WORLDWIDE PDB PROTEIN DATA BANK

wwPDB EM Validation Summary Report ⓘ

Feb 9, 2026 – 11:51 AM EST

PDB ID	:	9Y42 / pdb_00009y42
EMDB ID	:	EMD-72469
Title	:	Structure of naked mole-rat ribosome with P/E tRNA and eEF2 (rotated)
Authors	:	Gutierrez-Vargas, C.; De, S.; Maji, S.; Liu, Z.; Nieb, M.; Seluanov, A.; Gorbunova, V.; Frank, J.
Deposited on	:	2025-09-02
Resolution	:	5.00 Å(reported)
Based on initial models	:	4v6x, 707y

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

EMDB validation analysis	:	0.0.1.dev131
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
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 ⓘ

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

The reported resolution of this entry is 5.00 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.
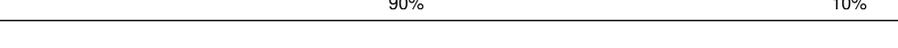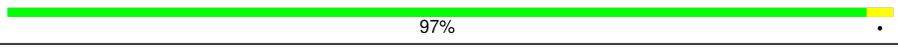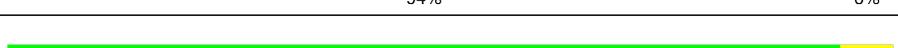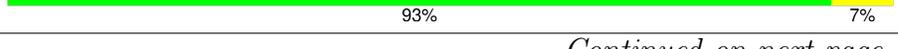
Metric	Percentile Ranks	Value
Clashscore		8
Ramachandran outliers		0.1%
Sidechain outliers		1.4%
RNA backbone		0.36

Worse   *Better*

▮ Percentile relative to all structures
❚ Percentile relative to all EM structures

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.237

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	1057 (4.50 - 5.50)

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	A	248	91% 9%
2	B	398	93% 7%
3	C	363	90% 10%

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Length	Quality of chain
4	c	121	83% 12% 5%
5	D	293	90% 10%
6	E	224	88% 10%
7	F	225	87% 13%
8	G	215	93% 7%
9	H	190	87% 13%
10	I	213	88% 6% 7%
11	J	170	87% 13%
12	L	205	90% 10%
13	M	136	88% 12%
14	N	203	95% 5%
15	O	199	89% 11%
16	P	153	97%
17	Q	187	88% 12%
18	S	176	94% 6%
19	T	159	94% 6%
20	U	99	81% 19%
21	V	131	85% 15%
22	W	180	94% 6%
23	X	118	89% 11%
24	Y	134	89% 11%
25	Z	135	88% 12%
26	a	147	92% 8%
27	b	104	69% 29%
28	d	107	93% 7%

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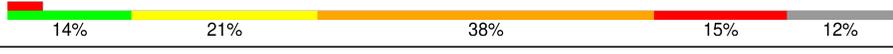| Mol	Chain	Length	Quality of chain
29	e	128	88% 12%
30	f	110	83% 15%
31	g	110	96%
32	h	121	86% 14%
33	i	102	93% 7%
34	j	86	95% 5%
35	k	69	91% 9%
36	l	50	94% 6%
37	m	51	94% 6%
38	n	25	92%
39	o	105	92% 8%
40	p	91	84% 16%
41	r	127	91% 9%
42	s	103	95% 5%
43	t	156	6% 82% 17%
44	u	100	14% 21% 38% 15% 12%
45	bb	82	91% 9%
46	ee	49	96%
47	aa	98	72% 27%
48	CC	218	86% 14%
49	EE	262	88% 12%
50	GG	228	91% 9%
51	HH	190	89% 8%
52	II	206	89% 11%
53	JJ	180	91% 9%
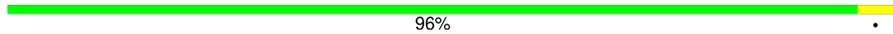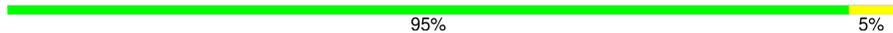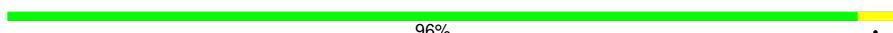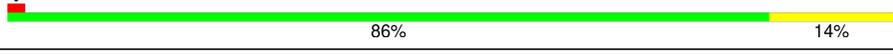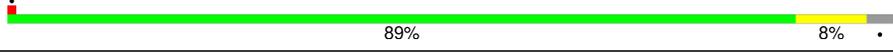
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Mol	Chain	Length	Quality of chain
54	LL	149	86% 9% 5%
55	NN	149	86% 14%
56	VV	83	7% 23% 42% 28%
57	WW	129	81% 19%
58	XX	141	85% 14%
59	YY	125	93% 7%
60	cc	61	5% 80% 20%
61	ff	67	97%
62	gg	313	88% 12%
63	dd	55	91% 9%
64	AA	214	6% 18% 45% 27%
65	DD	225	93% 7%
66	FF	189	85% 13%
67	KK	96	93% 7%
68	MM	124	81% 19%
69	PP	118	96%
70	QQ	141	91% 9%
71	SS	145	91% 9%
72	TT	141	92% 8%
73	UU	99	91% 9%
74	ZZ	75	72% 28%
75	EF	856	83% 17%
76	Cc	77	64% 32%
77	A5	1732	62% 35%
78	A7	121	65% 34%
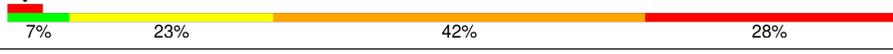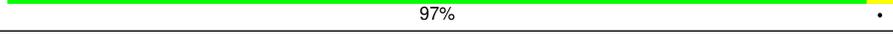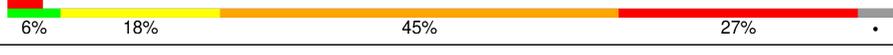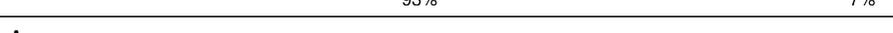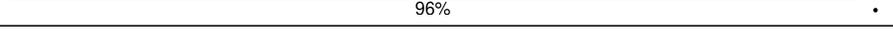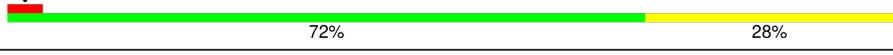
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Mol	Chain	Length	Quality of chain
79	A8	157	68% 31%
80	B2	1837	62% 35%
81	A6	2122	68% 29%
82	BB	218	74% 25%
83	OO	134	5% 59% 41%
84	RR	132	20% 55% 44%
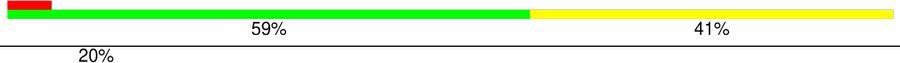
2   Entity composition ⓘ

There are 87 unique types of molecules in this entry. The entry contains 225388 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.

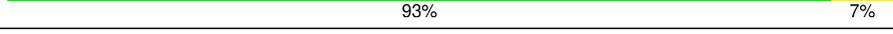- Molecule 1 is a protein called Large ribosomal subunit protein uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	248	Total	C	N	O	S	0	0
			1898	1189	389	314	6		

- Molecule 2 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	398	Total	C	N	O	S	0	0
			3206	2042	605	546	13		

- Molecule 3 is a protein called Large ribosomal subunit protein uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	363	Total	C	N	O	S	0	0
			2895	1822	576	483	14		

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	1	ACE	-	acetylation	UNP G5AN81
C	262	ASP	GLU	conflict	UNP G5AN81
C	352	GLU	ASP	conflict	UNP G5AN81

- Molecule 4 is a protein called Large ribosomal subunit protein eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	c	115	Total	C	N	O	S	0	0
			938	586	193	155	4		

- Molecule 5 is a protein called Large ribosomal subunit protein uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	D	293	Total	C	N	O	S	0	0
			2389	1511	437	427	14		

- Molecule 6 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	E	224	Total 1789	C 1149	N 340	O 297	S 3	0	0

- Molecule 7 is a protein called 60S ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	F	225	Total 1875	C 1205	N 358	O 303	S 9	0	0

- Molecule 8 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	G	215	Total 1741	C 1111	N 333	O 293	S 4	0	0

- Molecule 9 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	H	190	Total 1516	C 954	N 284	O 272	S 6	0	0

- Molecule 10 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	I	199	Total 1620	C 1029	N 313	O 266	S 12	0	0

- Molecule 11 is a protein called Large ribosomal subunit protein uL5.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	J	170	Total 1362	C 861	N 254	O 241	S 6	0	0

- Molecule 12 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	205	Total 1658	C 1037	N 346	O 271	S 4	0	0

- Molecule 13 is a protein called Large ribosomal subunit protein eL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	M	136	Total 1125	C 720	N 220	O 178	S 7	0	0

- Molecule 14 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	203	Total 1701	C 1072	N 359	O 266	S 4	0	0

- Molecule 15 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	199	Total 1630	C 1051	N 319	O 255	S 5	0	0

- Molecule 16 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	153	Total 1242	C 777	N 241	O 215	S 9	0	0

- Molecule 17 is a protein called 60S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	187	Total 1512	C 946	N 313	O 249	S 4	0	0

- Molecule 18 is a protein called Large ribosomal subunit protein eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	176	Total 1461	C 930	N 284	O 236	S 11	0	0

- Molecule 19 is a protein called Large ribosomal subunit protein eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	T	159	Total 1298	C 823	N 252	O 217	S 6	0	0

- Molecule 20 is a protein called 60S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	U	99	Total 808	C 518	N 141	O 147	S 2	0	0

- Molecule 21 is a protein called Large ribosomal subunit protein uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	V	131	Total 973	C 612	N 184	O 172	S 5	0	0

- Molecule 22 is a protein called Ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	W	180	Total 1508	C 933	N 328	O 238	S 9	0	0

- Molecule 23 is a protein called Large ribosomal subunit protein uL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X	118	Total 967	C 618	N 181	O 167	S 1	0	0

- Molecule 24 is a protein called 60S ribosomal protein L26.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	Y	134	Total 1115	C 700	N 226	O 186	S 3	0	0

- Molecule 25 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	135	Total 1107	C 714	N 208	O 182	S 3	0	0

- Molecule 26 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	a	147	Total 1163	C 734	N 239	O 186	S 4	0	0

- Molecule 27 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	74	Total	C	N	O	S	0	0
			620	382	141	95	2		

- Molecule 28 is a protein called Large ribosomal subunit protein eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	d	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 29 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	e	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 30 is a protein called Large ribosomal subunit protein eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	f	110	Total	C	N	O	S	0	0
			884	560	175	144	5		

- Molecule 31 is a protein called Large ribosomal subunit protein eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	g	110	Total	C	N	O	S	0	0
			873	547	180	140	6		

- Molecule 32 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	h	121	Total	C	N	O	S	0	0
			1011	640	204	166	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
h	119	TYR	PHE	conflict	UNP G5B6W3

- Molecule 33 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	i	102	Total 830	C 520	N 176	O 129	S 5	0	0

- Molecule 34 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	j	86	Total 705	C 434	N 155	O 111	S 5	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	k	69	Total 569	C 366	N 103	O 99	S 1	0	0

- Molecule 36 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	l	50	Total 447	C 286	N 96	O 64	S 1	0	0

- Molecule 37 is a protein called Ubiquitin-ribosomal protein eL40 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	m	51	Total 422	C 263	N 88	O 65	S 6	0	0

- Molecule 38 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	n	25	Total 239	C 145	N 64	O 27	S 3	0	0

- Molecule 39 is a protein called 60S ribosomal protein L36a.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	o	105	Total 863	C 543	N 175	O 139	S 6	0	0

- Molecule 40 is a protein called Large ribosomal subunit protein eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	p	91	Total	C	N	O	S	0	0
			708	445	136	120	7		

- Molecule 41 is a protein called Large ribosomal subunit protein eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	r	127	Total	C	N	O	S	0	0
			1015	630	209	170	6		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
r	1	ACE	-	acetylation	UNP G5BVZ2

- Molecule 42 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	s	103	Total	C	N	O	S	0	0
			825	525	150	143	7		

- Molecule 43 is a protein called 60S ribosomal protein L12.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	t	156	Total	C	N	O	S	0	0
			1178	733	221	220	4		

- Molecule 44 is a protein called Large ribosomal subunit protein eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	u	88	Total	C	N	O	S	0	0
			672	425	116	125	6		

- Molecule 45 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	bb	82	Total	C	N	O	S	0	0
			640	402	118	113	7		

- Molecule 46 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	ee	49	Total 398	C 243	N 90	O 64	S 1	0	0

- Molecule 47 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	aa	98	Total 781	C 486	N 161	O 129	S 5	0	0

- Molecule 48 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	CC	218	Total 1685	C 1092	N 288	O 296	S 9	0	0

- Molecule 49 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	EE	262	Total 2076	C 1324	N 386	O 358	S 8	0	0

- Molecule 50 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	GG	228	Total 1848	C 1155	N 368	O 318	S 7	0	0

- Molecule 51 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	HH	184	Total 1490	C 953	N 271	O 265	S 1	0	0

- Molecule 52 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	II	206	Total 1686	C 1058	N 332	O 291	S 5	0	0

- Molecule 53 is a protein called Small ribosomal subunit protein uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	JJ	180	Total	C	N	O	S	0	0
			1499	955	300	242	2		

- Molecule 54 is a protein called Small ribosomal subunit protein uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	LL	141	Total	C	N	O	S	0	0
			1157	737	218	196	6		

- Molecule 55 is a protein called Small ribosomal subunit protein uS15.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	NN	149	Total	C	N	O	S	0	0
			1202	770	228	203	1		

- Molecule 56 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	VV	83	Total	C	N	O	S	0	0
			637	392	117	123	5		

- Molecule 57 is a protein called Small ribosomal subunit protein uS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	WW	129	Total	C	N	O	S	0	0
			1034	659	193	176	6		

- Molecule 58 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	XX	141	Total	C	N	O	S	0	0
			1098	693	219	183	3		

- Molecule 59 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	YY	125	Total	C	N	O	S	0	0
			1015	642	199	169	5		

- Molecule 60 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	cc	61	Total 479	C 292	N 95	O 90	S 2	0	0

- Molecule 61 is a protein called Ubiquitin-ribosomal protein eS31 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	ff	67	Total 548	C 346	N 102	O 93	S 7	0	0

- Molecule 62 is a protein called Small ribosomal subunit protein RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	gg	313	Total 2436	C 1535	N 424	O 465	S 12	0	0

- Molecule 63 is a protein called Small ribosomal subunit protein uS14.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	dd	55	Total 459	C 286	N 94	O 74	S 5	0	0

- Molecule 64 is a protein called Small ribosomal subunit protein uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	AA	205	Total 1625	C 1035	N 283	O 299	S 8	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
AA	1	ACE	-	acetylation	UNP A0A0P6K1L6

- Molecule 65 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	DD	225	Total 1751	C 1116	N 315	O 313	S 7	0	0

- Molecule 66 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	FF	186	Total	C	N	O	S	0	0
			1475	923	278	267	7		

- Molecule 67 is a protein called Small ribosomal subunit protein eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	KK	96	Total	C	N	O	S	0	0
			810	530	143	131	6		

- Molecule 68 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	MM	124	Total	C	N	O	S	0	0
			958	600	170	179	9		

- Molecule 69 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	PP	118	Total	C	N	O	S	0	0
			979	621	185	166	7		

- Molecule 70 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	QQ	141	Total	C	N	O	S	0	0
			1124	715	212	194	3		

- Molecule 71 is a protein called Small ribosomal subunit protein uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	SS	145	Total	C	N	O	S	0	0
			1193	748	241	203	1		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
SS	1	ACE	-	acetylation	UNP G5BAZ4

- Molecule 72 is a protein called Small ribosomal subunit protein eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	TT	141	Total	C	N	O	S	0	0
			1097	687	211	196	3		

- Molecule 73 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	UU	99	Total	C	N	O	S	0	0
			790	495	151	140	4		

- Molecule 74 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	ZZ	75	Total	C	N	O	S	0	0
			598	382	111	104	1		

- Molecule 75 is a protein called eEF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	EF	856	Total	C	N	O	S	0	0
			6669	4232	1147	1246	44		

- Molecule 76 is a RNA chain called P/E tRNA (77-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Cc	77	Total	C	N	O	P	0	0
			1644	732	298	537	77		

- Molecule 77 is a RNA chain called LSU alpha rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	A5	1732	Total	C	N	O	P	0	0
			36419	16179	6629	11880	1731		

- Molecule 78 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	A7	121	Total	C	N	O	P	0	0
			2578	1150	458	850	120		

- Molecule 79 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	A8	157	Total 3334	C 1489	N 587	O 1102	P 156	0	0

- Molecule 80 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	B2	1837	Total 38185	C 17001	N 6745	O 12603	P 1836	0	0

- Molecule 81 is a RNA chain called LSU beta rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	A6	2122	Total 43819	C 19451	N 7789	O 14457	P 2122	0	0

- Molecule 82 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	BB	218	Total 1768	C 1120	N 320	O 314	S 14	0	0

- Molecule 83 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
83	OO	134	Total 1002	C 612	N 197	O 187	S 6	0	0

- Molecule 84 is a protein called Small ribosomal subunit protein eS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
84	RR	132	Total 1068	C 670	N 199	O 195	S 4	0	0

- Molecule 85 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
85	P	1	Total 1	Mg 1	0
85	a	1	Total 1	Mg 1	0
85	l	1	Total 1	Mg 1	0

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W O R L D W I D E
PDB
PROTEIN DATA BANK

Continued from previous page...

Mol	Chain	Residues	Atoms		AltConf
85	A5	7	Total 7	Mg 7	0
85	A8	1	Total 1	Mg 1	0
85	B2	6	Total 6	Mg 6	0
85	A6	7	Total 7	Mg 7	0
85	BB	2	Total 2	Mg 2	0

- Molecule 86 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
86	g	1	Total 1	Zn 1	0
86	j	1	Total 1	Zn 1	0
86	m	1	Total 1	Zn 1	0
86	o	1	Total 1	Zn 1	0
86	p	1	Total 1	Zn 1	0
86	aa	1	Total 1	Zn 1	0
86	ff	1	Total 1	Zn 1	0
86	dd	1	Total 1	Zn 1	0

- Molecule 87 is water.

Mol	Chain	Residues	Atoms		AltConf
87	A6	1	Total 1	O 1	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.
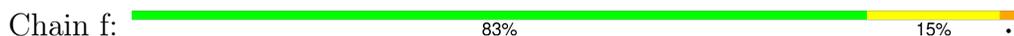
- Molecule 1: Large ribosomal subunit protein uL2

Chain A:
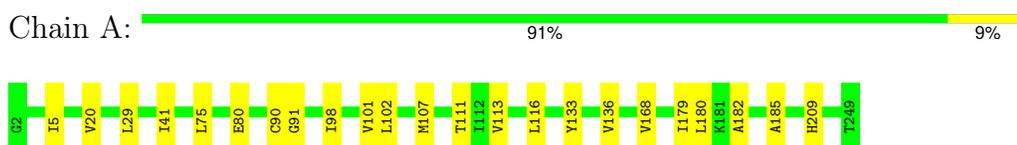
- Molecule 2: 60S ribosomal protein L3

Chain B:
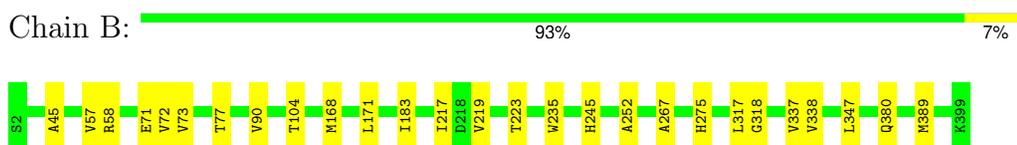
- Molecule 3: Large ribosomal subunit protein uL4

Chain C:
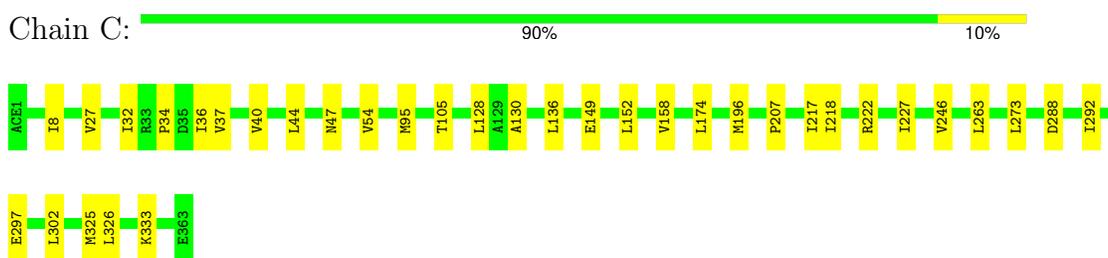
- Molecule 4: Large ribosomal subunit protein eL24

Chain c:
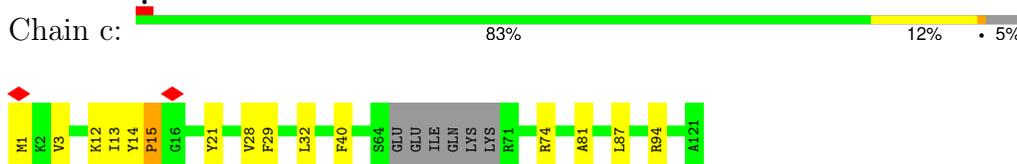
- Molecule 5: Large ribosomal subunit protein uL18

Chain D:

F3 V4 K5 V6 N9 I52 I64 Y99 L105 A106 L109 M115 I118 V132 I135 F142 D147 T153 N157 K158 V159 L171 S172 H195 I199 V204 L211 F223 V261 M271 S272 L273 A295

- Molecule 6: 60S ribosomal protein L6

Chain E:

88%   10%   •

K41 G42 L52 R58 T94 V99 K103 N104 G105 K111 L128 L153 T157 L168 L175 T179 F196 V197 I198 A199 T202 L215 Y219 F220 K221 V256 I260 F291
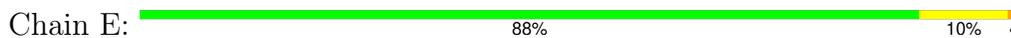
- Molecule 7: 60S ribosomal protein L7

Chain F:

87%   13%

N23 F36 M40 Y64 I68 P86 F90 V91 I92 R93 I94 N118 L124 M131 L132 V135 I139 A140 W141 I153 R156 K164 R165 I166 L178 L189 I190 L212 H225 F226 V227 D231 E236 N240 I243 N247

- Molecule 8: 60S ribosomal protein L7a

Chain G:

93%   7%

V27 L51 V55 Q66 I69 V147 A158 V161 V167 L173 M177 G178 V179 L215 V219 R223 N227 E260

- Molecule 9: 60S ribosomal protein L9

Chain H:

87%   13%

M1 L34 I41 K65 E66 T69 V70 I73 M80 V84 F88 M92 V95 L111 I118 R125 E147 G148 N149 D150 V154 I161 T165 T166 V167 V181 V187 A190
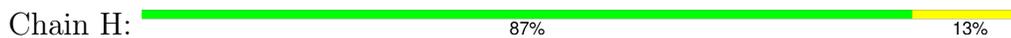
- Molecule 10: 60S ribosomal protein L10

Chain I:

88%   6%   7%

G2 R3 R4 R38 A41 K42 V43 D44 E45 R90 L91 I99 N100 LYS MET LEU SER CYS ALA GLY ALA ASP ARG LEU GLN THR GLY M115 I135 R139 L190 V197 S214
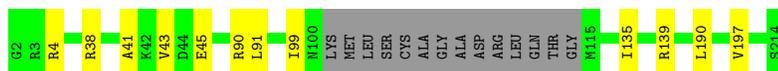
- Molecule 11: Large ribosomal subunit protein uL5

Chain J:

87%   13%

K8 M12 L15 L22 V26 G27 E28 R32 T56 I62 I68 L83 L87 K88 V89 I109 Q110 E111 H112 I113 Y119 L128 D129 F130 Y131 V132 W165 F166 G177
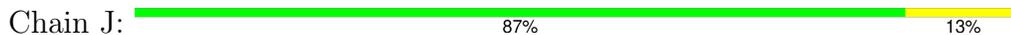
- Molecule 12: 60S ribosomal protein L13

Chain L:

90%   10%

A2 I9 I58 V59 G73 E79 V83 I86 T93 I94 G95 I96 R102 R103 N104 T107 L110 R116 R121 L126 L182 R183 M184 D206

• Molecule 13: Large ribosomal subunit protein eL14

Chain M: 88%   12%

V2 L24 V25 A36 G40 F52 T58 W86 W91 T105 D106 F107 K117 M118 I123 E126 V127 L130 K137

• Molecule 14: Ribosomal protein L15

Chain N: 95%   5%

G2 V101 L134 I135 R169 R172 G173 L174 T183 R193 T197 R204

• Molecule 15: 60S ribosomal protein L13a

Chain O: 89%   11% •

Q5 L9 K25 L29 F47 Y54 I79 T83 M87 V120 I124 L125 V126 V127 A136 L141 V145 Q180 A181 E182 K191 D194 V195 T198 V203

• Molecule 16: 60S ribosomal protein L17

Chain P: 97%   •

V2 S14 L112 E115 L150 T151 E154

• Molecule 17: 60S ribosomal protein L18

Chain Q: 88%   12%

G2 P18 L25 V29 F34 R38 T39 T42 V46 K49 M53 L61 M66 L72 G84 D88 L103 R104 V105 A109 D124 L128 V167 E175 N188

• Molecule 18: Large ribosomal subunit protein eL20

Chain S: 94%   6%

M1 Y28 F33 V38 V39 W45 I61 T102 V106 M113 A119 I124 F176

• Molecule 19: Large ribosomal subunit protein eL21

Chain T: 94%   6%

T2 M45 T61 V76 V80 I84 L85 E94 F105 V109 L151 A160

- Molecule 20: 60S ribosomal protein L22

Chain U: 81% 19%

Q17 T22 L23 D24 C25 V29 I33 A36 F39 L43 I47 L56 I63 E64 R65 V72 L83 L86 T87 L96 L100 L112 F115
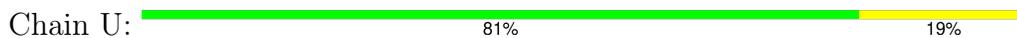
- Molecule 21: Large ribosomal subunit protein uL14

Chain V: 85% 15%

S10 L18 I26 T32 I40 S41 V42 I45 A54 M62 A63 T64 V65 L72 F95 L96 Y97 N101 I105 M112 A126 A133 A140

- Molecule 22: Ribosomal protein L19

Chain W: 94% 6%

S2 P26 T29 I32 G48 I51 R97 I101 K126 V127 K128 V131 K135 K181
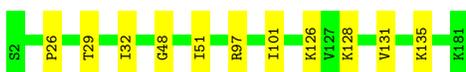
- Molecule 23: Large ribosomal subunit protein uL23

Chain X: 89% 11%

K39 Y74 K78 F79 P80 L81 T82 T83 A86 I90 I99 V102 I128 E133 R139 A146 I156
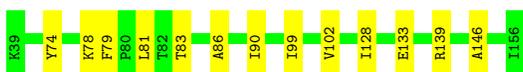
- Molecule 24: 60S ribosomal protein L26

Chain Y: 89% 11%

M1 V7 V55 V58 R59 I67 K77 Y78 V79 I80 P101 S102 K103 V104 V105 I106 L109 K110 G133 K134

- Molecule 25: 60S ribosomal protein L27

Chain Z: 88% 12%

G2 M5 V10 L14 A41 I46 V53 I62 I68 Y77 M81 V87 V95 V96 E120 T124 F136
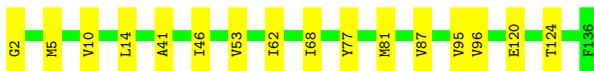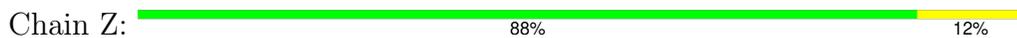
- Molecule 26: 60S ribosomal protein L27a

Chain a: 92% 8%

P2 H25 V5 N39 I43 W79 V82 I101 L112 K116 V122 I137 C144 V145 L146 V147 A148

- Molecule 27: 60S ribosomal protein L29

Chain b:　　　69%　　　・　　　29%

A2 L32 N60 ASN ALA LYS ALA MET SER ALA ARG ALA GLU ALA ILE VAL ASN ARG LYS LEU ALA ARG LEU ALA TYR ILE ALA HIS PRO LYS LEU GLY LYS R107 I112 P121

- Molecule 28: Large ribosomal subunit protein eL31

Chain d:　　　93%　　　7%

N18 E19 V20 I29 V86 R90 K91 L102 T107 E124

- Molecule 29: 60S ribosomal protein L32

Chain e:　　　88%　　　12%

A2 I12 V29 R33 I58 M69 L78 V79 L85 E86 V87 L88 L89 M90 I99 R108 V112 A119 L129
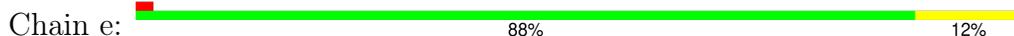
- Molecule 30: Large ribosomal subunit protein eL33

Chain f:　　　83%　　　15%　　　・

M1 L27 V33 Y42 A48 Y49 V50 Y51 V58 T59 V69 I70 W71 H78 V84 R85 A94 R100 I101 M104 L105 I110

- Molecule 31: Large ribosomal subunit protein eL34

Chain g:　　　96%　　　・

V2 Y32 L33 K92 L96 A111

- Molecule 32: Large ribosomal subunit protein uL29

Chain h:　　　86%　　　14%

K3 L9 L21 L24 K25 V26 E27 L28 L31 V36 A41 L44 I47 V50 V57 L58 T59 Q63 L116 R117 A123

- Molecule 33: 60S ribosomal protein L36

Chain i:　　　93%　　　7%

A2 N20 L33 T34 K35 H36 T37 K38 F39 V40 R41 K103

• Molecule 34: Ribosomal protein L37

Chain j: 95%   5%

T2 T5 A53 T59 M64 K87

• Molecule 35: Large ribosomal subunit protein eL38

Chain k: 91%   9%

P2 I8 F11 K24 I25 K26 L45 L69 K70

• Molecule 36: 60S ribosomal protein L39

Chain l: 94%   6%

S2 L13 R46 T47 L51

• Molecule 37: Ubiquitin-ribosomal protein eL40 fusion protein

Chain m: 94%   6%

I77 L82 L85 I95 V127

• Molecule 38: 60S ribosomal protein L41

Chain n: 92%

M1 M10 K25

• Molecule 39: 60S ribosomal protein L36a

Chain o: 92%   8%

V2 T7 H21 K22 V23 T52 L70 M82 L83 F106
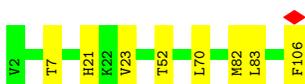
• Molecule 40: Large ribosomal subunit protein eL43

Chain p: 84%   16%
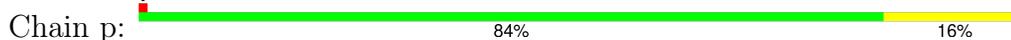
• Molecule 41: Large ribosomal subunit protein eL28

Chain r:

• Molecule 42: 60S acidic ribosomal protein P0

Chain s:

• Molecule 43: 60S ribosomal protein L12

Chain t:
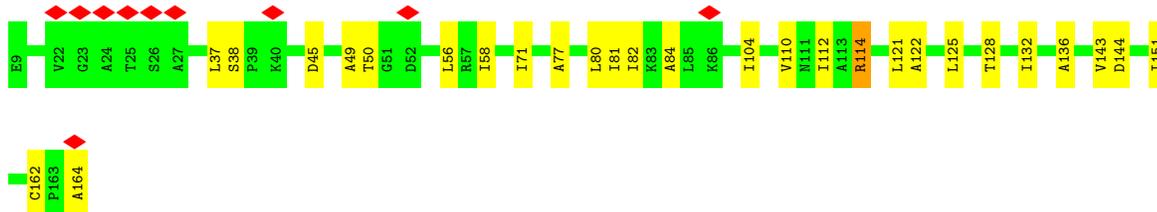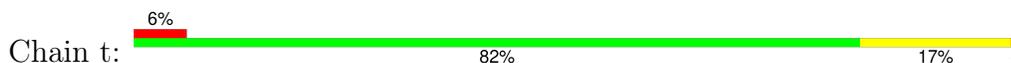
• Molecule 44: Large ribosomal subunit protein eL30

Chain u:
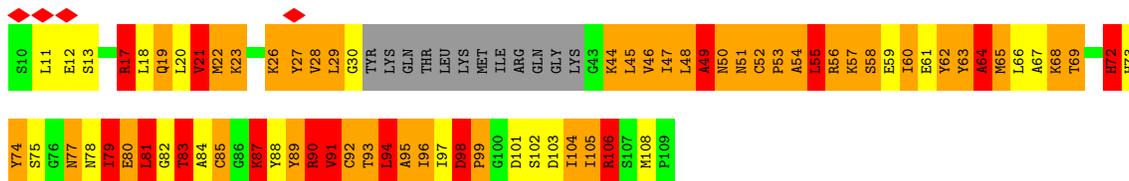
• Molecule 45: 40S ribosomal protein S27

Chain bb:

• Molecule 46: 40S ribosomal protein S30

Chain ee:

S79 L80 V83 S133

• Molecule 47: 40S ribosomal protein S26

Chain aa:　72%　27%

T2 R22 C23 T24 N25 C26 A27 R28 C29 N43 I44 V45 E46 A47 A48 A49 V50 R51 D52 I53 S54 E55 A56 S57 V58 F59 V63 L64 P65 K66 L67 Y68 V69 Y73 P99

• Molecule 48: 40S ribosomal protein S2

Chain CC:　86%　14%

E59 K65 Y82 L83 F84 P87 I88 K89 I109 A126 I130 I162 V165 Y169 K173 V184 V191 L195 A198 T202 G203 I204 L214 F236 I244 L251 E258 T259 V260 F261 T262 K263 S264 P265 V266 Q267 E268 F269 T270

L273 V274 K275 T276
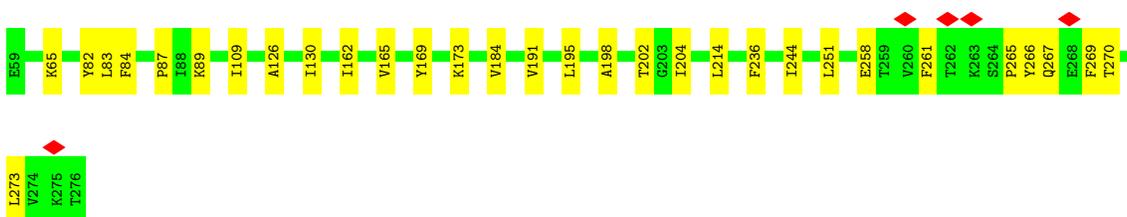
• Molecule 49: 40S ribosomal protein S4, X isoform

Chain EE:　88%　12%

A2 R11 M19 A28 L44 F47 M66 I70 K71 I72 V76 R77 I80 T81 Y82 I90 S91 I92 R100 L101 I102 I147 D151 I154 I160 Q161 I162 I169 V183 I192 T196 V207 K211 A219 T220 K242

S262 G263
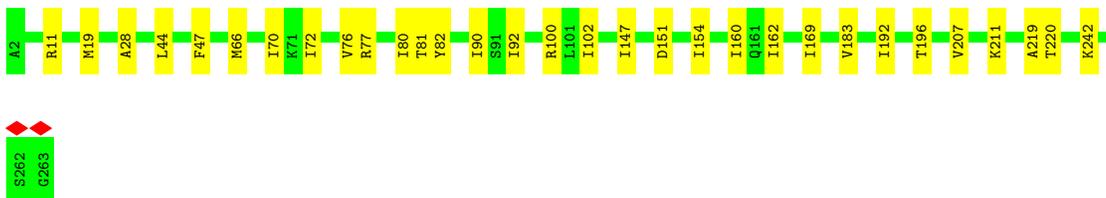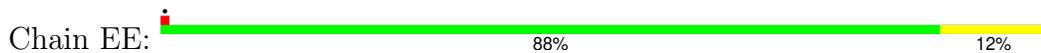
• Molecule 50: 40S ribosomal protein S6

Chain GG:　91%　9%

M1 K2 L3 N4 I5 S6 F7 P8 A9 T10 V50 L106 L109 N110 L111 V112 I113 L124 L133 A138 I141 V153 V157 V158 R159 R170 A173 R178 I228

• Molecule 51: 40S ribosomal protein S7

Chain HH:　89%　8%

S5 G13 E14 L30 L36 L40 E50 V53 GLY GLY GLY R57 I60 I61 L69 I75 I95 A96 K107 S108 ARG THR LYS N112 R116 T121 V166 V170 L194
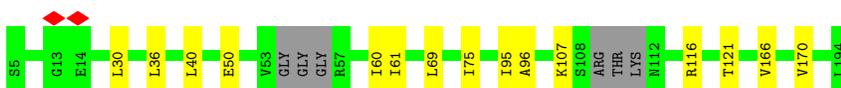
• Molecule 52: 40S ribosomal protein S8

Chain II:　89%　11%

G2 L29 G30 R31 I43 V48 L60 S66 T73 V81 V82 Y83 N84 L90 V91 C100 Y113 L121 K125 K144 I145 I158 F166 C174 I175 L190 E194 G207
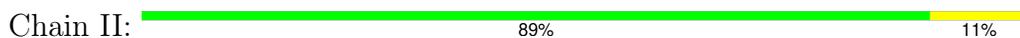
• Molecule 53: Small ribosomal subunit protein uS4

Chain JJ:

91%　　9%

P2 V3 I32 K40 V46 L50 I53 L61 R70 L78 L81 I97 F105 L106 I130 I135 I144 G181

• Molecule 54: Small ribosomal subunit protein uS17

Chain LL:

86%　　9%　5%

D3 Q18 V23 LEU LEU GLY THR GLY LYS GLU K32 L33 I72 L73 T78 R89 R90 L93 F102 E103 V111 V128 F140 T151
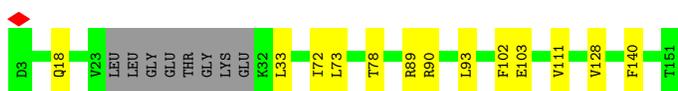
• Molecule 55: Small ribosomal subunit protein uS15

Chain NN:

86%　　14%

G2 R3 M4 L40 K43 I53 G59 V60 A61 Q62 V63 I71 L88 K94 V98 L102 K112 F113 R114 L115 I116 L117 L125 Y129 L135 V150

• Molecule 56: 40S ribosomal protein S21

Chain VV:

7%　23%　42%　28%

M1 Q2 N3 D4 A5 G6 E7 F8 V9 D10 L11 Y12 V13 P14 R15 K16 C17 S18 A19 S20 N21 R22 I23 I24 G25 A26 K27 D28 H29 A30 S31 I32 Q33 M34 N35 V36 A37 E38 V39 D40 K41 V42 T43 G44 R45 F46 N47 G48 Q49 F50 K51 T52 Y53 A54 I55 C56 G57 A58 I59 R60

R61 M62 G63 E64 S65 D66 D67 S68 I69 L70 R71 L72 A73 K74 S75 D76 G77 I78 V79 S80 Q81 N82 F83
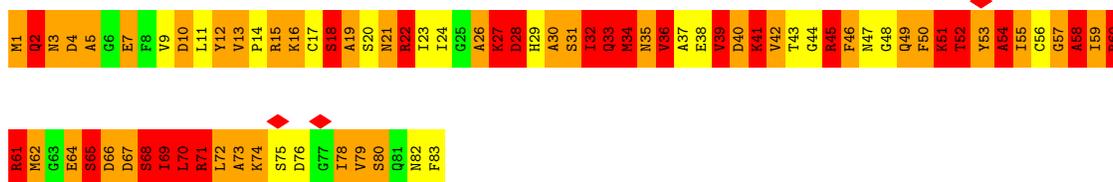
• Molecule 57: Small ribosomal subunit protein uS8

Chain WW:

81%　　19%

V2 R3 M4 N5 V6 L7 L26 C30 V33 I34 V35 T39 Y46 I47 I52 K60 I61 L69 V74 I75 L83 L86 L93 L94 G100 V103 L126 F130
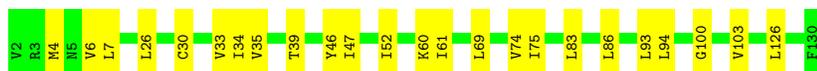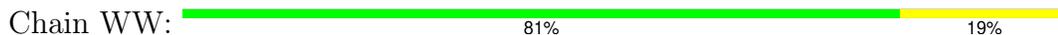
• Molecule 58: Small ribosomal subunit protein uS12

Chain XX:

85%　　14%

G2 T9 A10 R14 V51 V55 R67 V70 R71 N87 D88 G89 C90 L91 I94 F105 G106 R107 H110 A111 V112 I115 V118 V128 L133 K138 R142
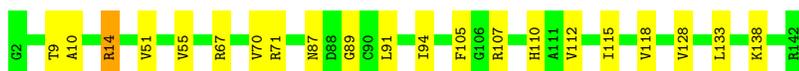
• Molecule 59: 40S ribosomal protein S24

Chain YY:

• Molecule 60: 40S ribosomal protein S28

Chain cc:
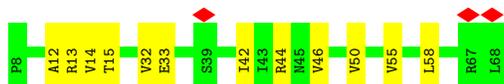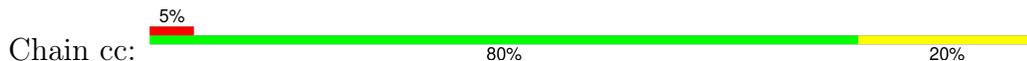
• Molecule 61: Ubiquitin-ribosomal protein eS31 fusion protein

Chain ff:

• Molecule 62: Small ribosomal subunit protein RACK1

Chain gg:
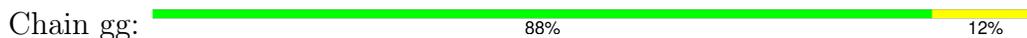
• Molecule 63: Small ribosomal subunit protein uS14

Chain dd:

• Molecule 64: Small ribosomal subunit protein uS2

Chain AA:

L122 V123 V124 T125 D126 P127 R128 A129 D130 H131 Q132 P133 L134 T135 E136 A137 S138 Y139 V140 N141 L142 P143 T144 I145 A146 L147 C148 N149 T150 D151 S152 P153 L154 R155 Y156 V157 D158 I159 A160 I161 P162 C163 N164 N165 K166 G167 A168 H169 S170 V171 G172 L173 M174 W175 W176 M177 L178 A179 R180 E181

V182 L183 R184 M185 R186 G187 T188 I189 S190 R191 E192 H193 P194 W195 E196 V197 M198 P199 D200 L201 Y202 F203 Y204 R205 D206 P207 E208 E209 I210 E211 K212 E213 E214

- Molecule 65: Small ribosomal subunit protein uS3

Chain DD: 93% 7%

V3 F24 E28 L29 I66 L69 V72 K75 L86 L96 Q101 I126 H159 V164 L176 L190 K227

- Molecule 66: Small ribosomal subunit protein uS7

Chain FF: 85% 13%

D16 I17 K18 L19 D27 V28 L35 I39 A46 K47 Y48 L87 M88 I99 I100 T104 L109 L112 I116 I117 G129 ARG ALA GLY T133 V147 I151 W152 T156 R159 I166 L177 E195 V199 R204

- Molecule 67: Small ribosomal subunit protein eS10

Chain KK: 93% 7%

M1 L15 V22 M49 Y68 W69 V90 L94 R95 R96

- Molecule 68: 40S ribosomal protein S12

Chain MM: 81% 19%

G9 G10 L22 K23 T24 I27 A41 L42 D43 H48 L49 C50 V51 L52 V62 K63 L64 V65 L68 I74 W88 V89 R96 R101 K102 V103 V104 S107 C108 V109 V110 K132

- Molecule 69: 40S ribosomal protein S15

Chain PP: 96%

R13 L22 L25 K108 M111 I112 R130

- Molecule 70: Small ribosomal subunit protein uS9

Chain QQ: 91% 9%

P6 F13 K16 K17 V22 L31 I32 R45 H77 V78 I81 S89 V93 R146

• Molecule 71: Small ribosomal subunit protein uS13

Chain SS:

• Molecule 72: Small ribosomal subunit protein eS19

Chain TT:

• Molecule 73: 40S ribosomal protein S20

Chain UU:

• Molecule 74: 40S ribosomal protein S25

Chain ZZ:

• Molecule 75: eEF2

Chain EF:
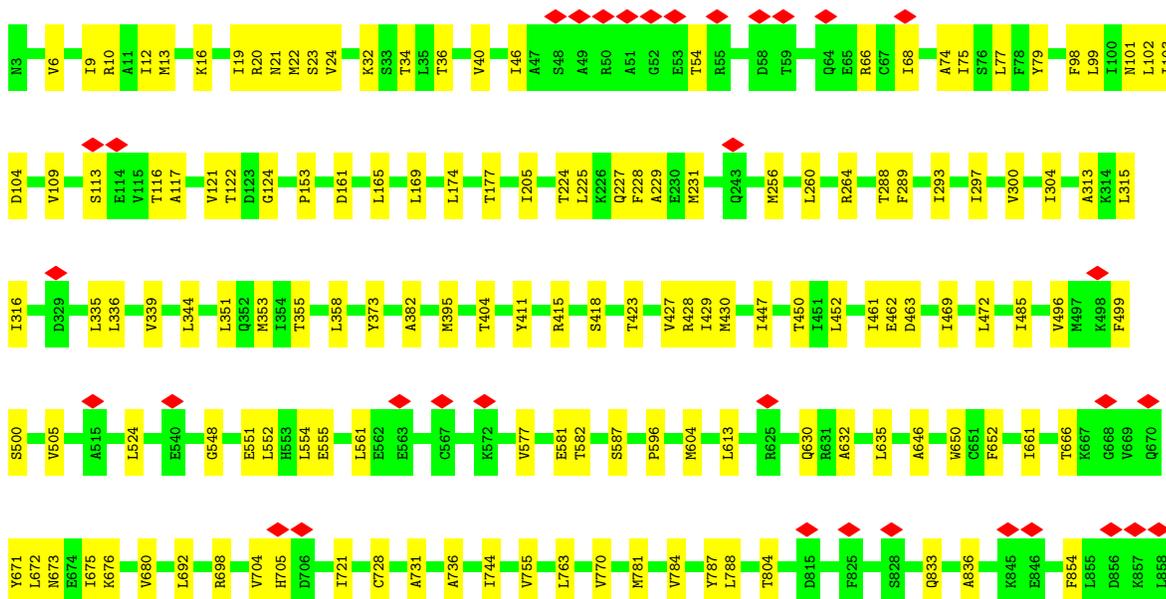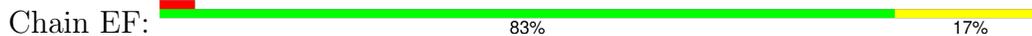
• Molecule 76: P/E tRNA (77-MER)

Chain Cc:

64%   32%   •

• Molecule 77: LSU alpha rRNA

Chain A5:

62%   35%   •
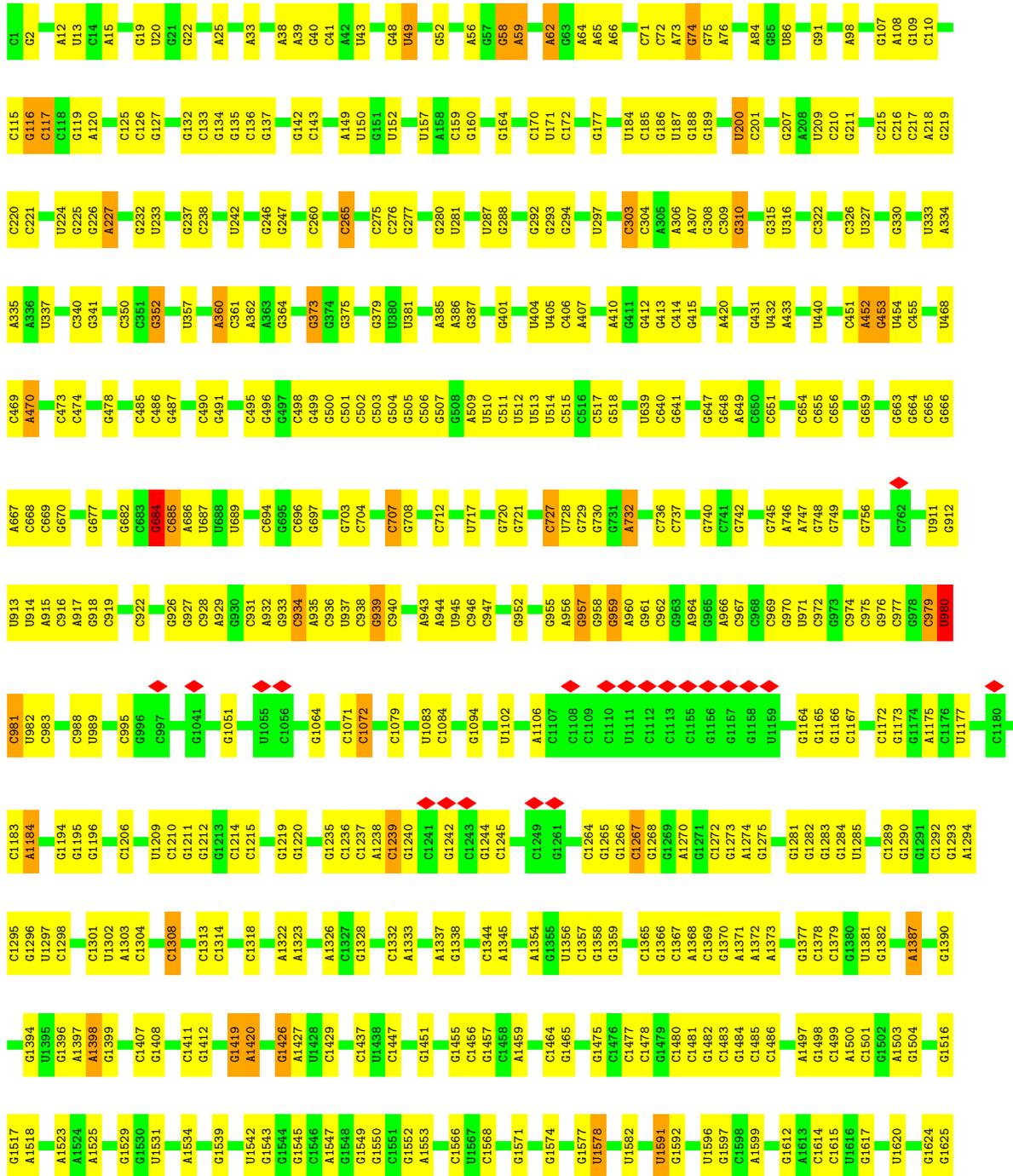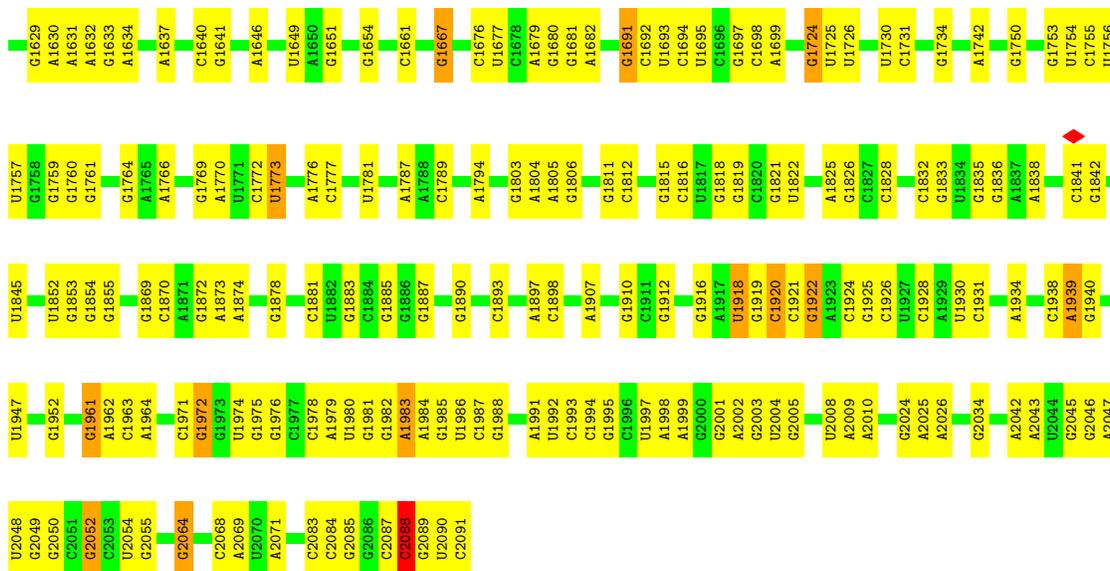
• Molecule 78: 5S ribosomal RNA

Chain A7:
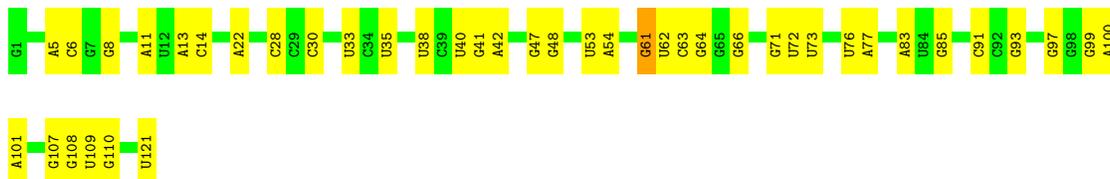
• Molecule 79: 5.8S ribosomal RNA

Chain A8:
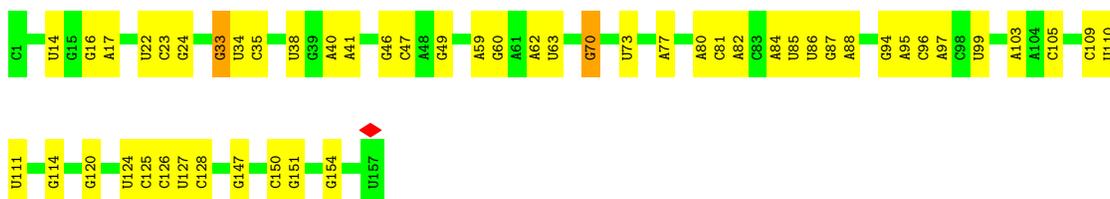
• Molecule 80: 18S ribosomal RNA

Chain B2:
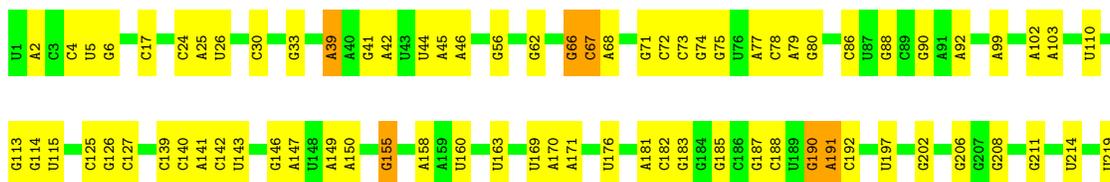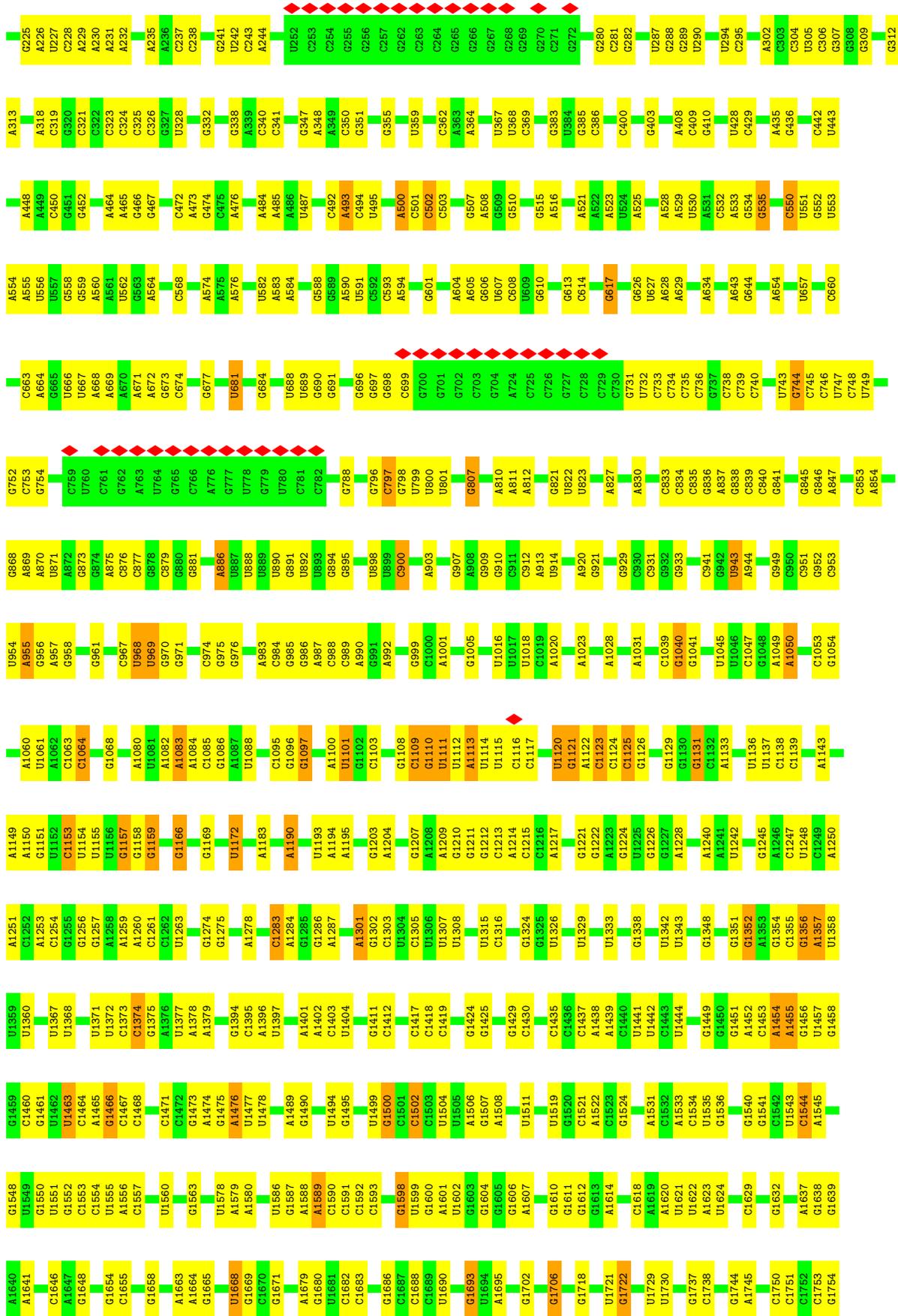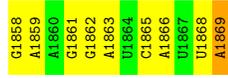
• Molecule 81: LSU beta rRNA

Chain A6:
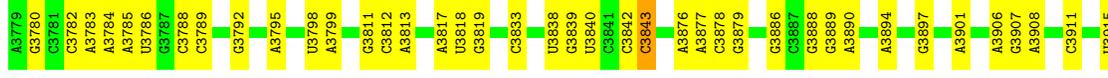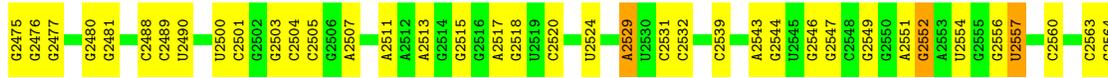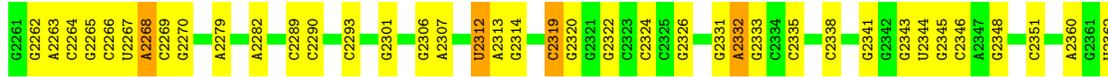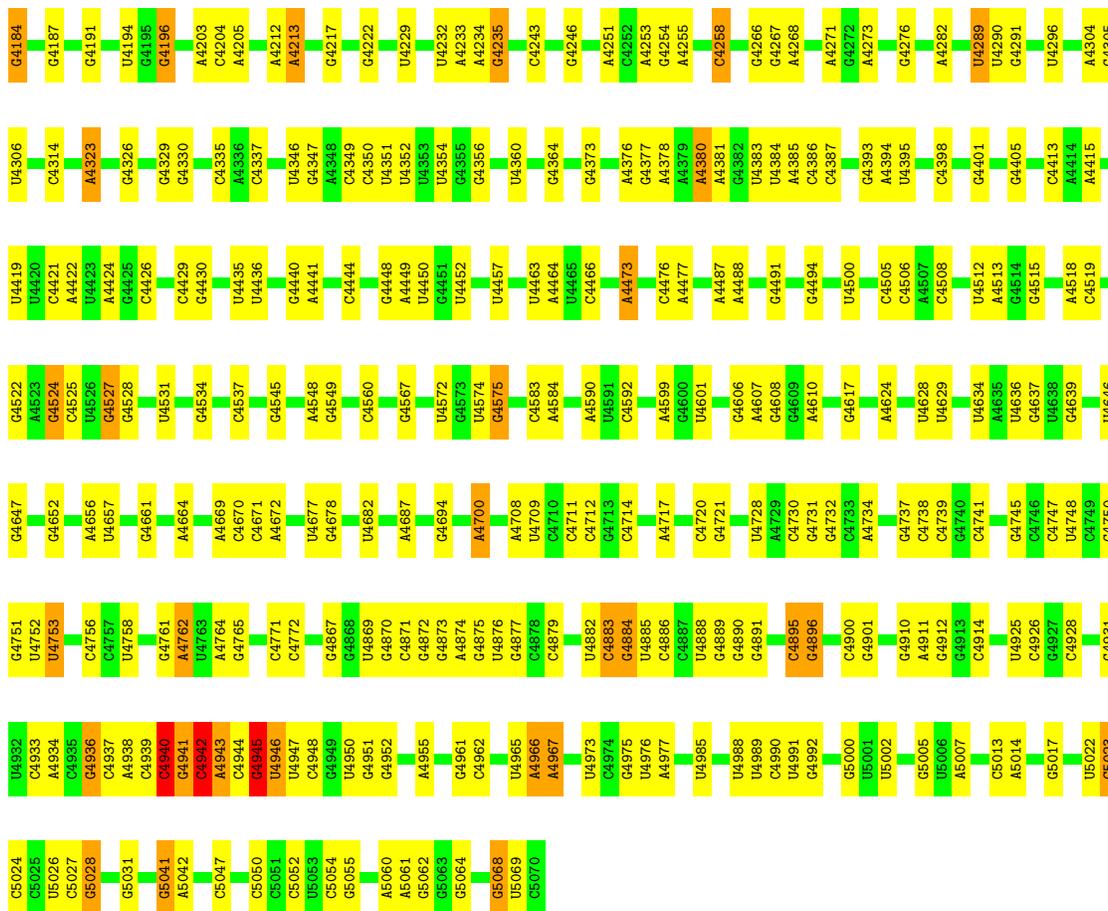
• Molecule 82: 40S ribosomal protein S3a

Chain BB:
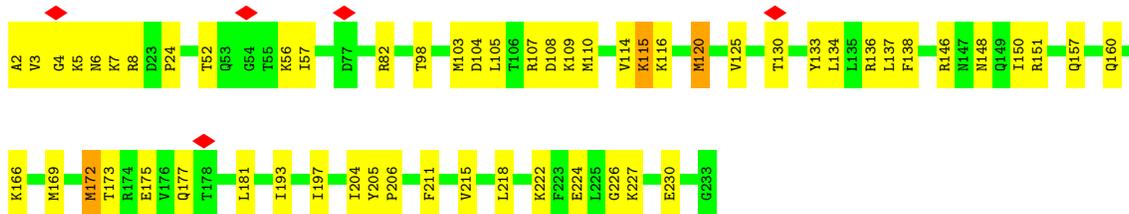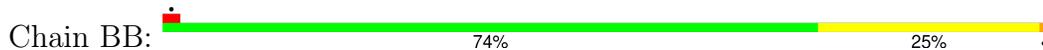
• Molecule 83: 40S ribosomal protein S14

Chain OO:

• Molecule 84: Small ribosomal subunit protein eS17

Chain RR:

20%

55%

44%
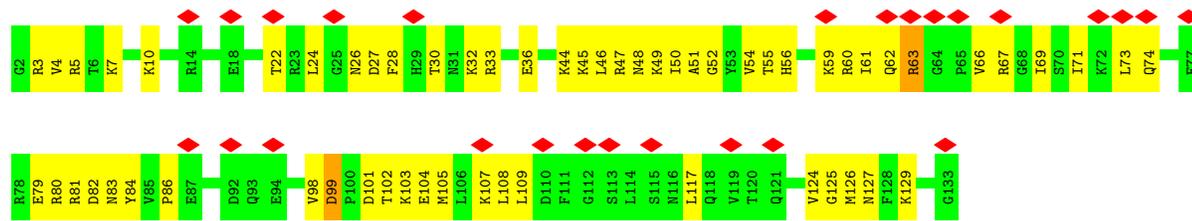
4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	Not provided	
Resolution determination method	Not provided	
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.059	Depositor
Minimum map value	-0.020	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	459.8, 459.8, 459.8	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.045, 1.045, 1.045	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ACE, MG, NMM, HIC, ZN, MLZ, M3L, V5N

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	0.22	0/1936	0.48	0/2596
2	B	0.20	0/3261	0.47	0/4364
3	C	0.21	0/2948	0.45	0/3959
4	c	0.24	0/952	0.50	0/1262
5	D	0.21	0/2435	0.47	0/3261
6	E	2.87	8/1822 (0.4%)	1.05	11/2442 (0.5%)
7	F	0.22	0/1911	0.51	0/2549
8	G	0.22	0/1772	0.49	0/2387
9	H	0.22	0/1535	0.45	0/2063
10	I	0.20	0/1658	0.45	0/2214
11	J	0.20	0/1385	0.47	0/1852
12	L	0.20	0/1689	0.46	0/2261
13	M	0.20	0/1146	0.43	0/1531
14	N	0.21	0/1746	0.46	0/2338
15	O	0.24	0/1662	0.52	1/2222 (0.0%)
16	P	0.23	0/1268	0.51	0/1700
17	Q	0.19	0/1537	0.46	0/2052
18	S	0.20	0/1501	0.44	0/2013
19	T	0.22	0/1326	0.50	0/1770
20	U	0.21	0/822	0.51	0/1103
21	V	0.24	0/986	0.58	1/1323 (0.1%)
22	W	0.26	0/1524	0.61	0/2013
23	X	0.20	0/984	0.41	0/1323
24	Y	0.25	0/1132	0.50	0/1504
25	Z	0.18	0/1130	0.41	0/1507
26	a	0.17	0/1179	0.41	0/1572
27	b	0.21	0/619	0.50	0/814
28	d	0.22	0/903	0.47	0/1216
29	e	0.21	0/1071	0.47	0/1429
30	f	2.83	4/903 (0.4%)	1.02	6/1208 (0.5%)
31	g	0.19	0/883	0.45	0/1177
32	h	0.22	0/1019	0.51	0/1344

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	i	0.20	0/841	0.51	0/1112
34	j	0.21	0/720	0.50	0/952
35	k	0.20	0/575	0.42	0/761
36	l	0.21	0/459	0.50	0/608
37	m	0.23	0/416	0.55	0/553
38	n	0.28	0/240	0.58	0/305
39	o	0.19	0/866	0.43	0/1141
40	p	0.23	0/718	0.51	0/953
41	r	0.25	0/1028	0.54	0/1377
42	s	0.22	0/837	0.50	0/1121
43	t	0.28	0/1193	0.57	0/1609
44	u	1.58	12/681 (1.8%)	2.72	69/916 (7.5%)
45	bb	0.17	0/653	0.42	0/876
46	ee	0.22	0/399	0.55	0/520
47	aa	0.26	0/794	0.58	0/1065
48	CC	0.23	0/1721	0.46	0/2328
49	EE	0.19	0/2118	0.42	0/2849
50	GG	0.20	0/1871	0.46	0/2492
51	HH	0.19	0/1511	0.40	0/2023
52	II	0.18	0/1715	0.41	0/2287
53	JJ	0.18	0/1524	0.40	0/2035
54	LL	0.28	0/1177	0.52	0/1575
55	NN	0.22	0/1226	0.45	0/1649
56	VV	1.68	16/644 (2.5%)	3.01	88/862 (10.2%)
57	WW	0.21	0/1051	0.50	0/1406
58	XX	0.23	0/1115	0.51	0/1486
59	YY	0.18	0/1032	0.45	0/1371
60	cc	0.23	0/481	0.53	0/643
61	ff	0.22	0/560	0.52	0/745
62	gg	0.20	0/2493	0.48	0/3394
63	dd	0.27	0/470	0.62	0/623
64	AA	1.64	29/1662 (1.7%)	3.25	271/2259 (12.0%)
65	DD	0.20	0/1779	0.43	0/2395
66	FF	0.21	0/1495	0.50	0/2008
67	KK	0.28	0/834	0.57	0/1125
68	MM	0.22	0/968	0.52	1/1296 (0.1%)
69	PP	0.21	0/997	0.46	0/1330
70	QQ	0.21	0/1142	0.50	0/1528
71	SS	0.21	0/1209	0.47	0/1620
72	TT	0.21	0/1102	0.49	0/1476
73	UU	0.20	0/800	0.51	0/1074
74	ZZ	0.31	0/604	0.59	0/810
75	EF	0.24	0/6800	0.55	0/9184

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
76	Cc	0.17	0/1836	0.37	0/2859
77	A5	0.78	11/40680 (0.0%)	0.45	9/63377 (0.0%)
78	A7	0.18	0/2880	0.37	0/4489
79	A8	0.18	0/3723	0.41	0/5800
80	B2	0.18	0/42627	0.42	0/66334
81	A6	0.75	13/48903 (0.0%)	0.42	3/76100 (0.0%)
82	BB	1.60	2/1794 (0.1%)	0.74	4/2396 (0.2%)
83	OO	0.22	0/1015	0.53	0/1361
84	RR	0.28	0/1082	0.63	0/1452
All	All	0.62	95/241706 (0.0%)	0.57	464/354279 (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
3	C	0	1
4	c	0	2
6	E	0	1
12	L	0	2
23	X	0	1
26	a	0	2
30	f	0	1
38	n	0	1
43	t	0	1
44	u	0	4
47	aa	0	2
50	GG	0	1
56	VV	0	14
58	XX	0	1
63	dd	0	1
64	AA	0	19
66	FF	0	1
75	EF	0	1
81	A6	1	0
All	All	1	56

The worst 5 of 95 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	E	104	ASN	CA-C	105.00	2.49	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
30	f	58	VAL	CA-CB	82.92	2.67	1.54
82	BB	115	LYS	CA-CB	66.18	2.48	1.53
77	A5	684	G	O4'-C1'	61.83	2.65	1.41
77	A5	980	U	C4'-O4'	59.57	2.64	1.45

The worst 5 of 464 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
64	AA	152	SER	N-CA-C	18.92	125.25	108.22
6	E	104	ASN	O-C-N	-18.12	102.81	122.38
6	E	221	LYS	N-CA-C	-17.89	80.51	108.96
64	AA	182	VAL	N-CA-C	-17.12	93.16	110.62
6	E	104	ASN	N-CA-CB	-16.86	84.43	110.39

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
81	A6	4942	C	C1'

5 of 56 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	C	95	MET	Peptide
6	E	104	ASN	Peptide
12	L	102	ARG	Peptide
4	c	1	MET	Peptide
4	c	94	ARG	Sidechain

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	1898	0	1993	15	0
2	B	3206	0	3353	23	0
3	C	2895	0	3064	25	0
4	c	938	0	990	12	0
5	D	2389	0	2423	23	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	E	1789	0	1941	89	0
7	F	1875	0	1995	17	0
8	G	1741	0	1861	10	0
9	H	1516	0	1597	20	0
10	I	1620	0	1663	10	0
11	J	1362	0	1399	17	0
12	L	1658	0	1766	14	0
13	M	1125	0	1198	15	0
14	N	1701	0	1749	8	0
15	O	1630	0	1778	21	0
16	P	1242	0	1274	4	0
17	Q	1512	0	1629	19	0
18	S	1461	0	1502	9	0
19	T	1298	0	1366	6	0
20	U	808	0	831	16	0
21	V	973	0	1032	16	0
22	W	1508	0	1664	10	0
23	X	967	0	1040	11	0
24	Y	1115	0	1205	11	0
25	Z	1107	0	1182	11	0
26	a	1163	0	1202	12	0
27	b	620	0	665	3	0
28	d	888	0	930	5	0
29	e	1053	0	1147	13	0
30	f	884	0	924	47	0
31	g	873	0	964	6	0
32	h	1011	0	1150	14	0
33	i	830	0	916	8	0
34	j	705	0	737	5	0
35	k	569	0	637	4	0
36	l	447	0	480	3	0
37	m	422	0	458	3	0
38	n	239	0	289	2	0
39	o	863	0	929	8	0
40	p	708	0	756	21	0
41	r	1015	0	1085	9	0
42	s	825	0	866	4	0
43	t	1178	0	1235	18	0
44	u	672	0	689	138	0
45	bb	640	0	665	6	0
46	ee	398	0	443	3	0
47	aa	781	0	821	288	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
48	CC	1685	0	1768	53	0
49	EE	2076	0	2177	24	0
50	GG	1848	0	2000	14	0
51	HH	1490	0	1583	10	0
52	II	1686	0	1772	15	0
53	JJ	1499	0	1618	11	0
54	LL	1157	0	1223	13	0
55	NN	1202	0	1289	16	0
56	VV	637	0	630	231	0
57	WW	1034	0	1080	19	0
58	XX	1098	0	1167	19	0
59	YY	1015	0	1086	6	0
60	cc	479	0	507	7	0
61	ff	548	0	552	2	0
62	gg	2436	0	2392	108	0
63	dd	459	0	448	4	0
64	AA	1625	0	1609	572	0
65	DD	1751	0	1846	10	0
66	FF	1475	0	1527	17	0
67	KK	810	0	836	6	0
68	MM	958	0	993	16	0
69	PP	979	0	1029	4	0
70	QQ	1124	0	1193	8	0
71	SS	1193	0	1253	11	0
72	TT	1097	0	1125	7	0
73	UU	790	0	857	6	0
74	ZZ	598	0	656	16	0
75	EF	6669	0	6742	99	0
76	Cc	1644	0	837	5	0
77	A5	36419	0	18340	161	0
78	A7	2578	0	1306	10	0
79	A8	3334	0	1693	11	0
80	B2	38185	0	19135	634	0
81	A6	43819	0	21847	237	0
82	BB	1768	0	1837	277	0
83	OO	1002	0	1009	360	0
84	RR	1068	0	1093	467	0
85	A5	7	0	0	0	0
85	A6	7	0	0	0	0
85	A8	1	0	0	0	0
85	B2	6	0	0	0	0
85	BB	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
85	P	1	0	0	0	0
85	a	1	0	0	0	0
85	l	1	0	0	0	0
86	aa	1	0	0	0	0
86	dd	1	0	0	0	0
86	ff	1	0	0	0	0
86	g	1	0	0	0	0
86	j	1	0	0	0	0
86	m	1	0	0	0	0
86	o	1	0	0	0	0
86	p	1	0	0	0	0
87	A6	1	0	0	0	0
All	All	225388	0	167538	2943	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 8.

The worst 5 of 2943 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)
64:AA:180:ARG:HD2	64:AA:195:TRP:CH2	1.27	1.69
47:aa:29:CYS:SG	83:OO:146:ARG:HA	1.34	1.61
47:aa:67:LEU:HD13	83:OO:108:PRO:CD	1.18	1.59
47:aa:69:VAL:CG2	83:OO:107:THR:H	1.08	1.59
47:aa:67:LEU:HD13	83:OO:108:PRO:CG	1.28	1.58

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	246/248 (99%)	228 (93%)	18 (7%)	0	100	100
2	B	395/398 (99%)	361 (91%)	34 (9%)	0	100	100
3	C	361/363 (99%)	348 (96%)	13 (4%)	0	100	100
4	c	111/121 (92%)	104 (94%)	6 (5%)	1 (1%)	14	51
5	D	291/293 (99%)	271 (93%)	20 (7%)	0	100	100
6	E	217/224 (97%)	197 (91%)	20 (9%)	0	100	100
7	F	223/225 (99%)	208 (93%)	15 (7%)	0	100	100
8	G	211/215 (98%)	201 (95%)	10 (5%)	0	100	100
9	H	188/190 (99%)	177 (94%)	11 (6%)	0	100	100
10	I	195/213 (92%)	186 (95%)	9 (5%)	0	100	100
11	J	168/170 (99%)	154 (92%)	14 (8%)	0	100	100
12	L	203/205 (99%)	192 (95%)	11 (5%)	0	100	100
13	M	134/136 (98%)	128 (96%)	6 (4%)	0	100	100
14	N	201/203 (99%)	185 (92%)	16 (8%)	0	100	100
15	O	197/199 (99%)	189 (96%)	8 (4%)	0	100	100
16	P	151/153 (99%)	145 (96%)	6 (4%)	0	100	100
17	Q	185/187 (99%)	171 (92%)	14 (8%)	0	100	100
18	S	174/176 (99%)	165 (95%)	9 (5%)	0	100	100
19	T	157/159 (99%)	148 (94%)	9 (6%)	0	100	100
20	U	97/99 (98%)	95 (98%)	2 (2%)	0	100	100
21	V	129/131 (98%)	115 (89%)	14 (11%)	0	100	100
22	W	178/180 (99%)	173 (97%)	5 (3%)	0	100	100
23	X	116/118 (98%)	107 (92%)	9 (8%)	0	100	100
24	Y	132/134 (98%)	127 (96%)	5 (4%)	0	100	100
25	Z	133/135 (98%)	124 (93%)	9 (7%)	0	100	100
26	a	144/147 (98%)	138 (96%)	6 (4%)	0	100	100
27	b	69/104 (66%)	67 (97%)	2 (3%)	0	100	100
28	d	105/107 (98%)	98 (93%)	7 (7%)	0	100	100
29	e	126/128 (98%)	119 (94%)	7 (6%)	0	100	100
30	f	108/110 (98%)	99 (92%)	9 (8%)	0	100	100
31	g	108/110 (98%)	101 (94%)	7 (6%)	0	100	100
32	h	119/121 (98%)	115 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
33	i	100/102 (98%)	95 (95%)	5 (5%)	0	100	100
34	j	84/86 (98%)	79 (94%)	5 (6%)	0	100	100
35	k	67/69 (97%)	67 (100%)	0	0	100	100
36	l	48/50 (96%)	46 (96%)	2 (4%)	0	100	100
37	m	48/51 (94%)	45 (94%)	3 (6%)	0	100	100
38	n	23/25 (92%)	23 (100%)	0	0	100	100
39	o	102/105 (97%)	93 (91%)	9 (9%)	0	100	100
40	p	89/91 (98%)	82 (92%)	7 (8%)	0	100	100
41	r	125/127 (98%)	116 (93%)	9 (7%)	0	100	100
42	s	101/103 (98%)	94 (93%)	7 (7%)	0	100	100
43	t	154/156 (99%)	140 (91%)	14 (9%)	0	100	100
44	u	84/100 (84%)	81 (96%)	2 (2%)	1 (1%)	11	44
45	bb	80/82 (98%)	75 (94%)	5 (6%)	0	100	100
46	ee	45/49 (92%)	43 (96%)	2 (4%)	0	100	100
47	aa	96/98 (98%)	79 (82%)	17 (18%)	0	100	100
48	CC	216/218 (99%)	199 (92%)	17 (8%)	0	100	100
49	EE	260/262 (99%)	249 (96%)	11 (4%)	0	100	100
50	GG	226/228 (99%)	212 (94%)	14 (6%)	0	100	100
51	HH	178/190 (94%)	167 (94%)	11 (6%)	0	100	100
52	II	204/206 (99%)	199 (98%)	5 (2%)	0	100	100
53	JJ	178/180 (99%)	173 (97%)	5 (3%)	0	100	100
54	LL	137/149 (92%)	131 (96%)	6 (4%)	0	100	100
55	NN	147/149 (99%)	140 (95%)	7 (5%)	0	100	100
56	VV	81/83 (98%)	68 (84%)	11 (14%)	2 (2%)	4	26
57	WW	127/129 (98%)	119 (94%)	8 (6%)	0	100	100
58	XX	137/141 (97%)	125 (91%)	11 (8%)	1 (1%)	19	56
59	YY	123/125 (98%)	117 (95%)	6 (5%)	0	100	100
60	cc	59/61 (97%)	53 (90%)	6 (10%)	0	100	100
61	ff	65/67 (97%)	60 (92%)	5 (8%)	0	100	100
62	gg	311/313 (99%)	276 (89%)	35 (11%)	0	100	100
63	dd	53/55 (96%)	51 (96%)	2 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
64	AA	203/214 (95%)	179 (88%)	17 (8%)	7 (3%)	3	21
65	DD	223/225 (99%)	211 (95%)	12 (5%)	0	100	100
66	FF	182/189 (96%)	175 (96%)	7 (4%)	0	100	100
67	KK	94/96 (98%)	87 (93%)	7 (7%)	0	100	100
68	MM	122/124 (98%)	111 (91%)	11 (9%)	0	100	100
69	PP	116/118 (98%)	107 (92%)	9 (8%)	0	100	100
70	QQ	139/141 (99%)	124 (89%)	15 (11%)	0	100	100
71	SS	143/145 (99%)	131 (92%)	12 (8%)	0	100	100
72	TT	138/141 (98%)	131 (95%)	6 (4%)	1 (1%)	19	56
73	UU	97/99 (98%)	95 (98%)	2 (2%)	0	100	100
74	ZZ	73/75 (97%)	69 (94%)	4 (6%)	0	100	100
75	EF	854/856 (100%)	743 (87%)	109 (13%)	2 (0%)	44	78
82	BB	214/218 (98%)	204 (95%)	10 (5%)	0	100	100
83	OO	132/134 (98%)	122 (92%)	10 (8%)	0	100	100
84	RR	130/132 (98%)	124 (95%)	6 (5%)	0	100	100
All	All	12180/12459 (98%)	11346 (93%)	819 (7%)	15 (0%)	50	83

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
64	AA	98	PRO
64	AA	155	ARG
64	AA	162	PRO
64	AA	198	MET
56	VV	80	SER

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	
1	A	190/190 (100%)	190 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	344/344 (100%)	344 (100%)	0	100	100
3	C	303/303 (100%)	303 (100%)	0	100	100
4	c	94/100 (94%)	94 (100%)	0	100	100
5	D	247/247 (100%)	247 (100%)	0	100	100
6	E	197/197 (100%)	197 (100%)	0	100	100
7	F	196/196 (100%)	196 (100%)	0	100	100
8	G	187/187 (100%)	187 (100%)	0	100	100
9	H	169/169 (100%)	169 (100%)	0	100	100
10	I	170/180 (94%)	170 (100%)	0	100	100
11	J	143/143 (100%)	143 (100%)	0	100	100
12	L	170/170 (100%)	170 (100%)	0	100	100
13	M	116/116 (100%)	116 (100%)	0	100	100
14	N	171/171 (100%)	171 (100%)	0	100	100
15	O	171/171 (100%)	171 (100%)	0	100	100
16	P	134/134 (100%)	134 (100%)	0	100	100
17	Q	164/164 (100%)	164 (100%)	0	100	100
18	S	157/157 (100%)	157 (100%)	0	100	100
19	T	139/139 (100%)	139 (100%)	0	100	100
20	U	89/89 (100%)	89 (100%)	0	100	100
21	V	100/101 (99%)	100 (100%)	0	100	100
22	W	159/159 (100%)	159 (100%)	0	100	100
23	X	106/106 (100%)	106 (100%)	0	100	100
24	Y	124/124 (100%)	124 (100%)	0	100	100
25	Z	117/117 (100%)	117 (100%)	0	100	100
26	a	118/118 (100%)	118 (100%)	0	100	100
27	b	63/84 (75%)	63 (100%)	0	100	100
28	d	98/98 (100%)	98 (100%)	0	100	100
29	e	114/114 (100%)	114 (100%)	0	100	100
30	f	89/89 (100%)	89 (100%)	0	100	100
31	g	94/94 (100%)	94 (100%)	0	100	100
32	h	109/109 (100%)	109 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
33	i	86/86 (100%)	86 (100%)	0	100	100
34	j	73/73 (100%)	73 (100%)	0	100	100
35	k	64/64 (100%)	64 (100%)	0	100	100
36	l	47/47 (100%)	47 (100%)	0	100	100
37	m	46/46 (100%)	46 (100%)	0	100	100
38	n	24/24 (100%)	24 (100%)	0	100	100
39	o	92/92 (100%)	92 (100%)	0	100	100
40	p	74/74 (100%)	74 (100%)	0	100	100
41	r	110/110 (100%)	110 (100%)	0	100	100
42	s	90/90 (100%)	90 (100%)	0	100	100
43	t	128/128 (100%)	128 (100%)	0	100	100
44	u	74/85 (87%)	39 (53%)	35 (47%)	0	0
45	bb	74/74 (100%)	74 (100%)	0	100	100
46	ee	41/41 (100%)	41 (100%)	0	100	100
47	aa	85/85 (100%)	85 (100%)	0	100	100
48	CC	182/183 (100%)	182 (100%)	0	100	100
49	EE	224/224 (100%)	224 (100%)	0	100	100
50	GG	199/199 (100%)	199 (100%)	0	100	100
51	HH	167/170 (98%)	167 (100%)	0	100	100
52	II	178/178 (100%)	178 (100%)	0	100	100
53	JJ	160/160 (100%)	160 (100%)	0	100	100
54	LL	128/134 (96%)	128 (100%)	0	100	100
55	NN	130/130 (100%)	130 (100%)	0	100	100
56	VV	68/68 (100%)	45 (66%)	23 (34%)	0	1
57	WW	112/112 (100%)	112 (100%)	0	100	100
58	XX	113/113 (100%)	113 (100%)	0	100	100
59	YY	107/107 (100%)	107 (100%)	0	100	100
60	cc	54/54 (100%)	54 (100%)	0	100	100
61	ff	60/60 (100%)	60 (100%)	0	100	100
62	gg	272/272 (100%)	272 (100%)	0	100	100
63	dd	48/48 (100%)	48 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
64	AA	172/179 (96%)	96 (56%)	76 (44%)	0	0
65	DD	189/189 (100%)	189 (100%)	0	100	100
66	FF	158/159 (99%)	158 (100%)	0	100	100
67	KK	87/87 (100%)	87 (100%)	0	100	100
68	MM	104/104 (100%)	104 (100%)	0	100	100
69	PP	107/107 (100%)	107 (100%)	0	100	100
70	QQ	117/117 (100%)	117 (100%)	0	100	100
71	SS	125/125 (100%)	125 (100%)	0	100	100
72	TT	110/110 (100%)	110 (100%)	0	100	100
73	UU	92/92 (100%)	92 (100%)	0	100	100
74	ZZ	66/66 (100%)	66 (100%)	0	100	100
75	EF	727/728 (100%)	727 (100%)	0	100	100
82	BB	197/197 (100%)	192 (98%)	5 (2%)	42	62
83	OO	104/104 (100%)	102 (98%)	2 (2%)	52	70
84	RR	119/119 (100%)	115 (97%)	4 (3%)	32	52
All	All	10626/10694 (99%)	10481 (99%)	145 (1%)	62	76

5 of 145 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
64	AA	169	HIS
84	RR	99	ASP
64	AA	178	LEU
64	AA	209	GLU
56	VV	45	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 54 such sidechains are listed below:

Mol	Chain	Res	Type
52	II	88	ASN
56	VV	81	GLN
82	BB	158	HIS
52	II	165	GLN
56	VV	21	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
76	Cc	76/77 (98%)	25 (32%)	0
77	A5	1668/1732 (96%)	582 (34%)	82 (4%)
78	A7	120/121 (99%)	29 (24%)	1 (0%)
79	A8	156/157 (99%)	46 (29%)	5 (3%)
80	B2	1756/1837 (95%)	581 (33%)	53 (3%)
81	A6	1995/2122 (94%)	607 (30%)	56 (2%)
All	All	5771/6046 (95%)	1870 (32%)	197 (3%)

5 of 1870 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
76	Cc	4	G
76	Cc	6	G
76	Cc	9	G
76	Cc	10	G
76	Cc	16	C

5 of 197 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
80	B2	869	A
81	A6	2266	C
80	B2	1283	C
80	B2	1556	A
81	A6	2517	A

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
2	HIC	B	245	2	8,11,12	1.09	1 (12%)	5,14,16	0.75	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
26	V5N	a	39	26	4,11,12	0.83	0	5,14,16	1.28	0
27	MLZ	b	5	27	8,9,10	0.79	0	4,9,11	0.62	0
37	M3L	m	98	37	10,11,12	0.40	0	9,14,16	0.32	0
72	NMM	TT	67	72	8,11,12	0.76	0	7,12,14	1.21	1 (14%)
39	MLZ	o	53	39	8,9,10	0.77	0	4,9,11	0.52	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
2	HIC	B	245	2	-	0/5/6/8	0/1/1/1
26	V5N	a	39	26	-	4/5/10/12	0/1/1/1
27	MLZ	b	5	27	-	2/7/8/10	-
37	M3L	m	98	37	-	0/9/10/12	-
72	NMM	TT	67	72	-	0/9/11/13	-
39	MLZ	o	53	39	-	2/7/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	245	HIC	CE1-ND1	-2.24	1.31	1.34

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
72	TT	67	NMM	NE-CZ-NH1	2.09	124.10	120.26

There are no chirality outliers.

5 of 8 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
39	o	53	MLZ	CD-CE-NZ-CM
26	a	39	V5N	O-C-CA-CB
26	a	39	V5N	C-CA-CB-CG
26	a	39	V5N	C-CA-CB-O2
27	b	5	MLZ	N-CA-CB-CG

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 34 ligands modelled in this entry, 34 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 ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

Mol	Chain	Number of breaks
77	A5	9
81	A6	4
6	E	3
80	B2	3
82	BB	1
8	G	1
46	ee	1
58	XX	1

The worst 5 of 23 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A5	1703:C	O3'	1720:C	P	20.34
1	E	78:ALA	C	90:LYS	N	20.05

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	BB	8:ARG	C	23:ASP	N	19.98
1	B2	704:G	O3'	724:A	P	19.89
1	B2	766:C	O3'	776:A	P	18.72

6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-72469. 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
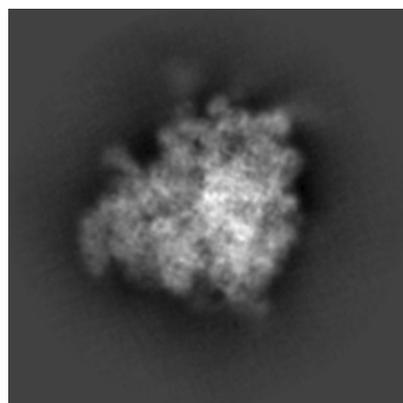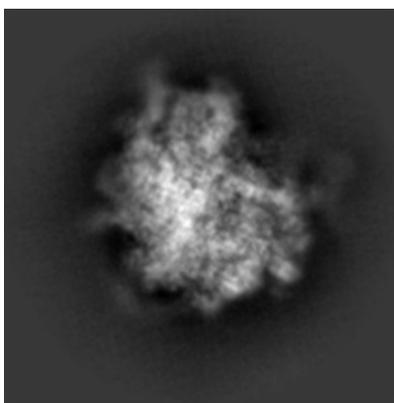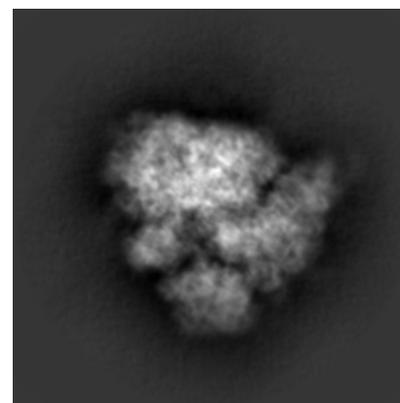
| X | Y | Z |

6.1.2 Raw map

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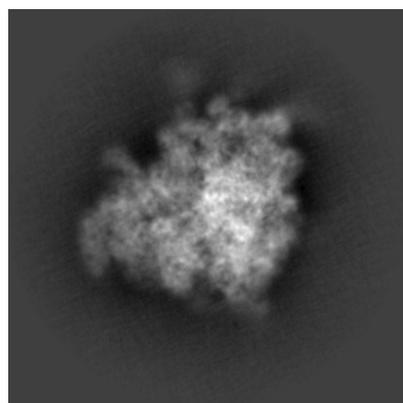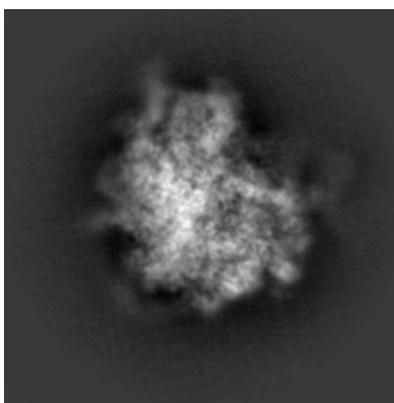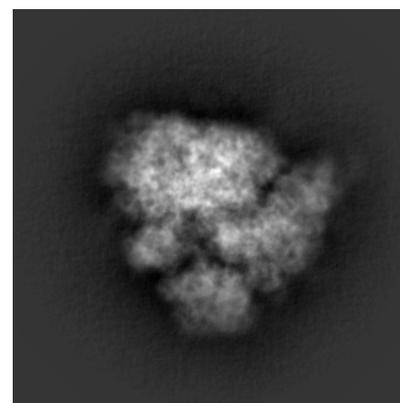
The images above show the map projected in three orthogonal directions.

6.2 Central slices   ⓘ
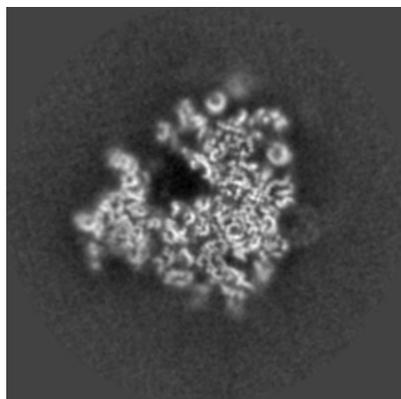
6.2.1 Primary map
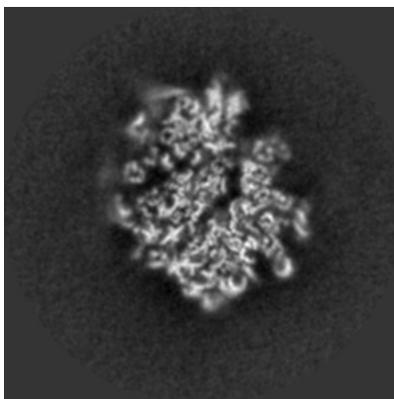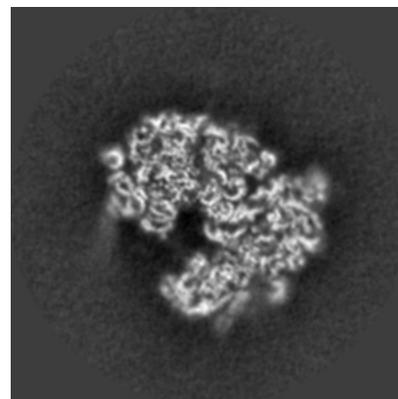
| X Index: 220 | Y Index: 220 | Z Index: 220 |

6.2.2 Raw map
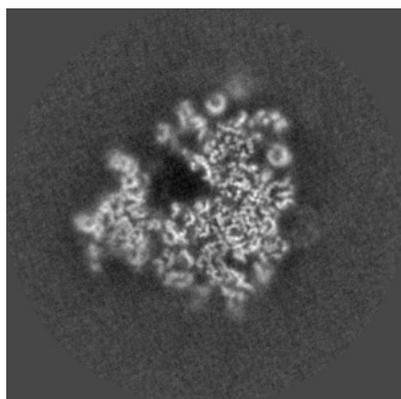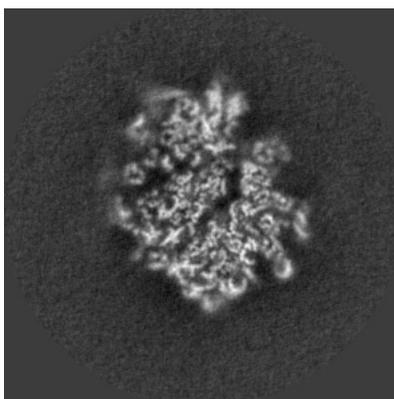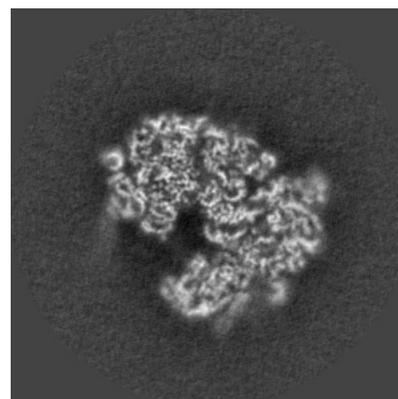
| X Index: 220 | Y Index: 220 | Z Index: 220 |

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

6.3 Largest variance slices (i)

6.3.1 Primary map
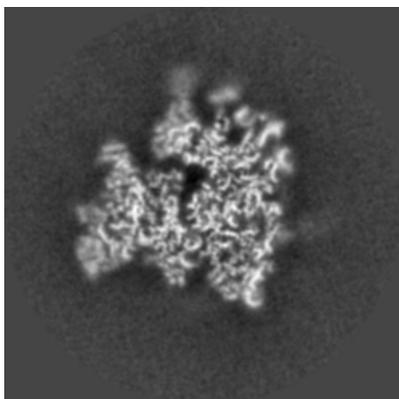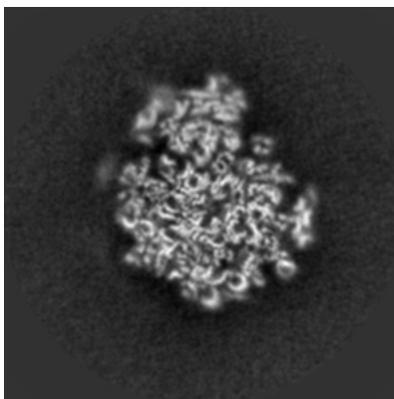
X Index: 236   Y Index: 228   Z Index: 229
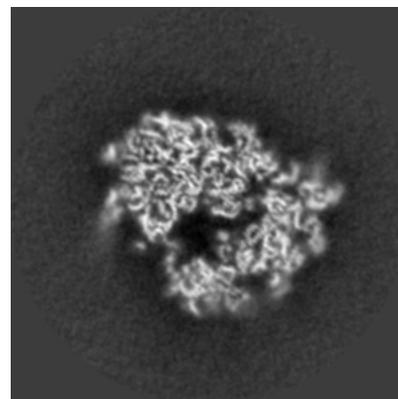
6.3.2 Raw map
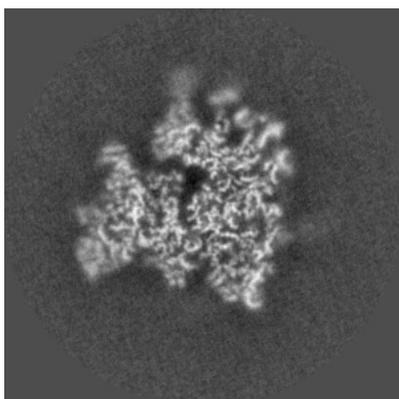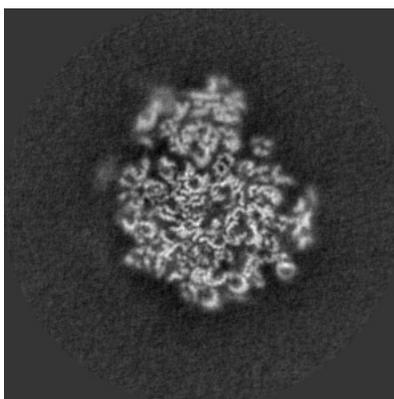
X Index: 236   Y Index: 229   Z Index: 229
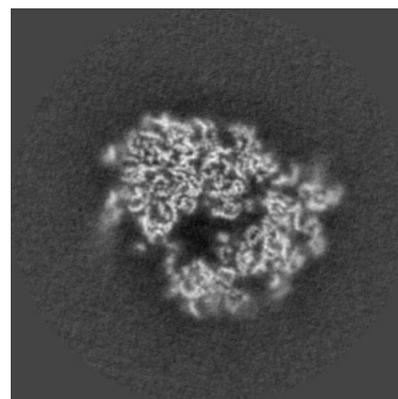
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
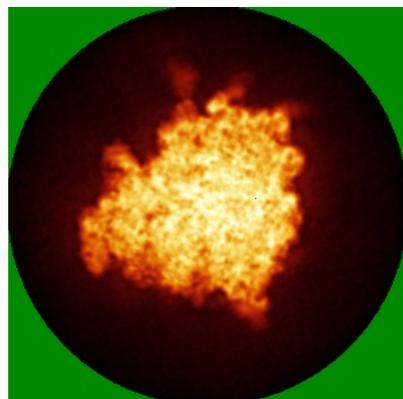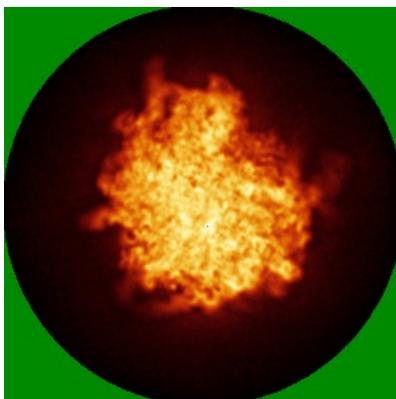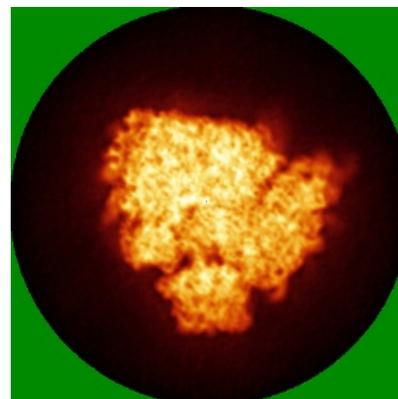
X	Y	Z

6.4.2 Raw map

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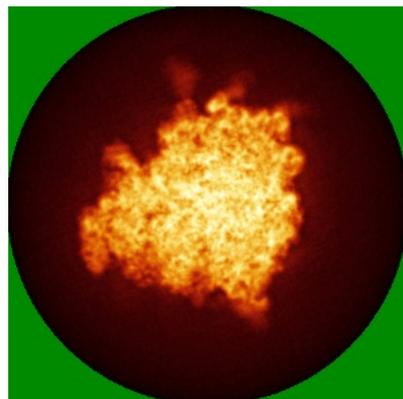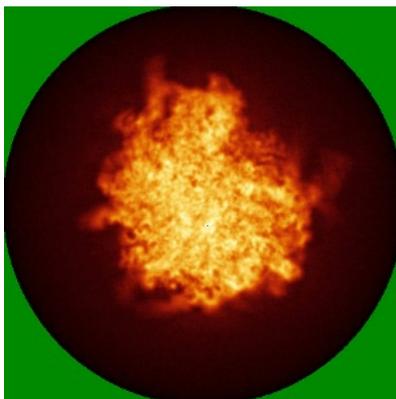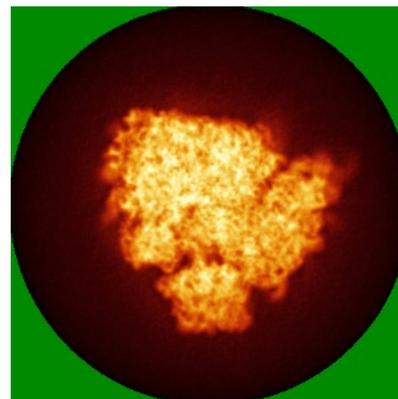
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

| X | Y | Z |
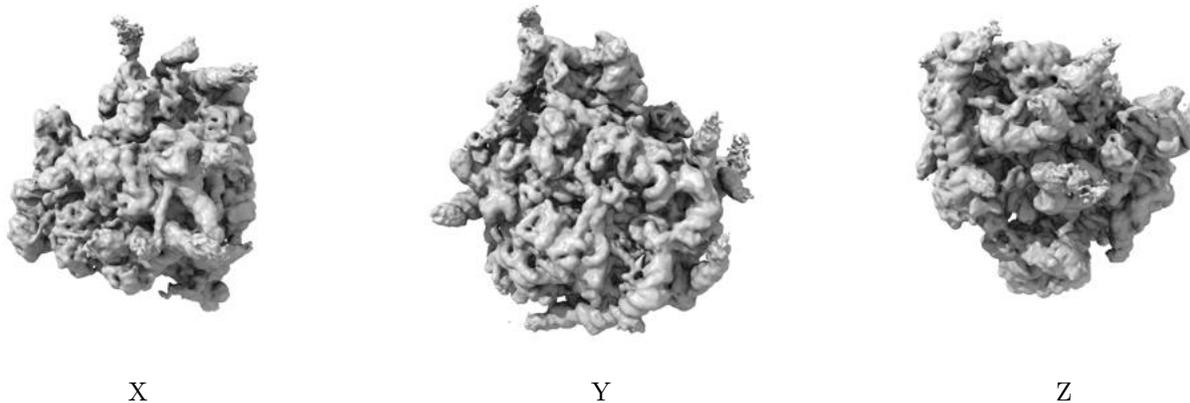
The images above show the 3D surface view of the map at the recommended contour level 0.01. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

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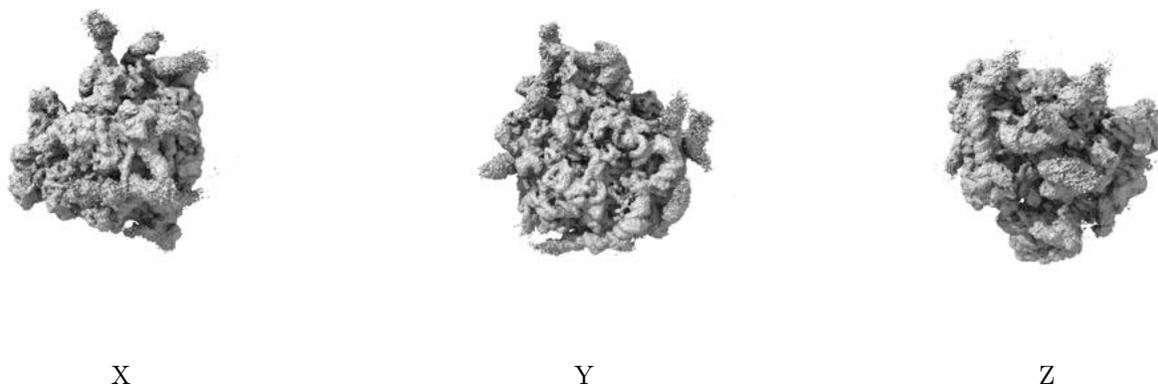
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

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

7   Map analysis ⓘ

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

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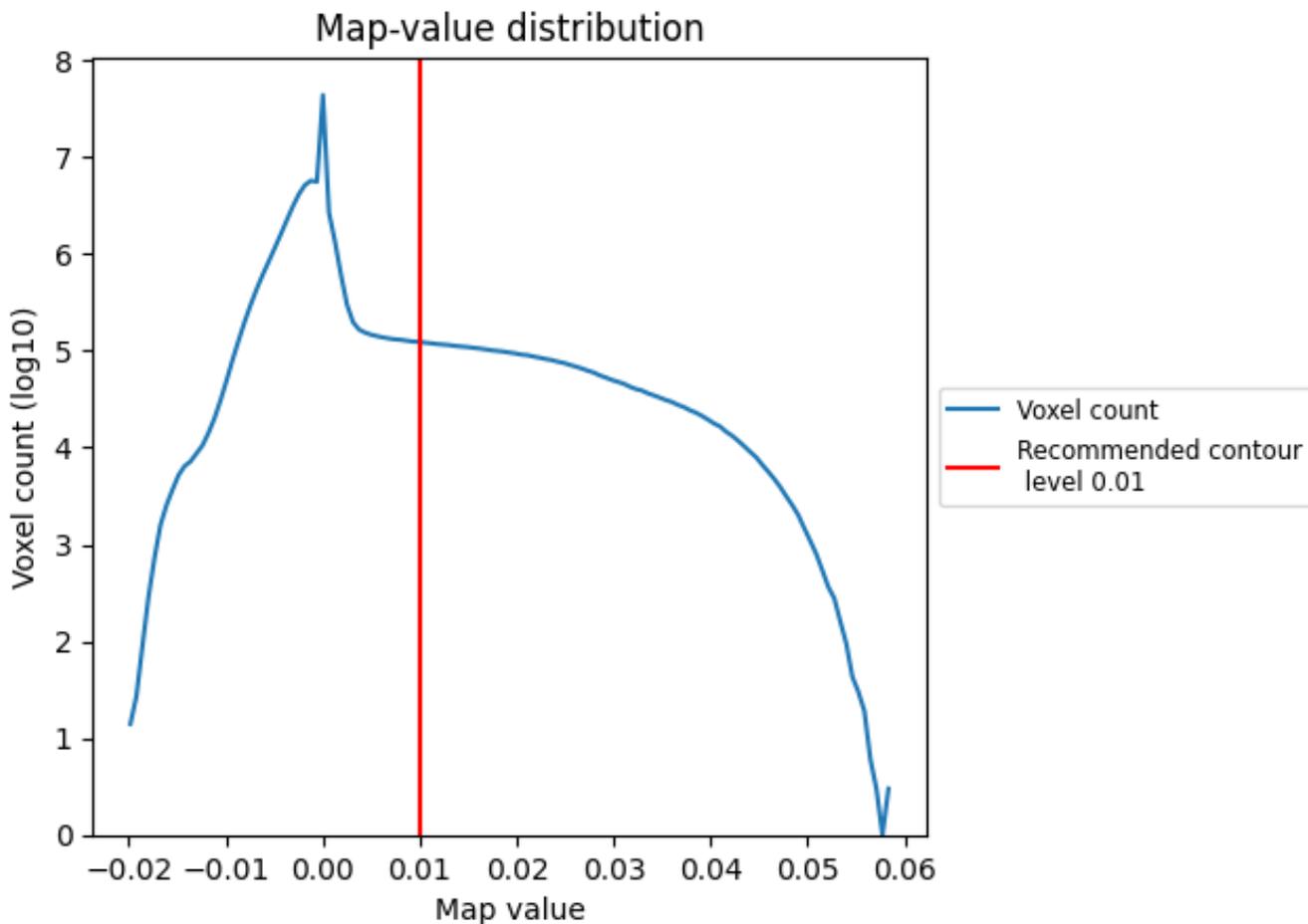
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
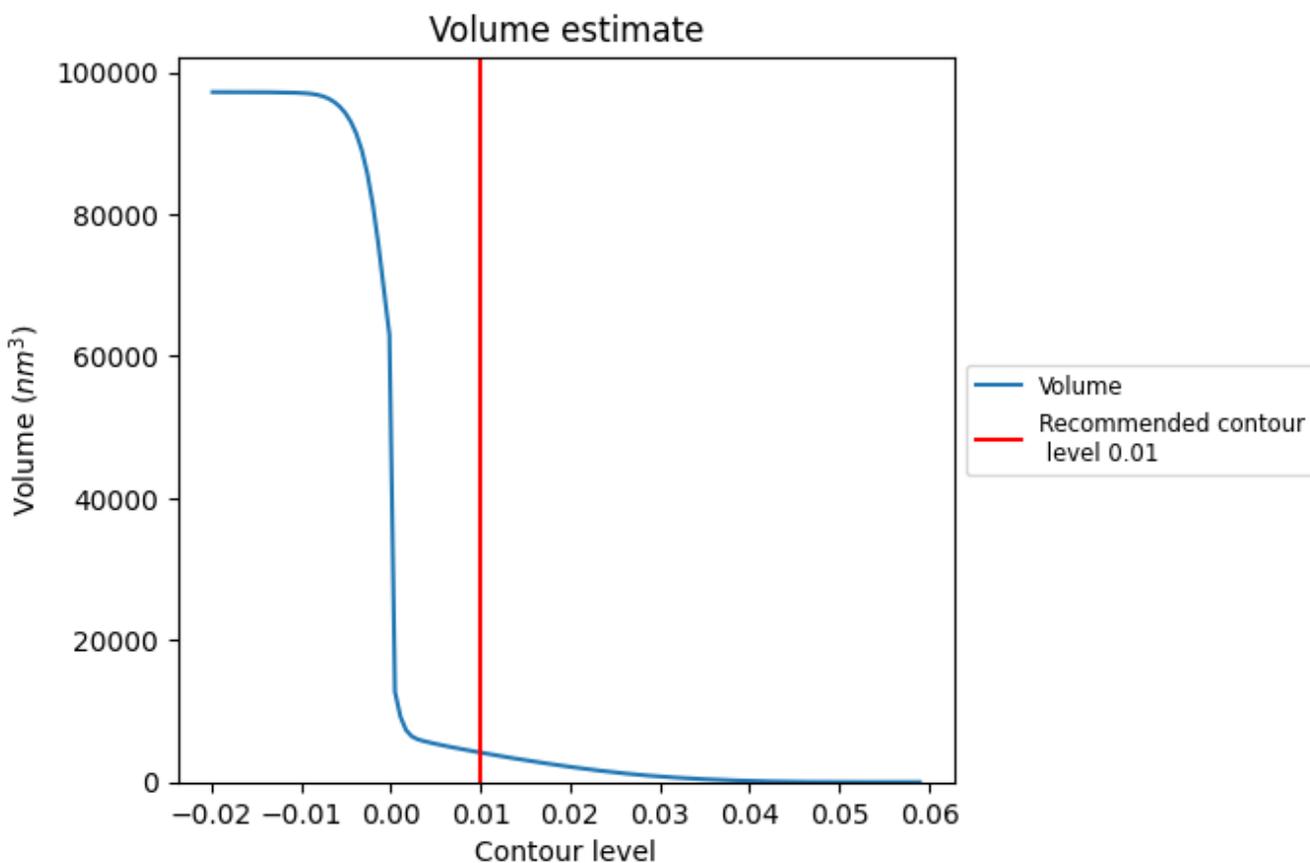
The volume at the recommended contour level is 4156 nm^3; this corresponds to an approximate mass of 3755 kDa.

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 ⓘ
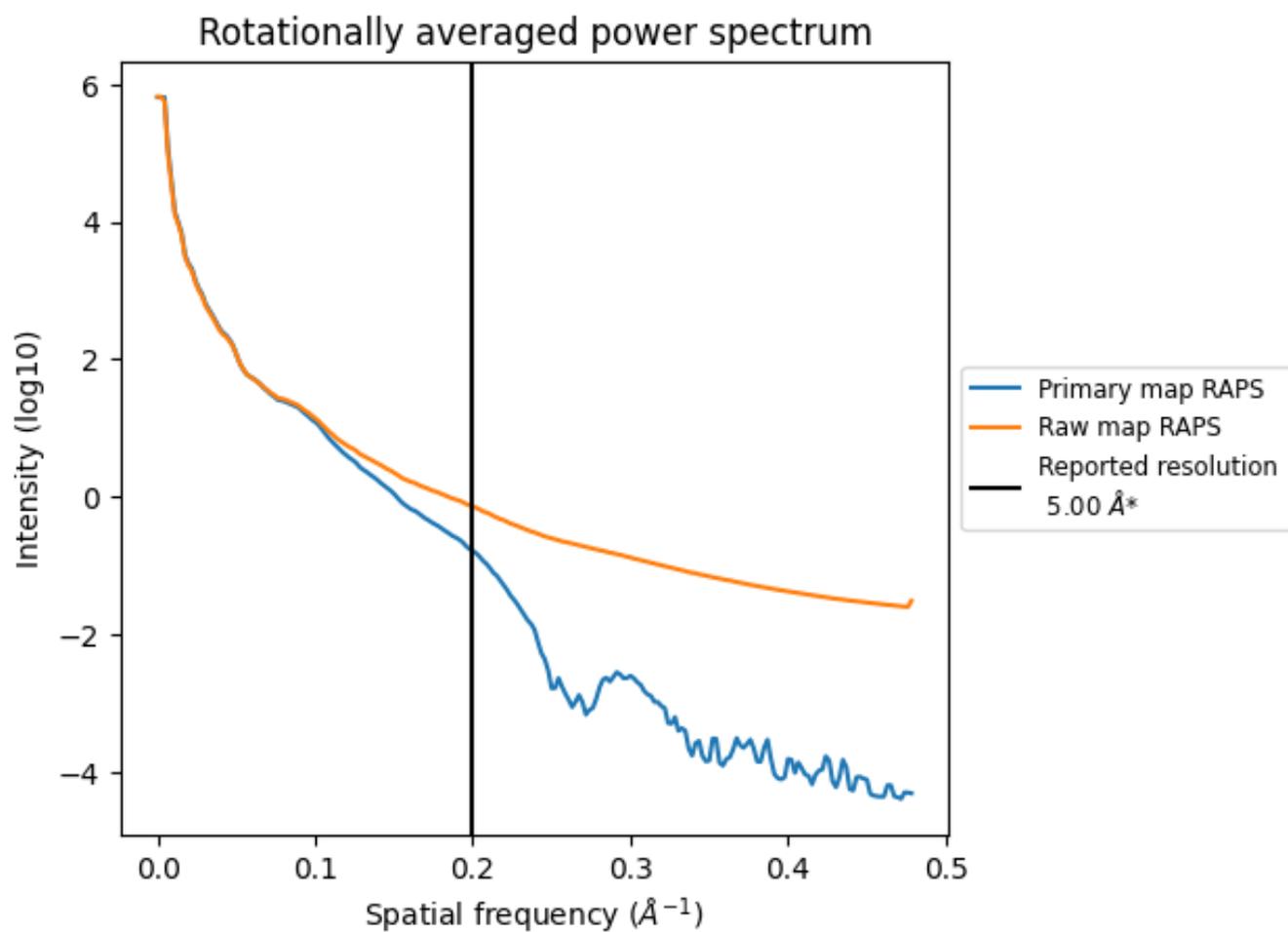
*Reported resolution corresponds to spatial frequency of 0.200 Å^{-1}

8   Fourier-Shell correlation ⓘ

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

8.1   FSC ⓘ
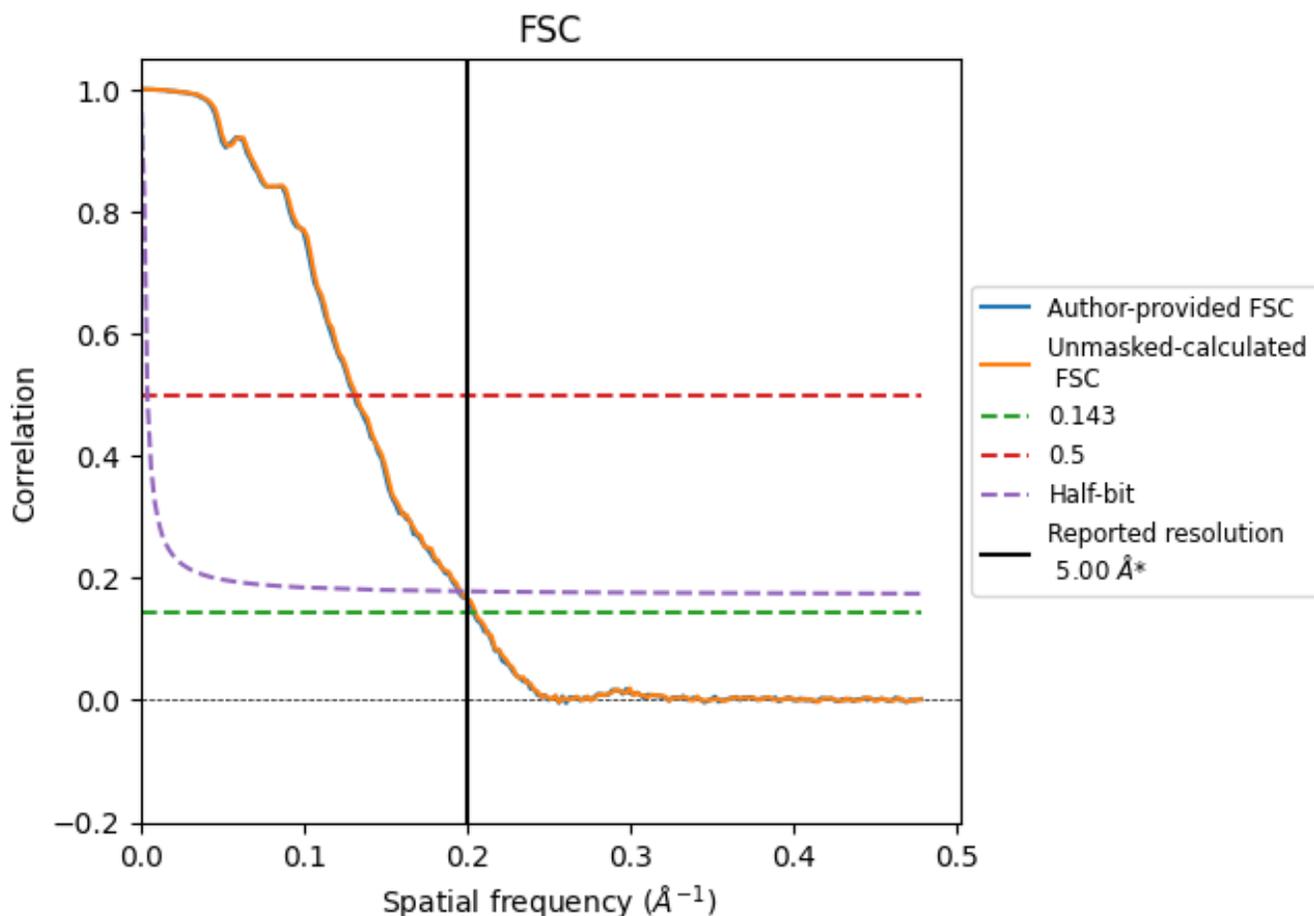
*Reported resolution corresponds to spatial frequency of 0.200 Å^{-1}

8.2   Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	4.90	7.64	5.13
Unmasked-calculated*	4.87	7.58	5.10

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

9   Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-72469 and PDB model 9Y42. Per-residue inclusion information can be found in section 3 on page 21.

## 9.1   Map-model overlay ⓘ

| X | Y | Z |
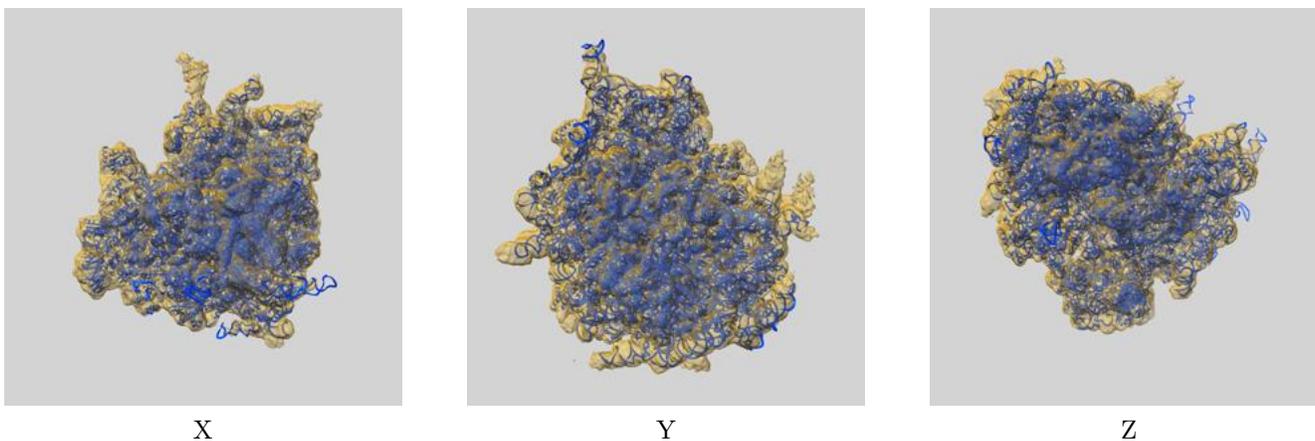
The images above show the 3D surface view of the map at the recommended contour level 0.01 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2   Q-score mapped to coordinate model ⓘ

X   Y   Z
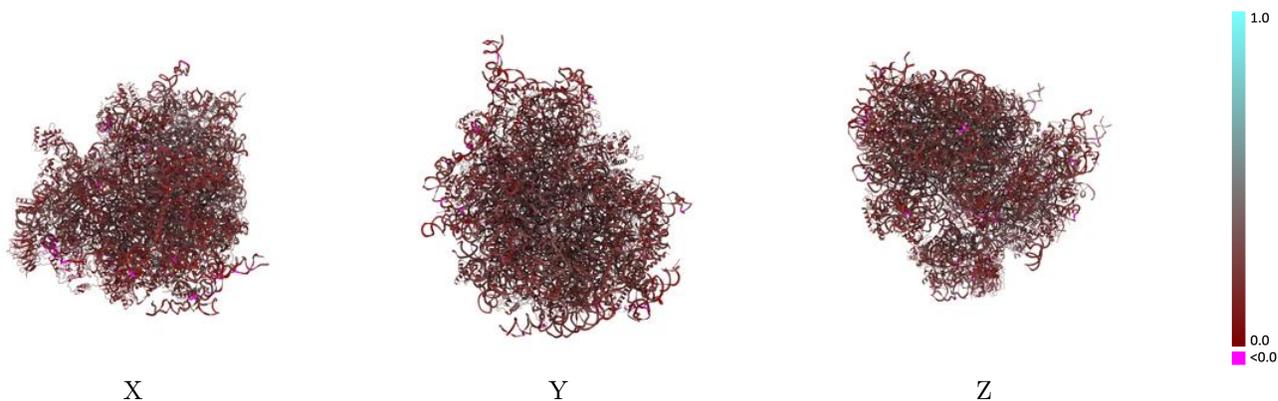
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
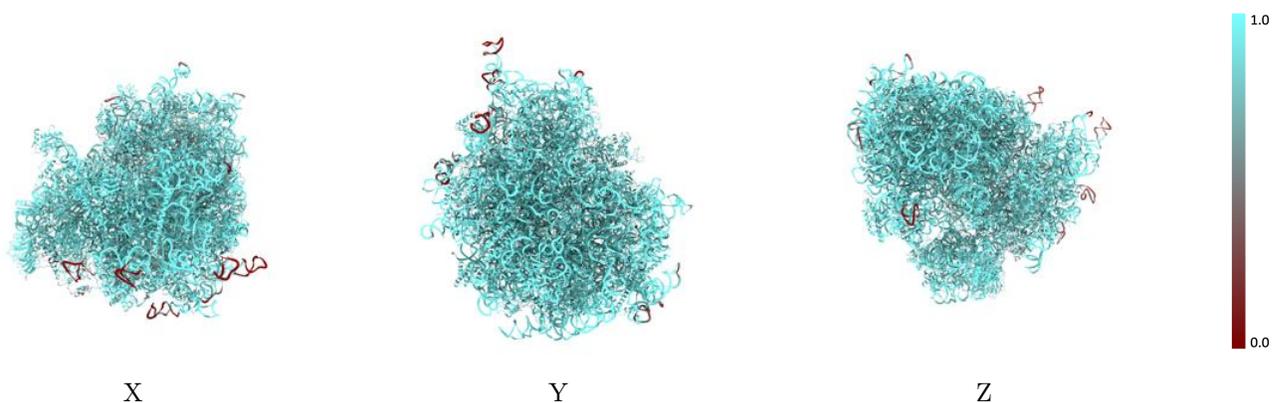
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.01).

9.4　Atom inclusion ⓘ
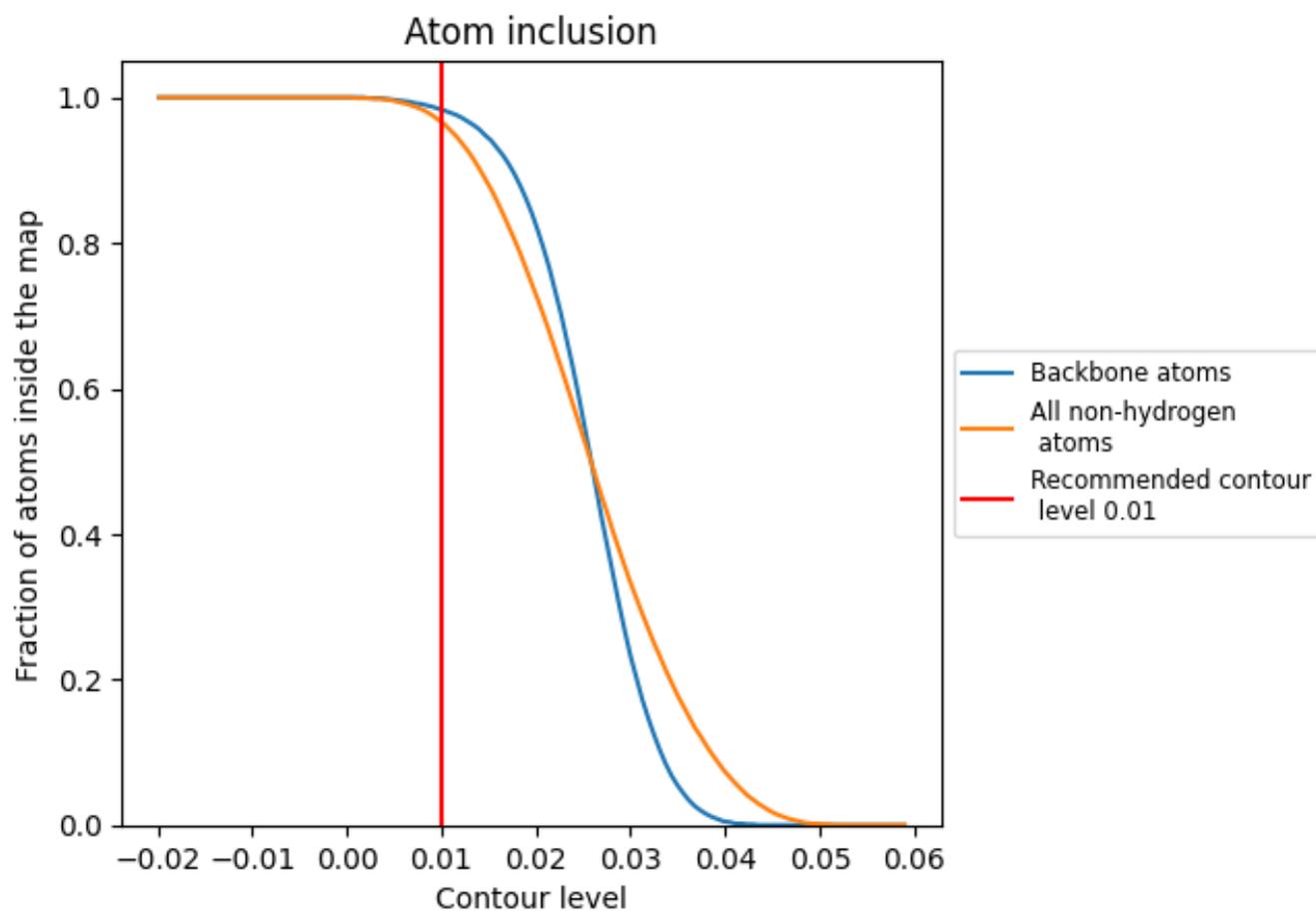
At the recommended contour level, 98% of all backbone atoms, 97% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9660	0.2370
A	0.9140	0.2370
A5	0.9870	0.2570
A6	0.9900	0.2680
A7	0.9980	0.2760
A8	0.9930	0.2580
AA	0.8950	0.1840
B	0.9490	0.2330
B2	0.9850	0.2500
BB	0.9060	0.1380
C	0.9520	0.2360
CC	0.9100	0.2210
Cc	0.9880	0.2470
D	0.9840	0.2080
DD	0.9430	0.2260
E	0.9720	0.2280
EE	0.9680	0.2120
EF	0.8390	0.1890
F	0.9370	0.2220
FF	0.9610	0.1810
G	0.9590	0.2130
GG	0.9660	0.1780
H	0.9400	0.2250
HH	0.9170	0.2060
I	0.9440	0.2460
II	0.9560	0.1950
J	0.9800	0.2030
JJ	0.9720	0.2010
KK	0.9920	0.1980
L	0.9590	0.2350
LL	0.9180	0.2350
M	0.9750	0.2270
MM	0.9490	0.1840
N	0.9620	0.2160
NN	0.9260	0.2010

1.0

0.0
<0.0

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Chain	Atom inclusion	Q-score
O	0.9240	0.2250
OO	0.8970	0.1160
P	0.9500	0.2260
PP	0.9760	0.1940
Q	0.9280	0.2400
QQ	0.9810	0.1790
RR	0.7460	0.0790
S	0.9680	0.2360
SS	0.9700	0.1830
T	0.9490	0.2450
TT	0.9900	0.1770
U	0.9810	0.2110
UU	0.9790	0.2010
V	0.8730	0.2370
VV	0.8590	0.2030
W	0.9420	0.2020
WW	0.9250	0.2210
X	0.9700	0.2310
XX	0.9380	0.2500
Y	0.9680	0.2200
YY	0.9830	0.1850
Z	0.9800	0.2130
ZZ	0.9500	0.1580
a	0.9690	0.2450
aa	0.9270	0.1880
b	0.9580	0.1830
bb	0.9670	0.2210
c	0.9380	0.1830
cc	0.9330	0.2010
d	0.9640	0.2340
dd	0.9750	0.1860
e	0.9280	0.2540
ee	0.9820	0.2050
f	0.9460	0.2380
ff	0.9790	0.1870
g	0.9510	0.2210
gg	0.9790	0.1900
h	0.9640	0.2100
i	0.9490	0.2170
j	0.9760	0.2110
k	0.9570	0.2020
l	0.9700	0.2290

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Chain	Atom inclusion	Q-score
m	0.9440	0.2290
n	0.8670	0.1580
o	0.9390	0.2250
p	0.8850	0.2290
r	0.9360	0.2500
s	0.9800	0.1910
t	0.8940	0.1390
u	0.8560	0.2190