



## wwPDB EM Validation Summary Report ⓘ

May 31, 2022 – 02:04 pm BST

PDB ID : 7PZY  
EMDB ID : EMD-13737  
Title : Structure of the vacant *Candida albicans* 80S ribosome  
Authors : Zgadzay, Y.; Kolosova, O.; Stetsenko, A.; Jenner, L.; Guskov, A.; Yusupova, G.; Yusupov, M.  
Deposited on : 2021-10-13  
Resolution : 2.32 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](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.

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

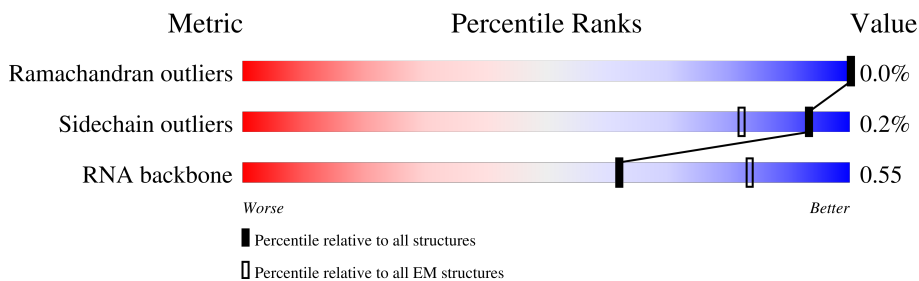
EMDB validation analysis : 0.0.1.dev8  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.28.1

# 1 Overall quality at a glance

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

The reported resolution of this entry is 2.32 Å.

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




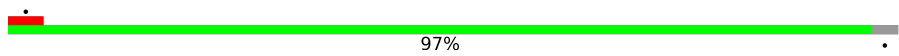
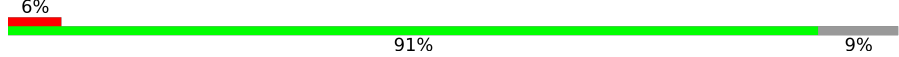
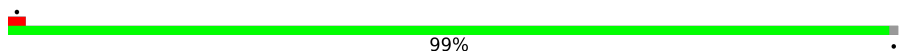
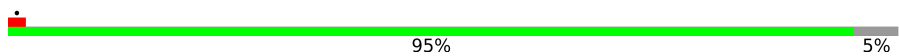
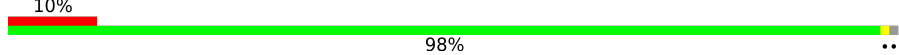
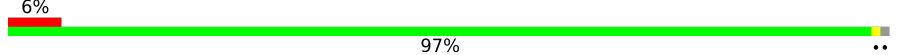
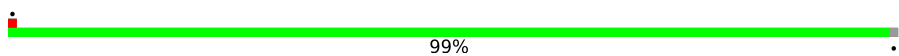


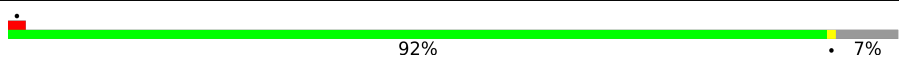
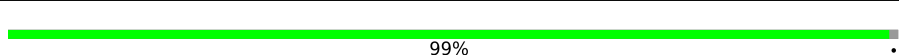
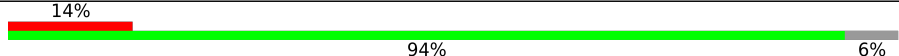
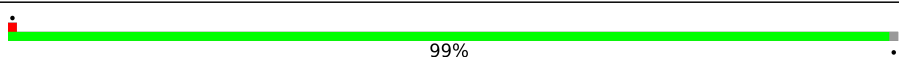
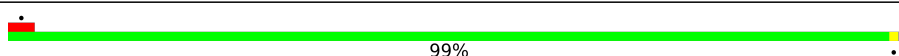

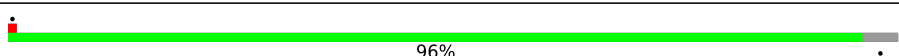

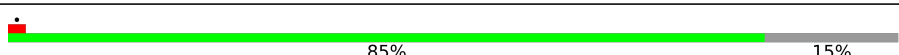
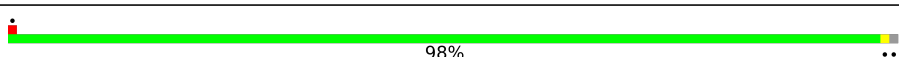
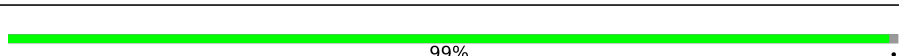
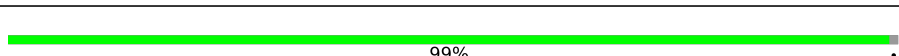
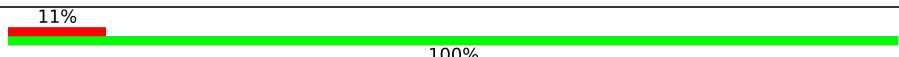
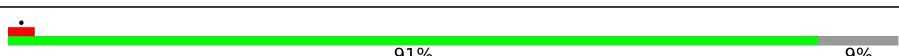
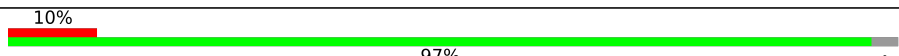
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	1	3359	
2	3	121	
3	4	158	
4	10	76	
5	j	254	
6	k	389	
7	l	363	
8	m	298	

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Mol	Chain	Length	Quality of chain
9	n	176	 88% 12%
10	o	241	 97%
11	p	262	 6% 91% 9%
12	q	191	 99%
13	r	220	 95% 5%
14	s	174	 10% 98% ..
15	t	202	 6% 97% ..
16	u	131	 99%
17	v	204	 100%
18	w	200	 100%
19	x	185	 92% 7%
20	y	186	 99%
21	z	190	 14% 94% 6%
22	0	172	 99%
23	2	160	 99% ..
24	5	124	 16% 82% 17%
25	6	137	 96%
26	7	155	 41% 59%
27	8	142	 85% 15%
28	9	127	 98% ..
29	AA	136	 99%
30	AB	149	 99%
31	AC	63	 11% 100%
32	AD	106	 91% 9%
33	AE	112	 10% 97%

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Mol	Chain	Length	Quality of chain
34	AF	131	95% 5%
35	AG	107	99%
36	AH	122	7% 92% 8%
37	AI	120	99%
38	AJ	99	98%
39	AK	90	96%
40	AL	78	9% 99%
41	AM	51	98%
42	AN	52	100%
43	AO	25	16% 76% 24%
44	AP	106	6% 97%
45	AQ	92	99%
46	i	267	42% 42% 58%
47	A	1787	40% 71% 24% 5%
48	B	261	47% 80% 20%
49	C	256	52% 84% 16%
50	D	249	29% 87% 13%
51	E	251	88% 88% 11%
52	F	262	65% 99%
53	G	225	92% 92% 8%
54	H	236	84% 96%
55	I	186	74% 98%
56	J	206	39% 98%
57	K	189	65% 94% 6%
58	L	118	79% 78% 21%

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Mol	Chain	Length	Quality of chain
59	M	155	31% 90% 9%
60	N	143	81% 81% 19%
61	O	151	28% 99%
62	P	132	42% 96%
63	Q	142	83% 82% 17%
64	R	142	99% 99%
65	S	137	88% 91% 9%
66	T	145	97% 98%
67	U	145	97% 97%
68	V	119	84% 82% 16%
69	W	87	52% 100%
70	X	130	12% 99%
71	Y	145	45% 99%
72	Z	135	87% 98%
73	a	105	69% 69% 31%
74	b	119	27% 84% 16%
75	c	82	57% 99%
76	d	67	93% 93% 7%
77	e	56	98% 98%
78	f	63	70% 89% 11%
79	g	193	36% 36% 64%
80	h	317	98% 98%

## 2 Entry composition [i](#)

There are 85 unique types of molecules in this entry. The entry contains 201513 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 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	1	3209	68595	30642	12317	22427	3209	0	0

- Molecule 2 is a RNA chain called 5S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	3	121	2579	1153	463	842	121	0	0

- Molecule 3 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	4	158	3353	1500	585	1110	158	0	0

- Molecule 4 is a RNA chain called Mixture of endogenous E-tRNAs.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	10	16	338	151	59	112	16	0	0

- Molecule 5 is a protein called Ribosomal 60S subunit protein L2A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	j	249	1894	1185	377	330	2	1	0

- Molecule 6 is a protein called 60S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	k	386	3084	1955	584	538	7	1	0

- Molecule 7 is a protein called Ribosomal 60S subunit protein L4B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	l	361	2751	1729	529	490	3	0	0

- Molecule 8 is a protein called Ribosomal 60S subunit protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	m	292	2394	1526	416	450	2	0	0

- Molecule 9 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	n	155	1237	794	226	217	1	0

- Molecule 10 is a protein called Ribosomal 60S subunit protein L7A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	o	234	1893	1213	348	331	1	1	0

- Molecule 11 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	p	238	1839	1175	327	334	3	0	0

- Molecule 12 is a protein called Ribosomal 60S subunit protein L9B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	q	190	1519	958	276	281	4	0	0

- Molecule 13 is a protein called Ribosomal 60S subunit protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	r	208	1689	1069	322	291	7	0	0

- Molecule 14 is a protein called Ribosomal 60S subunit protein L11B.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	s	172	Total	C	N	O	S	1	0
			1385	864	262	255	4		

- Molecule 15 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	t	200	Total	C	N	O		0	0
			1610	1009	318	283			

- Molecule 16 is a protein called Ribosomal 60S subunit protein L14B.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	u	130	Total	C	N	O	S	0	0
			1029	660	193	175	1		

- Molecule 17 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	v	203	Total	C	N	O	S	0	0
			1713	1075	356	280	2		

- Molecule 18 is a protein called Ribosomal 60S subunit protein L16A.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	w	199	Total	C	N	O	S	0	0
			1590	1025	294	269	2		

- Molecule 19 is a protein called Ribosomal 60S subunit protein L17B.

Mol	Chain	Residues	Atoms				AltConf	Trace
19	x	172	Total	C	N	O	0	0
			1375	850	279	246		

- Molecule 20 is a protein called Ribosomal 60S subunit protein L18A.

Mol	Chain	Residues	Atoms				AltConf	Trace
20	y	185	Total	C	N	O	3	0
			1478	930	302	246		

- Molecule 21 is a protein called Ribosomal protein L19.



Mol	Chain	Residues	Atoms					AltConf	Trace
21	z	179	Total	C	N	O	S	1	0
			1462	904	311	244	3		

- Molecule 22 is a protein called 60S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	0	171	Total	C	N	O	S	2	0
			1442	933	262	244	3		

- Molecule 23 is a protein called Ribosomal 60S subunit protein L21A.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	2	159	Total	C	N	O	S	2	0
			1276	807	244	223	2		

- Molecule 24 is a protein called Ribosomal 60S subunit protein L22B.

Mol	Chain	Residues	Atoms				AltConf	Trace
24	5	103	Total	C	N	O	2	0
			848	553	139	156		

- Molecule 25 is a protein called Ribosomal 60S subunit protein L23B.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	6	131	Total	C	N	O	S	1	0
			986	621	186	171	8		

- Molecule 26 is a protein called Ribosomal 60S subunit protein L24A.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	7	63	Total	C	N	O	S	0	0
			524	334	103	86	1		

- Molecule 27 is a protein called Ribosomal 60S subunit protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	8	121	Total	C	N	O	S	0	0
			974	622	175	176	1		

- Molecule 28 is a protein called Ribosomal 60S subunit protein L26B.

Mol	Chain	Residues	Atoms				AltConf	Trace
28	9	126	Total	C	N	O	0	0
			989	618	190	181		

- Molecule 29 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	AA	135	Total	C	N	O	S	0	0
			1087	705	197	183	2		

- Molecule 30 is a protein called Ribosomal 60S subunit protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	AB	148	Total	C	N	O	S	0	0
			1170	741	231	197	1		

- Molecule 31 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	AC	63	Total	C	N	O	S	1	0
			509	317	109	82	1		

- Molecule 32 is a protein called Ribosomal 60S subunit protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	AD	96	Total	C	N	O	S	0	0
			729	469	121	137	2		

- Molecule 33 is a protein called Ribosomal 60S subunit protein L31B.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	AE	109	Total	C	N	O	S	0	0
			889	562	167	158	2		

- Molecule 34 is a protein called Ribosomal 60S subunit protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	AF	125	Total	C	N	O	S	1	0
			1015	649	197	168	1		

- Molecule 35 is a protein called Ribosomal 60S subunit protein L33A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	AG	106	867	558	166	142	1	3	0

- Molecule 36 is a protein called Ribosomal 60S subunit protein L34B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	AH	112	913	567	188	154	4	4	0

- Molecule 37 is a protein called Ribosomal 60S subunit protein L35A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	AI	119	990	629	195	166		1	0

- Molecule 38 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	AJ	98	772	481	158	131	2	1	0

- Molecule 39 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	AK	86	677	413	148	110	6	0	0

- Molecule 40 is a protein called Ribosomal 60S subunit protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	AL	77	623	398	116	109		1	0

- Molecule 41 is a protein called 60S ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	AM	50	446	280	100	66		1	0

- Molecule 42 is a protein called Rpl40bp.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	AN	52	Total	C	N	O	S	1	0
			427	265	89	67	6		

- Molecule 43 is a protein called 60S ribosomal protein L41.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	AO	25	Total	C	N	O	S	0	0
			236	144	63	28	1		

- Molecule 44 is a protein called Ribosomal 60S subunit protein L42A.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	AP	103	Total	C	N	O	S	2	0
			843	533	168	137	5		

- Molecule 45 is a protein called Ribosomal 60S subunit protein L43A.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	AQ	91	Total	C	N	O	S	0	0
			698	430	140	124	4		

- Molecule 46 is a protein called HABP4\_PA1-RBP1 domain-containing protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
46	i	113	Total	C	N	O	0	0
			853	512	155	186		

- Molecule 47 is a RNA chain called 18S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	A	1692	Total	C	N	O	P	0	0
			36083	16130	6412	11849	1692		

- Molecule 48 is a protein called 40S ribosomal protein S0.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	B	208	Total	C	N	O	S	0	0
			1627	1041	284	297	5		

- Molecule 49 is a protein called 40S ribosomal protein S1.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	C	214	Total	C	N	O	S	0	0
			1724	1094	313	313	4		

- Molecule 50 is a protein called Ribosomal 40S subunit protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	D	216	Total	C	N	O	S	0	0
			1620	1033	287	295	5		

- Molecule 51 is a protein called Ribosomal 40S subunit protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	E	223	Total	C	N	O	S	0	0
			1707	1087	311	305	4		

- Molecule 52 is a protein called 40S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	F	260	Total	C	N	O	S	0	0
			2055	1306	386	358	5		

- Molecule 53 is a protein called Ribosomal 40S subunit protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	G	206	Total	C	N	O	S	0	0
			1614	1008	301	301	4		

- Molecule 54 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	H	226	Total	C	N	O	S	0	0
			1820	1133	351	330	6		

- Molecule 55 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms				AltConf	Trace
55	I	182	Total	C	N	O	0	0
			1466	939	264	263		

- Molecule 56 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	J	203	1579	973	322	283	1	0	0

- Molecule 57 is a protein called Ribosomal 40S subunit protein S9B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	K	178	1453	918	286	248	1	0	0

- Molecule 58 is a protein called Ribosomal 40S subunit protein S10A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	L	93	783	511	129	142	1	0	0

- Molecule 59 is a protein called Ribosomal 40S subunit protein S11A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	M	141	1129	722	212	192	3	0	0

- Molecule 60 is a protein called 40S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	N	116	885	550	158	172	5	0	0

- Molecule 61 is a protein called Ribosomal 40S subunit protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	O	150	1187	757	219	210	1	0	0

- Molecule 62 is a protein called Ribosomal 40S subunit protein S14B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	P	127	942	579	186	174	3	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
P	119	IAS	ASP	conflict	UNP A0A1D8PDT3

- Molecule 63 is a protein called Ribosomal 40S subunit protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	Q	118	935	598	169	162	6	0	0

- Molecule 64 is a protein called Ribosomal 40S subunit protein S16A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	R	140	1091	700	198	192	1	0	0

- Molecule 65 is a protein called Ribosomal 40S subunit protein S17B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	S	125	1002	631	184	186	1	0	0

- Molecule 66 is a protein called Ribosomal 40S subunit protein S18B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	T	142	1169	733	228	205	3	0	0

- Molecule 67 is a protein called Ribosomal 40S subunit protein S19A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	U	141	1100	689	210	200	1	0	0

- Molecule 68 is a protein called Ribosomal 40S subunit protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	V	100	790	499	146	143	2	0	0

- Molecule 69 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	W	87	Total	C	N	O	S	0	0
			676	415	126	133	2		

- Molecule 70 is a protein called 40S ribosomal protein S22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	X	129	Total	C	N	O	S	0	0
			1032	655	191	183	3		

- Molecule 71 is a protein called Ribosomal 40S subunit protein S23B.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	Y	143	Total	C	N	O	S	0	0
			1110	701	219	188	2		

- Molecule 72 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms				AltConf	Trace
72	Z	132	Total	C	N	O	0	0
			1072	670	216	186		

- Molecule 73 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms				AltConf	Trace
73	a	72	Total	C	N	O	0	0
			578	369	103	106		

- Molecule 74 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	b	100	Total	C	N	O	S	0	0
			799	494	169	130	6		

- Molecule 75 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	c	81	Total	C	N	O	S	0	0
			614	383	110	114	7		

- Molecule 76 is a protein called Ribosomal 40S subunit protein S28B.



Mol	Chain	Residues	Atoms					AltConf	Trace
76	d	62	Total	C	N	O	S	0	0
			487	299	98	88	2		

- Molecule 77 is a protein called Ribosomal 40S subunit protein S29A.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	e	55	Total	C	N	O	S	0	0
			454	281	94	75	4		

- Molecule 78 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	f	56	Total	C	N	O	S	0	0
			444	278	89	75	2		

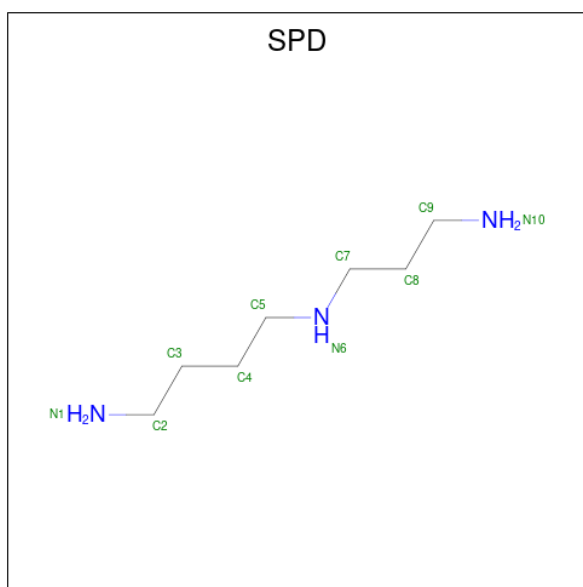
- Molecule 79 is a protein called Ubiquitin-ribosomal 40S subunit protein S31 fusion protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	g	70	Total	C	N	O	S	0	0
			574	362	113	93	6		

- Molecule 80 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

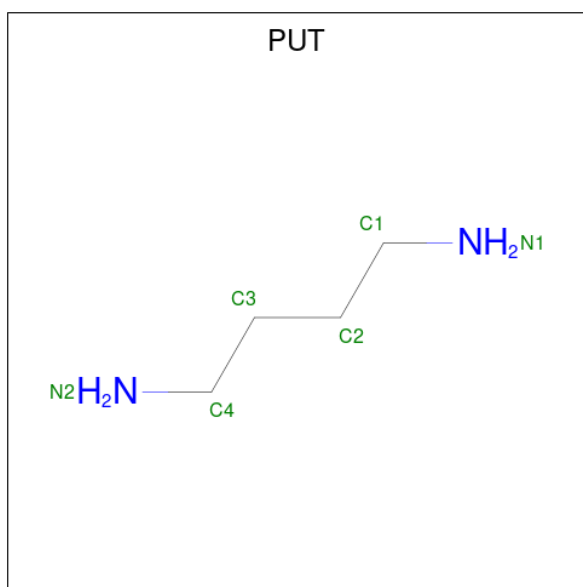
Mol	Chain	Residues	Atoms					AltConf	Trace
80	h	311	Total	C	N	O	S	0	0
			2398	1519	412	462	5		

- Molecule 81 is SPERMIDINE (three-letter code: SPD) (formula: C<sub>7</sub>H<sub>19</sub>N<sub>3</sub>).



Mol	Chain	Residues	Atoms			AltConf
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	
81	1	1	Total	C	N	0
			100	70	30	

- Molecule 82 is 1,4-DIAMINOBUTANE (three-letter code: PUT) (formula: C<sub>4</sub>H<sub>12</sub>N<sub>2</sub>).



Mol	Chain	Residues	Atoms			AltConf
82	1	1	Total	C	N	0
			6	4	2	
82	4	1	Total	C	N	0
			6	4	2	

- Molecule 83 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
83	1	296	Total	Mg	0
			296	296	
83	4	1	Total	Mg	0
			1	1	
83	j	1	Total	Mg	0
			1	1	
83	k	1	Total	Mg	0
			1	1	
83	o	1	Total	Mg	0
			1	1	
83	r	1	Total	Mg	0
			1	1	
83	x	1	Total	Mg	0
			1	1	
83	2	1	Total	Mg	0
			1	1	
83	AC	1	Total	Mg	0
			1	1	
83	AF	1	Total	Mg	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
83	AH	1	Total 1	Mg 1	0
83	AK	1	Total 1	Mg 1	0
83	AP	1	Total 1	Mg 1	0
83	A	133	Total 133	Mg 133	0
83	F	1	Total 1	Mg 1	0
83	U	1	Total 1	Mg 1	0

- Molecule 84 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
84	AK	1	Total 1	Zn 1	0
84	AN	1	Total 1	Zn 1	0
84	AP	1	Total 1	Zn 1	0
84	AQ	1	Total 1	Zn 1	0
84	b	1	Total 1	Zn 1	0
84	c	1	Total 1	Zn 1	0
84	e	1	Total 1	Zn 1	0
84	g	1	Total 1	Zn 1	0

- Molecule 85 is water.

Mol	Chain	Residues	Atoms		AltConf
85	1	1019	Total 1019	O 1019	0
85	3	8	Total 8	O 8	0
85	4	39	Total 39	O 39	0

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Mol	Chain	Residues	Atoms		AltConf
85	j	16	Total 16	O 16	0
85	k	38	Total 38	O 38	0
85	l	20	Total 20	O 20	0
85	m	1	Total 1	O 1	0
85	n	1	Total 1	O 1	0
85	o	11	Total 11	O 11	0
85	p	1	Total 1	O 1	0
85	r	1	Total 1	O 1	0
85	t	7	Total 7	O 7	0
85	v	24	Total 24	O 24	0
85	w	10	Total 10	O 10	0
85	x	14	Total 14	O 14	0
85	y	6	Total 6	O 6	0
85	z	3	Total 3	O 3	0
85	0	4	Total 4	O 4	0
85	2	1	Total 1	O 1	0
85	6	3	Total 3	O 3	0
85	7	3	Total 3	O 3	0
85	8	4	Total 4	O 4	0
85	AA	1	Total 1	O 1	0
85	AB	12	Total 12	O 12	0

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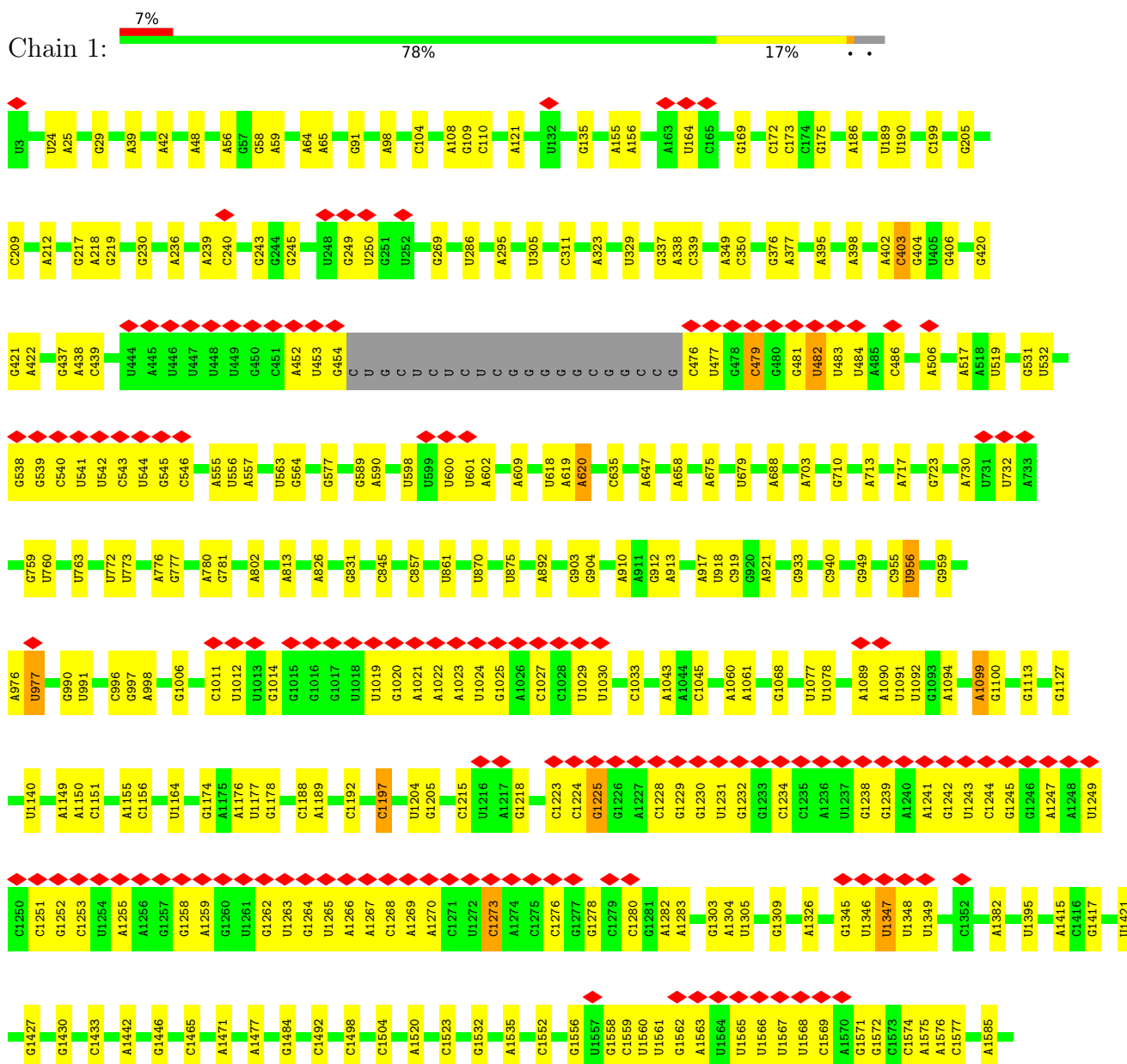
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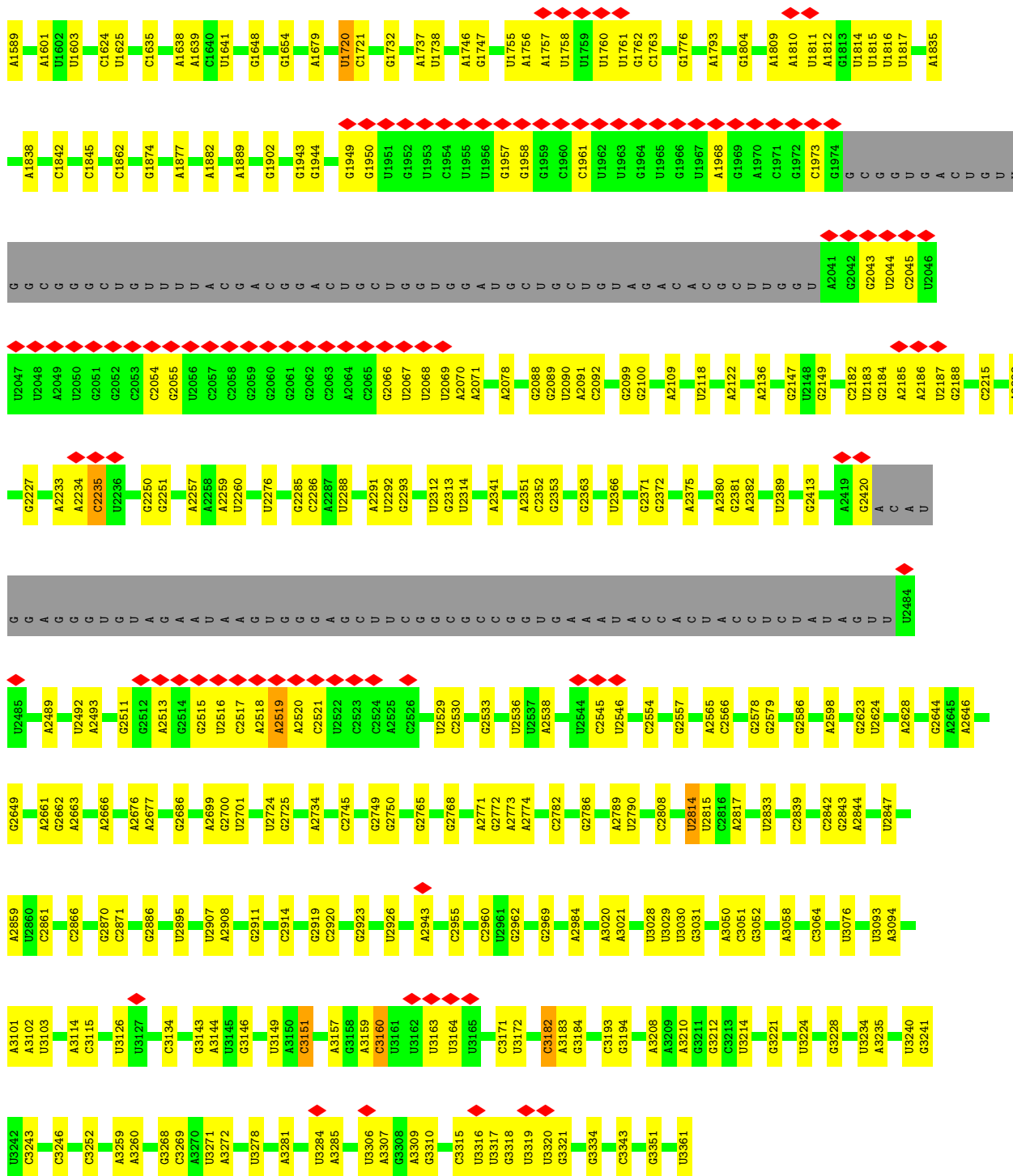
Mol	Chain	Residues	Atoms		AltConf
85	AC	6	Total 6	O 6	0
85	AE	3	Total 3	O 3	0
85	AF	16	Total 16	O 16	0
85	AG	10	Total 10	O 10	0
85	AH	11	Total 11	O 11	0
85	AI	4	Total 4	O 4	0
85	AK	16	Total 16	O 16	0
85	AM	3	Total 3	O 3	0
85	AP	2	Total 2	O 2	0
85	AQ	3	Total 3	O 3	0
85	A	38	Total 38	O 38	0
85	G	1	Total 1	O 1	0
85	O	1	Total 1	O 1	0

### 3 Residue-property plots [i](#)

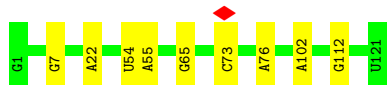
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: 25S ribosomal RNA






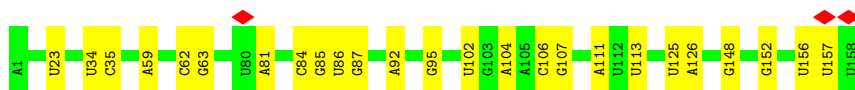
• Molecule 2: 5S ribosomal RNA



• Molecule 3: 5.8S ribosomal RNA

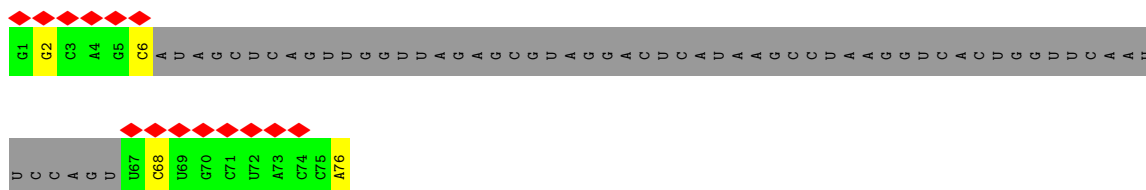


Chain 4:  84% 16%



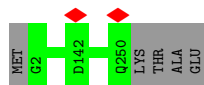
- Molecule 4: Mixture of endogenous E-tRNAs

Chain 10:  16% 5% 79%



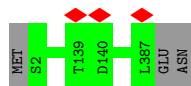
- Molecule 5: Ribosomal 60S subunit protein L2A

Chain j:  98%



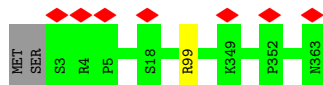
- Molecule 6: 60S ribosomal protein L3

Chain k:  99%



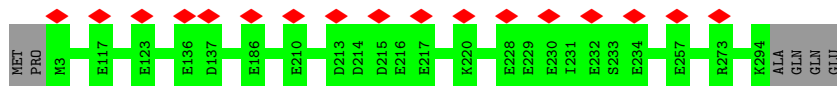
- Molecule 7: Ribosomal 60S subunit protein L4B

Chain l:  99%




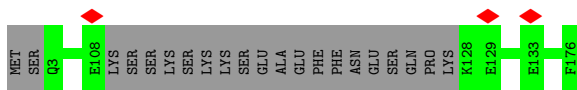
- Molecule 8: Ribosomal 60S subunit protein L5

Chain m:  6% 98%



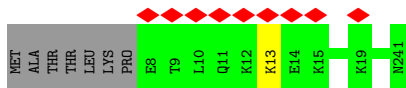
- Molecule 9: 60S ribosomal protein L6

Chain n:  88% 12%



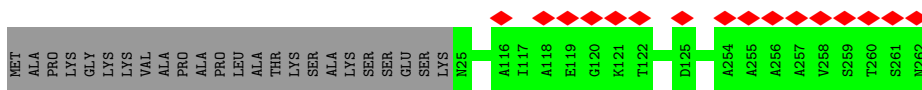
- Molecule 10: Ribosomal 60S subunit protein L7A

Chain o: 97%



- Molecule 11: 60S ribosomal protein L8

Chain p: 91%



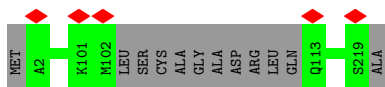
- Molecule 12: Ribosomal 60S subunit protein L9B

Chain q: 99%



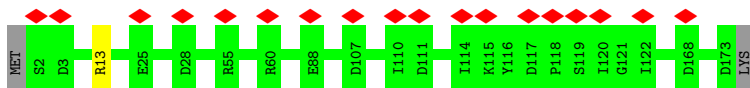
- Molecule 13: Ribosomal 60S subunit protein L10

Chain r: 95%



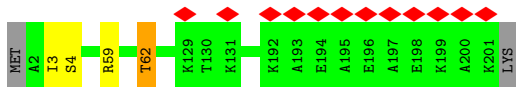
- Molecule 14: Ribosomal 60S subunit protein L11B

Chain s: 98%



- Molecule 15: 60S ribosomal protein L13

Chain t: 97%



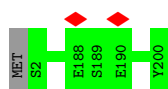
- Molecule 16: Ribosomal 60S subunit protein L14B



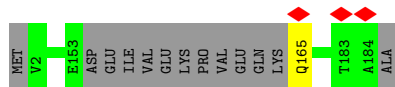
- Molecule 17: Ribosomal protein L15



- Molecule 18: Ribosomal 60S subunit protein L16A



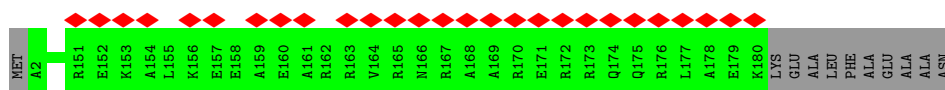
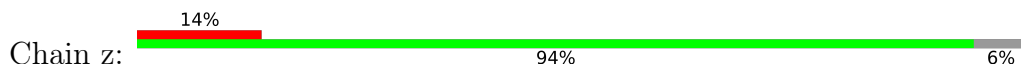
- Molecule 19: Ribosomal 60S subunit protein L17B



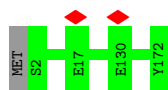
- Molecule 20: Ribosomal 60S subunit protein L18A



- Molecule 21: Ribosomal protein L19



- Molecule 22: 60S ribosomal protein L20





Chain AA:  99%



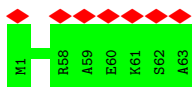
- Molecule 30: Ribosomal 60S subunit protein L28

Chain AB:  99%



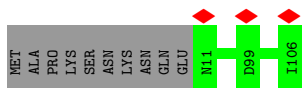
- Molecule 31: 60S ribosomal protein L29

Chain AC:  11% 100%



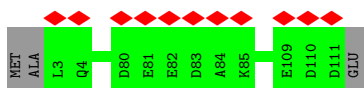
- Molecule 32: Ribosomal 60S subunit protein L30

Chain AD:  91% 9%



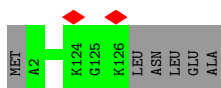
- Molecule 33: Ribosomal 60S subunit protein L31B

Chain AE:  10% 97%



- Molecule 34: Ribosomal 60S subunit protein L32

Chain AF:  95% 5%

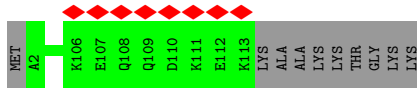


- Molecule 35: Ribosomal 60S subunit protein L33A

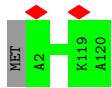
Chain AG:  99%



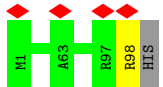
- Molecule 36: Ribosomal 60S subunit protein L34B



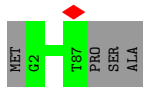
- Molecule 37: Ribosomal 60S subunit protein L35A



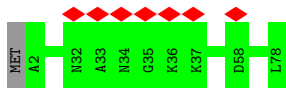
- Molecule 38: 60S ribosomal protein L36



- Molecule 39: Ribosomal protein L37



- Molecule 40: Ribosomal 60S subunit protein L38



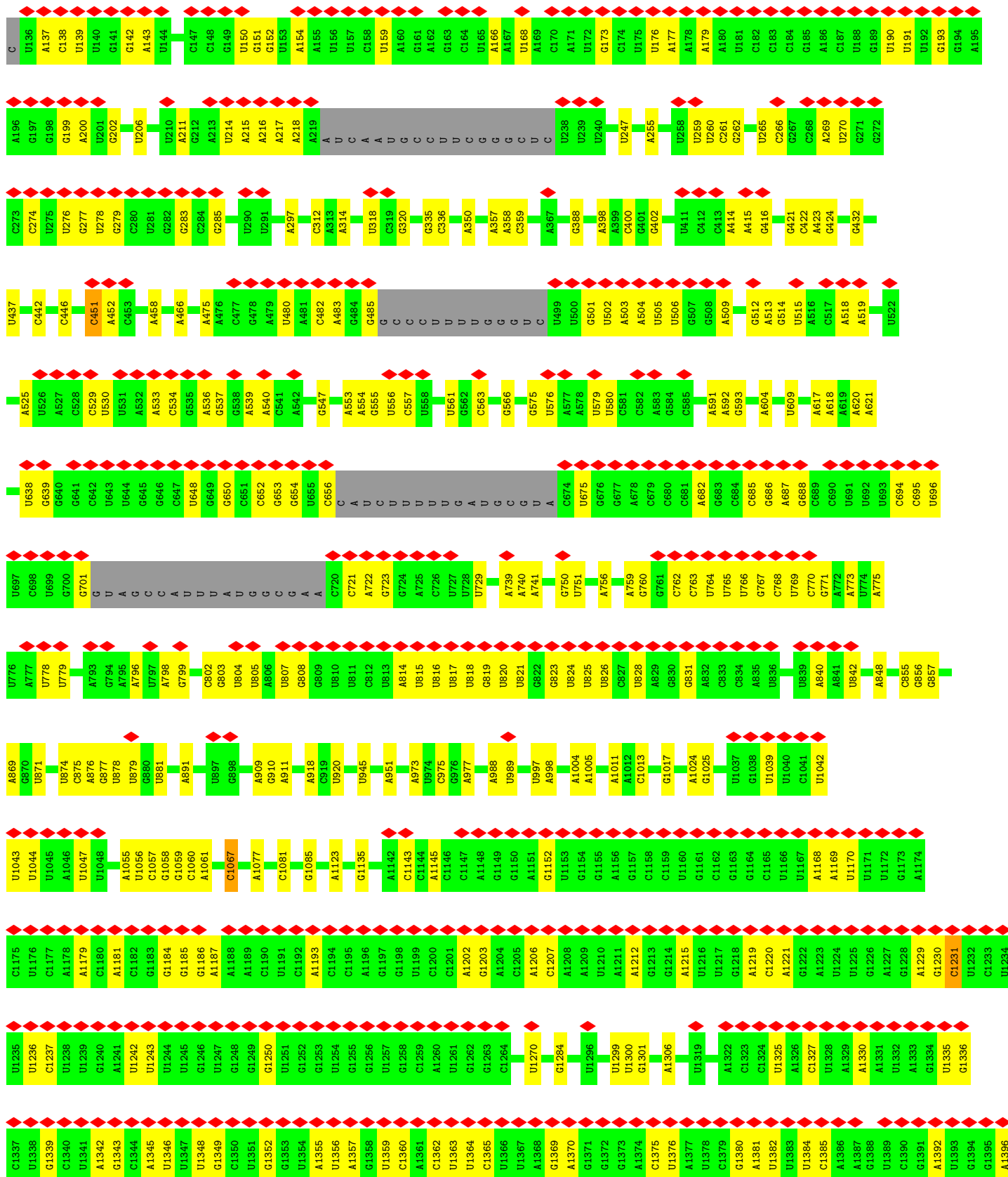
- Molecule 41: 60S ribosomal protein L39



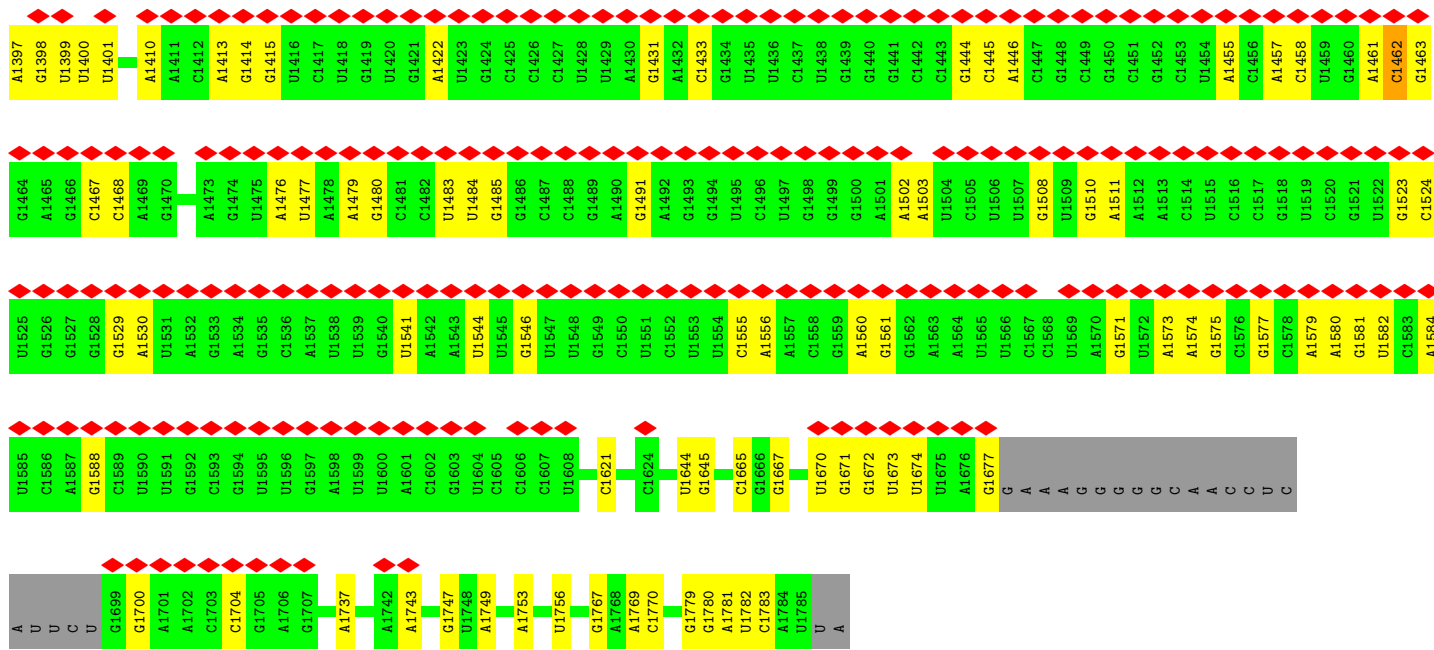
- Molecule 42: Rpl40bp



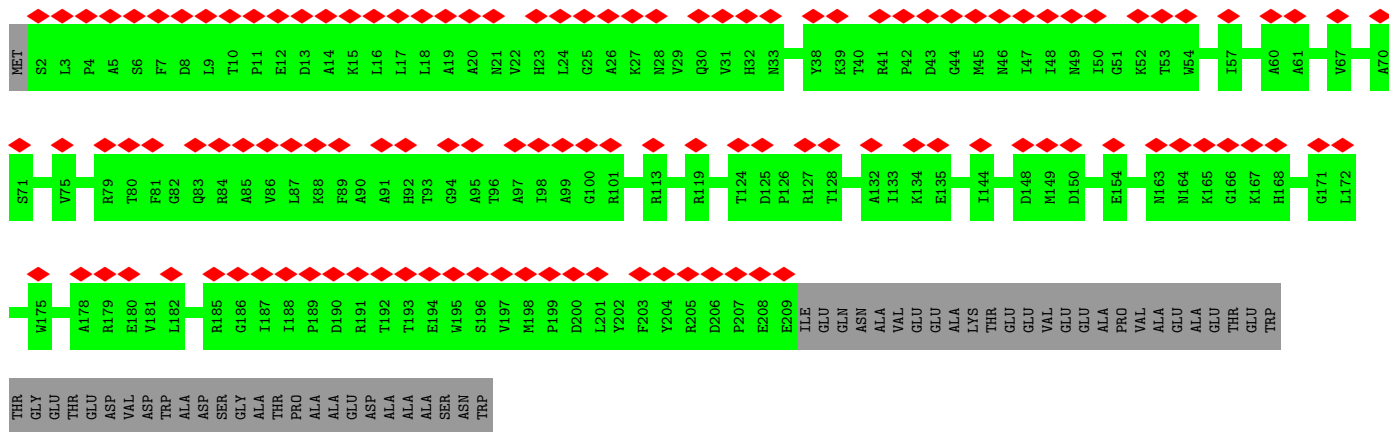
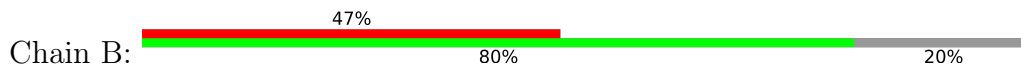




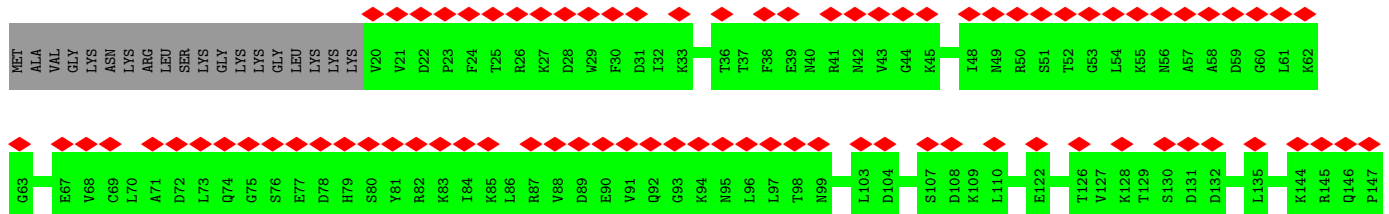
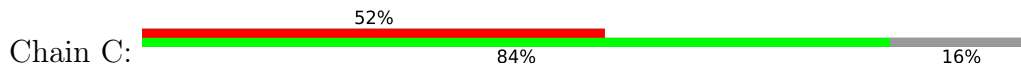


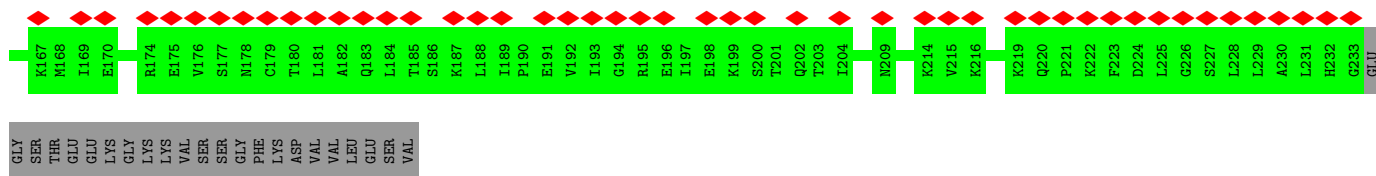


• Molecule 48: 40S ribosomal protein S0

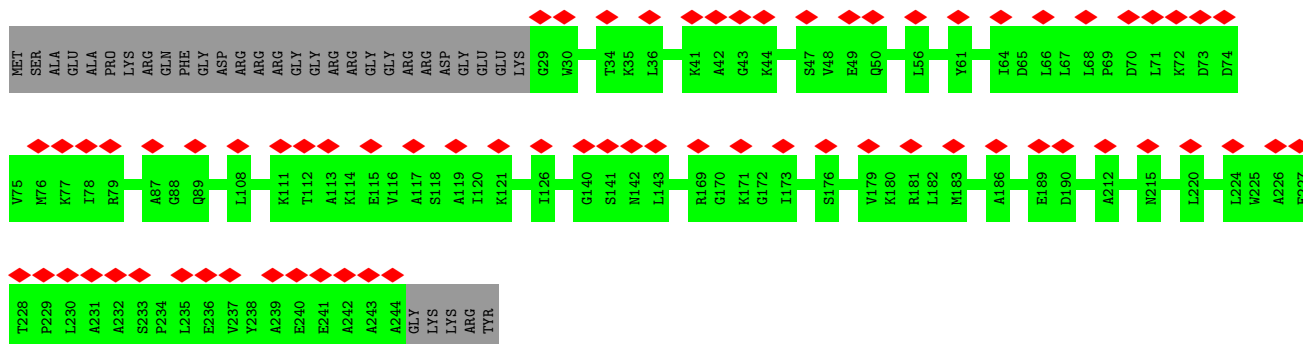
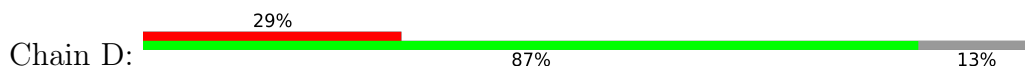


• Molecule 49: 40S ribosomal protein S1

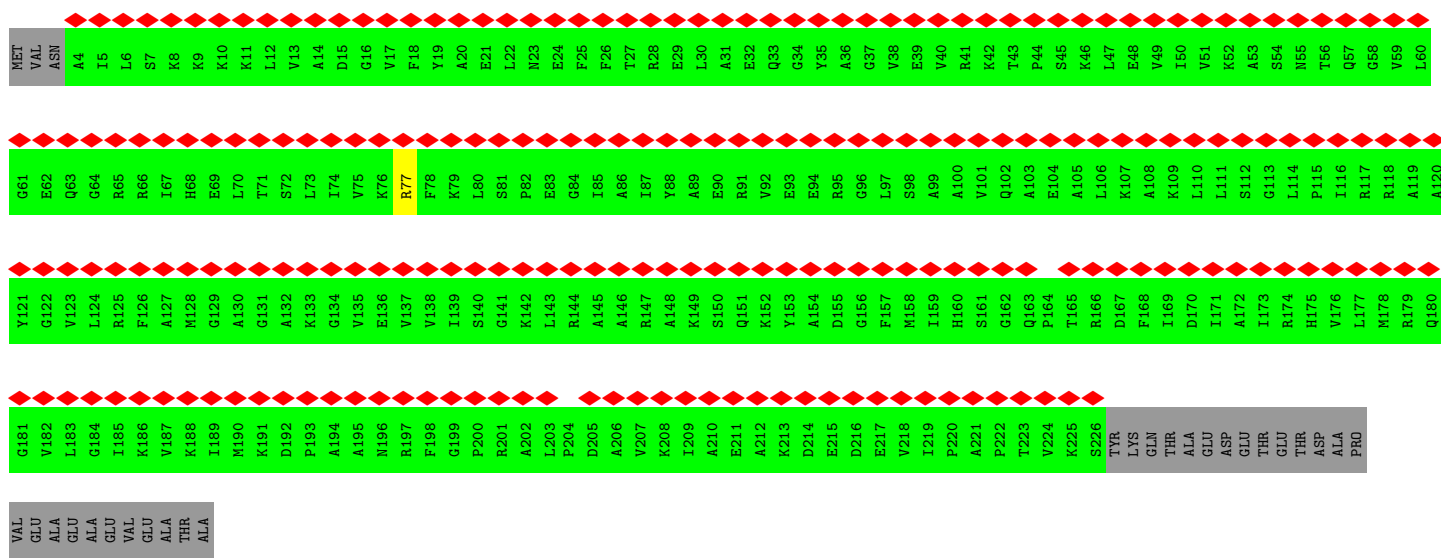
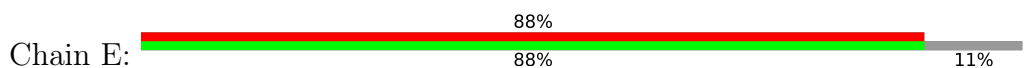




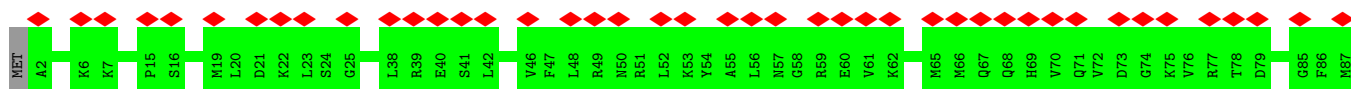
• Molecule 50: Ribosomal 40S subunit protein S2

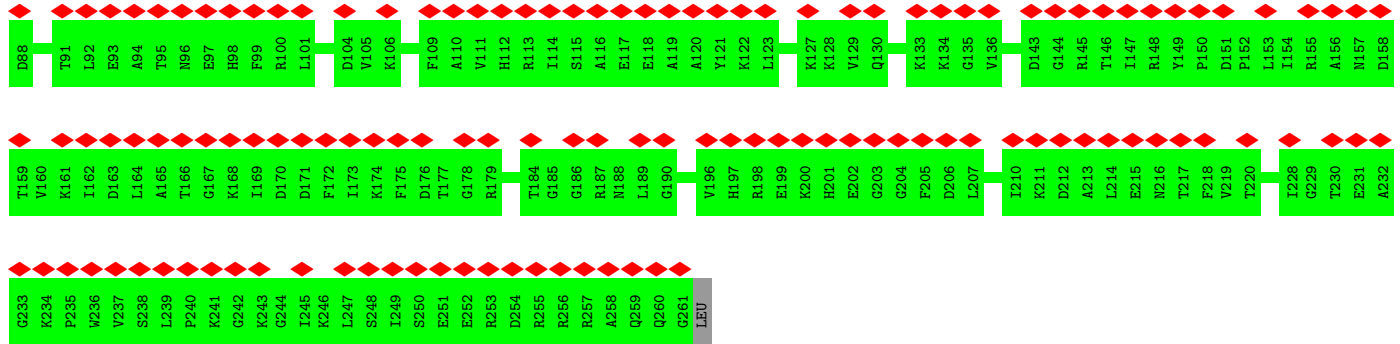


• Molecule 51: Ribosomal 40S subunit protein S3

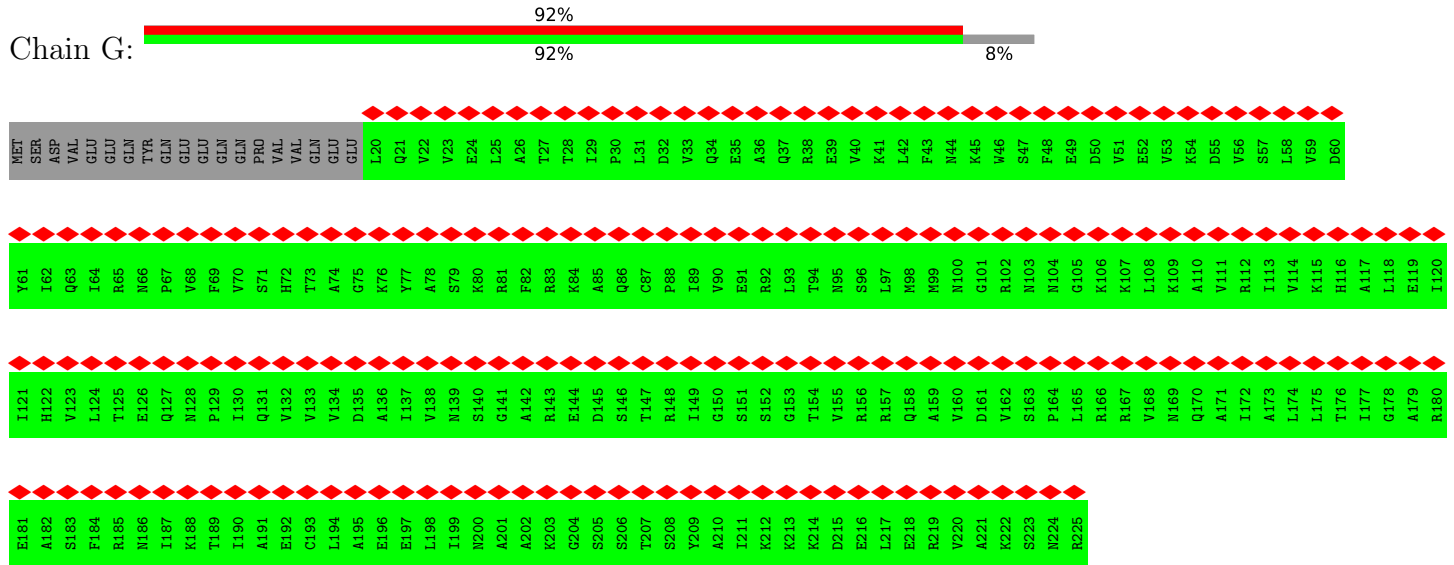


• Molecule 52: 40S ribosomal protein S4

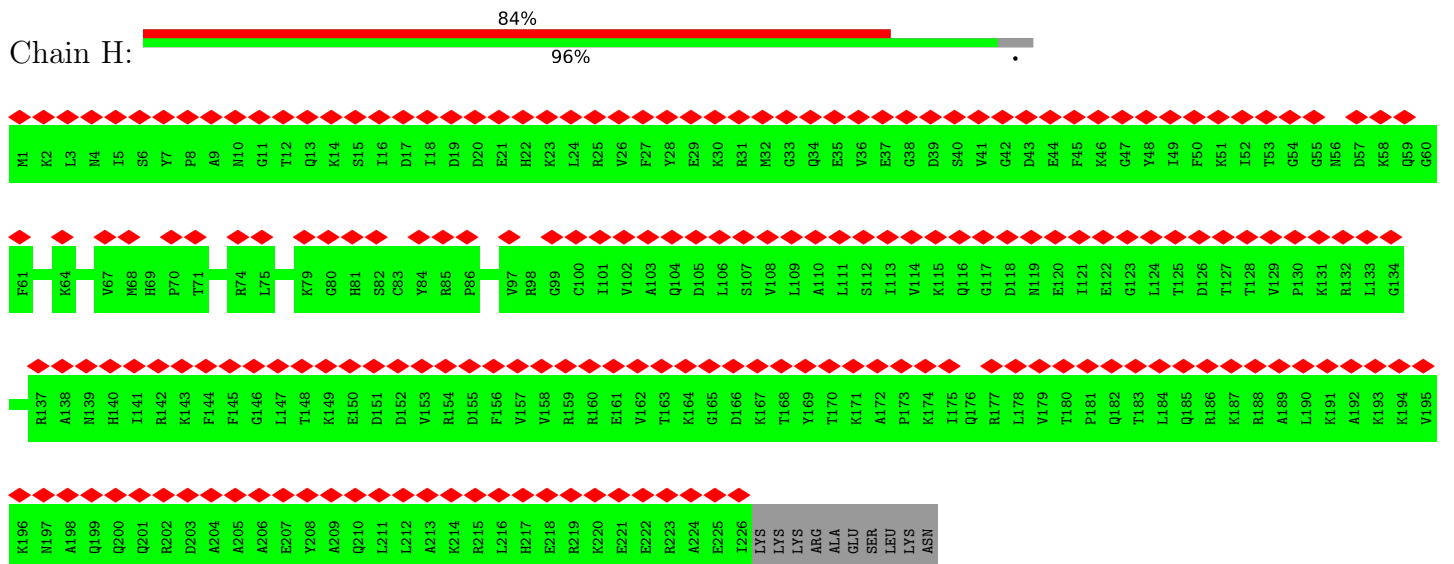




• Molecule 53: Ribosomal 40S subunit protein S5

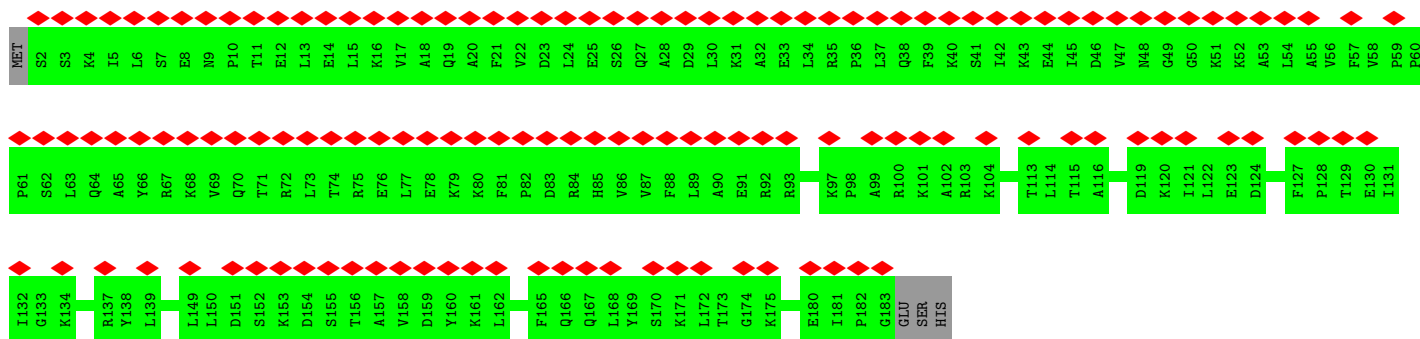


• Molecule 54: 40S ribosomal protein S6

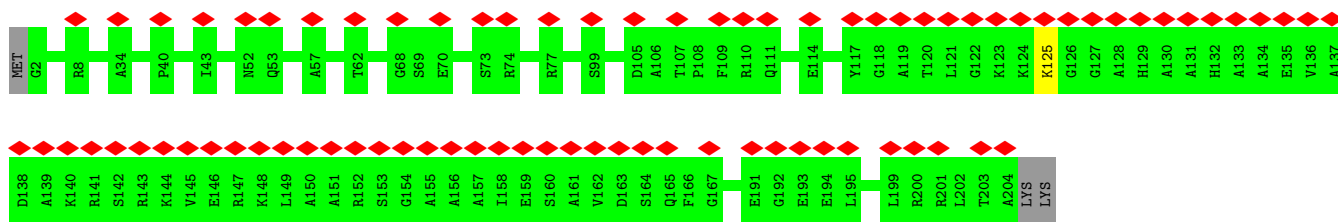
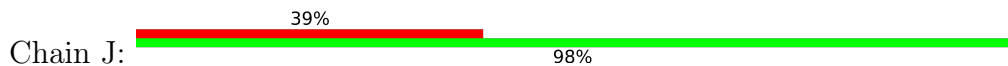


• Molecule 55: 40S ribosomal protein S7

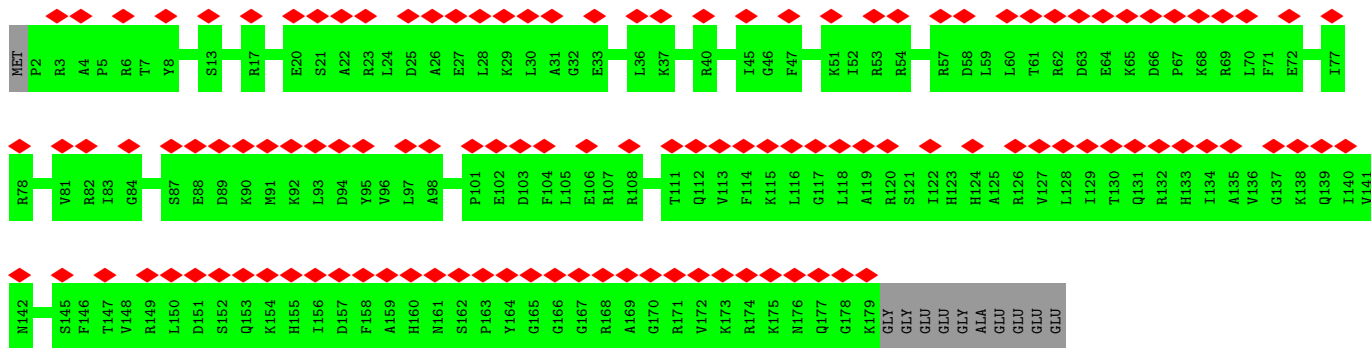
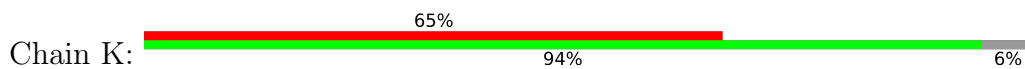




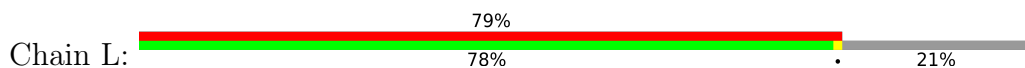
• Molecule 56: 40S ribosomal protein S8



• Molecule 57: Ribosomal 40S subunit protein S9B

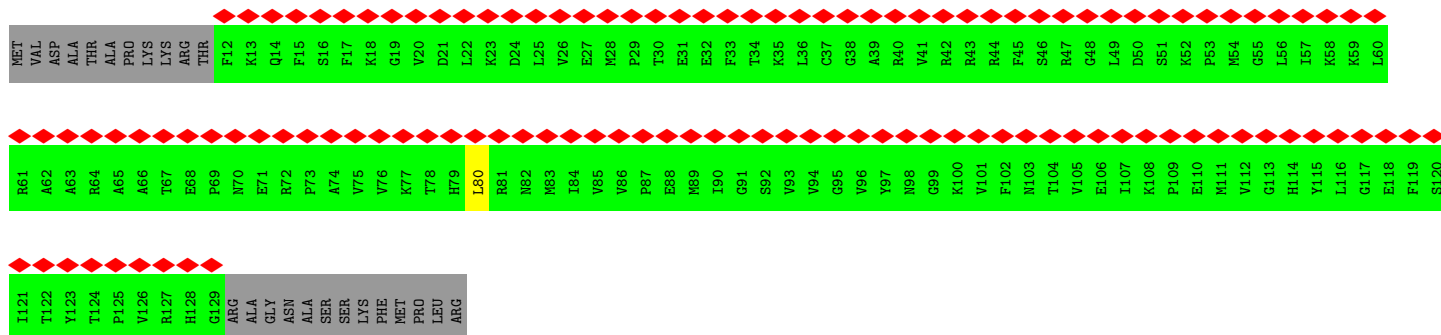


• Molecule 58: Ribosomal 40S subunit protein S10A

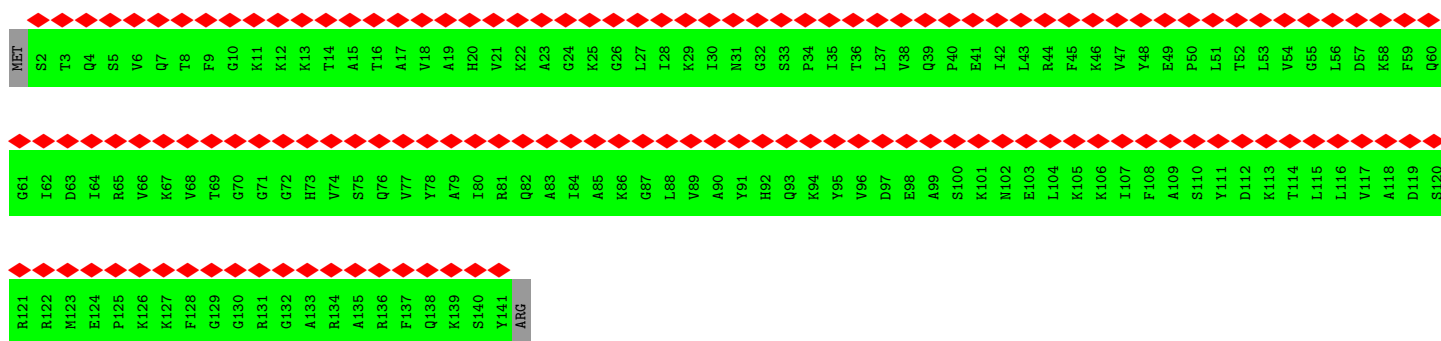


• Molecule 59: Ribosomal 40S subunit protein S11A

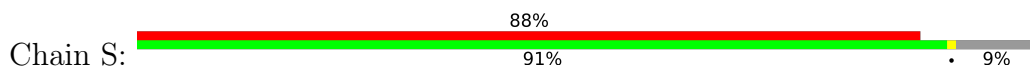




• Molecule 64: Ribosomal 40S subunit protein S16A

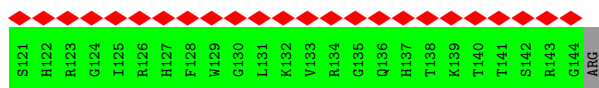


• Molecule 65: Ribosomal 40S subunit protein S17B

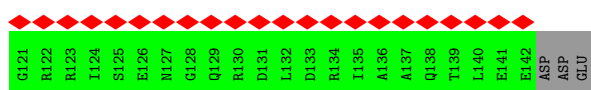


• Molecule 66: Ribosomal 40S subunit protein S18B

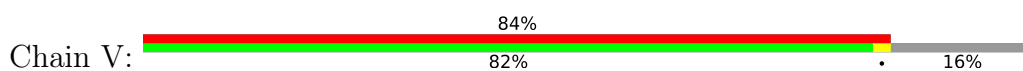




- Molecule 67: Ribosomal 40S subunit protein S19A



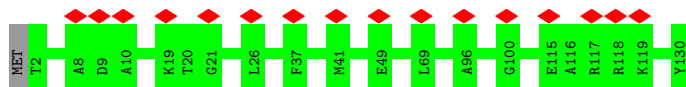
- Molecule 68: Ribosomal 40S subunit protein S20



- Molecule 69: 40S ribosomal protein S21

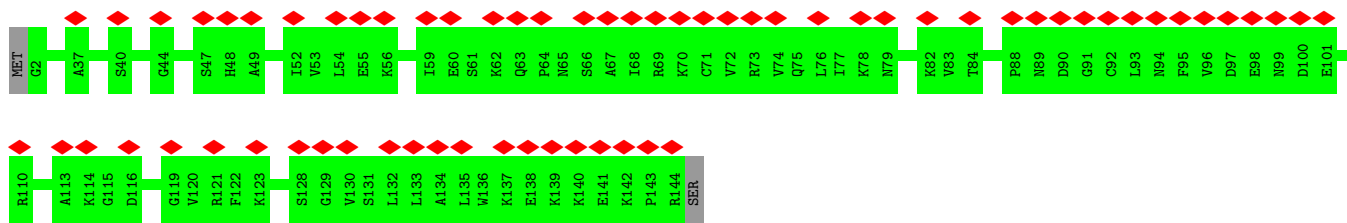


- Molecule 70: 40S ribosomal protein S22-A

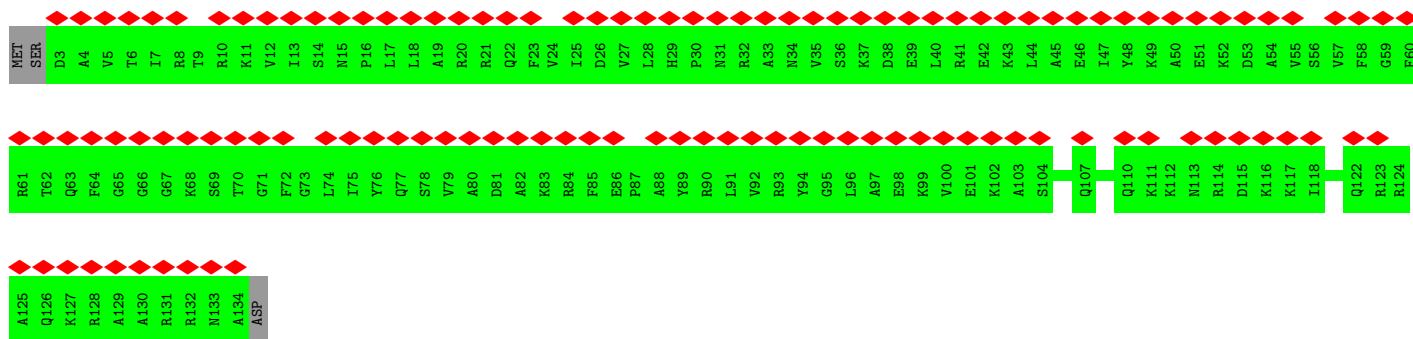
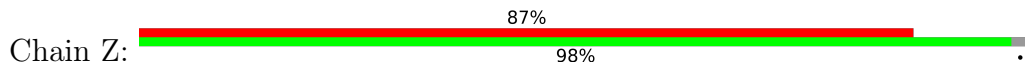


- Molecule 71: Ribosomal 40S subunit protein S23B

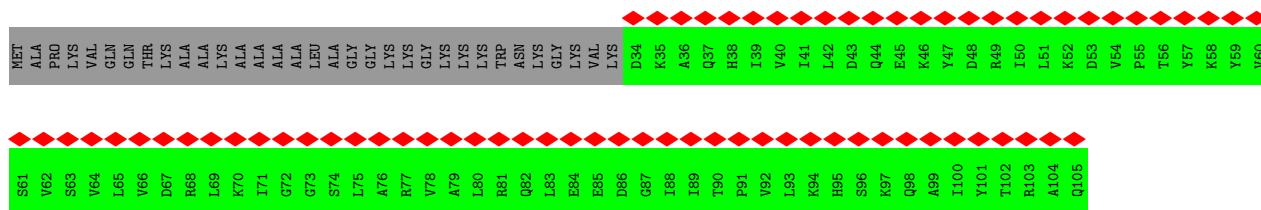




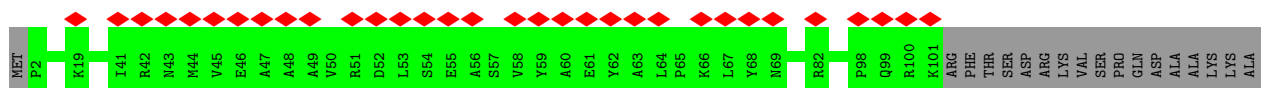
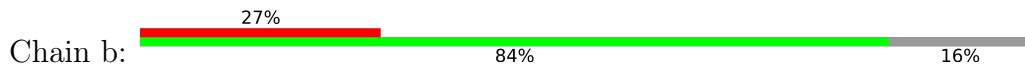
• Molecule 72: 40S ribosomal protein S24



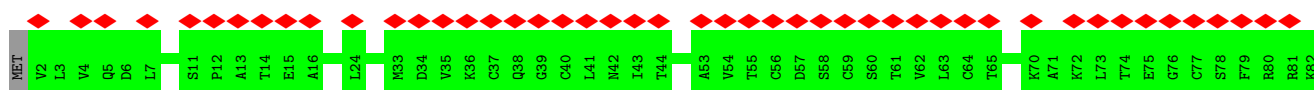
• Molecule 73: 40S ribosomal protein S25



• Molecule 74: 40S ribosomal protein S26



• Molecule 75: 40S ribosomal protein S27



• Molecule 76: Ribosomal 40S subunit protein S28B







## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	243386	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 ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.113	Depositor
Minimum map value	-0.967	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.063	Depositor
Recommended contour level	0.226	Depositor
Map size ( $\text{\AA}$ )	426.36002, 426.36002, 426.36002	wwPDB
Map dimensions	510, 510, 510	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.836, 0.836, 0.836	Depositor

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: PUT, MLZ, OMG, OMC, ZN, MG, IAS, SPD

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	1	0.46	12/76718 (0.0%)	0.85	51/119600 (0.0%)
2	3	0.38	0/2884	0.78	0/4492
3	4	0.42	0/3746	0.79	0/5832
4	10	0.43	1/375 (0.3%)	0.77	0/579
5	j	0.31	0/1931	0.56	0/2592
6	k	0.31	0/3156	0.55	0/4246
7	l	0.28	0/2799	0.53	0/3777
8	m	0.28	0/2447	0.50	0/3294
9	n	0.29	0/1258	0.51	0/1696
10	o	0.29	0/1929	0.51	0/2589
11	p	0.27	0/1869	0.46	0/2519
12	q	0.28	0/1537	0.52	0/2067
13	r	0.28	0/1724	0.53	0/2314
14	s	0.27	0/1404	0.54	0/1880
15	t	0.48	2/1637 (0.1%)	0.60	1/2195 (0.0%)
16	u	0.27	0/1044	0.52	0/1407
17	v	0.31	0/1753	0.58	0/2347
18	w	0.29	0/1620	0.51	0/2167
19	x	0.28	0/1398	0.55	0/1879
20	y	0.28	0/1511	0.58	0/2022
21	z	0.26	0/1483	0.55	0/1972
22	0	0.30	0/1483	0.53	0/1997
23	2	0.30	0/1305	0.52	0/1749
24	5	0.29	0/871	0.47	0/1175
25	6	0.29	0/994	0.57	0/1339
26	7	0.29	0/536	0.54	0/712
27	8	0.29	0/990	0.53	0/1337
28	9	0.28	0/999	0.54	0/1334
29	AA	0.29	0/1112	0.47	0/1488
30	AB	0.30	0/1199	0.52	0/1607
31	AC	0.26	0/522	0.50	0/692
32	AD	0.29	0/738	0.46	0/994

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
33	AE	0.27	0/902	0.52	0/1212
34	AF	0.29	0/1039	0.53	0/1390
35	AG	0.32	0/895	0.53	0/1201
36	AH	0.29	0/934	0.57	0/1242
37	AI	0.26	0/1004	0.56	0/1337
38	AJ	0.26	0/780	0.54	0/1033
39	AK	0.30	0/690	0.63	0/916
40	AL	0.30	0/632	0.53	0/842
41	AM	0.25	0/458	0.58	0/609
42	AN	0.27	0/436	0.56	0/577
43	AO	0.39	0/237	0.66	0/304
44	AP	0.29	0/840	0.52	0/1108
45	AQ	0.29	0/705	0.57	0/940
46	i	0.24	0/864	0.49	0/1156
47	A	0.38	2/40362 (0.0%)	0.84	23/62888 (0.0%)
48	B	0.28	0/1666	0.49	0/2273
49	C	0.26	0/1750	0.52	0/2354
50	D	0.28	0/1648	0.49	0/2237
51	E	0.27	0/1731	0.54	0/2324
52	F	0.29	0/2096	0.52	0/2822
53	G	0.26	0/1631	0.51	0/2199
54	H	0.27	0/1845	0.53	0/2464
55	I	0.28	0/1490	0.52	0/2004
56	J	0.28	0/1606	0.57	0/2150
57	K	0.28	0/1478	0.52	0/1978
58	L	0.28	0/801	0.56	0/1081
59	M	0.30	0/1154	0.53	0/1553
60	N	0.25	0/892	0.58	0/1203
61	O	0.27	0/1210	0.47	0/1631
62	P	0.27	0/944	0.58	0/1265
63	Q	0.28	0/954	0.58	1/1282 (0.1%)
64	R	0.26	0/1109	0.51	0/1486
65	S	0.25	0/1014	0.54	0/1361
66	T	0.25	0/1186	0.53	0/1590
67	U	0.27	0/1120	0.52	0/1508
68	V	0.25	0/800	0.51	0/1082
69	W	0.29	0/683	0.54	0/918
70	X	0.29	0/1049	0.52	0/1412
71	Y	0.40	0/1128	0.58	0/1505
72	Z	0.28	0/1086	0.54	0/1447
73	a	0.27	0/585	0.51	0/789
74	b	0.27	0/811	0.57	0/1085
75	c	0.27	0/624	0.50	0/843

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
76	d	0.27	0/489	0.65	0/654
77	e	0.26	0/466	0.53	0/620
78	f	0.27	0/451	0.56	0/601
79	g	0.26	0/585	0.58	0/778
80	h	0.25	0/2451	0.52	0/3337
All	All	0.38	17/214283 (0.0%)	0.74	76/314481 (0.0%)

The worst 5 of 17 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	1738	U	O3'-P	-10.97	1.48	1.61
47	A	1362	C	O3'-P	-7.76	1.51	1.61
1	1	1575	A	O3'-P	-7.36	1.52	1.61
15	t	62	THR	C-O	-6.56	1.10	1.23
1	1	484	U	C1'-N1	6.47	1.58	1.48

The worst 5 of 76 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
47	A	451	C	N1-C2-O2	9.04	124.33	118.90
47	A	451	C	N3-C2-O2	-8.05	116.26	121.90
47	A	451	C	C2-N1-C1'	7.58	127.14	118.80
1	1	2215	C	N3-C2-O2	-7.47	116.67	121.90
1	1	620	A	N1-C6-N6	7.28	122.97	118.60

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	j	248/254 (98%)	240 (97%)	8 (3%)	0	100	100
6	k	385/389 (99%)	373 (97%)	12 (3%)	0	100	100
7	l	359/363 (99%)	349 (97%)	10 (3%)	0	100	100
8	m	290/298 (97%)	279 (96%)	11 (4%)	0	100	100
9	n	152/176 (86%)	150 (99%)	2 (1%)	0	100	100
10	o	233/241 (97%)	226 (97%)	7 (3%)	0	100	100
11	p	236/262 (90%)	231 (98%)	5 (2%)	0	100	100
12	q	188/191 (98%)	183 (97%)	5 (3%)	0	100	100
13	r	204/220 (93%)	201 (98%)	3 (2%)	0	100	100
14	s	171/174 (98%)	166 (97%)	5 (3%)	0	100	100
15	t	198/202 (98%)	196 (99%)	2 (1%)	0	100	100
16	u	128/131 (98%)	125 (98%)	3 (2%)	0	100	100
17	v	201/204 (98%)	198 (98%)	3 (2%)	0	100	100
18	w	197/200 (98%)	195 (99%)	2 (1%)	0	100	100
19	x	168/185 (91%)	165 (98%)	3 (2%)	0	100	100
20	y	186/186 (100%)	182 (98%)	4 (2%)	0	100	100
21	z	178/190 (94%)	175 (98%)	3 (2%)	0	100	100
22	0	171/172 (99%)	170 (99%)	1 (1%)	0	100	100
23	2	159/160 (99%)	157 (99%)	2 (1%)	0	100	100
24	5	103/124 (83%)	97 (94%)	5 (5%)	1 (1%)	15	17
25	6	129/137 (94%)	126 (98%)	3 (2%)	0	100	100
26	7	61/155 (39%)	61 (100%)	0	0	100	100
27	8	119/142 (84%)	118 (99%)	1 (1%)	0	100	100
28	9	124/127 (98%)	123 (99%)	1 (1%)	0	100	100
29	AA	133/136 (98%)	132 (99%)	1 (1%)	0	100	100
30	AB	146/149 (98%)	138 (94%)	8 (6%)	0	100	100
31	AC	62/63 (98%)	61 (98%)	1 (2%)	0	100	100
32	AD	94/106 (89%)	93 (99%)	1 (1%)	0	100	100
33	AE	107/112 (96%)	106 (99%)	1 (1%)	0	100	100
34	AF	124/131 (95%)	123 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
35	AG	107/107 (100%)	104 (97%)	3 (3%)	0	100	100
36	AH	114/122 (93%)	112 (98%)	2 (2%)	0	100	100
37	AI	118/120 (98%)	114 (97%)	4 (3%)	0	100	100
38	AJ	97/99 (98%)	96 (99%)	1 (1%)	0	100	100
39	AK	84/90 (93%)	81 (96%)	3 (4%)	0	100	100
40	AL	76/78 (97%)	73 (96%)	3 (4%)	0	100	100
41	AM	49/51 (96%)	48 (98%)	1 (2%)	0	100	100
42	AN	51/52 (98%)	51 (100%)	0	0	100	100
43	AO	23/25 (92%)	23 (100%)	0	0	100	100
44	AP	101/106 (95%)	100 (99%)	1 (1%)	0	100	100
45	AQ	89/92 (97%)	85 (96%)	4 (4%)	0	100	100
46	i	109/267 (41%)	102 (94%)	7 (6%)	0	100	100
48	B	206/261 (79%)	201 (98%)	5 (2%)	0	100	100
49	C	212/256 (83%)	207 (98%)	5 (2%)	0	100	100
50	D	214/249 (86%)	209 (98%)	5 (2%)	0	100	100
51	E	221/251 (88%)	214 (97%)	7 (3%)	0	100	100
52	F	258/262 (98%)	254 (98%)	4 (2%)	0	100	100
53	G	204/225 (91%)	197 (97%)	7 (3%)	0	100	100
54	H	224/236 (95%)	221 (99%)	3 (1%)	0	100	100
55	I	180/186 (97%)	174 (97%)	6 (3%)	0	100	100
56	J	201/206 (98%)	200 (100%)	1 (0%)	0	100	100
57	K	176/189 (93%)	175 (99%)	1 (1%)	0	100	100
58	L	91/118 (77%)	84 (92%)	6 (7%)	1 (1%)	14	15
59	M	139/155 (90%)	136 (98%)	3 (2%)	0	100	100
60	N	114/143 (80%)	96 (84%)	18 (16%)	0	100	100
61	O	148/151 (98%)	145 (98%)	3 (2%)	0	100	100
62	P	123/132 (93%)	119 (97%)	4 (3%)	0	100	100
63	Q	116/142 (82%)	107 (92%)	9 (8%)	0	100	100
64	R	138/142 (97%)	134 (97%)	4 (3%)	0	100	100
65	S	123/137 (90%)	120 (98%)	3 (2%)	0	100	100
66	T	140/145 (97%)	136 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
67	U	139/145 (96%)	136 (98%)	3 (2%)	0	100	100
68	V	98/119 (82%)	96 (98%)	2 (2%)	0	100	100
69	W	85/87 (98%)	83 (98%)	2 (2%)	0	100	100
70	X	127/130 (98%)	125 (98%)	2 (2%)	0	100	100
71	Y	141/145 (97%)	139 (99%)	2 (1%)	0	100	100
72	Z	130/135 (96%)	130 (100%)	0	0	100	100
73	a	70/105 (67%)	69 (99%)	1 (1%)	0	100	100
74	b	98/119 (82%)	96 (98%)	2 (2%)	0	100	100
75	c	79/82 (96%)	75 (95%)	4 (5%)	0	100	100
76	d	60/67 (90%)	55 (92%)	5 (8%)	0	100	100
77	e	53/56 (95%)	51 (96%)	2 (4%)	0	100	100
78	f	54/63 (86%)	52 (96%)	2 (4%)	0	100	100
79	g	68/193 (35%)	61 (90%)	7 (10%)	0	100	100
80	h	309/317 (98%)	291 (94%)	18 (6%)	0	100	100
All	All	11011/12138 (91%)	10716 (97%)	293 (3%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
58	L	88	PRO
24	5	20	ALA

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	j	191/194 (98%)	191 (100%)	0	100	100
6	k	326/328 (99%)	326 (100%)	0	100	100
7	l	290/292 (99%)	289 (100%)	1 (0%)	92	96
8	m	247/252 (98%)	247 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
9	n	135/154 (88%)	135 (100%)	0	100	100
10	o	199/204 (98%)	198 (100%)	1 (0%)	88	95
11	p	198/216 (92%)	198 (100%)	0	100	100
12	q	169/170 (99%)	169 (100%)	0	100	100
13	r	178/186 (96%)	178 (100%)	0	100	100
14	s	148/149 (99%)	147 (99%)	1 (1%)	84	92
15	t	166/168 (99%)	164 (99%)	2 (1%)	71	83
16	u	108/109 (99%)	108 (100%)	0	100	100
17	v	177/178 (99%)	177 (100%)	0	100	100
18	w	166/167 (99%)	166 (100%)	0	100	100
19	x	142/154 (92%)	141 (99%)	1 (1%)	84	92
20	y	156/154 (101%)	156 (100%)	0	100	100
21	z	147/153 (96%)	147 (100%)	0	100	100
22	0	158/157 (101%)	158 (100%)	0	100	100
23	2	135/134 (101%)	134 (99%)	1 (1%)	84	92
24	5	95/112 (85%)	95 (100%)	0	100	100
25	6	101/103 (98%)	101 (100%)	0	100	100
26	7	57/127 (45%)	57 (100%)	0	100	100
27	8	108/121 (89%)	108 (100%)	0	100	100
28	9	111/112 (99%)	110 (99%)	1 (1%)	78	89
29	AA	117/118 (99%)	117 (100%)	0	100	100
30	AB	120/121 (99%)	120 (100%)	0	100	100
31	AC	50/49 (102%)	50 (100%)	0	100	100
32	AD	81/90 (90%)	81 (100%)	0	100	100
33	AE	98/100 (98%)	98 (100%)	0	100	100
34	AF	111/115 (96%)	111 (100%)	0	100	100
35	AG	94/92 (102%)	94 (100%)	0	100	100
36	AH	99/102 (97%)	99 (100%)	0	100	100
37	AI	106/106 (100%)	106 (100%)	0	100	100
38	AJ	79/79 (100%)	78 (99%)	1 (1%)	69	81
39	AK	70/73 (96%)	70 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
40	AL	69/69 (100%)	69 (100%)	0	100	100
41	AM	47/47 (100%)	47 (100%)	0	100	100
42	AN	48/47 (102%)	48 (100%)	0	100	100
43	AO	24/24 (100%)	18 (75%)	6 (25%)	0	0
44	AP	88/89 (99%)	88 (100%)	0	100	100
45	AQ	72/73 (99%)	72 (100%)	0	100	100
46	i	92/212 (43%)	92 (100%)	0	100	100
48	B	176/215 (82%)	176 (100%)	0	100	100
49	C	194/229 (85%)	194 (100%)	0	100	100
50	D	174/198 (88%)	174 (100%)	0	100	100
51	E	174/196 (89%)	173 (99%)	1 (1%)	86	93
52	F	218/220 (99%)	218 (100%)	0	100	100
53	G	178/197 (90%)	178 (100%)	0	100	100
54	H	195/204 (96%)	195 (100%)	0	100	100
55	I	163/167 (98%)	163 (100%)	0	100	100
56	J	157/160 (98%)	156 (99%)	1 (1%)	86	93
57	K	153/160 (96%)	153 (100%)	0	100	100
58	L	87/104 (84%)	87 (100%)	0	100	100
59	M	122/134 (91%)	121 (99%)	1 (1%)	81	90
60	N	98/123 (80%)	98 (100%)	0	100	100
61	O	129/130 (99%)	129 (100%)	0	100	100
62	P	96/101 (95%)	96 (100%)	0	100	100
63	Q	102/121 (84%)	102 (100%)	0	100	100
64	R	114/116 (98%)	114 (100%)	0	100	100
65	S	112/122 (92%)	111 (99%)	1 (1%)	78	89
66	T	126/129 (98%)	126 (100%)	0	100	100
67	U	113/117 (97%)	112 (99%)	1 (1%)	78	89
68	V	90/105 (86%)	88 (98%)	2 (2%)	52	68
69	W	71/71 (100%)	71 (100%)	0	100	100
70	X	112/113 (99%)	112 (100%)	0	100	100
71	Y	116/118 (98%)	116 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
72	Z	109/112 (97%)	109 (100%)	0	100	100
73	a	64/85 (75%)	64 (100%)	0	100	100
74	b	86/102 (84%)	86 (100%)	0	100	100
75	c	72/73 (99%)	72 (100%)	0	100	100
76	d	54/58 (93%)	54 (100%)	0	100	100
77	e	47/48 (98%)	47 (100%)	0	100	100
78	f	48/54 (89%)	48 (100%)	0	100	100
79	g	62/175 (35%)	62 (100%)	0	100	100
80	h	259/263 (98%)	258 (100%)	1 (0%)	91	96
All	All	9444/10220 (92%)	9421 (100%)	23 (0%)	93	97

5 of 23 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
43	AO	25	LYS
59	M	67	ARG
56	J	125	LYS
65	S	80	ARG
23	2	83	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 13 such sidechains are listed below:

Mol	Chain	Res	Type
45	AQ	32	GLN
48	B	30	GLN
68	V	93	GLN
55	I	48	ASN
66	T	89	GLN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	1	3205/3359 (95%)	560 (17%)	36 (1%)
2	3	120/121 (99%)	9 (7%)	0
3	4	157/158 (99%)	24 (15%)	3 (1%)
4	10	14/76 (18%)	3 (21%)	0
47	A	1685/1787 (94%)	390 (23%)	47 (2%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
All	All	5181/5501 (94%)	986 (19%)	86 (1%)

5 of 986 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	1	24	U
1	1	25	A
1	1	29	G
1	1	39	A
1	1	42	A

5 of 86 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
47	A	553	A
47	A	1335	U
47	A	638	U
47	A	820	U
47	A	1396	A

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

6 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
25	MLZ	6	110	25	8,9,10	0.71	0	4,9,11	0.92	0
44	MLZ	AP	40	44	8,9,10	0.70	0	4,9,11	0.95	0
44	MLZ	AP	55	44	8,9,10	0.66	0	4,9,11	0.83	0
1	OMG	1	2765	1	18,26,27	3.46	7 (38%)	20,38,41	1.97	5 (25%)
62	IAS	P	119	62	4,7,8	0.90	0	2,8,10	1.55	0
1	OMC	1	2808	1	15,22,23	3.23	6 (40%)	17,31,34	1.34	3 (17%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
25	MLZ	6	110	25	-	3/7/8/10	-
44	MLZ	AP	40	44	-	0/7/8/10	-
44	MLZ	AP	55	44	-	3/7/8/10	-
1	OMG	1	2765	1	-	0/5/27/28	0/3/3/3
62	IAS	P	119	62	-	0/3/7/8	-
1	OMC	1	2808	1	-	1/7/27/28	0/2/2/2

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	1	2765	OMG	C4-N3	8.29	1.48	1.35
1	1	2808	OMC	C6-N1	7.50	1.45	1.35
1	1	2765	OMG	C5-C6	6.94	1.53	1.41
1	1	2765	OMG	C6-N1	5.95	1.43	1.33
1	1	2808	OMC	C2-N3	5.42	1.48	1.38

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	2765	OMG	N3-C2-N1	-5.71	119.60	127.22
1	1	2765	OMG	C2-N3-C4	4.23	120.19	115.36
1	1	2808	OMC	C4-N3-C2	3.64	120.03	116.34
1	1	2765	OMG	C2-N1-C6	2.48	119.87	115.93
1	1	2808	OMC	N4-C4-N3	2.40	120.28	116.49

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
25	6	110	MLZ	N-CA-CB-CG
25	6	110	MLZ	C-CA-CB-CG
44	AP	55	MLZ	CG-CD-CE-NZ
44	AP	55	MLZ	CA-CB-CG-CD
44	AP	55	MLZ	CE-CD-CG-CB

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 463 ligands modelled in this entry, 451 are monoatomic - leaving 12 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
81	SPD	1	3406	-	9,9,9	0.15	0	8,8,8	0.24	0
81	SPD	1	3405	-	9,9,9	0.58	0	8,8,8	1.47	2 (25%)
81	SPD	1	3407	-	9,9,9	0.26	0	8,8,8	0.44	0
82	PUT	4	201	-	5,5,5	0.20	0	4,4,4	0.19	0
81	SPD	1	3402	-	9,9,9	0.16	0	8,8,8	0.18	0
81	SPD	1	3410	-	9,9,9	0.33	0	8,8,8	0.60	0
82	PUT	1	3403	-	5,5,5	0.14	0	4,4,4	0.20	0
81	SPD	1	3408	-	9,9,9	0.15	0	8,8,8	0.23	0
81	SPD	1	3409	-	9,9,9	0.16	0	8,8,8	0.18	0
81	SPD	1	3411	-	9,9,9	0.50	0	8,8,8	0.61	0
81	SPD	1	3404	-	9,9,9	0.14	0	8,8,8	0.16	0
81	SPD	1	3401	-	9,9,9	0.32	0	8,8,8	0.84	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
81	SPD	1	3406	-	-	4/7/7/7	-
81	SPD	1	3405	-	-	4/7/7/7	-
81	SPD	1	3407	-	-	4/7/7/7	-
82	PUT	4	201	-	-	2/3/3/3	-
81	SPD	1	3402	-	-	4/7/7/7	-
81	SPD	1	3410	-	-	4/7/7/7	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
82	PUT	1	3403	-	-	0/3/3/3	-
81	SPD	1	3408	-	-	6/7/7/7	-
81	SPD	1	3409	-	-	5/7/7/7	-
81	SPD	1	3411	-	-	5/7/7/7	-
81	SPD	1	3404	-	-	5/7/7/7	-
81	SPD	1	3401	-	-	1/7/7/7	-

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
81	1	3405	SPD	C7-N6-C5	-3.11	98.78	113.45
81	1	3405	SPD	C4-C5-N6	2.04	117.64	112.14

There are no chirality outliers.

5 of 44 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
81	1	3409	SPD	C4-C5-N6-C7
81	1	3411	SPD	C7-C8-C9-N10
81	1	3411	SPD	N6-C7-C8-C9
81	1	3404	SPD	N6-C7-C8-C9
81	1	3405	SPD	C3-C4-C5-N6

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



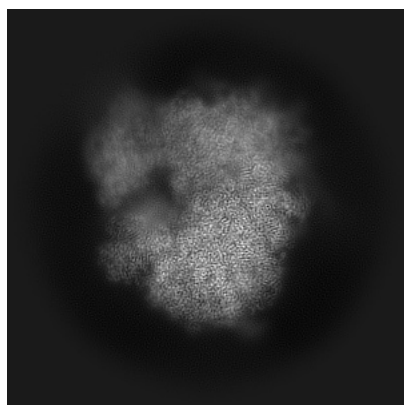
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13737. These allow visual inspection of the internal detail of the map and identification of artifacts.

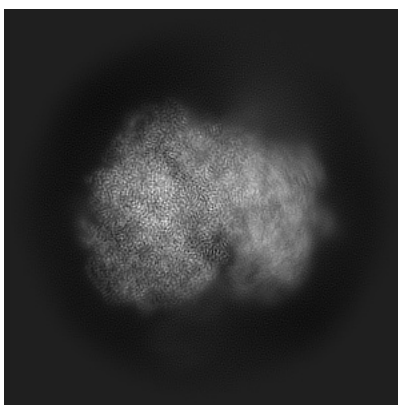
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

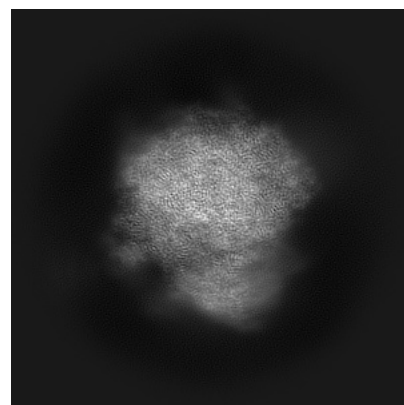
#### 6.1.1 Primary map



X



Y

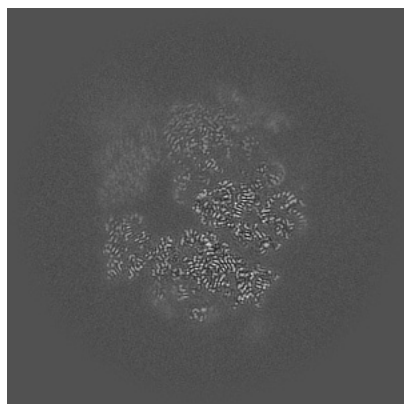


Z

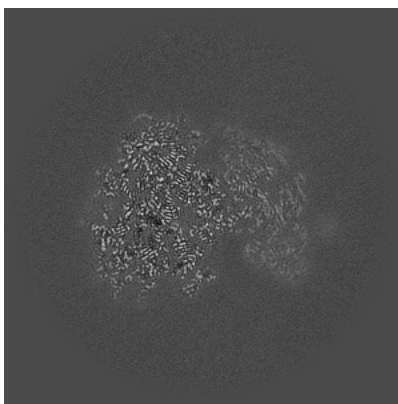
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

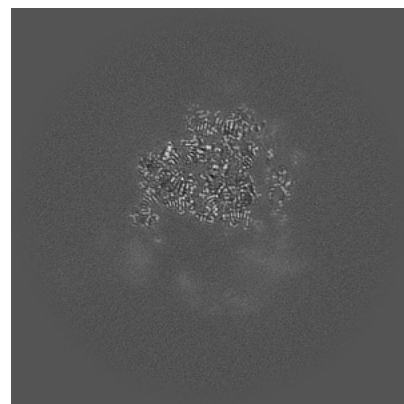
#### 6.2.1 Primary map



X Index: 255



Y Index: 255

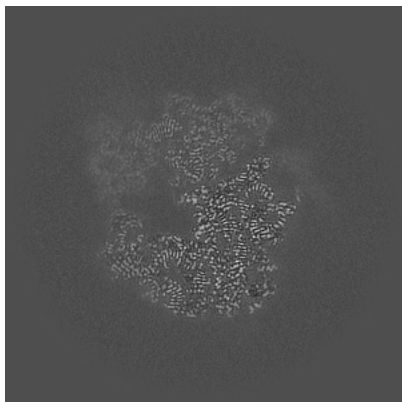


Z Index: 255

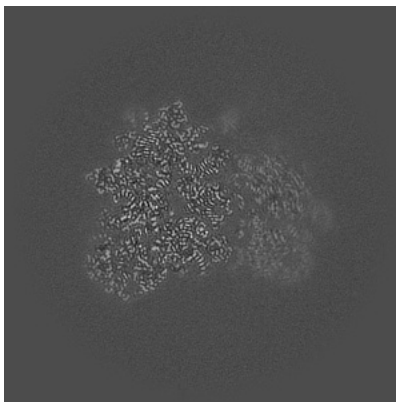
The images above show central slices of the map in three orthogonal directions.

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

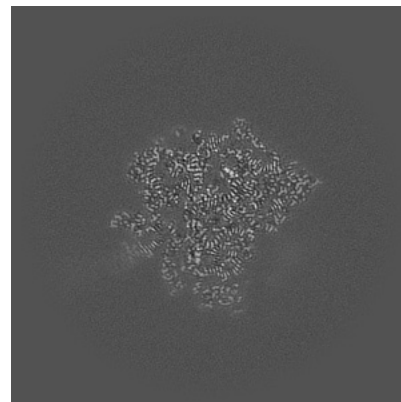
### 6.3.1 Primary map



X Index: 274



Y Index: 273



Z Index: 206

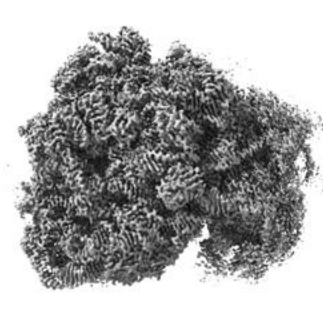
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.226. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

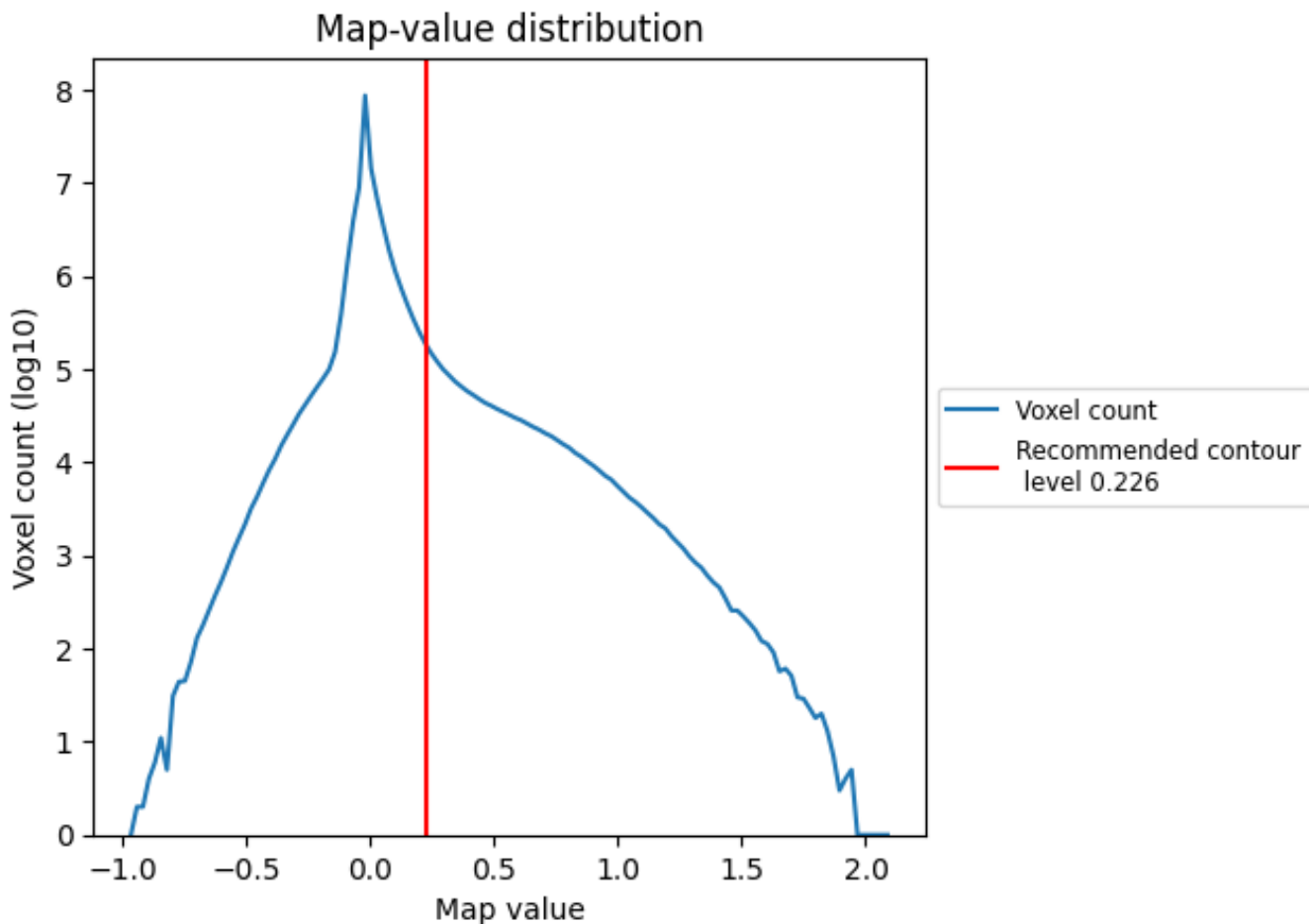
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

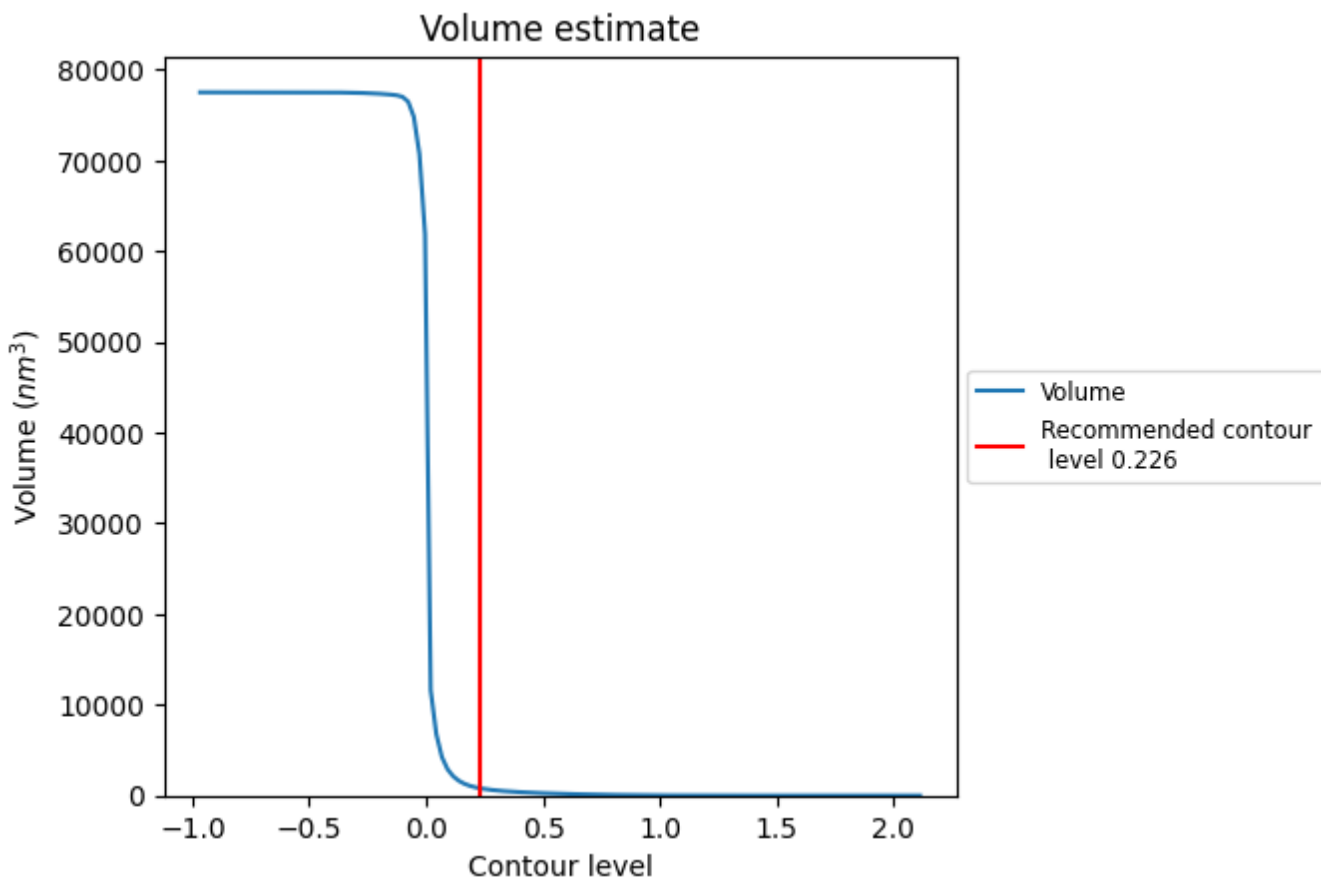
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

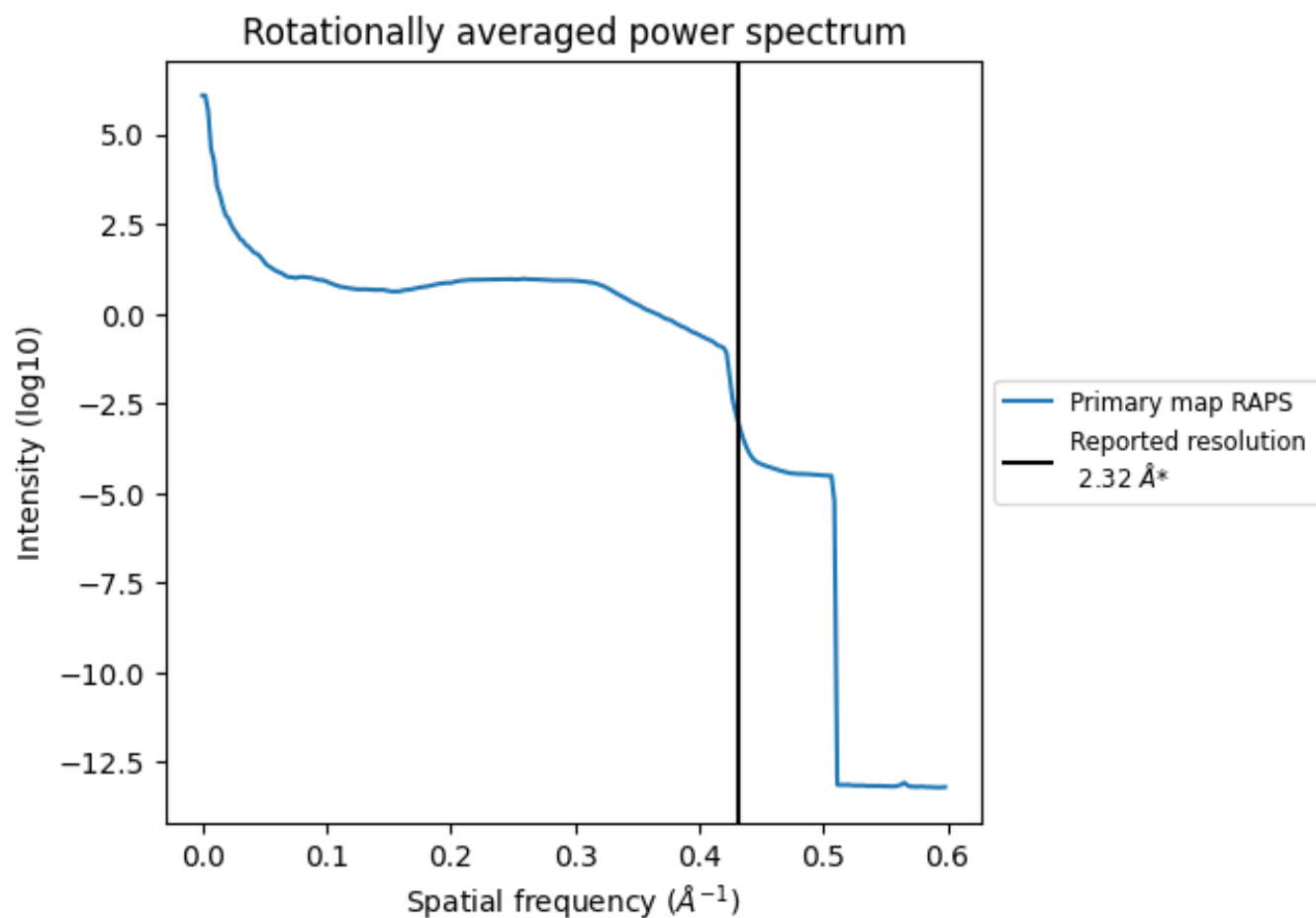
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 830 nm<sup>3</sup>; this corresponds to an approximate mass of 750 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](#)

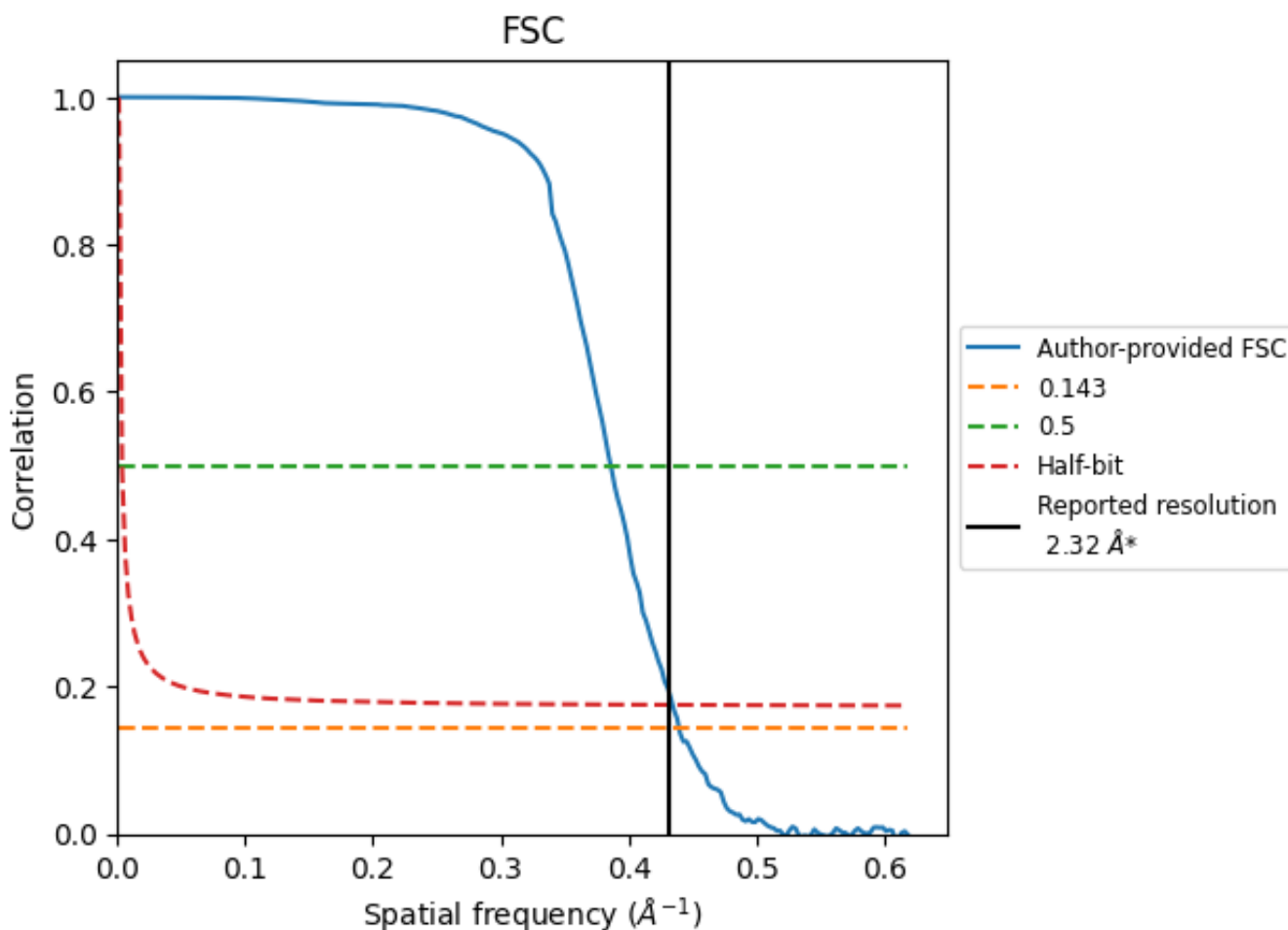


\*Reported resolution corresponds to spatial frequency of  $0.431 \text{\AA}^{-1}$

## 8 Fourier-Shell correlation [\(i\)](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

### 8.1 FSC [\(i\)](#)



\*Reported resolution corresponds to spatial frequency of 0.431 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	2.32	-	-
Author-provided FSC curve	2.27	2.59	2.30
Unmasked-calculated*	-	-	-

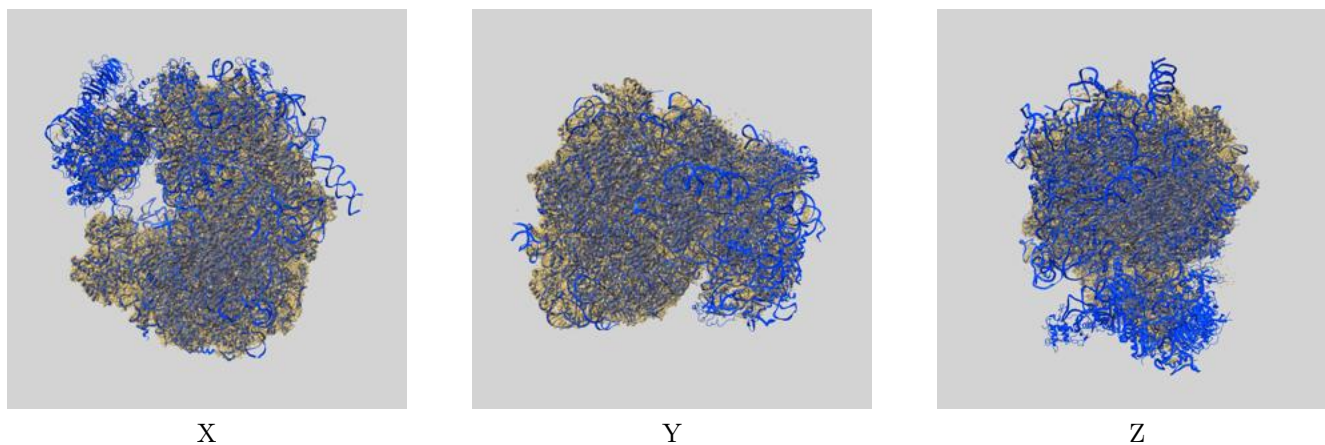
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.



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

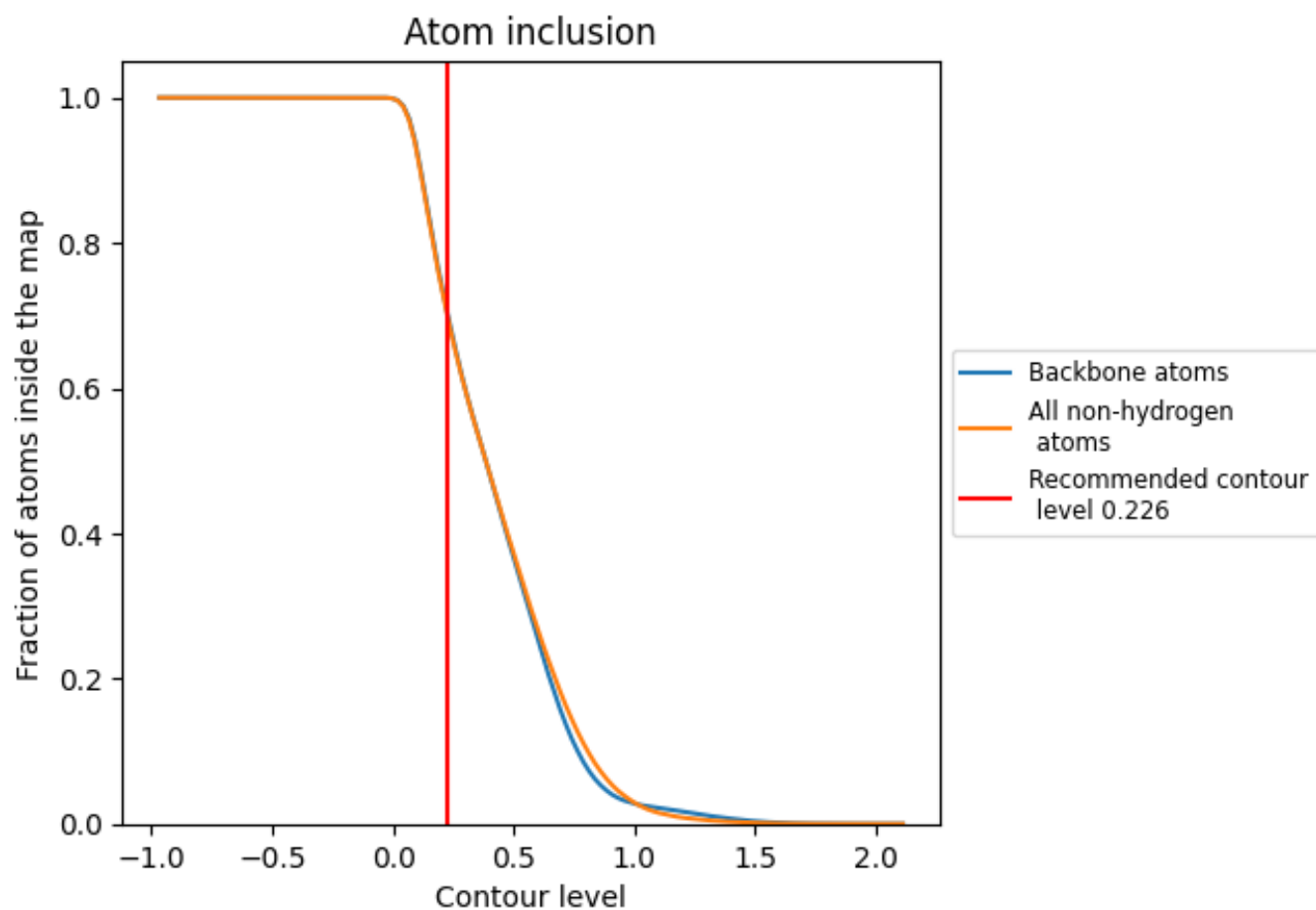
This section contains information regarding the fit between EMDB map EMD-13737 and PDB model 7PZY. Per-residue inclusion information can be found in section 3 on page 23.

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



The images above show the 3D surface view of the map at the recommended contour level 0.226 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 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 70% of all non-hydrogen atoms, are inside the map.