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PDB ID	:	7ZX7
EMDB ID	:	EMD-15006
Title	:	Structure of SNAPc containing Pol II pre-initiation complex bound to U1 snRNA promoter (CC)
Authors	:	Rengachari, S.; Schilbach, S.; Kaliyappan, T.; Gouge, J.; Zumer, K.; Schwarz, J.; Urlaub, H.; Dienemann, C.; Vannini, A.; Cramer, P.
Deposited on	:	2022-05-20
Resolution	:	3.40 Å(reported)
This is	a I	Full wwPDB EM Validation Report for a publicly released PDB entry.
		We welcome your comments at validation Or ail wounds and

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 (1)) were used in the production of this report:

EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 3.40 Å.

Ramachandran outliers

Sidechain outliers

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
Ramachandran outliers		0
Sidechain outliers		0.2%
Worse		Better
Percentile rel	ative to all structures	
Percentile rel	ative to all EM structures	
Metric	[${f EM\ structures}\ (\#{ m Entries})$

154571

154315

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.

4023

3826

Mol	Chain	Length	Quality of chain	
1	А	1970	72%	28%
2	В	1174	97%	•
3	С	275	93%	7%
4	D	142	90%	10%
5	Е	210	99%	•
6	F	127	62% 38	3%
7	G	172	99%	••
8	Н	150	99%	•
9	Ι	125	91%	9%

Continued on next page...



•
•
24%
23%
31%
47%
11%
31%
11%
42%
11%
±±/0
47%

Continued from previous page...



2 Entry composition (i)

There are 26 unique types of molecules in this entry. The entry contains 49277 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

• Molecule 1 is a protein called DNA-directed RNA polymerase subunit.

Mol	Chain	Residues		A	AltConf	Trace			
1	А	1423	Total 11274	C 7092	N 2016	O 2094	S 72	0	0

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

Mol	Chain	Residues		Α	AltConf	Trace			
2	В	1136	Total 9076	C 5739	N 1597	O 1676	S 64	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
3	С	257	Total 2059	C 1294	N 351	O 408	S 6	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	128	Total 1050	C 656	N 178	0 212	$\begin{array}{c} \mathrm{S} \\ \mathrm{4} \end{array}$	0	0

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

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

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

Mol	Chain	Residues		At	oms	AltConf	Trace		
6	F	79	Total 636	C 406	N 108	0 117	${S \atop 5}$	0	0



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

Mol	Chain	Residues		At	oms			AltConf	Trace
7	G	171	Total 1351	C 875	N 219	0 249	S 8	0	0

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

Mol	Chain	Residues		At	oms	AltConf	Trace		
8	Н	148	Total 1186	C 750	N 194	0 237	${ m S}{ m 5}$	0	0

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

Mol	Chain	Residues		A	toms			AltConf	Trace
9	Ι	114	Total 928	C 571	N 166	0 180	S 11	0	0

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

Mol	Chain	Residues		Ato	\mathbf{ms}	AltConf	Trace		
10	J	64	Total 507	C 328	N 86	O 87	S 6	0	0

• Molecule 11 is a protein called RNA polymerase II subunit J.

Mol	Chain	Residues		At	oms			AltConf	Trace
11	K	115	Total 920	C 593	N 152	0 173	${S \over 2}$	0	0

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

Mol	Chain	Residues		Ato	\mathbf{ms}			AltConf	Trace
12	L	44	Total 373	C 231	N 72	O 64	S 6	0	0

• Molecule 13 is a protein called Transcription initiation factor IIB.

Mol	Chain	Residues		At		AltConf	Trace		
13	М	242	Total 1879	C 1182	N 332	0 349	S 16	0	0

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



Mol	Chain	Residues		A	AltConf	Trace			
14	Ν	66	Total 1369	C 648	N 258	O 397	Р 66	0	0

• Molecule 15 is a protein called TATA-box-binding protein.

Mol	Chain	Residues		At	oms	AltConf	Trace		
15	0	179	Total 1422	C 923	N 251	0 241	${ m S} 7$	0	0

• Molecule 16 is a protein called General transcription factor IIF subunit 1.

Mol	Chain	Residues		At	oms			AltConf	Trace
16	Q	138	Total 1138	C 719	N 208	O 208	${ m S} { m 3}$	0	0

• Molecule 17 is a protein called General transcription factor IIF subunit 2.

Mol	Chain	Residues		At	oms			AltConf	Trace
17	R	222	Total 1788	C 1127	N 320	O 338	${ m S} { m 3}$	0	0

• Molecule 18 is a DNA chain called Template strand.

Mol	Chain	Residues		A	AltConf	Trace			
18	Т	66	Total 1337	C 637	N 239	O 395	Р 66	0	0

• Molecule 19 is a protein called Transcription initiation factor IIA subunit 1.

Mol	Chain	Residues		At	oms		AltConf	Trace	
19	U	88	Total 734	C 470	N 124	0 136	${f S}$ 4	0	0

• Molecule 20 is a protein called Transcription initiation factor IIA subunit 2.

Mol	Chain	Residues		At	AltConf	Trace			
20	V	97	Total 793	C 502	N 140	0 149	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0

• Molecule 21 is a protein called snRNA-activating protein complex subunit 1.



Mol	Chain	Residues		At	AltConf	Trace			
21	a	215	Total 1807	C 1165	N 313	O 319	S 10	0	0

• Molecule 22 is a protein called snRNA-activating protein complex subunit 3.

Mol	Chain	Residues		At	AltConf	Trace			
22	b	365	Total 2977	C 1890	N 510	O 557	S 20	0	0

• Molecule 23 is a protein called snRNA-activating protein complex subunit 4.

Mol	Chain	Residues		At	AltConf	Trace			
23	С	303	Total 2516	C 1574	N 453	0 479	S 10	0	0

• Molecule 24 is a protein called snRNA-activating protein complex subunit 5.

Mol	Chain	Residues		Ato	\mathbf{ms}	AltConf	Trace		
24	d	52	Total 424	C 259	N 81	0 81	S 3	0	0

• Molecule 25 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf						
25	А	2	Total Zn 2 2	0						
25	В	1	Total Zn 1 1	0						
25	С	1	Total Zn 1 1	0						
25	Ι	2	Total Zn 2 2	0						
25	J	1	Total Zn 1 1	0						
25	L	1	Total Zn 1 1	0						
25	М	1	Total Zn 1 1	0						
25	b	2	Total Zn 2 2	0						

• Molecule 26 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Lig-



and of Interest" by depositor).

Mol	Chain	Residues	Ato	AltConf	
26	А	1	Total 1	Mg 1	0



3 Residue-property plots (i)

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



• Molecule 1: DNA-directed RNA polymerase subunit

[•] Molecule 2: DNA-directed RNA polymerase subunit beta



• Molecule 3	: DNA-directed RNA polymerase II subunit RPB3	
Chain C:	93%	7%
MET P2 8132 ARG ARG ARG ARG ARG	PRO SER ASP TYR VAL GLU GLU GLU CLU LEU ASN ASN	
• Molecule 4	: RNA polymerase II subunit D	
Chain D:	90%	10%
MET ALA ALA ALA GLY GLY CLY SER SER ARG ARG	GLY ASP VAL E14 E14 E125 F140 C141 TTR	
• Molecule 5	: DNA-directed RNA polymerase II subunit E	
Chain E:	99%	
MET D2 R52 R162 Q210		
• Molecule 6	: DNA-directed RNA polymerase II subunit F	
Chain F:	62% 38%	
MET SER ASP ASN GLU ASP ASP ASP	ASP ASP ASP ASP ASP ASP ASP ASP CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU	
• Molecule 7	: DNA-directed RNA polymerase II subunit RPB7	
Chain G:	99%	
M1 K81 M131 E133 E133	SER 71	
• Molecule 8	: DNA-directed RNA polymerases I, II, and III subunit	RPABC3
Chain H:	99%	•
MET A2 A149 PHE		
• Molecule 9	: DNA-directed RNA polymerase II subunit RPB9	
Chain I:	91%	9%
MET RLU PRO ASP GLY THR TYR GLU PRO		

WORLDWIDE PROTEIN DATA BANK • Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:	g	96%	•	
M1 LEU LUNS				
• Molecule 11: RNA p	oolymerase II subu	unit J		
Chain K:		98%		
M1 C C 115 LLE GLU				
• Molecule 12: RNA p	oolymerase II subu	unit K		
Chain L:	76%		24%	
MET ASP ASP CGLN CLN CGLN ASP ASP CGLN PRO CLN PRO CGLN PRO CGLN PRO CGLN	888 8			
• Molecule 13: Transc	ription initiation f	factor IIB		
Chain M:	77%		23%	
MET ALA ALA SER THR SER SER ARG ALA ALA ALA ALA ALA ALA T14 T14 T14 T14	PHE SER ASP ASP ASP ALA THR THR TVS PRO SER ARC YAL	GLY ASP SER GLM ASN PRO PRO LEU LEU CLEU GLY ASP GLY ASP LEU	SER THR MET MET MET CLY CLY CLY CLY CLY ALA ALA ALA ALA ALA ALA ALA ALA CLU CLU CLU CLU CLU	ASN
SER LYS CLA GLA ARG ARG ARG SER ARG ARA ARA ARA ARA	P314 GLN LEU			
• Molecule 14: Non-te	mplate strand			
Chain N:	54%	15%	31%	
DG DG DD DD DD DG DG C - 26 C	60 620 621 622 823 824 825 627 627 832		000 000 000 000 000 000 000 000 000 00	
• Molecule 15: TATA-	-box-binding prote	ein		
Chain O:	53%		47%	
MET ASP GLN ASN ASN ASN ASN ASN PRO PRO PRO PRO CLN ALA ALA ALA ALA ALA	PRO GLN GLY GLY ALA ALA ALA AET PRO GLY ILE PRO FRO FRO SER	PRO MET MET PRO TYR GLY GLY LEU THR PRO GLN	ILE GLN ASN THR ASN SER SER SER LEU CLU GLU GLU GLN GLN GLN GLN	GLN
GLN GLN GLN GLN GLN GLN GLN GLN GLN GLN	GLN GLN GLN GLN GLN GLN GLN GLN GLN GLN	GLN GLN GLN GLN GLN GLN ALA ALA ALA ALA ALA ALA VAL	GLN GLN SER SER SER GLN GLN GLN GLN GLN GLY ALA ALA ALA	GLN
LEU PHE PHE SER SER SER CLN THR THR PHO FLO CLU CLU CLU CLU CLU CLU CLU CLU CLU THR THR	PRIO LEEU TTR PRIO SER SER NET THR PRIO PRIO PRIO TLLE	THR PRO ALA ALA PRO PRO ALA SER GIU SER SER SER THR	ТНК	
		WORLDWIDE PROTEIN DATA BANK		





• Molecule 17: General transcription factor IIF subunit 2





111 111 111 111 111 111 111 111
SER GLU GLU ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP
• Molecule 20: Transcription initiation factor IIA subunit 2
Chain V: 89% 11%
ALA ALA ALA ALA ASIN ASIN ASIN ASIN ASIN ASIN ASIN ASI
• Molecule 21: snRNA-activating protein complex subunit 1
Chain a: 58% 42%
MET MET MET FRD FRD FRD FRD FRD FRD FRD FRD FRD FRD
R230 K231 M232 P233 P233 P233 P233 P233 P233 P233
ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP
A GLU LEEU SER SER THR THR THR THR CLYS A ARG A ARG HIS HIS
• Molecule 22: $snRNA$ -activating protein complex subunit 3
Chain b: 89% 11%
MET MET ALA SER SER ARG CLY CTY SER ARG CLY CTY CLY CLY CLY CLY CLY CLY CLY CLY CLY CL
\bullet Molecule 23: snRNA-activating protein complex subunit 4
Chain c: 21% 79%
MET ASP ASP ASP ASP ASP ASP ASP CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU
CLU CLU CLU CLU CLU ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP
ASP CASP CASP CASP CASP CASP PRO SER THR THR THR THR THR THR THR TASP CASP CASP CASP CASP CASP CASP CASP C

WORLDWIDE PROTEIN DATA BANK

ARG	TYR	ARG	ARG	LEU	PHE	SER	LEU	LYS	GLY	TRP	ASN	LEU	GLU	GLU	GLU	TEU	ILE	GLU 1 FII	ILE	GLU	LYS TYR	GLY	VAL	SIH	TRP	ALA 1 VS	ILE	ALA	GLU	LEU	HIS	SER	GLY	NID	CYS	LEU	LYS	TRP	ILE	MET	CLY GLY
LYS	GLN	TEU	ARG	ARG	ARG	ARG	ALA	ARG	HIS	VAL	ARG	TRP	SER	THR	SER	SER	GLY	SFR	SER	GLY	SER	GLY	GLY	SER	SER	SER	SER	SER	SER	CLU	ASP	PRO	GLU	AL.A	GLN	ALA	GLU	GLY	ARG	ALA LEU	LEU SER
PRO	GLN	MET	VAL	PRO ASD	MET	ASP	TRP	VAL	PRO ALA	ARG	GLN	SER	SER	GLN	PRO TRD	ARG	GL Y	GL Y AT A	GLY	ALA	TRP LEU	GLY	GLY	ALA	ALA	SER I FII	SER	PRO	LYS	GLY	SER	ALA SER	GLN	GL Y	SER	LYS	ALA	SER THR	THR	ALA ALA	ALA PRO
GLY	GLU	THR	SER	PRO VAI	GLN	VAL	ALA	ARG	ALA HTS	GLY	PR0	VAL	ARG	SER	ALA	ALA	SER	SFR	ALA	ASP	THR	PRO	ALA	ALA	GLU	LYS	ALA	LEU	GLY	GLY	ARG	LEU	THR	PRO	VAL	GLU THR	VAL	LEU ARG	VAL	ARG	ALA ASN
THR	ALA	ALA ARG	SER	CYS	GLN	LYS	GLU	LEU	GLN	PRO	PRO	LEU	THR	SER	SER	GLY	VAL	SER	GLY	ASP	VAL	ALA	ARG	SIH	VAL	GLN	LEU	ARG	ARG	ALA	GLN	GLY	GLN	ARG	TRP	ARG HTS	ALA	LEU	ARG	ARG LEU	LEU
ARG	ARG	LEU	LEU	ALA VAT	THR	PRO	VAL	GLY	VAL	VAL	VAL	PRO	THR	GLN	ALA	GLN	ARG	AT A	VAL	VAL	GLN	GLN	ALA	GLY	LEU	GITT	GLN	LEU	GLN	ALA	LEU	SER	THR	VAL.	PHE	THR	PHE	CILN	LEU	нтS	ILE ASP
THR	ALA	CYS	LEU	GLU	VAL	ARG	ARG	LYS	ALA	PRO	PRO	ARG	PRO	GLN	ALA	ALA	ARG	PRO	PRO	VAL	HIS	LEU	GLN GLN	SER	SER	SER AT A	GLN	SER	PRO	GLY	TEU	PRO	ASN	PRO	ALA	GLN	ALA	SER	SER	ALA SER	HIS
GLY	SER	ARG	LEU	ALA SFP	SER	ARG	GLU	ARG	THR	PRO	GLN	ALA	LEU	LEU	ALA SFP	THR	GLY	ARG	PRO	LYS	PRO	THR	VAL	GLU	LEU	CI N	GLU	LYS	LEU	GLN GLN	ALA	ALA	ARG	GL.U AT.A	THR	ARG	PRO	VAL	TEU	PRU SER	GLN
LEU	VAL	SER	SER	VAL	LEU	GLN	PRO	LEU	PRO HTS	THR	PRO	HIS	ARG	PRO	ALA	GLY	PRO	VAT	LEU	ASN	VAL PRO	LEU	SER	PRO	GLY	ALA	ALA	ALA	LYS	PRO	THR	GLY	SER	GLN	GLU	ALA	THR	SER	LYS	ASP LYS	ARG
SER	THR	GLN	ALA	LEU	LEU	ALA	VAL	PHE	SER	ALA	GLU	GLY	ALA	PRO	ALA	SER	GLN	PRU	ALA	LEU	GLY PRO	GLY	GLN	SER	VAL	SER	PRO	GLU	GLY	LEU	GLN	GLN	ALA	AT.A	ALA	SER	TAS	GLN	LEU	GLU	ALA PRO
PRO	PHE	PRO	ALA	ALA	SER	PRO	PRO	LEU	PR0 VAL	GLN	PRO	LEU	LEU	THR	HIS	GLY	GLY	HTS	VAL	ALA	THR	VAL	PRO I EII	PRO	VAL	TRD	VAL	LEU	ALA	GLN GLN	LEU	PRO	VAL	VAL.	PRO	AL.A VAT.	VAL	SER	PRO	ARG PRO	ALA GLY
THR	PRO 21 Y	PRO	ALA	GLY	TEU	ALA	LEU	LEU	PR.O	LEU	THR	GLU	ARG	ALA	ALA	GLY	PRO	ARG AT A	PRO	ALA	LEU SER	SER	SER	GLN	PRO	PRO AT A	ALA	MET	ARG	GLU	GLU	SER	CYS	THR	ASP	THR	ALA	PR.O	THR	ALA	LEU SER
GLN	SER	ALA	GLU	ALA	GLY	SER	ALA	PHE	VAL	GLY	GLU	ALA	VAL	ALA	ARG	ILE	PRO	GLU PRO	ARG	THR	SER	HIS	ALA	PRO	PRO	GLU	GLU	PRO	TRP	SER	ARG	PRO	ALA	ЧН СI.Y	GLY	VAL	PRO	ALA THR	GLU	ARG	GLY THR
PRO	GLY	PRO	SER	GLY	GLN	GLU	ARG	GLY	PRO LETI	GLY	LEU	GLU GLU	LEU	PRO	LEU	GLN	PRO	GLY PRO	GLU	LYS	GLY ALA	LEU	ASP	GLU	LYS	PRO	LEU	PRO	PRO	GLY	GLU	GLY	ALA	ASP	LEU	GLY	LEU	GLN	GLU	GLY	ALA ALA
THR	GLN GLN	TRP	LEU	GL Y	GLN	ARG	VAL	ARG	VAL	TEU	LEU	GLY	ARG	LEU	PR0 TVB	GLN	PR0	AT A	LEU	CYS	SER	ARG	ALA	SER	GLY	LEU	LEU	HIS	LYS	ALA	GLU	STI	ALA	SER	LEU	VAL	GLY	GLY	ALA	GLU ARG	PRO ALA
GLY	ALA	GLN	ALA	SER	GLY	LEU	ARG	GLY	GLN	GLN	ASP	ASN	ALA	TYR	LEU	LEU	ARG	ALA	PHE	LEU	ALA ALA	PHE	THR	PRO	ALA	LEU	ALA	THR	ALA	PR0	GL Y	ARG	THR	1HK LEU	SER	VAL	SER	ARG VAL	GLY	GLU SER	SER GLU
ASP	GLU	LEU	LEU	SER	LEU	GLU	ALA	ASP	ARG	GLY	GLN	PRO	CYS	THR	THR	THR	CYS	TI F	GLN	GLY	PRO	ASP	SER	TAS	CYS	SER	SER	SER	LEU	ASP	SER	ASP	PRO	ASP	LEU	ASP	LEU	ARG THR	ARG	ALA	ARG HIS

THR ARG LYS ARG ARG ARG LEU VAL

 \bullet Molecule 24: snRNA-activating protein complex subunit 5

 27%

 Chain d:
 53%
 47%





SER HIS VAL THR GLU GLU GLU GLU GLU GLU SER SER



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	47293	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{\AA}^2)$	54.45	Depositor
Minimum defocus (nm)	300	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.193	Depositor
Minimum map value	-0.055	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.0183	Depositor
Map size (Å)	419.99997, 419.99997, 419.99997	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles $(^{\circ})$	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)

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

Mal	Bond lengths		Bond	angles	
	Ullalli	RMSZ	# Z > 5	RMSZ	# Z > 5
1	А	0.25	0/11479	0.41	0/15496
2	В	0.28	0/9257	0.42	0/12493
3	С	0.27	0/2102	0.43	0/2857
4	D	0.24	0/1064	0.35	0/1428
5	Е	0.25	0/1752	0.40	0/2366
6	F	0.27	0/646	0.40	0/871
7	G	0.25	0/1382	0.40	0/1874
8	Н	0.28	0/1207	0.46	0/1628
9	Ι	0.25	0/949	0.44	0/1284
10	J	0.29	0/516	0.42	0/696
11	Κ	0.27	0/939	0.42	0/1271
12	L	0.31	0/378	0.40	0/500
13	М	0.25	0/1909	0.42	0/2580
14	Ν	0.94	14/1538~(0.9%)	0.88	0/2376
15	0	0.25	0/1448	0.43	0/1948
16	Q	0.24	0/1167	0.39	0/1576
17	R	0.29	0/1817	0.45	0/2445
18	Т	1.03	13/1496~(0.9%)	0.88	0/2302
19	U	0.24	0/747	0.43	0/1005
20	V	0.25	0/803	0.45	0/1088
21	a	0.24	0/1851	0.39	0/2493
22	b	0.24	0/3053	0.43	0/4131
23	с	0.24	0/2562	0.40	0/3440
24	d	0.24	0/425	0.46	0/564
All	All	0.35	27/50487~(0.1%)	0.46	0/68712

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms		Observed(Å)	Ideal(Å)
14	Ν	-7	DG	C1'-N9	-7.92	1.36	1.47
14	Ν	-9	DG	C1'-N9	-7.87	1.36	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
14	Ν	24	DA	C1'-N9	-7.56	1.36	1.47
18	Т	-28	DA	C1'-N9	-7.54	1.36	1.47
18	Т	-9	DA	C1'-N9	-7.51	1.36	1.47
18	Т	5	DG	C1'-N9	-7.17	1.37	1.47
14	Ν	20	DG	C1'-N9	-7.01	1.37	1.47
18	Т	-23	DG	C1'-N9	-6.99	1.37	1.47
18	Т	-21	DG	C1'-N9	-6.92	1.37	1.47
14	Ν	34	DA	C1'-N9	-6.76	1.37	1.47
18	Т	3	DA	C1'-N9	-6.74	1.37	1.47
14	Ν	25	DA	C1'-N9	-6.74	1.37	1.47
14	Ν	32	DA	C1'-N9	-6.72	1.37	1.47
14	Ν	-14	DA	C1'-N9	-6.66	1.38	1.47
14	Ν	-8	DA	C1'-N9	-6.47	1.38	1.47
14	Ν	-15	DA	C1'-N9	-6.44	1.38	1.47
18	Т	-29	DA	C1'-N9	-6.36	1.38	1.47
14	Ν	38	DA	C1'-N9	-6.31	1.38	1.47
18	Т	-39	DG	C1'-N9	-6.13	1.38	1.47
14	Ν	27	DG	C1'-N9	-6.11	1.38	1.47
14	Ν	0	DG	C1'-N9	-6.09	1.38	1.47
18	Т	-10	DG	C1'-N9	-6.07	1.38	1.47
18	Т	-15	DG	C1'-N9	-6.03	1.38	1.47
18	Т	10	DA	C1'-N9	-5.87	1.39	1.47
18	Т	-20	DC	C1'-N1	5.85	1.56	1.49
18	Т	21	DA	C1'-N9	-5.79	1.39	1.47
14	Ν	22	DA	C1'-N9	-5.69	1.39	1.47

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There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.



Mol	Chain	Analysed	Favoured	Allowed	Outliers	tliers Percentiles	
1	А	1413/1970~(72%)	1377 (98%)	36~(2%)	0	100	100
2	В	1130/1174~(96%)	1098 (97%)	32 (3%)	0	100	100
3	С	253/275~(92%)	247 (98%)	6 (2%)	0	100	100
4	D	126/142~(89%)	124 (98%)	2 (2%)	0	100	100
5	Е	207/210~(99%)	203 (98%)	4 (2%)	0	100	100
6	F	77/127~(61%)	74 (96%)	3 (4%)	0	100	100
7	G	169/172~(98%)	165 (98%)	4 (2%)	0	100	100
8	Н	146/150~(97%)	143 (98%)	3 (2%)	0	100	100
9	Ι	112/125~(90%)	106 (95%)	6 (5%)	0	100	100
10	J	62/67~(92%)	62 (100%)	0	0	100	100
11	К	113/117~(97%)	112 (99%)	1 (1%)	0	100	100
12	L	42/58~(72%)	41 (98%)	1 (2%)	0	100	100
13	М	238/316~(75%)	231 (97%)	7 (3%)	0	100	100
15	Ο	177/339~(52%)	174 (98%)	3 (2%)	0	100	100
16	Q	134/517~(26%)	129 (96%)	5 (4%)	0	100	100
17	R	218/249~(88%)	211 (97%)	7 (3%)	0	100	100
19	U	84/376~(22%)	79 (94%)	5 (6%)	0	100	100
20	V	95/109 (87%)	87 (92%)	8 (8%)	0	100	100
21	a	211/368~(57%)	207 (98%)	4 (2%)	0	100	100
22	b	359/411 (87%)	336 (94%)	23 (6%)	0	100	100
23	с	299/1469~(20%)	288 (96%)	11 (4%)	0	100	100
24	d	50/98~(51%)	50 (100%)	0	0	100	100
All	All	5715/8839~(65%)	5544 (97%)	171 (3%)	0	100	100

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent side chain 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



Mol	Chain	Analysed	Rotameric	Outliers	Perce	ntiles
1	А	1254/1749~(72%)	1253 (100%)	1 (0%)	93	98
2	В	994/1027~(97%)	991 (100%)	3 (0%)	92	97
3	С	234/252~(93%)	234 (100%)	0	100	100
4	D	118/126 (94%)	118 (100%)	0	100	100
5	Е	191/192~(100%)	189 (99%)	2 (1%)	76	88
6	F	69/111~(62%)	69 (100%)	0	100	100
7	G	152/153~(99%)	151 (99%)	1 (1%)	84	92
8	Н	129/131~(98%)	129 (100%)	0	100	100
9	Ι	103/112~(92%)	103 (100%)	0	100	100
10	J	53/56~(95%)	53 (100%)	0	100	100
11	К	104/106~(98%)	104 (100%)	0	100	100
12	L	41/55~(74%)	41 (100%)	0	100	100
13	М	206/268~(77%)	206 (100%)	0	100	100
15	Ο	154/293~(53%)	154 (100%)	0	100	100
16	Q	121/448 (27%)	120 (99%)	1 (1%)	81	91
17	R	196/218~(90%)	195 (100%)	1 (0%)	88	94
19	U	82/324~(25%)	82 (100%)	0	100	100
20	V	89/98~(91%)	89 (100%)	0	100	100
21	a	198/334~(59%)	197 (100%)	1 (0%)	88	94
22	b	323/356~(91%)	323 (100%)	0	100	100
23	с	270/1213~(22%)	270 (100%)	0	100	100
24	d	48/93~(52%)	48 (100%)	0	100	100
All	All	5129/7715~(66%)	5119 (100%)	10 (0%)	93	98

analysed, and the total number of residues.

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	А	61	ARG
2	В	199	LYS
2	В	897	ARG
2	В	1131	ARG
5	Е	52	ARG
5	Ε	162	ARG

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Mol	Chain	Res	Type
7	G	81	LYS
16	Q	151	ARG
17	R	230	LYS
21	а	200	LYS

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

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 12 ligands modelled in this entry, 12 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.



5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.



6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-15006. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections (i)

6.1.1 Primary map



6.1.2 Raw map



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



6.2 Central slices (i)

6.2.1 Primary map



X Index: 200



Y Index: 200



Z Index: 200

6.2.2 Raw map



X Index: 200

Y Index: 200

Z Index: 200 $\,$

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: 218



Y Index: 208



Z Index: 243

6.3.2 Raw map



X Index: 218

Y Index: 208

Z Index: 243

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



6.4.2 Raw map



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 0.0183. 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.



Mask visualisation (i) 6.6

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

A mask typically either:

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

$emd_{15006}msk_{1.map}$ (i) 6.6.1





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 1079 nm^3 ; this corresponds to an approximate mass of 975 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.



7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.294 $\mathrm{\AA^{-1}}$



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 0.294 $\mathrm{\AA^{-1}}$



8.2 Resolution estimates (i)

$\begin{bmatrix} Bosolution ostimato (Å) \end{bmatrix}$	Estimation criterion (FSC cut-off)			
Resolution estimate (A)	0.143	0.5	Half-bit	
Reported by author	3.40	-	-	
Author-provided FSC curve	3.36	3.93	3.43	
Unmasked-calculated*	4.30	8.32	4.43	

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.30 differs from the reported value 3.4 by more than 10 %



9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-15006 and PDB model 7ZX7. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay (i)



The images above show the 3D surface view of the map at the recommended contour level 0.0183 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 (0.0183).



9.4 Atom inclusion (i)



At the recommended contour level, 98% of all backbone atoms, 95% of all non-hydrogen atoms, are inside the map.



1.0

0.0 <0.0

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.0183) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9500	0.2670
А	0.9770	0.3270
В	0.9610	0.3300
С	0.9810	0.3970
D	0.8760	0.1340
Е	0.9810	0.2990
F	0.9760	0.3720
G	0.9230	0.1600
Н	0.9880	0.3930
Ι	0.9780	0.2570
J	0.9560	0.3670
K	0.9800	0.4280
L	0.9660	0.2890
М	0.9650	0.3220
Ν	0.9740	0.2010
0	0.9770	0.2550
Q	0.9310	0.1400
R	0.9440	0.1430
Т	0.9720	0.1930
U	0.9580	0.1760
V	0.9700	0.1960
a	0.7910	0.1270
b	0.9580	0.1220
С	0.8780	0.1260
d	0.4590	0.1120

