



## Full wwPDB EM Validation Report ⓘ

Dec 2, 2024 – 09:12 PM JST

PDB ID : 8XU8  
EMDB ID : EMD-38660  
Title : State 2c(S2c) of yeast 80S ribosome bound to compact eEF2 and 2 tRNAs during peptidyl transferation  
Authors : Cheng, J.; Wu, C.L.; Li, J.X.; Zhang, X.Z.  
Deposited on : 2024-01-12  
Resolution : 3.40 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](mailto: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>.

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

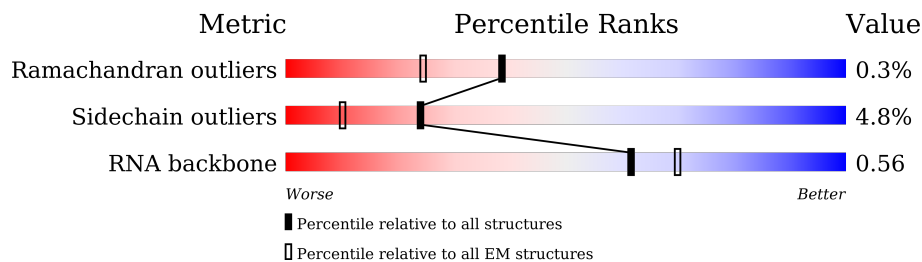
EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP)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

# 1 Overall quality at a glance i

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

The reported resolution of this entry is 3.40 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.



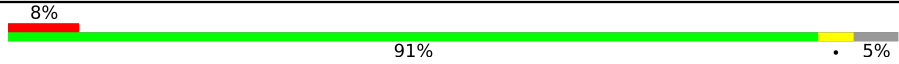
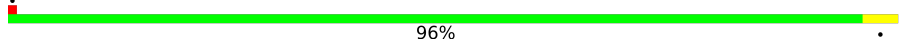
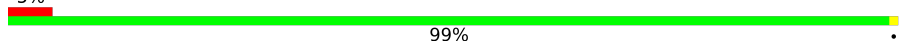
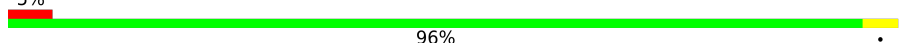
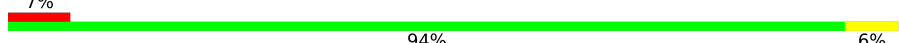
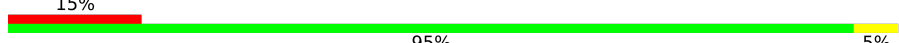
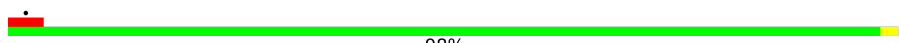

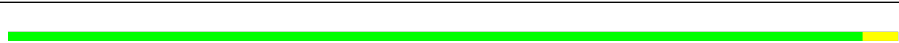

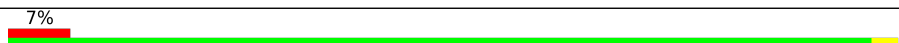

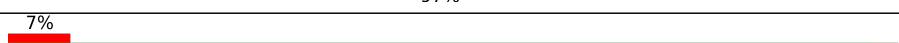
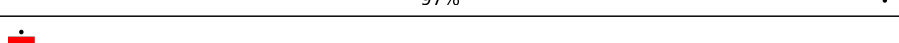
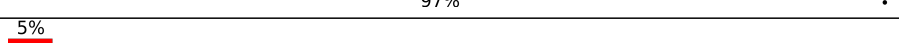
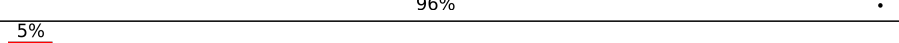
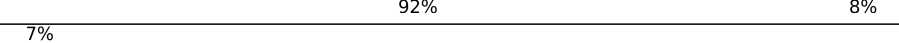
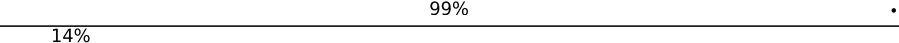
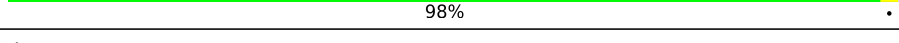
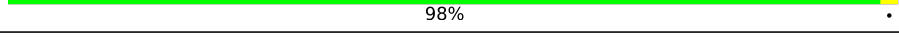
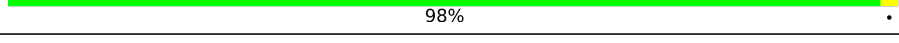
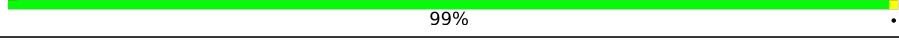
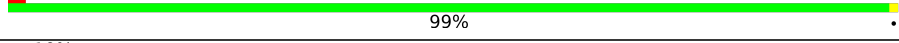
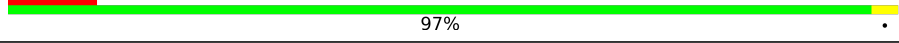
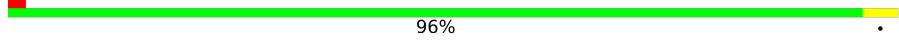
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	2	1799	
2	A	3394	
3	B	121	
4	C	158	
5	D	251	
6	E	386	
7	F	361	
8	G	294	

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Mol	Chain	Length	Quality of chain
9	H	175	 8% 91% 5%
10	I	222	 1% 96% 5%
11	J	233	 5% 99% 5%
12	K	191	 5% 96% 5%
13	L	218	 7% 94% 6% 5%
14	M	169	 15% 95% 5%
15	N	193	 1% 98% 5%
16	O	136	 1% 94% 6% 5%
17	P	203	 1% 96% 5%
18	Q	197	 1% 95% 5%
19	R	183	 7% 97% 5%
20	S	185	 1% 97% 5%
21	T	188	 7% 97% 5%
22	U	171	 1% 97% 5%
23	V	159	 5% 96% 5%
24	W	100	 5% 92% 8% 5%
25	X	136	 7% 99% 5%
26	Y	126	 14% 98% 5%
27	Z	121	 1% 98% 5%
28	a	125	 1% 98% 5%
29	b	135	 1% 99% 5%
30	c	148	 1% 99% 5%
31	d	58	 10% 97% 5%
32	e	96	 1% 96% 5%
33	f	109	 10% 98% 5%

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Mol	Chain	Length	Quality of chain
34	g	127	97%
35	h	106	95%
36	i	112	98%
37	j	119	97%
38	k	99	99%
39	l	81	86%
40	m	77	99%
41	n	50	98%
42	o	52	88%
43	p	25	96%
44	q	103	97%
45	r	91	92%
46	s	75	81%
46	t	75	81%
47	x	842	95%
48	SD	121	95%
49	SZ	127	95%
50	Se	94	89%
51	SC	92	89%
52	SE	117	92%
53	SA	222	94%
54	SI	143	94%
55	SJ	100	95%
56	SL	63	98%
57	SM	53	91%

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Mol	Chain	Length	Quality of chain
58	SB	206	25% 96% .
59	SF	141	19% 96% ..
60	SH	145	28% 94% 6%
61	SO	312	49% 89% 9% .
62	SN	73	70% 93% 7%
63	SG	121	25% 92% 8%
64	SP	206	11% 96% .
65	SQ	232	22% 91% 6% .
66	SR	216	5% 97% .
67	SS	258	11% 93% 7%
68	ST	228	18% 96% .
69	SU	184	23% 96% .
70	SV	198	8% 91% 6%
71	SW	184	12% 96% .
72	SX	142	12% 95% 5%
73	SY	150	13% 95% 5%
74	Sa	87	16% 93% 7%
75	Sb	129	. 97% .
76	Sc	144	8% 96% ..
77	Sd	134	12% 95% 5%
78	Sf	81	16% 95% 5%
79	Sg	60	17% 97% .
80	SK	108	43% 94% 5%

## 2 Entry composition [i](#)

There are 80 unique types of molecules in this entry. The entry contains 209284 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 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1767	37653	16834	6668	12384	1767	0	0

- Molecule 2 is a RNA chain called 25S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	A	3189	68216	30470	12302	22255	3189	0	0

- Molecule 3 is a RNA chain called 5S rRNA.

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

- Molecule 4 is a RNA chain called 5.8S rRNA.

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

- Molecule 5 is a protein called Large ribosomal subunit protein uL2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	D	251	1899	1182	385	331	1	0	0

- Molecule 6 is a protein called Large ribosomal subunit protein uL3.

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

- Molecule 7 is a protein called Large ribosomal subunit protein uL4A.

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

- Molecule 8 is a protein called Large ribosomal subunit protein uL18.

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

- Molecule 9 is a protein called Large ribosomal subunit protein eL6B.

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

- Molecule 10 is a protein called Large ribosomal subunit protein uL30A.

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

- Molecule 11 is a protein called Large ribosomal subunit protein eL8A.

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

- Molecule 12 is a protein called Large ribosomal subunit protein uL6A.

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

- Molecule 13 is a protein called Large ribosomal subunit protein uL16.

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

- Molecule 14 is a protein called Large ribosomal subunit protein uL5B.

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

- Molecule 15 is a protein called Large ribosomal subunit protein eL13A.

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

- Molecule 16 is a protein called Large ribosomal subunit protein eL14A.

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

- Molecule 17 is a protein called Large ribosomal subunit protein eL15A.

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

- Molecule 18 is a protein called Large ribosomal subunit protein uL13A.

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

- Molecule 19 is a protein called Large ribosomal subunit protein uL22A.

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

- Molecule 20 is a protein called Large ribosomal subunit protein eL18A.

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

- Molecule 21 is a protein called Large ribosomal subunit protein eL19A.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
21	T	188	1515	932	323	260	0	0

- Molecule 22 is a protein called Large ribosomal subunit protein eL20A.

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

- Molecule 23 is a protein called Large ribosomal subunit protein eL21A.

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

- Molecule 24 is a protein called Large ribosomal subunit protein eL22A.

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

- Molecule 25 is a protein called Large ribosomal subunit protein uL14A.

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

- Molecule 26 is a protein called Large ribosomal subunit protein eL24A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	Y	126	836	525	165	145	1	0	0

- Molecule 27 is a protein called Large ribosomal subunit protein uL23.

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

- Molecule 28 is a protein called Large ribosomal subunit protein uL24A.

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

- Molecule 29 is a protein called Large ribosomal subunit protein eL27A.

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

- Molecule 30 is a protein called Large ribosomal subunit protein uL15.

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

- Molecule 31 is a protein called Large ribosomal subunit protein eL29.

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

- Molecule 32 is a protein called Large ribosomal subunit protein eL30.

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

- Molecule 33 is a protein called Large ribosomal subunit protein eL31A.

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

- Molecule 34 is a protein called Large ribosomal subunit protein eL32.

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

- Molecule 35 is a protein called Large ribosomal subunit protein eL33A.

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

- Molecule 36 is a protein called Large ribosomal subunit protein eL34A.

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

- Molecule 37 is a protein called Large ribosomal subunit protein uL29A.

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

- Molecule 38 is a protein called Large ribosomal subunit protein eL36A.

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

- Molecule 39 is a protein called Large ribosomal subunit protein eL37A.

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

- Molecule 40 is a protein called Large ribosomal subunit protein eL38.

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

- Molecule 41 is a protein called Large ribosomal subunit protein eL39.

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

- Molecule 42 is a protein called Large ribosomal subunit protein eL40A.

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

- Molecule 43 is a protein called Large ribosomal subunit protein eL41A.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	p	25	Total	C	N	O	S	0	0
			229	139	62	27	1		

- Molecule 44 is a protein called Large ribosomal subunit protein eL42A.

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

- Molecule 45 is a protein called Large ribosomal subunit protein eL43A.

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

- Molecule 46 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	s	75	Total	C	N	O	P	0	0
			1605	716	297	517	75		
46	t	75	Total	C	N	O	P	0	0
			1606	716	297	518	75		

- Molecule 47 is a protein called Elongation factor 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	x	842	Total	C	N	O	S	0	0
			6559	4166	1124	1238	31		

- Molecule 48 is a protein called Small ribosomal subunit protein eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	SD	121	Total	C	N	O	S	0	0
			875	551	153	169	2		

- Molecule 49 is a protein called Small ribosomal subunit protein uS11B.

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

- Molecule 50 is a protein called Small ribosomal subunit protein eS26A.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	Se	94	Total	C	N	O	S	0	0
			750	462	157	126	5		

- Molecule 51 is a protein called Small ribosomal subunit protein eS10A.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	SC	92	Total	C	N	O	S	0	0
			752	487	122	141	2		

- Molecule 52 is a protein called Small ribosomal subunit protein uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	SE	117	Total	C	N	O	S	0	0
			916	583	171	155	7		

- Molecule 53 is a protein called Small ribosomal subunit protein uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	SA	222	Total	C	N	O	S	0	0
			1729	1098	312	313	6		

- Molecule 54 is a protein called Small ribosomal subunit protein eS19A.

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

- Molecule 55 is a protein called Small ribosomal subunit protein uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	SJ	100	Total	C	N	O	S	0	0
			797	506	144	146	1		

- Molecule 56 is a protein called Small ribosomal subunit protein eS28A.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	SL	63	Total	C	N	O	S	0	0
			491	303	96	91	1		

- Molecule 57 is a protein called Small ribosomal subunit protein uS14A.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	SM	53	Total	C	N	O	S	0	0
			442	274	92	72	4		

- Molecule 58 is a protein called Small ribosomal subunit protein uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	SB	206	Total	C	N	O	S	0	0
			1605	1005	299	298	3		

- Molecule 59 is a protein called Small ribosomal subunit protein uS9A.

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

- Molecule 60 is a protein called Small ribosomal subunit protein uS13A.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	SH	145	Total	C	N	O	S	0	0
			1188	741	237	208	2		

- Molecule 61 is a protein called Small ribosomal subunit protein RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	SO	304	Total	C	N	O	S	0	0
			2326	1477	401	440	8		

- Molecule 62 is a protein called Small ribosomal subunit protein eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	SN	73	Total	C	N	O	S	0	0
			560	355	106	95	4		

- Molecule 63 is a protein called Small ribosomal subunit protein eS17A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	SG	121	961	599	182	178	2	0	0

- Molecule 64 is a protein called Small ribosomal subunit protein uS2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	SP	206	1603	1030	284	287	2	0	0

- Molecule 65 is a protein called Small ribosomal subunit protein eS1A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	SQ	226	1798	1139	330	325	4	0	0

- Molecule 66 is a protein called Small ribosomal subunit protein uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	SR	216	1626	1042	287	295	2	0	0

- Molecule 67 is a protein called Small ribosomal subunit protein eS4A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	SS	258	2056	1308	387	358	3	0	0

- Molecule 68 is a protein called Small ribosomal subunit protein eS6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	ST	228	1815	1138	351	323	3	0	0

- Molecule 69 is a protein called Small ribosomal subunit protein eS7A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
69	SU	184	1473	946	263	264	0	0

- Molecule 70 is a protein called Small ribosomal subunit protein eS8A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
70	SV	187	1476	916	295	263	2	0	0

- Molecule 71 is a protein called Small ribosomal subunit protein uS4A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
71	SW	184	1479	935	285	258	1	0	0

- Molecule 72 is a protein called Small ribosomal subunit protein uS17A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
72	SX	142	1142	733	217	189	3	0	0

- Molecule 73 is a protein called Small ribosomal subunit protein uS15.

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

- Molecule 74 is a protein called Small ribosomal subunit protein eS21A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
74	Sa	87	673	415	125	131	2	0	0

- Molecule 75 is a protein called Small ribosomal subunit protein uS8A.

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

- Molecule 76 is a protein called Small ribosomal subunit protein uS12A.

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

- Molecule 77 is a protein called Small ribosomal subunit protein eS24A.



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

- Molecule 78 is a protein called Small ribosomal subunit protein eS27A.

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

- Molecule 79 is a protein called Small ribosomal subunit protein eS30A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
79	Sg	60	472	298	97	76	1	0	0

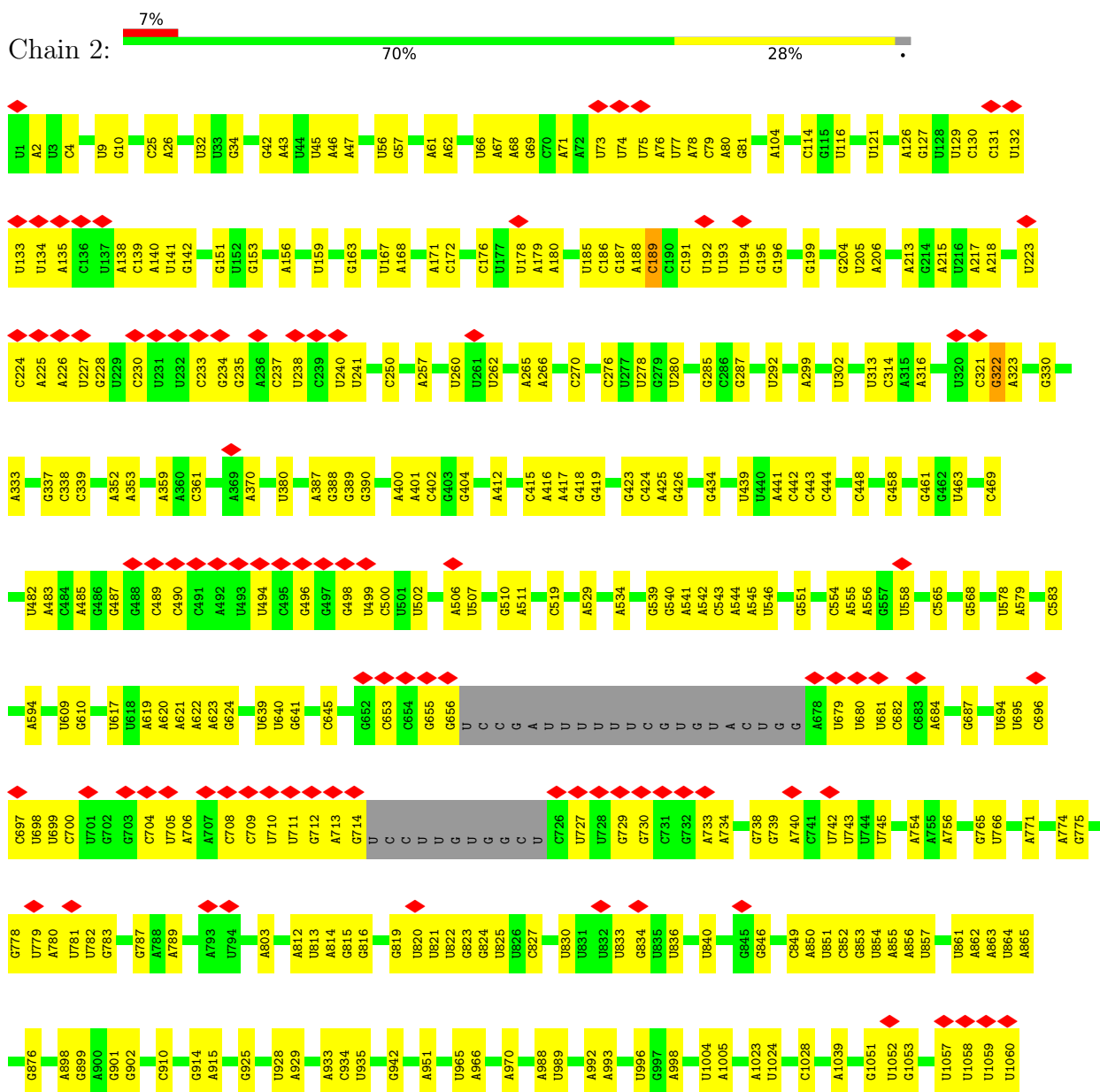
- Molecule 80 is a protein called Small ribosomal subunit protein eS25A.

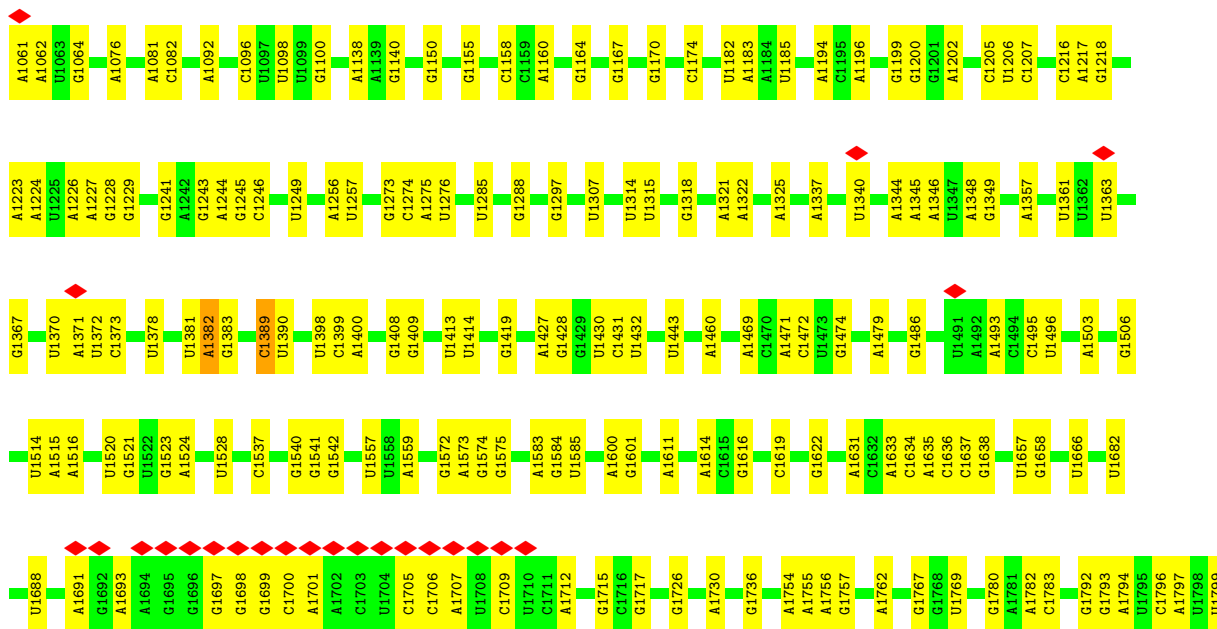
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
80	SK	103	810	514	151	143	2	0	0

### 3 Residue-property plots

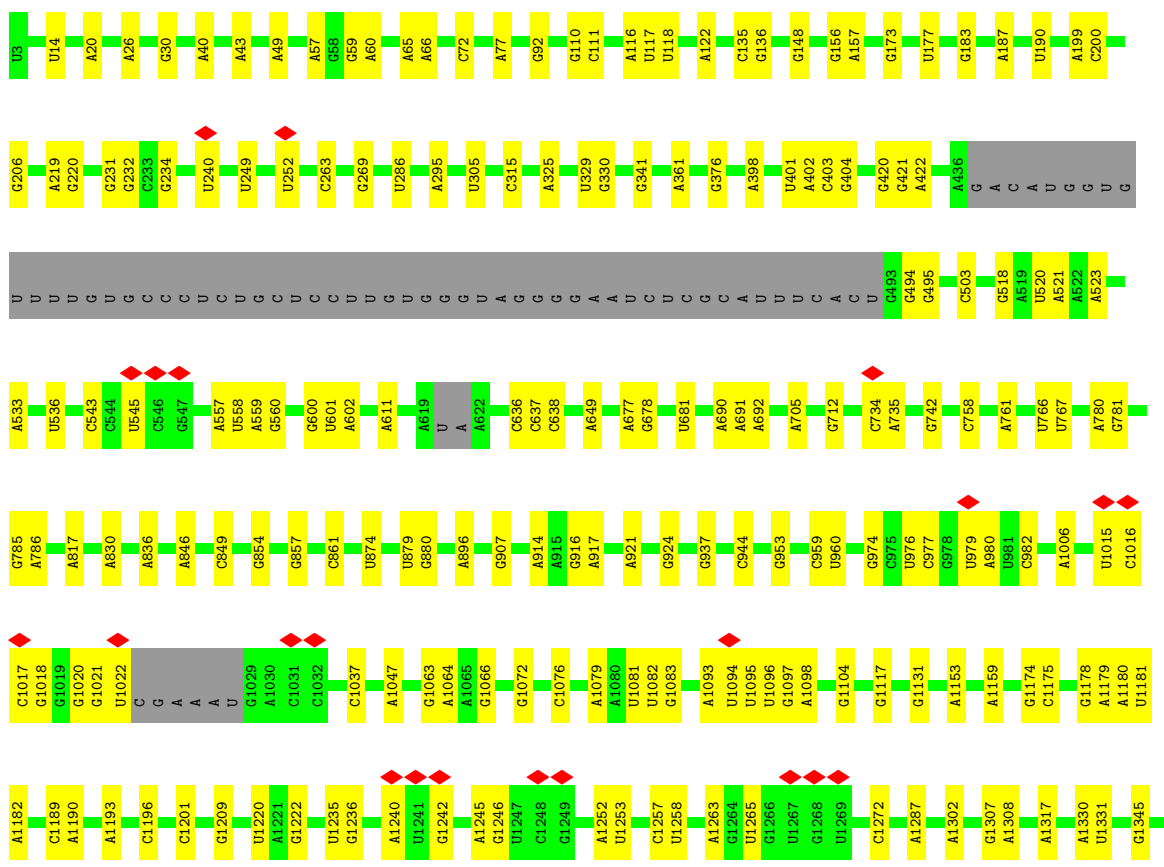
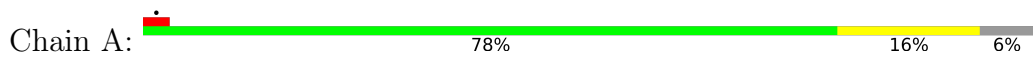
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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.

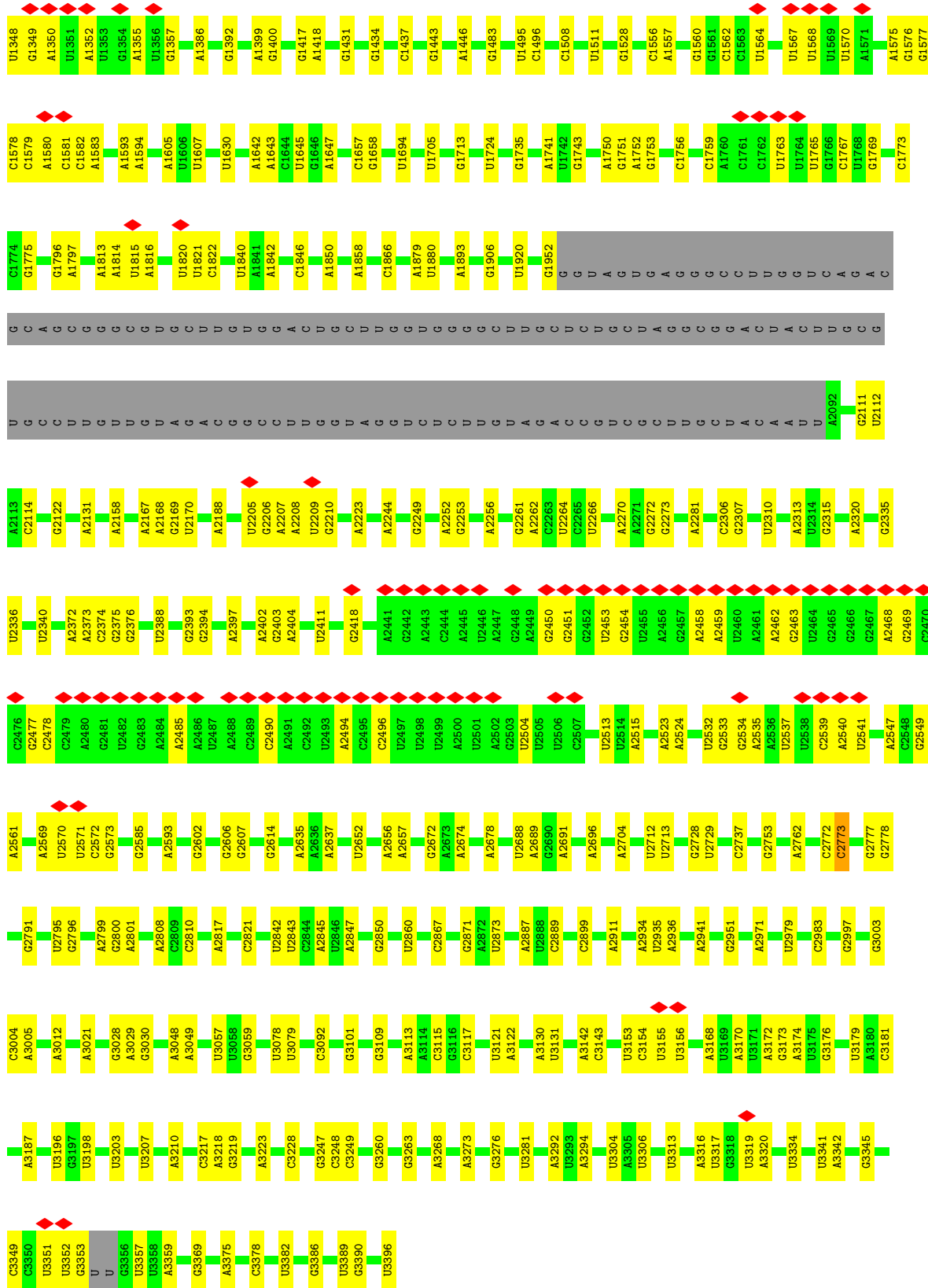
- Molecule 1: 18S rRNA



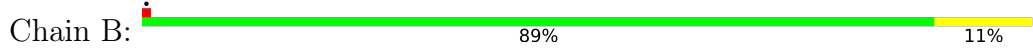


• Molecule 2: 25S rRNA



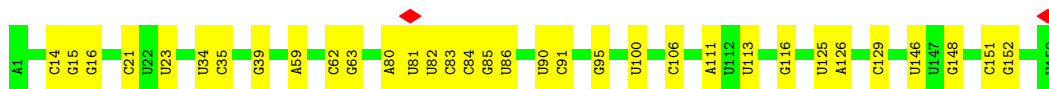
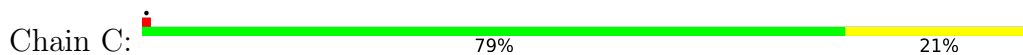


• Molecule 3: 5S rRNA

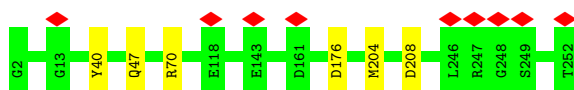




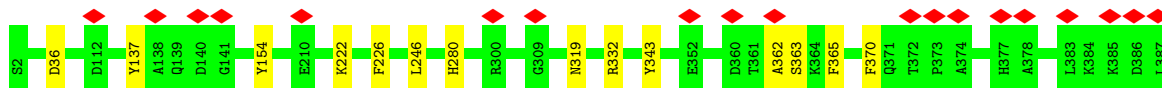
- Molecule 4: 5.8S rRNA



- Molecule 5: Large ribosomal subunit protein uL2A



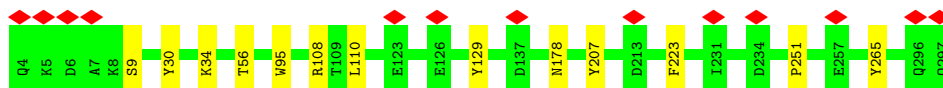
- Molecule 6: Large ribosomal subunit protein uL3



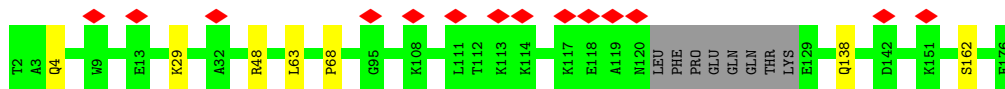
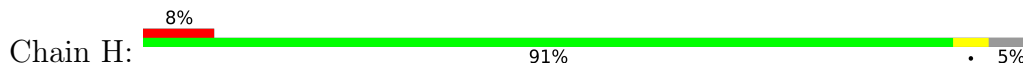
- Molecule 7: Large ribosomal subunit protein uL4A



- Molecule 8: Large ribosomal subunit protein uL18



- Molecule 9: Large ribosomal subunit protein eL6B



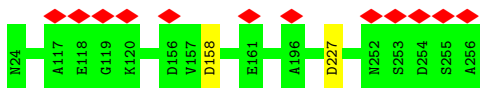
- Molecule 10: Large ribosomal subunit protein uL30A

Chain I:  96%



- Molecule 11: Large ribosomal subunit protein eL8A

Chain J:  99%



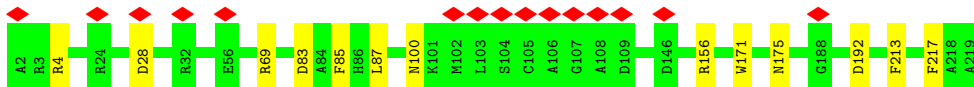
- Molecule 12: Large ribosomal subunit protein uL6A

Chain K:  96%



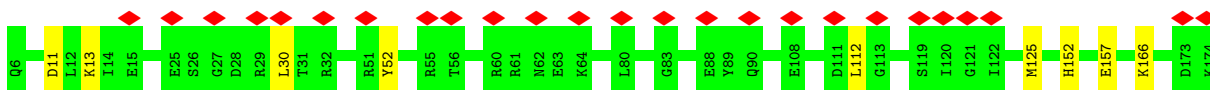
- Molecule 13: Large ribosomal subunit protein uL16

Chain L:  94%



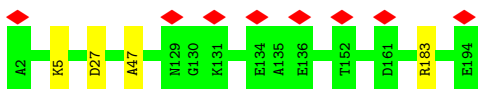
- Molecule 14: Large ribosomal subunit protein uL5B

Chain M:  95%



- Molecule 15: Large ribosomal subunit protein eL13A

Chain N:  98%



- Molecule 16: Large ribosomal subunit protein eL14A

Chain O:  94%



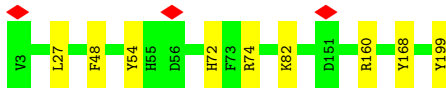
- Molecule 17: Large ribosomal subunit protein eL15A

Chain P:  96%



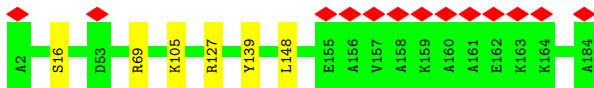
- Molecule 18: Large ribosomal subunit protein uL13A

Chain Q:  95%



- Molecule 19: Large ribosomal subunit protein uL22A

Chain R:  7% 97%



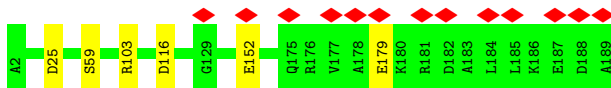
- Molecule 20: Large ribosomal subunit protein eL18A

Chain S:  7% 97%



- Molecule 21: Large ribosomal subunit protein eL19A

Chain T:  7% 97%



- Molecule 22: Large ribosomal subunit protein eL20A

Chain U:  7% 97%

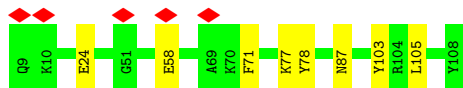
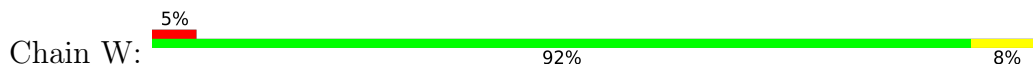


- Molecule 23: Large ribosomal subunit protein eL21A

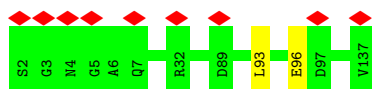
Chain V:  5% 96%



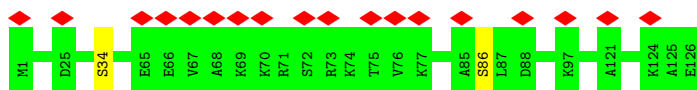
- Molecule 24: Large ribosomal subunit protein eL22A



- Molecule 25: Large ribosomal subunit protein uL14A



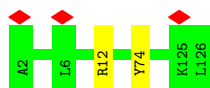
- Molecule 26: Large ribosomal subunit protein eL24A



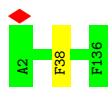
- Molecule 27: Large ribosomal subunit protein uL23



- Molecule 28: Large ribosomal subunit protein uL24A



- Molecule 29: Large ribosomal subunit protein eL27A



- Molecule 30: Large ribosomal subunit protein uL15

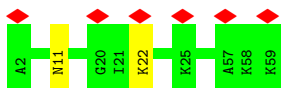


Chain c:  99%



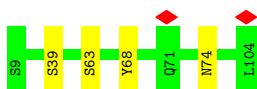
- Molecule 31: Large ribosomal subunit protein eL29

Chain d:  10% 97%



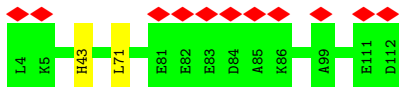
- Molecule 32: Large ribosomal subunit protein eL30

Chain e:  96%



- Molecule 33: Large ribosomal subunit protein eL31A

Chain f:  10% 98%



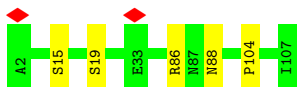
- Molecule 34: Large ribosomal subunit protein eL32

Chain g:  97%



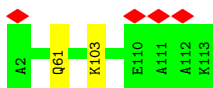
- Molecule 35: Large ribosomal subunit protein eL33A

Chain h:  95% 5%



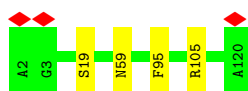
- Molecule 36: Large ribosomal subunit protein eL34A

Chain i:  98%



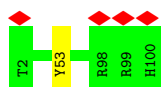
- Molecule 37: Large ribosomal subunit protein uL29A

Chain j:  97%




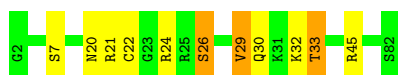
- Molecule 38: Large ribosomal subunit protein eL36A

Chain k:  99%



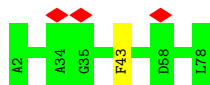
- Molecule 39: Large ribosomal subunit protein eL37A

Chain l:  86% 10%



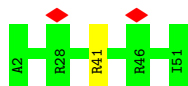
- Molecule 40: Large ribosomal subunit protein eL38

Chain m:  99%




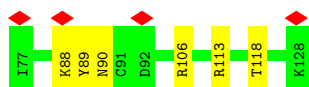
- Molecule 41: Large ribosomal subunit protein eL39

Chain n:  98%



- Molecule 42: Large ribosomal subunit protein eL40A

Chain o:  8% 88% 12%

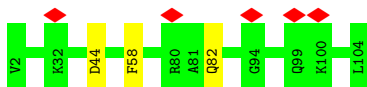


- Molecule 43: Large ribosomal subunit protein eL41A

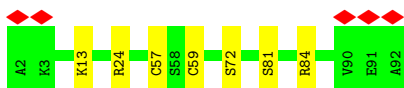
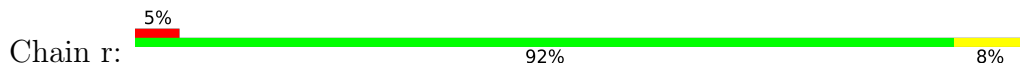
Chain p:  96%



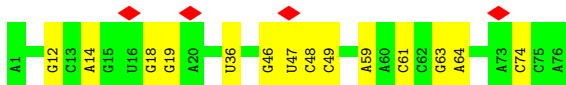
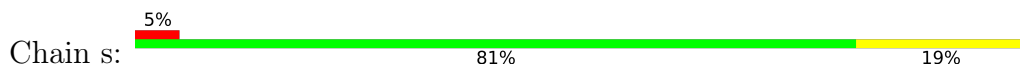
- Molecule 44: Large ribosomal subunit protein eL42A



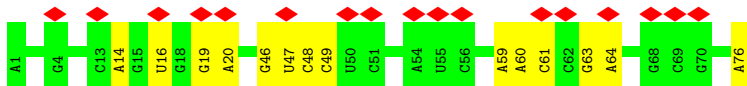
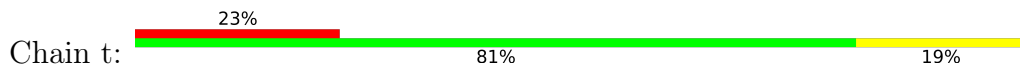
- Molecule 45: Large ribosomal subunit protein eL43A



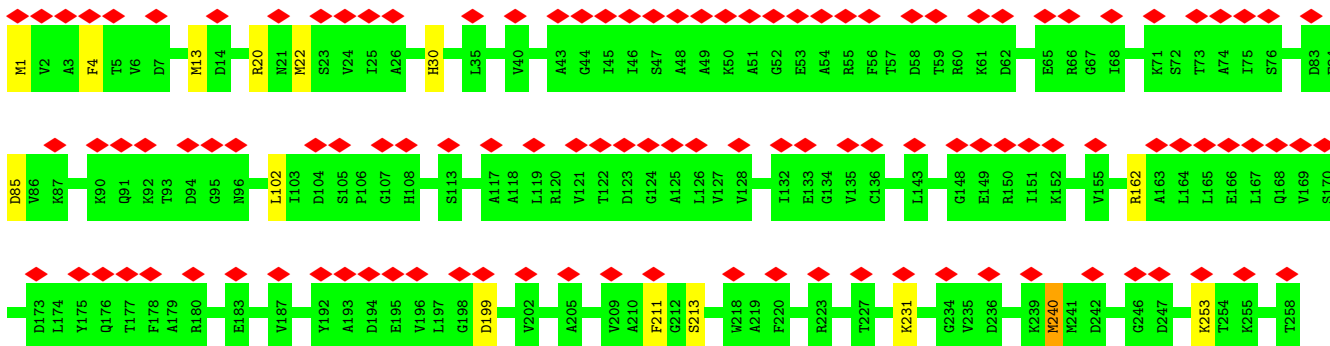
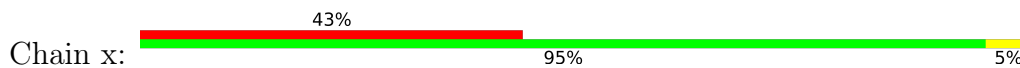
- Molecule 46: tRNA

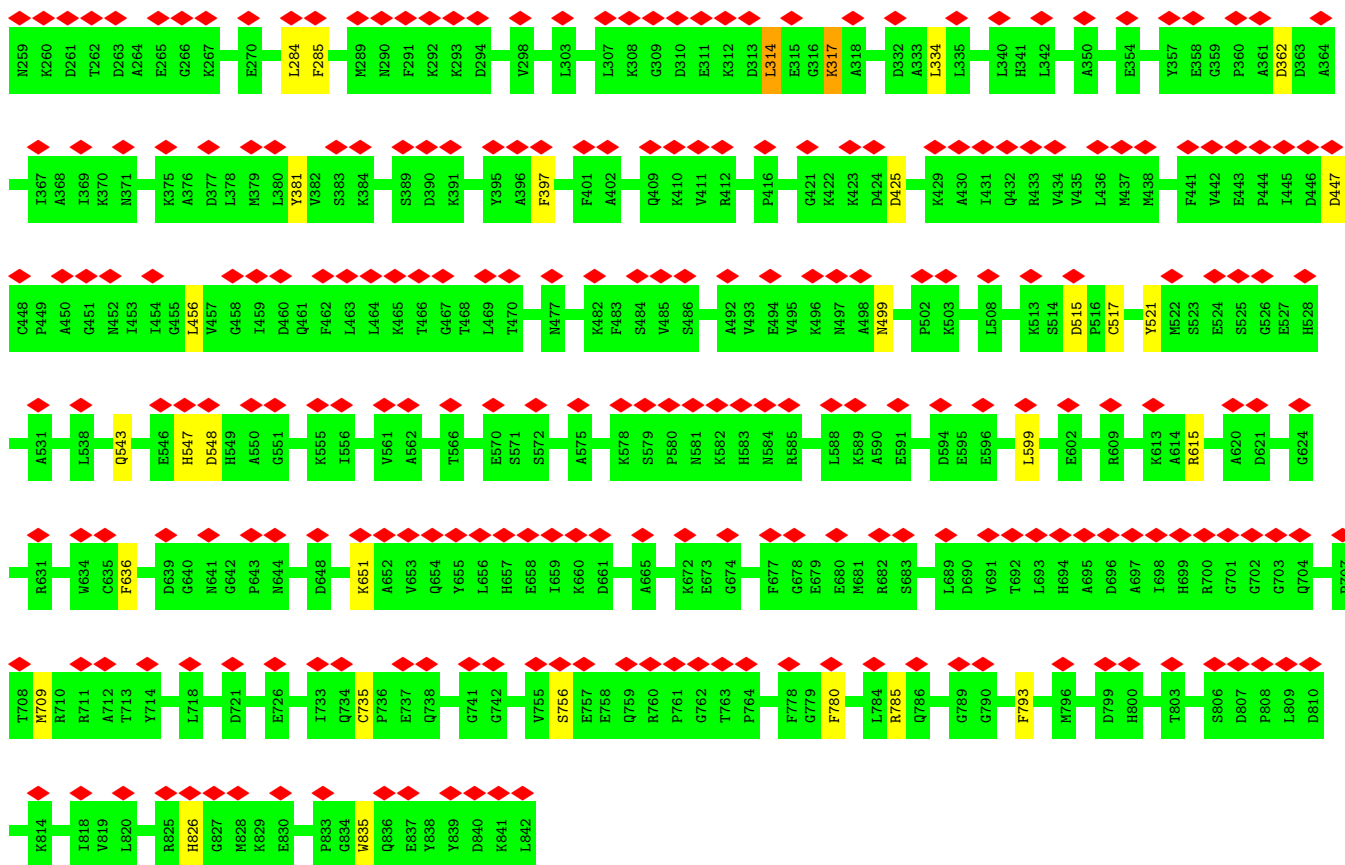


- Molecule 46: tRNA

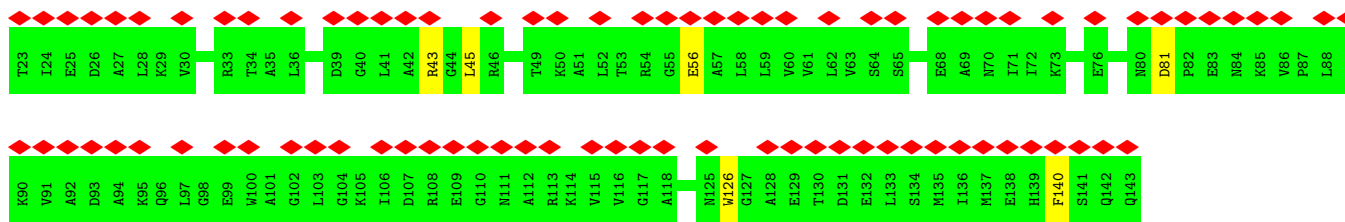


- Molecule 47: Elongation factor 2

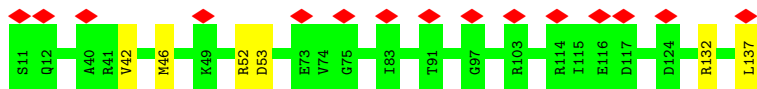




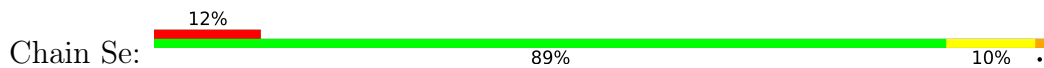
• Molecule 48: Small ribosomal subunit protein eS12

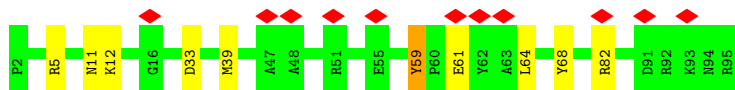


• Molecule 49: Small ribosomal subunit protein uS11B

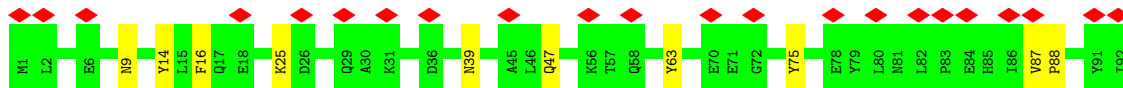
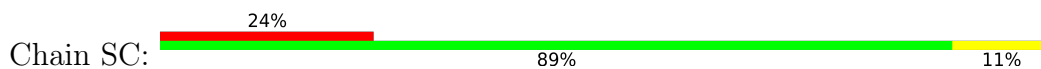


• Molecule 50: Small ribosomal subunit protein eS26A

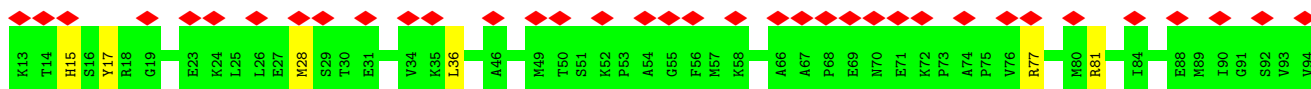
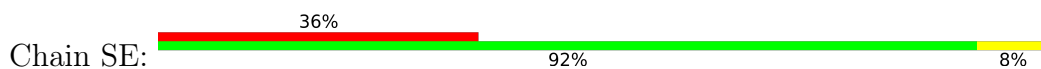




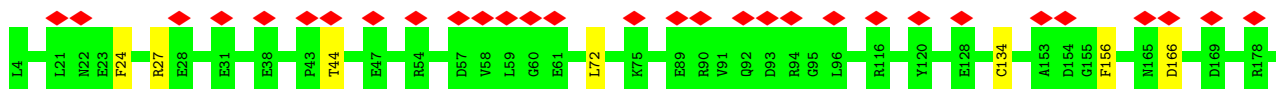
- Molecule 51: Small ribosomal subunit protein eS10A



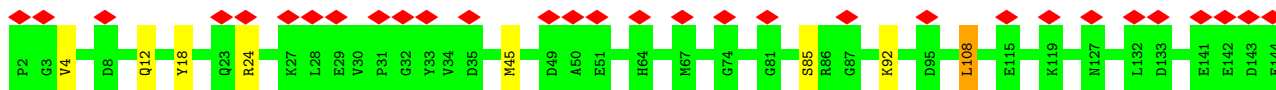
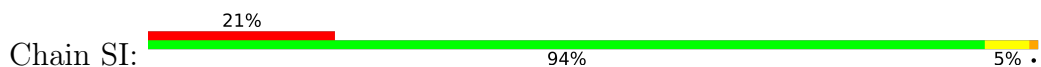
- Molecule 52: Small ribosomal subunit protein uS19



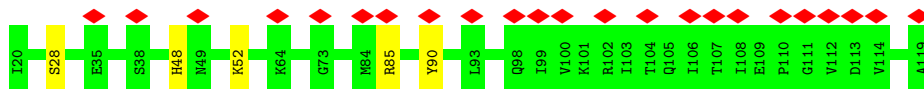
- Molecule 53: Small ribosomal subunit protein uS3



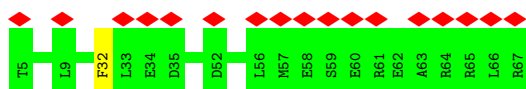
- Molecule 54: Small ribosomal subunit protein eS19A



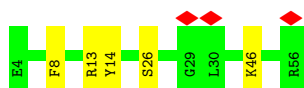
- Molecule 55: Small ribosomal subunit protein uS10



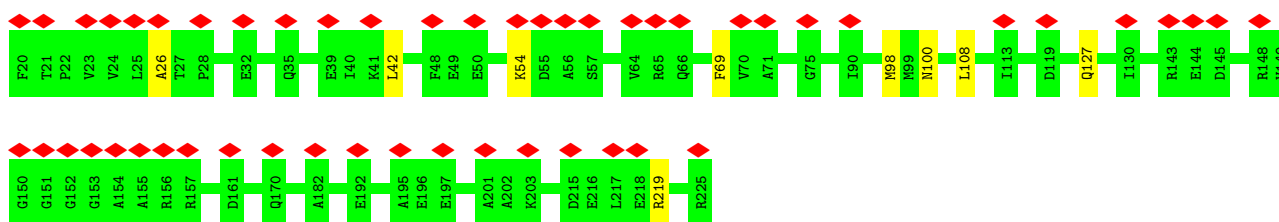
- Molecule 56: Small ribosomal subunit protein eS28A



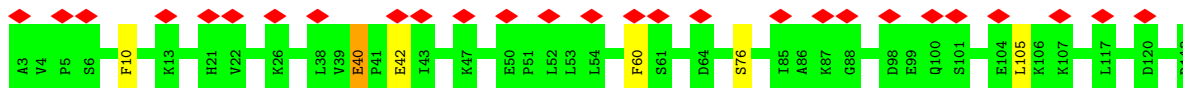
- Molecule 57: Small ribosomal subunit protein uS14A



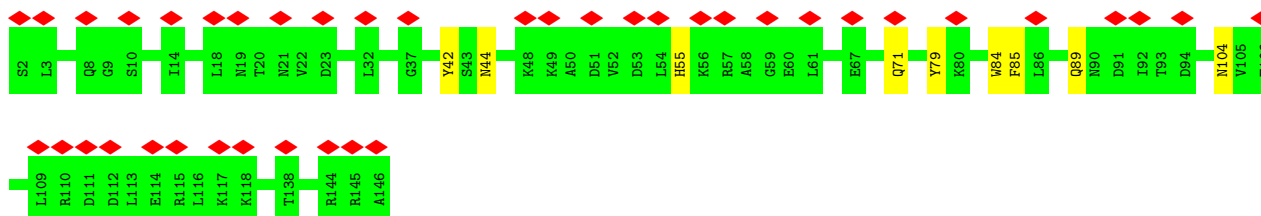
- Molecule 58: Small ribosomal subunit protein uS7



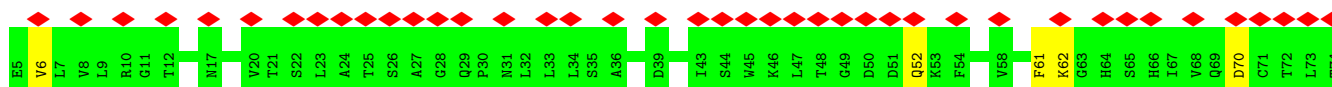
- Molecule 59: Small ribosomal subunit protein uS9A

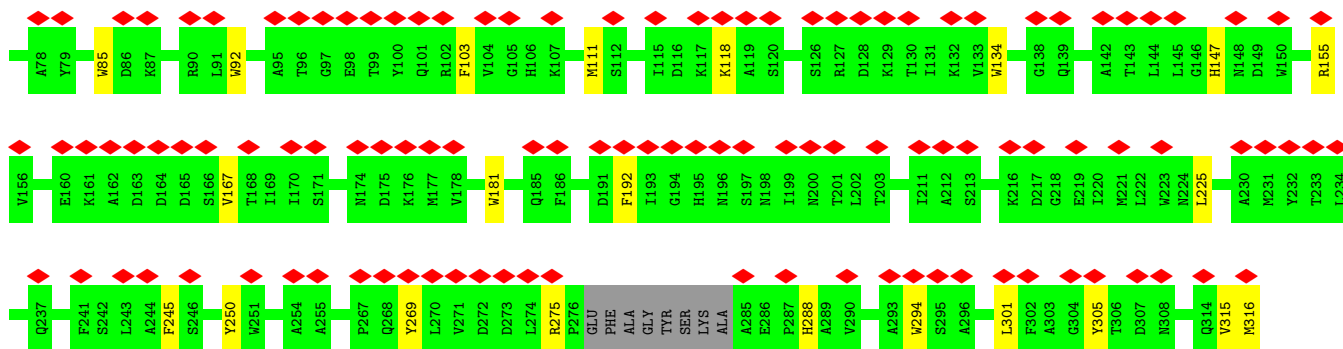


- Molecule 60: Small ribosomal subunit protein uS13A

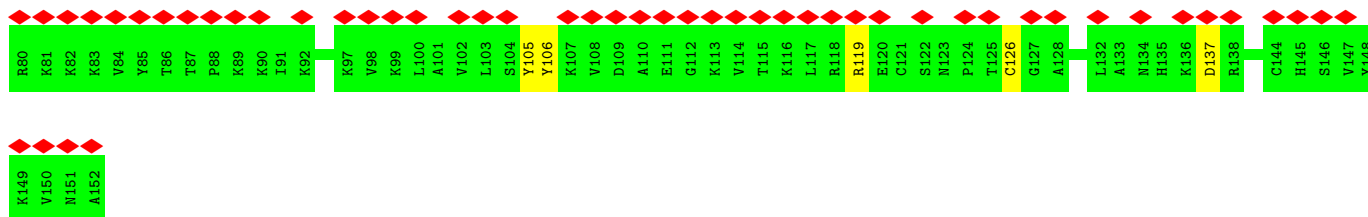


- Molecule 61: Small ribosomal subunit protein RACK1

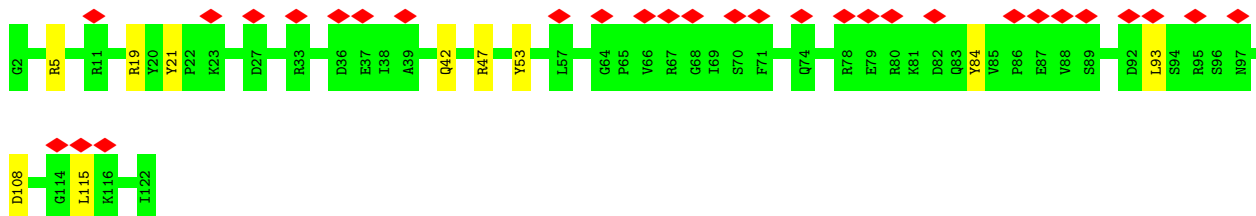




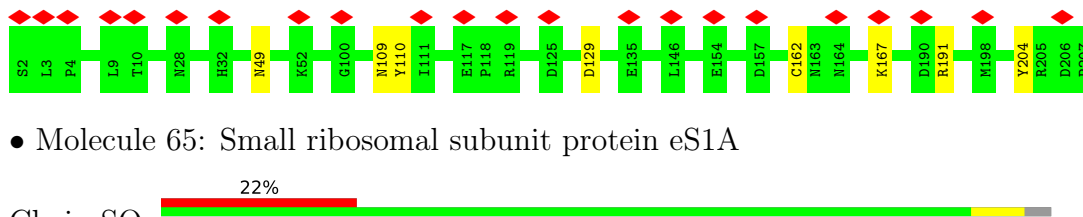
• Molecule 62: Small ribosomal subunit protein eS31



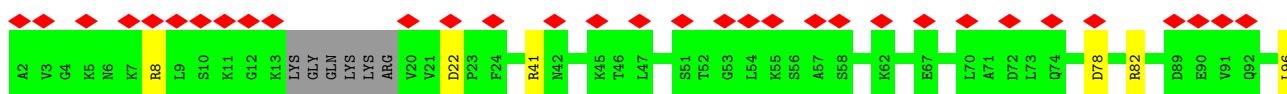
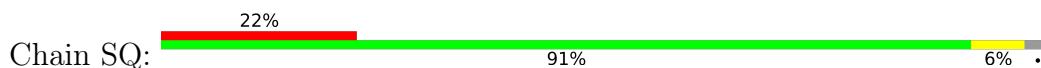
• Molecule 63: Small ribosomal subunit protein eS17A

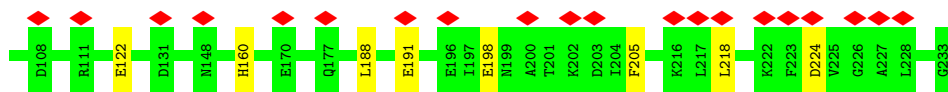


• Molecule 64: Small ribosomal subunit protein uS2A

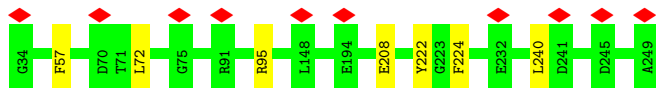


• Molecule 65: Small ribosomal subunit protein eS1A

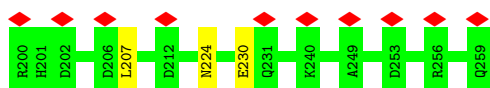
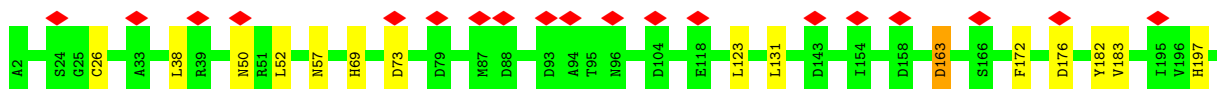




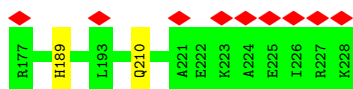
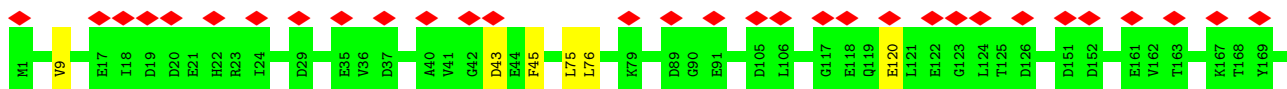
- Molecule 66: Small ribosomal subunit protein uS5



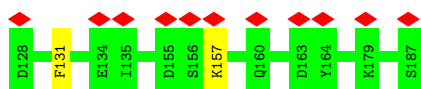
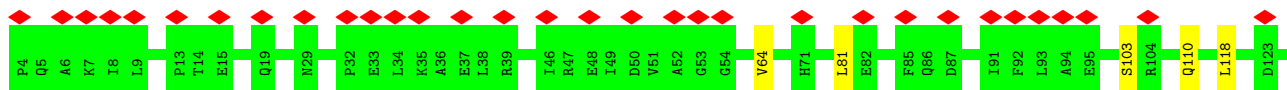
- Molecule 67: Small ribosomal subunit protein eS4A



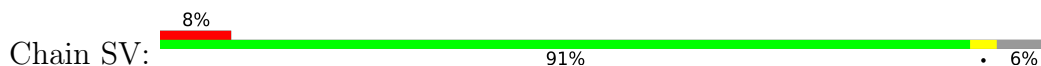
- Molecule 68: Small ribosomal subunit protein eS6A



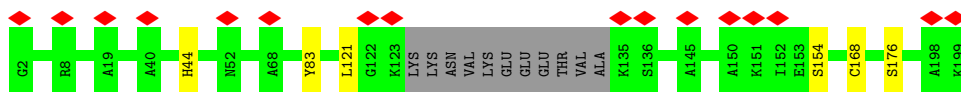
- Molecule 69: Small ribosomal subunit protein eS7A



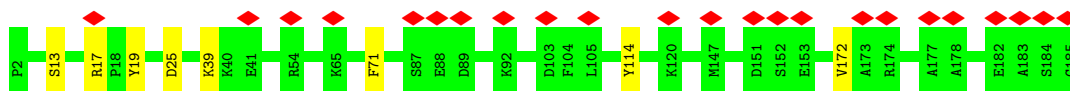
- Molecule 70: Small ribosomal subunit protein eS8A



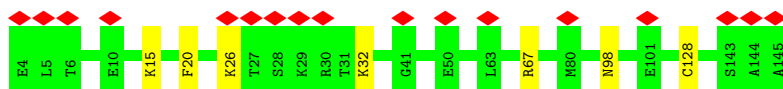




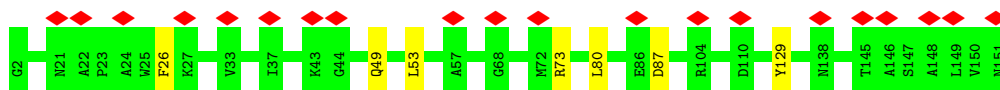
- Molecule 71: Small ribosomal subunit protein uS4A



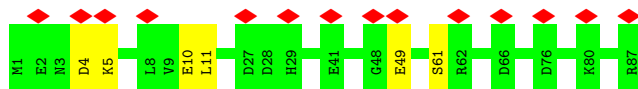
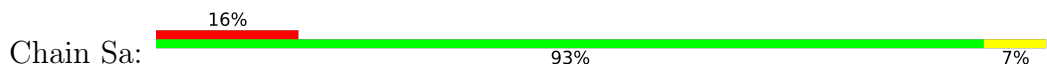
- Molecule 72: Small ribosomal subunit protein uS17A



- Molecule 73: Small ribosomal subunit protein uS15



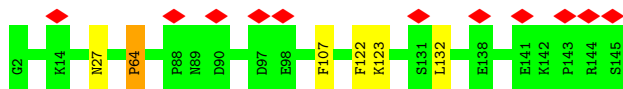
- Molecule 74: Small ribosomal subunit protein eS21A



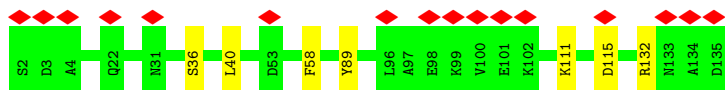
- Molecule 75: Small ribosomal subunit protein uS8A



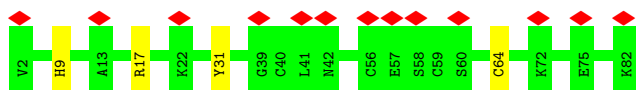
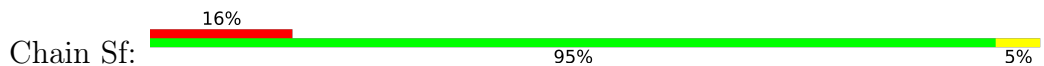
- Molecule 76: Small ribosomal subunit protein uS12A



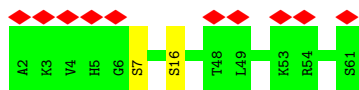
- Molecule 77: Small ribosomal subunit protein eS24A



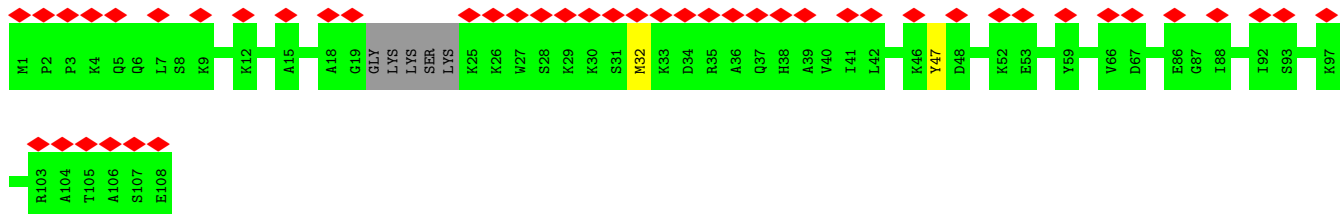
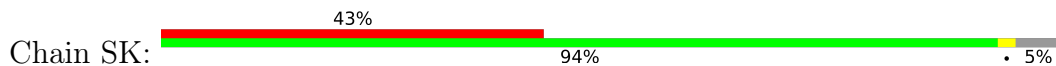
• Molecule 78: Small ribosomal subunit protein eS27A



• Molecule 79: Small ribosomal subunit protein eS30A



• Molecule 80: Small ribosomal subunit protein eS25A



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	39857	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 ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	1.933	Depositor
Minimum map value	-0.938	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.086	Depositor
Recommended contour level	0.295	Depositor
Map size ( $\text{\AA}$ )	528.0, 528.0, 528.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.32, 1.32, 1.32	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	0.17	0/42115	0.76	7/65623 (0.0%)
2	A	0.15	0/76357	0.74	5/119043 (0.0%)
3	B	0.15	0/2883	0.73	0/4491
4	C	0.16	0/3746	0.76	3/5832 (0.1%)
5	D	0.26	0/1933	0.55	0/2598
6	E	0.24	0/3146	0.52	0/4228
7	F	0.27	1/2800 (0.0%)	0.50	0/3790
8	G	0.26	0/2400	0.53	2/3239 (0.1%)
9	H	0.27	0/1329	0.53	0/1794
10	I	0.29	0/1821	0.52	0/2451
11	J	0.25	0/1836	0.48	0/2481
12	K	0.26	0/1529	0.50	0/2060
13	L	0.27	0/1801	0.57	0/2416
14	M	0.25	0/1367	0.56	0/1834
15	N	0.25	0/1568	0.57	1/2106 (0.0%)
16	O	0.27	0/1068	0.56	1/1438 (0.1%)
17	P	0.24	0/1757	0.55	0/2354
18	Q	0.27	0/1585	0.50	0/2128
19	R	0.25	0/1439	0.53	0/1938
20	S	0.28	0/1465	0.55	0/1965
21	T	0.26	0/1532	0.56	0/2043
22	U	0.25	0/1473	0.52	0/1980
23	V	0.29	0/1296	0.52	0/1739
24	W	0.29	0/812	0.50	0/1099
25	X	0.25	0/1018	0.50	0/1369
26	Y	0.25	0/850	0.48	0/1152
27	Z	0.26	0/979	0.50	0/1321
28	a	0.24	0/995	0.51	0/1329
29	b	0.29	0/1106	0.53	0/1485
30	c	0.24	0/1200	0.50	0/1607
31	d	0.25	0/473	0.50	0/629
32	e	0.28	0/745	0.53	0/1001
33	f	0.25	0/890	0.55	0/1196
34	g	0.24	0/1034	0.48	0/1385

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
35	h	0.28	0/868	0.57	0/1168
36	i	0.25	0/890	0.54	0/1189
37	j	0.27	0/978	0.52	0/1301
38	k	0.26	0/772	0.58	0/1026
39	l	0.48	0/660	0.62	0/875
40	m	0.26	0/618	0.60	0/826
41	n	0.23	0/443	0.57	0/588
42	o	0.24	0/416	0.55	0/553
43	p	0.22	0/230	0.69	0/296
44	q	0.26	0/836	0.54	0/1104
45	r	0.25	0/701	0.58	0/934
46	s	0.15	0/1795	0.73	0/2797
46	t	0.14	0/1796	0.73	0/2799
47	x	0.27	0/6685	0.58	3/9050 (0.0%)
48	SD	0.26	0/883	0.58	0/1199
49	SZ	0.26	0/901	0.63	0/1217
50	Se	0.27	0/761	0.63	0/1016
51	SC	0.35	0/769	0.56	0/1039
52	SE	0.29	0/936	0.63	0/1259
53	SA	0.28	0/1754	0.59	1/2361 (0.0%)
54	SI	0.33	0/1130	0.61	1/1517 (0.1%)
55	SJ	0.26	0/807	0.55	0/1091
56	SL	0.25	0/493	0.63	0/663
57	SM	0.27	0/452	0.55	0/600
58	SB	0.26	0/1625	0.57	1/2197 (0.0%)
59	SF	0.30	0/1125	0.59	0/1510
60	SH	0.28	0/1207	0.63	0/1623
61	SO	0.28	0/2376	0.59	0/3235
62	SN	0.24	0/571	0.55	0/768
63	SG	0.27	0/971	0.65	2/1303 (0.2%)
64	SP	0.25	0/1644	0.54	0/2249
65	SQ	0.26	0/1823	0.58	2/2447 (0.1%)
66	SR	0.27	0/1656	0.54	1/2251 (0.0%)
67	SS	0.28	0/2097	0.59	1/2823 (0.0%)
68	ST	0.25	0/1839	0.55	0/2460
69	SU	0.28	0/1498	0.57	0/2019
70	SV	0.25	0/1501	0.57	0/2006
71	SW	0.25	0/1504	0.55	0/2016
72	SX	0.25	0/1168	0.56	0/1575
73	SY	0.26	0/1215	0.54	0/1638
74	Sa	0.27	0/682	0.58	0/921
75	Sb	0.27	0/1038	0.57	0/1395
76	Sc	0.26	0/1139	0.56	0/1518

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
77	Sd	0.27	0/1087	0.57	0/1449
78	Sf	0.24	0/620	0.53	0/838
79	Sg	0.25	0/480	0.53	0/639
80	SK	0.25	0/821	0.54	0/1096
All	All	0.21	1/224609 (0.0%)	0.68	31/329588 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	F	148	ILE	C-N	5.26	1.44	1.34

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
65	SQ	188	LEU	CA-CB-CG	5.99	129.08	115.30
54	SI	108	LEU	CA-CB-CG	5.97	129.02	115.30
1	2	1706	C	N3-C2-O2	-5.87	117.79	121.90
1	2	1382	A	P-O3'-C3'	5.83	126.70	119.70
16	O	60	LEU	CB-CG-CD2	-5.82	101.10	111.00
47	x	334	LEU	CA-CB-CG	5.71	128.44	115.30
4	C	21	C	C2-N1-C1'	5.61	124.97	118.80
1	2	1389	C	C2-N1-C1'	5.57	124.93	118.80
1	2	238	U	C2-N1-C1'	5.56	124.37	117.70
4	C	14	C	C2-N1-C1'	5.54	124.90	118.80
2	A	3349	C	N3-C2-O2	-5.54	118.02	121.90
47	x	314	LEU	CA-CB-CG	5.52	128.00	115.30
15	N	27	ASP	CB-CG-OD1	5.50	123.25	118.30
8	G	251	PRO	CA-N-CD	-5.42	103.92	111.50
1	2	189	C	N1-C2-O2	5.41	122.14	118.90
66	SR	72	LEU	CA-CB-CG	5.36	127.62	115.30
47	x	240	MET	CA-CB-CG	5.34	122.38	113.30
53	SA	72	LEU	CB-CG-CD2	5.33	120.07	111.00
8	G	34	LYS	CD-CE-NZ	-5.32	99.46	111.70
1	2	322	G	P-O3'-C3'	5.29	126.05	119.70
4	C	14	C	N1-C2-O2	5.27	122.06	118.90
2	A	3349	C	N1-C2-O2	5.24	122.05	118.90
58	SB	42	LEU	CA-CB-CG	5.22	127.32	115.30
2	A	2773	C	N1-C2-O2	5.20	122.02	118.90
63	SG	115	LEU	CA-CB-CG	5.18	127.22	115.30
2	A	1175	C	N1-C2-O2	5.14	121.99	118.90
2	A	3306	U	C2-N1-C1'	5.10	123.82	117.70
63	SG	93	LEU	CA-CB-CG	5.06	126.94	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
65	SQ	224	ASP	CB-CG-OD1	5.04	122.83	118.30
67	SS	163	ASP	CB-CG-OD1	5.03	122.82	118.30
1	2	965	U	C2-N1-C1'	5.02	123.72	117.70

There are no chirality outliers.

There are no planarity outliers.

## 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	
5	D	249/251 (99%)	236 (95%)	13 (5%)	0	100	100
6	E	384/386 (100%)	363 (94%)	20 (5%)	1 (0%)	37	66
7	F	359/361 (99%)	350 (98%)	9 (2%)	0	100	100
8	G	292/294 (99%)	280 (96%)	12 (4%)	0	100	100
9	H	163/175 (93%)	155 (95%)	7 (4%)	1 (1%)	22	50
10	I	220/222 (99%)	216 (98%)	4 (2%)	0	100	100
11	J	231/233 (99%)	223 (96%)	7 (3%)	1 (0%)	30	60
12	K	189/191 (99%)	178 (94%)	11 (6%)	0	100	100
13	L	216/218 (99%)	208 (96%)	8 (4%)	0	100	100
14	M	167/169 (99%)	162 (97%)	5 (3%)	0	100	100
15	N	191/193 (99%)	180 (94%)	10 (5%)	1 (0%)	25	54
16	O	134/136 (98%)	131 (98%)	3 (2%)	0	100	100
17	P	201/203 (99%)	200 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
18	Q	195/197 (99%)	190 (97%)	5 (3%)	0	100	100
19	R	181/183 (99%)	176 (97%)	5 (3%)	0	100	100
20	S	183/185 (99%)	178 (97%)	4 (2%)	1 (0%)	25	54
21	T	186/188 (99%)	184 (99%)	2 (1%)	0	100	100
22	U	169/171 (99%)	166 (98%)	3 (2%)	0	100	100
23	V	157/159 (99%)	150 (96%)	7 (4%)	0	100	100
24	W	98/100 (98%)	92 (94%)	6 (6%)	0	100	100
25	X	134/136 (98%)	134 (100%)	0	0	100	100
26	Y	124/126 (98%)	121 (98%)	2 (2%)	1 (1%)	16	44
27	Z	119/121 (98%)	114 (96%)	5 (4%)	0	100	100
28	a	123/125 (98%)	121 (98%)	2 (2%)	0	100	100
29	b	133/135 (98%)	128 (96%)	5 (4%)	0	100	100
30	c	146/148 (99%)	141 (97%)	5 (3%)	0	100	100
31	d	56/58 (97%)	53 (95%)	3 (5%)	0	100	100
32	e	94/96 (98%)	93 (99%)	1 (1%)	0	100	100
33	f	107/109 (98%)	104 (97%)	3 (3%)	0	100	100
34	g	125/127 (98%)	123 (98%)	2 (2%)	0	100	100
35	h	104/106 (98%)	97 (93%)	6 (6%)	1 (1%)	13	39
36	i	110/112 (98%)	106 (96%)	4 (4%)	0	100	100
37	j	117/119 (98%)	115 (98%)	2 (2%)	0	100	100
38	k	97/99 (98%)	94 (97%)	3 (3%)	0	100	100
39	l	79/81 (98%)	68 (86%)	6 (8%)	5 (6%)	1	7
40	m	75/77 (97%)	74 (99%)	1 (1%)	0	100	100
41	n	48/50 (96%)	47 (98%)	1 (2%)	0	100	100
42	o	50/52 (96%)	47 (94%)	3 (6%)	0	100	100
43	p	23/25 (92%)	23 (100%)	0	0	100	100
44	q	101/103 (98%)	96 (95%)	5 (5%)	0	100	100
45	r	89/91 (98%)	87 (98%)	2 (2%)	0	100	100
47	x	840/842 (100%)	755 (90%)	84 (10%)	1 (0%)	48	78
48	SD	119/121 (98%)	95 (80%)	24 (20%)	0	100	100
49	SZ	125/127 (98%)	101 (81%)	23 (18%)	1 (1%)	16	44

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
50	Se	92/94 (98%)	81 (88%)	9 (10%)	2 (2%)	5	24
51	SC	90/92 (98%)	78 (87%)	10 (11%)	2 (2%)	5	24
52	SE	115/117 (98%)	96 (84%)	18 (16%)	1 (1%)	14	41
53	SA	220/222 (99%)	206 (94%)	11 (5%)	3 (1%)	9	31
54	SI	141/143 (99%)	132 (94%)	8 (6%)	1 (1%)	19	47
55	SJ	98/100 (98%)	91 (93%)	7 (7%)	0	100	100
56	SL	61/63 (97%)	59 (97%)	2 (3%)	0	100	100
57	SM	51/53 (96%)	47 (92%)	4 (8%)	0	100	100
58	SB	204/206 (99%)	182 (89%)	21 (10%)	1 (0%)	25	54
59	SF	139/141 (99%)	131 (94%)	6 (4%)	2 (1%)	9	31
60	SH	143/145 (99%)	123 (86%)	20 (14%)	0	100	100
61	SO	300/312 (96%)	238 (79%)	57 (19%)	5 (2%)	7	28
62	SN	71/73 (97%)	52 (73%)	19 (27%)	0	100	100
63	SG	119/121 (98%)	106 (89%)	13 (11%)	0	100	100
64	SP	204/206 (99%)	191 (94%)	13 (6%)	0	100	100
65	SQ	222/232 (96%)	201 (90%)	21 (10%)	0	100	100
66	SR	214/216 (99%)	205 (96%)	9 (4%)	0	100	100
67	SS	256/258 (99%)	226 (88%)	29 (11%)	1 (0%)	30	60
68	ST	226/228 (99%)	213 (94%)	12 (5%)	1 (0%)	30	60
69	SU	182/184 (99%)	174 (96%)	7 (4%)	1 (0%)	25	54
70	SV	183/198 (92%)	171 (93%)	12 (7%)	0	100	100
71	SW	182/184 (99%)	166 (91%)	15 (8%)	1 (0%)	25	54
72	SX	140/142 (99%)	132 (94%)	8 (6%)	0	100	100
73	SY	148/150 (99%)	144 (97%)	4 (3%)	0	100	100
74	Sa	85/87 (98%)	80 (94%)	4 (5%)	1 (1%)	11	35
75	Sb	127/129 (98%)	123 (97%)	4 (3%)	0	100	100
76	Sc	142/144 (99%)	127 (89%)	13 (9%)	2 (1%)	9	31
77	Sd	132/134 (98%)	129 (98%)	3 (2%)	0	100	100
78	Sf	79/81 (98%)	79 (100%)	0	0	100	100
79	Sg	58/60 (97%)	56 (97%)	2 (3%)	0	100	100
80	SK	99/108 (92%)	98 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	11826/12024 (98%)	11092 (94%)	696 (6%)	38 (0%)	38	66

All (38) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	E	362	ALA
9	H	68	PRO
35	h	104	PRO
49	SZ	42	VAL
51	SC	87	VAL
51	SC	88	PRO
52	SE	98	ASN
53	SA	195	SER
53	SA	217	ILE
59	SF	40	GLU
59	SF	42	GLU
61	SO	6	VAL
69	SU	64	VAL
71	SW	172	VAL
76	Sc	64	PRO
11	J	158	ASP
39	l	20	ASN
39	l	26	SER
53	SA	44	THR
61	SO	167	VAL
47	x	317	LYS
61	SO	118	LYS
15	N	47	ALA
39	l	22	CYS
39	l	29	VAL
39	l	33	THR
50	Se	61	GLU
54	SI	4	VAL
58	SB	26	ALA
20	S	18	ALA
26	Y	86	SER
74	Sa	10	GLU
76	Sc	132	LEU
67	SS	183	VAL
50	Se	59	TYR
61	SO	275	ARG
61	SO	315	VAL

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Mol	Chain	Res	Type
68	ST	9	VAL

### 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	
5	D	190/193 (98%)	184 (97%)	6 (3%)	34	59
6	E	319/322 (99%)	306 (96%)	13 (4%)	26	51
7	F	288/288 (100%)	280 (97%)	8 (3%)	38	62
8	G	241/243 (99%)	230 (95%)	11 (5%)	23	49
9	H	139/154 (90%)	133 (96%)	6 (4%)	25	50
10	I	186/186 (100%)	178 (96%)	8 (4%)	25	50
11	J	187/191 (98%)	186 (100%)	1 (0%)	86	91
12	K	168/171 (98%)	161 (96%)	7 (4%)	25	51
13	L	185/185 (100%)	172 (93%)	13 (7%)	12	37
14	M	145/147 (99%)	136 (94%)	9 (6%)	15	40
15	N	154/154 (100%)	152 (99%)	2 (1%)	65	78
16	O	107/107 (100%)	100 (94%)	7 (6%)	14	39
17	P	175/175 (100%)	167 (95%)	8 (5%)	23	49
18	Q	160/160 (100%)	151 (94%)	9 (6%)	17	43
19	R	138/145 (95%)	132 (96%)	6 (4%)	25	50
20	S	150/150 (100%)	146 (97%)	4 (3%)	40	63
21	T	152/153 (99%)	146 (96%)	6 (4%)	27	53
22	U	155/155 (100%)	150 (97%)	5 (3%)	34	59
23	V	135/136 (99%)	129 (96%)	6 (4%)	24	50
24	W	87/87 (100%)	79 (91%)	8 (9%)	7	26
25	X	104/104 (100%)	102 (98%)	2 (2%)	52	71
26	Y	56/108 (52%)	55 (98%)	1 (2%)	54	73
27	Z	104/105 (99%)	101 (97%)	3 (3%)	37	61

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
28	a	108/108 (100%)	106 (98%)	2 (2%)	52	71
29	b	112/115 (97%)	111 (99%)	1 (1%)	75	86
30	c	117/118 (99%)	116 (99%)	1 (1%)	75	86
31	d	46/46 (100%)	44 (96%)	2 (4%)	25	50
32	e	81/81 (100%)	77 (95%)	4 (5%)	21	48
33	f	92/96 (96%)	90 (98%)	2 (2%)	47	68
34	g	107/109 (98%)	103 (96%)	4 (4%)	29	54
35	h	90/90 (100%)	86 (96%)	4 (4%)	24	50
36	i	95/95 (100%)	93 (98%)	2 (2%)	48	69
37	j	104/104 (100%)	100 (96%)	4 (4%)	28	54
38	k	80/81 (99%)	79 (99%)	1 (1%)	65	78
39	l	67/67 (100%)	58 (87%)	9 (13%)	3	12
40	m	68/68 (100%)	67 (98%)	1 (2%)	60	76
41	n	45/45 (100%)	44 (98%)	1 (2%)	47	68
42	o	45/47 (96%)	39 (87%)	6 (13%)	3	12
43	p	22/23 (96%)	21 (96%)	1 (4%)	23	50
44	q	87/88 (99%)	84 (97%)	3 (3%)	32	57
45	r	71/71 (100%)	64 (90%)	7 (10%)	6	23
47	x	715/715 (100%)	671 (94%)	44 (6%)	15	40
48	SD	88/98 (90%)	82 (93%)	6 (7%)	13	38
49	SZ	81/96 (84%)	76 (94%)	5 (6%)	15	40
50	Se	81/81 (100%)	72 (89%)	9 (11%)	5	18
51	SC	77/85 (91%)	69 (90%)	8 (10%)	5	21
52	SE	95/98 (97%)	87 (92%)	8 (8%)	9	29
53	SA	182/182 (100%)	173 (95%)	9 (5%)	21	48
54	SI	115/115 (100%)	108 (94%)	7 (6%)	15	40
55	SJ	93/93 (100%)	88 (95%)	5 (5%)	18	44
56	SL	55/56 (98%)	54 (98%)	1 (2%)	54	73
57	SM	47/47 (100%)	42 (89%)	5 (11%)	5	20
58	SB	172/173 (99%)	165 (96%)	7 (4%)	26	51
59	SF	117/117 (100%)	112 (96%)	5 (4%)	25	50

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
60	SH	127/128 (99%)	118 (93%)	9 (7%)	12	37
61	SO	246/257 (96%)	224 (91%)	22 (9%)	8	27
62	SN	57/64 (89%)	52 (91%)	5 (9%)	8	28
63	SG	105/110 (96%)	97 (92%)	8 (8%)	11	34
64	SP	170/173 (98%)	162 (95%)	8 (5%)	22	49
65	SQ	200/205 (98%)	188 (94%)	12 (6%)	16	41
66	SR	175/175 (100%)	169 (97%)	6 (3%)	32	57
67	SS	220/220 (100%)	203 (92%)	17 (8%)	10	33
68	ST	189/195 (97%)	182 (96%)	7 (4%)	29	54
69	SU	163/165 (99%)	157 (96%)	6 (4%)	29	54
70	SV	148/159 (93%)	142 (96%)	6 (4%)	26	51
71	SW	156/157 (99%)	149 (96%)	7 (4%)	23	50
72	SX	126/127 (99%)	119 (94%)	7 (6%)	17	43
73	SY	127/127 (100%)	120 (94%)	7 (6%)	18	44
74	Sa	71/74 (96%)	66 (93%)	5 (7%)	12	37
75	Sb	110/110 (100%)	106 (96%)	4 (4%)	30	56
76	Sc	119/119 (100%)	114 (96%)	5 (4%)	25	51
77	Sd	112/112 (100%)	105 (94%)	7 (6%)	15	40
78	Sf	70/70 (100%)	66 (94%)	4 (6%)	17	43
79	Sg	50/51 (98%)	48 (96%)	2 (4%)	27	52
80	SK	85/89 (96%)	83 (98%)	2 (2%)	44	66
All	All	9906/10114 (98%)	9427 (95%)	479 (5%)	24	48

All (479) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	D	40	TYR
5	D	47	GLN
5	D	70	ARG
5	D	176	ASP
5	D	204	MET
5	D	208	ASP
6	E	36	ASP
6	E	137	TYR
6	E	154	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
6	E	222	LYS
6	E	226	PHE
6	E	246	LEU
6	E	280	HIS
6	E	319	ASN
6	E	332	ARG
6	E	343	TYR
6	E	363	SER
6	E	365	PHE
6	E	370	PHE
7	F	106	TRP
7	F	110	ASN
7	F	120	TYR
7	F	148	ILE
7	F	194	TYR
7	F	198	ARG
7	F	255	PHE
7	F	259	ASP
8	G	9	SER
8	G	30	TYR
8	G	56	THR
8	G	95	TRP
8	G	108	ARG
8	G	110	LEU
8	G	129	TYR
8	G	178	ASN
8	G	207	TYR
8	G	223	PHE
8	G	265	TYR
9	H	4	GLN
9	H	29	LYS
9	H	48	ARG
9	H	63	LEU
9	H	138	GLN
9	H	162	SER
10	I	81	HIS
10	I	113	SER
10	I	142	SER
10	I	163	LEU
10	I	175	LYS
10	I	180	SER
10	I	208	SER

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
10	I	229	PHE
11	J	227	ASP
12	K	7	GLU
12	K	8	GLN
12	K	42	ASP
12	K	92	TYR
12	K	107	ASP
12	K	117	PHE
12	K	153	ASP
13	L	4	ARG
13	L	28	ASP
13	L	69	ARG
13	L	83	ASP
13	L	85	PHE
13	L	87	LEU
13	L	100	ASN
13	L	156	ARG
13	L	171	TRP
13	L	175	ASN
13	L	192	ASP
13	L	213	PHE
13	L	217	PHE
14	M	11	ASP
14	M	13	LYS
14	M	30	LEU
14	M	52	TYR
14	M	112	LEU
14	M	125	MET
14	M	152	HIS
14	M	157	GLU
14	M	166	LYS
15	N	5	LYS
15	N	183	ARG
16	O	5	SER
16	O	14	LEU
16	O	59	ASN
16	O	65	LEU
16	O	77	ARG
16	O	92	GLU
16	O	107	GLU
17	P	7	LEU
17	P	14	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
17	P	23	GLN
17	P	26	ARG
17	P	33	LYS
17	P	38	ARG
17	P	62	TYR
17	P	187	ARG
18	Q	27[A]	LEU
18	Q	48[A]	PHE
18	Q	54[A]	TYR
18	Q	72[A]	HIS
18	Q	74[A]	ARG
18	Q	82[A]	LYS
18	Q	160[A]	ARG
18	Q	168[A]	TYR
18	Q	199[A]	TYR
19	R	16	SER
19	R	69	ARG
19	R	105	LYS
19	R	127	ARG
19	R	139	TYR
19	R	148	LEU
20	S	11	LYS
20	S	92	ARG
20	S	155	MET
20	S	171	LYS
21	T	25	ASP
21	T	59	SER
21	T	103	ARG
21	T	116	ASP
21	T	152	GLU
21	T	179	GLU
22	U	14	LEU
22	U	52	LYS
22	U	80	ARG
22	U	88	HIS
22	U	172	TYR
23	V	47	SER
23	V	60	LYS
23	V	84	TYR
23	V	86	GLU
23	V	112	ASN
23	V	139	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
24	W	24	GLU
24	W	58	GLU
24	W	71	PHE
24	W	77	LYS
24	W	78	TYR
24	W	87	ASN
24	W	103	TYR
24	W	105	LEU
25	X	93	LEU
25	X	96	GLU
26	Y	34	SER
27	Z	38	LEU
27	Z	106	ASP
27	Z	125	ARG
28	a	12	ARG
28	a	74	TYR
29	b	38	PHE
30	c	73	LEU
31	d	11	ASN
31	d	22	LYS
32	e	39	SER
32	e	63	SER
32	e	68	TYR
32	e	74	ASN
33	f	43	HIS
33	f	71	LEU
34	g	8	LYS
34	g	23	ASP
34	g	81	ASP
34	g	123	LYS
35	h	15	SER
35	h	19	SER
35	h	86	ARG
35	h	88	ASN
36	i	61	GLN
36	i	103	LYS
37	j	19	SER
37	j	59	ASN
37	j	95	PHE
37	j	105	ARG
38	k	53	TYR
39	l	7	SER

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
39	l	21	ARG
39	l	24	ARG
39	l	26	SER
39	l	29	VAL
39	l	30	GLN
39	l	32	LYS
39	l	33	THR
39	l	45	ARG
40	m	43	PHE
41	n	41	ARG
42	o	88	LYS
42	o	89	TYR
42	o	90	ASN
42	o	106	ARG
42	o	113	ARG
42	o	118	THR
43	p	23	ARG
44	q	44	ASP
44	q	58	PHE
44	q	82	GLN
45	r	13	LYS
45	r	24	ARG
45	r	57	CYS
45	r	59	CYS
45	r	72	SER
45	r	81	SER
45	r	84	ARG
47	x	1	MET
47	x	4	PHE
47	x	13	MET
47	x	20	ARG
47	x	22	MET
47	x	30	HIS
47	x	85	ASP
47	x	102	LEU
47	x	162	ARG
47	x	199	ASP
47	x	211	PHE
47	x	213	SER
47	x	231	LYS
47	x	240	MET
47	x	253	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
47	x	284	LEU
47	x	285	PHE
47	x	314	LEU
47	x	317	LYS
47	x	362	ASP
47	x	381	TYR
47	x	397	PHE
47	x	425	ASP
47	x	447	ASP
47	x	456	LEU
47	x	499	ASN
47	x	515	ASP
47	x	517	CYS
47	x	521	TYR
47	x	543	GLN
47	x	547	HIS
47	x	548	ASP
47	x	599	LEU
47	x	615	ARG
47	x	636	PHE
47	x	651	LYS
47	x	709	MET
47	x	735	CYS
47	x	756	SER
47	x	780	PHE
47	x	785	ARG
47	x	793	PHE
47	x	826	HIS
47	x	835	TRP
48	SD	43	ARG
48	SD	45	LEU
48	SD	56	GLU
48	SD	81	ASP
48	SD	126	TRP
48	SD	140	PHE
49	SZ	46	MET
49	SZ	52	ARG
49	SZ	53	ASP
49	SZ	132	ARG
49	SZ	137	LEU
50	Se	5	ARG
50	Se	11	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
50	Se	12	LYS
50	Se	33	ASP
50	Se	39	MET
50	Se	59	TYR
50	Se	64	LEU
50	Se	68	TYR
50	Se	82	ARG
51	SC	9	ASN
51	SC	14	TYR
51	SC	16	PHE
51	SC	25	LYS
51	SC	39	ASN
51	SC	47	GLN
51	SC	63	TYR
51	SC	75	TYR
52	SE	15	HIS
52	SE	17	TYR
52	SE	28	MET
52	SE	36	LEU
52	SE	77	ARG
52	SE	81	ARG
52	SE	97	TYR
52	SE	100	LYS
53	SA	24	PHE
53	SA	27	ARG
53	SA	134	CYS
53	SA	156	PHE
53	SA	166	ASP
53	SA	189	MET
53	SA	221	SER
53	SA	224	ASP
53	SA	225	TYR
54	SI	12	GLN
54	SI	18	TYR
54	SI	24	ARG
54	SI	45	MET
54	SI	85	SER
54	SI	92	LYS
54	SI	108	LEU
55	SJ	28	SER
55	SJ	48	HIS
55	SJ	52	LYS

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
55	SJ	85	ARG
55	SJ	90	TYR
56	SL	32	PHE
57	SM	8	PHE
57	SM	13	ARG
57	SM	14	TYR
57	SM	26	SER
57	SM	46	LYS
58	SB	54	LYS
58	SB	69	PHE
58	SB	98	MET
58	SB	100	ASN
58	SB	108	LEU
58	SB	127	GLN
58	SB	219	ARG
59	SF	10	PHE
59	SF	40	GLU
59	SF	60	PHE
59	SF	76	SER
59	SF	105	LEU
60	SH	42	TYR
60	SH	44	ASN
60	SH	55	HIS
60	SH	71	GLN
60	SH	79	TYR
60	SH	84	TRP
60	SH	85	PHE
60	SH	89	GLN
60	SH	104	ASN
61	SO	52	GLN
61	SO	61	PHE
61	SO	62	LYS
61	SO	70	ASP
61	SO	85	TRP
61	SO	92	TRP
61	SO	103	PHE
61	SO	111	MET
61	SO	134	TRP
61	SO	147	HIS
61	SO	155	ARG
61	SO	181	TRP
61	SO	192	PHE

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
61	SO	225	LEU
61	SO	245	PHE
61	SO	250	TYR
61	SO	269	TYR
61	SO	288	HIS
61	SO	294	TRP
61	SO	301	LEU
61	SO	305	TYR
61	SO	316	MET
62	SN	105	TYR
62	SN	106	TYR
62	SN	119	ARG
62	SN	126	CYS
62	SN	137	ASP
63	SG	5	ARG
63	SG	19	ARG
63	SG	21	TYR
63	SG	42	GLN
63	SG	47	ARG
63	SG	53	TYR
63	SG	84	TYR
63	SG	108	ASP
64	SP	49	ASN
64	SP	109	ASN
64	SP	110	TYR
64	SP	129	ASP
64	SP	162	CYS
64	SP	167	LYS
64	SP	191	ARG
64	SP	204	TYR
65	SQ	8	ARG
65	SQ	22	ASP
65	SQ	41	ARG
65	SQ	78	ASP
65	SQ	82	ARG
65	SQ	96	LEU
65	SQ	122	GLU
65	SQ	160	HIS
65	SQ	191	GLU
65	SQ	198	GLU
65	SQ	205	PHE
65	SQ	218	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
66	SR	57	PHE
66	SR	95	ARG
66	SR	208	GLU
66	SR	222	TYR
66	SR	224	PHE
66	SR	240	LEU
67	SS	26	CYS
67	SS	38	LEU
67	SS	50	ASN
67	SS	52	LEU
67	SS	57	ASN
67	SS	69	HIS
67	SS	73	ASP
67	SS	123	LEU
67	SS	131	LEU
67	SS	163	ASP
67	SS	172	PHE
67	SS	176	ASP
67	SS	182	TYR
67	SS	197	HIS
67	SS	207	LEU
67	SS	224	ASN
67	SS	230	GLU
68	ST	43	ASP
68	ST	45	PHE
68	ST	75	LEU
68	ST	76	LEU
68	ST	120	GLU
68	ST	189	HIS
68	ST	210	GLN
69	SU	81	LEU
69	SU	103	SER
69	SU	110	GLN
69	SU	118	LEU
69	SU	131	PHE
69	SU	157	LYS
70	SV	44	HIS
70	SV	83	TYR
70	SV	121	LEU
70	SV	154	SER
70	SV	168	CYS
70	SV	176	SER

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
71	SW	13	SER
71	SW	17	ARG
71	SW	19	TYR
71	SW	25	ASP
71	SW	39	LYS
71	SW	71	PHE
71	SW	114	TYR
72	SX	15	LYS
72	SX	20	PHE
72	SX	26	LYS
72	SX	32	LYS
72	SX	67	ARG
72	SX	98	ASN
72	SX	128	CYS
73	SY	26	PHE
73	SY	49	GLN
73	SY	53	LEU
73	SY	73	ARG
73	SY	80	LEU
73	SY	87	ASP
73	SY	129	TYR
74	Sa	4	ASP
74	Sa	5	LYS
74	Sa	11	LEU
74	Sa	49	GLU
74	Sa	61	SER
75	Sb	3	ARG
75	Sb	15	ASN
75	Sb	37	PHE
75	Sb	92	ASN
76	Sc	27	ASN
76	Sc	64	PRO
76	Sc	107	PHE
76	Sc	122	PHE
76	Sc	123	LYS
77	Sd	36	SER
77	Sd	40	LEU
77	Sd	58	PHE
77	Sd	89	TYR
77	Sd	111	LYS
77	Sd	115	ASP
77	Sd	132	ARG

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Mol	Chain	Res	Type
78	Sf	9	HIS
78	Sf	17	ARG
78	Sf	31	TYR
78	Sf	64	CYS
79	Sg	7	SER
79	Sg	16	SER
80	SK	32	MET
80	SK	47	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (35) such sidechains are listed below:

Mol	Chain	Res	Type
5	D	38	HIS
5	D	97	ASN
7	F	311	HIS
11	J	240	ASN
12	K	157	ASN
13	L	73	ASN
23	V	146	ASN
32	e	47	ASN
32	e	74	ASN
32	e	75	ASN
39	l	28	HIS
39	l	30	GLN
39	l	76	ASN
47	x	138	GLN
47	x	759	GLN
51	SC	13	GLN
51	SC	32	HIS
51	SC	58	GLN
52	SE	104	GLN
53	SA	74	GLN
53	SA	101	GLN
58	SB	169	ASN
60	SH	71	GLN
60	SH	103	ASN
61	SO	198	ASN
61	SO	308	ASN
63	SG	31	ASN
65	SQ	92	GLN
65	SQ	153	HIS
67	SS	157	ASN

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Mol	Chain	Res	Type
70	SV	87	ASN
72	SX	110	HIS
72	SX	138	ASN
73	SY	62	GLN
79	Sg	17	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1764/1799 (98%)	501 (28%)	32 (1%)
2	A	3183/3394 (93%)	526 (16%)	12 (0%)
3	B	120/121 (99%)	12 (10%)	1 (0%)
4	C	157/158 (99%)	30 (19%)	1 (0%)
46	s	74/75 (98%)	14 (18%)	0
46	t	74/75 (98%)	14 (18%)	0
All	All	5372/5622 (95%)	1097 (20%)	46 (0%)

All (1097) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	4	C
1	2	9	U
1	2	10	G
1	2	25	C
1	2	26	A
1	2	32	U
1	2	34	G
1	2	42	G
1	2	43	A
1	2	45	U
1	2	46	A
1	2	47	A
1	2	56	U
1	2	57	G
1	2	61	A
1	2	62	A
1	2	66	U
1	2	67	A
1	2	68	A
1	2	69	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	71	A
1	2	73	U
1	2	74	U
1	2	75	U
1	2	76	A
1	2	78	A
1	2	79	C
1	2	80	A
1	2	81	G
1	2	104	A
1	2	114	C
1	2	116	U
1	2	121	U
1	2	126	A
1	2	127	G
1	2	129	U
1	2	130	C
1	2	131	C
1	2	132	U
1	2	133	U
1	2	134	U
1	2	135	A
1	2	138	A
1	2	139	C
1	2	140	A
1	2	141	U
1	2	142	G
1	2	151	G
1	2	153	G
1	2	156	A
1	2	159	U
1	2	163	G
1	2	167	U
1	2	168	A
1	2	171	A
1	2	172	C
1	2	176	C
1	2	178	U
1	2	179	A
1	2	180	A
1	2	185	U
1	2	186	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	187	G
1	2	188	A
1	2	189	C
1	2	191	C
1	2	192	U
1	2	193	U
1	2	194	U
1	2	195	G
1	2	196	G
1	2	199	G
1	2	204	G
1	2	205	U
1	2	206	A
1	2	213	A
1	2	215	A
1	2	217	A
1	2	218	A
1	2	223	U
1	2	224	C
1	2	226	A
1	2	227	U
1	2	228	G
1	2	230	C
1	2	233	C
1	2	234	G
1	2	235	G
1	2	237	C
1	2	240	U
1	2	241	U
1	2	250	C
1	2	257	A
1	2	260	U
1	2	262	U
1	2	265	A
1	2	266	A
1	2	270	C
1	2	276	C
1	2	278	U
1	2	280	U
1	2	285	G
1	2	287	G
1	2	292	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	299	A
1	2	302	U
1	2	313	U
1	2	314	C
1	2	316	A
1	2	321	C
1	2	322	G
1	2	323	A
1	2	330	G
1	2	333	A
1	2	337	G
1	2	338	C
1	2	339	C
1	2	352	A
1	2	353	A
1	2	359	A
1	2	361	C
1	2	370	A
1	2	380	U
1	2	388	G
1	2	389	G
1	2	390	G
1	2	400	A
1	2	401	A
1	2	402	C
1	2	404	G
1	2	412	A
1	2	415	C
1	2	416	A
1	2	417	A
1	2	418	G
1	2	419	G
1	2	423	G
1	2	424	C
1	2	425	A
1	2	426	G
1	2	434	G
1	2	439	U
1	2	441	A
1	2	442	C
1	2	443	C
1	2	444	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	448	C
1	2	458	G
1	2	461	G
1	2	463	U
1	2	469	C
1	2	482	U
1	2	483	A
1	2	485	A
1	2	487	G
1	2	489	C
1	2	490	C
1	2	494	U
1	2	496	G
1	2	498	G
1	2	499	U
1	2	500	C
1	2	502	U
1	2	506	A
1	2	507	U
1	2	510	G
1	2	511	A
1	2	519	C
1	2	529	A
1	2	534	A
1	2	539	G
1	2	540	G
1	2	541	A
1	2	542	A
1	2	543	C
1	2	544	A
1	2	545	A
1	2	546	U
1	2	551	G
1	2	554	C
1	2	555	A
1	2	556	A
1	2	558	U
1	2	565	C
1	2	568	G
1	2	578	U
1	2	579	A
1	2	583	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	594	A
1	2	609	U
1	2	610	G
1	2	617	U
1	2	619	A
1	2	620	A
1	2	621	A
1	2	622	A
1	2	623	A
1	2	624	G
1	2	639	U
1	2	640	U
1	2	641	G
1	2	645	C
1	2	653	C
1	2	655	G
1	2	656	G
1	2	679	U
1	2	680	U
1	2	681	U
1	2	682	C
1	2	684	A
1	2	687	G
1	2	694	U
1	2	695	U
1	2	696	C
1	2	697	C
1	2	698	U
1	2	699	U
1	2	700	C
1	2	704	C
1	2	705	U
1	2	706	A
1	2	708	C
1	2	709	C
1	2	710	U
1	2	711	U
1	2	712	G
1	2	713	A
1	2	714	G
1	2	727	U
1	2	729	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	730	G
1	2	733	A
1	2	734	A
1	2	738	G
1	2	739	G
1	2	740	A
1	2	742	U
1	2	743	U
1	2	745	U
1	2	754	A
1	2	756	A
1	2	765	G
1	2	766	U
1	2	771	A
1	2	774	A
1	2	775	G
1	2	778	G
1	2	779	U
1	2	780	A
1	2	781	U
1	2	782	U
1	2	783	G
1	2	787	G
1	2	789	A
1	2	803	A
1	2	812	A
1	2	813	U
1	2	814	A
1	2	815	G
1	2	816	G
1	2	819	G
1	2	820	U
1	2	821	U
1	2	822	U
1	2	823	G
1	2	824	G
1	2	825	U
1	2	827	C
1	2	830	U
1	2	833	U
1	2	834	G
1	2	836	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	840	U
1	2	846	G
1	2	849	C
1	2	850	A
1	2	851	U
1	2	852	C
1	2	853	G
1	2	854	U
1	2	855	A
1	2	856	A
1	2	857	U
1	2	861	U
1	2	862	A
1	2	863	A
1	2	864	U
1	2	865	A
1	2	876	G
1	2	898	A
1	2	899	G
1	2	901	G
1	2	902	G
1	2	910	C
1	2	914	G
1	2	915	A
1	2	925	G
1	2	929	A
1	2	933	A
1	2	934	C
1	2	935	U
1	2	942	G
1	2	951	A
1	2	966	A
1	2	970	A
1	2	988	A
1	2	989	U
1	2	992	A
1	2	993	A
1	2	996	U
1	2	998	A
1	2	1004	U
1	2	1005	A
1	2	1023	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1024	U
1	2	1028	C
1	2	1039	A
1	2	1051	G
1	2	1052	U
1	2	1053	G
1	2	1057	U
1	2	1058	U
1	2	1059	U
1	2	1060	U
1	2	1061	A
1	2	1062	A
1	2	1064	G
1	2	1076	A
1	2	1081	A
1	2	1082	C
1	2	1092	A
1	2	1096	C
1	2	1098	U
1	2	1100	G
1	2	1138	A
1	2	1140	G
1	2	1150	G
1	2	1155	G
1	2	1158	C
1	2	1160	A
1	2	1164	G
1	2	1167	G
1	2	1170	G
1	2	1174	C
1	2	1182	U
1	2	1183	A
1	2	1185	U
1	2	1194	A
1	2	1196	A
1	2	1199	G
1	2	1200	G
1	2	1202	A
1	2	1206	U
1	2	1207	C
1	2	1216	C
1	2	1217	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1218	G
1	2	1223	A
1	2	1224	A
1	2	1227	A
1	2	1228	G
1	2	1229	G
1	2	1241	G
1	2	1243	G
1	2	1244	A
1	2	1245	G
1	2	1246	C
1	2	1249	U
1	2	1256	A
1	2	1257	U
1	2	1274	C
1	2	1275	A
1	2	1276	U
1	2	1285	U
1	2	1288	G
1	2	1297	G
1	2	1307	U
1	2	1314	U
1	2	1315	U
1	2	1318	G
1	2	1321	A
1	2	1322	A
1	2	1325	A
1	2	1337	A
1	2	1340	U
1	2	1344	A
1	2	1345	A
1	2	1346	A
1	2	1348	A
1	2	1349	G
1	2	1357	A
1	2	1361	U
1	2	1363	U
1	2	1367	G
1	2	1370	U
1	2	1371	A
1	2	1372	U
1	2	1373	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1378	U
1	2	1381	U
1	2	1382	A
1	2	1383	G
1	2	1389	C
1	2	1390	U
1	2	1398	U
1	2	1399	C
1	2	1400	A
1	2	1408	G
1	2	1409	G
1	2	1413	U
1	2	1414	U
1	2	1419	G
1	2	1427	A
1	2	1428	G
1	2	1431	C
1	2	1432	U
1	2	1443	U
1	2	1460	A
1	2	1469	A
1	2	1472	C
1	2	1474	G
1	2	1479	A
1	2	1486	G
1	2	1493	A
1	2	1495	C
1	2	1496	U
1	2	1503	A
1	2	1506	G
1	2	1514	U
1	2	1515	A
1	2	1516	A
1	2	1520	U
1	2	1521	G
1	2	1523	G
1	2	1524	A
1	2	1528	U
1	2	1537	C
1	2	1540	G
1	2	1541	G
1	2	1542	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1557	U
1	2	1559	A
1	2	1572	G
1	2	1573	A
1	2	1574	G
1	2	1575	G
1	2	1583	A
1	2	1584	G
1	2	1585	U
1	2	1600	A
1	2	1601	G
1	2	1611	A
1	2	1614	A
1	2	1616	G
1	2	1619	C
1	2	1622	G
1	2	1631	A
1	2	1633	A
1	2	1634	C
1	2	1635	A
1	2	1636	C
1	2	1637	C
1	2	1638	G
1	2	1657	U
1	2	1658	G
1	2	1666	U
1	2	1682	U
1	2	1688	U
1	2	1691	A
1	2	1693	A
1	2	1697	G
1	2	1698	G
1	2	1699	G
1	2	1700	C
1	2	1701	A
1	2	1705	C
1	2	1707	A
1	2	1709	C
1	2	1712	A
1	2	1715	G
1	2	1717	G
1	2	1726	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	1730	A
1	2	1736	G
1	2	1754	A
1	2	1755	A
1	2	1756	A
1	2	1757	G
1	2	1762	A
1	2	1767	G
1	2	1769	U
1	2	1780	G
1	2	1782	A
1	2	1783	C
1	2	1792	G
1	2	1793	G
1	2	1794	A
1	2	1796	C
1	2	1797	A
1	2	1799	U
2	A	14	U
2	A	20	A
2	A	26	A
2	A	30	G
2	A	40	A
2	A	43	A
2	A	49	A
2	A	57	A
2	A	59	G
2	A	60	A
2	A	65	A
2	A	66	A
2	A	72	C
2	A	77	A
2	A	92	G
2	A	110	G
2	A	111	C
2	A	116	A
2	A	117	U
2	A	118	U
2	A	122	A
2	A	135	C
2	A	136	G
2	A	148	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	156	G
2	A	157	A
2	A	173	G
2	A	177	U
2	A	183	G
2	A	187	A
2	A	190	U
2	A	199	A
2	A	200	C
2	A	206	G
2	A	219	A
2	A	220	G
2	A	231	G
2	A	232	G
2	A	234	G
2	A	240	U
2	A	249	U
2	A	252	U
2	A	263	C
2	A	269	G
2	A	286	U
2	A	295	A
2	A	305	U
2	A	315	C
2	A	325	A
2	A	329	U
2	A	330	G
2	A	341	G
2	A	361	A
2	A	376	G
2	A	398	A
2	A	401	U
2	A	402	A
2	A	403	C
2	A	404	G
2	A	420	G
2	A	421	G
2	A	422	A
2	A	494	G
2	A	495	G
2	A	503	C
2	A	518	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	520	U
2	A	521	A
2	A	523	A
2	A	533	A
2	A	536	U
2	A	543	C
2	A	545	U
2	A	557	A
2	A	558	U
2	A	559	A
2	A	560	G
2	A	600	G
2	A	601	U
2	A	602	A
2	A	611	A
2	A	636	C
2	A	637	C
2	A	638	C
2	A	649	A
2	A	677	A
2	A	678	G
2	A	681	U
2	A	690	A
2	A	691	A
2	A	692	A
2	A	705	A
2	A	712	G
2	A	734	C
2	A	735	A
2	A	742	G
2	A	758	C
2	A	761	A
2	A	766	U
2	A	767	U
2	A	780	A
2	A	781	G
2	A	785	G
2	A	786	A
2	A	817	A
2	A	830	A
2	A	836	A
2	A	846	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	849	C
2	A	854	G
2	A	857	G
2	A	861	C
2	A	874	U
2	A	879	U
2	A	880	G
2	A	896	A
2	A	907	G
2	A	914	A
2	A	916	G
2	A	917	A
2	A	921	A
2	A	924	G
2	A	937	G
2	A	944	C
2	A	953	G
2	A	959	C
2	A	960	U
2	A	974	G
2	A	976	U
2	A	977	C
2	A	979	U
2	A	980	A
2	A	982	C
2	A	1006	A
2	A	1015	U
2	A	1016	C
2	A	1017	C
2	A	1018	G
2	A	1020	G
2	A	1021	G
2	A	1022	U
2	A	1037	C
2	A	1047	A
2	A	1063	G
2	A	1064	A
2	A	1066	G
2	A	1072	G
2	A	1076	C
2	A	1079	A
2	A	1082	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	1083	G
2	A	1093	A
2	A	1094	U
2	A	1095	U
2	A	1096	U
2	A	1097	G
2	A	1098	A
2	A	1104	G
2	A	1117	G
2	A	1131	G
2	A	1153	A
2	A	1159	A
2	A	1174	G
2	A	1178	G
2	A	1179	A
2	A	1180	A
2	A	1181	U
2	A	1182	A
2	A	1189	C
2	A	1190	A
2	A	1193	A
2	A	1196	C
2	A	1201	C
2	A	1209	G
2	A	1220	U
2	A	1222	G
2	A	1235	U
2	A	1236	G
2	A	1240	A
2	A	1242	G
2	A	1245	A
2	A	1246	G
2	A	1252	A
2	A	1253	U
2	A	1257	C
2	A	1258	U
2	A	1263	A
2	A	1265	U
2	A	1272	C
2	A	1287	A
2	A	1302	A
2	A	1307	G

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	1308	A
2	A	1317	A
2	A	1330	A
2	A	1331	U
2	A	1345	G
2	A	1348	U
2	A	1349	G
2	A	1350	A
2	A	1352	A
2	A	1355	A
2	A	1357	G
2	A	1386	A
2	A	1392	G
2	A	1399	A
2	A	1400	G
2	A	1417	G
2	A	1418	A
2	A	1431	G
2	A	1434	G
2	A	1437	C
2	A	1443	G
2	A	1446	A
2	A	1483	G
2	A	1495	U
2	A	1496	C
2	A	1508	C
2	A	1511	U
2	A	1528	G
2	A	1556	C
2	A	1557	A
2	A	1560	G
2	A	1562	C
2	A	1564	U
2	A	1567	U
2	A	1568	U
2	A	1570	U
2	A	1575	A
2	A	1576	G
2	A	1577	G
2	A	1578	C
2	A	1579	C
2	A	1580	A

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	1581	C
2	A	1582	C
2	A	1583	A
2	A	1593	A
2	A	1594	A
2	A	1605	A
2	A	1607	U
2	A	1630	U
2	A	1642	A
2	A	1643	A
2	A	1645	U
2	A	1647	A
2	A	1657	C
2	A	1658	G
2	A	1694	U
2	A	1705	U
2	A	1713	G
2	A	1724	U
2	A	1735	G
2	A	1741	A
2	A	1743	G
2	A	1750	A
2	A	1751	G
2	A	1752	A
2	A	1753	G
2	A	1756	C
2	A	1759	C
2	A	1763	U
2	A	1765	U
2	A	1767	C
2	A	1769	G
2	A	1773	C
2	A	1775	G
2	A	1796	G
2	A	1797	A
2	A	1813	A
2	A	1814	A
2	A	1815	U
2	A	1816	A
2	A	1820	U
2	A	1821	U
2	A	1822	C

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	1840	U
2	A	1842	A
2	A	1846	C
2	A	1850	A
2	A	1858	A
2	A	1866	C
2	A	1879	A
2	A	1880	U
2	A	1893	A
2	A	1906	G
2	A	1920	U
2	A	1952	G
2	A	2111	G
2	A	2112	U
2	A	2114	C
2	A	2122	G
2	A	2131	A
2	A	2158	A
2	A	2167	A
2	A	2168	A
2	A	2169	G
2	A	2170	U
2	A	2188	A
2	A	2205	U
2	A	2206	G
2	A	2207	A
2	A	2208	A
2	A	2209	U
2	A	2210	G
2	A	2223	A
2	A	2244	A
2	A	2249	G
2	A	2252	A
2	A	2253	G
2	A	2256	A
2	A	2261	G
2	A	2262	A
2	A	2264	U
2	A	2266	U
2	A	2270	A
2	A	2272	G
2	A	2273	G

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	2281	A
2	A	2306	C
2	A	2307	G
2	A	2310	U
2	A	2313	A
2	A	2315	G
2	A	2320	A
2	A	2335	G
2	A	2336	U
2	A	2340	U
2	A	2372	A
2	A	2373	A
2	A	2374	C
2	A	2375	G
2	A	2376	G
2	A	2388	U
2	A	2393	G
2	A	2394	G
2	A	2397	A
2	A	2402	A
2	A	2403	G
2	A	2404	A
2	A	2411	U
2	A	2418	G
2	A	2450	G
2	A	2451	G
2	A	2453	U
2	A	2454	G
2	A	2458	A
2	A	2459	A
2	A	2462	A
2	A	2463	G
2	A	2468	A
2	A	2469	G
2	A	2472	U
2	A	2474	G
2	A	2477	G
2	A	2478	C
2	A	2485	A
2	A	2490	C
2	A	2494	A
2	A	2496	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	2504	U
2	A	2513	U
2	A	2515	A
2	A	2523	A
2	A	2524	A
2	A	2532	U
2	A	2533	G
2	A	2534	G
2	A	2535	A
2	A	2537	U
2	A	2539	C
2	A	2540	A
2	A	2541	U
2	A	2547	A
2	A	2549	G
2	A	2552	C
2	A	2555	G
2	A	2560	C
2	A	2561	A
2	A	2569	A
2	A	2570	U
2	A	2571	U
2	A	2572	C
2	A	2573	G
2	A	2585	G
2	A	2593	A
2	A	2602	G
2	A	2606	G
2	A	2607	G
2	A	2614	G
2	A	2635	A
2	A	2637	A
2	A	2652	U
2	A	2656	A
2	A	2657	A
2	A	2672	G
2	A	2674	A
2	A	2678	A
2	A	2688	U
2	A	2689	A
2	A	2691	A
2	A	2696	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	2704	A
2	A	2712	U
2	A	2713	U
2	A	2728	G
2	A	2729	U
2	A	2737	C
2	A	2753	G
2	A	2762	A
2	A	2772	C
2	A	2773	C
2	A	2777	G
2	A	2778	G
2	A	2791	G
2	A	2795	U
2	A	2796	G
2	A	2799	A
2	A	2800	G
2	A	2801	A
2	A	2808	A
2	A	2810	C
2	A	2817	A
2	A	2821	C
2	A	2843	U
2	A	2845	A
2	A	2847	A
2	A	2850	G
2	A	2860	U
2	A	2867	C
2	A	2871	G
2	A	2873	U
2	A	2887	A
2	A	2889	C
2	A	2899	C
2	A	2911	A
2	A	2934	A
2	A	2935	U
2	A	2936	A
2	A	2941	A
2	A	2951	G
2	A	2971	A
2	A	2979	U
2	A	2983	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	2997	G
2	A	3003	G
2	A	3005	A
2	A	3012	A
2	A	3021	A
2	A	3028	G
2	A	3029	A
2	A	3030	G
2	A	3048	A
2	A	3049	A
2	A	3057	U
2	A	3059	G
2	A	3078	U
2	A	3079	U
2	A	3092	C
2	A	3101	G
2	A	3109	G
2	A	3113	A
2	A	3115	C
2	A	3117	C
2	A	3122	A
2	A	3130	A
2	A	3131	U
2	A	3142	A
2	A	3143	C
2	A	3153	U
2	A	3154	C
2	A	3155	U
2	A	3156	U
2	A	3168	A
2	A	3170	A
2	A	3172	A
2	A	3173	G
2	A	3174	A
2	A	3176	G
2	A	3179	U
2	A	3181	C
2	A	3187	A
2	A	3196	U
2	A	3198	U
2	A	3203	U
2	A	3207	U

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
2	A	3210	A
2	A	3217	C
2	A	3218	A
2	A	3219	G
2	A	3223	A
2	A	3228	C
2	A	3247	G
2	A	3248	C
2	A	3249	C
2	A	3260	G
2	A	3263	G
2	A	3268	A
2	A	3273	A
2	A	3276	G
2	A	3281	U
2	A	3292	A
2	A	3294	A
2	A	3304	U
2	A	3313	U
2	A	3316	A
2	A	3317	U
2	A	3319	U
2	A	3320	A
2	A	3334	U
2	A	3341	U
2	A	3342	A
2	A	3345	G
2	A	3351	U
2	A	3352	U
2	A	3353	G
2	A	3357	U
2	A	3359	A
2	A	3369	G
2	A	3375	A
2	A	3378	C
2	A	3382	U
2	A	3386	G
2	A	3389	U
2	A	3390	G
2	A	3396	U
3	B	7	G
3	B	29	C

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	B	33	U
3	B	53	U
3	B	54	U
3	B	64	A
3	B	65	G
3	B	73	C
3	B	74	C
3	B	76	A
3	B	102	A
3	B	112	G
4	C	15	G
4	C	16	G
4	C	23	U
4	C	34	U
4	C	35	C
4	C	39	G
4	C	59	A
4	C	62	C
4	C	63	G
4	C	80	A
4	C	81	U
4	C	82	U
4	C	83	C
4	C	84	C
4	C	86	U
4	C	90	U
4	C	91	C
4	C	95	G
4	C	100	U
4	C	106	C
4	C	111	A
4	C	113	U
4	C	116	G
4	C	125	U
4	C	126	A
4	C	129	C
4	C	146	U
4	C	148	G
4	C	151	C
4	C	152	G
46	s	12	G
46	s	14	A

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
46	s	18	G
46	s	19	G
46	s	36	U
46	s	46	G
46	s	47	U
46	s	48	C
46	s	49	C
46	s	59	A
46	s	61	C
46	s	63	G
46	s	64	A
46	s	74	C
46	t	14	A
46	t	16	U
46	t	19	G
46	t	20	A
46	t	46	G
46	t	47	U
46	t	48	C
46	t	49	C
46	t	59	A
46	t	60	A
46	t	61	C
46	t	63	G
46	t	64	A
46	t	76	A

All (46) RNA pucker outliers are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	68	A
1	2	77	U
1	2	139	C
1	2	225	A
1	2	322	G
1	2	352	A
1	2	387	A
1	2	400	A
1	2	489	C
1	2	541	A
1	2	555	A
1	2	609	U

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	2	639	U
1	2	705	U
1	2	711	U
1	2	819	G
1	2	928	U
1	2	1023	A
1	2	1205	C
1	2	1226	A
1	2	1256	A
1	2	1273	G
1	2	1274	C
1	2	1344	A
1	2	1382	A
1	2	1430	U
1	2	1471	A
1	2	1573	A
1	2	1584	G
1	2	1633	A
1	2	1636	C
1	2	1756	A
2	A	601	U
2	A	916	G
2	A	1081	U
2	A	1814	A
2	A	2261	G
2	A	2450	G
2	A	2533	G
2	A	2842	U
2	A	3004	C
2	A	3028	G
2	A	3121	U
2	A	3341	U
3	B	52	G
4	C	85	G

## 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 oligosaccharides 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](#)

There are no chain breaks in this entry.

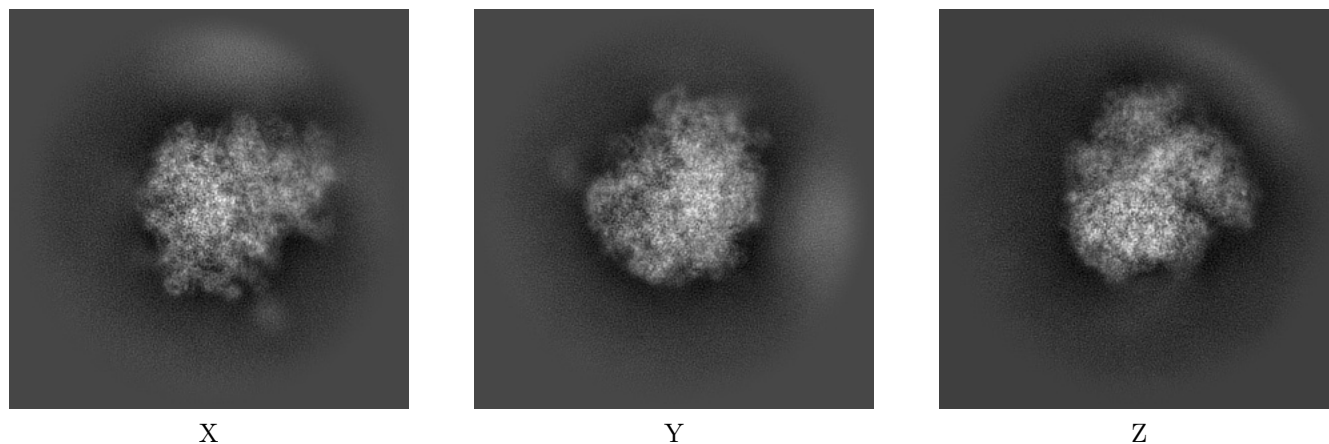
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-38660. These allow visual inspection of the internal detail of the map and identification of artifacts.

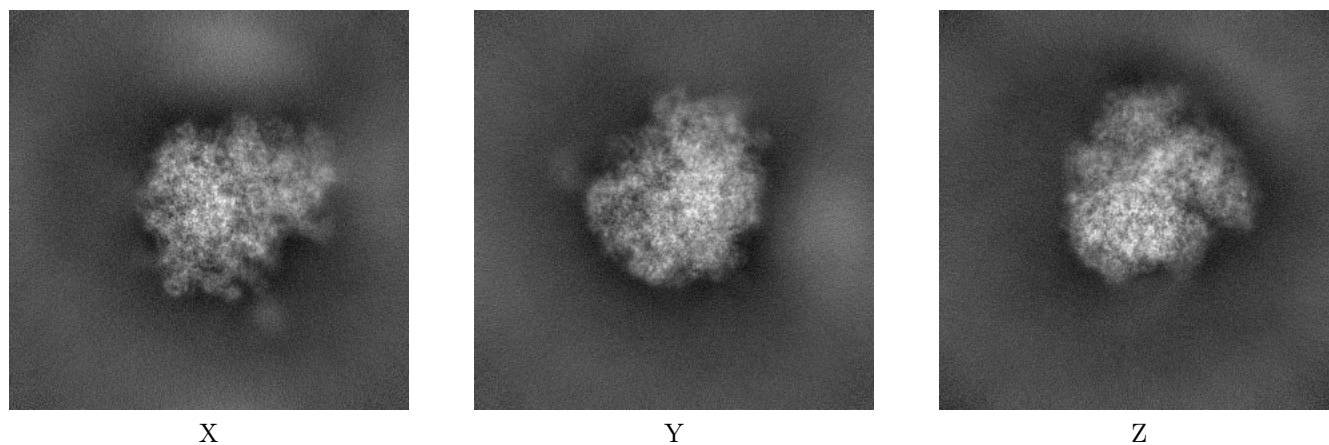
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



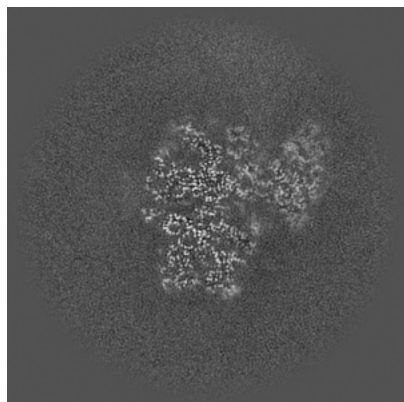
#### 6.1.2 Raw map



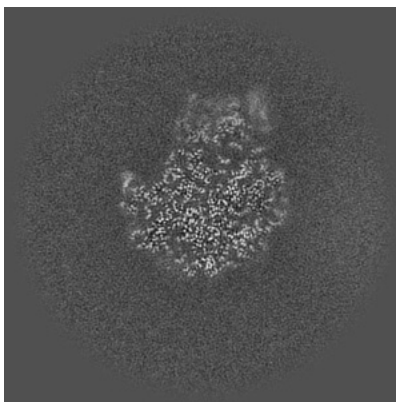
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

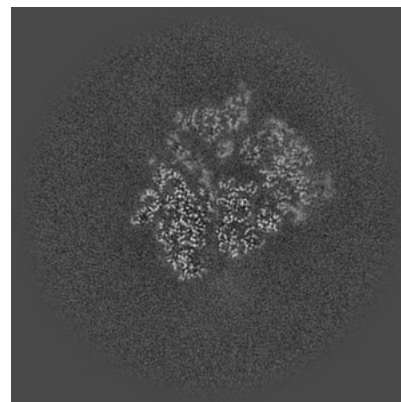
### 6.2.1 Primary map



X Index: 200

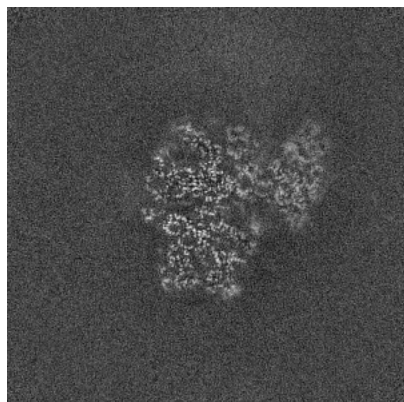


Y Index: 200

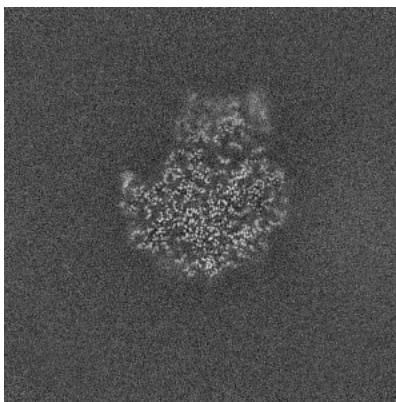


Z Index: 200

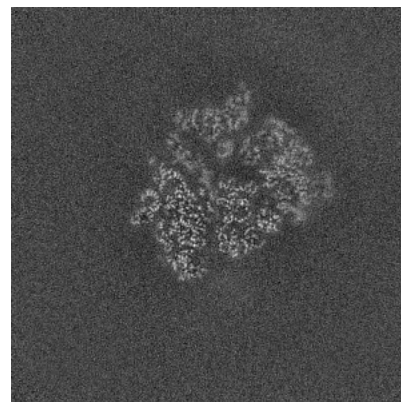
### 6.2.2 Raw map



X Index: 200



Y Index: 200



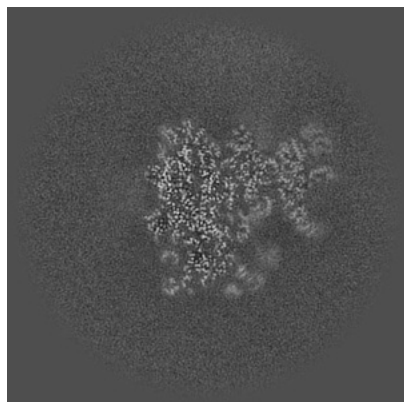
Z Index: 200

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

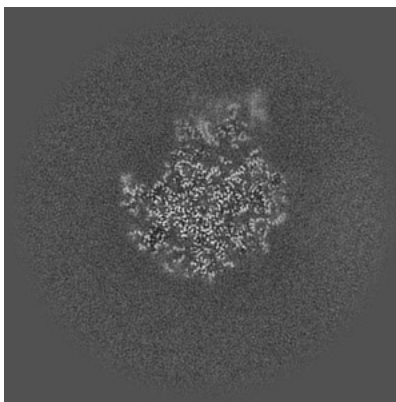


## 6.3 Largest variance slices [i](#)

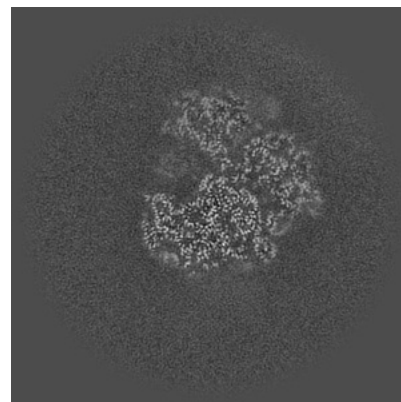
### 6.3.1 Primary map



X Index: 212

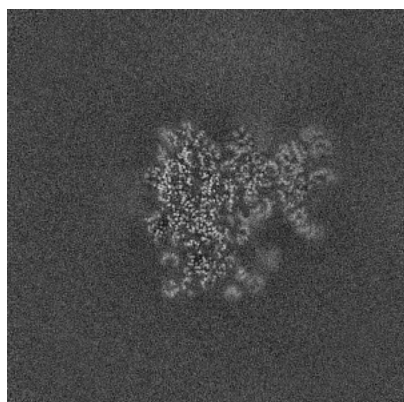


Y Index: 198

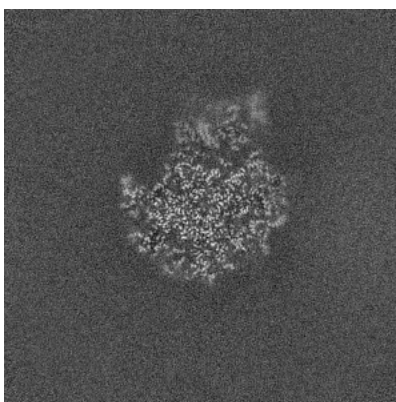


Z Index: 222

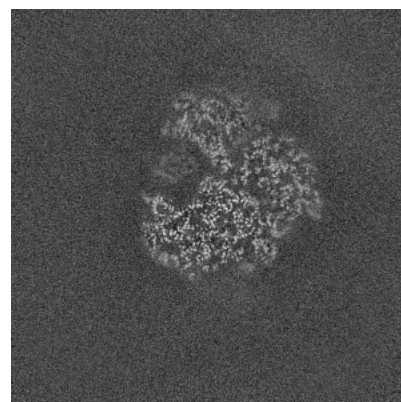
### 6.3.2 Raw map



X Index: 212



Y Index: 198

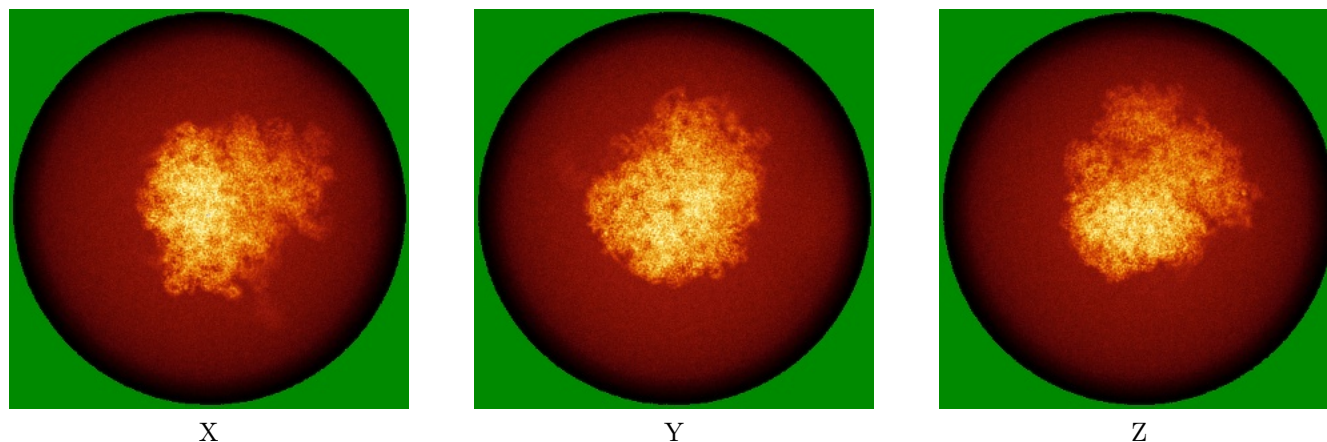


Z Index: 223

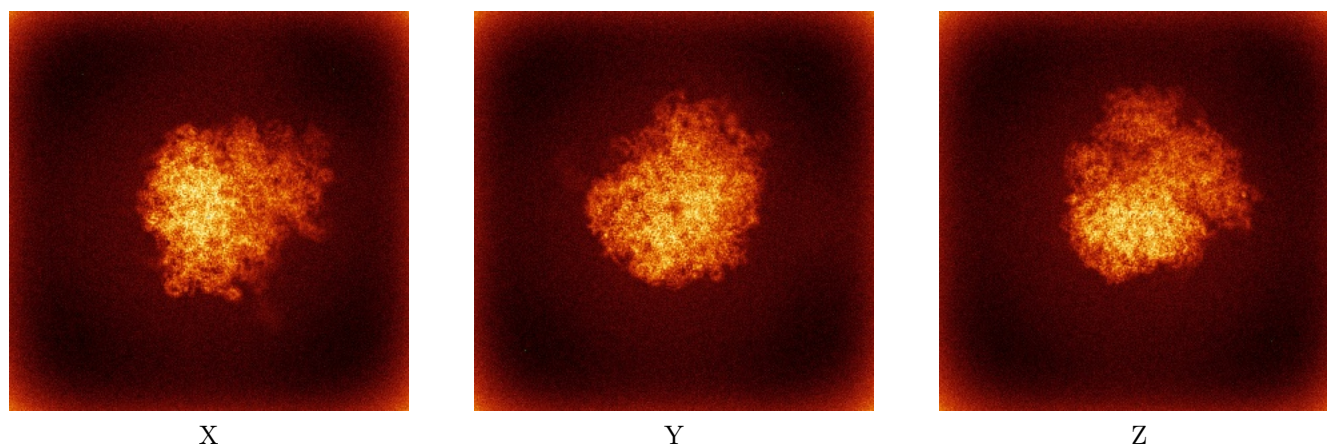
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

### 6.4.1 Primary map



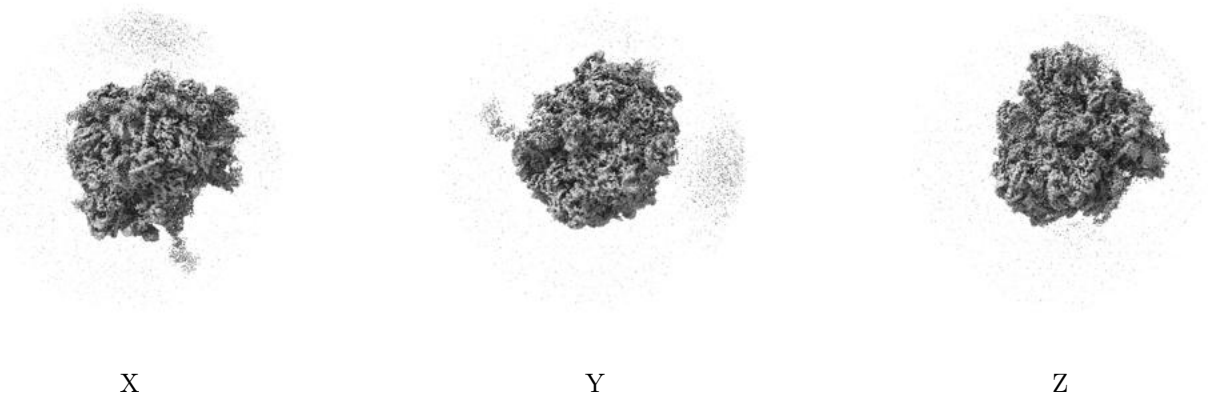
### 6.4.2 Raw map



The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

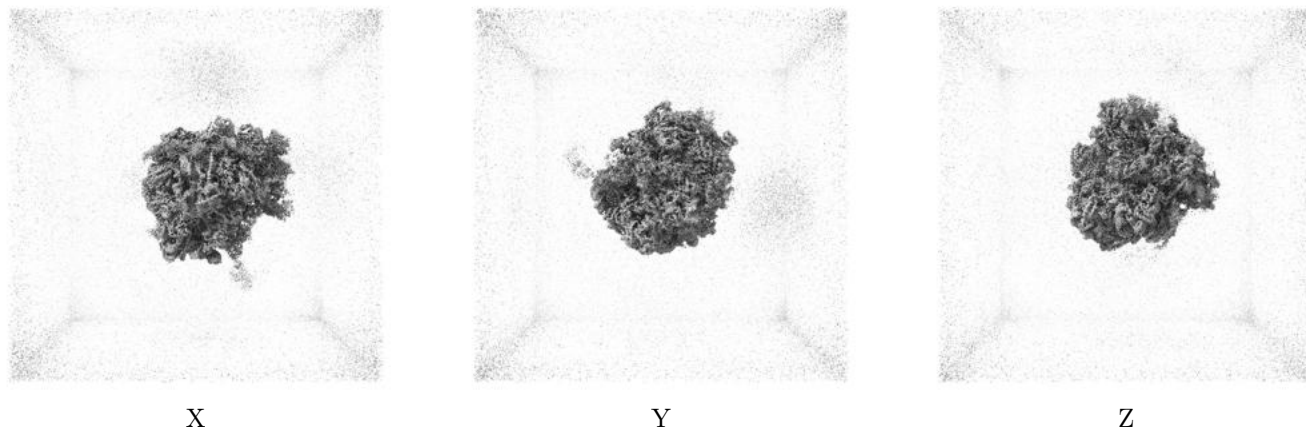
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.295. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

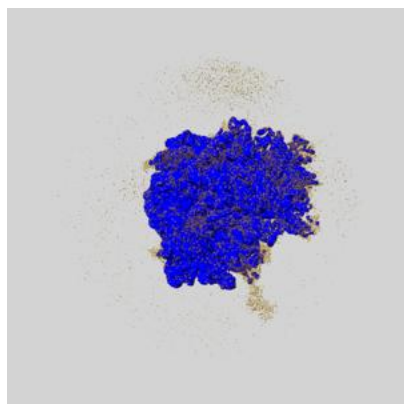
## 6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

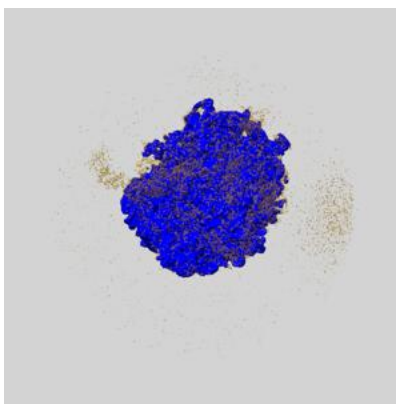
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

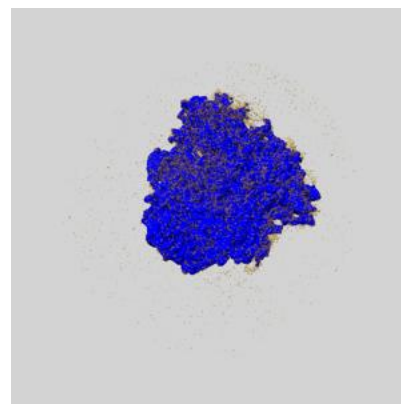
### 6.6.1 emd\_38660\_msk\_1.map [i](#)



X



Y

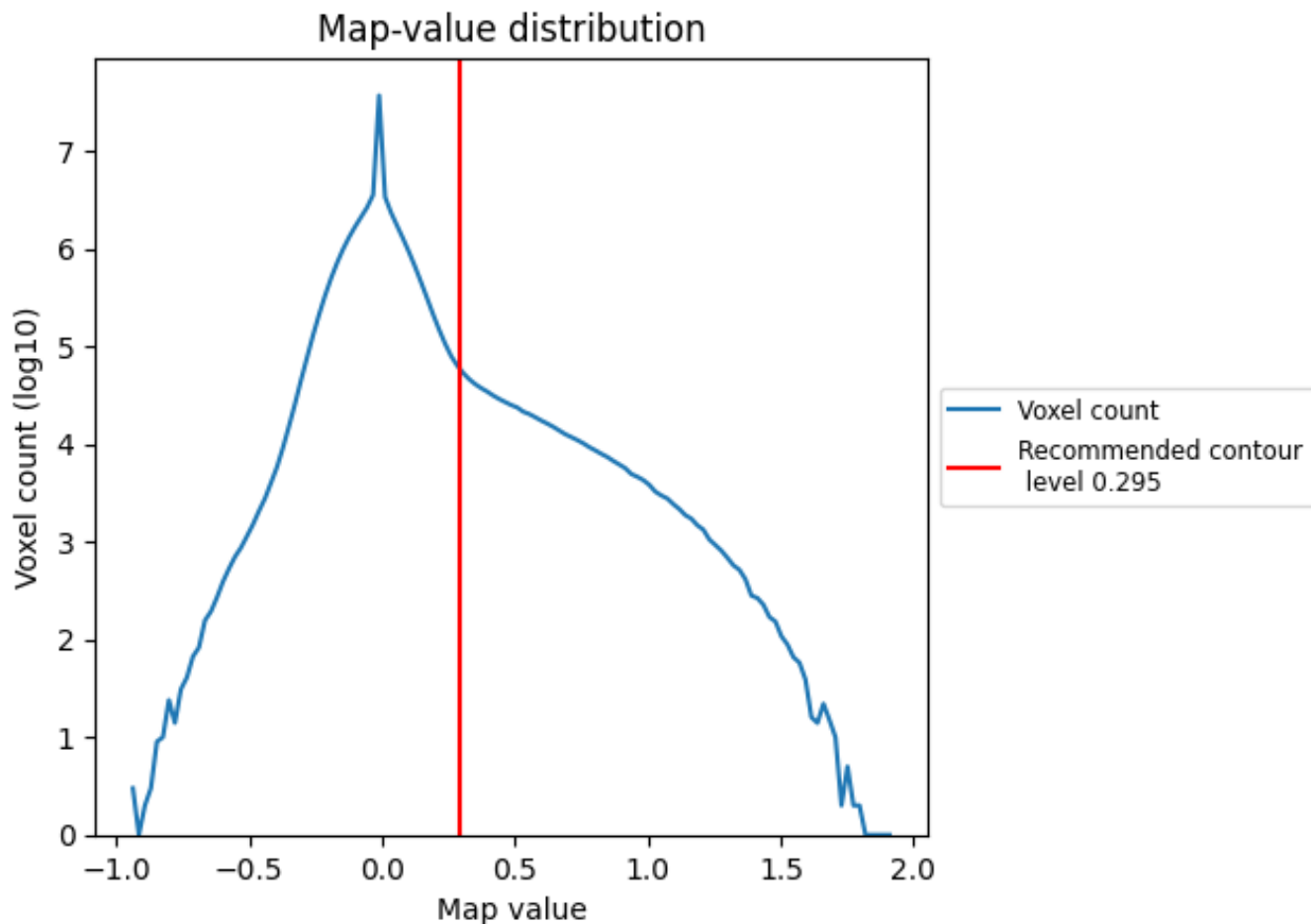


Z

## 7 Map analysis [i](#)

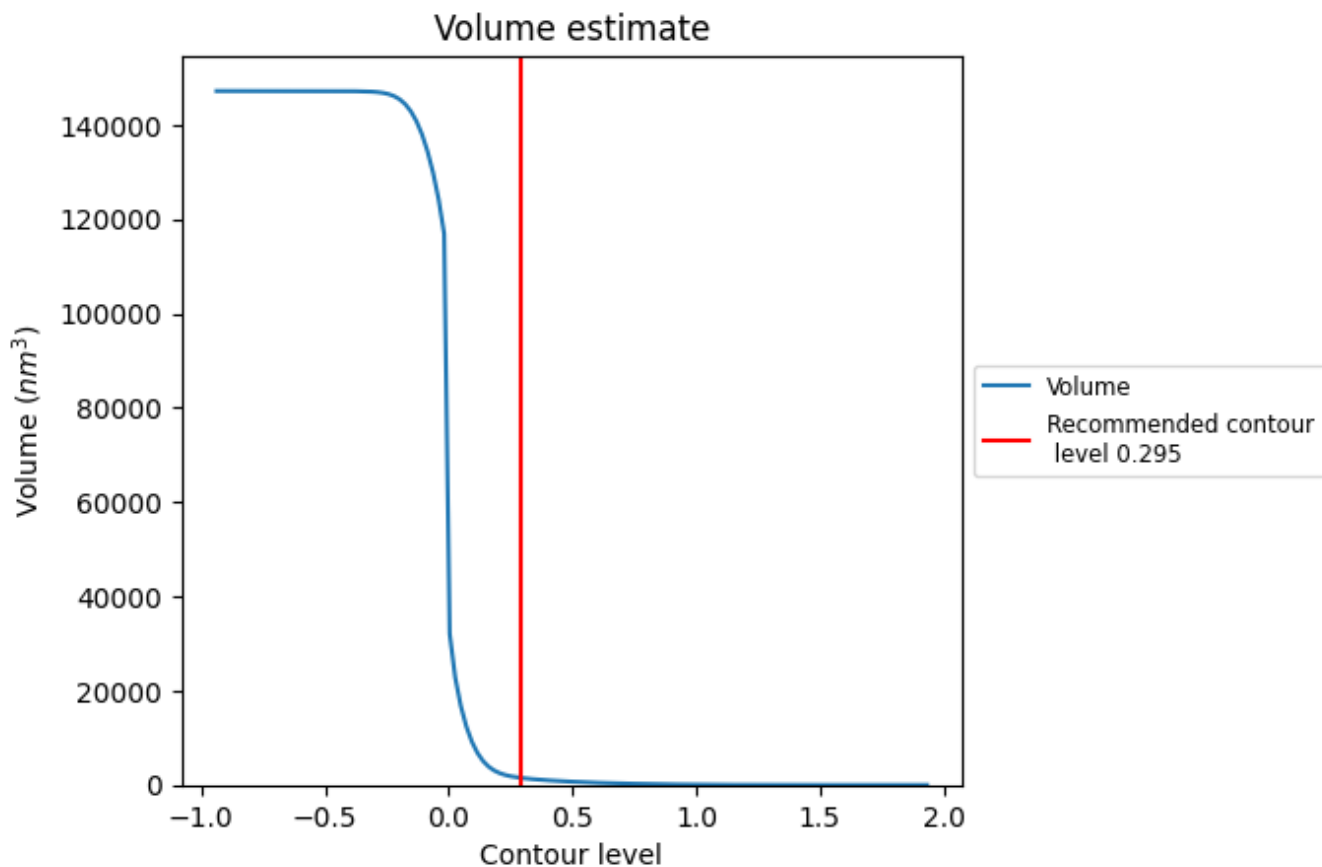
This section contains the results of statistical analysis of the map.

### 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.

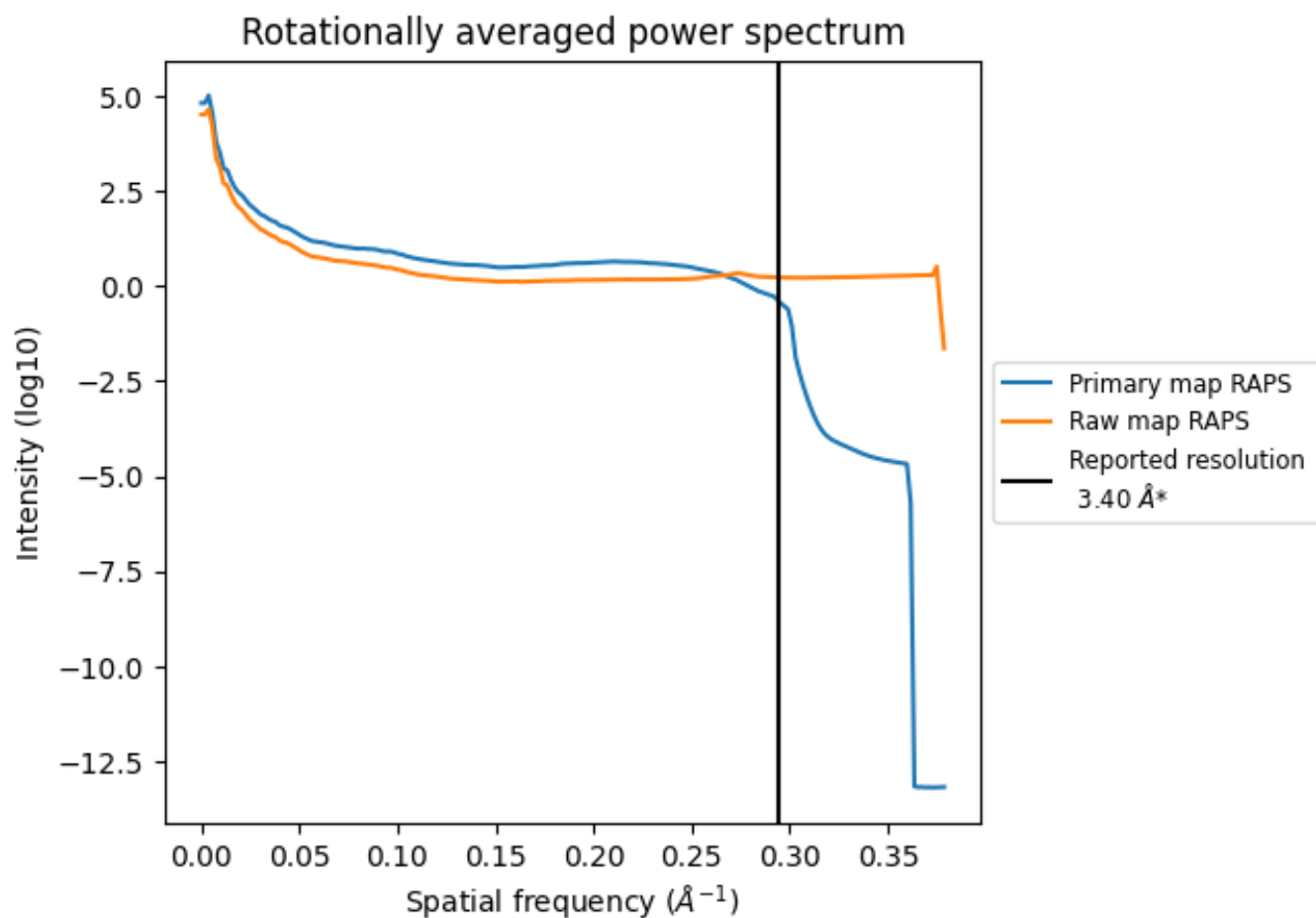
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1478 nm<sup>3</sup>; this corresponds to an approximate mass of 1335 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](#)

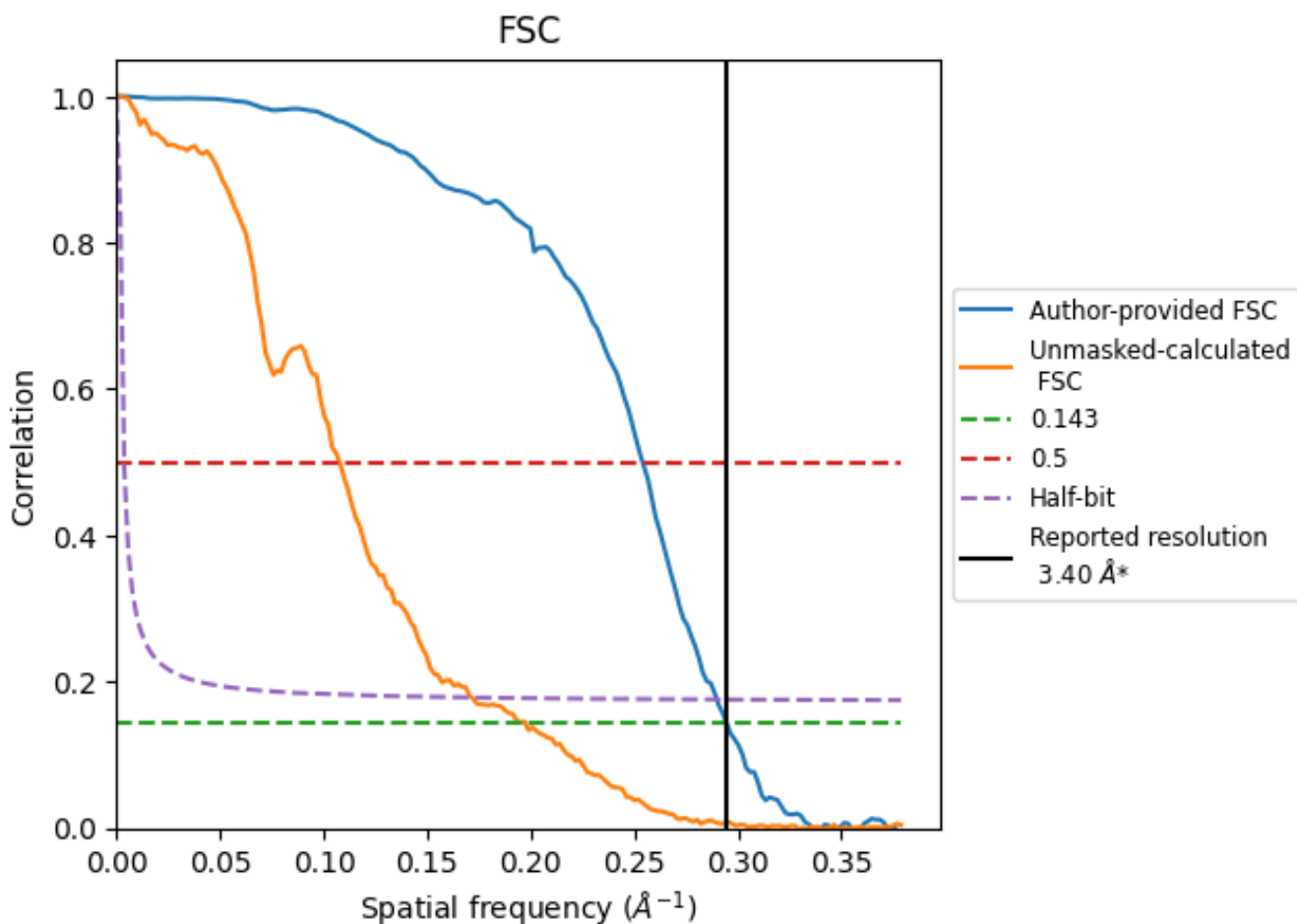


\*Reported resolution corresponds to spatial frequency of 0.294 Å<sup>-1</sup>

## 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 0.294 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

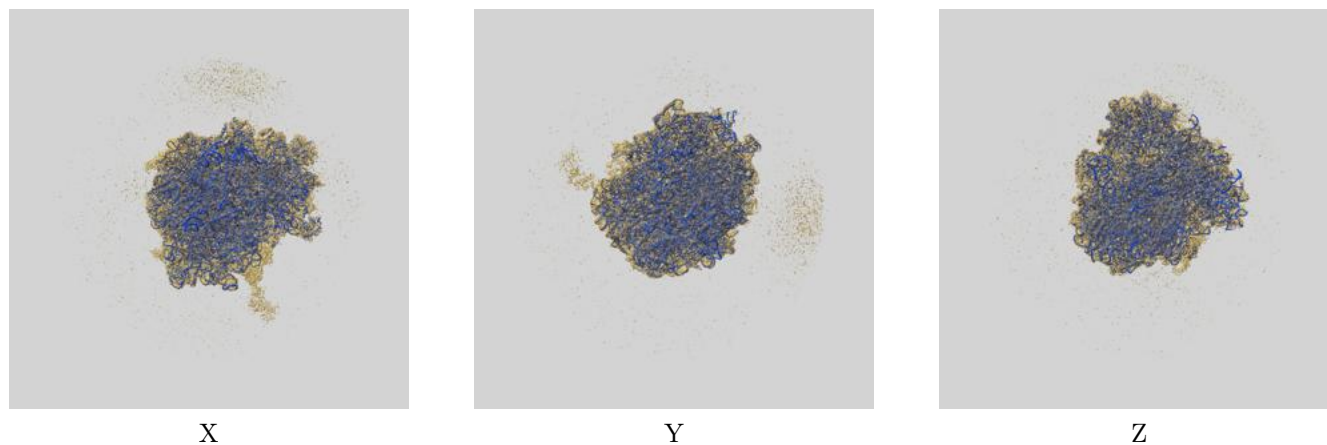
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.40	-	-
Author-provided FSC curve	3.39	3.94	3.45
Unmasked-calculated*	5.07	9.29	5.83

\*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 5.07 differs from the reported value 3.4 by more than 10 %

## 9 Map-model fit [i](#)

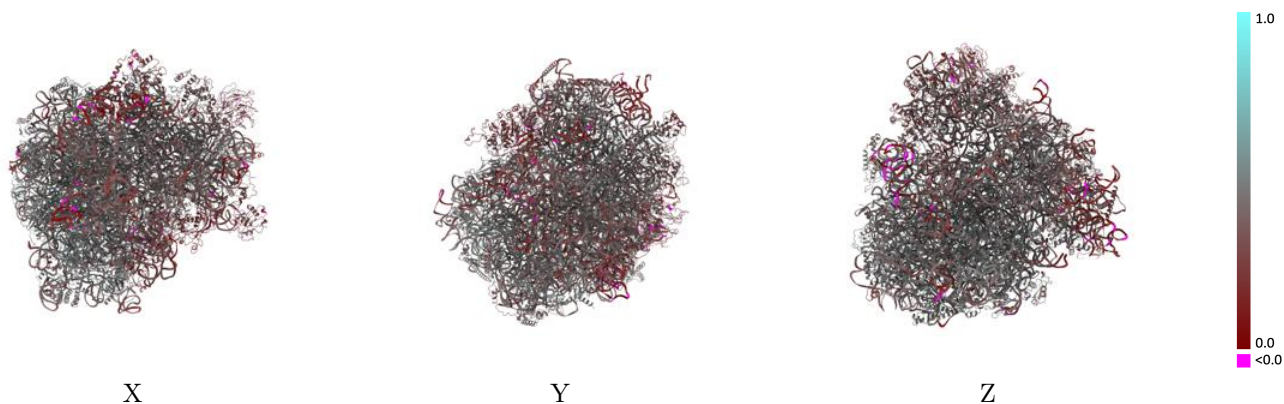
This section contains information regarding the fit between EMDB map EMD-38660 and PDB model 8XU8. Per-residue inclusion information can be found in section 3 on page 18.

### 9.1 Map-model overlay [i](#)



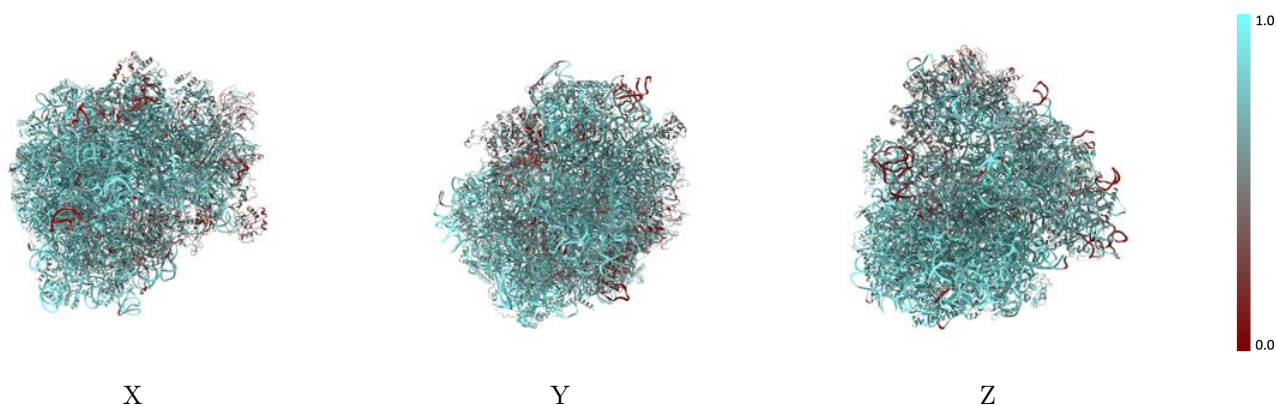
The images above show the 3D surface view of the map at the recommended contour level 0.295 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



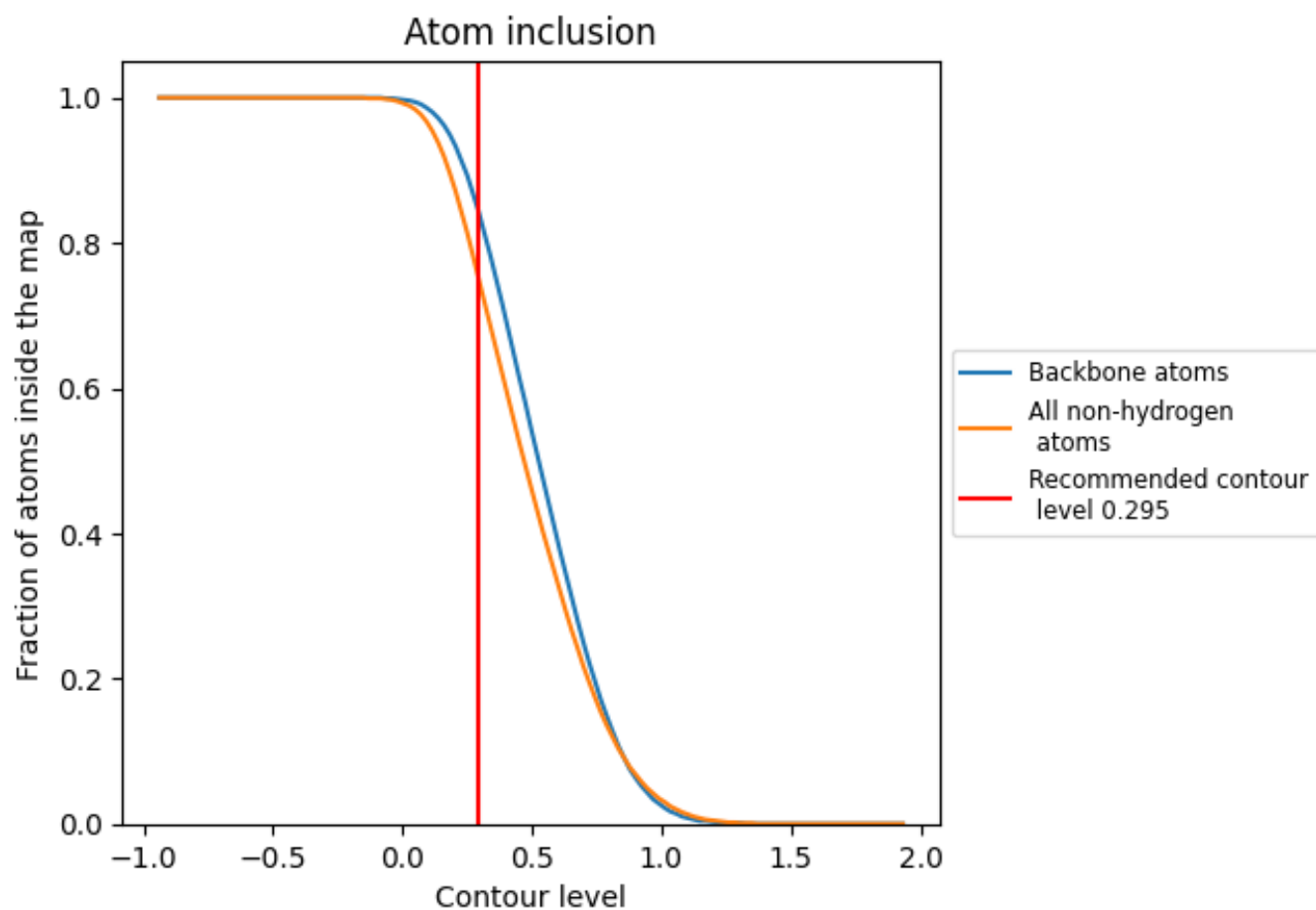
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.295).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 84% of all backbone atoms, 75% 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 (0.295) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7500	0.4140
2	0.7930	0.3750
A	0.8510	0.4220
B	0.8930	0.4220
C	0.8730	0.4380
D	0.7310	0.5010
E	0.7570	0.4770
F	0.7650	0.4880
G	0.7330	0.4310
H	0.7220	0.4460
I	0.7620	0.4740
J	0.7270	0.4500
K	0.7240	0.4610
L	0.6960	0.4560
M	0.6140	0.3900
N	0.7610	0.4880
O	0.7620	0.4670
P	0.7800	0.5040
Q	0.7510	0.4770
R	0.7540	0.4960
S	0.7570	0.4980
SA	0.5610	0.4110
SB	0.5240	0.3680
SC	0.5770	0.3500
SD	0.3090	0.2760
SE	0.5070	0.3480
SF	0.5710	0.3770
SG	0.5640	0.3770
SH	0.5420	0.3580
SI	0.5780	0.3640
SJ	0.5260	0.3810
SK	0.4300	0.3110
SL	0.5070	0.3940
SM	0.7090	0.4250
SN	0.3090	0.1940













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Chain	Atom inclusion	Q-score
SO	0.4070	0.2720
SP	0.6190	0.3890
SQ	0.5420	0.3890
SR	0.6570	0.4430
SS	0.6430	0.4290
ST	0.5980	0.3940
SU	0.5550	0.3530
SV	0.6820	0.4410
SW	0.6450	0.4070
SX	0.6630	0.4660
SY	0.6490	0.4340
SZ	0.6350	0.4260
Sa	0.6200	0.4120
Sb	0.6820	0.4530
Sc	0.6460	0.4650
Sd	0.6460	0.4080
Se	0.6570	0.4400
Sf	0.6060	0.4050
Sg	0.6140	0.4140
T	0.7050	0.4540
U	0.7600	0.4940
V	0.7340	0.4830
W	0.6960	0.4330
X	0.6970	0.4970
Y	0.6900	0.4240
Z	0.7400	0.4910
a	0.7670	0.4920
b	0.7560	0.4740
c	0.7920	0.4980
d	0.7190	0.4710
e	0.7030	0.4510
f	0.7190	0.4780
g	0.7480	0.5070
h	0.7710	0.4970
i	0.7200	0.4870
j	0.7300	0.4680
k	0.7100	0.4490
l	0.8300	0.5260
m	0.7250	0.4490
n	0.7280	0.4890
o	0.7500	0.4930
p	0.7500	0.5070

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Chain	Atom inclusion	Q-score
q	 0.7290	 0.4970
r	 0.7090	 0.4810
s	 0.7250	 0.3220
t	 0.5790	 0.2830
x	 0.4480	 0.2750