



Full wwPDB EM Validation Report ⓘ

Nov 2, 2024 – 07:26 PM EDT

PDB ID : 6P5I
EMDB ID : EMD-20255
Title : Structure of a mammalian 80S ribosome in complex with the Israeli Acute Paralysis Virus IRES (Class 1)
Authors : Acosta-Reyes, F.J.; Neupane, R.; Frank, J.; Fernandez, I.S.
Deposited on : 2019-05-30
Resolution : 3.10 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:

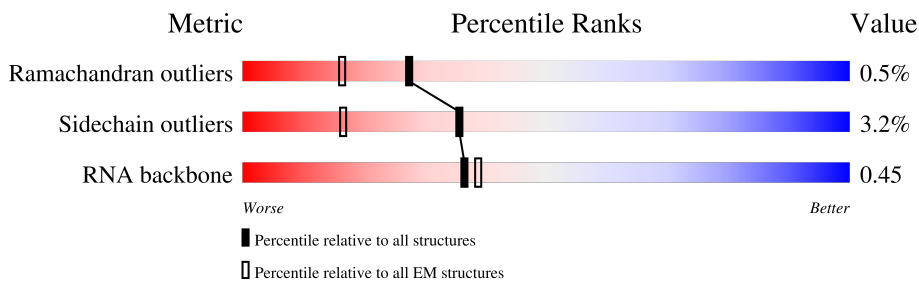
EMDB validation analysis : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

1 Overall quality at a glance

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

The reported resolution of this entry is 3.10 Å.

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



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

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 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	1869	
2	B	295	
3	C	264	
4	D	255	
5	E	281	
6	F	263	
7	G	204	
8	H	249	

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Mol	Chain	Length	Quality of chain
9	I	194	43% 94% 5%
10	J	207	17% 96% .
11	K	194	13% 93% 5%
12	L	149	51% 64% 36%
13	M	158	8% 89% 9%
14	N	132	87% 88% 11%
15	O	151	11% 97% ..
16	P	151	11% 89% 10%
17	Q	145	60% 74% 8% 18%
18	R	172	37% 81% .. 17%
19	S	135	47% 96% ..
20	T	152	61% 92% 5%
21	U	145	48% 96% ..
22	V	119	59% 83% 16%
23	W	83	19% 89% 11%
24	X	130	. 97% ..
25	Y	143	5% 97% ..
26	Z	134	22% 91% 7%
27	a	125	44% 59% 40%
28	b	115	8% 82% .. 15%
29	c	84	27% 98% ..
30	d	69	35% 90% 10%
31	e	56	29% 98% .
32	f	133	14% 40% 58%
33	g	156	44% 41% 56%








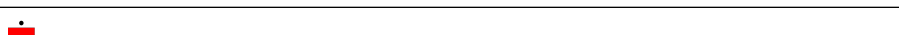
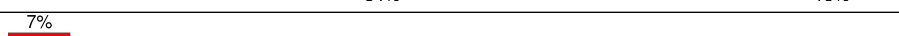
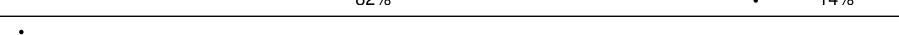
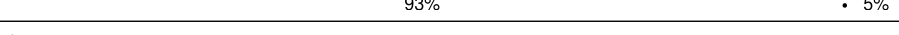


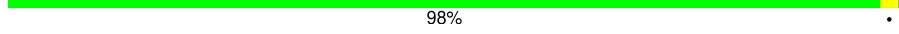
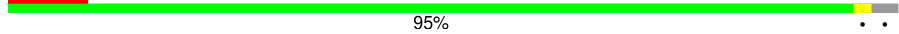

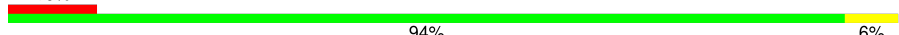
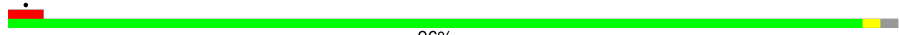





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Mol	Chain	Length	Quality of chain
34	h	317	81% 98%
35	1	253	54% 36% 45% 19%
36	5	3594	10% 73% 26%
37	7	119	90% 10%
38	8	156	6% 74% 22%
39	AA	257	89% 7%
40	AB	403	94%
41	AC	392	86% 6% 8%
42	AD	297	7% 97%
43	AE	291	72% 26%
44	AF	249	88% 10%
45	AG	242	11% 90% 7%
46	AH	192	7% 96%
47	AI	214	6% 92%
48	AJ	178	22% 94%
49	AL	211	5% 92% 5%
50	AM	198	67% 30%
51	AN	204	96%
52	AO	203	95%
53	AP	184	82% 17%
54	AQ	188	90% 10%
55	AR	196	11% 90% 8%
56	AS	176	90% 10%
57	AT	160	9% 94% 5%
58	AU	128	15% 73% 23%

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Mol	Chain	Length	Quality of chain
59	AV	140	 88% 8%
60	AW	157	 39% 60%
61	AX	156	 75% 24%
62	AY	145	 5% 90% 8%
63	AZ	136	 7% 98%
64	Aa	148	 96%
65	Ab	226	 10% 44% 54%
66	Ac	115	 84% 15%
67	Ad	125	 7% 82% 14%
68	Ae	135	 93% 5%
69	Af	110	 91% 7%
70	Ag	126	 6% 90% 10%
71	Ah	123	 6% 98%
72	Ai	105	 9% 95%
73	Aj	97	 85% 11%
74	Ak	69	 10% 94% 6%
75	Al	51	 96%
76	Am	52	 8% 94% 6%
77	An	25	 8% 96%
78	Ao	106	 9% 95%
79	Ap	92	 97%
80	Ar	137	 88% 9%
81	AK	217	 96% 92% 6%

2 Entry composition [i](#)

There are 81 unique types of molecules in this entry. The entry contains 215974 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called 18S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	2	1697	36229	16171	6507	11855	1696	0	0

- Molecule 2 is a protein called uS2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	217	1706	1085	295	317	9	0	0

- Molecule 3 is a protein called eS1.

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

- Molecule 4 is a protein called uS5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	221	1712	1107	296	299	10	0	0

- Molecule 5 is a protein called uS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	228	1768	1126	318	316	8	0	0

- Molecule 6 is a protein called eS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	262	2073	1323	384	357	9	0	0

- Molecule 7 is a protein called uS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	185	1471	921	277	266	7	0	0

- Molecule 8 is a protein called eS6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	H	237	1923	1200	387	329	7	0	0

- Molecule 9 is a protein called eS7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	I	185	1488	952	271	264	1	0	0

- Molecule 10 is a protein called eS8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	J	206	1686	1058	332	291	5	0	0

- Molecule 11 is a protein called uS4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K	185	1525	969	306	248	2	0	0

- Molecule 12 is a protein called eS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	L	96	810	530	143	131	6	0	0

- Molecule 13 is a protein called uS17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	M	143	1175	749	222	198	6	0	0

- Molecule 14 is a protein called eS12.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	117	Total	C	N	O	S	0	0
			908	570	161	169	8		

- Molecule 15 is a protein called uS15.

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

- Molecule 16 is a protein called uS11.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	136	Total	C	N	O	S	0	0
			1016	621	199	190	6		

- Molecule 17 is a protein called uS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	Q	119	Total	C	N	O	S	0	0
			990	630	186	167	7		

- Molecule 18 is a protein called uS9.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	R	142	Total	C	N	O	S	0	0
			1128	717	213	195	3		

- Molecule 19 is a protein called eS17.

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

- Molecule 20 is a protein called uS13.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	T	144	Total	C	N	O	S	0	0
			1190	746	241	202	1		

- Molecule 21 is a protein called eS19.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	U	141	Total	C	N	O	S	0	0
			1097	688	211	195	3		

- Molecule 22 is a protein called uS10.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	V	100	Total	C	N	O	S	0	0
			795	498	152	141	4		

- Molecule 23 is a protein called eS21.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	W	83	Total	C	N	O	S	0	0
			630	387	118	120	5		

- Molecule 24 is a protein called uS8.

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

- Molecule 25 is a protein called uS12.

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

- Molecule 26 is a protein called eS24.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	Z	124	Total	C	N	O	S	0	0
			1011	640	198	168	5		

- Molecule 27 is a protein called eS25.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	a	75	Total	C	N	O	S	0	0
			598	382	111	104	1		

- Molecule 28 is a protein called eS26.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	b	98	Total	C	N	O	S	0	0
			776	483	158	129	6		

- Molecule 29 is a protein called eS27.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	c	83	Total	C	N	O	S	0	0
			651	408	121	115	7		

- Molecule 30 is a protein called eS28.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	d	62	Total	C	N	O	S	0	0
			488	297	97	92	2		

- Molecule 31 is a protein called eS29.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	e	55	Total	C	N	O	S	0	0
			459	286	94	74	5		

- Molecule 32 is a protein called eS30.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	f	56	Total	C	N	O	S	0	0
			447	276	98	72	1		

- Molecule 33 is a protein called eS31.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	g	68	Total	C	N	O	S	0	0
			555	351	103	94	7		

- Molecule 34 is a protein called RACK1.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	h	313	Total	C	N	O	S	0	0
			2436	1535	424	465	12		

- Molecule 35 is a RNA chain called IAPV-IRES.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
35	1	205	4366	1951	775	1435	205	0	0

- Molecule 36 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
36	5	3594	77074	34325	14116	25039	3594	0	0

- Molecule 37 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
37	7	119	2538	1132	454	834	118	0	0

- Molecule 38 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
38	8	151	3208	1432	564	1062	150	0	0

- Molecule 39 is a protein called uL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	AA	248	1895	1186	389	314	6	0	0

- Molecule 40 is a protein called uL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	AB	394	3172	2020	597	542	13	0	0

- Molecule 41 is a protein called uL4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	AC	362	2883	1812	577	480	14	0	0

- Molecule 42 is a protein called uL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	AD	293	2391	1512	438	427	14	0	0

- Molecule 43 is a protein called eL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	AE	216	1729	1115	329	282	3	0	0

- Molecule 44 is a protein called uL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	AF	225	1875	1205	358	303	9	0	0

- Molecule 45 is a protein called eL8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	AG	225	1819	1161	351	303	4	0	0

- Molecule 46 is a protein called uL6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	AH	190	1516	954	284	272	6	0	0

- Molecule 47 is a protein called uL16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	AI	205	1664	1056	321	274	13	0	0

- Molecule 48 is a protein called uL11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	AJ	170	1362	861	254	241	6	0	0

- Molecule 49 is a protein called eL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	AL	201	Total	C	N	O	S	0	0
			1627	1020	341	262	4		

- Molecule 50 is a protein called L14e.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	AM	138	Total	C	N	O	S	0	0
			1137	727	221	182	7		

- Molecule 51 is a protein called eL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	AN	203	Total	C	N	O	S	0	0
			1701	1072	359	266	4		

- Molecule 52 is a protein called uL13.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	AO	199	Total	C	N	O	S	0	0
			1631	1052	319	255	5		

- Molecule 53 is a protein called uL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	AP	153	Total	C	N	O	S	0	0
			1242	777	241	215	9		

- Molecule 54 is a protein called eL18.

Mol	Chain	Residues	Atoms					AltConf	Trace
54	AQ	187	Total	C	N	O	S	0	0
			1526	964	306	252	4		

- Molecule 55 is a protein called eL19.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	AR	180	Total	C	N	O	S	0	0
			1503	931	324	238	10		

- Molecule 56 is a protein called eL20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	AS	176	1457	928	283	235	11	0	0

- Molecule 57 is a protein called eL21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	AT	159	1298	823	252	217	6	0	0

- Molecule 58 is a protein called eL22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	AU	99	818	520	146	150	2	0	0

- Molecule 59 is a protein called uL14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
59	AV	129	969	613	182	169	5	0	0

- Molecule 60 is a protein called eL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
60	AW	63	528	337	103	85	3	0	0

- Molecule 61 is a protein called eL23.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
61	AX	118	967	618	181	167	1	0	0

- Molecule 62 is a protein called uL24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
62	AY	134	1115	700	226	186	3	0	0

- Molecule 63 is a protein called eL27.

Mol	Chain	Residues	Atoms					AltConf	Trace
63	AZ	135	Total	C	N	O	S	0	0
			1107	714	208	182	3		

- Molecule 64 is a protein called uL15.

Mol	Chain	Residues	Atoms					AltConf	Trace
64	Aa	147	Total	C	N	O	S	0	0
			1162	734	239	185	4		

- Molecule 65 is a protein called eL29.

Mol	Chain	Residues	Atoms					AltConf	Trace
65	Ab	104	Total	C	N	O	S	0	0
			848	527	189	129	3		

- Molecule 66 is a protein called eL30.

Mol	Chain	Residues	Atoms					AltConf	Trace
66	Ac	98	Total	C	N	O	S	0	0
			761	481	134	140	6		

- Molecule 67 is a protein called eL31.

Mol	Chain	Residues	Atoms					AltConf	Trace
67	Ad	107	Total	C	N	O	S	0	0
			888	560	171	155	2		

- Molecule 68 is a protein called eL32.

Mol	Chain	Residues	Atoms					AltConf	Trace
68	Ae	128	Total	C	N	O	S	0	0
			1053	667	216	165	5		

- Molecule 69 is a protein called eL33.

Mol	Chain	Residues	Atoms					AltConf	Trace
69	Af	109	Total	C	N	O	S	0	0
			876	555	174	143	4		

- Molecule 70 is a protein called eL34.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	Ag	114	Total	C	N	O	S	0	0
			906	566	187	147	6		

- Molecule 71 is a protein called eL35.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	Ah	122	Total	C	N	O	S	0	0
			1013	640	204	168	1		

- Molecule 72 is a protein called eL36.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	Ai	102	Total	C	N	O	S	0	0
			830	520	176	129	5		

- Molecule 73 is a protein called eL37.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	Aj	86	Total	C	N	O	S	0	0
			705	434	155	111	5		

- Molecule 74 is a protein called eL38.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	Ak	69	Total	C	N	O	S	0	0
			569	366	101	99	3		

- Molecule 75 is a protein called eL39.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	Al	50	Total	C	N	O	S	0	0
			447	286	96	64	1		

- Molecule 76 is a protein called eL40.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	Am	52	Total	C	N	O	S	0	0
			429	266	90	67	6		

- Molecule 77 is a protein called eL41.

Mol	Chain	Residues	Atoms					AltConf	Trace
77	An	25	Total	C	N	O	S	0	0
			239	145	64	27	3		

- Molecule 78 is a protein called eL42.

Mol	Chain	Residues	Atoms					AltConf	Trace
78	Ao	104	Total	C	N	O	S	0	0
			851	533	174	138	6		

- Molecule 79 is a protein called eL43.

Mol	Chain	Residues	Atoms					AltConf	Trace
79	Ap	91	Total	C	N	O	S	0	0
			708	445	136	120	7		

- Molecule 80 is a protein called eL28.

Mol	Chain	Residues	Atoms					AltConf	Trace
80	Ar	124	Total	C	N	O	S	0	0
			994	616	205	167	6		

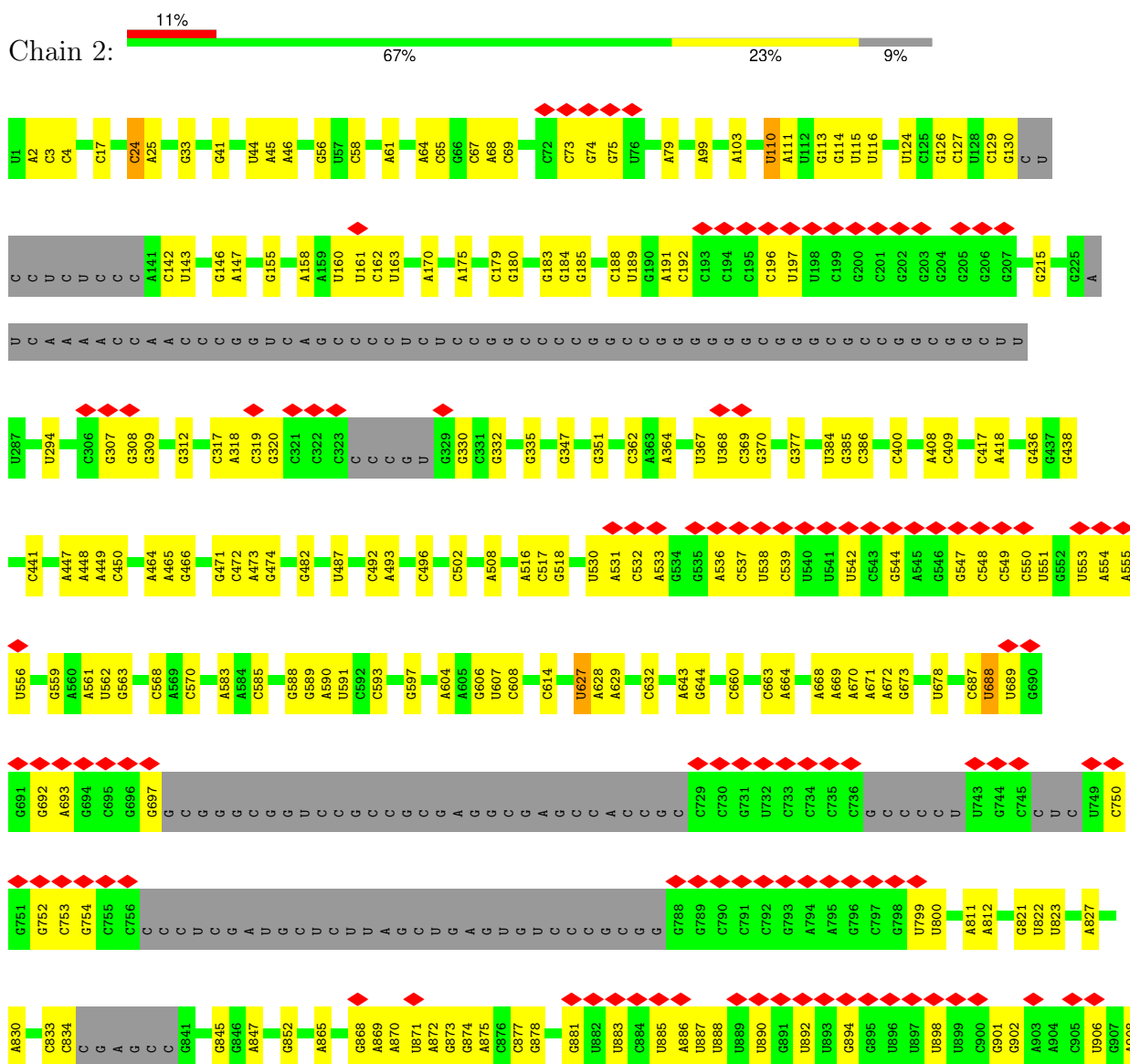
- Molecule 81 is a protein called uL1.

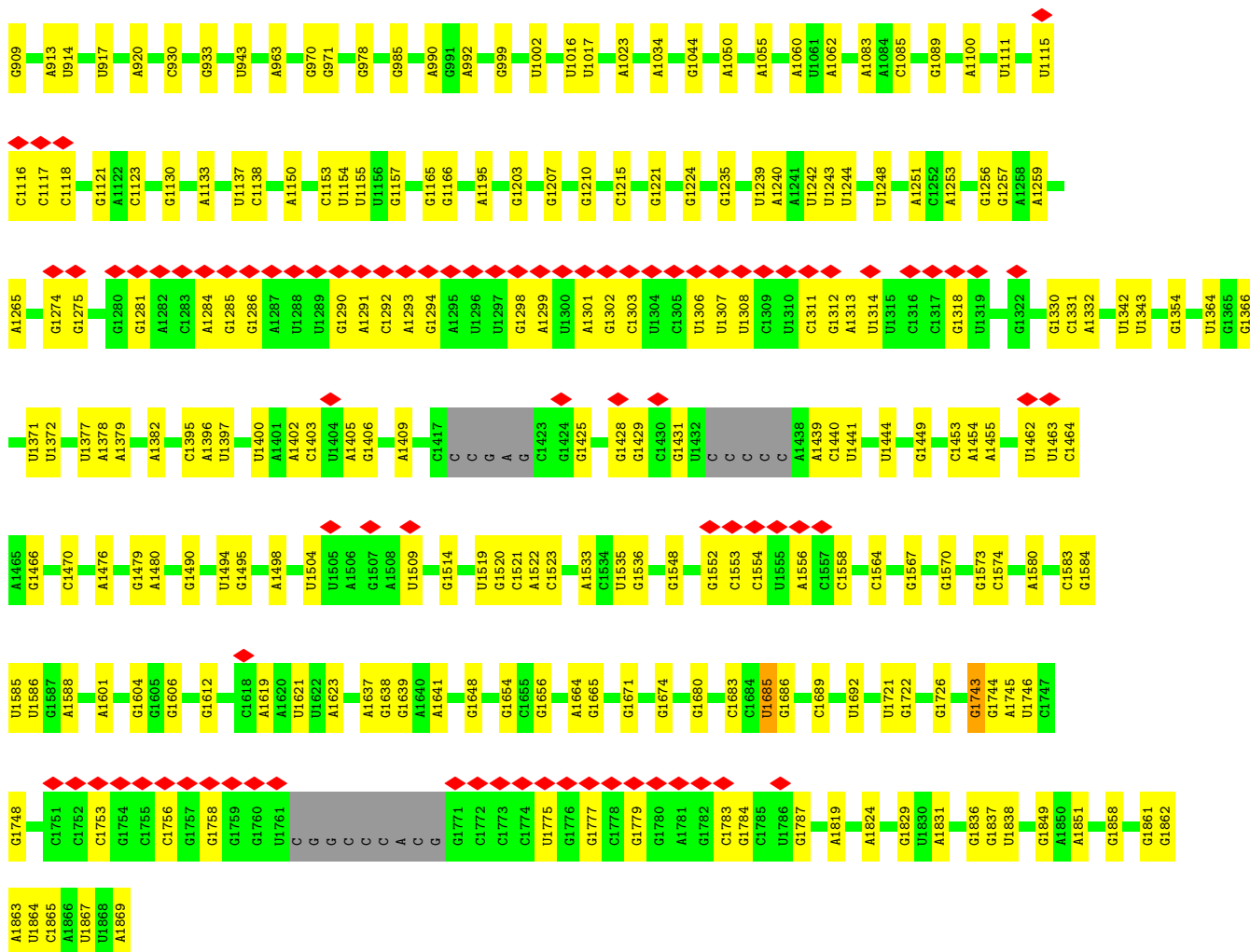
Mol	Chain	Residues	Atoms					AltConf	Trace
81	AK	212	Total	C	N	O	S	0	0
			1705	1091	306	300	8		

3 Residue-property plots

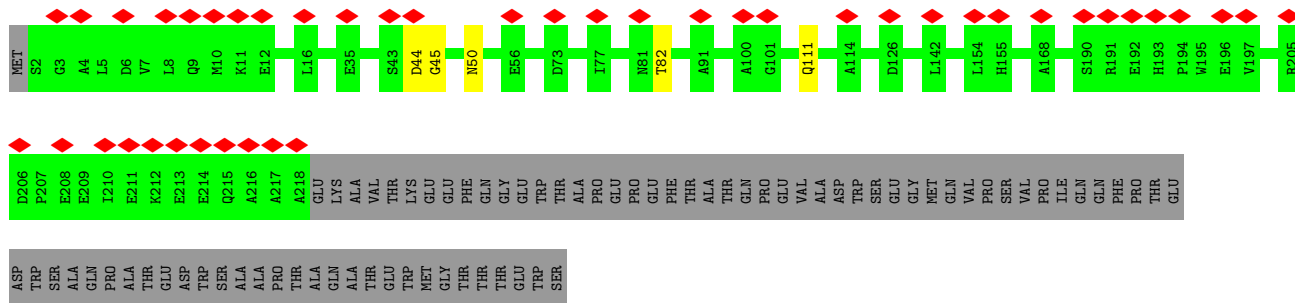
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 18S rRNA

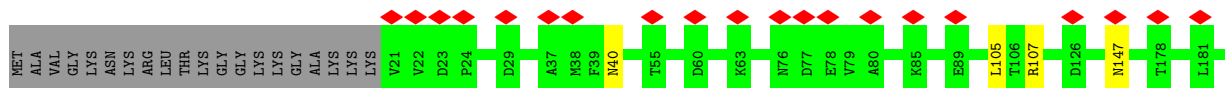
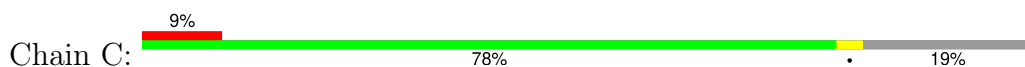


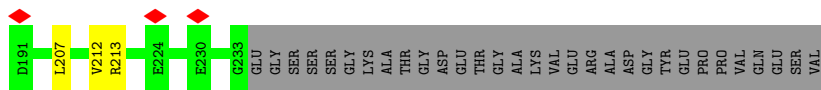


• Molecule 2: uS2

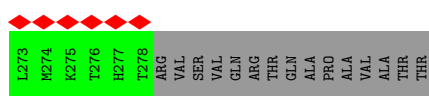
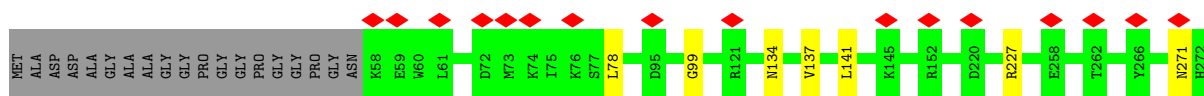
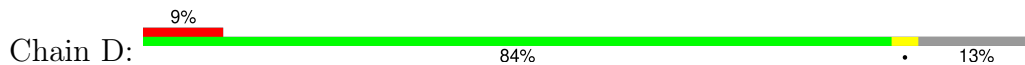


• Molecule 3: eS1

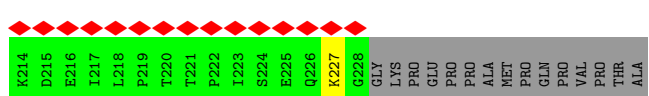
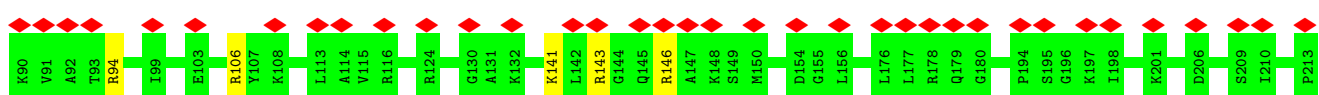
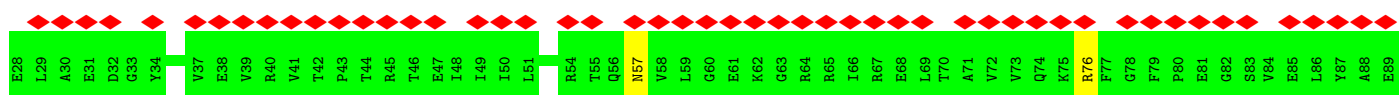
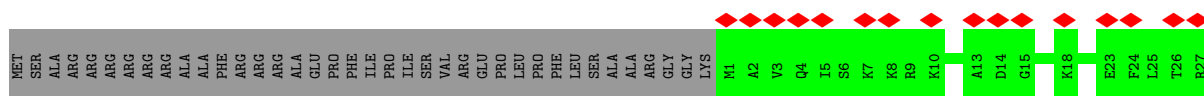
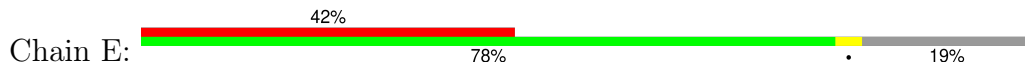




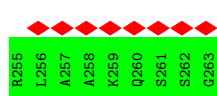
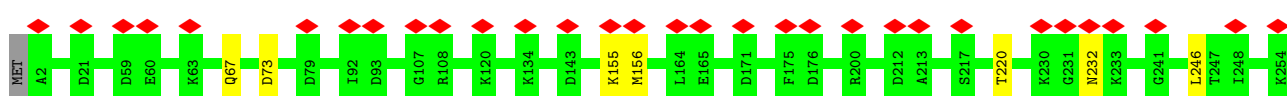
• Molecule 4: uS5



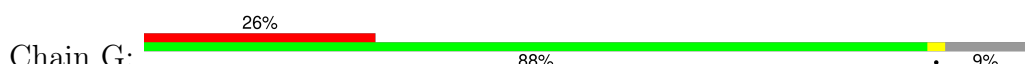
• Molecule 5: uS3

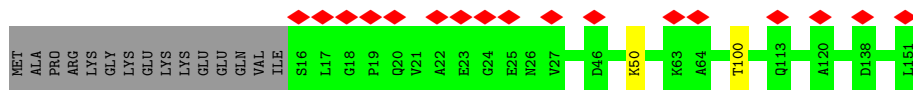
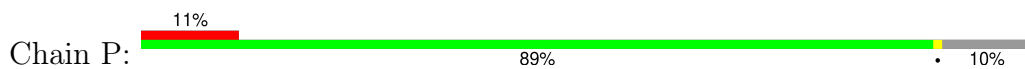


• Molecule 6: eS4

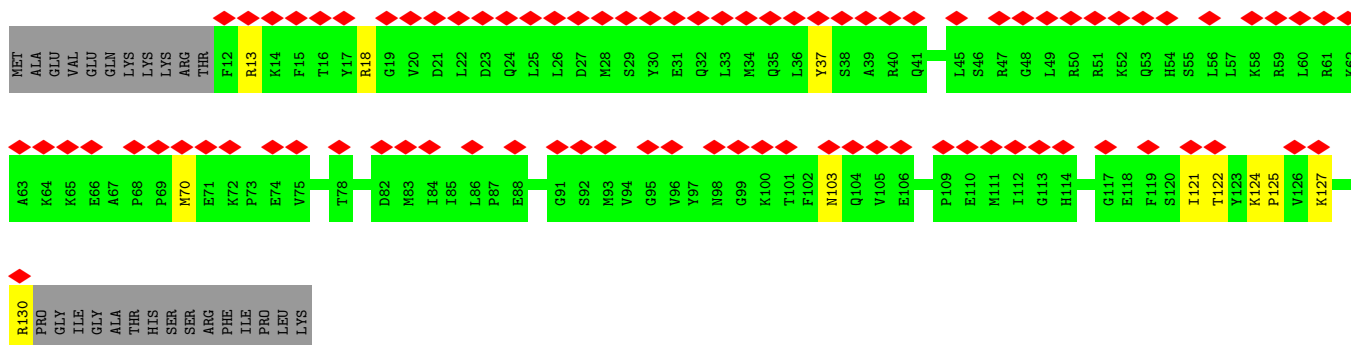
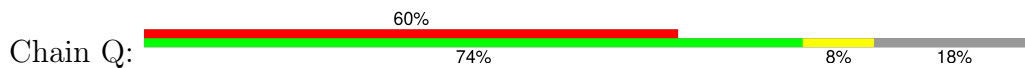


• Molecule 7: uS7

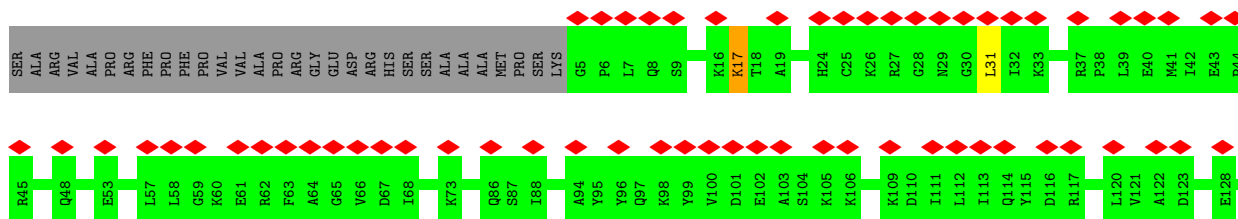
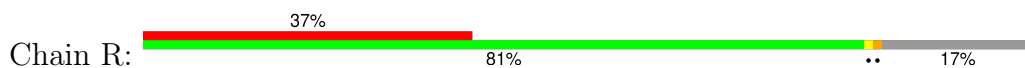




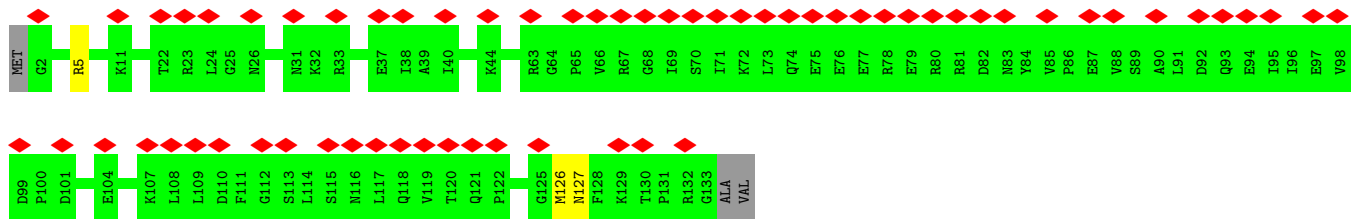
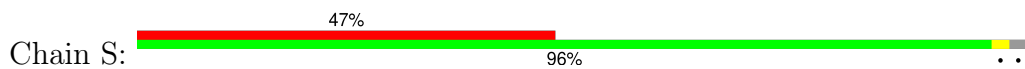
• Molecule 17: uS19



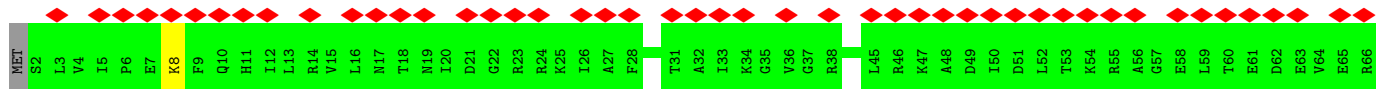
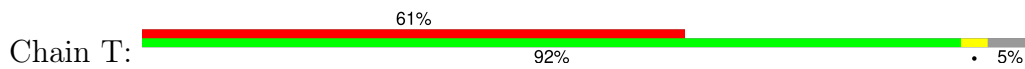
• Molecule 18: uS9

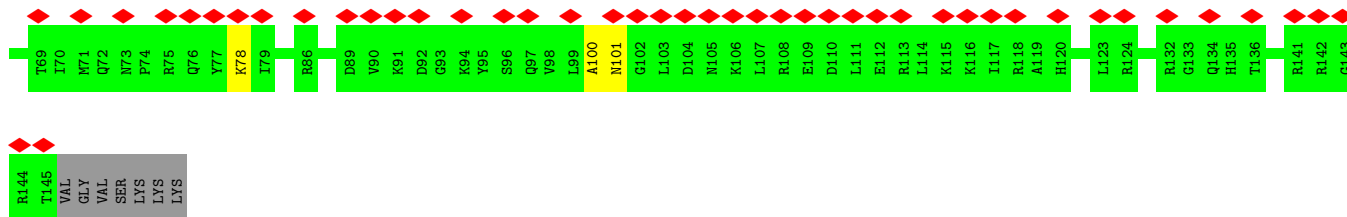


• Molecule 19: eS17

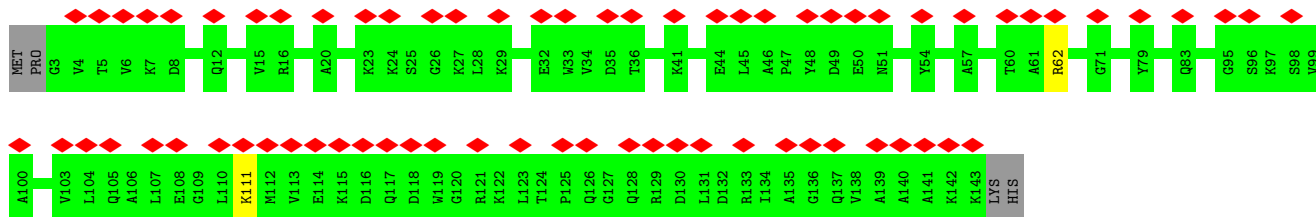


• Molecule 20: uS13

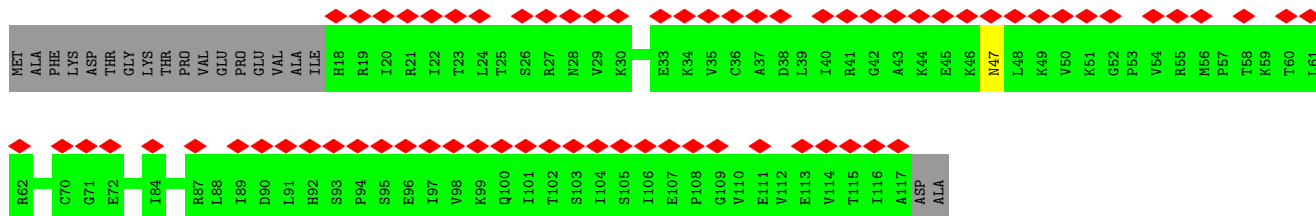
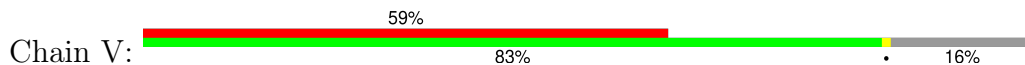




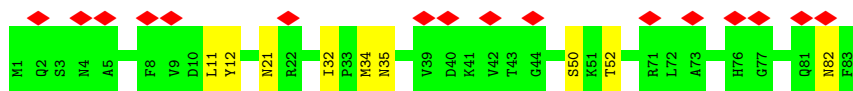
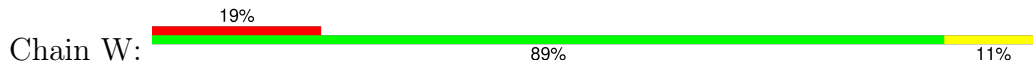
• Molecule 21: eS19



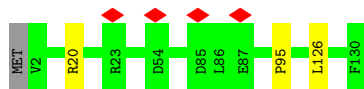
• Molecule 22: uS10



• Molecule 23: eS21

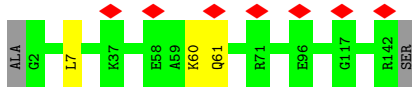


• Molecule 24: uS8

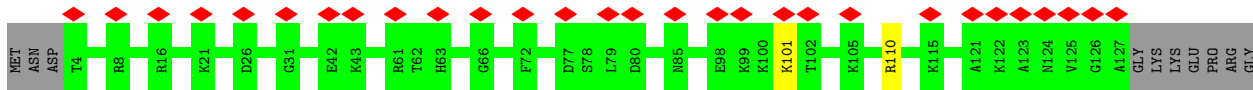
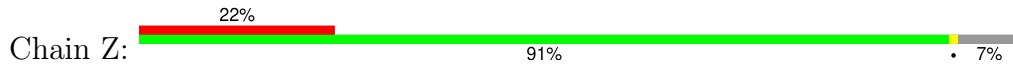


• Molecule 25: uS12

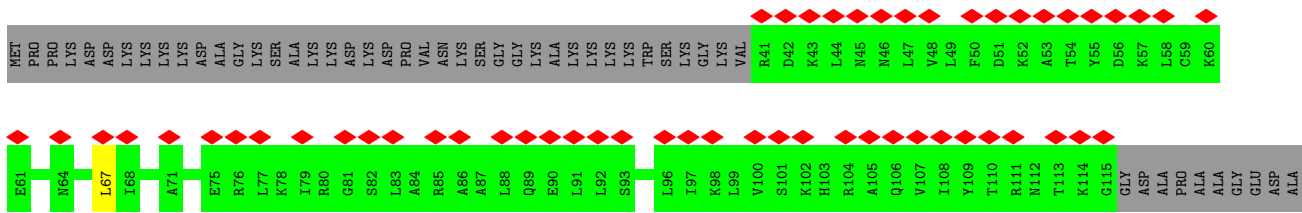




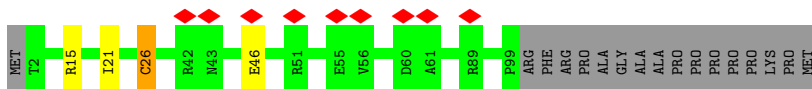
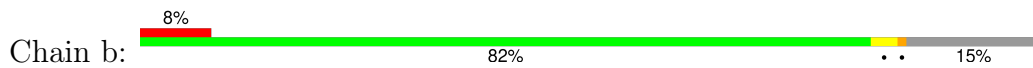
• Molecule 26: eS24



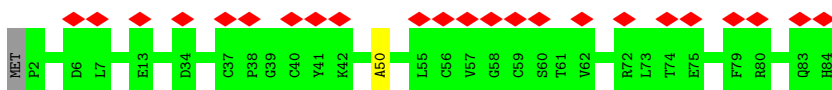
• Molecule 27: eS25



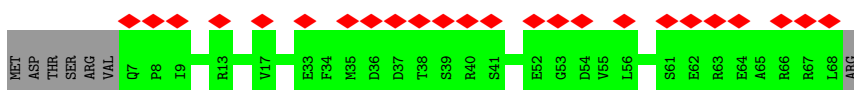
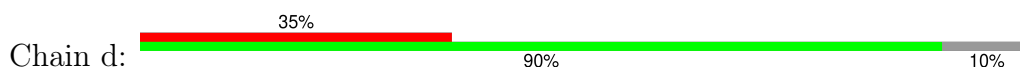
• Molecule 28: eS26



• Molecule 29: eS27



• Molecule 30: eS28

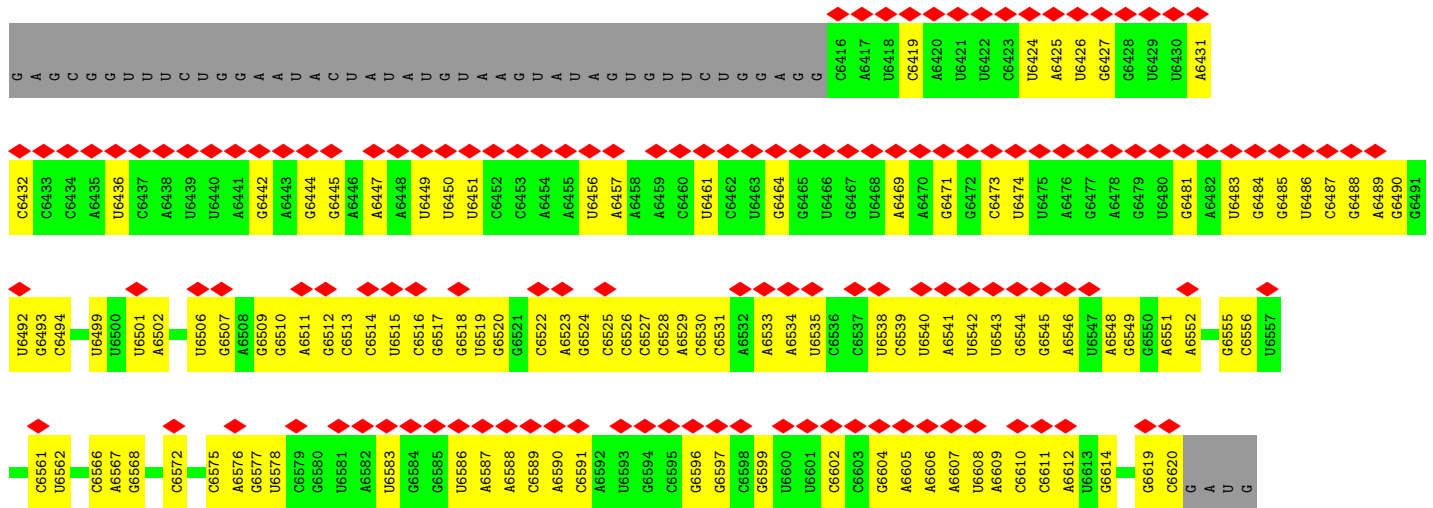


• Molecule 31: eS29

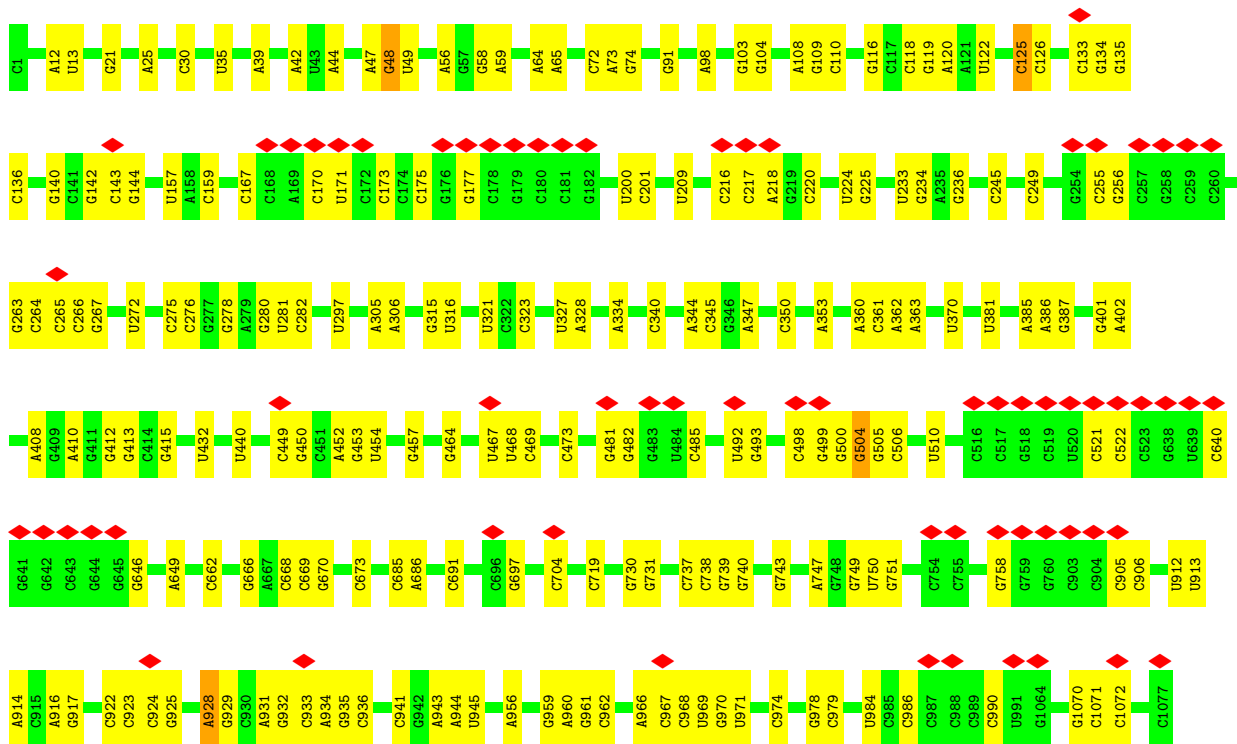
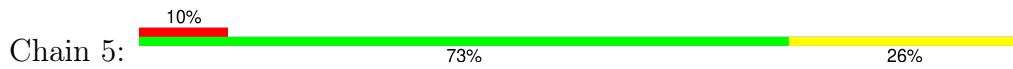


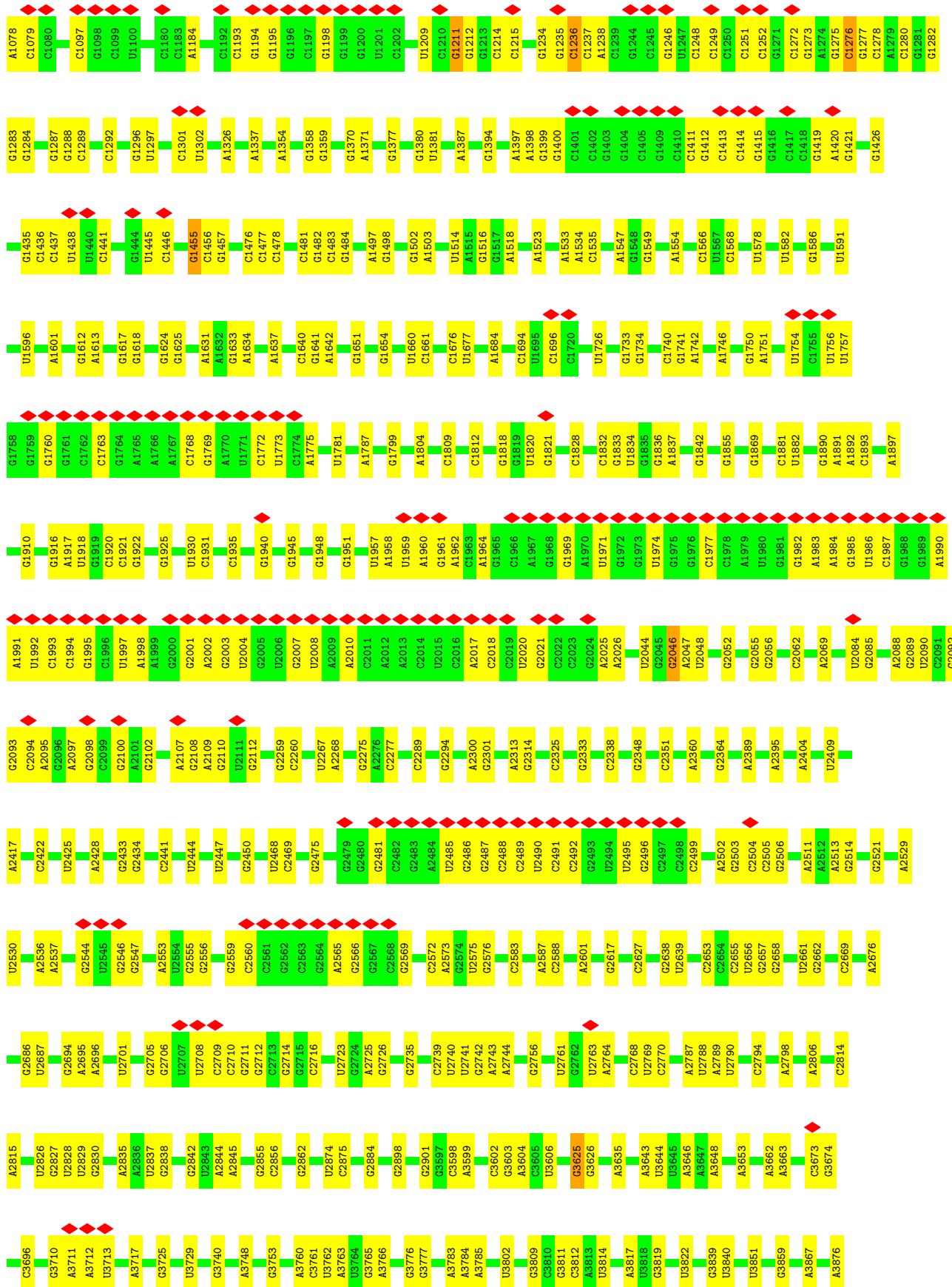
T313
I314
GLY
THR
ARG

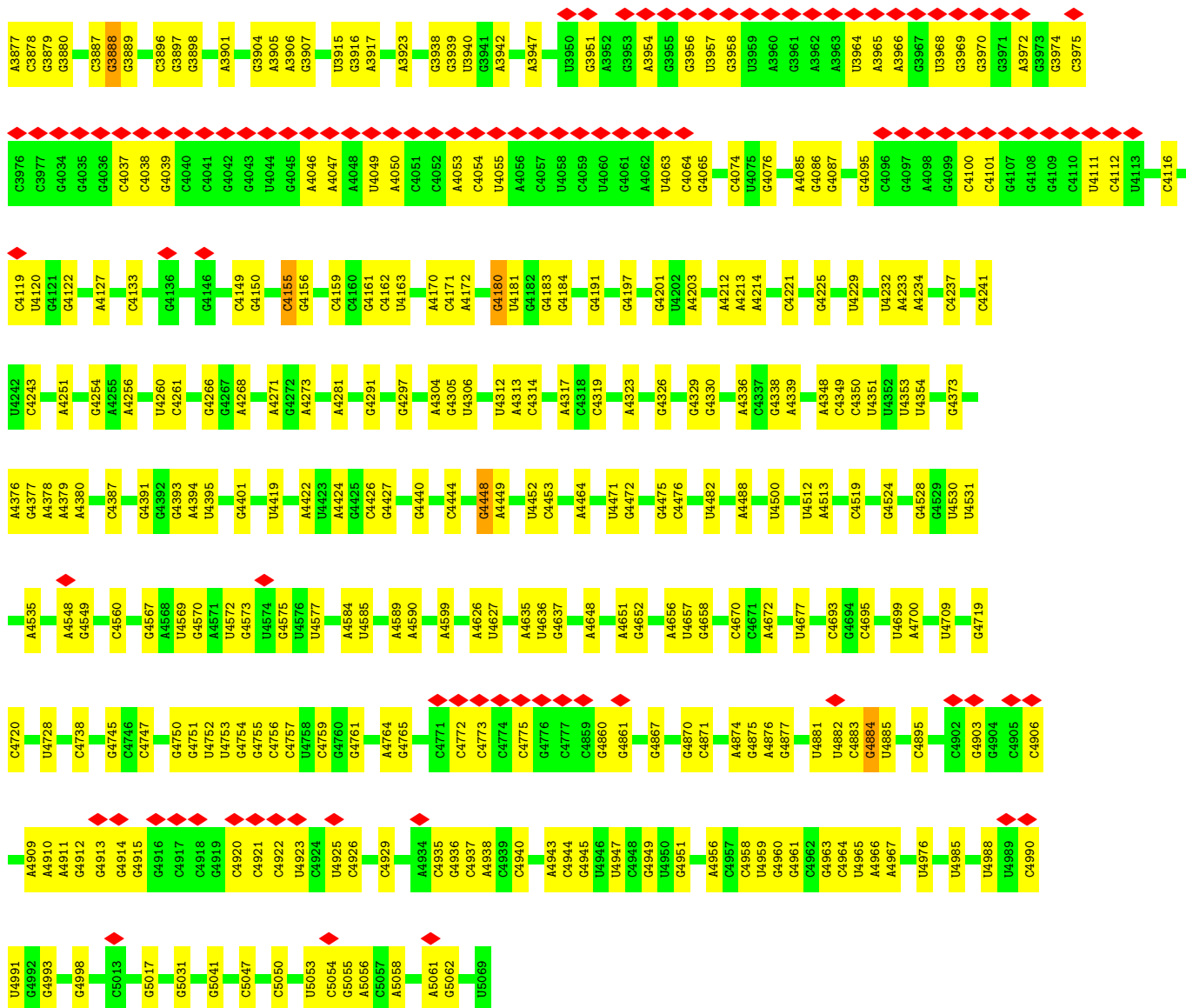
• Molecule 35: IAPV-IRES



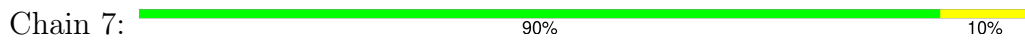
• Molecule 36: 28S rRNA



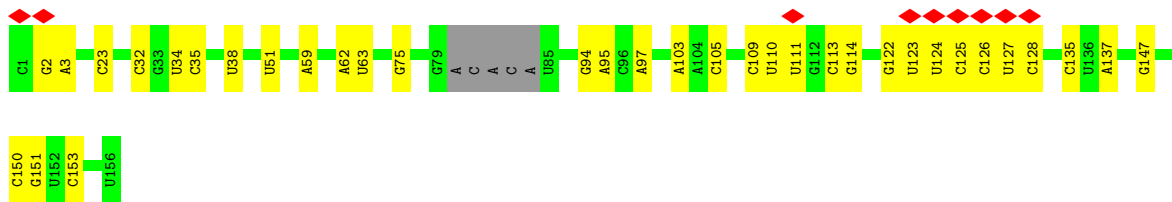




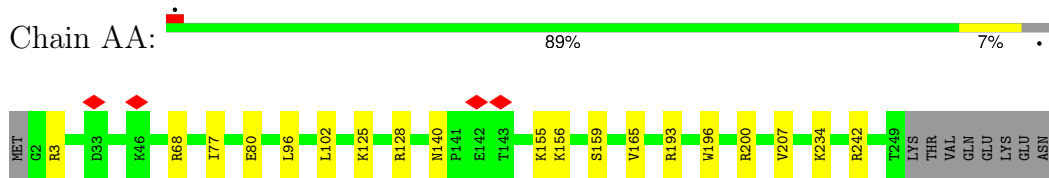
• Molecule 37: 5S rRNA



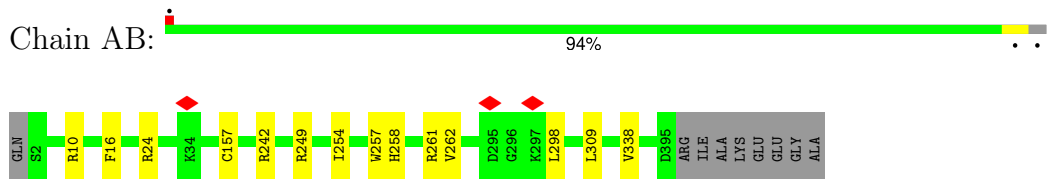
• Molecule 38: 5.8S rRNA



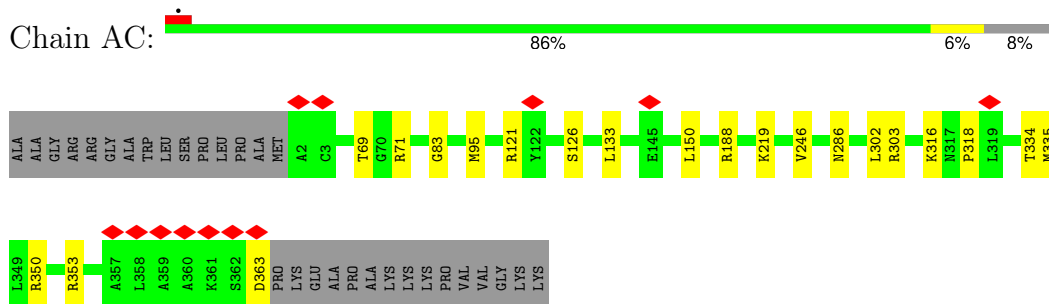
• Molecule 39: uL2



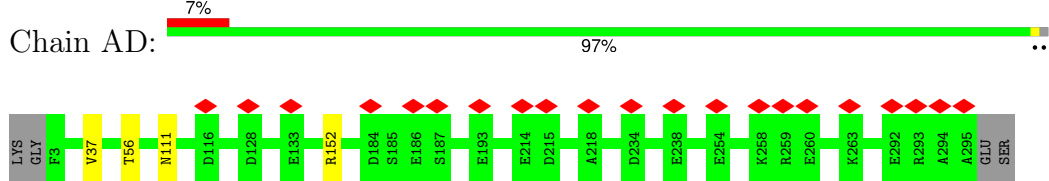
• Molecule 40: uL3



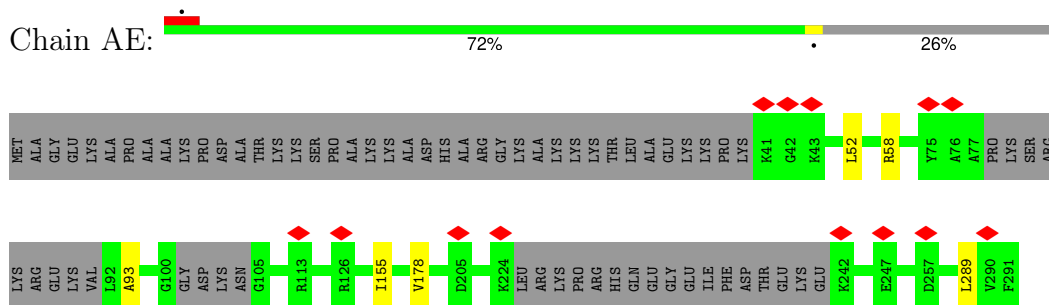
• Molecule 41: uL4



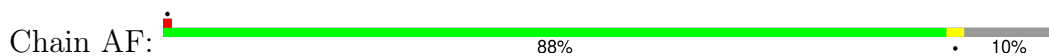
• Molecule 42: uL18



• Molecule 43: eL6

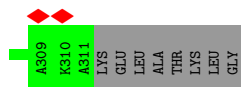
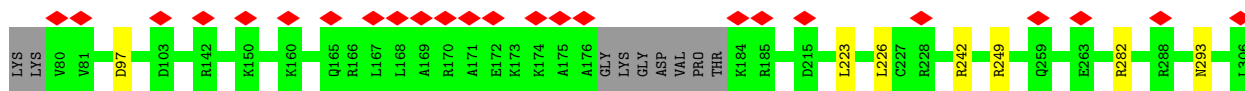
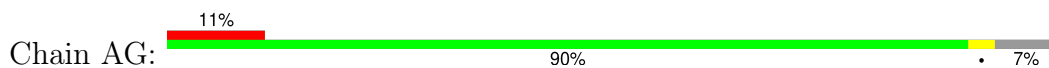


• Molecule 44: uL30

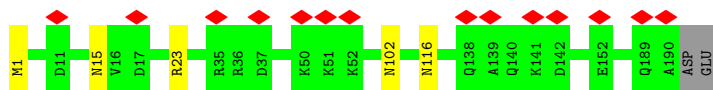




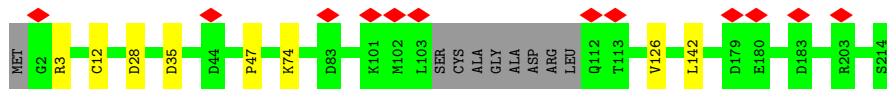
• Molecule 45: eL8



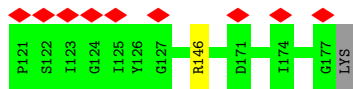
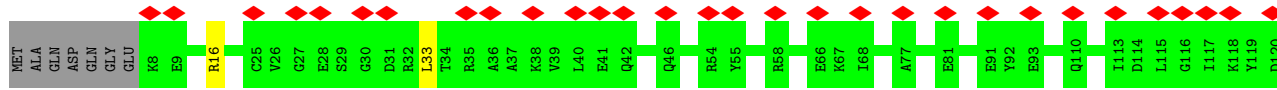
• Molecule 46: uL6



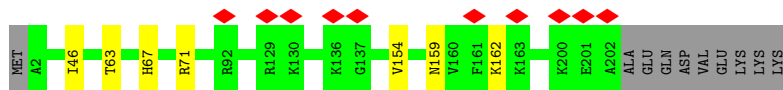
• Molecule 47: uL16



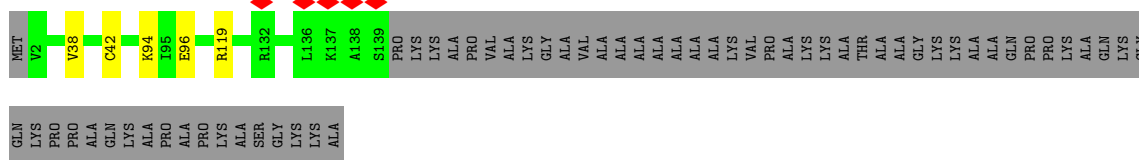
• Molecule 48: uL11



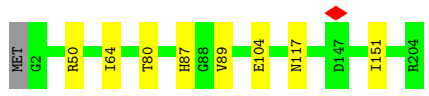
• Molecule 49: eL13



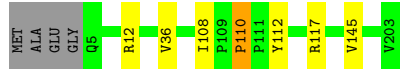
• Molecule 50: L14e



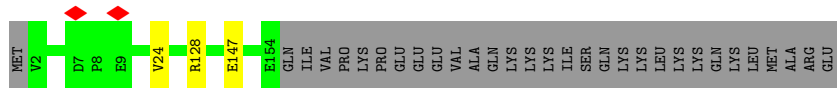
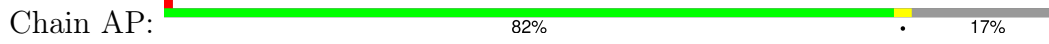
• Molecule 51: eL15



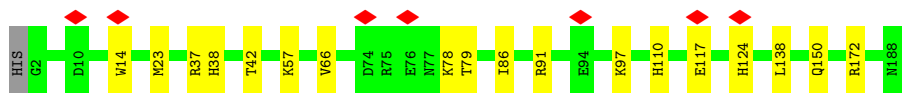
• Molecule 52: uL13



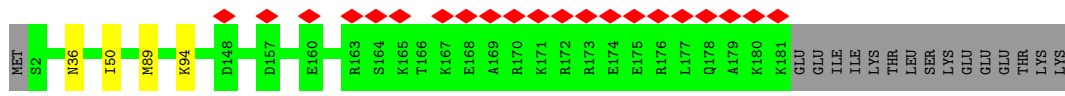
• Molecule 53: uL22



• Molecule 54: eL18

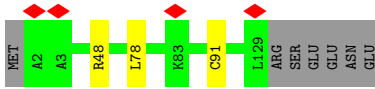


• Molecule 55: eL19

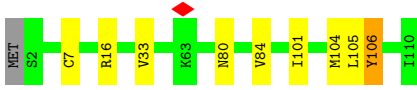
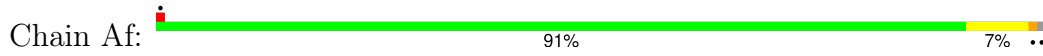


• Molecule 56: eL20

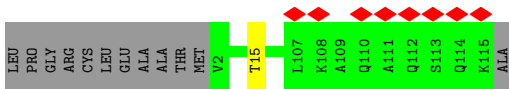
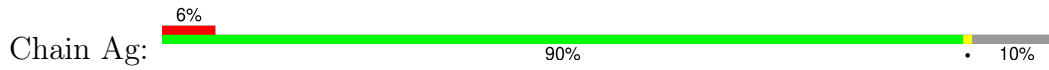




- Molecule 69: eL33



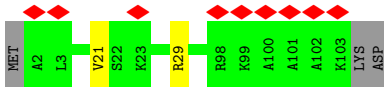
- Molecule 70: eL34



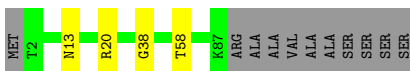
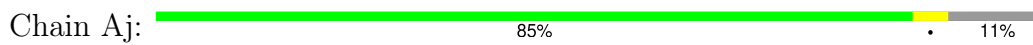
- Molecule 71: eL35



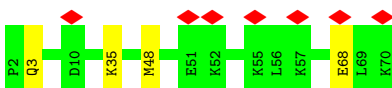
- Molecule 72: eL36



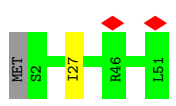
- Molecule 73: eL37



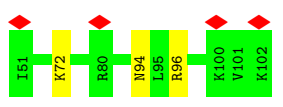
- Molecule 74: eL38



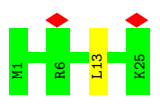
- Molecule 75: eL39



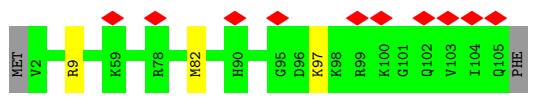
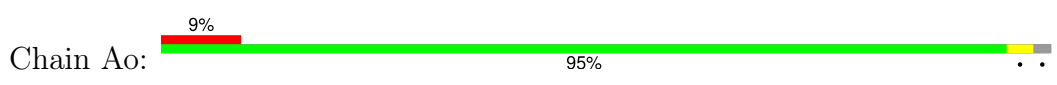
• Molecule 76: eL40



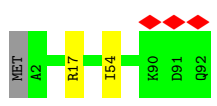
• Molecule 77: eL41



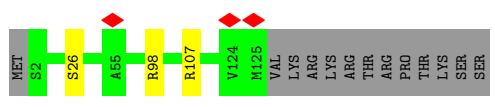
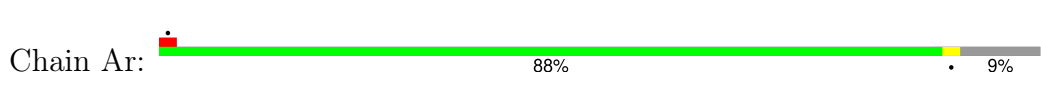
• Molecule 78: eL42



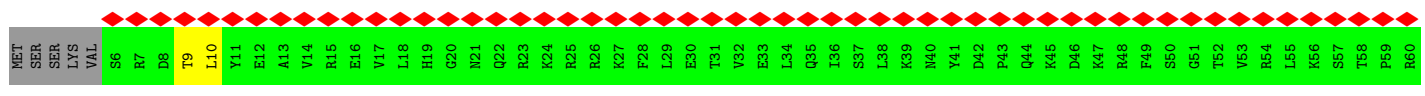
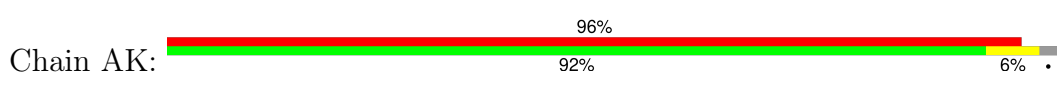
• Molecule 79: eL43



• Molecule 80: eL28



• Molecule 81: uL1



P61	K62	F63	S64	V65	C66	V67	L68	G69	D70	Q71	H72	C74	D75	E76	A77	K78	A79	V80	D81	I82	P83	H84	M85	D86	I87	E88	A89	L90	K91	K92	L93	N94	K95	N96	K97	K98	L99	V100	K101	K102	L103	A104	K105	K106	Y107	D108	A109	F110	L111	A112	S113	E114	S115	L116	I117	K118	Q119	I120	
P121	R122	I123	L124	G125	P126	G127	L128	N129	K130	A131	G132	K133	F134	P135	S136	L137	L138	T139	H140	N141	E142	N143	M144	V145	A146	K147	V148	D149	E150	V151	K152	S153	T154	I155	K156	F157	Q158	M159	K160	K161	V162	L163	C164	L165	A166	V167	A168	V169	G170	H171	V172	K173	M174	T175	D176	D177	E178	L179	V180
Y181	N182	I183	H184	L185	A186	V187	N188	F189	L190	V191	S192	L193	L194	K195	K196	N197	W198	Q199	N200	V201	R202	A203	L204	Y205	I206	K207	S208	T209	M210	G211	K212	P213	Q214	R215	L216	Y217																							

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	120176	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	42.09	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	31000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.289	Depositor
Minimum map value	-0.163	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.009	Depositor
Recommended contour level	0.032	Depositor
Map size (\AA)	443.88, 443.88, 443.88	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.233, 1.233, 1.233	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	2	0.23	0/40509	0.69	6/63128 (0.0%)
2	B	0.66	0/1744	0.78	0/2371
3	C	0.66	0/1756	0.79	0/2350
4	D	0.66	0/1748	0.80	0/2362
5	E	0.69	0/1796	0.81	0/2417
6	F	0.66	0/2115	0.81	0/2843
7	G	0.68	0/1492	0.79	0/2005
8	H	0.67	0/1946	0.83	0/2590
9	I	0.68	0/1510	0.78	0/2022
10	J	0.65	0/1715	0.82	0/2287
11	K	0.67	0/1550	0.83	0/2069
12	L	0.66	0/834	0.78	0/1125
13	M	0.65	0/1195	0.81	0/1597
14	N	0.72	0/918	0.80	0/1233
15	O	0.67	0/1226	0.80	0/1649
16	P	0.67	0/1029	0.84	0/1380
17	Q	0.67	0/1009	0.80	0/1346
18	R	0.68	0/1146	0.81	0/1534
19	S	0.68	0/1082	0.79	0/1452
20	T	0.68	0/1208	0.81	0/1618
21	U	0.69	0/1115	0.81	0/1493
22	V	0.69	0/805	0.80	0/1081
23	W	0.69	0/638	0.83	0/855
24	X	0.66	0/1051	0.80	0/1406
25	Y	0.66	0/1116	0.83	0/1490
26	Z	0.67	0/1028	0.80	0/1366
27	a	0.69	0/604	0.80	0/810
28	b	0.65	0/789	0.81	0/1059
29	c	0.66	0/665	0.79	0/891
30	d	0.69	0/490	0.83	0/656
31	e	0.67	0/470	0.80	0/623
32	f	0.68	0/451	0.81	0/592
33	g	0.69	0/567	0.83	0/753
34	h	0.69	0/2493	0.80	0/3394

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
35	1	0.24	0/4881	0.72	0/7604
36	5	0.26	0/86215	0.70	15/134459 (0.0%)
37	7	0.23	0/2836	0.68	0/4421
38	8	0.26	0/3581	0.69	0/5577
39	AA	0.64	0/1933	0.87	0/2592
40	AB	0.63	0/3240	0.81	0/4339
41	AC	0.63	0/2937	0.79	0/3946
42	AD	0.65	0/2437	0.78	0/3264
43	AE	0.65	0/1762	0.82	0/2362
44	AF	0.63	0/1911	0.80	0/2549
45	AG	0.65	0/1850	0.82	0/2491
46	AH	0.66	0/1535	0.81	0/2063
47	AI	0.63	0/1702	0.80	0/2272
48	AJ	0.67	0/1385	0.80	0/1852
49	AL	0.64	0/1658	0.83	0/2219
50	AM	0.64	0/1158	0.80	0/1547
51	AN	0.61	0/1746	0.85	0/2338
52	AO	0.63	0/1663	0.82	0/2223
53	AP	0.62	0/1268	0.81	0/1700
54	AQ	0.63	0/1557	0.83	0/2086
55	AR	0.65	0/1519	0.82	0/2006
56	AS	0.62	0/1498	0.80	0/2012
57	AT	0.62	0/1326	0.79	0/1770
58	AU	0.66	0/832	0.78	0/1116
59	AV	0.66	0/983	0.82	0/1319
60	AW	0.63	0/541	0.81	0/720
61	AX	0.63	0/984	0.80	0/1323
62	AY	0.64	0/1132	0.80	0/1504
63	AZ	0.64	0/1130	0.82	0/1507
64	Aa	0.63	0/1191	0.83	1/1590 (0.1%)
65	Ab	0.65	0/861	0.81	0/1138
66	Ac	0.68	0/771	0.80	0/1034
67	Ad	0.63	0/903	0.83	0/1216
68	Ae	0.63	0/1071	0.83	0/1429
69	Af	0.62	0/895	0.89	1/1198 (0.1%)
70	Ag	0.66	0/916	0.87	0/1220
71	Ah	0.65	0/1021	0.82	0/1348
72	Ai	0.65	0/841	0.81	0/1112
73	Aj	0.62	0/720	0.89	0/952
74	Ak	0.65	0/575	0.80	0/759
75	Al	0.62	0/459	0.80	0/608
76	Am	0.64	0/435	0.81	0/575
77	An	0.60	0/240	0.84	0/305

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
78	Ao	0.63	0/864	0.82	0/1140
79	Ap	0.66	0/718	0.84	0/953
80	Ar	0.65	0/1010	0.84	0/1354
81	AK	0.69	0/1733	0.84	0/2324
All	All	0.46	0/232234	0.74	23/341283 (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
28	b	0	1
40	AB	0	2
All	All	0	3

There are no bond length outliers.

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
69	Af	106	TYR	CB-CA-C	9.14	128.67	110.40
36	5	4180	G	C2'-C3'-O3'	7.16	125.24	109.50
36	5	3625	G	C2'-C3'-O3'	6.05	123.39	113.70
1	2	1685	U	C2'-C3'-O3'	5.89	123.12	113.70
36	5	928	A	C2'-C3'-O3'	5.83	123.03	113.70
1	2	110	U	C2'-C3'-O3'	5.70	122.82	113.70
36	5	4884	G	C2'-C3'-O3'	5.70	122.81	113.70
1	2	688	U	C2'-C3'-O3'	5.69	122.80	113.70
1	2	24	C	C2'-C3'-O3'	5.68	122.79	113.70
36	5	4155	C	C2'-C3'-O3'	5.67	122.78	113.70
36	5	2046	G	C2'-C3'-O3'	5.67	122.78	113.70
36	5	125	C	C2'-C3'-O3'	5.63	122.71	113.70
36	5	1211	G	C2'-C3'-O3'	5.60	122.67	113.70
36	5	1276	C	P-O3'-C3'	5.33	126.10	119.70
36	5	4448	G	C4'-C3'-O3'	5.32	123.63	113.00
1	2	1743	G	C2'-C3'-O3'	5.29	122.17	113.70
36	5	504	G	C2'-C3'-O3'	5.26	122.11	113.70
36	5	1455	G	C2'-C3'-O3'	5.23	122.07	113.70
64	Aa	14	HIS	CB-CA-C	5.20	120.81	110.40
36	5	1236	C	C4'-C3'-O3'	5.19	123.37	113.00
36	5	48	G	C2'-C3'-O3'	5.14	121.93	113.70
36	5	3888	G	C2'-C3'-O3'	5.13	121.91	113.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	2	627	U	C2'-C3'-O3'	5.04	121.76	113.70

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
40	AB	257	TRP	Peptide
40	AB	258	HIS	Peptide
28	b	26	CYS	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	
2	B	215/295 (73%)	196 (91%)	17 (8%)	2 (1%)	14	45
3	C	211/264 (80%)	188 (89%)	23 (11%)	0	100	100
4	D	219/255 (86%)	199 (91%)	18 (8%)	2 (1%)	14	45
5	E	226/281 (80%)	209 (92%)	17 (8%)	0	100	100
6	F	260/263 (99%)	239 (92%)	20 (8%)	1 (0%)	30	63
7	G	181/204 (89%)	169 (93%)	10 (6%)	2 (1%)	12	39
8	H	235/249 (94%)	210 (89%)	25 (11%)	0	100	100
9	I	181/194 (93%)	169 (93%)	11 (6%)	1 (1%)	22	53
10	J	204/207 (99%)	187 (92%)	15 (7%)	2 (1%)	13	42
11	K	183/194 (94%)	167 (91%)	16 (9%)	0	100	100
12	L	94/149 (63%)	86 (92%)	8 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
13	M	139/158 (88%)	124 (89%)	15 (11%)	0	100	100
14	N	115/132 (87%)	100 (87%)	15 (13%)	0	100	100
15	O	147/151 (97%)	139 (95%)	8 (5%)	0	100	100
16	P	134/151 (89%)	119 (89%)	15 (11%)	0	100	100
17	Q	117/145 (81%)	106 (91%)	8 (7%)	3 (3%)	4	21
18	R	140/172 (81%)	127 (91%)	12 (9%)	1 (1%)	19	51
19	S	130/135 (96%)	120 (92%)	9 (7%)	1 (1%)	16	48
20	T	142/152 (93%)	125 (88%)	15 (11%)	2 (1%)	9	34
21	U	139/145 (96%)	126 (91%)	12 (9%)	1 (1%)	19	51
22	V	98/119 (82%)	87 (89%)	11 (11%)	0	100	100
23	W	81/83 (98%)	77 (95%)	4 (5%)	0	100	100
24	X	127/130 (98%)	119 (94%)	7 (6%)	1 (1%)	16	48
25	Y	139/143 (97%)	129 (93%)	10 (7%)	0	100	100
26	Z	122/134 (91%)	113 (93%)	9 (7%)	0	100	100
27	a	73/125 (58%)	68 (93%)	5 (7%)	0	100	100
28	b	96/115 (84%)	83 (86%)	11 (12%)	2 (2%)	5	25
29	c	81/84 (96%)	71 (88%)	9 (11%)	1 (1%)	11	38
30	d	60/69 (87%)	59 (98%)	1 (2%)	0	100	100
31	e	53/56 (95%)	49 (92%)	4 (8%)	0	100	100
32	f	54/133 (41%)	48 (89%)	5 (9%)	1 (2%)	6	27
33	g	66/156 (42%)	58 (88%)	6 (9%)	2 (3%)	3	19
34	h	311/317 (98%)	268 (86%)	43 (14%)	0	100	100
39	AA	246/257 (96%)	230 (94%)	14 (6%)	2 (1%)	16	48
40	AB	392/403 (97%)	362 (92%)	30 (8%)	0	100	100
41	AC	360/392 (92%)	337 (94%)	20 (6%)	3 (1%)	16	48
42	AD	291/297 (98%)	270 (93%)	20 (7%)	1 (0%)	37	68
43	AE	208/291 (72%)	184 (88%)	23 (11%)	1 (0%)	25	58
44	AF	223/249 (90%)	211 (95%)	11 (5%)	1 (0%)	30	63
45	AG	221/242 (91%)	208 (94%)	13 (6%)	0	100	100
46	AH	188/192 (98%)	174 (93%)	14 (7%)	0	100	100
47	AI	201/214 (94%)	186 (92%)	13 (6%)	2 (1%)	13	42

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
48	AJ	168/178 (94%)	159 (95%)	8 (5%)	1 (1%)	22	53
49	AL	199/211 (94%)	191 (96%)	7 (4%)	1 (0%)	25	58
50	AM	136/198 (69%)	126 (93%)	10 (7%)	0	100	100
51	AN	201/204 (98%)	186 (92%)	15 (8%)	0	100	100
52	AO	197/203 (97%)	188 (95%)	8 (4%)	1 (0%)	25	58
53	AP	151/184 (82%)	145 (96%)	6 (4%)	0	100	100
54	AQ	185/188 (98%)	170 (92%)	15 (8%)	0	100	100
55	AR	178/196 (91%)	168 (94%)	10 (6%)	0	100	100
56	AS	174/176 (99%)	157 (90%)	14 (8%)	3 (2%)	7	30
57	AT	157/160 (98%)	143 (91%)	12 (8%)	2 (1%)	10	36
58	AU	97/128 (76%)	86 (89%)	10 (10%)	1 (1%)	13	42
59	AV	127/140 (91%)	120 (94%)	6 (5%)	1 (1%)	16	48
60	AW	61/157 (39%)	57 (93%)	4 (7%)	0	100	100
61	AX	116/156 (74%)	110 (95%)	6 (5%)	0	100	100
62	AY	132/145 (91%)	126 (96%)	6 (4%)	0	100	100
63	AZ	133/136 (98%)	124 (93%)	8 (6%)	1 (1%)	16	48
64	Aa	145/148 (98%)	132 (91%)	11 (8%)	2 (1%)	9	34
65	Ab	100/226 (44%)	94 (94%)	5 (5%)	1 (1%)	13	42
66	Ac	96/115 (84%)	91 (95%)	5 (5%)	0	100	100
67	Ad	105/125 (84%)	97 (92%)	7 (7%)	1 (1%)	13	42
68	Ae	126/135 (93%)	121 (96%)	5 (4%)	0	100	100
69	Af	107/110 (97%)	102 (95%)	5 (5%)	0	100	100
70	Ag	112/126 (89%)	110 (98%)	2 (2%)	0	100	100
71	Ah	120/123 (98%)	114 (95%)	6 (5%)	0	100	100
72	Ai	100/105 (95%)	93 (93%)	7 (7%)	0	100	100
73	Aj	84/97 (87%)	78 (93%)	5 (6%)	1 (1%)	11	38
74	Ak	67/69 (97%)	63 (94%)	3 (4%)	1 (2%)	8	33
75	Al	48/51 (94%)	44 (92%)	4 (8%)	0	100	100
76	Am	50/52 (96%)	49 (98%)	0	1 (2%)	6	26
77	An	23/25 (92%)	23 (100%)	0	0	100	100
78	Ao	102/106 (96%)	97 (95%)	5 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
79	Ap	89/92 (97%)	81 (91%)	8 (9%)	0	100	100
80	Ar	122/137 (89%)	112 (92%)	10 (8%)	0	100	100
81	AK	210/217 (97%)	155 (74%)	51 (24%)	4 (2%)	6	27
All	All	11321/12916 (88%)	10408 (92%)	856 (8%)	57 (0%)	27	58

All (57) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	45	GLY
17	Q	18	ARG
18	R	17	LYS
20	T	100	ALA
41	AC	126	SER
49	AL	63	THR
52	AO	110	PRO
58	AU	61	VAL
76	Am	94	ASN
81	AK	140	HIS
2	B	44	ASP
7	G	20	PHE
17	Q	70	MET
21	U	111	LYS
44	AF	196	VAL
48	AJ	146	ARG
65	Ab	25	ARG
67	Ad	58	GLY
73	Aj	38	GLY
7	G	77	MET
10	J	41	ARG
10	J	94	LYS
20	T	78	LYS
39	AA	234	LYS
41	AC	83	GLY
42	AD	152	ARG
43	AE	93	ALA
47	AI	12	CYS
57	AT	44	GLY
64	Aa	14	HIS
74	Ak	68	GLU
81	AK	126	PRO
81	AK	208	SER

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Mol	Chain	Res	Type
6	F	73	ASP
28	b	26	CYS
29	c	50	ALA
56	AS	158	VAL
63	AZ	91	LEU
64	Aa	24	LYS
81	AK	193	LEU
4	D	134	ASN
17	Q	125	PRO
28	b	46	GLU
33	g	96	LYS
39	AA	196	TRP
41	AC	318	PRO
59	AV	17	SER
4	D	99	GLY
19	S	126	MET
32	f	117	ASN
57	AT	130	ARG
9	I	54	GLY
56	AS	155	PRO
24	X	95	PRO
56	AS	165	PRO
33	g	127	GLY
47	AI	47	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	180/245 (74%)	177 (98%)	3 (2%)	56	78
3	C	194/231 (84%)	187 (96%)	7 (4%)	30	60
4	D	186/205 (91%)	181 (97%)	5 (3%)	40	67
5	E	190/232 (82%)	182 (96%)	8 (4%)	25	56
6	F	223/225 (99%)	217 (97%)	6 (3%)	40	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	G	158/170 (93%)	155 (98%)	3 (2%)	52	75
8	H	207/218 (95%)	204 (99%)	3 (1%)	62	81
9	I	165/174 (95%)	164 (99%)	1 (1%)	84	91
10	J	178/179 (99%)	172 (97%)	6 (3%)	32	62
11	K	161/168 (96%)	157 (98%)	4 (2%)	42	69
12	L	87/125 (70%)	86 (99%)	1 (1%)	70	84
13	M	130/142 (92%)	127 (98%)	3 (2%)	45	70
14	N	99/108 (92%)	98 (99%)	1 (1%)	73	86
15	O	130/131 (99%)	128 (98%)	2 (2%)	60	80
16	P	106/119 (89%)	104 (98%)	2 (2%)	52	75
17	Q	108/130 (83%)	100 (93%)	8 (7%)	11	36
18	R	117/140 (84%)	115 (98%)	2 (2%)	56	78
19	S	119/121 (98%)	117 (98%)	2 (2%)	56	78
20	T	125/132 (95%)	123 (98%)	2 (2%)	58	79
21	U	111/116 (96%)	110 (99%)	1 (1%)	75	88
22	V	92/107 (86%)	91 (99%)	1 (1%)	70	84
23	W	68/68 (100%)	59 (87%)	9 (13%)	3	14
24	X	112/113 (99%)	110 (98%)	2 (2%)	54	76
25	Y	113/114 (99%)	110 (97%)	3 (3%)	40	67
26	Z	107/115 (93%)	105 (98%)	2 (2%)	52	75
27	a	66/103 (64%)	65 (98%)	1 (2%)	60	80
28	b	85/99 (86%)	83 (98%)	2 (2%)	44	70
29	c	75/76 (99%)	75 (100%)	0	100	100
30	d	55/62 (89%)	55 (100%)	0	100	100
31	e	48/49 (98%)	48 (100%)	0	100	100
32	f	46/106 (43%)	44 (96%)	2 (4%)	25	55
33	g	61/140 (44%)	59 (97%)	2 (3%)	33	62
34	h	272/275 (99%)	270 (99%)	2 (1%)	81	90
39	AA	189/199 (95%)	172 (91%)	17 (9%)	8	29
40	AB	342/348 (98%)	330 (96%)	12 (4%)	31	61
41	AC	302/323 (94%)	281 (93%)	21 (7%)	12	39

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
42	AD	247/250 (99%)	244 (99%)	3 (1%)	67	83
43	AE	190/251 (76%)	185 (97%)	5 (3%)	41	68
44	AF	196/218 (90%)	192 (98%)	4 (2%)	50	74
45	AG	194/208 (93%)	187 (96%)	7 (4%)	30	60
46	AH	169/171 (99%)	164 (97%)	5 (3%)	36	64
47	AI	175/181 (97%)	169 (97%)	6 (3%)	32	62
48	AJ	143/149 (96%)	141 (99%)	2 (1%)	62	81
49	AL	167/176 (95%)	161 (96%)	6 (4%)	30	60
50	AM	117/151 (78%)	112 (96%)	5 (4%)	25	55
51	AN	171/172 (99%)	163 (95%)	8 (5%)	22	52
52	AO	171/173 (99%)	164 (96%)	7 (4%)	26	57
53	AP	134/163 (82%)	131 (98%)	3 (2%)	47	71
54	AQ	166/167 (99%)	148 (89%)	18 (11%)	5	21
55	AR	159/175 (91%)	155 (98%)	4 (2%)	42	69
56	AS	155/155 (100%)	141 (91%)	14 (9%)	8	29
57	AT	139/140 (99%)	133 (96%)	6 (4%)	25	55
58	AU	91/116 (78%)	86 (94%)	5 (6%)	18	47
59	AV	100/107 (94%)	95 (95%)	5 (5%)	20	50
60	AW	55/126 (44%)	54 (98%)	1 (2%)	54	76
61	AX	106/134 (79%)	105 (99%)	1 (1%)	75	88
62	AY	124/135 (92%)	120 (97%)	4 (3%)	34	63
63	AZ	117/118 (99%)	116 (99%)	1 (1%)	75	88
64	Aa	119/120 (99%)	116 (98%)	3 (2%)	42	69
65	Ab	84/172 (49%)	81 (96%)	3 (4%)	30	60
66	Ac	84/98 (86%)	83 (99%)	1 (1%)	67	83
67	Ad	98/110 (89%)	94 (96%)	4 (4%)	26	57
68	Ae	114/121 (94%)	111 (97%)	3 (3%)	41	68
69	Af	88/89 (99%)	79 (90%)	9 (10%)	6	23
70	Ag	98/106 (92%)	97 (99%)	1 (1%)	73	86
71	Ah	109/110 (99%)	107 (98%)	2 (2%)	54	76
72	Ai	86/89 (97%)	84 (98%)	2 (2%)	45	70

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
73	Aj	73/80 (91%)	70 (96%)	3 (4%)	26	57
74	Ak	64/64 (100%)	61 (95%)	3 (5%)	22	52
75	Al	47/48 (98%)	46 (98%)	1 (2%)	48	72
76	Am	48/48 (100%)	46 (96%)	2 (4%)	25	56
77	An	24/24 (100%)	23 (96%)	1 (4%)	25	56
78	Ao	92/94 (98%)	89 (97%)	3 (3%)	33	62
79	Ap	74/75 (99%)	72 (97%)	2 (3%)	40	67
80	Ar	108/121 (89%)	105 (97%)	3 (3%)	38	66
81	AK	190/196 (97%)	181 (95%)	9 (5%)	22	52
All	All	9893/11009 (90%)	9572 (97%)	321 (3%)	36	63

All (321) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	50	ASN
2	B	82	THR
2	B	111	GLN
3	C	40	ASN
3	C	105	LEU
3	C	107	ARG
3	C	147	ASN
3	C	207	LEU
3	C	212	VAL
3	C	213	ARG
4	D	78	LEU
4	D	137	VAL
4	D	141	LEU
4	D	227	ARG
4	D	271	ASN
5	E	57	ASN
5	E	76	ARG
5	E	94	ARG
5	E	106	ARG
5	E	141	LYS
5	E	143	ARG
5	E	146	ARG
5	E	227	LYS
6	F	67	GLN
6	F	155	LYS

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Mol	Chain	Res	Type
6	F	156	MET
6	F	220	THR
6	F	232	ASN
6	F	246	LEU
7	G	14	THR
7	G	41	VAL
7	G	88	MET
8	H	108	VAL
8	H	175	LYS
8	H	201	LYS
9	I	46	THR
10	J	37	LYS
10	J	72	CYS
10	J	99	ASN
10	J	145	ILE
10	J	168	GLN
10	J	190	LEU
11	K	69	ARG
11	K	70	ARG
11	K	79	ARG
11	K	110	LEU
12	L	58	VAL
13	M	20	LYS
13	M	56	ILE
13	M	69	ARG
14	N	33	ARG
15	O	24	THR
15	O	27	LYS
16	P	50	LYS
16	P	100	THR
17	Q	13	ARG
17	Q	37	TYR
17	Q	103	ASN
17	Q	121	ILE
17	Q	122	THR
17	Q	124	LYS
17	Q	127	LYS
17	Q	130	ARG
18	R	17	LYS
18	R	31	LEU
19	S	5	ARG
19	S	127	ASN

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Mol	Chain	Res	Type
20	T	8	LYS
20	T	101	ASN
21	U	62	ARG
22	V	47	ASN
23	W	11	LEU
23	W	12	TYR
23	W	21	ASN
23	W	32	ILE
23	W	34	MET
23	W	35	ASN
23	W	50	SER
23	W	52	THR
23	W	82	ASN
24	X	20	ARG
24	X	126	LEU
25	Y	7	LEU
25	Y	60	LYS
25	Y	61	GLN
26	Z	101	LYS
26	Z	110	ARG
27	a	67	LEU
28	b	15	ARG
28	b	21	ILE
32	f	99	LYS
32	f	104	ARG
33	g	126	CYS
33	g	138	ARG
34	h	178	ASN
34	h	206	LEU
39	AA	3	ARG
39	AA	68	ARG
39	AA	77	ILE
39	AA	80	GLU
39	AA	96	LEU
39	AA	102	LEU
39	AA	125	LYS
39	AA	128	ARG
39	AA	140	ASN
39	AA	155	LYS
39	AA	156	LYS
39	AA	159	SER
39	AA	165	VAL

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Mol	Chain	Res	Type
39	AA	193	ARG
39	AA	200	ARG
39	AA	207	VAL
39	AA	242	ARG
40	AB	10	ARG
40	AB	16	PHE
40	AB	24	ARG
40	AB	157	CYS
40	AB	242	ARG
40	AB	249	ARG
40	AB	254	ILE
40	AB	261	ARG
40	AB	262	VAL
40	AB	298	LEU
40	AB	309	LEU
40	AB	338	VAL
41	AC	69	THR
41	AC	71	ARG
41	AC	95	MET
41	AC	121	ARG
41	AC	133	LEU
41	AC	150	LEU
41	AC	188	ARG
41	AC	219	LYS
41	AC	246	VAL
41	AC	286	ASN
41	AC	302	LEU
41	AC	303	ARG
41	AC	316	LYS
41	AC	334	THR
41	AC	335	MET
41	AC	341	LEU
41	AC	342	ARG
41	AC	348	LYS
41	AC	350	ARG
41	AC	353	ARG
41	AC	363	ASP
42	AD	37	VAL
42	AD	56	THR
42	AD	111	ASN
43	AE	52	LEU
43	AE	58	ARG

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Mol	Chain	Res	Type
43	AE	155	ILE
43	AE	178	VAL
43	AE	289	LEU
44	AF	76	LYS
44	AF	205	ASN
44	AF	242	LEU
44	AF	244	ARG
45	AG	97	ASP
45	AG	223	LEU
45	AG	226	LEU
45	AG	242	ARG
45	AG	249	ARG
45	AG	282	ARG
45	AG	293	ASN
46	AH	1	MET
46	AH	15	ASN
46	AH	23	ARG
46	AH	102	ASN
46	AH	116	ASN
47	AI	3	ARG
47	AI	28	ASP
47	AI	35	ASP
47	AI	74	LYS
47	AI	126	VAL
47	AI	142	LEU
48	AJ	16	ARG
48	AJ	33	LEU
49	AL	46	ILE
49	AL	67	HIS
49	AL	71	ARG
49	AL	154	VAL
49	AL	159	ASN
49	AL	162	LYS
50	AM	38	VAL
50	AM	42	CYS
50	AM	94	LYS
50	AM	96	GLU
50	AM	119	ARG
51	AN	50	ARG
51	AN	64	ILE
51	AN	80	THR
51	AN	87	HIS

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Mol	Chain	Res	Type
51	AN	89	VAL
51	AN	104	GLU
51	AN	117	ASN
51	AN	151	ILE
52	AO	12	ARG
52	AO	36	VAL
52	AO	108	ILE
52	AO	110	PRO
52	AO	112	TYR
52	AO	117	ARG
52	AO	145	VAL
53	AP	24	VAL
53	AP	128	ARG
53	AP	147	GLU
54	AQ	14	TRP
54	AQ	23	MET
54	AQ	37	ARG
54	AQ	38	HIS
54	AQ	42	THR
54	AQ	57	LYS
54	AQ	66	VAL
54	AQ	78	LYS
54	AQ	79	THR
54	AQ	86	ILE
54	AQ	91	ARG
54	AQ	97	LYS
54	AQ	110	HIS
54	AQ	117	GLU
54	AQ	124	HIS
54	AQ	138	LEU
54	AQ	150	GLN
54	AQ	172	ARG
55	AR	36	ASN
55	AR	50	ILE
55	AR	89	MET
55	AR	94	LYS
56	AS	2	LYS
56	AS	15	ARG
56	AS	19	THR
56	AS	21	LYS
56	AS	49	LEU
56	AS	67	VAL

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Mol	Chain	Res	Type
56	AS	90	THR
56	AS	96	GLU
56	AS	102	MET
56	AS	104	SER
56	AS	120	ARG
56	AS	132	MET
56	AS	136	ARG
56	AS	159	LEU
57	AT	79	GLN
57	AT	80	VAL
57	AT	81	LYS
57	AT	83	LYS
57	AT	136	ARG
57	AT	146	LYS
58	AU	32	ARG
58	AU	36	GLU
58	AU	61	VAL
58	AU	80	LYS
58	AU	107	LYS
59	AV	15	ARG
59	AV	18	LEU
59	AV	25	VAL
59	AV	60	MET
59	AV	82	ILE
60	AW	44	ARG
61	AX	72	ASP
62	AY	2	LYS
62	AY	72	GLN
62	AY	79	VAL
62	AY	112	ASP
63	AZ	33	THR
64	Aa	4	ARG
64	Aa	10	LYS
64	Aa	56	VAL
65	Ab	9	THR
65	Ab	60	ASN
65	Ab	101	HIS
66	Ac	90	ARG
67	Ad	18	ASN
67	Ad	31	LYS
67	Ad	48	GLU
67	Ad	56	GLU

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Mol	Chain	Res	Type
68	Ae	48	ARG
68	Ae	78	LEU
68	Ae	91	CYS
69	Af	7	CYS
69	Af	16	ARG
69	Af	33	VAL
69	Af	80	ASN
69	Af	84	VAL
69	Af	101	ILE
69	Af	104	MET
69	Af	105	LEU
69	Af	106	TYR
70	Ag	15	THR
71	Ah	13	LYS
71	Ah	67	GLU
72	Ai	21	VAL
72	Ai	29	ARG
73	Aj	13	ASN
73	Aj	20	ARG
73	Aj	58	THR
74	Ak	3	GLN
74	Ak	35	LYS
74	Ak	48	MET
75	Al	27	ILE
76	Am	72	LYS
76	Am	96	ARG
77	An	13	LEU
78	Ao	9	ARG
78	Ao	82	MET
78	Ao	97	LYS
79	Ap	17	ARG
79	Ap	54	ILE
80	Ar	26	SER
80	Ar	98	ARG
80	Ar	107	ARG
81	AK	9	THR
81	AK	10	LEU
81	AK	92	LYS
81	AK	137	LEU
81	AK	156	LYS
81	AK	159	MET
81	AK	173	LYS

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Mol	Chain	Res	Type
81	AK	195	LYS
81	AK	196	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (90) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	147	ASN
4	D	271	ASN
6	F	232	ASN
7	G	118	ASN
8	H	186	GLN
8	H	202	ASN
10	J	99	ASN
10	J	165	GLN
10	J	168	GLN
11	K	177	ASN
12	L	7	ASN
13	M	18	GLN
13	M	19	ASN
13	M	83	GLN
15	O	36	GLN
15	O	105	ASN
15	O	123	HIS
17	Q	41	GLN
17	Q	103	ASN
17	Q	128	HIS
19	S	62	GLN
19	S	127	ASN
20	T	76	GLN
20	T	101	ASN
22	V	47	ASN
23	W	21	ASN
23	W	47	ASN
23	W	81	GLN
24	X	16	ASN
24	X	64	ASN
24	X	91	ASN
29	c	26	GLN
30	d	26	GLN
30	d	29	GLN
32	f	88	GLN
34	h	159	ASN

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Mol	Chain	Res	Type
34	h	178	ASN
39	AA	140	ASN
39	AA	205	ASN
39	AA	217	GLN
40	AB	271	GLN
41	AC	50	GLN
41	AC	286	ASN
41	AC	310	HIS
41	AC	329	ASN
41	AC	338	ASN
42	AD	275	GLN
43	AE	253	GLN
44	AF	130	ASN
45	AG	96	GLN
45	AG	99	GLN
45	AG	117	GLN
46	AH	8	GLN
46	AH	42	ASN
46	AH	102	ASN
46	AH	156	ASN
47	AI	95	HIS
47	AI	123	GLN
47	AI	163	GLN
48	AJ	104	ASN
49	AL	104	ASN
49	AL	188	ASN
51	AN	15	GLN
51	AN	32	GLN
52	AO	5	GLN
53	AP	75	GLN
53	AP	80	GLN
54	AQ	38	HIS
54	AQ	124	HIS
54	AQ	188	ASN
55	AR	36	ASN
56	AS	146	HIS
57	AT	49	GLN
59	AV	27	ASN
59	AV	36	ASN
60	AW	30	GLN
60	AW	50	ASN
61	AX	93	ASN

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Mol	Chain	Res	Type
61	AX	105	ASN
62	AY	14	ASN
64	Aa	34	ASN
64	Aa	44	ASN
65	Ab	50	ASN
66	Ac	19	GLN
67	Ad	79	ASN
73	Aj	30	GLN
73	Aj	57	ASN
78	Ao	45	GLN
80	Ar	21	ASN
80	Ar	45	HIS

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	2	1685/1869 (90%)	430 (25%)	35 (2%)
35	1	204/253 (80%)	109 (53%)	11 (5%)
36	5	3569/3594 (99%)	930 (26%)	88 (2%)
37	7	118/119 (99%)	11 (9%)	1 (0%)
38	8	149/156 (95%)	34 (22%)	3 (2%)
All	All	5725/5991 (95%)	1514 (26%)	138 (2%)

All (1514) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	2	2	A
1	2	3	C
1	2	4	C
1	2	17	C
1	2	25	A
1	2	33	G
1	2	41	G
1	2	44	U
1	2	45	A
1	2	46	A
1	2	56	G
1	2	58	C
1	2	61	A
1	2	64	A
1	2	65	C

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Mol	Chain	Res	Type
1	2	67	C
1	2	68	A
1	2	69	C
1	2	73	C
1	2	74	G
1	2	75	G
1	2	79	A
1	2	99	A
1	2	103	A
1	2	111	A
1	2	113	G
1	2	114	G
1	2	115	U
1	2	116	U
1	2	124	U
1	2	126	G
1	2	127	C
1	2	129	C
1	2	130	G
1	2	142	C
1	2	143	U
1	2	146	G
1	2	147	A
1	2	155	G
1	2	158	A
1	2	160	U
1	2	161	U
1	2	162	C
1	2	163	U
1	2	170	A
1	2	175	A
1	2	179	C
1	2	180	G
1	2	183	G
1	2	184	G
1	2	185	G
1	2	188	C
1	2	189	U
1	2	191	A
1	2	192	C
1	2	196	C
1	2	197	U

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Mol	Chain	Res	Type
1	2	215	G
1	2	294	U
1	2	307	G
1	2	308	G
1	2	309	G
1	2	312	G
1	2	317	C
1	2	318	A
1	2	319	C
1	2	320	G
1	2	330	G
1	2	332	G
1	2	335	G
1	2	347	G
1	2	351	G
1	2	362	C
1	2	364	A
1	2	367	U
1	2	368	U
1	2	369	C
1	2	370	G
1	2	377	G
1	2	384	U
1	2	385	G
1	2	386	C
1	2	400	C
1	2	408	A
1	2	409	C
1	2	417	C
1	2	418	A
1	2	436	G
1	2	438	G
1	2	441	C
1	2	447	A
1	2	448	A
1	2	449	A
1	2	450	C
1	2	464	A
1	2	465	A
1	2	466	G
1	2	471	G
1	2	472	C

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Mol	Chain	Res	Type
1	2	473	A
1	2	474	G
1	2	482	G
1	2	487	U
1	2	492	C
1	2	493	A
1	2	496	C
1	2	502	C
1	2	508	A
1	2	516	A
1	2	517	C
1	2	518	G
1	2	530	U
1	2	531	A
1	2	532	C
1	2	533	A
1	2	536	A
1	2	537	C
1	2	538	U
1	2	539	C
1	2	542	U
1	2	544	G
1	2	547	G
1	2	548	C
1	2	549	C
1	2	550	C
1	2	551	U
1	2	554	A
1	2	555	A
1	2	556	U
1	2	559	G
1	2	561	A
1	2	562	U
1	2	563	G
1	2	568	C
1	2	570	C
1	2	583	A
1	2	585	C
1	2	588	G
1	2	589	G
1	2	590	A
1	2	591	U

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Mol	Chain	Res	Type
1	2	593	C
1	2	597	G
1	2	604	A
1	2	606	G
1	2	607	U
1	2	608	C
1	2	614	C
1	2	627	U
1	2	628	A
1	2	629	A
1	2	632	C
1	2	643	A
1	2	644	G
1	2	660	C
1	2	663	C
1	2	664	A
1	2	668	A
1	2	669	A
1	2	671	A
1	2	672	A
1	2	673	G
1	2	678	U
1	2	687	C
1	2	688	U
1	2	689	U
1	2	692	G
1	2	693	A
1	2	697	G
1	2	750	C
1	2	752	G
1	2	753	C
1	2	754	G
1	2	799	U
1	2	800	U
1	2	811	A
1	2	812	A
1	2	821	G
1	2	822	U
1	2	823	U
1	2	827	A
1	2	830	A
1	2	833	C

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Mol	Chain	Res	Type
1	2	834	C
1	2	845	G
1	2	847	A
1	2	852	G
1	2	865	A
1	2	868	G
1	2	870	A
1	2	871	U
1	2	872	A
1	2	873	G
1	2	874	G
1	2	875	A
1	2	877	C
1	2	878	G
1	2	881	G
1	2	883	U
1	2	885	U
1	2	886	A
1	2	887	U
1	2	888	U
1	2	890	U
1	2	892	U
1	2	894	G
1	2	898	U
1	2	901	G
1	2	902	G
1	2	906	U
1	2	908	A
1	2	909	G
1	2	913	A
1	2	914	U
1	2	917	U
1	2	920	A
1	2	930	C
1	2	933	G
1	2	943	U
1	2	963	A
1	2	970	G
1	2	971	G
1	2	978	G
1	2	985	G
1	2	990	A

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Mol	Chain	Res	Type
1	2	992	A
1	2	999	G
1	2	1002	U
1	2	1017	U
1	2	1023	A
1	2	1034	A
1	2	1044	G
1	2	1050	A
1	2	1055	A
1	2	1060	A
1	2	1062	A
1	2	1083	A
1	2	1085	C
1	2	1089	G
1	2	1100	A
1	2	1111	U
1	2	1115	U
1	2	1116	C
1	2	1117	C
1	2	1118	C
1	2	1121	G
1	2	1123	C
1	2	1130	G
1	2	1133	A
1	2	1137	U
1	2	1138	C
1	2	1150	A
1	2	1153	C
1	2	1154	U
1	2	1155	U
1	2	1157	G
1	2	1166	G
1	2	1195	A
1	2	1203	G
1	2	1207	G
1	2	1210	G
1	2	1215	C
1	2	1221	G
1	2	1224	G
1	2	1235	G
1	2	1239	U
1	2	1240	A

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Mol	Chain	Res	Type
1	2	1242	U
1	2	1243	U
1	2	1244	U
1	2	1248	U
1	2	1251	A
1	2	1253	A
1	2	1256	G
1	2	1257	G
1	2	1259	A
1	2	1265	A
1	2	1274	G
1	2	1275	G
1	2	1281	G
1	2	1284	A
1	2	1285	G
1	2	1286	G
1	2	1290	G
1	2	1291	A
1	2	1292	C
1	2	1293	A
1	2	1294	G
1	2	1298	G
1	2	1299	A
1	2	1301	A
1	2	1302	G
1	2	1303	C
1	2	1306	U
1	2	1307	U
1	2	1308	U
1	2	1311	C
1	2	1314	U
1	2	1318	G
1	2	1330	G
1	2	1331	C
1	2	1332	A
1	2	1342	U
1	2	1343	U
1	2	1354	G
1	2	1364	U
1	2	1366	G
1	2	1371	U
1	2	1372	U

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Mol	Chain	Res	Type
1	2	1377	U
1	2	1378	A
1	2	1379	A
1	2	1382	A
1	2	1396	A
1	2	1397	U
1	2	1400	U
1	2	1402	A
1	2	1403	C
1	2	1405	A
1	2	1406	G
1	2	1409	A
1	2	1425	G
1	2	1428	G
1	2	1429	G
1	2	1431	G
1	2	1439	A
1	2	1440	C
1	2	1441	U
1	2	1444	U
1	2	1449	G
1	2	1453	C
1	2	1454	A
1	2	1455	A
1	2	1462	U
1	2	1463	U
1	2	1464	C
1	2	1466	G
1	2	1470	C
1	2	1476	A
1	2	1479	G
1	2	1480	A
1	2	1490	G
1	2	1494	U
1	2	1495	G
1	2	1498	A
1	2	1504	U
1	2	1509	U
1	2	1514	G
1	2	1519	U
1	2	1520	G
1	2	1521	C

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Mol	Chain	Res	Type
1	2	1522	A
1	2	1523	C
1	2	1533	A
1	2	1535	U
1	2	1536	G
1	2	1548	G
1	2	1552	G
1	2	1553	C
1	2	1554	C
1	2	1556	A
1	2	1558	C
1	2	1564	C
1	2	1567	G
1	2	1570	G
1	2	1573	G
1	2	1574	C
1	2	1580	A
1	2	1583	C
1	2	1584	G
1	2	1585	U
1	2	1586	U
1	2	1588	A
1	2	1601	A
1	2	1604	G
1	2	1606	G
1	2	1612	G
1	2	1619	A
1	2	1621	U
1	2	1623	A
1	2	1637	A
1	2	1638	G
1	2	1639	G
1	2	1641	A
1	2	1648	G
1	2	1654	G
1	2	1656	G
1	2	1664	A
1	2	1665	G
1	2	1671	G
1	2	1674	G
1	2	1680	G
1	2	1683	C

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Mol	Chain	Res	Type
1	2	1686	G
1	2	1689	C
1	2	1692	U
1	2	1721	U
1	2	1722	G
1	2	1726	G
1	2	1743	G
1	2	1744	G
1	2	1745	A
1	2	1746	U
1	2	1748	G
1	2	1753	C
1	2	1756	C
1	2	1758	G
1	2	1775	U
1	2	1777	G
1	2	1779	G
1	2	1783	C
1	2	1784	G
1	2	1787	G
1	2	1819	A
1	2	1824	A
1	2	1829	G
1	2	1831	A
1	2	1836	G
1	2	1837	G
1	2	1838	U
1	2	1849	G
1	2	1851	A
1	2	1858	G
1	2	1861	G
1	2	1862	G
1	2	1863	A
1	2	1864	U
1	2	1865	C
1	2	1867	U
1	2	1869	A
35	1	6419	C
35	1	6424	U
35	1	6425	A
35	1	6426	U
35	1	6427	G

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Mol	Chain	Res	Type
35	1	6431	A
35	1	6432	C
35	1	6436	U
35	1	6442	G
35	1	6444	G
35	1	6445	G
35	1	6447	A
35	1	6449	U
35	1	6450	U
35	1	6451	U
35	1	6457	A
35	1	6461	U
35	1	6464	G
35	1	6469	A
35	1	6471	G
35	1	6473	C
35	1	6474	U
35	1	6481	G
35	1	6483	U
35	1	6484	G
35	1	6485	G
35	1	6486	U
35	1	6487	C
35	1	6488	G
35	1	6489	A
35	1	6490	G
35	1	6492	U
35	1	6493	G
35	1	6494	C
35	1	6499	U
35	1	6501	U
35	1	6502	A
35	1	6506	U
35	1	6507	G
35	1	6509	G
35	1	6510	G
35	1	6511	A
35	1	6512	G
35	1	6513	C
35	1	6514	C
35	1	6515	U
35	1	6516	C

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Mol	Chain	Res	Type
35	1	6517	G
35	1	6518	G
35	1	6519	U
35	1	6520	G
35	1	6522	C
35	1	6523	A
35	1	6524	G
35	1	6525	C
35	1	6526	C
35	1	6527	C
35	1	6528	C
35	1	6529	A
35	1	6530	C
35	1	6531	C
35	1	6533	A
35	1	6534	A
35	1	6535	U
35	1	6539	C
35	1	6540	U
35	1	6541	A
35	1	6542	U
35	1	6544	G
35	1	6545	G
35	1	6546	A
35	1	6548	A
35	1	6549	G
35	1	6552	A
35	1	6555	G
35	1	6556	C
35	1	6561	C
35	1	6562	U
35	1	6566	C
35	1	6567	A
35	1	6568	G
35	1	6572	C
35	1	6575	C
35	1	6576	A
35	1	6577	G
35	1	6578	U
35	1	6583	U
35	1	6586	U
35	1	6587	A

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Mol	Chain	Res	Type
35	1	6588	A
35	1	6589	C
35	1	6590	A
35	1	6591	C
35	1	6596	G
35	1	6597	G
35	1	6599	G
35	1	6602	C
35	1	6604	G
35	1	6605	A
35	1	6606	A
35	1	6607	A
35	1	6608	U
35	1	6609	A
35	1	6610	C
35	1	6611	C
35	1	6612	A
35	1	6614	G
35	1	6619	G
35	1	6620	C
36	5	12	A
36	5	13	U
36	5	21	G
36	5	25	A
36	5	30	C
36	5	35	U
36	5	39	A
36	5	42	A
36	5	44	A
36	5	48	G
36	5	49	U
36	5	56	A
36	5	58	G
36	5	59	A
36	5	64	A
36	5	65	A
36	5	72	C
36	5	73	A
36	5	74	G
36	5	91	G
36	5	98	A
36	5	103	G

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Mol	Chain	Res	Type
36	5	104	G
36	5	108	A
36	5	109	G
36	5	110	C
36	5	116	G
36	5	118	C
36	5	119	G
36	5	120	A
36	5	122	U
36	5	126	C
36	5	133	C
36	5	134	G
36	5	135	G
36	5	136	C
36	5	140	G
36	5	142	G
36	5	143	C
36	5	144	G
36	5	157	U
36	5	159	C
36	5	167	C
36	5	171	U
36	5	173	C
36	5	175	C
36	5	177	G
36	5	200	U
36	5	201	C
36	5	209	U
36	5	216	C
36	5	217	C
36	5	218	A
36	5	220	C
36	5	224	U
36	5	225	G
36	5	233	U
36	5	234	G
36	5	236	G
36	5	245	C
36	5	249	C
36	5	255	C
36	5	256	G
36	5	263	G

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Mol	Chain	Res	Type
36	5	264	C
36	5	265	C
36	5	266	C
36	5	267	G
36	5	272	U
36	5	275	C
36	5	276	C
36	5	278	G
36	5	280	G
36	5	281	U
36	5	282	C
36	5	297	U
36	5	305	A
36	5	306	A
36	5	315	G
36	5	316	U
36	5	321	U
36	5	323	C
36	5	327	U
36	5	328	A
36	5	334	A
36	5	340	C
36	5	344	A
36	5	345	C
36	5	347	A
36	5	350	C
36	5	353	A
36	5	360	A
36	5	361	C
36	5	362	A
36	5	363	A
36	5	370	U
36	5	381	U
36	5	386	A
36	5	387	G
36	5	401	G
36	5	402	A
36	5	410	A
36	5	412	G
36	5	413	G
36	5	415	G
36	5	432	U

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Mol	Chain	Res	Type
36	5	440	U
36	5	449	C
36	5	450	G
36	5	452	A
36	5	453	G
36	5	454	U
36	5	457	G
36	5	464	G
36	5	467	U
36	5	468	U
36	5	469	C
36	5	473	C
36	5	481	G
36	5	482	G
36	5	485	C
36	5	492	U
36	5	493	G
36	5	498	C
36	5	499	G
36	5	500	G
36	5	505	G
36	5	506	C
36	5	510	U
36	5	521	C
36	5	522	C
36	5	640	C
36	5	646	G
36	5	649	A
36	5	662	C
36	5	666	G
36	5	668	C
36	5	669	C
36	5	670	G
36	5	673	C
36	5	685	C
36	5	686	A
36	5	691	C
36	5	697	G
36	5	704	C
36	5	719	C
36	5	730	G
36	5	731	G

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Mol	Chain	Res	Type
36	5	737	C
36	5	738	C
36	5	739	G
36	5	740	G
36	5	743	G
36	5	747	A
36	5	749	G
36	5	750	U
36	5	751	G
36	5	758	G
36	5	905	C
36	5	906	C
36	5	912	U
36	5	913	U
36	5	914	A
36	5	916	A
36	5	917	G
36	5	922	C
36	5	923	C
36	5	924	C
36	5	925	G
36	5	928	A
36	5	929	G
36	5	931	A
36	5	932	G
36	5	933	C
36	5	934	A
36	5	935	G
36	5	936	C
36	5	941	C
36	5	943	A
36	5	944	A
36	5	945	U
36	5	956	A
36	5	959	G
36	5	960	A
36	5	961	G
36	5	962	C
36	5	966	A
36	5	967	C
36	5	968	C
36	5	969	U

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Mol	Chain	Res	Type
36	5	970	G
36	5	971	U
36	5	974	C
36	5	978	G
36	5	979	C
36	5	984	U
36	5	986	C
36	5	990	C
36	5	1070	G
36	5	1071	C
36	5	1072	C
36	5	1078	A
36	5	1079	C
36	5	1097	C
36	5	1184	A
36	5	1193	C
36	5	1194	G
36	5	1195	G
36	5	1198	G
36	5	1209	U
36	5	1211	G
36	5	1212	G
36	5	1214	C
36	5	1215	C
36	5	1234	G
36	5	1235	G
36	5	1236	C
36	5	1237	C
36	5	1238	A
36	5	1246	G
36	5	1248	C
36	5	1249	C
36	5	1251	C
36	5	1252	C
36	5	1272	C
36	5	1273	G
36	5	1275	G
36	5	1276	C
36	5	1277	G
36	5	1278	C
36	5	1280	C
36	5	1282	G

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Mol	Chain	Res	Type
36	5	1283	G
36	5	1284	G
36	5	1287	G
36	5	1288	G
36	5	1289	C
36	5	1292	C
36	5	1296	G
36	5	1297	U
36	5	1301	C
36	5	1302	U
36	5	1326	A
36	5	1337	A
36	5	1354	A
36	5	1358	G
36	5	1359	G
36	5	1370	G
36	5	1371	A
36	5	1377	G
36	5	1380	G
36	5	1381	U
36	5	1387	A
36	5	1394	G
36	5	1397	A
36	5	1398	A
36	5	1399	G
36	5	1400	G
36	5	1411	C
36	5	1412	G
36	5	1413	C
36	5	1414	C
36	5	1415	G
36	5	1419	G
36	5	1420	A
36	5	1421	G
36	5	1426	G
36	5	1435	G
36	5	1436	C
36	5	1437	C
36	5	1438	U
36	5	1441	C
36	5	1445	U
36	5	1446	C

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Mol	Chain	Res	Type
36	5	1455	G
36	5	1456	C
36	5	1457	G
36	5	1476	C
36	5	1478	C
36	5	1481	C
36	5	1482	G
36	5	1483	C
36	5	1484	G
36	5	1497	A
36	5	1498	G
36	5	1502	G
36	5	1503	A
36	5	1514	U
36	5	1516	G
36	5	1518	A
36	5	1523	A
36	5	1534	A
36	5	1535	C
36	5	1547	A
36	5	1549	G
36	5	1554	A
36	5	1566	C
36	5	1568	C
36	5	1578	U
36	5	1582	U
36	5	1586	G
36	5	1591	U
36	5	1596	U
36	5	1601	A
36	5	1612	G
36	5	1613	A
36	5	1617	G
36	5	1618	G
36	5	1624	G
36	5	1625	G
36	5	1631	A
36	5	1633	G
36	5	1634	A
36	5	1637	A
36	5	1640	C
36	5	1641	G

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Mol	Chain	Res	Type
36	5	1642	A
36	5	1651	G
36	5	1654	G
36	5	1660	U
36	5	1661	C
36	5	1676	C
36	5	1677	U
36	5	1684	A
36	5	1694	C
36	5	1696	C
36	5	1726	U
36	5	1734	G
36	5	1740	C
36	5	1741	G
36	5	1742	A
36	5	1746	A
36	5	1750	G
36	5	1751	A
36	5	1754	U
36	5	1756	U
36	5	1757	U
36	5	1760	G
36	5	1763	C
36	5	1768	C
36	5	1769	G
36	5	1772	C
36	5	1773	U
36	5	1775	A
36	5	1781	U
36	5	1787	A
36	5	1799	G
36	5	1804	A
36	5	1809	C
36	5	1812	C
36	5	1818	G
36	5	1820	U
36	5	1821	G
36	5	1828	C
36	5	1832	C
36	5	1833	G
36	5	1834	U
36	5	1836	G

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Mol	Chain	Res	Type
36	5	1837	A
36	5	1842	G
36	5	1855	G
36	5	1869	G
36	5	1881	C
36	5	1882	U
36	5	1890	G
36	5	1891	A
36	5	1893	C
36	5	1897	A
36	5	1910	G
36	5	1916	G
36	5	1917	A
36	5	1918	U
36	5	1920	C
36	5	1921	C
36	5	1922	G
36	5	1925	G
36	5	1930	U
36	5	1931	C
36	5	1935	C
36	5	1940	G
36	5	1945	G
36	5	1948	G
36	5	1951	G
36	5	1957	U
36	5	1958	A
36	5	1959	U
36	5	1960	A
36	5	1961	G
36	5	1962	A
36	5	1964	A
36	5	1969	G
36	5	1971	U
36	5	1974	U
36	5	1977	C
36	5	1982	G
36	5	1983	A
36	5	1984	A
36	5	1985	G
36	5	1986	U
36	5	1987	C

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Mol	Chain	Res	Type
36	5	1990	A
36	5	1991	A
36	5	1992	U
36	5	1993	C
36	5	1994	C
36	5	1995	G
36	5	1997	U
36	5	1998	A
36	5	2001	G
36	5	2002	A
36	5	2003	G
36	5	2004	U
36	5	2007	G
36	5	2008	U
36	5	2010	A
36	5	2017	A
36	5	2018	C
36	5	2020	U
36	5	2021	G
36	5	2025	A
36	5	2026	A
36	5	2044	U
36	5	2046	G
36	5	2047	A
36	5	2048	U
36	5	2052	G
36	5	2055	G
36	5	2056	G
36	5	2062	C
36	5	2069	A
36	5	2084	U
36	5	2085	G
36	5	2088	A
36	5	2089	G
36	5	2090	U
36	5	2092	G
36	5	2093	G
36	5	2094	C
36	5	2095	A
36	5	2097	A
36	5	2098	G
36	5	2100	G

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Mol	Chain	Res	Type
36	5	2102	G
36	5	2107	A
36	5	2108	G
36	5	2109	A
36	5	2110	G
36	5	2112	G
36	5	2259	G
36	5	2260	C
36	5	2267	U
36	5	2268	A
36	5	2275	G
36	5	2277	C
36	5	2289	C
36	5	2294	G
36	5	2300	A
36	5	2301	G
36	5	2313	A
36	5	2314	G
36	5	2325	C
36	5	2333	G
36	5	2338	C
36	5	2348	G
36	5	2351	C
36	5	2360	A
36	5	2364	G
36	5	2389	A
36	5	2395	A
36	5	2404	A
36	5	2409	U
36	5	2417	A
36	5	2422	C
36	5	2425	U
36	5	2433	G
36	5	2434	G
36	5	2441	C
36	5	2444	U
36	5	2447	U
36	5	2450	G
36	5	2469	C
36	5	2475	G
36	5	2481	G
36	5	2485	U

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Mol	Chain	Res	Type
36	5	2486	G
36	5	2487	G
36	5	2488	C
36	5	2489	C
36	5	2490	U
36	5	2491	C
36	5	2492	C
36	5	2495	U
36	5	2496	G
36	5	2499	C
36	5	2503	G
36	5	2504	C
36	5	2505	C
36	5	2506	G
36	5	2511	A
36	5	2513	A
36	5	2514	G
36	5	2521	G
36	5	2530	U
36	5	2536	A
36	5	2537	A
36	5	2544	G
36	5	2546	G
36	5	2547	G
36	5	2553	A
36	5	2555	G
36	5	2556	G
36	5	2559	G
36	5	2560	C
36	5	2565	A
36	5	2566	G
36	5	2569	G
36	5	2572	C
36	5	2573	A
36	5	2575	U
36	5	2576	G
36	5	2583	C
36	5	2587	A
36	5	2588	C
36	5	2601	A
36	5	2617	G
36	5	2627	C

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Mol	Chain	Res	Type
36	5	2638	G
36	5	2639	U
36	5	2653	C
36	5	2655	C
36	5	2656	U
36	5	2657	G
36	5	2658	G
36	5	2661	U
36	5	2662	G
36	5	2669	C
36	5	2676	A
36	5	2686	G
36	5	2687	U
36	5	2694	G
36	5	2695	A
36	5	2696	A
36	5	2701	U
36	5	2705	G
36	5	2706	G
36	5	2708	U
36	5	2709	C
36	5	2710	C
36	5	2711	G
36	5	2712	G
36	5	2714	G
36	5	2716	C
36	5	2723	U
36	5	2725	A
36	5	2726	G
36	5	2735	G
36	5	2740	U
36	5	2741	U
36	5	2742	G
36	5	2743	A
36	5	2744	A
36	5	2756	G
36	5	2761	U
36	5	2763	U
36	5	2764	A
36	5	2768	C
36	5	2769	U
36	5	2770	C

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Mol	Chain	Res	Type
36	5	2787	A
36	5	2788	U
36	5	2789	A
36	5	2790	U
36	5	2798	A
36	5	2806	A
36	5	2814	C
36	5	2815	A
36	5	2826	U
36	5	2827	G
36	5	2828	U
36	5	2829	U
36	5	2830	G
36	5	2835	A
36	5	2837	U
36	5	2838	G
36	5	2842	G
36	5	2844	A
36	5	2845	A
36	5	2855	G
36	5	2856	C
36	5	2862	G
36	5	2874	U
36	5	2875	C
36	5	2884	G
36	5	2898	G
36	5	2901	G
36	5	3598	C
36	5	3599	A
36	5	3602	C
36	5	3603	G
36	5	3604	A
36	5	3606	U
36	5	3625	G
36	5	3626	G
36	5	3635	A
36	5	3643	A
36	5	3644	U
36	5	3646	A
36	5	3648	A
36	5	3653	A
36	5	3662	A

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Mol	Chain	Res	Type
36	5	3663	A
36	5	3673	C
36	5	3674	G
36	5	3696	C
36	5	3710	G
36	5	3711	A
36	5	3712	A
36	5	3713	U
36	5	3717	A
36	5	3725	G
36	5	3729	U
36	5	3740	G
36	5	3748	A
36	5	3753	G
36	5	3760	A
36	5	3761	C
36	5	3762	U
36	5	3763	A
36	5	3765	G
36	5	3766	A
36	5	3776	G
36	5	3777	G
36	5	3783	A
36	5	3784	A
36	5	3802	U
36	5	3809	G
36	5	3811	G
36	5	3812	C
36	5	3814	U
36	5	3817	A
36	5	3819	G
36	5	3822	U
36	5	3839	G
36	5	3840	U
36	5	3851	U
36	5	3859	G
36	5	3867	A
36	5	3877	A
36	5	3878	C
36	5	3879	G
36	5	3880	G
36	5	3887	C

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Mol	Chain	Res	Type
36	5	3888	G
36	5	3889	G
36	5	3896	C
36	5	3897	G
36	5	3898	G
36	5	3901	A
36	5	3905	A
36	5	3906	A
36	5	3907	G
36	5	3915	U
36	5	3916	G
36	5	3917	A
36	5	3923	A
36	5	3938	G
36	5	3939	G
36	5	3940	U
36	5	3942	A
36	5	3947	A
36	5	3951	G
36	5	3954	A
36	5	3956	G
36	5	3957	U
36	5	3958	G
36	5	3964	U
36	5	3965	A
36	5	3966	A
36	5	3968	U
36	5	3969	G
36	5	3970	G
36	5	3972	A
36	5	3974	G
36	5	3975	C
36	5	4037	C
36	5	4038	C
36	5	4039	G
36	5	4046	A
36	5	4047	A
36	5	4049	U
36	5	4050	A
36	5	4053	A
36	5	4054	C
36	5	4055	U

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Mol	Chain	Res	Type
36	5	4063	U
36	5	4064	C
36	5	4065	G
36	5	4074	C
36	5	4076	G
36	5	4085	A
36	5	4086	G
36	5	4087	G
36	5	4095	G
36	5	4100	C
36	5	4101	C
36	5	4111	U
36	5	4112	C
36	5	4116	C
36	5	4119	C
36	5	4120	U
36	5	4122	G
36	5	4127	A
36	5	4133	C
36	5	4149	C
36	5	4150	G
36	5	4156	G
36	5	4159	C
36	5	4161	G
36	5	4162	C
36	5	4163	U
36	5	4170	A
36	5	4171	C
36	5	4172	A
36	5	4181	U
36	5	4183	G
36	5	4184	G
36	5	4191	G
36	5	4197	G
36	5	4201	G
36	5	4203	A
36	5	4212	A
36	5	4213	A
36	5	4214	A
36	5	4225	G
36	5	4229	U
36	5	4233	A

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Mol	Chain	Res	Type
36	5	4234	A
36	5	4237	C
36	5	4241	C
36	5	4243	C
36	5	4251	A
36	5	4254	G
36	5	4256	A
36	5	4260	U
36	5	4261	C
36	5	4266	G
36	5	4268	A
36	5	4271	A
36	5	4273	A
36	5	4281	A
36	5	4291	G
36	5	4297	G
36	5	4304	A
36	5	4305	G
36	5	4306	U
36	5	4312	U
36	5	4313	A
36	5	4314	C
36	5	4317	A
36	5	4319	C
36	5	4323	A
36	5	4326	G
36	5	4329	G
36	5	4330	G
36	5	4336	A
36	5	4338	G
36	5	4339	A
36	5	4348	A
36	5	4349	C
36	5	4350	C
36	5	4351	U
36	5	4353	U
36	5	4354	U
36	5	4373	G
36	5	4376	A
36	5	4377	G
36	5	4378	A
36	5	4379	A

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Mol	Chain	Res	Type
36	5	4387	C
36	5	4391	G
36	5	4393	G
36	5	4394	A
36	5	4395	U
36	5	4401	G
36	5	4419	U
36	5	4422	A
36	5	4424	A
36	5	4426	C
36	5	4427	G
36	5	4440	G
36	5	4444	C
36	5	4448	G
36	5	4449	A
36	5	4452	U
36	5	4453	C
36	5	4464	A
36	5	4471	U
36	5	4472	G
36	5	4475	G
36	5	4476	C
36	5	4482	U
36	5	4488	A
36	5	4500	U
36	5	4512	U
36	5	4513	A
36	5	4519	C
36	5	4524	G
36	5	4528	G
36	5	4530	U
36	5	4531	U
36	5	4535	A
36	5	4548	A
36	5	4549	G
36	5	4560	C
36	5	4567	G
36	5	4569	U
36	5	4570	G
36	5	4573	G
36	5	4575	G
36	5	4577	U

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Mol	Chain	Res	Type
36	5	4584	A
36	5	4585	U
36	5	4589	A
36	5	4590	A
36	5	4599	A
36	5	4627	U
36	5	4635	A
36	5	4636	U
36	5	4637	G
36	5	4648	A
36	5	4651	A
36	5	4652	G
36	5	4656	A
36	5	4657	U
36	5	4658	G
36	5	4670	C
36	5	4672	A
36	5	4677	U
36	5	4693	C
36	5	4695	C
36	5	4700	A
36	5	4709	U
36	5	4720	C
36	5	4728	U
36	5	4738	C
36	5	4745	G
36	5	4747	C
36	5	4750	G
36	5	4751	G
36	5	4752	U
36	5	4754	G
36	5	4755	G
36	5	4756	C
36	5	4757	C
36	5	4759	C
36	5	4761	G
36	5	4764	A
36	5	4765	G
36	5	4772	C
36	5	4773	C
36	5	4775	C
36	5	4860	G

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Mol	Chain	Res	Type
36	5	4861	G
36	5	4867	G
36	5	4870	G
36	5	4871	C
36	5	4874	A
36	5	4875	G
36	5	4876	A
36	5	4877	G
36	5	4881	U
36	5	4882	U
36	5	4883	C
36	5	4885	U
36	5	4895	C
36	5	4903	G
36	5	4906	C
36	5	4909	A
36	5	4910	A
36	5	4911	A
36	5	4912	G
36	5	4913	G
36	5	4914	G
36	5	4915	G
36	5	4920	C
36	5	4921	C
36	5	4922	C
36	5	4923	U
36	5	4925	U
36	5	4926	C
36	5	4929	C
36	5	4935	C
36	5	4937	C
36	5	4938	A
36	5	4940	C
36	5	4943	A
36	5	4944	C
36	5	4945	G
36	5	4947	U
36	5	4949	G
36	5	4951	G
36	5	4956	A
36	5	4958	C
36	5	4959	U

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Mol	Chain	Res	Type
36	5	4960	G
36	5	4961	G
36	5	4963	G
36	5	4964	C
36	5	4965	U
36	5	4966	A
36	5	4967	A
36	5	4976	U
36	5	4985	U
36	5	4988	U
36	5	4990	C
36	5	4991	U
36	5	4993	G
36	5	4998	G
36	5	5017	G
36	5	5031	G
36	5	5041	G
36	5	5047	C
36	5	5050	C
36	5	5053	U
36	5	5054	C
36	5	5055	G
36	5	5056	A
36	5	5058	A
36	5	5061	A
36	5	5062	G
37	7	13	A
37	7	25	G
37	7	38	U
37	7	42	A
37	7	53	U
37	7	54	A
37	7	64	G
37	7	97	G
37	7	100	A
37	7	110	G
37	7	111	C
38	8	2	G
38	8	3	A
38	8	23	C
38	8	32	C
38	8	34	U

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Mol	Chain	Res	Type
38	8	35	C
38	8	38	U
38	8	59	A
38	8	62	A
38	8	63	U
38	8	75	G
38	8	94	G
38	8	95	A
38	8	97	A
38	8	103	A
38	8	105	C
38	8	109	C
38	8	110	U
38	8	111	U
38	8	113	C
38	8	114	G
38	8	122	G
38	8	123	U
38	8	124	U
38	8	125	C
38	8	126	C
38	8	127	U
38	8	128	C
38	8	135	C
38	8	137	A
38	8	147	G
38	8	150	C
38	8	151	G
38	8	153	C

All (138) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	2	24	C
1	2	110	U
1	2	127	C
1	2	448	A
1	2	465	A
1	2	532	C
1	2	553	U
1	2	555	A
1	2	561	A

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Mol	Chain	Res	Type
1	2	627	U
1	2	670	A
1	2	688	U
1	2	752	G
1	2	869	A
1	2	870	A
1	2	874	G
1	2	886	A
1	2	908	A
1	2	1016	U
1	2	1115	U
1	2	1130	G
1	2	1137	U
1	2	1165	G
1	2	1312	G
1	2	1313	A
1	2	1377	U
1	2	1395	C
1	2	1441	U
1	2	1637	A
1	2	1664	A
1	2	1665	G
1	2	1685	U
1	2	1743	G
1	2	1744	G
1	2	1837	G
35	1	6456	U
35	1	6484	G
35	1	6493	G
35	1	6506	U
35	1	6515	U
35	1	6538	U
35	1	6543	U
35	1	6551	A
35	1	6589	C
35	1	6605	A
35	1	6609	A
36	5	12	A
36	5	47	A
36	5	48	G
36	5	125	C
36	5	170	C

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Mol	Chain	Res	Type
36	5	217	C
36	5	265	C
36	5	266	C
36	5	275	C
36	5	361	C
36	5	385	A
36	5	408	A
36	5	449	C
36	5	453	G
36	5	504	G
36	5	737	C
36	5	928	A
36	5	933	C
36	5	934	A
36	5	961	G
36	5	1071	C
36	5	1211	G
36	5	1236	C
36	5	1237	C
36	5	1276	C
36	5	1287	G
36	5	1370	G
36	5	1411	C
36	5	1445	U
36	5	1455	G
36	5	1477	C
36	5	1503	A
36	5	1533	A
36	5	1625	G
36	5	1633	G
36	5	1654	G
36	5	1676	C
36	5	1733	G
36	5	1740	C
36	5	1892	A
36	5	1957	U
36	5	1990	A
36	5	2046	G
36	5	2089	G
36	5	2259	G
36	5	2260	C
36	5	2428	A

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Mol	Chain	Res	Type
36	5	2468	U
36	5	2502	A
36	5	2505	C
36	5	2513	A
36	5	2529	A
36	5	2587	A
36	5	2661	U
36	5	2695	A
36	5	2739	C
36	5	2787	A
36	5	2794	C
36	5	2806	A
36	5	3603	G
36	5	3625	G
36	5	3784	A
36	5	3785	A
36	5	3876	A
36	5	3888	G
36	5	3904	G
36	5	3938	G
36	5	4054	C
36	5	4119	C
36	5	4155	C
36	5	4170	A
36	5	4180	G
36	5	4221	C
36	5	4232	U
36	5	4291	G
36	5	4380	A
36	5	4395	U
36	5	4448	G
36	5	4572	U
36	5	4626	A
36	5	4635	A
36	5	4699	U
36	5	4719	G
36	5	4753	U
36	5	4884	G
36	5	4909	A
36	5	4925	U
36	5	4936	G
37	7	109	U

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Mol	Chain	Res	Type
38	8	51	U
38	8	94	G
38	8	124	U

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
36	5	25

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	5	2113:G	O3'	2258:C	P	41.19
1	5	1252:C	O3'	1271:G	P	35.34
1	5	1219:G	O3'	1233:G	P	21.81
1	5	1405:C	O3'	1409:G	P	18.37
1	5	4138:C	O3'	4146:G	P	18.26
1	5	1696:C	O3'	1720:C	P	17.92
1	5	523:C	O3'	638:G	P	17.19
1	5	3977:C	O3'	4034:G	P	16.38
1	5	760:G	O3'	903:C	P	15.99

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Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	5	4101:C	O3'	4107:G	P	15.68
1	5	991:U	O3'	1064:G	P	15.35
1	5	4777:C	O3'	4859:C	P	14.27
1	5	5022:U	O3'	5028:G	P	13.88
1	5	1364:U	O3'	1368:A	P	13.60
1	5	2901:G	O3'	3597:G	P	12.71
1	5	1180:C	O3'	1183:C	P	10.07
1	5	512:U	O3'	515:C	P	9.73
1	5	182:G	O3'	189:G	P	8.37
1	5	4729:A	O3'	4735:G	P	7.75
1	5	500:G	O3'	504:G	P	6.89
1	5	4740:G	O3'	4743:G	P	5.83
1	5	1100:U	O3'	1168:G	P	4.95
1	5	1438:U	O3'	1440:U	P	4.68
1	5	1239:C	O3'	1244:G	P	3.65
1	5	4899:G	O3'	4902:C	P	3.46

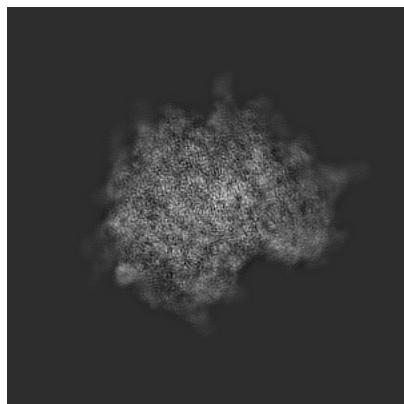
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20255. These allow visual inspection of the internal detail of the map and identification of artifacts.

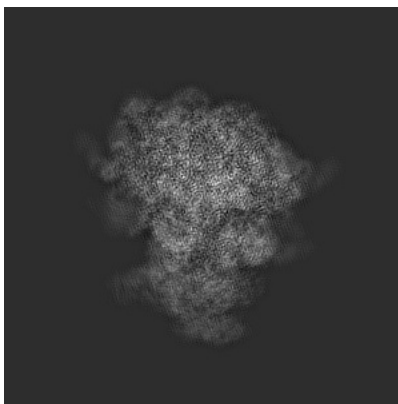
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

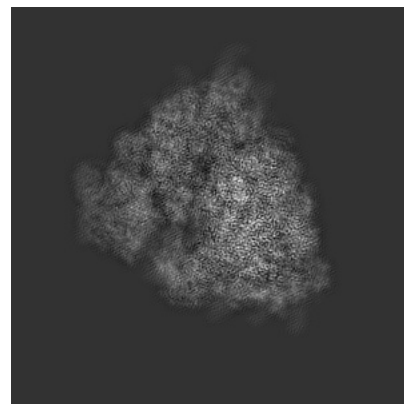
6.1.1 Primary map



X

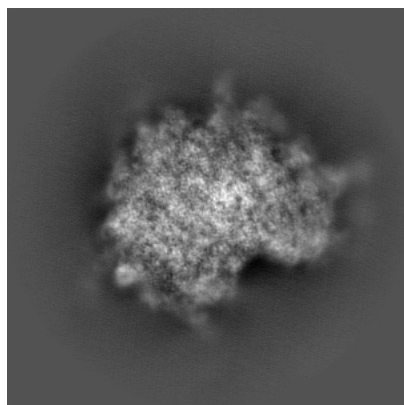


Y

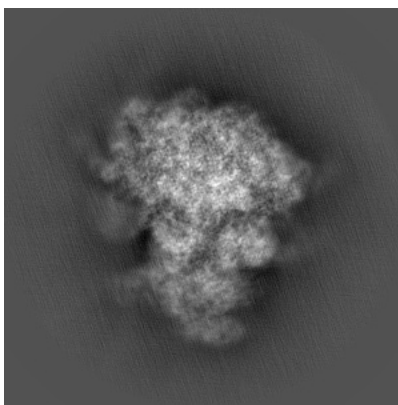


Z

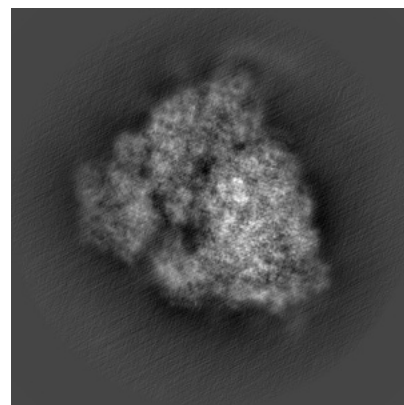
6.1.2 Raw map



X



Y

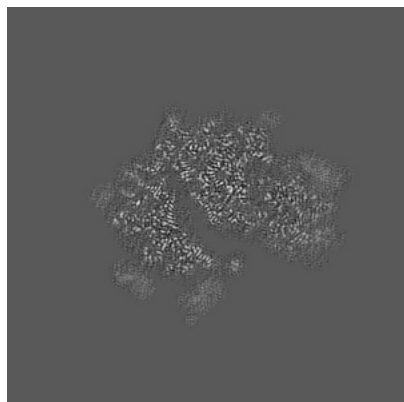


Z

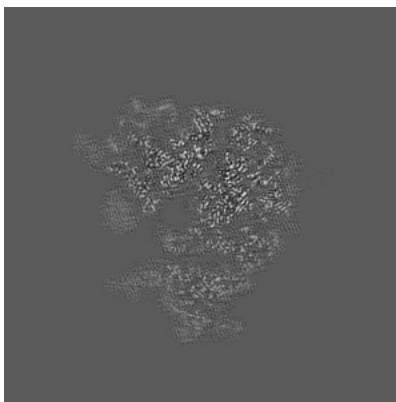
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

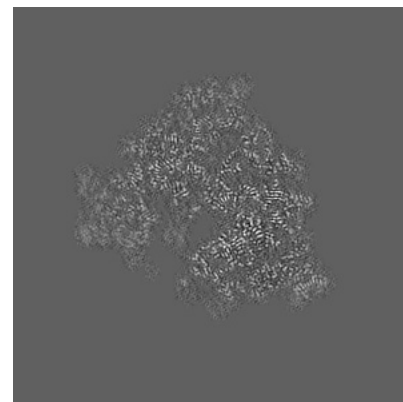
6.2.1 Primary map



X Index: 180

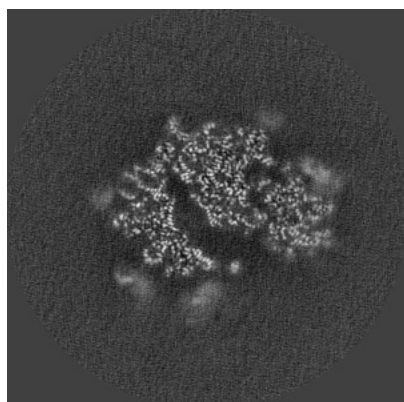


Y Index: 180

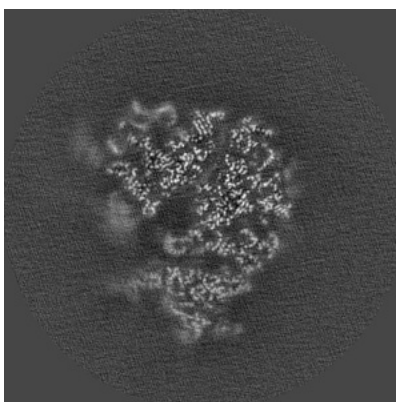


Z Index: 180

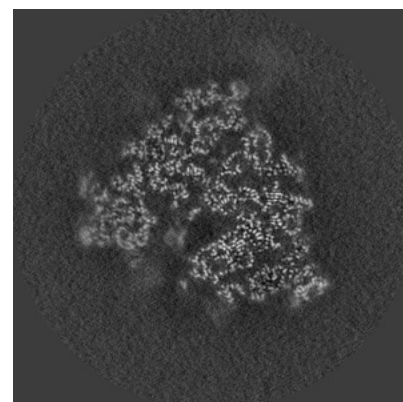
6.2.2 Raw map



X Index: 180



Y Index: 180

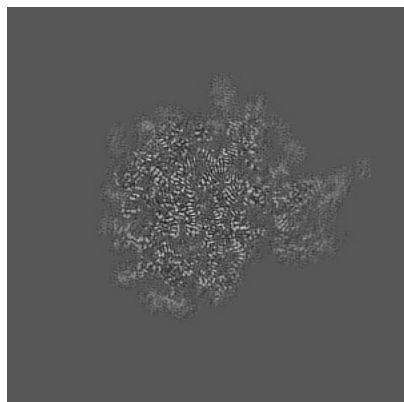


Z Index: 180

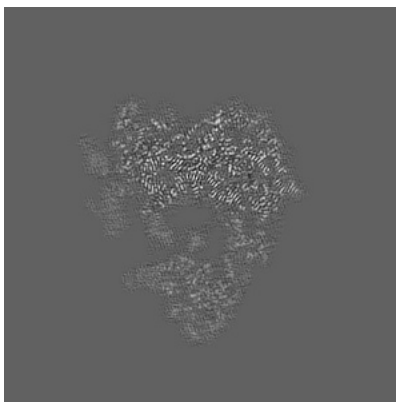
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

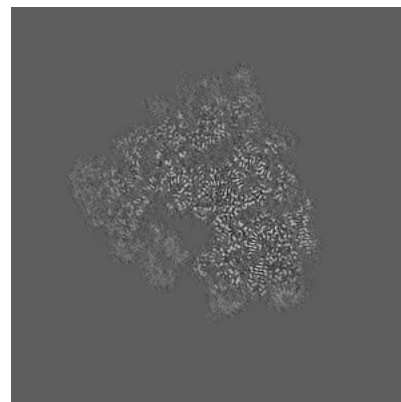
6.3.1 Primary map



X Index: 206

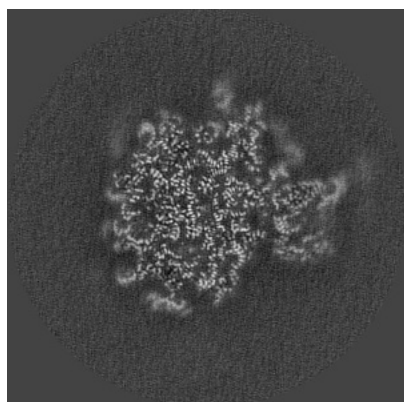


Y Index: 167

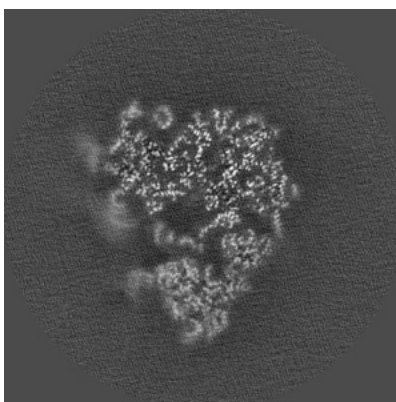


Z Index: 194

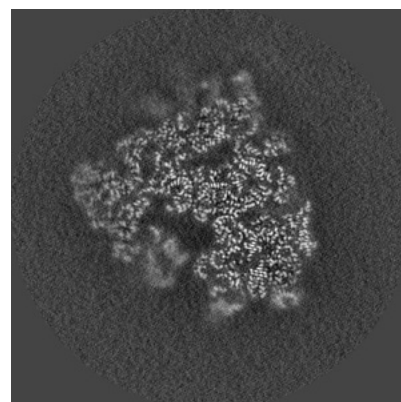
6.3.2 Raw map



X Index: 206



Y Index: 174

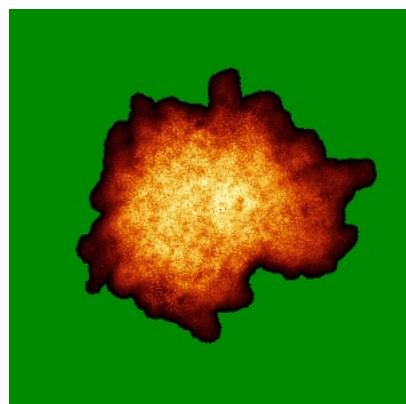


Z Index: 194

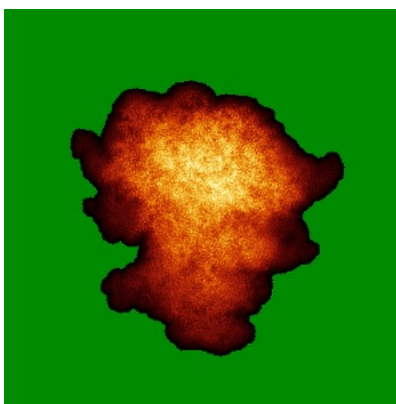
The images above show the largest variance slices of the map in three orthogonal directions.

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

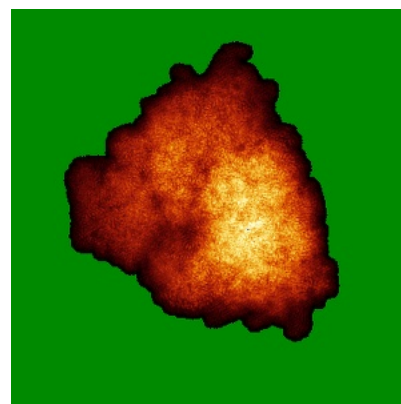
6.4.1 Primary map



X

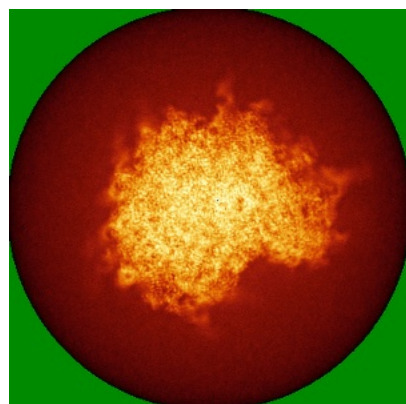


Y

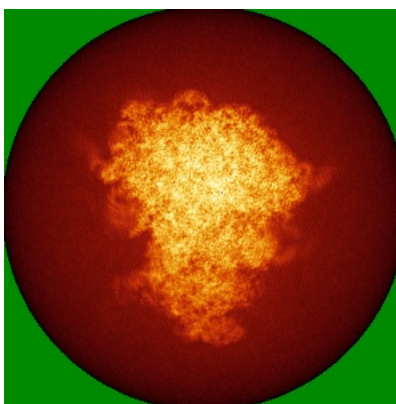


Z

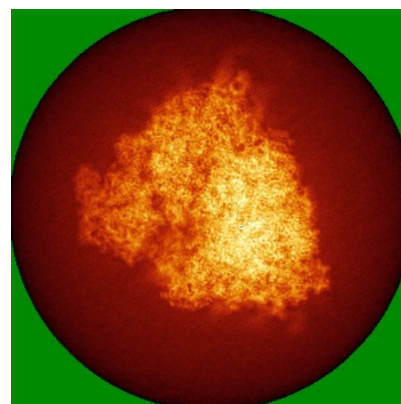
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.032. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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

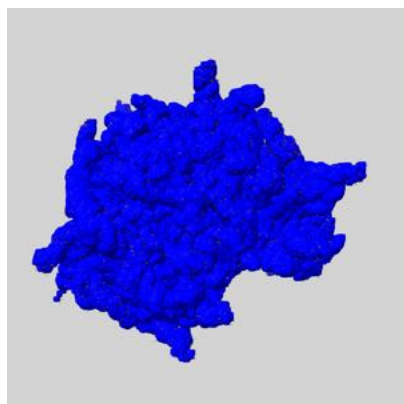
6.6 Mask visualisation [i](#)

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

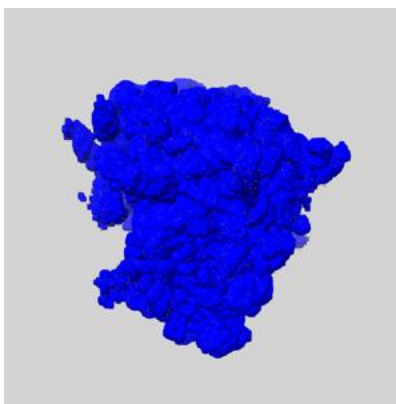
A mask typically either:

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

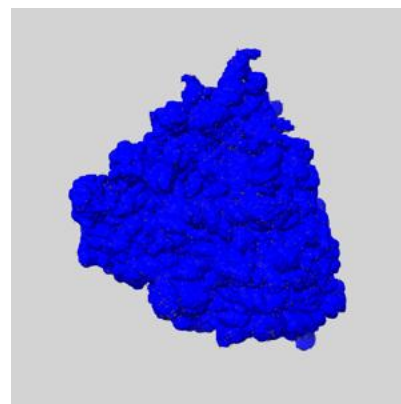
6.6.1 emd_20255_msk_1.map [i](#)



X



Y

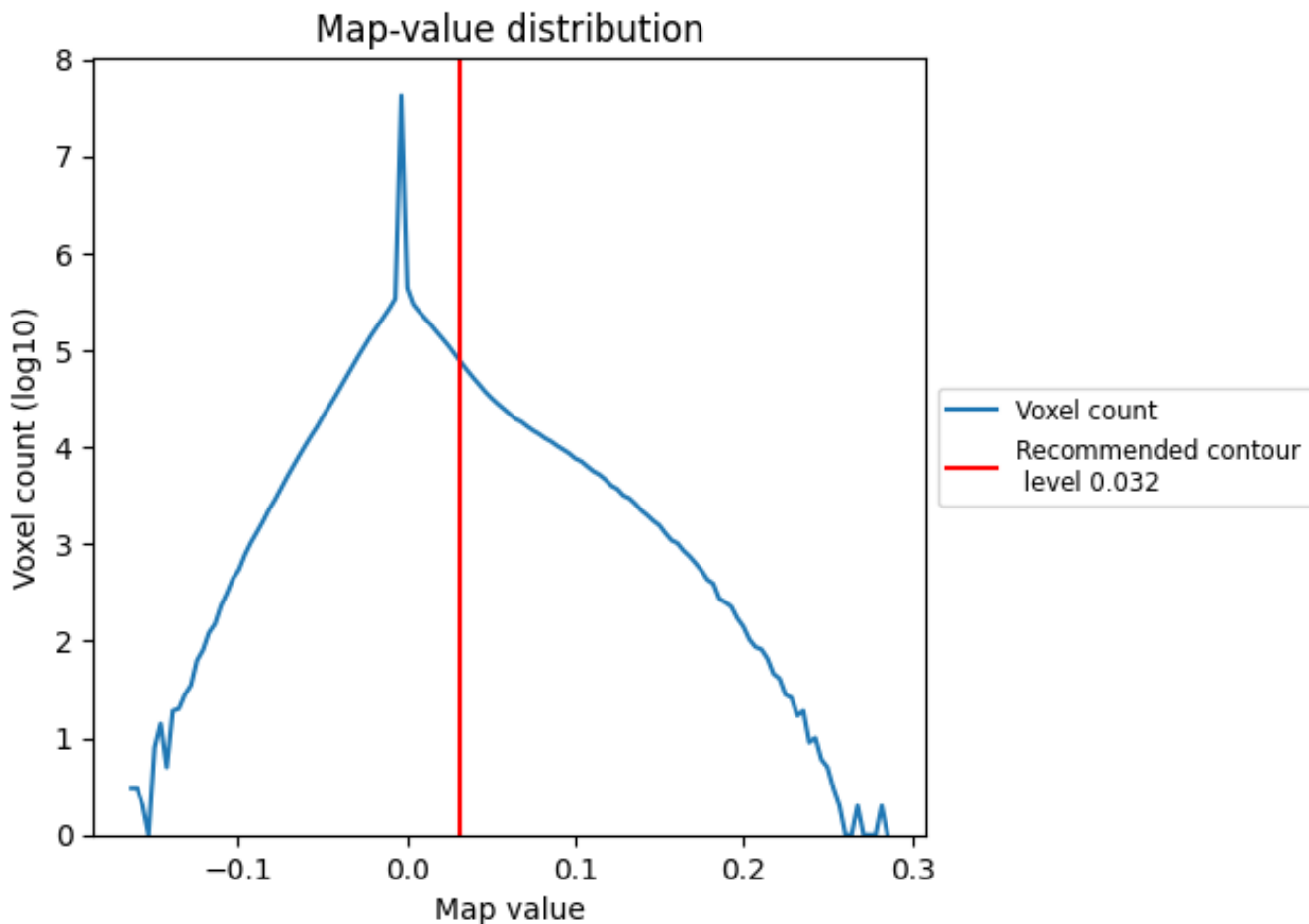


Z

7 Map analysis [i](#)

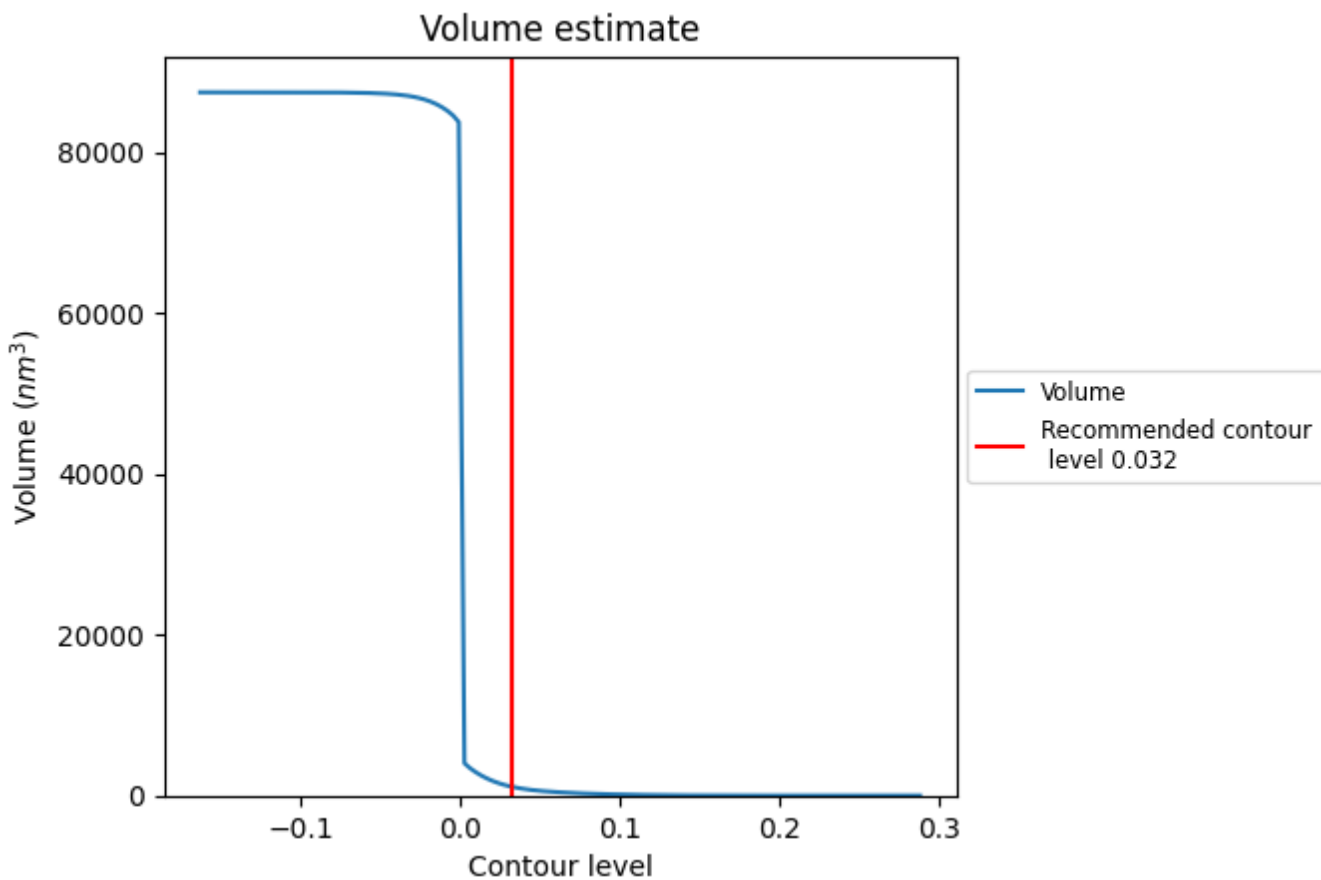
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

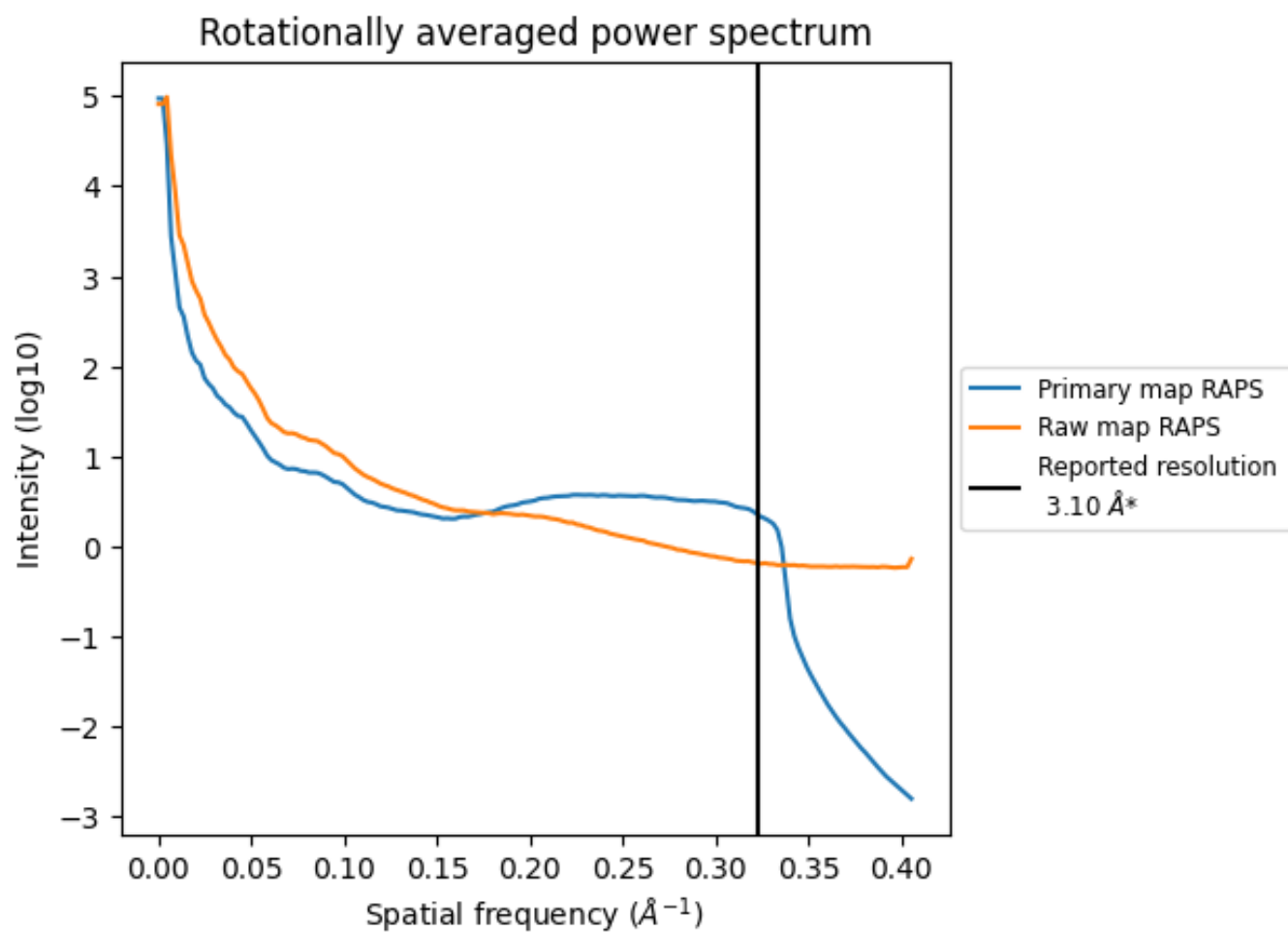
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1113 nm^3 ; this corresponds to an approximate mass of 1005 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

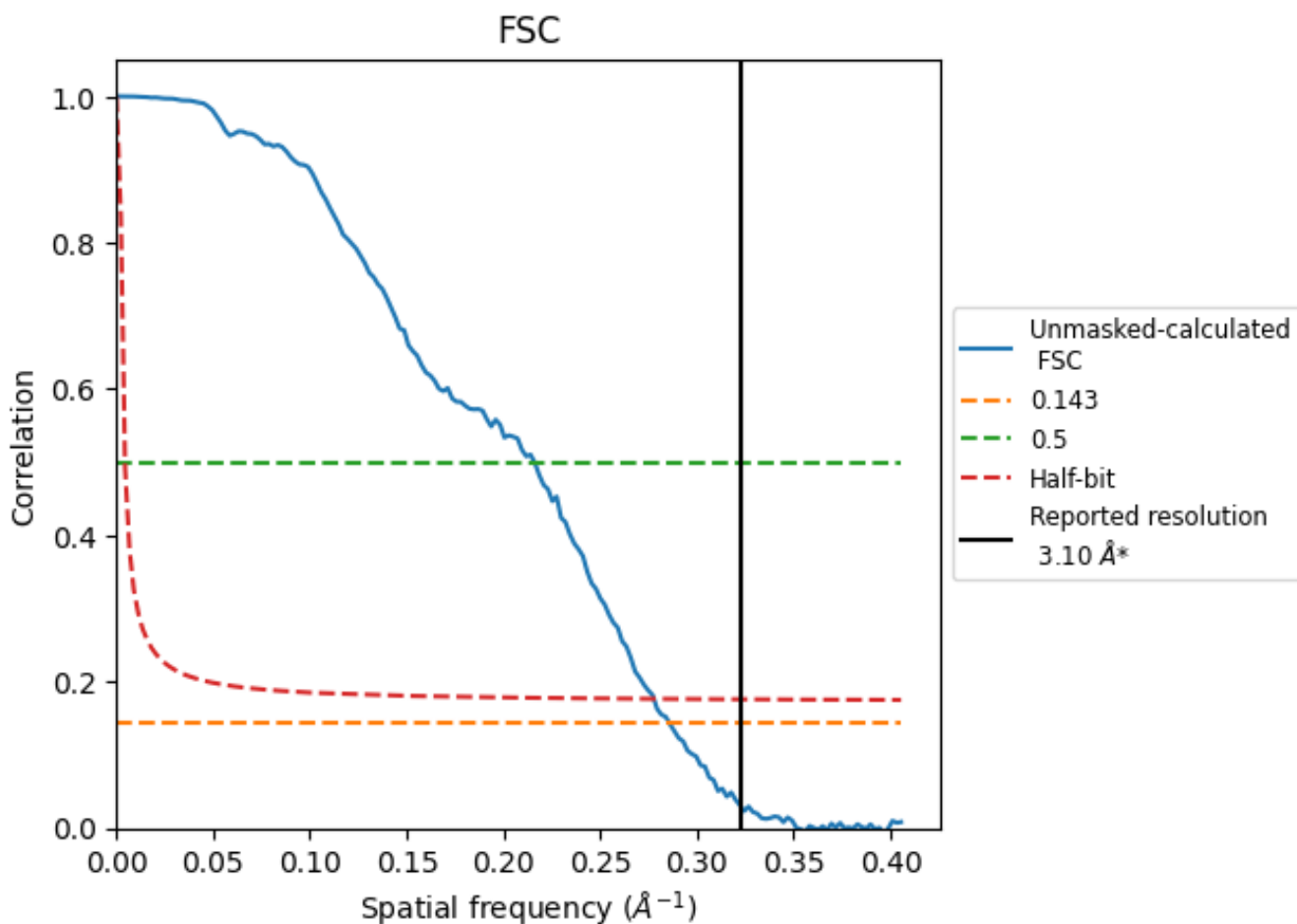


*Reported resolution corresponds to spatial frequency of 0.323 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.323 Å⁻¹

8.2 Resolution estimates [i](#)

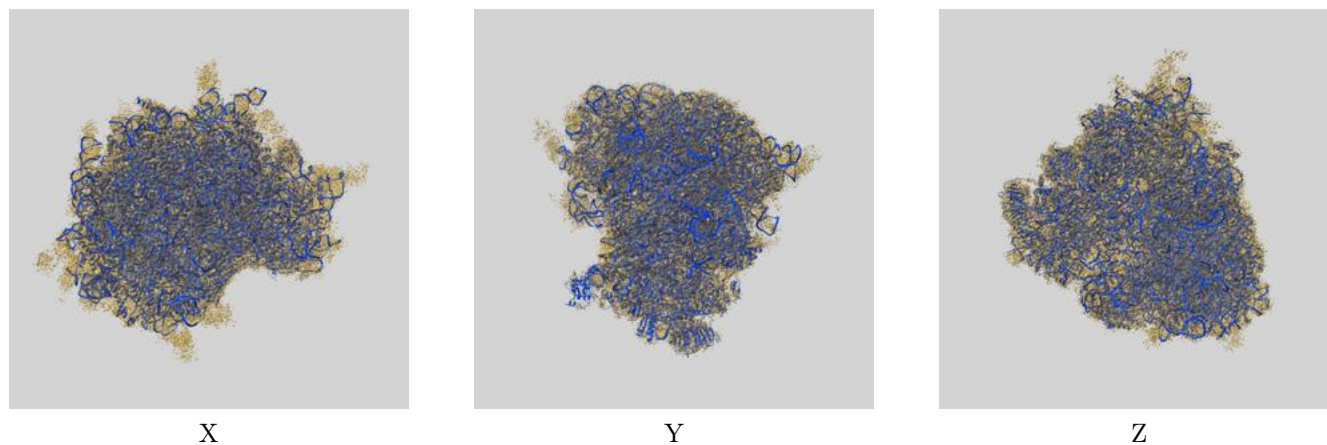
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.50	4.63	3.60

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.50 differs from the reported value 3.1 by more than 10 %

9 Map-model fit [i](#)

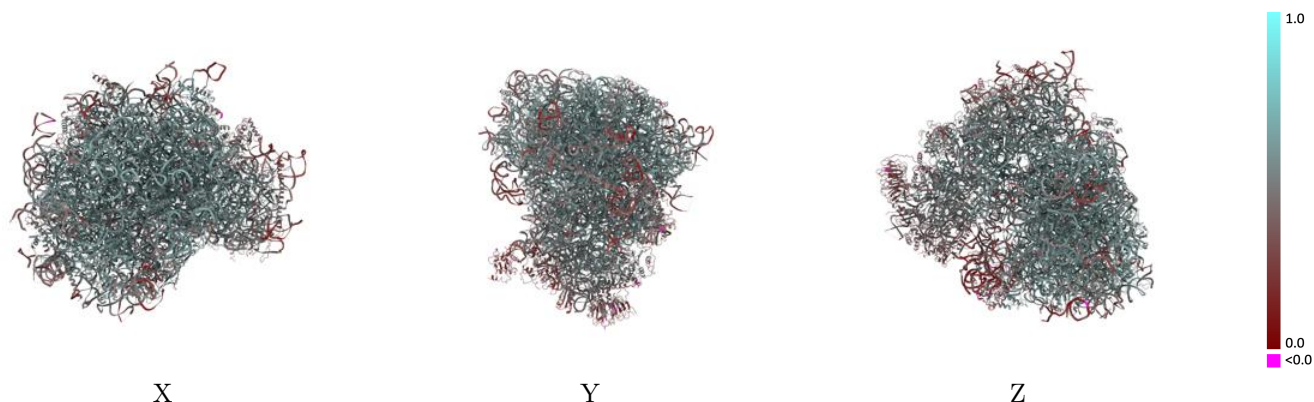
This section contains information regarding the fit between EMDB map EMD-20255 and PDB model 6P5I. Per-residue inclusion information can be found in section 3 on page 18.

9.1 Map-model overlay [i](#)



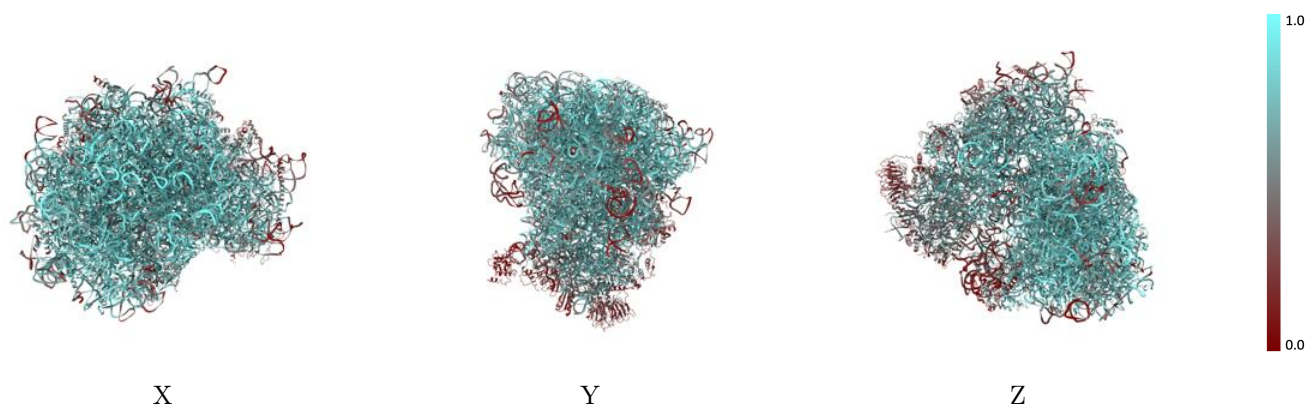
The images above show the 3D surface view of the map at the recommended contour level 0.032 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



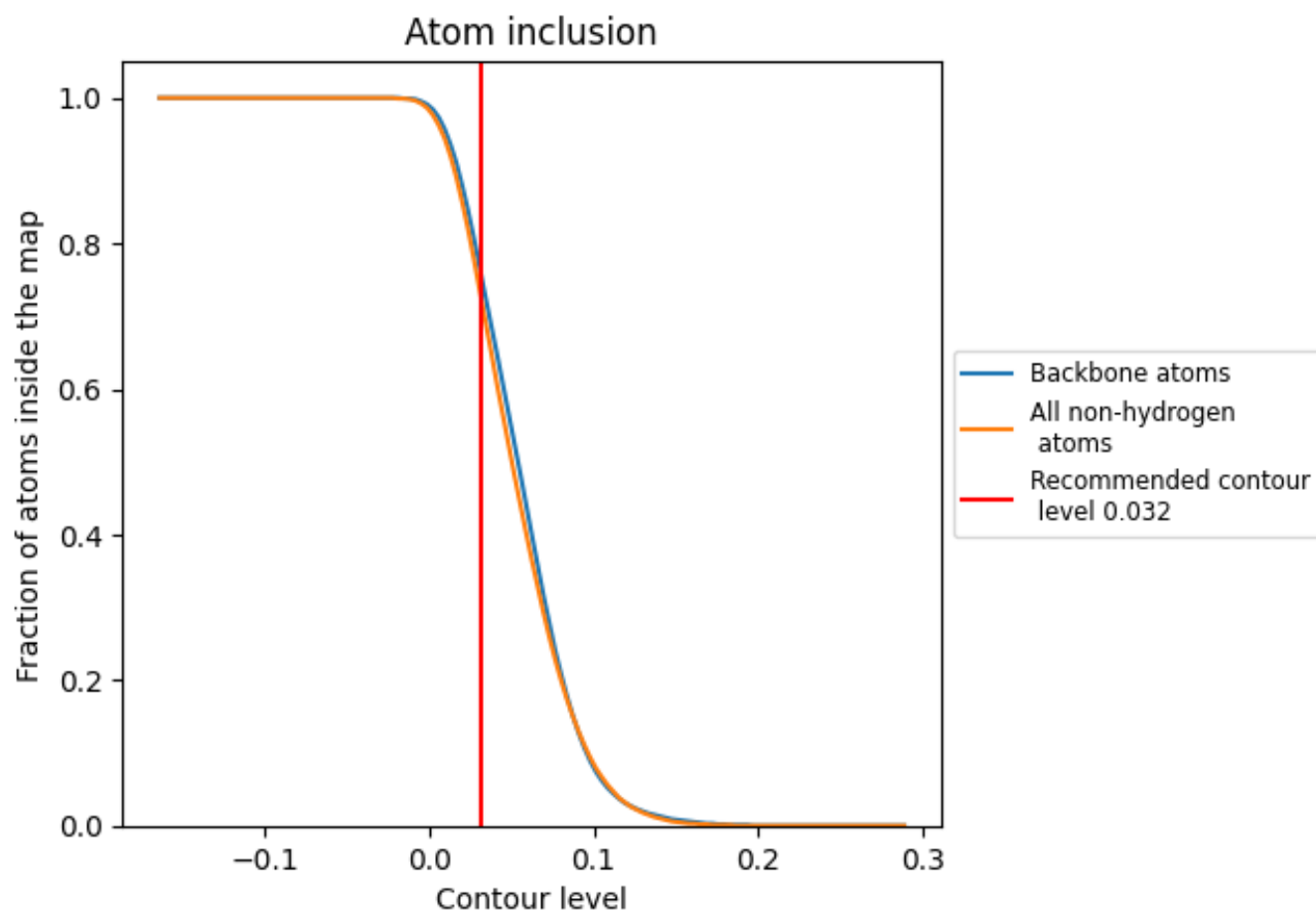
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.032).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 75% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.032) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7220	 0.5080
1	 0.3580	 0.3040
2	 0.7460	 0.5020
5	 0.8210	 0.5380
7	 0.9150	 0.5770
8	 0.8650	 0.5630
AA	 0.8030	 0.5750
AB	 0.7960	 0.5620
AC	 0.7950	 0.5520
AD	 0.7160	 0.5160
AE	 0.7300	 0.5190
AF	 0.8000	 0.5690
AG	 0.6800	 0.4990
AH	 0.7260	 0.5270
AI	 0.7620	 0.5500
AJ	 0.5530	 0.4670
AK	 0.0780	 0.2230
AL	 0.7430	 0.5270
AM	 0.7690	 0.5430
AN	 0.8420	 0.5810
AO	 0.7920	 0.5620
AP	 0.7980	 0.5670
AQ	 0.7810	 0.5540
AR	 0.6940	 0.5200
AS	 0.8080	 0.5650
AT	 0.7310	 0.5390
AU	 0.6020	 0.4610
AV	 0.7930	 0.5700
AW	 0.7210	 0.5530
AX	 0.7340	 0.5400
AY	 0.7720	 0.5540
AZ	 0.7320	 0.5180
Aa	 0.8410	 0.5800
Ab	 0.6380	 0.4940
Ac	 0.6950	 0.5280













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Chain	Atom inclusion	Q-score
Ad	0.7110	0.5310
Ae	0.8060	0.5760
Af	0.8370	0.5840
Ag	0.7380	0.5530
Ah	0.7200	0.5380
Ai	0.6810	0.5110
Aj	0.8190	0.5670
Ak	0.6370	0.4890
Al	0.7660	0.5590
Am	0.7520	0.5450
An	0.7250	0.5210
Ao	0.7030	0.5340
Ap	0.7310	0.5540
Ar	0.7990	0.5600
B	0.5940	0.4660
C	0.6350	0.4920
D	0.6560	0.5100
E	0.3980	0.3930
F	0.6210	0.4750
G	0.5060	0.4330
H	0.4630	0.4150
I	0.4460	0.4070
J	0.6430	0.4890
K	0.6260	0.4890
L	0.2670	0.3410
M	0.7230	0.5370
N	0.0550	0.2240
O	0.6680	0.5070
P	0.6510	0.5130
Q	0.2790	0.2930
R	0.4690	0.4380
S	0.4050	0.4050
T	0.3350	0.3520
U	0.3890	0.3820
V	0.3090	0.3640
W	0.5710	0.4680
X	0.7100	0.5270
Y	0.7180	0.5290
Z	0.5540	0.4510
a	0.3210	0.3490
b	0.7130	0.5300
c	0.5620	0.4750

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Chain	Atom inclusion	Q-score
d	 0.4530	 0.4200
e	 0.5310	 0.4440
f	 0.5090	 0.4330
g	 0.0430	 0.2010
h	 0.2450	 0.3190