



wwPDB/EMDatabank EM Map/Model Validation Summary Report ⓘ

Mar 12, 2018 – 02:45 PM EDT

PDB ID : 6EM4
EMDB ID: : EMD-3889
Title : State B architectural model (Nsa1-TAP Flag-Ytm1) - Visualizing the assembly pathway of nucleolar pre-60S ribosomes
Authors : Kater, L.; Cheng, J.; Barrio-Garcia, C.; Hurt, E.; Beckmann, R.
Deposited on : 2017-10-01
Resolution : 4.10 Å(reported)

This is a wwPDB/EMDatabank EM Map/Model Validation Summary Report for a publicly released PDB/EMDB entry.

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

A user guide is available at

<http://wwpdb.org/validation/2016/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

MolProbity : 4.02b-467
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : rb-20030736

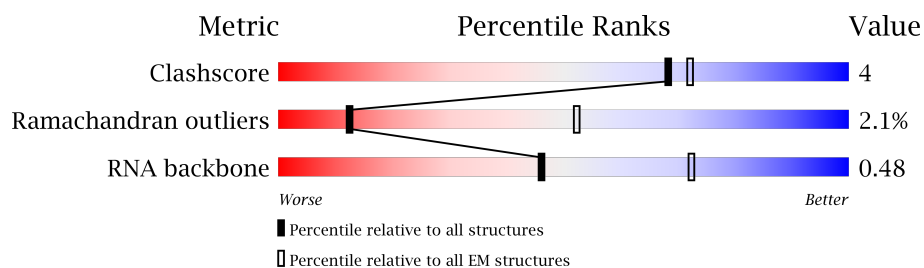
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.10 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.






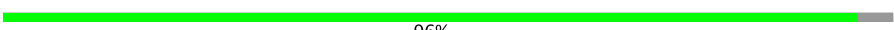






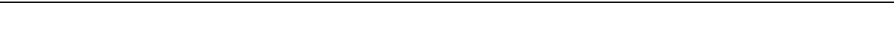

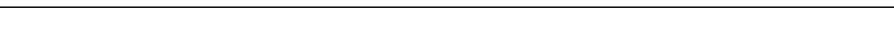
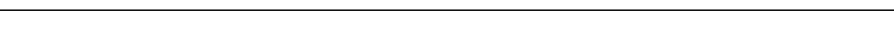



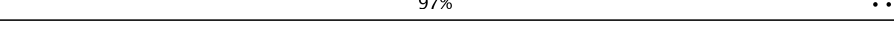

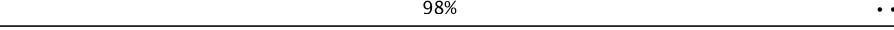





Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	125131	1336
Ramachandran outliers	121729	1120
RNA backbone	3398	335

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	x	295	
2	F	244	
3	3	306	
4	4	278	
5	5	463	
6	A	291	
7	J	427	
8	u	199	
9	v	231	

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Mol	Chain	Length	Quality of chain
10	y	245	
11	B	387	
12	C	362	
13	e	130	
14	E	176	
15	f	107	
16	G	256	
17	h	120	
18	i	100	
19	j	88	
20	L	199	
21	M	138	
22	N	204	
23	O	199	
24	P	184	
25	Q	186	
26	S	172	
27	V	137	
28	Y	127	
29	1	3396	
30	2	158	
31	D	505	
32	K	376	
33	n	605	
34	o	220	

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Mol	Chain	Length	Quality of chain
35	t	322	<div><div></div><div>76%</div><div></div><div>23%</div></div>
36	6	232	<div><div></div><div>14%</div><div></div><div>12%</div><div></div><div>72%</div></div>
37	H	807	<div><div></div><div>17%</div><div></div><div>82%</div></div>

2 Entry composition

There are 37 unique types of molecules in this entry. The entry contains 45400 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 Ribosome production factor 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	x	267	Total	C	N	O	0	0
			1068	534	267	267		

- Molecule 2 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	F	241	Total	C	N	O	0	0
			964	482	241	241		

- Molecule 3 is a protein called Protein MAK16.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	3	173	Total	C	N	O	0	0
			692	346	173	173		

- Molecule 4 is a protein called Ribosomal RNA-processing protein 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
4	4	220	Total	C	N	O	0	0
			880	440	220	220		

- Molecule 5 is a protein called Ribosome biogenesis protein NSA1.

Mol	Chain	Residues	Atoms				AltConf	Trace
5	5	385	Total	C	N	O	0	0
			1540	770	385	385		

- Molecule 6 is a protein called Ribosome biogenesis protein BRX1.

Mol	Chain	Residues	Atoms				AltConf	Trace
6	A	145	Total	C	N	O	0	0
			580	290	145	145		

- Molecule 7 is a protein called rRNA-processing protein EBP2.

Mol	Chain	Residues	Atoms				AltConf	Trace
7	J	66	Total	C	N	O	0	0
			264	132	66	66		

- Molecule 8 is a protein called Ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	u	116	Total	C	N	O	0	0
			464	232	116	116		

- Molecule 9 is a protein called Nucleolar protein 16.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	v	130	Total	C	N	O	0	0
			520	260	130	130		

- Molecule 10 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms				AltConf	Trace
10	y	225	Total	C	N	O	0	0
			900	450	225	225		

- Molecule 11 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms				AltConf	Trace
11	B	333	Total	C	N	O	0	0
			1332	666	333	333		

- Molecule 12 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
12	C	343	Total	C	N	O	0	0
			1372	686	343	343		

- Molecule 13 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	e	125	Total	C	N	O	0	0
			500	250	125	125		

- Molecule 14 is a protein called 60S ribosomal protein L6-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	E	151	Total	C	N	O	0	0
			604	302	151	151		

- Molecule 15 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
15	f	106	Total	C	N	O	0	0
			424	212	106	106		

- Molecule 16 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
16	G	159	Total	C	N	O	0	0
			636	318	159	159		

- Molecule 17 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	h	119	Total	C	N	O	0	0
			476	238	119	119		

- Molecule 18 is a protein called 60S ribosomal protein L36-B.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	i	74	Total	C	N	O	0	0
			296	148	74	74		

- Molecule 19 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	j	71	Total	C	N	O	0	0
			284	142	71	71		

- Molecule 20 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	L	108	Total	C	N	O	0	0
			432	216	108	108		

- Molecule 21 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
21	M	134	Total	C	N	O	0	0
			536	268	134	134		

- Molecule 22 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
22	N	177	Total	C	N	O	0	0
			708	354	177	177		

- Molecule 23 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
23	O	197	Total	C	N	O	0	0
			788	394	197	197		

- Molecule 24 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	P	137	Total	C	N	O	0	0
			548	274	137	137		

- Molecule 25 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
25	Q	131	Total	C	N	O	0	0
			524	262	131	131		

- Molecule 26 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	S	170	Total	C	N	O	0	0
			680	340	170	170		

- Molecule 27 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	V	126	Total	C	N	O	0	0
			504	252	126	126		

- Molecule 28 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	Y	125	Total	C	N	O	0	0
			500	250	125	125		

- Molecule 29 is a RNA chain called 25S ribosomal RNA.

Mol	Chain	Residues	Atoms				AltConf	Trace
29	1	1556	Total	C	O	P	0	0
			18672	7780	9336	1556		

- Molecule 30 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	2	158	Total	C	O	P	0	0
			1896	790	948	158		

- Molecule 31 is a protein called ATP-dependent RNA helicase HAS1.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	D	194	Total	C	N	O	0	0
			776	388	194	194		

- Molecule 32 is a protein called Proteasome-interacting protein CIC1.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	K	246	Total	C	N	O	0	0
			984	492	246	246		

- Molecule 33 is a protein called Pescadillo homolog.

Mol	Chain	Residues	Atoms				AltConf	Trace
33	n	312	Total	C	N	O	0	0
			1248	624	312	312		

- Molecule 34 is a protein called Ribosome biogenesis protein 15.

Mol	Chain	Residues	Atoms				AltConf	Trace
34	o	116	Total	C	N	O	0	0
			464	232	116	116		

- Molecule 35 is a protein called Ribosome biogenesis protein RLP7.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	t	248	Total	C	N	O	0	0
			992	496	248	248		

- Molecule 36 is a RNA chain called internal transcribed spacer 1.

Mol	Chain	Residues	Atoms				AltConf	Trace
36	6	65	Total	C	O	P	0	0
			780	325	390	65		

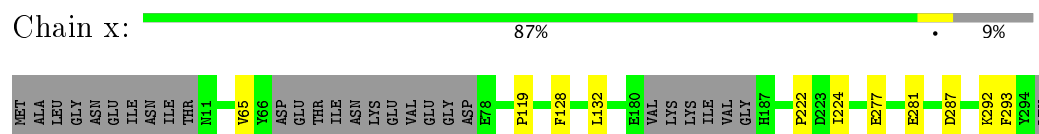
- Molecule 37 is a protein called Ribosome biogenesis protein ERB1.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	H	143	Total	C	N	O	0	0
			572	286	143	143		

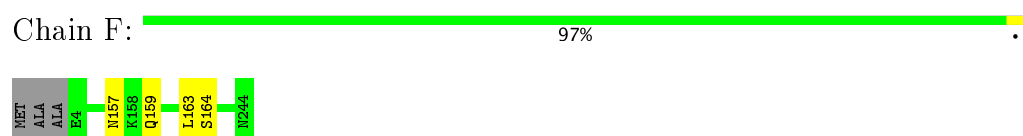
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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. 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. 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.

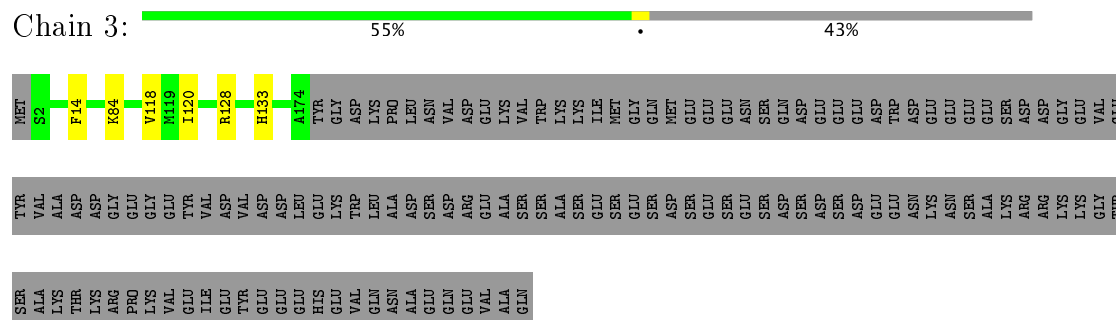
- Molecule 1: Ribosome production factor 1



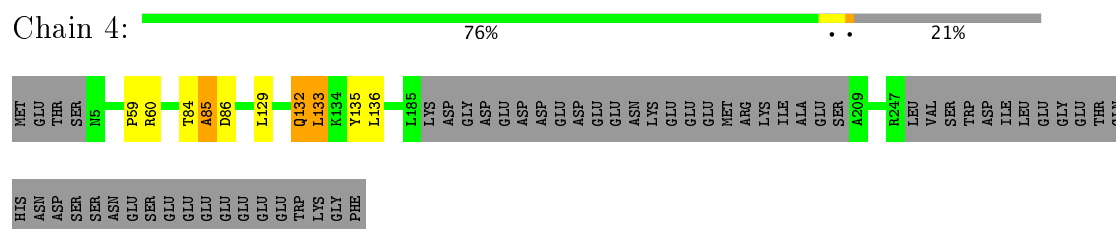
- Molecule 2: 60S ribosomal protein L7-A



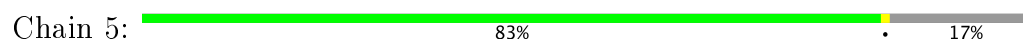
- Molecule 3: Protein MAK16

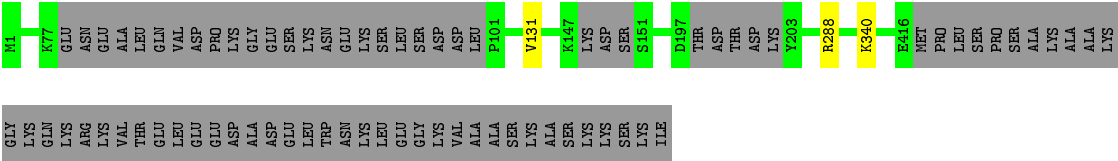


- Molecule 4: Ribosomal RNA-processing protein 1

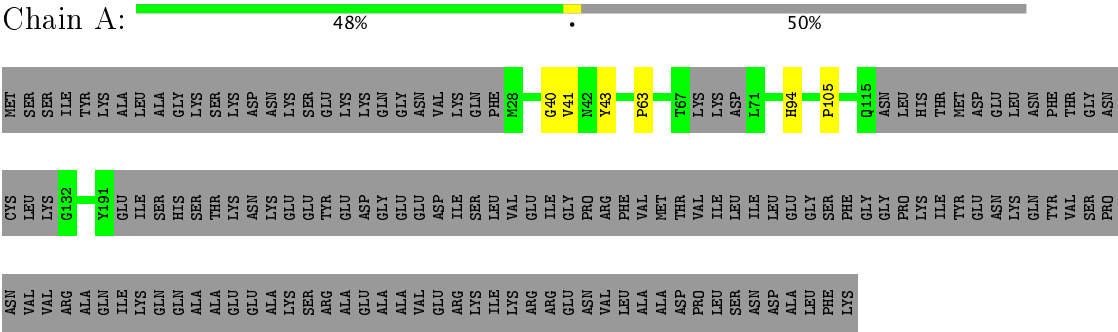


- Molecule 5: Ribosome biogenesis protein NSA1

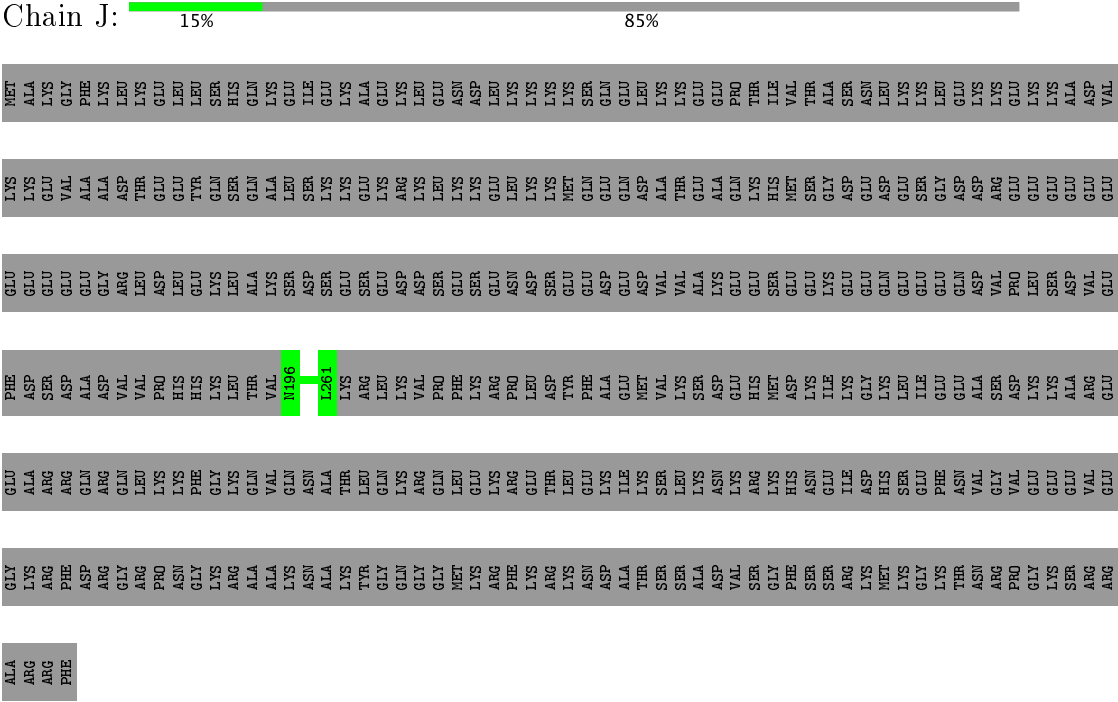




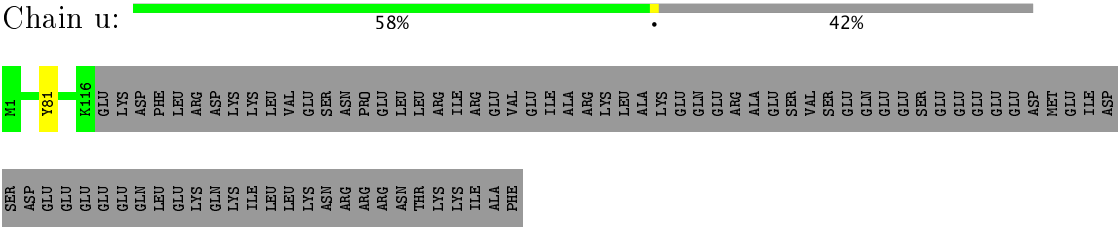
• Molecule 6: Ribosome biogenesis protein BRX1



• Molecule 7: rRNA-processing protein EBP2

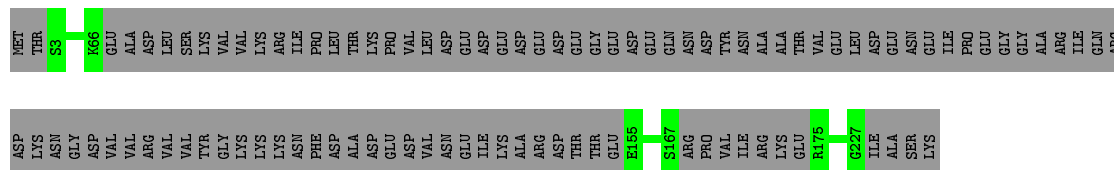


• Molecule 8: Ribosome biogenesis protein RLP24



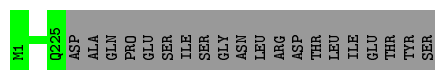
- Molecule 9: Nucleolar protein 16

Chain v:  56% 44%




- Molecule 10: Eukaryotic translation initiation factor 6

Chain y:  92% 8%



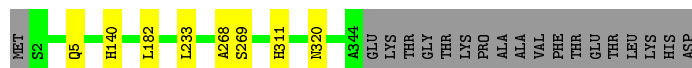
- Molecule 11: 60S ribosomal protein L3

Chain B:  82% 14%



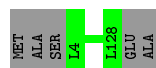
- Molecule 12: 60S ribosomal protein L4-A

Chain C:  93% 5%



- Molecule 13: 60S ribosomal protein L32

Chain e:  96%



- Molecule 14: 60S ribosomal protein L6-A

Chain E:  86% 14%

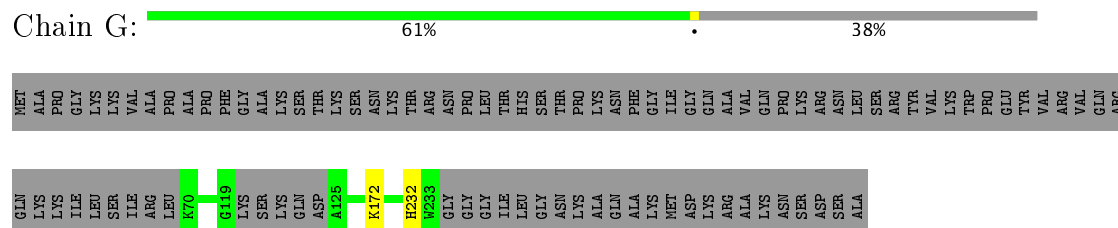


- Molecule 15: 60S ribosomal protein L33-A

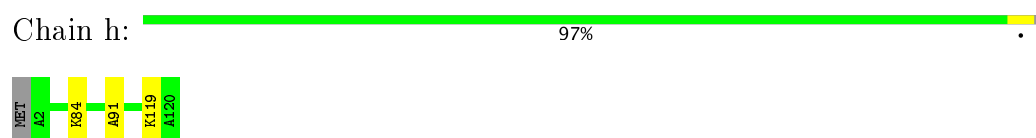
Chain f:  99%



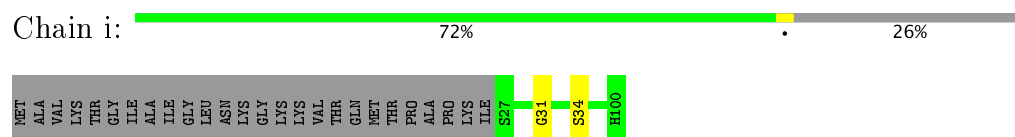
- Molecule 16: 60S ribosomal protein L8-A



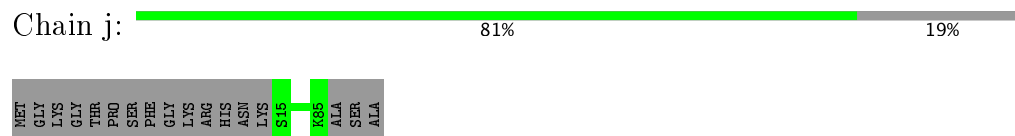
- Molecule 17: 60S ribosomal protein L35-A



- Molecule 18: 60S ribosomal protein L36-B



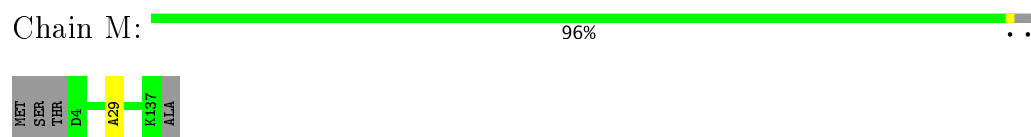
- Molecule 19: 60S ribosomal protein L37-A



- Molecule 20: 60S ribosomal protein L13-A

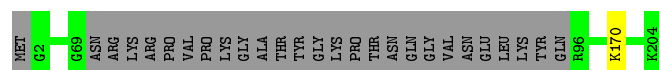


- Molecule 21: 60S ribosomal protein L14-A



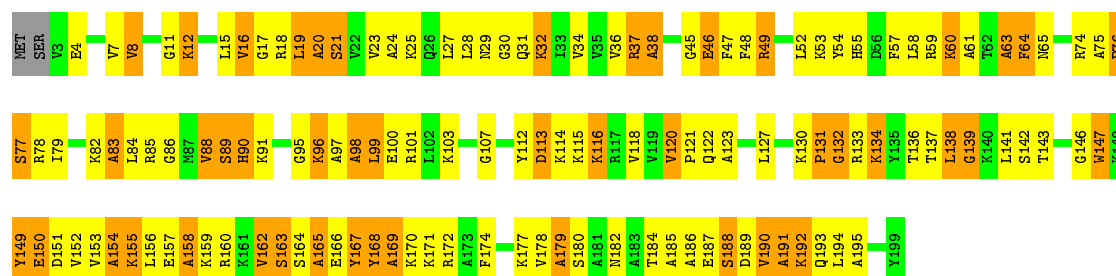
- Molecule 22: 60S ribosomal protein L15-A

Chain N: 86% 13%



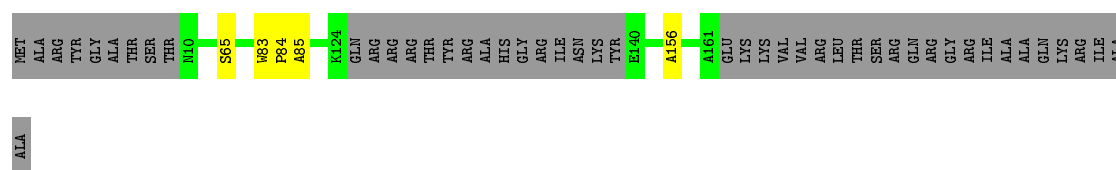
- Molecule 23: 60S ribosomal protein L16-A

Chain O: 33% 42% 24%



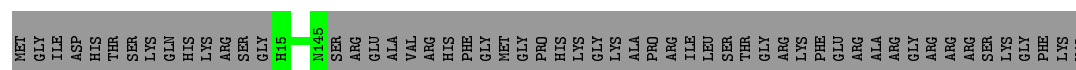
- Molecule 24: 60S ribosomal protein L17-A

Chain P: 72% . 26%



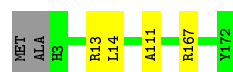
- Molecule 25: 60S ribosomal protein L18-A

Chain Q: 70% 30%



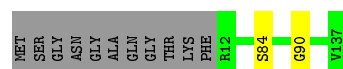
- Molecule 26: 60S ribosomal protein L20-A

Chain S: 97%



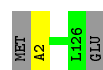
- Molecule 27: 60S ribosomal protein L23-A

Chain V:  91% • 8%




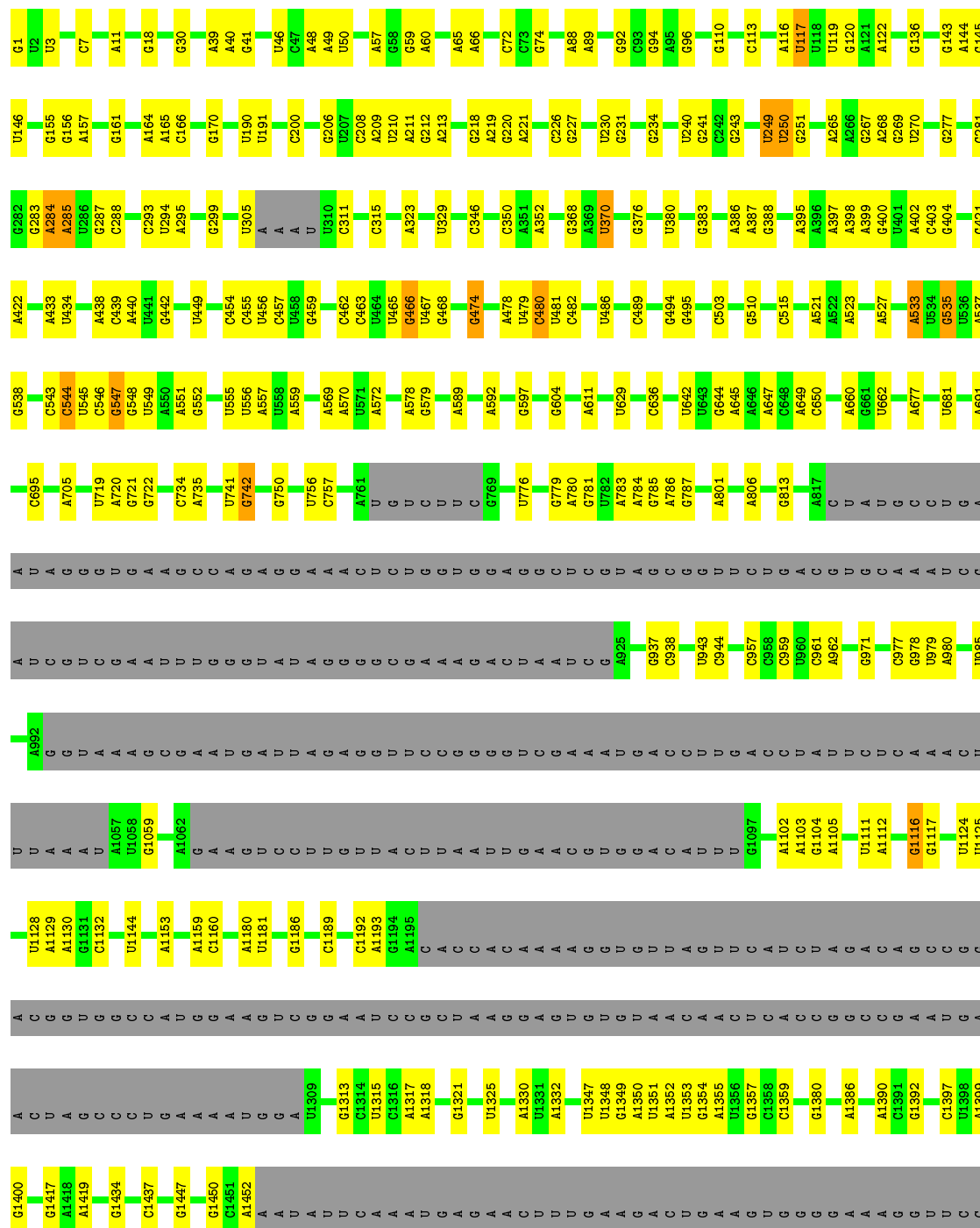
- Molecule 28: 60S ribosomal protein L26-A

Chain Y:  98%

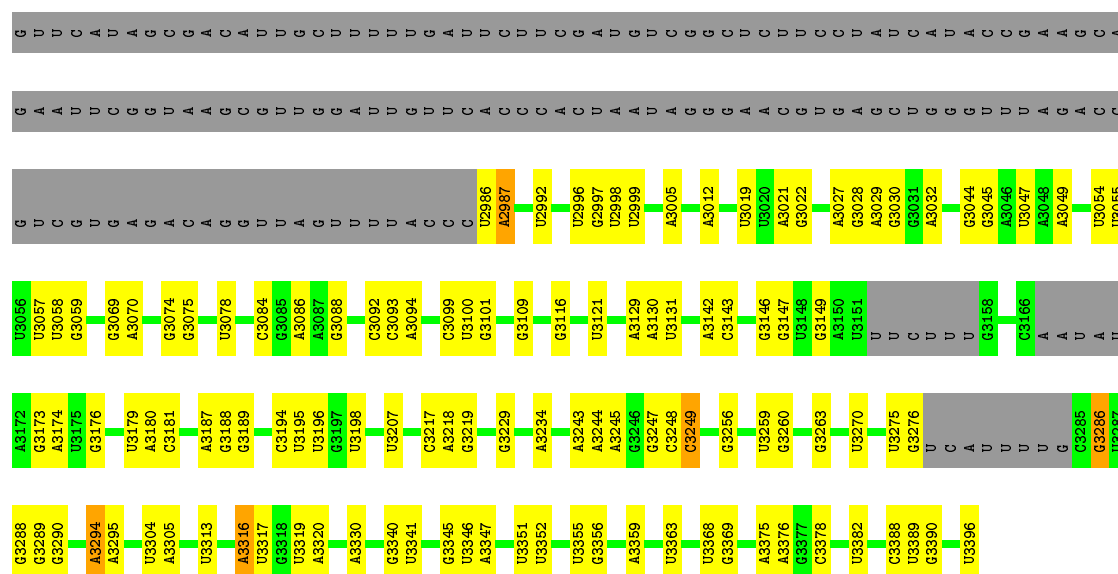


● Molecule 29: 25S ribosomal RNA

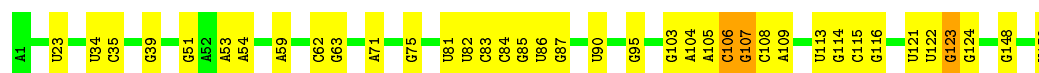
Chain 1:  34% 12% 54%



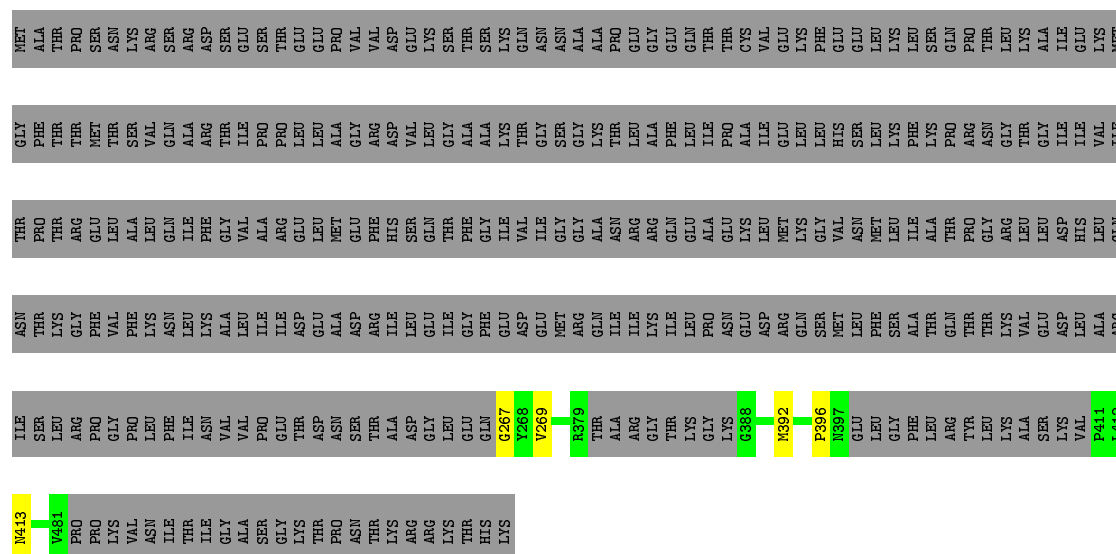
The figure displays a 1000x1000 grid visualization of a protein structure. The grid is composed of colored squares representing amino acids. The colors include yellow, green, red, blue, orange, and grey. The grid is organized into 100 columns and 100 rows. The columns are labeled with amino acid codes (e.g., A, C, G, U) and the rows are labeled with amino acid codes (e.g., A, C, G, U). The grid shows a complex pattern of interactions, with some regions being more densely colored than others. The overall structure is a square grid, with the columns and rows representing the sequence of the protein. The colors represent different types of amino acids, with yellow and green being the most common. The grid is a visual representation of the protein's structure, showing the spatial arrangement of the amino acids.



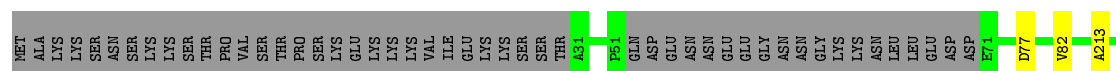
- Molecule 30: 5.8S ribosomal RNA



- Molecule 31: ATP-dependent RNA helicase HAS1



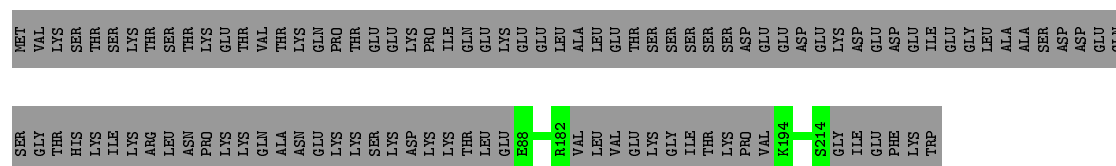
- Molecule 32: Proteasome-interacting protein CIC1



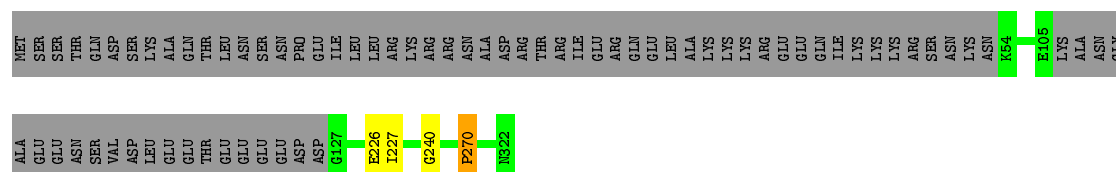
- Molecule 33: Pescadillo homolog



- Molecule 34: Ribosome biogenesis protein 15

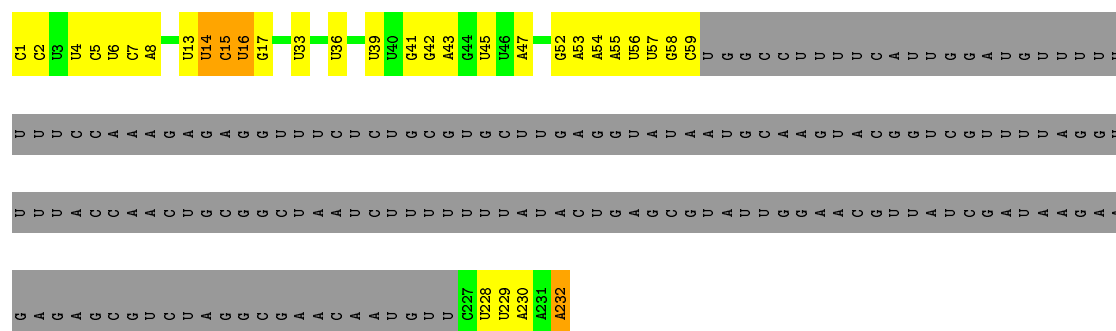


- Molecule 35: Ribosome biogenesis protein RLP7



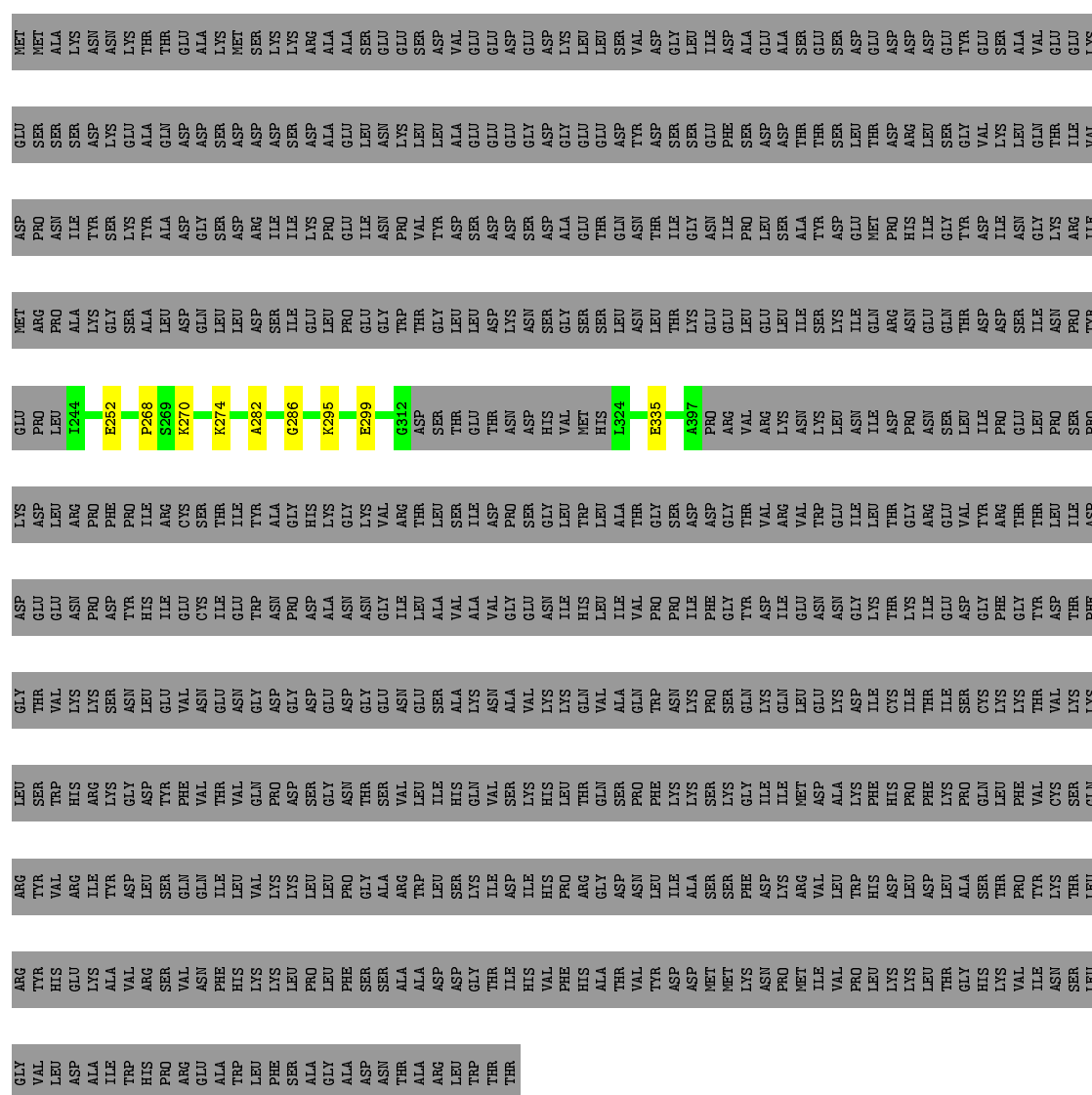
- Molecule 36: internal transcribed spacer 1





- Molecule 37: Ribosome biogenesis protein ERB1

Chain H:  17% 82%



4 Experimental information

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	65539	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	27	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	Not provided	Depositor
Magnification	Not provided	Depositor
Image detector	FEI FALCON II (4k x 4k)	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 >2	RMSZ	# Z >2
1	x	0.40	0/1064	0.67	0/1323
10	y	0.41	0/899	0.58	0/1122
11	B	0.38	0/1330	0.60	0/1659
12	C	0.37	0/1371	0.60	0/1712
13	e	0.35	0/499	0.58	0/622
14	E	0.35	0/602	0.59	0/749
15	f	0.32	0/423	0.57	0/527
16	G	0.37	0/634	0.61	0/789
17	h	0.36	0/475	0.55	0/592
18	i	0.38	0/295	0.56	0/367
19	j	0.36	0/283	0.59	0/352
2	F	0.35	0/963	0.57	0/1202
20	L	0.35	0/431	0.61	0/537
21	M	0.34	0/535	0.55	0/667
22	N	0.35	0/706	0.55	0/879
23	O	0.25	0/787	0.41	0/982
24	P	0.34	0/546	0.56	0/679
25	Q	0.35	0/523	0.55	0/652
26	S	0.38	0/679	0.61	0/847
27	V	0.41	0/503	0.58	0/627
28	Y	0.33	0/499	0.55	0/622
29	1	0.24	0/20215	0.84	5/31068 (0.0%)
3	3	0.36	0/691	0.63	0/862
30	2	0.23	0/2047	0.85	1/3132 (0.0%)
31	D	0.63	0/773	0.66	0/961
32	K	0.58	0/982	0.63	0/1224
33	n	0.59	0/1244	0.57	0/1548
34	o	0.71	0/462	0.65	0/574
35	t	0.65	0/990	0.65	0/1234
36	6	0.70	0/843	0.99	1/1292 (0.1%)
37	H	0.61	0/570	0.69	0/709
4	4	0.29	0/878	0.75	2/1094 (0.2%)
5	5	0.36	0/1536	0.57	0/1913
6	A	0.43	0/577	0.60	0/716

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >2	RMSZ	# Z >2
7	J	0.41	0/263	0.58	0/327
8	u	0.38	0/463	0.58	0/577
9	v	0.34	0/517	0.53	0/641
All	All	0.36	0/47098	0.74	9/65380 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
31	D	0	1
35	t	0	2
37	H	0	2
4	4	0	2
All	All	0	7

There are no bond length outliers.

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	4	132	GLN	N-CA-C	-12.69	76.73	111.00
29	1	1102	A	C2'-C3'-O3'	7.45	125.88	109.50
29	1	649	A	C2'-C3'-O3'	6.42	123.97	113.70
4	4	133	LEU	N-CA-C	-6.28	94.06	111.00
30	2	114	G	C2'-C3'-O3'	6.17	123.58	113.70

There are no chirality outliers.

5 of 7 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	4	135	TYR	Peptide
4	4	136	LEU	Peptide
31	D	396	PRO	Peptide
35	t	226	GLU	Peptide
35	t	270	PRO	Peptide

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	x	1068	0	271	0	0
2	F	964	0	259	0	0
3	3	692	0	177	1	0
4	4	880	0	222	7	0
5	5	1540	0	421	1	0
6	A	580	0	142	5	0
7	J	264	0	64	0	0
8	u	464	0	122	0	0
9	v	520	0	139	0	0
10	y	900	0	258	0	0
11	B	1332	0	372	34	0
12	C	1372	0	380	0	0
13	e	500	0	133	0	0
14	E	604	0	156	0	0
15	f	424	0	117	0	0
16	G	636	0	159	1	0
17	h	476	0	118	0	0
18	i	296	0	80	0	0
19	j	284	0	83	0	0
20	L	432	0	112	0	0
21	M	536	0	143	0	0
22	N	708	0	191	1	0
23	O	788	0	213	129	0
24	P	548	0	144	6	0
25	Q	524	0	137	0	0
26	S	680	0	170	1	0
27	V	504	0	146	0	0
28	Y	500	0	133	1	0
29	1	18672	0	9348	99	0
30	2	1896	0	954	8	0
31	D	776	0	199	2	0
32	K	984	0	248	3	0
33	n	1248	0	314	0	0
34	o	464	0	126	0	0
35	t	992	0	263	0	0
36	6	780	0	392	24	0
37	H	572	0	134	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	45400	0	17040	251	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 4.

The worst 5 of 251 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)
29:1:1:G:P	36:6:232:A:H3'	1.39	1.61
11:B:12:GLY:C	29:1:3044:G:H5''	1.15	1.50
29:1:1:G:OP2	36:6:232:A:H5''	1.29	1.30
23:O:98:ALA:O	23:O:100:GLU:N	1.60	1.29
23:O:189:ASP:O	23:O:191:ALA:N	1.64	1.28

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	x	259/295 (88%)	220 (85%)	28 (11%)	11 (4%)	3	32
2	F	239/244 (98%)	227 (95%)	8 (3%)	4 (2%)	11	51
3	3	171/306 (56%)	148 (86%)	19 (11%)	4 (2%)	7	45
4	4	216/278 (78%)	197 (91%)	17 (8%)	2 (1%)	20	62
5	5	377/463 (81%)	356 (94%)	19 (5%)	2 (0%)	32	73
6	A	139/291 (48%)	123 (88%)	12 (9%)	4 (3%)	5	40
7	J	64/427 (15%)	61 (95%)	3 (5%)	0	100	100
8	u	114/199 (57%)	108 (95%)	5 (4%)	1 (1%)	20	62
9	v	124/231 (54%)	117 (94%)	7 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	y	223/245 (91%)	215 (96%)	8 (4%)	0	100	100
11	B	329/387 (85%)	298 (91%)	25 (8%)	6 (2%)	10	50
12	C	341/362 (94%)	304 (89%)	29 (8%)	8 (2%)	7	45
13	e	123/130 (95%)	116 (94%)	7 (6%)	0	100	100
14	E	147/176 (84%)	134 (91%)	13 (9%)	0	100	100
15	f	104/107 (97%)	98 (94%)	6 (6%)	0	100	100
16	G	155/256 (60%)	142 (92%)	12 (8%)	1 (1%)	28	70
17	h	117/120 (98%)	109 (93%)	5 (4%)	3 (3%)	6	42
18	i	72/100 (72%)	67 (93%)	3 (4%)	2 (3%)	6	41
19	j	69/88 (78%)	68 (99%)	1 (1%)	0	100	100
20	L	106/199 (53%)	94 (89%)	9 (8%)	3 (3%)	6	41
21	M	132/138 (96%)	125 (95%)	6 (4%)	1 (1%)	22	65
22	N	173/204 (85%)	160 (92%)	13 (8%)	0	100	100
23	O	195/199 (98%)	81 (42%)	49 (25%)	65 (33%)	0	0
24	P	133/184 (72%)	127 (96%)	5 (4%)	1 (1%)	22	65
25	Q	129/186 (69%)	122 (95%)	7 (5%)	0	100	100
26	S	168/172 (98%)	155 (92%)	10 (6%)	3 (2%)	10	50
27	V	124/137 (90%)	117 (94%)	5 (4%)	2 (2%)	11	52
28	Y	123/127 (97%)	116 (94%)	7 (6%)	0	100	100
31	D	188/505 (37%)	174 (93%)	14 (7%)	0	100	100
32	K	242/376 (64%)	227 (94%)	15 (6%)	0	100	100
33	n	304/605 (50%)	280 (92%)	24 (8%)	0	100	100
34	o	112/220 (51%)	104 (93%)	8 (7%)	0	100	100
35	t	244/322 (76%)	214 (88%)	27 (11%)	3 (1%)	15	57
37	H	139/807 (17%)	125 (90%)	14 (10%)	0	100	100
All	All	5895/9086 (65%)	5329 (90%)	440 (8%)	126 (2%)	12	47

5 of 126 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	x	128	PHE
1	x	222	PRO
1	x	277	GLU

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Mol	Chain	Res	Type
3	3	133	HIS
4	4	85	ALA

5.3.2 Protein sidechains [i](#)

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

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
29	1	1543/3396 (45%)	354 (22%)	0
30	2	151/158 (95%)	29 (19%)	0
36	6	63/232 (27%)	31 (49%)	0
All	All	1757/3786 (46%)	414 (23%)	0

5 of 414 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
29	1	3	U
29	1	7	C
29	1	11	A
29	1	18	G
29	1	30	G

There are no RNA pucker outliers to report.

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 carbohydrates in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
30	2	6
1	x	1
29	1	1

The worst 5 of 8 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	2	125:U	O3'	126:A	P	7.31
1	2	124:G	O3'	125:U	P	7.17
1	2	110:C	O3'	111:A	P	6.69
1	2	113:U	O3'	114:G	P	4.18
1	2	128:U	O3'	129:C	P	3.61