Full wwPDB EM Validation Report

Feb 27, 2024 – 02:16 PM EST

PDB ID	:	8UU6
EMDB ID	:	EMD-42561
Title	:	Cryo-EM structure of the ratcheted Listeria innocua 70S ribosome in complex with p/E-tRNA (structure II-A)
Authors	:	Seely, S.M.; Basu, R.S.; Gagnon, M.G.
Deposited on	:	2023-10-31
Resolution	:	3.30 Å(reported)
Based on initial model	:	7NHN

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:

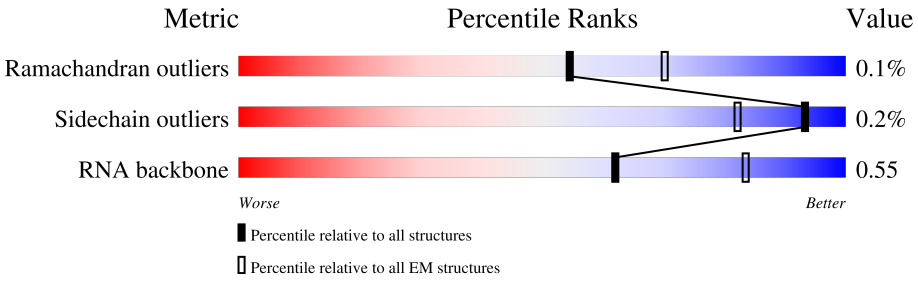
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (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 3.30 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)
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 >=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.

Mol	Chain	Length	Quality of chain
1	a	1550	81% 17%
2	b	249	7% 90% 10%
3	c	218	93% 7%
4	d	200	100%
5	e	167	93% 7%
6	f	97	96%
7	g	156	91% 8%
8	h	132	99%

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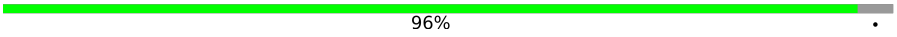
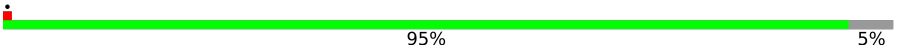
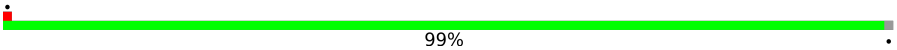
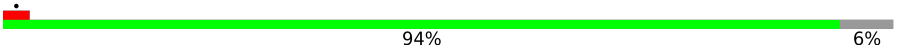
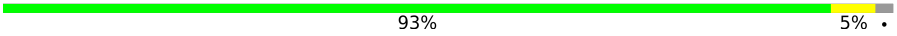
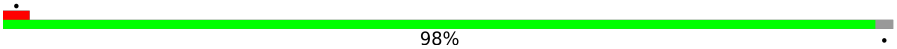
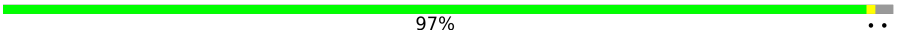
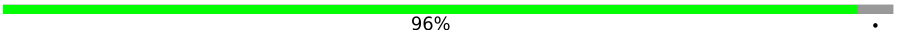
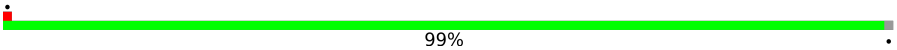
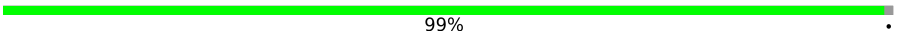
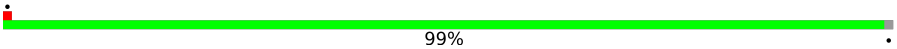
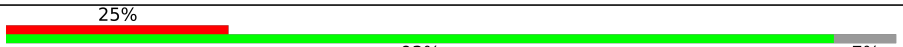
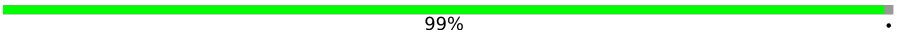
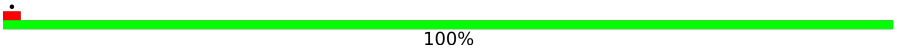
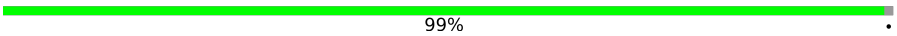
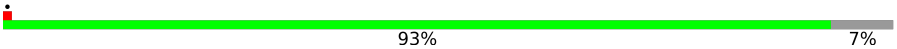
Mol	Chain	Length	Quality of chain
9	i	130	
10	j	102	
11	k	129	
12	l	137	
13	m	121	
14	n	61	
15	o	89	
16	p	90	
17	q	87	
18	r	79	
19	s	92	
20	t	84	
21	x	76	
22	w	21	
23	A	2932	
24	B	116	
25	C	277	
26	D	209	
27	E	207	
28	F	179	
29	G	178	
30	L	145	
31	M	122	
32	N	146	
33	O	144	

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Mol	Chain	Length	Quality of chain
34	P	135	90% 10%
35	Q	119	5% 94% 6%
36	R	114	99%
37	S	119	98%
38	T	102	99%
39	U	118	94% 6%
40	V	94	98%
41	W	103	99%
42	Y	96	78% 22%
43	Z	62	94% 5%
44	1	63	92% 6%
45	2	59	93% 5%
46	3	81	48% 94% 6%
47	4	57	93% 7%
48	5	49	98%
49	6	44	98%
50	7	66	97%
51	8	37	97%

2 Entry composition

There are 55 unique types of molecules in this entry. The entry contains 136923 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 Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	a	1516	32515	14504	5960	10535	1516	0	0

- Molecule 2 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	b	224	1228	757	236	235	0	0

- Molecule 3 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	c	203	1395	880	254	259	2	0	0

- Molecule 4 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	d	199	1429	893	269	266	1	0	0

- Molecule 5 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	e	156	1087	685	196	204	2	0	0

- Molecule 6 is a protein called Small ribosomal subunit protein bS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	f	93	652	419	117	114	2	0	0

- Molecule 7 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	g	143	Total	C	N	O	S	0	0
			1015	634	191	186	4		

- Molecule 8 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	h	131	Total	C	N	O	S	0	0
			929	597	159	171	2		

- Molecule 9 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	i	125	Total	C	N	O	S	0	0
			920	578	183	158	1		

- Molecule 10 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	j	97	Total	C	N	O	S	0	0
			714	449	129	135	1		

- Molecule 11 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	k	114	Total	C	N	O	S	0	0
			681	415	131	133	2		

- Molecule 12 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	l	135	Total	C	N	O	S	0	0
			935	584	184	166	1		

- Molecule 13 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	m	114	Total	C	N	O	S	0	0
			780	483	157	139	1		

- Molecule 14 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	n	60	Total 463	C 295	N 89	O 74	S 5	0	0

- Molecule 15 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	o	87	Total 635	C 393	N 124	O 116	S 2	0	0

- Molecule 16 is a protein called Small ribosomal subunit protein bS16.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	p	88	Total 641	C 406	N 120	O 112	S 3	0	0

- Molecule 17 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	q	80	Total 558	C 350	N 113	O 95	0	0

- Molecule 18 is a protein called Small ribosomal subunit protein bS18.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	r	64	Total 449	C 288	N 84	O 75	S 2	0	0

- Molecule 19 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	s	81	Total 502	C 314	N 100	O 87	S 1	0	0

- Molecule 20 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	t	81	Total 493	C 298	N 95	O 100	0	0

- Molecule 21 is a RNA chain called p/E Hybrid State Phenylalanine tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
21	x	74	Total	C	N	O	P	S	0	0
			1591	713	285	517	74	2		

- Molecule 22 is a RNA chain called F-Stop mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	w	6	Total	C	N	O	P	0	0
			126	57	22	41	6		

- Molecule 23 is a RNA chain called 23S Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	A	2904	Total	C	N	O	P	0	0
			62385	27841	11542	20098	2904		

- Molecule 24 is a RNA chain called 5S Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	B	114	Total	C	N	O	P	0	0
			2428	1082	428	804	114		

- Molecule 25 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	C	273	Total	C	N	O	S	0	0
			2059	1276	405	371	7		

- Molecule 26 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	D	206	Total	C	N	O	S	0	0
			1545	974	287	280	4		

- Molecule 27 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	E	205	Total	C	N	O	0	0
			1515	960	279	276		

- Molecule 28 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	F	167	Total	C	N	O	S	0	0
			1142	724	195	218	5		

- Molecule 29 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	G	160	Total	C	N	O	S	0	0
			1085	684	201	199	1		

- Molecule 30 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	L	143	Total	C	N	O	S	0	0
			1084	689	201	191	3		

- Molecule 31 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	M	122	Total	C	N	O	S	0	0
			914	566	173	170	5		

- Molecule 32 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms				AltConf	Trace
32	N	145	Total	C	N	O	0	0
			1022	633	205	184		

- Molecule 33 is a protein called Large ribosomal subunit protein uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	O	134	Total	C	N	O	S	0	0
			1025	658	194	167	6		

- Molecule 34 is a protein called Large ribosomal subunit protein bL17.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	P	122	Total	C	N	O	S	0	0
			952	596	188	167	1		

- Molecule 35 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms				AltConf	Trace
35	Q	112	Total 701	C 431	N 139	O 131	0	0

- Molecule 36 is a protein called Large ribosomal subunit protein bL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	R	113	Total 843	C 534	N 161	O 147	S 1	0	0

- Molecule 37 is a protein called Large ribosomal subunit protein bL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	S	117	Total 930	C 590	N 181	O 155	S 4	0	0

- Molecule 38 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	T	101	Total 762	C 492	N 131	O 138	S 1	0	0

- Molecule 39 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms				AltConf	Trace
39	U	111	Total 843	C 532	N 160	O 151	0	0

- Molecule 40 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	V	92	Total 724	C 460	N 122	O 140	S 2	0	0

- Molecule 41 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	W	102	Total 735	C 464	N 135	O 133	S 3	0	0

- Molecule 42 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	Y	75	Total	C	N	O	S	0	0
			549	338	106	104	1		

- Molecule 43 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Z	59	Total	C	N	O	S	0	0
			439	271	90	76	2		

- Molecule 44 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	1	59	Total	C	N	O	S	0	0
			467	286	92	88	1		

- Molecule 45 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	2	56	Total	C	N	O	S	0	0
			429	269	81	78	1		

- Molecule 46 is a protein called Large ribosomal subunit protein bL31B.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	3	76	Total	C	N	O	0	0
			529	332	92	105		

- Molecule 47 is a protein called Large ribosomal subunit protein bL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	4	53	Total	C	N	O	S	0	0
			425	259	87	74	5		

- Molecule 48 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	5	48	Total	C	N	O	S	0	0
			380	233	75	68	4		

- Molecule 49 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	6	43	Total	C	N	O	S	0	0
			361	219	87	53	2		

- Molecule 50 is a protein called Large ribosomal subunit protein bL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	7	64	Total	C	N	O	S	0	0
			512	316	112	79	5		

- Molecule 51 is a protein called Large ribosomal subunit protein bL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	8	36	Total	C	N	O	S	0	0
			292	183	59	44	6		

- Molecule 52 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
52	a	18	Total	Mg	0
			18	18	
52	q	1	Total	Mg	0
			1	1	
52	A	78	Total	Mg	0
			78	78	
52	D	1	Total	Mg	0
			1	1	

- Molecule 53 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
53	n	1	Total	Zn	0
			1	1	
53	4	1	Total	Zn	0
			1	1	
53	5	1	Total	Zn	0
			1	1	
53	8	1	Total	Zn	0
			1	1	

- Molecule 54 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	AltConf
54	O	1	Total K 1 1	0

- Molecule 55 is water.

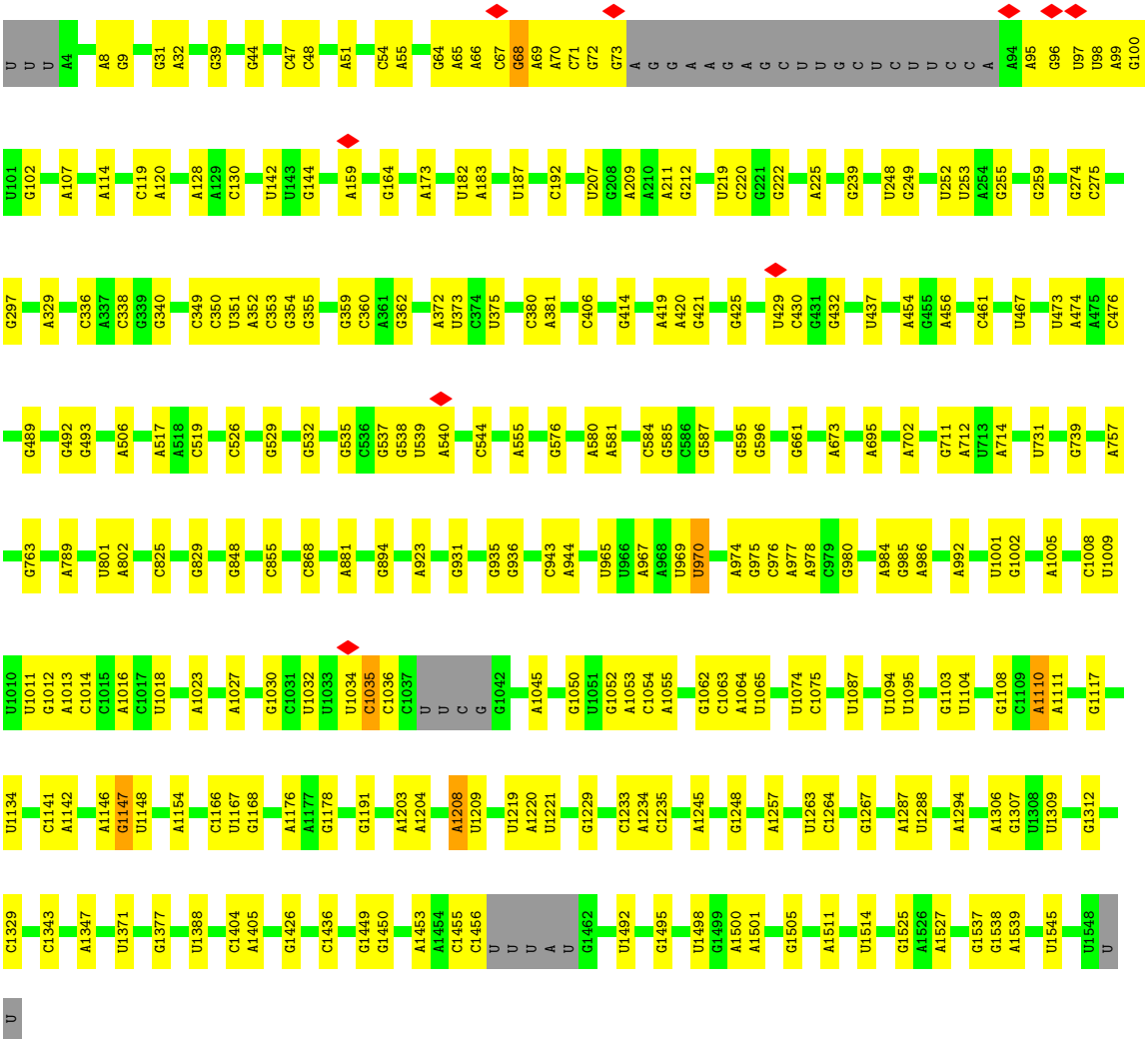
Mol	Chain	Residues	Atoms	AltConf
55	a	2	Total O 2 2	0
55	A	3	Total O 3 3	0

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.

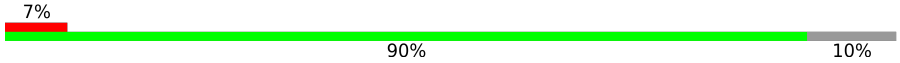
• Molecule 1: 16S Ribosomal RNA

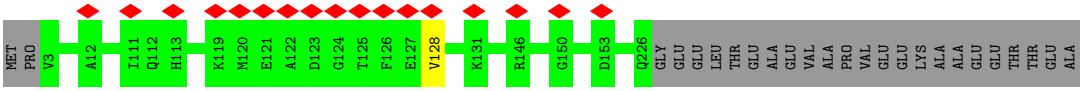
Chain a:



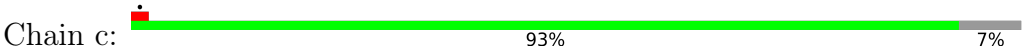
• Molecule 2: Small ribosomal subunit protein uS2

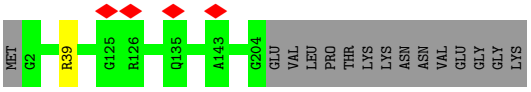
Chain b:



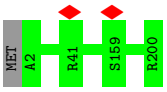


• Molecule 3: Small ribosomal subunit protein uS3

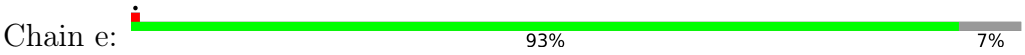


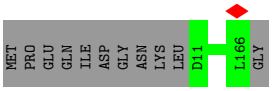


• Molecule 4: Small ribosomal subunit protein uS4

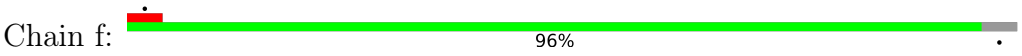


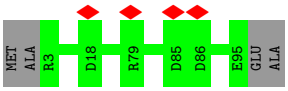
• Molecule 5: Small ribosomal subunit protein uS5



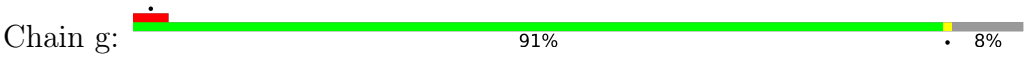


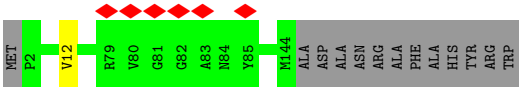
• Molecule 6: Small ribosomal subunit protein bS6





• Molecule 7: Small ribosomal subunit protein uS7

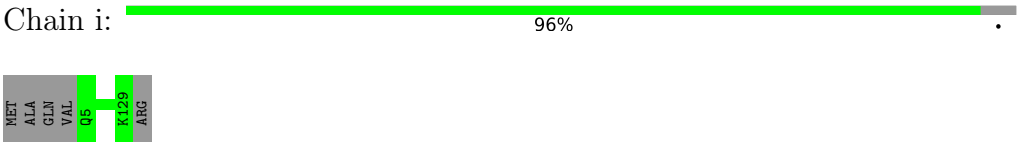




• Molecule 8: Small ribosomal subunit protein uS8

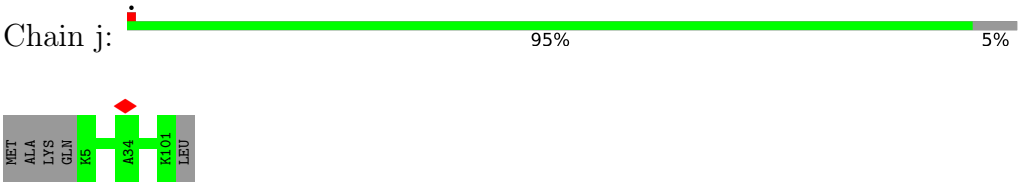
• Molecule 9: Small ribosomal subunit protein uS9

Chain i:



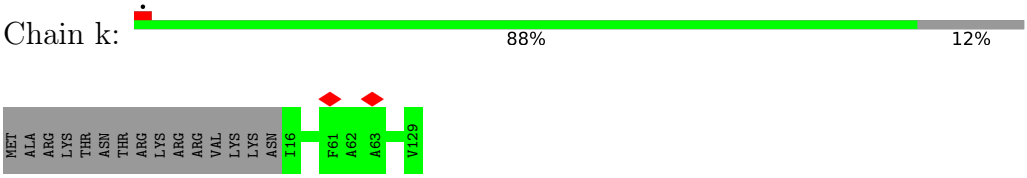
• Molecule 10: Small ribosomal subunit protein uS10

Chain j:



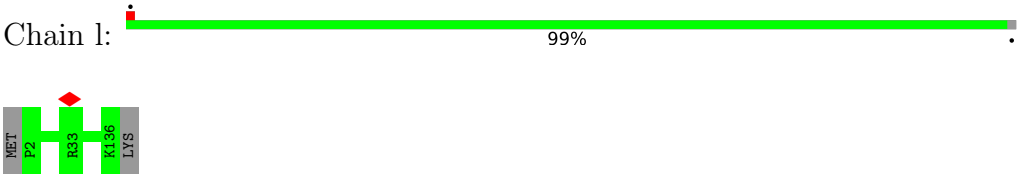
• Molecule 11: Small ribosomal subunit protein uS11

Chain k:



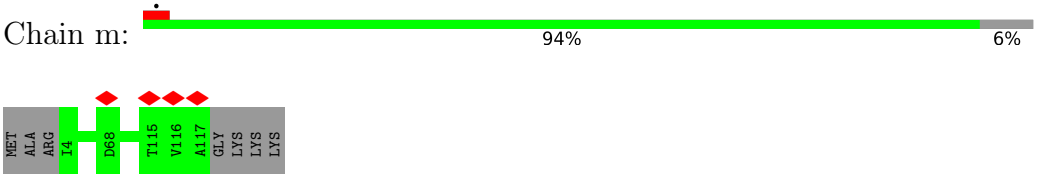
• Molecule 12: Small ribosomal subunit protein uS12

Chain l:



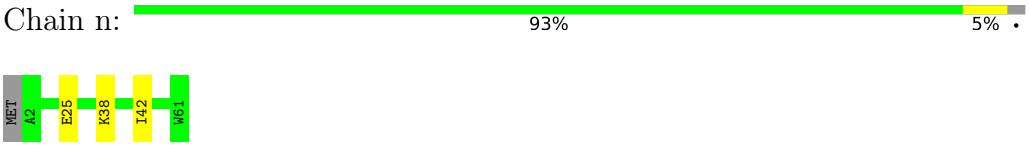
• Molecule 13: Small ribosomal subunit protein uS13

Chain m:



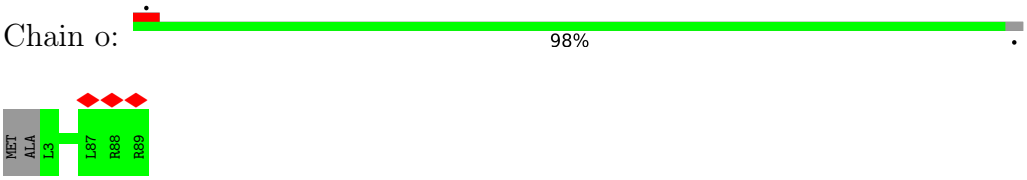
• Molecule 14: Small ribosomal subunit protein uS14

Chain n:



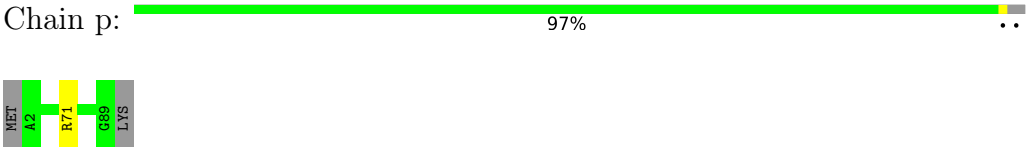
• Molecule 15: Small ribosomal subunit protein uS15

Chain o:



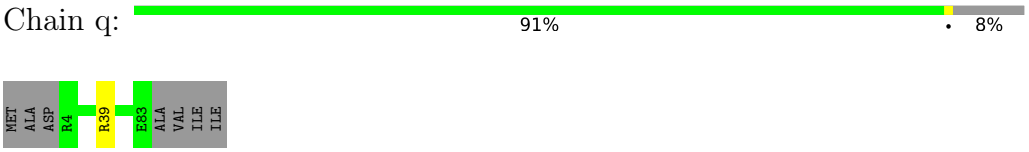
• Molecule 16: Small ribosomal subunit protein bS16

Chain p:



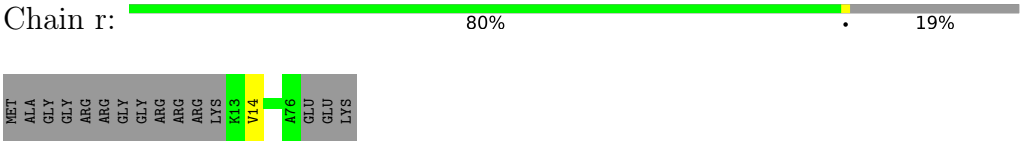
• Molecule 17: Small ribosomal subunit protein uS17

Chain q:



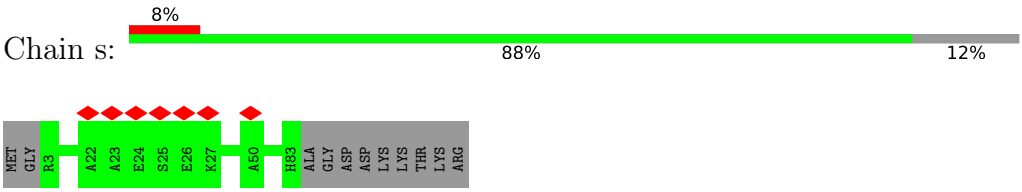
• Molecule 18: Small ribosomal subunit protein bS18

Chain r:



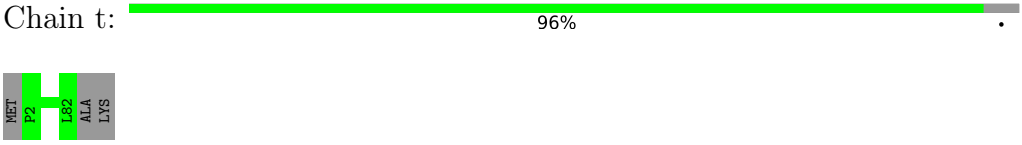
• Molecule 19: Small ribosomal subunit protein uS19

Chain s:



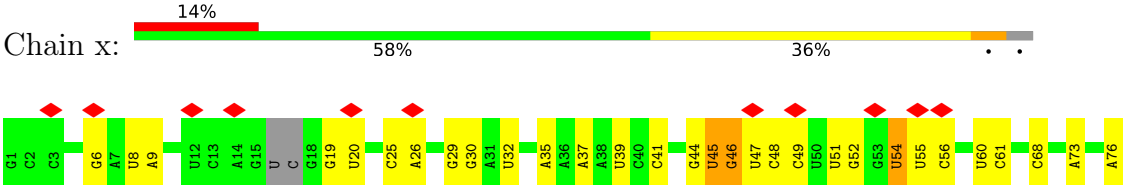
• Molecule 20: Small ribosomal subunit protein bS20

Chain t:



• Molecule 21: p/E Hybrid State Phenylalanine tRNA

Chain x:

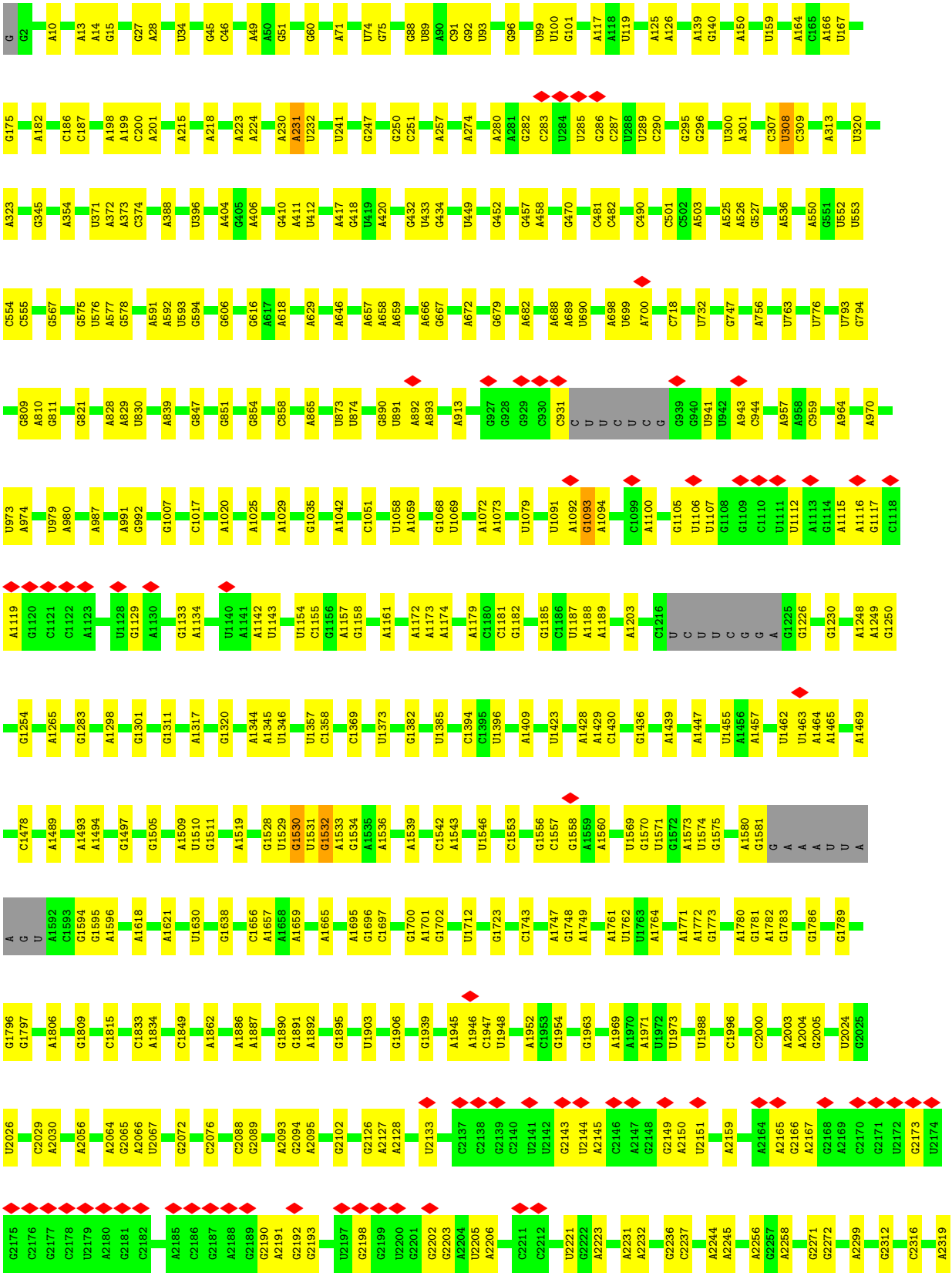


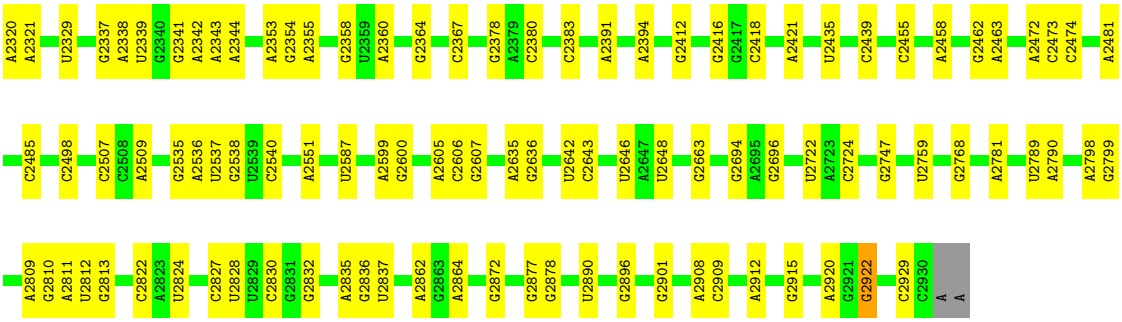
• Molecule 22: F-Stop mRNA

Chain w:

• Molecule 23: 23S Ribosomal RNA

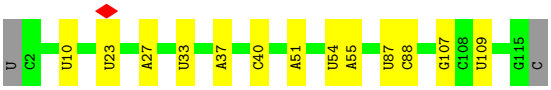
Chain A:





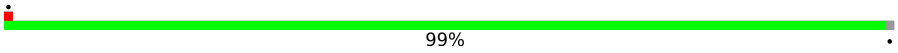
• Molecule 24: 5S Ribosomal RNA

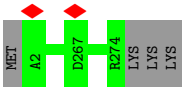
Chain B:



• Molecule 25: Large ribosomal subunit protein uL2

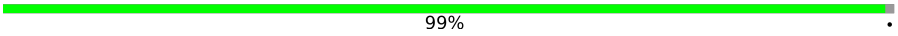
Chain C:

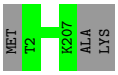




• Molecule 26: Large ribosomal subunit protein uL3

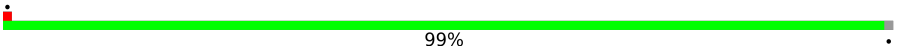
Chain D:

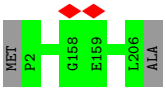




• Molecule 27: Large ribosomal subunit protein uL4

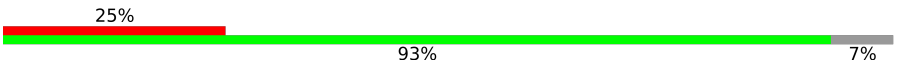
Chain E:

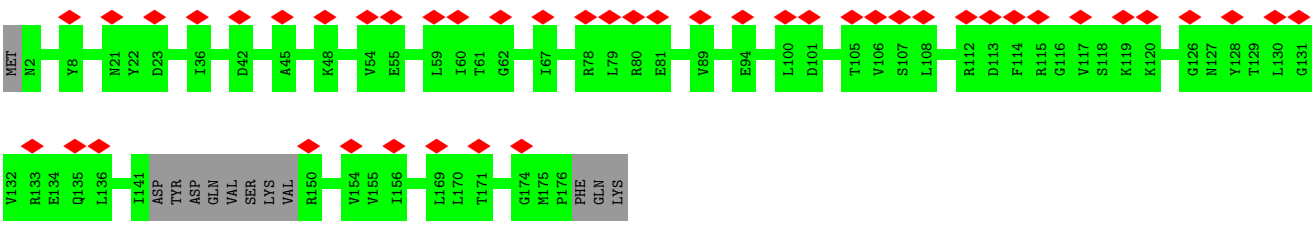




• Molecule 28: Large ribosomal subunit protein uL5

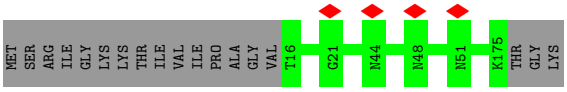
Chain F:





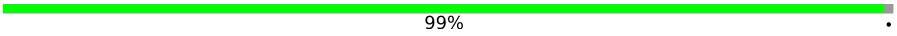
• Molecule 29: Large ribosomal subunit protein uL6

Chain G:



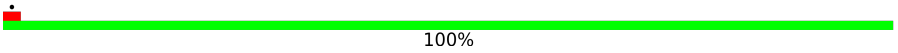
• Molecule 30: Large ribosomal subunit protein uL13

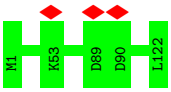
Chain L:



• Molecule 31: Large ribosomal subunit protein uL14

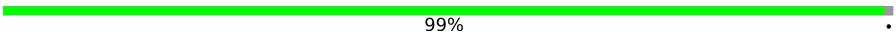
Chain M:





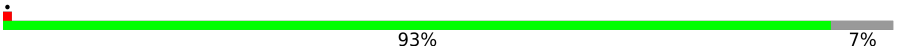
• Molecule 32: Large ribosomal subunit protein uL15

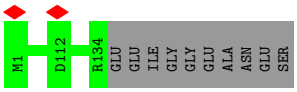
Chain N:



• Molecule 33: Large ribosomal subunit protein uL16

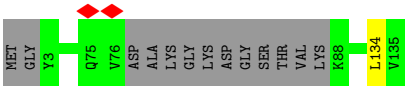
Chain O:





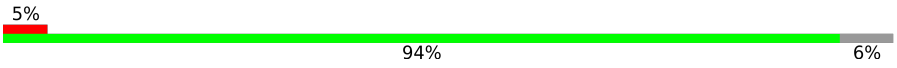
• Molecule 34: Large ribosomal subunit protein bL17

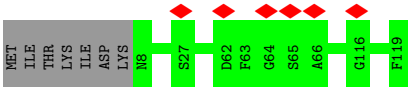
Chain P:



• Molecule 35: Large ribosomal subunit protein uL18

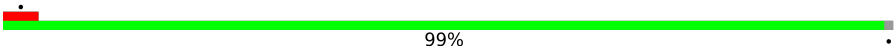
Chain Q:

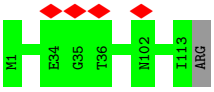




• Molecule 36: Large ribosomal subunit protein bL19

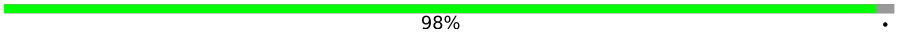
Chain R:





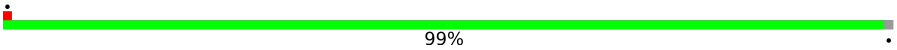
• Molecule 37: Large ribosomal subunit protein bL20

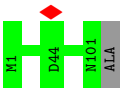
Chain S:



• Molecule 38: Large ribosomal subunit protein bL21

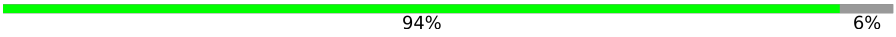
Chain T:

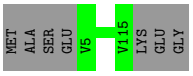




• Molecule 39: Large ribosomal subunit protein uL22

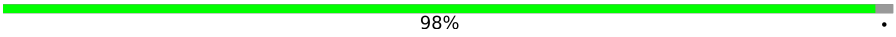
Chain U:





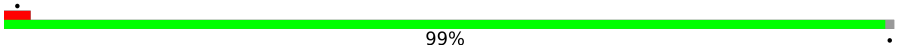
• Molecule 40: Large ribosomal subunit protein uL23

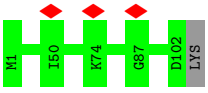
Chain V:



• Molecule 41: Large ribosomal subunit protein uL24

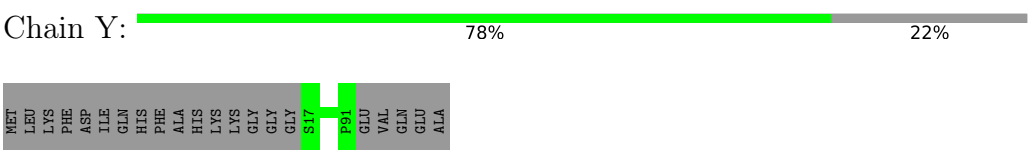
Chain W:





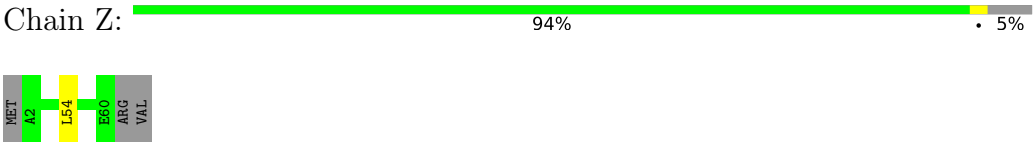
• Molecule 42: Large ribosomal subunit protein bL27

Chain Y:



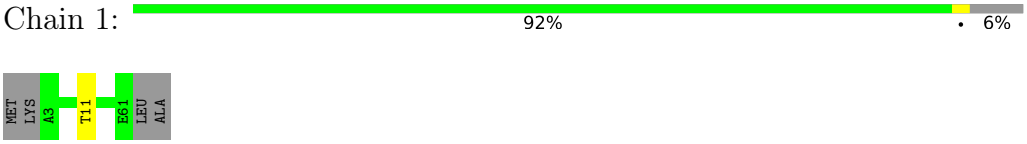
• Molecule 43: Large ribosomal subunit protein bL28

Chain Z:



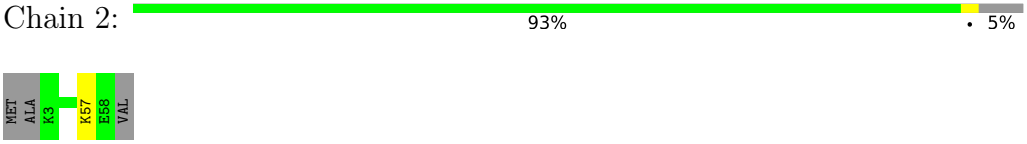
• Molecule 44: Large ribosomal subunit protein uL29

Chain 1:



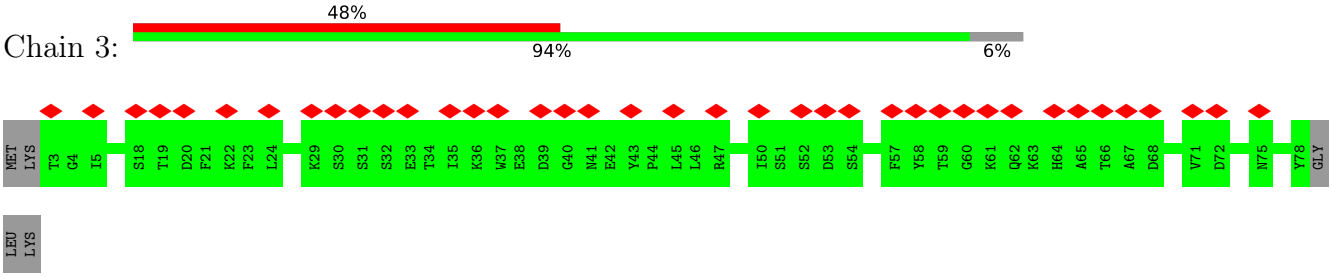
• Molecule 45: Large ribosomal subunit protein uL30

Chain 2:



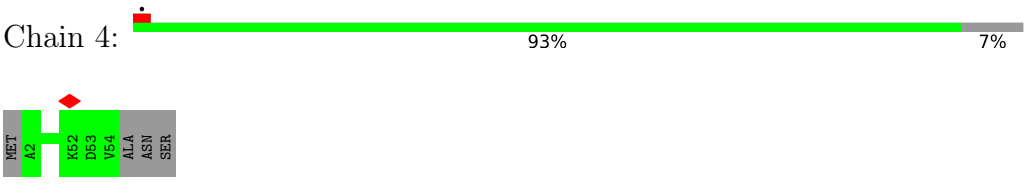
• Molecule 46: Large ribosomal subunit protein bL31B

Chain 3:



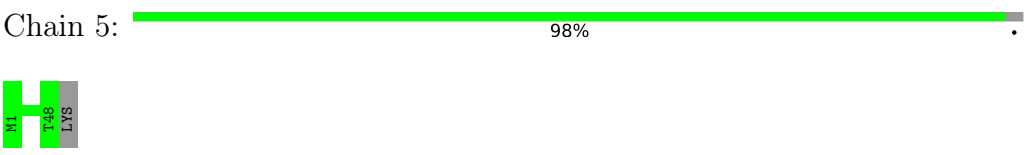
• Molecule 47: Large ribosomal subunit protein bL32

Chain 4:



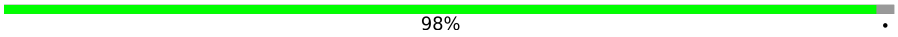
• Molecule 48: Large ribosomal subunit protein bL33

Chain 5:



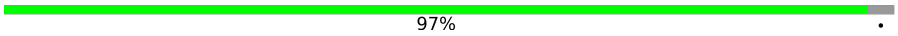
• Molecule 49: Large ribosomal subunit protein bL34

Chain 6:



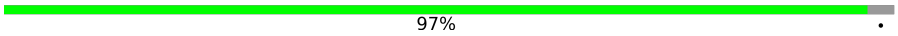
• Molecule 50: Large ribosomal subunit protein bL35

Chain 7:



• Molecule 51: Large ribosomal subunit protein bL36

Chain 8:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	15497	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40.0	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2300	Depositor
Magnification	96000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	25.559	Depositor
Minimum map value	-12.278	Depositor
Average map value	0.001	Depositor
Map value standard deviation	1.072	Depositor
Recommended contour level	3.2	Depositor
Map size (Å)	435.2, 435.2, 435.2	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85, 0.85, 0.85	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, K, 5MU, MIA, PSU, 4SU, MG, 7MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	a	0.68	1/36403 (0.0%)	0.87	12/56778 (0.0%)
2	b	0.26	0/1241	0.41	0/1721
3	c	0.40	0/1418	0.56	0/1939
4	d	0.34	0/1453	0.53	0/1976
5	e	0.35	0/1100	0.55	0/1496
6	f	0.33	0/663	0.51	0/904
7	g	0.35	0/1028	0.58	1/1396 (0.1%)
8	h	0.39	0/942	0.55	0/1284
9	i	0.40	0/936	0.59	0/1267
10	j	0.42	0/726	0.56	0/988
11	k	0.28	0/691	0.49	0/955
12	l	0.37	0/949	0.57	0/1290
13	m	0.36	0/786	0.57	0/1064
14	n	0.53	0/472	0.60	0/631
15	o	0.32	0/643	0.55	0/872
16	p	0.37	0/654	0.54	0/888
17	q	0.32	0/565	0.58	0/768
18	r	0.37	0/454	0.55	0/613
19	s	0.36	0/514	0.51	0/707
20	t	0.26	0/495	0.43	0/682
21	x	0.39	0/1605	0.87	1/2497 (0.0%)
22	w	0.41	0/140	0.80	0/215
23	A	0.66	0/69894	0.84	9/109035 (0.0%)
24	B	0.42	0/2711	0.79	0/4224
25	C	0.38	0/2095	0.58	0/2821
26	D	0.41	0/1567	0.56	0/2111
27	E	0.37	0/1536	0.56	0/2082
28	F	0.30	0/1156	0.54	0/1579
29	G	0.31	0/1102	0.55	0/1508
30	L	0.37	0/1107	0.52	0/1495
31	M	0.37	0/921	0.57	0/1236
32	N	0.34	0/1032	0.55	0/1381

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	O	0.37	0/1047	0.56	0/1406
34	P	0.37	0/963	0.63	1/1294 (0.1%)
35	Q	0.28	0/709	0.51	0/966
36	R	0.37	0/855	0.56	0/1158
37	S	0.41	0/943	0.56	0/1258
38	T	0.42	0/775	0.52	0/1045
39	U	0.37	0/853	0.55	0/1156
40	V	0.40	0/733	0.54	0/988
41	W	0.33	0/745	0.51	0/1005
42	Y	0.37	0/556	0.58	0/744
43	Z	0.34	0/444	0.62	1/593 (0.2%)
44	1	0.31	0/468	0.57	0/628
45	2	0.34	0/432	0.60	0/581
46	3	0.28	0/542	0.48	0/743
47	4	0.41	0/433	0.58	0/577
48	5	0.33	0/384	0.58	0/518
49	6	0.39	0/364	0.66	0/475
50	7	0.35	0/519	0.63	0/677
51	8	0.36	0/295	0.61	0/387
All	All	0.60	1/149059 (0.0%)	0.79	25/224602 (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
14	n	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	a	95	A	C1'-N9	-5.05	1.39	1.46

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	g	12	VAL	C-N-CA	-6.66	105.06	121.70
1	a	970	U	C2-N3-C4	-6.35	123.19	127.00
1	a	544	C	C2-N1-C1'	6.12	125.53	118.80
23	A	1358	C	C2-N1-C1'	5.97	125.37	118.80
23	A	231	A	O4'-C1'-N9	5.93	112.94	108.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	a	1035	C	C2-N1-C1'	5.58	124.94	118.80
23	A	308	U	C2-N1-C1'	5.56	124.37	117.70
23	A	2922	G	C4-N9-C1'	5.50	133.65	126.50
1	a	1075	C	C2-N1-C1'	5.48	124.83	118.80
1	a	1229	G	N1-C2-N3	5.46	127.18	123.90
21	x	45	U	C2-N1-C1'	5.46	124.25	117.70
1	a	1166	C	C2-N1-C1'	5.40	124.75	118.80
1	a	1147	G	P-O3'-C3'	5.30	126.06	119.70
1	a	1208	A	P-O3'-C3'	5.29	126.05	119.70
43	Z	54	LEU	CA-CB-CG	5.29	127.47	115.30
23	A	1093	G	C3'-C2'-C1'	-5.28	97.28	101.50
23	A	1532	G	OP1-P-O3'	5.23	116.72	105.20
1	a	970	U	N1-C2-N3	5.22	118.03	114.90
34	P	134	LEU	CA-CB-CG	5.14	127.13	115.30
23	A	1553	C	C2-N1-C1'	5.14	124.45	118.80
23	A	1530	G	C4-N9-C1'	5.12	133.16	126.50
1	a	68	G	N1-C6-O6	-5.07	116.86	119.90
23	A	482	C	C2-N1-C1'	5.07	124.38	118.80
1	a	1110	A	P-O3'-C3'	5.05	125.76	119.70
1	a	476	C	N1-C2-O2	5.02	121.91	118.90

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
14	n	42	ILE	Peptide

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.

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
2	b	222/249 (89%)	202 (91%)	19 (9%)	1 (0%)	29 61
3	c	201/218 (92%)	179 (89%)	22 (11%)	0	100 100
4	d	197/200 (98%)	178 (90%)	19 (10%)	0	100 100
5	e	154/167 (92%)	138 (90%)	16 (10%)	0	100 100
6	f	91/97 (94%)	84 (92%)	7 (8%)	0	100 100
7	g	141/156 (90%)	136 (96%)	5 (4%)	0	100 100
8	h	129/132 (98%)	122 (95%)	7 (5%)	0	100 100
9	i	123/130 (95%)	114 (93%)	9 (7%)	0	100 100
10	j	95/102 (93%)	88 (93%)	7 (7%)	0	100 100
11	k	112/129 (87%)	106 (95%)	6 (5%)	0	100 100
12	l	133/137 (97%)	119 (90%)	14 (10%)	0	100 100
13	m	112/121 (93%)	103 (92%)	9 (8%)	0	100 100
14	n	58/61 (95%)	53 (91%)	5 (9%)	0	100 100
15	o	85/89 (96%)	83 (98%)	2 (2%)	0	100 100
16	p	86/90 (96%)	81 (94%)	5 (6%)	0	100 100
17	q	78/87 (90%)	71 (91%)	7 (9%)	0	100 100
18	r	62/79 (78%)	56 (90%)	5 (8%)	1 (2%)	9 36
19	s	79/92 (86%)	69 (87%)	10 (13%)	0	100 100
20	t	79/84 (94%)	76 (96%)	3 (4%)	0	100 100
25	C	271/277 (98%)	257 (95%)	14 (5%)	0	100 100
26	D	204/209 (98%)	193 (95%)	11 (5%)	0	100 100
27	E	203/207 (98%)	193 (95%)	10 (5%)	0	100 100
28	F	163/179 (91%)	151 (93%)	12 (7%)	0	100 100
29	G	158/178 (89%)	149 (94%)	9 (6%)	0	100 100
30	L	141/145 (97%)	135 (96%)	6 (4%)	0	100 100
31	M	120/122 (98%)	113 (94%)	7 (6%)	0	100 100
32	N	143/146 (98%)	131 (92%)	12 (8%)	0	100 100
33	O	132/144 (92%)	127 (96%)	5 (4%)	0	100 100
34	P	118/135 (87%)	108 (92%)	10 (8%)	0	100 100
35	Q	110/119 (92%)	104 (94%)	6 (6%)	0	100 100
36	R	111/114 (97%)	106 (96%)	5 (4%)	0	100 100
37	S	115/119 (97%)	111 (96%)	4 (4%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
38	T	99/102 (97%)	94 (95%)	5 (5%)	0	100 100
39	U	109/118 (92%)	106 (97%)	3 (3%)	0	100 100
40	V	90/94 (96%)	83 (92%)	7 (8%)	0	100 100
41	W	100/103 (97%)	90 (90%)	10 (10%)	0	100 100
42	Y	73/96 (76%)	65 (89%)	8 (11%)	0	100 100
43	Z	57/62 (92%)	49 (86%)	8 (14%)	0	100 100
44	1	57/63 (90%)	54 (95%)	2 (4%)	1 (2%)	8 35
45	2	54/59 (92%)	52 (96%)	2 (4%)	0	100 100
46	3	74/81 (91%)	58 (78%)	16 (22%)	0	100 100
47	4	51/57 (90%)	46 (90%)	5 (10%)	0	100 100
48	5	46/49 (94%)	41 (89%)	5 (11%)	0	100 100
49	6	41/44 (93%)	40 (98%)	1 (2%)	0	100 100
50	7	62/66 (94%)	56 (90%)	6 (10%)	0	100 100
51	8	34/37 (92%)	32 (94%)	2 (6%)	0	100 100
All	All	5173/5545 (93%)	4802 (93%)	368 (7%)	3 (0%)	54 81

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	b	128	VAL
18	r	14	VAL
44	1	11	THR

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	b	31/214 (14%)	31 (100%)	0	100 100
3	c	112/177 (63%)	111 (99%)	1 (1%)	78 87
4	d	124/170 (73%)	124 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	e	108/131 (82%)	108 (100%)	0	100	100
6	f	49/85 (58%)	49 (100%)	0	100	100
7	g	90/130 (69%)	90 (100%)	0	100	100
8	h	86/110 (78%)	86 (100%)	0	100	100
9	i	85/102 (83%)	85 (100%)	0	100	100
10	j	71/93 (76%)	71 (100%)	0	100	100
11	k	44/100 (44%)	44 (100%)	0	100	100
12	l	83/118 (70%)	83 (100%)	0	100	100
13	m	64/102 (63%)	64 (100%)	0	100	100
14	n	46/52 (88%)	44 (96%)	2 (4%)	29	59
15	o	54/81 (67%)	54 (100%)	0	100	100
16	p	60/80 (75%)	59 (98%)	1 (2%)	60	78
17	q	45/78 (58%)	44 (98%)	1 (2%)	52	74
18	r	39/67 (58%)	39 (100%)	0	100	100
19	s	24/78 (31%)	24 (100%)	0	100	100
20	t	31/66 (47%)	31 (100%)	0	100	100
25	C	209/225 (93%)	209 (100%)	0	100	100
26	D	159/171 (93%)	159 (100%)	0	100	100
27	E	156/174 (90%)	156 (100%)	0	100	100
28	F	100/155 (64%)	100 (100%)	0	100	100
29	G	90/147 (61%)	90 (100%)	0	100	100
30	L	109/121 (90%)	109 (100%)	0	100	100
31	M	98/101 (97%)	98 (100%)	0	100	100
32	N	93/115 (81%)	93 (100%)	0	100	100
33	O	98/113 (87%)	98 (100%)	0	100	100
34	P	94/111 (85%)	94 (100%)	0	100	100
35	Q	40/97 (41%)	40 (100%)	0	100	100
36	R	83/99 (84%)	83 (100%)	0	100	100
37	S	92/97 (95%)	92 (100%)	0	100	100
38	T	76/82 (93%)	76 (100%)	0	100	100
39	U	89/97 (92%)	89 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
40	V	76/84 (90%)	76 (100%)	0	100 100
41	W	76/88 (86%)	76 (100%)	0	100 100
42	Y	54/76 (71%)	54 (100%)	0	100 100
43	Z	44/53 (83%)	44 (100%)	0	100 100
44	1	47/55 (86%)	47 (100%)	0	100 100
45	2	49/52 (94%)	48 (98%)	1 (2%)	55 76
46	3	45/73 (62%)	45 (100%)	0	100 100
47	4	47/50 (94%)	47 (100%)	0	100 100
48	5	41/48 (85%)	41 (100%)	0	100 100
49	6	38/39 (97%)	38 (100%)	0	100 100
50	7	52/56 (93%)	52 (100%)	0	100 100
51	8	35/35 (100%)	35 (100%)	0	100 100
All	All	3436/4648 (74%)	3430 (100%)	6 (0%)	93 97

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	c	39	ARG
14	n	25	GLU
14	n	38	LYS
16	p	71	ARG
17	q	39	ARG
45	2	57	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
3	c	91	ASN
3	c	99	HIS
4	d	85	ASN
5	e	46	HIS
9	i	81	HIS
11	k	28	ASN
11	k	40	ASN
12	l	5	ASN
12	l	86	ASN
12	l	109	HIS

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Mol	Chain	Res	Type
16	p	62	ASN
16	p	72	ASN
17	q	74	HIS
19	s	83	HIS
20	t	21	ASN
26	D	32	GLN
26	D	173	ASN
27	E	9	GLN
29	G	65	HIS
29	G	140	HIS
29	G	147	ASN
30	L	80	GLN
30	L	97	ASN
30	L	118	GLN
31	M	13	ASN
32	N	27	ASN
32	N	83	ASN
36	R	41	GLN
36	R	102	ASN
37	S	52	GLN
39	U	107	HIS
40	V	90	GLN
41	W	67	ASN
45	2	17	GLN
46	3	75	ASN
47	4	23	GLN
50	7	60	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	a	1512/1550 (97%)	261 (17%)	0
21	x	71/76 (93%)	25 (35%)	0
22	w	5/21 (23%)	1 (20%)	0
23	A	2900/2932 (98%)	507 (17%)	31 (1%)
24	B	113/116 (97%)	13 (11%)	0
All	All	4601/4695 (97%)	807 (17%)	31 (0%)

All (807) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	a	8	A
1	a	9	G
1	a	31	G
1	a	32	A
1	a	39	G
1	a	44	G
1	a	47	C
1	a	48	C
1	a	51	A
1	a	54	C
1	a	55	A
1	a	64	G
1	a	65	A
1	a	66	A
1	a	67	C
1	a	68	G
1	a	69	A
1	a	70	A
1	a	71	C
1	a	72	G
1	a	73	G
1	a	96	G
1	a	97	U
1	a	98	U
1	a	99	A
1	a	100	G
1	a	102	G
1	a	107	A
1	a	114	A
1	a	119	C
1	a	120	A
1	a	128	A
1	a	130	C
1	a	142	U
1	a	144	G
1	a	159	A
1	a	164	G
1	a	173	A
1	a	182	U
1	a	183	A
1	a	187	U
1	a	192	C
1	a	207	U

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Mol	Chain	Res	Type
1	a	209	A
1	a	211	A
1	a	212	G
1	a	219	U
1	a	220	C
1	a	222	G
1	a	225	A
1	a	239	G
1	a	248	U
1	a	249	G
1	a	252	U
1	a	253	U
1	a	255	G
1	a	259	G
1	a	274	G
1	a	275	C
1	a	297	G
1	a	329	A
1	a	336	C
1	a	338	C
1	a	340	G
1	a	349	C
1	a	350	C
1	a	351	U
1	a	352	A
1	a	353	C
1	a	354	G
1	a	355	G
1	a	359	G
1	a	360	C
1	a	362	G
1	a	372	A
1	a	373	U
1	a	375	U
1	a	380	C
1	a	381	A
1	a	406	C
1	a	414	G
1	a	419	A
1	a	420	A
1	a	421	G
1	a	425	G

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Mol	Chain	Res	Type
1	a	429	U
1	a	430	C
1	a	432	G
1	a	437	U
1	a	454	A
1	a	456	A
1	a	461	C
1	a	467	U
1	a	473	U
1	a	474	A
1	a	489	G
1	a	492	G
1	a	493	G
1	a	506	A
1	a	517	A
1	a	519	C
1	a	526	C
1	a	529	G
1	a	532	G
1	a	535	G
1	a	537	G
1	a	538	G
1	a	539	U
1	a	540	A
1	a	555	A
1	a	576	G
1	a	580	A
1	a	581	A
1	a	584	C
1	a	585	G
1	a	587	G
1	a	595	G
1	a	596	G
1	a	661	G
1	a	673	A
1	a	695	A
1	a	702	A
1	a	711	G
1	a	712	A
1	a	714	A
1	a	731	U
1	a	739	G

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Mol	Chain	Res	Type
1	a	757	A
1	a	763	G
1	a	789	A
1	a	801	U
1	a	802	A
1	a	825	C
1	a	829	G
1	a	848	G
1	a	855	C
1	a	868	C
1	a	881	A
1	a	894	G
1	a	923	A
1	a	931	G
1	a	935	G
1	a	936	G
1	a	943	C
1	a	944	A
1	a	965	U
1	a	967	A
1	a	969	U
1	a	970	U
1	a	974	A
1	a	975	G
1	a	976	C
1	a	977	A
1	a	978	A
1	a	980	G
1	a	984	A
1	a	985	G
1	a	986	A
1	a	992	A
1	a	1001	U
1	a	1002	G
1	a	1005	A
1	a	1008	C
1	a	1009	U
1	a	1011	U
1	a	1012	G
1	a	1013	A
1	a	1014	C
1	a	1016	A

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Mol	Chain	Res	Type
1	a	1018	U
1	a	1023	A
1	a	1027	A
1	a	1030	G
1	a	1032	U
1	a	1034	U
1	a	1035	C
1	a	1036	C
1	a	1045	A
1	a	1050	G
1	a	1052	G
1	a	1053	A
1	a	1054	C
1	a	1055	A
1	a	1062	G
1	a	1063	C
1	a	1064	A
1	a	1065	U
1	a	1074	U
1	a	1087	U
1	a	1094	U
1	a	1095	U
1	a	1103	G
1	a	1104	U
1	a	1108	G
1	a	1110	A
1	a	1111	A
1	a	1117	G
1	a	1134	U
1	a	1141	C
1	a	1142	A
1	a	1146	A
1	a	1147	G
1	a	1148	U
1	a	1154	A
1	a	1167	U
1	a	1168	G
1	a	1176	A
1	a	1178	G
1	a	1191	G
1	a	1203	A
1	a	1204	A

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Mol	Chain	Res	Type
1	a	1208	A
1	a	1209	U
1	a	1219	U
1	a	1220	A
1	a	1221	U
1	a	1233	C
1	a	1234	A
1	a	1235	C
1	a	1245	A
1	a	1248	G
1	a	1257	A
1	a	1263	U
1	a	1264	C
1	a	1267	G
1	a	1287	A
1	a	1288	U
1	a	1294	A
1	a	1306	A
1	a	1307	G
1	a	1309	U
1	a	1312	G
1	a	1329	C
1	a	1343	C
1	a	1347	A
1	a	1371	U
1	a	1377	G
1	a	1388	U
1	a	1404	C
1	a	1405	A
1	a	1426	G
1	a	1436	C
1	a	1449	G
1	a	1450	G
1	a	1453	A
1	a	1455	C
1	a	1456	C
1	a	1492	U
1	a	1495	G
1	a	1498	U
1	a	1500	A
1	a	1501	A
1	a	1505	G

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Mol	Chain	Res	Type
1	a	1511	A
1	a	1514	U
1	a	1525	G
1	a	1527	A
1	a	1537	G
1	a	1538	G
1	a	1539	A
1	a	1545	U
21	x	6	G
21	x	9	A
21	x	19	G
21	x	20	U
21	x	25	C
21	x	26	A
21	x	29	G
21	x	30	G
21	x	35	A
21	x	41	C
21	x	44	G
21	x	45	U
21	x	46	7MG
21	x	47	U
21	x	48	C
21	x	49	C
21	x	51	U
21	x	52	G
21	x	54	5MU
21	x	56	C
21	x	60	U
21	x	61	C
21	x	68	C
21	x	73	A
21	x	76	A
22	w	13	A
23	A	10	A
23	A	13	A
23	A	14	A
23	A	15	G
23	A	28	A
23	A	34	U
23	A	45	G
23	A	46	C

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Mol	Chain	Res	Type
23	A	49	A
23	A	51	G
23	A	60	G
23	A	71	A
23	A	74	U
23	A	75	G
23	A	89	U
23	A	91	C
23	A	93	U
23	A	96	G
23	A	99	U
23	A	100	U
23	A	101	G
23	A	117	A
23	A	119	U
23	A	125	A
23	A	126	A
23	A	140	G
23	A	150	A
23	A	159	U
23	A	164	A
23	A	166	A
23	A	167	U
23	A	175	G
23	A	182	A
23	A	186	C
23	A	187	C
23	A	198	A
23	A	199	A
23	A	200	C
23	A	201	A
23	A	215	A
23	A	218	A
23	A	223	A
23	A	224	A
23	A	230	A
23	A	231	A
23	A	232	U
23	A	241	U
23	A	247	G
23	A	250	G
23	A	251	C

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Mol	Chain	Res	Type
23	A	257	A
23	A	274	A
23	A	280	A
23	A	282	G
23	A	283	C
23	A	285	U
23	A	287	C
23	A	289	U
23	A	290	C
23	A	295	G
23	A	296	G
23	A	300	U
23	A	301	A
23	A	307	C
23	A	308	U
23	A	309	C
23	A	313	A
23	A	320	U
23	A	323	A
23	A	345	G
23	A	354	A
23	A	372	A
23	A	373	A
23	A	374	C
23	A	388	A
23	A	396	U
23	A	404	A
23	A	406	A
23	A	410	G
23	A	411	A
23	A	412	U
23	A	417	A
23	A	418	G
23	A	420	A
23	A	432	G
23	A	433	U
23	A	434	G
23	A	449	U
23	A	452	G
23	A	457	G
23	A	458	A
23	A	470	G

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Mol	Chain	Res	Type
23	A	481	C
23	A	490	C
23	A	501	C
23	A	503	A
23	A	526	A
23	A	527	G
23	A	536	A
23	A	550	A
23	A	552	U
23	A	553	U
23	A	554	C
23	A	555	C
23	A	567	G
23	A	575	G
23	A	576	U
23	A	577	A
23	A	578	G
23	A	591	A
23	A	592	A
23	A	593	U
23	A	594	G
23	A	606	G
23	A	616	G
23	A	618	A
23	A	629	A
23	A	646	A
23	A	657	A
23	A	658	A
23	A	659	A
23	A	666	A
23	A	667	G
23	A	672	A
23	A	679	G
23	A	682	A
23	A	689	A
23	A	690	U
23	A	698	A
23	A	699	U
23	A	700	A
23	A	718	C
23	A	732	U
23	A	747	G

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Mol	Chain	Res	Type
23	A	763	U
23	A	776	U
23	A	793	U
23	A	794	G
23	A	810	A
23	A	811	G
23	A	821	G
23	A	828	A
23	A	829	A
23	A	830	U
23	A	839	A
23	A	851	G
23	A	858	C
23	A	865	A
23	A	873	U
23	A	874	U
23	A	890	G
23	A	891	U
23	A	892	A
23	A	893	A
23	A	913	A
23	A	931	C
23	A	941	U
23	A	943	A
23	A	944	C
23	A	957	A
23	A	959	C
23	A	964	A
23	A	970	A
23	A	973	U
23	A	974	A
23	A	979	U
23	A	980	A
23	A	987	A
23	A	991	A
23	A	992	G
23	A	1007	G
23	A	1020	A
23	A	1025	A
23	A	1029	A
23	A	1035	G
23	A	1042	A

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Mol	Chain	Res	Type
23	A	1051	C
23	A	1058	U
23	A	1059	A
23	A	1068	G
23	A	1069	U
23	A	1072	A
23	A	1073	A
23	A	1079	U
23	A	1091	U
23	A	1092	A
23	A	1093	G
23	A	1094	A
23	A	1100	A
23	A	1105	G
23	A	1106	U
23	A	1107	U
23	A	1112	U
23	A	1115	A
23	A	1116	A
23	A	1117	G
23	A	1119	A
23	A	1129	G
23	A	1133	G
23	A	1134	A
23	A	1142	A
23	A	1143	U
23	A	1154	U
23	A	1155	C
23	A	1157	A
23	A	1158	G
23	A	1161	A
23	A	1173	A
23	A	1174	A
23	A	1179	A
23	A	1181	C
23	A	1182	G
23	A	1185	G
23	A	1187	U
23	A	1188	A
23	A	1189	A
23	A	1203	A
23	A	1226	G

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Mol	Chain	Res	Type
23	A	1230	G
23	A	1249	A
23	A	1250	G
23	A	1254	G
23	A	1265	A
23	A	1283	G
23	A	1298	A
23	A	1301	G
23	A	1311	G
23	A	1317	A
23	A	1320	G
23	A	1344	A
23	A	1345	A
23	A	1346	U
23	A	1357	U
23	A	1369	C
23	A	1373	U
23	A	1382	G
23	A	1385	U
23	A	1394	C
23	A	1396	U
23	A	1409	A
23	A	1423	U
23	A	1428	A
23	A	1429	A
23	A	1430	C
23	A	1436	G
23	A	1439	A
23	A	1447	A
23	A	1455	U
23	A	1457	A
23	A	1462	U
23	A	1463	U
23	A	1464	A
23	A	1465	A
23	A	1469	A
23	A	1478	C
23	A	1489	A
23	A	1493	A
23	A	1494	A
23	A	1505	G
23	A	1509	A

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Mol	Chain	Res	Type
23	A	1510	U
23	A	1511	G
23	A	1519	A
23	A	1528	G
23	A	1529	U
23	A	1530	G
23	A	1531	U
23	A	1532	G
23	A	1533	A
23	A	1534	G
23	A	1536	A
23	A	1539	A
23	A	1542	C
23	A	1543	A
23	A	1546	U
23	A	1556	G
23	A	1557	C
23	A	1558	G
23	A	1560	A
23	A	1570	G
23	A	1571	U
23	A	1573	A
23	A	1574	U
23	A	1575	G
23	A	1580	A
23	A	1581	G
23	A	1594	G
23	A	1596	A
23	A	1618	A
23	A	1621	A
23	A	1630	U
23	A	1638	G
23	A	1656	C
23	A	1657	A
23	A	1659	A
23	A	1665	A
23	A	1695	A
23	A	1696	G
23	A	1697	C
23	A	1700	G
23	A	1701	A
23	A	1702	G

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Mol	Chain	Res	Type
23	A	1712	U
23	A	1723	G
23	A	1743	C
23	A	1747	A
23	A	1748	G
23	A	1749	A
23	A	1761	A
23	A	1762	U
23	A	1764	A
23	A	1771	A
23	A	1772	A
23	A	1773	G
23	A	1780	A
23	A	1781	G
23	A	1782	A
23	A	1783	G
23	A	1786	G
23	A	1789	G
23	A	1796	G
23	A	1797	G
23	A	1806	A
23	A	1809	G
23	A	1815	C
23	A	1833	C
23	A	1834	A
23	A	1849	C
23	A	1862	A
23	A	1886	A
23	A	1887	A
23	A	1890	G
23	A	1891	G
23	A	1892	A
23	A	1895	G
23	A	1903	U
23	A	1906	G
23	A	1939	G
23	A	1945	A
23	A	1946	A
23	A	1947	C
23	A	1948	U
23	A	1952	A
23	A	1954	G

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Mol	Chain	Res	Type
23	A	1963	G
23	A	1969	A
23	A	1971	A
23	A	1973	U
23	A	1988	U
23	A	1996	C
23	A	2000	C
23	A	2003	A
23	A	2004	A
23	A	2005	G
23	A	2024	U
23	A	2026	U
23	A	2029	C
23	A	2030	A
23	A	2056	A
23	A	2064	A
23	A	2065	G
23	A	2066	A
23	A	2067	U
23	A	2072	G
23	A	2076	C
23	A	2088	C
23	A	2089	G
23	A	2093	A
23	A	2094	G
23	A	2095	A
23	A	2102	G
23	A	2126	G
23	A	2127	A
23	A	2128	A
23	A	2133	U
23	A	2143	G
23	A	2144	U
23	A	2145	A
23	A	2149	G
23	A	2150	A
23	A	2151	U
23	A	2159	A
23	A	2165	A
23	A	2166	G
23	A	2167	A
23	A	2173	G

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Mol	Chain	Res	Type
23	A	2190	G
23	A	2191	A
23	A	2192	G
23	A	2193	G
23	A	2198	G
23	A	2202	G
23	A	2203	G
23	A	2205	U
23	A	2206	A
23	A	2221	U
23	A	2223	A
23	A	2231	A
23	A	2232	A
23	A	2236	G
23	A	2237	C
23	A	2244	A
23	A	2245	A
23	A	2256	A
23	A	2258	A
23	A	2271	G
23	A	2272	G
23	A	2299	A
23	A	2312	G
23	A	2316	C
23	A	2319	A
23	A	2320	A
23	A	2321	A
23	A	2329	U
23	A	2337	G
23	A	2338	A
23	A	2339	U
23	A	2341	G
23	A	2342	A
23	A	2343	A
23	A	2344	A
23	A	2353	A
23	A	2354	G
23	A	2355	A
23	A	2358	G
23	A	2360	A
23	A	2364	G
23	A	2367	C

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Mol	Chain	Res	Type
23	A	2378	G
23	A	2380	C
23	A	2383	C
23	A	2391	A
23	A	2394	A
23	A	2412	G
23	A	2416	G
23	A	2418	C
23	A	2421	A
23	A	2435	U
23	A	2439	C
23	A	2455	C
23	A	2458	A
23	A	2462	G
23	A	2463	A
23	A	2473	C
23	A	2474	C
23	A	2481	A
23	A	2485	C
23	A	2498	C
23	A	2507	C
23	A	2509	A
23	A	2535	G
23	A	2536	A
23	A	2537	U
23	A	2538	G
23	A	2540	C
23	A	2551	A
23	A	2587	U
23	A	2599	A
23	A	2600	G
23	A	2605	A
23	A	2606	C
23	A	2607	G
23	A	2635	A
23	A	2636	G
23	A	2642	U
23	A	2643	C
23	A	2646	U
23	A	2648	U
23	A	2663	G
23	A	2694	G

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Mol	Chain	Res	Type
23	A	2696	G
23	A	2722	U
23	A	2724	C
23	A	2747	G
23	A	2759	U
23	A	2768	G
23	A	2781	A
23	A	2790	A
23	A	2798	A
23	A	2799	G
23	A	2810	G
23	A	2811	A
23	A	2812	U
23	A	2813	G
23	A	2822	C
23	A	2824	U
23	A	2827	C
23	A	2828	U
23	A	2830	C
23	A	2832	G
23	A	2835	A
23	A	2836	G
23	A	2837	U
23	A	2862	A
23	A	2864	A
23	A	2872	G
23	A	2877	G
23	A	2878	G
23	A	2890	U
23	A	2896	G
23	A	2901	G
23	A	2909	C
23	A	2912	A
23	A	2915	G
23	A	2920	A
23	A	2922	G
23	A	2929	C
24	B	10	U
24	B	23	U
24	B	27	A
24	B	33	U
24	B	37	A

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Mol	Chain	Res	Type
24	B	40	C
24	B	51	A
24	B	54	U
24	B	55	A
24	B	87	U
24	B	88	C
24	B	107	G
24	B	109	U

All (31) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
23	A	27	G
23	A	88	G
23	A	92	G
23	A	96	G
23	A	139	A
23	A	286	G
23	A	371	U
23	A	525	A
23	A	553	U
23	A	688	A
23	A	756	A
23	A	809	G
23	A	847	G
23	A	854	G
23	A	979	U
23	A	1017	C
23	A	1172	A
23	A	1248	A
23	A	1249	A
23	A	1497	G
23	A	1528	G
23	A	1532	G
23	A	1533	A
23	A	1569	U
23	A	1595	G
23	A	1886	A
23	A	2320	A
23	A	2472	A
23	A	2789	U
23	A	2809	A

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Mol	Chain	Res	Type
23	A	2908	A

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

7 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	$\#\|Z\| > 2$
21	MIA	x	37	21	24,31,32	2.20	3 (12%)	26,44,47	2.52	9 (34%)
21	5MU	x	54	21	19,22,23	1.32	4 (21%)	28,32,35	2.30	10 (35%)
21	PSU	x	39	21	18,21,22	1.32	2 (11%)	22,30,33	1.97	4 (18%)
21	7MG	x	46	21	22,26,27	1.30	3 (13%)	29,39,42	2.63	8 (27%)
21	4SU	x	8	21	18,21,22	1.80	4 (22%)	26,30,33	2.34	5 (19%)
21	PSU	x	55	21	18,21,22	1.34	2 (11%)	22,30,33	1.88	4 (18%)
21	PSU	x	32	21	18,21,22	1.36	3 (16%)	22,30,33	1.87	4 (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
21	MIA	x	37	21	-	3/11/33/34	0/3/3/3
21	5MU	x	54	21	-	0/7/25/26	0/2/2/2
21	PSU	x	39	21	-	1/7/25/26	0/2/2/2
21	7MG	x	46	21	-	4/7/37/38	0/3/3/3
21	4SU	x	8	21	-	2/7/25/26	0/2/2/2
21	PSU	x	55	21	-	2/7/25/26	0/2/2/2
21	PSU	x	32	21	-	0/7/25/26	0/2/2/2

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
21	x	37	MIA	C13-C14	7.08	1.52	1.32
21	x	37	MIA	C2-S10	-6.91	1.69	1.75
21	x	8	4SU	C4-S4	-4.77	1.59	1.68
21	x	8	4SU	C4-N3	-3.29	1.34	1.37
21	x	55	PSU	C6-C5	3.20	1.39	1.35
21	x	8	4SU	C5-C4	-2.96	1.38	1.42
21	x	39	PSU	C6-C5	2.91	1.38	1.35
21	x	46	7MG	C5-C4	2.88	1.47	1.38
21	x	32	PSU	C6-C5	2.85	1.38	1.35
21	x	46	7MG	C4-N9	-2.82	1.34	1.37
21	x	54	5MU	C6-N1	-2.74	1.33	1.38
21	x	54	5MU	C4-N3	-2.63	1.34	1.38
21	x	32	PSU	C4-N3	-2.60	1.34	1.38
21	x	46	7MG	C6-N1	-2.60	1.34	1.38
21	x	55	PSU	C4-N3	-2.53	1.34	1.38
21	x	39	PSU	C4-N3	-2.52	1.34	1.38
21	x	37	MIA	C5-C4	2.37	1.47	1.40
21	x	54	5MU	C2-N1	2.17	1.41	1.38
21	x	54	5MU	C6-C5	2.12	1.38	1.34
21	x	8	4SU	C2-N3	-2.08	1.34	1.38
21	x	32	PSU	C2-N1	-2.03	1.34	1.36

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	x	46	7MG	N9-C4-N3	9.32	139.41	125.47
21	x	37	MIA	C12-C13-C14	-7.79	111.98	127.14
21	x	8	4SU	C4-N3-C2	-7.11	120.43	127.34
21	x	8	4SU	C5-C4-N3	6.42	120.64	114.69
21	x	39	PSU	N1-C2-N3	6.03	121.96	115.13
21	x	55	PSU	N1-C2-N3	5.86	121.76	115.13
21	x	32	PSU	N1-C2-N3	5.79	121.69	115.13
21	x	54	5MU	C4-N3-C2	-5.68	120.00	127.35
21	x	46	7MG	C5-C4-N3	-5.53	117.59	128.13
21	x	46	7MG	N9-C8-N7	-5.30	95.80	103.38
21	x	54	5MU	N3-C2-N1	5.15	121.72	114.89
21	x	54	5MU	O4-C4-C5	-4.64	119.53	124.90
21	x	8	4SU	C5-C4-S4	-4.45	118.74	124.47
21	x	46	7MG	C2-N3-C4	4.42	120.18	112.30
21	x	39	PSU	C4-N3-C2	-4.32	120.11	126.34
21	x	37	MIA	C16-C14-C13	-4.22	110.44	122.65
21	x	37	MIA	C2-N3-C4	4.21	121.13	115.32
21	x	54	5MU	C5-C6-N1	-4.06	119.16	123.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	x	54	5MU	C5-C4-N3	3.99	118.71	115.31
21	x	37	MIA	C15-C14-C13	-3.92	111.33	122.65
21	x	32	PSU	O2-C2-N1	-3.87	118.53	122.79
21	x	8	4SU	N3-C2-N1	3.84	119.98	114.89
21	x	55	PSU	C4-N3-C2	-3.80	120.87	126.34
21	x	37	MIA	C11-S10-C2	-3.73	99.48	102.27
21	x	32	PSU	C4-N3-C2	-3.53	121.25	126.34
21	x	55	PSU	O2-C2-N1	-3.42	119.02	122.79
21	x	37	MIA	C5-C6-N1	-3.39	117.99	120.81
21	x	39	PSU	O2-C2-N1	-3.37	119.08	122.79
21	x	54	5MU	O2-C2-N1	-3.16	118.59	122.79
21	x	46	7MG	C5-C6-N1	2.98	116.25	110.99
21	x	37	MIA	C4-C5-N7	-2.73	106.55	109.40
21	x	46	7MG	C5-C4-N9	-2.59	102.98	106.35
21	x	37	MIA	C2-N1-C6	2.52	121.70	117.19
21	x	54	5MU	C5M-C5-C6	-2.32	119.74	122.85
21	x	8	4SU	C1'-N1-C2	2.23	121.61	117.57
21	x	54	5MU	C1'-N1-C2	2.23	121.61	117.57
21	x	55	PSU	O4'-C1'-C2'	2.21	108.26	105.14
21	x	32	PSU	O4'-C1'-C2'	2.20	108.25	105.14
21	x	37	MIA	N3-C2-N1	-2.16	123.02	126.98
21	x	46	7MG	CM7-N7-C5	2.15	131.94	126.40
21	x	54	5MU	C6-C5-C4	2.09	119.78	118.03
21	x	46	7MG	O6-C6-C5	-2.07	122.45	127.54
21	x	39	PSU	C6-C5-C4	-2.07	116.75	118.20
21	x	54	5MU	C1'-N1-C6	-2.05	117.70	121.12

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
21	x	37	MIA	C12-C13-C14-C15
21	x	8	4SU	O4'-C4'-C5'-O5'
21	x	46	7MG	O4'-C1'-N9-C8
21	x	46	7MG	O4'-C1'-N9-C4
21	x	8	4SU	C3'-C4'-C5'-O5'
21	x	46	7MG	O4'-C4'-C5'-O5'
21	x	37	MIA	C5-C6-N6-C12
21	x	55	PSU	O4'-C1'-C5-C4
21	x	37	MIA	N1-C6-N6-C12
21	x	39	PSU	O4'-C4'-C5'-O5'
21	x	55	PSU	O4'-C1'-C5-C6

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Mol	Chain	Res	Type	Atoms
21	x	46	7MG	C4'-C5'-O5'-P

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 103 ligands modelled in this entry, 103 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.

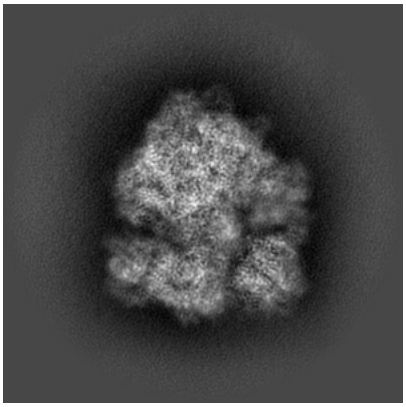
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-42561. These allow visual inspection of the internal detail of the map and identification of artifacts.

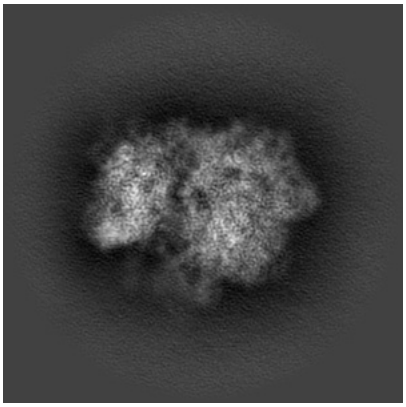
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

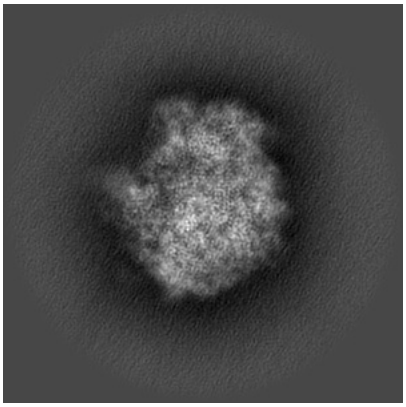
6.1.1 Primary map



X



Y

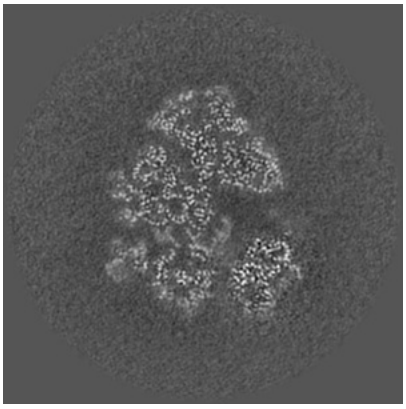


Z

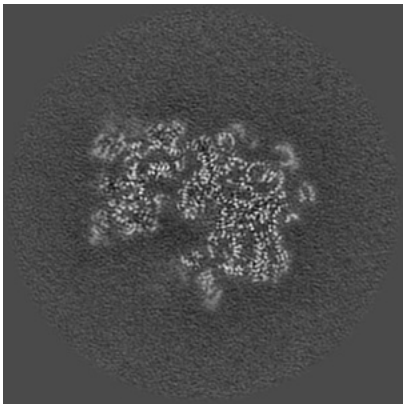
The images above show the map projected in three orthogonal directions.

6.2 Central slices

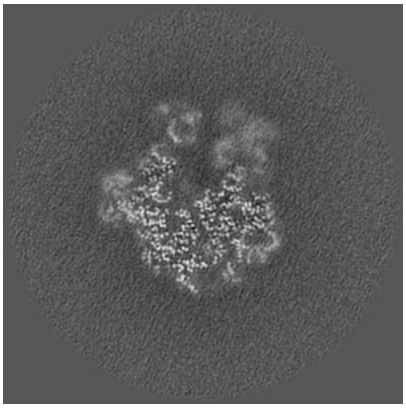
6.2.1 Primary map



X Index: 256



Y Index: 256

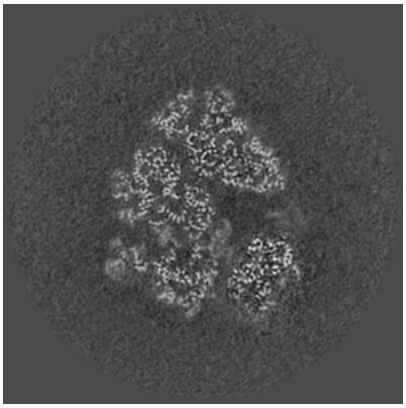


Z Index: 256

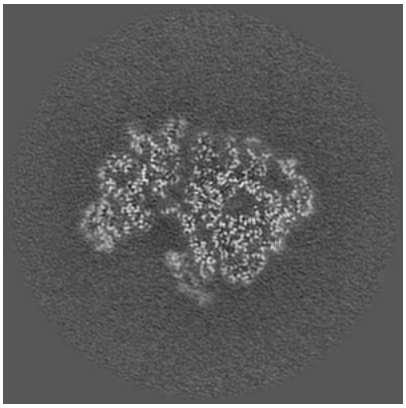
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

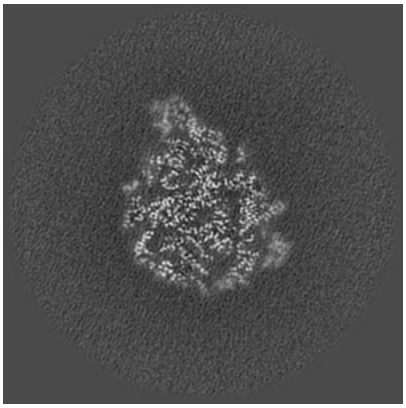
6.3.1 Primary map



X Index: 254



Y Index: 234

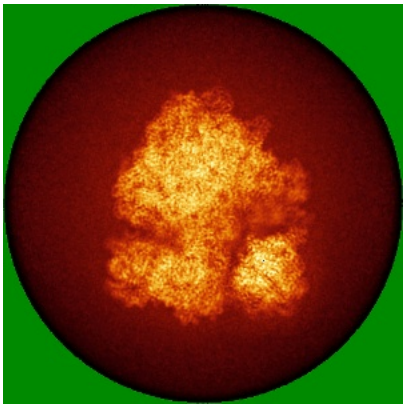


Z Index: 296

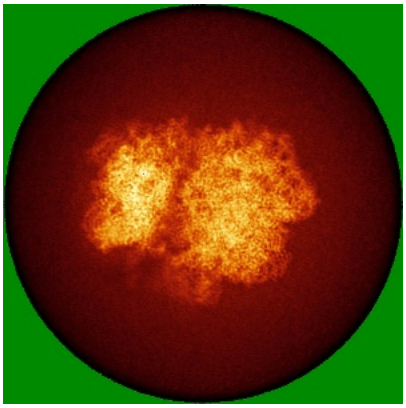
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

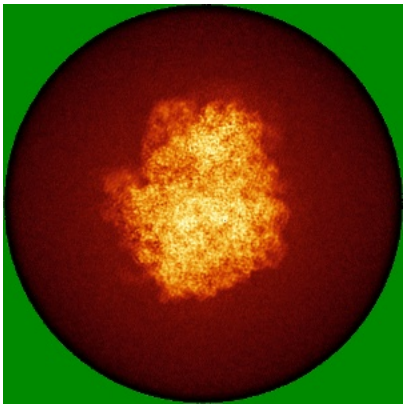
6.4.1 Primary map



X



Y

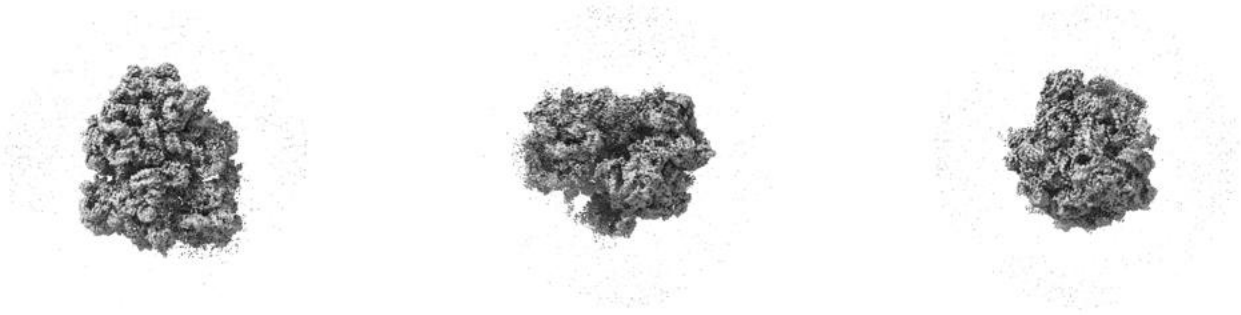


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 3.2. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

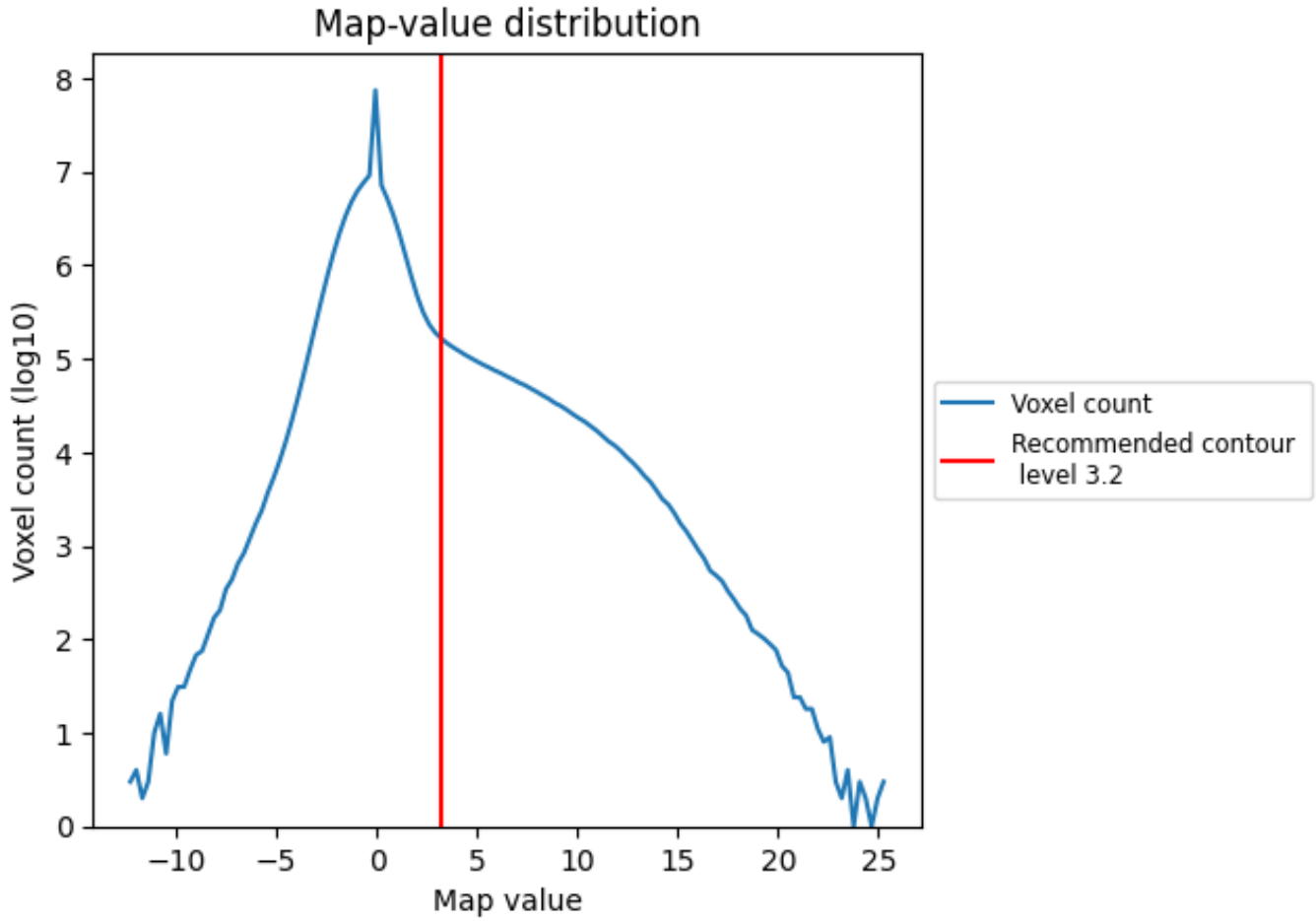
6.6 Mask visualisation (i)

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

7 Map analysis

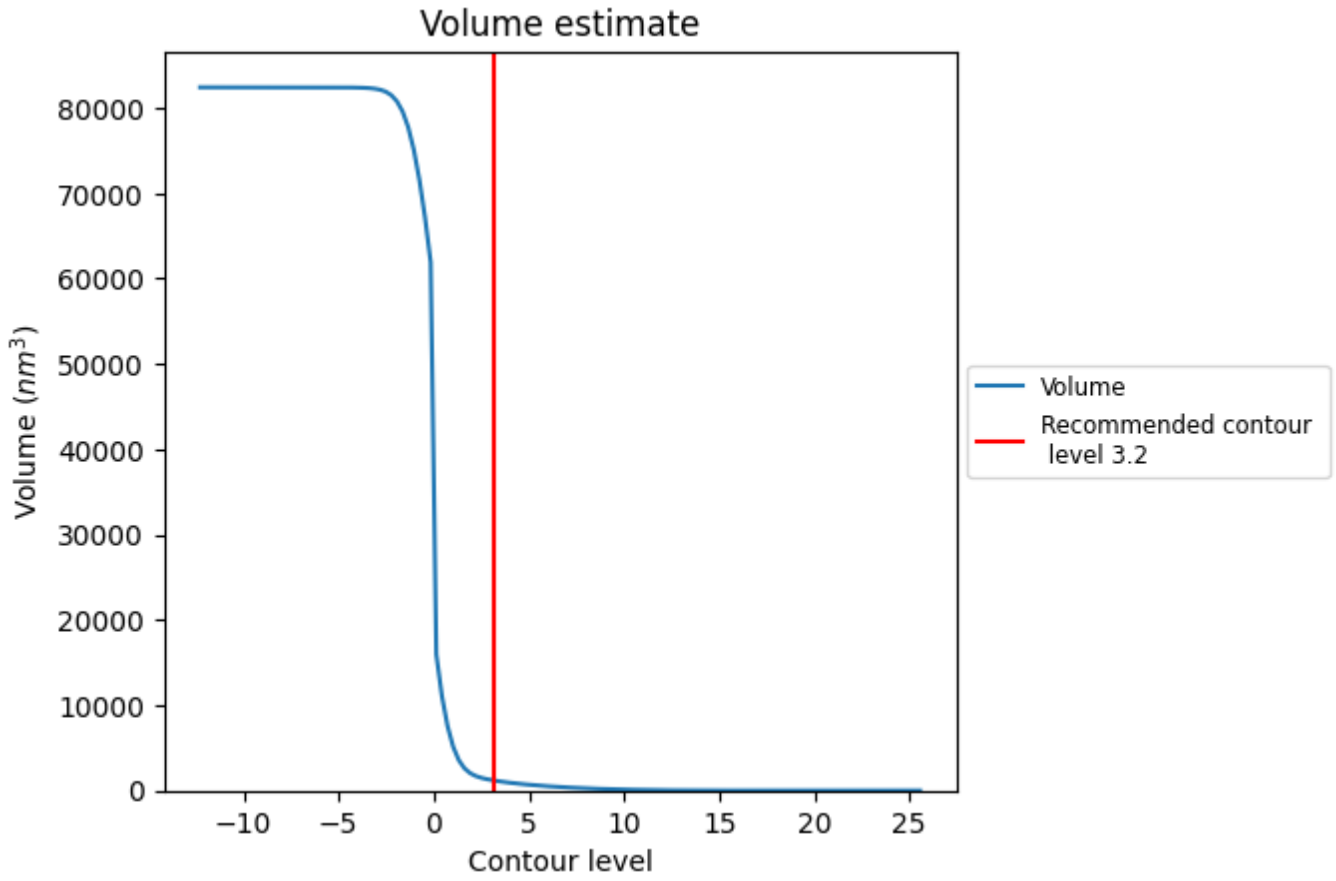
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

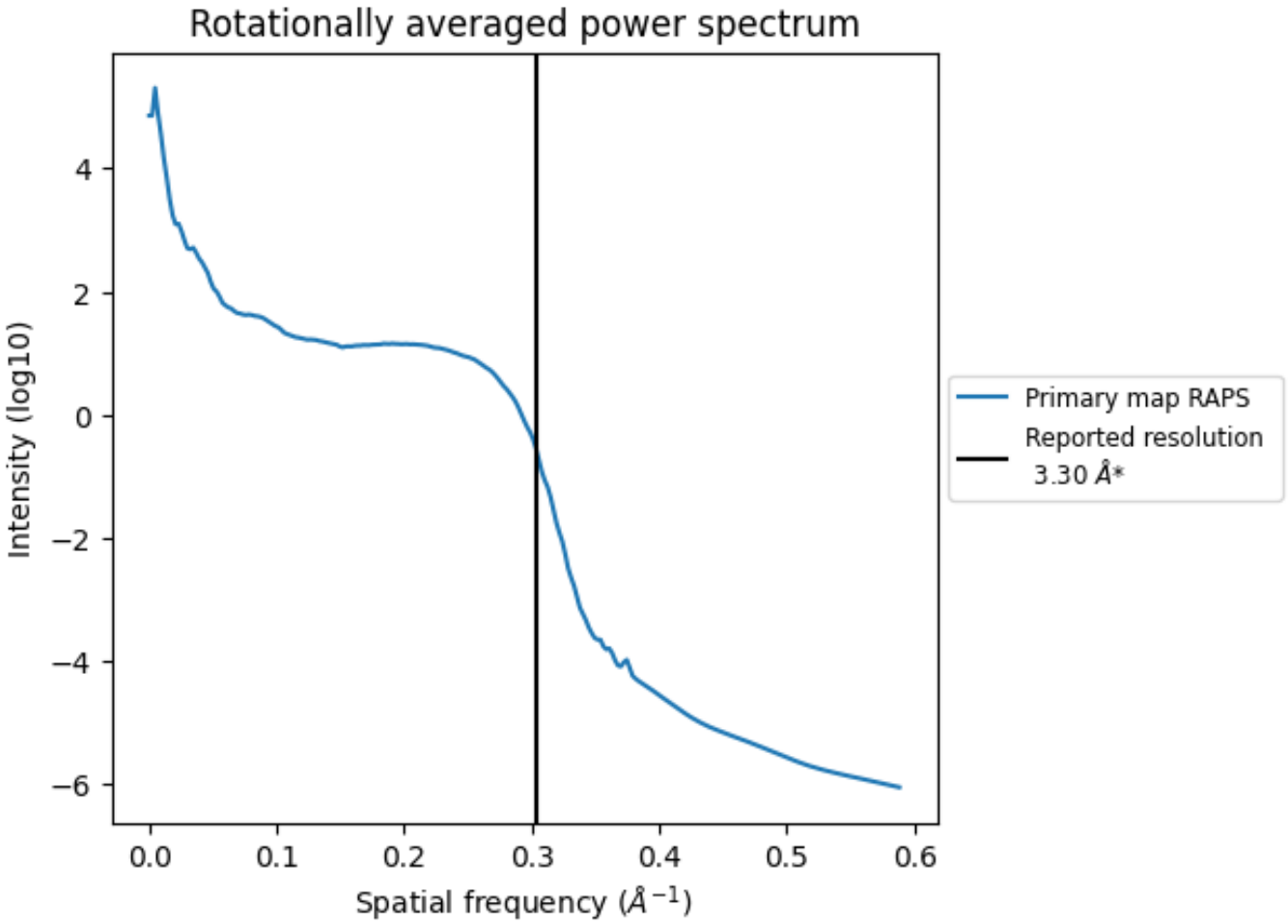
7.2 Volume estimate



The volume at the recommended contour level is 1168 nm^3; this corresponds to an approximate mass of 1055 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 0.303 Å^{-1}

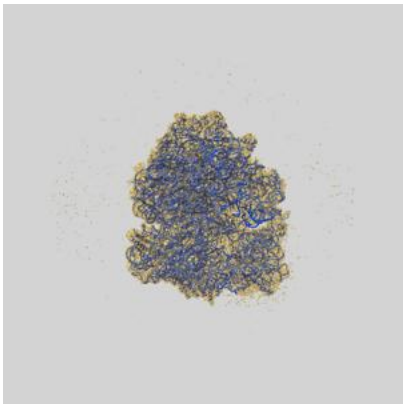
8 Fourier-Shell correlation

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

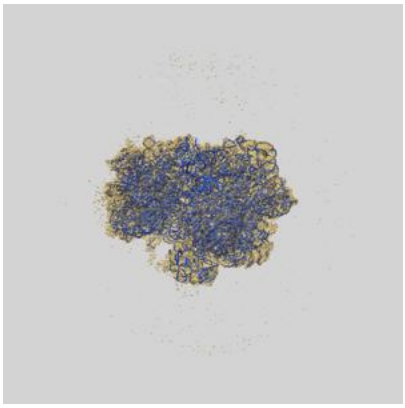
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-42561 and PDB model 8UU6. Per-residue inclusion information can be found in section 3 on page 14.

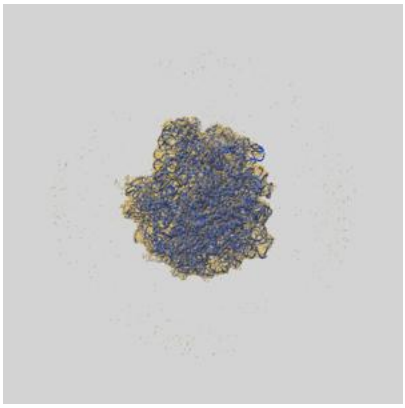
9.1 Map-model overlay



X



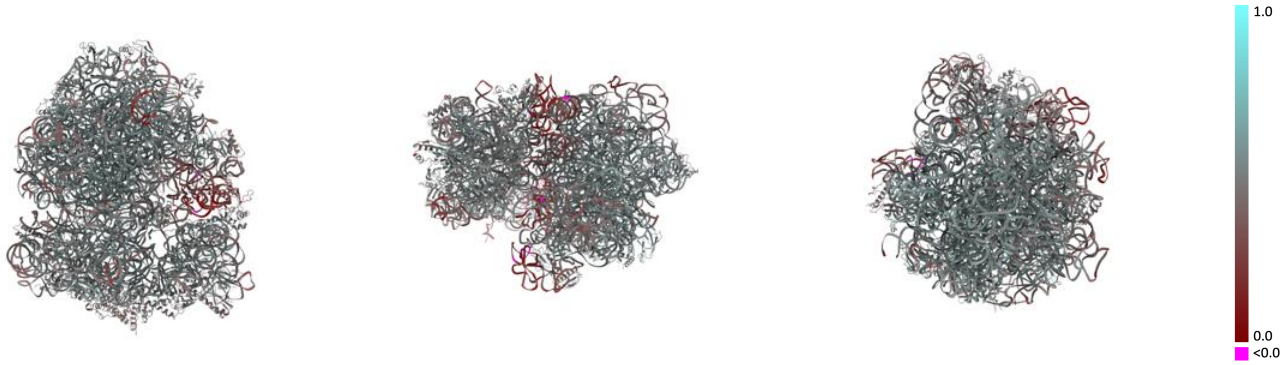
Y



Z

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

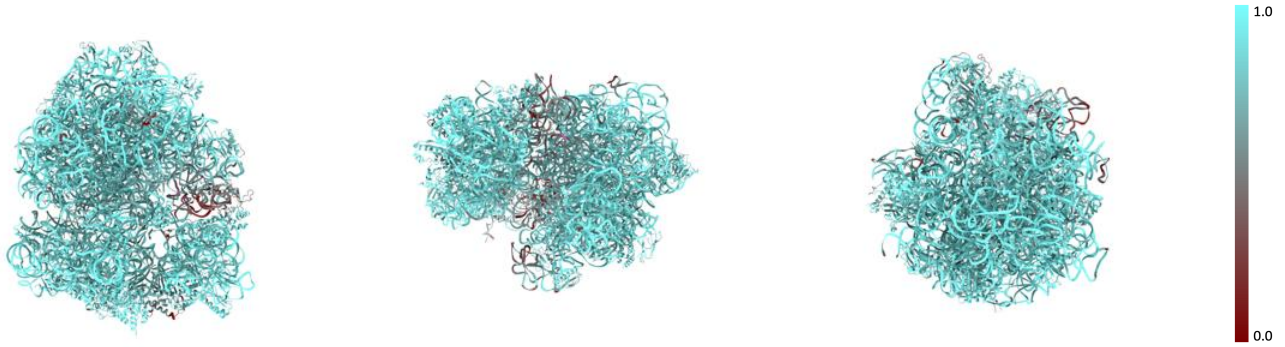
9.2 Q-score mapped to coordinate model (i)



X Y Z

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.

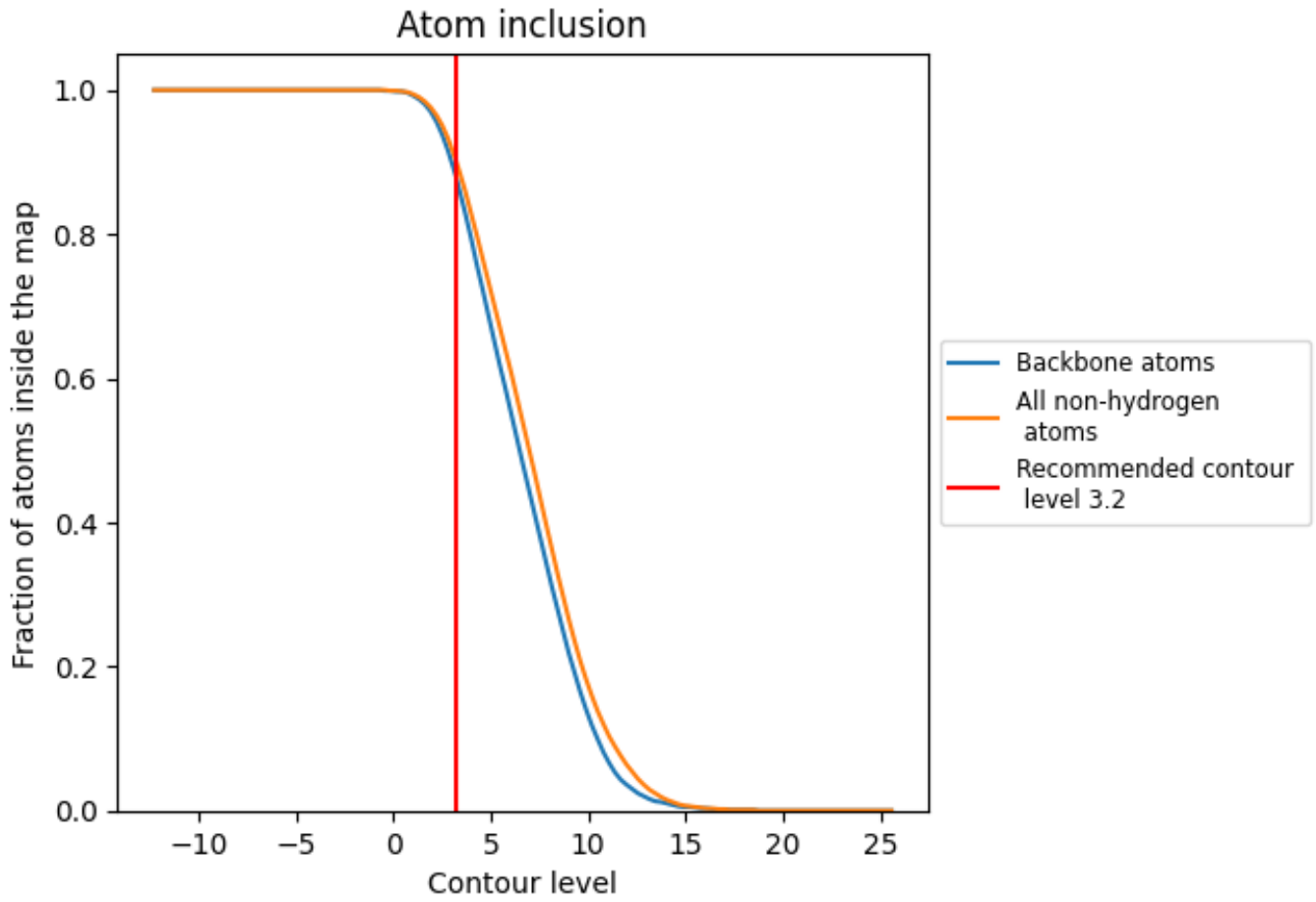
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (3.2).

9.4 Atom inclusion (i)



At the recommended contour level, 88% of all backbone atoms, 90% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (3.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9030	0.4890
1	0.8740	0.4880
2	0.8650	0.5280
3	0.4180	0.3130
4	0.8540	0.5110
5	0.8500	0.5350
6	0.8990	0.5620
7	0.9190	0.5670
8	0.8220	0.5480
A	0.9230	0.4900
B	0.9350	0.4280
C	0.8570	0.5560
D	0.8820	0.5520
E	0.8670	0.5280
F	0.5630	0.3370
G	0.8240	0.4470
L	0.9150	0.5550
M	0.7640	0.5390
N	0.8800	0.5330
O	0.8500	0.5280
P	0.8810	0.5350
Q	0.8440	0.4580
R	0.8500	0.5430
S	0.9050	0.5490
T	0.9020	0.5490
U	0.8780	0.5470
V	0.8390	0.5230
W	0.8370	0.5090
Y	0.8930	0.5530
Z	0.8880	0.5500
a	0.9330	0.4730
b	0.8320	0.4720
c	0.8820	0.5100
d	0.8990	0.4840
e	0.8560	0.5140

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Chain	Atom inclusion	Q-score
f	0.8610	0.4800
g	0.8880	0.4840
h	0.9190	0.5170
i	0.9560	0.5090
j	0.9230	0.4930
k	0.8670	0.4890
l	0.8810	0.5290
m	0.8900	0.4940
n	0.9580	0.5400
o	0.8230	0.5070
p	0.9200	0.5090
q	0.9150	0.5070
r	0.9180	0.5100
s	0.7900	0.5220
t	0.9080	0.4810
w	0.8250	0.4920
x	0.6190	0.3410