



## wwPDB EM Validation Summary Report ⓘ

Dec 29, 2024 – 12:50 PM EST

PDB ID : 7PKS  
EMDB ID : EMD-13479  
Title : Structural basis of Integrator-mediated transcription regulation  
Authors : Fianu, I.; Chen, Y.; Dienemann, C.; Cramer, P.  
Deposited on : 2021-08-26  
Resolution : 3.60 Å(reported)  
Based on initial models : 3DW8, 7CUN, 7BFP, 6GML

This is a wwPDB EM Validation Summary 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:

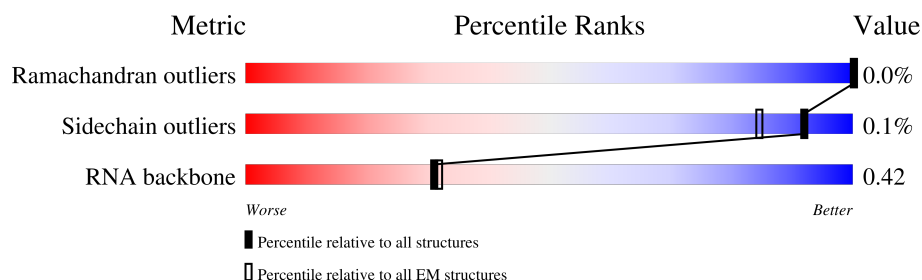
EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP)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



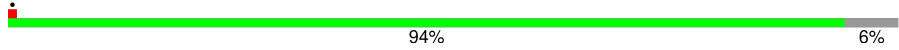
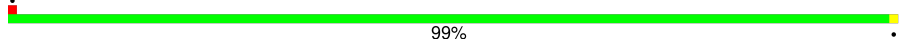
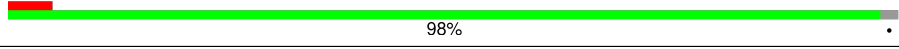

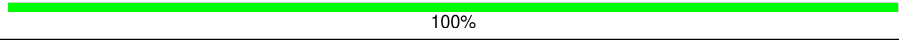

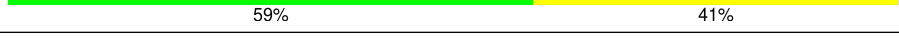
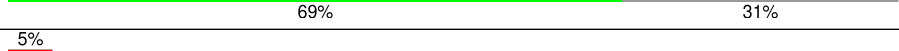
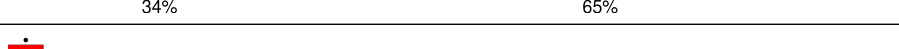
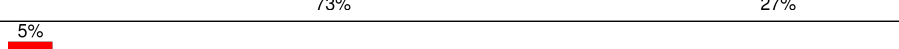
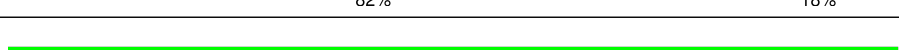
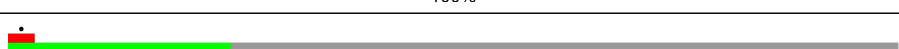
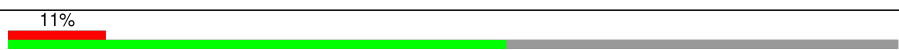

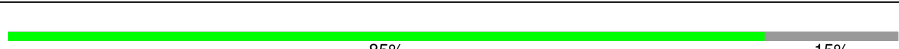


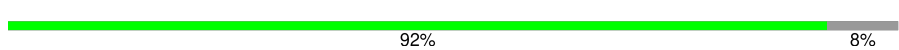


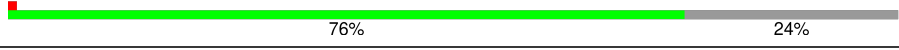
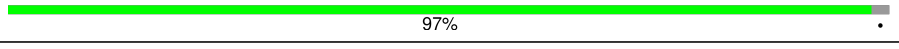
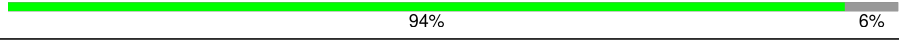
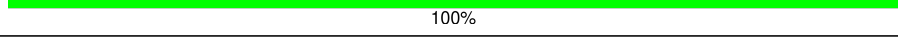

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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  $\geq 3$ , 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	A	1970	71% 29%
2	B	1174	95% 5%
3	C	275	95% 5%
4	D	142	12% 89% 11%
5	E	210	99% .
6	F	127	61% 39%
7	G	172	5% 99% ..
8	H	150	5% 99% .

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Mol	Chain	Length	Quality of chain
9	I	125	
10	J	67	
11	K	117	
12	L	58	
13	M	13	
14	N	48	
15	P	17	
16	T	48	
17	U	528	
18	V	614	
19	W	616	
20	X	22	
21	Z	1087	
22	a	2190	
23	b	1204	
24	d	963	
25	e	1019	
26	f	887	
27	g	962	
28	h	995	
29	i	658	
30	k	600	
31	p	589	
32	q	309	
33	u	27	

## 2 Entry composition

There are 36 unique types of molecules in this entry. The entry contains 101147 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 DNA-directed RNA polymerase subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1392	Total	C	N	O	S	0	0
			11012	6933	1973	2037	69		

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	?	-	TYR	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2
A	?	-	PRO	deletion	UNP A0A7M4DUC2
A	?	-	THR	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2
A	?	-	PRO	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2
A	?	-	TYR	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2
A	?	-	PRO	deletion	UNP A0A7M4DUC2
A	?	-	THR	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2
A	?	-	PRO	deletion	UNP A0A7M4DUC2
A	?	-	SER	deletion	UNP A0A7M4DUC2

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1112	Total	C	N	O	S	0	0
			8901	5634	1560	1643	64		

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	261	Total	C	N	O	S	0	0
			2096	1314	360	416	6		

- Molecule 4 is a protein called RNA polymerase II subunit D.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	126	Total	C	N	O	S	0	0
			975	613	166	192	4		

- Molecule 5 is a protein called DNA-directed RNA polymerase II subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	209	Total	C	N	O	S	0	0
			1721	1089	300	324	8		

- Molecule 6 is a protein called DNA-directed RNA polymerase II subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	78	Total	C	N	O	S	0	0
			627	401	106	115	5		

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1316	858	208	242	8		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	148	Total	C	N	O	S	0	0
			1186	750	194	237	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	117	Total	C	N	O	S	0	0
			944	584	166	183	11		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	67	Total	C	N	O	S	0	0
			533	345	90	92	6		

- Molecule 11 is a protein called RNA\_pol\_L\_2 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	115	Total	C	N	O	S	0	0
			920	593	152	173	2		

- Molecule 12 is a protein called RNA polymerase II subunit K.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	46	Total	C	N	O	S	0	0
			383	238	72	67	6		

- Molecule 13 is a protein called RPBI C-terminal domain peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	M	13	Total	C	N	O	0	0
			95	60	13	22		

- Molecule 14 is a DNA chain called Non-template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	24	Total	C	N	O	P	0	0
			489	234	90	141	24		

- Molecule 15 is a RNA chain called TAR RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	17	Total	C	N	O	P	0	0
			361	162	66	116	17		

- Molecule 16 is a DNA chain called DNA Template.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	T	33	Total	C	N	O	P	0	0
			682	325	122	202	33		

- Molecule 17 is a protein called Negative elongation factor A.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	U	183	Total	C	N	O	S	0	0
			1398	889	238	264	7		

- Molecule 18 is a protein called Negative elongation factor B.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	V	451	Total	C	N	O	0	0
			2040	1102	466	472		

- Molecule 19 is a protein called Negative elongation factor C/D.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	W	508	Total	C	N	O	S	0	0
			3854	2468	654	713	19		

- Molecule 20 is a protein called Negative elongation factor E.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	X	22	Total	C	N	O	0	0
			110	66	22	22		

- Molecule 21 is a protein called Transcription elongation factor SPT5.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Z	273	Total	C	N	O	S	0	0
			2174	1369	392	402	11		

- Molecule 22 is a protein called Integrator complex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	a	1227	Total	C	N	O	S	0	0
			8337	5233	1513	1550	41		

- Molecule 23 is a protein called Integrator complex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	b	1047	Total	C	N	O	S	0	0
			7926	5085	1332	1447	62		

- Molecule 24 is a protein called Integrator complex subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	d	820	Total	C	N	O	S	0	0
			6410	4090	1093	1193	34		

- Molecule 25 is a protein called Integrator complex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	e	649	Total	C	N	O	S	0	0
			4671	2973	857	824	17		

- Molecule 26 is a protein called Integrator complex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	f	536	Total	C	N	O	S	0	0
			4075	2617	692	743	23		

- Molecule 27 is a protein called Integrator complex subunit 7.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	g	886	Total	C	N	O	S	0	0
			6710	4250	1163	1257	40		

- Molecule 28 is a protein called Integrator complex subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	h	887	Total	C	N	O	S	0	0
			6749	4332	1156	1223	38		

- Molecule 29 is a protein called Integrator complex subunit 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	i	550	Total	C	N	O	S	0	0
			4249	2741	689	788	31		

- Molecule 30 is a protein called Integrator complex subunit 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	k	458	Total	C	N	O	S	0	0
			3336	2143	575	593	25		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k	487	GLU	ASP	conflict	UNP Q5TA45

- Molecule 31 is a protein called Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform.



Mol	Chain	Residues	Atoms					AltConf	Trace
31	p	575	Total	C	N	O	S	0	0
			4388	2795	748	818	27		

- Molecule 32 is a protein called Serine/threonine-protein phosphatase 2A catalytic subunit alpha isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	q	290	Total	C	N	O	S	0	0
			2322	1467	403	437	15		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
q	88	ASN	ASP	conflict	UNP P67775

- Molecule 33 is a protein called Unknown.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	u	27	Total	C	N	O	0	0
			144	89	28	27		

- Molecule 34 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
34	A	1	Total	Mg	0
			1	1	

- Molecule 35 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
35	A	2	Total	Zn	0
			2	2	
35	B	1	Total	Zn	0
			1	1	
35	C	1	Total	Zn	0
			1	1	
35	I	2	Total	Zn	0
			2	2	
35	J	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
35	L	1	Total 1	Zn 1	0
35	k	2	Total 2	Zn 2	0

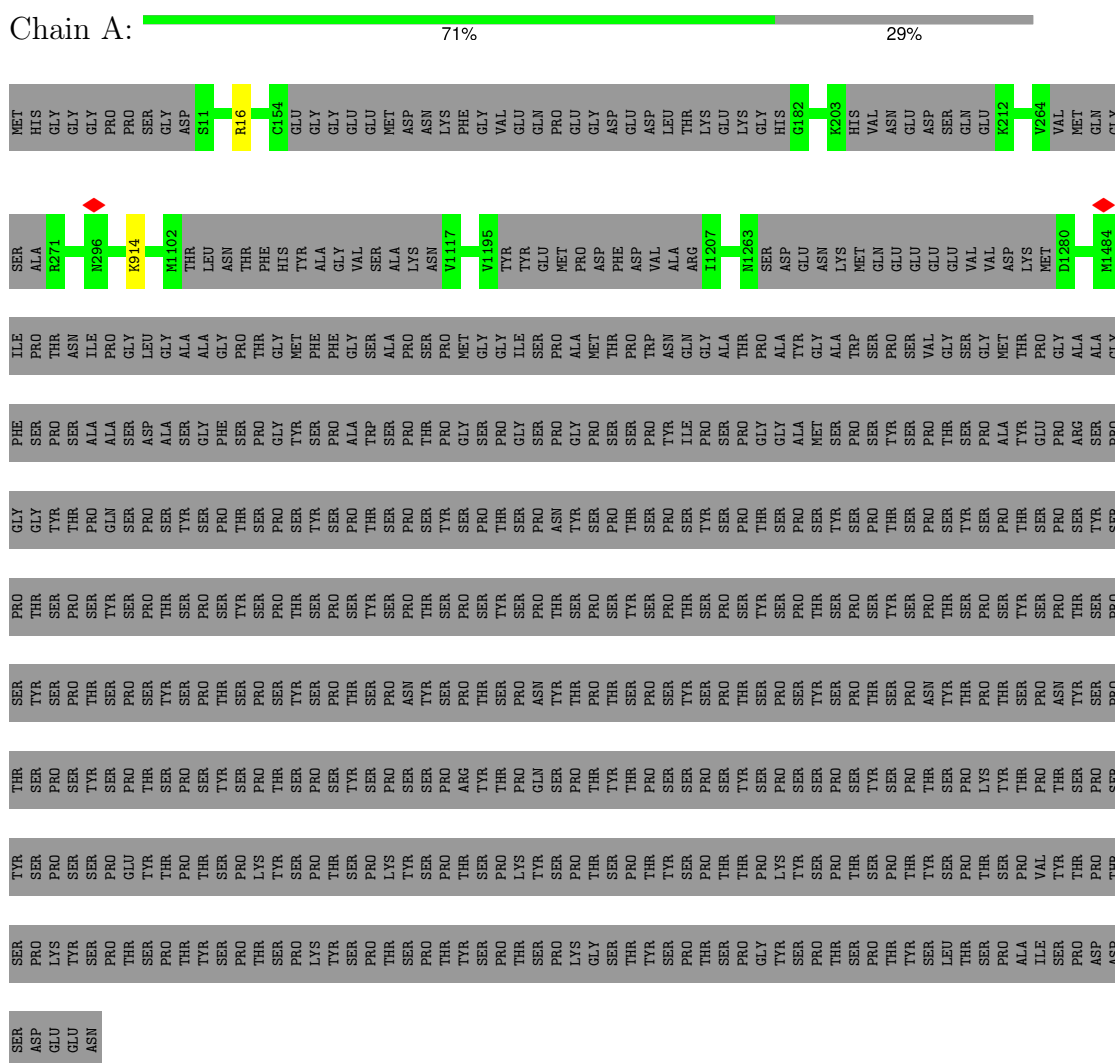
- Molecule 36 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
36	q	2	Total 2	Mn 2	0

### 3 Residue-property plots

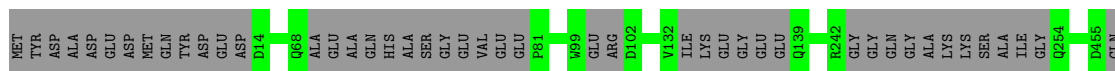
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: DNA-directed RNA polymerase subunit

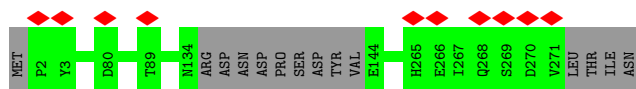


- Molecule 2: DNA-directed RNA polymerase subunit beta

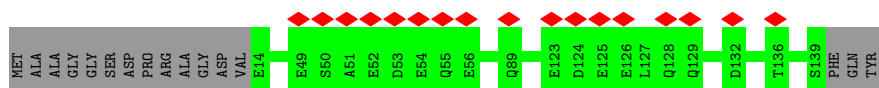
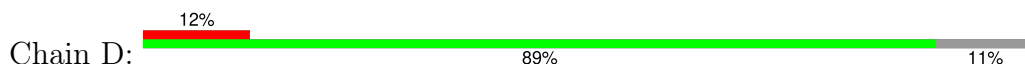




- Molecule 3: DNA-directed RNA polymerase II subunit RPB3



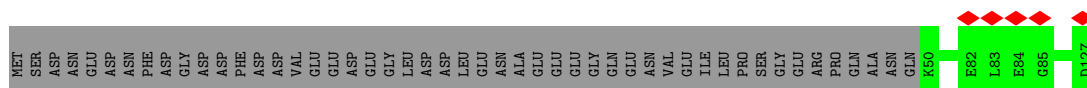
- Molecule 4: RNA polymerase II subunit D



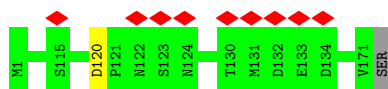
- Molecule 5: DNA-directed RNA polymerase II subunit E



- Molecule 6: DNA-directed RNA polymerase II subunit F

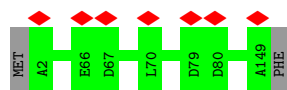


- Molecule 7: DNA-directed RNA polymerase II subunit RPB7

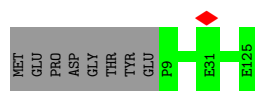


- Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

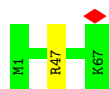




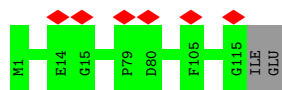
- Molecule 9: DNA-directed RNA polymerase II subunit RPB9



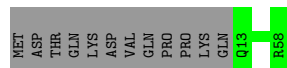
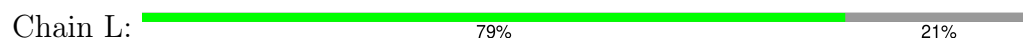
- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5



- Molecule 11: RNA\_pol\_L\_2 domain-containing protein



- Molecule 12: RNA polymerase II subunit K

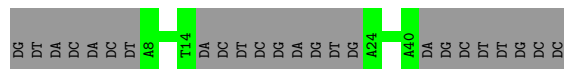


- Molecule 13: RPBI C-terminal domain peptide



There are no outlier residues recorded for this chain.

- Molecule 14: Non-template DNA



- Molecule 15: TAR RNA



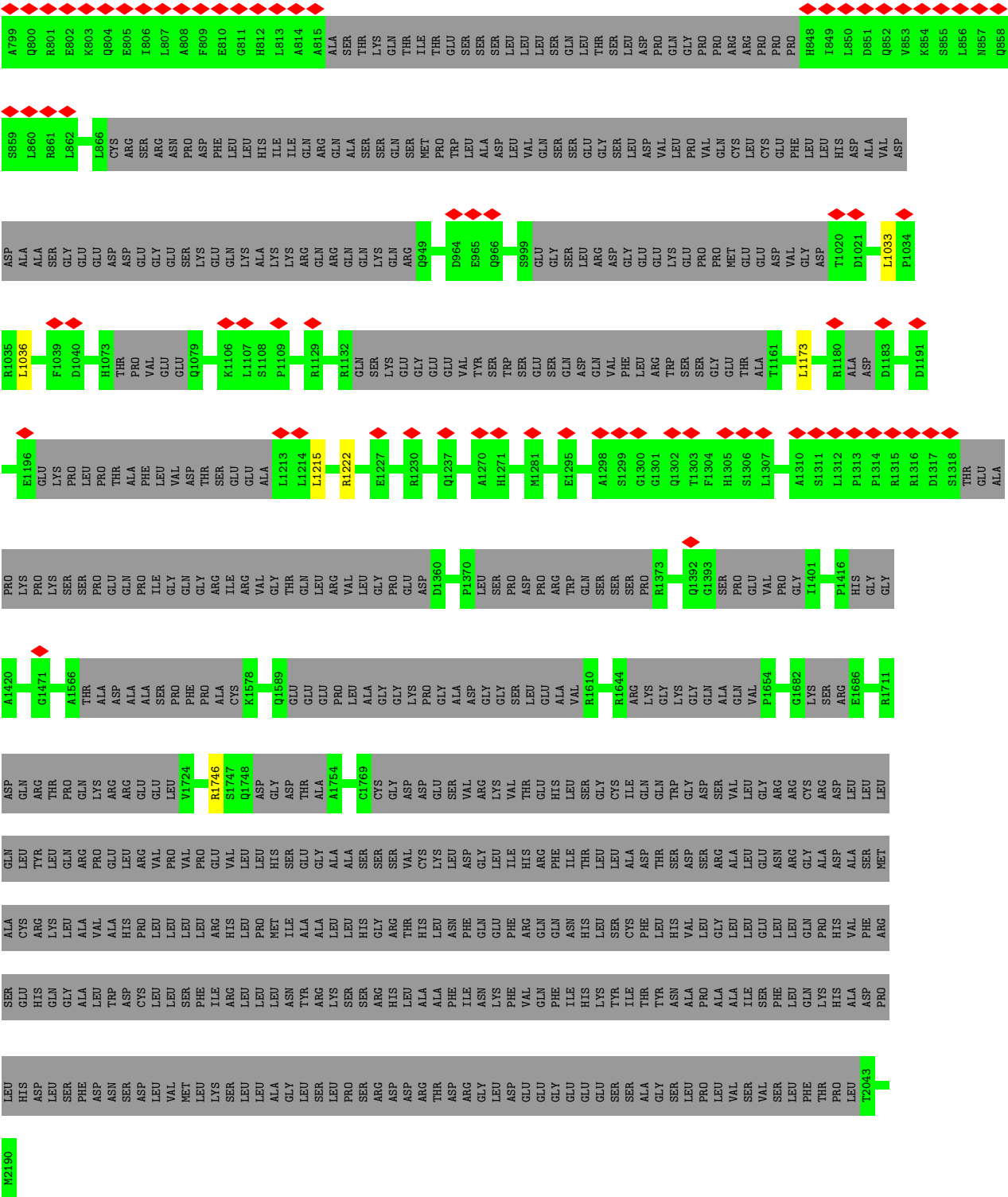


Chain W: 

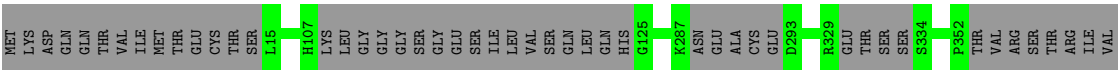
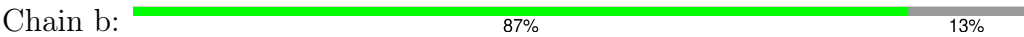


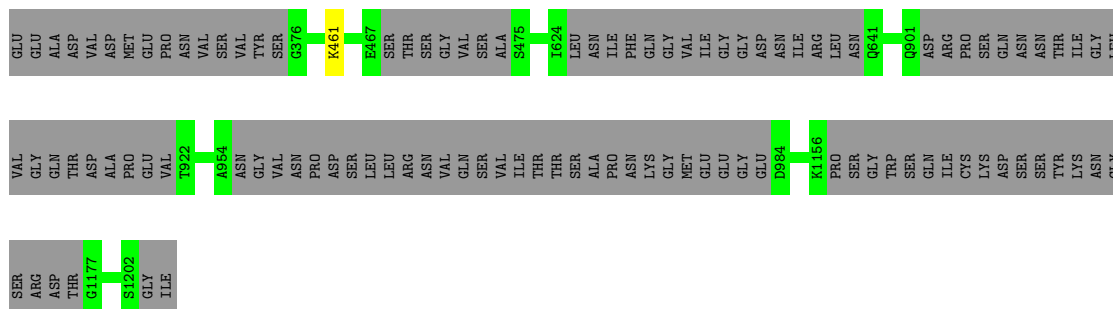




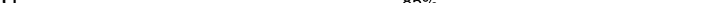


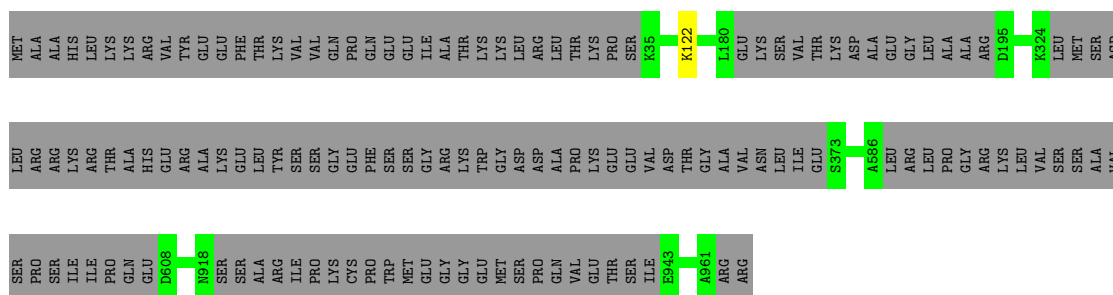
● Molecule 23: Integrator complex subunit 2





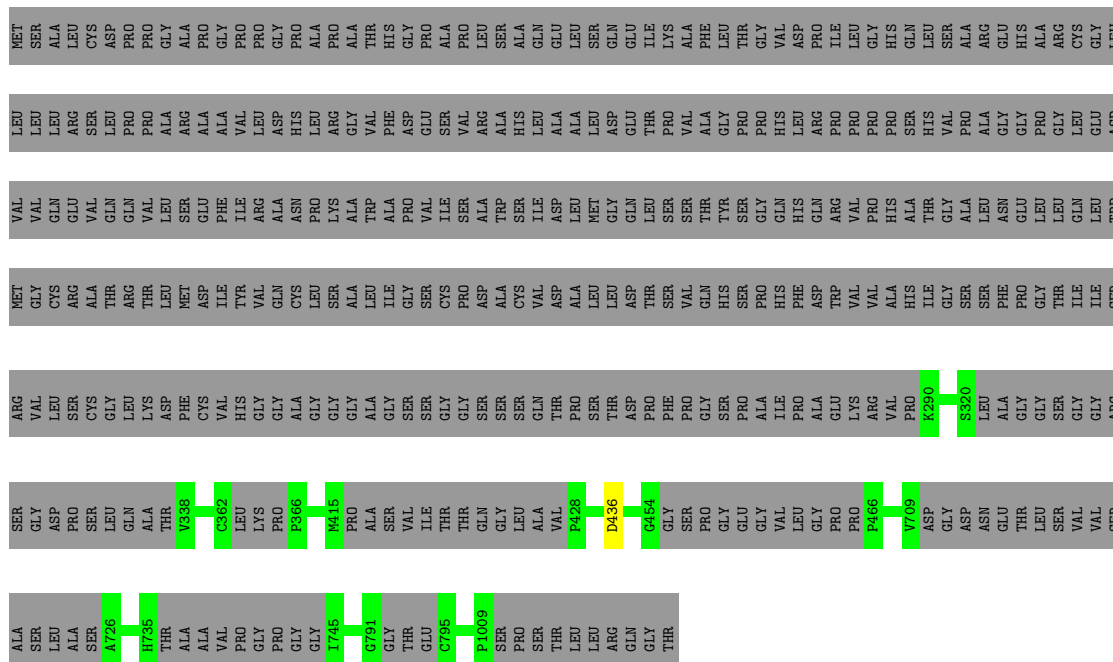
- Molecule 24: Integrator complex subunit 4

Chain d:  85% 15%



- Molecule 25: Integrator complex subunit 5

Chain e:  64% 36%

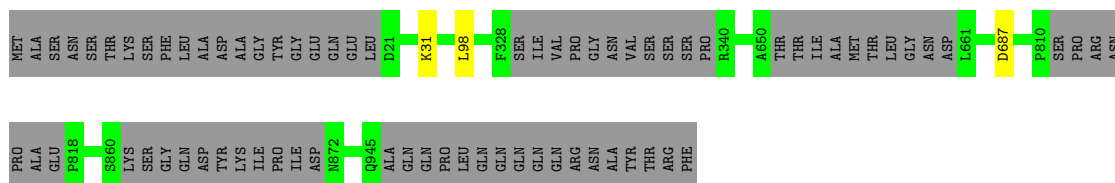
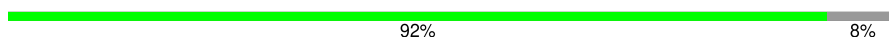


- Molecule 26: Integrator complex subunit 6

Chain f:  60% 40%

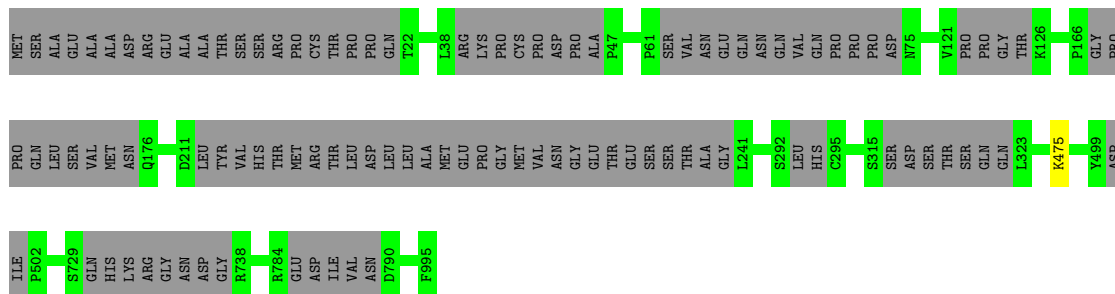
- Molecule 27: Integrator complex subunit 7

Chain g:



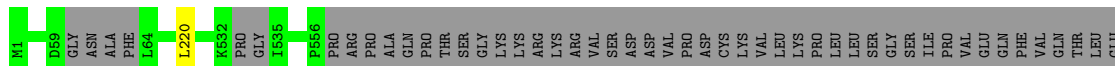
- Molecule 28: Integrator complex subunit 8

Chain h:




- Molecule 29: Integrator complex subunit 9

Chain i:



LYS HIS GLY PHE SER ASP THR LYS VAL ASP THR LYS HIS ILE VAL LEU LEU GLN GLU ALA GLU THR LEU ILE GLN TYR CYS GLU GLU ASP THR HIS ILE CYS ASP ASN ASP GLU MET LEU ARG VAL ARG LEU ARG ASP LEU VAL LYS PHE LEU GLN LYS PHE

• Molecule 30: Integrator complex subunit 11

Chain k:  76% 24%

MET P2 Y206 ALA THR THR ILE ARG ASP S213 R231 K262 N315 P316 G326 MET LEU H329 P351 GLY TYR CYS VAL GLN GLY THR THR GLY HIS ILE CYS LEU LEU GLN GLY MET ARG LYS LEU VAL MET GLY ARG LYS VAL LEU VAL MET GLY ARG LYS VAL LEU VAL VAL LEU VAL VAL LYS P382 L470 PRO GLU

ALA LYS LYS P476 L502 GLY LEU ALA ASP HIS GLN LEU ARG ARG PHE THR CYS VAL SER HIS LEU HIS ASP THR ARG LYS GLU TYR CYS GLU TYR THR THR ALA LEU ARG VAL VAL THR VAL THR LYS LEU SER SER VAL VAL LYS ASP HIS CYS VAL GLN MET LYS HIS THR VAL THR VAL

LEU LEU GLN ALA PRO SER GLU ASP PRO GLY THR LYS VAL LEU LEU VAL SER TRP THR TYR GLN ASP GLU GLU LEU GLY SER PHE LEU THR SER LEU LYS GLY LEU PRO GLN ALA PRO SER

• Molecule 31: Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform

Chain p:  97% .

MET ALA ALA LYS ASP GLY ASP D8 D57 THR ILE TYR ASP D63 G233 E238 L411 S587 LEU ALA

• Molecule 32: Serine/threonine-protein phosphatase 2A catalytic subunit alpha isoform

Chain q:  94% 6%

MET ASP GLU LYS VAL F6 K144 R295 GLY PRO HIS VAL THR ARG ARG THR PRO ASP TYR PHE LEU

• Molecule 33: Unknown

Chain u:  100%

There are no outlier residues recorded for this chain.

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	614283	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	46.18	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.203	Depositor
Minimum map value	-0.056	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.025	Depositor
Map size ( $\text{\AA}$ )	503.99997, 503.99997, 503.99997	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.05, 1.05, 1.05	Depositor

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MN, ZN, MG

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	0.28	0/11210	0.54	0/15130
2	B	0.31	0/9076	0.55	0/12250
3	C	0.33	0/2139	0.53	0/2906
4	D	0.27	0/988	0.62	0/1333
5	E	0.28	0/1752	0.54	0/2366
6	F	0.30	0/637	0.56	0/859
7	G	0.28	0/1347	0.55	1/1833 (0.1%)
8	H	0.31	0/1207	0.56	0/1628
9	I	0.30	0/967	0.58	0/1309
10	J	0.33	0/542	0.57	0/730
11	K	0.31	0/939	0.53	0/1271
12	L	0.35	0/389	0.67	0/517
13	M	0.29	0/100	0.42	0/139
14	N	0.52	0/547	0.93	0/838
15	P	0.28	0/403	0.94	0/625
16	T	0.52	0/764	0.98	0/1179
17	U	0.26	0/1422	0.56	0/1933
18	V	0.23	0/1912	0.45	0/2453
19	W	0.26	0/3812	0.52	1/5186 (0.0%)
21	Z	0.26	0/2206	0.54	0/2968
22	a	0.27	0/8430	0.58	2/11494 (0.0%)
23	b	0.28	0/8065	0.53	0/10992
24	d	0.28	0/6535	0.53	0/8877
25	e	0.28	0/4775	0.53	1/6511 (0.0%)
26	f	0.29	0/4179	0.55	1/5705 (0.0%)
27	g	0.29	0/6817	0.54	2/9246 (0.0%)
28	h	0.29	0/6867	0.51	0/9329
29	i	0.31	0/4360	0.54	1/5957 (0.0%)
30	k	0.29	0/3408	0.53	0/4632
31	p	0.27	0/4460	0.57	1/6064 (0.0%)
32	q	0.30	0/2378	0.54	0/3228
33	u	0.24	0/15	0.26	0/20

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
All	All	0.29	0/102648	0.55	10/139508 (0.0%)

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
22	a	0	1

There are no bond length outliers.

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
27	g	687	ASP	CB-CG-OD2	7.46	125.01	118.30
22	a	1036	LEU	CA-CB-CG	7.46	132.45	115.30
22	a	1173	LEU	CA-CB-CG	7.37	132.25	115.30
19	W	209	LEU	CA-CB-CG	7.21	131.87	115.30
31	p	411	LEU	CA-CB-CG	7.01	131.43	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
22	a	1033	LEU	Peptide

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

Due to software issues we are unable to calculate clashes - this section is therefore empty.

## 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	A	1378/1970 (70%)	1351 (98%)	27 (2%)	0	100	100
2	B	1096/1174 (93%)	1066 (97%)	30 (3%)	0	100	100
3	C	257/275 (94%)	252 (98%)	5 (2%)	0	100	100
4	D	124/142 (87%)	119 (96%)	5 (4%)	0	100	100
5	E	207/210 (99%)	202 (98%)	5 (2%)	0	100	100
6	F	76/127 (60%)	76 (100%)	0	0	100	100
7	G	169/172 (98%)	155 (92%)	14 (8%)	0	100	100
8	H	146/150 (97%)	143 (98%)	3 (2%)	0	100	100
9	I	115/125 (92%)	109 (95%)	6 (5%)	0	100	100
10	J	65/67 (97%)	65 (100%)	0	0	100	100
11	K	113/117 (97%)	110 (97%)	3 (3%)	0	100	100
12	L	44/58 (76%)	39 (89%)	5 (11%)	0	100	100
13	M	11/13 (85%)	11 (100%)	0	0	100	100
17	U	181/528 (34%)	174 (96%)	7 (4%)	0	100	100
18	V	400/614 (65%)	366 (92%)	34 (8%)	0	100	100
19	W	476/616 (77%)	455 (96%)	21 (4%)	0	100	100
21	Z	265/1087 (24%)	250 (94%)	15 (6%)	0	100	100
22	a	1177/2190 (54%)	1103 (94%)	69 (6%)	5 (0%)	30	63
23	b	1027/1204 (85%)	977 (95%)	50 (5%)	0	100	100
24	d	810/963 (84%)	784 (97%)	26 (3%)	0	100	100
25	e	633/1019 (62%)	609 (96%)	24 (4%)	0	100	100
26	f	524/887 (59%)	506 (97%)	18 (3%)	0	100	100
27	g	876/962 (91%)	842 (96%)	34 (4%)	0	100	100
28	h	865/995 (87%)	825 (95%)	40 (5%)	0	100	100
29	i	544/658 (83%)	516 (95%)	28 (5%)	0	100	100
30	k	448/600 (75%)	423 (94%)	25 (6%)	0	100	100
31	p	571/589 (97%)	556 (97%)	15 (3%)	0	100	100
32	q	288/309 (93%)	276 (96%)	12 (4%)	0	100	100
33	u	1/27 (4%)	1 (100%)	0	0	100	100
All	All	12887/17848 (72%)	12361 (96%)	521 (4%)	5 (0%)	100	100

All (5) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
22	a	631	PRO
22	a	761	PRO
22	a	415	LYS
22	a	1215	LEU
22	a	752	ILE

### 5.3.2 Protein sidechains ⓘ

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	A	1223/1749 (70%)	1221 (100%)	2 (0%)	92	96
2	B	978/1027 (95%)	978 (100%)	0	100	100
3	C	238/252 (94%)	238 (100%)	0	100	100
4	D	101/126 (80%)	101 (100%)	0	100	100
5	E	191/192 (100%)	189 (99%)	2 (1%)	73	85
6	F	68/111 (61%)	68 (100%)	0	100	100
7	G	141/153 (92%)	141 (100%)	0	100	100
8	H	129/131 (98%)	129 (100%)	0	100	100
9	I	104/112 (93%)	104 (100%)	0	100	100
10	J	56/56 (100%)	55 (98%)	1 (2%)	54	74
11	K	104/106 (98%)	104 (100%)	0	100	100
12	L	42/55 (76%)	42 (100%)	0	100	100
13	M	13/13 (100%)	13 (100%)	0	100	100
17	U	155/451 (34%)	154 (99%)	1 (1%)	84	92
18	V	49/515 (10%)	48 (98%)	1 (2%)	50	72
19	W	398/514 (77%)	397 (100%)	1 (0%)	91	96
21	Z	243/940 (26%)	243 (100%)	0	100	100
22	a	684/1907 (36%)	682 (100%)	2 (0%)	91	96
23	b	859/1072 (80%)	858 (100%)	1 (0%)	92	97
24	d	704/845 (83%)	703 (100%)	1 (0%)	92	97

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
25	e	444/812 (55%)	444 (100%)	0	100	100
26	f	431/796 (54%)	431 (100%)	0	100	100
27	g	719/840 (86%)	718 (100%)	1 (0%)	92	97
28	h	700/896 (78%)	699 (100%)	1 (0%)	92	97
29	i	482/600 (80%)	482 (100%)	0	100	100
30	k	317/520 (61%)	317 (100%)	0	100	100
31	p	480/512 (94%)	480 (100%)	0	100	100
32	q	251/274 (92%)	250 (100%)	1 (0%)	89	95
33	u	1/1 (100%)	1 (100%)	0	100	100
All	All	10305/15578 (66%)	10290 (100%)	15 (0%)	92	97

5 of 15 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
19	W	125	LYS
28	h	475	LYS
22	a	1222	ARG
32	q	144	LYS
24	d	122	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	260	GLN
19	W	95	ASN
23	b	622	GLN
28	h	988	GLN

### 5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
15	P	16/17 (94%)	6 (37%)	1 (6%)

5 of 6 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
15	P	31	A

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Mol	Chain	Res	Type
15	P	33	C
15	P	34	U
15	P	36	G
15	P	37	G

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
15	P	38	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](#)

Of 13 ligands modelled in this entry, 13 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

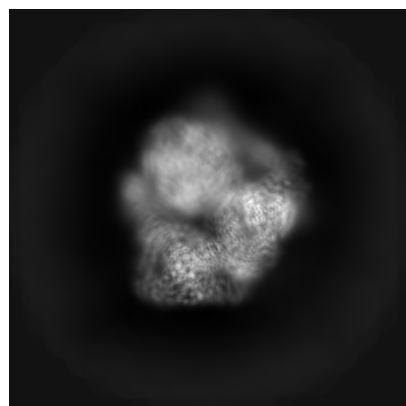
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13479. These allow visual inspection of the internal detail of the map and identification of artifacts.

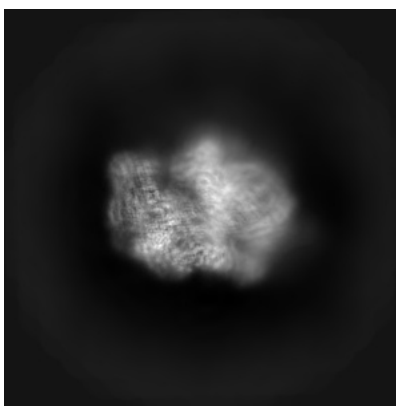
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

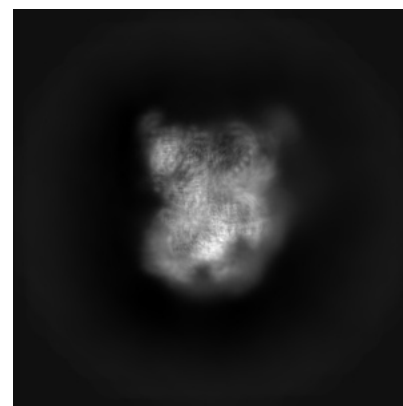
#### 6.1.1 Primary map



X

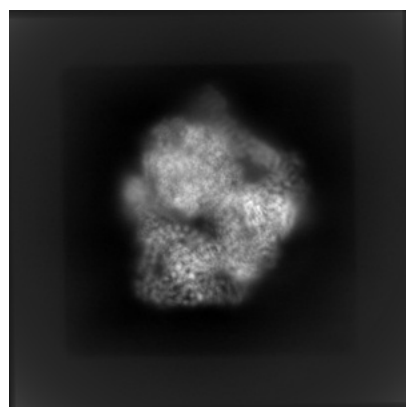


Y

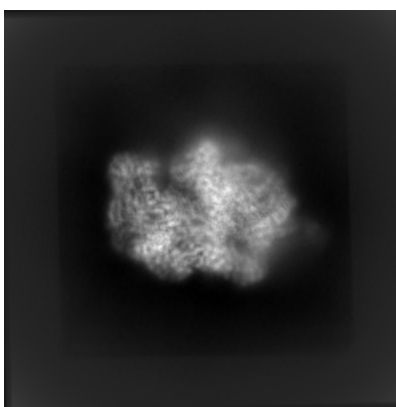


Z

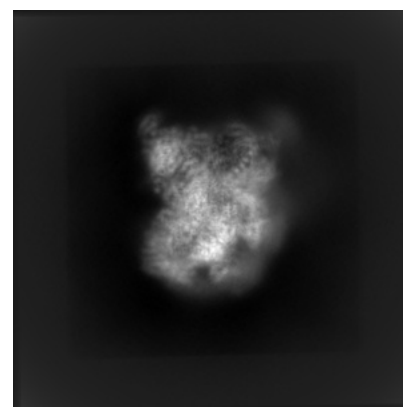
#### 6.1.2 Raw map



X



Y

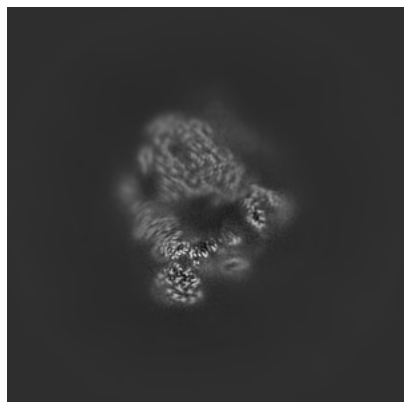


Z

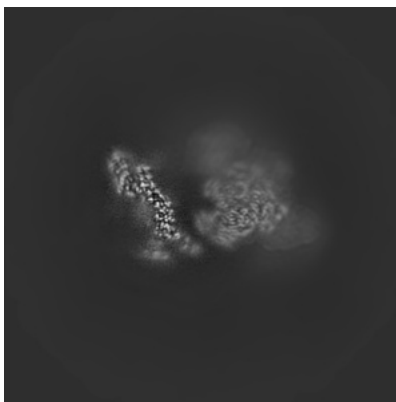
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

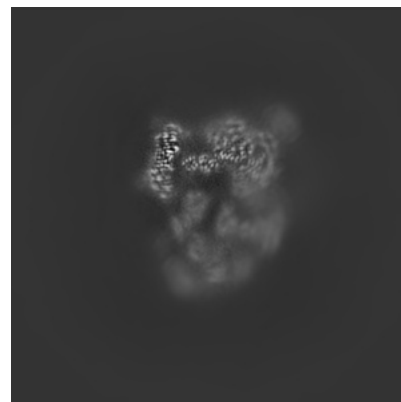
### 6.2.1 Primary map



X Index: 240

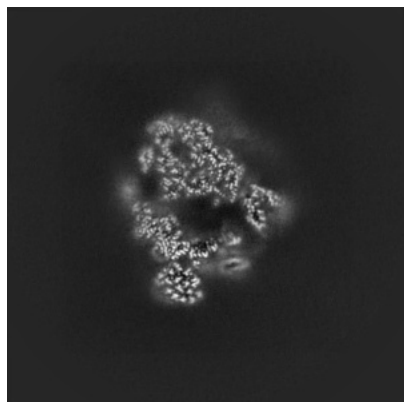


Y Index: 240

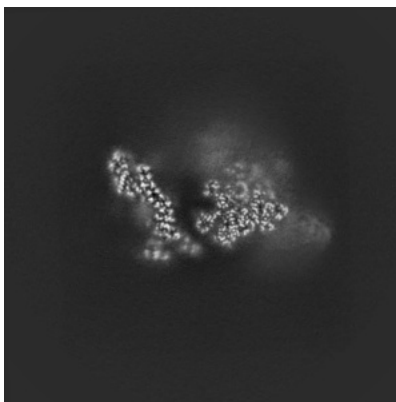


Z Index: 240

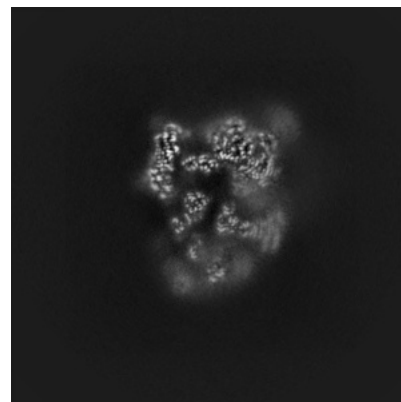
### 6.2.2 Raw map



X Index: 240



Y Index: 240

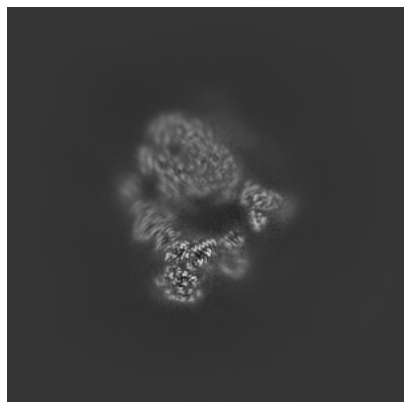


Z Index: 240

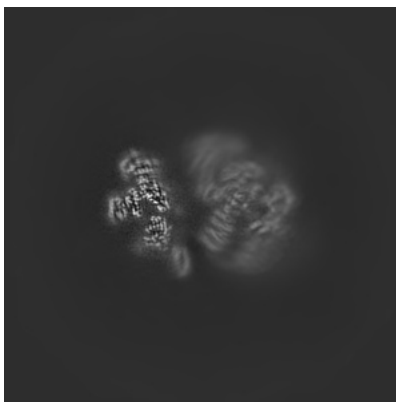
The images above show central slices of the map in three orthogonal directions.

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

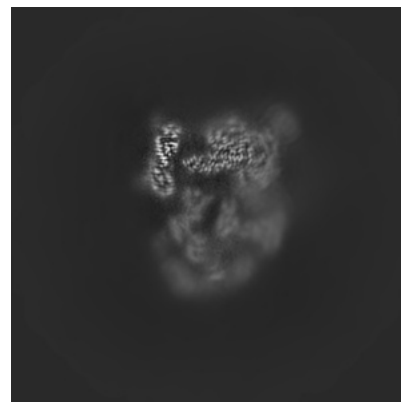
### 6.3.1 Primary map



X Index: 244

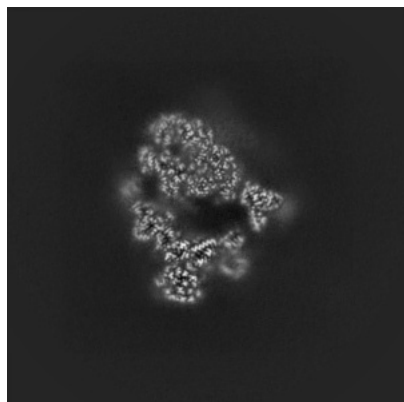


Y Index: 211

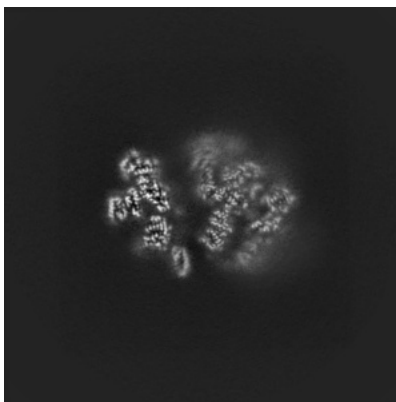


Z Index: 243

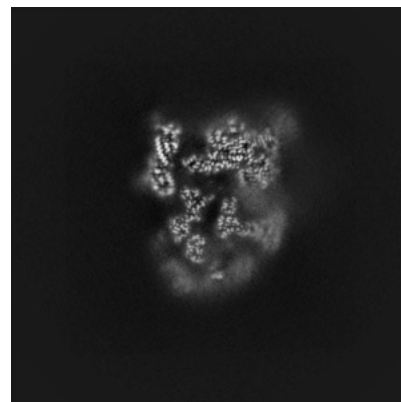
### 6.3.2 Raw map



X Index: 244



Y Index: 211

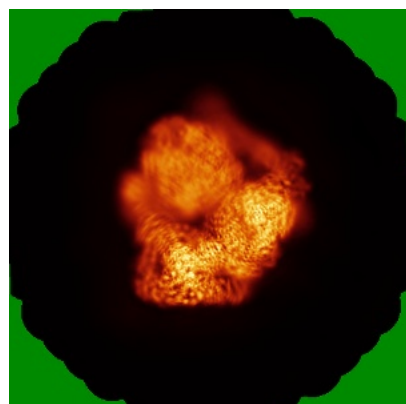


Z Index: 244

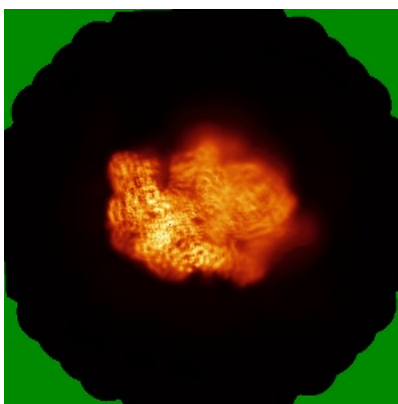
The images above show the largest variance slices of the map in three orthogonal directions.

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

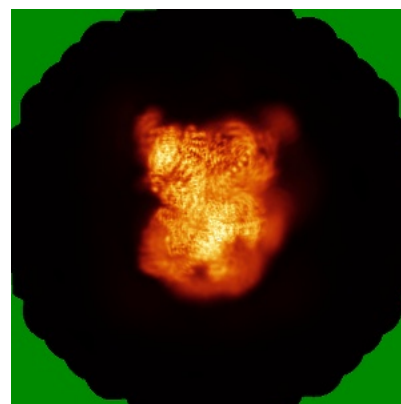
### 6.4.1 Primary map



X

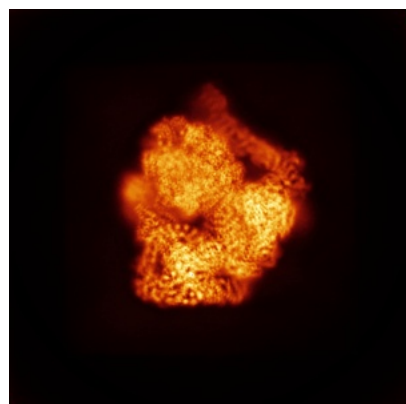


Y

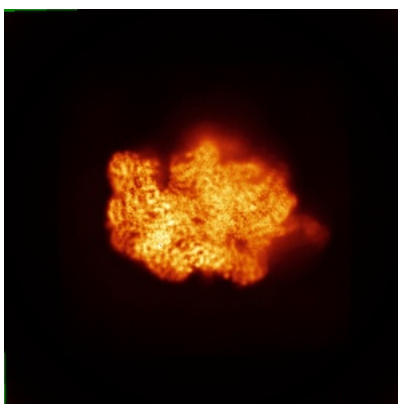


Z

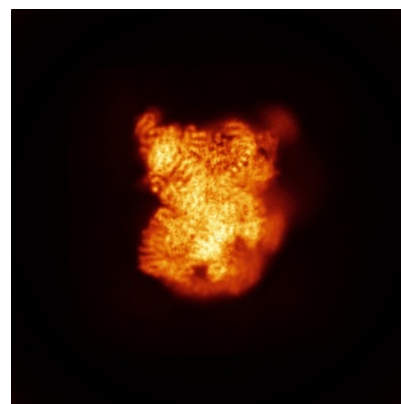
### 6.4.2 Raw map



X



Y

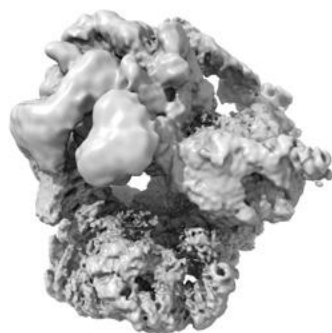


Z

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 0.025. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



X



Y



Z

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



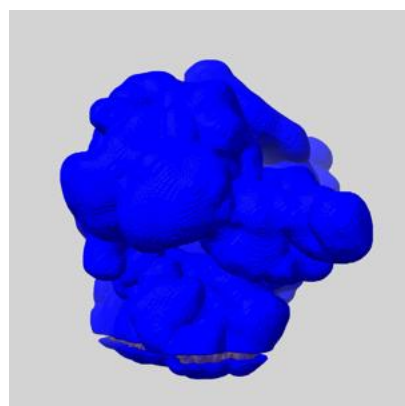
## 6.6 Mask visualisation [i](#)

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

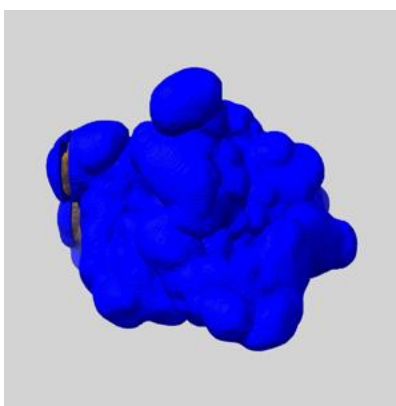
A mask typically either:

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

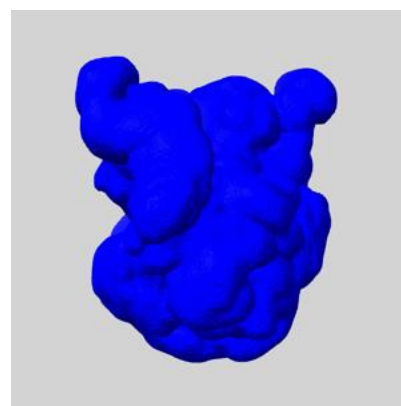
### 6.6.1 emd\_13479\_msk\_1.map [i](#)



X



Y

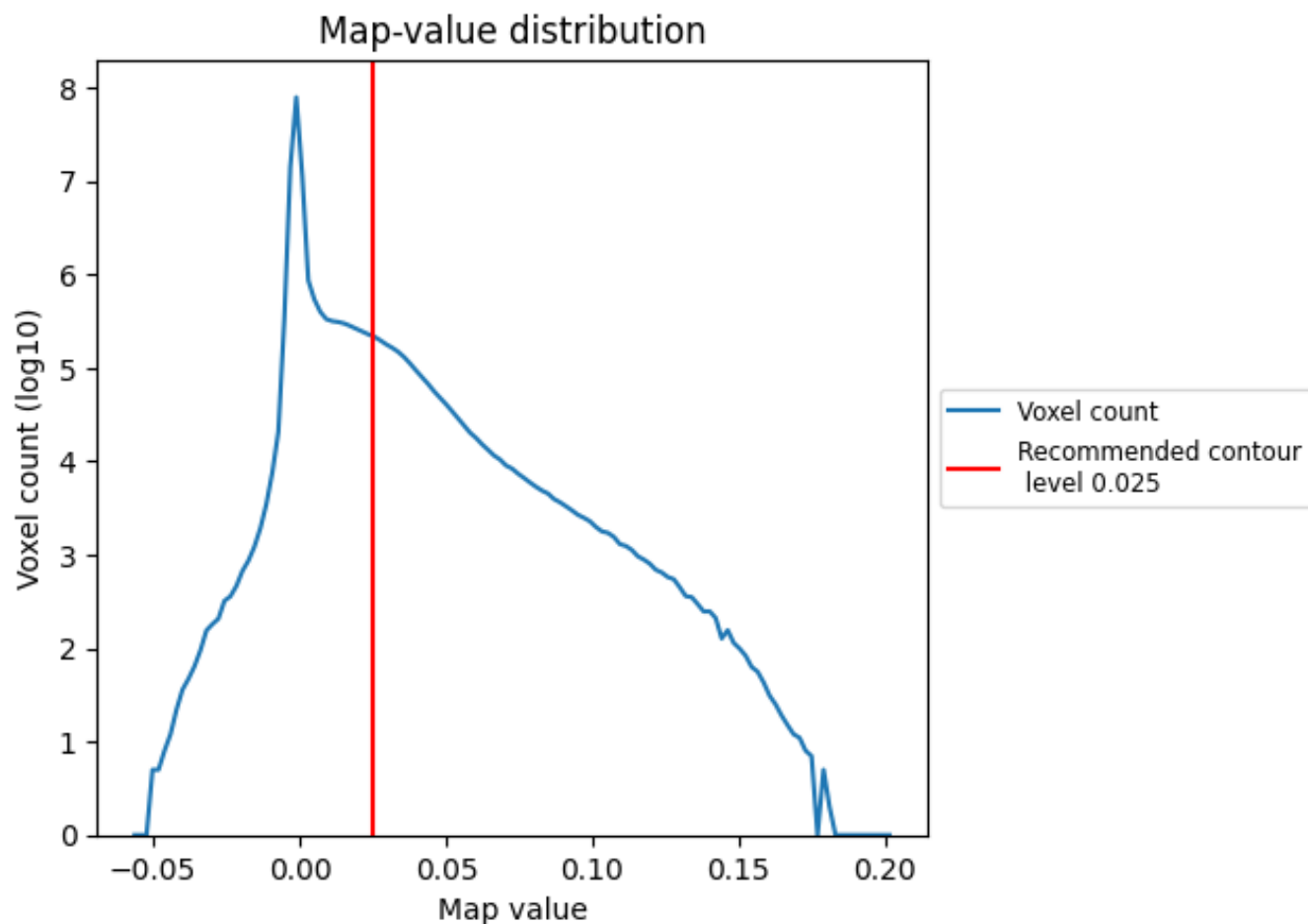


Z

## 7 Map analysis [i](#)

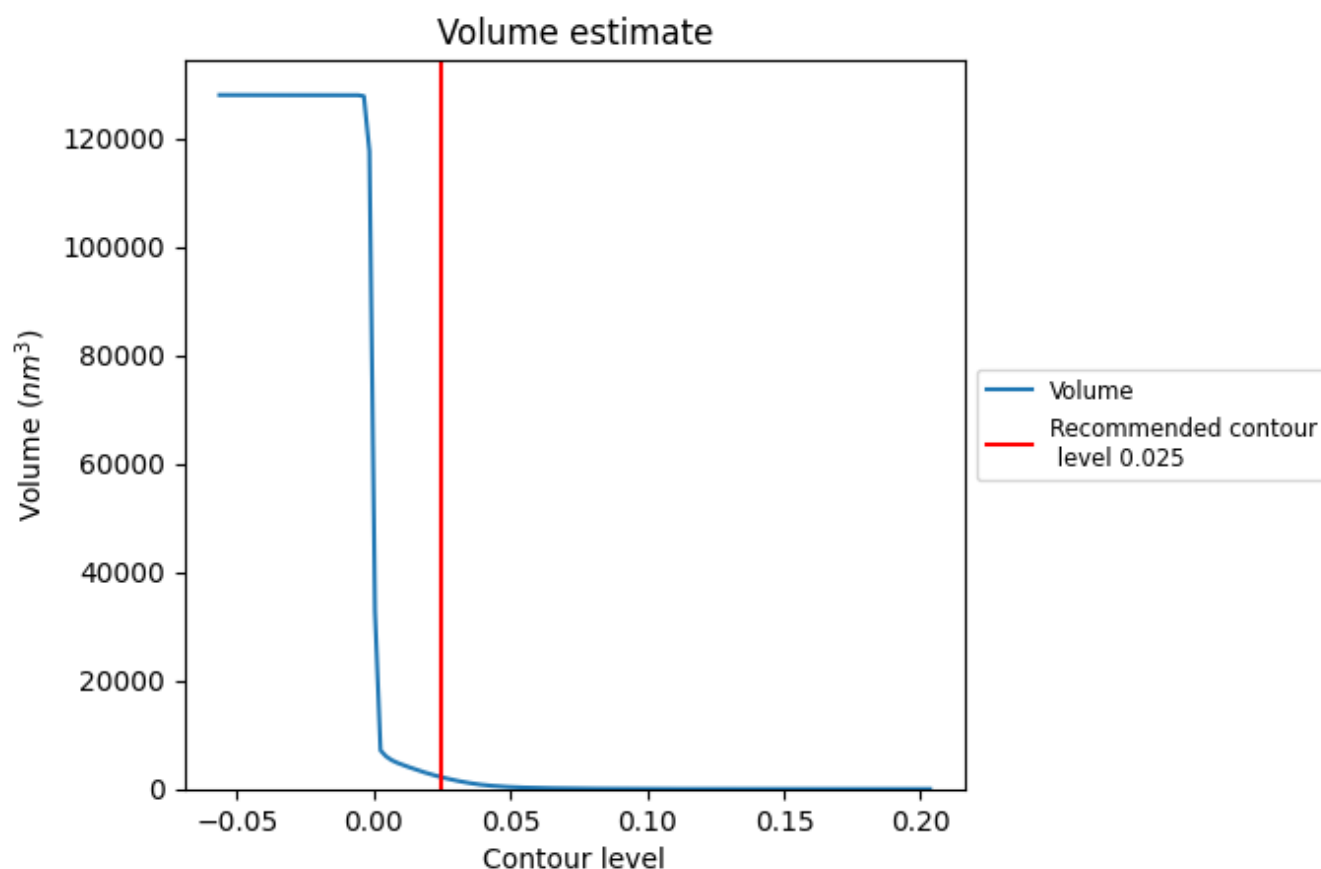
This section contains the results of statistical analysis of the map.

### 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.

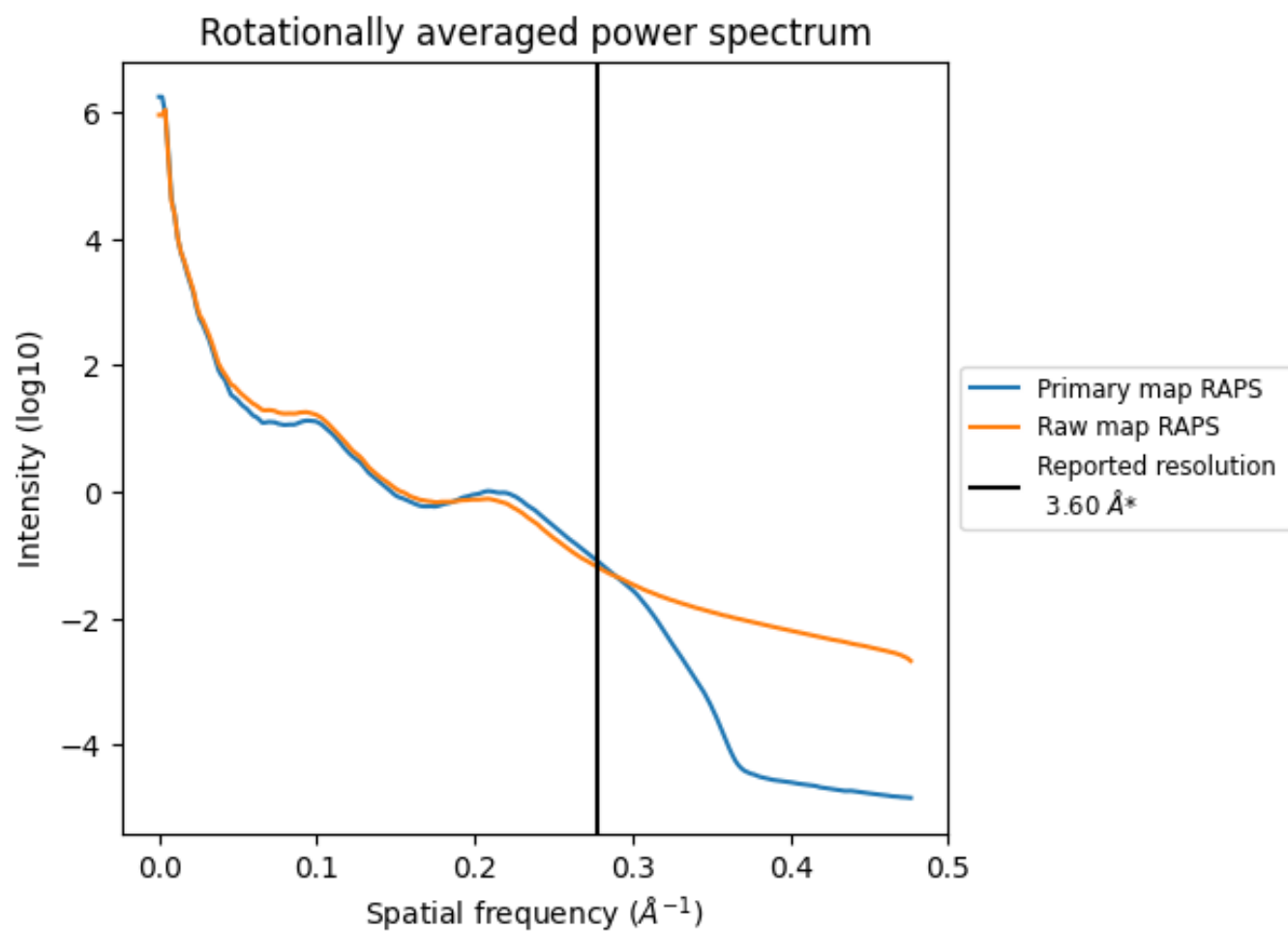
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2154  $\text{nm}^3$ ; this corresponds to an approximate mass of 1946 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 ⓘ

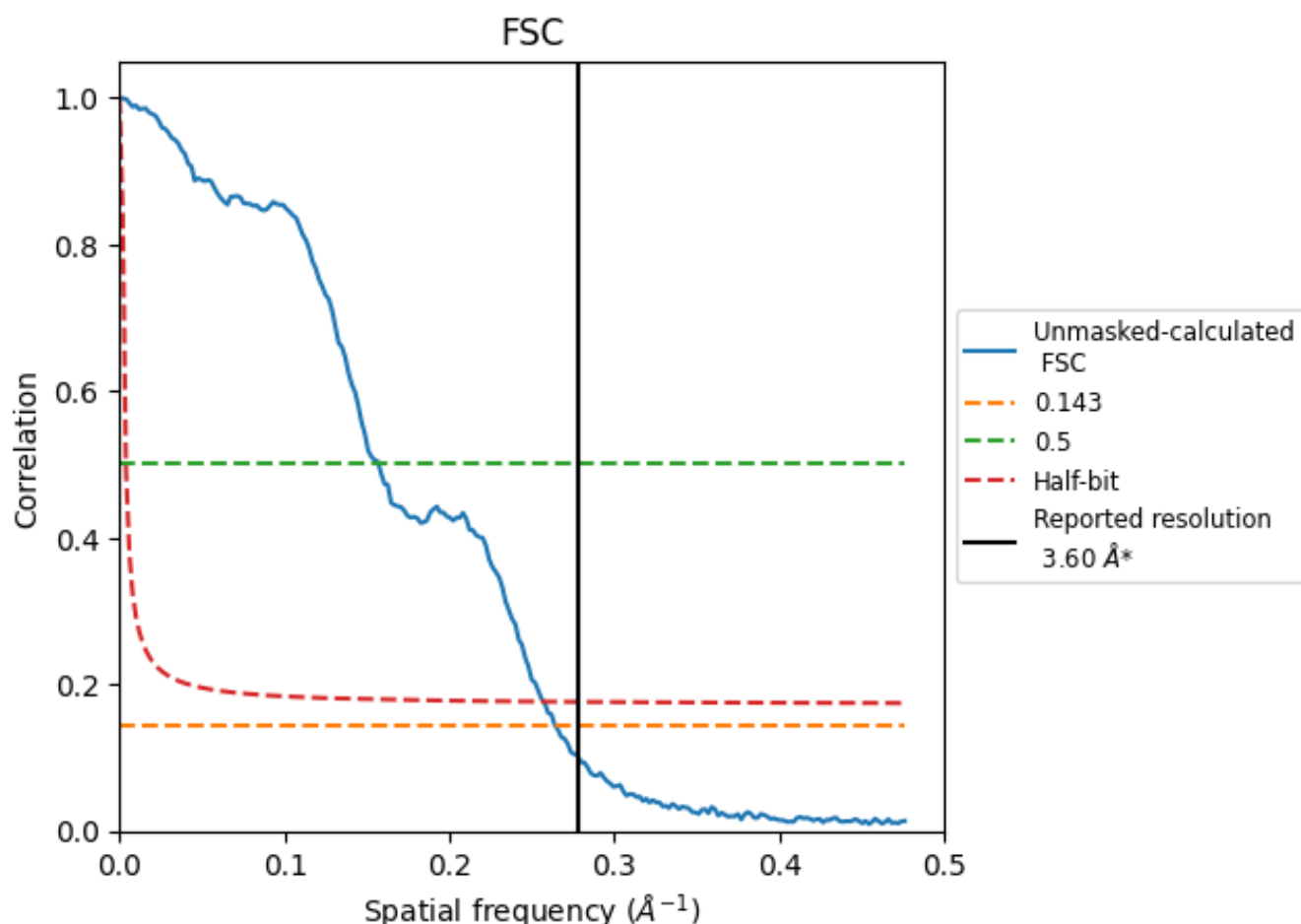


\*Reported resolution corresponds to spatial frequency of 0.278 Å<sup>-1</sup>

## 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  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

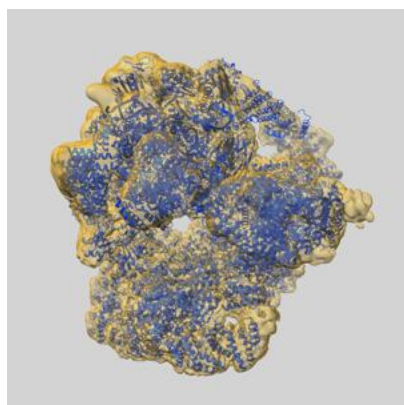
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.78	6.36	3.89

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

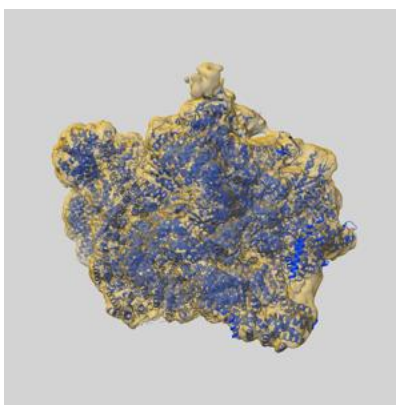
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-13479 and PDB model 7PKS. Per-residue inclusion information can be found in [section 3](#) on [page 11](#).

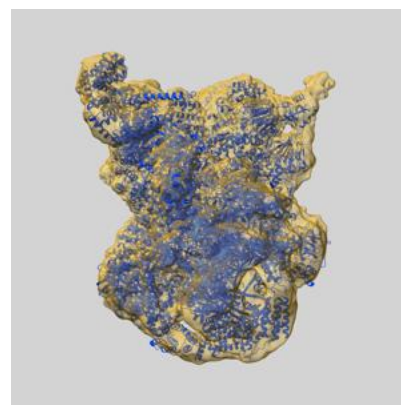
### 9.1 Map-model overlay [i](#)



X



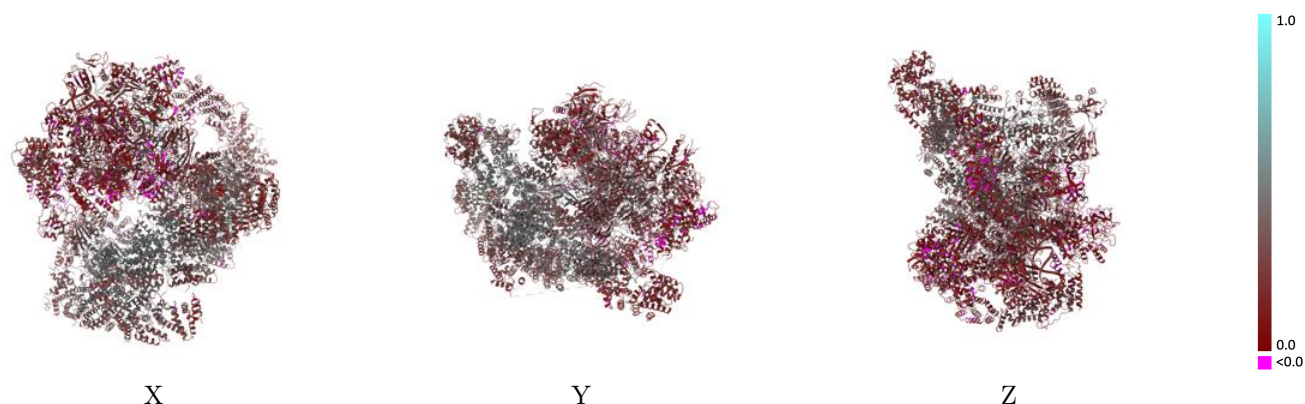
Y



Z

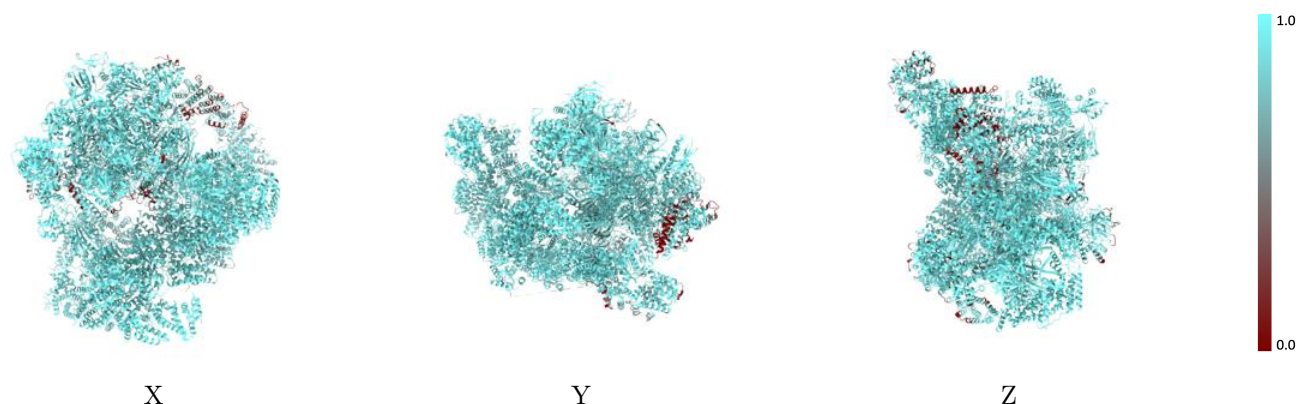
The images above show the 3D surface view of the map at the recommended contour level 0.025 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

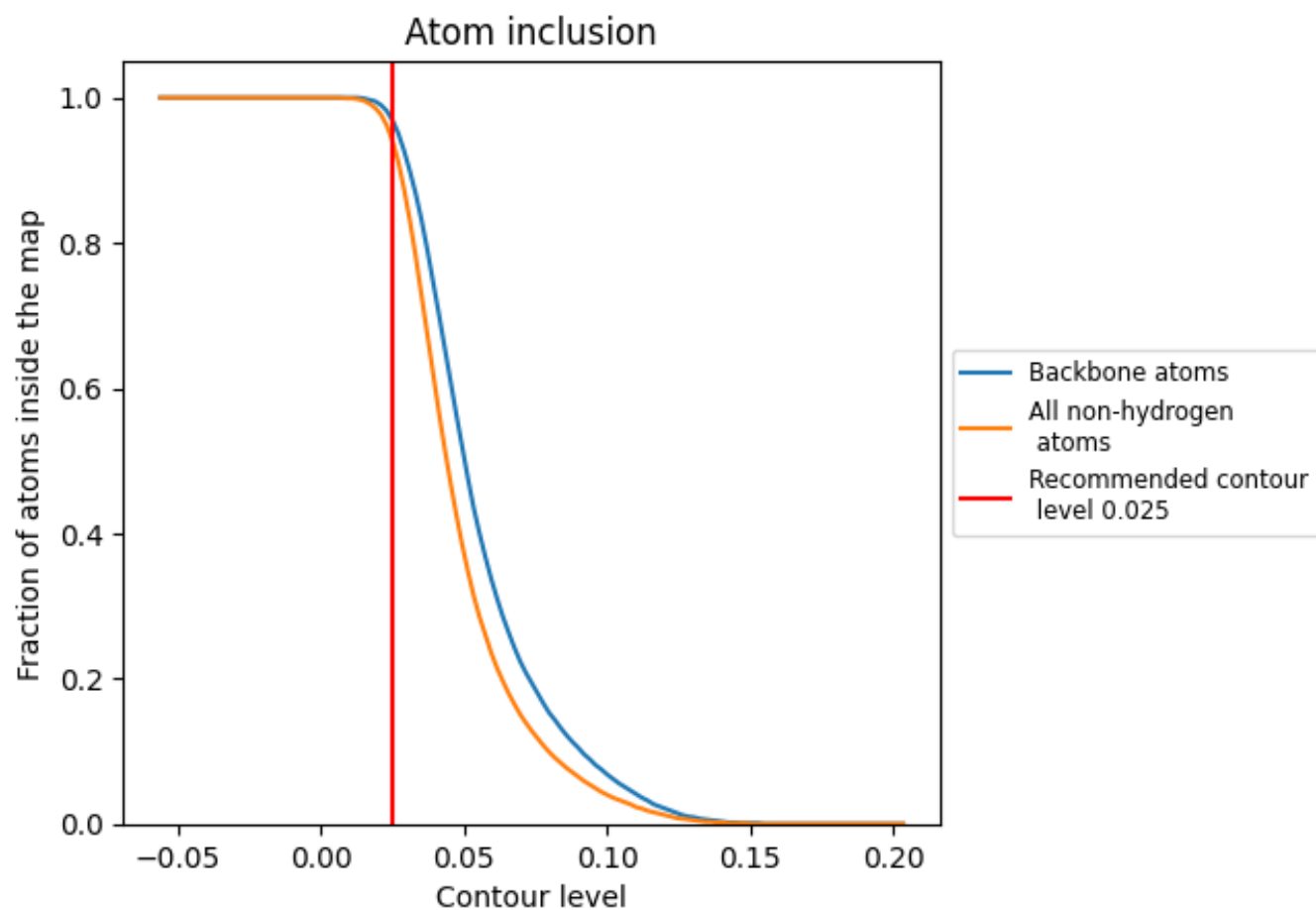
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.025).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 94% 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 (0.025) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9390	 0.2780
A	 0.9690	 0.2060
B	 0.9800	 0.2510
C	 0.8940	 0.2310
D	 0.8210	 0.1010
E	 0.9740	 0.1810
F	 0.9060	 0.1770
G	 0.9190	 0.1100
H	 0.9020	 0.1600
I	 0.9800	 0.1810
J	 0.9370	 0.2740
K	 0.8320	 0.1460
L	 0.9760	 0.2390
M	 0.8600	 0.5230
N	 0.9410	 0.1600
P	 0.9610	 0.1820
T	 0.9780	 0.2170
U	 0.8220	 0.1280
V	 0.9350	 0.1880
W	 0.9120	 0.1280
X	 0.9910	 0.1730
Z	 0.8300	 0.0840
a	 0.7910	 0.2410
b	 0.9620	 0.3980
d	 0.9650	 0.3400
e	 0.9780	 0.4090
f	 0.9590	 0.2910
g	 0.9690	 0.4280
h	 0.9700	 0.3550
i	 0.9700	 0.3500
k	 0.9640	 0.2540
p	 0.9410	 0.2370
q	 0.9700	 0.4230
u	 0.9930	 0.4520

