



Full wwPDB EM Validation Report ⓘ

Feb 22, 2023 – 08:28 am GMT

PDB ID : 7ZRS
EMDB ID : EMD-14921
Title : Structure of the RQT-bound 80S ribosome from *S. cerevisiae* (C2) - composite map
Authors : Best, K.M.; Ikeuchi, K.; Kater, L.; Best, D.M.; Musial, J.; Matsuo, Y.; Berninghausen, O.; Becker, T.; Inada, T.; Beckmann, R.
Deposited on : 2022-05-05
Resolution : 4.80 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

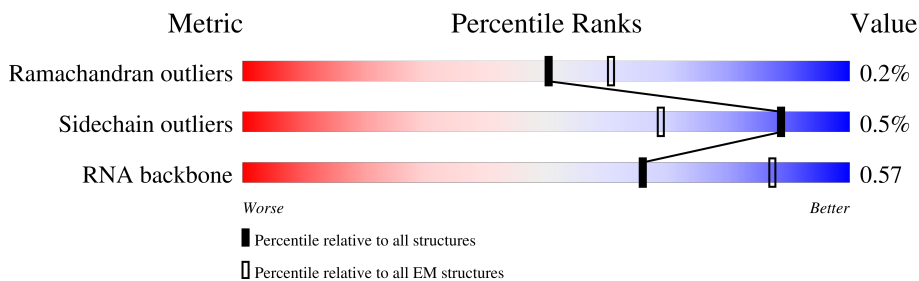
EMDB validation analysis : 0.0.1.dev43
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.32.1

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 4.80 Å.

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



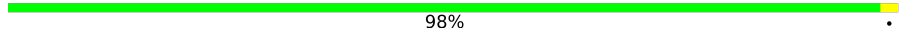
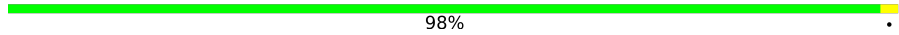
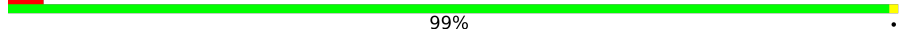
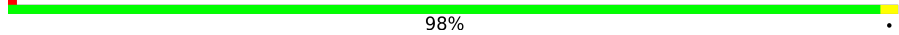
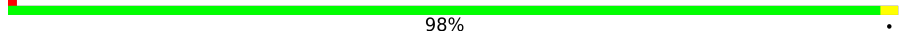
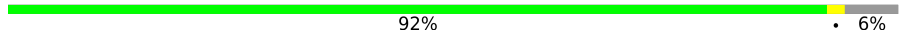
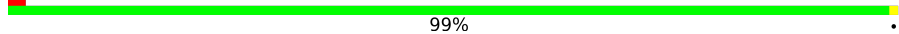
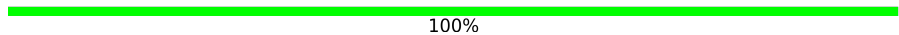
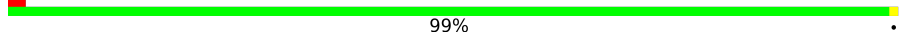
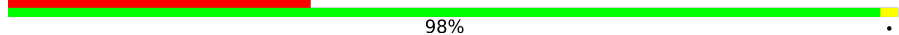
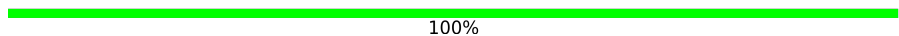
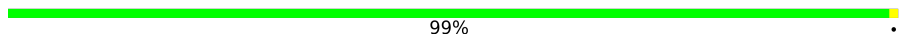
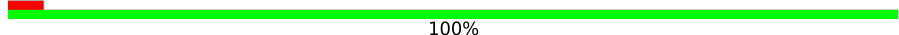
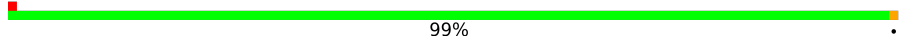

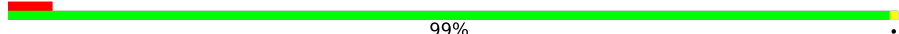
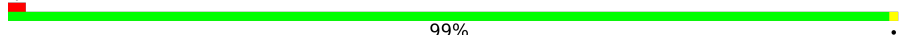
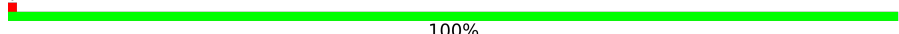
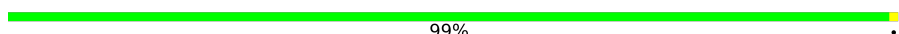
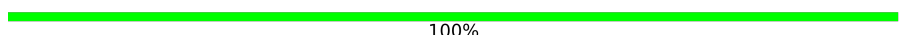
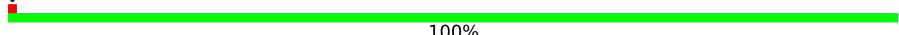
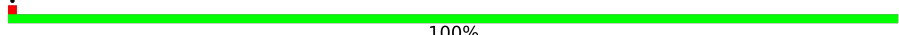
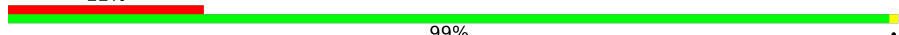
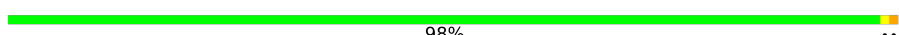
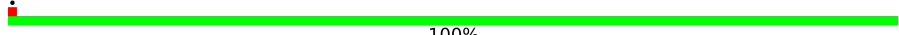
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	2	1798	
2	3	158	
3	4	121	
4	5	3396	
5	6	75	
6	AA	206	
7	AB	255	
8	AC	216	

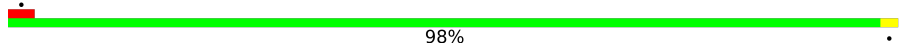
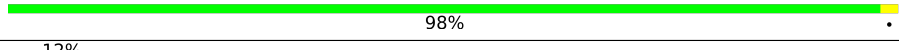
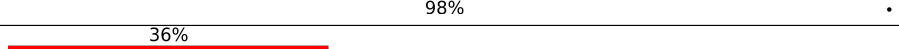
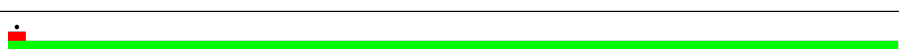

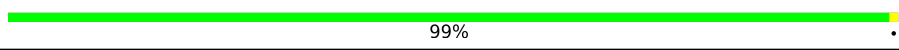
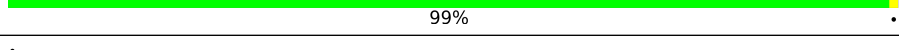
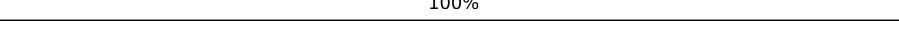

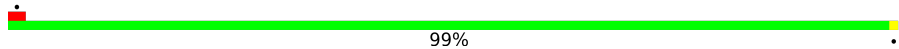
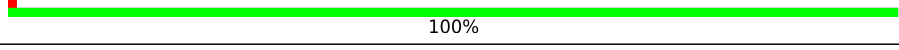
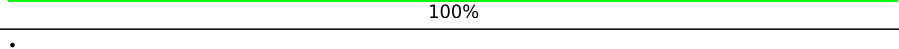
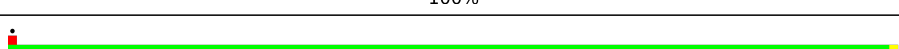
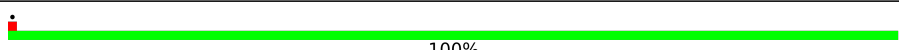
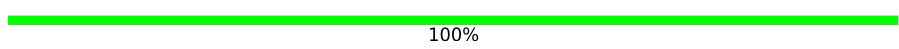
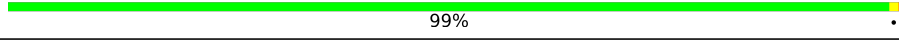
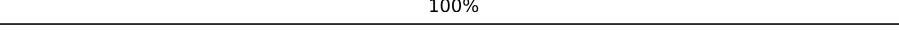

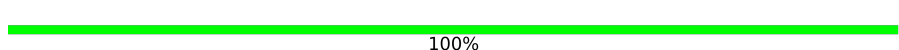
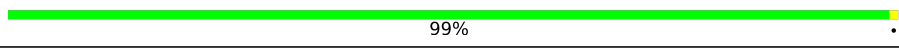
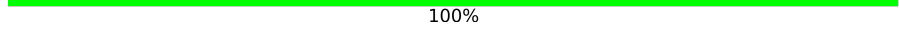



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Mol	Chain	Length	Quality of chain
9	AD	222	 98%
10	AE	258	 98%
11	AF	206	 99%
12	AG	228	 98%
13	AH	184	 98%
14	AI	200	 92% 6%
15	AJ	184	 99%
16	AK	92	 100%
17	AL	144	 99%
18	AM	121	 34% 98%
19	AN	150	 100%
20	AO	127	 99%
21	AP	117	 100%
22	AQ	141	 99%
23	AR	136	 85% 11%
24	AS	145	 5% 99%
25	AT	143	 99%
26	AU	100	 100%
27	AV	87	 99%
28	AW	129	 100%
29	AX	144	 100%
30	AY	134	 100%
31	AZ	82	 22% 99%
32	Aa	97	 98%
33	Ab	81	 100%

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Mol	Chain	Length	Quality of chain
34	Ac	63	 98%
35	Ad	53	 98%
36	Ae	56	 12% 98%
37	Af	73	 36% 100%
38	Ag	312	 100%
39	BA	251	 100%
40	BB	386	 99%
41	BC	361	 99%
42	BD	294	 100%
43	BE	176	 95% 5%
44	BF	222	 100%
45	BG	233	 99%
46	BH	191	 100%
47	BI	218	 100%
48	BJ	169	 100%
49	BK	193	 99%
50	BL	136	 100%
51	BM	203	 100%
52	BN	197	 99%
53	BO	183	 100%
54	BP	185	 100%
55	BQ	188	 99%
56	BR	171	 100%
57	BS	159	 99%
58	BT	100	100%

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Mol	Chain	Length	Quality of chain
59	BU	136	99%
60	BV	126	99%
61	BW	121	98%
62	BX	125	98%
63	BY	135	100%
64	BZ	148	99%
65	Ba	58	93% 7%
66	Bb	96	100%
67	Bc	109	100%
68	Bd	127	100%
69	Be	106	100%
70	Bf	112	100%
71	Bg	119	100%
72	Bh	99	100%
73	Bi	85	100%
74	Bj	77	96%
75	Bk	50	100%
76	Bl	52	100%
77	Bm	25	100%
78	Bn	103	100%
79	Bo	91	100%
80	CA	1967	33% 88% 11%
81	CB	297	99%
82	CC	530	17% 21% 78%

2 Entry composition [i](#)

There are 84 unique types of molecules in this entry. The entry contains 218399 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 ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1771	37739	16872	6683	12413	1771	0	0

- Molecule 2 is a RNA chain called 5.8S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	3	158	3353	1500	586	1109	158	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	4	121	2579	1152	461	845	121	0	0

- Molecule 4 is a RNA chain called 25S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	5	3185	68114	30425	12264	22240	3185	0	0

- Molecule 5 is a RNA chain called tRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	6	75	1589	710	279	525	75	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
6	11	C	U	conflict	GB 176418

- Molecule 6 is a protein called 40S ribosomal protein S0-A.

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

- Molecule 7 is a protein called 40S ribosomal protein S1-A.

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

- Molecule 8 is a protein called RPS2 isoform 1.

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

- Molecule 9 is a protein called RPS3 isoform 1.

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

- Molecule 10 is a protein called 40S ribosomal protein S4-A.

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

- Molecule 11 is a protein called Rps5p.

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

- Molecule 12 is a protein called 40S ribosomal protein S6-A.

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

- Molecule 13 is a protein called 40S ribosomal protein S7-A.

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

- Molecule 14 is a protein called 40S ribosomal protein S8-A.

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

- Molecule 15 is a protein called 40S ribosomal protein S9-A.

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

- Molecule 16 is a protein called 40S ribosomal protein S10-A.

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

- Molecule 17 is a protein called 40S ribosomal protein S11-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	AL	144	1159	742	219	195	3	0	0

- Molecule 18 is a protein called 40S ribosomal protein S12.

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

- Molecule 19 is a protein called 40S ribosomal protein S13.

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

- Molecule 20 is a protein called 40S ribosomal protein S14-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	AO	127	926	569	185	169	3	0	0

- Molecule 21 is a protein called RPS15 isoform 1.

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

- Molecule 22 is a protein called 40S ribosomal protein S16-A.

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

- Molecule 23 is a protein called 40S ribosomal protein S17-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	AR	121	948	596	179	171	2	0	0

- Molecule 24 is a protein called 40S ribosomal protein S18-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	AS	145	1192	743	237	210	2	0	0

- Molecule 25 is a protein called 40S ribosomal protein S19-A.

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

- Molecule 26 is a protein called RPS20 isoform 1.

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

- Molecule 27 is a protein called 40S ribosomal protein S21-A.

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

- Molecule 28 is a protein called RPS22A isoform 1.

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

- Molecule 29 is a protein called 40S ribosomal protein S23-A.

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

- Molecule 30 is a protein called 40S ribosomal protein S24-A.

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

- Molecule 31 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	AZ	82	Total	C	N	O	0	0
			651	416	123	112		

- Molecule 32 is a protein called RPS26B isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	Aa	97	Total	C	N	O	S	0	0
			769	475	160	129	5		

- Molecule 33 is a protein called 40S ribosomal protein S27-A.

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

- Molecule 34 is a protein called RPS28A isoform 1.

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

- Molecule 35 is a protein called RPS29A isoform 1.

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

- Molecule 36 is a protein called 40S ribosomal protein S30-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	Ae	56	Total	C	N	O	S	0	0
			448	283	93	71	1		

- Molecule 37 is a protein called RPS31 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	Af	73	Total	C	N	O	S	0	0
			556	352	105	95	4		

- Molecule 38 is a protein called Guanine nucleotide-binding protein subunit beta-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	Ag	312	Total	C	N	O	S	0	0
			2383	1514	409	452	8		

- Molecule 39 is a protein called 60S ribosomal protein L2-A.

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

- Molecule 40 is a protein called 60S ribosomal protein L3.

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

- Molecule 41 is a protein called RPL4A isoform 1.

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

- Molecule 42 is a protein called RPL5 isoform 1.

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

- Molecule 43 is a protein called 60S ribosomal protein L6-B.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	BE	167	Total	C	N	O	S	0	0
			1305	841	234	229	1		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BE	146	ILE	LEU	conflict	UNP P05739
BE	173	MET	LEU	conflict	UNP P05739

- Molecule 44 is a protein called 60S ribosomal protein L7-A.

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

- Molecule 45 is a protein called 60S ribosomal protein L8-A.

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

- Molecule 46 is a protein called 60S ribosomal protein L9-A.

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

- Molecule 47 is a protein called RPL10 isoform 1.

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

- Molecule 48 is a protein called RPL11B isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	BJ	169	Total	C	N	O	S	0	0
			1350	846	253	247	4		

- Molecule 49 is a protein called 60S ribosomal protein L13-A.

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

- Molecule 50 is a protein called 60S ribosomal protein L14-A.

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

- Molecule 51 is a protein called 60S ribosomal protein L15-A.

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

- Molecule 52 is a protein called 60S ribosomal protein L16-A.

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

- Molecule 53 is a protein called 60S ribosomal protein L17-A.

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

- Molecule 54 is a protein called 60S ribosomal protein L18-A.

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

- Molecule 55 is a protein called 60S ribosomal protein L19-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	BQ	188	1515	932	323	260		0	0

- Molecule 56 is a protein called 60S ribosomal protein L20-A.

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

- Molecule 57 is a protein called 60S ribosomal protein L21-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	BS	159	1276	805	246	221	4	0	0

- Molecule 58 is a protein called 60S ribosomal protein L22-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	BT	100	796	516	131	149		0	0

- Molecule 59 is a protein called 60S ribosomal protein L23-A.

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

- Molecule 60 is a protein called RPL24A isoform 1.

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

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
BV	104	GLN	ASN	conflict	UNP A0A6A5PY83
BV	109	GLN	LEU	conflict	UNP A0A6A5PY83
BV	112	ASP	ASN	conflict	UNP A0A6A5PY83
BV	119	ALA	GLU	conflict	UNP A0A6A5PY83

- Molecule 61 is a protein called 60S ribosomal protein L25.

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

- Molecule 62 is a protein called 60S ribosomal protein L26-A.

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

- Molecule 63 is a protein called 60S ribosomal protein L27-A.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
63	BY	135	1092	710	202	180	0	0

- Molecule 64 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
64	BZ	148	1173	749	231	190	3	0	0

- Molecule 65 is a protein called 60S ribosomal protein L29.

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

- Molecule 66 is a protein called 60S ribosomal protein L30.

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

- Molecule 67 is a protein called 60S ribosomal protein L31-A.

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

- Molecule 68 is a protein called RPL32 isoform 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	Bd	127	Total	C	N	O	S	0	0
			1017	644	205	167	1		

- Molecule 69 is a protein called 60S ribosomal protein L33-A.

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

- Molecule 70 is a protein called 60S ribosomal protein L34-A.

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

- Molecule 71 is a protein called 60S ribosomal protein L35-A.

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

- Molecule 72 is a protein called 60S ribosomal protein L36-A.

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

- Molecule 73 is a protein called 60S ribosomal protein L37-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	Bi	85	Total	C	N	O	S	0	0
			670	408	146	111	5		

- Molecule 74 is a protein called RPL38 isoform 1.

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

- Molecule 75 is a protein called 60S ribosomal protein L39.

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

- Molecule 76 is a protein called 60S ribosomal protein L40-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Bl	52	Total	C	N	O	S		
			417	259	86	67	5	0	0

- Molecule 77 is a protein called RPL41A isoform 1.

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

- Molecule 78 is a protein called 60S ribosomal protein L42-A.

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

- Molecule 79 is a protein called 60S ribosomal protein L43-A.

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

- Molecule 80 is a protein called RQC trigger complex helicase SLH1.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	CA	1742	Total	C	N	O	S		
			14008	8959	2378	2596	75	0	0

- Molecule 81 is a protein called RQC trigger complex subunit CUE3.

Mol	Chain	Residues	Atoms					AltConf	Trace
81	CB	297	Total	C	N	O	S	0	0
			2415	1568	414	427	6		

- Molecule 82 is a protein called RQC trigger complex subunit RQT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
82	CC	114	Total	C	N	O	S	0	0
			886	539	167	172	8		

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

Mol	Chain	Residues	Atoms		AltConf
83	2	2	Total	Mg	0
			2	2	
83	AE	1	Total	Mg	0
			1	1	
83	AF	1	Total	Mg	0
			1	1	

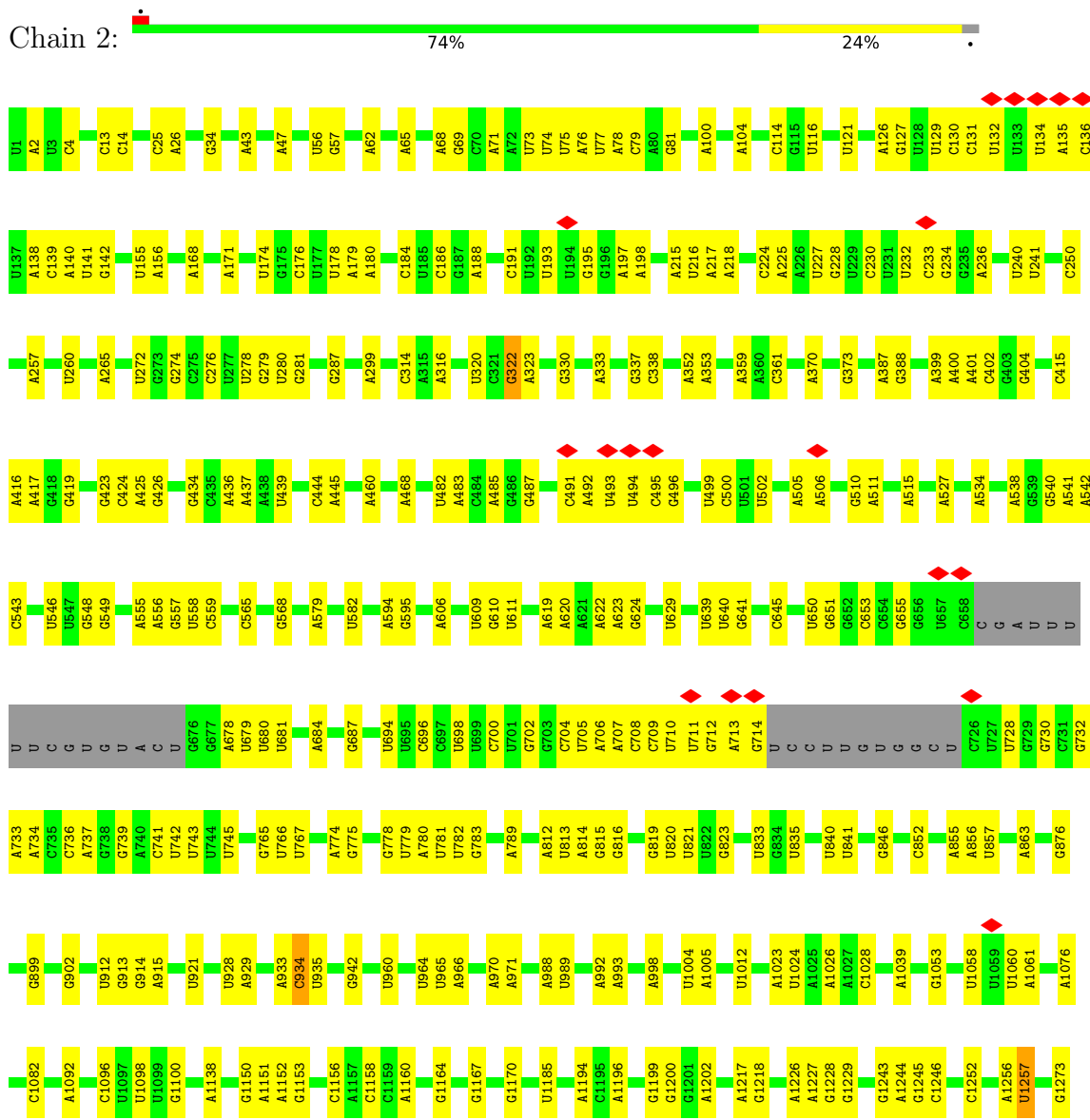
- Molecule 84 is ZINC ION (three-letter code: ZN) (formula: Zn).

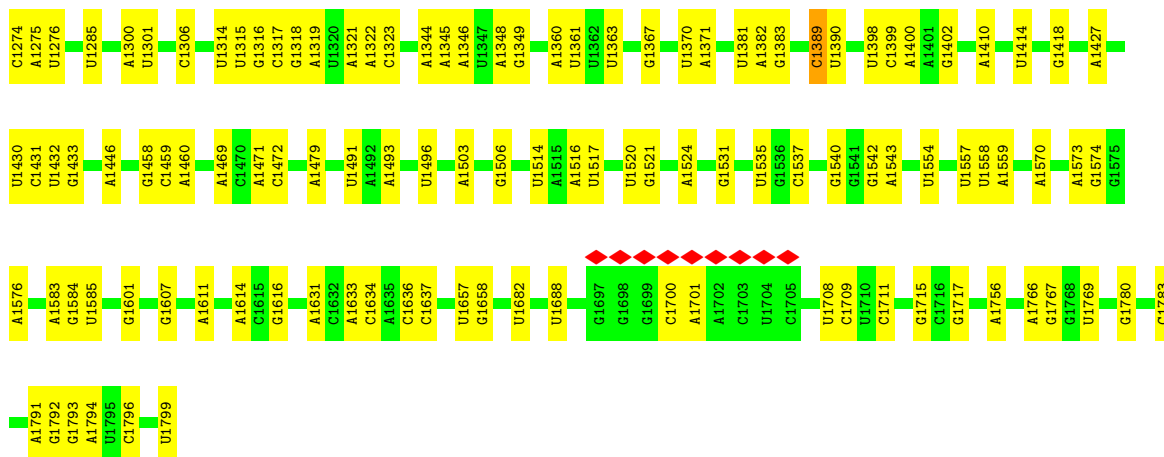
Mol	Chain	Residues	Atoms		AltConf
84	Ad	1	Total	Zn	0
			1	1	
84	Af	1	Total	Zn	0
			1	1	
84	Bf	1	Total	Zn	0
			1	1	
84	Bi	1	Total	Zn	0
			1	1	
84	Bl	1	Total	Zn	0
			1	1	
84	Bn	1	Total	Zn	0
			1	1	
84	Bo	1	Total	Zn	0
			1	1	
84	CC	2	Total	Zn	0
			2	2	

3 Residue-property plots i

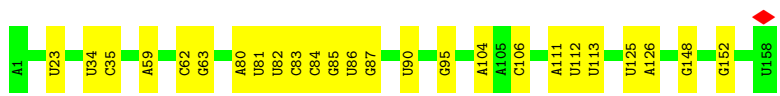
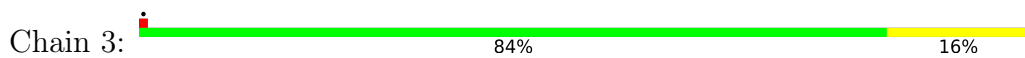
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: 18S ribosomal RNA

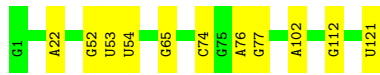
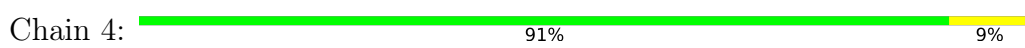




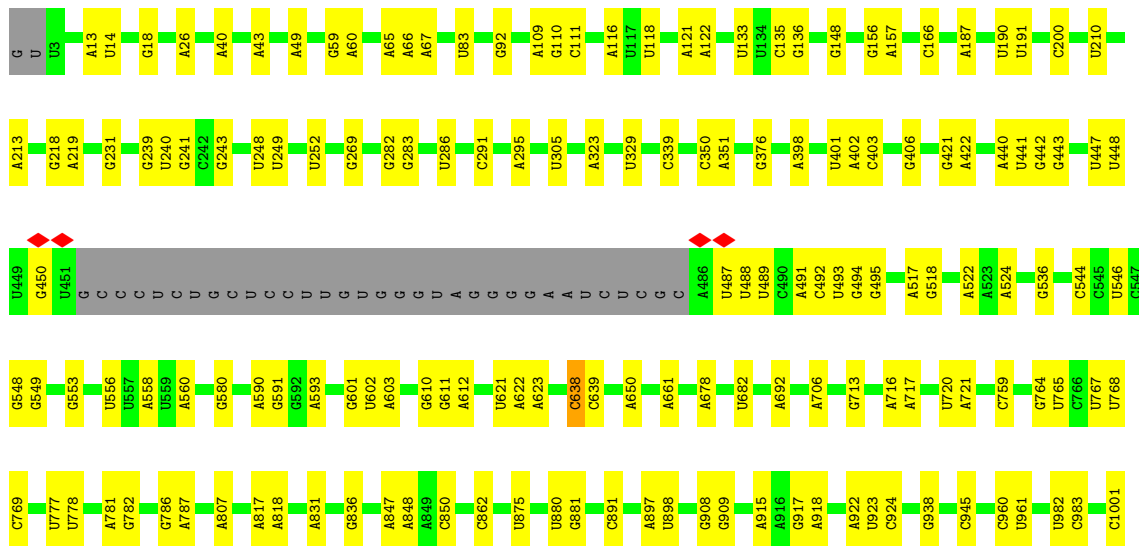
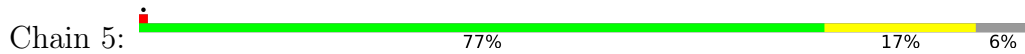
• Molecule 2: 5.8S ribosomal RNA



• Molecule 3: 5S ribosomal RNA

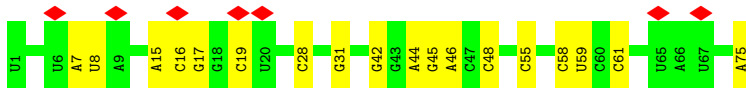
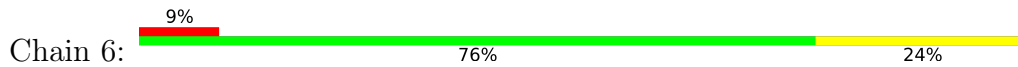


• Molecule 4: 25S ribosomal RNA

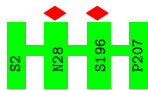




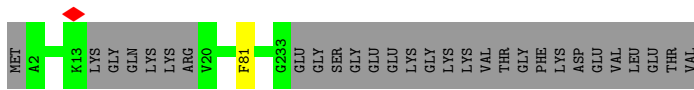
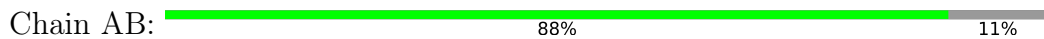
- Molecule 5: tRNA



- Molecule 6: 40S ribosomal protein S0-A



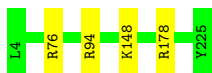
- Molecule 7: 40S ribosomal protein S1-A



- Molecule 8: RPS2 isoform 1



- Molecule 9: RPS3 isoform 1

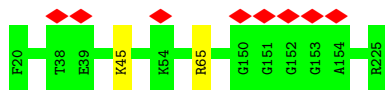


- Molecule 10: 40S ribosomal protein S4-A

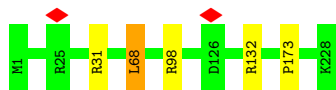


- Molecule 11: Rps5p

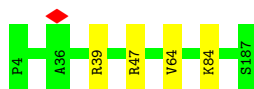




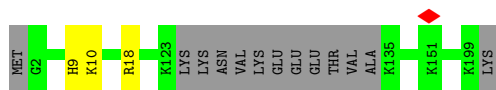
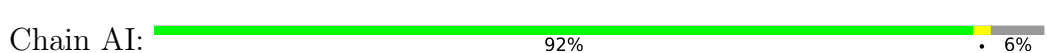
- Molecule 12: 40S ribosomal protein S6-A



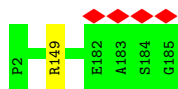
- Molecule 13: 40S ribosomal protein S7-A



- Molecule 14: 40S ribosomal protein S8-A



- Molecule 15: 40S ribosomal protein S9-A

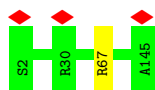


- Molecule 16: 40S ribosomal protein S10-A



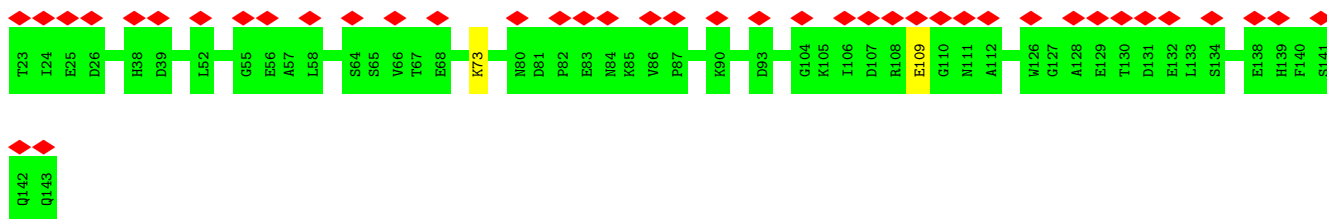
There are no outlier residues recorded for this chain.

- Molecule 17: 40S ribosomal protein S11-A



- Molecule 18: 40S ribosomal protein S12





- Molecule 19: 40S ribosomal protein S13

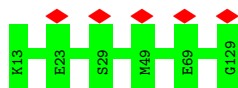


There are no outlier residues recorded for this chain.

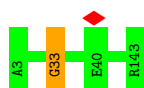
- Molecule 20: 40S ribosomal protein S14-B



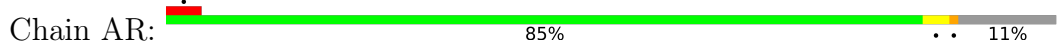
- Molecule 21: RPS15 isoform 1



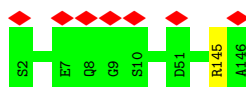
- Molecule 22: 40S ribosomal protein S16-A



- Molecule 23: 40S ribosomal protein S17-A

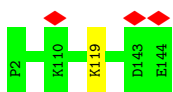


- Molecule 24: 40S ribosomal protein S18-A



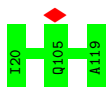
- Molecule 25: 40S ribosomal protein S19-A

Chain AT:  99%



- Molecule 26: RPS20 isoform 1

Chain AU:  100%



- Molecule 27: 40S ribosomal protein S21-A

Chain AV:  99%



- Molecule 28: RPS22A isoform 1

Chain AW:  100%

There are no outlier residues recorded for this chain.

- Molecule 29: 40S ribosomal protein S23-A

Chain AX:  100%



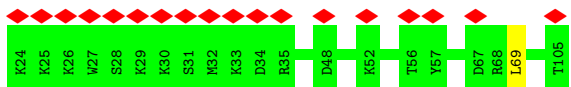
- Molecule 30: 40S ribosomal protein S24-A

Chain AY:  100%



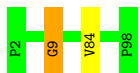
- Molecule 31: 40S ribosomal protein S25

Chain AZ:  22% 99%



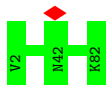
- Molecule 32: RPS26B isoform 1

Chain Aa:  98%



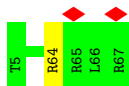
- Molecule 33: 40S ribosomal protein S27-A

Chain Ab:  100%



- Molecule 34: RPS28A isoform 1

Chain Ac:  98%



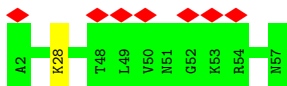
- Molecule 35: RPS29A isoform 1

Chain Ad:  98%



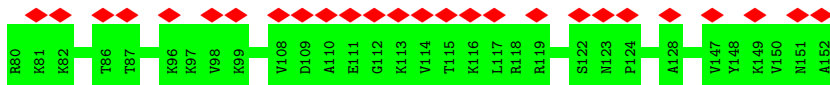
- Molecule 36: 40S ribosomal protein S30-A

Chain Ae:  12% 98%



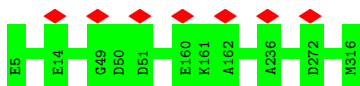
- Molecule 37: RPS31 isoform 1

Chain Af:  36% 100%



- Molecule 38: Guanine nucleotide-binding protein subunit beta-like protein

Chain Ag:  100%



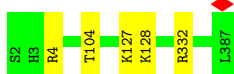
- Molecule 39: 60S ribosomal protein L2-A

Chain BA:  100%



- Molecule 40: 60S ribosomal protein L3

Chain BB:  99%



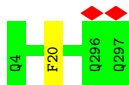
- Molecule 41: RPL4A isoform 1

Chain BC:  99%



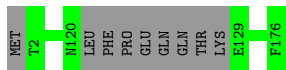
- Molecule 42: RPL5 isoform 1

Chain BD:  100%



- Molecule 43: 60S ribosomal protein L6-B

Chain BE:  95%



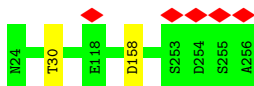
- Molecule 44: 60S ribosomal protein L7-A

Chain BF:  100%



- Molecule 45: 60S ribosomal protein L8-A

Chain BG:  99%



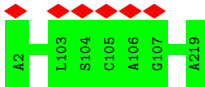
- Molecule 46: 60S ribosomal protein L9-A

Chain BH:  100%



- Molecule 47: RPL10 isoform 1

Chain BI:  100%



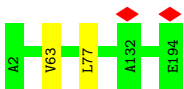
- Molecule 48: RPL11B isoform 1

Chain BJ:  100%



- Molecule 49: 60S ribosomal protein L13-A

Chain BK:  99%



- Molecule 50: 60S ribosomal protein L14-A

Chain BL:  100%



- Molecule 51: 60S ribosomal protein L15-A

Chain BM:  100%

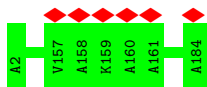


- Molecule 52: 60S ribosomal protein L16-A

Chain BN:  99%



- Molecule 53: 60S ribosomal protein L17-A

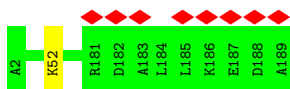


- Molecule 54: 60S ribosomal protein L18-A



There are no outlier residues recorded for this chain.

- Molecule 55: 60S ribosomal protein L19-A



- Molecule 56: 60S ribosomal protein L20-A



There are no outlier residues recorded for this chain.

- Molecule 57: 60S ribosomal protein L21-A

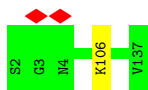


- Molecule 58: 60S ribosomal protein L22-A



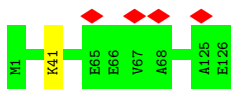
- Molecule 59: 60S ribosomal protein L23-A





- Molecule 60: RPL24A isoform 1

Chain BV: 99%



- Molecule 61: 60S ribosomal protein L25

Chain BW: 98%



- Molecule 62: 60S ribosomal protein L26-A

Chain BX: 98%



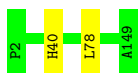
- Molecule 63: 60S ribosomal protein L27-A

Chain BY: 100%

There are no outlier residues recorded for this chain.

- Molecule 64: 60S ribosomal protein L28

Chain BZ: 99%



- Molecule 65: 60S ribosomal protein L29

Chain Ba: 93% 7%



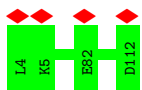
- Molecule 66: 60S ribosomal protein L30

Chain Bb: 100%

There are no outlier residues recorded for this chain.

- Molecule 67: 60S ribosomal protein L31-A

Chain Bc:  100%



- Molecule 68: RPL32 isoform 1

Chain Bd:  100%

There are no outlier residues recorded for this chain.

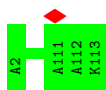
- Molecule 69: 60S ribosomal protein L33-A

Chain Be:  100%

There are no outlier residues recorded for this chain.

- Molecule 70: 60S ribosomal protein L34-A

Chain Bf:  100%



- Molecule 71: 60S ribosomal protein L35-A

Chain Bg:  100%

There are no outlier residues recorded for this chain.

- Molecule 72: 60S ribosomal protein L36-A

Chain Bh:  100%



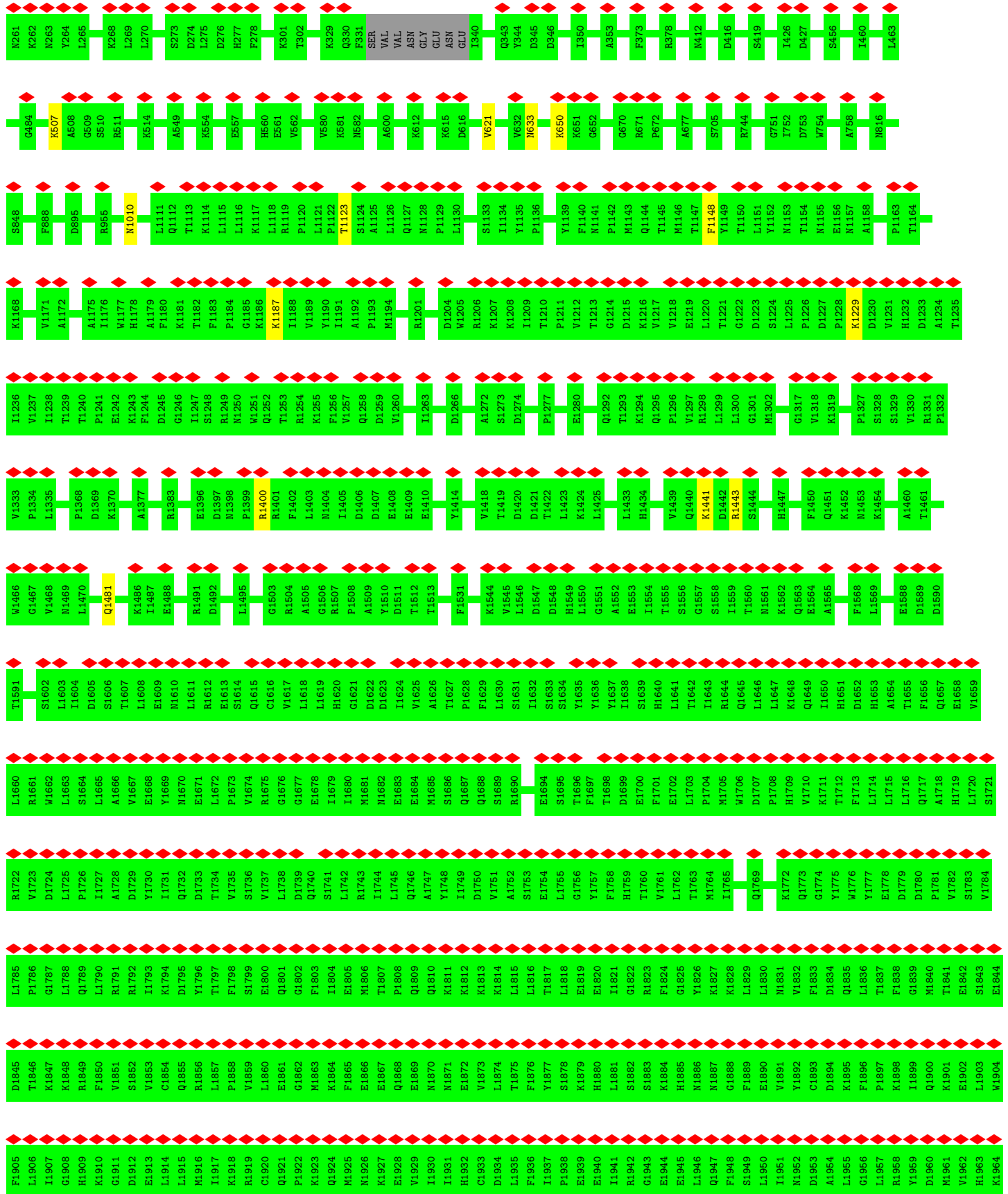
- Molecule 73: 60S ribosomal protein L37-A

Chain Bi:  100%

There are no outlier residues recorded for this chain.

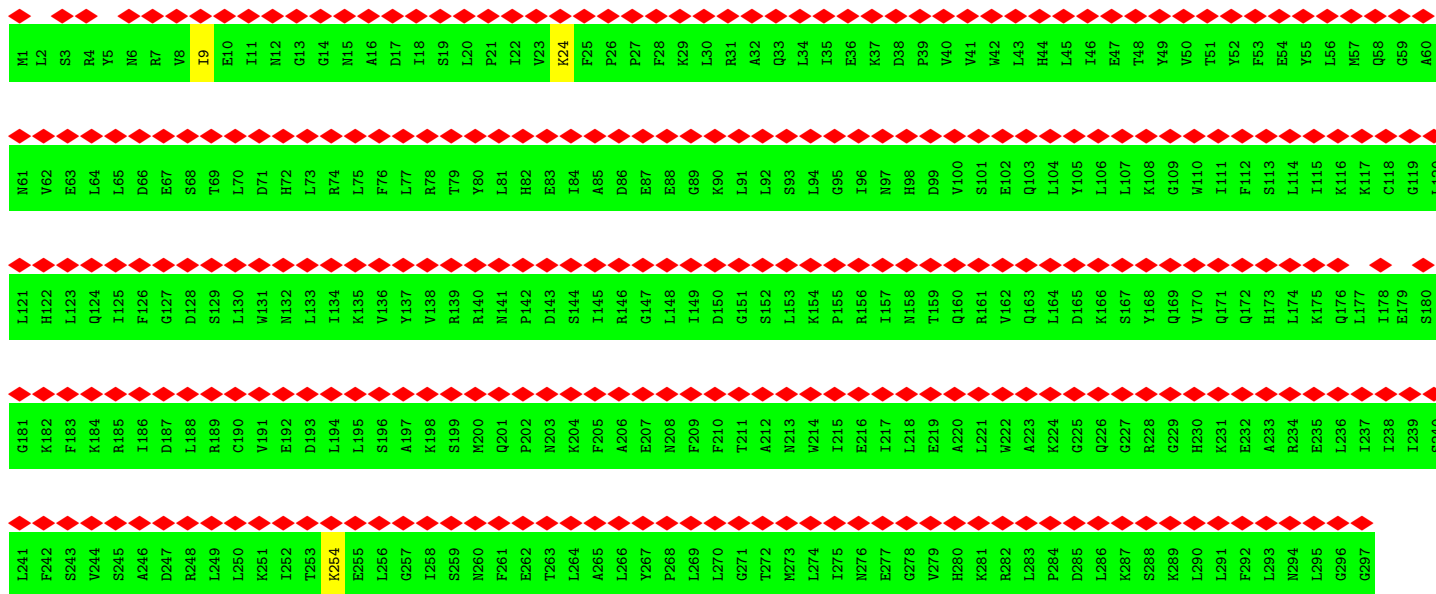
- Molecule 74: RPL38 isoform 1

Chain Bj:  96%

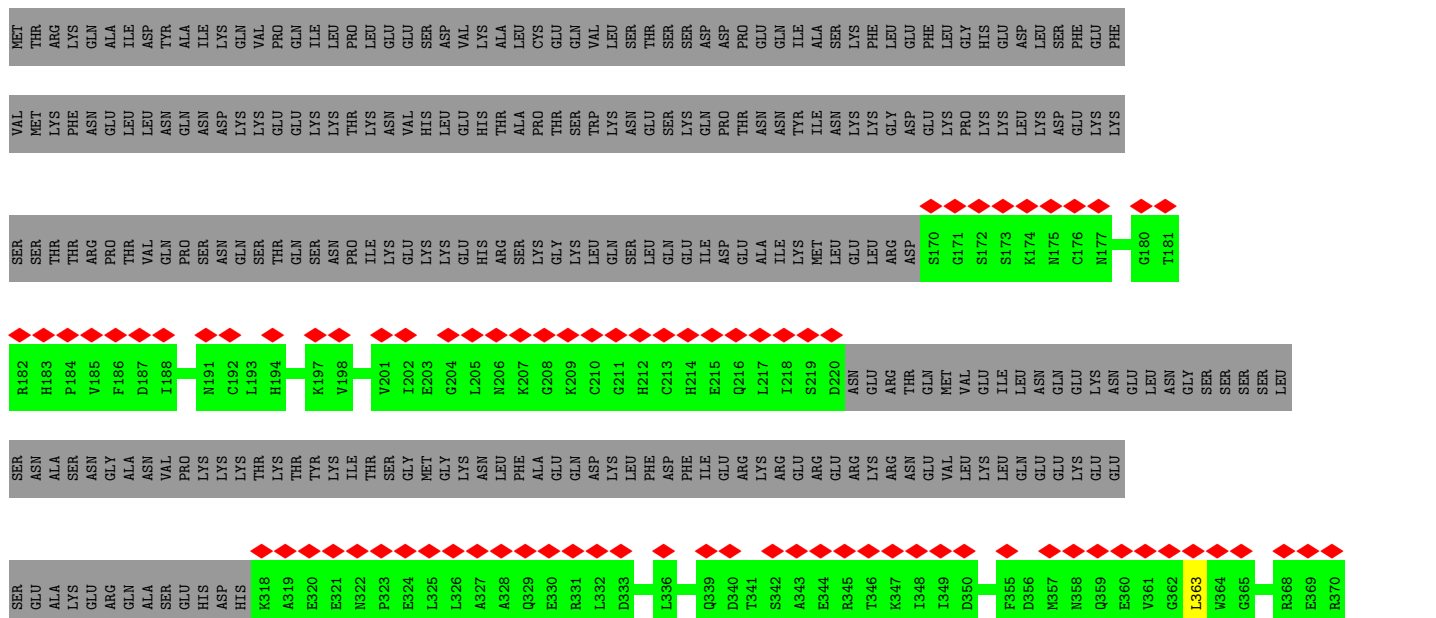




• Molecule 81: RQC trigger complex subunit CUE3



• Molecule 82: RQC trigger complex subunit RQT4





A371
L372
A373
L374
K375
Q377
Q378
R379
N380
LEU
ARG
LYS
TRP
GLU
GLY
VAL
GLU
LYS
GLU
GLU
ASN
ASN
GLY
ARG
ARG
GLU
LYS
TYR
VAL
VAL
SER
MET
ASN
ASN
ILE
GLY
SER
ASN
GLY
LYS
VAL
THR
MET
THR
GLU
VAL
PRO
LYS
ASP
THR
GLU
ASN
VAL
ILE
ALA
GLY
SER
ASP
ASP
ILE

SER
ASP
ILE
SER
LYS
GLU
GLU
ASP
ILE
SER
HIS
ASP
LEU
LYS
HIS
ILE
HIS
ASP
LEU
LYS
SER
GLU
ILE
ASN
THR
THR
LYS
SER
SER
LEU
GLN
LEU
GLN
LYS
ALA
TRP
ASP
TYR
GLU
ARG
LYS
LYS
GLN
PHE
ASP
ARG
PRO
THR
TYR
VAL
LYS
LYS
ASN
SER
ASP
THR
ALA

GLN
GLN
ASN
ARG
THR
GLU
GLU
LYS
ALA
HIS
ASP
MET
GLN
ALA
TYR
ASP
LEU
SER
ARG
VAL
GLN
VAL
GLN
ASN
ALA
ALA
SER
VAL
GLU
GLN
ASN
ILE
LEU
ALA
VAL
LEU

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	20380	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	43.6	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	5.964	Depositor
Minimum map value	-0.585	Depositor
Average map value	0.017	Depositor
Map value standard deviation	0.130	Depositor
Recommended contour level	0.4	Depositor
Map size (Å)	585.19995, 585.19995, 585.19995	wwPDB
Map dimensions	560, 560, 560	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.045, 1.045, 1.045	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, MG

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	0.34	0/42211	0.79	6/65773 (0.0%)
2	3	0.43	0/3746	0.76	0/5832
3	4	0.38	0/2883	0.76	0/4491
4	5	0.44	0/76240	0.80	34/118862 (0.0%)
5	6	0.18	0/1773	0.77	0/2759
6	AA	0.26	0/1644	0.52	0/2249
7	AB	0.26	0/1823	0.54	0/2447
8	AC	0.27	0/1656	0.51	0/2251
9	AD	0.26	0/1754	0.53	0/2361
10	AE	0.28	0/2097	0.54	0/2823
11	AF	0.25	0/1625	0.53	0/2197
12	AG	0.25	0/1839	0.58	1/2460 (0.0%)
13	AH	0.26	0/1498	0.54	0/2019
14	AI	0.28	0/1501	0.59	0/2006
15	AJ	0.25	0/1504	0.54	0/2016
16	AK	0.26	0/769	0.54	0/1039
17	AL	0.30	0/1185	0.53	0/1598
18	AM	0.24	0/883	0.57	0/1199
19	AN	0.28	0/1215	0.53	0/1638
20	AO	0.29	0/937	0.61	0/1261
21	AP	0.27	0/936	0.57	0/1259
22	AQ	0.25	0/1125	0.52	0/1510
23	AR	0.30	0/957	0.60	0/1283
24	AS	0.24	0/1211	0.54	0/1628
25	AT	0.26	0/1130	0.56	0/1517
26	AU	0.24	0/807	0.52	0/1091
27	AV	0.28	0/682	0.60	0/921
28	AW	0.29	0/1038	0.53	0/1395
29	AX	0.28	0/1139	0.55	0/1518
30	AY	0.27	0/1087	0.53	0/1449
31	AZ	0.24	0/661	0.56	0/888
32	Aa	0.28	0/782	0.67	0/1047

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	Ab	0.26	0/620	0.56	0/838
34	Ac	0.26	0/493	0.63	0/663
35	Ad	0.26	0/452	0.57	0/600
36	Ae	0.26	0/454	0.61	0/602
37	Af	0.27	0/567	0.60	0/764
38	Ag	0.24	0/2436	0.50	0/3318
39	BA	0.31	0/1933	0.58	0/2598
40	BB	0.30	0/3146	0.55	0/4228
41	BC	0.29	0/2800	0.52	0/3790
42	BD	0.28	0/2400	0.51	0/3239
43	BE	0.29	0/1327	0.50	0/1790
44	BF	0.30	0/1821	0.49	0/2451
45	BG	0.28	0/1836	0.49	0/2481
46	BH	0.28	0/1529	0.50	0/2060
47	BI	0.29	0/1801	0.54	0/2416
48	BJ	0.26	0/1371	0.57	0/1838
49	BK	0.29	0/1568	0.59	0/2106
50	BL	0.26	0/1068	0.50	0/1438
51	BM	0.30	0/1757	0.58	0/2354
52	BN	0.30	0/1585	0.51	0/2128
53	BO	0.29	0/1439	0.56	0/1938
54	BP	0.29	0/1465	0.56	0/1965
55	BQ	0.27	0/1532	0.56	0/2043
56	BR	0.31	0/1473	0.53	0/1980
57	BS	0.31	0/1300	0.53	0/1743
58	BT	0.29	0/812	0.54	0/1099
59	BU	0.31	0/1018	0.57	0/1369
60	BV	0.26	0/850	0.48	0/1152
61	BW	0.29	0/979	0.52	0/1321
62	BX	0.28	0/995	0.55	0/1329
63	BY	0.29	0/1118	0.51	0/1497
64	BZ	0.31	0/1204	0.53	0/1612
65	Ba	0.26	0/473	0.51	0/629
66	Bb	0.29	0/745	0.46	0/1001
67	Bc	0.28	0/890	0.53	0/1196
68	Bd	0.29	0/1038	0.55	0/1390
69	Be	0.33	0/868	0.54	0/1168
70	Bf	0.30	0/890	0.58	0/1189
71	Bg	0.27	0/978	0.50	0/1301
72	Bh	0.27	0/772	0.53	0/1026
73	Bi	0.31	0/685	0.59	0/908
74	Bj	0.29	0/618	0.60	0/826
75	Bk	0.26	0/443	0.57	0/588

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	B1	0.29	0/423	0.58	0/562
77	Bm	0.26	0/230	0.72	0/296
78	Bn	0.29	0/836	0.55	0/1104
79	Bo	0.30	0/701	0.57	0/934
80	CA	0.24	0/14309	0.48	0/19348
81	CB	0.23	0/2463	0.45	0/3324
82	CC	0.23	0/897	0.55	1/1203 (0.1%)
All	All	0.35	0/233746	0.70	42/341530 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
7	AB	0	1
10	AE	0	1
12	AG	0	1
13	AH	0	1
22	AQ	0	1
31	AZ	0	1
32	Aa	0	1
40	BB	0	2
45	BG	0	2
52	BN	0	1
55	BQ	0	1
61	BW	0	1
65	Ba	0	2
80	CA	0	1
All	All	0	17

There are no bond length outliers.

All (42) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	2940	G	O5'-P-OP2	-28.86	76.07	110.70
4	5	2940	G	OP1-P-OP2	-26.48	79.87	119.60
4	5	2940	G	O5'-P-OP1	16.94	131.02	110.70
4	5	2939	G	OP2-P-O3'	14.60	137.32	105.20
4	5	2939	G	OP1-P-O3'	-14.12	74.14	105.20
12	AG	68	LEU	CA-CB-CG	8.22	134.22	115.30
4	5	1281	C	N3-C2-O2	-7.98	116.31	121.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	3279	C	N1-C2-O2	7.53	123.42	118.90
4	5	3218	C	N1-C2-O2	7.42	123.35	118.90
4	5	3279	C	C2-N1-C1'	7.18	126.70	118.80
4	5	3218	C	C2-N1-C1'	7.03	126.53	118.80
1	2	1389	C	C2-N1-C1'	6.96	126.45	118.80
4	5	406	G	O4'-C1'-N9	6.81	113.65	108.20
4	5	923	U	C2-N1-C1'	6.66	125.69	117.70
82	CC	363	LEU	CA-CB-CG	6.28	129.75	115.30
4	5	3279	C	N3-C2-O2	-6.07	117.65	121.90
4	5	3218	C	N3-C2-O2	-5.85	117.81	121.90
1	2	965	U	C2-N1-C1'	5.75	124.60	117.70
4	5	2503	A	N1-C6-N6	5.72	122.03	118.60
4	5	2238	C	N1-C2-O2	5.71	122.33	118.90
1	2	322	G	P-O3'-C3'	5.61	126.44	119.70
4	5	2238	C	N3-C2-O2	-5.61	117.98	121.90
4	5	836	G	O4'-C1'-N9	5.45	112.56	108.20
4	5	1497	C	C2-N1-C1'	5.43	124.77	118.80
4	5	2837	C	C2-N1-C1'	5.43	124.77	118.80
1	2	1458	G	C4-N9-C1'	5.39	133.51	126.50
1	2	934	C	C2-N1-C1'	5.38	124.72	118.80
4	5	923	U	N1-C2-O2	5.38	126.57	122.80
4	5	2113	U	OP2-P-O3'	5.30	116.85	105.20
4	5	638	C	P-O3'-C3'	5.28	126.04	119.70
4	5	759	C	C2-N1-C1'	5.25	124.58	118.80
1	2	1257	U	C2-N1-C1'	5.23	123.97	117.70
4	5	1223	G	O4'-C1'-N9	5.18	112.34	108.20
4	5	3182	C	N1-C2-O2	5.14	121.99	118.90
4	5	3059	U	C2-N1-C1'	5.10	123.82	117.70
4	5	1566	G	C4-N9-C1'	5.06	133.08	126.50
4	5	2113	U	P-O3'-C3'	5.06	125.77	119.70
4	5	3279	C	C6-N1-C1'	-5.05	114.74	120.80
4	5	1098	G	P-O3'-C3'	5.04	125.75	119.70
4	5	638	C	OP1-P-O3'	5.03	116.27	105.20
4	5	3182	C	C2-N1-C1'	5.01	124.31	118.80
4	5	1281	C	N1-C2-O2	5.00	121.90	118.90

There are no chirality outliers.

All (17) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	AB	81	PHE	Peptide
10	AE	42	LEU	Peptide

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Mol	Chain	Res	Type	Group
12	AG	68	LEU	Peptide
13	AH	64	VAL	Peptide
22	AQ	33	GLY	Peptide
31	AZ	69	LEU	Peptide
32	Aa	9	GLY	Peptide
40	BB	127	LYS	Peptide
40	BB	4	ARG	Peptide
45	BG	158	ASP	Peptide
45	BG	30	THR	Peptide
52	BN	110[A]	PRO	Peptide
55	BQ	52	LYS	Peptide
61	BW	43	ALA	Peptide
65	Ba	19	ASN	Peptide
65	Ba	20	GLY	Peptide
80	CA	1010	ASN	Peptide

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	AA	204/206 (99%)	188 (92%)	16 (8%)	0	100	100
7	AB	222/255 (87%)	208 (94%)	14 (6%)	0	100	100
8	AC	214/216 (99%)	207 (97%)	7 (3%)	0	100	100
9	AD	220/222 (99%)	219 (100%)	1 (0%)	0	100	100
10	AE	256/258 (99%)	247 (96%)	8 (3%)	1 (0%)	34	72
11	AF	204/206 (99%)	199 (98%)	5 (2%)	0	100	100
12	AG	226/228 (99%)	217 (96%)	8 (4%)	1 (0%)	34	72

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	AH	182/184 (99%)	172 (94%)	10 (6%)	0	100	100
14	AI	183/200 (92%)	171 (93%)	10 (6%)	2 (1%)	14	51
15	AJ	182/184 (99%)	172 (94%)	10 (6%)	0	100	100
16	AK	90/92 (98%)	85 (94%)	5 (6%)	0	100	100
17	AL	142/144 (99%)	136 (96%)	6 (4%)	0	100	100
18	AM	119/121 (98%)	98 (82%)	20 (17%)	1 (1%)	19	59
19	AN	148/150 (99%)	143 (97%)	5 (3%)	0	100	100
20	AO	125/127 (98%)	121 (97%)	4 (3%)	0	100	100
21	AP	115/117 (98%)	115 (100%)	0	0	100	100
22	AQ	139/141 (99%)	133 (96%)	5 (4%)	1 (1%)	22	62
23	AR	117/136 (86%)	104 (89%)	10 (8%)	3 (3%)	5	34
24	AS	143/145 (99%)	137 (96%)	6 (4%)	0	100	100
25	AT	141/143 (99%)	132 (94%)	9 (6%)	0	100	100
26	AU	98/100 (98%)	97 (99%)	1 (1%)	0	100	100
27	AV	85/87 (98%)	75 (88%)	10 (12%)	0	100	100
28	AW	127/129 (98%)	124 (98%)	3 (2%)	0	100	100
29	AX	142/144 (99%)	131 (92%)	11 (8%)	0	100	100
30	AY	132/134 (98%)	125 (95%)	7 (5%)	0	100	100
31	AZ	80/82 (98%)	77 (96%)	3 (4%)	0	100	100
32	Aa	95/97 (98%)	81 (85%)	12 (13%)	2 (2%)	7	38
33	Ab	79/81 (98%)	74 (94%)	5 (6%)	0	100	100
34	Ac	61/63 (97%)	60 (98%)	1 (2%)	0	100	100
35	Ad	51/53 (96%)	51 (100%)	0	0	100	100
36	Ae	54/56 (96%)	52 (96%)	2 (4%)	0	100	100
37	Af	71/73 (97%)	66 (93%)	5 (7%)	0	100	100
38	Ag	310/312 (99%)	306 (99%)	4 (1%)	0	100	100
39	BA	249/251 (99%)	238 (96%)	10 (4%)	1 (0%)	34	72
40	BB	384/386 (100%)	368 (96%)	15 (4%)	1 (0%)	41	76
41	BC	359/361 (99%)	347 (97%)	11 (3%)	1 (0%)	41	76
42	BD	292/294 (99%)	281 (96%)	10 (3%)	1 (0%)	41	76
43	BE	163/176 (93%)	160 (98%)	3 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
44	BF	220/222 (99%)	215 (98%)	5 (2%)	0	100	100
45	BG	231/233 (99%)	222 (96%)	9 (4%)	0	100	100
46	BH	189/191 (99%)	183 (97%)	6 (3%)	0	100	100
47	BI	216/218 (99%)	212 (98%)	4 (2%)	0	100	100
48	BJ	167/169 (99%)	157 (94%)	10 (6%)	0	100	100
49	BK	191/193 (99%)	180 (94%)	9 (5%)	2 (1%)	15	53
50	BL	134/136 (98%)	133 (99%)	1 (1%)	0	100	100
51	BM	201/203 (99%)	195 (97%)	6 (3%)	0	100	100
52	BN	195/197 (99%)	189 (97%)	4 (2%)	2 (1%)	15	53
53	BO	181/183 (99%)	176 (97%)	5 (3%)	0	100	100
54	BP	183/185 (99%)	178 (97%)	5 (3%)	0	100	100
55	BQ	186/188 (99%)	183 (98%)	3 (2%)	0	100	100
56	BR	169/171 (99%)	167 (99%)	2 (1%)	0	100	100
57	BS	157/159 (99%)	150 (96%)	7 (4%)	0	100	100
58	BT	98/100 (98%)	97 (99%)	1 (1%)	0	100	100
59	BU	134/136 (98%)	133 (99%)	1 (1%)	0	100	100
60	BV	124/126 (98%)	121 (98%)	3 (2%)	0	100	100
61	BW	119/121 (98%)	116 (98%)	2 (2%)	1 (1%)	19	59
62	BX	123/125 (98%)	122 (99%)	1 (1%)	0	100	100
63	BY	133/135 (98%)	131 (98%)	2 (2%)	0	100	100
64	BZ	146/148 (99%)	135 (92%)	9 (6%)	2 (1%)	11	46
65	Ba	56/58 (97%)	51 (91%)	5 (9%)	0	100	100
66	Bb	94/96 (98%)	94 (100%)	0	0	100	100
67	Bc	107/109 (98%)	102 (95%)	5 (5%)	0	100	100
68	Bd	125/127 (98%)	122 (98%)	3 (2%)	0	100	100
69	Be	104/106 (98%)	104 (100%)	0	0	100	100
70	Bf	110/112 (98%)	109 (99%)	1 (1%)	0	100	100
71	Bg	117/119 (98%)	115 (98%)	2 (2%)	0	100	100
72	Bh	97/99 (98%)	95 (98%)	2 (2%)	0	100	100
73	Bi	83/85 (98%)	83 (100%)	0	0	100	100
74	Bj	75/77 (97%)	75 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
75	Bk	48/50 (96%)	48 (100%)	0	0	100	100
76	Bl	50/52 (96%)	48 (96%)	2 (4%)	0	100	100
77	Bm	23/25 (92%)	23 (100%)	0	0	100	100
78	Bn	101/103 (98%)	99 (98%)	2 (2%)	0	100	100
79	Bo	89/91 (98%)	89 (100%)	0	0	100	100
80	CA	1738/1967 (88%)	1657 (95%)	73 (4%)	8 (0%)	29	68
81	CB	295/297 (99%)	291 (99%)	3 (1%)	1 (0%)	41	76
82	CC	110/530 (21%)	104 (94%)	6 (6%)	0	100	100
All	All	13123/13996 (94%)	12621 (96%)	471 (4%)	31 (0%)	50	81

All (31) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
14	AI	10	LYS
23	AR	74	GLN
23	AR	76	GLU
32	Aa	84	VAL
80	CA	224	THR
80	CA	621	VAL
80	CA	633	ASN
80	CA	1123	THR
81	CB	9	ILE
23	AR	75	GLU
40	BB	128	LYS
49	BK	77	LEU
52	BN	111[A]	PRO
61	BW	44	PRO
49	BK	63	VAL
52	BN	110[A]	PRO
64	BZ	40	HIS
80	CA	248	HIS
64	BZ	78	LEU
80	CA	1148	PHE
10	AE	43	PRO
12	AG	173	PRO
14	AI	9	HIS
42	BD	20	PHE
80	CA	507	LYS
80	CA	1481	GLN

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Mol	Chain	Res	Type
18	AM	109	GLU
32	Aa	9	GLY
39	BA	126	LEU
41	BC	4	PRO
22	AQ	33	GLY

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	
6	AA	170/173 (98%)	170 (100%)	0	100	100
7	AB	200/224 (89%)	200 (100%)	0	100	100
8	AC	175/175 (100%)	173 (99%)	2 (1%)	73	85
9	AD	182/182 (100%)	178 (98%)	4 (2%)	52	71
10	AE	220/220 (100%)	218 (99%)	2 (1%)	78	87
11	AF	172/173 (99%)	170 (99%)	2 (1%)	71	84
12	AG	189/195 (97%)	186 (98%)	3 (2%)	62	79
13	AH	163/165 (99%)	160 (98%)	3 (2%)	59	77
14	AI	148/161 (92%)	147 (99%)	1 (1%)	84	90
15	AJ	156/157 (99%)	155 (99%)	1 (1%)	86	92
16	AK	77/85 (91%)	77 (100%)	0	100	100
17	AL	129/129 (100%)	128 (99%)	1 (1%)	81	89
18	AM	88/98 (90%)	87 (99%)	1 (1%)	73	85
19	AN	127/127 (100%)	127 (100%)	0	100	100
20	AO	91/96 (95%)	90 (99%)	1 (1%)	73	85
21	AP	95/98 (97%)	95 (100%)	0	100	100
22	AQ	117/117 (100%)	117 (100%)	0	100	100
23	AR	101/124 (82%)	96 (95%)	5 (5%)	24	50
24	AS	128/128 (100%)	127 (99%)	1 (1%)	81	89
25	AT	115/115 (100%)	114 (99%)	1 (1%)	78	87

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
26	AU	93/93 (100%)	93 (100%)	0	100	100
27	AV	71/74 (96%)	70 (99%)	1 (1%)	67	81
28	AW	110/110 (100%)	110 (100%)	0	100	100
29	AX	119/119 (100%)	119 (100%)	0	100	100
30	AY	112/112 (100%)	112 (100%)	0	100	100
31	AZ	67/73 (92%)	67 (100%)	0	100	100
32	Aa	83/83 (100%)	83 (100%)	0	100	100
33	Ab	70/70 (100%)	70 (100%)	0	100	100
34	Ac	55/56 (98%)	54 (98%)	1 (2%)	59	77
35	Ad	47/47 (100%)	46 (98%)	1 (2%)	53	72
36	Ae	47/48 (98%)	46 (98%)	1 (2%)	53	72
37	Af	56/64 (88%)	56 (100%)	0	100	100
38	Ag	250/257 (97%)	250 (100%)	0	100	100
39	BA	190/193 (98%)	190 (100%)	0	100	100
40	BB	319/322 (99%)	317 (99%)	2 (1%)	86	92
41	BC	288/288 (100%)	286 (99%)	2 (1%)	84	90
42	BD	241/243 (99%)	241 (100%)	0	100	100
43	BE	138/155 (89%)	138 (100%)	0	100	100
44	BF	186/186 (100%)	186 (100%)	0	100	100
45	BG	187/191 (98%)	187 (100%)	0	100	100
46	BH	168/171 (98%)	168 (100%)	0	100	100
47	BI	185/185 (100%)	185 (100%)	0	100	100
48	BJ	146/147 (99%)	146 (100%)	0	100	100
49	BK	154/154 (100%)	154 (100%)	0	100	100
50	BL	107/107 (100%)	107 (100%)	0	100	100
51	BM	175/175 (100%)	174 (99%)	1 (1%)	86	92
52	BN	160/160 (100%)	160 (100%)	0	100	100
53	BO	138/145 (95%)	138 (100%)	0	100	100
54	BP	150/150 (100%)	150 (100%)	0	100	100
55	BQ	152/153 (99%)	152 (100%)	0	100	100
56	BR	155/155 (100%)	155 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
57	BS	136/136 (100%)	135 (99%)	1 (1%)	84	90
58	BT	87/87 (100%)	87 (100%)	0	100	100
59	BU	104/104 (100%)	103 (99%)	1 (1%)	76	86
60	BV	56/107 (52%)	55 (98%)	1 (2%)	59	77
61	BW	104/105 (99%)	104 (100%)	0	100	100
62	BX	108/108 (100%)	106 (98%)	2 (2%)	57	75
63	BY	115/115 (100%)	115 (100%)	0	100	100
64	BZ	118/118 (100%)	118 (100%)	0	100	100
65	Ba	46/46 (100%)	44 (96%)	2 (4%)	29	54
66	Bb	81/81 (100%)	81 (100%)	0	100	100
67	Bc	92/96 (96%)	92 (100%)	0	100	100
68	Bd	108/109 (99%)	108 (100%)	0	100	100
69	Be	90/90 (100%)	90 (100%)	0	100	100
70	Bf	95/95 (100%)	95 (100%)	0	100	100
71	Bg	104/104 (100%)	104 (100%)	0	100	100
72	Bh	80/81 (99%)	80 (100%)	0	100	100
73	Bi	69/69 (100%)	69 (100%)	0	100	100
74	Bj	68/68 (100%)	65 (96%)	3 (4%)	28	54
75	Bk	45/45 (100%)	45 (100%)	0	100	100
76	Bl	47/47 (100%)	47 (100%)	0	100	100
77	Bm	22/23 (96%)	22 (100%)	0	100	100
78	Bn	87/88 (99%)	87 (100%)	0	100	100
79	Bo	71/71 (100%)	71 (100%)	0	100	100
80	CA	1560/1770 (88%)	1551 (99%)	9 (1%)	86	92
81	CB	266/266 (100%)	264 (99%)	2 (1%)	81	89
82	CC	97/482 (20%)	97 (100%)	0	100	100
All	All	11118/11939 (93%)	11060 (100%)	58 (0%)	89	93

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
8	AC	95	ARG
8	AC	141	ARG

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Mol	Chain	Res	Type
9	AD	76	ARG
9	AD	94	ARG
9	AD	148	LYS
9	AD	178	ARG
10	AE	66	MET
10	AE	233	LYS
11	AF	45	LYS
11	AF	65	ARG
12	AG	31	ARG
12	AG	98	ARG
12	AG	132	ARG
13	AH	39	ARG
13	AH	47	ARG
13	AH	84	LYS
14	AI	18	ARG
15	AJ	149	ARG
17	AL	67	ARG
18	AM	73	LYS
20	AO	136	ARG
23	AR	62	GLN
23	AR	73	LEU
23	AR	75	GLU
23	AR	76	GLU
23	AR	77	GLU
24	AS	145	ARG
25	AT	119	LYS
27	AV	5	LYS
34	Ac	64	ARG
35	Ad	19	ARG
36	Ae	28	LYS
40	BB	104	THR
40	BB	332	ARG
41	BC	144	LYS
41	BC	197	ARG
51	BM	20	ARG
57	BS	83	ARG
59	BU	106	LYS
60	BV	41	LYS
62	BX	3	LYS
62	BX	125	LYS
65	Ba	52	LYS
65	Ba	59	LYS

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Mol	Chain	Res	Type
74	Bj	9	LYS
74	Bj	67	GLN
74	Bj	74	LYS
80	CA	218	LYS
80	CA	233	LYS
80	CA	242	ARG
80	CA	650	LYS
80	CA	1187	LYS
80	CA	1229	LYS
80	CA	1400	ARG
80	CA	1441	LYS
80	CA	1443	ARG
81	CB	24	LYS
81	CB	254	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (31) such sidechains are listed below:

Mol	Chain	Res	Type
6	AA	49	ASN
6	AA	140	ASN
7	AB	149	GLN
7	AB	194	ASN
16	AK	39	ASN
18	AM	143	GLN
20	AO	99	GLN
26	AU	40	ASN
26	AU	47	GLN
30	AY	15	ASN
30	AY	22	GLN
31	AZ	38	HIS
33	Ab	51	GLN
37	Af	135	HIS
45	BG	38	GLN
45	BG	79	GLN
46	BH	5	GLN
47	BI	100	ASN
48	BJ	62	ASN
50	BL	27	GLN
53	BO	97	ASN
57	BS	58	GLN
63	BY	57	HIS
80	CA	261	ASN

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Mol	Chain	Res	Type
80	CA	292	GLN
80	CA	608	ASN
80	CA	700	GLN
80	CA	981	ASN
80	CA	1079	GLN
80	CA	1473	HIS
81	CB	103	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1768/1798 (98%)	417 (23%)	38 (2%)
2	3	157/158 (99%)	25 (15%)	1 (0%)
3	4	120/121 (99%)	10 (8%)	1 (0%)
4	5	3181/3396 (93%)	549 (17%)	32 (1%)
5	6	74/75 (98%)	16 (21%)	2 (2%)
All	All	5300/5548 (95%)	1017 (19%)	74 (1%)

All (1017) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	4	C
1	2	13	C
1	2	14	C
1	2	25	C
1	2	26	A
1	2	34	G
1	2	43	A
1	2	47	A
1	2	56	U
1	2	57	G
1	2	62	A
1	2	65	A
1	2	68	A
1	2	69	G
1	2	71	A
1	2	73	U
1	2	74	U
1	2	75	U
1	2	76	A

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Mol	Chain	Res	Type
1	2	78	A
1	2	79	C
1	2	81	G
1	2	100	A
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	134	U
1	2	135	A
1	2	136	C
1	2	138	A
1	2	140	A
1	2	141	U
1	2	142	G
1	2	155	U
1	2	156	A
1	2	168	A
1	2	171	A
1	2	174	U
1	2	176	C
1	2	178	U
1	2	179	A
1	2	180	A
1	2	184	C
1	2	186	C
1	2	188	A
1	2	191	C
1	2	193	U
1	2	195	G
1	2	197	A
1	2	198	A
1	2	215	A
1	2	216	U
1	2	217	A
1	2	218	A

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Mol	Chain	Res	Type
1	2	224	C
1	2	225	A
1	2	227	U
1	2	228	G
1	2	230	C
1	2	232	U
1	2	233	C
1	2	234	G
1	2	236	A
1	2	240	U
1	2	241	U
1	2	250	C
1	2	257	A
1	2	260	U
1	2	265	A
1	2	272	U
1	2	274	G
1	2	276	C
1	2	278	U
1	2	279	G
1	2	280	U
1	2	281	G
1	2	287	G
1	2	299	A
1	2	314	C
1	2	316	A
1	2	320	U
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	352	A
1	2	353	A
1	2	359	A
1	2	361	C
1	2	370	A
1	2	373	G
1	2	388	G
1	2	399	A
1	2	400	A

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Mol	Chain	Res	Type
1	2	401	A
1	2	402	C
1	2	404	G
1	2	415	C
1	2	416	A
1	2	417	A
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	436	A
1	2	437	A
1	2	439	U
1	2	444	C
1	2	445	A
1	2	460	A
1	2	468	A
1	2	482	U
1	2	483	A
1	2	485	A
1	2	487	G
1	2	491	C
1	2	492	A
1	2	493	U
1	2	494	U
1	2	495	C
1	2	496	G
1	2	499	U
1	2	500	C
1	2	502	U
1	2	505	A
1	2	506	A
1	2	510	G
1	2	511	A
1	2	515	A
1	2	527	A
1	2	534	A
1	2	538	A
1	2	540	G
1	2	541	A

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Mol	Chain	Res	Type
1	2	542	A
1	2	543	C
1	2	546	U
1	2	548	G
1	2	549	G
1	2	555	A
1	2	556	A
1	2	557	G
1	2	558	U
1	2	559	C
1	2	565	C
1	2	568	G
1	2	579	A
1	2	582	U
1	2	594	A
1	2	595	G
1	2	606	A
1	2	610	G
1	2	611	U
1	2	619	A
1	2	620	A
1	2	622	A
1	2	623	A
1	2	624	G
1	2	629	U
1	2	639	U
1	2	640	U
1	2	641	G
1	2	645	C
1	2	650	U
1	2	651	G
1	2	653	C
1	2	655	G
1	2	678	A
1	2	679	U
1	2	680	U
1	2	681	U
1	2	684	A
1	2	687	G
1	2	694	U
1	2	696	C
1	2	698	U

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Mol	Chain	Res	Type
1	2	700	C
1	2	702	G
1	2	704	C
1	2	705	U
1	2	706	A
1	2	707	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	728	U
1	2	730	G
1	2	732	G
1	2	733	A
1	2	734	A
1	2	736	C
1	2	737	A
1	2	739	G
1	2	741	C
1	2	742	U
1	2	743	U
1	2	745	U
1	2	765	G
1	2	766	U
1	2	767	U
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	789	A
1	2	812	A
1	2	813	U
1	2	814	A
1	2	815	G
1	2	816	G

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Mol	Chain	Res	Type
1	2	820	U
1	2	821	U
1	2	823	G
1	2	833	U
1	2	835	U
1	2	840	U
1	2	841	U
1	2	846	G
1	2	852	C
1	2	855	A
1	2	856	A
1	2	857	U
1	2	863	A
1	2	876	G
1	2	899	G
1	2	902	G
1	2	912	U
1	2	913	G
1	2	914	G
1	2	915	A
1	2	921	U
1	2	929	A
1	2	933	A
1	2	934	C
1	2	935	U
1	2	942	G
1	2	960	U
1	2	964	U
1	2	966	A
1	2	970	A
1	2	971	A
1	2	988	A
1	2	989	U
1	2	992	A
1	2	993	A
1	2	998	A
1	2	1004	U
1	2	1005	A
1	2	1012	U
1	2	1023	A
1	2	1024	U
1	2	1026	A

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Mol	Chain	Res	Type
1	2	1028	C
1	2	1039	A
1	2	1053	G
1	2	1058	U
1	2	1060	U
1	2	1061	A
1	2	1076	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	1150	G
1	2	1151	A
1	2	1153	G
1	2	1156	C
1	2	1158	C
1	2	1160	A
1	2	1164	G
1	2	1167	G
1	2	1170	G
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	1217	A
1	2	1218	G
1	2	1227	A
1	2	1228	G
1	2	1229	G
1	2	1243	G
1	2	1244	A
1	2	1245	G
1	2	1246	C
1	2	1252	C
1	2	1256	A
1	2	1257	U
1	2	1274	C
1	2	1275	A

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Mol	Chain	Res	Type
1	2	1276	U
1	2	1285	U
1	2	1300	A
1	2	1301	U
1	2	1306	C
1	2	1314	U
1	2	1315	U
1	2	1316	G
1	2	1317	C
1	2	1319	A
1	2	1321	A
1	2	1322	A
1	2	1323	C
1	2	1344	A
1	2	1345	A
1	2	1346	A
1	2	1348	A
1	2	1349	G
1	2	1360	A
1	2	1361	U
1	2	1363	U
1	2	1367	G
1	2	1370	U
1	2	1371	A
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	1402	G
1	2	1410	A
1	2	1414	U
1	2	1418	G
1	2	1427	A
1	2	1431	C
1	2	1432	U
1	2	1433	G
1	2	1446	A
1	2	1459	C

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Mol	Chain	Res	Type
1	2	1460	A
1	2	1469	A
1	2	1472	C
1	2	1479	A
1	2	1491	U
1	2	1493	A
1	2	1496	U
1	2	1503	A
1	2	1506	G
1	2	1514	U
1	2	1516	A
1	2	1517	U
1	2	1520	U
1	2	1521	G
1	2	1524	A
1	2	1531	G
1	2	1535	U
1	2	1537	C
1	2	1540	G
1	2	1542	G
1	2	1543	A
1	2	1554	U
1	2	1557	U
1	2	1558	U
1	2	1559	A
1	2	1570	A
1	2	1573	A
1	2	1574	G
1	2	1576	A
1	2	1583	A
1	2	1585	U
1	2	1601	G
1	2	1607	G
1	2	1611	A
1	2	1614	A
1	2	1616	G
1	2	1631	A
1	2	1634	C
1	2	1637	C
1	2	1657	U
1	2	1658	G
1	2	1682	U

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Mol	Chain	Res	Type
1	2	1688	U
1	2	1700	C
1	2	1701	A
1	2	1708	U
1	2	1709	C
1	2	1711	C
1	2	1715	G
1	2	1717	G
1	2	1756	A
1	2	1766	A
1	2	1767	G
1	2	1769	U
1	2	1780	G
1	2	1783	C
1	2	1792	G
1	2	1793	G
1	2	1794	A
1	2	1796	C
1	2	1799	U
2	3	23	U
2	3	34	U
2	3	35	C
2	3	59	A
2	3	62	C
2	3	63	G
2	3	80	A
2	3	81	U
2	3	82	U
2	3	83	C
2	3	84	C
2	3	85	G
2	3	86	U
2	3	87	G
2	3	90	U
2	3	95	G
2	3	104	A
2	3	106	C
2	3	111	A
2	3	112	U
2	3	113	U
2	3	125	U
2	3	126	A

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Mol	Chain	Res	Type
2	3	148	G
2	3	152	G
3	4	22	A
3	4	53	U
3	4	54	U
3	4	65	G
3	4	74	C
3	4	76	A
3	4	77	G
3	4	102	A
3	4	112	G
3	4	121	U
4	5	13	A
4	5	14	U
4	5	18	G
4	5	26	A
4	5	40	A
4	5	43	A
4	5	49	A
4	5	59	G
4	5	60	A
4	5	65	A
4	5	66	A
4	5	67	A
4	5	83	U
4	5	92	G
4	5	109	A
4	5	110	G
4	5	111	C
4	5	116	A
4	5	118	U
4	5	121	A
4	5	122	A
4	5	133	U
4	5	135	C
4	5	136	G
4	5	148	G
4	5	156	G
4	5	157	A
4	5	166	C
4	5	187	A
4	5	190	U

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Mol	Chain	Res	Type
4	5	191	U
4	5	200	C
4	5	210	U
4	5	213	A
4	5	218	G
4	5	219	A
4	5	231	G
4	5	240	U
4	5	241	G
4	5	243	G
4	5	248	U
4	5	249	U
4	5	252	U
4	5	269	G
4	5	283	G
4	5	286	U
4	5	291	C
4	5	295	A
4	5	305	U
4	5	323	A
4	5	329	U
4	5	339	C
4	5	350	C
4	5	351	A
4	5	376	G
4	5	398	A
4	5	401	U
4	5	402	A
4	5	403	C
4	5	421	G
4	5	422	A
4	5	440	A
4	5	441	U
4	5	442	G
4	5	443	G
4	5	447	U
4	5	448	U
4	5	450	G
4	5	487	U
4	5	488	U
4	5	489	U
4	5	491	A

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Mol	Chain	Res	Type
4	5	492	C
4	5	493	U
4	5	494	G
4	5	495	G
4	5	517	A
4	5	518	G
4	5	522	A
4	5	524	A
4	5	536	G
4	5	544	C
4	5	546	U
4	5	548	G
4	5	549	G
4	5	553	G
4	5	556	U
4	5	558	A
4	5	560	A
4	5	580	G
4	5	590	A
4	5	591	G
4	5	593	A
4	5	601	G
4	5	602	U
4	5	603	A
4	5	610	G
4	5	611	G
4	5	612	A
4	5	621	U
4	5	622	A
4	5	623	A
4	5	638	C
4	5	639	C
4	5	650	A
4	5	661	A
4	5	678	A
4	5	682	U
4	5	692	A
4	5	706	A
4	5	713	G
4	5	716	A
4	5	717	A
4	5	720	U

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Mol	Chain	Res	Type
4	5	721	A
4	5	765	U
4	5	767	U
4	5	768	U
4	5	769	C
4	5	777	U
4	5	778	U
4	5	781	A
4	5	782	G
4	5	786	G
4	5	787	A
4	5	807	A
4	5	817	A
4	5	818	A
4	5	831	A
4	5	847	A
4	5	848	A
4	5	850	C
4	5	862	C
4	5	875	U
4	5	880	U
4	5	881	G
4	5	891	C
4	5	897	A
4	5	898	U
4	5	908	G
4	5	909	G
4	5	915	A
4	5	917	G
4	5	918	A
4	5	922	A
4	5	924	C
4	5	938	G
4	5	945	C
4	5	960	C
4	5	961	U
4	5	982	U
4	5	983	C
4	5	1001	C
4	5	1002	G
4	5	1003	A
4	5	1011	G

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Mol	Chain	Res	Type
4	5	1018	C
4	5	1021	G
4	5	1025	G
4	5	1029	U
4	5	1033	C
4	5	1037	A
4	5	1048	A
4	5	1050	C
4	5	1065	A
4	5	1066	A
4	5	1073	G
4	5	1082	U
4	5	1094	A
4	5	1095	U
4	5	1096	U
4	5	1098	G
4	5	1099	A
4	5	1104	A
4	5	1105	G
4	5	1118	G
4	5	1132	G
4	5	1144	A
4	5	1145	U
4	5	1154	A
4	5	1160	A
4	5	1161	C
4	5	1180	A
4	5	1181	A
4	5	1182	U
4	5	1192	U
4	5	1193	C
4	5	1194	A
4	5	1197	C
4	5	1202	C
4	5	1203	A
4	5	1209	U
4	5	1218	A
4	5	1223	G
4	5	1226	A
4	5	1228	C
4	5	1233	C
4	5	1236	U

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Mol	Chain	Res	Type
4	5	1237	G
4	5	1239	C
4	5	1241	A
4	5	1242	U
4	5	1243	G
4	5	1246	A
4	5	1247	G
4	5	1252	A
4	5	1254	U
4	5	1255	C
4	5	1259	U
4	5	1263	G
4	5	1264	A
4	5	1265	G
4	5	1267	G
4	5	1270	U
4	5	1271	A
4	5	1272	A
4	5	1275	A
4	5	1279	A
4	5	1280	C
4	5	1287	A
4	5	1288	A
4	5	1308	G
4	5	1310	U
4	5	1314	G
4	5	1331	A
4	5	1333	A
4	5	1350	G
4	5	1352	U
4	5	1353	A
4	5	1356	A
4	5	1357	U
4	5	1358	G
4	5	1387	A
4	5	1393	G
4	5	1400	A
4	5	1401	G
4	5	1418	G
4	5	1419	A
4	5	1420	A
4	5	1435	G

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Mol	Chain	Res	Type
4	5	1438	C
4	5	1447	A
4	5	1482	A
4	5	1483	A
4	5	1484	G
4	5	1489	G
4	5	1495	U
4	5	1497	C
4	5	1509	C
4	5	1537	G
4	5	1540	A
4	5	1557	C
4	5	1558	A
4	5	1561	G
4	5	1563	C
4	5	1564	C
4	5	1566	G
4	5	1567	A
4	5	1568	U
4	5	1569	U
4	5	1570	U
4	5	1573	U
4	5	1574	G
4	5	1576	A
4	5	1577	G
4	5	1581	A
4	5	1583	C
4	5	1584	A
4	5	1589	A
4	5	1590	A
4	5	1594	A
4	5	1606	A
4	5	1608	U
4	5	1630	U
4	5	1640	C
4	5	1643	A
4	5	1644	A
4	5	1646	U
4	5	1647	G
4	5	1658	C
4	5	1684	A
4	5	1717	U

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Mol	Chain	Res	Type
4	5	1718	U
4	5	1725	U
4	5	1726	C
4	5	1737	G
4	5	1742	A
4	5	1743	U
4	5	1751	A
4	5	1752	G
4	5	1761	A
4	5	1766	U
4	5	1767	G
4	5	1771	G
4	5	1776	G
4	5	1781	G
4	5	1798	A
4	5	1815	A
4	5	1817	A
4	5	1818	G
4	5	1820	U
4	5	1821	U
4	5	1822	U
4	5	1836	A
4	5	1840	A
4	5	1841	U
4	5	1843	A
4	5	1847	C
4	5	1859	A
4	5	1867	C
4	5	1868	A
4	5	1879	G
4	5	1881	U
4	5	1894	A
4	5	1907	G
4	5	1953	G
4	5	1954	G
4	5	1955	G
4	5	2102	C
4	5	2103	U
4	5	2108	A
4	5	2111	G
4	5	2112	G
4	5	2113	U

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Mol	Chain	Res	Type
4	5	2114	A
4	5	2122	G
4	5	2123	G
4	5	2132	A
4	5	2141	U
4	5	2145	A
4	5	2159	A
4	5	2161	G
4	5	2170	G
4	5	2171	U
4	5	2172	G
4	5	2189	A
4	5	2193	C
4	5	2202	G
4	5	2205	C
4	5	2206	U
4	5	2207	G
4	5	2208	A
4	5	2210	U
4	5	2211	G
4	5	2224	A
4	5	2250	G
4	5	2251	G
4	5	2257	A
4	5	2258	C
4	5	2273	G
4	5	2274	G
4	5	2280	A
4	5	2282	A
4	5	2283	U
4	5	2289	G
4	5	2308	G
4	5	2311	U
4	5	2314	A
4	5	2315	U
4	5	2316	G
4	5	2319	U
4	5	2335	U
4	5	2336	G
4	5	2374	A
4	5	2375	C
4	5	2376	G

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Mol	Chain	Res	Type
4	5	2386	G
4	5	2389	U
4	5	2394	G
4	5	2398	A
4	5	2403	A
4	5	2404	G
4	5	2405	A
4	5	2412	U
4	5	2413	G
4	5	2420	A
4	5	2436	G
4	5	2440	A
4	5	2446	A
4	5	2447	U
4	5	2448	A
4	5	2450	A
4	5	2453	G
4	5	2495	A
4	5	2497	C
4	5	2499	U
4	5	2500	U
4	5	2502	U
4	5	2503	A
4	5	2507	U
4	5	2508	C
4	5	2515	U
4	5	2516	A
4	5	2527	C
4	5	2532	C
4	5	2538	U
4	5	2539	U
4	5	2540	C
4	5	2541	A
4	5	2542	U
4	5	2543	U
4	5	2545	U
4	5	2548	A
4	5	2549	C
4	5	2550	G
4	5	2553	C
4	5	2562	A
4	5	2570	A

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Mol	Chain	Res	Type
4	5	2571	U
4	5	2572	U
4	5	2573	C
4	5	2574	G
4	5	2586	G
4	5	2594	A
4	5	2595	C
4	5	2607	G
4	5	2608	G
4	5	2615	G
4	5	2627	A
4	5	2652	G
4	5	2653	U
4	5	2657	A
4	5	2658	A
4	5	2673	G
4	5	2675	A
4	5	2678	G
4	5	2682	U
4	5	2689	U
4	5	2690	A
4	5	2692	A
4	5	2695	A
4	5	2697	A
4	5	2705	A
4	5	2715	G
4	5	2729	G
4	5	2730	U
4	5	2738	C
4	5	2753	U
4	5	2754	G
4	5	2756	C
4	5	2763	A
4	5	2773	C
4	5	2778	G
4	5	2779	G
4	5	2789	C
4	5	2797	G
4	5	2800	A
4	5	2801	G
4	5	2802	A
4	5	2804	A

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Mol	Chain	Res	Type
4	5	2811	C
4	5	2818	A
4	5	2819	U
4	5	2820	A
4	5	2822	C
4	5	2843	U
4	5	2845	C
4	5	2846	A
4	5	2860	U
4	5	2868	C
4	5	2872	G
4	5	2873	A
4	5	2876	U
4	5	2888	A
4	5	2899	G
4	5	2912	A
4	5	2915	G
4	5	2924	U
4	5	2934	A
4	5	2936	U
4	5	2937	A
4	5	2948	G
4	5	2972	A
4	5	2984	C
4	5	2991	G
4	5	2993	U
4	5	2997	U
4	5	2998	G
4	5	3013	A
4	5	3057	U
4	5	3060	G
4	5	3079	U
4	5	3081	G
4	5	3087	A
4	5	3093	C
4	5	3102	G
4	5	3105	U
4	5	3114	A
4	5	3120	U
4	5	3123	A
4	5	3131	A
4	5	3132	U

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Mol	Chain	Res	Type
4	5	3143	A
4	5	3144	C
4	5	3152	U
4	5	3155	C
4	5	3156	U
4	5	3157	U
4	5	3158	U
4	5	3166	A
4	5	3171	A
4	5	3173	A
4	5	3174	G
4	5	3175	A
4	5	3177	G
4	5	3180	U
4	5	3182	C
4	5	3188	A
4	5	3197	U
4	5	3207	C
4	5	3208	U
4	5	3218	C
4	5	3219	A
4	5	3220	G
4	5	3230	G
4	5	3240	G
4	5	3244	A
4	5	3246	A
4	5	3248	G
4	5	3260	U
4	5	3261	G
4	5	3271	U
4	5	3274	A
4	5	3277	G
4	5	3282	U
4	5	3288	U
4	5	3289	G
4	5	3290	G
4	5	3295	A
4	5	3296	A
4	5	3305	U
4	5	3315	A
4	5	3317	A
4	5	3319	G

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Mol	Chain	Res	Type
4	5	3320	U
4	5	3321	A
4	5	3342	U
4	5	3343	A
4	5	3346	G
4	5	3352	U
4	5	3353	U
4	5	3354	G
4	5	3355	U
4	5	3356	U
4	5	3370	G
4	5	3376	A
4	5	3379	C
4	5	3383	U
4	5	3391	G
5	6	8	U
5	6	15	A
5	6	16	C
5	6	17	G
5	6	19	C
5	6	28	C
5	6	31	G
5	6	42	G
5	6	44	A
5	6	45	G
5	6	46	A
5	6	48	C
5	6	55	C
5	6	59	U
5	6	61	C
5	6	75	A

All (74) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	68	A
1	2	77	U
1	2	139	C
1	2	141	U
1	2	280	U
1	2	322	G
1	2	352	A

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Mol	Chain	Res	Type
1	2	387	A
1	2	400	A
1	2	541	A
1	2	555	A
1	2	609	U
1	2	639	U
1	2	640	U
1	2	705	U
1	2	711	U
1	2	765	G
1	2	819	G
1	2	912	U
1	2	928	U
1	2	1023	A
1	2	1152	A
1	2	1226	A
1	2	1256	A
1	2	1273	G
1	2	1274	C
1	2	1318	G
1	2	1321	A
1	2	1344	A
1	2	1348	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	1791	A
2	3	85	G
3	4	52	G
4	5	13	A
4	5	239	G
4	5	282	G
4	5	492	C
4	5	493	U
4	5	602	U
4	5	638	C
4	5	716	A
4	5	764	G

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Mol	Chain	Res	Type
4	5	917	G
4	5	1065	A
4	5	1098	G
4	5	1356	A
4	5	1563	C
4	5	1569	U
4	5	1717	U
4	5	1816	U
4	5	1817	A
4	5	1821	U
4	5	2102	C
4	5	2113	U
4	5	2496	C
4	5	2526	G
4	5	2538	U
4	5	2542	U
4	5	3122	U
4	5	3219	A
4	5	3229	C
4	5	3270	U
4	5	3320	U
4	5	3351	C
4	5	3352	U
5	6	7	A
5	6	58	C

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 13 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

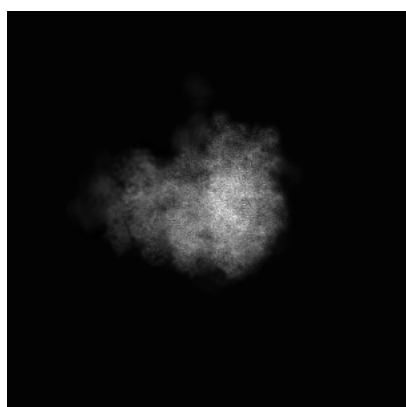
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-14921. These allow visual inspection of the internal detail of the map and identification of artifacts.

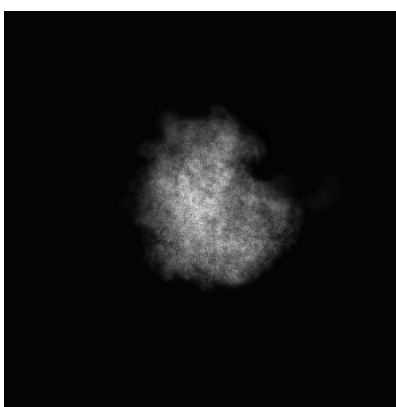
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

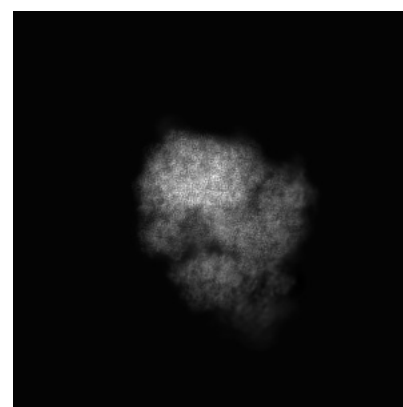
6.1.1 Primary map



X



Y

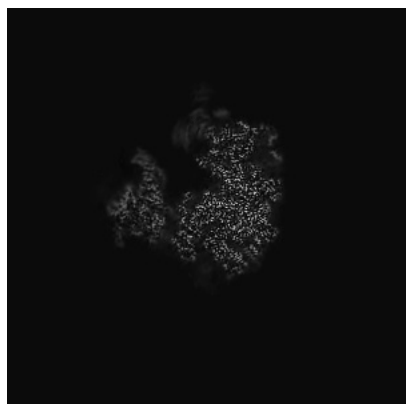


Z

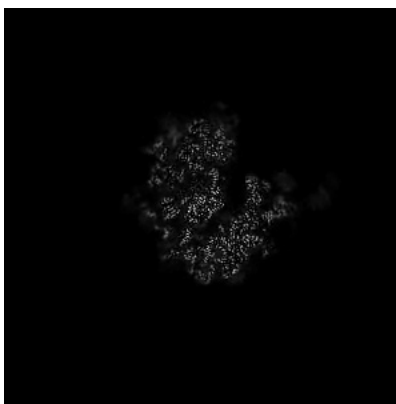
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

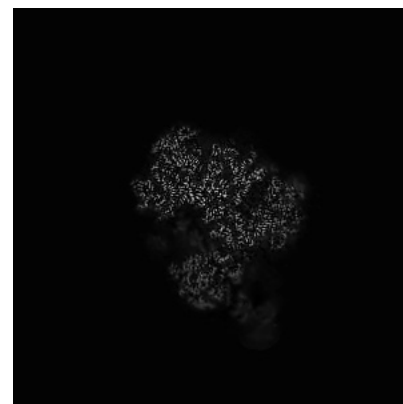
6.2.1 Primary map



X Index: 280



Y Index: 280

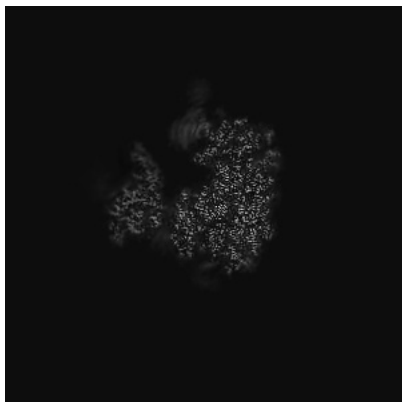


Z Index: 280

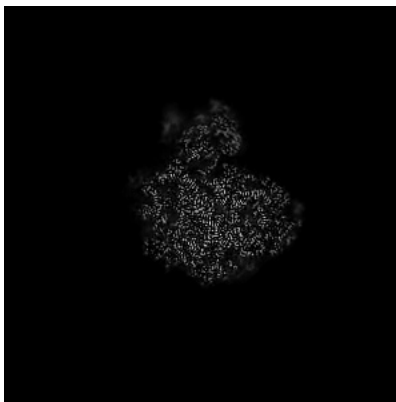
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

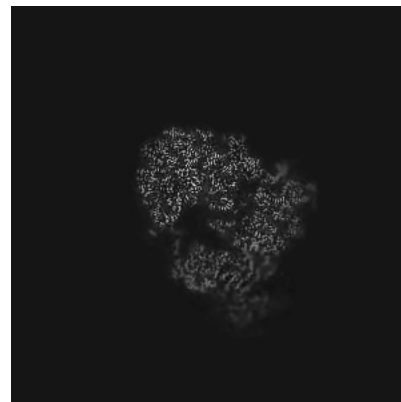
6.3.1 Primary map



X Index: 285



Y Index: 305

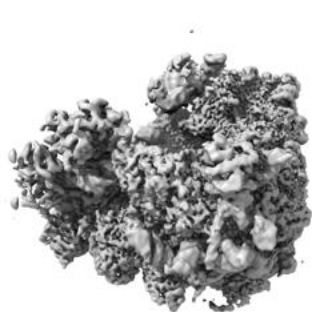


Z Index: 300

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

6.4 Orthogonal surface views [i](#)

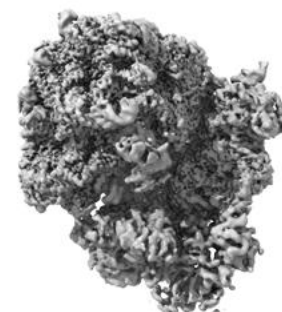
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

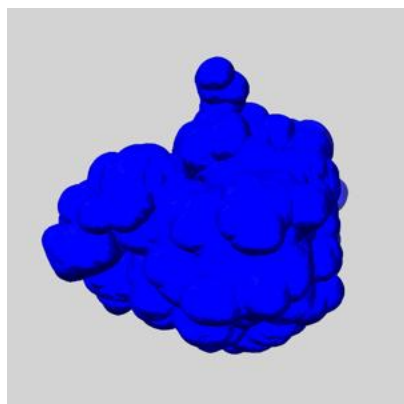
6.5 Mask visualisation [i](#)

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

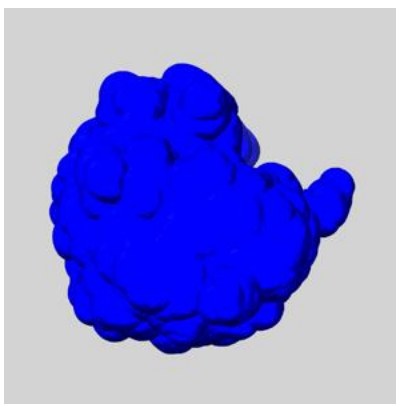
A mask typically either:

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

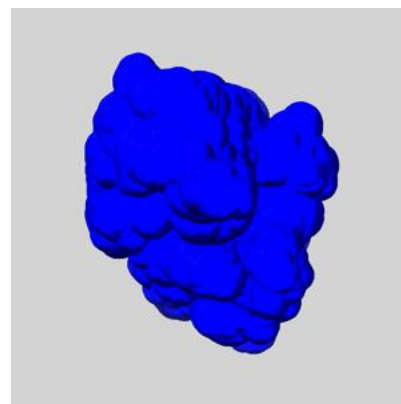
6.5.1 emd_14921_msk_1.map [i](#)



X

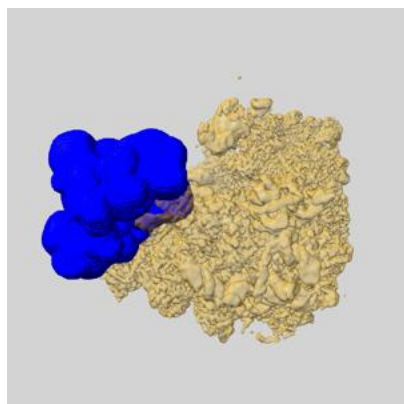


Y

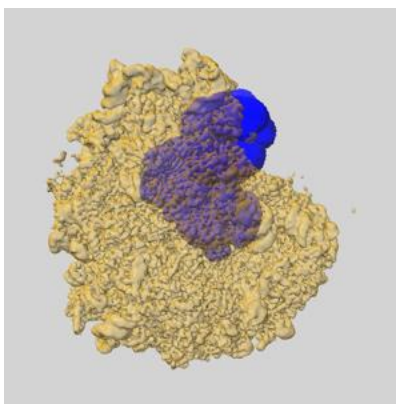


Z

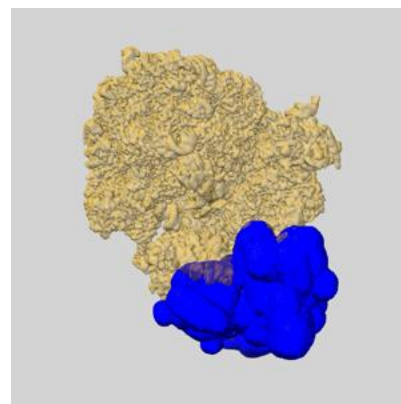
6.5.2 emd_14921_msk_2.map [i](#)



X



Y

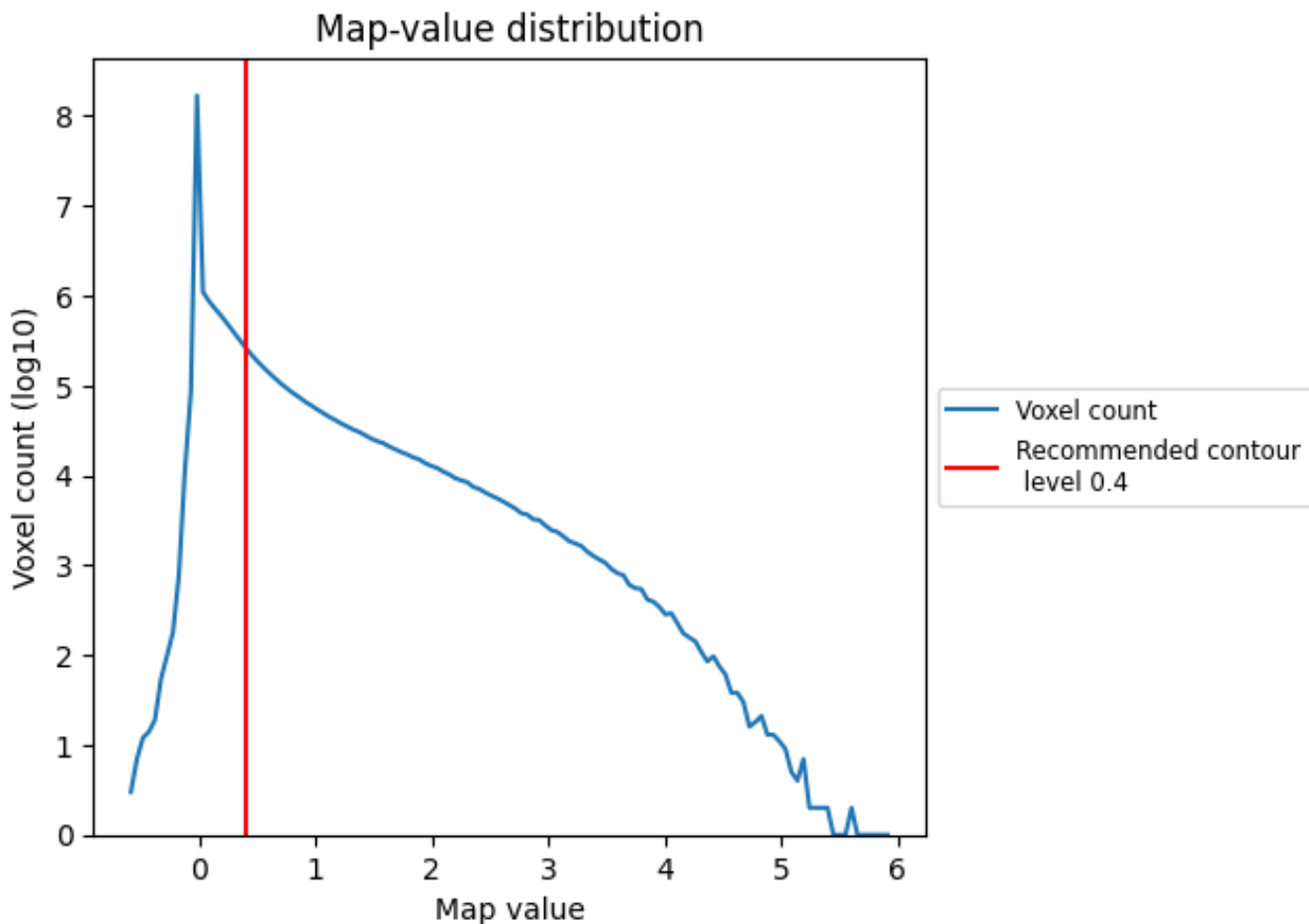


Z

7 Map analysis [i](#)

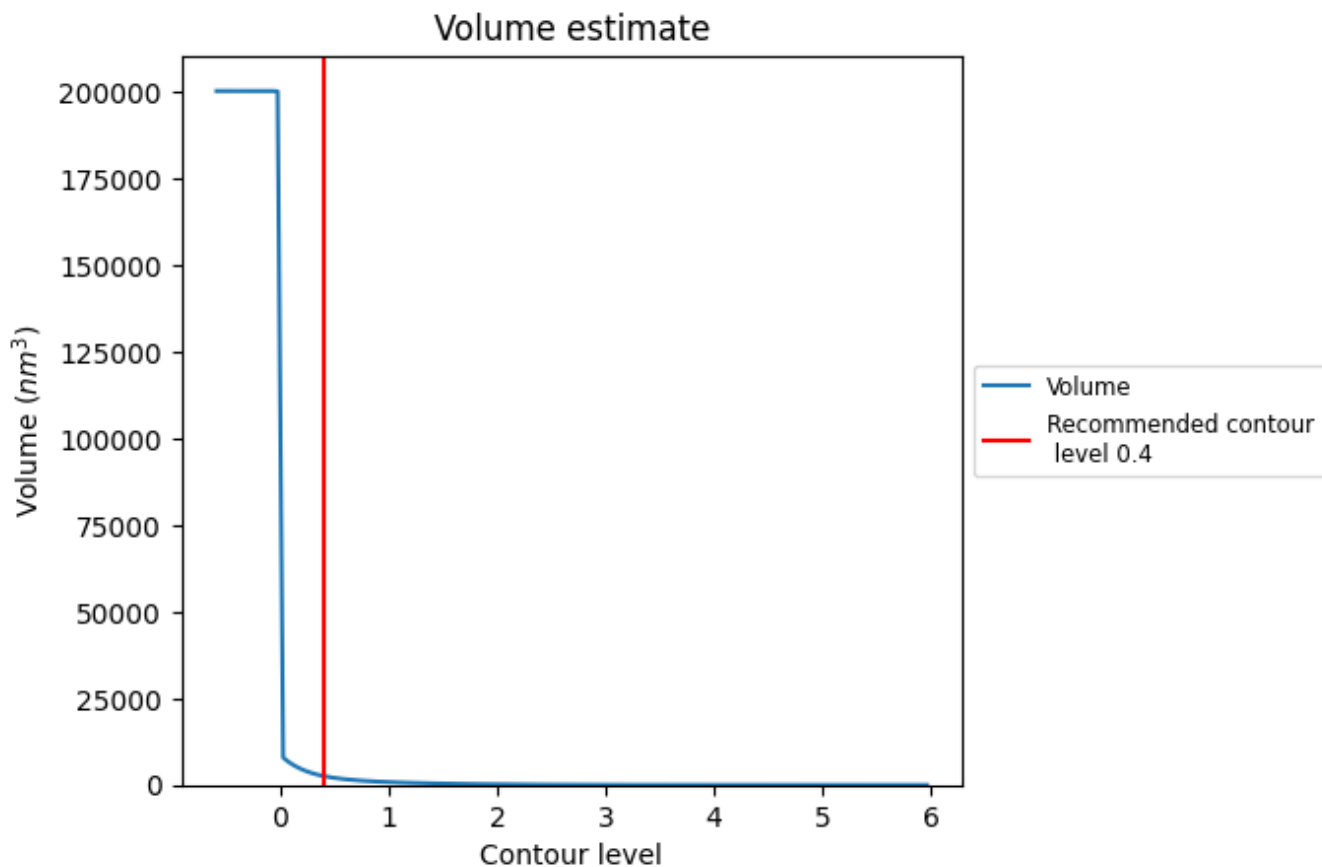
This section contains the results of statistical analysis of the map.

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.

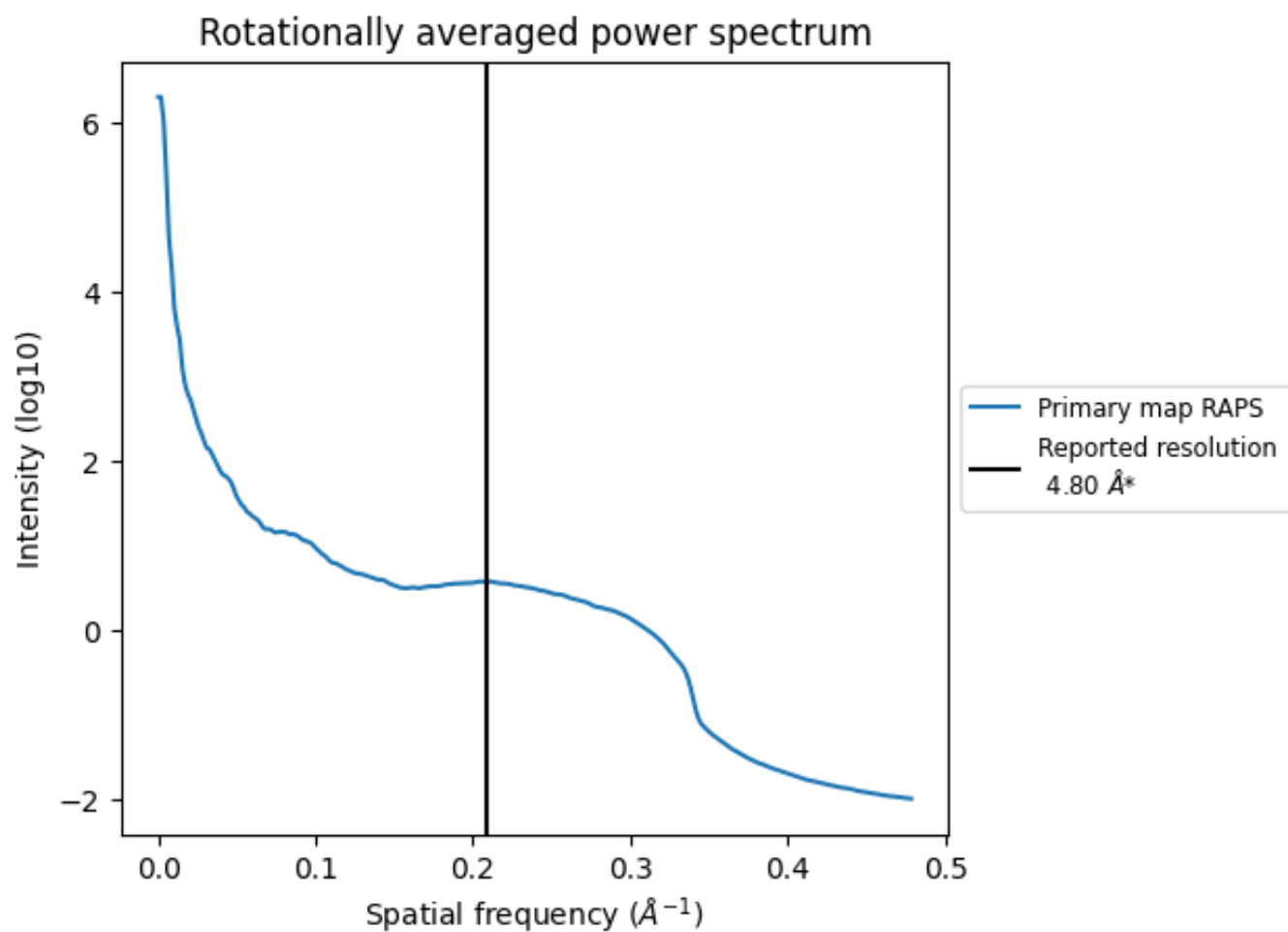
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2583 nm^3 ; this corresponds to an approximate mass of 2333 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](#)

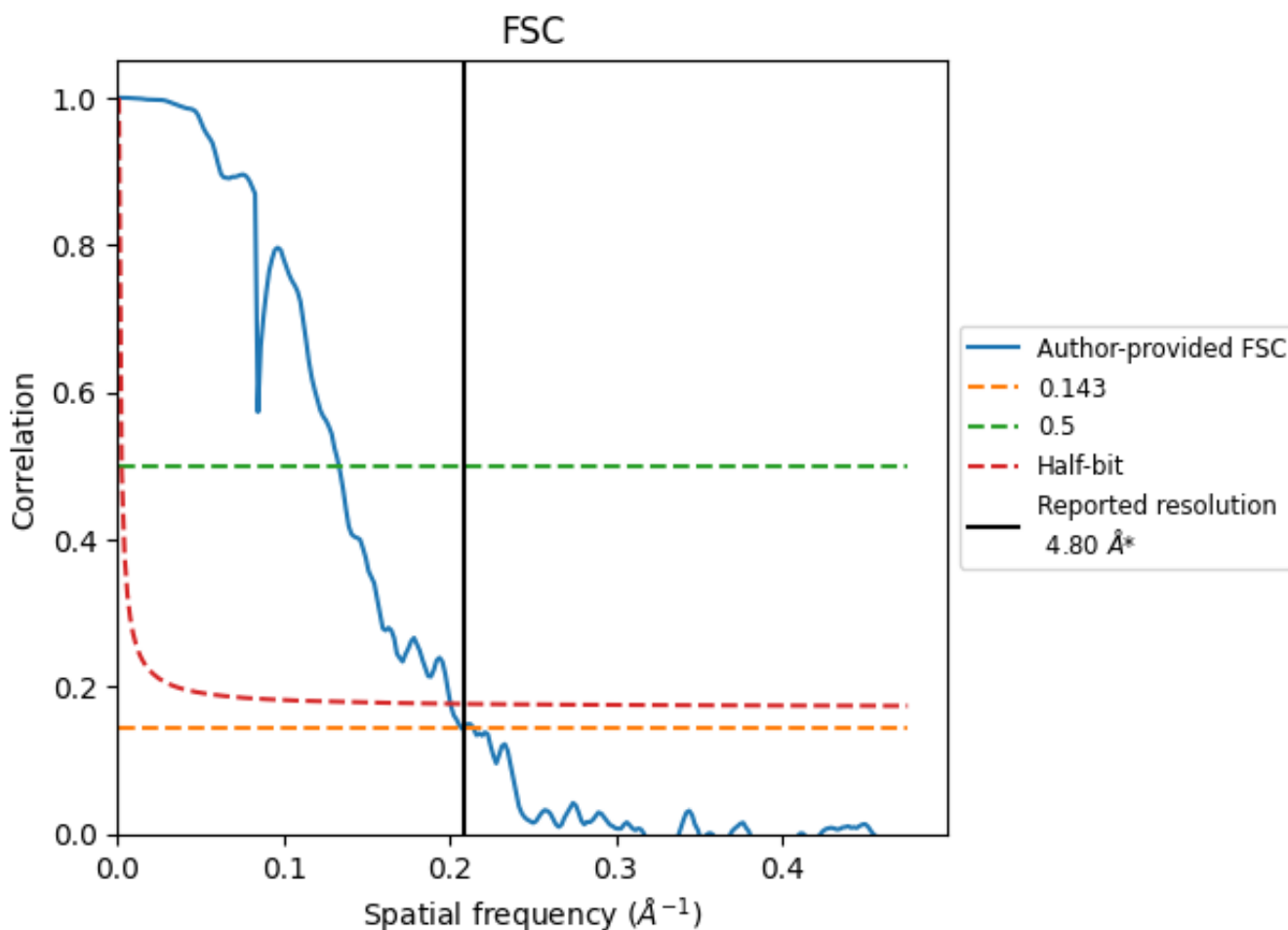


*Reported resolution corresponds to spatial frequency of 0.208\AA^{-1}

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 0.208 Å⁻¹

8.2 Resolution estimates [i](#)

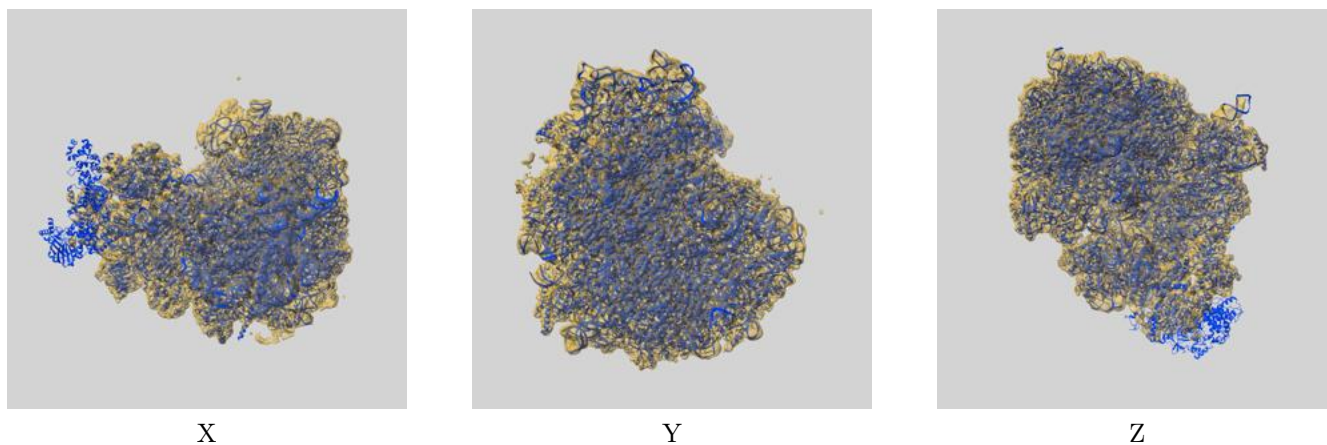
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.80	-	-
Author-provided FSC curve	4.82	7.50	4.99
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

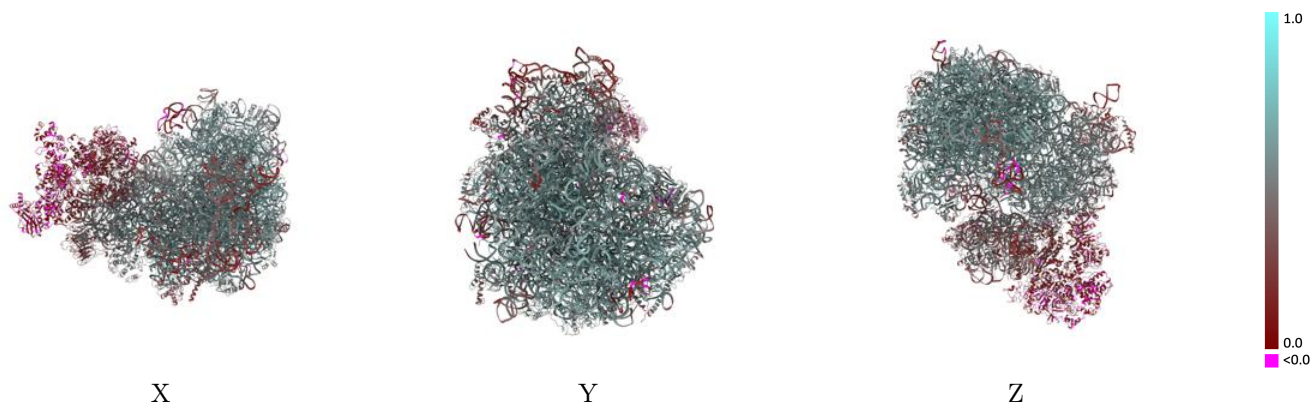
This section contains information regarding the fit between EMDB map EMD-14921 and PDB model 7ZRS. Per-residue inclusion information can be found in section 3 on page 19.

9.1 Map-model overlay [i](#)



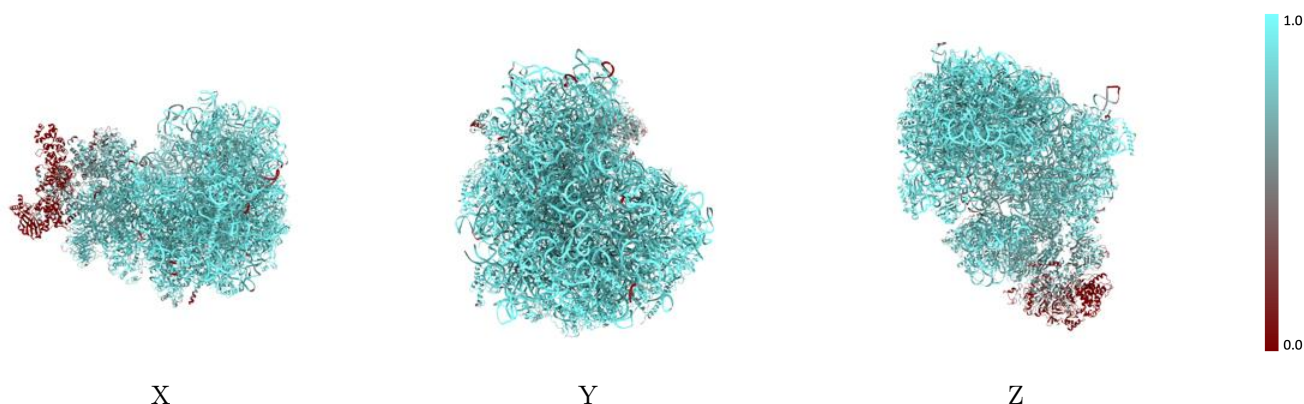
The images above show the 3D surface view of the map at the recommended contour level 0.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



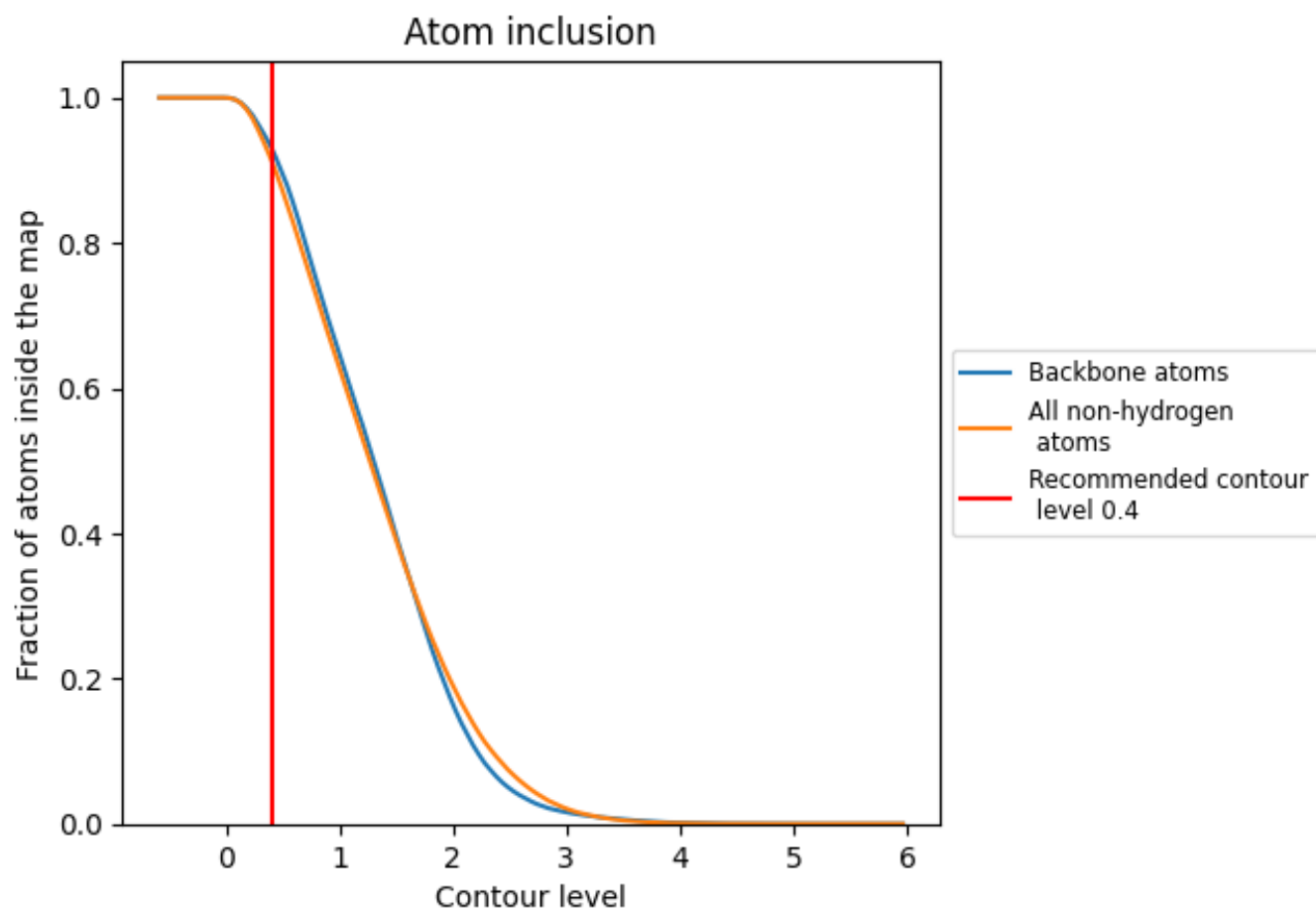
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.4).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 93% of all backbone atoms, 91% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary





















































































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

Chain	Atom inclusion	Q-score
All	 0.9143	 0.4900
2	 0.9699	 0.4750
3	 0.9878	 0.5860
4	 0.9984	 0.5700
5	 0.9813	 0.5620
6	 0.7218	 0.2630
AA	 0.9610	 0.4930
AB	 0.9281	 0.4880
AC	 0.9737	 0.5330
AD	 0.9163	 0.3880
AE	 0.9651	 0.5010
AF	 0.8648	 0.3940
AG	 0.9023	 0.4120
AH	 0.8636	 0.4280
AI	 0.9621	 0.5270
AJ	 0.9496	 0.4820
AK	 0.8794	 0.2790
AL	 0.9566	 0.5480
AM	 0.4798	 0.1940
AN	 0.9723	 0.5300
AO	 0.9799	 0.5330
AP	 0.8438	 0.3310
AQ	 0.9240	 0.4390
AR	 0.8915	 0.3950
AS	 0.8501	 0.3420
AT	 0.8964	 0.3760
AU	 0.8900	 0.3520
AV	 0.9495	 0.4830
AW	 0.9920	 0.5670
AX	 0.9698	 0.5530
AY	 0.9328	 0.4540
AZ	 0.6487	 0.2680
Aa	 0.9756	 0.5140
Ab	 0.9418	 0.5010
Ac	 0.8605	 0.3850















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Chain	Atom inclusion	Q-score
Ad	 0.9811	 0.4550
Ae	 0.8194	 0.3940
Af	 0.5882	 0.2110
Ag	 0.8162	 0.3330
BA	 0.9913	 0.6070
BB	 0.9766	 0.5790
BC	 0.9747	 0.5720
BD	 0.9388	 0.5010
BE	 0.9578	 0.5350
BF	 0.9713	 0.5820
BG	 0.9402	 0.5200
BH	 0.9568	 0.5480
BI	 0.9479	 0.5490
BJ	 0.9299	 0.4630
BK	 0.9509	 0.5540
BL	 0.9698	 0.5520
BM	 0.9951	 0.6120
BN	 0.9861	 0.5890
BO	 0.9693	 0.5880
BP	 0.9935	 0.5940
BQ	 0.9216	 0.5360
BR	 0.9770	 0.5900
BS	 0.9718	 0.5670
BT	 0.9412	 0.4860
BU	 0.9653	 0.5810
BV	 0.9488	 0.4910
BW	 0.9682	 0.5560
BX	 0.9749	 0.5680
BY	 0.9589	 0.5360
BZ	 0.9720	 0.5890
Ba	 0.9558	 0.5360
Bb	 0.9807	 0.5560
Bc	 0.9318	 0.5490
Bd	 0.9869	 0.6000
Be	 0.9963	 0.6180
Bf	 0.9730	 0.5730
Bg	 0.9703	 0.5530
Bh	 0.9568	 0.5300
Bi	 0.9969	 0.6170
Bj	 0.9299	 0.4860
Bk	 1.0000	 0.5980
Bl	 0.9604	 0.5690

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Chain	Atom inclusion	Q-score
Bm	 0.9712	 0.5750
Bn	 0.9752	 0.5690
Bo	 0.9746	 0.5900
CA	 0.4789	 0.1540
CB	 0.0144	 0.0800
CC	 0.1674	 0.1150