



Full wwPDB EM Validation Report ⓘ

Aug 19, 2024 – 09:12 AM EDT

PDB ID : 8T5D
EMDB ID : EMD-41049
Title : Cryo-EM studies of the interplay between uS2 ribosomal protein and leaderless mRNA during bacterial translation initiation
Authors : Bhattacharjee, S.; Gottesman, M.E.; Frank, J.
Deposited on : 2023-06-13
Resolution : 3.20 Å(reported)

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 ⓘ 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 ⓘ](#)) were used in the production of this report:

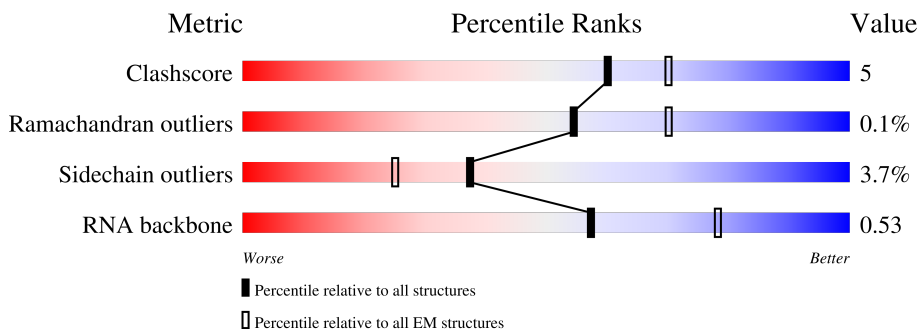
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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.








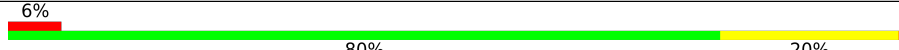
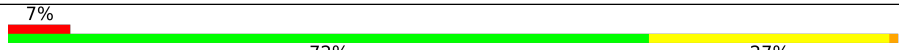

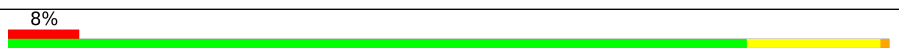

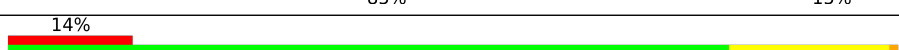
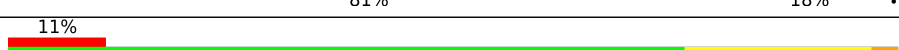

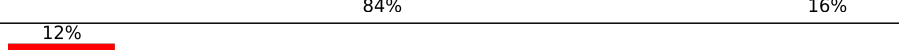
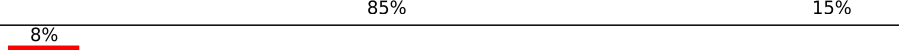
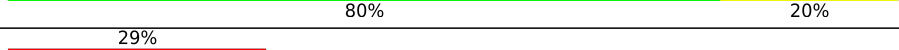




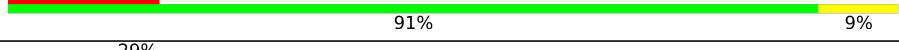
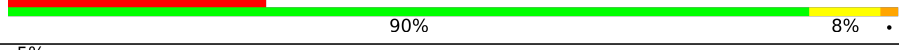
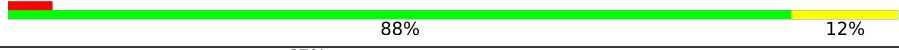
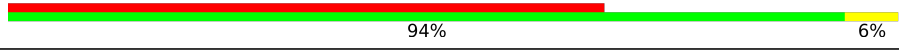
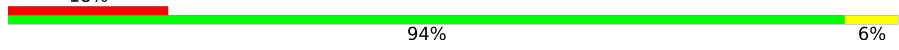
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	0	56	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 71%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 27%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">12% 71% 27% •</p>
2	1	51	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 84%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 16%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="text-align: center;">12% 84% 16%</p>
3	2	46	<div style="display: flex; align-items: center;"> <div style="width: 9%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 85%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 15%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="text-align: center;">9% 85% 15%</p>
4	3	64	<div style="display: flex; align-items: center;"> <div style="width: 1%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 78%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 22%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="text-align: center;">• 78% 22%</p>
5	4	38	<div style="display: flex; align-items: center;"> <div style="width: 1%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 76%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 24%; height: 10px; background-color: yellow; margin-right: 5px;"></div> </div> <p style="text-align: center;">• 76% 24%</p>
6	A	117	<div style="display: flex; align-items: center;"> <div style="width: 8%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 64%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 32%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">8% 64% 32% •</p>
7	B	2903	<div style="display: flex; align-items: center;"> <div style="width: 11%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 65%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 30%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> </div> <p style="text-align: center;">11% 65% 30% 5%</p>

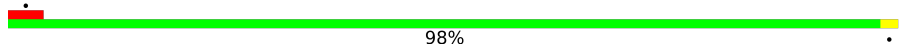
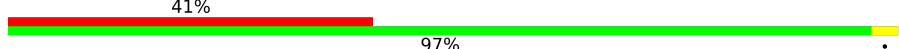
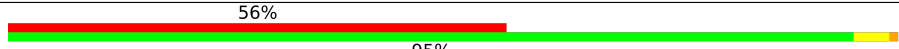
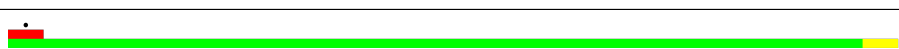
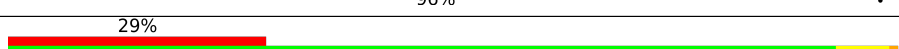
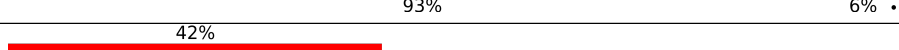
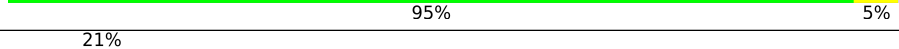
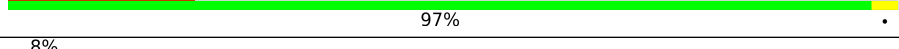
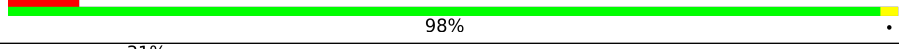
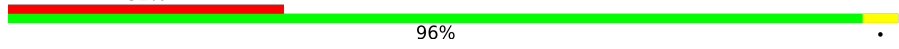
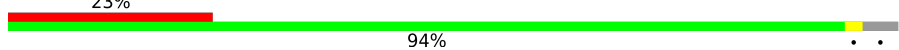
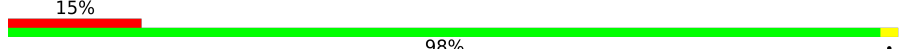
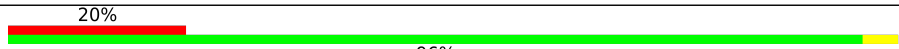
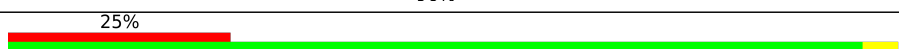
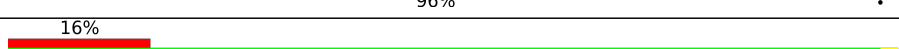
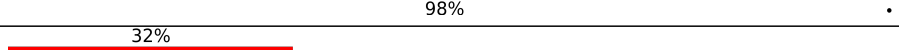
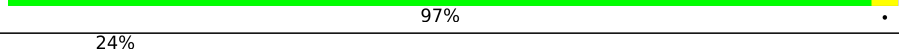
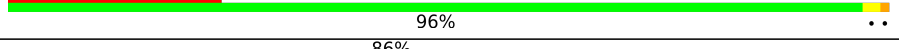
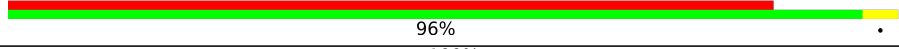
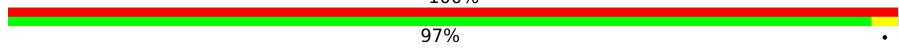

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Mol	Chain	Length	Quality of chain
8	C	272	 82% 17%
9	D	209	 89% 11% 6%
10	E	201	 86% 14% 10%
11	F	178	 66% 33% 47%
12	G	176	 80% 20% 43%
13	J	142	 80% 20% 6%
14	K	122	 72% 27% 7%
15	L	143	 83% 16% 8%
16	M	136	 83% 15% 8%
17	N	121	 85% 15% 6%
18	O	116	 81% 18% 14%
19	P	114	 76% 21% 11%
20	Q	117	 84% 16%
21	R	103	 85% 15% 12%
22	S	110	 80% 20% 8%
23	T	94	 79% 20% 29%
24	U	103	 83% 15% 23%
25	V	94	 84% 14% 27%
26	W	79	 67% 28% 19% 5%
27	X	77	 91% 9% 17%
28	Y	63	 90% 8% 29%
29	Z	58	 88% 12% 5%
30	a	218	 94% 6% 67%
31	b	206	 94% 6% 18%
32	c	205	 98% 24%

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Mol	Chain	Length	Quality of chain
33	d	150	 98%
34	e	100	 41% 97%
35	f	151	 56% 95%
36	g	129	 96%
37	h	127	 29% 93% 6%
38	i	98	 42% 95% 5%
39	j	117	 21% 97%
40	k	123	 8% 98%
41	l	114	 31% 96%
42	m	100	 23% 94%
43	n	88	 15% 98%
44	o	82	 20% 96%
45	p	80	 25% 96%
46	q	55	 16% 98%
47	r	79	 32% 97%
48	s	85	 24% 96%
49	t	51	 86% 96%
50	u	59	 100% 97%
51	v	1539	 10% 76% 23%
52	x	12	 67% 50% 50%
53	5	77	 12% 70% 27%

2 Entry composition

There are 53 unique types of molecules in this entry. The entry contains 142752 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 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	56	444	269	94	80	1	0	0

- Molecule 2 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	1	51	410	263	76	71	0	1

- Molecule 3 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	46	377	228	90	57	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	3	64	504	323	105	74	2	0	0

- Molecule 5 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	38	302	185	65	48	4	0	0

- Molecule 6 is a RNA chain called 5S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
6	A	117	2504	1116	459	813	116	0	0

- Molecule 7 is a RNA chain called 23S RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	B	2903	62317	27801	11467	20147	2902	0	0

- Molecule 8 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	C	272	2083	1288	424	364	7	0	1

- Molecule 9 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	D	209	1565	979	288	294	4	0	0

- Molecule 10 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	E	201	1552	974	283	290	5	0	0

- Molecule 11 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	F	178	1420	905	251	258	6	0	0

- Molecule 12 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	G	176	1323	832	243	246	2	0	0

- Molecule 13 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	J	142	1129	714	212	199	4	0	0

- Molecule 14 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	K	122	Total	C	N	O	S	0	1
			931	582	180	164	5		

- Molecule 15 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	L	143	Total	C	N	O	S	0	0
			1045	649	206	189	1		

- Molecule 16 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	M	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 17 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	N	121	Total	C	N	O	S	0	1
			961	593	197	166	5		

- Molecule 18 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	O	116	Total	C	N	O	0	0
			892	552	178	162		

- Molecule 19 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	P	114	Total	C	N	O	S	0	0
			917	574	179	163	1		

- Molecule 20 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	Q	117	Total	C	N	O	0	0
			947	604	192	151		

- Molecule 21 is a protein called Ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	R	103	Total	C	N	O	S	0	0
			816	516	153	145	2		

- Molecule 22 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	S	110	Total	C	N	O	S	0	0
			857	532	166	156	3		

- Molecule 23 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	T	94	Total	C	N	O	S	0	1
			739	466	140	131	2		

- Molecule 24 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	U	103	Total	C	N	O	0	1
			780	492	147	141		

- Molecule 25 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	V	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 26 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	W	79	Total	C	N	O	S	0	0
			596	367	120	108	1		

- Molecule 27 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	X	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 28 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	Y	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 29 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Z	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 30 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	a	218	Total	C	N	O	S	0	0
			1705	1081	305	312	7		

- Molecule 31 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	b	206	Total	C	N	O	S	0	0
			1625	1028	305	289	3		

- Molecule 32 is a protein called 30S ribosomal protein S4.

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

- Molecule 33 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	d	150	Total	C	N	O	S	0	0
			1106	687	211	202	6		

- Molecule 34 is a protein called 30S ribosomal protein S6, non-modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	e	100	Total	C	N	O	S	0	0
			818	515	148	149	6		

- Molecule 35 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	f	151	Total	C	N	O	S	0	0
			1182	735	227	216	4		

- Molecule 36 is a protein called 30S ribosomal protein S8.

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

- Molecule 37 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	h	127	Total	C	N	O	S	0	0
			1022	634	206	179	3		

- Molecule 38 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	i	98	Total	C	N	O	S	0	0
			787	493	150	143	1		

- Molecule 39 is a protein called 30S ribosomal protein S11.

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

- Molecule 40 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	k	123	Total	C	N	O	S	0	0
			955	590	196	165	4		

- Molecule 41 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	l	114	Total	C	N	O	S	0	0
			884	546	178	157	3		

- Molecule 42 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	m	96	Total	C	N	O	S	0	0
			774	483	160	128	3		

- Molecule 43 is a protein called 30S ribosomal protein S15.

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

- Molecule 44 is a protein called 30S ribosomal protein S16.

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

- Molecule 45 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	p	80	Total	C	N	O	S	0	0
			649	411	121	114	3		

- Molecule 46 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	q	55	Total	C	N	O	0	0
			456	288	86	82		

- Molecule 47 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	r	79	Total	C	N	O	S	0	0
			638	408	120	108	2		

- Molecule 48 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	s	85	Total	C	N	O	S	0	0
			665	411	137	114	3		

- Molecule 49 is a protein called 30S ribosomal protein S21 (Fragment).

Mol	Chain	Residues	Atoms					AltConf	Trace
49	t	51	Total	C	N	O	S	0	0
			426	265	86	74	1		

- Molecule 50 is a protein called Transcription termination/antitermination protein NusG.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	u	59	Total	C	N	O	S	0	0
			468	297	78	92	1		

- Molecule 51 is a RNA chain called 16s RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	v	1539	Total	C	N	O	P	0	0
			33012	14725	6052	10697	1538		

- Molecule 52 is a RNA chain called lmRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	x	12	Total	C	N	O	P	0	0
			257	117	53	76	11		

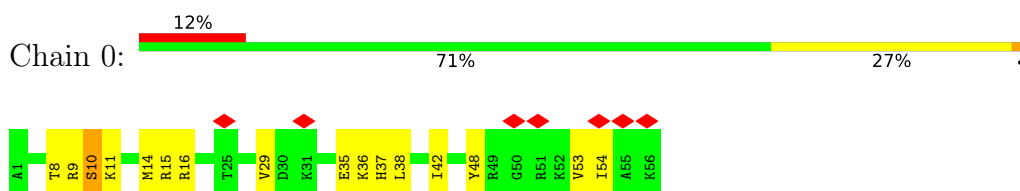
- Molecule 53 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	5	77	Total	C	N	O	P	0	0
			1640	732	297	535	76		

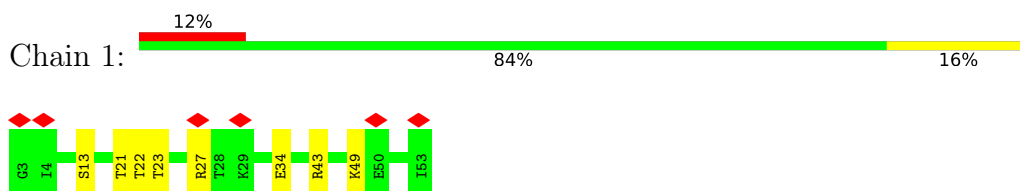
3 Residue-property plots [i](#)

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.

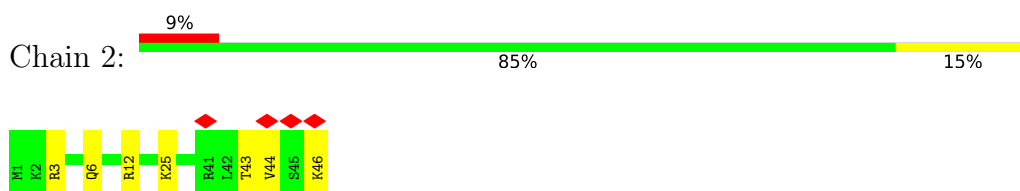
- Molecule 1: 50S ribosomal protein L32



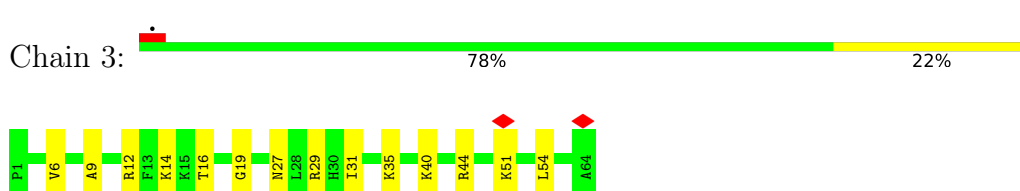
- Molecule 2: 50S ribosomal protein L33



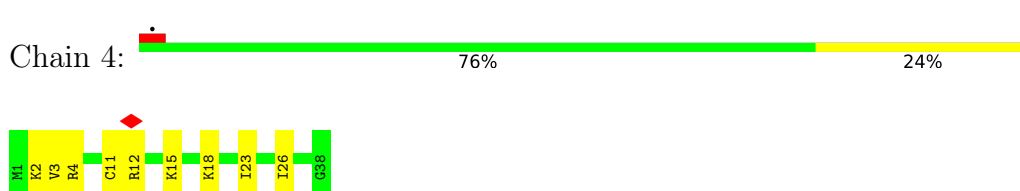
- Molecule 3: 50S ribosomal protein L34



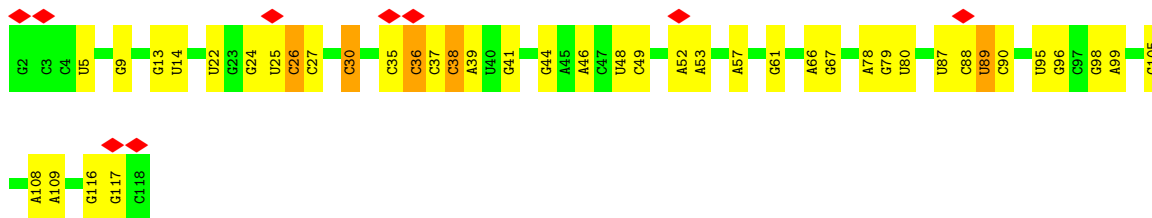
- Molecule 4: 50S ribosomal protein L35



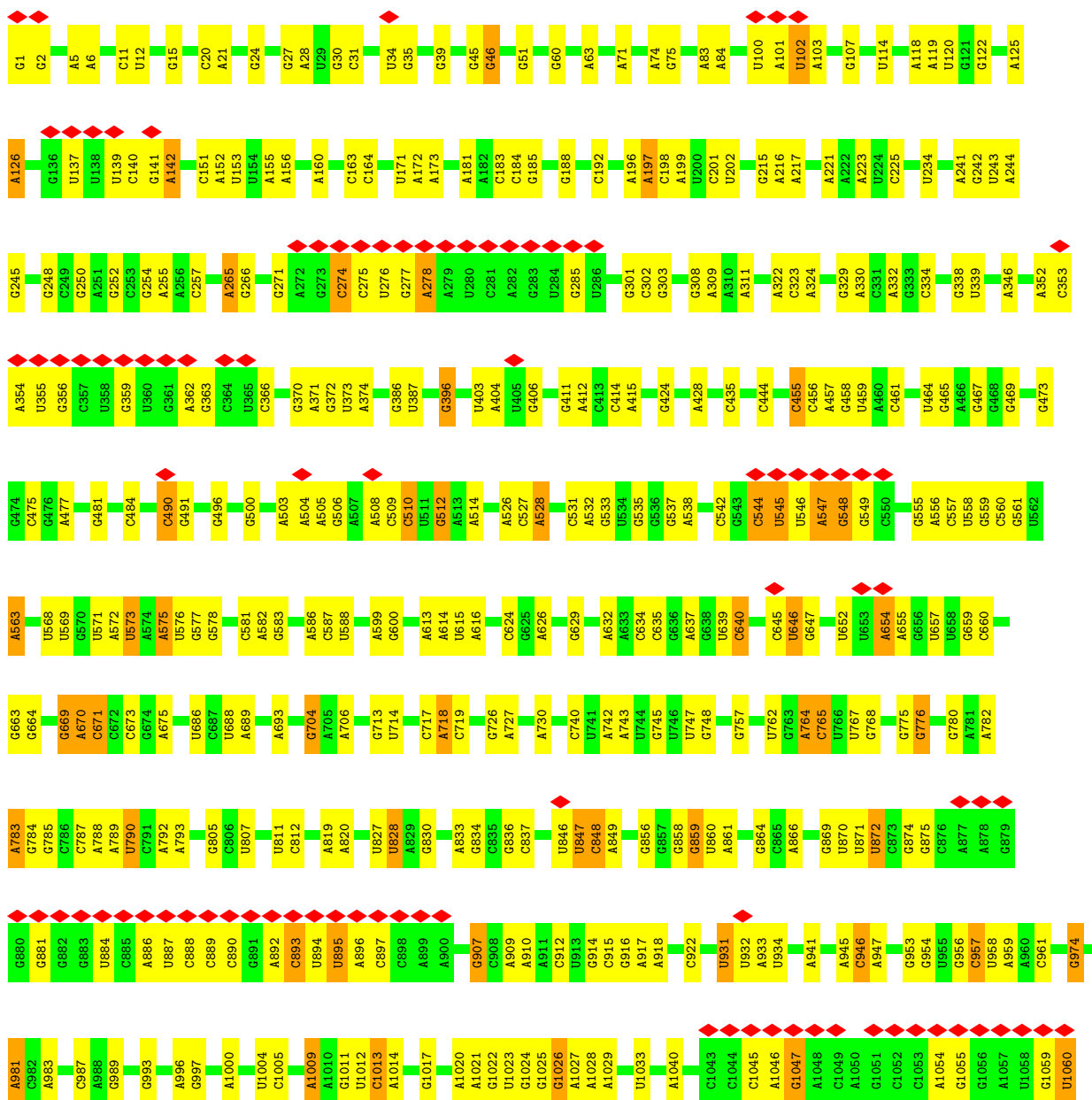
- Molecule 5: 50S ribosomal protein L36

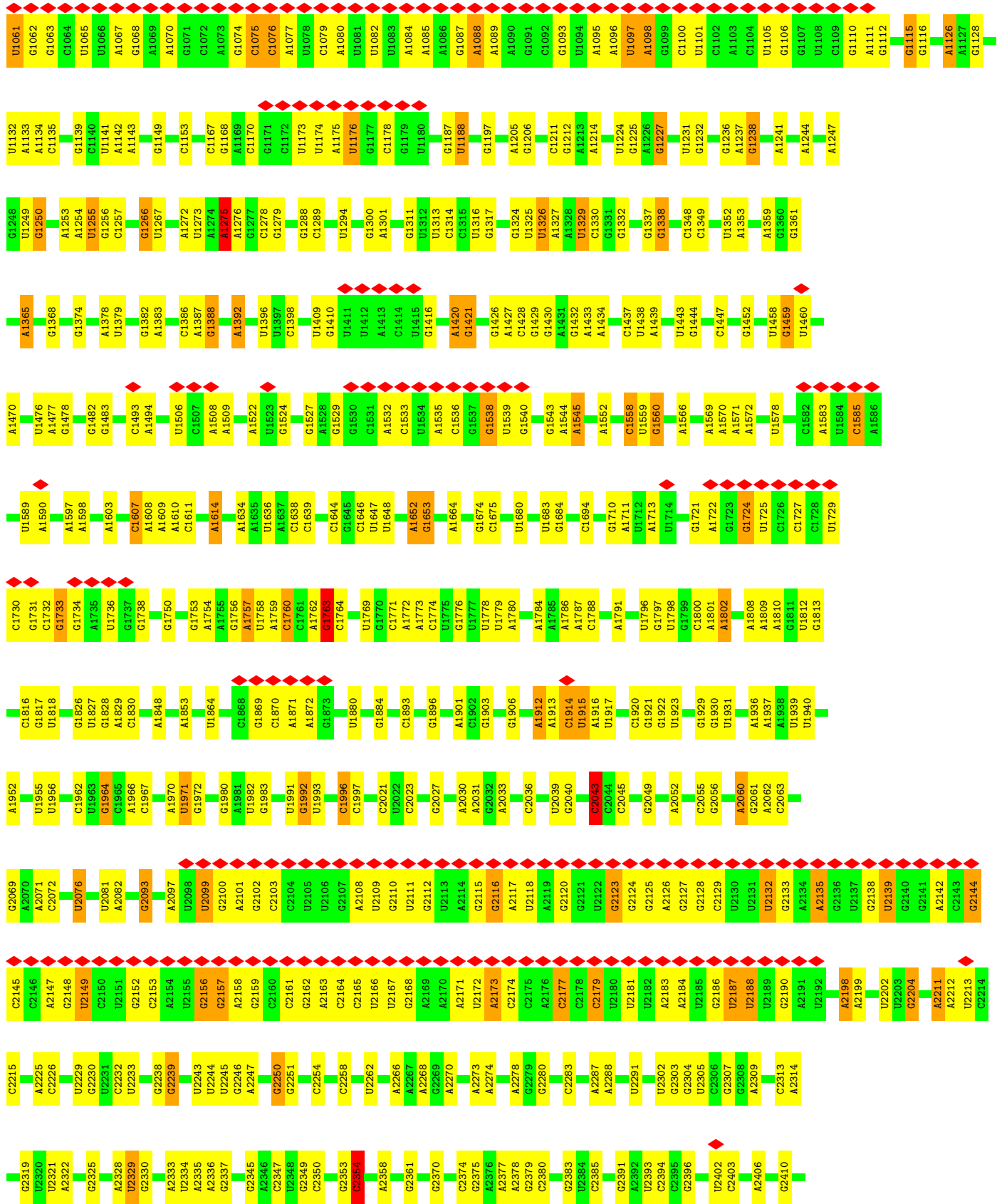


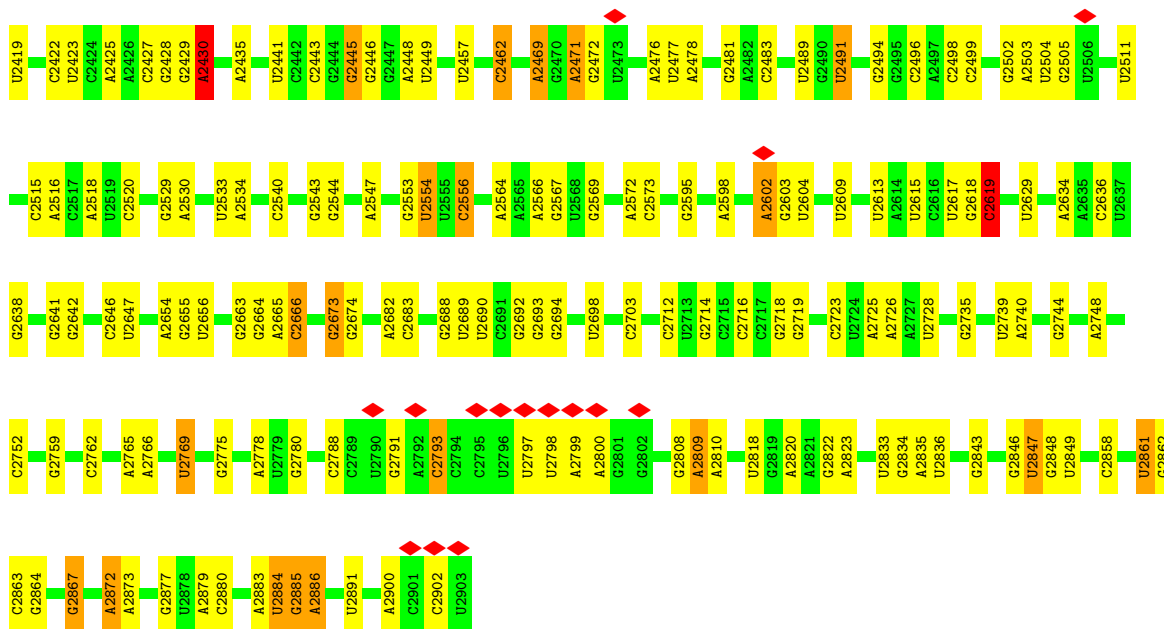
• Molecule 6: 5S RNA



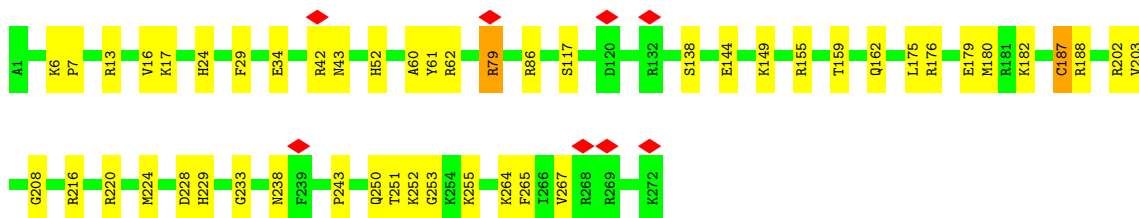
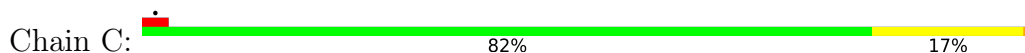
• Molecule 7: 23S RNA



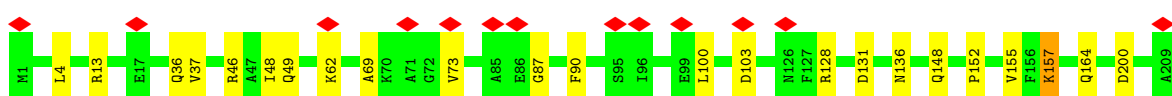




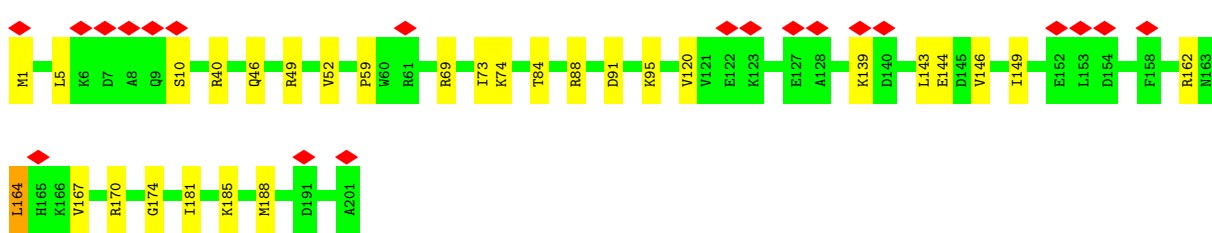
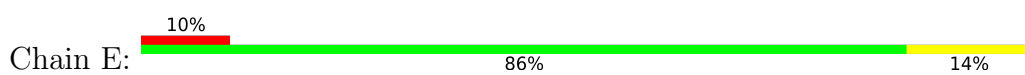
• Molecule 8: 50S ribosomal protein L2



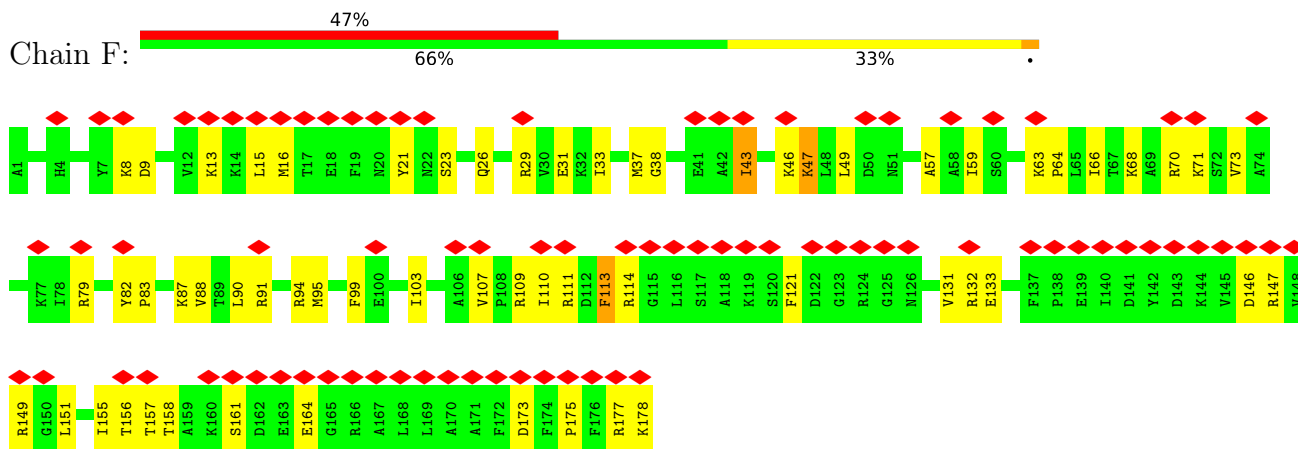
• Molecule 9: 50S ribosomal protein L3



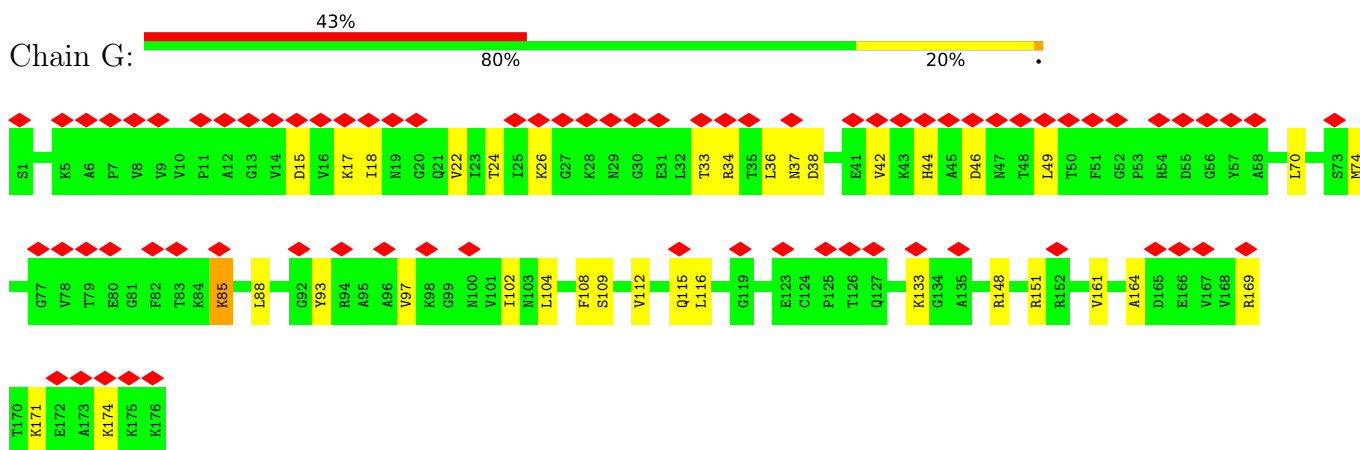
• Molecule 10: 50S ribosomal protein L4



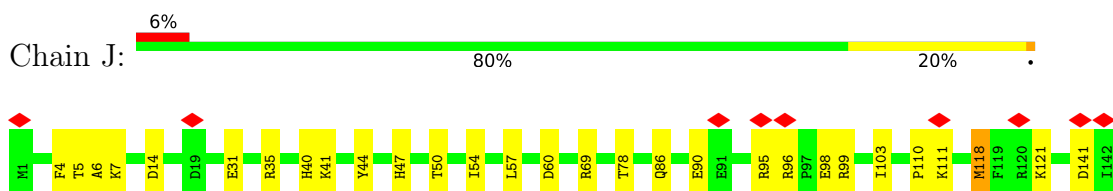
• Molecule 11: 50S ribosomal protein L5



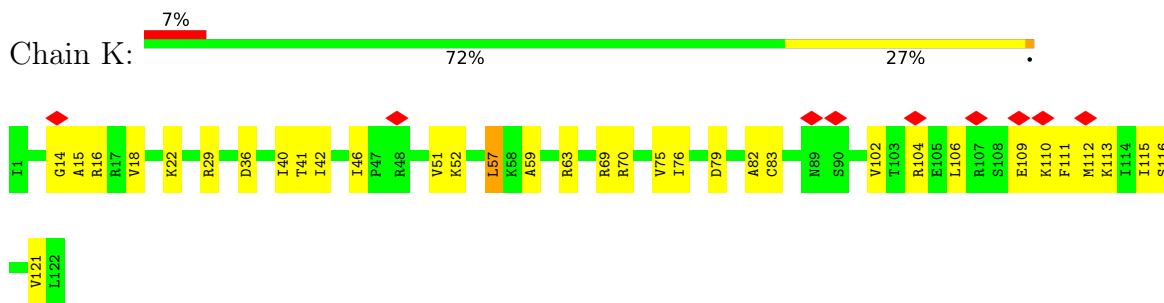
- Molecule 12: 50S ribosomal protein L6



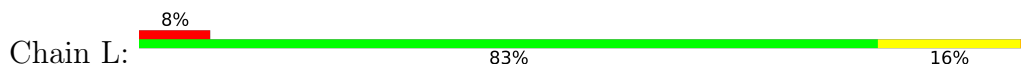
- Molecule 13: 50S ribosomal protein L13

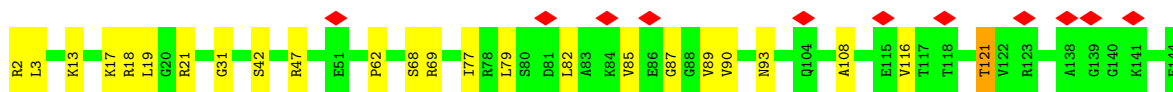


- Molecule 14: 50S ribosomal protein L14

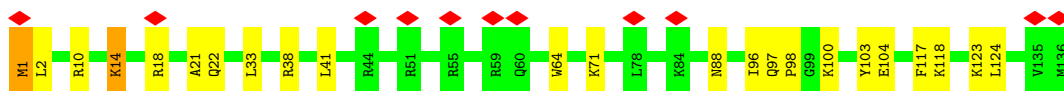
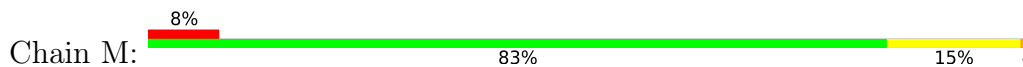


- Molecule 15: 50S ribosomal protein L15

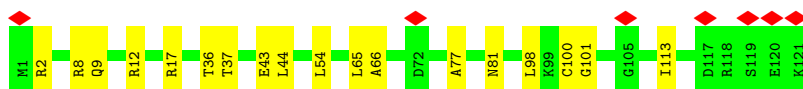
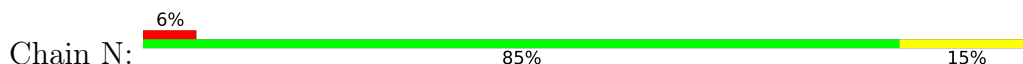




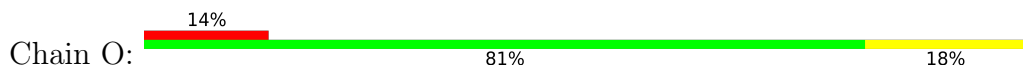
- Molecule 16: 50S ribosomal protein L16



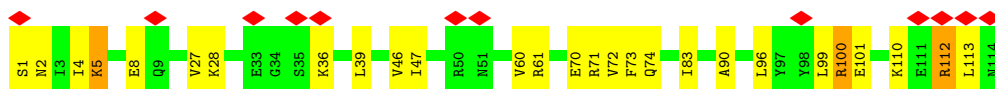
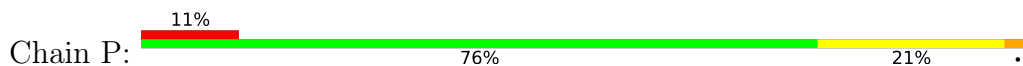
- Molecule 17: 50S ribosomal protein L17



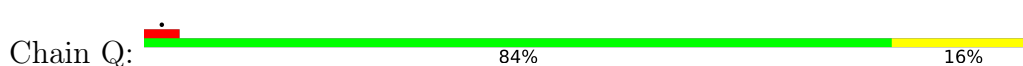
- Molecule 18: 50S ribosomal protein L18



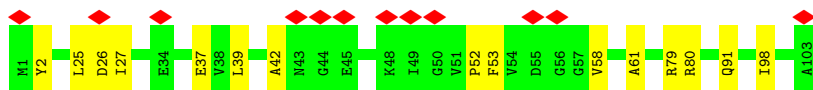
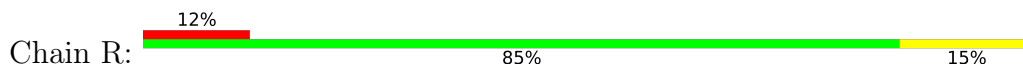
- Molecule 19: 50S ribosomal protein L19



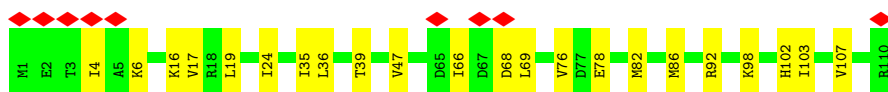
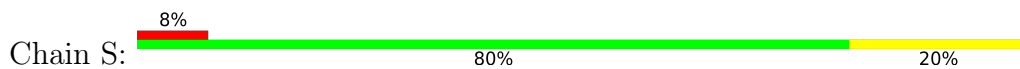
- Molecule 20: 50S ribosomal protein L20



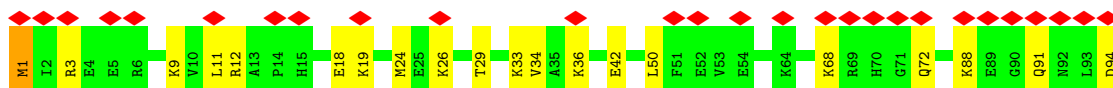
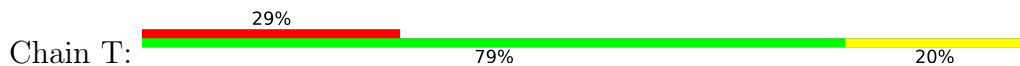
- Molecule 21: Ribosomal protein L21



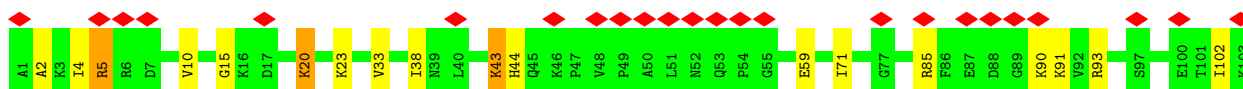
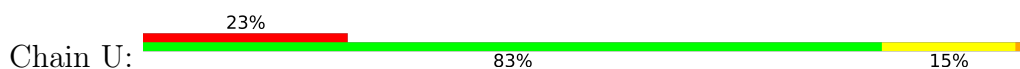
- Molecule 22: 50S ribosomal protein L22



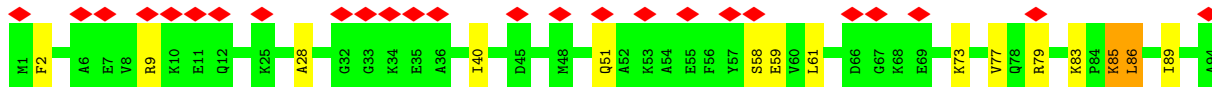
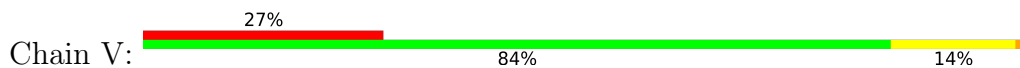
- Molecule 23: 50S ribosomal protein L23



- Molecule 24: 50S ribosomal protein L24



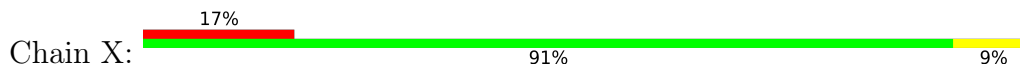
- Molecule 25: 50S ribosomal protein L25



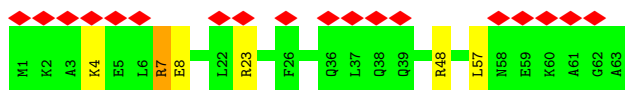
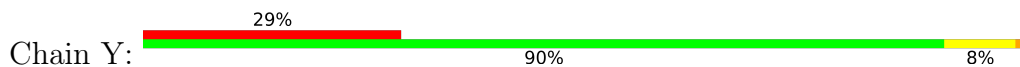
- Molecule 26: 50S ribosomal protein L27



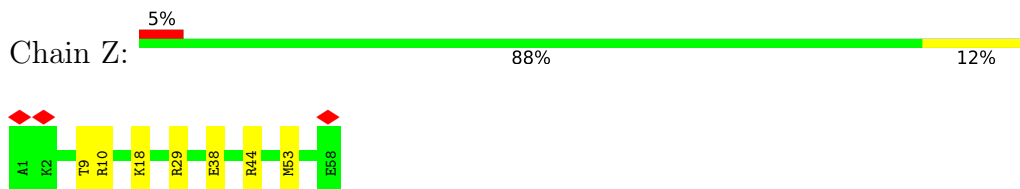
- Molecule 27: 50S ribosomal protein L28



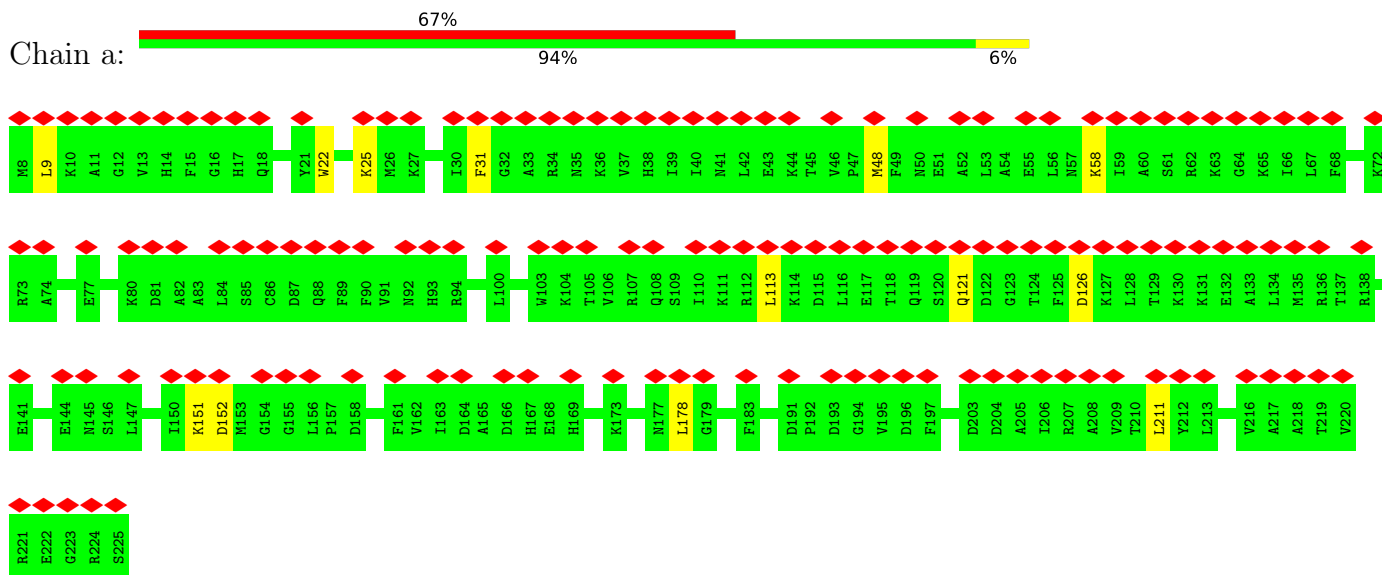
- Molecule 28: 50S ribosomal protein L29



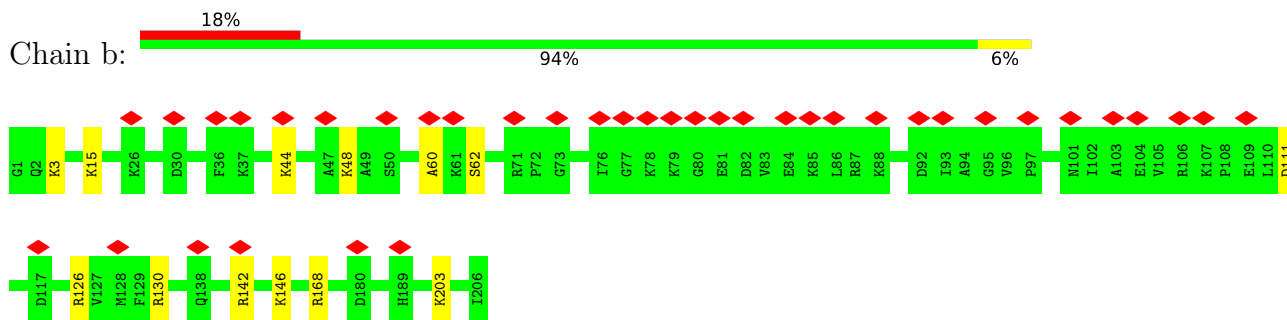
- Molecule 29: 50S ribosomal protein L30



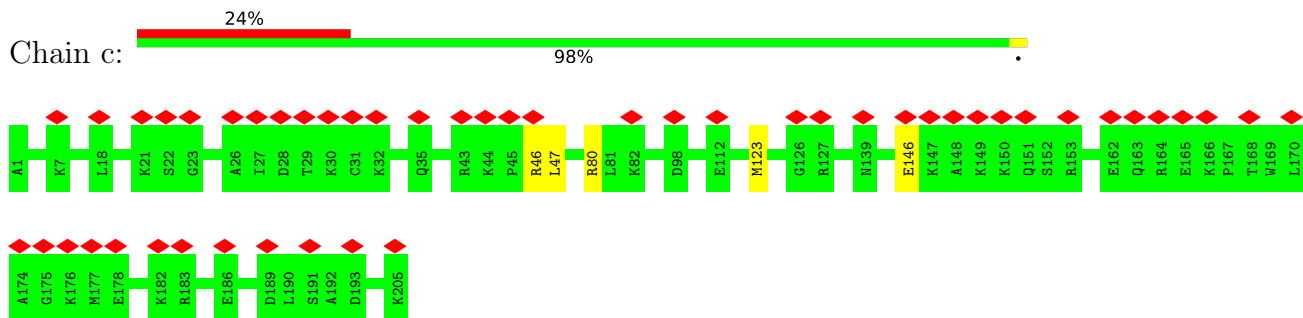
- Molecule 30: 30S ribosomal protein S2



- Molecule 31: 30S ribosomal protein S3

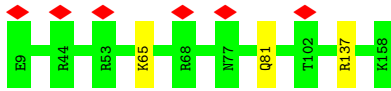


- Molecule 32: 30S ribosomal protein S4

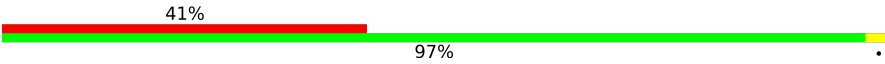


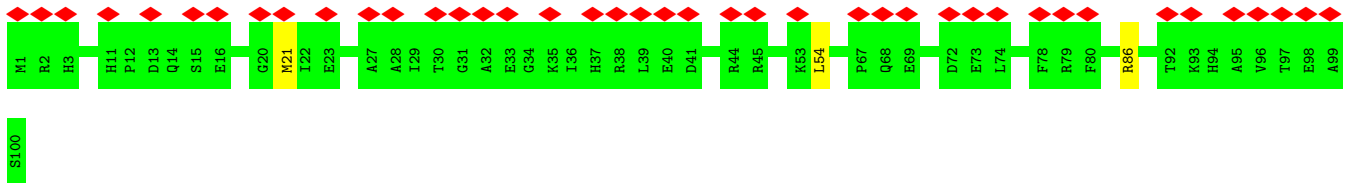
- Molecule 33: 30S ribosomal protein S5

Chain d:  98%

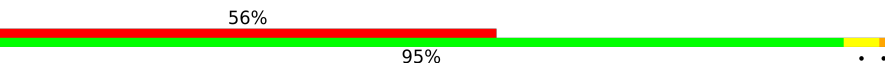


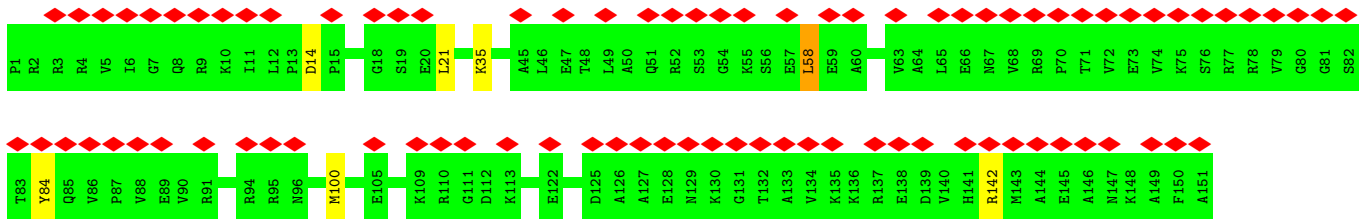
- Molecule 34: 30S ribosomal protein S6, non-modified isoform

Chain e:  41% 97%



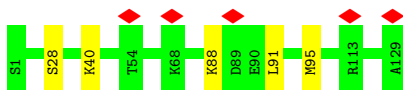
- Molecule 35: 30S ribosomal protein S7

Chain f:  56% 95%



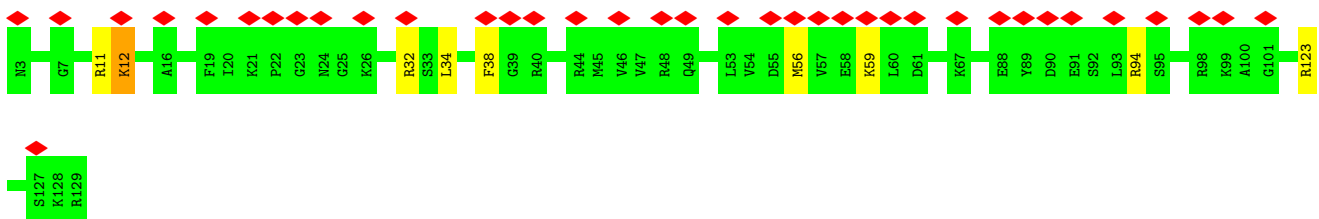
- Molecule 36: 30S ribosomal protein S8

Chain g:  96%

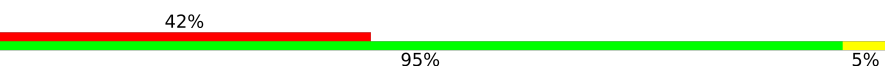


- Molecule 37: 30S ribosomal protein S9

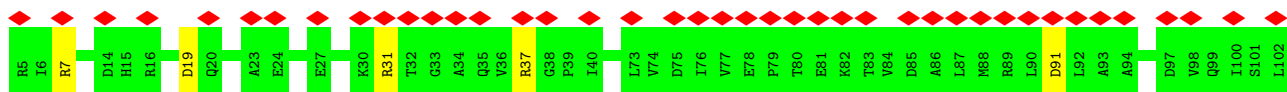
Chain h:  29% 93% 6%



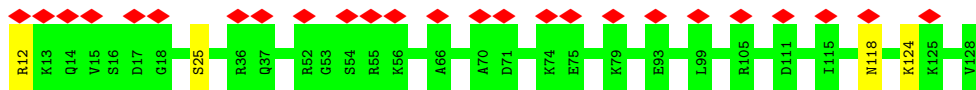
- Molecule 38: 30S ribosomal protein S10

Chain i:  42% 95% 5%

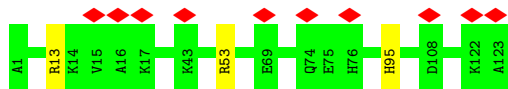




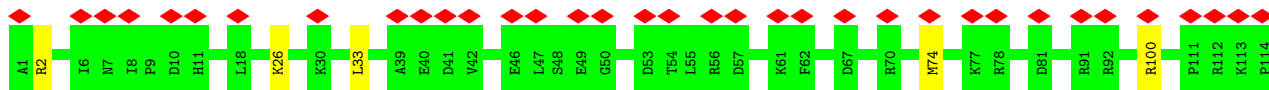
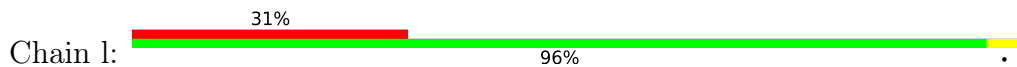
- Molecule 39: 30S ribosomal protein S11



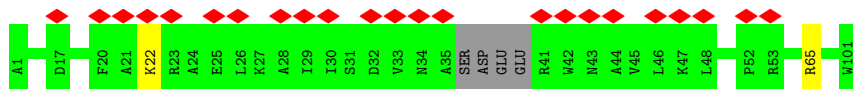
- Molecule 40: 30S ribosomal protein S12



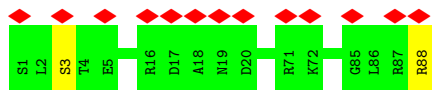
- Molecule 41: 30S ribosomal protein S13



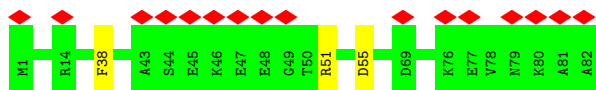
- Molecule 42: 30S ribosomal protein S14



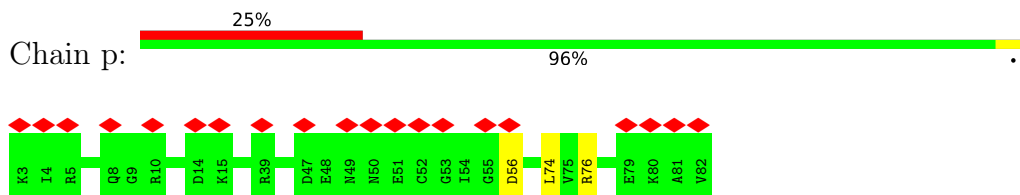
- Molecule 43: 30S ribosomal protein S15



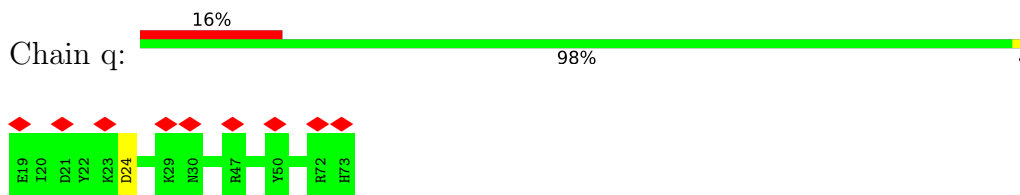
- Molecule 44: 30S ribosomal protein S16



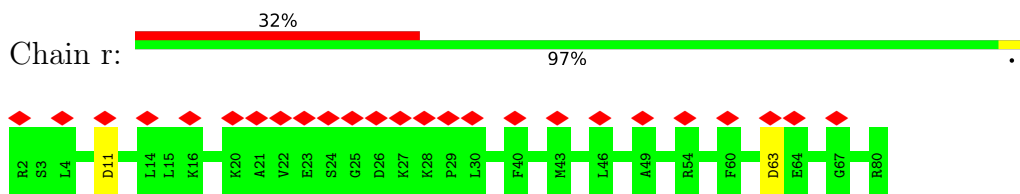
- Molecule 45: 30S ribosomal protein S17



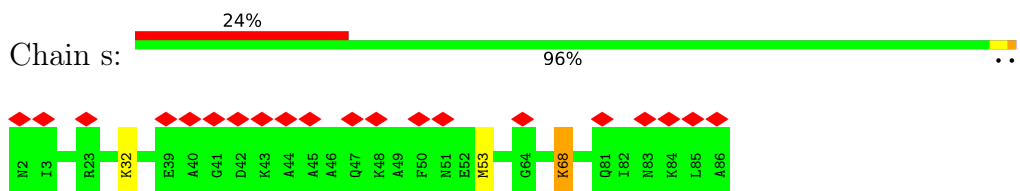
- Molecule 46: 30S ribosomal protein S18



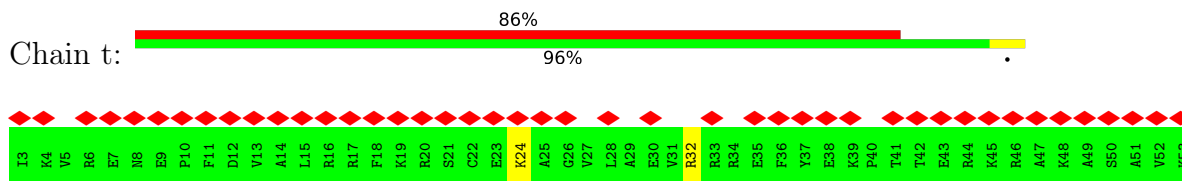
- Molecule 47: 30S ribosomal protein S19



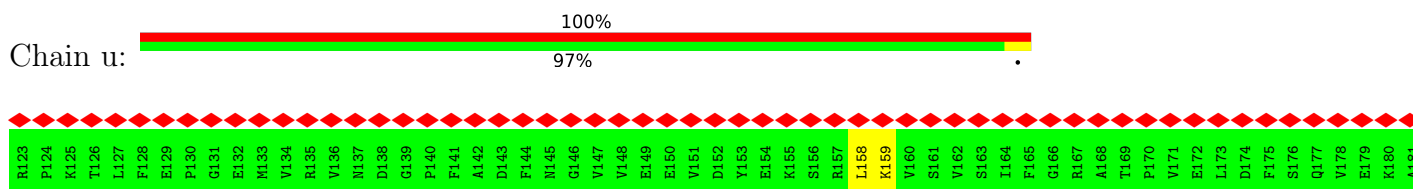
- Molecule 48: 30S ribosomal protein S20



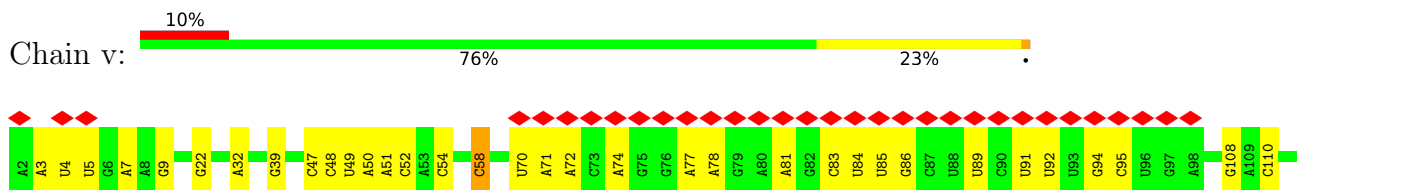
- Molecule 49: 30S ribosomal protein S21 (Fragment)

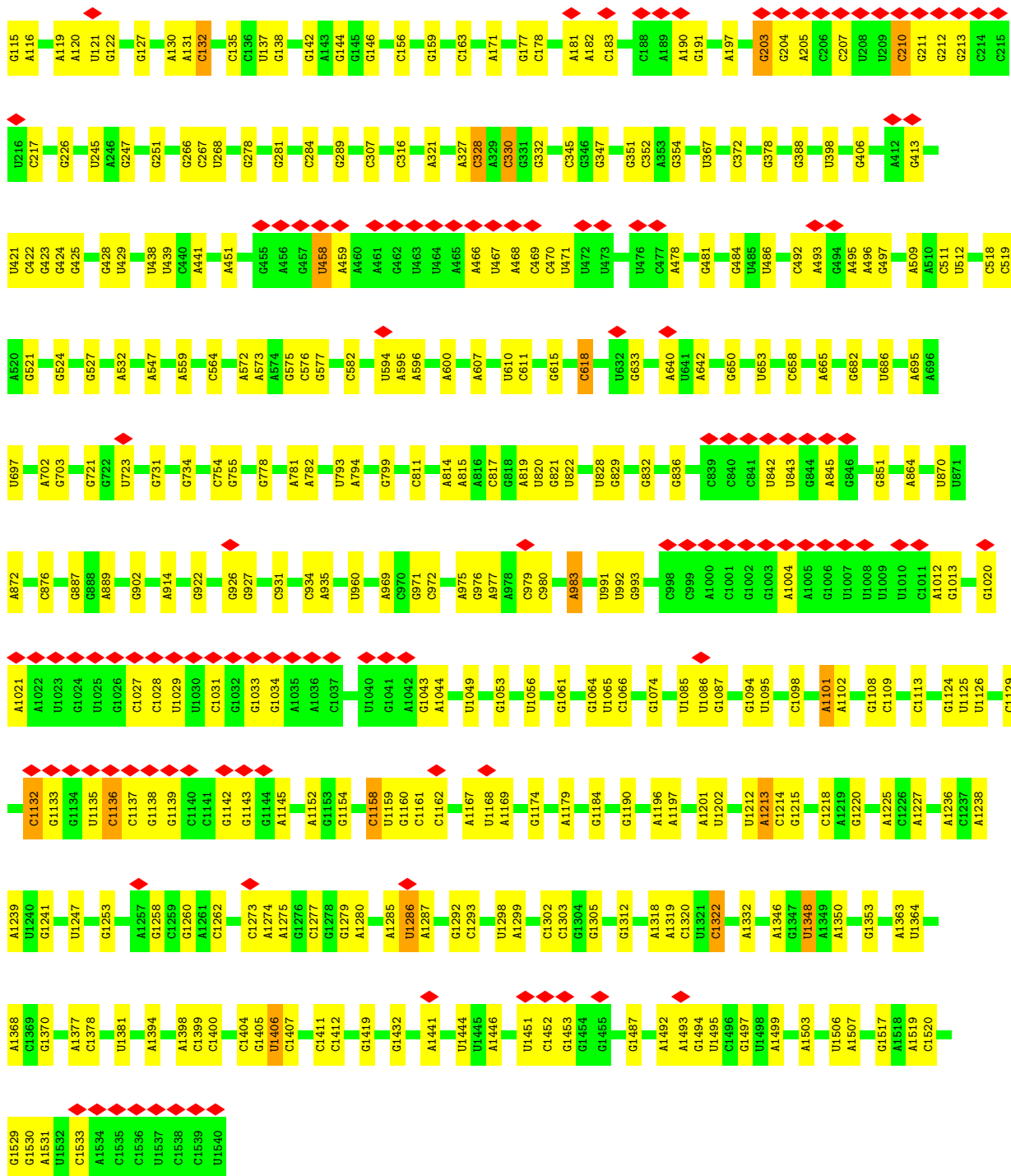


- Molecule 50: Transcription termination/antitermination protein NusG



- Molecule 51: 16s RNA





• Molecule 52: lmRNA



• Molecule 53: tRNA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	120000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	58	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.734	Depositor
Minimum map value	-0.026	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.051	Depositor
Recommended contour level	0.124	Depositor
Map size (Å)	332.0, 332.0, 332.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.83, 0.83, 0.83	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 >5	RMSZ	# Z >5
1	0	0.29	0/450	0.63	0/599
2	1	0.29	0/417	0.54	0/556
3	2	0.31	0/380	0.74	0/498
4	3	0.32	0/513	0.66	0/676
5	4	0.32	0/303	0.74	1/397 (0.3%)
6	A	0.41	0/2800	1.06	11/4367 (0.3%)
7	B	0.51	0/69796	1.05	273/108888 (0.3%)
8	C	0.35	0/2122	0.67	0/2854
9	D	0.34	0/1586	0.64	2/2134 (0.1%)
10	E	0.34	0/1571	0.67	2/2113 (0.1%)
11	F	0.28	0/1444	0.65	1/1937 (0.1%)
12	G	0.29	0/1343	0.61	1/1816 (0.1%)
13	J	0.32	0/1152	0.58	0/1551
14	K	0.35	0/940	0.72	1/1260 (0.1%)
15	L	0.29	0/1054	0.62	0/1403
16	M	0.33	0/1093	0.62	1/1460 (0.1%)
17	N	0.30	0/974	0.66	0/1303
18	O	0.30	0/902	0.58	0/1209
19	P	0.33	0/929	0.73	3/1242 (0.2%)
20	Q	0.34	0/960	0.61	0/1278
21	R	0.33	0/829	0.59	0/1107
22	S	0.32	0/864	0.62	0/1156
23	T	0.29	0/745	0.64	0/996
24	U	0.31	0/788	0.64	0/1053
25	V	0.26	0/766	0.55	0/1025
26	W	0.31	0/603	0.73	0/797
27	X	0.28	0/635	0.60	0/848
28	Y	0.27	0/510	0.62	0/677
29	Z	0.28	0/453	0.61	0/605
30	a	0.28	0/1736	0.65	3/2338 (0.1%)
31	b	0.33	0/1652	0.66	0/2225
32	c	0.31	0/1665	0.66	0/2227
33	d	0.32	0/1119	0.65	0/1504
34	e	0.30	0/836	0.62	0/1128

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	f	0.27	0/1196	0.61	1/1602 (0.1%)
36	g	0.31	0/989	0.59	2/1326 (0.2%)
37	h	0.30	0/1034	0.70	0/1375
38	i	0.31	0/797	0.65	0/1077
39	j	0.29	0/893	0.59	0/1205
40	k	0.31	0/969	0.67	0/1300
41	l	0.27	0/893	0.64	1/1193 (0.1%)
42	m	0.31	0/785	0.65	0/1043
43	n	0.28	0/722	0.60	0/964
44	o	0.31	0/659	0.66	1/884 (0.1%)
45	p	0.30	0/658	0.64	1/881 (0.1%)
46	q	0.26	0/463	0.58	0/621
47	r	0.25	0/653	0.56	0/877
48	s	0.30	0/671	0.59	0/888
49	t	0.31	0/431	0.71	0/570
50	u	0.28	0/477	0.58	0/642
51	v	0.50	1/36963 (0.0%)	1.05	133/57662 (0.2%)
52	x	0.35	0/289	0.94	1/449 (0.2%)
53	5	0.35	0/1832	0.98	5/2855 (0.2%)
All	All	0.45	1/155304 (0.0%)	0.96	444/232641 (0.2%)

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
23	T	0	1
30	a	0	1
31	b	0	1
37	h	0	1
39	j	0	1
All	All	0	5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	v	1531	A	O3'-P	-35.66	1.18	1.61

All (444) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	v	1531	A	P-O3'-C3'	-15.02	101.68	119.70
7	B	828	U	C2-N1-C1'	10.81	130.68	117.70
7	B	1313	U	C2-N1-C1'	10.16	129.89	117.70
7	B	1076	C	N3-C2-O2	-9.94	114.94	121.90
7	B	828	U	N1-C2-O2	9.71	129.60	122.80
51	v	1407	C	C2-N1-C1'	9.49	129.24	118.80
7	B	2666	C	N1-C2-O2	9.47	124.58	118.90
7	B	2254	C	C2-N1-C1'	9.45	129.19	118.80
7	B	1313	U	N1-C2-O2	9.30	129.31	122.80
51	v	1322	C	N1-C2-O2	9.15	124.39	118.90
7	B	2666	C	C2-N1-C1'	8.97	128.67	118.80
7	B	2254	C	N1-C2-O2	8.97	124.28	118.90
7	B	2177	C	N1-C2-O2	8.94	124.26	118.90
51	v	135	C	N1-C2-O2	8.78	124.17	118.90
6	A	30	C	C2-N1-C1'	8.77	128.45	118.80
51	v	91	U	C2-N1-C1'	8.68	128.12	117.70
7	B	1349	C	N1-C2-O2	8.66	124.09	118.90
51	v	1407	C	N3-C2-O2	-8.63	115.86	121.90
7	B	893	C	N3-C2-O2	-8.55	115.91	121.90
51	v	91	U	N1-C2-O2	8.55	128.78	122.80
6	A	30	C	C6-N1-C2	-8.52	116.89	120.30
7	B	1348	C	N1-C2-O2	8.49	124.00	118.90
7	B	1458	U	N1-C2-O2	8.39	128.67	122.80
51	v	1322	C	C2-N1-C1'	8.38	128.02	118.80
7	B	1314	C	C2-N1-C1'	8.33	127.96	118.80
7	B	1458	U	N3-C2-O2	-8.32	116.38	122.20
51	v	1138	G	C4-N9-C1'	8.29	137.28	126.50
7	B	847	U	N1-C2-O2	8.27	128.59	122.80
7	B	1313	U	N3-C2-O2	-8.25	116.43	122.20
7	B	202	U	N3-C2-O2	-8.25	116.43	122.20
51	v	58	C	C6-N1-C2	-8.23	117.01	120.30
7	B	2858	C	C2-N1-C1'	8.22	127.85	118.80
51	v	1407	C	N1-C2-O2	8.18	123.81	118.90
51	v	328	C	N1-C2-O2	8.12	123.78	118.90
6	A	26	C	N1-C2-O2	8.11	123.77	118.90
51	v	91	U	N3-C2-O2	-8.07	116.55	122.20
7	B	828	U	N3-C2-O2	-7.96	116.63	122.20
7	B	847	U	C2-N1-C1'	7.96	127.25	117.70
7	B	1915	U	C2-N1-C1'	7.94	127.23	117.70
7	B	202	U	C2-N1-C1'	7.90	127.18	117.70
7	B	2666	C	N3-C2-O2	-7.85	116.40	121.90
7	B	828	U	C6-N1-C1'	-7.81	110.26	121.20
7	B	202	U	N1-C2-O2	7.81	128.26	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	2858	C	N1-C2-O2	7.76	123.55	118.90
7	B	1915	U	N1-C2-O2	7.72	128.20	122.80
51	v	307	C	N1-C2-O2	7.64	123.48	118.90
7	B	2858	C	N3-C2-O2	-7.61	116.57	121.90
51	v	1322	C	N3-C2-O2	-7.59	116.58	121.90
51	v	135	C	C6-N1-C2	-7.59	117.26	120.30
51	v	1286	U	C2-N1-C1'	7.52	126.73	117.70
7	B	847	U	N3-C2-O2	-7.51	116.94	122.20
51	v	1407	C	C6-N1-C2	-7.50	117.30	120.30
7	B	1915	U	N3-C2-O2	-7.49	116.96	122.20
51	v	135	C	C2-N1-C1'	7.47	127.02	118.80
51	v	439	U	N1-C2-O2	7.46	128.02	122.80
51	v	135	C	N3-C2-O2	-7.42	116.70	121.90
7	B	2471	A	O4'-C1'-N9	7.42	114.13	108.20
7	B	2858	C	C6-N1-C2	-7.39	117.34	120.30
51	v	1213	A	P-O3'-C3'	7.39	128.56	119.70
51	v	58	C	C2-N1-C1'	7.37	126.91	118.80
7	B	2179	C	N1-C2-O2	7.34	123.30	118.90
6	A	26	C	C6-N1-C2	-7.33	117.37	120.30
51	v	58	C	N1-C2-O2	7.33	123.30	118.90
7	B	2430	A	C2-N3-C4	7.32	114.26	110.60
7	B	234	U	N3-C2-O2	-7.31	117.08	122.20
7	B	387	U	C2-N1-C1'	7.31	126.47	117.70
51	v	1161	C	C2-N1-C1'	7.26	126.79	118.80
7	B	510	C	N1-C2-O2	7.22	123.23	118.90
7	B	1774	C	C6-N1-C2	-7.17	117.43	120.30
7	B	1931	U	C5-C6-N1	7.14	126.27	122.70
5	4	3	VAL	CA-CB-CG1	7.14	121.61	110.90
19	P	113	LEU	CA-CB-CG	7.12	131.69	115.30
7	B	490	C	P-O3'-C3'	7.11	128.23	119.70
7	B	1349	C	N3-C2-O2	-7.11	116.93	121.90
7	B	2063	C	C6-N1-C2	-7.10	117.46	120.30
51	v	1138	G	C8-N9-C1'	-7.09	117.78	127.00
51	v	610	U	N1-C2-O2	7.08	127.75	122.80
7	B	1559	U	C2-N1-C1'	7.06	126.18	117.70
51	v	328	C	C2-N1-C1'	7.03	126.53	118.80
7	B	1458	U	C2-N1-C1'	7.01	126.11	117.70
51	v	1286	U	N1-C2-O2	6.99	127.69	122.80
7	B	2177	C	N3-C2-O2	-6.98	117.01	121.90
51	v	132	C	C2-N1-C1'	6.98	126.48	118.80
7	B	2884	U	C2-N1-C1'	6.98	126.07	117.70
51	v	330	C	N1-C2-O2	6.97	123.08	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	v	58	C	C5-C6-N1	6.97	124.48	121.00
6	A	26	C	N3-C2-O2	-6.96	117.03	121.90
7	B	542	C	C2-N1-C1'	6.95	126.44	118.80
7	B	670	A	P-O3'-C3'	6.95	128.04	119.70
7	B	274	C	N1-C2-O2	6.93	123.06	118.90
7	B	635	C	C6-N1-C2	-6.93	117.53	120.30
7	B	1614	A	C2-N3-C4	6.92	114.06	110.60
51	v	439	U	N3-C2-O2	-6.89	117.38	122.20
51	v	610	U	N3-C2-O2	-6.87	117.39	122.20
6	A	30	C	C5-C6-N1	6.86	124.43	121.00
7	B	527	C	N1-C2-O2	6.82	122.99	118.90
51	v	439	U	C2-N1-C1'	6.81	125.88	117.70
51	v	458	U	C2-N1-C1'	6.81	125.87	117.70
7	B	2177	C	C2-N1-C1'	6.81	126.29	118.80
7	B	1348	C	N3-C2-O2	-6.78	117.15	121.90
7	B	2254	C	N3-C2-O2	-6.76	117.17	121.90
51	v	1531	A	OP1-P-O3'	-6.75	90.34	105.20
7	B	893	C	N1-C2-O2	6.75	122.95	118.90
7	B	1188	U	N1-C2-O2	6.75	127.52	122.80
7	B	2254	C	C6-N1-C1'	-6.73	112.73	120.80
7	B	1313	U	C6-N1-C1'	-6.71	111.80	121.20
51	v	1406	U	N1-C2-O2	6.71	127.50	122.80
7	B	1931	U	C2-N1-C1'	6.70	125.74	117.70
51	v	983	A	C2-N3-C4	6.70	113.95	110.60
7	B	1920	C	C5-C6-N1	6.67	124.34	121.00
7	B	2752	C	N1-C2-O2	6.67	122.90	118.90
7	B	1774	C	C2-N1-C1'	6.67	126.13	118.80
7	B	1076	C	N1-C2-O2	6.67	122.90	118.90
51	v	1158	C	C2-N1-C1'	6.66	126.13	118.80
51	v	1262	C	N1-C2-O2	6.65	122.89	118.90
10	E	91	ASP	CB-CG-OD1	6.64	124.27	118.30
7	B	2354	C	C6-N1-C2	-6.63	117.65	120.30
51	v	1138	G	N3-C4-C5	-6.63	125.29	128.60
51	v	1286	U	N3-C2-O2	-6.62	117.56	122.20
51	v	132	C	N1-C2-O2	6.61	122.86	118.90
7	B	2666	C	C6-N1-C2	-6.61	117.66	120.30
51	v	1201	A	P-O3'-C3'	6.59	127.60	119.70
7	B	1956	U	N1-C2-O2	6.58	127.41	122.80
7	B	2043	C	C5-C6-N1	6.54	124.27	121.00
7	B	1585	C	N1-C2-O2	6.54	122.82	118.90
51	v	1531	A	OP2-P-O3'	6.54	119.58	105.20
7	B	1559	U	N1-C2-O2	6.49	127.34	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	v	618	C	N1-C2-O2	6.49	122.79	118.90
51	v	1138	G	N3-C4-N9	6.47	129.88	126.00
7	B	527	C	C2-N1-C1'	6.46	125.91	118.80
7	B	1314	C	C5-C6-N1	6.44	124.22	121.00
51	v	1101	A	P-O3'-C3'	6.43	127.42	119.70
7	B	1348	C	C2-N1-C1'	6.42	125.86	118.80
7	B	274	C	C2-N1-C1'	6.42	125.86	118.80
7	B	1314	C	N1-C2-O2	6.41	122.75	118.90
51	v	458	U	N1-C2-O2	6.40	127.28	122.80
7	B	387	U	N1-C2-O2	6.38	127.27	122.80
6	A	26	C	C2-N1-C1'	6.38	125.82	118.80
51	v	1406	U	N3-C2-O2	-6.38	117.73	122.20
7	B	1931	U	N1-C2-O2	6.37	127.26	122.80
7	B	114	U	C2-N1-C1'	6.36	125.34	117.70
7	B	2683	C	N1-C2-O2	6.35	122.71	118.90
51	v	754	C	C2-N1-C1'	6.35	125.78	118.80
7	B	1956	U	N3-C2-O2	-6.34	117.76	122.20
7	B	1607	C	C2-N1-C1'	6.34	125.77	118.80
7	B	2177	C	C6-N1-C2	-6.32	117.77	120.30
51	v	458	U	N3-C2-O2	-6.32	117.78	122.20
7	B	1914	C	C6-N1-C2	-6.29	117.78	120.30
51	v	470	C	N1-C2-O2	6.28	122.67	118.90
51	v	115	G	P-O3'-C3'	6.27	127.22	119.70
51	v	1049	U	C2-N1-C1'	6.24	125.19	117.70
7	B	257	C	N1-C2-O2	6.23	122.64	118.90
7	B	981	A	N7-C8-N9	6.22	116.91	113.80
7	B	2617	U	N3-C2-O2	-6.21	117.85	122.20
7	B	1349	C	C6-N1-C2	-6.20	117.82	120.30
7	B	2619	C	C6-N1-C2	-6.19	117.82	120.30
7	B	640	C	C2-N1-C1'	6.18	125.60	118.80
51	v	611	C	N1-C2-O2	6.17	122.60	118.90
51	v	1029	U	C2-N1-C1'	6.17	125.11	117.70
7	B	545	U	C2-N1-C1'	6.17	125.10	117.70
51	v	658	C	N1-C2-O2	6.17	122.60	118.90
7	B	748	G	O4'-C1'-N9	6.14	113.11	108.20
7	B	1559	U	N3-C2-O2	-6.14	117.90	122.20
7	B	2656	U	N1-C2-O2	6.14	127.09	122.80
7	B	2762	C	C2-N1-C1'	6.14	125.55	118.80
51	v	1406	U	C2-N1-C1'	6.13	125.06	117.70
51	v	1407	C	C6-N1-C1'	-6.13	113.45	120.80
7	B	455	C	N1-C2-O2	6.10	122.56	118.90
7	B	1727	C	C2-N1-C1'	6.09	125.50	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1644	C	N1-C2-O2	6.07	122.54	118.90
7	B	243	U	N1-C2-O2	6.07	127.05	122.80
7	B	234	U	N1-C2-O2	6.06	127.04	122.80
7	B	1314	C	C6-N1-C2	-6.06	117.88	120.30
7	B	510	C	C2-N1-C1'	6.06	125.47	118.80
51	v	1406	U	C5-C6-N1	6.05	125.72	122.70
7	B	2334	U	C2-N1-C1'	6.04	124.94	117.70
9	D	4	LEU	CA-CB-CG	6.03	129.16	115.30
51	v	307	C	N3-C2-O2	-6.02	117.69	121.90
51	v	1161	C	N1-C2-O2	6.00	122.50	118.90
7	B	1652	A	P-O3'-C3'	6.00	126.90	119.70
7	B	915	C	C2-N1-C1'	6.00	125.39	118.80
51	v	972	C	N3-C2-O2	-5.99	117.71	121.90
7	B	1607	C	N1-C2-O2	5.98	122.49	118.90
7	B	459	U	N1-C2-O2	5.98	126.98	122.80
7	B	2666	C	C6-N1-C1'	-5.97	113.63	120.80
51	v	1158	C	N1-C2-O2	5.97	122.48	118.90
30	a	113	LEU	CA-CB-CG	5.97	129.03	115.30
7	B	274	C	C6-N1-C2	-5.96	117.92	120.30
7	B	2043	C	C6-N1-C2	-5.95	117.92	120.30
51	v	492	C	N3-C2-O2	-5.95	117.73	121.90
51	v	307	C	C2-N1-C1'	5.94	125.33	118.80
7	B	2072	C	C5-C6-N1	5.94	123.97	121.00
51	v	439	U	C5-C6-N1	5.93	125.67	122.70
36	g	95	MET	CA-CB-CG	5.93	123.38	113.30
7	B	1313	U	C5-C6-N1	5.92	125.66	122.70
7	B	2179	C	N3-C2-O2	-5.91	117.76	121.90
51	v	697	U	N1-C2-O2	5.91	126.94	122.80
7	B	2793	C	C2-N1-C1'	5.90	125.29	118.80
7	B	2043	C	C2-N1-C1'	5.89	125.28	118.80
7	B	387	U	N3-C2-O2	-5.88	118.08	122.20
51	v	1049	U	N3-C2-O2	-5.88	118.08	122.20
7	B	2354	C	C2-N1-C1'	5.88	125.27	118.80
51	v	156	C	C2-N1-C1'	5.88	125.27	118.80
7	B	837	C	C6-N1-C2	-5.88	117.95	120.30
7	B	2226	C	N1-C2-O2	5.86	122.42	118.90
51	v	137	U	N1-C2-O2	5.86	126.90	122.80
7	B	323	C	C2-N1-C1'	5.84	125.22	118.80
7	B	1893	C	C6-N1-C2	-5.83	117.97	120.30
7	B	1774	C	C5-C6-N1	5.83	123.91	121.00
7	B	652	U	C2-N1-C1'	5.83	124.69	117.70
14	K	57	LEU	CA-CB-CG	5.83	128.70	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1188	U	N3-C2-O2	-5.82	118.12	122.20
7	B	2179	C	C2-N1-C1'	5.82	125.20	118.80
51	v	1049	U	N1-C2-O2	5.82	126.87	122.80
7	B	243	U	C5-C6-N1	5.82	125.61	122.70
7	B	1437	C	C2-N1-C1'	5.81	125.19	118.80
7	B	981	A	O4'-C1'-N9	5.80	112.84	108.20
7	B	1348	C	C6-N1-C2	-5.79	117.98	120.30
7	B	1893	C	N1-C2-O2	5.78	122.37	118.90
7	B	192	C	N1-C2-O2	5.77	122.36	118.90
7	B	544	C	N1-C2-O2	5.75	122.35	118.90
7	B	2063	C	C5-C6-N1	5.74	123.87	121.00
7	B	2145	C	C2-N1-C1'	5.74	125.12	118.80
7	B	2179	C	C6-N1-C2	-5.74	118.00	120.30
51	v	132	C	C6-N1-C2	-5.74	118.00	120.30
51	v	658	C	N3-C2-O2	-5.74	117.88	121.90
51	v	1348	U	N1-C2-O2	5.74	126.81	122.80
51	v	1066	C	N1-C2-O2	5.73	122.34	118.90
51	v	492	C	N1-C2-O2	5.73	122.34	118.90
6	A	30	C	N1-C2-O2	5.72	122.33	118.90
51	v	1322	C	C6-N1-C1'	-5.72	113.93	120.80
7	B	2884	U	N1-C2-O2	5.71	126.80	122.80
7	B	2619	C	C2-N1-C1'	5.71	125.08	118.80
51	v	328	C	N3-C2-O2	-5.71	117.90	121.90
53	5	32	C	N1-C2-O2	5.71	122.32	118.90
51	v	1520	C	C2-N1-C1'	5.70	125.07	118.80
7	B	366	C	C6-N1-C2	-5.70	118.02	120.30
7	B	1005	C	C6-N1-C2	-5.70	118.02	120.30
7	B	2354	C	C5-C6-N1	5.70	123.85	121.00
7	B	2739	U	N3-C2-O2	-5.68	118.23	122.20
7	B	545	U	N1-C2-O2	5.66	126.76	122.80
6	A	26	C	C5-C6-N1	5.66	123.83	121.00
7	B	981	A	C4-N9-C1'	5.64	136.46	126.30
7	B	137	U	N3-C2-O2	-5.64	118.25	122.20
51	v	58	C	N3-C2-O2	-5.64	117.95	121.90
7	B	243	U	C2-N1-C1'	5.63	124.45	117.70
7	B	1314	C	C6-N1-C1'	-5.63	114.05	120.80
7	B	114	U	N1-C2-O2	5.63	126.74	122.80
12	G	46	ASP	C-N-CA	5.62	135.75	121.70
51	v	1322	C	C6-N1-C2	-5.62	118.05	120.30
51	v	135	C	C5-C6-N1	5.60	123.80	121.00
51	v	330	C	N3-C2-O2	-5.60	117.98	121.90
7	B	1914	C	N1-C2-O2	5.60	122.26	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	M	1	MET	CA-CB-CG	5.59	122.81	113.30
7	B	1585	C	N3-C2-O2	-5.59	117.99	121.90
7	B	1644	C	N3-C2-O2	-5.58	117.99	121.90
7	B	2656	U	N3-C2-O2	-5.58	118.29	122.20
7	B	2556	C	N1-C2-O2	5.57	122.25	118.90
7	B	765	C	C2-N1-C1'	5.57	124.92	118.80
7	B	1170	C	C2-N1-C1'	5.56	124.92	118.80
7	B	671	C	C6-N1-C2	-5.56	118.08	120.30
51	v	611	C	C6-N1-C2	-5.55	118.08	120.30
7	B	1326	U	N1-C2-O2	5.55	126.68	122.80
7	B	2302	U	N3-C2-O2	-5.54	118.32	122.20
7	B	2254	C	C6-N1-C2	-5.54	118.08	120.30
51	v	178	C	N3-C2-O2	-5.53	118.03	121.90
51	v	697	U	N3-C2-O2	-5.52	118.33	122.20
51	v	1262	C	N3-C2-O2	-5.52	118.03	121.90
11	F	43	ILE	CG1-CB-CG2	-5.52	99.26	111.40
7	B	1082	U	C2-N1-C1'	5.52	124.32	117.70
7	B	1760	C	N1-C2-O2	5.51	122.20	118.90
7	B	790	U	C2-N1-C1'	5.50	124.31	117.70
7	B	2244	U	N3-C4-O4	5.50	123.25	119.40
51	v	1218	C	C6-N1-C2	-5.49	118.10	120.30
7	B	544	C	C2-N1-C1'	5.49	124.84	118.80
51	v	575	G	O4'-C1'-N9	-5.48	103.82	108.20
7	B	2329	U	C5-C6-N1	5.48	125.44	122.70
7	B	2129	C	N1-C2-O2	5.48	122.19	118.90
51	v	91	U	C6-N1-C1'	-5.48	113.53	121.20
7	B	1611	C	C2-N1-C1'	5.47	124.82	118.80
51	v	316	C	C2-N1-C1'	5.46	124.81	118.80
7	B	2703	C	C6-N1-C2	-5.45	118.12	120.30
10	E	164	LEU	CA-CB-CG	5.45	127.84	115.30
7	B	1459	G	N3-C4-C5	-5.45	125.88	128.60
7	B	640	C	C5-C6-N1	5.44	123.72	121.00
7	B	198	C	C5-C6-N1	5.44	123.72	121.00
51	v	307	C	C6-N1-C2	-5.44	118.12	120.30
51	v	1412	C	C2-N1-C1'	5.44	124.79	118.80
7	B	837	C	N3-C2-O2	-5.44	118.09	121.90
51	v	1412	C	C6-N1-C2	-5.44	118.12	120.30
7	B	2063	C	C2-N1-C1'	5.44	124.78	118.80
7	B	922	C	C6-N1-C2	-5.43	118.13	120.30
7	B	1920	C	C6-N1-C2	-5.42	118.13	120.30
7	B	2617	U	N1-C2-O2	5.42	126.59	122.80
51	v	156	C	C6-N1-C2	-5.42	118.13	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	475	C	C6-N1-C2	-5.41	118.14	120.30
7	B	257	C	N3-C2-O2	-5.41	118.11	121.90
7	B	2302	U	N1-C2-O2	5.41	126.59	122.80
51	v	470	C	N3-C2-O2	-5.41	118.11	121.90
51	v	210	C	N1-C2-O2	5.40	122.14	118.90
7	B	183	C	N1-C2-O2	5.40	122.14	118.90
7	B	527	C	N3-C2-O2	-5.40	118.12	121.90
6	A	38	C	C6-N1-C2	-5.40	118.14	120.30
45	p	74	LEU	CA-CB-CG	5.39	127.70	115.30
51	v	1098	C	C2-N1-C1'	5.39	124.72	118.80
7	B	183	C	C6-N1-C2	-5.38	118.15	120.30
7	B	1176	U	C2-N1-C1'	5.38	124.15	117.70
7	B	274	C	C5-C6-N1	5.38	123.69	121.00
7	B	765	C	C5-C6-N1	5.38	123.69	121.00
51	v	54	C	N1-C2-O2	5.37	122.12	118.90
51	v	1113	C	C6-N1-C2	-5.37	118.15	120.30
7	B	1880	U	N1-C2-O2	5.37	126.56	122.80
7	B	652	U	N1-C2-O2	5.36	126.55	122.80
7	B	1931	U	N3-C2-O2	-5.35	118.45	122.20
7	B	1993	U	N1-C2-O2	5.35	126.54	122.80
7	B	974	G	C4-N9-C1'	5.35	133.45	126.50
51	v	972	C	C6-N1-C2	-5.34	118.16	120.30
7	B	1830	C	C6-N1-C2	-5.34	118.17	120.30
51	v	1029	U	N1-C2-O2	5.34	126.54	122.80
7	B	1075	C	N1-C2-O2	5.34	122.10	118.90
51	v	811	C	N1-C2-O2	5.34	122.10	118.90
7	B	1047	G	O4'-C1'-N9	5.33	112.46	108.20
7	B	1912	A	N7-C8-N9	5.33	116.46	113.80
51	v	328	C	C5-C6-N1	5.33	123.66	121.00
7	B	828	U	C5-C6-N1	5.33	125.36	122.70
7	B	2254	C	C5-C6-N1	5.32	123.66	121.00
30	a	178	LEU	CA-CB-CG	5.32	127.53	115.30
51	v	582	C	N1-C2-O2	5.32	122.09	118.90
7	B	459	U	N3-C2-O2	-5.31	118.48	122.20
7	B	1607	C	N3-C2-O2	-5.31	118.18	121.90
7	B	2394	C	N1-C2-O2	5.30	122.08	118.90
51	v	611	C	N3-C2-O2	-5.29	118.20	121.90
7	B	1830	C	C5-C6-N1	5.29	123.64	121.00
19	P	5	LYS	CA-CB-CG	5.29	125.03	113.40
7	B	2043	C	N1-C2-O2	5.28	122.07	118.90
7	B	2177	C	C5-C6-N1	5.27	123.64	121.00
7	B	2752	C	N3-C2-O2	-5.27	118.21	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1267	U	N1-C2-O2	5.27	126.49	122.80
7	B	1675	C	N1-C2-O2	5.27	122.06	118.90
51	v	822	U	N3-C2-O2	-5.27	118.51	122.20
7	B	860	U	N1-C2-O2	5.26	126.48	122.80
7	B	1763	G	O4'-C1'-N9	5.26	112.41	108.20
7	B	669	G	C4-N9-C1'	5.26	133.34	126.50
9	D	100	LEU	CA-CB-CG	5.26	127.40	115.30
7	B	1349	C	C2-N1-C1'	5.26	124.58	118.80
7	B	201	C	C6-N1-C2	-5.25	118.20	120.30
7	B	484	C	C5-C6-N1	5.25	123.63	121.00
7	B	1275	A	C4-N9-C1'	5.25	135.75	126.30
7	B	542	C	C6-N1-C2	-5.25	118.20	120.30
7	B	2847	U	N1-C2-O2	5.25	126.47	122.80
7	B	635	C	C5-C6-N1	5.25	123.62	121.00
7	B	1063	G	N1-C6-O6	-5.25	116.75	119.90
7	B	455	C	N3-C2-O2	-5.24	118.23	121.90
7	B	2656	U	C2-N1-C1'	5.24	123.99	117.70
7	B	2076	U	N1-C2-O2	5.23	126.46	122.80
35	f	58	LEU	CA-CB-CG	5.23	127.33	115.30
7	B	671	C	C5-C6-N1	5.23	123.61	121.00
7	B	1914	C	N3-C2-O2	-5.23	118.24	121.90
7	B	545	U	N3-C2-O2	-5.22	118.54	122.20
51	v	132	C	C5-C6-N1	5.21	123.61	121.00
7	B	2602	A	C2-N3-C4	5.21	113.20	110.60
7	B	461	C	C6-N1-C2	-5.21	118.22	120.30
7	B	1101	U	N3-C2-O2	-5.21	118.55	122.20
51	v	1029	U	N3-C2-O2	-5.21	118.55	122.20
51	v	1520	C	C5-C6-N1	5.21	123.61	121.00
19	P	4	ILE	C-N-CA	5.21	134.72	121.70
51	v	983	A	N3-C4-N9	5.20	131.56	127.40
7	B	847	U	C6-N1-C1'	-5.20	113.92	121.20
7	B	1097	U	N1-C2-O2	5.20	126.44	122.80
51	v	1138	G	C2-N3-C4	5.20	114.50	111.90
7	B	1294	U	N1-C2-O2	5.20	126.44	122.80
7	B	1348	C	C5-C6-N1	5.18	123.59	121.00
7	B	243	U	N3-C2-O2	-5.18	118.58	122.20
7	B	323	C	N1-C2-O2	5.17	122.00	118.90
7	B	669	G	N3-C4-N9	5.17	129.10	126.00
7	B	872	U	C2-N1-C1'	5.17	123.91	117.70
7	B	528	A	C8-N9-C4	-5.17	103.73	105.80
7	B	2683	C	N3-C2-O2	-5.17	118.28	121.90
7	B	2723	C	C6-N1-C2	-5.17	118.23	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	1294	U	N3-C2-O2	-5.16	118.59	122.20
51	v	217	C	C5-C6-N1	5.16	123.58	121.00
7	B	2884	U	N3-C2-O2	-5.16	118.59	122.20
7	B	1437	C	C6-N1-C2	-5.16	118.24	120.30
7	B	1585	C	C6-N1-C2	-5.16	118.24	120.30
30	a	211	LEU	CA-CB-CG	5.16	127.16	115.30
51	v	203	G	N3-C4-N9	5.15	129.09	126.00
53	5	36	U	N1-C2-O2	5.15	126.41	122.80
51	v	1132	C	C2-N1-C1'	5.15	124.46	118.80
7	B	1993	U	N3-C2-O2	-5.13	118.61	122.20
53	5	31	G	C4-N9-C1'	5.13	133.17	126.50
7	B	1176	U	N1-C2-O2	5.13	126.39	122.80
7	B	2762	C	N1-C2-O2	5.13	121.97	118.90
7	B	1289	C	C2-N1-C1'	5.12	124.44	118.80
6	A	30	C	C6-N1-C1'	-5.12	114.65	120.80
7	B	1267	U	N3-C2-O2	-5.12	118.62	122.20
51	v	610	U	C2-N1-C1'	5.12	123.84	117.70
52	x	6	C	N1-C2-O2	5.11	121.97	118.90
53	5	56	C	N3-C2-O2	-5.11	118.33	121.90
7	B	339	U	C5-C6-N1	5.11	125.25	122.70
7	B	2063	C	N1-C2-O2	5.10	121.96	118.90
7	B	2462	C	C5-C6-N1	5.10	123.55	121.00
7	B	475	C	C5-C6-N1	5.10	123.55	121.00
7	B	2076	U	N3-C2-O2	-5.10	118.63	122.20
51	v	328	C	C6-N1-C2	-5.10	118.26	120.30
7	B	2858	C	C6-N1-C1'	-5.09	114.69	120.80
44	o	38	PHE	CB-CG-CD1	5.09	124.36	120.80
51	v	1444	U	N1-C2-O2	5.09	126.36	122.80
7	B	1915	U	C6-N1-C1'	-5.09	114.08	121.20
7	B	2430	A	N3-C4-C5	-5.09	123.24	126.80
51	v	1136	C	N1-C2-O2	5.09	121.95	118.90
7	B	2063	C	N3-C2-O2	-5.08	118.34	121.90
53	5	36	U	N3-C2-O2	-5.08	118.64	122.20
7	B	1267	U	C2-N1-C1'	5.08	123.80	117.70
41	l	33	LEU	CA-CB-CG	5.08	126.98	115.30
7	B	542	C	N1-C2-O2	5.07	121.94	118.90
51	v	284	C	C6-N1-C2	-5.07	118.27	120.30
51	v	156	C	N1-C2-O2	5.07	121.94	118.90
36	g	91	LEU	CA-CB-CG	5.07	126.95	115.30
7	B	1398	C	C2-N1-C1'	5.06	124.37	118.80
7	B	1760	C	C6-N1-C2	-5.06	118.28	120.30
7	B	461	C	C2-N1-C1'	5.05	124.36	118.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
51	v	972	C	N1-C2-O2	5.05	121.93	118.90
7	B	2123	G	N3-C4-N9	5.04	129.03	126.00
7	B	646	U	N3-C2-O2	-5.04	118.67	122.20
51	v	1406	U	C6-N1-C2	-5.04	117.98	121.00
7	B	652	U	N3-C2-O2	-5.03	118.68	122.20
51	v	1412	C	C5-C6-N1	5.03	123.52	121.00
7	B	1076	C	C6-N1-C2	-5.03	118.29	120.30
51	v	132	C	N3-C2-O2	-5.03	118.38	121.90
7	B	2636	C	C2-N1-C1'	5.03	124.33	118.80
51	v	91	U	C5-C6-N1	5.03	125.21	122.70
7	B	274	C	N3-C2-O2	-5.02	118.39	121.90
7	B	2477	U	C2-N1-C1'	5.02	123.73	117.70
7	B	646	U	N1-C2-O2	5.02	126.31	122.80
51	v	1109	C	C6-N1-C2	-5.02	118.29	120.30
7	B	2703	C	C5-C6-N1	5.02	123.51	121.00
7	B	202	U	C6-N1-C1'	-5.01	114.18	121.20
51	v	1161	C	C6-N1-C1'	-5.01	114.79	120.80
7	B	1437	C	N1-C2-O2	5.01	121.91	118.90
51	v	611	C	C2-N1-C1'	5.01	124.31	118.80
51	v	1303	C	C6-N1-C2	-5.01	118.30	120.30
7	B	848	C	C6-N1-C2	-5.01	118.30	120.30
7	B	2554	U	C2-N1-C1'	5.01	123.71	117.70
7	B	126	A	N7-C8-N9	5.00	116.30	113.80

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
23	T	1	MET	Peptide
30	a	152	ASP	Peptide
31	b	60	ALA	Peptide
37	h	11	ARG	Peptide
39	j	118	ASN	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	0	444	0	461	11	0
2	1	410	0	440	6	0
3	2	377	0	418	4	0
4	3	504	0	574	9	0
5	4	302	0	343	3	0
6	A	2504	0	1271	13	0
7	B	62317	0	31345	312	0
8	C	2083	0	2157	29	0
9	D	1565	0	1616	11	0
10	E	1552	0	1619	19	0
11	F	1420	0	1460	36	0
12	G	1323	0	1374	20	0
13	J	1129	0	1162	25	0
14	K	931	0	1003	25	0
15	L	1045	0	1117	17	0
16	M	1074	0	1157	12	0
17	N	961	0	1000	12	0
18	O	892	0	923	13	0
19	P	917	0	965	16	0
20	Q	947	0	1022	15	0
21	R	816	0	839	8	0
22	S	857	0	922	12	0
23	T	739	0	807	14	0
24	U	780	0	834	8	0
25	V	753	0	780	8	0
26	W	596	0	610	22	0
27	X	625	0	655	6	0
28	Y	509	0	543	5	0
29	Z	449	0	491	2	0
30	a	1705	0	1732	0	0
31	b	1625	0	1699	0	0
32	c	1643	0	1710	0	0
33	d	1106	0	1148	0	0
34	e	818	0	808	0	0
35	f	1182	0	1240	0	0
36	g	979	0	1034	0	0
37	h	1022	0	1070	0	0
38	i	787	0	828	0	0
39	j	877	0	887	0	0
40	k	955	0	1019	0	0
41	l	884	0	944	0	0
42	m	774	0	827	0	0
43	n	714	0	737	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	o	649	0	666	0	0
45	p	649	0	691	0	0
46	q	456	0	478	0	0
47	r	638	0	665	0	0
48	s	665	0	714	0	0
49	t	426	0	449	0	0
50	u	468	0	458	0	0
51	v	33012	0	16619	0	0
52	x	257	0	133	0	0
53	5	1640	0	837	4	0
All	All	142752	0	95301	597	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 5.

All (597) 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)
7:B:1311:G:H21	7:B:1603:A:H62	1.13	0.95
7:B:1021:A:H62	7:B:1141:U:H3	1.18	0.91
7:B:2735:G:H1	7:B:2769:U:H3	1.01	0.89
7:B:1311:G:N2	7:B:1603:A:H62	1.71	0.88
7:B:1483:G:H1	7:B:1506:U:H3	1.27	0.81
7:B:1664:A:H61	7:B:1996:C:H42	1.30	0.79
7:B:2099:U:H3	7:B:2190:G:H1	1.33	0.76
7:B:2125:G:H21	7:B:2173:A:N6	1.86	0.73
6:A:22:U:H3	6:A:61:G:H1	1.35	0.70
19:P:90:ALA:HB2	19:P:110:LYS:HB2	1.75	0.68
11:F:147:ARG:HG3	11:F:149:ARG:H	1.59	0.68
7:B:2116:G:HO2'	7:B:2144:G:HO2'	1.38	0.67
11:F:49:LEU:HD12	11:F:64:PRO:HG2	1.77	0.67
22:S:82:MET:HG3	22:S:98:LYS:HB2	1.78	0.66
7:B:1311:G:H21	7:B:1603:A:N6	1.89	0.66
7:B:2125:G:N2	7:B:2173:A:N6	2.44	0.66
7:B:981:A:H8	7:B:2027:G:H21	1.44	0.65
7:B:1664:A:H61	7:B:1996:C:N4	1.94	0.64
11:F:175:PRO:HB2	11:F:177:ARG:HH12	1.63	0.63
26:W:30:VAL:HG13	26:W:59:PHE:HB2	1.80	0.63
7:B:1653:G:H3'	17:N:2:ARG:HG2	1.81	0.62
4:3:51:LYS:HA	4:3:54:LEU:HB2	1.81	0.61
7:B:1365:A:H5''	27:X:27:ARG:HH12	1.65	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
21:R:2:TYR:HB2	21:R:42:ALA:HB3	1.82	0.61
26:W:23:LYS:HD2	26:W:68:PHE:H	1.66	0.61
9:D:131:ASP:O	9:D:136:ASN:ND2	2.34	0.60
10:E:164:LEU:HB2	10:E:167:VAL:HG22	1.84	0.60
22:S:16:LYS:HA	22:S:19:LEU:HD12	1.82	0.60
7:B:1060:U:H4'	7:B:1061:U:H3'	1.84	0.60
7:B:2864:G:OP1	19:P:112:ARG:NH1	2.35	0.60
7:B:2682:A:H61	7:B:2728:U:H1'	1.67	0.60
7:B:2822:G:O6	17:N:2:ARG:NH1	2.35	0.60
16:M:64:TRP:HB2	16:M:104:GLU:HB2	1.84	0.60
27:X:4:CYS:HB3	27:X:9:LYS:H	1.66	0.60
18:O:2:ASP:N	18:O:5:SER:HG	2.00	0.59
11:F:68:LYS:HA	11:F:83:PRO:HA	1.84	0.59
11:F:103:ILE:O	11:F:107:VAL:HB	2.03	0.59
9:D:46:ARG:NH2	9:D:87:GLY:O	2.35	0.59
14:K:70:ARG:HE	14:K:76:ILE:HD11	1.68	0.59
16:M:38:ARG:HG3	16:M:98:PRO:HD3	1.84	0.59
19:P:71:ARG:HH21	19:P:73:PHE:HB3	1.68	0.59
22:S:24:ILE:HD13	22:S:36:LEU:HD11	1.84	0.59
24:U:20:LYS:HD2	24:U:38:ILE:HG12	1.85	0.59
7:B:563:A:OP2	21:R:79:ARG:NH2	2.33	0.58
11:F:64:PRO:HB3	11:F:88:VAL:HB	1.85	0.58
7:B:586:A:H5'	10:E:84:THR:HG21	1.83	0.58
7:B:2103:C:H42	7:B:2187:U:H3	1.50	0.58
7:B:1059:G:N1	7:B:1080:A:C2	2.72	0.58
7:B:780:G:N1	8:C:228:ASP:OD1	2.37	0.58
7:B:1539:U:H2'	7:B:1540:G:H8	1.69	0.58
14:K:106:LEU:HB3	14:K:111:PHE:HB3	1.84	0.58
26:W:50:VAL:H	26:W:61:LYS:HE3	1.68	0.58
7:B:856:G:H4'	26:W:23:LYS:HD3	1.84	0.58
11:F:15:LEU:HG	11:F:21:TYR:H	1.69	0.58
7:B:2641:G:H5''	13:J:78:THR:HB	1.86	0.57
7:B:793:A:OP2	7:B:2071:A:O2'	2.21	0.57
7:B:1055:G:N2	7:B:1085:A:O2'	2.37	0.57
7:B:2861:U:H2'	7:B:2862:G:H8	1.70	0.57
8:C:175:LEU:HD12	8:C:179:GLU:HB3	1.87	0.57
11:F:90:LEU:HB3	11:F:95:MET:HB2	1.85	0.57
12:G:22:VAL:HA	12:G:36:LEU:HD22	1.86	0.57
1:O:53:VAL:HG23	1:O:54:ILE:HG12	1.86	0.57
8:C:52:HIS:HA	8:C:216:ARG:HB2	1.86	0.57
13:J:4:PHE:O	20:Q:63:ARG:NH2	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:1275:A:OP2	7:B:1646:C:N4	2.38	0.56
12:G:88:LEU:HG	12:G:161:VAL:HG12	1.86	0.56
14:K:79:ASP:OD2	19:P:61:ARG:NH2	2.36	0.56
7:B:1664:A:N6	7:B:1996:C:H42	2.00	0.56
7:B:569:U:O2'	7:B:983:A:N1	2.38	0.56
7:B:587:C:OP2	15:L:21:ARG:NH2	2.39	0.56
7:B:1338:G:H4'	23:T:18:GLU:HG3	1.88	0.56
25:V:79:ARG:HA	25:V:86:LEU:HA	1.88	0.56
7:B:713:G:H21	7:B:718:A:H2	1.52	0.56
14:K:102:VAL:HG13	14:K:106:LEU:HD13	1.87	0.56
26:W:17:ALA:HA	26:W:36:ILE:HB	1.87	0.56
11:F:47:LYS:HE3	11:F:147:ARG:HB2	1.88	0.56
12:G:17:LYS:HD3	12:G:26:LYS:HE3	1.88	0.56
14:K:14:GLY:HA2	14:K:51:VAL:HG21	1.88	0.56
16:M:14:LYS:O	16:M:71:LYS:NZ	2.39	0.56
7:B:2848:G:O2'	7:B:2867:G:N2	2.36	0.55
7:B:1597:A:H5''	7:B:1598:A:H5'	1.88	0.55
23:T:11:LEU:HA	23:T:34:VAL:HG12	1.88	0.55
4:3:6:VAL:HG12	4:3:9:ALA:H	1.70	0.55
7:B:663:G:H5''	15:L:17:LYS:HD3	1.88	0.55
7:B:1420:A:H5''	7:B:2211:A:H62	1.72	0.55
23:T:24:MET:O	23:T:29:THR:N	2.37	0.55
7:B:2314:A:OP2	11:F:70:ARG:NH1	2.40	0.55
16:M:103:TYR:HE2	16:M:124:LEU:HD11	1.72	0.55
26:W:42:THR:HG22	26:W:43:LYS:HZ2	1.71	0.55
7:B:2081:U:H3	7:B:2239:G:H1	1.54	0.55
7:B:1826:G:O2'	7:B:1971:U:OP2	2.25	0.55
13:J:6:ALA:HB2	13:J:44:TYR:HB3	1.89	0.55
7:B:1527:G:H21	7:B:1545:A:H62	1.55	0.55
7:B:1680:U:O2	7:B:1763:G:O2'	2.22	0.55
8:C:243:PRO:O	8:C:250:GLN:NE2	2.40	0.55
7:B:2822:G:OP1	9:D:164:GLN:NE2	2.39	0.54
18:O:62:LEU:HD22	18:O:70:ALA:HA	1.88	0.54
6:A:39:A:O2'	6:A:46:A:N1	2.40	0.54
7:B:1059:G:C6	7:B:1080:A:N1	2.75	0.54
13:J:40:HIS:O	20:Q:70:GLN:NE2	2.40	0.54
7:B:1059:G:O6	7:B:1080:A:N1	2.41	0.54
13:J:35:ARG:HB2	13:J:54:ILE:HD11	1.89	0.54
7:B:24:G:O2'	22:S:78:GLU:O	2.25	0.54
11:F:38:GLY:O	11:F:147:ARG:NH2	2.40	0.54
12:G:44:HIS:HB3	12:G:49:LEU:HD13	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:2885:G:O2'	7:B:2886:A:N3	2.40	0.54
13:J:96:ARG:NH1	13:J:98:GLU:OE1	2.40	0.54
7:B:2103:C:N4	7:B:2187:U:H3	2.05	0.54
7:B:2258:C:O2'	7:B:2427:C:OP2	2.26	0.54
17:N:54:LEU:HD21	17:N:65:LEU:HB3	1.90	0.54
7:B:820:A:H4'	7:B:836:G:H22	1.73	0.54
14:K:75:VAL:H	19:P:72:VAL:HG22	1.73	0.54
17:N:100:CYS:SG	17:N:101:GLY:N	2.78	0.54
13:J:41:LYS:HD2	13:J:50:THR:HG22	1.90	0.54
7:B:2330:G:O2'	26:W:39:GLN:NE2	2.41	0.53
7:B:2619:C:OP1	9:D:157:LYS:NZ	2.41	0.53
7:B:2674:G:H4'	14:K:29:ARG:HD2	1.90	0.53
7:B:626:A:OP1	7:B:654:A:N6	2.41	0.53
3:2:43:THR:HG22	3:2:46:LYS:H	1.73	0.53
53:5:63:G:H2'	53:5:64:G:H8	1.74	0.53
7:B:704:G:O2'	7:B:727:A:N6	2.41	0.53
23:T:91:GLN:OE1	23:T:94:ASP:N	2.42	0.53
7:B:578:G:OP1	7:B:1255:U:O2'	2.25	0.53
7:B:1028:A:OP2	7:B:1126:A:N6	2.42	0.53
17:N:36:THR:OG1	17:N:37:THR:N	2.42	0.53
7:B:660:C:O2'	15:L:13:LYS:NZ	2.41	0.53
5:4:18:LYS:HG3	5:4:23:ILE:HG13	1.90	0.53
7:B:560:C:O2	20:Q:47:ARG:NH2	2.40	0.53
7:B:693:A:O2'	7:B:1353:A:N3	2.40	0.53
14:K:15:ALA:HB1	14:K:46:ILE:H	1.74	0.53
10:E:139:LYS:NZ	10:E:144:GLU:OE2	2.38	0.53
7:B:2469:A:N6	7:B:2481:G:O2'	2.42	0.52
13:J:14:ASP:OD1	13:J:14:ASP:N	2.41	0.52
7:B:577:G:O2'	7:B:1254:A:OP1	2.27	0.52
17:N:54:LEU:HD23	17:N:66:ALA:HB2	1.91	0.52
7:B:30:G:O2'	7:B:1214:A:N3	2.37	0.52
2:1:21:THR:HG21	7:B:2419:U:H4'	1.91	0.52
7:B:1798:U:O2'	7:B:1802:A:N3	2.42	0.52
16:M:41:LEU:HD13	16:M:96:ILE:HG13	1.90	0.52
7:B:2125:G:N2	7:B:2173:A:C6	2.77	0.52
11:F:31:GLU:OE2	11:F:156:THR:N	2.41	0.52
7:B:987:C:O2'	7:B:1000:A:N3	2.39	0.52
18:O:8:ILE:O	18:O:12:THR:OG1	2.28	0.52
7:B:1817:G:OP1	8:C:86:ARG:NH2	2.42	0.52
18:O:31:THR:O	18:O:102:ARG:NH2	2.39	0.52
2:1:34:GLU:HG2	2:1:49:LYS:HB2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:2314:A:HO2'	11:F:156:THR:HG1	1.58	0.52
7:B:2692:G:N3	7:B:2847:U:O2'	2.42	0.52
7:B:1026:G:H2'	7:B:1027:A:H8	1.73	0.51
7:B:1812:U:O2	8:C:43:ASN:ND2	2.40	0.51
21:R:37:GLU:HB3	21:R:53:PHE:HB3	1.92	0.51
7:B:2102:G:N1	7:B:2188:U:N3	2.58	0.51
8:C:60:ALA:O	8:C:62:ARG:NH1	2.43	0.51
10:E:181:ILE:HG23	15:L:2:ARG:HB3	1.92	0.51
14:K:40:ILE:HD13	14:K:59:ALA:HB2	1.93	0.51
6:A:89:U:O2	7:B:958:U:O2'	2.28	0.51
7:B:1791:A:N6	7:B:1828:G:O2'	2.38	0.51
3:2:3:ARG:O	3:2:6:GLN:NE2	2.42	0.51
7:B:807:U:O2'	7:B:2060:A:N1	2.42	0.51
7:B:1197:G:N2	7:B:1249:U:O2'	2.44	0.51
7:B:1227:G:OP2	20:Q:15:LYS:NZ	2.43	0.51
7:B:1992:G:N2	7:B:1996:C:O2'	2.44	0.51
7:B:2081:U:H2'	7:B:2082:A:H8	1.76	0.51
22:S:35:ILE:O	22:S:39:THR:OG1	2.26	0.51
7:B:1093:G:H21	7:B:1098:A:H62	1.58	0.51
7:B:309:A:H4'	24:U:15:GLY:HA2	1.92	0.51
7:B:500:G:N1	7:B:503:A:OP2	2.43	0.51
7:B:2666:C:H41	12:G:108:PHE:HA	1.76	0.51
7:B:2780:G:O6	13:J:99:ARG:NH1	2.42	0.51
8:C:159:THR:HG22	8:C:176:ARG:HG3	1.92	0.51
11:F:23:SER:HB2	11:F:26:GLN:HB2	1.93	0.51
13:J:99:ARG:HE	13:J:103:ILE:HG13	1.76	0.51
25:V:51:GLN:HE22	25:V:77:VAL:HG21	1.76	0.51
7:B:1438:U:H2'	7:B:1439:A:H8	1.76	0.51
11:F:33:ILE:HG23	11:F:155:ILE:HG23	1.93	0.51
15:L:19:LEU:HB3	15:L:31:GLY:HA3	1.93	0.51
7:B:881:G:N7	7:B:895:U:N3	2.58	0.50
22:S:47:VAL:HG12	22:S:103:ILE:HG21	1.92	0.50
26:W:19:ARG:O	26:W:19:ARG:NH1	2.38	0.50
25:V:2:PHE:HB3	25:V:61:LEU:HD23	1.93	0.50
3:2:44:VAL:HG21	7:B:465:G:H5''	1.92	0.50
7:B:1434:A:H62	7:B:1558:C:H42	1.59	0.50
7:B:1788:C:OP1	8:C:220:ARG:NH2	2.43	0.50
7:B:1853:A:N3	7:B:2233:U:O2'	2.41	0.50
2:1:13:SER:OG	2:1:49:LYS:NZ	2.38	0.50
7:B:1009:A:N3	7:B:1153:C:O2'	2.42	0.50
19:P:46:VAL:HG22	19:P:60:VAL:HG12	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:547:A:H5'	7:B:548:G:H21	1.76	0.50
7:B:953:G:H2'	7:B:954:G:H8	1.76	0.50
7:B:1361:G:HO2'	7:B:2215:C:HO2'	1.59	0.50
7:B:514:A:N3	7:B:581:C:O2'	2.42	0.50
11:F:31:GLU:OE1	11:F:157:THR:OG1	2.30	0.50
14:K:115:ILE:HG23	14:K:121:VAL:HG21	1.91	0.50
7:B:142:A:N3	23:T:1:MET:N	2.58	0.50
9:D:37:VAL:HG22	9:D:48:ILE:HG22	1.93	0.50
23:T:3:ARG:HH11	23:T:42:GLU:HG3	1.77	0.50
11:F:91:ARG:HB2	11:F:94:ARG:HB2	1.92	0.50
7:B:1187:G:N2	7:B:1188:U:O4	2.45	0.49
7:B:1869:G:N2	7:B:1872:A:OP2	2.40	0.49
8:C:24:HIS:HA	8:C:79:ARG:HE	1.76	0.49
7:B:1288:G:OP2	7:B:1288:G:N2	2.39	0.49
11:F:131:VAL:HG12	11:F:133:GLU:H	1.77	0.49
7:B:909:A:OP1	16:M:18:ARG:NH2	2.44	0.49
7:B:917:A:H5''	7:B:2268:A:H61	1.77	0.49
7:B:2719:G:H21	7:B:2872:A:H61	1.58	0.49
7:B:848:C:H2'	7:B:849:A:H8	1.77	0.49
9:D:13:ARG:NH1	19:P:74:GLN:OE1	2.43	0.49
6:A:79:G:O2'	7:B:861:A:N3	2.44	0.49
14:K:18:VAL:HG12	14:K:42:ILE:HA	1.94	0.49
14:K:69:ARG:HG2	14:K:75:VAL:HG12	1.93	0.49
28:Y:4:LYS:O	28:Y:7:ARG:NH1	2.46	0.49
7:B:2788:C:O2'	7:B:2809:A:N3	2.38	0.49
10:E:46:GLN:O	10:E:88:ARG:NH2	2.46	0.49
7:B:629:G:N3	7:B:639:U:O2'	2.44	0.49
7:B:1421:G:H4'	7:B:1493:C:H41	1.76	0.49
7:B:2099:U:H2'	7:B:2100:G:H8	1.78	0.49
10:E:5:LEU:HB2	10:E:10:SER:HB3	1.93	0.49
7:B:1028:A:H2'	7:B:1029:A:C8	2.48	0.49
7:B:1508:A:H4'	7:B:1509:A:H5'	1.94	0.48
7:B:2885:G:O2'	7:B:2886:A:O4'	2.29	0.48
16:M:1:MET:HG3	16:M:2:LEU:H	1.78	0.48
26:W:35:ILE:HG12	26:W:36:ILE:HG12	1.95	0.48
7:B:673:C:OP1	10:E:49:ARG:NH1	2.46	0.48
7:B:1721:G:H22	7:B:1738:G:H1'	1.78	0.48
7:B:1753:G:N2	7:B:1756:G:OP2	2.43	0.48
26:W:23:LYS:HG3	26:W:68:PHE:HD1	1.77	0.48
7:B:2598:A:H5''	8:C:233:GLY:HA3	1.95	0.48
12:G:104:LEU:HB2	12:G:112:VAL:HG13	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:706:A:OP1	8:C:6:LYS:NZ	2.36	0.48
7:B:1901:A:OP2	8:C:252:LYS:NZ	2.46	0.48
7:B:2229:U:H2'	7:B:2230:G:H8	1.79	0.48
11:F:57:ALA:HA	11:F:94:ARG:HH22	1.78	0.48
14:K:36:ASP:OD1	14:K:36:ASP:N	2.38	0.48
19:P:96:LEU:HD22	19:P:99:LEU:HD13	1.95	0.48
7:B:2135:A:OP2	7:B:2156:G:N2	2.46	0.48
19:P:28:LYS:HB3	19:P:39:LEU:HD22	1.95	0.48
7:B:107:G:H21	7:B:346:A:N6	2.12	0.48
11:F:71:LYS:HG3	11:F:73:VAL:HB	1.96	0.48
18:O:25:ARG:HH21	18:O:40:ILE:HG21	1.78	0.48
7:B:538:A:H4'	13:J:7:LYS:HG3	1.95	0.48
7:B:1433:A:H61	7:B:1560:G:H1	1.62	0.48
7:B:1733:G:H2'	7:B:1734:G:H8	1.79	0.48
22:S:6:LYS:HD2	22:S:102:HIS:HB3	1.96	0.48
7:B:776:G:OP2	7:B:776:G:N2	2.44	0.47
7:B:993:G:N3	21:R:91:GLN:NE2	2.61	0.47
11:F:161:SER:HB2	11:F:164:GLU:HB3	1.96	0.47
8:C:180:MET:HB3	8:C:267:VAL:HB	1.96	0.47
12:G:93:TYR:OH	12:G:151:ARG:NH1	2.46	0.47
24:U:4:ILE:HG21	24:U:33:VAL:HG11	1.95	0.47
6:A:5:U:OP1	6:A:61:G:O2'	2.26	0.47
7:B:2093:G:O2'	7:B:2198:A:N1	2.45	0.47
7:B:2515:C:H2'	7:B:2516:A:H8	1.79	0.47
11:F:111:ARG:HH11	11:F:114:ARG:HH12	1.61	0.47
15:L:85:VAL:HG12	15:L:87:GLY:H	1.79	0.47
17:N:44:LEU:HD23	17:N:113:ILE:HG21	1.96	0.47
26:W:48:ALA:HB2	26:W:81:ILE:HB	1.96	0.47
23:T:36:LYS:HD2	23:T:36:LYS:HA	1.72	0.47
26:W:58:LEU:HD22	26:W:79:ILE:HD12	1.97	0.47
7:B:1962:C:O2'	7:B:1964:G:OP2	2.30	0.47
7:B:2638:G:O2'	7:B:2775:G:N2	2.40	0.47
13:J:118:MET:HA	13:J:121:LYS:HE2	1.97	0.47
19:P:61:ARG:HD2	19:P:100:ARG:HB2	1.95	0.47
13:J:96:ARG:HH12	13:J:98:GLU:HB2	1.80	0.47
29:Z:9:THR:N	29:Z:53:MET:O	2.42	0.47
7:B:184:C:O2'	7:B:217:A:N3	2.42	0.47
7:B:558:U:H5''	13:J:111:LYS:HD3	1.97	0.47
7:B:1250:G:N7	15:L:18:ARG:NH2	2.49	0.47
11:F:109:ARG:NH2	11:F:173:ASP:OD1	2.48	0.47
53:5:21:A:H61	53:5:46:G:H2'	1.80	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:2270:A:O2'	26:W:15:SER:O	2.28	0.47
7:B:859:G:O2'	7:B:916:G:O6	2.27	0.46
7:B:1864:U:OP1	7:B:2410:G:O2'	2.29	0.46
4:3:40:LYS:NZ	7:B:2419:U:OP1	2.39	0.46
7:B:83:A:N6	7:B:102:U:OP2	2.47	0.46
11:F:43:ILE:HG13	11:F:82:TYR:HB3	1.97	0.46
7:B:548:G:OP2	7:B:549:G:N2	2.48	0.46
7:B:1076:C:H2'	7:B:1077:A:H8	1.80	0.46
7:B:1939:U:OP1	7:B:2604:U:O2'	2.31	0.46
7:B:2250:G:H21	7:B:2496:C:H4'	1.81	0.46
24:U:93:ARG:HB3	24:U:102:ILE:HD12	1.98	0.46
7:B:572:A:OP2	21:R:80:ARG:NH2	2.46	0.46
7:B:1923:U:OP1	53:5:24:U:O2'	2.34	0.46
7:B:833:A:H2'	7:B:834:G:C8	2.50	0.46
7:B:2132:U:O4'	7:B:2157:G:N2	2.48	0.46
7:B:2313:C:H5'	11:F:87:LYS:HD3	1.98	0.46
7:B:1080:A:N6	7:B:1088:A:OP1	2.49	0.46
7:B:2647:U:O2	7:B:2673:G:O6	2.34	0.46
11:F:46:LYS:HB3	11:F:49:LEU:HD23	1.97	0.46
12:G:70:LEU:O	12:G:74:MET:HG2	2.15	0.46
9:D:148:GLN:HB2	9:D:152:PRO:HG2	1.97	0.46
7:B:1614:A:N6	22:S:92:ARG:O	2.48	0.46
24:U:43:LYS:NZ	24:U:44:HIS:O	2.48	0.46
53:5:73:A:H5''	53:5:74:C:H5'	1.98	0.46
1:0:29:VAL:HG22	1:0:36:LYS:HG2	1.96	0.46
4:3:29:ARG:HE	15:L:62:PRO:HB3	1.81	0.46
7:B:2462:C:H1'	7:B:2491:U:H5	1.81	0.46
7:B:788:A:H5''	7:B:790:U:H3	1.80	0.46
7:B:1316:U:H2'	7:B:1317:G:H8	1.80	0.46
7:B:1769:U:H3	7:B:1983:G:H1	1.64	0.45
14:K:63:ARG:HB2	14:K:82:ALA:HB3	1.97	0.45
17:N:12:ARG:O	17:N:17:ARG:NH1	2.49	0.45
2:1:22:THR:OG1	2:1:23:THR:N	2.48	0.45
7:B:537:G:H4'	13:J:5:THR:HG21	1.98	0.45
20:Q:94:LEU:HD13	20:Q:94:LEU:HA	1.79	0.45
22:S:66:ILE:HA	22:S:69:LEU:HD12	1.97	0.45
23:T:9:LYS:HB2	23:T:9:LYS:HE3	1.77	0.45
26:W:63:ASP:OD1	26:W:63:ASP:N	2.49	0.45
7:B:414:C:H2'	7:B:415:A:H8	1.82	0.45
8:C:144:GLU:HB2	8:C:187:CYS:HB2	1.98	0.45
11:F:13:LYS:HA	11:F:13:LYS:HD3	1.68	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:P:1:SER:OG	19:P:2:ASN:N	2.50	0.45
6:A:27:C:OP1	18:O:34:HIS:NE2	2.46	0.45
7:B:742:A:H2'	7:B:743:A:C8	2.52	0.45
7:B:931:U:OP1	29:Z:29:ARG:NH2	2.50	0.45
7:B:1812:U:H2'	7:B:1813:G:H8	1.82	0.45
7:B:2125:G:N2	7:B:2173:A:H62	2.15	0.45
4:3:44:ARG:NH2	7:B:2349:G:OP1	2.50	0.45
7:B:561:G:HO2'	20:Q:44:TYR:HH	1.65	0.45
12:G:85:LYS:HB3	12:G:164:ALA:HA	1.99	0.45
13:J:69:ARG:HG2	13:J:90:GLU:HG3	1.99	0.45
7:B:373:U:H2'	7:B:374:A:H8	1.82	0.45
7:B:1952:A:C8	14:K:41:THR:HG21	2.52	0.45
25:V:28:ALA:HB3	25:V:40:ILE:HD12	1.98	0.45
6:A:36:C:N4	6:A:49:C:O2	2.50	0.45
7:B:265:A:N6	7:B:428:A:N7	2.65	0.45
7:B:458:G:O2'	7:B:469:G:O6	2.28	0.45
10:E:5:LEU:HA	10:E:120:VAL:HG23	1.99	0.45
11:F:8:LYS:HA	11:F:8:LYS:HD2	1.78	0.45
14:K:42:ILE:HD11	14:K:57:LEU:HD21	1.99	0.45
7:B:244:A:O2'	15:L:69:ARG:NH2	2.50	0.45
7:B:1231:U:H2'	7:B:1232:G:H8	1.82	0.45
7:B:1332:G:N7	7:B:1609:A:O2'	2.39	0.45
7:B:1757:A:H62	7:B:1762:A:H2	1.64	0.45
15:L:77:ILE:HD11	15:L:108:ALA:HB1	1.97	0.45
16:M:118:LYS:HB3	16:M:118:LYS:HE2	1.71	0.45
23:T:68:LYS:HD2	23:T:68:LYS:HA	1.85	0.45
25:V:58:SER:OG	25:V:59:GLU:OE1	2.34	0.45
4:3:27:ASN:O	4:3:35:LYS:NZ	2.48	0.44
7:B:184:C:H2'	7:B:185:G:H8	1.81	0.44
15:L:79:LEU:HA	15:L:82:LEU:HD12	3.60	0.44
9:D:69:ALA:HA	9:D:73:VAL:HB	1.99	0.44
25:V:77:VAL:HG22	25:V:89:ILE:HG12	1.99	0.44
25:V:83:LYS:HB3	25:V:85:LYS:HD2	2.00	0.44
7:B:1432:G:H2'	7:B:1433:A:C8	2.52	0.44
11:F:146:ASP:N	11:F:146:ASP:OD1	2.42	0.44
7:B:1570:A:H2'	7:B:1571:A:C8	2.52	0.44
10:E:146:VAL:HG12	10:E:185:LYS:HB2	1.99	0.44
14:K:52:LYS:HA	14:K:52:LYS:HD3	1.73	0.44
23:T:88:LYS:HA	23:T:91:GLN:HE21	1.82	0.44
7:B:1724:G:H1	7:B:1736:U:H3	1.66	0.44
7:B:1921:G:H2'	7:B:1922:G:H8	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:2693:G:H2'	7:B:2694:G:H8	1.83	0.44
8:C:182:LYS:N	8:C:265:PHE:O	2.49	0.44
20:Q:86:SER:HB3	21:R:52:PRO:HD3	1.98	0.44
7:B:557:C:O2'	13:J:47:HIS:O	2.34	0.44
7:B:1539:U:H2'	7:B:1540:G:C8	2.51	0.44
7:B:2540:C:O2'	7:B:2740:A:N3	2.41	0.44
26:W:24:ARG:HD3	26:W:24:ARG:HA	1.85	0.44
7:B:576:U:H2'	7:B:577:G:C8	2.53	0.44
7:B:1818:U:OP2	8:C:155:ARG:NH1	2.51	0.44
7:B:2759:G:H21	12:G:34:ARG:HH22	1.66	0.44
14:K:16:ARG:HD2	14:K:16:ARG:HA	1.76	0.44
16:M:33:LEU:HD13	16:M:117:PHE:HB3	2.00	0.44
3:2:12:ARG:NH2	7:B:464:U:O3'	2.50	0.44
7:B:526:A:O2'	7:B:2043:C:O2	2.32	0.44
7:B:632:A:H4'	15:L:68:SER:HB3	1.99	0.44
7:B:1796:U:H2'	7:B:1797:G:C8	2.52	0.44
24:U:2:ALA:O	24:U:5:ARG:NH2	2.51	0.44
7:B:1:G:H2'	7:B:2:G:H8	1.83	0.44
7:B:322:A:OP1	10:E:162:ARG:NH1	2.51	0.44
7:B:1710:G:H2'	7:B:1711:A:C8	2.53	0.44
11:F:33:ILE:HG13	11:F:95:MET:HG3	2.00	0.44
6:A:36:C:H5''	6:A:38:C:H41	1.83	0.43
6:A:78:A:H62	6:A:98:G:H21	1.65	0.43
7:B:581:C:H2'	7:B:582:A:C8	2.53	0.43
7:B:659:G:O2'	10:E:95:LYS:O	2.28	0.43
7:B:1443:U:H2'	7:B:1444:G:H8	1.83	0.43
7:B:2511:U:OP1	9:D:128:ARG:NE	2.48	0.43
26:W:39:GLN:NE2	26:W:42:THR:OG1	2.46	0.43
7:B:45:G:H5''	7:B:46:G:H5'	2.00	0.43
7:B:1224:U:H2'	7:B:1225:G:C8	2.53	0.43
7:B:1329:U:H5''	7:B:1330:C:H5	1.83	0.43
11:F:59:ILE:H	11:F:94:ARG:HH21	1.66	0.43
16:M:22:GLN:O	16:M:100:LYS:NZ	2.49	0.43
7:B:764:A:H5''	8:C:208:GLY:HA3	2.01	0.43
7:B:864:G:O2'	7:B:914:G:O6	2.36	0.43
7:B:1392:A:H62	23:T:19:LYS:HD3	1.83	0.43
7:B:2328:A:H2'	7:B:2329:U:C6	2.53	0.43
8:C:182:LYS:HB3	8:C:182:LYS:HE3	1.75	0.43
25:V:58:SER:O	25:V:73:LYS:NZ	2.52	0.43
7:B:197:A:N6	7:B:2430:A:O2'	2.51	0.43
7:B:555:G:HO2'	7:B:556:A:H8	1.65	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:1059:G:C6	7:B:1080:A:C2	3.06	0.43
7:B:1278:C:H2'	7:B:1279:G:H8	1.83	0.43
7:B:2167:U:H2'	7:B:2168:G:C8	2.53	0.43
7:B:2202:U:O2'	7:B:2204:G:OP1	2.35	0.43
12:G:133:LYS:HA	12:G:133:LYS:HD3	1.78	0.43
24:U:90:LYS:NZ	24:U:91:LYS:O	2.39	0.43
28:Y:23:ARG:HA	28:Y:23:ARG:HD3	1.85	0.43
6:A:80:U:O2'	7:B:918:A:N3	2.49	0.43
7:B:414:C:H2'	7:B:415:A:C8	2.54	0.43
7:B:582:A:H2'	7:B:583:G:H8	1.82	0.43
7:B:1128:G:N7	7:B:2489:U:O2'	2.50	0.43
12:G:37:ASN:N	12:G:37:ASN:OD1	2.51	0.43
13:J:141:ASP:N	13:J:141:ASP:OD2	2.47	0.43
28:Y:7:ARG:HG2	28:Y:8:GLU:HG3	2.00	0.43
7:B:444:C:OP1	10:E:40:ARG:NH2	2.51	0.43
8:C:7:PRO:HB3	8:C:13:ARG:HG3	2.00	0.43
28:Y:48:ARG:HD3	28:Y:48:ARG:HA	1.72	0.43
5:4:15:LYS:HG2	5:4:26:ILE:HG13	2.00	0.43
7:B:2102:G:N2	7:B:2188:U:O2	2.51	0.43
7:B:2809:A:H2'	7:B:2810:A:C8	2.54	0.43
12:G:15:ASP:HB3	12:G:26:LYS:HB2	2.01	0.43
18:O:69:ASP:OD1	18:O:69:ASP:N	2.84	0.43
21:R:25:LEU:HB2	21:R:27:ILE:HG22	1.98	0.43
22:S:4:ILE:HG12	22:S:6:LYS:HE2	2.00	0.43
7:B:396:G:OP2	27:X:9:LYS:NZ	2.50	0.43
7:B:675:A:N3	7:B:2443:C:O2'	2.44	0.43
7:B:1796:U:H2'	7:B:1797:G:H8	1.84	0.43
7:B:2533:U:OP1	7:B:2665:A:O2'	2.34	0.43
20:Q:71:ASN:HB3	20:Q:109:VAL:HG11	1.99	0.43
7:B:276:U:O2'	7:B:278:A:N6	2.48	0.43
7:B:870:U:H3	7:B:907:G:H1	1.67	0.43
7:B:1115:G:H2'	7:B:1116:G:H8	1.82	0.43
7:B:1683:U:H2'	7:B:1684:G:H8	1.84	0.43
18:O:55:GLU:HG2	18:O:58:ILE:HB	2.00	0.43
1:0:15:ARG:NH1	7:B:1266:G:OP1	2.52	0.43
5:4:2:LYS:HD2	5:4:4:ARG:HH21	1.82	0.43
7:B:787:C:H5''	7:B:788:A:H5'	2.01	0.43
7:B:1105:U:H2'	7:B:1106:G:H8	1.84	0.43
7:B:1980:G:O2'	7:B:1982:U:OP2	2.34	0.43
7:B:2148:G:H2'	7:B:2149:U:H4'	2.00	0.43
7:B:2291:U:O2'	7:B:2374:C:O2	2.36	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:C:16:VAL:HG22	8:C:203:VAL:HG22	2.01	0.43
7:B:302:C:H2'	7:B:303:G:H8	1.84	0.42
7:B:581:C:H2'	7:B:582:A:H8	1.83	0.42
7:B:1167:C:H2'	7:B:1168:G:H8	1.84	0.42
7:B:1638:C:O2	7:B:2698:U:O2'	2.37	0.42
7:B:2039:U:H2'	7:B:2040:G:C8	2.54	0.42
12:G:115:GLN:NE2	12:G:116:LEU:O	2.52	0.42
13:J:60:ASP:OD1	13:J:60:ASP:N	2.48	0.42
1:O:14:MET:HB3	7:B:2045:C:H4'	2.00	0.42
12:G:18:ILE:HD13	12:G:42:VAL:HG13	2.00	0.42
17:N:77:ALA:O	17:N:81:ASN:HB2	2.19	0.42
22:S:17:VAL:HB	22:S:76:VAL:HG11	2.00	0.42
4:3:12:ARG:NH1	7:B:250:G:OP2	2.44	0.42
6:A:95:U:H2'	6:A:96:G:H8	1.84	0.42
7:B:2483:C:N3	16:M:123:LYS:NZ	2.64	0.42
7:B:2543:G:H2'	7:B:2544:G:C8	2.54	0.42
7:B:2595:G:N2	7:B:2598:A:OP2	2.42	0.42
10:E:170:ARG:NH1	10:E:174:GLY:O	2.52	0.42
11:F:110:ILE:HG22	11:F:113:PHE:H	1.83	0.42
15:L:82:LEU:HD22	15:L:90:VAL:HG11	2.01	0.42
20:Q:97:ILE:HA	20:Q:100:PHE:O	2.19	0.42
2:1:43:ARG:NH2	7:B:2370:G:O2'	2.52	0.42
12:G:174:LYS:HD3	12:G:174:LYS:HA	1.89	0.42
14:K:46:ILE:HD13	14:K:46:ILE:HA	1.96	0.42
20:Q:82:LEU:HD22	20:Q:88:GLU:HB3	2.02	0.42
7:B:1447:C:O2'	7:B:1544:A:N3	2.46	0.42
7:B:2446:G:N2	7:B:2449:U:O2	2.44	0.42
18:O:15:ARG:HH22	18:O:95:SER:HG	1.63	0.42
23:T:50:LEU:O	28:Y:23:ARG:NH2	2.52	0.42
7:B:151:C:H2'	7:B:152:A:H8	1.85	0.42
7:B:1912:A:H2	7:B:1917:U:H3	1.66	0.42
7:B:2246:G:H2'	7:B:2247:A:H8	1.85	0.42
10:E:59:PRO:HG3	10:E:73:ILE:HG13	2.00	0.42
7:B:573:U:O2'	7:B:575:A:OP1	2.31	0.42
7:B:1827:U:H5'	7:B:1971:U:H5'	2.01	0.42
8:C:251:THR:OG1	8:C:252:LYS:N	2.52	0.42
19:P:27:VAL:HG22	19:P:83:ILE:HG23	2.02	0.42
19:P:70:GLU:OE1	19:P:100:ARG:NH1	2.52	0.42
1:O:16:ARG:NE	7:B:1266:G:OP2	2.53	0.42
7:B:956:G:H2'	7:B:957:C:H2'	2.02	0.42
7:B:1429:G:H2'	7:B:1430:G:H8	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:1571:A:H2'	7:B:1572:A:C8	2.55	0.42
7:B:2204:G:H4'	8:C:149:LYS:HG3	2.02	0.42
7:B:2329:U:H2'	7:B:2330:G:C8	2.55	0.42
8:C:224:MET:SD	8:C:229:HIS:HB2	2.59	0.42
20:Q:16:ILE:HD12	20:Q:38:VAL:HG21	2.02	0.42
26:W:67:LYS:N	26:W:80:SER:O	2.48	0.42
7:B:171:U:H2'	7:B:172:A:H8	1.85	0.42
7:B:1338:G:O2'	23:T:18:GLU:OE2	2.37	0.42
7:B:1386:C:H2'	7:B:1387:A:C8	2.55	0.42
7:B:2861:U:H2'	7:B:2862:G:C8	2.53	0.42
15:L:79:LEU:HD13	15:L:116:VAL:HG12	2.01	0.42
2:1:13:SER:HG	2:1:49:LYS:HZ2	1.60	0.42
4:3:12:ARG:NH2	7:B:2393:U:O2'	2.53	0.42
7:B:1004:U:H2'	7:B:1011:G:H2'	2.02	0.42
7:B:1409:U:H2'	7:B:1410:G:H8	1.85	0.42
10:E:143:LEU:HD22	10:E:185:LYS:HD2	2.01	0.42
11:F:37:MET:HG3	11:F:151:LEU:HB3	2.02	0.42
15:L:93:ASN:N	15:L:93:ASN:OD1	2.53	0.42
7:B:2262:U:H5''	26:W:38:ARG:HH22	1.85	0.41
13:J:57:LEU:HD23	13:J:57:LEU:HA	1.84	0.41
14:K:59:ALA:HB1	14:K:83:CYS:HB2	2.02	0.41
14:K:70:ARG:HH22	14:K:104:ARG:HB2	1.85	0.41
17:N:8:ARG:NH1	17:N:43:GLU:OE2	2.50	0.41
7:B:767:U:H2'	7:B:768:G:H8	1.85	0.41
7:B:1060:U:H3	7:B:1079:C:H42	1.68	0.41
7:B:2735:G:O6	7:B:2769:U:O4	2.38	0.41
19:P:47:ILE:HG23	19:P:96:LEU:H	1.84	0.41
1:0:10:SER:O	1:0:14:MET:HG3	2.20	0.41
1:0:36:LYS:HB2	1:0:36:LYS:HE2	1.86	0.41
7:B:2229:U:H2'	7:B:2230:G:C8	2.55	0.41
7:B:2245:U:H5''	7:B:2246:G:H5'	2.03	0.41
11:F:43:ILE:HG21	11:F:83:PRO:HG2	2.01	0.41
17:N:9:GLN:O	17:N:17:ARG:NH1	2.48	0.41
7:B:599:A:H2'	7:B:600:G:H8	1.85	0.41
8:C:176:ARG:HD2	8:C:176:ARG:HA	1.81	0.41
10:E:143:LEU:HD13	10:E:146:VAL:HG11	2.02	0.41
10:E:149:ILE:HD13	10:E:188:MET:HG2	2.02	0.41
11:F:49:LEU:HD13	11:F:66:ILE:HG12	2.02	0.41
13:J:96:ARG:HG3	13:J:99:ARG:HB2	2.01	0.41
15:L:89:VAL:HA	15:L:121:THR:HG23	2.03	0.41
19:P:5:LYS:HA	19:P:8:GLU:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:3:16:THR:OG1	4:3:19:GLY:O	2.29	0.41
7:B:2457:U:H3	7:B:2494:G:H1	1.68	0.41
8:C:34:GLU:HG3	8:C:61:TYR:HB3	2.02	0.41
9:D:36:GLN:HB3	9:D:49:GLN:HE21	1.86	0.41
13:J:31:GLU:O	13:J:35:ARG:HG2	2.20	0.41
22:S:69:LEU:HD22	22:S:107:VAL:HB	2.03	0.41
7:B:1797:G:H5''	8:C:255:LYS:HG2	2.01	0.41
7:B:5:A:H2'	7:B:6:A:C8	2.55	0.41
7:B:1421:G:H5'	7:B:2211:A:C8	2.55	0.41
7:B:1532:A:H2'	7:B:1533:C:C6	2.56	0.41
7:B:2125:G:N1	7:B:2174:C:N3	2.66	0.41
7:B:2139:U:H3	7:B:2152:G:H2'	1.85	0.41
14:K:22:LYS:HB2	14:K:22:LYS:HE2	1.87	0.41
14:K:110:LYS:HB2	14:K:110:LYS:HE2	1.75	0.41
14:K:113:LYS:O	14:K:116:SER:OG	2.36	0.41
18:O:67:ASN:H	18:O:70:ALA:HB3	1.85	0.41
1:0:37:HIS:ND1	1:0:38:LEU:O	2.54	0.41
7:B:1538:G:H2'	7:B:1539:U:C6	2.55	0.41
7:B:2377:A:H2'	7:B:2378:A:C8	2.56	0.41
7:B:2618:G:H21	9:D:155:VAL:HG21	1.86	0.41
14:K:111:PHE:O	14:K:115:ILE:HG12	2.20	0.41
1:0:8:THR:OG1	1:0:9:ARG:N	2.53	0.41
1:0:11:LYS:HD2	1:0:11:LYS:HA	1.86	0.41
7:B:28:A:N6	7:B:512:G:O2'	2.54	0.41
7:B:155:A:H2'	7:B:156:A:H8	1.85	0.41
7:B:624:C:O2'	7:B:657:U:OP1	2.37	0.41
7:B:688:U:H2'	7:B:689:A:H8	1.85	0.41
7:B:1754:A:H5'	19:P:99:LEU:HD21	2.02	0.41
7:B:1796:U:H4'	8:C:253:GLY:H	1.85	0.41
7:B:2232:C:P	27:X:26:ARG:HH12	2.43	0.41
7:B:2354:C:H4'	26:W:31:LEU:HD22	2.03	0.41
7:B:2530:A:N7	12:G:171:LYS:NZ	2.51	0.41
7:B:2655:G:O2'	7:B:2664:G:O6	2.29	0.41
11:F:79:ARG:HD2	11:F:79:ARG:HA	1.82	0.41
12:G:38:ASP:OD1	12:G:38:ASP:N	2.53	0.41
13:J:41:LYS:HB2	13:J:41:LYS:HE2	1.77	0.41
16:M:21:ALA:HB2	16:M:97:GLN:HB2	2.03	0.41
18:O:25:ARG:O	18:O:40:ILE:N	2.52	0.41
20:Q:30:VAL:HG12	20:Q:33:VAL:H	1.86	0.41
26:W:39:GLN:OE1	26:W:42:THR:N	2.47	0.41
27:X:42:GLU:HB3	27:X:44:ARG:HG2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:A:95:U:H2'	6:A:96:G:C8	2.56	0.41
7:B:242:G:O2'	7:B:254:G:O6	2.32	0.41
7:B:2099:U:H2'	7:B:2100:G:C8	2.56	0.41
7:B:2291:U:OP1	7:B:2380:C:O2'	2.39	0.41
7:B:2353:G:H21	26:W:30:VAL:HG12	1.86	0.41
10:E:52:VAL:HG13	10:E:74:LYS:HG2	2.02	0.41
12:G:97:VAL:HG22	12:G:102:ILE:HG23	2.02	0.41
20:Q:16:ILE:HD13	20:Q:16:ILE:HA	1.91	0.41
6:A:116:G:H2'	6:A:117:G:C8	2.56	0.40
7:B:31:C:O2'	7:B:1238:G:OP1	2.36	0.40
7:B:172:A:H2'	7:B:173:A:C8	2.56	0.40
7:B:783:A:H2	7:B:1778:U:H4'	1.86	0.40
7:B:1543:G:HO2'	7:B:1544:A:H8	1.67	0.40
7:B:2863:C:H2'	7:B:2864:G:H8	1.86	0.40
18:O:10:ARG:NH1	18:O:96:GLY:O	2.54	0.40
23:T:33:LYS:HE2	23:T:33:LYS:HB2	1.96	0.40
7:B:20:C:H2'	7:B:21:A:H8	1.87	0.40
7:B:946:C:H2'	7:B:947:A:H8	1.86	0.40
7:B:1020:A:N1	7:B:1141:U:O2'	2.47	0.40
7:B:1278:C:H2'	7:B:1279:G:C8	2.57	0.40
7:B:1013:C:H2'	7:B:1014:A:H8	1.86	0.40
7:B:1387:A:H2'	7:B:1388:G:H8	1.86	0.40
7:B:2273:A:H2'	7:B:2274:A:C8	2.57	0.40
13:J:44:TYR:O	20:Q:63:ARG:NH2	2.53	0.40
15:L:69:ARG:HE	15:L:69:ARG:HB3	1.64	0.40
7:B:153:U:OP1	27:X:76:LYS:NZ	2.45	0.40
7:B:874:G:H2'	7:B:875:G:C8	2.56	0.40
7:B:874:G:H2'	7:B:875:G:H8	1.86	0.40
7:B:1326:U:H2'	7:B:1327:A:H8	1.87	0.40
7:B:1636:U:O2'	7:B:1760:C:O2	2.32	0.40
18:O:115:LEU:HD12	18:O:115:LEU:HA	1.91	0.40
24:U:10:VAL:HG12	24:U:71:ILE:HD13	2.03	0.40
1:O:42:ILE:HD11	17:N:98:LEU:HB3	2.03	0.40
7:B:559:G:N3	20:Q:55:GLN:NE2	2.70	0.40
7:B:1771:C:H2'	7:B:1772:A:H8	1.87	0.40
7:B:2445:G:OP1	10:E:69:ARG:NH1	2.50	0.40
8:C:117:SER:O	8:C:188:ARG:NH2	2.55	0.40
12:G:24:THR:HG23	12:G:33:THR:HB	2.03	0.40
13:J:96:ARG:HD2	13:J:96:ARG:HA	1.88	0.40
21:R:61:ALA:HB2	21:R:98:ILE:HD13	2.03	0.40
26:W:40:ARG:HD3	26:W:40:ARG:H	1.85	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	0	54/56 (96%)	52 (96%)	2 (4%)	0	100	100
2	1	49/51 (96%)	49 (100%)	0	0	100	100
3	2	44/46 (96%)	44 (100%)	0	0	100	100
4	3	62/64 (97%)	59 (95%)	2 (3%)	1 (2%)	9	43
5	4	36/38 (95%)	34 (94%)	2 (6%)	0	100	100
8	C	270/272 (99%)	260 (96%)	10 (4%)	0	100	100
9	D	207/209 (99%)	192 (93%)	15 (7%)	0	100	100
10	E	199/201 (99%)	190 (96%)	9 (4%)	0	100	100
11	F	176/178 (99%)	165 (94%)	11 (6%)	0	100	100
12	G	174/176 (99%)	170 (98%)	4 (2%)	0	100	100
13	J	140/142 (99%)	130 (93%)	9 (6%)	1 (1%)	22	61
14	K	120/122 (98%)	111 (92%)	8 (7%)	1 (1%)	19	58
15	L	141/143 (99%)	133 (94%)	8 (6%)	0	100	100
16	M	134/136 (98%)	134 (100%)	0	0	100	100
17	N	119/121 (98%)	112 (94%)	7 (6%)	0	100	100
18	O	114/116 (98%)	114 (100%)	0	0	100	100
19	P	112/114 (98%)	104 (93%)	8 (7%)	0	100	100
20	Q	115/117 (98%)	112 (97%)	3 (3%)	0	100	100
21	R	101/103 (98%)	93 (92%)	7 (7%)	1 (1%)	15	54
22	S	108/110 (98%)	104 (96%)	4 (4%)	0	100	100
23	T	92/94 (98%)	85 (92%)	7 (8%)	0	100	100
24	U	101/103 (98%)	94 (93%)	7 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
25	V	92/94 (98%)	90 (98%)	2 (2%)	0	100	100
26	W	77/79 (98%)	69 (90%)	8 (10%)	0	100	100
27	X	75/77 (97%)	74 (99%)	1 (1%)	0	100	100
28	Y	61/63 (97%)	57 (93%)	4 (7%)	0	100	100
29	Z	56/58 (97%)	55 (98%)	1 (2%)	0	100	100
30	a	216/218 (99%)	203 (94%)	13 (6%)	0	100	100
31	b	204/206 (99%)	196 (96%)	8 (4%)	0	100	100
32	c	203/205 (99%)	197 (97%)	6 (3%)	0	100	100
33	d	148/150 (99%)	144 (97%)	4 (3%)	0	100	100
34	e	98/100 (98%)	95 (97%)	3 (3%)	0	100	100
35	f	149/151 (99%)	148 (99%)	1 (1%)	0	100	100
36	g	127/129 (98%)	125 (98%)	2 (2%)	0	100	100
37	h	125/127 (98%)	116 (93%)	8 (6%)	1 (1%)	19	58
38	i	96/98 (98%)	89 (93%)	7 (7%)	0	100	100
39	j	115/117 (98%)	112 (97%)	3 (3%)	0	100	100
40	k	121/123 (98%)	112 (93%)	9 (7%)	0	100	100
41	l	112/114 (98%)	109 (97%)	3 (3%)	0	100	100
42	m	92/100 (92%)	87 (95%)	5 (5%)	0	100	100
43	n	86/88 (98%)	83 (96%)	3 (4%)	0	100	100
44	o	80/82 (98%)	77 (96%)	3 (4%)	0	100	100
45	p	78/80 (98%)	75 (96%)	3 (4%)	0	100	100
46	q	53/55 (96%)	50 (94%)	3 (6%)	0	100	100
47	r	77/79 (98%)	73 (95%)	4 (5%)	0	100	100
48	s	83/85 (98%)	81 (98%)	1 (1%)	1 (1%)	13	49
49	t	49/51 (96%)	46 (94%)	3 (6%)	0	100	100
50	u	57/59 (97%)	55 (96%)	2 (4%)	0	100	100
All	All	5398/5500 (98%)	5159 (96%)	233 (4%)	6 (0%)	54	83

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
14	K	109	GLU
37	h	12	LYS

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Mol	Chain	Res	Type
48	s	68	LYS
21	R	58	VAL
4	3	31	ILE
13	J	110	PRO

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	
1	0	47/47 (100%)	44 (94%)	3 (6%)	17	52
2	1	45/46 (98%)	44 (98%)	1 (2%)	52	79
3	2	38/38 (100%)	37 (97%)	1 (3%)	46	76
4	3	51/51 (100%)	50 (98%)	1 (2%)	55	80
5	4	34/34 (100%)	32 (94%)	2 (6%)	19	54
8	C	216/217 (100%)	206 (95%)	10 (5%)	27	63
9	D	164/164 (100%)	159 (97%)	5 (3%)	41	73
10	E	165/165 (100%)	164 (99%)	1 (1%)	86	94
11	F	149/149 (100%)	138 (93%)	11 (7%)	13	46
12	G	137/137 (100%)	133 (97%)	4 (3%)	42	74
13	J	116/116 (100%)	113 (97%)	3 (3%)	46	76
14	K	102/103 (99%)	101 (99%)	1 (1%)	76	90
15	L	102/102 (100%)	98 (96%)	4 (4%)	32	67
16	M	109/109 (100%)	106 (97%)	3 (3%)	43	74
17	N	100/101 (99%)	100 (100%)	0	100	100
18	O	86/86 (100%)	83 (96%)	3 (4%)	36	69
19	P	99/99 (100%)	95 (96%)	4 (4%)	31	66
20	Q	89/89 (100%)	88 (99%)	1 (1%)	73	88
21	R	84/84 (100%)	82 (98%)	2 (2%)	49	77
22	S	93/93 (100%)	91 (98%)	2 (2%)	52	79

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	T	80/81 (99%)	77 (96%)	3 (4%)	33	67
24	U	83/84 (99%)	77 (93%)	6 (7%)	14	47
25	V	78/78 (100%)	75 (96%)	3 (4%)	33	67
26	W	59/59 (100%)	54 (92%)	5 (8%)	10	38
27	X	67/67 (100%)	67 (100%)	0	100	100
28	Y	55/55 (100%)	53 (96%)	2 (4%)	35	69
29	Z	48/48 (100%)	44 (92%)	4 (8%)	11	40
30	a	180/180 (100%)	171 (95%)	9 (5%)	24	60
31	b	170/170 (100%)	158 (93%)	12 (7%)	14	47
32	c	172/172 (100%)	167 (97%)	5 (3%)	42	74
33	d	113/113 (100%)	110 (97%)	3 (3%)	44	75
34	e	87/87 (100%)	84 (97%)	3 (3%)	37	70
35	f	124/124 (100%)	117 (94%)	7 (6%)	21	57
36	g	104/104 (100%)	101 (97%)	3 (3%)	42	74
37	h	105/105 (100%)	97 (92%)	8 (8%)	13	45
38	i	86/86 (100%)	81 (94%)	5 (6%)	20	55
39	j	90/90 (100%)	87 (97%)	3 (3%)	38	71
40	k	103/103 (100%)	100 (97%)	3 (3%)	42	74
41	l	92/92 (100%)	88 (96%)	4 (4%)	29	64
42	m	79/83 (95%)	77 (98%)	2 (2%)	47	77
43	n	76/76 (100%)	74 (97%)	2 (3%)	46	76
44	o	65/65 (100%)	63 (97%)	2 (3%)	40	72
45	p	74/74 (100%)	72 (97%)	2 (3%)	44	75
46	q	48/48 (100%)	47 (98%)	1 (2%)	53	79
47	r	70/70 (100%)	68 (97%)	2 (3%)	42	74
48	s	65/65 (100%)	62 (95%)	3 (5%)	27	63
49	t	44/44 (100%)	42 (96%)	2 (4%)	27	63
50	u	52/52 (100%)	50 (96%)	2 (4%)	33	67
All	All	4495/4505 (100%)	4327 (96%)	168 (4%)	37	68

All (168) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	10	SER
1	0	35	GLU
1	0	48	TYR
2	1	27	ARG
3	2	25	LYS
4	3	14	LYS
5	4	11	CYS
5	4	12	ARG
8	C	17	LYS
8	C	29	PHE
8	C	42	ARG
8	C	79	ARG
8	C	138	SER
8	C	162	GLN
8	C	187	CYS
8	C	202	ARG
8	C	238	ASN
8	C	264	LYS
9	D	62	LYS
9	D	90	PHE
9	D	103	ASP
9	D	157	LYS
9	D	200	ASP
10	E	1	MET
11	F	9	ASP
11	F	16	MET
11	F	29	ARG
11	F	47	LYS
11	F	63	LYS
11	F	99	PHE
11	F	113	PHE
11	F	121	PHE
11	F	132	ARG
11	F	158	THR
11	F	178	LYS
12	G	85	LYS
12	G	109	SER
12	G	148	ARG
12	G	169	ARG
13	J	86	GLN
13	J	95	ARG
13	J	118	MET
14	K	112	MET

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Mol	Chain	Res	Type
15	L	3	LEU
15	L	42	SER
15	L	47	ARG
15	L	121	THR
16	M	10	ARG
16	M	14	LYS
16	M	88	ASN
18	O	63	LYS
18	O	85	LYS
18	O	95	SER
19	P	36	LYS
19	P	100	ARG
19	P	101	GLU
19	P	112	ARG
20	Q	101	ASP
21	R	26	ASP
21	R	39	LEU
22	S	68	ASP
22	S	86	MET
23	T	12	ARG
23	T	26	LYS
23	T	72	GLN
24	U	5	ARG
24	U	20	LYS
24	U	23	LYS
24	U	43	LYS
24	U	59	GLU
24	U	85	ARG
25	V	9	ARG
25	V	85	LYS
25	V	86	LEU
26	W	19	ARG
26	W	39	GLN
26	W	40	ARG
26	W	55	ASP
26	W	63	ASP
28	Y	7	ARG
28	Y	57	LEU
29	Z	10	ARG
29	Z	18	LYS
29	Z	38	GLU
29	Z	44	ARG

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Mol	Chain	Res	Type
30	a	9	LEU
30	a	22	TRP
30	a	25	LYS
30	a	31	PHE
30	a	48	MET
30	a	58	LYS
30	a	121	GLN
30	a	126	ASP
30	a	151	LYS
31	b	3	LYS
31	b	15	LYS
31	b	44	LYS
31	b	48	LYS
31	b	62	SER
31	b	111	ASP
31	b	126	ARG
31	b	130	ARG
31	b	142	ARG
31	b	146	LYS
31	b	168	ARG
31	b	203	LYS
32	c	46	ARG
32	c	47	LEU
32	c	80	ARG
32	c	123	MET
32	c	146	GLU
33	d	65	LYS
33	d	81	GLN
33	d	137	ARG
34	e	21	MET
34	e	54	LEU
34	e	86	ARG
35	f	14	ASP
35	f	21	LEU
35	f	35	LYS
35	f	58	LEU
35	f	84	TYR
35	f	100	MET
35	f	142	ARG
36	g	28	SER
36	g	40	LYS
36	g	88	LYS

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Mol	Chain	Res	Type
37	h	12	LYS
37	h	32	ARG
37	h	34	LEU
37	h	38	PHE
37	h	56	MET
37	h	59	LYS
37	h	94	ARG
37	h	123	ARG
38	i	7	ARG
38	i	19	ASP
38	i	31	ARG
38	i	37	ARG
38	i	91	ASP
39	j	12	ARG
39	j	25	SER
39	j	124	LYS
40	k	13	ARG
40	k	53	ARG
40	k	95	HIS
41	l	2	ARG
41	l	26	LYS
41	l	74	MET
41	l	100	ARG
42	m	22	LYS
42	m	65	ARG
43	n	3	SER
43	n	88	ARG
44	o	51	ARG
44	o	55	ASP
45	p	56	ASP
45	p	76	ARG
46	q	24	ASP
47	r	11	ASP
47	r	63	ASP
48	s	32	LYS
48	s	53	MET
48	s	68	LYS
49	t	24	LYS
49	t	32	ARG
50	u	158	LEU
50	u	159	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such

sidechains are listed below:

Mol	Chain	Res	Type
31	b	68	HIS
42	m	62	ASN
44	o	40	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
51	v	1538/1539 (99%)	332 (21%)	0
52	x	11/12 (91%)	5 (45%)	0
53	5	76/77 (98%)	14 (18%)	0
6	A	116/117 (99%)	25 (21%)	1 (0%)
7	B	2902/2903 (99%)	598 (20%)	5 (0%)
All	All	4643/4648 (99%)	974 (20%)	6 (0%)

All (974) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
6	A	9	G
6	A	13	G
6	A	14	U
6	A	24	G
6	A	25	U
6	A	26	C
6	A	30	C
6	A	35	C
6	A	36	C
6	A	37	C
6	A	41	G
6	A	44	G
6	A	48	U
6	A	52	A
6	A	53	A
6	A	57	A
6	A	67	G
6	A	87	U
6	A	88	C
6	A	89	U
6	A	90	C
6	A	99	A
6	A	105	G
6	A	108	A

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Mol	Chain	Res	Type
6	A	109	A
7	B	11	C
7	B	12	U
7	B	15	G
7	B	27	G
7	B	34	U
7	B	35	G
7	B	39	G
7	B	46	G
7	B	51	G
7	B	60	G
7	B	63	A
7	B	71	A
7	B	74	A
7	B	75	G
7	B	84	A
7	B	100	U
7	B	101	A
7	B	102	U
7	B	103	A
7	B	118	A
7	B	119	A
7	B	120	U
7	B	122	G
7	B	125	A
7	B	126	A
7	B	139	U
7	B	140	C
7	B	141	G
7	B	142	A
7	B	160	A
7	B	163	C
7	B	164	C
7	B	181	A
7	B	188	G
7	B	196	A
7	B	197	A
7	B	199	A
7	B	215	G
7	B	216	A
7	B	221	A
7	B	223	A

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Mol	Chain	Res	Type
7	B	225	C
7	B	241	A
7	B	245	G
7	B	248	G
7	B	252	G
7	B	255	A
7	B	265	A
7	B	266	G
7	B	271	G
7	B	274	C
7	B	275	C
7	B	277	G
7	B	278	A
7	B	285	G
7	B	301	G
7	B	308	G
7	B	311	A
7	B	324	A
7	B	329	G
7	B	330	A
7	B	332	A
7	B	334	C
7	B	338	G
7	B	352	A
7	B	353	C
7	B	354	A
7	B	355	U
7	B	356	G
7	B	359	G
7	B	362	A
7	B	363	G
7	B	370	G
7	B	371	A
7	B	372	G
7	B	386	G
7	B	396	G
7	B	403	U
7	B	404	A
7	B	406	G
7	B	411	G
7	B	412	A
7	B	424	G

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Mol	Chain	Res	Type
7	B	435	C
7	B	455	C
7	B	456	C
7	B	457	A
7	B	467	G
7	B	473	G
7	B	477	A
7	B	481	G
7	B	490	C
7	B	491	G
7	B	496	G
7	B	504	A
7	B	505	A
7	B	506	G
7	B	508	A
7	B	509	C
7	B	510	C
7	B	512	G
7	B	528	A
7	B	531	C
7	B	532	A
7	B	533	G
7	B	535	G
7	B	544	C
7	B	545	U
7	B	546	U
7	B	547	A
7	B	548	G
7	B	563	A
7	B	568	U
7	B	571	U
7	B	573	U
7	B	575	A
7	B	588	U
7	B	613	A
7	B	614	A
7	B	615	U
7	B	616	A
7	B	634	C
7	B	637	A
7	B	640	C
7	B	645	C

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Mol	Chain	Res	Type
7	B	646	U
7	B	647	G
7	B	654	A
7	B	655	A
7	B	664	G
7	B	669	G
7	B	670	A
7	B	671	C
7	B	686	U
7	B	704	G
7	B	714	U
7	B	717	C
7	B	718	A
7	B	719	C
7	B	726	G
7	B	730	A
7	B	740	C
7	B	745	G
7	B	747	U
7	B	757	G
7	B	762	U
7	B	764	A
7	B	765	C
7	B	775	G
7	B	776	G
7	B	782	A
7	B	783	A
7	B	784	G
7	B	785	G
7	B	789	A
7	B	792	A
7	B	805	G
7	B	811	U
7	B	812	C
7	B	819	A
7	B	827	U
7	B	828	U
7	B	830	G
7	B	846	U
7	B	847	U
7	B	858	G
7	B	859	G

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Mol	Chain	Res	Type
7	B	866	A
7	B	869	G
7	B	871	U
7	B	872	U
7	B	884	U
7	B	886	A
7	B	887	U
7	B	888	C
7	B	889	C
7	B	890	C
7	B	892	A
7	B	893	C
7	B	894	U
7	B	895	U
7	B	896	A
7	B	897	C
7	B	907	G
7	B	910	A
7	B	912	C
7	B	931	U
7	B	932	U
7	B	933	A
7	B	934	U
7	B	941	A
7	B	945	A
7	B	946	C
7	B	957	C
7	B	959	A
7	B	961	C
7	B	974	G
7	B	989	G
7	B	996	A
7	B	997	G
7	B	1009	A
7	B	1012	U
7	B	1013	C
7	B	1017	G
7	B	1022	G
7	B	1023	U
7	B	1024	G
7	B	1025	G
7	B	1026	G

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Mol	Chain	Res	Type
7	B	1033	U
7	B	1040	A
7	B	1045	C
7	B	1046	A
7	B	1047	G
7	B	1054	A
7	B	1060	U
7	B	1061	U
7	B	1062	G
7	B	1065	U
7	B	1067	A
7	B	1068	G
7	B	1070	A
7	B	1074	G
7	B	1075	C
7	B	1084	A
7	B	1087	G
7	B	1088	A
7	B	1089	A
7	B	1095	A
7	B	1096	A
7	B	1097	U
7	B	1098	A
7	B	1100	C
7	B	1110	G
7	B	1111	A
7	B	1112	G
7	B	1115	G
7	B	1126	A
7	B	1132	U
7	B	1133	A
7	B	1134	A
7	B	1135	C
7	B	1139	G
7	B	1142	A
7	B	1143	A
7	B	1149	G
7	B	1173	U
7	B	1174	U
7	B	1175	A
7	B	1176	U
7	B	1178	C

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Mol	Chain	Res	Type
7	B	1205	A
7	B	1206	G
7	B	1211	C
7	B	1212	G
7	B	1227	G
7	B	1236	G
7	B	1237	A
7	B	1238	G
7	B	1241	A
7	B	1244	A
7	B	1247	A
7	B	1250	G
7	B	1253	A
7	B	1255	U
7	B	1256	G
7	B	1257	C
7	B	1266	G
7	B	1272	A
7	B	1273	U
7	B	1275	A
7	B	1276	A
7	B	1300	G
7	B	1301	A
7	B	1324	G
7	B	1325	U
7	B	1329	U
7	B	1337	G
7	B	1338	G
7	B	1352	U
7	B	1359	A
7	B	1365	A
7	B	1368	G
7	B	1374	G
7	B	1378	A
7	B	1379	U
7	B	1382	G
7	B	1383	A
7	B	1388	G
7	B	1392	A
7	B	1396	U
7	B	1416	G
7	B	1420	A

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Mol	Chain	Res	Type
7	B	1421	G
7	B	1426	G
7	B	1427	A
7	B	1428	C
7	B	1452	G
7	B	1459	G
7	B	1460	U
7	B	1470	A
7	B	1476	U
7	B	1477	A
7	B	1478	G
7	B	1482	G
7	B	1494	A
7	B	1522	A
7	B	1524	G
7	B	1529	G
7	B	1535	A
7	B	1536	C
7	B	1538	G
7	B	1545	A
7	B	1552	A
7	B	1558	C
7	B	1560	G
7	B	1566	A
7	B	1569	A
7	B	1578	U
7	B	1583	A
7	B	1585	C
7	B	1589	U
7	B	1590	A
7	B	1607	C
7	B	1608	A
7	B	1610	A
7	B	1634	A
7	B	1639	C
7	B	1647	U
7	B	1648	U
7	B	1653	G
7	B	1674	G
7	B	1694	C
7	B	1713	A
7	B	1722	A

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Mol	Chain	Res	Type
7	B	1724	G
7	B	1725	U
7	B	1729	U
7	B	1730	C
7	B	1731	G
7	B	1732	C
7	B	1733	G
7	B	1750	G
7	B	1757	A
7	B	1758	U
7	B	1759	A
7	B	1763	G
7	B	1764	C
7	B	1773	A
7	B	1776	G
7	B	1779	U
7	B	1780	A
7	B	1784	A
7	B	1786	A
7	B	1787	A
7	B	1800	C
7	B	1801	A
7	B	1802	A
7	B	1808	A
7	B	1809	A
7	B	1810	A
7	B	1816	C
7	B	1829	A
7	B	1848	A
7	B	1870	C
7	B	1871	A
7	B	1884	G
7	B	1896	G
7	B	1903	G
7	B	1906	G
7	B	1913	A
7	B	1914	C
7	B	1915	U
7	B	1916	A
7	B	1929	G
7	B	1930	G
7	B	1936	A

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Mol	Chain	Res	Type
7	B	1937	A
7	B	1940	U
7	B	1955	U
7	B	1964	G
7	B	1966	A
7	B	1967	C
7	B	1970	A
7	B	1971	U
7	B	1972	G
7	B	1991	U
7	B	1992	G
7	B	1996	C
7	B	1997	C
7	B	2021	C
7	B	2023	C
7	B	2030	A
7	B	2031	A
7	B	2033	A
7	B	2036	C
7	B	2043	C
7	B	2049	G
7	B	2052	A
7	B	2055	C
7	B	2056	G
7	B	2060	A
7	B	2061	G
7	B	2062	A
7	B	2069	G
7	B	2076	U
7	B	2093	G
7	B	2097	A
7	B	2099	U
7	B	2101	A
7	B	2108	A
7	B	2109	U
7	B	2110	G
7	B	2111	U
7	B	2112	G
7	B	2115	G
7	B	2116	G
7	B	2117	A
7	B	2118	U

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Mol	Chain	Res	Type
7	B	2120	G
7	B	2123	G
7	B	2124	G
7	B	2126	A
7	B	2127	G
7	B	2128	G
7	B	2132	U
7	B	2133	G
7	B	2135	A
7	B	2138	G
7	B	2139	U
7	B	2142	A
7	B	2144	G
7	B	2147	A
7	B	2149	U
7	B	2153	C
7	B	2156	G
7	B	2157	G
7	B	2158	A
7	B	2159	G
7	B	2161	C
7	B	2162	G
7	B	2163	A
7	B	2164	C
7	B	2165	C
7	B	2166	U
7	B	2171	A
7	B	2172	U
7	B	2173	A
7	B	2177	C
7	B	2179	C
7	B	2181	U
7	B	2183	A
7	B	2184	A
7	B	2186	G
7	B	2187	U
7	B	2188	U
7	B	2198	A
7	B	2199	A
7	B	2204	G
7	B	2211	A
7	B	2212	A

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Mol	Chain	Res	Type
7	B	2213	U
7	B	2225	A
7	B	2238	G
7	B	2239	G
7	B	2243	U
7	B	2250	G
7	B	2251	G
7	B	2266	A
7	B	2278	A
7	B	2280	G
7	B	2283	C
7	B	2287	A
7	B	2288	A
7	B	2303	G
7	B	2304	G
7	B	2305	U
7	B	2307	G
7	B	2309	A
7	B	2319	G
7	B	2321	U
7	B	2322	A
7	B	2325	G
7	B	2333	A
7	B	2335	A
7	B	2336	A
7	B	2337	G
7	B	2345	G
7	B	2347	C
7	B	2350	C
7	B	2354	C
7	B	2358	A
7	B	2361	G
7	B	2375	G
7	B	2379	G
7	B	2383	G
7	B	2385	C
7	B	2391	G
7	B	2396	G
7	B	2402	U
7	B	2403	C
7	B	2406	A
7	B	2422	C

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Mol	Chain	Res	Type
7	B	2423	U
7	B	2425	A
7	B	2428	G
7	B	2429	G
7	B	2430	A
7	B	2435	A
7	B	2441	U
7	B	2445	G
7	B	2448	A
7	B	2469	A
7	B	2471	A
7	B	2472	G
7	B	2476	A
7	B	2478	A
7	B	2491	U
7	B	2498	C
7	B	2499	C
7	B	2502	G
7	B	2503	A
7	B	2504	U
7	B	2505	G
7	B	2518	A
7	B	2520	C
7	B	2529	G
7	B	2534	A
7	B	2547	A
7	B	2553	G
7	B	2554	U
7	B	2556	C
7	B	2564	A
7	B	2566	A
7	B	2567	G
7	B	2569	G
7	B	2572	A
7	B	2573	C
7	B	2602	A
7	B	2603	G
7	B	2609	U
7	B	2613	U
7	B	2615	U
7	B	2619	C
7	B	2629	U

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Mol	Chain	Res	Type
7	B	2634	A
7	B	2642	G
7	B	2646	C
7	B	2654	A
7	B	2663	G
7	B	2673	G
7	B	2688	G
7	B	2689	U
7	B	2690	U
7	B	2712	C
7	B	2714	G
7	B	2716	C
7	B	2718	G
7	B	2725	A
7	B	2726	A
7	B	2744	G
7	B	2748	A
7	B	2765	A
7	B	2766	A
7	B	2769	U
7	B	2778	A
7	B	2791	G
7	B	2793	C
7	B	2797	U
7	B	2798	U
7	B	2799	A
7	B	2800	A
7	B	2808	G
7	B	2809	A
7	B	2818	U
7	B	2820	A
7	B	2823	A
7	B	2833	U
7	B	2834	G
7	B	2835	A
7	B	2836	U
7	B	2843	G
7	B	2846	G
7	B	2849	U
7	B	2861	U
7	B	2867	G
7	B	2872	A

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Mol	Chain	Res	Type
7	B	2873	A
7	B	2877	G
7	B	2879	A
7	B	2880	C
7	B	2883	A
7	B	2884	U
7	B	2885	G
7	B	2886	A
7	B	2891	U
7	B	2900	A
7	B	2902	C
51	v	3	A
51	v	4	U
51	v	5	U
51	v	7	A
51	v	9	G
51	v	22	G
51	v	32	A
51	v	39	G
51	v	47	C
51	v	48	C
51	v	49	U
51	v	50	A
51	v	51	A
51	v	52	C
51	v	58	C
51	v	70	U
51	v	71	A
51	v	72	A
51	v	74	A
51	v	77	A
51	v	78	A
51	v	81	A
51	v	83	C
51	v	84	U
51	v	85	U
51	v	86	G
51	v	89	U
51	v	92	U
51	v	94	G
51	v	95	C
51	v	108	G

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Mol	Chain	Res	Type
51	v	110	C
51	v	116	A
51	v	119	A
51	v	120	A
51	v	121	U
51	v	122	G
51	v	127	G
51	v	130	A
51	v	131	A
51	v	132	C
51	v	138	G
51	v	142	G
51	v	144	G
51	v	146	G
51	v	159	G
51	v	163	C
51	v	171	A
51	v	177	G
51	v	181	A
51	v	182	A
51	v	183	C
51	v	190	A
51	v	191	G
51	v	197	A
51	v	203	G
51	v	204	G
51	v	205	A
51	v	207	C
51	v	210	C
51	v	211	G
51	v	212	G
51	v	213	G
51	v	226	G
51	v	245	U
51	v	247	G
51	v	251	G
51	v	266	G
51	v	267	C
51	v	268	U
51	v	278	G
51	v	281	G
51	v	289	G

Continued on next page...

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Mol	Chain	Res	Type
51	v	321	A
51	v	327	A
51	v	328	C
51	v	330	C
51	v	332	G
51	v	345	C
51	v	347	G
51	v	351	G
51	v	352	C
51	v	354	G
51	v	367	U
51	v	372	C
51	v	378	G
51	v	388	G
51	v	398	U
51	v	406	G
51	v	413	G
51	v	421	U
51	v	422	C
51	v	423	G
51	v	424	G
51	v	425	G
51	v	428	G
51	v	429	U
51	v	438	U
51	v	441	A
51	v	451	A
51	v	458	U
51	v	459	A
51	v	466	A
51	v	467	U
51	v	468	A
51	v	469	C
51	v	471	U
51	v	478	A
51	v	481	G
51	v	484	G
51	v	486	U
51	v	493	A
51	v	495	A
51	v	496	A
51	v	497	G

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Mol	Chain	Res	Type
51	v	509	A
51	v	511	C
51	v	512	U
51	v	518	C
51	v	519	C
51	v	521	G
51	v	524	G
51	v	527	G
51	v	532	A
51	v	547	A
51	v	559	A
51	v	564	C
51	v	572	A
51	v	573	A
51	v	576	C
51	v	577	G
51	v	594	U
51	v	595	A
51	v	596	A
51	v	600	A
51	v	607	A
51	v	615	G
51	v	618	C
51	v	633	G
51	v	640	A
51	v	642	A
51	v	650	G
51	v	653	U
51	v	665	A
51	v	682	G
51	v	686	U
51	v	695	A
51	v	702	A
51	v	703	G
51	v	721	G
51	v	723	U
51	v	731	G
51	v	734	G
51	v	755	G
51	v	778	G
51	v	781	A
51	v	782	A

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Mol	Chain	Res	Type
51	v	793	U
51	v	794	A
51	v	799	G
51	v	814	A
51	v	815	A
51	v	817	C
51	v	819	A
51	v	820	U
51	v	821	G
51	v	828	U
51	v	829	G
51	v	832	G
51	v	836	G
51	v	842	U
51	v	843	U
51	v	845	A
51	v	851	G
51	v	864	A
51	v	870	U
51	v	872	A
51	v	876	C
51	v	887	G
51	v	889	A
51	v	902	G
51	v	914	A
51	v	922	G
51	v	926	G
51	v	927	G
51	v	931	C
51	v	934	C
51	v	935	A
51	v	960	U
51	v	969	A
51	v	971	G
51	v	975	A
51	v	976	G
51	v	977	A
51	v	979	C
51	v	980	C
51	v	983	A
51	v	991	U
51	v	992	U

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Mol	Chain	Res	Type
51	v	993	G
51	v	1004	A
51	v	1012	A
51	v	1013	G
51	v	1020	G
51	v	1021	A
51	v	1027	C
51	v	1028	C
51	v	1031	C
51	v	1033	G
51	v	1034	G
51	v	1043	G
51	v	1044	A
51	v	1053	G
51	v	1056	U
51	v	1061	G
51	v	1064	G
51	v	1065	U
51	v	1074	G
51	v	1085	U
51	v	1086	U
51	v	1087	G
51	v	1094	G
51	v	1095	U
51	v	1101	A
51	v	1102	A
51	v	1108	G
51	v	1124	G
51	v	1125	U
51	v	1126	U
51	v	1129	C
51	v	1132	C
51	v	1133	G
51	v	1135	U
51	v	1136	C
51	v	1137	C
51	v	1139	G
51	v	1142	G
51	v	1143	G
51	v	1145	A
51	v	1152	A
51	v	1154	G

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Mol	Chain	Res	Type
51	v	1158	C
51	v	1159	U
51	v	1160	G
51	v	1162	C
51	v	1167	A
51	v	1168	U
51	v	1169	A
51	v	1174	G
51	v	1179	A
51	v	1184	G
51	v	1190	G
51	v	1196	A
51	v	1197	A
51	v	1202	U
51	v	1212	U
51	v	1213	A
51	v	1214	C
51	v	1215	G
51	v	1220	G
51	v	1225	A
51	v	1227	A
51	v	1236	A
51	v	1238	A
51	v	1239	A
51	v	1241	G
51	v	1247	U
51	v	1253	G
51	v	1258	G
51	v	1260	G
51	v	1273	C
51	v	1274	A
51	v	1275	A
51	v	1277	C
51	v	1279	G
51	v	1280	A
51	v	1285	A
51	v	1286	U
51	v	1287	A
51	v	1292	G
51	v	1293	C
51	v	1298	U
51	v	1299	A

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Mol	Chain	Res	Type
51	v	1302	C
51	v	1305	G
51	v	1312	G
51	v	1318	A
51	v	1319	A
51	v	1320	C
51	v	1322	C
51	v	1332	A
51	v	1346	A
51	v	1348	U
51	v	1350	A
51	v	1353	G
51	v	1363	A
51	v	1364	U
51	v	1368	A
51	v	1370	G
51	v	1377	A
51	v	1378	C
51	v	1381	U
51	v	1394	A
51	v	1398	A
51	v	1399	C
51	v	1400	C
51	v	1404	C
51	v	1405	G
51	v	1406	U
51	v	1411	C
51	v	1419	G
51	v	1432	G
51	v	1441	A
51	v	1446	A
51	v	1451	U
51	v	1452	C
51	v	1453	G
51	v	1487	G
51	v	1492	A
51	v	1493	A
51	v	1494	G
51	v	1495	U
51	v	1497	G
51	v	1499	A
51	v	1503	A

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Mol	Chain	Res	Type
51	v	1506	U
51	v	1507	A
51	v	1517	G
51	v	1519	A
51	v	1529	G
51	v	1530	G
51	v	1533	C
52	x	4	A
52	x	8	C
52	x	9	A
52	x	10	A
52	x	12	A
53	5	8	U
53	5	9	G
53	5	16	C
53	5	18	G
53	5	19	G
53	5	20	U
53	5	21	A
53	5	43	A
53	5	47	U
53	5	48	C
53	5	56	C
53	5	57	A
53	5	60	U
53	5	76	A

All (6) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
6	A	66	A
7	B	490	C
7	B	669	G
7	B	670	A
7	B	1652	A
7	B	2808	G

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
51	v	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	v	1531:A	O3'	1532:U	P	1.18

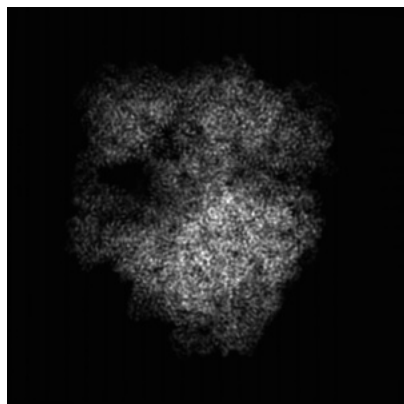
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41049. These allow visual inspection of the internal detail of the map and identification of artifacts.

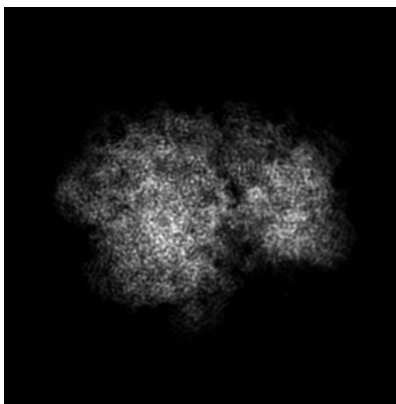
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

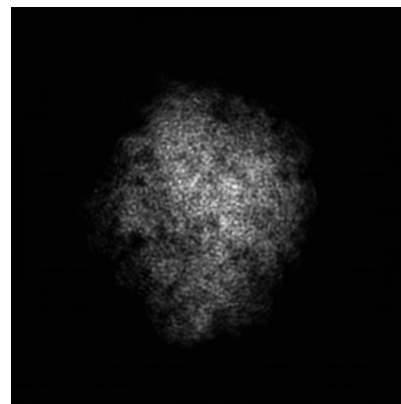
6.1.1 Primary map



X

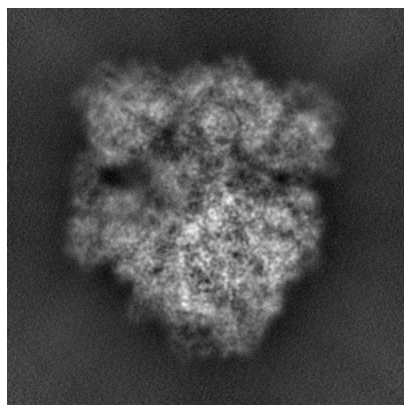


Y

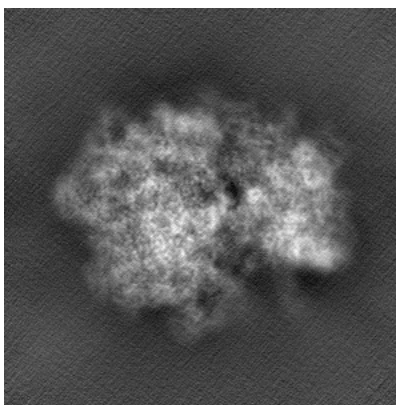


Z

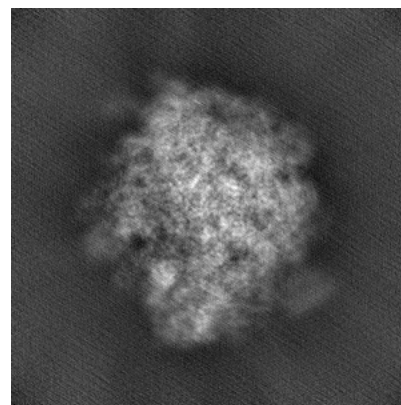
6.1.2 Raw map



X



Y

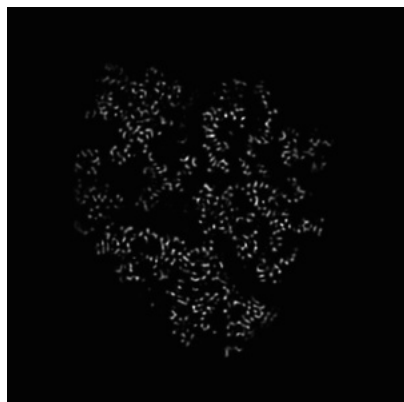


Z

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

6.2 Central slices [i](#)

6.2.1 Primary map



X Index: 200

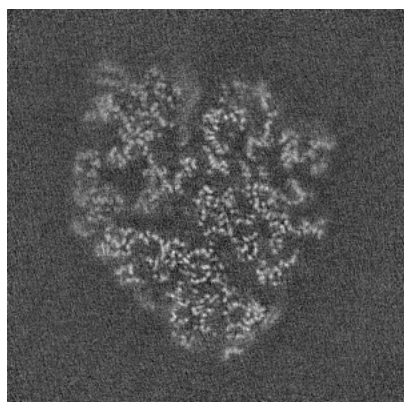


Y Index: 200

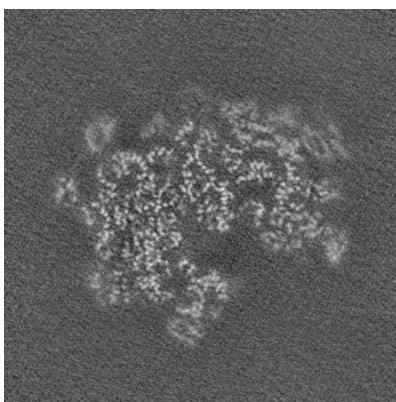


Z Index: 200

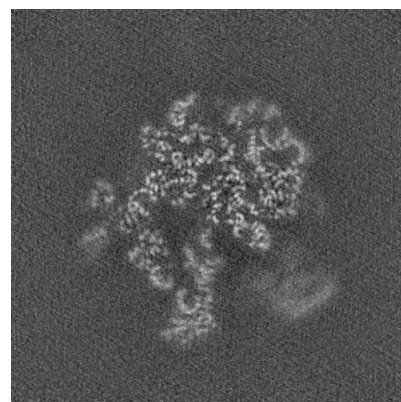
6.2.2 Raw map



X Index: 200



Y Index: 200

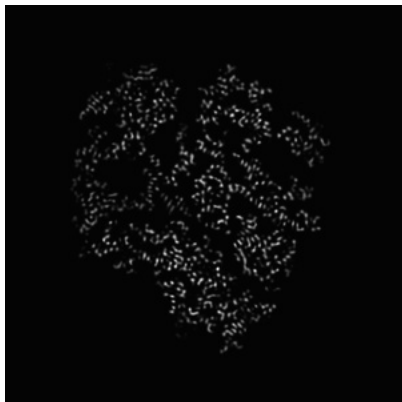


Z Index: 200

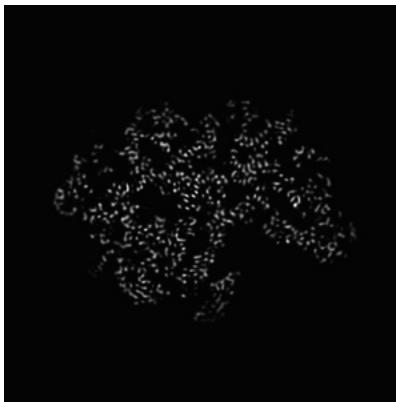
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

6.3.1 Primary map



X Index: 195

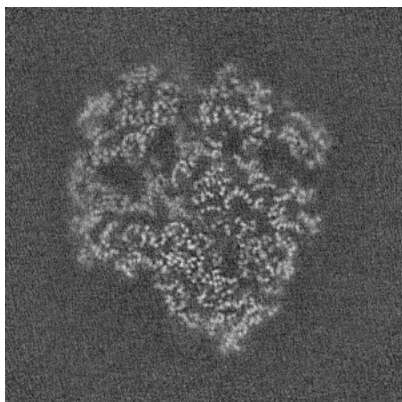


Y Index: 218

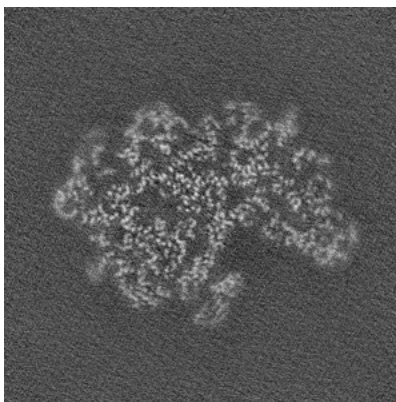


Z Index: 165

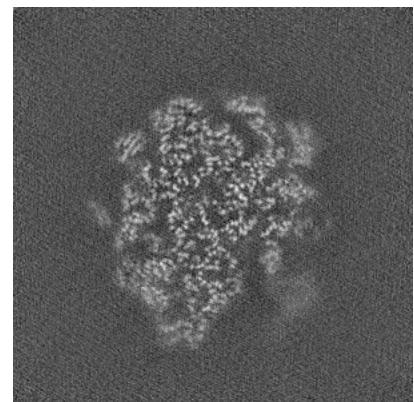
6.3.2 Raw map



X Index: 193



Y Index: 218

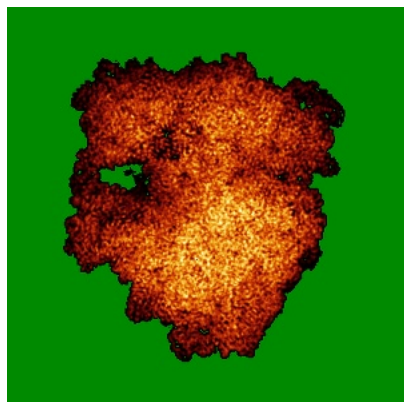


Z Index: 165

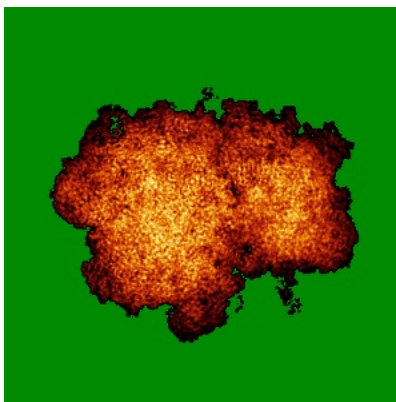
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

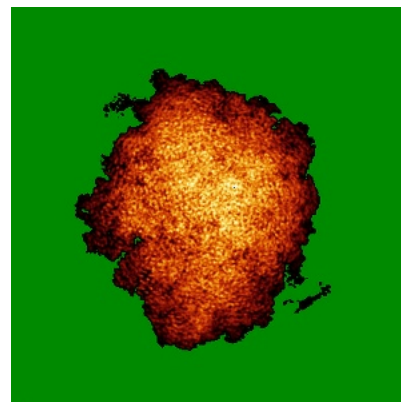
6.4.1 Primary map



X

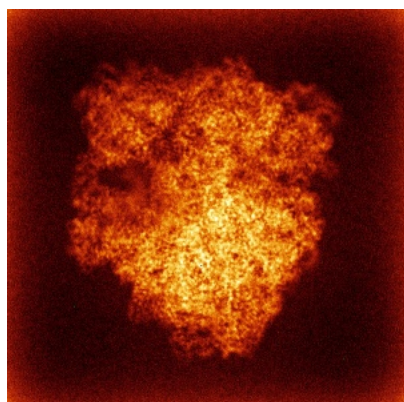


Y

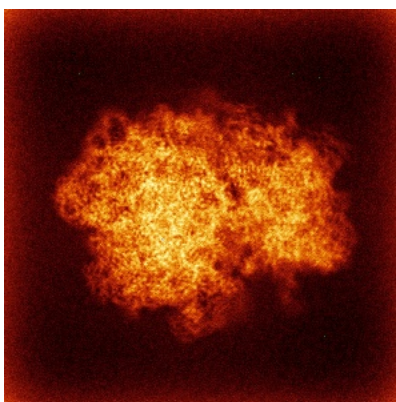


Z

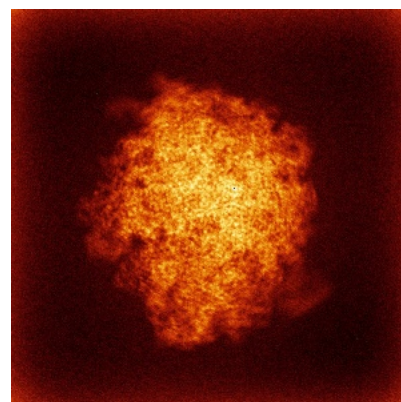
6.4.2 Raw map



X



Y

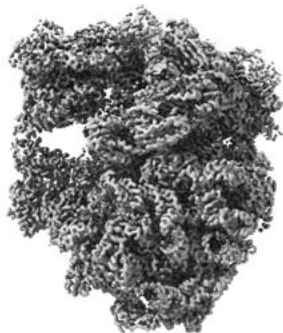


Z

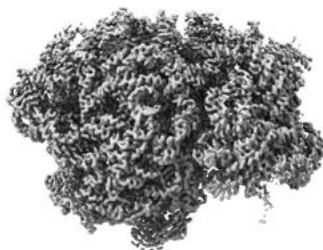
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

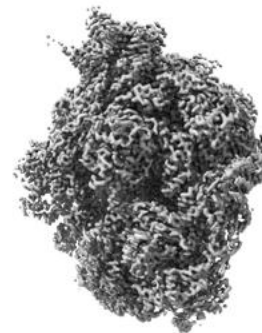
6.5.1 Primary map



X



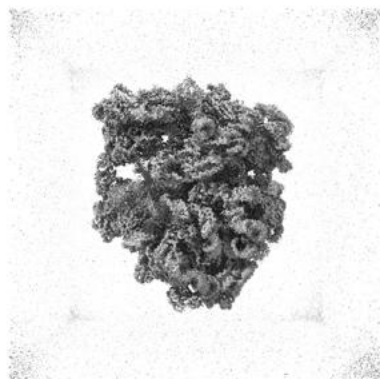
Y



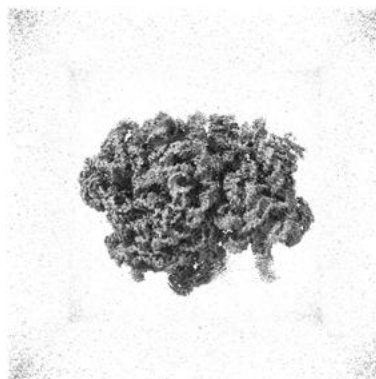
Z

The images above show the 3D surface view of the map at the recommended contour level 0.124. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

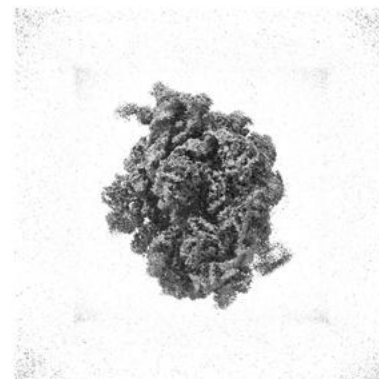
6.5.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

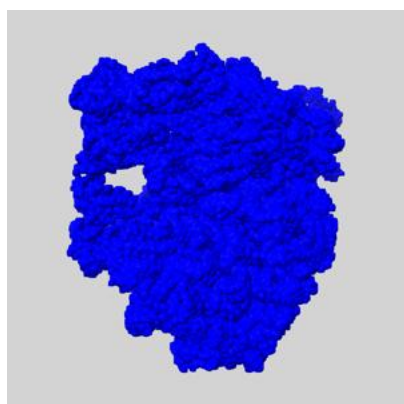
6.6 Mask visualisation [i](#)

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

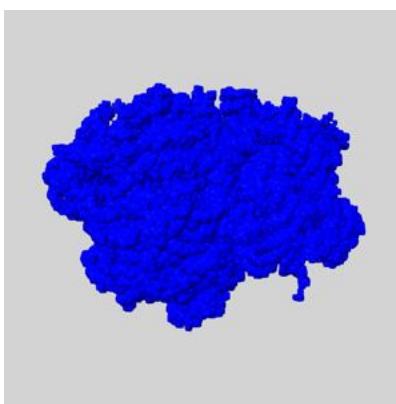
A mask typically either:

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

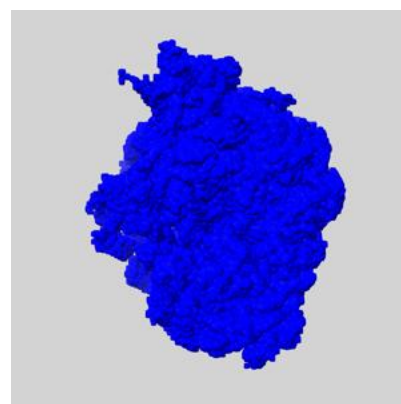
6.6.1 emd_41049_msk_1.map [i](#)



X



Y

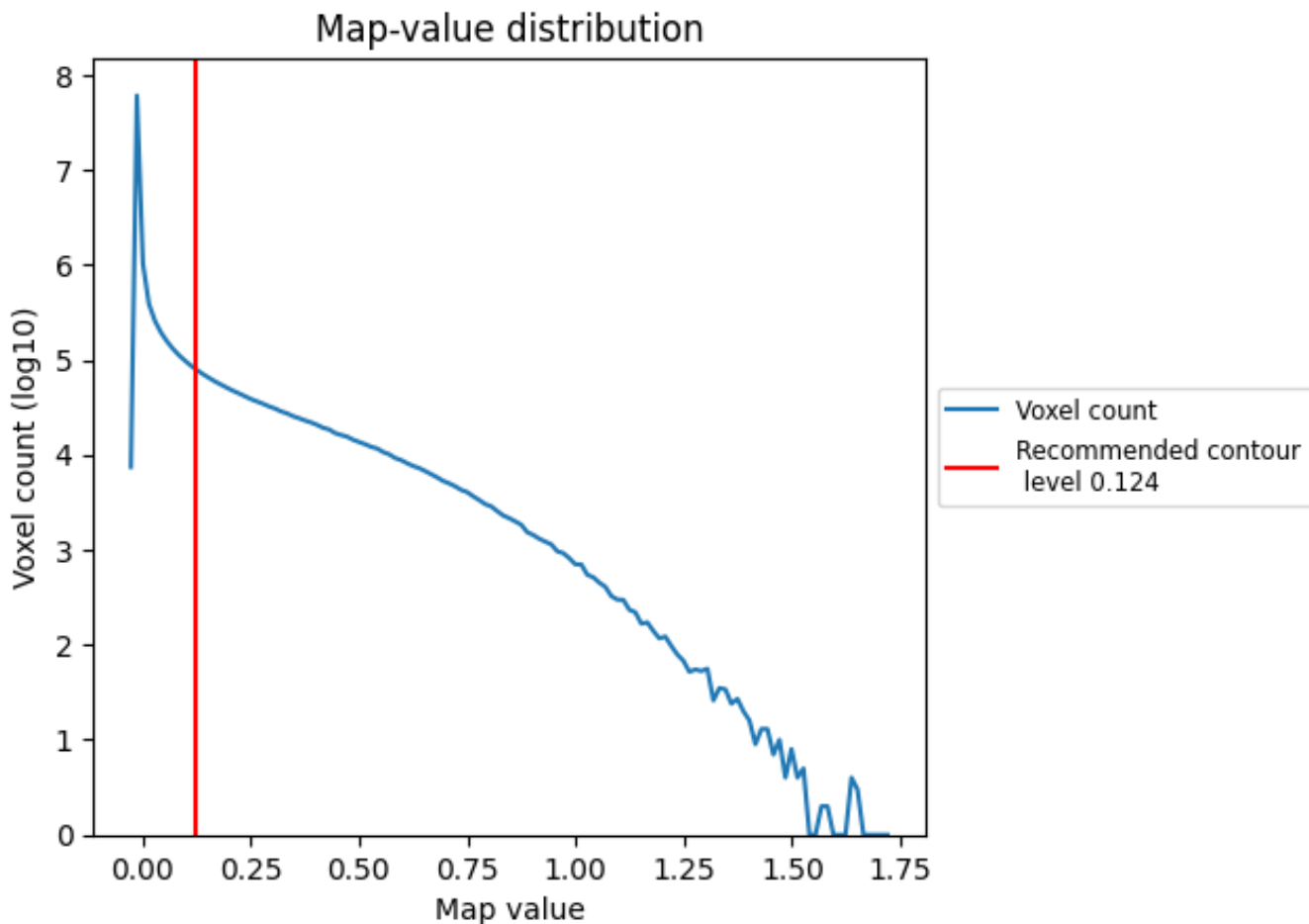


Z

7 Map analysis [i](#)

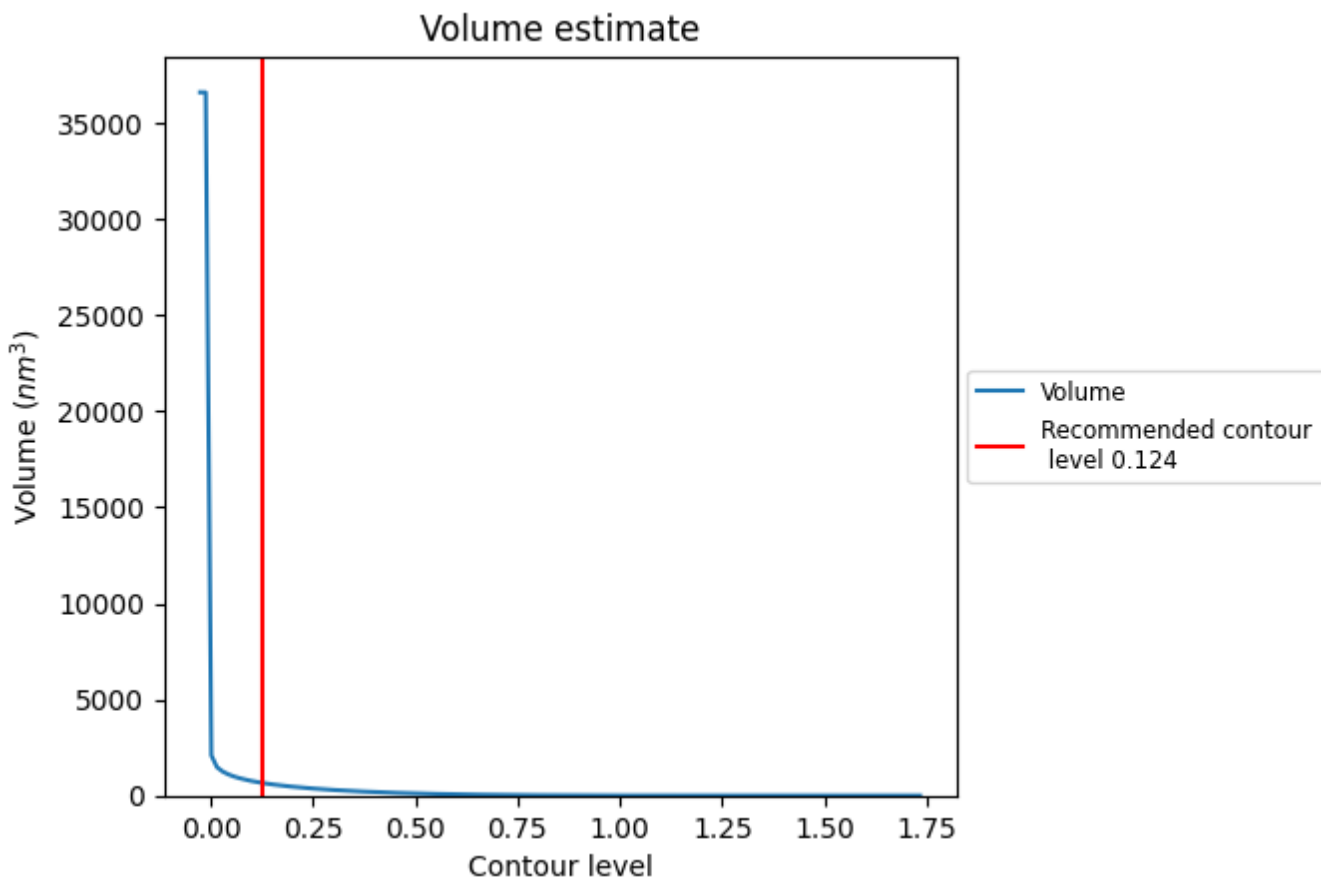
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

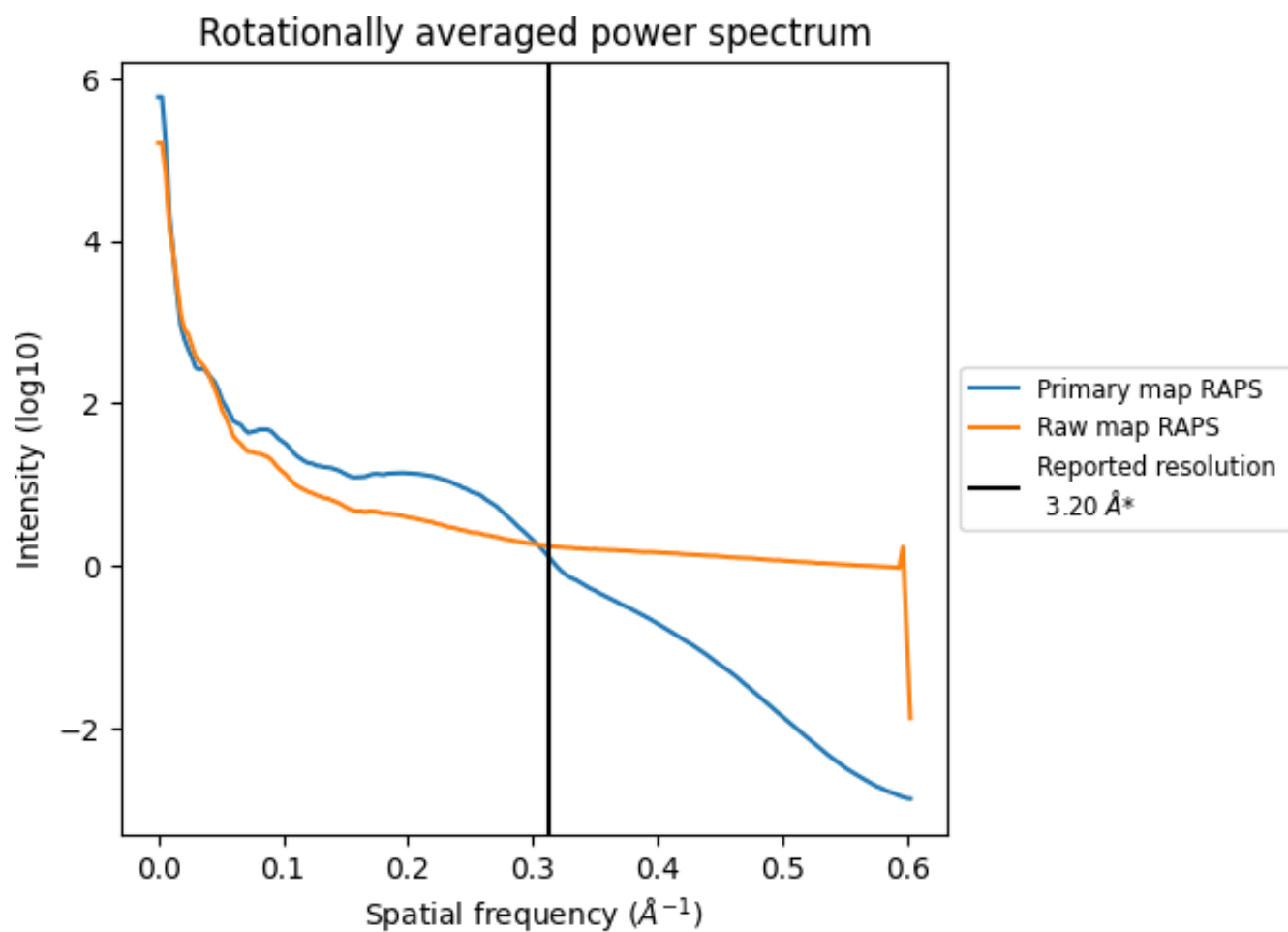
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 665 nm^3 ; this corresponds to an approximate mass of 601 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

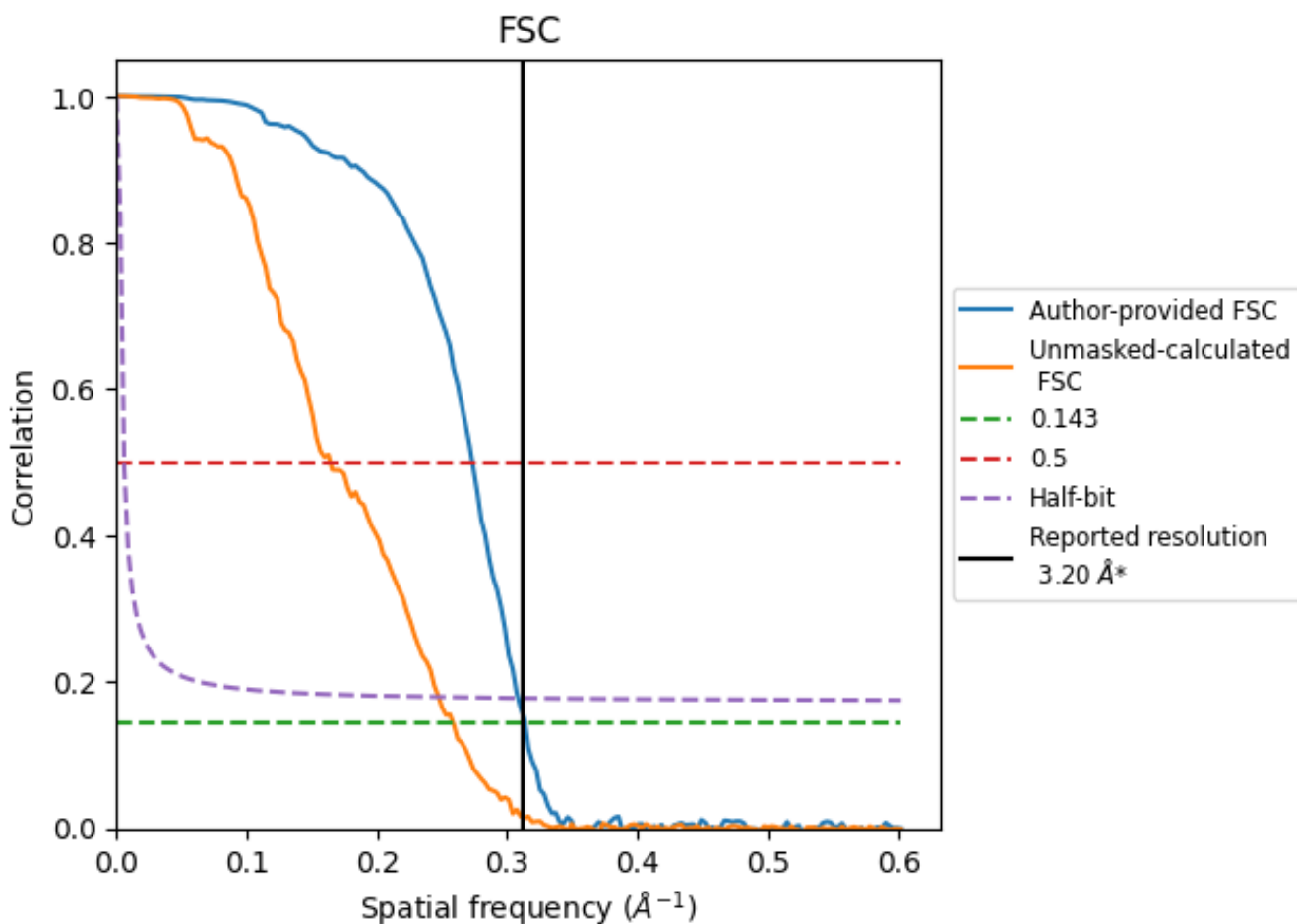


*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

8.2 Resolution estimates [i](#)

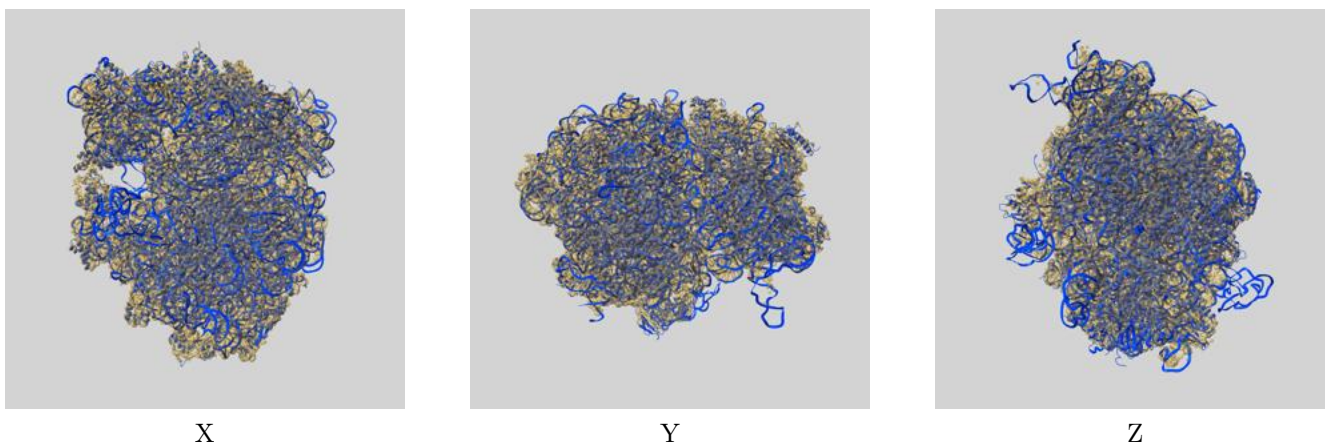
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.19	3.66	3.24
Unmasked-calculated*	3.87	6.09	4.04

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.87 differs from the reported value 3.2 by more than 10 %

9 Map-model fit [i](#)

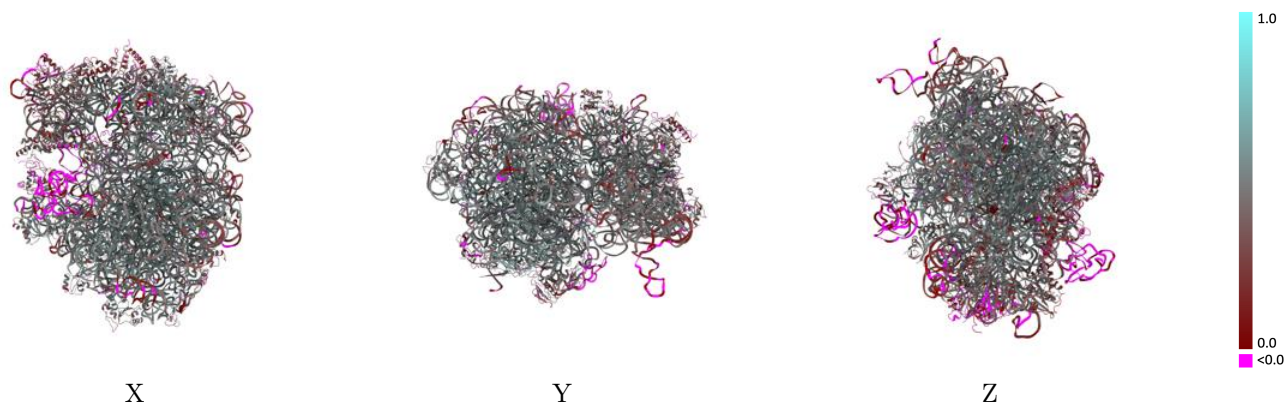
This section contains information regarding the fit between EMDB map EMD-41049 and PDB model 8T5D. Per-residue inclusion information can be found in section 3 on page 13.

9.1 Map-model overlay [i](#)



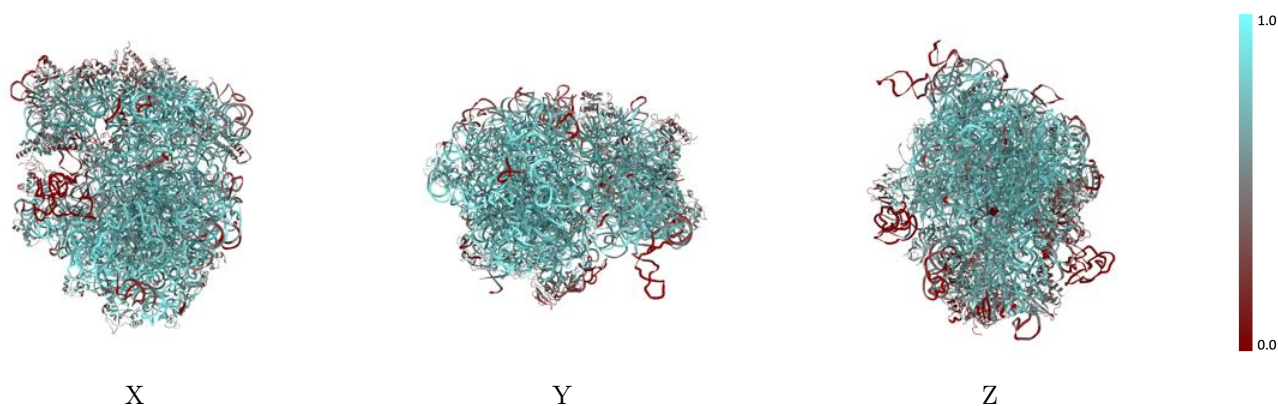
The images above show the 3D surface view of the map at the recommended contour level 0.124 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



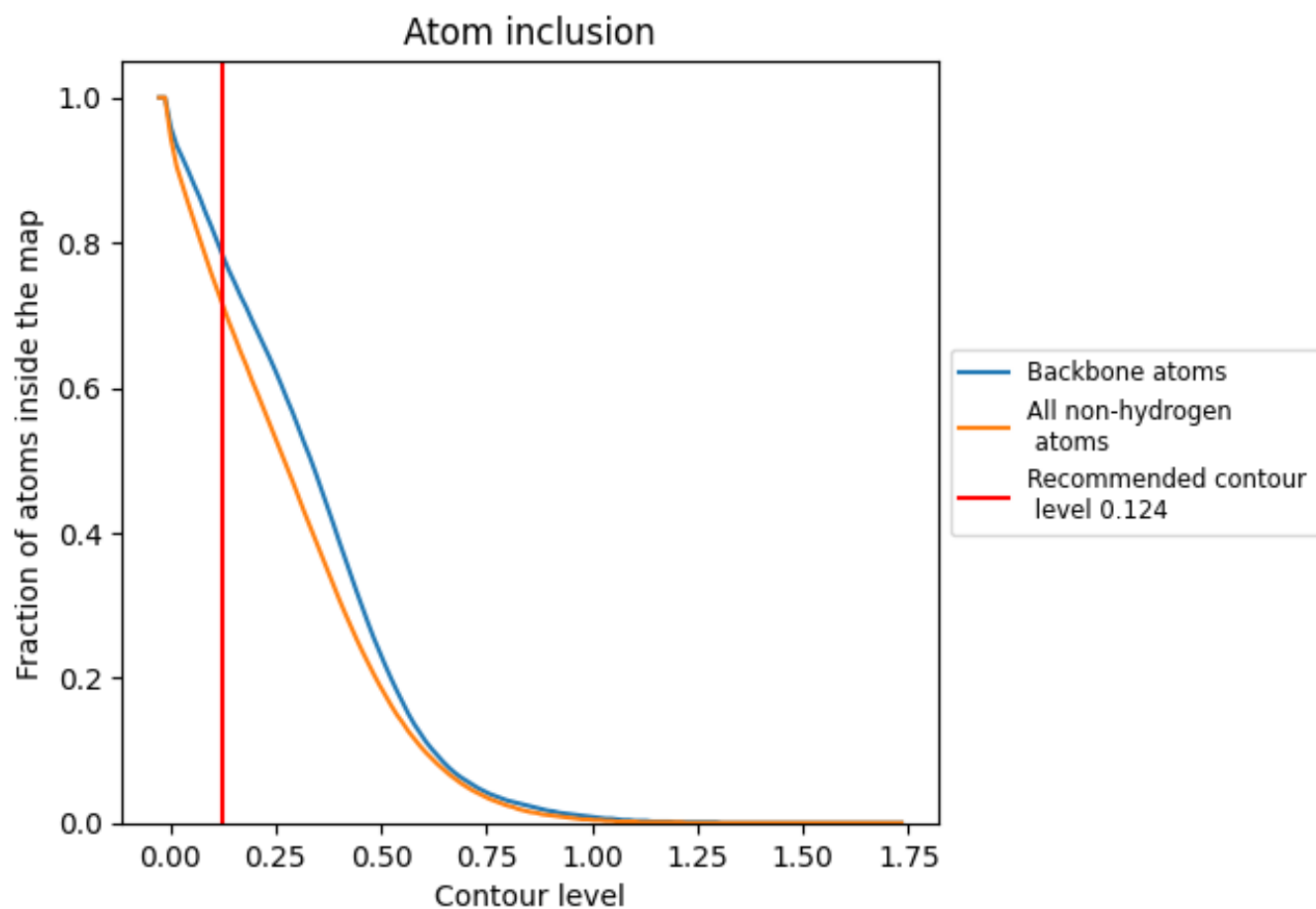
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.124).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 78% of all backbone atoms, 72% 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 (0.124) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7150	 0.4360
0	 0.6920	 0.4730
1	 0.6470	 0.4380
2	 0.7890	 0.5200
3	 0.8290	 0.5590
4	 0.7360	 0.5210
5	 0.6360	 0.4160
A	 0.7220	 0.4280
B	 0.7740	 0.4580
C	 0.7880	 0.5200
D	 0.7460	 0.4940
E	 0.6970	 0.4640
F	 0.3930	 0.1950
G	 0.4260	 0.3290
J	 0.7360	 0.4790
K	 0.7310	 0.4770
L	 0.7090	 0.4740
M	 0.7190	 0.4840
N	 0.7760	 0.5150
O	 0.6170	 0.4220
P	 0.6910	 0.4260
Q	 0.7610	 0.5110
R	 0.6850	 0.4600
S	 0.7210	 0.4690
T	 0.5480	 0.3430
U	 0.5690	 0.3890
V	 0.5220	 0.3980
W	 0.6450	 0.3720
X	 0.6640	 0.4840
Y	 0.5210	 0.3350
Z	 0.7090	 0.4800
a	 0.3180	 0.2320
b	 0.6190	 0.4080
c	 0.5840	 0.3900
d	 0.7090	 0.4730



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Chain	Atom inclusion	Q-score
e	 0.4520	 0.3310
f	 0.3380	 0.2560
g	 0.7160	 0.4650
h	 0.5130	 0.3320
i	 0.4720	 0.3010
j	 0.5670	 0.3830
k	 0.6910	 0.4790
l	 0.5010	 0.3450
m	 0.5530	 0.3660
n	 0.6390	 0.4180
o	 0.6410	 0.4350
p	 0.5610	 0.3830
q	 0.6060	 0.4150
r	 0.5210	 0.3640
s	 0.5570	 0.3870
t	 0.1670	 0.1190
u	 0.0020	 -0.0270
v	 0.7510	 0.4400
x	 0.3110	 0.2350