

wwPDB EM Validation Summary Report (i)

Jul 13, 2023 – 07:37 PM EDT

PDB ID	:	8FKQ
EMDB ID	:	EMD-29253
Title	:	Human nucleolar pre-60S ribosomal subunit (State A2)
Authors	:	Vanden Broeck, A.; Klinge, S.
Deposited on	:	2022-12-21
Resolution	:	2.76 Å(reported)

This is a wwPDB EM Validation Summary 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. dev 50
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

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 2.76 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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f EM} {f structures} \ (\#{f Entries})$		
Clashscore	158937	4297		
Ramachandran outliers	154571	4023		
Sidechain outliers	154315	3826		
RNA backbone	4643	859		

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for $\geq=3, 2, 1$ 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	Quality of chain								
1	L1	157	83%	11% • •								
2	L2	1167	5%• 94%									
3	L3	5070	2 5% 5 % • 69%									
4	L6	211	51% • 46%									
5	m L7	203	83% 7'	% 9%								
6	L8	215	• 59% • 37%									
7	L9	204	85%	• 10%								

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Mol	Chain	Length	Quality of chain	
8	LA	184	• 65% •	34%
9	LB	188	77%	• 20%
10	LC	176	9 6%	
11	LE	160	66%	37%
19		140	7%	5270
12	LG	140	/9%	• 19%
13	LH	156	13% 87%	
14	LI	145	87%	6% 8%
15	LK	148	· ·	27%
16	LL	137	85%	• 11%
17	LN	403	87%	7% 6%
18	LQ	135	85%	10% 5%
19	LS	123	94%	5%•
20	LT	110	93%	6% •
21	LU	105	9%	7% •
22	LW	97	7% 	29%
23	NE	361	5% 36% 7% 57%	
24	NG	282	13% 30% • 68%	
25	NN	473	48%	0/2
26	SA	497	720/	220/
20	SC	121	•	2370
21	50	200	66% 7%	27%
28	SD	248		• 15%
29	SE	266	65% 5%	30%
30	SH	293	50% • 499	%
31	SI	255	74%	22%
32	SJ	847	8% 91%	

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Mol	Chain	Length	Quality of chain	
33	SK	245	82%	10% 8%
34	SL	490	47% • 50%	
35	SM	588	71%	26%
36	SN	306	5% 52% · 45%	
37	SO	353	81%	• 16%
38	SR	634	10% · 88%	
39	\mathbf{SS}	746	29% • 68%	
40	ST	365	10% 90%	
41	SV	163	79%	• 16%
42	SW	670	61% 5% 3	34%
43	SZ	178	90%	10%

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2 Entry composition (i)

There are 45 unique types of molecules in this entry. The entry contains 93805 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 5.8S rRNA.

Mol	Chain	Residues		А	AltConf	Trace			
1	L1	150	Total 3189	C 1423	N 561	O 1055	Р 150	0	0

• Molecule 2 is a RNA chain called ITS2 rRNA.

Mol	Chain	Residues		\mathbf{A}^{\dagger}	toms	AltConf	Trace		
2	L2	69	Total 1468	C 653	N 263	0 483	Р 69	0	0

• Molecule 3 is a RNA chain called 28S rRNA.

Mol	Chain	Residues		I	AltConf	Trace			
3	L3	1565	$\begin{array}{c} \text{Total} \\ 33557 \end{array}$	C 14935	N 6157	O 10900	Р 1565	0	0

• Molecule 4 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	L6	114	Total 936	C 583	N 206	0 146	S 1	0	0

• Molecule 5 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues		At	oms	AltConf	Trace		
5	L7	184	Total 1507	C 976	N 290	0 237	$\begin{array}{c} \mathrm{S} \\ \mathrm{4} \end{array}$	0	0

• Molecule 6 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L8	135	Total 1111	C 713	N 213	0 178	${ m S} 7$	0	0



• Molecule 7 is a protein called 60S ribosomal protein L15.

Mol	Chain	Residues		At	oms			AltConf	Trace
7	L9	183	Total 1553	C 979	N 327	0 243	${f S}$ 4	1	0

• Molecule 8 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues		At	AltConf	Trace			
8	LA	121	Total 981	C 616	N 182	0 176	${f S}{7}$	0	0

• Molecule 9 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues		At	Atoms						
9	LB	151	Total 1223	C 768	N 247	O 203	${ m S}{ m 5}$	0	0		

• Molecule 10 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues		\mathbf{A}		AltConf	Trace		
10	LC	173	Total 1431	C 908	N 281	0 231	S 11	0	0

• Molecule 11 is a protein called 60S ribosomal protein L21.

Mol	Chain	Residues		Ato	ms	AltConf	Trace	
11	LE	108	Total 702	C 430	N 138	0 134	0	0

• Molecule 12 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues		At	oms	AltConf	Trace		
12	LG	114	Total 844	C 532	N 155	0 152	${ m S}{ m 5}$	0	0

• Molecule 13 is a protein called 60S ribosomal protein L23a.

Mol	Chain	Residues	1	Ator	ns	AltConf	Trace	
13	LH	20	Total 146	C 95	N 29	0 22	0	0

• Molecule 14 is a protein called 60S ribosomal protein L26.



Mol	Chain	Residues		At	oms			AltConf	Trace
14	LI	134	Total 1115	C 700	N 226	O 186	${ m S} { m 3}$	0	0

• Molecule 15 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues		At	oms	AltConf	Trace		
15	LK	108	Total 642	C 388	N 137	0 115	${ m S} { m 2}$	0	0

• Molecule 16 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues		At	oms	AltConf	Trace		
16	LL	122	Total 980	C 607	N 204	0 165	$\begin{array}{c} \mathrm{S} \\ \mathrm{4} \end{array}$	0	0

• Molecule 17 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues		At	AltConf	Trace			
17	LN	377	Total 3044	C 1937	N 566	O 527	S 14	0	0

• Molecule 18 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues		At	AltConf	Trace			
18	LQ	128	Total 1053	C 667	N 216	0 165	${ m S}{ m 5}$	0	0

• Molecule 19 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues		At	oms	AltConf	Trace		
19	LS	122	Total 1015	C 641	N 205	0 168	S 1	0	0

• Molecule 20 is a protein called 60S ribosomal protein L35a.

Mol	Chain	Residues		At	oms	AltConf	Trace		
20	LT	109	Total 876	C 555	N 174	0 144	${ m S} { m 3}$	0	0

• Molecule 21 is a protein called 60S ribosomal protein L36.



Mol	Chain	Residues		At	oms	AltConf	Trace		
21	LU	102	Total 840	C 526	N 180	0 129	${f S}{5}$	1	0

• Molecule 22 is a protein called 60S ribosomal protein L37.

Mol	Chain	Residues		Ate	oms	AltConf	Trace		
22	LW	69	Total 563	C 346	N 126	O 86	${ m S}{ m 5}$	0	0

• Molecule 23 is a protein called Surfeit locus protein 6.

Mol	Chain	Residues		At	oms	AltConf	Trace		
23	NE	156	Total 1331	C 810	N 293	0 226	$\begin{array}{c} \mathrm{S} \\ \mathrm{2} \end{array}$	0	0

• Molecule 24 is a protein called RRP15-like protein.

Mol	Chain	Residues		At	oms	AltConf	Trace		
24	NG	89	Total 738	C 456	N 145	0 133	${f S}$ 4	0	0

• Molecule 25 is a protein called Suppressor of SWI4 1 homolog.

Mol	Chain	Residues		At	AltConf	Trace			
25	NN	244	Total 1950	C 1230	N 371	O 338	S 11	0	0

• Molecule 26 is a protein called 60S ribosomal protein L4.

Mol	Chain	Residues		At	AltConf	Trace			
26	SA	329	Total 2645	C 1675	N 522	0 435	S 13	0	0

• Molecule 27 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues		At			AltConf	Trace	
27	SC	211	Total 1692	C 1090	N 320	0 278	${S \atop 4}$	0	0

• Molecule 28 is a protein called 60S ribosomal protein L7.



Mol	Chain	Residues		At	oms			AltConf	Trace
28	SD	212	Total 1755	C 1127	N 334	O 285	S 9	0	0

• Molecule 29 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues		At	oms	AltConf	Trace		
29	SE	186	Total 1498	C 951	N 290	O 253	$\frac{S}{4}$	0	0

• Molecule 30 is a protein called MKI67 FHA domain-interacting nucleolar phosphoprotein.

Mol	Chain	Residues		At	oms	AltConf	Trace		
30	SH	150	Total 1267	C 819	N 224	0 220	$\frac{S}{4}$	0	0

• Molecule 31 is a protein called 60S ribosomal protein L7-like 1.

Mol	Chain	Residues		At	oms			AltConf	Trace
31	SI	199	Total 1661	C 1076	N 311	O 270	${S \atop 4}$	1	0

• Molecule 32 is a protein called pre-rRNA 2'-O-ribose RNA methyltransferase FTSJ3.

Mol	Chain	Residues		Ato	ms		AltConf	Trace
32	SJ	72	Total 609	C 385	N 114	O 110	0	0

• Molecule 33 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues		At	oms			AltConf	Trace
33	SK	226	Total 1721	C 1070	N 296	0 343	S 12	0	0

• Molecule 34 is a protein called Ribosomal L1 domain-containing protein 1.

Mol	Chain	Residues		Ate		AltConf	Trace		
34	SL	243	Total 1960	C 1254	N 344	O 356	S 6	0	0

• Molecule 35 is a protein called Pescadillo homolog.



Mol	Chain	Residues		At	AltConf	Trace			
35	SM	437	Total 3452	C 2229	N 603	O 609	S 11	0	0

• Molecule 36 is a protein called Probable rRNA-processing protein EBP2.

Mol	Chain	Residues		At	oms	AltConf	Trace		
36	SN	168	Total 1308	C 821	N 247	O 235	${ m S}{ m 5}$	0	0

• Molecule 37 is a protein called Ribosome biogenesis protein BRX1 homolog.

Mol	Chain	Residues		At	oms			AltConf	Trace
37	SO	296	Total 2460	C 1583	N 446	0 416	S 15	0	0

• Molecule 38 is a protein called GTP-binding protein 4.

Mol	Chain	Residues		At	\mathbf{oms}	AltConf	Trace		
38	SR	77	Total 642	C 411	N 107	0 122	${S \over 2}$	0	0

• Molecule 39 is a protein called Ribosome biogenesis protein BOP1.

Mol	Chain	Residues		A	toms	5			AltConf	Trace
39	\mathbf{SS}	235	Total 1955	C 1238	N 348	O 360	Р 2	S 7	0	0

• Molecule 40 is a protein called Ribosome biogenesis regulatory protein homolog.

Mol	Chain	Residues		Atc	\mathbf{ms}	AltConf	Trace		
40	ST	36	Total 263	C 160	N 51	O 51	S 1	0	0

• Molecule 41 is a protein called Probable ribosome biogenesis protein RLP24.

Mol	Chain	Residues		\mathbf{A}	toms			AltConf	Trace
41	SV	137	Total 1171	C 745	N 227	0 189	S 10	0	0

• Molecule 42 is a protein called ATP-dependent RNA helicase DDX18.



Mol	Chain	Residues		At	AltConf	Trace			
42	SW	445	Total 3560	C 2288	N 609	O 646	S 17	0	0

• Molecule 43 is a protein called Nucleolar protein 16.

Mol	Chain	Residues	Atoms				AltConf	Trace	
43	SZ	160	Total 1338	C 835	N 260	0 238	${ m S}{ m 5}$	0	0

• Molecule 44 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	AltConf
44	L1	4	Total Mg 4 4	0
44	L2	1	Total Mg 1 1	0
44	L3	42	TotalMg4242	0
44	L9	1	Total Mg 1 1	0
44	LQ	1	Total Mg 1 1	0
44	LT	1	Total Mg 1 1	0
44	SA	1	Total Mg 1 1	0

• Molecule 45 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
45	LW	1	Total Zn 1 1	0
45	SV	1	Total Zn 1 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: 5.8S rRNA















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WORLDWIDE PROTEIN DATA BANK



• Molecule 4: 60S ribosomal protein L13



• Molecule 9:	60S ribosomal protein L18	
Chain LB:	77% •	20%
MET 62 734 N40 R65 R108	T122 T122 T122 T123 T123 T123 T123 T12 T12 T12 T12 T12 T12 T12 T12 T12 T12	GLY TYR LYS ASN
• Molecule 10	0: 60S ribosomal protein L18a	
Chain LC:	96%	
M1 R87 S88 V106 R118 A119	H120 H122 H122 H127 H127 H173 PHE	
• Molecule 11	1: 60S ribosomal protein L21	
Chain LE:	11% 66% · 32%	
MET THR ASN THR LYS GLY ARG ARG GLY GLY	TH: TH: ARG ARG ARG ARG ARG ARG CIVS ARG ARG ARG ARG ARG ARG ARG ARG ARG ARG	A71 A71 K78 K78 V80 K81 C82 K83 K83 A86
K87 892 193 K115 A119 A119 K120	E121 LYS GLY THR V126 V126 P155 P155 ALA ALA	
• Molecule 12	2: 60S ribosomal protein L23	
Chain LG:	79% .	19%
MET SER LYS ARG GLY ARG ARG ARG SER SER SER	ALA ALA ALA ALA ALA ARG ILE SER SER ARG C44 ASU ASU ASU ASU ASU ASU ASU ASU ASU ASU	199 <mark>0 1990 1990 1990 1990 1990 1990 1990</mark>
• Molecule 13	3: 60S ribosomal protein L23a	
Chain LH:	13% 87%	
MET ALA PRO LYS LYS LYS GLU ALA PRO	ALA ALA ALA ALA ALA ALA ALA ALA ALA ALA	LYS TYR PRO ARO SER SER ALA ARG ARG ARG ARG ARG
LEU ASP HIS ALA ALA ALA ILE LVS PHE PRO	112 112 112 112 114 114 114 114 114 114	ALL ALA ALA ALA ALA ALA ASN THR LLEU TLLE ARG PRO
ASP GLY GLU LYS LYS LYS ALA ALA VAL ARG	ALA ASP ASP ASP ASP ASP ASS ASS ASS ILE ILE ILE ILE	
• Molecule 14	4: 60S ribosomal protein L26	
Chain LI:	87%	6% 8%





• Molecule 20: 60S ribosomal protein L35a



Chain LT:		93%		6% •
MET 82 V33 E38 E38 L43 K62	R89 R109 T110			
• Molecule 21	: 60S ribosomal	protein L36		
Chain LU:	%	90%		7% •
MET A2 L3 R4 M7 G10	N12 K12 K13 K47 V47 C48 C48 C48 C48 C49 F50 Y53	V77 R82 V93 LYS ASP		
• Molecule 22	: 60S ribosomal	protein L37		
Chain LW:	<u>%</u>	66%	5%	29%
MET THR LIYS GLY GLY THR SER SER PHE GLY CLYS	ARIG ASIG ASIG ASI T15 C29 C30 C30 K31	K46 TYR ASN TRP SER A51 A53 K52 A53 K54 K54 K55 K53 K55 K53	H76 H76 T82 ARG ARG ALA ALA ALA ALA ALA ALA ALA	S ER S S
• Molecule 23	: Surfeit locus p	protein 6		
Chain NE:	36%	7%	57%	
MET ALA SER LEU LEU LEU ALA ASP ALA ATYR	LEU GLN SER LLYS LYS LYS TLE CYS SER HIS SER	ALA PRO GLU GLN GLN ALA ARG ALA ALA CLYS	THR GLN GLY SER GLU THR ALA FLU PRO PRO LYS LYS LYS	LYS LYS LYS THR GLN LYS PHE LYS PHE LYS ARG CYS CS CU GLU GLU
LYS ALA ALA ALA GLU HIS CVS LYS SER SER SER LYS	GLY GLU CYS SER SER ALA ALA GLY GLY ALA ARG	PRO GLU GLU GLU GLU GLU GLU ALA ALA ALA SER	SER SER ALA ALA GLY ASN ASN ALA ALA ALA ALA ALA CLU GLU	GLU SER VAL PHE ALA ASP LEU ASP LEU ARG GLN ARG GLN
LEU HIS GLU CVS CLU GLU ALA ALA ALA CLU	GLN SER ALA LYS CLU CLU CLU SER PRO ALA ALA ALA	GLU LYS ARG ARG ARG ARG CLN CLN GLU ARG ARG	LYS LYS ARG LYS ARG GLU ARG ALA ALA ALA ALA ALA	ARG LYS ALA GLU GLU GLU ALA ALA ALA GLU CLU VAL
VAL VAL ALA ALA PRO PRO GLU GLU CYS ALA ALA ALA ALA	PR.0 PR.0 PR.0 PR.0 PR.0 PR.0 PR.0 PR.0	ASP GLU PRO ALA ALA R221 V224	N227 1228 1228 1228 1253 1265 1264 1264	4200 W276 W276 W276 W276 V276 V276 V280 V280 V280 V281 V281 V280
R283 R310 R321 K332 K332 A337	E338 R339 R340 R344 A344 R345 K346 K346 K346 K346	R349 1350 L351 P352 Q353 Q353 C355 E355 R357 ALA	VAL CLY CLY	
• Molecule 24	: RRP15-like pr	rotein		
Chain NG:	13% 30%		68%	
MET ALA ALA ALA ALA PRO PRO ASP SER VAL	SER GLU GLU GLU GLU CLEU LYS THR PRO LYS LYS	LYS MET LYS MET WET VAL ALA ALA ALA ALA ALA ALA SER VAL	LEU GLU GLU GLU GLU GLU THR THR THR THR SER SER SER GLU GLY SER	CYS GLY GLU GLU LYS GLU LYS ASP PHE TYR SER ASP ASP
ASP ALA ALA GLU GLU ALA ASP SER GLU GLY	ALA GLU PRO CYS ASP GLU ASN ASN ASP GLU ASP	GLU SER SER VAL CLY THR ASN MET CLY ALA ASP	ALA MET ALA ALA LYS LYS LYS LYS THR PRO CLU SER YYS	PRO THR THR THR THR VAL LVS LVS LVS LVS CLV CLVS CLV







CTU CTU CTU CTU CTU CTU CTU CTU	098 D99 M101 C103 R104 R105 P117 R156	R161 1181 1201 1202 8204 N205 V206 K207	K220 LYS LEU LEU LEU LEU PRG PRG ARG GLU GLU CLU CLU CLU CLU	ASF THR GLU LYS GLU
K239 K260 1264 1278 1278 1278 1286 1286 1286 1286 1286				
• Molecule 28: 60	S ribosomal protein L7			
Chain SD:	82%		15%	
	02.70	_		
MET GLU GLV GLV GLU GLU CYS LYS LYS CLV SLU SLU VAL PRO	VAL PRO GUU THR THR LEU LVS LVS LVS ASN ASN ASN ASN ALA ALA OLU OLU ULEU ULEU	LEU LEU LYS LYS LYS LYS K107 V108 V108 V108 V108 V108 V108	A176 G180 D232 R236 N248	
• Molecule 29: 60	S ribosomal protein L7a	Ŀ		
Chain SE:	65%	5%	30%	
		3 월 3 8 8 8 8 8 8 8 9 5 9 5 9		31
M Y U U U U U U U U U U U U U U U U U U	PF ALL ALL ALL C C C C C C C C C C C C C C C C C C C		AR 11 0 DE 12 DE 12 DE 12 DE 14 DE 1	I
Q90 R113 K121 V128 K186 V207	1215 1218 1222 1222 1222 1222 1223 1223 1223	ALA ARG TLE ALA ALA LYS CJU LYS ALA ALA ALA LYS CJU	LEU ALA THR LYS LEU GLY	
• Molecule 30: M	KI67 FHA domain-inter	acting nucleolar p	ohosphoprotein	
Chain SH:	50%	•	49%	
			<mark>n v o -</mark>	
MET ALA PHE SER GLY GLY PRO GLY PRO CLY SERU SERU SERU	LEU PROF GLUU GLUU GLUU CLUS CLUS CLUS CLUS CLUS CLUS CLUS C	THRE THRE GLNU GLNU GLN GLN GLN GLN	113 113 113 113 114 114 114 114 114 114	ASN
GLN THR SER THR LYS CLY GLY GLN VAL LYS LYS	LYS LYS VAL SER GLY CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU	PRO THR PRO VAL CYS CYS PRO PHE LEU CALU ARG	ARG LYS SER GLU GLU ALA ASP ASP ASP ASP ASP ASP ASP	ILE
VAL PHE LYS CLN PRO CLN PRO TLE SER CYS CYS CYS CYS CYS CYS CYS CYS CYS CYS	GLM THR GLM GLM CLN CLN CLN FRD THR HIS SER ARG ARG SER ARG SER ARG	NJE		
• Molecule 31: 60	S ribosomal protein L7-	like 1		
Chain SI:	74%		• 22%	
MET ILE SER SER SER SER CYS THR THR ARG LYS GLU	GLU GLN ARG ARG TLE PTLE PTLE PTLE CU CLEU CLEU CLEU CLEU CLEU CLEU CLEU	TYR TYR GLN ALA LEU LEU LVS ALA ALA CLN ALA ALA	LEU LEU LYS LYS CLY CLY CLY CLY CLY CLY CLY CLY CLY CLY	00H
178 1105 1111 1143 1143	K170 ▼ 1192 15 1245 1245 1245 1245 1245 1245 1245 1245			
• Molecule 32: pr	e-rRNA 2'-O-ribose RN.	A methyltransfera	ase FTSJ3	
Chain SJ:		91%		

W O R L D W I D E PROTEIN DATA BANK





• Molecule 33: Eukaryotic translation initiation factor 6



PRO SER THR ILE ALA ALA ALA SER MET ARG ASP SER LEU ILEU ILEU THR THR

• Molecule 34: Ribosomal L1 domain-containing protein 1

Chain SL:

47%

50%





HIS		
• Molecule 37: Ribosome biogenesi	s protein BRX1 homolog	
Chain SO:	81%	• 16%
MET ALA ALA ALA ALA ALA LYS LYS ARG CLY CLY CLY CLN ALA ALA ALA ALA ALA ALA ALA ALA ALA A	GLU PRO PRO PRO PRO ALA ALA ALA ALA ALA ALA ALA ALA ALA CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU	147 K63 K63 R96 M109 M154 M154
D173 E174 E174 E225 E228 H300 P301 P302 P302 P302 P302 P302 P302 P302 P302	P315 1316 E317 E324 P325 K326 K326 K332 K330 A331 K3344 K3345 K3345 K3345 K3346 K3345 K3346	B349 C3360 K3351 T355 K355 K355
• Molecule 38: GTP-binding protein	in 4	
Chain SR: 10% .	88%	
MET ALA ALA ALA ALA ASN ASN CYS CLYS CLYS CLYS CLYS ASD ALA ALA ALA ALA ALA ALA ALA ALA ALA AL	GLN ARG THR PRO THR PRO THR THR THR THR THR THR GLN THR GLN THR THR THR THR THR THR THR THR THR THR	TYR MET ARG LYS LYS VYL LYS PHE THR GLN CLN ASN TYR ASP
ARG LEU SLEU GLN TLE TLEU TLEU ASP PRO ASP PRO ASP PRO ASP ASP ASP ASP AST ALEU ALEU ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP	TYR ASP ASP ASP ASP HIS TYR LYS LZS LZS CLV CLV CLV CLV CLV ALA ASN CLV CLV CLV ASN ASN ASN ASN ASN ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP	ASP VAL ALA ALA ASP TYS VAL ARC LEU MET LYS TYR CLY
ASP ASP TYR TYR TYR CYS CYS CYS ALA ALA ALA ALA ALA ALA ALA ALA ALA AL	SER SER CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU	ASN THR ARG LEU LEU LEU CYS GLY GLY ASN ASN ASN ASN ASN
LYS SER SER PHE ILE ILE LYS VAL ASP ASP ASP ASP ASP ASP ASP ASP ASP ASP	VAL VAL HIS MET ASP ASP TYR ASP TYR ASP TRP ARC VAL VAL VAL VAL TRP OIN VAL TRP TIRE TIRE TIRE TIRE TIRE TIRE TIRE TIRE	ASP ASP PRO LEU CLU ASP ASC ASC ASC ASC ASS ASS ASS ASS ASS ASS
LLE THR ALA ALA ALA ALA ALA ALA ALA ALA ALA AL	GLU GLU CLU CLU CLU CLU CLU CLU CLU CLU CLU C	VAL ASN ASN ASN ASN ASP ASP ASP ASP ASP ASP ALA GLU LEU SER SER
GLU ASP ASP CLN CLN CLN CLN CLN CLN CLU CLU CLU CLU CLU CLU CLU CLU CLU CLU	GLY VAL LIVE LIVE VAL LIVE VAL CVS ASP CVS ASP ARG ASP ARG ASP ARG ASP ARG CVS ASP ATA ATA THR	LYS MET LYS CLY CLY CLY ASN CLY CAL CNY CLU CLU ASN ARG ARG LEU
H361 F366 F367 F366 F367 B369 D369 D369 D370 F371 F373 F373 C380 V381 VAL VAL ARG C380 VAL ARG C380 VAL ARG C1U C1U	GLU GLU SER ARG ILYS ILYS ILYS ARG GLU GLU CLU CLU CLU CLU CLU CLU CLU CLU CLU C	E424 A439 A439 A441 I442 M447 K448 K448 E451 E451 E451 E453 E454 K455
E456 E457 E458 E458 E458 E458 A463 A463 A463 A463 A463 A463 A463 A463	ILE ARG ARG ARG ARG ILE ILE CYS CVS CVS CVS CVS CVS CVS CVS CVS CVS CV	LU LYS ASN ASN ALN GLY PRO ALN ARG ARG ARG ALA ALA ALA VAL
GLN THR THR VAL VAL CLU CLU CLU CLU CLU CLU CLU CLU CLU CL	GIN ALA ALA ARG ARG SER ARG SER THR THR THR THR ARG CUU ARG CUU ASP ASE ARG ASP ARG ASP ARG ARG ARG ARG ARG ARG ARG ARG ARG ARG	SER SER ALA ALA ARG SER SER CYS SER THR THR ARG THR
ASP VAL SER GLY GLY CLU ASP ASP CLYS LYS CLYS ASN ASN ASN ASN ASN	ARG LEU LEU LEU LYS LYS CLYS CLYS ARC ARC ARC ARC ARC ARC ARC ARC ARC ARC	LEU GLAY GLAY LYS LYS LYS CLYS LYS ARG ARG ARG ARG
• Molecule 39: Ribosome biogenesi	s protein BOP1	
Chain SS: 29% ·	68%	
MET ALA ALA ALA ARG GLY ARG GLY PRO PRO OLU PRO ARG CU PRO CU PRO CU D	PR0 GLU GLU GLU GLU GLU GLU GLU FR0 PR0 FR0 FR0 FR0 FR1 FR1 FR1 FR1 FR1 FR1 FR1 FR1 FR1 FR1	GLY SER ASP GLY VAL VAL SER SER SER VAL VAL PHE











4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	68600	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE	Depositor
	CORRECTION	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{\AA}^2)$	60	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	64000	Depositor
Image detector	GATAN K3 $(6k \ge 4k)$	Depositor
Maximum map value	6.040	Depositor
Minimum map value	-0.046	Depositor
Average map value	0.035	Depositor
Map value standard deviation	0.141	Depositor
Recommended contour level	0.75	Depositor
Map size (Å)	514.56, 514.56, 514.56	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.072, 1.072, 1.072	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: SEP, MG, HIC, 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	Chain	Bond	lengths	Bond angles	
		RMSZ	# Z > 5	RMSZ	# Z > 5
1	L1	0.26	0/3559	0.73	0/5539
2	L2	0.31	0/1634	0.80	0/2538
3	L3	0.29	0/37504	0.77	0/58442
4	L6	0.26	0/953	0.66	0/1276
5	L7	0.28	0/1534	0.57	0/2049
6	L8	0.25	0/1133	0.52	0/1516
7	L9	0.26	0/1595	0.63	0/2132
8	LA	0.25	0/997	0.50	0/1334
9	LB	0.25	0/1239	0.62	0/1658
10	LC	0.26	0/1469	0.57	0/1971
11	LE	0.26	0/708	0.55	0/958
12	LG	0.27	0/856	0.53	0/1149
13	LH	0.25	0/146	0.37	0/190
14	LI	0.26	0/1132	0.58	0/1504
15	LK	0.25	0/648	0.55	0/880
16	LL	0.26	0/995	0.62	0/1334
17	LN	0.26	0/3092	0.53	0/4133
18	LQ	0.25	0/1071	0.57	0/1429
19	LS	0.25	0/1023	0.57	0/1351
20	LT	0.26	0/895	0.59	0/1198
21	LU	0.27	0/854	0.63	0/1129
22	LW	0.25	0/573	0.64	0/755
23	NE	0.25	0/1339	0.63	0/1767
24	NG	0.25	0/743	0.52	0/986
25	NN	0.26	0/1988	0.56	0/2678
26	SA	0.25	0/2694	0.56	0/3617
27	SC	0.25	0/1725	0.56	0/2316
28	SD	0.26	0/1789	0.56	0/2388
29	SE	0.26	0/1524	0.55	0/2056
30	SH	0.28	0/1298	0.51	0/1742
31	SI	0.25	0/1702	0.54	0/2289
32	SJ	0.26	0/623	0.59	0/836



Mal	Chain	Bond	lengths	Bond angles	
10101		RMSZ	# Z > 5	RMSZ	# Z > 5
33	SK	0.26	0/1745	0.53	0/2374
34	SL	0.25	0/1994	0.50	0/2684
35	SM	0.25	0/3530	0.48	0/4779
36	SN	0.25	0/1327	0.51	0/1774
37	SO	0.25	0/2521	0.52	0/3384
38	SR	0.27	0/657	0.52	0/887
39	\mathbf{SS}	0.26	0/1994	0.54	0/2703
40	ST	0.24	0/267	0.48	0/357
41	SV	0.28	0/1194	0.56	0/1582
42	SW	0.26	0/3631	0.49	0/4900
43	SZ	0.25	0/1364	0.53	0/1826
All	All	0.27	0/99259	0.66	0/142390

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	L1	3189	0	1618	7	0
2	L2	1468	0	755	4	0
3	L3	33557	0	17010	105	0
4	L6	936	0	1017	4	0
5	L7	1507	0	1649	13	0
6	L8	1111	0	1174	8	0
7	L9	1553	0	1592	8	0
8	LA	981	0	1013	2	0
9	LB	1223	0	1330	6	0
10	LC	1431	0	1477	5	0
11	LE	702	0	561	3	0
12	LG	844	0	883	3	0
13	LH	146	0	176	0	0
14	LI	1115	0	1205	8	0

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	Chain	Non-H	H(model)	H(addad)	Clashes	Symm-Clashes
15		642		11(added)	2	
$10 \\ 16$		042	0	10/1	5	0
10		3044	0	3178		0
10		1052	0	1147	10	0
10		1055	0	1147	5	0
19		1015 976	0	012	0 5	0
20		870	0	912	3	0
21		840 562	0	930	(F	0
		003 1991	0	090 1420	<u> </u>	0
23	NE NC	1331	0	1430	24	0
24	NG	(38	0	(80	8	0
25		1950	0	2005	10	0
26	SA	2645	0	2823	11	0
27	SC	1692	0	1839	18	0
28	SD	1755	0	1859	5	0
29	SE	1498	0	1601	9	0
30	SH	1267	0	1291	2	0
31	SI	1661	0	1752	7	0
32	SJ	609	0	600	1	0
33	SK	1721	0	1695	16	0
34	SL	1960	0	2052	8	0
35	SM	3452	0	3376	11	0
36	SN	1308	0	1286	8	0
37	SO	2460	0	2551	8	0
38	SR	642	0	630	10	0
39	SS	1955	0	1871	14	0
40	ST	263	0	260	1	0
41	SV	1171	0	1232	9	0
42	SW	3560	0	3641	20	0
43	SZ	1338	0	1352	0	0
44	L1	4	0	0	0	0
44	L2	1	0	0	0	0
44	L3	42	0	0	0	0
44	L9	1	0	0	0	0
44	LQ	1	0	0	0	0
44	LT	1	0	0	0	0
44	SA	1	0	0	0	0
45	LW	1	0	0	0	0
45	SV	1	0	0	0	0
All	All	93805	0	76799	321	0

 α tia d fa

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 2.



Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
34:SL:30:GLN:HE21	34:SL:30:GLN:N	1.69	0.90
3:L3:404:U:O2'	14:LI:87:ARG:NH2	2.13	0.81
23:NE:228:LEU:HD21	23:NE:271:THR:HG21	1.64	0.80
3:L3:2055:G:OP2	5:L7:133:ARG:NH1	2.17	0.78
12:LG:85:ARG:NH1	12:LG:99:GLU:O	2.17	0.77

The worst 5 of 321 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
4	L6	112/211~(53%)	110 (98%)	2(2%)	0	100	100
5	L7	180/203~(89%)	179 (99%)	1 (1%)	0	100	100
6	L8	133/215~(62%)	131 (98%)	2(2%)	0	100	100
7	L9	180/204~(88%)	179 (99%)	1 (1%)	0	100	100
8	LA	115/184~(62%)	113 (98%)	2(2%)	0	100	100
9	LB	149/188~(79%)	149 (100%)	0	0	100	100
10	LC	171/176~(97%)	171 (100%)	0	0	100	100
11	LE	102/160~(64%)	101 (99%)	1 (1%)	0	100	100
12	LG	110/140~(79%)	110 (100%)	0	0	100	100
13	LH	18/156~(12%)	18 (100%)	0	0	100	100
14	LI	132/145~(91%)	131 (99%)	1 (1%)	0	100	100
15	LK	104/148~(70%)	102 (98%)	2(2%)	0	100	100
16	LL	120/137~(88%)	118 (98%)	2 (2%)	0	100	100
17	LN	372/403~(92%)	367 (99%)	5 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
18	LQ	126/135~(93%)	126 (100%)	0	0	100	100
19	LS	120/123~(98%)	119~(99%)	1 (1%)	0	100	100
20	LT	107/110~(97%)	107 (100%)	0	0	100	100
21	LU	101/105~(96%)	100 (99%)	1 (1%)	0	100	100
22	LW	65/97~(67%)	65 (100%)	0	0	100	100
23	NE	152/361~(42%)	150 (99%)	2(1%)	0	100	100
24	NG	87/282~(31%)	87 (100%)	0	0	100	100
25	NN	238/473~(50%)	234~(98%)	4 (2%)	0	100	100
26	SA	325/427~(76%)	321 (99%)	4 (1%)	0	100	100
27	\mathbf{SC}	205/288~(71%)	203 (99%)	2(1%)	0	100	100
28	SD	210/248~(85%)	205~(98%)	5(2%)	0	100	100
29	SE	184/266~(69%)	183 (100%)	1 (0%)	0	100	100
30	SH	148/293~(50%)	145 (98%)	3(2%)	0	100	100
31	SI	198/255~(78%)	196 (99%)	2(1%)	0	100	100
32	SJ	70/847~(8%)	70 (100%)	0	0	100	100
33	SK	224/245~(91%)	219~(98%)	5(2%)	0	100	100
34	SL	241/490~(49%)	236~(98%)	5 (2%)	0	100	100
35	SM	427/588~(73%)	425 (100%)	2(0%)	0	100	100
36	SN	162/306~(53%)	161 (99%)	1 (1%)	0	100	100
37	SO	292/353~(83%)	288~(99%)	4 (1%)	0	100	100
38	SR	73/634~(12%)	71 (97%)	2(3%)	0	100	100
39	SS	227/746~(30%)	225~(99%)	2(1%)	0	100	100
40	ST	34/365~(9%)	33~(97%)	1 (3%)	0	100	100
41	SV	$\overline{135/163}$ (83%)	133 (98%)	2 (2%)	0	100	100
42	SW	441/670~(66%)	433 (98%)	8 (2%)	0	100	100
43	SZ	$\overline{156/178} \ (88\%)$	155 (99%)	1 (1%)	0	100	100
All	All	6746/11718 (58%)	6669 (99%)	77 (1%)	0	100	100

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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 side chain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	tliers Percen	
4	L6	98/177~(55%)	98~(100%)	0	100	100
5	L7	157/174~(90%)	156~(99%)	1 (1%)	86	90
6	L8	115/161~(71%)	115 (100%)	0	100	100
7	L9	156/172~(91%)	156 (100%)	0	100	100
8	LA	111/163~(68%)	111 (100%)	0	100	100
9	LB	136/165~(82%)	136 (100%)	0	100	100
10	LC	154/157~(98%)	154 (100%)	0	100	100
11	LE	47/140 (34%)	47 (100%)	0	100	100
12	LG	87/107 (81%)	87 (100%)	0	100	100
13	LH	13/133~(10%)	13 (100%)	0	100	100
14	LI	124/135~(92%)	124 (100%)	0	100	100
15	LK	29/121~(24%)	29 (100%)	0	100	100
16	LL	106/121~(88%)	106 (100%)	0	100	100
17	LN	328/348~(94%)	328 (100%)	0	100	100
18	LQ	114/121~(94%)	114 (100%)	0	100	100
19	LS	109/110~(99%)	109 (100%)	0	100	100
20	LT	88/89~(99%)	88 (100%)	0	100	100
21	LU	87/89~(98%)	87 (100%)	0	100	100
22	LW	58/80~(72%)	58 (100%)	0	100	100
23	NE	136/294~(46%)	136 (100%)	0	100	100
24	NG	83/246~(34%)	83 (100%)	0	100	100
25	NN	218/398~(55%)	217 (100%)	1 (0%)	88	92
26	SA	279/348~(80%)	279 (100%)	0	100	100
27	SC	187/252~(74%)	187 (100%)	0	100	100
28	SD	182/215~(85%)	182 (100%)	0	100	100
29	SE	159/223~(71%)	159 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
30	SH	140/274~(51%)	140 (100%)	0	100	100
31	SI	182/228~(80%)	182 (100%)	0	100	100
32	SJ	64/733~(9%)	64 (100%)	0	100	100
33	SK	196/213~(92%)	196 (100%)	0	100	100
34	SL	226/437~(52%)	224~(99%)	2(1%)	78	87
35	SM	350/509~(69%)	350~(100%)	0	100	100
36	SN	126/260~(48%)	126 (100%)	0	100	100
37	SO	274/319~(86%)	274 (100%)	0	100	100
38	SR	69/574~(12%)	69~(100%)	0	100	100
39	SS	208/648~(32%)	208 (100%)	0	100	100
40	ST	27/300~(9%)	27~(100%)	0	100	100
41	SV	127/149~(85%)	125~(98%)	2(2%)	62	77
42	SW	394/591~(67%)	394 (100%)	0	100	100
43	SZ	141/158 (89%)	141 (100%)	0	100	100
All	All	5885/10132 (58%)	5879 (100%)	6 (0%)	93	96

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5 of 6 residues with a non-rotameric side chain are listed below:

Mol	Chain	Res	Type
34	SL	162	ARG
41	SV	76	ASN
41	SV	82	GLN
25	NN	65	ARG
5	L7	117	ARG

Sometimes side chains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 12 such side chains are listed below:

Mol	Chain	Res	Type
33	SK	83	HIS
38	SR	436	HIS
42	SW	402	GLN
39	SS	310	HIS
21	LU	26	HIS

5.3.3 RNA (i)



Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	L1	147/157~(93%)	14 (9%)	1 (0%)
2	L2	65/1167~(5%)	9~(13%)	0
3	L3	1532/5070~(30%)	204 (13%)	5~(0%)
All	All	1744/6394~(27%)	227 (13%)	6 (0%)

5 of 227 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	L1	34	U
1	L1	59	А
1	L1	62	А
1	L1	63	U
1	L1	82	А

5 of 6 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	L3	1880	G
3	L3	2267	U
3	L3	4679	G
3	L3	172	С
1	L1	156	U

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

3 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).

Mal Tun	Turne	o Chain Bog		Chain Bog Link	B	Bond lengths			Bond angles		
	туре	Chain	nes		Counts	RMSZ	# Z >2	Counts	RMSZ	# Z >2	
17	HIC	LN	245	17	8,11,12	1.66	2 (25%)	6,14,16	1.10	0	
39	SEP	SS	126	39	8,9,10	1.52	1 (12%)	8,12,14	1.50	2 (25%)	
39	SEP	SS	127	39	8,9,10	1.51	1 (12%)	8,12,14	1.65	2 (25%)	

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



Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	HIC	LN	245	17	-	0/5/6/8	0/1/1/1
39	SEP	SS	126	39	-	0/5/8/10	-
39	SEP	SS	127	39	-	2/5/8/10	-

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	LN	245	HIC	CD2-CG	3.55	1.41	1.36
39	SS	126	SEP	P-O1P	3.32	1.61	1.50
39	SS	127	SEP	P-O1P	3.29	1.61	1.50
17	LN	245	HIC	CZ-NE2	-2.09	1.42	1.48

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	$Observed(^{o})$	$Ideal(^{o})$
39	\mathbf{SS}	127	SEP	P-OG-CB	-3.17	109.55	118.30
39	\mathbf{SS}	126	SEP	P-OG-CB	-2.89	110.32	118.30
39	\mathbf{SS}	127	SEP	OG-CB-CA	2.83	110.90	108.14
39	\mathbf{SS}	126	SEP	OG-CB-CA	2.50	110.58	108.14

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
39	\mathbf{SS}	127	SEP	CA-CB-OG-P
39	SS	127	SEP	N-CA-CB-OG

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
39	SS	126	SEP	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.



5.6 Ligand geometry (i)

Of 53 ligands modelled in this entry, 53 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-29253. 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: 240



Y Index: 240



Z Index: 240

6.2.2 Raw map



X Index: 240

Y Index: 240



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: 244



Y Index: 205



Z Index: 249

6.3.2 Raw map



X Index: 0

Y Index: 0



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 0.75. 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

$emd_{29253}msk_{1.map}$ (i) 6.6.1



Х



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 $696~{\rm nm^3};$ this corresponds to an approximate mass of 629 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 0.362 ${\rm \AA^{-1}}$



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 0.362 ${\rm \AA^{-1}}$



8.2 Resolution estimates (i)

$\mathbf{Bosolution} \text{ ostimato } (\mathbf{\hat{\lambda}})$	Estimation criterion (FSC cut-off		
Resolution estimate (A)	0.143	0.5	Half-bit
Reported by author	2.76	-	-
Author-provided FSC curve	2.76	3.08	2.80
Unmasked-calculated*	4.11	7.67	4.24

*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 4.11 differs from the reported value 2.76 by more than 10 %



9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-29253 and PDB model 8FKQ. Per-residue inclusion information can be found in section 3 on page 12.

9.1 Map-model overlay (i)



The images above show the 3D surface view of the map at the recommended contour level 0.75 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 (0.75).



9.4 Atom inclusion (i)



At the recommended contour level, 88% of all backbone atoms, 83% 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 (0.75) and Q-score for the entire model and for each chain.

\mathbf{Chain}	Atom inclusion	$\mathbf{Q} extsf{-score}$
All	0.8340	0.5250
L1	0.8310	0.5210
L2	0.9460	0.5650
L3	0.8780	0.5130
L6	0.9520	0.6070
L7	0.7960	0.5040
L8	0.8190	0.5300
L9	0.9660	0.6190
LA	0.8040	0.5230
LB	0.9550	0.6180
LC	0.8010	0.5400
LE	0.7100	0.4250
LG	0.7420	0.4720
LH	0.5200	0.4810
LI	0.8860	0.5890
LK	0.7910	0.4190
LL	0.9590	0.6170
LN	0.8520	0.5470
LQ	0.9550	0.6230
LS	0.6940	0.5150
LT	0.9640	0.6220
LU	0.8400	0.5670
LW	0.7300	0.5510
NE	0.6820	0.3950
NG	0.4440	0.3450
NN	0.8260	0.5010
SA	0.9490	0.6140
\mathbf{SC}	0.8180	0.5320
SD	0.9520	0.6100
SE	0.9400	0.5970
SH	0.8810	0.5730
SI	0.8440	0.5770
SJ	0.6870	0.5180
SK	0.7200	0.4520
SL	0.8550	0.5650

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Chain	Atom inclusion	Q-score
SM	0.7280	0.5010
SN	0.7390	0.4810
SO	0.7930	0.5360
SR	0.5470	0.3920
SS	0.7510	0.5090
ST	0.6060	0.4910
SV	0.6420	0.4330
SW	0.6170	0.4790
SZ	0.8540	0.5540

