



## Full wwPDB EM Validation Report ⓘ

Jun 1, 2023 – 04:28 am BST

PDB ID : 8BVH  
EMDB ID : EMD-16264  
Title : Cryo-EM structure of the Hfq-Crc-amiE translation repression assembly.  
Authors : Dendooven, T.; Luisi, B.F.  
Deposited on : 2022-12-03  
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](mailto: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>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : 0.0.1.dev50  
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) : 2.33

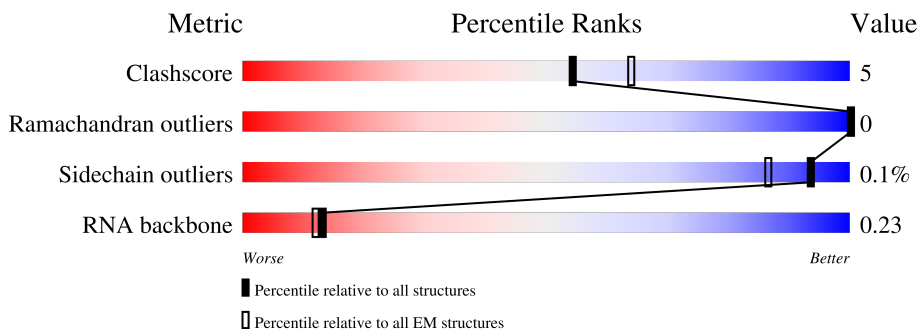
# 1 Overall quality at a glance i

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  $\geq 3$ , 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	C	82	6% (red), 71% (green), 7% (yellow), 16% (grey)
1	D	82	13% (red), 71% (green), 12% (yellow), 4% (grey)
1	E	82	5% (red), 68% (green), 11% (yellow), 16% (grey)
1	F	82	• (red), 72% (green), 9% (yellow), 19% (grey)
1	J	82	6% (red), 72% (green), 10% (yellow), 12% (grey)
1	K	82	• (red), 72% (green), 10% (yellow), 18% (grey)
1	L	82	12% (red), 76% (green), 9% (yellow), 2% (grey)

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Mol	Chain	Length	Quality of chain
1	M	82	
1	N	82	
1	O	82	
1	P	82	
1	Q	82	
1	R	82	
1	S	82	
1	T	82	
1	U	82	
1	w	82	
1	x	82	
2	B	262	
2	G	262	
2	H	262	
2	I	262	
3	A	108	

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 38177 atoms, of which 18921 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 RNA-binding protein Hfq.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	w	67	1083	341	555	94	92	1	0	0
1	x	66	1097	345	563	94	94	1	0	0
1	C	64	1054	333	539	89	92	1	0	0
1	D	68	1118	352	573	96	96	1	0	0
1	E	65	1061	335	542	90	93	1	0	0
1	F	66	1098	345	564	94	94	1	0	0
1	R	68	1118	352	573	96	96	1	0	0
1	T	67	1105	347	567	95	95	1	0	0
1	J	67	1111	350	570	95	95	1	0	0
1	L	69	1140	358	586	98	97	1	0	0
1	N	69	1140	358	586	98	97	1	0	0
1	P	65	1080	339	556	91	93	1	0	0
1	S	68	1118	352	573	96	96	1	0	0
1	U	67	1104	347	566	95	95	1	0	0
1	K	67	1111	350	570	95	95	1	0	0
1	M	69	1140	358	586	98	97	1	0	0
1	O	69	1141	358	587	98	97	1	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
1	Q	67	1104	347	566	95	95	1	0	0

- Molecule 2 is a protein called Catabolite repression control protein.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
2	H	262	4182	1354	2053	373	393	9	1	0
2	I	262	4169	1350	2046	372	392	9	0	0
2	B	262	4183	1354	2054	373	393	9	1	0
2	G	262	4184	1354	2055	373	393	9	1	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
H	-2	GLY	-	expression tag	UNP Q51380
H	-1	PRO	-	expression tag	UNP Q51380
H	0	ALA	-	expression tag	UNP Q51380
I	-2	GLY	-	expression tag	UNP Q51380
I	-1	PRO	-	expression tag	UNP Q51380
I	0	ALA	-	expression tag	UNP Q51380
B	-2	GLY	-	expression tag	UNP Q51380
B	-1	PRO	-	expression tag	UNP Q51380
B	0	ALA	-	expression tag	UNP Q51380
G	-2	GLY	-	expression tag	UNP Q51380
G	-1	PRO	-	expression tag	UNP Q51380
G	0	ALA	-	expression tag	UNP Q51380

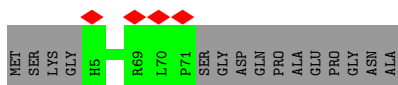
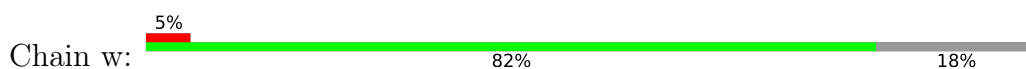
- Molecule 3 is a RNA chain called amiE.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			P
3	A	49	1536	471	491	200	325	49	0	0

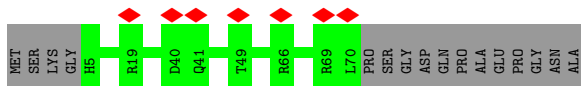
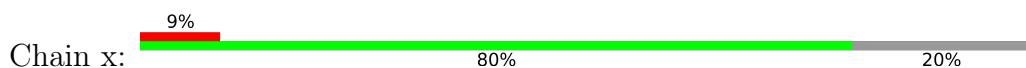
### 3 Residue-property plots [i](#)

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

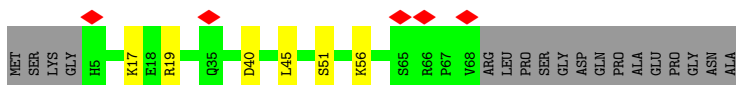
- Molecule 1: RNA-binding protein Hfq



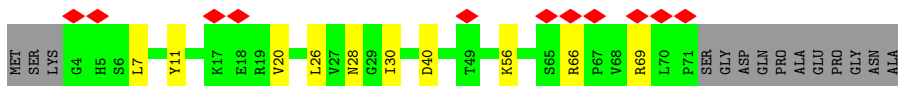
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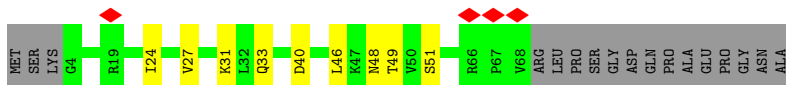
- Molecule 1: RNA-binding protein Hfq



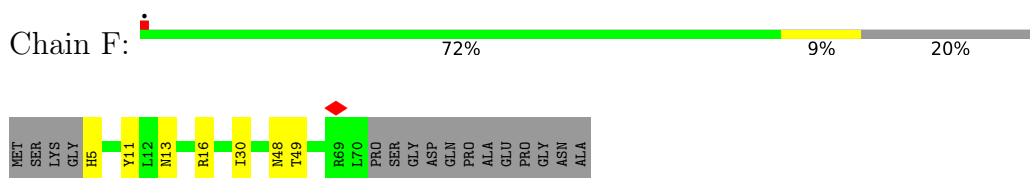
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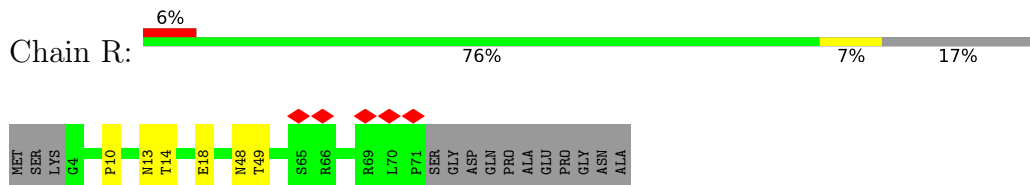
- Molecule 1: RNA-binding protein Hfq



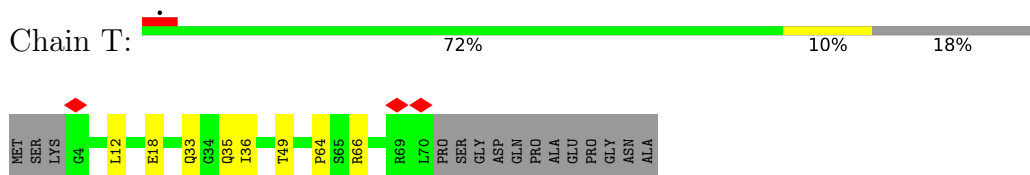
- Molecule 1: RNA-binding protein Hfq



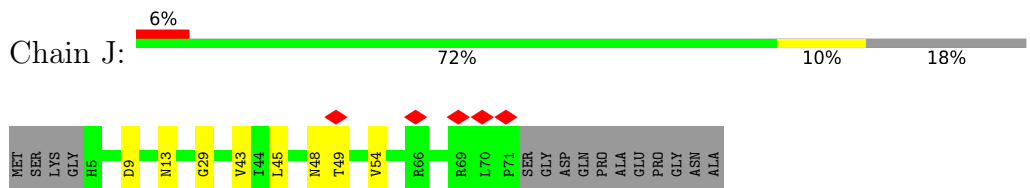
- Molecule 1: RNA-binding protein Hfq



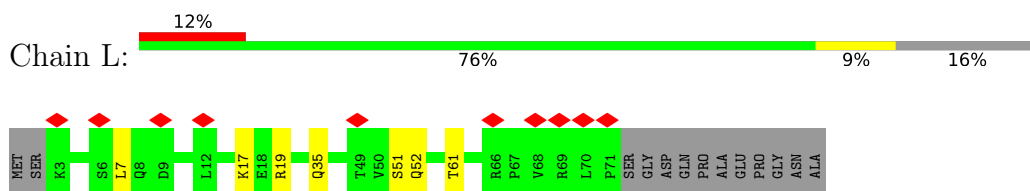
- Molecule 1: RNA-binding protein Hfq



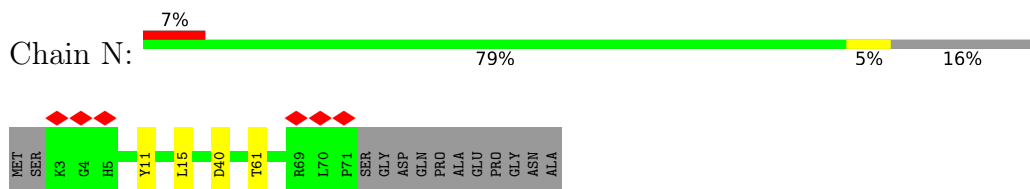
- Molecule 1: RNA-binding protein Hfq



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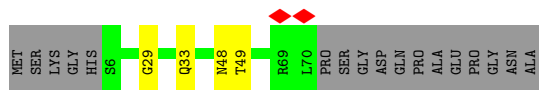


- Molecule 1: RNA-binding protein Hfq



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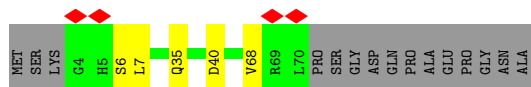
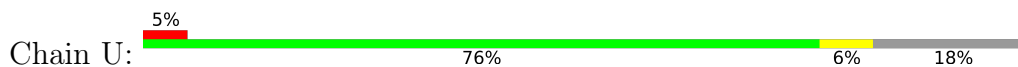




• Molecule 1: RNA-binding protein Hfq



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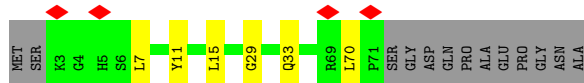
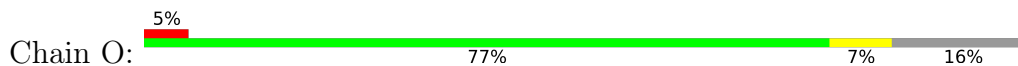
• Molecule 1: RNA-binding protein Hfq



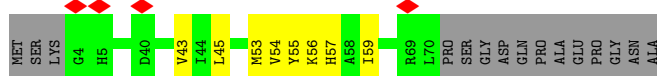
• Molecule 1: RNA-binding protein Hfq



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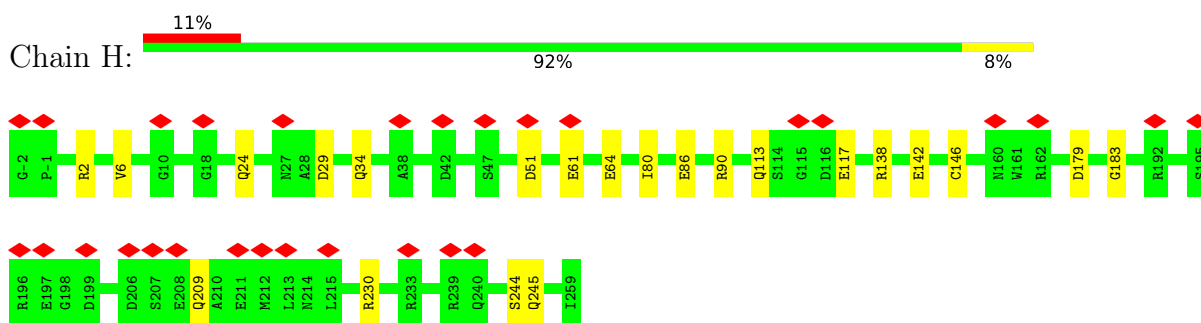


• Molecule 1: RNA-binding protein Hfq

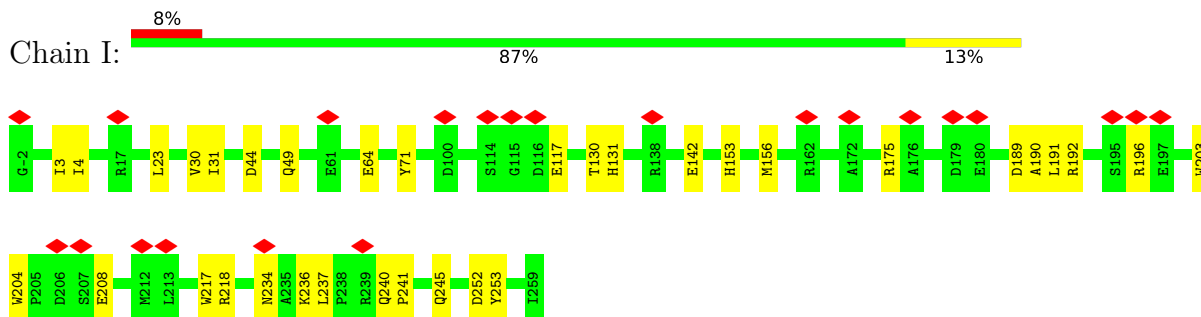


• Molecule 2: Catabolite repression control protein

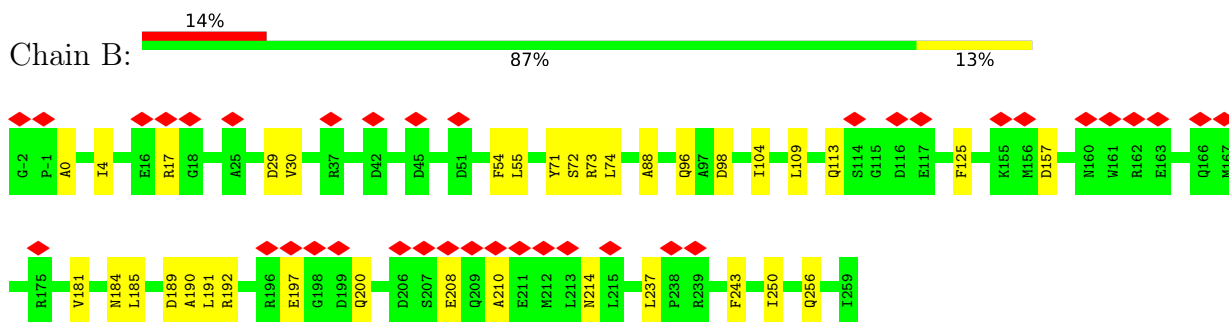




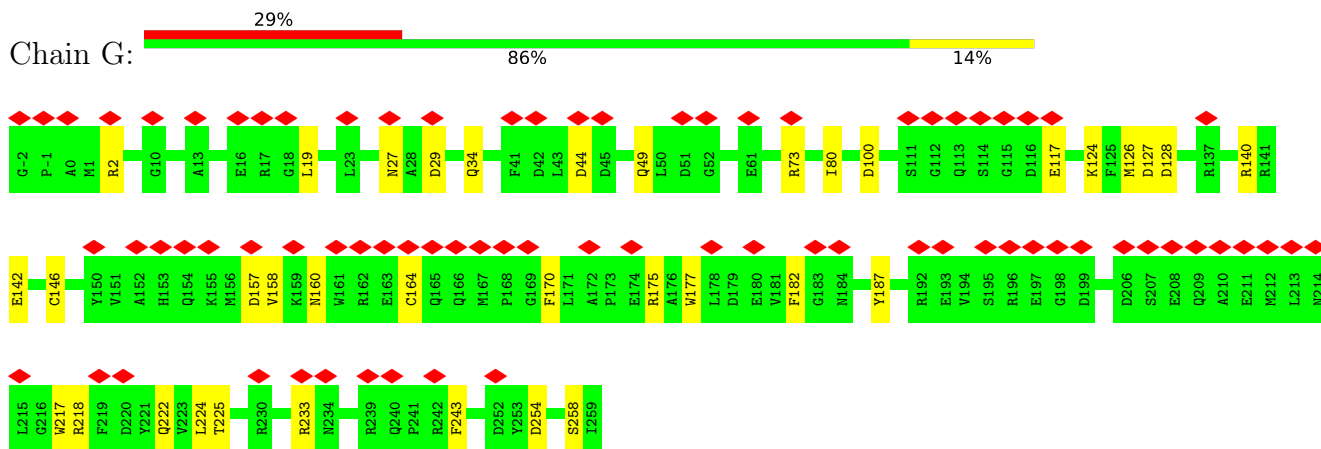
• Molecule 2: Catabolite repression control protein



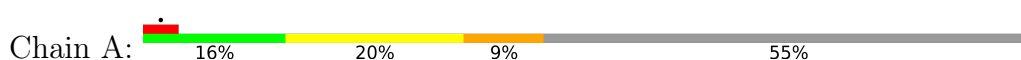
• Molecule 2: Catabolite repression control protein

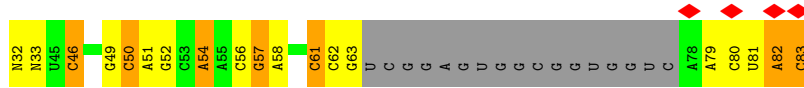


• Molecule 2: Catabolite repression control protein



• Molecule 3: amiE





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	63000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2600	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.703	Depositor
Minimum map value	-0.473	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.103	Depositor
Map size (Å)	249.0, 249.0, 249.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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	C	0.24	0/525	0.41	0/713
1	D	0.24	0/556	0.41	0/755
1	E	0.24	0/529	0.41	0/718
1	F	0.24	0/544	0.42	0/738
1	J	0.24	0/552	0.41	0/750
1	K	0.24	0/552	0.40	0/750
1	L	0.24	0/565	0.42	0/766
1	M	0.23	0/565	0.41	0/766
1	N	0.24	0/565	0.40	0/766
1	O	0.24	0/565	0.41	0/766
1	P	0.24	0/533	0.43	0/723
1	Q	0.24	0/548	0.40	0/743
1	R	0.24	0/556	0.40	0/755
1	S	0.23	0/556	0.40	0/755
1	T	0.24	0/548	0.41	0/743
1	U	0.23	0/548	0.41	0/743
1	w	0.23	0/538	0.41	0/732
1	x	0.23	0/544	0.40	0/738
2	B	0.24	0/2186	0.39	0/2960
2	G	0.25	0/2186	0.39	0/2960
2	H	0.25	0/2186	0.40	0/2960
2	I	0.25	0/2177	0.40	0/2948
3	A	0.24	0/982	0.65	0/1522
All	All	0.24	0/19606	0.42	0/26770

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	515	539	539	4	0
1	D	545	573	573	6	0
1	E	519	542	542	6	0
1	F	534	564	563	5	0
1	J	541	570	570	8	0
1	K	541	570	570	6	0
1	L	554	586	586	9	0
1	M	554	586	586	10	0
1	N	554	586	586	4	0
1	O	554	587	586	9	0
1	P	524	556	556	3	0
1	Q	538	566	566	7	0
1	R	545	573	573	4	0
1	S	545	573	573	11	0
1	T	538	567	566	6	0
1	U	538	566	566	5	0
1	w	528	555	555	0	0
1	x	534	563	563	0	0
2	B	2129	2054	2053	23	0
2	G	2129	2055	2055	23	0
2	H	2129	2053	2053	17	0
2	I	2123	2046	2045	23	0
3	A	1045	491	505	37	0
All	All	19256	18921	18930	190	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 5.

All (190) 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)
3:A:20:N:C5	3:A:20:N:OP2	2.06	1.03
3:A:20:N:C6	3:A:20:N:O5'	2.06	1.03
3:A:20:N:C6	3:A:20:N:P	2.50	0.98
3:A:20:N:C5	3:A:20:N:P	2.52	0.97

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:32:N:C3'	3:A:33:N:P	2.60	0.89
2:G:127:ASP:OD1	2:G:128:ASP:N	2.15	0.80
1:C:17:LYS:O	1:C:19:ARG:NH1	2.19	0.76
1:K:48:ASN:O	1:K:49:THR:OG1	2.04	0.75
2:G:29:ASP:OD1	2:G:73:ARG:NH2	2.20	0.74
3:A:32:N:O3'	3:A:33:N:P	2.47	0.73
2:B:29:ASP:OD1	2:B:73:ARG:NH2	2.23	0.71
3:A:20:N:O2	3:A:32:N:N1	2.25	0.70
2:I:4:ILE:HB	2:I:31:ILE:HG22	1.73	0.69
2:B:0:ALA:N	2:B:256:GLN:OE1	2.25	0.69
1:D:28:ASN:ND2	1:E:27:VAL:O	2.25	0.69
2:B:181:VAL:HA	2:B:185:LEU:HD12	1.74	0.68
1:U:40:ASP:OD2	1:K:6:SER:N	2.27	0.68
1:J:54:VAL:HG12	1:L:61:THR:HG22	1.76	0.67
2:H:142:GLU:OE1	2:H:142:GLU:N	2.28	0.66
2:B:54:PHE:N	2:B:72:SER:O	2.28	0.66
2:G:100:ASP:OD2	2:G:258:SER:OG	2.15	0.65
1:F:48:ASN:O	1:F:49:THR:OG1	2.11	0.64
3:A:12:C:O2	2:G:140:ARG:N	2.30	0.63
1:U:35:GLN:N	1:U:35:GLN:OE1	2.32	0.63
1:P:48:ASN:O	1:P:49:THR:OG1	2.10	0.63
3:A:32:N:O2'	3:A:33:N:O4'	2.16	0.63
2:G:142:GLU:N	2:G:142:GLU:OE1	2.32	0.63
1:P:29:GLY:O	3:A:5:A:O2'	2.17	0.62
2:B:208:GLU:N	2:B:208:GLU:OE1	2.32	0.62
2:I:234:ASN:N	2:I:252:ASP:OD1	2.31	0.62
3:A:32:N:N3	3:A:33:N:C8	2.62	0.62
2:I:208:GLU:OE1	2:I:208:GLU:N	2.32	0.61
1:M:48:ASN:O	1:M:49:THR:OG1	2.16	0.61
1:O:33:GLN:O	3:A:54:A:N6	2.30	0.61
2:I:156:MET:SD	2:I:192:ARG:NH1	2.73	0.61
1:S:7:LEU:HD22	1:Q:43:VAL:HG21	1.83	0.60
2:H:61:GLU:N	2:H:61:GLU:OE1	2.34	0.60
2:I:3:ILE:HG23	2:I:30:VAL:HG23	1.84	0.60
3:A:19:N:H2'	3:A:20:N:C6	2.31	0.59
2:I:64:GLU:N	2:I:64:GLU:OE1	2.36	0.58
3:A:32:N:O2'	3:A:33:N:C5'	2.51	0.58
1:S:40:ASP:OD2	1:U:6:SER:N	2.37	0.58
1:Q:55:TYR:O	1:Q:57:HIS:N	2.37	0.58
1:Q:56:LYS:HA	1:Q:59:ILE:HD12	1.85	0.58
1:J:45:LEU:HG	1:L:7:LEU:HD21	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:I:203:TRP:N	2:I:217:TRP:O	2.36	0.57
1:K:52:GLN:HG3	1:M:63:VAL:HG22	1.86	0.57
1:E:24:ILE:HD12	1:E:46:LEU:HD11	1.87	0.57
1:D:40:ASP:O	1:D:56:LYS:NZ	2.37	0.56
3:A:20:N:N3	3:A:32:N:N6	2.52	0.56
1:S:35:GLN:O	1:S:47:LYS:N	2.39	0.56
1:E:51:SER:O	1:F:11:TYR:OH	2.22	0.56
2:I:117:GLU:OE1	2:I:117:GLU:N	2.38	0.56
2:G:233:ARG:NE	2:G:254:ASP:OD1	2.39	0.56
1:R:13:ASN:OD1	1:R:14:THR:N	2.39	0.55
1:C:45:LEU:HD13	1:D:7:LEU:HD21	1.87	0.55
1:S:25:TYR:OH	3:A:61:C:OP1	2.23	0.55
2:B:184:ASN:OD1	2:B:185:LEU:N	2.40	0.55
3:A:32:N:HO2'	3:A:33:N:C5'	2.19	0.55
1:R:18:GLU:OE1	1:R:18:GLU:N	2.40	0.55
1:Q:43:VAL:HG23	1:Q:53:MET:HG3	1.89	0.55
1:T:35:GLN:OE1	1:T:35:GLN:N	2.40	0.54
1:J:48:ASN:O	1:J:49:THR:OG1	2.19	0.54
3:A:49:G:O2'	3:A:50:C:O5'	2.20	0.54
3:A:15:G:C6	3:A:19:N:H5'	2.42	0.54
1:P:33:GLN:HB2	2:H:80:ILE:HG22	1.90	0.54
2:B:96:GLN:NE2	2:B:98:ASP:OD1	2.42	0.53
3:A:20:N:C2	3:A:32:N:N1	2.72	0.53
2:G:117:GLU:OE1	2:G:117:GLU:N	2.39	0.53
1:S:40:ASP:OD1	1:S:41:GLN:N	2.37	0.53
1:M:45:LEU:HD21	1:O:7:LEU:HD21	1.89	0.53
3:A:20:N:N3	3:A:32:N:N1	2.56	0.53
2:B:88:ALA:HB2	2:B:125:PHE:HE1	1.74	0.52
1:K:69:ARG:NH1	1:K:70:LEU:O	2.42	0.52
3:A:15:G:C5	3:A:19:N:H5'	2.44	0.52
1:C:51:SER:OG	1:D:11:TYR:OH	2.26	0.52
2:H:245:GLN:N	2:H:245:GLN:OE1	2.42	0.52
1:M:45:LEU:HD11	1:O:7:LEU:HD21	1.91	0.52
2:G:146:CYS:SG	2:G:222:GLN:NE2	2.81	0.52
1:L:19:ARG:O	1:L:35:GLN:NE2	2.43	0.52
2:B:113:GLN:N	2:B:113:GLN:OE1	2.42	0.52
2:I:142:GLU:OE1	2:I:142:GLU:N	2.43	0.52
1:K:40:ASP:OD2	1:M:6:SER:N	2.41	0.51
1:E:48:ASN:OD1	1:E:49:THR:N	2.43	0.51
2:G:158:VAL:HG21	2:G:217:TRP:NE1	2.25	0.51
2:H:230:ARG:O	2:I:196:ARG:NH1	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:2:ARG:NH2	2:G:27:ASN:OD1	2.44	0.51
2:B:4:ILE:HD12	2:B:250:ILE:HG12	1.93	0.50
2:H:113:GLN:OE1	2:H:113:GLN:N	2.44	0.50
2:B:30:VAL:HG21	2:B:104:ILE:HD13	1.94	0.50
3:A:82:A:O2'	3:A:83:C:OP2	2.21	0.50
2:H:209:GLN:N	2:H:209:GLN:OE1	2.40	0.50
1:J:43:VAL:HG23	1:L:7:LEU:HD22	1.93	0.50
1:T:33:GLN:HB3	2:G:80:ILE:HG22	1.93	0.49
2:H:117:GLU:OE1	2:H:117:GLU:N	2.40	0.49
1:J:29:GLY:O	3:A:14:A:O2'	2.21	0.49
1:S:63:VAL:O	1:S:63:VAL:HG13	2.13	0.49
2:G:157:ASP:OD2	2:G:218:ARG:NE	2.41	0.49
2:I:240:GLN:N	2:I:241:PRO:CD	2.75	0.49
1:Q:54:VAL:HG21	1:Q:59:ILE:HD11	1.95	0.49
2:I:189:ASP:OD1	2:I:190:ALA:N	2.44	0.49
2:H:2:ARG:N	2:H:29:ASP:OD2	2.46	0.48
1:M:52:GLN:NE2	3:A:51:A:N1	2.56	0.48
1:L:52:GLN:OE1	3:A:2:A:N6	2.43	0.48
2:G:170:PHE:O	2:G:175:ARG:NH1	2.44	0.48
2:G:34:GLN:N	2:G:34:GLN:OE1	2.46	0.48
1:M:20:VAL:O	1:M:22:VAL:N	2.47	0.48
2:I:191:LEU:HD22	2:I:218:ARG:HD2	1.96	0.48
1:J:9:ASP:OD1	1:J:13:ASN:ND2	2.46	0.48
2:B:109:LEU:HD22	2:B:125:PHE:CD2	2.48	0.48
1:F:13:ASN:OD1	1:F:16:ARG:NH2	2.44	0.48
2:B:55:LEU:HD13	2:B:71:TYR:CZ	2.49	0.48
1:R:48:ASN:OD1	1:R:49:THR:N	2.43	0.47
3:A:32:N:O2'	3:A:33:N:O5'	2.31	0.47
2:G:182:PHE:O	2:G:187:TYR:N	2.48	0.47
2:I:153:HIS:O	2:I:175:ARG:NE	2.47	0.47
1:E:40:ASP:OD2	1:F:5:HIS:N	2.47	0.47
1:T:64:PRO:O	1:T:66:ARG:N	2.47	0.47
1:J:45:LEU:CG	1:L:7:LEU:HD21	2.44	0.47
1:N:11:TYR:CE2	1:N:15:LEU:HD11	2.50	0.47
1:O:11:TYR:CE2	1:O:15:LEU:HD11	2.50	0.47
2:I:31:ILE:HD11	2:I:71:TYR:HD2	1.79	0.47
1:Q:54:VAL:CG2	1:Q:59:ILE:HD11	2.45	0.47
2:I:44:ASP:O	2:I:49:GLN:NE2	2.48	0.47
1:S:32:LEU:HD13	1:S:52:GLN:HG2	1.97	0.46
1:O:70:LEU:H	1:O:70:LEU:HD23	1.80	0.46
2:H:244:SER:HG	2:H:245:GLN:H	1.62	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:21:N:N3	3:A:31:N:N1	2.63	0.46
1:T:18:GLU:N	1:T:18:GLU:OE1	2.49	0.46
2:G:164:CYS:HG	2:G:217:TRP:HE1	1.62	0.46
2:B:192:ARG:NH2	2:B:200:GLN:O	2.49	0.46
1:J:54:VAL:HG12	1:L:61:THR:CG2	2.46	0.46
2:B:192:ARG:NH1	2:B:197:GLU:O	2.49	0.46
1:D:26:LEU:HD12	1:D:30:ILE:HD11	1.99	0.45
2:H:34:GLN:NE2	2:H:146:CYS:O	2.48	0.45
2:B:189:ASP:OD1	2:B:190:ALA:N	2.41	0.45
2:H:138:ARG:NH2	3:A:6:U:OP2	2.50	0.45
1:O:29:GLY:O	3:A:52:G:O2'	2.35	0.44
2:G:160:ASN:ND2	2:G:160:ASN:O	2.50	0.44
1:S:7:LEU:HD21	1:Q:45:LEU:HD11	1.99	0.44
1:S:40:ASP:OD2	1:U:7:LEU:N	2.46	0.44
2:H:179:ASP:O	2:H:183:GLY:N	2.50	0.44
1:U:68:VAL:O	1:U:68:VAL:HG23	2.17	0.44
2:H:6:VAL:O	2:H:6:VAL:HG13	2.17	0.44
2:B:210:ALA:O	2:B:214:ASN:N	2.51	0.44
1:E:31:LYS:NZ	1:E:33:GLN:OE1	2.51	0.44
2:G:126:MET:O	2:G:177:TRP:NE1	2.50	0.44
2:G:224:LEU:HD23	2:G:225:THR:O	2.18	0.44
1:N:40:ASP:N	1:N:40:ASP:OD1	2.50	0.44
1:M:33:GLN:O	1:M:48:ASN:ND2	2.50	0.44
3:A:32:N:C2	3:A:33:N:C5	2.96	0.43
1:T:49:THR:HG23	1:T:49:THR:O	2.17	0.43
1:L:52:GLN:OE1	1:N:61:THR:HG21	2.18	0.43
2:I:23:LEU:CD2	2:I:31:ILE:HD12	2.49	0.43
3:A:49:G:HO2'	3:A:50:C:C5'	2.29	0.43
2:G:19:LEU:HD11	2:G:243:PHE:CD2	2.54	0.43
2:G:124:LYS:O	2:G:127:ASP:OD1	2.36	0.43
1:T:12:LEU:CD1	1:T:36:ILE:HD13	2.49	0.42
2:B:157:ASP:OD1	2:B:192:ARG:NE	2.52	0.42
2:B:197:GLU:N	2:B:197:GLU:OE1	2.52	0.42
1:O:70:LEU:O	1:O:70:LEU:HG	2.19	0.42
2:I:204:TRP:O	2:I:245:GLN:NE2	2.52	0.42
2:G:19:LEU:HD11	2:G:243:PHE:CE2	2.54	0.42
1:R:10:PRO:O	1:R:14:THR:OG1	2.21	0.42
2:I:191:LEU:HD21	2:I:237:LEU:HD11	2.02	0.42
1:F:30:ILE:HD12	3:A:57:G:N3	2.35	0.42
2:I:130:THR:HG23	2:I:131:HIS:N	2.34	0.42
2:B:17:ARG:NH2	2:B:243:PHE:O	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:20:N:O2	3:A:32:N:C2	2.67	0.42
2:B:74:LEU:O	2:B:74:LEU:HD12	2.19	0.42
1:M:43:VAL:HG23	1:O:7:LEU:HD22	2.02	0.42
2:I:3:ILE:HD12	2:I:253:TYR:CE1	2.55	0.42
2:I:23:LEU:HD23	2:I:31:ILE:HD12	2.01	0.42
1:C:40:ASP:O	1:C:56:LYS:NZ	2.45	0.42
1:D:20:VAL:HG13	1:D:66:ARG:HG2	2.02	0.42
3:A:32:N:HO2'	3:A:33:N:C4'	2.33	0.42
1:M:19:ARG:NH2	1:M:35:GLN:OE1	2.51	0.41
1:S:13:ASN:OD1	1:S:14:THR:N	2.53	0.41
2:B:30:VAL:HG23	2:B:30:VAL:O	2.19	0.41
2:H:64:GLU:OE1	2:H:64:GLU:N	2.53	0.41
3:A:32:N:N3	3:A:33:N:N7	2.69	0.41
1:K:61:THR:HG21	3:A:46:C:H42	1.84	0.41
2:H:86:GLU:OE2	2:H:90:ARG:NH1	2.51	0.41
2:G:44:ASP:O	2:G:49:GLN:NE2	2.53	0.41
1:L:51:SER:O	1:N:11:TYR:OH	2.37	0.41
2:B:191:LEU:HD11	2:B:237:LEU:HD11	2.03	0.41
1:O:7:LEU:HD23	1:O:7:LEU:O	2.21	0.40
1:S:7:LEU:O	1:S:7:LEU:HD23	2.21	0.40
2:I:31:ILE:HD11	2:I:71:TYR:CD2	2.56	0.40
2:H:24:GLN:OE1	2:H:51:ASP:N	2.44	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	C	62/82 (76%)	61 (98%)	1 (2%)	0	100	100
1	D	66/82 (80%)	62 (94%)	4 (6%)	0	100	100
1	E	63/82 (77%)	60 (95%)	3 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	F	64/82 (78%)	60 (94%)	4 (6%)	0	100	100
1	J	65/82 (79%)	60 (92%)	5 (8%)	0	100	100
1	K	65/82 (79%)	60 (92%)	5 (8%)	0	100	100
1	L	67/82 (82%)	66 (98%)	1 (2%)	0	100	100
1	M	67/82 (82%)	63 (94%)	4 (6%)	0	100	100
1	N	67/82 (82%)	64 (96%)	3 (4%)	0	100	100
1	O	67/82 (82%)	61 (91%)	6 (9%)	0	100	100
1	P	63/82 (77%)	59 (94%)	4 (6%)	0	100	100
1	Q	65/82 (79%)	60 (92%)	5 (8%)	0	100	100
1	R	66/82 (80%)	63 (96%)	3 (4%)	0	100	100
1	S	66/82 (80%)	59 (89%)	7 (11%)	0	100	100
1	T	65/82 (79%)	60 (92%)	5 (8%)	0	100	100
1	U	65/82 (79%)	58 (89%)	7 (11%)	0	100	100
1	w	65/82 (79%)	63 (97%)	2 (3%)	0	100	100
1	x	64/82 (78%)	57 (89%)	7 (11%)	0	100	100
2	B	261/262 (100%)	245 (94%)	16 (6%)	0	100	100
2	G	261/262 (100%)	246 (94%)	15 (6%)	0	100	100
2	H	261/262 (100%)	249 (95%)	12 (5%)	0	100	100
2	I	260/262 (99%)	243 (94%)	17 (6%)	0	100	100
All	All	2215/2524 (88%)	2079 (94%)	136 (6%)	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	
1	C	61/74 (82%)	61 (100%)	0	100	100
1	D	64/74 (86%)	63 (98%)	1 (2%)	62	83

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	61/74 (82%)	61 (100%)	0	100	100
1	F	63/74 (85%)	63 (100%)	0	100	100
1	J	64/74 (86%)	64 (100%)	0	100	100
1	K	64/74 (86%)	64 (100%)	0	100	100
1	L	65/74 (88%)	64 (98%)	1 (2%)	65	84
1	M	65/74 (88%)	65 (100%)	0	100	100
1	N	65/74 (88%)	65 (100%)	0	100	100
1	O	65/74 (88%)	65 (100%)	0	100	100
1	P	62/74 (84%)	62 (100%)	0	100	100
1	Q	63/74 (85%)	63 (100%)	0	100	100
1	R	64/74 (86%)	64 (100%)	0	100	100
1	S	64/74 (86%)	64 (100%)	0	100	100
1	T	63/74 (85%)	63 (100%)	0	100	100
1	U	63/74 (85%)	63 (100%)	0	100	100
1	w	61/74 (82%)	61 (100%)	0	100	100
1	x	63/74 (85%)	63 (100%)	0	100	100
2	B	222/221 (100%)	222 (100%)	0	100	100
2	G	222/221 (100%)	222 (100%)	0	100	100
2	H	222/221 (100%)	222 (100%)	0	100	100
2	I	221/221 (100%)	220 (100%)	1 (0%)	88	95
All	All	2027/2216 (92%)	2024 (100%)	3 (0%)	93	98

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	69	ARG
1	L	17	LYS
2	I	236	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	A	38/108 (35%)	20 (52%)	0

All (20) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	A	3	A
3	A	4	A
3	A	5	A
3	A	6	U
3	A	7	A
3	A	15	G
3	A	46	C
3	A	50	C
3	A	54	A
3	A	56	C
3	A	57	G
3	A	58	A
3	A	61	C
3	A	62	C
3	A	63	G
3	A	79	A
3	A	80	C
3	A	81	U
3	A	82	A
3	A	83	C

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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	A	5

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	33:N	O3'	45:U	P	43.99
1	A	22:N	O3'	30:N	P	16.19
1	A	32:N	O3'	33:N	P	2.47
1	A	19:N	O3'	20:N	P	2.18
1	A	20:N	O3'	21:N	P	1.35

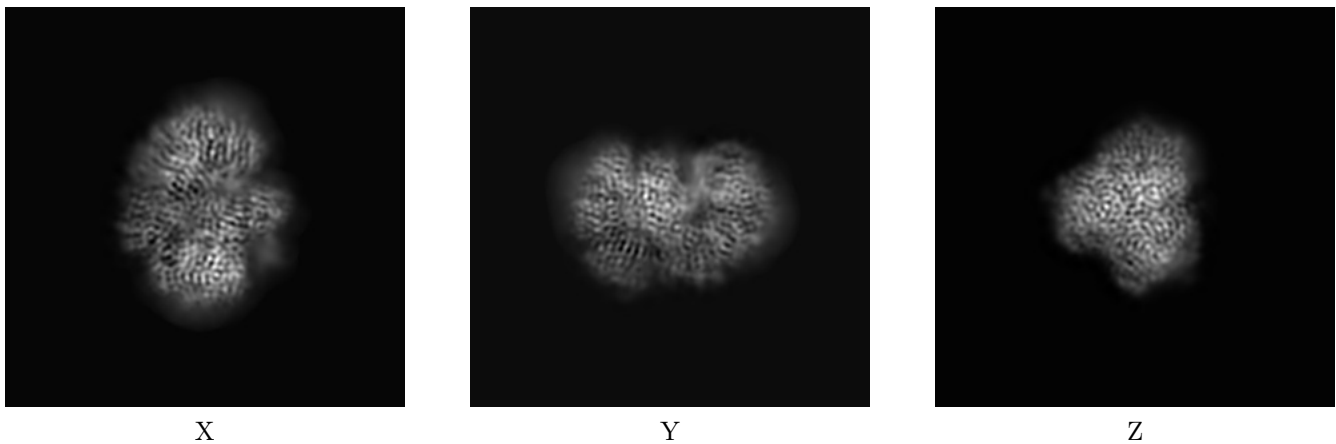
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-16264. These allow visual inspection of the internal detail of the map and identification of artifacts.

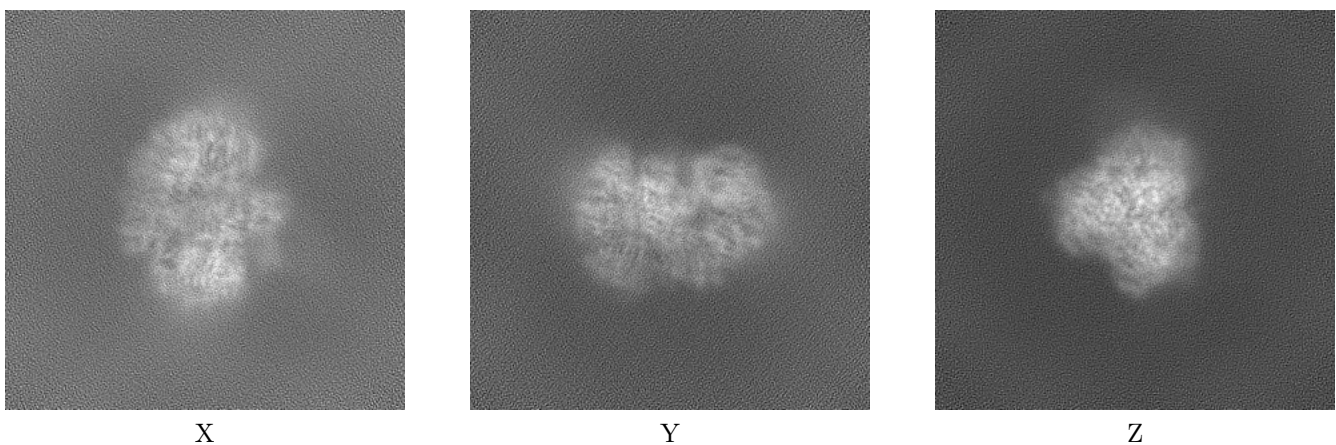
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



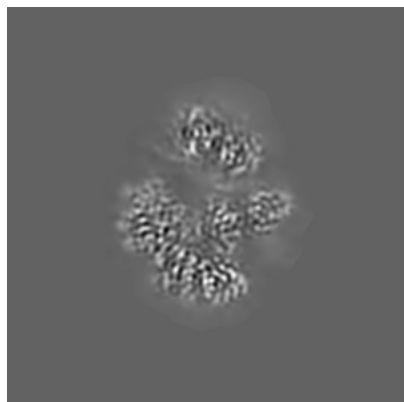
#### 6.1.2 Raw map



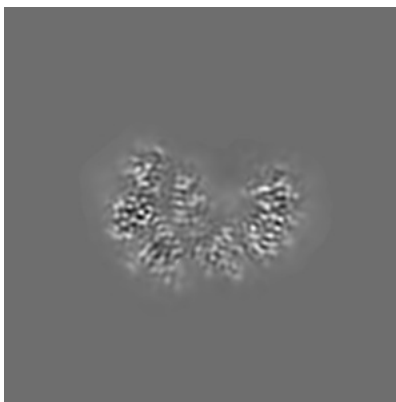
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

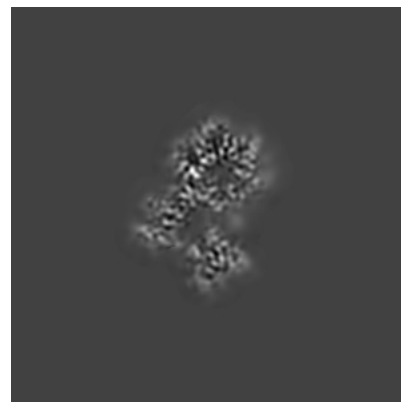
### 6.2.1 Primary map



X Index: 150

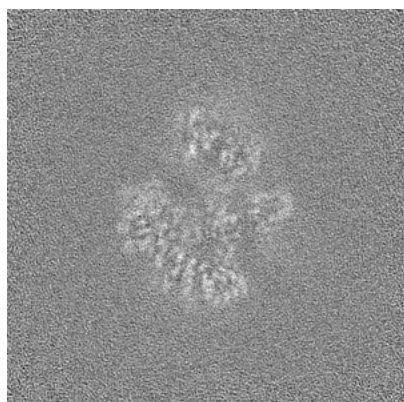


Y Index: 150

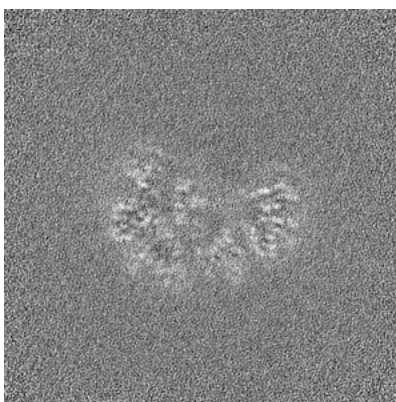


Z Index: 150

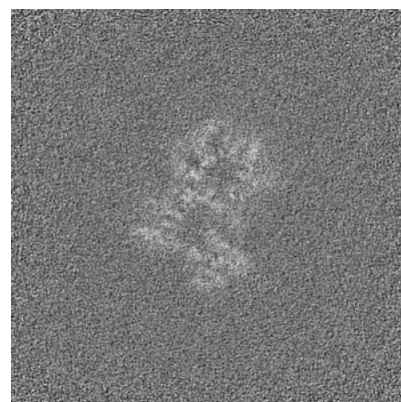
### 6.2.2 Raw map



X Index: 150



Y Index: 150



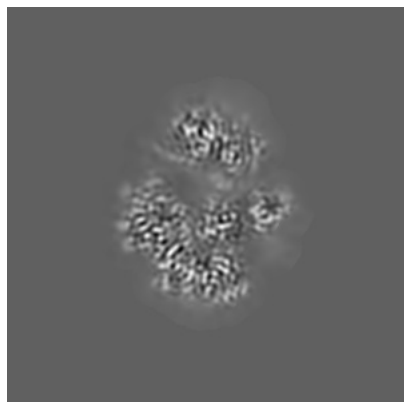
Z Index: 150

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

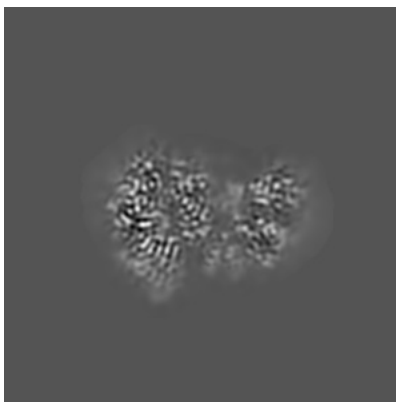


## 6.3 Largest variance slices [i](#)

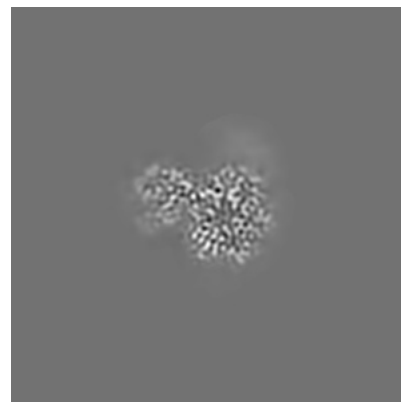
### 6.3.1 Primary map



X Index: 152

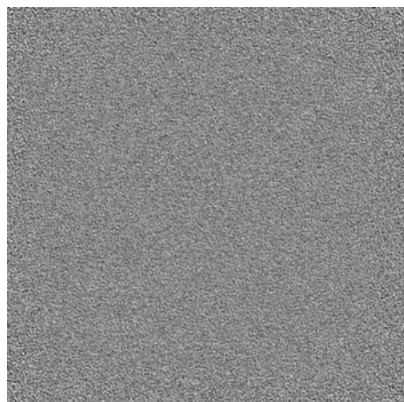


Y Index: 157

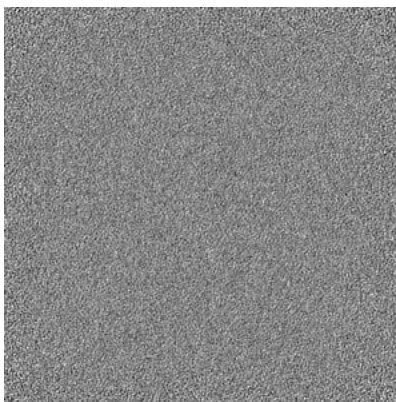


Z Index: 105

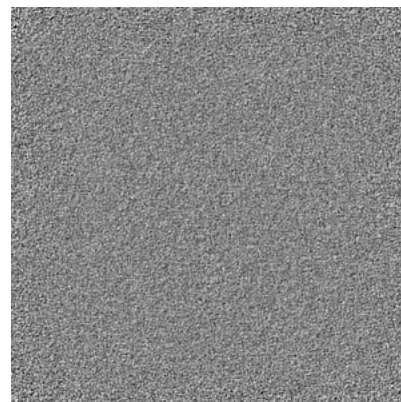
### 6.3.2 Raw map



X Index: 0



Y Index: 0

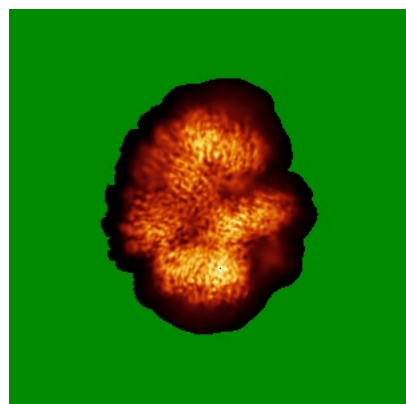


Z Index: 0

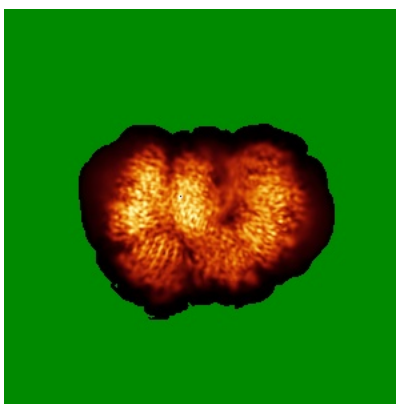
The images above show the largest variance slices of the map in three orthogonal directions.

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

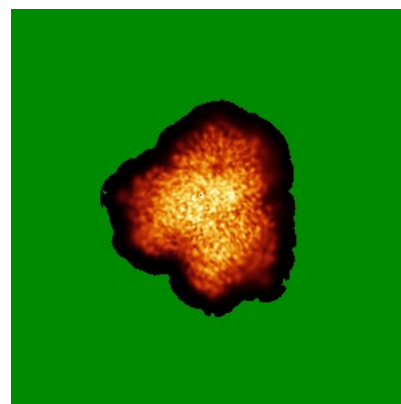
### 6.4.1 Primary map



X

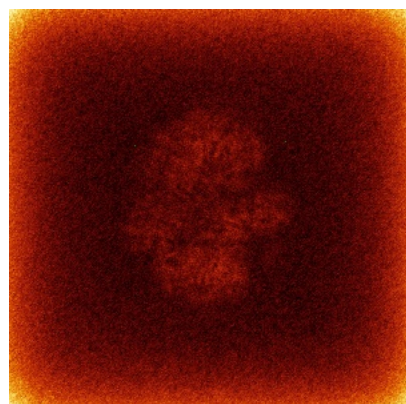


Y

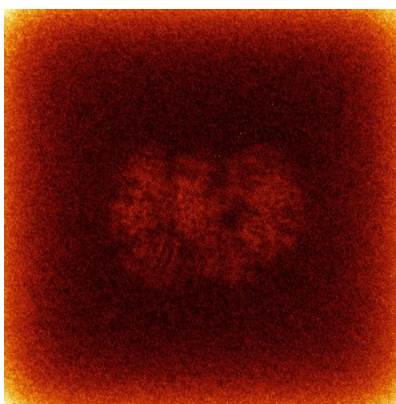


Z

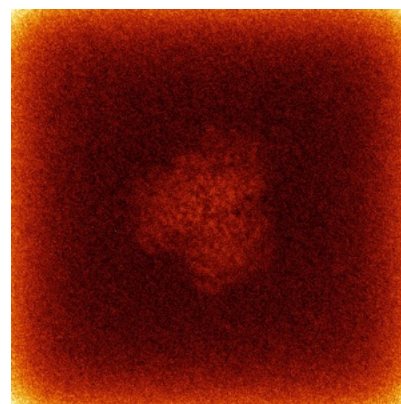
### 6.4.2 Raw map



X



Y

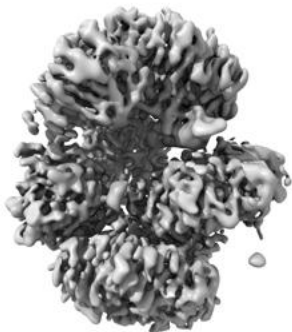


Z

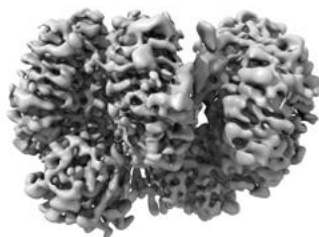
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views [i](#)

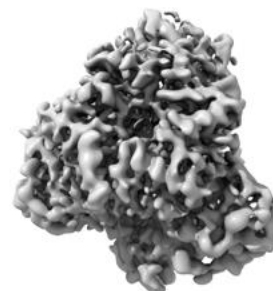
### 6.5.1 Primary map



X



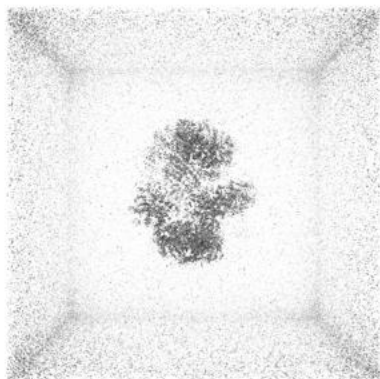
Y



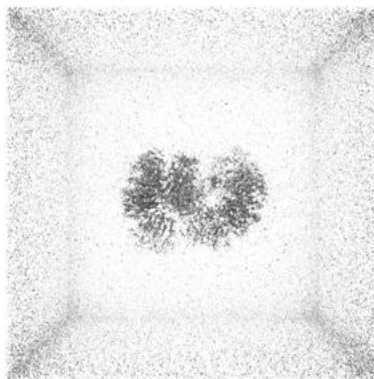
Z

The images above show the 3D surface view of the map at the recommended contour level 0.103. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

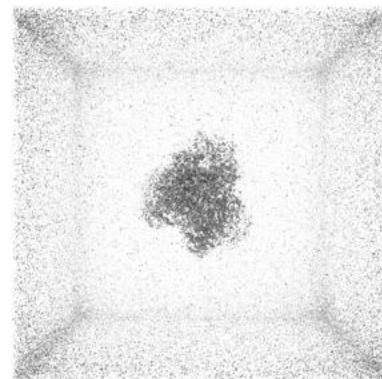
### 6.5.2 Raw map



X



Y



Z

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

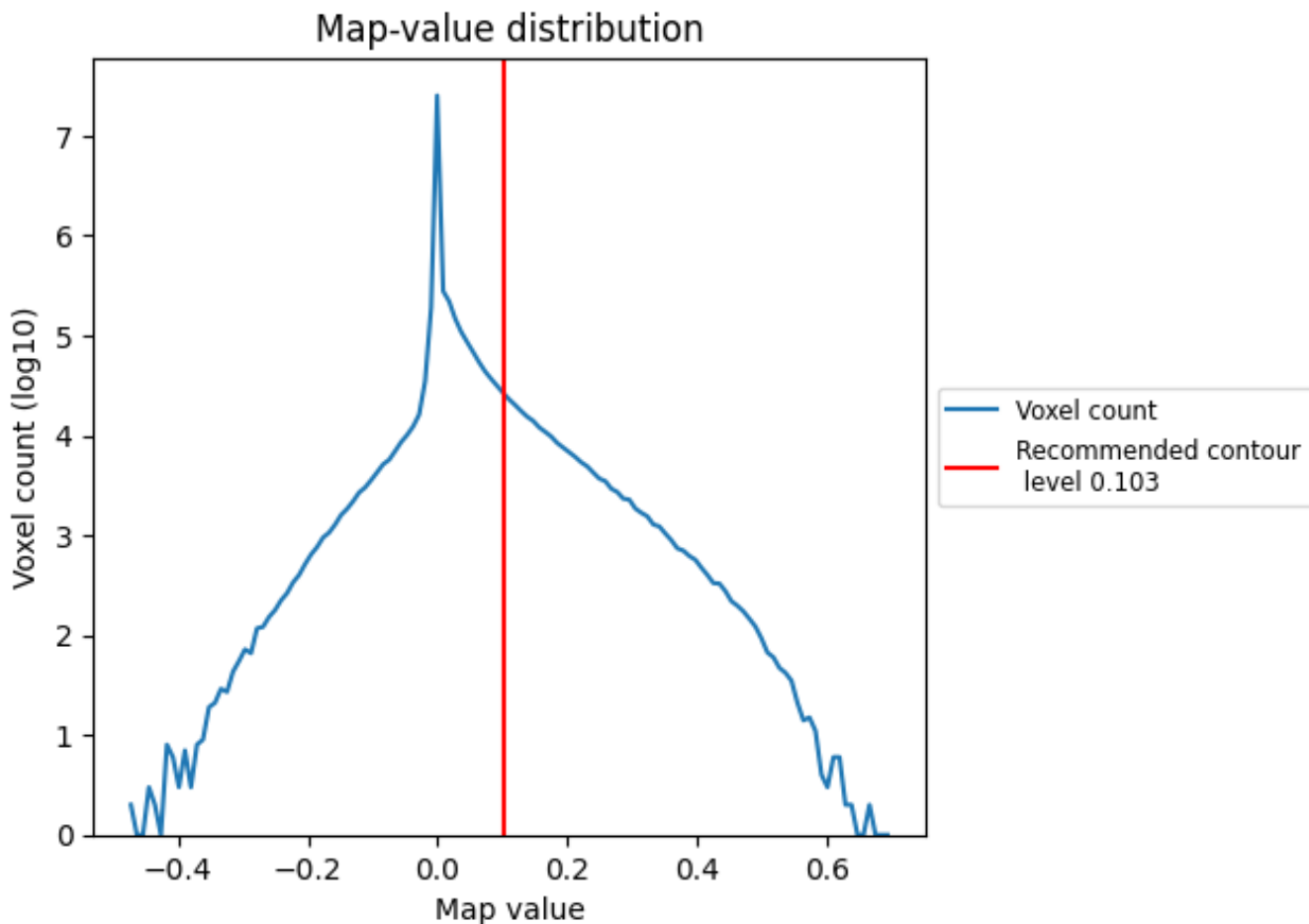
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

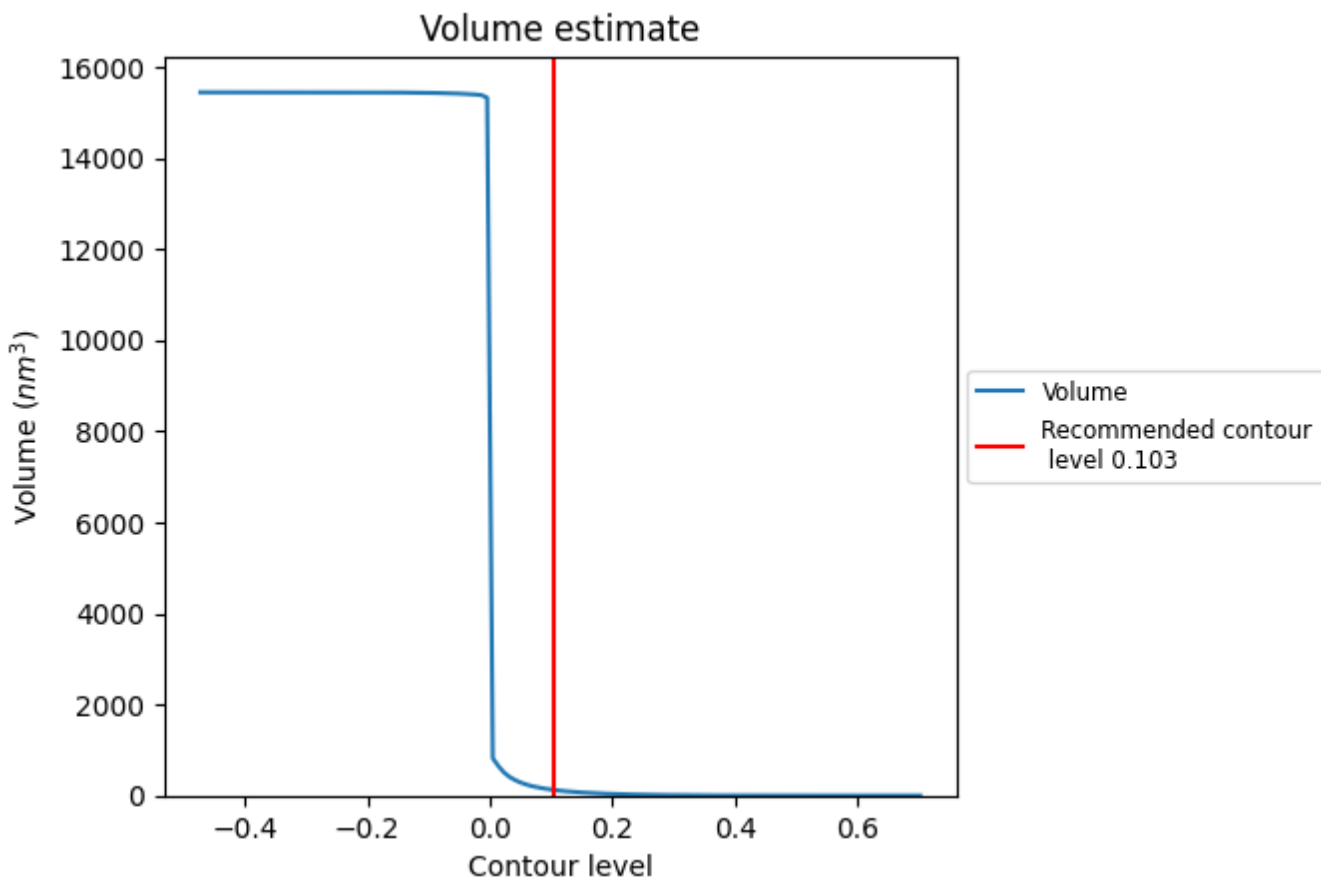
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

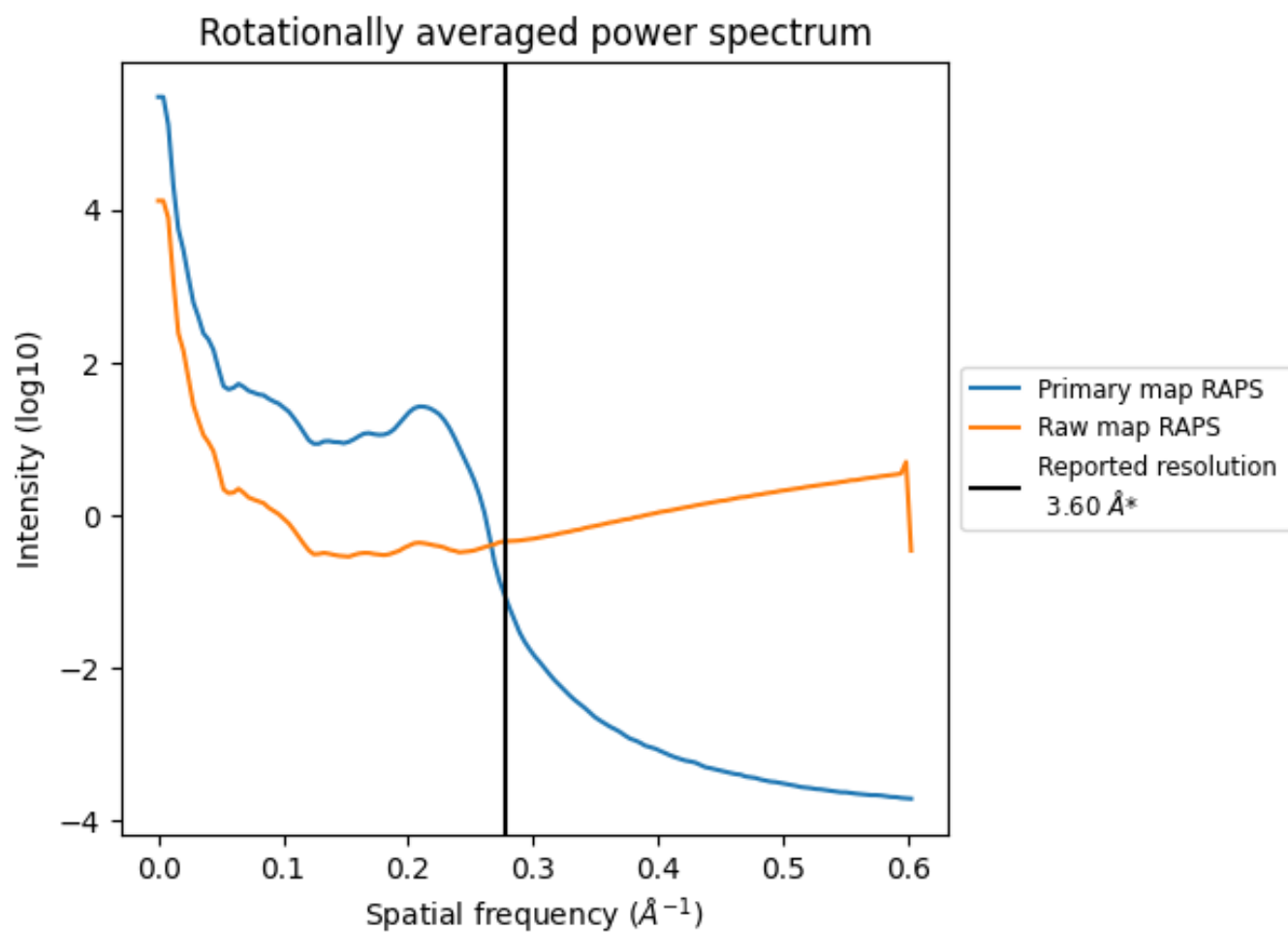
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 126 nm<sup>3</sup>; this corresponds to an approximate mass of 114 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](#)

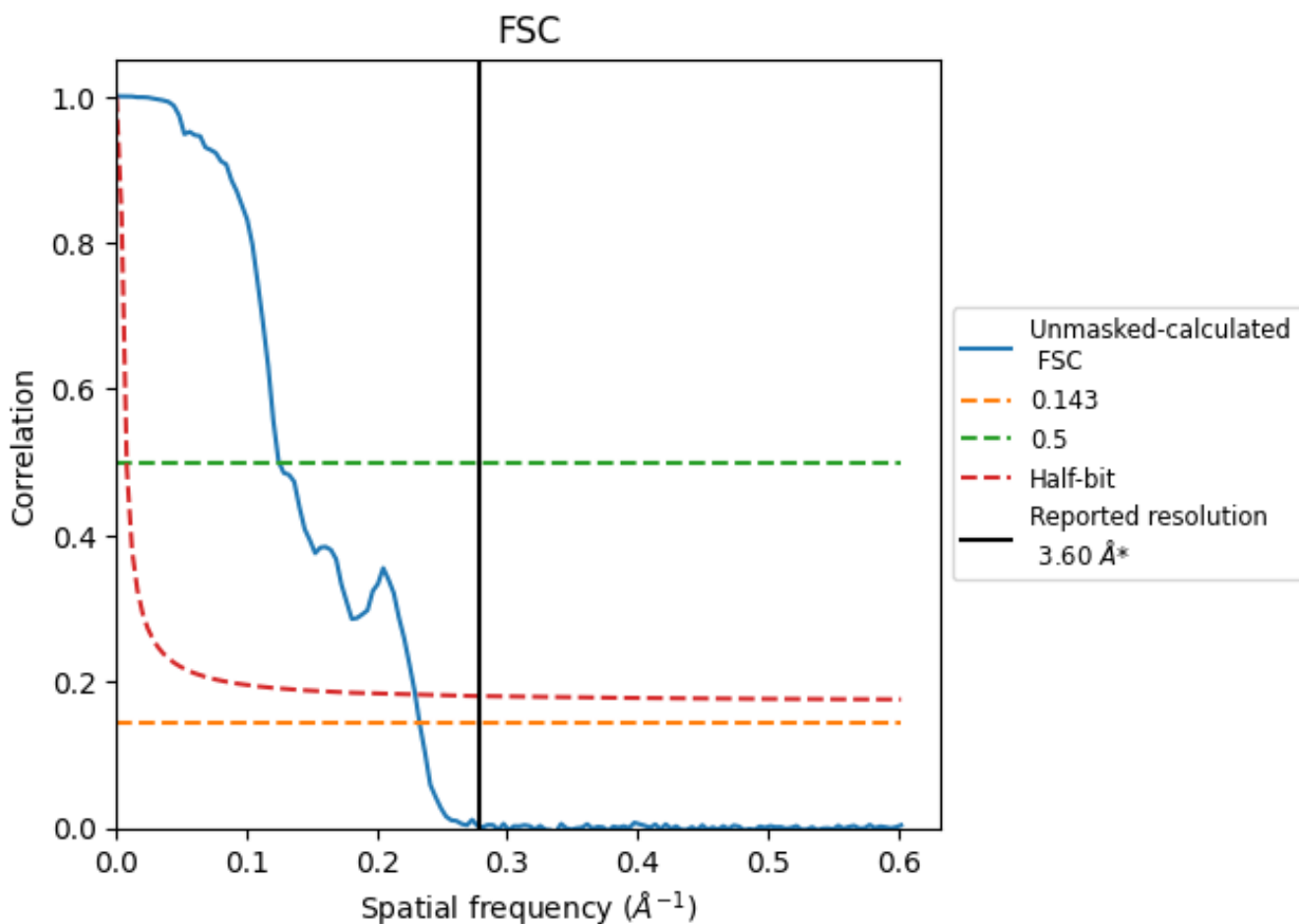


\*Reported resolution corresponds to spatial frequency of 0.278 Å<sup>-1</sup>

## 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 0.278 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.30	8.02	4.36

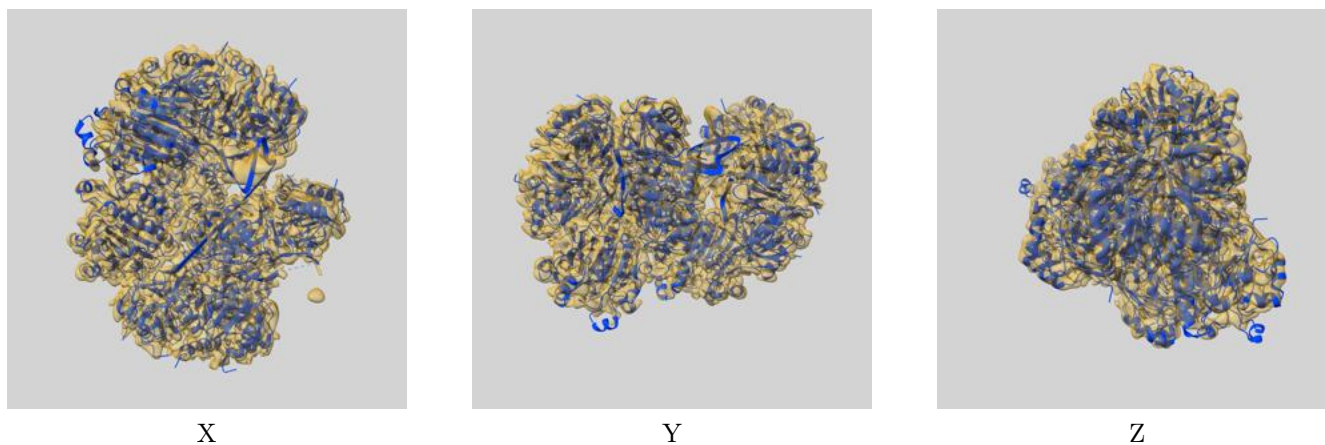
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.30 differs from the reported value 3.6 by more than 10 %



## 9 Map-model fit [i](#)

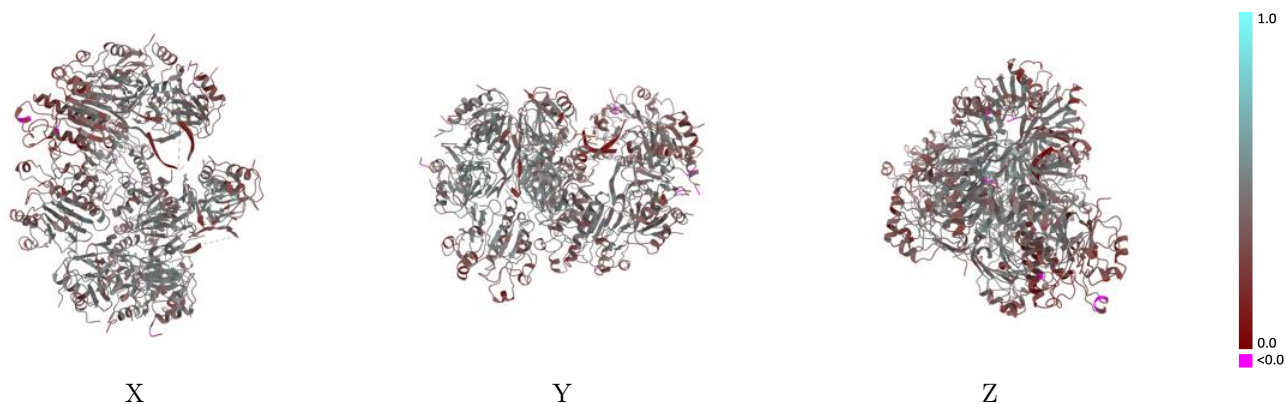
This section contains information regarding the fit between EMDB map EMD-16264 and PDB model 8BVH. Per-residue inclusion information can be found in section 3 on page 6.

### 9.1 Map-model overlay [i](#)



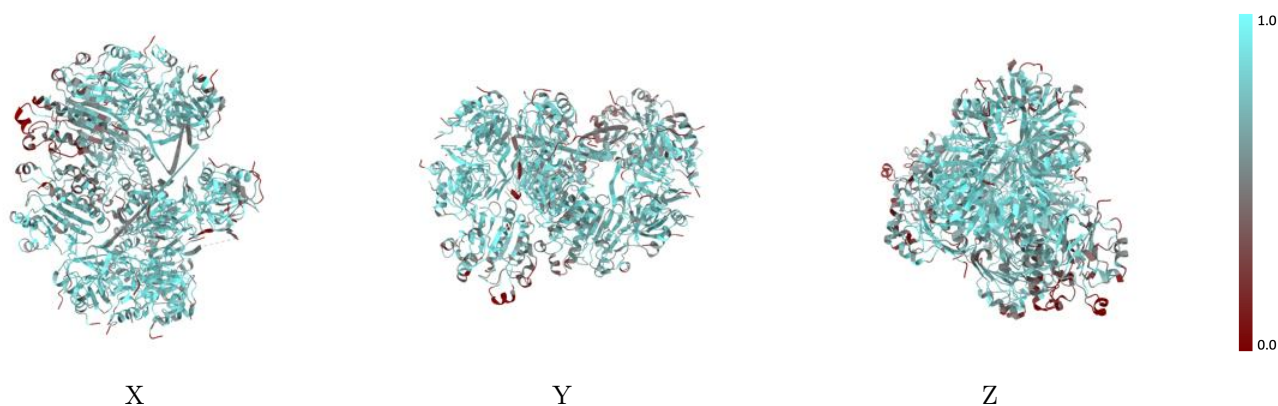
The images above show the 3D surface view of the map at the recommended contour level 0.103 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



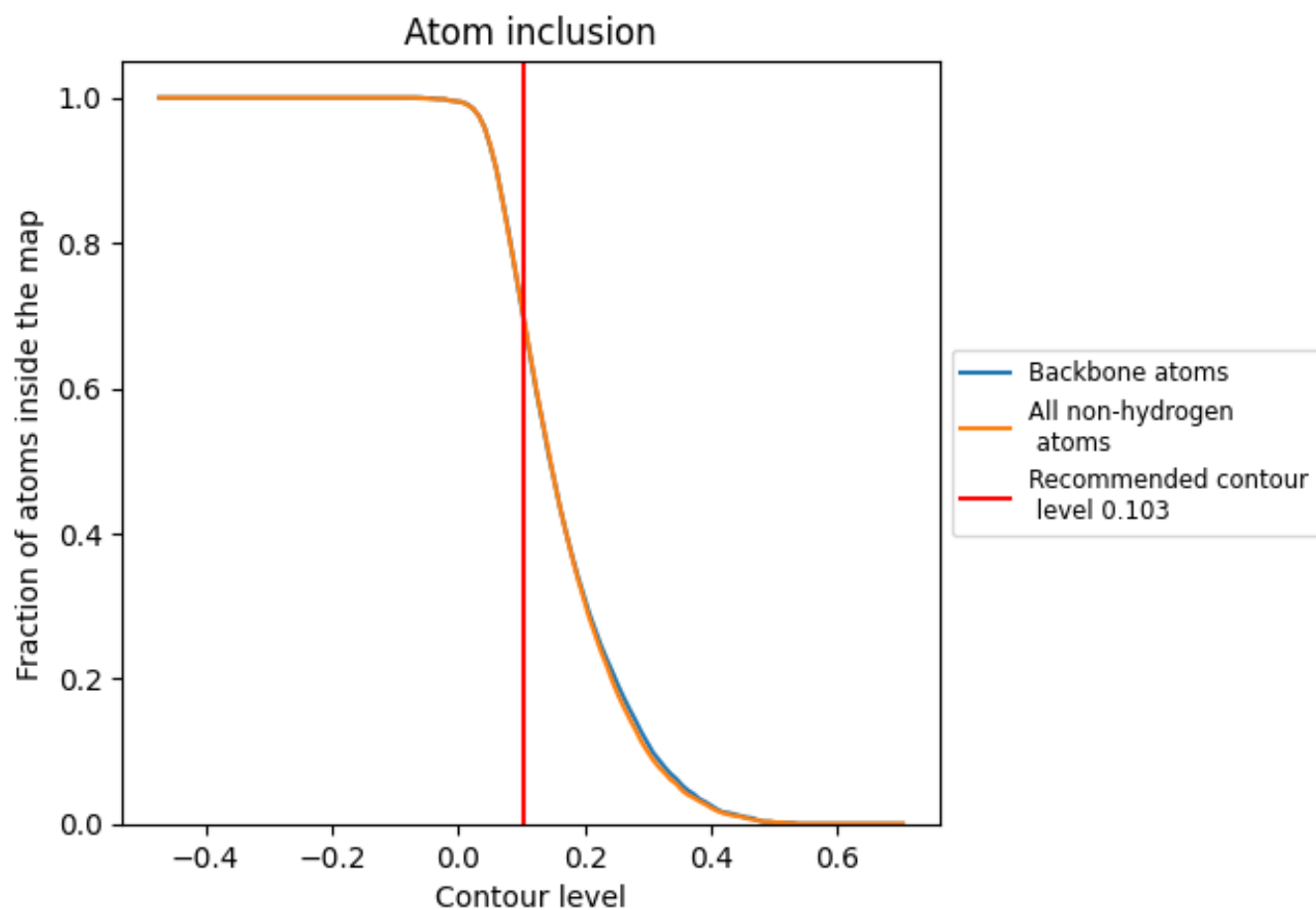
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.103).

















































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 70% 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 (0.103) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6980	 0.4040
A	 0.7420	 0.3790
B	 0.6690	 0.3940
C	 0.6960	 0.4060
D	 0.6330	 0.3880
E	 0.7690	 0.4520
F	 0.7760	 0.4790
G	 0.5470	 0.3170
H	 0.7190	 0.4050
I	 0.7240	 0.4120
J	 0.7190	 0.4030
K	 0.8090	 0.4560
L	 0.6810	 0.3660
M	 0.7920	 0.4520
N	 0.7150	 0.3900
O	 0.7830	 0.4420
P	 0.7470	 0.4080
Q	 0.7740	 0.4450
R	 0.7340	 0.4020
S	 0.7790	 0.4560
T	 0.7910	 0.4230
U	 0.7340	 0.4270
w	 0.7560	 0.4610
x	 0.7190	 0.4120

