



Full wwPDB EM Validation Report ⓘ

Dec 30, 2024 – 08:24 AM EST

PDB ID : 8AGV
EMDB ID : EMD-15425
Title : Yeast RQC complex in state H
Authors : Tesina, P.; Buschauer, R.; Beckmann, R.
Deposited on : 2022-07-20
Resolution : 2.60 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:

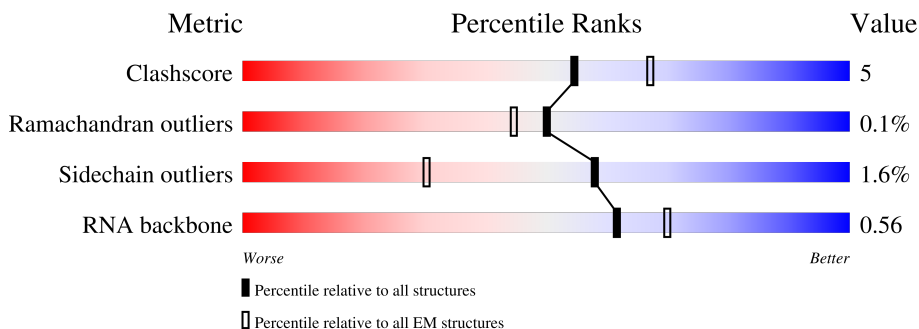
EMDB validation analysis : 0.0.1.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)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

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







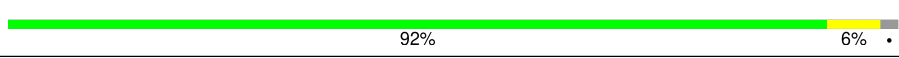
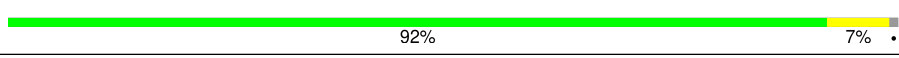
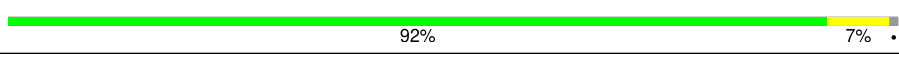
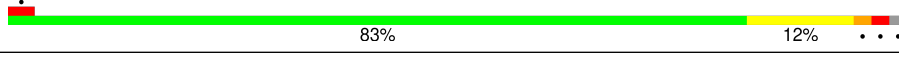
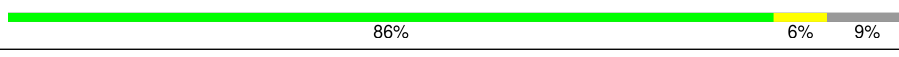

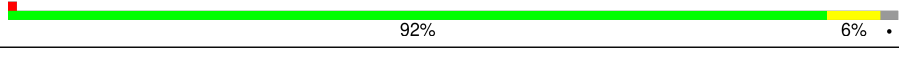
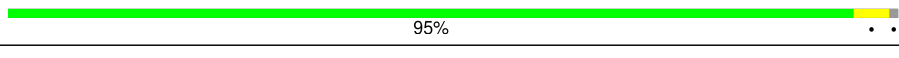

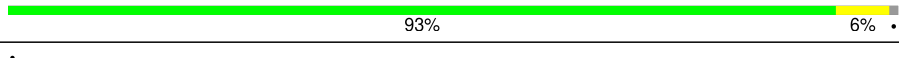
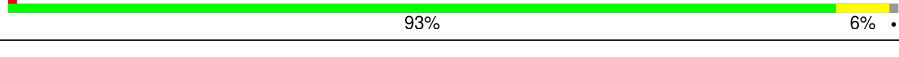


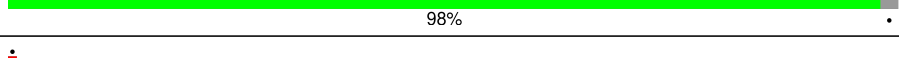

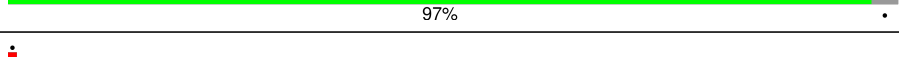
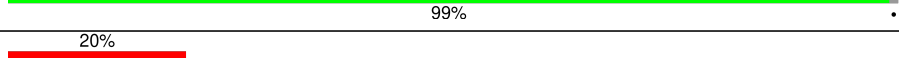
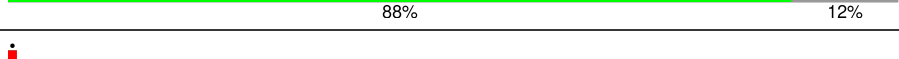

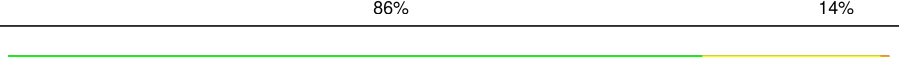

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	204	
2	B	199	
3	C	184	
4	D	186	
5	E	189	
6	F	172	
7	G	160	

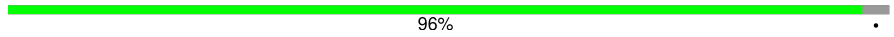
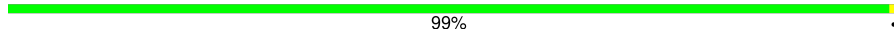
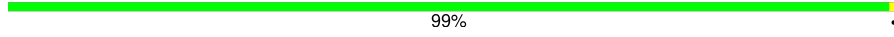
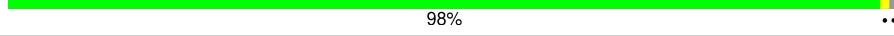
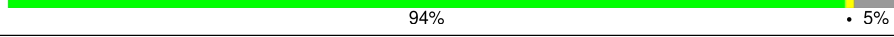
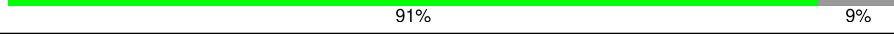

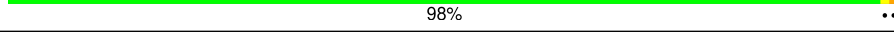
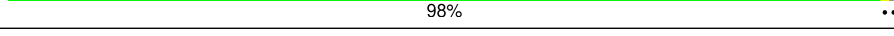
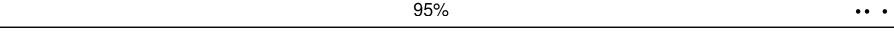
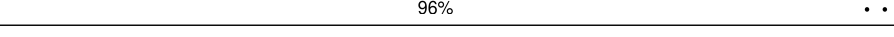
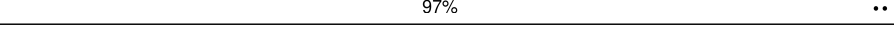

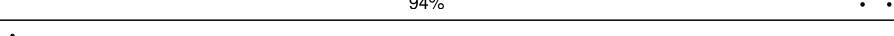
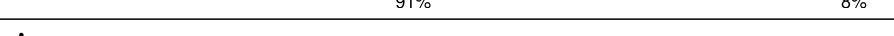
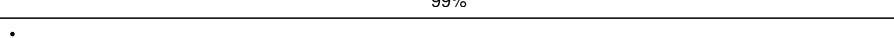
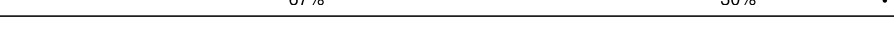

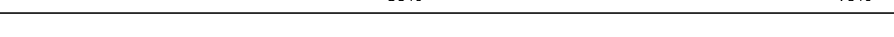



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Mol	Chain	Length	Quality of chain
8	H	121	 74% 9% 17%
9	I	137	 90% 9%
10	J	155	 37% 59%
11	K	142	 84% 15%
12	L	127	 92% 6%
13	M	136	 92% 7%
14	N	149	 92% 7%
15	O	59	 83% 12%
16	P	105	 86% 6% 9%
17	Q	113	 80% 17%
18	R	130	 92% 6%
19	S	107	 95%
20	T	121	 88% 5% 7%
21	U	120	 93% 6%
22	V	100	 93% 6%
23	W	88	 85% 7% 8%
24	X	78	 88% 10%
25	Y	51	 98%
26	Z	128	 41% 59%
27	b	106	 97%
28	c	92	 99%
29	d	25	 20% 88% 12%
30	f	3395	 75% 18% 5%
31	h	121	 86% 14%
32	i	158	 78% 20%

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Mol	Chain	Length	Quality of chain
33	j	254	 96%
34	k	387	 99%
35	l	362	 99%
36	m	297	 98%
37	n	176	 94% 5%
38	o	244	 91% 9%
39	p	256	 89% 9%
40	q	191	 98%
41	r	221	 98%
42	s	174	 95%
43	t	199	 96%
44	u	138	 97%
45	a	1038	 78% 18%
46	e	1562	 66% 94%
47	g	245	 91% 8%
48	w	217	 99%
49	x	76	 67% 30%
49	y	76	 57% 39%
50	z	165	 89% 10%
51	0	312	 31% 7% 61%
52	1	18	 100%
53	v	157	 88% 10%

2 Entry composition [i](#)

There are 55 unique types of molecules in this entry. The entry contains 151349 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	203	1720	1077	361	281	1	0	0

- Molecule 2 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	197	1555	1003	289	262	1	197	0

- Molecule 3 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	183	1416	879	284	253	0	0

- Molecule 4 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	185	1441	908	290	241	2	0	0

- Molecule 5 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	E	156	1258	781	265	212	0	0

- Molecule 6 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	171	1437	925	266	243	3	0	0

- Molecule 7 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	159	1272	802	245	221	4	0	0

- Molecule 8 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
8	H	100	796	516	131	149	0	0

- Molecule 9 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	I	136	1003	628	189	179	7	0	0

- Molecule 10 is a protein called 60S ribosomal protein L24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	J	63	518	333	102	82	1	0	0

- Molecule 11 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K	121	964	620	169	173	2	0	0

- Molecule 12 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	L	125	984	620	191	173	0	0

- Molecule 13 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	M	135	1080	701	199	180	0	0

- Molecule 14 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	N	148	1169	747	231	188	3	0	0

- Molecule 15 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	O	58	462	289	100	73		0	0

- Molecule 16 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	P	96	737	476	123	137	1	0	0

- Molecule 17 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	Q	109	876	556	167	152	1	0	0

- Molecule 18 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	R	127	1013	642	205	165	1	0	0

- Molecule 19 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	S	106	850	540	165	144	1	0	0

- Molecule 20 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	T	112	880	545	179	152	4	0	0

- Molecule 21 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	U	119	Total	C	N	O	S	0	0
			969	615	186	167	1		

- Molecule 22 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	V	99	Total	C	N	O	S	0	0
			766	478	154	132	2		

- Molecule 23 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	W	81	Total	C	N	O	S	0	0
			645	393	141	106	5		

- Molecule 24 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	X	77	Total	C	N	O	0	0
			612	391	115	106		

- Molecule 25 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Y	50	Total	C	N	O	S	0	0
			436	272	97	65	2		

- Molecule 26 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z	52	Total	C	N	O	S	0	0
			410	254	86	65	5		

- Molecule 27 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	103	Total	C	N	O	S	0	0
			824	517	167	135	5		

- Molecule 28 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	c	91	694	429	138	121	6	0	0

- Molecule 29 is a protein called 60S ribosomal protein L41-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	d	22	207	127	56	23	1	0	0

- Molecule 30 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
30	f	3216	68802	30732	12391	22462	3217	1	0

- Molecule 31 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
31	h	121	2579	1152	461	845	121	0	0

- Molecule 32 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
32	i	158	3353	1500	586	1109	158	0	0

- Molecule 33 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	j	246	1874	1168	380	325	1	0	0

- Molecule 34 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	k	386	3075	1950	584	533	8	0	0

- Molecule 35 is a protein called 60S ribosomal protein L4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	l	361	Total	C	N	O	S	0	0
			2748	1729	522	494	3		

- Molecule 36 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	m	294	Total	C	N	O	S	0	0
			2351	1484	410	455	2		

- Molecule 37 is a protein called 60S ribosomal protein L6-B.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	n	167	Total	C	N	O	0	0
			1307	843	234	230		

- Molecule 38 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	o	222	Total	C	N	O	S	0	0
			1784	1151	324	308	1		

- Molecule 39 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	p	233	Total	C	N	O	S	0	0
			1804	1151	323	327	3		

- Molecule 40 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	q	191	Total	C	N	O	S	0	0
			1508	957	274	273	4		

- Molecule 41 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	r	218	Total	C	N	O	S	0	0
			1764	1117	334	306	7		

- Molecule 42 is a protein called 60S ribosomal protein L11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	s	169	1346	843	252	247	4	0	0

- Molecule 43 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	t	193	1543	962	315	266		0	0

- Molecule 44 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	u	136	1053	675	199	177	2	0	0

- Molecule 45 is a protein called RQC2 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	a	848	6569	4188	1138	1226	17	0	0

- Molecule 46 is a protein called E3 ubiquitin-protein ligase listerin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	e	1527	11516	7358	1937	2183	38	0	0

- Molecule 47 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	g	225	1651	1030	282	332	7	0	0

- Molecule 48 is a protein called 60S ribosomal protein L1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	w	216	1709	1092	298	310	9	0	0

- Molecule 49 is a RNA chain called Ala tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	x	74	Total	C	N	O	P	0	0
			1579	702	278	525	74		
49	y	73	Total	C	N	O	P	0	0
			1556	692	273	518	73		

- Molecule 50 is a protein called 60S ribosomal protein L12-B.

Mol	Chain	Residues	Atoms				AltConf	Trace
50	z	148	Total	C	N	O	0	0
			728	432	148	148		

- Molecule 51 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	0	121	Total	C	N	O	S	0	0
			961	618	167	173	3		

- Molecule 52 is a protein called CAT-tailed nascent peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
52	1	18	Total	C	N	O	0	0
			90	54	18	18		

- Molecule 53 is a protein called Eukaryotic translation initiation factor 5A-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	v	142	Total	C	N	O	S	0	0
			1085	676	183	217	9		

- Molecule 54 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	A	1	Total	Mg	0
			1	1	
54	C	1	Total	Mg	0
			1	1	
54	E	1	Total	Mg	0
			1	1	
54	I	1	Total	Mg	0
			1	1	
54	R	1	Total	Mg	0
			1	1	

Continued on next page...

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Mol	Chain	Residues	Atoms		AltConf
54	T	1	Total 1	Mg 1	0
54	f	3	Total 3	Mg 3	0
54	h	1	Total 1	Mg 1	0
54	j	2	Total 2	Mg 2	0
54	k	1	Total 1	Mg 1	0

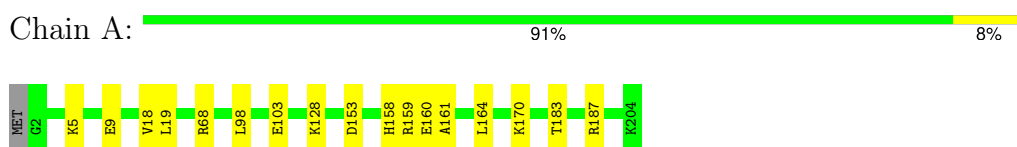
- Molecule 55 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
55	T	1	Total 1	Zn 1	0
55	W	1	Total 1	Zn 1	0
55	Z	1	Total 1	Zn 1	0
55	b	1	Total 1	Zn 1	0
55	c	1	Total 1	Zn 1	0
55	e	2	Total 2	Zn 2	0

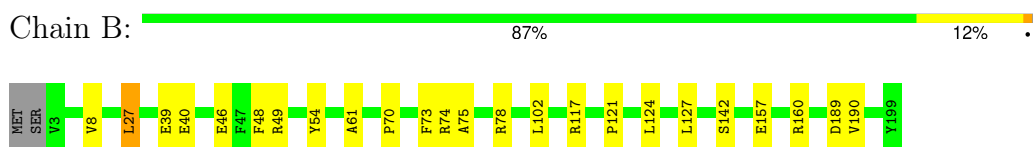
3 Residue-property plots [i](#)

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.

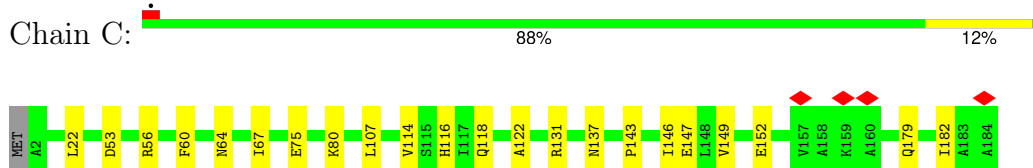
- Molecule 1: 60S ribosomal protein L15-A



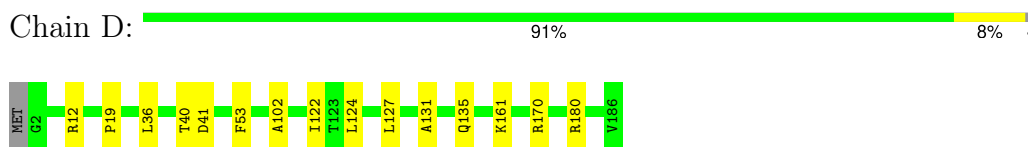
- Molecule 2: 60S ribosomal protein L16-A



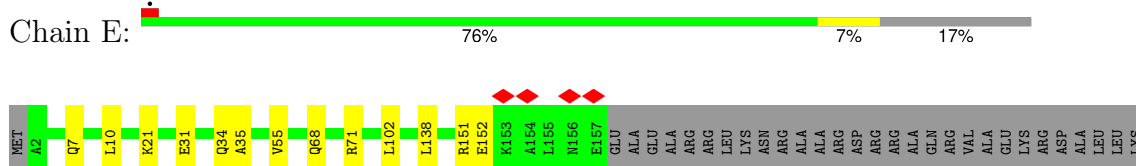
- Molecule 3: 60S ribosomal protein L17-A



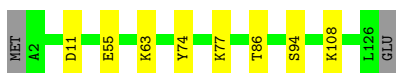
- Molecule 4: 60S ribosomal protein L18-A



- Molecule 5: 60S ribosomal protein L19-A



Chain L:  92% 6%



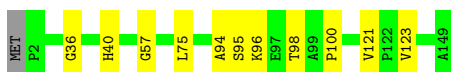
- Molecule 13: 60S ribosomal protein L27-A

Chain M:  92% 7%




- Molecule 14: 60S ribosomal protein L28

Chain N:  92% 7%




- Molecule 15: 60S ribosomal protein L29

Chain O:  83% 12%




- Molecule 16: 60S ribosomal protein L30

Chain P:  86% 6% 9%



- Molecule 17: 60S ribosomal protein L31-A

Chain Q:  80% 17%



- Molecule 18: 60S ribosomal protein L32

Chain R:  92% 6%




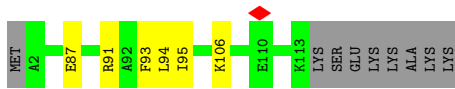
- Molecule 19: 60S ribosomal protein L33-A

Chain S:  95%



- Molecule 20: 60S ribosomal protein L34-A

Chain T:  88% 5% 7%



- Molecule 21: 60S ribosomal protein L35-A

Chain U:  93% 6%




- Molecule 22: 60S ribosomal protein L36-A

Chain V:  93% 6%




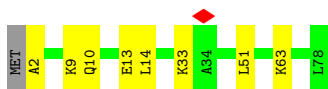
- Molecule 23: 60S ribosomal protein L37-A

Chain W:  85% 7% 8%



- Molecule 24: 60S ribosomal protein L38

Chain X:  88% 10%



- Molecule 25: 60S ribosomal protein L39

Chain Y:  98%



- Molecule 26: Ubiquitin-60S ribosomal protein L40



MET GLN ILE PHE VAL LYS THR LEU THR LEU GLY LYS THR ILE THR LEU GLU VAL GLU SER SER ASP THR ILE ASP ASP VAL LYS SER ILE ILE GLN ASP ASP LYS GLY ILE PRO PRO ASP GLN ARG LEU PHE ALA GLY LYS GLN LEU LEU ASP ASP GLY ARG THR LEU SER ASP TYR ASN

ILE GLN LYS SER THR LEU HIS LEU VAL LEU ARG LEU ARG GLY I77 KI28

- Molecule 27: 60S ribosomal protein L42-A



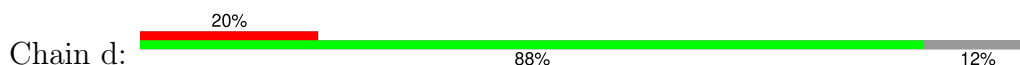
MET V2 L104 GLN PHE

- Molecule 28: 60S ribosomal protein L43-A



MET A2 A92

- Molecule 29: 60S ribosomal protein L41-A



M4 R20 R21 K22 V23 R24 A25 ARG SER LYS

- Molecule 30: 25S rRNA



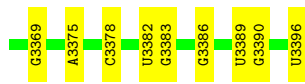
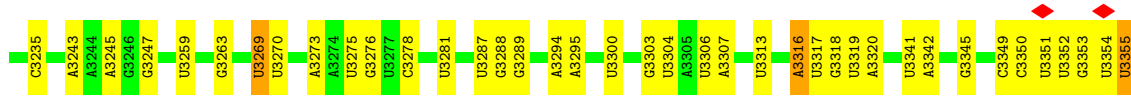
G U U3 A6 A13 U14 A26 C36 A40 A43 A49 G59 A60 A65 A66 U78 U87 G92 U97 G98 A99 A109 C110 C111 U112 C113 A116 G120 A121 A122 U133 U134 C135 G136 C142 U149 G156 A157 A165

C166 G172 G173 A187 U190 U191 C192 C200 G206 U210 A211 G212 A213 G218 A219 G234 U240 G241 G242 U244 G243 G244 U245 U249 U252 G269 U270 G282 G283 U286 A295 U305 C315 A323 U329 C339 C350 U354

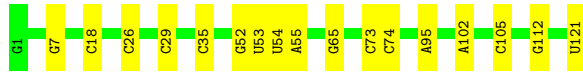
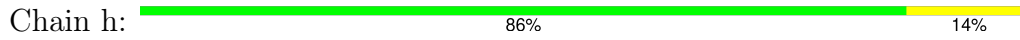
A374 A375 G376 A398 A399 G400 U401 A402 C403 G406 U411 G421 A422 C439 A440 U441 G442 G443 G444 G445 U446 U447 U448 U449 G450 U451 G C C C U C U C C C U U U G C C C U U U G C C C U U C

U C G C A486 U487 U488 U489 C490 G494 G518 A519 U520 A521 A522 A523 U524 G535 U536 C543 C544 U545 C546 G547 U548 A551 G552 U555 U556 A557 U558 A559 A578 G579 A589 G597 G604 G608 G609 G610 A611 U620 A621 A622 C637 C638

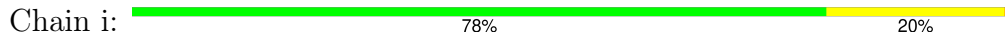
A649 A660 A677 U681 G684 A690 A691 A705 G712 A715 A716 U719 A720 C758 G763 U764 C765 U766 U767 U776 U777 A780 G781 G785 A786 A806 A817 A830 C835 A846 C849 U850 C861 U865 U874 U879



• Molecule 31: 5S rRNA



• Molecule 32: 5.8S rRNA



• Molecule 33: 60S ribosomal protein L2-A



• Molecule 34: 60S ribosomal protein L3



• Molecule 35: 60S ribosomal protein L4-A

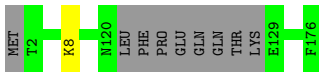


• Molecule 36: 60S ribosomal protein L5




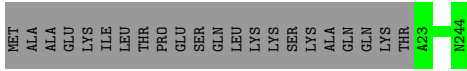
- Molecule 37: 60S ribosomal protein L6-B

Chain n:  94% 5%




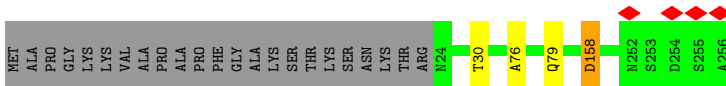
- Molecule 38: 60S ribosomal protein L7-A

Chain o:  91% 9%



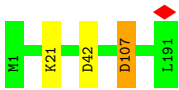
- Molecule 39: 60S ribosomal protein L8-A

Chain p:  89% 9%



- Molecule 40: 60S ribosomal protein L9-A

Chain q:  98%



- Molecule 41: 60S ribosomal protein L10

Chain r:  98%



- Molecule 42: 60S ribosomal protein L11-A

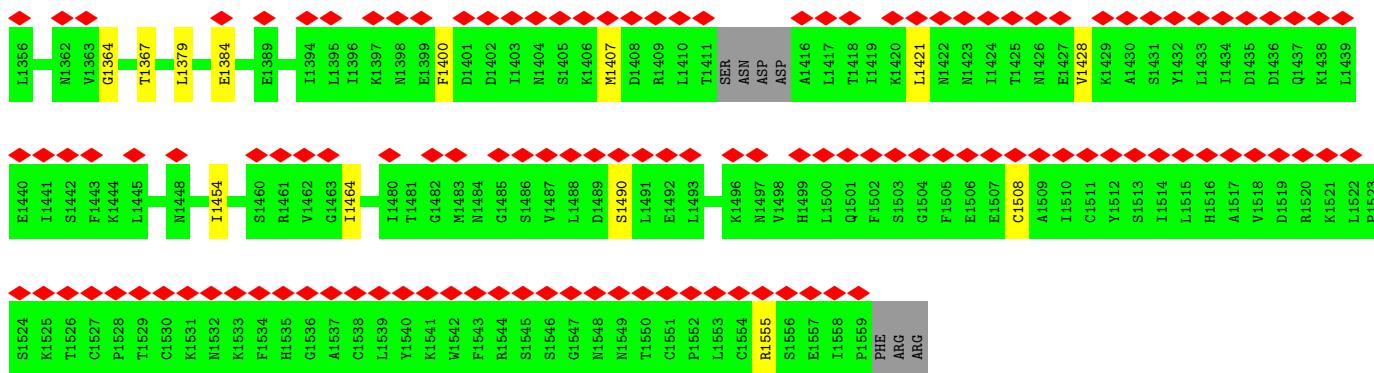
Chain s:  95%



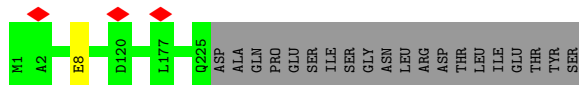
- Molecule 43: 60S ribosomal protein L13-A

Chain t:  96%

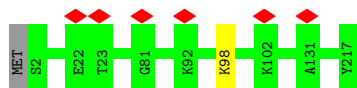




- Molecule 47: Eukaryotic translation initiation factor 6



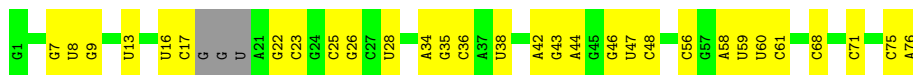
- Molecule 48: 60S ribosomal protein L1-A



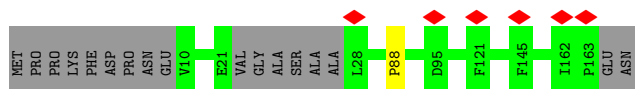
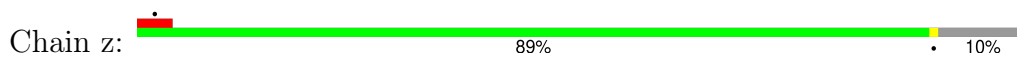
- Molecule 49: Ala tRNA



- Molecule 49: Ala tRNA



- Molecule 50: 60S ribosomal protein L12-B



- Molecule 51: 60S acidic ribosomal protein P0

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	54175	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	46	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	3.799	Depositor
Minimum map value	-0.723	Depositor
Average map value	0.021	Depositor
Map value standard deviation	0.132	Depositor
Recommended contour level	0.4	Depositor
Map size (\AA)	476.55002, 476.55002, 476.55002	wwPDB
Map dimensions	450, 450, 450	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.059, 1.059, 1.059	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: 5CT, ZN, MG

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	0.39	0/1757	0.70	1/2354 (0.0%)
2	B	0.39	0/1585	0.64	1/2128 (0.0%)
3	C	0.36	0/1439	0.71	2/1938 (0.1%)
4	D	0.34	0/1465	0.67	1/1965 (0.1%)
5	E	0.37	0/1275	0.67	1/1702 (0.1%)
6	F	0.38	0/1473	0.65	0/1980
7	G	0.36	0/1296	0.62	0/1739
8	H	0.37	0/812	0.73	3/1099 (0.3%)
9	I	0.35	0/1018	0.64	0/1369
10	J	0.36	0/530	0.63	0/703
11	K	0.41	0/979	0.69	1/1321 (0.1%)
12	L	0.35	0/995	0.68	1/1329 (0.1%)
13	M	0.36	0/1106	0.61	0/1485
14	N	0.40	0/1200	0.62	0/1607
15	O	0.32	0/473	0.72	2/629 (0.3%)
16	P	0.35	0/745	0.68	0/1001
17	Q	0.39	0/890	0.77	2/1196 (0.2%)
18	R	0.32	0/1034	0.59	0/1385
19	S	0.38	0/868	0.61	0/1168
20	T	0.35	0/890	0.67	0/1189
21	U	0.34	0/978	0.65	1/1301 (0.1%)
22	V	0.34	0/772	0.66	0/1026
23	W	0.38	0/660	0.69	0/875
24	X	0.33	0/618	0.78	1/826 (0.1%)
25	Y	0.33	0/443	0.65	0/588
26	Z	0.33	0/416	0.70	0/553
27	b	0.36	0/836	0.66	0/1104
28	c	0.36	0/701	0.66	0/934
29	d	0.26	0/208	0.84	0/267
30	f	0.61	1/77011 (0.0%)	1.03	297/120065 (0.2%)
31	h	0.53	0/2883	0.98	8/4491 (0.2%)
32	i	0.60	0/3746	0.96	7/5832 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	j	0.39	0/1908	0.68	0/2564
34	k	0.36	0/3146	0.64	1/4228 (0.0%)
35	l	0.36	0/2800	0.64	2/3790 (0.1%)
36	m	0.34	0/2400	0.67	4/3239 (0.1%)
37	n	0.36	0/1329	0.67	0/1794
38	o	0.37	0/1821	0.61	0/2451
39	p	0.34	0/1836	0.62	2/2481 (0.1%)
40	q	0.37	0/1529	0.68	2/2060 (0.1%)
41	r	0.33	0/1801	0.64	0/2416
42	s	0.33	0/1367	0.70	3/1834 (0.2%)
43	t	0.36	0/1568	0.68	1/2106 (0.0%)
44	u	0.34	0/1068	0.66	1/1438 (0.1%)
45	a	0.30	0/6679	0.49	0/9012
46	e	0.38	0/11715	0.55	2/15908 (0.0%)
47	g	0.32	0/1672	0.63	0/2281
48	w	0.33	0/1736	0.65	0/2332
49	x	0.21	0/1761	0.64	0/2742
49	y	0.23	0/1735	0.65	0/2701
50	z	0.37	0/726	0.60	0/1006
51	0	0.33	0/976	0.55	0/1313
53	v	0.32	0/1084	0.63	1/1456 (0.1%)
All	All	0.50	1/161759 (0.0%)	0.87	348/236301 (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
15	O	0	1
21	U	0	1
34	k	0	1
35	l	0	2
39	p	0	3
40	q	0	1
44	u	0	1
47	g	0	1
All	All	0	11

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	f	2416	U	O3'-P	-5.92	1.54	1.61

All (348) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	3217	C	N1-C2-O2	12.13	126.18	118.90
30	f	3217	C	C2-N1-C1'	11.32	131.25	118.80
30	f	3217	C	N3-C2-O2	-9.75	115.08	121.90
11	K	134	ASP	CB-CG-OD1	9.69	127.02	118.30
30	f	922	U	C2-N1-C1'	9.30	128.86	117.70
17	Q	84	ASP	CB-CG-OD1	9.23	126.60	118.30
30	f	2531	C	N1-C2-O2	8.88	124.23	118.90
30	f	922	U	N1-C2-O2	8.82	128.97	122.80
30	f	3278	C	N1-C2-O2	8.73	124.14	118.90
30	f	3181	C	N1-C2-O2	8.71	124.12	118.90
30	f	3181	C	C2-N1-C1'	8.46	128.11	118.80
30	f	1279	C	C5-C6-N1	8.39	125.19	121.00
30	f	2836	C	N3-C2-O2	-8.38	116.04	121.90
30	f	2836	C	C2-N1-C1'	8.18	127.80	118.80
30	f	1496	C	C2-N1-C1'	8.12	127.73	118.80
36	m	230	ASP	CB-CG-OD1	8.08	125.57	118.30
30	f	1645	U	N3-C2-O2	-7.95	116.64	122.20
30	f	922	U	N3-C2-O2	-7.93	116.65	122.20
30	f	406	G	O4'-C1'-N9	7.92	114.54	108.20
30	f	3217	C	C6-N1-C2	-7.87	117.15	120.30
30	f	2205	U	N1-C2-O2	7.85	128.30	122.80
4	D	41	ASP	CB-CG-OD1	7.80	125.32	118.30
30	f	2983	C	C2-N1-C1'	7.79	127.37	118.80
30	f	2444	C	C2-N1-C1'	7.77	127.35	118.80
30	f	3217	C	C6-N1-C1'	-7.74	111.52	120.80
30	f	1208	U	N1-C2-O2	7.73	128.21	122.80
30	f	2652	U	N3-C2-O2	-7.67	116.83	122.20
30	f	3306	U	N3-C2-O2	-7.60	116.88	122.20
30	f	3278	C	N3-C2-O2	-7.58	116.59	121.90
30	f	2541	U	P-O3'-C3'	7.57	128.78	119.70
30	f	3306	U	C2-N1-C1'	7.55	126.75	117.70
30	f	3278	C	C2-N1-C1'	7.52	127.08	118.80
30	f	2836	C	N1-C2-O2	7.49	123.39	118.90
30	f	2205	U	N3-C2-O2	-7.48	116.97	122.20
30	f	758	C	C2-N1-C1'	7.47	127.02	118.80
30	f	1645	U	N1-C2-O2	7.45	128.02	122.80
30	f	1277	C	C2-N1-C1'	7.43	126.97	118.80
30	f	2502	A	OP2-P-O3'	7.41	121.50	105.20

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	3181	C	N3-C2-O2	-7.34	116.77	121.90
30	f	2235	C	C2-N1-C1'	7.30	126.83	118.80
15	O	36	ASP	CB-CG-OD1	7.29	124.86	118.30
30	f	1239	C	C2-N1-C1'	7.23	126.75	118.80
30	f	1556	C	N1-C2-O2	7.22	123.23	118.90
30	f	2531	C	C2-N1-C1'	7.17	126.68	118.80
42	s	170	ASP	CB-CG-OD1	7.16	124.74	118.30
30	f	2923	U	N1-C2-O2	7.15	127.80	122.80
39	p	158	ASP	CB-CG-OD1	7.15	124.73	118.30
30	f	36	C	N1-C2-O2	7.15	123.19	118.90
30	f	1349	G	N3-C4-C5	-7.14	125.03	128.60
30	f	2502	A	P-O3'-C3'	7.14	128.27	119.70
30	f	1277	C	N1-C2-O2	7.12	123.17	118.90
30	f	1227	C	N1-C2-O2	7.12	123.17	118.90
30	f	1227	C	C2-N1-C1'	7.11	126.62	118.80
30	f	2205	U	C2-N1-C1'	7.09	126.21	117.70
30	f	1815	U	P-O3'-C3'	7.08	128.20	119.70
30	f	1307	G	P-O3'-C3'	7.08	128.19	119.70
30	f	78	U	N3-C2-O2	-7.04	117.27	122.20
30	f	982	C	C2-N1-C1'	7.04	126.54	118.80
30	f	1645	U	C2-N1-C1'	7.02	126.12	117.70
30	f	1604	G	C4-N9-C1'	7.01	135.61	126.50
30	f	1872	C	N1-C2-O2	7.00	123.10	118.90
30	f	14	U	O5'-P-OP2	-6.99	99.41	105.70
30	f	1272	C	N1-C2-O2	6.98	123.09	118.90
30	f	3217	C	C5-C6-N1	6.96	124.48	121.00
30	f	1208	U	C2-N1-C1'	6.95	126.04	117.70
30	f	1349	G	C4-N9-C1'	6.95	135.53	126.50
30	f	2405	C	C6-N1-C2	-6.90	117.54	120.30
30	f	3275	U	OP1-P-O3'	6.86	120.28	105.20
30	f	3306	U	N1-C2-O2	6.83	127.58	122.80
30	f	3235	C	C2-N1-C1'	6.81	126.29	118.80
30	f	2846	U	N3-C2-O2	-6.79	117.44	122.20
30	f	2846	U	C2-N1-C1'	6.75	125.81	117.70
30	f	2923	U	N3-C2-O2	-6.75	117.47	122.20
30	f	1227	C	C5-C6-N1	6.72	124.36	121.00
12	L	11	ASP	CB-CG-OD1	6.72	124.35	118.30
30	f	270	U	N1-C2-O2	6.70	127.49	122.80
30	f	2983	C	N3-C2-O2	-6.68	117.22	121.90
31	h	26	C	N1-C2-O2	6.66	122.90	118.90
30	f	1227	C	C6-N1-C2	-6.65	117.64	120.30
30	f	2537	U	P-O3'-C3'	6.64	127.67	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	2836	C	C6-N1-C2	-6.60	117.66	120.30
30	f	2531	C	N3-C2-O2	-6.60	117.28	121.90
30	f	2112	U	OP2-P-O3'	6.60	119.71	105.20
30	f	270	U	N3-C2-O2	-6.59	117.58	122.20
30	f	1208	U	N3-C2-O2	-6.59	117.59	122.20
30	f	3058	U	C2-N1-C1'	6.57	125.58	117.70
30	f	1239	C	N1-C2-O2	6.56	122.84	118.90
30	f	3214	U	C2-N1-C1'	6.53	125.53	117.70
2	B	27[A]	LEU	CB-CG-CD2	-6.52	99.91	111.00
30	f	2189	U	N1-C2-O2	6.52	127.37	122.80
30	f	2189	U	N3-C2-O2	-6.47	117.67	122.20
32	i	64	U	N3-C2-O2	-6.47	117.67	122.20
30	f	2235	C	C6-N1-C2	-6.46	117.71	120.30
30	f	2101	C	P-O3'-C3'	6.46	127.45	119.70
30	f	3034	C	N1-C2-O2	6.46	122.78	118.90
31	h	105	C	N1-C2-O2	6.46	122.78	118.90
30	f	2112	U	P-O3'-C3'	6.46	127.45	119.70
30	f	2550	U	N3-C2-O2	-6.43	117.70	122.20
30	f	524	U	N1-C2-O2	6.41	127.29	122.80
30	f	1269	U	N1-C2-O2	6.39	127.28	122.80
35	l	155	ASP	CB-CG-OD1	6.37	124.04	118.30
30	f	524	U	N3-C2-O2	-6.34	117.76	122.20
30	f	1269	U	C2-N1-C1'	6.34	125.31	117.70
30	f	3058	U	N1-C2-O2	6.34	127.24	122.80
30	f	865	U	N3-C2-O2	-6.33	117.77	122.20
21	U	79	ASP	CB-CG-OD1	6.33	124.00	118.30
44	u	47	ASP	CB-CG-OD1	6.33	124.00	118.30
30	f	1556	C	N3-C2-O2	-6.33	117.47	121.90
30	f	2274	U	N1-C2-O2	6.32	127.23	122.80
30	f	2983	C	N1-C2-O2	6.32	122.69	118.90
30	f	986	U	N3-C2-O2	-6.32	117.78	122.20
30	f	36	C	N3-C2-O2	-6.29	117.50	121.90
30	f	2464	U	C2-N1-C1'	6.29	125.25	117.70
1	A	153	ASP	CB-CG-OD1	6.27	123.94	118.30
30	f	2617	U	N3-C2-O2	-6.26	117.82	122.20
30	f	922	U	C6-N1-C1'	-6.26	112.44	121.20
36	m	137	ASP	CB-CG-OD1	6.24	123.92	118.30
30	f	1716	U	P-O3'-C3'	6.24	127.18	119.70
30	f	192	C	C2-N1-C1'	6.23	125.65	118.80
30	f	2726	C	N3-C2-O2	-6.23	117.54	121.90
40	q	42	ASP	CB-CG-OD1	6.23	123.90	118.30
30	f	1496	C	C6-N1-C2	-6.23	117.81	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	3104	U	N1-C2-O2	6.21	127.15	122.80
30	f	2444	C	C6-N1-C2	-6.21	117.82	120.30
30	f	2726	C	C2-N1-C1'	6.21	125.63	118.80
30	f	1269	U	N3-C2-O2	-6.20	117.86	122.20
46	e	437	LYS	N-CA-C	-6.20	94.26	111.00
30	f	1097	G	P-O3'-C3'	6.20	127.13	119.70
30	f	1878	G	C4-N9-C1'	6.19	134.54	126.50
30	f	2846	U	N1-C2-O2	6.18	127.13	122.80
30	f	637	C	P-O3'-C3'	6.18	127.11	119.70
30	f	2550	U	C2-N1-C1'	6.14	125.07	117.70
30	f	1349	G	N3-C4-N9	6.13	129.68	126.00
30	f	915	A	C2-N3-C4	6.12	113.66	110.60
30	f	3104	U	N3-C2-O2	-6.11	117.93	122.20
30	f	2132	C	N3-C2-O2	-6.09	117.64	121.90
30	f	1115	G	C4-N9-C1'	6.09	134.41	126.50
30	f	995	U	N1-C2-O2	6.06	127.04	122.80
30	f	1907	C	N1-C2-O2	6.05	122.53	118.90
30	f	1064	A	P-O3'-C3'	6.05	126.96	119.70
30	f	1279	C	C6-N1-C2	-6.05	117.88	120.30
30	f	2553	U	C2-N1-C1'	6.05	124.96	117.70
30	f	2388	U	N3-C2-O2	-6.05	117.97	122.20
30	f	2923	U	C2-N1-C1'	6.04	124.95	117.70
30	f	1604	G	N3-C4-N9	6.04	129.62	126.00
30	f	2842	U	N1-C2-O2	6.03	127.02	122.80
30	f	2132	C	C6-N1-C2	-6.03	117.89	120.30
30	f	3300	U	N3-C2-O2	-6.03	117.98	122.20
30	f	985	U	N3-C2-O2	-6.01	117.99	122.20
30	f	3131	U	C2-N1-C1'	6.01	124.91	117.70
30	f	2405	C	N3-C2-O2	-6.00	117.70	121.90
30	f	2274	U	C2-N1-C1'	6.00	124.89	117.70
30	f	3181	C	C6-N1-C1'	-5.99	113.61	120.80
30	f	1556	C	C2-N1-C1'	5.99	125.39	118.80
30	f	1872	C	N3-C2-O2	-5.97	117.72	121.90
30	f	1604	G	C8-N9-C1'	-5.97	119.24	127.00
30	f	969	C	C6-N1-C2	-5.96	117.92	120.30
8	H	18	ASP	CB-CG-OD1	5.94	123.65	118.30
8	H	51	GLY	C-N-CA	5.94	136.55	121.70
30	f	1355	A	P-O3'-C3'	5.94	126.82	119.70
34	k	87	VAL	CG1-CB-CG2	-5.93	101.42	110.90
30	f	2652	U	N1-C2-O2	5.93	126.95	122.80
31	h	26	C	C6-N1-C2	-5.93	117.93	120.30
30	f	865	U	N1-C2-O2	5.92	126.95	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	1604	G	N3-C4-C5	-5.92	125.64	128.60
30	f	1425	U	N3-C2-O2	-5.92	118.06	122.20
32	i	100	U	C2-N1-C1'	5.92	124.80	117.70
30	f	2585	G	N3-C4-C5	-5.91	125.65	128.60
30	f	1272	C	N3-C2-O2	-5.90	117.77	121.90
30	f	2204	C	C6-N1-C2	-5.89	117.94	120.30
30	f	2622	C	N1-C2-O2	5.87	122.42	118.90
30	f	1525	G	C4-N9-C1'	5.86	134.11	126.50
30	f	1562	C	P-O3'-C3'	5.86	126.73	119.70
30	f	1820	U	P-O3'-C3'	5.86	126.73	119.70
30	f	2638	C	N1-C2-O2	5.86	122.41	118.90
30	f	835	G	O4'-C1'-N9	5.84	112.87	108.20
30	f	3350	C	C6-N1-C2	-5.84	117.97	120.30
30	f	3214	U	N3-C2-O2	-5.82	118.13	122.20
30	f	3048	A	O4'-C1'-N9	5.82	112.85	108.20
30	f	1577	G	N1-C6-O6	-5.81	116.41	119.90
30	f	2531	C	C6-N1-C2	-5.81	117.98	120.30
30	f	1437	C	C2-N1-C1'	5.80	125.18	118.80
30	f	3316	A	P-O3'-C3'	5.79	126.65	119.70
30	f	97	U	N3-C2-O2	-5.79	118.15	122.20
30	f	758	C	C6-N1-C2	-5.76	118.00	120.30
30	f	270	U	C2-N1-C1'	5.75	124.60	117.70
42	s	9	MET	CA-CB-CG	5.75	123.07	113.30
30	f	2204	C	C5-C6-N1	5.74	123.87	121.00
30	f	2274	U	N3-C2-O2	-5.74	118.18	122.20
30	f	142	C	N1-C2-O2	5.74	122.34	118.90
30	f	2992	U	N3-C2-O2	-5.73	118.19	122.20
30	f	3228	C	P-O3'-C3'	5.72	126.57	119.70
30	f	2132	C	N1-C2-O2	5.71	122.33	118.90
30	f	2531	C	C5-C6-N1	5.71	123.86	121.00
30	f	2899	C	C2-N1-C1'	5.70	125.07	118.80
32	i	64	U	N1-C2-O2	5.70	126.79	122.80
30	f	3034	C	N3-C2-O2	-5.69	117.92	121.90
30	f	354	U	N1-C2-O2	5.68	126.78	122.80
30	f	1448	U	N3-C2-O2	-5.68	118.22	122.20
30	f	1190	A	C4-N9-C1'	5.68	136.52	126.30
30	f	2899	C	N3-C2-O2	-5.68	117.93	121.90
30	f	3058	U	N3-C2-O2	-5.67	118.23	122.20
30	f	3218	A	P-O3'-C3'	5.67	126.51	119.70
46	e	1364	GLY	N-CA-C	5.67	127.29	113.10
30	f	282	G	P-O3'-C3'	5.67	126.50	119.70
30	f	916	G	P-O3'-C3'	5.66	126.50	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	H	50	LEU	CA-CB-CG	5.65	128.30	115.30
30	f	2553	U	C6-N1-C1'	-5.65	113.29	121.20
30	f	1277	C	N3-C2-O2	-5.64	117.95	121.90
30	f	3057	U	N3-C2-O2	-5.63	118.26	122.20
30	f	142	C	C6-N1-C2	-5.62	118.05	120.30
30	f	2983	C	C6-N1-C2	-5.61	118.06	120.30
30	f	1349	G	C8-N9-C1'	-5.60	119.72	127.00
30	f	2366	C	C2-N1-C1'	5.59	124.95	118.80
30	f	113	C	C2-N1-C1'	5.59	124.95	118.80
31	h	26	C	N3-C2-O2	-5.58	117.99	121.90
30	f	777	U	N3-C2-O2	-5.58	118.30	122.20
30	f	2378	C	C2-N1-C1'	5.58	124.94	118.80
30	f	2137	U	C2-N1-C1'	5.58	124.39	117.70
3	C	53	ASP	CB-CG-OD1	5.55	123.30	118.30
30	f	3269	U	P-O3'-C3'	5.55	126.36	119.70
31	h	35	C	N1-C2-O2	5.54	122.23	118.90
30	f	1496	C	C5-C6-N1	5.54	123.77	121.00
30	f	2842	U	N3-C2-O2	-5.53	118.33	122.20
30	f	2764	C	N1-C2-O2	5.53	122.22	118.90
32	i	125	U	C2-N1-C1'	5.53	124.33	117.70
30	f	1688	U	N3-C2-O2	-5.52	118.33	122.20
30	f	2366	C	C5-C6-N1	5.51	123.76	121.00
30	f	2726	C	N1-C2-O2	5.51	122.21	118.90
30	f	995	U	N3-C2-O2	-5.51	118.34	122.20
30	f	1554	U	P-O3'-C3'	5.51	126.31	119.70
40	q	107	ASP	CB-CG-OD1	5.51	123.26	118.30
30	f	2444	C	N1-C2-O2	5.50	122.20	118.90
30	f	982	C	N1-C2-O2	5.48	122.19	118.90
30	f	283	G	N3-C4-N9	5.48	129.29	126.00
30	f	2552	C	N1-C2-O2	5.48	122.19	118.90
24	X	14	LEU	CA-CB-CG	5.47	127.89	115.30
30	f	315	C	C2-N1-C1'	5.46	124.81	118.80
30	f	1496	C	N1-C2-O2	5.46	122.18	118.90
30	f	982	C	C6-N1-C2	-5.46	118.12	120.30
30	f	1190	A	C2-N3-C4	5.46	113.33	110.60
31	h	52	G	P-O3'-C3'	5.46	126.25	119.70
30	f	1878	G	C8-N9-C1'	-5.44	119.93	127.00
30	f	2552	C	C2-N1-C1'	5.44	124.79	118.80
30	f	3057	U	N1-C2-O2	5.44	126.61	122.80
30	f	3355	U	C2-N1-C1'	5.44	124.22	117.70
30	f	283	G	C4-N9-C1'	5.43	133.56	126.50
30	f	3214	U	N1-C2-O2	5.43	126.60	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	1277	C	C6-N1-C2	-5.42	118.13	120.30
30	f	2585	G	N3-C4-N9	5.42	129.25	126.00
30	f	2622	C	N3-C2-O2	-5.42	118.10	121.90
30	f	2783	U	N3-C2-O2	-5.41	118.41	122.20
30	f	3350	C	P-O3'-C3'	5.41	126.19	119.70
30	f	2210	G	N3-C4-C5	-5.41	125.89	128.60
30	f	3153	U	C2-N1-C1'	5.40	124.18	117.70
30	f	986	U	N1-C2-O2	5.39	126.58	122.80
30	f	982	C	C5-C6-N1	5.39	123.70	121.00
30	f	1496	C	C6-N1-C1'	-5.39	114.33	120.80
30	f	78	U	N1-C2-O2	5.38	126.57	122.80
30	f	411	U	N3-C2-O2	-5.38	118.43	122.20
30	f	1349	G	C2-N3-C4	5.38	114.59	111.90
3	C	114	VAL	CG1-CB-CG2	-5.38	102.30	110.90
30	f	1425	U	N1-C2-O2	5.36	126.55	122.80
30	f	915	A	C4-N9-C1'	5.36	135.95	126.30
30	f	1732	U	N1-C2-O2	5.36	126.55	122.80
30	f	3278	C	C6-N1-C1'	-5.36	114.37	120.80
30	f	2497	U	N3-C2-O2	-5.35	118.46	122.20
30	f	3235	C	N1-C2-O2	5.33	122.10	118.90
30	f	890	C	N1-C2-O2	5.32	122.09	118.90
30	f	2500	A	P-O3'-C3'	5.32	126.08	119.70
30	f	2336	U	N3-C2-O2	-5.32	118.48	122.20
30	f	2444	C	C5-C6-N1	5.32	123.66	121.00
30	f	2836	C	C6-N1-C1'	-5.31	114.42	120.80
32	i	125	U	N1-C2-O2	5.31	126.51	122.80
30	f	1907	C	N3-C2-O2	-5.30	118.19	121.90
30	f	2235	C	N1-C2-O2	5.29	122.08	118.90
30	f	142	C	N3-C2-O2	-5.29	118.20	121.90
43	t	136	GLU	CA-CB-CG	5.29	125.04	113.40
30	f	1560	G	N3-C4-N9	-5.29	122.83	126.00
30	f	3349	C	C6-N1-C2	-5.29	118.19	120.30
30	f	2726	C	C6-N1-C2	-5.28	118.19	120.30
30	f	192	C	C6-N1-C2	-5.28	118.19	120.30
30	f	1115	G	C8-N9-C1'	-5.28	120.14	127.00
30	f	1732	U	N3-C2-O2	-5.28	118.50	122.20
30	f	1525	G	C8-N9-C1'	-5.28	120.14	127.00
30	f	2568	C	O4'-C1'-N1	5.27	112.42	108.20
30	f	1608	C	C2-N1-C1'	5.26	124.59	118.80
31	h	105	C	N3-C2-O2	-5.26	118.22	121.90
53	v	50	GLY	N-CA-C	-5.26	99.95	113.10
30	f	915	A	C8-N9-C4	-5.25	103.70	105.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	1608	C	C5-C6-N1	5.25	123.63	121.00
42	s	108	GLU	CA-CB-CG	5.24	124.93	113.40
30	f	2622	C	C6-N1-C2	-5.24	118.21	120.30
30	f	1237	G	N3-C4-N9	5.23	129.14	126.00
30	f	1608	C	C6-N1-C2	-5.22	118.21	120.30
30	f	2366	C	C6-N1-C2	-5.22	118.21	120.30
30	f	3148	U	N3-C2-O2	-5.22	118.55	122.20
30	f	149	U	N3-C2-O2	-5.21	118.55	122.20
30	f	2114	C	C6-N1-C2	-5.21	118.22	120.30
30	f	1437	C	C6-N1-C2	-5.21	118.22	120.30
30	f	2496	C	C2-N1-C1'	5.21	124.53	118.80
30	f	2405	C	N1-C2-O2	5.20	122.02	118.90
30	f	2983	C	C6-N1-C1'	-5.20	114.56	120.80
30	f	1239	C	C6-N1-C1'	-5.19	114.58	120.80
30	f	969	C	N3-C2-O2	-5.18	118.27	121.90
30	f	2585	G	C4-N9-C1'	5.18	133.24	126.50
30	f	2772	C	N1-C2-O2	5.18	122.00	118.90
30	f	890	C	N3-C2-O2	-5.17	118.28	121.90
30	f	849	C	P-O3'-C3'	5.16	125.90	119.70
30	f	954	U	N3-C2-O2	-5.16	118.59	122.20
31	h	18	C	C2-N1-C1'	5.16	124.48	118.80
30	f	2446	U	O4'-C1'-N1	5.15	112.32	108.20
30	f	637	C	OP1-P-O3'	5.15	116.53	105.20
30	f	1563	C	C6-N1-C1'	5.15	126.97	120.80
30	f	166	C	C2-N1-C1'	5.14	124.45	118.80
30	f	2235	C	C5-C6-N1	5.14	123.57	121.00
30	f	1951	C	C2-N1-C1'	5.13	124.45	118.80
30	f	2405	C	C2-N1-C1'	5.13	124.44	118.80
30	f	2638	C	N3-C2-O2	-5.12	118.31	121.90
30	f	3181	C	C6-N1-C2	-5.12	118.25	120.30
30	f	2899	C	N1-C2-O2	5.11	121.97	118.90
30	f	2873	U	C2-N1-C1'	5.09	123.81	117.70
30	f	1597	C	C5-C6-N1	5.09	123.55	121.00
36	m	222	LEU	CA-CB-CG	5.09	127.00	115.30
32	i	100	U	N1-C2-O2	5.08	126.36	122.80
35	l	4	PRO	C-N-CA	5.08	134.41	121.70
30	f	87	U	N1-C2-O2	5.08	126.36	122.80
32	i	157	U	N1-C2-O2	5.07	126.35	122.80
17	Q	42	LEU	CA-CB-CG	5.07	126.95	115.30
30	f	1097	G	OP2-P-O3'	5.06	116.34	105.20
30	f	2899	C	C6-N1-C2	-5.06	118.28	120.30
30	f	3355	U	N1-C2-O2	5.06	126.34	122.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	f	2550	U	N1-C2-O2	5.05	126.34	122.80
30	f	758	C	N1-C2-O2	5.05	121.93	118.90
39	p	79	GLN	CA-CB-CG	5.04	124.50	113.40
30	f	1820	U	OP2-P-O3'	5.04	116.28	105.20
30	f	2444	C	C6-N1-C1'	-5.03	114.76	120.80
30	f	1272	C	C6-N1-C2	-5.03	118.29	120.30
30	f	354	U	N3-C2-O2	-5.03	118.68	122.20
15	O	21	ILE	CG1-CB-CG2	-5.03	100.34	111.40
30	f	969	C	N1-C2-O2	5.03	121.92	118.90
30	f	2497	U	N1-C2-O2	5.02	126.31	122.80
30	f	777	U	N1-C2-O2	5.02	126.31	122.80
5	E	10	LEU	CB-CG-CD1	5.02	119.53	111.00
36	m	146	LEU	CB-CG-CD1	-5.02	102.47	111.00
30	f	1355	A	OP2-P-O3'	5.01	116.22	105.20
30	f	1688	U	N1-C2-O2	5.01	126.30	122.80
30	f	282	G	C2'-C3'-O3'	5.00	121.71	113.70

There are no chirality outliers.

All (11) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
15	O	20	GLY	Peptide
21	U	83	LYS	Peptide
47	g	8	GLU	Peptide
34	k	141	GLY	Peptide
35	l	13	GLY	Peptide
35	l	318	LEU	Peptide
39	p	158	ASP	Peptide
39	p	30	THR	Peptide
39	p	76	ALA	Peptide
40	q	21	LYS	Peptide
44	u	12	TRP	Peptide

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1720	0	1779	10	0
2	B	1555	0	1659	13	0
3	C	1416	0	1433	11	0
4	D	1441	0	1543	8	0
5	E	1258	0	1342	6	0
6	F	1437	0	1475	15	0
7	G	1272	0	1312	9	0
8	H	796	0	812	4	0
9	I	1003	0	1048	7	0
10	J	518	0	542	3	0
11	K	964	0	1025	1	0
12	L	984	0	1075	4	0
13	M	1080	0	1122	5	0
14	N	1169	0	1211	7	0
15	O	462	0	491	6	0
16	P	737	0	792	3	0
17	Q	876	0	912	9	0
18	R	1013	0	1077	5	0
19	S	850	0	880	2	0
20	T	880	0	942	3	0
21	U	969	0	1078	3	0
22	V	766	0	844	4	0
23	W	645	0	645	3	0
24	X	612	0	682	3	0
25	Y	436	0	475	0	0
26	Z	410	0	442	0	0
27	b	824	0	888	0	0
28	c	694	0	734	0	0
29	d	207	0	250	0	0
30	f	68802	0	34573	0	0
31	h	2579	0	1304	0	0
32	i	3353	0	1695	0	0
33	j	1874	0	1943	0	0
34	k	3075	0	3142	0	0
35	l	2748	0	2859	0	0
36	m	2351	0	2294	0	0
37	n	1307	0	1377	0	0
38	o	1784	0	1862	0	0
39	p	1804	0	1877	0	0
40	q	1508	0	1572	0	0
41	r	1764	0	1804	0	0
42	s	1346	0	1370	0	0
43	t	1543	0	1608	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
44	u	1053	0	1149	0	0
45	a	6569	0	6460	0	0
46	e	11516	0	10776	0	0
47	g	1651	0	1613	0	0
48	w	1709	0	1799	0	0
49	x	1579	0	799	0	0
49	y	1556	0	789	0	0
50	z	728	0	337	0	0
51	0	961	0	979	11	0
52	1	90	0	21	0	0
53	v	1085	0	1086	0	0
54	A	1	0	0	0	0
54	C	1	0	0	0	0
54	E	1	0	0	0	0
54	I	1	0	0	0	0
54	R	1	0	0	0	0
54	T	1	0	0	0	0
54	f	3	0	0	0	0
54	h	1	0	0	0	0
54	j	2	0	0	0	0
54	k	1	0	0	0	0
55	T	1	0	0	0	0
55	W	1	0	0	0	0
55	Z	1	0	0	0	0
55	b	1	0	0	0	0
55	c	1	0	0	0	0
55	e	2	0	0	0	0
All	All	151349	0	113598	146	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 5.

All (146) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:O:16:ALA:O	15:O:20:GLY:HA3	1.69	0.90
15:O:16:ALA:O	15:O:20:GLY:CA	2.36	0.73
23:W:21:ARG:HE	23:W:39:TYR:HB2	1.58	0.69
51:0:26:PHE:HB2	51:0:87:VAL:HB	1.73	0.68
2:B:46[A]:GLU:HB3	2:B:49[A]:ARG:HG3	1.75	0.68
7:G:84:TYR:HB2	15:O:24:PRO:HD3	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:27[A]:LEU:HD21	2:B:102[A]:LEU:HB2	1.80	0.63
13:M:27:LYS:HB3	13:M:42:LEU:HB2	1.81	0.62
9:I:14:SER:O	9:I:81:GLN:NE2	2.33	0.62
6:F:80:ARG:HH21	6:F:87:THR:HG21	1.66	0.60
6:F:8:GLN:HB3	6:F:64:ILE:HD11	1.84	0.59
51:O:192:ASP:HB2	51:O:197:PHE:HE2	1.67	0.59
1:A:183:THR:HG22	1:A:187:ARG:HB2	1.85	0.59
21:U:5:LYS:HB2	21:U:8:GLU:HG2	1.84	0.58
6:F:77:VAL:HG22	6:F:126:VAL:HG23	1.85	0.58
51:O:43:LYS:HA	51:O:46:ARG:HG2	1.87	0.57
11:K:50:ALA:HB1	21:U:66:VAL:HG11	1.86	0.57
17:Q:4:LEU:O	17:Q:79:ARG:NH2	2.38	0.56
17:Q:55:LEU:HB2	17:Q:95:PRO:HD3	1.86	0.56
20:T:87:GLU:OE1	20:T:91:ARG:NH1	2.39	0.55
18:R:19:ARG:HD3	18:R:33:ARG:HB2	1.89	0.55
51:O:42:ARG:HG2	51:O:51:VAL:HG11	1.88	0.55
2:B:157[A]:GLU:OE1	2:B:160[A]:ARG:NH2	2.40	0.54
17:Q:9:THR:HG23	17:Q:109:VAL:HG23	1.88	0.54
14:N:95:SER:OG	14:N:98:THR:OG1	2.25	0.54
7:G:17:ARG:HG2	7:G:22:HIS:HA	1.90	0.53
8:H:56:VAL:HG12	8:H:65:VAL:HG22	1.88	0.53
2:B:75[A]:ALA:HB3	2:B:78[A]:ARG:HG2	1.90	0.53
10:J:6:ASP:OD1	10:J:32:GLN:N	2.40	0.53
8:H:44:GLU:OE2	8:H:49:ASN:ND2	2.41	0.53
2:B:61[A]:ALA:HA	2:B:70[A]:PRO:HD2	1.90	0.52
6:F:96:ASP:OD1	6:F:97:VAL:N	2.38	0.52
10:J:47:ARG:HH21	10:J:58:HIS:HB2	1.73	0.52
6:F:77:VAL:HG11	6:F:106:LEU:HD22	1.92	0.52
3:C:118:GLN:NE2	3:C:147:GLU:OE2	2.39	0.52
4:D:36:LEU:O	4:D:40:THR:OG1	2.27	0.52
6:F:80:ARG:HB2	6:F:122:HIS:HB2	1.91	0.52
7:G:136:ARG:HD2	7:G:139:ARG:HH12	1.74	0.52
9:I:94:TYR:OH	10:J:41:LYS:NZ	2.39	0.51
14:N:100:PRO:HG2	14:N:123:VAL:HG23	1.93	0.51
7:G:99:SER:HG	7:G:101:CYS:HG	1.59	0.51
1:A:103:GLU:HG3	1:A:160:GLU:HB2	1.93	0.51
15:O:23:LYS:HG3	15:O:24:PRO:HD2	1.93	0.50
3:C:107:LEU:HD12	3:C:152:GLU:HG3	1.92	0.50
2:B:74[A]:ARG:O	2:B:142[A]:SER:OG	2.23	0.50
3:C:60:PHE:HB3	3:C:64:ASN:HB3	1.93	0.49
17:Q:77:ARG:HD2	17:Q:89:LEU:HD13	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:46[A]:GLU:HG3	2:B:48[A]:PHE:H	1.77	0.49
16:P:9:SER:OG	16:P:10:ILE:N	2.38	0.49
16:P:30:THR:HG23	16:P:91:SER:HB2	1.95	0.49
6:F:155:ARG:HB2	6:F:172:TYR:HD1	1.77	0.49
7:G:108:ARG:O	7:G:112:ASN:HB2	2.12	0.49
4:D:131:ALA:HB1	4:D:135:GLN:H	1.78	0.48
14:N:94:ALA:HA	14:N:121:VAL:HG23	1.95	0.48
17:Q:80:ASN:OD1	17:Q:81:GLU:N	2.45	0.48
19:S:49:ILE:HD11	19:S:71:VAL:HG22	1.96	0.48
6:F:93:GLU:HG3	6:F:140:VAL:HG11	1.95	0.48
13:M:133:LYS:HE3	13:M:135:ARG:HD3	1.96	0.48
4:D:102:ALA:HA	4:D:122:ILE:O	2.14	0.48
17:Q:75:ILE:HG12	17:Q:93:VAL:HG22	1.96	0.47
4:D:19:PRO:HB3	4:D:53:PHE:HA	1.96	0.47
3:C:22:LEU:HD12	3:C:146:ILE:HD12	1.97	0.47
13:M:23:VAL:HG12	13:M:45:GLY:HA3	1.94	0.47
51:O:26:PHE:HZ	51:O:93:LEU:HA	1.80	0.47
5:E:151:ARG:NH2	5:E:152:GLU:OE2	2.45	0.47
9:I:18:PRO:HA	9:I:51:ALA:HA	1.97	0.47
5:E:21:LYS:HE3	5:E:55:VAL:HA	1.97	0.47
4:D:170:ARG:HD2	14:N:57:GLY:HA3	1.97	0.47
1:A:5:LYS:HE2	22:V:40:VAL:HG21	1.97	0.47
5:E:68:GLN:OE1	5:E:71:ARG:NH2	2.43	0.47
3:C:67:ILE:HD11	3:C:80:LYS:HB3	1.97	0.46
15:O:55:ALA:O	15:O:59:LYS:HB3	2.16	0.46
12:L:55:GLU:HB2	12:L:108:LYS:HB3	1.98	0.46
12:L:74:TYR:HB3	12:L:77:LYS:HB2	1.98	0.46
13:M:28:PRO:O	13:M:29:HIS:ND1	2.48	0.46
18:R:9:ILE:HG12	18:R:63:THR:HG23	1.97	0.46
2:B:39[A]:GLU:HG2	2:B:40[A]:GLU:HG2	1.97	0.46
14:N:96:LYS:HB2	14:N:96:LYS:HE2	1.70	0.46
18:R:60:ASN:HB3	18:R:63:THR:HB	1.97	0.46
19:S:14:LEU:HD11	19:S:31:LYS:HB2	1.98	0.46
1:A:159:ARG:HB3	1:A:164:LEU:HB2	1.98	0.45
13:M:22:LYS:NZ	13:M:132:SER:O	2.47	0.45
17:Q:44:MET:O	17:Q:77:ARG:NH1	2.49	0.45
6:F:22:PRO:O	7:G:146:ASN:ND2	2.38	0.45
22:V:53:TYR:HA	22:V:56:ARG:HG2	1.99	0.45
9:I:38:ALA:HB3	9:I:59:MET:HB2	1.99	0.44
4:D:161:LYS:HD3	4:D:161:LYS:HA	1.82	0.44
24:X:10:GLN:HA	24:X:13:GLU:HG2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:80:ARG:HG3	6:F:124:LEU:HD21	1.99	0.44
2:B:127[A]:LEU:HD22	6:F:156:VAL:HG13	2.00	0.44
9:I:129:VAL:O	9:I:133:SER:HB3	2.17	0.44
6:F:80:ARG:HD2	7:G:155:PRO:HA	2.00	0.44
15:O:21:ILE:HD12	15:O:21:ILE:HG23	1.83	0.43
17:Q:46:THR:HG22	17:Q:48:ASP:H	1.82	0.43
14:N:36:GLY:HA3	14:N:40:HIS:CE1	2.53	0.43
51:O:45:LEU:HB3	51:O:49:ALA:HB3	1.99	0.43
9:I:117:PRO:HA	9:I:135:VAL:HG13	2.00	0.43
8:H:20:SER:HA	8:H:23:THR:HG22	2.00	0.43
51:O:15:LEU:O	51:O:19:LEU:HG	2.18	0.43
23:W:58:THR:OG1	23:W:59:THR:N	2.51	0.43
23:W:27:PHE:HA	23:W:34:CYS:HA	2.01	0.43
51:O:75:LYS:O	51:O:78:PRO:HD2	2.19	0.43
1:A:158:HIS:HB3	1:A:161:ALA:HB3	2.00	0.43
4:D:124:LEU:HD13	4:D:127:LEU:HD23	2.01	0.43
24:X:2:ALA:N	24:X:51:LEU:O	2.52	0.43
1:A:68:ARG:HA	1:A:98:LEU:HD21	2.01	0.43
3:C:56:ARG:NH2	3:C:75:GLU:OE2	2.51	0.43
5:E:102:LEU:HD22	5:E:138:LEU:HD22	2.01	0.43
12:L:86:THR:OG1	12:L:94:SER:OG	2.36	0.43
18:R:3:SER:OG	18:R:4:LEU:N	2.51	0.43
2:B:54[A]:TYR:OH	2:B:73[A]:PHE:O	2.37	0.43
9:I:80:ARG:HB2	9:I:99:ALA:HB3	2.00	0.42
3:C:179:GLN:HA	3:C:182:ILE:HG22	2.00	0.42
6:F:95:ARG:HB2	6:F:140:VAL:HG23	2.00	0.42
51:O:70:LEU:HB3	51:O:73:PHE:CD1	2.55	0.42
21:U:78:LYS:HA	21:U:81:ARG:HG2	2.00	0.42
24:X:33:LYS:HA	24:X:33:LYS:HD3	1.84	0.42
51:O:14:LYS:HE3	51:O:52:LEU:HD11	2.00	0.42
8:H:41:ILE:HG21	8:H:54:VAL:HG21	2.02	0.42
3:C:182:ILE:HD12	3:C:182:ILE:HA	1.85	0.42
6:F:32:SER:HB2	6:F:36:ILE:HD12	2.01	0.42
51:O:67:LEU:HD22	51:O:67:LEU:HA	1.85	0.42
16:P:73:GLY:N	16:P:76:GLU:OE2	2.42	0.42
3:C:116:HIS:HB3	3:C:149:VAL:HB	2.02	0.41
20:T:95:ILE:HD13	20:T:95:ILE:HG21	1.81	0.41
1:A:98:LEU:HD22	1:A:128:LYS:HD2	2.02	0.41
2:B:8[A]:VAL:HG12	2:B:117[A]:ARG:HG3	2.03	0.41
1:A:170:LYS:HE3	1:A:170:LYS:HB3	4.56	0.41
7:G:102:ARG:HD2	7:G:102:ARG:HA	1.76	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
22:V:5:THR:HG23	22:V:12:ASN:HB2	2.03	0.41
3:C:122:ALA:HB3	3:C:143:PRO:HB2	2.02	0.41
3:C:131:ARG:HG3	3:C:137:ASN:ND2	2.36	0.41
5:E:7:GLN:NE2	5:E:35:ALA:O	2.53	0.41
12:L:63:LYS:HA	12:L:63:LYS:HD3	1.92	0.41
1:A:9:GLU:HG3	22:V:44:VAL:HG21	2.03	0.41
2:B:189[A]:ASP:OD1	2:B:190[A]:VAL:N	2.53	0.41
1:A:18:VAL:HG13	1:A:19:LEU:HD12	2.02	0.40
2:B:121[A]:PRO:HA	2:B:124[A]:LEU:HD12	2.03	0.40
18:R:4:LEU:HD12	18:R:5:PRO:HD2	2.01	0.40
4:D:180:ARG:HE	4:D:180:ARG:HB2	1.61	0.40
6:F:40:ARG:HA	6:F:40:ARG:HD2	1.84	0.40
14:N:75:LEU:HD23	14:N:75:LEU:HA	1.92	0.40
17:Q:20:LEU:HD11	17:Q:32:ALA:HB2	2.03	0.40
20:T:93:PHE:HD2	20:T:94:LEU:HD22	1.86	0.40
5:E:31:GLU:HA	5:E:34:GLN:HB2	2.03	0.40
7:G:73:GLY:HA2	7:G:89:LEU:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	201/204 (98%)	190 (94%)	11 (6%)	0	100	100
2	B	195/199 (98%)	192 (98%)	3 (2%)	0	100	100
3	C	181/184 (98%)	172 (95%)	9 (5%)	0	100	100
4	D	183/186 (98%)	176 (96%)	7 (4%)	0	100	100
5	E	154/189 (82%)	151 (98%)	3 (2%)	0	100	100
6	F	169/172 (98%)	163 (96%)	6 (4%)	0	100	100
7	G	157/160 (98%)	149 (95%)	8 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
8	H	98/121 (81%)	93 (95%)	5 (5%)	0	100	100
9	I	134/137 (98%)	132 (98%)	2 (2%)	0	100	100
10	J	61/155 (39%)	61 (100%)	0	0	100	100
11	K	119/142 (84%)	118 (99%)	1 (1%)	0	100	100
12	L	123/127 (97%)	119 (97%)	4 (3%)	0	100	100
13	M	133/136 (98%)	126 (95%)	7 (5%)	0	100	100
14	N	146/149 (98%)	136 (93%)	10 (7%)	0	100	100
15	O	56/59 (95%)	52 (93%)	3 (5%)	1 (2%)	7	14
16	P	94/105 (90%)	93 (99%)	1 (1%)	0	100	100
17	Q	107/113 (95%)	98 (92%)	9 (8%)	0	100	100
18	R	125/130 (96%)	123 (98%)	2 (2%)	0	100	100
19	S	104/107 (97%)	101 (97%)	3 (3%)	0	100	100
20	T	110/121 (91%)	108 (98%)	2 (2%)	0	100	100
21	U	117/120 (98%)	112 (96%)	5 (4%)	0	100	100
22	V	97/100 (97%)	93 (96%)	4 (4%)	0	100	100
23	W	79/88 (90%)	75 (95%)	4 (5%)	0	100	100
24	X	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
25	Y	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
26	Z	50/128 (39%)	47 (94%)	3 (6%)	0	100	100
27	b	101/106 (95%)	95 (94%)	6 (6%)	0	100	100
28	c	89/92 (97%)	85 (96%)	4 (4%)	0	100	100
29	d	20/25 (80%)	19 (95%)	1 (5%)	0	100	100
33	j	244/254 (96%)	226 (93%)	18 (7%)	0	100	100
34	k	384/387 (99%)	363 (94%)	21 (6%)	0	100	100
35	l	359/362 (99%)	329 (92%)	29 (8%)	1 (0%)	37	59
36	m	292/297 (98%)	277 (95%)	15 (5%)	0	100	100
37	n	163/176 (93%)	154 (94%)	9 (6%)	0	100	100
38	o	220/244 (90%)	207 (94%)	13 (6%)	0	100	100
39	p	231/256 (90%)	220 (95%)	11 (5%)	0	100	100
40	q	189/191 (99%)	174 (92%)	14 (7%)	1 (0%)	25	47
41	r	216/221 (98%)	206 (95%)	10 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
42	s	167/174 (96%)	161 (96%)	5 (3%)	1 (1%)	22	43
43	t	191/199 (96%)	174 (91%)	16 (8%)	1 (0%)	25	47
44	u	134/138 (97%)	125 (93%)	9 (7%)	0	100	100
45	a	842/1038 (81%)	830 (99%)	12 (1%)	0	100	100
46	e	1519/1562 (97%)	1495 (98%)	22 (1%)	2 (0%)	48	71
47	g	223/245 (91%)	215 (96%)	8 (4%)	0	100	100
48	w	214/217 (99%)	211 (99%)	3 (1%)	0	100	100
50	z	144/165 (87%)	135 (94%)	8 (6%)	1 (1%)	19	38
51	0	117/312 (38%)	116 (99%)	0	1 (1%)	14	31
53	v	139/157 (88%)	139 (100%)	0	0	100	100
All	All	9314/10279 (91%)	8956 (96%)	349 (4%)	9 (0%)	50	71

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
50	z	88	PRO
46	e	437	LYS
46	e	855	PRO
35	l	4	PRO
40	q	107	ASP
42	s	108	GLU
51	0	93	LEU
15	O	21	ILE
43	t	47	ALA

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	175/176 (99%)	175 (100%)	0	100	100
2	B	160/162 (99%)	160 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	C	138/146 (94%)	138 (100%)	0	100	100
4	D	150/151 (99%)	149 (99%)	1 (1%)	81	93
5	E	129/154 (84%)	129 (100%)	0	100	100
6	F	155/156 (99%)	155 (100%)	0	100	100
7	G	135/137 (98%)	134 (99%)	1 (1%)	81	93
8	H	87/107 (81%)	87 (100%)	0	100	100
9	I	104/105 (99%)	104 (100%)	0	100	100
10	J	54/129 (42%)	54 (100%)	0	100	100
11	K	104/118 (88%)	104 (100%)	0	100	100
12	L	108/110 (98%)	108 (100%)	0	100	100
13	M	112/116 (97%)	112 (100%)	0	100	100
14	N	117/119 (98%)	117 (100%)	0	100	100
15	O	46/47 (98%)	45 (98%)	1 (2%)	47	72
16	P	81/88 (92%)	81 (100%)	0	100	100
17	Q	92/97 (95%)	92 (100%)	0	100	100
18	R	107/111 (96%)	107 (100%)	0	100	100
19	S	90/91 (99%)	90 (100%)	0	100	100
20	T	95/103 (92%)	94 (99%)	1 (1%)	70	86
21	U	104/105 (99%)	104 (100%)	0	100	100
22	V	80/82 (98%)	80 (100%)	0	100	100
23	W	67/71 (94%)	67 (100%)	0	100	100
24	X	68/69 (99%)	66 (97%)	2 (3%)	37	64
25	Y	45/46 (98%)	45 (100%)	0	100	100
26	Z	45/116 (39%)	45 (100%)	0	100	100
27	b	87/91 (96%)	87 (100%)	0	100	100
28	c	71/72 (99%)	71 (100%)	0	100	100
29	d	20/23 (87%)	20 (100%)	0	100	100
33	j	189/196 (96%)	188 (100%)	1 (0%)	86	95
34	k	321/323 (99%)	319 (99%)	2 (1%)	84	94
35	l	288/289 (100%)	288 (100%)	0	100	100
36	m	241/245 (98%)	241 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
37	n	139/155 (90%)	138 (99%)	1 (1%)	81	93
38	o	186/205 (91%)	186 (100%)	0	100	100
39	p	187/208 (90%)	187 (100%)	0	100	100
40	q	168/171 (98%)	168 (100%)	0	100	100
41	r	185/187 (99%)	183 (99%)	2 (1%)	70	86
42	s	145/150 (97%)	145 (100%)	0	100	100
43	t	154/159 (97%)	154 (100%)	0	100	100
44	u	107/109 (98%)	107 (100%)	0	100	100
45	a	676/949 (71%)	638 (94%)	38 (6%)	17	38
46	e	1152/1451 (79%)	1092 (95%)	60 (5%)	19	41
47	g	180/211 (85%)	180 (100%)	0	100	100
48	w	197/198 (100%)	196 (100%)	1 (0%)	86	95
51	0	104/254 (41%)	95 (91%)	9 (9%)	8	17
53	v	119/132 (90%)	117 (98%)	2 (2%)	56	78
All	All	7564/8690 (87%)	7442 (98%)	122 (2%)	58	79

All (122) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	D	12	ARG
7	G	83	ARG
15	O	33	LYS
20	T	106	LYS
24	X	9	LYS
24	X	63	LYS
33	j	221	LYS
34	k	332	ARG
34	k	369	ARG
37	n	8	LYS
41	r	112	GLN
41	r	144	ASN
45	a	74	SER
45	a	89	LEU
45	a	114	LEU
45	a	121	ASN
45	a	139	LEU
45	a	157	PHE

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Mol	Chain	Res	Type
45	a	255	LEU
45	a	261	LEU
45	a	285	ILE
45	a	293	TYR
45	a	308	THR
45	a	309	PHE
45	a	316	ILE
45	a	541	LYS
45	a	580	PHE
45	a	589	MET
45	a	605	ILE
45	a	609	ASP
45	a	612	MET
45	a	627	LYS
45	a	649	TRP
45	a	665	VAL
45	a	675	ILE
45	a	696	GLN
45	a	697	LEU
45	a	705	TRP
45	a	837	VAL
45	a	855	ASP
45	a	868	THR
45	a	881	GLU
45	a	896	ARG
45	a	924	LEU
45	a	947	LEU
45	a	973	TYR
45	a	979	LEU
45	a	994	HIS
45	a	1003	GLN
45	a	1014	LEU
46	e	8	THR
46	e	30	PHE
46	e	105	VAL
46	e	125	ILE
46	e	169	LEU
46	e	205	GLU
46	e	254	ASN
46	e	271	LEU
46	e	277	MET
46	e	299	THR

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Mol	Chain	Res	Type
46	e	309	VAL
46	e	319	THR
46	e	327	THR
46	e	364	SER
46	e	400	GLU
46	e	707	LYS
46	e	710	LYS
46	e	731	LEU
46	e	733	HIS
46	e	754	ILE
46	e	770	ILE
46	e	780	ILE
46	e	797	LEU
46	e	799	THR
46	e	807	LYS
46	e	826	LEU
46	e	867	PHE
46	e	904	VAL
46	e	910	SER
46	e	924	VAL
46	e	933	LEU
46	e	978	THR
46	e	989	GLU
46	e	1032	LEU
46	e	1059	LEU
46	e	1102	CYS
46	e	1149	THR
46	e	1164	LEU
46	e	1175	PHE
46	e	1179	LEU
46	e	1189	ASN
46	e	1239	LYS
46	e	1269	LEU
46	e	1286	MET
46	e	1300	ILE
46	e	1303	MET
46	e	1341	LYS
46	e	1342	GLU
46	e	1367	THR
46	e	1379	LEU
46	e	1384	GLU
46	e	1400	PHE

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Mol	Chain	Res	Type
46	e	1407	MET
46	e	1421	LEU
46	e	1428	VAL
46	e	1454	ILE
46	e	1464	ILE
46	e	1490	SER
46	e	1508	CYS
46	e	1555	ARG
48	w	98	LYS
51	0	30	VAL
51	0	51	VAL
51	0	52	LEU
51	0	67	LEU
51	0	76	LEU
51	0	80	VAL
51	0	93	LEU
51	0	95	GLU
51	0	189	GLN
53	v	54	HIS
53	v	73	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
45	a	141	HIS
45	a	143	ASN
45	a	382	GLN
45	a	413	GLN
45	a	532	GLN
45	a	599	GLN
45	a	696	GLN
45	a	957	GLN
45	a	1003	GLN
46	e	79	ASN
46	e	160	ASN
46	e	189	ASN
46	e	226	ASN
46	e	233	ASN
46	e	251	ASN
46	e	805	ASN
46	e	902	ASN
46	e	1141	GLN

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Mol	Chain	Res	Type
46	e	1288	GLN
46	e	1455	GLN
46	e	1457	ASN
46	e	1477	GLN
46	e	1499	HIS
46	e	1501	GLN
47	g	9	ASN
51	0	36	GLN
53	v	52	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
30	f	3211/3395 (94%)	591 (18%)	0
31	h	120/121 (99%)	12 (10%)	0
32	i	157/158 (99%)	32 (20%)	0
49	x	72/76 (94%)	23 (31%)	0
49	y	71/76 (93%)	30 (42%)	0
All	All	3631/3826 (94%)	688 (18%)	0

All (688) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
30	f	6	A
30	f	13	A
30	f	14	U
30	f	26	A
30	f	40	A
30	f	43	A
30	f	49	A
30	f	59	G
30	f	60	A
30	f	65	A
30	f	66	A
30	f	92	G
30	f	99	A
30	f	109	A
30	f	110	G
30	f	111	C
30	f	116	A
30	f	120	G

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Mol	Chain	Res	Type
30	f	121	A
30	f	122	A
30	f	133	U
30	f	134	U
30	f	135	C
30	f	136	G
30	f	156	G
30	f	157	A
30	f	165	A
30	f	166	C
30	f	172	G
30	f	173	G
30	f	187	A
30	f	190	U
30	f	191	U
30	f	200	C
30	f	206	G
30	f	210	U
30	f	211	A
30	f	213	A
30	f	218	G
30	f	219	A
30	f	234	G
30	f	240	U
30	f	241	G
30	f	242	C
30	f	243	G
30	f	245	U
30	f	249	U
30	f	252	U
30	f	269	G
30	f	283	G
30	f	286	U
30	f	295	A
30	f	305	U
30	f	323	A
30	f	329	U
30	f	339	C
30	f	350	C
30	f	374	A
30	f	376	G
30	f	398	A

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Mol	Chain	Res	Type
30	f	399	A
30	f	401	U
30	f	402	A
30	f	403	C
30	f	421	G
30	f	422	A
30	f	439	C
30	f	440	A
30	f	441	U
30	f	442	G
30	f	443	G
30	f	445	G
30	f	446	U
30	f	447	U
30	f	448	U
30	f	450	G
30	f	487	U
30	f	488	U
30	f	489	U
30	f	490	C
30	f	494	G
30	f	518	G
30	f	520	U
30	f	521	A
30	f	523	A
30	f	535	G
30	f	536	U
30	f	543	C
30	f	544	C
30	f	546	C
30	f	547	G
30	f	548	G
30	f	551	A
30	f	552	G
30	f	555	U
30	f	557	A
30	f	559	A
30	f	578	A
30	f	579	G
30	f	589	A
30	f	597	G
30	f	604	G

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Mol	Chain	Res	Type
30	f	608	A
30	f	609	G
30	f	611	A
30	f	620	U
30	f	621	A
30	f	622	A
30	f	637	C
30	f	638	C
30	f	649	A
30	f	660	A
30	f	677	A
30	f	681	U
30	f	684	G
30	f	690	A
30	f	691	A
30	f	705	A
30	f	712	G
30	f	715	A
30	f	716	A
30	f	719	U
30	f	720	A
30	f	758	C
30	f	763	G
30	f	764	U
30	f	765	C
30	f	766	U
30	f	767	U
30	f	776	U
30	f	777	U
30	f	780	A
30	f	781	G
30	f	785	G
30	f	786	A
30	f	806	A
30	f	817	A
30	f	830	A
30	f	846	A
30	f	849	C
30	f	850	U
30	f	861	C
30	f	874	U
30	f	879	U

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Mol	Chain	Res	Type
30	f	896	A
30	f	907	G
30	f	908	G
30	f	914	A
30	f	916	G
30	f	917	A
30	f	920	A
30	f	921	A
30	f	924	G
30	f	925	A
30	f	937	G
30	f	944	C
30	f	959	C
30	f	960	U
30	f	981	U
30	f	982	C
30	f	991	G
30	f	994	G
30	f	1001	G
30	f	1002	A
30	f	1010	G
30	f	1015	U
30	f	1016	C
30	f	1017	C
30	f	1018	G
30	f	1021	G
30	f	1024	G
30	f	1025	A
30	f	1028	U
30	f	1036	A
30	f	1041	U
30	f	1047	A
30	f	1049	C
30	f	1063	G
30	f	1064	A
30	f	1065	A
30	f	1072	G
30	f	1081	U
30	f	1087	G
30	f	1093	A
30	f	1094	U
30	f	1095	U

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Mol	Chain	Res	Type
30	f	1097	G
30	f	1098	A
30	f	1103	A
30	f	1104	G
30	f	1117	G
30	f	1131	G
30	f	1144	U
30	f	1153	A
30	f	1159	A
30	f	1160	C
30	f	1177	G
30	f	1180	A
30	f	1181	U
30	f	1192	C
30	f	1193	A
30	f	1196	C
30	f	1197	A
30	f	1201	C
30	f	1202	A
30	f	1208	U
30	f	1217	A
30	f	1218	U
30	f	1219	C
30	f	1222	G
30	f	1225	A
30	f	1227	C
30	f	1235	U
30	f	1236	G
30	f	1238	C
30	f	1241	U
30	f	1242	G
30	f	1244	A
30	f	1245	A
30	f	1251	A
30	f	1252	A
30	f	1254	C
30	f	1258	U
30	f	1259	A
30	f	1263	A
30	f	1264	G
30	f	1265	U
30	f	1269	U

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Mol	Chain	Res	Type
30	f	1272	C
30	f	1277	C
30	f	1278	A
30	f	1279	C
30	f	1282	G
30	f	1285	G
30	f	1286	A
30	f	1287	A
30	f	1295	G
30	f	1307	G
30	f	1308	A
30	f	1309	U
30	f	1313	G
30	f	1330	A
30	f	1348	U
30	f	1349	G
30	f	1351	U
30	f	1352	A
30	f	1354	G
30	f	1355	A
30	f	1356	U
30	f	1357	G
30	f	1386	A
30	f	1392	G
30	f	1399	A
30	f	1400	G
30	f	1419	A
30	f	1434	G
30	f	1437	C
30	f	1446	A
30	f	1450	G
30	f	1481	A
30	f	1482	A
30	f	1483	G
30	f	1487	G
30	f	1488	G
30	f	1502	C
30	f	1508	C
30	f	1536	G
30	f	1539	A
30	f	1555	U
30	f	1556	C

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Mol	Chain	Res	Type
30	f	1557	A
30	f	1560	G
30	f	1562	C
30	f	1563	C
30	f	1566	A
30	f	1568	U
30	f	1569	U
30	f	1572	U
30	f	1573	G
30	f	1575	A
30	f	1576	G
30	f	1580	A
30	f	1581	C
30	f	1582	C
30	f	1583	A
30	f	1589	A
30	f	1590	G
30	f	1605	A
30	f	1607	U
30	f	1620	U
30	f	1629	U
30	f	1639	C
30	f	1642	A
30	f	1643	A
30	f	1645	U
30	f	1657	C
30	f	1683	A
30	f	1716	U
30	f	1717	U
30	f	1724	U
30	f	1725	C
30	f	1736	G
30	f	1741	A
30	f	1750	A
30	f	1751	G
30	f	1760	A
30	f	1761	C
30	f	1764	U
30	f	1765	U
30	f	1766	G
30	f	1770	G
30	f	1775	G

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Mol	Chain	Res	Type
30	f	1780	G
30	f	1797	A
30	f	1814	A
30	f	1816	A
30	f	1819	U
30	f	1820	U
30	f	1821	U
30	f	1835	A
30	f	1839	A
30	f	1840	U
30	f	1841	A
30	f	1842	A
30	f	1846	C
30	f	1849	C
30	f	1850	A
30	f	1866	C
30	f	1867	A
30	f	1880	U
30	f	1881	A
30	f	1893	A
30	f	1906	G
30	f	1943	C
30	f	1952	G
30	f	1953	G
30	f	1954	G
30	f	2094	C
30	f	2101	C
30	f	2102	U
30	f	2111	G
30	f	2112	U
30	f	2113	A
30	f	2114	C
30	f	2121	G
30	f	2122	G
30	f	2131	A
30	f	2134	G
30	f	2140	U
30	f	2144	A
30	f	2158	A
30	f	2160	G
30	f	2169	G
30	f	2176	U

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Mol	Chain	Res	Type
30	f	2201	G
30	f	2206	G
30	f	2207	A
30	f	2208	A
30	f	2209	U
30	f	2222	A
30	f	2223	A
30	f	2225	U
30	f	2228	A
30	f	2249	G
30	f	2270	A
30	f	2272	G
30	f	2273	G
30	f	2274	U
30	f	2281	A
30	f	2282	U
30	f	2288	G
30	f	2307	G
30	f	2308	C
30	f	2310	U
30	f	2313	A
30	f	2314	U
30	f	2315	G
30	f	2334	U
30	f	2335	G
30	f	2336	U
30	f	2373	A
30	f	2374	C
30	f	2375	G
30	f	2385	G
30	f	2388	U
30	f	2393	G
30	f	2397	A
30	f	2402	A
30	f	2403	G
30	f	2404	A
30	f	2411	U
30	f	2419	A
30	f	2437	G
30	f	2446	U
30	f	2447	A
30	f	2450	G

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Mol	Chain	Res	Type
30	f	2461	A
30	f	2463	G
30	f	2464	U
30	f	2468	A
30	f	2469	G
30	f	2470	C
30	f	2471	U
30	f	2472	U
30	f	2474	G
30	f	2479	C
30	f	2480	A
30	f	2484	A
30	f	2486	A
30	f	2487	U
30	f	2488	A
30	f	2494	A
30	f	2495	C
30	f	2496	C
30	f	2499	U
30	f	2501	U
30	f	2502	A
30	f	2503	G
30	f	2505	U
30	f	2514	U
30	f	2515	A
30	f	2522	G
30	f	2526	C
30	f	2531	C
30	f	2537	U
30	f	2538	U
30	f	2539	C
30	f	2540	A
30	f	2541	U
30	f	2542	U
30	f	2544	U
30	f	2547	A
30	f	2548	C
30	f	2549	G
30	f	2552	C
30	f	2554	A
30	f	2555	G
30	f	2561	A

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Mol	Chain	Res	Type
30	f	2569	A
30	f	2570	U
30	f	2571	U
30	f	2572	C
30	f	2573	G
30	f	2581	U
30	f	2585	G
30	f	2593	A
30	f	2594	C
30	f	2606	G
30	f	2607	G
30	f	2614	G
30	f	2648	G
30	f	2651	G
30	f	2652	U
30	f	2656	A
30	f	2674	A
30	f	2677	G
30	f	2678	A
30	f	2689	A
30	f	2691	A
30	f	2694	A
30	f	2696	A
30	f	2704	A
30	f	2714	G
30	f	2719	U
30	f	2728	G
30	f	2729	U
30	f	2740	A
30	f	2752	U
30	f	2753	G
30	f	2755	C
30	f	2772	C
30	f	2773	C
30	f	2777	G
30	f	2778	G
30	f	2788	C
30	f	2796	G
30	f	2800	G
30	f	2801	A
30	f	2803	A
30	f	2810	C

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Mol	Chain	Res	Type
30	f	2814	G
30	f	2817	A
30	f	2818	U
30	f	2821	C
30	f	2834	G
30	f	2842	U
30	f	2844	C
30	f	2845	A
30	f	2849	C
30	f	2860	U
30	f	2867	C
30	f	2871	G
30	f	2872	A
30	f	2876	C
30	f	2887	A
30	f	2898	G
30	f	2899	C
30	f	2911	A
30	f	2914	G
30	f	2923	U
30	f	2935	U
30	f	2936	A
30	f	2941	A
30	f	2942	C
30	f	2947	G
30	f	2971	A
30	f	2983	C
30	f	2990	G
30	f	2992	U
30	f	2996	U
30	f	2997	G
30	f	3006	A
30	f	3012	A
30	f	3056	U
30	f	3059	G
30	f	3078	U
30	f	3079	U
30	f	3080	G
30	f	3086	A
30	f	3092	C
30	f	3104	U
30	f	3113	A

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Mol	Chain	Res	Type
30	f	3122	A
30	f	3130	A
30	f	3131	U
30	f	3142	A
30	f	3143	C
30	f	3151	U
30	f	3154	C
30	f	3155	U
30	f	3156	U
30	f	3157	U
30	f	3165	A
30	f	3170	A
30	f	3173	G
30	f	3174	A
30	f	3175	U
30	f	3176	G
30	f	3179	U
30	f	3181	C
30	f	3186	A
30	f	3187	A
30	f	3196	U
30	f	3207	U
30	f	3209	A
30	f	3217	C
30	f	3218	A
30	f	3219	G
30	f	3228	C
30	f	3229	G
30	f	3243	A
30	f	3245	A
30	f	3247	G
30	f	3259	U
30	f	3263	G
30	f	3269	U
30	f	3270	U
30	f	3273	A
30	f	3276	G
30	f	3281	U
30	f	3287	U
30	f	3288	G
30	f	3289	G
30	f	3294	A

Continued on next page...

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Mol	Chain	Res	Type
30	f	3295	A
30	f	3303	G
30	f	3304	U
30	f	3307	A
30	f	3313	U
30	f	3316	A
30	f	3317	U
30	f	3318	G
30	f	3319	U
30	f	3320	A
30	f	3341	U
30	f	3342	A
30	f	3345	G
30	f	3351	U
30	f	3352	U
30	f	3353	G
30	f	3354	U
30	f	3355	U
30	f	3369	G
30	f	3375	A
30	f	3378	C
30	f	3382	U
30	f	3383	G
30	f	3386	G
30	f	3389	U
30	f	3390	G
30	f	3396	U
31	h	7	G
31	h	29	C
31	h	53	U
31	h	54	U
31	h	55	A
31	h	65	G
31	h	73	C
31	h	74	C
31	h	95	A
31	h	102	A
31	h	112	G
31	h	121	U
32	i	23	U
32	i	34	U
32	i	35	C

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Mol	Chain	Res	Type
32	i	39	G
32	i	48	A
32	i	52	A
32	i	53	A
32	i	59	A
32	i	62	C
32	i	63	G
32	i	80	A
32	i	81	U
32	i	82	U
32	i	83	C
32	i	84	C
32	i	85	G
32	i	86	U
32	i	87	G
32	i	90	U
32	i	95	G
32	i	104	A
32	i	105	A
32	i	106	C
32	i	111	A
32	i	113	U
32	i	125	U
32	i	126	A
32	i	138	A
32	i	151	C
32	i	152	G
32	i	157	U
32	i	158	U
49	x	7	G
49	x	10	G
49	x	15	G
49	x	16	U
49	x	17	C
49	x	18	G
49	x	22	G
49	x	28	U
49	x	33	U
49	x	35	G
49	x	37	A
49	x	38	U
49	x	42	A

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Mol	Chain	Res	Type
49	x	43	G
49	x	46	G
49	x	48	C
49	x	49	U
49	x	56	C
49	x	57	G
49	x	59	U
49	x	60	U
49	x	61	C
49	x	74	C
49	y	7	G
49	y	8	U
49	y	9	G
49	y	13	U
49	y	16	U
49	y	17	C
49	y	22	G
49	y	23	C
49	y	25	C
49	y	26	G
49	y	28	U
49	y	34	A
49	y	35	G
49	y	36	C
49	y	38	U
49	y	42	A
49	y	43	G
49	y	44	A
49	y	46	G
49	y	47	U
49	y	48	C
49	y	56	C
49	y	58	A
49	y	59	U
49	y	60	U
49	y	61	C
49	y	68	C
49	y	71	C
49	y	75	C
49	y	76	A

There are no RNA pucker outliers to report.

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

1 non-standard protein/DNA/RNA residue is 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
53	5CT	v	51	53	13,14,15	0.78	0	8,15,17	1.29	1 (12%)

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
53	5CT	v	51	53	-	9/13/14/16	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
53	v	51	5CT	C4-C3-C2	-2.20	108.84	113.47

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
53	v	51	5CT	NZ-C1-C2-C3
53	v	51	5CT	O1-C2-C3-C4
53	v	51	5CT	C2-C3-C4-N1
53	v	51	5CT	C-CA-CB-CG
53	v	51	5CT	N-CA-CB-CG
53	v	51	5CT	NZ-C1-C2-O1
53	v	51	5CT	C1-C2-C3-C4
53	v	51	5CT	C2-C1-NZ-CE
53	v	51	5CT	CE-CD-CG-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 20 ligands modelled in this entry, 20 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

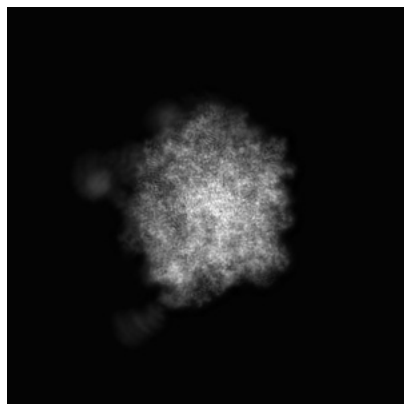
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-15425. These allow visual inspection of the internal detail of the map and identification of artifacts.

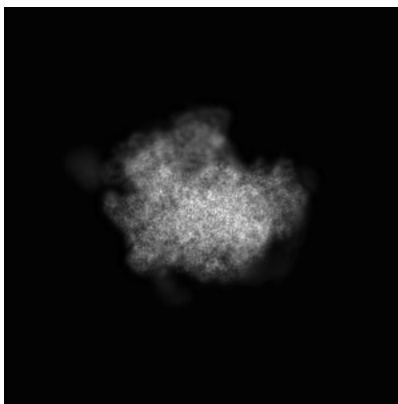
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

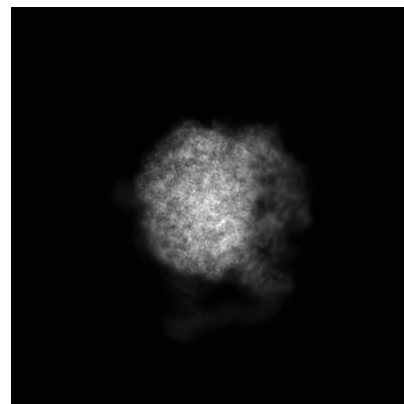
6.1.1 Primary map



X

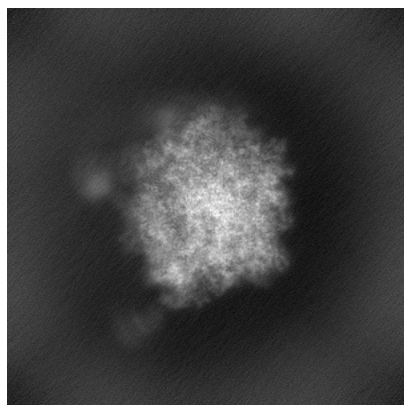


Y

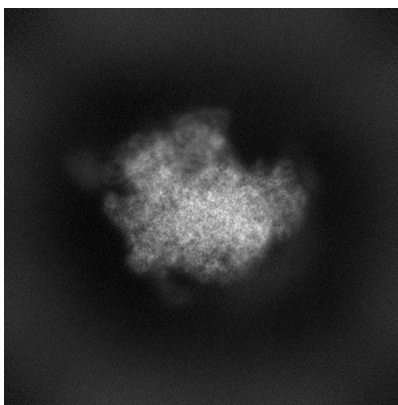


Z

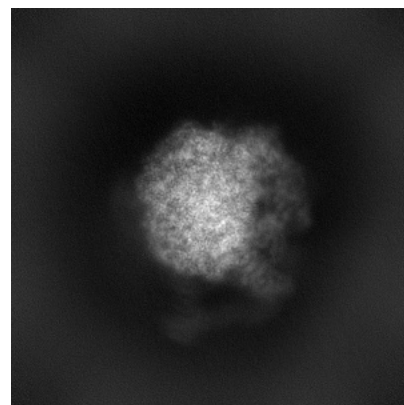
6.1.2 Raw map



X



Y

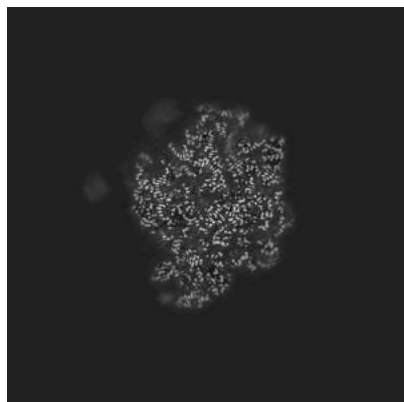


Z

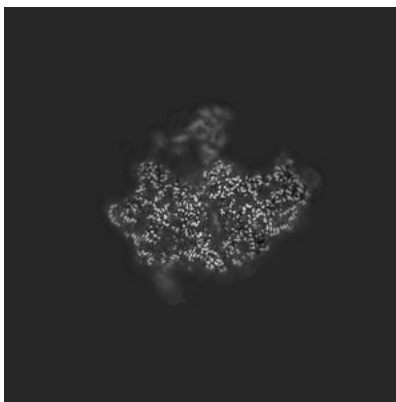
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

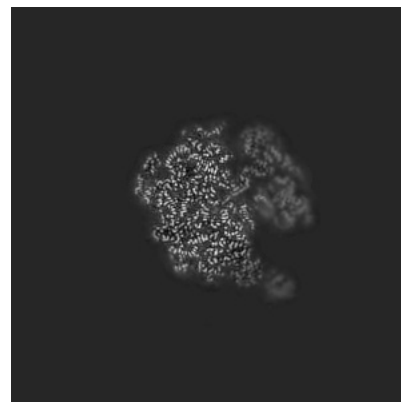
6.2.1 Primary map



X Index: 225

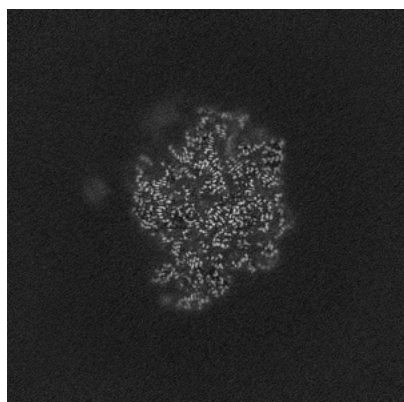


Y Index: 225

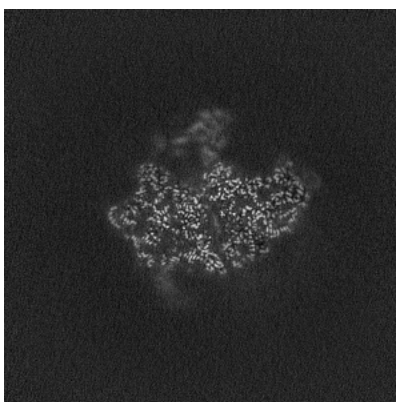


Z Index: 225

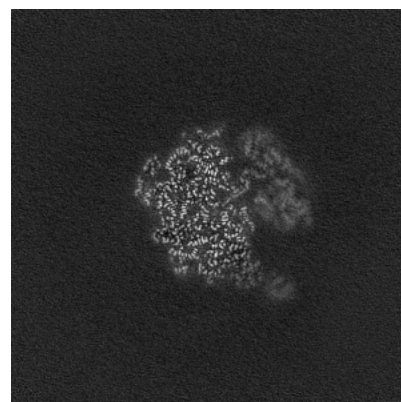
6.2.2 Raw map



X Index: 225



Y Index: 225

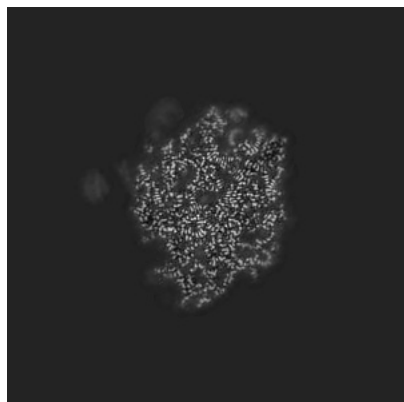


Z Index: 225

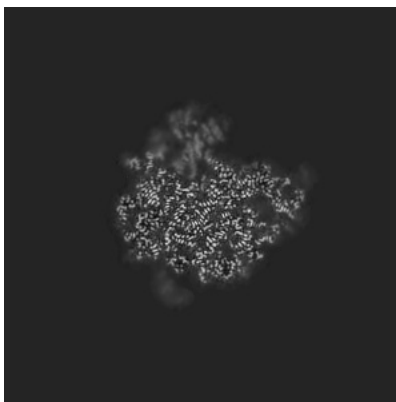
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

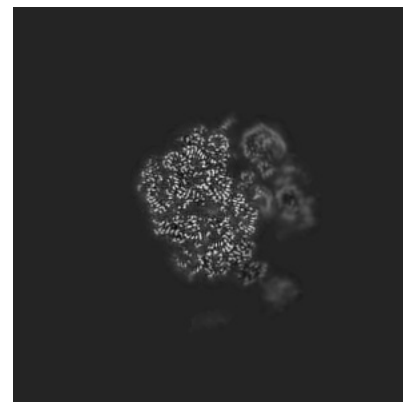
6.3.1 Primary map



X Index: 219

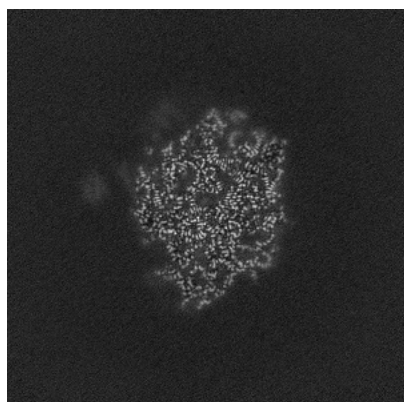


Y Index: 242

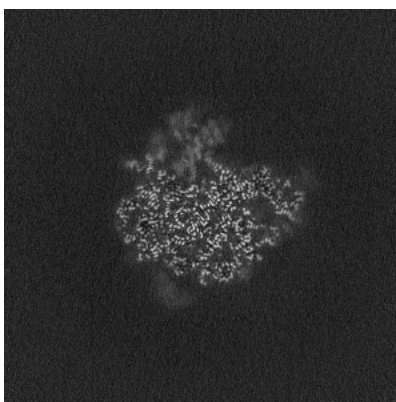


Z Index: 231

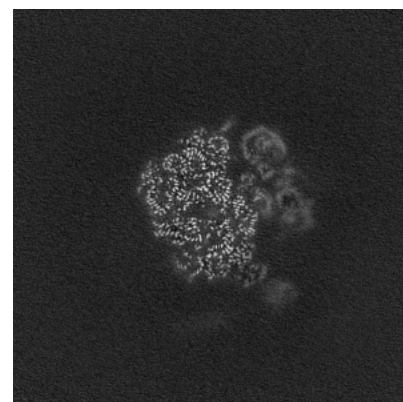
6.3.2 Raw map



X Index: 219



Y Index: 241

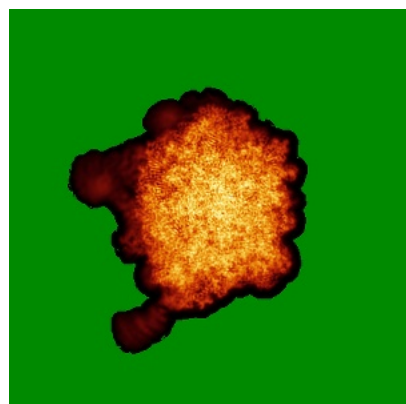


Z Index: 231

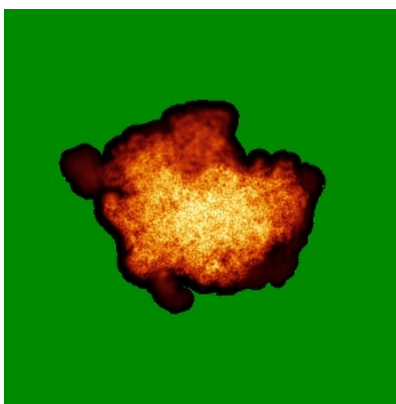
The images above show the largest variance slices of the map in three orthogonal directions.

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

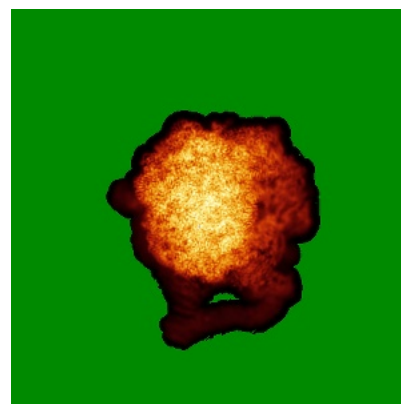
6.4.1 Primary map



X

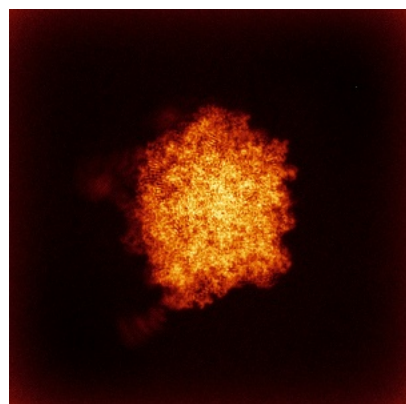


Y

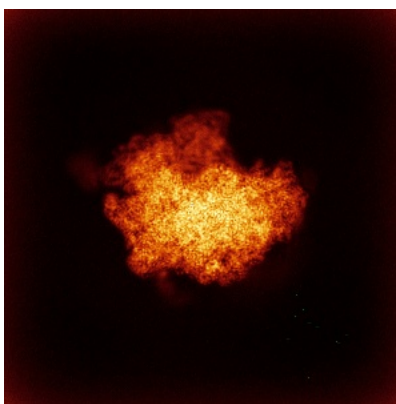


Z

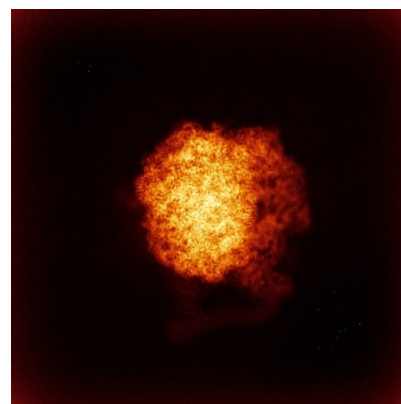
6.4.2 Raw map



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.

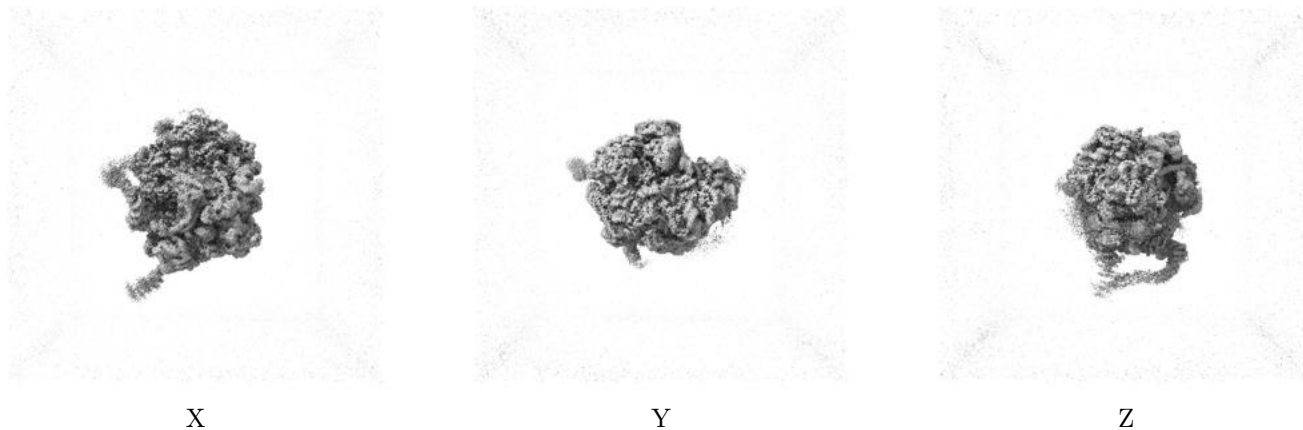
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.4. 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.

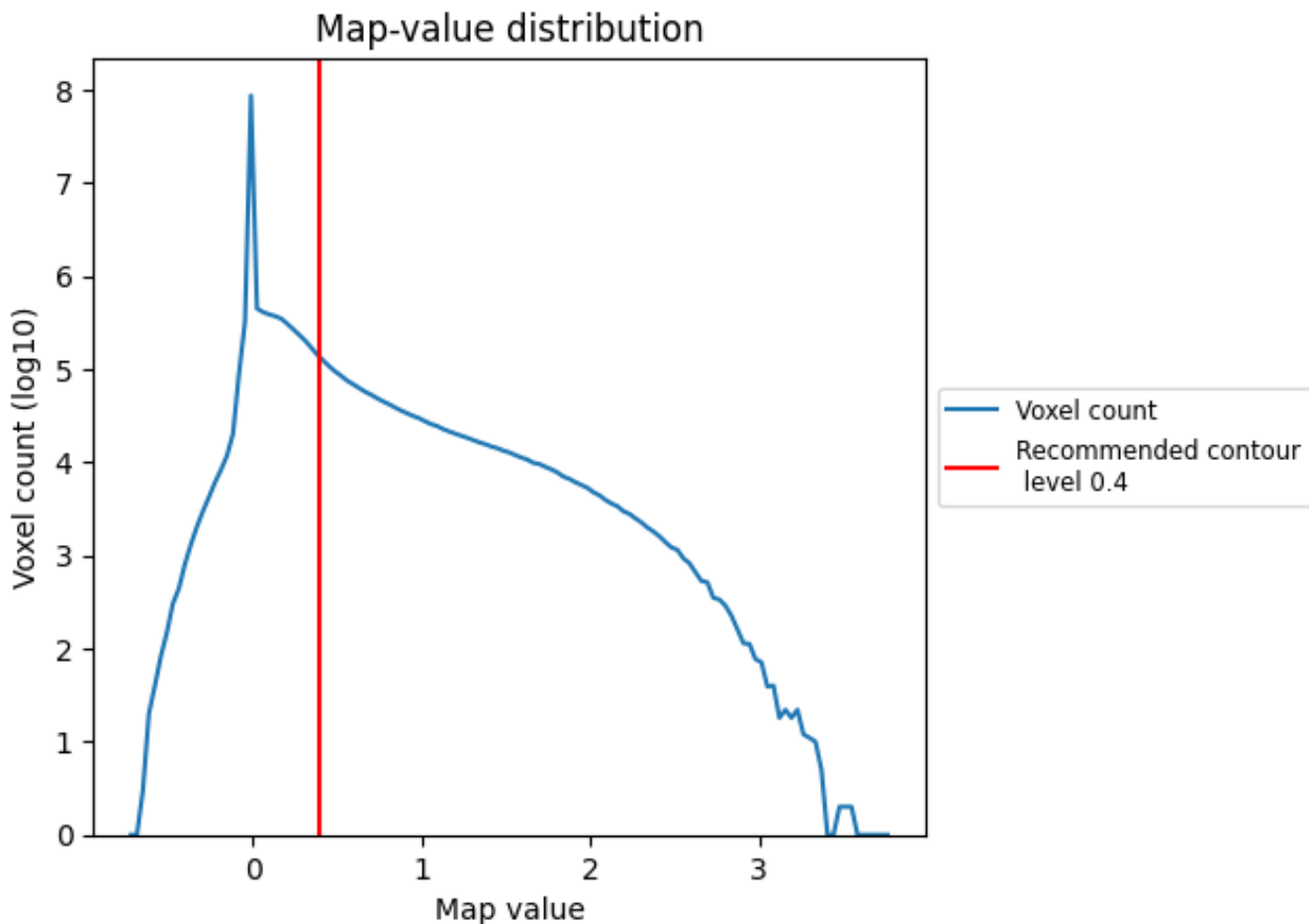
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

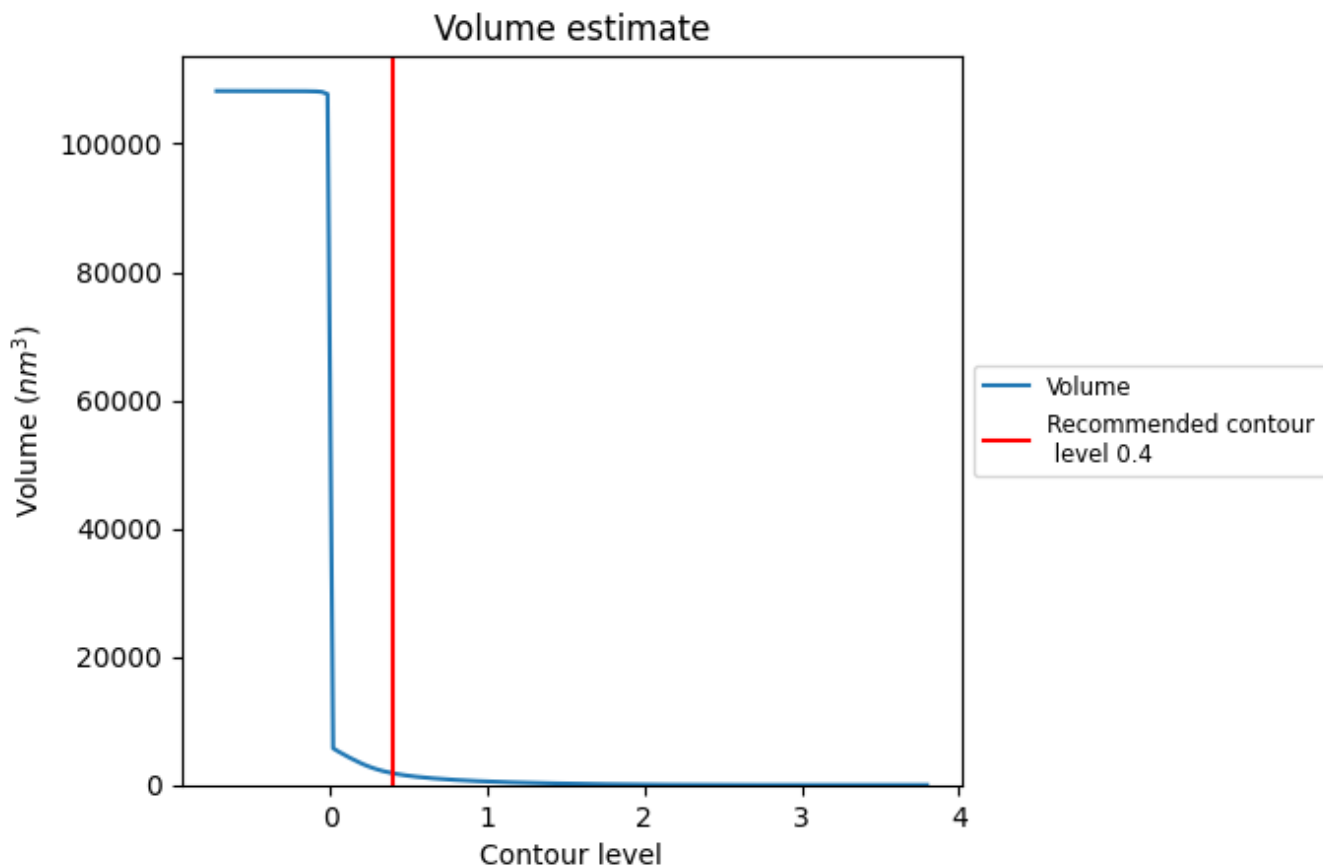
This section contains the results of statistical analysis of the map.

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.

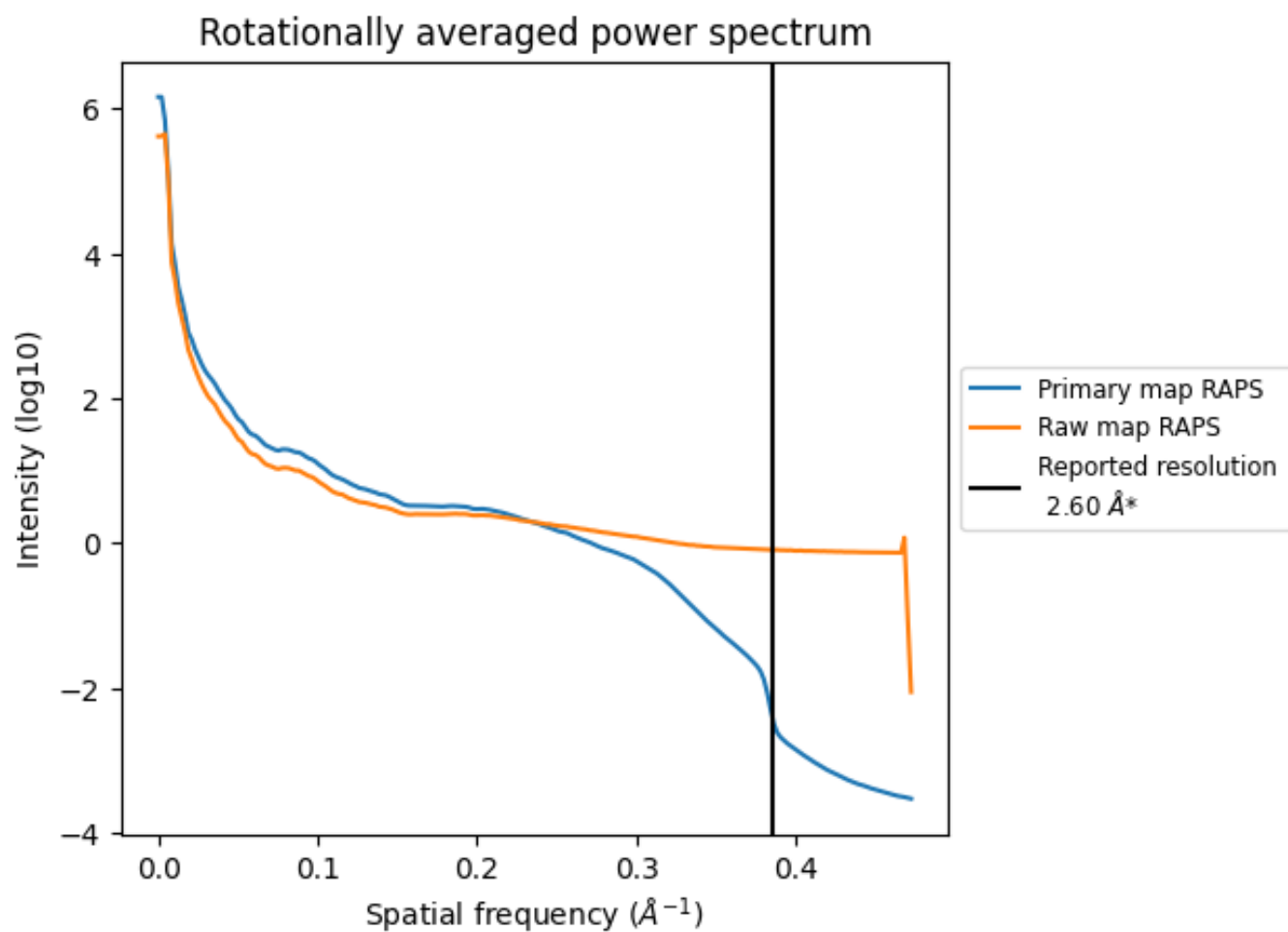
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1819 nm³; this corresponds to an approximate mass of 1643 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

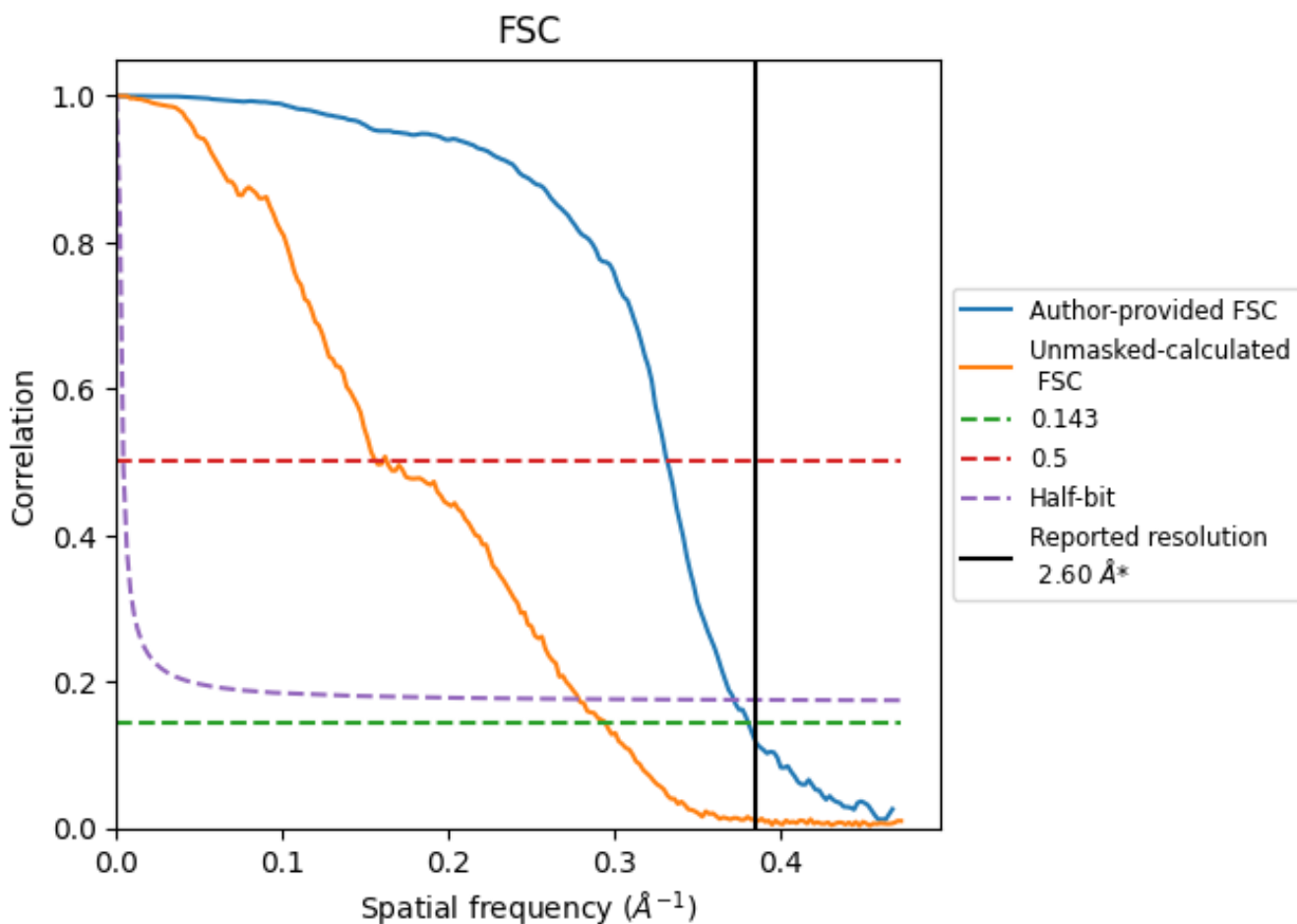


*Reported resolution corresponds to spatial frequency of 0.385 Å⁻¹

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 0.385 Å⁻¹

8.2 Resolution estimates [i](#)

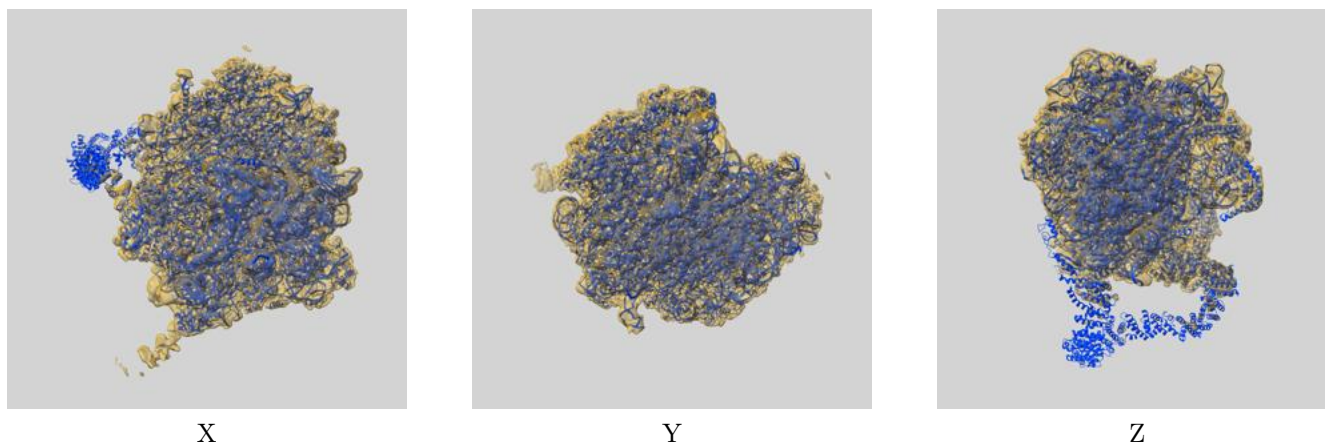
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.60	-	-
Author-provided FSC curve	2.63	3.02	2.69
Unmasked-calculated*	3.40	6.40	3.59

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.40 differs from the reported value 2.6 by more than 10 %

9 Map-model fit [i](#)

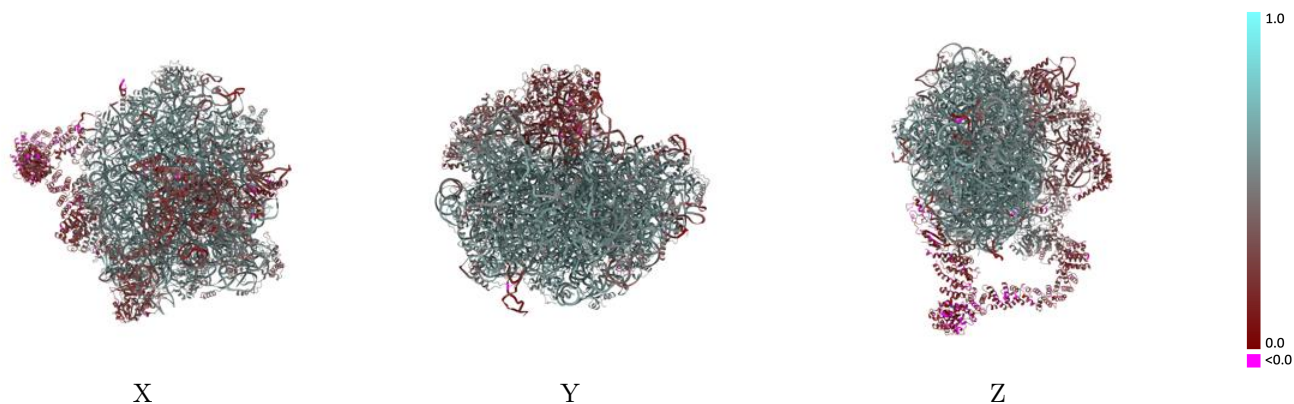
This section contains information regarding the fit between EMDB map EMD-15425 and PDB model 8AGV. Per-residue inclusion information can be found in section [3](#) on page [14](#).

9.1 Map-model overlay [i](#)



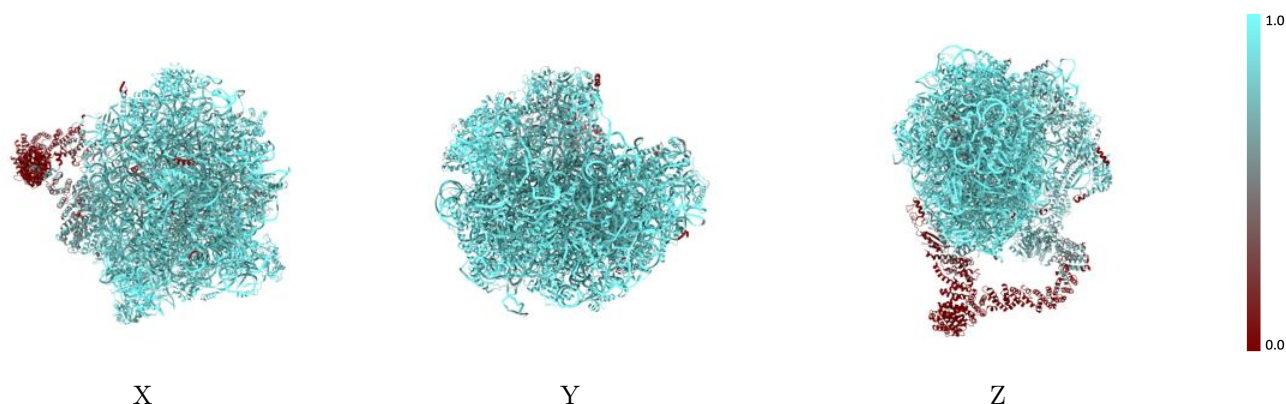
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



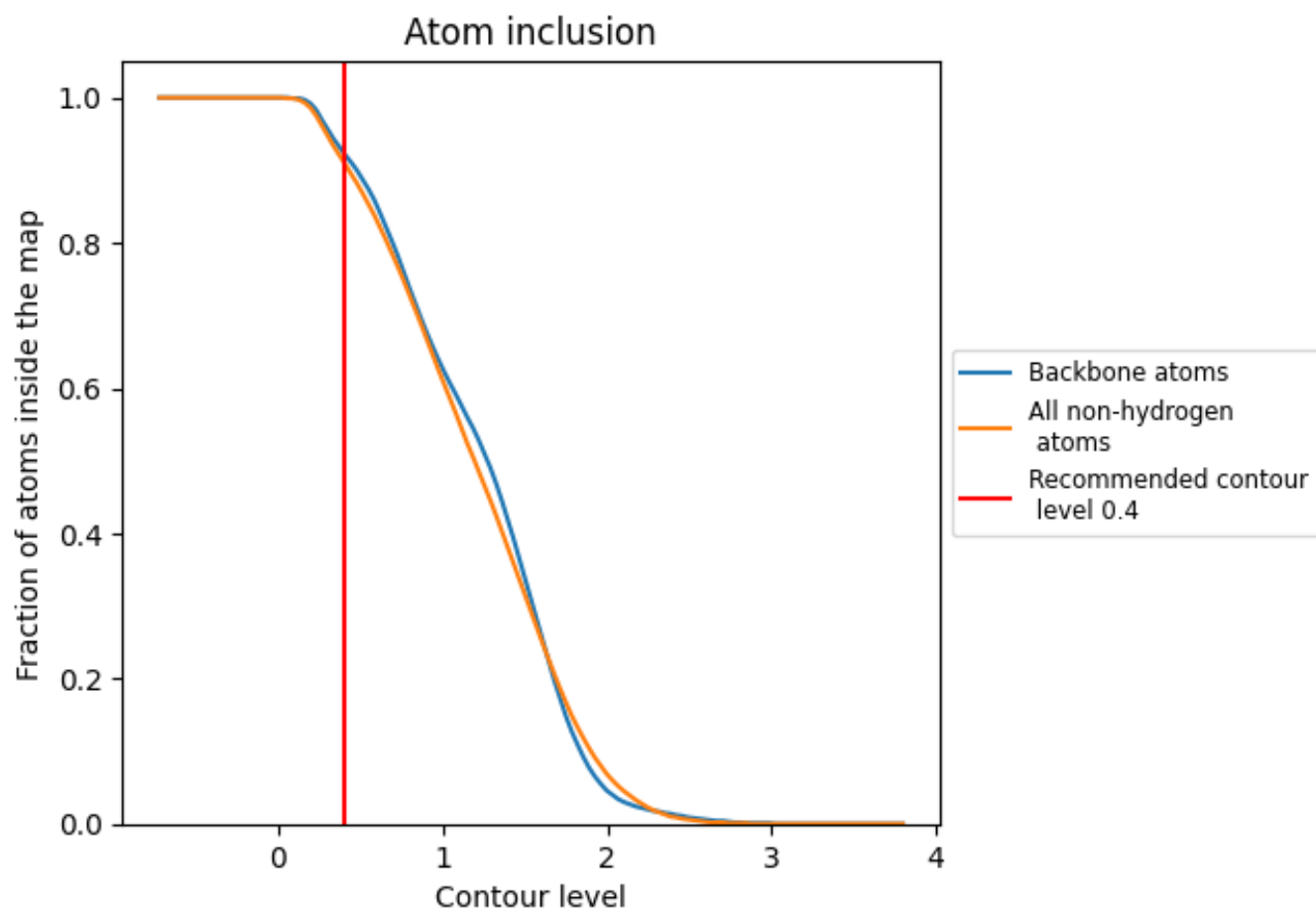
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.4).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 91% 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 (0.4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9110	 0.5030
0	 0.8290	 0.2900
1	 1.0000	 0.4570
A	 0.9930	 0.6050
B	 0.9760	 0.5790
C	 0.9670	 0.5860
D	 0.9790	 0.5790
E	 0.9420	 0.5390
F	 0.9770	 0.5730
G	 0.9690	 0.5580
H	 0.9310	 0.4750
I	 0.9640	 0.5630
J	 0.9600	 0.5600
K	 0.9660	 0.5650
L	 0.9730	 0.5580
M	 0.9550	 0.5190
N	 0.9800	 0.5870
O	 0.9560	 0.5330
P	 0.9420	 0.5100
Q	 0.9250	 0.5480
R	 0.9810	 0.5950
S	 0.9900	 0.6120
T	 0.9660	 0.5690
U	 0.9670	 0.5480
V	 0.9570	 0.5200
W	 1.0000	 0.6200
X	 0.9200	 0.4970
Y	 0.9950	 0.5950
Z	 0.9670	 0.5650
a	 0.8080	 0.2780
b	 0.9640	 0.5640
c	 0.9720	 0.5620
d	 0.7130	 0.3910
e	 0.2590	 0.1800
f	 0.9910	 0.5650



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Chain	Atom inclusion	Q-score
g	 0.7570	 0.4630
h	 0.9990	 0.5600
i	 0.9950	 0.5920
j	 0.9860	 0.5960
k	 0.9790	 0.5810
l	 0.9760	 0.5680
m	 0.9350	 0.4780
n	 0.9450	 0.5190
o	 0.9690	 0.5640
p	 0.9410	 0.5120
q	 0.9590	 0.5410
r	 0.9530	 0.5300
s	 0.9250	 0.4200
t	 0.9670	 0.5540
u	 0.9680	 0.5400
v	 0.8470	 0.3530
w	 0.7890	 0.2020
x	 0.9770	 0.2800
y	 0.9760	 0.2610
z	 0.9130	 0.2760