



Full wwPDB EM Validation Report ⓘ

Nov 19, 2022 – 06:35 pm GMT

PDB ID : 5OA3
EMDB ID : EMD-3770
Title : Human 40S-eIF2D-re-initiation complex
Authors : Weisser, M.; Schaefer, T.; Leibundgut, M.; Boehringer, D.; Aylett, C.H.S.;
Ban, N.
Deposited on : 2017-06-20
Resolution : 4.30 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:

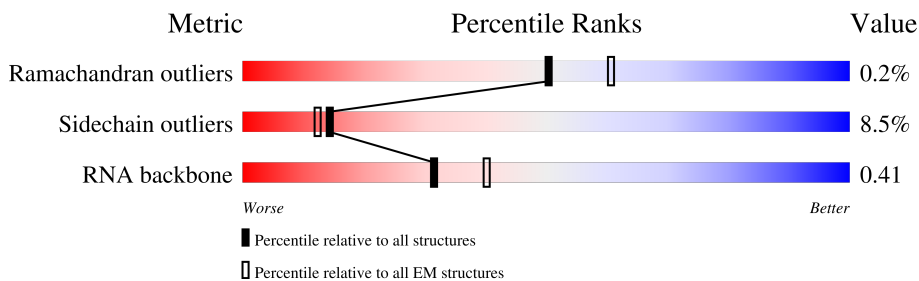
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

1 Overall quality at a glance

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

The reported resolution of this entry is 4.30 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.



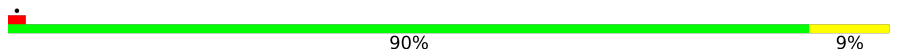


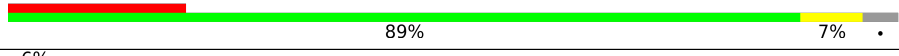
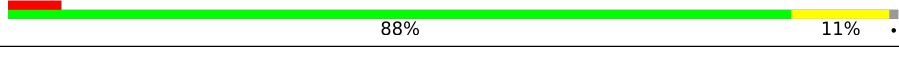



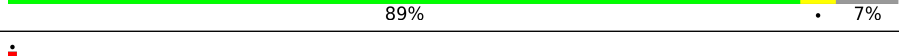
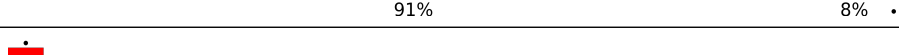
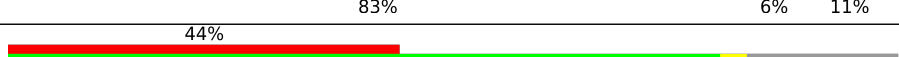
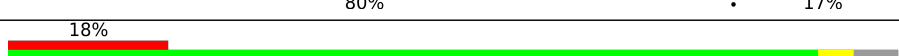
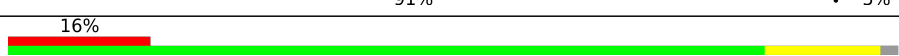
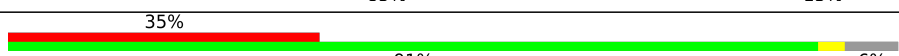
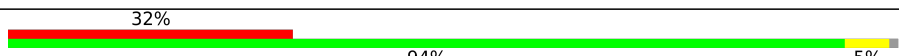
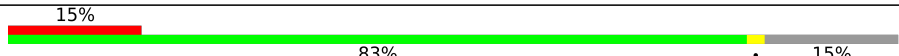


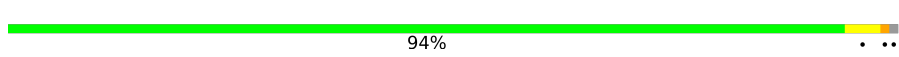


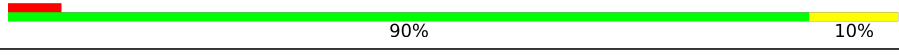
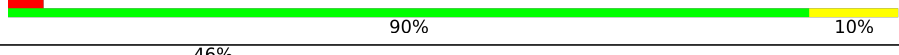
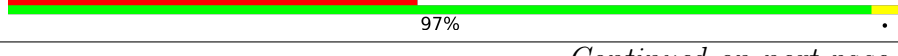

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	0	584	
2	1	75	
3	2	1868	
4	3	275	
5	A	295	
6	B	264	
7	C	293	
8	D	243	

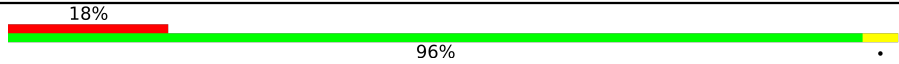

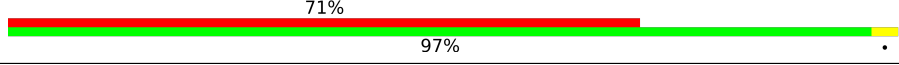
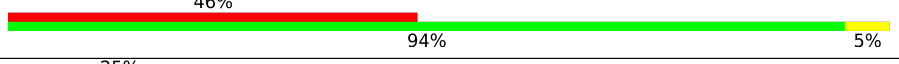
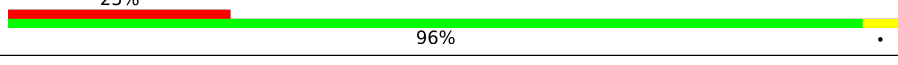
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Mol	Chain	Length	Quality of chain
9	E	263	
10	F	204	
11	G	249	
12	H	194	
13	I	208	
14	J	194	
15	K	165	
16	L	158	
17	M	132	
18	N	151	
19	O	151	
20	P	145	
21	Q	146	
22	R	135	
23	S	152	
24	T	145	
25	U	119	
26	V	83	
27	W	130	
28	X	143	
29	Y	130	
30	Z	125	
31	a	101	
32	b	82	
33	c	61	

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Mol	Chain	Length	Quality of chain
34	d	55	 <p>18% 96%</p>
35	e	56	 <p>16% 89% 11%</p>
36	f	72	 <p>71% 97%</p>
37	g	315	 <p>46% 94% 5%</p>
38	h	24	 <p>25% 96%</p>

2 Entry composition

There are 39 unique types of molecules in this entry. The entry contains 83675 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 Eukaryotic translation initiation factor 2D.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	479	3740	2392	643	684	21	0	0

- Molecule 2 is a RNA chain called initiator Met-tRNA-i.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	1	75	1608	716	297	520	75	0	0

- Molecule 3 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	2	1661	35466	15831	6370	11604	1661	0	0

- Molecule 4 is a RNA chain called IRES mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	3	186	3976	1770	713	1307	186	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A	216	1705	1083	299	315	8	0	0

- Molecule 6 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	B	213	1729	1098	309	308	14	0	0

- Molecule 7 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	C	218	1690	1094	289	297	10	0	0

- Molecule 8 is a protein called 40S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	D	225	1752	1117	315	313	7	0	0

- Molecule 9 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	E	262	2076	1324	386	358	8	0	0

- Molecule 10 is a protein called 40S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	F	189	1495	934	284	270	7	0	0

- Molecule 11 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	G	230	1862	1164	371	320	7	0	0

- Molecule 12 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	H	186	1501	957	276	267	1	0	0

- Molecule 13 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	I	205	1675	1053	328	289	5	0	0

- Molecule 14 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	J	180	1499	955	300	242	2	0	0

- Molecule 15 is a protein called 40S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	K	95	800	522	142	131	5	0	0

- Molecule 16 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	L	151	1229	782	230	211	6	0	0

- Molecule 17 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	M	123	953	598	169	177	9	0	0

- Molecule 18 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	N	149	1202	770	228	203	1	0	0

- Molecule 19 is a protein called 40S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	O	135	1010	618	198	188	6	0	0

- Molecule 20 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	P	120	984	625	184	168	7	0	0

- Molecule 21 is a protein called 40S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	Q	139	1109	704	210	192	3	0	0

- Molecule 22 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	R	132	1068	670	199	195	4	0	0

- Molecule 23 is a protein called 40S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	S	143	1184	743	240	200	1	0	0

- Molecule 24 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	T	144	1122	703	217	199	3	0	0

- Molecule 25 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	U	101	803	504	153	142	4	0	0

- Molecule 26 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	V	82	625	384	116	120	5	0	0

- Molecule 27 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	W	129	1034	659	193	176	6	0	0

- Molecule 28 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	X	141	Total	C	N	O	S	0	0
			1098	693	219	183	3		

- Molecule 29 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	Y	124	Total	C	N	O	S	0	0
			1014	641	198	170	5		

- Molecule 30 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	Z	72	Total	C	N	O	S	0	0
			574	368	104	101	1		

- Molecule 31 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	a	101	Total	C	N	O	S	0	0
			814	507	170	132	5		

- Molecule 32 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	b	82	Total	C	N	O	S	0	0
			640	402	118	113	7		

- Molecule 33 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	c	61	Total	C	N	O	S	0	0
			479	292	95	90	2		

- Molecule 34 is a protein called 40S ribosomal protein S29.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	d	55	Total	C	N	O	S	0	0
			458	286	94	73	5		

- Molecule 35 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	e	56	442	273	96	72	1	0	0

- Molecule 36 is a protein called Ribosomal protein S27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	f	72	585	366	114	97	8	0	0

- Molecule 37 is a protein called Receptor of activated protein C kinase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	g	314	2440	1537	425	466	12	0	0

- Molecule 38 is a protein called RIBOSOMAL PROTEIN EL41.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	h	24	231	140	63	26	2	0	0

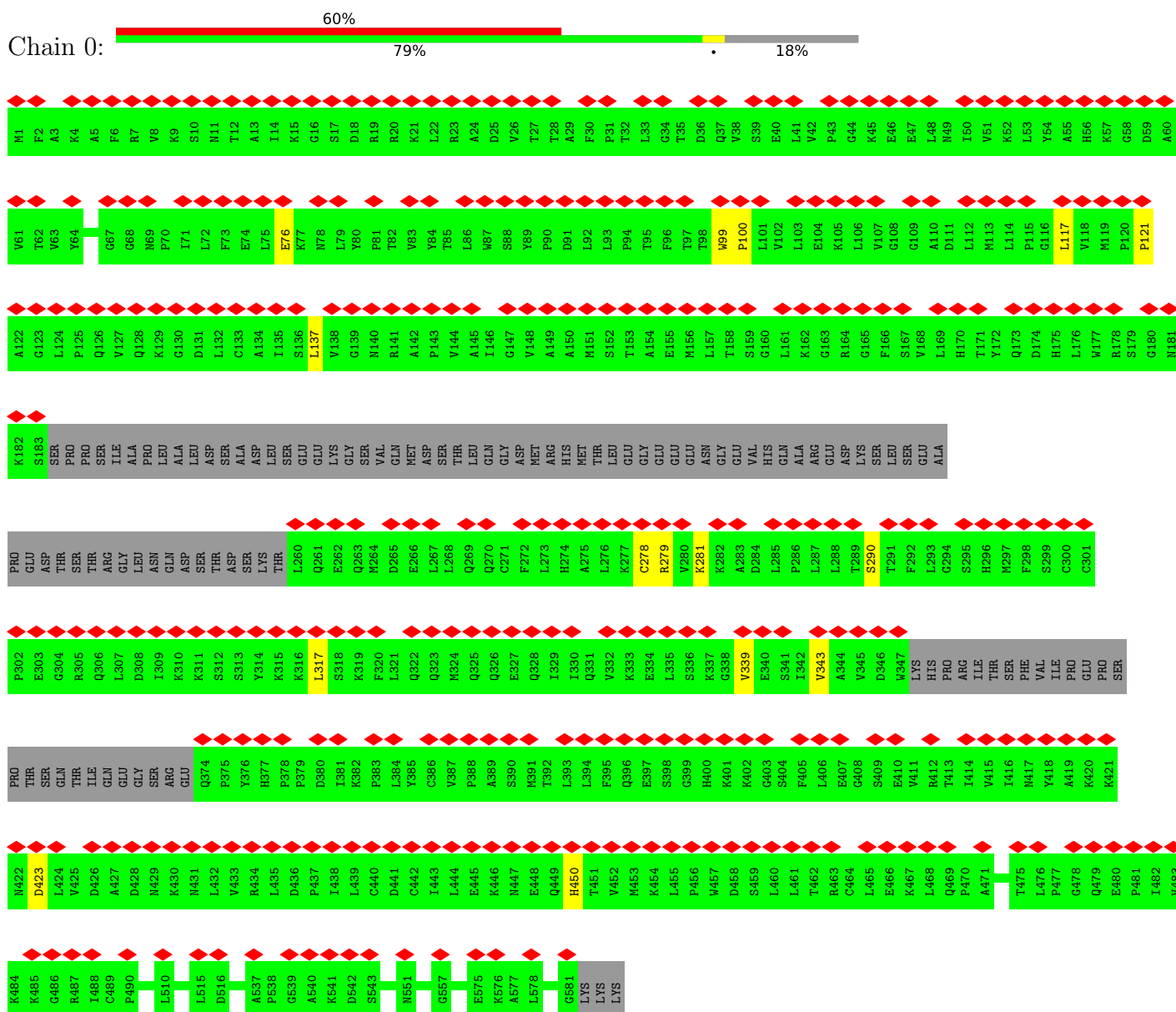
- Molecule 39 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
39	a	1	Total	Zn	0
			1	1	
39	d	1	Total	Zn	0
			1	1	
39	f	1	Total	Zn	0
			1	1	

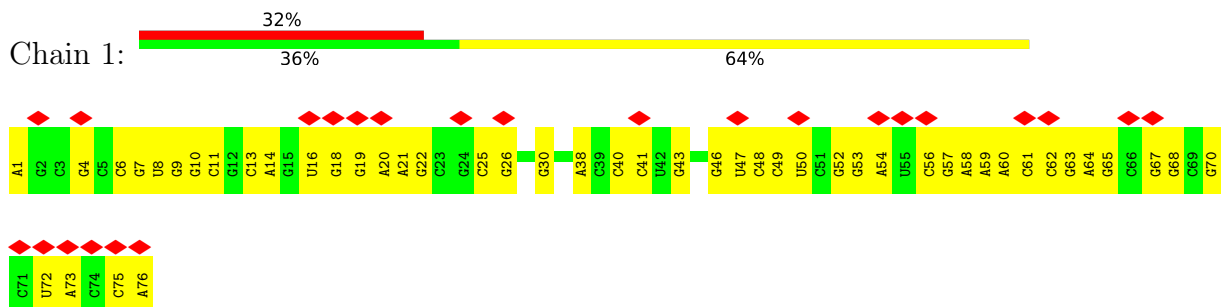
3 Residue-property plots i

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.

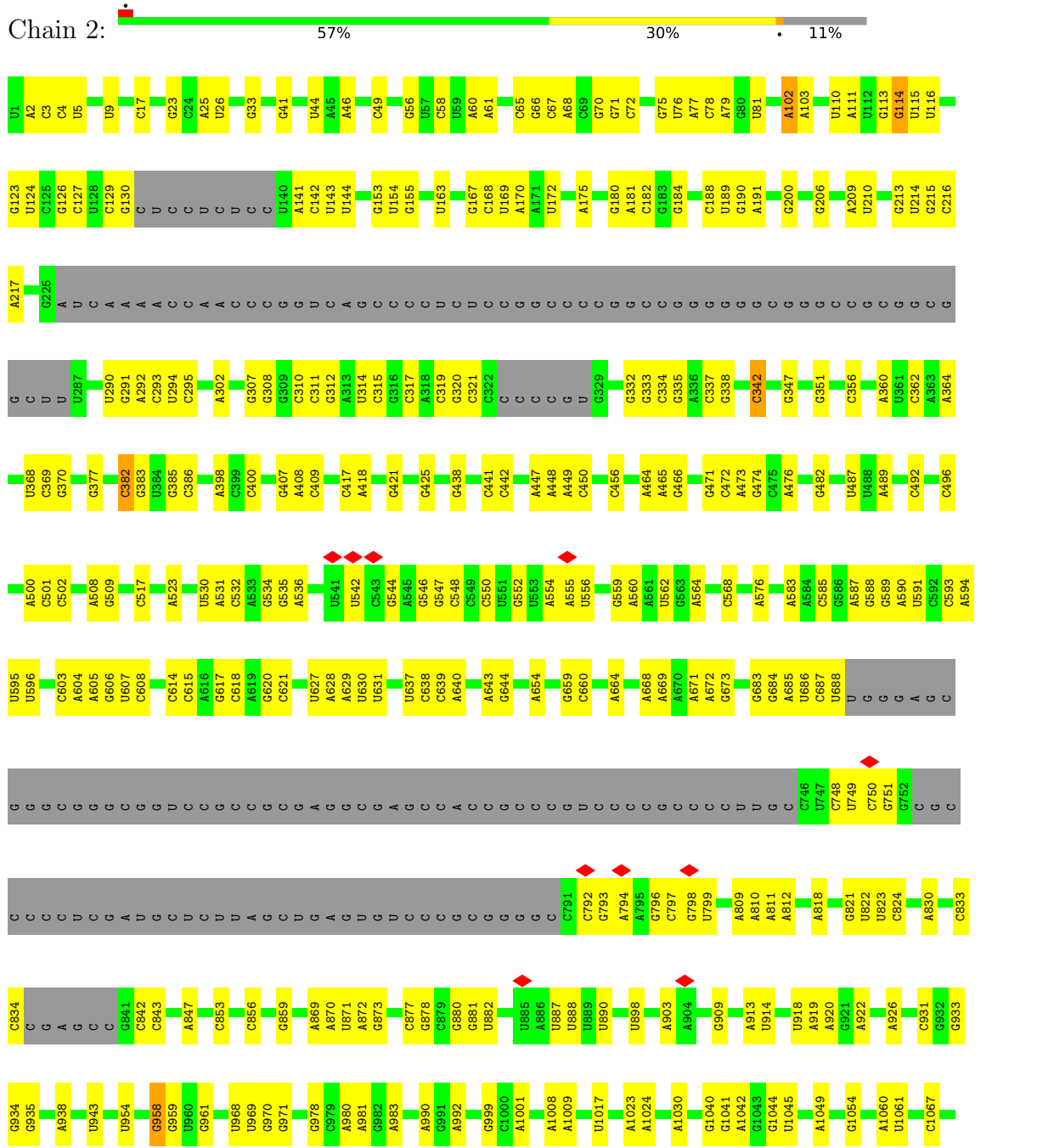
- Molecule 1: Eukaryotic translation initiation factor 2D

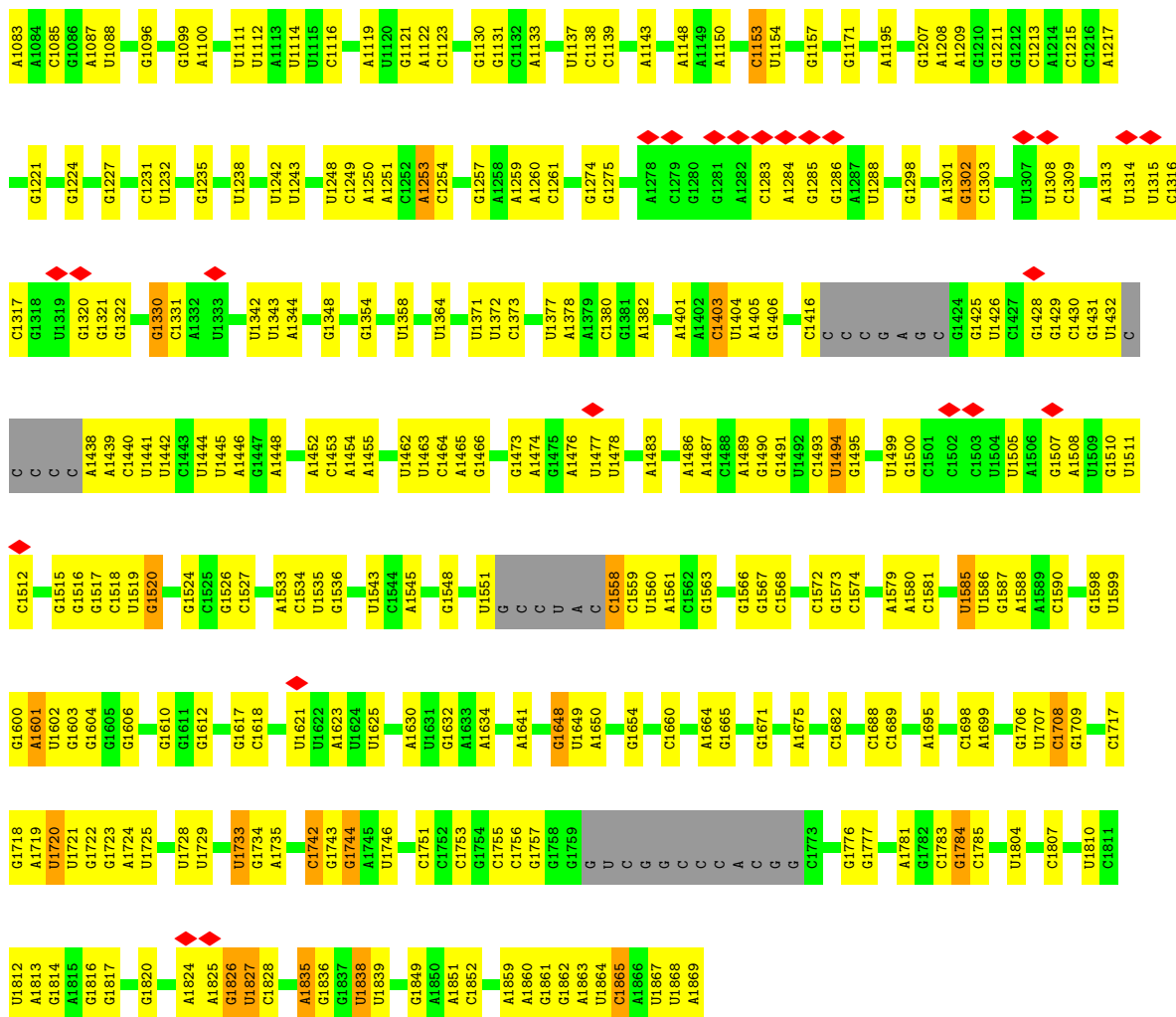


- Molecule 2: initiator Met-tRNA-i

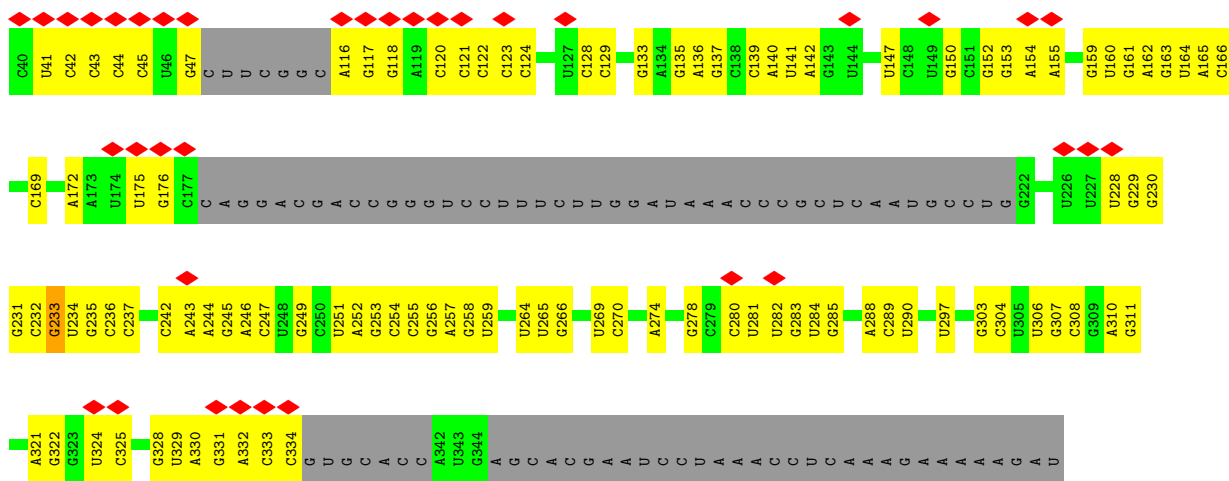


• Molecule 3: 18S ribosomal RNA





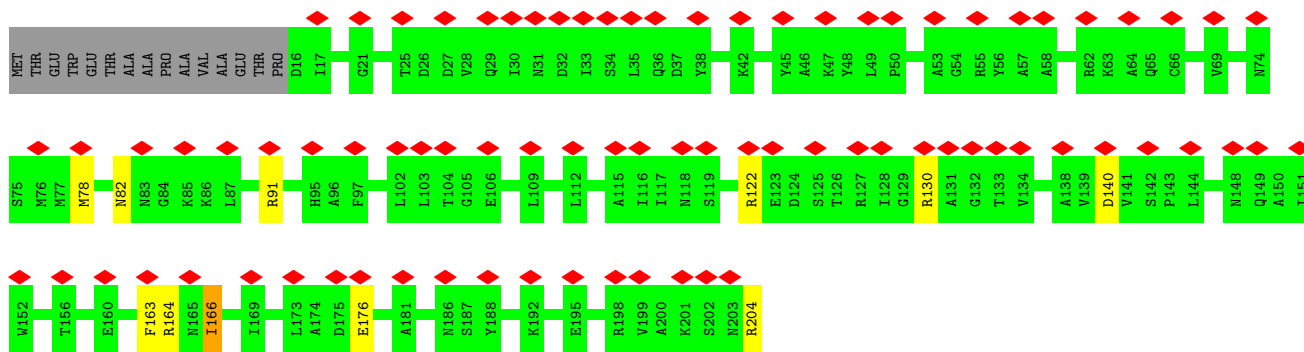
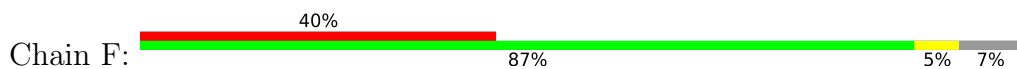
• Molecule 4: IRES mRNA



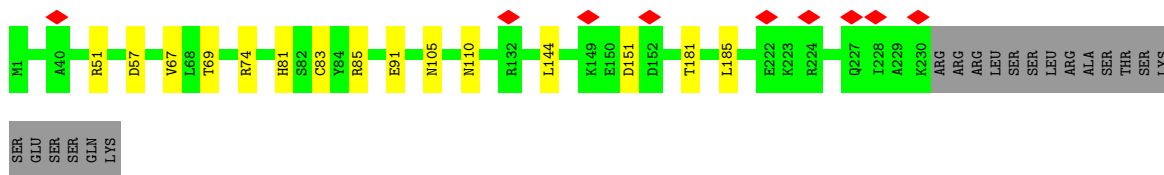
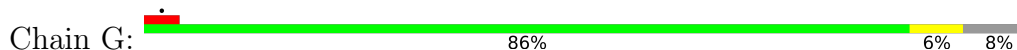
• Molecule 5: 40S ribosomal protein SA



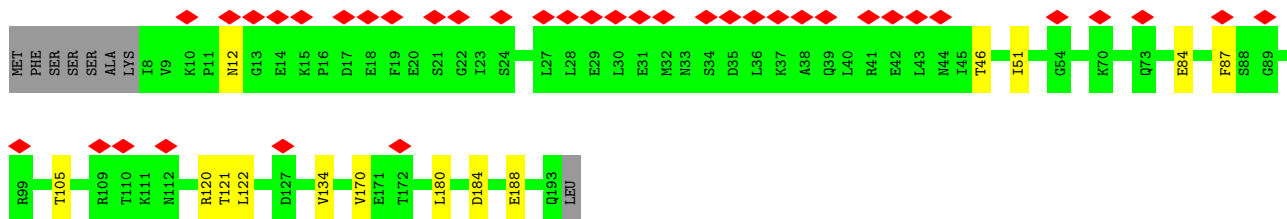
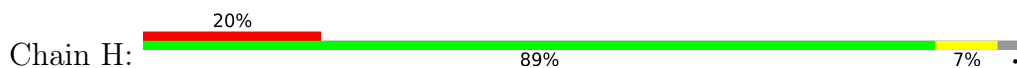
• Molecule 10: 40S ribosomal protein S5



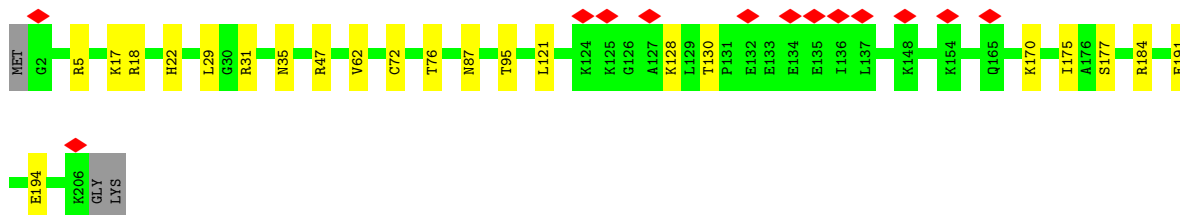
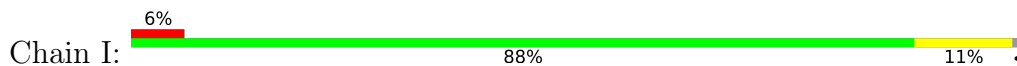
• Molecule 11: 40S ribosomal protein S6



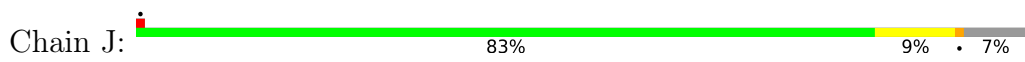
• Molecule 12: 40S ribosomal protein S7



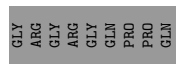
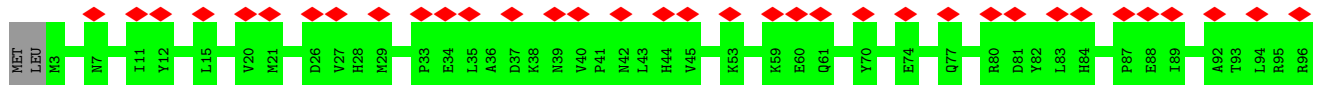
• Molecule 13: 40S ribosomal protein S8



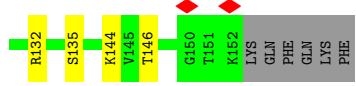
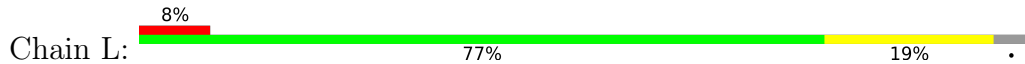
• Molecule 14: 40S ribosomal protein S9



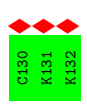
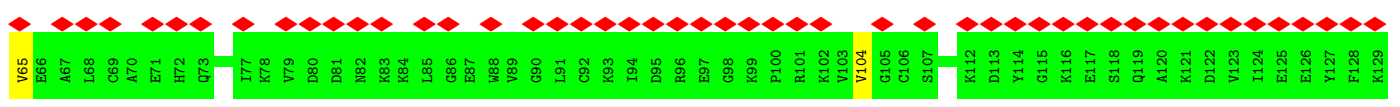
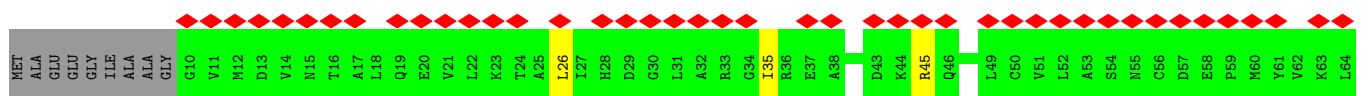
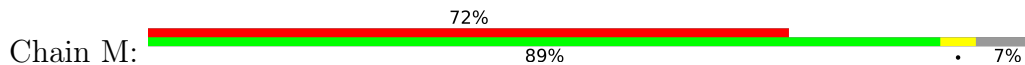
• Molecule 15: 40S ribosomal protein S10



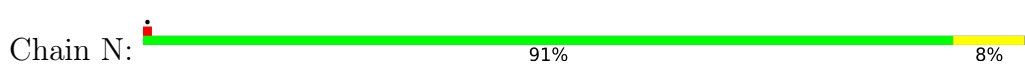
• Molecule 16: 40S ribosomal protein S11

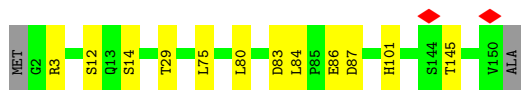


• Molecule 17: 40S ribosomal protein S12

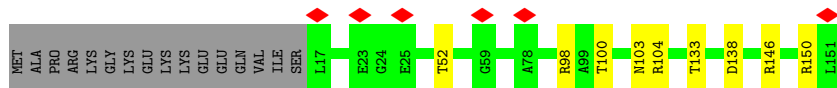
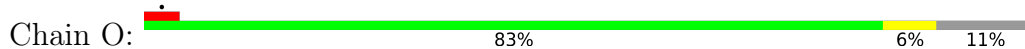


• Molecule 18: 40S ribosomal protein S13

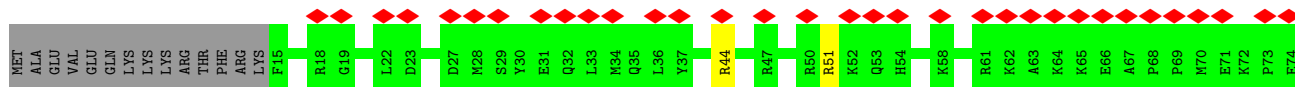
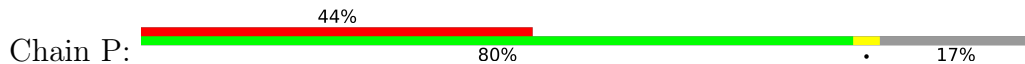




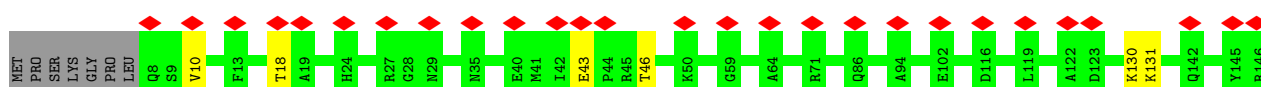
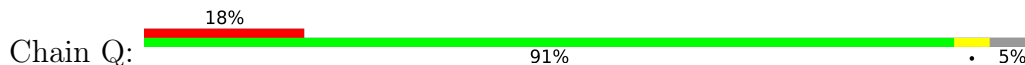
• Molecule 19: 40S ribosomal protein S14



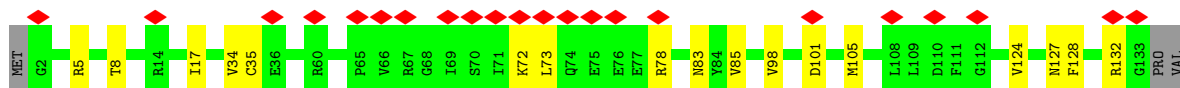
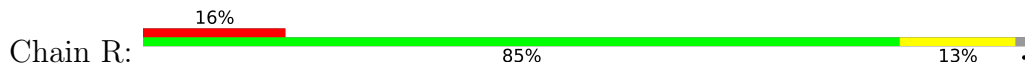
• Molecule 20: 40S ribosomal protein S15



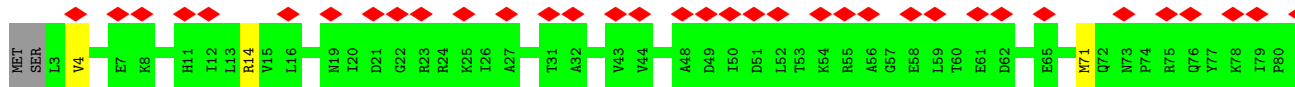
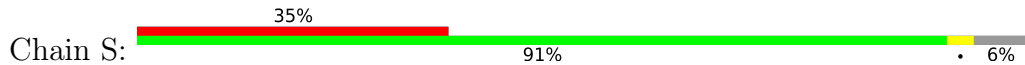
• Molecule 21: 40S ribosomal protein S16



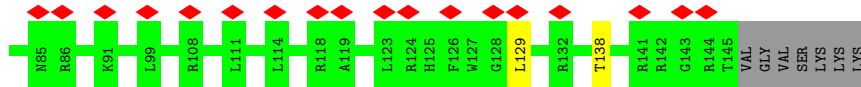
• Molecule 22: 40S ribosomal protein S17

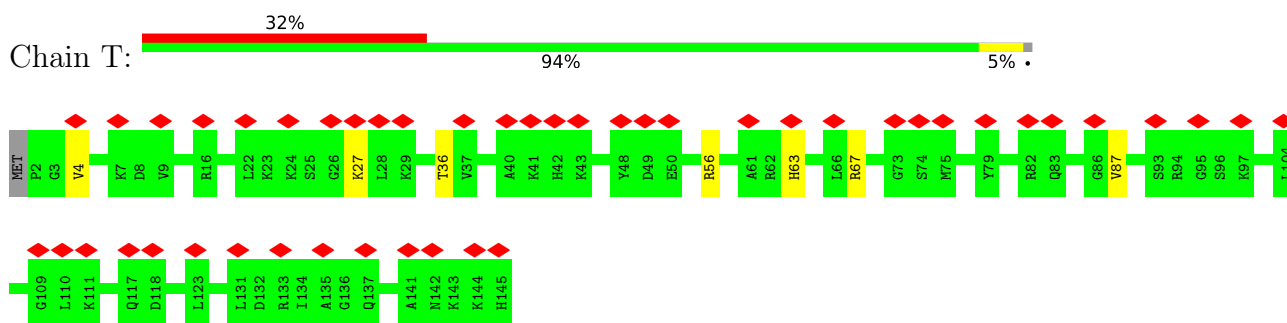


• Molecule 23: 40S ribosomal protein S18

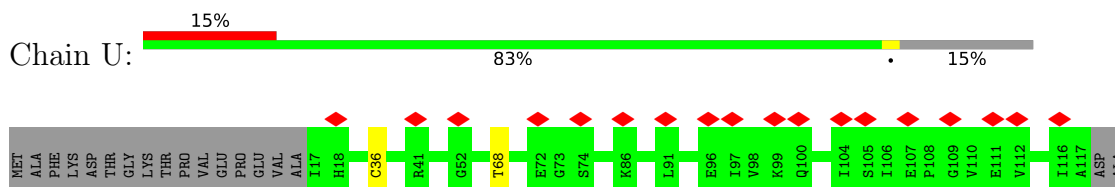


• Molecule 24: 40S ribosomal protein S19

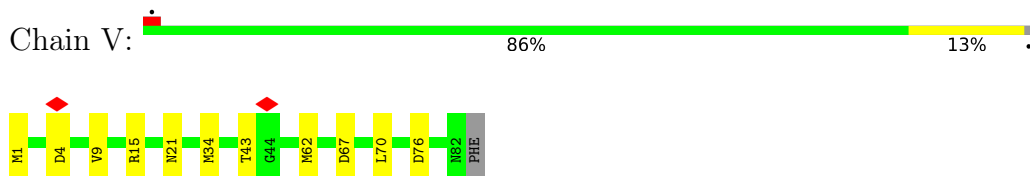




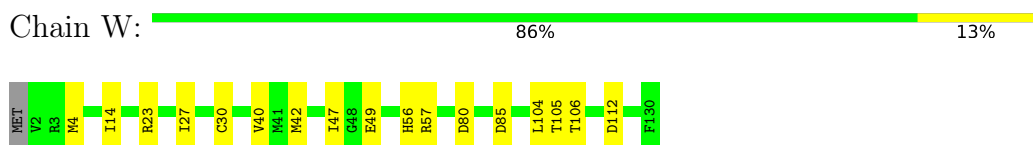
- Molecule 25: 40S ribosomal protein S20



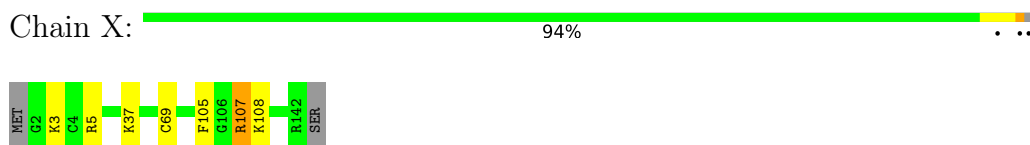
- Molecule 26: 40S ribosomal protein S21



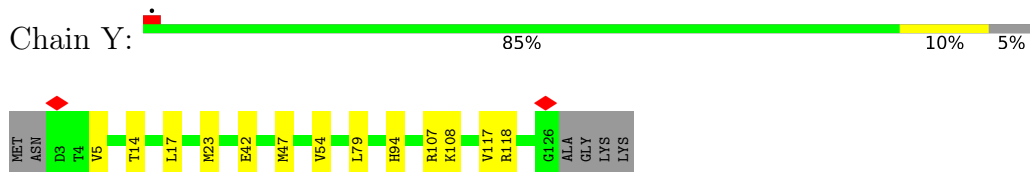
- Molecule 27: 40S ribosomal protein S15a



- Molecule 28: 40S ribosomal protein S23

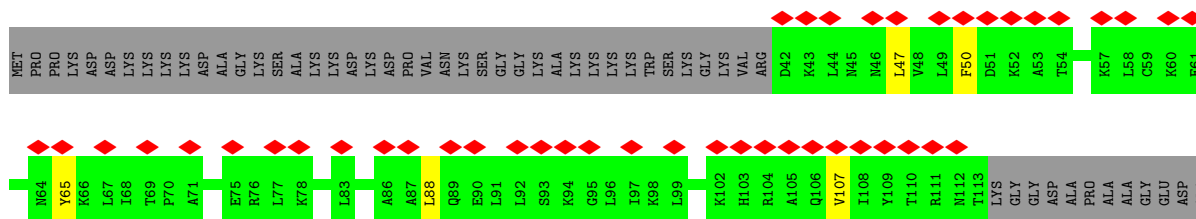


- Molecule 29: 40S ribosomal protein S24

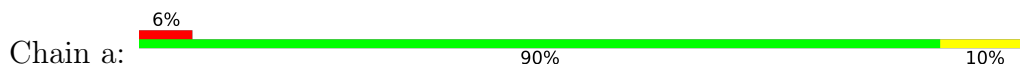


- Molecule 30: 40S ribosomal protein S25

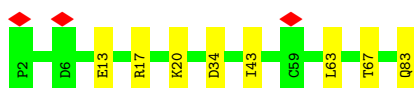
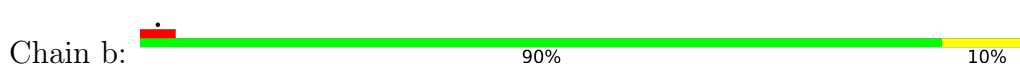




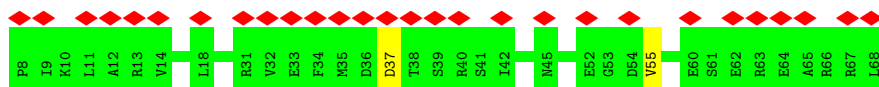
• Molecule 31: 40S ribosomal protein S26



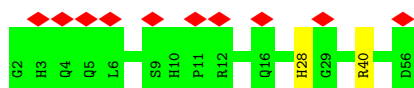
• Molecule 32: 40S ribosomal protein S27



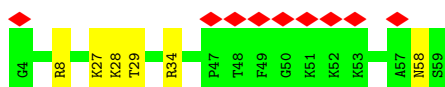
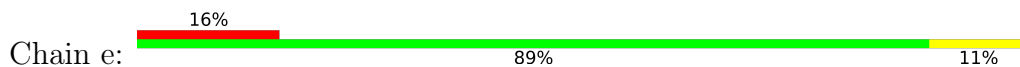
• Molecule 33: 40S ribosomal protein S28



• Molecule 34: 40S ribosomal protein S29

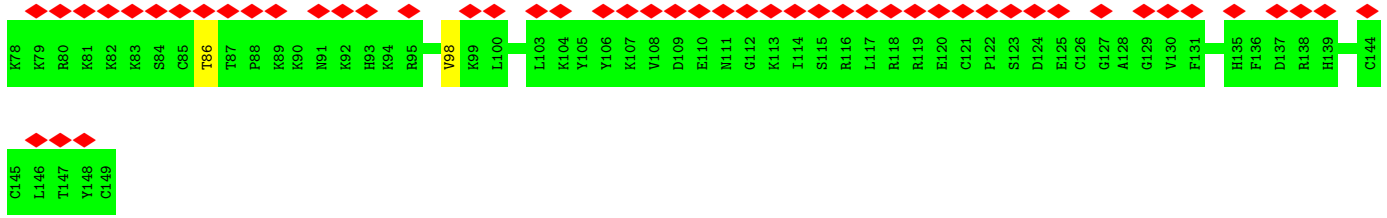


• Molecule 35: 40S ribosomal protein S30

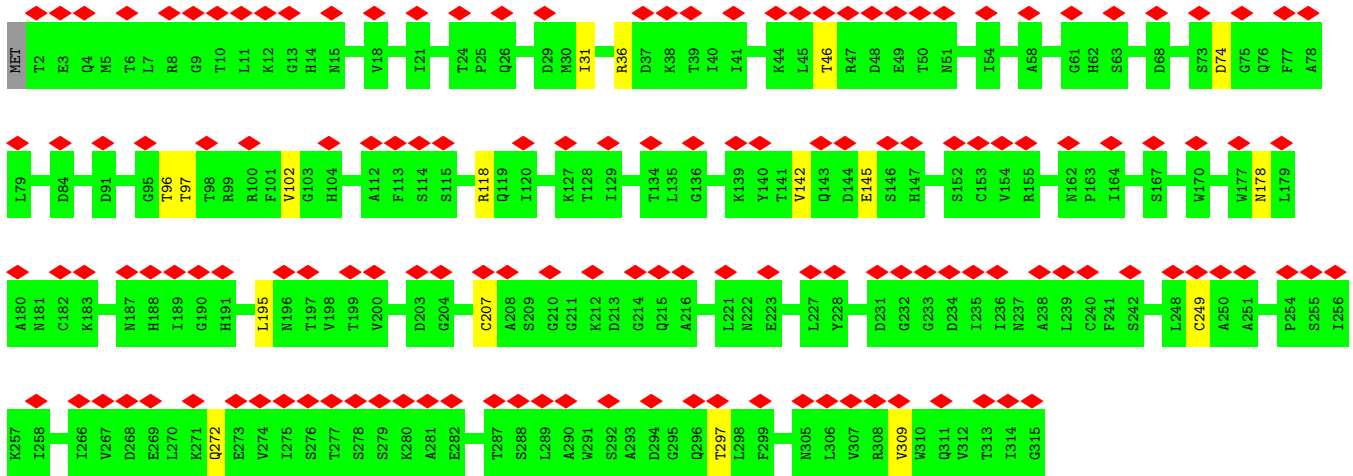
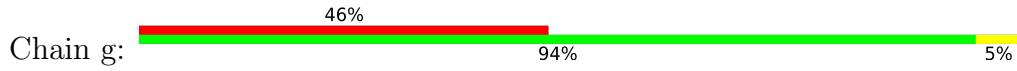


• Molecule 36: Ribosomal protein S27a

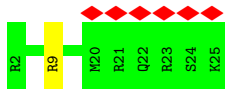




• Molecule 37: Receptor of activated protein C kinase 1



• Molecule 38: RIBOSOMAL PROTEIN EL41



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	62177	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 ($e^-/\text{\AA}^2$)	40	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	0.881	Depositor
Minimum map value	-0.648	Depositor
Average map value	0.008	Depositor
Map value standard deviation	0.048	Depositor
Recommended contour level	0.09	Depositor
Map size (Å)	274.4, 274.4, 274.4	wwPDB
Map dimensions	196, 196, 196	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.4, 1.4, 1.4	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:
ZN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# $ Z > 5$	RMSZ	# $ Z > 5$
1	0	0.63	0/3816	0.74	0/5171
2	1	0.40	1/1798 (0.1%)	1.00	0/2801
3	2	0.40	0/39659	0.96	69/61804 (0.1%)
4	3	0.27	0/4440	0.86	2/6916 (0.0%)
5	A	0.33	0/1742	0.52	0/2367
6	B	0.32	0/1756	0.51	0/2350
7	C	0.38	0/1726	0.59	1/2332 (0.0%)
8	D	0.27	0/1780	0.47	0/2397
9	E	0.32	0/2118	0.53	0/2849
10	F	0.31	0/1516	0.50	0/2037
11	G	0.30	0/1885	0.50	0/2510
12	H	0.29	0/1524	0.51	0/2042
13	I	0.31	0/1704	0.51	0/2274
14	J	0.33	0/1524	0.50	0/2035
15	K	0.24	0/824	0.40	0/1112
16	L	0.36	0/1250	0.56	0/1673
17	M	0.24	0/963	0.44	0/1291
18	N	0.34	0/1226	0.53	0/1649
19	O	0.33	0/1023	0.59	0/1372
20	P	0.25	0/1003	0.45	0/1341
21	Q	0.28	0/1126	0.48	0/1506
22	R	0.46	1/1081 (0.1%)	0.65	2/1449 (0.1%)
23	S	0.24	0/1202	0.46	0/1610
24	T	0.25	0/1142	0.44	0/1530
25	U	0.28	0/813	0.49	0/1092
26	V	0.33	0/631	0.48	0/844
27	W	0.39	0/1051	0.55	0/1406
28	X	0.36	0/1116	0.56	0/1490
29	Y	0.32	0/1031	0.54	0/1370
30	Z	0.29	0/580	0.46	0/780
31	a	0.35	0/828	0.53	0/1109
32	b	0.33	0/653	0.53	0/876

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	c	0.28	0/481	0.49	0/643
34	d	0.30	0/469	0.50	0/623
35	e	0.31	0/447	0.48	0/587
36	f	0.24	0/595	0.46	0/785
37	g	0.27	0/2497	0.48	0/3399
38	h	0.29	0/232	0.46	0/295
All	All	0.37	2/89252 (0.0%)	0.80	74/129717 (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
8	D	0	1
28	X	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	1	1	A	OP3-P	-10.60	1.48	1.61
22	R	72	LYS	CB-CG	-5.58	1.37	1.52

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	2	501	C	C2-N1-C1'	8.77	128.44	118.80
3	2	501	C	N1-C2-O2	8.62	124.08	118.90
3	2	1708	C	C2-N1-C1'	7.98	127.58	118.80
22	R	73	LEU	CB-CG-CD2	-7.83	97.69	111.00
3	2	1314	U	C2-N1-C1'	7.67	126.90	117.70
3	2	1827	U	C5-C6-N1	7.32	126.36	122.70
22	R	73	LEU	CA-CB-CG	7.22	131.91	115.30
3	2	1827	U	C2-N1-C1'	7.01	126.11	117.70
3	2	501	C	C6-N1-C1'	-6.98	112.42	120.80
3	2	382	C	C5-C6-N1	6.93	124.47	121.00
3	2	1253	A	P-O3'-C3'	6.89	127.97	119.70
3	2	1708	C	C6-N1-C1'	-6.60	112.88	120.80
3	2	1838	U	P-O3'-C3'	6.43	127.42	119.70
3	2	1720	U	C5-C6-N1	6.41	125.90	122.70
3	2	1784	G	C4-N9-C1'	6.23	134.60	126.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	2	114	G	P-O3'-C3'	6.23	127.17	119.70
3	2	1835	A	P-O3'-C3'	6.13	127.06	119.70
3	2	1828	C	C6-N1-C2	-6.09	117.86	120.30
3	2	456	C	C6-N1-C2	-6.08	117.87	120.30
3	2	1826	G	P-O3'-C3'	6.04	126.95	119.70
3	2	1720	U	C2-N1-C1'	6.03	124.94	117.70
4	3	233	G	N3-C4-C5	-5.99	125.60	128.60
3	2	501	C	N3-C2-O2	-5.94	117.74	121.90
3	2	958	G	C4-N9-C1'	5.91	134.18	126.50
3	2	1520	G	C4-N9-C1'	5.89	134.16	126.50
3	2	1742	C	C2-N1-C1'	5.86	125.24	118.80
3	2	1865	C	C6-N1-C2	-5.86	117.96	120.30
3	2	1784	G	C8-N9-C1'	-5.80	119.46	127.00
3	2	1826	G	OP1-P-O3'	5.80	117.95	105.20
3	2	356	C	N1-C2-O2	5.74	122.34	118.90
3	2	1024	A	C8-N9-C4	-5.69	103.52	105.80
3	2	958	G	C8-N9-C4	-5.66	104.14	106.40
3	2	1153	C	N1-C2-O2	5.65	122.29	118.90
3	2	1453	C	N1-C2-O2	5.63	122.28	118.90
3	2	1520	G	N3-C4-N9	5.61	129.37	126.00
3	2	1744	G	O4'-C1'-N9	5.59	112.67	108.20
3	2	1601	A	OP2-P-O3'	5.57	117.46	105.20
3	2	382	C	P-O3'-C3'	5.55	126.36	119.70
3	2	1708	C	N1-C2-O2	5.50	122.20	118.90
3	2	1453	C	C6-N1-C2	-5.49	118.10	120.30
3	2	1835	A	OP1-P-O3'	5.44	117.16	105.20
3	2	356	C	C2-N1-C1'	5.42	124.76	118.80
3	2	1403	C	P-O3'-C3'	5.39	126.17	119.70
3	2	1253	A	OP2-P-O3'	5.39	117.05	105.20
3	2	1520	G	C8-N9-C1'	-5.33	120.07	127.00
3	2	1784	G	N3-C4-N9	5.33	129.20	126.00
3	2	1314	U	N1-C2-O2	5.32	126.52	122.80
3	2	1314	U	N3-C2-O2	-5.31	118.48	122.20
3	2	102	A	P-O3'-C3'	5.30	126.06	119.70
3	2	958	G	N3-C4-C5	-5.29	125.95	128.60
3	2	382	C	C6-N1-C2	-5.25	118.20	120.30
3	2	1585	U	OP1-P-O3'	5.25	116.75	105.20
3	2	1708	C	C5-C6-N1	5.23	123.61	121.00
3	2	1453	C	N3-C2-O2	-5.22	118.24	121.90
3	2	630	U	N3-C2-O2	-5.21	118.55	122.20
3	2	853	C	N3-C2-O2	-5.21	118.25	121.90
3	2	1558	C	P-O3'-C3'	5.21	125.95	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	2	1453	C	C2-N1-C1'	5.20	124.52	118.80
3	2	1733	U	C2-N1-C1'	5.18	123.91	117.70
3	2	856	C	N1-C2-O2	5.16	122.00	118.90
3	2	1804	U	N1-C2-O2	5.14	126.40	122.80
3	2	293	C	C2-N1-C1'	5.13	124.44	118.80
3	2	853	C	C6-N1-C2	-5.13	118.25	120.30
3	2	1302	G	P-O3'-C3'	5.13	125.85	119.70
3	2	342	C	C2-N1-C1'	5.11	124.42	118.80
3	2	1330	G	P-O3'-C3'	5.11	125.83	119.70
7	C	233	LEU	CA-CB-CG	-5.11	103.56	115.30
3	2	853	C	C2-N1-C1'	5.08	124.38	118.80
3	2	659	G	C4-N9-C1'	5.06	133.08	126.50
3	2	1585	U	P-O3'-C3'	5.05	125.76	119.70
4	3	233	G	C8-N9-C4	-5.05	104.38	106.40
3	2	1648	G	P-O3'-C3'	5.02	125.73	119.70
3	2	1601	A	P-O3'-C3'	5.02	125.73	119.70
3	2	1494	U	P-O3'-C3'	5.00	125.71	119.70

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	D	193	ASP	Peptide
28	X	107	ARG	Peptide

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	
1	0	473/584 (81%)	451 (95%)	20 (4%)	2 (0%)	34	72
5	A	214/295 (72%)	202 (94%)	11 (5%)	1 (0%)	29	68
6	B	211/264 (80%)	200 (95%)	11 (5%)	0	100	100
7	C	216/293 (74%)	215 (100%)	1 (0%)	0	100	100
8	D	223/243 (92%)	214 (96%)	8 (4%)	1 (0%)	34	72
9	E	260/263 (99%)	250 (96%)	10 (4%)	0	100	100
10	F	187/204 (92%)	172 (92%)	13 (7%)	2 (1%)	14	52
11	G	228/249 (92%)	218 (96%)	10 (4%)	0	100	100
12	H	184/194 (95%)	174 (95%)	9 (5%)	1 (0%)	29	68
13	I	203/208 (98%)	196 (97%)	7 (3%)	0	100	100
14	J	178/194 (92%)	173 (97%)	4 (2%)	1 (1%)	25	65
15	K	93/165 (56%)	89 (96%)	4 (4%)	0	100	100
16	L	149/158 (94%)	145 (97%)	4 (3%)	0	100	100
17	M	121/132 (92%)	111 (92%)	10 (8%)	0	100	100
18	N	147/151 (97%)	145 (99%)	2 (1%)	0	100	100
19	O	133/151 (88%)	128 (96%)	5 (4%)	0	100	100
20	P	118/145 (81%)	117 (99%)	1 (1%)	0	100	100
21	Q	137/146 (94%)	131 (96%)	6 (4%)	0	100	100
22	R	128/135 (95%)	121 (94%)	7 (6%)	0	100	100
23	S	141/152 (93%)	136 (96%)	5 (4%)	0	100	100
24	T	142/145 (98%)	137 (96%)	4 (3%)	1 (1%)	22	62
25	U	99/119 (83%)	94 (95%)	5 (5%)	0	100	100
26	V	80/83 (96%)	79 (99%)	1 (1%)	0	100	100
27	W	127/130 (98%)	122 (96%)	5 (4%)	0	100	100
28	X	139/143 (97%)	131 (94%)	7 (5%)	1 (1%)	22	62
29	Y	122/130 (94%)	118 (97%)	4 (3%)	0	100	100
30	Z	70/125 (56%)	65 (93%)	5 (7%)	0	100	100
31	a	99/101 (98%)	95 (96%)	4 (4%)	0	100	100
32	b	80/82 (98%)	78 (98%)	2 (2%)	0	100	100
33	c	59/61 (97%)	56 (95%)	3 (5%)	0	100	100
34	d	53/55 (96%)	50 (94%)	3 (6%)	0	100	100
35	e	54/56 (96%)	51 (94%)	3 (6%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
36	f	70/72 (97%)	65 (93%)	5 (7%)	0	100	100
37	g	312/315 (99%)	295 (95%)	16 (5%)	1 (0%)	41	76
38	h	22/24 (92%)	22 (100%)	0	0	100	100
All	All	5272/5967 (88%)	5046 (96%)	215 (4%)	11 (0%)	50	81

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	A	189	ILE
12	H	170	VAL
14	J	161	LEU
28	X	108	LYS
37	g	145	GLU
1	0	278	CYS
10	F	163	PHE
1	0	76	GLU
24	T	4	VAL
10	F	166	ILE
8	D	193	ASP

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	0	417/511 (82%)	404 (97%)	13 (3%)	40	63
5	A	180/243 (74%)	159 (88%)	21 (12%)	5	23
6	B	194/231 (84%)	174 (90%)	20 (10%)	7	27
7	C	184/225 (82%)	150 (82%)	34 (18%)	1	11
8	D	189/202 (94%)	180 (95%)	9 (5%)	25	52
9	E	224/225 (100%)	200 (89%)	24 (11%)	6	27
10	F	159/170 (94%)	149 (94%)	10 (6%)	18	45
11	G	200/218 (92%)	185 (92%)	15 (8%)	13	40

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
12	H	167/174 (96%)	154 (92%)	13 (8%)	12	38
13	I	176/180 (98%)	154 (88%)	22 (12%)	4	22
14	J	160/168 (95%)	141 (88%)	19 (12%)	5	23
15	K	86/136 (63%)	86 (100%)	0	100	100
16	L	135/142 (95%)	105 (78%)	30 (22%)	1	6
17	M	104/108 (96%)	99 (95%)	5 (5%)	25	52
18	N	130/131 (99%)	118 (91%)	12 (9%)	9	31
19	O	105/119 (88%)	96 (91%)	9 (9%)	10	35
20	P	107/130 (82%)	103 (96%)	4 (4%)	34	59
21	Q	115/121 (95%)	109 (95%)	6 (5%)	23	50
22	R	119/122 (98%)	104 (87%)	15 (13%)	4	22
23	S	124/132 (94%)	119 (96%)	5 (4%)	31	56
24	T	114/115 (99%)	108 (95%)	6 (5%)	22	50
25	U	93/107 (87%)	91 (98%)	2 (2%)	52	71
26	V	66/67 (98%)	55 (83%)	11 (17%)	2	14
27	W	112/113 (99%)	95 (85%)	17 (15%)	3	16
28	X	113/115 (98%)	107 (95%)	6 (5%)	22	50
29	Y	108/112 (96%)	95 (88%)	13 (12%)	5	23
30	Z	64/103 (62%)	59 (92%)	5 (8%)	12	38
31	a	88/88 (100%)	78 (89%)	10 (11%)	5	24
32	b	74/74 (100%)	66 (89%)	8 (11%)	6	26
33	c	54/54 (100%)	52 (96%)	2 (4%)	34	59
34	d	48/48 (100%)	46 (96%)	2 (4%)	30	55
35	e	45/45 (100%)	39 (87%)	6 (13%)	4	20
36	f	65/65 (100%)	63 (97%)	2 (3%)	40	63
37	g	272/273 (100%)	256 (94%)	16 (6%)	19	47
38	h	23/23 (100%)	22 (96%)	1 (4%)	29	55
All	All	4614/5090 (91%)	4221 (92%)	393 (8%)	14	36

All (393) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	0	99	TRP

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Mol	Chain	Res	Type
1	0	100	PRO
1	0	117	LEU
1	0	121	PRO
1	0	137	LEU
1	0	279	ARG
1	0	281	LYS
1	0	290	SER
1	0	317	LEU
1	0	339	VAL
1	0	343	VAL
1	0	423	ASP
1	0	450	HIS
5	A	5	LEU
5	A	14	ASP
5	A	53	ARG
5	A	60	LEU
5	A	78	SER
5	A	80	ARG
5	A	94	THR
5	A	111	GLN
5	A	120	ARG
5	A	130	ASP
5	A	131	HIS
5	A	136	GLU
5	A	140	VAL
5	A	145	ILE
5	A	157	VAL
5	A	178	LEU
5	A	180	ARG
5	A	185	MET
5	A	186	ARG
5	A	188	THR
5	A	200	ASP
6	B	25	PHE
6	B	33	VAL
6	B	38	MET
6	B	76	ASN
6	B	77	ASP
6	B	79	VAL
6	B	88	THR
6	B	95	ASN
6	B	98	THR

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Mol	Chain	Res	Type
6	B	103	MET
6	B	107	ARG
6	B	131	ASP
6	B	146	ARG
6	B	147	ASN
6	B	169	MET
6	B	181	LEU
6	B	210	VAL
6	B	212	VAL
6	B	213	ARG
6	B	217	MET
7	C	68	ARG
7	C	73	MET
7	C	80	GLU
7	C	94	ILE
7	C	97	PHE
7	C	98	LEU
7	C	101	SER
7	C	112	VAL
7	C	120	GLN
7	C	121	ARG
7	C	123	ARG
7	C	125	LYS
7	C	132	ASP
7	C	134	ASN
7	C	137	VAL
7	C	143	CYS
7	C	147	VAL
7	C	157	LEU
7	C	165	VAL
7	C	167	ARG
7	C	180	VAL
7	C	204	ILE
7	C	212	LYS
7	C	213	LEU
7	C	215	MET
7	C	221	ASP
7	C	227	ARG
7	C	232	THR
7	C	236	PHE
7	C	242	ASP
7	C	244	ILE

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Mol	Chain	Res	Type
7	C	252	THR
7	C	271	ASP
7	C	276	THR
8	D	3	VAL
8	D	54	ARG
8	D	70	THR
8	D	123	LEU
8	D	134	CYS
8	D	193	ASP
8	D	195	THR
8	D	198	ILE
8	D	206	ASP
9	E	3	ARG
9	E	19	MET
9	E	23	LEU
9	E	38	LEU
9	E	39	ARG
9	E	42	LEU
9	E	45	ILE
9	E	49	ARG
9	E	51	ARG
9	E	59	ASP
9	E	95	THR
9	E	113	ARG
9	E	114	ILE
9	E	143	ASP
9	E	145	ARG
9	E	151	ASP
9	E	156	VAL
9	E	160	ILE
9	E	171	ASP
9	E	181	CYS
9	E	197	ASN
9	E	198	ARG
9	E	200	ARG
9	E	240	ARG
10	F	78	MET
10	F	82	ASN
10	F	91	ARG
10	F	122	ARG
10	F	130	ARG
10	F	140	ASP

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Mol	Chain	Res	Type
10	F	164	ARG
10	F	166	ILE
10	F	176	GLU
10	F	204	ARG
11	G	51	ARG
11	G	57	ASP
11	G	67	VAL
11	G	69	THR
11	G	74	ARG
11	G	81	HIS
11	G	83	CYS
11	G	85	ARG
11	G	91	GLU
11	G	105	ASN
11	G	110	ASN
11	G	144	LEU
11	G	151	ASP
11	G	181	THR
11	G	185	LEU
12	H	12	ASN
12	H	46	THR
12	H	51	ILE
12	H	84	GLU
12	H	87	PHE
12	H	105	THR
12	H	120	ARG
12	H	121	THR
12	H	122	LEU
12	H	134	VAL
12	H	180	LEU
12	H	184	ASP
12	H	188	GLU
13	I	5	ARG
13	I	17	LYS
13	I	18	ARG
13	I	22	HIS
13	I	29	LEU
13	I	31	ARG
13	I	35	ASN
13	I	47	ARG
13	I	62	VAL
13	I	72	CYS

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Mol	Chain	Res	Type
13	I	76	THR
13	I	87	ASN
13	I	95	THR
13	I	121	LEU
13	I	128	LYS
13	I	130	THR
13	I	170	LYS
13	I	175	ILE
13	I	177	SER
13	I	184	ARG
13	I	191	GLU
13	I	194	GLU
14	J	3	VAL
14	J	12	THR
14	J	17	ARG
14	J	21	GLU
14	J	29	LEU
14	J	42	GLU
14	J	50	LEU
14	J	70	ARG
14	J	88	ASP
14	J	94	LEU
14	J	104	ASP
14	J	108	ARG
14	J	117	LEU
14	J	132	GLN
14	J	136	ARG
14	J	138	ARG
14	J	153	SER
14	J	156	HIS
14	J	161	LEU
16	L	3	ASP
16	L	5	GLN
16	L	6	THR
16	L	13	GLN
16	L	15	THR
16	L	35	ARG
16	L	40	ILE
16	L	42	LEU
16	L	45	LYS
16	L	46	THR
16	L	48	LYS

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Mol	Chain	Res	Type
16	L	49	GLU
16	L	52	GLU
16	L	60	CYS
16	L	69	ARG
16	L	71	ARG
16	L	74	SER
16	L	76	VAL
16	L	78	THR
16	L	80	MET
16	L	83	GLN
16	L	85	THR
16	L	89	ARG
16	L	101	ARG
16	L	119	ASP
16	L	121	GLN
16	L	132	ARG
16	L	135	SER
16	L	144	LYS
16	L	146	THR
17	M	26	LEU
17	M	35	ILE
17	M	45	ARG
17	M	65	VAL
17	M	104	VAL
18	N	3	ARG
18	N	12	SER
18	N	14	SER
18	N	29	THR
18	N	75	LEU
18	N	80	LEU
18	N	83	ASP
18	N	84	LEU
18	N	86	GLU
18	N	87	ASP
18	N	101	HIS
18	N	145	THR
19	O	52	THR
19	O	98	ARG
19	O	100	THR
19	O	103	ASN
19	O	104	ARG
19	O	133	THR

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Mol	Chain	Res	Type
19	O	138	ASP
19	O	146	ARG
19	O	150	ARG
20	P	44	ARG
20	P	51	ARG
20	P	79	HIS
20	P	122	THR
21	Q	10	VAL
21	Q	18	THR
21	Q	43	GLU
21	Q	46	THR
21	Q	130	LYS
21	Q	131	LYS
22	R	5	ARG
22	R	8	THR
22	R	17	ILE
22	R	34	VAL
22	R	35	CYS
22	R	78	ARG
22	R	83	ASN
22	R	85	VAL
22	R	98	VAL
22	R	101	ASP
22	R	105	MET
22	R	124	VAL
22	R	127	ASN
22	R	128	PHE
22	R	132	ARG
23	S	4	VAL
23	S	14	ARG
23	S	71	MET
23	S	129	LEU
23	S	138	THR
24	T	27	LYS
24	T	36	THR
24	T	56	ARG
24	T	63	HIS
24	T	67	ARG
24	T	87	VAL
25	U	36	CYS
25	U	68	THR
26	V	1	MET

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Mol	Chain	Res	Type
26	V	4	ASP
26	V	9	VAL
26	V	15	ARG
26	V	21	ASN
26	V	34	MET
26	V	43	THR
26	V	62	MET
26	V	67	ASP
26	V	70	LEU
26	V	76	ASP
27	W	4	MET
27	W	14	ILE
27	W	23	ARG
27	W	27	ILE
27	W	30	CYS
27	W	40	VAL
27	W	42	MET
27	W	47	ILE
27	W	49	GLU
27	W	56	HIS
27	W	57	ARG
27	W	80	ASP
27	W	85	ASP
27	W	104	LEU
27	W	105	THR
27	W	106	THR
27	W	112	ASP
28	X	3	LYS
28	X	5	ARG
28	X	37	LYS
28	X	69	CYS
28	X	105	PHE
28	X	107	ARG
29	Y	5	VAL
29	Y	14	THR
29	Y	17	LEU
29	Y	23	MET
29	Y	42	GLU
29	Y	47	MET
29	Y	54	VAL
29	Y	79	LEU
29	Y	94	HIS

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Mol	Chain	Res	Type
29	Y	107	ARG
29	Y	108	LYS
29	Y	117	VAL
29	Y	118	ARG
30	Z	47	LEU
30	Z	50	PHE
30	Z	65	TYR
30	Z	88	LEU
30	Z	107	VAL
31	a	2	THR
31	a	6	ARG
31	a	7	ASN
31	a	17	HIS
31	a	18	VAL
31	a	26	CYS
31	a	28	ARG
31	a	29	CYS
31	a	45	VAL
31	a	64	LEU
32	b	13	GLU
32	b	17	ARG
32	b	20	LYS
32	b	34	ASP
32	b	43	ILE
32	b	63	LEU
32	b	67	THR
32	b	83	GLN
33	c	37	ASP
33	c	55	VAL
34	d	28	HIS
34	d	40	ARG
35	e	8	ARG
35	e	27	LYS
35	e	28	LYS
35	e	29	THR
35	e	34	ARG
35	e	58	ASN
36	f	86	THR
36	f	98	VAL
37	g	31	ILE
37	g	36	ARG
37	g	46	THR

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Mol	Chain	Res	Type
37	g	74	ASP
37	g	96	THR
37	g	97	THR
37	g	102	VAL
37	g	118	ARG
37	g	142	VAL
37	g	178	ASN
37	g	195	LEU
37	g	207	CYS
37	g	249	CYS
37	g	272	GLN
37	g	297	THR
37	g	309	VAL
38	h	9	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (55) such sidechains are listed below:

Mol	Chain	Res	Type
1	0	175	HIS
1	0	570	HIS
5	A	111	GLN
5	A	169	HIS
7	C	178	HIS
8	D	56	GLN
8	D	174	HIS
8	D	226	GLN
9	E	50	ASN
9	E	138	HIS
9	E	179	ASN
10	F	82	ASN
10	F	110	GLN
10	F	137	GLN
10	F	203	ASN
11	G	59	GLN
11	G	65	GLN
11	G	186	GLN
12	H	76	GLN
12	H	112	ASN
12	H	114	GLN
12	H	126	HIS
13	I	84	ASN
13	I	87	ASN

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Mol	Chain	Res	Type
13	I	116	HIS
13	I	168	GLN
14	J	125	HIS
15	K	61	GLN
16	L	11	GLN
16	L	94	HIS
18	N	58	HIS
18	N	62	GLN
18	N	105	ASN
19	O	43	HIS
20	P	53	GLN
21	Q	77	HIS
21	Q	142	GLN
23	S	72	GLN
23	S	87	GLN
23	S	101	ASN
27	W	56	HIS
27	W	64	ASN
28	X	31	HIS
29	Y	15	ASN
29	Y	63	HIS
29	Y	124	ASN
30	Z	103	HIS
33	c	29	GLN
35	e	37	GLN
36	f	111	ASN
37	g	20	GLN
37	g	147	HIS
37	g	159	ASN
37	g	178	ASN
37	g	305	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	1	74/75 (98%)	47 (63%)	4 (5%)
3	2	1652/1868 (88%)	558 (33%)	62 (3%)
4	3	183/275 (66%)	98 (53%)	18 (9%)
All	All	1909/2218 (86%)	703 (36%)	84 (4%)

All (703) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	1	4	G
2	1	6	C
2	1	7	G
2	1	8	U
2	1	9	G
2	1	10	G
2	1	11	C
2	1	13	C
2	1	14	A
2	1	16	U
2	1	18	G
2	1	19	G
2	1	20	A
2	1	21	A
2	1	22	G
2	1	25	C
2	1	26	G
2	1	30	G
2	1	38	A
2	1	40	C
2	1	41	C
2	1	43	G
2	1	46	G
2	1	47	U
2	1	48	C
2	1	49	C
2	1	50	U
2	1	52	G
2	1	53	G
2	1	54	A
2	1	56	C
2	1	57	G
2	1	58	A
2	1	59	A
2	1	60	A
2	1	61	C
2	1	62	C
2	1	63	G
2	1	64	A
2	1	65	G
2	1	67	G
2	1	68	G
2	1	70	G

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Mol	Chain	Res	Type
2	1	72	U
2	1	73	A
2	1	75	C
2	1	76	A
3	2	3	C
3	2	4	C
3	2	5	U
3	2	9	U
3	2	17	C
3	2	23	G
3	2	25	A
3	2	26	U
3	2	33	G
3	2	41	G
3	2	44	U
3	2	46	A
3	2	49	C
3	2	56	G
3	2	58	C
3	2	60	A
3	2	61	A
3	2	65	C
3	2	66	G
3	2	67	C
3	2	68	A
3	2	70	G
3	2	71	G
3	2	72	C
3	2	75	G
3	2	76	U
3	2	77	A
3	2	78	C
3	2	79	A
3	2	81	U
3	2	103	A
3	2	110	U
3	2	111	A
3	2	113	G
3	2	114	G
3	2	115	U
3	2	116	U
3	2	123	G

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Mol	Chain	Res	Type
3	2	124	U
3	2	126	G
3	2	127	C
3	2	129	C
3	2	130	G
3	2	141	A
3	2	142	C
3	2	143	U
3	2	144	U
3	2	153	G
3	2	154	U
3	2	155	G
3	2	163	U
3	2	167	G
3	2	168	C
3	2	169	U
3	2	170	A
3	2	172	U
3	2	175	A
3	2	181	A
3	2	182	C
3	2	184	G
3	2	188	C
3	2	189	U
3	2	190	G
3	2	191	A
3	2	200	G
3	2	206	G
3	2	209	A
3	2	210	U
3	2	213	G
3	2	214	U
3	2	215	G
3	2	216	C
3	2	217	A
3	2	290	U
3	2	291	G
3	2	292	A
3	2	294	U
3	2	295	C
3	2	302	A
3	2	307	G

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Mol	Chain	Res	Type
3	2	308	G
3	2	310	C
3	2	311	C
3	2	312	G
3	2	315	C
3	2	317	C
3	2	319	C
3	2	320	G
3	2	321	C
3	2	332	G
3	2	333	G
3	2	334	C
3	2	335	G
3	2	337	C
3	2	338	G
3	2	342	C
3	2	347	G
3	2	351	G
3	2	360	A
3	2	362	C
3	2	364	A
3	2	368	U
3	2	369	C
3	2	370	G
3	2	377	G
3	2	382	C
3	2	383	G
3	2	385	G
3	2	386	C
3	2	398	A
3	2	400	C
3	2	407	G
3	2	408	A
3	2	409	C
3	2	417	C
3	2	418	A
3	2	421	G
3	2	425	G
3	2	438	G
3	2	441	C
3	2	442	C
3	2	447	A

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Mol	Chain	Res	Type
3	2	448	A
3	2	449	A
3	2	450	C
3	2	464	A
3	2	465	A
3	2	466	G
3	2	471	G
3	2	472	C
3	2	473	A
3	2	474	G
3	2	476	A
3	2	482	G
3	2	487	U
3	2	489	A
3	2	492	C
3	2	496	C
3	2	500	A
3	2	502	C
3	2	508	A
3	2	509	G
3	2	517	C
3	2	523	A
3	2	530	U
3	2	531	A
3	2	532	C
3	2	534	G
3	2	535	G
3	2	536	A
3	2	542	U
3	2	544	G
3	2	546	G
3	2	548	C
3	2	550	C
3	2	552	G
3	2	554	A
3	2	555	A
3	2	556	U
3	2	559	G
3	2	560	A
3	2	562	U
3	2	564	A
3	2	568	C

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Mol	Chain	Res	Type
3	2	576	A
3	2	583	A
3	2	585	C
3	2	587	A
3	2	588	G
3	2	589	G
3	2	590	A
3	2	591	U
3	2	593	C
3	2	595	U
3	2	596	U
3	2	603	C
3	2	604	A
3	2	605	A
3	2	606	G
3	2	607	U
3	2	608	C
3	2	614	C
3	2	615	C
3	2	617	G
3	2	618	C
3	2	621	C
3	2	627	U
3	2	628	A
3	2	629	A
3	2	631	U
3	2	637	U
3	2	638	C
3	2	639	C
3	2	640	A
3	2	643	A
3	2	644	G
3	2	654	A
3	2	660	C
3	2	664	A
3	2	668	A
3	2	669	A
3	2	671	A
3	2	672	A
3	2	673	G
3	2	683	G
3	2	684	G

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Mol	Chain	Res	Type
3	2	685	A
3	2	686	U
3	2	687	C
3	2	688	U
3	2	748	C
3	2	749	U
3	2	750	C
3	2	751	G
3	2	792	C
3	2	793	G
3	2	794	A
3	2	796	G
3	2	797	C
3	2	798	G
3	2	799	U
3	2	809	A
3	2	810	A
3	2	811	A
3	2	812	A
3	2	818	A
3	2	821	G
3	2	822	U
3	2	823	U
3	2	824	C
3	2	830	A
3	2	833	C
3	2	834	C
3	2	842	C
3	2	843	C
3	2	847	A
3	2	859	G
3	2	869	A
3	2	870	A
3	2	871	U
3	2	872	A
3	2	873	G
3	2	877	C
3	2	878	G
3	2	880	G
3	2	881	G
3	2	882	U
3	2	887	U

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Mol	Chain	Res	Type
3	2	888	U
3	2	890	U
3	2	898	U
3	2	903	A
3	2	909	G
3	2	913	A
3	2	914	U
3	2	918	U
3	2	919	A
3	2	920	A
3	2	922	A
3	2	926	A
3	2	931	C
3	2	933	G
3	2	934	G
3	2	935	G
3	2	938	A
3	2	943	U
3	2	954	U
3	2	959	G
3	2	961	G
3	2	968	U
3	2	969	U
3	2	970	G
3	2	971	G
3	2	978	G
3	2	980	A
3	2	981	A
3	2	983	A
3	2	990	A
3	2	992	A
3	2	999	G
3	2	1001	A
3	2	1008	A
3	2	1009	A
3	2	1017	U
3	2	1023	A
3	2	1030	A
3	2	1040	G
3	2	1041	G
3	2	1042	A
3	2	1044	G

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Mol	Chain	Res	Type
3	2	1045	U
3	2	1049	A
3	2	1054	G
3	2	1060	A
3	2	1061	U
3	2	1067	C
3	2	1083	A
3	2	1085	C
3	2	1087	A
3	2	1088	U
3	2	1096	G
3	2	1099	G
3	2	1100	A
3	2	1111	U
3	2	1112	U
3	2	1114	U
3	2	1116	C
3	2	1119	A
3	2	1121	G
3	2	1122	A
3	2	1123	C
3	2	1130	G
3	2	1131	G
3	2	1133	A
3	2	1137	U
3	2	1138	C
3	2	1139	C
3	2	1143	A
3	2	1148	A
3	2	1150	A
3	2	1153	C
3	2	1154	U
3	2	1157	G
3	2	1171	G
3	2	1195	A
3	2	1207	G
3	2	1208	A
3	2	1209	A
3	2	1211	G
3	2	1213	C
3	2	1215	C
3	2	1217	A

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Mol	Chain	Res	Type
3	2	1221	G
3	2	1224	G
3	2	1227	G
3	2	1232	U
3	2	1235	G
3	2	1238	U
3	2	1242	U
3	2	1243	U
3	2	1248	U
3	2	1249	C
3	2	1250	A
3	2	1251	A
3	2	1253	A
3	2	1254	C
3	2	1257	G
3	2	1259	A
3	2	1260	A
3	2	1261	C
3	2	1274	G
3	2	1275	G
3	2	1283	C
3	2	1284	A
3	2	1285	G
3	2	1286	G
3	2	1288	U
3	2	1298	G
3	2	1301	A
3	2	1302	G
3	2	1303	C
3	2	1308	U
3	2	1309	C
3	2	1313	A
3	2	1315	U
3	2	1317	C
3	2	1320	G
3	2	1321	G
3	2	1322	G
3	2	1330	G
3	2	1331	C
3	2	1343	U
3	2	1344	A
3	2	1348	G

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Mol	Chain	Res	Type
3	2	1354	G
3	2	1358	U
3	2	1364	U
3	2	1371	U
3	2	1372	U
3	2	1373	C
3	2	1377	U
3	2	1378	A
3	2	1380	C
3	2	1382	A
3	2	1401	A
3	2	1404	U
3	2	1405	A
3	2	1406	G
3	2	1416	C
3	2	1426	U
3	2	1428	G
3	2	1429	G
3	2	1430	C
3	2	1431	G
3	2	1432	U
3	2	1439	A
3	2	1441	U
3	2	1442	U
3	2	1444	U
3	2	1446	A
3	2	1448	A
3	2	1452	A
3	2	1454	A
3	2	1455	A
3	2	1462	U
3	2	1463	U
3	2	1464	C
3	2	1465	A
3	2	1466	G
3	2	1473	G
3	2	1474	A
3	2	1477	U
3	2	1478	U
3	2	1483	A
3	2	1486	A
3	2	1487	A

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Mol	Chain	Res	Type
3	2	1489	A
3	2	1490	G
3	2	1491	G
3	2	1493	C
3	2	1494	U
3	2	1495	G
3	2	1499	U
3	2	1500	G
3	2	1505	U
3	2	1507	G
3	2	1508	A
3	2	1510	G
3	2	1512	C
3	2	1515	G
3	2	1516	G
3	2	1517	G
3	2	1518	C
3	2	1519	U
3	2	1520	G
3	2	1524	G
3	2	1526	G
3	2	1527	C
3	2	1533	A
3	2	1535	U
3	2	1536	G
3	2	1543	U
3	2	1545	A
3	2	1548	G
3	2	1551	U
3	2	1559	C
3	2	1560	U
3	2	1561	A
3	2	1563	G
3	2	1566	G
3	2	1567	G
3	2	1568	C
3	2	1572	C
3	2	1573	G
3	2	1574	C
3	2	1579	A
3	2	1580	A
3	2	1581	C

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Mol	Chain	Res	Type
3	2	1585	U
3	2	1586	U
3	2	1587	G
3	2	1588	A
3	2	1590	C
3	2	1598	G
3	2	1599	U
3	2	1600	G
3	2	1601	A
3	2	1602	U
3	2	1603	G
3	2	1604	G
3	2	1606	G
3	2	1610	G
3	2	1612	G
3	2	1617	G
3	2	1618	C
3	2	1621	U
3	2	1623	A
3	2	1625	U
3	2	1630	A
3	2	1632	G
3	2	1634	A
3	2	1641	A
3	2	1648	G
3	2	1649	U
3	2	1650	A
3	2	1654	G
3	2	1660	C
3	2	1664	A
3	2	1665	G
3	2	1671	G
3	2	1675	A
3	2	1682	C
3	2	1688	C
3	2	1689	C
3	2	1695	A
3	2	1698	C
3	2	1699	A
3	2	1706	G
3	2	1707	U
3	2	1708	C

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Mol	Chain	Res	Type
3	2	1709	G
3	2	1717	C
3	2	1718	G
3	2	1719	A
3	2	1720	U
3	2	1721	U
3	2	1722	G
3	2	1723	G
3	2	1724	A
3	2	1725	U
3	2	1728	U
3	2	1729	U
3	2	1733	U
3	2	1734	G
3	2	1735	A
3	2	1742	C
3	2	1744	G
3	2	1746	U
3	2	1751	C
3	2	1753	C
3	2	1755	C
3	2	1756	C
3	2	1757	G
3	2	1776	G
3	2	1777	G
3	2	1781	A
3	2	1783	C
3	2	1784	G
3	2	1785	C
3	2	1807	C
3	2	1810	U
3	2	1812	U
3	2	1813	A
3	2	1814	G
3	2	1816	G
3	2	1817	G
3	2	1820	G
3	2	1824	A
3	2	1825	A
3	2	1826	G
3	2	1827	U
3	2	1835	A

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Mol	Chain	Res	Type
3	2	1836	G
3	2	1838	U
3	2	1839	U
3	2	1849	G
3	2	1851	A
3	2	1852	C
3	2	1859	A
3	2	1860	A
3	2	1861	G
3	2	1862	G
3	2	1863	A
3	2	1864	U
3	2	1865	C
3	2	1867	U
3	2	1868	U
3	2	1869	A
4	3	41	U
4	3	42	C
4	3	43	C
4	3	44	C
4	3	45	C
4	3	47	G
4	3	117	G
4	3	118	G
4	3	120	C
4	3	121	C
4	3	122	C
4	3	123	C
4	3	124	C
4	3	128	C
4	3	129	C
4	3	133	G
4	3	135	G
4	3	137	G
4	3	139	C
4	3	140	A
4	3	141	U
4	3	142	A
4	3	147	U
4	3	150	G
4	3	152	G
4	3	153	G

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Mol	Chain	Res	Type
4	3	154	A
4	3	155	A
4	3	159	G
4	3	160	U
4	3	161	G
4	3	162	A
4	3	163	G
4	3	164	U
4	3	165	A
4	3	166	C
4	3	169	C
4	3	172	A
4	3	175	U
4	3	176	G
4	3	228	U
4	3	229	G
4	3	231	G
4	3	232	C
4	3	233	G
4	3	234	U
4	3	235	G
4	3	236	C
4	3	237	C
4	3	242	C
4	3	243	A
4	3	244	A
4	3	245	G
4	3	246	A
4	3	247	C
4	3	249	G
4	3	251	U
4	3	252	A
4	3	253	G
4	3	254	C
4	3	255	C
4	3	256	G
4	3	257	A
4	3	258	G
4	3	259	U
4	3	264	U
4	3	265	U
4	3	266	G

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Mol	Chain	Res	Type
4	3	269	U
4	3	270	C
4	3	274	A
4	3	278	G
4	3	280	C
4	3	281	U
4	3	282	U
4	3	283	G
4	3	284	U
4	3	285	G
4	3	288	A
4	3	290	U
4	3	297	U
4	3	303	G
4	3	304	C
4	3	306	U
4	3	307	G
4	3	308	C
4	3	310	A
4	3	311	G
4	3	321	A
4	3	322	G
4	3	324	U
4	3	325	C
4	3	328	G
4	3	330	A
4	3	331	G
4	3	332	A
4	3	333	C
4	3	334	C

All (84) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	1	16	U
2	1	19	G
2	1	48	C
2	1	75	C
3	2	2	A
3	2	60	A
3	2	65	C
3	2	102	A

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Mol	Chain	Res	Type
3	2	114	G
3	2	143	U
3	2	180	G
3	2	291	G
3	2	314	U
3	2	319	C
3	2	332	G
3	2	368	U
3	2	382	C
3	2	465	A
3	2	547	G
3	2	554	A
3	2	590	A
3	2	594	A
3	2	604	A
3	2	620	G
3	2	748	C
3	2	750	C
3	2	793	G
3	2	797	C
3	2	811	A
3	2	870	A
3	2	958	G
3	2	980	A
3	2	1137	U
3	2	1231	C
3	2	1250	A
3	2	1253	A
3	2	1302	G
3	2	1308	U
3	2	1316	C
3	2	1321	G
3	2	1330	G
3	2	1342	U
3	2	1403	C
3	2	1404	U
3	2	1425	G
3	2	1428	G
3	2	1430	C
3	2	1438	A
3	2	1440	C
3	2	1445	U

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Mol	Chain	Res	Type
3	2	1464	C
3	2	1476	A
3	2	1493	C
3	2	1494	U
3	2	1511	U
3	2	1534	C
3	2	1558	C
3	2	1585	U
3	2	1587	G
3	2	1601	A
3	2	1648	G
3	2	1649	U
3	2	1743	G
3	2	1826	G
3	2	1835	A
3	2	1838	U
4	3	116	A
4	3	123	C
4	3	136	A
4	3	160	U
4	3	163	G
4	3	230	G
4	3	243	A
4	3	244	A
4	3	245	G
4	3	252	A
4	3	254	C
4	3	257	A
4	3	280	C
4	3	281	U
4	3	289	C
4	3	306	U
4	3	329	U
4	3	330	A

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
22	R	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	R	72:LYS	C	73:LEU	N	4.52

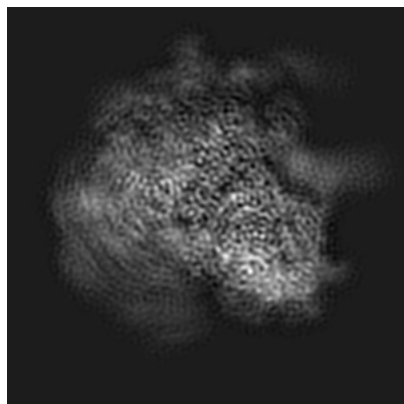
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-3770. These allow visual inspection of the internal detail of the map and identification of artifacts.

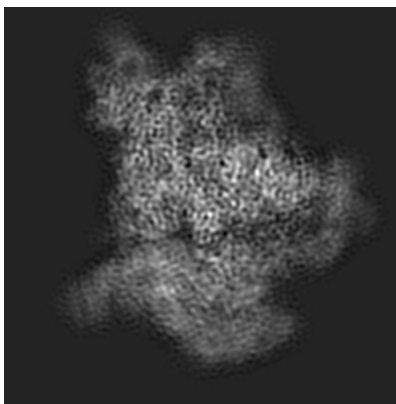
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

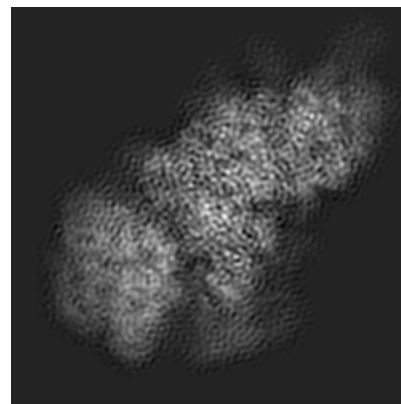
6.1.1 Primary map



X

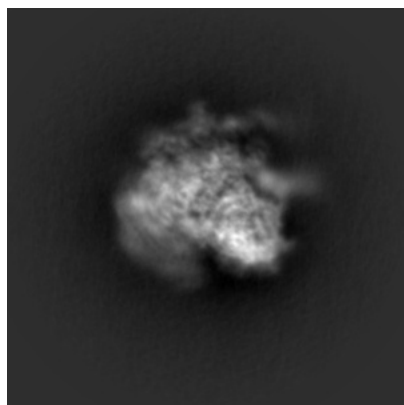


Y

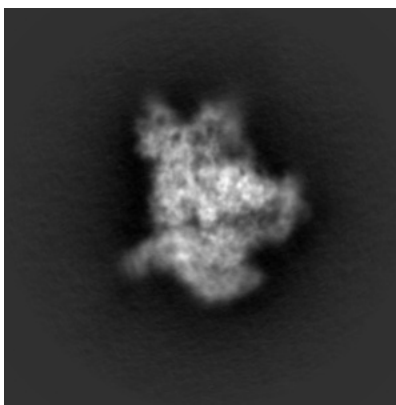


Z

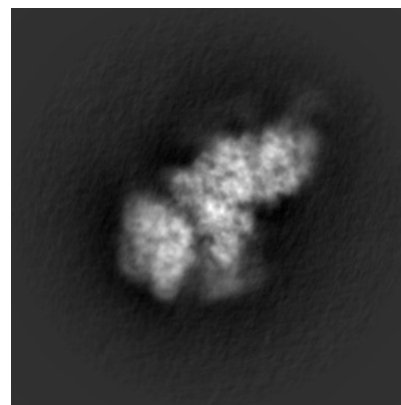
6.1.2 Raw map



X



Y

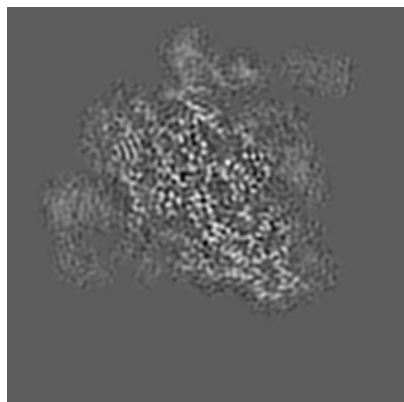


Z

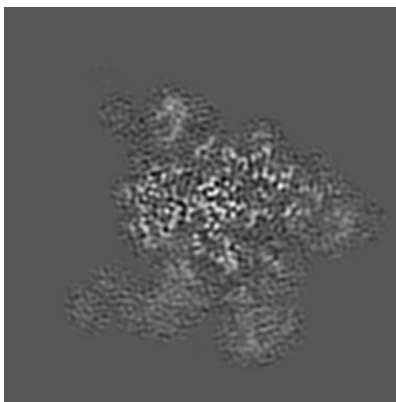
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

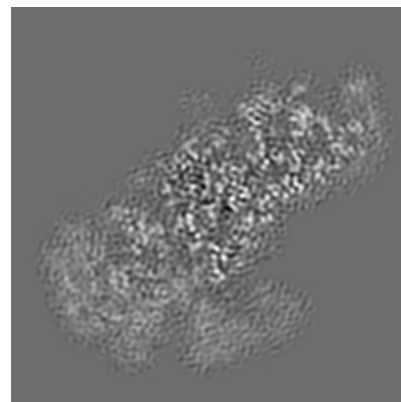
6.2.1 Primary map



X Index: 98

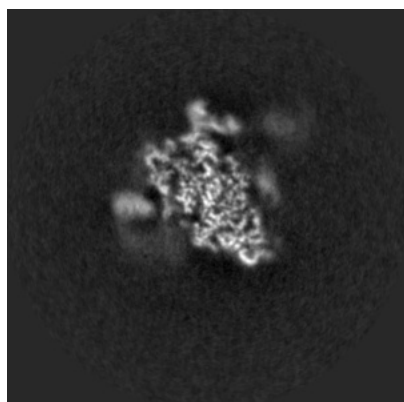


Y Index: 98

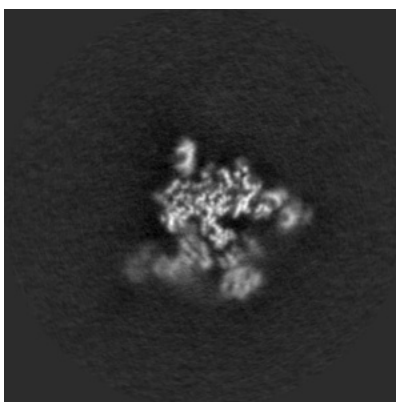


Z Index: 98

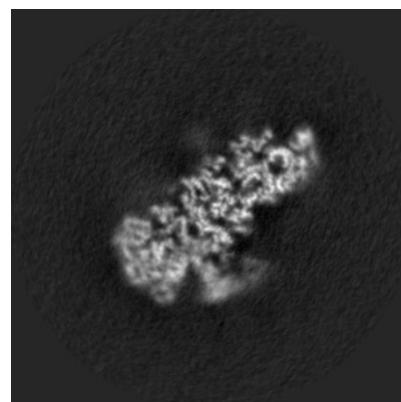
6.2.2 Raw map



X Index: 160



Y Index: 160

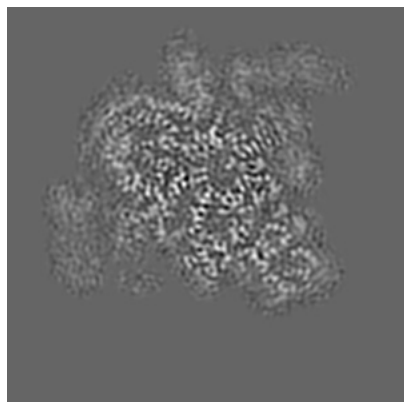


Z Index: 160

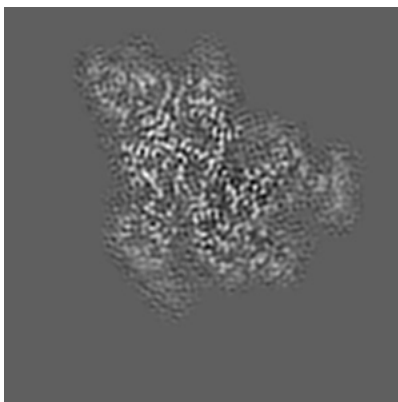
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

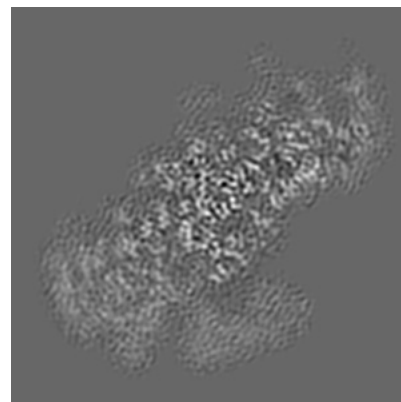
6.3.1 Primary map



X Index: 105

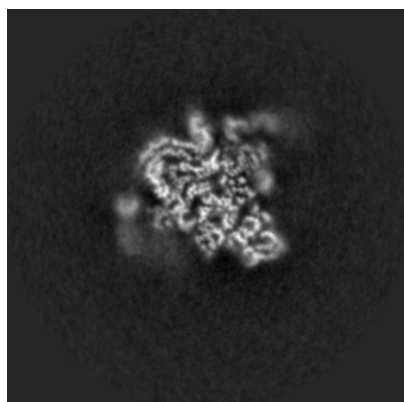


Y Index: 117

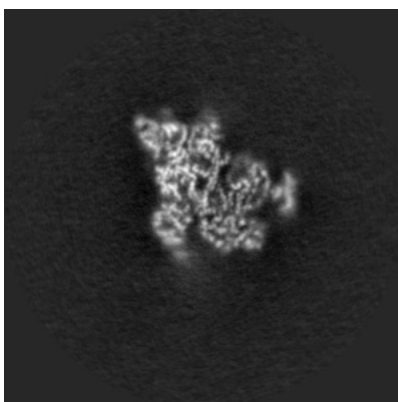


Z Index: 101

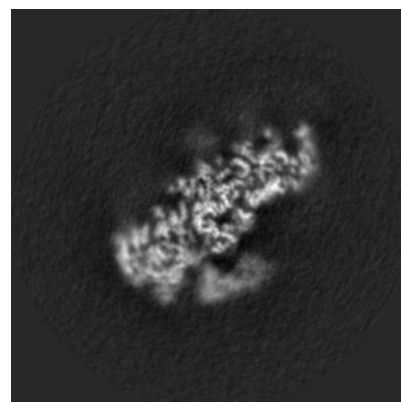
6.3.2 Raw map



X Index: 169



Y Index: 181

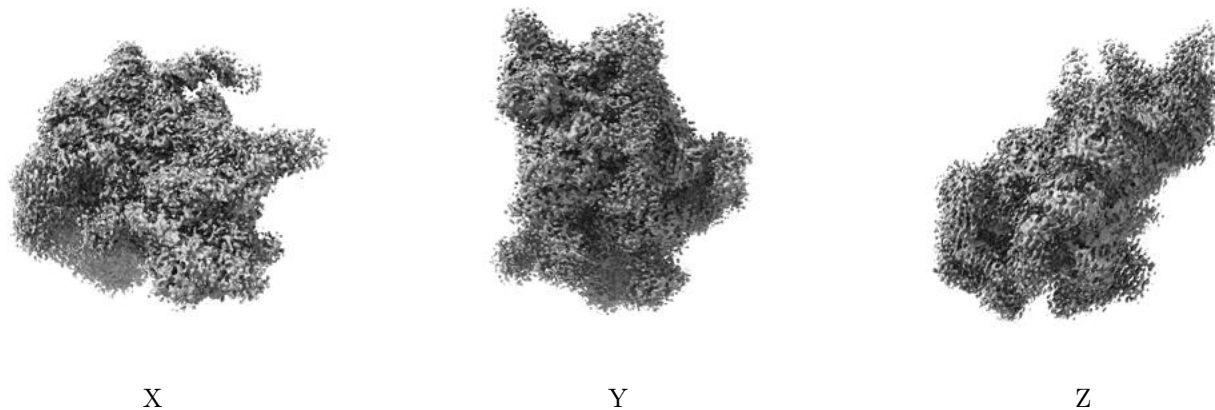


Z Index: 165

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

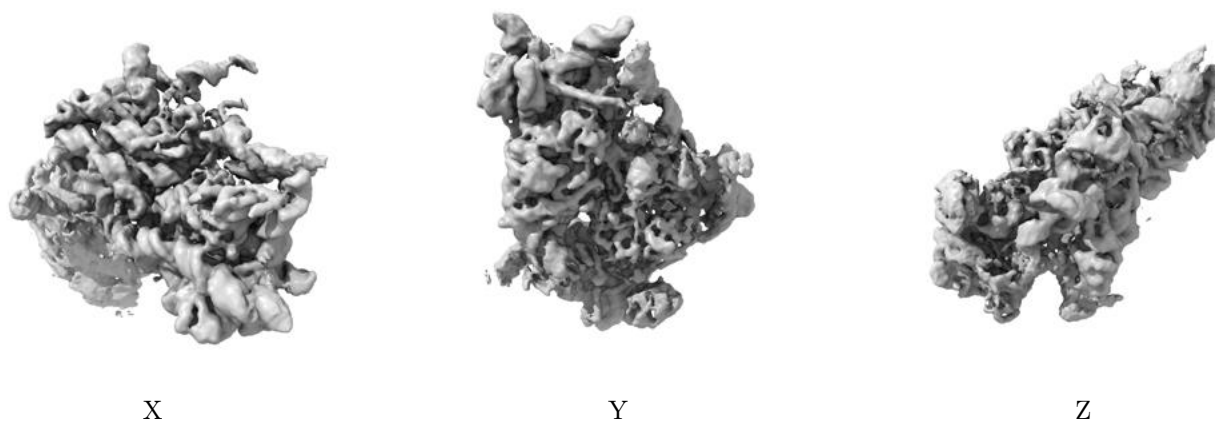
6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.09. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.4.2 Raw map



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.

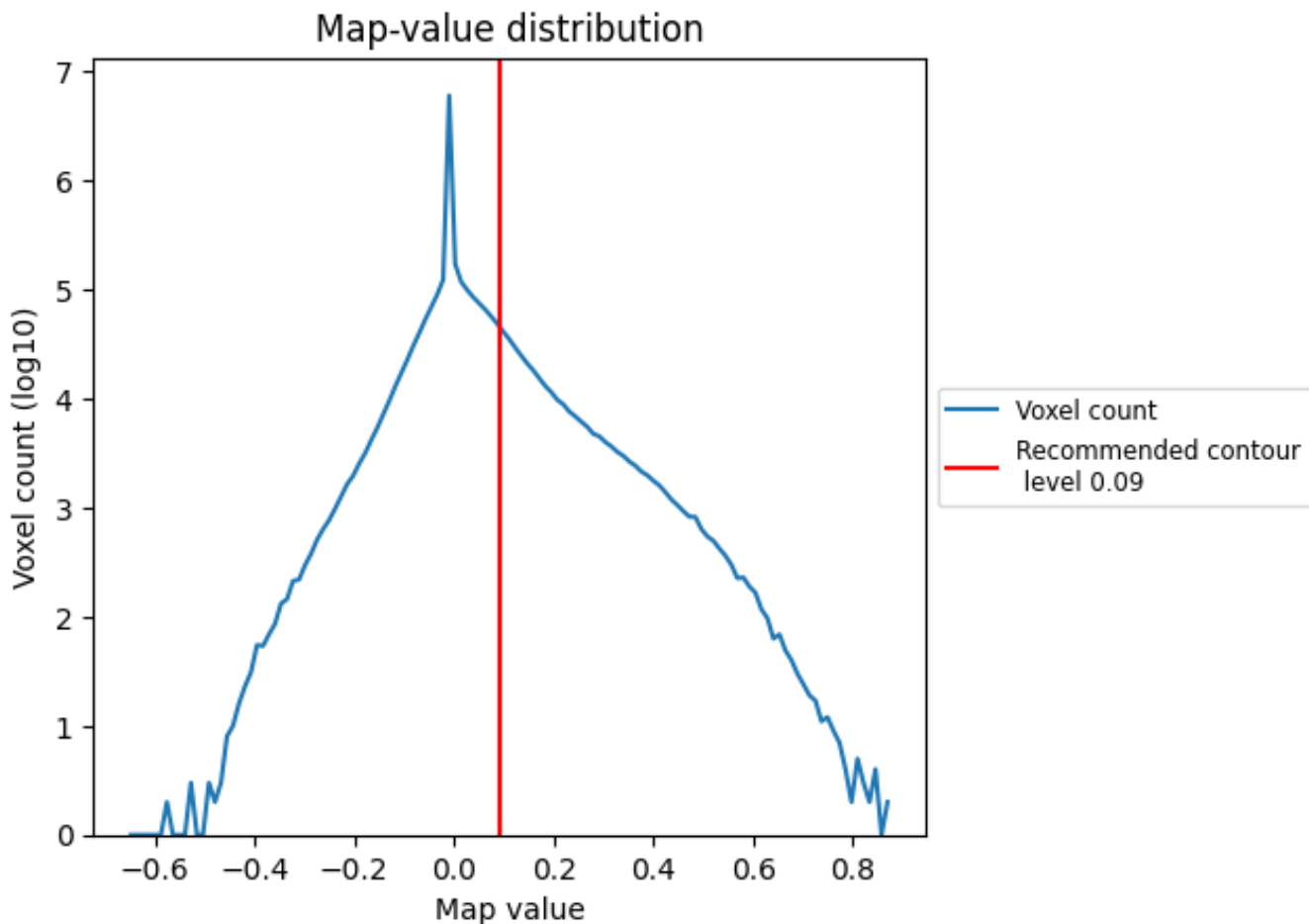
6.5 Mask visualisation [i](#)

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

7 Map analysis [i](#)

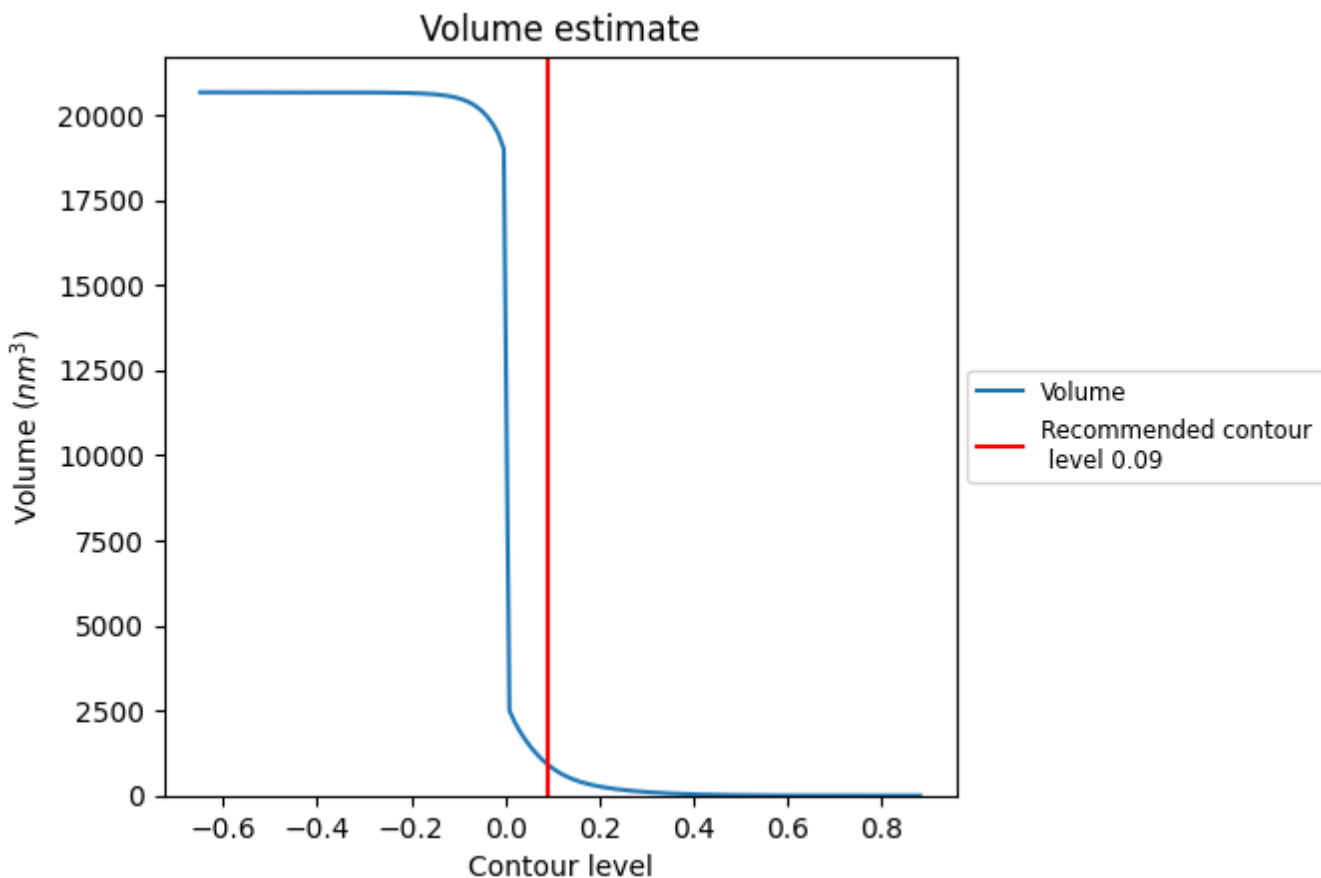
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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.

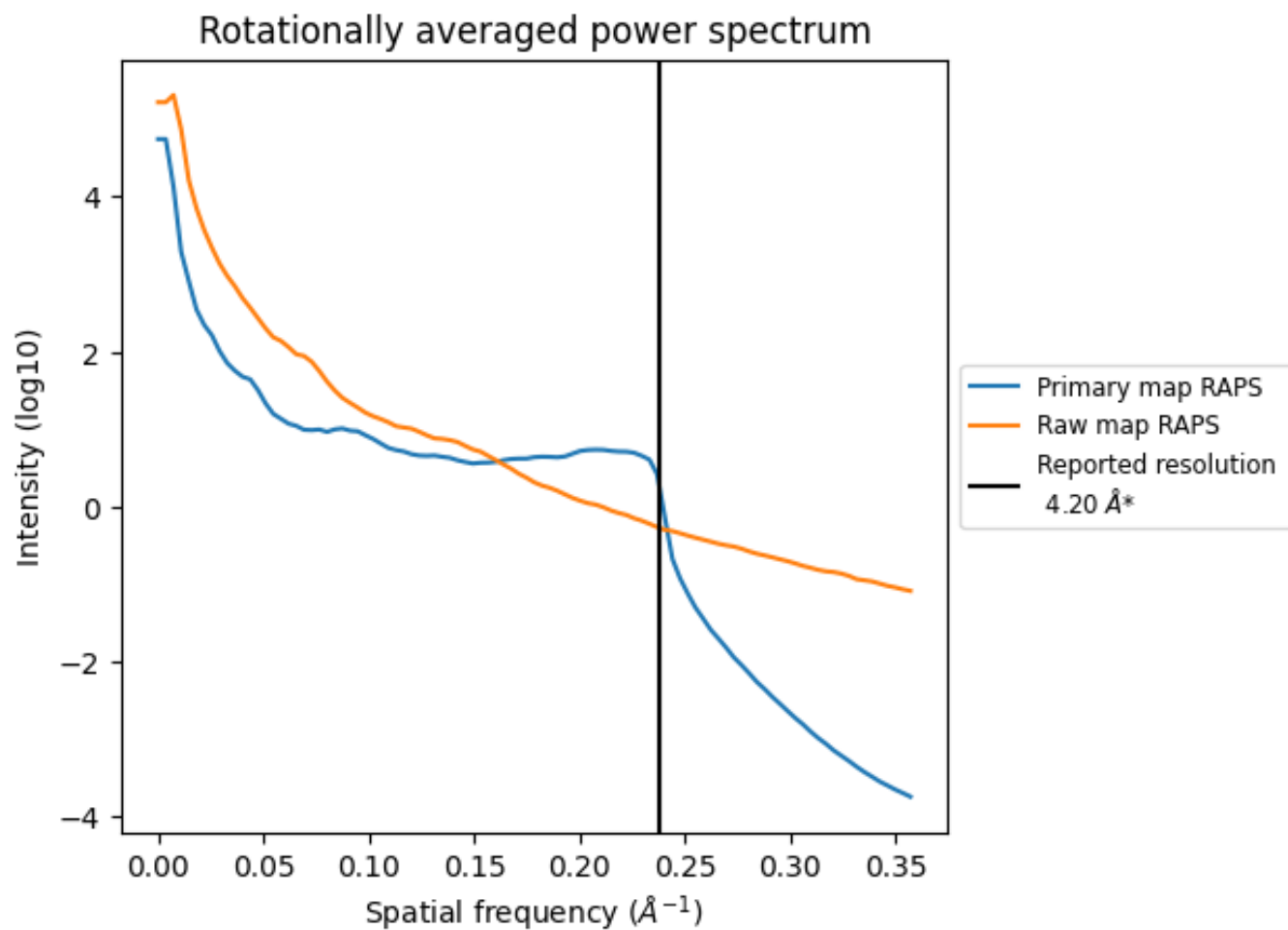
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 916 nm^3 ; this corresponds to an approximate mass of 827 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](#)

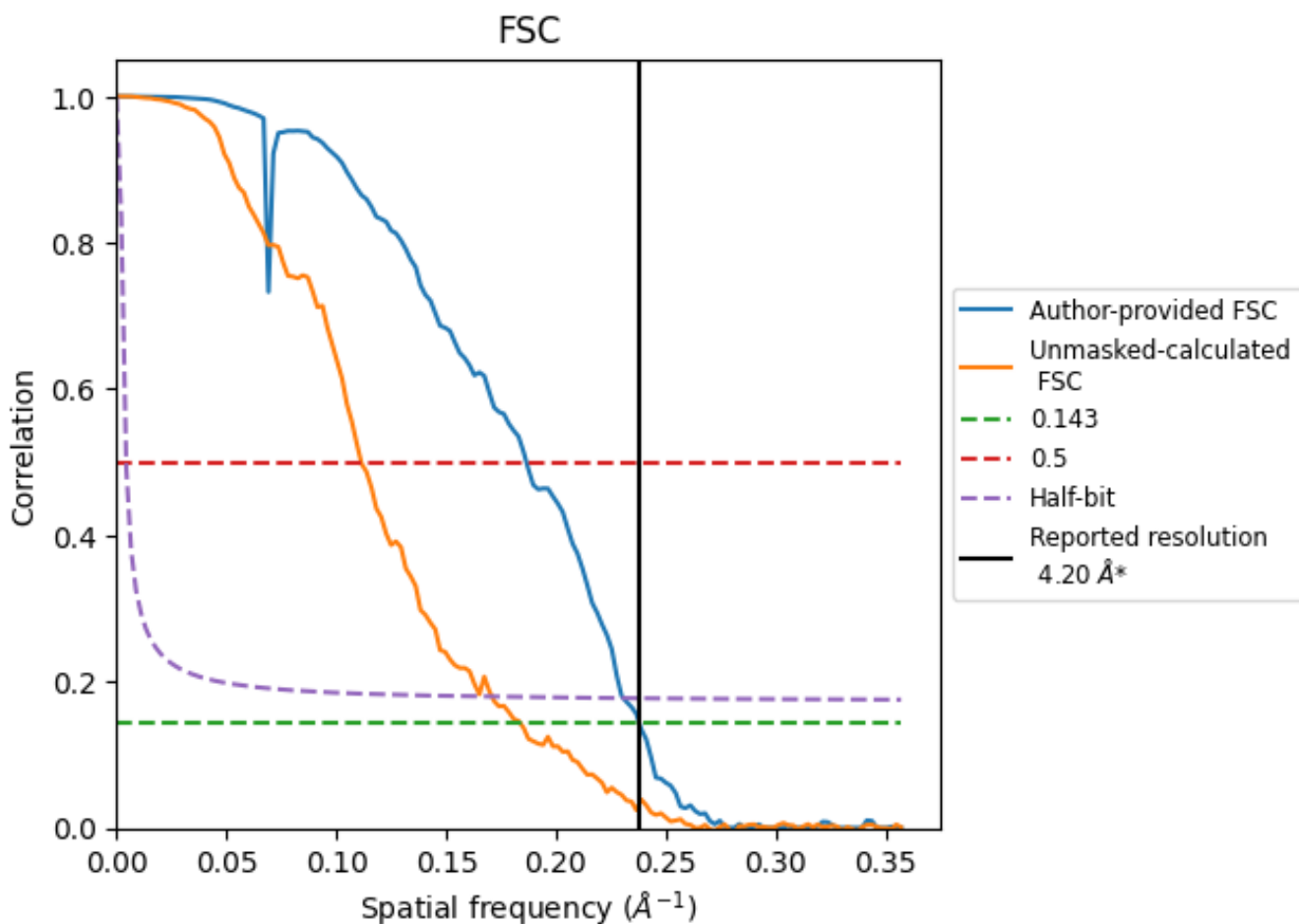


*Reported resolution corresponds to spatial frequency of 0.238 Å⁻¹

8 Fourier-Shell correlation [i](#)

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 [i](#)



*Reported resolution corresponds to spatial frequency of 0.238 \AA^{-1}

8.2 Resolution estimates [i](#)

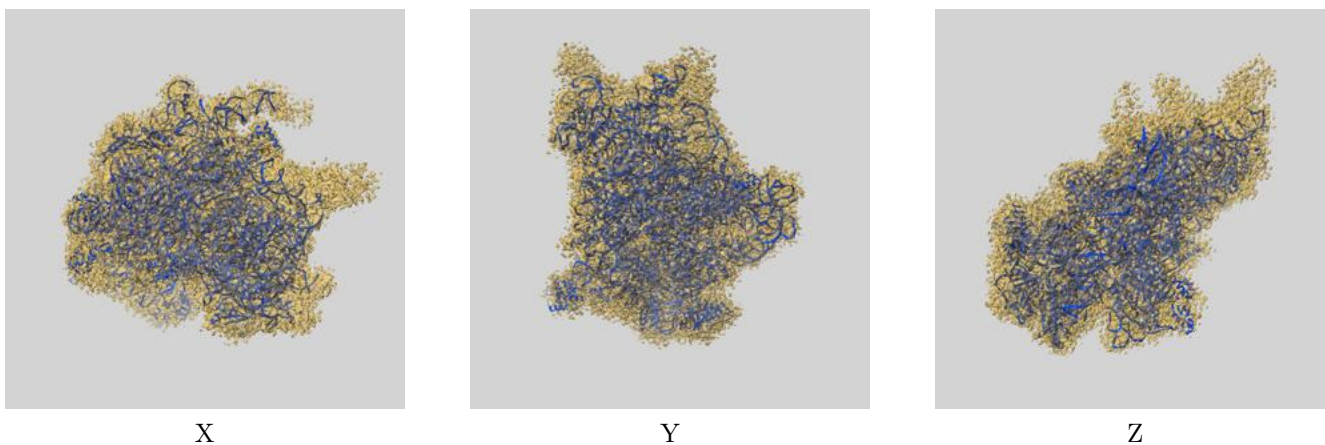
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.20	-	-
Author-provided FSC curve	4.20	5.36	4.33
Unmasked-calculated*	5.44	8.98	5.85

*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 5.44 differs from the reported value 4.2 by more than 10 %

9 Map-model fit [i](#)

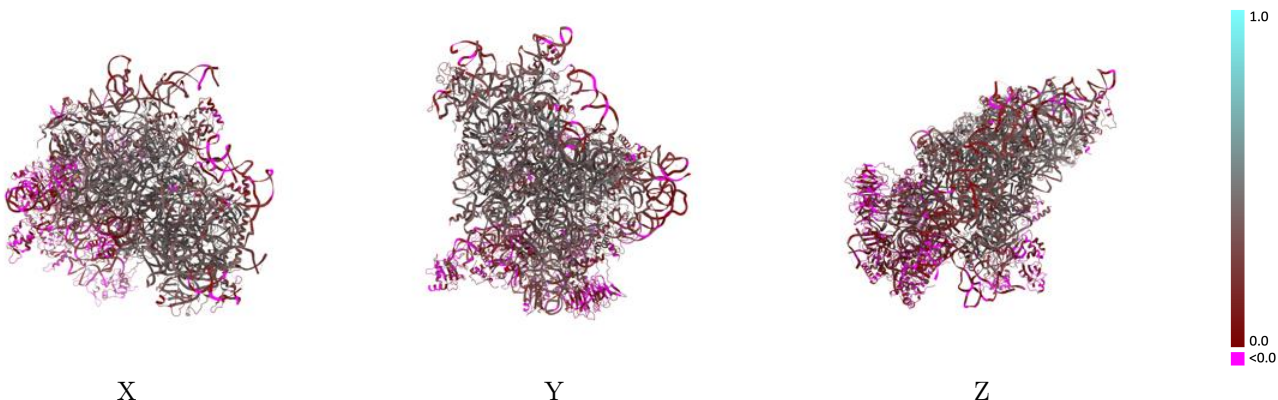
This section contains information regarding the fit between EMDB map EMD-3770 and PDB model 5OA3. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



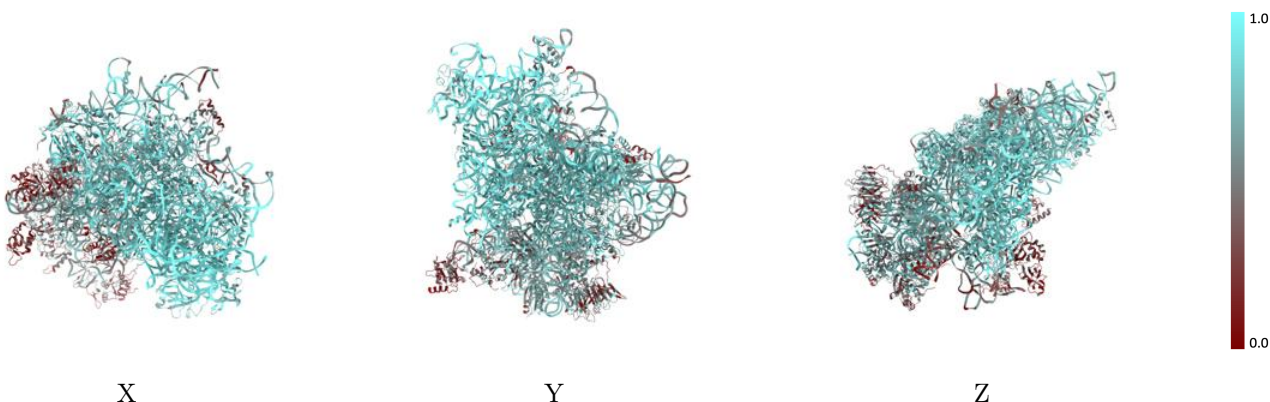
The images above show the 3D surface view of the map at the recommended contour level 0.09 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



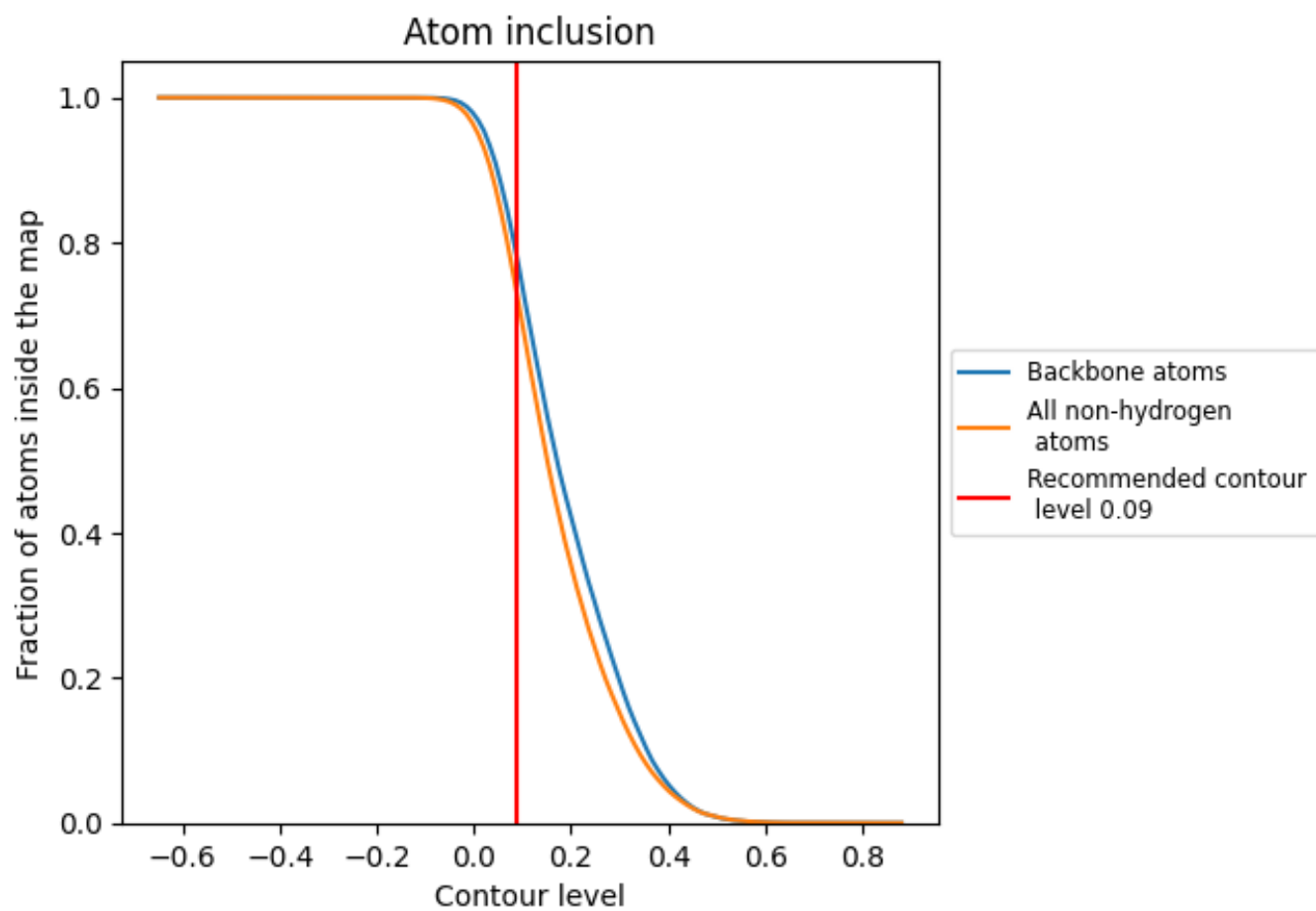
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)



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 (0.09).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 78% of all backbone atoms, 72% 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 (0.09) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7249	 0.2650
0	 0.2802	 0.0960
1	 0.4907	 0.0950
2	 0.8635	 0.3120
3	 0.6247	 0.1520
A	 0.7837	 0.3440
B	 0.7810	 0.3450
C	 0.7937	 0.3880
D	 0.5828	 0.1790
E	 0.8272	 0.3970
F	 0.4718	 0.1010
G	 0.7872	 0.3110
H	 0.6182	 0.2840
I	 0.7682	 0.3290
J	 0.8270	 0.3810
K	 0.4885	 0.1030
L	 0.7680	 0.3780
M	 0.2183	 0.0450
N	 0.8139	 0.3700
O	 0.7492	 0.3300
P	 0.3983	 0.0540
Q	 0.5909	 0.1510
R	 0.6040	 0.2430
S	 0.4960	 0.0970
T	 0.5174	 0.1010
U	 0.6215	 0.2370
V	 0.8003	 0.3710
W	 0.8198	 0.4260
X	 0.8245	 0.4100
Y	 0.8354	 0.3600
Z	 0.3743	 0.0470
a	 0.7762	 0.3810
b	 0.7707	 0.3450
c	 0.4143	 0.1040
d	 0.6122	 0.1920



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Chain	Atom inclusion	Q-score
e	 0.6862	 0.3280
f	 0.2579	 0.0210
g	 0.4363	 0.0400
h	 0.6857	 0.3190