WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report (i)

Feb 10, 2026 – 01:11 pm GMT

PDB ID	:	9QSJ / pdb_00009qsj
EMDB ID	:	EMD-53341
Title	:	Cryo-EM structure of SKM-70S ribosomal stalled complex in the A-tRNA positioned (Body open) state.
Authors	:	Morici, M.; Corazza, M.; Safdari, H.A.; Wilson, D.N.
Deposited on	:	2025-04-05
Resolution	:	2.62 Å(reported)

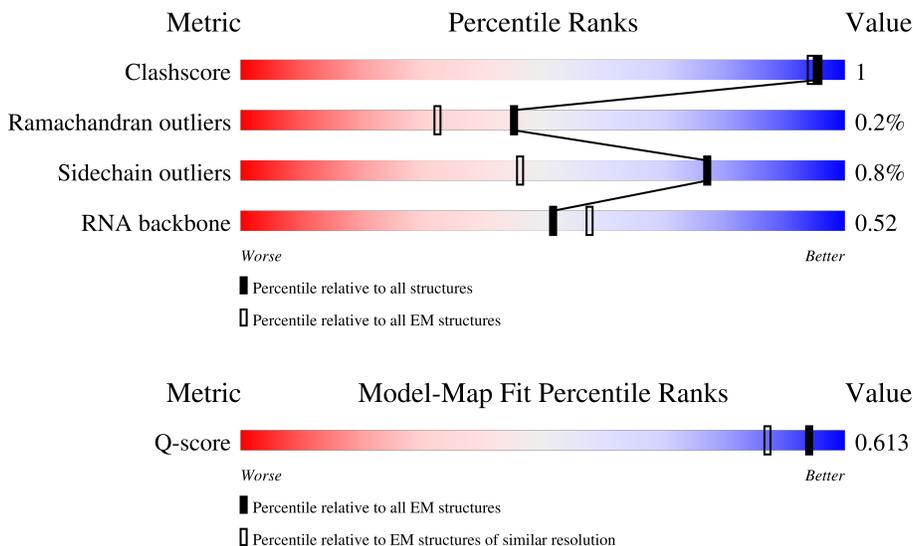The following versions of software and data (see references (i)) were used in the production of this report:

EMDB validation analysis	:	0.0.1.dev131
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.48

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.62 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	Percentile Ranks	Value
Clashscore		1
Ramachandran outliers		0.2%
Sidechain outliers		0.8%
RNA backbone		0.52

Worse *Better*

▮ Percentile relative to all structures
◫ Percentile relative to all EM structures

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.613

Worse *Better*

▮ Percentile relative to all EM structures
◫ Percentile relative to EM structures of similar resolution

Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	8810 (2.12 - 3.12)

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

Mol	Chain	Length	Quality of chain
1	Y	73	22% / 73% 25% •
2	0	55	24% / 93% 7%
3	1	46	85% 13% •

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Mol	Chain	Length	Quality of chain
4	2	65	6% 92% 6%
5	3	38	11% 92% 5%
6	4	70	49% 80% 17%
7	A	1541	74% 21%
8	B	239	19% 90% 6%
9	C	233	5% 86% 12%
10	D	206	5% 97%
11	E	167	90% 7%
12	F	135	73% 24%
13	G	179	9% 84% 15%
14	H	130	94% 5%
15	I	130	5% 97%
16	J	103	27% 87% 8% 5%
17	K	129	87% 10%
18	L	124	95%
19	M	118	92% 5%
20	N	101	97%
21	O	89	99%
22	P	82	5% 98%
23	Q	84	7% 92% 6%
24	R	75	85% 13%
25	S	92	88% 10%
26	T	87	95%
27	U	71	24% 94%
28	X	136	7% 92%

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Mol	Chain	Length	Quality of chain
29	Z	73	21% / 79% / 18%
30	a	2900	9% / 72% / 20% / 5%
31	b	120	15% / 82% / 13%
32	c	273	95%
33	d	209	14% / 95%
34	e	201	55% / 96%
35	f	179	35% / 96%
36	g	177	73% / 92% / 6%
37	h	149	14% / 26% / 72%
38	i	142	20% / 96%
39	j	123	98%
40	k	144	33% / 95%
41	l	136	11% / 96%
42	m	127	89% / 7%
43	n	117	46% / 91% / 6%
44	o	115	6% / 97%
45	p	118	28% / 94% / 5%
46	q	103	61% / 95%
47	r	110	18% / 95%
48	s	100	26% / 91% / 8%
49	t	104	73% / 87% / 13%
50	u	94	60% / 97%
51	v	85	19% / 94%
52	w	78	12% / 94%
53	x	63	73% / 90% / 10%

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Mol	Chain	Length	Quality of chain
54	y	59	22% 88% 10%
55	z	57	25% 93%
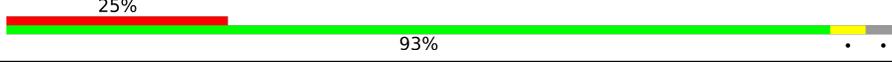
2 Entry composition ⓘ

There are 59 unique types of molecules in this entry. The entry contains 149078 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called A-site tRNA-Leu.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	Y	73	1562	697	286	506	73	0	0

- Molecule 2 is a protein called Large ribosomal subunit protein bL33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	0	51	417	269	76	72	0	0

- Molecule 3 is a protein called Large ribosomal subunit protein bL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	1	45	367	222	88	55	2	0	0

- Molecule 4 is a protein called Large ribosomal subunit protein bL35.

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

- Molecule 5 is a protein called Large ribosomal subunit protein bL36A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	3	38	302	185	65	48	4	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein bL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	4	58	464	289	87	82	6	0	0

- Molecule 7 is a RNA chain called E. coli 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	A	1502	Total 32256	C 14392	N 5930	O 10432	P 1502	0	0

- Molecule 8 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	B	224	Total 1753	C 1109	N 315	O 321	S 8	0	0

- Molecule 9 is a protein called Small ribosomal subunit protein uS3.

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

- Molecule 10 is a protein called Small ribosomal subunit protein uS4.

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

- Molecule 11 is a protein called Small ribosomal subunit protein uS5.

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

- Molecule 12 is a protein called Small ribosomal subunit protein bS6, fully modified isoform.

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

- Molecule 13 is a protein called Small ribosomal subunit protein uS7.

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

- Molecule 14 is a protein called Small ribosomal subunit protein uS8.

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

- Molecule 15 is a protein called Small ribosomal subunit protein uS9.

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

- Molecule 16 is a protein called Small ribosomal subunit protein uS10.

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

- Molecule 17 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	K	116	Total 866	C 534	N 169	O 160	S 3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	119	IAS	ASN	conflict	UNP P0A7R9

- Molecule 18 is a protein called Small ribosomal subunit protein uS12.

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

- Molecule 19 is a protein called Small ribosomal subunit protein uS13.

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

- Molecule 20 is a protein called Small ribosomal subunit protein uS14.

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

- Molecule 21 is a protein called Small ribosomal subunit protein uS15.

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

- Molecule 22 is a protein called Small ribosomal subunit protein bS16.

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

- Molecule 23 is a protein called Small ribosomal subunit protein uS17.

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

- Molecule 24 is a protein called Small ribosomal subunit protein bS18.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	R	65	Total 535	C 339	N 100	O 95	S 1	0	0

- Molecule 25 is a protein called Small ribosomal subunit protein uS19.

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

- Molecule 26 is a protein called Small ribosomal subunit protein bS20.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	T	85	Total 664	C 411	N 137	O 113	S 3	0	0

- Molecule 27 is a protein called Small ribosomal subunit protein bS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	U	70	Total 589	C 366	N 125	O 97	S 1	0	0

- Molecule 28 is a RNA chain called ermBL mRNA transcript.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	X	11	Total 235	C 105	N 40	O 79	P 11	0	0

- Molecule 29 is a RNA chain called P-site tRNA-fMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Z	73	Total 1563	C 696	N 286	O 508	P 73	0	0

- Molecule 30 is a RNA chain called E. coli 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	a	2751	Total 59090	C 26366	N 10892	O 19081	P 2751	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
31	b	119	Total 2549	C 1135	N 466	O 829	P 119	0	0

- Molecule 32 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	c	270	Total 2076	C 1285	N 422	O 362	S 7	0	0

- Molecule 33 is a protein called Large ribosomal subunit protein uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	d	208	Total 1560	C 977	N 287	O 292	S 4	0	0

- Molecule 34 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	e	200	Total 1546	C 971	N 282	O 288	S 5	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein uL5.

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

- Molecule 36 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	g	173	Total 1295	C 814	N 237	O 242	S 2	0	0

- Molecule 37 is a protein called Large ribosomal subunit protein bL9.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	h	41	Total 303	C 194	N 54	O 54	S 1	0	0

- Molecule 38 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	i	140	Total 1112	C 703	N 210	O 196	S 3	0	0

- Molecule 39 is a protein called Large ribosomal subunit protein uL14.

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

- Molecule 40 is a protein called Large ribosomal subunit protein uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	k	143	Total 1043	C 649	N 206	O 186	S 2	0	0

- Molecule 41 is a protein called Large ribosomal subunit protein uL16.

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

- Molecule 42 is a protein called Large ribosomal subunit protein bL17.

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

- Molecule 43 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	n	110	Total 845	C 522	N 171	O 152	0	0

- Molecule 44 is a protein called Large ribosomal subunit protein bL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	o	113	Total 908	C 570	N 177	O 160	S 1	0	0

- Molecule 45 is a protein called Large ribosomal subunit protein bL20.

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

- Molecule 46 is a protein called Large ribosomal subunit protein bL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	q	101	Total 802	C 508	N 151	O 142	S 1	0	0

- Molecule 47 is a protein called Large ribosomal subunit protein uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	r	108	Total 837	C 522	N 161	O 151	S 3	0	0

- Molecule 48 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	s	92	Total 730	C 460	N 138	O 130	S 2	0	0

- Molecule 49 is a protein called Large ribosomal subunit protein uL24.

Mol	Chain	Residues	Atoms				AltConf	Trace
49	t	90	Total 695	C 439	N 130	O 126	0	0

- Molecule 50 is a protein called Large ribosomal subunit protein bL25.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	u	92	Total 739	C 471	N 135	O 131	S 2	0	0

- Molecule 51 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	v	83	Total 618	C 383	N 125	O 109	S 1	0	0

- Molecule 52 is a protein called Large ribosomal subunit protein bL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	w	75	Total 603	C 373	N 126	O 102	S 2	0	0

- Molecule 53 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	x	57	Total 468	C 288	N 91	O 88	S 1	0	0

- Molecule 54 is a protein called Large ribosomal subunit protein uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	y	53	Total 410	C 257	N 81	O 70	S 2	0	0

- Molecule 55 is a protein called Large ribosomal subunit protein bL32.

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

- Molecule 56 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
56	3	1	1	1	0
			Total	Zn	
56	4	1	1	1	0

- Molecule 57 is [(2 {S},3 {S},4 {R},5 {R},6 {S})-4-[(2 {S},3 {R},4 {S},5 {R},6 {S})-5-aceta mido-6-(hydroxymethyl)-4-[(2 {R},3 {R},4 {S},5 {S},6 {R})-6-(hydroxymethyl)-4-[(2 {S},3 {R},4 {R},5 {R},6 {R})-6-(hydroxymethyl)-5-methoxy-3,4-bis(oxidanyl)oxan-2-yl]oxy-3,5-bis(oxidanyl)oxan-2-yl]oxy-3-oxidanyl-oxan-2-yl]oxy-2-(hydroxymethyl)-6-[[{N}-[4-[({N}-methylcarbamimidoyl)amino]butyl]carbamimidoyl]amino]-5-oxidanyl-oxan-3-yl] carbamate (CCD ID: A1JAI) (formula: $C_{35}H_{64}N_8O_{21}$) (labeled as "Ligand of Interest" by depositor).

A1JAI
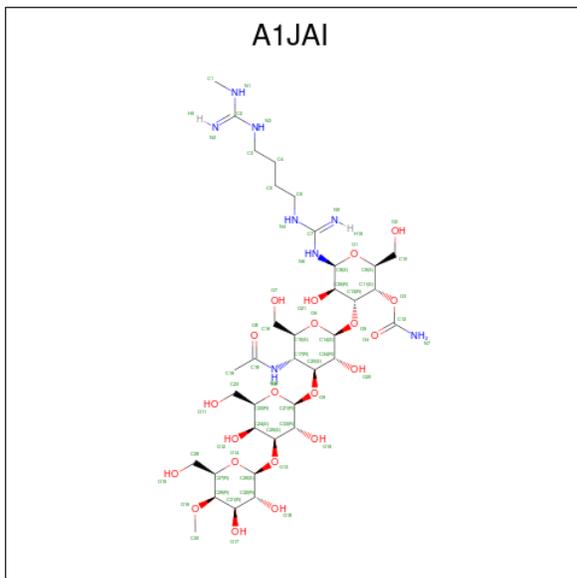
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
57	A	1	64	35	8	21	0

- Molecule 58 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
58	A	105	105	105	0

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Mol	Chain	Residues	Atoms		AltConf
58	a	198	Total 198	Mg 198	0
58	b	5	Total 5	Mg 5	0
58	c	1	Total 1	Mg 1	0
58	d	1	Total 1	Mg 1	0
58	k	1	Total 1	Mg 1	0

- Molecule 59 is water.

Mol	Chain	Residues	Atoms		AltConf
59	Y	6	Total 6	O 6	0
59	0	11	Total 11	O 11	0
59	1	30	Total 30	O 30	0
59	2	31	Total 31	O 31	0
59	3	2	Total 2	O 2	0
59	4	6	Total 6	O 6	0
59	A	2780	Total 2780	O 2780	0
59	B	7	Total 7	O 7	0
59	C	46	Total 46	O 46	0
59	D	35	Total 35	O 35	0
59	E	27	Total 27	O 27	0
59	F	2	Total 2	O 2	0
59	G	13	Total 13	O 13	0
59	H	36	Total 36	O 36	0

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Mol	Chain	Residues	Atoms		AltConf
59	I	33	Total 33	O 33	0
59	J	23	Total 23	O 23	0
59	K	14	Total 14	O 14	0
59	L	32	Total 32	O 32	0
59	M	24	Total 24	O 24	0
59	N	40	Total 40	O 40	0
59	O	22	Total 22	O 22	0
59	P	21	Total 21	O 21	0
59	Q	9	Total 9	O 9	0
59	R	13	Total 13	O 13	0
59	S	22	Total 22	O 22	0
59	T	23	Total 23	O 23	0
59	U	10	Total 10	O 10	0
59	X	14	Total 14	O 14	0
59	Z	17	Total 17	O 17	0
59	a	4026	Total 4026	O 4026	0
59	b	151	Total 151	O 151	0
59	c	118	Total 118	O 118	0
59	d	45	Total 45	O 45	0
59	e	45	Total 45	O 45	0
59	f	30	Total 30	O 30	0

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Mol	Chain	Residues	Atoms		AltConf
59	h	3	Total 3	O 3	0
59	i	11	Total 11	O 11	0
59	j	20	Total 20	O 20	0
59	k	53	Total 53	O 53	0
59	l	27	Total 27	O 27	0
59	m	26	Total 26	O 26	0
59	n	33	Total 33	O 33	0
59	o	14	Total 14	O 14	0
59	p	36	Total 36	O 36	0
59	q	17	Total 17	O 17	0
59	r	21	Total 21	O 21	0
59	s	7	Total 7	O 7	0
59	u	6	Total 6	O 6	0
59	v	16	Total 16	O 16	0
59	w	19	Total 19	O 19	0
59	x	1	Total 1	O 1	0
59	y	5	Total 5	O 5	0
59	z	24	Total 24	O 24	0

3 Residue-property plots ⓘ

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: A-site tRNA-Leu

Chain Y:
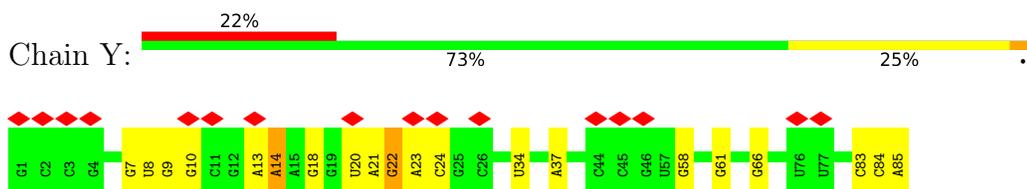
- Molecule 2: Large ribosomal subunit protein bL33

Chain 0:
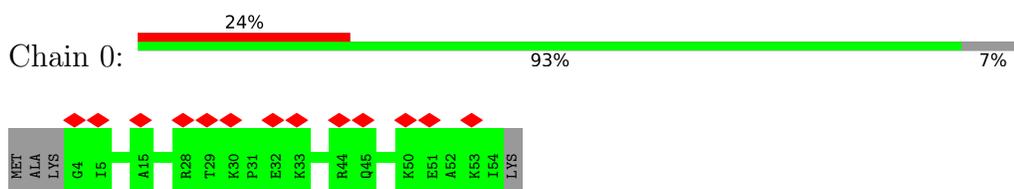
- Molecule 3: Large ribosomal subunit protein bL34

Chain 1:
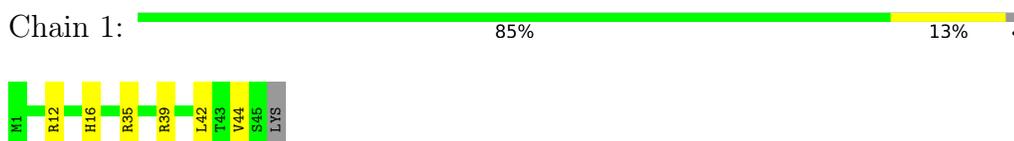
- Molecule 4: Large ribosomal subunit protein bL35

Chain 2:
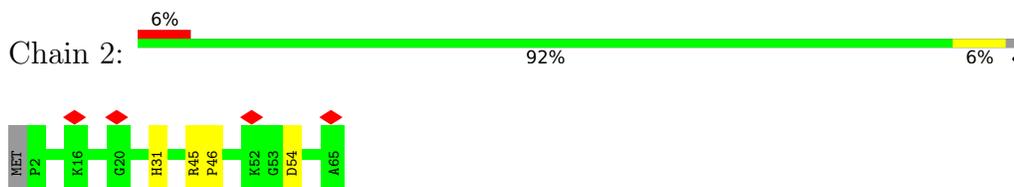
- Molecule 5: Large ribosomal subunit protein bL36A

Chain 3:

• Molecule 6: Large ribosomal subunit protein bL31

Chain 4:

• Molecule 7: E. coli 16S rRNA

Chain A:

C1533 A1534 C U C C U U A
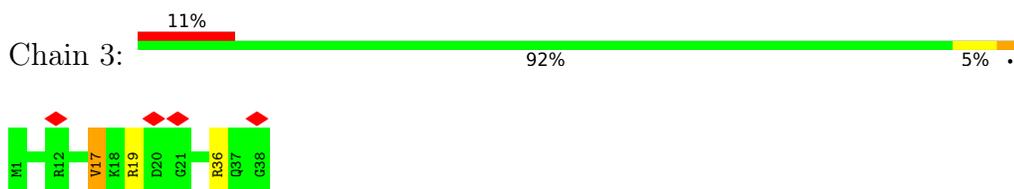
• Molecule 8: Small ribosomal subunit protein uS2

19%

Chain B: 90%   6%

THR V4 S5 M6 R7 D8 M9 L10 K11 A12 G13 F16 K28 P29 E56 K59 I60 A61 S62 R63 K64 L68 R74 E78 K81 D82 S86 C87 D88 F91 V92 N103 L117 S121 Q122 D123 G124 T125 F126 D127 K128 L129 T130 K131 K132 E133 A134

L135 M136 R137 T138 R139 E140 D194 F198 D204 R208 A209 L212 V221 R222 E223 G224 R225 S226 Q227 ASP LEU ALA SER GLN ALA GLU GLU SER PHE VAL GLU ALA GLU
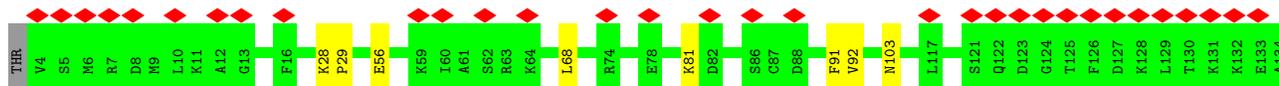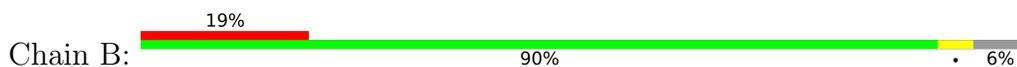
• Molecule 9: Small ribosomal subunit protein uS3

5%

Chain C: 86%   12%

MET G2 H6 T44 A61 K62 V76 I77 G78 K79 K80 G81 E82 D83 V84 E85 R88 P98 I103 R107 N185 I207 LEU GLY GLY MET ALA ALA VAL GLU GLN PRO GLU LYS PRO ALA ALA GLN PRO LYS LYS GLN GLN ARG LYS GLY ARG LYS
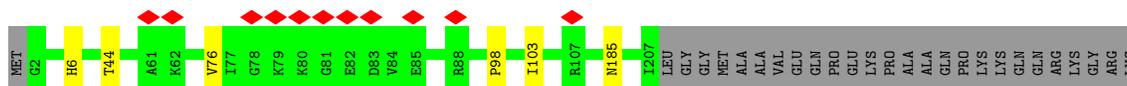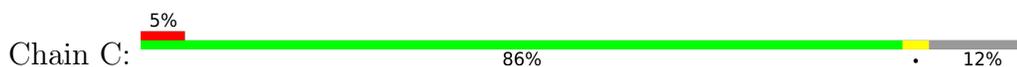
• Molecule 10: Small ribosomal subunit protein uS4

5%

Chain D: 97%

MET A2 R26 E35 K45 P46 R47 F107 R128 I145 K151 R154 E163 E166 K167 D174 E179 D194 K206

• Molecule 11: Small ribosomal subunit protein uS5

Chain E: 90%   7%

MET ALA HIS ILE GLU LYS GLN ALA GLY E10 F33 V38 S100 V114 L115 V123 E162 E163 I164 L165 GLY LYS
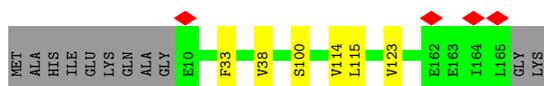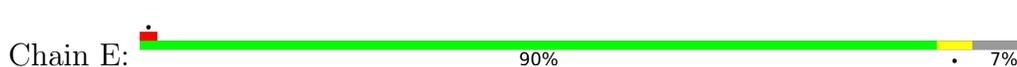
• Molecule 12: Small ribosomal subunit protein bS6, fully modified isoform

Chain F: 73%   24%

M1 Y4 D13 E33 N52 P67 V70 I71 E98 V103 LYS ALA LYS ASP GLU ARG ARG GLU ARG ARG ASP ASP PHE ALA ASN GLU THR ALA ASP ASP GLU ALA GLY ASP SER GLU GLU GLU GLU GLU GLU
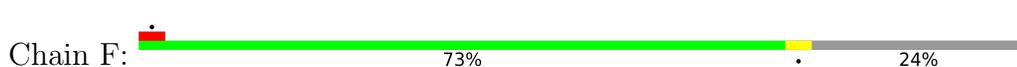
• Molecule 13: Small ribosomal subunit protein uS7

9%

Chain G: 84%   15%

MET P2 R5 V6 I7 G8 Q9 Q52 R53 S54 G55 K56 E60 R79 V80 G81 G82 S83 R92 K114 E129 N130 K131 H153 TYR ARG TRP LEU SER LEU ARG SER PHE SER HIS GLN ALA GLY ALA SER SER LYS GLN PRO ALA LEU GLY TYR LEU ASN
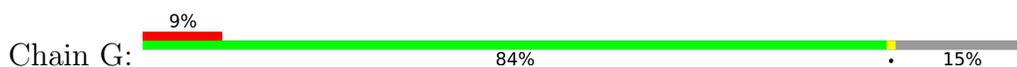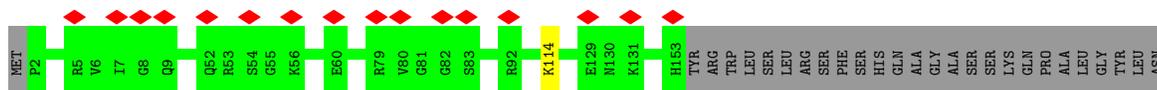
- Molecule 14: Small ribosomal subunit protein uS8

Chain H: 94%   5%

MET S2 V25 D54 T55 E60 L63 F66 Q67 I75 A130

- Molecule 15: Small ribosomal subunit protein uS9

Chain I: 5%   97%

MET ALA GLU N4 Q5 K27 V47 D56 D91 E92 R130
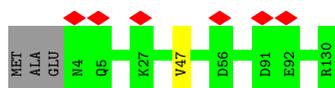
- Molecule 16: Small ribosomal subunit protein uS10

Chain J: 27%   87%   8%   5%

MET GLN ASN GLN R5 L10 T22 A23 E24 E27 T28 A29 K30 R31 T32 G33 A34 Q35 E47 R48 F49 V57 D75 I76 V77 E78 P79 T80 E81 K82 T83 V84 D85 A86 L87 M88 R89 L90 D91 L92 L102 GLY

- Molecule 17: Small ribosomal subunit protein uS11

Chain K: 87%   10%

MET ALA LYS ALA PRO ILE ARG ALA ARG LYS ARG VAL ARG K14 T35 A41 P89 T114 V129
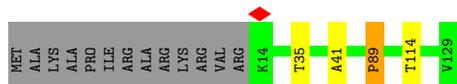
- Molecule 18: Small ribosomal subunit protein uS12

Chain L: 95%

MET A2 R14 K15 V16 A17 K43 K44 P45 D2T89 P122 LYS ALA
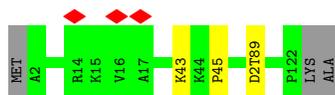
- Molecule 19: Small ribosomal subunit protein uS13

Chain M: 92%   5%

MET A2 N8 I17 T28 E50 D54 Y86 R90 H91 R92 R98 I116 LYS LYS
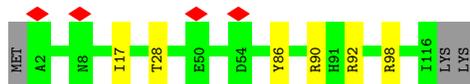
- Molecule 20: Small ribosomal subunit protein uS14

Chain N:

97%

MET A2 A36 P70 M89 W101
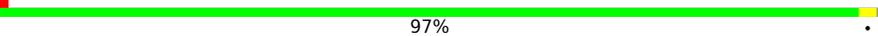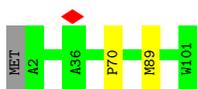
• Molecule 21: Small ribosomal subunit protein uS15

Chain O:

99%

MET S2 R17 D18 D74 R89

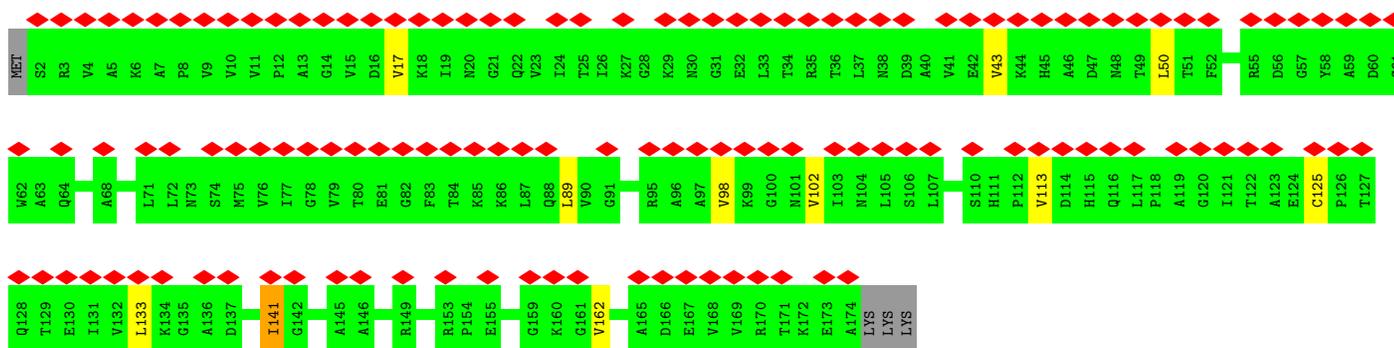• Molecule 22: Small ribosomal subunit protein bS16

5%

Chain P:

98%

M1 R35 E45 K46 E47 E48 A81 ALA
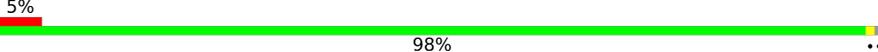
• Molecule 23: Small ribosomal subunit protein uS17

7%

Chain Q:

92%   6%

MET THR ASP K4 I5 S20 K36 E52 D57 K81 A82 VAL LEU
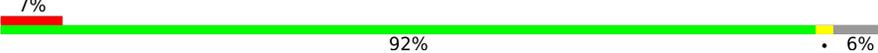
• Molecule 24: Small ribosomal subunit protein bS18

Chain R:

85%   13%

MET ALA ARG TYR PHE ARG ARG LYS F10 R61 R73 H74 GLN

• Molecule 25: Small ribosomal subunit protein uS19

Chain S:

88%   10%

MET P2 D27 K28 K29 H52 N53 G54 A84 ALA ASP LYS LYS ALA LYS LYS LYS

• Molecule 26: Small ribosomal subunit protein bS20

Chain T:

95%

MET A2 E40 D43 Q55 P56 K85 L86 ALA

• Molecule 27: Small ribosomal subunit protein bS21

Chain U:

• Molecule 28: ermBL mRNA transcript

Chain X:

• Molecule 29: P-site tRNA-fMet

Chain Z:

• Molecule 30: E. coli 23S rRNA

Chain a:

A2211 A2212 U2213 C2222 G2223 G2224 A2225 C2226 G2238 G2239 U2243 U2244 G2251 U2262 U2268 U2272 A2273 A2274 A2278 G2279 G2280 A2281 G2282 C2283 G2286 A2287 G2288 G2289 U2305 A2308 A2309 U2312 A2322 G2325 G2331 C2332 A2333 U2334 A2335 A2336 A2340 U2344

G2345 A2346 C2347 C2350 G2351 A2352 G2361 G2365 A2366 A2381 G2382 G2383 U2384 C2385 A2388 C2395 G2396 U2402 G2405 A2406 G2409 G2410 C2420 A2425 G2428 G2429 A2430 U2431 A2432 A2433 A2434 A2435 U2441 G2445 A2448 U2449 C2452 U2457 C2465 G2470

U2473 U2474 C2475 A2476 U2477 A2478 U2479 C2480 C2481 G2485 U2491 U2492 U2493 G2494 C2498 C2501 C2502 A2503 U2504 G2505 A2518 U2519 C2520 C2521 G2529 G2532 G2543 A2547 U2548 G2549 G2550 C2551 U2552 G2553 U2554 U2555 C2556 A2566 U2567 C2573 G2574 C2575 G2576 U2580 G2581 G2595

A2602 G2603 U2604 G2605 U2609 C2610 U2613 G2618 G2619 C2620 G2621 U2622 C2626 G2627 C2628 U2629 G2630 C2636 U2637 A2654 A2657 A2660 G2661 A2662 G2663 G2671 G2672 G2673 U2680 C2681 A2682 C2683 U2684 U2689 U2690 C2699 A2700 U2708 G2714 G2715 C2716 C2717 G2718 U2724 A2725

C2730 A2733 G2742 U2743 G2744 G2747 A2748 G2751 U2754 C2755 U2756 A2765 A2778 U2779 G2780 G2791 A2792 C2793 C2794 C2795 U2796 U2797 U2798 A2799 A2800 G2801 G2802 G2803 U2804 C2805 C2806 A2809 U2818 U2819 A2820 A2821 G2822 A2823 C2824 G2825 U2833 G2843 G2846 U2847 G2848 U2849

A2850 U2861 U2865 U2866 C2874 U2884 G2885 A2893 A2900 C2901 C U U

- Molecule 31: E. coli 5S rRNA

15%

Chain b:

82% 13% · ·

U1 G2 C3 G9 U14 A15 G16 C17 G18 C19 G20 G24 U25 C35 C36 G41 C42 C43 G44 C49 A53 G56 C63 G67 G72 G84 U87 C88 U89 C90 A99 G100 A101 G102 G105 A109 C110 C118 A119 U

- Molecule 32: Large ribosomal subunit protein uL2

Chain c:

95% · ·

MET A2 R13 R14 R43 R48 D121 R167 D168 S178 V184 E199 H200 K207 K242 R271 SER LYS

- Molecule 33: Large ribosomal subunit protein uL3

14%

Chain d:

95% ·

M1 E17 D18 G19 E30 L40 A41 N42 D43 G44 K56 A57 N58 T61 K62 P63 A69 K70 A71 A75 A85 E86 G87 E88 E89 F90 T91 S95 I96 S97 D103 T121 F127 G135 N136 P152 V155 E183 R184 K208 ALA

- Molecule 34: Large ribosomal subunit protein uL4

55%

Chain e:

96% ·

M1 E2 L3 V4 L5 K6 D7 A8 Q9 S10 A11 L12 T13 V14 S15 E16 T17 T18 F19 G20 R21 D22 F23 N24 E25 A26 A39 G42 T43 R44 T48 G66 R79 F85 A86 A87 R88 D91 M100 K106 S107 I108 E111 L112 V113 R114 Q115 D116 R117 L118

I119 V120 V121 E122 K123 F124 S125 V126 E127 A128 P129 K130 T131 K132 L133 L134 A135 Q136 K137 L138 K139 D140 M141 A142 L143 E144 D145 V146 L147 I148 T149 T150 G151 E152 L153 D154 E155 N156 L157 F158 L159 A160 A161 R162 N163 L164 H165 K166 V167 D168 V169 R170 D171 A172 T173 G174 I175 D176 S179

L180 F183 D184 K185 V186 V187 M188 T189 A190 D191 A192 V193 K194 Q195 V196 E197 E198 M199 L200 ALA

• Molecule 35: Large ribosomal subunit protein uL5

Chain f:

35%

96%

• • •

MET A2 K3 D6 D10 V13 K14 K15 L16 M17 T18 E19 F20 N21 Y22 N23 S24 V25 M26 Q27 E32 G41 E42 A43 I44 A45 D46 K47 K48 L49 L50 D51 N52 A53 A54 A55 D56 G62 I67 R80 Q81 E94 V108 P109 R112 D113 F114 R115

S118 A119 K120 R125 I136 P139 E140 I141 D142 Y143 D144 K145 V146 D147 R148 V149 D153 T157 K161 S162 D163 E164 A168 A171 D174 F175 P176 F177 R178 LYS

• Molecule 36: Large ribosomal subunit protein uL6

Chain g:

73%

92%

6% • •

MET S2 R3 V4 A5 K6 A7 P8 V9 V10 V11 P12 A13 G14 V15 D16 V17 K18 I19 N20 G21 Q22 V23 I24 T25 I26 K27 G28 K29 N30 Q31 E32 L33 T34 R35 T36 L37 N38 D39 A40 V41 E42 V43 K44 H45 A46 D47 N48 T49 L50 T51 F52 R55 D56 G57 Y58 A59 D60 G61

W62 A63 Q64 A68 L71 L72 N73 S74 M75 V76 I77 G78 V79 T80 E81 G82 F83 T84 K85 K86 L87 Q88 L89 V90 G91 R95 A96 A97 V98 K99 G100 N101 V102 I103 N104 L105 S106 L107 S110 H111 P112 V113 D114 H115 Q116 L117 P118 A119 G120 I121 T122 A123 E124 C125 P126 T127

Q128 T129 E130 I131 V132 L133 K134 G135 A136 D137 I141 G142 A145 A146 R149 R153 P154 E155 G159 K160 G161 V162 A165 D166 E167 V168 V169 R170 T171 K172 E173 A174 LYS LYS LYS

• Molecule 37: Large ribosomal subunit protein bL9

Chain h:

14%

26%

•

72%

M1 Q2 V3 I4 L5 L6 D7 K8 V9 A10 N11 L12 G13 S14 L15 G16 D17 Q18 V19 N20 V31 P32 Q33 G34 A39 T40 K41 LYS ASN ILE GLU PHE GLU ALA ARG ARG ALA GLU LEU GLU ALA LYS LEU ALA GLU VAL LEU LEU ALA ALA ASN ALA ARG ALA GLU LYS ILE

ASN ALA LEU GLU THR VAL THR ILE ALA SER LYS ALA GLY ASP GLU GLY LYS LEU PHE GLY SER ILE GLY THR ARG ASP ILE ALA ASP ALA VAL THR ALA ALA GLY VAL GLU VAL ALA LYS SER GLU GLU VAL ARG LEU PRO ASN GLY VAL LEU ARG THR THR GLY GLU HIS GLU VAL VAL SER PHE

GLN VAL HIS SER GLU VAL PHE ALA LYS VAL ILE VAL ASN VAL VAL ALA GLU

• Molecule 38: Large ribosomal subunit protein uL13

Chain i:

20%

96%

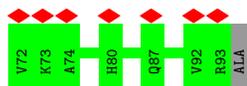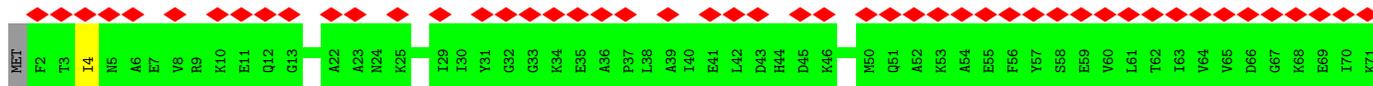MET K2 K7 P8 E9 T10 V11 K12 R13 V17 V18 D19 A20 K23 G26 R34 A42 E43 D49 D52 L57 N58 A59 D60 A63 R69 I84 R95 E102 L114 G127 N128 E129 H130 N131 Q136 P137 Q138 D141 ILE

• Molecule 39: Large ribosomal subunit protein uL14

Chain j:

98%

M1 D12 I38 R49 N90 R108 S109 E110 K111 F112 L123

• Molecule 40: Large ribosomal subunit protein uL15

Chain k:

33%

95%

M1 R2 E10 R21 G22 I23 K29 L57 A75 E76 I77 R78 L79 S80 D81 I82 A83 K84 V85 E86 G87 G88 V89 V90 D91 L92 N93 T94 L95 A98 N99 I100 I101 G102 I103 Q104 G114 E115 V116 T117 T118 P119 V120 T121 V122 R123 G124 L125 R126 K129 R132

A133 A134 I135 E136 A137 A138 G139 G140 K141 I142 E143 GLU

• Molecule 41: Large ribosomal subunit protein uL16

Chain l:

11%

96%

M1 A21 D25 K34 Q45 R55 Q60 L78 A79 V80 M105 D106 E110 E111 R114 E115 T134 V135 M136

• Molecule 42: Large ribosomal subunit protein bL17

Chain m:

89%

7%

M1 A55 T70 R71 D72 F80 R118 SER GLU LYS ALA GLU ALA ALA ALA GLU

• Molecule 43: Large ribosomal subunit protein uL18

Chain n:

46%

91%

6%

MET D2 K3 K4 I8 A11 T12 R13 A14 R15 R16 K17 L18 Q19 E20 L21 G22 A23 T24 Y36 A41 P42 N43 G44 S45 L48 V49 A50 E55 K56 A57 I58 A59 E60 Q61 L62 K63 Y64 D69 A70 A71 A72 A73 V74 G75 K76 A77 V78 A79 E80 R81 A82 L83

E84 K85 G86 I87 K88 D89 V90 S91 F92 D93 G96 V103 A107 D108 A109 A110 R111 GLU ALA GLY LEU GLN PHE
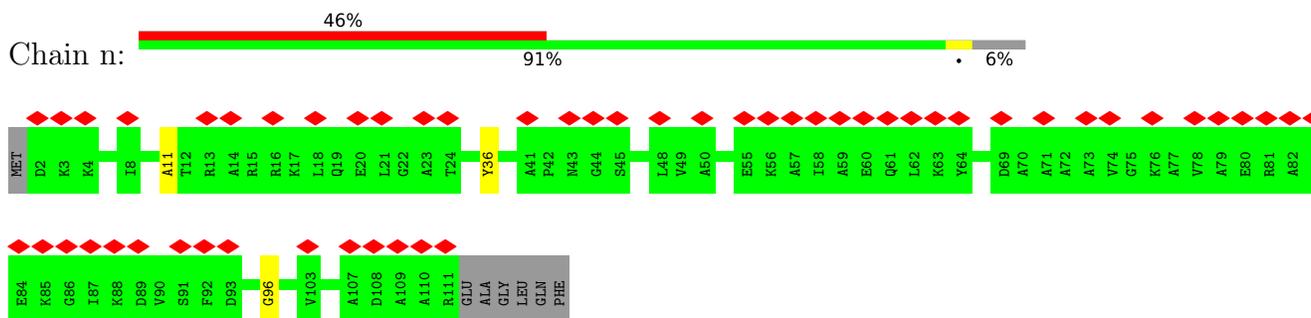
• Molecule 44: Large ribosomal subunit protein bL19

Chain o:
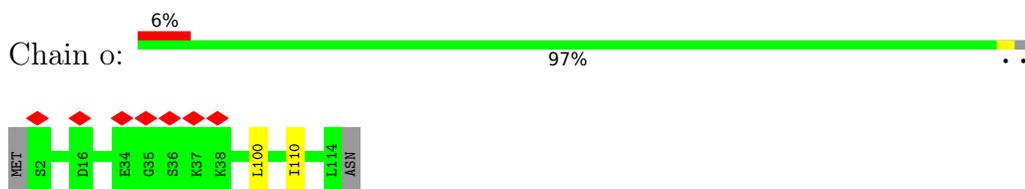
• Molecule 45: Large ribosomal subunit protein bL20

Chain p:
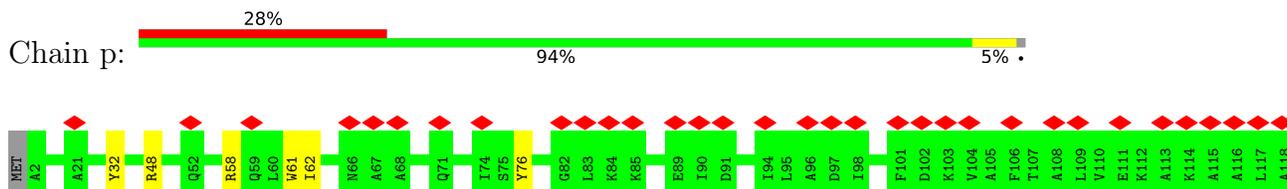
• Molecule 46: Large ribosomal subunit protein bL21

Chain q:
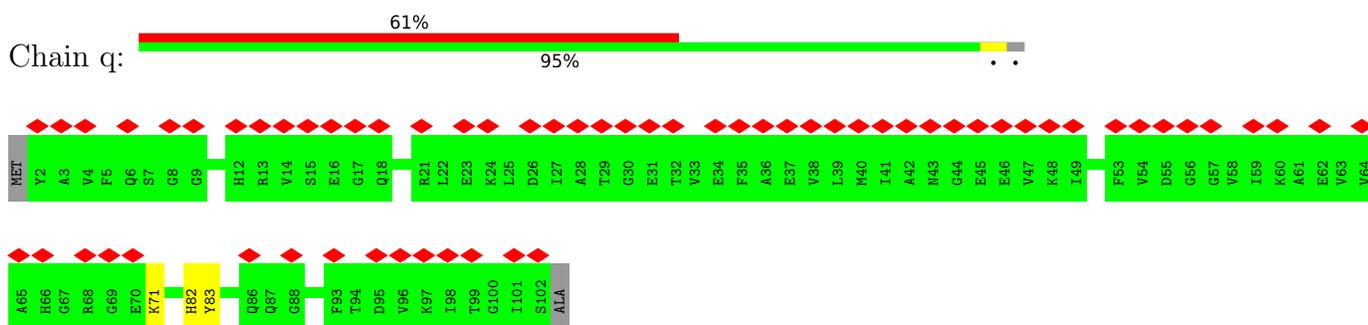
• Molecule 47: Large ribosomal subunit protein uL22

Chain r:
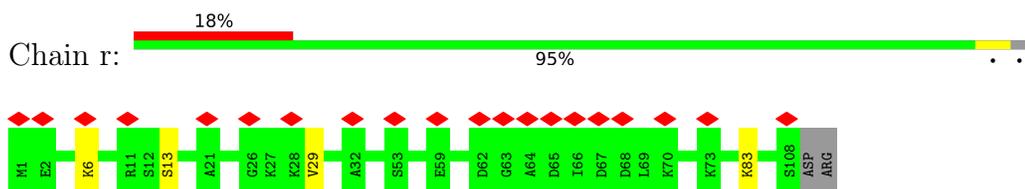
• Molecule 48: Large ribosomal subunit protein uL23

Chain s:
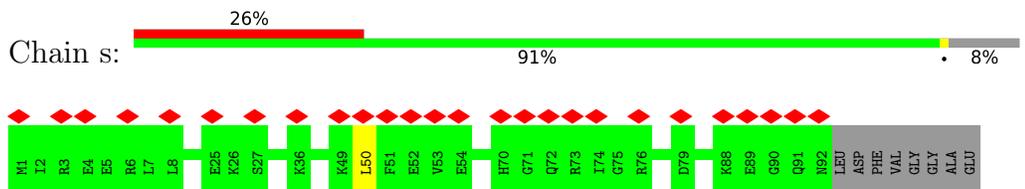
• Molecule 49: Large ribosomal subunit protein uL24

Chain t:

K61 E62 A63 A64 I65 Q66 A71 I72 F73 N74 A75 A76 T77 G78 K79 A80 D81 R82 F85 R86 F87 E88 D89 G90 K91 K92 V93 R94 F95 F96 K97 S98 N99 S100 E101 T102 I103 LYS
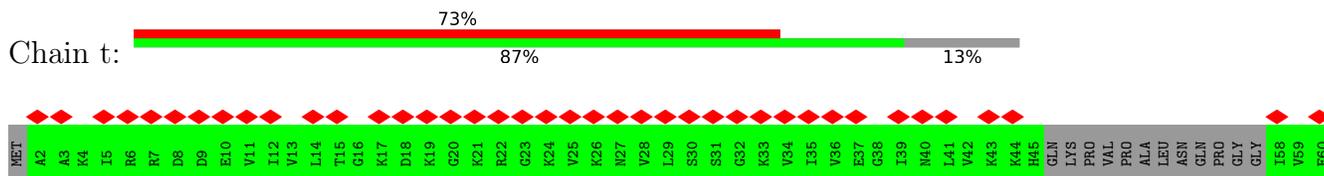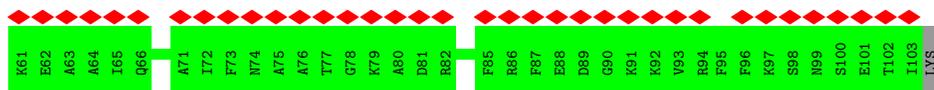
• Molecule 50: Large ribosomal subunit protein bL25

Chain u:
60%
97%

MET F2 T3 I4 N5 A6 E7 V8 R9 K10 E11 Q12 G13 A22 A23 N24 K25 I29 I30 Y31 G32 G33 K34 E35 A36 P37 L38 A39 I40 E41 L42 D43 H44 D45 K46 M50 Q51 A52 K53 A54 E55 F56 Y57 S58 E59 V60 L61 T62 I63 V64 V65 D66 G67 K68 E69 I70 K71

V72 K73 A74 H80 Q87 V92 R93 ALA

• Molecule 51: Large ribosomal subunit protein bL27

Chain v:
19%
94%

MET A2 H3 K4 K5 A6 G27 G28 E29 S30 K44 A49 C53 L59 F60 A63 K68 F69 E70 V71 K72 I80 S81 I82 E83 A84 GLU
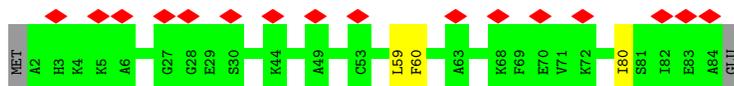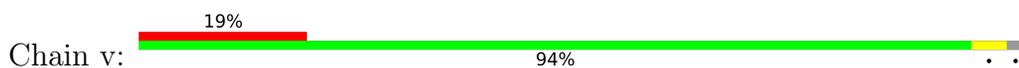
• Molecule 52: Large ribosomal subunit protein bL28

Chain w:
12%
94%

MET S2 N16 R28 E41 S42 E43 K44 R45 E70 L71 R72 A73 E76 LYS TYR
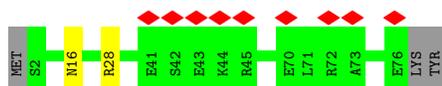
• Molecule 53: Large ribosomal subunit protein uL29

Chain x:
73%
90% 10%

MET LYS ALA LYS E5 L6 R7 E8 K9 S10 V11 E12 E13 L14 N15 T16 E17 L18 L19 N20 L21 L22 R23 E24 Q25 F26 N27 L28 R29 M30 Q31 A32 A33 S34 G35 Q36 L37 Q38 Q39 S40 H41 L42 L43 K44 Q45 V50 A51 R52 V53 K54 T55 L56 L57 N58 E59 K60 A61 GLY ALA

• Molecule 54: Large ribosomal subunit protein uL30

Chain y:
22%
88% 10%

MET ALA LYS THR ILE K6 I7 R30 R31 I32 T35 V36 E37 R38 E39 D40 T41 R45 V57 E58 GLU
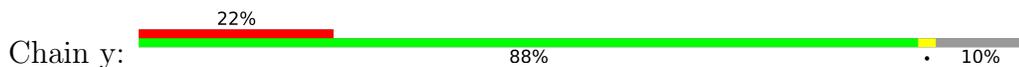
• Molecule 55: Large ribosomal subunit protein bL32

Chain z:
25%
93%
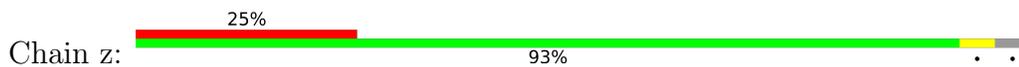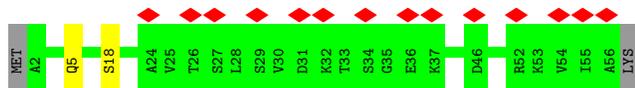
4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	103241	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	1.14	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.209	Depositor
Minimum map value	-0.096	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.028	Depositor
Map size (Å)	359.424, 359.424, 359.424	wwPDB
Map dimensions	432, 432, 432	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 2MA, 4OC, OMC, ZN, PSU, MA6, OMU, D2T, G7M, 3TD, 6MZ, 1MG, UR3, MS6, 2MG, MG, OMG, 5MU, H2U, MEQ, A1JAI, 5MC, 4D4, IAS

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	Y	0.60	0/1745	0.92	5/2714 (0.2%)
2	0	0.58	0/424	0.86	0/565
3	1	0.57	0/370	0.95	0/487
4	2	0.57	0/513	0.93	0/676
5	3	0.59	0/303	0.84	0/397
6	4	0.57	0/472	0.86	0/627
7	A	0.57	1/35864 (0.0%)	1.03	110/55935 (0.2%)
8	B	0.60	0/1784	0.98	1/2403 (0.0%)
9	C	0.70	0/1651	0.95	0/2225
10	D	0.64	0/1665	0.94	1/2227 (0.0%)
11	E	0.72	0/1165	1.02	1/1568 (0.1%)
12	F	0.60	0/858	0.89	0/1160
13	G	0.64	0/1206	0.97	0/1617
14	H	0.69	0/989	0.94	0/1326
15	I	0.70	0/1034	0.93	0/1375
16	J	0.65	0/796	0.93	0/1077
17	K	0.69	0/873	0.90	1/1177 (0.1%)
18	L	0.64	0/945	0.90	1/1268 (0.1%)
19	M	0.59	0/900	0.98	0/1204
20	N	0.70	0/817	0.98	0/1088
21	O	0.69	0/722	0.96	0/964
22	P	0.69	0/653	0.94	0/877
23	Q	0.59	0/650	0.88	0/871
24	R	0.68	0/544	0.96	0/731
25	S	0.66	0/680	0.94	0/915
26	T	0.66	0/670	0.97	0/888
27	U	0.61	0/597	1.06	1/792 (0.1%)
28	X	0.66	0/262	0.93	1/406 (0.2%)
29	Z	0.63	0/1746	0.93	2/2719 (0.1%)
30	a	0.56	2/65607 (0.0%)	0.95	161/102345 (0.2%)
31	b	0.58	0/2850	0.88	3/4444 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	c	0.64	0/2115	0.92	0/2844
33	d	0.56	0/1570	0.91	0/2112
34	e	0.54	0/1565	0.91	0/2106
35	f	0.54	0/1434	0.92	1/1926 (0.1%)
36	g	0.57	0/1315	0.94	0/1783
37	h	0.59	0/306	0.98	0/413
38	i	0.55	0/1135	0.90	0/1530
39	j	0.60	0/955	0.89	1/1279 (0.1%)
40	k	0.58	0/1052	0.90	0/1401
41	l	0.53	0/1073	0.86	0/1433
42	m	0.57	0/958	0.93	0/1281
43	n	0.58	0/854	0.94	0/1146
44	o	0.60	0/920	0.86	0/1231
45	p	0.53	0/960	0.99	0/1278
46	q	0.55	0/815	0.80	0/1090
47	r	0.57	0/844	0.91	0/1131
48	s	0.56	0/736	0.90	0/983
49	t	0.55	0/699	0.86	0/928
50	u	0.56	0/752	0.85	0/1008
51	v	0.57	0/626	0.84	0/829
52	w	0.60	0/612	0.94	0/819
53	x	0.51	0/469	1.01	0/626
54	y	0.58	0/414	0.89	0/554
55	z	0.56	0/440	0.91	0/588
All	All	0.58	3/151974 (0.0%)	0.96	290/227387 (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
7	A	0	9
30	a	0	2
35	f	0	1
41	l	0	1
48	s	0	1
52	w	0	1
All	All	0	15

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	a	2069	G7M	O3'-P	5.61	1.61	1.56
7	A	527	G7M	O3'-P	5.06	1.61	1.56
30	a	2552	OMU	O3'-P	5.01	1.61	1.56

The worst 5 of 290 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	A	746	A	O3'-P-O5'	-11.75	86.38	104.00
1	Y	84	C	O3'-P-O5'	-9.78	89.33	104.00
7	A	413	G	C4'-C3'-O3'	9.63	123.84	109.40
7	A	493	A	O3'-P-O5'	-9.61	89.59	104.00
30	a	2198	A	O3'-P-O5'	-8.04	91.94	104.00

There are no chirality outliers.

5 of 15 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	A	362	G	Sidechain
7	A	524	G	Sidechain
7	A	573	A	Sidechain
7	A	575	G	Sidechain
7	A	587	G	Sidechain

5.2   Too-close contacts   ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	Y	1562	0	793	2	0
2	0	417	0	451	0	0
3	1	367	0	405	4	0
4	2	504	0	572	2	0
5	3	302	0	340	1	0
6	4	464	0	461	1	0
7	A	32256	0	16253	44	0
8	B	1753	0	1780	5	0
9	C	1624	0	1696	2	0
10	D	1643	0	1707	2	0
11	E	1152	0	1196	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	F	839	0	833	2	0
13	G	1191	0	1245	0	0
14	H	979	0	1031	3	0
15	I	1022	0	1070	0	0
16	J	786	0	828	3	0
17	K	866	0	871	2	0
18	L	942	0	999	0	0
19	M	891	0	952	5	0
20	N	805	0	844	1	0
21	O	714	0	734	0	0
22	P	643	0	661	1	0
23	Q	641	0	682	1	0
24	R	535	0	552	1	0
25	S	663	0	688	1	0
26	T	664	0	714	1	0
27	U	589	0	629	2	0
28	X	235	0	117	0	0
29	Z	1563	0	794	2	0
30	a	59090	0	29746	113	0
31	b	2549	0	1291	2	0
32	c	2076	0	2149	6	0
33	d	1560	0	1613	5	0
34	e	1546	0	1614	6	0
35	f	1410	0	1444	2	0
36	g	1295	0	1332	3	0
37	h	303	0	327	1	0
38	i	1112	0	1139	1	0
39	j	946	0	1023	2	0
40	k	1043	0	1123	3	0
41	l	1075	0	1145	2	0
42	m	945	0	989	2	0
43	n	845	0	881	1	0
44	o	908	0	956	1	0
45	p	947	0	1019	4	0
46	q	802	0	822	3	0
47	r	837	0	905	1	0
48	s	730	0	796	0	0
49	t	695	0	743	0	0
50	u	739	0	763	0	0
51	v	618	0	636	2	0
52	w	603	0	630	1	0
53	x	468	0	492	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
54	y	410	0	446	1	0
55	z	434	0	445	1	0
56	3	1	0	0	0	0
56	4	1	0	0	0	0
57	A	64	0	0	0	0
58	A	105	0	0	0	0
58	a	198	0	0	0	0
58	b	5	0	0	0	0
58	c	1	0	0	0	0
58	d	1	0	0	0	0
58	k	1	0	0	0	0
59	0	11	0	0	0	0
59	1	30	0	0	0	0
59	2	31	0	0	0	0
59	3	2	0	0	0	0
59	4	6	0	0	0	0
59	A	2780	0	0	0	0
59	B	7	0	0	0	0
59	C	46	0	0	0	0
59	D	35	0	0	0	0
59	E	27	0	0	0	0
59	F	2	0	0	0	0
59	G	13	0	0	0	0
59	H	36	0	0	0	0
59	I	33	0	0	0	0
59	J	23	0	0	0	0
59	K	14	0	0	0	0
59	L	32	0	0	0	0
59	M	24	0	0	0	0
59	N	40	0	0	0	0
59	O	22	0	0	0	0
59	P	21	0	0	0	0
59	Q	9	0	0	1	0
59	R	13	0	0	0	0
59	S	22	0	0	0	0
59	T	23	0	0	0	0
59	U	10	0	0	0	0
59	X	14	0	0	0	0
59	Y	6	0	0	0	0
59	Z	17	0	0	0	0
59	a	4026	0	0	0	0
59	b	151	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
59	c	118	0	0	0	0
59	d	45	0	0	0	0
59	e	45	0	0	0	0
59	f	30	0	0	0	0
59	h	3	0	0	0	0
59	i	11	0	0	0	0
59	j	20	0	0	0	0
59	k	53	0	0	0	0
59	l	27	0	0	0	0
59	m	26	0	0	0	0
59	n	33	0	0	0	0
59	o	14	0	0	0	0
59	p	36	0	0	1	0
59	q	17	0	0	0	0
59	r	21	0	0	0	0
59	s	7	0	0	0	0
59	u	6	0	0	0	0
59	v	16	0	0	0	0
59	w	19	0	0	0	0
59	x	1	0	0	0	0
59	y	5	0	0	0	0
59	z	24	0	0	0	0
All	All	149078	0	94367	215	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 1.

The worst 5 of 215 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)
30:a:568:U:H1'	30:a:2030:6MZ:H9C1	1.68	0.76
7:A:664:G:H22	7:A:741:G:H1	1.39	0.70
16:J:34:ALA:HB2	16:J:83:THR:HG21	1.75	0.68
7:A:823:C:HO2'	14:H:2:SER:N	1.96	0.64
30:a:12:U:H2'	30:a:12:U:O2	1.98	0.61

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	0	49/55 (89%)	49 (100%)	0	0	100	100
3	1	43/46 (94%)	43 (100%)	0	0	100	100
4	2	62/65 (95%)	57 (92%)	5 (8%)	0	100	100
5	3	36/38 (95%)	34 (94%)	1 (3%)	1 (3%)	4	6
6	4	54/70 (77%)	48 (89%)	5 (9%)	1 (2%)	6	12
8	B	222/239 (93%)	214 (96%)	8 (4%)	0	100	100
9	C	204/233 (88%)	195 (96%)	8 (4%)	1 (0%)	25	45
10	D	203/206 (98%)	197 (97%)	6 (3%)	0	100	100
11	E	154/167 (92%)	147 (96%)	7 (4%)	0	100	100
12	F	101/135 (75%)	97 (96%)	4 (4%)	0	100	100
13	G	150/179 (84%)	143 (95%)	6 (4%)	1 (1%)	19	36
14	H	127/130 (98%)	123 (97%)	3 (2%)	1 (1%)	16	32
15	I	125/130 (96%)	117 (94%)	8 (6%)	0	100	100
16	J	96/103 (93%)	94 (98%)	1 (1%)	1 (1%)	13	26
17	K	112/129 (87%)	105 (94%)	7 (6%)	0	100	100
18	L	118/124 (95%)	116 (98%)	2 (2%)	0	100	100
19	M	113/118 (96%)	109 (96%)	4 (4%)	0	100	100
20	N	98/101 (97%)	98 (100%)	0	0	100	100
21	O	86/89 (97%)	85 (99%)	1 (1%)	0	100	100
22	P	79/82 (96%)	73 (92%)	6 (8%)	0	100	100
23	Q	77/84 (92%)	75 (97%)	2 (3%)	0	100	100
24	R	63/75 (84%)	63 (100%)	0	0	100	100
25	S	81/92 (88%)	78 (96%)	3 (4%)	0	100	100
26	T	83/87 (95%)	83 (100%)	0	0	100	100
27	U	68/71 (96%)	65 (96%)	3 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
32	c	268/273 (98%)	258 (96%)	10 (4%)	0	100	100
33	d	205/209 (98%)	193 (94%)	11 (5%)	1 (0%)	25	45
34	e	198/201 (98%)	185 (93%)	13 (7%)	0	100	100
35	f	175/179 (98%)	166 (95%)	9 (5%)	0	100	100
36	g	171/177 (97%)	148 (86%)	23 (14%)	0	100	100
37	h	39/149 (26%)	36 (92%)	2 (5%)	1 (3%)	4	7
38	i	138/142 (97%)	132 (96%)	6 (4%)	0	100	100
39	j	121/123 (98%)	116 (96%)	5 (4%)	0	100	100
40	k	141/144 (98%)	132 (94%)	8 (6%)	1 (1%)	19	36
41	l	132/136 (97%)	126 (96%)	6 (4%)	0	100	100
42	m	116/127 (91%)	105 (90%)	10 (9%)	1 (1%)	14	29
43	n	108/117 (92%)	97 (90%)	11 (10%)	0	100	100
44	o	111/115 (96%)	108 (97%)	3 (3%)	0	100	100
45	p	115/118 (98%)	110 (96%)	5 (4%)	0	100	100
46	q	99/103 (96%)	95 (96%)	4 (4%)	0	100	100
47	r	106/110 (96%)	105 (99%)	1 (1%)	0	100	100
48	s	90/100 (90%)	83 (92%)	7 (8%)	0	100	100
49	t	86/104 (83%)	78 (91%)	8 (9%)	0	100	100
50	u	90/94 (96%)	81 (90%)	9 (10%)	0	100	100
51	v	81/85 (95%)	79 (98%)	2 (2%)	0	100	100
52	w	73/78 (94%)	70 (96%)	3 (4%)	0	100	100
53	x	55/63 (87%)	55 (100%)	0	0	100	100
54	y	51/59 (86%)	48 (94%)	3 (6%)	0	100	100
55	z	53/57 (93%)	50 (94%)	3 (6%)	0	100	100
All	All	5426/5911 (92%)	5164 (95%)	252 (5%)	10 (0%)	45	65

5 of 10 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	4	4	ASP
16	J	57	VAL
42	m	71	ARG
14	H	75	ILE
5	3	17	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	0	46/49 (94%)	46 (100%)	0	100	100
3	1	37/38 (97%)	37 (100%)	0	100	100
4	2	51/52 (98%)	50 (98%)	1 (2%)	50	73
5	3	34/34 (100%)	32 (94%)	2 (6%)	16	33
6	4	53/62 (86%)	53 (100%)	0	100	100
8	B	186/198 (94%)	186 (100%)	0	100	100
9	C	170/190 (90%)	168 (99%)	2 (1%)	67	84
10	D	172/173 (99%)	171 (99%)	1 (1%)	84	94
11	E	119/126 (94%)	118 (99%)	1 (1%)	79	91
12	F	90/116 (78%)	90 (100%)	0	100	100
13	G	125/147 (85%)	125 (100%)	0	100	100
14	H	104/105 (99%)	103 (99%)	1 (1%)	73	87
15	I	105/107 (98%)	104 (99%)	1 (1%)	73	87
16	J	86/90 (96%)	85 (99%)	1 (1%)	67	84
17	K	88/98 (90%)	87 (99%)	1 (1%)	70	86
18	L	101/103 (98%)	100 (99%)	1 (1%)	73	87
19	M	93/96 (97%)	93 (100%)	0	100	100
20	N	83/84 (99%)	82 (99%)	1 (1%)	67	84
21	O	76/77 (99%)	76 (100%)	0	100	100
22	P	65/65 (100%)	65 (100%)	0	100	100
23	Q	73/78 (94%)	72 (99%)	1 (1%)	62	81
24	R	56/65 (86%)	56 (100%)	0	100	100
25	S	72/79 (91%)	72 (100%)	0	100	100
26	T	65/66 (98%)	65 (100%)	0	100	100
27	U	60/61 (98%)	60 (100%)	0	100	100
32	c	215/218 (99%)	214 (100%)	1 (0%)	86	95

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	d	163/163 (100%)	162 (99%)	1 (1%)	84	94
34	e	165/165 (100%)	165 (100%)	0	100	100
35	f	148/150 (99%)	148 (100%)	0	100	100
36	g	134/138 (97%)	128 (96%)	6 (4%)	23	45
37	h	32/114 (28%)	32 (100%)	0	100	100
38	i	114/116 (98%)	112 (98%)	2 (2%)	54	76
39	j	104/104 (100%)	104 (100%)	0	100	100
40	k	102/103 (99%)	100 (98%)	2 (2%)	50	73
41	l	107/107 (100%)	105 (98%)	2 (2%)	52	75
42	m	98/103 (95%)	98 (100%)	0	100	100
43	n	82/87 (94%)	81 (99%)	1 (1%)	67	84
44	o	98/100 (98%)	98 (100%)	0	100	100
45	p	89/90 (99%)	89 (100%)	0	100	100
46	q	83/84 (99%)	83 (100%)	0	100	100
47	r	91/93 (98%)	88 (97%)	3 (3%)	33	57
48	s	79/84 (94%)	79 (100%)	0	100	100
49	t	74/85 (87%)	74 (100%)	0	100	100
50	u	77/78 (99%)	76 (99%)	1 (1%)	65	83
51	v	60/63 (95%)	60 (100%)	0	100	100
52	w	65/68 (96%)	65 (100%)	0	100	100
53	x	52/55 (94%)	52 (100%)	0	100	100
54	y	44/49 (90%)	44 (100%)	0	100	100
55	z	46/48 (96%)	45 (98%)	1 (2%)	47	70
All	All	4532/4824 (94%)	4498 (99%)	34 (1%)	77	91

5 of 34 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
43	n	36	TYR
47	r	13	SER
50	u	4	ILE
20	N	70	PRO
18	L	45	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 55 such sidechains are listed below:

Mol	Chain	Res	Type
32	c	197	ASN
36	g	116	GLN
55	z	6	ASN
50	u	49	ASN
33	d	148	GLN

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	Y	70/73 (95%)	14 (20%)	2 (2%)
28	X	10/136 (7%)	0	0
29	Z	71/73 (97%)	11 (15%)	1 (1%)
30	a	2747/2900 (94%)	361 (13%)	0
31	b	118/120 (98%)	17 (14%)	0
7	A	1496/1541 (97%)	194 (12%)	36 (2%)
All	All	4512/4843 (93%)	597 (13%)	39 (0%)

5 of 597 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	Y	7	G
1	Y	8	U
1	Y	9	G
1	Y	10	G
1	Y	14	A

5 of 39 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
7	A	1212	U
7	A	1452	C
7	A	1213	A
7	A	1320	C
7	A	1493	A

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\lvert Z \rvert > 2$	Counts	RMSZ	$\#\lvert Z \rvert > 2$
30	PSU	a	1917	30	18,21,22	0.78	1 (5%)	22,30,33	0.65	0
30	PSU	a	1911	30	18,21,22	0.88	1 (5%)	22,30,33	0.67	0
7	MA6	A	1518	7	18,26,27	0.86	1 (5%)	19,38,41	0.61	0
17	IAS	K	119	17	6,7,8	0.89	0	6,8,10	0.89	0
30	1MG	a	745	30	18,26,27	1.04	2 (11%)	19,39,42	0.59	0
41	MS6	l	82	41	5,7,8	0.37	0	2,7,9	0.17	0
30	5MU	a	1939	30	19,22,23	0.42	0	28,32,35	0.40	0
30	PSU	a	2457	30	18,21,22	0.95	1 (5%)	22,30,33	0.58	0
7	5MC	A	1407	7	18,22,23	0.34	0	26,32,35	0.69	0
30	PSU	a	746	58,30	18,21,22	0.97	1 (5%)	22,30,33	0.65	0
30	2MG	a	2445	30	18,26,27	1.13	2 (11%)	16,38,41	0.79	0
30	6MZ	a	2030	30	18,25,26	0.78	0	16,36,39	0.78	1 (6%)
30	PSU	a	2604	30	18,21,22	0.98	1 (5%)	22,30,33	0.81	1 (4%)
30	2MA	a	2503	58,30	19,25,26	1.24	3 (15%)	21,37,40	1.73	5 (23%)
30	5MU	a	747	30	19,22,23	0.35	0	28,32,35	0.42	0
30	OMU	a	2552	30	19,22,23	0.33	0	26,31,34	0.38	0
30	3TD	a	1915	30	18,22,23	1.03	1 (5%)	22,32,35	0.69	0
7	PSU	A	516	58,7	18,21,22	0.98	1 (5%)	22,30,33	0.64	0
7	4OC	A	1402	7	20,23,24	0.36	0	26,32,35	0.64	0
7	UR3	A	1498	7	19,22,23	0.32	0	26,32,35	0.71	1 (3%)
30	H2U	a	2449	30	18,21,22	0.58	0	21,30,33	0.77	0
30	G7M	a	2069	30	20,26,27	1.11	2 (10%)	17,39,42	0.61	0
7	G7M	A	527	7	20,26,27	1.06	3 (15%)	17,39,42	0.64	0
7	2MG	A	966	7	18,26,27	1.01	2 (11%)	16,38,41	0.73	1 (6%)
30	5MC	a	1962	30	18,22,23	0.54	0	26,32,35	0.49	0
7	5MC	A	967	7	18,22,23	0.45	0	26,32,35	0.86	2 (7%)
30	PSU	a	955	30	18,21,22	1.00	1 (5%)	22,30,33	0.64	0
30	PSU	a	2504	30	18,21,22	0.98	1 (5%)	22,30,33	0.71	1 (4%)
30	PSU	a	2605	30	18,21,22	0.89	1 (5%)	22,30,33	0.80	0
7	MA6	A	1519	7	18,26,27	0.82	0	19,38,41	0.68	0
41	4D4	l	81	41	9,11,12	0.49	0	8,13,15	0.54	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
33	MEQ	d	150	33	8,9,10	0.53	0	5,10,12	0.83	0
7	2MG	A	1516	7	18,26,27	1.08	2 (11%)	16,38,41	0.85	0
30	PSU	a	2580	58,30	18,21,22	1.03	1 (5%)	22,30,33	0.83	1 (4%)
30	2MG	a	1835	30	18,26,27	0.95	1 (5%)	16,38,41	0.76	0
18	D2T	L	89	18	7,9,10	1.02	0	6,11,13	1.66	3 (50%)
30	6MZ	a	1618	30	18,25,26	0.63	0	16,36,39	0.87	1 (6%)
30	OMC	a	2498	58,30	19,22,23	0.50	0	26,31,34	0.64	1 (3%)
30	OMG	a	2251	29,30	18,26,27	1.04	2 (11%)	19,38,41	0.69	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
30	PSU	a	1917	30	-	0/7/25/26	0/2/2/2
30	PSU	a	1911	30	-	0/7/25/26	0/2/2/2
7	MA6	A	1518	7	-	0/7/29/30	0/3/3/3
17	IAS	K	119	17	-	0/7/7/8	-
30	1MG	a	745	30	-	0/3/25/26	0/3/3/3
41	MS6	l	82	41	-	1/4/6/8	-
30	5MU	a	1939	30	-	0/7/25/26	0/2/2/2
30	PSU	a	2457	30	-	0/7/25/26	0/2/2/2
7	5MC	A	1407	7	-	0/7/25/26	0/2/2/2
30	PSU	a	746	58,30	-	4/7/25/26	0/2/2/2
30	2MG	a	2445	30	-	0/5/27/28	0/3/3/3
30	6MZ	a	2030	30	-	2/5/27/28	0/3/3/3
30	PSU	a	2604	30	-	0/7/25/26	0/2/2/2
30	2MA	a	2503	58,30	-	1/3/25/26	0/3/3/3
30	5MU	a	747	30	-	1/7/25/26	0/2/2/2
30	OMU	a	2552	30	-	1/9/27/28	0/2/2/2
30	3TD	a	1915	30	-	2/7/25/26	0/2/2/2
7	PSU	A	516	58,7	-	0/7/25/26	0/2/2/2
7	4OC	A	1402	7	-	0/9/29/30	0/2/2/2
7	UR3	A	1498	7	-	0/7/25/26	0/2/2/2
30	H2U	a	2449	30	-	0/7/38/39	0/2/2/2
30	G7M	a	2069	30	-	1/3/25/26	0/3/3/3
7	G7M	A	527	7	-	0/3/25/26	0/3/3/3
7	2MG	A	966	7	-	0/5/27/28	0/3/3/3
30	5MC	a	1962	30	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	5MC	A	967	7	-	0/7/25/26	0/2/2/2
30	PSU	a	955	30	-	0/7/25/26	0/2/2/2
30	PSU	a	2504	30	-	2/7/25/26	0/2/2/2
30	PSU	a	2605	30	-	0/7/25/26	0/2/2/2
7	MA6	A	1519	7	-	3/7/29/30	0/3/3/3
41	4D4	l	81	41	-	0/11/12/14	-
33	MEQ	d	150	33	-	4/8/9/11	-
7	2MG	A	1516	7	-	0/5/27/28	0/3/3/3
30	PSU	a	2580	58,30	-	0/7/25/26	0/2/2/2
30	2MG	a	1835	30	-	0/5/27/28	0/3/3/3
18	D2T	L	89	18	-	3/7/12/14	-
30	6MZ	a	1618	30	-	0/5/27/28	0/3/3/3
30	OMC	a	2498	58,30	-	0/9/27/28	0/2/2/2
30	OMG	a	2251	29,30	-	0/5/27/28	0/3/3/3

The worst 5 of 31 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	a	1915	3TD	C6-C5	3.97	1.39	1.35
30	a	2580	PSU	C6-C5	3.81	1.39	1.35
30	a	2504	PSU	C6-C5	3.73	1.39	1.35
30	a	746	PSU	C6-C5	3.68	1.39	1.35
30	a	955	PSU	C6-C5	3.61	1.39	1.35

The worst 5 of 18 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
30	a	2503	2MA	C5-C6-N1	-4.93	117.77	121.01
30	a	2503	2MA	C5-C6-N6	4.07	126.53	120.35
30	a	2503	2MA	N3-C2-N1	-2.72	120.77	125.73
7	A	967	5MC	O3'-C3'-C4'	-2.54	103.70	111.05
18	L	89	D2T	OD1-CG-CB	-2.38	117.46	122.44

There are no chirality outliers.

5 of 25 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
18	L	89	D2T	CA-CB-SB-CB1
30	a	746	PSU	C2'-C1'-C5-C4
30	a	746	PSU	C2'-C1'-C5-C6
30	a	746	PSU	O4'-C1'-C5-C6

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Mol	Chain	Res	Type	Atoms
30	a	1915	3TD	O4'-C4'-C5'-O5'

There are no ring outliers.

6 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
30	a	1939	5MU	1	0
30	a	2030	6MZ	1	0
30	a	2604	PSU	1	0
7	A	1402	4OC	1	0
30	a	1835	2MG	1	0
30	a	2251	OMG	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 314 ligands modelled in this entry, 313 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
57	A1JAI	A	1601	-	65,67,67	0.63	1 (1%)	87,94,94	1.16	6 (6%)

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
57	A1JAI	A	1601	-	-	9/43/125/125	0/4/4/4

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
57	A	1601	A1JAI	C2-N2	2.53	1.36	1.29

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
57	A	1601	A1JAI	O1-C8-N6	5.20	117.35	108.01
57	A	1601	A1JAI	C8-N6-C7	3.50	129.19	123.30
57	A	1601	A1JAI	C9-O1-C8	-2.72	108.83	112.52
57	A	1601	A1JAI	O3-C11-C9	-2.47	103.27	108.22
57	A	1601	A1JAI	C14-C34-C20	-2.42	105.82	110.07

There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
57	A	1601	A1JAI	O1-C8-N6-C7
57	A	1601	A1JAI	O2-C10-C9-O1
57	A	1601	A1JAI	O2-C10-C9-C11
57	A	1601	A1JAI	N3-C3-C4-C5
57	A	1601	A1JAI	C4-C5-C6-N4

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand A1JAI A 1601

Bond lengths

Bond angles

Torsions

Rings
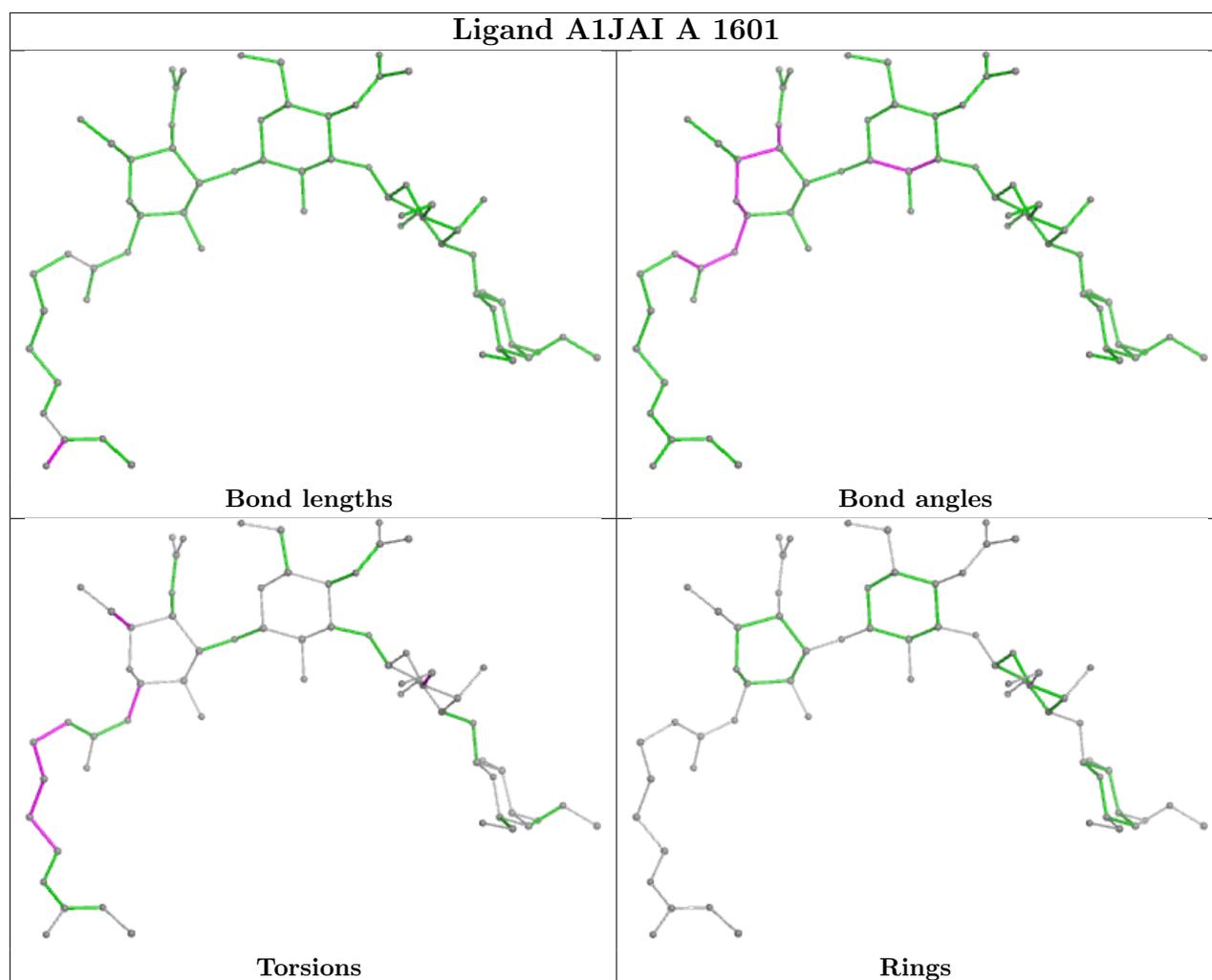
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	Y	2
30	a	1
29	Z	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	a	1172:C	O3'	1177:G	P	15.74

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	Y	46:G	O3'	57:U	P	10.36
1	Z	15:G	O3'	18:G	P	9.45
1	Y	15:A	O3'	18:G	P	8.18

6   Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-53341. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1   Orthogonal projections ⓘ
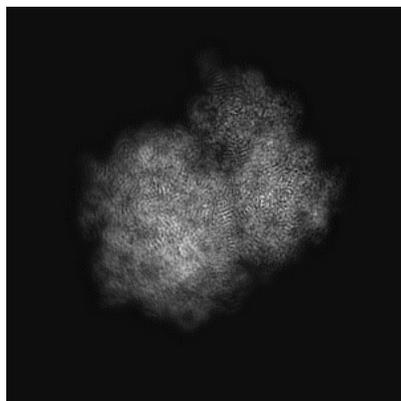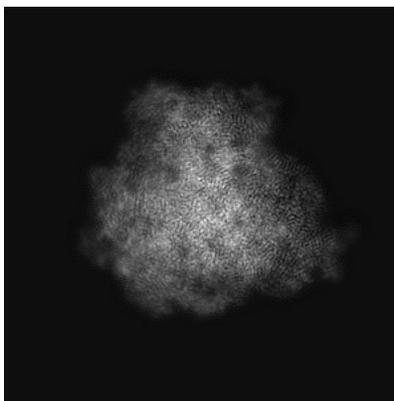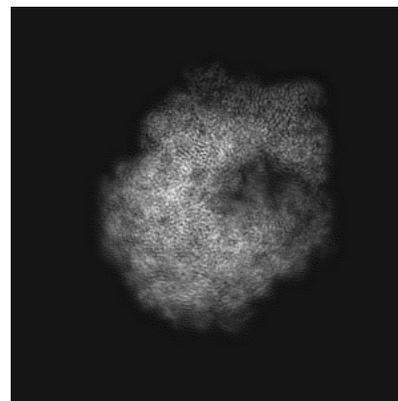
6.1.1   Primary map

X   Y   Z

6.1.2   Raw map

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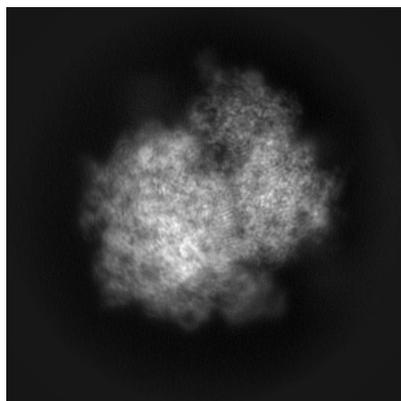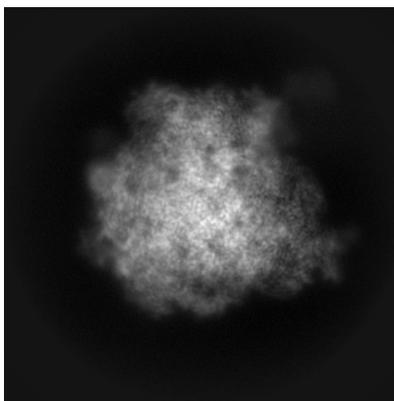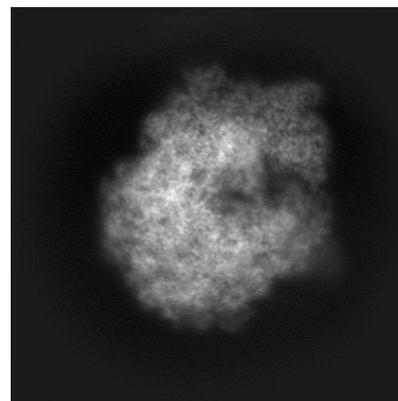
The images above show the map projected in three orthogonal directions.

6.2   Central slices   ⓘ
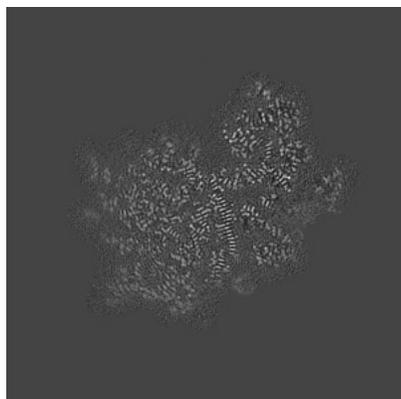
6.2.1   Primary map
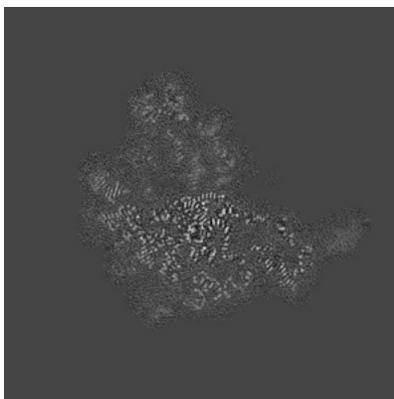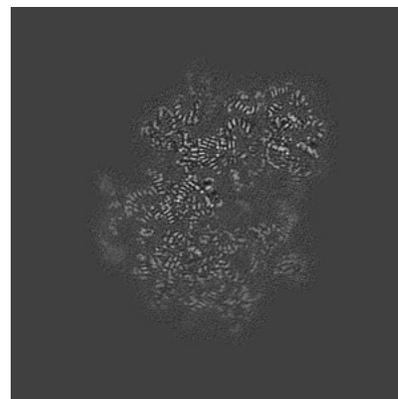
| X Index: 216 | Y Index: 216 | Z Index: 216 |

6.2.2   Raw map
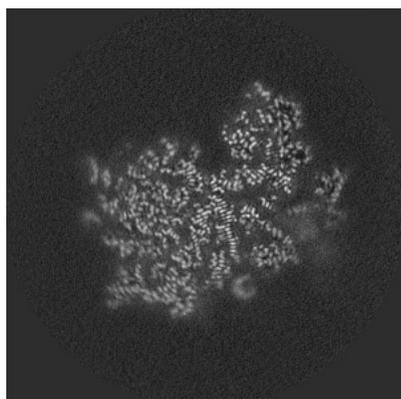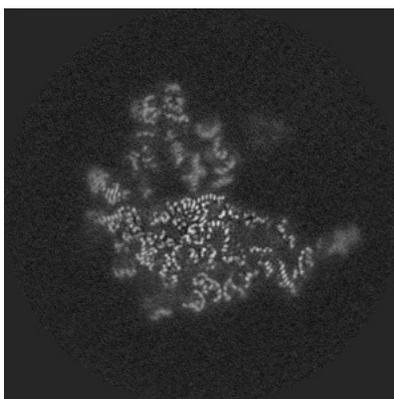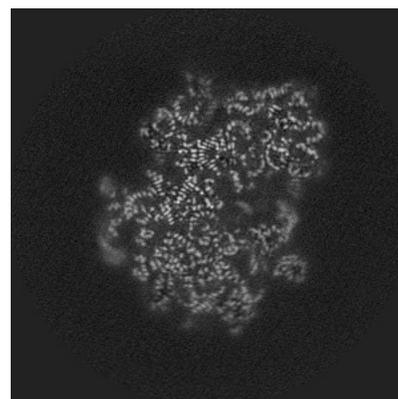
| X Index: 216 | Y Index: 216 | Z Index: 216 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
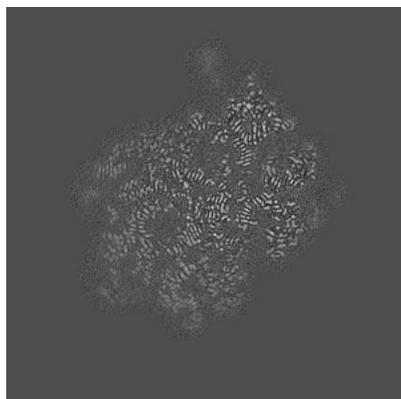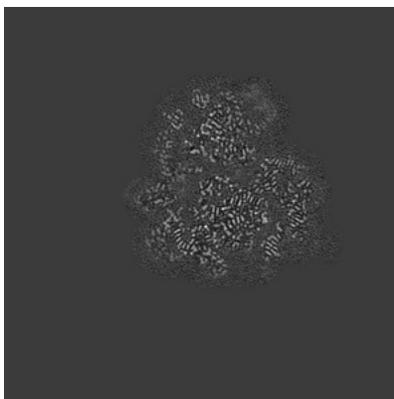
| X Index: 187 | Y Index: 288 | Z Index: 216 |
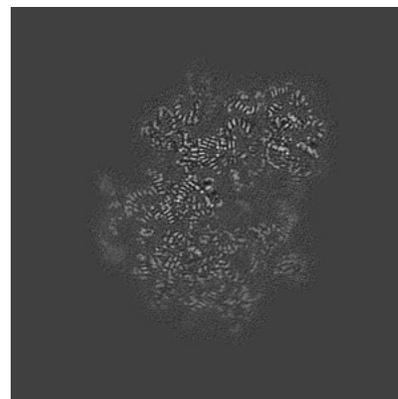
6.3.2 Raw map
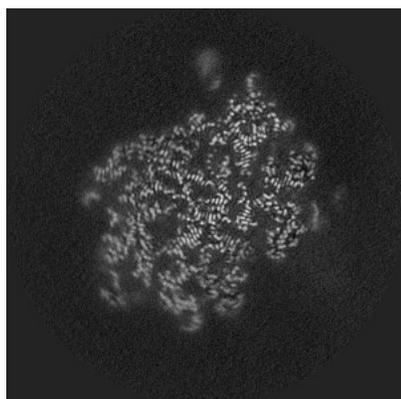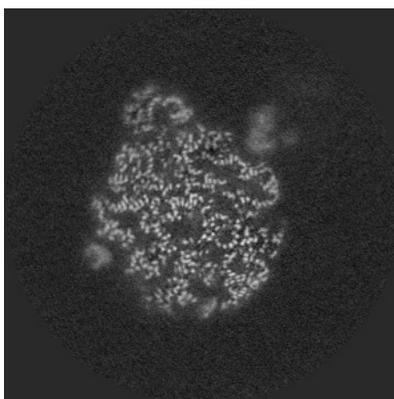
| X Index: 186 | Y Index: 182 | Z Index: 217 |
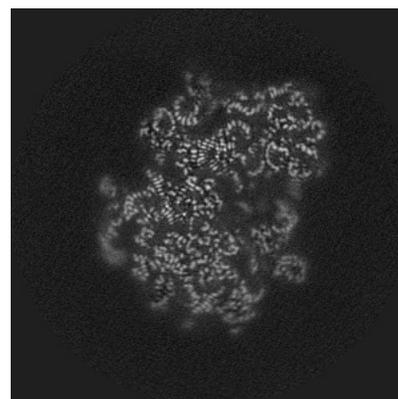
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
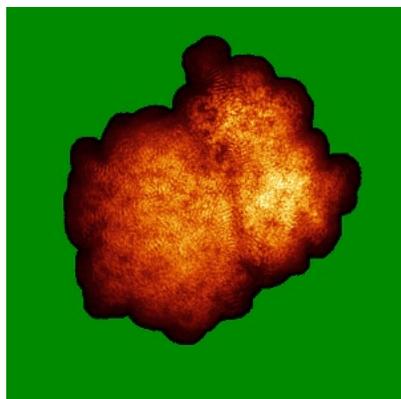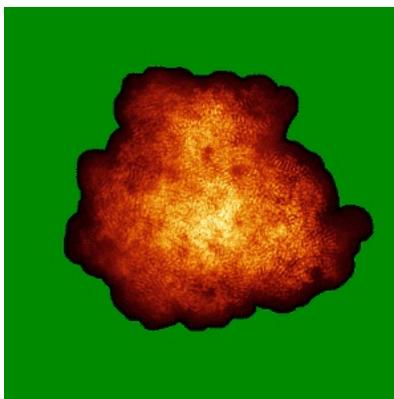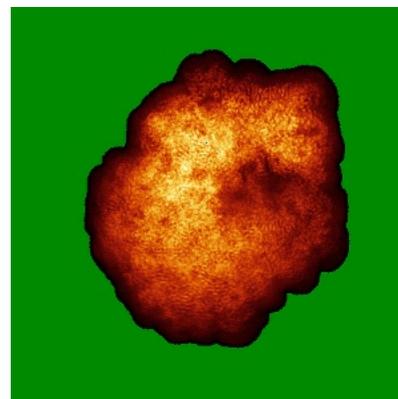
X   Y   Z

6.4.2 Raw map

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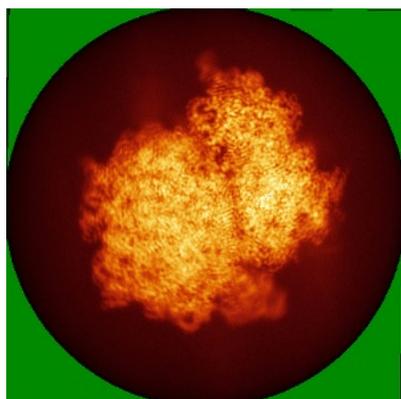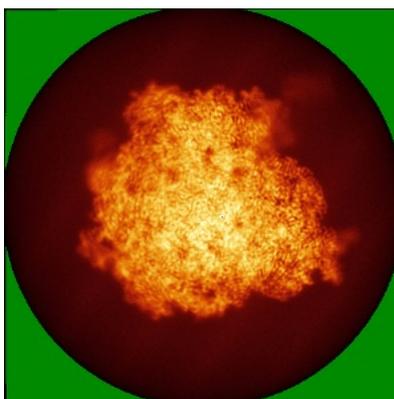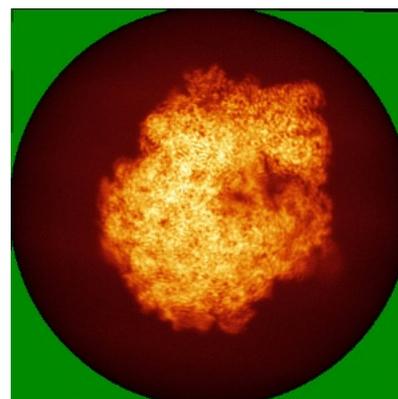
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views ⓘ

6.5.1   Primary map

| X | Y | Z |
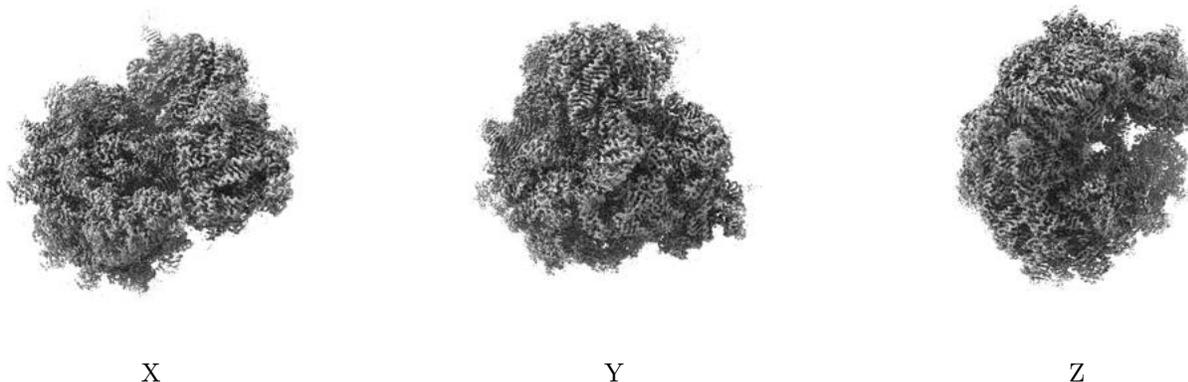
The images above show the 3D surface view of the map at the recommended contour level 0.028. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2   Raw map

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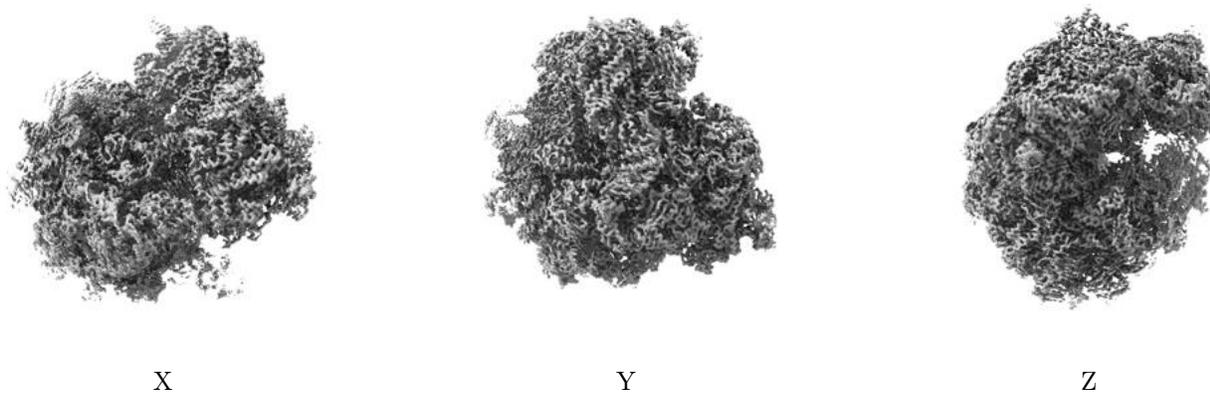
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6   Mask visualisation ⓘ

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

A mask typically either:

- Encompasses the whole structure

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

6.6.1   emd_53341_msk_1.map ⓘ
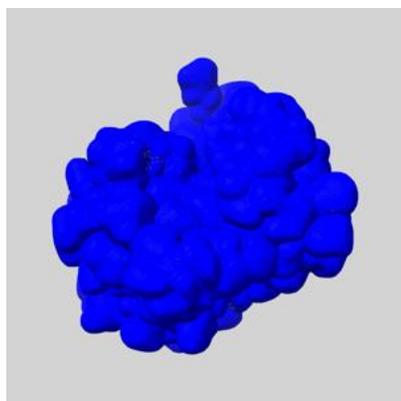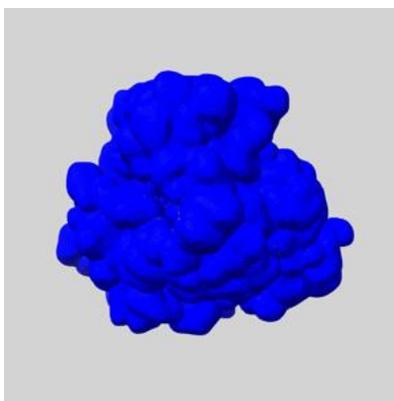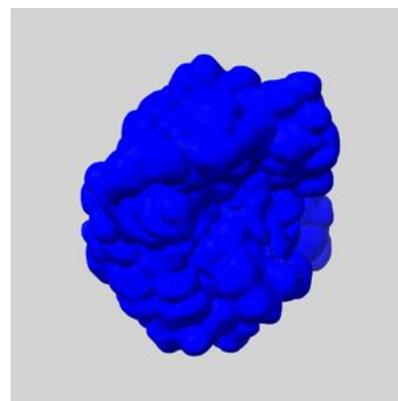
| X | Y | Z |

6.6.2   emd_53341_msk_2.map ⓘ

| X | Y | Z |
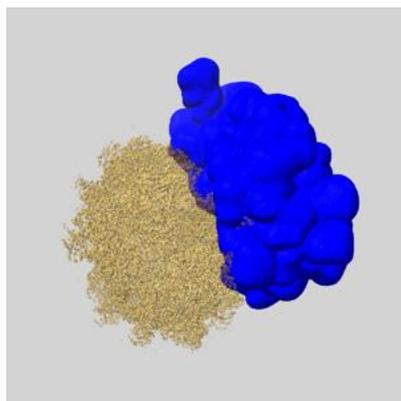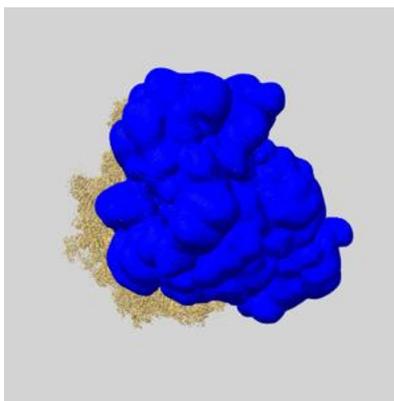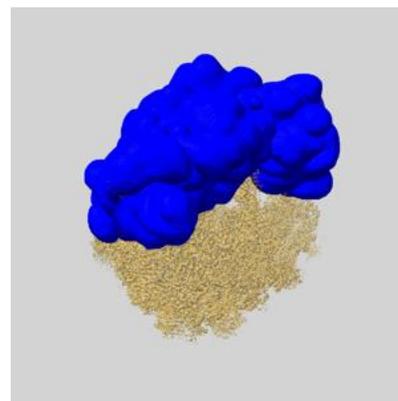
7 Map analysis ⓘ

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

7.1 Map-value distribution ⓘ

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

7.2　Volume estimate ⓘ
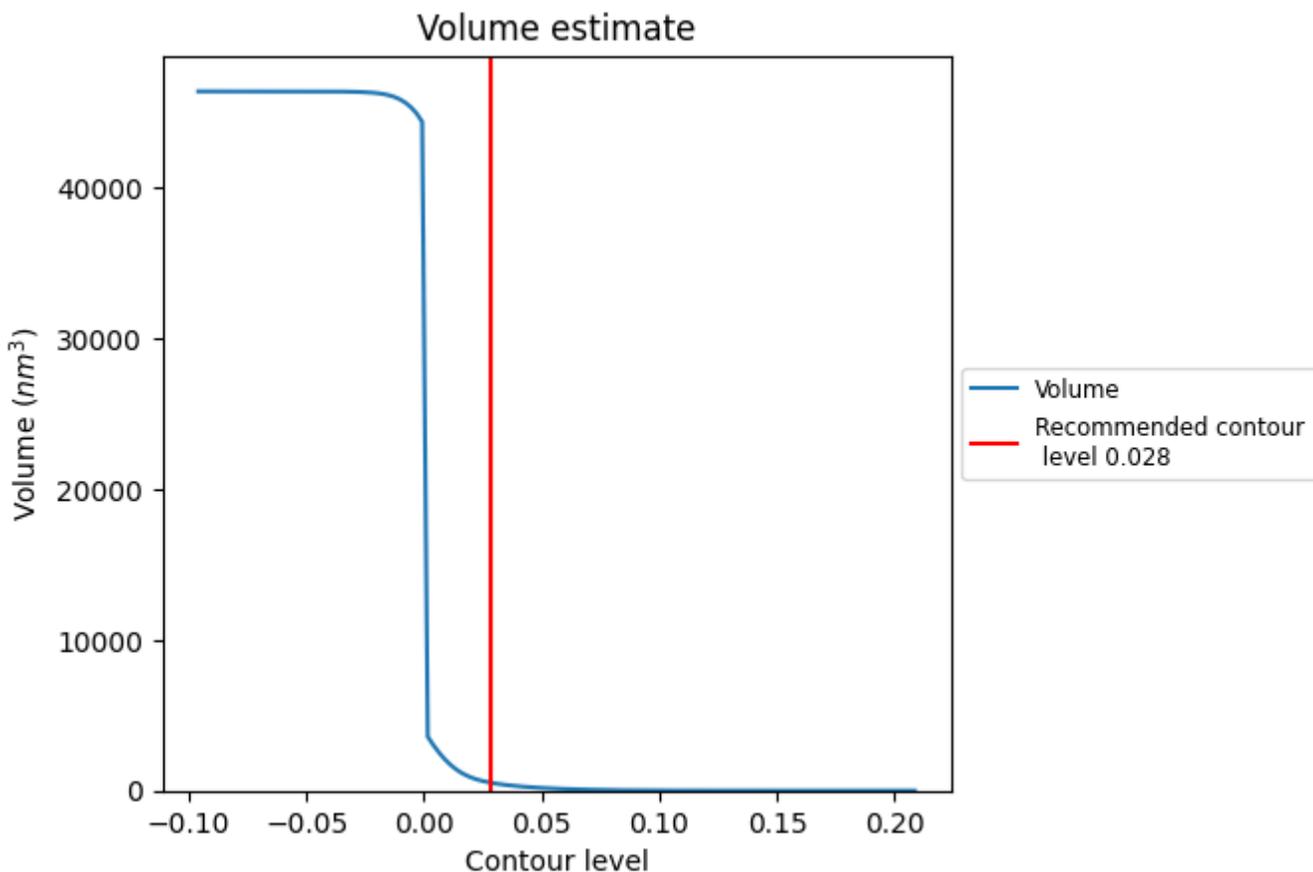
The volume at the recommended contour level is 536 nm^3; this corresponds to an approximate mass of 484 kDa.

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 ⓘ
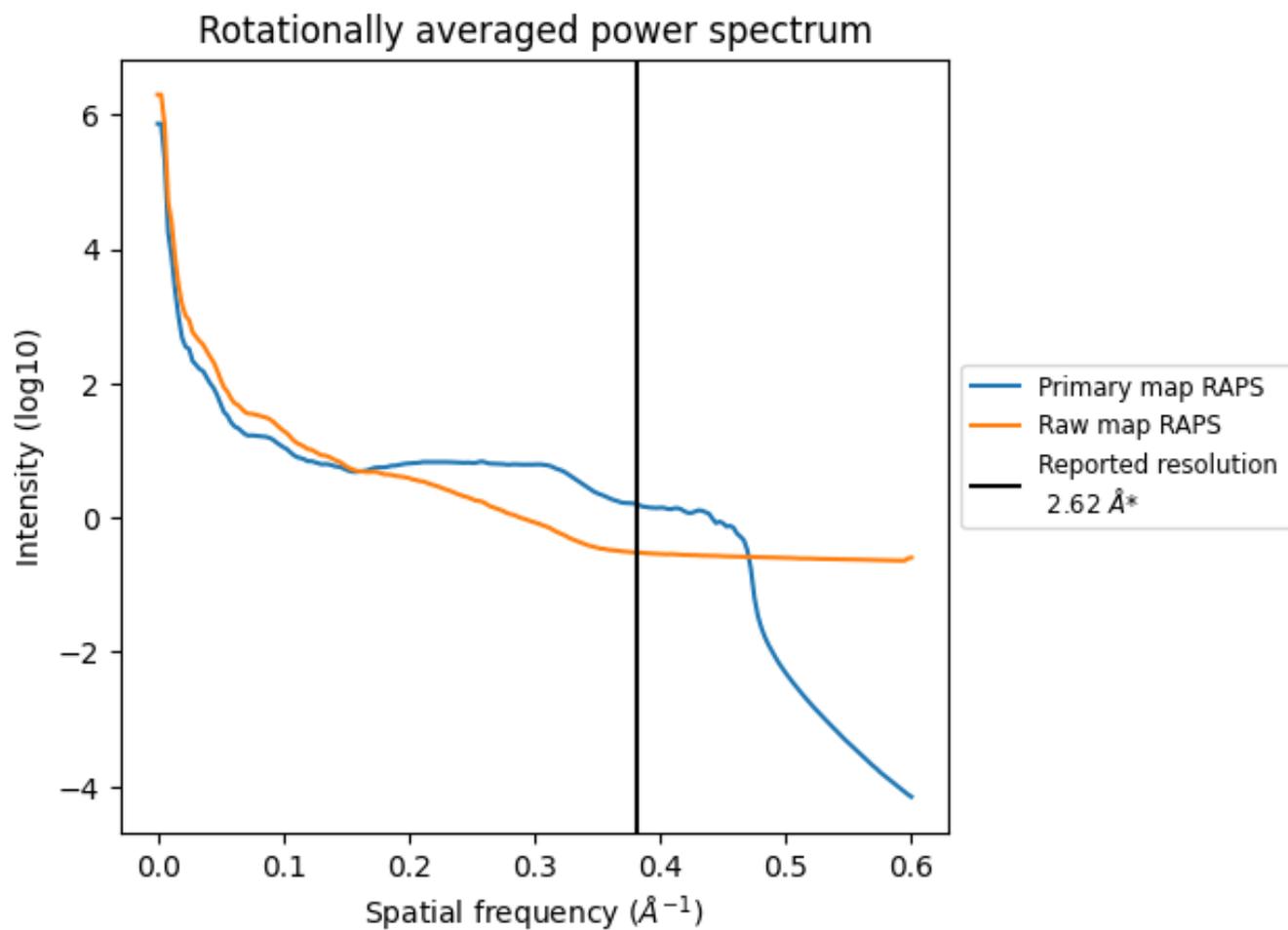
*Reported resolution corresponds to spatial frequency of 0.382 Å^{-1}

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)
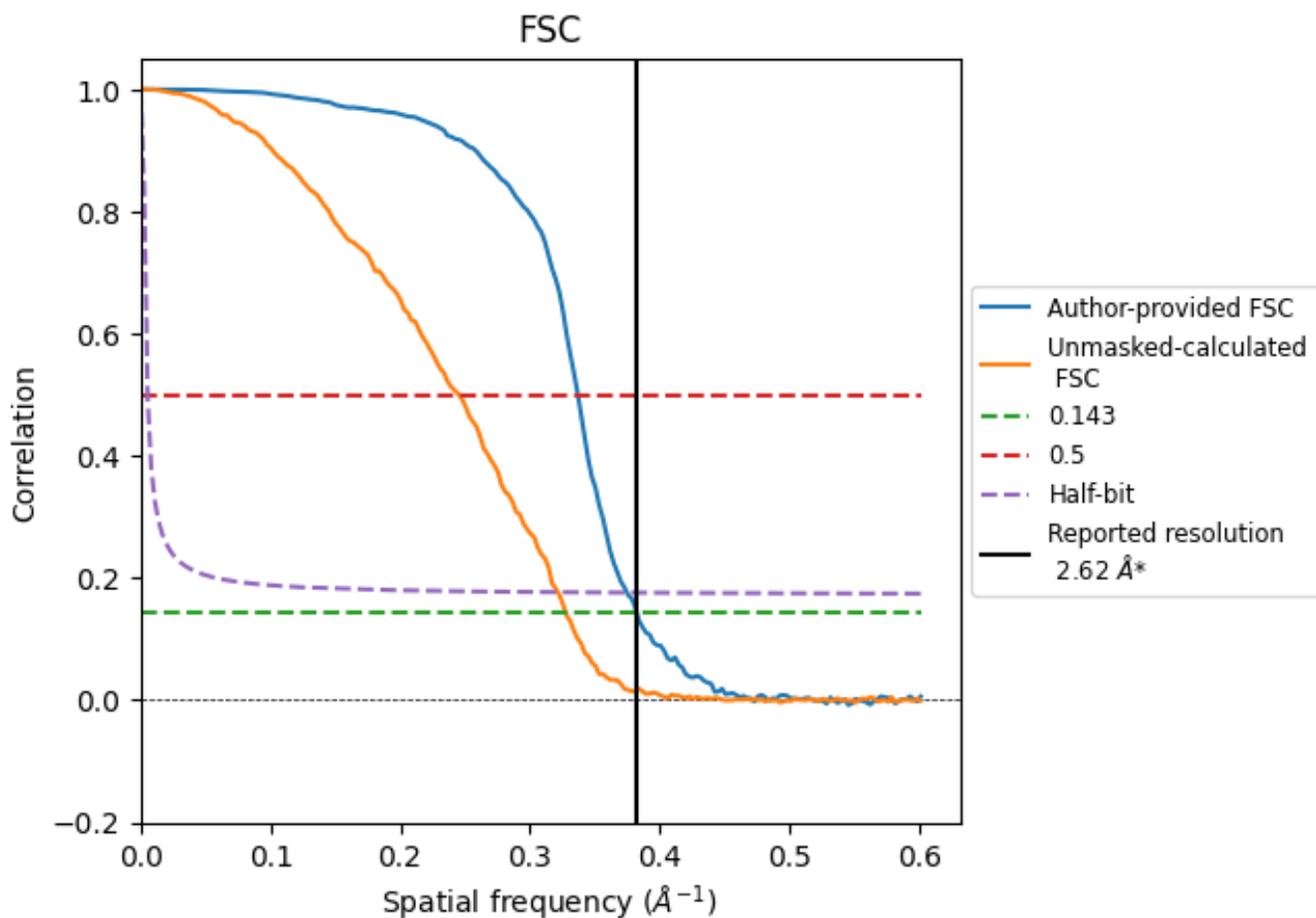
*Reported resolution corresponds to spatial frequency of 0.382 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.62	-	-
Author-provided FSC curve	2.62	2.97	2.67
Unmasked-calculated*	3.05	4.08	3.11

*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 3.05 differs from the reported value 2.62 by more than 10 %

9   Map-model fit   ⓘ

This section contains information regarding the fit between EMDB map EMD-53341 and PDB model 9QSJ. Per-residue inclusion information can be found in section 3 on page 18.

## 9.1   Map-model overlay   ⓘ

| X | Y | Z |
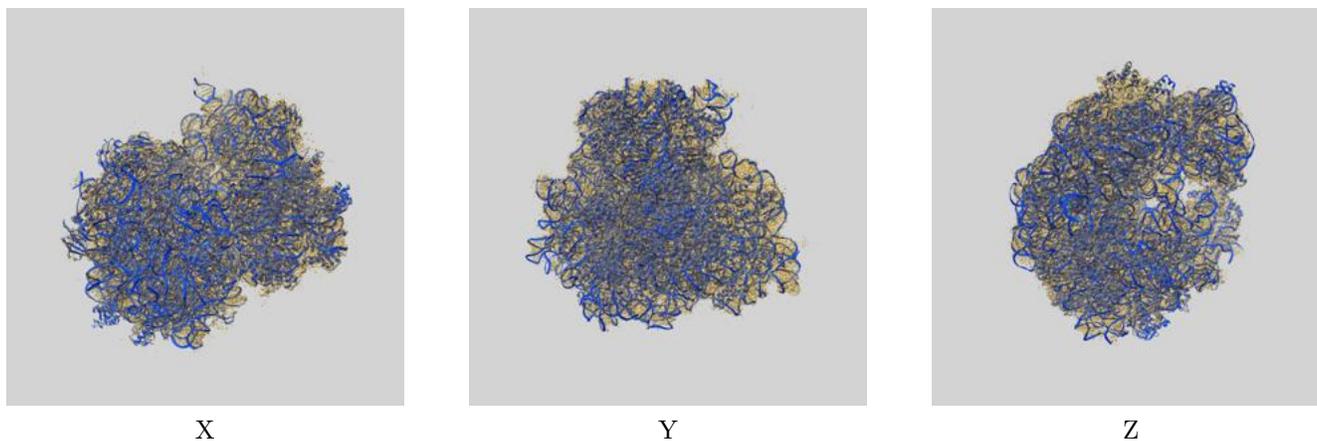
The images above show the 3D surface view of the map at the recommended contour level 0.028 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ


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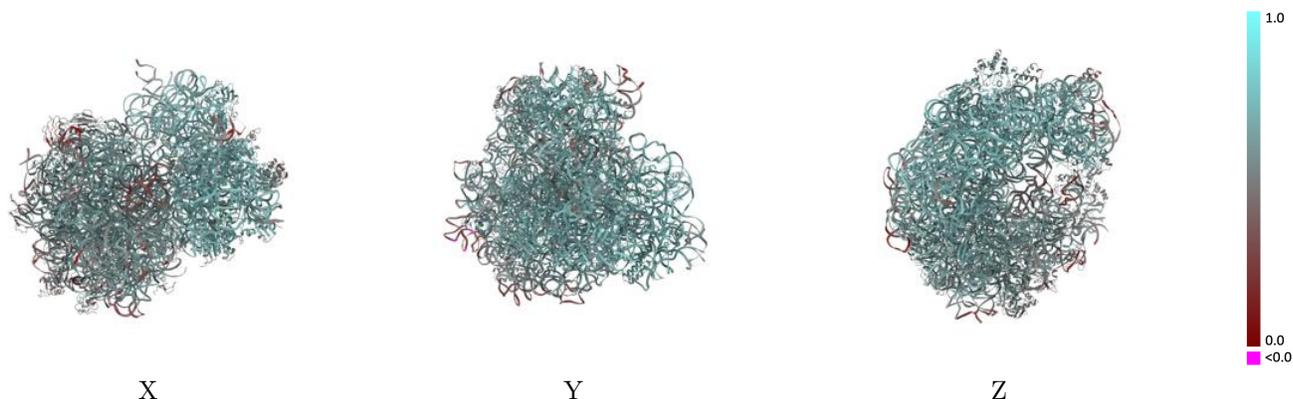
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3   Atom inclusion mapped to coordinate model ⓘ

X   Y   Z
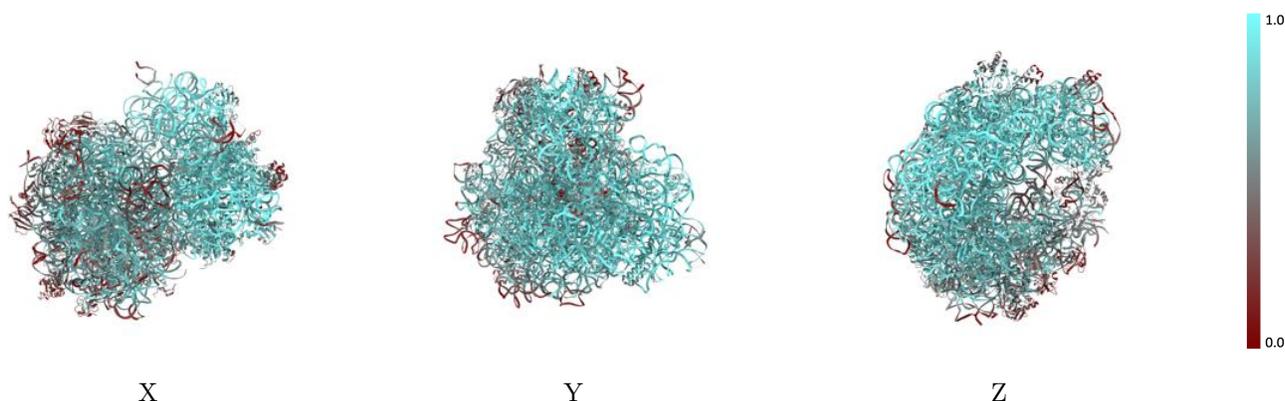
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.028).
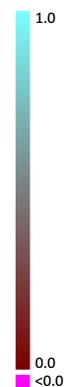
9.4 Atom inclusion (i)
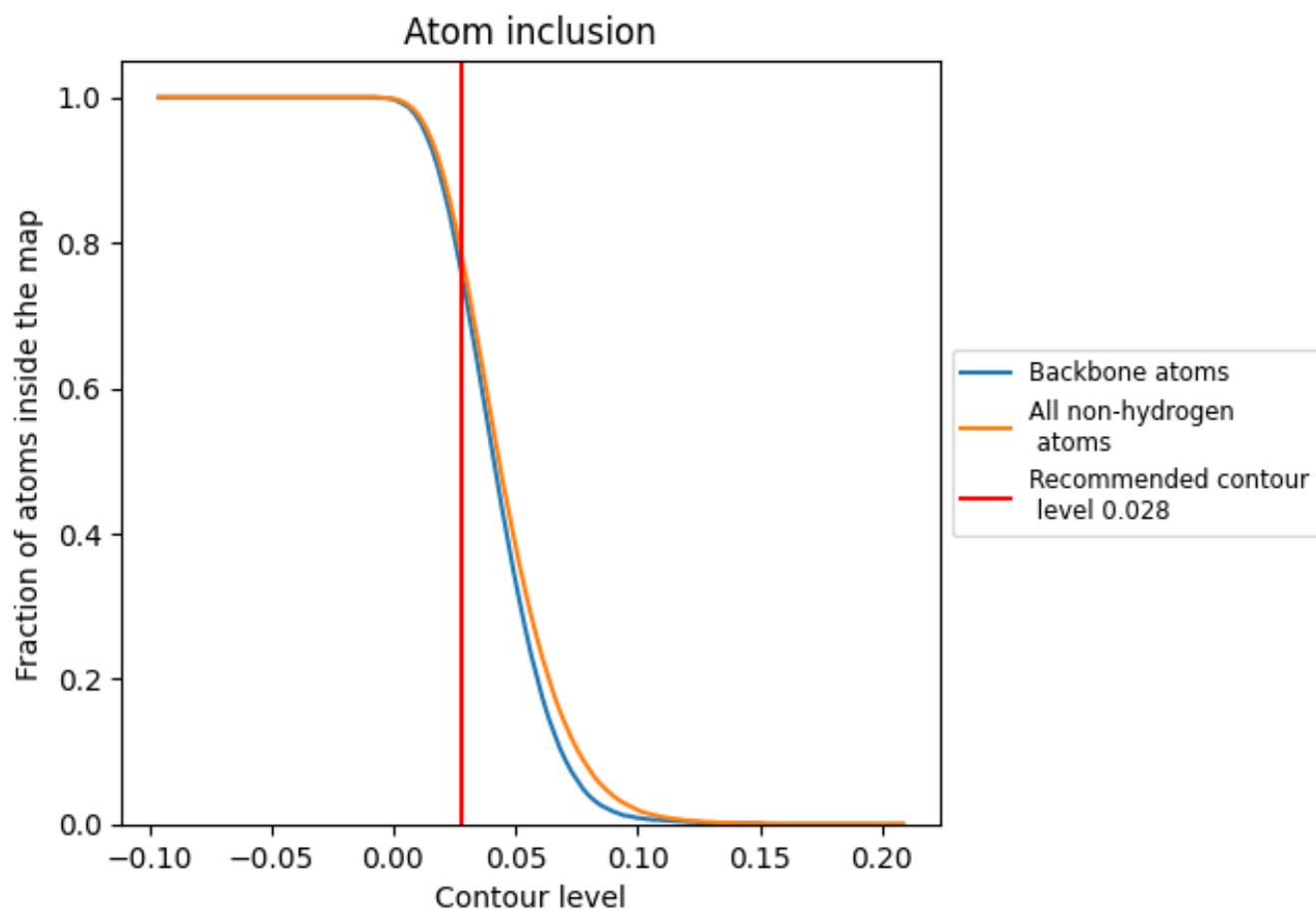
At the recommended contour level, 76% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.028) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7820	0.6130
0	0.5500	0.5600
1	0.8780	0.6690
2	0.7450	0.6270
3	0.6790	0.5840
4	0.4430	0.5170
A	0.9280	0.6710
B	0.6600	0.5910
C	0.8170	0.6450
D	0.8370	0.6530
E	0.8890	0.6780
F	0.7660	0.6280
G	0.7430	0.6170
H	0.8950	0.6800
I	0.8140	0.6460
J	0.6480	0.5840
K	0.8650	0.6610
L	0.8990	0.6840
M	0.7780	0.6410
N	0.8930	0.6730
O	0.8610	0.6700
P	0.8970	0.6860
Q	0.7630	0.6240
R	0.8790	0.6600
S	0.8110	0.6420
T	0.8740	0.6700
U	0.5920	0.5380
X	0.8430	0.6170
Y	0.5720	0.4940
Z	0.6300	0.5300
a	0.7940	0.5990
b	0.6290	0.5280
c	0.8740	0.6830
d	0.7050	0.6160
e	0.4050	0.5030

1.0

0.0
<0.0

Continued from previous page...

Chain	Atom inclusion	Q-score
f	0.4940	0.5300
g	0.2870	0.4420
h	0.4600	0.4980
i	0.5900	0.5660
j	0.8110	0.6590
k	0.5550	0.5550
l	0.6960	0.5990
m	0.7850	0.6330
n	0.4340	0.4990
o	0.7850	0.6370
p	0.5940	0.5770
q	0.3920	0.5200
r	0.6200	0.5760
s	0.5240	0.5180
t	0.2270	0.4380
u	0.3830	0.4950
v	0.6030	0.5910
w	0.7290	0.6060
x	0.3000	0.4300
y	0.5800	0.5560
z	0.6390	0.5990