wwPDB EM Validation Summary Report ⓘ

Jun 9, 2025 – 09:17 PM JST

PDB ID	:	8ZFI / pdb_00008zfi
EMDB ID	:	EMD-60061
Title	:	Structure of E.coli ribosome in complex with an engineered arrest peptide and trigger factor
Authors	:	Sriramoju, M.K.; Ko, T.P.; Draczkowski, P.; Hsu, S.T.D.
Deposited on	:	2024-05-07
Resolution	:	2.90 Å(reported)
Based on initial model	:	3JBU

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

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

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

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

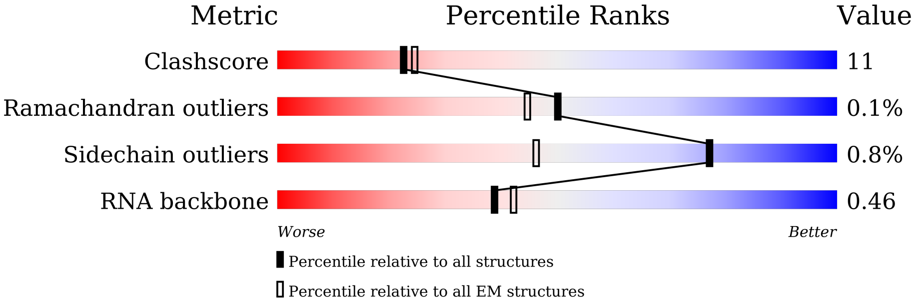
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.90 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	0	78	 76% 23% •
2	1	63	 63% 33% •
3	2	59	 81% 17% •
4	4	57	 70% 28% •
5	5	55	 • 80% 15% 5%
6	6	46	 85% 15%
7	7	65	 78% 20% •

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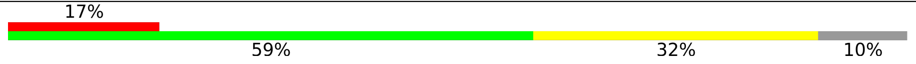
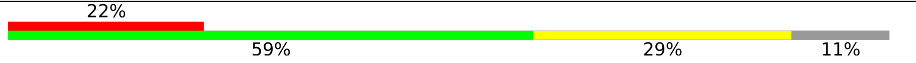
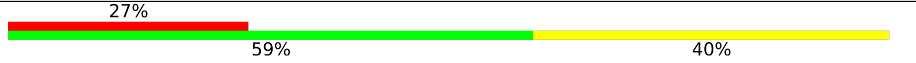
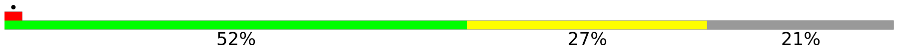
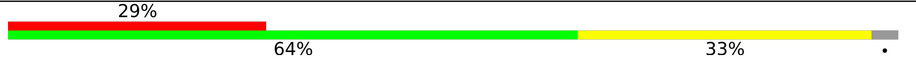
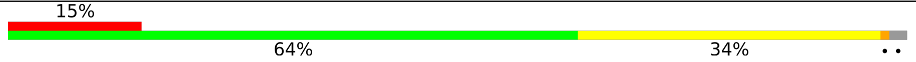
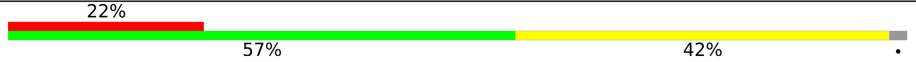
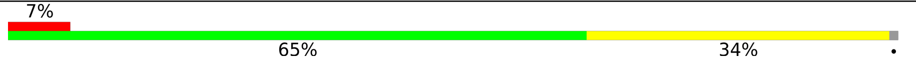
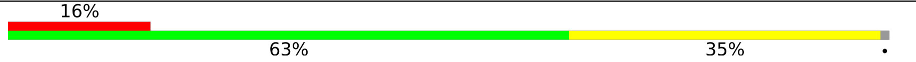
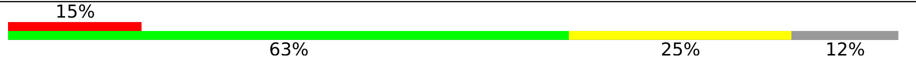
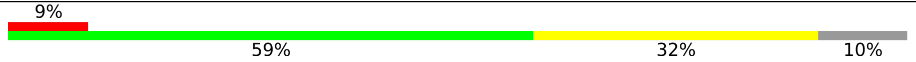
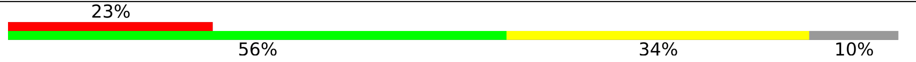
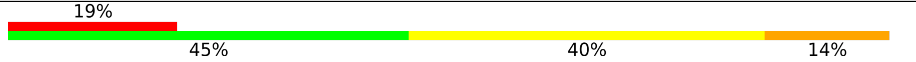
Mol	Chain	Length	Quality of chain
8	8	38	
9	A	1533	
10	B	241	
11	C	233	
12	D	206	
13	E	167	
14	F	135	
15	G	179	
16	H	130	
17	I	130	
18	J	103	
19	K	129	
20	L	124	
21	M	118	
22	N	101	
23	O	89	
24	P	82	
25	Q	84	
26	R	75	
27	S	92	
28	T	87	
29	U	71	
30	X	76	
31	Y	77	
31	Z	77	

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Mol	Chain	Length	Quality of chain
32	a	120	62% 32% 5%
33	b	2904	60% 31% 8%
34	c	273	79% 20% •
35	d	209	85% 14% •
36	e	201	78% 21% •
37	f	179	9% 60% 38% ••
38	g	177	75% 23% ••
39	h	149	21% 68% 31% •
40	k	142	87% 13%
41	l	123	92% 8%
42	m	144	81% 19%
43	n	136	81% 19%
44	o	127	84% 10% 6%
45	p	117	83% 16% •
46	q	115	• 79% 20% •
47	r	118	85% 14% •
48	s	103	78% 19% •
49	t	110	82% 18%
50	u	100	• 84% 16%
51	v	104	73% 25% ••
52	w	94	80% 20%
53	x	14	50% 29% 21%
54	y	85	11% 82% 16% •
55	z	49	27% 41% 35% • 20%
56	V	432	• 8% • • 86%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	**Type**	**Chain**	**Res**	**Chirality**	**Geometry**	**Clashes**	**Electron density**
58	PRO	Z	163	-	-	X	-

2 Entry composition

There are 58 unique types of molecules in this entry. The entry contains 148019 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 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	77	625	388	129	106	2	0	0

- Molecule 2 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	61	495	305	97	92	1	0	0

- Molecule 3 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	58	449	281	87	79	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	4	56	444	269	94	80	1	0	0

- Molecule 5 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	5	52	426	275	78	73	0	0

- Molecule 6 is a protein called 50S ribosomal protein L34.

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

- Molecule 7 is a protein called 50S ribosomal protein L35.

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

- Molecule 8 is a protein called 50S ribosomal protein L36.

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

- Molecule 9 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
9	A	1533	32895	14671	6036	10655	1533	0	0

- Molecule 10 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	B	218	1704	1081	305	311	7	0	0

- Molecule 11 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	C	207	1632	1034	306	289	3	0	0

- Molecule 12 is a protein called 30S ribosomal protein S4.

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

- Molecule 13 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	E	157	1156	719	218	213	6	0	0

- Molecule 14 is a protein called 30S ribosomal protein S6, fully modified isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	F	106	862	545	156	154	7	0	0

- Molecule 15 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	G	153	1203	750	231	218	4	0	0

- Molecule 16 is a protein called 30S ribosomal protein S8.

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

- Molecule 17 is a protein called 30S ribosomal protein S9.

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

- Molecule 18 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	J	100	803	502	154	146	1	0	0

- Molecule 19 is a protein called Small ribosomal subunit protein uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	K	117	877	540	174	160	3	0	0

- Molecule 20 is a protein called Small ribosomal subunit protein uS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	L	122	949	587	195	163	4	0	0

- Molecule 21 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	M	116	900	558	181	158	3	0	0

- Molecule 22 is a protein called 30S ribosomal protein S14.

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

- Molecule 23 is a protein called 30S ribosomal protein S15.

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

- Molecule 24 is a protein called 30S ribosomal protein S16.

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

- Molecule 25 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	Q	80	648	411	121	113	3	0	0

- Molecule 26 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	R	66	544	345	102	96	1	0	0

- Molecule 27 is a protein called 30S ribosomal protein S19.

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

- Molecule 28 is a protein called 30S ribosomal protein S20.

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

- Molecule 29 is a protein called 30S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	U	64	529	329	110	89	1	0	0

- Molecule 30 is a RNA chain called E-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
30	X	76	1621	722	287	536	76	0	0

- Molecule 31 is a RNA chain called P-site tRNA (Chain-Y), A-site tRNA-PRO (Chain-Z).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
31	Y	77	1647	733	295	542	77	0	0
			Total	C	N	O	P		
31	Z	77	1647	733	295	542	77	0	0

- Molecule 32 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
32	a	120	2568	1144	468	837	119	0	0

- Molecule 33 is a RNA chain called RNA (2903-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
33	b	2903	62321	27801	11467	20150	2903	0	0

- Molecule 34 is a protein called 50S ribosomal protein L2.

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

- Molecule 35 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	d	209	1565	979	288	294	4	0	0

- Molecule 36 is a protein called 50S ribosomal protein L4.

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

- Molecule 37 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	f	178	1419	905	251	257	6	0	0

- Molecule 38 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	g	175	1313	826	241	244	2	0	0

- Molecule 39 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	h	149	1110	699	197	213	1	0	0

- Molecule 40 is a protein called 50S ribosomal protein L13.

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

- Molecule 41 is a protein called 50S ribosomal protein L14.

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

- Molecule 42 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	m	144	Total	C	N	O	S	0	0
			1053	654	207	190	2		

- Molecule 43 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	n	136	Total	C	N	O	S	0	0
			1074	686	205	177	6		

- Molecule 44 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	o	120	Total	C	N	O	S	0	0
			960	593	196	166	5		

- Molecule 45 is a protein called 50S ribosomal protein L18.

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

- Molecule 46 is a protein called 50S ribosomal protein L19.

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

- Molecule 47 is a protein called 50S ribosomal protein L20.

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

- Molecule 48 is a protein called 50S ribosomal protein L21.

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

- Molecule 49 is a protein called 50S ribosomal protein L22.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	u	100	786	496	146	142	2	0	0

- Molecule 51 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
51	v	103	788	498	148	142	0	0

- Molecule 52 is a protein called 50S ribosomal protein L25.

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

- Molecule 53 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
53	x	14	299	133	55	97	14	0	0

- Molecule 54 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	y	84	634	391	129	113	1	0	0

- Molecule 55 is a protein called eRAP-NC.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	z	39	398	260	72	64	2	8	0

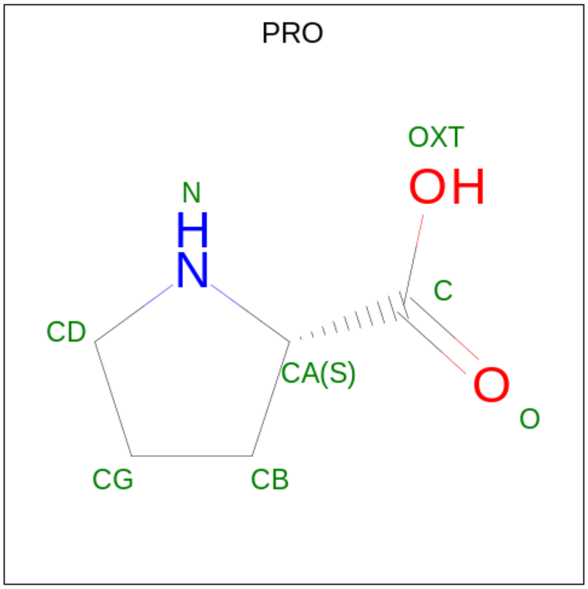
- Molecule 56 is a protein called Trigger factor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	V	59	454	284	84	84	2	0	0

- Molecule 57 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
57	8	1	1	1	0

- Molecule 58 is PROLINE (CCD ID: PRO) (formula: $C_5H_9NO_2$).



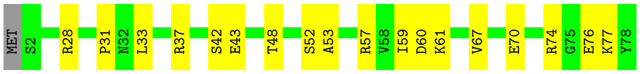
Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
58	Z	1	7	5	1	1	0

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.

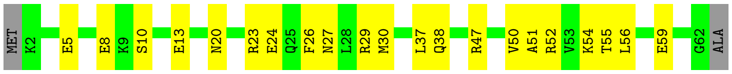
- Molecule 1: 50S ribosomal protein L28

Chain 0:



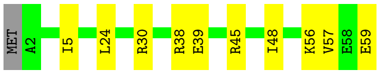
- Molecule 2: 50S ribosomal protein L29

Chain 1:



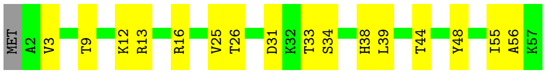
- Molecule 3: 50S ribosomal protein L30

Chain 2:



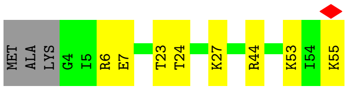
- Molecule 4: 50S ribosomal protein L32

Chain 4:



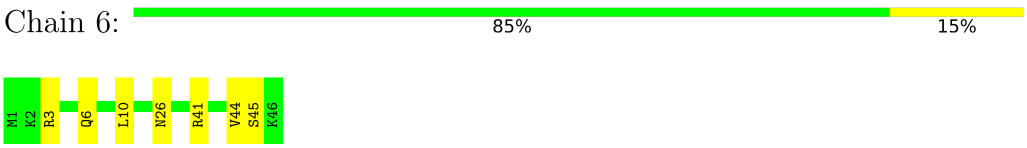
- Molecule 5: 50S ribosomal protein L33

Chain 5:



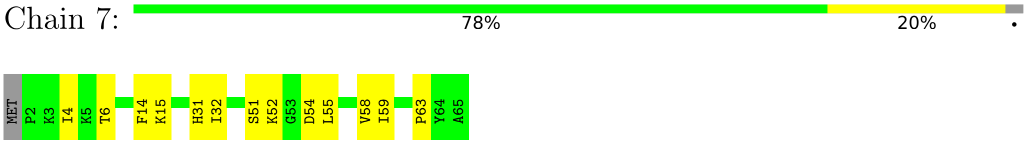
- Molecule 6: 50S ribosomal protein L34

Chain 6:



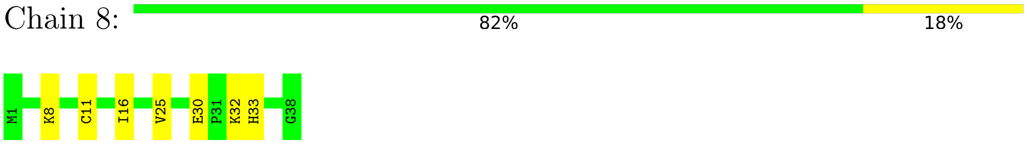
- Molecule 7: 50S ribosomal protein L35

Chain 7:



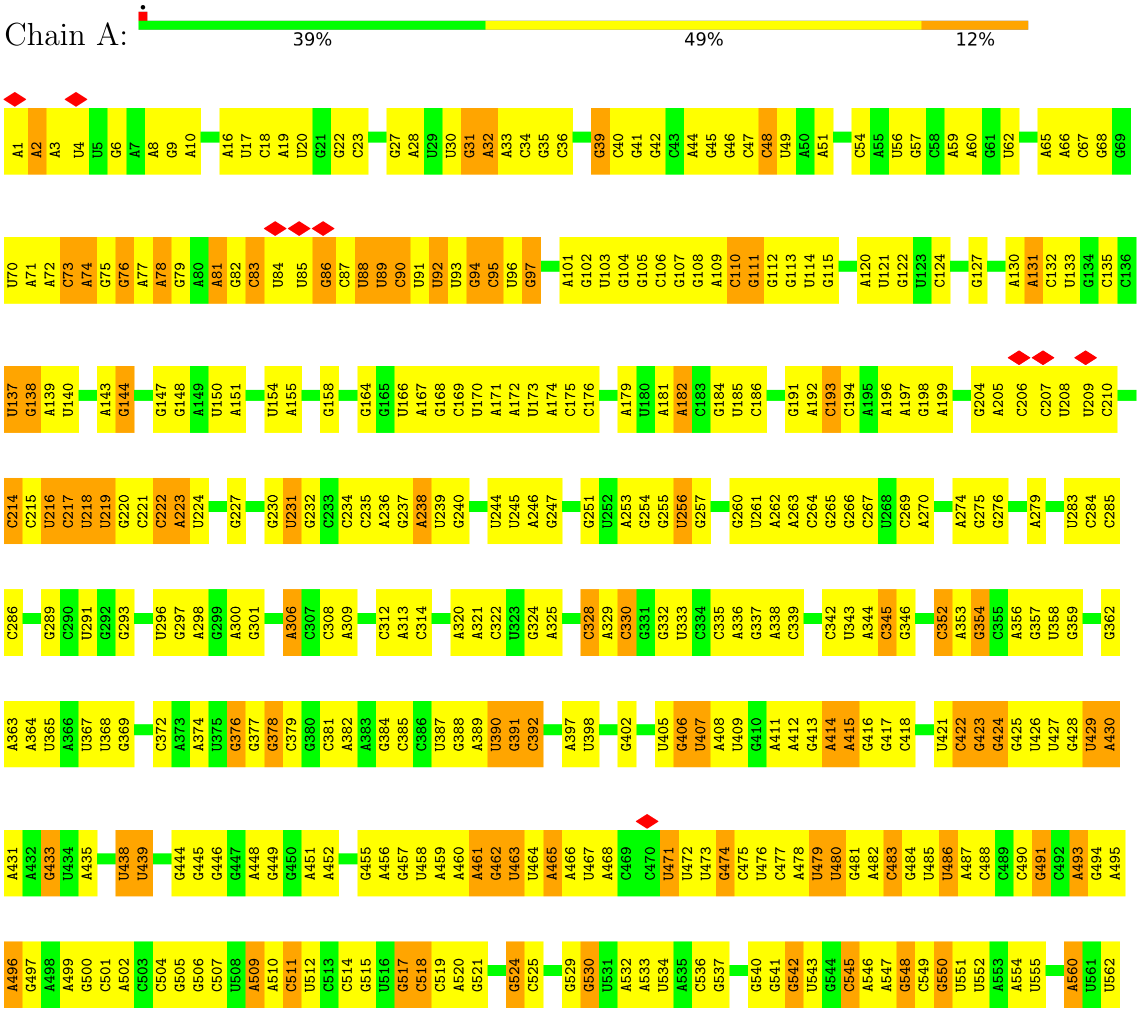
- Molecule 8: 50S ribosomal protein L36

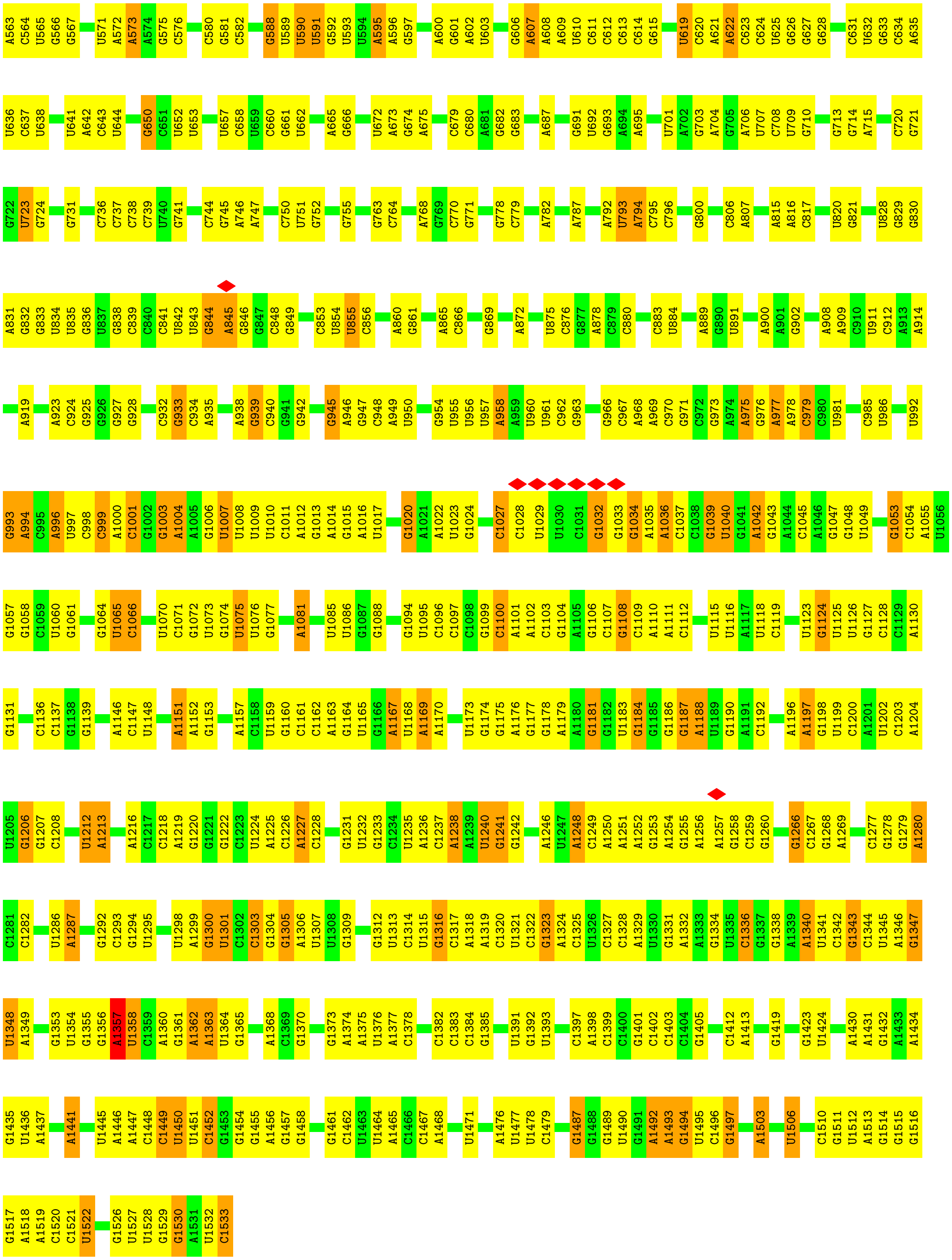
Chain 8:



- Molecule 9: 16S rRNA

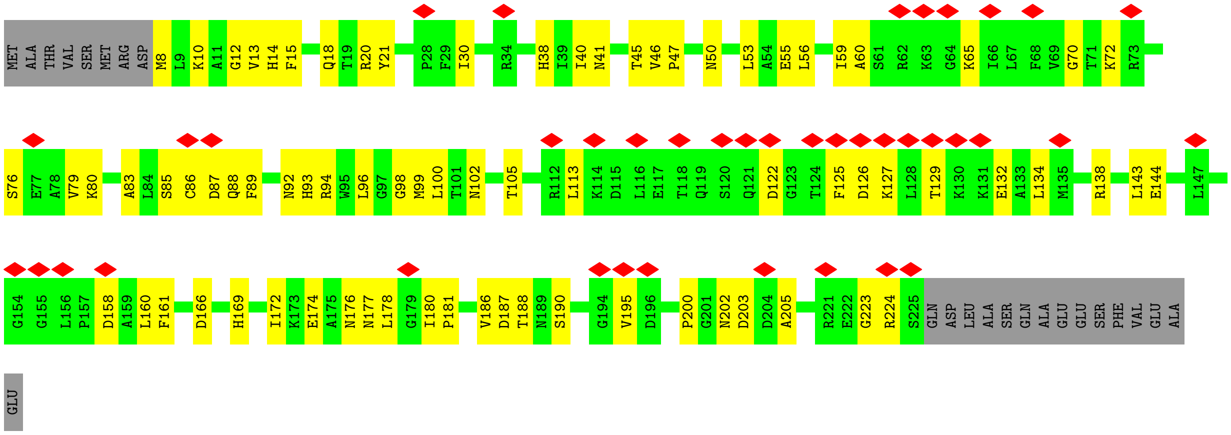
Chain A:





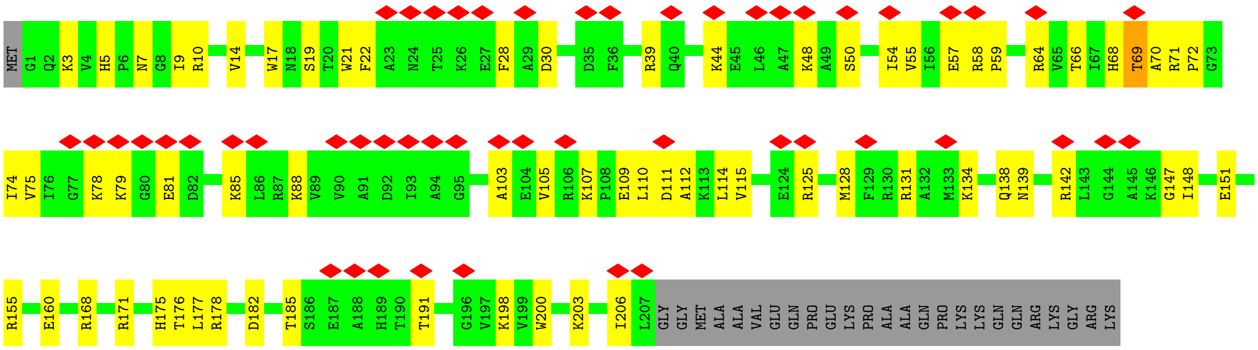
- Molecule 10: 30S ribosomal protein S2

Chain B:



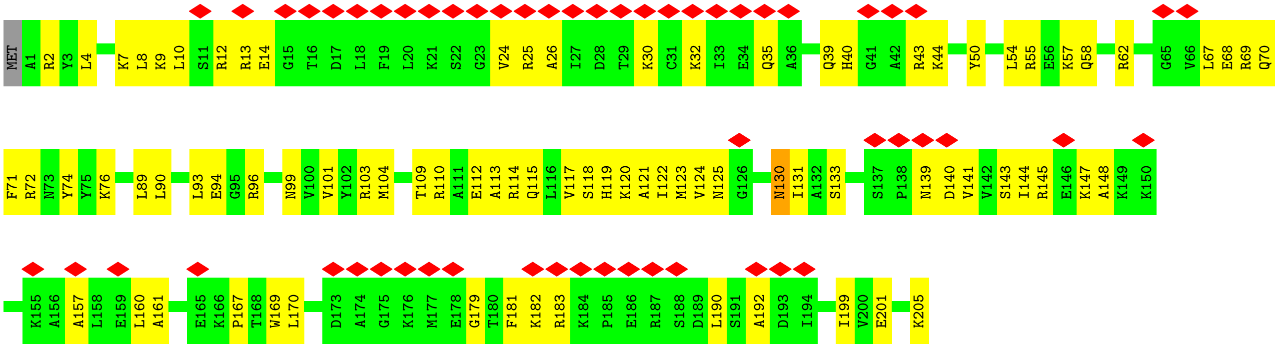
- Molecule 11: 30S ribosomal protein S3

Chain C:



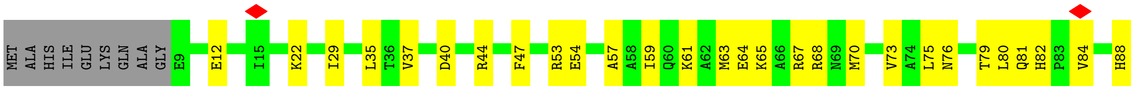
- Molecule 12: 30S ribosomal protein S4

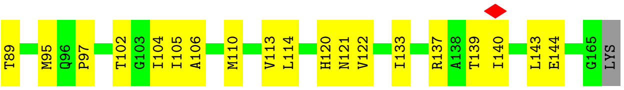
Chain D:



- Molecule 13: 30S ribosomal protein S5

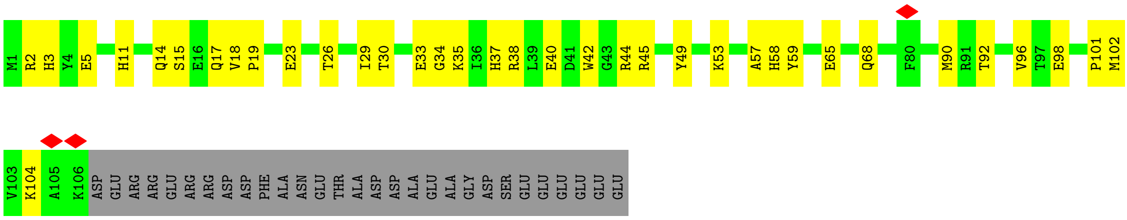
Chain E:





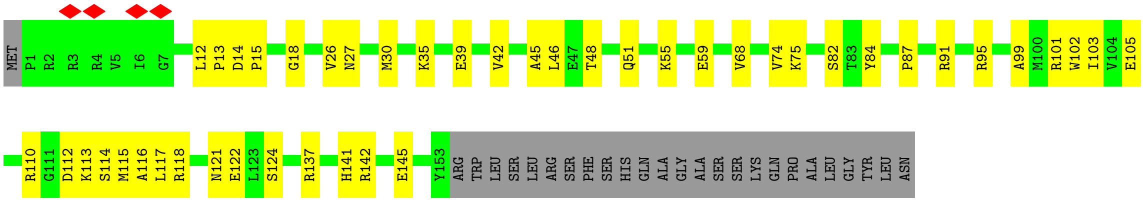
- Molecule 14: 30S ribosomal protein S6, fully modified isoform

Chain F:



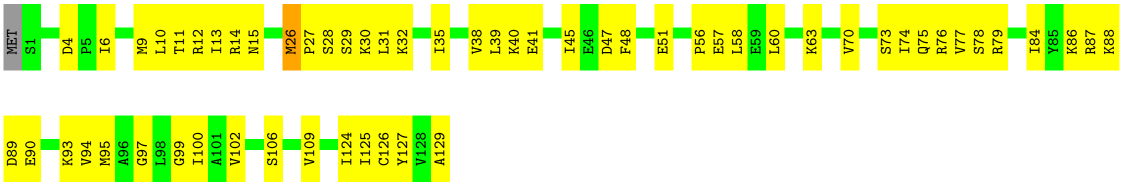
- Molecule 15: 30S ribosomal protein S7

Chain G:



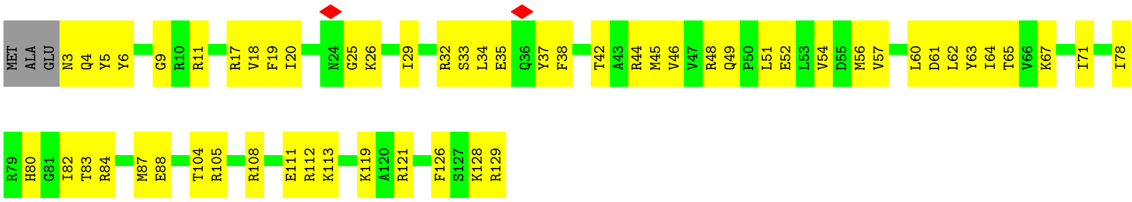
- Molecule 16: 30S ribosomal protein S8

Chain H:



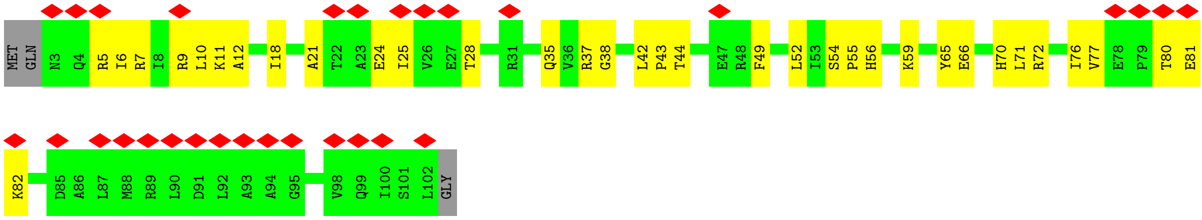
- Molecule 17: 30S ribosomal protein S9

Chain I:

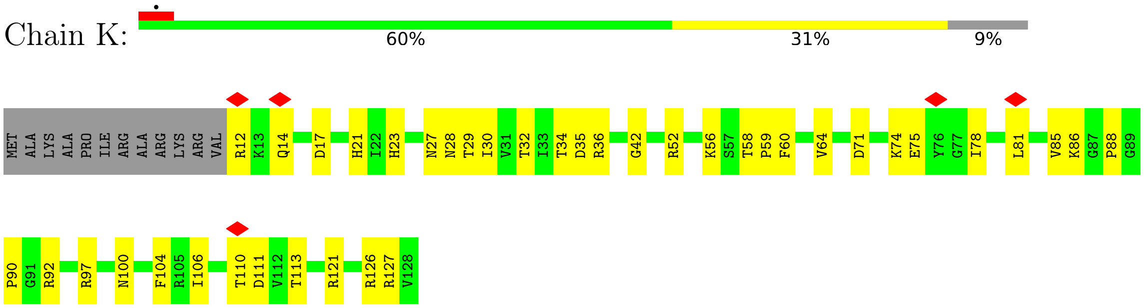


- Molecule 18: 30S ribosomal protein S10

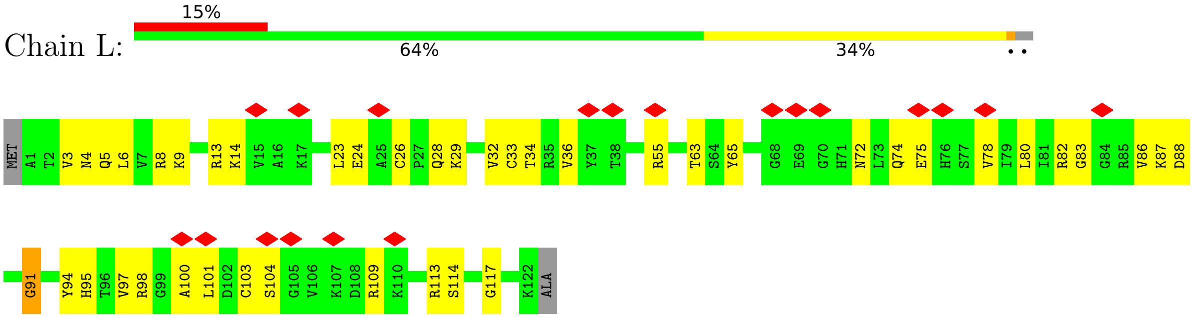
Chain J:



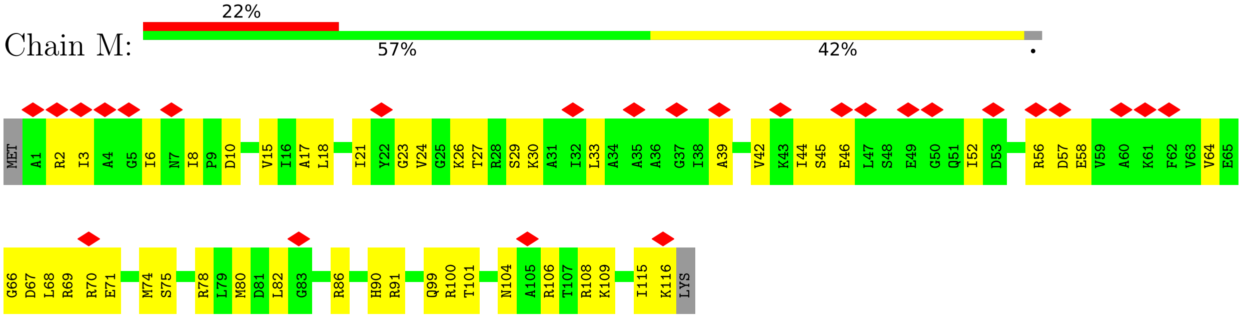
- Molecule 19: Small ribosomal subunit protein uS11



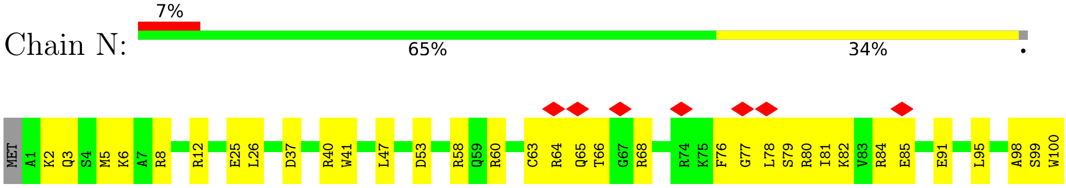
- Molecule 20: Small ribosomal subunit protein uS12



- Molecule 21: 30S ribosomal protein S13

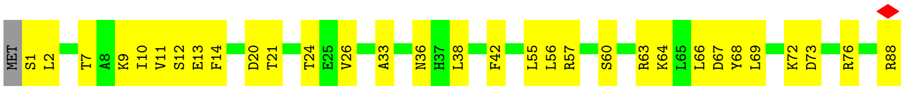


- Molecule 22: 30S ribosomal protein S14



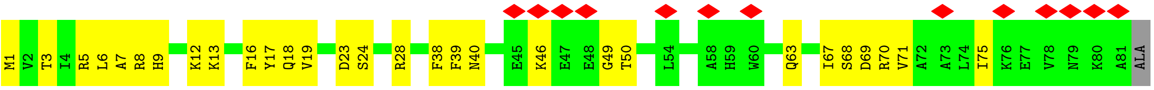
- Molecule 23: 30S ribosomal protein S15

Chain O:



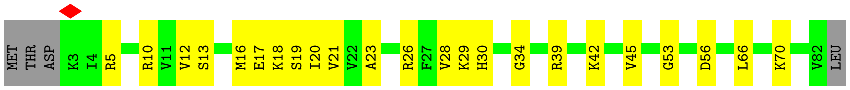
- Molecule 24: 30S ribosomal protein S16

Chain P:



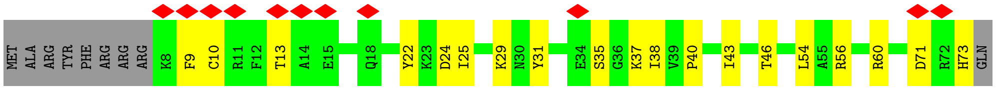
- Molecule 25: 30S ribosomal protein S17

Chain Q:



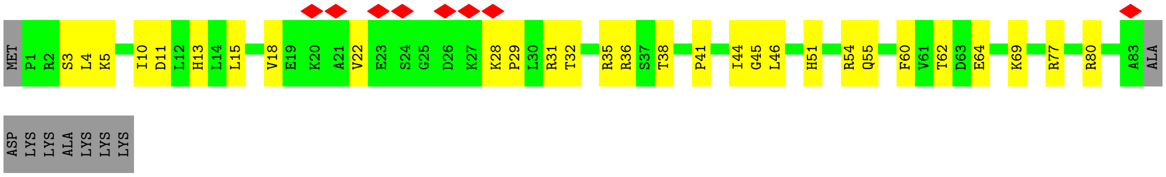
- Molecule 26: 30S ribosomal protein S18

Chain R:



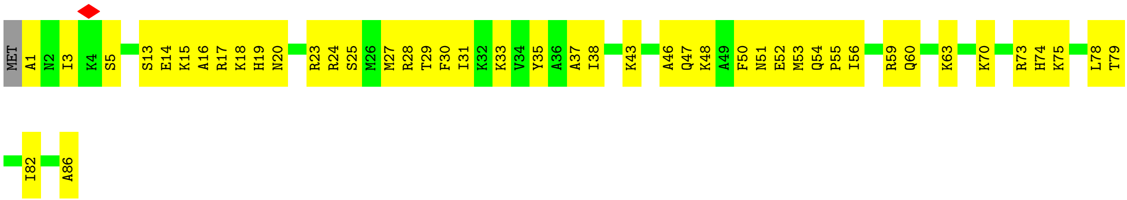
- Molecule 27: 30S ribosomal protein S19

Chain S:



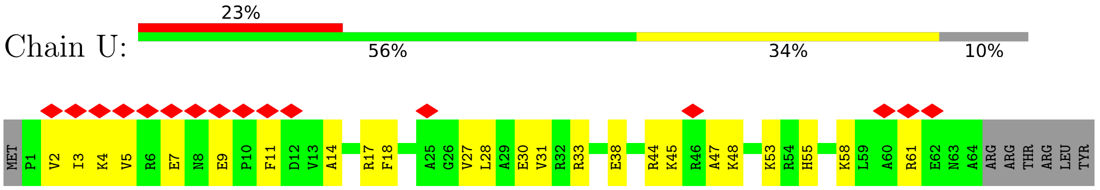
- Molecule 28: 30S ribosomal protein S20

Chain T:



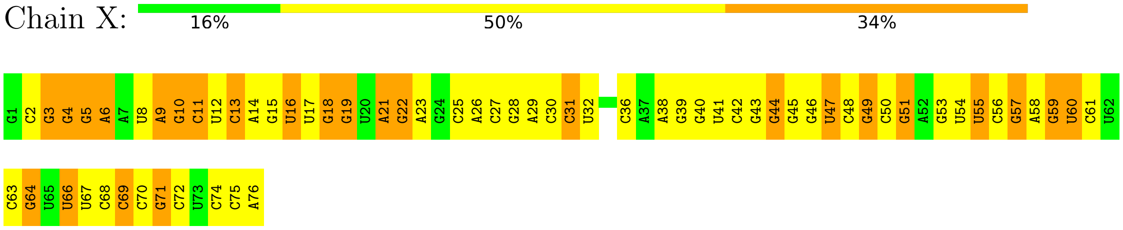
- Molecule 29: 30S ribosomal protein S21

Chain U:



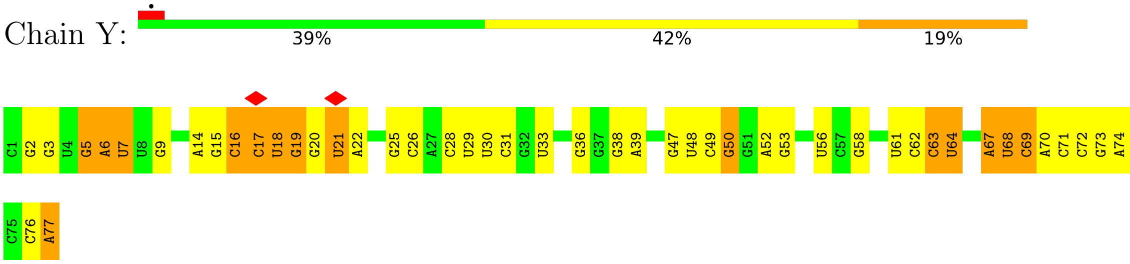
- Molecule 30: E-site tRNA

Chain X:



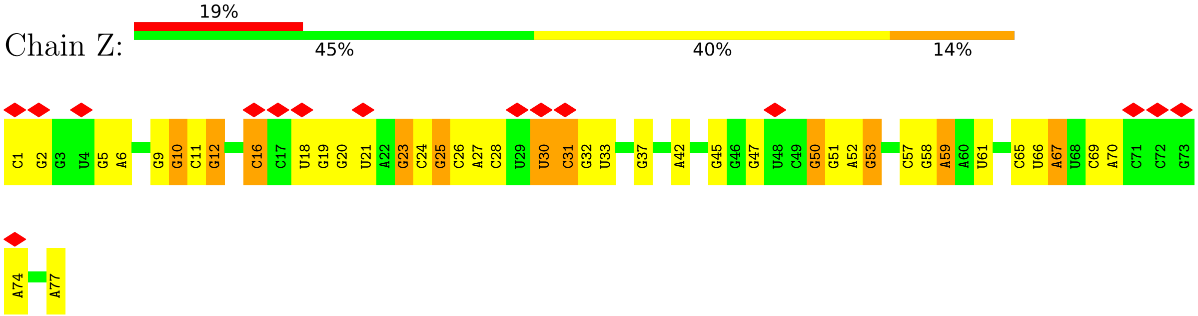
- Molecule 31: P-site tRNA (Chain-Y), A-site tRNA-PRO (Chain-Z)

Chain Y:



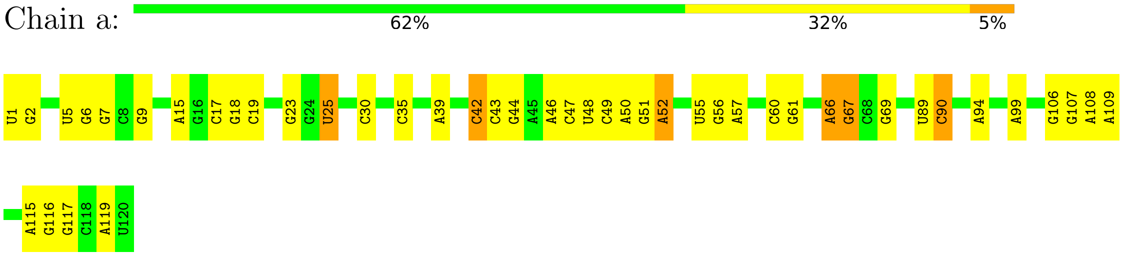
- Molecule 31: P-site tRNA (Chain-Y), A-site tRNA-PRO (Chain-Z)

Chain Z:



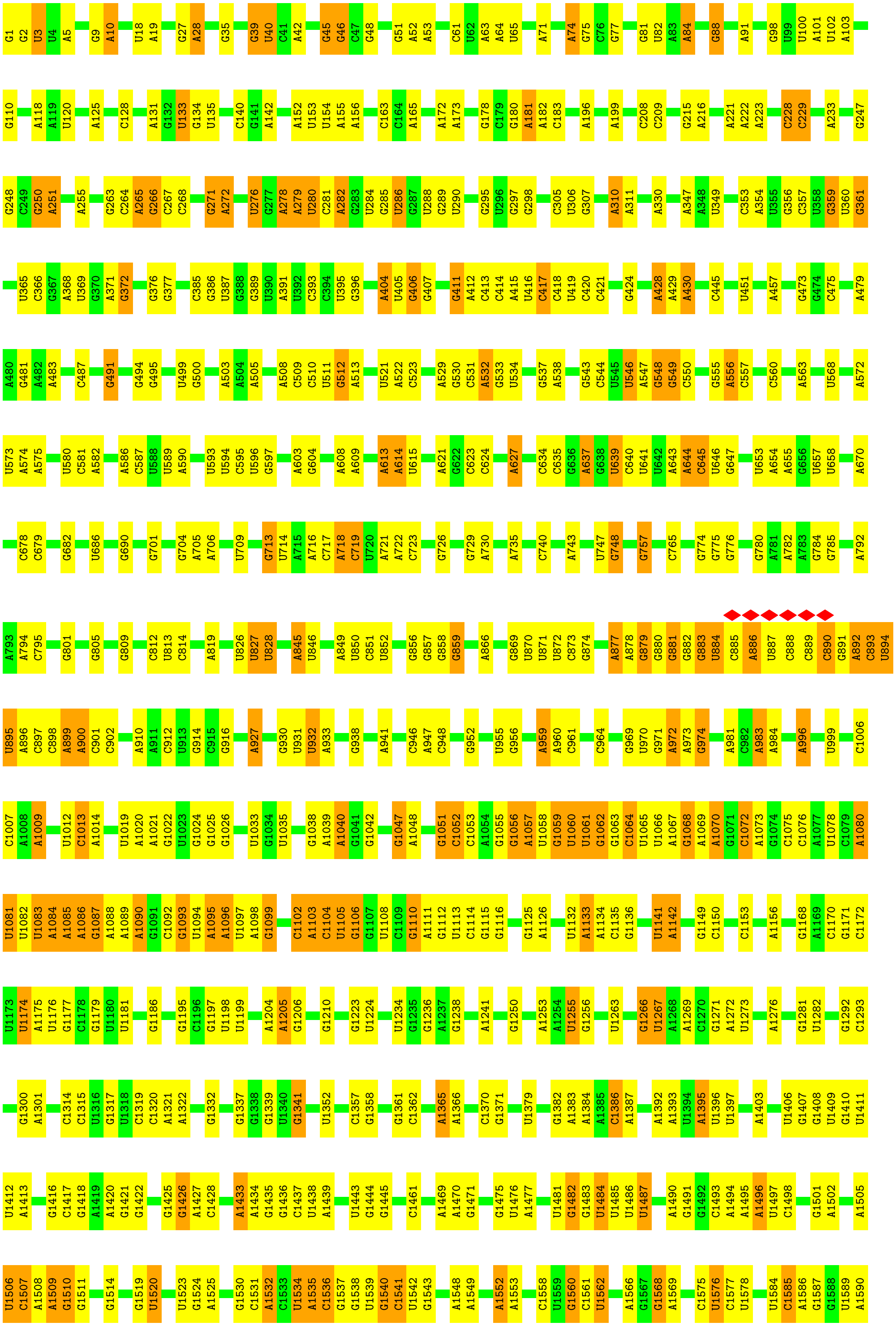
- Molecule 32: 5S rRNA

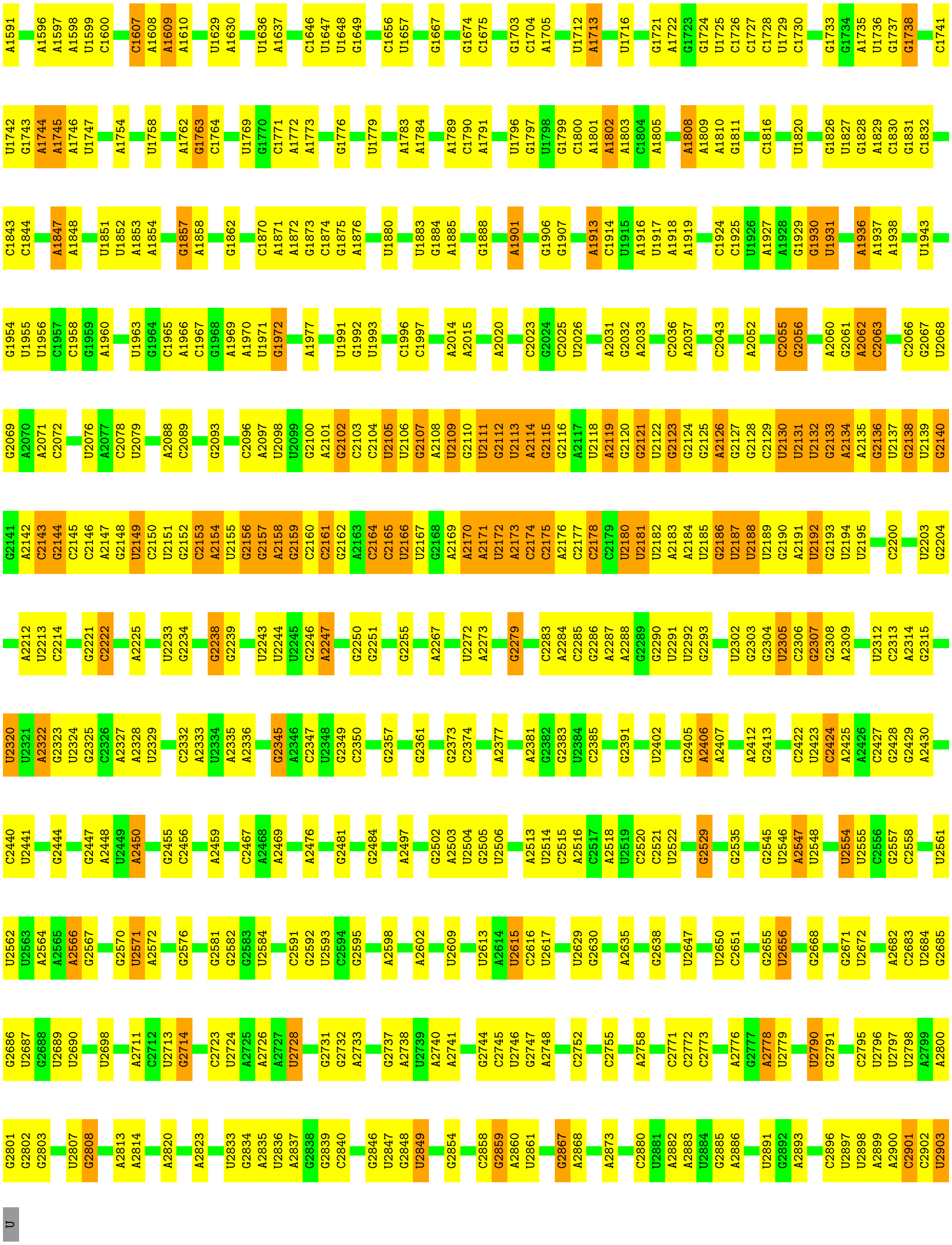
Chain a:



- Molecule 33: RNA (2903-MER)

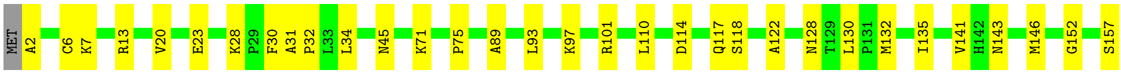
Chain b:

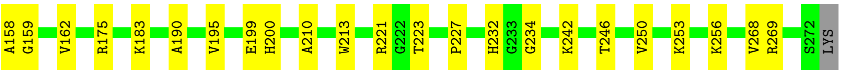

G1 G2 U3 U4 A5 G9 A10 U18 A19 G27 A28 G35 G39 U40 C41 A42 G45 G46 C47 G48 G51 A52 A53 C61 U62 A63 A64 U65 A71 A74 G75 C76 G77 G81 U82 A83 A84 G88 A91 G98 U99 U100 A101 U102 A103
G110 A118 A119 U120 A125 C128 A131 G132 U133 G134 U135 C140 G141 A142 A152 U153 U154 A155 A156 C163 C164 A165 A172 A173 G178 C179 G180 A181 A182 C183 A196 A199 C208 C209 G215 A216 A221 A222 A223 C228 C229 A233 G247
G248 C249 G250 A251 A255 G263 C264 A265 G266 C267 C268 G271 A272 U276 G277 A278 A279 U280 C281 A282 G283 U284 G285 U286 G287 U288 G289 U290 G295 U296 G297 G298 C305 U306 G307 A310 A311 A330 A347 A348 U349 C353 A354 U355 G356 C357 U358 G359 U360 G361
U365 C366 G367 A368 U369 G370 A371 G372 G376 G377 C385 G386 U387 G388 G389 U390 A391 U392 C393 C394 U395 G396 A404 U405 G406 G407 G411 A412 C413 C414 A415 U416 C417 C418 U419 C420 C421 G424 A428 A429 A430 C445 U451 A457 G473 G474 C475 A479
A480 G481 A482 A483 C487 G491 G494 G495 U499 G500 A503 A504 A505 A508 C509 C510 U511 G512 A513 U521 A522 C523 A529 G530 C531 A532 G533 U534 G537 A538 G543 C544 U545 U546 A547 G548 G549 C550 G555 A556 C557 C560 A563 U568 A572
U573 A574 A575 U580 C581 A582 A586 C587 U588 U589 A590 U593 U594 C595 U596 G597 A603 G604 A608 A609 A613 A614 U615 A621 G622 C623 C624 A627 C634 C635 G636 A637 G638 U639 C640 U641 U642 A643 A644 C645 U646 G647 U653 A654 A655 G656 U657 U658 A670
C678 C679 G682 U686 G690 G701 G704 A705 A706 U709 G713 U714 A715 A716 C717 A718 C719 U720 A721 A722 C723 G726 G729 A730 A735 C740 A743 U747 G748 G757 C765 G774 G775 G776 G780 A781 A782 A783 G784 G785 A792
A793 A794 C795 G801 G805 G809 C812 U813 C814 A819 U826 U827 U828 A845 U846 A849 U850 C851 U852 G856 G857 G858 G859 A866 G869 U870 U871 U872 C873 G874 A877 A878 G879 G880 G881 G882 G883 U884 C885 A886 U887 C888 C889 C890 G891 A892 C893 U894
U895 A896 C897 C898 A899 A900 C901 C902 A910 A911 C912 U913 G914 C915 G916 A927 G930 U931 U932 A933 G938 A941 C946 A947 C948 G952 U955 G956 A959 A960 C961 C964 G969 U970 G971 A972 A973 G974 A981 C982 A983 A984 A996 U999 C1006
C1007 A1008 A1009 U1012 C1013 A1014 U1019 A1020 A1021 G1022 U1023 G1024 G1025 G1026 U1033 G1034 U1035 G1038 A1039 A1040 G1041 G1042 G1047 A1048 G1051 C1052 C1053 A1054 G1055 G1056 A1057 U1058 G1059 U1060 U1061 G1062 G1063 C1064 U1065 U1066 A1067 G1068 A1069 A1070 G1071 C1072 A1073 G1074 C1075 C1076 A1077 U1078 C1079 A1080
U1081 U1082 U1083 A1084 A1085 A1086 G1087 A1088 A1089 A1090 G1091 C1092 G1093 U1094 A1095 A1096 U1097 A1098 G1099 C1102 A1103 C1104 U1105 G1106 U1107 U1108 C1109 G1110 A1111 G1112 U1113 C1114 G1115 G1116 G1125 A1126 U1132 A1133 A1134 C1135 G1136 U1141 A1142 G1149 C1150 C1153 A1156 G1168 A1169 C1170 G1171 C1172
U1173 U1174 A1175 U1176 G1177 C1178 G1179 U1180 U1181 G1186 G1195 C1196 G1197 U1198 U1199 A1204 A1205 G1206 G1210 G1223 U1224 U1234 G1235 G1236 A1237 G1238 A1241 G1250 A1253 A1254 U1255 G1256 U1263 G1266 U1267 A1268 A1269 C1270 G1271 A1272 U1273 A1276 G1281 U1282 G1292 C1293
G1300 A1301 C1314 C1315 U1316 G1317 U1318 C1319 C1320 A1321 A1322 G1332 G1337 G1338 G1339 U1340 G1341 U1352 C1357 G1358 G1361 C1362 A1365 A1366 C1370 G1371 U1379 G1382 A1383 A1384 A1385 C1386 A1387 A1392 A1393 U1394 A1395 U1396 U1397 A1403 U1406 G1407 G1408 A1409 G1410 U1411
U1412 A1413 G1416 C1417 G1418 A1419 A1420 G1421 G1422 G1425 G1426 A1427 C1428 A1433 A1434 G1435 G1436 C1437 U1438 A1439 U1443 G1444 G1445 C1461 A1469 A1470 G1471 G1475 U1476 A1477 U1481 G1482 G1483 U1484 U1485 U1486 U1487 A1490 G1491 G1492 C1493 A1494 A1495 A1496 U1497 C1498 G1501 A1502 A1505
U1506 C1507 A1508 A1509 G1510 G1511 G1514 G1519 U1520 U1523 G1524 A1525 G1530 C1531 A1532 C1533 U1534 A1535 C1536 G1537 G1538 U1539 G1540 C1541 U1542 G1543 A1548 A1549 A1552 A1553 C1558 U1559 G1560 C1561 U1562 A1566 G1567 G1568 A1569 C1575 U1576 C1577 U1578 U1584 C1585 A1586 G1587 G1588 U1589 A1590
]



- Molecule 34: 50S ribosomal protein L2

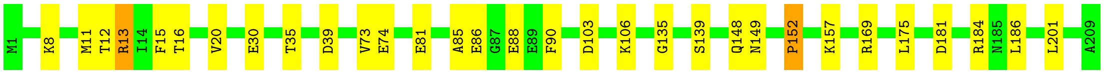
Chain c:





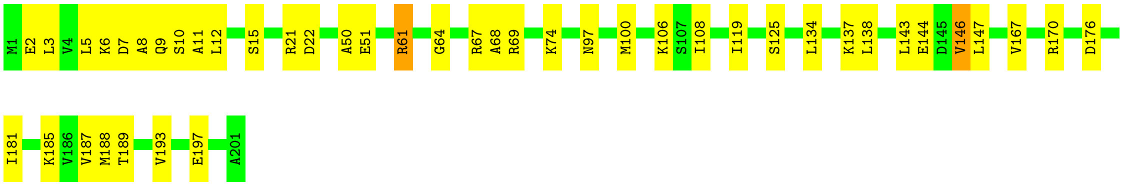
- Molecule 35: 50S ribosomal protein L3

Chain d:



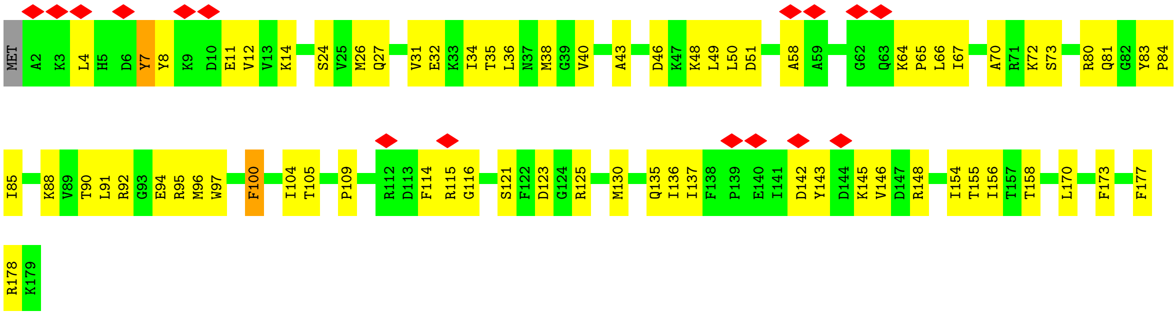
- Molecule 36: 50S ribosomal protein L4

Chain e:



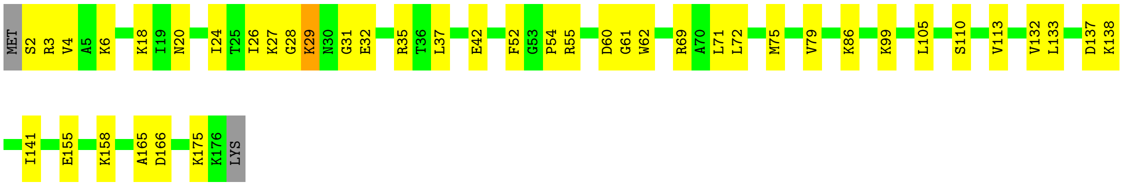
- Molecule 37: 50S ribosomal protein L5

Chain f:



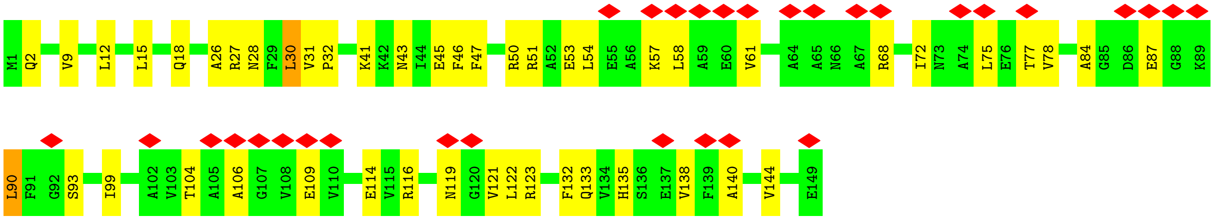
- Molecule 38: 50S ribosomal protein L6

Chain g:



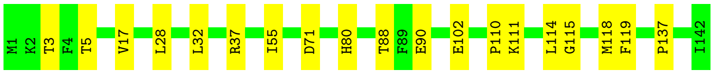
- Molecule 39: 50S ribosomal protein L9

Chain h:



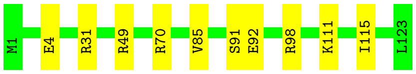
- Molecule 40: 50S ribosomal protein L13

Chain k:



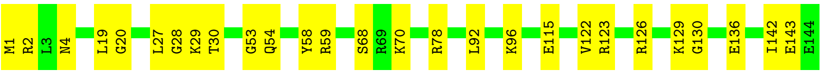
- Molecule 41: 50S ribosomal protein L14

Chain l:



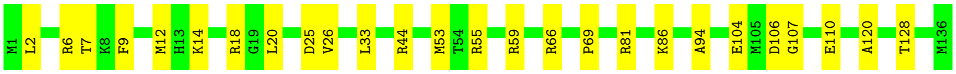
- Molecule 42: 50S ribosomal protein L15

Chain m:



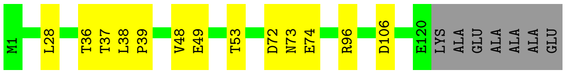
- Molecule 43: 50S ribosomal protein L16

Chain n:



- Molecule 44: 50S ribosomal protein L17

Chain o:

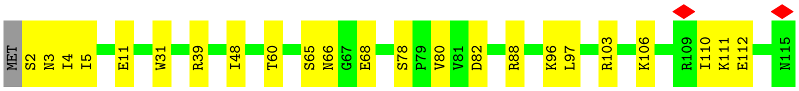


- Molecule 45: 50S ribosomal protein L18

Chain p:

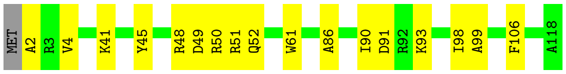
- Molecule 46: 50S ribosomal protein L19

Chain q:



- Molecule 47: 50S ribosomal protein L20

Chain r:

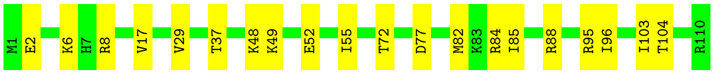


- Molecule 48: 50S ribosomal protein L21

Chain s:

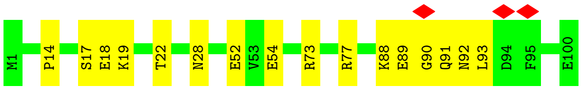
- Molecule 49: 50S ribosomal protein L22

Chain t:



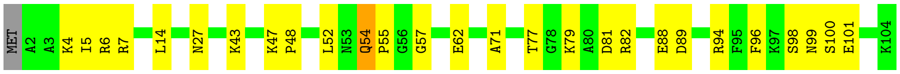
- Molecule 50: 50S ribosomal protein L23

Chain u:



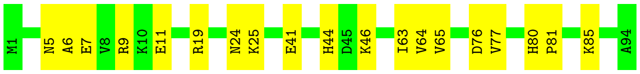
- Molecule 51: 50S ribosomal protein L24

Chain v:

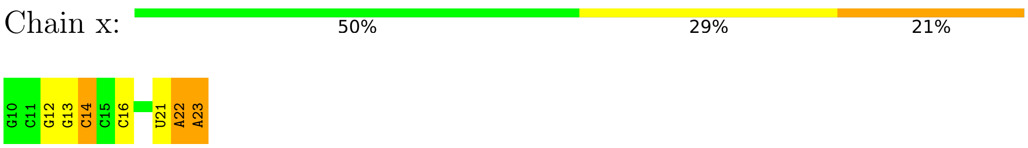


- Molecule 52: 50S ribosomal protein L25

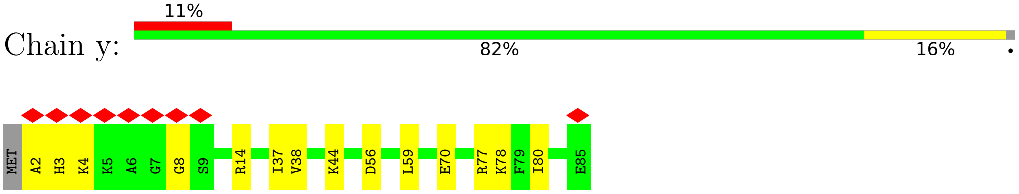
Chain w:



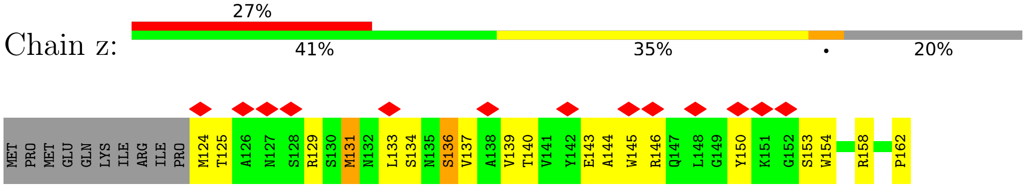
- Molecule 53: mRNA



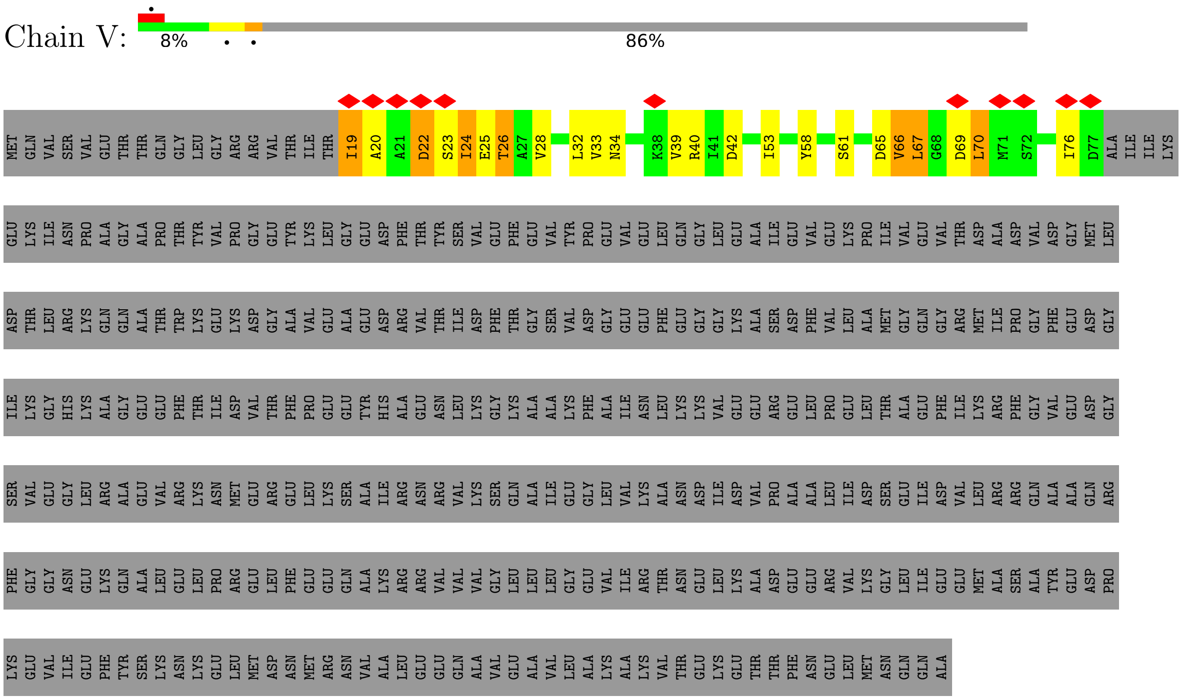
- Molecule 54: 50S ribosomal protein L27



- Molecule 55: eRAP-NC



- Molecule 56: Trigger factor



4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	145326	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 ($e^-/\text{Å}^2$)	38	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.007	Depositor
Minimum map value	-0.742	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.069	Depositor
Recommended contour level	0.2	Depositor
Map size (Å)	528.0, 528.0, 528.0	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.1, 1.1, 1.1	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN

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	0	0.28	0/635	0.34	0/848
2	1	0.25	0/496	0.37	0/660
3	2	0.29	0/453	0.37	0/605
4	4	0.33	0/450	0.37	0/599
5	5	0.22	0/433	0.32	0/576
6	6	0.33	0/380	0.36	0/498
7	7	0.31	0/513	0.31	0/676
8	8	0.32	0/303	0.29	0/397
9	A	0.16	0/36834	0.28	1/57462 (0.0%)
10	B	0.12	0/1735	0.31	0/2338
11	C	0.12	0/1659	0.29	0/2236
12	D	0.13	0/1665	0.30	0/2227
13	E	0.15	0/1169	0.34	0/1573
14	F	0.14	0/881	0.30	0/1189
15	G	0.11	0/1219	0.25	0/1635
16	H	0.17	0/989	0.34	0/1326
17	I	0.19	0/1034	0.35	0/1375
18	J	0.14	0/813	0.37	0/1100
19	K	0.16	0/893	0.31	0/1205
20	L	0.19	0/963	0.39	0/1293
21	M	0.13	0/909	0.30	0/1215
22	N	0.12	0/817	0.26	0/1088
23	O	0.14	0/722	0.28	0/964
24	P	0.11	0/653	0.27	0/877
25	Q	0.13	0/657	0.34	0/881
26	R	0.12	0/553	0.28	0/742
27	S	0.12	0/680	0.34	0/915
28	T	0.17	0/676	0.30	0/895
29	U	0.15	0/536	0.39	0/711
30	X	0.22	0/1810	0.32	0/2820
31	Y	0.15	0/1840	0.29	0/2866
31	Z	0.18	0/1840	0.28	0/2866

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
32	a	0.27	0/2869	0.28	0/4474
33	b	0.34	0/69800	0.32	1/108892 (0.0%)
34	c	0.32	0/2121	0.38	0/2852
35	d	0.37	1/1586 (0.1%)	0.45	2/2134 (0.1%)
36	e	0.32	0/1571	0.33	0/2113
37	f	0.25	0/1443	0.52	2/1937 (0.1%)
38	g	0.22	0/1333	0.29	0/1805
39	h	0.30	0/1121	0.42	0/1515
40	k	0.33	0/1152	0.32	0/1551
41	l	0.28	0/955	0.39	0/1279
42	m	0.29	0/1062	0.37	0/1413
43	n	0.28	0/1093	0.34	0/1460
44	o	0.30	0/973	0.33	0/1301
45	p	0.21	0/902	0.29	0/1209
46	q	0.27	0/929	0.30	0/1242
47	r	0.35	0/960	0.32	0/1278
48	s	0.31	0/829	0.43	0/1107
49	t	0.33	0/864	0.31	0/1156
50	u	0.27	0/793	0.35	0/1060
51	v	0.56	2/796 (0.3%)	0.40	0/1062
52	w	0.25	0/766	0.33	0/1025
53	x	0.13	0/333	0.28	0/517
54	y	0.31	0/642	0.33	0/848
55	z	0.36	0/416	0.61	1/569 (0.2%)
56	V	0.40	0/457	0.70	0/612
All	All	0.28	3/160976 (0.0%)	0.32	7/241069 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
51	v	54	GLN	C-O	-12.92	1.17	1.23
35	d	152	PRO	CG-CD	-7.24	1.26	1.50
51	v	54	GLN	CA-C	5.31	1.57	1.53

The worst 5 of 7 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
35	d	152	PRO	N-CD-CG	10.27	118.60	103.20
35	d	152	PRO	CA-N-CD	-7.25	101.85	112.00
9	A	1357	A	C2'-C3'-O3'	6.34	123.21	113.70
33	b	2571	U	C3'-C2'-O2'	5.13	118.39	110.70
37	f	4	LEU	CA-C-N	-5.11	110.76	121.64

There are no chirality outliers.

There are no planarity outliers.

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	0	625	0	652	14	0
2	1	495	0	526	14	0
3	2	449	0	488	7	0
4	4	444	0	458	14	0
5	5	426	0	464	6	0
6	6	377	0	418	5	0
7	7	504	0	572	7	0
8	8	302	0	341	4	0
9	A	32895	0	16553	715	0
10	B	1704	0	1732	58	0
11	C	1632	0	1710	59	0
12	D	1643	0	1710	80	0
13	E	1156	0	1199	33	0
14	F	862	0	864	33	0
15	G	1203	0	1256	39	0
16	H	979	0	1034	49	0
17	I	1022	0	1070	79	0
18	J	803	0	842	38	0
19	K	877	0	887	34	0
20	L	949	0	1014	43	0
21	M	900	0	968	38	0
22	N	805	0	847	37	0
23	O	714	0	737	27	0
24	P	643	0	661	22	0
25	Q	648	0	691	19	0
26	R	544	0	565	15	0
27	S	663	0	690	28	0
28	T	670	0	722	39	0
29	U	529	0	565	20	0
30	X	1621	0	820	63	0
31	Y	1647	0	832	43	0
31	Z	1647	0	832	32	0
32	a	2568	0	1302	35	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
33	b	62321	0	31344	686	0
34	c	2082	0	2154	43	0
35	d	1565	0	1616	27	0
36	e	1552	0	1619	57	0
37	f	1419	0	1457	73	0
38	g	1313	0	1358	34	0
39	h	1110	0	1148	44	0
40	k	1129	0	1162	14	0
41	l	946	0	1023	9	0
42	m	1053	0	1129	19	0
43	n	1074	0	1157	22	0
44	o	960	0	1000	9	0
45	p	892	0	923	15	0
46	q	917	0	962	19	0
47	r	947	0	1019	14	0
48	s	816	0	839	33	0
49	t	857	0	922	21	0
50	u	786	0	846	16	0
51	v	788	0	844	18	0
52	w	753	0	780	14	0
53	x	299	0	154	6	0
54	y	634	0	653	16	0
55	z	398	0	372	35	0
56	V	454	0	476	30	0
57	8	1	0	0	0	0
58	Z	7	0	7	4	0
All	All	148019	0	98986	2676	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 11.

The worst 5 of 2676 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)
36:e:5:LEU:CD2	36:e:8:ALA:HB3	1.60	1.29
48:s:51:VAL:HB	48:s:52:PRO:CD	1.60	1.29
56:V:19:ILE:HG22	56:V:23:SER:CB	1.68	1.23
31:Y:77:A:O3'	55:z:162:PRO:C	1.88	1.15
31:Z:77:A:HO3'	58:Z:163:PRO:C	1.52	1.15

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	
1	0	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
2	1	59/63 (94%)	57 (97%)	2 (3%)	0	100	100
3	2	56/59 (95%)	54 (96%)	2 (4%)	0	100	100
4	4	54/57 (95%)	45 (83%)	9 (17%)	0	100	100
5	5	50/55 (91%)	48 (96%)	2 (4%)	0	100	100
6	6	44/46 (96%)	39 (89%)	5 (11%)	0	100	100
7	7	62/65 (95%)	58 (94%)	4 (6%)	0	100	100
8	8	36/38 (95%)	35 (97%)	1 (3%)	0	100	100
10	B	216/241 (90%)	198 (92%)	18 (8%)	0	100	100
11	C	205/233 (88%)	192 (94%)	13 (6%)	0	100	100
12	D	203/206 (98%)	183 (90%)	20 (10%)	0	100	100
13	E	155/167 (93%)	142 (92%)	13 (8%)	0	100	100
14	F	104/135 (77%)	98 (94%)	6 (6%)	0	100	100
15	G	151/179 (84%)	144 (95%)	7 (5%)	0	100	100
16	H	127/130 (98%)	121 (95%)	6 (5%)	0	100	100
17	I	125/130 (96%)	111 (89%)	14 (11%)	0	100	100
18	J	98/103 (95%)	84 (86%)	14 (14%)	0	100	100
19	K	115/129 (89%)	107 (93%)	8 (7%)	0	100	100
20	L	120/124 (97%)	105 (88%)	14 (12%)	1 (1%)	16	45
21	M	114/118 (97%)	104 (91%)	10 (9%)	0	100	100
22	N	98/101 (97%)	92 (94%)	6 (6%)	0	100	100
23	O	86/89 (97%)	80 (93%)	6 (7%)	0	100	100
24	P	79/82 (96%)	67 (85%)	12 (15%)	0	100	100
25	Q	78/84 (93%)	72 (92%)	6 (8%)	0	100	100
26	R	64/75 (85%)	63 (98%)	1 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
27	S	81/92 (88%)	72 (89%)	9 (11%)	0	100	100
28	T	84/87 (97%)	83 (99%)	1 (1%)	0	100	100
29	U	62/71 (87%)	53 (86%)	9 (14%)	0	100	100
34	c	269/273 (98%)	248 (92%)	21 (8%)	0	100	100
35	d	207/209 (99%)	190 (92%)	17 (8%)	0	100	100
36	e	199/201 (99%)	192 (96%)	7 (4%)	0	100	100
37	f	176/179 (98%)	156 (89%)	20 (11%)	0	100	100
38	g	173/177 (98%)	162 (94%)	11 (6%)	0	100	100
39	h	147/149 (99%)	135 (92%)	12 (8%)	0	100	100
40	k	140/142 (99%)	137 (98%)	3 (2%)	0	100	100
41	l	121/123 (98%)	106 (88%)	15 (12%)	0	100	100
42	m	142/144 (99%)	125 (88%)	17 (12%)	0	100	100
43	n	134/136 (98%)	126 (94%)	8 (6%)	0	100	100
44	o	118/127 (93%)	110 (93%)	8 (7%)	0	100	100
45	p	114/117 (97%)	108 (95%)	6 (5%)	0	100	100
46	q	112/115 (97%)	108 (96%)	4 (4%)	0	100	100
47	r	115/118 (98%)	114 (99%)	1 (1%)	0	100	100
48	s	101/103 (98%)	89 (88%)	10 (10%)	2 (2%)	6	23
49	t	108/110 (98%)	102 (94%)	6 (6%)	0	100	100
50	u	98/100 (98%)	89 (91%)	9 (9%)	0	100	100
51	v	101/104 (97%)	88 (87%)	13 (13%)	0	100	100
52	w	92/94 (98%)	89 (97%)	3 (3%)	0	100	100
54	y	82/85 (96%)	80 (98%)	2 (2%)	0	100	100
55	z	45/49 (92%)	32 (71%)	13 (29%)	0	100	100
56	V	57/432 (13%)	52 (91%)	5 (9%)	0	100	100
All	All	5652/6324 (89%)	5216 (92%)	433 (8%)	3 (0%)	50	77

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
48	s	51	VAL
20	L	91	GLY
48	s	53	PHE

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	0	67/68 (98%)	67 (100%)	0	100	100
2	1	54/55 (98%)	54 (100%)	0	100	100
3	2	48/49 (98%)	48 (100%)	0	100	100
4	4	47/48 (98%)	47 (100%)	0	100	100
5	5	47/49 (96%)	47 (100%)	0	100	100
6	6	38/38 (100%)	38 (100%)	0	100	100
7	7	51/52 (98%)	51 (100%)	0	100	100
8	8	34/34 (100%)	34 (100%)	0	100	100
10	B	180/199 (90%)	180 (100%)	0	100	100
11	C	171/190 (90%)	170 (99%)	1 (1%)	84	95
12	D	172/173 (99%)	171 (99%)	1 (1%)	84	95
13	E	119/126 (94%)	119 (100%)	0	100	100
14	F	92/116 (79%)	92 (100%)	0	100	100
15	G	126/147 (86%)	126 (100%)	0	100	100
16	H	104/105 (99%)	103 (99%)	1 (1%)	73	91
17	I	105/107 (98%)	105 (100%)	0	100	100
18	J	88/90 (98%)	88 (100%)	0	100	100
19	K	90/99 (91%)	90 (100%)	0	100	100
20	L	103/104 (99%)	103 (100%)	0	100	100
21	M	94/96 (98%)	94 (100%)	0	100	100
22	N	83/84 (99%)	83 (100%)	0	100	100
23	O	76/77 (99%)	76 (100%)	0	100	100
24	P	65/65 (100%)	65 (100%)	0	100	100
25	Q	74/78 (95%)	74 (100%)	0	100	100
26	R	57/65 (88%)	57 (100%)	0	100	100
27	S	72/79 (91%)	72 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
28	T	65/66 (98%)	65 (100%)	0	100	100
29	U	54/61 (88%)	54 (100%)	0	100	100
34	c	216/218 (99%)	216 (100%)	0	100	100
35	d	164/164 (100%)	162 (99%)	2 (1%)	67	89
36	e	165/165 (100%)	162 (98%)	3 (2%)	54	82
37	f	149/150 (99%)	146 (98%)	3 (2%)	50	79
38	g	136/138 (99%)	134 (98%)	2 (2%)	60	85
39	h	114/114 (100%)	112 (98%)	2 (2%)	54	82
40	k	116/116 (100%)	116 (100%)	0	100	100
41	l	104/104 (100%)	104 (100%)	0	100	100
42	m	103/103 (100%)	103 (100%)	0	100	100
43	n	109/109 (100%)	109 (100%)	0	100	100
44	o	100/103 (97%)	100 (100%)	0	100	100
45	p	86/87 (99%)	84 (98%)	2 (2%)	45	77
46	q	99/100 (99%)	99 (100%)	0	100	100
47	r	89/90 (99%)	89 (100%)	0	100	100
48	s	84/84 (100%)	82 (98%)	2 (2%)	44	76
49	t	93/93 (100%)	92 (99%)	1 (1%)	70	90
50	u	84/84 (100%)	84 (100%)	0	100	100
51	v	84/85 (99%)	82 (98%)	2 (2%)	44	76
52	w	78/78 (100%)	77 (99%)	1 (1%)	65	88
54	y	62/63 (98%)	61 (98%)	1 (2%)	58	84
55	z	39/43 (91%)	34 (87%)	5 (13%)	3	11
56	V	49/359 (14%)	40 (82%)	9 (18%)	1	4
All	All	4699/5170 (91%)	4661 (99%)	38 (1%)	77	93

5 of 38 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
55	z	146	ARG
56	V	67	LEU
56	V	19	ILE
56	V	25	GLU
56	V	76	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 38 such sidechains are listed below:

Mol	Chain	Res	Type
28	T	81	GLN
45	p	116	GLN
35	d	49	GLN
39	h	145	ASN
52	w	87	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
30	X	75/76 (98%)	40 (53%)	1 (1%)
31	Y	76/77 (98%)	20 (26%)	2 (2%)
31	Z	76/77 (98%)	19 (25%)	0
32	a	119/120 (99%)	17 (14%)	0
33	b	2902/2904 (99%)	603 (20%)	0
53	x	13/14 (92%)	5 (38%)	0
9	A	1532/1533 (99%)	371 (24%)	9 (0%)
All	All	4793/4801 (99%)	1075 (22%)	12 (0%)

5 of 1075 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
9	A	2	A
9	A	4	U
9	A	6	G
9	A	9	G
9	A	16	A

5 of 12 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
9	A	1357	A
9	A	1493	A
31	Y	16	C
30	X	21	A
9	A	429	U

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 2 ligands modelled in this entry, 1 is 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	$\#\|Z\| > 2$
58	PRO	Z	163	-	5,7,8	0.56	0	7,8,10	1.31	1 (14%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
58	PRO	Z	163	-	-	0/0/9/11	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
58	Z	163	PRO	O-C-CA	-2.38	118.55	124.78

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
58	Z	163	PRO	4	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

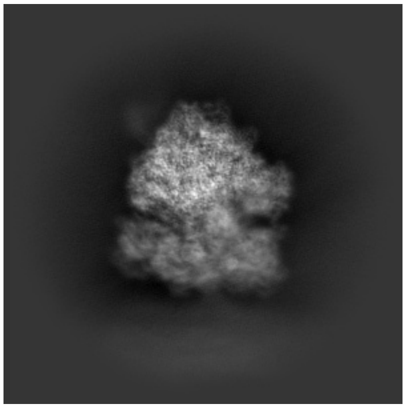
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-60061. These allow visual inspection of the internal detail of the map and identification of artifacts.

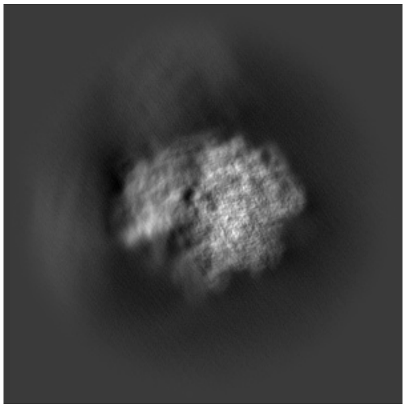
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections ⓘ

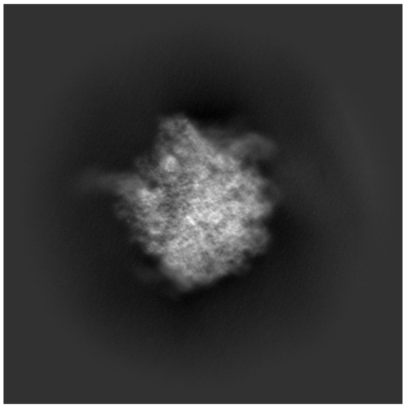
6.1.1 Primary map



X

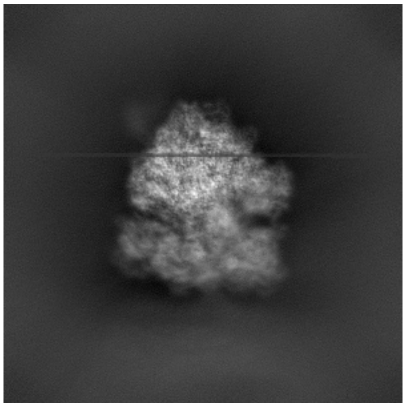


Y

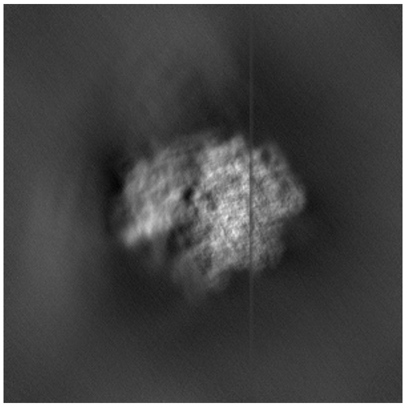


Z

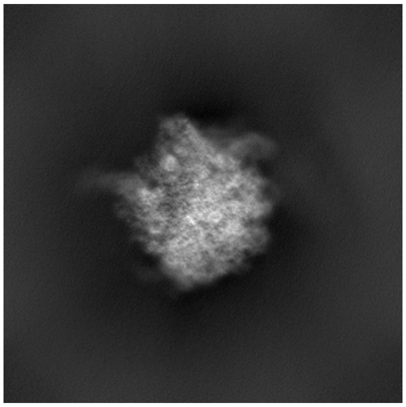
6.1.2 Raw map



X



Y

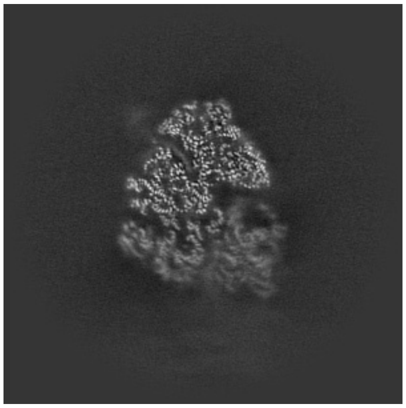


Z

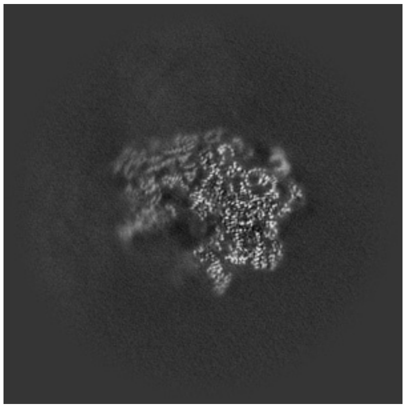
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

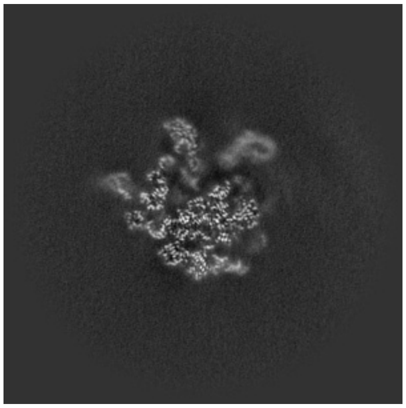
6.2.1 Primary map



X Index: 240

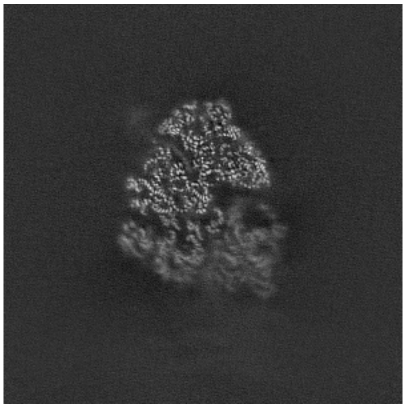


Y Index: 240

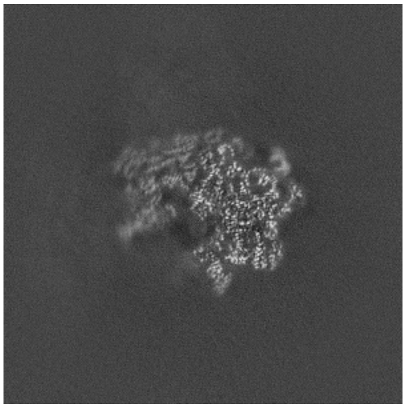


Z Index: 240

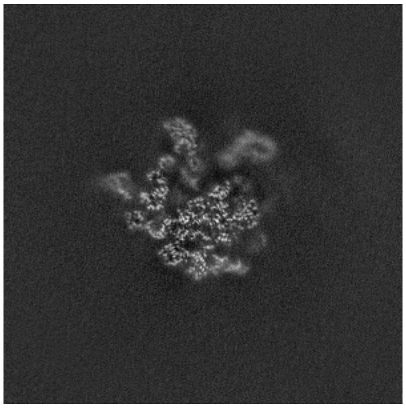
6.2.2 Raw map



X Index: 240



Y Index: 240

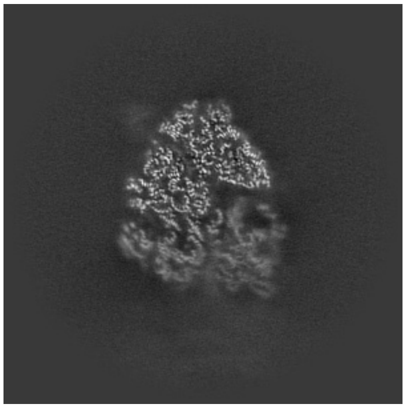


Z Index: 240

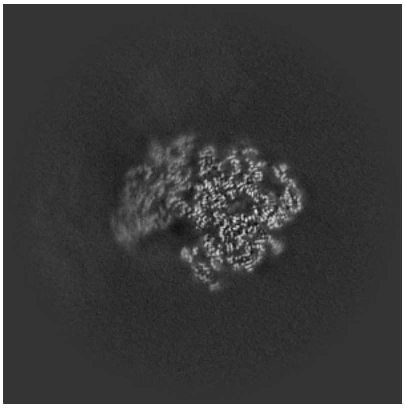
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

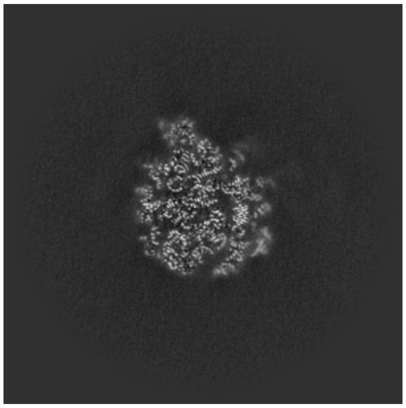
6.3.1 Primary map



X Index: 238

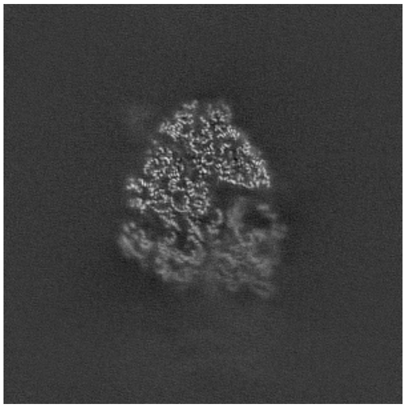


Y Index: 223

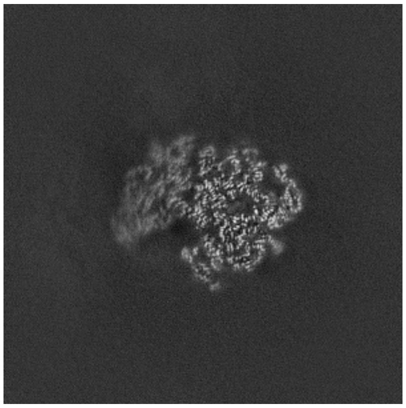


Z Index: 280

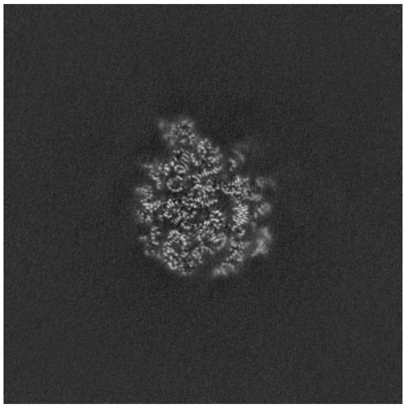
6.3.2 Raw map



X Index: 238



Y Index: 223

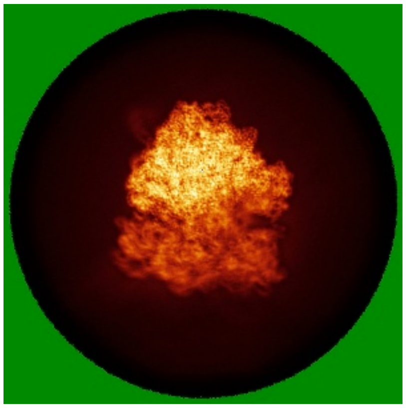


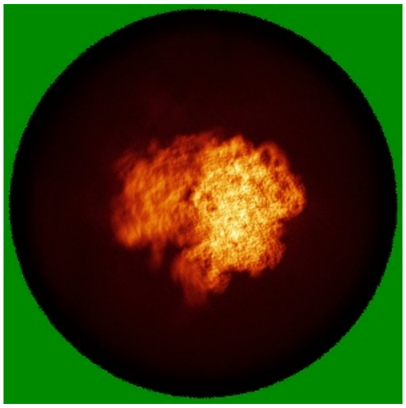
Z Index: 280

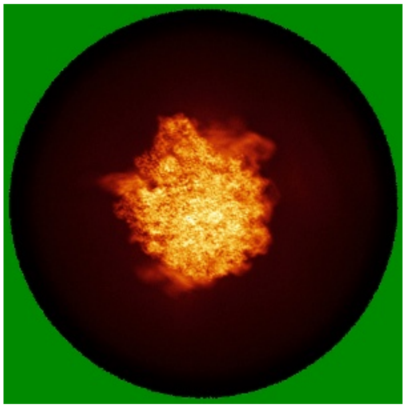
The images above show the largest variance slices of the map in three orthogonal directions.

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

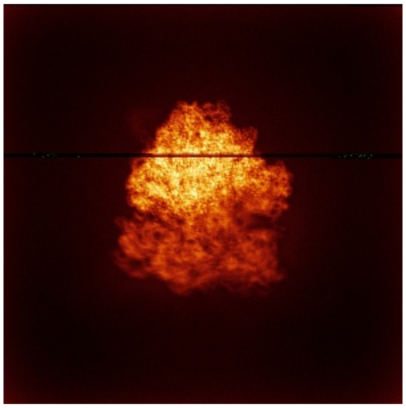
6.4.1 Primary map

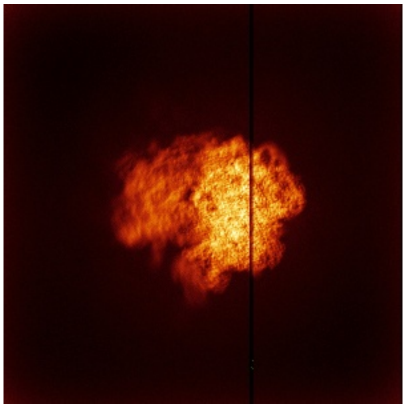

X

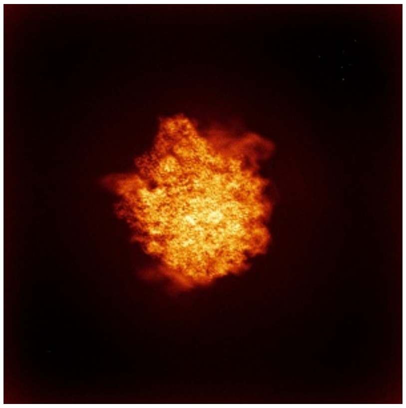

Y


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 0.2. 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.

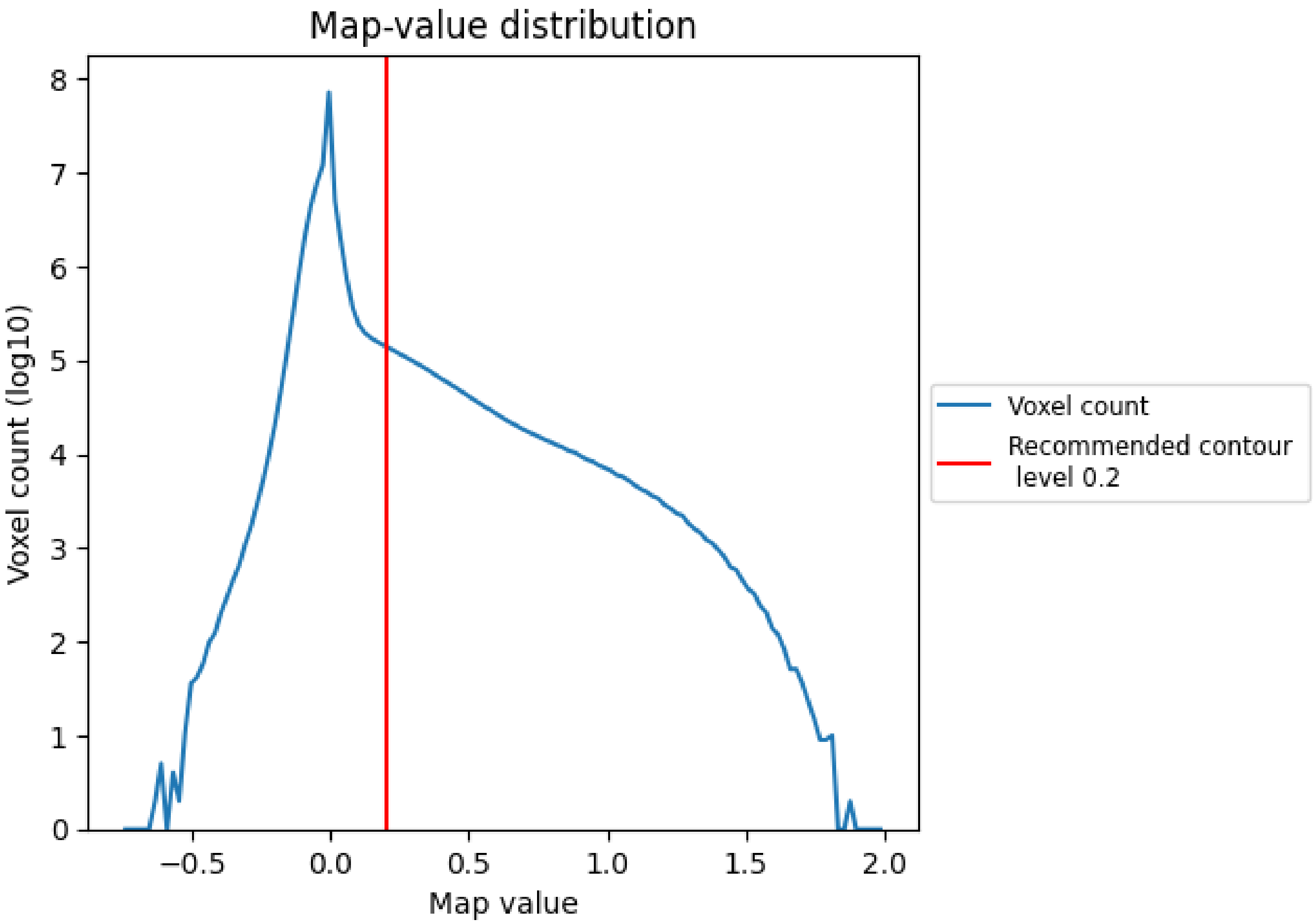
6.6 Mask visualisation

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

7 Map analysis ⓘ

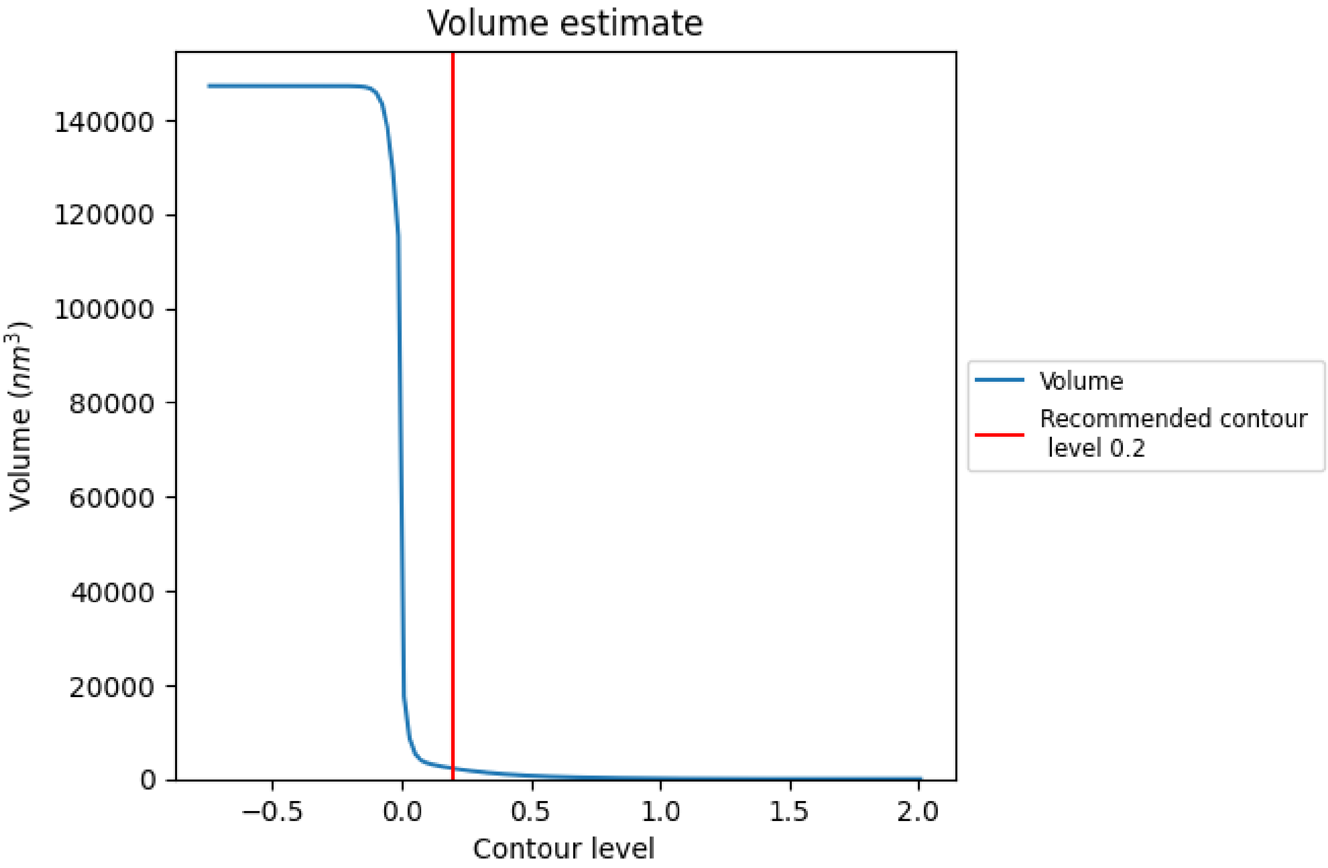
This section contains the results of statistical analysis of the map.

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.

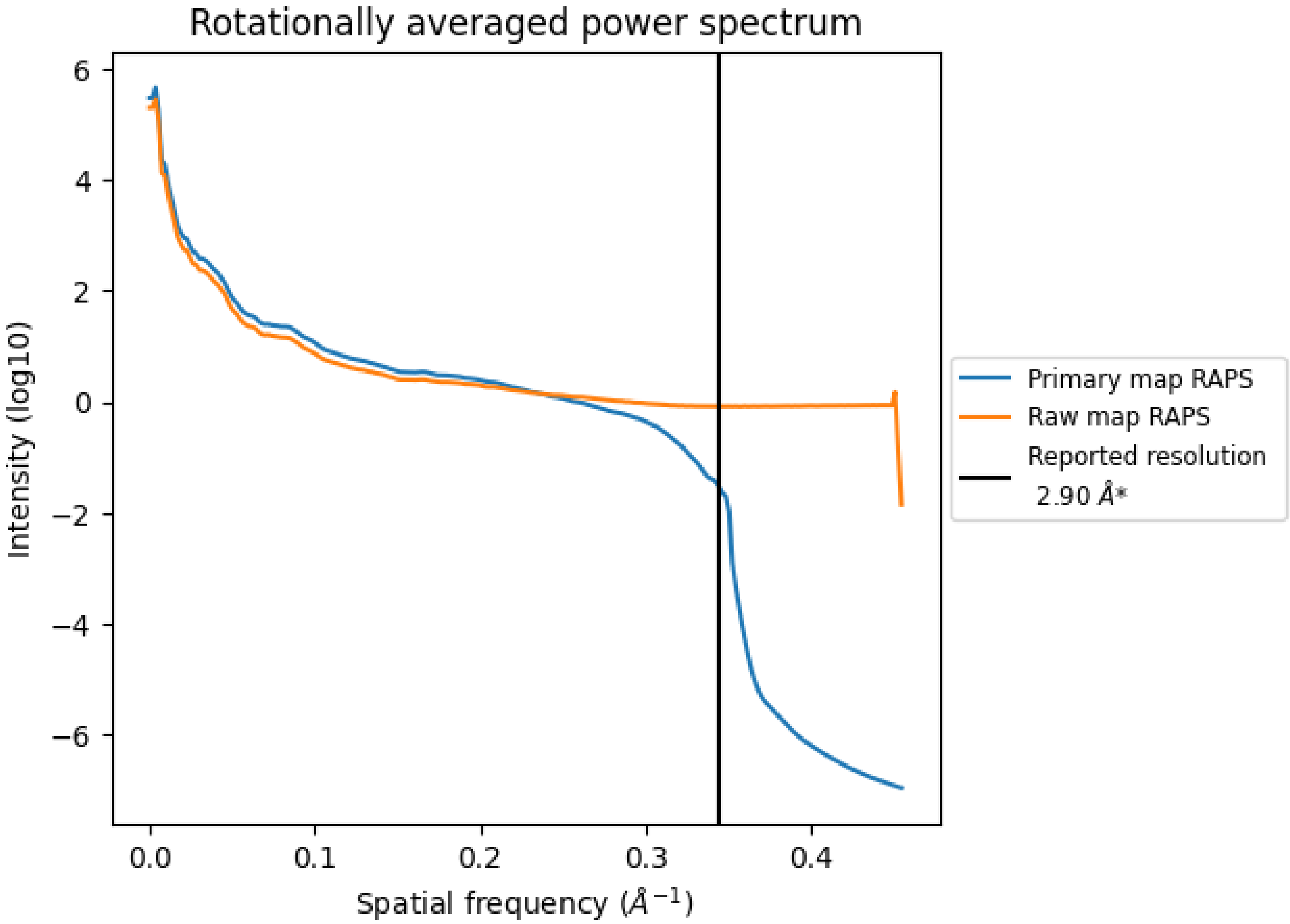
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 2269 nm^3; this corresponds to an approximate mass of 2050 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 ⓘ

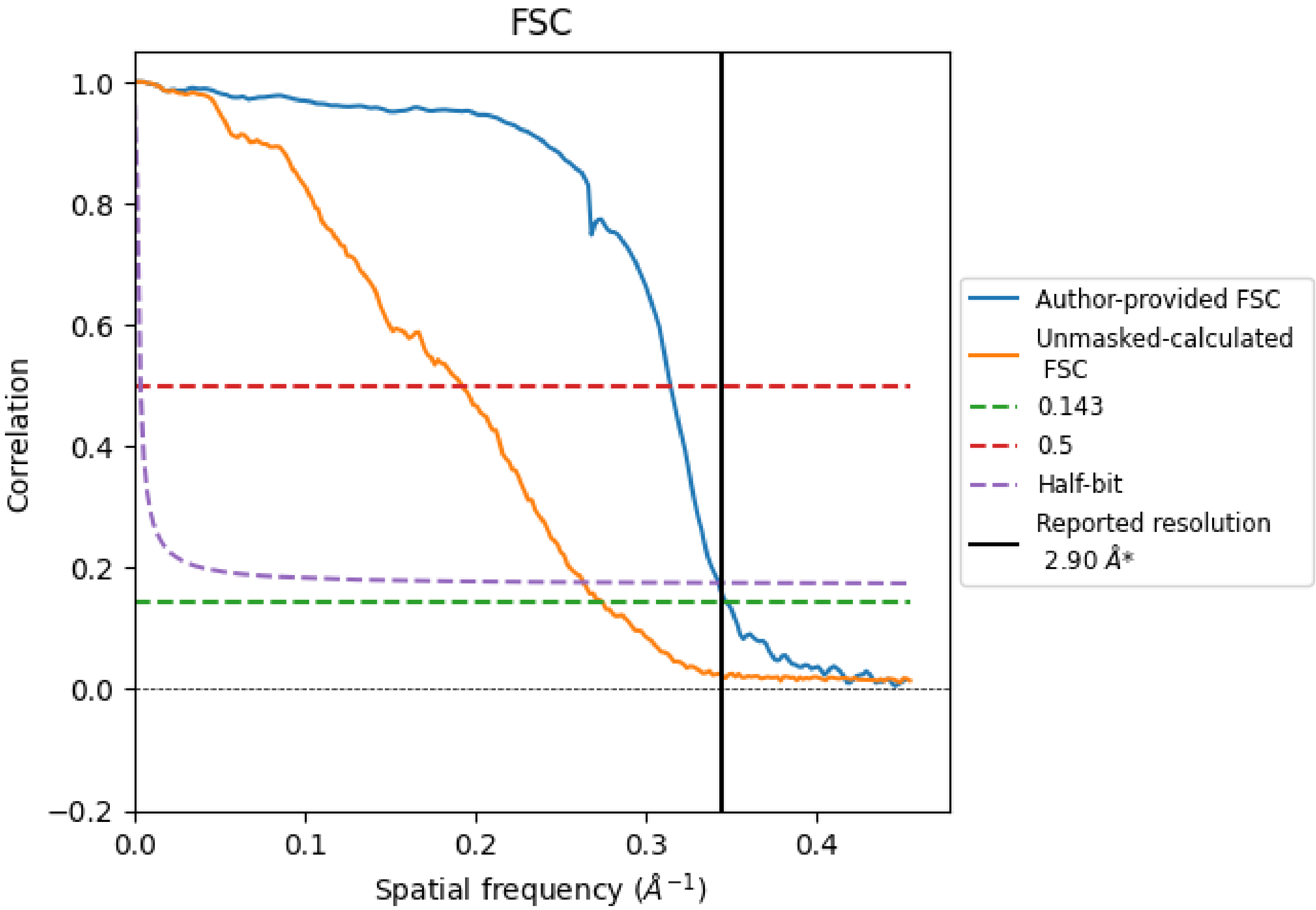


*Reported resolution corresponds to spatial frequency of 0.345 $Å^{-1}$

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 0.345 $Å^{-1}$

8.2 Resolution estimates ⓘ

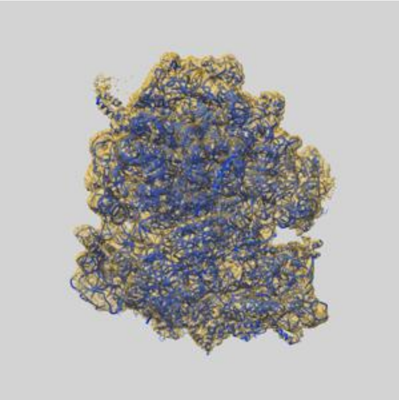
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.88	3.18	2.92
Unmasked-calculated*	3.64	5.21	3.80

*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 3.64 differs from the reported value 2.9 by more than 10 %

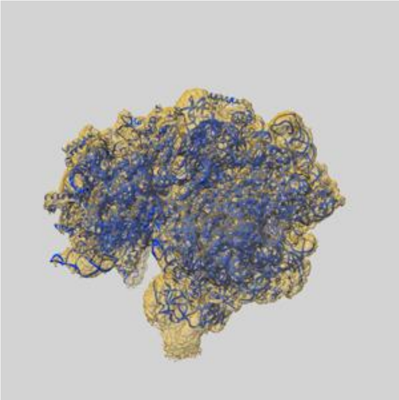
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-60061 and PDB model 8ZFI. Per-residue inclusion information can be found in section 3 on page 15.

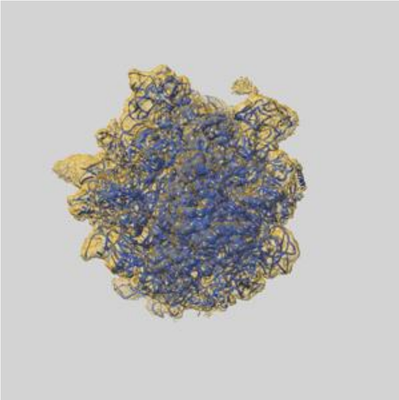
9.1 Map-model overlay (i)



X



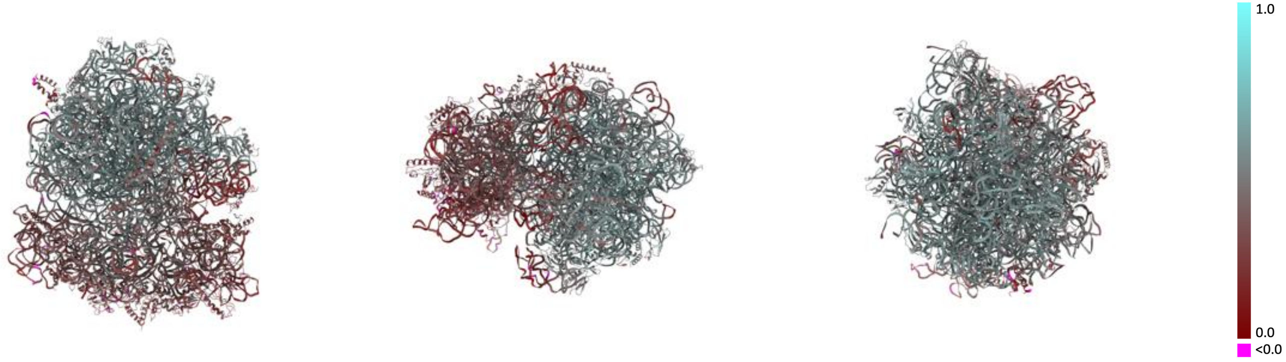
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

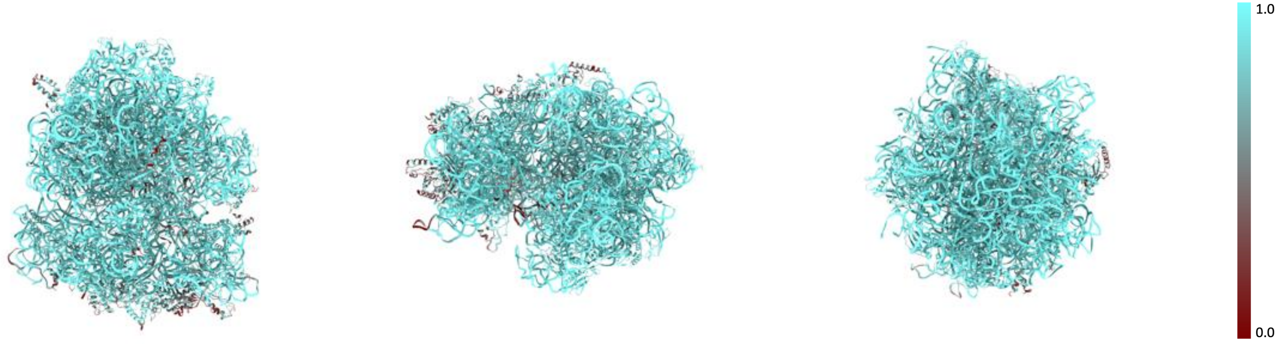
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

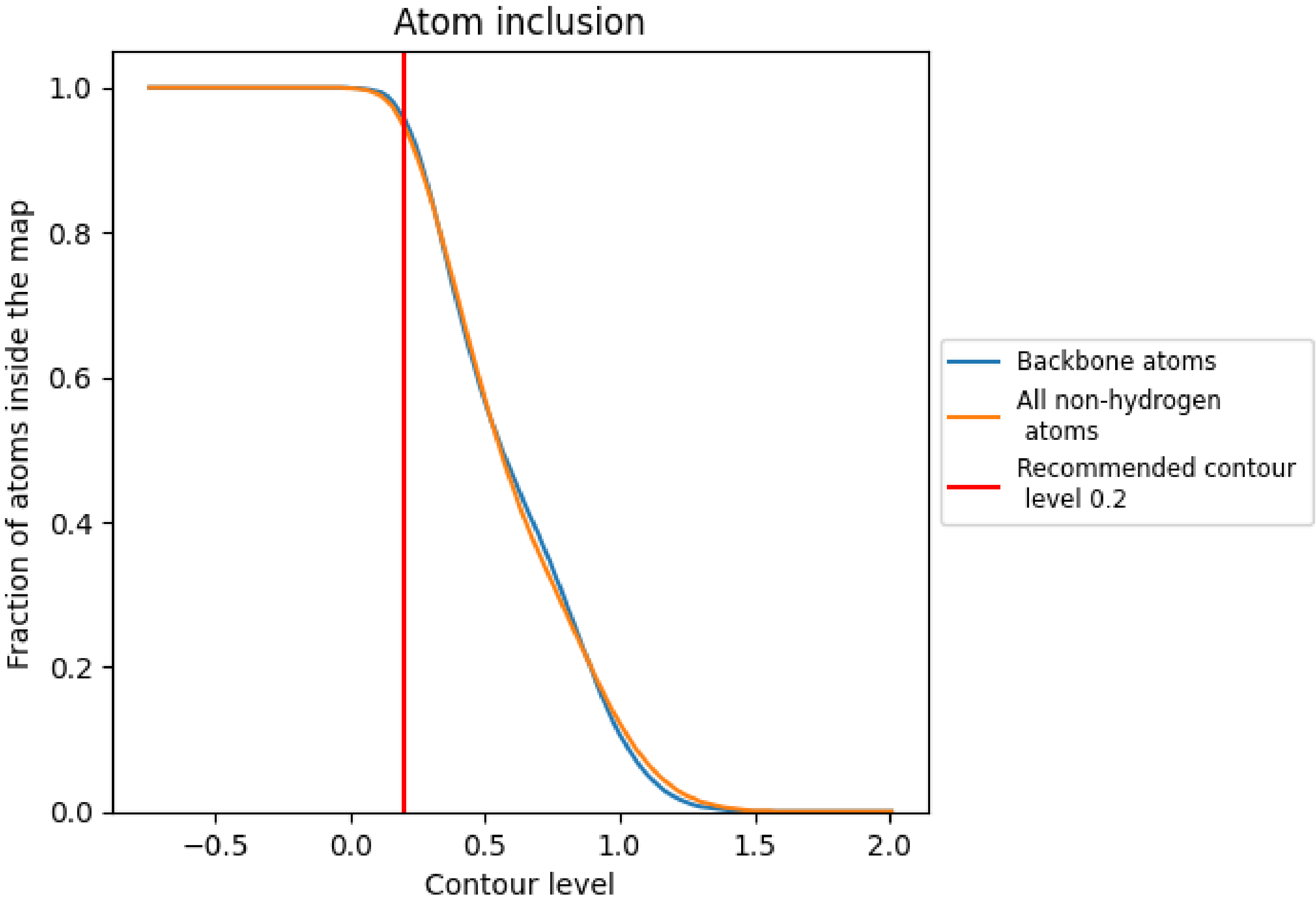
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.2).

9.4 Atom inclusion ⓘ



At the recommended contour level, 96% of all backbone atoms, 95% 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 (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9470	0.4410
0	0.9980	0.5010
1	0.9900	0.4730
2	0.9730	0.5430
4	0.9700	0.5400
5	0.9500	0.5100
6	0.9970	0.5680
7	0.9760	0.5700
8	0.9900	0.5500
A	0.9680	0.3400
B	0.6660	0.3070
C	0.6200	0.3200
D	0.6430	0.1970
E	0.8770	0.3710
F	0.9330	0.3760
G	0.9030	0.3000
H	0.8860	0.3760
I	0.9060	0.2590
J	0.6270	0.2650
K	0.8510	0.3980
L	0.7120	0.2850
M	0.6600	0.2880
N	0.8590	0.2440
O	0.9480	0.4050
P	0.7870	0.3160
Q	0.8690	0.3130
R	0.7710	0.3560
S	0.8360	0.2420
T	0.8700	0.2700
U	0.6170	0.3470
V	0.6430	0.2910
X	0.9460	0.2420
Y	0.8890	0.3530
Z	0.6520	0.3790
a	0.9980	0.5120

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Chain	Atom inclusion	Q-score
b	0.9960	0.5150
c	0.9890	0.5490
d	0.9770	0.5530
e	0.9720	0.5170
f	0.8420	0.3280
g	0.9850	0.4950
h	0.7010	0.3980
k	0.9780	0.5560
l	0.9030	0.5420
m	0.9770	0.5370
n	0.9790	0.5480
o	0.9880	0.5560
p	0.9760	0.4790
q	0.9190	0.5330
r	0.9840	0.5460
s	0.9850	0.5340
t	0.9770	0.5360
u	0.9510	0.4870
v	0.9850	0.4930
w	0.9770	0.5210
x	0.8960	0.3890
y	0.8900	0.5140
z	0.5540	0.3540