



Full wwPDB EM Validation Report ⓘ

Jan 16, 2025 – 12:32 am GMT

PDB ID : 9HA7
EMDB ID : EMD-51979
Title : Pooled 50S subunit C-CP_(L22)- H61 precursor states supplemented with Api137
Authors : Lauer, S.; Nikolay, R.; Spahn, C.M.T.
Deposited on : 2024-11-01
Resolution : 4.37 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:

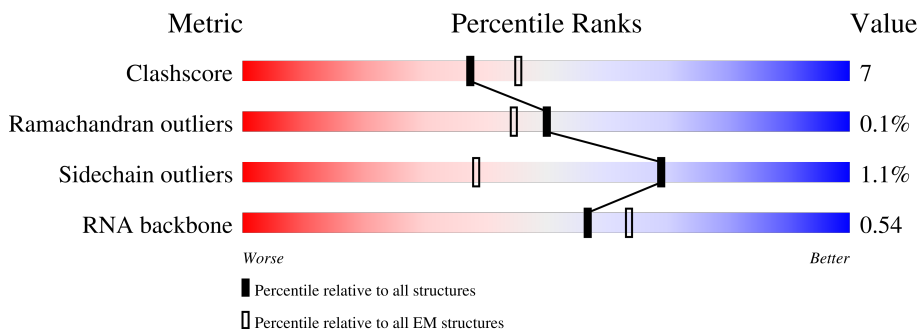
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 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 4.37 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	2	46	 67% 15% 17%
2	B	120	 60% 36%
3	F	177	 66% 32%
4	J	142	 81% 18%
5	L	143	 80% 20%
6	N	120	 73% 27%
7	O	116	 81% 19%

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Mol	Chain	Length	Quality of chain
8	Q	117	85% 15%
9	R	103	77% 22%
10	T	93	86% 14%
11	U	102	82% 17%
12	V	94	77% 23%
13	W	75	81% 19%
14	Y	63	89% 11%
15	Z	58	81% 19%
16	A	2903	41% 23% 5% 32%
17	D	209	68% 14% 17%
18	E	201	64% 23% 12%
19	y	17	59% 94% 6%

2 Entry composition

There are 19 unique types of molecules in this entry. The entry contains 59416 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 bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	2	38	309	185	77	46	1	0	0

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

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

- Molecule 3 is a protein called Large ribosomal subunit protein uL5.

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

- Molecule 4 is a protein called Large ribosomal subunit protein uL13.

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

- Molecule 5 is a protein called Large ribosomal subunit protein uL15.

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

- Molecule 6 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	N	120	957	592	196	164	5	0	0

- Molecule 7 is a protein called Large ribosomal subunit protein uL18.

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

- Molecule 8 is a protein called Large ribosomal subunit protein bL20.

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

- Molecule 9 is a protein called Large ribosomal subunit protein bL21.

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

- Molecule 10 is a protein called Large ribosomal subunit protein uL23.

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

- Molecule 11 is a protein called Large ribosomal subunit protein uL24.

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

- Molecule 12 is a protein called Large ribosomal subunit protein bL25.

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

- Molecule 13 is a protein called Large ribosomal subunit protein bL27.

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

- Molecule 14 is a protein called Large ribosomal subunit protein uL29.

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

- Molecule 15 is a protein called Large ribosomal subunit protein uL30.

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

- Molecule 16 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	A	1988	Total	C	N	O	P	0	0
			42736	19062	7924	13762	1988		

- Molecule 17 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	D	173	Total	C	N	O	S	0	0
			1284	805	231	244	4		

- Molecule 18 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	E	176	Total	C	N	O	S	0	0
			1368	862	243	258	5		

- Molecule 19 is a protein called Apidaecins type 22.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	y	17	Total	C	N	O	0	0
			148	94	33	21		

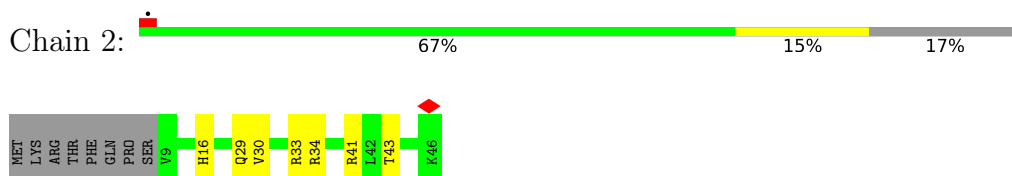
There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
y	10	ARG	GLN	conflict	UNP P35581

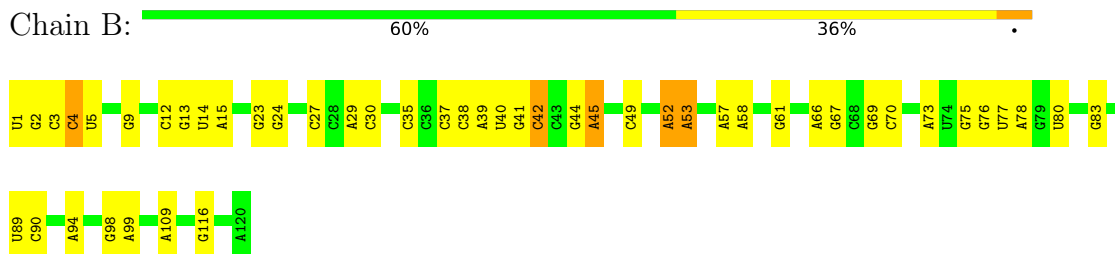
3 Residue-property plots [i](#)

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.

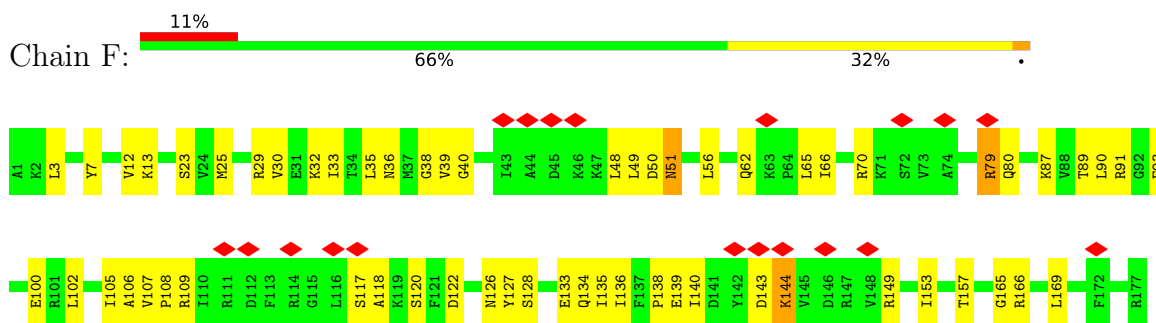
- Molecule 1: Large ribosomal subunit protein bL34



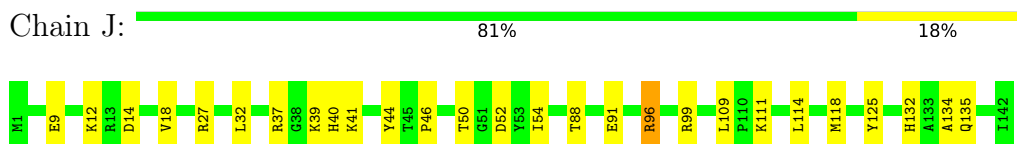
- Molecule 2: 5S ribosomal RNA



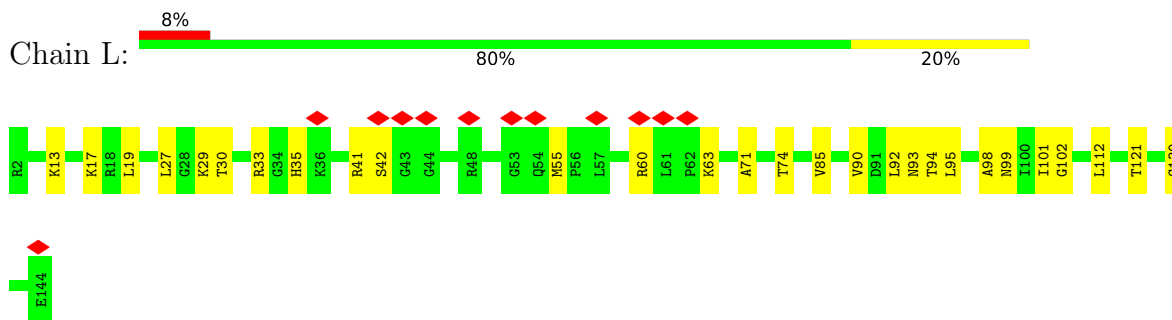
- Molecule 3: Large ribosomal subunit protein uL5



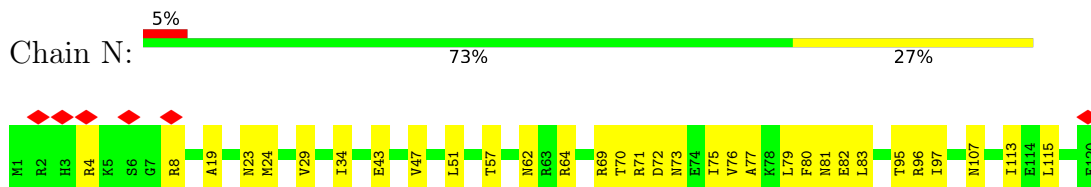
- Molecule 4: Large ribosomal subunit protein uL13



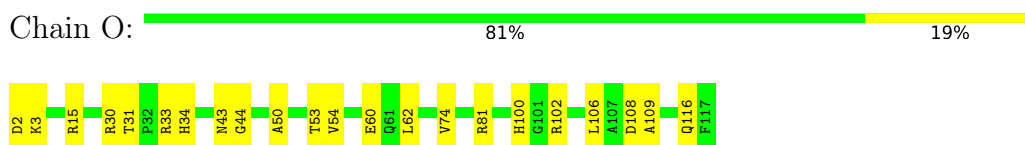
- Molecule 5: Large ribosomal subunit protein uL15



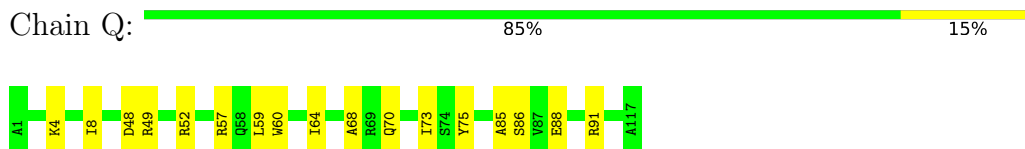
- Molecule 6: Large ribosomal subunit protein bL17



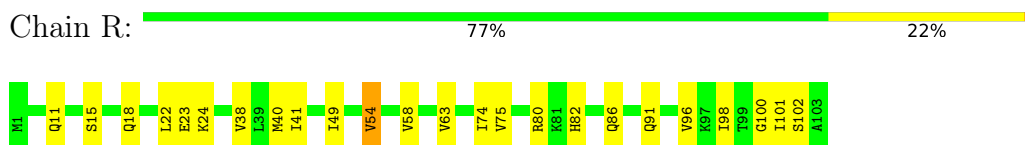
- Molecule 7: Large ribosomal subunit protein uL18



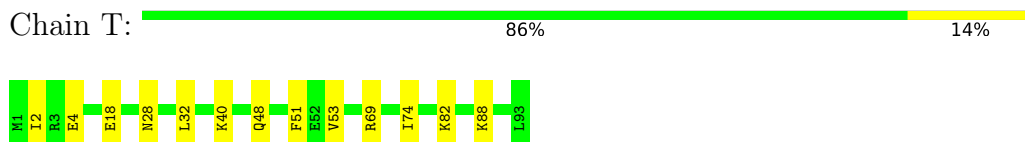
- Molecule 8: Large ribosomal subunit protein bL20



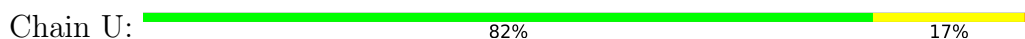
- Molecule 9: Large ribosomal subunit protein bL21



- Molecule 10: Large ribosomal subunit protein uL23

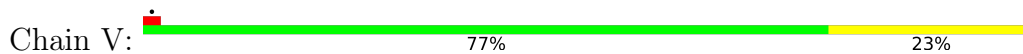


- Molecule 11: Large ribosomal subunit protein uL24

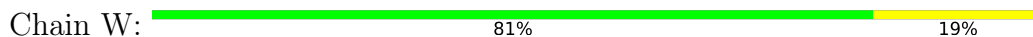




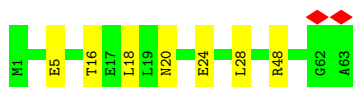
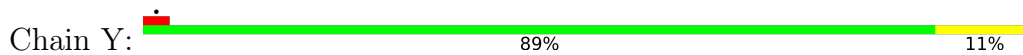
• Molecule 12: Large ribosomal subunit protein bL25



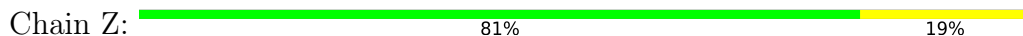
• Molecule 13: Large ribosomal subunit protein bL27



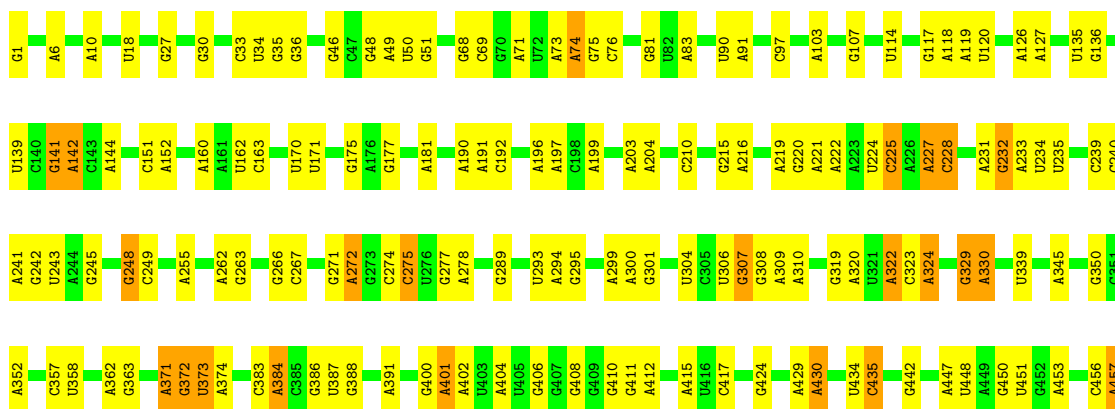
• Molecule 14: Large ribosomal subunit protein uL29



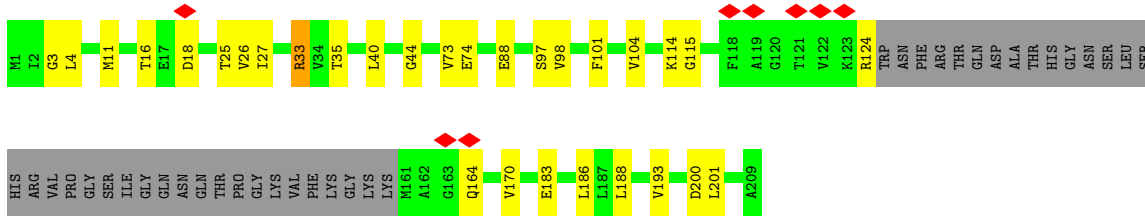
• Molecule 15: Large ribosomal subunit protein uL30



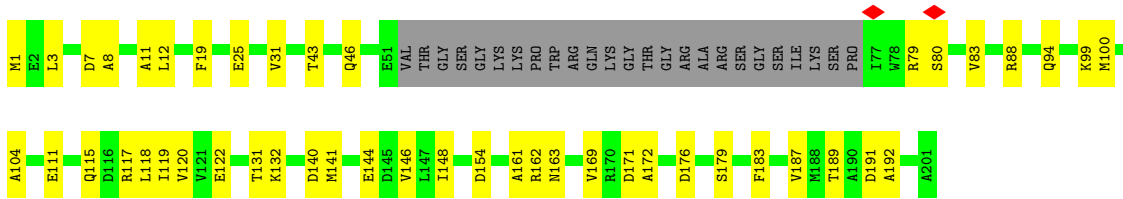
• Molecule 16: 23S ribosomal RNA



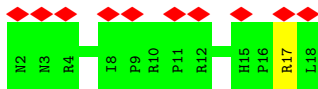
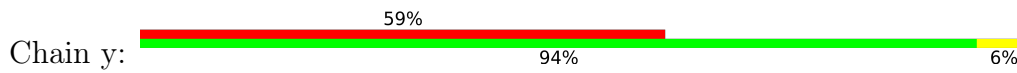
G	A1603	A1585	A1383	C1315	G1210	A975	A1974	A669	U568	G668	U568	G668	A	A194	G	A975	U	G1210	C1315	A1383	A1585	A1603
C	C1604	C1536	A1384	C1319	C1211	G976	G801	A670	U569	A670	U569	A670	A	G802	A	G976	C	G1211	C1319	A1384	C1536	C1604
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A	A1608	C1541	A1387	A1321	G1225	A982	A805	C672	U571	C672	U571	C672	A	C806	U	A982	G	G1225	A1321	A1387	C1541	A1608
A	A1609	U1542	G1388	A1322	U1234	A983	C806	C673	U572	C673	U572	C673	A	U807	U	A983	C	U1234	A1322	G1388	U1542	A1609
U	A1610	G1543	U1389	G1323	G1235	A984	U807	A675	A573	A675	A573	A675	U	U810	C	A984	U	G1235	G1323	U1389	G1543	A1610
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G	C1612	C1547	U1391	U1325	G1237	C986	U812	A677	A575	A677	A575	A677	G	A819	C	C986	U	U1325	U1325	U1391	C1547	C1612
U	A1613	A1548	A1392	U1326	A1237	C987	C812	A678	A576	A678	A576	A678	U	A820	C	C987	U	A1237	A1392	A1392	A1548	A1613
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C	A1615	U1549	U1394	U1328	A1244	C989	U814	A680	A578	A680	A578	A680	C	U822	C	C989	U	A1244	U1328	U1394	U1549	A1615
C	A1616	A1550	U1395	U1329	G1245	C990	U815	A681	A579	A681	A579	A681	C	U823	C	C990	U	G1245	U1329	U1395	A1550	A1616
C	A1617	A1551	U1396	U1330	A1246	C991	U816	A682	A580	A682	A580	A682	C	U824	C	C991	U	A1246	U1330	U1396	A1551	A1617
G	A1618	A1552	U1397	G1331	G1250	C992	U817	A683	A581	A683	A581	A683	G	U825	C	C992	U	G1331	G1331	U1397	A1552	A1618
A	G1619	A1553	U1400	G1332	U1251	C993	U818	A684	A582	A684	A582	A684	A	U826	C	C993	U	U1251	U1251	U1400	A1553	G1619
A	U1620	U1554	U1401	G1333	A1252	C994	U819	A685	A583	A685	A583	A685	A	U827	C	C994	U	A1252	A1252	U1401	U1554	U1620
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G	A1634	U1562	C1414	G1345	G1267	C1002	U827	A693	A591	A693	A591	A693	G	U835	C	C1002	U	C1414	C1414	G1345	U1562	A1634
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A	C1638	A1496	G1421	C1350	A1271	C1007	U832	A698	A596	A698	A596	A698	A	U840	C	C1007	U	G1421	G1421	C1350	A1496	C1638
C	C1644	U1497	G1422	C1351	A1272	C1008	U833	A699	A597	A699	A597	A699	C	U841	C	C1008	U	U1497	U1497	C1351	U1497	C1644
C	U1647	C1498	G1423	U1352	U1273	C1009	U834	A700	A598	A700	A598	A700	C	U842	C	C1009	U	G1422	G1422	U1352	C1498	U1647
G	U1647	G1501	G1425	A1353	A1274	C1010	U835	A701	A599	A701	A599	A701	G	U843	C	C1010	U	A1353	A1353	G1425	G1501	U1647
U	U1648	C1504	G1426	A1354	A1275	C1011	U836	A702	A600	A702	A600	A702	U	U844	C	C1011	U	G1426	G1426	A1354	C1504	U1648
U	G1649	A1505	A1427	G1355	A1276	C1012	U837	A703	A601	A703	A601	A703	U	U845	C	C1012	U	A1427	A1427	G1355	A1505	G1649
A	A1650	C1577	C1428	C1357	C1278	C1013	U838	A704	A602	A704	A602	A704	A	U846	C	C1013	U	C1428	C1428	C1357	C1577	A1650
U	G1651	U1578	G1429	G1358	G1279	C1014	U839	A705	A603	A705	A603	A705	U	U847	C	C1014	U	G1429	G1429	G1358	U1578	G1651
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U	A1654	G1511	G1432	C1361	C1171	C1017	U842	A708	A606	A708	A606	A708	U	U850	C	C1017	U	A1431	A1431	C1361	G1511	A1654
U	A1655	U1584	A1433	C1362	U1174	C1018	U843	A709	A607	A709	A607	A709	U	U851	C	C1018	U	G1432	G1432	A1433	U1584	A1655
A	C1656	C1585	A1434	G1363	A1175	C1019	U844	A710	A608	A710	A608	A710	A	U852	C	C1019	U	A1434	A1434	G1363	C1585	C1656
G	U1657	A1586	G1435	A1365	A1176	C1020	U845	A711	A609	A711	A609	A711	G	U853	C	C1020	U	G1435	G1435	A1365	A1586	U1657
U	G1660	G1587	G1441	G1366	G1287	C1021	U846	A712	A610	A712	A610	A712	U	U854	C	C1021	U	G1441	G1441	G1366	G1587	G1660
G	U1661	G1588	U1442	A1367	A1300	C1022	U847	A713	A611	A713	A611	A713	G	U855	C	C1022	U	U1442	U1442	A1367	U1588	U1661
A	U1662	U1589	U1443	A1368	A1301	C1023	U848	A714	A612	A714	A612	A714	A	U856	C	C1023	U	U1443	U1443	A1368	U1589	U1662
C	G1663	A1591	G1444	A1369	A1302	C1024	U849	A715	A613	A715	A613	A715	C	U857	C	C1024	U	G1444	G1444	A1369	A1591	G1663
U	A1664	C1592	G1445	C1370	G1303	C1025	U850	A716	A614	A716	A614	A716	U	U858	C	C1025	U	A1369	A1369	C1370	C1592	A1664
G	A1665	A1593	U1446	G1371	A1304	C1026	U851	A717	A615	A717	A615	A717	G	U859	C	C1026	U	U1446	U1446	U1446	A1593	A1665
U	G1666	C1594	G1447	U1372	C1305	C1027	U852	A718	A616	A718	A616	A718	U	U860	C	C1027	U	G1447	G1447	U1372	C1594	G1666
C	G1667	U1595	U1448	A1373	C1306	C1028	U853	A719	A617	A719	A617	A719	C	U861	C	C1028	U	U1448	U1448	A1373	U1595	G1667
U	A1668	A1596	G1449	C1374	A1307	C1029	U854	A720	A618	A720	A618	A720	U	U862	C	C1029	U	G1449	G1449	C1374	A1596	A1668
C	A1669	U1597	U1451	G1377	A1308	C1030	U855	A721	A619	A721	A619	A721	C	U863	C	C1030	U	U1451	U1451	G1377	U1597	A1669
C	C	A1598	C1452	A1378	G1309	C	U856	A722	A620	A722	A620	A722	C	U864	C	C	U	C1452	C1452	A1378	A1598	C
C	U	G1601	G1453	A1379	G1309	C	U857	A723	A621	A723	A621	A723	C	U865	C	C	U	G1453	G1453	A1379	G1601	U
C	A	U1602	C1454	G1380	U1312	C	U858	A724	A622	A724	A622	A724	C	U866	C	C	U	U1602	U1602	C1454	U1602	A
G	G					C	U859	A725	A623	A725	A623	A725	G	U867	C	C	U					G



• Molecule 18: Large ribosomal subunit protein uL4



• Molecule 19: Apidaecins type 22



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	28649	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 ($e^-/\text{\AA}^2$)	46.2	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.499	Depositor
Minimum map value	-0.761	Depositor
Average map value	-0.012	Depositor
Map value standard deviation	0.142	Depositor
Recommended contour level	0.255	Depositor
Map size (Å)	399.6, 399.6, 399.6	wwPDB
Map dimensions	200, 200, 200	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.998, 1.998, 1.998	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	2	0.23	0/310	0.65	0/405
2	B	0.24	1/2876 (0.0%)	0.69	0/4483
3	F	0.25	0/1434	0.52	0/1926
4	J	0.24	0/1152	0.49	0/1551
5	L	0.25	0/1054	0.57	0/1403
6	N	0.25	0/970	0.58	0/1297
7	O	0.24	0/902	0.54	0/1209
8	Q	0.24	0/960	0.52	0/1278
9	R	0.25	0/829	0.53	0/1107
10	T	0.24	0/744	0.50	0/994
11	U	0.25	0/787	0.51	0/1051
12	V	0.25	0/766	0.49	0/1025
13	W	0.25	0/582	0.53	0/769
14	Y	0.25	0/510	0.49	0/677
15	Z	0.24	0/453	0.54	0/605
16	A	0.16	1/47875 (0.0%)	0.72	6/74684 (0.0%)
17	D	0.25	0/1296	0.52	0/1742
18	E	0.24	0/1382	0.47	0/1860
19	y	0.48	0/155	0.65	0/212
All	All	0.19	2/65037 (0.0%)	0.68	6/98278 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	A	1	G	OP3-P	-10.70	1.48	1.61
2	B	1	U	OP3-P	-10.57	1.48	1.61

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	A	1541	C	N3-C2-O2	-7.06	116.96	121.90
16	A	1541	C	N1-C2-O2	6.82	122.99	118.90
16	A	1512	C	N3-C2-O2	-5.58	117.99	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	A	363	G	N1-C2-N2	-5.55	111.21	116.20
16	A	1529	G	N3-C4-N9	5.39	129.23	126.00
16	A	1512	C	N1-C2-O2	5.19	122.02	118.90

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	2	309	0	344	5	0
2	B	2572	0	1302	33	0
3	F	1410	0	1447	46	0
4	J	1129	0	1162	22	0
5	L	1045	0	1117	23	0
6	N	957	0	998	22	0
7	O	892	0	923	17	0
8	Q	947	0	1022	16	0
9	R	816	0	839	16	0
10	T	738	0	807	10	0
11	U	779	0	834	14	0
12	V	753	0	780	17	0
13	W	575	0	592	9	0
14	Y	509	0	543	5	0
15	Z	449	0	491	11	0
16	A	42736	0	21494	377	0
17	D	1284	0	1339	24	0
18	E	1368	0	1421	35	0
19	y	148	0	151	0	0
All	All	59416	0	37606	621	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 7.

All (621) 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)
16:A:239:C:HO2'	16:A:622:G:HO2'	1.07	0.95
16:A:1007:C:OP2	16:A:1008:A:O2'	1.90	0.88
16:A:1667:G:N2	16:A:1669:A:N6	2.24	0.86
4:J:134:ALA:O	16:A:2898:U:O2'	1.94	0.86
16:A:951:C:N4	16:A:952:G:O6	2.10	0.85
16:A:909:A:O2'	16:A:911:A:OP2	1.95	0.84
16:A:514:A:N3	16:A:581:C:O2'	2.08	0.84
16:A:2865:U:OP2	16:A:2866:U:O2'	1.95	0.84
16:A:542:C:N4	16:A:543:G:O6	2.11	0.83
16:A:1492:G:OP2	16:A:1493:C:O2'	1.96	0.83
16:A:2642:G:N2	16:A:2772:C:O2	2.11	0.83
16:A:1315:C:O2'	16:A:1392:A:N3	2.11	0.82
16:A:1378:A:O2'	16:A:1380:G:N7	2.12	0.82
16:A:83:A:O2'	16:A:103:A:N6	2.11	0.82
16:A:571:U:O2'	16:A:573:U:OP2	1.98	0.82
16:A:126:A:O2'	16:A:127:A:O4'	1.96	0.82
16:A:1287:A:N1	16:A:1648:U:O2'	2.11	0.82
16:A:1414:C:O2'	16:A:1415:U:O4'	1.98	0.81
18:E:46:GLN:O	18:E:88:ARG:NH2	2.13	0.81
2:B:39:A:O2'	2:B:40:U:O4'	1.99	0.81
3:F:109:ARG:NH2	3:F:136:ILE:O	2.14	0.81
16:A:675:A:N3	16:A:2443:C:O2'	2.13	0.81
16:A:177:G:OP2	16:A:177:G:N2	2.13	0.80
16:A:2049:G:N2	16:A:2619:C:O2	2.13	0.80
3:F:38:GLY:O	16:A:2306:C:N4	2.15	0.80
7:O:50:ALA:O	7:O:81:ARG:NH1	2.15	0.80
16:A:1667:G:H21	16:A:1669:A:N6	1.77	0.80
16:A:548:G:O2'	16:A:549:G:O4'	1.98	0.79
16:A:2743:U:OP2	16:A:2755:C:N4	2.15	0.79
2:B:14:U:OP2	2:B:70:C:O2'	2.01	0.79
16:A:1604:C:O2'	16:A:1610:A:N1	2.13	0.79
3:F:87:LYS:NZ	16:A:2314:A:OP1	2.16	0.79
2:B:5:U:OP1	2:B:61:G:O2'	2.00	0.79
16:A:1667:G:N2	16:A:1669:A:H62	1.80	0.78
12:V:58:SER:OG	12:V:59:GLU:OE1	2.01	0.78
16:A:2678:C:OP1	17:D:124:ARG:NH2	2.16	0.78
16:A:463:G:N2	16:A:466:A:OP2	2.16	0.78
3:F:70:ARG:NH1	16:A:2298:A:OP1	2.16	0.78
11:U:3:LYS:O	11:U:93:ARG:NH1	2.16	0.77
5:L:41:ARG:NH2	16:A:807:U:OP2	2.18	0.77
16:A:2050:C:O2	16:A:2618:G:N2	2.16	0.77
16:A:532:A:N1	16:A:2035:G:N2	2.33	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:966:G:O4'	16:A:2267:A:N6	2.18	0.77
16:A:2326:C:O2'	16:A:2327:A:OP1	2.02	0.77
16:A:234:U:O4	16:A:263:G:N2	2.19	0.76
16:A:2645:G:OP2	16:A:2645:G:N2	2.17	0.76
16:A:2816:G:N3	16:A:2883:A:O2'	2.18	0.76
6:N:77:ALA:O	6:N:81:ASN:ND2	2.18	0.76
16:A:569:U:OP1	16:A:945:A:O2'	2.03	0.76
16:A:629:G:N3	16:A:639:U:O2'	2.19	0.76
16:A:2646:C:OP2	16:A:2732:G:O2'	2.02	0.76
3:F:133:GLU:OE1	3:F:133:GLU:N	2.19	0.76
16:A:1466:U:HO2'	16:A:1546:G:HO2'	1.00	0.76
16:A:227:A:O2'	16:A:228:C:O5'	2.02	0.76
3:F:120:SER:OG	3:F:128:SER:O	2.03	0.76
16:A:2788:C:O2'	16:A:2809:A:N3	2.17	0.75
16:A:117:G:OP2	16:A:119:A:O2'	2.03	0.75
16:A:805:G:N2	16:A:829:A:OP1	2.20	0.75
16:A:2009:A:O2'	16:A:2010:G:O4'	2.01	0.75
15:Z:18:LYS:NZ	16:A:850:U:OP1	2.19	0.74
16:A:2258:C:O2'	16:A:2427:C:OP2	2.05	0.74
2:B:75:G:O2'	12:V:88:HIS:NE2	2.20	0.74
16:A:1322:A:N1	16:A:1333:G:O2'	2.20	0.74
16:A:570:G:O2'	16:A:983:A:N1	2.20	0.74
17:D:16:THR:OG1	17:D:18:ASP:OD1	2.03	0.74
16:A:220:G:O2'	16:A:233:A:O2'	2.05	0.74
1:2:16:HIS:NE2	16:A:464:U:O2	2.21	0.72
16:A:192:C:O2'	16:A:802:A:N3	2.20	0.72
16:A:1359:A:OP2	16:A:1371:G:N2	2.21	0.72
16:A:322:A:OP1	18:E:162:ARG:NE	2.21	0.72
16:A:1024:G:OP2	16:A:1025:G:O2'	2.03	0.71
16:A:239:C:O2'	16:A:622:G:O2'	1.96	0.71
16:A:1588:G:O2'	16:A:1589:U:O4'	2.05	0.71
6:N:95:THR:HB	6:N:113:ILE:HD11	1.72	0.71
16:A:18:U:O2'	16:A:554:U:OP1	2.07	0.71
5:L:55:MET:O	5:L:60:ARG:NH1	2.23	0.70
4:J:88:THR:OG1	4:J:91:GLU:OE1	2.09	0.70
16:A:931:U:O2	16:A:1167:C:O2'	2.09	0.70
16:A:1272:A:N6	16:A:1619:G:OP2	2.24	0.70
16:A:48:G:N2	16:A:177:G:OP1	2.22	0.70
18:E:122:GLU:N	18:E:122:GLU:OE1	2.25	0.70
9:R:80:ARG:NH1	16:A:572:A:OP2	2.25	0.70
3:F:117:SER:O	3:F:127:TYR:OH	2.10	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:J:46:PRO:HD3	8:Q:59:LEU:HD11	1.73	0.69
14:Y:48:ARG:NH1	16:A:76:C:OP1	2.25	0.69
12:V:48:MET:SD	12:V:51:GLN:NE2	2.64	0.69
16:A:550:C:N4	16:A:551:G:O6	2.25	0.69
16:A:2043:C:OP1	16:A:2777:G:O2'	2.07	0.69
5:L:95:LEU:HD23	5:L:101:ILE:HD13	1.75	0.69
15:Z:4:ILE:HD11	15:Z:56:VAL:CG2	2.22	0.69
16:A:464:U:O4	16:A:684:G:O2'	2.11	0.69
16:A:372:G:O2'	16:A:373:U:O5'	2.12	0.68
16:A:961:C:O2	16:A:2031:A:N6	2.26	0.68
16:A:1319:C:O2'	16:A:1320:C:OP1	2.12	0.68
16:A:1125:G:OP2	16:A:1126:A:O2'	2.08	0.68
1:2:29:GLN:NE2	16:A:210:C:OP1	2.26	0.68
12:V:64:VAL:HG22	12:V:69:GLU:OE1	1.93	0.68
12:V:45:ASP:OD1	12:V:46:LYS:N	2.28	0.67
7:O:60:GLU:OE1	7:O:60:GLU:N	2.26	0.67
16:A:612:G:N2	16:A:614:A:O2'	2.27	0.67
16:A:475:C:O2	16:A:479:A:N6	2.27	0.67
16:A:224:U:OP2	16:A:408:G:N2	2.27	0.67
16:A:1341:G:OP1	16:A:1602:U:O2'	2.10	0.67
16:A:1638:C:OP1	16:A:2710:C:O2'	2.13	0.67
3:F:89:THR:OG1	3:F:91:ARG:NH2	2.27	0.67
10:T:48:GLN:NE2	10:T:53:VAL:O	2.27	0.67
10:T:40:LYS:NZ	16:A:1343:G:OP1	2.28	0.67
15:Z:30:ARG:NH2	16:A:1184:U:OP2	2.28	0.67
16:A:248:G:O2'	16:A:2432:A:OP1	2.09	0.66
2:B:9:G:OP2	7:O:15:ARG:NH2	2.28	0.66
16:A:1651:G:O5'	16:A:2006:C:N4	2.29	0.66
16:A:659:G:O3'	18:E:94:GLN:NE2	2.27	0.66
16:A:1415:U:O2	16:A:1587:G:N2	2.28	0.66
2:B:42:C:H5	3:F:65:LEU:HD13	1.61	0.66
16:A:627:A:O4'	16:A:637:A:N6	2.29	0.66
5:L:93:ASN:O	5:L:94:THR:OG1	2.09	0.66
16:A:453:A:N3	16:A:457:A:O2'	2.28	0.66
16:A:227:A:HO2'	16:A:228:C:P	2.19	0.66
2:B:37:C:O2	7:O:100:HIS:NE2	2.28	0.65
7:O:2:ASP:OD1	7:O:3:LYS:N	2.29	0.65
16:A:605:G:OP1	18:E:99:LYS:NZ	2.29	0.65
9:R:23:GLU:OE2	9:R:91:GLN:NE2	2.29	0.65
16:A:631:A:N3	16:A:2415:G:O2'	2.27	0.65
16:A:191:A:O2'	16:A:678:C:O2	2.13	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:2751:G:N2	16:A:2751:G:OP1	2.26	0.65
16:A:1390:U:O2	16:A:1395:A:N7	2.30	0.65
3:F:23:SER:OG	3:F:25:MET:SD	2.54	0.64
8:Q:52:ARG:NH2	16:A:994:C:OP1	2.30	0.64
3:F:50:ASP:OD1	3:F:51:ASN:N	2.30	0.64
5:L:13:LYS:NZ	16:A:1245:G:OP1	2.29	0.64
16:A:1209:U:O2'	16:A:1237:A:N1	2.25	0.64
8:Q:88:GLU:N	8:Q:88:GLU:OE1	2.31	0.64
16:A:1650:A:O2'	16:A:1652:A:OP1	2.14	0.64
16:A:2822:G:OP1	17:D:164:GLN:NE2	2.30	0.64
6:N:64:ARG:NH1	16:A:2851:A:O2'	2.31	0.64
6:N:8:ARG:N	6:N:43:GLU:OE2	2.29	0.64
16:A:1024:G:O2'	16:A:1144:A:O2'	2.16	0.64
16:A:1413:A:O2'	16:A:1414:C:O4'	2.14	0.64
4:J:91:GLU:OE1	4:J:91:GLU:N	2.31	0.63
6:N:24:MET:SD	16:A:1277:G:O2'	2.56	0.63
16:A:2291:U:O2'	16:A:2374:C:O2	2.16	0.63
16:A:2659:G:N2	16:A:2662:A:OP2	2.31	0.63
4:J:109:LEU:HD13	4:J:118:MET:HG3	1.81	0.63
11:U:81:ARG:NH2	16:A:301:G:OP2	2.32	0.63
15:Z:4:ILE:HD11	15:Z:56:VAL:HG23	1.81	0.63
16:A:2633:G:N2	16:A:2786:U:O2	2.32	0.62
16:A:1422:G:O2'	16:A:1492:G:N2	2.32	0.62
16:A:569:U:O2'	16:A:971:G:N2	2.31	0.62
11:U:9:GLU:OE1	11:U:9:GLU:N	2.33	0.62
16:A:1270:C:O2	16:A:2010:G:N1	2.32	0.62
18:E:111:GLU:OE2	18:E:115:GLN:NE2	2.32	0.62
5:L:27:LEU:HD23	5:L:27:LEU:H	1.65	0.62
16:A:1651:G:N2	16:A:2006:C:OP2	2.31	0.62
16:A:448:U:O4'	18:E:79:ARG:NE	2.31	0.61
2:B:77:U:OP1	12:V:21:ARG:NH1	2.32	0.61
16:A:844:A:N1	16:A:845:A:N6	2.48	0.61
8:Q:4:LYS:NZ	16:A:30:G:OP2	2.27	0.61
16:A:97:C:O2	16:A:103:A:O2'	2.17	0.61
17:D:26:VAL:CG1	17:D:186:LEU:HD12	2.30	0.61
4:J:39:LYS:NZ	16:A:1007:C:OP1	2.31	0.61
16:A:1026:G:OP2	16:A:1134:A:O2'	2.10	0.61
1:2:34:ARG:NH2	1:2:41:ARG:O	2.34	0.61
16:A:612:G:N2	16:A:614:A:HO2'	1.98	0.61
16:A:2446:G:N2	16:A:2449:U:O2	2.30	0.60
11:U:80:ASP:OD1	11:U:81:ARG:N	2.33	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:69:C:O2	16:A:73:A:O2'	2.18	0.60
17:D:33:ARG:HG3	17:D:73:VAL:HG13	1.83	0.60
3:F:35:LEU:HG	3:F:56:LEU:HD11	1.82	0.60
18:E:117:ARG:NH2	18:E:183:PHE:O	2.35	0.60
16:A:372:G:HO2'	16:A:373:U:P	2.24	0.60
2:B:27:C:OP1	7:O:34:HIS:NE2	2.34	0.60
6:N:107:ASN:ND2	16:A:1652:A:OP2	2.34	0.60
9:R:58:VAL:N	9:R:102:SER:OG	2.35	0.60
16:A:68:G:N2	16:A:74:A:O4'	2.35	0.60
16:A:1534:U:O2'	16:A:1535:A:OP1	2.20	0.60
16:A:442:G:N2	18:E:43:THR:O	2.33	0.60
17:D:25:THR:HG21	17:D:193:VAL:HG22	1.83	0.60
16:A:644:A:O2'	16:A:645:C:O5'	2.20	0.59
3:F:133:GLU:HG2	3:F:135:ILE:HG22	1.84	0.59
5:L:63:LYS:NZ	16:A:249:C:O2'	2.24	0.59
8:Q:57:ARG:NH2	16:A:998:C:OP2	2.36	0.59
16:A:2399:G:O6	16:A:2418:A:N6	2.35	0.59
16:A:152:A:N6	16:A:175:G:O6	2.36	0.59
16:A:2341:G:N2	16:A:2374:C:O3'	2.35	0.59
10:T:82:LYS:NZ	16:A:1339:G:OP1	2.36	0.59
3:F:93:GLU:OE1	3:F:93:GLU:N	2.35	0.59
4:J:135:GLN:N	4:J:135:GLN:OE1	2.36	0.59
16:A:1271:G:N2	16:A:1615:C:H42	2.01	0.58
18:E:46:GLN:N	18:E:46:GLN:OE1	2.36	0.58
5:L:33:ARG:NH2	16:A:587:C:O2	2.36	0.58
7:O:116:GLN:N	7:O:116:GLN:OE1	2.36	0.58
5:L:99:ASN:ND2	16:A:621:A:OP2	2.37	0.58
16:A:1651:G:H22	16:A:2006:C:P	2.26	0.58
6:N:96:ARG:O	6:N:113:ILE:HD12	2.04	0.58
3:F:134:GLN:N	3:F:134:GLN:OE1	2.36	0.58
16:A:2375:G:O2'	16:A:2377:A:N6	2.37	0.58
17:D:88:GLU:N	17:D:88:GLU:OE1	2.37	0.58
16:A:1451:C:O2'	16:A:1452:G:O4'	2.17	0.58
10:T:28:ASN:ND2	10:T:88:LYS:O	2.37	0.58
16:A:548:G:O2'	16:A:549:G:O5'	2.21	0.58
16:A:603:A:N6	16:A:655:A:O4'	2.37	0.57
16:A:1589:U:O4	16:A:1590:A:N6	2.37	0.57
16:A:2050:C:N3	16:A:2618:G:N1	2.45	0.57
6:N:82:GLU:HG2	6:N:83:LEU:HD22	1.86	0.57
16:A:224:U:O4	16:A:232:G:N2	2.36	0.57
16:A:324:A:N6	16:A:339:U:O4'	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:W:10:ARG:NH2	16:A:2279:G:N7	2.52	0.57
16:A:2007:U:O2'	16:A:2009:A:OP2	2.17	0.57
16:A:526:A:O2'	16:A:2043:C:O2	2.22	0.57
18:E:176:ASP:OD1	18:E:179:SER:OG	2.15	0.57
16:A:2049:G:N1	16:A:2619:C:N3	2.44	0.56
5:L:19:LEU:HD23	5:L:27:LEU:HD12	1.87	0.56
16:A:371:A:N6	16:A:402:A:OP2	2.38	0.56
16:A:2326:C:HO2'	16:A:2327:A:P	2.27	0.56
2:B:80:U:O2'	16:A:918:A:N3	2.36	0.56
16:A:2692:G:N3	16:A:2847:U:O2'	2.34	0.56
2:B:75:G:HO2'	12:V:88:HIS:CD2	2.22	0.56
5:L:93:ASN:OD1	5:L:94:THR:N	2.38	0.56
16:A:1271:G:H22	16:A:1615:C:N4	2.04	0.56
16:A:987:C:O2'	16:A:1000:A:N3	2.34	0.56
16:A:2375:G:N2	16:A:2378:A:OP2	2.38	0.56
18:E:171:ASP:OD1	18:E:172:ALA:N	2.39	0.56
1:2:43:THR:OG1	16:A:126:A:N6	2.39	0.56
16:A:864:G:O2'	16:A:914:G:O6	2.23	0.56
3:F:30:VAL:HG22	3:F:157:THR:HG22	1.88	0.55
2:B:38:C:O4'	7:O:100:HIS:NE2	2.39	0.55
16:A:1515:A:O2'	16:A:1556:C:O2	2.23	0.55
17:D:3:GLY:C	17:D:4:LEU:HD12	2.27	0.55
2:B:42:C:C5	3:F:65:LEU:HD13	2.41	0.55
7:O:31:THR:OG1	7:O:33:ARG:O	2.22	0.55
18:E:144:GLU:N	18:E:144:GLU:OE1	2.40	0.55
16:A:673:C:P	16:A:801:G:H21	2.29	0.55
18:E:1:MET:SD	18:E:1:MET:N	2.79	0.55
3:F:62:GLN:OE1	3:F:62:GLN:N	2.40	0.55
16:A:644:A:O2'	16:A:645:C:O4'	2.23	0.54
3:F:134:GLN:NE2	3:F:149:ARG:O	2.40	0.54
2:B:76:G:OP2	12:V:12:GLN:NE2	2.39	0.54
16:A:271:G:O2'	16:A:272:A:OP2	2.22	0.54
16:A:976:G:HO2'	16:A:1155:A:HO2'	1.55	0.54
4:J:37:ARG:NH1	4:J:44:TYR:OH	2.41	0.53
16:A:1432:G:H2'	16:A:1433:A:C8	2.43	0.53
4:J:96:ARG:NH1	16:A:2640:G:OP1	2.42	0.53
16:A:549:G:HO2'	16:A:550:C:P	2.31	0.53
16:A:1414:C:HO2'	16:A:1415:U:C4'	2.20	0.53
8:Q:48:ASP:OD1	8:Q:49:ARG:N	2.42	0.53
16:A:549:G:O2'	16:A:550:C:OP1	2.26	0.53
18:E:189:THR:OG1	18:E:191:ASP:OD1	2.18	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:15:A:OP2	2:B:69:G:N2	2.37	0.53
5:L:30:THR:HG22	16:A:810:U:O4	2.08	0.53
16:A:659:G:O2'	18:E:94:GLN:NE2	2.42	0.53
16:A:1319:C:HO2'	16:A:1320:C:P	2.30	0.53
8:Q:48:ASP:OD2	16:A:534:U:O2'	2.17	0.53
13:W:14:ALA:O	13:W:16:ARG:NH1	2.39	0.53
16:A:289:G:O6	16:A:352:A:N6	2.42	0.53
13:W:7:ARG:O	13:W:10:ARG:NH1	2.42	0.53
3:F:143:ASP:OD1	3:F:144:LYS:N	2.42	0.52
16:A:308:G:O2'	16:A:329:G:N2	2.43	0.52
16:A:1596:A:H2'	16:A:1597:A:H5'	1.92	0.52
16:A:2857:G:N2	16:A:2860:A:OP2	2.36	0.52
14:Y:16:THR:O	14:Y:20:ASN:ND2	2.41	0.52
16:A:2345:G:O2'	16:A:2381:A:N3	2.38	0.52
16:A:2821:A:OP2	17:D:115:GLY:N	2.40	0.52
16:A:532:A:OP1	16:A:561:G:N2	2.33	0.52
9:R:15:SER:OG	9:R:18:GLN:NE2	2.43	0.52
16:A:1352:U:O2'	16:A:1570:A:N3	2.39	0.52
2:B:52:A:O2'	2:B:53:A:O5'	2.27	0.52
16:A:2017:U:O2'	16:A:2019:A:OP2	2.10	0.52
4:J:114:LEU:HD12	4:J:114:LEU:H	1.75	0.52
4:J:41:LYS:NZ	4:J:52:ASP:OD1	2.25	0.51
11:U:71:ILE:HD12	11:U:82:VAL:HG21	1.91	0.51
16:A:1244:A:N6	16:A:1245:G:O6	2.44	0.51
16:A:1656:C:N4	16:A:1657:U:O4	2.43	0.51
3:F:35:LEU:HD12	3:F:36:ASN:N	2.26	0.51
10:T:32:LEU:HD12	10:T:32:LEU:O	2.10	0.51
16:A:1021:A:N6	16:A:1142:A:H61	2.08	0.51
16:A:1271:G:H22	16:A:1615:C:H42	1.56	0.51
16:A:1358:G:O2'	16:A:1359:A:O5'	2.25	0.51
9:R:49:ILE:HG21	9:R:54:VAL:HG12	1.92	0.51
16:A:373:U:O4	16:A:401:A:N7	2.44	0.51
16:A:584:C:N4	16:A:585:G:O6	2.43	0.51
2:B:75:G:HO2'	12:V:88:HIS:CE1	2.27	0.51
9:R:38:VAL:O	9:R:54:VAL:HG13	2.11	0.51
16:A:274:C:H2'	16:A:275:C:C1'	2.39	0.51
16:A:673:C:OP1	16:A:801:G:N2	2.39	0.51
16:A:1402:U:O2'	16:A:1470:A:N1	2.29	0.51
16:A:2299:U:O4	16:A:2318:G:N2	2.44	0.51
16:A:2317:A:H2'	16:A:2318:G:O4'	2.11	0.51
16:A:2705:A:O2'	16:A:2852:G:OP1	2.25	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:J:40:HIS:O	8:Q:70:GLN:NE2	2.43	0.51
6:N:4:ARG:NH2	16:A:2874:C:OP1	2.43	0.51
4:J:27:ARG:NH1	16:A:1012:U:O2	2.44	0.51
9:R:100:GLY:O	9:R:101:ILE:HD13	2.11	0.51
12:V:29:ILE:HD12	12:V:38:LEU:O	2.11	0.51
7:O:53:THR:HG23	7:O:74:VAL:CG2	2.40	0.51
12:V:26:PHE:HZ	12:V:47:VAL:HG11	1.76	0.51
16:A:1303:G:O6	16:A:1304:A:N6	2.44	0.51
18:E:140:ASP:OD1	18:E:141:MET:N	2.43	0.51
16:A:1329:U:OP2	16:A:1330:C:N4	2.42	0.51
2:B:52:A:O2'	2:B:53:A:P	2.68	0.50
16:A:68:G:N2	16:A:74:A:O5'	2.44	0.50
3:F:120:SER:OG	16:A:2303:G:O2'	2.29	0.50
6:N:73:ASN:OD1	16:A:1454:C:N4	2.43	0.50
17:D:200:ASP:C	17:D:201:LEU:HD12	2.30	0.50
6:N:69:ARG:O	6:N:70:THR:OG1	2.19	0.50
6:N:71:ARG:NH1	16:A:2707:U:O2	2.44	0.50
16:A:1016:G:O6	16:A:1147:A:N6	2.44	0.50
16:A:299:A:N3	16:A:319:G:O2'	2.25	0.50
16:A:1020:A:H4'	16:A:1021:A:O5'	2.12	0.50
10:T:51:PHE:O	10:T:53:VAL:HG13	2.11	0.50
4:J:135:GLN:NE2	16:A:6:A:N3	2.60	0.50
16:A:1205:A:O2'	16:A:1206:G:OP1	2.29	0.50
16:A:1413:A:H2'	16:A:1414:C:C6	2.47	0.50
16:A:1992:G:N1	16:A:1995:U:O4	2.45	0.50
16:A:591:U:O4	16:A:592:A:N6	2.43	0.50
16:A:640:C:N4	16:A:641:U:O4	2.45	0.50
16:A:2723:C:OP1	17:D:114:LYS:NZ	2.28	0.50
18:E:25:GLU:OE1	18:E:25:GLU:N	2.40	0.50
6:N:57:THR:HG23	6:N:62:ASN:ND2	2.27	0.49
12:V:35:GLU:N	12:V:35:GLU:OE1	2.45	0.49
11:U:33:VAL:HG13	11:U:66:VAL:HG22	1.93	0.49
15:Z:57:GLU:N	15:Z:57:GLU:OE1	2.44	0.49
18:E:148:ILE:HB	18:E:169:VAL:HG22	1.93	0.49
16:A:245:G:O2'	16:A:384:A:N1	2.42	0.49
10:T:18:GLU:OE1	10:T:18:GLU:N	2.41	0.49
16:A:434:U:O2	16:A:435:C:N4	2.41	0.49
2:B:49:C:OP2	7:O:30:ARG:NH1	2.46	0.49
3:F:32:LYS:C	3:F:33:ILE:HD12	2.33	0.49
10:T:2:ILE:HD11	16:A:144:A:H4'	1.93	0.49
16:A:554:U:H2'	16:A:555:G:O4'	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:231:A:H2'	16:A:232:G:O4'	2.12	0.49
17:D:40:LEU:HD13	17:D:44:GLY:O	2.12	0.49
18:E:3:LEU:HD13	18:E:120:VAL:HG21	1.94	0.49
16:A:307:G:N1	16:A:309:A:O5'	2.46	0.49
16:A:549:G:O2'	16:A:550:C:P	2.70	0.49
16:A:948:C:O2	16:A:984:A:O2'	2.07	0.49
16:A:1512:C:H2'	16:A:1513:U:N1	2.27	0.49
16:A:141:G:N2	16:A:142:A:N3	2.60	0.49
16:A:2647:U:O2	16:A:2673:G:O6	2.31	0.49
2:B:42:C:C5	3:F:65:LEU:HD22	2.48	0.49
16:A:1028:A:OP2	16:A:1126:A:N6	2.44	0.49
3:F:3:LEU:HD22	3:F:100:GLU:HG2	1.93	0.49
9:R:63:VAL:HA	9:R:96:VAL:HG12	1.95	0.49
15:Z:4:ILE:HD12	15:Z:58:GLU:OE2	2.13	0.49
16:A:90:U:OP2	16:A:91:A:O2'	2.27	0.49
5:L:112:LEU:HD22	5:L:130:GLY:HA3	1.94	0.48
11:U:81:ARG:NH2	16:A:300:A:O5'	2.46	0.48
16:A:1170:C:N4	16:A:1171:G:O6	2.47	0.48
2:B:42:C:N3	3:F:89:THR:HG22	2.28	0.48
8:Q:57:ARG:NH1	16:A:997:G:OP2	2.45	0.48
12:V:62:THR:OG1	12:V:69:GLU:OE2	2.19	0.48
16:A:1386:C:H2'	16:A:1387:A:C8	2.47	0.48
2:B:3:C:H3'	2:B:4:C:H5''	1.94	0.48
6:N:97:ILE:CD1	6:N:113:ILE:HD13	2.43	0.48
16:A:1441:G:H2'	16:A:1442:U:C6	2.48	0.48
12:V:7:GLU:N	12:V:7:GLU:OE1	2.47	0.48
16:A:391:A:O2'	16:A:410:G:OP1	2.32	0.48
16:A:1266:G:N2	16:A:2012:G:O2'	2.47	0.48
16:A:1608:A:N7	16:A:1621:U:O2	2.46	0.48
16:A:330:A:N7	16:A:1210:G:O2'	2.42	0.48
2:B:78:A:H62	2:B:98:G:H21	1.61	0.48
16:A:956:G:O2'	16:A:960:A:N6	2.47	0.48
16:A:1448:G:H2'	16:A:1449:G:O4'	2.14	0.48
18:E:161:ALA:CB	18:E:169:VAL:HG23	2.43	0.48
18:E:191:ASP:OD1	18:E:192:ALA:N	2.46	0.48
16:A:1324:G:O2'	16:A:1328:A:N6	2.46	0.48
4:J:125:TYR:HH	4:J:132:HIS:HE2	1.61	0.47
16:A:1266:G:N2	16:A:2012:G:HO2'	2.12	0.47
16:A:1588:G:H2'	16:A:1589:U:C6	2.49	0.47
17:D:33:ARG:NH2	17:D:74:GLU:OE1	2.48	0.47
18:E:7:ASP:OD1	18:E:8:ALA:N	2.46	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:102:LEU:HD12	3:F:106:ALA:CB	2.45	0.47
6:N:19:ALA:O	6:N:23:ASN:ND2	2.42	0.47
16:A:320:A:N7	18:E:132:LYS:NZ	2.59	0.47
16:A:415:A:N6	16:A:2409:G:O6	2.48	0.47
16:A:1434:A:H2'	16:A:1435:G:C8	2.49	0.47
16:A:1449:G:H3'	16:A:1450:G:O4'	2.15	0.47
7:O:43:ASN:OD1	7:O:44:GLY:N	2.47	0.47
15:Z:22:THR:HG22	16:A:850:U:O2'	2.14	0.47
16:A:1435:G:H2'	16:A:1436:G:C8	2.49	0.47
16:A:1466:U:O2'	16:A:1546:G:O2'	1.93	0.47
16:A:1386:C:H2'	16:A:1387:A:H8	1.79	0.47
2:B:39:A:H2'	2:B:40:U:C6	2.49	0.47
8:Q:85:ALA:O	8:Q:86:SER:OG	2.25	0.47
12:V:61:LEU:HD12	12:V:61:LEU:N	2.30	0.47
16:A:36:G:N3	16:A:450:G:O2'	2.48	0.47
16:A:573:U:O4	16:A:2029:G:O2'	2.20	0.47
16:A:107:G:O3'	16:A:293:U:O2'	2.26	0.47
18:E:31:VAL:HG21	18:E:104:ALA:HB2	1.96	0.47
5:L:85:VAL:HG13	5:L:98:ALA:HB2	1.97	0.47
17:D:26:VAL:HG12	17:D:186:LEU:HD12	1.97	0.47
9:R:11:GLN:N	9:R:11:GLN:OE1	2.48	0.47
15:Z:18:LYS:O	15:Z:22:THR:HG23	2.14	0.47
4:J:50:THR:O	4:J:50:THR:HG22	2.15	0.46
5:L:35:HIS:NE2	16:A:567:U:OP1	2.48	0.46
12:V:38:LEU:HD23	12:V:39:ALA:N	2.30	0.46
16:A:357:C:C2	16:A:358:U:C5	3.03	0.46
16:A:2375:G:N1	16:A:2379:G:O6	2.48	0.46
6:N:72:ASP:O	6:N:76:VAL:HG23	2.14	0.46
16:A:203:A:OP2	16:A:204:A:O2'	2.14	0.46
16:A:1510:G:H2'	16:A:1511:G:C8	2.50	0.46
16:A:224:U:H2'	16:A:225:C:O4'	2.15	0.46
16:A:1551:A:H2'	16:A:1552:A:O4'	2.16	0.46
10:T:69:ARG:HG2	10:T:74:ILE:HG22	1.97	0.46
3:F:139:GLU:OE1	3:F:139:GLU:N	2.45	0.46
6:N:34:ILE:HD11	16:A:1278:C:O3'	2.16	0.46
16:A:600:G:H1'	18:E:100:MET:HE3	1.97	0.46
16:A:974:G:OP1	16:A:1187:G:O2'	2.18	0.46
16:A:1524:G:H2'	16:A:1525:A:C8	2.51	0.46
13:W:32:ILE:N	13:W:32:ILE:HD12	2.30	0.46
16:A:451:U:C4	16:A:453:A:C8	3.03	0.46
16:A:1345:C:N4	16:A:1346:G:O6	2.48	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:35:LEU:HD13	3:F:153:ILE:HD13	1.97	0.46
13:W:79:GLU:OE1	13:W:79:GLU:N	2.49	0.46
15:Z:4:ILE:HD11	15:Z:56:VAL:HG21	1.95	0.46
16:A:932:U:O2'	16:A:934:U:O4	2.28	0.46
16:A:1000:A:OP2	16:A:1154:G:N1	2.43	0.46
16:A:1263:U:H2'	16:A:1264:A:N9	2.31	0.46
16:A:1360:G:C8	16:A:1361:G:C8	3.04	0.46
16:A:2047:C:O2'	16:A:2823:A:N1	2.46	0.46
9:R:58:VAL:H	9:R:102:SER:HG	1.61	0.46
2:B:116:G:H4'	7:O:54:VAL:HG12	1.97	0.45
15:Z:19:HIS:O	15:Z:23:LEU:HD23	2.15	0.45
16:A:549:G:C2'	16:A:550:C:O5'	2.64	0.45
16:A:1344:U:H3'	16:A:1345:C:H5'	1.98	0.45
5:L:17:LYS:CE	5:L:27:LEU:HD13	2.46	0.45
16:A:1269:A:H2'	16:A:1270:C:O4'	2.16	0.45
17:D:183:GLU:OE1	17:D:183:GLU:N	2.43	0.45
2:B:29:A:O2'	2:B:58:A:N1	2.49	0.45
6:N:79:LEU:HD13	6:N:83:LEU:HB2	1.99	0.45
8:Q:75:TYR:OH	8:Q:91:ARG:NH1	2.48	0.45
13:W:60:ASP:OD1	13:W:61:GLY:N	2.49	0.45
16:A:81:G:O2'	16:A:295:G:O2'	2.33	0.45
17:D:27:ILE:N	17:D:27:ILE:HD12	2.31	0.45
16:A:543:G:O6	16:A:551:G:O6	2.34	0.45
18:E:79:ARG:O	18:E:80:SER:OG	2.32	0.45
16:A:299:A:N6	16:A:322:A:O2'	2.46	0.45
16:A:1413:A:C2'	16:A:1414:C:O4'	2.65	0.45
16:A:219:A:N3	16:A:234:U:O2'	2.50	0.45
3:F:33:ILE:O	3:F:90:LEU:HD23	2.17	0.45
4:J:114:LEU:HD11	16:A:557:C:O2'	2.17	0.45
16:A:500:G:O2'	16:A:505:A:N6	2.50	0.45
16:A:307:G:H22	16:A:309:A:H3'	1.82	0.45
16:A:1351:C:H2'	16:A:1352:U:O4'	2.16	0.45
16:A:1601:G:H2'	16:A:1602:U:O4'	2.17	0.45
16:A:2679:A:H5'	17:D:170:VAL:HG21	1.98	0.45
2:B:2:G:H2'	2:B:3:C:C6	2.52	0.44
2:B:23:G:O2'	2:B:24:G:O4'	2.35	0.44
7:O:106:LEU:HD23	7:O:106:LEU:O	2.17	0.44
16:A:543:G:H2'	16:A:544:C:C6	2.52	0.44
16:A:1309:G:N2	16:A:1611:C:O4'	2.43	0.44
16:A:1484:U:H2'	16:A:1485:U:O4'	2.16	0.44
18:E:146:VAL:HG21	18:E:187:VAL:HG13	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:39:VAL:HG11	3:F:149:ARG:HH21	1.82	0.44
3:F:48:LEU:HD12	3:F:49:LEU:N	2.32	0.44
16:A:1542:U:H2'	16:A:1543:G:C8	2.53	0.44
16:A:320:A:H2'	18:E:131:THR:HG21	1.99	0.44
16:A:1443:U:C2	16:A:1444:G:C8	3.05	0.44
13:W:11:ASP:OD1	13:W:12:SER:N	2.51	0.44
16:A:548:G:C2'	16:A:549:G:O4'	2.65	0.44
16:A:820:A:OP2	16:A:973:A:N6	2.42	0.44
16:A:1307:A:H2'	16:A:1308:A:O4'	2.17	0.44
16:A:1342:A:O2'	16:A:1345:C:N4	2.50	0.44
16:A:1349:C:C2	16:A:1350:C:C5	3.05	0.44
16:A:1478:G:H2'	16:A:1479:G:C1'	2.48	0.44
18:E:176:ASP:OD1	18:E:176:ASP:N	2.50	0.44
16:A:49:A:N1	16:A:177:G:N2	2.66	0.44
16:A:374:A:N6	16:A:400:G:O2'	2.51	0.44
16:A:151:C:N4	16:A:152:A:H62	2.16	0.44
16:A:471:A:OP1	18:E:79:ARG:NH1	2.47	0.44
6:N:115:LEU:HD12	6:N:115:LEU:H	1.83	0.44
7:O:31:THR:O	7:O:102:ARG:NH2	2.49	0.44
9:R:40:MET:SD	9:R:41:ILE:N	2.91	0.44
16:A:383:C:N3	16:A:391:A:N6	2.64	0.44
3:F:118:ALA:O	3:F:166:ARG:NH1	2.48	0.44
4:J:32:LEU:HD23	4:J:54:ILE:HD13	2.00	0.44
5:L:90:VAL:N	5:L:121:THR:O	2.46	0.44
8:Q:68:ALA:HB1	8:Q:73:ILE:HG23	1.99	0.44
16:A:262:A:N3	16:A:430:A:O2'	2.41	0.44
16:A:966:G:H4'	16:A:2271:G:H22	1.83	0.44
9:R:74:ILE:N	9:R:74:ILE:HD12	2.31	0.43
16:A:630:G:N2	16:A:633:A:OP2	2.43	0.43
1:2:30:VAL:HG22	1:2:33:ARG:NH2	2.34	0.43
2:B:30:C:H1'	2:B:57:A:H61	1.83	0.43
11:U:27:VAL:HG12	11:U:33:VAL:HG12	2.00	0.43
17:D:188:LEU:HD12	17:D:188:LEU:N	2.33	0.43
2:B:77:U:O2	2:B:99:A:N7	2.51	0.43
16:A:240:C:OP2	16:A:241:A:O2'	2.20	0.43
5:L:42:SER:OG	16:A:672:C:OP2	2.32	0.43
9:R:98:ILE:HG21	9:R:101:ILE:HD11	2.00	0.43
17:D:26:VAL:C	17:D:27:ILE:HD12	2.38	0.43
4:J:9:GLU:OE1	4:J:9:GLU:N	2.46	0.43
16:A:549:G:H2'	16:A:550:C:O4'	2.18	0.43
16:A:1346:G:H2'	16:A:1347:A:O4'	2.17	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:1348:C:C2	16:A:1349:C:C6	3.07	0.43
16:A:1425:G:H2'	16:A:1426:G:O4'	2.18	0.43
16:A:2321:U:O2	16:A:2321:U:H2'	2.19	0.43
17:D:97:SER:OG	17:D:98:VAL:N	2.52	0.43
18:E:118:LEU:HD23	18:E:119:ILE:N	2.33	0.43
3:F:66:ILE:N	3:F:66:ILE:HD12	2.33	0.43
6:N:29:VAL:HG11	6:N:75:ILE:HG23	2.00	0.43
16:A:235:U:O4	16:A:263:G:N2	2.52	0.43
16:A:1205:A:HO2'	16:A:1206:G:P	2.42	0.43
16:A:1494:A:N3	16:A:1494:A:H2'	2.34	0.43
6:N:47:VAL:O	6:N:51:LEU:HD23	2.19	0.43
8:Q:8:ILE:HD12	8:Q:8:ILE:H	1.84	0.43
16:A:545:U:O4	16:A:548:G:O6	2.36	0.43
16:A:1566:A:H2'	16:A:1566:A:N3	2.34	0.43
16:A:2009:A:C2'	16:A:2010:G:O4'	2.66	0.43
11:U:97:SER:O	11:U:98:ASN:OD1	2.36	0.43
16:A:1414:C:O2'	16:A:1415:U:C4'	2.67	0.43
14:Y:5:GLU:OE1	14:Y:5:GLU:N	2.47	0.43
16:A:33:C:O2	16:A:447:A:N6	2.51	0.43
16:A:2004:G:H2'	16:A:2005:A:O4'	2.18	0.43
17:D:101:PHE:HA	17:D:104:VAL:HG12	2.01	0.43
3:F:39:VAL:HG23	3:F:40:GLY:N	2.34	0.42
4:J:111:LYS:NZ	16:A:2039:U:OP1	2.37	0.42
16:A:465:G:H21	16:A:684:G:H1'	1.84	0.42
18:E:11:ALA:C	18:E:12:LEU:HD22	2.39	0.42
4:J:12:LYS:NZ	4:J:14:ASP:OD1	2.50	0.42
6:N:79:LEU:O	6:N:80:PHE:HB2	2.19	0.42
16:A:544:C:H2'	16:A:545:U:C2	2.53	0.42
16:A:2051:A:N3	16:A:2052:A:N6	2.67	0.42
5:L:29:LYS:O	5:L:30:THR:OG1	2.30	0.42
16:A:1141:U:H4'	16:A:1142:A:O4'	2.20	0.42
16:A:1245:G:H2'	16:A:1246:A:C8	2.55	0.42
16:A:1319:C:O2'	16:A:1320:C:P	2.77	0.42
16:A:1364:G:O2'	16:A:1367:A:N6	2.53	0.42
16:A:1591:A:H2'	16:A:1592:C:O4'	2.18	0.42
5:L:92:LEU:O	5:L:92:LEU:HD23	2.20	0.42
16:A:170:U:C2	16:A:171:U:C5	3.07	0.42
16:A:832:U:O2	16:A:833:A:C8	2.73	0.42
16:A:1576:U:H2'	16:A:1577:C:C6	2.55	0.42
16:A:2287:A:N6	16:A:2346:A:N7	2.68	0.42
3:F:165:GLY:O	3:F:169:LEU:HD13	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:2028:U:O4	16:A:2033:A:N7	2.52	0.42
5:L:71:ALA:HA	5:L:74:THR:HG22	2.01	0.42
12:V:35:GLU:OE2	12:V:93:ARG:NH1	2.53	0.42
13:W:66:GLU:N	13:W:66:GLU:OE1	2.52	0.42
14:Y:24:GLU:O	14:Y:28:LEU:HD12	2.20	0.42
16:A:1370:C:H2'	16:A:1371:G:O4'	2.20	0.42
16:A:1430:G:C4	16:A:1431:A:C8	3.08	0.42
16:A:2399:G:C6	16:A:2418:A:C6	3.08	0.42
2:B:73:A:N3	2:B:73:A:H2'	2.35	0.42
9:R:75:VAL:HG22	9:R:86:GLN:OE1	2.19	0.42
11:U:98:ASN:O	11:U:98:ASN:CG	2.58	0.42
16:A:1208:C:H2'	16:A:1209:U:O4'	2.19	0.42
16:A:1357:C:H2'	16:A:1358:G:O4'	2.20	0.42
17:D:33:ARG:CG	17:D:73:VAL:HG13	2.48	0.42
18:E:31:VAL:HG21	18:E:104:ALA:CB	2.48	0.42
16:A:1021:A:H61	16:A:1142:A:H61	1.68	0.42
16:A:1389:G:H2'	16:A:1390:U:O4'	2.20	0.42
16:A:1480:C:H2'	16:A:1481:U:O4'	2.19	0.42
16:A:1998:A:H2'	16:A:1999:C:C6	2.55	0.42
3:F:122:ASP:OD2	3:F:126:ASN:ND2	2.44	0.41
10:T:4:GLU:CD	14:Y:18:LEU:HD13	2.41	0.41
16:A:1504:A:N1	16:A:1505:A:N6	2.67	0.41
16:A:2831:G:N2	16:A:2884:U:OP2	2.53	0.41
8:Q:8:ILE:HD12	8:Q:8:ILE:N	2.35	0.41
3:F:48:LEU:O	3:F:51:ASN:ND2	2.53	0.41
7:O:108:ASP:OD1	7:O:109:ALA:N	2.54	0.41
8:Q:60:TRP:O	8:Q:64:ILE:HG12	2.20	0.41
13:W:64:LYS:N	13:W:77:SER:O	2.48	0.41
16:A:2345:G:O6	16:A:2371:G:O6	2.39	0.41
5:L:17:LYS:HE3	5:L:27:LEU:HD13	2.03	0.41
8:Q:91:ARG:NH1	16:A:1153:C:OP1	2.47	0.41
15:Z:46:MET:O	15:Z:50:VAL:HG22	2.20	0.41
16:A:1327:A:H2'	16:A:1328:A:O4'	2.21	0.41
16:A:1385:A:H1'	16:A:1386:C:C6	2.55	0.41
16:A:1561:C:H2'	16:A:1562:U:O4'	2.20	0.41
16:A:2720:U:C2	16:A:2721:A:C8	3.09	0.41
3:F:107:VAL:N	3:F:108:PRO:CD	2.84	0.41
16:A:1595:C:H2'	16:A:1596:A:O4'	2.20	0.41
16:A:2848:G:O2'	16:A:2868:A:N6	2.46	0.41
9:R:23:GLU:OE1	9:R:24:LYS:N	2.50	0.41
16:A:1346:G:N1	16:A:1601:G:C6	2.88	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:1353:A:N7	16:A:1377:G:N2	2.68	0.41
16:A:1414:C:C2'	16:A:1415:U:O4'	2.68	0.41
3:F:12:VAL:HG13	3:F:13:LYS:N	2.36	0.41
3:F:33:ILE:HD12	3:F:33:ILE:N	2.36	0.41
9:R:82:HIS:ND1	9:R:82:HIS:O	2.53	0.41
16:A:967:U:H2'	16:A:968:C:C6	2.56	0.41
16:A:1234:U:H2'	16:A:1235:G:O4'	2.21	0.41
16:A:1593:A:H2'	16:A:1594:U:O4'	2.21	0.41
3:F:65:LEU:HD23	3:F:65:LEU:H	1.86	0.41
11:U:85:ARG:NH2	11:U:101:THR:OG1	2.54	0.41
16:A:306:U:H2'	16:A:307:G:O4'	2.20	0.41
16:A:1358:G:N1	16:A:1372:U:OP2	2.45	0.41
16:A:1451:C:C2'	16:A:1452:G:OP2	2.69	0.41
16:A:1528:A:OP2	16:A:1543:G:N2	2.41	0.41
4:J:18:VAL:CG2	4:J:54:ILE:HD11	2.51	0.41
11:U:35:VAL:HG23	11:U:38:ILE:HB	2.02	0.41
16:A:1425:G:N2	16:A:1574:C:N4	2.69	0.41
16:A:1607:C:O4'	16:A:1621:U:N3	2.53	0.41
16:A:1630:A:H2'	16:A:1631:G:O4'	2.20	0.41
16:A:1665:A:C2'	16:A:1666:G:O5'	2.69	0.41
2:B:83:G:O6	2:B:94:A:N6	2.53	0.41
3:F:79:ARG:NH1	3:F:80:GLN:O	2.54	0.41
16:A:1351:C:H1'	16:A:1572:A:H1'	2.03	0.41
16:A:2368:C:O2	16:A:2369:A:C8	2.74	0.41
3:F:105:ILE:HD12	3:F:138:PRO:HG2	2.03	0.40
7:O:62:LEU:HD22	7:O:62:LEU:N	2.36	0.40
11:U:9:GLU:O	11:U:72:PHE:N	2.46	0.40
11:U:28:LEU:HD22	11:U:28:LEU:N	2.36	0.40
16:A:1354:A:H62	16:A:1377:G:H21	1.68	0.40
17:D:25:THR:HG21	17:D:193:VAL:CG2	2.50	0.40
16:A:1513:U:H2'	16:A:1514:G:O4'	2.22	0.40
16:A:2812:G:N2	16:A:2889:C:C2	2.89	0.40
2:B:45:A:O4'	3:F:91:ARG:NH1	2.55	0.40
18:E:154:ASP:OD1	18:E:154:ASP:N	2.48	0.40
3:F:140:ILE:N	3:F:140:ILE:HD12	2.36	0.40
16:A:635:C:O2'	16:A:639:U:OP1	2.40	0.40
16:A:928:A:H2'	16:A:929:U:C6	2.56	0.40
16:A:1347:A:C5	16:A:1348:C:C6	3.09	0.40
17:D:35:THR:HG22	17:D:73:VAL:HG11	2.04	0.40
5:L:101:ILE:HG13	5:L:102:GLY:N	2.37	0.40
16:A:458:G:C2'	16:A:459:U:OP2	2.70	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:A:499:U:H2'	16:A:500:G:O4'	2.22	0.40
16:A:1372:U:O4	16:A:1373:A:N6	2.55	0.40
16:A:1394:U:H2'	16:A:1395:A:O4'	2.22	0.40
16:A:1413:A:H2'	16:A:1414:C:O4'	2.22	0.40
16:A:1574:C:H2'	16:A:1575:C:O4'	2.21	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	2	36/46 (78%)	36 (100%)	0	0	100	100
3	F	175/177 (99%)	169 (97%)	6 (3%)	0	100	100
4	J	140/142 (99%)	139 (99%)	1 (1%)	0	100	100
5	L	141/143 (99%)	129 (92%)	12 (8%)	0	100	100
6	N	118/120 (98%)	107 (91%)	11 (9%)	0	100	100
7	O	114/116 (98%)	111 (97%)	3 (3%)	0	100	100
8	Q	115/117 (98%)	113 (98%)	2 (2%)	0	100	100
9	R	101/103 (98%)	97 (96%)	3 (3%)	1 (1%)	13	48
10	T	91/93 (98%)	86 (94%)	5 (6%)	0	100	100
11	U	100/102 (98%)	89 (89%)	11 (11%)	0	100	100
12	V	92/94 (98%)	89 (97%)	3 (3%)	0	100	100
13	W	73/75 (97%)	71 (97%)	2 (3%)	0	100	100
14	Y	61/63 (97%)	59 (97%)	2 (3%)	0	100	100
15	Z	56/58 (97%)	55 (98%)	1 (2%)	0	100	100
17	D	169/209 (81%)	163 (96%)	6 (4%)	0	100	100
18	E	172/201 (86%)	168 (98%)	3 (2%)	1 (1%)	22	59

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
19	y	15/17 (88%)	11 (73%)	4 (27%)	0	100	100
All	All	1769/1876 (94%)	1692 (96%)	75 (4%)	2 (0%)	50	83

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
9	R	54	VAL
18	E	83	VAL

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	2	30/38 (79%)	30 (100%)	0	100	100
3	F	148/148 (100%)	143 (97%)	5 (3%)	32	53
4	J	116/116 (100%)	114 (98%)	2 (2%)	56	73
5	L	102/102 (100%)	102 (100%)	0	100	100
6	N	99/100 (99%)	99 (100%)	0	100	100
7	O	86/86 (100%)	86 (100%)	0	100	100
8	Q	89/89 (100%)	89 (100%)	0	100	100
9	R	84/84 (100%)	83 (99%)	1 (1%)	67	79
10	T	80/80 (100%)	80 (100%)	0	100	100
11	U	83/83 (100%)	82 (99%)	1 (1%)	67	79
12	V	78/78 (100%)	77 (99%)	1 (1%)	65	77
13	W	57/57 (100%)	56 (98%)	1 (2%)	54	71
14	Y	55/55 (100%)	55 (100%)	0	100	100
15	Z	48/48 (100%)	48 (100%)	0	100	100
17	D	134/164 (82%)	132 (98%)	2 (2%)	60	75
18	E	146/165 (88%)	144 (99%)	2 (1%)	62	76
19	y	17/17 (100%)	16 (94%)	1 (6%)	16	38

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1452/1510 (96%)	1436 (99%)	16 (1%)	69 80

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	F	7	TYR
3	F	29	ARG
3	F	51	ASN
3	F	79	ARG
3	F	144	LYS
4	J	96	ARG
4	J	99	ARG
9	R	22	LEU
11	U	98	ASN
12	V	42	LEU
13	W	65	PHE
17	D	11	MET
17	D	33	ARG
18	E	19	PHE
18	E	163	ASN
19	y	17	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
4	J	80	HIS
5	L	99	ASN
6	N	107	ASN
8	Q	70	GLN
9	R	18	GLN
18	E	94	GLN
19	y	3	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	A	1981/2903 (68%)	428 (21%)	17 (0%)
2	B	119/120 (99%)	14 (11%)	2 (1%)
All	All	2100/3023 (69%)	442 (21%)	19 (0%)

All (442) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	4	C
2	B	12	C
2	B	13	G
2	B	35	C
2	B	41	G
2	B	42	C
2	B	44	G
2	B	45	A
2	B	53	A
2	B	66	A
2	B	67	G
2	B	89	U
2	B	90	C
2	B	109	A
16	A	10	A
16	A	27	G
16	A	34	U
16	A	35	G
16	A	46	G
16	A	50	U
16	A	51	G
16	A	71	A
16	A	74	A
16	A	75	G
16	A	114	U
16	A	118	A
16	A	120	U
16	A	135	U
16	A	136	G
16	A	139	U
16	A	141	G
16	A	142	A
16	A	160	A
16	A	162	U
16	A	163	C
16	A	181	A
16	A	190	A
16	A	196	A
16	A	197	A
16	A	199	A
16	A	215	G
16	A	216	A

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Mol	Chain	Res	Type
16	A	221	A
16	A	222	A
16	A	225	C
16	A	228	C
16	A	232	G
16	A	242	G
16	A	243	U
16	A	248	G
16	A	255	A
16	A	266	G
16	A	267	C
16	A	272	A
16	A	275	C
16	A	277	G
16	A	278	A
16	A	294	A
16	A	304	U
16	A	307	G
16	A	310	A
16	A	322	A
16	A	323	C
16	A	324	A
16	A	329	G
16	A	330	A
16	A	345	A
16	A	350	G
16	A	362	A
16	A	371	A
16	A	372	G
16	A	373	U
16	A	384	A
16	A	386	G
16	A	387	U
16	A	388	G
16	A	401	A
16	A	404	A
16	A	406	G
16	A	411	G
16	A	412	A
16	A	417	C
16	A	424	G
16	A	429	A

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Mol	Chain	Res	Type
16	A	430	A
16	A	435	C
16	A	456	C
16	A	457	A
16	A	458	G
16	A	459	U
16	A	465	G
16	A	466	A
16	A	473	G
16	A	480	A
16	A	481	G
16	A	491	G
16	A	505	A
16	A	509	C
16	A	510	C
16	A	529	A
16	A	530	G
16	A	531	C
16	A	532	A
16	A	543	G
16	A	544	C
16	A	545	U
16	A	547	A
16	A	549	G
16	A	550	C
16	A	563	A
16	A	568	U
16	A	572	A
16	A	573	U
16	A	575	A
16	A	588	U
16	A	603	A
16	A	614	A
16	A	621	A
16	A	627	A
16	A	637	A
16	A	645	C
16	A	646	U
16	A	647	G
16	A	654	A
16	A	668	A
16	A	669	G

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Mol	Chain	Res	Type
16	A	670	A
16	A	671	C
16	A	675	A
16	A	684	G
16	A	801	G
16	A	805	G
16	A	812	C
16	A	819	A
16	A	827	U
16	A	828	U
16	A	830	G
16	A	845	A
16	A	846	U
16	A	847	U
16	A	856	G
16	A	857	G
16	A	910	A
16	A	914	G
16	A	918	A
16	A	931	U
16	A	932	U
16	A	941	A
16	A	946	C
16	A	952	G
16	A	953	G
16	A	957	C
16	A	959	A
16	A	961	C
16	A	973	A
16	A	974	G
16	A	981	A
16	A	983	A
16	A	985	C
16	A	995	C
16	A	996	A
16	A	1009	A
16	A	1012	U
16	A	1013	C
16	A	1021	A
16	A	1022	G
16	A	1023	U
16	A	1026	G

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Mol	Chain	Res	Type
16	A	1129	A
16	A	1132	U
16	A	1135	C
16	A	1143	A
16	A	1151	A
16	A	1157	G
16	A	1169	A
16	A	1171	G
16	A	1174	U
16	A	1175	A
16	A	1176	U
16	A	1178	C
16	A	1180	U
16	A	1206	G
16	A	1212	G
16	A	1225	G
16	A	1236	G
16	A	1250	G
16	A	1253	A
16	A	1255	U
16	A	1256	G
16	A	1263	U
16	A	1265	A
16	A	1266	G
16	A	1267	U
16	A	1269	A
16	A	1271	G
16	A	1272	A
16	A	1273	U
16	A	1274	A
16	A	1275	A
16	A	1280	G
16	A	1284	A
16	A	1288	G
16	A	1289	C
16	A	1300	G
16	A	1301	A
16	A	1306	C
16	A	1307	A
16	A	1312	U
16	A	1315	C
16	A	1320	C

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Mol	Chain	Res	Type
16	A	1321	A
16	A	1325	U
16	A	1327	A
16	A	1329	U
16	A	1332	G
16	A	1333	G
16	A	1334	G
16	A	1340	U
16	A	1341	G
16	A	1343	G
16	A	1345	C
16	A	1352	U
16	A	1355	G
16	A	1356	G
16	A	1359	A
16	A	1361	G
16	A	1362	C
16	A	1365	A
16	A	1374	G
16	A	1379	U
16	A	1380	G
16	A	1383	A
16	A	1386	C
16	A	1391	U
16	A	1394	U
16	A	1395	A
16	A	1397	U
16	A	1400	U
16	A	1403	A
16	A	1404	C
16	A	1407	G
16	A	1413	A
16	A	1416	G
16	A	1419	A
16	A	1420	A
16	A	1421	G
16	A	1427	A
16	A	1428	C
16	A	1432	G
16	A	1434	A
16	A	1436	G
16	A	1445	G

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Mol	Chain	Res	Type
16	A	1449	G
16	A	1450	G
16	A	1452	G
16	A	1453	A
16	A	1454	C
16	A	1458	U
16	A	1459	G
16	A	1461	C
16	A	1467	U
16	A	1468	U
16	A	1469	A
16	A	1473	G
16	A	1474	U
16	A	1475	G
16	A	1478	G
16	A	1480	C
16	A	1482	G
16	A	1483	G
16	A	1484	U
16	A	1486	U
16	A	1493	C
16	A	1495	A
16	A	1497	U
16	A	1498	C
16	A	1501	G
16	A	1504	A
16	A	1508	A
16	A	1509	A
16	A	1515	A
16	A	1516	G
16	A	1519	G
16	A	1528	A
16	A	1529	G
16	A	1532	A
16	A	1535	A
16	A	1536	C
16	A	1537	G
16	A	1542	U
16	A	1546	G
16	A	1548	A
16	A	1553	A
16	A	1554	U

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Mol	Chain	Res	Type
16	A	1555	G
16	A	1558	C
16	A	1559	U
16	A	1560	G
16	A	1563	U
16	A	1566	A
16	A	1567	G
16	A	1569	A
16	A	1575	C
16	A	1576	U
16	A	1578	U
16	A	1579	A
16	A	1583	A
16	A	1584	U
16	A	1585	C
16	A	1592	C
16	A	1593	A
16	A	1596	A
16	A	1597	A
16	A	1598	A
16	A	1603	A
16	A	1607	C
16	A	1608	A
16	A	1613	G
16	A	1614	A
16	A	1615	C
16	A	1616	A
16	A	1618	A
16	A	1619	G
16	A	1620	G
16	A	1622	G
16	A	1627	G
16	A	1628	G
16	A	1634	A
16	A	1635	A
16	A	1636	U
16	A	1637	A
16	A	1644	C
16	A	1647	U
16	A	1648	U
16	A	1649	G
16	A	1650	A

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Mol	Chain	Res	Type
16	A	1651	G
16	A	1652	A
16	A	1653	G
16	A	1654	A
16	A	1656	C
16	A	1657	U
16	A	1660	G
16	A	1662	U
16	A	1663	G
16	A	1664	A
16	A	1666	G
16	A	1667	G
16	A	1992	G
16	A	1993	U
16	A	1997	C
16	A	1998	A
16	A	2003	A
16	A	2004	G
16	A	2006	C
16	A	2007	U
16	A	2008	C
16	A	2009	A
16	A	2011	U
16	A	2012	G
16	A	2013	A
16	A	2015	A
16	A	2022	U
16	A	2023	C
16	A	2030	A
16	A	2031	A
16	A	2043	C
16	A	2052	A
16	A	2250	G
16	A	2251	G
16	A	2266	A
16	A	2279	G
16	A	2283	C
16	A	2286	G
16	A	2287	A
16	A	2297	A
16	A	2305	U
16	A	2309	A

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Mol	Chain	Res	Type
16	A	2319	G
16	A	2327	A
16	A	2333	A
16	A	2334	U
16	A	2335	A
16	A	2336	A
16	A	2343	U
16	A	2350	C
16	A	2383	G
16	A	2385	C
16	A	2388	A
16	A	2402	U
16	A	2407	A
16	A	2422	C
16	A	2424	C
16	A	2425	A
16	A	2429	G
16	A	2430	A
16	A	2434	A
16	A	2435	A
16	A	2441	U
16	A	2448	A
16	A	2449	U
16	A	2615	U
16	A	2629	U
16	A	2630	G
16	A	2646	C
16	A	2647	U
16	A	2655	G
16	A	2656	U
16	A	2682	A
16	A	2689	U
16	A	2690	U
16	A	2714	G
16	A	2726	A
16	A	2732	G
16	A	2733	A
16	A	2744	G
16	A	2748	A
16	A	2764	A
16	A	2765	A
16	A	2778	A

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Mol	Chain	Res	Type
16	A	2779	U
16	A	2780	G
16	A	2791	G
16	A	2794	C
16	A	2799	A
16	A	2800	A
16	A	2809	A
16	A	2818	U
16	A	2820	A
16	A	2833	U
16	A	2835	A
16	A	2849	U
16	A	2867	G
16	A	2872	A
16	A	2873	A
16	A	2880	C
16	A	2883	A
16	A	2893	A
16	A	2894	G
16	A	2901	C
16	A	2902	C
16	A	2903	U

All (19) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	52	A
2	B	66	A
16	A	227	A
16	A	242	G
16	A	372	G
16	A	458	G
16	A	548	G
16	A	549	G
16	A	644	A
16	A	1020	A
16	A	1022	G
16	A	1319	C
16	A	1358	G
16	A	1427	A
16	A	1534	U
16	A	2010	G

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Mol	Chain	Res	Type
16	A	2318	G
16	A	2326	C
16	A	2655	G

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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

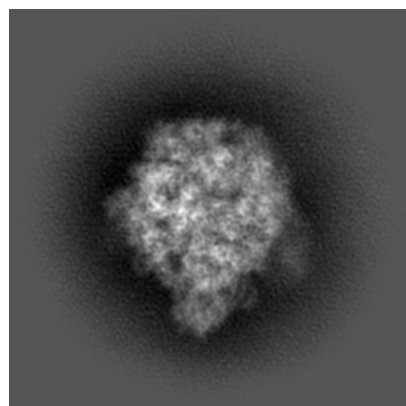
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-51979. These allow visual inspection of the internal detail of the map and identification of artifacts.

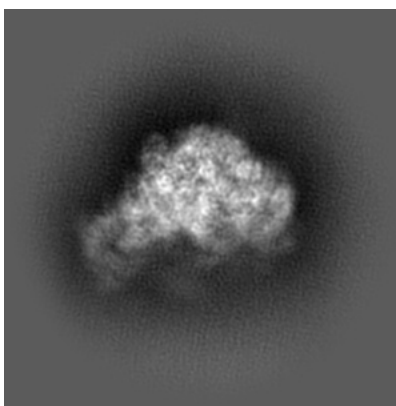
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

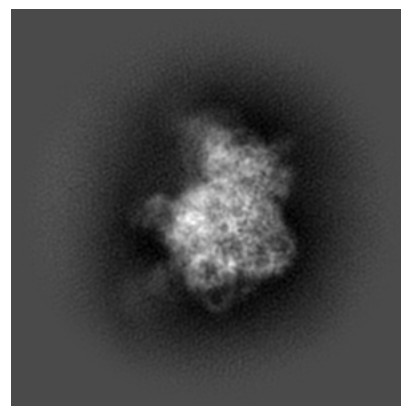
6.1.1 Primary map



X

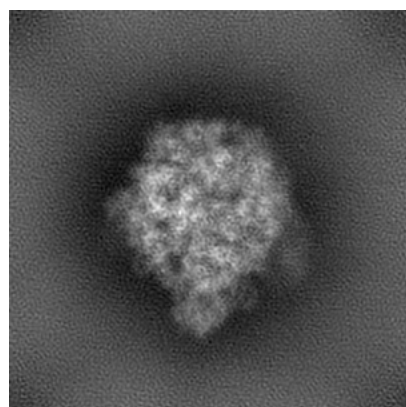


Y

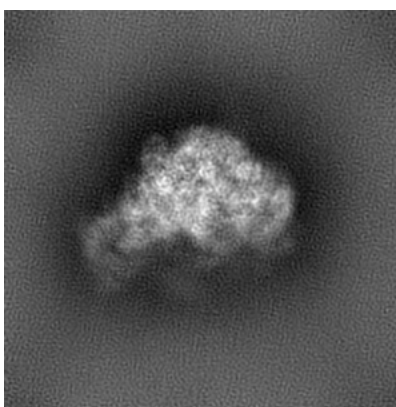


Z

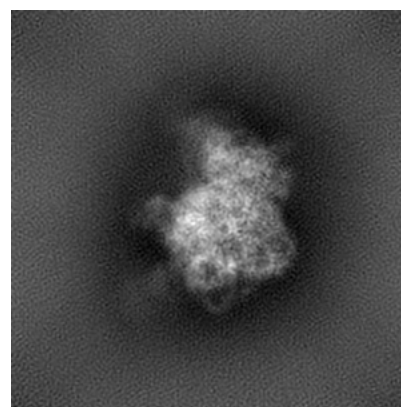
6.1.2 Raw map



X



Y

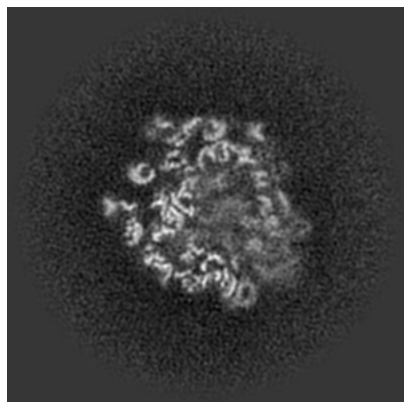


Z

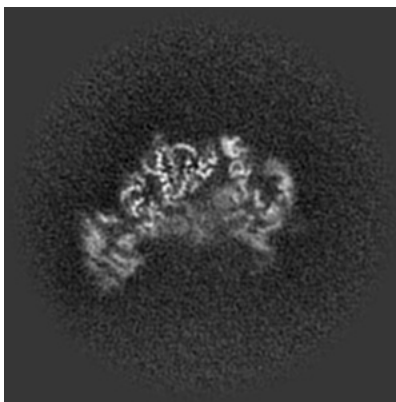
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

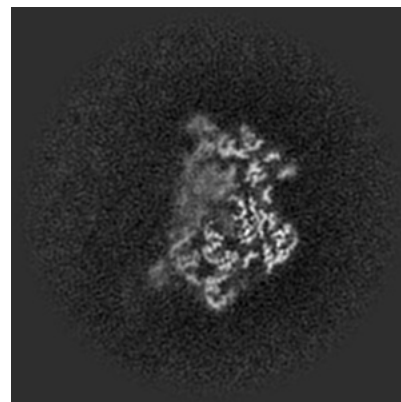
6.2.1 Primary map



X Index: 100

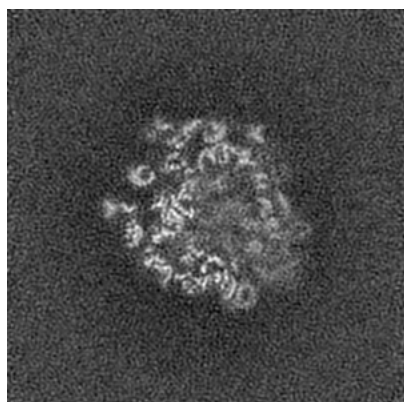


Y Index: 100

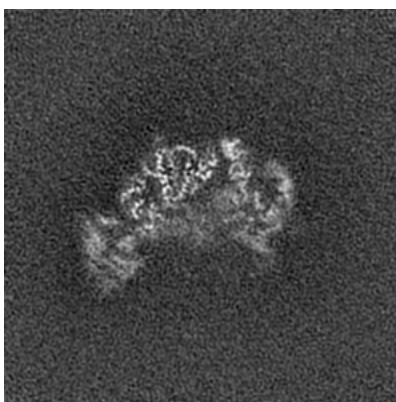


Z Index: 100

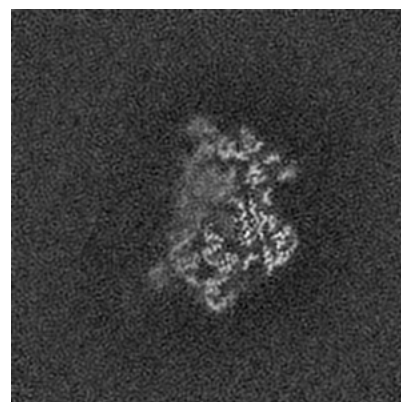
6.2.2 Raw map



X Index: 100



Y Index: 100

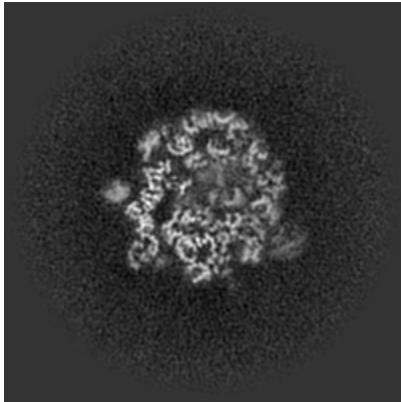


Z Index: 100

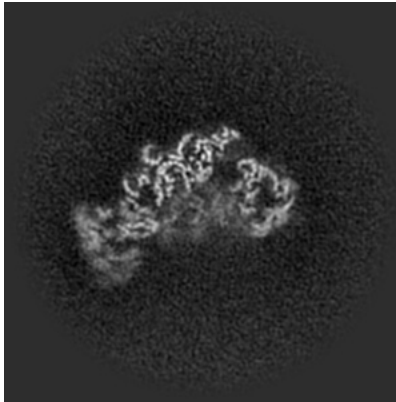
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

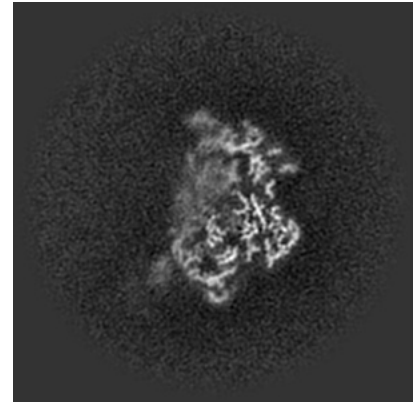
6.3.1 Primary map



X Index: 109

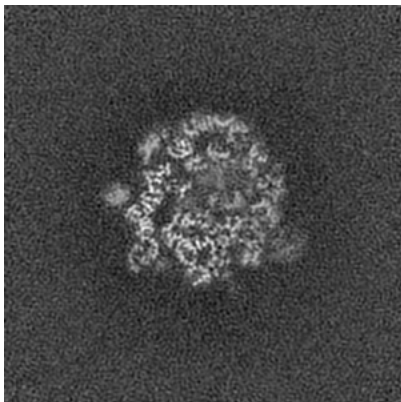


Y Index: 95

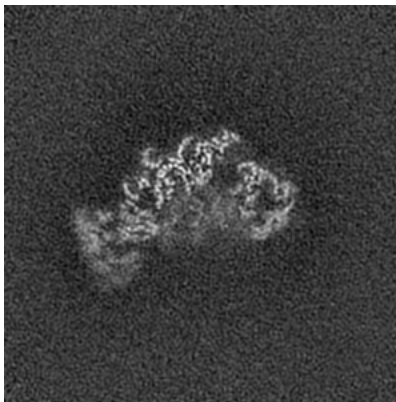


Z Index: 99

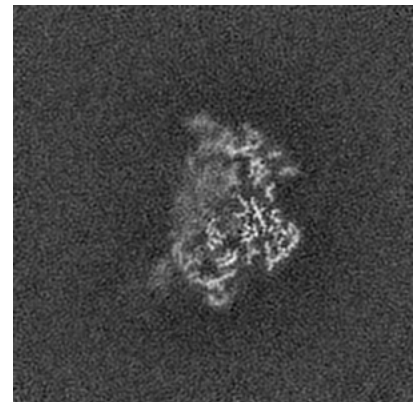
6.3.2 Raw map



X Index: 109



Y Index: 95

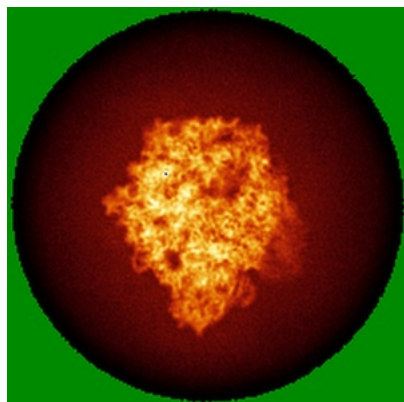


Z Index: 99

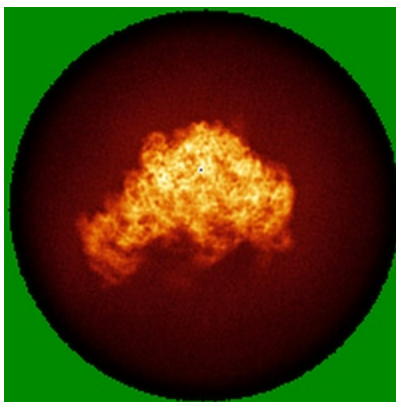
The images above show the largest variance slices of the map in three orthogonal directions.

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

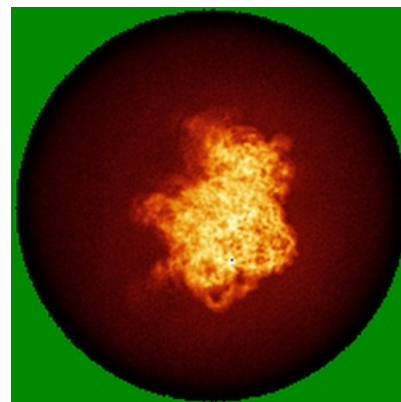
6.4.1 Primary map



X

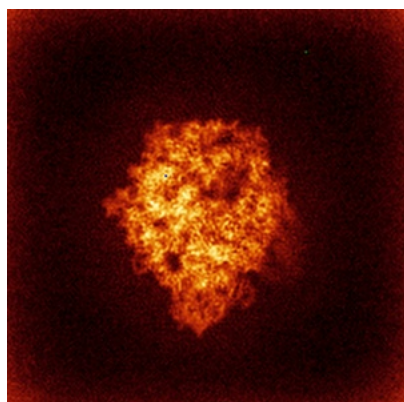


Y

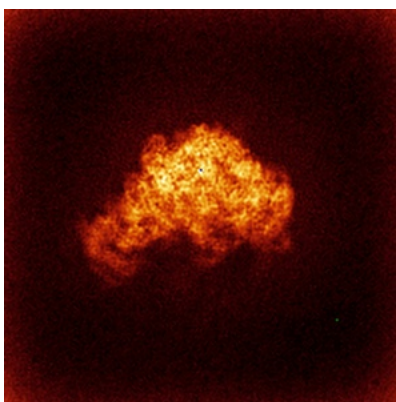


Z

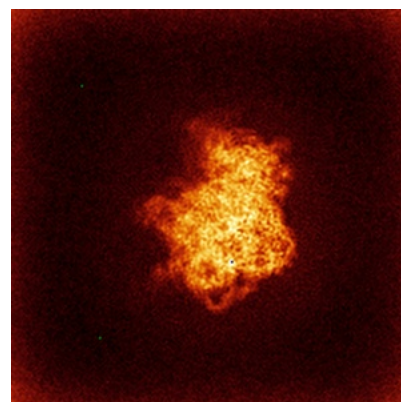
6.4.2 Raw map



X



Y

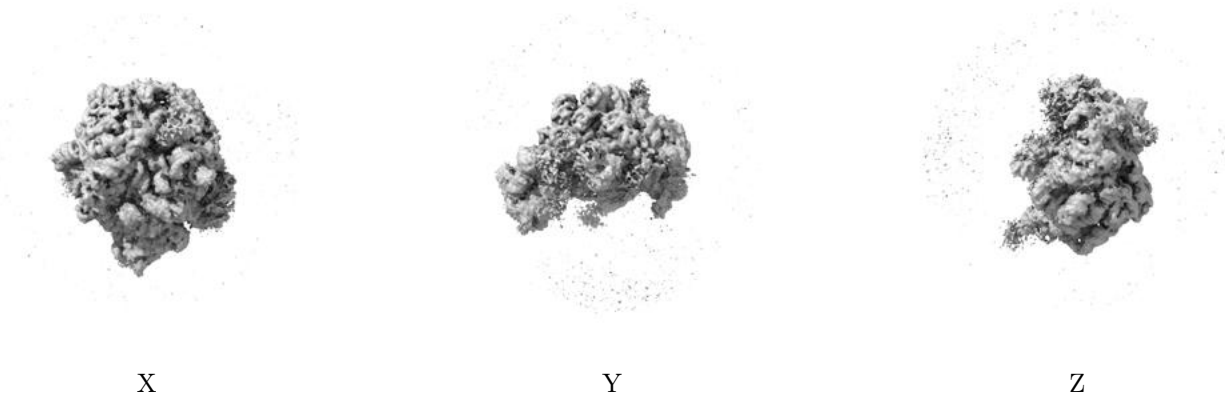


Z

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.

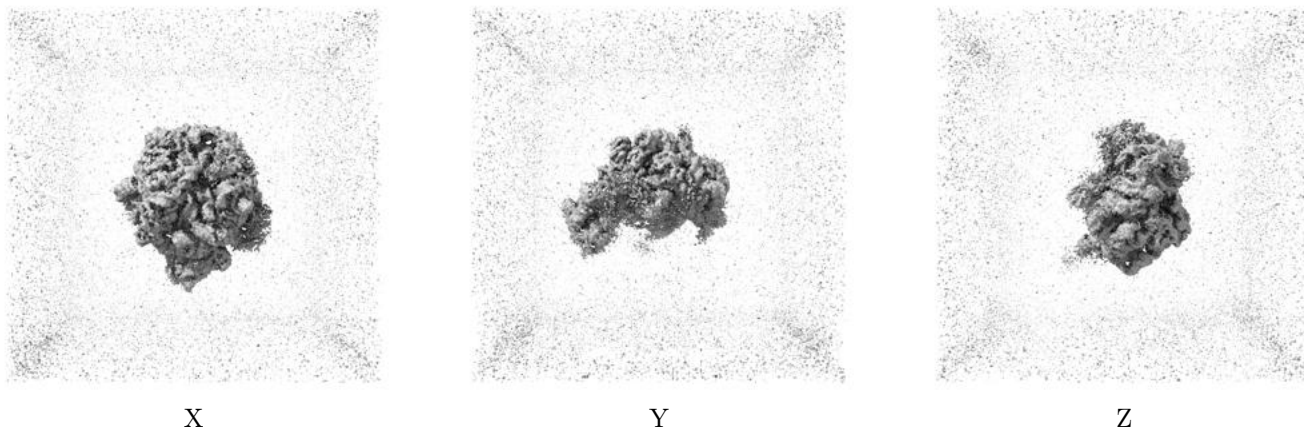
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.255. 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.

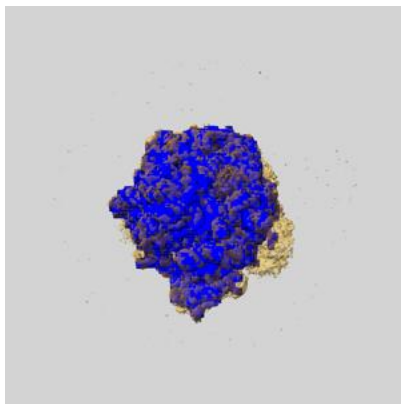
6.6 Mask visualisation [i](#)

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

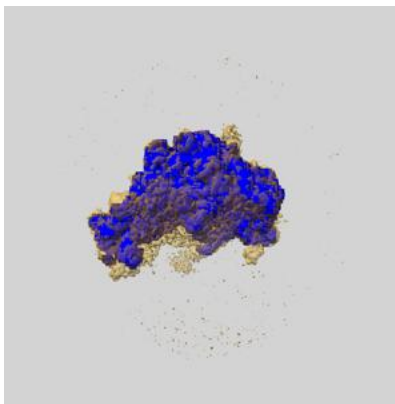
A mask typically either:

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

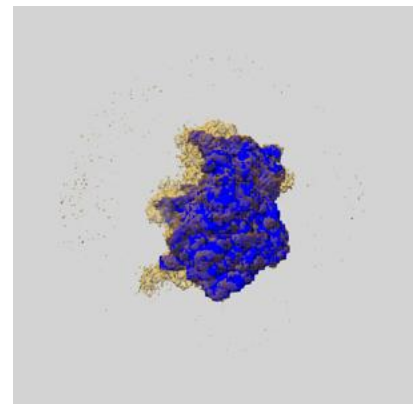
6.6.1 emd_51979_msk_1.map [i](#)



X



Y

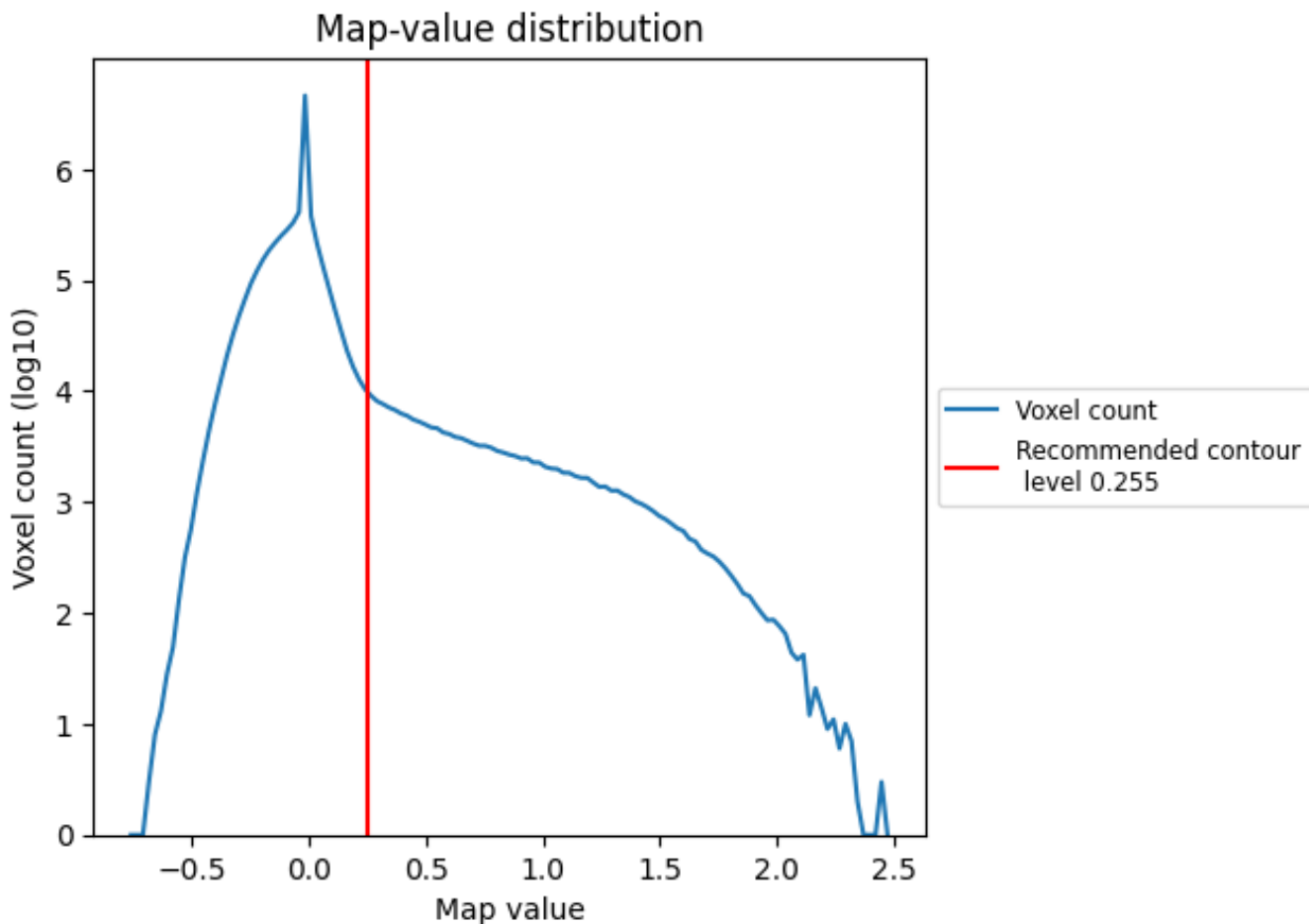


Z

7 Map analysis [i](#)

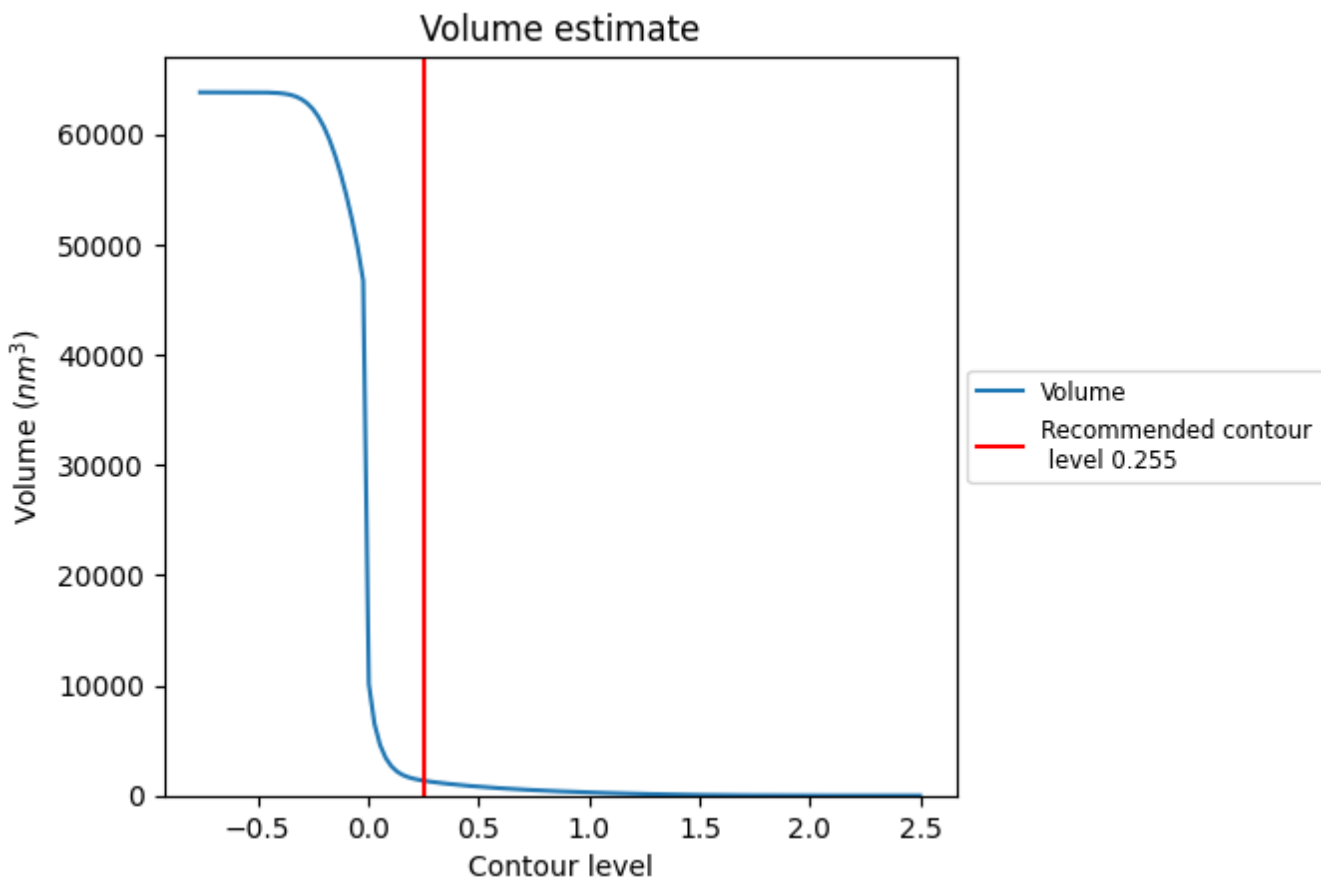
This section contains the results of statistical analysis of the map.

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.

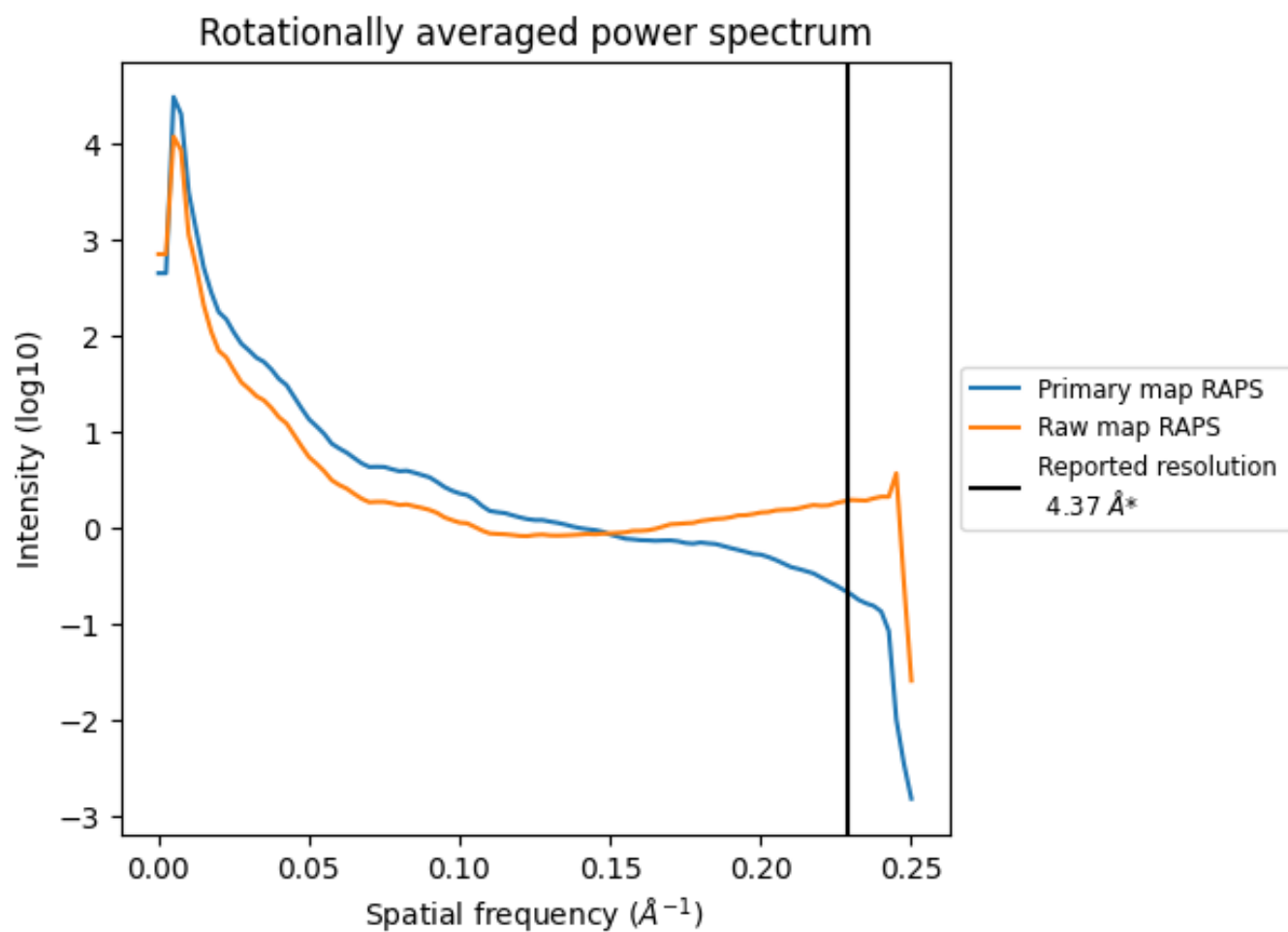
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1342 nm^3 ; this corresponds to an approximate mass of 1212 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

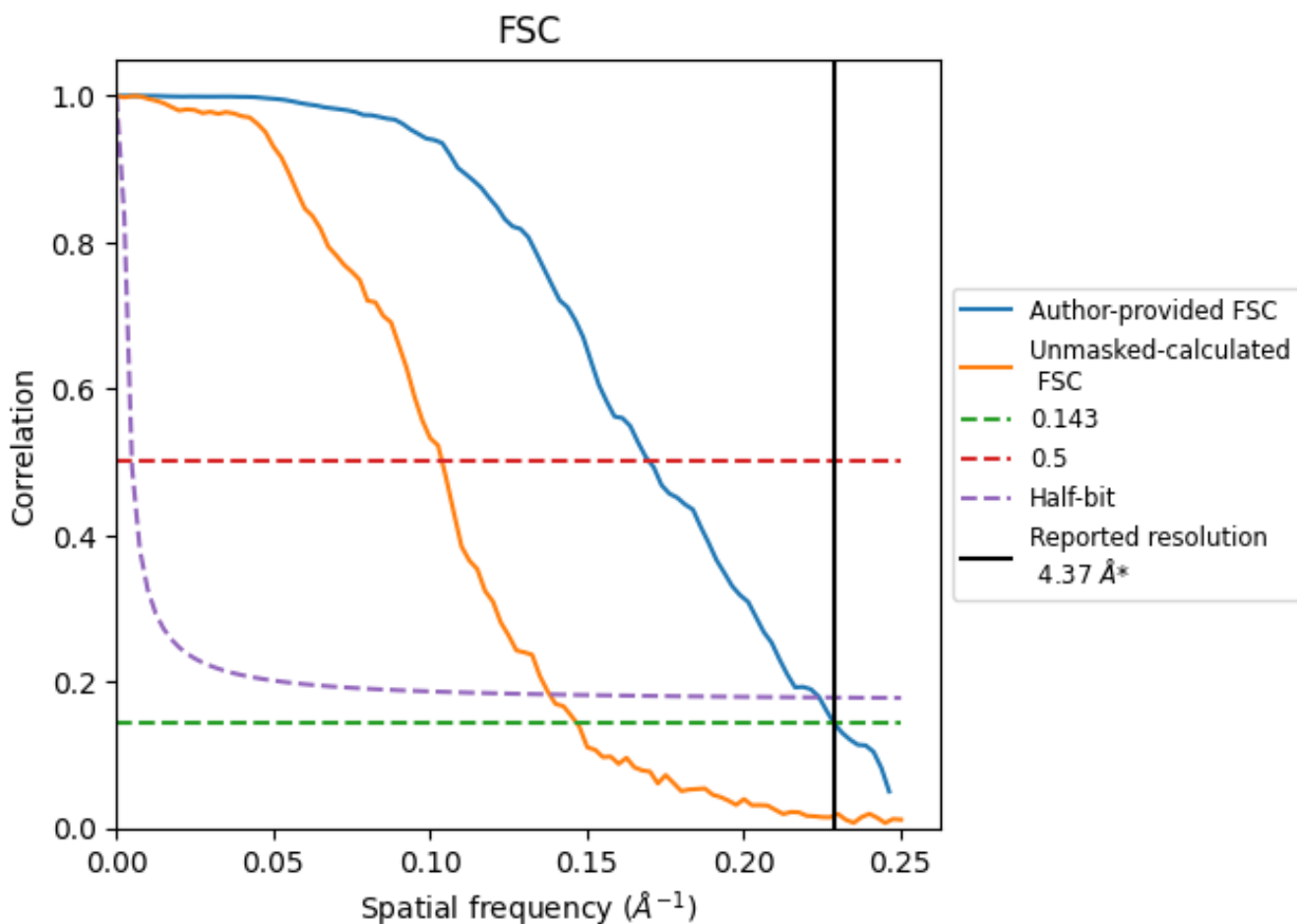


*Reported resolution corresponds to spatial frequency of 0.229 Å⁻¹

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 0.229 Å⁻¹

8.2 Resolution estimates [i](#)

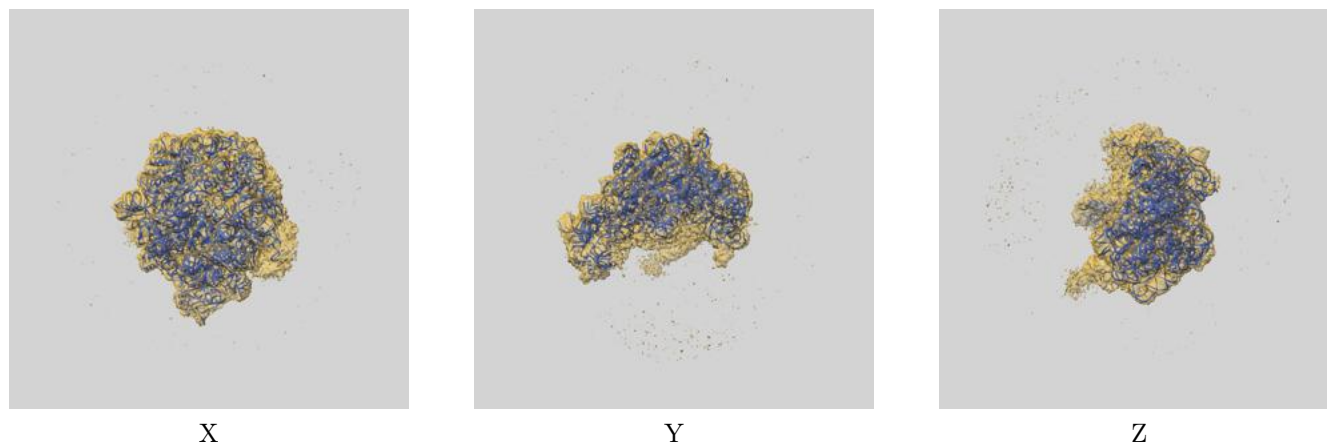
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.37	-	-
Author-provided FSC curve	4.37	5.88	4.46
Unmasked-calculated*	6.81	9.62	7.24

*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 6.81 differs from the reported value 4.37 by more than 10 %

9 Map-model fit [i](#)

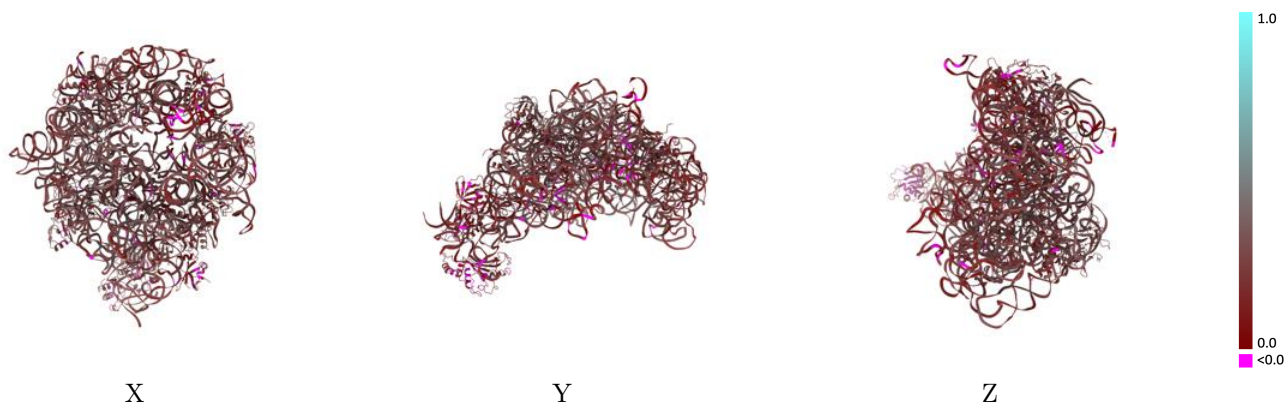
This section contains information regarding the fit between EMDB map EMD-51979 and PDB model 9HA7. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay [i](#)



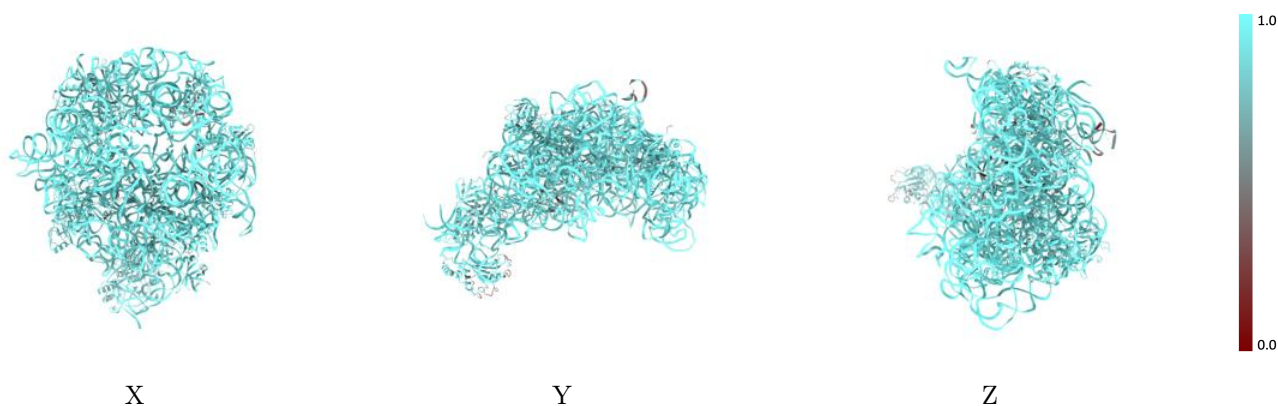
The images above show the 3D surface view of the map at the recommended contour level 0.255 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



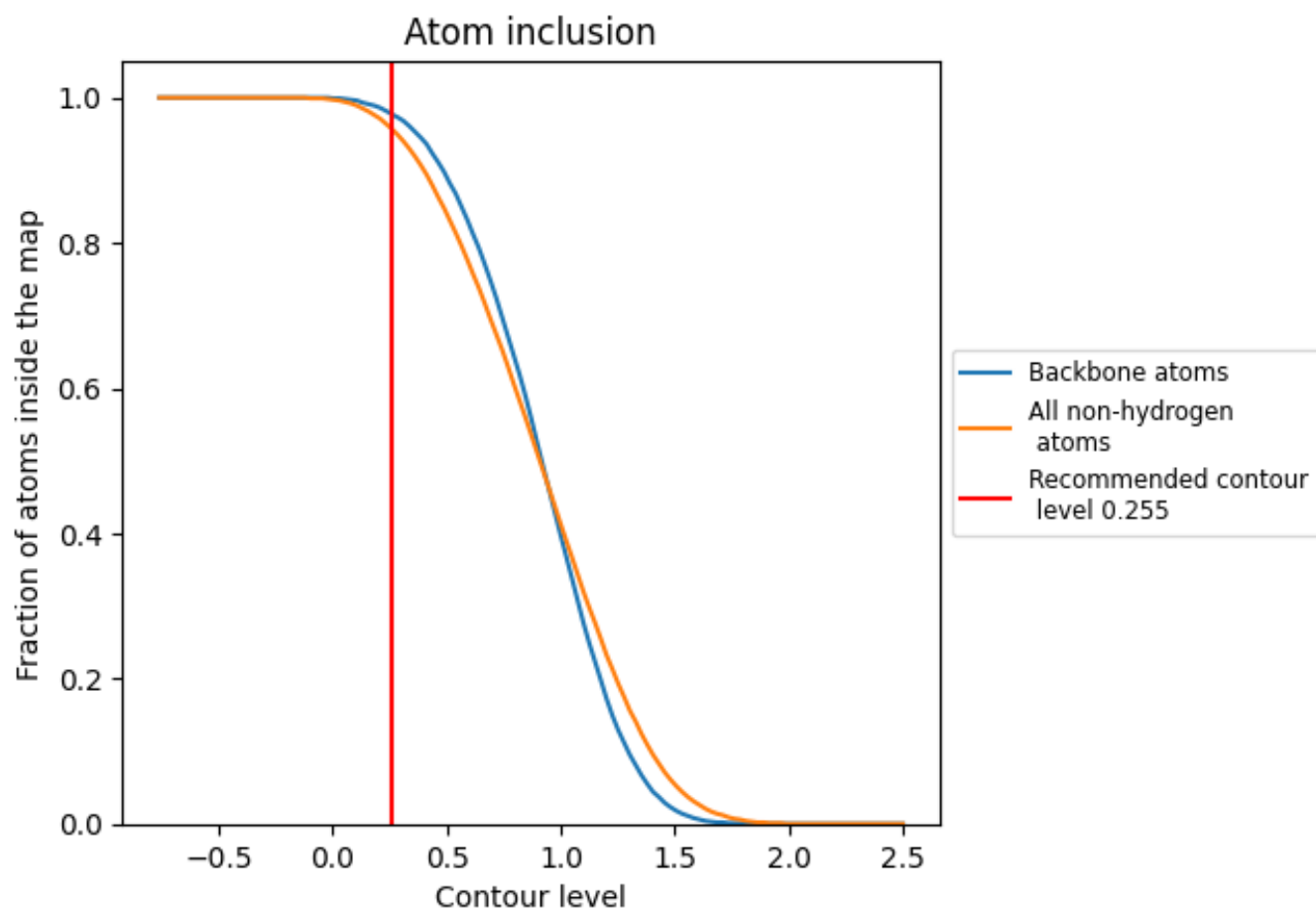
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.255).









































9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 96% 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 (0.255) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9580	 0.2430
2	 0.9030	 0.2520
A	 0.9810	 0.2550
B	 0.9760	 0.1940
D	 0.8870	 0.1710
E	 0.8960	 0.2690
F	 0.8030	 0.1160
J	 0.9370	 0.2770
L	 0.8130	 0.1800
N	 0.8760	 0.1920
O	 0.9300	 0.1730
Q	 0.9350	 0.2620
R	 0.9250	 0.3000
T	 0.8890	 0.2500
U	 0.9330	 0.2920
V	 0.8560	 0.1370
W	 0.9120	 0.2270
Y	 0.8790	 0.2260
Z	 0.9290	 0.2440
y	 0.4100	 0.0950

