Full wwPDB EM Validation Report

Jan 8, 2025 – 01:07 pm GMT

PDB ID	:	9FS8
EMDB ID	:	EMD-50725
Title	:	Cryo-EM structure of Saccharolobus solfataricus 30S initiation complex bound to Ss-aEF1A-like mRNA
Authors	:	Bourgeois, G.; Coureux, P.D.; Mechulam, Y.; Schmitt, E.
Deposited on	:	2024-06-20
Resolution	:	3.70 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

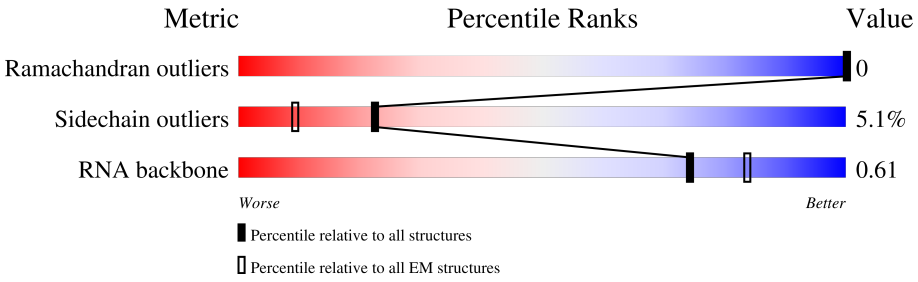
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.70 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 <=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	2	1497	81% 18%
2	3	127	84% 8% 8%
3	4	77	78% 22%
4	A	208	85% 5% 11%
5	B	231	87% 6% 7%
6	C	65	86% 11%
7	D	181	87% 5% 8%
8	E	239	97%

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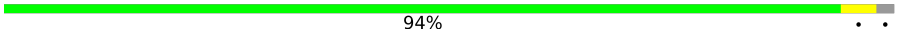
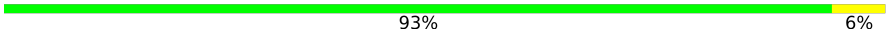
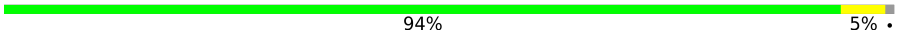
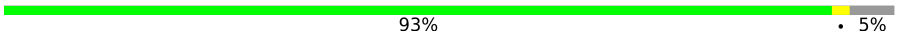
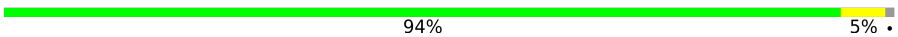
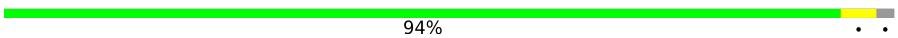
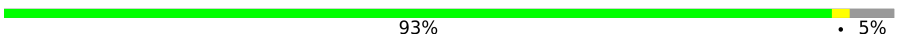
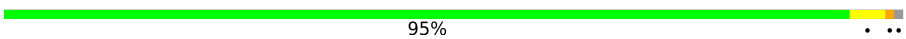
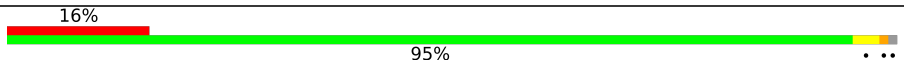
Mol	Chain	Length	Quality of chain
9	F	214	
10	G	214	
11	H	193	
12	I	133	
13	J	133	
14	K	137	
15	L	102	
16	M	132	
17	N	147	
18	O	165	
19	P	54	
20	Q	152	
21	R	114	
22	S	79	
23	T	140	
24	U	158	
25	V	120	
26	W	66	
27	X	83	
28	Y	75	
29	Z	229	
30	a	72	
31	c	110	
32	d	72	
33	e	52	

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Mol	Chain	Length	Quality of chain
34	5	28	18% 11% 68%
35	b	95	89% 6%

2 Entry composition (i)

There are 39 unique types of molecules in this entry. The entry contains 66643 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 rRNA 16S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1493	32121	14323	5934	10371	1493	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
2	843	4AC	C	modified residue	GB AE006641.1
2	930	C4J	U	modified residue	GB AE006641.1
2	1466	4AC	C	modified residue	GB AE006641.1
2	1467	4AC	C	modified residue	GB AE006641.1
2	1477	4AC	C	modified residue	GB AE006641.1
2	1478	4AC	C	modified residue	GB AE006641.1
2	1496	C	A	conflict	GB AE006641.1

- Molecule 2 is a protein called Large ribosomal subunit protein eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	3	117	893	567	149	175	2	0	0

- Molecule 3 is a RNA chain called tRNA met initiator.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	N	O	P	S		
3	4	77	1645	734	296	537	77	1	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
4	1	A	C	engineered mutation	GB 1334604293
4	72	U	A	engineered mutation	GB 1334604293

- Molecule 4 is a protein called Small ribosomal subunit protein eS1.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	A	186	Total	C	N	O	S	0	0
			1515	974	261	278	2		

- Molecule 5 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	B	215	Total	C	N	O	S	0	0
			1698	1092	291	312	3		

- Molecule 6 is a protein called Small zinc finger protein HVO-2753-like zinc-binding pocket domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	C	58	Total	C	N	O	S	0	0
			455	282	84	81	8		

- Molecule 7 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	D	166	Total	C	N	O	S	0	0
			1354	864	249	240	1		

- Molecule 8 is a protein called Small ribosomal subunit protein eS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	E	238	Total	C	N	O	S	0	0
			1930	1238	342	344	6		

- Molecule 9 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	F	210	Total	C	N	O	S	0	0
			1625	1041	275	303	6		

- Molecule 10 is a protein called Small ribosomal subunit protein eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	G	213	Total	C	N	O	S	0	0
			1661	1052	292	315	2		

- Molecule 11 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	H	192	Total	C	N	O	S	0	0
			1543	983	283	274	3		

- Molecule 12 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	I	132	Total	C	N	O	S	0	0
			1050	675	187	182	6		

- Molecule 13 is a protein called Small ribosomal subunit protein eS8.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	J	127	Total	C	N	O	0	0
			982	617	186	179		

- Molecule 14 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	K	133	Total	C	N	O	S	0	0
			1068	675	201	185	7		

- Molecule 15 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	L	101	Total	C	N	O	S	0	0
			840	536	157	142	5		

- Molecule 16 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	M	127	Total	C	N	O	S	0	0
			944	587	184	170	3		

- Molecule 17 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	N	146	Total	C	N	O	S	0	0
			1140	723	220	193	4		

- Molecule 18 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	O	140	Total	C	N	O	S	0	0
			1124	708	210	202	4		

- Molecule 19 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	P	53	Total	C	N	O	S	0	0
			440	282	80	74	4		

- Molecule 20 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	Q	145	Total	C	N	O	S	0	0
			1185	753	224	205	3		

- Molecule 21 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	R	113	Total	C	N	O	S	0	0
			901	570	166	161	4		

- Molecule 22 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	S	66	Total	C	N	O	S	0	0
			571	364	101	105	1		

- Molecule 23 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	T	128	Total	C	N	O	S	0	0
			1064	684	192	184	4		

- Molecule 24 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	U	154	Total	C	N	O	S	0	0
			1247	805	223	217	2		

- Molecule 25 is a protein called Small ribosomal subunit protein eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	V	107	Total	C	N	O	S	0	0
			836	524	154	156	2		

- Molecule 26 is a protein called Small ribosomal subunit protein eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	W	65	Total	C	N	O	S	0	0
			503	319	93	84	7		

- Molecule 27 is a protein called Small ribosomal subunit protein eS28.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	X	67	Total	C	N	O	0	0
			535	335	103	97		

- Molecule 28 is a protein called Small ribosomal subunit protein eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	Y	49	Total	C	N	O	S	0	0
			395	252	73	65	5		

- Molecule 29 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Z	196	Total	C	N	O	S	0	0
			1561	1009	274	272	6		

- Molecule 30 is a protein called aS34.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	a	71	Total	C	N	O	S	0	0
			562	361	98	96	7		

- Molecule 31 is a protein called Small ribosomal subunit protein eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	c	109	Total	C	N	O	S	0	0
			856	539	152	164	1		

- Molecule 32 is a protein called aS33.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	d	70	Total	C	N	O	S	0	0
			570	370	92	105	3		

- Molecule 33 is a protein called LSU ribosomal protein S30E (Rps30E).

Mol	Chain	Residues	Atoms				AltConf	Trace
33	e	43	Total	C	N	O	0	0
			354	220	74	60		

- Molecule 34 is a RNA chain called mRNA Ss-aEF1A-like.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	5	9	Total	C	N	O	P	0	0
			194	87	36	62	9		

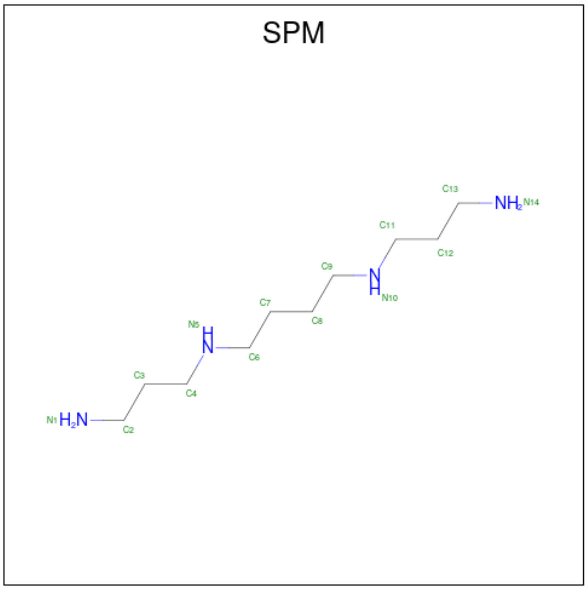
- Molecule 35 is a protein called LSU ribosomal protein S26E (Rps26E).

Mol	Chain	Residues	Atoms					AltConf	Trace
35	b	91	Total	C	N	O	S	0	0
			704	437	134	126	7		

- Molecule 36 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
36	2	55	Total	Mg	0
			55	55	
36	F	1	Total	Mg	0
			1	1	
36	R	1	Total	Mg	0
			1	1	

- Molecule 37 is SPERMINE (three-letter code: SPM) (formula: $C_{10}H_{26}N_4$).



Mol	Chain	Residues	Atoms	AltConf
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0

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Mol	Chain	Residues	Atoms	AltConf
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	2	1	Total C N 14 10 4	0
37	F	1	Total C N 14 10 4	0

- Molecule 38 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
38	C	2	Total Zn 2 2	0
38	F	1	Total Zn 1 1	0
38	P	1	Total Zn 1 1	0

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Mol	Chain	Residues	Atoms	AltConf
38	R	1	Total Zn 1 1	0
38	W	1	Total Zn 1 1	0
38	a	2	Total Zn 2 2	0
38	b	1	Total Zn 1 1	0

- Molecule 39 is water.

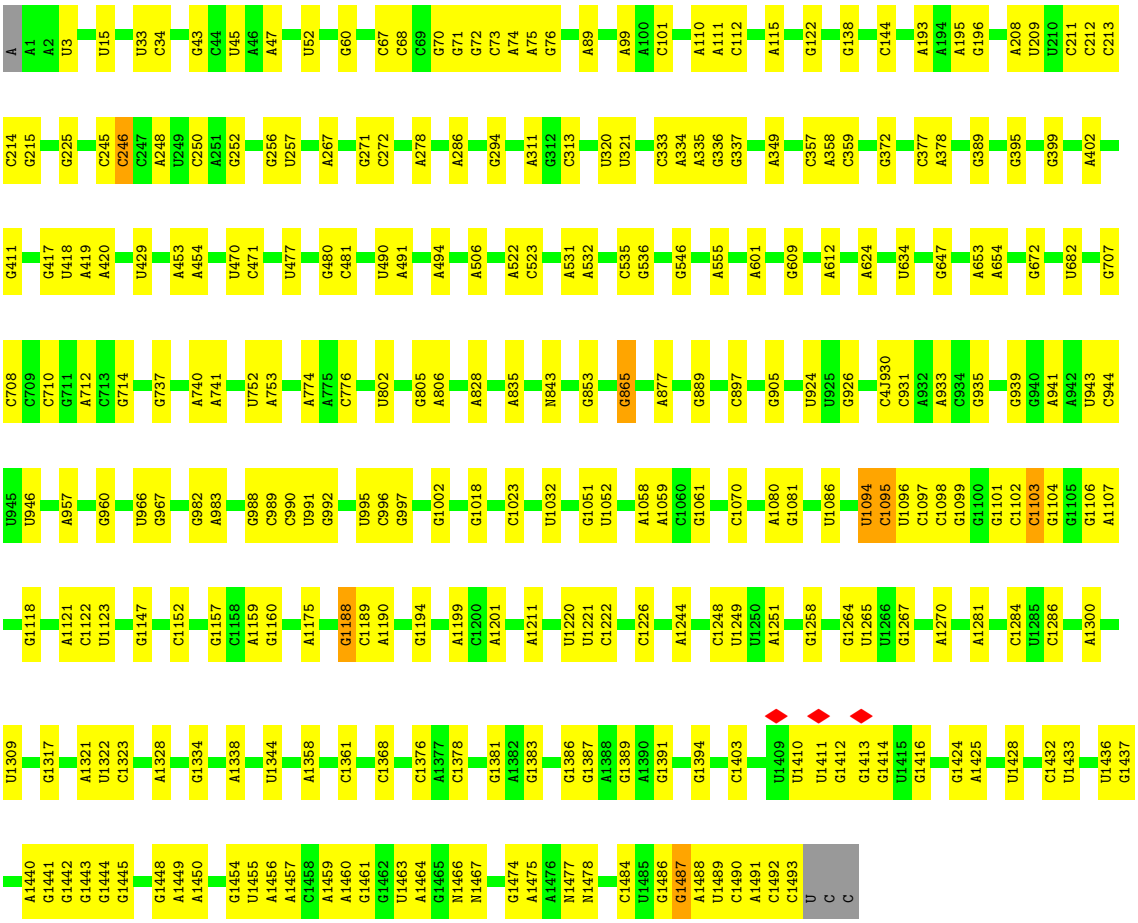
Mol	Chain	Residues	Atoms	AltConf
39	2	78	Total O 78 78	0
39	4	3	Total O 3 3	0
39	D	1	Total O 1 1	0
39	E	1	Total O 1 1	0
39	H	1	Total O 1 1	0
39	I	2	Total O 2 2	0
39	K	2	Total O 2 2	0
39	Q	1	Total O 1 1	0
39	R	1	Total O 1 1	0
39	b	1	Total O 1 1	0

3 Residue-property plots (i)

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

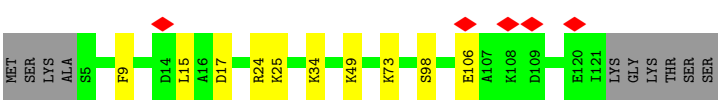
• Molecule 1: rRNA 16S

Chain 2:



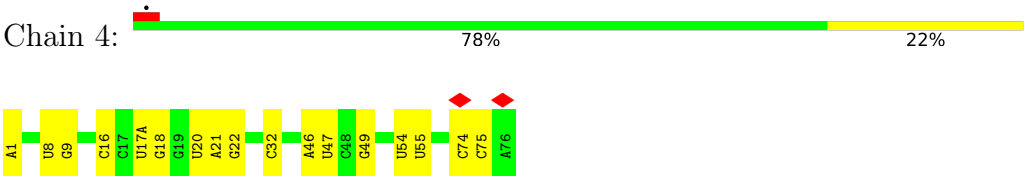
• Molecule 2: Large ribosomal subunit protein eL8

Chain 3:



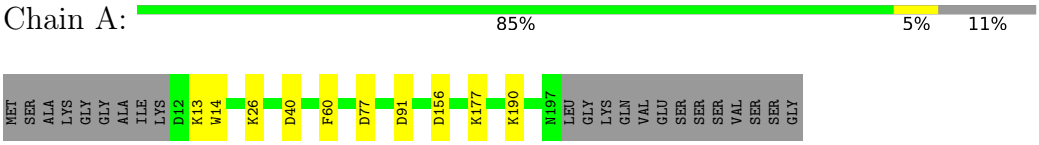
• Molecule 3: tRNA met initiator

Chain 4:



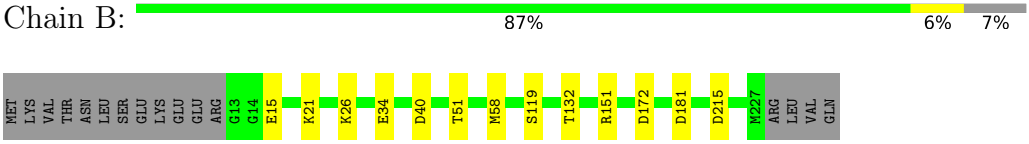
• Molecule 4: Small ribosomal subunit protein eS1

Chain A:



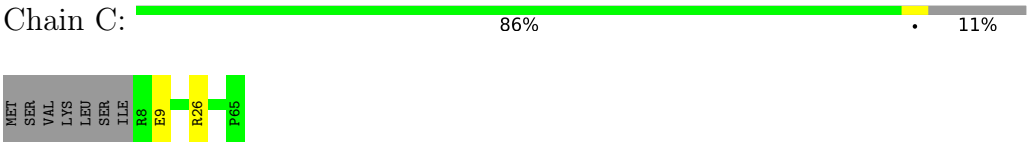
• Molecule 5: Small ribosomal subunit protein uS2

Chain B:



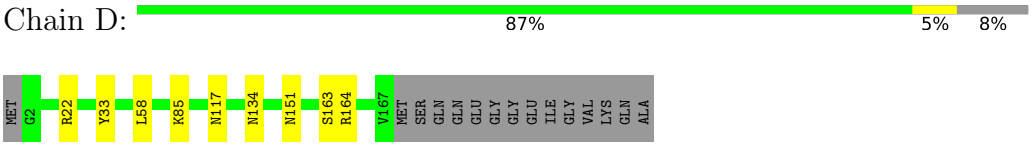
• Molecule 6: Small zinc finger protein HVO-2753-like zinc-binding pocket domain-containing protein

Chain C:



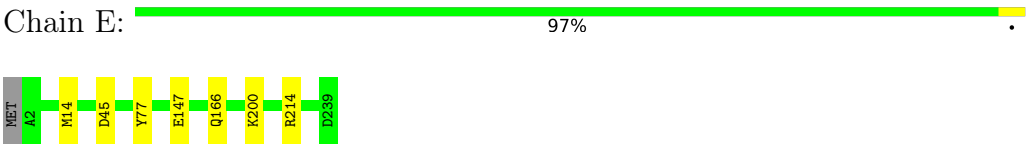
• Molecule 7: Small ribosomal subunit protein uS4

Chain D:



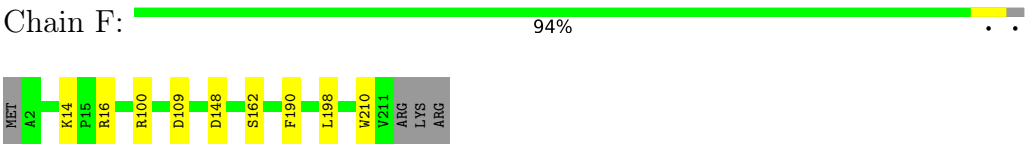
• Molecule 8: Small ribosomal subunit protein eS4

Chain E:



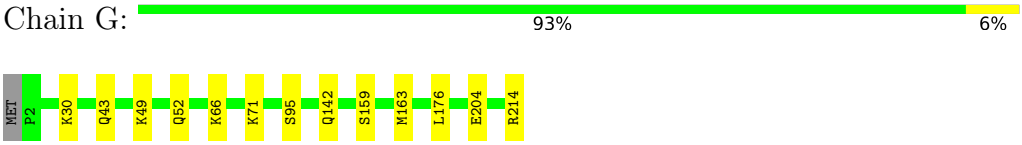
• Molecule 9: Small ribosomal subunit protein uS5

Chain F:



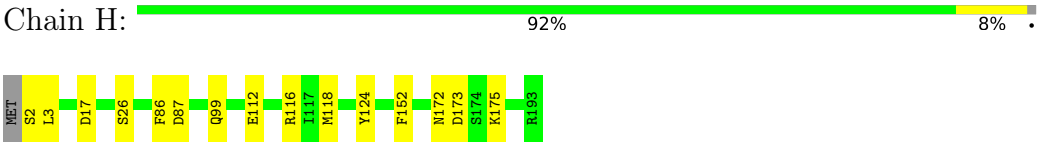
• Molecule 10: Small ribosomal subunit protein eS6

Chain G:



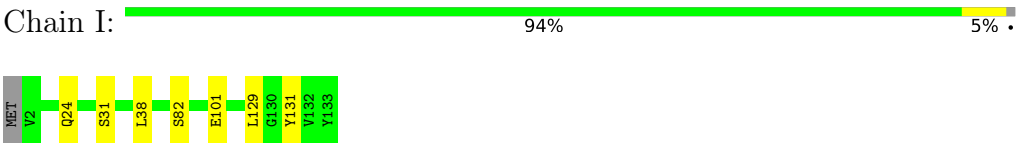
• Molecule 11: Small ribosomal subunit protein uS7

Chain H:



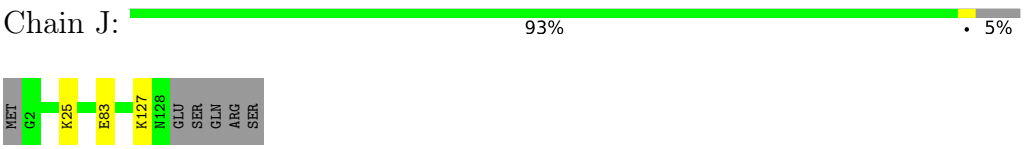
• Molecule 12: Small ribosomal subunit protein uS8

Chain I:



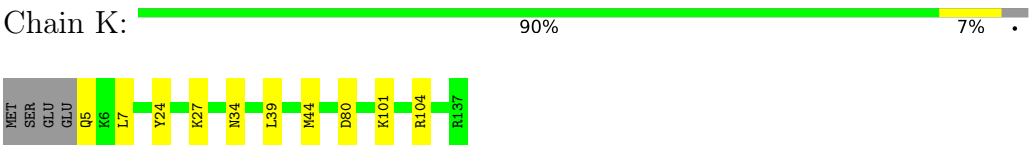
• Molecule 13: Small ribosomal subunit protein eS8

Chain J:



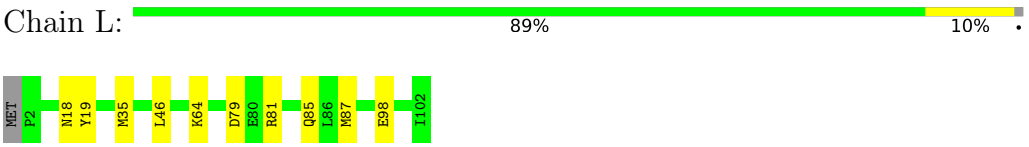
• Molecule 14: Small ribosomal subunit protein uS9

Chain K:



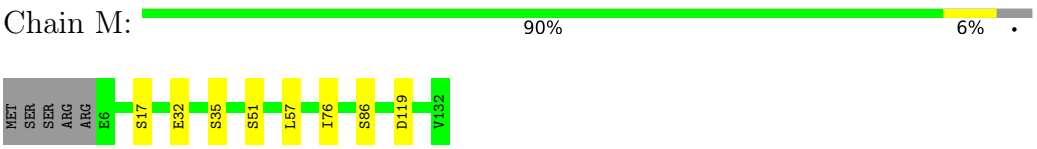
• Molecule 15: Small ribosomal subunit protein uS10

Chain L:



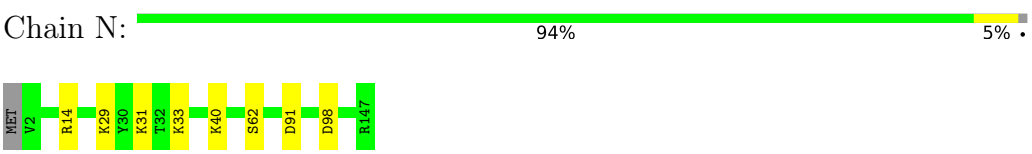
• Molecule 16: Small ribosomal subunit protein uS11

Chain M:



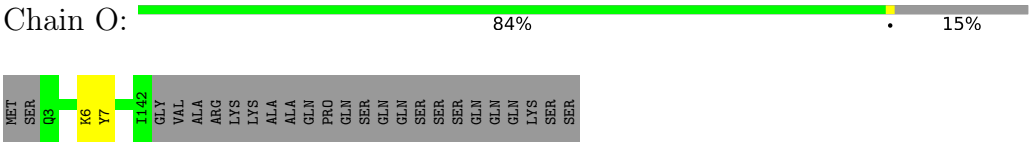
• Molecule 17: Small ribosomal subunit protein uS12

Chain N:



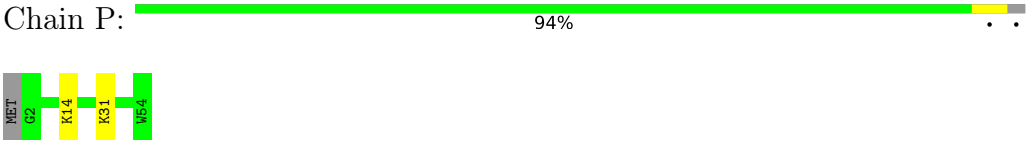
• Molecule 18: Small ribosomal subunit protein uS13

Chain O:



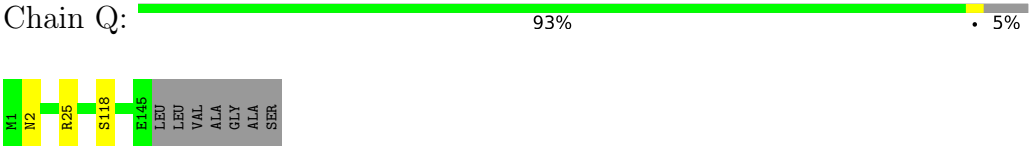
• Molecule 19: Small ribosomal subunit protein uS14

Chain P:



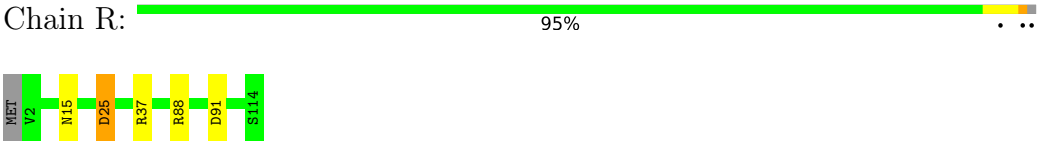
• Molecule 20: Small ribosomal subunit protein uS15

Chain Q:



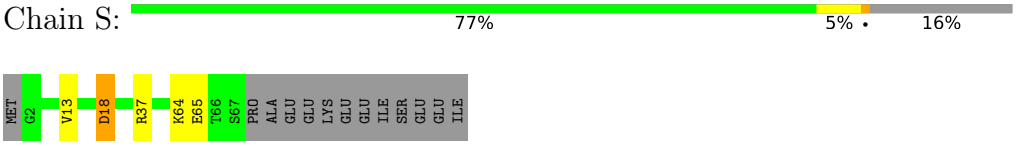
• Molecule 21: Small ribosomal subunit protein uS17

Chain R:



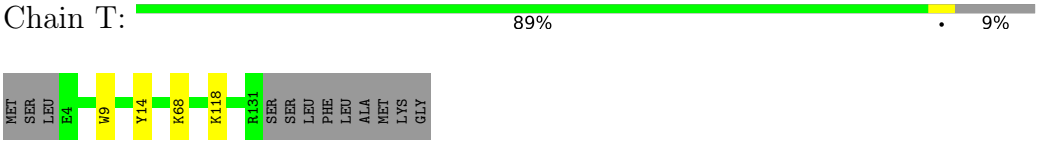
• Molecule 22: Small ribosomal subunit protein eS17

Chain S:



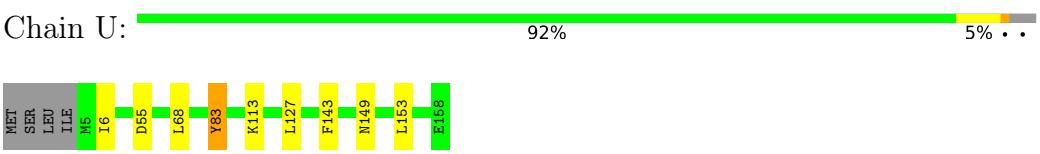
• Molecule 23: Small ribosomal subunit protein uS19

Chain T:



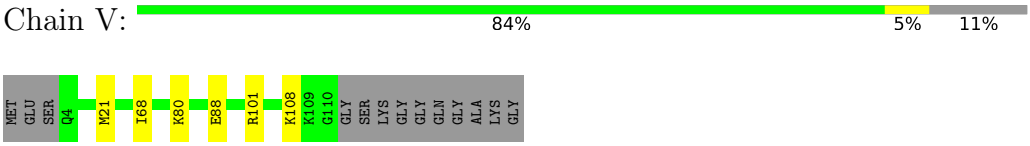
• Molecule 24: Small ribosomal subunit protein eS19

Chain U:



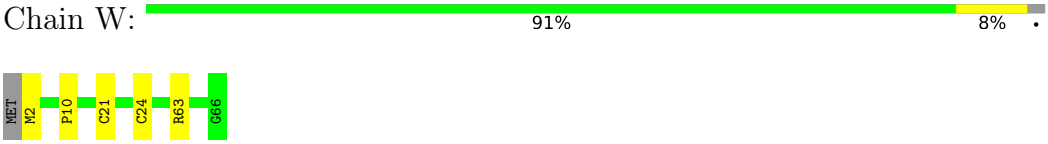
• Molecule 25: Small ribosomal subunit protein eS24

Chain V:



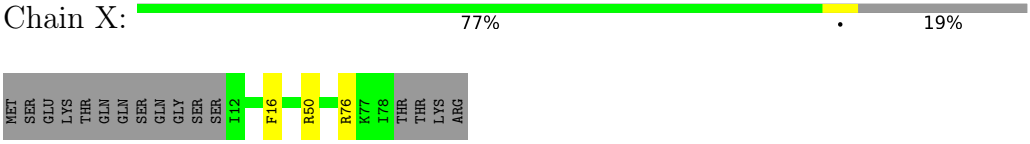
• Molecule 26: Small ribosomal subunit protein eS27

Chain W:



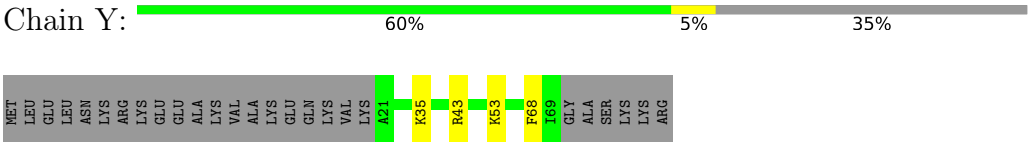
• Molecule 27: Small ribosomal subunit protein eS28

Chain X:



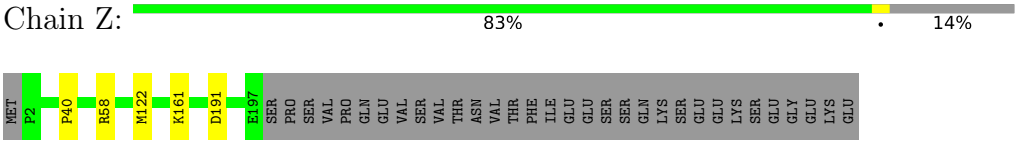
• Molecule 28: Small ribosomal subunit protein eS31

Chain Y:



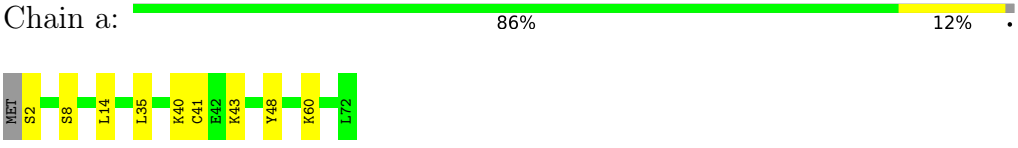
• Molecule 29: Small ribosomal subunit protein uS3

Chain Z:



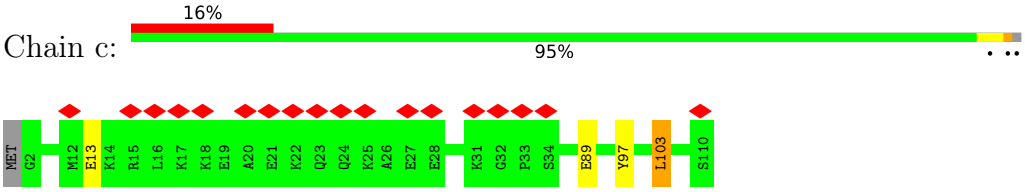
• Molecule 30: aS34

Chain a:



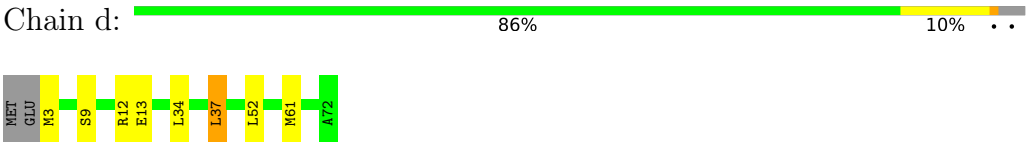
• Molecule 31: Small ribosomal subunit protein eS25

Chain c:



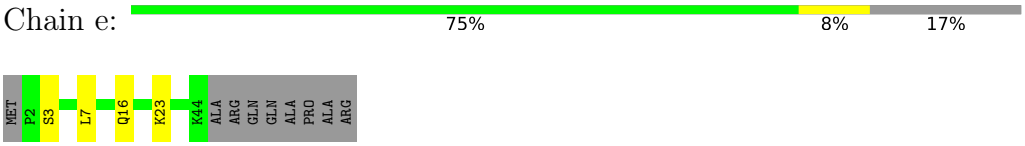
• Molecule 32: aS33

Chain d:



• Molecule 33: LSU ribosomal protein S30E (Rps30E)

Chain e:

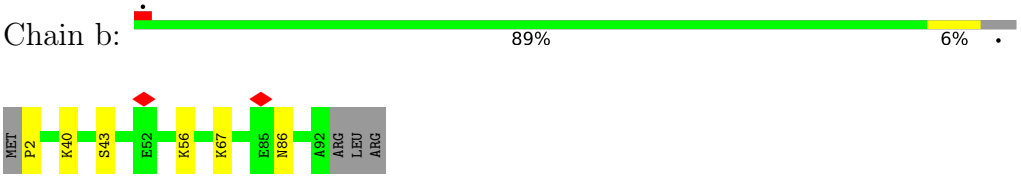


• Molecule 34: mRNA Ss-aEF1A-like

Chain 5:

• Molecule 35: LSU ribosomal protein S26E (Rps26E)

Chain b:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	155917	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.162	Depositor
Minimum map value	-0.061	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	352.0, 352.0, 352.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.88, 0.88, 0.88	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: PSU, 4SU, OMG, 4AC, 5MU, OMC, 5MC, MG, 6MZ, MA6, C4J, ZN, A2M, H2U, OMU, SPM

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	2	0.47	9/35117 (0.0%)	0.84	40/54790 (0.1%)
2	3	0.40	0/902	0.67	0/1216
3	4	0.35	1/1725 (0.1%)	0.74	0/2687
4	A	0.40	0/1543	0.68	4/2077 (0.2%)
5	B	0.36	0/1731	0.70	3/2349 (0.1%)
6	C	0.54	0/466	0.71	0/625
7	D	0.42	1/1380 (0.1%)	0.60	1/1859 (0.1%)
8	E	0.37	0/1965	0.63	0/2644
9	F	0.41	0/1654	0.58	0/2240
10	G	0.34	0/1684	0.58	0/2265
11	H	0.41	0/1571	0.75	2/2116 (0.1%)
12	I	0.52	0/1070	0.71	3/1444 (0.2%)
13	J	0.44	0/994	0.67	0/1337
14	K	0.47	0/1084	0.80	2/1450 (0.1%)
15	L	0.42	0/856	0.87	7/1154 (0.6%)
16	M	0.63	1/960 (0.1%)	0.93	3/1294 (0.2%)
17	N	0.42	0/1155	0.73	1/1540 (0.1%)
18	O	0.53	1/1142 (0.1%)	0.78	0/1532
19	P	0.60	0/451	0.74	1/600 (0.2%)
20	Q	0.40	0/1206	0.64	0/1618
21	R	0.44	0/918	0.70	3/1236 (0.2%)
22	S	0.58	1/578 (0.2%)	0.82	1/770 (0.1%)
23	T	0.40	0/1087	0.63	0/1456
24	U	0.45	1/1270 (0.1%)	0.73	3/1710 (0.2%)
25	V	0.39	0/843	0.73	1/1124 (0.1%)
26	W	0.49	0/511	0.85	1/684 (0.1%)
27	X	0.33	0/538	0.71	0/722
28	Y	0.32	0/404	0.68	0/540
29	Z	0.41	0/1584	0.73	2/2124 (0.1%)
30	a	0.48	0/574	0.77	1/770 (0.1%)
31	c	0.48	1/861 (0.1%)	0.74	1/1143 (0.1%)
32	d	0.46	0/581	0.81	1/786 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	e	0.44	0/360	0.70	0/477
34	5	0.64	0/217	1.04	1/336 (0.3%)
35	b	1.19	4/713 (0.6%)	1.39	6/951 (0.6%)
All	All	0.47	20/69695 (0.0%)	0.79	88/101666 (0.1%)

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
6	C	0	1
7	D	0	1
All	All	0	2

All (20) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
35	b	2	PRO	CB-CG	18.76	2.43	1.50
1	2	1464	A	C6-N1	-16.54	1.24	1.35
1	2	1464	A	C8-N7	14.70	1.41	1.31
35	b	2	PRO	CG-CD	-14.07	1.04	1.50
1	2	1464	A	C5-C4	-13.21	1.29	1.38
35	b	2	PRO	N-CA	-11.41	1.27	1.47
3	4	1	A	OP3-P	-10.37	1.48	1.61
18	O	7	TYR	CD2-CE2	-8.87	1.26	1.39
1	2	1464	A	N7-C5	-7.84	1.34	1.39
1	2	653	A	N9-C4	-7.78	1.33	1.37
1	2	1464	A	C6-N6	-6.83	1.28	1.33
35	b	2	PRO	N-CD	6.57	1.57	1.47
1	2	737	G	C8-N7	-6.53	1.27	1.30
24	U	83	TYR	CD1-CE1	-6.11	1.30	1.39
1	2	1464	A	N9-C8	-5.53	1.33	1.37
31	c	13	GLU	CB-CG	-5.37	1.42	1.52
22	S	13	VAL	CB-CG1	-5.37	1.41	1.52
16	M	32	GLU	CB-CG	-5.34	1.42	1.52
1	2	1464	A	N3-C4	-5.25	1.31	1.34
7	D	33	TYR	CD1-CE1	-5.21	1.31	1.39

All (88) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
35	b	2	PRO	CB-CG-CD	-27.30	0.03	106.50
1	2	1464	A	N9-C4-C5	18.34	113.13	105.80
1	2	1322	U	O5'-P-OP2	-17.99	89.11	110.70
35	b	2	PRO	CA-N-CD	-14.91	90.63	111.50
1	2	1321	A	O5'-P-OP1	11.32	124.28	110.70
1	2	1464	A	C8-N9-C4	-10.84	101.47	105.80
35	b	2	PRO	N-CA-CB	-10.53	90.66	103.30
1	2	1323	C	N3-C4-N4	-10.38	110.73	118.00
31	c	103	LEU	CB-CG-CD2	-9.69	94.53	111.00
1	2	1152	C	C6-N1-C2	9.16	123.96	120.30
4	A	91	ASP	CB-CG-OD1	-8.97	110.22	118.30
16	M	76	ILE	CG1-CB-CG2	-8.84	91.95	111.40
5	B	58	MET	CG-SD-CE	8.78	114.25	100.20
11	H	3	LEU	CA-CB-CG	8.65	135.20	115.30
1	2	1095	C	O4'-C1'-N1	8.04	114.64	108.20
14	K	44	MET	CG-SD-CE	-7.99	87.41	100.20
1	2	1323	C	C5-C4-N4	7.62	125.53	120.20
1	2	1188	G	C2-N3-C4	7.55	115.68	111.90
30	a	60	LYS	CD-CE-NZ	-7.40	94.67	111.70
35	b	56	LYS	CD-CE-NZ	-7.29	94.94	111.70
29	Z	40	PRO	CA-N-CD	-7.23	101.38	111.50
35	b	2	PRO	CA-CB-CG	-7.04	90.62	104.00
35	b	67	LYS	CD-CE-NZ	6.97	127.74	111.70
7	D	58	LEU	CB-CG-CD1	-6.97	99.16	111.00
1	2	1464	A	C5-C6-N1	6.86	121.13	117.70
32	d	37	LEU	CA-CB-CG	6.67	130.63	115.30
1	2	943	U	N1-C2-O2	6.64	127.44	122.80
21	R	25	ASP	CB-CG-OD2	6.59	124.23	118.30
15	L	46	LEU	CB-CG-CD1	6.57	122.16	111.00
1	2	737	G	N9-C4-C5	-6.56	102.78	105.40
21	R	91	ASP	CB-CG-OD1	6.54	124.18	118.30
1	2	1152	C	N3-C4-C5	6.43	124.47	121.90
15	L	46	LEU	CB-CG-CD2	-6.37	100.17	111.00
1	2	1464	A	O4'-C1'-N9	-6.25	103.20	108.20
1	2	1102	C	C2-N1-C1'	6.24	125.67	118.80
1	2	1487	G	C2'-C3'-O3'	6.20	123.62	113.70
16	M	119	ASP	CB-CG-OD1	-6.20	112.72	118.30
24	U	127	LEU	CB-CG-CD2	-6.18	100.50	111.00
29	Z	191	ASP	CB-CG-OD2	6.00	123.70	118.30
15	L	79	ASP	CB-CG-OD2	5.98	123.68	118.30
25	V	68	ILE	CG1-CB-CG2	-5.94	98.33	111.40
15	L	64	LYS	CD-CE-NZ	-5.88	98.17	111.70
16	M	57	LEU	CA-CB-CG	5.88	128.82	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1122	C	C6-N1-C2	-5.87	117.95	120.30
12	I	38	LEU	CB-CG-CD2	-5.83	101.09	111.00
26	W	2	MET	CG-SD-CE	-5.82	90.89	100.20
17	N	91	ASP	CB-CG-OD1	5.82	123.54	118.30
12	I	129	LEU	CB-CG-CD2	-5.67	101.36	111.00
5	B	58	MET	CB-CG-SD	-5.66	95.41	112.40
21	R	91	ASP	CB-CG-OD2	-5.62	113.25	118.30
15	L	46	LEU	CA-CB-CG	5.61	128.19	115.30
14	K	80	ASP	CB-CG-OD2	5.58	123.32	118.30
1	2	653	A	O5'-P-OP1	5.58	117.39	110.70
22	S	18	ASP	CB-CG-OD1	5.57	123.31	118.30
1	2	1103	C	N3-C4-N4	5.57	121.90	118.00
1	2	1122	C	C2-N1-C1'	5.56	124.92	118.80
1	2	1094	U	N1-C2-O2	5.55	126.68	122.80
1	2	943	U	C2-N1-C1'	5.54	124.34	117.70
24	U	6	ILE	CG1-CB-CG2	-5.50	99.29	111.40
15	L	87	MET	CA-CB-CG	5.48	122.62	113.30
1	2	1323	C	C5-C6-N1	-5.43	118.28	121.00
1	2	1484	C	OP1-P-O3'	5.43	117.14	105.20
1	2	1487	G	P-O3'-C3'	5.42	126.20	119.70
1	2	1464	A	N3-C4-N9	-5.40	123.08	127.40
1	2	1094	U	N3-C2-O2	-5.38	118.43	122.20
1	2	943	U	N3-C2-O2	-5.38	118.43	122.20
19	P	31	LYS	CA-CB-CG	-5.36	101.60	113.40
12	I	101	GLU	CA-CB-CG	5.36	125.19	113.40
1	2	654	A	OP1-P-OP2	-5.30	111.65	119.60
34	5	8	A	P-O3'-C3'	-5.30	113.34	119.70
1	2	1188	G	O4'-C1'-N9	-5.26	103.99	108.20
1	2	653	A	P-O3'-C3'	5.25	126.00	119.70
1	2	653	A	N3-C4-C5	5.22	130.46	126.80
4	A	77	ASP	CB-CG-OD1	5.21	122.99	118.30
24	U	68	LEU	CB-CG-CD2	5.18	119.80	111.00
1	2	1464	A	C5-N7-C8	-5.17	101.31	103.90
4	A	40	ASP	CB-CG-OD1	5.14	122.92	118.30
4	A	91	ASP	CB-CG-OD2	5.11	122.90	118.30
1	2	1102	C	N1-C2-O2	5.08	121.95	118.90
1	2	1188	G	C5-C6-N1	5.07	114.03	111.50
5	B	215	ASP	CB-CG-OD1	5.07	122.86	118.30
11	H	112	GLU	CA-CB-CG	5.07	124.54	113.40
15	L	35	MET	CA-CB-CG	5.06	121.91	113.30
1	2	1152	C	C6-N1-C1'	-5.05	114.74	120.80
1	2	1070	C	C6-N1-C2	5.03	122.31	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1188	G	N3-C4-C5	-5.02	126.09	128.60
1	2	1321	A	OP2-P-O3'	5.01	116.23	105.20
1	2	1103	C	C2-N1-C1'	5.01	124.31	118.80

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
6	C	26	ARG	Sidechain
7	D	22	ARG	Sidechain

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	3	115/127 (91%)	100 (87%)	15 (13%)	0	100	100
4	A	184/208 (88%)	180 (98%)	4 (2%)	0	100	100
5	B	213/231 (92%)	209 (98%)	4 (2%)	0	100	100
6	C	56/65 (86%)	55 (98%)	1 (2%)	0	100	100
7	D	164/181 (91%)	162 (99%)	2 (1%)	0	100	100
8	E	236/239 (99%)	229 (97%)	7 (3%)	0	100	100
9	F	208/214 (97%)	200 (96%)	8 (4%)	0	100	100
10	G	211/214 (99%)	201 (95%)	10 (5%)	0	100	100
11	H	190/193 (98%)	182 (96%)	8 (4%)	0	100	100
12	I	130/133 (98%)	124 (95%)	6 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	J	125/133 (94%)	121 (97%)	4 (3%)	0	100	100
14	K	131/137 (96%)	125 (95%)	6 (5%)	0	100	100
15	L	99/102 (97%)	92 (93%)	7 (7%)	0	100	100
16	M	125/132 (95%)	115 (92%)	10 (8%)	0	100	100
17	N	144/147 (98%)	137 (95%)	7 (5%)	0	100	100
18	O	138/165 (84%)	132 (96%)	6 (4%)	0	100	100
19	P	51/54 (94%)	50 (98%)	1 (2%)	0	100	100
20	Q	143/152 (94%)	142 (99%)	1 (1%)	0	100	100
21	R	111/114 (97%)	110 (99%)	1 (1%)	0	100	100
22	S	64/79 (81%)	63 (98%)	1 (2%)	0	100	100
23	T	126/140 (90%)	124 (98%)	2 (2%)	0	100	100
24	U	152/158 (96%)	146 (96%)	6 (4%)	0	100	100
25	V	105/120 (88%)	104 (99%)	1 (1%)	0	100	100
26	W	63/66 (96%)	58 (92%)	5 (8%)	0	100	100
27	X	65/83 (78%)	59 (91%)	6 (9%)	0	100	100
28	Y	47/75 (63%)	38 (81%)	9 (19%)	0	100	100
29	Z	194/229 (85%)	191 (98%)	3 (2%)	0	100	100
30	a	69/72 (96%)	66 (96%)	3 (4%)	0	100	100
31	c	107/110 (97%)	99 (92%)	8 (8%)	0	100	100
32	d	68/72 (94%)	65 (96%)	3 (4%)	0	100	100
33	e	41/52 (79%)	40 (98%)	1 (2%)	0	100	100
35	b	89/95 (94%)	89 (100%)	0	0	100	100
All	All	3964/4292 (92%)	3808 (96%)	156 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	3	97/105 (92%)	87 (90%)	10 (10%)	6 25
4	A	168/184 (91%)	161 (96%)	7 (4%)	25 51
5	B	182/198 (92%)	171 (94%)	11 (6%)	16 43
6	C	51/58 (88%)	50 (98%)	1 (2%)	50 68
7	D	147/158 (93%)	141 (96%)	6 (4%)	26 52
8	E	214/215 (100%)	207 (97%)	7 (3%)	33 57
9	F	180/184 (98%)	171 (95%)	9 (5%)	20 47
10	G	186/187 (100%)	173 (93%)	13 (7%)	12 39
11	H	166/167 (99%)	153 (92%)	13 (8%)	10 36
12	I	113/114 (99%)	109 (96%)	4 (4%)	31 56
13	J	104/110 (94%)	101 (97%)	3 (3%)	37 59
14	K	109/113 (96%)	101 (93%)	8 (7%)	11 38
15	L	93/94 (99%)	88 (95%)	5 (5%)	18 46
16	M	93/98 (95%)	89 (96%)	4 (4%)	25 50
17	N	122/123 (99%)	115 (94%)	7 (6%)	17 45
18	O	121/142 (85%)	120 (99%)	1 (1%)	79 85
19	P	45/46 (98%)	44 (98%)	1 (2%)	47 65
20	Q	125/129 (97%)	122 (98%)	3 (2%)	44 63
21	R	101/102 (99%)	97 (96%)	4 (4%)	27 52
22	S	63/75 (84%)	59 (94%)	4 (6%)	15 42
23	T	116/126 (92%)	112 (97%)	4 (3%)	32 56
24	U	134/138 (97%)	128 (96%)	6 (4%)	23 50
25	V	92/99 (93%)	87 (95%)	5 (5%)	18 46
26	W	57/58 (98%)	53 (93%)	4 (7%)	12 39
27	X	58/73 (80%)	55 (95%)	3 (5%)	19 46
28	Y	43/65 (66%)	39 (91%)	4 (9%)	7 30
29	Z	163/195 (84%)	160 (98%)	3 (2%)	54 71
30	a	61/62 (98%)	53 (87%)	8 (13%)	3 18
31	c	95/96 (99%)	92 (97%)	3 (3%)	34 57
32	d	63/65 (97%)	55 (87%)	8 (13%)	3 19
33	e	40/46 (87%)	36 (90%)	4 (10%)	6 26
35	b	75/79 (95%)	72 (96%)	3 (4%)	27 52

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	3477/3704 (94%)	3301 (95%)	176 (5%)	22 47

All (176) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	3	9	PHE
2	3	15	LEU
2	3	17	ASP
2	3	24	ARG
2	3	25	LYS
2	3	34	LYS
2	3	49	LYS
2	3	73	LYS
2	3	98	SER
2	3	106	GLU
4	A	13	LYS
4	A	14	TRP
4	A	26	LYS
4	A	60	PHE
4	A	156	ASP
4	A	177	LYS
4	A	190	LYS
5	B	15	GLU
5	B	21	LYS
5	B	26	LYS
5	B	34	GLU
5	B	40	ASP
5	B	51	THR
5	B	119	SER
5	B	132	THR
5	B	151	ARG
5	B	172	ASP
5	B	181	ASP
6	C	9	GLU
7	D	85	LYS
7	D	117	ASN
7	D	134	ASN
7	D	151	ASN
7	D	163	SER
7	D	164	ARG
8	E	14	MET
8	E	45	ASP

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Mol	Chain	Res	Type
8	E	77	TYR
8	E	147	GLU
8	E	166	GLN
8	E	200	LYS
8	E	214	ARG
9	F	14	LYS
9	F	16	ARG
9	F	100	ARG
9	F	109	ASP
9	F	148	ASP
9	F	162	SER
9	F	190	PHE
9	F	198	LEU
9	F	210	TRP
10	G	30	LYS
10	G	43	GLN
10	G	49	LYS
10	G	52	GLN
10	G	66	LYS
10	G	71	LYS
10	G	95	SER
10	G	142	GLN
10	G	159	SER
10	G	163	MET
10	G	176	LEU
10	G	204	GLU
10	G	214	ARG
11	H	2	SER
11	H	17	ASP
11	H	26	SER
11	H	86	PHE
11	H	87	ASP
11	H	99	GLN
11	H	116	ARG
11	H	118	MET
11	H	124	TYR
11	H	152	PHE
11	H	172	ASN
11	H	173	ASP
11	H	175	LYS
12	I	24	GLN
12	I	31	SER

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Mol	Chain	Res	Type
12	I	82	SER
12	I	131	TYR
13	J	25	LYS
13	J	83	GLU
13	J	127	LYS
14	K	5	GLN
14	K	7	LEU
14	K	24	TYR
14	K	27	LYS
14	K	34	ASN
14	K	39	LEU
14	K	101	LYS
14	K	104	ARG
15	L	18	ASN
15	L	19	TYR
15	L	81	ARG
15	L	85	GLN
15	L	98	GLU
16	M	17	SER
16	M	35	SER
16	M	51	SER
16	M	86	SER
17	N	14	ARG
17	N	29	LYS
17	N	31	LYS
17	N	33	LYS
17	N	40	LYS
17	N	62	SER
17	N	98	ASP
18	O	6	LYS
19	P	14	LYS
20	Q	2	ASN
20	Q	25	ARG
20	Q	118	SER
21	R	15	ASN
21	R	25	ASP
21	R	37	ARG
21	R	88	ARG
22	S	18	ASP
22	S	37	ARG
22	S	64	LYS
22	S	65	GLU

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Mol	Chain	Res	Type
23	T	9	TRP
23	T	14	TYR
23	T	68	LYS
23	T	118	LYS
24	U	55	ASP
24	U	83	TYR
24	U	113	LYS
24	U	143	PHE
24	U	149	ASN
24	U	153	LEU
25	V	21	MET
25	V	80	LYS
25	V	88	GLU
25	V	101	ARG
25	V	108	LYS
26	W	10	PRO
26	W	21	CYS
26	W	24	CYS
26	W	63	ARG
27	X	16	PHE
27	X	50	ARG
27	X	76	ARG
28	Y	35	LYS
28	Y	43	ARG
28	Y	53	LYS
28	Y	68	PHE
29	Z	58	ARG
29	Z	122	MET
29	Z	161	LYS
30	a	2	SER
30	a	8	SER
30	a	14	LEU
30	a	35	LEU
30	a	40	LYS
30	a	41	CYS
30	a	43	LYS
30	a	48	TYR
31	c	89	GLU
31	c	97	TYR
31	c	103	LEU
32	d	3	MET
32	d	9	SER

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Mol	Chain	Res	Type
32	d	12	ARG
32	d	13	GLU
32	d	34	LEU
32	d	37	LEU
32	d	52	LEU
32	d	61	MET
33	e	3	SER
33	e	7	LEU
33	e	16	GLN
33	e	23	LYS
35	b	40	LYS
35	b	43	SER
35	b	86	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
6	C	51	GLN
7	D	27	GLN
7	D	121	GLN
7	D	134	ASN
8	E	225	ASN
9	F	9	ASN
9	F	113	ASN
9	F	189	ASN
10	G	85	ASN
10	G	142	GLN
10	G	203	GLN
11	H	40	HIS
11	H	47	HIS
12	I	70	ASN
14	K	5	GLN
15	L	100	GLN
16	M	60	ASN
18	O	14	GLN
20	Q	2	ASN
22	S	29	ASN
23	T	24	ASN
24	U	149	ASN
26	W	28	GLN
27	X	37	GLN
29	Z	62	ASN

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Mol	Chain	Res	Type
29	Z	158	GLN
30	a	5	ASN
30	a	25	ASN
32	d	25	ASN
32	d	55	GLN
33	e	16	GLN
35	b	25	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1484/1497 (99%)	243 (16%)	6 (0%)
3	4	76/77 (98%)	13 (17%)	1 (1%)
34	5	8/28 (28%)	4 (50%)	0
All	All	1568/1602 (97%)	260 (16%)	7 (0%)

All (260) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	3	U
1	2	33	U
1	2	34	C
1	2	43	G
1	2	45	U
1	2	47	A
1	2	60	G
1	2	67	C
1	2	68	C
1	2	70	G
1	2	71	G
1	2	72	G
1	2	73	C
1	2	74	A
1	2	75	A
1	2	76	G
1	2	89	A
1	2	99	A
1	2	101	C
1	2	110	A
1	2	111	A
1	2	112	C

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Mol	Chain	Res	Type
1	2	115	A
1	2	122	G
1	2	138	G
1	2	144	C
1	2	193	A
1	2	195	A
1	2	196	G
1	2	208	A
1	2	209	U
1	2	211	C
1	2	212	C
1	2	213	C
1	2	214	C
1	2	215	G
1	2	225	G
1	2	245	C
1	2	246	OMC
1	2	248	A
1	2	250	C
1	2	252	G
1	2	256	G
1	2	257	U
1	2	267	A
1	2	271	G
1	2	272	C
1	2	278	A
1	2	286	A
1	2	294	G
1	2	311	A
1	2	320	U
1	2	321	U
1	2	333	C
1	2	334	A
1	2	335	A
1	2	336	G
1	2	349	A
1	2	357	C
1	2	358	A
1	2	359	C
1	2	372	G
1	2	377	C
1	2	378	A

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Mol	Chain	Res	Type
1	2	389	G
1	2	395	G
1	2	402	A
1	2	411	G
1	2	417	G
1	2	418	U
1	2	419	A
1	2	420	A
1	2	429	U
1	2	453	A
1	2	454	A
1	2	470	U
1	2	471	C
1	2	477	U
1	2	480	G
1	2	490	U
1	2	491	A
1	2	506	A
1	2	522	A
1	2	523	C
1	2	531	A
1	2	532	A
1	2	535	C
1	2	536	G
1	2	555	A
1	2	601	A
1	2	609	G
1	2	612	A
1	2	624	A
1	2	634	U
1	2	647	G
1	2	682	U
1	2	707	G
1	2	708	C
1	2	712	A
1	2	714	G
1	2	740	A
1	2	741	A
1	2	752	U
1	2	753	A
1	2	774	A
1	2	776	C

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Mol	Chain	Res	Type
1	2	802	U
1	2	805	G
1	2	806	A
1	2	828	A
1	2	835	A
1	2	853	G
1	2	865	OMG
1	2	877	A
1	2	889	G
1	2	897	C
1	2	924	U
1	2	931	C
1	2	933	A
1	2	935	G
1	2	939	G
1	2	941	A
1	2	944	C
1	2	946	U
1	2	957	A
1	2	960	G
1	2	966	U
1	2	967	G
1	2	982	G
1	2	983	A
1	2	988	G
1	2	989	C
1	2	990	C
1	2	991	U
1	2	992	G
1	2	995	U
1	2	996	C
1	2	997	G
1	2	1002	G
1	2	1023	C
1	2	1051	G
1	2	1052	U
1	2	1058	A
1	2	1059	A
1	2	1080	A
1	2	1081	G
1	2	1086	U
1	2	1094	U

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Mol	Chain	Res	Type
1	2	1095	C
1	2	1096	U
1	2	1097	C
1	2	1098	C
1	2	1099	G
1	2	1101	G
1	2	1103	C
1	2	1104	G
1	2	1106	G
1	2	1107	A
1	2	1118	G
1	2	1121	A
1	2	1123	U
1	2	1147	G
1	2	1157	G
1	2	1159	A
1	2	1160	G
1	2	1175	A
1	2	1188	G
1	2	1189	C
1	2	1190	A
1	2	1199	A
1	2	1201	A
1	2	1211	A
1	2	1220	U
1	2	1221	U
1	2	1222	C
1	2	1226	C
1	2	1244	A
1	2	1248	C
1	2	1249	U
1	2	1251	A
1	2	1258	G
1	2	1264	G
1	2	1265	U
1	2	1267	G
1	2	1270	A
1	2	1281	A
1	2	1284	C
1	2	1286	C
1	2	1300	A
1	2	1309	U

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Mol	Chain	Res	Type
1	2	1317	G
1	2	1328	A
1	2	1334	G
1	2	1338	A
1	2	1358	A
1	2	1361	C
1	2	1376	C
1	2	1378	C
1	2	1381	G
1	2	1383	G
1	2	1386	G
1	2	1387	G
1	2	1389	G
1	2	1391	G
1	2	1394	G
1	2	1403	C
1	2	1410	U
1	2	1411	U
1	2	1412	G
1	2	1413	G
1	2	1414	G
1	2	1416	G
1	2	1424	G
1	2	1425	A
1	2	1428	U
1	2	1432	C
1	2	1433	U
1	2	1437	G
1	2	1440	A
1	2	1441	G
1	2	1442	G
1	2	1443	G
1	2	1444	G
1	2	1445	G
1	2	1448	G
1	2	1449	A
1	2	1450	A
1	2	1454	G
1	2	1455	U
1	2	1456	A
1	2	1459	A
1	2	1460	A

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Mol	Chain	Res	Type
1	2	1461	G
1	2	1463	U
1	2	1474	G
1	2	1486	G
1	2	1487	G
1	2	1488	A
1	2	1489	U
1	2	1490	C
1	2	1491	A
1	2	1492	C
1	2	1493	C
3	4	8	4SU
3	4	9	G
3	4	16	C
3	4	17(A)	U
3	4	18	G
3	4	20	H2U
3	4	21	A
3	4	22	G
3	4	46	A
3	4	47	U
3	4	49	G
3	4	74	C
3	4	75	C
34	5	4	A
34	5	5	G
34	5	8	A
34	5	10	U

All (7) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	256	G
1	2	1188	G
1	2	1436	U
1	2	1443	G
1	2	1487	G
1	2	1488	A
3	4	74	C

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

38 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	$\#\|Z\| > 2$
1	OMU	2	1032	1	19,22,23	1.26	3 (15%)	26,31,34	1.75	4 (15%)
1	OMU	2	15	1	19,22,23	1.23	3 (15%)	26,31,34	1.75	5 (19%)
1	6MZ	2	1457	36,1	18,25,26	0.84	1 (5%)	16,36,39	2.17	3 (18%)
1	OMG	2	672	1	18,26,27	0.95	1 (5%)	19,38,41	1.08	2 (10%)
3	5MU	4	54	3	19,22,23	1.38	5 (26%)	28,32,35	2.06	7 (25%)
1	OMC	2	1366	1	19,22,23	0.82	0	26,31,34	0.78	0
1	A2M	2	494	1	18,25,26	0.95	1 (5%)	18,36,39	1.30	2 (11%)
1	OMU	2	1344	1	19,22,23	1.22	3 (15%)	26,31,34	1.72	6 (23%)
3	PSU	4	55	3	18,21,22	1.32	2 (11%)	22,30,33	1.89	3 (13%)
1	OMG	2	1061	1	18,26,27	0.96	1 (5%)	19,38,41	1.10	2 (10%)
1	OMG	2	546	1	18,26,27	0.92	1 (5%)	19,38,41	1.12	2 (10%)
1	C4J	2	930	1	24,29,30	0.85	1 (4%)	29,42,45	0.62	0
3	H2U	4	20	3	18,21,22	0.31	0	21,30,33	0.42	0
3	4SU	4	8	3	18,21,22	0.28	0	26,30,33	0.35	0
1	4AC	2	1478	1	21,24,25	1.02	2 (9%)	29,34,37	1.37	4 (13%)
1	OMG	2	1194	1	18,26,27	0.97	1 (5%)	19,38,41	1.14	2 (10%)
1	OMC	2	313	1	19,22,23	0.85	0	26,31,34	0.97	1 (3%)
1	OMU	2	52	1	19,22,23	1.23	3 (15%)	26,31,34	1.75	4 (15%)
1	OMC	2	512	1	19,22,23	0.81	0	26,31,34	0.82	0
1	4AC	2	1467	1	21,24,25	1.01	2 (9%)	29,34,37	1.38	4 (13%)
1	OMC	2	246	1	19,22,23	0.86	0	26,31,34	1.08	2 (7%)
1	OMG	2	1018	1	18,26,27	0.96	1 (5%)	19,38,41	1.08	2 (10%)
1	4AC	2	1466	1	21,24,25	1.01	2 (9%)	29,34,37	1.33	4 (13%)
1	OMC	2	710	1	19,22,23	0.83	0	26,31,34	0.88	1 (3%)
1	OMC	2	113	1	19,22,23	0.82	0	26,31,34	0.82	0
1	4AC	2	843	1	21,24,25	1.05	2 (9%)	29,34,37	1.37	5 (17%)
1	OMG	2	905	1	18,26,27	0.96	1 (5%)	19,38,41	1.13	2 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
1	OMG	2	399	1	18,26,27	0.96	1 (5%)	19,38,41	1.07	2 (10%)
1	OMC	2	481	1	19,22,23	1.30	3 (15%)	26,31,34	0.89	1 (3%)
1	MA6	2	1475	1	18,26,27	0.92	1 (5%)	19,38,41	1.21	2 (10%)
3	OMC	4	32	3	19,22,23	0.85	0	26,31,34	1.03	2 (7%)
1	OMG	2	337	1	18,26,27	0.95	1 (5%)	19,38,41	1.17	2 (10%)
1	OMC	2	538	1	19,22,23	0.82	0	26,31,34	0.84	0
1	5MC	2	1368	1	18,22,23	0.94	2 (11%)	26,32,35	1.11	2 (7%)
1	4AC	2	1477	1	21,24,25	1.02	2 (9%)	29,34,37	1.54	5 (17%)
1	OMG	2	926	1	18,26,27	0.93	1 (5%)	19,38,41	1.11	2 (10%)
1	OMC	2	1060	1	19,22,23	0.83	0	26,31,34	0.76	0
1	OMG	2	865	1	18,26,27	0.96	1 (5%)	19,38,41	1.09	2 (10%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	OMU	2	1032	1	-	0/9/27/28	0/2/2/2
1	OMU	2	15	1	-	0/9/27/28	0/2/2/2
1	6MZ	2	1457	36,1	-	0/5/27/28	0/3/3/3
1	OMG	2	672	1	-	0/5/27/28	0/3/3/3
3	5MU	4	54	3	-	0/7/25/26	0/2/2/2
1	OMC	2	1366	1	-	0/9/27/28	0/2/2/2
1	A2M	2	494	1	-	0/5/27/28	0/3/3/3
1	OMU	2	1344	1	-	0/9/27/28	0/2/2/2
3	PSU	4	55	3	-	1/7/25/26	0/2/2/2
1	OMG	2	1061	1	-	0/5/27/28	0/3/3/3
1	OMG	2	546	1	-	0/5/27/28	0/3/3/3
1	C4J	2	930	1	-	2/16/34/35	0/2/2/2
3	H2U	4	20	3	-	3/7/38/39	0/2/2/2
3	4SU	4	8	3	-	0/7/25/26	0/2/2/2
1	4AC	2	1478	1	-	0/11/29/30	0/2/2/2
1	OMG	2	1194	1	-	0/5/27/28	0/3/3/3
1	OMC	2	313	1	-	1/9/27/28	0/2/2/2
1	OMU	2	52	1	-	0/9/27/28	0/2/2/2
1	OMC	2	512	1	-	0/9/27/28	0/2/2/2
1	4AC	2	1467	1	-	0/11/29/30	0/2/2/2
1	OMC	2	246	1	-	3/9/27/28	0/2/2/2
1	OMG	2	1018	1	-	0/5/27/28	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	4AC	2	1466	1	-	0/11/29/30	0/2/2/2
1	OMC	2	710	1	-	0/9/27/28	0/2/2/2
1	OMC	2	113	1	-	0/9/27/28	0/2/2/2
1	4AC	2	843	1	-	0/11/29/30	0/2/2/2
1	OMG	2	905	1	-	0/5/27/28	0/3/3/3
1	OMG	2	399	1	-	0/5/27/28	0/3/3/3
1	OMC	2	481	1	-	0/9/27/28	0/2/2/2
1	MA6	2	1475	1	-	0/7/29/30	0/3/3/3
3	OMC	4	32	3	-	3/9/27/28	0/2/2/2
1	OMG	2	337	1	-	1/5/27/28	0/3/3/3
1	OMC	2	538	1	-	0/9/27/28	0/2/2/2
1	5MC	2	1368	1	-	0/7/25/26	0/2/2/2
1	4AC	2	1477	1	-	2/11/29/30	0/2/2/2
1	OMG	2	926	1	-	0/5/27/28	0/3/3/3
1	OMC	2	1060	1	-	0/9/27/28	0/2/2/2
1	OMG	2	865	1	-	2/5/27/28	0/3/3/3

All (48) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	481	OMC	C4-N4	3.94	1.43	1.33
3	4	55	PSU	C6-C5	3.23	1.39	1.35
1	2	1478	4AC	C5-C4	2.88	1.47	1.40
1	2	843	4AC	C5-C4	2.86	1.47	1.40
1	2	930	C4J	O4'-C1'	-2.78	1.40	1.43
1	2	1018	OMG	C6-N1	-2.77	1.33	1.37
1	2	1194	OMG	C6-N1	-2.76	1.33	1.37
1	2	1467	4AC	C5-C4	2.76	1.46	1.40
1	2	1466	4AC	C5-C4	2.74	1.46	1.40
1	2	1061	OMG	C6-N1	-2.73	1.33	1.37
1	2	1032	OMU	C4-N3	-2.73	1.33	1.38
1	2	1477	4AC	C5-C4	2.72	1.46	1.40
1	2	865	OMG	C6-N1	-2.72	1.33	1.37
1	2	672	OMG	C6-N1	-2.68	1.33	1.37
1	2	337	OMG	C6-N1	-2.68	1.33	1.37
1	2	399	OMG	C6-N1	-2.68	1.33	1.37
1	2	905	OMG	C6-N1	-2.67	1.33	1.37
1	2	52	OMU	C4-N3	-2.62	1.33	1.38
1	2	15	OMU	C4-N3	-2.61	1.33	1.38
1	2	1344	OMU	C4-N3	-2.61	1.33	1.38
3	4	54	5MU	C6-C5	2.59	1.38	1.34
3	4	55	PSU	C4-N3	-2.58	1.34	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	4	54	5MU	C4-N3	-2.57	1.34	1.38
1	2	926	OMG	C6-N1	-2.57	1.34	1.37
1	2	1368	5MC	C6-C5	2.54	1.38	1.34
1	2	843	4AC	C4-N3	-2.49	1.28	1.32
1	2	1368	5MC	C6-N1	-2.49	1.33	1.38
1	2	546	OMG	C6-N1	-2.47	1.34	1.37
1	2	1457	6MZ	C5-C4	2.41	1.47	1.40
1	2	1475	MA6	C5-C4	2.39	1.47	1.40
1	2	1032	OMU	C2-N3	-2.39	1.33	1.38
3	4	54	5MU	C4-C5	2.34	1.48	1.44
3	4	54	5MU	C6-N1	-2.32	1.34	1.38
1	2	1467	4AC	C4-N3	-2.28	1.28	1.32
1	2	52	OMU	C2-N3	-2.27	1.33	1.38
1	2	15	OMU	C2-N3	-2.25	1.34	1.38
1	2	1466	4AC	C4-N3	-2.25	1.28	1.32
1	2	481	OMC	C5-C4	-2.24	1.37	1.42
1	2	494	A2M	C5-C4	2.23	1.46	1.40
1	2	1344	OMU	C2-N3	-2.23	1.34	1.38
1	2	481	OMC	C6-C5	2.22	1.40	1.35
1	2	1478	4AC	C4-N3	-2.21	1.29	1.32
1	2	1344	OMU	C5-C4	-2.21	1.38	1.43
3	4	54	5MU	C2-N1	2.15	1.41	1.38
1	2	15	OMU	C5-C4	-2.13	1.38	1.43
1	2	1477	4AC	C4-N3	-2.11	1.29	1.32
1	2	1032	OMU	C5-C4	-2.10	1.39	1.43
1	2	52	OMU	C5-C4	-2.09	1.39	1.43

All (87) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	1457	6MZ	C2-N1-C6	7.10	122.68	116.59
3	4	55	PSU	N1-C2-N3	5.83	121.73	115.13
3	4	54	5MU	C4-N3-C2	-5.07	120.79	127.35
3	4	54	5MU	N3-C2-N1	4.75	121.20	114.89
1	2	1032	OMU	C4-N3-C2	-4.64	120.46	126.58
1	2	52	OMU	C4-N3-C2	-4.63	120.47	126.58
1	2	15	OMU	C4-N3-C2	-4.61	120.50	126.58
1	2	1467	4AC	O7-C7-N4	4.56	129.20	121.82
1	2	1477	4AC	O7-C7-N4	4.49	129.08	121.82
1	2	1478	4AC	O7-C7-N4	4.47	129.06	121.82
1	2	1344	OMU	C4-N3-C2	-4.46	120.70	126.58
1	2	1466	4AC	O7-C7-N4	4.45	129.01	121.82

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	843	4AC	O7-C7-N4	4.34	128.84	121.82
3	4	54	5MU	C5-C4-N3	4.34	119.01	115.31
1	2	52	OMU	N3-C2-N1	4.29	120.58	114.89
1	2	1032	OMU	N3-C2-N1	4.14	120.38	114.89
1	2	1344	OMU	N3-C2-N1	4.13	120.38	114.89
1	2	15	OMU	N3-C2-N1	3.99	120.19	114.89
3	4	55	PSU	C4-N3-C2	-3.98	120.61	126.34
3	4	54	5MU	O4-C4-C5	-3.81	120.49	124.90
1	2	15	OMU	C5-C4-N3	3.78	120.49	114.84
1	2	1032	OMU	C5-C4-N3	3.70	120.38	114.84
1	2	1344	OMU	C5-C4-N3	3.58	120.20	114.84
1	2	52	OMU	C5-C4-N3	3.56	120.17	114.84
1	2	1477	4AC	N4-C4-N3	3.55	119.81	113.85
3	4	54	5MU	C5-C6-N1	-3.46	119.78	123.34
1	2	1457	6MZ	N3-C2-N1	-3.38	123.40	128.68
1	2	1477	4AC	C5-C4-N4	-3.38	117.05	122.92
1	2	15	OMU	O4-C4-C5	-3.33	119.31	125.16
3	4	55	PSU	O2-C2-N1	-3.31	119.15	122.79
1	2	1457	6MZ	C4-C5-N7	-3.30	105.97	109.40
1	2	1467	4AC	CM7-C7-N4	-3.29	109.61	115.29
1	2	1368	5MC	C5-C6-N1	-3.26	119.98	123.34
1	2	1475	MA6	C4-C5-N7	-3.23	106.03	109.40
1	2	494	A2M	N3-C2-N1	-3.22	123.65	128.68
1	2	1475	MA6	N3-C2-N1	-3.12	123.81	128.68
1	2	1478	4AC	N4-C4-N3	3.08	119.02	113.85
1	2	1344	OMU	O4-C4-C5	-3.08	119.75	125.16
1	2	843	4AC	CM7-C7-N4	-3.04	110.03	115.29
1	2	1032	OMU	O4-C4-C5	-3.04	119.81	125.16
1	2	1467	4AC	C5-C4-N4	-3.03	117.66	122.92
1	2	1478	4AC	C5-C4-N4	-3.00	117.71	122.92
1	2	1466	4AC	N4-C4-N3	2.97	118.84	113.85
1	2	1368	5MC	C5-C4-N3	-2.97	118.47	121.67
1	2	1467	4AC	N4-C4-N3	2.95	118.80	113.85
1	2	52	OMU	O4-C4-C5	-2.93	120.00	125.16
1	2	1466	4AC	C5-C4-N4	-2.90	117.88	122.92
1	2	1466	4AC	CM7-C7-N4	-2.89	110.30	115.29
1	2	1478	4AC	CM7-C7-N4	-2.79	110.47	115.29
1	2	246	OMC	O2-C2-N3	-2.71	117.92	122.33
1	2	1477	4AC	CM7-C7-N4	-2.69	110.65	115.29
1	2	843	4AC	C5-C4-N4	-2.64	118.34	122.92
3	4	32	OMC	O2-C2-N3	-2.63	118.06	122.33
1	2	313	OMC	O2-C2-N3	-2.49	118.28	122.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	865	OMG	C5-C6-N1	2.47	118.31	113.95
1	2	481	OMC	O2-C2-N3	-2.46	118.33	122.33
1	2	1061	OMG	C5-C6-N1	2.41	118.21	113.95
1	2	672	OMG	C5-C6-N1	2.40	118.19	113.95
1	2	337	OMG	C5-C6-N1	2.40	118.19	113.95
1	2	843	4AC	N4-C4-N3	2.40	117.88	113.85
1	2	1194	OMG	C5-C6-N1	2.38	118.15	113.95
1	2	905	OMG	C8-N7-C5	2.37	107.51	102.99
1	2	494	A2M	C4-C5-N7	-2.37	106.93	109.40
3	4	54	5MU	O2-C2-N1	-2.35	119.66	122.79
1	2	905	OMG	C5-C6-N1	2.35	118.10	113.95
1	2	926	OMG	C5-C6-N1	2.35	118.10	113.95
1	2	1018	OMG	C5-C6-N1	2.35	118.09	113.95
1	2	1194	OMG	C8-N7-C5	2.32	107.42	102.99
1	2	546	OMG	C5-C6-N1	2.31	118.04	113.95
1	2	337	OMG	C8-N7-C5	2.31	107.40	102.99
1	2	926	OMG	C8-N7-C5	2.30	107.38	102.99
3	4	32	OMC	C1'-N1-C2	2.30	123.55	118.42
1	2	546	OMG	C8-N7-C5	2.29	107.36	102.99
1	2	399	OMG	C5-C6-N1	2.29	117.99	113.95
1	2	865	OMG	C8-N7-C5	2.28	107.33	102.99
1	2	1477	4AC	C1'-N1-C2	2.27	123.48	118.42
1	2	399	OMG	C8-N7-C5	2.25	107.27	102.99
1	2	672	OMG	C8-N7-C5	2.24	107.26	102.99
1	2	1061	OMG	C8-N7-C5	2.24	107.25	102.99
1	2	1018	OMG	C8-N7-C5	2.21	107.20	102.99
1	2	1344	OMU	O2-C2-N1	-2.18	119.88	122.79
1	2	710	OMC	O2-C2-N3	-2.13	118.88	122.33
1	2	15	OMU	O2-C2-N1	-2.12	119.97	122.79
3	4	54	5MU	C5M-C5-C4	2.12	121.10	118.77
1	2	843	4AC	O2-C2-N3	-2.11	118.91	122.33
1	2	246	OMC	CM2-O2'-C2'	-2.06	109.11	114.52
1	2	1344	OMU	C1'-N1-C2	2.01	121.21	117.57

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	2	246	OMC	C3'-C4'-C5'-O5'
3	4	20	H2U	O4'-C1'-N1-C6
1	2	930	C4J	C4'-C5'-O5'-P
1	2	246	OMC	O4'-C4'-C5'-O5'

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Mol	Chain	Res	Type	Atoms
3	4	20	H2U	O4'-C1'-N1-C2
1	2	930	C4J	C3'-C4'-C5'-O5'
1	2	865	OMG	C4'-C5'-O5'-P
3	4	20	H2U	C4'-C5'-O5'-P
3	4	32	OMC	C3'-C2'-O2'-CM2
1	2	337	OMG	C4'-C5'-O5'-P
1	2	865	OMG	C3'-C4'-C5'-O5'
3	4	32	OMC	C2'-C1'-N1-C6
3	4	55	PSU	O4'-C1'-C5-C4
1	2	246	OMC	C2'-C1'-N1-C2
3	4	32	OMC	C2'-C1'-N1-C2
1	2	1477	4AC	C2'-C1'-N1-C2
1	2	313	OMC	C2'-C1'-N1-C2
1	2	1477	4AC	C4'-C5'-O5'-P

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 96 ligands modelled in this entry, 66 are monoatomic - leaving 30 for Mogul analysis.

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	$\#\|Z\| > 2$
37	SPM	2	1559	-	13,13,13	0.10	0	12,12,12	0.08	0
37	SPM	2	1575	-	13,13,13	0.08	0	12,12,12	0.12	0
37	SPM	2	1573	-	13,13,13	0.10	0	12,12,12	0.11	0
37	SPM	2	1579	-	13,13,13	0.10	0	12,12,12	0.09	0
37	SPM	2	1580	-	13,13,13	0.13	0	12,12,12	0.12	0
37	SPM	2	1584	-	13,13,13	0.07	0	12,12,12	0.18	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
37	SPM	2	1560	-	13,13,13	0.08	0	12,12,12	0.12	0
37	SPM	2	1557	-	13,13,13	0.12	0	12,12,12	0.06	0
37	SPM	2	1571	-	13,13,13	0.10	0	12,12,12	0.11	0
37	SPM	2	1578	-	13,13,13	0.09	0	12,12,12	0.11	0
37	SPM	2	1581	-	13,13,13	0.09	0	12,12,12	0.22	0
37	SPM	2	1572	-	13,13,13	0.07	0	12,12,12	0.15	0
37	SPM	2	1582	-	13,13,13	0.10	0	12,12,12	0.09	0
37	SPM	2	1566	-	13,13,13	0.10	0	12,12,12	0.09	0
37	SPM	2	1561	-	13,13,13	0.09	0	12,12,12	0.09	0
37	SPM	2	1577	-	13,13,13	0.10	0	12,12,12	0.10	0
37	SPM	2	1556	-	13,13,13	0.09	0	12,12,12	0.12	0
37	SPM	2	1563	-	13,13,13	0.10	0	12,12,12	0.11	0
37	SPM	2	1567	-	13,13,13	0.10	0	12,12,12	0.08	0
37	SPM	2	1570	-	13,13,13	0.10	0	12,12,12	0.09	0
37	SPM	2	1568	-	13,13,13	0.10	0	12,12,12	0.12	0
37	SPM	2	1583	-	13,13,13	0.12	0	12,12,12	0.06	0
37	SPM	F	303	-	13,13,13	0.09	0	12,12,12	0.10	0
37	SPM	2	1562	-	13,13,13	0.08	0	12,12,12	0.13	0
37	SPM	2	1558	-	13,13,13	0.09	0	12,12,12	0.12	0
37	SPM	2	1569	-	13,13,13	0.08	0	12,12,12	0.14	0
37	SPM	2	1574	-	13,13,13	0.12	0	12,12,12	0.07	0
37	SPM	2	1576	-	13,13,13	0.10	0	12,12,12	0.17	0
37	SPM	2	1564	-	13,13,13	0.09	0	12,12,12	0.13	0
37	SPM	2	1565	-	13,13,13	0.10	0	12,12,12	0.11	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
37	SPM	2	1559	-	-	3/11/11/11	-
37	SPM	2	1575	-	-	3/11/11/11	-
37	SPM	2	1573	-	-	2/11/11/11	-
37	SPM	2	1579	-	-	2/11/11/11	-
37	SPM	2	1580	-	-	2/11/11/11	-
37	SPM	2	1584	-	-	3/11/11/11	-
37	SPM	2	1560	-	-	2/11/11/11	-
37	SPM	2	1557	-	-	2/11/11/11	-
37	SPM	2	1571	-	-	3/11/11/11	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
37	SPM	2	1578	-	-	3/11/11/11	-
37	SPM	2	1581	-	-	2/11/11/11	-
37	SPM	2	1572	-	-	7/11/11/11	-
37	SPM	2	1582	-	-	3/11/11/11	-
37	SPM	2	1566	-	-	3/11/11/11	-
37	SPM	2	1561	-	-	4/11/11/11	-
37	SPM	2	1577	-	-	3/11/11/11	-
37	SPM	2	1556	-	-	2/11/11/11	-
37	SPM	2	1563	-	-	3/11/11/11	-
37	SPM	2	1567	-	-	3/11/11/11	-
37	SPM	2	1570	-	-	5/11/11/11	-
37	SPM	2	1568	-	-	0/11/11/11	-
37	SPM	2	1583	-	-	3/11/11/11	-
37	SPM	F	303	-	-	4/11/11/11	-
37	SPM	2	1562	-	-	1/11/11/11	-
37	SPM	2	1558	-	-	3/11/11/11	-
37	SPM	2	1569	-	-	1/11/11/11	-
37	SPM	2	1574	-	-	4/11/11/11	-
37	SPM	2	1576	-	-	2/11/11/11	-
37	SPM	2	1564	-	-	2/11/11/11	-
37	SPM	2	1565	-	-	2/11/11/11	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (82) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
37	2	1564	SPM	C12-C11-N10-C9
37	2	1571	SPM	C7-C6-N5-C4
37	2	1572	SPM	N1-C2-C3-C4
37	2	1572	SPM	C12-C11-N10-C9
37	2	1576	SPM	C3-C4-N5-C6
37	2	1582	SPM	C3-C4-N5-C6
37	2	1556	SPM	C8-C9-N10-C11
37	2	1559	SPM	C3-C4-N5-C6
37	2	1571	SPM	C3-C4-N5-C6

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Mol	Chain	Res	Type	Atoms
37	2	1575	SPM	C7-C6-N5-C4
37	F	303	SPM	C12-C11-N10-C9
37	2	1562	SPM	C12-C11-N10-C9
37	2	1565	SPM	C3-C4-N5-C6
37	2	1573	SPM	C7-C6-N5-C4
37	2	1577	SPM	C3-C4-N5-C6
37	2	1577	SPM	C8-C9-N10-C11
37	2	1578	SPM	C12-C11-N10-C9
37	2	1580	SPM	C12-C11-N10-C9
37	2	1581	SPM	C3-C4-N5-C6
37	2	1558	SPM	C12-C11-N10-C9
37	2	1564	SPM	C8-C9-N10-C11
37	2	1557	SPM	C12-C11-N10-C9
37	2	1559	SPM	C8-C9-N10-C11
37	2	1561	SPM	C12-C11-N10-C9
37	2	1573	SPM	C3-C4-N5-C6
37	2	1576	SPM	C12-C11-N10-C9
37	2	1579	SPM	C7-C6-N5-C4
37	F	303	SPM	C7-C6-N5-C4
37	2	1561	SPM	C3-C4-N5-C6
37	2	1561	SPM	C7-C6-N5-C4
37	2	1584	SPM	C6-C7-C8-C9
37	2	1558	SPM	C8-C9-N10-C11
37	2	1567	SPM	C8-C9-N10-C11
37	2	1581	SPM	C7-C6-N5-C4
37	2	1572	SPM	C2-C3-C4-N5
37	2	1557	SPM	C7-C6-N5-C4
37	2	1563	SPM	C7-C6-N5-C4
37	2	1565	SPM	C7-C6-N5-C4
37	2	1566	SPM	C7-C6-N5-C4
37	2	1570	SPM	C3-C4-N5-C6
37	2	1580	SPM	C7-C6-N5-C4
37	2	1584	SPM	C12-C11-N10-C9
37	2	1572	SPM	N5-C6-C7-C8
37	2	1575	SPM	C6-C7-C8-C9
37	2	1558	SPM	C3-C4-N5-C6
37	2	1559	SPM	C7-C6-N5-C4
37	2	1570	SPM	C7-C6-N5-C4
37	2	1572	SPM	C8-C9-N10-C11
37	2	1575	SPM	C8-C9-N10-C11
37	2	1570	SPM	N10-C11-C12-C13
37	2	1566	SPM	C3-C4-N5-C6

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Mol	Chain	Res	Type	Atoms
37	2	1582	SPM	C7-C6-N5-C4
37	2	1572	SPM	C7-C6-N5-C4
37	2	1569	SPM	C3-C4-N5-C6
37	2	1582	SPM	C8-C9-N10-C11
37	2	1583	SPM	C3-C4-N5-C6
37	2	1567	SPM	C7-C6-N5-C4
37	2	1567	SPM	C12-C11-N10-C9
37	2	1578	SPM	C3-C4-N5-C6
37	2	1560	SPM	C8-C9-N10-C11
37	2	1563	SPM	C3-C4-N5-C6
37	2	1570	SPM	C8-C9-N10-C11
37	2	1578	SPM	C7-C6-N5-C4
37	2	1556	SPM	C12-C11-N10-C9
37	2	1563	SPM	C12-C11-N10-C9
37	2	1583	SPM	C8-C9-N10-C11
37	2	1583	SPM	C12-C11-N10-C9
37	2	1561	SPM	C6-C7-C8-C9
37	2	1572	SPM	C3-C4-N5-C6
37	2	1574	SPM	C12-C11-N10-C9
37	F	303	SPM	C3-C4-N5-C6
37	2	1560	SPM	C7-C6-N5-C4
37	2	1566	SPM	C8-C9-N10-C11
37	2	1570	SPM	C12-C11-N10-C9
37	2	1574	SPM	C3-C4-N5-C6
37	2	1574	SPM	C8-C9-N10-C11
37	2	1577	SPM	C12-C11-N10-C9
37	2	1579	SPM	C8-C9-N10-C11
37	2	1584	SPM	C3-C4-N5-C6
37	2	1574	SPM	C6-C7-C8-C9
37	F	303	SPM	C8-C9-N10-C11
37	2	1571	SPM	C6-C7-C8-C9

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

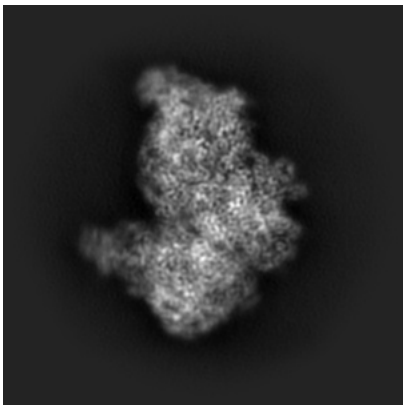
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-50725. These allow visual inspection of the internal detail of the map and identification of artifacts.

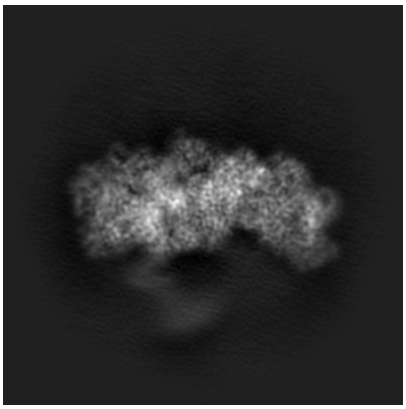
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

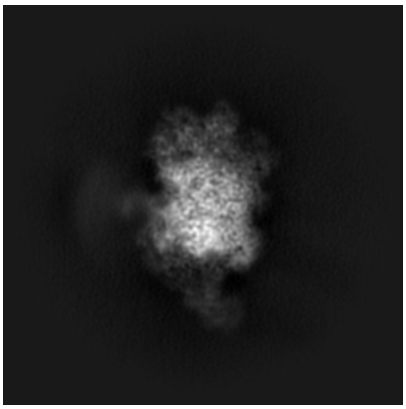
6.1.1 Primary map



X

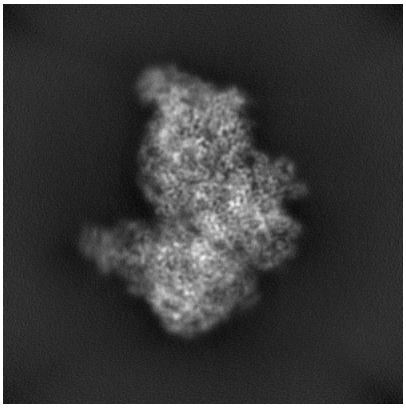


Y

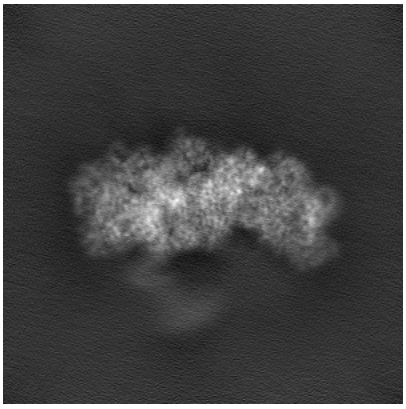


Z

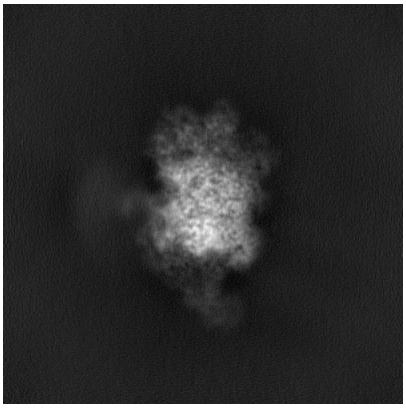
6.1.2 Raw map



X



Y

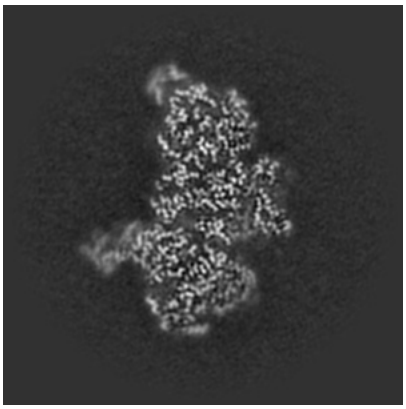


Z

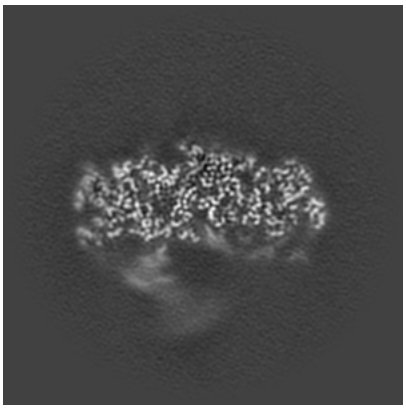
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

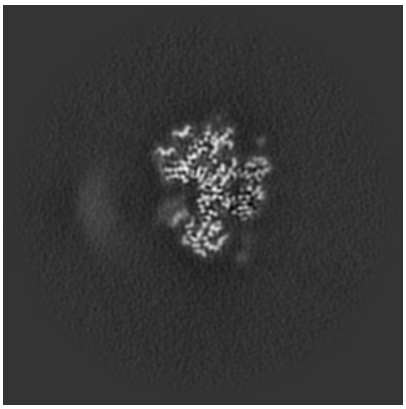
6.2.1 Primary map



X Index: 200

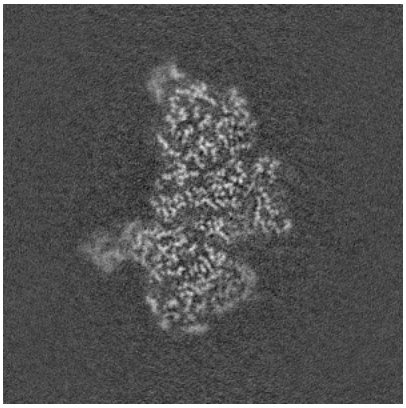


Y Index: 200

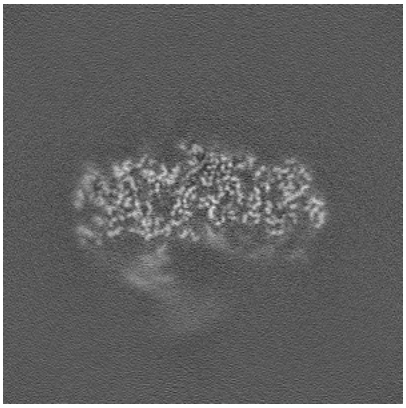


Z Index: 200

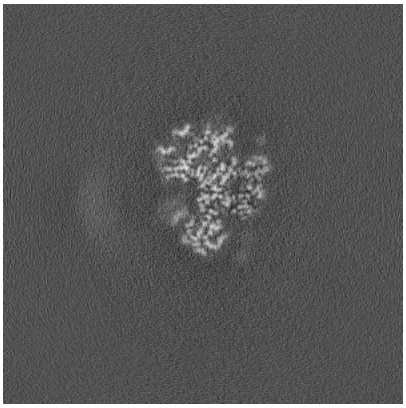
6.2.2 Raw map



X Index: 200



Y Index: 200

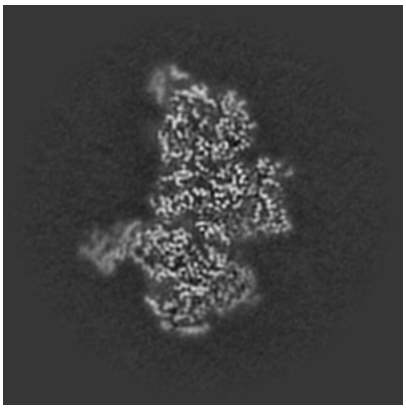


Z Index: 200

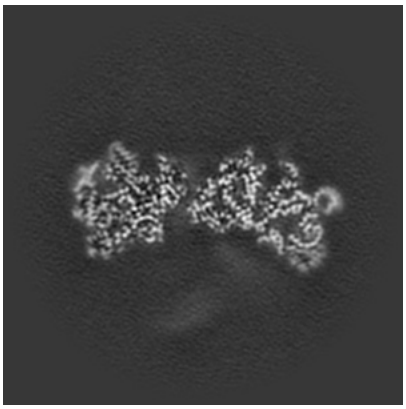
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

6.3.1 Primary map



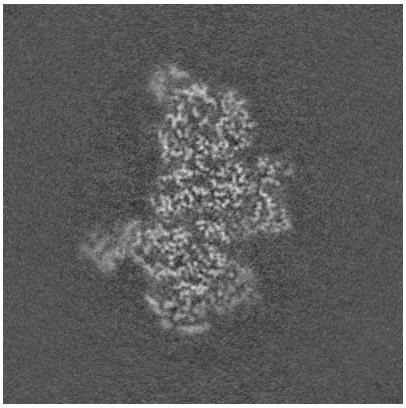
X Index: 202



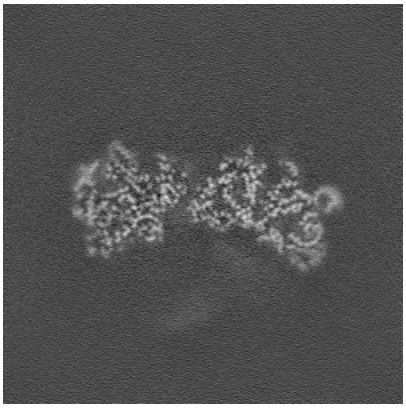
Y Index: 172

Z Index: 146

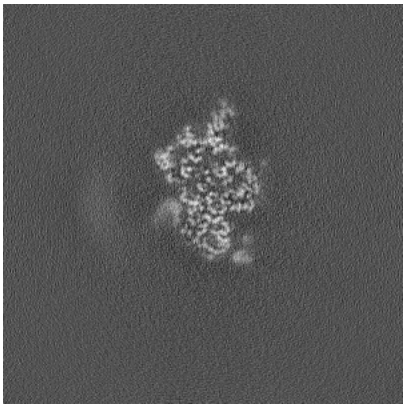
6.3.2 Raw map



X Index: 202



Y Index: 172

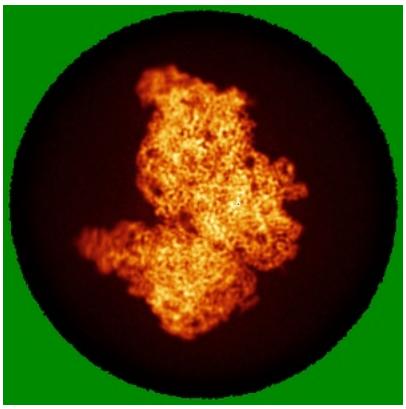


Z Index: 207

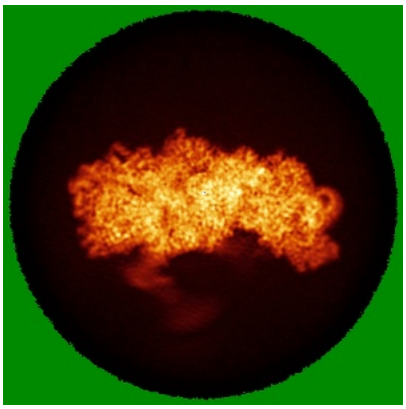
The images above show the largest variance slices of the map in three orthogonal directions.

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

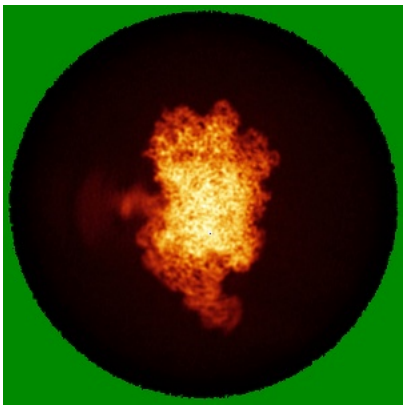
6.4.1 Primary map



X

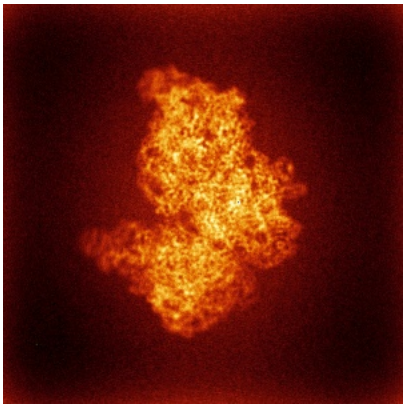


Y

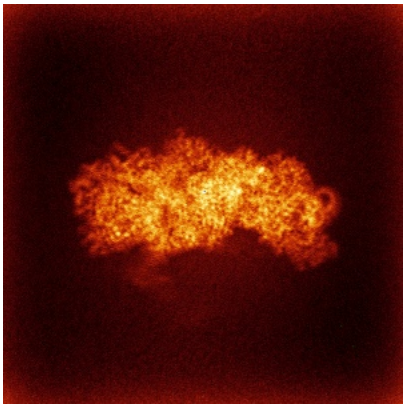


Z

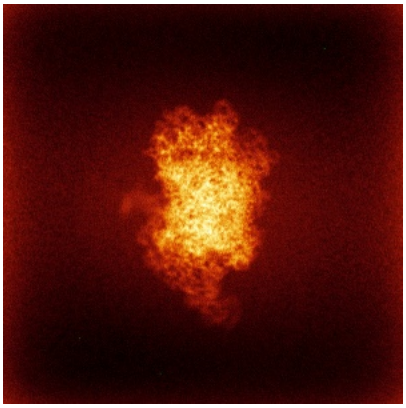
6.4.2 Raw map



X



Y



Z

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

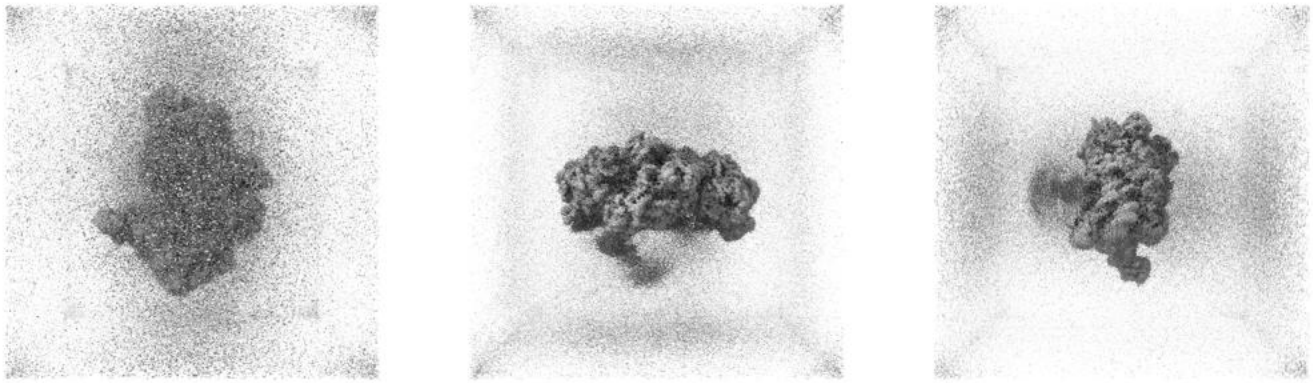
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

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

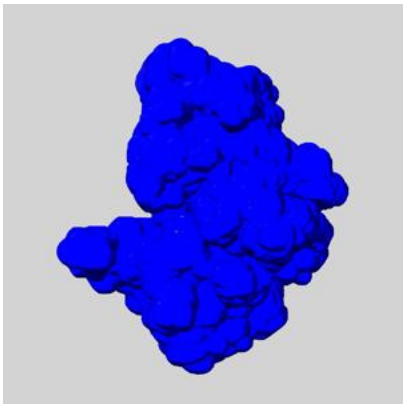
6.6 Mask visualisation (i)

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

A mask typically either:

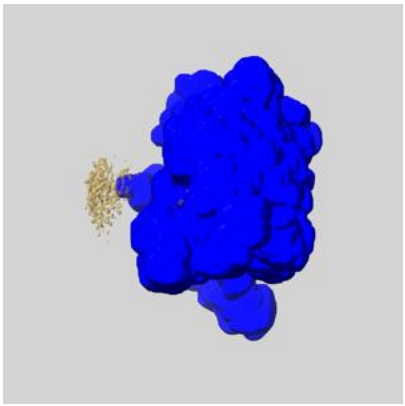
- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_50725_msk_1.map (i)



X

Y

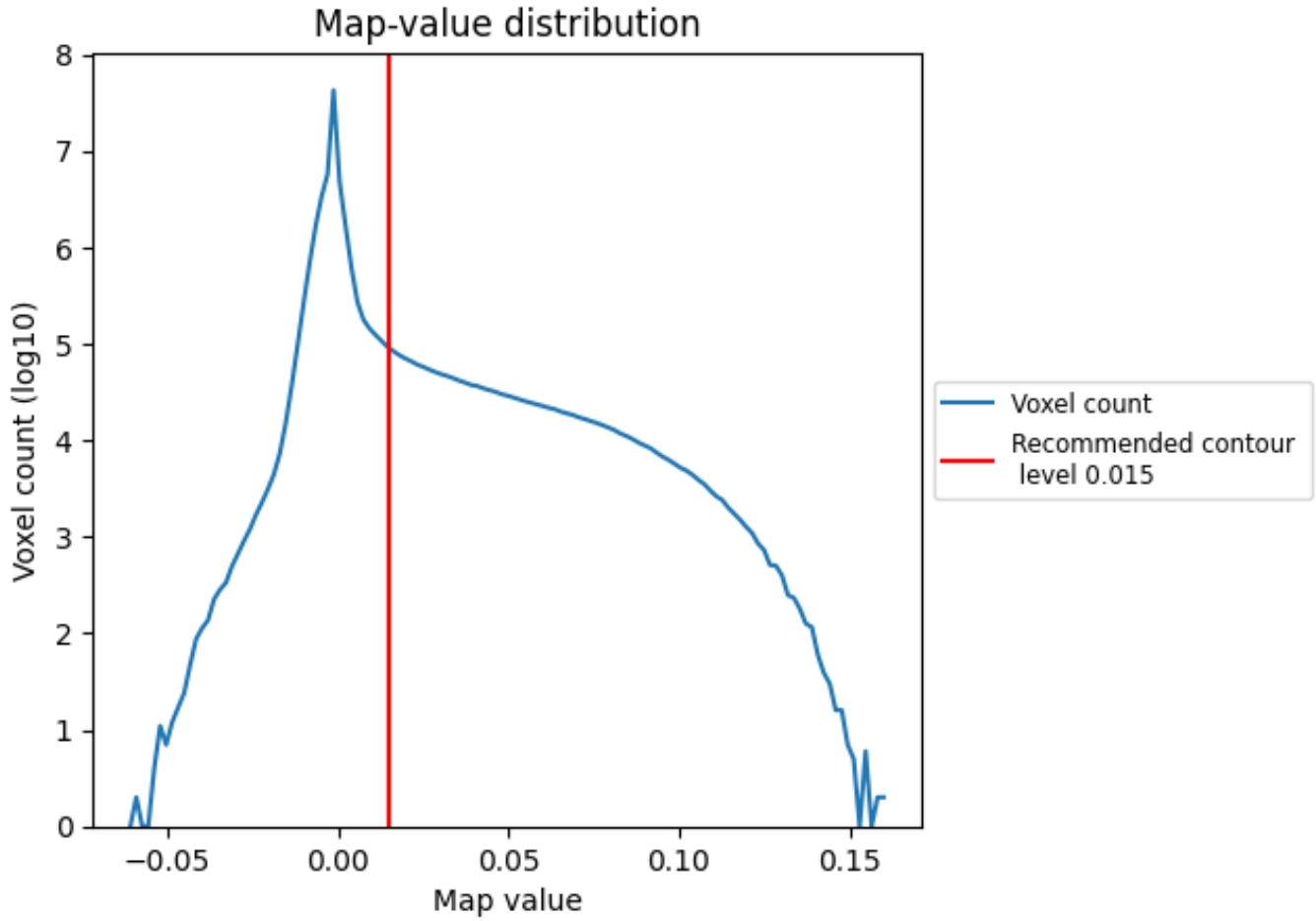


Z

7 Map analysis

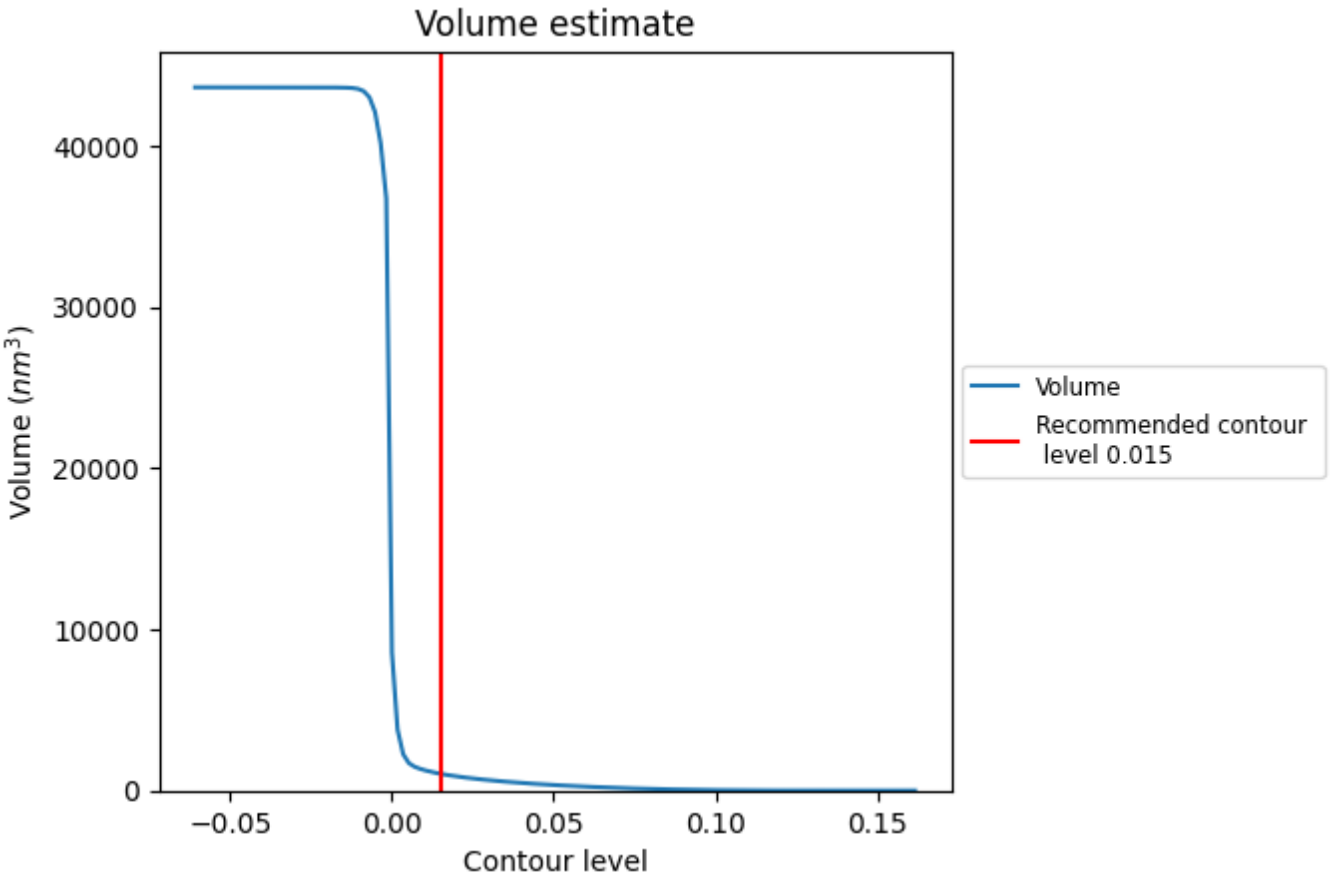
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

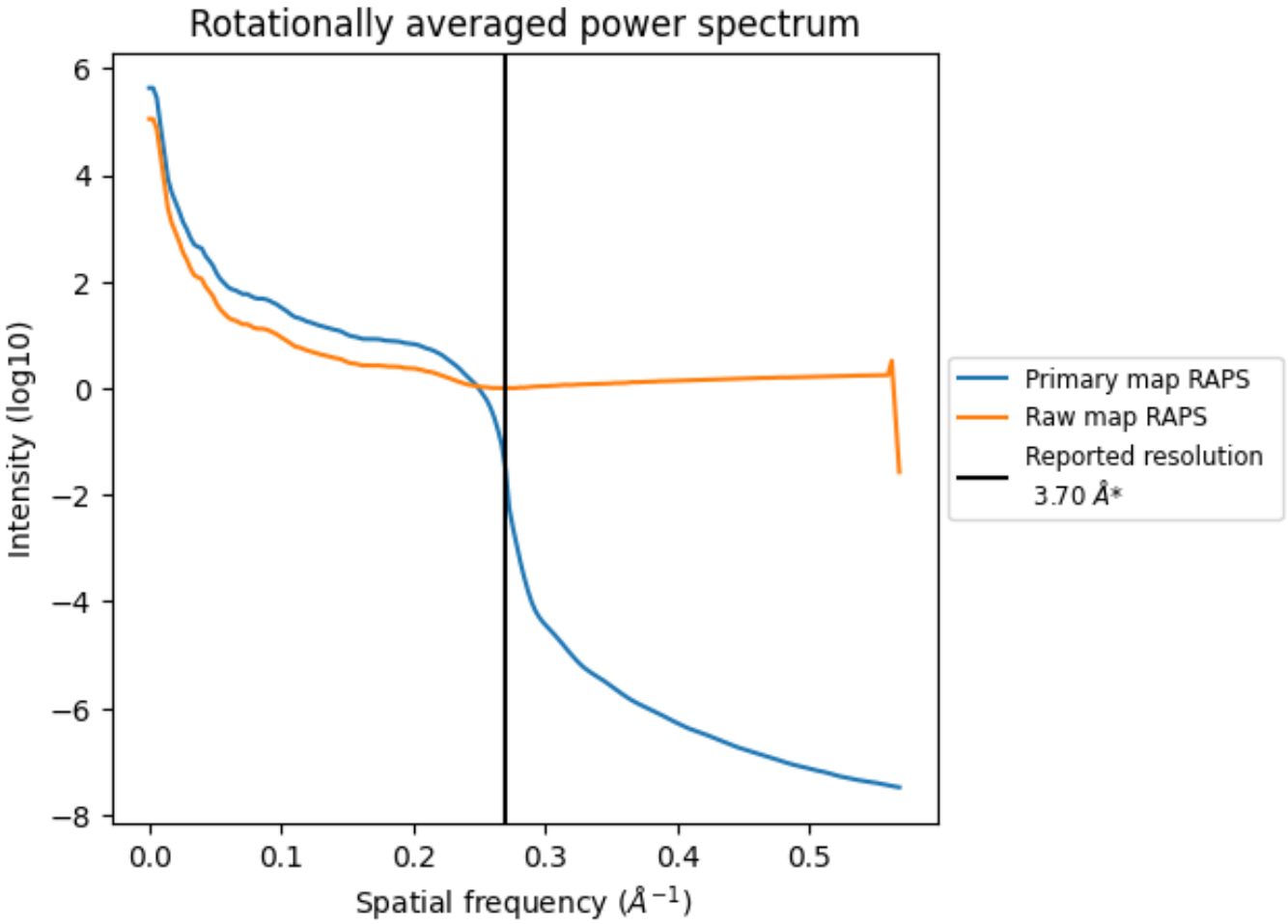
7.2 Volume estimate



The volume at the recommended contour level is 1042 nm^3; this corresponds to an approximate mass of 941 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)

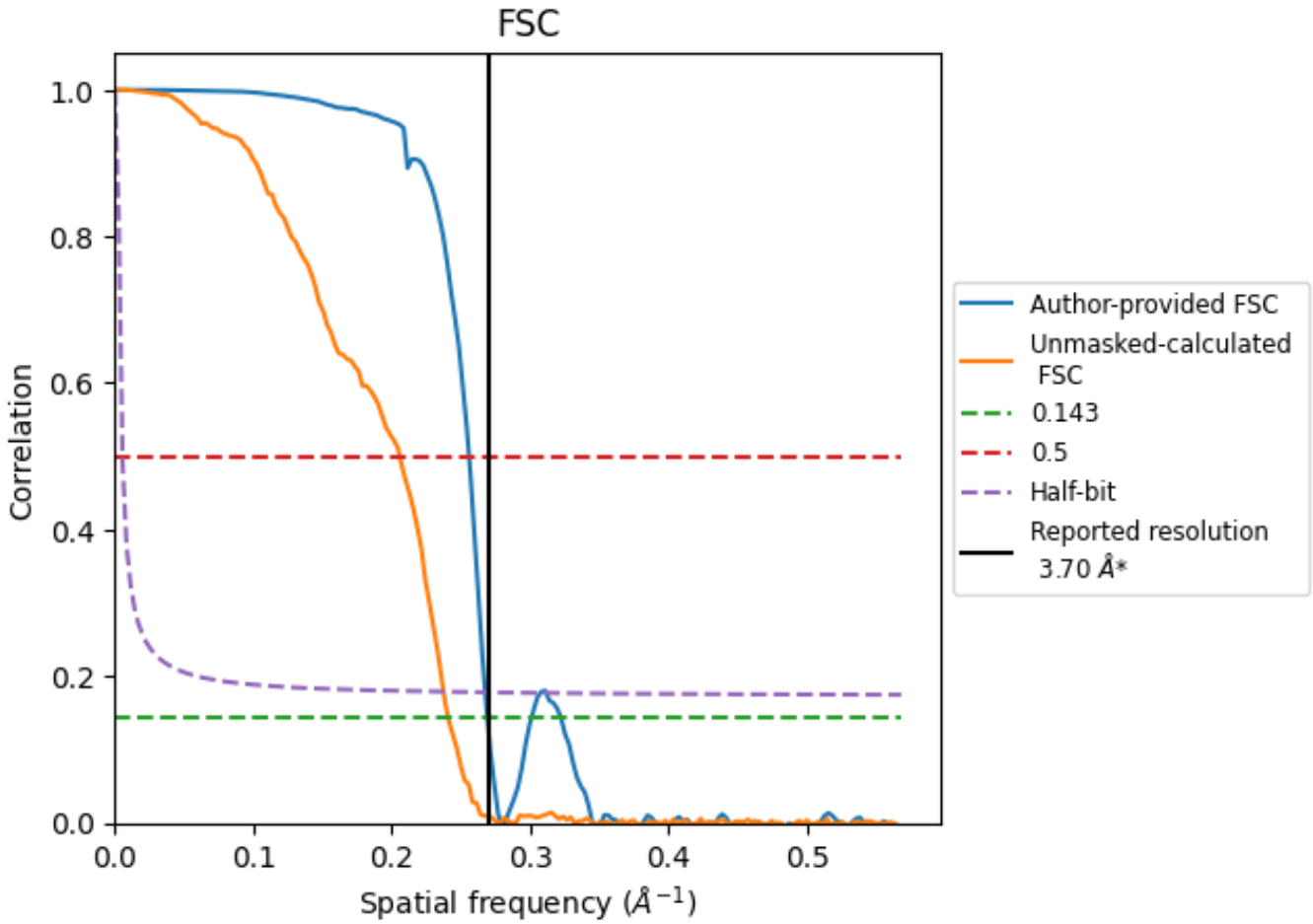


*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.270 Å^{-1}

8.2 Resolution estimates (i)

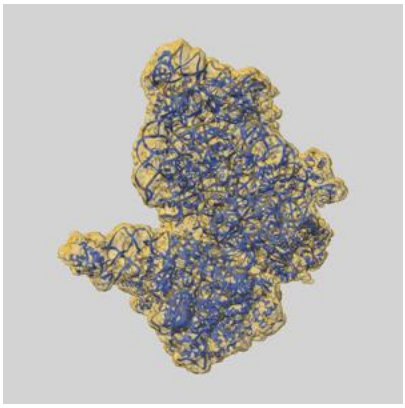
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.70	-	-
Author-provided FSC curve	3.71	3.91	3.74
Unmasked-calculated*	4.15	4.86	4.21

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.15 differs from the reported value 3.7 by more than 10 %

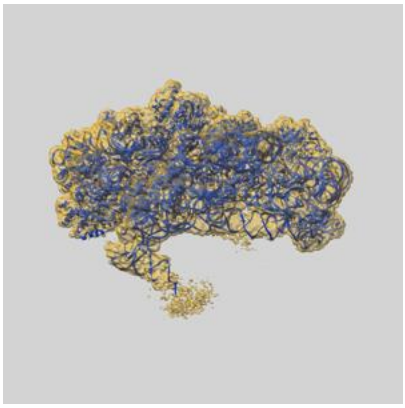
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-50725 and PDB model 9FS8. Per-residue inclusion information can be found in section 3 on page 14.

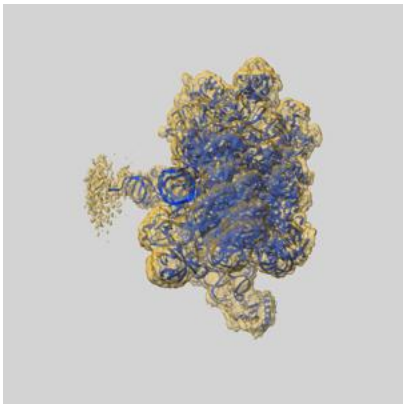
9.1 Map-model overlay



X



Y



Z

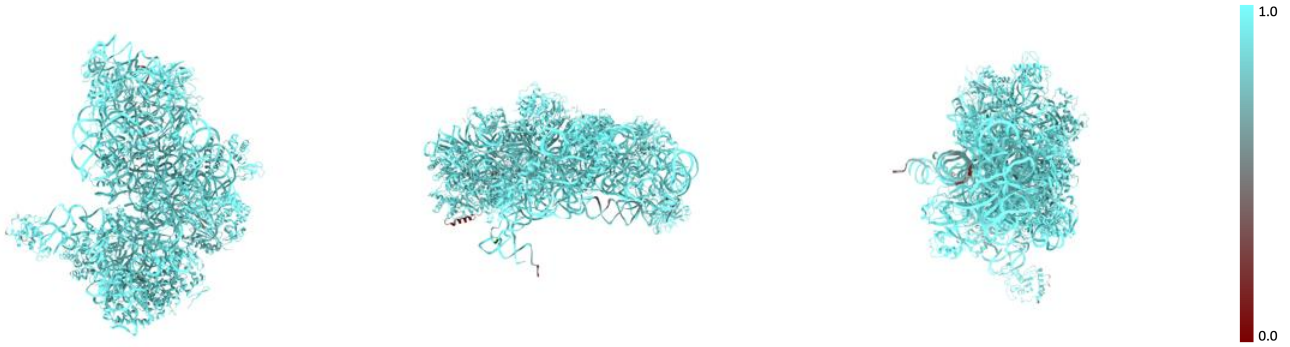
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)

X Y Z

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

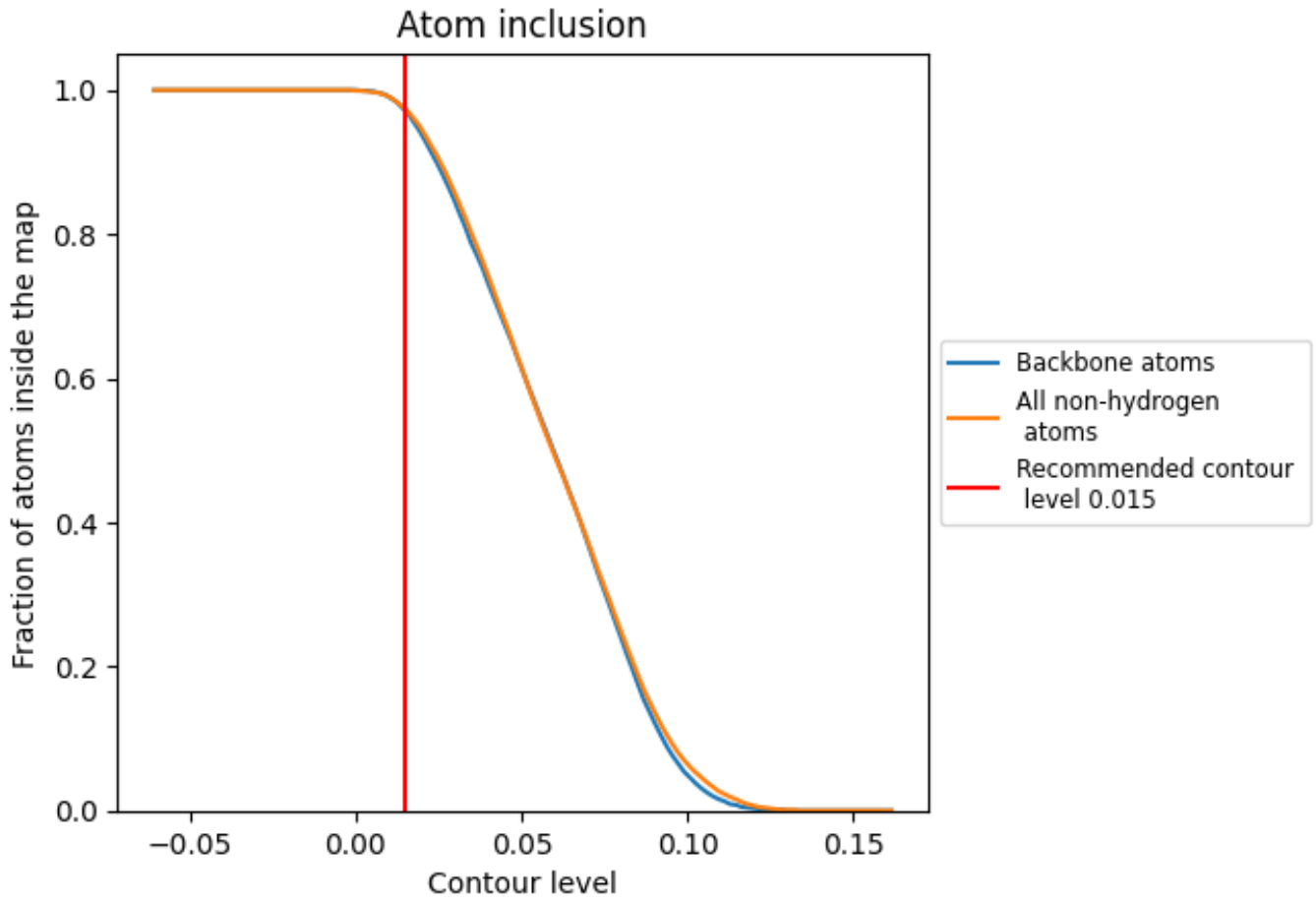
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.015).

9.4 Atom inclusion (i)



At the recommended contour level, 97% of all backbone atoms, 97% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9740	0.3910
2	0.9870	0.4040
3	0.9190	0.1810
4	0.9280	0.1940
5	0.9900	0.3840
A	0.9690	0.3930
B	0.9680	0.4000
C	0.9840	0.4520
D	0.9710	0.4350
E	0.9830	0.4400
F	0.9540	0.4410
G	0.9860	0.3530
H	0.9540	0.3380
I	0.9760	0.4560
J	0.9850	0.4330
K	0.9830	0.3770
L	0.9620	0.3740
M	0.9730	0.3950
N	0.9680	0.4500
O	0.9880	0.3940
P	0.9930	0.4340
Q	0.9750	0.4080
R	0.9730	0.4590
S	0.9660	0.3860
T	0.9670	0.3730
U	0.9720	0.3680
V	0.9840	0.4180
W	0.9900	0.4350
X	0.9630	0.3430
Y	0.9970	0.2070
Z	0.9650	0.4050
a	0.9820	0.3840
b	0.8700	0.3690
c	0.7790	0.2620
d	0.9710	0.2930
e	0.9910	0.4270