wwPDB EM Validation Summary Report (i)

Nov 19, 2022 – 08:15 pm GMT

PDB ID	:	6EML
EMDB ID	:	EMD-3886
Title	:	Cryo-EM structure of a late pre-40S ribosomal subunit from Saccharomyces cerevisiae
Authors	:	Heuer, A.; Thomson, E.; Schmidt, C.; Berninghausen, O.; Becker, T.; Hurt, E.; Beckmann, R.
Deposited on	:	2017-10-02
Resolution	:	3.60 Å(reported)

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

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

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

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

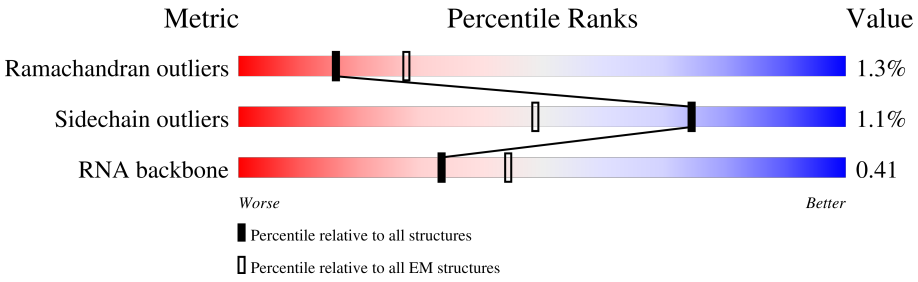
EMDB validation analysis	:	0.0.1.dev43
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.60 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	2	1800	21% 53% 35% 5% 7%
2	D	143	86% 84% • 13%
3	B	225	77% 88% • 10%
4	C	136	65% 81% • 16%
5	E	142	59% 79% • 18%
6	F	143	88% 94% • ••
7	H	146	75% 83% • 16%
8	I	144	83% 97% • •

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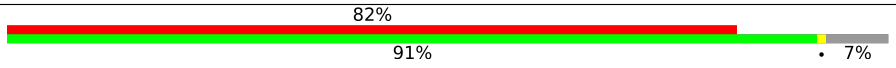
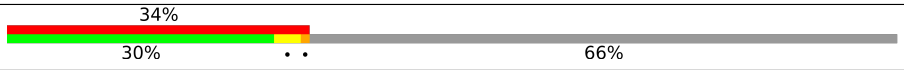
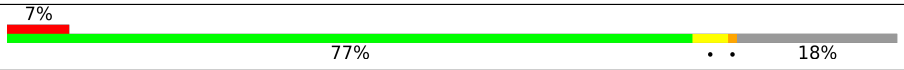
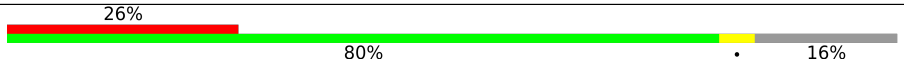
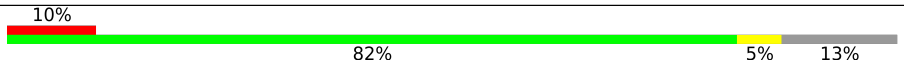
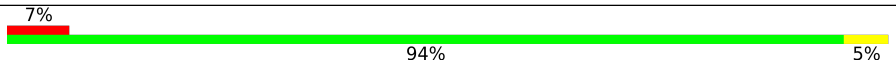
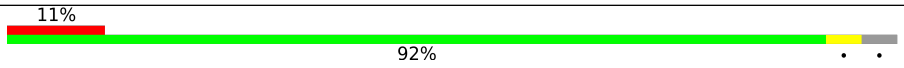
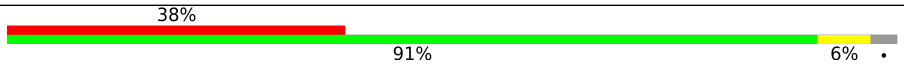
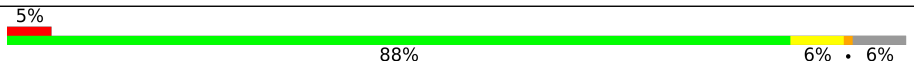
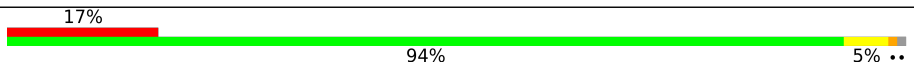
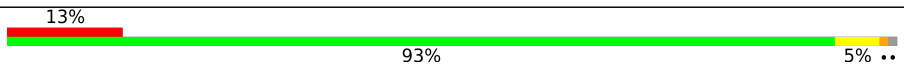
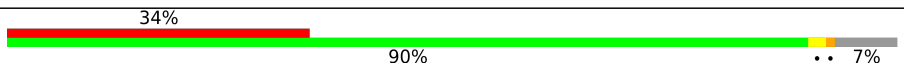
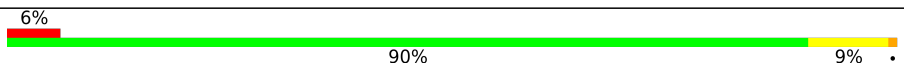
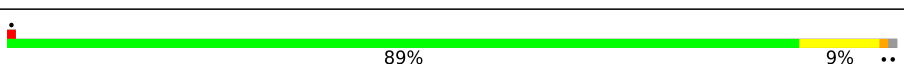
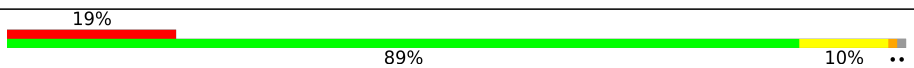
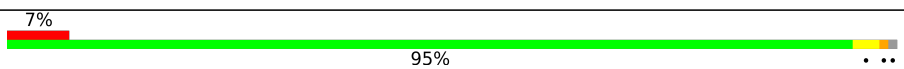
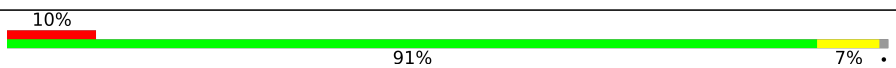
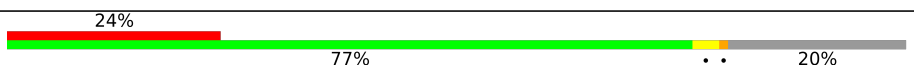
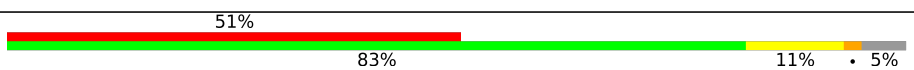
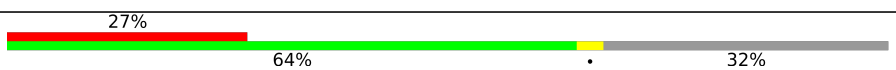
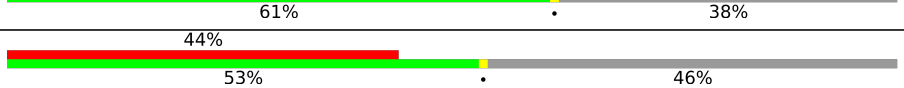
Mol	Chain	Length	Quality of chain
9	K	108	
10	L	67	
11	N	152	
12	P	252	
13	Q	255	
14	R	254	
15	S	261	
16	T	236	
17	U	190	
18	V	200	
19	W	197	
20	X	156	
21	Y	151	
22	Z	137	
23	a	87	
24	b	130	
25	c	145	
26	d	135	
27	f	82	
28	t	788	
29	g	63	
30	p	274	
31	r	425	
32	e	483	

2 Entry composition (i)

There are 32 unique types of molecules in this entry. The entry contains 75886 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called pre-18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1675	35695	15958	6312	11750	1675	0	0

- Molecule 2 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	124	892	561	156	173	2	0	0

- Molecule 3 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	B	202	1592	998	296	295	3	0	0

- Molecule 4 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	C	114	871	541	169	159	2	0	0

- Molecule 5 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	117	928	590	172	159	7	0	0

- Molecule 6 is a protein called 40S ribosomal protein S16-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
6	F	141	1105	708	203	194	0	0

- Molecule 7 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	122	Total	C	N	O	S	0	0
			1009	636	193	178	2		

- Molecule 8 is a protein called 40S ribosomal protein S19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	143	Total	C	N	O	S	0	0
			1112	694	208	208	2		

- Molecule 9 is a protein called 40S ribosomal protein S25-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
9	K	64	Total	C	N	O	0	0
			519	332	95	92		

- Molecule 10 is a protein called 40S ribosomal protein S28-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	62	Total	C	N	O	S	0	0
			486	300	95	90	1		

- Molecule 11 is a protein called Ubiquitin-40S ribosomal protein S31.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	N	51	Total	C	N	O	S	0	0
			397	249	73	71	4		

- Molecule 12 is a protein called 40S ribosomal protein S0-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	P	206	Total	C	N	O	S	0	0
			1577	1014	278	283	2		

- Molecule 13 is a protein called 40S ribosomal protein S1-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	Q	214	Total	C	N	O	S	0	0
			1709	1084	310	311	4		

- Molecule 14 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	R	220	Total	C	N	O	S	0	0
			1662	1065	295	300	2		

- Molecule 15 is a protein called 40S ribosomal protein S4-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	S	260	Total	C	N	O	S	0	0
			2068	1316	389	360	3		

- Molecule 16 is a protein called 40S ribosomal protein S6-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	T	226	Total	C	N	O	S	0	0
			1799	1129	346	321	3		

- Molecule 17 is a protein called 40S ribosomal protein S7-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
17	U	184	Total	C	N	O	0	0
			1481	951	265	265		

- Molecule 18 is a protein called 40S ribosomal protein S8-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	V	188	Total	C	N	O	S	0	0
			1489	925	298	264	2		

- Molecule 19 is a protein called 40S ribosomal protein S9-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	W	185	Total	C	N	O	S	0	0
			1494	943	289	261	1		

- Molecule 20 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	X	155	Total	C	N	O	S	0	0
			1213	774	230	206	3		

- Molecule 21 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Y	150	Total	C	N	O	S	0	0
			1192	759	224	207	2		

- Molecule 22 is a protein called 40S ribosomal protein S14-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	Z	127	Total	C	N	O	S	0	0
			891	545	182	163	1		

- Molecule 23 is a protein called 40S ribosomal protein S21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	a	87	Total	C	N	O	S	0	0
			684	420	125	137	2		

- Molecule 24 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	b	129	Total	C	N	O	S	0	0
			1021	650	188	180	3		

- Molecule 25 is a protein called 40S ribosomal protein S23-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	c	144	Total	C	N	O	S	0	0
			1121	708	220	191	2		

- Molecule 26 is a protein called 40S ribosomal protein S24-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
26	d	134	Total	C	N	O	0	0
			1073	676	208	189		

- Molecule 27 is a protein called 40S ribosomal protein S27-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	f	81	Total	C	N	O	S	0	0
			610	382	110	113	5		

- Molecule 28 is a protein called Ribosome biogenesis protein TSR1.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	t	633	Total	C	N	O	S	0	0
			5037	3220	875	929	13		

- Molecule 29 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	g	60	Total	C	N	O	S	0	0
			475	299	98	77	1		

- Molecule 30 is a protein called Pre-rRNA-processing protein PNO1.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	p	185	Total	C	N	O	S	0	0
			1473	942	267	260	4		

- Molecule 31 is a protein called Serine/threonine-protein kinase RIO2.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	r	264	Total	C	N	O	S	0	0
			2166	1379	384	387	16		

- Molecule 32 is a protein called Essential nuclear protein 1.

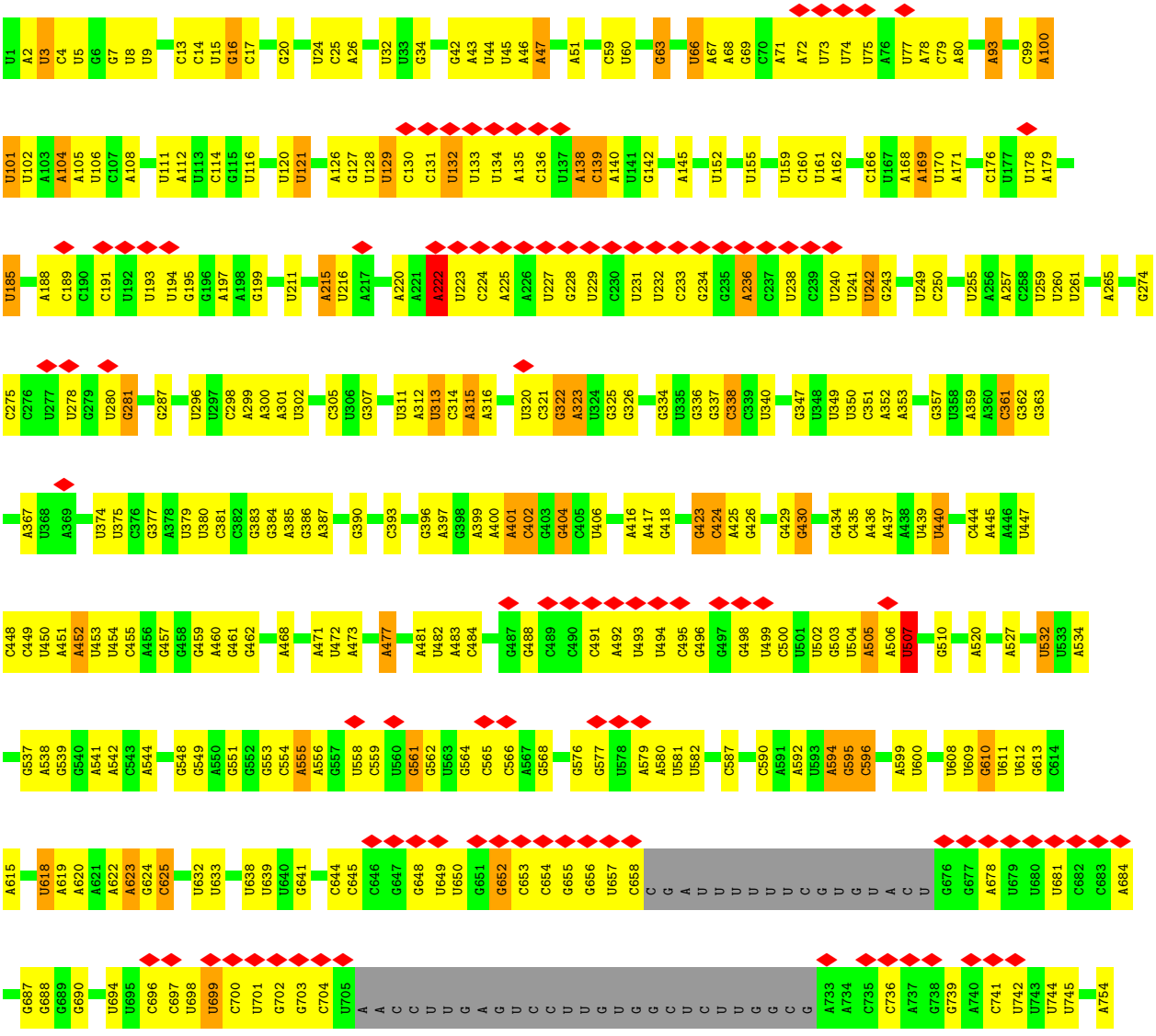
Mol	Chain	Residues	Atoms				AltConf	Trace
32	e	261	Total	C	N	O	0	0
			1045	523	261	261		

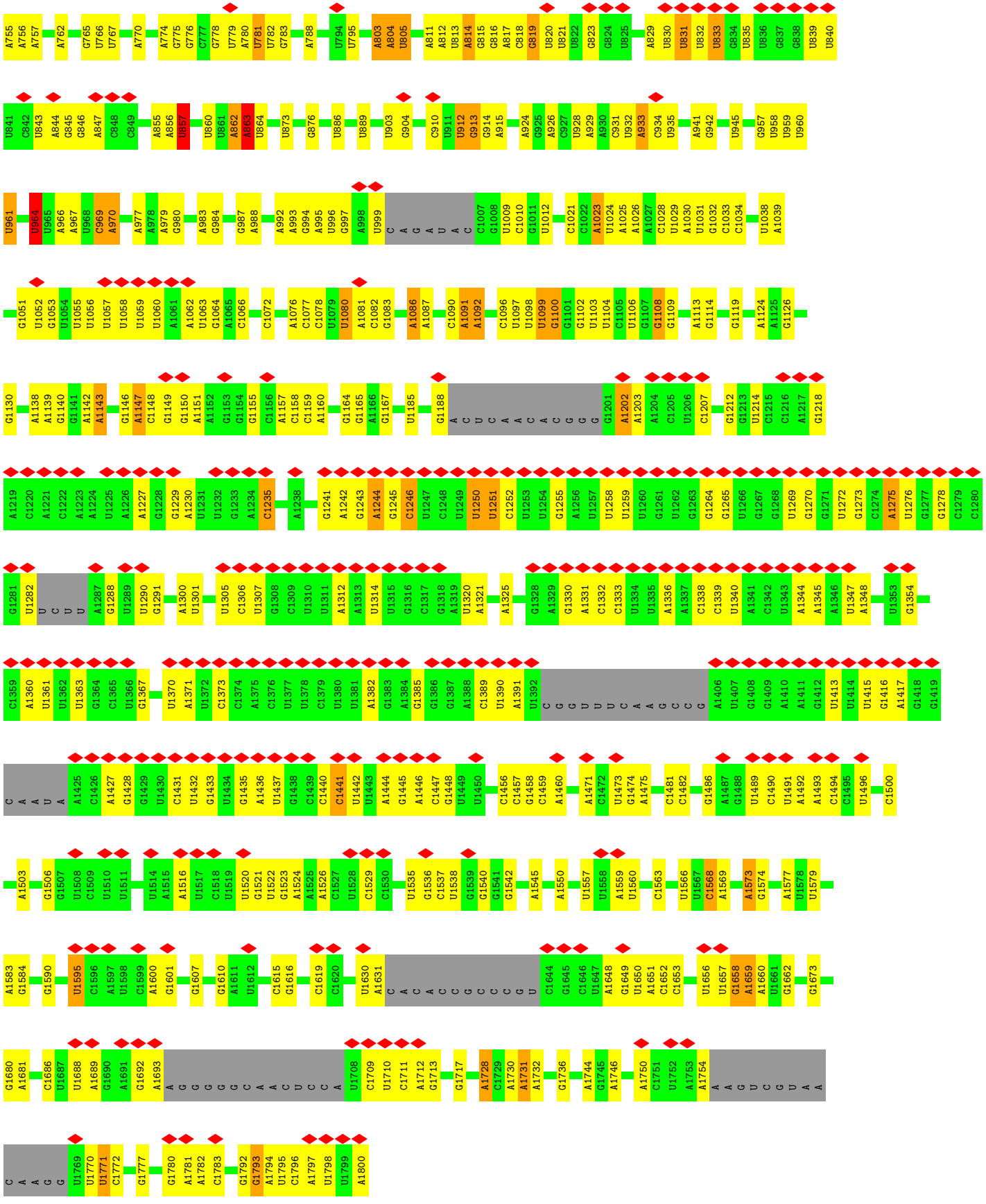
3 Residue-property plots (i)

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: pre-18S ribosomal RNA

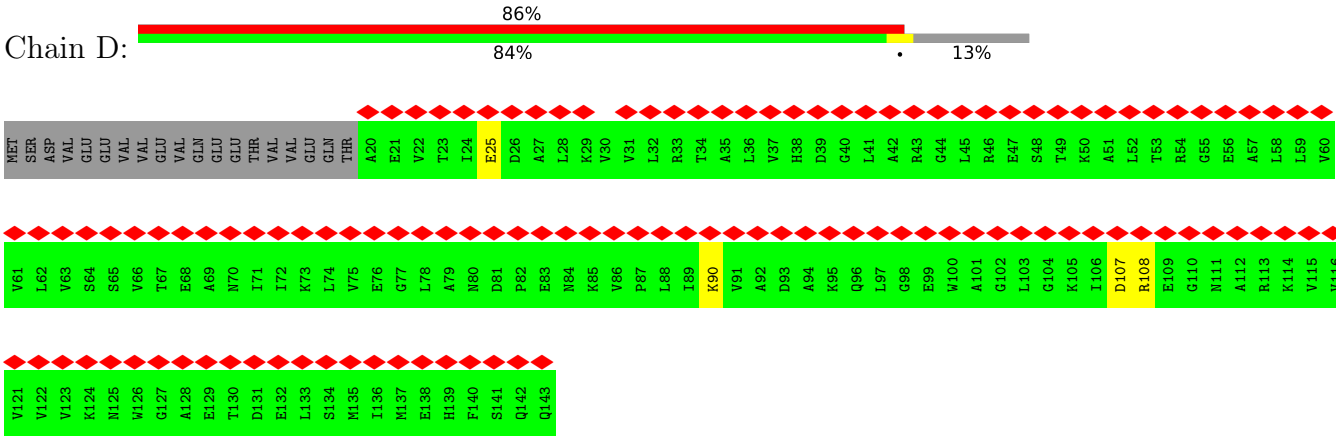
Chain 2:





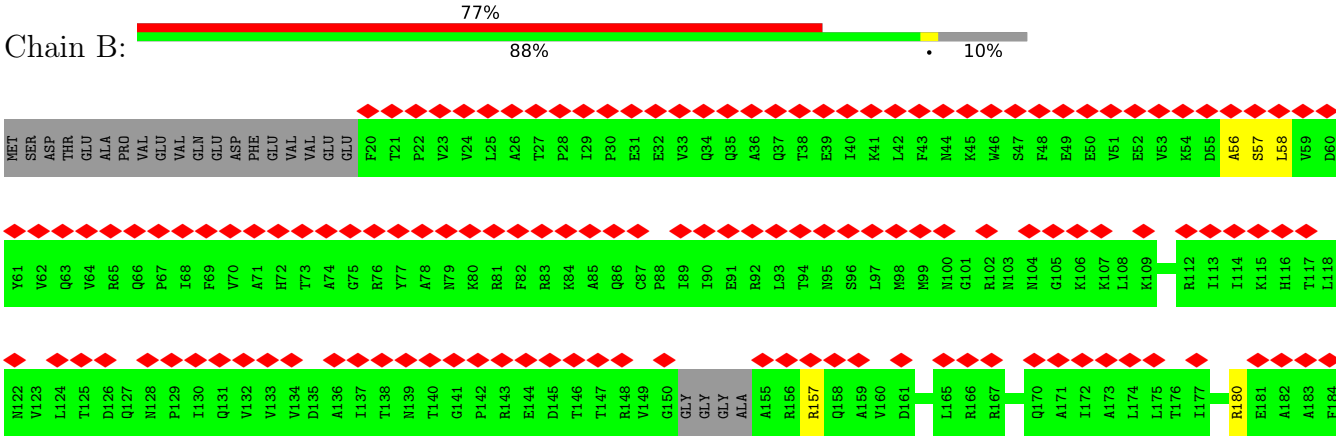
• Molecule 2: 40S ribosomal protein S12

Chain D:



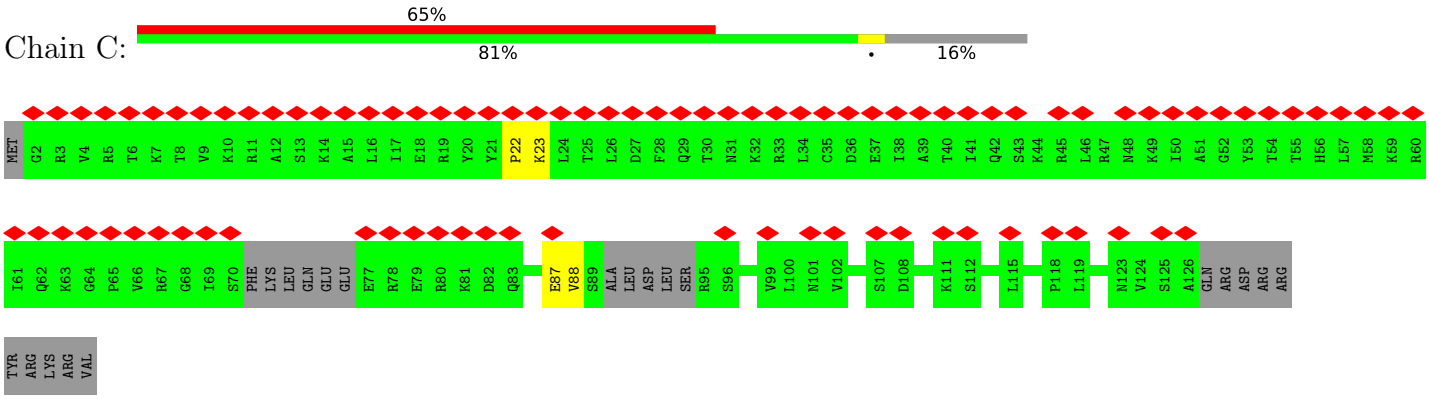
• Molecule 3: 40S ribosomal protein S5

Chain B:



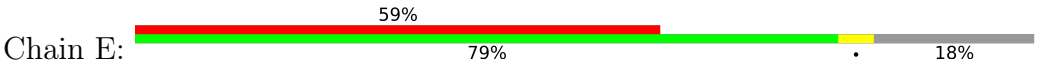
• Molecule 4: 40S ribosomal protein S17-A

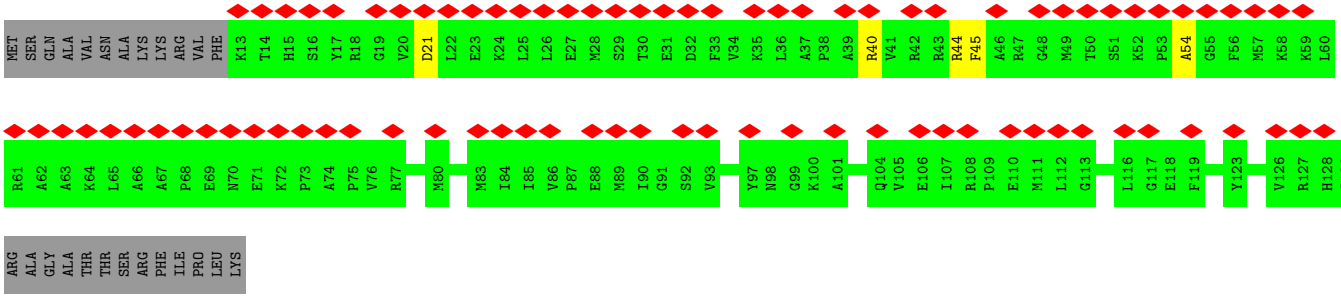
Chain C:



• Molecule 5: 40S ribosomal protein S15

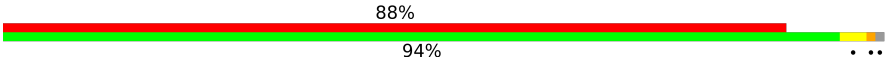
Chain E:

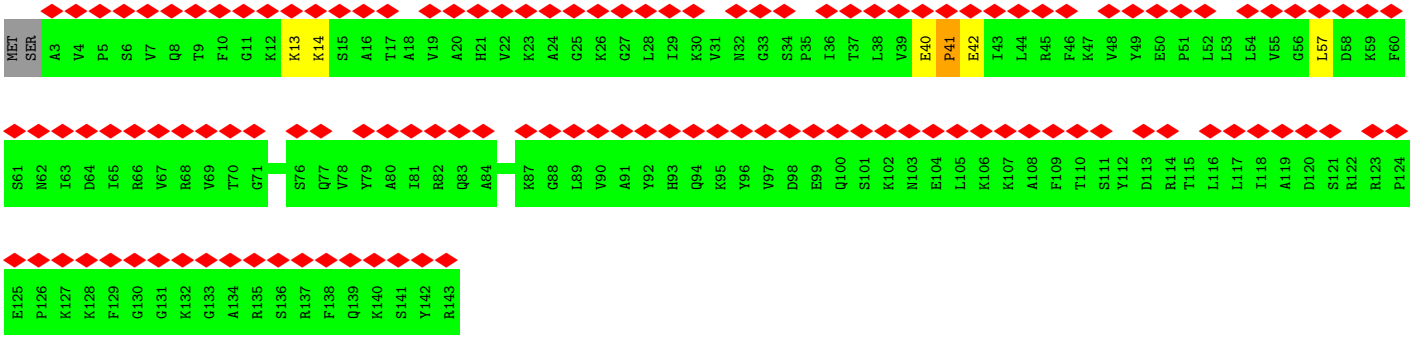




• Molecule 6: 40S ribosomal protein S16-A

Chain F:



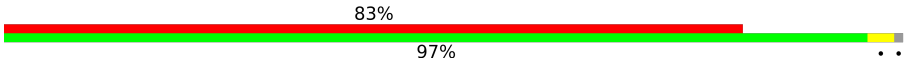


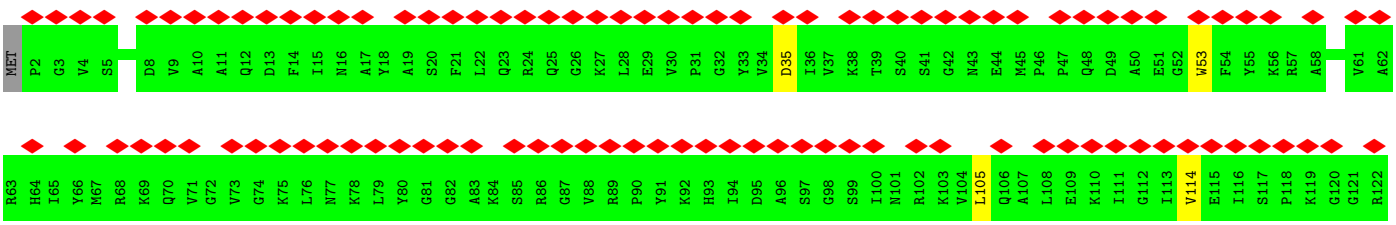
• Molecule 7: 40S ribosomal protein S18-A

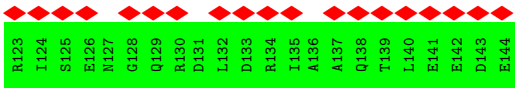
Chain H:

• Molecule 8: 40S ribosomal protein S19-A

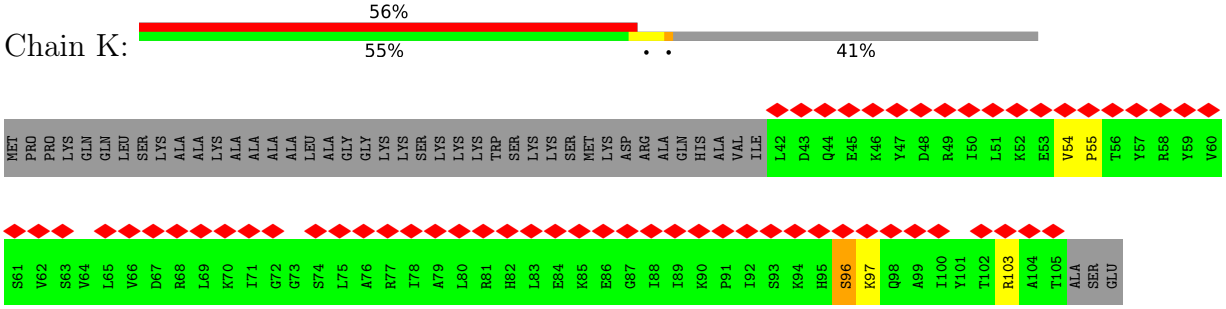
Chain I:



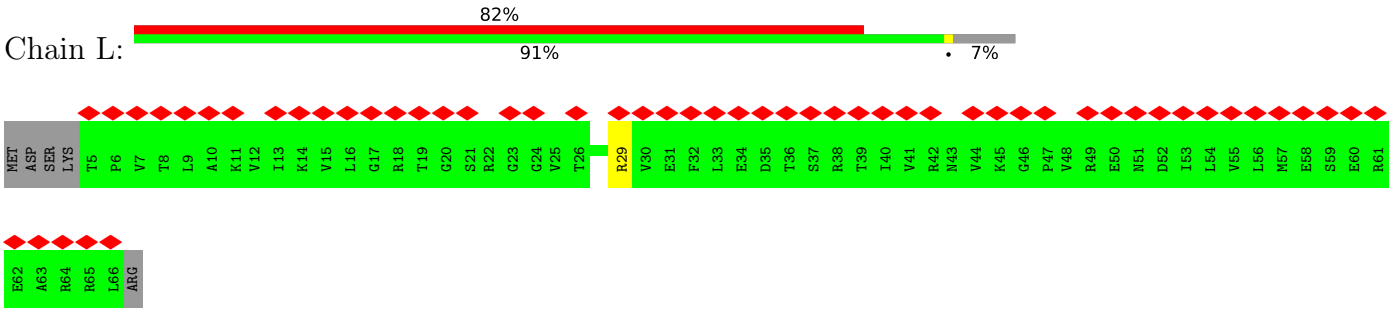




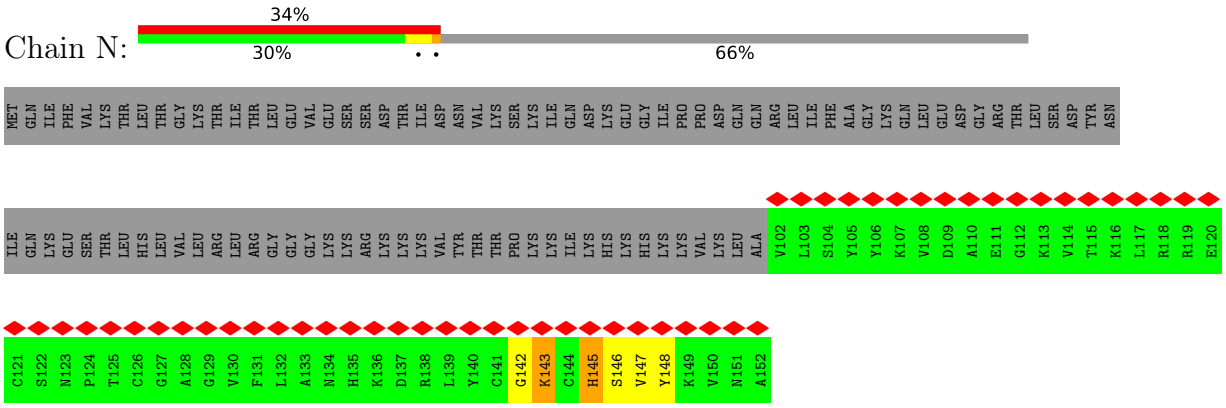
• Molecule 9: 40S ribosomal protein S25-A



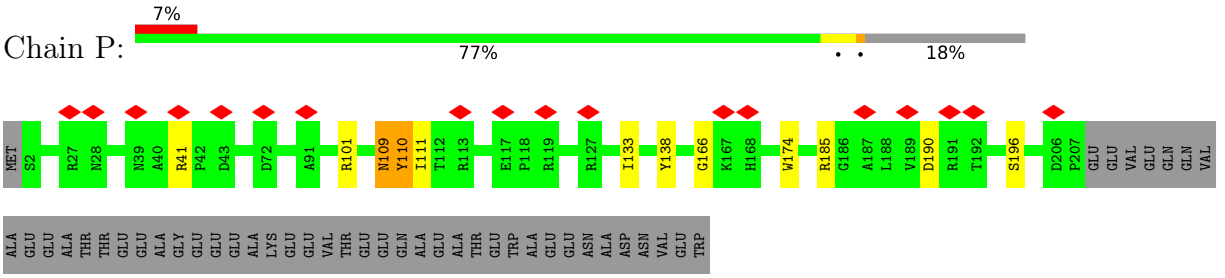
• Molecule 10: 40S ribosomal protein S28-B



• Molecule 11: Ubiquitin-40S ribosomal protein S31

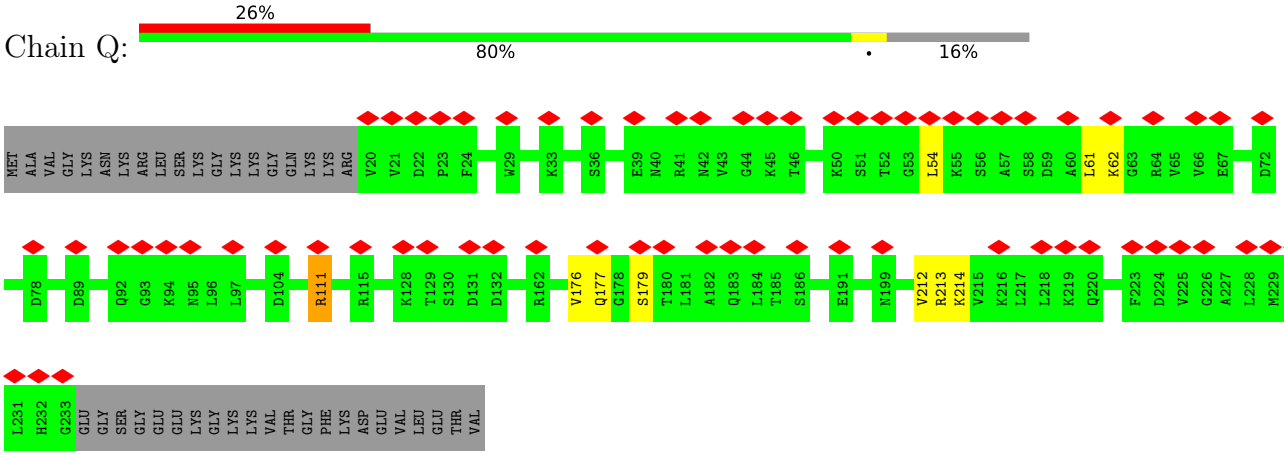


• Molecule 12: 40S ribosomal protein S0-A



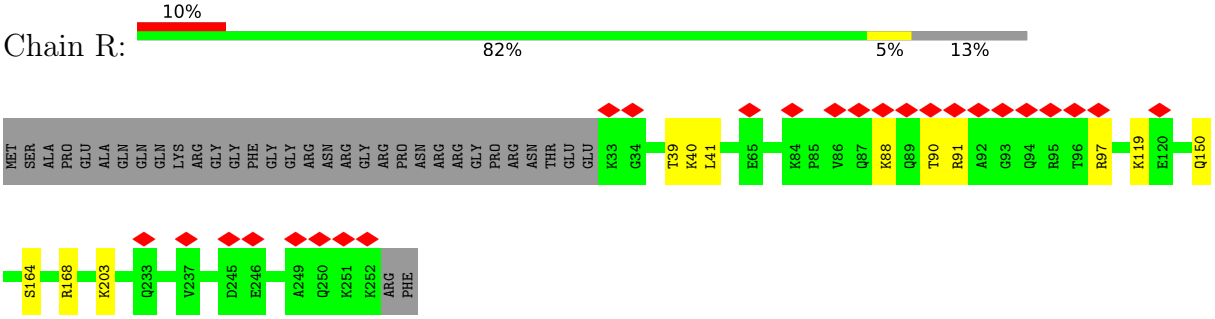
• Molecule 13: 40S ribosomal protein S1-A

Chain Q:



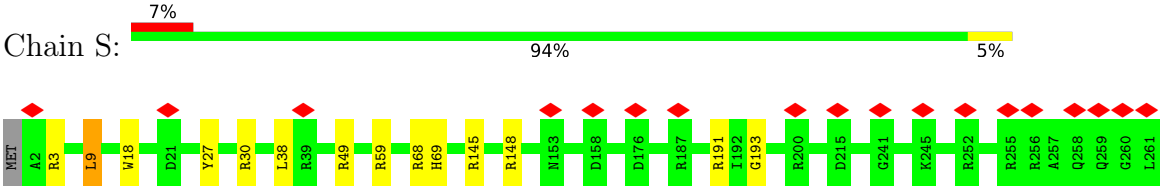
• Molecule 14: 40S ribosomal protein S2

Chain R:



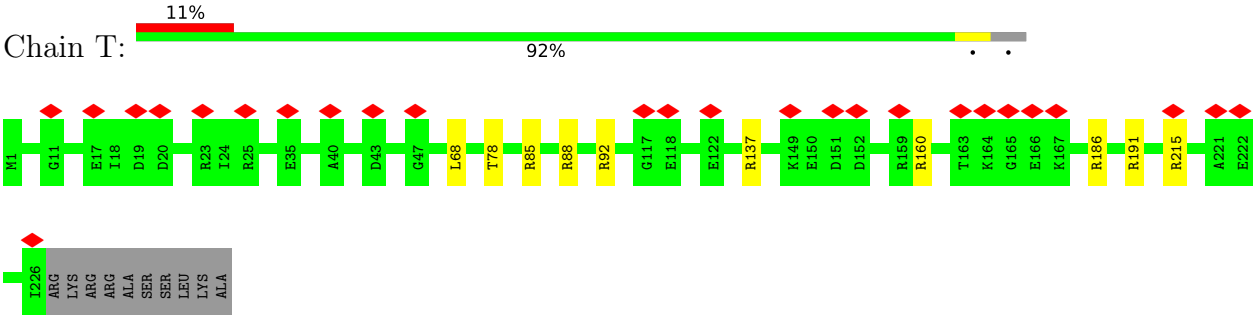
• Molecule 15: 40S ribosomal protein S4-A

Chain S:



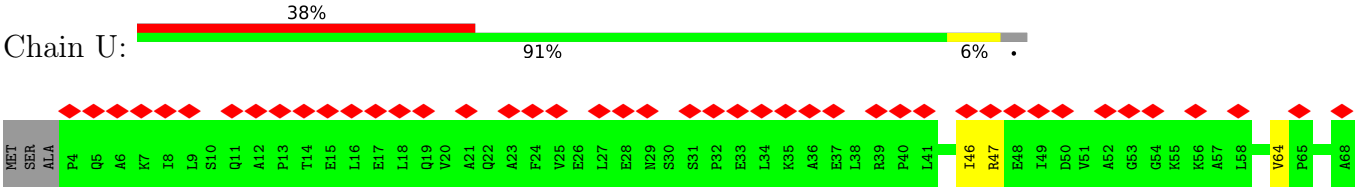
• Molecule 16: 40S ribosomal protein S6-A

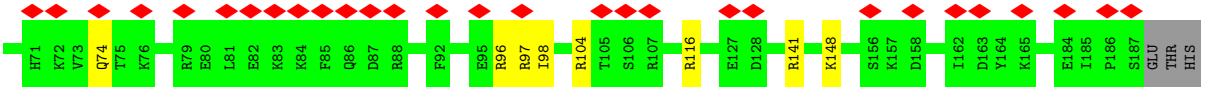
Chain T:



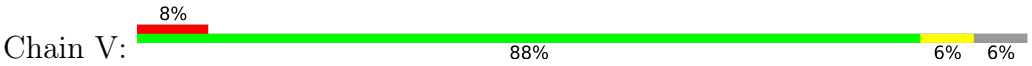
• Molecule 17: 40S ribosomal protein S7-A

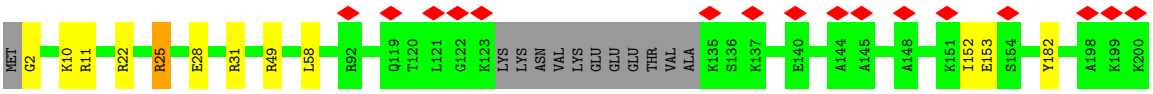
Chain U:



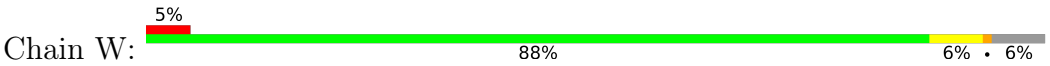


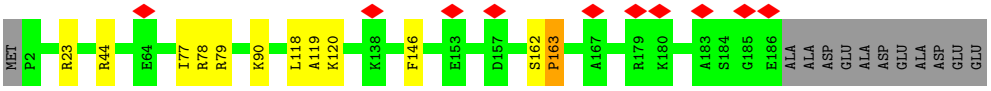
• Molecule 18: 40S ribosomal protein S8-A



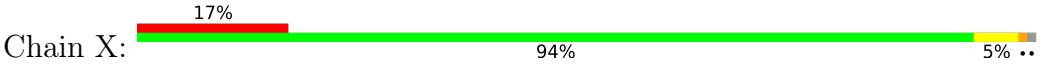


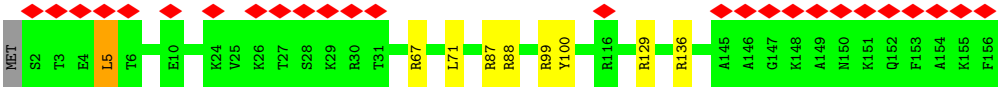
• Molecule 19: 40S ribosomal protein S9-A



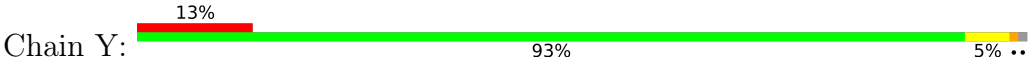


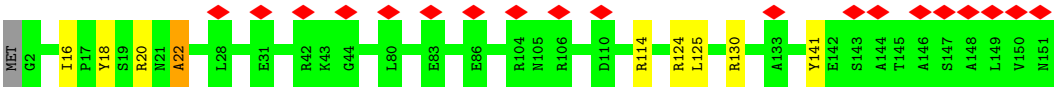
• Molecule 20: 40S ribosomal protein S11-A



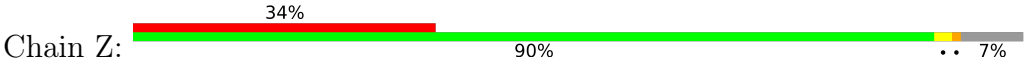


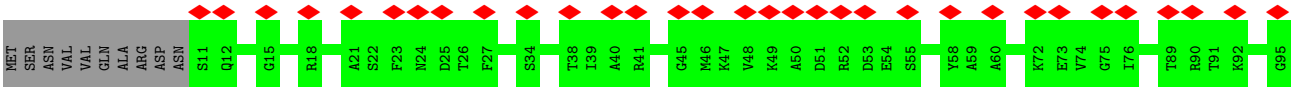
• Molecule 21: 40S ribosomal protein S13

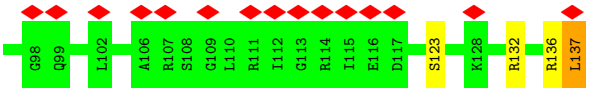




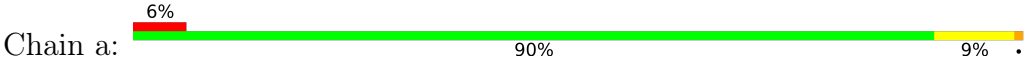
• Molecule 22: 40S ribosomal protein S14-A

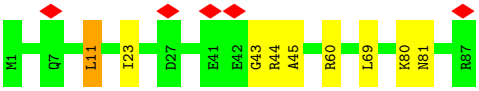






• Molecule 23: 40S ribosomal protein S21-A



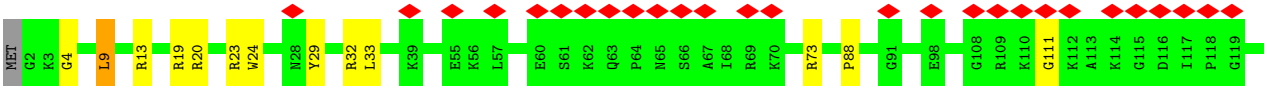


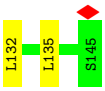
• Molecule 24: 40S ribosomal protein S22-A

Chain b:

• Molecule 25: 40S ribosomal protein S23-A

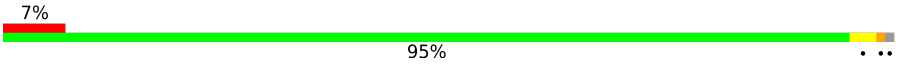
Chain c:

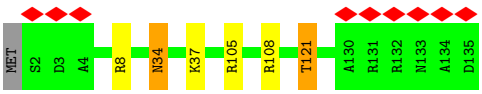




• Molecule 26: 40S ribosomal protein S24-A

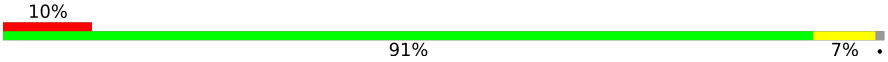
Chain d:

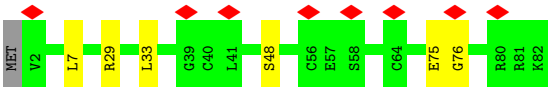




• Molecule 27: 40S ribosomal protein S27-A

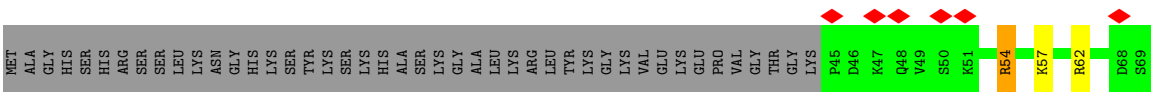
Chain f:

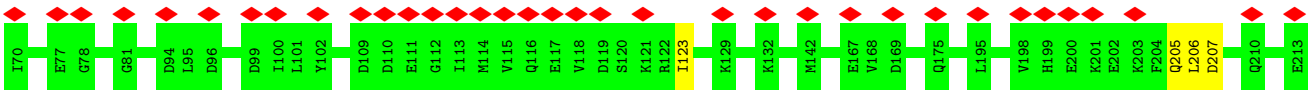


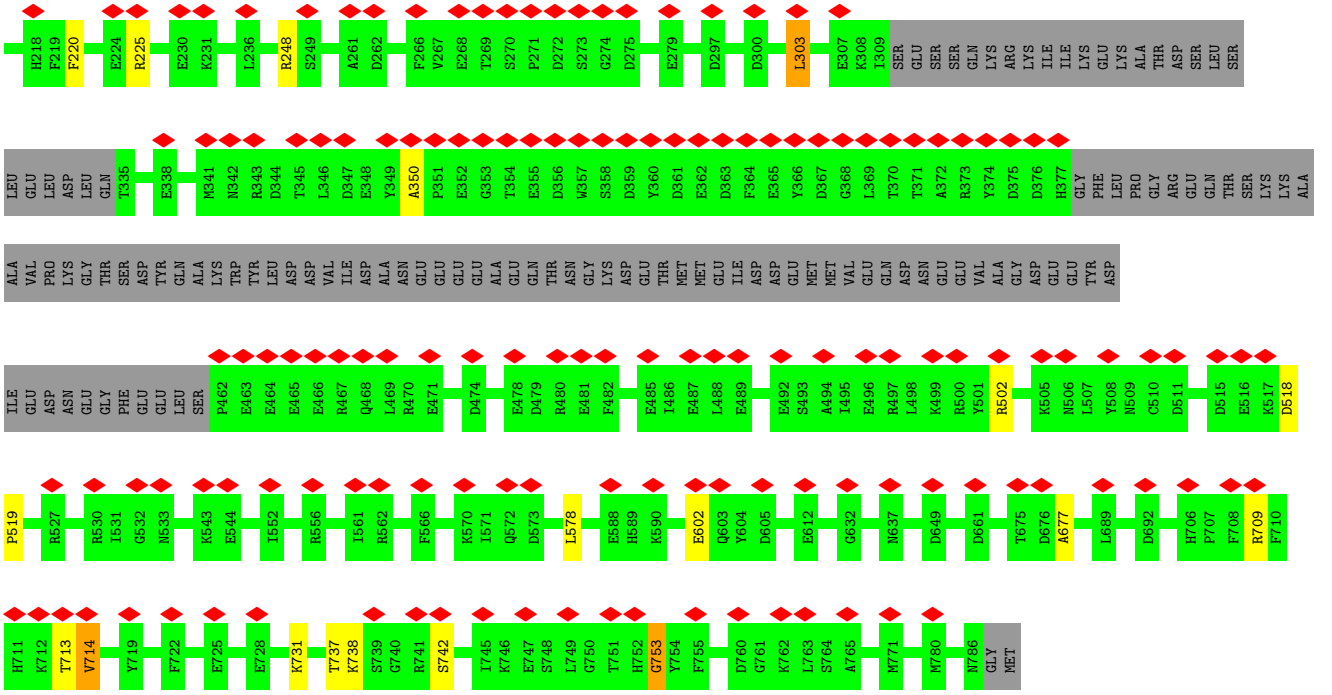


• Molecule 28: Ribosome biogenesis protein TSR1

Chain t:

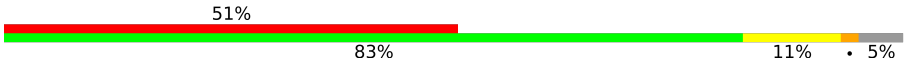


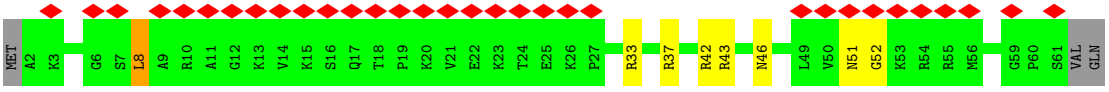




• Molecule 29: 40S ribosomal protein S30-A

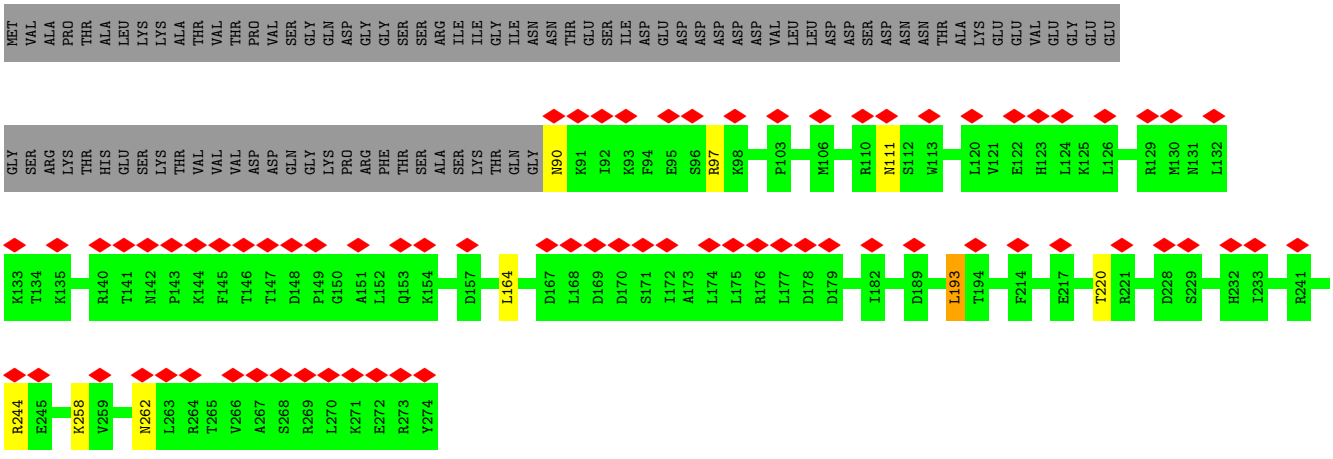
Chain g:





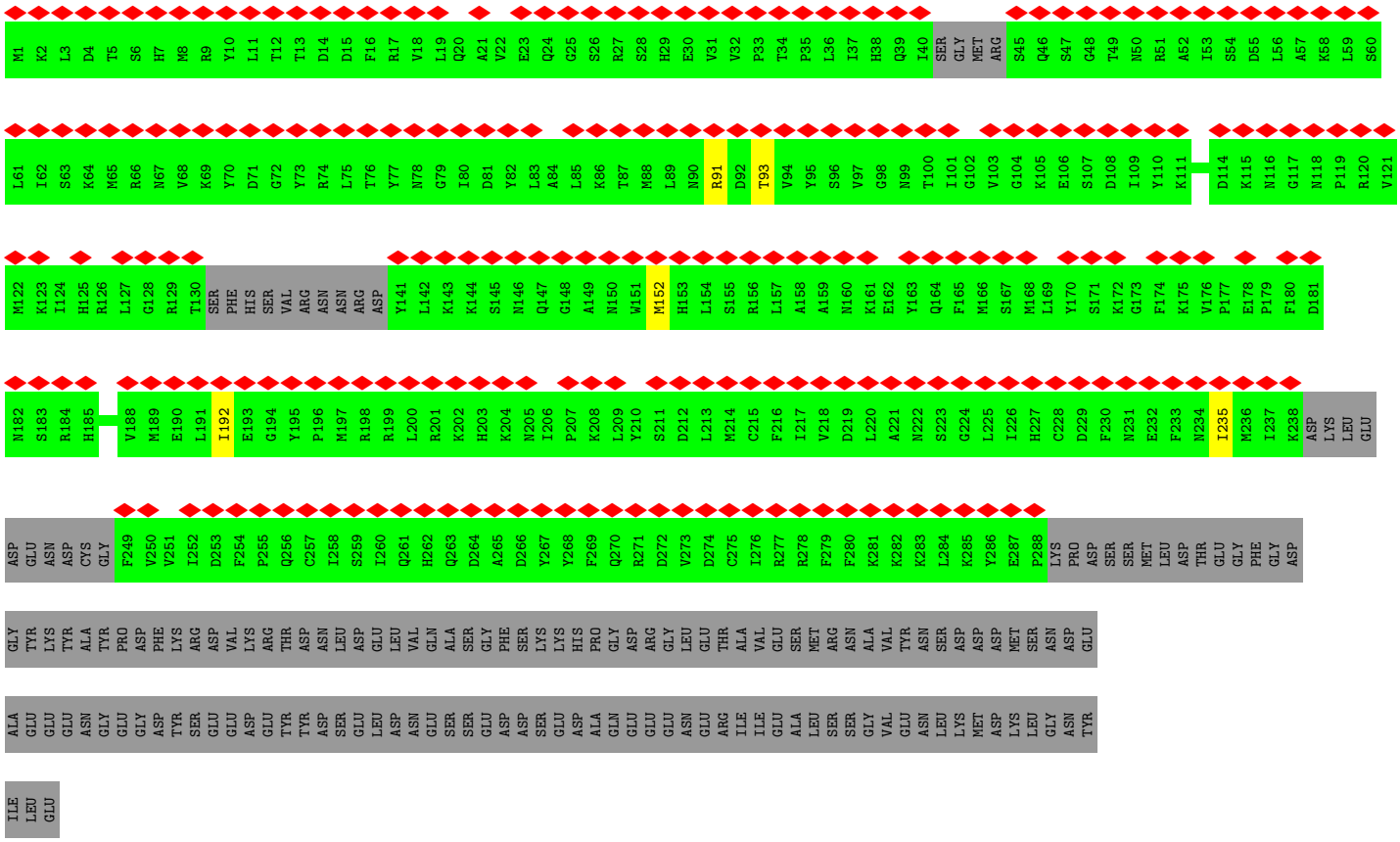
• Molecule 30: Pre-rRNA-processing protein PNO1

Chain p:



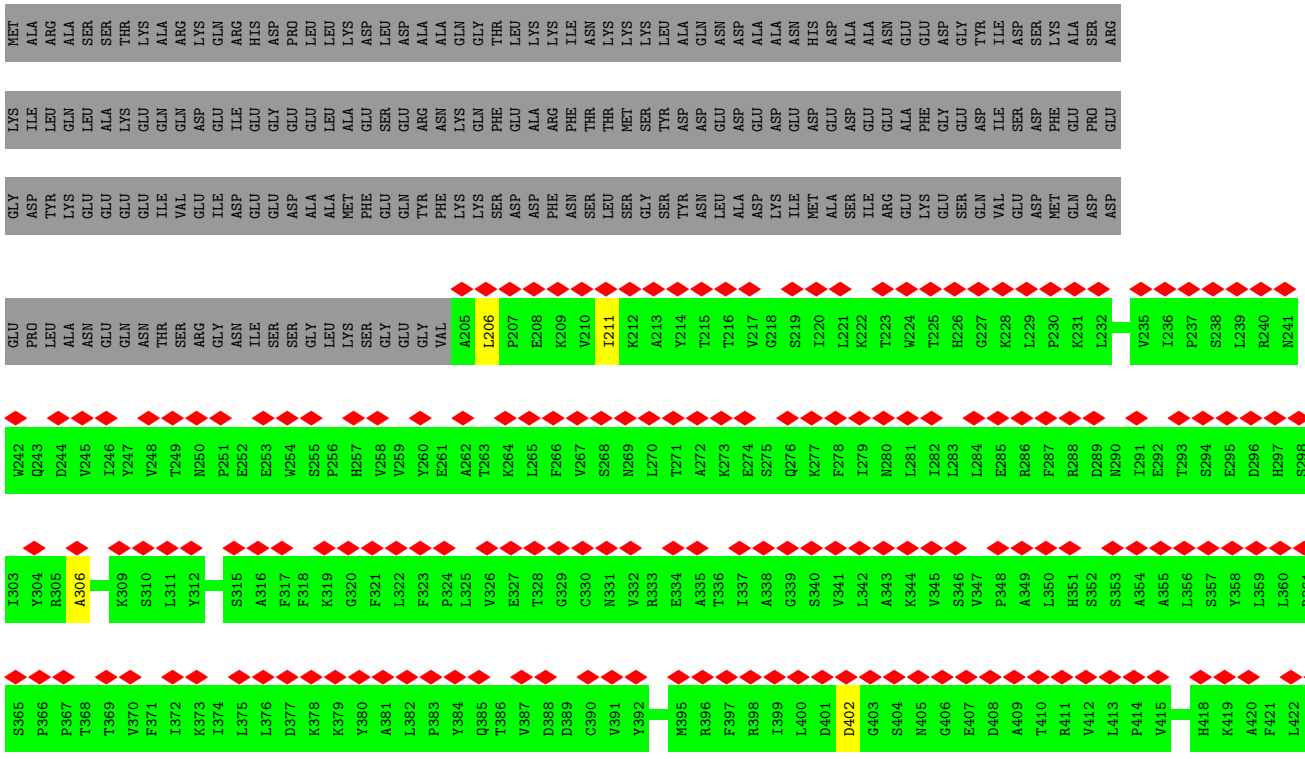
• Molecule 31: Serine/threonine-protein kinase RIO2

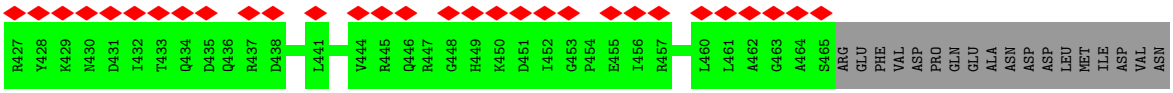
Chain r:



• Molecule 32: Essential nuclear protein 1

Chain e:




R427 Y428 K429 N430 D431 I432 T433 Q434 D435 Q436 R437 D438 L441 V444 R445 Q446 R447 G448 H449 K450 D451 I452 G453 P454 E455 I456 R457 L460 L461 A462 G463 A464 S465 ARG GLU PHE VAL ASP PRO GLN GLU ALA ASN ASP ASP LEU MET ILE ASP VAL ASN

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	84100	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	2.4	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON II (4k x 4k)	Depositor
Maximum map value	0.523	Depositor
Minimum map value	-0.262	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.016	Depositor
Recommended contour level	0.0722	Depositor
Map size (Å)	416.25598, 416.25598, 416.25598	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.084, 1.084, 1.084	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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	2	1.27	181/39917 (0.5%)	1.13	242/62179 (0.4%)
2	D	0.44	0/900	0.76	0/1223
3	B	0.43	0/1611	0.75	3/2177 (0.1%)
4	C	0.45	0/878	0.76	0/1177
5	E	0.49	0/948	0.80	2/1273 (0.2%)
6	F	0.46	0/1125	0.73	0/1510
7	H	0.43	0/1027	0.72	1/1383 (0.1%)
8	I	0.45	0/1130	0.78	2/1517 (0.1%)
9	K	0.42	0/526	0.77	0/706
10	L	0.42	0/488	0.79	1/656 (0.2%)
11	N	0.46	0/404	0.76	0/542
12	P	0.90	2/1617 (0.1%)	0.93	4/2215 (0.2%)
13	Q	0.65	0/1735	0.85	2/2335 (0.1%)
14	R	0.94	1/1692 (0.1%)	0.94	2/2296 (0.1%)
15	S	1.05	2/2109 (0.1%)	1.07	12/2839 (0.4%)
16	T	0.78	0/1823	0.99	12/2439 (0.5%)
17	U	0.68	0/1506	0.94	5/2028 (0.2%)
18	V	1.00	4/1514 (0.3%)	1.07	6/2021 (0.3%)
19	W	1.02	1/1519 (0.1%)	1.10	7/2035 (0.3%)
20	X	1.21	4/1239 (0.3%)	1.17	7/1673 (0.4%)
21	Y	0.94	2/1215 (0.2%)	1.07	7/1638 (0.4%)
22	Z	0.60	0/901	0.87	2/1217 (0.2%)
23	a	0.96	0/693	1.08	2/935 (0.2%)
24	b	1.27	3/1038 (0.3%)	1.22	8/1395 (0.6%)
25	c	1.15	4/1139 (0.4%)	1.33	13/1518 (0.9%)
26	d	0.96	0/1087	1.01	6/1449 (0.4%)
27	f	0.83	1/620 (0.2%)	1.01	5/838 (0.6%)
28	t	0.70	1/5150 (0.0%)	0.81	7/6972 (0.1%)
29	g	0.85	0/483	1.15	5/643 (0.8%)
30	p	0.62	0/1500	0.84	2/2020 (0.1%)
31	r	0.29	0/2209	0.54	0/2965
32	e	0.27	0/1044	0.54	1/1304 (0.1%)
All	All	1.05	206/80787 (0.3%)	1.04	366/117118 (0.3%)

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
1	2	0	11
2	D	0	1
3	B	0	1
4	C	0	2
5	E	0	2
6	F	0	2
9	K	0	3
12	P	0	3
13	Q	0	5
14	R	0	1
15	S	0	1
17	U	0	3
18	V	0	1
19	W	0	2
20	X	0	1
21	Y	0	1
22	Z	0	1
23	a	0	3
24	b	0	1
25	c	0	1
28	t	0	8
29	g	0	1
31	r	0	2
All	All	0	57

The worst 5 of 206 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	2	220	A	C6-N1	-46.67	1.02	1.35
1	2	222	A	C6-N1	-43.87	1.04	1.35
1	2	831	U	C2-N3	34.00	1.61	1.37
1	2	833	U	C2-N3	32.63	1.60	1.37
1	2	863	A	C6-N1	-27.67	1.16	1.35

The worst 5 of 366 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	831	U	C2-N3-C4	-33.08	107.15	127.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	2	833	U	C2-N3-C4	-28.03	110.18	127.00
1	2	220	A	N1-C6-N6	-26.49	102.71	118.60
1	2	964	U	C2-N3-C4	-23.66	112.80	127.00
1	2	222	A	N1-C6-N6	-22.82	104.91	118.60

There are no chirality outliers.

5 of 57 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	2	222	A	Sidechain
1	2	236	A	Sidechain
1	2	440	U	Sidechain
1	2	507	U	Sidechain
1	2	618	U	Sidechain

5.2 Too-close contacts (i)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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
2	D	122/143 (85%)	89 (73%)	30 (25%)	3 (2%)	5 36
3	B	198/225 (88%)	168 (85%)	28 (14%)	2 (1%)	15 55
4	C	108/136 (79%)	92 (85%)	14 (13%)	2 (2%)	8 42
5	E	115/142 (81%)	93 (81%)	21 (18%)	1 (1%)	17 57
6	F	139/143 (97%)	121 (87%)	14 (10%)	4 (3%)	4 33
7	H	120/146 (82%)	107 (89%)	13 (11%)	0	100 100
8	I	141/144 (98%)	129 (92%)	11 (8%)	1 (1%)	22 61

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
9	K	62/108 (57%)	49 (79%)	10 (16%)	3 (5%)	2 22
10	L	60/67 (90%)	54 (90%)	6 (10%)	0	100 100
11	N	49/152 (32%)	32 (65%)	12 (24%)	5 (10%)	0 7
12	P	204/252 (81%)	168 (82%)	32 (16%)	4 (2%)	7 41
13	Q	212/255 (83%)	172 (81%)	38 (18%)	2 (1%)	17 57
14	R	218/254 (86%)	186 (85%)	29 (13%)	3 (1%)	11 48
15	S	258/261 (99%)	226 (88%)	31 (12%)	1 (0%)	34 71
16	T	224/236 (95%)	206 (92%)	17 (8%)	1 (0%)	34 71
17	U	182/190 (96%)	158 (87%)	22 (12%)	2 (1%)	14 53
18	V	184/200 (92%)	160 (87%)	21 (11%)	3 (2%)	9 46
19	W	183/197 (93%)	156 (85%)	24 (13%)	3 (2%)	9 46
20	X	153/156 (98%)	133 (87%)	19 (12%)	1 (1%)	22 61
21	Y	148/151 (98%)	130 (88%)	17 (12%)	1 (1%)	22 61
22	Z	125/137 (91%)	110 (88%)	15 (12%)	0	100 100
23	a	85/87 (98%)	66 (78%)	16 (19%)	3 (4%)	3 30
24	b	127/130 (98%)	118 (93%)	8 (6%)	1 (1%)	19 59
25	c	142/145 (98%)	116 (82%)	23 (16%)	3 (2%)	7 40
26	d	132/135 (98%)	121 (92%)	9 (7%)	2 (2%)	10 47
27	f	79/82 (96%)	60 (76%)	17 (22%)	2 (2%)	5 36
28	t	627/788 (80%)	542 (86%)	78 (12%)	7 (1%)	14 53
29	g	58/63 (92%)	42 (72%)	14 (24%)	2 (3%)	3 31
30	p	183/274 (67%)	168 (92%)	15 (8%)	0	100 100
31	r	256/425 (60%)	227 (89%)	26 (10%)	3 (1%)	13 51
32	e	259/483 (54%)	242 (93%)	14 (5%)	3 (1%)	13 51
All	All	5153/6307 (82%)	4441 (86%)	644 (12%)	68 (1%)	16 50

5 of 68 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
9	K	97	LYS
11	N	148	TYR
12	P	110	TYR
12	P	111	ILE
15	S	69	HIS

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	
2	D	89/119 (75%)	89 (100%)	0	100	100
3	B	173/191 (91%)	173 (100%)	0	100	100
4	C	88/124 (71%)	88 (100%)	0	100	100
5	E	98/118 (83%)	98 (100%)	0	100	100
6	F	117/119 (98%)	116 (99%)	1 (1%)	78	90
7	H	109/129 (84%)	109 (100%)	0	100	100
8	I	115/116 (99%)	114 (99%)	1 (1%)	78	90
9	K	57/89 (64%)	57 (100%)	0	100	100
10	L	55/60 (92%)	55 (100%)	0	100	100
11	N	43/135 (32%)	40 (93%)	3 (7%)	15	48
12	P	164/210 (78%)	162 (99%)	2 (1%)	71	87
13	Q	191/224 (85%)	189 (99%)	2 (1%)	76	88
14	R	179/205 (87%)	174 (97%)	5 (3%)	43	72
15	S	221/222 (100%)	220 (100%)	1 (0%)	88	95
16	T	188/201 (94%)	187 (100%)	1 (0%)	88	95
17	U	165/170 (97%)	163 (99%)	2 (1%)	71	87
18	V	150/161 (93%)	150 (100%)	0	100	100
19	W	158/166 (95%)	157 (99%)	1 (1%)	86	94
20	X	129/137 (94%)	129 (100%)	0	100	100
21	Y	127/128 (99%)	126 (99%)	1 (1%)	81	91
22	Z	81/105 (77%)	79 (98%)	2 (2%)	47	75
23	a	74/74 (100%)	72 (97%)	2 (3%)	44	73
24	b	110/111 (99%)	108 (98%)	2 (2%)	59	81
25	c	119/120 (99%)	118 (99%)	1 (1%)	81	91
26	d	112/113 (99%)	111 (99%)	1 (1%)	78	90
27	f	70/71 (99%)	70 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
28	t	533/703 (76%)	525 (98%)	8 (2%)	65 84
29	g	51/54 (94%)	49 (96%)	2 (4%)	32 65
30	p	162/238 (68%)	154 (95%)	8 (5%)	25 59
31	r	242/384 (63%)	242 (100%)	0	100 100
All	All	4170/4997 (84%)	4124 (99%)	46 (1%)	74 88

5 of 46 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
28	t	54	ARG
28	t	714	VAL
28	t	123	ILE
28	t	225	ARG
29	g	33	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 47 such sidechains are listed below:

Mol	Chain	Res	Type
21	Y	105	ASN
28	t	116	GLN
22	Z	80	HIS
25	c	75	GLN
28	t	199	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1664/1800 (92%)	589 (35%)	68 (4%)

5 of 589 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	3	U
1	2	4	C
1	2	5	U
1	2	8	U
1	2	9	U

5 of 68 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	1441	C
1	2	1481	C
1	2	1680	G
1	2	401	A
1	2	400	A

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	2	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	2	401:A	O3'	402:C	P	1.78

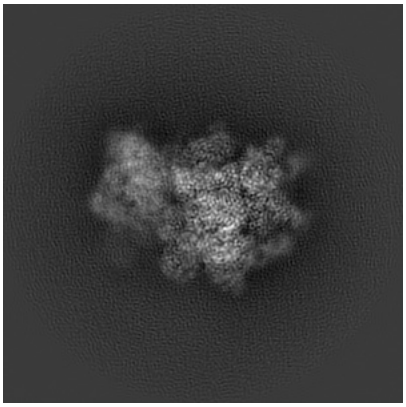
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-3886. These allow visual inspection of the internal detail of the map and identification of artifacts.

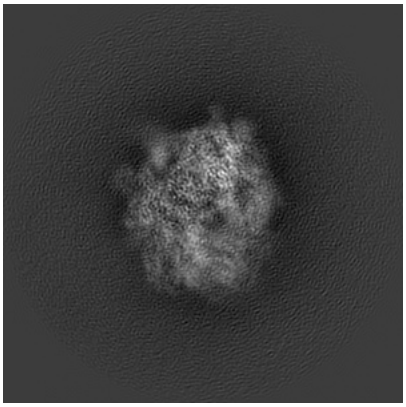
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

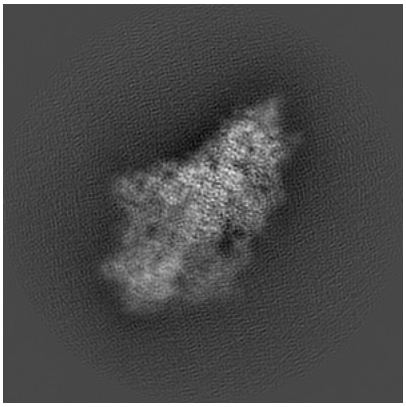
6.1.1 Primary map



X



Y

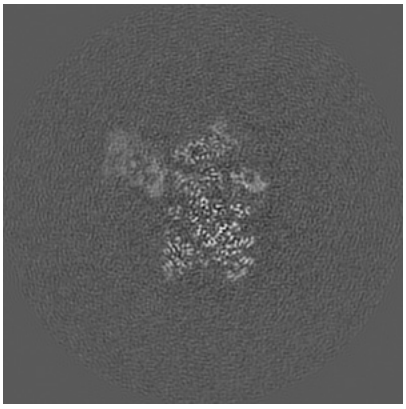


Z

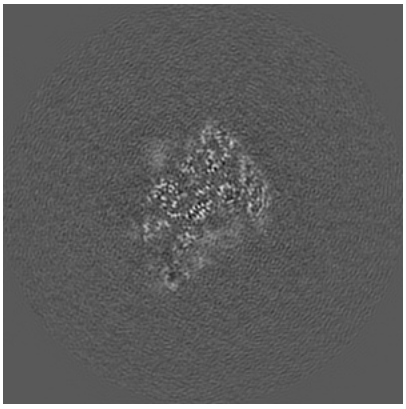
The images above show the map projected in three orthogonal directions.

6.2 Central slices

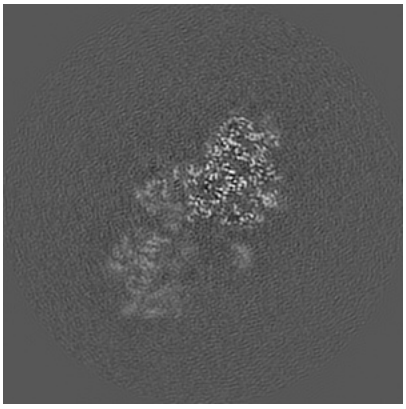
6.2.1 Primary map



X Index: 192



Y Index: 192

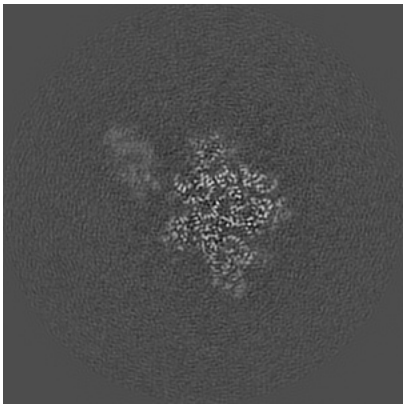


Z Index: 192

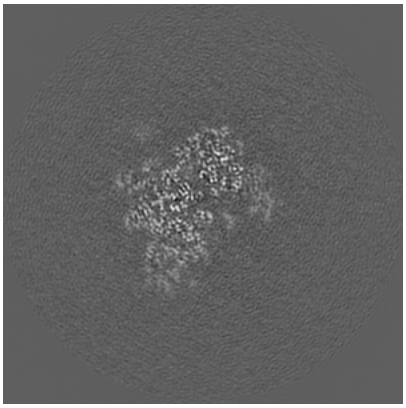
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

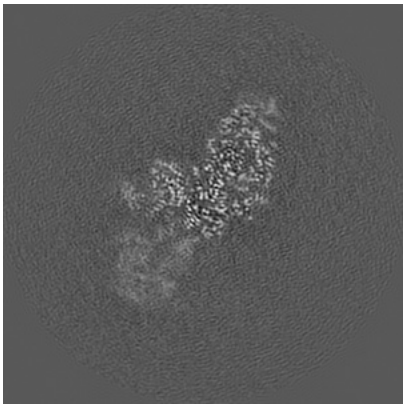
6.3.1 Primary map



X Index: 209



Y Index: 214



Z Index: 178

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

6.4 Orthogonal surface views (i)

6.4.1 Primary map

X

Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.0722. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

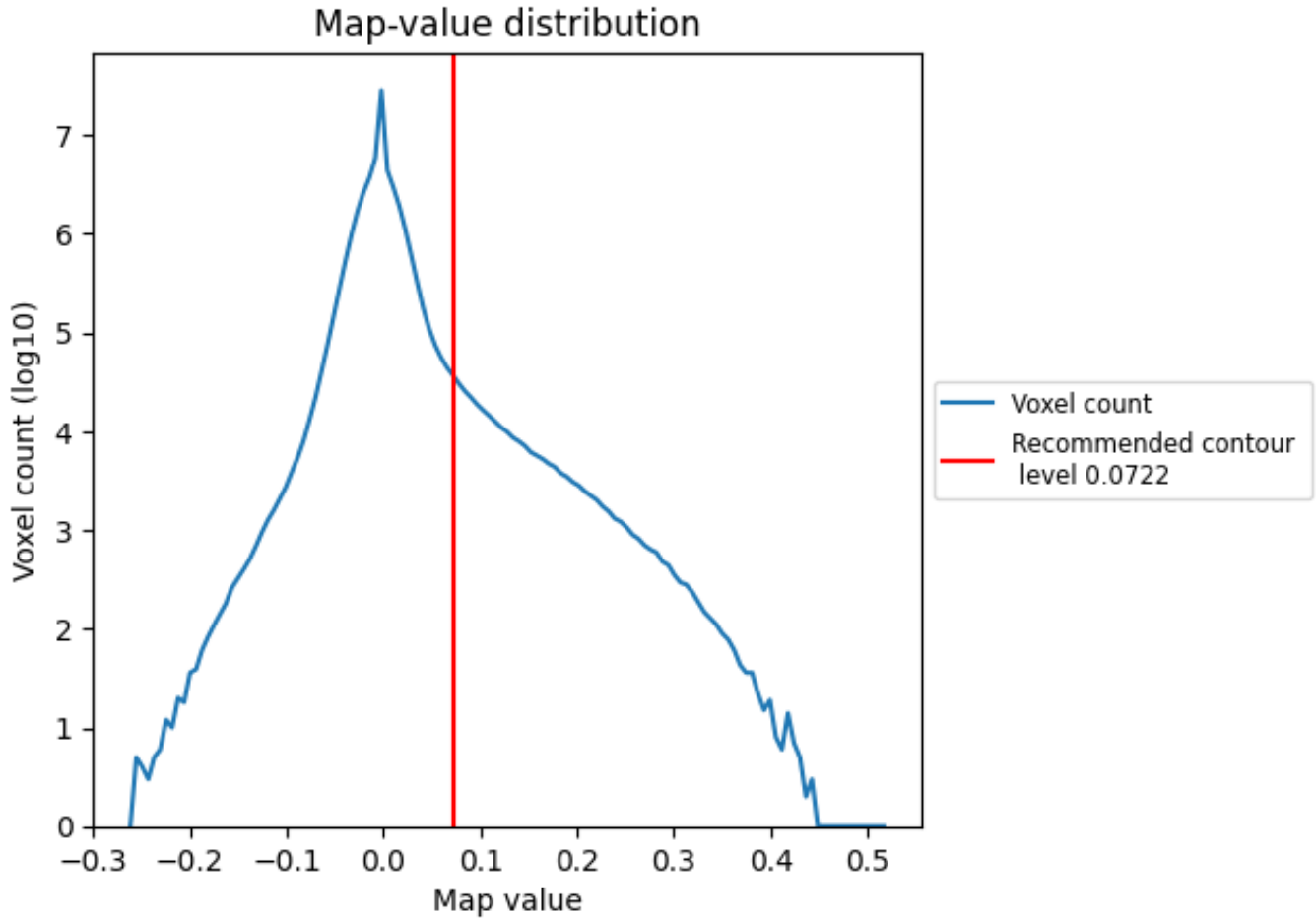
6.5 Mask visualisation (i)

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

7 Map analysis

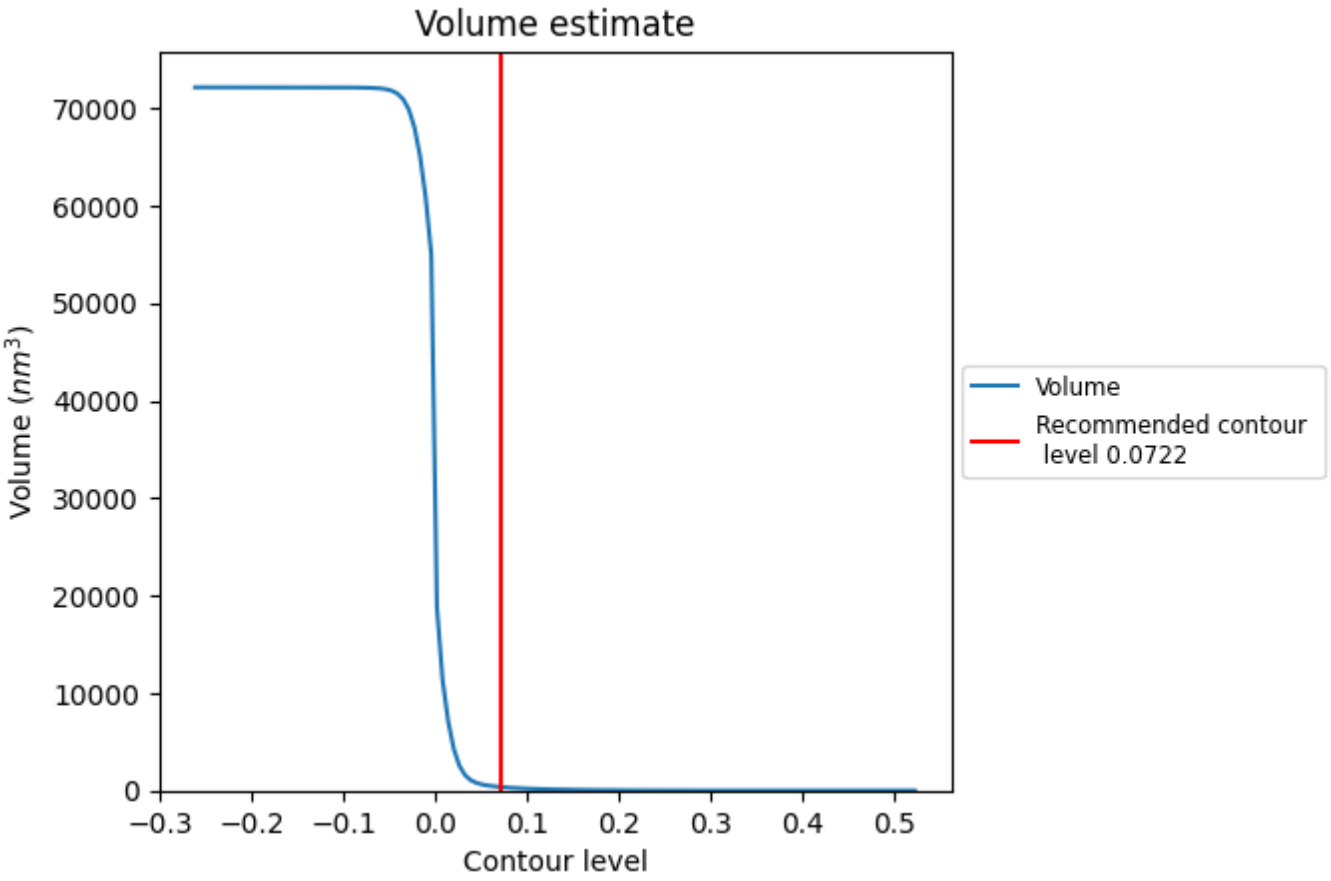
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

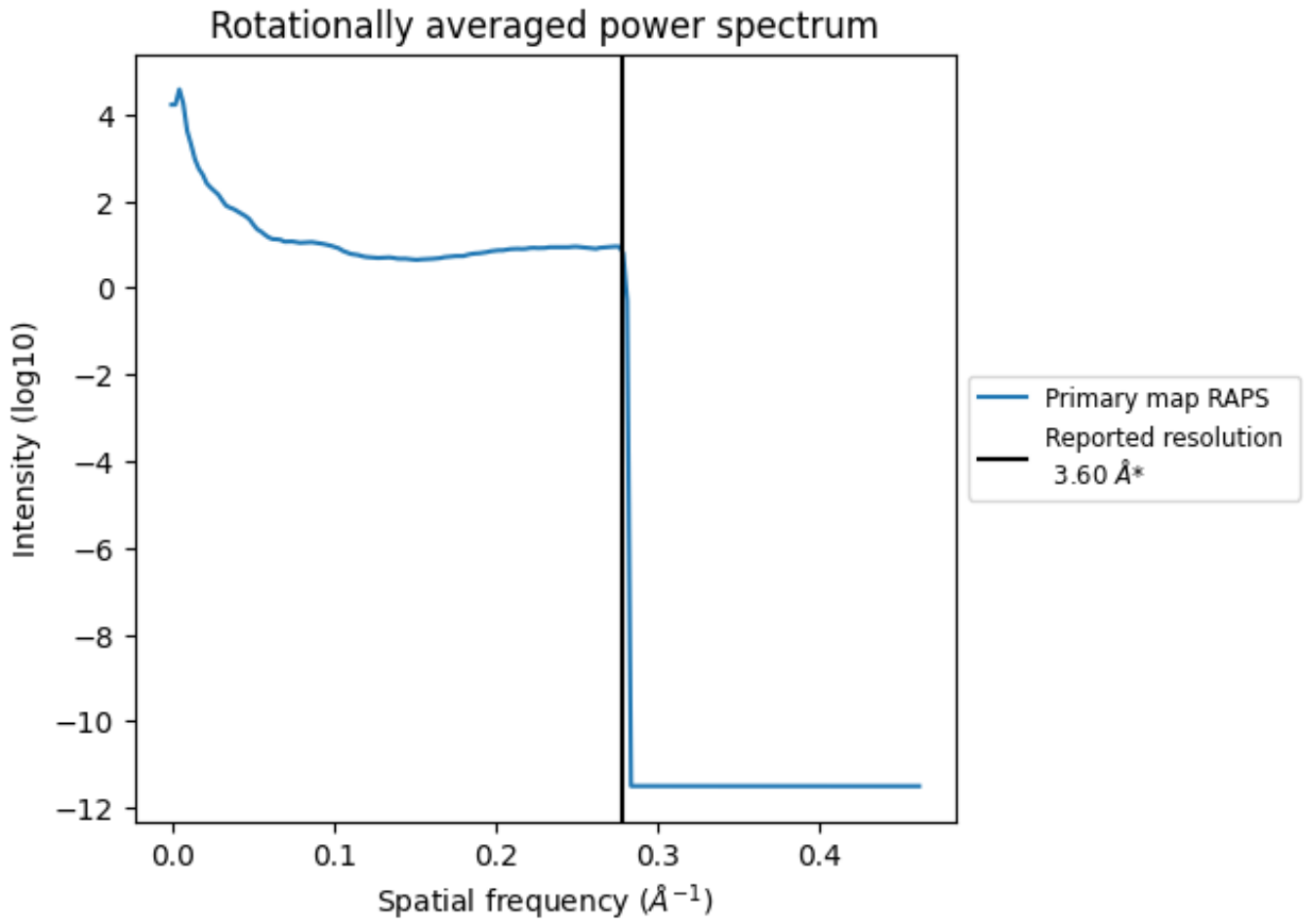
7.2 Volume estimate (i)



The volume at the recommended contour level is 359 nm^3; this corresponds to an approximate mass of 324 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)

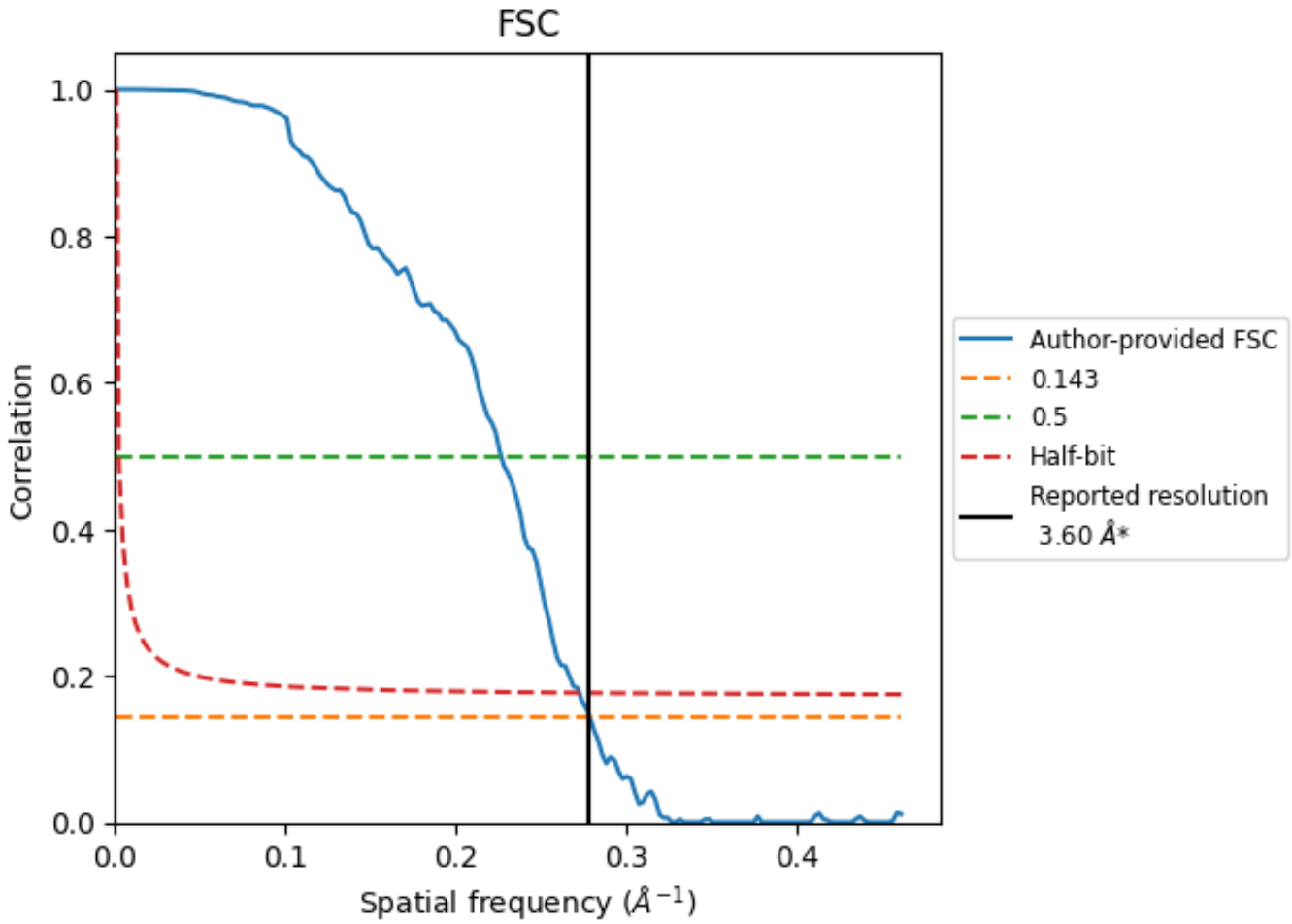


*Reported resolution corresponds to spatial frequency of 0.278 $Å^{-1}$

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 0.278 Å^{-1}

8.2 Resolution estimates (i)

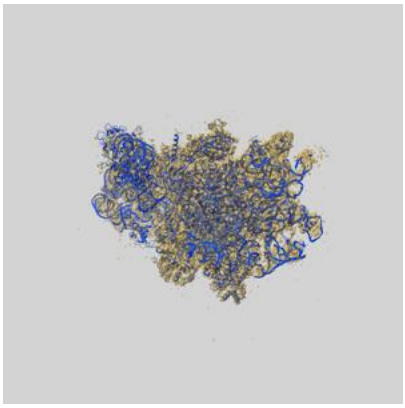
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	3.59	4.41	3.67
Unmasked-calculated*	-	-	-

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

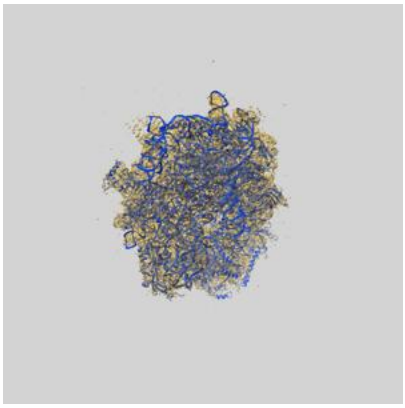
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-3886 and PDB model 6EML. Per-residue inclusion information can be found in section 3 on page 9.

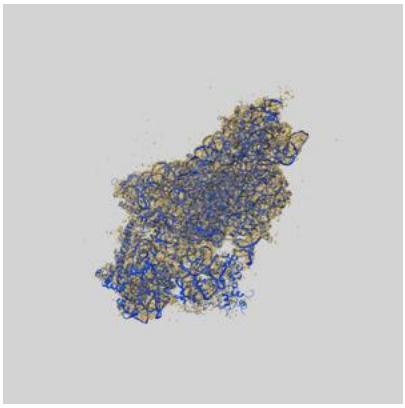
9.1 Map-model overlay



X



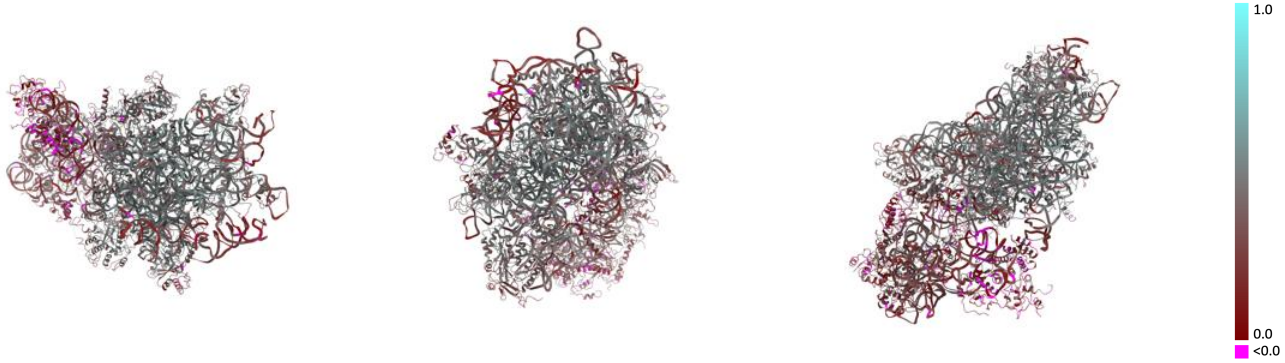
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0722 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

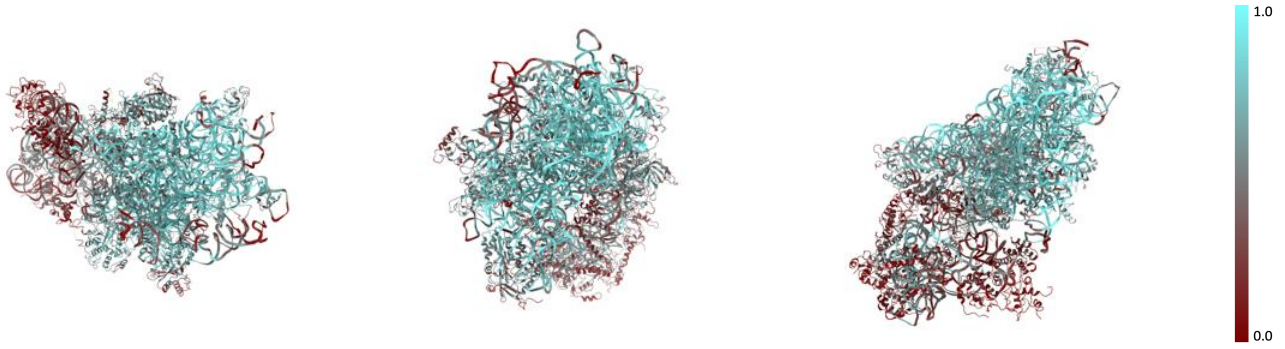
9.2 Q-score mapped to coordinate model



X Y Z

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

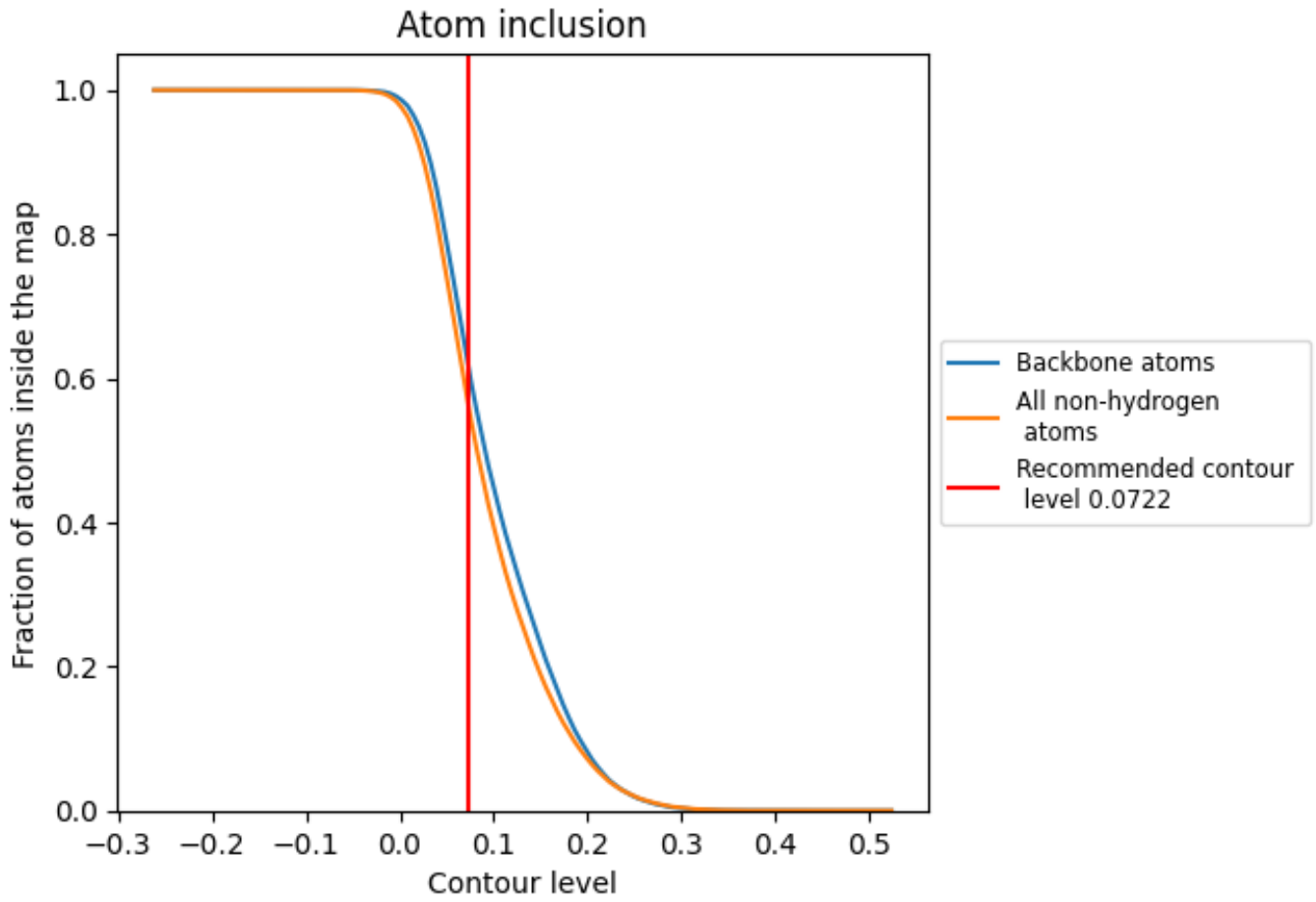
9.3 Atom inclusion mapped to coordinate model



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.0722).

9.4 Atom inclusion (i)



At the recommended contour level, 62% of all backbone atoms, 57% 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 (0.0722) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5678	0.3710
2	0.6673	0.3790
B	0.2304	0.2400
C	0.1811	0.2180
D	0.0454	0.1680
E	0.2594	0.2530
F	0.1603	0.2270
H	0.1814	0.2510
I	0.2109	0.2440
K	0.1054	0.2120
L	0.1752	0.2370
N	0.0310	0.1090
P	0.6649	0.4400
Q	0.5110	0.3880
R	0.6508	0.4630
S	0.7195	0.4930
T	0.6592	0.4410
U	0.4793	0.3780
V	0.7082	0.4540
W	0.7101	0.4740
X	0.6810	0.4750
Y	0.6996	0.4510
Z	0.4872	0.3840
a	0.6762	0.4490
b	0.7715	0.5160
c	0.6170	0.4600
d	0.6964	0.4720
e	0.1665	0.1520
f	0.6755	0.4590
g	0.3856	0.3360
p	0.4152	0.3700
r	0.1447	0.1400
t	0.5279	0.4020