wwPDB EM Validation Summary Report (i)

Feb 11, 2024 – 03:24 AM EST

PDB ID	:	3BBX
EMDB ID	:	EMD-1455
Title	:	The Hsp15 protein fitted into the low resolution Cryo-EM map of the 50S.nc-tRNA.Hsp15 complex
Authors	:	Jiang, L.; Abrahams, J.P.
Deposited on	:	2007-11-11
Resolution	:	10.00 Å(reported)
Based on initial model	:	2AW4

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 (i) 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 (i)) were used in the production of this report:

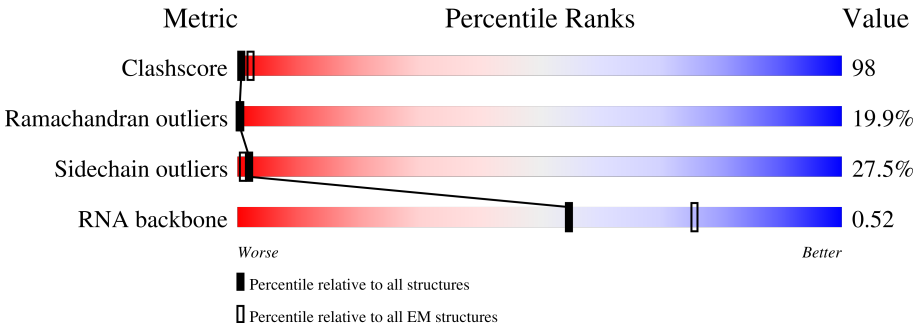
EMDB validation analysis	:	0.0.1.dev70
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 10.00 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	A	120	11% 22% 63% 12%
2	B	2904	12% 20% 66% 13%
3	V	94	38% 27% 56% 16%
4	C	273	26% 13% 41% 37% 8%
5	D	209	33% 10% 53% 33%
6	E	201	34% 12% 55% 28% 5%
7	F	178	16% 19% 52% 27%

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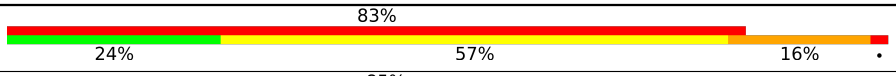
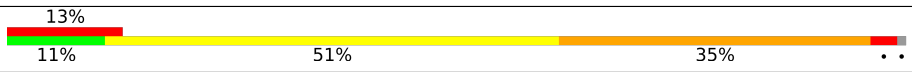
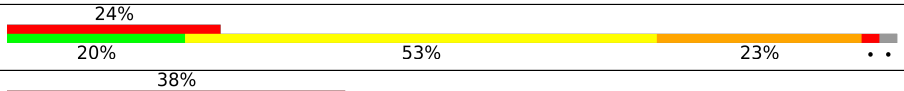
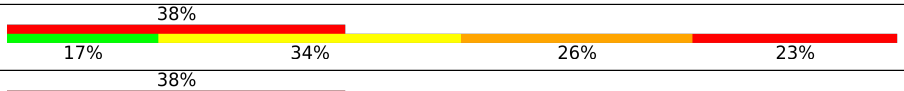
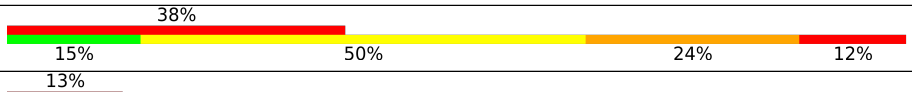
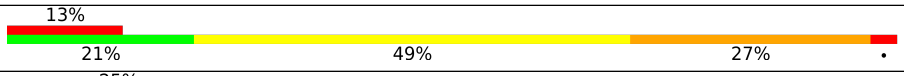
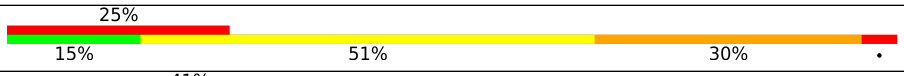
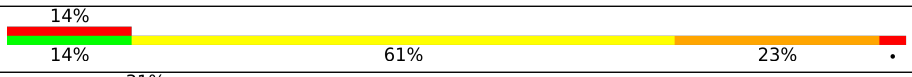
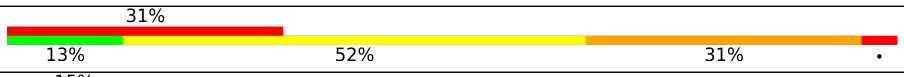
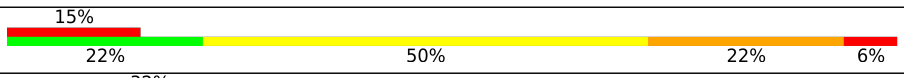
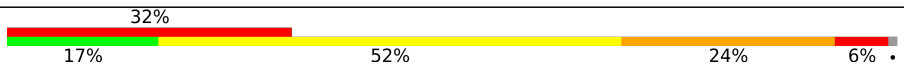
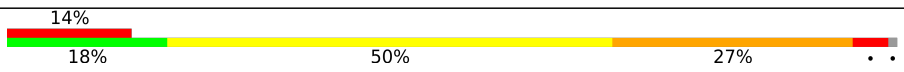
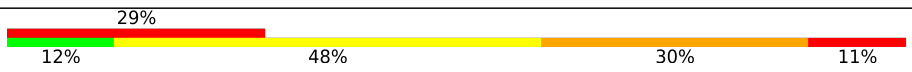
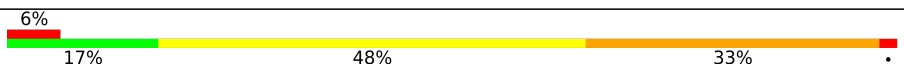
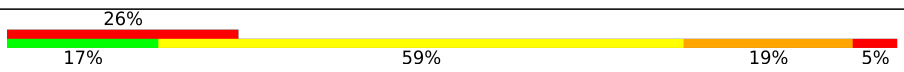
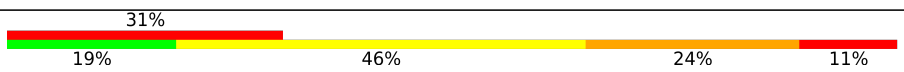
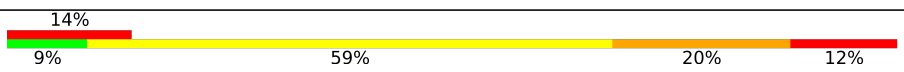
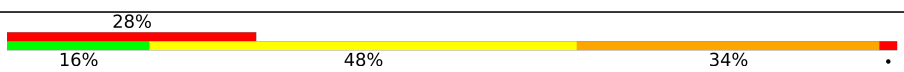
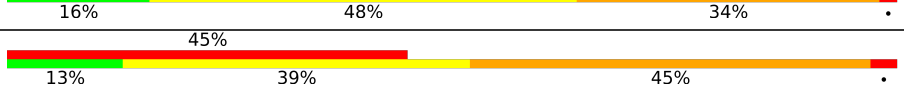
Mol	Chain	Length	Quality of chain
8	G	176	
9	H	149	
10	J	142	
11	K	123	
12	L	144	
13	M	136	
14	N	127	
15	O	117	
16	P	114	
17	Q	117	
18	R	103	
19	S	110	
20	T	100	
21	U	103	
22	W	84	
23	X	63	
24	Y	58	
25	Z	70	
26	0	56	
27	1	54	
28	2	46	
29	3	64	
30	4	38	

2 Entry composition (i)

There are 32 unique types of molecules in this entry. The entry contains 89335 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	A	117	2507	1116	459	815	117	0	0

- Molecule 2 is a RNA chain called 23S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	B	2902	61056	27210	11229	19715	2902	0	61

- Molecule 3 is a protein called 50S ribosomal protein L25.

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

- Molecule 4 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	267	2053	1271	416	359	7	0	0

- Molecule 5 is a protein called 50S ribosomal protein L3.

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

- Molecule 6 is a protein called 50S ribosomal protein L4.

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

- Molecule 7 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	F	178	Total	C	N	O	S	0	0
			1420	905	251	258	6		

- Molecule 8 is a protein called 50S ribosomal protein L6.

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

- Molecule 9 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	H	149	Total	C	N	O	S	0	0
			1111	699	197	214	1		

- Molecule 10 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	140	Total	C	N	O	S	0	0
			1112	704	210	194	4		

- Molecule 11 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	121	Total	C	N	O	S	0	0
			930	582	179	164	5		

- Molecule 12 is a protein called 50S ribosomal protein L15.

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

- Molecule 13 is a protein called 50S ribosomal protein L16.

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

- Molecule 14 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	127	Total	C	N	O	S	0	0
			1008	621	204	178	5		

- Molecule 15 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	117	Total	C	N	O	S	0	0
			900	557	179	163	1		

- Molecule 16 is a protein called 50S ribosomal protein L19.

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

- Molecule 17 is a protein called 50S ribosomal protein L20.

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

- Molecule 18 is a protein called 50S ribosomal protein L21.

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

- Molecule 19 is a protein called 50S ribosomal protein L22.

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

- Molecule 20 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	99	Total	C	N	O	S	0	0
			777	491	145	139	2		

- Molecule 21 is a protein called 50S ribosomal protein L24.

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

- Molecule 22 is a protein called 50S ribosomal protein L27.

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

- Molecule 23 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	X	63	Total 509	C 313	N 99	O 95	S 2	0	0

- Molecule 24 is a protein called 50S ribosomal protein L30.

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

- Molecule 25 is a protein called 50S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Z	70	Total 549	C 339	N 104	O 100	S 6	0	0

- Molecule 26 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	0	56	Total 444	C 269	N 94	O 80	S 1	0	0

- Molecule 27 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
27	1	54	Total 441	C 284	N 81	O 76	0	0

- Molecule 28 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	2	46	Total	C	N	O	S	0	0
			377	228	90	57	2		

- Molecule 29 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	3	64	Total	C	N	O	S	0	0
			504	323	105	74	2		

- Molecule 30 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	4	38	Total	C	N	O	S	0	0
			302	185	65	48	4		

- Molecule 31 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
31	B	92	Total	Mg	0
			92	92	
31	C	1	Total	Mg	0
			1	1	
31	E	3	Total	Mg	0
			3	3	
31	L	4	Total	Mg	0
			4	4	
31	Q	2	Total	Mg	0
			2	2	
31	S	2	Total	Mg	0
			2	2	
31	T	2	Total	Mg	0
			2	2	
31	U	1	Total	Mg	0
			1	1	
31	2	3	Total	Mg	0
			3	3	

- Molecule 32 is water.

Mol	Chain	Residues	Atoms		AltConf
32	B	443	Total	O	0
			443	443	

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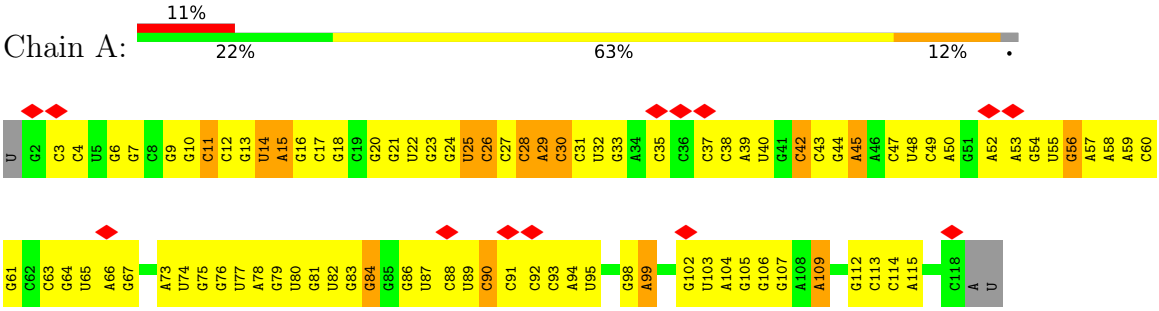
Mol	Chain	Residues	Atoms	AltConf
32	C	1	Total O 1 1	0
32	D	1	Total O 1 1	0
32	E	18	Total O 18 18	0
32	L	8	Total O 8 8	0
32	Q	7	Total O 7 7	0
32	S	7	Total O 7 7	0
32	T	5	Total O 5 5	0
32	U	5	Total O 5 5	0
32	2	11	Total O 11 11	0

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.

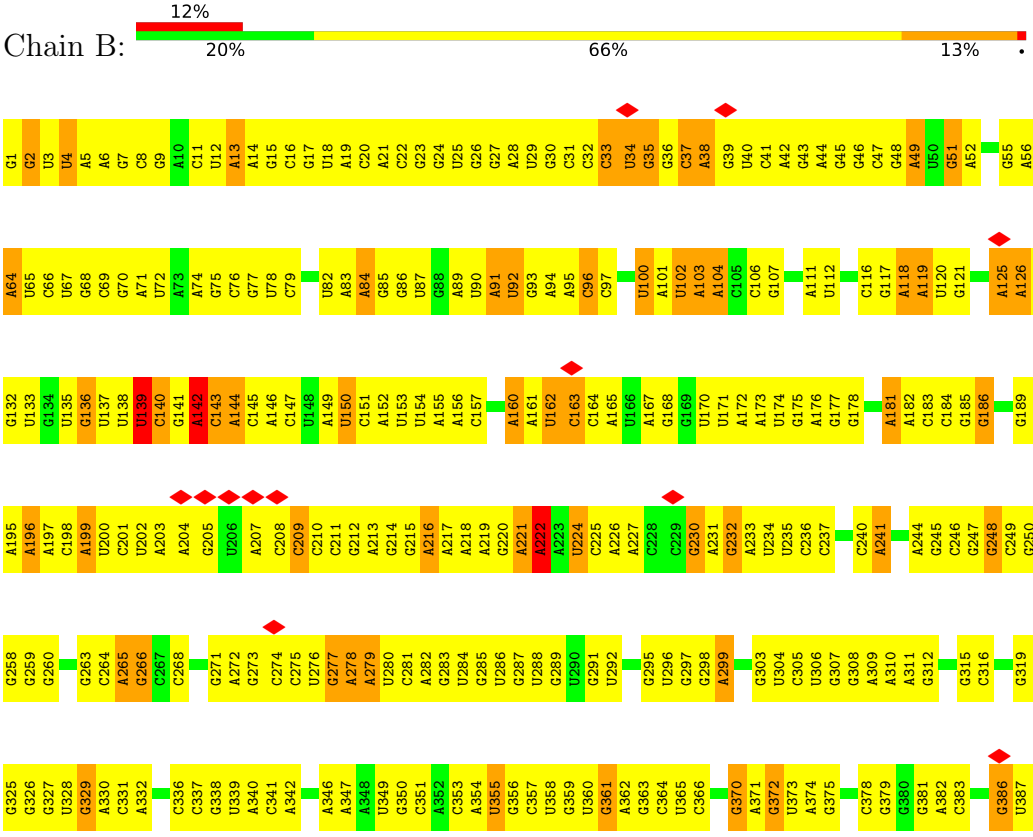
- Molecule 1: 5S ribosomal RNA

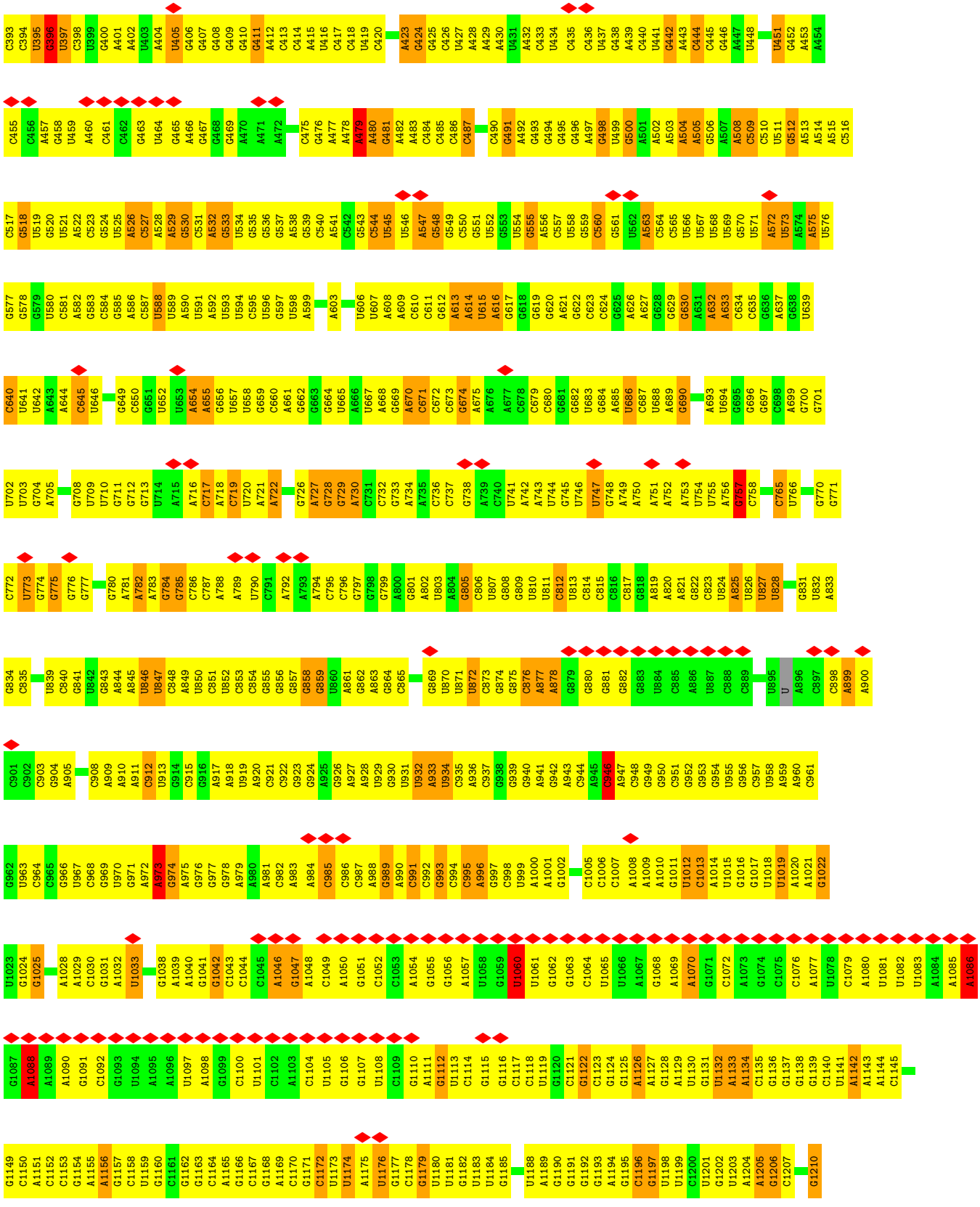
Chain A:



- Molecule 2: 23S ribosomal RNA

Chain B:




C393 C394 U395 G396 U397 C398 U399 G400 A401 A402 U403 A404 U405 G406 G407 G408 G409 G410 G411 A412 C413 C414 A415 U416 C417 C418 U419 C420 A423 G424 G425 C426 U427 A428 A429 A430 U431 A432 C433 U434 C435 C436 U437 G438 A439 C440 U441 G442 A443 C444 C445 G446 A447 U448 U451 G452 A453 A454
C455 C456 A457 G458 U459 A460 C461 C462 G463 U464 G465 A466 G467 G468 G469 A470 A471 A472 C475 G476 A477 A478 A479 A480 G481 A482 A483 C484 C485 C486 C487 C490 G491 A492 G493 G494 G495 G496 A497 G498 U499 G500 A501 A502 A503 A504 A505 C506 A507 A508 C509 C510 U511 G512 A513 A514 A515 C516
C517 G518 U519 G520 U521 A522 C523 G524 U525 A526 C527 A528 A529 G530 C531 A532 G533 U534 G535 U536 G537 A538 G539 C540 A541 G542 G543 C544 U545 U546 A547 G548 G549 C550 G551 U552 G553 U554 G555 A556 C557 U558 G559 C560 G561 U562 A563 C564 C565 U566 U567 U568 U569 G570 U571 A572 U573 A574 A575 U576
G577 G578 G579 U580 C581 A582 G583 C584 G585 A586 C587 U588 U589 A590 U591 A592 U593 U594 C595 U596 G597 U598 A599 A603 U606 U607 A608 A609 C610 C611 G612 A613 A614 U615 A616 G617 G618 G619 G620 A621 G622 C623 C624 G625 A626 A627 G628 G629 G630 A631 A632 A633 C634 C635 G636 A637 G638 U639
C640 U641 U642 A643 A644 C645 U646 G649 C650 G651 U652 U653 A654 A655 G656 U657 U658 G659 C660 A661 G662 G663 G664 U665 A666 U667 A668 G669 A670 C671 C672 C673 G674 A675 A676 A677 C678 C679 C680 G681 G682 U683 G684 A685 U686 C687 U688 A689 G690 A693 U694 G695 G696 G697 C698 A699 G700 G701
U702 U703 G704 A705 G708 U709 U710 G711 G712 G713 U714 A715 A716 C717 A718 C719 U720 A721 A722 G726 A727 G728 G729 A730 C731 C732 G733 A734 A735 C736 C737 G738 A739 C740 U741 A742 A743 U744 G745 U746 U747 G748 A749 A750 A751 A752 A753 U754 U755 A756 G757 C758 C765 U766 G770 G771
C772 U773 G774 G775 G776 G777 G780 A781 A782 A783 G784 G785 C786 C787 A788 A789 U790 C791 A792 A793 A794 C795 C796 G797 G798 G799 A800 G801 A802 U803 A804 G805 C806 U807 G808 G809 U810 U811 C812 U813 C814 C815 C816 C817 G818 A819 A820 A821 G822 C823 U824 A825 U826 U827 U828 G831 U832 A833
G834 C835 U839 C840 C841 U842 G843 A844 A845 U846 U847 C848 A849 U850 C851 U852 C853 C854 G855 C856 G857 G858 G859 U860 A861 C862 A863 G864 C865 G869 U870 U871 U872 C873 G874 G875 C876 A877 A878 G879 G880 G881 G882 G883 U884 C885 A886 U887 C888 C889 U895 U A896 C897 G898 A899 A900
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G962 U963 C964 C965 G966 U967 C968 G969 U970 G971 A972 A973 G974 A975 G976 G977 G978 A979 A980 A981 C982 A983 A984 C985 C986 C987 A988 G989 A990 C991 C992 G993 C994 C995 A996 G997 C998 U999 A1000 A1001 G1002 C1005 C1006 C1007 A1008 A1009 A1010 G1011 U1012 C1013 A1014 U1015 G1016 G1017 U1018 U1019 A1020 A1021 G1022
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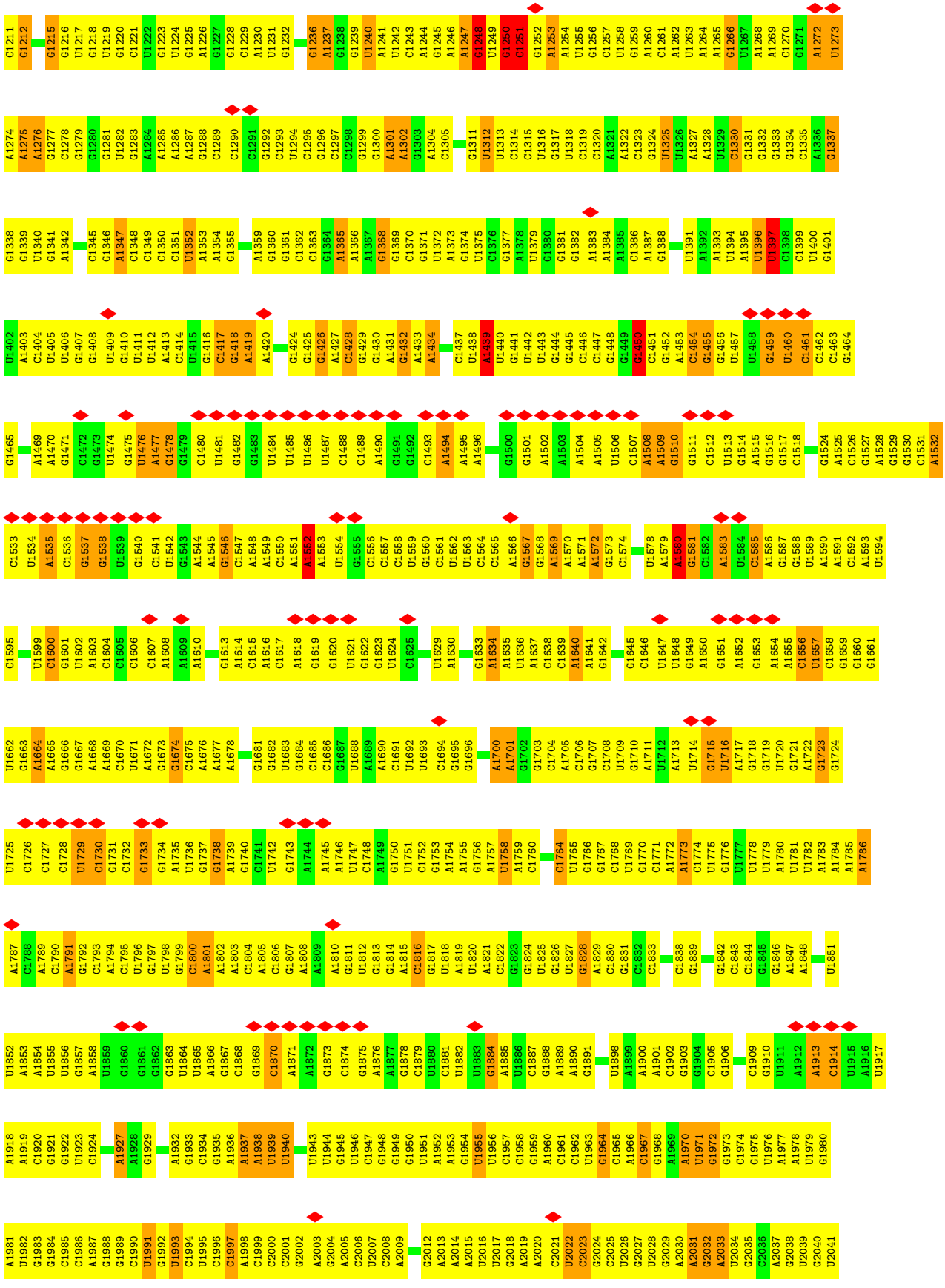

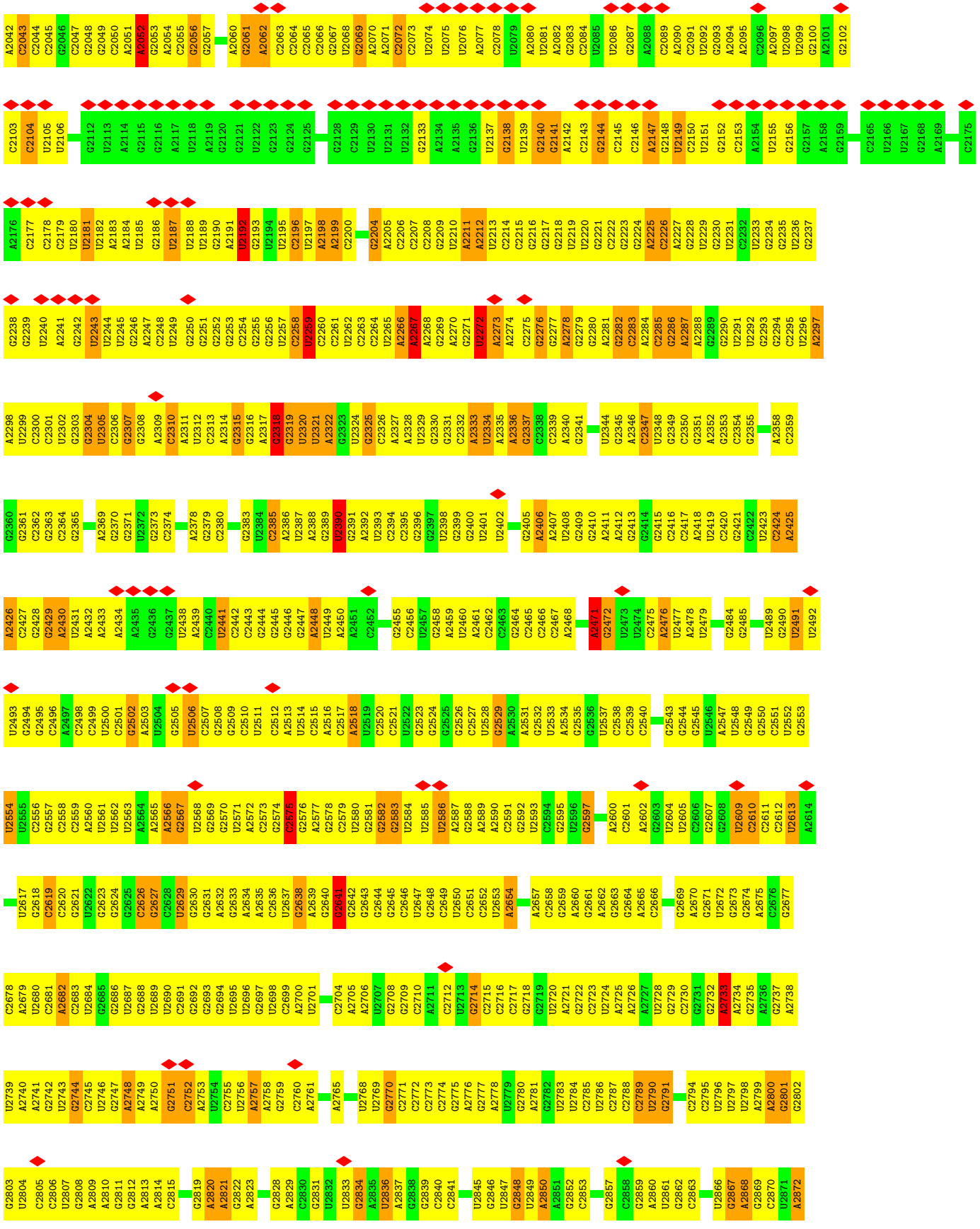
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• Molecule 3: 50S ribosomal protein L25

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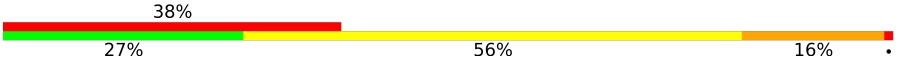

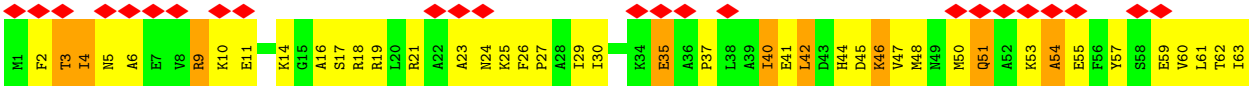

• Molecule 4: 50S ribosomal protein L2

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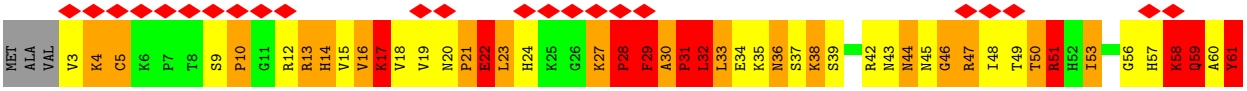

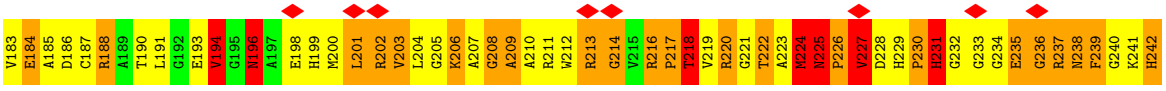

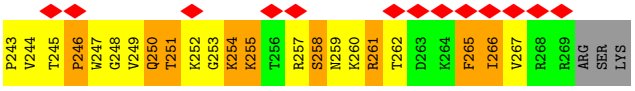

• Molecule 5: 50S ribosomal protein L3

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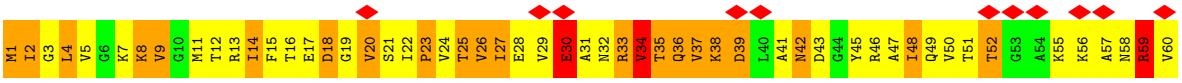
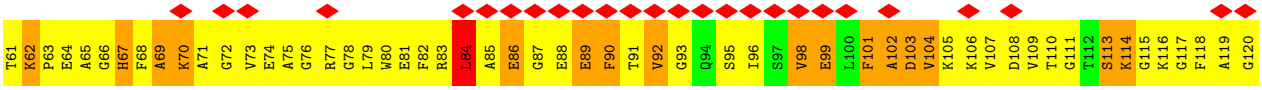
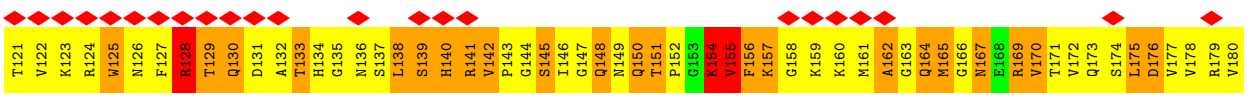
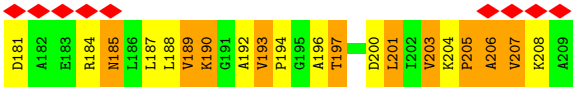
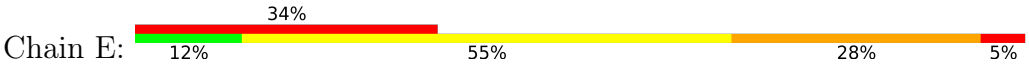


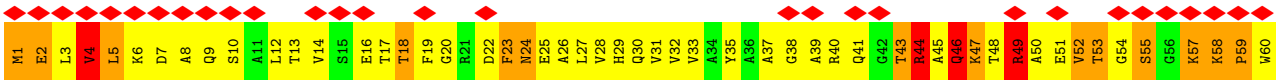


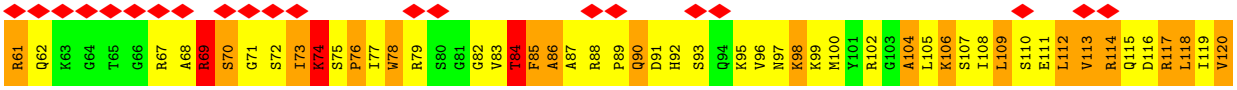


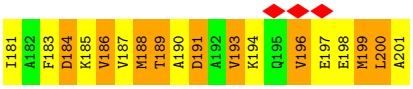


• Molecule 6: 50S ribosomal protein L4

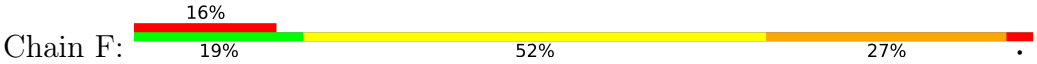


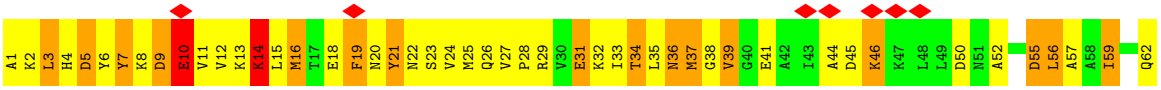


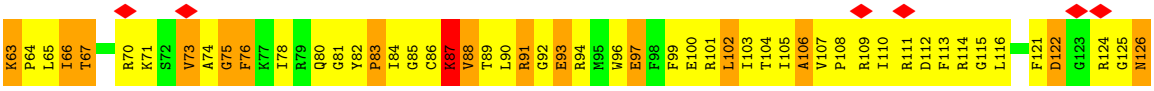




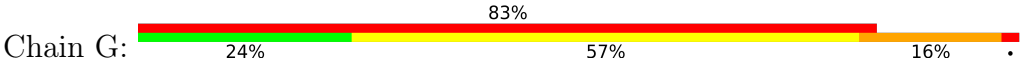
• Molecule 7: 50S ribosomal protein L5

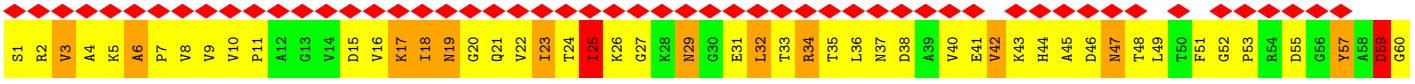


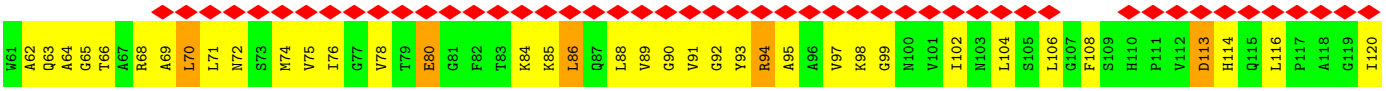


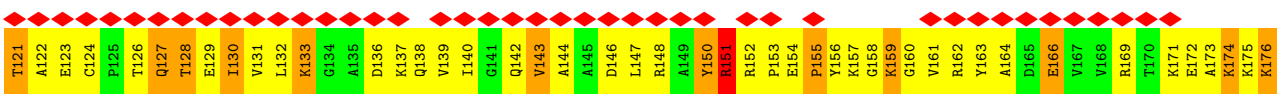


• Molecule 8: 50S ribosomal protein L6



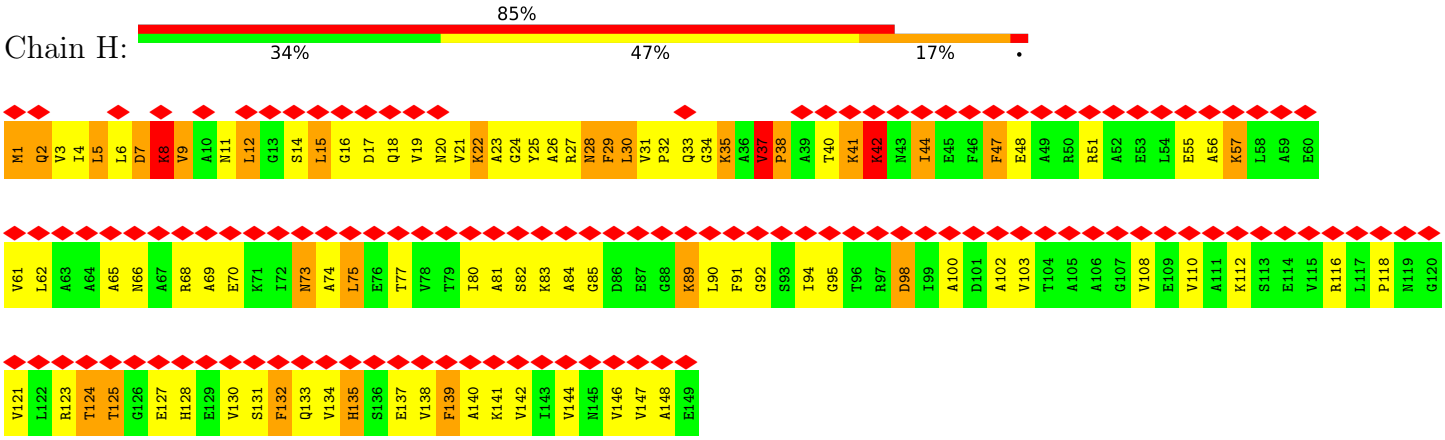






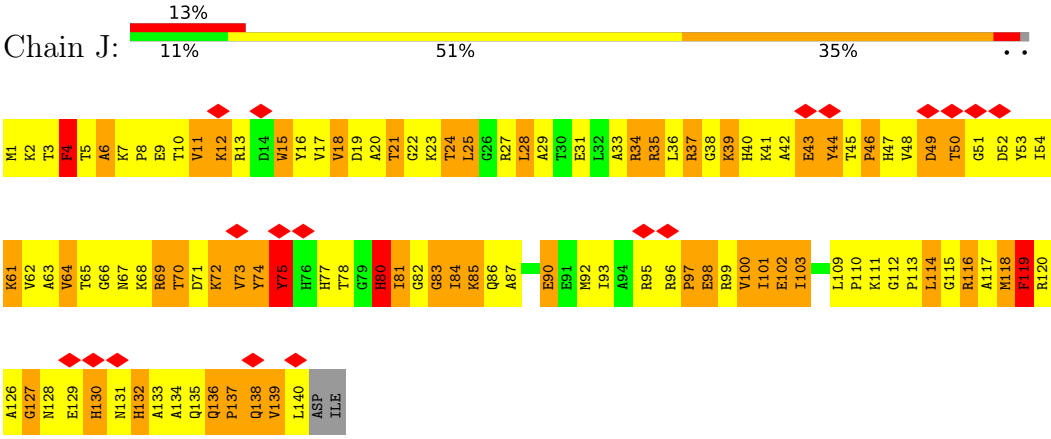
• Molecule 9: 50S ribosomal protein L9

Chain H:



• Molecule 10: 50S ribosomal protein L13

Chain J:



• Molecule 11: 50S ribosomal protein L14

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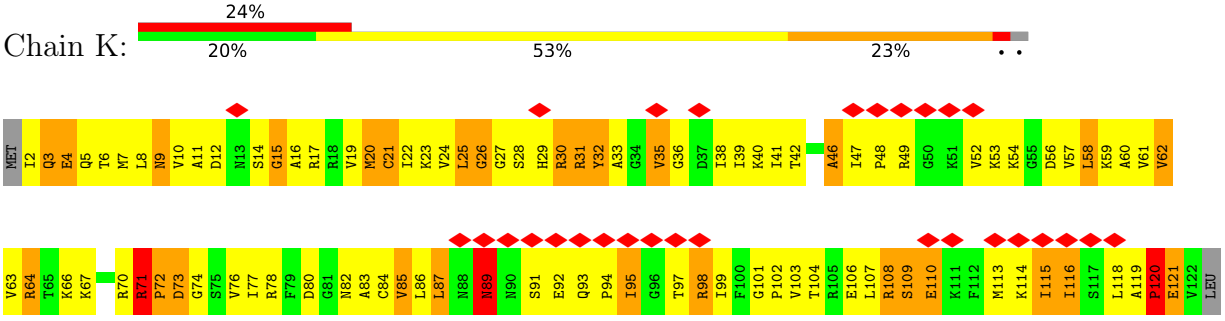
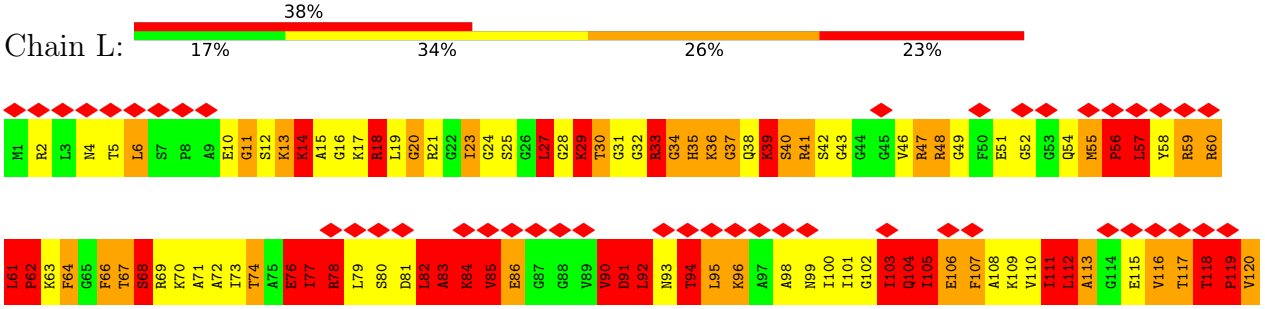
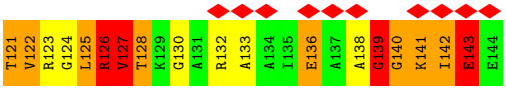


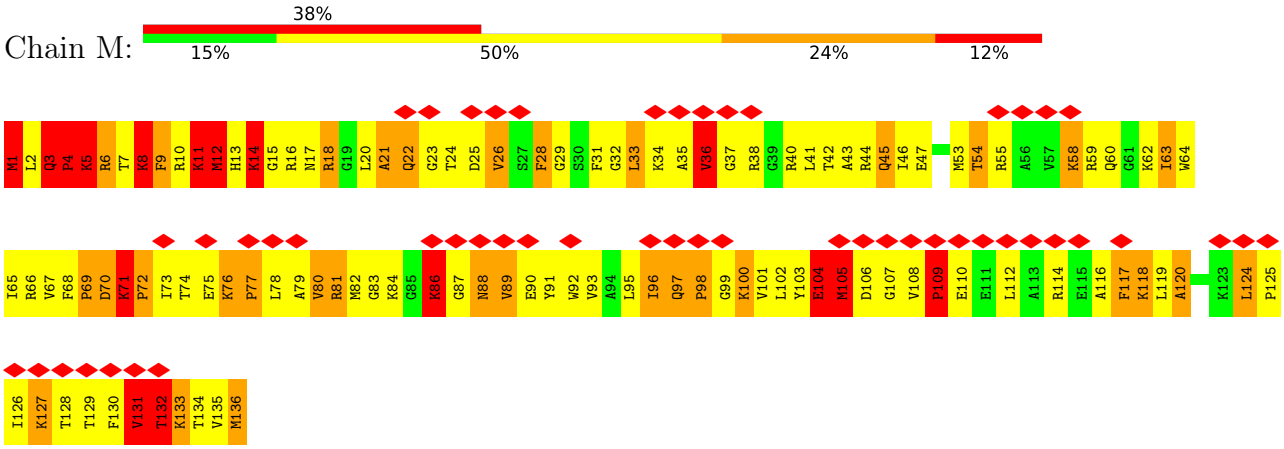
• Molecule 12: 50S ribosomal protein L15

Chain L:

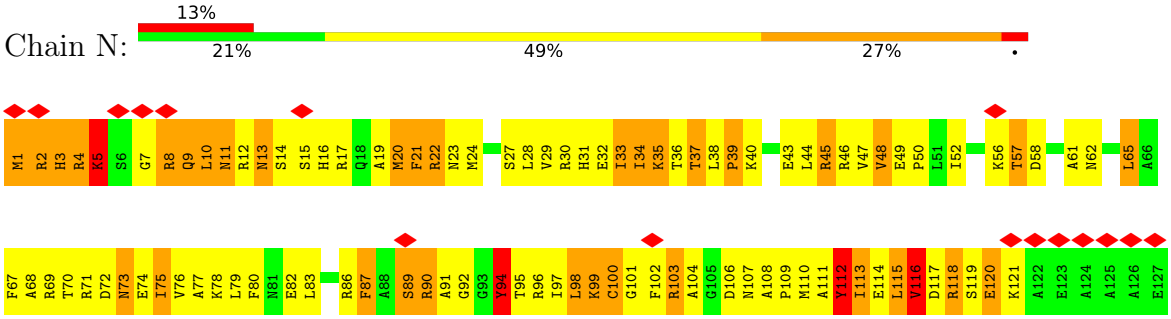




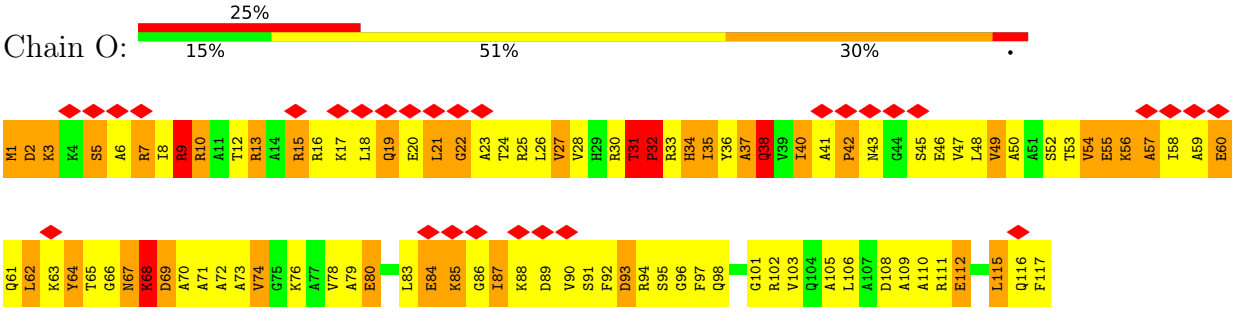
• Molecule 13: 50S ribosomal protein L16



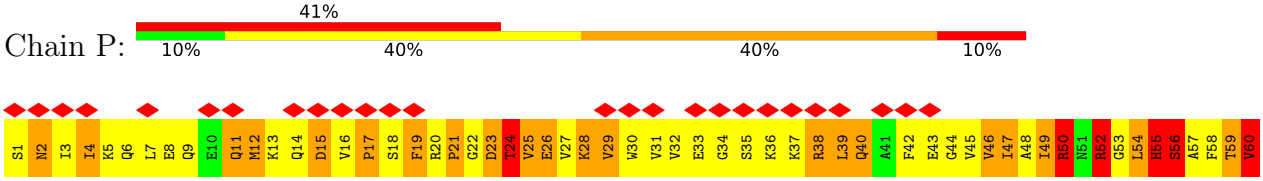
• Molecule 14: 50S ribosomal protein L17

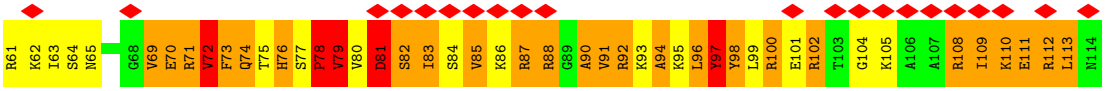


• Molecule 15: 50S ribosomal protein L18



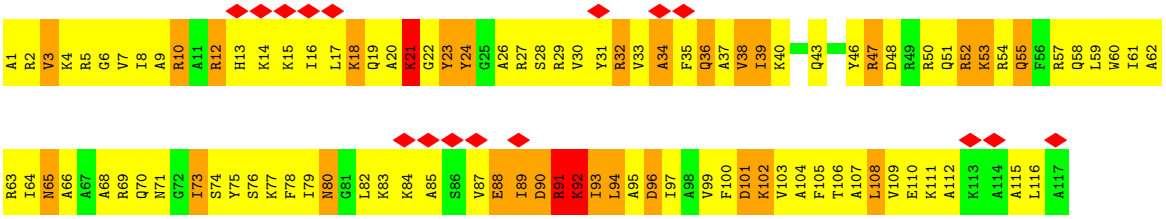
• Molecule 16: 50S ribosomal protein L19





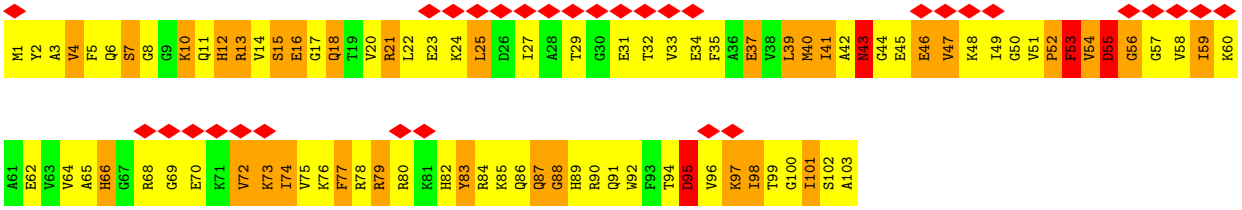
• Molecule 17: 50S ribosomal protein L20

Chain Q:



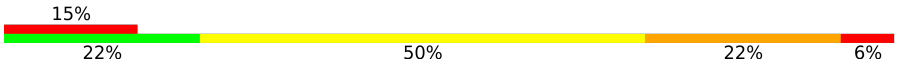
• Molecule 18: 50S ribosomal protein L21

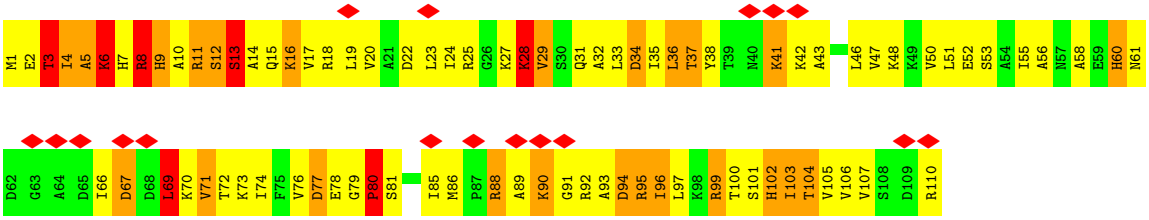
Chain R:



• Molecule 19: 50S ribosomal protein L22

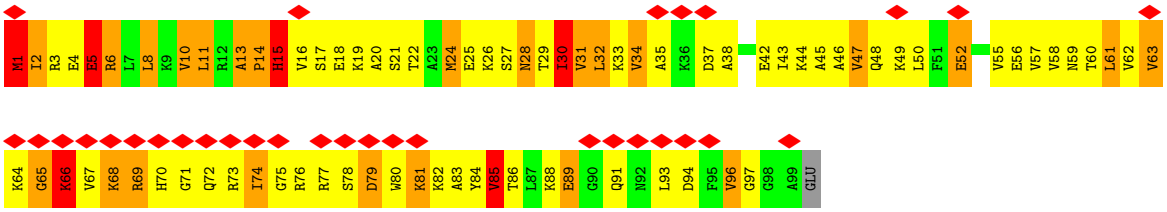
Chain S:





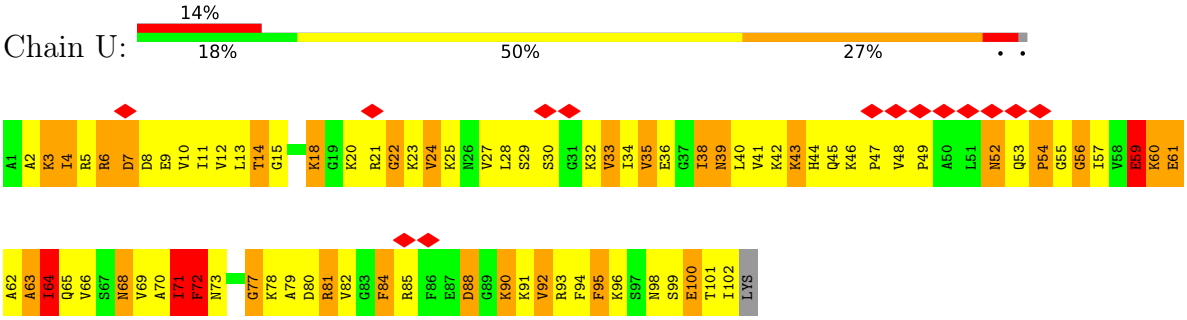
• Molecule 20: 50S ribosomal protein L23

Chain T:



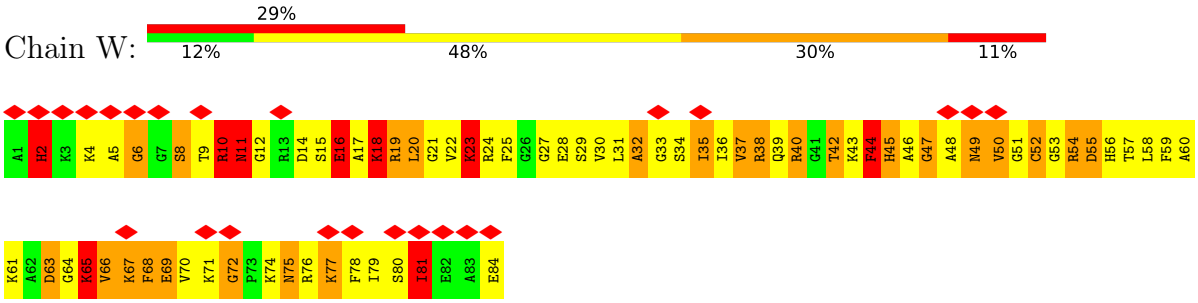
• Molecule 21: 50S ribosomal protein L24

Chain U:



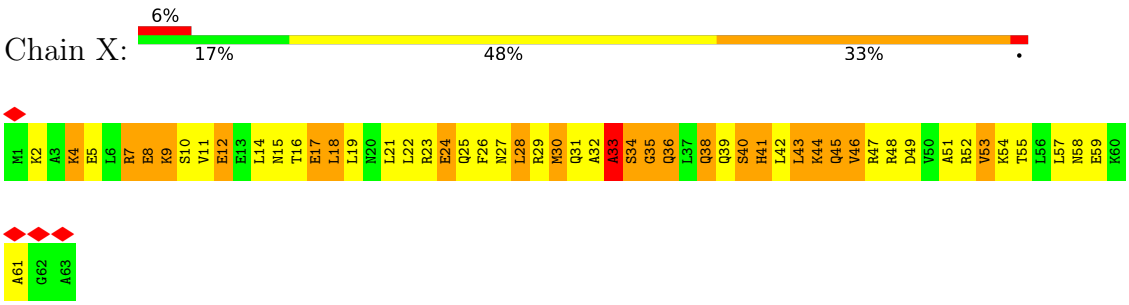
• Molecule 22: 50S ribosomal protein L27

Chain W:



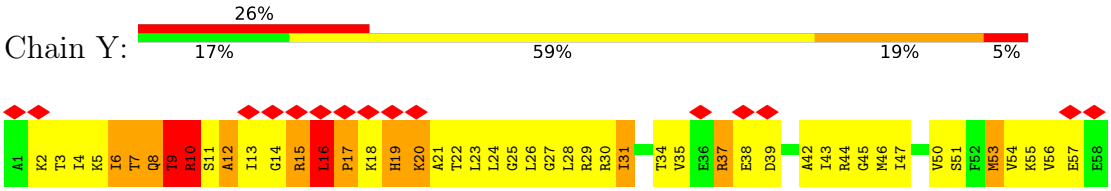
• Molecule 23: 50S ribosomal protein L29

Chain X:



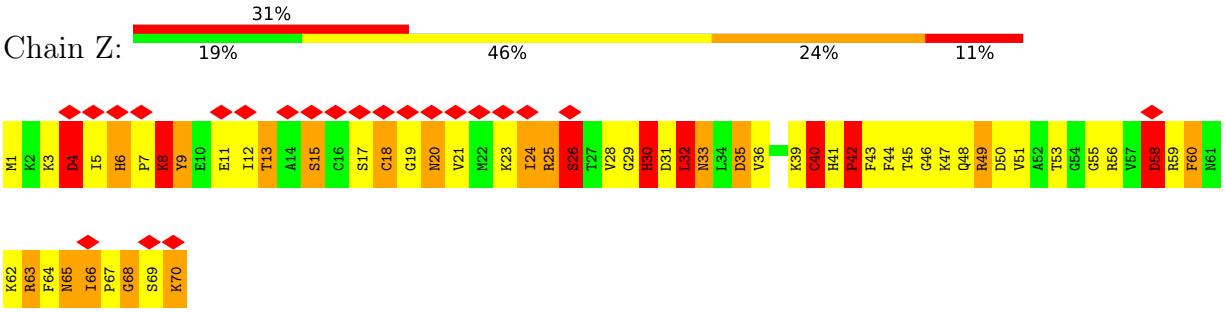
• Molecule 24: 50S ribosomal protein L30

Chain Y:



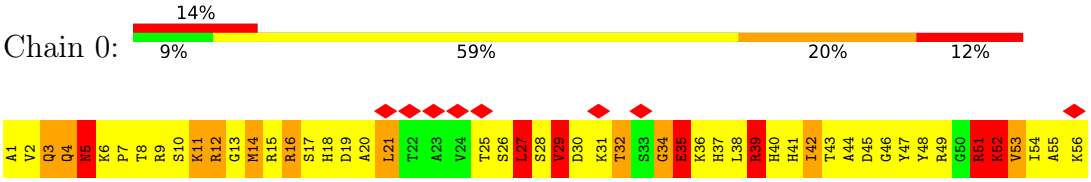
• Molecule 25: 50S ribosomal protein L31

Chain Z:



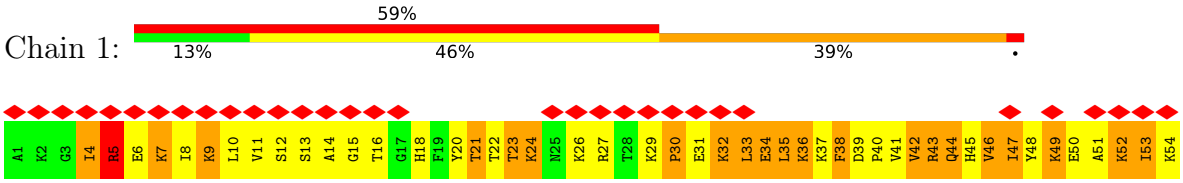
• Molecule 26: 50S ribosomal protein L32

Chain 0:



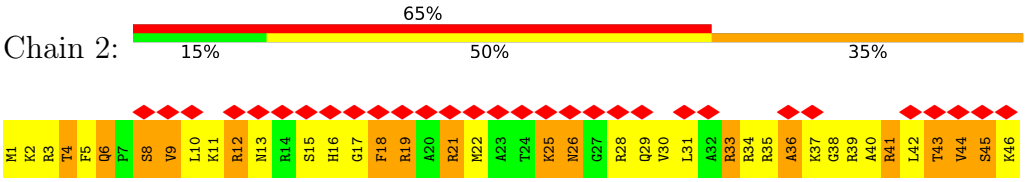
• Molecule 27: 50S ribosomal protein L33

Chain 1:



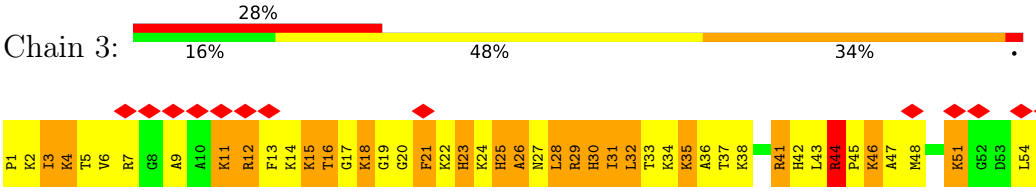
• Molecule 28: 50S ribosomal protein L34

Chain 2:



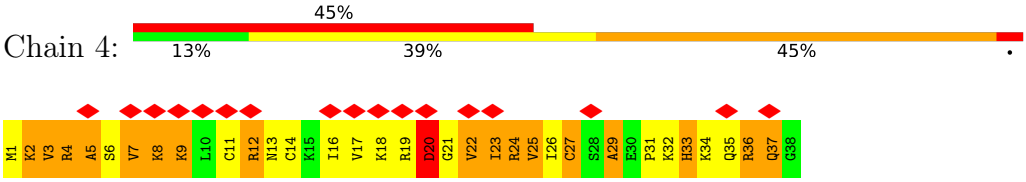
• Molecule 29: 50S ribosomal protein L35

Chain 3:



• Molecule 30: 50S ribosomal protein L36

Chain 4:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	Not provided	
Resolution determination method	Not provided	
CTF correction method	CTF correction of each particle	Depositor
Microscope	FEI TECNAI F20	Depositor
Voltage (kV)	200	Depositor
Electron dose ($e^-/Å^2$)	Not provided	
Minimum defocus (nm)	1.5	Depositor
Maximum defocus (nm)	3.5	Depositor
Magnification	50000	Depositor
Image detector	KODAK SO-163 FILM	Depositor
Maximum map value	9.232	Depositor
Minimum map value	-0.000	Depositor
Average map value	0.265	Depositor
Map value standard deviation	0.975	Depositor
Recommended contour level	2.48	Depositor
Map size (Å)	325.12, 325.12, 325.12	wwPDB
Map dimensions	128, 128, 128	wwPDB
Map angles (°)	90, 90, 90	wwPDB
Pixel spacing (Å)	2.54, 2.54, 2.54	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.29	0/2801	0.75	0/4363
2	B	0.45	23/68281 (0.0%)	0.93	94/106437 (0.1%)
3	V	0.31	0/766	0.53	0/1025
4	C	0.40	0/2092	0.88	7/2813 (0.2%)
5	D	0.40	0/1586	0.80	2/2134 (0.1%)
6	E	0.45	1/1571 (0.1%)	0.88	6/2113 (0.3%)
7	F	0.34	0/1444	0.87	5/1937 (0.3%)
8	G	0.31	0/1343	0.70	0/1816
9	H	1.99	0/1121	0.83	1/1512 (0.1%)
10	J	0.41	1/1135 (0.1%)	0.72	3/1529 (0.2%)
11	K	0.35	0/939	1.00	2/1258 (0.2%)
12	L	0.70	0/1062	1.60	30/1413 (2.1%)
13	M	0.48	0/1093	1.03	8/1460 (0.5%)
14	N	0.38	0/1021	0.92	7/1364 (0.5%)
15	O	0.30	0/910	0.67	0/1219
16	P	0.55	0/929	1.40	16/1242 (1.3%)
17	Q	0.41	0/960	0.86	2/1278 (0.2%)
18	R	1.06	6/829 (0.7%)	1.42	14/1107 (1.3%)
19	S	0.28	0/864	0.69	1/1156 (0.1%)
20	T	0.39	0/784	0.78	4/1048 (0.4%)
21	U	0.33	0/787	0.74	0/1051
22	W	0.37	0/642	0.96	5/848 (0.6%)
23	X	0.30	0/510	0.80	1/677 (0.1%)
24	Y	0.31	0/453	0.64	0/605
25	Z	0.48	0/559	1.04	5/745 (0.7%)
26	0	0.53	1/450 (0.2%)	1.15	7/599 (1.2%)
27	1	0.36	0/448	0.71	0/594
28	2	0.33	0/380	0.64	0/498
29	3	0.48	0/513	0.96	1/676 (0.1%)
30	4	0.40	0/303	0.73	0/397
All	All	0.49	32/96576 (0.0%)	0.92	221/144914 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	61
4	C	0	3
10	J	0	2
12	L	0	1
16	P	0	1
17	Q	0	1
18	R	0	1
All	All	0	70

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2789	C	O3'-P	44.85	2.15	1.61
2	B	2390	U	O3'-P	-27.39	1.28	1.61
2	B	2626	C	O3'-P	23.56	1.89	1.61
2	B	2582	G	O3'-P	21.37	1.86	1.61
2	B	1417	C	O3'-P	-19.51	1.37	1.61

The worst 5 of 221 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1250	G	P-O3'-C3'	-66.83	39.50	119.70
2	B	2582	G	P-O3'-C3'	-54.08	54.80	119.70
2	B	1250	G	O3'-P-O5'	-47.15	14.41	104.00
2	B	1417	C	O3'-P-O5'	-41.83	24.52	104.00
2	B	1580	A	O3'-P-O5'	-38.06	31.68	104.00

There are no chirality outliers.

5 of 70 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	136	G	Sidechain
2	B	139	U	Sidechain
2	B	142	A	Sidechain
2	B	143	C	Sidechain
2	B	51	G	Sidechain

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2507	0	1261	547	0
2	B	61056	0	30280	9648	0
3	V	753	0	777	235	0
4	C	2053	0	2111	760	0
5	D	1565	0	1597	807	0
6	E	1552	0	1611	578	0
7	F	1420	0	1451	471	0
8	G	1323	0	1367	217	0
9	H	1111	0	1146	140	0
10	J	1112	0	1141	313	0
11	K	930	0	997	291	0
12	L	1053	0	1114	673	0
13	M	1074	0	1136	507	0
14	N	1008	0	1040	285	0
15	O	900	0	927	259	0
16	P	917	0	958	316	0
17	Q	947	0	1016	425	0
18	R	816	0	830	336	0
19	S	857	0	915	293	0
20	T	777	0	832	278	0
21	U	779	0	832	210	0
22	W	634	0	654	294	0
23	X	509	0	528	238	0
24	Y	449	0	487	170	0
25	Z	549	0	546	175	0
26	0	444	0	444	324	0
27	1	441	0	485	153	0
28	2	377	0	408	327	0
29	3	504	0	563	259	0
30	4	302	0	336	147	0
31	2	3	0	0	0	0
31	B	92	0	0	0	0
31	C	1	0	0	0	0
31	E	3	0	0	0	0
31	L	4	0	0	0	0
31	Q	2	0	0	0	0
31	S	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
31	T	2	0	0	0	0
31	U	1	0	0	0	0
32	2	11	0	0	8	0
32	B	443	0	0	273	0
32	C	1	0	0	1	0
32	D	1	0	0	0	0
32	E	18	0	0	5	0
32	L	8	0	0	7	0
32	Q	7	0	0	2	0
32	S	7	0	0	0	0
32	T	5	0	0	16	0
32	U	5	0	0	6	0
All	All	89335	0	57790	14330	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 98.

The worst 5 of 14330 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)
2:B:1417:C:C5	2:B:1418:G:C5	1.77	1.72
2:B:827:U:P	2:B:2446:G:H5'	1.30	1.69
2:B:5:A:C2	2:B:2899:A:C5	1.79	1.68
1:A:57:A:C4	7:F:12:VAL:HG13	1.19	1.68
2:B:2848:G:C8	16:P:96:LEU:HD23	1.24	1.67

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
3	V	92/94 (98%)	62 (67%)	21 (23%)	9 (10%)	0 10
4	C	265/273 (97%)	103 (39%)	82 (31%)	80 (30%)	0 0
5	D	207/209 (99%)	90 (44%)	69 (33%)	48 (23%)	0 1
6	E	199/201 (99%)	99 (50%)	60 (30%)	40 (20%)	0 2
7	F	176/178 (99%)	95 (54%)	48 (27%)	33 (19%)	0 2
8	G	174/176 (99%)	118 (68%)	39 (22%)	17 (10%)	0 10
9	H	145/149 (97%)	86 (59%)	43 (30%)	16 (11%)	0 7
10	J	138/142 (97%)	69 (50%)	40 (29%)	29 (21%)	0 2
11	K	119/123 (97%)	71 (60%)	32 (27%)	16 (13%)	0 5
12	L	142/144 (99%)	60 (42%)	40 (28%)	42 (30%)	0 0
13	M	134/136 (98%)	69 (52%)	37 (28%)	28 (21%)	0 2
14	N	125/127 (98%)	73 (58%)	35 (28%)	17 (14%)	0 4
15	O	115/117 (98%)	64 (56%)	26 (23%)	25 (22%)	0 2
16	P	112/114 (98%)	39 (35%)	36 (32%)	37 (33%)	0 0
17	Q	115/117 (98%)	81 (70%)	22 (19%)	12 (10%)	0 8
18	R	101/103 (98%)	44 (44%)	31 (31%)	26 (26%)	0 1
19	S	108/110 (98%)	63 (58%)	27 (25%)	18 (17%)	0 3
20	T	97/100 (97%)	42 (43%)	40 (41%)	15 (16%)	0 3
21	U	100/103 (97%)	33 (33%)	46 (46%)	21 (21%)	0 2
22	W	82/84 (98%)	29 (35%)	26 (32%)	27 (33%)	0 0
23	X	61/63 (97%)	28 (46%)	21 (34%)	12 (20%)	0 2
24	Y	56/58 (97%)	29 (52%)	17 (30%)	10 (18%)	0 3
25	Z	68/70 (97%)	29 (43%)	26 (38%)	13 (19%)	0 2
26	0	54/56 (96%)	30 (56%)	15 (28%)	9 (17%)	0 3
27	1	52/54 (96%)	19 (36%)	23 (44%)	10 (19%)	0 2
28	2	44/46 (96%)	23 (52%)	14 (32%)	7 (16%)	0 3
29	3	62/64 (97%)	30 (48%)	25 (40%)	7 (11%)	0 7
30	4	36/38 (95%)	18 (50%)	9 (25%)	9 (25%)	0 1
All	All	3179/3249 (98%)	1596 (50%)	950 (30%)	633 (20%)	0 2

5 of 633 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	C	21	PRO
4	C	22	GLU
4	C	28	PRO
4	C	29	PHE
4	C	31	PRO

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
3	V	78/78 (100%)	66 (85%)	12 (15%)	2 14
4	C	213/218 (98%)	144 (68%)	69 (32%)	0 2
5	D	164/164 (100%)	112 (68%)	52 (32%)	0 2
6	E	165/165 (100%)	115 (70%)	50 (30%)	0 2
7	F	149/149 (100%)	118 (79%)	31 (21%)	1 6
8	G	137/137 (100%)	105 (77%)	32 (23%)	1 4
9	H	114/114 (100%)	83 (73%)	31 (27%)	0 3
10	J	114/116 (98%)	84 (74%)	30 (26%)	0 3
11	K	102/104 (98%)	78 (76%)	24 (24%)	1 4
12	L	103/103 (100%)	61 (59%)	42 (41%)	0 0
13	M	109/109 (100%)	77 (71%)	32 (29%)	0 2
14	N	103/103 (100%)	78 (76%)	25 (24%)	0 4
15	O	87/87 (100%)	58 (67%)	29 (33%)	0 2
16	P	99/99 (100%)	77 (78%)	22 (22%)	1 6
17	Q	89/89 (100%)	66 (74%)	23 (26%)	0 3
18	R	84/84 (100%)	68 (81%)	16 (19%)	1 8
19	S	93/93 (100%)	72 (77%)	21 (23%)	1 5
20	T	83/84 (99%)	60 (72%)	23 (28%)	0 3
21	U	83/84 (99%)	62 (75%)	21 (25%)	0 3
22	W	62/62 (100%)	46 (74%)	16 (26%)	0 3

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	X	55/55 (100%)	40 (73%)	15 (27%)	0	3
24	Y	48/48 (100%)	36 (75%)	12 (25%)	0	3
25	Z	62/62 (100%)	44 (71%)	18 (29%)	0	2
26	0	47/47 (100%)	31 (66%)	16 (34%)	0	1
27	1	48/48 (100%)	33 (69%)	15 (31%)	0	2
28	2	38/38 (100%)	27 (71%)	11 (29%)	0	2
29	3	51/51 (100%)	33 (65%)	18 (35%)	0	1
30	4	34/34 (100%)	21 (62%)	13 (38%)	0	0
All	All	2614/2625 (100%)	1895 (72%)	719 (28%)	2	3

5 of 719 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
16	P	38	ARG
21	U	66	VAL
16	P	88	ARG
16	P	24	THR
19	S	3	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 94 such sidechains are listed below:

Mol	Chain	Res	Type
14	N	81	ASN
20	T	72	GLN
15	O	67	ASN
17	Q	55	GLN
22	W	2	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	114/120 (95%)	22 (19%)	0
2	B	2805/2904 (96%)	445 (15%)	20 (0%)
All	All	2919/3024 (96%)	467 (15%)	20 (0%)

5 of 467 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	11	C
1	A	12	C
1	A	13	G
1	A	14	U
1	A	15	A

5 of 20 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	2258	C
2	B	2390	U
2	B	2756	U
2	B	2425	A
2	B	1205	A

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 110 ligands modelled in this entry, 110 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	B	44
1	A	2
9	H	1

The worst 5 of 47 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	B	2450:A	O3’	2451:A	P	28.22
1	B	2059:A	O3’	2060:A	P	25.69
1	B	1679:A	O3’	1680:U	P	25.40
1	B	1760:C	O3’	1761:C	P	22.71
1	B	2433:A	O3’	2434:A	P	20.69

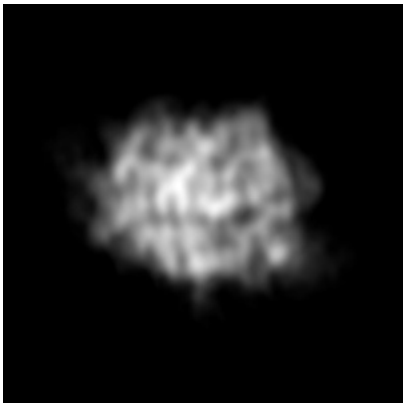
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-1455. These allow visual inspection of the internal detail of the map and identification of artifacts.

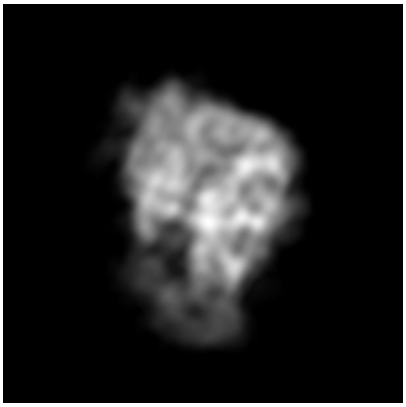
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

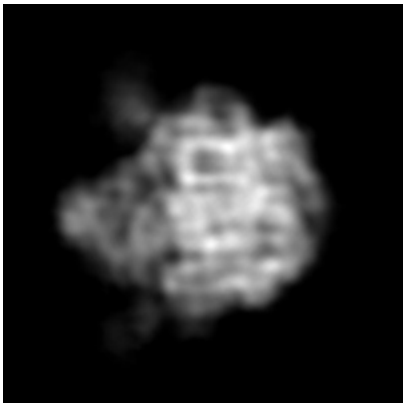
6.1.1 Primary map



X



Y

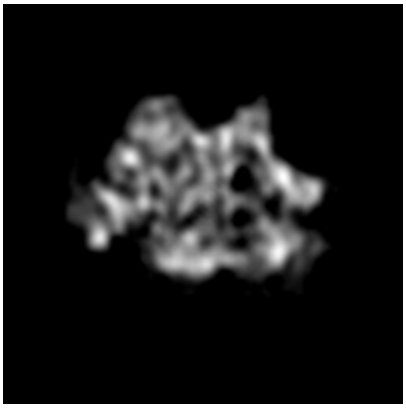


Z

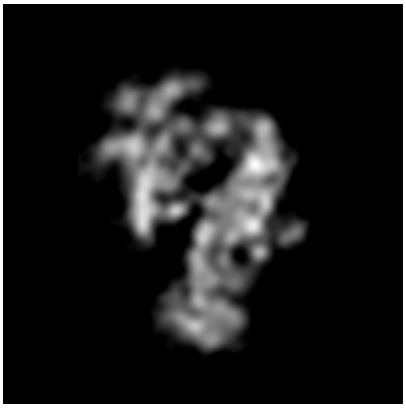
The images above show the map projected in three orthogonal directions.

6.2 Central slices

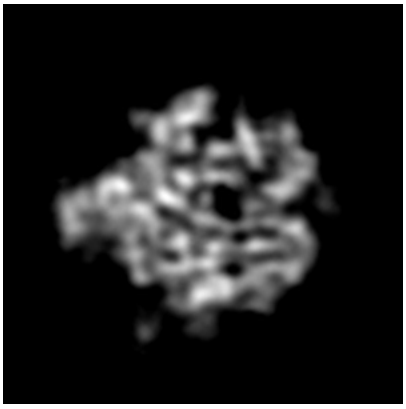
6.2.1 Primary map



X Index: 64



Y Index: 64



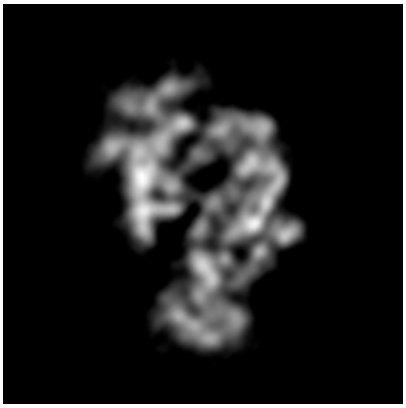
Z Index: 64

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

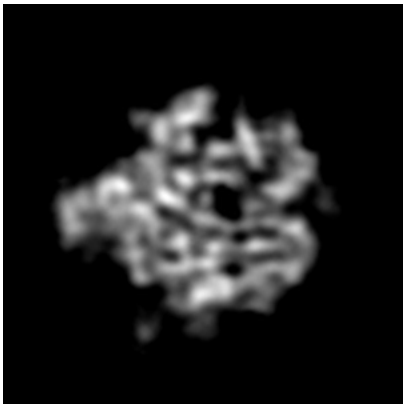
6.3 Largest variance slices (i)

6.3.1 Primary map

X Index: 58



Y Index: 62

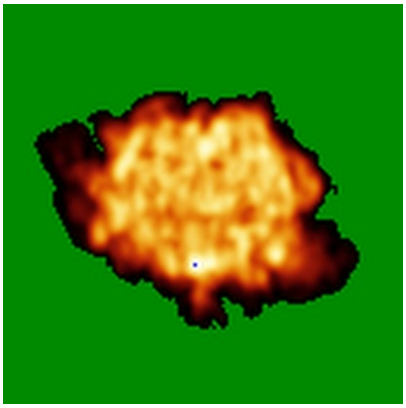


Z Index: 64

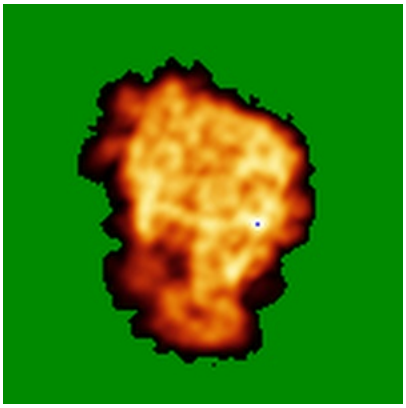
The images above show the largest variance slices of the map in three orthogonal directions.

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

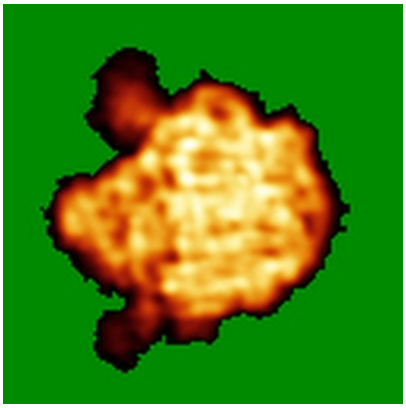
6.4.1 Primary map



X



Y

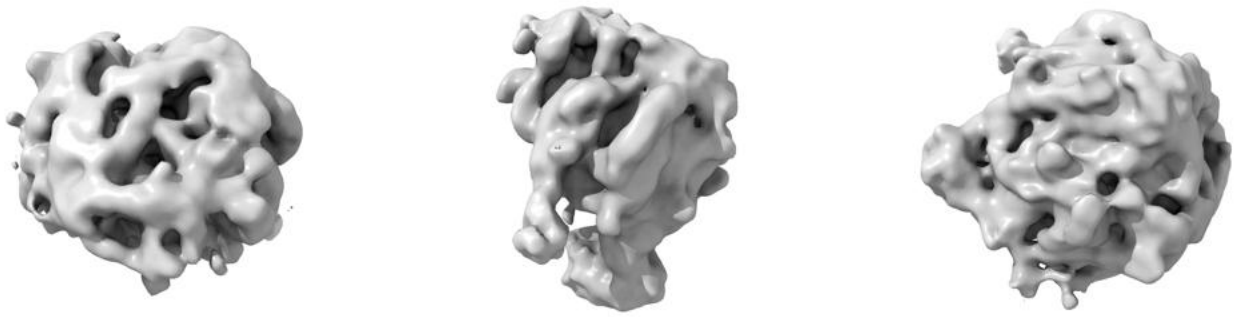


Z

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 2.48. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

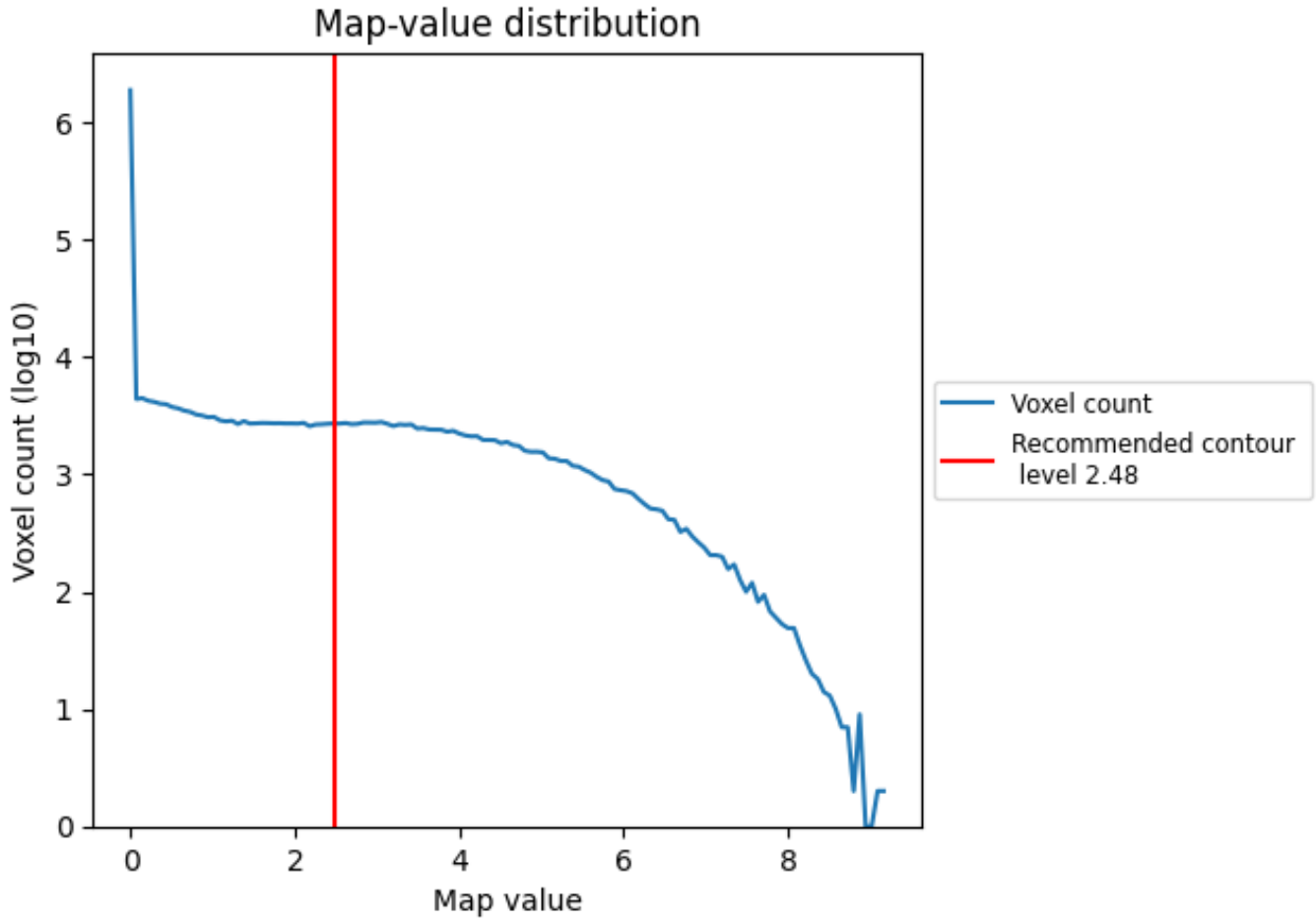
6.6 Mask visualisation (i)

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

7 Map analysis

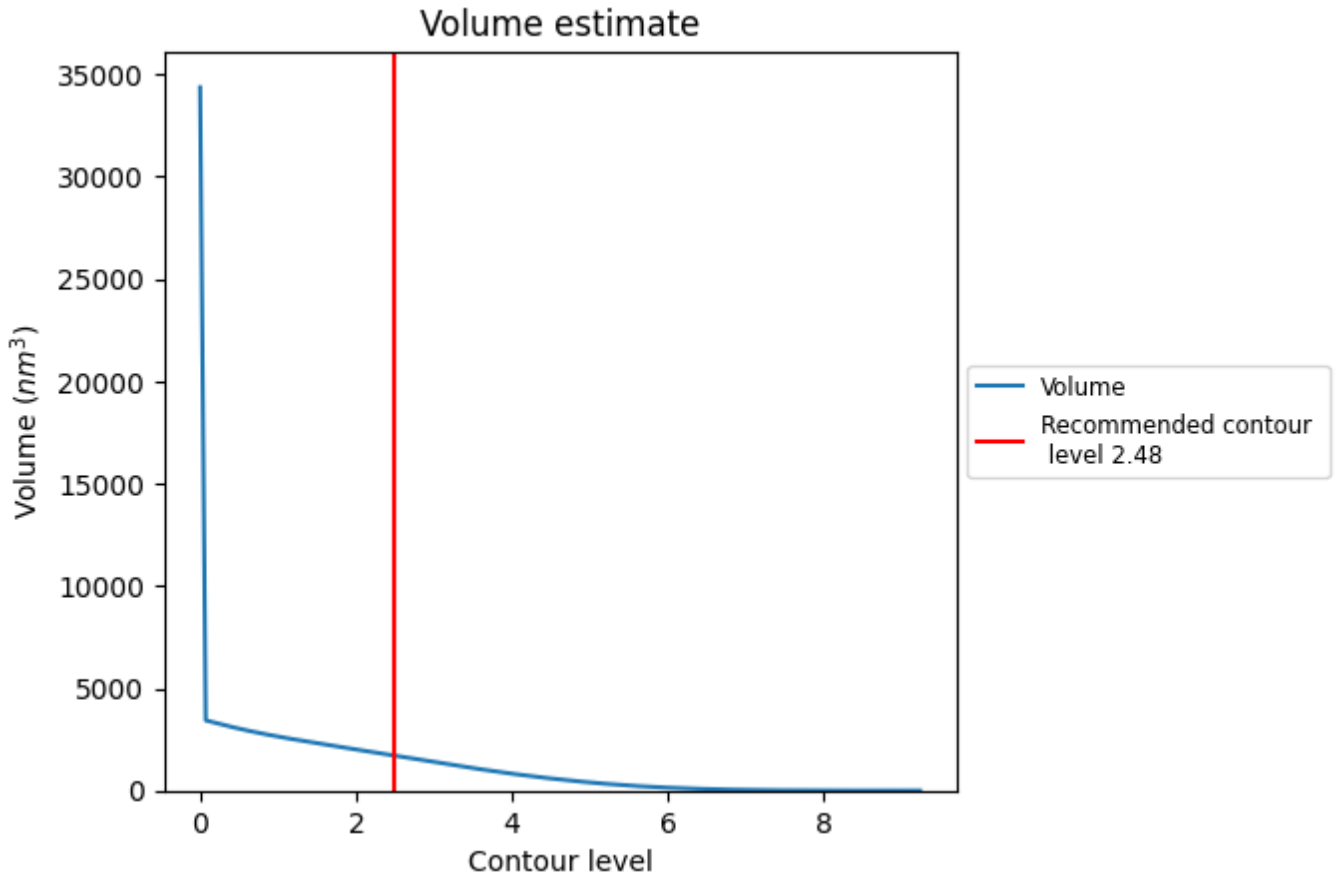
This section contains the results of statistical analysis of the map.

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.

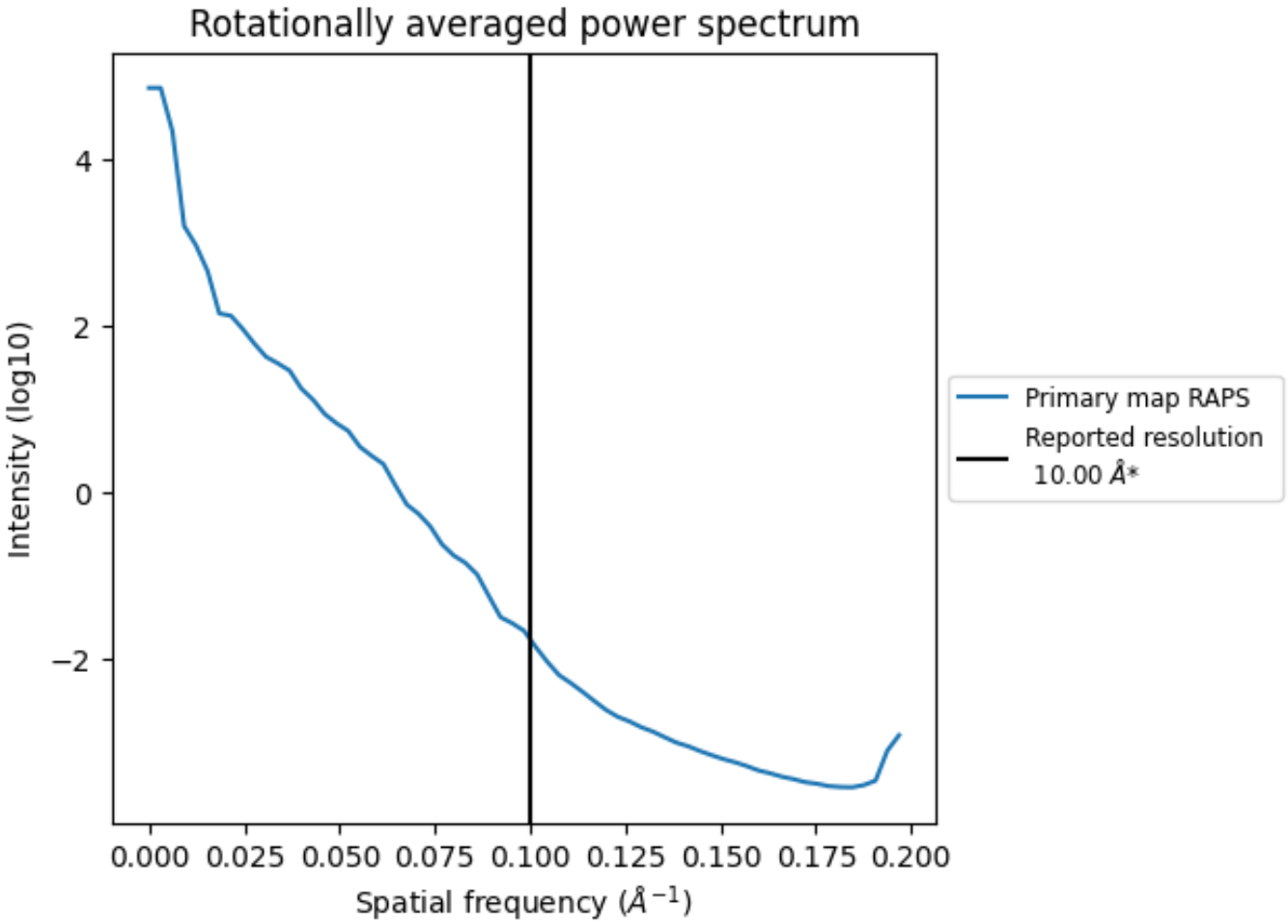
7.2 Volume estimate (i)



The volume at the recommended contour level is 1718 nm^3; this corresponds to an approximate mass of 1552 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)



*Reported resolution corresponds to spatial frequency of 0.100 Å^{-1}

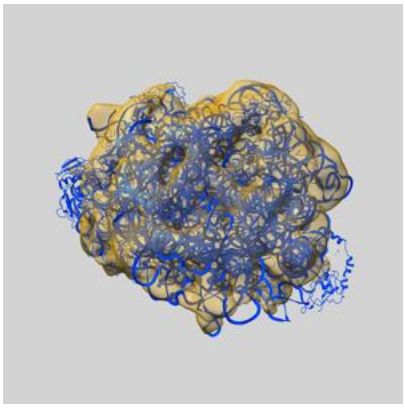
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

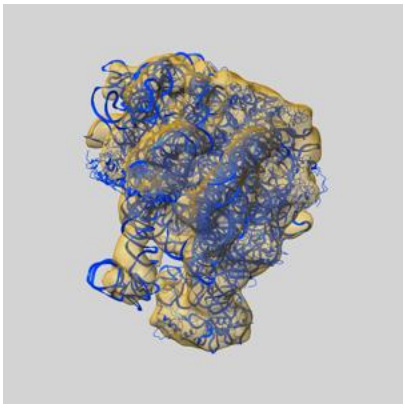
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-1455 and PDB model 3BBX. Per-residue inclusion information can be found in section 3 on page 10.

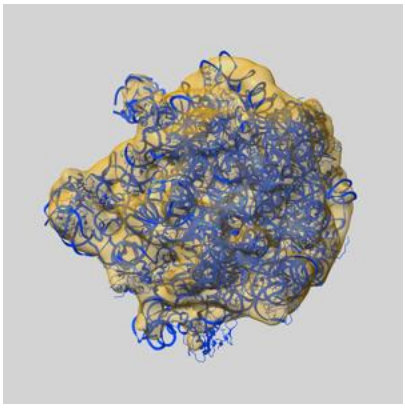
9.1 Map-model overlay



X



Y



Z

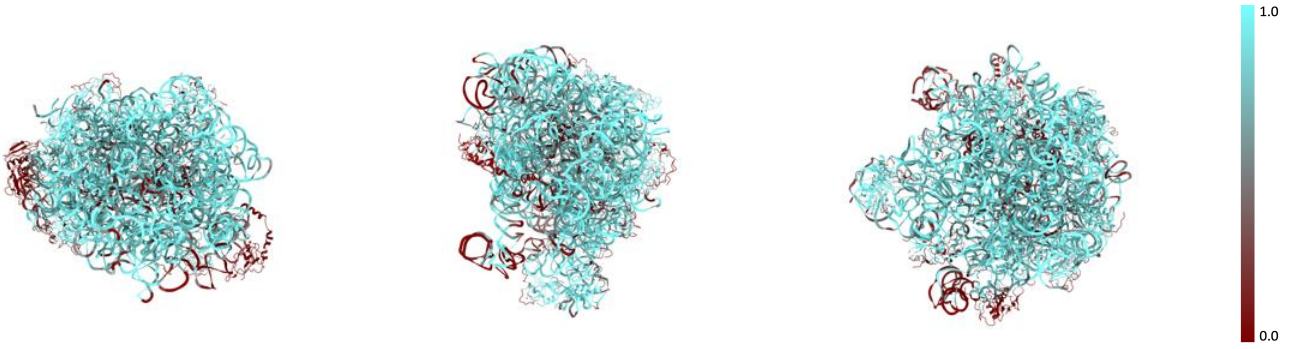
The images above show the 3D surface view of the map at the recommended contour level 2.48 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model

X Y Z

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

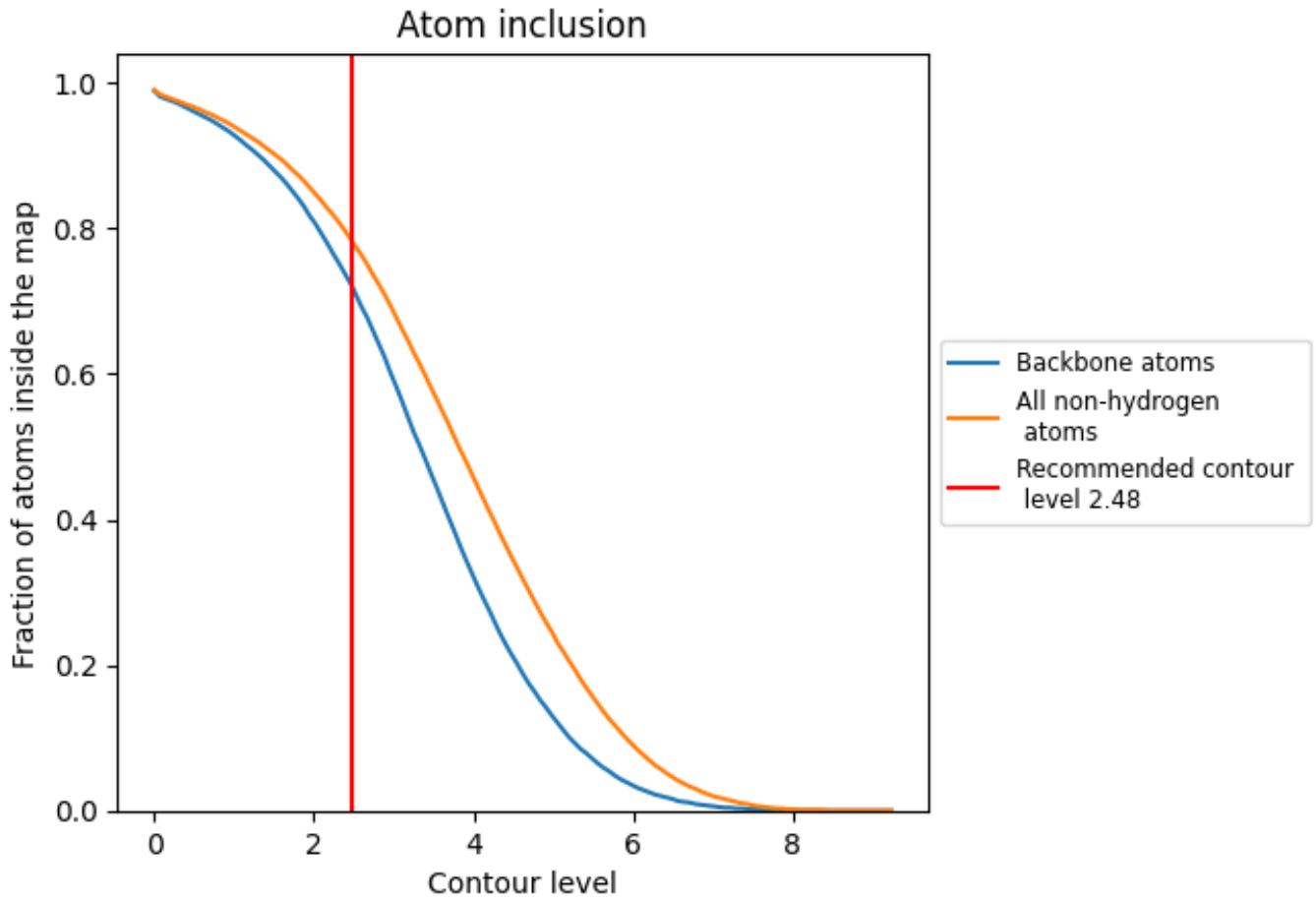
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (2.48).

9.4 Atom inclusion (i)



At the recommended contour level, 72% of all backbone atoms, 78% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (2.48) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7820	0.0610
0	0.8390	0.0380
1	0.3970	-0.0230
2	0.3570	-0.0240
3	0.6840	-0.0280
4	0.5440	0.0040
A	0.8290	0.0870
B	0.8390	0.0740
C	0.6920	0.0250
D	0.6230	0.0220
E	0.6380	0.0220
F	0.7800	0.0580
G	0.1510	0.0540
H	0.1540	0.0020
J	0.8190	0.0210
K	0.7140	0.0500
L	0.5640	0.0080
M	0.6070	0.0190
N	0.8370	0.0000
O	0.7390	0.0250
P	0.5540	0.0180
Q	0.8340	0.0240
R	0.6550	0.0470
S	0.8100	0.0580
T	0.6580	0.0050
U	0.8010	0.0630
V	0.5890	0.0760
W	0.6930	0.0300
X	0.8870	0.0530
Y	0.7090	0.0470
Z	0.6470	0.0080