



Full wwPDB EM Validation Report ⓘ

Mar 17, 2026 – 12:21 PM UTC

PDB ID : 8IHT / pdb_00008iht
EMDB ID : EMD-35455
Title : Rpd3S bound to the nucleosome
Authors : Zhang, Y.; Gang, C.
Deposited on : 2023-02-23
Resolution : 3.72 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

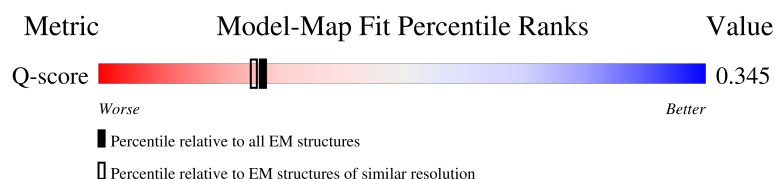
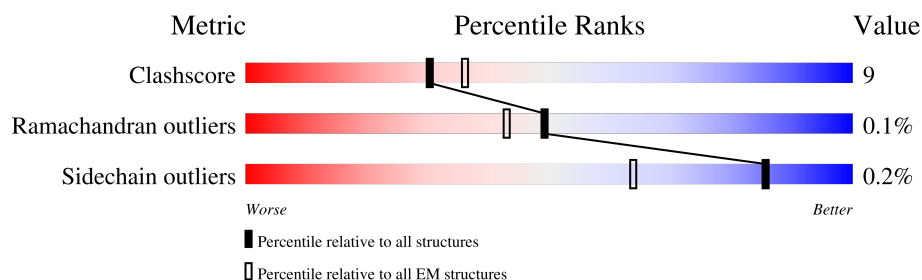
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

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 3.72 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	10474 (3.22 - 4.22)

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

Mol	Chain	Length	Quality of chain
1	A	135	 6% 68% 18% 10%
1	E	135	 60% 14% 26%
2	B	102	 67% 11% 22%
2	F	102	 71% 10% 20%

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Mol	Chain	Length	Quality of chain
3	C	129	
3	G	129	
4	D	122	
4	H	122	
5	I	164	
6	J	165	
7	M	684	
7	O	684	
8	N	401	
8	P	401	
9	K	1536	
10	L	433	

2 Entry composition [i](#)

There are 12 unique types of molecules in this entry. The entry contains 27545 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 Histone H3.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	121	Total	C	N	O	S	0	0
			925	581	184	159	1		
1	E	100	Total	C	N	O	S	0	0
			779	490	151	136	2		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	110	ALA	CYS	engineered mutation	UNP A0A310TTQ1
E	110	ALA	CYS	engineered mutation	UNP A0A310TTQ1

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	80	Total	C	N	O	S	0	0
			607	381	119	106	1		
2	F	82	Total	C	N	O	S	0	0
			609	385	117	106	1		

- Molecule 3 is a protein called Histone H2A.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	C	107	Total	C	N	O	0	0
			801	499	161	141		
3	G	106	Total	C	N	O	0	0
			760	473	151	136		

- Molecule 4 is a protein called Histone H2B.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	94	Total	C	N	O	S	0	0
			711	452	126	131	2		

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Mol	Chain	Residues	Atoms					AltConf	Trace
4	H	89	Total	C	N	O	S	0	0
			639	398	120	120	1		

- Molecule 5 is a DNA chain called DNA (164-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	158	Total	C	N	O	P	0	0
			3216	1527	581	950	158		

- Molecule 6 is a DNA chain called DNA (165-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
6	J	159	Total	C	N	O	P	0	0
			3280	1551	621	949	159		

- Molecule 7 is a protein called RCO1 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	M	375	Total	C	N	O	S	0	0
			2844	1789	500	544	11		
7	O	153	Total	C	N	O	S	0	0
			1125	718	193	209	5		

- Molecule 8 is a protein called Chromatin modification-related protein EAF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	N	295	Total	C	N	O	S	0	0
			2212	1412	373	416	11		
8	P	184	Total	C	N	O	S	0	0
			1320	847	213	254	6		

- Molecule 9 is a protein called Transcriptional regulatory protein SIN3.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	K	598	Total	C	N	O	S	0	0
			4668	2982	810	861	15		

- Molecule 10 is a protein called Histone deacetylase RPD3.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	410	Total	C	N	O	S	0	0
			3047	1924	524	578	21		

- Molecule 11 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
11	L	1	Total	Zn	0
			1	1	

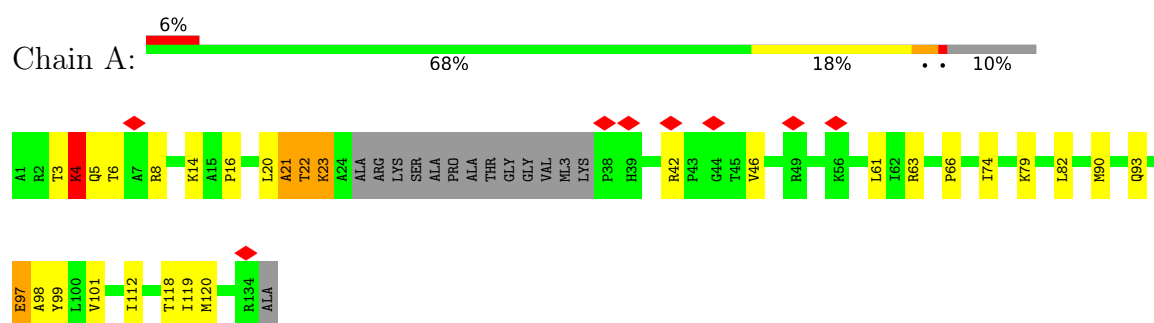
- Molecule 12 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
12	L	1	Total	Ca	0
			1	1	

3 Residue-property plots [i](#)

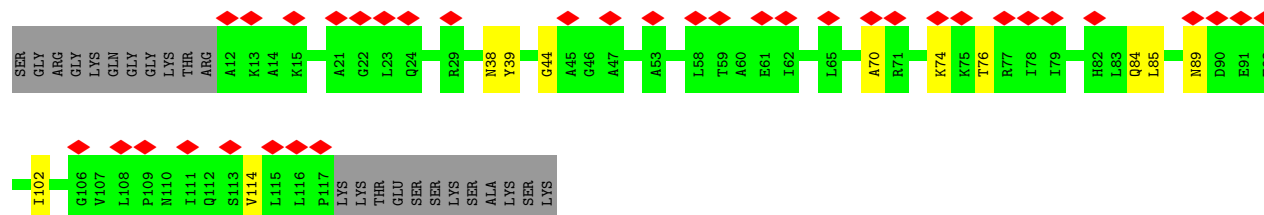
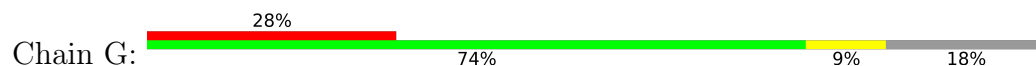
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: Histone H3

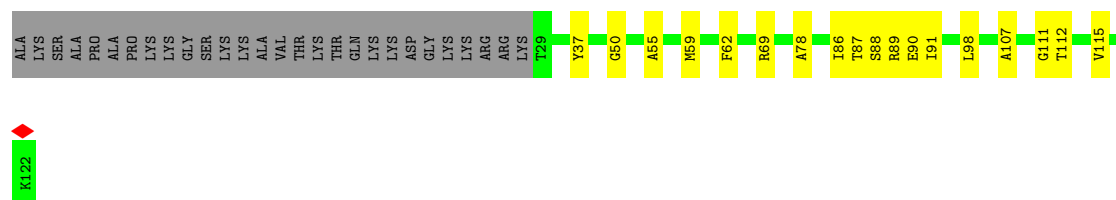




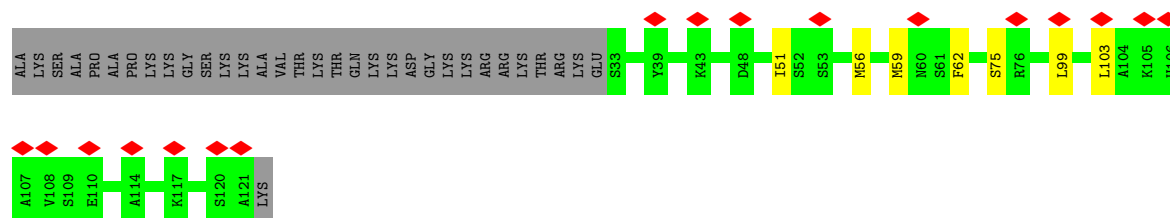
• Molecule 3: Histone H2A



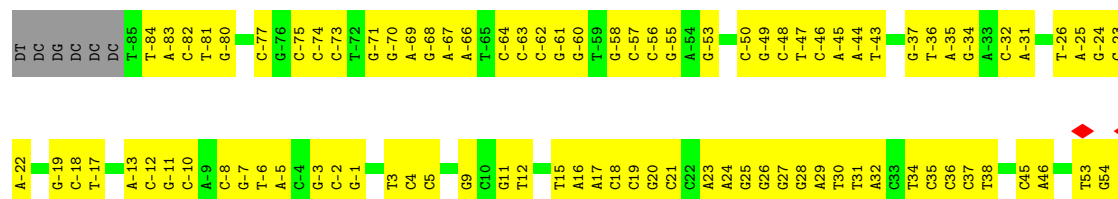
• Molecule 4: Histone H2B

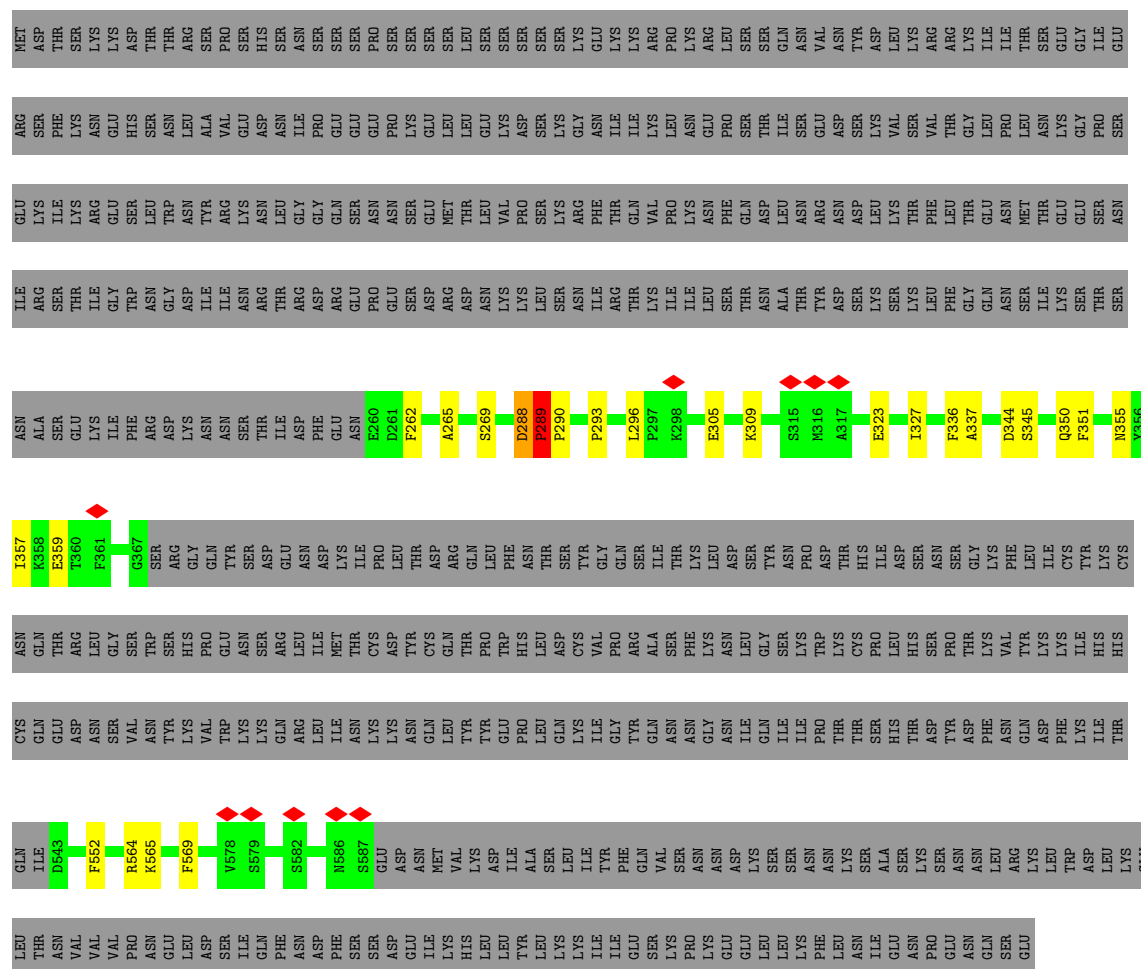


• Molecule 4: Histone H2B

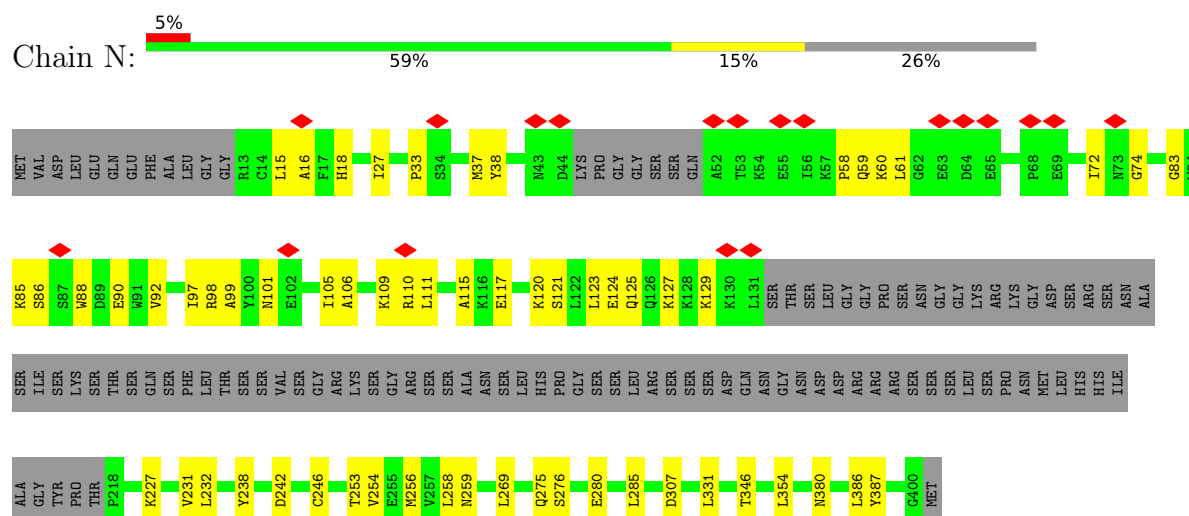


• Molecule 5: DNA (164-MER)

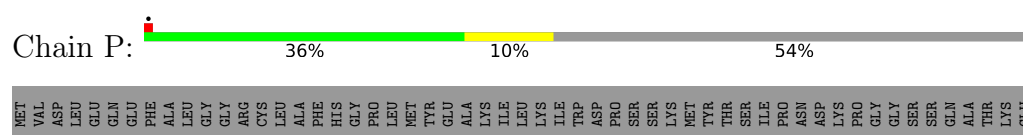


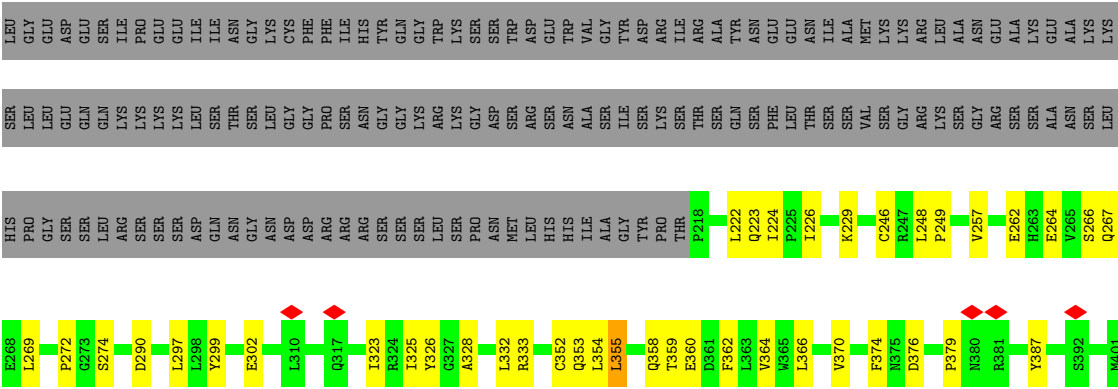


• Molecule 8: Chromatin modification-related protein EAF3

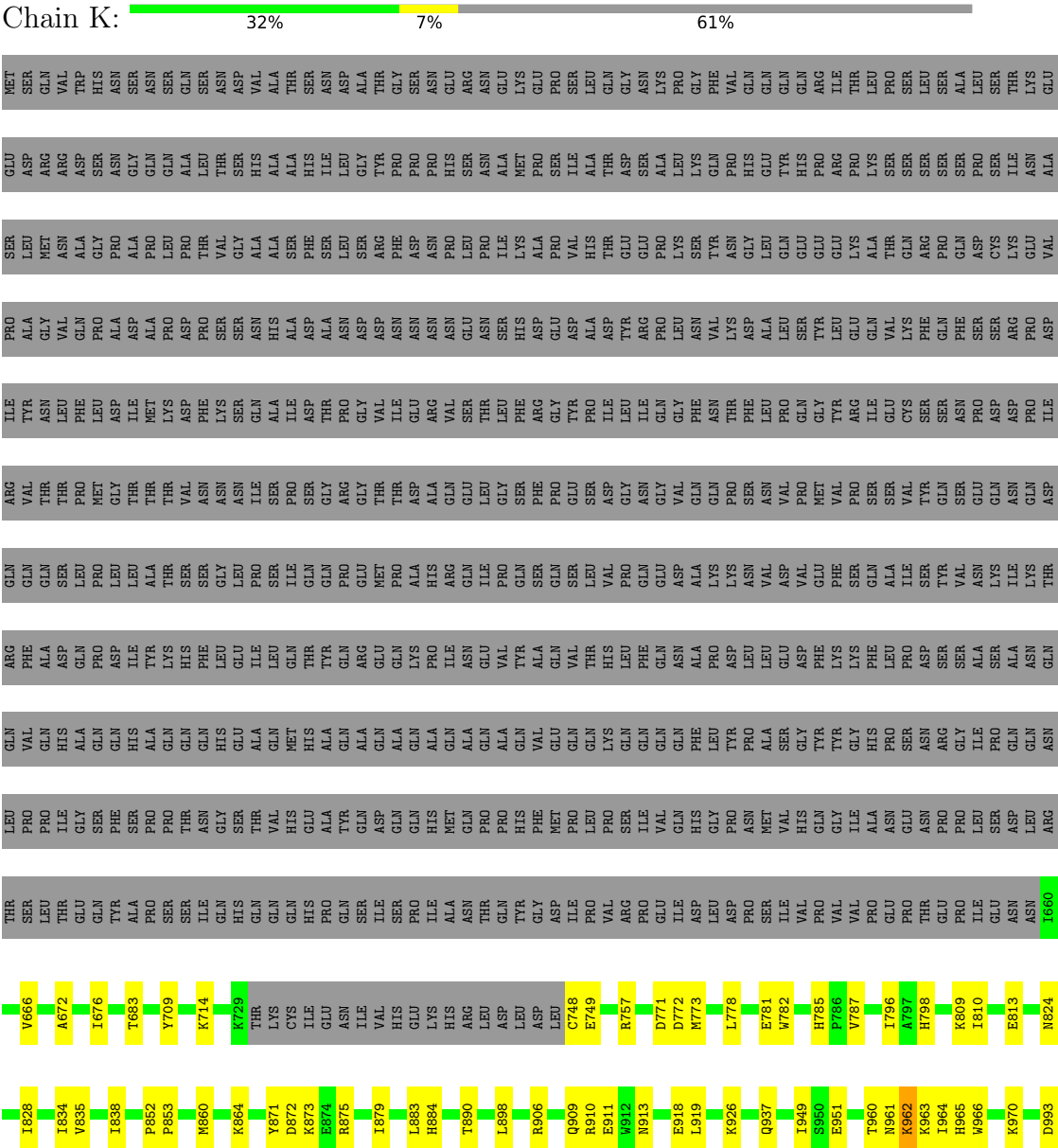


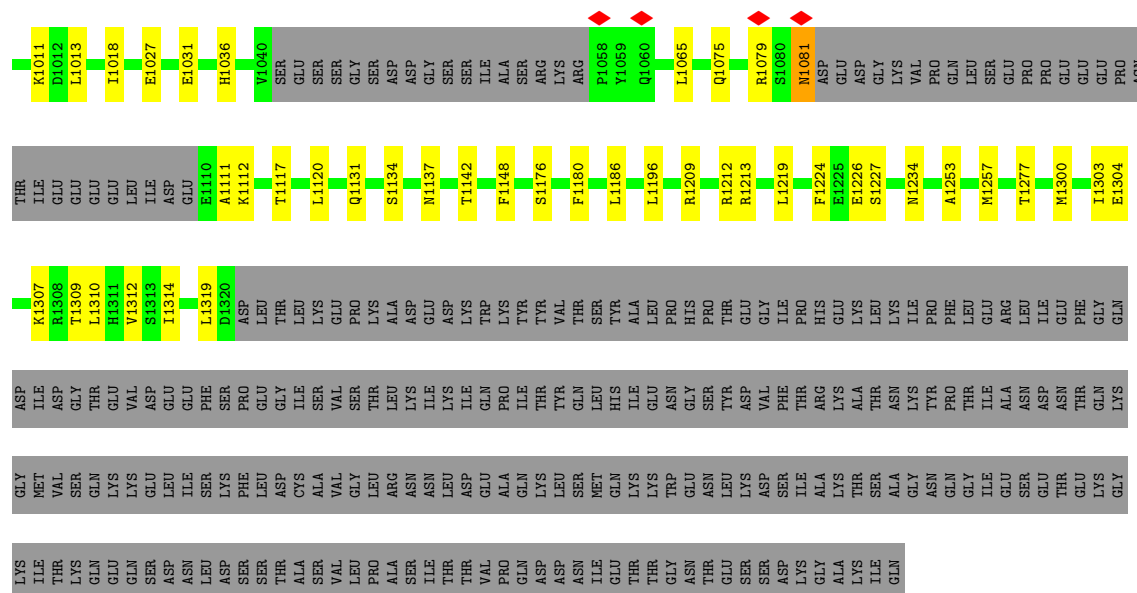
• Molecule 8: Chromatin modification-related protein EAF3



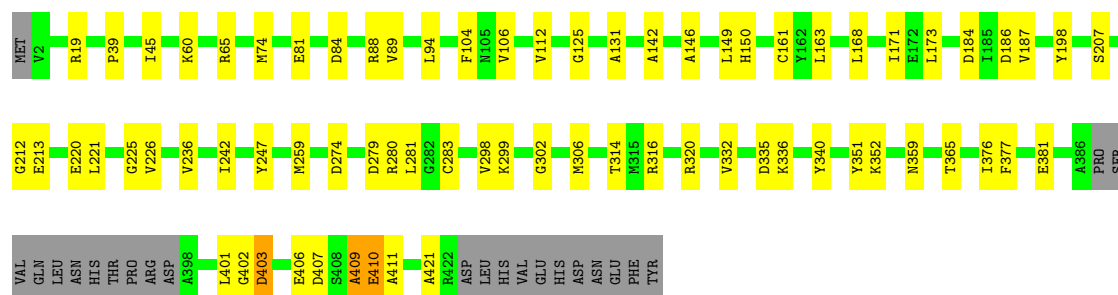
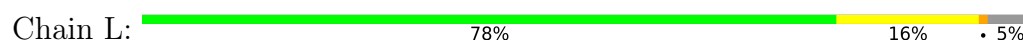


• Molecule 9: Transcriptional regulatory protein SIN3





- Molecule 10: Histone deacetylase RPD3



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	107252	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 ($e^-/\text{\AA}^2$)	53	Depositor
Minimum defocus (nm)	1800	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.030	Depositor
Minimum map value	-0.745	Depositor
Average map value	0.006	Depositor
Map value standard deviation	0.058	Depositor
Recommended contour level	0.254	Depositor
Map size (Å)	359.52002, 359.52002, 359.52002	wwPDB
Map dimensions	336, 336, 336	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CA, ZN, ML3

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	0.44	0/937	0.67	2/1256 (0.2%)
1	E	0.43	0/777	0.66	2/1045 (0.2%)
2	B	0.48	0/613	0.57	1/824 (0.1%)
2	F	0.45	0/616	0.56	0/827
3	C	0.38	0/811	0.47	0/1093
3	G	0.20	0/769	0.36	0/1043
4	D	0.45	0/721	0.53	0/969
4	H	0.31	0/647	0.52	0/877
5	I	0.31	0/3601	0.45	0/5548
6	J	0.31	0/3685	0.42	0/5688
7	M	0.41	1/2904 (0.0%)	0.79	15/3928 (0.4%)
7	O	0.27	0/1147	0.65	4/1547 (0.3%)
8	N	0.31	0/2256	0.55	3/3057 (0.1%)
8	P	0.23	0/1344	0.46	1/1836 (0.1%)
9	K	0.28	0/4762	0.54	8/6444 (0.1%)
10	L	0.35	0/3116	0.61	6/4226 (0.1%)
All	All	0.34	1/28706 (0.0%)	0.56	42/40208 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	M	452	VAL	CA-C	-8.65	1.46	1.53

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	M	452	VAL	N-CA-C	-15.70	90.18	107.77
1	E	46	VAL	N-CA-C	-11.34	102.06	111.81
7	O	289	PRO	N-CA-C	-10.09	98.40	110.70
1	A	21	ALA	N-CA-C	-9.29	99.54	112.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	M	452	VAL	CA-C-N	-9.11	110.38	119.76
7	M	452	VAL	C-N-CA	-9.11	110.38	119.76
7	M	107	LYS	N-CA-C	-8.97	98.69	110.53
7	M	108	VAL	N-CA-C	8.82	119.62	110.62
7	M	466	CYS	CA-C-N	-8.15	112.39	120.21
7	M	466	CYS	C-N-CA	-8.15	112.39	120.21
7	M	88	ASP	N-CA-C	-7.88	97.81	109.15
10	L	409	ALA	N-CA-C	7.62	121.67	112.38
7	O	289	PRO	CA-C-N	-7.20	112.35	119.76
7	O	289	PRO	C-N-CA	-7.20	112.35	119.76
8	N	98	ARG	N-CA-C	-7.18	98.23	109.72
9	K	872	ASP	N-CA-C	7.17	121.42	111.74
8	N	380	ASN	N-CA-C	-7.10	103.62	111.36
9	K	875	ARG	N-CA-C	-7.04	103.61	111.28
10	L	125	GLY	N-CA-C	-7.04	105.64	114.16
7	M	317	ALA	N-CA-C	6.96	118.87	111.28
7	M	453	PRO	N-CA-C	-6.79	100.55	111.14
8	P	355	LEU	N-CA-C	-6.74	103.94	111.28
1	A	97	GLU	N-CA-C	-6.68	103.25	111.40
7	M	452	VAL	CB-CA-C	-6.54	103.25	110.78
10	L	410	GLU	N-CA-C	6.49	118.35	111.28
7	M	467	PRO	N-CA-C	-6.47	102.16	111.22
1	E	48	LEU	N-CA-C	-6.16	104.48	111.14
7	M	106	SER	N-CA-C	-5.91	104.84	111.28
9	K	1081	ASN	CB-CA-C	5.76	121.04	110.10
7	M	108	VAL	CB-CA-C	-5.71	104.43	112.14
10	L	403	ASP	N-CA-C	-5.59	101.77	110.10
7	O	288	ASP	N-CA-C	-5.58	105.24	113.16
9	K	852	PRO	CA-C-N	-5.50	114.03	119.92
9	K	852	PRO	C-N-CA	-5.50	114.03	119.92
9	K	962	LYS	N-CA-C	-5.47	105.31	111.28
8	N	72	ILE	N-CA-C	5.27	119.83	112.50
2	B	48	GLY	N-CA-C	5.20	120.18	113.27
9	K	871	TYR	N-CA-C	5.15	117.84	110.68
10	L	365	THR	CA-C-N	-5.15	113.62	119.28
10	L	365	THR	C-N-CA	-5.15	113.62	119.28
7	M	316	MET	N-CA-C	-5.09	104.37	111.39
9	K	873	LYS	CB-CA-C	-5.05	110.36	117.23

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	925	0	936	29	0
1	E	779	0	771	16	0
2	B	607	0	606	10	0
2	F	609	0	597	7	0
3	C	801	0	815	15	0
3	G	760	0	754	8	0
4	D	711	0	718	14	0
4	H	639	0	610	4	0
5	I	3216	0	1770	97	0
6	J	3280	0	1782	88	0
7	M	2844	0	2569	45	0
7	O	1125	0	1008	19	0
8	N	2212	0	2068	35	0
8	P	1320	0	1180	30	0
9	K	4668	0	4404	67	0
10	L	3047	0	2781	45	0
11	L	1	0	0	0	0
12	L	1	0	0	0	0
All	All	27545	0	23369	456	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 (456) 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)
4:H:51:ILE:HD13	4:H:56:MET:HE2	1.68	0.73
5:I:11:DG:H2''	5:I:12:DT:H5''	1.70	0.73
5:I:-73:DC:N3	6:J:74:DG:N2	2.37	0.72
5:I:-68:DG:H2'	5:I:-67:DA:C8	2.25	0.71
1:A:20:LEU:CB	1:A:23:LYS:H	2.05	0.69
5:I:30:DT:H2'	5:I:31:DT:H71	1.75	0.68
5:I:-7:DG:H2''	5:I:-6:DT:H72	1.75	0.68
1:E:38:PRO:HG2	1:E:40:ARG:HG3	1.76	0.67
6:J:49:DC:H2'	6:J:50:DG:C8	2.28	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:M:315:SER:O	7:M:316:MET:C	2.38	0.67
6:J:31:DT:H2'	6:J:32:DG:C8	2.31	0.65
1:A:4:LYS:O	1:A:5:GLN:HG2	1.97	0.63
5:I:69:DC:H2''	5:I:70:DC:H5''	1.81	0.62
5:I:-70:DG:H2''	5:I:-69:DA:C8	2.34	0.62
1:A:8:ARG:HD3	1:A:14:LYS:NZ	2.15	0.61
1:A:16:PRO:HG2	9:K:787:VAL:HG12	1.82	0.61
6:J:-8:DG:C8	6:J:-8:DG:H5'	2.36	0.61
1:A:8:ARG:CZ	1:A:22:THR:HG21	2.32	0.60
6:J:64:DG:H2''	6:J:65:DA:H5'	1.82	0.60
10:L:402:GLY:O	10:L:403:ASP:C	2.46	0.59
6:J:14:DT:H2''	6:J:15:DT:H71	1.83	0.59
1:E:40:ARG:HH21	5:I:9:DG:H1'	1.68	0.58
5:I:12:DT:OP1	8:N:83:GLY:N	2.36	0.58
5:I:62:DT:H2''	5:I:63:DA:H8	1.68	0.58
10:L:142:ALA:HB3	10:L:306:MET:HG3	1.86	0.58
7:O:351:PHE:CE1	8:P:333:ARG:HB3	2.39	0.57
9:K:1196:LEU:HD11	9:K:1219:LEU:HD11	1.86	0.57
8:N:253:THR:H	8:N:256:MET:HE3	1.69	0.57
7:O:564:ARG:HH22	7:O:565:LYS:HG3	1.70	0.57
1:A:14:LYS:HE2	1:A:22:THR:HG23	1.87	0.56
9:K:962:LYS:O	9:K:966:TRP:N	2.37	0.56
8:N:269:LEU:HD11	8:N:275:GLN:HG3	1.87	0.56
3:G:44:GLY:HA2	5:I:38:DT:H5''	1.86	0.56
8:N:124:GLU:HA	8:N:127:LYS:HD3	1.87	0.56
1:A:14:LYS:HG2	1:A:21:ALA:H	1.70	0.56
7:O:336:PHE:HE1	8:P:355:LEU:HD21	1.71	0.56
5:I:-6:DT:H1'	5:I:-5:DA:C5	2.42	0.55
8:N:111:LEU:O	8:N:115:ALA:N	2.39	0.55
9:K:853:PRO:HA	9:K:884:HIS:CE1	2.41	0.55
5:I:53:DT:H2''	5:I:54:DG:C8	2.41	0.55
9:K:1186:LEU:HD23	10:L:351:TYR:CZ	2.42	0.55
8:P:222:LEU:HD11	8:P:359:THR:HG21	1.88	0.55
7:O:357:ILE:HD11	8:P:229:LYS:HA	1.88	0.55
5:I:54:DG:H2''	5:I:55:DT:C7	2.37	0.55
7:M:85:LEU:O	7:M:86:GLU:C	2.49	0.55
5:I:-71:DG:H2''	5:I:-70:DG:C8	2.42	0.55
8:P:376:ASP:HB3	8:P:379:PRO:HB3	1.88	0.55
6:J:22:DT:H1'	6:J:23:DG:H5'	1.89	0.54
6:J:35:DT:H2''	6:J:36:DA:C8	2.42	0.54
5:I:-44:DA:H1'	5:I:-43:DT:H5'	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:112:THR:HA	4:D:115:VAL:HG12	1.89	0.54
9:K:960:THR:O	9:K:963:LYS:HB3	2.06	0.54
3:C:115:LEU:HD21	1:E:112:ILE:HD11	1.88	0.54
5:I:45:DC:H2''	5:I:46:DA:N7	2.22	0.54
9:K:906:ARG:HB3	9:K:910:ARG:HH21	1.73	0.54
6:J:81:DA:H2''	6:J:82:DG:OP2	2.06	0.54
10:L:401:LEU:O	10:L:402:GLY:C	2.46	0.53
1:A:8:ARG:HD3	1:A:14:LYS:HZ1	1.73	0.53
8:P:226:ILE:HA	8:P:229:LYS:HD3	1.90	0.53
6:J:31:DT:H2'	6:J:32:DG:H8	1.72	0.53
6:J:62:DG:C2	6:J:63:DG:C2	2.97	0.53
7:M:99:PRO:HB2	7:M:101:THR:HG23	1.89	0.53
8:N:256:MET:HA	8:N:259:ASN:HB2	1.90	0.53
5:I:16:DA:H1'	5:I:17:DA:N7	2.24	0.53
6:J:-48:DC:H2''	6:J:-47:DC:C5	2.44	0.53
6:J:37:DC:H2''	6:J:38:DG:C8	2.44	0.53
8:N:99:ALA:O	8:N:101:ASN:ND2	2.42	0.53
10:L:89:VAL:HG22	10:L:112:VAL:HG11	1.90	0.53
3:G:85:LEU:O	3:G:89:ASN:ND2	2.41	0.52
3:C:89:ASN:ND2	7:M:54:ILE:HG21	2.25	0.52
6:J:42:DA:H5'	6:J:42:DA:C8	2.44	0.52
7:M:396:THR:CB	9:K:796:ILE:HD13	2.38	0.52
10:L:74:MET:HE3	10:L:163:LEU:HD22	1.91	0.52
1:E:42:ARG:O	1:E:45:THR:HG22	2.10	0.52
5:I:-46:DC:H1'	5:I:-45:DA:C8	2.45	0.52
5:I:-8:DC:H2''	5:I:-7:DG:C8	2.45	0.52
6:J:-4:DG:H2''	6:J:-3:DA:C8	2.45	0.52
6:J:23:DG:H1'	6:J:24:DC:H5'	1.91	0.52
10:L:335:ASP:OD2	10:L:336:LYS:N	2.42	0.52
7:O:262:PHE:HA	7:O:269:SER:HA	1.91	0.52
7:O:344:ASP:OD1	7:O:345:SER:N	2.42	0.52
4:D:86:ILE:HA	4:D:90:GLU:OE1	2.10	0.52
5:I:-13:DA:C8	5:I:-13:DA:H5'	2.45	0.52
5:I:-35:DA:H1'	5:I:-34:DG:O4'	2.11	0.51
9:K:810:ILE:HD11	9:K:919:LEU:HD23	1.92	0.51
2:B:48:GLY:H	6:J:7:DC:P	2.33	0.51
9:K:748:CYS:SG	9:K:749:GLU:N	2.83	0.51
9:K:962:LYS:O	9:K:965:HIS:N	2.44	0.51
6:J:-5:DG:H2''	6:J:-4:DG:C8	2.45	0.51
1:E:69:ARG:HB3	2:F:25:ASN:ND2	2.26	0.51
5:I:-50:DC:H2''	5:I:-49:DG:C8	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:N:60:LYS:NZ	8:N:61:LEU:O	2.43	0.51
9:K:1013:LEU:HD22	9:K:1257:MET:SD	2.51	0.51
5:I:63:DA:H1'	5:I:64:DT:OP2	2.10	0.51
6:J:15:DT:H2''	6:J:16:DA:O4'	2.11	0.51
9:K:962:LYS:O	9:K:963:LYS:C	2.51	0.51
3:C:31:HIS:CE1	3:C:35:ARG:HH22	2.29	0.51
5:I:66:DC:H2''	5:I:67:DA:C8	2.45	0.51
8:N:117:GLU:O	8:N:121:SER:N	2.33	0.51
6:J:82:DG:H2''	6:J:83:DT:OP2	2.11	0.51
3:C:40:ALA:HA	3:G:38:ASN:HD22	1.76	0.51
5:I:-80:DG:H5'	5:I:-80:DG:C8	2.46	0.51
6:J:3:DC:H4'	6:J:4:DG:OP1	2.10	0.51
6:J:32:DG:H2'	6:J:33:DT:H71	1.92	0.51
6:J:83:DT:H2''	6:J:84:DA:C8	2.46	0.51
7:M:452:VAL:O	7:M:453:PRO:C	2.50	0.51
6:J:62:DG:N2	6:J:63:DG:C2	2.79	0.51
10:L:184:ASP:HB3	10:L:207:SER:HA	1.92	0.51
7:M:103:SER:O	7:M:104:GLU:C	2.50	0.50
9:K:1219:LEU:HD23	9:K:1224:PHE:HB2	1.93	0.50
10:L:279:ASP:HA	10:L:314:THR:OG1	2.12	0.50
8:P:299:TYR:H	8:P:302:GLU:HB2	1.75	0.50
10:L:406:GLU:O	10:L:407:ASP:HB2	2.11	0.50
7:M:553:ASP:HA	8:P:272:PRO:HD2	1.92	0.50
9:K:1075:GLN:O	9:K:1079:ARG:N	2.37	0.50
9:K:853:PRO:HA	9:K:884:HIS:HE1	1.76	0.50
5:I:15:DT:H2''	5:I:16:DA:C8	2.46	0.50
7:M:441:ASP:HB3	7:M:463:LYS:HD3	1.94	0.50
5:I:55:DT:H2''	5:I:56:DC:H5'	1.94	0.50
6:J:-14:DA:H2''	6:J:-13:DA:C8	2.46	0.49
7:M:522:ILE:HG13	9:K:683:THR:HG23	1.92	0.49
8:P:366:LEU:HD12	8:P:374:PHE:CE1	2.47	0.49
5:I:-56:DC:H2''	5:I:-55:DG:N7	2.27	0.49
7:M:410:ASN:OD1	7:M:411:SER:N	2.45	0.49
8:N:37:MET:HE1	8:N:58:PRO:HB2	1.94	0.49
8:N:238:TYR:HA	8:N:242:ASP:HB2	1.95	0.49
5:I:67:DA:C8	5:I:67:DA:H5'	2.47	0.49
7:M:424:ARG:O	7:M:434:SER:HA	2.12	0.49
8:N:254:VAL:HG13	8:N:331:LEU:HD22	1.94	0.49
1:A:119:ILE:HD13	2:B:43:VAL:HG11	1.94	0.49
6:J:-72:DC:H2''	6:J:-71:DA:C8	2.48	0.49
7:O:351:PHE:HD1	8:P:297:LEU:HA	1.75	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:-26:DT:H2''	5:I:-25:DA:C8	2.48	0.49
10:L:410:GLU:O	10:L:411:ALA:C	2.55	0.49
8:P:246:CYS:HB2	8:P:387:TYR:CE1	2.48	0.49
5:I:-82:DC:H1'	5:I:-81:DT:C5	2.47	0.49
5:I:26:DG:H2''	5:I:27:DG:C8	2.48	0.49
5:I:67:DA:H2''	5:I:68:DT:H5''	1.95	0.49
8:N:33:PRO:HG3	8:N:74:GLY:O	2.12	0.49
9:K:1303:ILE:HG13	9:K:1314:ILE:HG12	1.93	0.49
3:C:26:PRO:HG3	4:D:37:TYR:CE2	2.47	0.49
8:N:246:CYS:HA	8:N:387:TYR:HA	1.94	0.49
1:A:3:THR:O	1:A:4:LYS:O	2.30	0.49
3:C:77:ARG:HA	4:D:50:GLY:O	2.13	0.49
3:C:100:VAL:HG11	2:F:98:TYR:CE2	2.48	0.49
1:E:47:ALA:HA	1:E:50:GLU:HG2	1.93	0.49
5:I:64:DT:H2''	5:I:65:DA:H8	1.78	0.49
6:J:39:DA:C4	6:J:40:DC:C5	3.01	0.49
6:J:63:DG:H2''	6:J:64:DG:C8	2.48	0.49
5:I:-13:DA:H5'	5:I:-13:DA:H8	1.78	0.49
5:I:67:DA:C2	6:J:-66:DG:C2	3.01	0.49
9:K:778:LEU:HD21	10:L:171:ILE:HD11	1.95	0.49
10:L:163:LEU:HD11	10:L:168:LEU:HD11	1.95	0.49
8:P:223:GLN:NE2	8:P:224:ILE:O	2.46	0.49
5:I:67:DA:N6	6:J:-67:DT:O4	2.46	0.48
6:J:-44:DG:H2''	6:J:-43:DA:C8	2.48	0.48
5:I:-83:DA:H2'	5:I:-83:DA:N3	2.27	0.48
6:J:-54:DC:H2''	6:J:-53:DA:C8	2.48	0.48
8:P:264:GLU:HA	8:P:267:GLN:NE2	2.28	0.48
4:H:99:LEU:HD23	4:H:103:LEU:HB3	1.95	0.48
5:I:-63:DC:H1'	5:I:-62:DC:O4'	2.13	0.48
6:J:-22:DG:H2''	6:J:-21:DG:H8	1.78	0.48
7:M:264:SER:HB2	7:M:282:PHE:CE1	2.48	0.48
9:K:771:ASP:OD1	9:K:772:ASP:N	2.46	0.48
2:F:90:LEU:HB3	2:F:95:ARG:O	2.12	0.48
6:J:47:DA:H5'	6:J:47:DA:C8	2.48	0.48
8:P:269:LEU:HD22	8:P:274:SER:HB3	1.95	0.48
3:C:97:LEU:HD21	4:D:62:PHE:HE1	1.79	0.48
9:K:798:HIS:CG	10:L:283:CYS:HB3	2.49	0.48
1:A:20:LEU:CB	1:A:23:LYS:HB3	2.43	0.48
8:P:333:ARG:NH2	8:P:387:TYR:OH	2.46	0.48
8:P:358:GLN:O	8:P:362:PHE:N	2.41	0.48
3:G:39:TYR:HB3	4:H:75:SER:HB2	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:-71:DG:H2''	5:I:-70:DG:H8	1.77	0.48
9:K:666:VAL:HG11	7:O:552:PHE:HD1	1.78	0.48
6:J:-37:DG:H2''	6:J:-36:DG:C8	2.48	0.48
7:M:54:ILE:O	7:M:55:THR:OG1	2.30	0.48
7:M:404:ASP:O	7:M:407:ILE:HG22	2.14	0.47
9:K:961:ASN:O	9:K:964:ILE:HB	2.14	0.47
5:I:56:DC:H2''	5:I:57:DA:N7	2.29	0.47
3:C:37:GLY:HA3	3:C:39:TYR:HE2	1.79	0.47
3:C:115:LEU:HD22	1:E:117:VAL:HG13	1.97	0.47
5:I:59:DA:H2'	5:I:60:DT:H71	1.96	0.47
7:M:120:SER:O	9:K:918:GLU:HB2	2.15	0.47
7:M:416:ILE:O	7:M:446:PRO:HG2	2.14	0.47
9:K:672:ALA:O	9:K:676:ILE:HG12	2.14	0.47
8:P:360:GLU:O	8:P:364:VAL:HG23	2.15	0.47
5:I:-3:DG:H1'	5:I:-2:DC:H5'	1.97	0.47
7:M:88:ASP:O	7:M:91:GLY:N	2.48	0.47
9:K:1209:ARG:O	9:K:1213:ARG:HG3	2.15	0.47
9:K:1309:THR:O	9:K:1310:LEU:C	2.56	0.47
10:L:377:PHE:O	10:L:381:GLU:HG3	2.14	0.47
1:A:4:LYS:HB2	1:A:5:GLN:H	1.48	0.47
1:A:6:THR:OG1	7:M:271:SER:N	2.48	0.47
1:E:62:ILE:O	1:E:93:GLN:NE2	2.48	0.47
7:M:478:ILE:HG13	7:M:480:HIS:H	1.79	0.47
9:K:834:ILE:O	9:K:838:ILE:HD12	2.14	0.47
10:L:212:GLY:O	10:L:213:GLU:HG2	2.15	0.47
6:J:-11:DC:H2''	6:J:-10:DG:H8	1.80	0.47
7:M:287:LEU:HA	7:M:348:PRO:HG2	1.96	0.47
7:M:382:THR:HG22	7:M:384:ARG:H	1.80	0.47
8:N:15:LEU:O	8:N:97:ILE:HA	2.14	0.47
7:O:323:GLU:O	7:O:327:ILE:HD12	2.15	0.47
2:B:23:ARG:HG3	2:B:24:ASP:N	2.29	0.47
8:N:106:ALA:O	8:N:110:ARG:HG2	2.15	0.47
1:A:61:LEU:O	2:B:36:ARG:NH2	2.40	0.46
5:I:-84:DT:H3'	5:I:-83:DA:H8	1.80	0.46
5:I:-18:DC:H2'	5:I:-17:DT:H72	1.96	0.46
5:I:4:DC:H2''	5:I:5:DC:C5	2.49	0.46
6:J:-27:DC:H2''	6:J:-26:DC:C5	2.51	0.46
5:I:28:DG:H2''	5:I:29:DA:H8	1.81	0.46
5:I:35:DC:OP2	5:I:35:DC:H2'	2.15	0.46
6:J:-43:DA:H2''	6:J:-42:DG:H8	1.81	0.46
9:K:963:LYS:HE3	9:K:970:LYS:HB3	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:K:1234:ASN:O	10:L:359:ASN:ND2	2.48	0.46
6:J:-56:DG:H4'	6:J:-55:DA:OP1	2.14	0.46
10:L:65:ARG:HB2	10:L:409:ALA:HB2	1.98	0.46
7:O:355:ASN:O	7:O:359:GLU:N	2.39	0.46
3:C:80:PRO:HD3	4:D:55:ALA:HB2	1.96	0.46
9:K:993:ASP:OD1	9:K:1011:LYS:HE3	2.15	0.46
7:M:438:MET:HE2	7:M:464:TRP:CE3	2.51	0.46
4:D:69:ARG:HB3	4:D:98:LEU:HD13	1.97	0.46
6:J:-31:DA:C6	6:J:-30:DA:C6	3.04	0.46
7:O:327:ILE:HG13	7:O:337:ALA:HB1	1.97	0.46
7:M:567:PHE:HB3	7:O:569:PHE:CE2	2.51	0.46
5:I:-19:DG:H5'	9:K:937:GLN:HE21	1.81	0.46
5:I:35:DC:H2''	5:I:36:DC:C5	2.51	0.46
6:J:80:DC:H2''	6:J:81:DA:C8	2.51	0.46
5:I:19:DC:H2''	5:I:20:DG:C8	2.50	0.46
8:N:276:SER:O	8:N:280:GLU:HG2	2.16	0.46
8:P:290:ASP:OD1	8:P:323:ILE:HG23	2.16	0.46
8:P:366:LEU:O	8:P:370:VAL:N	2.49	0.46
5:I:20:DG:H4'	5:I:21:DC:OP1	2.15	0.45
5:I:63:DA:H2''	5:I:64:DT:OP1	2.16	0.45
3:G:84:GLN:NE2	3:G:102:ILE:HB	2.31	0.45
10:L:60:LYS:HE2	10:L:332:VAL:HG21	1.97	0.45
10:L:149:LEU:HB3	10:L:161:CYS:HB3	1.99	0.45
10:L:104:PHE:O	10:L:106:VAL:N	2.50	0.45
1:A:90:MET:O	1:A:93:GLN:N	2.48	0.45
1:A:112:ILE:HD12	3:G:114:VAL:HB	1.97	0.45
1:A:42:ARG:NH2	5:I:-5:DA:OP1	2.48	0.45
1:A:79:LYS:HD3	1:A:82:LEU:HD21	1.99	0.45
6:J:-42:DG:H8	6:J:-42:DG:H5'	1.81	0.45
6:J:32:DG:C2'	6:J:33:DT:H71	2.47	0.45
7:M:120:SER:OG	9:K:919:LEU:HD22	2.17	0.45
7:M:338:LYS:NZ	8:N:346:THR:O	2.47	0.45
9:K:1013:LEU:HD23	9:K:1253:ALA:HB1	1.98	0.45
4:D:78:ALA:HB2	4:D:90:GLU:OE1	2.16	0.45
9:K:1176:SER:O	10:L:352:LYS:NZ	2.46	0.45
5:I:-67:DA:H2''	5:I:-66:DA:C8	2.51	0.45
5:I:20:DG:H2''	5:I:21:DC:O5'	2.17	0.45
6:J:-59:DT:H2''	6:J:-58:DC:C6	2.52	0.45
10:L:19:ARG:NH2	10:L:299:LYS:O	2.50	0.45
9:K:714:LYS:HB2	9:K:714:LYS:NZ	2.32	0.45
9:K:1131:GLN:O	9:K:1277:THR:HG22	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:90:ASP:OD1	7:M:59:ILE:HD11	2.17	0.45
5:I:-61:DG:C6	5:I:-60:DG:C6	3.05	0.45
5:I:-37:DG:H2'	5:I:-36:DT:H71	1.98	0.45
7:M:503:GLN:HE21	7:M:539:ILE:HG12	1.82	0.45
8:N:105:ILE:HG22	8:N:109:LYS:HZ3	1.82	0.45
8:N:227:LYS:O	8:N:231:VAL:HG23	2.17	0.45
10:L:242:ILE:HG12	10:L:247:TYR:HD1	1.82	0.45
10:L:316:ARG:O	10:L:320:ARG:HG3	2.17	0.45
10:L:186:ASP:OD1	10:L:187:VAL:N	2.50	0.44
1:A:14:LYS:HE3	1:A:21:ALA:HB3	1.99	0.44
5:I:62:DT:H2''	5:I:63:DA:C8	2.51	0.44
7:M:300:ASP:OD1	7:M:300:ASP:N	2.50	0.44
5:I:29:DA:H2'	5:I:30:DT:H71	2.00	0.44
5:I:58:DG:H2''	5:I:59:DA:C8	2.53	0.44
6:J:41:DC:N3	6:J:42:DA:N6	2.66	0.44
7:M:66:GLU:H	7:M:66:GLU:CD	2.25	0.44
7:M:319:LEU:O	7:M:320:LYS:C	2.59	0.44
8:N:85:LYS:NZ	8:N:86:SER:OG	2.50	0.44
8:N:231:VAL:O	8:N:232:LEU:C	2.57	0.44
9:K:1300:MET:HE2	9:K:1319:LEU:HD21	1.98	0.44
10:L:81:GLU:HG3	10:L:104:PHE:HZ	1.82	0.44
8:P:354:LEU:O	8:P:355:LEU:C	2.58	0.44
5:I:-74:DC:C5	6:J:75:DG:C6	3.06	0.44
10:L:198:TYR:CE2	10:L:225:GLY:HA2	2.52	0.44
1:E:36:ML3:HM1A	8:N:88:TRP:CZ3	2.53	0.44
6:J:-25:DC:H1'	6:J:-24:DT:C5	2.52	0.44
6:J:2:DG:C5	6:J:3:DC:C4	3.06	0.44
9:K:785:HIS:ND1	9:K:787:VAL:HG22	2.33	0.44
9:K:1027:GLU:O	9:K:1031:GLU:HG2	2.17	0.44
8:P:248:LEU:HA	8:P:249:PRO:C	2.43	0.44
5:I:-13:DA:H1'	5:I:-12:DC:H5'	2.00	0.44
5:I:-11:DG:C4	5:I:-10:DC:C5	3.05	0.44
9:K:809:LYS:O	9:K:813:GLU:HG3	2.18	0.44
6:J:40:DC:C2	6:J:41:DC:C5	3.06	0.44
7:M:113:LEU:HD22	9:K:911:GLU:HG3	2.00	0.44
10:L:236:VAL:HG22	10:L:376:ILE:HD13	2.00	0.44
1:A:97:GLU:O	1:A:101:VAL:HG23	2.18	0.44
6:J:-21:DG:C2	6:J:-20:DC:C4	3.06	0.44
7:M:477:LYS:NZ	7:M:489:TYR:HB3	2.33	0.44
8:N:125:GLN:O	8:N:129:LYS:N	2.49	0.44
2:F:32:PRO:HA	2:F:35:ARG:HG2	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:-58:DG:H2''	5:I:-57:DC:C6	2.52	0.43
5:I:28:DG:H2''	5:I:29:DA:C8	2.54	0.43
7:M:93:ILE:HD13	9:K:890:THR:HA	1.99	0.43
8:N:123:LEU:HD23	8:N:127:LYS:HG3	1.99	0.43
10:L:259:MET:HE1	10:L:298:VAL:HG13	1.98	0.43
5:I:26:DG:N2	6:J:-25:DC:O2	2.51	0.43
9:K:773:MET:HE1	10:L:171:ILE:HG23	2.00	0.43
9:K:1117:THR:HB	9:K:1120:LEU:HG	1.99	0.43
10:L:45:ILE:HG12	10:L:146:ALA:HA	2.00	0.43
8:P:248:LEU:HD13	8:P:326:TYR:CE2	2.52	0.43
8:P:262:GLU:O	8:P:266:SER:HB3	2.18	0.43
1:A:74:ILE:HD11	2:B:59:LYS:HE2	2.00	0.43
1:E:39:HIS:O	1:E:39:HIS:ND1	2.51	0.43
5:I:-75:DC:H1'	6:J:75:DG:H1	1.83	0.43
5:I:-25:DA:H2''	5:I:-24:DG:H8	1.84	0.43
6:J:30:DC:C6	6:J:31:DT:H72	2.54	0.43
7:M:568:GLN:O	7:M:572:SER:N	2.50	0.43
9:K:898:LEU:HD23	9:K:898:LEU:HA	1.89	0.43
9:K:1137:ASN:HA	9:K:1304:GLU:HA	2.00	0.43
10:L:198:TYR:CZ	10:L:225:GLY:HA2	2.53	0.43
4:D:88:SER:O	4:D:89:ARG:C	2.61	0.43
1:E:45:THR:HG21	6:J:70:DC:OP1	2.18	0.43
6:J:17:DA:C6	6:J:18:DG:C6	3.06	0.43
6:J:43:DA:H1'	6:J:44:DT:H5'	2.00	0.43
9:K:1134:SER:HB3	9:K:1307:LYS:HB3	2.00	0.43
10:L:84:ASP:OD2	10:L:88:ARG:NH2	2.52	0.43
7:O:265:ALA:O	7:O:350:GLN:HB2	2.18	0.43
8:P:257:VAL:HG21	8:P:328:ALA:HB2	2.01	0.43
1:A:118:THR:HA	2:B:45:ARG:O	2.18	0.43
3:G:76:THR:N	5:I:58:DG:OP1	2.51	0.43
6:J:71:DC:H2''	6:J:72:DA:N7	2.33	0.43
7:M:290:PRO:HG2	8:N:307:ASP:HB2	2.01	0.43
7:M:499:ASN:OD1	7:M:500:LYS:N	2.52	0.43
2:B:23:ARG:HG3	2:B:24:ASP:H	1.83	0.43
2:B:78:ARG:NH2	2:B:82:THR:HG22	2.34	0.43
6:J:-9:DC:H6	6:J:-9:DC:H5'	1.84	0.43
7:O:293:PRO:O	7:O:296:LEU:HG	2.18	0.43
8:P:246:CYS:HB2	8:P:387:TYR:CD1	2.54	0.43
1:A:46:VAL:HB	6:J:9:DT:OP1	2.19	0.43
5:I:-7:DG:C2	6:J:8:DG:N2	2.87	0.43
6:J:-20:DC:C2	6:J:-19:DG:C5	3.07	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:84:DA:H2''	6:J:85:DA:C8	2.53	0.43
9:K:676:ILE:HD12	9:K:709:TYR:HD1	1.82	0.43
9:K:1111:ALA:O	9:K:1112:LYS:C	2.62	0.43
5:I:-32:DC:H2''	5:I:-31:DA:H8	1.83	0.43
6:J:37:DC:H2''	6:J:38:DG:H8	1.84	0.43
8:N:117:GLU:HA	8:N:120:LYS:HB2	2.01	0.43
9:K:949:ILE:HD11	9:K:1142:THR:HG23	1.99	0.43
9:K:1036:HIS:CB	9:K:1212:ARG:HH22	2.32	0.43
10:L:220:GLU:OE1	10:L:221:LEU:N	2.51	0.43
4:D:89:ARG:C	4:D:91:ILE:N	2.76	0.42
5:I:23:DA:H2''	5:I:24:DA:C8	2.54	0.42
6:J:52:DC:H5'	6:J:52:DC:C6	2.54	0.42
2:F:84:MET:HG3	2:F:88:TYR:CE2	2.54	0.42
5:I:-48:DC:H2''	5:I:-47:DT:C7	2.49	0.42
6:J:17:DA:H2''	6:J:18:DG:H8	1.83	0.42
7:M:396:THR:O	7:M:459:ASN:ND2	2.51	0.42
8:N:88:TRP:O	8:N:90:GLU:HG2	2.19	0.42
8:P:332:LEU:HD22	8:P:374:PHE:CE1	2.55	0.42
2:B:92:ARG:C	2:B:94:GLY:H	2.27	0.42
3:C:13:LYS:NZ	6:J:46:DG:OP1	2.51	0.42
1:E:108:ASN:ND2	2:F:42:GLY:O	2.52	0.42
6:J:-22:DG:C2	6:J:-21:DG:C5	3.08	0.42
6:J:3:DC:H2''	6:J:4:DG:N7	2.34	0.42
1:E:51:ILE:HD11	2:F:43:VAL:O	2.19	0.42
6:J:14:DT:H2''	6:J:15:DT:C7	2.49	0.42
9:K:926:LYS:NZ	9:K:1226:GLU:OE2	2.52	0.42
9:K:1013:LEU:HD12	9:K:1065:LEU:HD11	2.00	0.42
7:O:289:PRO:O	7:O:290:PRO:C	2.60	0.42
5:I:34:DT:H2''	5:I:35:DC:OP2	2.18	0.42
6:J:21:DG:C8	6:J:21:DG:H5'	2.55	0.42
10:L:280:ARG:HG3	10:L:281:LEU:HG	2.00	0.42
1:E:40:ARG:NH2	5:I:9:DG:H1'	2.34	0.42
5:I:70:DC:H2''	5:I:71:DT:H5'	2.02	0.42
9:K:824:ASN:O	9:K:828:ILE:HG12	2.20	0.42
5:I:-49:DG:H2''	5:I:-48:DC:C6	2.55	0.42
6:J:-37:DG:H2''	6:J:-36:DG:N7	2.35	0.42
1:A:98:ALA:O	1:A:99:TYR:C	2.60	0.42
6:J:-70:DG:C2	6:J:-69:DG:C6	3.07	0.42
9:K:909:GLN:O	9:K:913:ASN:N	2.53	0.42
1:A:4:LYS:H	1:A:4:LYS:HG2	1.54	0.42
5:I:-47:DT:H2''	5:I:-46:DC:C5	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:37:DC:H6	5:I:37:DC:H2'	1.69	0.42
9:K:757:ARG:HG3	9:K:781:GLU:HG2	2.01	0.42
5:I:-77:DC:O2	6:J:78:DG:N2	2.53	0.41
5:I:-23:DC:H2''	5:I:-22:DA:H5'	2.01	0.41
6:J:0:DG:C4	6:J:1:DC:C5	3.08	0.41
6:J:71:DC:C2	6:J:72:DA:C6	3.08	0.41
9:K:860:MET:O	9:K:864:LYS:HE2	2.20	0.41
9:K:879:ILE:O	9:K:883:LEU:N	2.46	0.41
3:C:63:LEU:HD21	4:D:59:MET:HE3	2.03	0.41
4:D:50:GLY:HA3	5:I:-53:DG:OP1	2.19	0.41
6:J:19:DC:H2''	6:J:20:DG:C8	2.55	0.41
7:M:565:LYS:HA	7:M:565:LYS:HD3	1.96	0.41
8:N:258:LEU:HD21	8:N:285:LEU:HD23	2.02	0.41
6:J:-41:DA:H1'	6:J:-40:DC:H5'	2.02	0.41
7:O:288:ASP:CB	7:O:289:PRO:HD3	2.51	0.41
1:A:120:MET:C	2:B:50:ILE:HD11	2.46	0.41
3:C:44:GLY:HA2	6:J:38:DG:H5''	2.02	0.41
5:I:64:DT:H2''	5:I:65:DA:C8	2.56	0.41
6:J:-43:DA:C4	6:J:-42:DG:N7	2.88	0.41
5:I:19:DC:H2''	5:I:20:DG:H8	1.86	0.41
5:I:24:DA:H2''	5:I:25:DG:C8	2.56	0.41
7:M:52:LYS:HE3	7:M:52:LYS:HB3	1.90	0.41
7:M:378:LYS:HB2	7:M:378:LYS:HE2	1.90	0.41
7:O:336:PHE:CE1	8:P:355:LEU:HD21	2.53	0.41
8:P:248:LEU:HD22	8:P:326:TYR:CD2	2.55	0.41
5:I:-64:DC:H3'	7:M:51:ARG:HD2	2.03	0.41
6:J:-2:DC:H2''	6:J:-1:DA:H8	1.85	0.41
7:M:340:LEU:O	7:M:343:ILE:HG22	2.20	0.41
8:N:16:ALA:HB1	8:N:92:VAL:HG11	2.03	0.41
8:N:27:ILE:HG13	8:N:27:ILE:O	2.21	0.41
1:A:63:ARG:C	1:A:66:PRO:HD2	2.45	0.41
4:D:107:ALA:O	4:D:111:GLY:N	2.50	0.41
3:G:70:ALA:O	3:G:74:LYS:N	2.54	0.41
9:K:782:TRP:CE2	10:L:226:VAL:HG21	2.55	0.41
8:P:352:CYS:O	8:P:353:GLN:C	2.61	0.41
5:I:18:DC:H2''	5:I:19:DC:C6	2.55	0.41
6:J:38:DG:C2	6:J:39:DA:C5	3.08	0.41
9:K:1081:ASN:N	9:K:1081:ASN:OD1	2.53	0.41
10:L:39:PRO:HB3	10:L:280:ARG:HD3	2.03	0.41
10:L:186:ASP:OD1	10:L:274:ASP:HB2	2.20	0.41
1:A:8:ARG:HD3	1:A:14:LYS:HZ3	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:113:HIS:C	1:E:115:LYS:H	2.29	0.41
5:I:-7:DG:C4	5:I:-6:DT:C4	3.09	0.41
5:I:27:DG:H2''	5:I:28:DG:N7	2.36	0.41
6:J:11:DC:C2	6:J:12:DG:C5	3.09	0.41
6:J:81:DA:H2''	6:J:82:DG:C8	2.56	0.41
7:M:466:CYS:C	7:M:467:PRO:O	2.61	0.41
10:L:131:ALA:HB1	10:L:173:LEU:HG	2.02	0.41
7:O:305:GLU:HG2	7:O:309:LYS:NZ	2.35	0.41
8:P:325:ILE:HG13	8:P:326:TYR:N	2.36	0.41
5:I:67:DA:N1	6:J:-67:DT:C4	2.89	0.41
8:N:38:TYR:N	8:N:59:GLN:O	2.54	0.41
9:K:1018:ILE:HD13	9:K:1018:ILE:HA	1.92	0.41
10:L:340:TYR:HE2	10:L:421:ALA:HB3	1.86	0.41
4:D:87:THR:HG22	4:D:90:GLU:HG3	2.04	0.40
5:I:31:DT:H2''	5:I:32:DA:C8	2.56	0.40
6:J:42:DA:H1'	6:J:43:DA:H5'	2.03	0.40
5:I:-58:DG:H2''	5:I:-57:DC:H5'	2.02	0.40
8:N:354:LEU:HD12	8:N:354:LEU:HA	1.88	0.40
8:N:386:LEU:H	8:N:386:LEU:HG	1.66	0.40
9:K:666:VAL:HG11	7:O:552:PHE:CD1	2.56	0.40
10:L:19:ARG:HH21	10:L:302:GLY:CA	2.35	0.40
5:I:-2:DC:H2''	5:I:-1:DG:C8	2.56	0.40
5:I:56:DC:H6	5:I:56:DC:H2'	1.76	0.40
9:K:835:VAL:HA	9:K:838:ILE:HD13	2.03	0.40
9:K:1148:PHE:CZ	9:K:1312:VAL:HG11	2.57	0.40
9:K:1180:PHE:CD2	10:L:340:TYR:HB2	2.56	0.40
1:A:23:LYS:HB3	1:A:23:LYS:HE2	1.61	0.40
1:E:36:ML3:HM2A	8:N:18:HIS:CD2	2.57	0.40
4:H:59:MET:HA	4:H:62:PHE:HB3	2.04	0.40
6:J:-69:DG:C2	6:J:-68:DA:C2	3.09	0.40
6:J:28:DA:C6	6:J:29:DG:C6	3.09	0.40
5:I:3:DT:H2''	5:I:4:DC:C6	2.56	0.40
6:J:20:DG:H1'	6:J:21:DG:H5''	2.03	0.40
7:M:88:ASP:O	7:M:89:SER:C	2.64	0.40
9:K:1196:LEU:HB3	9:K:1227:SER:HB2	2.04	0.40
10:L:94:LEU:HD23	10:L:94:LEU:HA	1.80	0.40
10:L:150:HIS:NE2	10:L:186:ASP:OD2	2.50	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	117/135 (87%)	109 (93%)	7 (6%)	1 (1%)	14	45
1	E	97/135 (72%)	91 (94%)	6 (6%)	0	100	100
2	B	78/102 (76%)	73 (94%)	5 (6%)	0	100	100
2	F	80/102 (78%)	76 (95%)	4 (5%)	0	100	100
3	C	105/129 (81%)	104 (99%)	1 (1%)	0	100	100
3	G	104/129 (81%)	104 (100%)	0	0	100	100
4	D	92/122 (75%)	88 (96%)	4 (4%)	0	100	100
4	H	87/122 (71%)	85 (98%)	2 (2%)	0	100	100
7	M	363/684 (53%)	339 (93%)	24 (7%)	0	100	100
7	O	149/684 (22%)	143 (96%)	5 (3%)	1 (1%)	18	49
8	N	289/401 (72%)	279 (96%)	10 (4%)	0	100	100
8	P	182/401 (45%)	178 (98%)	4 (2%)	0	100	100
9	K	590/1536 (38%)	568 (96%)	22 (4%)	0	100	100
10	L	406/433 (94%)	392 (97%)	14 (3%)	0	100	100
All	All	2739/5115 (54%)	2629 (96%)	108 (4%)	2 (0%)	49	78

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	4	LYS
7	O	289	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	87/108 (81%)	84 (97%)	3 (3%)	32	55
1	E	72/108 (67%)	72 (100%)	0	100	100
2	B	56/78 (72%)	56 (100%)	0	100	100
2	F	54/78 (69%)	54 (100%)	0	100	100
3	C	75/101 (74%)	75 (100%)	0	100	100
3	G	69/101 (68%)	69 (100%)	0	100	100
4	D	72/102 (71%)	72 (100%)	0	100	100
4	H	60/102 (59%)	60 (100%)	0	100	100
7	M	286/653 (44%)	286 (100%)	0	100	100
7	O	108/653 (16%)	108 (100%)	0	100	100
8	N	216/359 (60%)	216 (100%)	0	100	100
8	P	123/359 (34%)	123 (100%)	0	100	100
9	K	468/1391 (34%)	467 (100%)	1 (0%)	87	86
10	L	291/367 (79%)	291 (100%)	0	100	100
All	All	2037/4560 (45%)	2033 (100%)	4 (0%)	85	86

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	LYS
1	A	22	THR
1	A	23	LYS
9	K	951	GLU

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

Mol	Chain	Res	Type
2	B	27	GLN
2	F	25	ASN
3	G	24	GLN
3	G	38	ASN
3	G	73	ASN
3	G	82	HIS
4	H	60	ASN

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Mol	Chain	Res	Type
7	M	325	ASN
7	M	342	ASN
7	M	346	HIS
7	M	444	GLN
7	M	495	GLN
7	M	545	ASN
8	N	18	HIS
8	N	358	GLN
9	K	727	GLN
9	K	937	GLN
9	K	1206	GLN
10	L	341	ASN
7	O	583	GLN
8	P	263	HIS
8	P	277	GLN
8	P	389	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
1	ML3	E	36	1	10,11,12	0.74	0	11,14,16	0.79	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '–' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	ML3	E	36	1	-	1/8/10/12	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	E	36	ML3	SG-CD-CE-NZ

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	E	36	ML3	2	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

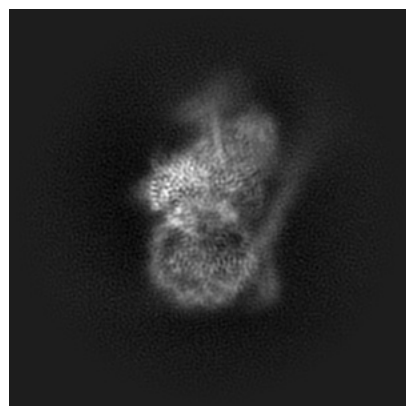
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-35455. These allow visual inspection of the internal detail of the map and identification of artifacts.

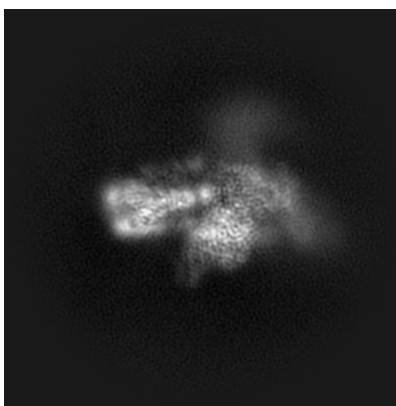
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

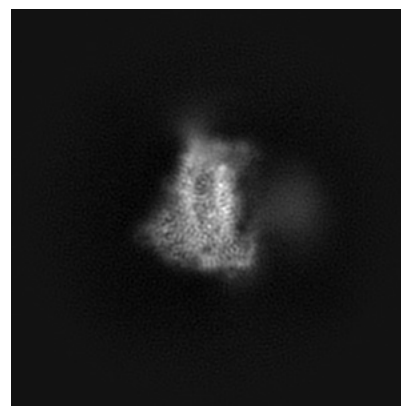
6.1.1 Primary map



X

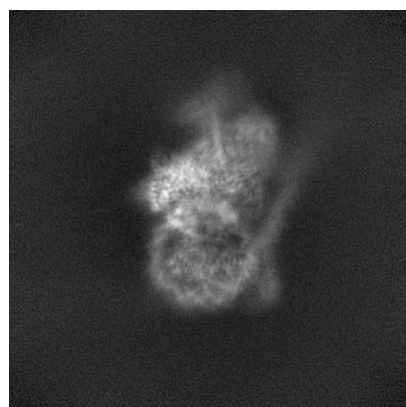


Y

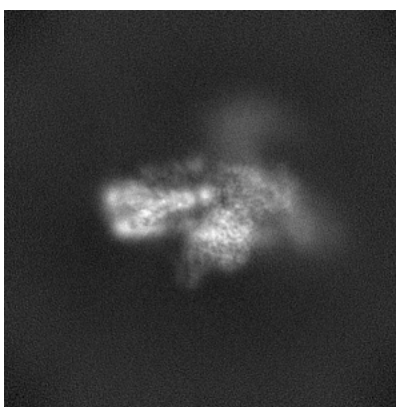


Z

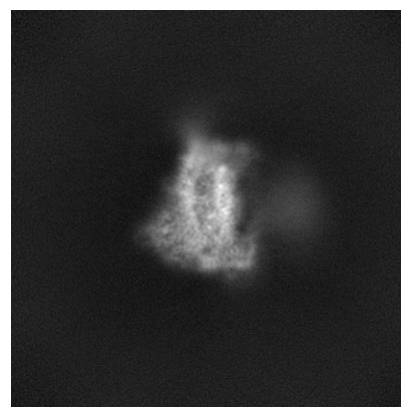
6.1.2 Raw map



X



Y

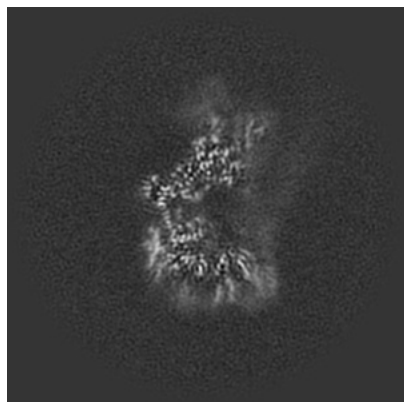


Z

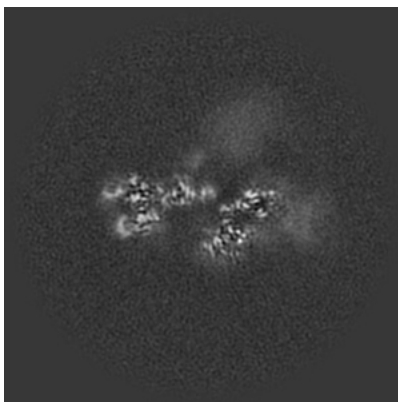
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

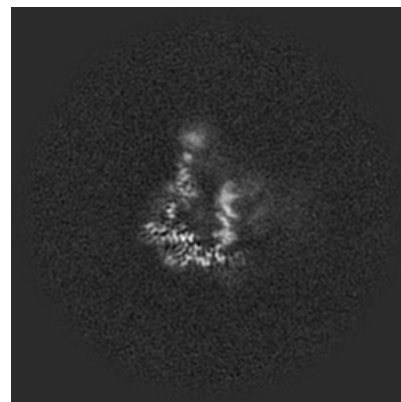
6.2.1 Primary map



X Index: 168

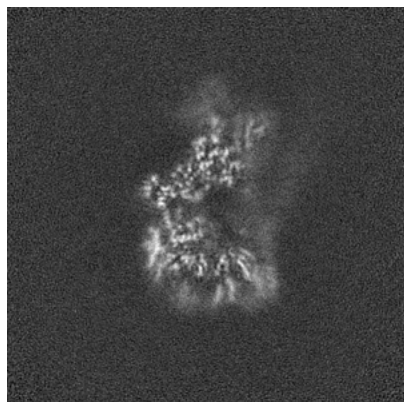


Y Index: 168

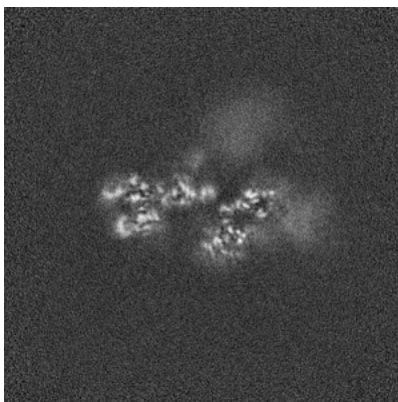


Z Index: 168

6.2.2 Raw map



X Index: 168



Y Index: 168

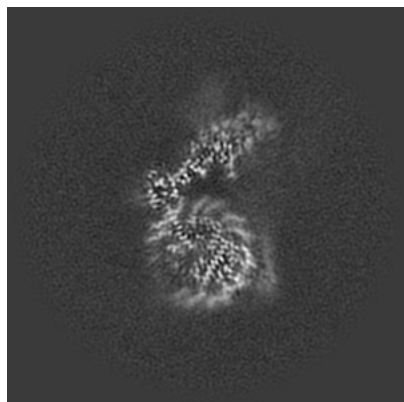


Z Index: 168

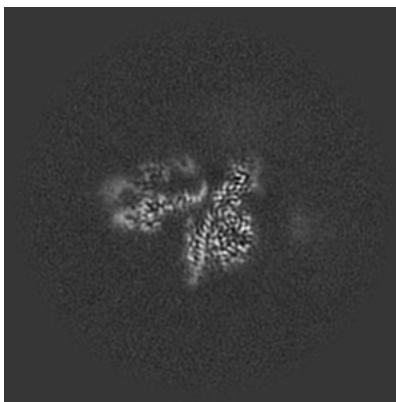
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

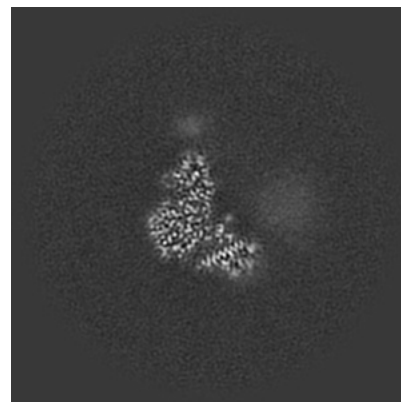
6.3.1 Primary map



X Index: 175

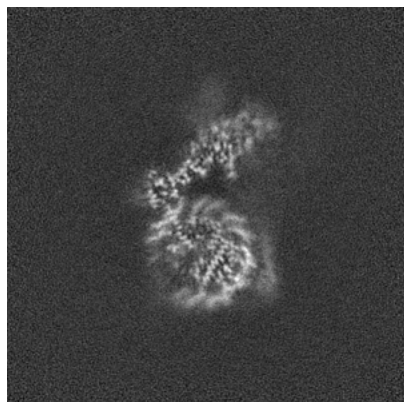


Y Index: 141

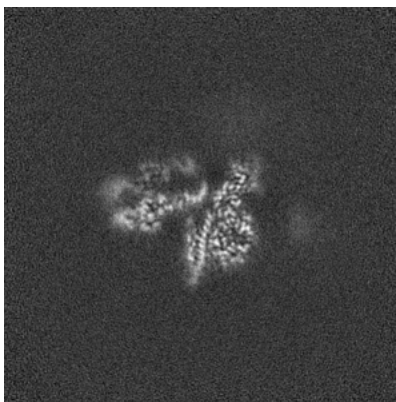


Z Index: 189

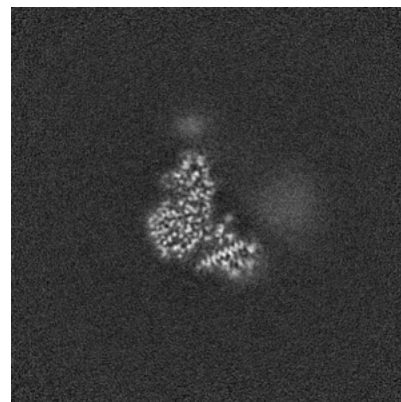
6.3.2 Raw map



X Index: 175



Y Index: 141

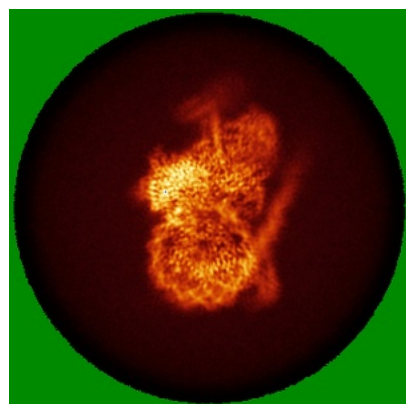


Z Index: 189

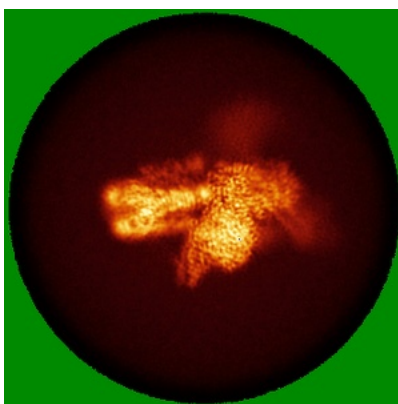
The images above show the largest variance slices of the map in three orthogonal directions.

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

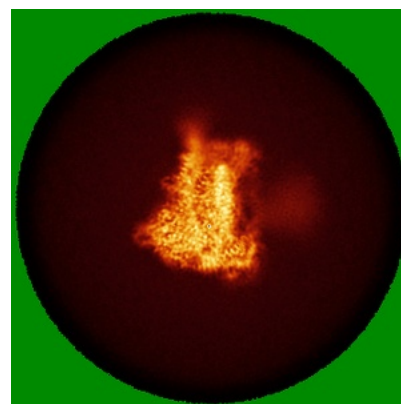
6.4.1 Primary map



X

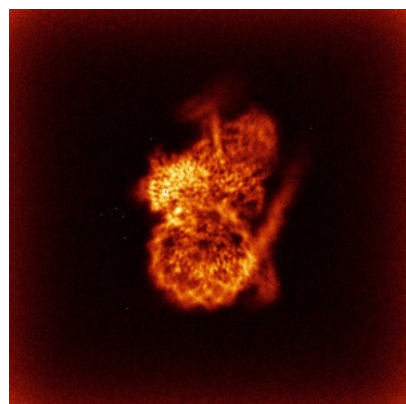


Y

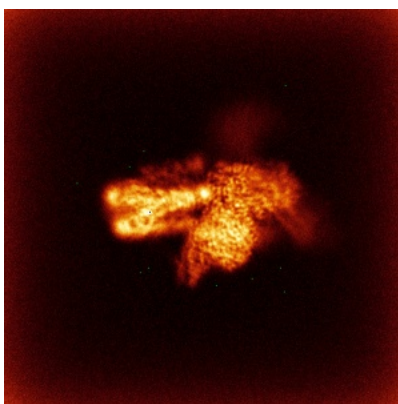


Z

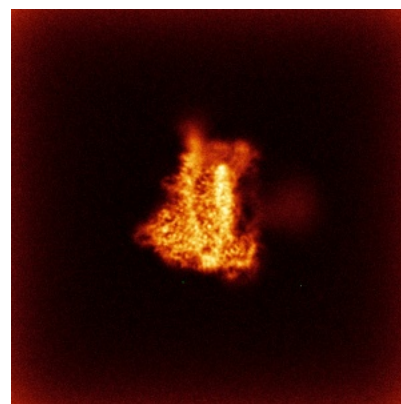
6.4.2 Raw map



X



Y

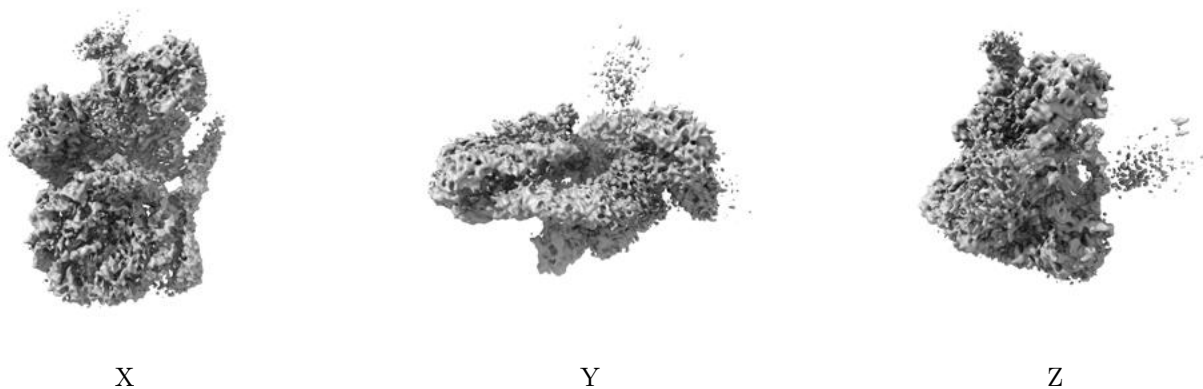


Z

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

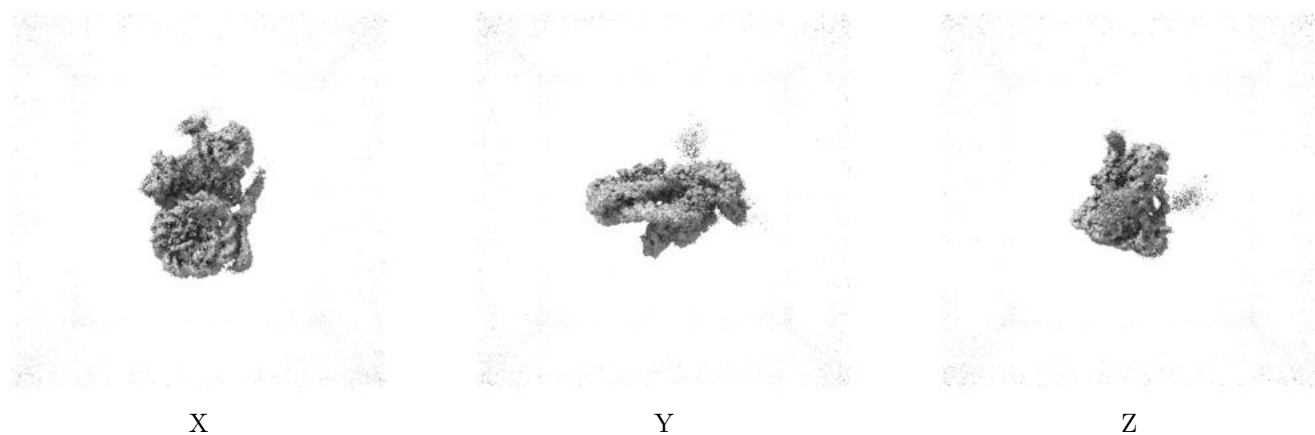
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.254. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

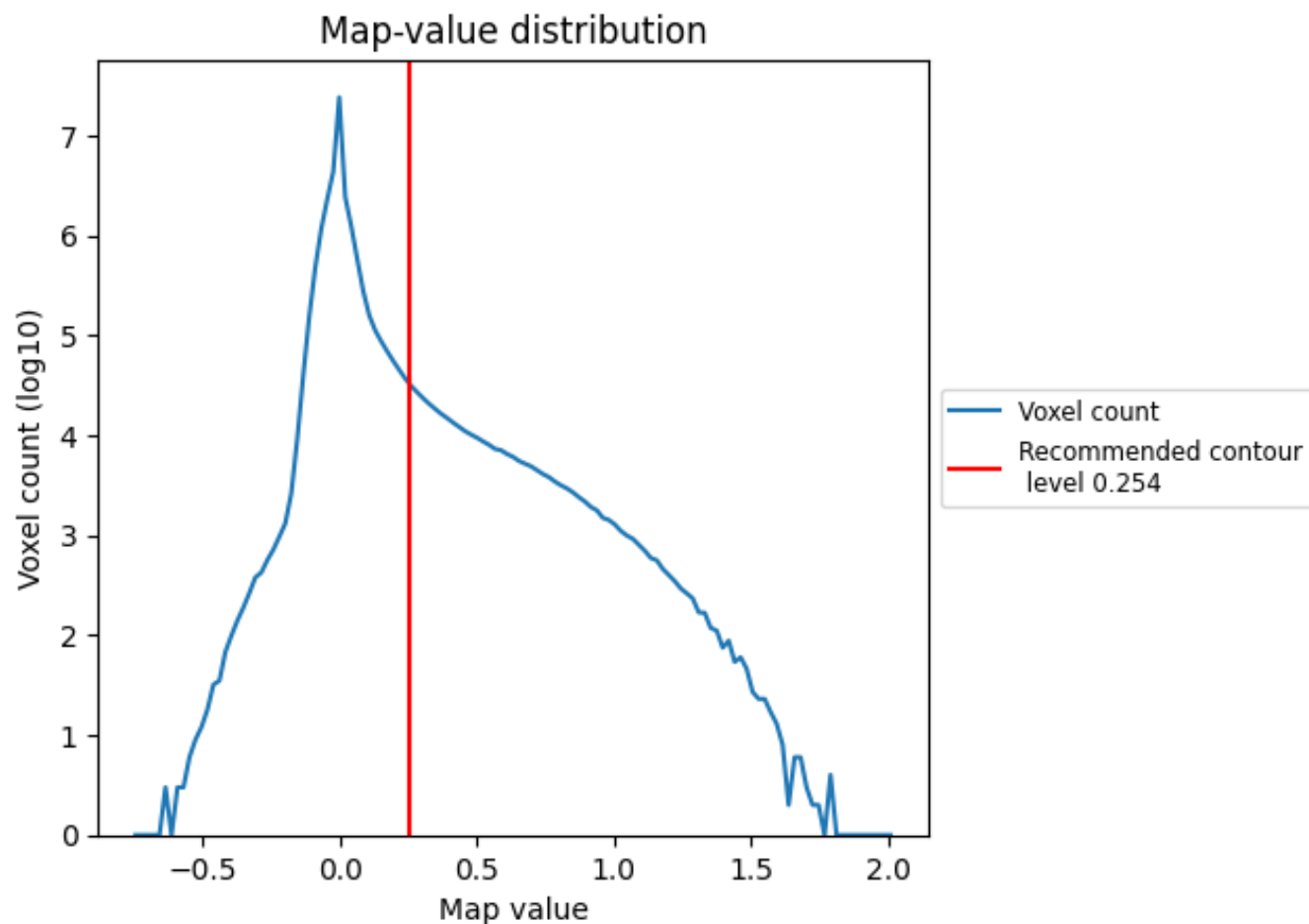
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

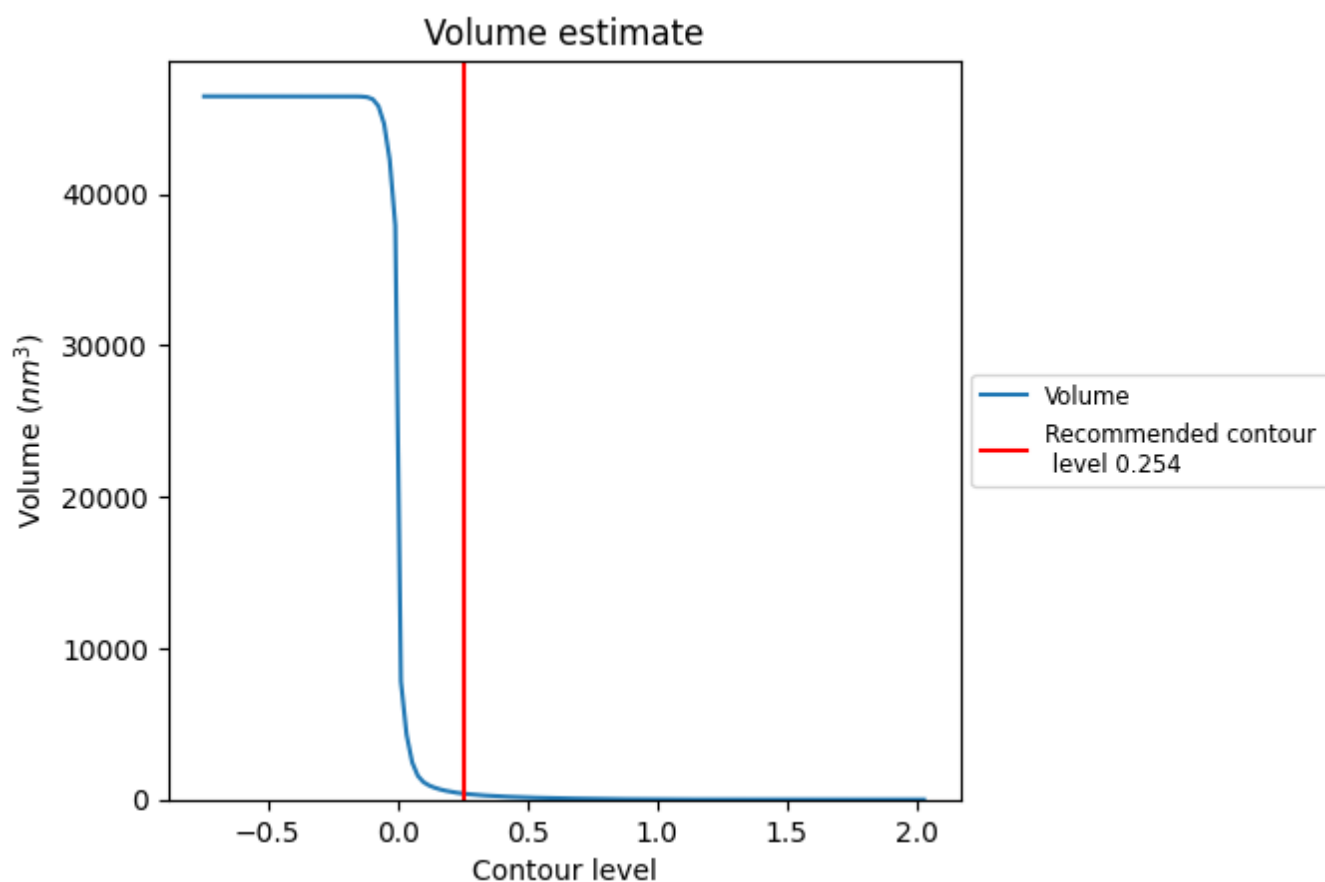
This section contains the results of statistical analysis of the map.

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.

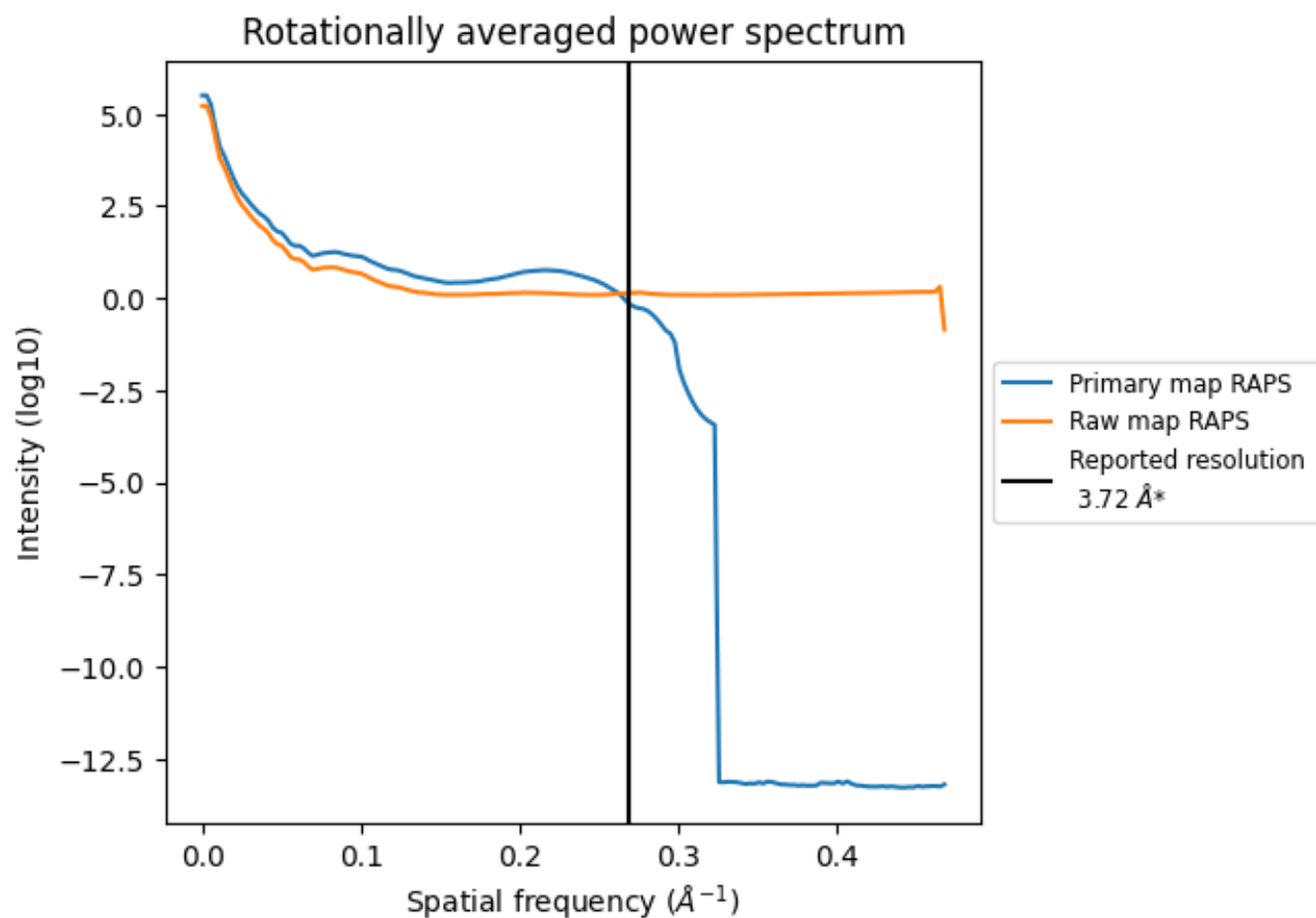
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 395 nm^3 ; this corresponds to an approximate mass of 357 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 ⓘ

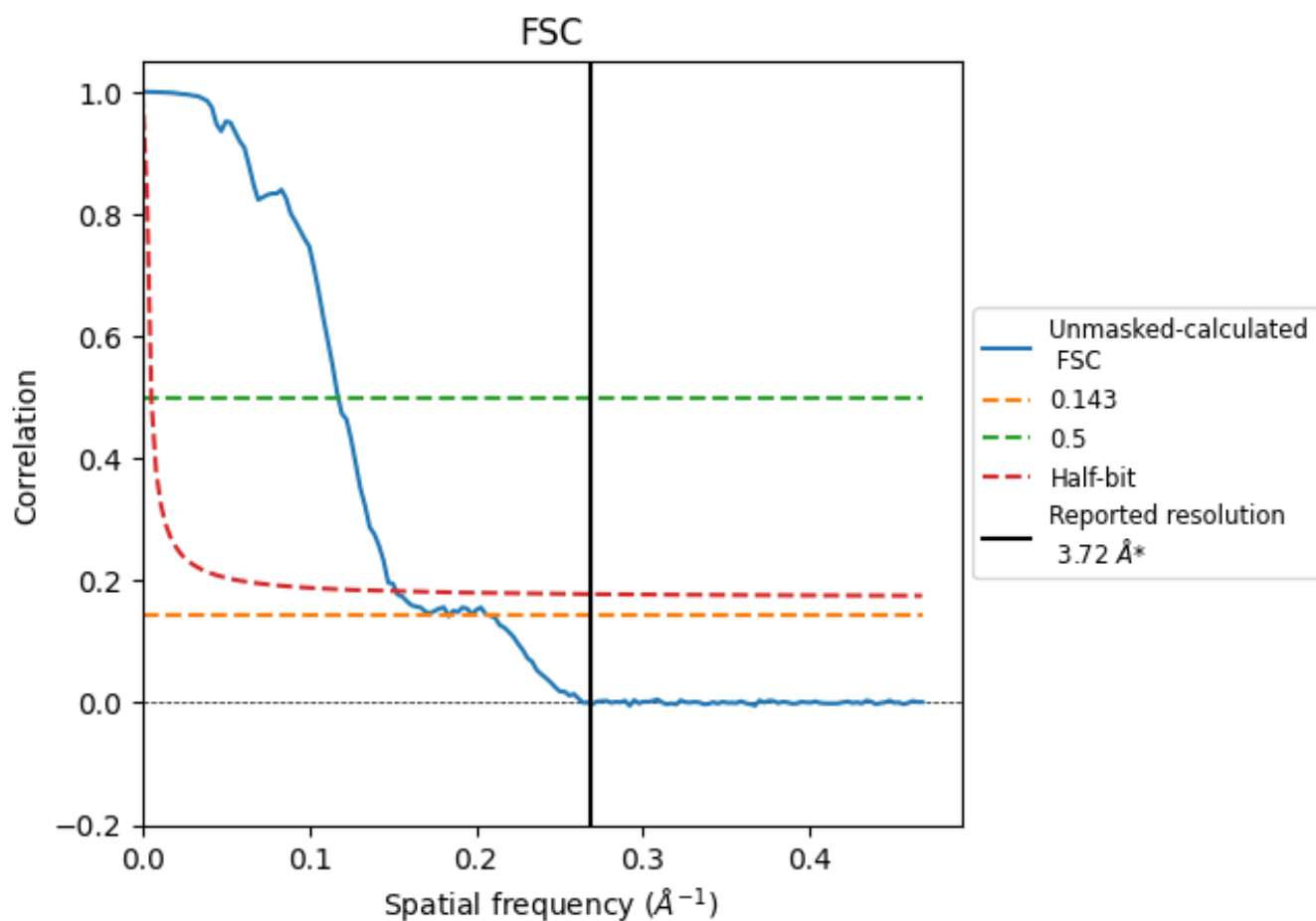


*Reported resolution corresponds to spatial frequency of 0.269 $\text{\AA}^{-1}$

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of $0.269 \text{ \AA}^{-1}$

8.2 Resolution estimates [i](#)

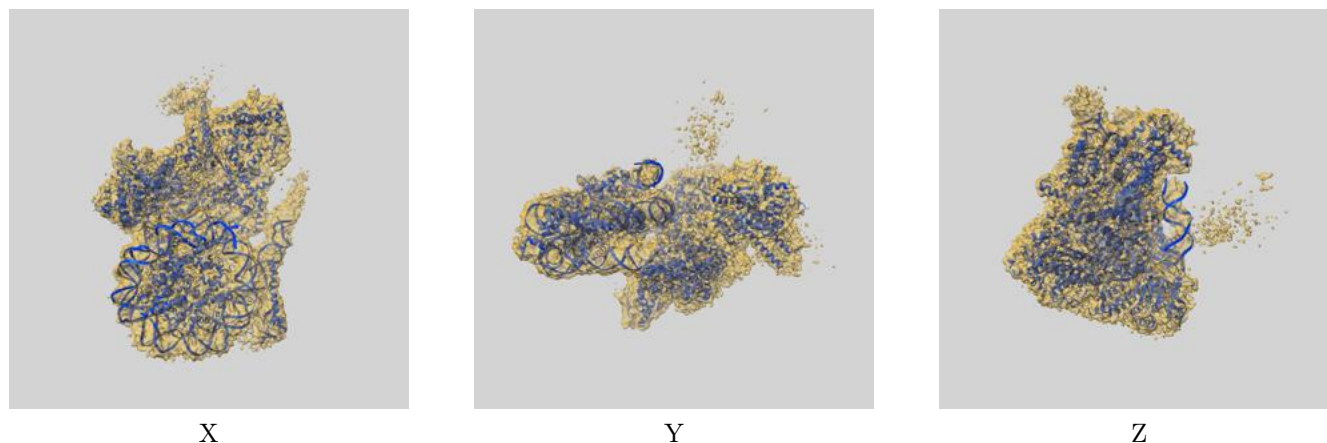
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.72	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.46	8.52	6.57

*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 5.46 differs from the reported value 3.72 by more than 10 %

9 Map-model fit [i](#)

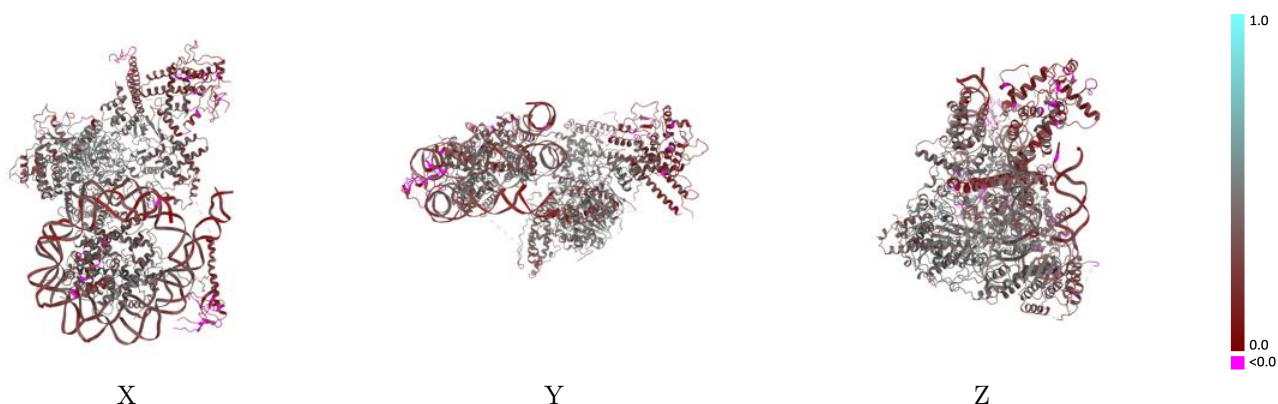
This section contains information regarding the fit between EMDB map EMD-35455 and PDB model 8IHT. Per-residue inclusion information can be found in [section 3](#) on [page 7](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.254 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](#)



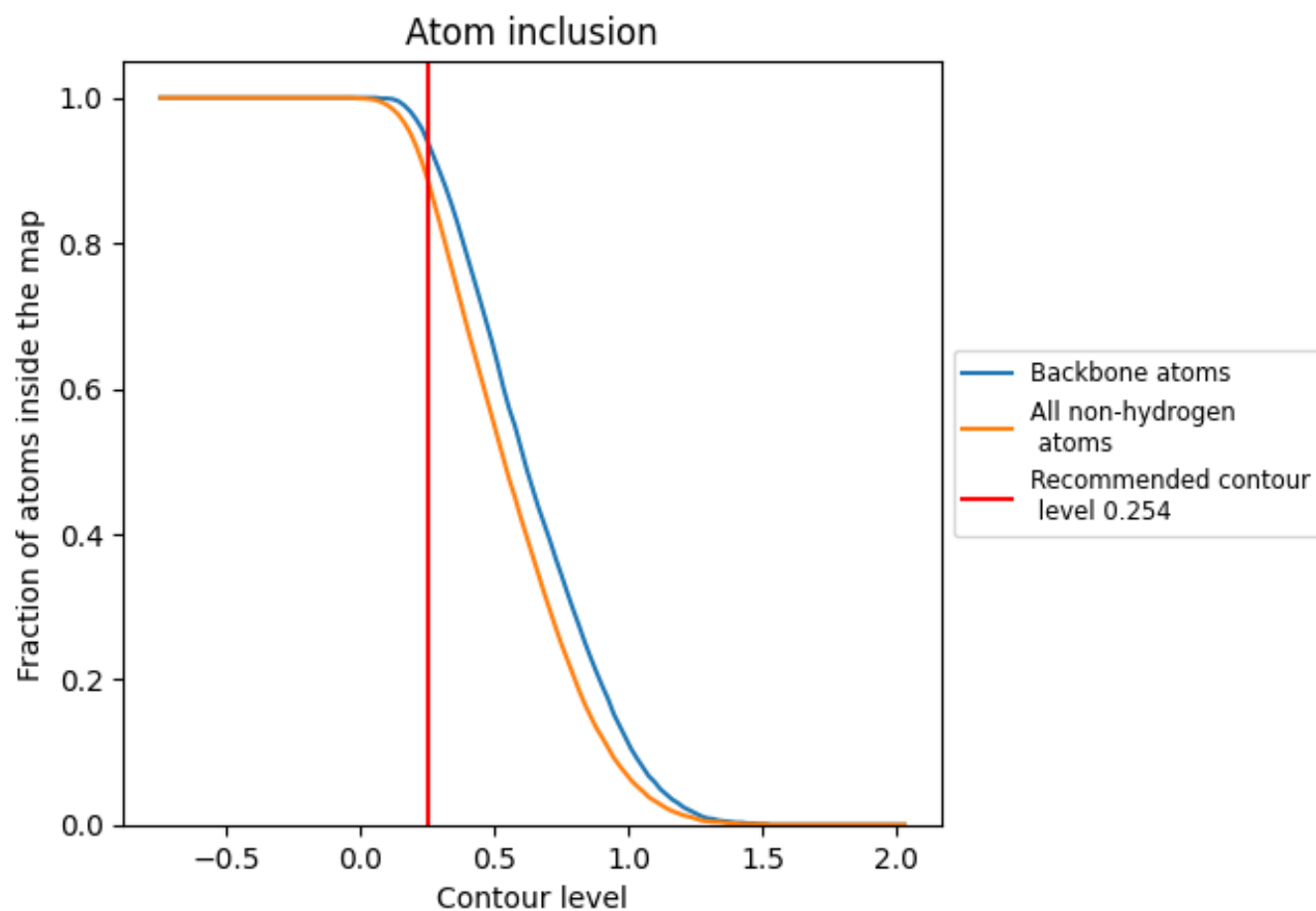
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.254).

9.4 Atom inclusion [i](#)



At the recommended contour level, 94% of all backbone atoms, 88% 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 (0.254) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8840	0.3450
A	0.8450	0.3750
B	0.8800	0.4040
C	0.9260	0.4110
D	0.9300	0.4190
E	0.9470	0.4050
F	0.9560	0.4290
G	0.4880	0.2970
H	0.5920	0.3100
I	0.8970	0.2860
J	0.8940	0.2790
K	0.9240	0.3960
L	0.9630	0.4560
M	0.8950	0.3600
N	0.8490	0.2890
O	0.8440	0.2220
P	0.8480	0.2290

1.0

0.0

<0.0