Full wwPDB EM Validation Report ⓘ

Dec 11, 2022 – 12:48 pm GMT

PDB ID	:	6SPE
EMDB ID	:	EMD-10283
Title	:	Pseudomonas aeruginosa 30s ribosome from a clinical isolate
Authors	:	Halfon, Y.; Jimenez-Fernande, A.; La Ros, R.; Espinos, R.; Krogh Johansen, H.; Matzov, D.; Eyal, Z.; Bashan, A.; Zimmerman, E.; Belousoff, M.; Molin, S.; Yonath, A.
Deposited on	:	2019-09-01
Resolution	:	3.60 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:

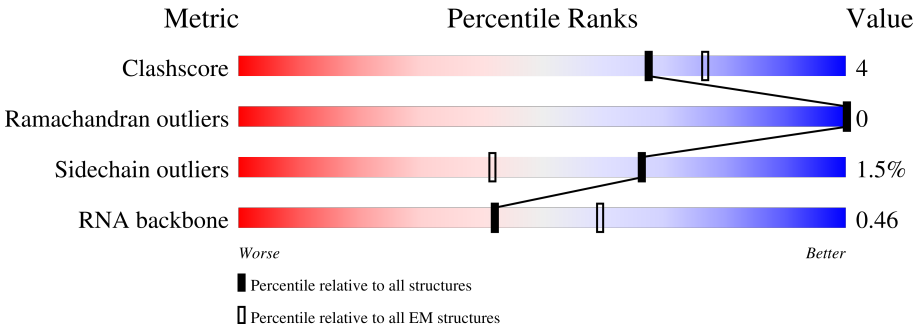
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.3

1 Overall quality at a glance

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

The reported resolution of this entry is 3.60 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	a	1526	74% 25%
2	b	239	13% 97%
3	c	205	100%
4	d	205	99%
5	e	156	98%
6	f	105	99%
7	g	154	99%

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Mol	Chain	Length	Quality of chain
8	h	129	100%
9	i	126	98%
10	j	96	96%
11	k	115	100%
12	l	121	97%
13	m	110	96%
14	n	98	100%
15	o	86	100%
16	p	78	100%
17	q	76	96%
18	r	71	97%
19	s	80	99%
20	t	85	99%
21	u	63	97%

2 Entry composition (i)

There are 21 unique types of molecules in this entry. The entry contains 51429 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	a	1526	32744	14606	6011	10602	1525	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
a	72	A	G	conflict	GB 1353913695

- Molecule 2 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	b	234	1822	1145	329	338	10	0	0

- Molecule 3 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	c	205	1627	1028	307	287	5	0	0

- Molecule 4 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	d	205	1603	991	311	296	5	0	0

- Molecule 5 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	e	156	1145	720	209	210	6	0	0

- Molecule 6 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	f	105	Total	C	N	O	S	0	0
			853	531	158	159	5		

- Molecule 7 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	g	154	Total	C	N	O	S	0	0
			1190	747	227	211	5		

- Molecule 8 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	h	129	Total	C	N	O	S	0	0
			982	618	173	185	6		

- Molecule 9 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	i	126	Total	C	N	O	S	0	0
			994	616	198	179	1		

- Molecule 10 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	j	96	Total	C	N	O	S	0	0
			765	479	143	142	1		

- Molecule 11 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	k	115	Total	C	N	O	S	0	0
			838	517	163	156	2		

- Molecule 12 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	l	121	Total	C	N	O	S	0	0
			949	582	196	167	4		

- Molecule 13 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	m	110	Total	C	N	O	S	0	0
			859	524	174	157	4		

- Molecule 14 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	n	98	Total	C	N	O	S	0	0
			778	479	163	133	3		

- Molecule 15 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	o	86	Total	C	N	O	S	0	0
			686	425	134	126	1		

- Molecule 16 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	p	78	Total	C	N	O	0	0
			610	381	121	108		

- Molecule 17 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	q	76	Total	C	N	O	S	0	0
			619	387	120	110	2		

- Molecule 18 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	r	71	Total	C	N	O	S	0	0
			556	355	103	97	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
r	9	ARG	LYS	conflict	UNP A0A2V3DLV3

- Molecule 19 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	s	80	Total	C	N	O	S	0	0
			635	405	121	106	3		

- Molecule 20 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	t	85	Total	C	N	O	S	0	0
			655	404	135	114	2		

- Molecule 21 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	u	62	Total	C	N	O	S	0	0
			519	320	112	86	1		

There is a discrepancy between the modelled and reference sequences:

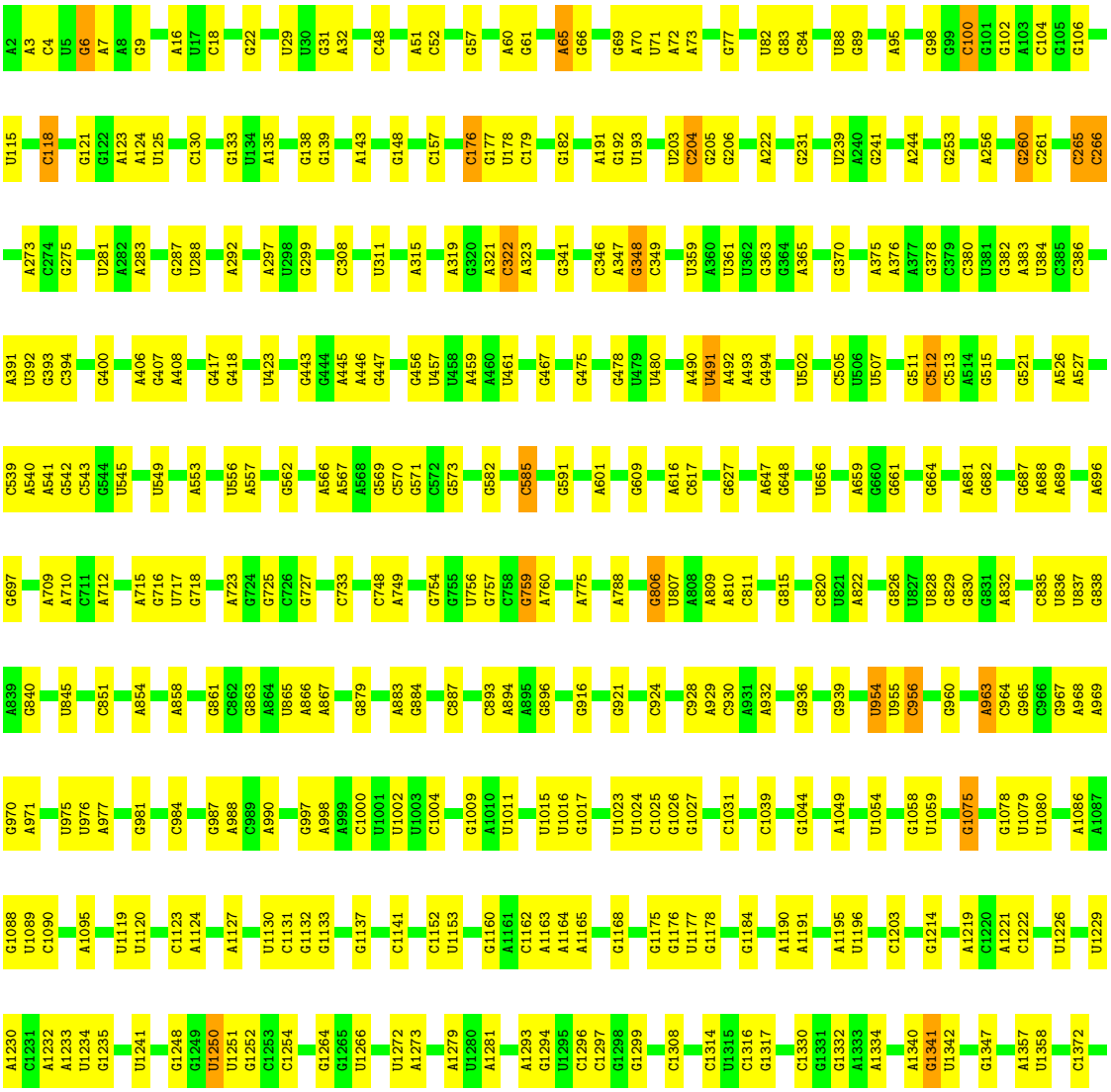
Chain	Residue	Modelled	Actual	Comment	Reference
u	28	ALA	VAL	conflict	UNP A0A069QC99

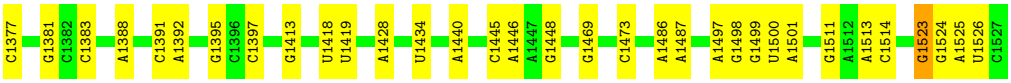
3 Residue-property plots (i)

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: 16S ribosomal RNA

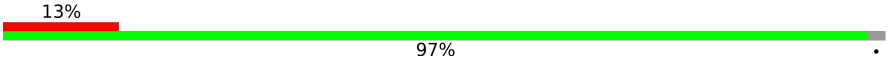
Chain a:

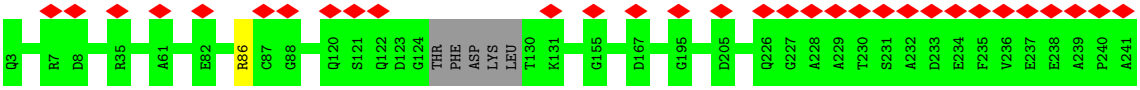




• Molecule 2: 30S ribosomal protein S2

Chain b:





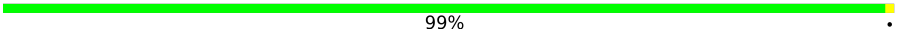
• Molecule 3: 30S ribosomal protein S3

Chain c:

There are no outlier residues recorded for this chain.

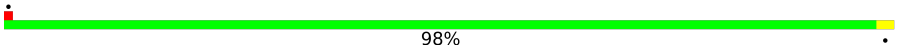
• Molecule 4: 30S ribosomal protein S4

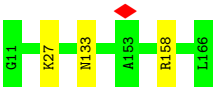
Chain d:



• Molecule 5: 30S ribosomal protein S5

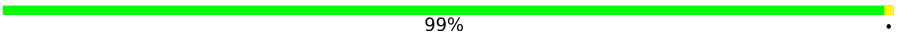
Chain e:





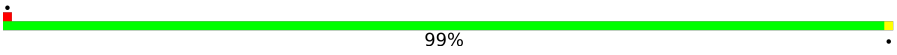
• Molecule 6: 30S ribosomal protein S6

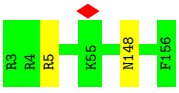
Chain f:



• Molecule 7: 30S ribosomal protein S7

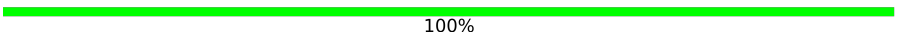
Chain g:





• Molecule 8: 30S ribosomal protein S8

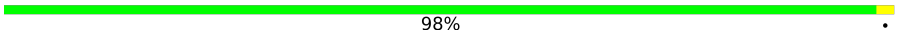
Chain h:



There are no outlier residues recorded for this chain.

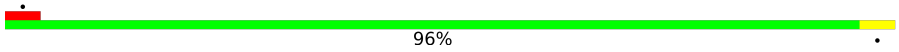
• Molecule 9: 30S ribosomal protein S9

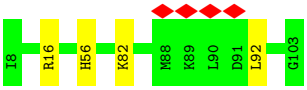
Chain i:



• Molecule 10: 30S ribosomal protein S10

Chain j:





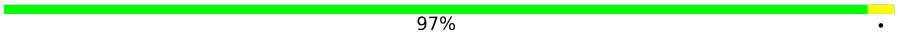
• Molecule 11: 30S ribosomal protein S11

Chain k:

There are no outlier residues recorded for this chain.

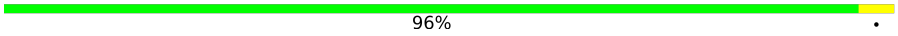
• Molecule 12: 30S ribosomal protein S12

Chain l:



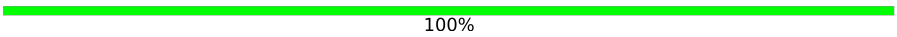
• Molecule 13: 30S ribosomal protein S13

Chain m:



• Molecule 14: 30S ribosomal protein S14

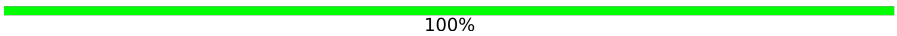
Chain n:



There are no outlier residues recorded for this chain.

• Molecule 15: 30S ribosomal protein S15

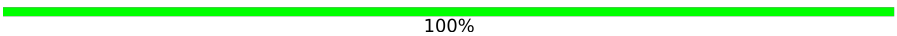
Chain o:



There are no outlier residues recorded for this chain.

• Molecule 16: 30S ribosomal protein S16

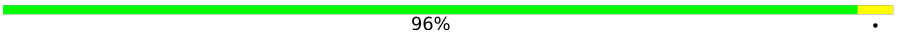
Chain p:

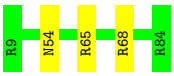


There are no outlier residues recorded for this chain.

• Molecule 17: 30S ribosomal protein S17

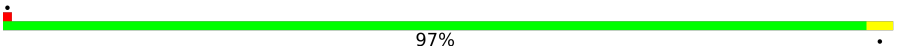
Chain q:

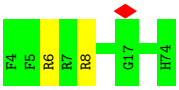




• Molecule 18: 30S ribosomal protein S18

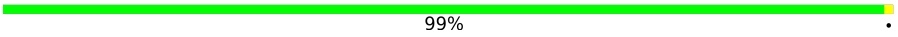
Chain r:





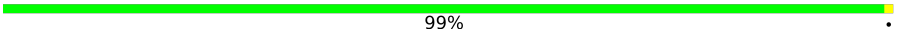
• Molecule 19: 30S ribosomal protein S19

Chain s:



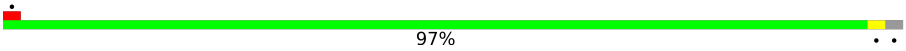
• Molecule 20: 30S ribosomal protein S20

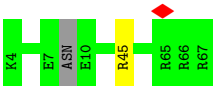
Chain t:



• Molecule 21: 30S ribosomal protein S21

Chain u:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	128795	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	1.0	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.351	Depositor
Minimum map value	-0.120	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.028	Depositor
Map size (Å)	440.0, 440.0, 440.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality

5.1 Standard geometry

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	a	0.86	0/36667	1.02	112/57202 (0.2%)
2	b	0.30	0/1850	0.53	0/2486
3	c	0.36	0/1656	0.58	0/2232
4	d	0.40	0/1622	0.55	0/2171
5	e	0.44	0/1159	0.63	0/1559
6	f	0.38	0/867	0.53	0/1167
7	g	0.30	0/1207	0.52	0/1616
8	h	0.42	0/993	0.54	0/1332
9	i	0.36	0/1006	0.57	0/1347
10	j	0.35	0/775	0.58	1/1046 (0.1%)
11	k	0.36	0/854	0.51	0/1159
12	l	0.42	0/963	0.65	2/1292 (0.2%)
13	m	0.29	0/867	0.54	0/1165
14	n	0.35	0/788	0.53	0/1048
15	o	0.37	0/693	0.50	0/926
16	p	0.46	0/621	0.57	0/837
17	q	0.44	0/627	0.59	0/844
18	r	0.40	0/566	0.55	0/763
19	s	0.30	0/649	0.54	0/874
20	t	0.35	0/662	0.50	0/881
21	u	0.35	0/524	0.48	0/689
All	All	0.73	0/55616	0.90	115/82636 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
10	j	0	1

There are no bond length outliers.

All (115) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	a	104	C	C2-N1-C1'	9.77	129.54	118.80
1	a	975	U	N1-C2-O2	8.85	129.00	122.80
1	a	806	G	N3-C4-N9	8.75	131.25	126.00
1	a	203	U	C2-N1-C1'	8.73	128.17	117.70
1	a	975	U	N3-C2-O2	-8.67	116.13	122.20
1	a	203	U	N1-C2-O2	8.52	128.76	122.80
1	a	203	U	N3-C2-O2	-8.51	116.25	122.20
1	a	806	G	N3-C4-C5	-8.25	124.47	128.60
1	a	104	C	C6-N1-C2	-7.76	117.20	120.30
1	a	6	G	C4-N9-C1'	7.39	136.11	126.50
1	a	6	G	N3-C4-N9	7.31	130.38	126.00
1	a	975	U	C2-N1-C1'	7.18	126.31	117.70
1	a	266	C	C5-C6-N1	7.16	124.58	121.00
1	a	130	C	N3-C2-O2	-7.10	116.93	121.90
1	a	104	C	N3-C2-O2	-7.10	116.93	121.90
1	a	130	C	N1-C2-O2	7.02	123.11	118.90
1	a	6	G	N3-C4-C5	-7.01	125.09	128.60
1	a	266	C	C6-N1-C2	-7.01	117.50	120.30
12	l	24	LEU	CA-CB-CG	6.96	131.30	115.30
1	a	963	A	P-O3'-C3'	6.88	127.96	119.70
1	a	130	C	C6-N1-C2	-6.81	117.58	120.30
1	a	806	G	C2-N3-C4	6.70	115.25	111.90
1	a	987	G	C4-N9-C1'	6.64	135.13	126.50
1	a	104	C	N1-C2-O2	6.60	122.86	118.90
1	a	1250	U	N3-C2-O2	-6.60	117.58	122.20
1	a	1195	A	P-O3'-C3'	6.56	127.57	119.70
1	a	6	G	C8-N9-C1'	-6.47	118.59	127.00
1	a	319	A	C2-N3-C4	6.45	113.83	110.60
1	a	759	G	C6-C5-N7	-6.45	126.53	130.40
1	a	963	A	OP1-P-O3'	6.44	119.37	105.20
1	a	176	C	N1-C2-O2	6.44	122.76	118.90
1	a	1341	G	P-O3'-C3'	6.36	127.34	119.70
1	a	383	A	N1-C6-N6	6.36	122.42	118.60
1	a	104	C	C6-N1-C1'	-6.28	113.26	120.80
1	a	1308	C	N1-C2-O2	6.27	122.66	118.90
1	a	984	C	N1-C2-O2	6.25	122.65	118.90
1	a	585	C	N1-C2-O2	6.22	122.63	118.90
1	a	4	C	C6-N1-C2	-6.07	117.87	120.30
1	a	759	G	C8-N9-C4	-6.03	103.99	106.40
1	a	987	G	N3-C4-N9	6.03	129.62	126.00
1	a	370	G	O4'-C1'-N9	6.00	113.00	108.20
1	a	893	C	P-O3'-C3'	5.95	126.84	119.70
1	a	319	A	N3-C4-C5	-5.93	122.65	126.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	a	954	U	P-O3'-C3'	5.92	126.80	119.70
1	a	1250	U	C2-N1-C1'	5.90	124.78	117.70
1	a	617	C	C6-N1-C2	-5.90	117.94	120.30
1	a	851	C	N1-C2-O2	5.89	122.43	118.90
1	a	1250	U	N1-C2-O2	5.87	126.91	122.80
1	a	759	G	N3-C4-C5	-5.87	125.67	128.60
1	a	748	C	C2-N1-C1'	5.86	125.25	118.80
1	a	65	A	C2-N3-C4	5.85	113.53	110.60
1	a	347	A	O4'-C1'-N9	5.84	112.88	108.20
1	a	924	C	C6-N1-C2	-5.84	117.97	120.30
1	a	987	G	C8-N9-C1'	-5.79	119.48	127.00
1	a	370	G	C8-N9-C4	-5.77	104.09	106.40
1	a	265	C	OP1-P-O3'	5.76	117.87	105.20
1	a	976	U	N3-C2-O2	-5.72	118.19	122.20
1	a	100	C	C6-N1-C2	-5.70	118.02	120.30
1	a	319	A	C4-N9-C1'	5.68	136.53	126.30
1	a	322	C	P-O3'-C3'	5.66	126.49	119.70
1	a	806	G	C5-C6-N1	5.65	114.32	111.50
1	a	512	C	P-O3'-C3'	5.63	126.45	119.70
1	a	349	C	C6-N1-C2	-5.60	118.06	120.30
1	a	976	U	P-O3'-C3'	5.60	126.42	119.70
1	a	837	U	C2-N1-C1'	5.58	124.40	117.70
1	a	1233	A	P-O3'-C3'	5.58	126.40	119.70
1	a	956	C	C6-N1-C2	-5.55	118.08	120.30
1	a	1377	C	N1-C2-O2	5.54	122.22	118.90
1	a	319	A	N3-C4-N9	5.54	131.83	127.40
1	a	1024	U	C2-N1-C1'	5.50	124.30	117.70
1	a	348	G	C4-N9-C1'	5.49	133.64	126.50
1	a	617	C	C5-C6-N1	5.47	123.74	121.00
1	a	204	C	C2-N1-C1'	5.46	124.81	118.80
1	a	265	C	P-O3'-C3'	5.45	126.24	119.70
1	a	203	U	C6-N1-C1'	-5.44	113.58	121.20
1	a	311	U	N3-C2-O2	-5.43	118.40	122.20
1	a	359	U	C2-N1-C1'	5.42	124.21	117.70
1	a	829	G	O4'-C1'-N9	5.42	112.53	108.20
1	a	18	C	C6-N1-C2	-5.39	118.14	120.30
1	a	467	G	O4'-C1'-N9	5.39	112.51	108.20
1	a	176	C	C2-N1-C1'	5.37	124.71	118.80
1	a	1308	C	N3-C2-O2	-5.36	118.15	121.90
1	a	987	G	N3-C4-C5	-5.36	125.92	128.60
1	a	1316	C	C2-N1-C1'	5.35	124.69	118.80
1	a	585	C	C6-N1-C2	-5.33	118.17	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	a	930	C	N1-C2-O2	5.33	122.10	118.90
1	a	1266	U	N1-C2-O2	5.33	126.53	122.80
1	a	102	G	C4-C5-N7	5.32	112.93	110.80
1	a	1357	A	C4-N9-C1'	5.31	135.86	126.30
1	a	661	G	C4-N9-C1'	5.30	133.38	126.50
1	a	319	A	N7-C8-N9	5.29	116.45	113.80
1	a	1024	U	N1-C2-O2	5.29	126.50	122.80
1	a	1523	G	C4-N9-C1'	5.27	133.36	126.50
1	a	102	G	C4-N9-C1'	5.26	133.34	126.50
1	a	260	G	P-O3'-C3'	5.24	125.98	119.70
1	a	759	G	N3-C4-N9	5.23	129.14	126.00
1	a	100	C	N1-C2-O2	5.20	122.02	118.90
1	a	491	U	P-O3'-C3'	5.20	125.94	119.70
1	a	104	C	O4'-C1'-N1	5.17	112.34	108.20
12	l	24	LEU	CB-CG-CD2	-5.16	102.22	111.00
1	a	585	C	C5-C6-N1	5.16	123.58	121.00
1	a	956	C	C5-C6-N1	5.14	123.57	121.00
1	a	319	A	C8-N9-C4	-5.13	103.75	105.80
1	a	851	C	N3-C2-O2	-5.13	118.31	121.90
1	a	311	U	N1-C2-O2	5.12	126.39	122.80
1	a	130	C	C2-N1-C1'	5.12	124.43	118.80
1	a	1075	G	C4-C5-N7	5.12	112.85	110.80
1	a	118	C	C5-C6-N1	5.10	123.55	121.00
1	a	806	G	C4-N9-C1'	5.10	133.13	126.50
1	a	806	G	C8-N9-C1'	-5.09	120.38	127.00
1	a	104	C	C5-C6-N1	5.08	123.54	121.00
10	j	92	LEU	CA-CB-CG	5.07	126.96	115.30
1	a	984	C	N3-C2-O2	-5.04	118.37	121.90
1	a	102	G	C6-C5-N7	-5.04	127.38	130.40
1	a	828	U	N3-C2-O2	-5.02	118.69	122.20

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
10	j	56	HIS	Peptide

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	a	32744	0	16477	0	0
2	b	1822	0	1847	0	0
3	c	1627	0	1657	0	0
4	d	1603	0	1624	0	0
5	e	1145	0	1192	0	0
6	f	853	0	828	0	0
7	g	1190	0	1227	0	0
8	h	982	0	1036	0	0
9	i	994	0	1031	0	0
10	j	765	0	801	0	0
11	k	838	0	830	0	0
12	l	949	0	996	0	0
13	m	859	0	898	0	0
14	n	778	0	818	0	0
15	o	686	0	709	0	0
16	p	610	0	612	0	0
17	q	619	0	659	0	0
18	r	556	0	556	0	0
19	s	635	0	662	0	0
20	t	655	0	699	0	0
21	u	519	0	551	0	0
All	All	51429	0	35710	0	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

There are no clashes within the asymmetric unit.

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	
2	b	230/239 (96%)	211 (92%)	19 (8%)	0	100	100
3	c	203/205 (99%)	179 (88%)	24 (12%)	0	100	100
4	d	203/205 (99%)	185 (91%)	18 (9%)	0	100	100
5	e	154/156 (99%)	132 (86%)	22 (14%)	0	100	100
6	f	103/105 (98%)	92 (89%)	11 (11%)	0	100	100
7	g	152/154 (99%)	141 (93%)	11 (7%)	0	100	100
8	h	127/129 (98%)	117 (92%)	10 (8%)	0	100	100
9	i	124/126 (98%)	119 (96%)	5 (4%)	0	100	100
10	j	94/96 (98%)	85 (90%)	9 (10%)	0	100	100
11	k	113/115 (98%)	103 (91%)	10 (9%)	0	100	100
12	l	119/121 (98%)	101 (85%)	18 (15%)	0	100	100
13	m	108/110 (98%)	100 (93%)	8 (7%)	0	100	100
14	n	96/98 (98%)	91 (95%)	5 (5%)	0	100	100
15	o	84/86 (98%)	81 (96%)	3 (4%)	0	100	100
16	p	76/78 (97%)	70 (92%)	6 (8%)	0	100	100
17	q	74/76 (97%)	69 (93%)	5 (7%)	0	100	100
18	r	69/71 (97%)	65 (94%)	4 (6%)	0	100	100
19	s	78/80 (98%)	71 (91%)	7 (9%)	0	100	100
20	t	83/85 (98%)	81 (98%)	2 (2%)	0	100	100
21	u	58/63 (92%)	57 (98%)	1 (2%)	0	100	100
All	All	2348/2398 (98%)	2150 (92%)	198 (8%)	0	100	100

There are no Ramachandran outliers to report.

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	
2	b	191/197 (97%)	190 (100%)	1 (0%)	88	95

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	c	165/171 (96%)	165 (100%)	0	100	100
4	d	166/173 (96%)	164 (99%)	2 (1%)	71	87
5	e	114/115 (99%)	111 (97%)	3 (3%)	46	74
6	f	88/90 (98%)	87 (99%)	1 (1%)	73	88
7	g	116/120 (97%)	114 (98%)	2 (2%)	60	82
8	h	108/108 (100%)	108 (100%)	0	100	100
9	i	102/102 (100%)	99 (97%)	3 (3%)	42	72
10	j	85/85 (100%)	83 (98%)	2 (2%)	49	75
11	k	84/87 (97%)	84 (100%)	0	100	100
12	l	105/105 (100%)	102 (97%)	3 (3%)	42	72
13	m	92/92 (100%)	88 (96%)	4 (4%)	29	63
14	n	78/80 (98%)	78 (100%)	0	100	100
15	o	73/73 (100%)	73 (100%)	0	100	100
16	p	61/63 (97%)	61 (100%)	0	100	100
17	q	70/70 (100%)	67 (96%)	3 (4%)	29	63
18	r	54/61 (88%)	52 (96%)	2 (4%)	34	66
19	s	69/71 (97%)	68 (99%)	1 (1%)	67	85
20	t	67/68 (98%)	66 (98%)	1 (2%)	65	84
21	u	51/52 (98%)	50 (98%)	1 (2%)	55	79
All	All	1939/1983 (98%)	1910 (98%)	29 (2%)	66	84

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	b	86	ARG
4	d	26	ARG
4	d	62	ARG
5	e	27	LYS
5	e	133	ASN
5	e	158	ARG
6	f	9	LEU
7	g	5	ARG
7	g	148	ASN
9	i	12	ARG
9	i	41	ARG

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Mol	Chain	Res	Type
9	i	106	ARG
10	j	16	ARG
10	j	82	LYS
12	l	14	ARG
12	l	15	MET
12	l	114	ARG
13	m	27	ARG
13	m	40	ASN
13	m	105	ASN
13	m	109	ARG
17	q	54	ASN
17	q	65	ARG
17	q	68	ARG
18	r	6	ARG
18	r	8	ARG
19	s	29	LYS
20	t	27	MET
21	u	45	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
2	b	24	ASN
3	c	6	HIS
4	d	100	ASN
5	e	123	ASN
5	e	133	ASN
6	f	14	GLN
6	f	81	ASN
11	k	22	HIS
11	k	81	ASN
12	l	72	HIS
13	m	40	ASN
13	m	58	ASN
13	m	91	HIS
13	m	105	ASN
14	n	8	ASN
14	n	45	GLN
15	o	13	ASN
17	q	34	HIS
17	q	54	ASN
19	s	26	ASN

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Mol	Chain	Res	Type
19	s	52	HIS
19	s	53	ASN
20	t	68	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	a	1525/1526 (99%)	365 (23%)	0

All (365) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	a	3	A
1	a	6	G
1	a	7	A
1	a	9	G
1	a	16	A
1	a	22	G
1	a	29	U
1	a	31	G
1	a	32	A
1	a	48	C
1	a	51	A
1	a	52	C
1	a	57	G
1	a	60	A
1	a	61	G
1	a	65	A
1	a	66	G
1	a	69	G
1	a	70	A
1	a	71	U
1	a	72	A
1	a	73	A
1	a	77	G
1	a	82	U
1	a	83	G
1	a	84	C
1	a	88	U
1	a	89	G
1	a	95	A

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Mol	Chain	Res	Type
1	a	98	G
1	a	100	C
1	a	106	G
1	a	115	U
1	a	118	C
1	a	121	G
1	a	123	A
1	a	124	A
1	a	125	U
1	a	133	G
1	a	135	A
1	a	138	G
1	a	139	G
1	a	143	A
1	a	148	G
1	a	157	C
1	a	176	C
1	a	177	G
1	a	178	U
1	a	179	C
1	a	182	G
1	a	191	A
1	a	192	G
1	a	193	U
1	a	204	C
1	a	205	G
1	a	206	G
1	a	222	A
1	a	231	G
1	a	239	U
1	a	241	G
1	a	244	A
1	a	253	G
1	a	256	A
1	a	260	G
1	a	261	C
1	a	265	C
1	a	266	C
1	a	273	A
1	a	275	G
1	a	281	U
1	a	283	A

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Mol	Chain	Res	Type
1	a	287	G
1	a	288	U
1	a	292	A
1	a	297	A
1	a	299	G
1	a	308	C
1	a	315	A
1	a	321	A
1	a	322	C
1	a	323	A
1	a	341	G
1	a	346	C
1	a	348	G
1	a	361	U
1	a	363	G
1	a	365	A
1	a	375	A
1	a	376	A
1	a	378	G
1	a	380	C
1	a	382	G
1	a	384	U
1	a	386	C
1	a	391	A
1	a	392	U
1	a	393	G
1	a	394	C
1	a	400	G
1	a	406	A
1	a	407	G
1	a	408	A
1	a	417	G
1	a	418	G
1	a	423	U
1	a	443	G
1	a	445	A
1	a	446	A
1	a	447	G
1	a	456	G
1	a	457	U
1	a	459	A
1	a	461	U

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Mol	Chain	Res	Type
1	a	475	G
1	a	478	G
1	a	480	U
1	a	490	A
1	a	491	U
1	a	492	A
1	a	493	A
1	a	494	G
1	a	502	U
1	a	505	C
1	a	507	U
1	a	511	G
1	a	512	C
1	a	513	C
1	a	515	G
1	a	521	G
1	a	526	A
1	a	527	A
1	a	539	C
1	a	540	A
1	a	541	A
1	a	542	G
1	a	543	C
1	a	545	U
1	a	549	U
1	a	553	A
1	a	556	U
1	a	557	A
1	a	562	G
1	a	566	A
1	a	567	A
1	a	569	G
1	a	570	C
1	a	571	G
1	a	573	G
1	a	582	G
1	a	585	C
1	a	591	G
1	a	601	A
1	a	609	G
1	a	616	A
1	a	627	G

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Mol	Chain	Res	Type
1	a	647	A
1	a	648	G
1	a	656	U
1	a	659	A
1	a	664	G
1	a	681	A
1	a	682	G
1	a	687	G
1	a	688	A
1	a	689	A
1	a	696	A
1	a	697	G
1	a	709	A
1	a	710	A
1	a	712	A
1	a	715	A
1	a	716	G
1	a	717	U
1	a	718	G
1	a	723	A
1	a	725	G
1	a	727	G
1	a	733	C
1	a	749	A
1	a	754	G
1	a	756	U
1	a	757	G
1	a	759	G
1	a	760	A
1	a	775	A
1	a	788	A
1	a	806	G
1	a	807	U
1	a	809	A
1	a	810	A
1	a	811	C
1	a	815	G
1	a	820	C
1	a	822	A
1	a	826	G
1	a	830	G
1	a	832	A

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Mol	Chain	Res	Type
1	a	835	C
1	a	836	U
1	a	838	G
1	a	840	G
1	a	845	U
1	a	854	A
1	a	858	A
1	a	861	G
1	a	863	G
1	a	865	U
1	a	866	A
1	a	867	A
1	a	879	G
1	a	883	A
1	a	884	G
1	a	887	C
1	a	894	A
1	a	896	G
1	a	916	G
1	a	921	G
1	a	928	C
1	a	929	A
1	a	932	A
1	a	936	G
1	a	939	G
1	a	954	U
1	a	955	U
1	a	956	C
1	a	960	G
1	a	963	A
1	a	964	C
1	a	965	G
1	a	967	G
1	a	968	A
1	a	969	A
1	a	970	G
1	a	971	A
1	a	977	A
1	a	981	G
1	a	988	A
1	a	990	A
1	a	997	G

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Mol	Chain	Res	Type
1	a	998	A
1	a	1000	C
1	a	1002	U
1	a	1004	C
1	a	1009	G
1	a	1011	U
1	a	1015	U
1	a	1016	U
1	a	1017	G
1	a	1023	U
1	a	1025	C
1	a	1026	G
1	a	1027	G
1	a	1031	C
1	a	1039	C
1	a	1044	G
1	a	1049	A
1	a	1054	U
1	a	1058	G
1	a	1059	U
1	a	1075	G
1	a	1078	G
1	a	1079	U
1	a	1080	U
1	a	1086	A
1	a	1088	G
1	a	1089	U
1	a	1090	C
1	a	1095	A
1	a	1119	U
1	a	1120	U
1	a	1123	C
1	a	1124	A
1	a	1127	A
1	a	1130	U
1	a	1131	C
1	a	1132	G
1	a	1133	G
1	a	1137	G
1	a	1141	C
1	a	1152	C
1	a	1153	U

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Mol	Chain	Res	Type
1	a	1160	G
1	a	1162	C
1	a	1163	A
1	a	1164	A
1	a	1165	A
1	a	1168	G
1	a	1175	G
1	a	1176	G
1	a	1177	U
1	a	1178	G
1	a	1184	G
1	a	1190	A
1	a	1191	A
1	a	1196	U
1	a	1203	C
1	a	1214	G
1	a	1219	A
1	a	1221	A
1	a	1222	C
1	a	1226	U
1	a	1229	U
1	a	1230	A
1	a	1232	A
1	a	1234	U
1	a	1235	G
1	a	1241	U
1	a	1248	G
1	a	1250	U
1	a	1251	U
1	a	1252	G
1	a	1254	C
1	a	1264	G
1	a	1272	U
1	a	1273	A
1	a	1279	A
1	a	1281	A
1	a	1293	A
1	a	1294	G
1	a	1296	C
1	a	1297	C
1	a	1299	G
1	a	1314	C

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Mol	Chain	Res	Type
1	a	1317	G
1	a	1330	C
1	a	1332	G
1	a	1334	A
1	a	1340	A
1	a	1341	G
1	a	1342	U
1	a	1347	G
1	a	1358	U
1	a	1372	C
1	a	1381	G
1	a	1383	C
1	a	1388	A
1	a	1391	C
1	a	1392	A
1	a	1395	G
1	a	1397	C
1	a	1413	G
1	a	1418	U
1	a	1419	U
1	a	1428	A
1	a	1434	U
1	a	1440	A
1	a	1445	C
1	a	1446	A
1	a	1448	G
1	a	1469	G
1	a	1473	C
1	a	1486	A
1	a	1487	A
1	a	1497	A
1	a	1498	G
1	a	1499	G
1	a	1500	U
1	a	1501	A
1	a	1511	G
1	a	1513	A
1	a	1514	C
1	a	1523	G
1	a	1524	G
1	a	1525	A
1	a	1526	U

There are no RNA pucker outliers to report.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

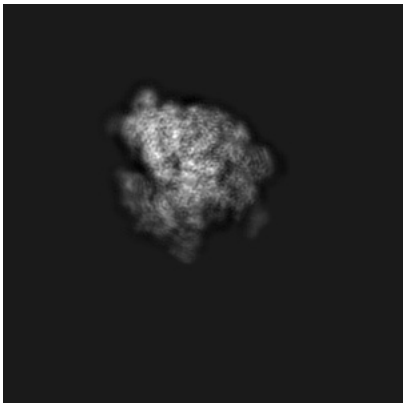
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-10283. These allow visual inspection of the internal detail of the map and identification of artifacts.

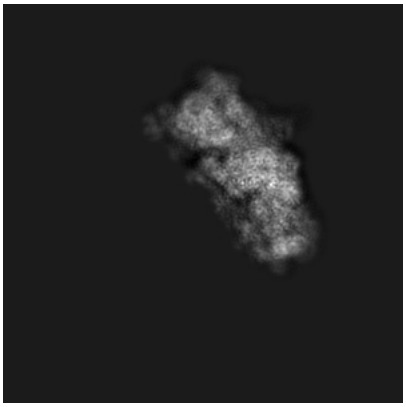
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

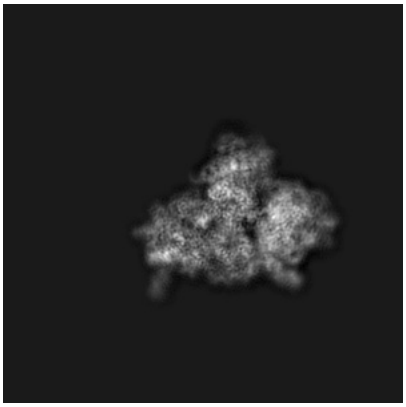
6.1.1 Primary map



X



Y

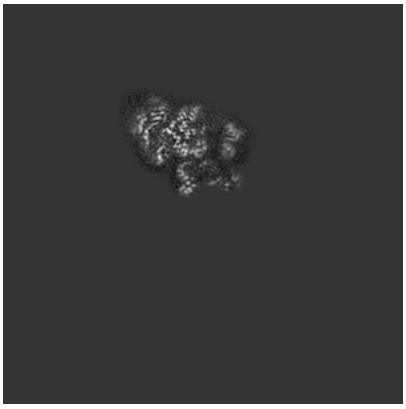


Z

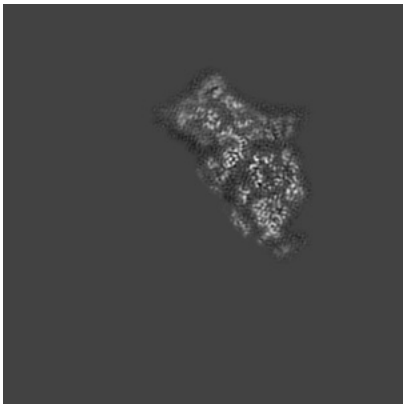
The images above show the map projected in three orthogonal directions.

6.2 Central slices

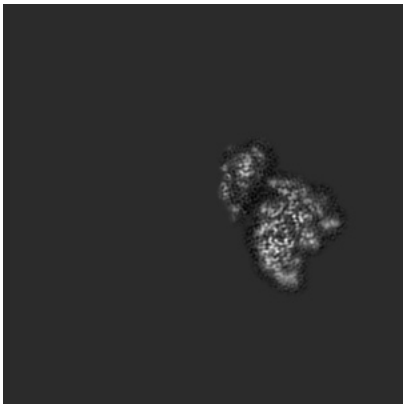
6.2.1 Primary map



X Index: 200



Y Index: 200

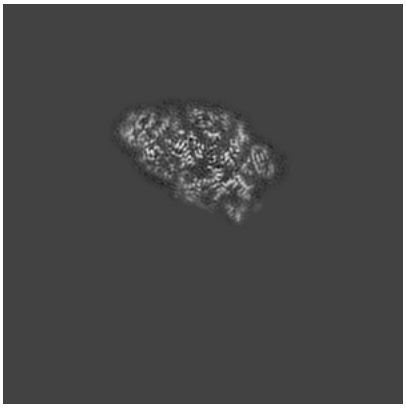


Z Index: 200

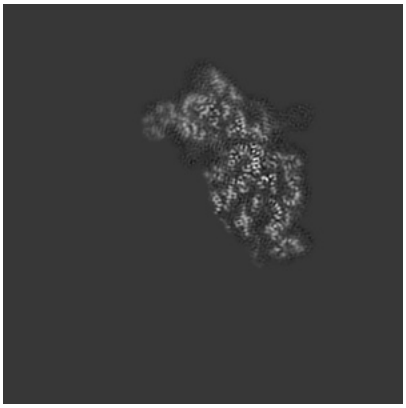
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

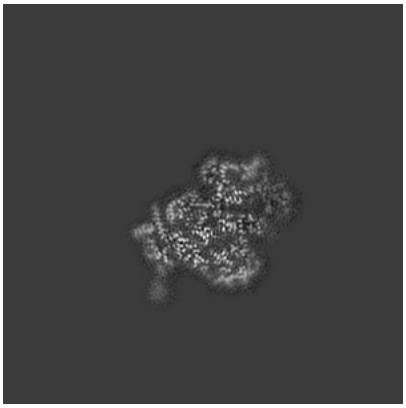
6.3.1 Primary map



X Index: 228



Y Index: 188



Z Index: 271

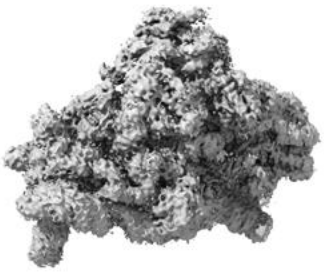
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.028. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

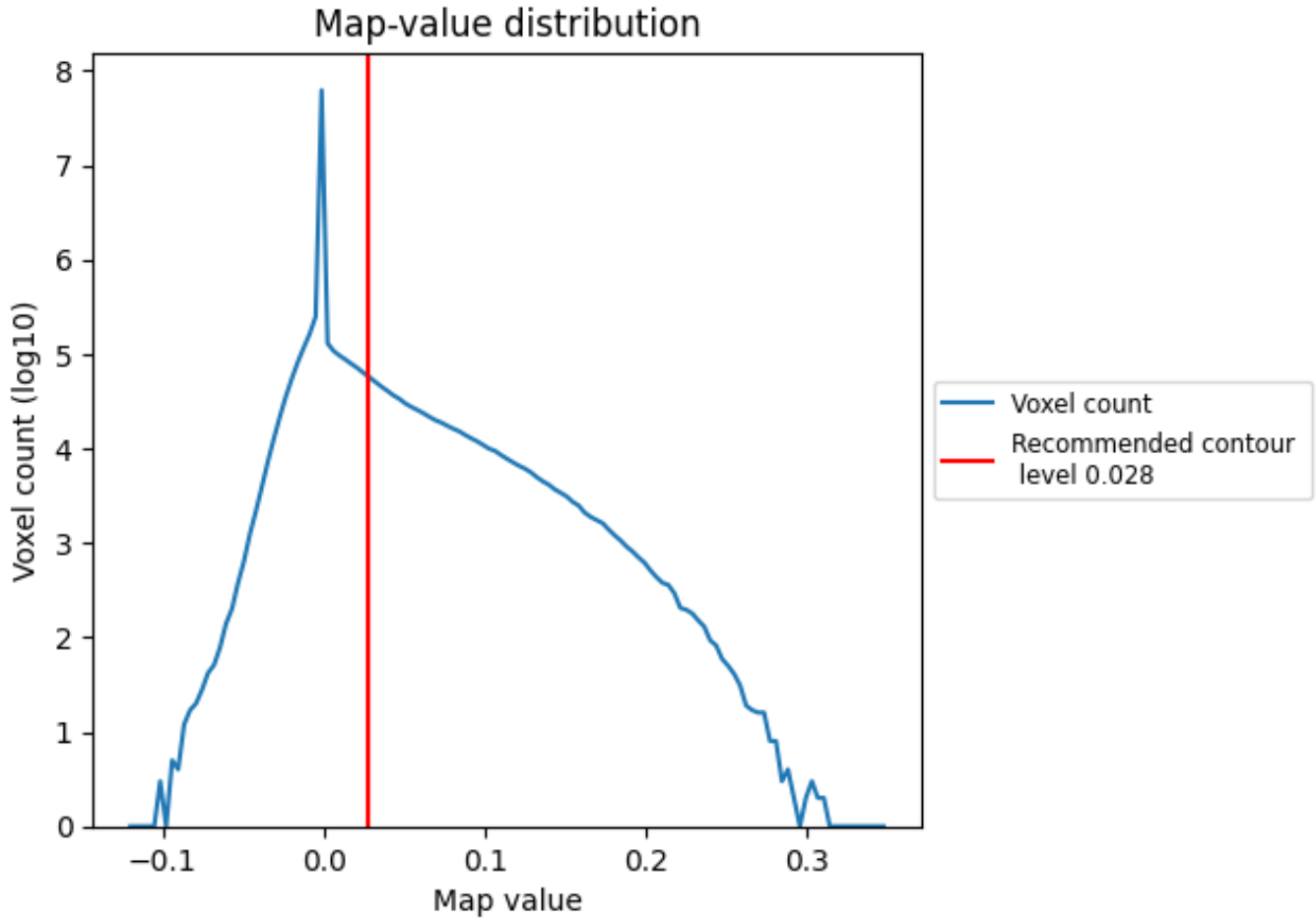
6.5 Mask visualisation (i)

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

7 Map analysis

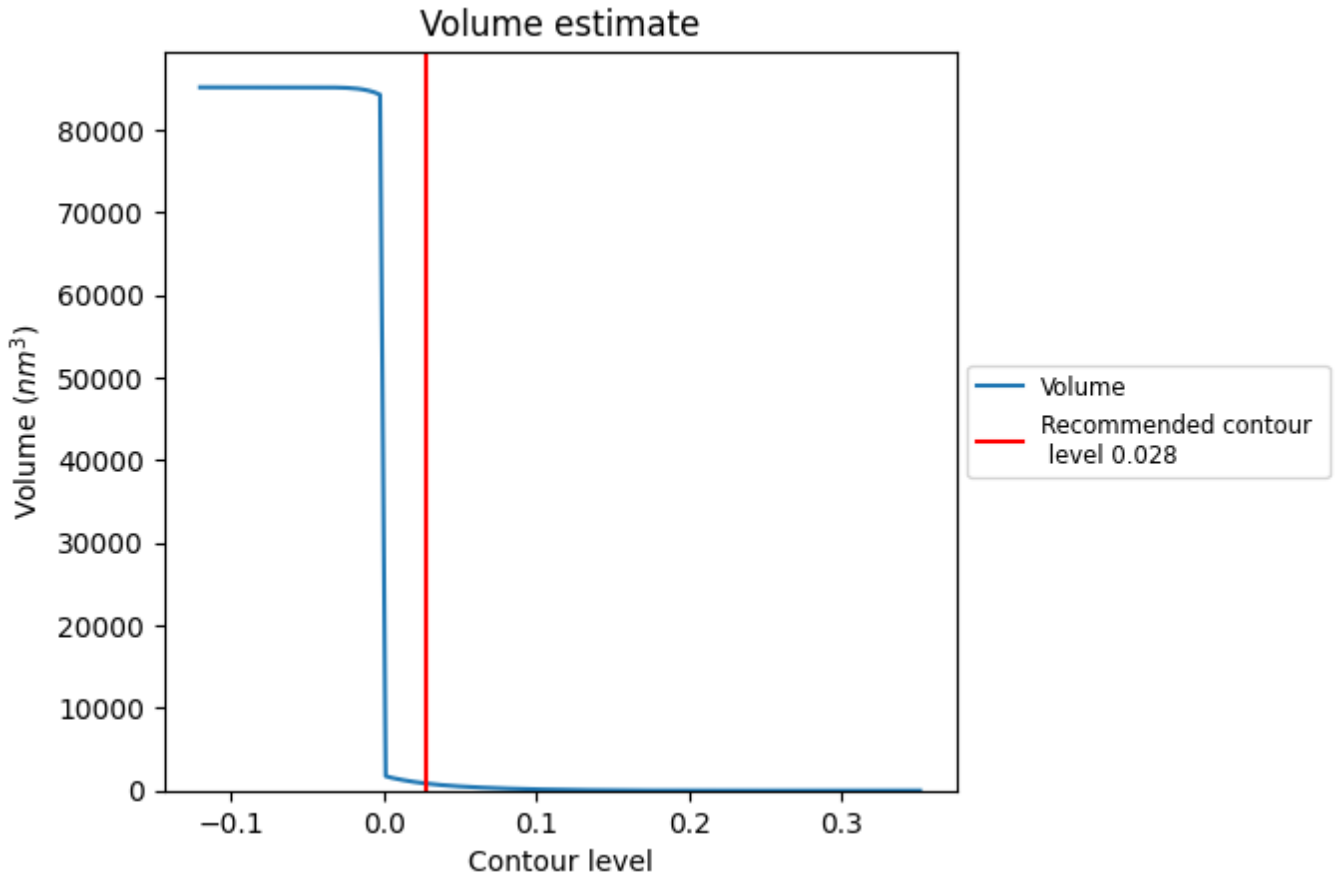
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

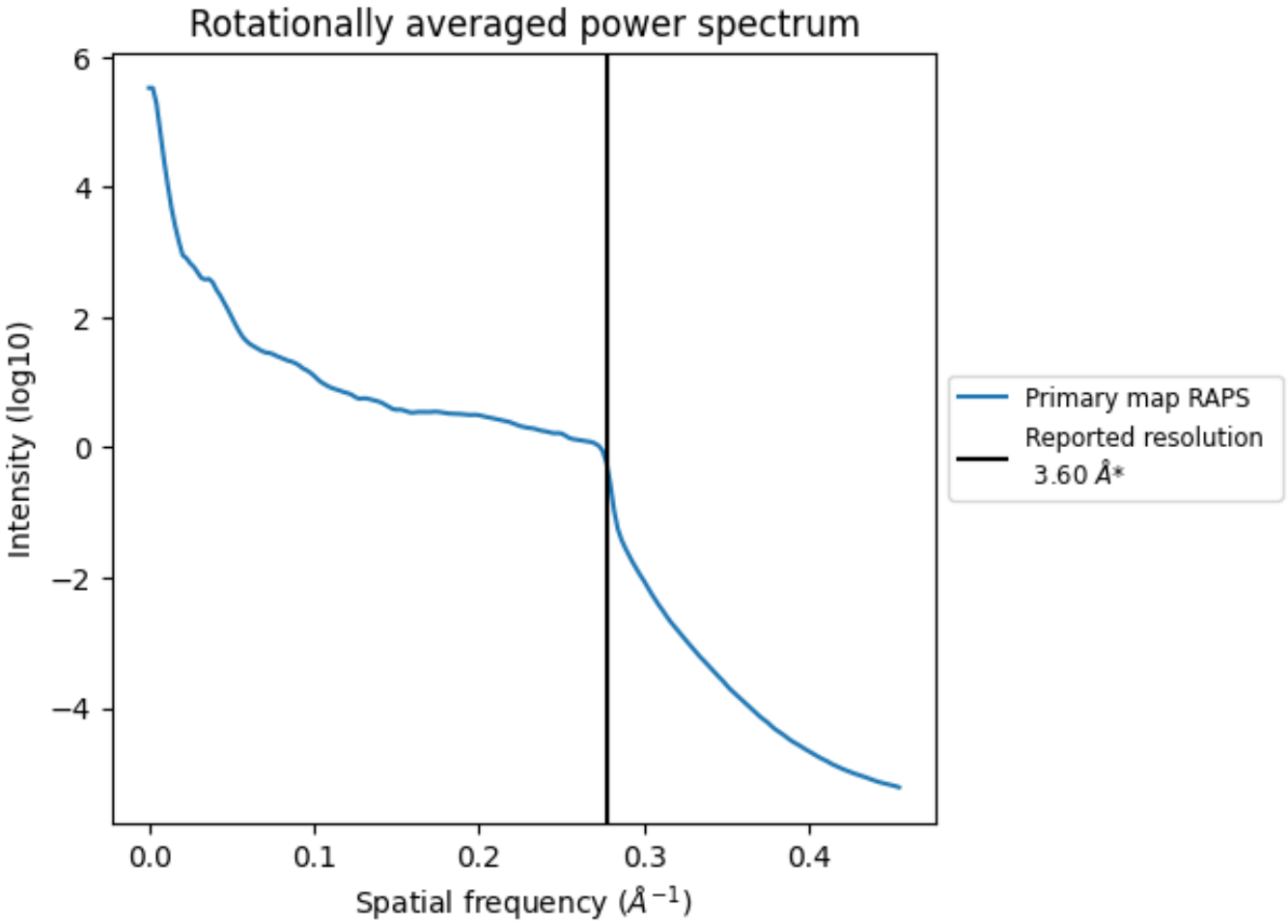
7.2 Volume estimate



The volume at the recommended contour level is 853 nm^3; this corresponds to an approximate mass of 770 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 0.278 $Å^{-1}$

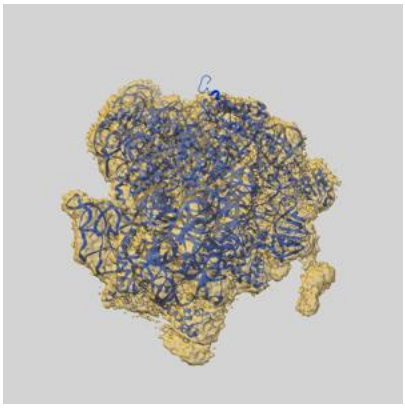
8 Fourier-Shell correlation (i)

This section was not generated. No FSC curve or half-maps provided.

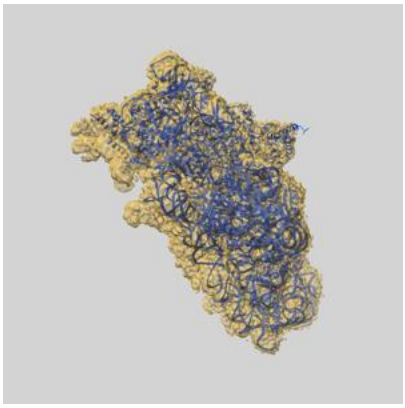
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-10283 and PDB model 6SPE. Per-residue inclusion information can be found in section 3 on page 8.

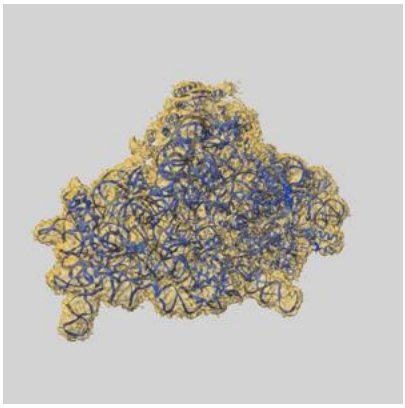
9.1 Map-model overlay



X



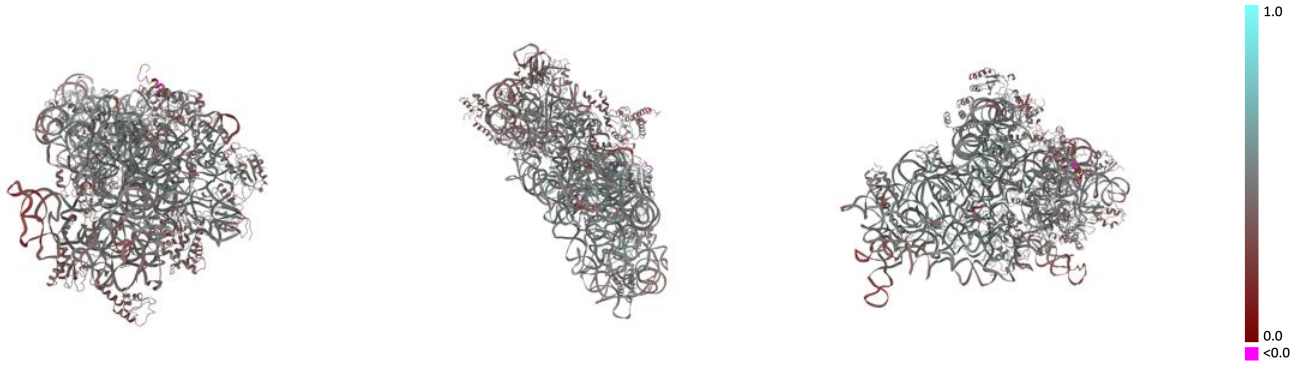
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.028 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

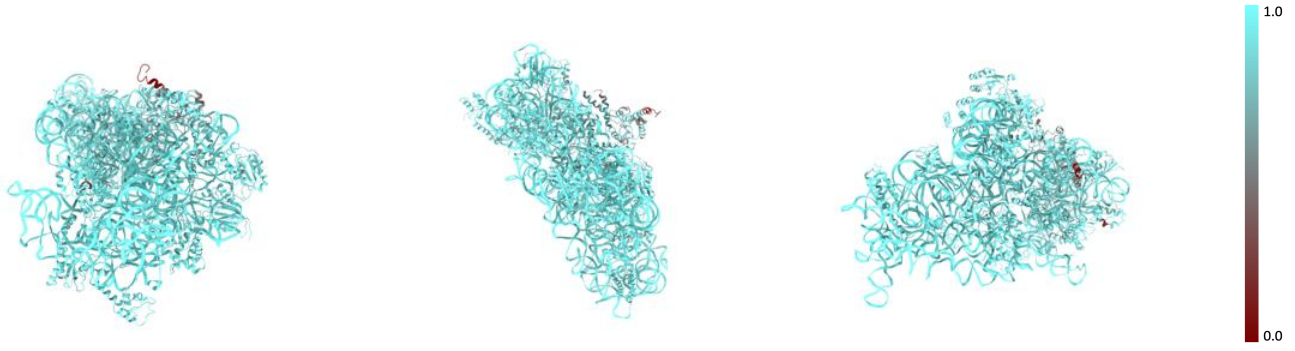
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

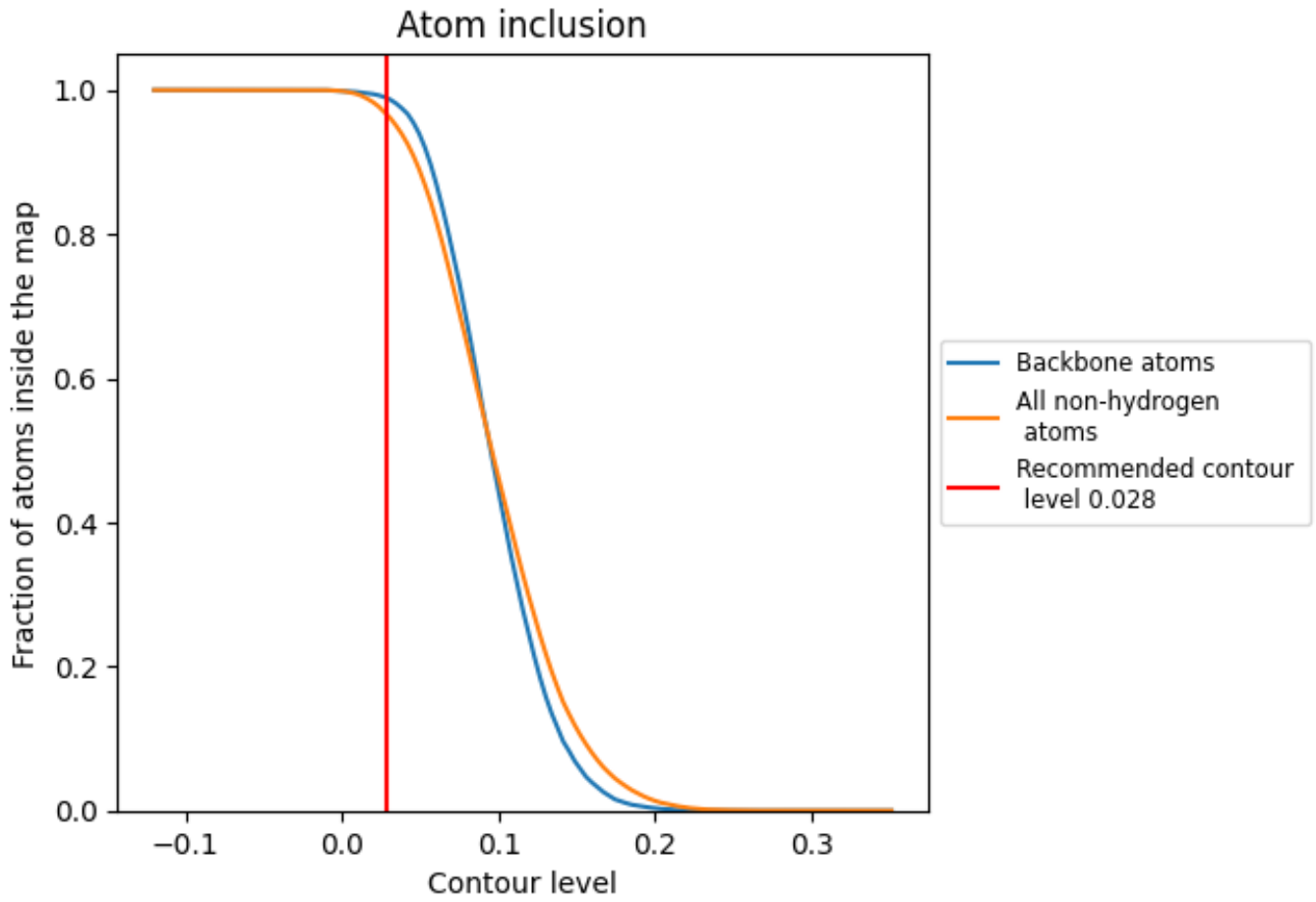
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.028).

9.4 Atom inclusion (i)



At the recommended contour level, 99% of all backbone atoms, 97% 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 (0.028) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9670	0.4600
a	0.9974	0.4700
b	0.6865	0.3840
c	0.9062	0.4390
d	0.9606	0.4660
e	0.9333	0.4690
f	0.9156	0.4220
g	0.9152	0.4020
h	0.9491	0.4920
i	0.9591	0.4150
j	0.8954	0.4150
k	0.9486	0.4670
l	0.9266	0.4930
m	0.9565	0.3770
n	0.9411	0.4440
o	0.9595	0.4720
p	0.9744	0.5090
q	0.9532	0.4840
r	0.9497	0.4530
s	0.9549	0.4050
t	0.9592	0.4780
u	0.8462	0.4320