.41
6:A:202:U:H2'	6:A:203:A:O4'	2.20	0.41
6:A:464:U:C2'	6:A:465:G:O5'	2.69	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:619:G:OP2	6:A:620:G:N2	2.53	0.41
6:A:813:U:OP2	16:L:23:ILE:N	2.53	0.41
6:A:2074:U:O2'	6:A:2597:G:H1'	2.20	0.41
6:A:2085:U:O2	6:A:2234:G:O6	2.38	0.41
6:A:2447:G:H2'	6:A:2500:U:OP2	2.21	0.41
13:H:12:LEU:HD23	13:H:12:LEU:N	2.35	0.41
6:A:633:A:O2'	6:A:2404:U:OP1	2.38	0.41
6:A:1024:G:H1'	6:A:1144:A:O2'	2.19	0.41
6:A:2464:G:C6	6:A:2487:G:C6	3.07	0.41
12:G:51:PHE:CZ	12:G:71:LEU:HD22	2.55	0.41
21:Q:78:PHE:CZ	21:Q:82:LEU:HD11	2.56	0.41
24:T:11:LEU:HD23	24:T:12:ARG:N	2.35	0.41
6:A:45:G:H5''	6:A:46:G:H5'	2.02	0.41
6:A:322:A:OP1	10:E:162:ARG:NE	2.41	0.41
6:A:512:G:OP1	6:A:1234:U:O2'	2.22	0.41
6:A:2058:A:H61	6:A:2611:C:H42	1.67	0.41
6:A:2489:U:H2'	6:A:2490:G:O4'	2.20	0.41
12:G:47:ASN:O	12:G:48:THR:HG23	2.21	0.41
18:N:28:LEU:C	18:N:28:LEU:HD23	2.41	0.41
5:4:2:LYS:NZ	5:4:32:LYS:O	2.49	0.41
6:A:242:G:H4'	6:A:243:U:O5'	2.20	0.41
6:A:1425:G:N2	6:A:1574:C:N3	2.69	0.41
6:A:1664:A:H61	6:A:1996:C:H42	1.69	0.41
6:A:2125:G:N2	6:A:2170:A:O3'	2.50	0.41
9:D:33:ARG:HD2	9:D:73:VAL:HG13	2.01	0.41
18:N:28:LEU:HD23	18:N:28:LEU:O	2.20	0.41
6:A:458:G:O2'	6:A:459:U:O5'	2.38	0.41
6:A:499:U:H2'	6:A:500:G:O4'	2.20	0.41
6:A:725:G:O2'	6:A:726:G:C4'	2.67	0.41
6:A:2028:U:H3	6:A:2033:A:H62	1.69	0.41
6:A:2357:G:N1	6:A:2360:G:OP2	2.48	0.41
6:A:2364:C:H2'	6:A:2365:G:O4'	2.21	0.41
11:F:46:LYS:O	11:F:49:LEU:HD22	2.20	0.41
14:J:100:VAL:HG23	14:J:101:ILE:N	2.36	0.41
20:P:96:LEU:HD12	20:P:96:LEU:N	2.35	0.41
6:A:196:A:H61	6:A:831:G:H21	1.69	0.41
6:A:2585:U:O2	6:A:2585:U:O4'	2.38	0.41
11:F:39:VAL:HG13	11:F:40:GLY:N	2.36	0.41
16:L:127:VAL:HG21	16:L:132:ARG:N	2.35	0.41
18:N:31:HIS:O	18:N:32:GLU:HB2	2.20	0.41
19:O:72:ALA:O	19:O:76:LYS:HG2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:P:63:ILE:HG23	20:P:63:ILE:O	2.21	0.41
26:V:72:VAL:HG22	26:V:73:LYS:N	2.36	0.41
6:A:1164:C:O2'	6:A:1224:U:O4	2.37	0.41
6:A:1215:G:O6	6:A:1235:G:C2	2.74	0.41
6:A:1394:U:H2'	6:A:1395:A:C4	2.56	0.41
8:C:162:GLN:OE1	8:C:162:GLN:N	2.53	0.41
1:O:30:ASP:OD1	1:O:31:LYS:N	2.54	0.40
6:A:306:U:H2'	6:A:307:G:O4'	2.22	0.40
6:A:1096:A:H3'	6:A:1097:U:H5''	2.03	0.40
6:A:2659:G:OP2	12:G:157:LYS:NZ	2.50	0.40
6:A:75:G:N3	6:A:75:G:H2'	2.36	0.40
6:A:1182:G:H2'	6:A:1183:U:O4'	2.22	0.40
6:A:1390:U:O4	6:A:1395:A:N7	2.54	0.40
6:A:2106:U:N3	6:A:2107:G:N7	2.69	0.40
6:A:2578:G:H21	9:D:130:GLN:NE2	2.19	0.40
6:A:285:G:C6	6:A:356:G:C5	3.09	0.40
6:A:993:G:OP2	21:Q:50:ARG:NH2	2.54	0.40
6:A:1196:C:C2	6:A:1197:G:C8	3.10	0.40
6:A:1264:A:H4'	6:A:2615:U:H5'	2.03	0.40
6:A:1365:A:OP1	28:X:2:ARG:NH1	2.51	0.40
6:A:2553:G:H1'	6:A:2582:G:H21	1.86	0.40
6:A:2655:G:O2'	6:A:2656:U:P	2.78	0.40
18:N:70:THR:O	18:N:71:ARG:C	2.60	0.40
6:A:636:G:C2	16:L:111:ILE:HD12	2.57	0.40
6:A:886:A:O4'	6:A:891:G:N1	2.55	0.40
6:A:2580:U:HO2'	6:A:2581:G:C4'	2.31	0.40
6:A:2687:U:H2'	6:A:2688:G:O4'	2.21	0.40
13:H:135:HIS:CB	13:H:138:VAL:HG12	2.50	0.40
24:T:74:ILE:N	24:T:74:ILE:HD12	2.36	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	
1	0	54/56 (96%)	53 (98%)	1 (2%)	0	100	100
2	1	48/50 (96%)	47 (98%)	1 (2%)	0	100	100
3	2	44/46 (96%)	44 (100%)	0	0	100	100
4	3	62/64 (97%)	60 (97%)	1 (2%)	1 (2%)	8	32
5	4	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
8	C	269/271 (99%)	258 (96%)	11 (4%)	0	100	100
9	D	207/209 (99%)	196 (95%)	11 (5%)	0	100	100
10	E	199/201 (99%)	192 (96%)	6 (3%)	1 (0%)	25	59
11	F	175/177 (99%)	168 (96%)	7 (4%)	0	100	100
12	G	174/176 (99%)	170 (98%)	4 (2%)	0	100	100
13	H	147/149 (99%)	140 (95%)	7 (5%)	0	100	100
14	J	140/142 (99%)	137 (98%)	3 (2%)	0	100	100
15	K	120/122 (98%)	116 (97%)	4 (3%)	0	100	100
16	L	141/143 (99%)	132 (94%)	9 (6%)	0	100	100
17	M	134/136 (98%)	130 (97%)	4 (3%)	0	100	100
18	N	118/120 (98%)	109 (92%)	9 (8%)	0	100	100
19	O	114/116 (98%)	113 (99%)	1 (1%)	0	100	100
20	P	112/114 (98%)	109 (97%)	3 (3%)	0	100	100
21	Q	115/117 (98%)	113 (98%)	2 (2%)	0	100	100
22	R	101/103 (98%)	98 (97%)	2 (2%)	1 (1%)	13	43
23	S	109/110 (99%)	105 (96%)	4 (4%)	0	100	100
24	T	91/93 (98%)	89 (98%)	2 (2%)	0	100	100
25	U	100/102 (98%)	89 (89%)	11 (11%)	0	100	100
26	V	92/94 (98%)	91 (99%)	1 (1%)	0	100	100
27	W	73/75 (97%)	69 (94%)	4 (6%)	0	100	100
28	X	75/77 (97%)	74 (99%)	1 (1%)	0	100	100
29	Y	61/63 (97%)	58 (95%)	3 (5%)	0	100	100
30	Z	56/58 (97%)	55 (98%)	1 (2%)	0	100	100
All	All	3167/3222 (98%)	3050 (96%)	114 (4%)	3 (0%)	50	79

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
22	R	54	VAL
10	E	83	VAL
4	3	31	ILE

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	
1	0	47/47 (100%)	45 (96%)	2 (4%)	25	56
2	1	45/45 (100%)	44 (98%)	1 (2%)	47	74
3	2	38/38 (100%)	37 (97%)	1 (3%)	41	70
4	3	51/51 (100%)	49 (96%)	2 (4%)	27	59
5	4	34/34 (100%)	34 (100%)	0	100	100
8	C	216/216 (100%)	215 (100%)	1 (0%)	86	94
9	D	164/164 (100%)	164 (100%)	0	100	100
10	E	165/165 (100%)	162 (98%)	3 (2%)	54	79
11	F	148/148 (100%)	141 (95%)	7 (5%)	22	53
12	G	137/137 (100%)	135 (98%)	2 (2%)	60	82
13	H	114/114 (100%)	114 (100%)	0	100	100
14	J	116/116 (100%)	115 (99%)	1 (1%)	75	88
15	K	103/103 (100%)	102 (99%)	1 (1%)	73	87
16	L	102/102 (100%)	101 (99%)	1 (1%)	73	87
17	M	109/109 (100%)	108 (99%)	1 (1%)	75	88
18	N	100/100 (100%)	98 (98%)	2 (2%)	50	76
19	O	86/86 (100%)	85 (99%)	1 (1%)	67	85
20	P	99/99 (100%)	97 (98%)	2 (2%)	50	76
21	Q	89/89 (100%)	89 (100%)	0	100	100
22	R	84/84 (100%)	84 (100%)	0	100	100
23	S	94/93 (101%)	93 (99%)	1 (1%)	70	86
24	T	80/80 (100%)	80 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
25	U	83/83 (100%)	83 (100%)	0	100	100
26	V	78/78 (100%)	77 (99%)	1 (1%)	65	84
27	W	57/57 (100%)	57 (100%)	0	100	100
28	X	67/67 (100%)	67 (100%)	0	100	100
29	Y	55/55 (100%)	54 (98%)	1 (2%)	54	79
30	Z	48/48 (100%)	47 (98%)	1 (2%)	48	75
All	All	2609/2608 (100%)	2577 (99%)	32 (1%)	66	85

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	5	ASN
1	0	47	TYR
2	1	36	LYS
3	2	1	MET
4	3	54	LEU
4	3	61	LEU
8	C	212	TRP
10	E	19	PHE
10	E	94	GLN
10	E	112	LEU
11	F	6	TYR
11	F	7	TYR
11	F	11	VAL
11	F	25	MET
11	F	29	ARG
11	F	37	MET
11	F	141	ASP
12	G	36	LEU
12	G	98	LYS
14	J	96	ARG
15	K	100	PHE
16	L	27	LEU
17	M	59	ARG
18	N	20	MET
18	N	73	ASN
19	O	35	ILE
20	P	23	ASP
20	P	113	LEU
23	S	77	ASP

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Mol	Chain	Res	Type
26	V	42	LEU
29	Y	2	LYS
30	Z	29	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	0	3	GLN
2	1	44	GLN
8	C	85	ASN
8	C	250	GLN
10	E	41	GLN
10	E	163	ASN
18	N	18	GLN
21	Q	55	GLN
23	S	60	HIS
26	V	49	ASN
27	W	72	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
6	A	2897/2904 (99%)	462 (15%)	18 (0%)
7	B	119/120 (99%)	14 (11%)	2 (1%)
All	All	3016/3024 (99%)	476 (15%)	20 (0%)

All (476) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
6	A	10	A
6	A	27	G
6	A	28	A
6	A	34	U
6	A	35	G
6	A	46	G
6	A	51	G
6	A	60	G
6	A	63	A
6	A	71	A
6	A	74	A

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Mol	Chain	Res	Type
6	A	75	G
6	A	118	A
6	A	119	A
6	A	120	U
6	A	126	A
6	A	135	U
6	A	136	G
6	A	139	U
6	A	141	G
6	A	142	A
6	A	162	U
6	A	163	C
6	A	181	A
6	A	196	A
6	A	199	A
6	A	215	G
6	A	216	A
6	A	221	A
6	A	222	A
6	A	225	C
6	A	228	C
6	A	233	A
6	A	242	G
6	A	243	U
6	A	248	G
6	A	255	A
6	A	266	G
6	A	267	C
6	A	272	A
6	A	277	G
6	A	278	A
6	A	294	A
6	A	307	G
6	A	310	A
6	A	322	A
6	A	323	C
6	A	324	A
6	A	329	G
6	A	330	A
6	A	345	A
6	A	356	G
6	A	362	A

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Mol	Chain	Res	Type
6	A	371	A
6	A	372	G
6	A	373	U
6	A	386	G
6	A	387	U
6	A	404	A
6	A	406	G
6	A	411	G
6	A	417	C
6	A	424	G
6	A	429	A
6	A	435	C
6	A	446	G
6	A	456	C
6	A	457	A
6	A	458	G
6	A	459	U
6	A	465	G
6	A	473	G
6	A	480	A
6	A	481	G
6	A	491	G
6	A	505	A
6	A	509	C
6	A	528	A
6	A	530	G
6	A	531	C
6	A	532	A
6	A	533	G
6	A	543	G
6	A	544	C
6	A	545	U
6	A	547	A
6	A	550	C
6	A	563	A
6	A	573	U
6	A	575	A
6	A	588	U
6	A	603	A
6	A	614	A
6	A	627	A
6	A	637	A

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Mol	Chain	Res	Type
6	A	645	C
6	A	646	U
6	A	647	G
6	A	652	U
6	A	654	A
6	A	669	G
6	A	670	A
6	A	675	A
6	A	683	U
6	A	686	U
6	A	687	C
6	A	695	G
6	A	717	C
6	A	725	G
6	A	726	G
6	A	730	A
6	A	740	C
6	A	747	U
6	A	748	G
6	A	752	A
6	A	763	G
6	A	764	A
6	A	775	G
6	A	776	G
6	A	782	A
6	A	784	G
6	A	785	G
6	A	789	A
6	A	805	G
6	A	812	C
6	A	819	A
6	A	827	U
6	A	828	U
6	A	845	A
6	A	846	U
6	A	847	U
6	A	856	G
6	A	857	G
6	A	869	G
6	A	877	A
6	A	878	A
6	A	885	C

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Mol	Chain	Res	Type
6	A	891	G
6	A	896	A
6	A	897	C
6	A	907	G
6	A	910	A
6	A	941	A
6	A	946	C
6	A	953	G
6	A	961	C
6	A	973	A
6	A	974	G
6	A	980	A
6	A	983	A
6	A	984	A
6	A	985	C
6	A	995	C
6	A	996	A
6	A	1010	A
6	A	1011	G
6	A	1012	U
6	A	1013	C
6	A	1021	A
6	A	1022	G
6	A	1023	U
6	A	1026	G
6	A	1033	U
6	A	1040	A
6	A	1045	C
6	A	1046	A
6	A	1047	G
6	A	1053	C
6	A	1054	A
6	A	1057	A
6	A	1059	G
6	A	1060	U
6	A	1061	U
6	A	1062	G
6	A	1065	U
6	A	1066	U
6	A	1068	G
6	A	1070	A
6	A	1073	A

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Mol	Chain	Res	Type
6	A	1076	C
6	A	1079	C
6	A	1082	U
6	A	1083	U
6	A	1084	A
6	A	1088	A
6	A	1089	A
6	A	1097	U
6	A	1101	U
6	A	1104	C
6	A	1111	A
6	A	1119	U
6	A	1132	U
6	A	1135	C
6	A	1143	A
6	A	1157	G
6	A	1169	A
6	A	1171	G
6	A	1174	U
6	A	1175	A
6	A	1176	U
6	A	1180	U
6	A	1206	G
6	A	1212	G
6	A	1225	G
6	A	1236	G
6	A	1250	G
6	A	1253	A
6	A	1256	G
6	A	1271	G
6	A	1272	A
6	A	1273	U
6	A	1288	G
6	A	1300	G
6	A	1301	A
6	A	1306	C
6	A	1314	C
6	A	1329	U
6	A	1341	G
6	A	1345	C
6	A	1359	A
6	A	1365	A

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Mol	Chain	Res	Type
6	A	1378	A
6	A	1379	U
6	A	1383	A
6	A	1416	G
6	A	1419	A
6	A	1420	A
6	A	1421	G
6	A	1428	C
6	A	1437	C
6	A	1454	C
6	A	1458	U
6	A	1461	C
6	A	1475	G
6	A	1482	G
6	A	1490	A
6	A	1491	G
6	A	1508	A
6	A	1515	A
6	A	1524	G
6	A	1535	A
6	A	1536	C
6	A	1537	G
6	A	1559	U
6	A	1560	G
6	A	1563	U
6	A	1565	C
6	A	1566	A
6	A	1569	A
6	A	1578	U
6	A	1585	C
6	A	1608	A
6	A	1622	G
6	A	1634	A
6	A	1646	C
6	A	1647	U
6	A	1648	U
6	A	1654	A
6	A	1664	A
6	A	1674	G
6	A	1699	G
6	A	1715	G
6	A	1729	U

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Mol	Chain	Res	Type
6	A	1730	C
6	A	1731	G
6	A	1732	C
6	A	1733	G
6	A	1735	A
6	A	1737	G
6	A	1738	G
6	A	1744	A
6	A	1756	G
6	A	1764	C
6	A	1773	A
6	A	1776	G
6	A	1781	U
6	A	1800	C
6	A	1801	A
6	A	1808	A
6	A	1816	C
6	A	1819	A
6	A	1820	U
6	A	1829	A
6	A	1833	C
6	A	1835	G
6	A	1866	A
6	A	1871	A
6	A	1901	A
6	A	1906	G
6	A	1913	A
6	A	1917	U
6	A	1927	A
6	A	1929	G
6	A	1930	G
6	A	1937	A
6	A	1940	U
6	A	1941	C
6	A	1955	U
6	A	1963	U
6	A	1967	C
6	A	1970	A
6	A	1971	U
6	A	1972	G
6	A	1991	U
6	A	1992	G

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Mol	Chain	Res	Type
6	A	1997	C
6	A	2022	U
6	A	2023	C
6	A	2030	A
6	A	2031	A
6	A	2033	A
6	A	2043	C
6	A	2052	A
6	A	2055	C
6	A	2056	G
6	A	2059	A
6	A	2060	A
6	A	2061	G
6	A	2062	A
6	A	2069	G
6	A	2072	C
6	A	2093	G
6	A	2096	C
6	A	2100	G
6	A	2104	C
6	A	2110	G
6	A	2111	U
6	A	2112	G
6	A	2113	U
6	A	2118	U
6	A	2119	A
6	A	2120	G
6	A	2124	G
6	A	2125	G
6	A	2127	G
6	A	2131	U
6	A	2132	U
6	A	2133	G
6	A	2136	G
6	A	2137	U
6	A	2139	U
6	A	2145	C
6	A	2162	G
6	A	2164	C
6	A	2172	U
6	A	2173	A
6	A	2184	A

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Mol	Chain	Res	Type
6	A	2189	U
6	A	2199	A
6	A	2204	G
6	A	2211	A
6	A	2213	U
6	A	2225	A
6	A	2226	C
6	A	2238	G
6	A	2239	G
6	A	2250	G
6	A	2251	G
6	A	2266	A
6	A	2279	G
6	A	2283	C
6	A	2286	G
6	A	2287	A
6	A	2297	A
6	A	2305	U
6	A	2309	A
6	A	2325	G
6	A	2327	A
6	A	2333	A
6	A	2334	U
6	A	2335	A
6	A	2336	A
6	A	2345	G
6	A	2350	C
6	A	2357	G
6	A	2383	G
6	A	2385	C
6	A	2396	G
6	A	2402	U
6	A	2407	A
6	A	2422	C
6	A	2424	C
6	A	2425	A
6	A	2428	G
6	A	2429	G
6	A	2430	A
6	A	2434	A
6	A	2435	A
6	A	2441	U

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Mol	Chain	Res	Type
6	A	2445	G
6	A	2447	G
6	A	2448	A
6	A	2475	C
6	A	2476	A
6	A	2491	U
6	A	2492	U
6	A	2494	G
6	A	2497	A
6	A	2498	C
6	A	2502	G
6	A	2503	A
6	A	2504	U
6	A	2505	G
6	A	2513	A
6	A	2518	A
6	A	2520	C
6	A	2529	G
6	A	2530	A
6	A	2535	G
6	A	2547	A
6	A	2554	U
6	A	2564	A
6	A	2566	A
6	A	2567	G
6	A	2573	C
6	A	2582	G
6	A	2597	G
6	A	2602	A
6	A	2609	U
6	A	2610	C
6	A	2613	U
6	A	2614	A
6	A	2629	U
6	A	2655	G
6	A	2656	U
6	A	2661	G
6	A	2682	A
6	A	2689	U
6	A	2690	U
6	A	2714	G
6	A	2718	G

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Mol	Chain	Res	Type
6	A	2722	G
6	A	2726	A
6	A	2733	A
6	A	2739	U
6	A	2744	G
6	A	2748	A
6	A	2762	C
6	A	2764	A
6	A	2765	A
6	A	2778	A
6	A	2779	U
6	A	2780	G
6	A	2791	G
6	A	2799	A
6	A	2800	A
6	A	2809	A
6	A	2818	U
6	A	2820	A
6	A	2833	U
6	A	2849	U
6	A	2867	G
6	A	2868	A
6	A	2871	U
6	A	2872	A
6	A	2880	C
6	A	2883	A
6	A	2891	U
6	A	2894	G
6	A	2901	C
6	A	2902	C
6	A	2903	U
7	B	4	C
7	B	9	G
7	B	12	C
7	B	13	G
7	B	24	G
7	B	35	C
7	B	42	C
7	B	44	G
7	B	45	A
7	B	53	A
7	B	67	G

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Mol	Chain	Res	Type
7	B	89	U
7	B	90	C
7	B	109	A

All (20) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	A	227	A
6	A	242	G
6	A	372	G
6	A	458	G
6	A	549	G
6	A	644	A
6	A	784	G
6	A	1020	A
6	A	1022	G
6	A	1224	U
6	A	1358	G
6	A	1378	A
6	A	1663	G
6	A	1940	U
6	A	2058	A
6	A	2326	C
6	A	2655	G
6	A	2808	G
7	B	52	A
7	B	66	A

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

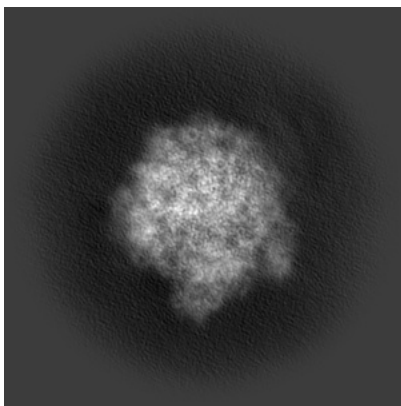
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51843. These allow visual inspection of the internal detail of the map and identification of artifacts.

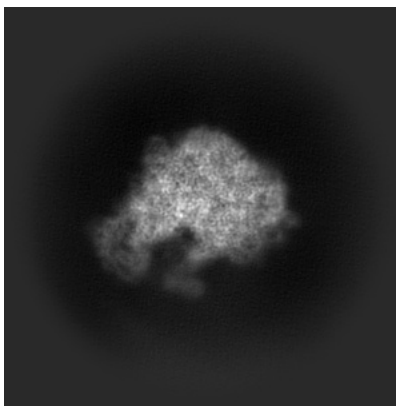
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

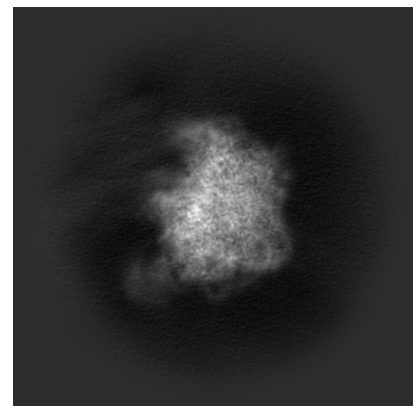
6.1.1 Primary map



X

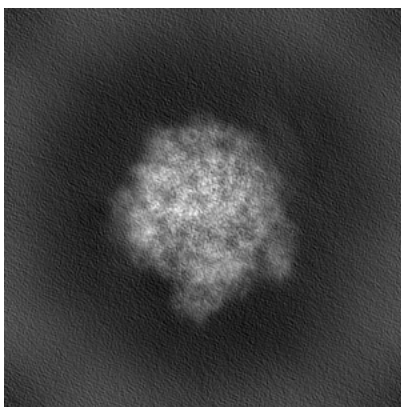


Y

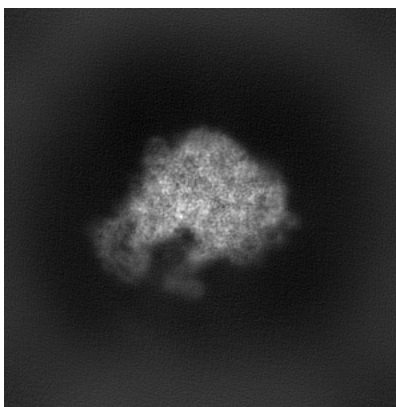


Z

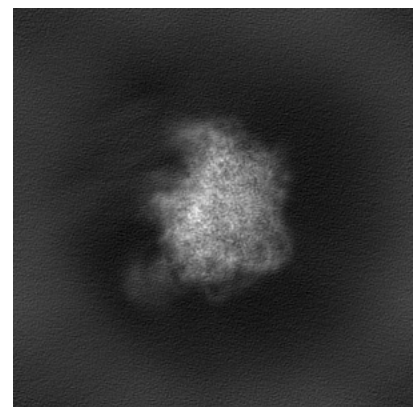
6.1.2 Raw map



X



Y

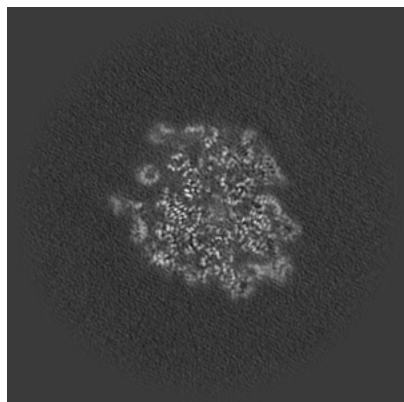


Z

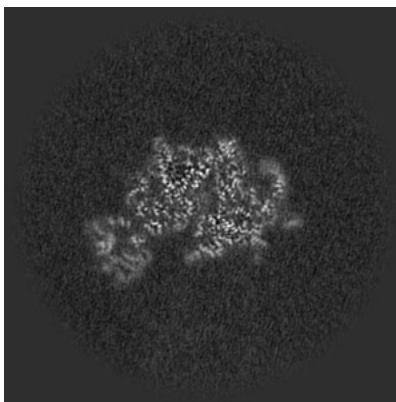
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

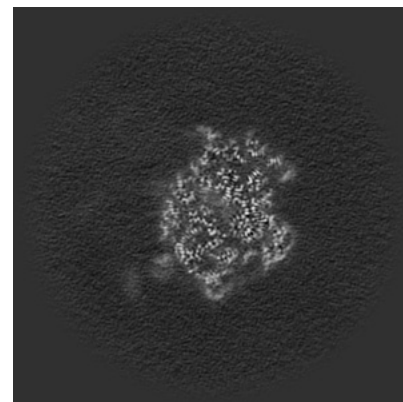
6.2.1 Primary map



X Index: 150

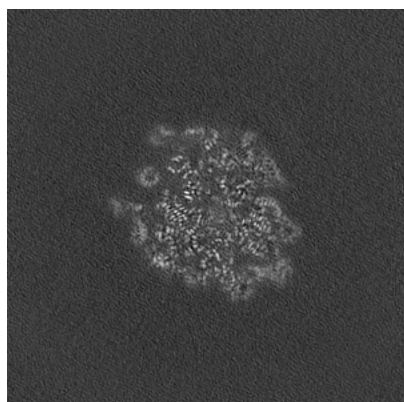


Y Index: 150

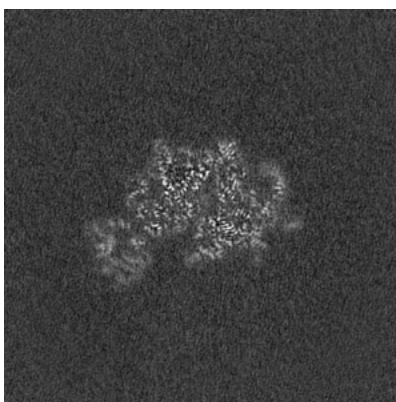


Z Index: 150

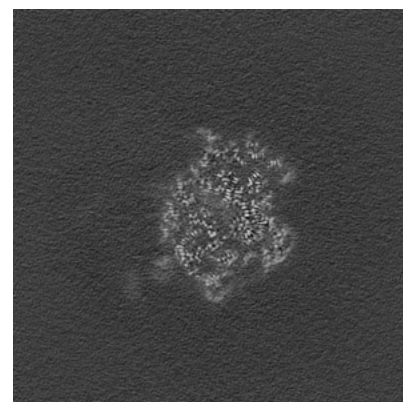
6.2.2 Raw map



X Index: 150



Y Index: 150

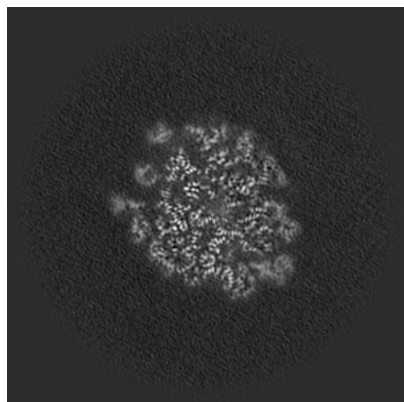


Z Index: 150

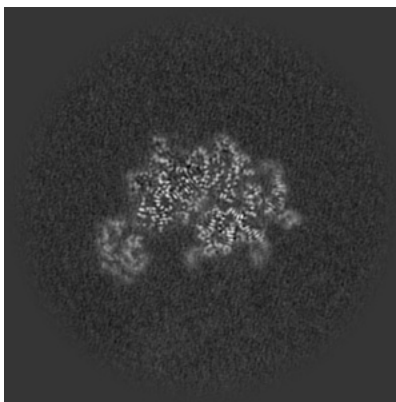
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

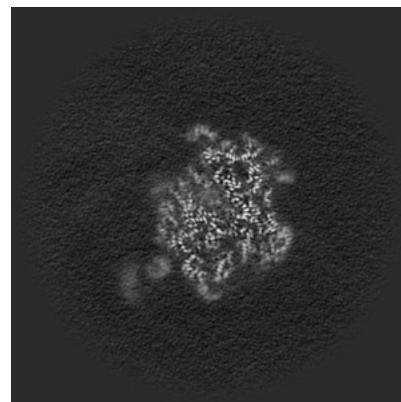
6.3.1 Primary map



X Index: 148

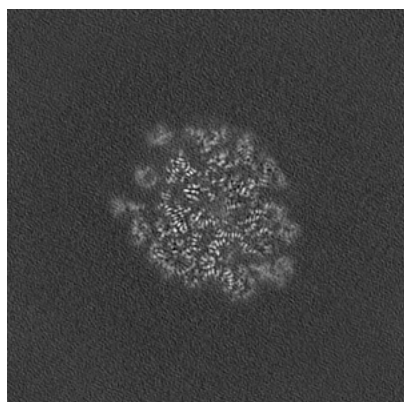


Y Index: 154

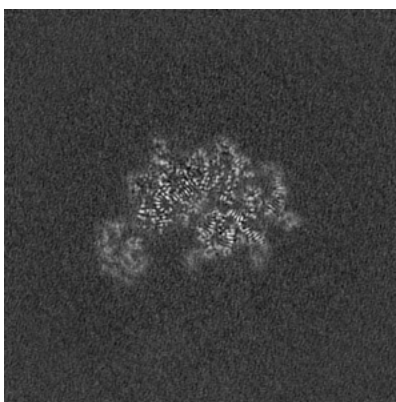


Z Index: 147

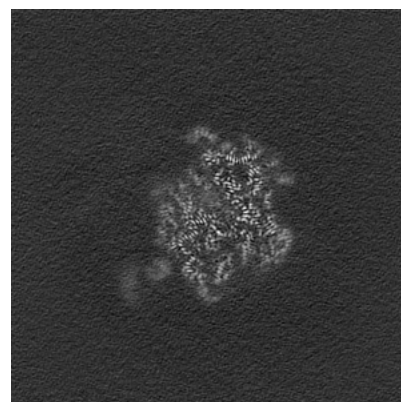
6.3.2 Raw map



X Index: 148



Y Index: 154

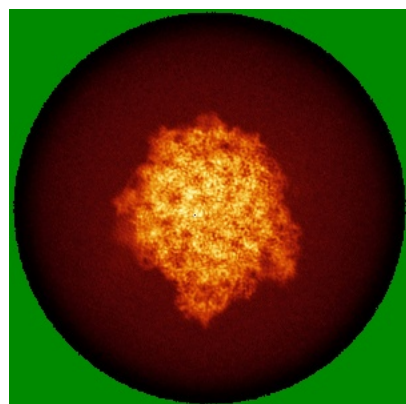


Z Index: 147

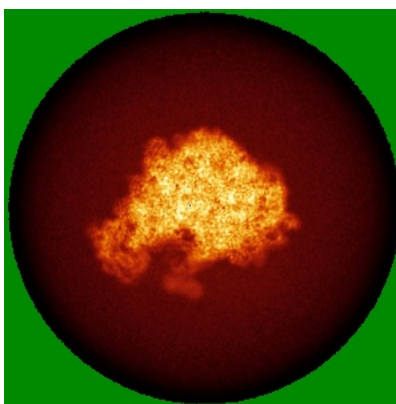
The images above show the largest variance slices of the map in three orthogonal directions.

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

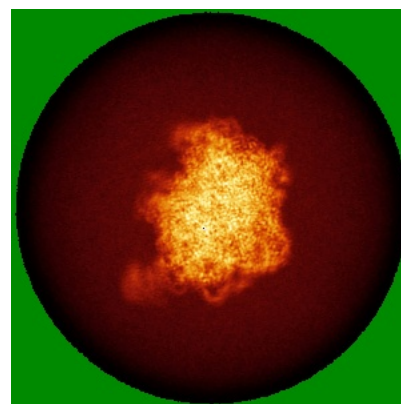
6.4.1 Primary map



X

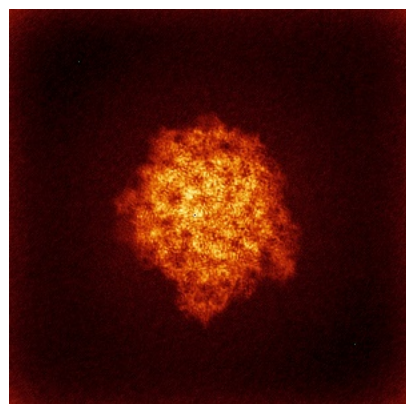


Y

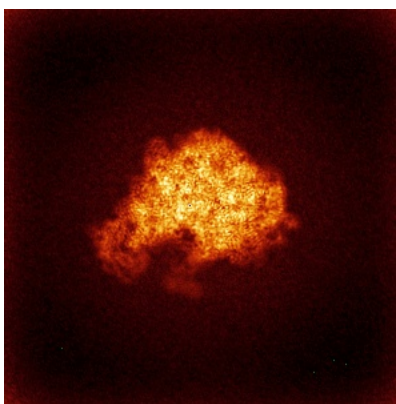


Z

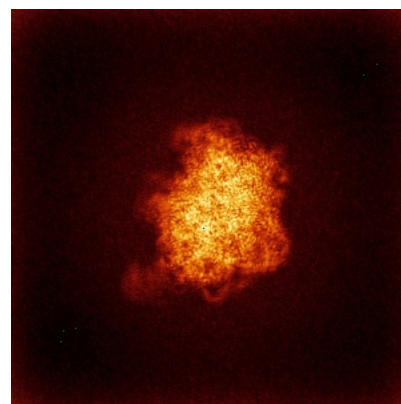
6.4.2 Raw map



X



Y



Z

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

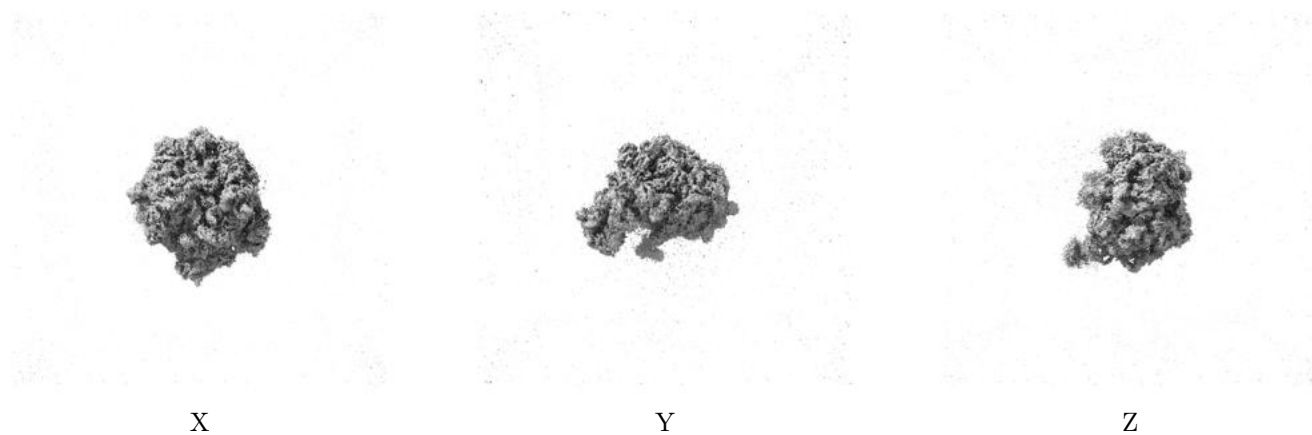
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.44. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

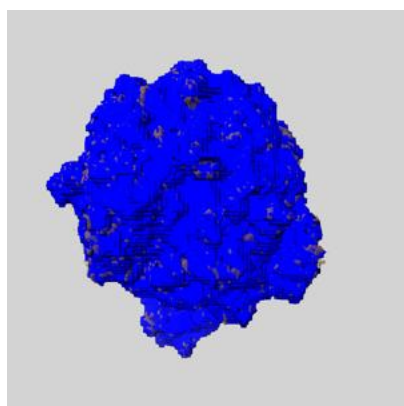
6.6 Mask visualisation [i](#)

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

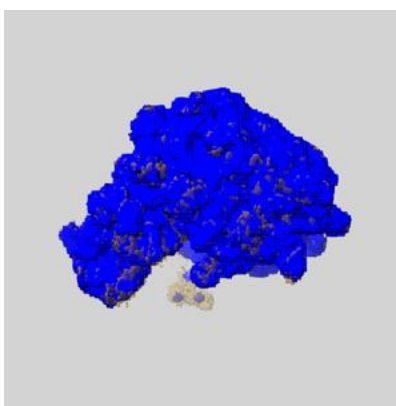
A mask typically either:

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

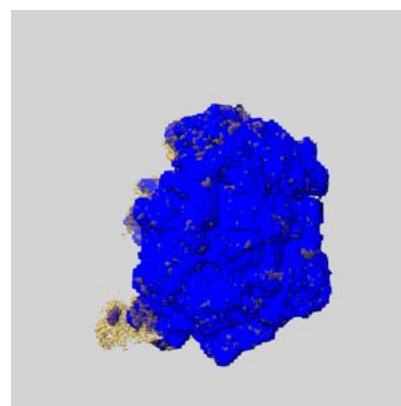
6.6.1 emd_51843_msk_1.map [i](#)



X



Y

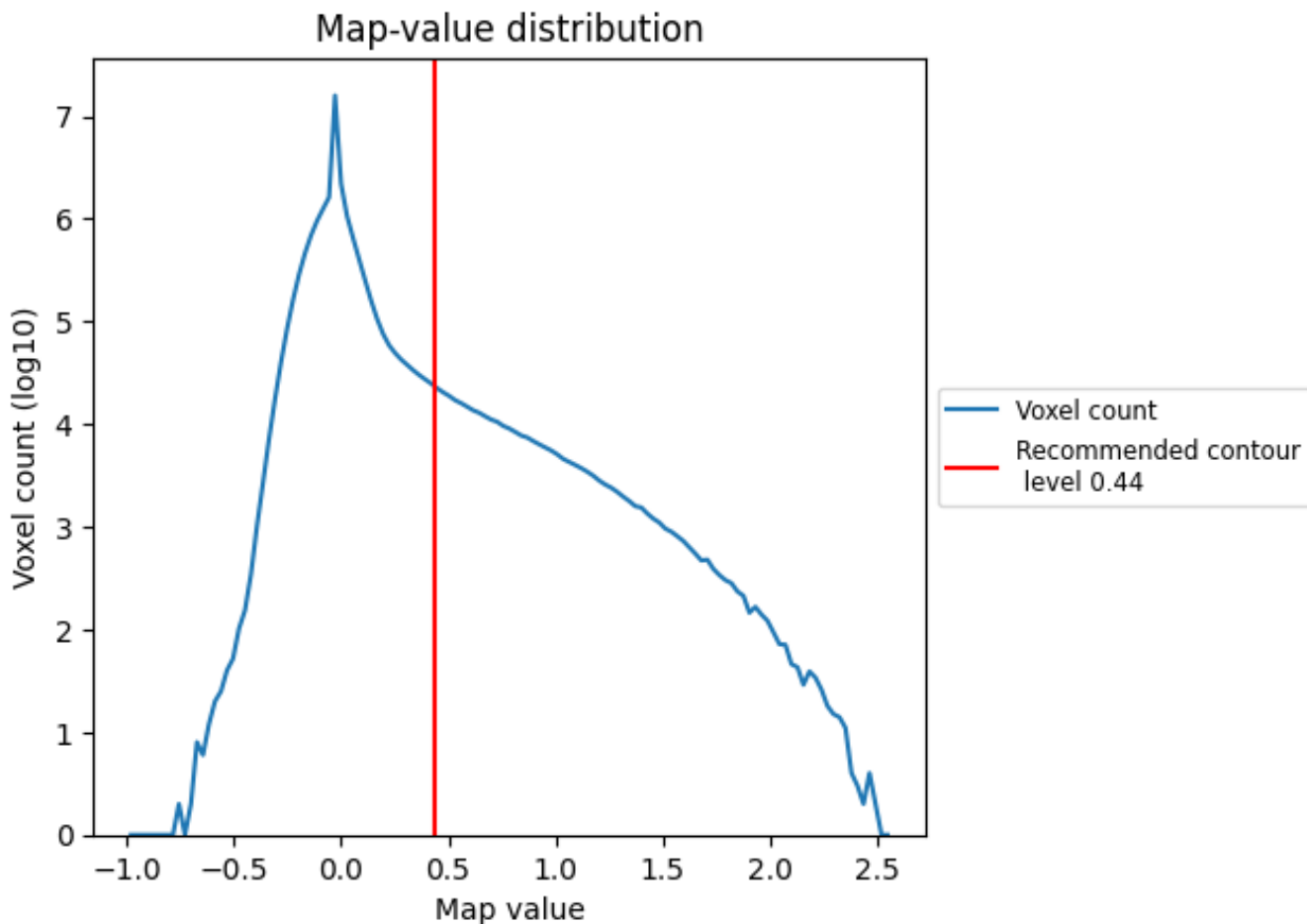


Z

7 Map analysis [i](#)

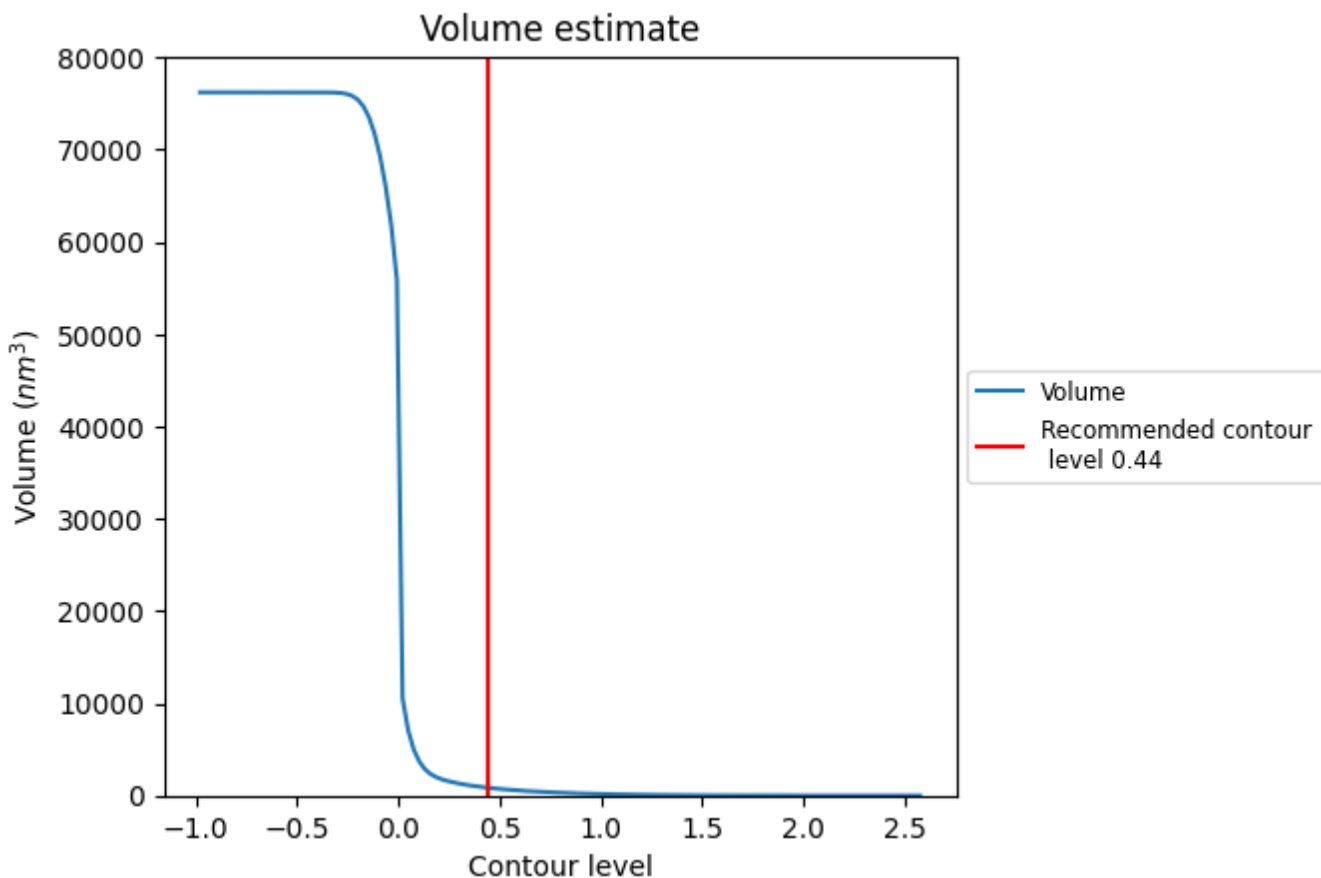
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

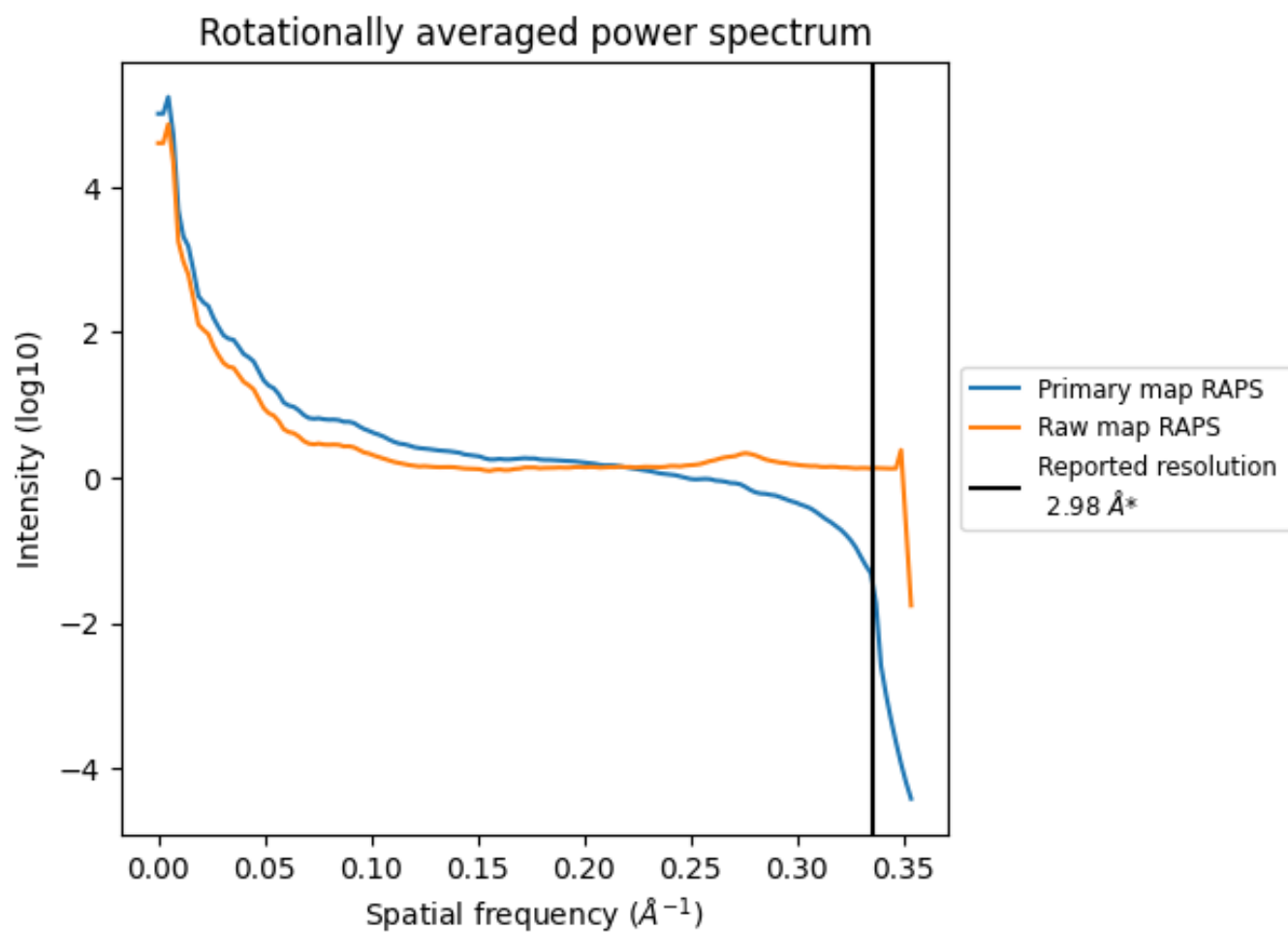
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 849 nm³; this corresponds to an approximate mass of 767 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

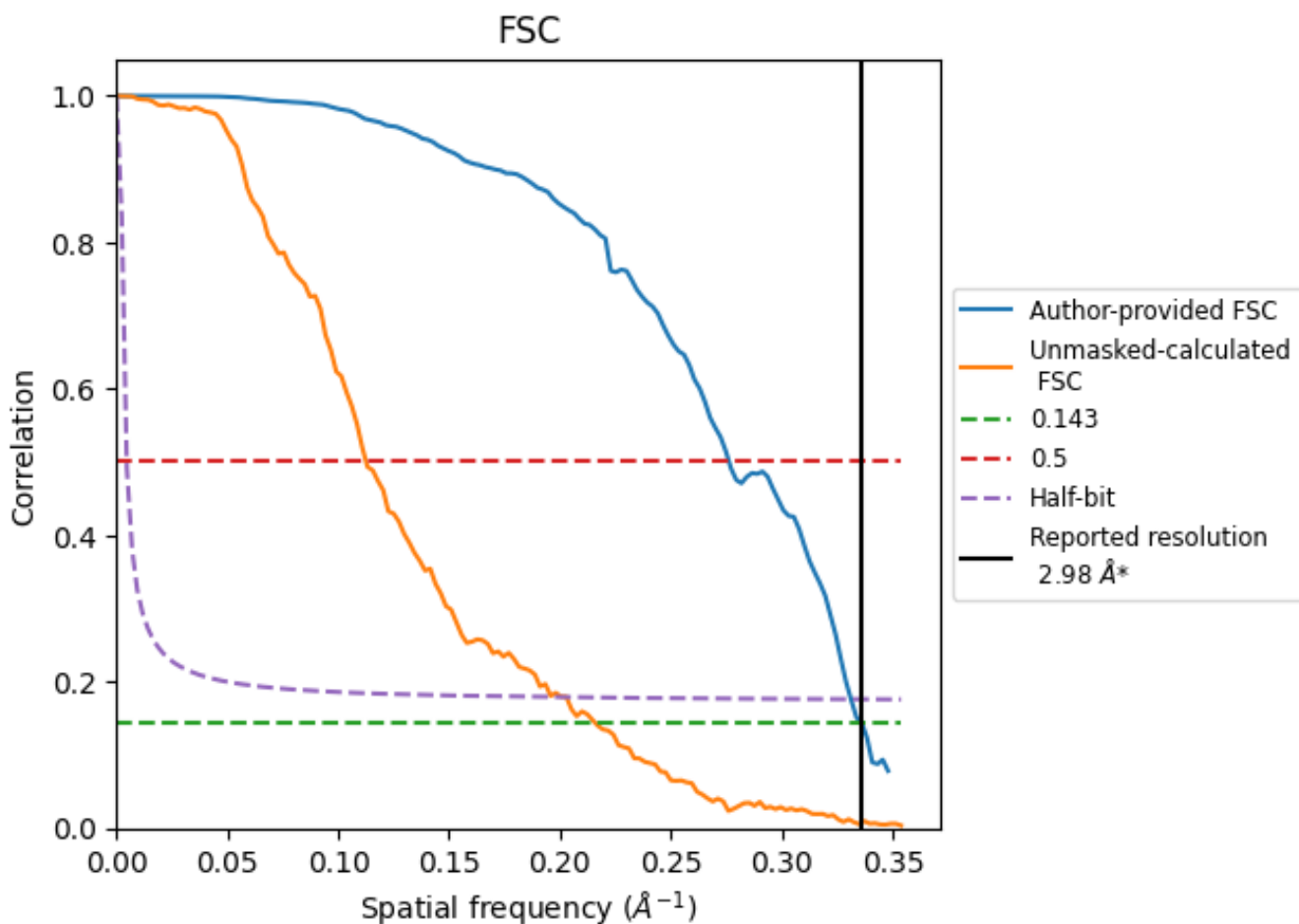


*Reported resolution corresponds to spatial frequency of 0.336 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.336 Å⁻¹

8.2 Resolution estimates [i](#)

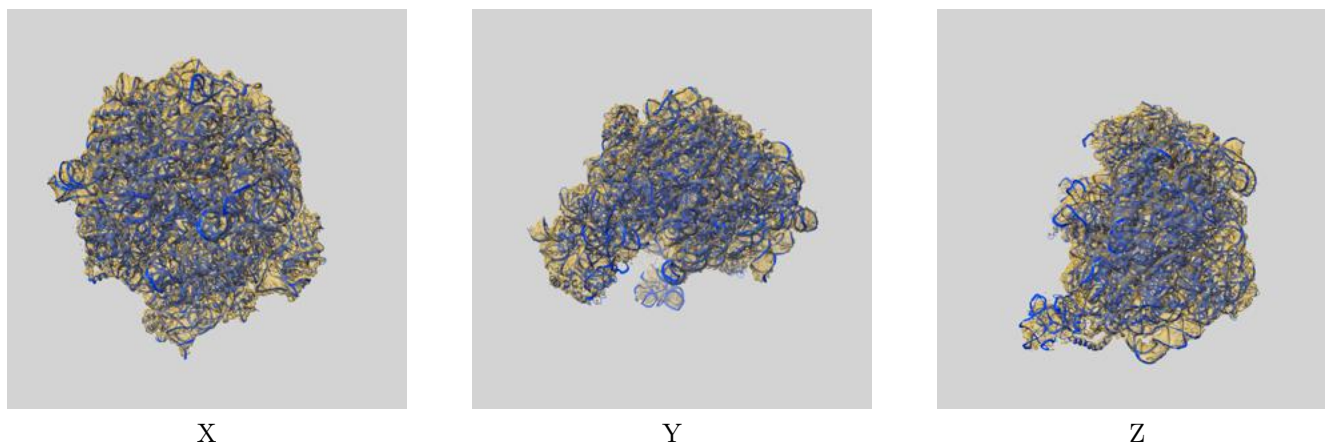
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.98	-	-
Author-provided FSC curve	2.98	3.62	3.02
Unmasked-calculated*	4.63	8.88	4.93

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.63 differs from the reported value 2.98 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-51843 and PDB model 9H3Z. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay [i](#)



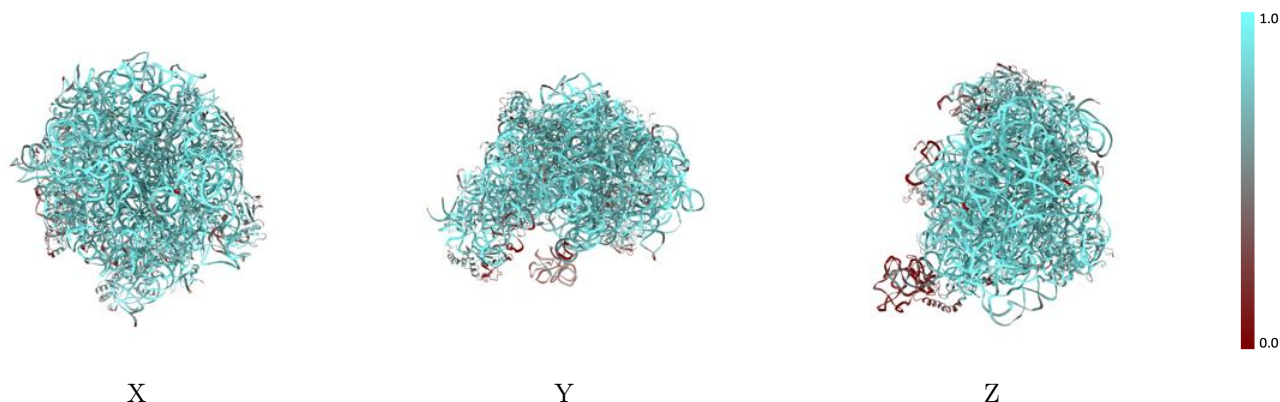
The images above show the 3D surface view of the map at the recommended contour level 0.44 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



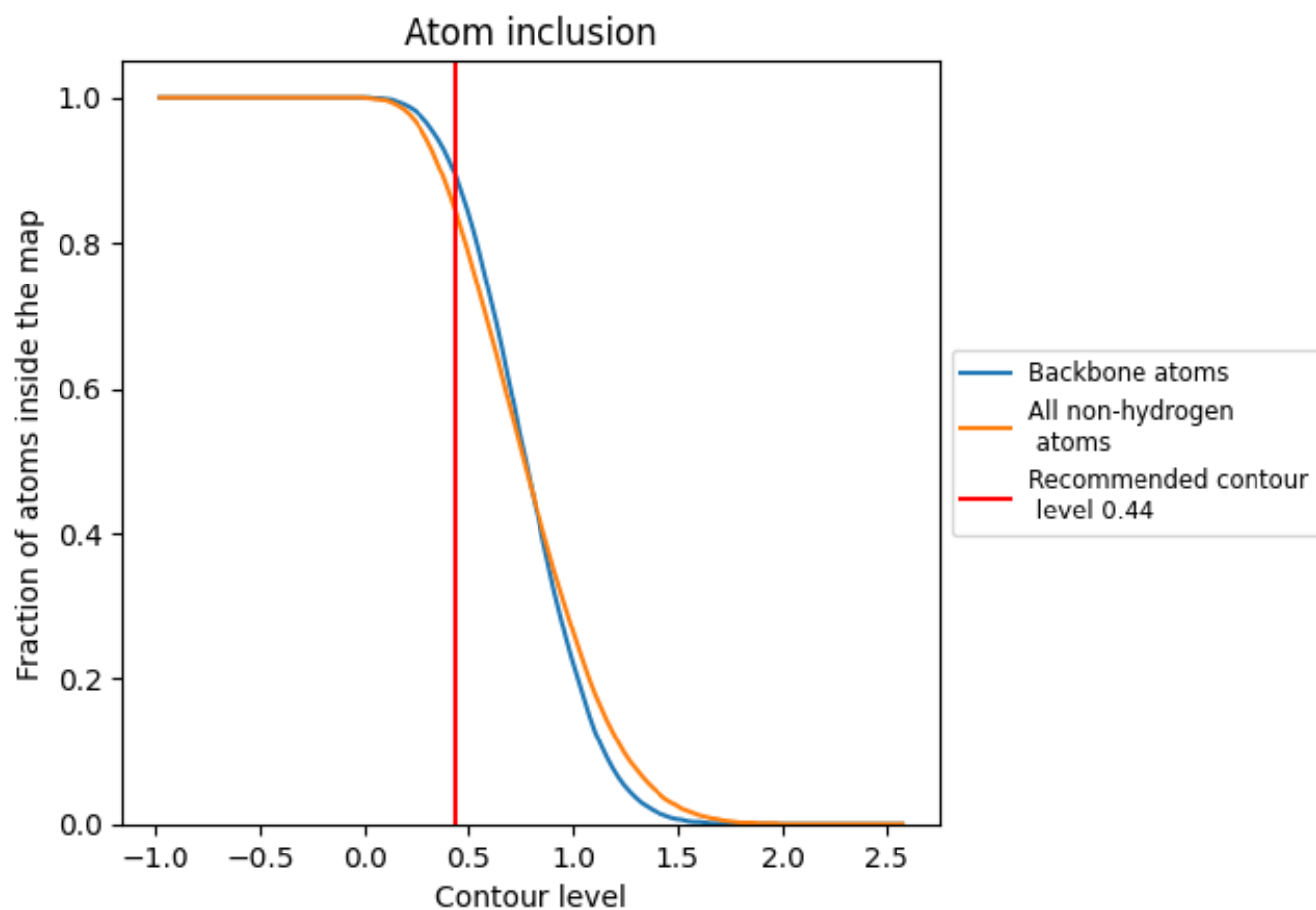
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.44).































































9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 84% 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 (0.44) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8410	 0.3940
0	 0.7850	 0.4310
1	 0.5090	 0.3950
2	 0.8820	 0.4790
3	 0.8150	 0.4510
4	 0.7600	 0.4280
A	 0.8870	 0.3980
B	 0.9000	 0.3810
C	 0.8250	 0.4440
D	 0.7660	 0.4340
E	 0.6840	 0.3560
F	 0.5050	 0.2500
G	 0.6580	 0.3300
H	 0.2890	 0.2260
J	 0.7980	 0.4420
K	 0.6350	 0.3530
L	 0.7020	 0.3530
M	 0.7900	 0.4430
N	 0.8190	 0.4410
O	 0.7280	 0.3640
P	 0.6350	 0.3660
Q	 0.8510	 0.4400
R	 0.7500	 0.4110
S	 0.7850	 0.4430
T	 0.7820	 0.4120
U	 0.7120	 0.3340
V	 0.7720	 0.3910
W	 0.7780	 0.4410
X	 0.8200	 0.4450
Y	 0.7060	 0.3120
Z	 0.7890	 0.4220

