



Full wwPDB EM Validation Report ⓘ

Dec 14, 2024 – 06:59 PM EST

PDB ID : 8FZD
EMDB ID : EMD-29620
Title : Cryo-EM structure of an E. coli non-rotated ribosome termination complex bound with apoRF3, RF1, P- and E-site tRNAPhe (Composite state I-B)
Authors : Rybak, M.Y.; Li, L.; Lin, J.; Gagnon, M.G.
Deposited on : 2023-01-28
Resolution : 3.10 Å(reported)
Based on initial model : 7K00

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:

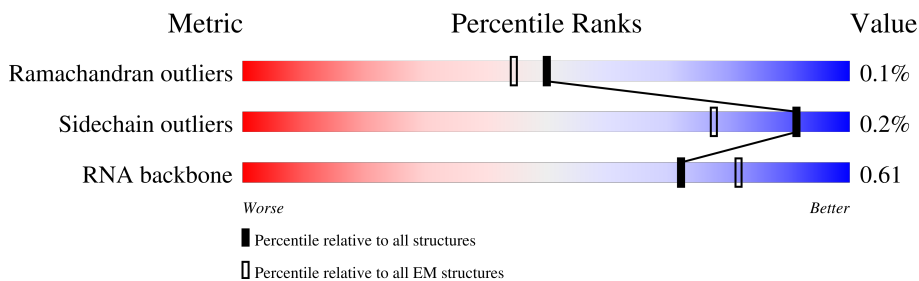
EMDB validation analysis : 0.0.1.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

1 Overall quality at a glance

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

The reported resolution of this entry is 3.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



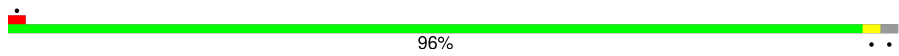
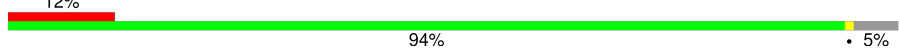
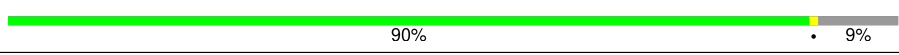
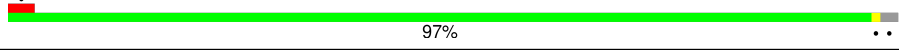
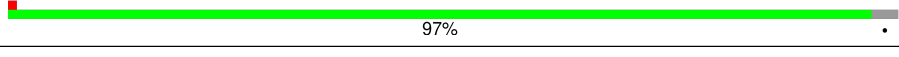
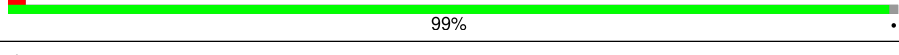
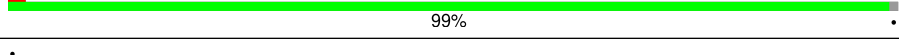
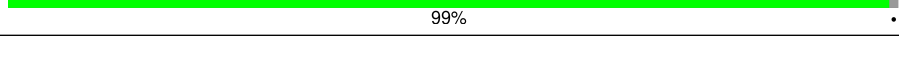
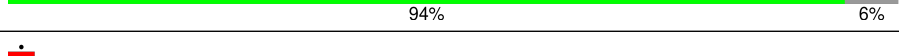
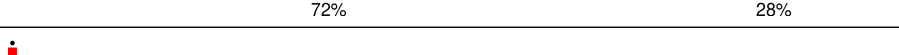
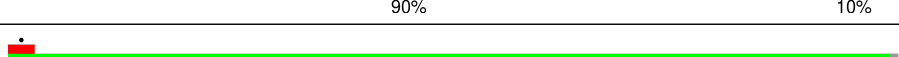
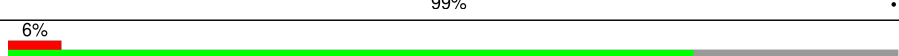

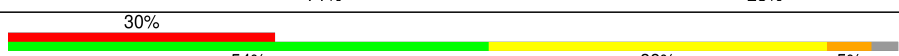
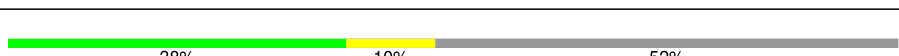
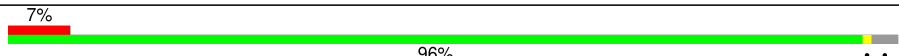
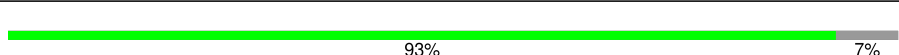


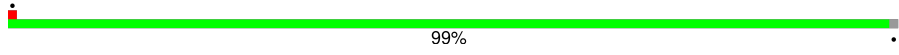
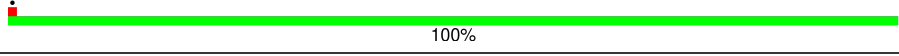
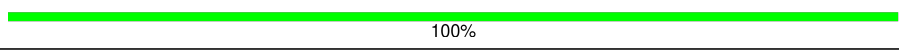
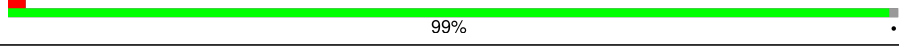
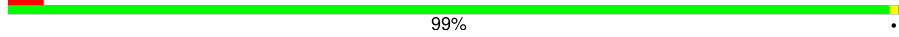

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	a	1542	
2	b	241	
3	c	233	
4	d	206	
5	e	167	
6	f	131	
7	g	156	
8	h	130	

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Mol	Chain	Length	Quality of chain
9	i	130	 96%
10	j	103	 94% 5%
11	k	129	 90% 9%
12	l	124	 97%
13	m	118	 97%
14	n	101	 99%
15	o	89	 99%
16	p	82	 99%
17	q	84	 94% 6%
18	r	75	 72% 28%
19	s	92	 90% 10%
20	t	87	 99%
21	u	71	 77% 23%
22	x	76	 71% 28%
23	y	76	 54% 38% 5%
24	z	21	 38% 10% 52%
25	w	360	 96%
26	v	529	 93% 7%
27	A	2904	 87% 13%
28	B	120	 88% 12%
29	C	273	 99%
30	D	209	 100%
31	E	201	 100%
32	F	179	 99%
33	G	177	 99%

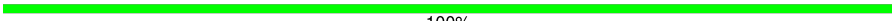
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Mol	Chain	Length	Quality of chain
34	H	149	20% 26% 74%
35	I	165	25% 79% 21%
36	J	142	15% 98%
37	L	142	100%
38	M	123	100%
39	N	144	100%
40	O	136	99%
41	P	127	93% 7%
42	Q	117	99%
43	R	115	99%
44	S	118	99%
45	T	103	100%
46	U	110	100%
47	V	100	93% 7%
48	W	104	5% 98%
49	X	94	100%
50	Y	85	88% 11%
51	Z	78	99%
52	1	63	97%
53	2	59	5% 98%
54	3	70	9% 86% 14%
55	4	57	96%
56	5	55	93% 7%
57	6	46	98%
58	7	65	97%

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Mol	Chain	Length	Quality of chain
59	8	38	 100%

2 Entry composition [i](#)

There are 62 unique types of molecules in this entry. The entry contains 153912 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called 16S Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	a	1528	32803	14637	6019	10619	1528	0	0

- Molecule 2 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	b	224	1754	1110	315	321	8	0	0

- Molecule 3 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	c	206	1624	1028	305	288	3	0	0

- Molecule 4 is a protein called 30S ribosomal protein S4.

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

- Molecule 5 is a protein called 30S ribosomal protein S5.

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

- Molecule 6 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	f	103	839	530	151	151	7	0	0

- Molecule 7 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	g	152	1191	741	230	216	4	0	0

- Molecule 8 is a protein called 30S ribosomal protein S8.

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

- Molecule 9 is a protein called 30S ribosomal protein S9.

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

- Molecule 10 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	j	98	786	493	150	142	1	0	0

- Molecule 11 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	k	117	877	540	173	161	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
k	119	IAS	ASN	conflict	UNP A0A0H3PWX2

- Molecule 12 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	l	121	942	582	193	162	5	0	0

- Molecule 13 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	m	115	Total	C	N	O	S	0	0
			891	552	179	157	3		

- Molecule 14 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	n	100	Total	C	N	O	S	0	0
			805	499	164	139	3		

- Molecule 15 is a protein called 30S ribosomal protein S15.

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

- Molecule 16 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	p	81	Total	C	N	O	S	0	0
			643	403	127	112	1		

- Molecule 17 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	q	79	Total	C	N	O	S	0	0
			641	406	120	112	3		

- Molecule 18 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms				AltConf	Trace
18	r	54	Total	C	N	O	0	0
			446	283	85	78		

- Molecule 19 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	s	83	Total	C	N	O	S	0	0
			663	424	126	111	2		

- Molecule 20 is a protein called 30S ribosomal protein S20.

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

- Molecule 21 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	u	55	Total	C	N	O	S	0	0
			460	287	95	77	1		

- Molecule 22 is a RNA chain called P-site phenylalanyl-tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
22	x	76	Total	C	N	O	P	S	0	0
			1632	731	290	533	76	2		

- Molecule 23 is a RNA chain called P-site phenylalanyl-tRNA.

Mol	Chain	Residues	Atoms						AltConf	Trace
23	y	74	Total	C	N	O	P	S	0	0
			1584	707	285	517	74	1		

- Molecule 24 is a RNA chain called F-UAA mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	z	10	Total	C	N	O	P	0	0
			210	95	36	69	10		

- Molecule 25 is a protein called Peptide chain release factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	w	349	Total	C	N	O	S	0	0
			2750	1679	513	545	13		

- Molecule 26 is a protein called Peptide chain release factor RF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	v	493	Total	C	N	O	S	0	0
			3898	2469	671	738	20		

- Molecule 27 is a RNA chain called 23S Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
27	A	2899	62252	27778	11456	20119	2899	0	0

- Molecule 28 is a RNA chain called 5S Ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
28	B	120	2572	1145	470	837	120	0	0

- Molecule 29 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	C	271	2082	1288	423	364	7	0	0

- Molecule 30 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	D	209	1566	980	288	294	4	0	0

- Molecule 31 is a protein called 50S ribosomal protein L4.

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

- Molecule 32 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	F	177	1410	899	249	256	6	0	0

- Molecule 33 is a protein called 50S ribosomal protein L6.

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

- Molecule 34 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	H	39	Total	C	N	O	S	0	0
			287	184	51	51	1		

- Molecule 35 is a protein called 50S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	I	131	Total	C	N	O	S	0	0
			984	622	174	183	5		

- Molecule 36 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	J	141	Total	C	N	O	S	0	0
			1028	649	178	195	6		

- Molecule 37 is a protein called 50S ribosomal protein L13.

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

- Molecule 38 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	M	123	Total	C	N	O	S	0	0
			946	593	181	166	6		

- Molecule 39 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	N	144	Total	C	N	O	S	0	0
			1052	653	207	190	2		

- Molecule 40 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	O	136	Total	C	N	O	S	0	0
			1075	686	205	177	7		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
O	82	MS6	MET	conflict	UNP E6BI61

- Molecule 41 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	P	118	945	585	194	161	5	0	0

- Molecule 42 is a protein called 50S ribosomal protein L18.

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

- Molecule 43 is a protein called 50S ribosomal protein L19.

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

- Molecule 44 is a protein called 50S ribosomal protein L20.

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

- Molecule 45 is a protein called Ribosomal protein L21.

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

- Molecule 46 is a protein called 50S ribosomal protein L22.

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

- Molecule 47 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	V	93	Total	C	N	O	S	0	0
			738	466	139	131	2		

- Molecule 48 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	W	102	Total	C	N	O	S	0	0
			779	492	146	141			

- Molecule 49 is a protein called 50S ribosomal protein L25.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
50	Y	76	Total	C	N	O	S	0	0
			582	360	117	104	1		

- Molecule 51 is a protein called 50S ribosomal protein L28.

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

- Molecule 52 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	1	61	Total	C	N	O	S	0	0
			495	305	97	92	1		

- Molecule 53 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	2	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 54 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	3	60	Total	C	N	O	S	0	0
			468	290	87	85	6		

- Molecule 55 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	4	55	Total	C	N	O	S	0	0
			434	263	92	78	1		

- Molecule 56 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
56	5	51	Total	C	N	O	0	0
			417	269	76	72		

- Molecule 57 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	6	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 58 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	7	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 59 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	8	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 60 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
60	a	130	Total	Mg	0
			130	130	
60	n	1	Total	Mg	0
			1	1	
60	x	2	Total	Mg	0
			2	2	

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Mol	Chain	Residues	Atoms		AltConf
60	A	428	Total 428	Mg 428	0
60	B	11	Total 11	Mg 11	0
60	C	2	Total 2	Mg 2	0
60	N	1	Total 1	Mg 1	0
60	S	2	Total 2	Mg 2	0
60	V	1	Total 1	Mg 1	0
60	4	1	Total 1	Mg 1	0
60	6	1	Total 1	Mg 1	0
60	7	1	Total 1	Mg 1	0

- Molecule 61 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
61	3	1	Total 1	Zn 1	0
61	8	1	Total 1	Zn 1	0

- Molecule 62 is water.

Mol	Chain	Residues	Atoms		AltConf
62	a	23	Total 23	O 23	0
62	y	1	Total 1	O 1	0
62	z	1	Total 1	O 1	0
62	A	122	Total 122	O 122	0
62	B	5	Total 5	O 5	0
62	C	1	Total 1	O 1	0

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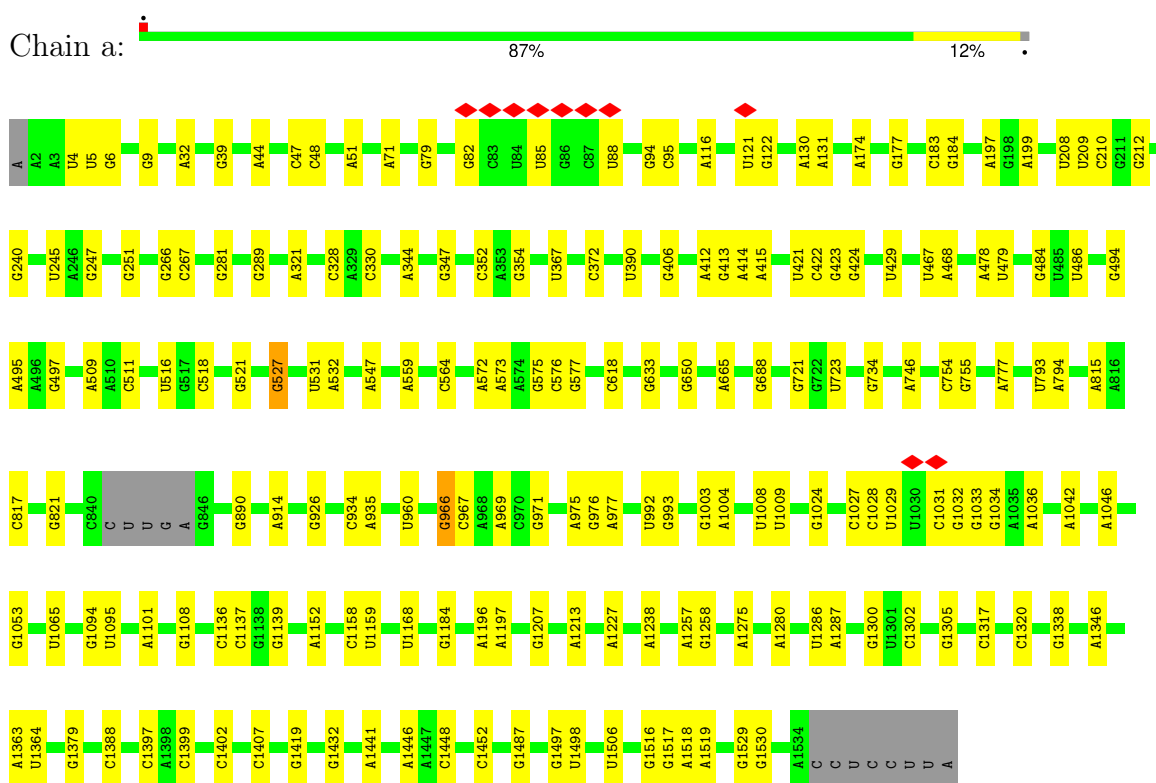
Continued from previous page...

Mol	Chain	Residues	Atoms		AltConf
62	N	1	Total 1	O 1	0
62	8	1	Total 1	O 1	0

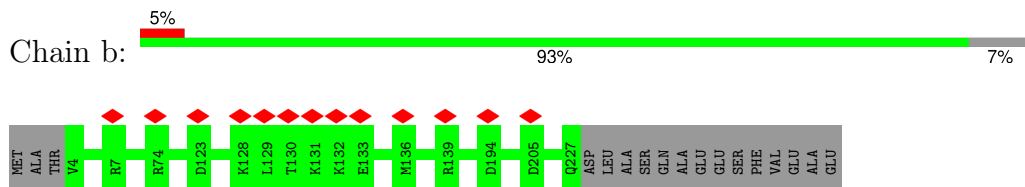
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

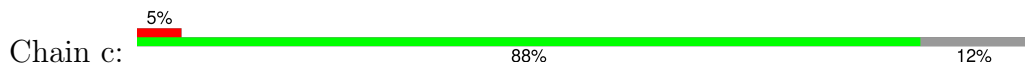
- Molecule 1: 16S Ribosomal RNA

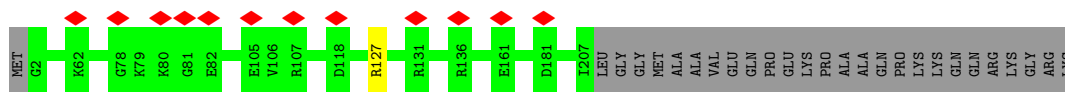


- Molecule 2: 30S ribosomal protein S2

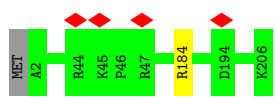


- Molecule 3: 30S ribosomal protein S3

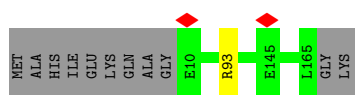
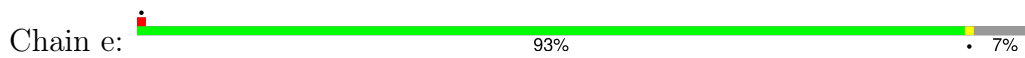




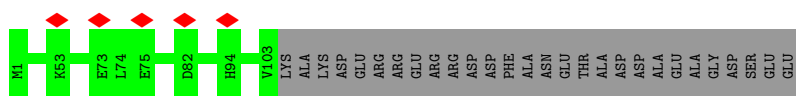
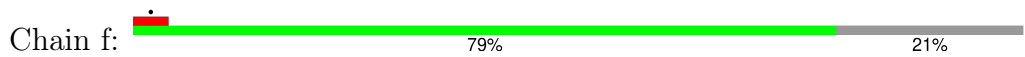
● Molecule 4: 30S ribosomal protein S4



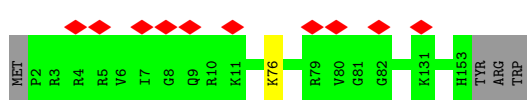
● Molecule 5: 30S ribosomal protein S5



● Molecule 6: 30S ribosomal protein S6



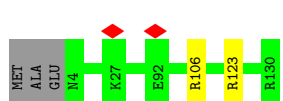
● Molecule 7: 30S ribosomal protein S7



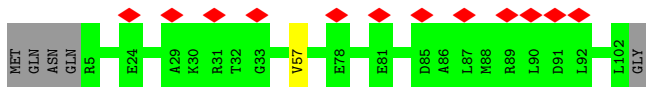
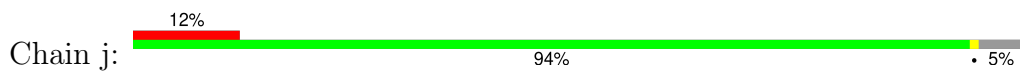
● Molecule 8: 30S ribosomal protein S8



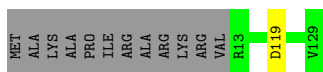
● Molecule 9: 30S ribosomal protein S9



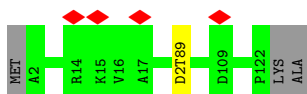
● Molecule 10: 30S ribosomal protein S10



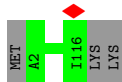
- Molecule 11: 30S ribosomal protein S11



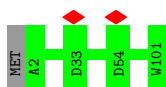
- Molecule 12: 30S ribosomal protein S12



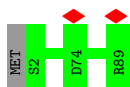
- Molecule 13: 30S ribosomal protein S13



- Molecule 14: 30S ribosomal protein S14



- Molecule 15: 30S ribosomal protein S15

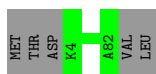


- Molecule 16: 30S ribosomal protein S16



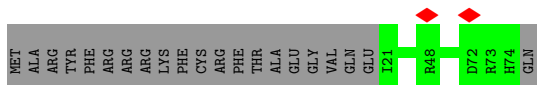
- Molecule 17: 30S ribosomal protein S17

Chain q:  94% 6%




- Molecule 18: 30S ribosomal protein S18

Chain r:  72% 28%



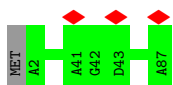
- Molecule 19: 30S ribosomal protein S19

Chain s:  90% 10%




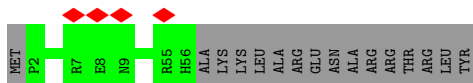
- Molecule 20: 30S ribosomal protein S20

Chain t:  99%



- Molecule 21: 30S ribosomal protein S21

Chain u:  6% 77% 23%



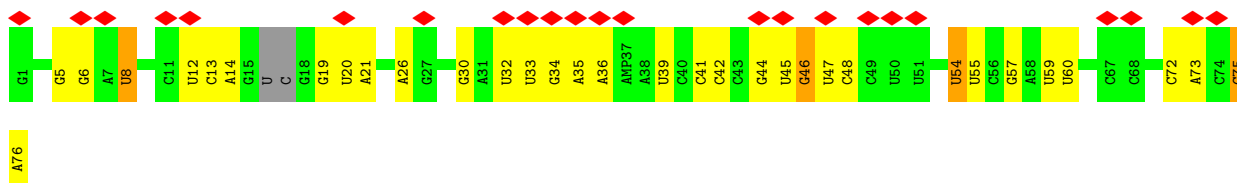
- Molecule 22: P-site phenylalanyl-tRNA

Chain x:  71% 28%

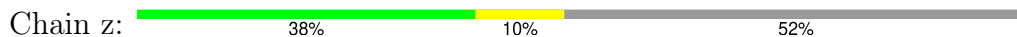


- Molecule 23: P-site phenylalanyl-tRNA

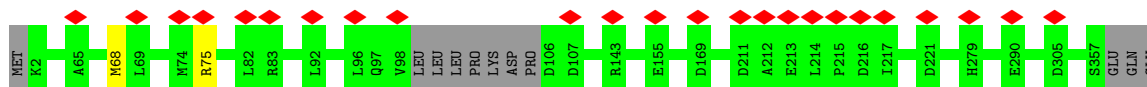
Chain y:  30% 54% 38% 5%



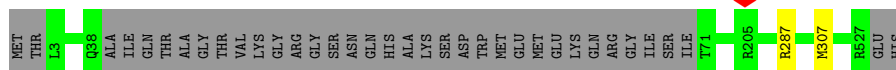
- Molecule 24: F-UAA mRNA



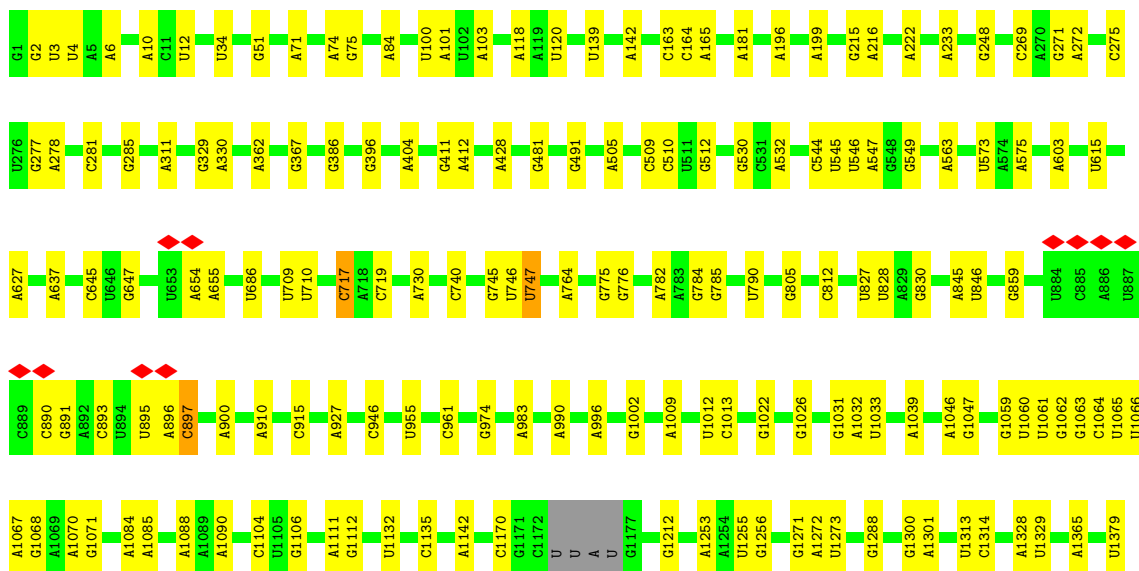
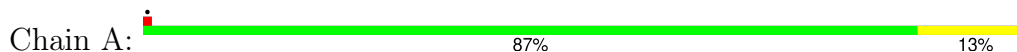
- Molecule 25: Peptide chain release factor 1

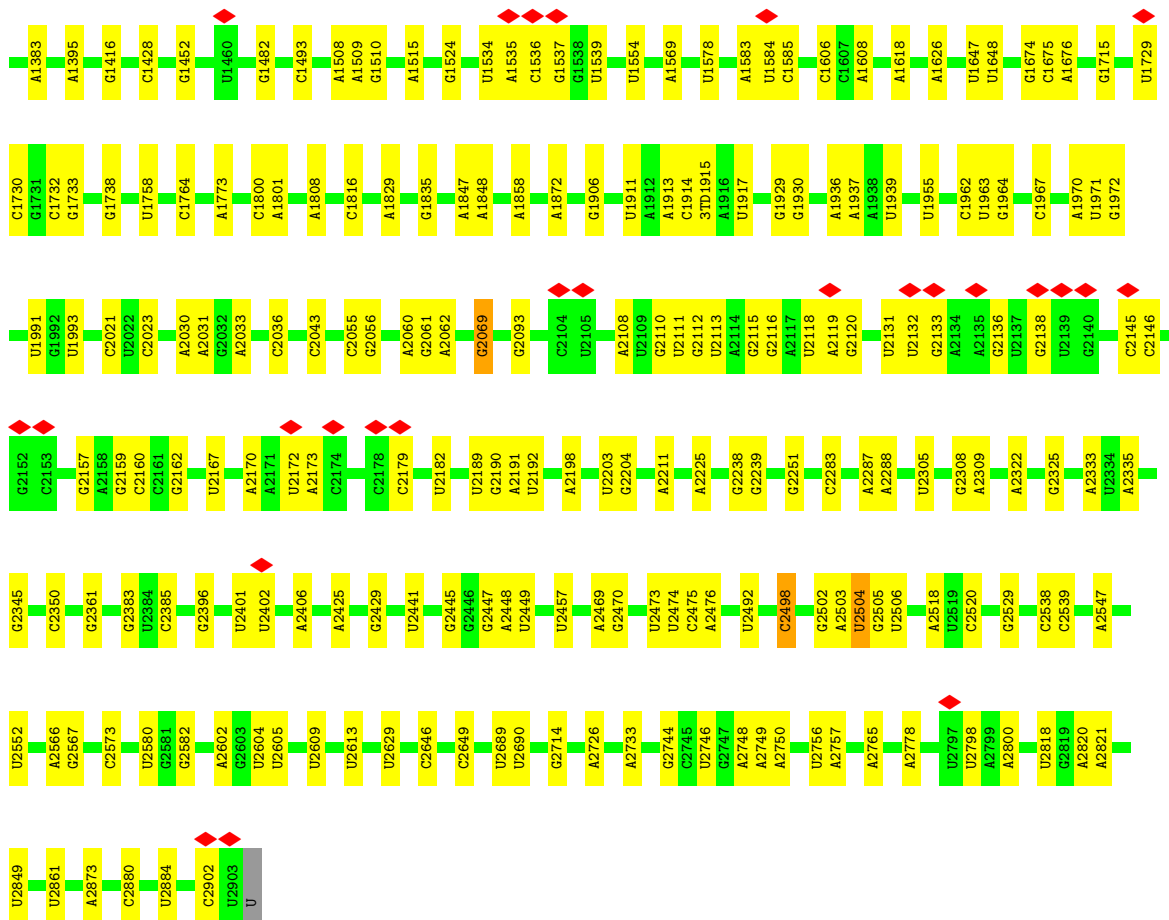


- Molecule 26: Peptide chain release factor RF3

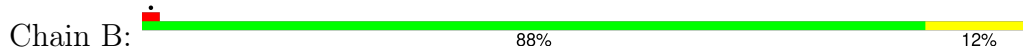


- Molecule 27: 23S Ribosomal RNA

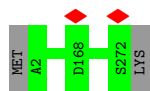




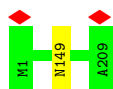
• Molecule 28: 5S Ribosomal RNA



• Molecule 29: 50S ribosomal protein L2

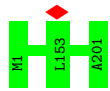


• Molecule 30: 50S ribosomal protein L3



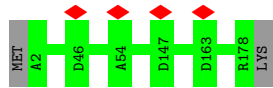
• Molecule 31: 50S ribosomal protein L4

Chain E:  100%



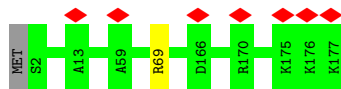
- Molecule 32: 50S ribosomal protein L5

Chain F:  99%



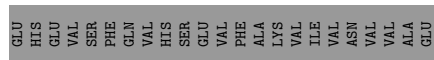
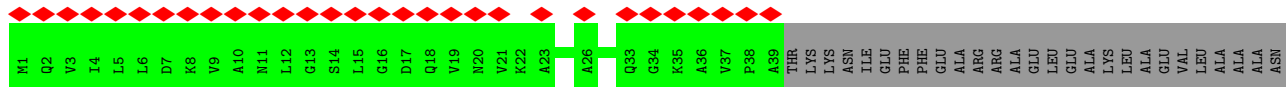
- Molecule 33: 50S ribosomal protein L6

Chain G:  99%




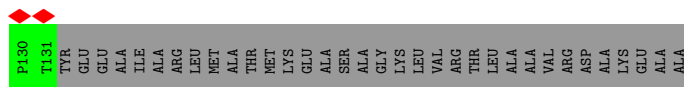
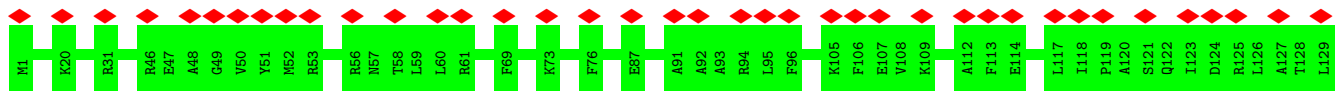
- Molecule 34: 50S ribosomal protein L9

Chain H:  20%
26% 74%



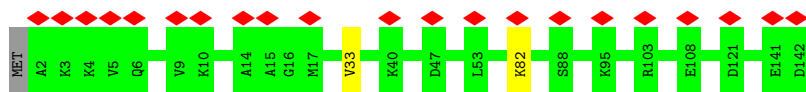
- Molecule 35: 50S ribosomal protein L10

Chain I:  25%
79% 21%



- Molecule 36: 50S ribosomal protein L11

Chain J:  15%
98%



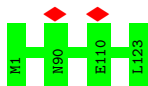
- Molecule 37: 50S ribosomal protein L13

Chain L: 100%

There are no outlier residues recorded for this chain.

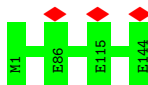
- Molecule 38: 50S ribosomal protein L14

Chain M: 100%



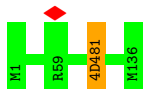
- Molecule 39: 50S ribosomal protein L15

Chain N: 100%



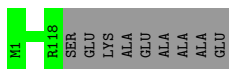
- Molecule 40: 50S ribosomal protein L16

Chain O: 99%



- Molecule 41: 50S ribosomal protein L17

Chain P: 93% 7%



- Molecule 42: 50S ribosomal protein L18

Chain Q: 99%



- Molecule 43: 50S ribosomal protein L19

Chain R: 99%



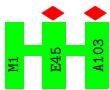
- Molecule 44: 50S ribosomal protein L20

Chain S: 99%



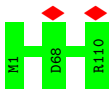
- Molecule 45: Ribosomal protein L21

Chain T: 100%



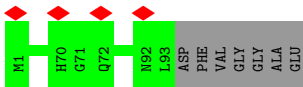
- Molecule 46: 50S ribosomal protein L22

Chain U: 100%



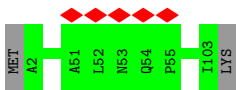
- Molecule 47: 50S ribosomal protein L23

Chain V: 93% 7%



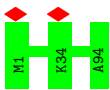
- Molecule 48: 50S ribosomal protein L24

Chain W: 5% 98%




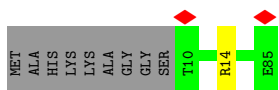
- Molecule 49: 50S ribosomal protein L25

Chain X: 100%



- Molecule 50: 50S ribosomal protein L27

Chain Y:  88% 11%



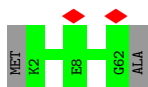
- Molecule 51: 50S ribosomal protein L28

Chain Z:  99%



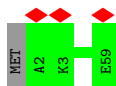
- Molecule 52: 50S ribosomal protein L29

Chain 1:  97%




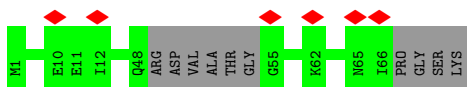
- Molecule 53: 50S ribosomal protein L30

Chain 2:  5% 98%



- Molecule 54: 50S ribosomal protein L31

Chain 3:  9% 86% 14%



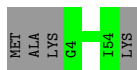
- Molecule 55: 50S ribosomal protein L32

Chain 4:  96%



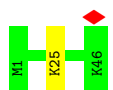
- Molecule 56: 50S ribosomal protein L33

Chain 5:  93% 7%



- Molecule 57: 50S ribosomal protein L34

Chain 6:  98%



- Molecule 58: 50S ribosomal protein L35

Chain 7:  97%



- Molecule 59: 50S ribosomal protein L36

Chain 8:  100%

There are no outlier residues recorded for this chain.

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	80766	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	96000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	51.756	Depositor
Minimum map value	-35.316	Depositor
Average map value	0.001	Depositor
Map value standard deviation	1.043	Depositor
Recommended contour level	3.5	Depositor
Map size (\AA)	435.2, 435.2, 435.2	wwPDB
Map dimensions	512, 512, 512	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.85, 0.85, 0.85	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: OMC, 4SU, UR3, 1MG, OMG, ZN, 3TD, G7M, MS6, IAS, MEQ, MIA, AMP, 2MG, 2MA, D2T, 6MZ, 4D4, PSU, 4OC, 5MC, 5MU, MA6, MG, H2U, OMU

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	a	0.26	0/36450	0.77	4/56856 (0.0%)
2	b	0.25	0/1785	0.52	0/2404
3	c	0.25	0/1651	0.52	0/2225
4	d	0.25	0/1665	0.53	0/2227
5	e	0.25	0/1165	0.51	0/1568
6	f	0.26	0/858	0.54	0/1160
7	g	0.24	0/1206	0.53	0/1617
8	h	0.26	0/989	0.52	0/1326
9	i	0.25	0/1034	0.57	0/1375
10	j	0.24	0/796	0.57	0/1077
11	k	0.26	0/884	0.53	0/1191
12	l	0.26	0/945	0.57	0/1268
13	m	0.25	0/900	0.57	0/1204
14	n	0.25	0/817	0.56	0/1088
15	o	0.25	0/722	0.53	0/964
16	p	0.25	0/653	0.57	0/877
17	q	0.26	0/650	0.56	0/871
18	r	0.26	0/453	0.54	0/609
19	s	0.25	0/680	0.52	0/915
20	t	0.25	0/676	0.50	0/895
21	u	0.25	0/467	0.56	0/620
22	x	0.37	1/1651 (0.1%)	0.79	0/2569
23	y	0.22	0/1605	0.87	2/2497 (0.1%)
24	z	0.25	0/234	0.75	0/361
25	w	0.25	0/2788	0.54	0/3753
26	v	0.36	0/3971	0.59	0/5368
27	A	0.29	0/69147	0.78	10/107869 (0.0%)
28	B	0.33	1/2876 (0.0%)	0.80	0/4483
29	C	0.26	0/2121	0.57	0/2852
30	D	0.27	0/1576	0.53	0/2119
31	E	0.25	0/1571	0.50	0/2113

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
32	F	0.26	0/1434	0.52	0/1926
33	G	0.26	0/1343	0.52	0/1816
34	H	0.24	0/290	0.49	0/392
35	I	0.27	0/997	0.58	0/1346
36	J	0.25	0/1042	0.52	0/1405
37	L	0.27	0/1152	0.50	0/1551
38	M	0.26	0/955	0.55	0/1279
39	N	0.25	0/1061	0.56	0/1412
40	O	0.25	0/1073	0.54	0/1433
41	P	0.25	0/958	0.58	0/1281
42	Q	0.24	0/902	0.54	0/1209
43	R	0.26	0/929	0.54	0/1242
44	S	0.27	0/960	0.50	0/1278
45	T	0.27	0/829	0.54	0/1107
46	U	0.24	0/864	0.52	0/1156
47	V	0.24	0/744	0.51	0/994
48	W	0.27	0/787	0.54	0/1051
49	X	0.25	0/766	0.52	0/1025
50	Y	0.26	0/589	0.56	0/779
51	Z	0.24	0/635	0.57	0/848
52	1	0.22	0/496	0.48	0/660
53	2	0.24	0/453	0.55	0/605
54	3	0.25	0/475	0.49	0/633
55	4	0.25	0/440	0.57	0/588
56	5	0.25	0/424	0.50	0/565
57	6	0.24	0/380	0.61	0/498
58	7	0.24	0/513	0.53	0/676
59	8	0.25	0/303	0.58	0/397
All	All	0.28	2/164780 (0.0%)	0.72	16/245473 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
26	v	0	1
40	O	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
28	B	1	U	OP3-P	-10.70	1.48	1.61
22	x	1	G	OP3-P	-10.65	1.48	1.61

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
27	A	1313	U	C2-N1-C1'	7.02	126.12	117.70
1	a	754	C	C2-N1-C1'	6.30	125.73	118.80
27	A	790	U	C2-N1-C1'	6.10	125.02	117.70
27	A	510	C	N1-C2-O2	6.04	122.53	118.90
27	A	2160	C	N3-C2-O2	-5.67	117.93	121.90
1	a	330	C	C2-N1-C1'	5.64	125.00	118.80
27	A	897	C	C2-N1-C1'	5.57	124.92	118.80
27	A	717	C	C2-N1-C1'	5.50	124.85	118.80
1	a	330	C	N1-C2-O2	5.41	122.14	118.90
27	A	2160	C	N1-C2-O2	5.31	122.08	118.90
27	A	717	C	N1-C2-O2	5.25	122.05	118.90
27	A	1313	U	N1-C2-O2	5.22	126.46	122.80
1	a	1158	C	C2-N1-C1'	5.22	124.54	118.80
27	A	1314	C	C2-N1-C1'	5.11	124.42	118.80
23	y	75	C	C2-N1-C1'	5.02	124.32	118.80
23	y	33	U	C2-N1-C1'	5.01	123.71	117.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
40	O	81	4D4	Mainchain
26	v	307	MET	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	b	222/241 (92%)	207 (93%)	15 (7%)	0	100	100
3	c	204/233 (88%)	199 (98%)	5 (2%)	0	100	100
4	d	203/206 (98%)	203 (100%)	0	0	100	100
5	e	154/167 (92%)	146 (95%)	8 (5%)	0	100	100
6	f	101/131 (77%)	97 (96%)	4 (4%)	0	100	100
7	g	150/156 (96%)	140 (93%)	10 (7%)	0	100	100
8	h	127/130 (98%)	124 (98%)	3 (2%)	0	100	100
9	i	125/130 (96%)	121 (97%)	4 (3%)	0	100	100
10	j	96/103 (93%)	90 (94%)	5 (5%)	1 (1%)	13	42
11	k	113/129 (88%)	107 (95%)	6 (5%)	0	100	100
12	l	118/124 (95%)	112 (95%)	6 (5%)	0	100	100
13	m	113/118 (96%)	110 (97%)	3 (3%)	0	100	100
14	n	98/101 (97%)	98 (100%)	0	0	100	100
15	o	86/89 (97%)	83 (96%)	3 (4%)	0	100	100
16	p	79/82 (96%)	76 (96%)	3 (4%)	0	100	100
17	q	77/84 (92%)	75 (97%)	2 (3%)	0	100	100
18	r	52/75 (69%)	51 (98%)	1 (2%)	0	100	100
19	s	81/92 (88%)	78 (96%)	3 (4%)	0	100	100
20	t	84/87 (97%)	82 (98%)	2 (2%)	0	100	100
21	u	53/71 (75%)	51 (96%)	2 (4%)	0	100	100
25	w	345/360 (96%)	318 (92%)	27 (8%)	0	100	100
26	v	489/529 (92%)	425 (87%)	64 (13%)	0	100	100
29	C	269/273 (98%)	261 (97%)	8 (3%)	0	100	100
30	D	206/209 (99%)	201 (98%)	4 (2%)	1 (0%)	25	58
31	E	199/201 (99%)	194 (98%)	5 (2%)	0	100	100
32	F	175/179 (98%)	171 (98%)	4 (2%)	0	100	100
33	G	174/177 (98%)	167 (96%)	7 (4%)	0	100	100
34	H	37/149 (25%)	31 (84%)	6 (16%)	0	100	100
35	I	129/165 (78%)	102 (79%)	27 (21%)	0	100	100
36	J	139/142 (98%)	123 (88%)	15 (11%)	1 (1%)	19	51

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
37	L	140/142 (99%)	139 (99%)	1 (1%)	0	100	100
38	M	121/123 (98%)	119 (98%)	2 (2%)	0	100	100
39	N	142/144 (99%)	140 (99%)	2 (1%)	0	100	100
40	O	132/136 (97%)	130 (98%)	2 (2%)	0	100	100
41	P	116/127 (91%)	112 (97%)	4 (3%)	0	100	100
42	Q	114/117 (97%)	110 (96%)	4 (4%)	0	100	100
43	R	112/115 (97%)	109 (97%)	3 (3%)	0	100	100
44	S	115/118 (98%)	114 (99%)	1 (1%)	0	100	100
45	T	101/103 (98%)	98 (97%)	3 (3%)	0	100	100
46	U	108/110 (98%)	106 (98%)	2 (2%)	0	100	100
47	V	91/100 (91%)	87 (96%)	4 (4%)	0	100	100
48	W	100/104 (96%)	92 (92%)	8 (8%)	0	100	100
49	X	92/94 (98%)	90 (98%)	2 (2%)	0	100	100
50	Y	74/85 (87%)	72 (97%)	2 (3%)	0	100	100
51	Z	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
52	1	59/63 (94%)	57 (97%)	2 (3%)	0	100	100
53	2	56/59 (95%)	55 (98%)	1 (2%)	0	100	100
54	3	56/70 (80%)	56 (100%)	0	0	100	100
55	4	53/57 (93%)	53 (100%)	0	0	100	100
56	5	49/55 (89%)	49 (100%)	0	0	100	100
57	6	44/46 (96%)	44 (100%)	0	0	100	100
58	7	62/65 (95%)	58 (94%)	3 (5%)	1 (2%)	8	31
59	8	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
All	All	6546/7082 (92%)	6242 (95%)	300 (5%)	4 (0%)	50	79

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	j	57	VAL
30	D	149	ASN
36	J	33	VAL
58	7	32	ILE

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	b	186/199 (94%)	186 (100%)	0	100	100
3	c	170/190 (90%)	169 (99%)	1 (1%)	84	91
4	d	172/173 (99%)	171 (99%)	1 (1%)	84	91
5	e	119/126 (94%)	118 (99%)	1 (1%)	79	89
6	f	90/112 (80%)	90 (100%)	0	100	100
7	g	125/129 (97%)	124 (99%)	1 (1%)	79	89
8	h	104/105 (99%)	104 (100%)	0	100	100
9	i	105/107 (98%)	103 (98%)	2 (2%)	52	75
10	j	86/90 (96%)	86 (100%)	0	100	100
11	k	89/98 (91%)	89 (100%)	0	100	100
12	l	101/103 (98%)	101 (100%)	0	100	100
13	m	93/96 (97%)	93 (100%)	0	100	100
14	n	83/84 (99%)	83 (100%)	0	100	100
15	o	76/77 (99%)	76 (100%)	0	100	100
16	p	65/65 (100%)	65 (100%)	0	100	100
17	q	73/78 (94%)	73 (100%)	0	100	100
18	r	47/65 (72%)	47 (100%)	0	100	100
19	s	72/79 (91%)	72 (100%)	0	100	100
20	t	65/66 (98%)	65 (100%)	0	100	100
21	u	48/61 (79%)	48 (100%)	0	100	100
25	w	289/300 (96%)	287 (99%)	2 (1%)	81	90
26	v	422/453 (93%)	421 (100%)	1 (0%)	92	96
29	C	216/218 (99%)	216 (100%)	0	100	100
30	D	163/163 (100%)	163 (100%)	0	100	100
31	E	165/165 (100%)	165 (100%)	0	100	100
32	F	148/150 (99%)	148 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	G	137/138 (99%)	136 (99%)	1 (1%)	81	90
34	H	30/114 (26%)	30 (100%)	0	100	100
35	I	99/123 (80%)	99 (100%)	0	100	100
36	J	108/110 (98%)	107 (99%)	1 (1%)	75	88
37	L	116/116 (100%)	116 (100%)	0	100	100
38	M	104/104 (100%)	104 (100%)	0	100	100
39	N	103/103 (100%)	103 (100%)	0	100	100
40	O	107/107 (100%)	107 (100%)	0	100	100
41	P	98/103 (95%)	98 (100%)	0	100	100
42	Q	86/87 (99%)	86 (100%)	0	100	100
43	R	99/100 (99%)	99 (100%)	0	100	100
44	S	89/90 (99%)	89 (100%)	0	100	100
45	T	84/84 (100%)	84 (100%)	0	100	100
46	U	93/93 (100%)	93 (100%)	0	100	100
47	V	80/84 (95%)	80 (100%)	0	100	100
48	W	83/85 (98%)	83 (100%)	0	100	100
49	X	78/78 (100%)	78 (100%)	0	100	100
50	Y	58/63 (92%)	57 (98%)	1 (2%)	56	78
51	Z	67/68 (98%)	67 (100%)	0	100	100
52	1	54/55 (98%)	54 (100%)	0	100	100
53	2	48/49 (98%)	48 (100%)	0	100	100
54	3	53/62 (86%)	53 (100%)	0	100	100
55	4	46/48 (96%)	46 (100%)	0	100	100
56	5	46/49 (94%)	46 (100%)	0	100	100
57	6	38/38 (100%)	37 (97%)	1 (3%)	41	68
58	7	51/52 (98%)	51 (100%)	0	100	100
59	8	34/34 (100%)	34 (100%)	0	100	100
All	All	5461/5789 (94%)	5448 (100%)	13 (0%)	91	96

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	c	127	ARG

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Mol	Chain	Res	Type
4	d	184	ARG
5	e	93	ARG
7	g	76	LYS
9	i	106	ARG
9	i	123	ARG
25	w	68	MET
25	w	75	ARG
26	v	287	ARG
33	G	69	ARG
36	J	82	LYS
50	Y	14	ARG
57	6	25	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (69) such sidechains are listed below:

Mol	Chain	Res	Type
2	b	15	HIS
2	b	89	GLN
2	b	178	ASN
3	c	3	GLN
3	c	100	GLN
4	d	74	ASN
4	d	131	ASN
4	d	140	ASN
4	d	152	GLN
5	e	70	ASN
5	e	83	HIS
6	f	46	GLN
6	f	58	HIS
7	g	68	ASN
7	g	122	ASN
7	g	130	ASN
8	h	16	ASN
9	i	126	GLN
11	k	15	GLN
11	k	28	ASN
12	l	96	HIS
13	m	105	ASN
14	n	60	GLN
14	n	66	GLN
16	p	9	HIS
16	p	29	ASN

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Mol	Chain	Res	Type
17	q	9	GLN
19	s	52	HIS
20	t	13	GLN
20	t	21	ASN
21	u	9	ASN
21	u	56	HIS
25	w	20	GLN
25	w	66	GLN
25	w	110	ASN
25	w	156	HIS
25	w	264	HIS
25	w	288	GLN
25	w	296	ASN
26	v	21	HIS
26	v	92	HIS
26	v	304	GLN
26	v	369	ASN
29	C	70	ASN
29	C	153	GLN
30	D	49	GLN
30	D	134	HIS
31	E	62	GLN
31	E	94	GLN
31	E	97	ASN
31	E	165	HIS
33	G	22	GLN
33	G	128	GLN
37	L	40	HIS
37	L	76	HIS
38	M	3	GLN
40	O	45	GLN
41	P	16	HIS
41	P	23	ASN
41	P	62	ASN
42	Q	38	GLN
45	T	6	GLN
45	T	89	HIS
45	T	91	GLN
46	U	57	ASN
48	W	74	ASN
52	1	45	GLN
54	3	41	HIS

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Mol	Chain	Res	Type
55	4	6	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	a	1523/1542 (98%)	177 (11%)	0
22	x	74/76 (97%)	15 (20%)	0
23	y	71/76 (93%)	29 (40%)	0
24	z	9/21 (42%)	2 (22%)	0
27	A	2893/2904 (99%)	342 (11%)	16 (0%)
28	B	119/120 (99%)	11 (9%)	2 (1%)
All	All	4689/4739 (98%)	576 (12%)	18 (0%)

All (576) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	a	4	U
1	a	5	U
1	a	6	G
1	a	9	G
1	a	32	A
1	a	39	G
1	a	44	A
1	a	47	C
1	a	48	C
1	a	51	A
1	a	71	A
1	a	79	G
1	a	82	G
1	a	85	U
1	a	88	U
1	a	94	G
1	a	95	C
1	a	116	A
1	a	121	U
1	a	122	G
1	a	130	A
1	a	131	A
1	a	174	A
1	a	177	G
1	a	183	C

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Mol	Chain	Res	Type
1	a	184	G
1	a	197	A
1	a	199	A
1	a	208	U
1	a	209	U
1	a	210	C
1	a	212	G
1	a	240	G
1	a	245	U
1	a	247	G
1	a	251	G
1	a	266	G
1	a	267	C
1	a	281	G
1	a	289	G
1	a	321	A
1	a	328	C
1	a	344	A
1	a	347	G
1	a	352	C
1	a	354	G
1	a	367	U
1	a	372	C
1	a	390	U
1	a	406	G
1	a	412	A
1	a	413	G
1	a	414	A
1	a	415	A
1	a	421	U
1	a	422	C
1	a	423	G
1	a	424	G
1	a	429	U
1	a	467	U
1	a	468	A
1	a	478	A
1	a	479	U
1	a	484	G
1	a	486	U
1	a	494	G
1	a	495	A

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Mol	Chain	Res	Type
1	a	497	G
1	a	509	A
1	a	511	C
1	a	518	C
1	a	521	G
1	a	527	G7M
1	a	531	U
1	a	532	A
1	a	547	A
1	a	559	A
1	a	564	C
1	a	572	A
1	a	573	A
1	a	575	G
1	a	576	C
1	a	577	G
1	a	618	C
1	a	633	G
1	a	650	G
1	a	665	A
1	a	688	G
1	a	721	G
1	a	723	U
1	a	734	G
1	a	746	A
1	a	755	G
1	a	777	A
1	a	793	U
1	a	794	A
1	a	815	A
1	a	817	C
1	a	821	G
1	a	890	G
1	a	914	A
1	a	926	G
1	a	934	C
1	a	935	A
1	a	960	U
1	a	966	2MG
1	a	969	A
1	a	971	G
1	a	975	A

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Mol	Chain	Res	Type
1	a	976	G
1	a	977	A
1	a	992	U
1	a	993	G
1	a	1003	G
1	a	1004	A
1	a	1008	U
1	a	1009	U
1	a	1024	G
1	a	1027	C
1	a	1028	C
1	a	1029	U
1	a	1031	C
1	a	1032	G
1	a	1033	G
1	a	1034	G
1	a	1036	A
1	a	1042	A
1	a	1046	A
1	a	1053	G
1	a	1065	U
1	a	1094	G
1	a	1095	U
1	a	1101	A
1	a	1108	G
1	a	1136	C
1	a	1137	C
1	a	1139	G
1	a	1152	A
1	a	1159	U
1	a	1168	U
1	a	1184	G
1	a	1196	A
1	a	1197	A
1	a	1213	A
1	a	1227	A
1	a	1238	A
1	a	1257	A
1	a	1258	G
1	a	1275	A
1	a	1280	A
1	a	1286	U

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Mol	Chain	Res	Type
1	a	1287	A
1	a	1300	G
1	a	1302	C
1	a	1305	G
1	a	1317	C
1	a	1320	C
1	a	1338	G
1	a	1346	A
1	a	1363	A
1	a	1364	U
1	a	1379	G
1	a	1388	C
1	a	1397	C
1	a	1399	C
1	a	1419	G
1	a	1432	G
1	a	1441	A
1	a	1446	A
1	a	1448	C
1	a	1452	C
1	a	1487	G
1	a	1497	G
1	a	1506	U
1	a	1517	G
1	a	1529	G
1	a	1530	G
22	x	12	U
22	x	13	C
22	x	16	U
22	x	17	C
22	x	19	G
22	x	20	U
22	x	22	G
22	x	38	A
22	x	44	G
22	x	45	U
22	x	47	U
22	x	48	C
22	x	49	C
22	x	55	PSU
22	x	76	A
23	y	5	G

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Mol	Chain	Res	Type
23	y	6	G
23	y	8	4SU
23	y	12	U
23	y	13	C
23	y	14	A
23	y	19	G
23	y	20	U
23	y	21	A
23	y	26	A
23	y	30	G
23	y	34	G
23	y	35	A
23	y	36	A
23	y	41	C
23	y	42	C
23	y	44	G
23	y	45	U
23	y	46	G7M
23	y	47	U
23	y	48	C
23	y	54	5MU
23	y	57	G
23	y	59	U
23	y	60	U
23	y	72	C
23	y	73	A
23	y	75	C
23	y	76	A
24	z	12	A
24	z	20	U
27	A	2	G
27	A	4	U
27	A	6	A
27	A	10	A
27	A	12	U
27	A	34	U
27	A	51	G
27	A	71	A
27	A	74	A
27	A	75	G
27	A	84	A
27	A	100	U

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Mol	Chain	Res	Type
27	A	101	A
27	A	103	A
27	A	118	A
27	A	120	U
27	A	139	U
27	A	142	A
27	A	163	C
27	A	164	C
27	A	165	A
27	A	181	A
27	A	196	A
27	A	199	A
27	A	215	G
27	A	216	A
27	A	222	A
27	A	233	A
27	A	248	G
27	A	269	C
27	A	271	G
27	A	272	A
27	A	275	C
27	A	278	A
27	A	281	C
27	A	285	G
27	A	311	A
27	A	329	G
27	A	330	A
27	A	362	A
27	A	367	G
27	A	386	G
27	A	396	G
27	A	404	A
27	A	411	G
27	A	412	A
27	A	428	A
27	A	481	G
27	A	491	G
27	A	505	A
27	A	509	C
27	A	512	G
27	A	530	G
27	A	532	A

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Mol	Chain	Res	Type
27	A	544	C
27	A	545	U
27	A	546	U
27	A	547	A
27	A	549	G
27	A	563	A
27	A	573	U
27	A	575	A
27	A	603	A
27	A	615	U
27	A	627	A
27	A	637	A
27	A	645	C
27	A	647	G
27	A	654	A
27	A	655	A
27	A	686	U
27	A	709	U
27	A	710	U
27	A	717	C
27	A	719	C
27	A	730	A
27	A	740	C
27	A	747	5MU
27	A	764	A
27	A	775	G
27	A	776	G
27	A	782	A
27	A	784	G
27	A	785	G
27	A	805	G
27	A	812	C
27	A	827	U
27	A	828	U
27	A	830	G
27	A	845	A
27	A	846	U
27	A	859	G
27	A	890	C
27	A	891	G
27	A	893	C
27	A	895	U

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Mol	Chain	Res	Type
27	A	896	A
27	A	897	C
27	A	900	A
27	A	910	A
27	A	915	C
27	A	927	A
27	A	946	C
27	A	961	C
27	A	974	G
27	A	983	A
27	A	990	A
27	A	996	A
27	A	1009	A
27	A	1012	U
27	A	1013	C
27	A	1022	G
27	A	1026	G
27	A	1032	A
27	A	1033	U
27	A	1039	A
27	A	1046	A
27	A	1047	G
27	A	1059	G
27	A	1060	U
27	A	1061	U
27	A	1062	G
27	A	1063	G
27	A	1064	C
27	A	1065	U
27	A	1066	U
27	A	1067	A
27	A	1068	G
27	A	1070	A
27	A	1071	G
27	A	1084	A
27	A	1085	A
27	A	1088	A
27	A	1090	A
27	A	1104	C
27	A	1106	G
27	A	1111	A
27	A	1112	G

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Mol	Chain	Res	Type
27	A	1132	U
27	A	1135	C
27	A	1142	A
27	A	1170	C
27	A	1212	G
27	A	1253	A
27	A	1255	U
27	A	1256	G
27	A	1271	G
27	A	1272	A
27	A	1273	U
27	A	1288	G
27	A	1300	G
27	A	1301	A
27	A	1329	U
27	A	1365	A
27	A	1379	U
27	A	1383	A
27	A	1395	A
27	A	1416	G
27	A	1428	C
27	A	1452	G
27	A	1482	G
27	A	1493	C
27	A	1508	A
27	A	1509	A
27	A	1510	G
27	A	1515	A
27	A	1524	G
27	A	1534	U
27	A	1535	A
27	A	1536	C
27	A	1537	G
27	A	1539	U
27	A	1554	U
27	A	1569	A
27	A	1578	U
27	A	1583	A
27	A	1584	U
27	A	1585	C
27	A	1606	C
27	A	1608	A

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Mol	Chain	Res	Type
27	A	1626	A
27	A	1647	U
27	A	1648	U
27	A	1674	G
27	A	1675	C
27	A	1676	A
27	A	1715	G
27	A	1729	U
27	A	1730	C
27	A	1732	C
27	A	1733	G
27	A	1738	G
27	A	1758	U
27	A	1764	C
27	A	1773	A
27	A	1800	C
27	A	1801	A
27	A	1808	A
27	A	1816	C
27	A	1829	A
27	A	1848	A
27	A	1858	A
27	A	1872	A
27	A	1906	G
27	A	1913	A
27	A	1914	C
27	A	1929	G
27	A	1930	G
27	A	1936	A
27	A	1937	A
27	A	1955	U
27	A	1963	U
27	A	1964	G
27	A	1967	C
27	A	1970	A
27	A	1971	U
27	A	1972	G
27	A	1991	U
27	A	1993	U
27	A	2021	C
27	A	2023	C
27	A	2031	A

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Mol	Chain	Res	Type
27	A	2033	A
27	A	2036	C
27	A	2043	C
27	A	2055	C
27	A	2056	G
27	A	2060	A
27	A	2061	G
27	A	2062	A
27	A	2069	G7M
27	A	2093	G
27	A	2108	A
27	A	2110	G
27	A	2111	U
27	A	2112	G
27	A	2113	U
27	A	2115	G
27	A	2116	G
27	A	2118	U
27	A	2119	A
27	A	2120	G
27	A	2131	U
27	A	2132	U
27	A	2133	G
27	A	2136	G
27	A	2138	G
27	A	2145	C
27	A	2146	C
27	A	2157	G
27	A	2159	G
27	A	2162	G
27	A	2167	U
27	A	2170	A
27	A	2172	U
27	A	2173	A
27	A	2179	C
27	A	2182	U
27	A	2189	U
27	A	2190	G
27	A	2192	U
27	A	2198	A
27	A	2203	U
27	A	2204	G

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Mol	Chain	Res	Type
27	A	2211	A
27	A	2225	A
27	A	2238	G
27	A	2239	G
27	A	2283	C
27	A	2287	A
27	A	2288	A
27	A	2305	U
27	A	2308	G
27	A	2309	A
27	A	2322	A
27	A	2325	G
27	A	2333	A
27	A	2335	A
27	A	2345	G
27	A	2350	C
27	A	2361	G
27	A	2383	G
27	A	2385	C
27	A	2396	G
27	A	2401	U
27	A	2402	U
27	A	2406	A
27	A	2425	A
27	A	2429	G
27	A	2441	U
27	A	2447	G
27	A	2448	A
27	A	2469	A
27	A	2470	G
27	A	2474	U
27	A	2475	C
27	A	2476	A
27	A	2492	U
27	A	2498	OMC
27	A	2502	G
27	A	2504	PSU
27	A	2505	G
27	A	2506	U
27	A	2518	A
27	A	2520	C
27	A	2529	G

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Mol	Chain	Res	Type
27	A	2539	C
27	A	2547	A
27	A	2566	A
27	A	2567	G
27	A	2573	C
27	A	2582	G
27	A	2602	A
27	A	2609	U
27	A	2613	U
27	A	2629	U
27	A	2646	C
27	A	2649	C
27	A	2689	U
27	A	2690	U
27	A	2714	G
27	A	2726	A
27	A	2733	A
27	A	2744	G
27	A	2746	U
27	A	2748	A
27	A	2749	A
27	A	2750	A
27	A	2757	A
27	A	2765	A
27	A	2778	A
27	A	2798	U
27	A	2800	A
27	A	2818	U
27	A	2820	A
27	A	2821	A
27	A	2849	U
27	A	2861	U
27	A	2873	A
27	A	2880	C
27	A	2884	U
27	A	2902	C
28	B	4	C
28	B	24	G
28	B	35	C
28	B	41	G
28	B	44	G
28	B	45	A

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Mol	Chain	Res	Type
28	B	56	G
28	B	67	G
28	B	89	U
28	B	91	C
28	B	109	A

All (18) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
27	A	3	U
27	A	271	G
27	A	277	G
27	A	784	G
27	A	1002	G
27	A	1026	G
27	A	1031	G
27	A	1111	A
27	A	1328	A
27	A	1583	A
27	A	1847	A
27	A	2189	U
27	A	2191	A
27	A	2473	U
27	A	2538	C
27	A	2756	U
28	B	3	C
28	B	66	A

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

52 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
27	5MU	A	1939	27	19,22,23	1.38	5 (26%)	27,32,35	2.16	6 (22%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	5MC	a	967	1	19,22,23	1.60	3 (15%)	26,32,35	1.11	2 (7%)
27	5MC	A	1962	27,60	19,22,23	1.49	3 (15%)	26,32,35	1.10	2 (7%)
22	PSU	x	39	22	18,21,22	1.36	2 (11%)	21,30,33	2.10	4 (19%)
22	PSU	x	55	22	18,21,22	1.38	2 (11%)	21,30,33	2.10	4 (19%)
1	2MG	a	1207	1	18,26,27	0.89	1 (5%)	16,38,41	1.31	3 (18%)
27	5MU	A	747	27	19,22,23	1.40	6 (31%)	27,32,35	2.08	6 (22%)
27	2MG	A	1835	27	18,26,27	0.88	1 (5%)	16,38,41	1.31	3 (18%)
1	PSU	a	516	1	18,21,22	1.38	2 (11%)	21,30,33	2.06	4 (19%)
27	PSU	A	1917	27	18,21,22	1.40	2 (11%)	21,30,33	2.00	4 (19%)
27	H2U	A	2449	27	18,21,22	1.15	3 (16%)	19,30,33	0.79	0
27	PSU	A	2457	27	18,21,22	1.38	3 (16%)	21,30,33	2.11	5 (23%)
27	OMU	A	2552	27	19,22,23	1.24	3 (15%)	25,31,34	1.84	5 (20%)
12	D2T	l	89	12	8,9,10	2.32	1 (12%)	6,11,13	2.49	2 (33%)
23	PSU	y	32	23	18,21,22	1.35	2 (11%)	21,30,33	2.04	5 (23%)
40	4D4	O	81	40	9,11,12	2.54	2 (22%)	7,13,15	0.95	1 (14%)
27	PSU	A	2580	27	18,21,22	1.42	3 (16%)	21,30,33	2.07	4 (19%)
22	PSU	x	32	22	18,21,22	1.38	3 (16%)	21,30,33	1.98	3 (14%)
23	G7M	y	46	23	20,26,27	2.64	4 (20%)	16,39,42	0.91	1 (6%)
23	PSU	y	39	23	18,21,22	1.37	2 (11%)	21,30,33	2.06	5 (23%)
1	MA6	a	1518	1	19,26,27	0.98	1 (5%)	18,38,41	2.25	7 (38%)
1	5MC	a	1407	1	19,22,23	1.54	3 (15%)	26,32,35	1.10	3 (11%)
27	1MG	A	745	27	19,26,27	0.90	1 (5%)	18,39,42	1.15	2 (11%)
27	PSU	A	2605	27	18,21,22	1.35	3 (16%)	21,30,33	2.06	4 (19%)
22	G7M	x	46	22	20,26,27	2.63	4 (20%)	16,39,42	0.96	1 (6%)
23	4SU	y	8	23	18,21,22	1.86	5 (27%)	25,30,33	2.43	5 (20%)
27	6MZ	A	1618	27	17,25,26	0.93	1 (5%)	15,36,39	2.25	4 (26%)
1	UR3	a	1498	1	19,22,23	0.94	0	26,32,35	1.73	3 (11%)
27	PSU	A	1911	27	18,21,22	1.40	2 (11%)	21,30,33	2.05	4 (19%)
22	4SU	x	8	22	18,21,22	1.90	4 (22%)	25,30,33	2.07	4 (16%)
23	5MU	y	54	23	19,22,23	1.40	5 (26%)	27,32,35	2.20	6 (22%)
1	2MG	a	966	1	18,26,27	0.88	1 (5%)	16,38,41	1.28	3 (18%)
27	PSU	A	2604	27	18,21,22	1.39	3 (16%)	21,30,33	2.01	4 (19%)
30	MEQ	D	150	30	8,9,10	0.51	0	5,10,12	0.14	0
27	G7M	A	2069	27	20,26,27	1.18	2 (10%)	16,39,42	0.63	0
22	5MU	x	54	22	19,22,23	1.34	4 (21%)	27,32,35	2.17	8 (29%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	2MG	a	1516	1	18,26,27	0.88	1 (5%)	16,38,41	1.44	4 (25%)
27	PSU	A	746	27,60	18,21,22	1.37	3 (16%)	21,30,33	2.01	4 (19%)
27	PSU	A	2504	27	18,21,22	1.39	2 (11%)	21,30,33	2.05	4 (19%)
1	G7M	a	527	1	20,26,27	1.20	2 (10%)	16,39,42	0.57	0
27	OMC	A	2498	27,60	19,22,23	0.80	0	25,31,34	0.90	1 (4%)
27	OMG	A	2251	27,60,22	19,26,27	0.88	1 (5%)	21,38,41	1.07	2 (9%)
27	6MZ	A	2030	27	17,25,26	0.91	1 (5%)	15,36,39	2.30	4 (26%)
27	3TD	A	1915	27,60	19,22,23	4.21	7 (36%)	23,32,35	1.81	3 (13%)
27	2MA	A	2503	27	17,25,26	1.03	1 (5%)	16,37,40	1.26	3 (18%)
11	IAS	k	119	11	6,7,8	0.95	0	3,8,10	1.51	1 (33%)
22	MIA	x	37	22	24,31,32	2.23	3 (12%)	22,44,47	2.50	7 (31%)
1	4OC	a	1402	60,1	20,23,24	0.75	0	25,32,35	0.96	1 (4%)
27	PSU	A	955	27	18,21,22	1.41	3 (16%)	21,30,33	2.03	3 (14%)
27	2MG	A	2445	27,60	18,26,27	0.88	1 (5%)	16,38,41	1.33	3 (18%)
1	MA6	a	1519	1	19,26,27	1.01	1 (5%)	18,38,41	2.33	7 (38%)
23	PSU	y	55	23	18,21,22	1.36	2 (11%)	21,30,33	2.06	3 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
27	5MU	A	1939	27	-	0/7/25/26	0/2/2/2
1	5MC	a	967	1	-	0/7/25/26	0/2/2/2
27	5MC	A	1962	27,60	-	0/7/25/26	0/2/2/2
22	PSU	x	39	22	-	0/7/25/26	0/2/2/2
22	PSU	x	55	22	-	3/7/25/26	0/2/2/2
1	2MG	a	1207	1	-	0/5/27/28	0/3/3/3
27	5MU	A	747	27	-	0/7/25/26	0/2/2/2
27	2MG	A	1835	27	-	0/5/27/28	0/3/3/3
1	PSU	a	516	1	-	0/7/25/26	0/2/2/2
27	PSU	A	1917	27	-	1/7/25/26	0/2/2/2
27	H2U	A	2449	27	-	0/7/38/39	0/2/2/2
27	PSU	A	2457	27	-	0/7/25/26	0/2/2/2
27	OMU	A	2552	27	-	0/9/27/28	0/2/2/2
12	D2T	l	89	12	-	1/7/12/14	-
23	PSU	y	32	23	-	0/7/25/26	0/2/2/2
40	4D4	O	81	40	-	7/11/12/14	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
27	PSU	A	2580	27	-	0/7/25/26	0/2/2/2
22	PSU	x	32	22	-	0/7/25/26	0/2/2/2
23	G7M	y	46	23	-	2/3/25/26	0/3/3/3
23	PSU	y	39	23	-	1/7/25/26	0/2/2/2
1	MA6	a	1518	1	-	1/7/29/30	0/3/3/3
1	5MC	a	1407	1	-	0/7/25/26	0/2/2/2
27	1MG	A	745	27	-	0/3/25/26	0/3/3/3
27	PSU	A	2605	27	-	0/7/25/26	0/2/2/2
22	G7M	x	46	22	-	0/3/25/26	0/3/3/3
23	4SU	y	8	23	-	0/7/25/26	0/2/2/2
27	6MZ	A	1618	27	-	0/5/27/28	0/3/3/3
1	UR3	a	1498	1	-	0/7/25/26	0/2/2/2
27	PSU	A	1911	27	-	0/7/25/26	0/2/2/2
22	4SU	x	8	22	-	0/7/25/26	0/2/2/2
23	5MU	y	54	23	-	2/7/25/26	0/2/2/2
1	2MG	a	966	1	-	2/5/27/28	0/3/3/3
27	PSU	A	2604	27	-	0/7/25/26	0/2/2/2
30	MEQ	D	150	30	-	2/8/9/11	-
27	G7M	A	2069	27	-	0/3/25/26	0/3/3/3
22	5MU	x	54	22	-	0/7/25/26	0/2/2/2
1	2MG	a	1516	1	-	0/5/27/28	0/3/3/3
27	PSU	A	746	27,60	-	4/7/25/26	0/2/2/2
27	PSU	A	2504	27	-	0/7/25/26	0/2/2/2
1	G7M	a	527	1	-	2/3/25/26	0/3/3/3
27	OMC	A	2498	27,60	-	2/9/27/28	0/2/2/2
27	OMG	A	2251	27,60,22	-	0/5/27/28	0/3/3/3
27	6MZ	A	2030	27	-	2/5/27/28	0/3/3/3
27	3TD	A	1915	27,60	-	0/7/25/26	0/2/2/2
27	2MA	A	2503	27	-	0/3/25/26	0/3/3/3
11	IAS	k	119	11	-	0/7/7/8	-
22	MIA	x	37	22	-	5/11/33/34	0/3/3/3
1	4OC	a	1402	60,1	-	3/9/29/30	0/2/2/2
27	PSU	A	955	27	-	0/7/25/26	0/2/2/2
27	2MG	A	2445	27,60	-	0/5/27/28	0/3/3/3
1	MA6	a	1519	1	-	4/7/29/30	0/3/3/3
23	PSU	y	55	23	-	3/7/25/26	0/2/2/2

All (120) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
27	A	1915	3TD	C6-C5	12.58	1.49	1.35
27	A	1915	3TD	C2-N1	9.69	1.49	1.37
23	y	46	G7M	C8-N9	7.55	1.47	1.33
22	x	46	G7M	C8-N9	7.44	1.46	1.33
22	x	37	MIA	C2-S10	-7.35	1.69	1.75
22	x	46	G7M	C8-N7	7.26	1.46	1.33
23	y	46	G7M	C8-N7	7.12	1.46	1.33
22	x	37	MIA	C13-C14	6.83	1.52	1.32
40	O	81	4D4	CZ-NE	6.24	1.45	1.33
12	l	89	D2T	CB-CA	-5.88	1.52	1.54
27	A	1915	3TD	C6-N1	5.86	1.45	1.36
1	a	967	5MC	C5-C4	5.75	1.48	1.44
1	a	1407	5MC	C5-C4	5.44	1.48	1.44
27	A	1962	5MC	C5-C4	5.26	1.48	1.44
23	y	8	4SU	C4-S4	-5.17	1.59	1.68
27	A	1915	3TD	C2-N3	4.97	1.49	1.38
22	x	8	4SU	C4-S4	-4.94	1.60	1.68
23	y	46	G7M	C5-C4	4.33	1.47	1.39
22	x	46	G7M	C5-C4	4.15	1.47	1.39
22	x	8	4SU	C4-N3	-3.78	1.33	1.37
1	a	527	G7M	C5-C4	3.62	1.46	1.39
27	A	2069	G7M	C5-C4	3.46	1.46	1.39
23	y	8	4SU	C4-N3	-3.43	1.34	1.37
23	y	55	PSU	C6-C5	3.38	1.39	1.35
23	y	32	PSU	C6-C5	3.38	1.39	1.35
23	y	39	PSU	C6-C5	3.35	1.39	1.35
27	A	1917	PSU	C6-C5	3.32	1.39	1.35
27	A	1911	PSU	C6-C5	3.30	1.38	1.35
22	x	55	PSU	C6-C5	3.24	1.38	1.35
27	A	955	PSU	C6-C5	3.20	1.38	1.35
27	A	2504	PSU	C6-C5	3.14	1.38	1.35
22	x	39	PSU	C6-C5	3.11	1.38	1.35
22	x	32	PSU	C6-C5	3.09	1.38	1.35
27	A	2580	PSU	C6-C5	3.08	1.38	1.35
40	O	81	4D4	CZ-NH1	3.06	1.45	1.34
27	A	746	PSU	C6-C5	3.06	1.38	1.35
27	A	2604	PSU	C6-C5	3.05	1.38	1.35
1	a	516	PSU	C6-C5	3.05	1.38	1.35
27	A	2449	H2U	C2-N3	-2.98	1.32	1.38
27	A	2457	PSU	C6-C5	2.86	1.38	1.35
22	x	8	4SU	C5-C4	-2.86	1.39	1.42
27	A	2552	OMU	C4-N3	-2.83	1.33	1.38
27	A	2604	PSU	C4-N3	-2.82	1.33	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
27	A	2605	PSU	C6-C5	2.81	1.38	1.35
27	A	955	PSU	C4-N3	-2.78	1.33	1.38
27	A	746	PSU	C4-N3	-2.78	1.33	1.38
27	A	2504	PSU	C4-N3	-2.78	1.33	1.38
27	A	2457	PSU	C4-N3	-2.76	1.33	1.38
27	A	2605	PSU	C4-N3	-2.75	1.33	1.38
22	x	32	PSU	C4-N3	-2.75	1.33	1.38
23	y	54	5MU	C6-C5	2.75	1.39	1.34
27	A	747	5MU	C6-C5	2.75	1.39	1.34
27	A	1915	3TD	C4-N3	2.74	1.46	1.40
1	a	967	5MC	C6-C5	2.74	1.39	1.34
27	A	747	5MU	C4-N3	-2.73	1.33	1.38
27	A	1911	PSU	C4-N3	-2.72	1.33	1.38
27	A	1939	5MU	C4-N3	-2.70	1.33	1.38
27	A	2580	PSU	C4-N3	-2.70	1.33	1.38
22	x	55	PSU	C4-N3	-2.69	1.33	1.38
27	A	1917	PSU	C4-N3	-2.68	1.33	1.38
22	x	39	PSU	C4-N3	-2.68	1.33	1.38
1	a	516	PSU	C4-N3	-2.67	1.33	1.38
27	A	2449	H2U	C4-N3	-2.66	1.33	1.37
23	y	8	4SU	C5-C4	-2.65	1.39	1.42
1	a	1407	5MC	C6-C5	2.64	1.38	1.34
23	y	39	PSU	C4-N3	-2.61	1.34	1.38
27	A	1962	5MC	C6-C5	2.61	1.38	1.34
27	A	1915	3TD	O2-C2	-2.60	1.18	1.23
27	A	1939	5MU	C6-C5	2.58	1.38	1.34
22	x	54	5MU	C4-N3	-2.57	1.34	1.38
23	y	55	PSU	C4-N3	-2.56	1.34	1.38
23	y	32	PSU	C4-N3	-2.55	1.34	1.38
27	A	1835	2MG	C6-N1	-2.51	1.34	1.37
23	y	54	5MU	C4-N3	-2.51	1.34	1.38
1	a	966	2MG	C6-N1	-2.50	1.34	1.37
22	x	54	5MU	C6-C5	2.48	1.38	1.34
1	a	1207	2MG	C6-N1	-2.47	1.34	1.37
1	a	1519	MA6	C6-C5	2.45	1.48	1.44
27	A	2445	2MG	C6-N1	-2.45	1.34	1.37
22	x	8	4SU	C2-N3	-2.43	1.33	1.38
27	A	1939	5MU	C6-N1	-2.41	1.33	1.38
23	y	54	5MU	C4-C5	2.40	1.48	1.44
27	A	2069	G7M	C6-N1	-2.40	1.34	1.37
27	A	2251	OMG	C6-N1	-2.39	1.34	1.37
27	A	2552	OMU	C2-N3	-2.39	1.33	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
22	x	54	5MU	C6-N1	-2.39	1.33	1.38
27	A	2030	6MZ	C6-C5	2.38	1.48	1.44
1	a	527	G7M	C6-N1	-2.38	1.34	1.37
27	A	747	5MU	C6-N1	-2.36	1.34	1.38
27	A	1618	6MZ	C6-C5	2.35	1.48	1.44
23	y	54	5MU	C6-N1	-2.33	1.34	1.38
27	A	2449	H2U	C2-N1	-2.32	1.32	1.35
1	a	1407	5MC	C6-N1	-2.31	1.34	1.38
27	A	1962	5MC	C6-N1	-2.30	1.34	1.38
1	a	1516	2MG	C6-N1	-2.30	1.34	1.37
27	A	745	1MG	C2-N1	2.28	1.41	1.37
1	a	967	5MC	C6-N1	-2.27	1.34	1.38
23	y	46	G7M	C6-N1	-2.23	1.34	1.37
27	A	2580	PSU	O4'-C1'	-2.23	1.40	1.43
22	x	46	G7M	C6-N1	-2.22	1.34	1.37
27	A	1939	5MU	C2-N3	-2.22	1.34	1.38
23	y	54	5MU	C2-N1	2.22	1.41	1.38
27	A	1939	5MU	C4-C5	2.21	1.48	1.44
1	a	1518	MA6	C6-C5	2.20	1.48	1.44
27	A	747	5MU	C2-N3	-2.18	1.34	1.38
22	x	54	5MU	C2-N1	2.18	1.41	1.38
22	x	37	MIA	C6-C5	2.15	1.48	1.44
27	A	1915	3TD	O4-C4	-2.14	1.18	1.23
27	A	747	5MU	C4-C5	2.14	1.48	1.44
23	y	8	4SU	C2-N3	-2.13	1.34	1.38
27	A	955	PSU	C2-N3	-2.11	1.34	1.37
27	A	746	PSU	C2-N3	-2.09	1.34	1.37
27	A	2604	PSU	C2-N3	-2.07	1.34	1.37
27	A	2552	OMU	C5-C4	-2.06	1.39	1.43
23	y	8	4SU	C2-N1	2.05	1.41	1.38
27	A	2605	PSU	C2-N3	-2.05	1.34	1.37
22	x	32	PSU	C2-N3	-2.05	1.34	1.37
27	A	2457	PSU	C2-N3	-2.05	1.34	1.37
27	A	2503	2MA	C6-N6	2.03	1.35	1.27
27	A	747	5MU	C2-N1	2.01	1.41	1.38

All (177) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
22	x	37	MIA	C12-C13-C14	-8.54	111.67	127.01
23	y	8	4SU	C4-N3-C2	-7.58	120.05	127.31
1	a	1498	UR3	C4-N3-C2	-6.93	119.00	124.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
27	A	1618	6MZ	C2-N1-C6	6.57	121.70	116.60
27	A	2457	PSU	N1-C2-N3	6.55	122.08	115.17
22	x	55	PSU	N1-C2-N3	6.54	122.06	115.17
22	x	39	PSU	N1-C2-N3	6.50	122.03	115.17
27	A	955	PSU	N1-C2-N3	6.43	121.95	115.17
27	A	1911	PSU	N1-C2-N3	6.41	121.93	115.17
27	A	746	PSU	N1-C2-N3	6.41	121.93	115.17
27	A	2580	PSU	N1-C2-N3	6.41	121.93	115.17
27	A	2504	PSU	N1-C2-N3	6.39	121.91	115.17
27	A	2030	6MZ	C2-N1-C6	6.39	121.56	116.60
23	y	55	PSU	N1-C2-N3	6.38	121.89	115.17
23	y	39	PSU	N1-C2-N3	6.37	121.89	115.17
27	A	1917	PSU	N1-C2-N3	6.32	121.84	115.17
23	y	32	PSU	N1-C2-N3	6.31	121.83	115.17
1	a	516	PSU	N1-C2-N3	6.30	121.81	115.17
27	A	2604	PSU	N1-C2-N3	6.28	121.79	115.17
27	A	2605	PSU	N1-C2-N3	6.24	121.75	115.17
23	y	8	4SU	C5-C4-N3	6.22	120.53	114.75
22	x	32	PSU	N1-C2-N3	6.17	121.67	115.17
22	x	8	4SU	C4-N3-C2	-6.00	121.56	127.31
27	A	1915	3TD	N1-C2-N3	5.76	120.31	116.13
22	x	8	4SU	C5-C4-N3	5.54	119.91	114.75
23	y	54	5MU	C4-N3-C2	-5.48	120.15	127.34
27	A	1939	5MU	C4-N3-C2	-5.33	120.35	127.34
23	y	54	5MU	N3-C2-N1	5.21	121.68	114.89
1	a	1519	MA6	C2-N1-C6	5.13	121.87	116.84
22	x	54	5MU	C4-N3-C2	-5.11	120.64	127.34
27	A	747	5MU	N3-C2-N1	5.08	121.51	114.89
27	A	747	5MU	C4-N3-C2	-5.07	120.69	127.34
27	A	1939	5MU	N3-C2-N1	5.04	121.45	114.89
27	A	2552	OMU	C4-N3-C2	-5.00	120.41	126.61
1	a	1518	MA6	C2-N1-C6	4.88	121.63	116.84
22	x	54	5MU	N3-C2-N1	4.79	121.12	114.89
22	x	54	5MU	O4-C4-C5	-4.62	119.63	124.92
27	A	1939	5MU	C5-C4-N3	4.56	119.28	115.32
22	x	54	5MU	C5-C4-N3	4.56	119.28	115.32
23	y	54	5MU	C5-C4-N3	4.53	119.26	115.32
23	y	8	4SU	N3-C2-N1	4.48	120.72	114.89
27	A	2552	OMU	N3-C2-N1	4.44	120.67	114.89
22	x	39	PSU	C4-N3-C2	-4.32	120.42	126.37
27	A	2605	PSU	C4-N3-C2	-4.32	120.42	126.37
27	A	747	5MU	C5-C4-N3	4.31	119.07	115.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
12	l	89	D2T	CB1-SB-CB	4.29	110.07	102.36
27	A	1915	3TD	C4-N3-C2	-4.25	120.11	124.61
27	A	746	PSU	C4-N3-C2	-4.24	120.53	126.37
27	A	2457	PSU	C4-N3-C2	-4.23	120.54	126.37
23	y	39	PSU	C4-N3-C2	-4.21	120.58	126.37
27	A	2504	PSU	C4-N3-C2	-4.14	120.66	126.37
23	y	8	4SU	C5-C4-S4	-4.13	119.58	124.31
27	A	1911	PSU	C4-N3-C2	-4.11	120.71	126.37
22	x	55	PSU	O2-C2-N1	-4.10	118.56	122.79
23	y	55	PSU	C4-N3-C2	-4.09	120.73	126.37
1	a	516	PSU	C4-N3-C2	-4.09	120.74	126.37
23	y	32	PSU	C4-N3-C2	-4.09	120.74	126.37
1	a	1518	MA6	N1-C6-N6	4.08	121.55	116.83
22	x	55	PSU	C4-N3-C2	-4.08	120.75	126.37
27	A	747	5MU	O4-C4-C5	-4.07	120.26	124.92
23	y	54	5MU	O4-C4-C5	-4.07	120.26	124.92
27	A	2580	PSU	C4-N3-C2	-4.04	120.81	126.37
27	A	1939	5MU	O4-C4-C5	-4.02	120.32	124.92
27	A	955	PSU	C4-N3-C2	-4.00	120.86	126.37
27	A	2604	PSU	C4-N3-C2	-4.00	120.86	126.37
22	x	32	PSU	C4-N3-C2	-3.95	120.93	126.37
22	x	37	MIA	C16-C14-C13	-3.92	110.90	122.66
1	a	1519	MA6	C10-N6-C6	-3.90	108.64	119.40
27	A	2552	OMU	C5-C4-N3	3.90	120.26	114.80
27	A	1939	5MU	C5-C6-N1	-3.88	119.10	123.31
1	a	516	PSU	O2-C2-N1	-3.80	118.87	122.79
27	A	2457	PSU	O2-C2-N1	-3.80	118.87	122.79
27	A	1917	PSU	C4-N3-C2	-3.77	121.17	126.37
23	y	32	PSU	O2-C2-N1	-3.75	118.92	122.79
23	y	55	PSU	O2-C2-N1	-3.75	118.92	122.79
27	A	1917	PSU	O2-C2-N1	-3.73	118.94	122.79
22	x	8	4SU	N3-C2-N1	3.73	119.74	114.89
27	A	1618	6MZ	N3-C2-N1	-3.72	123.62	128.67
27	A	2030	6MZ	C9-N6-C6	-3.71	119.41	122.85
22	x	37	MIA	C15-C14-C13	-3.71	111.52	122.66
1	a	1518	MA6	C10-N6-C6	-3.70	109.18	119.40
22	x	39	PSU	O2-C2-N1	-3.70	118.97	122.79
27	A	2504	PSU	O2-C2-N1	-3.70	118.98	122.79
1	a	1519	MA6	N3-C2-N1	-3.69	123.67	128.67
22	x	37	MIA	C11-S10-C2	-3.68	99.49	102.25
1	a	1519	MA6	C9-N6-C6	-3.68	109.25	119.40
27	A	2580	PSU	O2-C2-N1	-3.68	119.00	122.79

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	y	54	5MU	C5-C6-N1	-3.67	119.33	123.31
27	A	1911	PSU	O2-C2-N1	-3.66	119.02	122.79
23	y	39	PSU	O2-C2-N1	-3.61	119.06	122.79
27	A	2030	6MZ	N3-C2-N1	-3.58	123.82	128.67
27	A	2605	PSU	O2-C2-N1	-3.57	119.10	122.79
1	a	1518	MA6	N3-C2-N1	-3.56	123.84	128.67
27	A	2604	PSU	O2-C2-N1	-3.56	119.12	122.79
22	x	8	4SU	C5-C4-S4	-3.52	120.28	124.31
27	A	747	5MU	C5-C6-N1	-3.47	119.55	123.31
22	x	32	PSU	O2-C2-N1	-3.45	119.23	122.79
1	a	1518	MA6	C9-N6-C6	-3.42	109.98	119.40
27	A	746	PSU	O2-C2-N1	-3.41	119.27	122.79
1	a	967	5MC	C5-C6-N1	-3.36	119.67	123.31
27	A	955	PSU	O2-C2-N1	-3.35	119.33	122.79
12	l	89	D2T	OD2-CG-CB	3.24	120.16	113.15
1	a	1498	UR3	C5-C4-N3	3.22	119.28	115.04
27	A	1962	5MC	C5-C6-N1	-3.18	119.86	123.31
22	x	54	5MU	C5-C6-N1	-3.13	119.91	123.31
1	a	1407	5MC	C5-C6-N1	-3.11	119.94	123.31
1	a	1519	MA6	N1-C6-N6	3.10	120.41	116.83
27	A	1618	6MZ	C9-N6-C6	-2.98	120.08	122.85
27	A	2552	OMU	O4-C4-C5	-2.98	120.02	125.16
27	A	2445	2MG	C8-N7-C5	2.93	107.54	102.55
1	a	1516	2MG	C8-N7-C5	2.90	107.49	102.55
27	A	2503	2MA	C8-N7-C5	2.88	107.45	102.55
1	a	1519	MA6	C4-C5-N7	-2.88	106.29	109.34
27	A	2030	6MZ	C4-C5-N7	-2.87	106.30	109.34
27	A	745	1MG	C8-N7-C5	2.86	107.43	102.55
23	y	54	5MU	O2-C2-N1	-2.86	119.07	122.80
1	a	1207	2MG	C8-N7-C5	2.85	107.41	102.55
27	A	2251	OMG	C8-N7-C5	2.84	107.38	102.55
27	A	1939	5MU	O2-C2-N1	-2.83	119.11	122.80
1	a	1407	5MC	C5-C4-N3	-2.79	118.89	121.75
27	A	2503	2MA	C4-N3-C2	-2.79	121.16	123.30
1	a	966	2MG	C8-N7-C5	2.78	107.28	102.55
27	A	1835	2MG	C8-N7-C5	2.76	107.24	102.55
27	A	1618	6MZ	C4-C5-N7	-2.71	106.47	109.34
1	a	967	5MC	C5-C4-N3	-2.70	118.98	121.75
1	a	1519	MA6	C10-N6-C9	-2.68	107.58	116.18
27	A	1962	5MC	C5-C4-N3	-2.68	119.01	121.75
1	a	1516	2MG	N1-C2-N2	2.64	119.25	116.56
22	x	46	G7M	CN7-N7-C8	-2.63	112.77	125.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	y	46	G7M	CN7-N7-C8	-2.62	112.84	125.43
11	k	119	IAS	OD1-CG-CB	-2.51	118.08	125.38
27	A	747	5MU	O2-C2-N1	-2.49	119.56	122.80
22	x	37	MIA	C4-C5-N7	-2.48	106.72	109.34
27	A	2552	OMU	O2-C2-N1	-2.46	119.60	122.80
27	A	745	1MG	C5-C6-N1	2.44	117.48	113.96
23	y	8	4SU	O2-C2-N1	-2.43	119.63	122.80
27	A	2580	PSU	O4'-C1'-C2'	2.39	108.46	105.15
22	x	54	5MU	C1'-N1-C2	2.38	121.86	117.59
22	x	37	MIA	C2-N1-C6	2.38	121.64	117.42
1	a	1518	MA6	C4-C5-N7	-2.37	106.83	109.34
1	a	516	PSU	O4'-C1'-C2'	2.34	108.39	105.15
27	A	1915	3TD	C6-C5-C4	2.30	119.74	118.19
1	a	1402	4OC	C6-C5-C4	2.28	119.75	117.00
22	x	54	5MU	C1'-N1-C6	-2.27	117.41	121.15
27	A	2457	PSU	O4'-C1'-C2'	2.27	108.30	105.15
27	A	2498	OMC	O2-C2-N3	-2.26	118.76	122.33
22	x	37	MIA	N3-C2-N1	-2.26	122.89	127.03
22	x	54	5MU	O2-C2-N1	-2.25	119.87	122.80
22	x	39	PSU	C5-C6-N1	-2.23	119.05	122.14
1	a	1518	MA6	C10-N6-C9	-2.21	109.09	116.18
27	A	746	PSU	C5-C6-N1	-2.18	119.11	122.14
27	A	2445	2MG	N1-C2-N2	2.15	118.76	116.56
23	y	39	PSU	C5-C6-N1	-2.14	119.17	122.14
1	a	1516	2MG	N2-C2-N3	-2.12	117.81	120.51
27	A	1835	2MG	C5-C6-N1	2.12	118.11	114.07
1	a	1207	2MG	N1-C2-N2	2.11	118.72	116.56
27	A	2251	OMG	C5-C6-N1	2.11	118.10	114.07
27	A	2504	PSU	C5-C6-N1	-2.11	119.21	122.14
27	A	2445	2MG	C5-C6-N1	2.10	118.08	114.07
1	a	1516	2MG	C5-C6-N1	2.10	118.08	114.07
27	A	2503	2MA	C5-C6-N1	2.10	118.03	114.12
1	a	1207	2MG	C5-C6-N1	2.09	118.06	114.07
27	A	1835	2MG	N1-C2-N2	2.09	118.69	116.56
1	a	966	2MG	CM2-N2-C2	-2.09	119.16	123.65
23	y	32	PSU	O4'-C1'-C2'	2.08	108.03	105.15
1	a	966	2MG	C5-C6-N1	2.06	118.00	114.07
1	a	1498	UR3	C3U-N3-C4	2.06	120.72	117.87
27	A	2605	PSU	O4'-C1'-C2'	2.05	107.99	105.15
40	O	81	4D4	O-C-CA	-2.05	119.50	124.77
27	A	1917	PSU	O4'-C1'-C2'	2.04	107.98	105.15
27	A	2604	PSU	C5-C6-N1	-2.04	119.31	122.14

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
23	y	32	PSU	C5-C6-N1	-2.04	119.31	122.14
27	A	1911	PSU	C5-C6-N1	-2.03	119.32	122.14
27	A	2457	PSU	C5-C6-N1	-2.01	119.35	122.14
22	x	55	PSU	C5-C6-N1	-2.01	119.35	122.14
23	y	39	PSU	O4'-C1'-C2'	2.01	107.93	105.15
1	a	1407	5MC	O2-C2-N3	-2.00	119.17	122.33

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	a	966	2MG	N1-C2-N2-CM2
1	a	966	2MG	N3-C2-N2-CM2
1	a	1519	MA6	O4'-C4'-C5'-O5'
1	a	1519	MA6	C5-C6-N6-C9
22	x	37	MIA	N6-C12-C13-C14
22	x	37	MIA	C12-C13-C14-C15
22	x	37	MIA	C12-C13-C14-C16
40	O	81	4D4	C-CA-CB-OB
40	O	81	4D4	C-CA-CB-CG
40	O	81	4D4	N-CA-CB-OB
40	O	81	4D4	N-CA-CB-CG
40	O	81	4D4	OB-CB-CG-CD
23	y	46	G7M	C4'-C5'-O5'-P
23	y	54	5MU	C3'-C4'-C5'-O5'
23	y	54	5MU	O4'-C4'-C5'-O5'
23	y	55	PSU	C2'-C1'-C5-C4
27	A	746	PSU	C2'-C1'-C5-C4
27	A	746	PSU	O4'-C1'-C5-C4
27	A	746	PSU	C2'-C1'-C5-C6
1	a	527	G7M	O4'-C4'-C5'-O5'
1	a	527	G7M	C3'-C4'-C5'-O5'
1	a	1402	4OC	O4'-C4'-C5'-O5'
22	x	37	MIA	O4'-C4'-C5'-O5'
22	x	37	MIA	C3'-C4'-C5'-O5'
1	a	1519	MA6	N1-C6-N6-C9
1	a	1519	MA6	C3'-C4'-C5'-O5'
30	D	150	MEQ	NE2-CD-CG-CB
30	D	150	MEQ	OE1-CD-CG-CB
22	x	55	PSU	C3'-C4'-C5'-O5'
22	x	55	PSU	O4'-C4'-C5'-O5'
27	A	2030	6MZ	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
22	x	55	PSU	C4'-C5'-O5'-P
1	a	1402	4OC	C3'-C4'-C5'-O5'
23	y	46	G7M	C3'-C4'-C5'-O5'
12	l	89	D2T	CG-CB-SB-CB1
27	A	2030	6MZ	C3'-C4'-C5'-O5'
40	O	81	4D4	CA-CB-CG-CD
27	A	2498	OMC	O4'-C4'-C5'-O5'
1	a	1402	4OC	C3'-C2'-O2'-CM2
27	A	2498	OMC	C3'-C2'-O2'-CM2
23	y	39	PSU	O4'-C1'-C5-C4
23	y	55	PSU	O4'-C1'-C5-C4
23	y	55	PSU	C4'-C5'-O5'-P
27	A	746	PSU	O4'-C1'-C5-C6
27	A	1917	PSU	C3'-C4'-C5'-O5'
1	a	1518	MA6	N1-C6-N6-C9
40	O	81	4D4	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 583 ligands modelled in this entry, 583 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

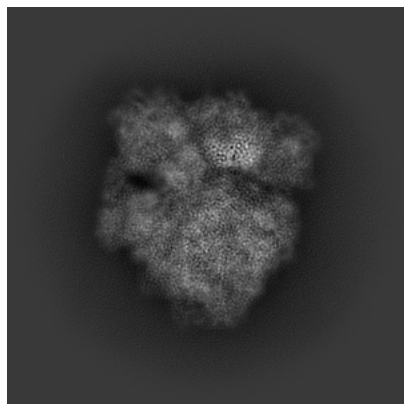
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29620. These allow visual inspection of the internal detail of the map and identification of artifacts.

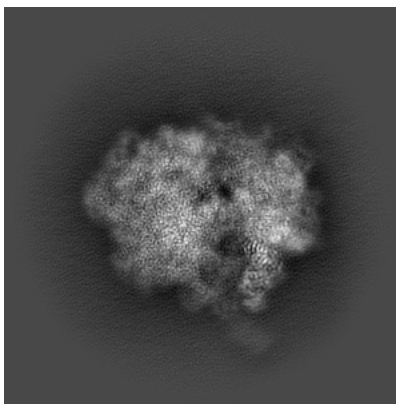
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

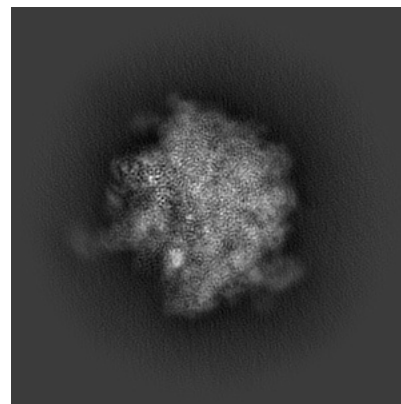
6.1.1 Primary map



X

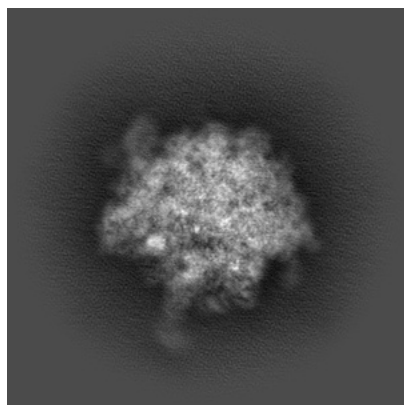


Y

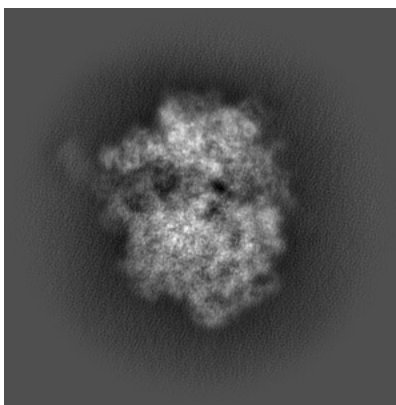


Z

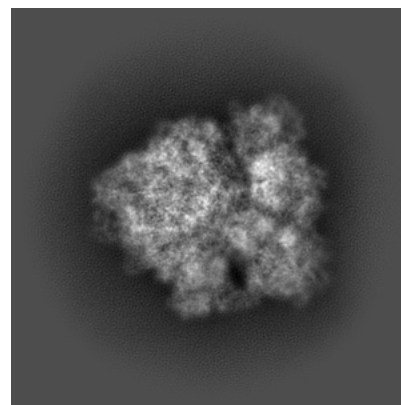
6.1.2 Raw map



X



Y

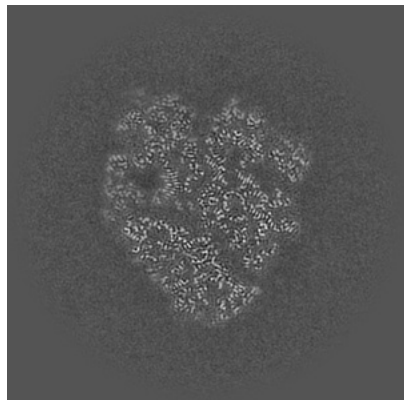


Z

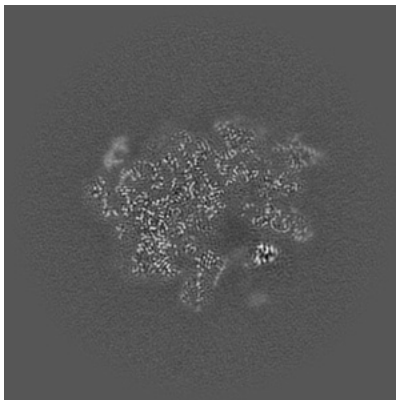
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

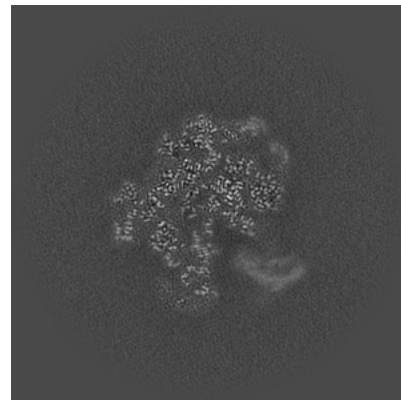
6.2.1 Primary map



X Index: 256

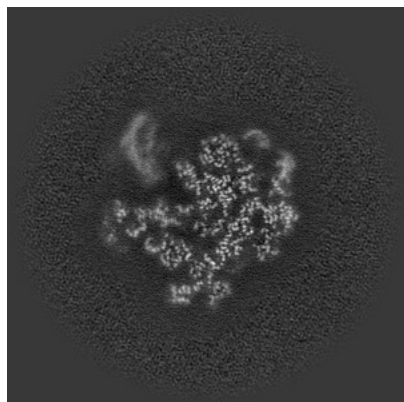


Y Index: 256

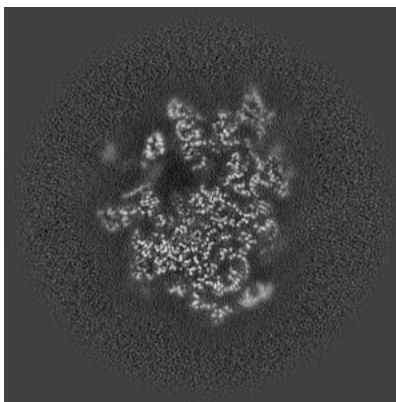


Z Index: 256

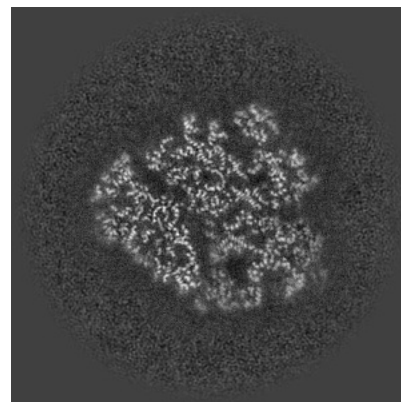
6.2.2 Raw map



X Index: 256



Y Index: 256

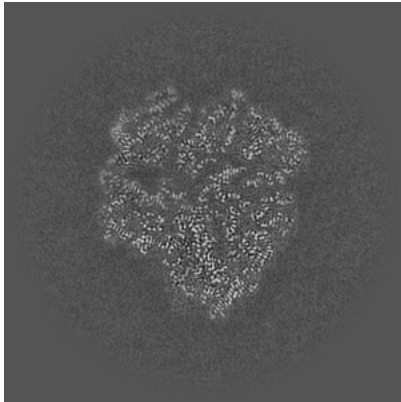


Z Index: 256

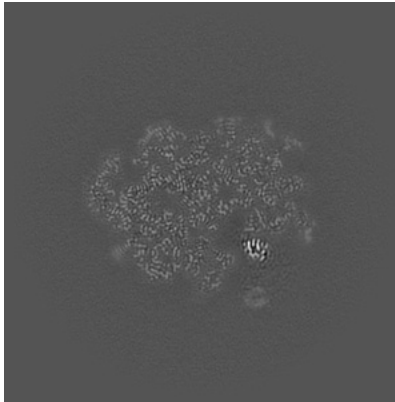
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

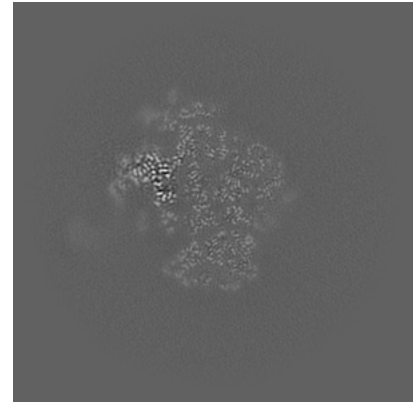
6.3.1 Primary map



X Index: 246

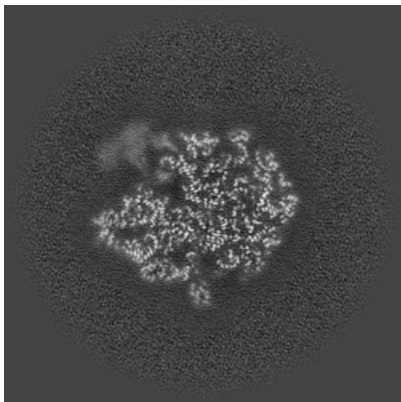


Y Index: 272

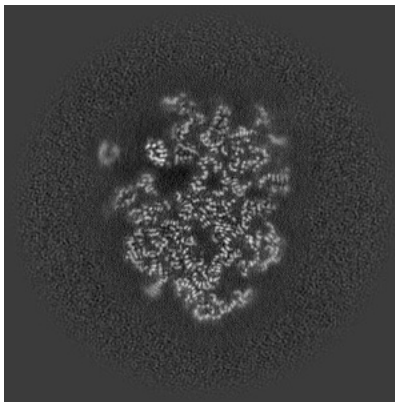


Z Index: 328

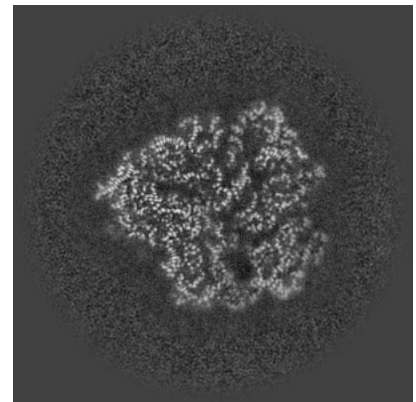
6.3.2 Raw map



X Index: 231



Y Index: 272

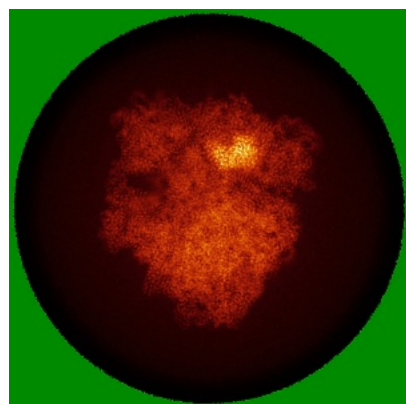


Z Index: 247

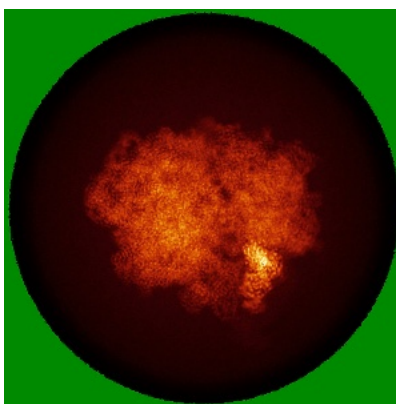
The images above show the largest variance slices of the map in three orthogonal directions.

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

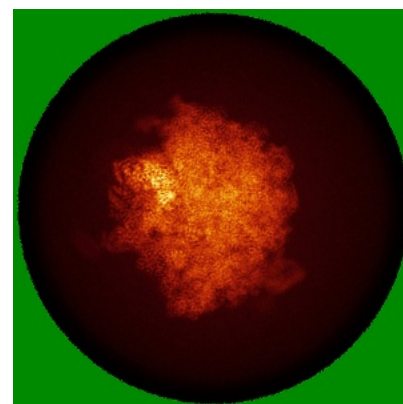
6.4.1 Primary map



X

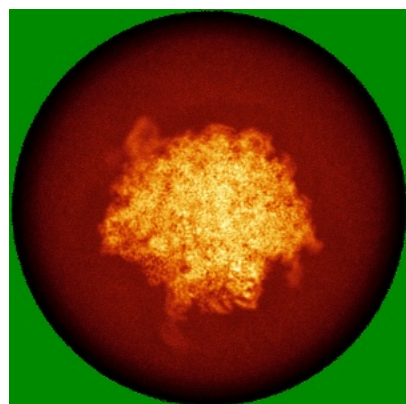


Y

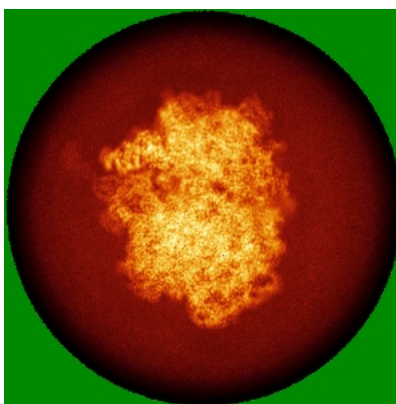


Z

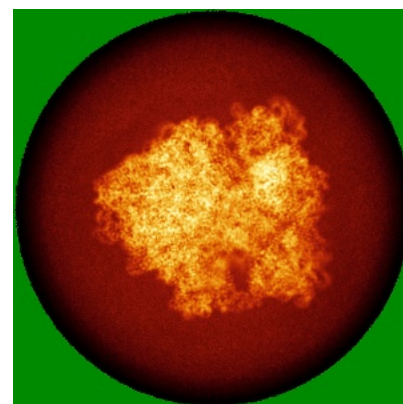
6.4.2 Raw map



X



Y

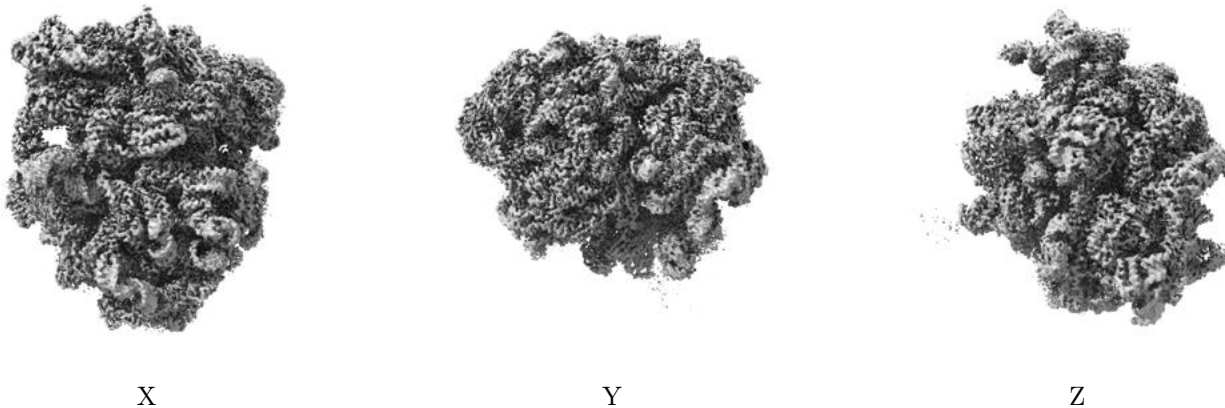


Z

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



The images above show the 3D surface view of the map at the recommended contour level 3.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

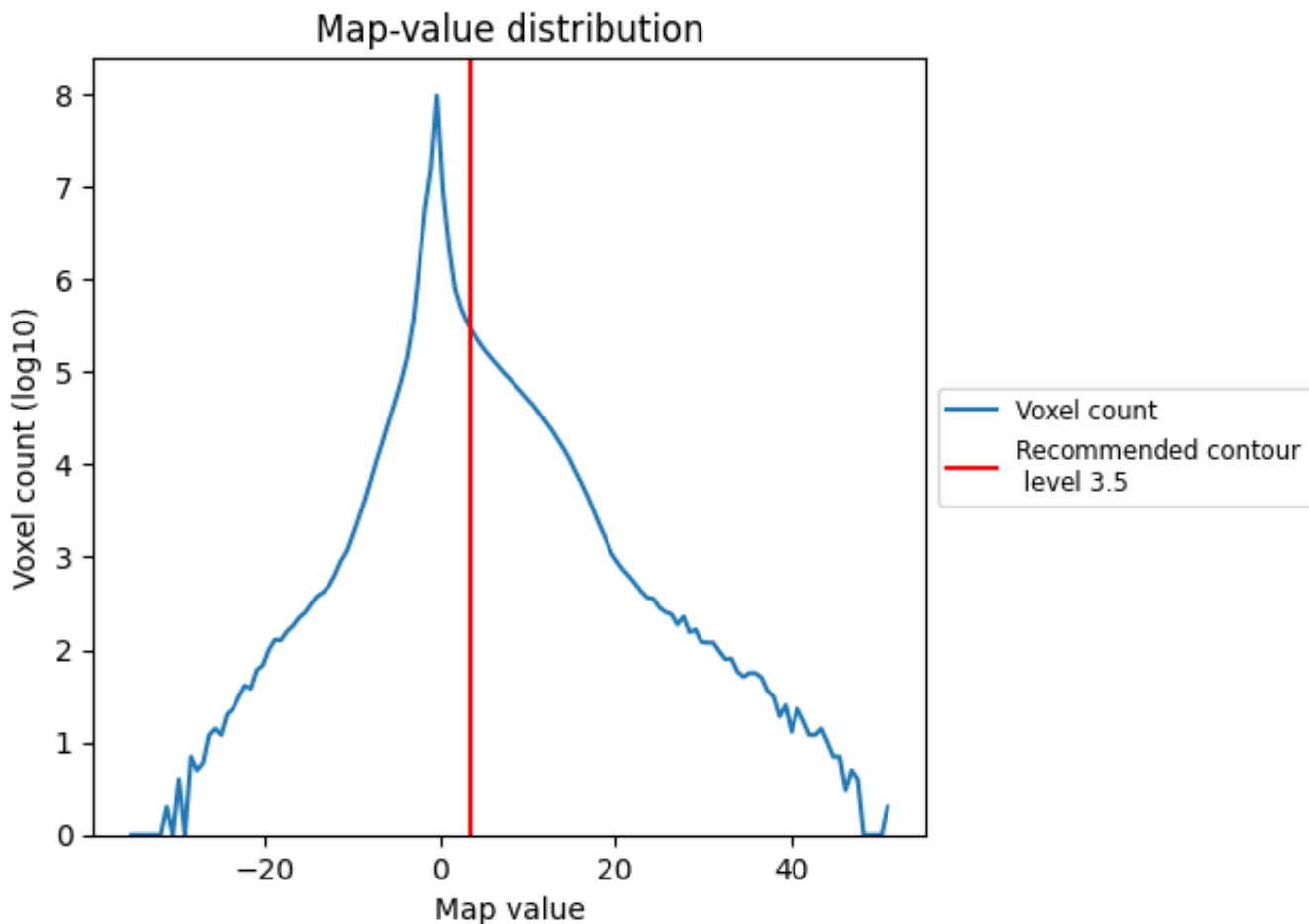
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

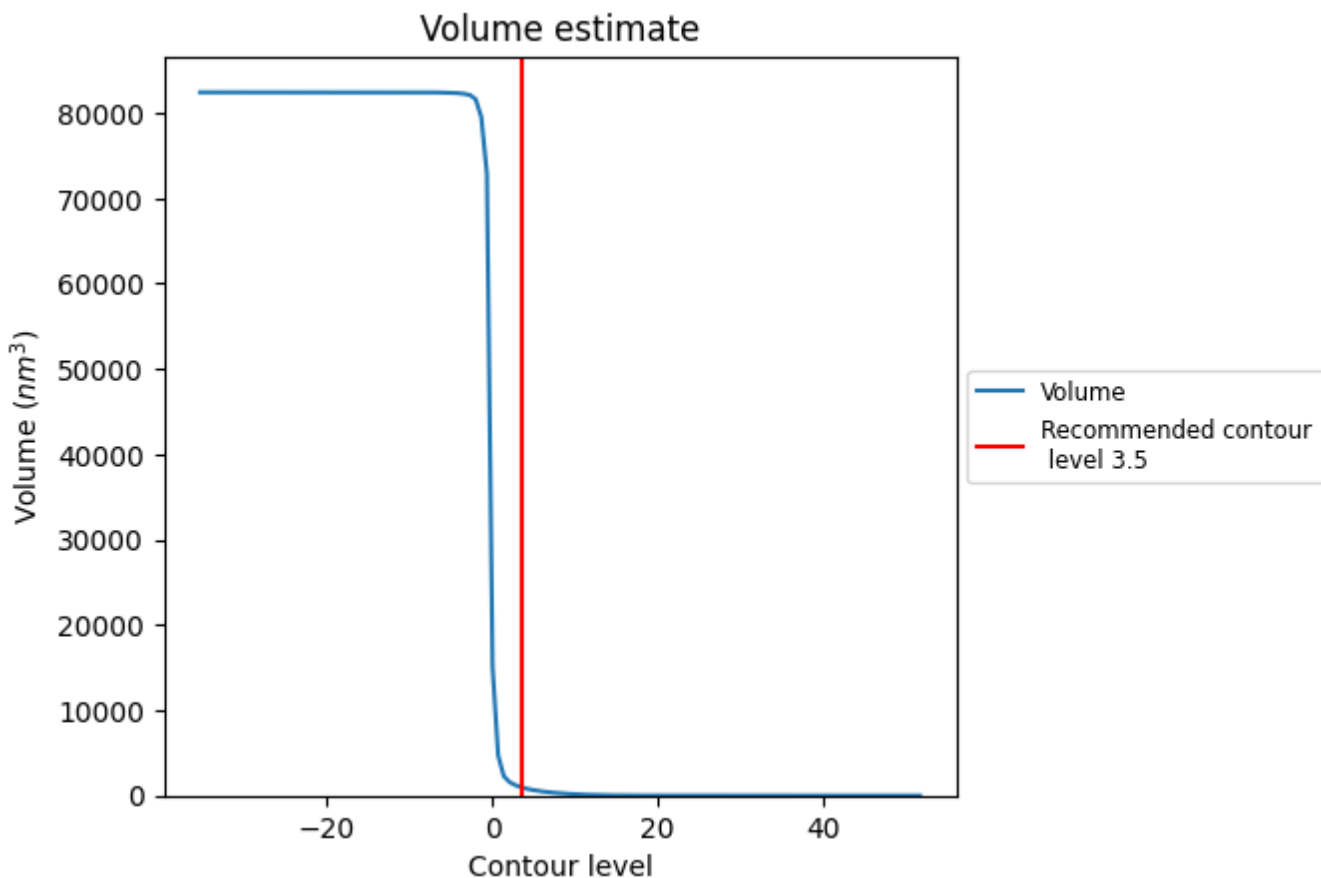
This section contains the results of statistical analysis of the map.

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.

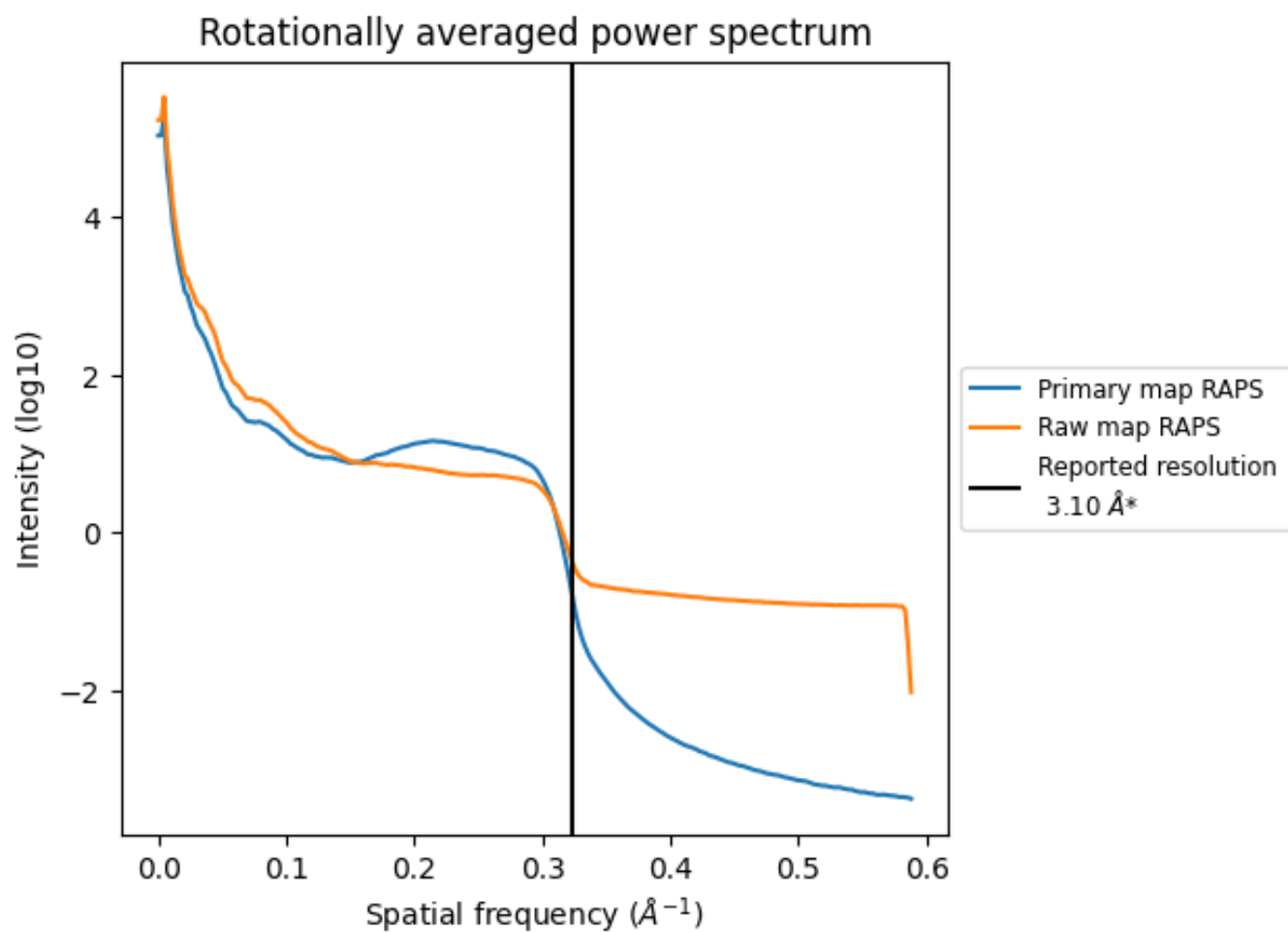
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 983 nm³; this corresponds to an approximate mass of 888 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](#)

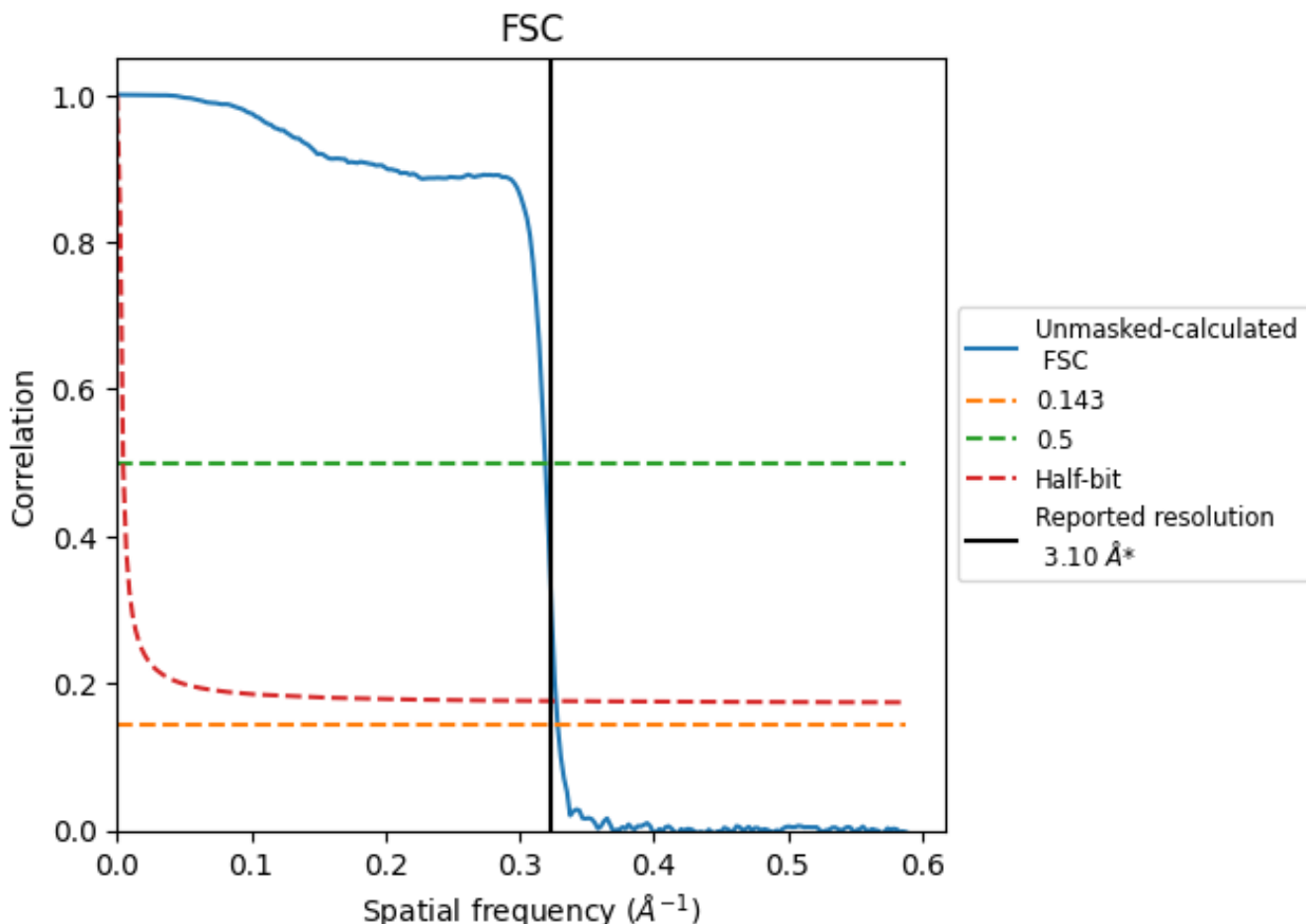


*Reported resolution corresponds to spatial frequency of 0.323 Å⁻¹

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 0.323 Å⁻¹

8.2 Resolution estimates [i](#)

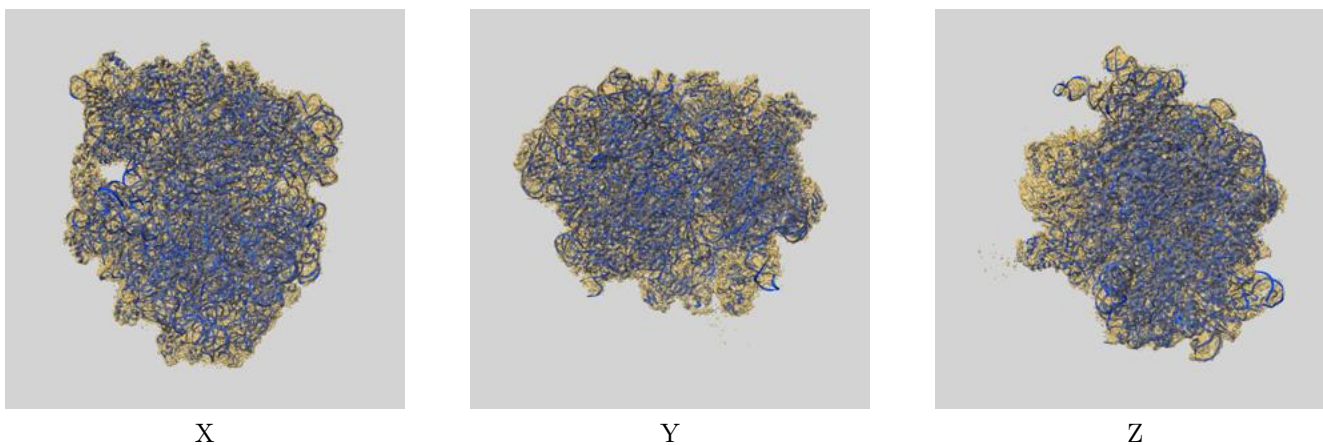
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.04	3.13	3.06

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

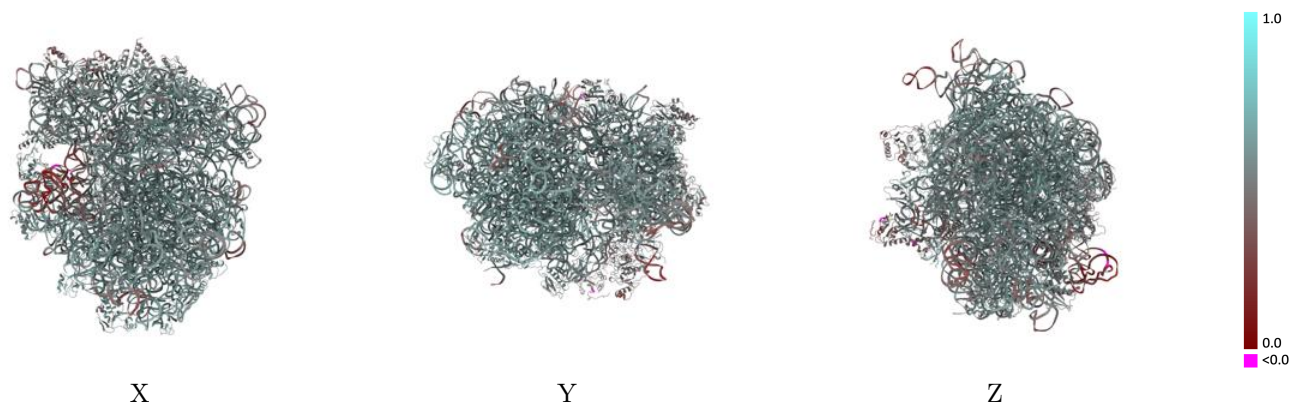
This section contains information regarding the fit between EMDB map EMD-29620 and PDB model 8FZD. Per-residue inclusion information can be found in section 3 on page 17.

9.1 Map-model overlay [i](#)



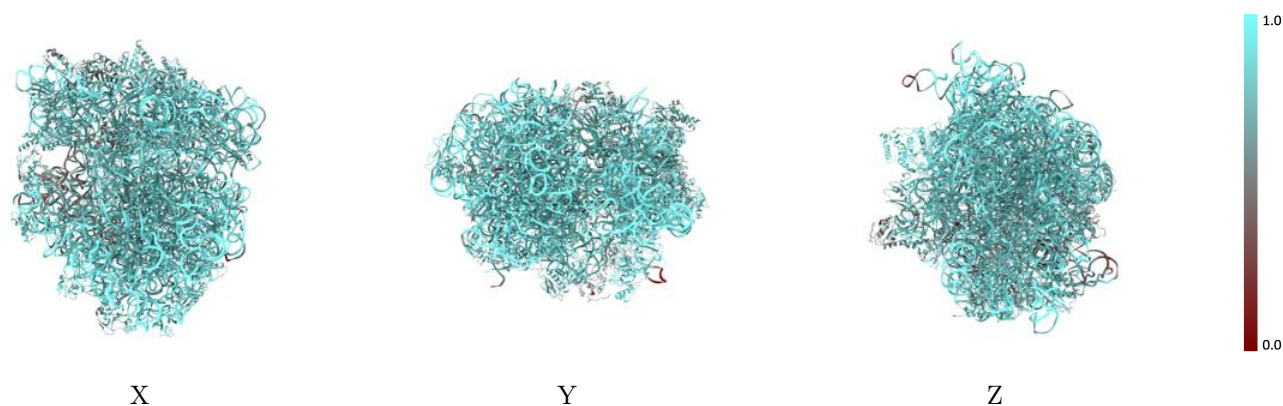
The images above show the 3D surface view of the map at the recommended contour level 3.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



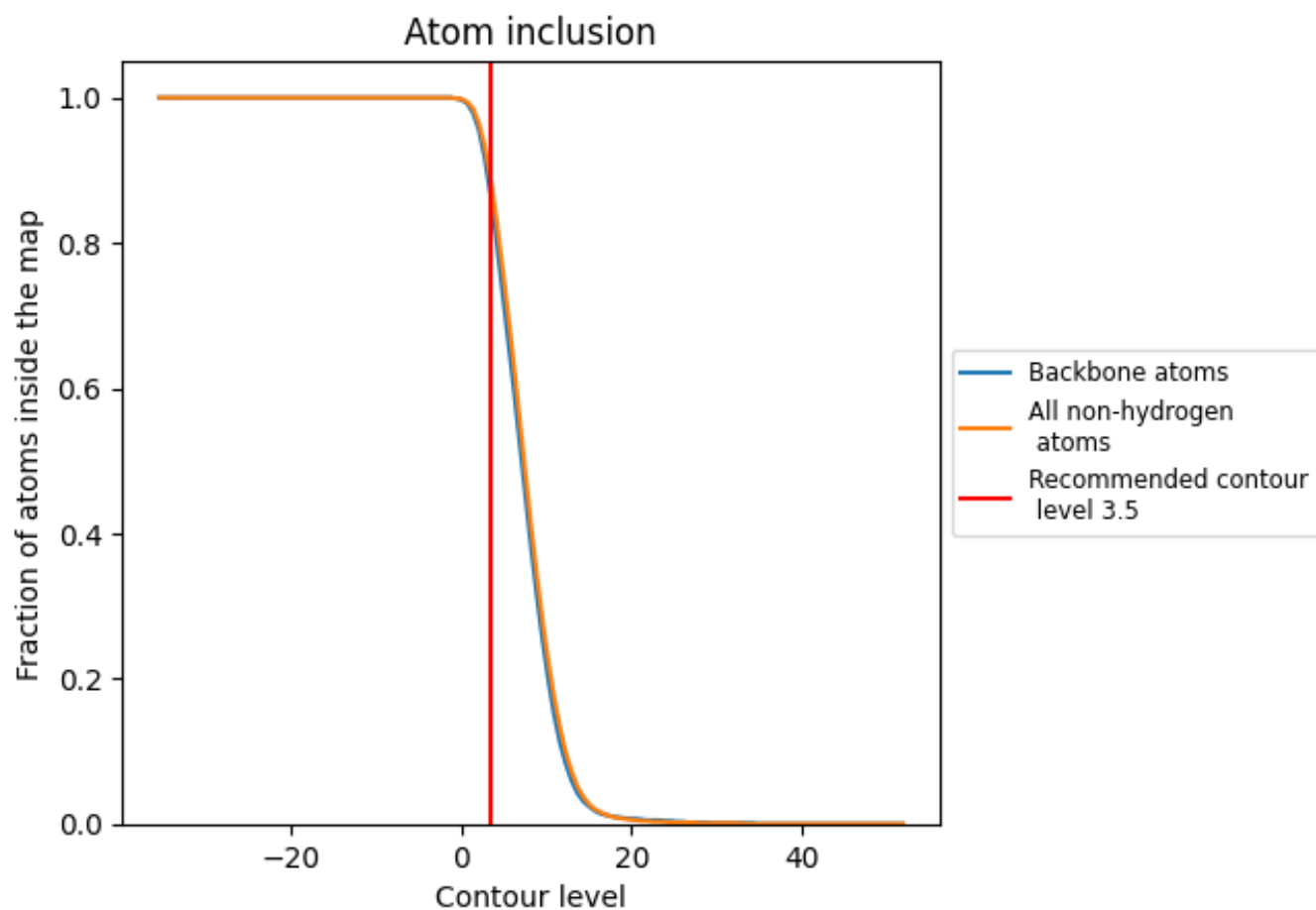
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (3.5).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 86% of all backbone atoms, 89% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary



















































The table lists the average atom inclusion at the recommended contour level (3.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8860	 0.5520
1	 0.8340	 0.5670
2	 0.8560	 0.5900
3	 0.7060	 0.5050
4	 0.9190	 0.6070
5	 0.8410	 0.5610
6	 0.9040	 0.6070
7	 0.9130	 0.6120
8	 0.8940	 0.5950
A	 0.9330	 0.5640
B	 0.9130	 0.5530
C	 0.8710	 0.5980
D	 0.8820	 0.5930
E	 0.8550	 0.5830
F	 0.8050	 0.5490
G	 0.7900	 0.5390
H	 0.2150	 0.4510
I	 0.5320	 0.3520
J	 0.6590	 0.3980
L	 0.8880	 0.5970
M	 0.8280	 0.5960
N	 0.8800	 0.5900
O	 0.8690	 0.5940
P	 0.9260	 0.6090
Q	 0.8700	 0.5740
R	 0.8540	 0.5910
S	 0.9300	 0.6090
T	 0.8850	 0.5890
U	 0.8720	 0.5910
V	 0.8200	 0.5790
W	 0.8270	 0.5620
X	 0.8390	 0.5750
Y	 0.8850	 0.6010
Z	 0.8690	 0.5840
a	 0.9270	 0.5510



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Chain	Atom inclusion	Q-score
b	 0.7200	 0.4860
c	 0.7100	 0.5260
d	 0.8010	 0.5090
e	 0.8270	 0.5600
f	 0.7620	 0.5020
g	 0.7250	 0.5020
h	 0.8320	 0.5630
i	 0.8070	 0.5270
j	 0.6850	 0.4780
k	 0.8170	 0.5430
l	 0.8280	 0.5820
m	 0.7920	 0.5340
n	 0.7970	 0.5290
o	 0.7880	 0.5400
p	 0.8360	 0.5520
q	 0.8060	 0.5670
r	 0.7990	 0.5540
s	 0.8050	 0.5240
t	 0.8240	 0.5480
u	 0.6540	 0.4970
v	 0.9420	 0.4950
w	 0.7530	 0.5250
x	 0.8870	 0.5570
y	 0.4930	 0.3010
z	 0.8430	 0.5640