Full wwPDB EM Validation Report

Apr 16, 2024 – 06:12 am BST

PDB ID	:	7BOG
EMDB ID	:	EMD-12242
Title	:	Bacterial 30S ribosomal subunit assembly complex state E (body domain)
Authors	:	Schedlbauer, A.; Iturrioz, I.; Ochoa-Lizarralde, B.; Diercks, T.; Lopez-Alonso, J.; Kaminishi, T.; Capuni, R.; Astigarraga, E.; Gil-Carton, D.; Fucini, P.; Connell, S.
Deposited on	:	2021-01-25
Resolution	:	2.75 Å(reported)
Based on initial model	:	4YBB

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

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

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

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

EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	FAILED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.75 Å.

There are no overall percentile quality scores available for this entry.

MolProbity failed to run properly - the sequence quality summary graphics cannot be shown.

2 Entry composition

There are 14 unique types of molecules in this entry. The entry contains 33589 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 RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1071	Total 23015	C 10266	N 4236	O 7442	P 1071	0	0

- Molecule 2 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	205	Total 1643	C 1026	N 315	O 298	S 4	0	0

- Molecule 3 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	156	Total 1152	C 717	N 217	O 212	S 6	0	0

- Molecule 4 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	F	106	Total 862	C 545	N 156	O 154	S 7	0	0

- Molecule 5 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	H	129	Total 979	C 616	N 173	O 184	S 6	0	0

- Molecule 6 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	K	117	Total 877	C 540	N 174	O 160	S 3	0	0

- Molecule 7 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	L	123	Total	C	N	O	S	0	0
			957	591	196	165	5		

- Molecule 8 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	O	88	Total	C	N	O	S	0	0
			714	439	144	130	1		

- Molecule 9 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	P	82	Total	C	N	O	S	0	0
			649	406	128	114	1		

- Molecule 10 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	Q	80	Total	C	N	O	S	0	0
			648	411	121	113	3		

- Molecule 11 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	R	65	Total	C	N	O	S	0	0
			535	339	100	95	1		

- Molecule 12 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	T	86	Total	C	N	O	S	0	0
			670	414	138	115	3		

- Molecule 13 is a protein called 30S ribosome-binding factor.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	V	99	Total	C	N	O	S	0	0
			783	497	137	144	5		

- Molecule 14 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
14	A	103	Total Mg 103 103	0
14	D	1	Total Mg 1 1	0
14	K	1	Total Mg 1 1	0

MolProbity failed to run properly - this section is therefore empty.

3 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	57144	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 ($e^-/Å^2$)	38.8	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

4 Model quality

4.1 Standard geometry

MolProbity failed to run properly - this section is therefore empty.

4.2 Too-close contacts

MolProbity failed to run properly - this section is therefore empty.

4.3 Torsion angles

4.3.1 Protein backbone

MolProbity failed to run properly - this section is therefore empty.

4.3.2 Protein sidechains

MolProbity failed to run properly - this section is therefore empty.

4.3.3 RNA

MolProbity failed to run properly - this section is therefore empty.

4.4 Non-standard residues in protein, DNA, RNA chains

8 non-standard protein/DNA/RNA residues are 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	UR3	A	1498	1	19,22,23	0.97	0	26,32,35	1.47	1 (3%)
1	5MC	A	1407	1	18,22,23	0.95	2 (11%)	26,32,35	1.12	3 (11%)
1	MA6	A	1518	1	18,26,27	0.98	1 (5%)	19,38,41	1.86	6 (31%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
1	G7M	A	527	1	20,26,27	0.94	1 (5%)	17,39,42	1.07	2 (11%)
1	PSU	A	516	1,14	18,21,22	1.39	3 (16%)	22,30,33	1.90	4 (18%)
1	MA6	A	1519	1	18,26,27	0.96	1 (5%)	19,38,41	1.88	6 (31%)
7	D2T	L	89	7	7,9,10	0.99	1 (14%)	6,11,13	1.71	1 (16%)
1	2MG	A	1516	1	18,26,27	0.88	1 (5%)	16,38,41	1.21	3 (18%)

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	UR3	A	1498	1	-	0/7/25/26	0/2/2/2
1	5MC	A	1407	1	-	0/7/25/26	0/2/2/2
1	MA6	A	1518	1	-	1/7/29/30	0/3/3/3
1	G7M	A	527	1	-	3/3/25/26	0/3/3/3
1	PSU	A	516	1,14	-	0/7/25/26	0/2/2/2
1	MA6	A	1519	1	-	4/7/29/30	0/3/3/3
7	D2T	L	89	7	-	2/7/12/14	-
1	2MG	A	1516	1	-	0/5/27/28	0/3/3/3

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	516	PSU	C4-N3	-2.93	1.33	1.38
1	A	1407	5MC	C6-C5	2.82	1.39	1.34
1	A	527	G7M	C8-N9	2.79	1.38	1.33
1	A	516	PSU	C6-C5	2.69	1.38	1.35
7	L	89	D2T	O-C	2.58	1.30	1.19
1	A	1516	2MG	C6-N1	-2.47	1.34	1.37
1	A	1519	MA6	C5-C4	2.43	1.47	1.40
1	A	1518	MA6	C5-C4	2.39	1.47	1.40
1	A	1407	5MC	C6-N1	-2.18	1.34	1.38
1	A	516	PSU	C2-N3	-2.09	1.33	1.37

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	1498	UR3	C4-N3-C2	-6.03	118.88	124.56
1	A	516	PSU	N1-C2-N3	5.99	121.92	115.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	516	PSU	C4-N3-C2	-3.90	120.72	126.34
1	A	1518	MA6	C10-N6-C6	-3.52	108.86	119.51
1	A	1519	MA6	C9-N6-C6	-3.49	108.95	119.51
1	A	1518	MA6	N1-C6-N6	3.42	120.66	117.06
1	A	516	PSU	O2-C2-N1	-3.42	119.02	122.79
1	A	1518	MA6	N3-C2-N1	-3.37	123.41	128.68
1	A	1407	5MC	C5-C6-N1	-3.36	119.88	123.34
1	A	1519	MA6	C10-N6-C6	-3.26	109.63	119.51
1	A	1519	MA6	N3-C2-N1	-3.26	123.58	128.68
1	A	1518	MA6	C9-N6-C6	-3.22	109.75	119.51
1	A	1519	MA6	N1-C6-N6	3.19	120.42	117.06
1	A	1519	MA6	C4-C5-N7	-3.18	106.09	109.40
7	L	89	D2T	O-C-CA	-2.96	117.02	124.78
1	A	1518	MA6	C4-C5-N7	-2.91	106.36	109.40
1	A	527	G7M	C2'-C3'-C4'	-2.89	97.03	102.64
1	A	1519	MA6	C10-N6-C9	-2.55	107.90	116.12
1	A	1407	5MC	C5-C4-N3	-2.47	119.01	121.67
1	A	1516	2MG	CM2-N2-C2	-2.34	118.69	123.86
1	A	1516	2MG	C8-N7-C5	2.30	107.38	102.99
1	A	1516	2MG	C5-C6-N1	2.26	117.94	113.95
1	A	1518	MA6	C10-N6-C9	-2.21	109.01	116.12
1	A	527	G7M	O4'-C4'-C3'	-2.09	100.99	105.11
1	A	1407	5MC	O2-C2-N3	-2.08	118.94	122.33
1	A	516	PSU	O4'-C1'-C2'	2.04	108.02	105.14

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	1519	MA6	C5-C6-N6-C9
1	A	1519	MA6	C5-C6-N6-C10
1	A	1519	MA6	N1-C6-N6-C10
1	A	527	G7M	C3'-C4'-C5'-O5'
1	A	527	G7M	O4'-C4'-C5'-O5'
1	A	1519	MA6	N1-C6-N6-C9
7	L	89	D2T	CG-CB-SB-CB1
1	A	1518	MA6	C5-C6-N6-C9
1	A	527	G7M	C4'-C5'-O5'-P
7	L	89	D2T	CA-CB-SB-CB1

There are no ring outliers.

No monomer is involved in short contacts.

4.5 Carbohydrates (i)

There are no monosaccharides in this entry.

4.6 Ligand geometry (i)

Of 105 ligands modelled in this entry, 105 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.

4.7 Other polymers (i)

There are no such residues in this entry.

4.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

5 Map visualisation

This section contains visualisations of the EMDB entry EMD-12242. 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.

5.1 Orthogonal projections

This section was not generated.

5.2 Central slices

This section was not generated.

5.3 Largest variance slices

This section was not generated.

5.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

5.5 Orthogonal surface views

This section was not generated.

5.6 Mask visualisation

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

6 Map analysis

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

6.1 Map-value distribution

This section was not generated.

6.2 Volume estimate versus contour level

This section was not generated.

6.3 Rotationally averaged power spectrum

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

7 Fourier-Shell correlation (i)

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

8 Map-model fit

This section was not generated.