Full wwPDB EM Validation Report (i)

Nov 12, 2022 – 06:51 PM EST

PDB ID	:	6V4X
EMDB ID	:	EMD-21050
Title	:	Cryo-EM structure of an active human histone pre-mRNA 3'-end processing machinery at 3.2 Angstrom resolution
Authors	:	Sun, Y.; Zhang, Y.; Walz, T.; Tong, L.
Deposited on	:	2019-12-02
Resolution	:	3.20 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

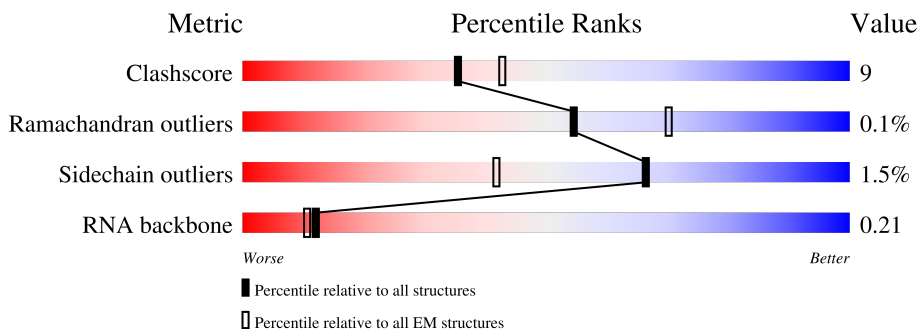|		
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

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 3.20 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.
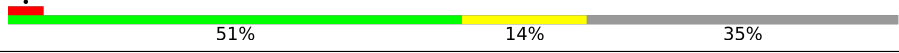
Metric	Percentile Ranks	Value
Clashscore		9
Ramachandran outliers		0.1%
Sidechain outliers		1.5%
RNA backbone		0.21

Worse   *Better*

▌ Percentile relative to all structures

▯ Percentile relative to all EM structures

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

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

Mol	Chain	Length	Quality of chain
1	A	146	46% 10% • 43%
2	B	95	68% 12% 20%
3	F	86	69% 17% 14%
4	E	92	76% 12% 12%
5	G	84	76% 14% • 8%
6	C	123	77% 15% 7%
7	D	259	33% 8% 59%

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Mol	Chain	Length	Quality of chain
8	H	684	59% 13% 27%
9	I	782	51% 14% 35%
10	J	1072	5% 26% 71%
11	Z	60	18% 12% 15% 55%
12	Y	52	10% 19% 17% 10% 52%

2 Entry composition ⓘ

There are 13 unique types of molecules in this entry. The entry contains 16499 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 Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	83	652	409	115	122	6	0	0

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP P62318
A	-18	GLY	-	expression tag	UNP P62318
A	-17	SER	-	expression tag	UNP P62318
A	-16	SER	-	expression tag	UNP P62318
A	-15	HIS	-	expression tag	UNP P62318
A	-14	HIS	-	expression tag	UNP P62318
A	-13	HIS	-	expression tag	UNP P62318
A	-12	HIS	-	expression tag	UNP P62318
A	-11	HIS	-	expression tag	UNP P62318
A	-10	HIS	-	expression tag	UNP P62318
A	-9	SER	-	expression tag	UNP P62318
A	-8	SER	-	expression tag	UNP P62318
A	-7	GLY	-	expression tag	UNP P62318
A	-6	LEU	-	expression tag	UNP P62318
A	-5	VAL	-	expression tag	UNP P62318
A	-4	PRO	-	expression tag	UNP P62318
A	-3	ARG	-	expression tag	UNP P62318
A	-2	GLY	-	expression tag	UNP P62318
A	-1	SER	-	expression tag	UNP P62318
A	0	HIS	-	expression tag	UNP P62318

- Molecule 2 is a protein called Small nuclear ribonucleoprotein-associated proteins B and B'.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	76	612	387	111	107	7	0	0

- Molecule 3 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	F	74	Total 579	C 375	N 95	O 104	S 5	0	0

- Molecule 4 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	81	Total 670	C 426	N 119	O 120	S 5	0	0

- Molecule 5 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	G	77	Total 604	C 381	N 110	O 107	S 6	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	77	LEU	-	expression tag	UNP P62308
G	78	GLU	-	expression tag	UNP P62308
G	79	HIS	-	expression tag	UNP P62308
G	80	HIS	-	expression tag	UNP P62308
G	81	HIS	-	expression tag	UNP P62308
G	82	HIS	-	expression tag	UNP P62308
G	83	HIS	-	expression tag	UNP P62308
G	84	HIS	-	expression tag	UNP P62308

- Molecule 6 is a protein called U7 snRNA-associated Sm-like protein LSm10.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	C	114	Total 911	C 565	N 175	O 169	S 2	0	0

- Molecule 7 is a protein called U7 snRNA-associated Sm-like protein LSm11.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	D	106	Total 872	C 556	N 170	O 141	S 5	0	0

There are 11 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-10	MET	-	expression tag	UNP P83369
D	-9	HIS	-	expression tag	UNP P83369
D	-8	HIS	-	expression tag	UNP P83369
D	-7	HIS	-	expression tag	UNP P83369
D	-6	HIS	-	expression tag	UNP P83369
D	-5	HIS	-	expression tag	UNP P83369
D	-4	HIS	-	expression tag	UNP P83369
D	-3	SER	-	expression tag	UNP P83369
D	-2	GLY	-	expression tag	UNP P83369
D	-1	GLY	-	expression tag	UNP P83369
D	0	SER	-	expression tag	UNP P83369

- Molecule 8 is a protein called Cleavage and polyadenylation specificity factor subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	499	Total	C	N	O	S	0	0
			3980	2534	682	735	29		

- Molecule 9 is a protein called Cleavage and polyadenylation specificity factor subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	510	Total	C	N	O	S	0	0
			4055	2580	692	760	23		

- Molecule 10 is a protein called Symplekin.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	311	Total	C	N	O	S	0	0
			2461	1569	422	457	13		

- Molecule 11 is a RNA chain called U7 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	Z	27	Total	C	N	O	P	0	0
			564	253	88	196	27		

- Molecule 12 is a RNA chain called modified H2a pre-mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	Y	25	Total	C	N	O	P	0	0
			537	241	102	169	25		

- Molecule 13 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of

Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
13	H	2	Total 2	Zn 2	0

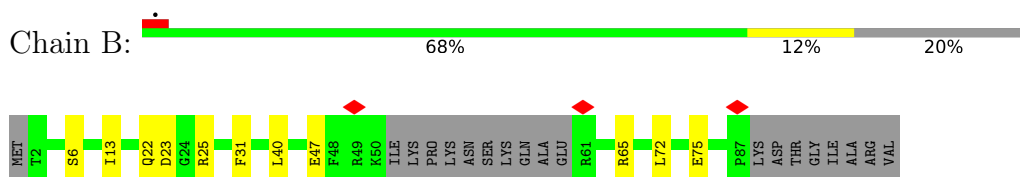# 3 Residue-property plots ⓘ

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.
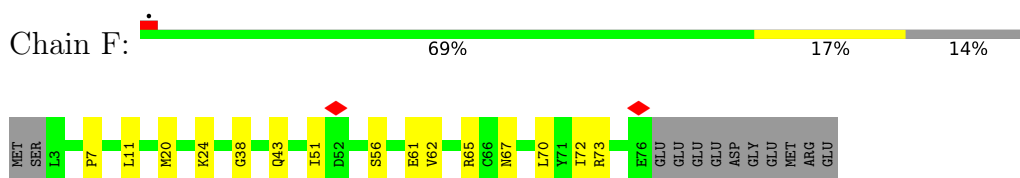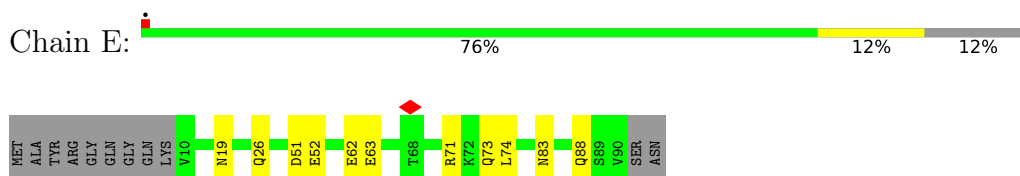
- Molecule 1: Small nuclear ribonucleoprotein Sm D3

Chain A:

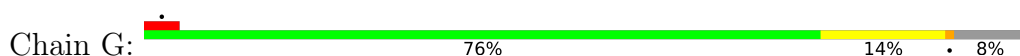- Molecule 2: Small nuclear ribonucleoprotein-associated proteins B and B'

Chain B:

- Molecule 3: Small nuclear ribonucleoprotein F

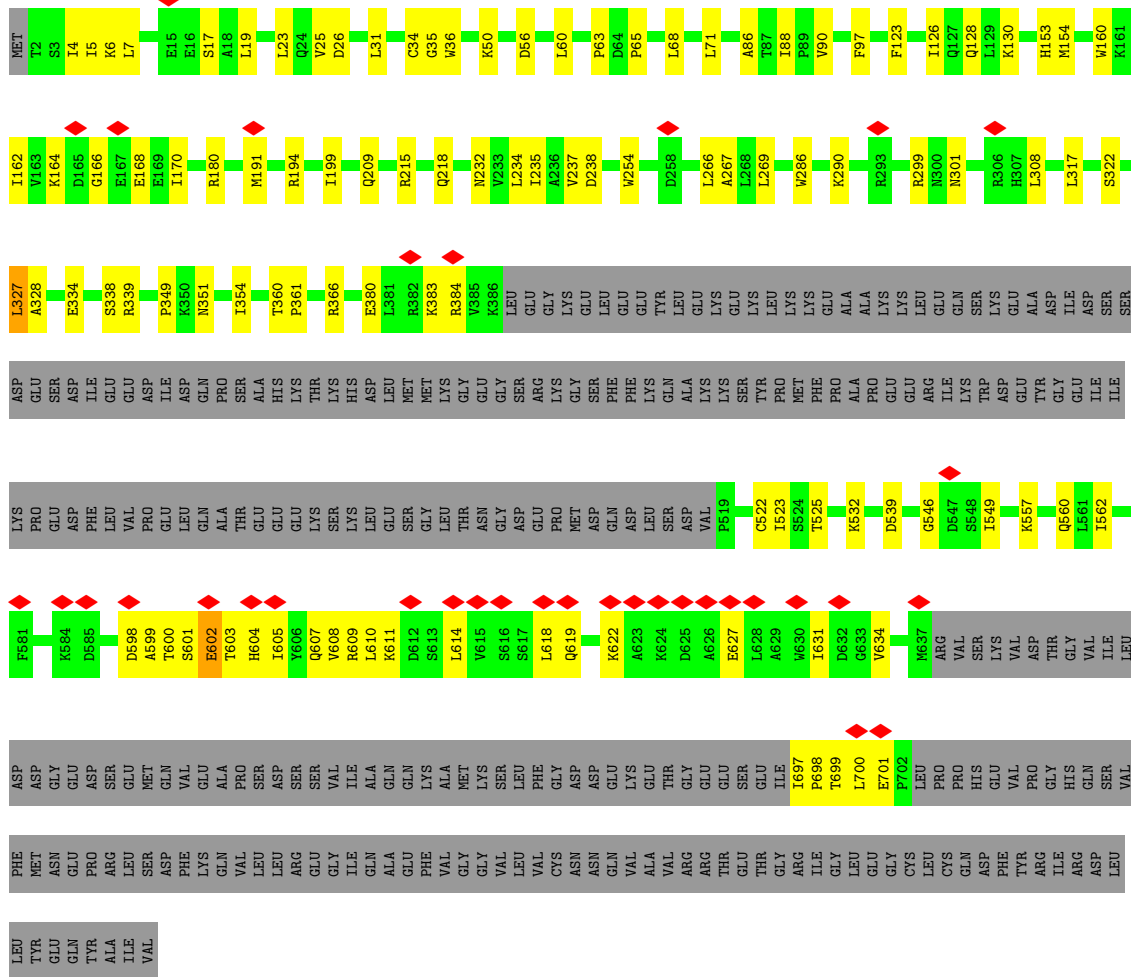Chain F:

- Molecule 4: Small nuclear ribonucleoprotein E

Chain E:

- Molecule 5: Small nuclear ribonucleoprotein G

Chain G:

MET SER LYS A4 P7 D14 R32 D35 N39 E47 G52 N55 N56 I57 R63 G64 N65 L70 E71 E78 H79 H80 HIS HIS HIS

• Molecule 6: U7 snRNA-associated Sm-like protein LSm10

Chain C: 77%   15%   7%

M1 S4 K8 S13 L17 I18 I19 T29 D32 R42 N45 V46 D47 A48 A55 G76 Y81 V82 H83 I84 P85 G108 G109 Q112 G113 R114 TRP GLU PHE PRO PRO LYS ASN CYS LYS

• Molecule 7: U7 snRNA-associated Sm-like protein LSm11

Chain D: 33%   8%   59%

MET HIS HIS HIS HIS HIS HIS SER GLY GLY SER MET GLU GLU ARG ARG GLY ALA ARG SER ALA GLY ALA GLY SER PRO ALA ARG PRO PRO SER PRO ARG LEU ASP VAL SER SER ASP PHE ASP PRO LEU LEU ALA LEU TYR ALA PRO ARG LEU PRO PRO ILE PRO TYR PRO ASN

ALA PRO CYS PHE ASN ASN VAL ALA GLU TYR GLU SER PHE LEU ARG THR GLY VAL ARG GLY GLY ARG GLY ARG GLY ALA ARG GLY ALA ALA ALA GLY SER GLY VAL PRO ALA ALA PRO GLY PRO SER GLY ARG THR ARG ARG ARG ASP ALA ALA PRO ASP P107 E108 R109

R112 L113 V118 ALA LYS GLU GLU GLY GLY ASP GLY ALA ALA GLY ALA ALA GLY ARG ARG GLY PRO GLY ARG SER ARG K139 E158 R161 R164 N170 V171 H172 F176 L179 A189 E203 T204 P208 VAL LEU GLN SER ARG LYS LYS ARG LYS PRO LYS VAL

ASP TYR Q336 Q337 V338 F339 T340 R341 F347 I348 R349 G350 E351 L355 A359 GLN

• Molecule 8: Cleavage and polyadenylation specificity factor subunit 3

Chain H: 59%   13%   •   27%

MET SER ALA ILE PRO ALA GLU GLU S9 R15 P16 V23 I37 M38 L39 D40 L53 P54 Y55 L58 I59 D60 P61 A62 L66 H76 F83 L84 T87 K90 T93 A98 R104 W105 L106 A118 D119 D120 K134 I135 I149 C153

V159 L160 A163 I167 E168 I169 L174 E184 D185 R186 P194 I200 L201 I202 G208 E213 K214 R215 G233 G234 R235 I238 L243 G244 R245 A246 Q247 E248 L249 L250 E255 Y256 W257 D265 I266 P267 I268 M289 N290 D291 R294 N300 N301 P302

F305 K306 D319 P322 M326 Y357 C358 G361 K365 E370 I406 L409 V414 N422 L427 D437 E440 V441 H442 P448 A453 F458 R459 G460 E461 K462 L463 A464 K465 V466 M467 G468 F469 L470 A471 D472 LYS LYS PRO GLU GLN G478

Q479 I484 L485 V486 K487 R488 N491 I494 L500 S501 N502 Y503 T504 D505 L506 A507 M508 S509 T510 V511 K512 GLN THR GLN ALA ILE PRO TYR THR GLY PRO PHE ASN LEU LEU CYS TYR LEU GLN LEU LYS LEU THR GLY ASP VAL GLU GLU LEU GLU ILE GLN GLU LYS PRO ALA

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

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

MET VAL GLU LEU ALA ALA GLN ARG LEU TYR GLU ALA LEU THR PRO VAL HIS

• Molecule 9: Cleavage and polyadenylation specificity factor subunit 2

Chain I:

51%   14%   35%

MET T2 S3 I4 I5 K6 L7 E15 E16 S17 A18 L19 L23 Q24 V25 D26 L31 C34 G35 W36 K50 D56 L60 P63 D64 P65 L68 L71 A86 T87 I88 P89 V90 F97 F123 I126 Q127 Q128 L129 K130 H153 M154 W160 K161

I162 V163 K164 D165 G166 E167 E168 E169 I170 R180 M191 R194 I199 Q209 R215 Q218 N232 V233 L234 I235 A236 V237 D238 W254 D258 L266 A267 L268 L269 W286 K290 R293 R299 N300 N301 R306 H307 L308 L317 S322 V326

L327 A328 E334 S338 R339 P349 K350 N351 I354 T360 P361 R366 E380 L381 R382 K383 R384 V385 K386 LEU GLU LYS GLU LEU GLU TYR LEU GLU LYS GLU LYS LEU LYS GLU ALA ALA LYS LYS LEU GLN SER LYS GLU ALA ASP ILE ASP SER

ASP GLU SER ASP ILE GLU GLU ASP ILE ASP ILE ASP GLN PRO SER ALA HIS LYS THR LYS HIS ASP LEU MET LYS GLY GLU GLY SER ARG LYS GLY SER PHE PHE LYS GLN ALA LYS LYS SER TYR PRO MET PHE PRO ALA PRO GLU ARG ILE LYS TRP ASP TYR GLY GLU ILE ILE

LYS PRO GLU ASP PHE LEU VAL PRO GLU GLU LEU GLN ALA THR GLU GLU LYS SER LEU GLU SER GLY LEU THR ASN GLY ASP GLU PRO MET ASP GLN ASP LEU SER ASP VAL P519 C522 I523 S524 T525 K532 D539 G546 D547 S548 I549 K557 Q560 L561 I562

F581 K584 D585 D598 A599 T600 S601 E602 T603 H604 I605 Y606 Q607 V608 R609 L610 K611 D612 S613 L614 V615 S616 S617 L618 Q619 K622 A623 K624 D625 A626 E627 L628 A629 W630 I631 D632 G633 V634 M637 ARG VAL SER LYS VAL ASP THR GLY VAL ILE LEU GLU GLU GLY GLU LEU LYS

ASP ASP GLY GLU GLU ASP SER GLU MET GLN VAL GLU ALA PRO SER ASP SER SER VAL ILE ALA GLN GLN LYS ALA MET LYS SER LEU PHE GLY ASP ASP GLU LYS GLU THR GLY GLU GLU SER GLU ILE I697 P698 T699 L700 E701 P702 LEU PRO PRO HIS GLU VAL PRO GLY HIS GLN SER VAL

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

LEU TYR GLU GLN TYR ALA ILE VAL

• Molecule 10: Symplekin

5%

Chain J:

26%   •   71%

M30 V36 M48 V58 Q59 E60 I63 N64 Q81 K84 V92 R102 D103 N113 L117 R148 E152 D159 G166 I169 V192 T193 L194 M198 A199 D200 S201 E202 I203 P204 R205 H209 D210 D214 P217 R218 D219 H220 N226

V227 L228 H245 I251 T254 L260 R267 V274 E279 H282 A283 N284 L285 P286 P287 T288 L289 A290 K291 S292 Q293 S296 V297 R298 K302 L306 S307 K310 H311 S314 L315 E316 F317 Q318 A319 Q320 L324 L325 V326 D327 L328 G329 T330 P331 Q332 A333

E334 I335 A336 R337 N338 M339 P340 SER SER LYS ASP THR ARG LYS ARG ARG ASP ASP SER ASP SER SER THR LEU LYS LYS MET LYS LEU GLU PRO ASN LEU SER GLU GLU ASP GLU ASP LYS ASP LEU GLU LEU PRO GLY GLY PRO GLY HIS SER GLY THR SER LYS ALA SER ALA GLN ILE LEU SER GLY GLN SER

• Molecule 11: U7 snRNA

Chain Z: 18% 12% 15% 55%

A G U G U6 U7 A8 C12 U16 G20 A21 A22 U23 U24 G25 G26 U27 C28 U29 A30 G31 U32 A G G C U U U C U C G G C U U U U A C C C G G A A G C C C

• Molecule 12: modified H2a pre-mRNA

Chain Y: 10% 19% 17% 10% · 52%

C C A A A G C U C U U U U C A C A G A G C C A C C C25 A26 C27 U28 G29 A30 A31 U32 C33 A34 G35 A36 U37 G41 A42 G46 U47 A48 A49 C A C

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	325282	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 $(e^-/\text{Å}^2)$	70, 73	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	22500	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k), GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.158	Depositor
Minimum map value	-0.106	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.0243	Depositor
Map size (Å)	357.38, 357.38, 357.38	wwPDB
Map dimensions	334, 334, 334	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

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

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	0.30	0/660	0.57	0/889
2	B	0.34	0/620	0.55	0/826
3	F	0.36	0/591	0.64	0/799
4	E	0.34	0/678	0.55	0/910
5	G	0.32	0/613	0.55	0/821
6	C	0.32	0/923	0.61	0/1246
7	D	0.33	0/888	0.63	0/1192
8	H	0.34	0/4068	0.57	0/5498
9	I	0.35	0/4135	0.63	0/5596
10	J	0.26	0/2497	0.50	0/3385
11	Z	0.58	0/627	0.94	0/972
12	Y	0.59	2/602 (0.3%)	1.18	4/936 (0.4%)
All	All	0.35	2/16902 (0.0%)	0.64	4/23070 (0.0%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
12	Y	46	G	O3'-P	7.30	1.70	1.61
12	Y	48	A	O3'-P	6.75	1.69	1.61

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	Y	48	A	P-O3'-C3'	16.28	139.23	119.70
12	Y	48	A	OP2-P-O3'	12.11	131.83	105.20
12	Y	48	A	OP1-P-O3'	-10.86	81.30	105.20
12	Y	47	U	P-O3'-C3'	-9.85	107.88	119.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	652	0	670	20	0
2	B	612	0	634	8	0
3	F	579	0	590	11	0
4	E	670	0	696	9	0
5	G	604	0	621	19	0
6	C	911	0	923	17	0
7	D	872	0	907	20	0
8	H	3980	0	3947	76	0
9	I	4055	0	4080	103	0
10	J	2461	0	2566	17	0
11	Z	564	0	285	23	0
12	Y	537	0	271	10	0
13	H	2	0	0	0	0
All	All	16499	0	16190	279	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 9.

All (279) 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)
1:A:62:TYR:HB3	5:G:70:LEU:HD21	1.27	1.10
8:H:471:ALA:HB1	9:I:604:HIS:O	1.59	1.00
9:I:194:ARG:NH2	9:I:557:LYS:HB3	1.79	0.98
1:A:62:TYR:HB3	5:G:70:LEU:CD2	1.93	0.97
8:H:465:LYS:NZ	9:I:166:GLY:HA2	1.90	0.86
9:I:328:ALA:HB1	9:I:338:SER:HB2	1.61	0.83
9:I:194:ARG:NH2	9:I:557:LYS:CB	2.43	0.81
9:I:194:ARG:HG3	9:I:557:LYS:O	1.80	0.81
8:H:501:SER:HB3	8:H:507:ALA:CB	2.11	0.80
8:H:501:SER:HB3	8:H:507:ALA:HB2	1.62	0.79
8:H:500:LEU:HB3	8:H:507:ALA:HA	1.63	0.79
9:I:327:LEU:N	9:I:327:LEU:HD23	1.99	0.77
9:I:5:ILE:H	9:I:600:THR:HG22	1.51	0.76
1:A:62:TYR:CB	5:G:70:LEU:HD21	2.15	0.74

Continued on next page...

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:D:337:GLN:HB2	7:D:339:PHE:CZ	2.23	0.73
11:Z:7:U:H5"	11:Z:7:U:H6	1.54	0.73
9:I:634:VAL:CG1	9:I:701:GLU:HB2	2.18	0.73
8:H:467:MET:CB	9:I:605:ILE:HG12	2.18	0.72
8:H:106:LEU:HD23	8:H:243:LEU:HD12	1.71	0.72
9:I:194:ARG:HH22	9:I:557:LYS:HB3	1.50	0.72
1:A:62:TYR:O	5:G:70:LEU:CD2	2.38	0.71
1:A:62:TYR:O	5:G:70:LEU:HD23	1.88	0.71
9:I:610:LEU:CD2	9:I:700:LEU:HD12	2.20	0.71
9:I:5:ILE:N	9:I:600:THR:HG22	2.06	0.70
9:I:608:VAL:HG22	9:I:698:PRO:HG2	1.74	0.70
8:H:471:ALA:CB	9:I:604:HIS:O	2.38	0.70
1:A:32:LEU:C	1:A:32:LEU:HD12	2.12	0.69
6:C:32:ASP:HB2	6:C:81:TYR:HB2	1.74	0.69
9:I:328:ALA:HB1	9:I:338:SER:CB	2.22	0.69
8:H:500:LEU:CB	8:H:507:ALA:HA	2.23	0.68
8:H:465:LYS:HZ3	9:I:166:GLY:HA2	1.58	0.68
9:I:5:ILE:HG13	9:I:599:ALA:O	1.94	0.67
9:I:17:SER:HB2	9:I:360:THR:HG22	1.76	0.67
11:Z:7:U:H5"	11:Z:7:U:C6	2.30	0.66
6:C:18:ILE:HD13	6:C:48:ALA:HA	1.77	0.66
3:F:7:PRO:HG2	4:E:51:ASP:HB2	1.78	0.65
8:H:465:LYS:HZ2	9:I:166:GLY:HA2	1.60	0.65
8:H:186:ARG:NH1	8:H:255:GLU:OE2	2.30	0.65
8:H:98:ALA:HB1	8:H:160:LEU:CD1	2.27	0.65
9:I:634:VAL:HG12	9:I:701:GLU:O	1.97	0.65
5:G:7:PRO:HG3	11:Z:24:U:O4	1.98	0.64
9:I:269:LEU:HD11	9:I:317:LEU:HD22	1.80	0.64
8:H:200:ILE:HD11	8:H:458:PHE:HE2	1.62	0.64
8:H:194:PRO:HD2	8:H:409:LEU:HD21	1.80	0.64
3:F:20:MET:SD	3:F:73:ARG:NH1	2.71	0.64
8:H:200:ILE:HD11	8:H:458:PHE:CE2	2.33	0.64
9:I:5:ILE:H	9:I:600:THR:CG2	2.11	0.63
8:H:467:MET:HB3	9:I:605:ILE:HG12	1.79	0.63
9:I:618:LEU:HB3	9:I:627:GLU:HB3	1.82	0.62
8:H:500:LEU:HB3	8:H:506:LEU:O	2.00	0.62
9:I:602:GLU:CD	9:I:602:GLU:H	2.02	0.62
9:I:5:ILE:CG1	9:I:600:THR:HG22	2.30	0.61
8:H:500:LEU:HD23	8:H:506:LEU:O	2.00	0.61
1:A:19:THR:HB	1:A:72:ILE:HB	1.82	0.61
11:Z:7:U:H2'	11:Z:8:A:H8	1.66	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:5:ILE:HG12	9:I:600:THR:HG22	1.82	0.60
9:I:634:VAL:HG12	9:I:701:GLU:HB2	1.83	0.60
9:I:23:LEU:HD13	9:I:23:LEU:O	2.01	0.60
9:I:603:THR:HG23	9:I:603:THR:O	2.02	0.60
9:I:5:ILE:N	9:I:600:THR:CG2	2.64	0.60
6:C:76:GLY:O	7:D:349:ARG:NH1	2.35	0.59
8:H:301:ASN:HD22	8:H:302:PRO:HD2	1.67	0.59
6:C:17:LEU:HD11	7:D:189:ALA:O	2.01	0.59
9:I:560:GLN:NE2	9:I:601:SER:HB2	2.16	0.59
9:I:611:LYS:HD3	9:I:701:GLU:HG3	1.83	0.59
11:Z:7:U:H2'	11:Z:8:A:C8	2.37	0.59
8:H:184:GLU:O	8:H:215:ARG:NH1	2.35	0.59
8:H:257:TRP:CE2	8:H:268:ILE:HD11	2.38	0.59
11:Z:7:U:H6	11:Z:7:U:C5'	2.15	0.59
9:I:610:LEU:HD23	9:I:700:LEU:HD12	1.85	0.58
11:Z:26:G:O2'	11:Z:27:U:OP2	2.18	0.58
7:D:158:GLU:OE2	7:D:161:ARG:NH2	2.35	0.58
8:H:501:SER:CB	8:H:507:ALA:HB2	2.32	0.58
9:I:6:LYS:HG2	9:I:598:ASP:HA	1.84	0.58
9:I:234:LEU:HD11	9:I:328:ALA:HB2	1.85	0.58
8:H:153:CYS:HB2	8:H:163:ALA:HB1	1.86	0.58
2:B:31:PHE:HE1	2:B:40:LEU:HD22	1.69	0.58
8:H:500:LEU:O	8:H:504:THR:O	2.22	0.58
3:F:67:ASN:ND2	11:Z:28:C:OP2	2.37	0.57
2:B:47:GLU:OE1	2:B:65:ARG:NH1	2.38	0.57
9:I:560:GLN:HE21	9:I:601:SER:HB2	1.70	0.57
8:H:98:ALA:HB1	8:H:160:LEU:HD13	1.87	0.57
9:I:611:LYS:HB2	9:I:699:THR:HB	1.86	0.57
9:I:60:LEU:O	9:I:160:TRP:NE1	2.36	0.57
8:H:463:LEU:HA	9:I:609:ARG:HA	1.86	0.56
9:I:31:LEU:HD21	9:I:34:CYS:HB3	1.88	0.56
12:Y:49:A:H4'	12:Y:49:A:OP1	2.05	0.56
9:I:164:LYS:HB3	9:I:168:GLU:HB2	1.88	0.56
10:J:260:LEU:HB3	10:J:274:VAL:HG13	1.87	0.55
8:H:265:ASP:OD1	8:H:266:ILE:N	2.38	0.55
8:H:406:ILE:HD11	8:H:414:VAL:HG21	1.88	0.55
9:I:349:PRO:HG3	9:I:532:LYS:HE2	1.87	0.55
9:I:603:THR:O	9:I:605:ILE:HG13	2.06	0.55
12:Y:46:G:H2'	12:Y:47:U:C6	2.41	0.55
9:I:162:ILE:HB	9:I:170:ILE:HB	1.88	0.55
8:H:37:ILE:HD11	8:H:149:ILE:HD13	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:23:LEU:HD13	9:I:23:LEU:C	2.27	0.55
11:Z:32:U:H2'	11:Z:32:U:O2	2.07	0.55
3:F:24:LYS:NZ	4:E:83:ASN:OD1	2.39	0.54
9:I:88:ILE:HG12	9:I:128:GLN:HB3	1.89	0.54
9:I:4:ILE:HG22	9:I:4:ILE:O	2.06	0.54
4:E:62:GLU:OE1	4:E:73:GLN:NE2	2.40	0.54
8:H:485:LEU:HD12	8:H:494:ILE:HB	1.89	0.54
12:Y:48:A:C2'	12:Y:49:A:OP1	2.56	0.54
5:G:39:ASN:OD1	5:G:63:ARG:HA	2.09	0.53
8:H:467:MET:HB2	9:I:605:ILE:HG12	1.88	0.53
9:I:235:ILE:O	9:I:328:ALA:N	2.31	0.53
8:H:300:ASN:HD21	8:H:306:LYS:NZ	2.05	0.53
8:H:291:ASP:OD1	8:H:294:ARG:NH1	2.41	0.53
10:J:36:VAL:HG13	10:J:58:VAL:HG13	1.91	0.53
4:E:62:GLU:OE2	4:E:71:ARG:NH2	2.40	0.53
9:I:194:ARG:CZ	9:I:557:LYS:HB2	2.40	0.52
11:Z:30:A:C6	11:Z:32:U:H1'	2.44	0.52
9:I:560:GLN:NE2	9:I:601:SER:CB	2.72	0.52
3:F:65:ARG:NH2	11:Z:27:U:O2'	2.42	0.52
3:F:62:VAL:HG13	7:D:355:LEU:HD13	1.92	0.52
2:B:13:ILE:HA	2:B:31:PHE:HD2	1.75	0.52
7:D:172:HIS:HD2	7:D:179:LEU:HD11	1.75	0.52
12:Y:46:G:H2'	12:Y:47:U:H6	1.73	0.51
1:A:26:GLU:HG3	1:A:50:TYR:HA	1.92	0.51
5:G:14:ASP:OD1	5:G:32:ARG:NH1	2.44	0.51
8:H:55:TYR:HB3	8:H:58:LEU:HD23	1.93	0.51
8:H:502:ASN:O	9:I:194:ARG:CD	2.58	0.51
7:D:204:THR:HG22	7:D:340:THR:OG1	2.11	0.51
10:J:203:ILE:HD11	10:J:267:ARG:HH12	1.76	0.51
2:B:40:LEU:HD12	2:B:72:LEU:HD23	1.93	0.51
7:D:337:GLN:HG3	7:D:339:PHE:HE2	1.75	0.51
9:I:290:LYS:NZ	12:Y:46:G:OP1	2.38	0.51
10:J:63:ILE:O	10:J:102:ARG:NH1	2.43	0.51
7:D:176:PHE:CE2	11:Z:30:A:C2	2.98	0.51
9:I:611:LYS:CD	9:I:701:GLU:OE2	2.59	0.51
8:H:500:LEU:HB2	8:H:507:ALA:O	2.12	0.50
1:A:43:MET:HB3	1:A:46:ILE:HD11	1.93	0.50
3:F:51:ILE:HG22	3:F:56:SER:HB2	1.93	0.50
3:F:43:GLN:NE2	3:F:61:GLU:OE2	2.43	0.50
10:J:81:GLN:HB3	10:J:92:VAL:HG11	1.94	0.50
8:H:62:ALA:O	8:H:90:LYS:NZ	2.43	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:83:PHE:O	8:H:87:THR:OG1	2.29	0.49
9:I:546:GLY:HA2	9:I:549:ILE:HG22	1.94	0.49
8:H:238:ILE:HB	8:H:326:MET:HB3	1.94	0.49
10:J:194:LEU:HD22	10:J:228:LEU:HB3	1.95	0.49
1:A:69:ARG:HH11	2:B:25:ARG:HH22	1.59	0.49
9:I:7:LEU:HD21	9:I:562:ILE:HD13	1.95	0.49
9:I:130:LYS:HA	9:I:286:TRP:HH2	1.77	0.49
9:I:327:LEU:N	9:I:327:LEU:CD2	2.73	0.49
9:I:19:LEU:O	9:I:35:GLY:N	2.45	0.49
9:I:209:GLN:HE21	9:I:215:ARG:HH22	1.60	0.49
6:C:82:VAL:HB	7:D:347:PHE:HB3	1.93	0.49
9:I:23:LEU:CD1	9:I:25:VAL:HG23	2.43	0.49
1:A:62:TYR:CD2	5:G:70:LEU:HD21	2.48	0.49
8:H:501:SER:HB3	8:H:507:ALA:HB1	1.90	0.49
9:I:384:ARG:HD3	9:I:523:ILE:HD11	1.95	0.49
8:H:233:GLY:HA2	8:H:322:PRO:HG3	1.95	0.48
5:G:70:LEU:HD23	5:G:70:LEU:H	1.78	0.48
9:I:634:VAL:O	9:I:700:LEU:HD23	2.12	0.48
7:D:170:ASN:OD1	7:D:170:ASN:N	2.47	0.48
8:H:98:ALA:HB1	8:H:160:LEU:HD11	1.95	0.48
5:G:63:ARG:NH2	11:Z:23:U:C6	2.82	0.48
9:I:232:ASN:N	9:I:351:ASN:OD1	2.46	0.48
12:Y:46:G:H2'	12:Y:47:U:O4'	2.13	0.48
7:D:337:GLN:HG3	7:D:339:PHE:CE2	2.48	0.48
9:I:611:LYS:HD3	9:I:701:GLU:CG	2.43	0.48
8:H:289:MET:O	8:H:294:ARG:NH2	2.46	0.48
5:G:35:ASP:OD1	5:G:39:ASN:N	2.45	0.47
1:A:18:VAL:HG12	1:A:74:PRO:HD3	1.95	0.47
8:H:208:GLY:HA2	8:H:427:LEU:HB2	1.96	0.47
9:I:180:ARG:NH2	9:I:290:LYS:HD2	2.29	0.47
1:A:61:VAL:HA	5:G:71:GLU:HA	1.96	0.47
3:F:24:LYS:HA	3:F:70:LEU:HD12	1.95	0.47
5:G:65:ASN:HB2	11:Z:23:U:O2	2.14	0.47
9:I:63:PRO:HD3	9:I:90:VAL:HG22	1.97	0.47
9:I:215:ARG:NH2	9:I:539:ASP:O	2.48	0.47
11:Z:20:G:H5'	11:Z:21:A:H5"	1.96	0.47
8:H:300:ASN:ND2	8:H:306:LYS:CE	2.78	0.47
9:I:215:ARG:HA	9:I:218:GLN:HG2	1.97	0.47
8:H:245:ARG:O	8:H:249:LEU:HG	2.15	0.47
7:D:113:LEU:HD13	8:H:53:LEU:HD12	1.97	0.47
8:H:487:LYS:NZ	9:I:619:GLN:O	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:C:114:ARG:HB2	8:H:361:GLY:HA2	1.97	0.46
9:I:68:LEU:HD13	9:I:123:PHE:HZ	1.79	0.46
9:I:266:LEU:HB3	9:I:308:LEU:HD13	1.97	0.46
10:J:217:PRO:HG2	10:J:220:HIS:HB2	1.96	0.46
2:B:6:SER:HG	6:C:4:SER:HG	1.60	0.46
6:C:83:HIS:CE1	7:D:341:ARG:HH12	2.33	0.46
8:H:160:LEU:HD13	8:H:160:LEU:O	2.15	0.46
9:I:267:ALA:HB3	9:I:326:VAL:HG22	1.97	0.46
9:I:180:ARG:HH22	9:I:290:LYS:HD2	1.81	0.46
9:I:5:ILE:O	9:I:600:THR:CG2	2.63	0.46
10:J:166:GLY:HA2	10:J:169:ILE:HD12	1.97	0.46
9:I:199:ILE:HG23	9:I:562:ILE:HD11	1.96	0.46
8:H:235:ARG:NH2	8:H:319:ASP:O	2.42	0.46
8:H:463:LEU:HD13	9:I:607:GLN:HE21	1.81	0.46
1:A:40:ASN:HD21	11:Z:24:U:H3	1.63	0.45
6:C:17:LEU:HD23	6:C:17:LEU:HA	1.67	0.45
6:C:18:ILE:CD1	6:C:47:ASP:O	2.65	0.45
8:H:23:VAL:HG11	12:Y:26:A:H5'	1.97	0.45
8:H:84:LEU:O	8:H:134:LYS:NZ	2.40	0.45
10:J:289:LEU:HD12	10:J:293:GLN:HG3	1.98	0.45
1:A:60:GLN:NE2	5:G:78:GLU:OE2	2.50	0.45
8:H:93:THR:HG23	8:H:135:ILE:HA	1.98	0.45
8:H:174:LEU:HD21	8:H:202:ILE:HD12	1.98	0.45
9:I:611:LYS:HB3	9:I:700:LEU:O	2.16	0.45
2:B:23:ASP:O	11:Z:32:U:OP1	2.35	0.45
10:J:48:ASN:ND2	12:Y:36:A:N7	2.64	0.45
3:F:11:LEU:HD21	3:F:72:ILE:HG21	1.99	0.44
8:H:16:PRO:HG2	8:H:448:PRO:HG2	1.99	0.44
8:H:160:LEU:HD13	8:H:160:LEU:C	2.37	0.44
9:I:65:PRO:HD3	9:I:97:PHE:CD1	2.52	0.44
8:H:149:ILE:HG12	8:H:169:ILE:HG12	2.00	0.44
9:I:232:ASN:ND2	9:I:322:SER:O	2.41	0.44
9:I:611:LYS:HD2	9:I:699:THR:OG1	2.17	0.44
7:D:203:GLU:O	7:D:340:THR:HG23	2.17	0.44
1:A:62:TYR:HB3	5:G:70:LEU:HD23	1.92	0.44
8:H:37:ILE:HG12	8:H:66:LEU:HB2	1.98	0.44
8:H:39:LEU:HD21	8:H:167:ILE:HD11	1.99	0.44
8:H:40:ASP:OD2	8:H:76:HIS:ND1	2.35	0.44
6:C:18:ILE:HD13	6:C:47:ASP:O	2.18	0.44
7:D:351:GLU:HG3	11:Z:28:C:H5"	1.99	0.44
8:H:484:ILE:HG21	8:H:500:LEU:HD11	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:194:ARG:CZ	9:I:557:LYS:CB	2.94	0.44
6:C:13:SER:HA	6:C:18:ILE:HG22	2.00	0.44
8:H:60:ASP:OD1	8:H:60:ASP:N	2.50	0.44
11:Z:26:G:N2	12:Y:33:C:O2	2.47	0.44
6:C:42:ARG:HB3	6:C:55:ALA:HB3	1.99	0.43
8:H:358:CYS:HB3	8:H:365:LYS:HB2	2.00	0.43
4:E:63:GLU:HG3	4:E:74:LEU:HD11	2.00	0.43
10:J:60:GLU:HG2	10:J:64:ASN:HD22	1.83	0.43
6:C:8:LYS:CE	11:Z:26:G:O6	2.67	0.43
9:I:5:ILE:O	9:I:600:THR:HG22	2.18	0.43
9:I:56:ASP:N	9:I:56:ASP:OD1	2.50	0.43
9:I:383:LYS:HA	9:I:522:CYS:HA	2.01	0.43
4:E:52:GLU:HG3	10:J:84:LYS:HG2	2.01	0.42
4:E:88:GLN:HG3	5:G:57:ILE:HB	1.99	0.42
7:D:337:GLN:O	7:D:339:PHE:CD2	2.72	0.42
5:G:47:GLU:HB3	5:G:55:ASN:HB2	2.01	0.42
9:I:60:LEU:HD21	9:I:71:LEU:HD22	2.01	0.42
1:A:32:LEU:C	1:A:32:LEU:CD1	2.85	0.42
8:H:462:LYS:HD2	9:I:614:LEU:HD13	2.01	0.42
5:G:70:LEU:HD23	5:G:70:LEU:O	2.20	0.42
6:C:29:THR:HG22	6:C:85:PRO:HD3	2.01	0.42
11:Z:26:G:O2'	11:Z:27:U:P	2.78	0.42
3:F:38:GLY:O	11:Z:22:A:N6	2.53	0.42
9:I:209:GLN:HE21	9:I:215:ARG:NH2	2.18	0.42
9:I:235:ILE:HG22	9:I:237:VAL:HG13	2.02	0.42
8:H:466:VAL:HG13	8:H:494:ILE:HG23	2.02	0.42
9:I:235:ILE:HG12	9:I:354:ILE:HB	2.02	0.42
9:I:697:ILE:N	9:I:698:PRO:HD2	2.35	0.42
1:A:32:LEU:HD12	1:A:32:LEU:O	2.20	0.41
12:Y:46:G:C5	12:Y:47:U:C5	3.08	0.41
6:C:32:ASP:OD2	6:C:83:HIS:NE2	2.42	0.41
8:H:250:LEU:HD13	8:H:305:PHE:CE2	2.54	0.41
6:C:18:ILE:CG2	6:C:19:ILE:N	2.82	0.41
8:H:15:ARG:HE	8:H:453:ALA:HB2	1.86	0.41
9:I:4:ILE:N	9:I:26:ASP:OD1	2.33	0.41
10:J:251:ILE:HA	10:J:254:THR:HG22	2.03	0.41
10:J:81:GLN:HB2	10:J:117:LEU:HD21	2.02	0.41
1:A:25:GLY:HA3	1:A:51:ARG:HD3	2.03	0.41
1:A:32:LEU:HA	1:A:43:MET:HA	2.02	0.41
8:H:243:LEU:HA	8:H:247:GLN:HE22	1.85	0.41
9:I:86:ALA:HB3	9:I:126:ILE:HD11	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:Z:30:A:N1	11:Z:32:U:H1'	2.35	0.41
8:H:488:ARG:HA	9:I:622:LYS:HB2	2.03	0.41
9:I:194:ARG:HH22	9:I:557:LYS:CB	2.19	0.41
8:H:300:ASN:ND2	8:H:306:LYS:HE3	2.35	0.41
9:I:361:PRO:HA	9:I:366:ARG:HG3	2.03	0.41
9:I:380:GLU:N	9:I:525:THR:O	2.48	0.41
7:D:109:ARG:HA	7:D:112:ARG:HE	1.84	0.41
9:I:334:GLU:HA	9:I:339:ARG:HH11	1.86	0.41
4:E:26:GLN:NE2	10:J:113:ASN:HD21	2.19	0.40
8:H:485:LEU:HD13	9:I:631:ILE:HD12	2.03	0.40
9:I:97:PHE:CZ	9:I:238:ASP:HB3	2.56	0.40
9:I:153:HIS:CD2	9:I:154:MET:HG3	2.57	0.40
8:H:501:SER:CA	8:H:507:ALA:HB2	2.50	0.40
10:J:192:VAL:O	10:J:267:ARG:NH2	2.53	0.40
2:B:22:GLN:NE2	2:B:75:GLU:O	2.55	0.40
4:E:26:GLN:HE21	10:J:113:ASN:HD21	1.70	0.40
7:D:337:GLN:CG	7:D:339:PHE:CE2	3.05	0.40
8:H:235:ARG:NE	8:H:319:ASP:OD1	2.40	0.40
7:D:337:GLN:O	7:D:339:PHE:CE2	2.74	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	A	81/146 (56%)	78 (96%)	3 (4%)	0	100	100
2	B	72/95 (76%)	68 (94%)	4 (6%)	0	100	100
3	F	72/86 (84%)	70 (97%)	2 (3%)	0	100	100
4	E	79/92 (86%)	77 (98%)	2 (2%)	0	100	100
5	G	75/84 (89%)	75 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	C	112/123 (91%)	100 (89%)	12 (11%)	0	100	100
7	D	100/259 (39%)	93 (93%)	7 (7%)	0	100	100
8	H	495/684 (72%)	469 (95%)	25 (5%)	1 (0%)	47	79
9	I	504/782 (64%)	457 (91%)	47 (9%)	0	100	100
10	J	309/1072 (29%)	303 (98%)	6 (2%)	0	100	100
All	All	1899/3423 (56%)	1790 (94%)	108 (6%)	1 (0%)	54	83

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
8	H	267	PRO

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	73/118 (62%)	72 (99%)	1 (1%)	67	86
2	B	69/85 (81%)	69 (100%)	0	100	100
3	F	63/74 (85%)	63 (100%)	0	100	100
4	E	76/84 (90%)	75 (99%)	1 (1%)	69	87
5	G	67/74 (90%)	66 (98%)	1 (2%)	65	85
6	C	101/110 (92%)	100 (99%)	1 (1%)	76	90
7	D	95/206 (46%)	94 (99%)	1 (1%)	73	88
8	H	435/602 (72%)	426 (98%)	9 (2%)	53	79
9	I	455/695 (66%)	447 (98%)	8 (2%)	59	82
10	J	278/946 (29%)	275 (99%)	3 (1%)	73	88
All	All	1712/2994 (57%)	1687 (98%)	25 (2%)	66	85

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	LEU
4	E	19	ASN
5	G	70	LEU
6	C	45	ASN
7	D	139	LYS
8	H	104	ARG
8	H	159	VAL
8	H	301	ASN
8	H	357	TYR
8	H	466	VAL
8	H	467	MET
8	H	491	ASN
8	H	502	ASN
8	H	508	MET
9	I	36	TRP
9	I	50	LYS
9	I	191	MET
9	I	254	TRP
9	I	299	ARG
9	I	301	ASN
9	I	327	LEU
9	I	602	GLU
10	J	205	ARG
10	J	337	ARG
10	J	338	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	76	ASN
3	F	41	ASN
4	E	19	ASN
6	C	45	ASN
6	C	78	ASN
7	D	160	HIS
7	D	172	HIS
7	D	352	ASN
8	H	85	GLN
8	H	97	HIS
8	H	187	HIS
8	H	247	GLN
8	H	296	GLN
8	H	300	ASN

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Mol	Chain	Res	Type
8	H	301	ASN
8	H	307	HIS
8	H	491	ASN
8	H	502	ASN
9	I	62	HIS
9	I	301	ASN
9	I	607	GLN
10	J	64	ASN
10	J	113	ASN
10	J	207	GLN
10	J	220	HIS
10	J	338	ASN

5.3.3　RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	Z	26/60 (43%)	12 (46%)	2 (7%)
12	Y	24/52 (46%)	11 (45%)	1 (4%)
All	All	50/112 (44%)	23 (46%)	3 (6%)

All (23) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	Z	7	U
11	Z	12	C
11	Z	16	U
11	Z	20	G
11	Z	21	A
11	Z	22	A
11	Z	24	U
11	Z	27	U
11	Z	28	C
11	Z	29	U
11	Z	31	G
11	Z	32	U
12	Y	26	A
12	Y	27	C
12	Y	28	U
12	Y	29	G
12	Y	31	A
12	Y	35	G

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Mol	Chain	Res	Type
12	Y	36	A
12	Y	37	U
12	Y	41	G
12	Y	42	A
12	Y	49	A

All (3) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
11	Z	7	U
11	Z	26	G
12	Y	48	A

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

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

5.5　Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6　Ligand geometry ⓘ

Of 2 ligands modelled in this entry, 2 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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-21050. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections ⓘ

6.1.1 Primary map

| X | Y | Z |
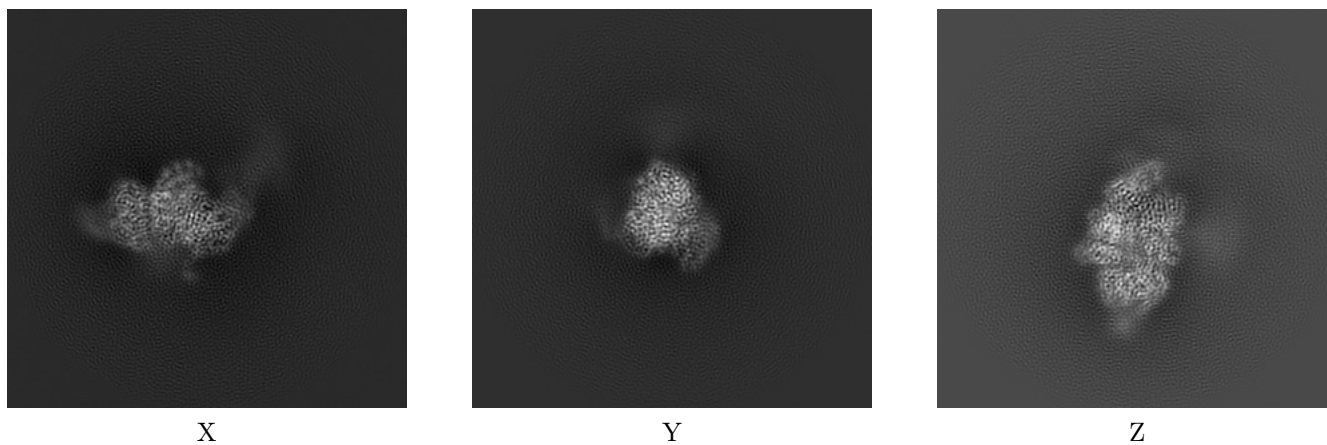
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map

| X Index: 167 | Y Index: 167 | Z Index: 167 |
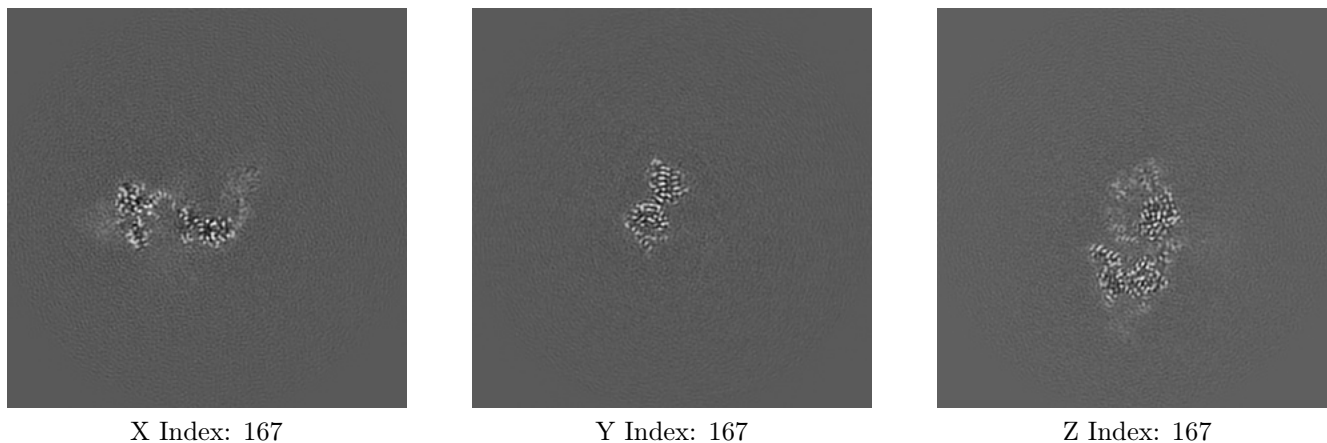
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ
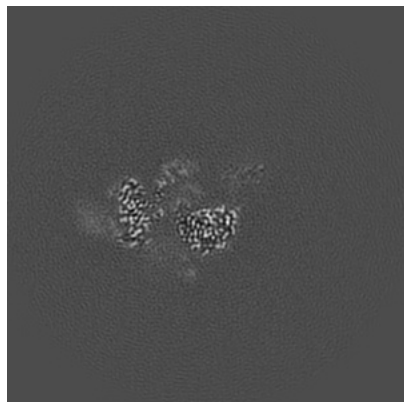
6.3.1 Primary map
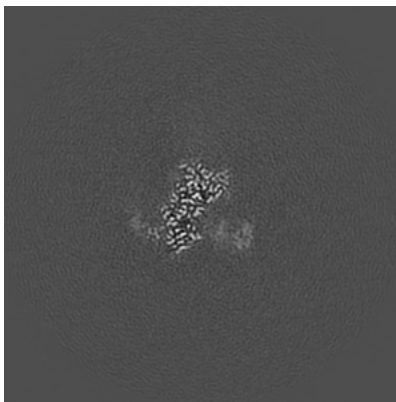
| X Index: 153 | Y Index: 153 | Z Index: 153 |
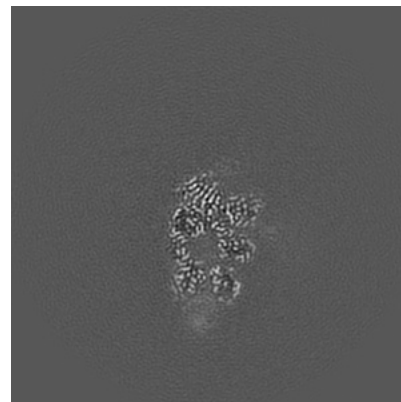
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views ⓘ
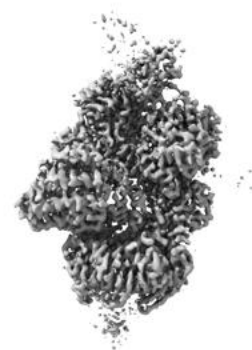
6.4.1 Primary map

| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.0243. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5   Mask visualisation (i)

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

7 Map analysis ⓘ

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

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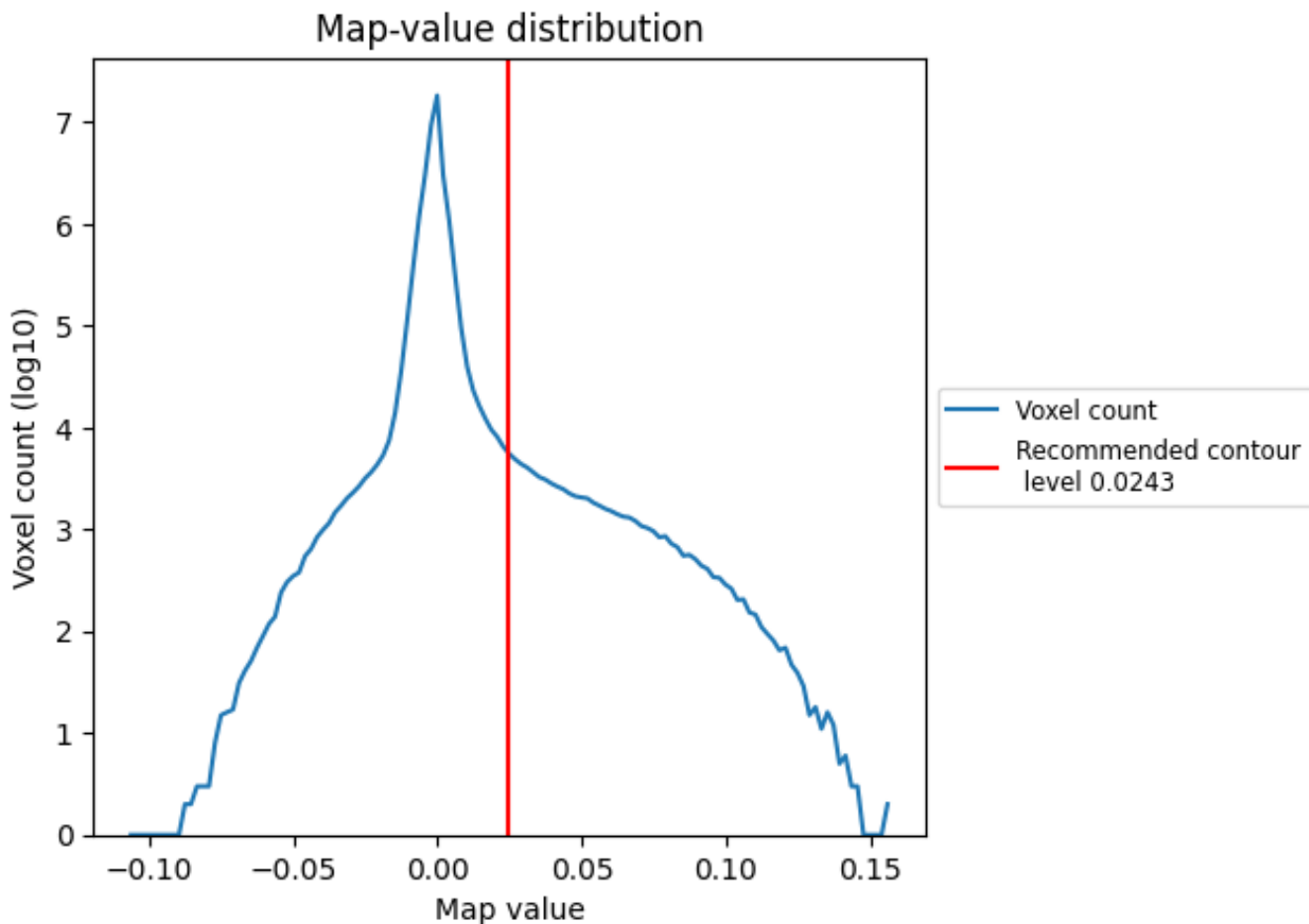
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
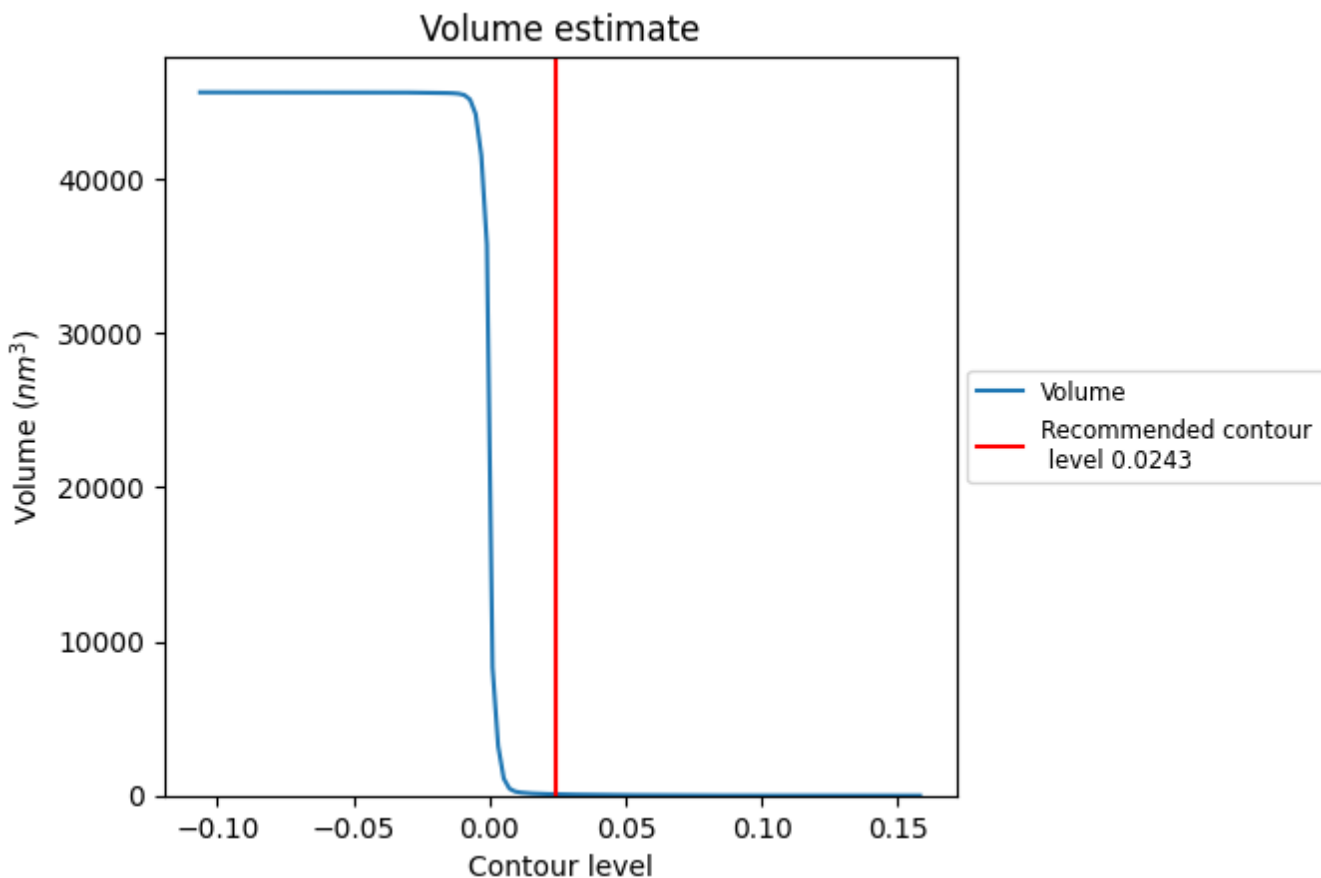
The volume at the recommended contour level is 86 nm^3; this corresponds to an approximate mass of 78 kDa.

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 ⓘ
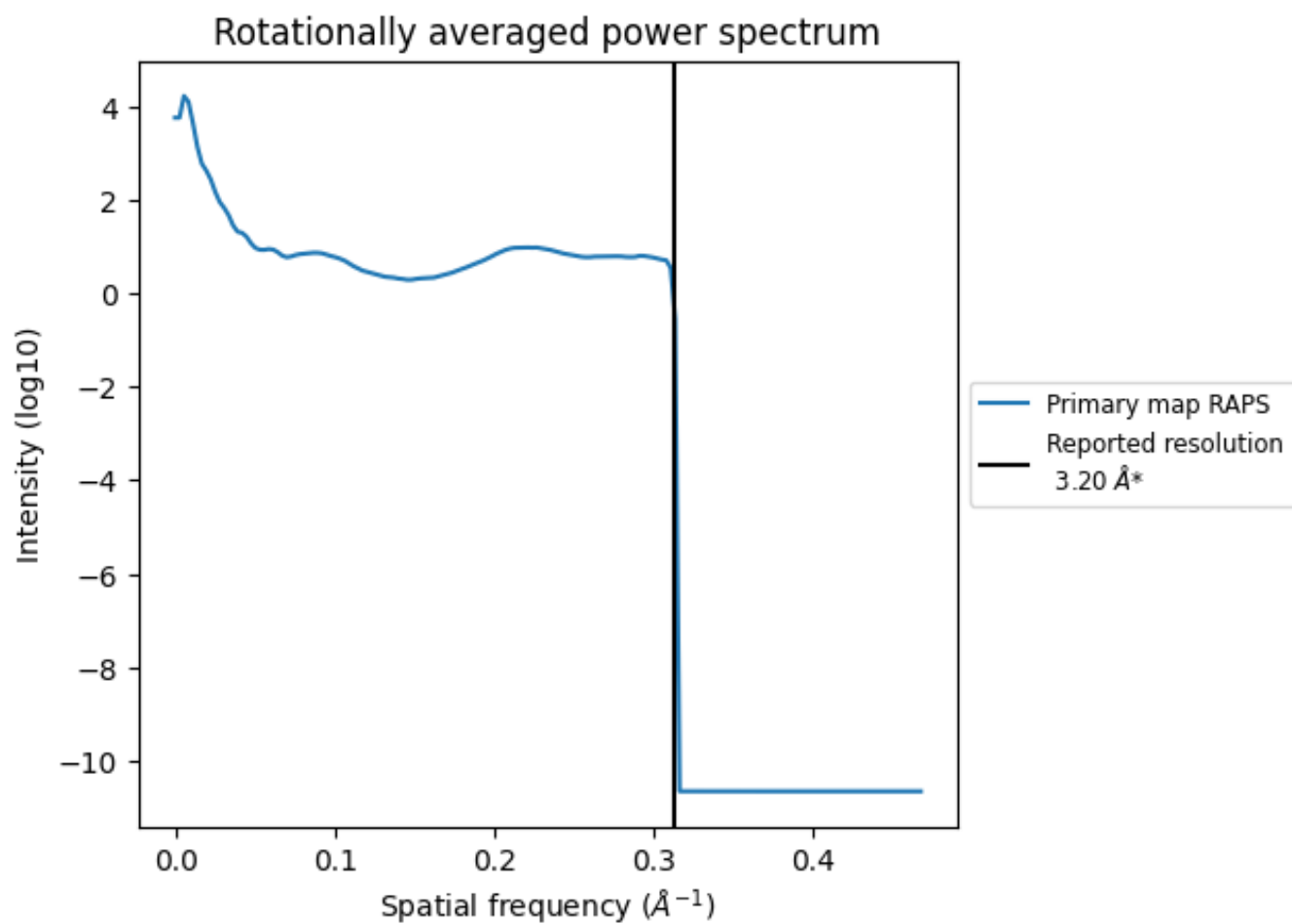
*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

8   Fourier-Shell correlation (i)

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

9　Map-model fit　ⓘ

This section contains information regarding the fit between EMDB map EMD-21050 and PDB model 6V4X. Per-residue inclusion information can be found in section 3 on page 8.

9.1　Map-model overlay　ⓘ
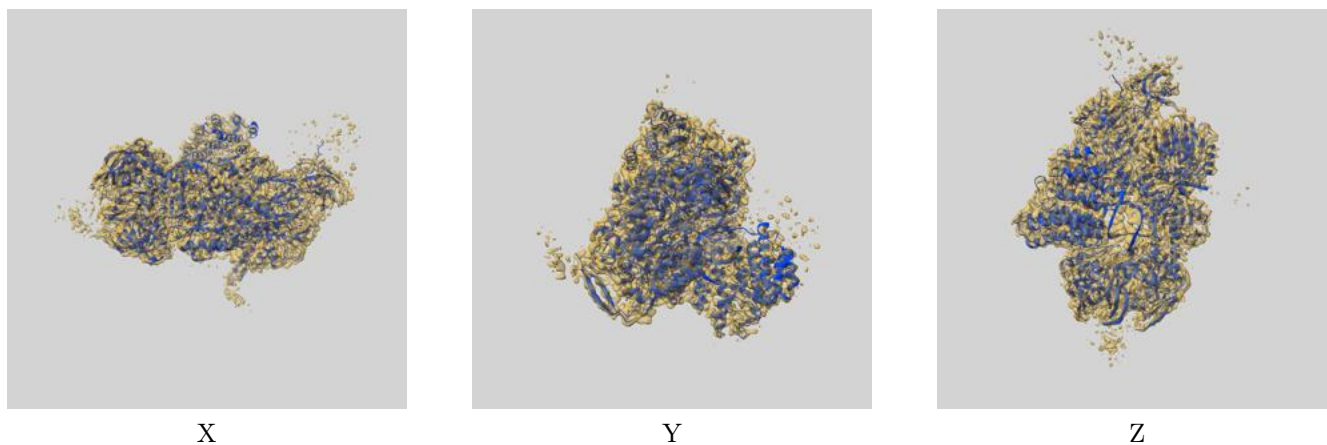
X　　　　　　　　　　　Y　　　　　　　　　　　Z

The images above show the 3D surface view of the map at the recommended contour level 0.0243 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 ⓘ

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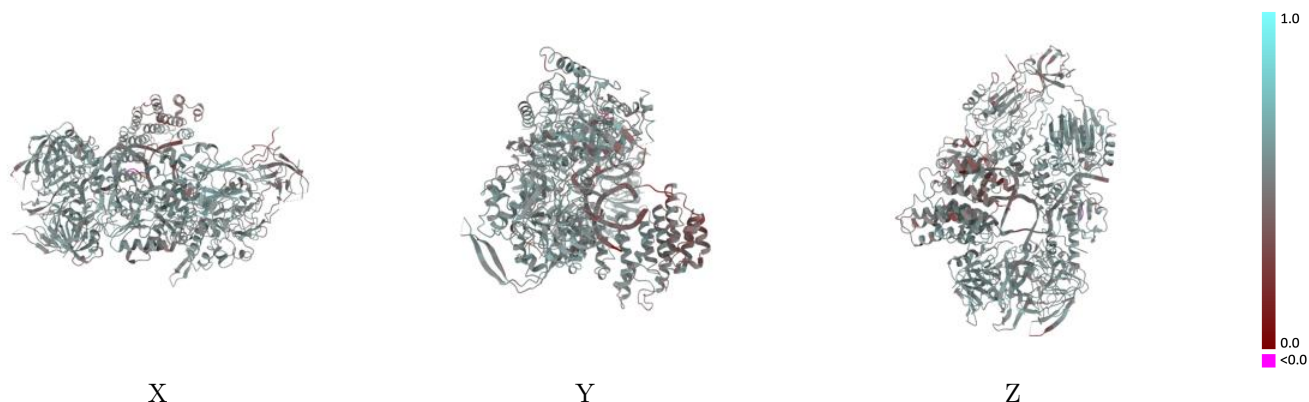
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3 Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
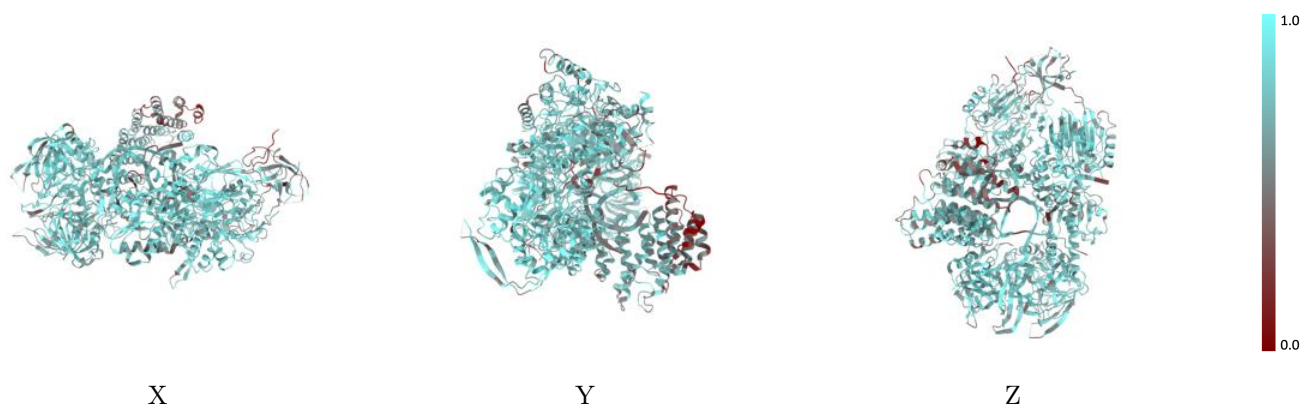
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0243).

## 9.4   Atom inclusion ⓘ
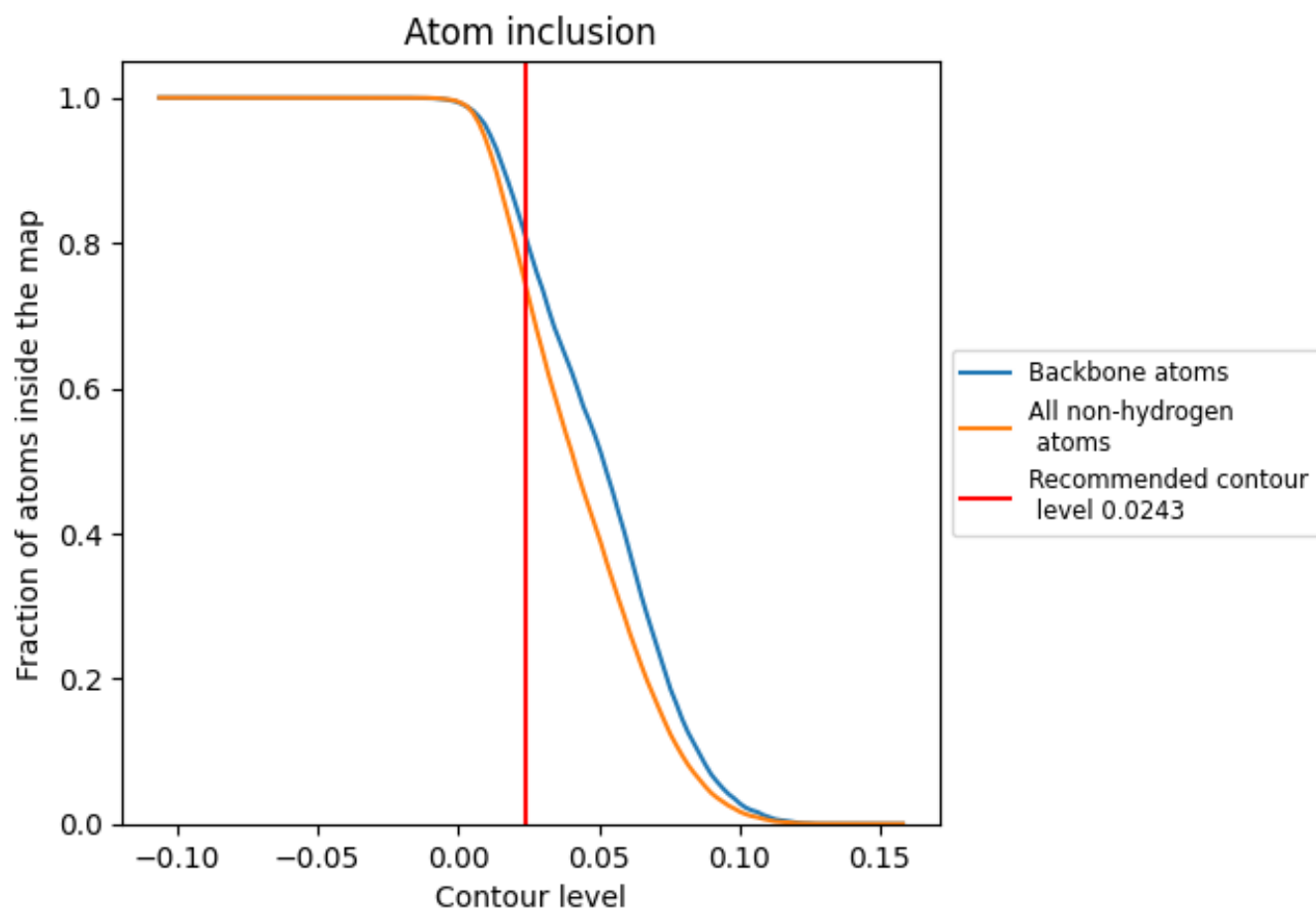
At the recommended contour level, 80% of all backbone atoms, 74% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.0243) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7358	0.5160
A	0.7418	0.5300
B	0.7521	0.5350
C	0.7765	0.5310
D	0.7796	0.5130
E	0.7722	0.5430
F	0.7838	0.5400
G	0.7416	0.5410
H	0.7524	0.5290
I	0.7523	0.5200
J	0.6374	0.4800
Y	0.6629	0.4560
Z	0.7465	0.4820

1.0

0.0
<0.0