



Full wwPDB EM Validation Report ⓘ

Jun 25, 2025 – 02:10 PM JST

PDB ID : 7D69 / pdb_00007d69
EMDB ID : EMD-30591
Title : Cryo-EM structure of the nucleosome containing Giardia histones
Authors : Sato, S.; Takizawa, Y.; Kurumizaka, H.
Deposited on : 2020-09-29
Resolution : 3.57 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.dev118
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

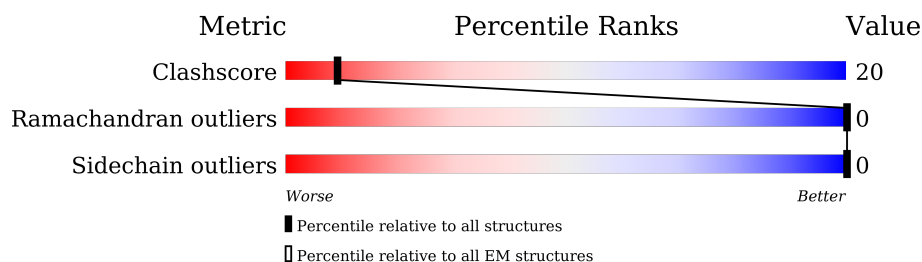
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.57 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	149	 35% 26% 40%
1	E	149	 34% 32% 34%
2	B	102	 43% 33% 24%
2	F	102	 40% 36% 24%
3	D	133	 5% 42% 30% 28%
3	H	133	 5% 45% 27% 28%
4	C	127	 43% 32% 25%
4	G	127	 45% 30% 25%

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Mol	Chain	Length	Quality of chain
5	I	145	
6	J	145	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 10857 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	90	Total	C	N	O	S	0	0
			716	454	124	135	3		
1	E	99	Total	C	N	O	S	0	0
			779	494	136	145	4		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP V6TEE9
A	-2	SER	-	expression tag	UNP V6TEE9
A	-1	HIS	-	expression tag	UNP V6TEE9
E	-3	GLY	-	expression tag	UNP V6TEE9
E	-2	SER	-	expression tag	UNP V6TEE9
E	-1	HIS	-	expression tag	UNP V6TEE9

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	B	78	Total	C	N	O	0	0
			622	390	120	112		
2	F	78	Total	C	N	O	0	0
			621	390	120	111		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	GLY	-	expression tag	UNP E2RU60
B	-2	SER	-	expression tag	UNP E2RU60
B	-1	HIS	-	expression tag	UNP E2RU60
F	-3	GLY	-	expression tag	UNP E2RU60
F	-2	SER	-	expression tag	UNP E2RU60
F	-1	HIS	-	expression tag	UNP E2RU60

- Molecule 3 is a protein called Histone H2B.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	96	Total	C	N	O	S	0	0
			743	461	129	151	2		
3	H	96	Total	C	N	O	S	0	0
			743	461	129	151	2		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-3	GLY	-	expression tag	UNP V6TJV6
D	-2	SER	-	expression tag	UNP V6TJV6
D	-1	HIS	-	expression tag	UNP V6TJV6
H	-3	GLY	-	expression tag	UNP V6TJV6
H	-2	SER	-	expression tag	UNP V6TJV6
H	-1	HIS	-	expression tag	UNP V6TJV6

- Molecule 4 is a protein called Histone H2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	C	95	Total	C	N	O	S	0	0
			754	469	153	131	1		
4	G	95	Total	C	N	O	S	0	0
			754	469	153	131	1		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP E2RU15
C	-2	SER	-	expression tag	UNP E2RU15
C	-1	HIS	-	expression tag	UNP E2RU15
G	-3	GLY	-	expression tag	UNP E2RU15
G	-2	SER	-	expression tag	UNP E2RU15
G	-1	HIS	-	expression tag	UNP E2RU15

- Molecule 5 is a DNA chain called 601L DNA (145-MER).

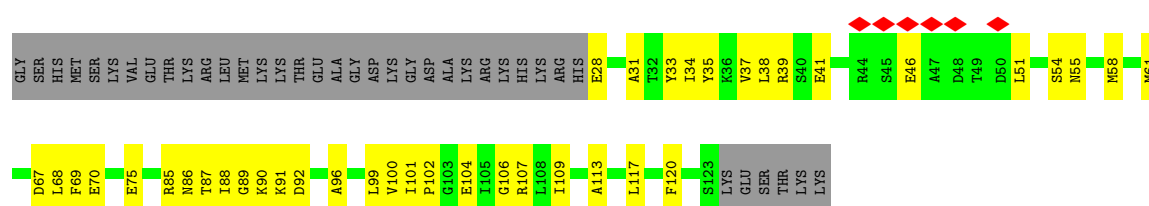
Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	125	Total	C	N	O	P	0	0
			2561	1213	473	750	125		

- Molecule 6 is a DNA chain called 601L DNA (145-MER).

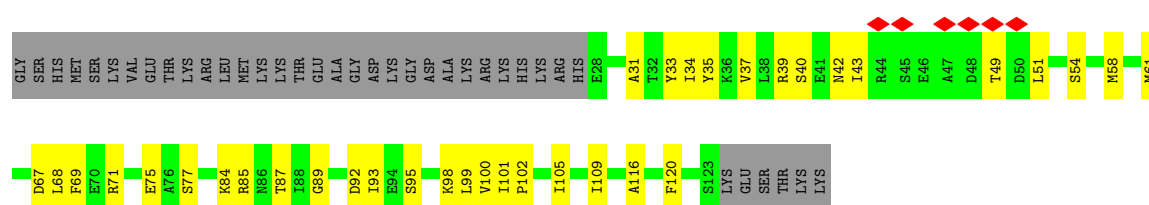
Mol	Chain	Residues	Atoms					AltConf	Trace
6	J	125	Total	C	N	O	P	0	0
			2564	1214	475	750	125		

Y68	GLY
H71	HIS
G72	SER
K74	MET
T76	SER
	GLY
	LYS
	GLY
L86	LYS
K87	GLY
R88	TYR
R91	GLY
T92	LYS
L93	SER
Y94	LYS
G95	ARG
F96	HIS
G97	SER
	LYS
ILE	GLU
	LYS
	D20
	T21
	L22
	T26
	K27
	P28
	A29
	I30
	R31
	R32
	L33
	K34
	R35
	G38
	V39
	K40
	R41
	L42
	S43
	S44
	T45
	L46
	Y47
	T50
	R51
	L58
	E59
	L62
	R63
	L66
	T67

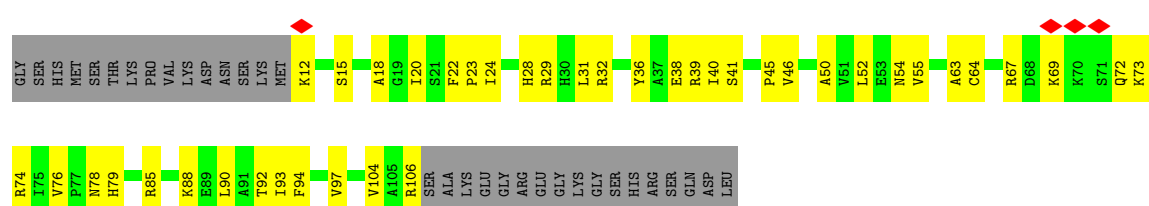
Chain D:



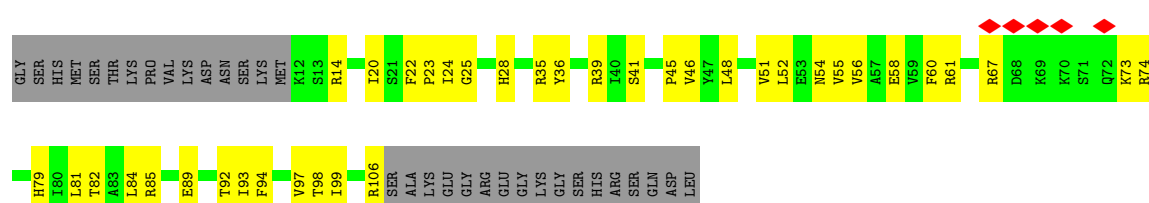
Chain H:



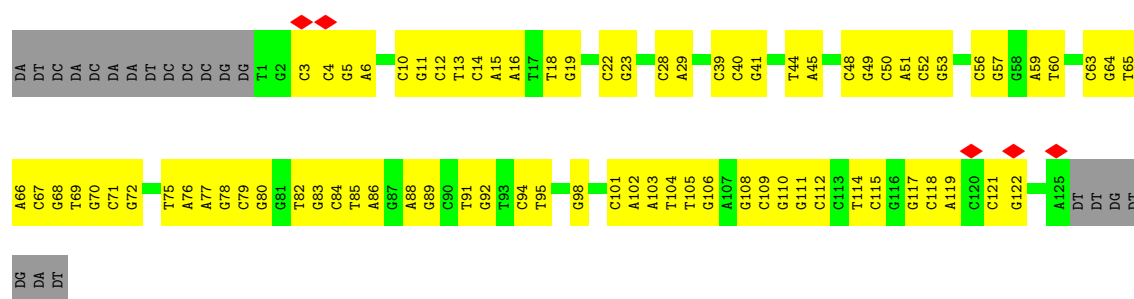
Chain C:



Chain G:



Chain I:



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	194041	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 ($e^-/\text{\AA}^2$)	64	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	25.903	Depositor
Minimum map value	-15.833	Depositor
Average map value	0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	3.2	Depositor
Map size (Å)	168.0, 168.0, 168.0	wwPDB
Map dimensions	160, 160, 160	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.05, 1.05, 1.05	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.43	0/724	0.51	0/971
1	E	0.41	0/787	0.46	0/1054
2	B	0.48	0/629	0.54	0/844
2	F	0.47	0/628	0.48	0/843
3	D	0.41	0/748	0.43	0/1002
3	H	0.39	0/748	0.43	0/1002
4	C	0.38	0/765	0.48	0/1027
4	G	0.37	0/765	0.49	0/1027
5	I	0.33	0/2872	0.58	0/4430
6	J	0.34	0/2876	0.56	0/4437
All	All	0.38	0/11542	0.53	0/16637

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	716	0	753	49	0
1	E	779	0	824	56	0
2	B	622	0	654	44	0
2	F	621	0	654	48	0
3	D	743	0	762	42	0
3	H	743	0	762	43	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	C	754	0	783	45	0
4	G	754	0	783	46	0
5	I	2561	0	1402	80	0
6	J	2564	0	1402	73	0
All	All	10857	0	8779	393	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 20.

All (393) 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:E:69:SER:OG	1:E:73:ARG:NH1	2.06	0.88
5:I:115:DC:H2'	5:I:116:DG:C8	2.08	0.88
1:A:72:VAL:HG23	2:B:62:LEU:HD11	1.58	0.85
6:J:109:DC:H2'	6:J:110:DG:C8	2.12	0.83
1:A:76:VAL:HG23	2:B:66:LEU:HD11	1.62	0.82
3:H:87:THR:HG22	4:G:39:ARG:HB2	1.63	0.81
3:D:55:ASN:N	5:I:12:DA:OP1	2.13	0.80
2:B:93:LEU:HD22	2:B:96:PHE:HE1	1.45	0.80
1:A:82:LYS:HD2	2:B:66:LEU:HD13	1.64	0.78
1:E:69:SER:HG	1:E:73:ARG:HH12	1.32	0.77
1:E:72:VAL:HG13	2:F:62:LEU:HD11	1.68	0.76
1:E:111:GLN:HE21	2:F:39:VAL:HA	1.49	0.76
3:D:69:PHE:HB2	4:C:52:LEU:HD11	1.67	0.76
1:A:64:ARG:HH11	6:J:78:DG:H5'	1.50	0.75
5:I:16:DC:H2''	5:I:17:DG:C8	2.22	0.74
2:F:31:ARG:HD2	2:F:42:ILE:HD12	1.67	0.74
5:I:114:DG:N2	6:J:13:DT:O2	2.21	0.74
6:J:52:DC:H2''	6:J:53:DG:C8	2.24	0.72
4:G:20:ILE:HG22	4:G:22:PHE:H	1.54	0.72
1:A:73:ARG:NH2	5:I:43:DC:OP1	2.25	0.70
3:D:87:THR:HG22	4:C:39:ARG:HB2	1.75	0.69
1:E:75:ILE:HD11	2:F:59:GLU:HG3	1.73	0.69
1:E:85:ILE:HD13	2:F:66:LEU:HD22	1.73	0.69
4:C:85:ARG:NH2	4:C:94:PHE:O	2.26	0.69
2:F:88:ARG:NH1	3:H:75:GLU:OE2	2.26	0.69
6:J:67:DC:H2'	6:J:68:DG:C8	2.29	0.68
2:F:75:LYS:NZ	5:I:93:DG:OP1	2.23	0.67
4:G:24:ILE:HD12	4:G:46:VAL:HA	1.76	0.67
1:A:76:VAL:HG11	1:A:87:PHE:HE1	1.59	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:126:ASP:OD1	1:E:116:HIS:NE2	2.27	0.65
5:I:46:DC:H2''	5:I:47:DG:C8	2.32	0.65
1:A:71:LEU:HD13	2:B:22:LEU:HA	1.79	0.64
3:H:69:PHE:HB2	4:G:52:LEU:HD11	1.80	0.64
5:I:62:DC:H2''	5:I:63:DG:C8	2.33	0.64
3:H:89:GLY:HA2	4:G:41:SER:OG	1.98	0.63
5:I:60:DT:H2''	5:I:61:DA:C8	2.33	0.63
5:I:81:DT:H2''	5:I:82:DA:C8	2.34	0.63
3:D:89:GLY:HA2	4:C:41:SER:HB3	1.81	0.63
1:E:109:ASP:OD2	1:E:136:ARG:NH2	2.26	0.63
6:J:56:DC:H2''	6:J:57:DG:C8	2.33	0.63
1:E:111:GLN:HB2	2:F:39:VAL:HG12	1.82	0.62
4:C:67:ARG:HD3	4:C:72:GLN:O	1.99	0.62
6:J:71:DC:H2'	6:J:72:DG:C8	2.35	0.62
1:A:69:SER:OG	1:A:73:ARG:NH1	2.33	0.61
3:D:34:ILE:HD13	3:D:61:MET:HB3	1.82	0.61
1:A:64:ARG:NH2	5:I:52:DA:H4'	2.15	0.61
5:I:54:DC:H2''	5:I:55:DG:C8	2.36	0.61
6:J:79:DC:H2''	6:J:80:DG:C8	2.36	0.61
1:E:51:GLU:HG2	2:F:35:ARG:HH11	1.66	0.60
2:B:88:ARG:NH2	3:D:75:GLU:OE2	2.34	0.60
5:I:48:DC:H2''	5:I:49:DT:C6	2.36	0.60
5:I:85:DC:H2''	5:I:86:DG:C8	2.37	0.60
6:J:28:DC:H2''	6:J:29:DA:C8	2.37	0.60
1:A:73:ARG:HH21	5:I:43:DC:P	2.24	0.60
1:A:76:VAL:HG11	1:A:87:PHE:CE1	2.36	0.60
3:H:34:ILE:HD13	3:H:61:MET:HB3	1.84	0.60
1:A:62:LEU:HD11	2:B:36:ARG:CZ	2.32	0.60
1:A:103:ILE:HG13	2:B:54:LEU:HD12	1.83	0.60
3:D:101:ILE:HG23	4:C:93:ILE:HD11	1.83	0.60
6:J:118:DC:H2''	6:J:119:DA:N7	2.17	0.60
1:E:122:ILE:HD13	2:F:39:VAL:HG11	1.82	0.59
4:G:41:SER:HA	5:I:104:DG:H5''	1.84	0.59
4:C:74:ARG:NH2	5:I:12:DA:H5'	2.18	0.59
2:B:76:THR:HG22	6:J:88:DA:H5''	1.84	0.59
2:F:68:TYR:OH	3:H:75:GLU:OE1	2.20	0.59
6:J:63:DC:H2''	6:J:64:DG:C8	2.38	0.59
3:D:100:VAL:HG12	3:D:101:ILE:HG13	1.85	0.58
1:E:86:ARG:O	2:F:76:THR:HA	2.04	0.58
1:E:134:GLY:O	1:E:136:ARG:N	2.37	0.58
6:J:75:DT:H2''	6:J:76:DA:C8	2.38	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:19:DT:H2''	5:I:20:DC:C6	2.38	0.58
2:F:76:THR:HB	5:I:94:DA:H5''	1.84	0.58
6:J:10:DC:H2''	6:J:11:DG:C8	2.38	0.58
3:D:51:LEU:HD12	4:C:73:LYS:O	2.04	0.58
1:A:111:GLN:HB2	2:B:39:VAL:HG12	1.86	0.57
5:I:117:DG:H1'	5:I:118:DC:H5'	1.85	0.57
5:I:50:DT:H2''	5:I:51:DA:C8	2.39	0.57
1:E:82:LYS:HE2	2:F:63:ARG:HH22	1.70	0.57
3:D:28:GLU:OE1	4:C:29:ARG:NH2	2.37	0.57
1:A:116:HIS:HE1	1:E:126:ASP:OD1	1.88	0.57
1:A:53:LYS:NZ	1:A:57:LYS:HB2	2.19	0.57
2:B:94:TYR:OH	3:H:67:ASP:OD2	2.22	0.57
5:I:20:DC:H2''	5:I:21:DA:C8	2.40	0.56
5:I:111:DT:H2''	5:I:112:DG:C8	2.39	0.56
4:C:63:ALA:O	4:C:67:ARG:HB2	2.05	0.56
6:J:40:DC:H2''	6:J:41:DG:C8	2.40	0.56
3:D:109:ILE:HD13	4:C:55:VAL:HG22	1.87	0.56
4:G:24:ILE:CD1	4:G:46:VAL:HA	2.34	0.56
1:E:62:LEU:HD12	2:F:32:ARG:HB3	1.88	0.56
3:H:85:ARG:NH2	3:H:92:ASP:OD1	2.39	0.56
6:J:12:DC:H2''	6:J:13:DT:C6	2.41	0.56
3:D:33:TYR:OH	6:J:108:DG:H5''	2.05	0.56
1:A:63:ILE:HD11	2:B:33:LEU:HD11	1.87	0.55
6:J:65:DT:H2''	6:J:66:DA:N7	2.20	0.55
1:A:62:LEU:HD22	2:B:33:LEU:HD23	1.88	0.55
1:E:52:ILE:HD11	2:F:38:GLY:HA2	1.88	0.55
3:H:101:ILE:HG23	4:G:93:ILE:HD11	1.87	0.55
2:B:22:LEU:HD21	2:B:51:ARG:HB3	1.88	0.55
2:F:93:LEU:HD22	2:F:96:PHE:HE2	1.71	0.55
2:B:57:PHE:HE1	2:B:89:GLN:HE22	1.53	0.55
2:B:76:THR:CG2	6:J:88:DA:H5''	2.37	0.55
6:J:4:DC:H2''	6:J:5:DG:N7	2.21	0.55
3:D:109:ILE:HG23	4:C:54:ASN:HB2	1.89	0.55
5:I:7:DT:H2''	5:I:8:DG:C8	2.41	0.55
4:G:48:LEU:O	4:G:51:VAL:HG12	2.07	0.55
2:B:68:TYR:OH	3:D:75:GLU:OE1	2.23	0.54
2:F:31:ARG:HH21	2:F:35:ARG:HH12	1.55	0.54
3:H:35:TYR:O	3:H:39:ARG:HG2	2.07	0.54
4:C:24:ILE:HG12	4:C:46:VAL:HA	1.89	0.54
4:G:67:ARG:HG3	4:G:79:HIS:CD2	2.42	0.54
6:J:82:DT:H2''	6:J:83:DG:H8	1.72	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:68:PHE:CZ	2:F:58:LEU:HD11	2.42	0.54
3:D:70:GLU:OE1	4:C:36:TYR:OH	2.26	0.54
3:D:33:TYR:CG	4:C:23:PRO:HD3	2.42	0.53
1:E:66:LEU:N	5:I:84:DG:OP2	2.39	0.53
6:J:13:DT:H2''	6:J:14:DC:C5	2.42	0.53
6:J:94:DC:H2''	6:J:95:DT:C6	2.43	0.53
5:I:116:DG:H2''	5:I:117:DG:H8	1.73	0.53
4:C:15:SER:HA	4:C:24:ILE:HD12	1.90	0.53
3:H:40:SER:O	3:H:43:ILE:HG12	2.09	0.53
3:D:31:ALA:HA	3:D:58:MET:HE2	1.90	0.53
6:J:28:DC:H2''	6:J:29:DA:H8	1.72	0.53
3:D:85:ARG:NH2	3:D:92:ASP:OD1	2.42	0.53
4:C:73:LYS:HD3	6:J:117:DG:H4'	1.90	0.53
5:I:103:DC:H2''	5:I:104:DG:C8	2.43	0.53
6:J:101:DC:H2''	6:J:102:DA:C8	2.43	0.53
6:J:48:DC:H2''	6:J:49:DG:C8	2.42	0.53
6:J:85:DT:H2''	6:J:86:DA:N7	2.23	0.53
3:H:31:ALA:HA	3:H:58:MET:HE2	1.91	0.52
4:C:28:HIS:ND1	4:C:45:PRO:HG2	2.23	0.52
4:G:28:HIS:CD2	4:G:45:PRO:HG2	2.44	0.52
4:G:67:ARG:HH12	4:G:73:LYS:H	1.57	0.52
1:A:53:LYS:HZ1	1:A:57:LYS:HB2	1.74	0.52
3:D:35:TYR:O	3:D:39:ARG:HG3	2.09	0.52
1:E:76:VAL:HG21	1:E:87:PHE:CZ	2.44	0.52
4:G:85:ARG:NH2	4:G:97:VAL:O	2.41	0.52
4:C:88:LYS:N	4:C:88:LYS:HD2	2.24	0.52
6:J:79:DC:H2''	6:J:80:DG:H8	1.74	0.52
5:I:77:DC:H2''	5:I:78:DG:C8	2.44	0.52
6:J:23:DG:H2'	6:J:23:DG:OP2	2.10	0.52
3:D:38:LEU:O	3:D:41:GLU:HG3	2.10	0.52
3:D:104:GLU:OE2	3:D:107:ARG:NH1	2.43	0.52
6:J:110:DG:H2''	6:J:111:DG:OP2	2.09	0.52
2:B:74:ARG:HB2	6:J:88:DA:P	2.51	0.51
2:B:93:LEU:HD23	4:G:98:THR:HG23	1.92	0.51
3:H:33:TYR:CZ	4:G:23:PRO:HB3	2.45	0.51
5:I:8:DG:H2''	5:I:9:DC:OP2	2.10	0.51
3:H:33:TYR:CG	4:G:23:PRO:HD3	2.46	0.51
3:H:120:PHE:HE2	4:G:14:ARG:HG2	1.76	0.51
2:F:67:THR:HG21	3:H:99:LEU:HG	1.93	0.51
3:H:100:VAL:HG12	3:H:101:ILE:HG13	1.91	0.51
6:J:3:DC:H2''	6:J:4:DC:C5	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:83:DG:H2''	6:J:84:DC:OP2	2.10	0.51
3:H:105:ILE:HB	4:G:89:GLU:HG3	1.93	0.51
5:I:24:DT:H2''	5:I:25:DG:C8	2.46	0.51
6:J:68:DG:H2'	6:J:69:DT:H71	1.92	0.51
1:E:76:VAL:HG21	1:E:87:PHE:HZ	1.76	0.51
3:H:61:MET:HE2	4:G:56:VAL:HG13	1.92	0.51
4:C:50:ALA:O	4:C:54:ASN:ND2	2.32	0.51
1:A:109:ASP:OD2	1:A:136:ARG:NH2	2.44	0.50
3:D:113:ALA:HA	4:C:50:ALA:HB1	1.92	0.50
5:I:43:DC:H2''	5:I:44:DA:H8	1.76	0.50
6:J:121:DC:H2''	6:J:122:DG:C8	2.46	0.50
5:I:10:DC:H2''	5:I:11:DG:N7	2.26	0.50
4:C:41:SER:OG	6:J:98:DG:OP1	2.18	0.50
4:C:88:LYS:O	4:C:92:THR:HG23	2.12	0.50
6:J:22:DC:H2''	6:J:23:DG:OP2	2.12	0.50
6:J:29:DA:H2'	6:J:29:DA:OP2	2.12	0.50
6:J:102:DA:H2''	6:J:103:DA:OP2	2.12	0.50
3:H:34:ILE:HA	3:H:37:VAL:HG12	1.93	0.50
2:B:67:THR:HG21	3:D:99:LEU:HG	1.93	0.50
1:E:76:VAL:HA	1:E:80:LEU:HD23	1.94	0.50
1:E:123:MET:O	1:E:126:ASP:N	2.42	0.50
3:H:39:ARG:O	3:H:43:ILE:HG23	2.11	0.50
1:E:71:LEU:HD22	2:F:58:LEU:HD12	1.93	0.50
6:J:44:DT:H2''	6:J:45:DA:C8	2.47	0.50
1:A:62:LEU:HD11	2:B:36:ARG:NH1	2.27	0.50
1:E:63:ILE:HD11	2:F:33:LEU:HD11	1.93	0.50
3:H:42:ASN:ND2	3:H:51:LEU:H	2.09	0.50
4:C:38:GLU:OE1	4:G:35:ARG:NH1	2.41	0.50
6:J:14:DC:H2''	6:J:15:DA:C8	2.47	0.50
1:A:71:LEU:O	1:A:75:ILE:HG13	2.12	0.49
1:A:86:ARG:O	2:B:76:THR:HA	2.11	0.49
1:E:75:ILE:HD11	2:F:59:GLU:CG	2.41	0.49
1:E:119:ARG:HH12	1:E:123:MET:HB2	1.77	0.49
2:F:43:SER:OG	2:F:44:SER:N	2.44	0.49
5:I:100:DC:H2''	5:I:101:DT:OP2	2.13	0.49
4:C:24:ILE:HD11	4:C:46:VAL:HG23	1.94	0.49
5:I:2:DC:H2''	5:I:3:DC:C6	2.48	0.49
6:J:11:DG:H2''	6:J:12:DC:C5	2.48	0.49
1:E:46:MET:HG3	1:E:47:VAL:HG13	1.95	0.49
1:E:63:ILE:O	1:E:96:GLN:NE2	2.46	0.48
5:I:56:DC:H2''	5:I:57:DA:C8	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:H:61:MET:HG3	4:G:60:PHE:CE1	2.48	0.48
3:H:67:ASP:OD2	3:H:71:ARG:NH2	2.31	0.48
5:I:28:DC:H2''	5:I:29:DG:OP2	2.12	0.48
1:A:62:LEU:HD23	2:B:32:ARG:HB3	1.94	0.48
2:B:57:PHE:HE1	2:B:89:GLN:NE2	2.12	0.48
1:E:82:LYS:HE2	2:F:63:ARG:NH2	2.29	0.48
4:C:94:PHE:HD1	4:C:97:VAL:HG21	1.79	0.48
1:E:121:THR:HG22	2:F:41:ARG:HE	1.79	0.48
3:H:116:ALA:HB1	4:G:20:ILE:HD11	1.95	0.48
6:J:88:DA:C6	6:J:89:DG:C6	3.01	0.47
6:J:91:DT:H2''	6:J:92:DG:C8	2.48	0.47
3:D:68:LEU:CD2	4:C:55:VAL:HG11	2.44	0.47
5:I:4:DC:H2''	5:I:5:DG:C8	2.49	0.47
5:I:65:DA:H2''	5:I:66:DA:H8	1.79	0.47
1:A:66:LEU:N	6:J:78:DG:OP2	2.40	0.47
5:I:86:DG:H1'	5:I:87:DG:C8	2.50	0.47
4:G:74:ARG:HH12	6:J:6:DA:H5''	1.79	0.47
5:I:92:DA:H2''	5:I:93:DG:C8	2.50	0.47
3:H:69:PHE:CD1	4:G:48:LEU:HD21	2.50	0.47
4:C:28:HIS:CD2	4:C:32:ARG:HH21	2.32	0.47
1:A:67:PRO:HD3	6:J:77:DA:O5'	2.14	0.47
1:E:114:ALA:O	1:E:117:ALA:N	2.47	0.47
4:G:81:LEU:HD13	4:G:99:ILE:CG1	2.44	0.47
5:I:47:DG:OP2	5:I:47:DG:H2'	2.15	0.47
3:H:77:SER:OG	4:G:36:TYR:O	2.29	0.47
3:H:34:ILE:HB	3:H:58:MET:HE1	1.96	0.47
3:H:109:ILE:HG22	4:G:51:VAL:HG23	1.97	0.46
4:C:78:ASN:HD21	4:C:106:ARG:HH12	1.63	0.46
4:G:58:GLU:OE1	4:G:61:ARG:NH1	2.48	0.46
1:E:73:ARG:O	1:E:77:THR:HG23	2.16	0.46
4:G:67:ARG:NH1	4:G:73:LYS:H	2.13	0.46
1:A:68:PHE:CD2	1:A:96:GLN:HB2	2.50	0.46
6:J:115:DC:OP2	6:J:115:DC:H2'	2.16	0.46
3:D:34:ILE:HB	3:D:58:MET:HE1	1.98	0.46
2:F:30:ILE:HG12	2:F:50:THR:CG2	2.46	0.46
6:J:39:DC:C2	6:J:40:DC:C4	3.02	0.46
2:F:26:THR:OG1	2:F:28:PRO:HD2	2.16	0.46
2:F:46:ILE:O	2:F:50:THR:HG22	2.16	0.46
3:H:58:MET:HE3	3:H:58:MET:O	2.16	0.46
5:I:67:DT:H2''	5:I:68:DC:C6	2.51	0.46
3:D:100:VAL:O	3:D:102:PRO:HD3	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:96:DC:C6	5:I:97:DT:H72	2.51	0.46
5:I:124:DC:H2''	5:I:125:DA:N7	2.31	0.46
3:H:116:ALA:CB	4:G:20:ILE:HD11	2.46	0.45
5:I:20:DC:H2''	5:I:21:DA:N7	2.31	0.45
5:I:64:DG:H2''	5:I:65:DA:C8	2.51	0.45
5:I:101:DT:H2''	5:I:102:DA:N7	2.31	0.45
1:E:67:PRO:HD3	5:I:83:DA:H3'	1.99	0.45
5:I:120:DT:H2''	5:I:121:DC:C6	2.52	0.45
3:H:68:LEU:HA	3:H:68:LEU:HD12	1.69	0.45
1:A:104:ILE:HD13	2:B:36:ARG:HD2	1.98	0.45
2:B:86:LEU:HB3	2:B:91:ARG:O	2.16	0.45
6:J:108:DG:H2''	6:J:109:DC:C5	2.52	0.45
1:E:122:ILE:HD11	2:F:42:ILE:HG23	1.99	0.45
5:I:35:DA:OP2	5:I:35:DA:H8	2.00	0.45
3:D:54:SER:O	3:D:58:MET:N	2.44	0.45
3:D:88:ILE:HD11	4:C:31:LEU:HD22	1.99	0.45
3:H:68:LEU:CD2	4:G:55:VAL:HG11	2.46	0.45
5:I:26:DG:H2''	5:I:27:DT:OP2	2.16	0.45
1:A:117:ALA:HB2	1:E:116:HIS:CE1	2.52	0.45
1:A:127:MET:HE3	1:A:127:MET:HB2	1.79	0.45
2:B:22:LEU:HD12	2:B:55:LYS:HB2	1.99	0.45
5:I:82:DA:H1'	5:I:83:DA:N7	2.32	0.45
6:J:50:DC:H2''	6:J:51:DA:C8	2.52	0.45
5:I:82:DA:H1'	5:I:83:DA:C8	2.52	0.45
1:E:76:VAL:HG22	2:F:66:LEU:HD11	1.98	0.44
2:F:71:HIS:HB2	3:H:95:SER:OG	2.17	0.44
5:I:83:DA:C6	5:I:84:DG:C6	3.05	0.44
6:J:103:DA:H2''	6:J:104:DT:OP2	2.17	0.44
6:J:108:DG:H2''	6:J:109:DC:C6	2.52	0.44
1:E:77:THR:O	1:E:81:SER:HA	2.17	0.44
3:H:100:VAL:O	3:H:102:PRO:HD3	2.16	0.44
3:H:109:ILE:HD13	4:G:55:VAL:HG22	2.00	0.44
6:J:50:DC:H2''	6:J:51:DA:H8	1.82	0.44
6:J:114:DT:H2''	6:J:115:DC:C6	2.52	0.44
1:A:56:GLN:HA	2:B:36:ARG:HG3	2.00	0.44
4:C:20:ILE:HG22	4:C:22:PHE:H	1.82	0.44
5:I:60:DT:H2''	5:I:61:DA:N7	2.31	0.44
1:A:111:GLN:HE21	2:B:39:VAL:HA	1.81	0.44
1:E:49:VAL:HA	1:E:52:ILE:HG22	2.00	0.44
5:I:6:DG:C8	5:I:7:DT:H72	2.52	0.44
6:J:13:DT:H2''	6:J:14:DC:C6	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:59:DA:H1'	6:J:60:DT:H5'	1.98	0.44
1:A:122:ILE:HD13	2:B:39:VAL:HG11	1.99	0.44
3:H:93:ILE:HG21	4:G:48:LEU:HB2	1.99	0.44
5:I:117:DG:C5	5:I:118:DC:C4	3.06	0.44
2:B:74:ARG:HH11	2:B:78:THR:HG22	1.82	0.44
5:I:63:DG:C6	5:I:64:DG:C6	3.05	0.44
5:I:87:DG:H2''	5:I:88:DT:OP2	2.17	0.44
1:E:44:GLN:HE22	6:J:53:DG:H21	1.66	0.44
4:C:76:VAL:HG22	4:C:79:HIS:CD2	2.53	0.44
4:G:81:LEU:HD13	4:G:99:ILE:HG13	1.99	0.44
2:F:86:LEU:HB3	2:F:91:ARG:O	2.18	0.44
6:J:94:DC:H2''	6:J:95:DT:C5	2.53	0.44
5:I:34:DC:H2''	5:I:35:DA:OP2	2.18	0.44
5:I:124:DC:H2''	5:I:125:DA:C8	2.53	0.44
1:A:116:HIS:CE1	1:E:126:ASP:OD1	2.70	0.43
2:F:22:LEU:HD13	2:F:51:ARG:HB3	1.99	0.43
2:F:58:LEU:O	2:F:62:LEU:HB2	2.18	0.43
2:F:63:ARG:NH1	3:H:98:LYS:HD3	2.33	0.43
4:G:35:ARG:O	4:G:35:ARG:HG2	2.17	0.43
5:I:116:DG:H2''	5:I:117:DG:C8	2.52	0.43
2:B:73:GLN:HE22	3:D:91:LYS:HG2	1.82	0.43
3:H:84:LYS:HD3	3:H:84:LYS:HA	1.72	0.43
4:C:41:SER:HA	6:J:98:DG:H5''	1.99	0.43
6:J:3:DC:H2''	6:J:4:DC:C6	2.54	0.43
4:C:88:LYS:HD2	4:C:88:LYS:H	1.84	0.43
4:G:74:ARG:NH1	6:J:6:DA:H5''	2.34	0.43
2:B:72:GLY:HA3	2:B:74:ARG:NH2	2.34	0.43
2:B:85:ALA:O	2:B:88:ARG:HB3	2.18	0.43
1:E:68:PHE:CE1	2:F:58:LEU:HD11	2.54	0.43
5:I:16:DC:H2''	5:I:17:DG:H8	1.77	0.43
1:A:68:PHE:CE1	2:B:58:LEU:HD11	2.53	0.43
4:G:84:LEU:HD22	4:G:94:PHE:CD2	2.53	0.43
1:A:57:LYS:NZ	4:G:106:ARG:HB3	2.34	0.43
1:A:129:LEU:HD12	1:A:129:LEU:HA	1.86	0.43
2:B:69:THR:OG1	2:B:81:ASP:OD2	2.27	0.43
1:E:56:GLN:HG2	4:C:104:VAL:HG21	1.99	0.43
5:I:63:DG:H2''	5:I:64:DG:C8	2.54	0.43
1:A:72:VAL:HG11	1:A:92:VAL:HG23	2.00	0.43
2:B:32:ARG:NH2	5:I:53:DA:OP1	2.51	0.43
5:I:19:DT:H2''	5:I:20:DC:C5	2.54	0.43
1:A:102:TYR:OH	1:A:136:ARG:HB3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:75:GLU:HB3	3:D:96:ALA:HB1	2.01	0.43
1:E:121:THR:HG22	2:F:41:ARG:HB2	2.00	0.43
3:H:109:ILE:HG12	4:G:54:ASN:HB3	2.01	0.43
4:C:73:LYS:HB2	4:C:73:LYS:HE2	1.81	0.43
3:D:33:TYR:CZ	4:C:23:PRO:HB3	2.53	0.43
1:E:106:LEU:O	1:E:110:THR:OG1	2.27	0.43
3:D:34:ILE:HA	3:D:37:VAL:HG12	2.01	0.42
3:D:120:PHE:HB2	4:C:18:ALA:HB2	2.01	0.42
4:G:79:HIS:O	4:G:82:THR:HG22	2.19	0.42
1:E:55:TYR:HE2	2:F:32:ARG:HD2	1.84	0.42
5:I:4:DC:H2''	5:I:5:DG:N7	2.34	0.42
2:B:58:LEU:O	2:B:62:LEU:HB2	2.19	0.42
3:D:46:GLU:H	3:D:46:GLU:HG3	1.71	0.42
1:A:107:PHE:CE1	1:A:127:MET:HE1	2.55	0.42
1:E:76:VAL:HG23	2:F:62:LEU:HD13	2.02	0.42
1:E:113:CYS:SG	1:E:129:LEU:HD23	2.59	0.42
4:C:69:LYS:HE2	4:C:69:LYS:HB2	1.80	0.42
3:D:58:MET:HE3	3:D:58:MET:O	2.19	0.42
5:I:54:DC:H2''	5:I:55:DG:H8	1.82	0.42
6:J:105:DT:H2''	6:J:106:DG:C8	2.54	0.42
1:A:133:ILE:HD12	1:E:109:ASP:HB3	2.02	0.42
3:D:86:ASN:HD21	4:C:38:GLU:CD	2.27	0.42
5:I:17:DG:OP2	5:I:17:DG:H2'	2.20	0.42
6:J:70:DG:H2''	6:J:71:DC:C6	2.55	0.42
6:J:105:DT:H2''	6:J:106:DG:N7	2.34	0.42
1:A:122:ILE:HD11	2:B:42:ILE:HG12	2.02	0.42
2:F:31:ARG:HH21	2:F:35:ARG:NH1	2.18	0.42
4:G:81:LEU:HD11	4:G:85:ARG:CZ	2.50	0.42
1:A:109:ASP:HB3	1:E:133:ILE:HD12	2.01	0.42
1:A:51:GLU:HG3	1:A:54:LYS:H	1.85	0.42
2:F:30:ILE:HG12	2:F:50:THR:HG21	2.01	0.42
6:J:111:DG:C5	6:J:112:DC:C4	3.08	0.42
3:D:90:LYS:HG3	3:D:117:LEU:HD13	2.02	0.41
5:I:74:DG:H2'	5:I:75:DT:H71	2.01	0.41
1:E:100:GLU:HB2	2:F:33:LEU:HD21	2.02	0.41
1:E:112:LEU:HD23	1:E:112:LEU:HA	1.86	0.41
4:G:89:GLU:O	4:G:92:THR:OG1	2.33	0.41
5:I:37:DC:H2''	5:I:38:DT:OP2	2.19	0.41
2:F:27:LYS:HE2	2:F:47:TYR:CZ	2.56	0.41
3:H:49:THR:HG21	4:G:73:LYS:HB3	2.01	0.41
5:I:44:DA:H2''	5:I:45:DC:C6	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:J:18:DT:H2''	6:J:19:DG:H8	1.84	0.41
6:J:22:DC:H2''	6:J:23:DG:C8	2.55	0.41
3:D:33:TYR:OH	6:J:108:DG:OP1	2.33	0.41
3:D:67:ASP:OD2	2:F:94:TYR:OH	2.33	0.41
1:A:111:GLN:OE1	1:A:115:GLU:HG3	2.20	0.41
2:B:93:LEU:HD23	4:G:98:THR:O	2.20	0.41
2:F:21:THR:OG1	2:F:22:LEU:N	2.53	0.41
6:J:18:DT:H2''	6:J:19:DG:C8	2.56	0.41
2:F:75:LYS:HB2	2:F:75:LYS:HE3	1.83	0.41
2:B:46:ILE:HD13	2:B:46:ILE:HA	1.83	0.41
2:B:77:VAL:O	2:B:77:VAL:HG23	2.21	0.41
4:C:90:LEU:HD23	4:C:90:LEU:HA	1.85	0.41
5:I:43:DC:H2''	5:I:44:DA:C8	2.53	0.41
5:I:50:DT:C2'	5:I:51:DA:C8	3.04	0.41
5:I:71:DT:H2''	5:I:72:DA:N7	2.36	0.41
1:A:68:PHE:CE2	1:A:96:GLN:HB2	2.55	0.41
2:F:71:HIS:C	2:F:73:GLN:H	2.29	0.41
3:D:109:ILE:HG12	4:C:54:ASN:HB3	2.03	0.40
1:E:64:ARG:HA	1:E:64:ARG:HD2	1.87	0.40
5:I:97:DT:H2''	5:I:98:DG:C8	2.57	0.40
6:J:82:DT:H2''	6:J:83:DG:C8	2.55	0.40
3:D:51:LEU:HD21	4:C:64:CYS:SG	2.62	0.40
1:E:82:LYS:HB3	1:E:85:ILE:HD12	2.03	0.40
3:H:33:TYR:OH	5:I:114:DG:H5''	2.20	0.40
4:C:12:LYS:HE2	4:C:12:LYS:HB3	1.76	0.40
5:I:98:DG:C2'	5:I:99:DT:H71	2.51	0.40
2:B:63:ARG:HA	2:B:63:ARG:HD2	1.89	0.40
3:D:101:ILE:HG22	3:D:106:GLY:HA2	2.04	0.40
3:H:54:SER:HB3	4:G:74:ARG:HD3	2.03	0.40
4:C:31:LEU:HB3	4:C:40:ILE:HG12	2.04	0.40
1:A:111:GLN:HG2	2:B:38:GLY:O	2.22	0.40
1:A:119:ARG:HG2	5:I:63:DG:OP1	2.20	0.40
1:E:103:ILE:HA	1:E:103:ILE:HD13	1.84	0.40
1:E:129:LEU:HD12	1:E:129:LEU:HA	1.88	0.40
4:G:25:GLY:HA3	6:J:16:DA:H3'	2.03	0.40
5:I:27:DT:H1'	5:I:28:DC:H5'	2.03	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	88/149 (59%)	85 (97%)	3 (3%)	0	100	100
1	E	97/149 (65%)	88 (91%)	9 (9%)	0	100	100
2	B	76/102 (74%)	75 (99%)	1 (1%)	0	100	100
2	F	76/102 (74%)	70 (92%)	6 (8%)	0	100	100
3	D	94/133 (71%)	90 (96%)	4 (4%)	0	100	100
3	H	94/133 (71%)	89 (95%)	5 (5%)	0	100	100
4	C	93/127 (73%)	88 (95%)	5 (5%)	0	100	100
4	G	93/127 (73%)	89 (96%)	4 (4%)	0	100	100
All	All	711/1022 (70%)	674 (95%)	37 (5%)	0	100	100

There are no Ramachandran outliers to report.

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	80/125 (64%)	80 (100%)	0	100	100
1	E	86/125 (69%)	86 (100%)	0	100	100
2	B	66/84 (79%)	66 (100%)	0	100	100
2	F	66/84 (79%)	66 (100%)	0	100	100
3	D	82/114 (72%)	82 (100%)	0	100	100
3	H	82/114 (72%)	82 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	C	78/105 (74%)	78 (100%)	0	100	100
4	G	78/105 (74%)	78 (100%)	0	100	100
All	All	618/856 (72%)	618 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	96	GLN
1	A	116	HIS
2	B	71	HIS
3	D	62	ASN
1	E	44	GLN
2	F	48	GLN
3	H	62	ASN
4	C	30	HIS
4	C	78	ASN
4	C	79	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

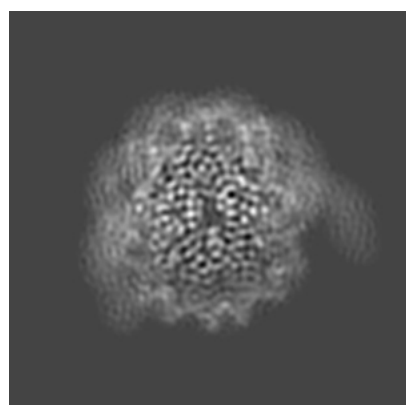
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-30591. These allow visual inspection of the internal detail of the map and identification of artifacts.

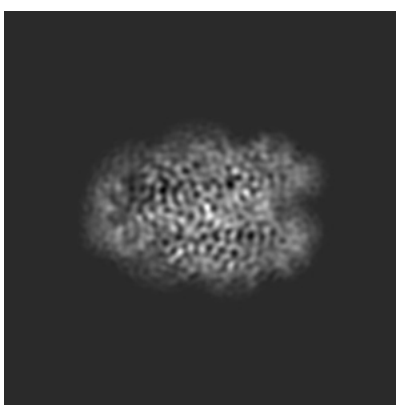
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

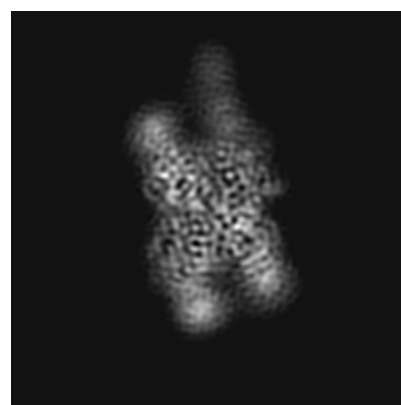
6.1.1 Primary map



X



Y



Z

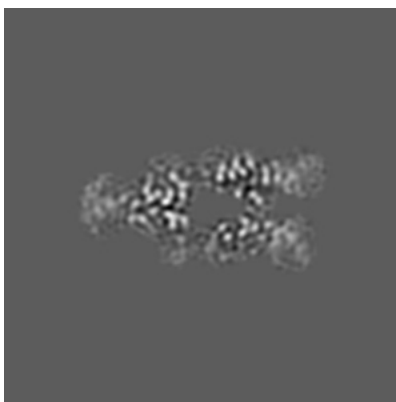
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

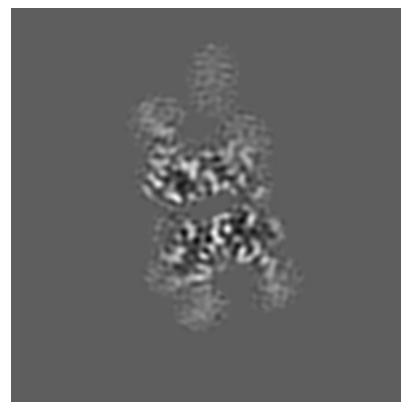
6.2.1 Primary map



X Index: 80



Y Index: 80

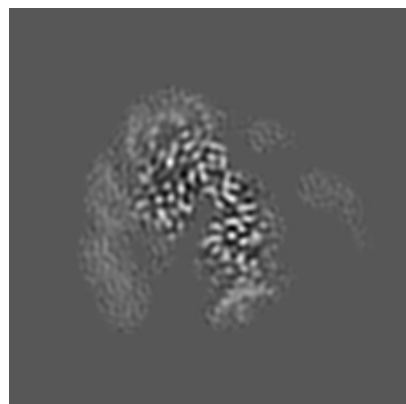


Z Index: 80

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

6.3 Largest variance slices [i](#)

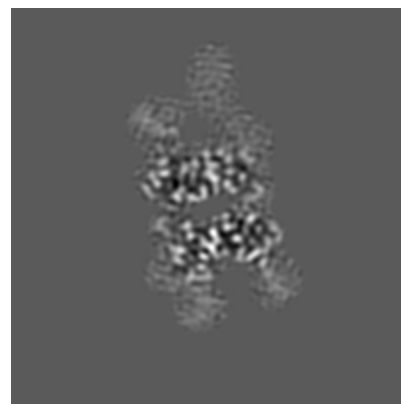
6.3.1 Primary map



X Index: 72



Y Index: 72

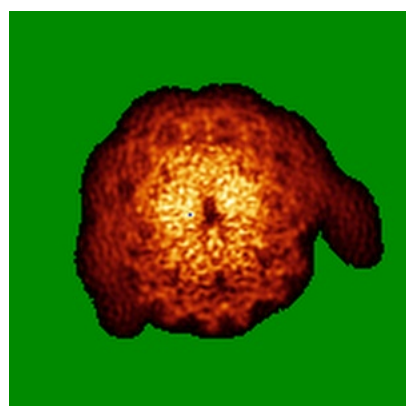


Z Index: 81

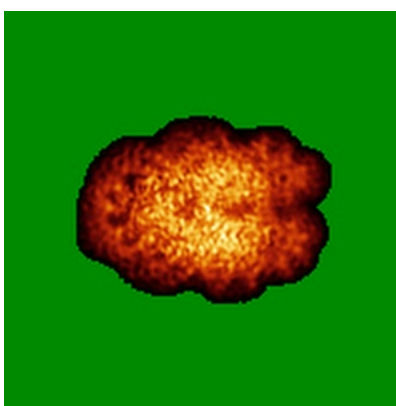
The images above show the largest variance slices of the map in three orthogonal directions.

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

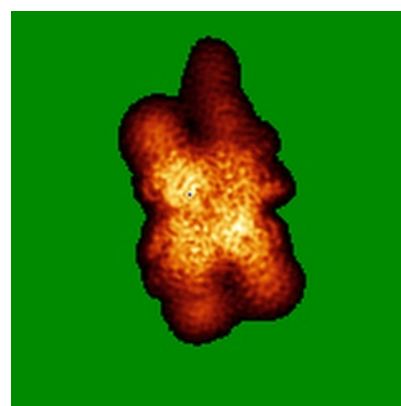
6.4.1 Primary map



X



Y

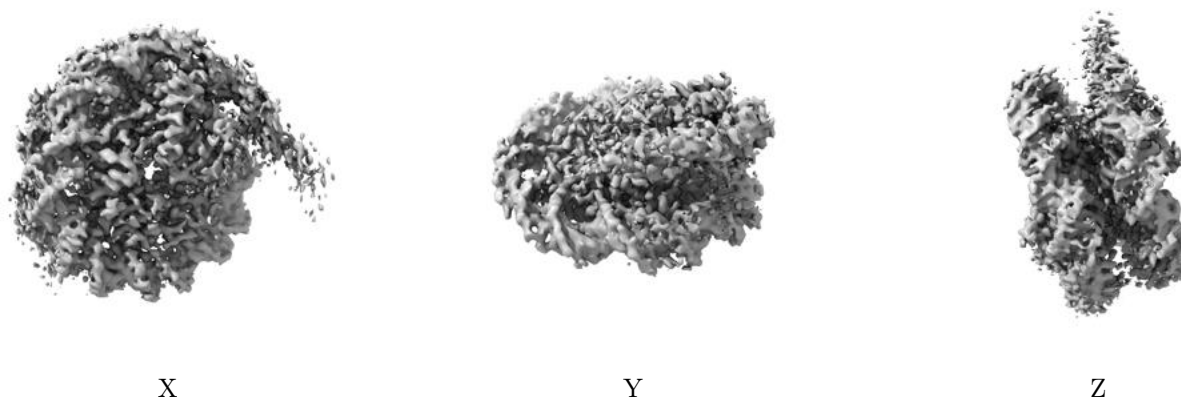


Z

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

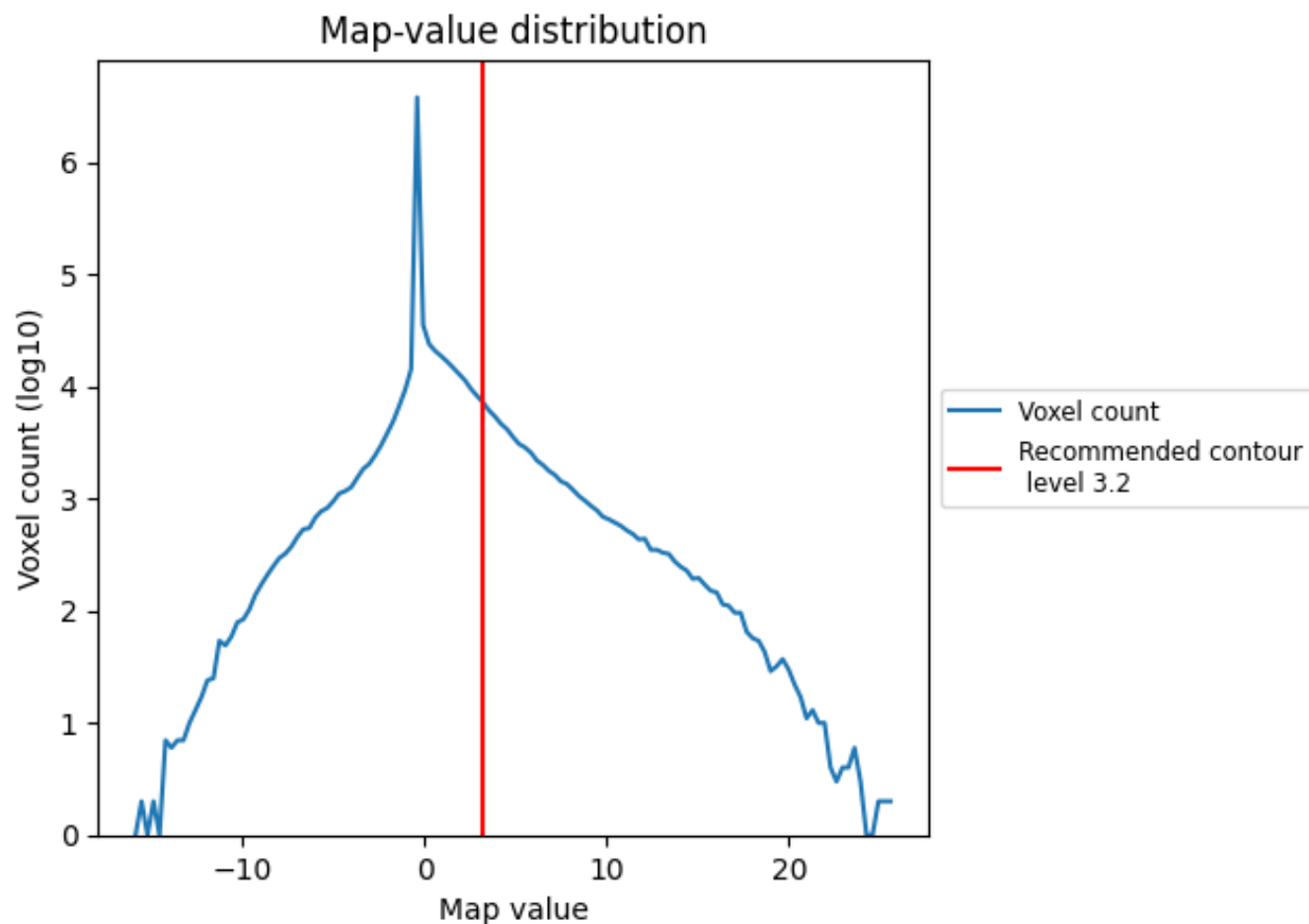
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

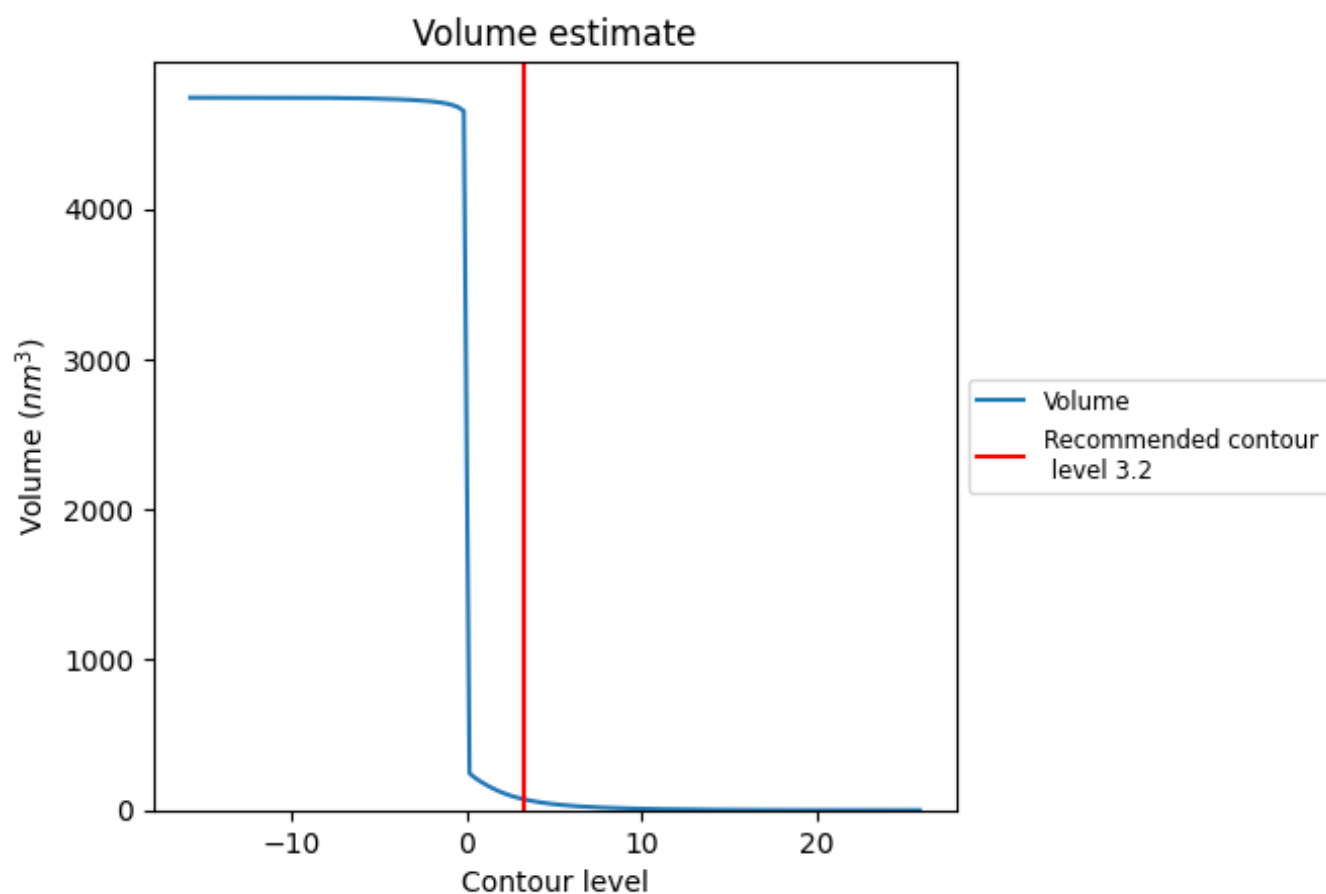
This section contains the results of statistical analysis of the map.

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.

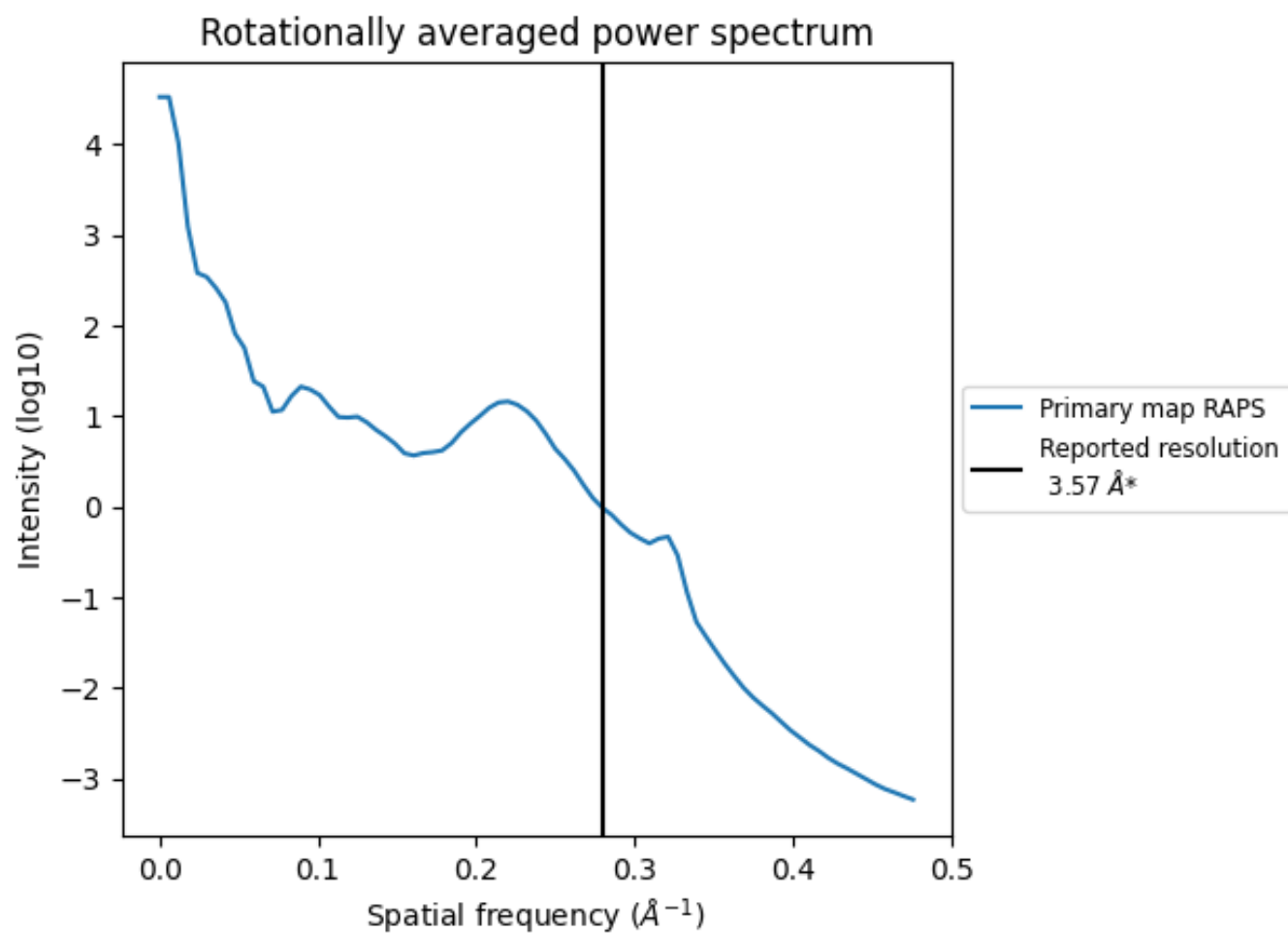
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 74 nm^3 ; this corresponds to an approximate mass of 67 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 ⓘ

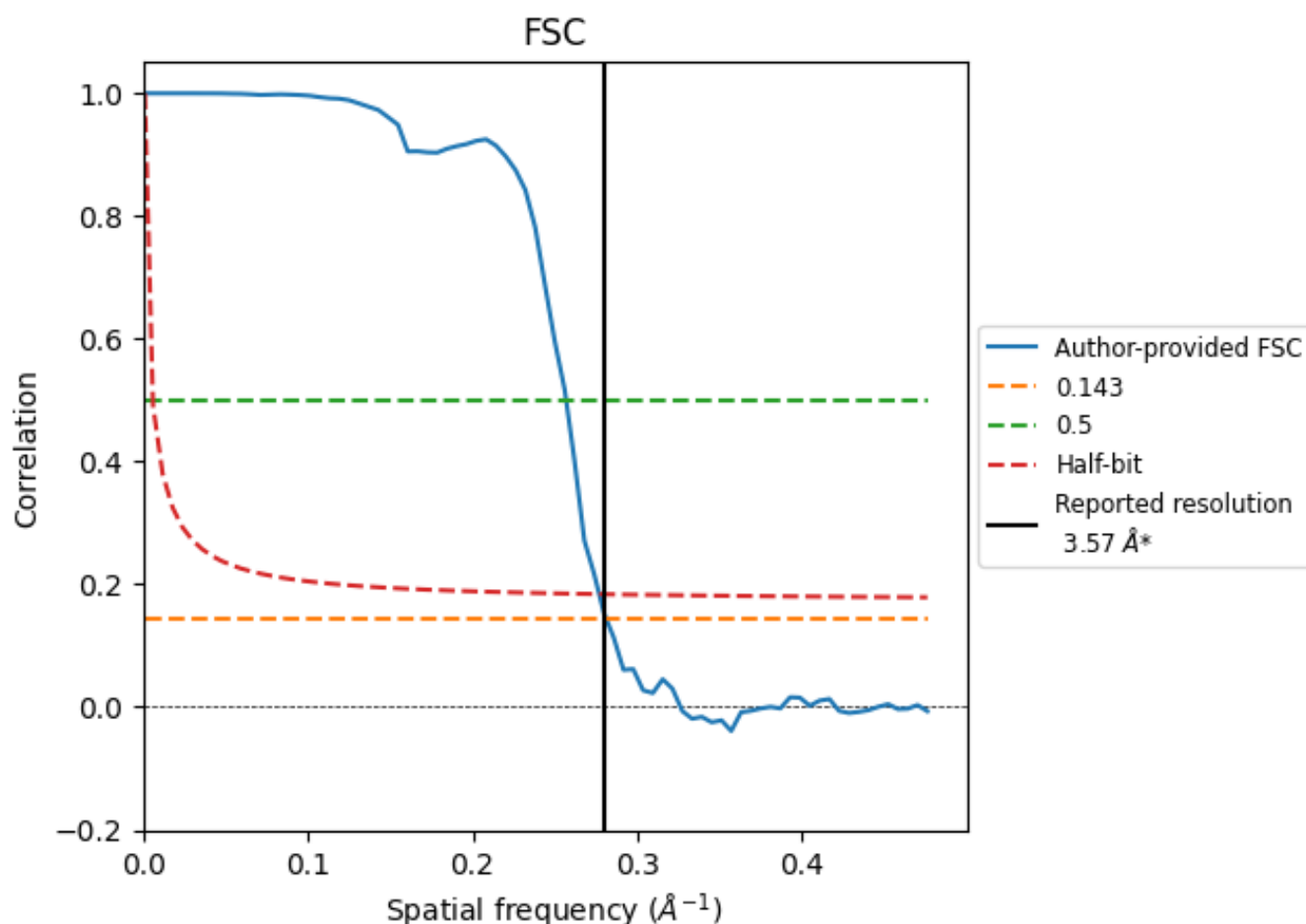


*Reported resolution corresponds to spatial frequency of 0.280 Å⁻¹

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 0.280 Å⁻¹

8.2 Resolution estimates [i](#)

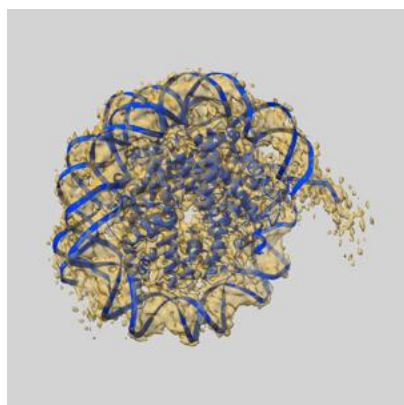
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.57	-	-
Author-provided FSC curve	3.55	3.89	3.61
Unmasked-calculated*	-	-	-

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

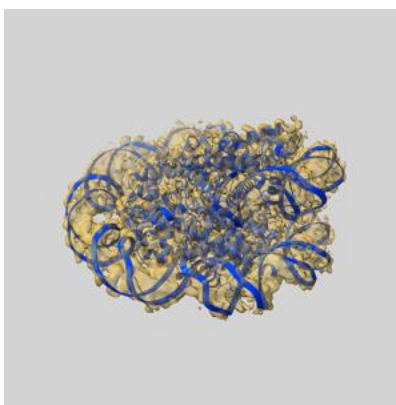
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-30591 and PDB model 7D69. Per-residue inclusion information can be found in section [3](#) on page [7](#).

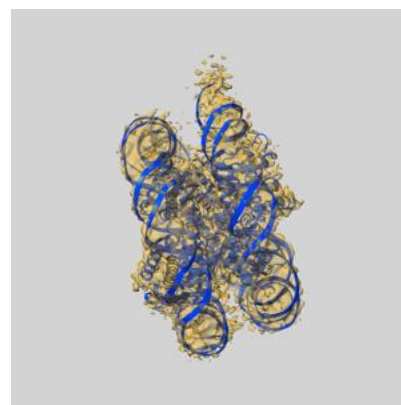
9.1 Map-model overlay [i](#)



X



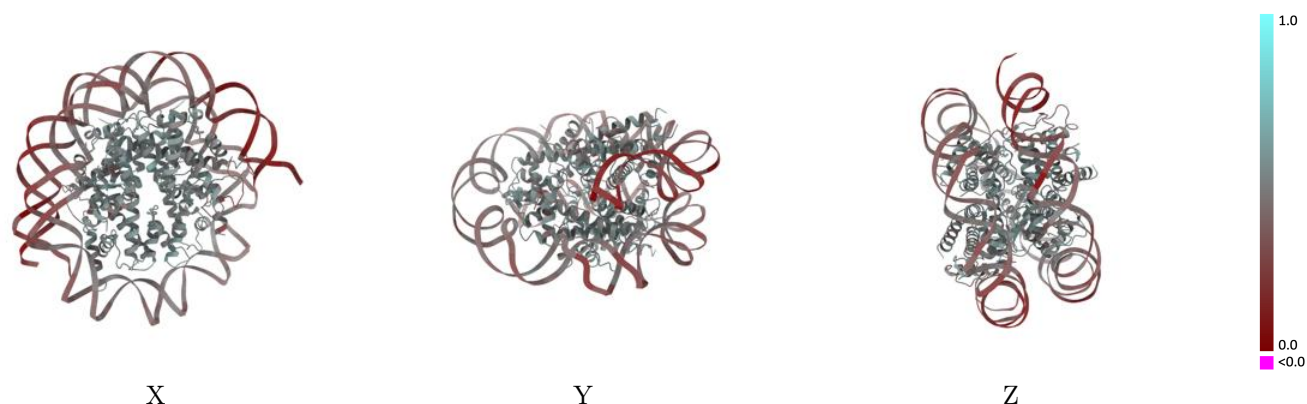
Y



Z

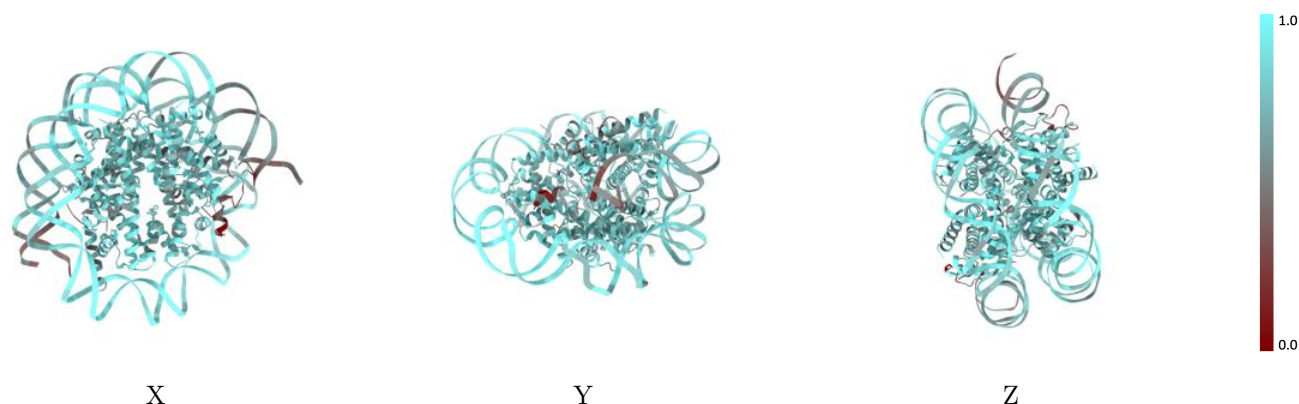
The images above show the 3D surface view of the map at the recommended contour level 3.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



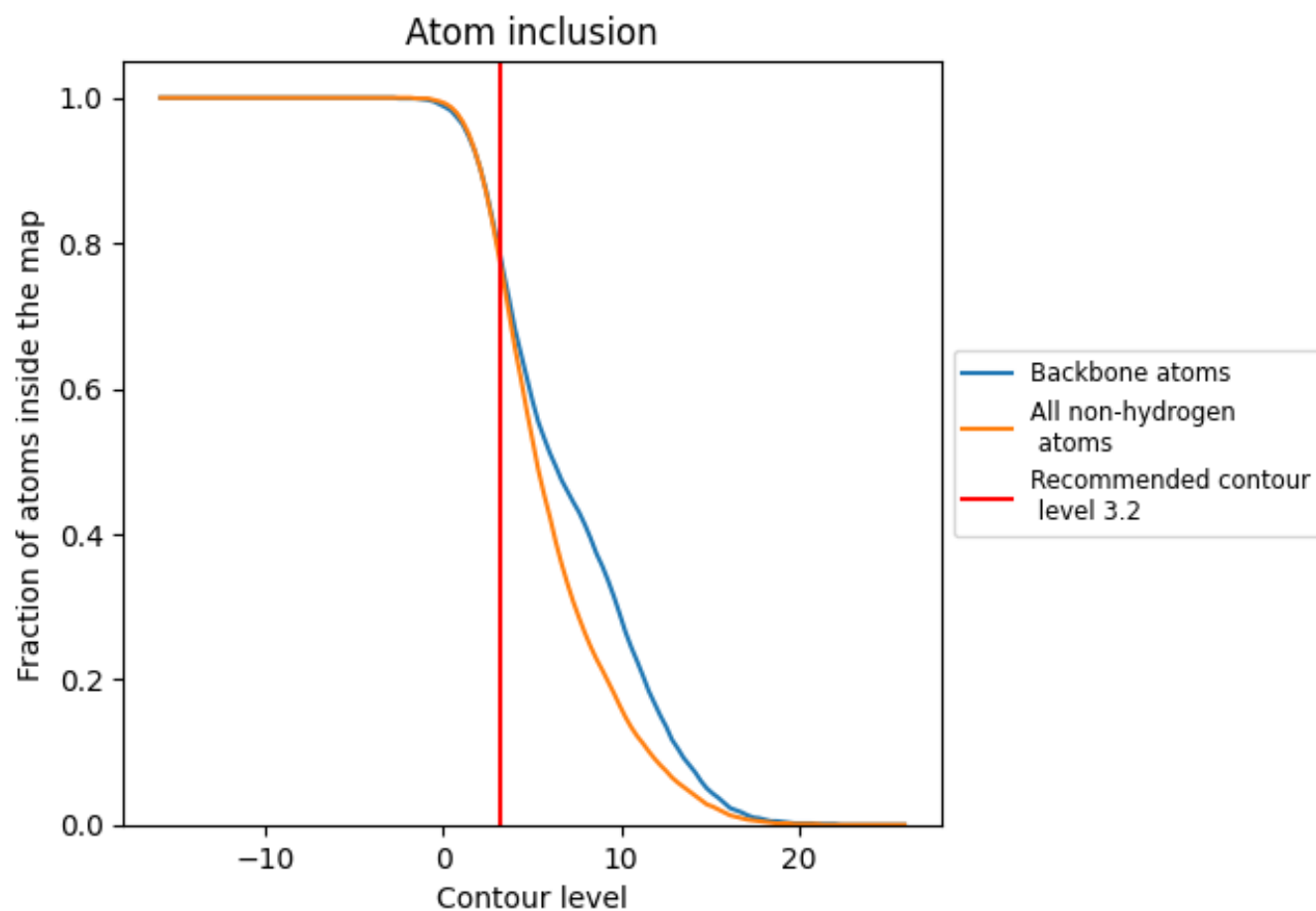
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (3.2).

9.4 Atom inclusion [i](#)



At the recommended contour level, 79% of all backbone atoms, 78% 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 (3.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7760	 0.4270
A	 0.7620	 0.5110
B	 0.8500	 0.5250
C	 0.7730	 0.5020
D	 0.7470	 0.4930
E	 0.7860	 0.5200
F	 0.8640	 0.5310
G	 0.7710	 0.4980
H	 0.7570	 0.5000
I	 0.7590	 0.3310
J	 0.7740	 0.3390

