wwPDB EM Validation Summary Report ⓘ

Jul 21, 2025 – 11:04 AM EDT

PDB ID	:	9MKK / pdb_00009mkk
EMDB ID	:	EMD-48329
Title	:	Structure of arbekacin bound Escherichia coli 70S ribosome
Authors	:	Majumdar, S.; Parajuli, N.P.; Ge, X.; Emmerich, A.; Sanyal, S.
Deposited on	:	2024-12-17
Resolution	:	3.20 Å(reported)
Based on initial model	:	7K00

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

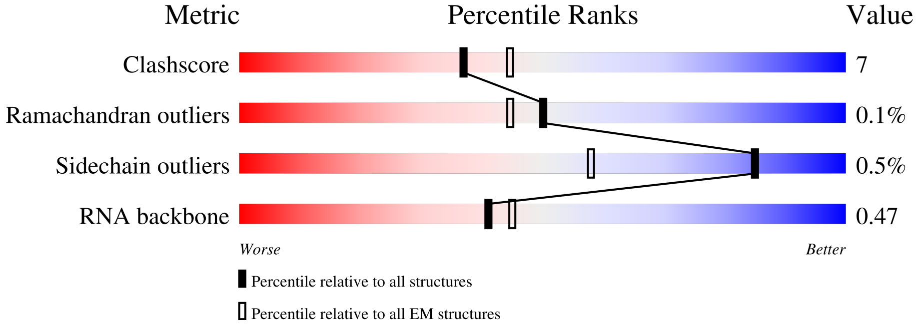
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

1 Overall quality at a glance

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

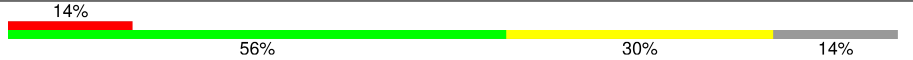
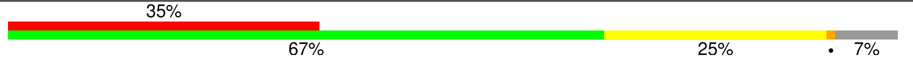
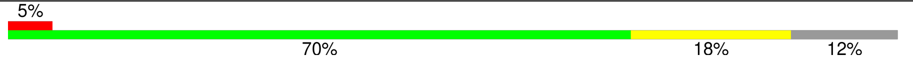
The reported resolution of this entry is 3.20 Å.

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	55	
2	1	46	
3	2	65	
4	3	38	
5	4	70	
6	B	241	
7	C	233	

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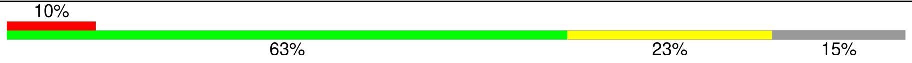
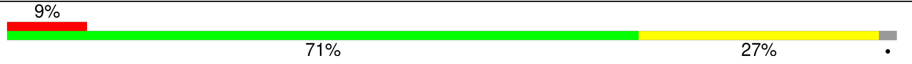
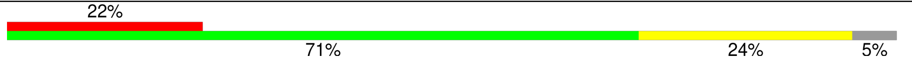
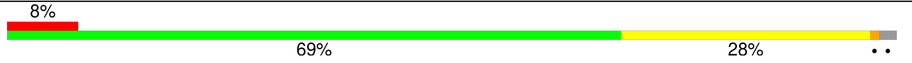
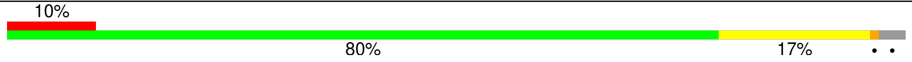
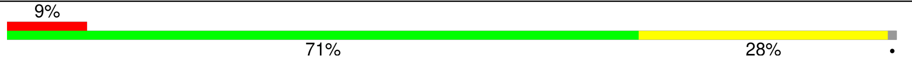
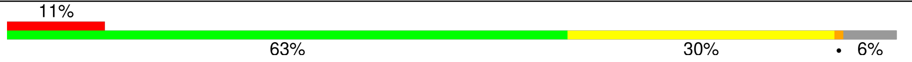
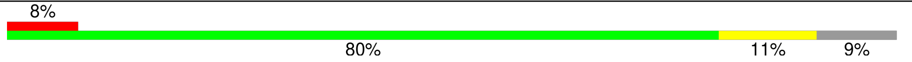
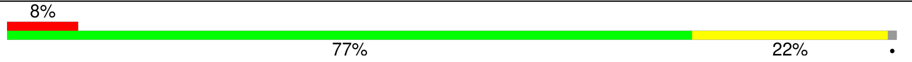
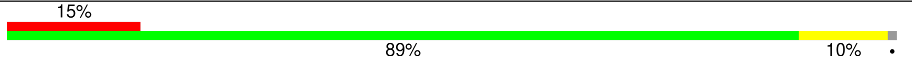
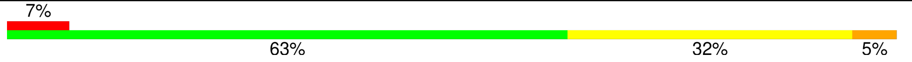
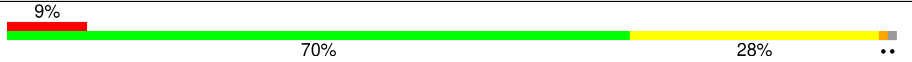
Mol	Chain	Length	Quality of chain
8	D	206	
9	E	167	
10	F	135	
11	G	179	
12	H	130	
13	I	130	
14	J	103	
15	K	129	
16	L	124	
17	M	118	
18	N	101	
19	O	89	
20	P	82	
21	Q	84	
22	R	75	
23	S	92	
24	T	87	
25	U	71	
26	X	28	
27	Z	76	
28	b	120	
29	c	273	
30	d	209	
31	e	201	
32	f	179	

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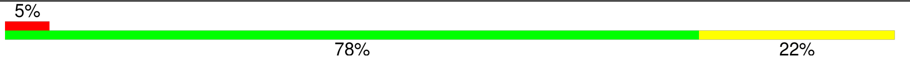
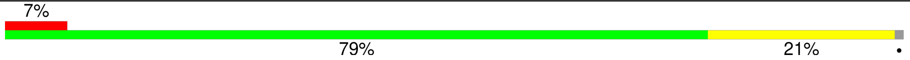
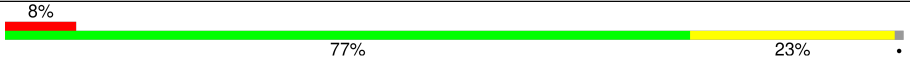
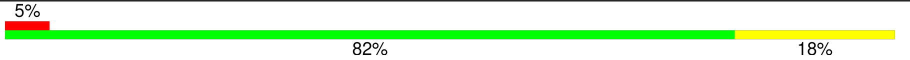
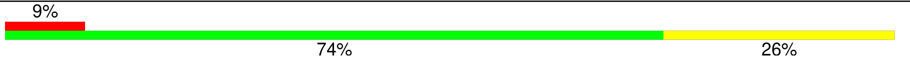
Mol	Chain	Length	Quality of chain
33	g	177	
34	i	142	
35	j	123	
36	k	144	
37	l	136	
38	m	127	
39	n	117	
40	o	115	
41	p	118	
42	q	103	
43	s	100	
44	t	104	
45	u	94	
46	v	85	
47	w	78	
48	x	63	
49	y	59	
50	z	57	
51	A	1542	
52	a	2904	

2 Entry composition ⓘ

There are 53 unique types of molecules in this entry. The entry contains 137440 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 L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	0	51	417	269	76	72	0	0

- Molecule 2 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	46	377	228	90	57	2	0	0

- Molecule 3 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	64	504	323	105	74	2	0	0

- Molecule 4 is a protein called 50S ribosomal protein L36.

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

- Molecule 5 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	4	60	480	299	90	85	6	0	0

- Molecule 6 is a protein called 30S ribosomal protein S2.

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

- Molecule 7 is a protein called Small ribosomal subunit protein uS3.

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

- Molecule 8 is a protein called Small ribosomal subunit protein uS4.

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

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

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

- Molecule 10 is a protein called Small ribosomal subunit protein bS6.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	G	153	1197	747	228	218	4	0	0

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

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

- Molecule 13 is a protein called Small ribosomal subunit protein uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	I	127	1019	632	206	179	2	0	0

- Molecule 14 is a protein called Small ribosomal subunit protein uS10.

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

- Molecule 15 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	K	116	Total	C	N	O	S	0	0
			869	536	172	158	3		

- Molecule 16 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L	122	Total	C	N	O	S	0	0
			944	583	195	162	4		

- Molecule 17 is a protein called Small ribosomal subunit protein uS13.

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

- Molecule 18 is a protein called Small ribosomal subunit protein uS14.

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

- Molecule 19 is a protein called Small ribosomal subunit protein uS15.

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

- Molecule 20 is a protein called Small ribosomal subunit protein bS16.

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

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

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

- Molecule 22 is a protein called Small ribosomal subunit protein bS18.

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

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	S	84	668	427	127	112	2	0	0

- Molecule 24 is a protein called Small ribosomal subunit protein bS20.

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

- Molecule 25 is a protein called Small ribosomal subunit protein bS21.

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

- Molecule 26 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
26	X	3	65	29	12	21	3	0	0

- Molecule 27 is a RNA chain called tRNA-fMet.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
27	Z	76	1623	723	294	530	76	0	0

- Molecule 28 is a RNA chain called 5S rRNA.

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

- Molecule 29 is a protein called 50S ribosomal protein L2.

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

- Molecule 30 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	d	208	1556	974	286	292	4	0	0

- Molecule 31 is a protein called Large ribosomal subunit protein uL4.

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

- Molecule 32 is a protein called Large ribosomal subunit protein uL5.

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

- Molecule 33 is a protein called Large ribosomal subunit protein uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	g	176	1323	832	243	246	2	0	0

- Molecule 34 is a protein called Large ribosomal subunit protein uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	i	142	1123	711	209	199	4	0	0

- Molecule 35 is a protein called Large ribosomal subunit protein uL14.

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

- Molecule 36 is a protein called Large ribosomal subunit protein uL15.

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

- Molecule 37 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	l	134	Total	C	N	O	S	0	0
			1055	675	200	175	5		

- Molecule 38 is a protein called Large ribosomal subunit protein bL17.

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

- Molecule 39 is a protein called Large ribosomal subunit protein uL18.

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

- Molecule 40 is a protein called Large ribosomal subunit protein bL19.

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

- Molecule 41 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
41	p	54	Total	C	N	O	0	0
			431	270	96	65		

- Molecule 42 is a protein called Large ribosomal subunit protein bL21.

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

- Molecule 43 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	s	92	Total 730	C 461	N 138	O 130	S 1	0	0

- Molecule 44 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	t	102	Total 779	C 492	N 146	O 141	0	0

- Molecule 45 is a protein called Large ribosomal subunit protein bL25.

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

- Molecule 46 is a protein called Large ribosomal subunit protein bL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	v	78	Total 586	C 362	N 116	O 107	S 1	0	0

- Molecule 47 is a protein called 50S ribosomal protein L28.

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

- Molecule 48 is a protein called Large ribosomal subunit protein uL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	x	62	Total 485	C 300	N 91	O 93	S 1	0	0

- Molecule 49 is a protein called 50S ribosomal protein L30.

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

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

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

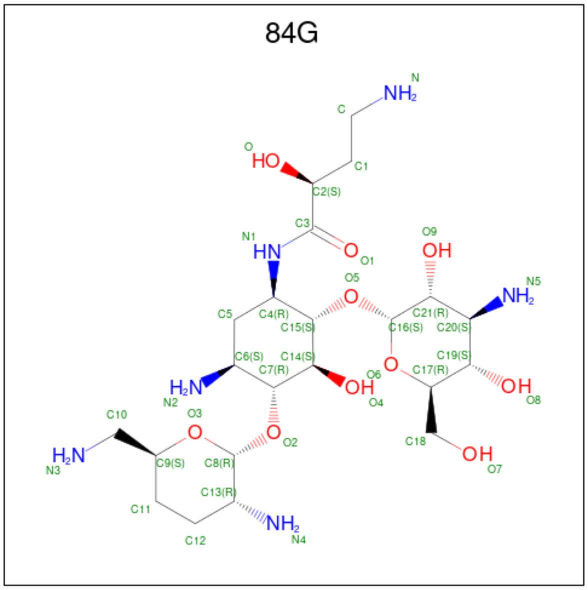
- Molecule 51 is a RNA chain called 16S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
51	A	1512	32450	14473	5962	10503	1512	0	0

- Molecule 52 is a RNA chain called 23S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
52	a	2732	58675	26173	10829	18941	2732	0	0

- Molecule 53 is Arbekacin (CCD ID: 84G) (formula: $C_{22}H_{44}N_6O_{10}$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
53	A	1	38	22	6	10	0

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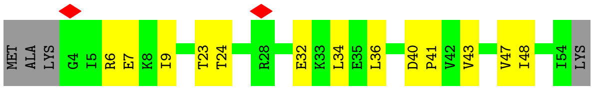
Mol	**Chain**	**Residues**	**Atoms**				**AltConf**
			Total	C	N	O	
53	a	1	38	22	6	10	0

3 Residue-property plots (i)

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

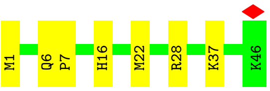
- Molecule 1: 50S ribosomal protein L33

Chain 0:



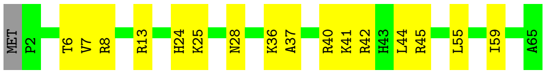
- Molecule 2: 50S ribosomal protein L34

Chain 1:



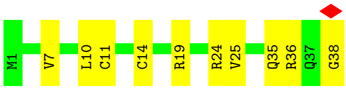
- Molecule 3: 50S ribosomal protein L35

Chain 2:



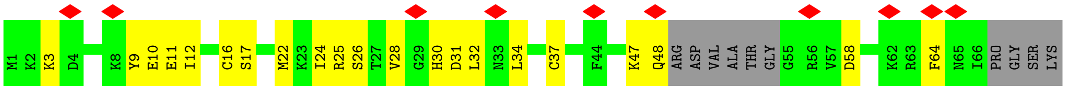
- Molecule 4: 50S ribosomal protein L36

Chain 3:



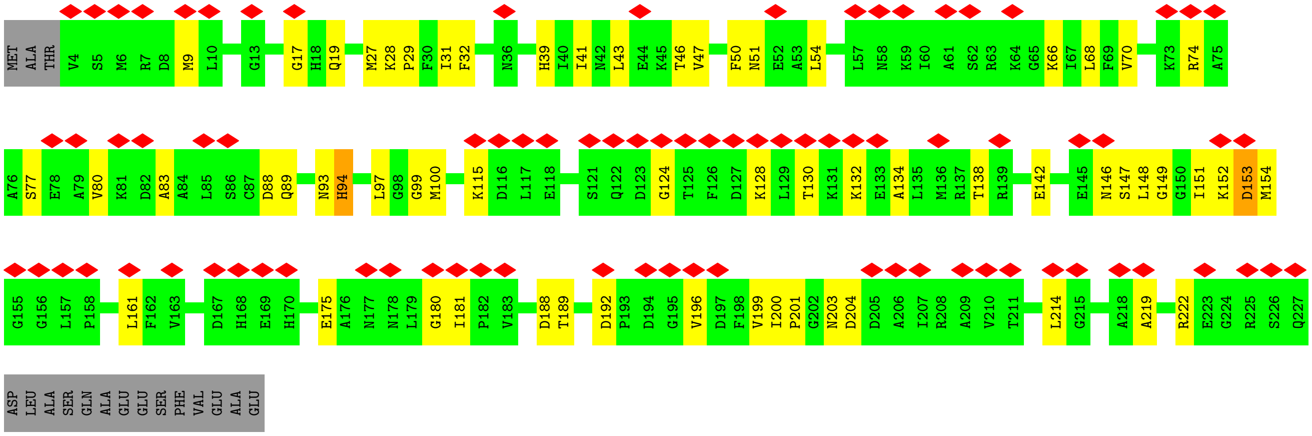
- Molecule 5: 50S ribosomal protein L31

Chain 4:



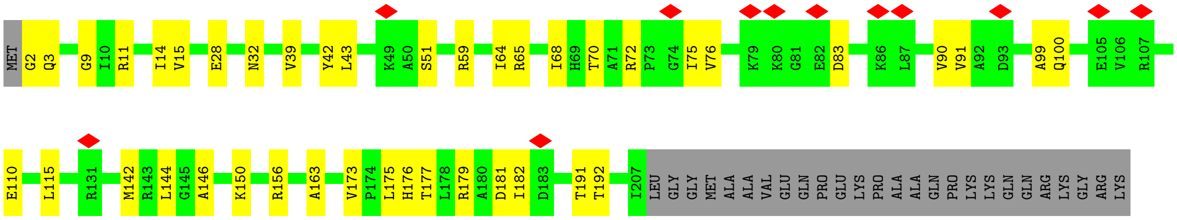
- Molecule 6: 30S ribosomal protein S2

Chain B:



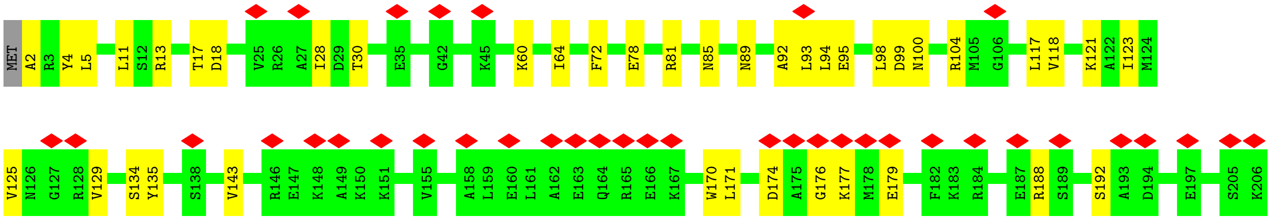
- Molecule 7: Small ribosomal subunit protein uS3

Chain C:



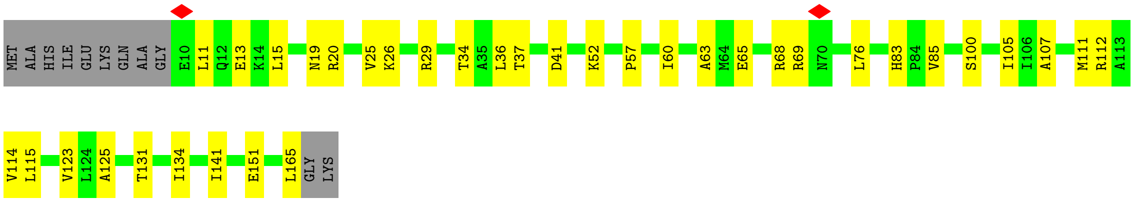
- Molecule 8: Small ribosomal subunit protein uS4

Chain D:

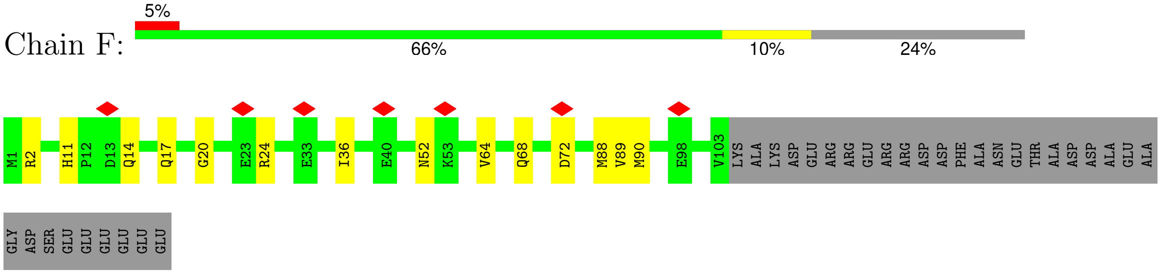


- Molecule 9: Small ribosomal subunit protein uS5

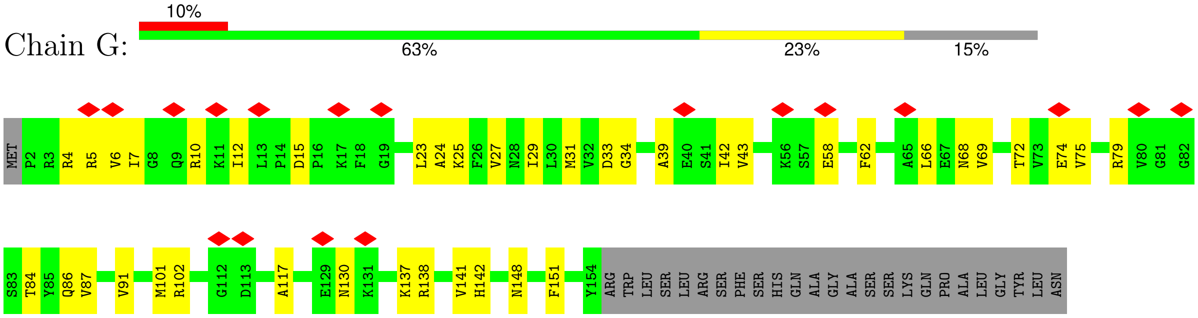
Chain E:



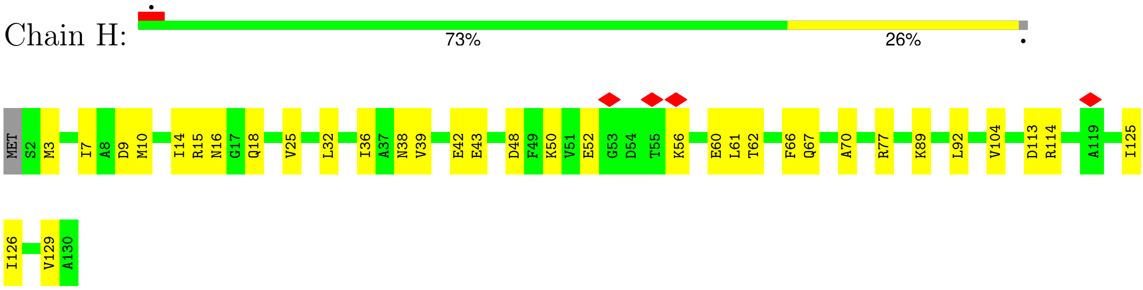
- Molecule 10: Small ribosomal subunit protein bS6



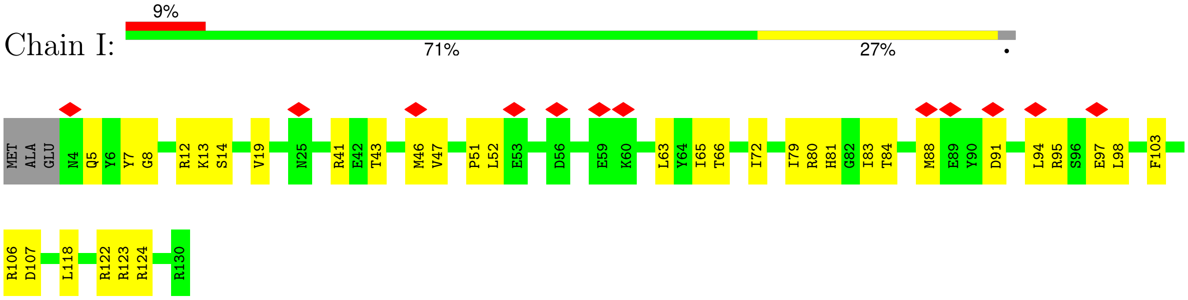
- Molecule 11: Small ribosomal subunit protein uS7



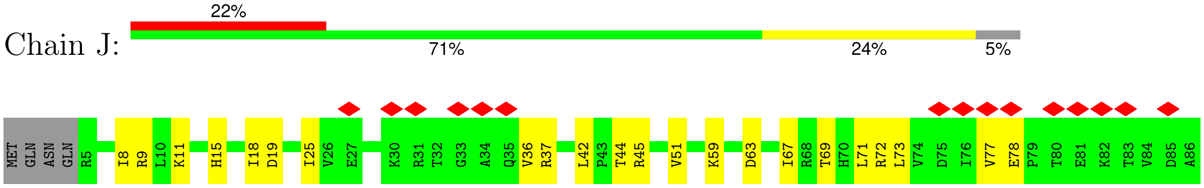
- Molecule 12: Small ribosomal subunit protein uS8

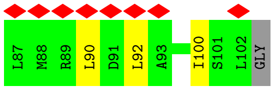


- Molecule 13: Small ribosomal subunit protein uS9



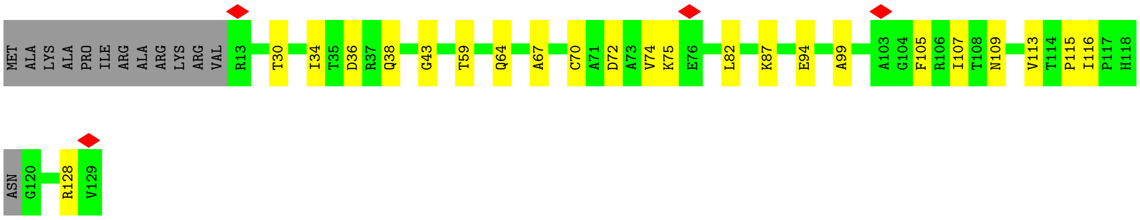
- Molecule 14: Small ribosomal subunit protein uS10





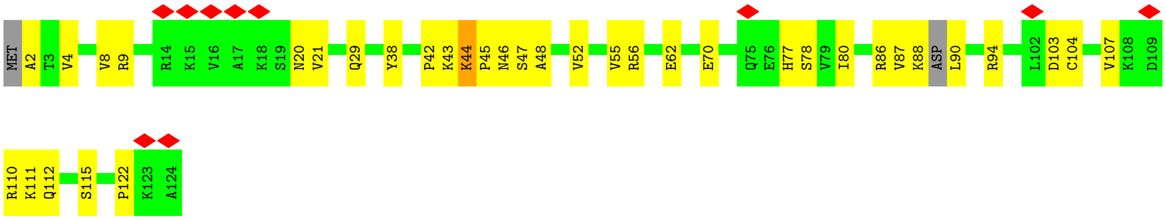
- Molecule 15: 30S ribosomal protein S11

Chain K:



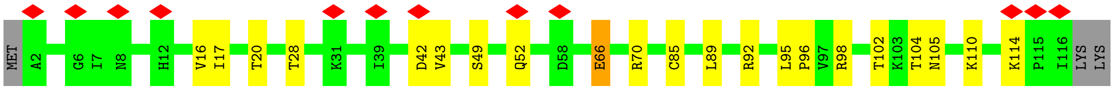
- Molecule 16: 30S ribosomal protein S12

Chain L:



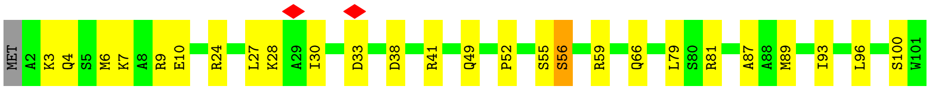
- Molecule 17: Small ribosomal subunit protein uS13

Chain M:



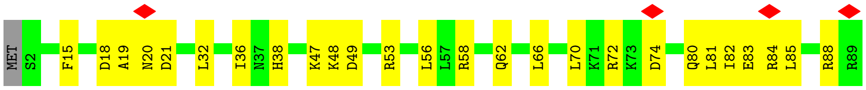
- Molecule 18: Small ribosomal subunit protein uS14

Chain N:



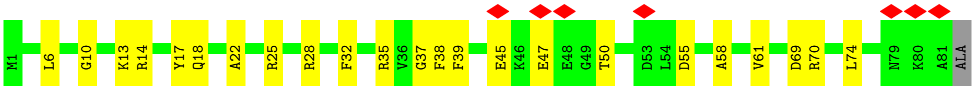
- Molecule 19: Small ribosomal subunit protein uS15

Chain O:



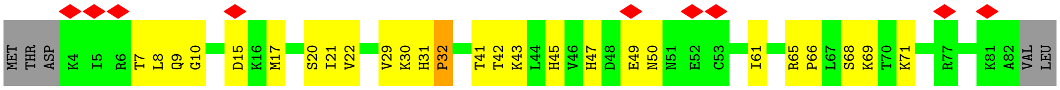
- Molecule 20: Small ribosomal subunit protein bS16

Chain P:



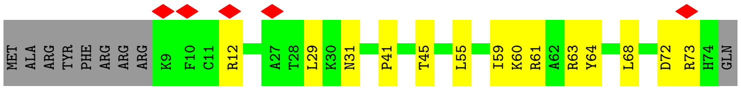
- Molecule 21: Small ribosomal subunit protein uS17

Chain Q:



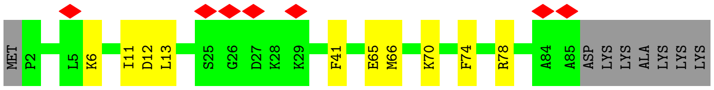
- Molecule 22: Small ribosomal subunit protein bS18

Chain R:



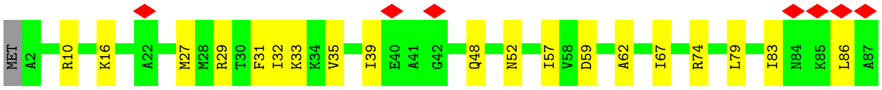
- Molecule 23: Small ribosomal subunit protein uS19

Chain S:



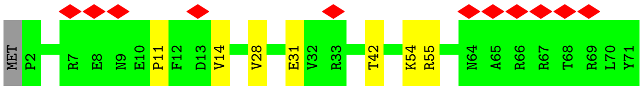
- Molecule 24: Small ribosomal subunit protein bS20

Chain T:



- Molecule 25: Small ribosomal subunit protein bS21

Chain U:

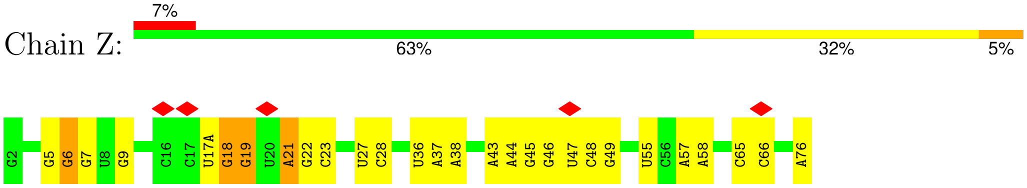


- Molecule 26: mRNA

Chain X:

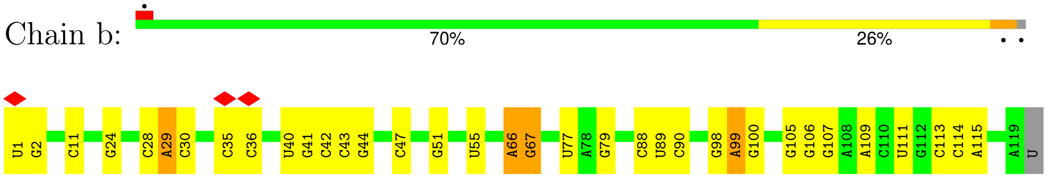
- Molecule 27: tRNA-fMet

Chain Z:



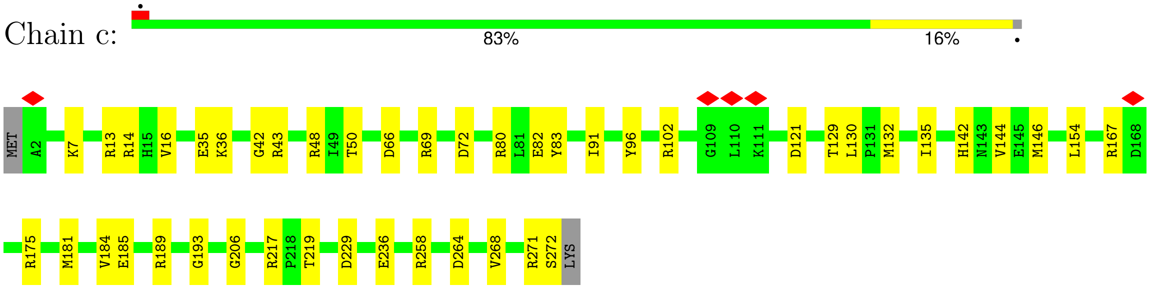
- Molecule 28: 5S rRNA

Chain b:



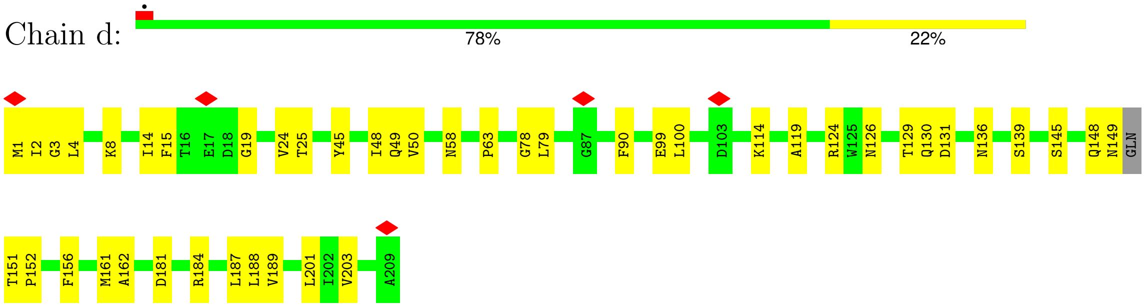
- Molecule 29: 50S ribosomal protein L2

Chain c:



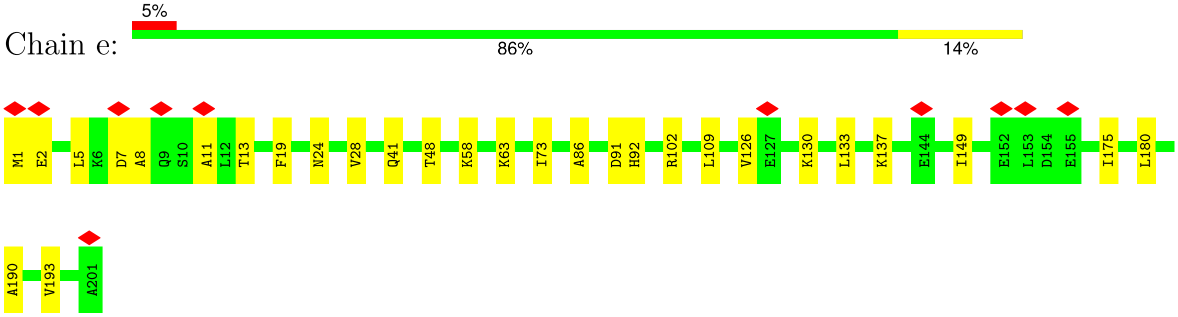
- Molecule 30: 50S ribosomal protein L3

Chain d:

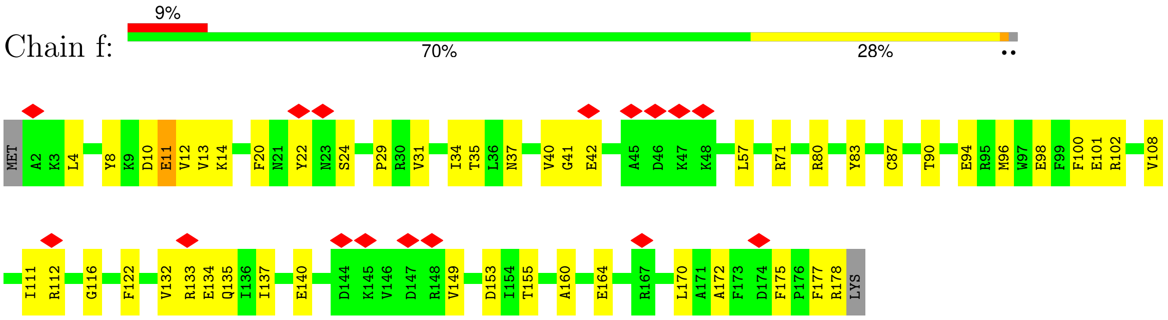


- Molecule 31: Large ribosomal subunit protein uL4

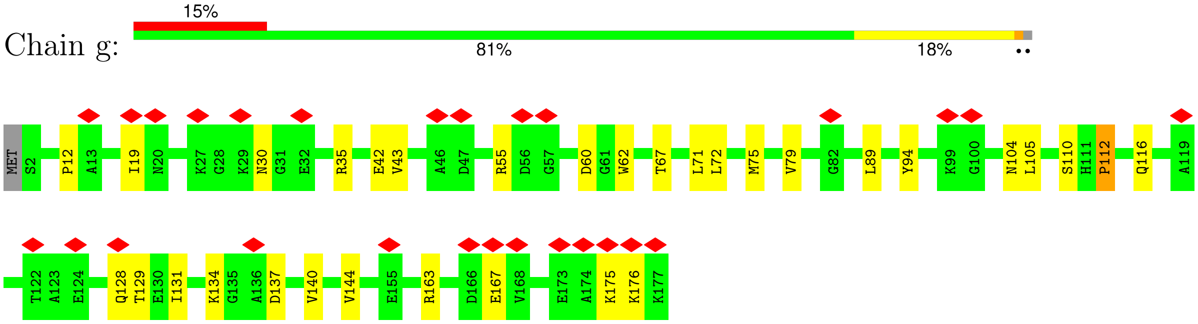
Chain e:



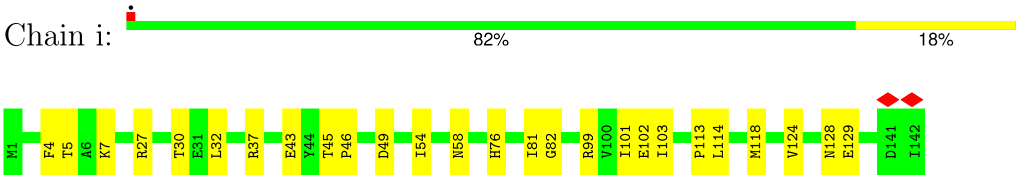
- Molecule 32: Large ribosomal subunit protein uL5



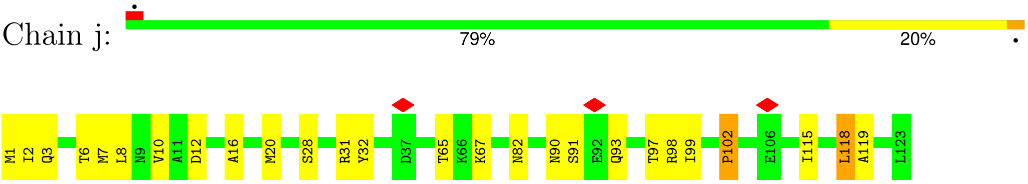
- Molecule 33: Large ribosomal subunit protein uL6



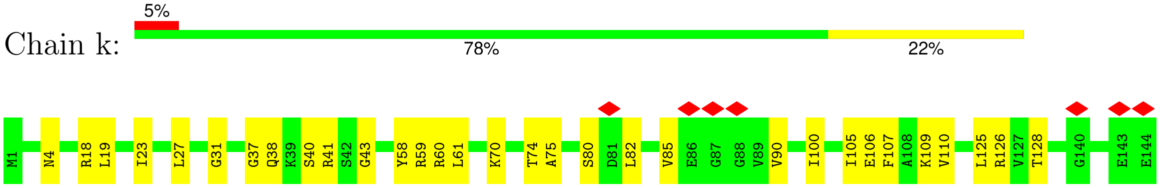
- Molecule 34: Large ribosomal subunit protein uL13



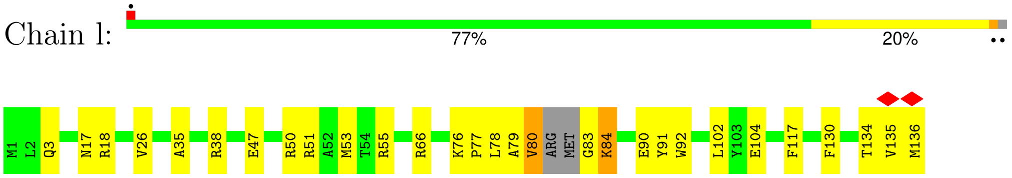
- Molecule 35: Large ribosomal subunit protein uL14



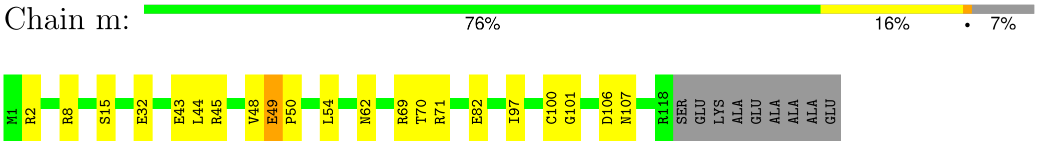
- Molecule 36: Large ribosomal subunit protein uL15



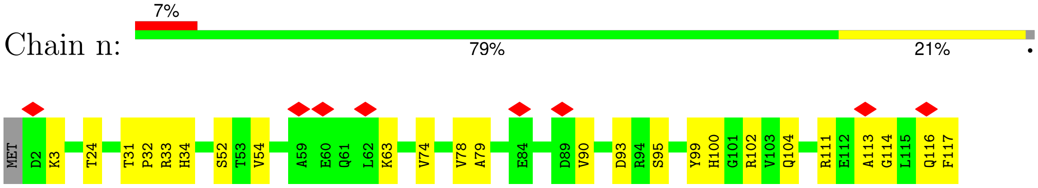
- Molecule 37: 50S ribosomal protein L16



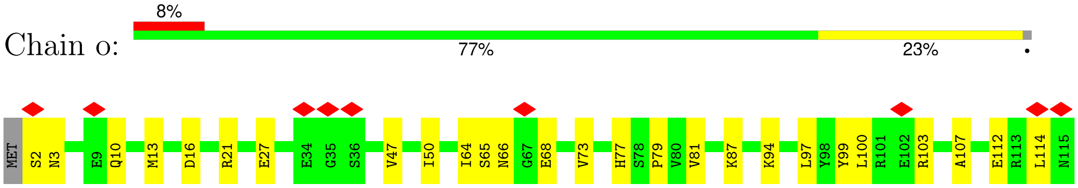
- Molecule 38: Large ribosomal subunit protein bL17



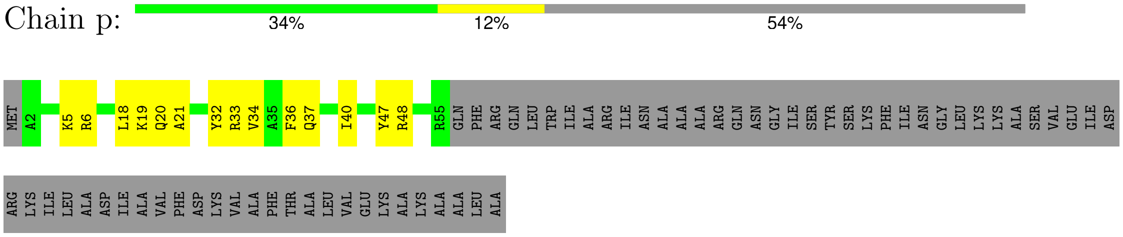
- Molecule 39: Large ribosomal subunit protein uL18



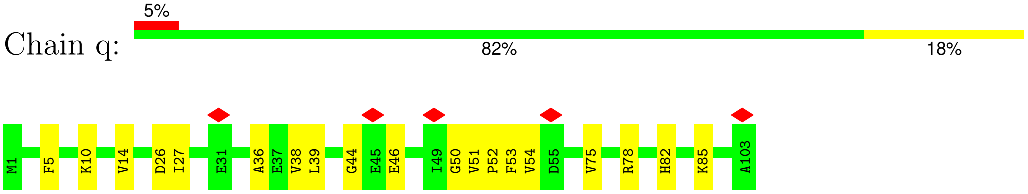
- Molecule 40: Large ribosomal subunit protein bL19



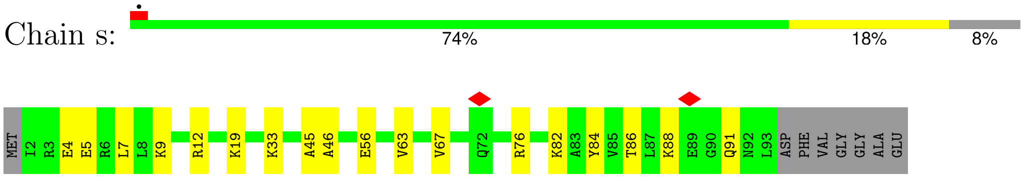
- Molecule 41: 50S ribosomal protein L20



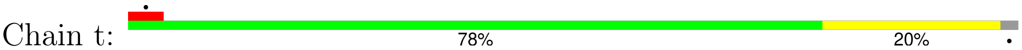
- Molecule 42: Large ribosomal subunit protein bL21

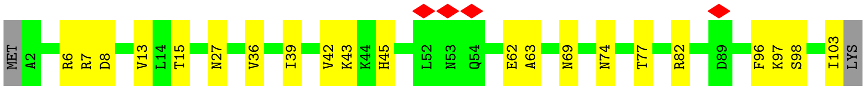


- Molecule 43: 50S ribosomal protein L23



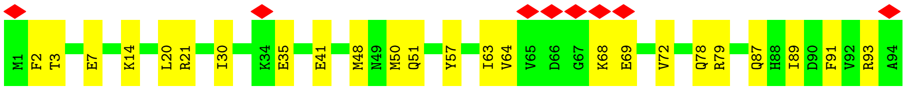
- Molecule 44: 50S ribosomal protein L24





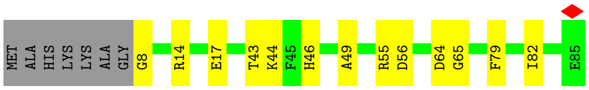
- Molecule 45: Large ribosomal subunit protein bL25

Chain u:



- Molecule 46: Large ribosomal subunit protein bL27

Chain v:

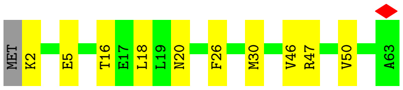


- Molecule 47: 50S ribosomal protein L28

Chain w:

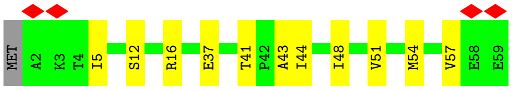
- Molecule 48: Large ribosomal subunit protein uL29

Chain x:



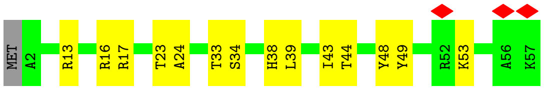
- Molecule 49: 50S ribosomal protein L30

Chain y:

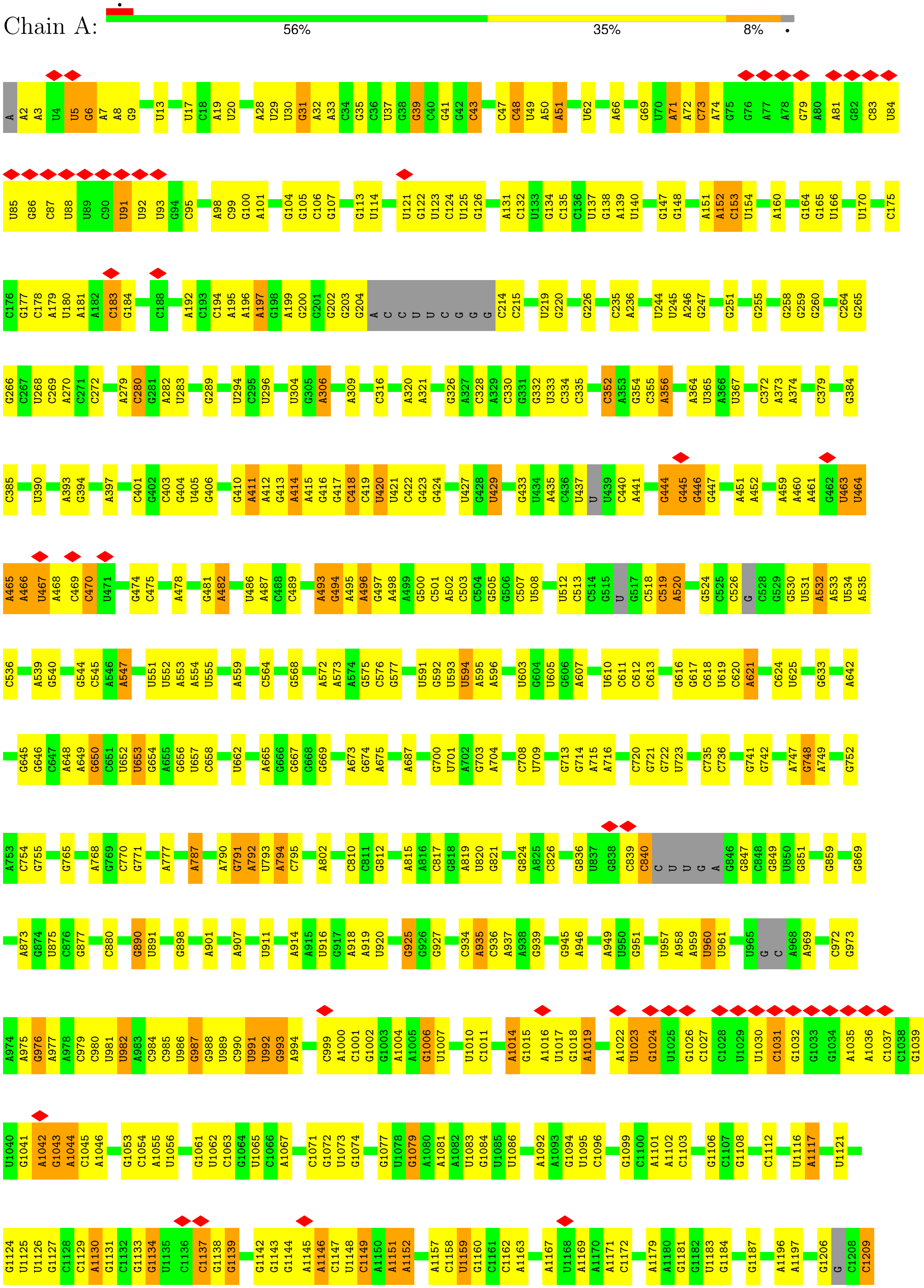


- Molecule 50: 50S ribosomal protein L32

Chain z:



- Molecule 51: 16S rRNA


Chain A:
56%
35%
8%
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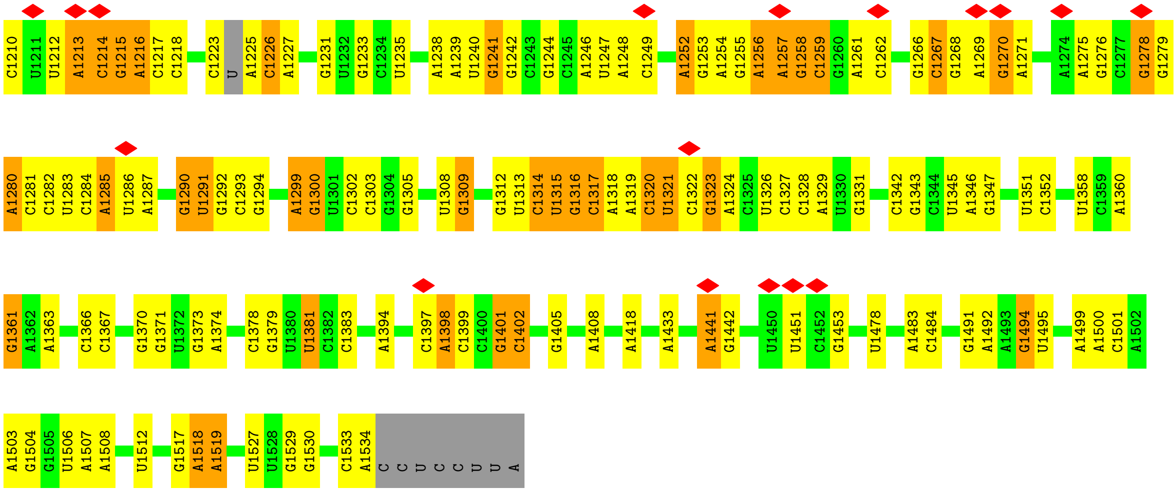
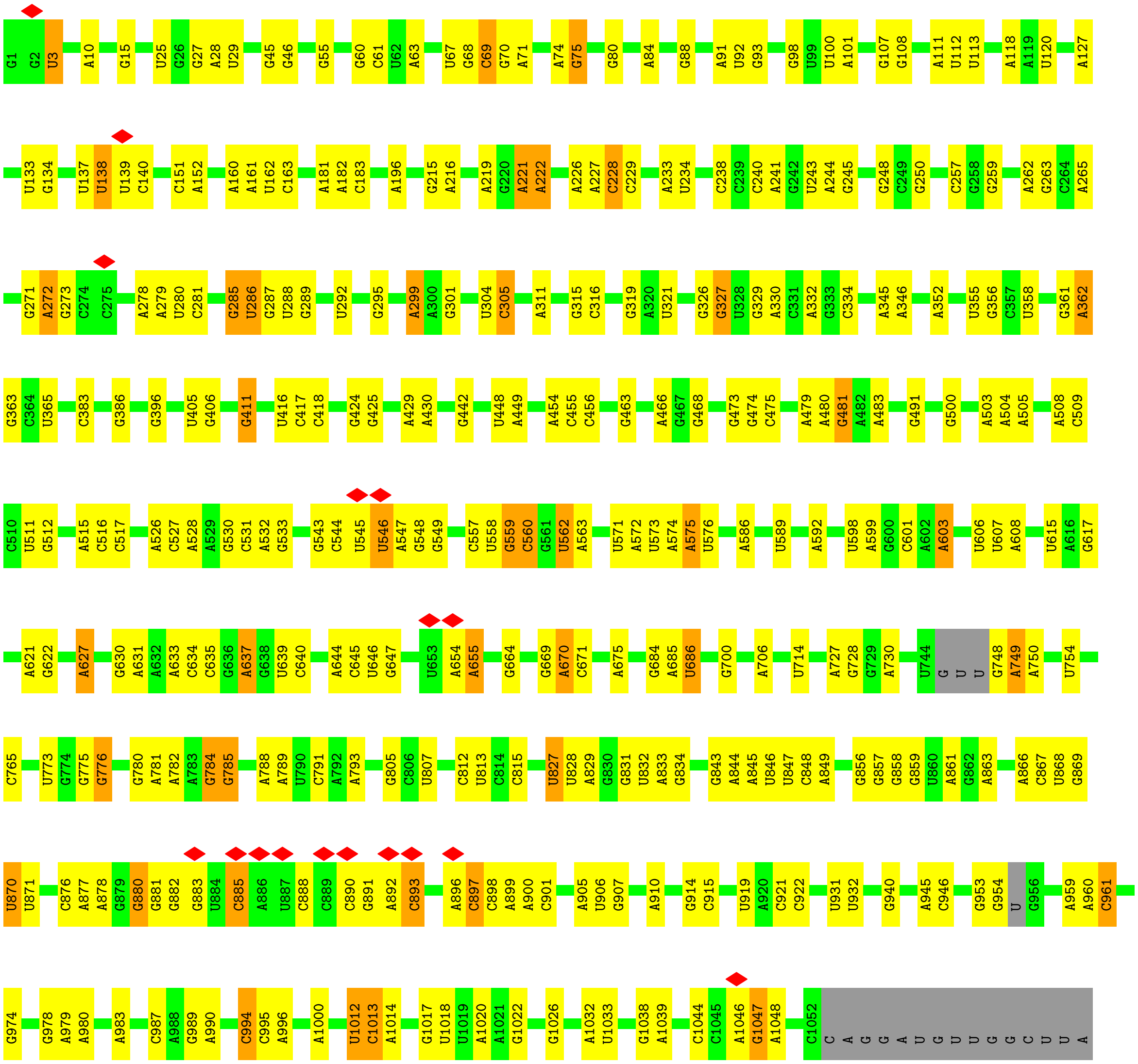
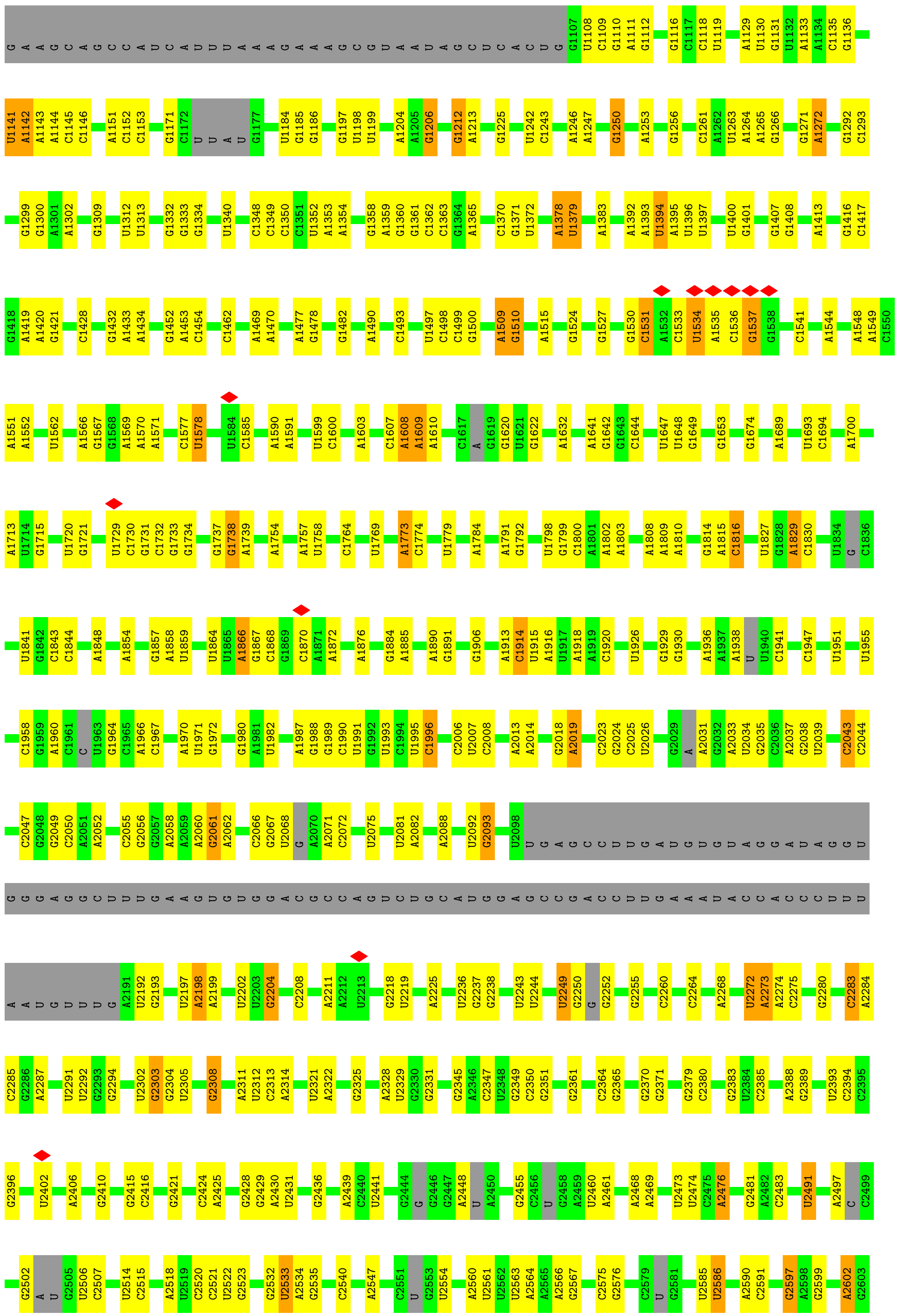
U85 G86 C87 U88 U89 C90 U91 U92 U93 G94 C95 A98 C99 G100 A101 G104 G105 C106 G107 G113 U114 U121 G122 U123 C124 U125 G126 A131 C132 U133 G134 C135 C136 U137 G138 A139 U140 G147 G148 A151 A152 C153 U154 A160 G164 G165 U166 U170 C175
C176 G177 C178 A179 U180 A181 A182 C183 G184 C188 A192 C193 C194 A195 A196 A197 G198 A199 G200 G201 G202 G203 G204 A C C U U C G G G C214 C215 U219 G220 G226 C235 A236 U244 U245 A246 G247 G251 G255 G258 G259 G260 C264 G265
G266 C267 U268 C269 A270 C271 C272 A279 C280 G281 A282 U283 G289 U294 C295 U296 U304 G305 A306 A309 C316 A320 A321 G326 A327 C328 A329 C330 G331 G332 U333 C334 C335 C352 A353 G354 C355 A356 A364 U365 A366 U367 C372 A373 A374 C379 G384
C385 U390 A393 G394 A397 C401 G402 C403 G404 U405 G406 G410 A411 A412 G413 A414 A415 G416 G417 C418 C419 U420 U421 C422 G423 G424 U427 G428 U429 G433 U434 A435 C436 U437 U U439 C440 A441 G444 G445 G446 G447 A451 A452 A459 A460 A461 G462 U463 U464
A465 A466 U467 A468 C469 C470 U471 G474 C475 A478 G481 A482 U486 A487 C488 C489 A493 G494 A495 A496 G497 A498 A499 G500 C501 A502 C503 C504 G505 G506 C507 U508 U512 C513 C514 G515 U G517 C518 C519 A520 G524 C525 C526 G C528 G529 G530 U531 A532 A533 U534 A535
C536 A539 G540 G544 C545 A546 A547 U551 U552 A553 A554 U555 A559 C564 G568 A572 A573 A574 G575 C576 G577 U591 G592 U593 U594 A595 A596 U603 G604 U605 G606 A607 U610 C611 C612 C613 G616 G617 C618 U619 C620 A621 C624 U625 G633 A642
G645 G646 C647 A648 A649 G650 C651 U652 U653 G654 A655 G656 U657 C658 U662 A665 G666 G667 G668 G669 A673 G674 A675 A687 G700 U701 A702 G703 A704 C708 U709 G713 G714 A715 A716 C720 G721 G722 U723 C735 C736 G741 G742 A747 G748 A749 G752
A753 C754 G755 G765 A768 G769 C770 G771 A777 A787 A790 G791 A792 U793 A794 C795 A802 C810 C811 G812 A815 A816 C817 G818 A819 U820 G821 G824 A825 C826 G836 U837 G838 C839 C840 C U U G A G846 G847 C848 G849 U850 G851 G859 G869
A873 G874 U875 C876 G877 C880 G890 U891 G898 A901 A907 U911 A914 A915 U916 G917 A918 A919 U920 G925 G926 G927 C934 A935 C936 A937 A938 G939 G945 A946 A949 U950 G951 U957 A958 A959 U960 U961 U965 G C A968 A969 C972 G973
A974 A975 G976 A977 A978 C979 C980 U981 U982 A983 C984 C985 U986 G987 G988 U989 C990 U991 U992 G993 A994 C999 A1000 C1001 C1002 G1003 A1004 A1005 G1006 U1007 U1010 C1011 A1014 G1015 A1016 U1017 G1018 A1019 A1022 U1023 G1024 U1025 G1026 C1027 C1028 U1029 U1030 C1031 G1032 G1033 G1034 A1035 A1036 C1037 C1038 G1039
U1040 G1041 A1042 G1043 A1044 C1045 A1046 G1053 C1054 A1055 U1056 G1061 U1062 C1063 G1064 U1065 C1066 A1067 C1071 G1072 U1073 G1074 G1077 U1078 G1079 A1080 A1081 A1082 U1083 G1084 U1085 U1086 A1092 A1093 G1094 U1095 C1096 G1099 C1100 A1101 A1102 C1103 G1106 C1107 G1108 C1112 U1116 A1117 U1121
G1124 U1125 U1126 G1127 C1128 C1129 A1130 G1131 C1132 G1133 G1134 U1135 C1136 C1137 G1138 G1139 G1142 G1143 G1144 A1145 A1146 C1147 U1148 C1149 A1150 A1151 A1152 A1157 C1158 U1159 G1160 C1161 C1162 A1163 A1167 U1168 A1169 A1170 A1171 C1172 A1179 A1180 G1181 G1182 U1183 G1184 G1187 A1196 A1197 G1206 G C1208 C1209



- Molecule 52: 23S rRNA

Chain a:


G A A G C A G C C A U C A U U U A A A G A A A G C G U A A U A G C U C A C U G
G1107 U1108 C1109 G1110 A1111 G1112 G1116 C1117 C1118 U1119 A1129 U1130 G1131 U1132 A1133 A1134 C1135 G1136
U1141 A1142 A1143 A1144 C1145 C1146 A1151 C1152 C1153 G1171 C1172 U U A U G1177 U1184 G1185 G1186 G1197 U1198 U1199 A1204 A1205 G1206 G1212 A1213 G1225 U1242 C1243 A1246 A1247 G1250 A1253 G1256 C1261 A1262 U1263 A1264 A1265 G1266 G1271 A1272 G1292 C1293
G1299 G1300 A1301 A1302 G1309 U1312 U1313 G1332 G1333 G1334 U1340 C1348 C1349 C1350 C1351 U1352 A1353 A1354 G1358 A1359 G1360 G1361 C1362 C1363 G1364 A1365 C1370 G1371 U1372 A1378 U1379 A1383 A1392 A1393 U1394 A1395 U1396 U1397 U1400 G1401 G1407 G1408 A1413 G1416 C1417
G1418 A1419 A1420 G1421 C1428 G1432 A1433 A1434 G1452 A1453 C1454 C1462 A1469 A1470 A1477 G1478 G1482 A1490 C1493 U1497 C1498 C1499 G1500 A1509 G1510 A1515 G1524 G1527 G1530 C1531 A1532 C1533 U1534 A1535 C1536 G1537 G1538 C1541 A1544 A1548 A1549 C1550
A1551 A1552 U1562 A1566 G1567 G1568 A1569 A1570 A1571 C1577 U1578 U1584 C1585 A1590 A1591 U1599 C1600 A1603 C1607 A1608 A1609 A1610 C1617 A G1619 G1620 U1621 G1622 A1632 A1641 G1642 G1643 C1644 U1647 U1648 G1649 G1653 G1674 A1689 U1693 C1694 A1700
A1713 U1714 G1715 U1720 G1721 U1729 C1730 G1731 C1732 G1733 G1734 G1737 G1738 A1739 A1754 A1757 U1758 C1764 U1769 A1773 C1774 U1779 A1784 A1791 G1792 U1798 G1799 C1800 A1801 A1802 A1803 A1808 A1809 A1810 G1814 A1815 C1816 U1827 G1828 A1829 C1830 U1834 G C1836
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G G G A G G C U U U G A A G U G U G G A C G C C A G U C U G C A U G G A G C C G A C C U U G A A A U A C C A C C C U U U
A A U G U U G A2191 U2192 G2193 U2197 A2198 A2199 U2202 U2203 G2204 C2208 A2211 A2212 U2213 G2218 U2219 A2225 U2236 G2237 G2238 U2243 U2244 U2249 G2250 G G2252 G2255 C2260 C2264 A2268 U2272 A2273 A2274 C2275 G2280 C2283 A2284
C2285 G2286 A2287 U2291 U2292 G2293 G2294 U2302 G2303 G2304 U2305 G2308 A2311 U2312 C2313 A2314 U2321 A2322 G2325 A2328 U2329 G2330 G2331 G2345 A2346 C2347 U2348 G2349 C2350 G2351 G2361 C2364 G2365 G2370 G2371 G2379 C2380 G2383 U2384 C2385 A2388 G2389 U2393 C2394 C2395
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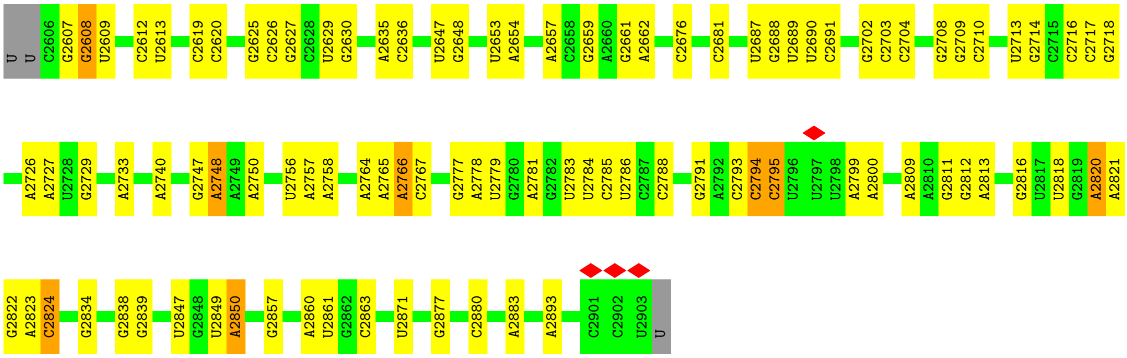
G2502 A U G2505 U2506 C2507 U2514 C2515 A2518 U2519 C2520 C2521 U2522 G2523 G2532 U2533 A2534 G2535 C2540 A2547 C2551 U G2553 U2554 A2560 U2561 U2562 U2563 A2564 A2565 A2566 G2567 C2575 G2576 C2579 U G2581 U2585 U2586 A2590 C2591 G2597 A2598 G2599 A2602 G2603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U2861
G2862
C2863
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G2877
C2880
A2883
A2893
C2901
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U

4 Experimental information ⓘ

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	46282	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{Å}^2$)	1.37	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.105	Depositor
Minimum map value	-0.036	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	425.0, 425.0, 425.0	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85, 0.85, 0.85	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 84G

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	0.46	1/424 (0.2%)	0.81	2/565 (0.4%)
2	1	0.25	0/380	0.41	0/498
3	2	0.22	0/513	0.43	0/676
4	3	0.23	0/303	0.48	0/397
5	4	0.24	0/488	0.51	0/649
6	B	0.21	0/1784	0.46	0/2403
7	C	0.20	0/1651	0.40	0/2225
8	D	0.19	0/1665	0.40	0/2227
9	E	0.24	0/1165	0.46	0/1568
10	F	0.22	0/858	0.44	0/1160
11	G	0.22	0/1213	0.42	0/1628
12	H	0.22	0/989	0.43	0/1326
13	I	0.26	0/1031	0.55	0/1372
14	J	0.23	0/796	0.41	0/1077
15	K	0.22	0/884	0.46	0/1191
16	L	0.26	0/957	0.48	0/1282
17	M	0.20	0/900	0.41	0/1204
18	N	0.20	0/817	0.43	0/1088
19	O	0.24	0/722	0.43	0/964
20	P	0.21	0/653	0.45	0/877
21	Q	1.21	4/650 (0.6%)	1.31	5/871 (0.6%)
22	R	0.18	0/553	0.45	0/742
23	S	0.20	0/685	0.41	0/922
24	T	0.23	0/676	0.44	0/895
25	U	0.20	0/597	0.42	0/792
26	X	0.17	0/72	0.26	0/110
27	Z	0.17	0/1813	0.33	0/2825
28	b	0.18	0/2850	0.30	0/4444
29	c	0.24	0/2121	0.43	0/2852
30	d	0.27	0/1576	0.48	0/2119
31	e	0.23	0/1571	0.40	0/2113
32	f	0.21	0/1434	0.45	0/1926

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	g	0.47	3/1343 (0.2%)	0.82	6/1816 (0.3%)
34	i	0.30	0/1146	0.47	0/1544
35	j	0.26	0/955	0.57	1/1279 (0.1%)
36	k	0.25	0/1062	0.45	0/1413
37	l	0.32	0/1073	0.53	1/1433 (0.1%)
38	m	0.76	1/958 (0.1%)	1.22	7/1281 (0.5%)
39	n	0.21	0/902	0.42	0/1209
40	o	0.22	0/929	0.42	0/1242
41	p	0.27	0/436	0.55	1/578 (0.2%)
42	q	0.24	0/829	0.44	0/1107
43	s	0.22	0/736	0.40	0/984
44	t	0.21	0/787	0.42	0/1051
45	u	0.23	0/766	0.43	0/1025
46	v	0.22	0/593	0.43	0/785
47	w	0.34	0/635	0.43	0/848
48	x	0.21	0/486	0.44	0/648
49	y	0.22	0/453	0.39	0/605
50	z	0.22	0/450	0.44	0/599
51	A	0.19	1/36330 (0.0%)	0.32	0/56657
52	a	0.20	0/65703	0.31	0/102459
All	All	0.23	10/149363 (0.0%)	0.38	23/223551 (0.0%)

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
21	Q	32	PRO	CB-CG	22.09	2.60	1.49
38	m	50	PRO	CG-CD	-20.28	0.81	1.50
21	Q	32	PRO	CG-CD	-18.25	0.88	1.50
33	g	112	PRO	CG-CD	-8.93	1.20	1.50
1	0	41	PRO	CG-CD	-7.24	1.26	1.50

The worst 5 of 23 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
21	Q	32	PRO	CB-CG-CD	-29.43	11.92	106.10
38	m	50	PRO	CB-CG-CD	23.07	179.91	106.10
38	m	50	PRO	N-CD-CG	-19.44	74.03	103.20
33	g	112	PRO	CA-N-CD	-15.69	90.04	112.00
38	m	50	PRO	CA-CB-CG	-15.44	75.17	104.50

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	417	0	451	9	0
2	1	377	0	418	6	0
3	2	504	0	572	14	0
4	3	302	0	340	8	0
5	4	480	0	482	26	0
6	B	1753	0	1780	50	0
7	C	1624	0	1696	28	0
8	D	1643	0	1707	26	0
9	E	1152	0	1196	26	0
10	F	839	0	833	11	0
11	G	1197	0	1243	29	0
12	H	979	0	1031	25	0
13	I	1019	0	1063	30	0
14	J	786	0	828	37	0
15	K	869	0	880	18	0
16	L	944	0	1002	30	0
17	M	891	0	952	18	0
18	N	805	0	844	19	0
19	O	714	0	734	26	0
20	P	643	0	661	21	0
21	Q	641	0	682	34	0
22	R	544	0	565	12	0
23	S	668	0	693	10	0
24	T	670	0	719	13	0
25	U	589	0	629	7	0
26	X	65	0	33	1	0
27	Z	1623	0	825	16	0
28	b	2549	0	1291	18	0
29	c	2082	0	2154	37	0
30	d	1556	0	1607	35	0
31	e	1552	0	1619	21	0
32	f	1410	0	1444	44	0
33	g	1323	0	1371	21	0
34	i	1123	0	1151	24	0
35	j	946	0	1023	21	0
36	k	1053	0	1129	33	0
37	l	1055	0	1134	28	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
38	m	945	0	989	19	0
39	n	892	0	923	19	0
40	o	917	0	962	19	0
41	p	431	0	454	10	0
42	q	816	0	839	15	0
43	s	730	0	795	12	0
44	t	779	0	831	19	0
45	u	753	0	780	20	0
46	v	586	0	596	14	0
47	w	625	0	652	14	0
48	x	485	0	503	7	0
49	y	449	0	488	12	0
50	z	444	0	458	10	0
51	A	32450	0	16337	409	0
52	a	58675	0	29536	426	0
53	A	38	0	0	2	0
53	a	38	0	0	1	0
All	All	137440	0	91925	1659	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 7.

The worst 5 of 1659 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)
21:Q:32:PRO:N	21:Q:32:PRO:CG	1.75	1.47
33:g:112:PRO:CB	33:g:112:PRO:CG	1.79	1.42
21:Q:32:PRO:CD	21:Q:32:PRO:HG3	1.65	1.06
21:Q:32:PRO:CG	21:Q:32:PRO:HD3	1.57	1.05
21:Q:32:PRO:CD	21:Q:32:PRO:HG2	1.65	1.04

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	49/55 (89%)	45 (92%)	4 (8%)	0	100	100
2	1	44/46 (96%)	42 (96%)	2 (4%)	0	100	100
3	2	62/65 (95%)	57 (92%)	5 (8%)	0	100	100
4	3	36/38 (95%)	34 (94%)	2 (6%)	0	100	100
5	4	56/70 (80%)	48 (86%)	8 (14%)	0	100	100
6	B	222/241 (92%)	197 (89%)	25 (11%)	0	100	100
7	C	204/233 (88%)	193 (95%)	11 (5%)	0	100	100
8	D	203/206 (98%)	188 (93%)	15 (7%)	0	100	100
9	E	154/167 (92%)	140 (91%)	14 (9%)	0	100	100
10	F	101/135 (75%)	99 (98%)	2 (2%)	0	100	100
11	G	151/179 (84%)	140 (93%)	11 (7%)	0	100	100
12	H	127/130 (98%)	111 (87%)	16 (13%)	0	100	100
13	I	125/130 (96%)	110 (88%)	14 (11%)	1 (1%)	16	51
14	J	96/103 (93%)	88 (92%)	8 (8%)	0	100	100
15	K	112/129 (87%)	105 (94%)	7 (6%)	0	100	100
16	L	118/124 (95%)	104 (88%)	13 (11%)	1 (1%)	16	51
17	M	113/118 (96%)	107 (95%)	6 (5%)	0	100	100
18	N	98/101 (97%)	94 (96%)	4 (4%)	0	100	100
19	O	86/89 (97%)	82 (95%)	4 (5%)	0	100	100
20	P	79/82 (96%)	71 (90%)	8 (10%)	0	100	100
21	Q	77/84 (92%)	65 (84%)	12 (16%)	0	100	100
22	R	64/75 (85%)	57 (89%)	7 (11%)	0	100	100
23	S	82/92 (89%)	76 (93%)	6 (7%)	0	100	100
24	T	84/87 (97%)	81 (96%)	3 (4%)	0	100	100
25	U	68/71 (96%)	68 (100%)	0	0	100	100
29	c	269/273 (98%)	249 (93%)	20 (7%)	0	100	100
30	d	204/209 (98%)	191 (94%)	13 (6%)	0	100	100
31	e	199/201 (99%)	175 (88%)	24 (12%)	0	100	100
32	f	175/179 (98%)	158 (90%)	17 (10%)	0	100	100
33	g	174/177 (98%)	153 (88%)	20 (12%)	1 (1%)	22	57

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
34	i	140/142 (99%)	134 (96%)	6 (4%)	0	100	100
35	j	121/123 (98%)	112 (93%)	9 (7%)	0	100	100
36	k	142/144 (99%)	134 (94%)	8 (6%)	0	100	100
37	l	130/136 (96%)	124 (95%)	5 (4%)	1 (1%)	16	51
38	m	116/127 (91%)	108 (93%)	8 (7%)	0	100	100
39	n	114/117 (97%)	99 (87%)	15 (13%)	0	100	100
40	o	112/115 (97%)	101 (90%)	11 (10%)	0	100	100
41	p	52/118 (44%)	37 (71%)	15 (29%)	0	100	100
42	q	101/103 (98%)	90 (89%)	11 (11%)	0	100	100
43	s	90/100 (90%)	81 (90%)	9 (10%)	0	100	100
44	t	100/104 (96%)	93 (93%)	7 (7%)	0	100	100
45	u	92/94 (98%)	87 (95%)	5 (5%)	0	100	100
46	v	76/85 (89%)	70 (92%)	6 (8%)	0	100	100
47	w	75/78 (96%)	71 (95%)	4 (5%)	0	100	100
48	x	60/63 (95%)	59 (98%)	1 (2%)	0	100	100
49	y	56/59 (95%)	53 (95%)	3 (5%)	0	100	100
50	z	54/57 (95%)	47 (87%)	7 (13%)	0	100	100
All	All	5263/5654 (93%)	4828 (92%)	431 (8%)	4 (0%)	50	80

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
33	g	128	GLN
37	l	84	LYS
13	I	13	LYS
16	L	44	LYS

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	46/49 (94%)	46 (100%)	0	100	100
2	1	38/38 (100%)	38 (100%)	0	100	100
3	2	51/52 (98%)	51 (100%)	0	100	100
4	3	34/34 (100%)	34 (100%)	0	100	100
5	4	55/62 (89%)	55 (100%)	0	100	100
6	B	186/199 (94%)	184 (99%)	2 (1%)	70	86
7	C	170/190 (90%)	169 (99%)	1 (1%)	84	92
8	D	172/173 (99%)	170 (99%)	2 (1%)	67	85
9	E	119/126 (94%)	117 (98%)	2 (2%)	56	78
10	F	90/116 (78%)	90 (100%)	0	100	100
11	G	125/147 (85%)	124 (99%)	1 (1%)	79	90
12	H	104/105 (99%)	104 (100%)	0	100	100
13	I	104/107 (97%)	104 (100%)	0	100	100
14	J	86/90 (96%)	86 (100%)	0	100	100
15	K	89/99 (90%)	88 (99%)	1 (1%)	70	86
16	L	101/104 (97%)	100 (99%)	1 (1%)	73	87
17	M	93/96 (97%)	92 (99%)	1 (1%)	70	86
18	N	83/84 (99%)	82 (99%)	1 (1%)	67	85
19	O	76/77 (99%)	76 (100%)	0	100	100
20	P	65/65 (100%)	65 (100%)	0	100	100
21	Q	73/78 (94%)	73 (100%)	0	100	100
22	R	57/65 (88%)	57 (100%)	0	100	100
23	S	72/79 (91%)	72 (100%)	0	100	100
24	T	65/66 (98%)	64 (98%)	1 (2%)	60	81
25	U	60/61 (98%)	60 (100%)	0	100	100
29	c	216/218 (99%)	216 (100%)	0	100	100
30	d	163/164 (99%)	161 (99%)	2 (1%)	67	85
31	e	165/165 (100%)	165 (100%)	0	100	100
32	f	148/150 (99%)	147 (99%)	1 (1%)	81	92
33	g	137/138 (99%)	135 (98%)	2 (2%)	60	81
34	i	115/116 (99%)	115 (100%)	0	100	100
35	j	104/104 (100%)	103 (99%)	1 (1%)	73	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
36	k	103/103 (100%)	102 (99%)	1 (1%)	73	87
37	l	107/109 (98%)	106 (99%)	1 (1%)	75	89
38	m	98/103 (95%)	98 (100%)	0	100	100
39	n	86/87 (99%)	86 (100%)	0	100	100
40	o	99/100 (99%)	99 (100%)	0	100	100
41	p	37/90 (41%)	37 (100%)	0	100	100
42	q	84/84 (100%)	83 (99%)	1 (1%)	67	85
43	s	79/84 (94%)	78 (99%)	1 (1%)	65	83
44	t	83/85 (98%)	83 (100%)	0	100	100
45	u	78/78 (100%)	78 (100%)	0	100	100
46	v	58/63 (92%)	57 (98%)	1 (2%)	56	78
47	w	67/68 (98%)	67 (100%)	0	100	100
48	x	51/55 (93%)	51 (100%)	0	100	100
49	y	48/49 (98%)	48 (100%)	0	100	100
50	z	47/48 (98%)	47 (100%)	0	100	100
All	All	4387/4623 (95%)	4363 (100%)	24 (0%)	85	93

5 of 24 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
30	d	129	THR
33	g	131	ILE
33	g	116	GLN
35	j	118	LEU
9	E	141	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 41 such sidechains are listed below:

Mol	Chain	Res	Type
34	i	40	HIS
39	n	116	GLN
34	i	80	HIS
37	l	13	HIS
42	q	91	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
26	X	2/28 (7%)	0	0
27	Z	75/76 (98%)	10 (13%)	0
28	b	118/120 (98%)	16 (13%)	0
51	A	1503/1542 (97%)	288 (19%)	9 (0%)
52	a	2711/2904 (93%)	357 (13%)	0
All	All	4409/4670 (94%)	671 (15%)	9 (0%)

5 of 671 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
27	Z	6	G
27	Z	9	G
27	Z	17(A)	U
27	Z	18	G
27	Z	19	G

5 of 9 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
51	A	1299	A
51	A	1518	A
51	A	326	G
51	A	445	G
51	A	466	A

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 ⓘ

2 ligands 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	$\#\|Z\| > 2$
53	84G	A	1601	-	39,40,40	1.87	8 (20%)	48,57,57	1.21	5 (10%)
53	84G	a	3001	-	39,40,40	1.85	7 (17%)	48,57,57	1.13	6 (12%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
53	84G	A	1601	-	-	4/23/76/76	0/3/3/3
53	84G	a	3001	-	-	7/23/76/76	0/3/3/3

The worst 5 of 15 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
53	A	1601	84G	C3-N1	7.25	1.49	1.34
53	a	3001	84G	C3-N1	6.37	1.47	1.34
53	a	3001	84G	C21-C20	-4.56	1.47	1.53
53	A	1601	84G	C21-C20	-3.78	1.48	1.53
53	a	3001	84G	C19-C20	-3.66	1.48	1.53

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
53	A	1601	84G	C16-O5-C15	-3.71	109.17	117.98
53	A	1601	84G	C8-O2-C7	-3.26	110.25	117.98
53	a	3001	84G	O6-C17-C19	2.39	114.01	109.70
53	a	3001	84G	C-C1-C2	-2.39	109.26	112.52
53	a	3001	84G	C7-C14-C15	2.36	113.89	109.11

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
53	a	3001	84G	C-C1-C2-O

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
53	a	3001	84G	N3-C10-C9-O3
53	a	3001	84G	N3-C10-C9-C11
53	a	3001	84G	O6-C17-C18-O7
53	A	1601	84G	C19-C17-C18-O7

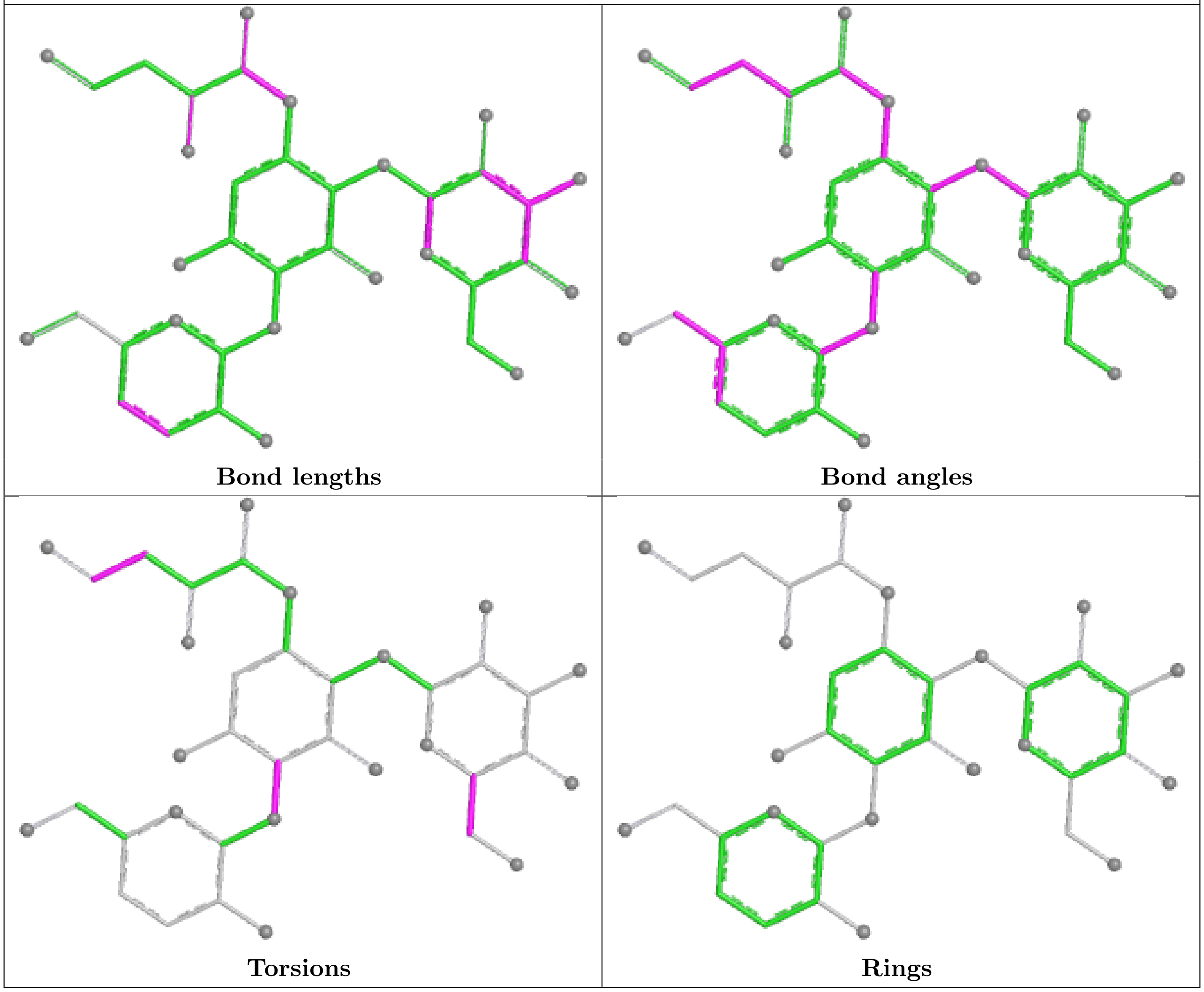
There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
53	A	1601	84G	2	0
53	a	3001	84G	1	0

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

Ligand 84G A 1601



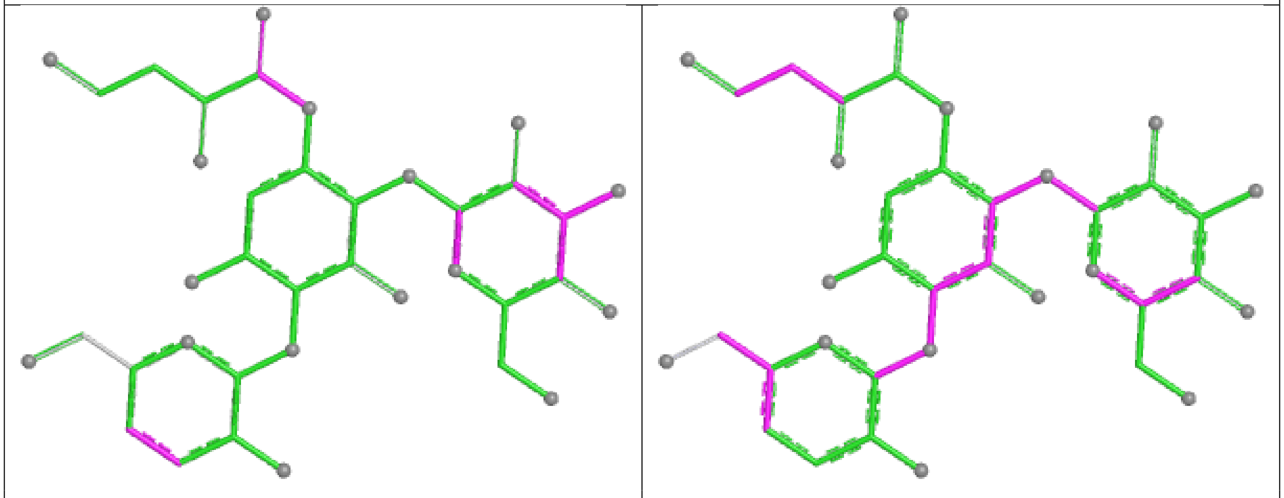
Bond lengths

Bond angles

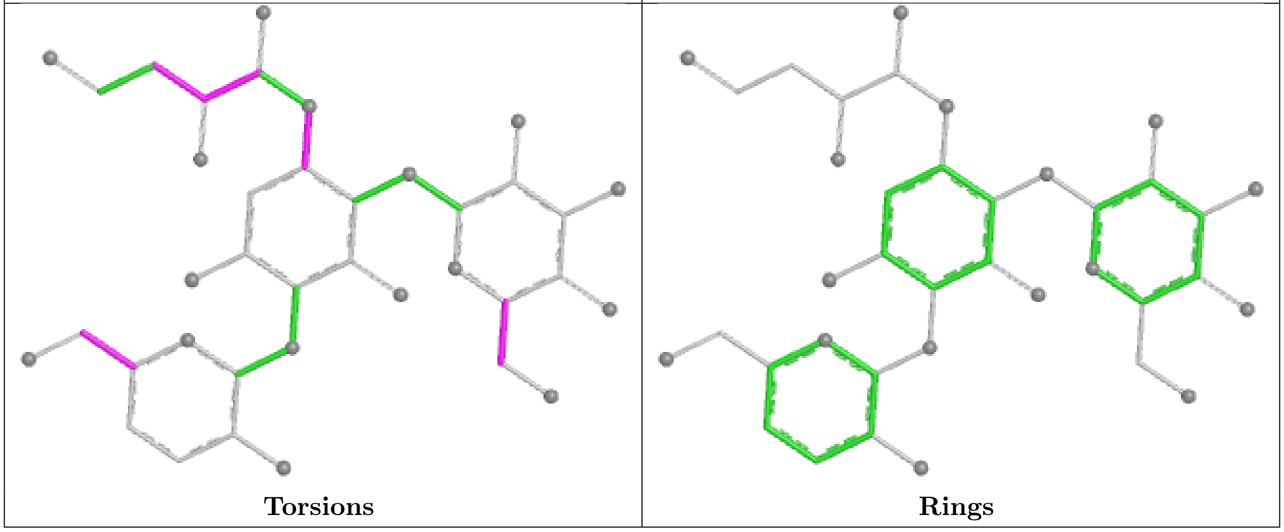
Torsions

Rings

Ligand 84G a 3001



Bond lengths **Bond angles**



Torsions **Rings**

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.

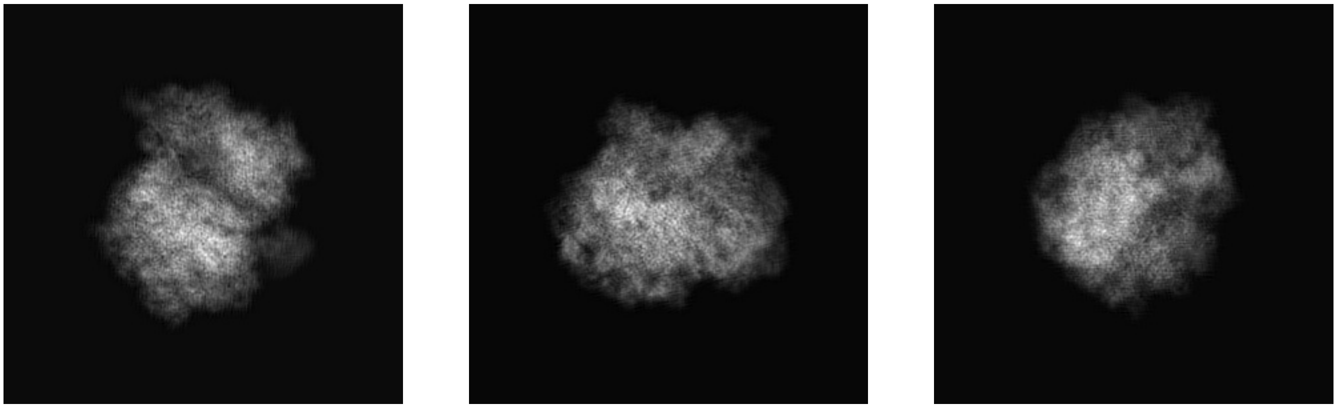
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-48329. 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.

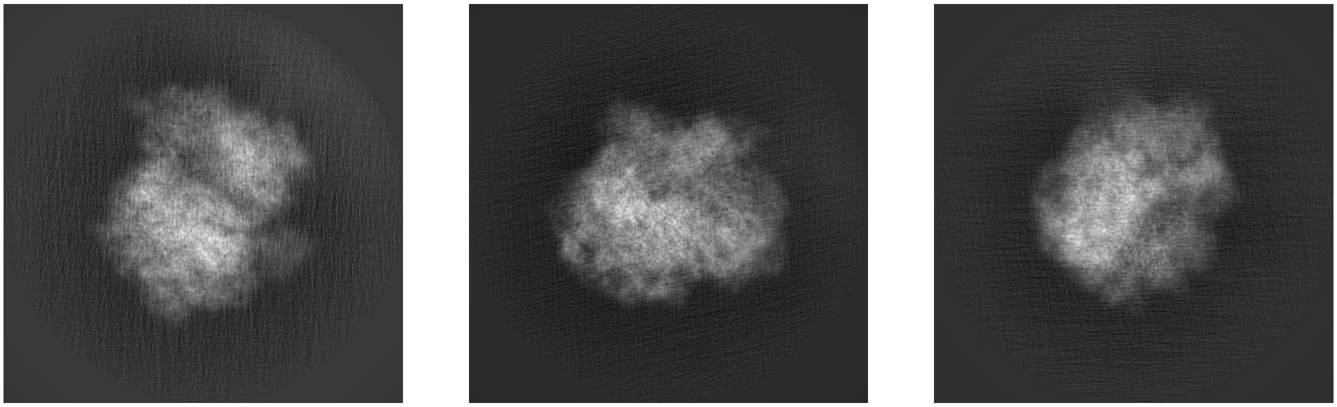
6.1 Orthogonal projections

6.1.1 Primary map



X Y Z

6.1.2 Raw map

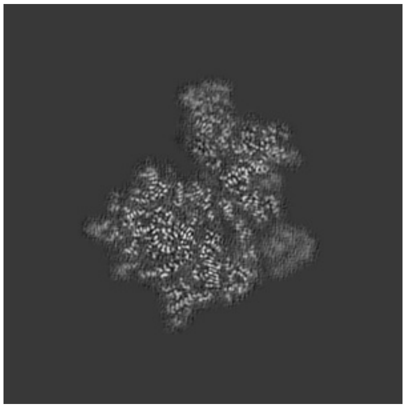


X Y Z

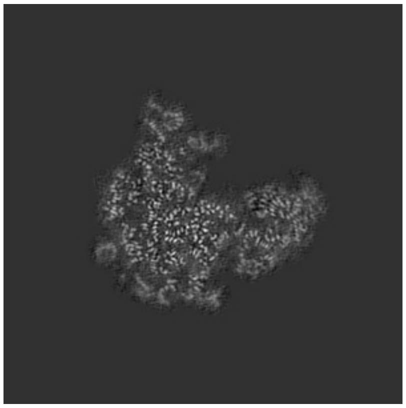
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

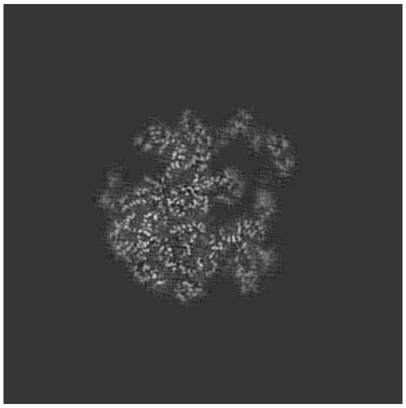
6.2.1 Primary map



X Index: 250

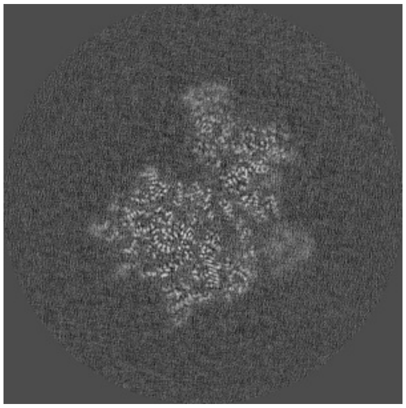


Y Index: 250

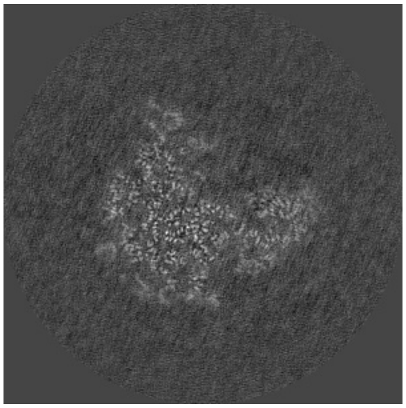


Z Index: 250

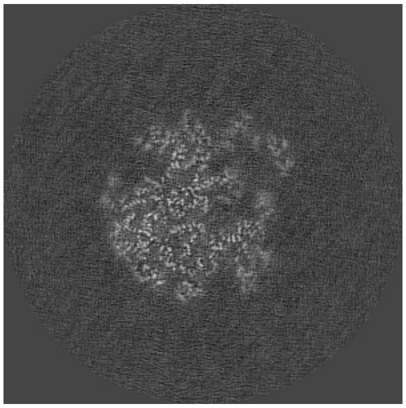
6.2.2 Raw map



X Index: 250



Y Index: 250

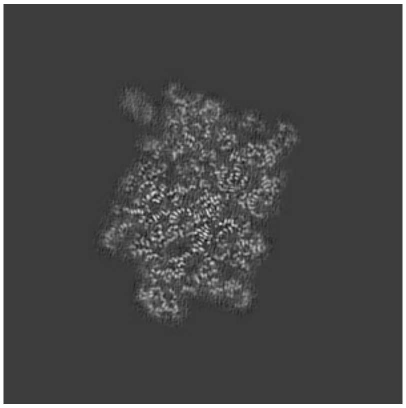


Z Index: 250

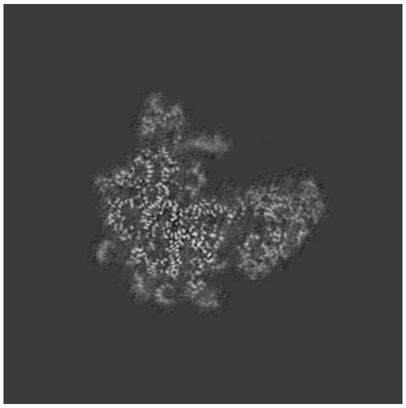
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices ⓘ

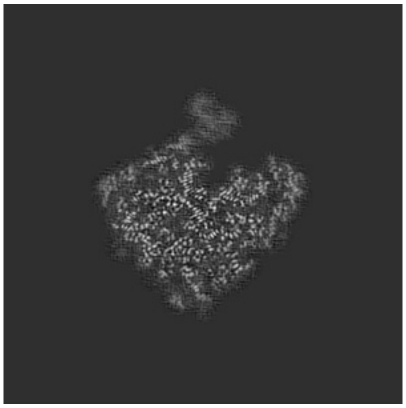
6.3.1 Primary map



X Index: 212

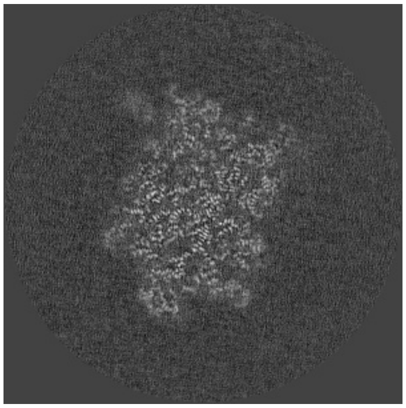


Y Index: 255

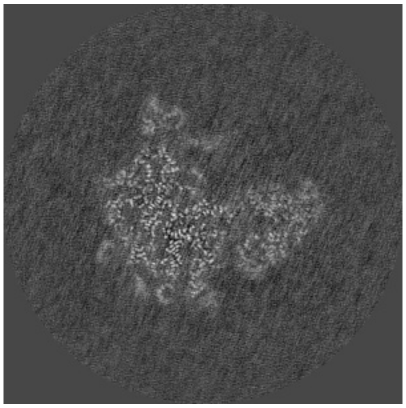


Z Index: 205

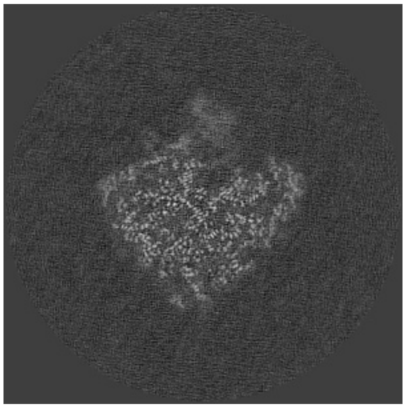
6.3.2 Raw map



X Index: 212



Y Index: 254

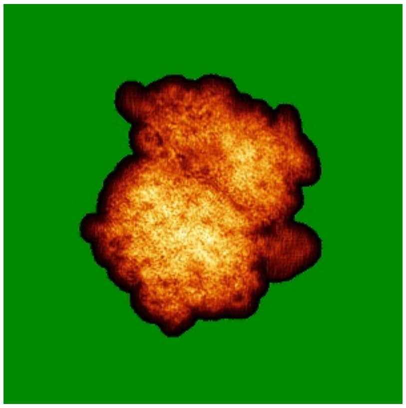


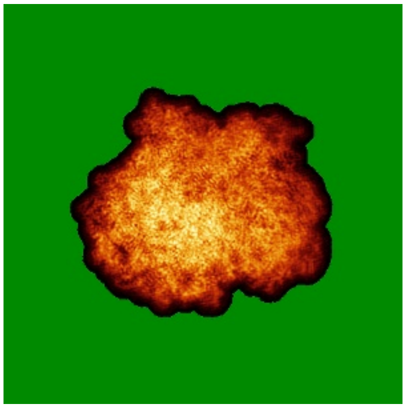
Z Index: 205

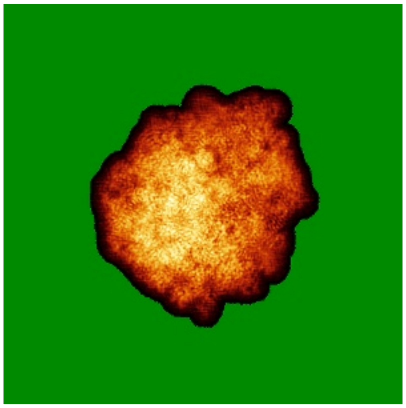
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color)

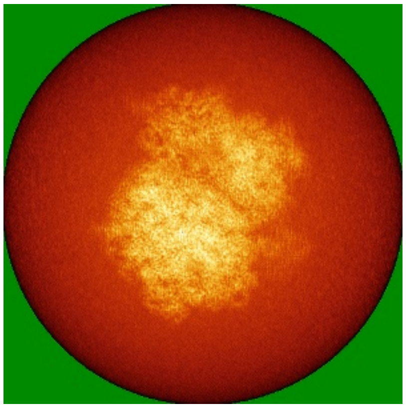
6.4.1 Primary map

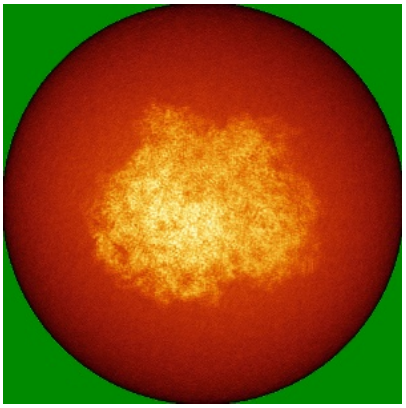

X

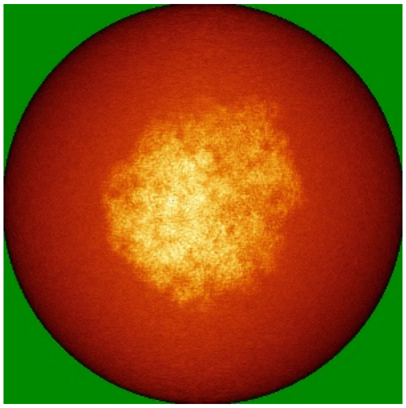

Y


Z

6.4.2 Raw map


X

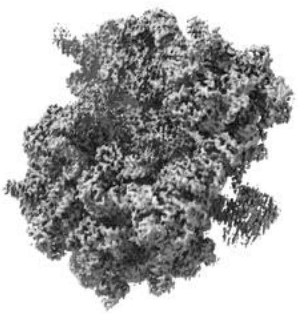

Y


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.

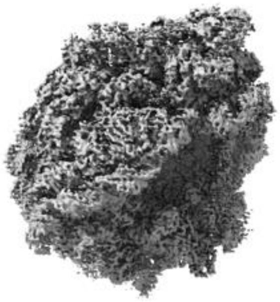
6.5 Orthogonal surface views (i)

6.5.1 Primary map



X

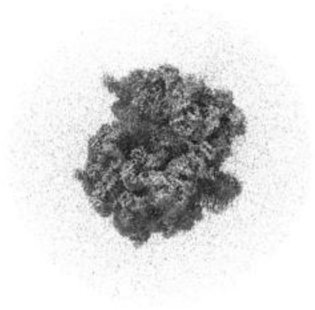
Y



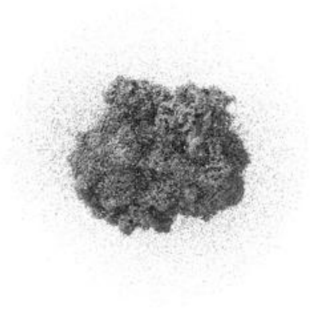
Z

The images above show the 3D surface view of the map at the recommended contour level 0.02. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X



Y

Z

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

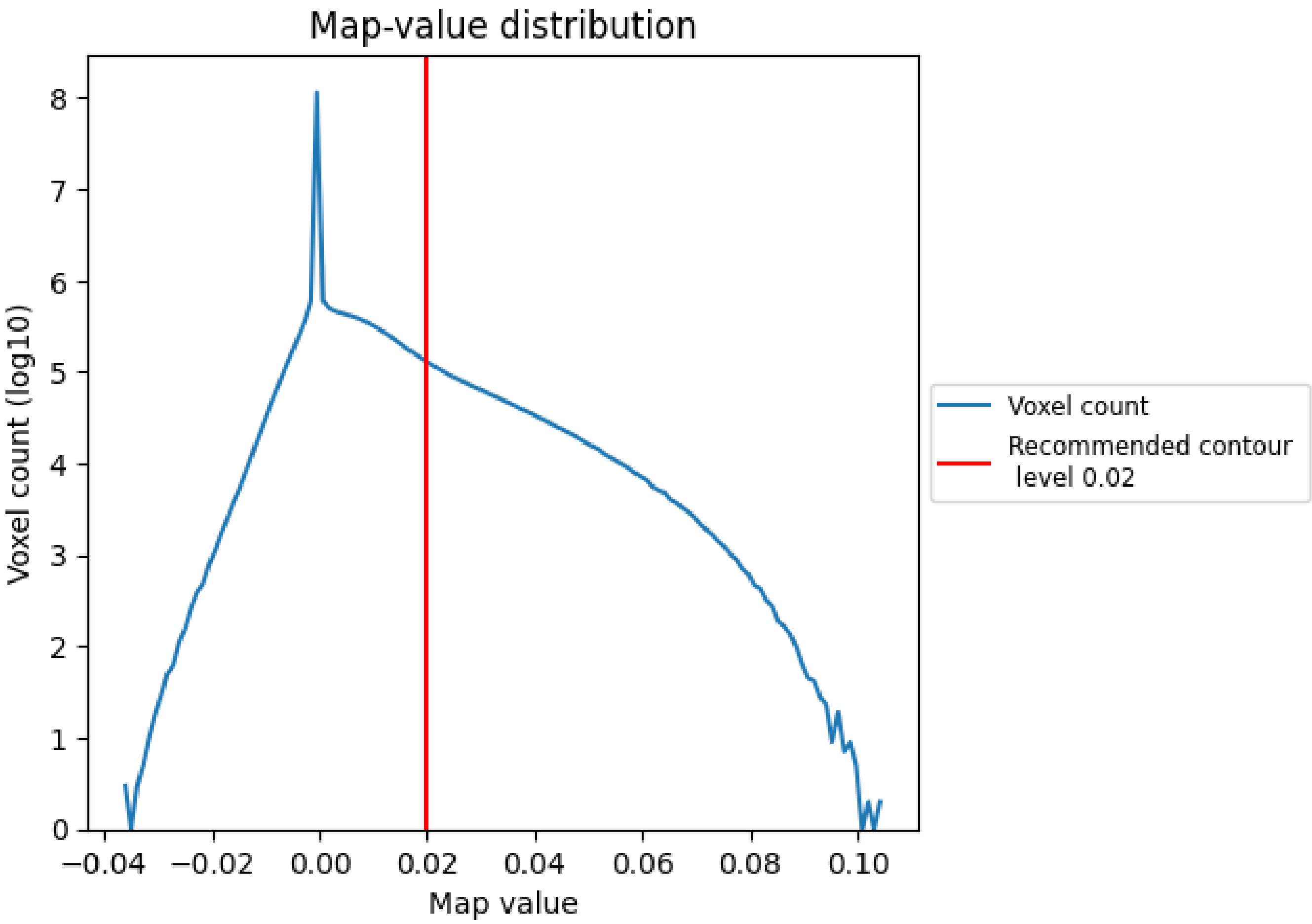
6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

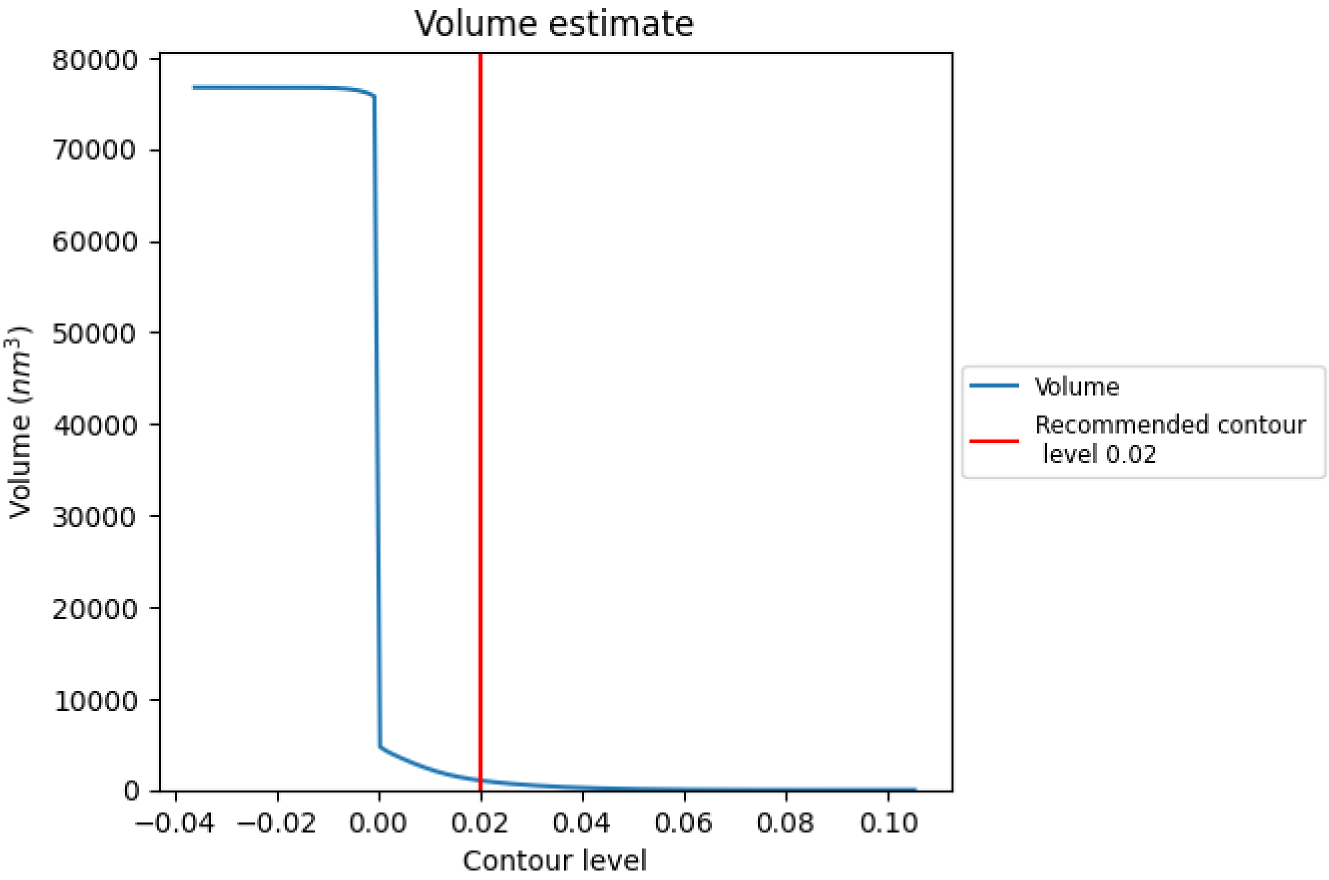
This section contains the results of statistical analysis of the map.

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.

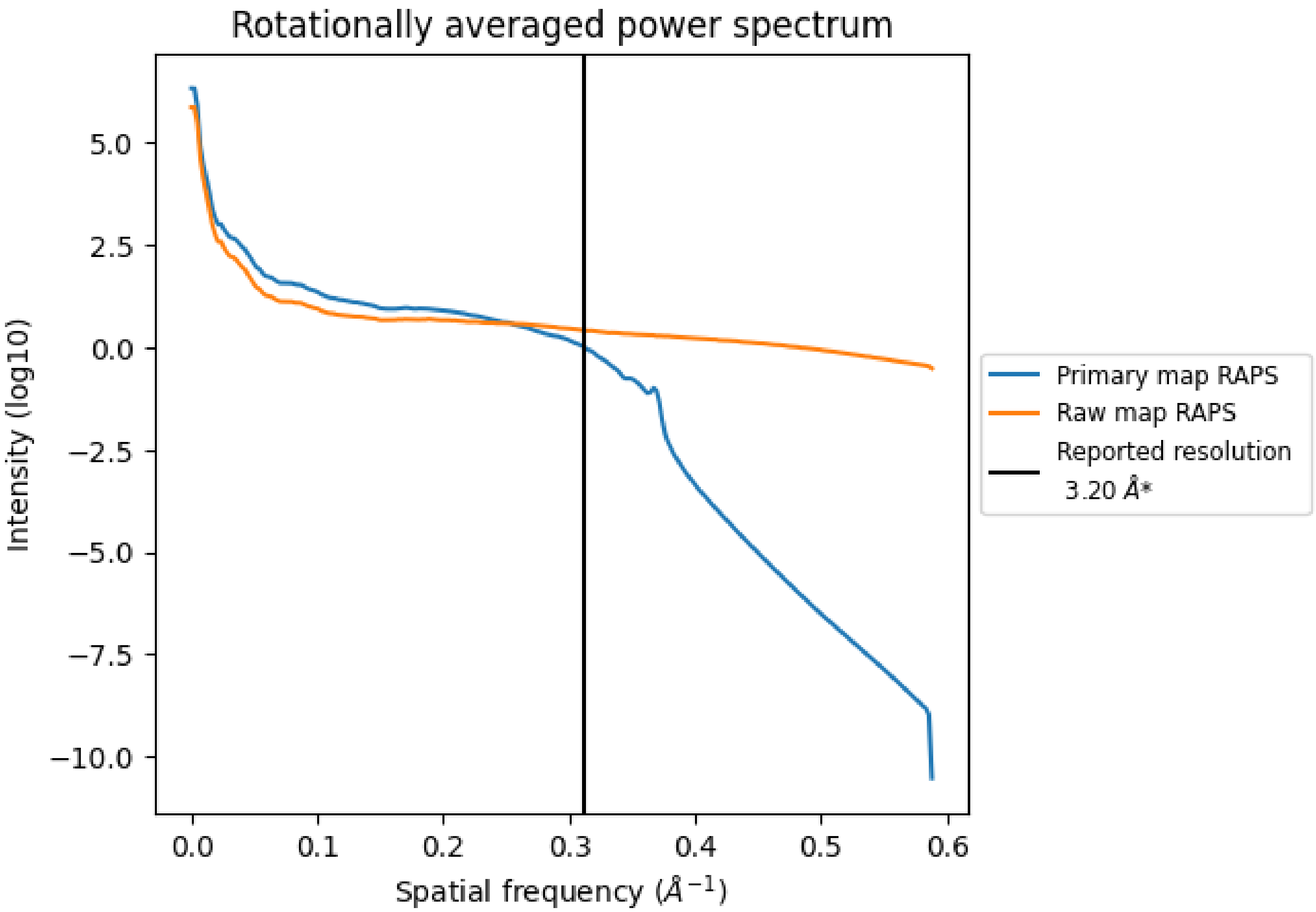
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 1035 nm^3; this corresponds to an approximate mass of 935 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 ⓘ

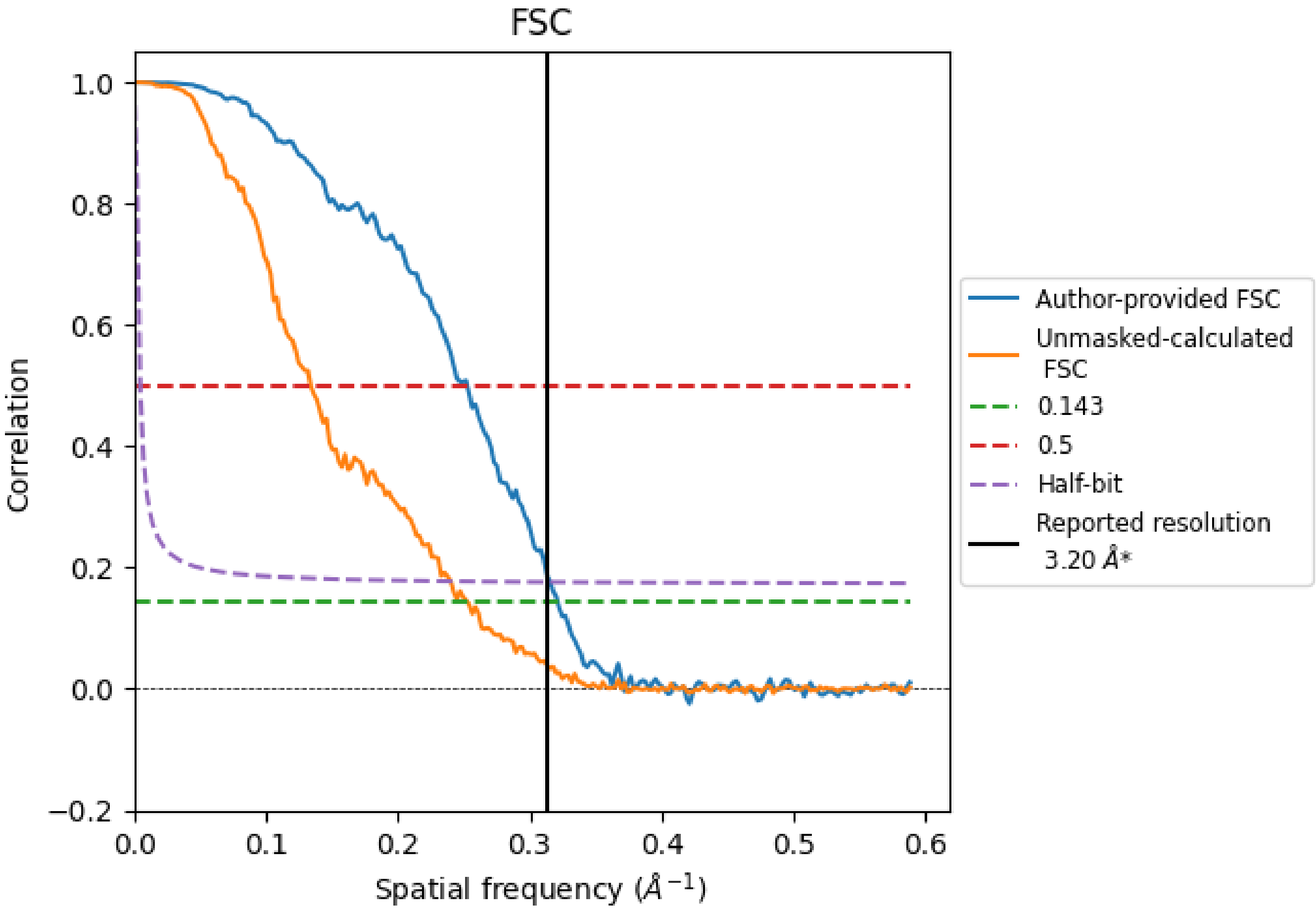


*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

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 0.312 Å^{-1}

8.2 Resolution estimates

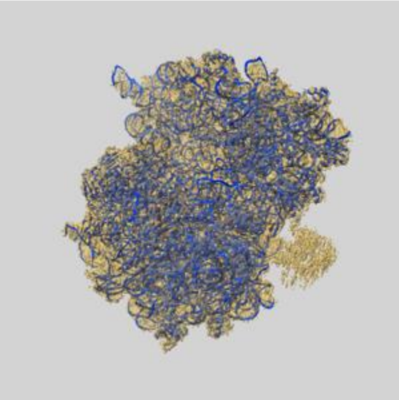
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.11	3.96	3.17
Unmasked-calculated*	3.96	7.46	4.16

*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 3.96 differs from the reported value 3.2 by more than 10 %

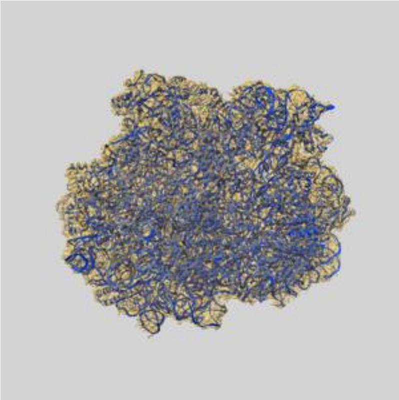
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-48329 and PDB model 9MKK. Per-residue inclusion information can be found in section 3 on page 14.

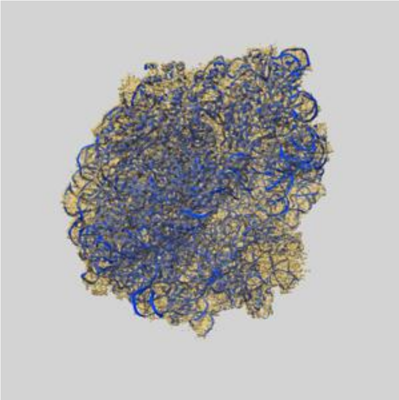
9.1 Map-model overlay (i)



X



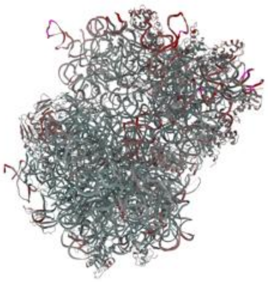
Y



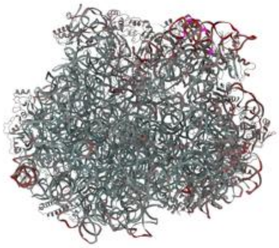
Z

The images above show the 3D surface view of the map at the recommended contour level 0.02 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.

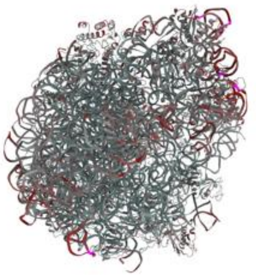
9.2 Q-score mapped to coordinate model (i)



X



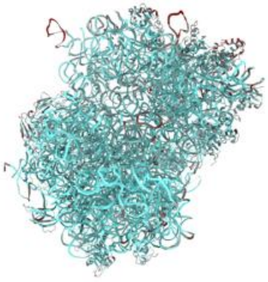
Y



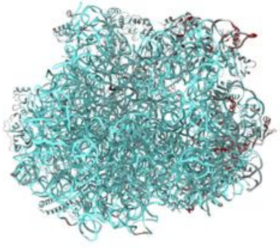
Z

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.

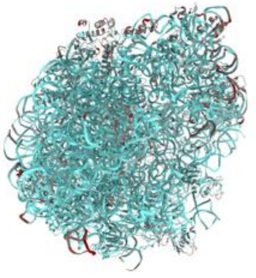
9.3 Atom inclusion mapped to coordinate model (i)



X



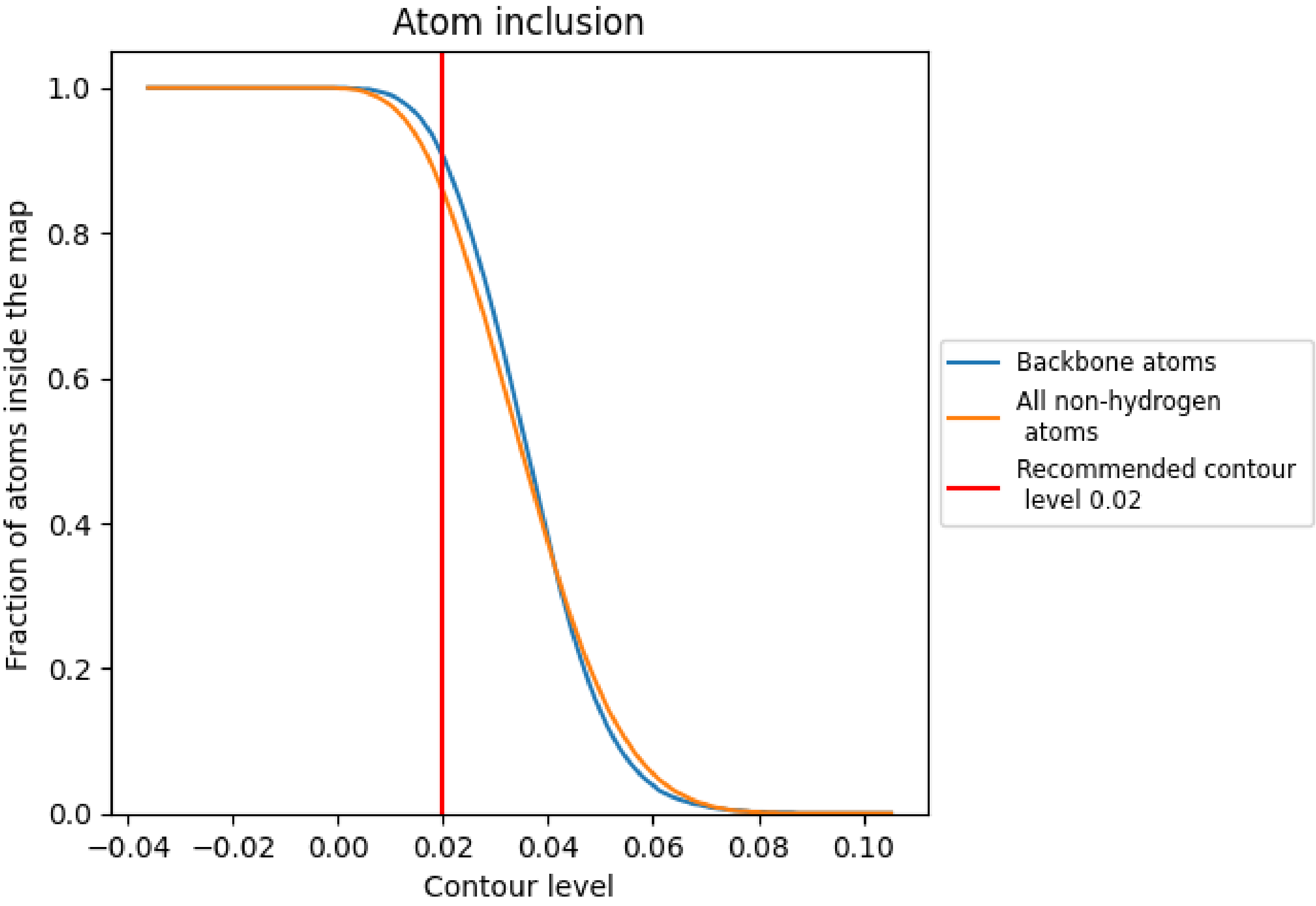
Y



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 (0.02).

9.4 Atom inclusion ⓘ



At the recommended contour level, 91% of all backbone atoms, 86% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8580	0.5030
0	0.7310	0.4900
1	0.8930	0.5630
2	0.8600	0.5420
3	0.8250	0.5070
4	0.5880	0.4020
A	0.8730	0.4720
B	0.4890	0.4100
C	0.7230	0.4720
D	0.6260	0.4240
E	0.7700	0.5000
F	0.6780	0.4620
G	0.6710	0.4400
H	0.7530	0.4890
I	0.6990	0.4560
J	0.6030	0.4260
K	0.7630	0.4990
L	0.7140	0.4550
M	0.6890	0.4610
N	0.7560	0.4640
O	0.7840	0.5020
P	0.7330	0.4480
Q	0.6640	0.4350
R	0.7210	0.4720
S	0.7120	0.4560
T	0.7050	0.4420
U	0.6300	0.4310
X	0.9540	0.5530
Z	0.7980	0.4710
a	0.9350	0.5370
b	0.9120	0.5030
c	0.8490	0.5510
d	0.8160	0.5250
e	0.7740	0.5080
f	0.6690	0.4390

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Chain	Atom inclusion	Q-score
g	0.6310	0.4180
i	0.8060	0.5160
j	0.7560	0.5200
k	0.7820	0.5090
l	0.8190	0.5210
m	0.8820	0.5420
n	0.7390	0.4660
o	0.7700	0.5240
p	0.8700	0.4920
q	0.7790	0.4970
s	0.7630	0.4960
t	0.7510	0.4770
u	0.7240	0.4830
v	0.8270	0.5270
w	0.8050	0.4980
x	0.7420	0.4740
y	0.7800	0.5070
z	0.7990	0.5080