Full wwPDB EM Validation Report

Dec 30, 2024 – 08:24 AM EST

PDB ID	:	8AGU
EMDB ID	:	EMD-15424
Title	:	Yeast RQC complex in state E
Authors	:	Tesina, P.; Buschauer, R.; Beckmann, R.
Deposited on	:	2022-07-20
Resolution	:	2.70 Å(reported)

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

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

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

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

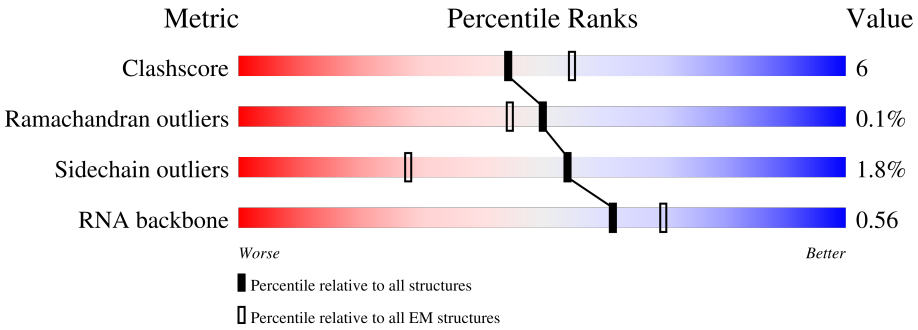
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance

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

The reported resolution of this entry is 2.70 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	A	204	91% 8%
2	B	199	87% 12%
3	C	184	88% 12%
4	D	186	92% 8%
5	E	189	76% 6% 17%
6	F	172	87% 12%
7	G	160	90% 9%

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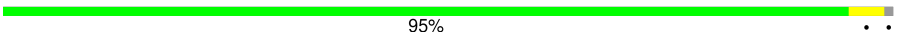
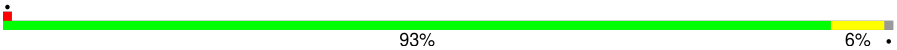
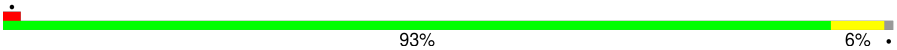
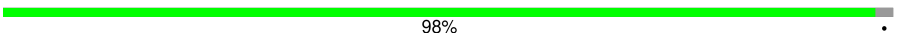
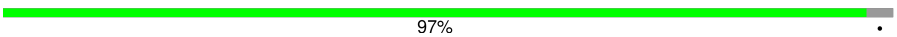
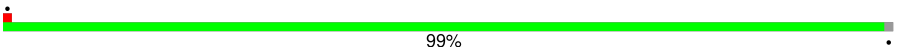
Mol	Chain	Length	Quality of chain
8	H	121	
9	I	137	
10	J	155	
11	K	142	
12	L	127	
13	M	136	
14	N	149	
15	O	59	
16	P	105	
17	Q	113	
18	R	130	
19	S	107	
20	T	121	
21	U	120	
22	V	100	
23	W	88	
24	X	78	
25	Y	51	
26	Z	128	
27	b	106	
28	c	92	
29	d	25	
30	f	3395	
31	h	121	
32	i	158	

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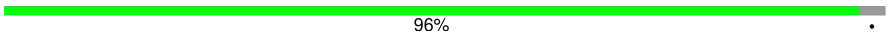
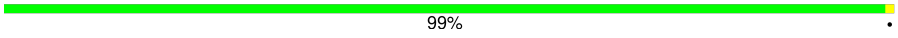
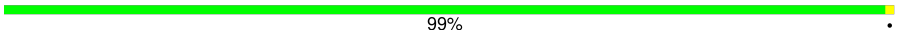
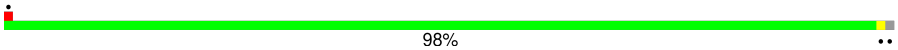
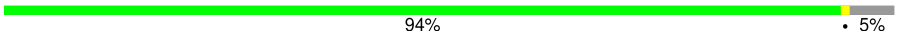
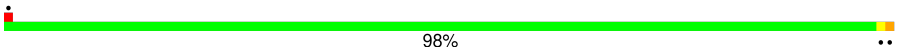
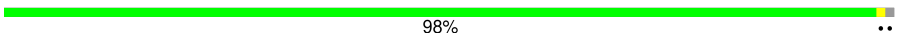
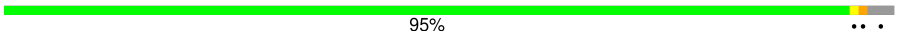
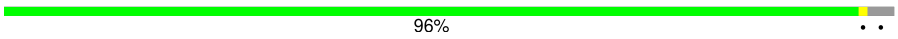
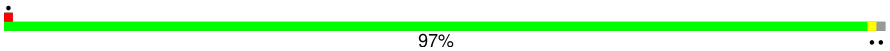
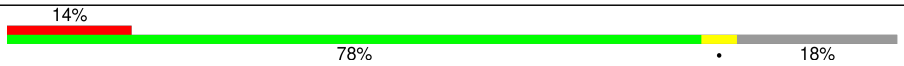
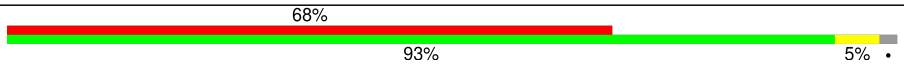
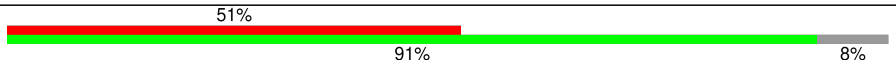
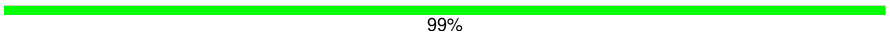
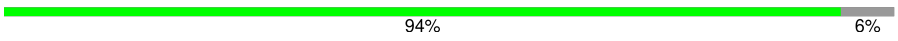
Mol	Chain	Length	Quality of chain
33	j	254	
34	k	387	
35	l	362	
36	m	297	
37	n	176	
38	o	244	
39	p	256	
40	q	191	
41	r	221	
42	s	174	
43	t	199	
44	u	138	
45	a	1038	
46	e	1562	
47	g	245	
48	v	157	
49	w	217	
50	y	76	
51	z	165	
52	0	312	
53	1	18	

2 Entry composition (i)

There are 56 unique types of molecules in this entry. The entry contains 149748 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 60S ribosomal protein L15-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	203	1720	1077	361	281	1	0	0

- Molecule 2 is a protein called 60S ribosomal protein L16-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	197	1555	1003	289	262	1	197	0

- Molecule 3 is a protein called 60S ribosomal protein L17-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	183	1416	879	284	253	0	0

- Molecule 4 is a protein called 60S ribosomal protein L18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	185	1441	908	290	241	2	0	0

- Molecule 5 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
5	E	156	1258	781	265	212	0	0

- Molecule 6 is a protein called 60S ribosomal protein L20-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	171	1437	925	266	243	3	0	0

- Molecule 7 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	159	Total	C	N	O	S	0	0
			1272	802	245	221	4		

- Molecule 8 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
8	H	100	Total	C	N	O	0	0
			796	516	131	149		

- Molecule 9 is a protein called 60S ribosomal protein L23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	136	Total	C	N	O	S	0	0
			1003	628	189	179	7		

- Molecule 10 is a protein called 60S ribosomal protein L24-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	63	Total	C	N	O	S	0	0
			518	333	102	82	1		

- Molecule 11 is a protein called 60S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	121	Total	C	N	O	S	0	0
			964	620	169	173	2		

- Molecule 12 is a protein called 60S ribosomal protein L26-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
12	L	125	Total	C	N	O	0	0
			984	620	191	173		

- Molecule 13 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
13	M	135	Total	C	N	O	0	0
			1080	701	199	180		

- Molecule 14 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	148	Total	C	N	O	S	0	0
			1169	747	231	188	3		

- Molecule 15 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
15	O	58	Total	C	N	O	0	0
			462	289	100	73		

- Molecule 16 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	96	Total	C	N	O	S	0	0
			737	476	123	137	1		

- Molecule 17 is a protein called 60S ribosomal protein L31-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	109	Total	C	N	O	S	0	0
			876	556	167	152	1		

- Molecule 18 is a protein called 60S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	127	Total	C	N	O	S	0	0
			1013	642	205	165	1		

- Molecule 19 is a protein called 60S ribosomal protein L33-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	S	106	Total	C	N	O	S	0	0
			850	540	165	144	1		

- Molecule 20 is a protein called 60S ribosomal protein L34-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	112	Total	C	N	O	S	0	0
			880	545	179	152	4		

- Molecule 21 is a protein called 60S ribosomal protein L35-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	U	119	Total	C	N	O	S	0	0
			969	615	186	167	1		

- Molecule 22 is a protein called 60S ribosomal protein L36-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	V	99	Total	C	N	O	S	0	0
			766	478	154	132	2		

- Molecule 23 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	W	81	Total	C	N	O	S	0	0
			645	393	141	106	5		

- Molecule 24 is a protein called BJ4_G0032190.mRNA.1.CDS.1.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	X	77	Total	C	N	O	0	0
			612	391	115	106		

- Molecule 25 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	Y	50	Total	C	N	O	S	0	0
			436	272	97	65	2		

- Molecule 26 is a protein called Ubiquitin-60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z	52	Total	C	N	O	S	0	0
			410	254	86	65	5		

- Molecule 27 is a protein called 60S ribosomal protein L42-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	b	103	Total	C	N	O	S	0	0
			824	517	167	135	5		

- Molecule 28 is a protein called 60S ribosomal protein L43-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	c	91	Total	C	N	O	S	0	0
			694	429	138	121	6		

- Molecule 29 is a protein called RPL41A isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	d	22	Total	C	N	O	S	0	0
			207	127	56	23	1		

- Molecule 30 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	f	3216	Total	C	N	O	P	0	0
			68782	30723	12389	22454	3216		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
31	h	121	Total	C	N	O	P	0	0
			2579	1152	461	845	121		

- Molecule 32 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	i	158	Total	C	N	O	P	0	0
			3353	1500	586	1109	158		

- Molecule 33 is a protein called 60S ribosomal protein L2-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	j	246	Total	C	N	O	S	0	0
			1874	1168	380	325	1		

- Molecule 34 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	k	386	Total	C	N	O	S	0	0
			3075	1950	584	533	8		

- Molecule 35 is a protein called BJ4_G0008850.mRNA.1.CDS.1.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	l	361	Total	C	N	O	S	0	0
			2748	1729	522	494	3		

- Molecule 36 is a protein called 60S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	m	294	Total	C	N	O	S	0	0
			2351	1484	410	455	2		

- Molecule 37 is a protein called 60S ribosomal protein L6-B.

Mol	Chain	Residues	Atoms				AltConf	Trace
37	n	167	Total	C	N	O	0	0
			1307	843	234	230		

- Molecule 38 is a protein called 60S ribosomal protein L7-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	o	222	Total	C	N	O	S	0	0
			1784	1151	324	308	1		

- Molecule 39 is a protein called 60S ribosomal protein L8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	p	233	Total	C	N	O	S	0	0
			1804	1151	323	327	3		

- Molecule 40 is a protein called 60S ribosomal protein L9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	q	191	Total	C	N	O	S	0	0
			1508	957	274	273	4		

- Molecule 41 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	r	218	Total	C	N	O	S	0	0
			1764	1117	334	306	7		

- Molecule 42 is a protein called BJ4_G0027750.mRNA.1.CDS.1.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	s	169	Total	C	N	O	S	0	0
			1346	843	252	247	4		

- Molecule 43 is a protein called 60S ribosomal protein L13-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
43	t	193	Total	C	N	O	0	0
			1543	962	315	266		

- Molecule 44 is a protein called 60S ribosomal protein L14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	u	136	Total	C	N	O	S	0	0
			1053	675	199	177	2		

- Molecule 45 is a protein called RQC2 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	a	848	Total	C	N	O	S	0	0
			6569	4188	1138	1226	17		

- Molecule 46 is a protein called E3 ubiquitin-protein ligase listerin.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	e	1527	Total	C	N	O	S	0	0
			11509	7353	1937	2181	38		

- Molecule 47 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	g	225	Total	C	N	O	S	0	0
			1651	1030	282	332	7		

- Molecule 48 is a protein called Eukaryotic translation initiation factor 5A-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	v	142	Total	C	N	O	S	0	0
			1085	676	183	217	9		

- Molecule 49 is a protein called 60S ribosomal protein L1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	w	216	Total	C	N	O	S	0	0
			1709	1092	298	310	9		

- Molecule 50 is a RNA chain called P-site tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	y	73	Total	C	N	O	P	0	0
			1556	692	273	518	73		

- Molecule 51 is a protein called 60S ribosomal protein L12-B.

Mol	Chain	Residues	Atoms				AltConf	Trace
51	z	148	Total	C	N	O	0	0
			728	432	148	148		

- Molecule 52 is a protein called 60S acidic ribosomal protein P0.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	0	121	Total	C	N	O	S	0	0
			961	618	167	173	3		

- Molecule 53 is a protein called CAT-tailed nascent peptide.

Mol	Chain	Residues	Atoms				AltConf	Trace
53	1	17	Total	C	N	O	0	0
			85	51	17	17		

- Molecule 54 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
54	A	1	Total	Mg	0
			1	1	
54	C	1	Total	Mg	0
			1	1	
54	E	1	Total	Mg	0
			1	1	
54	I	1	Total	Mg	0
			1	1	
54	R	1	Total	Mg	0
			1	1	
54	T	1	Total	Mg	0
			1	1	

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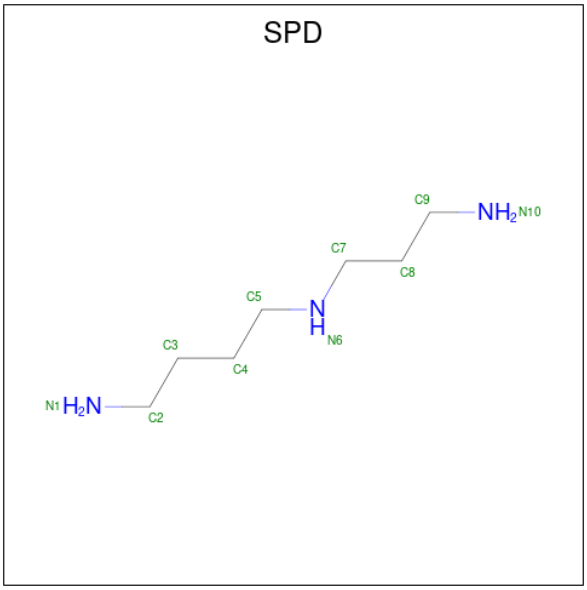
Mol	Chain	Residues	Atoms	AltConf
54	f	3	Total Mg 3 3	0
54	h	1	Total Mg 1 1	0
54	j	2	Total Mg 2 2	0
54	k	1	Total Mg 1 1	0

- Molecule 55 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
55	T	1	Total Zn 1 1	0
55	W	1	Total Zn 1 1	0
55	Z	1	Total Zn 1 1	0
55	b	1	Total Zn 1 1	0
55	c	1	Total Zn 1 1	0
55	e	2	Total Zn 2 2	0

- Molecule 56 is SPERMIDINE (three-letter code: SPD) (formula: $C_7H_{19}N_3$).



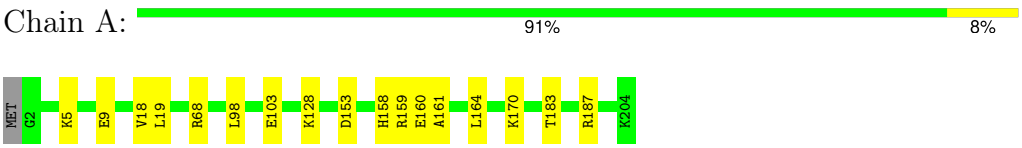
Mol	Chain	Residues	Atoms			AltConf
56	f	1	Total	C	N	0
			10	7	3	

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.

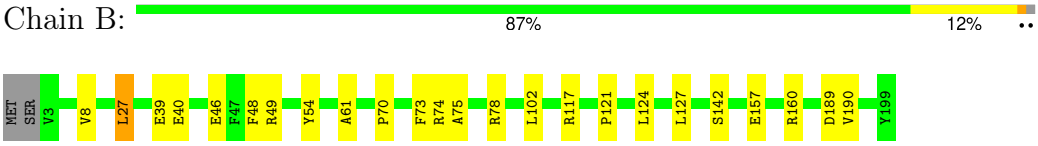
• Molecule 1: 60S ribosomal protein L15-A

Chain A:



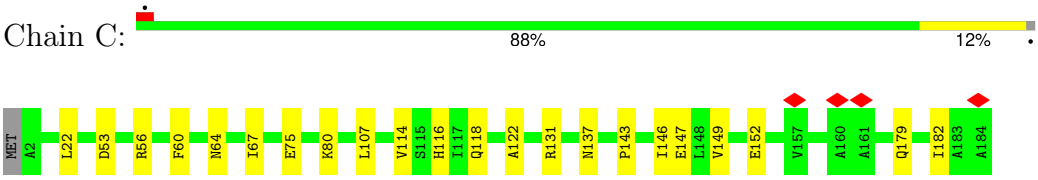
• Molecule 2: 60S ribosomal protein L16-A

Chain B:



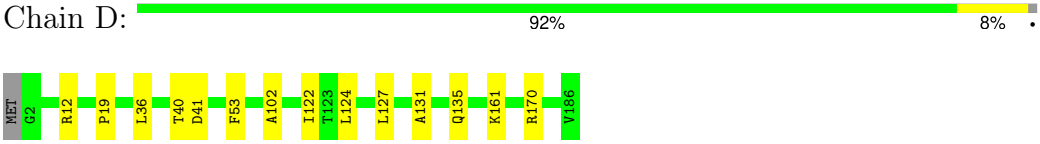
• Molecule 3: 60S ribosomal protein L17-A

Chain C:



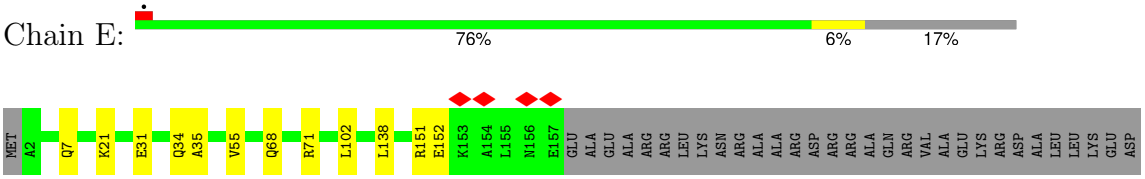
• Molecule 4: 60S ribosomal protein L18-A

Chain D:



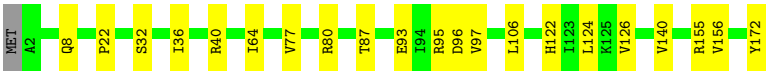
• Molecule 5: 60S ribosomal protein L19-A

Chain E:



• Molecule 6: 60S ribosomal protein L20-A

Chain F:



• Molecule 7: 60S ribosomal protein L21-A

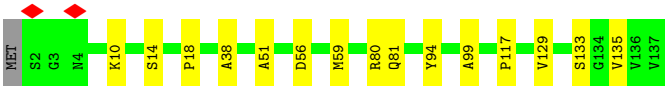
Chain G:

• Molecule 8: 60S ribosomal protein L22-A

Chain H:

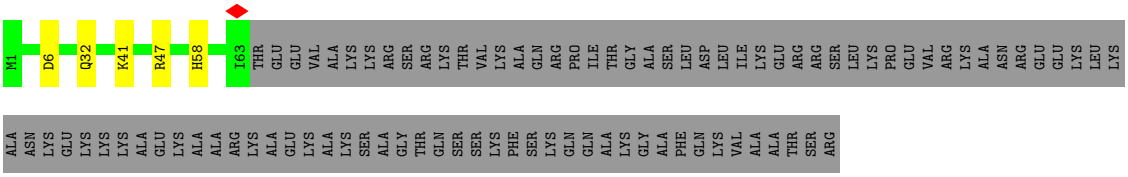
• Molecule 9: 60S ribosomal protein L23-A

Chain I:



• Molecule 10: 60S ribosomal protein L24-A

Chain J:

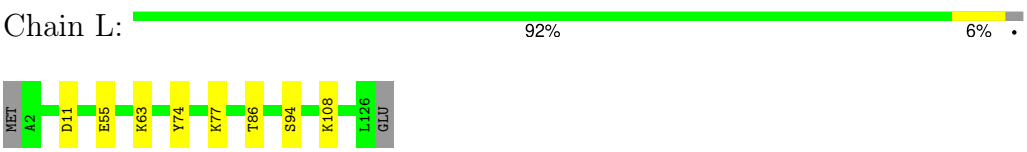


• Molecule 11: 60S ribosomal protein L25

Chain K:

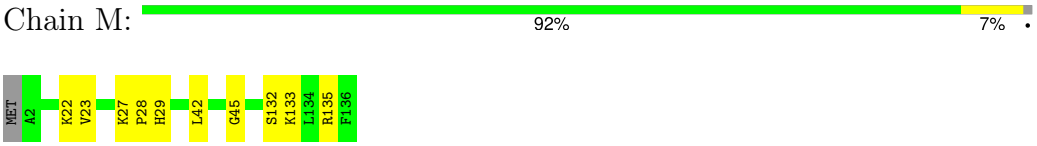
• Molecule 12: 60S ribosomal protein L26-A

Chain L:



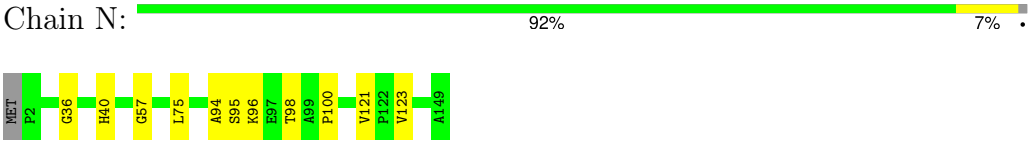
• Molecule 13: 60S ribosomal protein L27-A

Chain M:



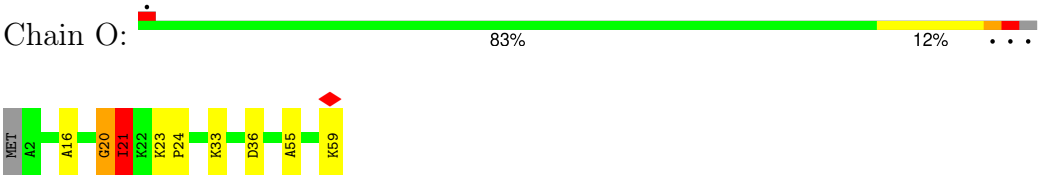
• Molecule 14: 60S ribosomal protein L28

Chain N:



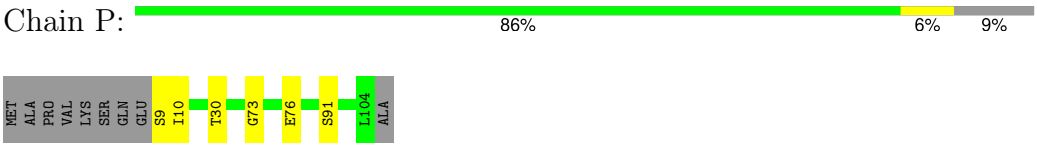
• Molecule 15: 60S ribosomal protein L29

Chain O:



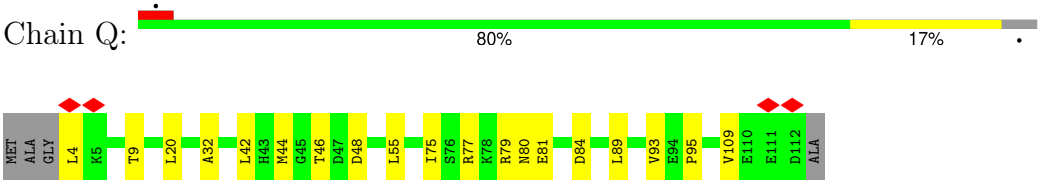
• Molecule 16: 60S ribosomal protein L30

Chain P:



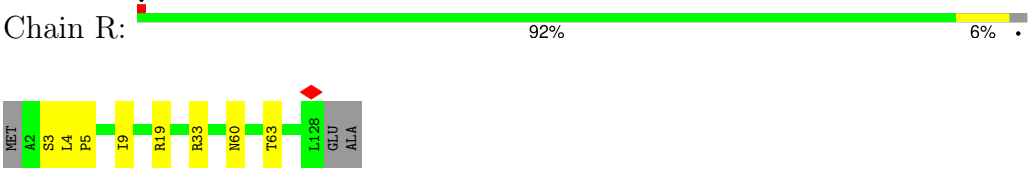
• Molecule 17: 60S ribosomal protein L31-A

Chain Q:



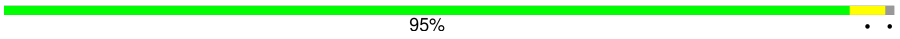
• Molecule 18: 60S ribosomal protein L32

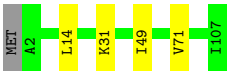
Chain R:



• Molecule 19: 60S ribosomal protein L33-A

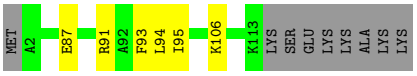
Chain S:





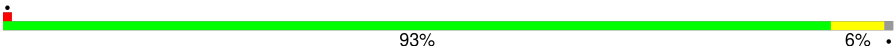
• Molecule 20: 60S ribosomal protein L34-A

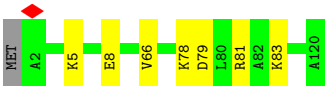
Chain T:



• Molecule 21: 60S ribosomal protein L35-A

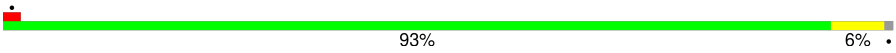
Chain U:

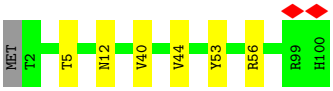




• Molecule 22: 60S ribosomal protein L36-A

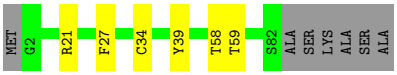
Chain V:





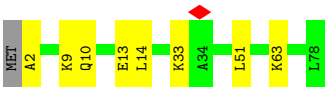
• Molecule 23: 60S ribosomal protein L37-A

Chain W:



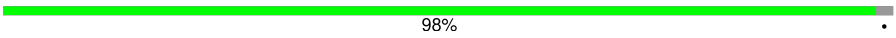
• Molecule 24: BJ4_G0032190.mRNA.1.CDS.1

Chain X:



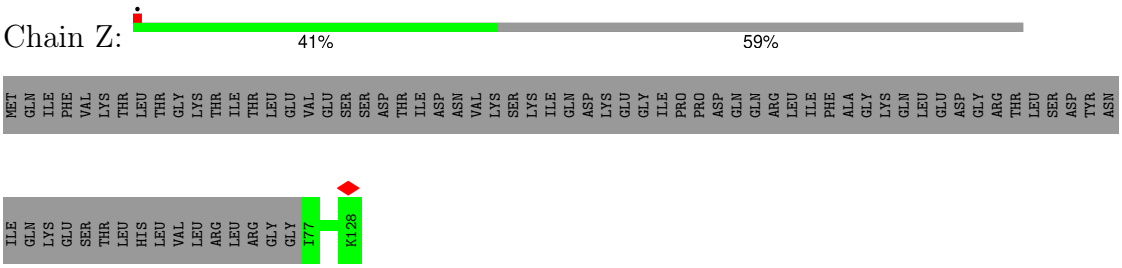
• Molecule 25: 60S ribosomal protein L39

Chain Y:



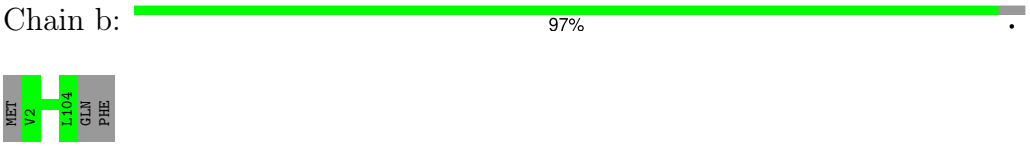
• Molecule 26: Ubiquitin-60S ribosomal protein L40

Chain Z:



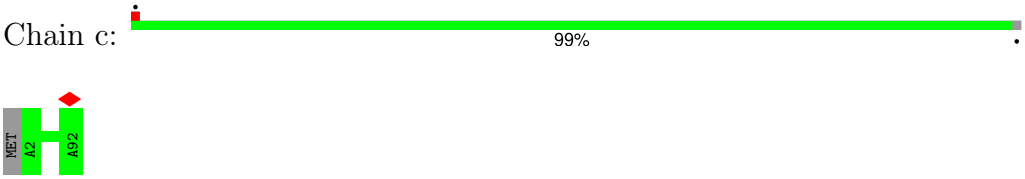
• Molecule 27: 60S ribosomal protein L42-A

Chain b:



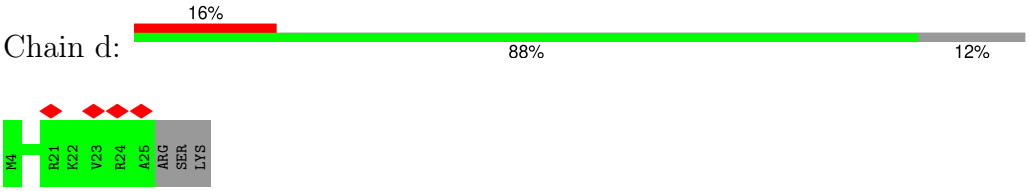
• Molecule 28: 60S ribosomal protein L43-A

Chain c:



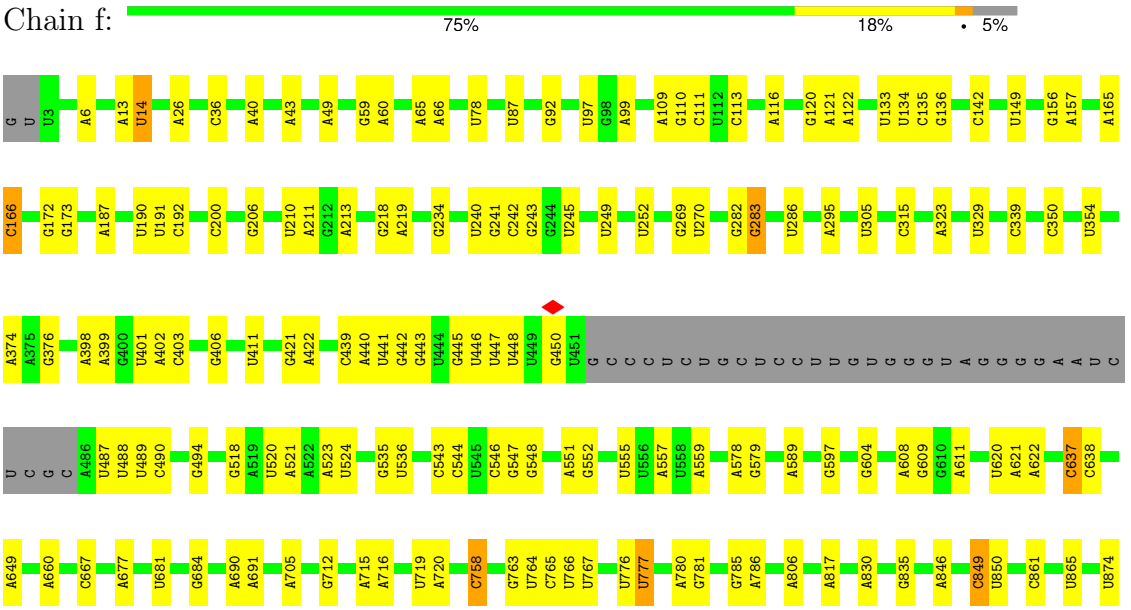
• Molecule 29: RPL41A isoform 1

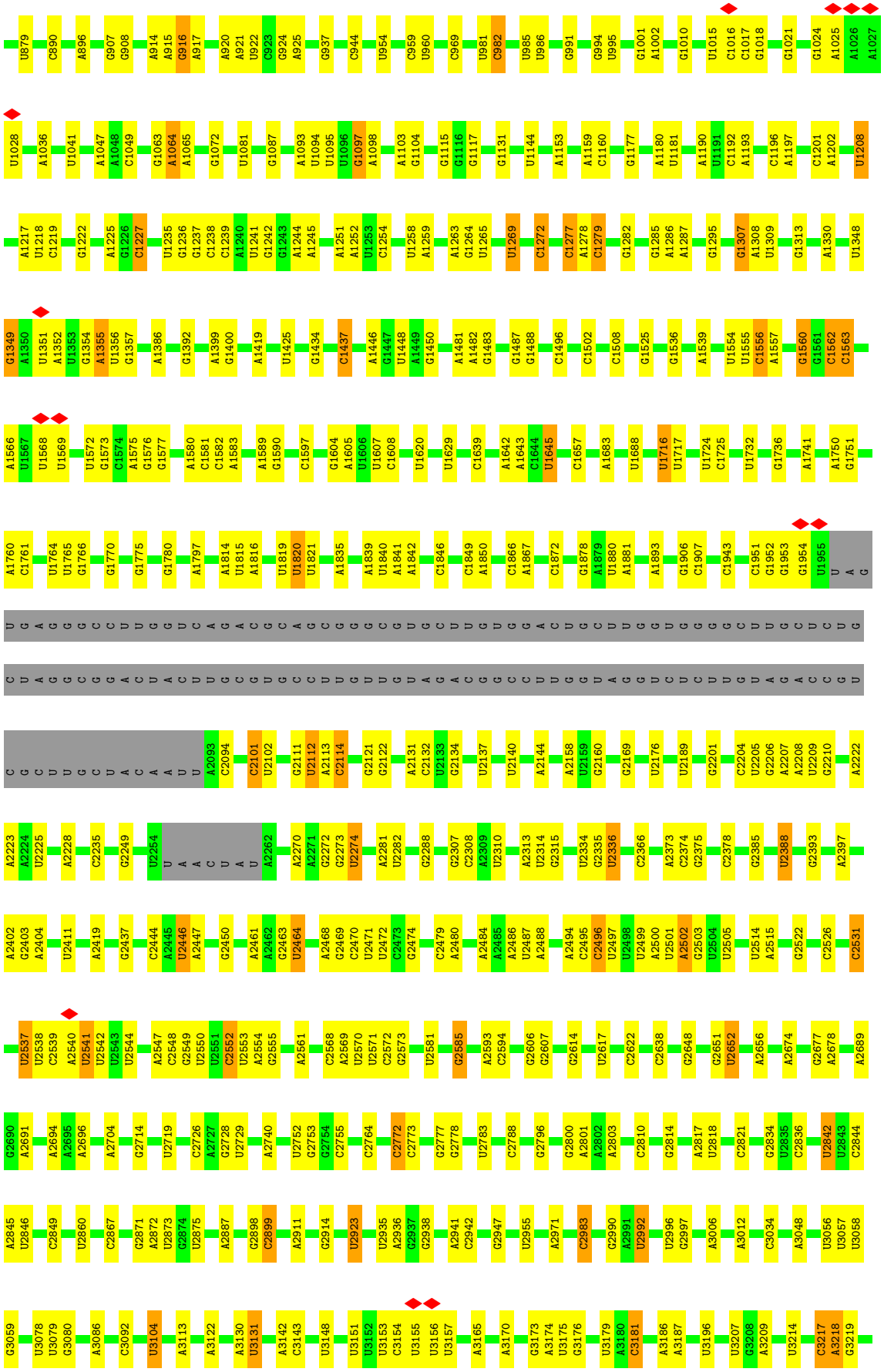
Chain d:

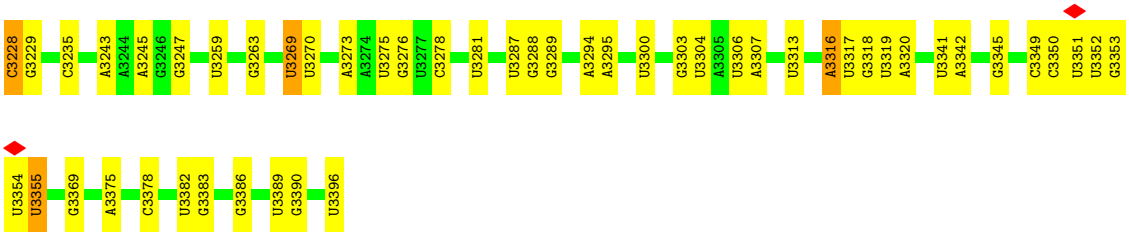


• Molecule 30: 25S rRNA

Chain f:

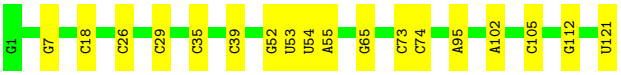






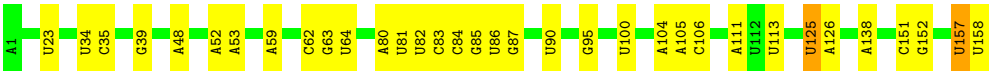
• Molecule 31: 5S rRNA

Chain h:



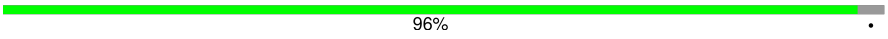
• Molecule 32: 5.8S rRNA

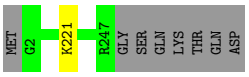
Chain i:



• Molecule 33: 60S ribosomal protein L2-A

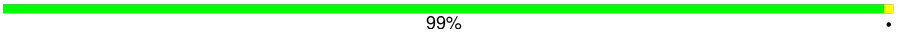
Chain j:

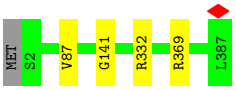




• Molecule 34: 60S ribosomal protein L3

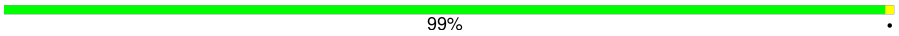
Chain k:

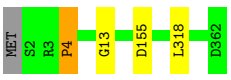




• Molecule 35: BJ4_G0008850.mRNA.1.CDS.1

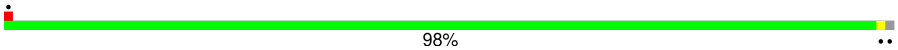
Chain l:

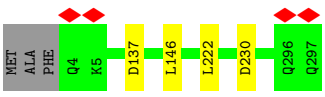




• Molecule 36: 60S ribosomal protein L5

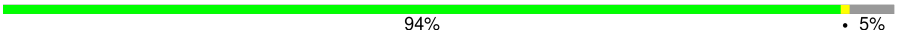
Chain m:

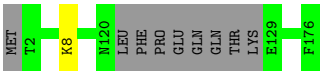




• Molecule 37: 60S ribosomal protein L6-B

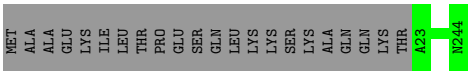
Chain n:





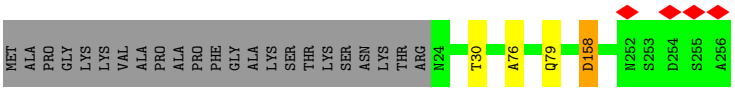
• Molecule 38: 60S ribosomal protein L7-A

Chain o:



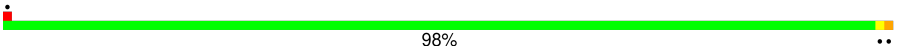
• Molecule 39: 60S ribosomal protein L8-A

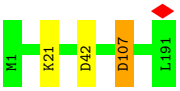
Chain p:



• Molecule 40: 60S ribosomal protein L9-A

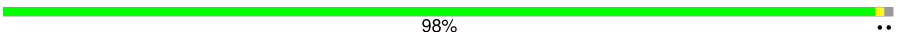
Chain q:

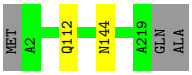




• Molecule 41: 60S ribosomal protein L10

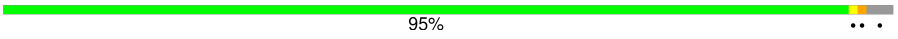
Chain r:

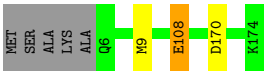




• Molecule 42: BJ4_G0027750.mRNA.1.CDS.1

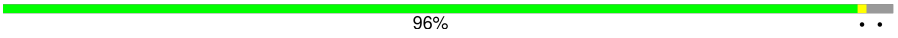
Chain s:

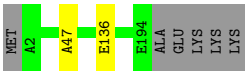




• Molecule 43: 60S ribosomal protein L13-A

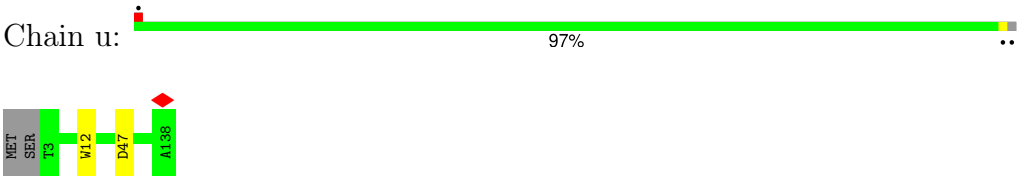
Chain t:





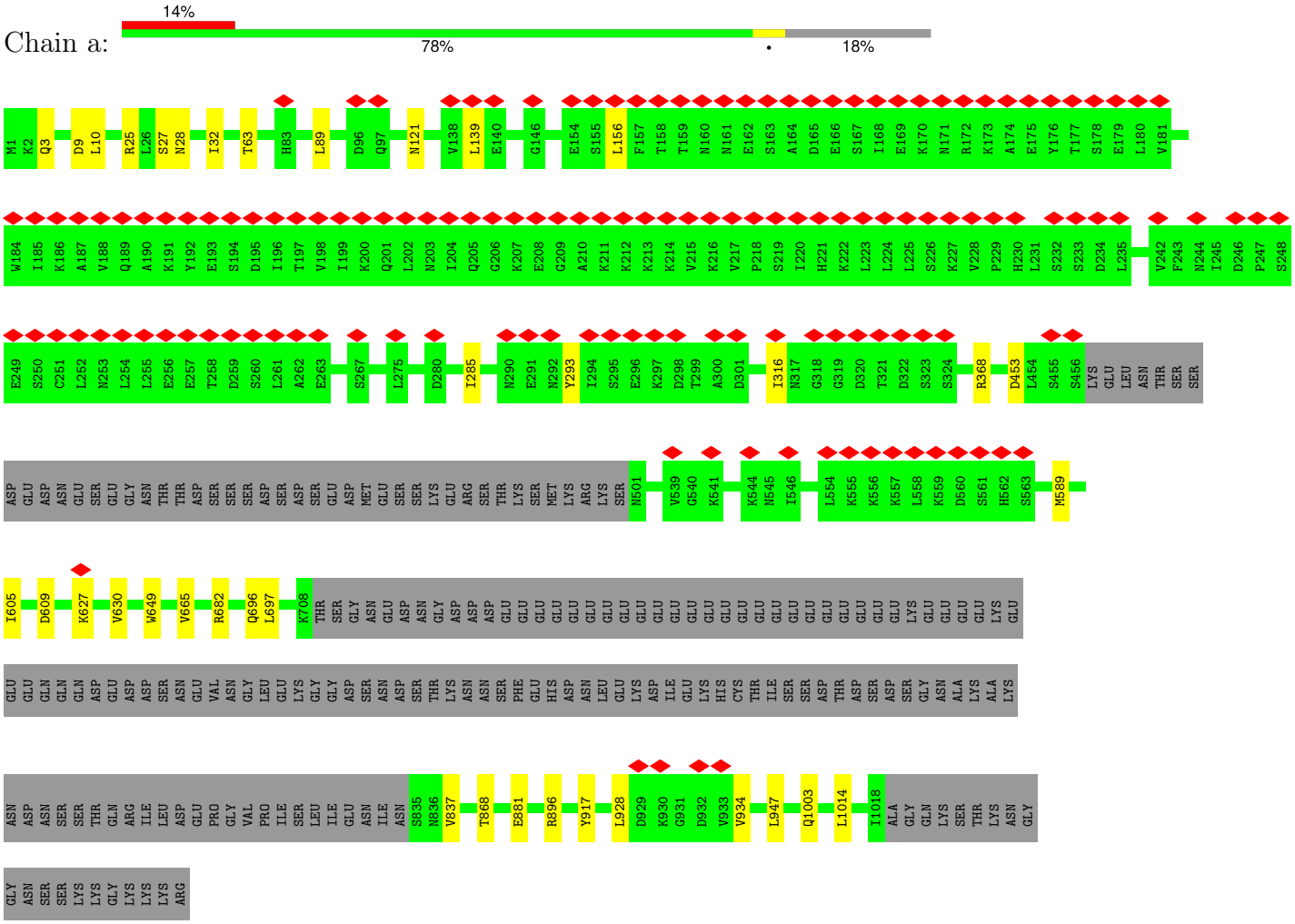
• Molecule 44: 60S ribosomal protein L14-A

Chain u:



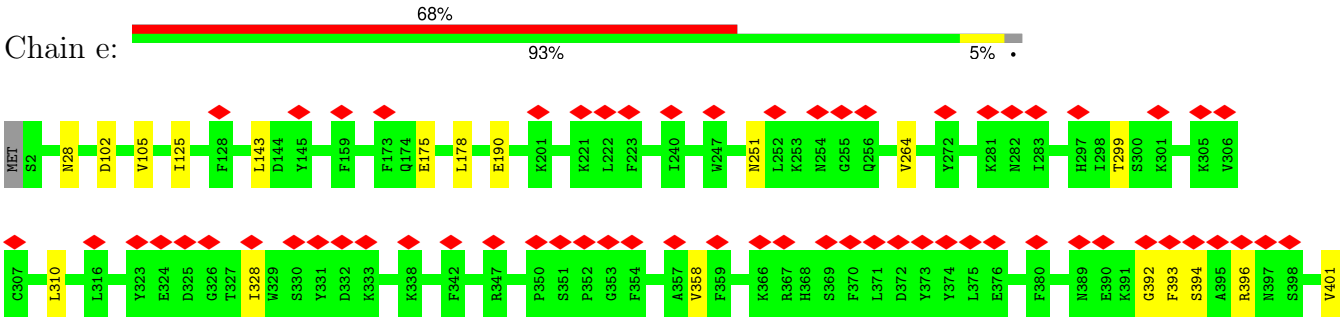
• Molecule 45: RQC2 isoform 1

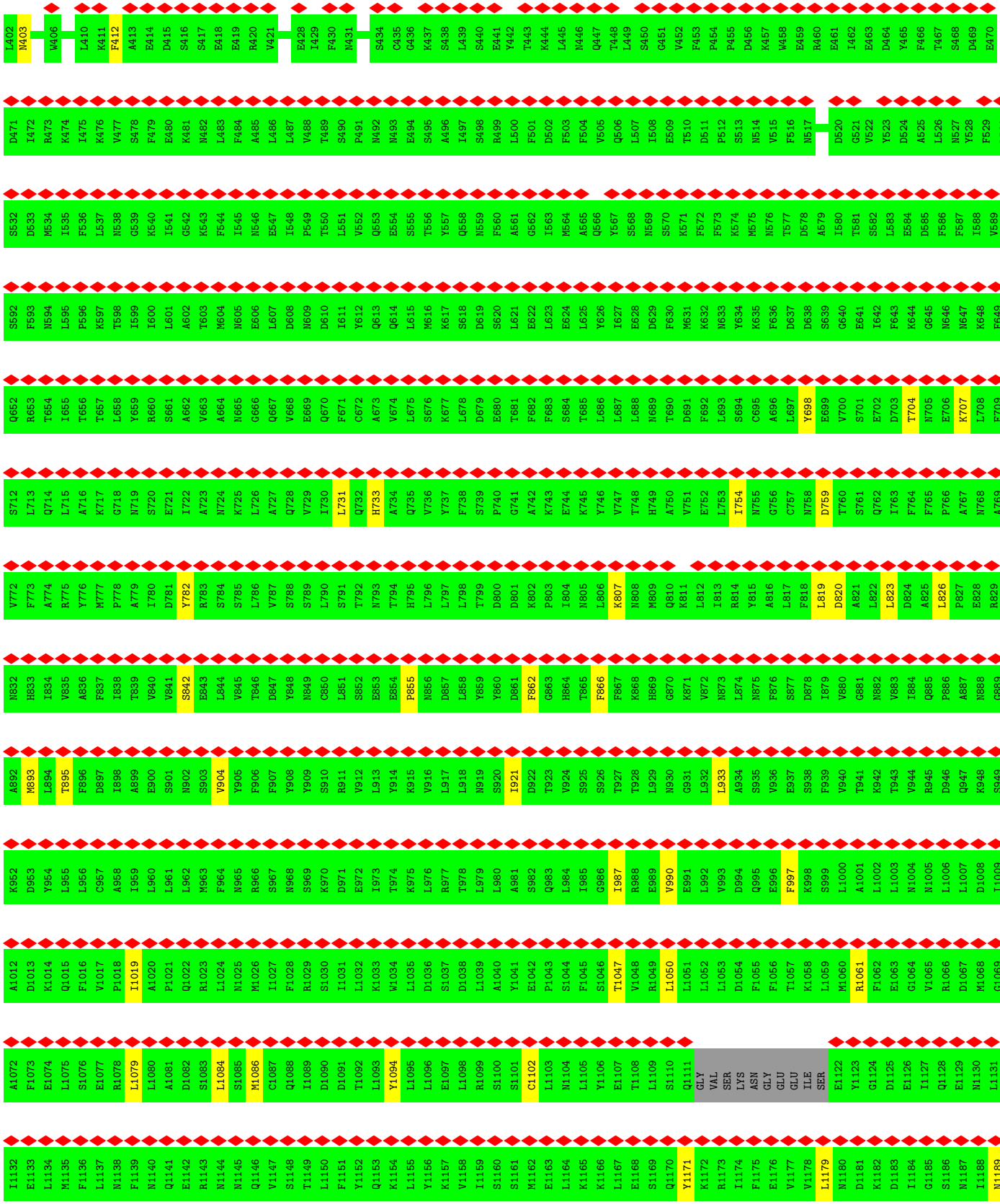
Chain a:

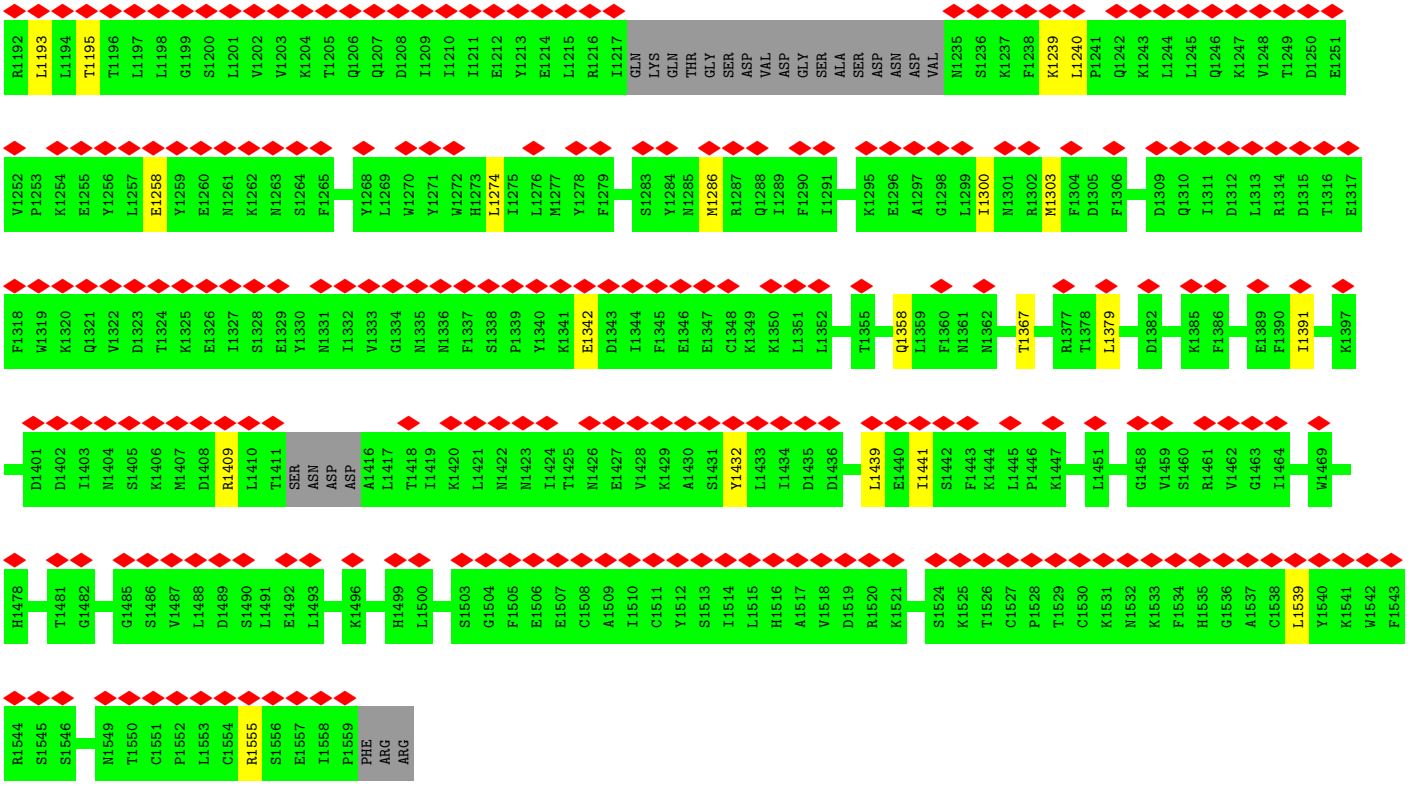


• Molecule 46: E3 ubiquitin-protein ligase listerin

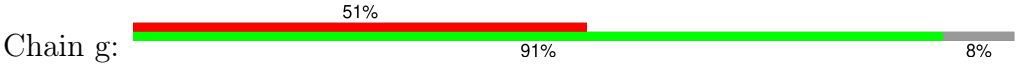
Chain e:



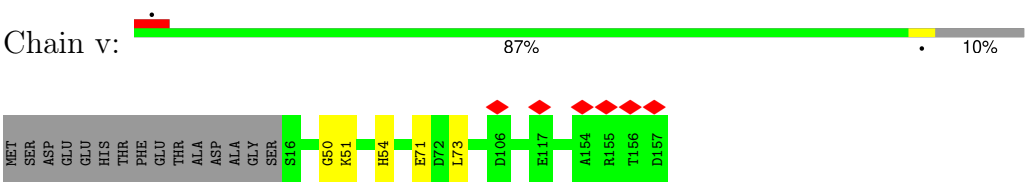

L402 N403 W406 L410 K411 F412 A413 E414 D415 S416 S417 E418 E419 R420 V421 E428 I429 F430 N431 S434 C435 G436 K437 S438 L439 S440 E441 Y442 T443 K444 L445 N446 Q447 T448 L449 S450 G451 V452 F453 P454 P455 D456 K457 W458 E459 R460 E461 I462 E463 D464 Y465 F466 T467 S468 D469 E470
D471 I472 R473 K474 I475 K476 V477 S478 F479 E480 K481 N482 L483 F484 A485 L486 L487 V488 T489 S490 P491 N492 N493 E494 S495 A496 I497 S498 R499 L500 F501 D502 F503 F504 V505 Q506 L507 I508 E509 T510 D511 P512 S513 N514 V515 F516 N517 D520 G521 V522 Y523 D524 A525 L526 N527 Y528 F529 L530 D531
S532 D533 M534 I535 F536 L537 N538 G539 K540 I541 G542 K543 F544 I545 N546 E547 I548 P549 T550 L551 V552 Q553 E554 S555 T556 Y557 Q558 N559 F560 A561 G562 I563 M564 A565 Q566 Y567 S568 N569 S570 K571 F572 F573 K574 M575 N576 T577 D578 D638 A579 I580 T581 S582 L583 E584 D585 F586 F587 I588 V589 A590 L591
S592 F593 N594 L595 P596 K597 T598 I599 I600 L601 A602 T603 M604 N605 E606 L607 D608 N609 D610 I611 Y612 Q613 Q614 L615 M616 K617 S618 D619 S620 L621 E622 L623 E624 L625 Y626 I627 E628 D629 F630 M631 K632 N633 Y634 K635 F636 D637 S639 G640 E641 I642 F643 K644 G645 N646 N647 K648 F649 L650 N651
Q652 R653 T654 I655 T656 T657 L658 Y659 R660 S661 A662 V663 A664 N665 G666 Q667 V668 E669 Q670 F671 C672 A673 V674 L675 S676 K677 L678 D679 E680 T681 F682 F683 S684 T685 L686 L687 L688 N689 T690 D691 F692 L693 S694 C695 A696 L697 Y698 E699 V700 S701 E702 D703 T704 N705 E706 K707 L708 F709 K710 L711
S712 L713 Q714 L715 A716 K717 G718 N719 S720 E721 I722 A723 N724 K725 L726 A727 Q728 V729 I730 L731 Q732 H733 A734 Q735 V736 Y737 F738 S739 P740 G741 A742 K743 E744 K745 Y746 V747 T748 H749 A750 V751 E752 L753 I754 N755 G756 C757 N758 D759 T760 S761 Q762 I763 F764 F765 P766 A767 N768 A769 I770 E771
V772 F773 A774 R775 Y776 M777 P778 A779 I780 D781 Y782 R783 S784 S785 L786 V787 S788 S789 L790 S791 T792 N793 T794 H795 L796 L797 L798 T799 D800 D801 K802 P803 I804 N805 L806 K807 N808 M809 Q810 K811 L812 I813 R814 Y815 A816 L817 F818 L819 D820 A821 L822 L823 D824 A825 L826 P827 E828 R829 V830 N831
N832 H833 I834 V835 A836 P837 I838 T839 V840 V841 S842 E843 L844 V845 T846 D847 Y848 N849 C850 L851 S852 E853 E854 P855 N856 D857 L858 Y859 Y860 D861 F862 G863 H864 T865 F866 F867 K868 H869 G870 K871 V872 N873 L874 N875 F876 S877 D878 I879 V880 G881 N882 V883 I884 Q885 P886 A887 N888 G889 G890 D891
A892 M893 L894 T895 F896 D897 I898 A899 E900 S901 N902 S903 V904 Y905 F906 F907 Y908 Y909 S910 R911 V912 L913 Y914 K915 V916 L917 L918 N919 S920 I921 D922 T923 V924 S925 S926 T927 T928 L929 N930 G931 L932 L933 A934 S935 V936 E937 S938 F939 V940 T941 K942 T943 V944 R945 D946 Q947 K948 S949 T950 D951
K952 D953 Y954 L955 L956 C957 A958 I959 L960 L961 L962 M963 F964 N965 R966 S967 N968 S969 K970 D971 E972 I973 T974 K975 L976 R977 T978 L979 L980 A981 S982 Q983 L984 I985 G986 I987 R988 E989 V990 E991 L992 V993 D994 Q995 E996 F997 K998 S999 L1000 A1001 L1002 L1003 N1004 N1005 L1006 L1007 D1008 I1009 P1010 Q1011
A1012 D1013 K1014 Q1015 F1016 V1017 P1018 I1019 A1020 P1021 Q1022 R1023 L1024 N1025 M1026 I1027 F1028 R1029 S1030 I1031 L1032 K1033 W1034 L1035 D1036 S1037 D1038 L1039 A1040 Y1041 E1042 P1043 S1044 F1045 S1046 T1047 V1048 R1049 L1050 L1051 L1052 L1053 D1054 F1055 F1056 T1057 K1058 L1059 M1060 R1061 F1062 E1063 G1064 V1065 R1066 D1067 M1068 G1069 I1070 T1071
A1072 F1073 E1074 L1075 S1076 E1077 R1078 L1079 L1080 A1081 D1082 S1083 L1084 S1085 M1086 C1087 Q1088 I1089 D1090 D1091 T1092 L1093 Y1094 L1095 L1096 E1097 L1098 R1099 S1100 S1101 C1102 L1103 N1104 L1105 Y1106 E1107 T1108 L1109 S1110 Q1111 GLY VAL SER LYS ASN GLY GLU GLU ILE SER E1122 Y1123 G1124 D1125 E1126 I1127 Q1128 E1129 N1130 L1131
I1132 E1133 L1134 M1135 F1136 L1137 N1138 F1139 N1140 Q1141 E1142 R1143 N1144 N1145 Q1146 V1147 S1148 T1149 L1150 F1151 Y1152 Q1153 K1154 L1155 Y1156 K1157 V1158 I1159 S1160 S1161 M1162 E1163 L1164 K1165 K1166 L1167 E1168 S1169 Q1170 Y1171 K1172 R1173 I1174 F1175 E1176 V1177 V1178 L1179 N1180 D1181 K1182 D1183 I1184 G1185 S1186 N1187 I1188 N1189 Q1190 S1191



• Molecule 47: Eukaryotic translation initiation factor 6

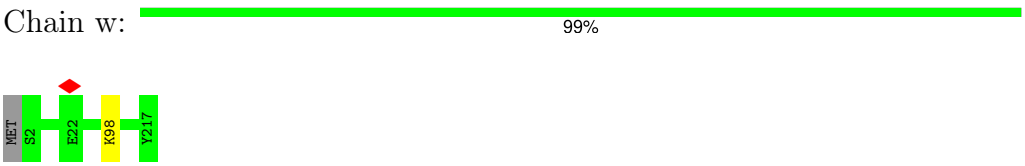


• Molecule 48: Eukaryotic translation initiation factor 5A-1



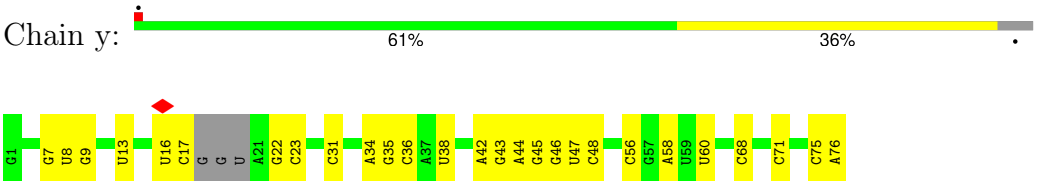
• Molecule 49: 60S ribosomal protein L1-A

Chain w:



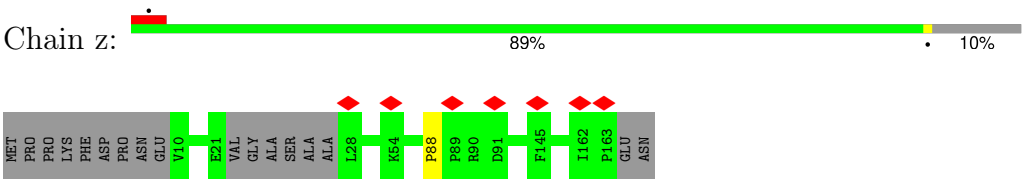
• Molecule 50: P-site tRNA

Chain y:



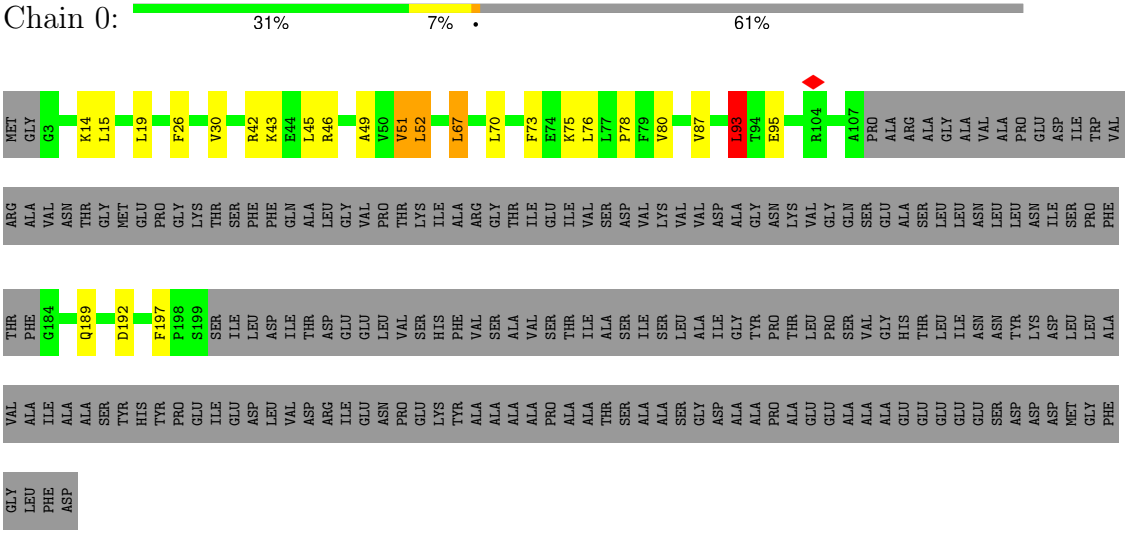
• Molecule 51: 60S ribosomal protein L12-B

Chain z:



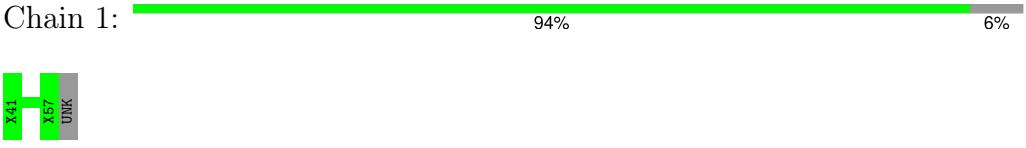
• Molecule 52: 60S acidic ribosomal protein P0

Chain 0:



• Molecule 53: CAT-tailed nascent peptide

Chain 1:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	44241	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	46	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	3.554	Depositor
Minimum map value	-0.671	Depositor
Average map value	0.020	Depositor
Map value standard deviation	0.128	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	476.55002, 476.55002, 476.55002	wwPDB
Map dimensions	450, 450, 450	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.059, 1.059, 1.059	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, 5CT, ZN, SPD

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	0.39	0/1757	0.70	1/2354 (0.0%)
2	B	0.39	0/1585	0.64	1/2128 (0.0%)
3	C	0.38	0/1439	0.71	2/1938 (0.1%)
4	D	0.34	0/1465	0.67	1/1965 (0.1%)
5	E	0.37	0/1275	0.67	0/1702
6	F	0.38	0/1473	0.65	0/1980
7	G	0.36	0/1296	0.62	0/1739
8	H	0.37	0/812	0.73	3/1099 (0.3%)
9	I	0.35	0/1018	0.64	0/1369
10	J	0.36	0/530	0.62	0/703
11	K	0.41	0/979	0.69	1/1321 (0.1%)
12	L	0.35	0/995	0.68	1/1329 (0.1%)
13	M	0.36	0/1106	0.61	0/1485
14	N	0.40	0/1200	0.62	0/1607
15	O	0.32	0/473	0.72	2/629 (0.3%)
16	P	0.35	0/745	0.67	0/1001
17	Q	0.39	0/890	0.77	2/1196 (0.2%)
18	R	0.32	0/1034	0.59	0/1385
19	S	0.38	0/868	0.61	0/1168
20	T	0.35	0/890	0.67	0/1189
21	U	0.34	0/978	0.65	1/1301 (0.1%)
22	V	0.34	0/772	0.66	0/1026
23	W	0.39	0/660	0.69	0/875
24	X	0.33	0/618	0.78	1/826 (0.1%)
25	Y	0.33	0/443	0.65	0/588
26	Z	0.33	0/416	0.70	0/553
27	b	0.36	0/836	0.66	0/1104
28	c	0.36	0/701	0.67	0/934
29	d	0.26	0/208	0.84	0/267
30	f	0.61	0/76989	1.03	289/120031 (0.2%)
31	h	0.53	0/2883	0.98	9/4491 (0.2%)
32	i	0.60	0/3746	0.96	7/5832 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#|Z| >5	RMSZ	#|Z| >5
33	j	0.38	0/1908	0.68	0/2564
34	k	0.36	0/3146	0.64	1/4228 (0.0%)
35	l	0.36	0/2800	0.64	2/3790 (0.1%)
36	m	0.34	0/2400	0.67	4/3239 (0.1%)
37	n	0.36	0/1329	0.67	0/1794
38	o	0.37	0/1821	0.61	0/2451
39	p	0.34	0/1836	0.62	2/2481 (0.1%)
40	q	0.37	0/1529	0.68	2/2060 (0.1%)
41	r	0.33	0/1801	0.64	0/2416
42	s	0.33	0/1367	0.70	3/1834 (0.2%)
43	t	0.36	0/1568	0.69	1/2106 (0.0%)
44	u	0.34	0/1068	0.66	1/1438 (0.1%)
45	a	0.28	0/6679	0.48	0/9012
46	e	0.28	0/11708	0.48	0/15899
47	g	0.32	0/1672	0.63	0/2281
48	v	0.33	0/1084	0.63	1/1456 (0.1%)
49	w	0.33	0/1736	0.65	0/2332
50	y	0.23	0/1735	0.66	0/2701
51	z	0.38	0/726	0.61	0/1006
52	0	0.33	0/976	0.55	0/1313
All	All	0.50	0/159969	0.87	338/233516 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
15	O	0	1
21	U	0	1
34	k	0	1
35	l	0	2
39	p	0	3
40	q	0	1
44	u	0	1
46	e	0	1
47	g	0	1
All	All	0	12

There are no bond length outliers.

All (338) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	3217	C	N1-C2-O2	12.15	126.19	118.90
30	f	3217	C	C2-N1-C1'	11.32	131.25	118.80
30	f	3217	C	N3-C2-O2	-9.76	115.07	121.90
11	K	134	ASP	CB-CG-OD1	9.69	127.02	118.30
17	Q	84	ASP	CB-CG-OD1	9.31	126.68	118.30
30	f	922	U	C2-N1-C1'	9.28	128.84	117.70
30	f	2531	C	N1-C2-O2	8.91	124.25	118.90
30	f	922	U	N1-C2-O2	8.83	128.98	122.80
30	f	3181	C	N1-C2-O2	8.69	124.11	118.90
30	f	3278	C	N1-C2-O2	8.66	124.10	118.90
30	f	3181	C	C2-N1-C1'	8.46	128.11	118.80
30	f	2836	C	N3-C2-O2	-8.33	116.07	121.90
30	f	1279	C	C5-C6-N1	8.30	125.15	121.00
30	f	2836	C	C2-N1-C1'	8.21	127.83	118.80
36	m	230	ASP	CB-CG-OD1	8.11	125.60	118.30
30	f	1496	C	C2-N1-C1'	8.10	127.71	118.80
30	f	922	U	N3-C2-O2	-7.96	116.63	122.20
30	f	406	G	O4'-C1'-N9	7.95	114.56	108.20
30	f	1645	U	N3-C2-O2	-7.93	116.65	122.20
30	f	2205	U	N1-C2-O2	7.85	128.30	122.80
30	f	3217	C	C6-N1-C2	-7.84	117.16	120.30
30	f	2444	C	C2-N1-C1'	7.80	127.38	118.80
30	f	1208	U	N1-C2-O2	7.78	128.25	122.80
30	f	3217	C	C6-N1-C1'	-7.75	111.50	120.80
4	D	41	ASP	CB-CG-OD1	7.74	125.27	118.30
30	f	2983	C	C2-N1-C1'	7.72	127.29	118.80
30	f	3306	U	N3-C2-O2	-7.67	116.83	122.20
30	f	2652	U	N3-C2-O2	-7.64	116.85	122.20
30	f	3278	C	N3-C2-O2	-7.57	116.60	121.90
30	f	3306	U	C2-N1-C1'	7.56	126.77	117.70
30	f	2541	U	P-O3'-C3'	7.55	128.76	119.70
30	f	2205	U	N3-C2-O2	-7.55	116.92	122.20
30	f	3278	C	C2-N1-C1'	7.54	127.10	118.80
30	f	758	C	C2-N1-C1'	7.49	127.03	118.80
30	f	1645	U	N1-C2-O2	7.49	128.04	122.80
30	f	2836	C	N1-C2-O2	7.45	123.37	118.90
30	f	1277	C	C2-N1-C1'	7.42	126.96	118.80
30	f	2502	A	OP2-P-O3'	7.38	121.44	105.20
30	f	2235	C	C2-N1-C1'	7.31	126.84	118.80
30	f	3181	C	N3-C2-O2	-7.25	116.82	121.90
30	f	1556	C	N1-C2-O2	7.25	123.25	118.90
15	O	36	ASP	CB-CG-OD1	7.24	124.81	118.30
30	f	2923	U	N1-C2-O2	7.22	127.86	122.80

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	1239	C	C2-N1-C1'	7.21	126.73	118.80
42	s	170	ASP	CB-CG-OD1	7.21	124.79	118.30
30	f	2531	C	C2-N1-C1'	7.20	126.72	118.80
30	f	1349	G	N3-C4-C5	-7.18	125.01	128.60
30	f	2502	A	P-O3'-C3'	7.15	128.28	119.70
30	f	1227	C	C2-N1-C1'	7.14	126.66	118.80
30	f	78	U	N3-C2-O2	-7.14	117.20	122.20
30	f	2205	U	C2-N1-C1'	7.11	126.23	117.70
39	p	158	ASP	CB-CG-OD1	7.11	124.70	118.30
30	f	1277	C	N1-C2-O2	7.09	123.16	118.90
30	f	14	U	O5'-P-OP2	-7.06	99.34	105.70
30	f	982	C	C2-N1-C1'	7.05	126.56	118.80
30	f	36	C	N1-C2-O2	7.05	123.13	118.90
30	f	1307	G	P-O3'-C3'	7.05	128.16	119.70
30	f	1815	U	P-O3'-C3'	7.04	128.15	119.70
30	f	1604	G	C4-N9-C1'	7.04	135.65	126.50
30	f	1227	C	N1-C2-O2	7.03	123.12	118.90
30	f	1645	U	C2-N1-C1'	7.00	126.10	117.70
30	f	3217	C	C5-C6-N1	7.00	124.50	121.00
30	f	1872	C	N1-C2-O2	6.97	123.08	118.90
30	f	1349	G	C4-N9-C1'	6.96	135.56	126.50
30	f	1272	C	N1-C2-O2	6.91	123.05	118.90
30	f	1208	U	C2-N1-C1'	6.90	125.98	117.70
30	f	3275	U	OP1-P-O3'	6.88	120.34	105.20
30	f	3235	C	C2-N1-C1'	6.87	126.36	118.80
30	f	3306	U	N1-C2-O2	6.87	127.61	122.80
30	f	2923	U	N3-C2-O2	-6.83	117.42	122.20
30	f	2846	U	C2-N1-C1'	6.78	125.83	117.70
12	L	11	ASP	CB-CG-OD1	6.75	124.38	118.30
30	f	270	U	N1-C2-O2	6.74	127.52	122.80
30	f	1227	C	C5-C6-N1	6.73	124.36	121.00
30	f	2846	U	N3-C2-O2	-6.72	117.49	122.20
30	f	1227	C	C6-N1-C2	-6.71	117.62	120.30
30	f	2983	C	N3-C2-O2	-6.71	117.21	121.90
30	f	2531	C	N3-C2-O2	-6.69	117.22	121.90
30	f	2537	U	P-O3'-C3'	6.67	127.70	119.70
31	h	26	C	N1-C2-O2	6.66	122.90	118.90
30	f	2836	C	C6-N1-C2	-6.65	117.64	120.30
30	f	270	U	N3-C2-O2	-6.64	117.55	122.20
30	f	1239	C	N1-C2-O2	6.64	122.88	118.90
30	f	2112	U	OP2-P-O3'	6.60	119.73	105.20
30	f	3058	U	C2-N1-C1'	6.58	125.60	117.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	2189	U	N1-C2-O2	6.58	127.41	122.80
30	f	3214	U	C2-N1-C1'	6.54	125.54	117.70
2	B	27[A]	LEU	CB-CG-CD2	-6.52	99.91	111.00
32	i	64	U	N3-C2-O2	-6.52	117.64	122.20
30	f	3034	C	N1-C2-O2	6.51	122.80	118.90
30	f	2101	C	P-O3'-C3'	6.49	127.49	119.70
30	f	2235	C	C6-N1-C2	-6.49	117.70	120.30
30	f	1208	U	N3-C2-O2	-6.47	117.67	122.20
30	f	524	U	N1-C2-O2	6.46	127.33	122.80
30	f	2189	U	N3-C2-O2	-6.46	117.68	122.20
30	f	2112	U	P-O3'-C3'	6.44	127.43	119.70
31	h	105	C	N1-C2-O2	6.44	122.76	118.90
30	f	2550	U	N3-C2-O2	-6.43	117.70	122.20
30	f	2983	C	N1-C2-O2	6.42	122.75	118.90
35	l	155	ASP	CB-CG-OD1	6.41	124.07	118.30
30	f	524	U	N3-C2-O2	-6.38	117.73	122.20
30	f	1269	U	C2-N1-C1'	6.38	125.35	117.70
30	f	986	U	N3-C2-O2	-6.36	117.75	122.20
30	f	2274	U	N1-C2-O2	6.36	127.25	122.80
21	U	79	ASP	CB-CG-OD1	6.34	124.01	118.30
36	m	137	ASP	CB-CG-OD1	6.34	124.00	118.30
30	f	3058	U	N1-C2-O2	6.33	127.23	122.80
44	u	47	ASP	CB-CG-OD1	6.33	123.99	118.30
30	f	1269	U	N1-C2-O2	6.32	127.22	122.80
30	f	1556	C	N3-C2-O2	-6.31	117.48	121.90
30	f	2464	U	C2-N1-C1'	6.30	125.27	117.70
30	f	1496	C	C6-N1-C2	-6.29	117.78	120.30
1	A	153	ASP	CB-CG-OD1	6.28	123.95	118.30
30	f	2617	U	N3-C2-O2	-6.27	117.81	122.20
30	f	2726	C	N3-C2-O2	-6.26	117.52	121.90
30	f	36	C	N3-C2-O2	-6.26	117.52	121.90
30	f	922	U	C6-N1-C1'	-6.25	112.45	121.20
30	f	865	U	N3-C2-O2	-6.25	117.83	122.20
30	f	1716	U	P-O3'-C3'	6.23	127.18	119.70
30	f	2726	C	C2-N1-C1'	6.23	125.66	118.80
40	q	42	ASP	CB-CG-OD1	6.22	123.90	118.30
30	f	192	C	C2-N1-C1'	6.21	125.64	118.80
30	f	1269	U	N3-C2-O2	-6.21	117.85	122.20
30	f	1097	G	P-O3'-C3'	6.17	127.11	119.70
30	f	1878	G	C4-N9-C1'	6.16	134.51	126.50
30	f	2444	C	C6-N1-C2	-6.15	117.84	120.30
30	f	2132	C	C6-N1-C2	-6.15	117.84	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	2846	U	N1-C2-O2	6.14	127.10	122.80
30	f	1349	G	N3-C4-N9	6.13	129.68	126.00
30	f	2550	U	C2-N1-C1'	6.13	125.05	117.70
30	f	637	C	P-O3'-C3'	6.12	127.05	119.70
30	f	1115	G	C4-N9-C1'	6.11	134.45	126.50
30	f	3104	U	N1-C2-O2	6.11	127.08	122.80
30	f	995	U	N1-C2-O2	6.11	127.08	122.80
30	f	2842	U	N1-C2-O2	6.11	127.08	122.80
30	f	3104	U	N3-C2-O2	-6.11	117.92	122.20
30	f	2388	U	N3-C2-O2	-6.09	117.94	122.20
30	f	915	A	C2-N3-C4	6.05	113.63	110.60
30	f	2553	U	C2-N1-C1'	6.05	124.96	117.70
30	f	1064	A	P-O3'-C3'	6.04	126.95	119.70
30	f	3131	U	C2-N1-C1'	6.03	124.93	117.70
30	f	2274	U	C2-N1-C1'	6.02	124.92	117.70
30	f	2923	U	C2-N1-C1'	6.02	124.92	117.70
30	f	1872	C	N3-C2-O2	-6.01	117.69	121.90
30	f	1604	G	C8-N9-C1'	-6.00	119.19	127.00
30	f	1604	G	N3-C4-N9	6.00	129.60	126.00
30	f	1907	C	N1-C2-O2	6.00	122.50	118.90
30	f	3300	U	N3-C2-O2	-5.99	118.00	122.20
30	f	1279	C	C6-N1-C2	-5.99	117.90	120.30
30	f	3181	C	C6-N1-C1'	-5.99	113.61	120.80
30	f	2132	C	N3-C2-O2	-5.99	117.71	121.90
30	f	1556	C	C2-N1-C1'	5.98	125.38	118.80
8	H	51	GLY	C-N-CA	5.97	136.62	121.70
34	k	87	VAL	CG1-CB-CG2	-5.95	101.38	110.90
30	f	985	U	N3-C2-O2	-5.95	118.03	122.20
8	H	18	ASP	CB-CG-OD1	5.94	123.64	118.30
30	f	2652	U	N1-C2-O2	5.94	126.96	122.80
30	f	969	C	C6-N1-C2	-5.93	117.93	120.30
30	f	1355	A	P-O3'-C3'	5.91	126.79	119.70
30	f	1425	U	N3-C2-O2	-5.91	118.06	122.20
30	f	1604	G	N3-C4-C5	-5.89	125.65	128.60
32	i	100	U	C2-N1-C1'	5.89	124.77	117.70
30	f	2585	G	N3-C4-C5	-5.89	125.66	128.60
30	f	3048	A	O4'-C1'-N9	5.89	112.91	108.20
30	f	1820	U	P-O3'-C3'	5.87	126.74	119.70
30	f	2531	C	C6-N1-C2	-5.87	117.95	120.30
30	f	1562	C	P-O3'-C3'	5.86	126.73	119.70
30	f	1437	C	C2-N1-C1'	5.85	125.24	118.80
30	f	2274	U	N3-C2-O2	-5.85	118.11	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	142	C	N1-C2-O2	5.85	122.41	118.90
30	f	2638	C	N1-C2-O2	5.84	122.41	118.90
30	f	865	U	N1-C2-O2	5.84	126.89	122.80
30	f	2622	C	N1-C2-O2	5.84	122.40	118.90
30	f	3350	C	C6-N1-C2	-5.83	117.97	120.30
31	h	26	C	C6-N1-C2	-5.83	117.97	120.30
30	f	1525	G	C4-N9-C1'	5.83	134.07	126.50
30	f	1577	G	N1-C6-O6	-5.83	116.41	119.90
30	f	3214	U	N3-C2-O2	-5.82	118.12	122.20
30	f	3316	A	P-O3'-C3'	5.82	126.68	119.70
30	f	835	G	O4'-C1'-N9	5.80	112.84	108.20
30	f	1272	C	N3-C2-O2	-5.80	117.84	121.90
30	f	2204	C	C6-N1-C2	-5.80	117.98	120.30
42	s	9	MET	CA-CB-CG	5.76	123.10	113.30
30	f	270	U	C2-N1-C1'	5.74	124.58	117.70
30	f	758	C	C6-N1-C2	-5.74	118.01	120.30
30	f	3228	C	P-O3'-C3'	5.73	126.58	119.70
30	f	2992	U	N3-C2-O2	-5.72	118.19	122.20
30	f	3218	A	P-O3'-C3'	5.71	126.55	119.70
30	f	1190	A	C4-N9-C1'	5.71	136.57	126.30
30	f	142	C	C6-N1-C2	-5.70	118.02	120.30
30	f	282	G	P-O3'-C3'	5.69	126.53	119.70
30	f	1448	U	N3-C2-O2	-5.69	118.22	122.20
30	f	2531	C	C5-C6-N1	5.69	123.84	121.00
30	f	3034	C	N3-C2-O2	-5.68	117.92	121.90
30	f	97	U	N3-C2-O2	-5.68	118.22	122.20
30	f	1277	C	N3-C2-O2	-5.68	117.92	121.90
30	f	2899	C	N3-C2-O2	-5.68	117.93	121.90
30	f	354	U	N1-C2-O2	5.67	126.77	122.80
30	f	1496	C	C5-C6-N1	5.67	123.84	121.00
30	f	2366	C	C2-N1-C1'	5.67	125.03	118.80
32	i	64	U	N1-C2-O2	5.66	126.77	122.80
8	H	50	LEU	CA-CB-CG	5.65	128.29	115.30
30	f	916	G	P-O3'-C3'	5.65	126.48	119.70
30	f	2553	U	C6-N1-C1'	-5.64	113.30	121.20
30	f	2899	C	C2-N1-C1'	5.63	124.99	118.80
30	f	2204	C	C5-C6-N1	5.62	123.81	121.00
30	f	1349	G	C8-N9-C1'	-5.62	119.70	127.00
30	f	2378	C	C2-N1-C1'	5.62	124.98	118.80
30	f	1496	C	N1-C2-O2	5.61	122.26	118.90
30	f	2137	U	C2-N1-C1'	5.60	124.42	117.70
30	f	777	U	N3-C2-O2	-5.60	118.28	122.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	113	C	C2-N1-C1'	5.60	124.96	118.80
30	f	3058	U	N3-C2-O2	-5.60	118.28	122.20
30	f	2764	C	N1-C2-O2	5.59	122.25	118.90
30	f	2842	U	N3-C2-O2	-5.58	118.29	122.20
30	f	3057	U	N3-C2-O2	-5.58	118.30	122.20
30	f	2132	C	N1-C2-O2	5.58	122.25	118.90
30	f	3269	U	P-O3'-C3'	5.58	126.39	119.70
30	f	2983	C	C6-N1-C2	-5.57	118.07	120.30
31	h	26	C	N3-C2-O2	-5.57	118.00	121.90
40	q	107	ASP	CB-CG-OD1	5.55	123.30	118.30
30	f	2366	C	C5-C6-N1	5.55	123.78	121.00
32	i	125	U	C2-N1-C1'	5.54	124.34	117.70
31	h	35	C	N1-C2-O2	5.53	122.22	118.90
30	f	1554	U	P-O3'-C3'	5.53	126.33	119.70
3	C	53	ASP	CB-CG-OD1	5.52	123.27	118.30
30	f	995	U	N3-C2-O2	-5.51	118.34	122.20
30	f	283	G	N3-C4-N9	5.50	129.30	126.00
30	f	315	C	C2-N1-C1'	5.50	124.85	118.80
30	f	986	U	N1-C2-O2	5.50	126.65	122.80
30	f	982	C	N1-C2-O2	5.50	122.20	118.90
30	f	2726	C	N1-C2-O2	5.49	122.19	118.90
30	f	411	U	N3-C2-O2	-5.49	118.36	122.20
30	f	2552	C	N1-C2-O2	5.48	122.19	118.90
30	f	2585	G	N3-C4-N9	5.48	129.29	126.00
31	h	52	G	P-O3'-C3'	5.47	126.27	119.70
24	X	14	LEU	CA-CB-CG	5.46	127.86	115.30
30	f	2444	C	N1-C2-O2	5.46	122.18	118.90
30	f	2210	G	N3-C4-C5	-5.46	125.87	128.60
30	f	3214	U	N1-C2-O2	5.45	126.62	122.80
30	f	3355	U	C2-N1-C1'	5.45	124.24	117.70
30	f	283	G	C4-N9-C1'	5.44	133.57	126.50
30	f	2783	U	N3-C2-O2	-5.44	118.39	122.20
30	f	3153	U	C2-N1-C1'	5.42	124.21	117.70
30	f	3057	U	N1-C2-O2	5.42	126.59	122.80
30	f	78	U	N1-C2-O2	5.42	126.59	122.80
30	f	1878	G	C8-N9-C1'	-5.42	119.96	127.00
30	f	1688	U	N3-C2-O2	-5.42	118.41	122.20
30	f	3350	C	P-O3'-C3'	5.41	126.19	119.70
30	f	1437	C	C6-N1-C2	-5.41	118.14	120.30
30	f	2726	C	C6-N1-C2	-5.40	118.14	120.30
30	f	2552	C	C2-N1-C1'	5.39	124.73	118.80
30	f	1277	C	C6-N1-C2	-5.39	118.14	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	114	VAL	CG1-CB-CG2	-5.39	102.28	110.90
30	f	2622	C	N3-C2-O2	-5.37	118.14	121.90
30	f	142	C	N3-C2-O2	-5.36	118.15	121.90
30	f	1425	U	N1-C2-O2	5.36	126.55	122.80
30	f	1349	G	C2-N3-C4	5.35	114.58	111.90
30	f	3278	C	C6-N1-C1'	-5.35	114.38	120.80
30	f	1496	C	C6-N1-C1'	-5.35	114.38	120.80
30	f	1732	U	N1-C2-O2	5.34	126.54	122.80
30	f	2500	A	P-O3'-C3'	5.34	126.11	119.70
30	f	915	A	C4-N9-C1'	5.33	135.90	126.30
30	f	2497	U	N3-C2-O2	-5.33	118.47	122.20
30	f	2366	C	C6-N1-C2	-5.33	118.17	120.30
30	f	2336	U	N3-C2-O2	-5.33	118.47	122.20
30	f	2568	C	O4'-C1'-N1	5.33	112.46	108.20
30	f	2836	C	C6-N1-C1'	-5.33	114.41	120.80
30	f	1732	U	N3-C2-O2	-5.30	118.49	122.20
30	f	982	C	C6-N1-C2	-5.29	118.18	120.30
30	f	1115	G	C8-N9-C1'	-5.29	120.12	127.00
30	f	890	C	N1-C2-O2	5.29	122.07	118.90
43	t	136	GLU	CA-CB-CG	5.29	125.03	113.40
30	f	1608	C	C2-N1-C1'	5.28	124.61	118.80
30	f	2114	C	C6-N1-C2	-5.28	118.19	120.30
30	f	954	U	N3-C2-O2	-5.27	118.51	122.20
30	f	1525	G	C8-N9-C1'	-5.27	120.15	127.00
30	f	982	C	C5-C6-N1	5.25	123.63	121.00
30	f	2235	C	N1-C2-O2	5.25	122.05	118.90
31	h	105	C	N3-C2-O2	-5.24	118.23	121.90
48	v	50	GLY	N-CA-C	-5.24	100.00	113.10
30	f	1907	C	N3-C2-O2	-5.24	118.23	121.90
30	f	1560	G	N3-C4-N9	-5.24	122.86	126.00
30	f	1190	A	C2-N3-C4	5.24	113.22	110.60
30	f	2446	U	O4'-C1'-N1	5.24	112.39	108.20
42	s	108	GLU	CA-CB-CG	5.24	124.92	113.40
32	i	125	U	N1-C2-O2	5.23	126.46	122.80
30	f	3349	C	C6-N1-C2	-5.22	118.21	120.30
30	f	192	C	C6-N1-C2	-5.21	118.21	120.30
30	f	2235	C	C5-C6-N1	5.21	123.61	121.00
30	f	2899	C	N1-C2-O2	5.21	122.03	118.90
30	f	1608	C	C5-C6-N1	5.21	123.60	121.00
30	f	3235	C	N1-C2-O2	5.20	122.02	118.90
30	f	2444	C	C5-C6-N1	5.20	123.60	121.00
30	f	2772	C	N1-C2-O2	5.20	122.02	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
32	i	100	U	N1-C2-O2	5.20	126.44	122.80
30	f	2496	C	C2-N1-C1'	5.19	124.51	118.80
30	f	2585	G	C4-N9-C1'	5.19	133.25	126.50
30	f	915	A	C8-N9-C4	-5.18	103.73	105.80
30	f	1237	G	N3-C4-N9	5.18	129.11	126.00
30	f	3148	U	N3-C2-O2	-5.17	118.58	122.20
30	f	969	C	N3-C2-O2	-5.17	118.28	121.90
30	f	1239	C	C6-N1-C1'	-5.17	114.59	120.80
30	f	890	C	N3-C2-O2	-5.17	118.28	121.90
30	f	87	U	N1-C2-O2	5.16	126.41	122.80
30	f	2622	C	C6-N1-C2	-5.16	118.24	120.30
30	f	637	C	OP1-P-O3'	5.16	116.55	105.20
30	f	849	C	P-O3'-C3'	5.16	125.89	119.70
30	f	1563	C	C6-N1-C1'	5.16	126.99	120.80
31	h	18	C	C2-N1-C1'	5.15	124.47	118.80
30	f	2983	C	C6-N1-C1'	-5.15	114.62	120.80
30	f	149	U	N3-C2-O2	-5.14	118.60	122.20
30	f	166	C	C2-N1-C1'	5.14	124.46	118.80
30	f	3181	C	C6-N1-C2	-5.13	118.25	120.30
30	f	2638	C	N3-C2-O2	-5.13	118.31	121.90
30	f	1951	C	C2-N1-C1'	5.12	124.43	118.80
30	f	758	C	N1-C2-O2	5.10	121.96	118.90
36	m	222	LEU	CA-CB-CG	5.08	126.99	115.30
17	Q	42	LEU	CA-CB-CG	5.08	126.98	115.30
30	f	2873	U	C2-N1-C1'	5.08	123.79	117.70
30	f	1097	G	OP2-P-O3'	5.07	116.36	105.20
30	f	1608	C	C6-N1-C2	-5.07	118.27	120.30
30	f	2444	C	C6-N1-C1'	-5.07	114.71	120.80
35	l	4	PRO	C-N-CA	5.07	134.38	121.70
30	f	2550	U	N1-C2-O2	5.06	126.34	122.80
30	f	3355	U	N1-C2-O2	5.06	126.34	122.80
30	f	969	C	N1-C2-O2	5.05	121.93	118.90
15	O	21	ILE	CG1-CB-CG2	-5.04	100.30	111.40
30	f	1820	U	OP2-P-O3'	5.04	116.30	105.20
30	f	1597	C	C5-C6-N1	5.04	123.52	121.00
30	f	1272	C	C6-N1-C2	-5.04	118.28	120.30
36	m	146	LEU	CB-CG-CD1	-5.04	102.44	111.00
32	i	157	U	N1-C2-O2	5.02	126.32	122.80
31	h	39	C	N1-C2-O2	5.02	121.91	118.90
39	p	79	GLN	CA-CB-CG	5.02	124.45	113.40
30	f	777	U	N1-C2-O2	5.02	126.31	122.80
30	f	1562	C	N3-C2-O2	-5.01	118.39	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
30	f	1277	C	C6-N1-C1'	-5.00	114.80	120.80

There are no chirality outliers.

All (12) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
15	O	20	GLY	Peptide
21	U	83	LYS	Peptide
46	e	392	GLY	Peptide
47	g	8	GLU	Peptide
34	k	141	GLY	Peptide
35	l	13	GLY	Peptide
35	l	318	LEU	Peptide
39	p	158	ASP	Peptide
39	p	30	THR	Peptide
39	p	76	ALA	Peptide
40	q	21	LYS	Peptide
44	u	12	TRP	Peptide

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	1720	0	1779	10	0
2	B	1555	0	1659	13	0
3	C	1416	0	1433	11	0
4	D	1441	0	1543	7	0
5	E	1258	0	1342	6	0
6	F	1437	0	1475	15	0
7	G	1272	0	1312	9	0
8	H	796	0	812	4	0
9	I	1003	0	1048	8	0
10	J	518	0	542	3	0
11	K	964	0	1025	1	0
12	L	984	0	1075	4	0
13	M	1080	0	1122	5	0
14	N	1169	0	1211	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
15	O	462	0	491	6	0
16	P	737	0	792	3	0
17	Q	876	0	912	9	0
18	R	1013	0	1077	5	0
19	S	850	0	880	2	0
20	T	880	0	942	3	0
21	U	969	0	1078	3	0
22	V	766	0	844	4	0
23	W	645	0	645	3	0
24	X	612	0	682	3	0
25	Y	436	0	475	0	0
26	Z	410	0	442	0	0
27	b	824	0	888	0	0
28	c	694	0	734	0	0
29	d	207	0	250	0	0
30	f	68782	0	34563	0	0
31	h	2579	0	1304	0	0
32	i	3353	0	1695	0	0
33	j	1874	0	1943	0	0
34	k	3075	0	3142	0	0
35	l	2748	0	2859	0	0
36	m	2351	0	2294	0	0
37	n	1307	0	1377	0	0
38	o	1784	0	1862	0	0
39	p	1804	0	1877	0	0
40	q	1508	0	1572	0	0
41	r	1764	0	1804	0	0
42	s	1346	0	1370	0	0
43	t	1543	0	1608	0	0
44	u	1053	0	1149	0	0
45	a	6569	0	6459	0	0
46	e	11509	0	10765	0	0
47	g	1651	0	1613	0	0
48	v	1085	0	1086	0	0
49	w	1709	0	1799	0	0
50	y	1556	0	788	0	0
51	z	728	0	337	0	0
52	0	961	0	979	11	0
53	1	85	0	19	0	0
54	A	1	0	0	0	0
54	C	1	0	0	0	0
54	E	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
54	I	1	0	0	0	0
54	R	1	0	0	0	0
54	T	1	0	0	0	0
54	f	3	0	0	0	0
54	h	1	0	0	0	0
54	j	2	0	0	0	0
54	k	1	0	0	0	0
55	T	1	0	0	0	0
55	W	1	0	0	0	0
55	Z	1	0	0	0	0
55	b	1	0	0	0	0
55	c	1	0	0	0	0
55	e	2	0	0	0	0
56	f	10	0	19	0	0
All	All	149748	0	112793	146	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 6.

All (146) 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)
15:O:16:ALA:O	15:O:20:GLY:HA3	1.69	0.90
15:O:16:ALA:O	15:O:20:GLY:CA	2.36	0.73
23:W:21:ARG:HE	23:W:39:TYR:HB2	1.58	0.69
2:B:46[A]:GLU:HB3	2:B:49[A]:ARG:HG3	1.75	0.68
52:0:26:PHE:HB2	52:0:87:VAL:HB	1.73	0.68
7:G:84:TYR:HB2	15:O:24:PRO:HD3	1.78	0.64
2:B:27[A]:LEU:HD21	2:B:102[A]:LEU:HB2	1.80	0.63
13:M:27:LYS:HB3	13:M:42:LEU:HB2	1.81	0.62
9:I:14:SER:O	9:I:81:GLN:NE2	2.33	0.62
6:F:80:ARG:HH21	6:F:87:THR:HG21	1.66	0.60
52:0:192:ASP:HB2	52:0:197:PHE:HE2	1.67	0.59
6:F:8:GLN:HB3	6:F:64:ILE:HD11	1.85	0.59
1:A:183:THR:HG22	1:A:187:ARG:HB2	1.85	0.59
21:U:5:LYS:HB2	21:U:8:GLU:HG2	1.84	0.58
6:F:77:VAL:HG22	6:F:126:VAL:HG23	1.85	0.58
52:0:43:LYS:HA	52:0:46:ARG:HG2	1.87	0.57
11:K:50:ALA:HB1	21:U:66:VAL:HG11	1.86	0.57
17:Q:4:LEU:O	17:Q:79:ARG:NH2	2.38	0.56
17:Q:55:LEU:HB2	17:Q:95:PRO:HD3	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:T:87:GLU:OE2	20:T:91:ARG:NH1	2.39	0.55
52:0:42:ARG:HG2	52:0:51:VAL:HG11	1.88	0.55
18:R:19:ARG:HD3	18:R:33:ARG:HB2	1.89	0.55
2:B:157[A]:GLU:OE2	2:B:160[A]:ARG:NH2	2.40	0.54
17:Q:9:THR:HG23	17:Q:109:VAL:HG23	1.88	0.54
14:N:95:SER:OG	14:N:98:THR:OG1	2.25	0.54
7:G:17:ARG:HG2	7:G:22:HIS:HA	1.90	0.53
8:H:56:VAL:HG12	8:H:65:VAL:HG22	1.88	0.53
2:B:75[A]:ALA:HB3	2:B:78[A]:ARG:HG2	1.90	0.53
10:J:6:ASP:OD1	10:J:32:GLN:N	2.40	0.53
8:H:44:GLU:OE2	8:H:49:ASN:ND2	2.41	0.52
10:J:47:ARG:HH21	10:J:58:HIS:HB2	1.73	0.52
2:B:61[A]:ALA:HA	2:B:70[A]:PRO:HD2	1.90	0.52
6:F:96:ASP:OD1	6:F:97:VAL:N	2.38	0.52
6:F:77:VAL:HG11	6:F:106:LEU:HD22	1.92	0.52
3:C:118:GLN:NE2	3:C:147:GLU:OE2	2.39	0.52
4:D:36:LEU:O	4:D:40:THR:OG1	2.27	0.52
6:F:80:ARG:HB2	6:F:122:HIS:HB2	1.91	0.52
7:G:136:ARG:HD2	7:G:139:ARG:HH12	1.74	0.52
9:I:94:TYR:OH	10:J:41:LYS:NZ	2.39	0.52
14:N:100:PRO:HG2	14:N:123:VAL:HG23	1.93	0.51
1:A:103:GLU:HG3	1:A:160:GLU:HB2	1.93	0.51
7:G:99:SER:HG	7:G:101:CYS:HG	1.59	0.50
15:O:23:LYS:HG3	15:O:24:PRO:HD2	1.93	0.50
3:C:107:LEU:HD12	3:C:152:GLU:HG3	1.92	0.50
2:B:74[A]:ARG:O	2:B:142[A]:SER:OG	2.23	0.50
3:C:60:PHE:HB3	3:C:64:ASN:HB3	1.93	0.49
17:Q:77:ARG:HD2	17:Q:89:LEU:HD13	1.94	0.49
2:B:46[A]:GLU:HG3	2:B:48[A]:PHE:H	1.77	0.49
16:P:30:THR:HG23	16:P:91:SER:HB2	1.95	0.49
16:P:9:SER:OG	16:P:10:ILE:N	2.39	0.49
6:F:155:ARG:HB2	6:F:172:TYR:HD1	1.77	0.49
7:G:108:ARG:O	7:G:112:ASN:HB2	2.12	0.49
14:N:94:ALA:HA	14:N:121:VAL:HG23	1.95	0.48
4:D:131:ALA:HB1	4:D:135:GLN:H	1.79	0.48
17:Q:80:ASN:OD1	17:Q:81:GLU:N	2.45	0.48
19:S:49:ILE:HD11	19:S:71:VAL:HG22	1.96	0.48
4:D:102:ALA:HA	4:D:122:ILE:O	2.14	0.48
13:M:133:LYS:HE3	13:M:135:ARG:HD3	1.95	0.48
6:F:93:GLU:HG3	6:F:140:VAL:HG11	1.95	0.48
4:D:19:PRO:HB3	4:D:53:PHE:HA	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:23:VAL:HG12	13:M:45:GLY:HA3	1.94	0.47
17:Q:75:ILE:HG12	17:Q:93:VAL:HG22	1.96	0.47
3:C:22:LEU:HD12	3:C:146:ILE:HD12	1.97	0.47
52:0:26:PHE:HZ	52:0:93:LEU:HA	1.80	0.47
5:E:151:ARG:NH2	5:E:152:GLU:OE2	2.45	0.47
4:D:170:ARG:HD2	14:N:57:GLY:HA3	1.97	0.47
5:E:21:LYS:HE3	5:E:55:VAL:HA	1.97	0.47
9:I:18:PRO:HA	9:I:51:ALA:HA	1.97	0.47
1:A:5:LYS:HE2	22:V:40:VAL:HG21	1.97	0.47
5:E:68:GLN:OE1	5:E:71:ARG:NH2	2.43	0.46
3:C:67:ILE:HD11	3:C:80:LYS:HB3	1.98	0.46
15:O:55:ALA:O	15:O:59:LYS:HB3	2.16	0.46
12:L:55:GLU:HB2	12:L:108:LYS:HB3	1.98	0.46
12:L:74:TYR:HB3	12:L:77:LYS:HB2	1.98	0.46
13:M:28:PRO:O	13:M:29:HIS:ND1	2.48	0.46
18:R:9:ILE:HG12	18:R:63:THR:HG23	1.97	0.46
2:B:39[A]:GLU:HG2	2:B:40[A]:GLU:HG2	1.97	0.46
14:N:96:LYS:HB2	14:N:96:LYS:HE2	1.70	0.46
18:R:60:ASN:HB3	18:R:63:THR:HB	1.97	0.46
13:M:22:LYS:NZ	13:M:132:SER:O	2.47	0.45
1:A:159:ARG:HB3	1:A:164:LEU:HB2	1.98	0.45
19:S:14:LEU:HD11	19:S:31:LYS:HB2	1.98	0.45
9:I:10:LYS:NZ	9:I:56:ASP:OD1	2.41	0.45
17:Q:44:MET:O	17:Q:77:ARG:NH1	2.49	0.45
6:F:22:PRO:O	7:G:146:ASN:ND2	2.38	0.45
22:V:53:TYR:HA	22:V:56:ARG:HG2	1.99	0.45
1:A:170:LYS:HB3	1:A:170:LYS:HE3	4.56	0.45
9:I:38:ALA:HB3	9:I:59:MET:HB2	1.99	0.44
6:F:80:ARG:HG3	6:F:124:LEU:HD21	1.99	0.44
15:O:21:ILE:HD12	15:O:21:ILE:HG23	1.83	0.44
24:X:10:GLN:HA	24:X:13:GLU:HG2	1.99	0.44
2:B:127[A]:LEU:HD22	6:F:156:VAL:HG13	2.00	0.44
17:Q:46:THR:HG22	17:Q:48:ASP:H	1.82	0.44
9:I:129:VAL:O	9:I:133:SER:HB3	2.17	0.44
14:N:36:GLY:HA3	14:N:40:HIS:CE1	2.53	0.44
4:D:161:LYS:HD3	4:D:161:LYS:HA	1.82	0.43
6:F:80:ARG:HD2	7:G:155:PRO:HA	2.00	0.43
52:0:45:LEU:HB3	52:0:49:ALA:HB3	1.99	0.43
8:H:20:SER:HA	8:H:23:THR:HG22	2.00	0.43
9:I:117:PRO:HA	9:I:135:VAL:HG13	2.00	0.43
23:W:58:THR:OG1	23:W:59:THR:N	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
23:W:27:PHE:HA	23:W:34:CYS:HA	2.01	0.43
52:0:15:LEU:O	52:0:19:LEU:HG	2.18	0.43
4:D:124:LEU:HD13	4:D:127:LEU:HD23	2.01	0.43
52:0:75:LYS:O	52:0:78:PRO:HD2	2.19	0.43
1:A:158:HIS:HB3	1:A:161:ALA:HB3	2.00	0.43
3:C:56:ARG:NH2	3:C:75:GLU:OE2	2.51	0.43
5:E:102:LEU:HD22	5:E:138:LEU:HD22	2.01	0.43
24:X:2:ALA:N	24:X:51:LEU:O	2.52	0.43
1:A:68:ARG:HA	1:A:98:LEU:HD21	2.01	0.43
2:B:54[A]:TYR:OH	2:B:73[A]:PHE:O	2.37	0.43
18:R:3:SER:OG	18:R:4:LEU:N	2.51	0.43
12:L:86:THR:OG1	12:L:94:SER:OG	2.36	0.42
3:C:179:GLN:HA	3:C:182:ILE:HG22	2.00	0.42
9:I:80:ARG:HB2	9:I:99:ALA:HB3	2.00	0.42
6:F:95:ARG:HB2	6:F:140:VAL:HG23	2.00	0.42
21:U:78:LYS:HA	21:U:81:ARG:HG2	2.00	0.42
52:0:14:LYS:HE3	52:0:52:LEU:HD11	2.00	0.42
52:0:70:LEU:HB3	52:0:73:PHE:CD1	2.55	0.42
6:F:32:SER:HB2	6:F:36:ILE:HD12	2.01	0.42
8:H:41:ILE:HG21	8:H:54:VAL:HG21	2.02	0.42
24:X:33:LYS:HA	24:X:33:LYS:HD3	1.84	0.42
3:C:182:ILE:HD12	3:C:182:ILE:HA	1.85	0.42
16:P:73:GLY:N	16:P:76:GLU:OE1	2.42	0.42
52:0:67:LEU:HD22	52:0:67:LEU:HA	1.85	0.42
20:T:95:ILE:HD13	20:T:95:ILE:HG21	1.81	0.42
1:A:98:LEU:HD22	1:A:128:LYS:HD2	2.02	0.41
3:C:116:HIS:HB3	3:C:149:VAL:HB	2.02	0.41
2:B:8[A]:VAL:HG12	2:B:117[A]:ARG:HG3	2.03	0.41
12:L:63:LYS:HA	12:L:63:LYS:HD3	1.92	0.41
22:V:5:THR:HG23	22:V:12:ASN:HB2	2.03	0.41
3:C:122:ALA:HB3	3:C:143:PRO:HB2	2.02	0.41
3:C:131:ARG:HG3	3:C:137:ASN:ND2	2.36	0.41
5:E:7:GLN:NE2	5:E:35:ALA:O	2.53	0.41
7:G:102:ARG:HD2	7:G:102:ARG:HA	1.77	0.41
1:A:9:GLU:HG3	22:V:44:VAL:HG21	2.03	0.41
14:N:75:LEU:HD23	14:N:75:LEU:HA	1.92	0.41
18:R:4:LEU:HD12	18:R:5:PRO:HD2	2.01	0.41
1:A:18:VAL:HG13	1:A:19:LEU:HD12	2.02	0.40
2:B:189[A]:ASP:OD1	2:B:190[A]:VAL:N	2.53	0.40
2:B:121[A]:PRO:HA	2:B:124[A]:LEU:HD12	2.03	0.40
17:Q:20:LEU:HD11	17:Q:32:ALA:HB2	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:T:93:PHE:HD2	20:T:94:LEU:HD22	1.86	0.40
5:E:31:GLU:HA	5:E:34:GLN:HB2	2.03	0.40
6:F:40:ARG:HA	6:F:40:ARG:HD2	1.84	0.40
7:G:73:GLY:HA2	7:G:89:LEU:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	201/204 (98%)	190 (94%)	11 (6%)	0	100	100
2	B	195/199 (98%)	192 (98%)	3 (2%)	0	100	100
3	C	181/184 (98%)	172 (95%)	9 (5%)	0	100	100
4	D	183/186 (98%)	176 (96%)	7 (4%)	0	100	100
5	E	154/189 (82%)	151 (98%)	3 (2%)	0	100	100
6	F	169/172 (98%)	163 (96%)	6 (4%)	0	100	100
7	G	157/160 (98%)	149 (95%)	8 (5%)	0	100	100
8	H	98/121 (81%)	93 (95%)	5 (5%)	0	100	100
9	I	134/137 (98%)	132 (98%)	2 (2%)	0	100	100
10	J	61/155 (39%)	61 (100%)	0	0	100	100
11	K	119/142 (84%)	118 (99%)	1 (1%)	0	100	100
12	L	123/127 (97%)	119 (97%)	4 (3%)	0	100	100
13	M	133/136 (98%)	126 (95%)	7 (5%)	0	100	100
14	N	146/149 (98%)	136 (93%)	10 (7%)	0	100	100
15	O	56/59 (95%)	52 (93%)	3 (5%)	1 (2%)	7	18
16	P	94/105 (90%)	93 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
17	Q	107/113 (95%)	98 (92%)	9 (8%)	0	100	100
18	R	125/130 (96%)	123 (98%)	2 (2%)	0	100	100
19	S	104/107 (97%)	101 (97%)	3 (3%)	0	100	100
20	T	110/121 (91%)	108 (98%)	2 (2%)	0	100	100
21	U	117/120 (98%)	112 (96%)	5 (4%)	0	100	100
22	V	97/100 (97%)	93 (96%)	4 (4%)	0	100	100
23	W	79/88 (90%)	75 (95%)	4 (5%)	0	100	100
24	X	75/78 (96%)	74 (99%)	1 (1%)	0	100	100
25	Y	48/51 (94%)	46 (96%)	2 (4%)	0	100	100
26	Z	50/128 (39%)	47 (94%)	3 (6%)	0	100	100
27	b	101/106 (95%)	95 (94%)	6 (6%)	0	100	100
28	c	89/92 (97%)	85 (96%)	4 (4%)	0	100	100
29	d	20/25 (80%)	19 (95%)	1 (5%)	0	100	100
33	j	244/254 (96%)	225 (92%)	19 (8%)	0	100	100
34	k	384/387 (99%)	364 (95%)	20 (5%)	0	100	100
35	l	359/362 (99%)	329 (92%)	29 (8%)	1 (0%)	37	61
36	m	292/297 (98%)	278 (95%)	14 (5%)	0	100	100
37	n	163/176 (93%)	154 (94%)	9 (6%)	0	100	100
38	o	220/244 (90%)	207 (94%)	13 (6%)	0	100	100
39	p	231/256 (90%)	220 (95%)	11 (5%)	0	100	100
40	q	189/191 (99%)	174 (92%)	14 (7%)	1 (0%)	25	49
41	r	216/221 (98%)	206 (95%)	10 (5%)	0	100	100
42	s	167/174 (96%)	161 (96%)	5 (3%)	1 (1%)	22	45
43	t	191/199 (96%)	174 (91%)	16 (8%)	1 (0%)	25	49
44	u	134/138 (97%)	125 (93%)	9 (7%)	0	100	100
45	a	842/1038 (81%)	831 (99%)	11 (1%)	0	100	100
46	e	1519/1562 (97%)	1505 (99%)	11 (1%)	3 (0%)	44	68
47	g	223/245 (91%)	215 (96%)	8 (4%)	0	100	100
48	v	139/157 (88%)	139 (100%)	0	0	100	100
49	w	214/217 (99%)	211 (99%)	3 (1%)	0	100	100
51	z	144/165 (87%)	137 (95%)	6 (4%)	1 (1%)	19	42

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
52	0	117/312 (38%)	116 (99%)	0	1 (1%)	14 35
All	All	9314/10279 (91%)	8970 (96%)	334 (4%)	10 (0%)	50 73

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
46	e	393	PHE
51	z	88	PRO
46	e	396	ARG
35	l	4	PRO
40	q	107	ASP
42	s	108	GLU
52	0	93	LEU
46	e	855	PRO
15	O	21	ILE
43	t	47	ALA

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
1	A	175/176 (99%)	175 (100%)	0	100 100
2	B	160/162 (99%)	160 (100%)	0	100 100
3	C	138/146 (94%)	138 (100%)	0	100 100
4	D	150/151 (99%)	149 (99%)	1 (1%)	81 93
5	E	129/154 (84%)	129 (100%)	0	100 100
6	F	155/156 (99%)	155 (100%)	0	100 100
7	G	135/137 (98%)	134 (99%)	1 (1%)	81 93
8	H	87/107 (81%)	87 (100%)	0	100 100
9	I	104/105 (99%)	104 (100%)	0	100 100
10	J	54/129 (42%)	54 (100%)	0	100 100
11	K	104/118 (88%)	104 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
12	L	108/110 (98%)	108 (100%)	0	100	100
13	M	112/116 (97%)	112 (100%)	0	100	100
14	N	117/119 (98%)	117 (100%)	0	100	100
15	O	46/47 (98%)	45 (98%)	1 (2%)	47	76
16	P	81/88 (92%)	81 (100%)	0	100	100
17	Q	92/97 (95%)	92 (100%)	0	100	100
18	R	107/111 (96%)	107 (100%)	0	100	100
19	S	90/91 (99%)	90 (100%)	0	100	100
20	T	95/103 (92%)	94 (99%)	1 (1%)	70	87
21	U	104/105 (99%)	104 (100%)	0	100	100
22	V	80/82 (98%)	80 (100%)	0	100	100
23	W	67/71 (94%)	67 (100%)	0	100	100
24	X	68/69 (99%)	66 (97%)	2 (3%)	37	67
25	Y	45/46 (98%)	45 (100%)	0	100	100
26	Z	45/116 (39%)	45 (100%)	0	100	100
27	b	87/91 (96%)	87 (100%)	0	100	100
28	c	71/72 (99%)	71 (100%)	0	100	100
29	d	20/23 (87%)	20 (100%)	0	100	100
33	j	189/196 (96%)	188 (100%)	1 (0%)	86	95
34	k	320/323 (99%)	318 (99%)	2 (1%)	84	94
35	l	288/289 (100%)	288 (100%)	0	100	100
36	m	241/245 (98%)	241 (100%)	0	100	100
37	n	139/155 (90%)	138 (99%)	1 (1%)	81	93
38	o	186/205 (91%)	186 (100%)	0	100	100
39	p	187/208 (90%)	187 (100%)	0	100	100
40	q	168/171 (98%)	168 (100%)	0	100	100
41	r	185/187 (99%)	183 (99%)	2 (1%)	70	87
42	s	145/150 (97%)	145 (100%)	0	100	100
43	t	154/159 (97%)	154 (100%)	0	100	100
44	u	107/109 (98%)	107 (100%)	0	100	100
45	a	676/949 (71%)	639 (94%)	37 (6%)	18	41

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
46	e	1150/1451 (79%)	1073 (93%)	77 (7%)	13 33
47	g	180/211 (85%)	180 (100%)	0	100 100
48	v	119/132 (90%)	116 (98%)	3 (2%)	42 72
49	w	197/198 (100%)	196 (100%)	1 (0%)	86 95
52	0	104/254 (41%)	95 (91%)	9 (9%)	8 20
All	All	7561/8690 (87%)	7422 (98%)	139 (2%)	54 80

All (139) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	D	12	ARG
7	G	83	ARG
15	O	33	LYS
20	T	106	LYS
24	X	9	LYS
24	X	63	LYS
33	j	221	LYS
34	k	332	ARG
34	k	369	ARG
37	n	8	LYS
41	r	112	GLN
41	r	144	ASN
45	a	3	GLN
45	a	9	ASP
45	a	10	LEU
45	a	25	ARG
45	a	27	SER
45	a	28	ASN
45	a	32	ILE
45	a	63	THR
45	a	89	LEU
45	a	121	ASN
45	a	139	LEU
45	a	156	LEU
45	a	285	ILE
45	a	293	TYR
45	a	316	ILE
45	a	368	ARG
45	a	453	ASP
45	a	589	MET

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Mol	Chain	Res	Type
45	a	605	ILE
45	a	609	ASP
45	a	627	LYS
45	a	630	VAL
45	a	649	TRP
45	a	665	VAL
45	a	682	ARG
45	a	696	GLN
45	a	697	LEU
45	a	837	VAL
45	a	868	THR
45	a	881	GLU
45	a	896	ARG
45	a	917	TYR
45	a	928	LEU
45	a	934	VAL
45	a	947	LEU
45	a	1003	GLN
45	a	1014	LEU
46	e	28	ASN
46	e	102	ASP
46	e	105	VAL
46	e	125	ILE
46	e	143	LEU
46	e	175	GLU
46	e	178	LEU
46	e	190	GLU
46	e	251	ASN
46	e	264	VAL
46	e	299	THR
46	e	310	LEU
46	e	328	ILE
46	e	358	VAL
46	e	394	SER
46	e	401	VAL
46	e	403	ASN
46	e	412	PHE
46	e	698	TYR
46	e	704	THR
46	e	707	LYS
46	e	710	LYS
46	e	731	LEU

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Mol	Chain	Res	Type
46	e	733	HIS
46	e	754	ILE
46	e	759	ASP
46	e	770	ILE
46	e	782	TYR
46	e	807	LYS
46	e	819	LEU
46	e	820	ASP
46	e	823	LEU
46	e	826	LEU
46	e	842	SER
46	e	862	PHE
46	e	866	PHE
46	e	893	MET
46	e	895	THR
46	e	904	VAL
46	e	921	ILE
46	e	933	LEU
46	e	987	ILE
46	e	990	VAL
46	e	997	PHE
46	e	1019	ILE
46	e	1047	THR
46	e	1050	LEU
46	e	1061	ARG
46	e	1079	LEU
46	e	1084	LEU
46	e	1086	MET
46	e	1094	TYR
46	e	1102	CYS
46	e	1171	TYR
46	e	1179	LEU
46	e	1189	ASN
46	e	1190	GLN
46	e	1193	LEU
46	e	1195	THR
46	e	1239	LYS
46	e	1240	LEU
46	e	1258	GLU
46	e	1274	LEU
46	e	1286	MET
46	e	1300	ILE

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Mol	Chain	Res	Type
46	e	1303	MET
46	e	1342	GLU
46	e	1358	GLN
46	e	1367	THR
46	e	1379	LEU
46	e	1391	ILE
46	e	1409	ARG
46	e	1432	TYR
46	e	1439	LEU
46	e	1441	ILE
46	e	1539	LEU
46	e	1555	ARG
48	v	54	HIS
48	v	71	GLU
48	v	73	LEU
49	w	98	LYS
52	0	30	VAL
52	0	51	VAL
52	0	52	LEU
52	0	67	LEU
52	0	76	LEU
52	0	80	VAL
52	0	93	LEU
52	0	95	GLU
52	0	189	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (27) such sidechains are listed below:

Mol	Chain	Res	Type
45	a	3	GLN
45	a	382	GLN
45	a	413	GLN
45	a	445	GLN
45	a	532	GLN
45	a	599	GLN
45	a	664	ASN
45	a	696	GLN
45	a	957	GLN
45	a	1003	GLN
46	e	160	ASN
46	e	174	GLN
46	e	226	ASN

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Mol	Chain	Res	Type
46	e	233	ASN
46	e	254	ASN
46	e	1111	GLN
46	e	1138	ASN
46	e	1141	GLN
46	e	1206	GLN
46	e	1293	GLN
46	e	1354	HIS
46	e	1455	GLN
46	e	1484	ASN
46	e	1532	ASN
47	g	9	ASN
48	v	52	HIS
52	0	36	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
30	f	3212/3395 (94%)	594 (18%)	0
31	h	120/121 (99%)	12 (10%)	0
32	i	157/158 (99%)	32 (20%)	0
50	y	71/76 (93%)	27 (38%)	0
All	All	3560/3750 (94%)	665 (18%)	0

All (665) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
30	f	6	A
30	f	13	A
30	f	14	U
30	f	26	A
30	f	40	A
30	f	43	A
30	f	49	A
30	f	59	G
30	f	60	A
30	f	65	A
30	f	66	A
30	f	92	G
30	f	99	A
30	f	109	A

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Mol	Chain	Res	Type
30	f	110	G
30	f	111	C
30	f	116	A
30	f	120	G
30	f	121	A
30	f	122	A
30	f	133	U
30	f	134	U
30	f	135	C
30	f	136	G
30	f	156	G
30	f	157	A
30	f	165	A
30	f	166	C
30	f	172	G
30	f	173	G
30	f	187	A
30	f	190	U
30	f	191	U
30	f	200	C
30	f	206	G
30	f	210	U
30	f	211	A
30	f	213	A
30	f	218	G
30	f	219	A
30	f	234	G
30	f	240	U
30	f	241	G
30	f	242	C
30	f	243	G
30	f	245	U
30	f	249	U
30	f	252	U
30	f	269	G
30	f	283	G
30	f	286	U
30	f	295	A
30	f	305	U
30	f	323	A
30	f	329	U
30	f	339	C

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Mol	Chain	Res	Type
30	f	350	C
30	f	374	A
30	f	376	G
30	f	398	A
30	f	399	A
30	f	401	U
30	f	402	A
30	f	403	C
30	f	421	G
30	f	422	A
30	f	439	C
30	f	440	A
30	f	441	U
30	f	442	G
30	f	443	G
30	f	445	G
30	f	446	U
30	f	447	U
30	f	448	U
30	f	450	G
30	f	487	U
30	f	488	U
30	f	489	U
30	f	490	C
30	f	494	G
30	f	518	G
30	f	520	U
30	f	521	A
30	f	523	A
30	f	535	G
30	f	536	U
30	f	543	C
30	f	544	C
30	f	546	C
30	f	547	G
30	f	548	G
30	f	551	A
30	f	552	G
30	f	555	U
30	f	557	A
30	f	559	A
30	f	578	A

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Mol	Chain	Res	Type
30	f	579	G
30	f	589	A
30	f	597	G
30	f	604	G
30	f	608	A
30	f	609	G
30	f	611	A
30	f	620	U
30	f	621	A
30	f	622	A
30	f	637	C
30	f	638	C
30	f	649	A
30	f	660	A
30	f	667	C
30	f	677	A
30	f	681	U
30	f	684	G
30	f	690	A
30	f	691	A
30	f	705	A
30	f	712	G
30	f	715	A
30	f	716	A
30	f	719	U
30	f	720	A
30	f	758	C
30	f	763	G
30	f	764	U
30	f	765	C
30	f	766	U
30	f	767	U
30	f	776	U
30	f	777	U
30	f	780	A
30	f	781	G
30	f	785	G
30	f	786	A
30	f	806	A
30	f	817	A
30	f	830	A
30	f	846	A

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Mol	Chain	Res	Type
30	f	849	C
30	f	850	U
30	f	861	C
30	f	874	U
30	f	879	U
30	f	896	A
30	f	907	G
30	f	908	G
30	f	914	A
30	f	916	G
30	f	917	A
30	f	920	A
30	f	921	A
30	f	924	G
30	f	925	A
30	f	937	G
30	f	944	C
30	f	959	C
30	f	960	U
30	f	981	U
30	f	982	C
30	f	991	G
30	f	994	G
30	f	1001	G
30	f	1002	A
30	f	1010	G
30	f	1015	U
30	f	1016	C
30	f	1017	C
30	f	1018	G
30	f	1021	G
30	f	1024	G
30	f	1025	A
30	f	1028	U
30	f	1036	A
30	f	1041	U
30	f	1047	A
30	f	1049	C
30	f	1063	G
30	f	1064	A
30	f	1065	A
30	f	1072	G

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Mol	Chain	Res	Type
30	f	1081	U
30	f	1087	G
30	f	1093	A
30	f	1094	U
30	f	1095	U
30	f	1097	G
30	f	1098	A
30	f	1103	A
30	f	1104	G
30	f	1117	G
30	f	1131	G
30	f	1144	U
30	f	1153	A
30	f	1159	A
30	f	1160	C
30	f	1177	G
30	f	1180	A
30	f	1181	U
30	f	1192	C
30	f	1193	A
30	f	1196	C
30	f	1197	A
30	f	1201	C
30	f	1202	A
30	f	1208	U
30	f	1217	A
30	f	1218	U
30	f	1219	C
30	f	1222	G
30	f	1225	A
30	f	1227	C
30	f	1235	U
30	f	1236	G
30	f	1238	C
30	f	1241	U
30	f	1242	G
30	f	1244	A
30	f	1245	A
30	f	1251	A
30	f	1252	A
30	f	1254	C
30	f	1258	U

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Mol	Chain	Res	Type
30	f	1259	A
30	f	1263	A
30	f	1264	G
30	f	1265	U
30	f	1269	U
30	f	1272	C
30	f	1277	C
30	f	1278	A
30	f	1279	C
30	f	1282	G
30	f	1285	G
30	f	1286	A
30	f	1287	A
30	f	1295	G
30	f	1307	G
30	f	1308	A
30	f	1309	U
30	f	1313	G
30	f	1330	A
30	f	1348	U
30	f	1349	G
30	f	1351	U
30	f	1352	A
30	f	1354	G
30	f	1355	A
30	f	1356	U
30	f	1357	G
30	f	1386	A
30	f	1392	G
30	f	1399	A
30	f	1400	G
30	f	1419	A
30	f	1434	G
30	f	1437	C
30	f	1446	A
30	f	1450	G
30	f	1481	A
30	f	1482	A
30	f	1483	G
30	f	1487	G
30	f	1488	G
30	f	1502	C

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Mol	Chain	Res	Type
30	f	1508	C
30	f	1536	G
30	f	1539	A
30	f	1555	U
30	f	1556	C
30	f	1557	A
30	f	1560	G
30	f	1562	C
30	f	1563	C
30	f	1566	A
30	f	1568	U
30	f	1569	U
30	f	1572	U
30	f	1573	G
30	f	1575	A
30	f	1576	G
30	f	1580	A
30	f	1581	C
30	f	1582	C
30	f	1583	A
30	f	1589	A
30	f	1590	G
30	f	1605	A
30	f	1607	U
30	f	1620	U
30	f	1629	U
30	f	1639	C
30	f	1642	A
30	f	1643	A
30	f	1645	U
30	f	1657	C
30	f	1683	A
30	f	1716	U
30	f	1717	U
30	f	1724	U
30	f	1725	C
30	f	1736	G
30	f	1741	A
30	f	1750	A
30	f	1751	G
30	f	1760	A
30	f	1761	C

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Mol	Chain	Res	Type
30	f	1764	U
30	f	1765	U
30	f	1766	G
30	f	1770	G
30	f	1775	G
30	f	1780	G
30	f	1797	A
30	f	1814	A
30	f	1816	A
30	f	1819	U
30	f	1820	U
30	f	1821	U
30	f	1835	A
30	f	1839	A
30	f	1840	U
30	f	1841	A
30	f	1842	A
30	f	1846	C
30	f	1849	C
30	f	1850	A
30	f	1866	C
30	f	1867	A
30	f	1880	U
30	f	1881	A
30	f	1893	A
30	f	1906	G
30	f	1943	C
30	f	1952	G
30	f	1953	G
30	f	1954	G
30	f	2094	C
30	f	2101	C
30	f	2102	U
30	f	2111	G
30	f	2112	U
30	f	2113	A
30	f	2114	C
30	f	2121	G
30	f	2122	G
30	f	2131	A
30	f	2134	G
30	f	2140	U

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Mol	Chain	Res	Type
30	f	2144	A
30	f	2158	A
30	f	2160	G
30	f	2169	G
30	f	2176	U
30	f	2201	G
30	f	2206	G
30	f	2207	A
30	f	2208	A
30	f	2209	U
30	f	2222	A
30	f	2223	A
30	f	2225	U
30	f	2228	A
30	f	2249	G
30	f	2270	A
30	f	2272	G
30	f	2273	G
30	f	2274	U
30	f	2281	A
30	f	2282	U
30	f	2288	G
30	f	2307	G
30	f	2308	C
30	f	2310	U
30	f	2313	A
30	f	2314	U
30	f	2315	G
30	f	2334	U
30	f	2335	G
30	f	2336	U
30	f	2373	A
30	f	2374	C
30	f	2375	G
30	f	2385	G
30	f	2388	U
30	f	2393	G
30	f	2397	A
30	f	2402	A
30	f	2403	G
30	f	2404	A
30	f	2411	U

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Mol	Chain	Res	Type
30	f	2419	A
30	f	2437	G
30	f	2446	U
30	f	2447	A
30	f	2450	G
30	f	2461	A
30	f	2463	G
30	f	2464	U
30	f	2468	A
30	f	2469	G
30	f	2470	C
30	f	2471	U
30	f	2472	U
30	f	2474	G
30	f	2479	C
30	f	2480	A
30	f	2484	A
30	f	2486	A
30	f	2487	U
30	f	2488	A
30	f	2494	A
30	f	2495	C
30	f	2496	C
30	f	2499	U
30	f	2501	U
30	f	2502	A
30	f	2503	G
30	f	2505	U
30	f	2514	U
30	f	2515	A
30	f	2522	G
30	f	2526	C
30	f	2531	C
30	f	2537	U
30	f	2538	U
30	f	2539	C
30	f	2540	A
30	f	2541	U
30	f	2542	U
30	f	2544	U
30	f	2547	A
30	f	2548	C

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Mol	Chain	Res	Type
30	f	2549	G
30	f	2552	C
30	f	2554	A
30	f	2555	G
30	f	2561	A
30	f	2569	A
30	f	2570	U
30	f	2571	U
30	f	2572	C
30	f	2573	G
30	f	2581	U
30	f	2585	G
30	f	2593	A
30	f	2594	C
30	f	2606	G
30	f	2607	G
30	f	2614	G
30	f	2648	G
30	f	2651	G
30	f	2652	U
30	f	2656	A
30	f	2674	A
30	f	2677	G
30	f	2678	A
30	f	2689	A
30	f	2691	A
30	f	2694	A
30	f	2696	A
30	f	2704	A
30	f	2714	G
30	f	2719	U
30	f	2728	G
30	f	2729	U
30	f	2740	A
30	f	2752	U
30	f	2753	G
30	f	2755	C
30	f	2772	C
30	f	2773	C
30	f	2777	G
30	f	2778	G
30	f	2788	C

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Mol	Chain	Res	Type
30	f	2796	G
30	f	2800	G
30	f	2801	A
30	f	2803	A
30	f	2810	C
30	f	2814	G
30	f	2817	A
30	f	2818	U
30	f	2821	C
30	f	2834	G
30	f	2842	U
30	f	2844	C
30	f	2845	A
30	f	2849	C
30	f	2860	U
30	f	2867	C
30	f	2871	G
30	f	2872	A
30	f	2875	U
30	f	2887	A
30	f	2898	G
30	f	2899	C
30	f	2911	A
30	f	2914	G
30	f	2923	U
30	f	2935	U
30	f	2936	A
30	f	2938	G
30	f	2941	A
30	f	2942	C
30	f	2947	G
30	f	2955	U
30	f	2971	A
30	f	2983	C
30	f	2990	G
30	f	2992	U
30	f	2996	U
30	f	2997	G
30	f	3006	A
30	f	3012	A
30	f	3056	U
30	f	3059	G

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Mol	Chain	Res	Type
30	f	3078	U
30	f	3079	U
30	f	3080	G
30	f	3086	A
30	f	3092	C
30	f	3104	U
30	f	3113	A
30	f	3122	A
30	f	3130	A
30	f	3131	U
30	f	3142	A
30	f	3143	C
30	f	3151	U
30	f	3154	C
30	f	3155	U
30	f	3156	U
30	f	3157	U
30	f	3165	A
30	f	3170	A
30	f	3173	G
30	f	3174	A
30	f	3175	U
30	f	3176	G
30	f	3179	U
30	f	3181	C
30	f	3186	A
30	f	3187	A
30	f	3196	U
30	f	3207	U
30	f	3209	A
30	f	3217	C
30	f	3218	A
30	f	3219	G
30	f	3228	C
30	f	3229	G
30	f	3243	A
30	f	3245	A
30	f	3247	G
30	f	3259	U
30	f	3263	G
30	f	3269	U
30	f	3270	U

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Mol	Chain	Res	Type
30	f	3273	A
30	f	3276	G
30	f	3281	U
30	f	3287	U
30	f	3288	G
30	f	3289	G
30	f	3294	A
30	f	3295	A
30	f	3303	G
30	f	3304	U
30	f	3307	A
30	f	3313	U
30	f	3316	A
30	f	3317	U
30	f	3318	G
30	f	3319	U
30	f	3320	A
30	f	3341	U
30	f	3342	A
30	f	3345	G
30	f	3351	U
30	f	3352	U
30	f	3353	G
30	f	3354	U
30	f	3355	U
30	f	3369	G
30	f	3375	A
30	f	3378	C
30	f	3382	U
30	f	3383	G
30	f	3386	G
30	f	3389	U
30	f	3390	G
30	f	3396	U
31	h	7	G
31	h	29	C
31	h	53	U
31	h	54	U
31	h	55	A
31	h	65	G
31	h	73	C
31	h	74	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
31	h	95	A
31	h	102	A
31	h	112	G
31	h	121	U
32	i	23	U
32	i	34	U
32	i	35	C
32	i	39	G
32	i	48	A
32	i	52	A
32	i	53	A
32	i	59	A
32	i	62	C
32	i	63	G
32	i	80	A
32	i	81	U
32	i	82	U
32	i	83	C
32	i	84	C
32	i	85	G
32	i	86	U
32	i	87	G
32	i	90	U
32	i	95	G
32	i	104	A
32	i	105	A
32	i	106	C
32	i	111	A
32	i	113	U
32	i	125	U
32	i	126	A
32	i	138	A
32	i	151	C
32	i	152	G
32	i	157	U
32	i	158	U
50	y	7	G
50	y	8	U
50	y	9	G
50	y	13	U
50	y	16	U
50	y	17	C

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Mol	Chain	Res	Type
50	y	22	G
50	y	23	C
50	y	31	C
50	y	34	A
50	y	35	G
50	y	36	C
50	y	38	U
50	y	42	A
50	y	43	G
50	y	44	A
50	y	45	G
50	y	46	G
50	y	47	U
50	y	48	C
50	y	56	C
50	y	58	A
50	y	60	U
50	y	68	C
50	y	71	C
50	y	75	C
50	y	76	A

There are no RNA pucker outliers to report.

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

1 non-standard protein/DNA/RNA residue is 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	$\#\|Z\| > 2$
48	5CT	v	51	48	13,14,15	0.78	0	8,15,17	1.29	1 (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
48	5CT	v	51	48	-	9/13/14/16	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
48	v	51	5CT	C4-C3-C2	-2.19	108.85	113.47

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
48	v	51	5CT	NZ-C1-C2-C3
48	v	51	5CT	O1-C2-C3-C4
48	v	51	5CT	C2-C3-C4-N1
48	v	51	5CT	C-CA-CB-CG
48	v	51	5CT	N-CA-CB-CG
48	v	51	5CT	NZ-C1-C2-O1
48	v	51	5CT	C1-C2-C3-C4
48	v	51	5CT	C2-C1-NZ-CE
48	v	51	5CT	CE-CD-CG-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 21 ligands modelled in this entry, 20 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the

expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
56	SPD	f	3401	-	9,9,9	0.32	0	8,8,8	0.85	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
56	SPD	f	3401	-	-	5/7/7/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
56	f	3401	SPD	C3-C4-C5-N6
56	f	3401	SPD	N6-C7-C8-C9
56	f	3401	SPD	C2-C3-C4-C5
56	f	3401	SPD	C4-C5-N6-C7
56	f	3401	SPD	C8-C7-N6-C5

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)

There are no chain breaks in this entry.

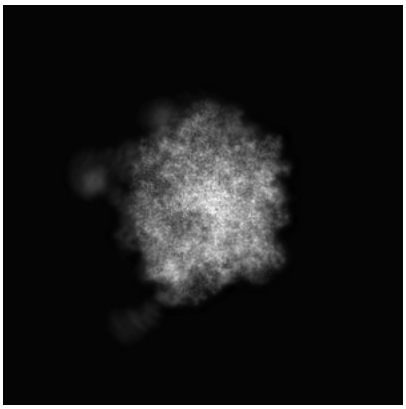
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-15424. These allow visual inspection of the internal detail of the map and identification of artifacts.

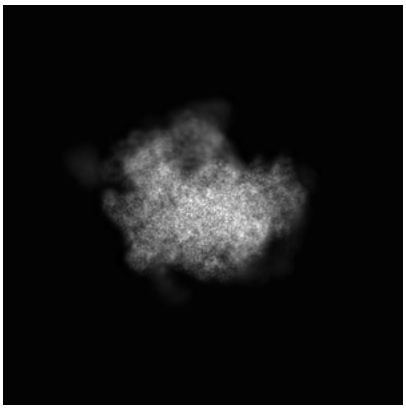
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

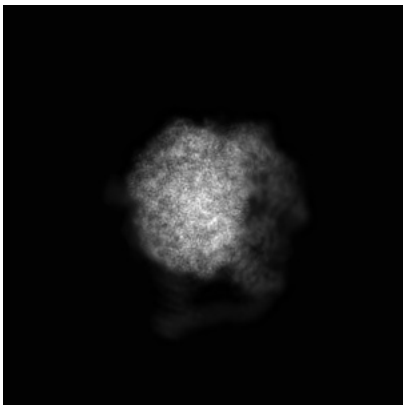
6.1.1 Primary map



X

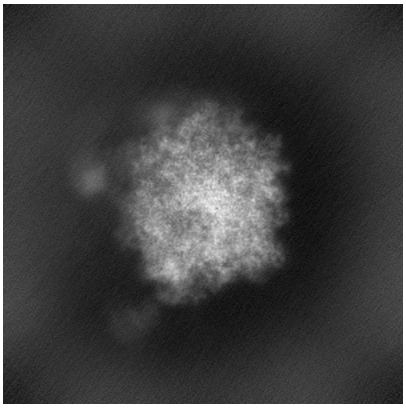


Y

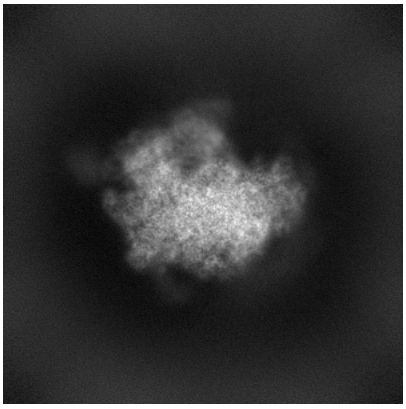


Z

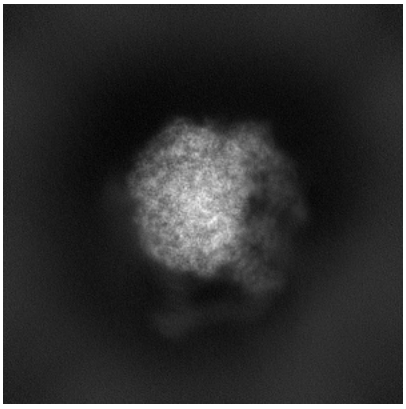
6.1.2 Raw map



X



Y

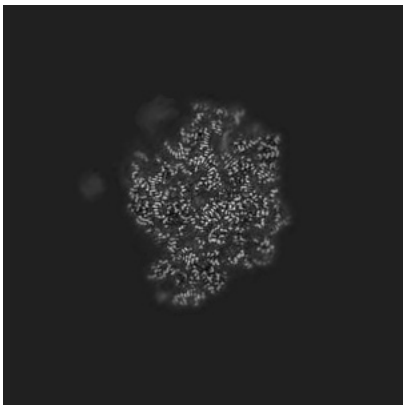


Z

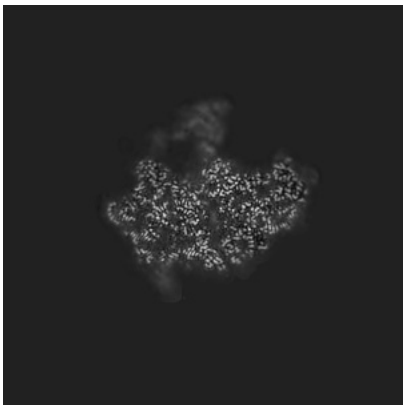
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

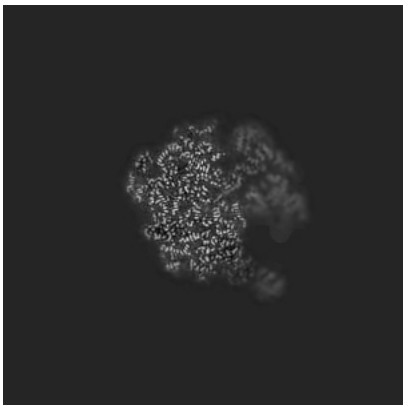
6.2.1 Primary map



X Index: 225

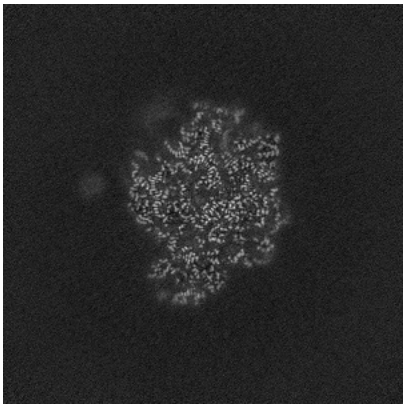


Y Index: 225

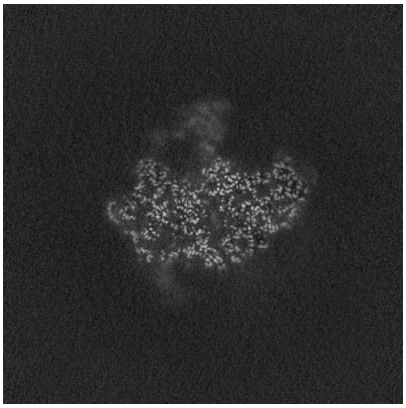


Z Index: 225

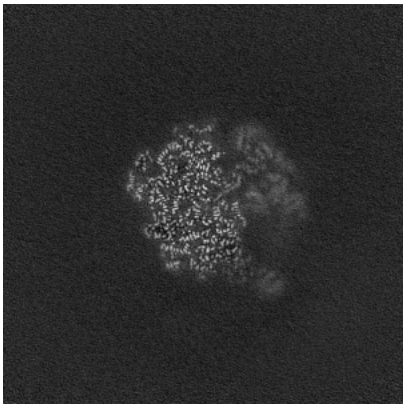
6.2.2 Raw map



X Index: 225



Y Index: 225

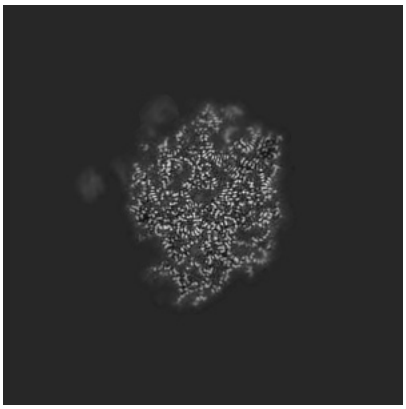


Z Index: 225

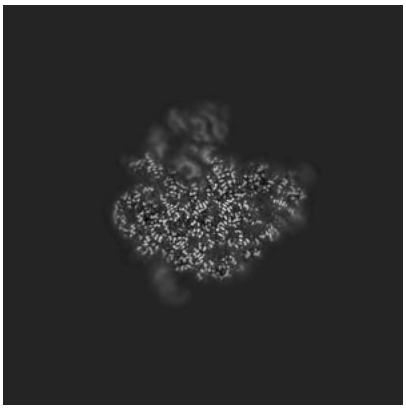
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

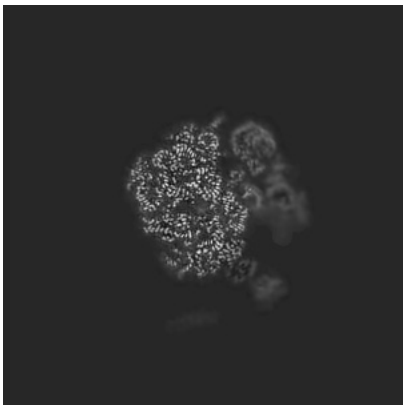
6.3.1 Primary map



X Index: 219

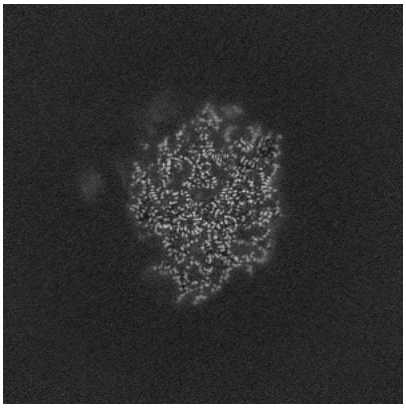


Y Index: 237

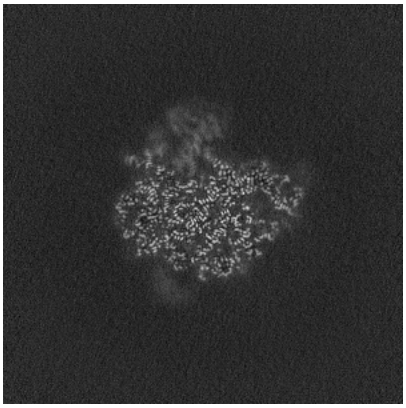


Z Index: 231

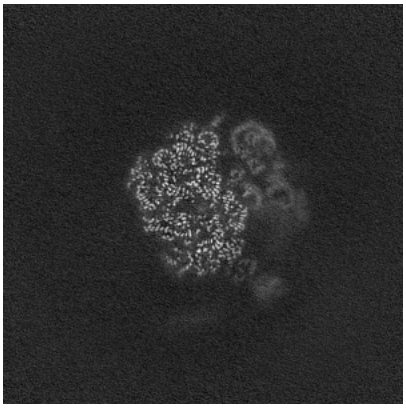
6.3.2 Raw map



X Index: 219



Y Index: 241

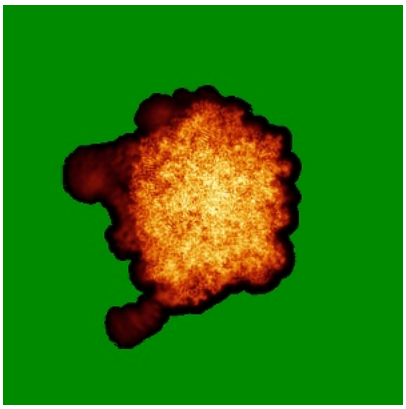


Z Index: 231

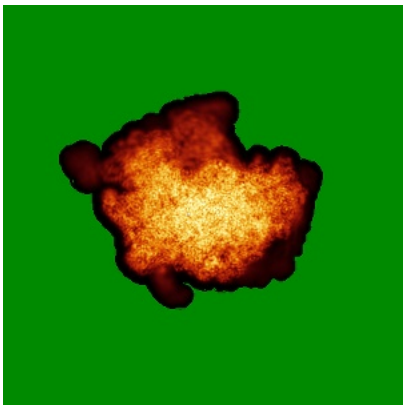
The images above show the largest variance slices of the map in three orthogonal directions.

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

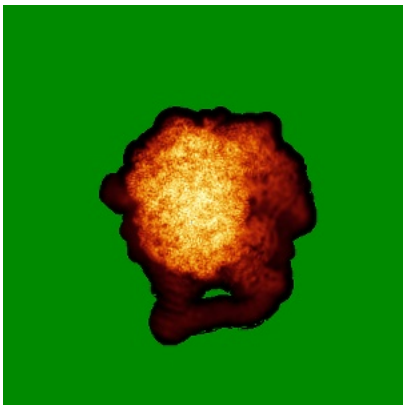
6.4.1 Primary map



X

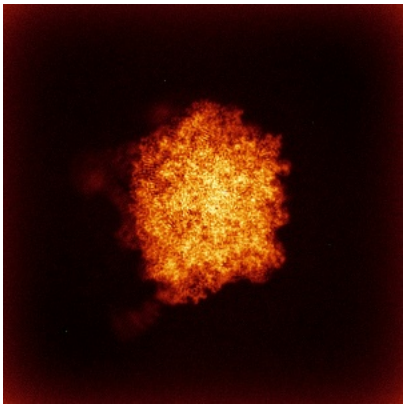


Y

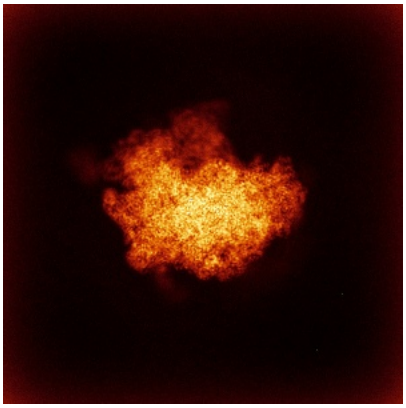


Z

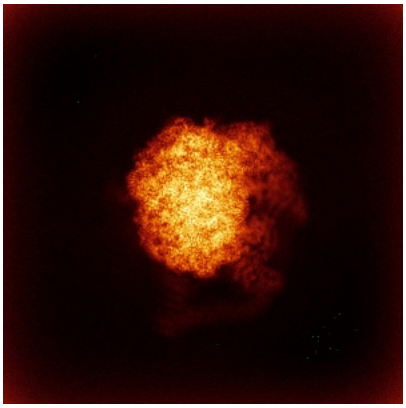
6.4.2 Raw map



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 0.4. 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.

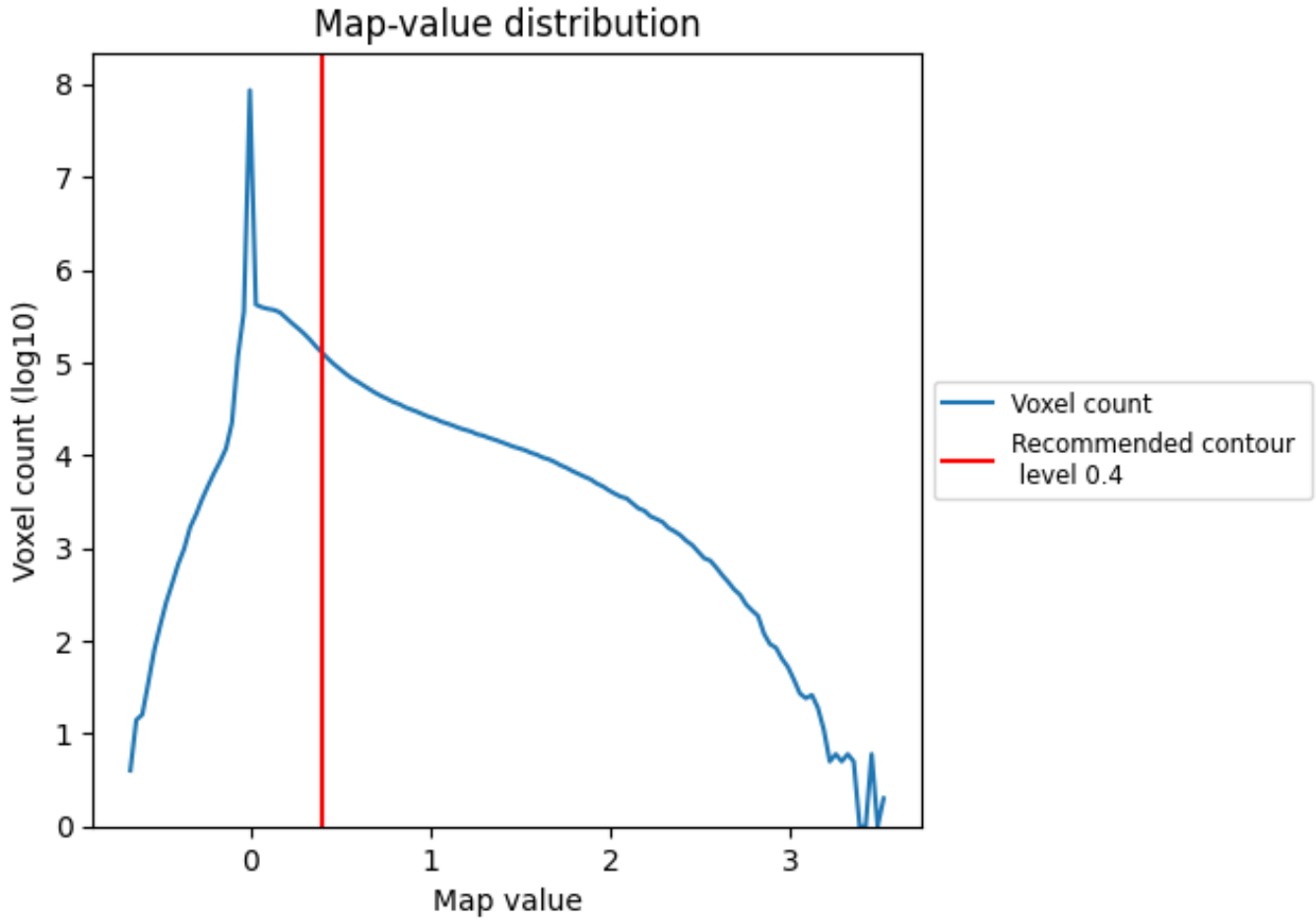
6.6 Mask visualisation (i)

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

7 Map analysis

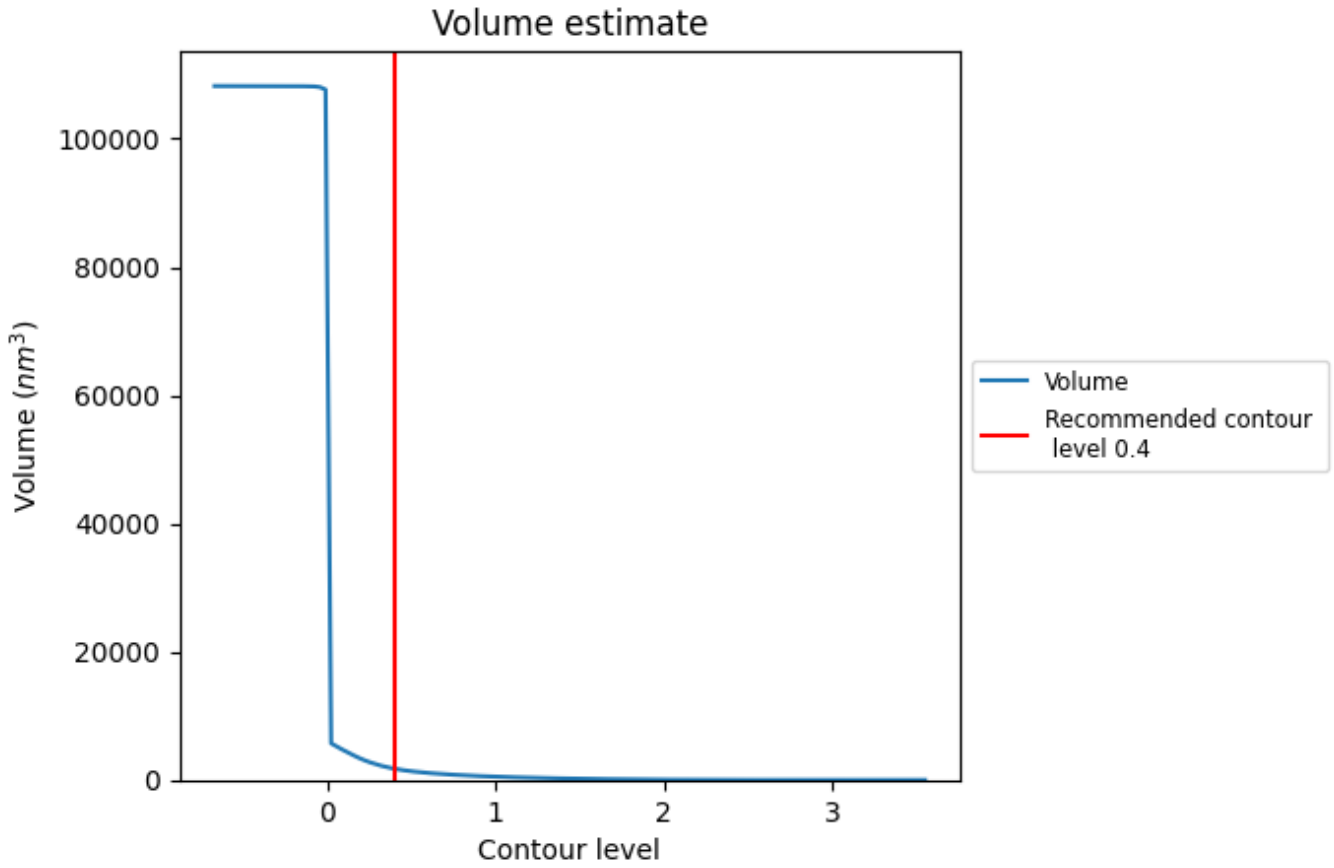
This section contains the results of statistical analysis of the map.

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.

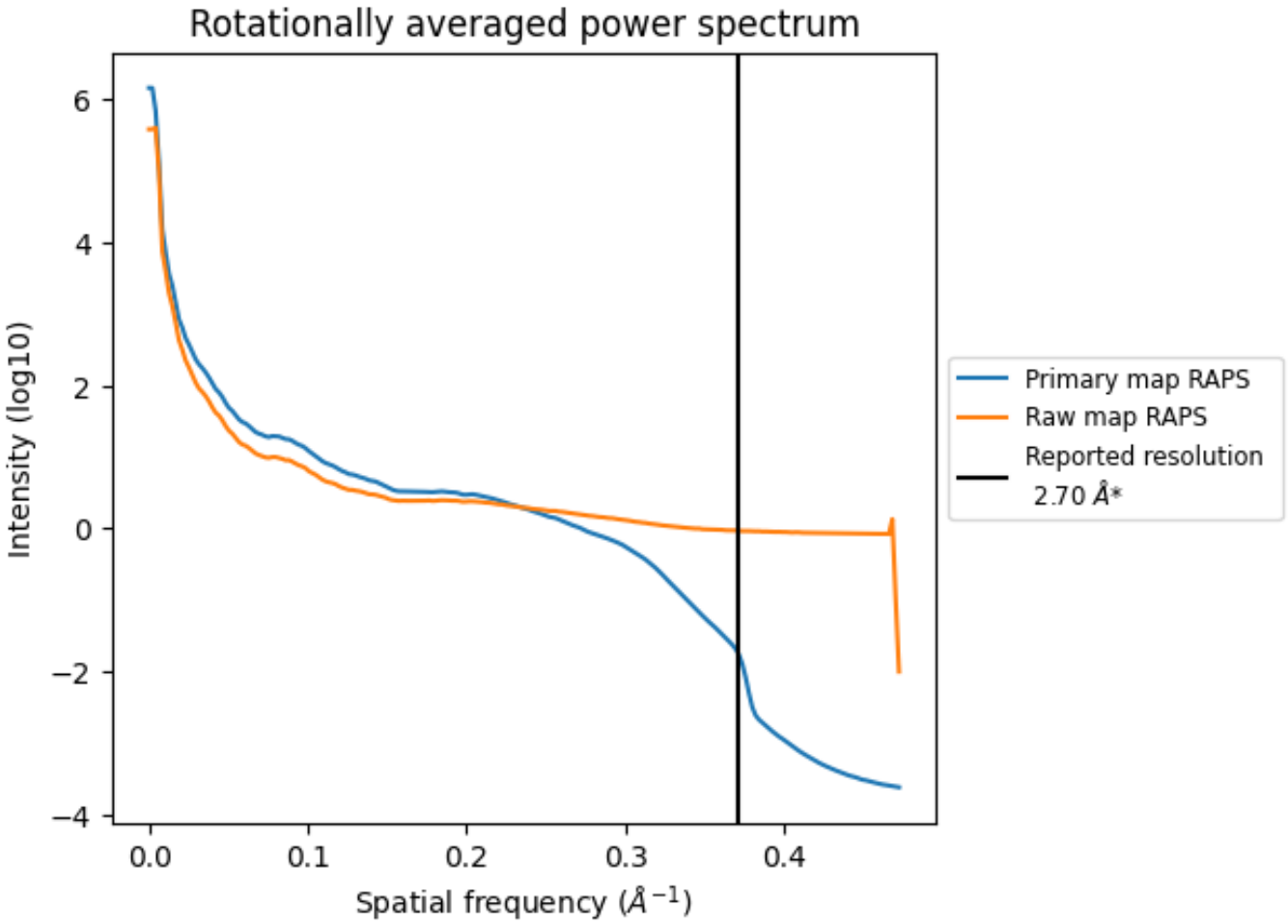
7.2 Volume estimate



The volume at the recommended contour level is 1749 nm^3; this corresponds to an approximate mass of 1580 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)

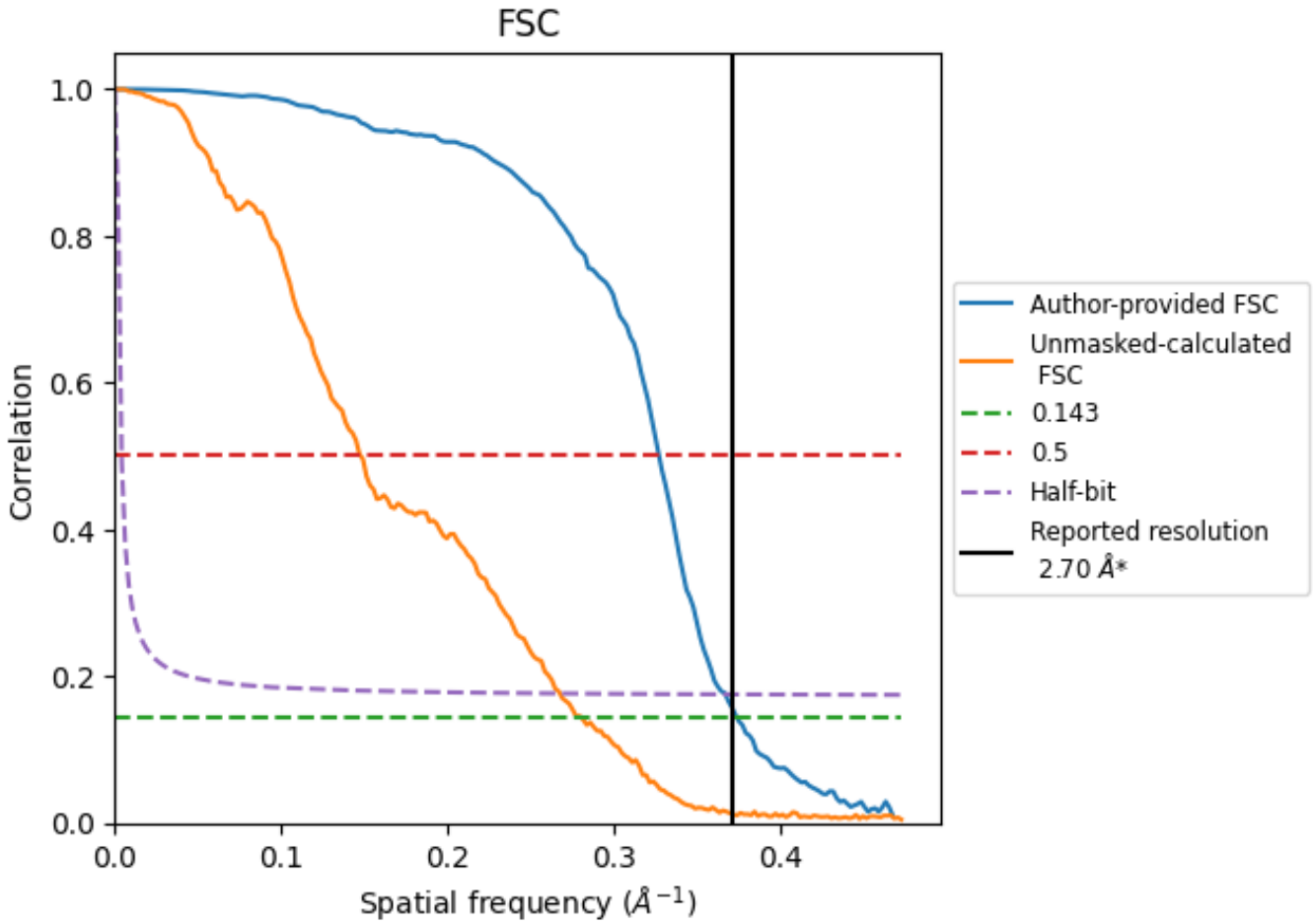


*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

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 0.370 Å^{-1}

8.2 Resolution estimates (i)

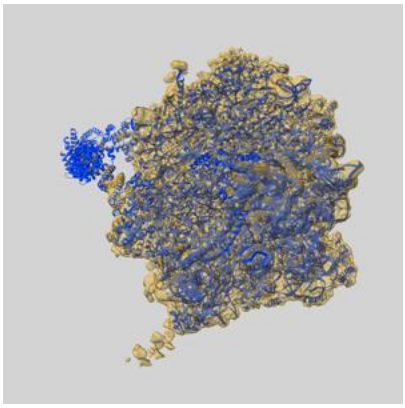
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	2.68	3.06	2.73
Unmasked-calculated*	3.57	6.78	3.74

*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 3.57 differs from the reported value 2.7 by more than 10 %

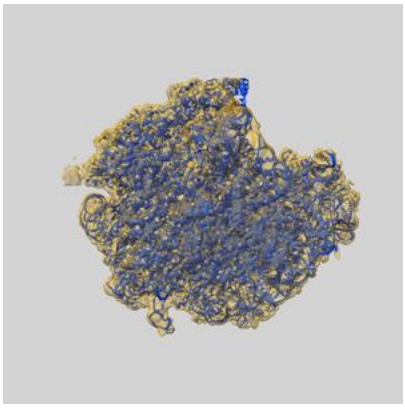
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-15424 and PDB model 8AGU. Per-residue inclusion information can be found in section 3 on page 15.

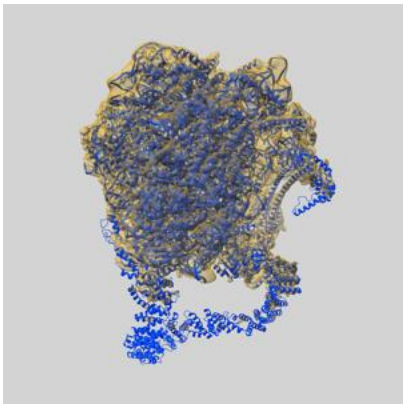
9.1 Map-model overlay



X



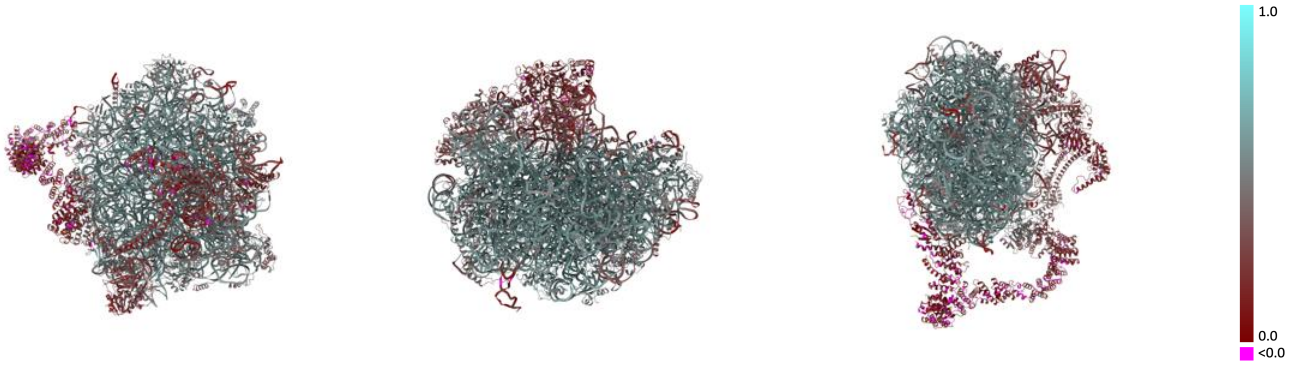
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.4 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.

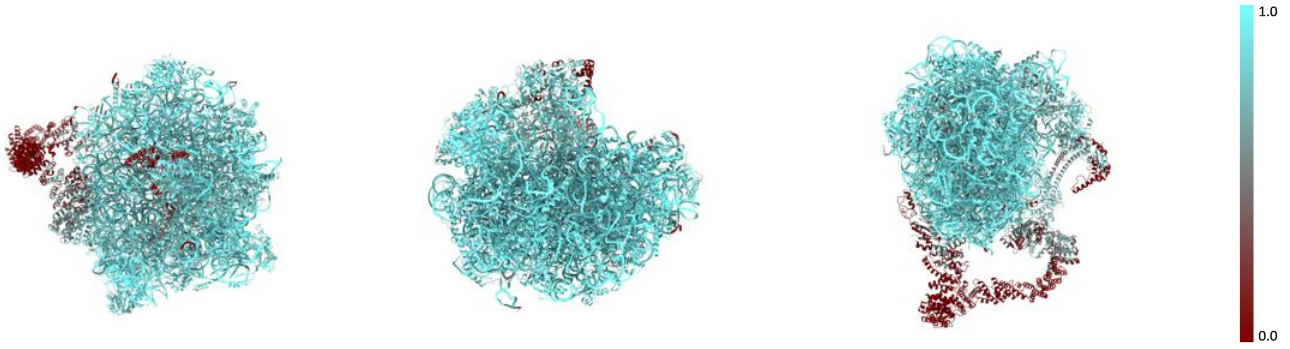
9.2 Q-score mapped to coordinate model (i)



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.

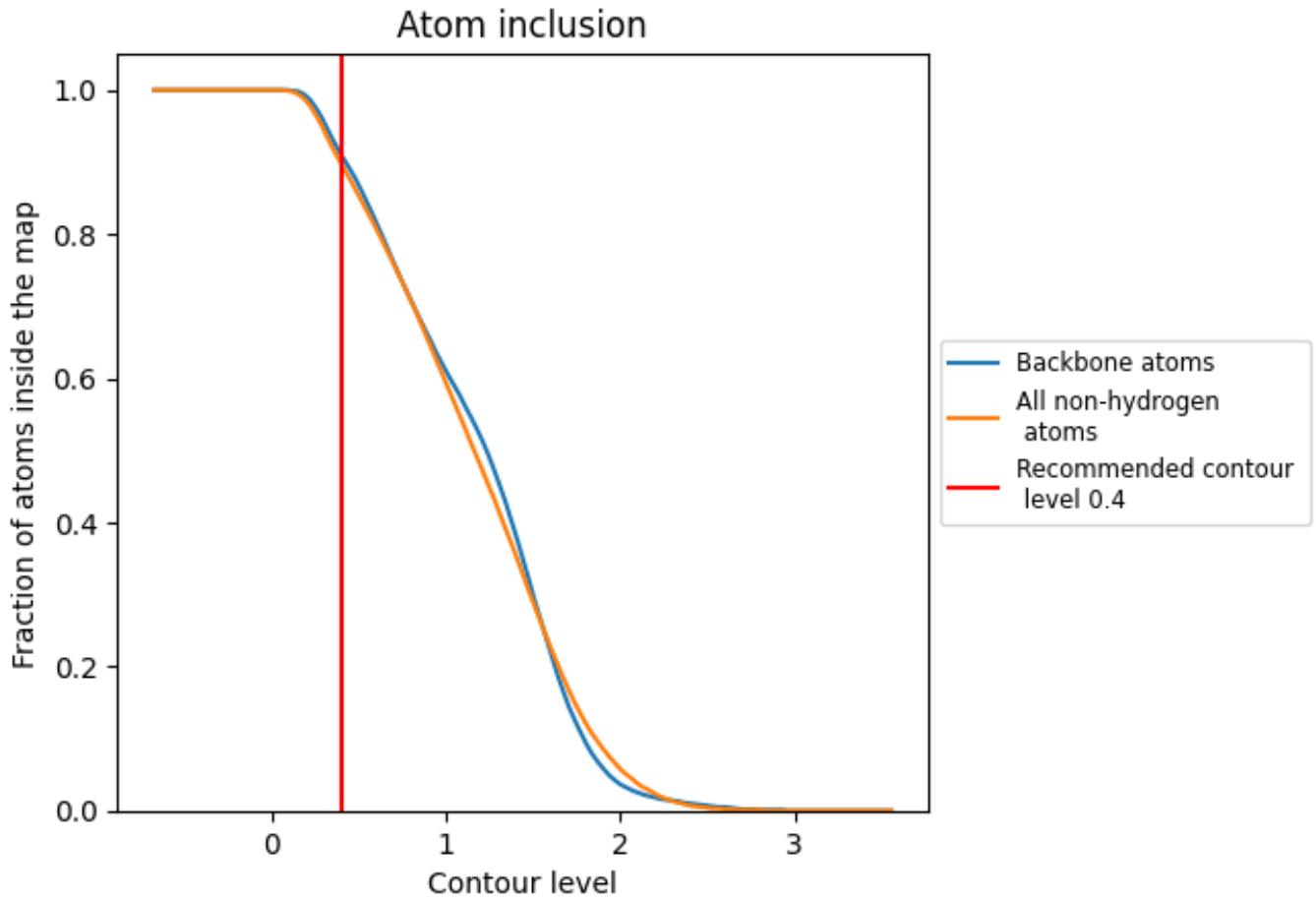
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.4).

9.4 Atom inclusion (i)



At the recommended contour level, 91% of all backbone atoms, 90% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8980	0.4960
0	0.8070	0.2580
1	0.9880	0.4550
A	0.9920	0.5990
B	0.9790	0.5770
C	0.9680	0.5790
D	0.9760	0.5700
E	0.9340	0.5360
F	0.9720	0.5680
G	0.9650	0.5510
H	0.9130	0.4540
I	0.9560	0.5630
J	0.9580	0.5570
K	0.9690	0.5560
L	0.9680	0.5530
M	0.9400	0.5040
N	0.9750	0.5820
O	0.9450	0.5240
P	0.9370	0.5070
Q	0.9200	0.5350
R	0.9770	0.5880
S	0.9900	0.6100
T	0.9700	0.5620
U	0.9620	0.5400
V	0.9540	0.5170
W	1.0000	0.6140
X	0.9080	0.4740
Y	0.9980	0.5930
Z	0.9650	0.5610
a	0.6670	0.2240
b	0.9630	0.5560
c	0.9670	0.5530
d	0.7180	0.3780
e	0.2490	0.1560
f	0.9900	0.5600

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Chain	Atom inclusion	Q-score
g	0.3760	0.3870
h	0.9990	0.5570
i	0.9940	0.5870
j	0.9820	0.5950
k	0.9720	0.5730
l	0.9720	0.5620
m	0.9380	0.4740
n	0.9510	0.5130
o	0.9700	0.5580
p	0.9370	0.5060
q	0.9560	0.5330
r	0.9510	0.5240
s	0.9210	0.4230
t	0.9650	0.5490
u	0.9680	0.5350
v	0.8410	0.3850
w	0.8050	0.2370
y	0.9700	0.2580
z	0.9080	0.2700