



Full wwPDB EM Validation Report ⓘ

Jul 7, 2024 – 10:53 pm BST

PDB ID : 7OYB
EMDB ID : EMD-13112
Title : Cryo-EM structure of the 6 hpf zebrafish embryo 80S ribosome
Authors : Leesch, F.; Lorenzo-Orts, L.; Grishkovskaya, I.; Kandolf, S.; Belacic, K.; Meinhart, A.; Haselbach, D.; Pauli, A.
Deposited on : 2021-06-24
Resolution : 2.40 Å(reported)

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

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

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:

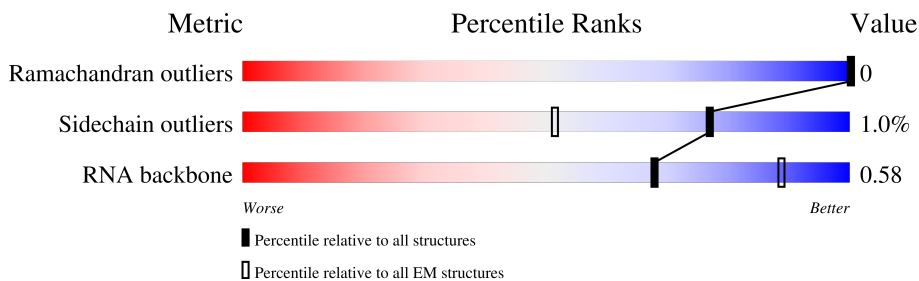
EMDB validation analysis : 0.0.1.dev92
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

1 Overall quality at a glance

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

The reported resolution of this entry is 2.40 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	22	1939	
2	51	4269	
3	71	120	
4	81	158	
5	A1	257	
6	A2	308	
7	B1	403	
8	B2	267	


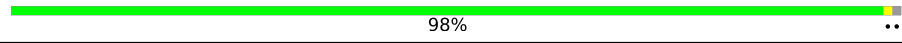


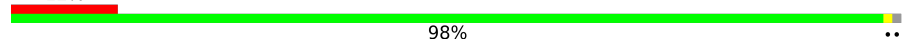
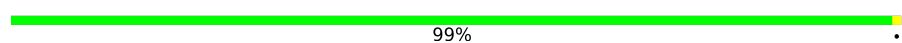

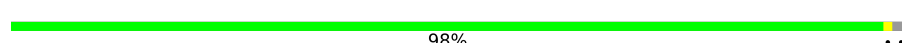
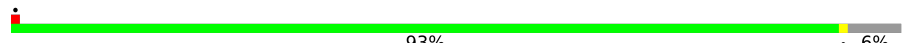


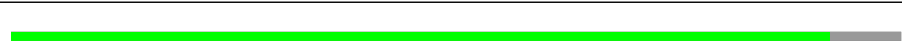



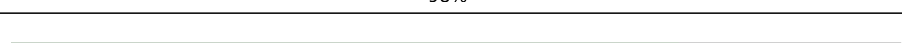
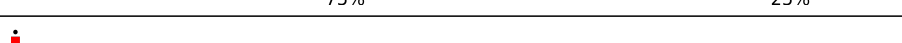
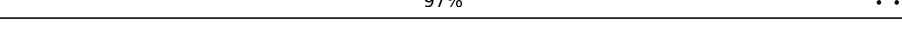

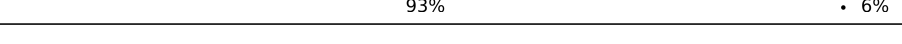
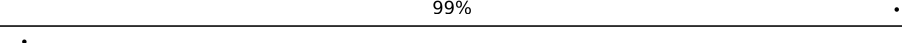
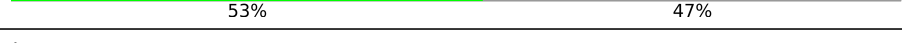
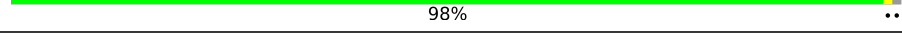


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Mol	Chain	Length	Quality of chain
9	C1	375	93% 7%
10	C2	280	74% 24%
11	D1	296	96%
12	D2	245	6% 90% 10%
13	E1	265	77% 22%
14	E2	263	98%
15	F1	246	89% 10%
16	F2	204	90% 10%
17	G1	266	77% 22%
18	G2	249	92% 8%
19	H1	192	99%
20	H2	194	10% 95%
21	I1	215	98%
22	I2	208	9% 96%
23	J1	178	93% 6%
24	J2	194	93% 7%
25	K2	166	55% 44%
26	L1	211	92% 7%
27	L2	159	5% 82% 16%
28	M1	139	96%
29	N1	204	98%
30	N2	151	99%
31	O1	205	100%
32	O2	151	82% 17%
33	P1	184	82% 17%




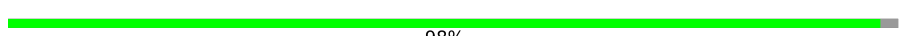




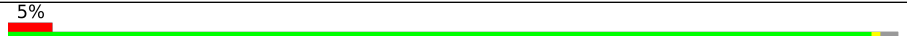

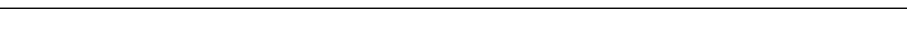
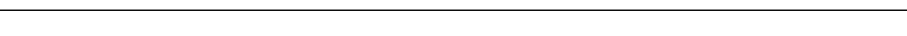
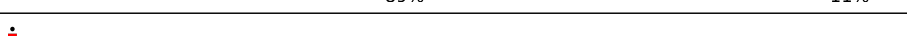
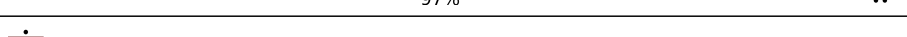
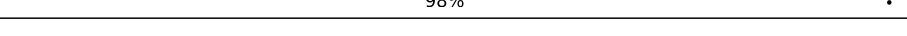
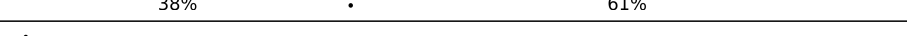
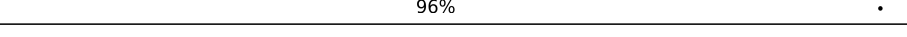
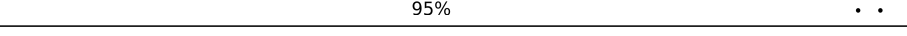
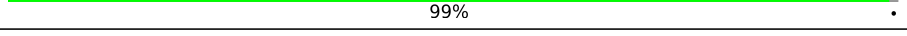
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Mol	Chain	Length	Quality of chain
34	P2	145	 79% 20%
35	Q1	182	 98%
36	Q2	146	 90% 8%
37	R1	196	 84% 15%
38	R2	134	 12% 98%
39	S1	176	 99%
40	S2	152	 89% 11%
41	T1	160	 98%
42	T2	146	 93% 6%
43	U1	141	 67% 31%
44	U2	119	 82% 18%
45	V1	140	 92% 8%
46	V2	81	 99%
47	W1	157	 38% 62%
48	W2	130	 98%
49	X1	155	 75% 25%
50	X2	143	 97%
51	Y1	145	 83% 16%
52	Y2	132	 5% 93% 6%
53	Z1	136	 99%
54	Z2	124	 53% 47%
55	a1	148	 98%
56	a2	115	 84% 15%
57	b1	64	 75% 23%
58	b2	84	 96%

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Mol	Chain	Length	Quality of chain
59	c1	117	 78% 21%
60	c2	69	 6% 87% 12%
61	d1	123	 86% 13%
62	d2	56	 98%
63	e1	135	 93% 7%
64	e2	133	 37% 62%
65	f1	110	 97%
66	g1	117	 88% 11%
67	g2	317	 5% 97%
68	h1	123	 96%
69	i1	105	 92% 7%
70	j1	97	 89% 11%
71	k1	70	 97%
72	l1	50	 98%
73	m1	128	 38% 61%
74	n1	25	 96%
75	o1	106	 95%
76	p1	92	 99%
77	r1	138	 85% 14%

2 Entry composition [i](#)

There are 79 unique types of molecules in this entry. The entry contains 194863 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	22	1502	32102	14330	5809	10462	1501	0	0

- Molecule 2 is a RNA chain called 28S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	51	3263	69917	31143	12776	22736	3262	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	71	120	2563	1145	465	834	119	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	81	150	3199	1427	574	1048	150	0	0

- Molecule 5 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	A1	245	1879	1181	381	310	7	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	A2	210	1665	1061	290	305	9	0	0

- Molecule 7 is a protein called Ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	B1	394	3181	2021	600	544	16	0	0

- Molecule 8 is a protein called 40S ribosomal protein S3a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	B2	213	1730	1097	310	309	14	0	0

- Molecule 9 is a protein called Ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	C1	348	2774	1741	551	464	18	0	0

- Molecule 10 is a protein called 40S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	C2	213	1651	1069	283	290	9	0	0

- Molecule 11 is a protein called Ribosomal protein L5b.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	D1	288	2337	1482	429	415	11	0	0

- Molecule 12 is a protein called DNA-(apurinic or apyrimidinic site) lyase.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	D2	221	1713	1091	309	306	7	0	0

- Molecule 13 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	E1	206	1671	1065	327	272	7	0	0

- Molecule 14 is a protein called 40S ribosomal protein S4, X isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	E2	261	Total	C	N	O	S	0	0
			2070	1320	385	357	8		

- Molecule 15 is a protein called Ribosomal protein L7.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	F1	222	Total	C	N	O	S	0	0
			1811	1160	346	298	7		

- Molecule 16 is a protein called Ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	F2	183	Total	C	N	O	S	0	0
			1442	904	268	264	6		

- Molecule 17 is a protein called 60S ribosomal protein L7a.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	G1	207	Total	C	N	O	S	0	0
			1683	1076	322	281	4		

- Molecule 18 is a protein called 40S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	G2	230	Total	C	N	O	S	0	0
			1864	1163	375	319	7		

- Molecule 19 is a protein called 60S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	H1	190	Total	C	N	O	S	0	0
			1505	949	279	271	6		

- Molecule 20 is a protein called 40S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	H2	186	Total	C	N	O	S	0	0
			1492	952	276	264			

- Molecule 21 is a protein called 60S ribosomal protein L10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	I1	211	1699	1076	329	279	15	0	0

- Molecule 22 is a protein called 40S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	I2	206	1666	1047	329	285	5	0	0

- Molecule 23 is a protein called 60S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	J1	167	1348	854	254	235	5	0	0

- Molecule 24 is a protein called 40S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	J2	180	1492	952	295	243	2	0	0

- Molecule 25 is a protein called Ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	K2	93	769	507	131	127	4	0	0

- Molecule 26 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	L1	197	1603	1003	335	260	5	0	0

- Molecule 27 is a protein called 40S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	L2	133	1086	686	211	183	6	0	0

- Molecule 28 is a protein called 60S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	M1	134	Total	C	N	O	S	0	0
			1094	702	207	180	5		

- Molecule 29 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	N1	202	Total	C	N	O	S	0	0
			1689	1065	352	267	5		

- Molecule 30 is a protein called 40S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
30	N2	149	Total	C	N	O	S	0	0
			1200	767	230	202	1		

- Molecule 31 is a protein called 60S ribosomal protein L13a.

Mol	Chain	Residues	Atoms					AltConf	Trace
31	O1	204	Total	C	N	O	S	0	0
			1662	1073	318	266	5		

- Molecule 32 is a protein called Ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	O2	126	Total	C	N	O	S	0	0
			943	579	186	172	6		

- Molecule 33 is a protein called 60S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	P1	152	Total	C	N	O	S	0	0
			1235	770	243	213	9		

- Molecule 34 is a protein called 40S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	P2	116	Total	C	N	O	S	0	0
			957	608	177	165	7		

- Molecule 35 is a protein called Ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	Q1	180	1459	917	302	236	4	0	0

- Molecule 36 is a protein called Ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Q2	134	1052	671	196	182	3	0	0

- Molecule 37 is a protein called 60S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	R1	166	1381	856	300	215	10	0	0

- Molecule 38 is a protein called 40S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	R2	132	1068	670	199	195	4	0	0

- Molecule 39 is a protein called 60S ribosomal protein L18a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	S1	176	1457	934	284	230	9	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
40	S2	136	1129	708	228	192	1	0	0

- Molecule 41 is a protein called 60S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	T1	157	1283	816	250	213	4	0	0

- Molecule 42 is a protein called 40S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	T2	137	Total	C	N	O	S	0	0
			1058	667	202	185	4		

- Molecule 43 is a protein called Ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	U1	97	Total	C	N	O	S	0	0
			792	508	138	144	2		

- Molecule 44 is a protein called 40S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
44	U2	97	Total	C	N	O	S	0	0
			754	473	139	138	4		

- Molecule 45 is a protein called 60S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	V1	129	Total	C	N	O	S	0	0
			970	613	182	170	5		

- Molecule 46 is a protein called 40S ribosomal protein S21.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	V2	81	Total	C	N	O	S	0	0
			623	384	116	119	4		

- Molecule 47 is a protein called 60S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	W1	60	Total	C	N	O	S	0	0
			503	323	98	80	2		

- Molecule 48 is a protein called 40S ribosomal protein S15a.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	W2	129	Total	C	N	O	S	0	0
			1034	659	193	176	6		

- Molecule 49 is a protein called Ribosomal protein L23a.

Mol	Chain	Residues	Atoms					AltConf	Trace
49	X1	117	Total	C	N	O	S	0	0
			959	614	179	165	1		

- Molecule 50 is a protein called 40S ribosomal protein S23.

Mol	Chain	Residues	Atoms					AltConf	Trace
50	X2	139	Total	C	N	O	S	0	0
			1083	684	215	181	3		

- Molecule 51 is a protein called ATPase H⁺ transporting V0 subunit e1.

Mol	Chain	Residues	Atoms					AltConf	Trace
51	Y1	122	Total	C	N	O	S	0	0
			1024	643	209	169	3		

- Molecule 52 is a protein called 40S ribosomal protein S24.

Mol	Chain	Residues	Atoms					AltConf	Trace
52	Y2	124	Total	C	N	O	S	0	0
			1011	643	193	170	5		

- Molecule 53 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
53	Z1	135	Total	C	N	O	S	0	0
			1105	714	208	179	4		

- Molecule 54 is a protein called 40S ribosomal protein S25.

Mol	Chain	Residues	Atoms				AltConf	Trace
54	Z2	66	Total	C	N	O	0	0
			529	343	95	91		

- Molecule 55 is a protein called 60S ribosomal protein L27a.

Mol	Chain	Residues	Atoms					AltConf	Trace
55	a1	147	Total	C	N	O	S	0	0
			1164	740	233	188	3		

- Molecule 56 is a protein called 40S ribosomal protein S26.

Mol	Chain	Residues	Atoms					AltConf	Trace
56	a2	98	Total	C	N	O	S	0	0
			782	486	161	130	5		

- Molecule 57 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
57	b1	49	Total	C	N	O	S	0	0
			419	259	92	67	1		

- Molecule 58 is a protein called 40S ribosomal protein S27.

Mol	Chain	Residues	Atoms					AltConf	Trace
58	b2	81	Total	C	N	O	S	0	0
			636	398	120	111	7		

- Molecule 59 is a protein called 60S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
59	c1	93	Total	C	N	O	S	0	0
			721	457	127	131	6		

- Molecule 60 is a protein called 40S ribosomal protein S28.

Mol	Chain	Residues	Atoms					AltConf	Trace
60	c2	61	Total	C	N	O	S	0	0
			475	288	94	91	2		

- Molecule 61 is a protein called 60S ribosomal protein L31.

Mol	Chain	Residues	Atoms					AltConf	Trace
61	d1	107	Total	C	N	O	S	0	0
			888	558	172	156	2		

- Molecule 62 is a protein called 40S ribosomal protein S29.

Mol	Chain	Residues	Atoms					AltConf	Trace
62	d2	55	Total	C	N	O	S	0	0
			459	285	94	75	5		

- Molecule 63 is a protein called Ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
63	e1	125	1030	649	212	163	6	0	0

- Molecule 64 is a protein called 40S ribosomal protein S30.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
64	e2	50	399	244	88	67	0	0

- Molecule 65 is a protein called 60S ribosomal protein L35a.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
65	f1	107	861	550	171	137	3	0	0

- Molecule 66 is a protein called 60S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
66	g1	104	833	519	172	136	6	0	0

- Molecule 67 is a protein called Guanine nucleotide-binding protein subunit beta-2-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
67	g2	310	2394	1507	418	457	12	0	0

- Molecule 68 is a protein called 60S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
68	h1	120	991	627	197	165	2	0	0

- Molecule 69 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
69	i1	98	801	502	170	125	4	0	0

- Molecule 70 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
70	j1	86	Total	C	N	O	S	0	0
			701	430	155	110	6		

- Molecule 71 is a protein called 60S ribosomal protein L38.

Mol	Chain	Residues	Atoms					AltConf	Trace
71	k1	69	Total	C	N	O	S	0	0
			569	366	103	99	1		

- Molecule 72 is a protein called Ribosomal protein L39.

Mol	Chain	Residues	Atoms					AltConf	Trace
72	l1	49	Total	C	N	O	S	0	0
			434	275	97	61	1		

- Molecule 73 is a protein called 60S ribosomal protein L40.

Mol	Chain	Residues	Atoms					AltConf	Trace
73	m1	50	Total	C	N	O	S	0	0
			413	256	87	64	6		

- Molecule 74 is a protein called Rpl41.

Mol	Chain	Residues	Atoms					AltConf	Trace
74	n1	24	Total	C	N	O	S	0	0
			231	140	63	26	2		

- Molecule 75 is a protein called 60S ribosomal protein L36a.

Mol	Chain	Residues	Atoms					AltConf	Trace
75	o1	102	Total	C	N	O	S	0	0
			840	526	172	136	6		

- Molecule 76 is a protein called Zgc:171772.

Mol	Chain	Residues	Atoms					AltConf	Trace
76	p1	91	Total	C	N	O	S	0	0
			703	444	132	120	7		

- Molecule 77 is a protein called 60S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
77	r1	118	943	589	193	159	2	0	0

- Molecule 78 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
78	51	189	Total 189	Mg 189	0
78	71	3	Total 3	Mg 3	0
78	81	4	Total 4	Mg 4	0
78	A1	2	Total 2	Mg 2	0
78	B1	1	Total 1	Mg 1	0
78	V1	1	Total 1	Mg 1	0
78	b1	1	Total 1	Mg 1	0
78	e1	1	Total 1	Mg 1	0
78	m1	1	Total 1	Mg 1	0

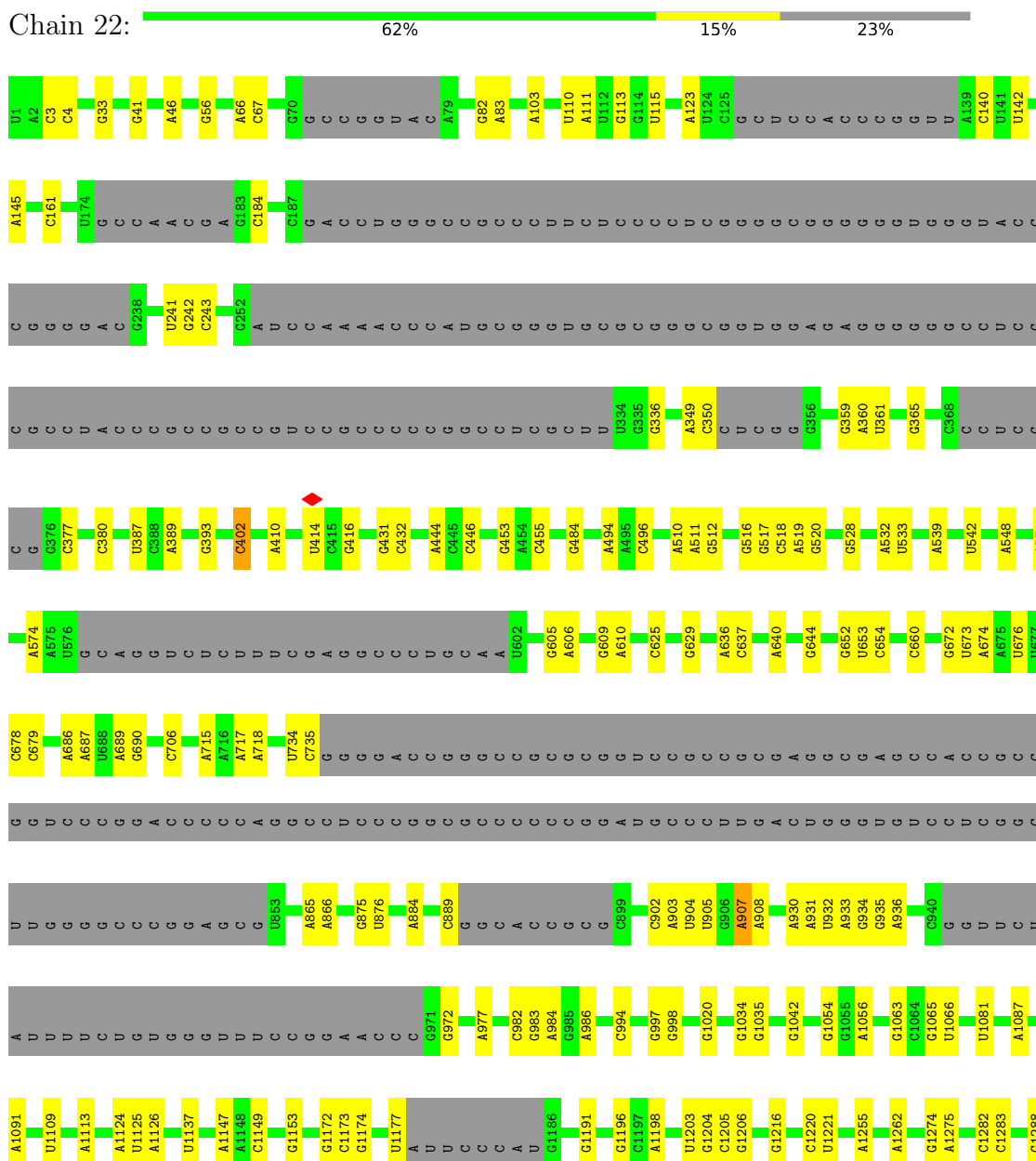
- Molecule 79 is ZINC ION (three-letter code: ZN) (formula: Zn).

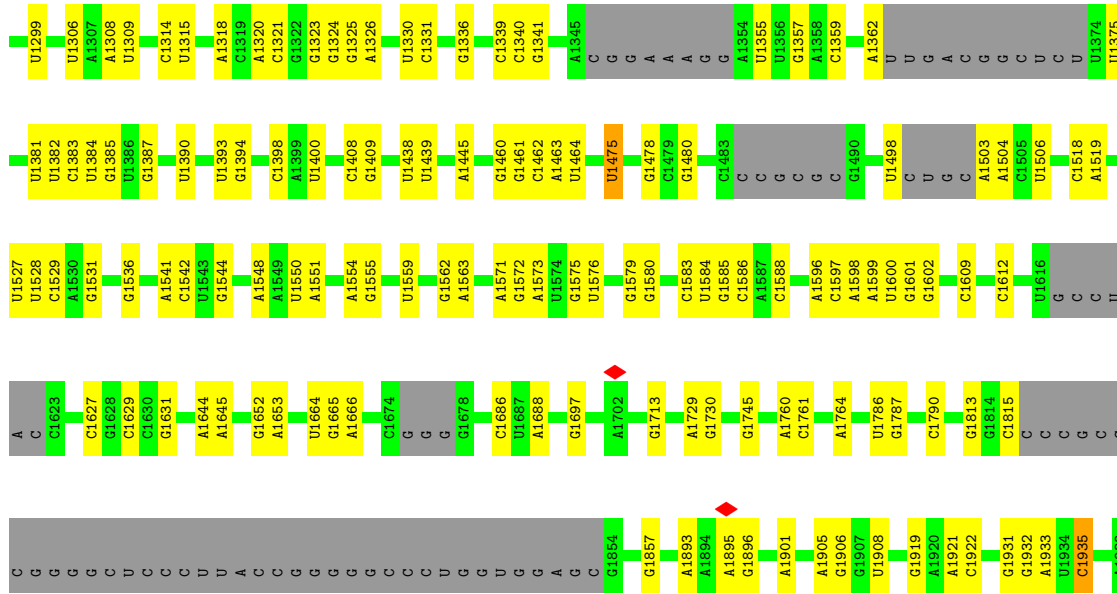
Mol	Chain	Residues	Atoms		AltConf
79	a2	1	Total 1	Zn 1	0
79	d2	1	Total 1	Zn 1	0
79	g1	1	Total 1	Zn 1	0
79	j1	1	Total 1	Zn 1	0
79	m1	1	Total 1	Zn 1	0
79	o1	1	Total 1	Zn 1	0
79	p1	1	Total 1	Zn 1	0

3 Residue-property plots [i](#)

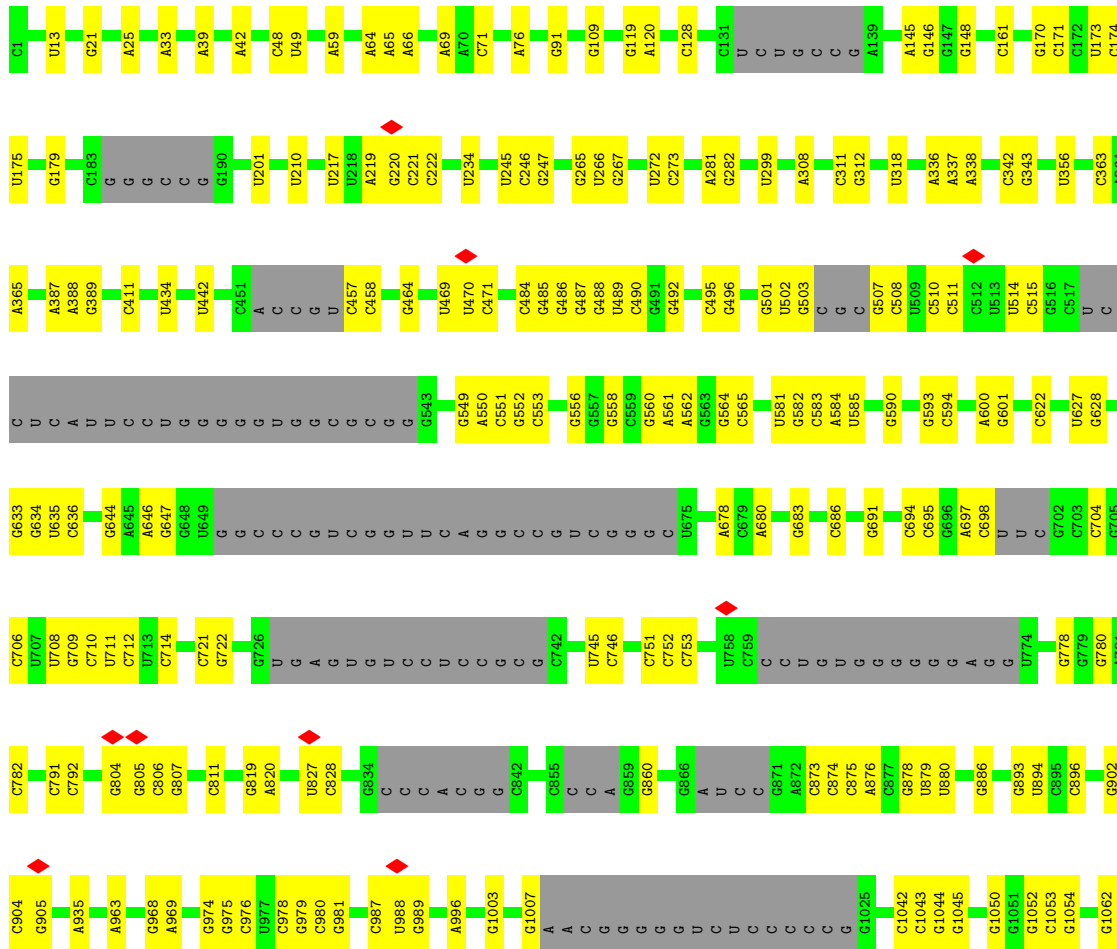
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

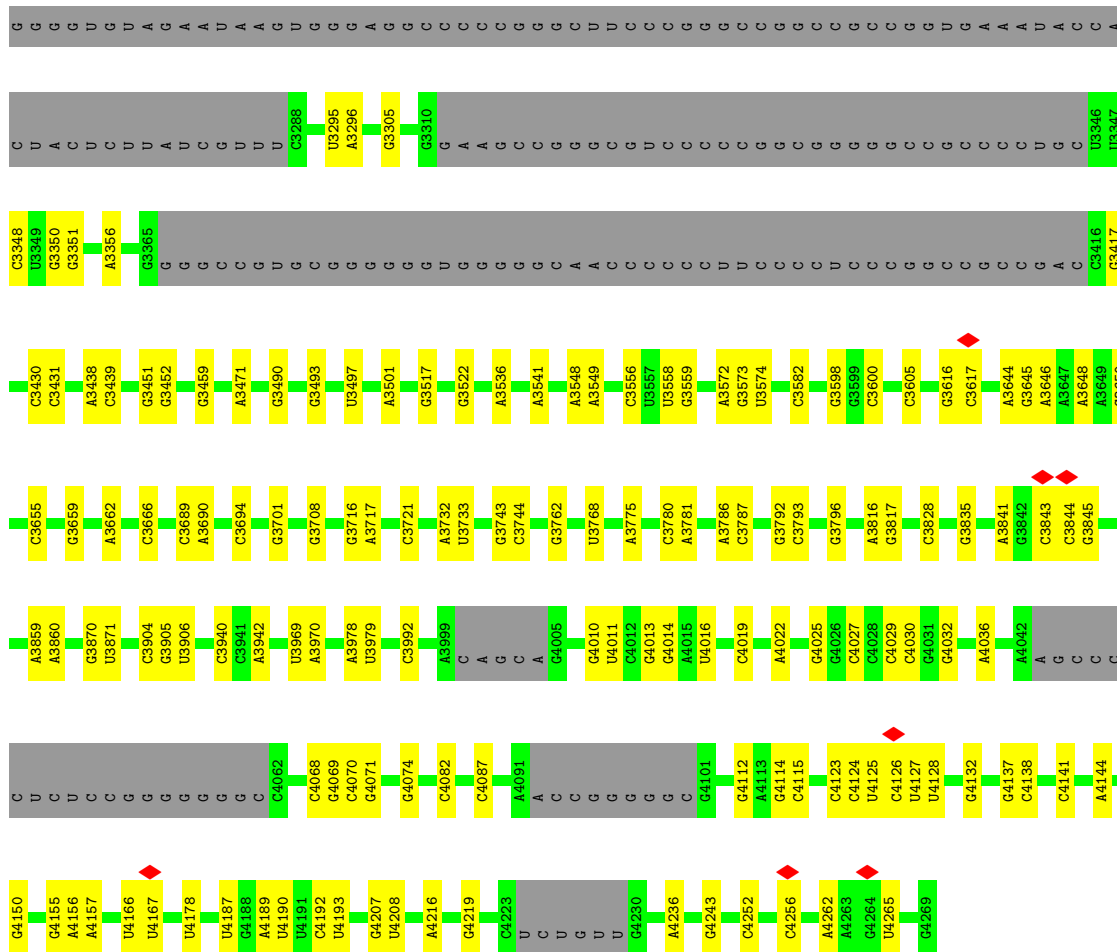
• Molecule 1: 18S rRNA



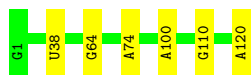


• Molecule 2: 28S rRNA

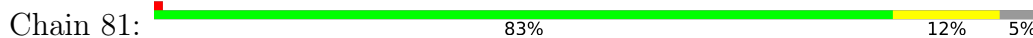




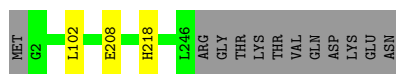
• Molecule 3: 5S rRNA



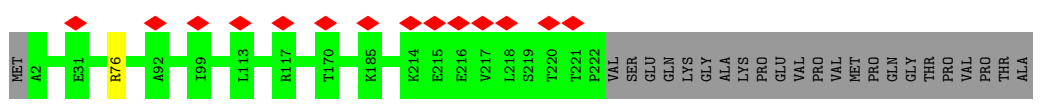
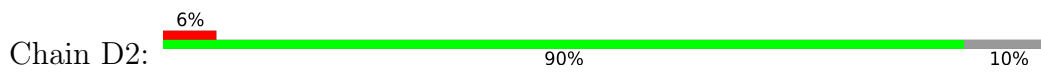
• Molecule 4: 5.8S rRNA



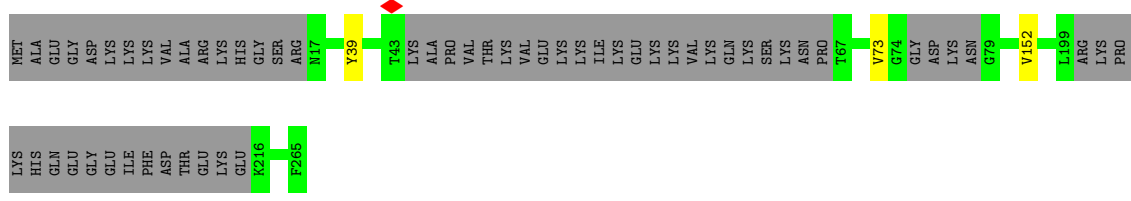
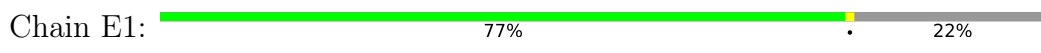
• Molecule 5: 60S ribosomal protein L8



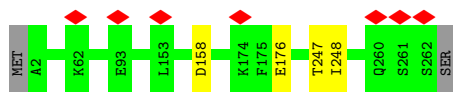
• Molecule 6: 40S ribosomal protein SA



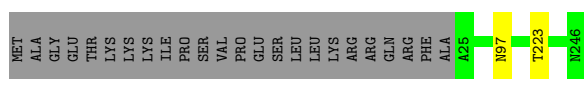
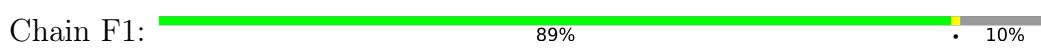
• Molecule 13: 60S ribosomal protein L6



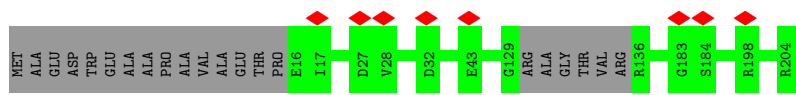
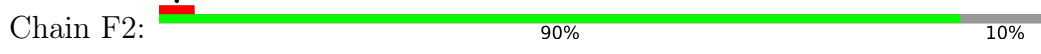
• Molecule 14: 40S ribosomal protein S4, X isoform



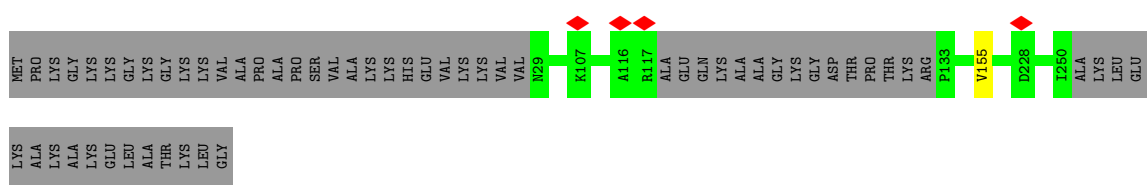
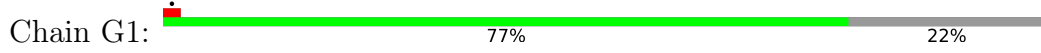
• Molecule 15: Ribosomal protein L7



• Molecule 16: Ribosomal protein S5

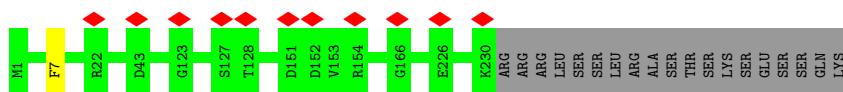


• Molecule 17: 60S ribosomal protein L7a



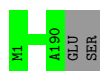
• Molecule 18: 40S ribosomal protein S6

Chain G2:  92% 8%



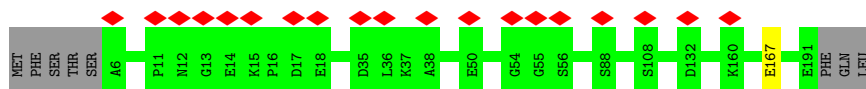
- Molecule 19: 60S ribosomal protein L9

Chain H1:  99%



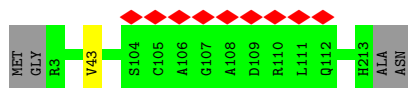
- Molecule 20: 40S ribosomal protein S7

Chain H2:  10% 95%



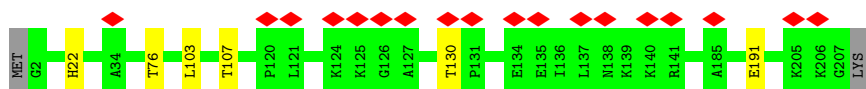
- Molecule 21: 60S ribosomal protein L10

Chain I1:  98%



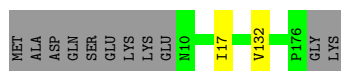
- Molecule 22: 40S ribosomal protein S8

Chain I2:  9% 96%



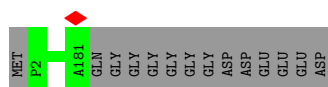
- Molecule 23: 60S ribosomal protein L11

Chain J1:  93% 6%



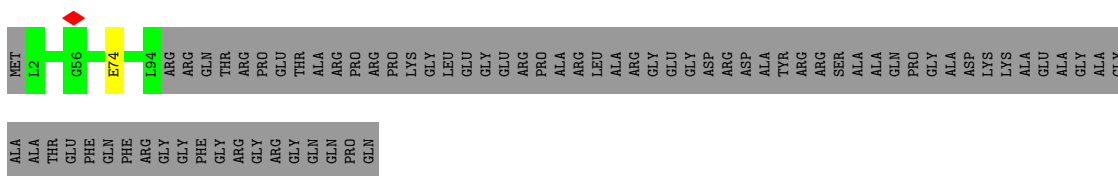
- Molecule 24: 40S ribosomal protein S9

Chain J2:  93% 7%



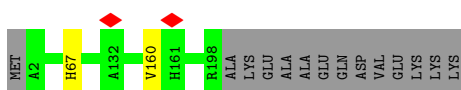
- Molecule 25: Ribosomal protein S10

Chain K2:  55% 44%




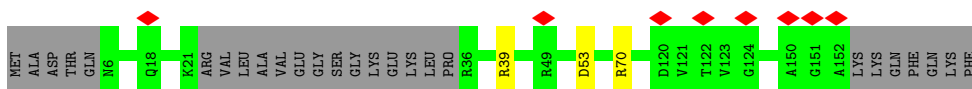
- Molecule 26: 60S ribosomal protein L13

Chain L1:  92% 7%



- Molecule 27: 40S ribosomal protein S11

Chain L2:  5% 82% 16%



- Molecule 28: 60S ribosomal protein L14

Chain M1:  96%



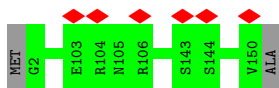
- Molecule 29: Ribosomal protein L15

Chain N1:  98%



- Molecule 30: 40S ribosomal protein S13

Chain N2:  99%

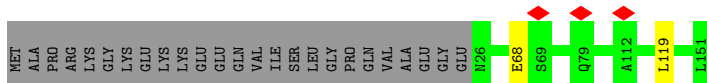
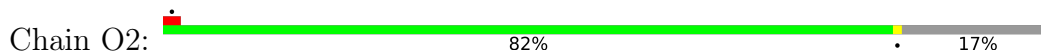


- Molecule 31: 60S ribosomal protein L13a

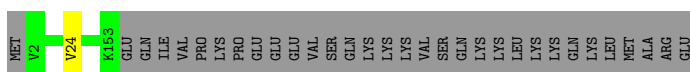
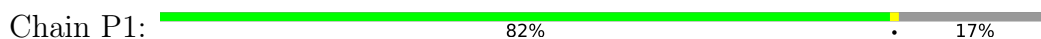
Chain O1:  100%



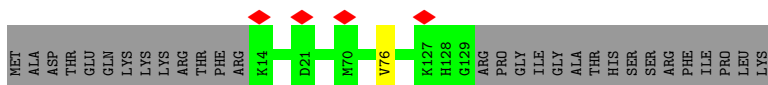
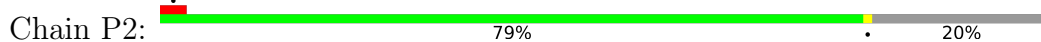
- Molecule 32: Ribosomal protein S14



- Molecule 33: 60S ribosomal protein L17



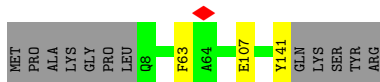
- Molecule 34: 40S ribosomal protein S15



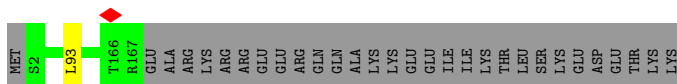
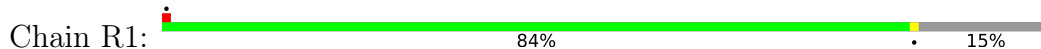
- Molecule 35: Ribosomal protein L18



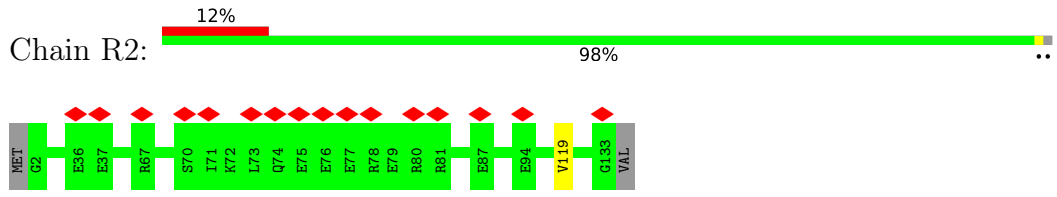
- Molecule 36: Ribosomal protein S16



- Molecule 37: 60S ribosomal protein L19



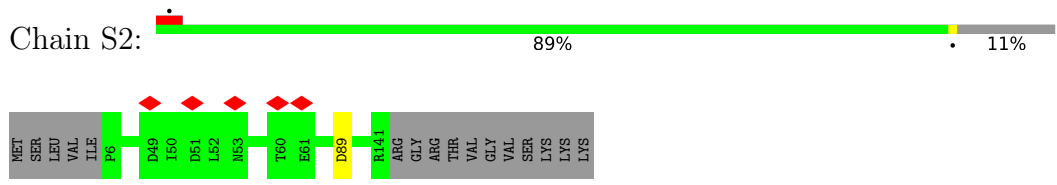
- Molecule 38: 40S ribosomal protein S17



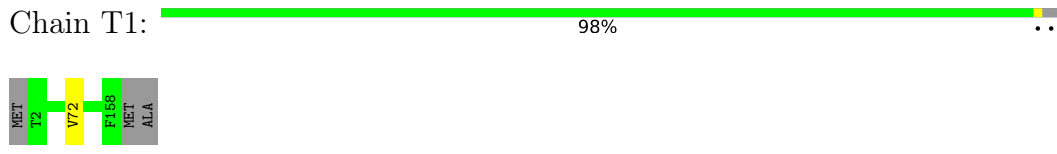
• Molecule 39: 60S ribosomal protein L18a



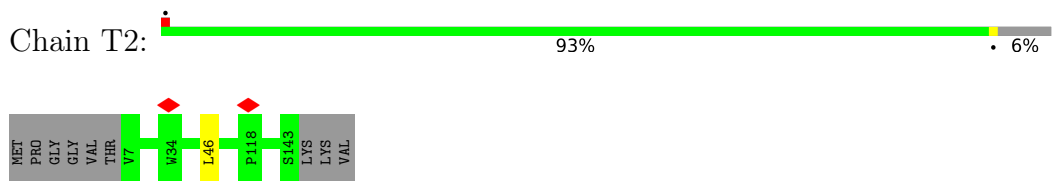
• Molecule 40: 40S ribosomal protein S18



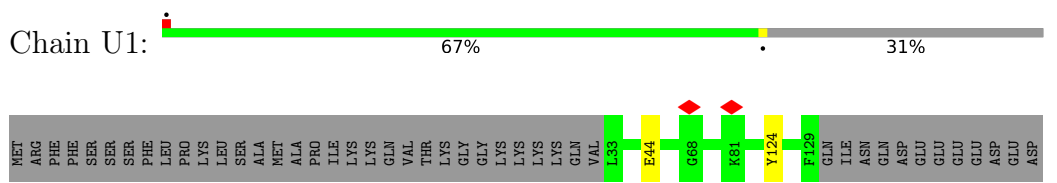
• Molecule 41: 60S ribosomal protein L21



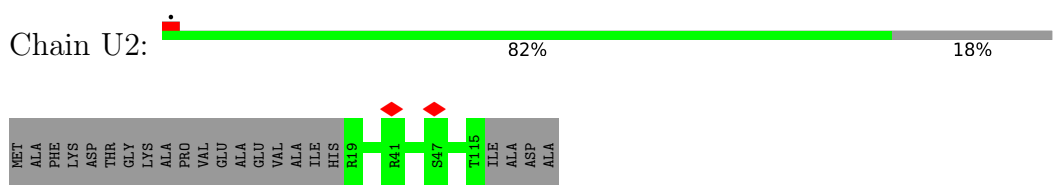
• Molecule 42: 40S ribosomal protein S19



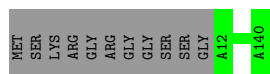
• Molecule 43: Ribosomal protein L22



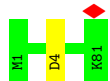
• Molecule 44: 40S ribosomal protein S20



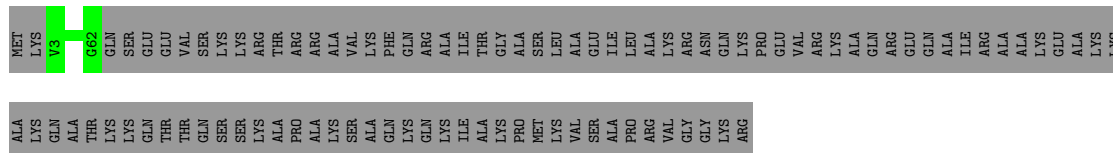
- Molecule 45: 60S ribosomal protein L23



- Molecule 46: 40S ribosomal protein S21



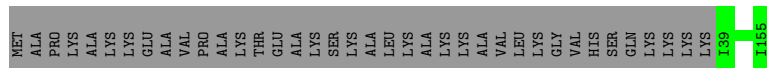
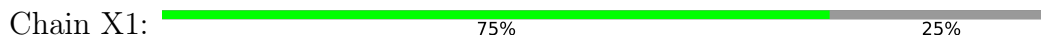
- Molecule 47: 60S ribosomal protein L24



- Molecule 48: 40S ribosomal protein S15a



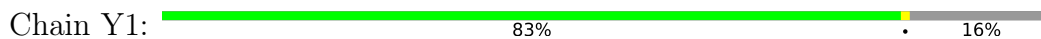
- Molecule 49: Ribosomal protein L23a

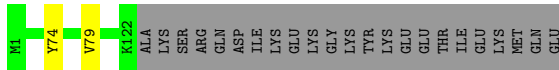


- Molecule 50: 40S ribosomal protein S23

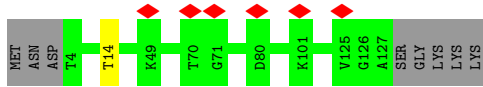


- Molecule 51: ATPase H⁺ transporting V0 subunit e1

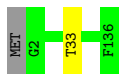




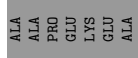
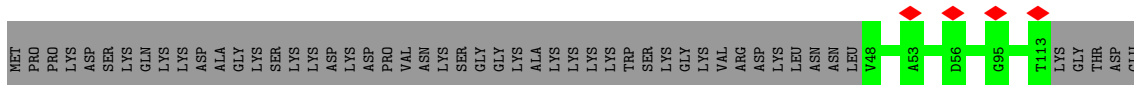
- Molecule 52: 40S ribosomal protein S24



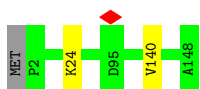
- Molecule 53: 60S ribosomal protein L27



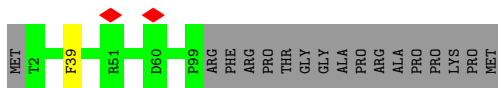
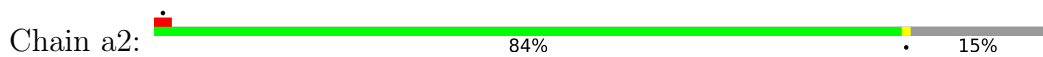
- Molecule 54: 40S ribosomal protein S25



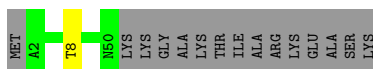
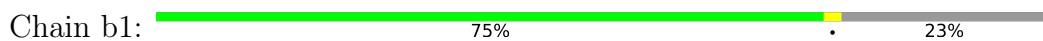
- Molecule 55: 60S ribosomal protein L27a



- Molecule 56: 40S ribosomal protein S26

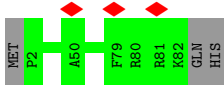


- Molecule 57: 60S ribosomal protein L29




- Molecule 58: 40S ribosomal protein S27

Chain b2:  96%




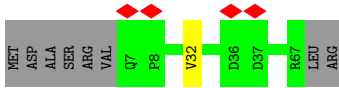
- Molecule 59: 60S ribosomal protein L30

Chain c1:  78%




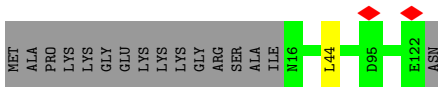
- Molecule 60: 40S ribosomal protein S28

Chain c2:  87%



- Molecule 61: 60S ribosomal protein L31

Chain d1:  86%



- Molecule 62: 40S ribosomal protein S29

Chain d2:  98%



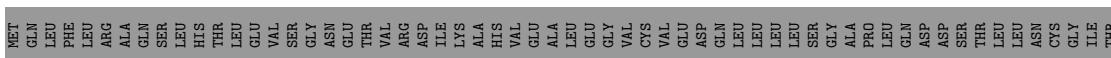
- Molecule 63: Ribosomal protein L32

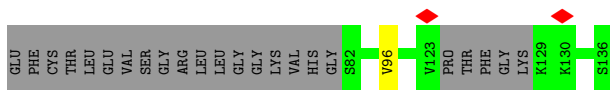
Chain e1:  93%



- Molecule 64: 40S ribosomal protein S30

Chain e2:  37%





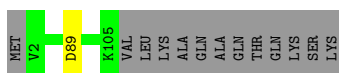
- Molecule 65: 60S ribosomal protein L35a

Chain f1: 97%



- Molecule 66: 60S ribosomal protein L34

Chain g1: 88% 11%



- Molecule 67: Guanine nucleotide-binding protein subunit beta-2-like 1

Chain g2: 5% 97% ..



- Molecule 68: 60S ribosomal protein L35

Chain h1: 96% ..



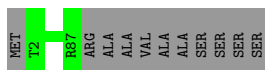
- Molecule 69: 60S ribosomal protein L36

Chain i1: 92% 7%

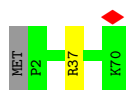


- Molecule 70: Ribosomal protein L37

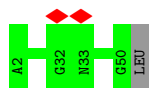
Chain j1: 89% 11%



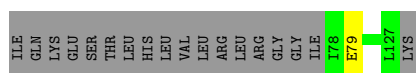
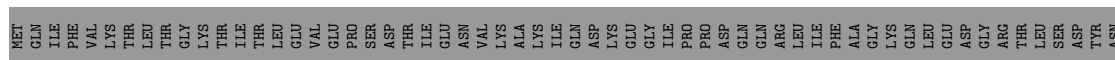
- Molecule 71: 60S ribosomal protein L38



• Molecule 72: Ribosomal protein L39



• Molecule 73: 60S ribosomal protein L40



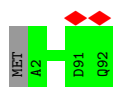
• Molecule 74: Rpl41



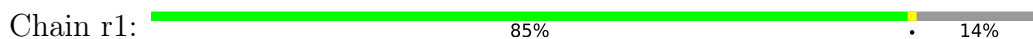
• Molecule 75: 60S ribosomal protein L36a



• Molecule 76: Zgc:171772



• Molecule 77: 60S ribosomal protein L28



MET	ALA	S3	L44	S120	SER	GLN	LYS	PRO	VAL	VAL	VAL	ARG	LYS	LYS	ARG	SER	ARG	ALA	PRO	LYS	SER	SER
-----	-----	----	-----	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	775288	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	48.3	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	10.815	Depositor
Minimum map value	-0.721	Depositor
Average map value	0.068	Depositor
Map value standard deviation	0.247	Depositor
Recommended contour level	0.7	Depositor
Map size (Å)	508.8, 508.8, 508.8	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	22	0.16	0/35898	0.69	14/55926 (0.0%)
2	51	0.24	0/78190	0.71	8/121918 (0.0%)
3	71	0.22	0/2867	0.66	0/4469
4	81	0.23	0/3573	0.69	0/5563
5	A1	0.25	0/1918	0.42	0/2569
6	A2	0.24	0/1703	0.39	0/2313
7	B1	0.25	0/3251	0.42	0/4351
8	B2	0.23	0/1757	0.41	0/2353
9	C1	0.24	0/2828	0.39	0/3797
10	C2	0.24	0/1687	0.40	0/2281
11	D1	0.25	0/2380	0.39	0/3185
12	D2	0.24	0/1740	0.42	0/2342
13	E1	0.25	0/1697	0.41	0/2264
14	E2	0.24	0/2110	0.42	0/2839
15	F1	0.25	0/1842	0.38	0/2460
16	F2	0.23	0/1462	0.38	0/1966
17	G1	0.24	0/1717	0.39	0/2316
18	G2	0.23	0/1887	0.41	0/2515
19	H1	0.24	0/1523	0.43	0/2048
20	H2	0.23	0/1515	0.41	0/2033
21	I1	0.26	0/1738	0.41	0/2325
22	I2	0.23	0/1695	0.42	0/2267
23	J1	0.24	0/1371	0.41	0/1833
24	J2	0.23	0/1517	0.37	0/2028
25	K2	0.23	0/792	0.39	0/1072
26	L1	0.24	0/1631	0.40	0/2178
27	L2	0.23	0/1105	0.42	0/1479
28	M1	0.25	0/1115	0.37	0/1488
29	N1	0.24	0/1731	0.40	0/2314
30	N2	0.22	0/1223	0.37	0/1644
31	O1	0.24	0/1694	0.38	0/2267
32	O2	0.24	0/955	0.43	0/1279

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	P1	0.24	0/1261	0.40	0/1691
34	P2	0.24	0/974	0.39	0/1301
35	Q1	0.24	0/1484	0.41	0/1985
36	Q2	0.23	0/1068	0.40	0/1434
37	R1	0.22	0/1397	0.36	0/1849
38	R2	0.23	0/1082	0.37	0/1452
39	S1	0.26	0/1496	0.40	0/2009
40	S2	0.23	0/1147	0.39	0/1535
41	T1	0.25	0/1312	0.40	0/1756
42	T2	0.23	0/1076	0.37	0/1445
43	U1	0.24	0/806	0.42	0/1081
44	U2	0.23	0/763	0.42	0/1027
45	V1	0.26	0/984	0.43	0/1320
46	V2	0.24	0/629	0.42	0/842
47	W1	0.26	0/516	0.39	0/688
48	W2	0.23	0/1051	0.41	0/1406
49	X1	0.24	0/978	0.40	0/1318
50	X2	0.24	0/1100	0.41	0/1468
51	Y1	0.24	0/1039	0.41	0/1383
52	Y2	0.23	0/1027	0.42	0/1364
53	Z1	0.25	0/1128	0.39	0/1504
54	Z2	0.23	0/536	0.42	0/721
55	a1	0.25	0/1196	0.41	0/1601
56	a2	0.23	0/795	0.41	0/1066
57	b1	0.23	0/429	0.37	0/568
58	b2	0.23	0/649	0.41	0/872
59	c1	0.25	0/731	0.39	0/981
60	c2	0.22	0/477	0.45	0/639
61	d1	0.24	0/903	0.42	0/1217
62	d2	0.23	0/470	0.37	0/624
63	e1	0.24	0/1048	0.40	0/1396
64	e2	0.23	0/401	0.37	0/526
65	f1	0.26	0/880	0.42	0/1175
66	g1	0.24	0/843	0.42	0/1123
67	g2	0.23	0/2451	0.45	0/3343
68	h1	0.23	0/998	0.36	0/1318
69	i1	0.23	0/812	0.36	0/1074
70	j1	0.24	0/715	0.42	0/944
71	k1	0.25	0/575	0.39	0/761
72	l1	0.23	0/444	0.40	0/587
73	m1	0.24	0/419	0.41	0/555
74	n1	0.20	0/232	0.33	0/295
75	o1	0.25	0/853	0.41	0/1125

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
76	p1	0.25	0/713	0.41	0/945
77	r1	0.23	0/956	0.41	0/1279
All	All	0.23	0/208956	0.60	22/306275 (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
39	S1	0	1

There are no bond length outliers.

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	22	676	U	C2-N1-C1'	7.74	126.98	117.70
1	22	676	U	N1-C2-O2	7.31	127.92	122.80
1	22	676	U	N3-C2-O2	-6.83	117.42	122.20
1	22	907	A	P-O3'-C3'	6.36	127.34	119.70
1	22	402	C	C2-N1-C1'	6.16	125.58	118.80
1	22	1475	U	C2-N1-C1'	6.00	124.90	117.70
2	51	3992	C	C2-N1-C1'	5.98	125.38	118.80
1	22	402	C	N1-C2-O2	5.95	122.47	118.90
2	51	706	C	C2-N1-C1'	5.79	125.17	118.80
2	51	4068	C	N1-C2-O2	5.78	122.37	118.90
1	22	1935	C	N1-C2-O2	5.75	122.35	118.90
1	22	1627	C	N1-C2-O2	5.75	122.35	118.90
1	22	402	C	N3-C2-O2	-5.62	117.97	121.90
2	51	4068	C	C2-N1-C1'	5.45	124.80	118.80
1	22	1935	C	C2-N1-C1'	5.38	124.72	118.80
1	22	1627	C	C2-N1-C1'	5.37	124.71	118.80
1	22	1475	U	N1-C2-O2	5.12	126.38	122.80
2	51	490	C	N1-C2-O2	5.09	121.95	118.90
2	51	3992	C	N1-C2-O2	5.06	121.94	118.90
2	51	706	C	N1-C2-O2	5.05	121.93	118.90
1	22	1475	U	N3-C2-O2	-5.04	118.68	122.20
2	51	686	C	C2-N1-C1'	5.01	124.31	118.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
39	S1	164	LYS	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	
5	A1	243/257 (95%)	236 (97%)	7 (3%)	0	100	100
6	A2	208/308 (68%)	204 (98%)	4 (2%)	0	100	100
7	B1	392/403 (97%)	381 (97%)	11 (3%)	0	100	100
8	B2	211/267 (79%)	205 (97%)	6 (3%)	0	100	100
9	C1	346/375 (92%)	336 (97%)	10 (3%)	0	100	100
10	C2	211/280 (75%)	210 (100%)	1 (0%)	0	100	100
11	D1	286/296 (97%)	278 (97%)	8 (3%)	0	100	100
12	D2	219/245 (89%)	208 (95%)	11 (5%)	0	100	100
13	E1	198/265 (75%)	191 (96%)	7 (4%)	0	100	100
14	E2	259/263 (98%)	243 (94%)	16 (6%)	0	100	100
15	F1	220/246 (89%)	215 (98%)	5 (2%)	0	100	100
16	F2	179/204 (88%)	171 (96%)	8 (4%)	0	100	100
17	G1	203/266 (76%)	196 (97%)	7 (3%)	0	100	100
18	G2	228/249 (92%)	220 (96%)	8 (4%)	0	100	100
19	H1	188/192 (98%)	184 (98%)	4 (2%)	0	100	100
20	H2	184/194 (95%)	174 (95%)	10 (5%)	0	100	100
21	I1	209/215 (97%)	201 (96%)	8 (4%)	0	100	100
22	I2	204/208 (98%)	194 (95%)	10 (5%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
23	J1	165/178 (93%)	161 (98%)	4 (2%)	0	100	100
24	J2	178/194 (92%)	177 (99%)	1 (1%)	0	100	100
25	K2	91/166 (55%)	86 (94%)	5 (6%)	0	100	100
26	L1	195/211 (92%)	188 (96%)	7 (4%)	0	100	100
27	L2	129/159 (81%)	123 (95%)	6 (5%)	0	100	100
28	M1	132/139 (95%)	129 (98%)	3 (2%)	0	100	100
29	N1	200/204 (98%)	195 (98%)	5 (2%)	0	100	100
30	N2	147/151 (97%)	145 (99%)	2 (1%)	0	100	100
31	O1	202/205 (98%)	199 (98%)	3 (2%)	0	100	100
32	O2	124/151 (82%)	120 (97%)	4 (3%)	0	100	100
33	P1	150/184 (82%)	143 (95%)	7 (5%)	0	100	100
34	P2	114/145 (79%)	111 (97%)	3 (3%)	0	100	100
35	Q1	178/182 (98%)	171 (96%)	7 (4%)	0	100	100
36	Q2	132/146 (90%)	127 (96%)	5 (4%)	0	100	100
37	R1	164/196 (84%)	163 (99%)	1 (1%)	0	100	100
38	R2	130/134 (97%)	127 (98%)	3 (2%)	0	100	100
39	S1	174/176 (99%)	170 (98%)	4 (2%)	0	100	100
40	S2	134/152 (88%)	127 (95%)	7 (5%)	0	100	100
41	T1	155/160 (97%)	151 (97%)	4 (3%)	0	100	100
42	T2	135/146 (92%)	127 (94%)	8 (6%)	0	100	100
43	U1	95/141 (67%)	90 (95%)	5 (5%)	0	100	100
44	U2	95/119 (80%)	93 (98%)	2 (2%)	0	100	100
45	V1	127/140 (91%)	125 (98%)	2 (2%)	0	100	100
46	V2	79/81 (98%)	78 (99%)	1 (1%)	0	100	100
47	W1	58/157 (37%)	57 (98%)	1 (2%)	0	100	100
48	W2	127/130 (98%)	121 (95%)	6 (5%)	0	100	100
49	X1	115/155 (74%)	112 (97%)	3 (3%)	0	100	100
50	X2	137/143 (96%)	132 (96%)	5 (4%)	0	100	100
51	Y1	120/145 (83%)	116 (97%)	4 (3%)	0	100	100
52	Y2	122/132 (92%)	115 (94%)	7 (6%)	0	100	100
53	Z1	133/136 (98%)	129 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
54	Z2	64/124 (52%)	61 (95%)	3 (5%)	0	100	100
55	a1	145/148 (98%)	135 (93%)	10 (7%)	0	100	100
56	a2	96/115 (84%)	95 (99%)	1 (1%)	0	100	100
57	b1	47/64 (73%)	44 (94%)	3 (6%)	0	100	100
58	b2	79/84 (94%)	75 (95%)	4 (5%)	0	100	100
59	c1	91/117 (78%)	90 (99%)	1 (1%)	0	100	100
60	c2	59/69 (86%)	58 (98%)	1 (2%)	0	100	100
61	d1	105/123 (85%)	102 (97%)	3 (3%)	0	100	100
62	d2	53/56 (95%)	53 (100%)	0	0	100	100
63	e1	123/135 (91%)	121 (98%)	2 (2%)	0	100	100
64	e2	46/133 (35%)	45 (98%)	1 (2%)	0	100	100
65	f1	105/110 (96%)	104 (99%)	1 (1%)	0	100	100
66	g1	102/117 (87%)	99 (97%)	3 (3%)	0	100	100
67	g2	308/317 (97%)	291 (94%)	17 (6%)	0	100	100
68	h1	118/123 (96%)	114 (97%)	4 (3%)	0	100	100
69	i1	96/105 (91%)	94 (98%)	2 (2%)	0	100	100
70	j1	84/97 (87%)	84 (100%)	0	0	100	100
71	k1	67/70 (96%)	67 (100%)	0	0	100	100
72	l1	47/50 (94%)	46 (98%)	1 (2%)	0	100	100
73	m1	48/128 (38%)	48 (100%)	0	0	100	100
74	n1	22/25 (88%)	22 (100%)	0	0	100	100
75	o1	100/106 (94%)	96 (96%)	4 (4%)	0	100	100
76	p1	89/92 (97%)	88 (99%)	1 (1%)	0	100	100
77	r1	116/138 (84%)	114 (98%)	2 (2%)	0	100	100
All	All	10635/12237 (87%)	10301 (97%)	334 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	A1	189/200 (94%)	186 (98%)	3 (2%)	62	79
6	A2	179/250 (72%)	176 (98%)	3 (2%)	60	78
7	B1	346/353 (98%)	346 (100%)	0	100	100
8	B2	194/231 (84%)	192 (99%)	2 (1%)	76	88
9	C1	291/313 (93%)	290 (100%)	1 (0%)	92	97
10	C2	179/220 (81%)	173 (97%)	6 (3%)	37	56
11	D1	244/249 (98%)	241 (99%)	3 (1%)	71	85
12	D2	184/204 (90%)	183 (100%)	1 (0%)	88	95
13	E1	182/234 (78%)	179 (98%)	3 (2%)	62	79
14	E2	226/229 (99%)	222 (98%)	4 (2%)	59	76
15	F1	189/210 (90%)	187 (99%)	2 (1%)	73	87
16	F2	154/170 (91%)	154 (100%)	0	100	100
17	G1	181/224 (81%)	180 (99%)	1 (1%)	86	94
18	G2	201/219 (92%)	200 (100%)	1 (0%)	88	95
19	H1	167/169 (99%)	167 (100%)	0	100	100
20	H2	165/176 (94%)	164 (99%)	1 (1%)	86	94
21	I1	180/182 (99%)	179 (99%)	1 (1%)	86	94
22	I2	176/181 (97%)	170 (97%)	6 (3%)	37	56
23	J1	141/150 (94%)	139 (99%)	2 (1%)	67	82
24	J2	160/168 (95%)	160 (100%)	0	100	100
25	K2	82/132 (62%)	81 (99%)	1 (1%)	71	85
26	L1	167/178 (94%)	165 (99%)	2 (1%)	71	85
27	L2	119/141 (84%)	116 (98%)	3 (2%)	47	67
28	M1	113/117 (97%)	113 (100%)	0	100	100
29	N1	171/172 (99%)	168 (98%)	3 (2%)	59	76
30	N2	129/130 (99%)	129 (100%)	0	100	100
31	O1	175/176 (99%)	175 (100%)	0	100	100
32	O2	98/119 (82%)	96 (98%)	2 (2%)	55	74
33	P1	134/165 (81%)	133 (99%)	1 (1%)	84	92
34	P2	105/130 (81%)	104 (99%)	1 (1%)	76	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
35	Q1	158/160 (99%)	156 (99%)	2 (1%)	69	84
36	Q2	108/119 (91%)	105 (97%)	3 (3%)	43	63
37	R1	145/173 (84%)	144 (99%)	1 (1%)	84	92
38	R2	119/121 (98%)	118 (99%)	1 (1%)	81	91
39	S1	155/155 (100%)	154 (99%)	1 (1%)	86	94
40	S2	118/132 (89%)	117 (99%)	1 (1%)	81	91
41	T1	138/140 (99%)	137 (99%)	1 (1%)	84	92
42	T2	110/117 (94%)	109 (99%)	1 (1%)	78	90
43	U1	87/127 (68%)	85 (98%)	2 (2%)	50	70
44	U2	87/105 (83%)	87 (100%)	0	100	100
45	V1	101/108 (94%)	101 (100%)	0	100	100
46	V2	65/65 (100%)	64 (98%)	1 (2%)	65	80
47	W1	52/129 (40%)	52 (100%)	0	100	100
48	W2	112/113 (99%)	111 (99%)	1 (1%)	78	90
49	X1	105/134 (78%)	105 (100%)	0	100	100
50	X2	111/115 (96%)	110 (99%)	1 (1%)	78	90
51	Y1	115/136 (85%)	113 (98%)	2 (2%)	60	78
52	Y2	108/116 (93%)	107 (99%)	1 (1%)	78	90
53	Z1	115/116 (99%)	114 (99%)	1 (1%)	78	90
54	Z2	57/105 (54%)	57 (100%)	0	100	100
55	a1	121/122 (99%)	119 (98%)	2 (2%)	60	78
56	a2	86/99 (87%)	85 (99%)	1 (1%)	71	85
57	b1	45/56 (80%)	44 (98%)	1 (2%)	52	71
58	b2	73/76 (96%)	73 (100%)	0	100	100
59	c1	78/98 (80%)	76 (97%)	2 (3%)	46	66
60	c2	53/61 (87%)	52 (98%)	1 (2%)	57	75
61	d1	98/110 (89%)	97 (99%)	1 (1%)	76	88
62	d2	48/49 (98%)	48 (100%)	0	100	100
63	e1	113/121 (93%)	113 (100%)	0	100	100
64	e2	41/112 (37%)	40 (98%)	1 (2%)	49	68
65	f1	86/88 (98%)	86 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
66	g1	91/102 (89%)	90 (99%)	1 (1%)	73	87
67	g2	263/274 (96%)	260 (99%)	3 (1%)	73	87
68	h1	108/110 (98%)	106 (98%)	2 (2%)	57	75
69	i1	83/88 (94%)	82 (99%)	1 (1%)	71	85
70	j1	73/80 (91%)	73 (100%)	0	100	100
71	k1	64/65 (98%)	63 (98%)	1 (2%)	62	79
72	l1	45/46 (98%)	45 (100%)	0	100	100
73	m1	46/116 (40%)	45 (98%)	1 (2%)	52	71
74	n1	23/24 (96%)	23 (100%)	0	100	100
75	o1	91/95 (96%)	90 (99%)	1 (1%)	73	87
76	p1	74/75 (99%)	74 (100%)	0	100	100
77	r1	102/120 (85%)	101 (99%)	1 (1%)	76	88
All	All	9292/10465 (89%)	9199 (99%)	93 (1%)	77	88

All (93) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	A1	102	LEU
5	A1	208	GLU
5	A1	218	HIS
6	A2	12	GLU
6	A2	192	GLU
6	A2	206	ASP
8	B2	189	ILE
8	B2	211	TYR
9	C1	122	TYR
10	C2	149	ILE
10	C2	151	VAL
10	C2	222	PHE
10	C2	234	TYR
10	C2	240	ASP
10	C2	244	GLU
11	D1	115	LEU
11	D1	155	THR
11	D1	265	ARG
12	D2	76	ARG
13	E1	39	TYR
13	E1	73	VAL

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Mol	Chain	Res	Type
13	E1	152	VAL
14	E2	158	ASP
14	E2	176	GLU
14	E2	247	THR
14	E2	248	ILE
15	F1	97	ASN
15	F1	223	THR
17	G1	155	VAL
18	G2	7	PHE
20	H2	167	GLU
21	I1	43	VAL
22	I2	22	HIS
22	I2	76	THR
22	I2	103	LEU
22	I2	107	THR
22	I2	130	THR
22	I2	191	GLU
23	J1	17	ILE
23	J1	132	VAL
25	K2	74	GLU
26	L1	67	HIS
26	L1	160	VAL
27	L2	39	ARG
27	L2	53	ASP
27	L2	70	ARG
29	N1	85	VAL
29	N1	174	LEU
29	N1	204	ARG
32	O2	68	GLU
32	O2	119	LEU
33	P1	24	VAL
34	P2	76	VAL
35	Q1	63	LEU
35	Q1	107	ASP
36	Q2	63	PHE
36	Q2	107	GLU
36	Q2	141	TYR
37	R1	93	LEU
38	R2	119	VAL
39	S1	82	LEU
40	S2	89	ASP
41	T1	72	VAL

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Mol	Chain	Res	Type
42	T2	46	LEU
43	U1	44	GLU
43	U1	124	TYR
46	V2	4	ASP
48	W2	18	GLU
50	X2	105	PHE
51	Y1	74	TYR
51	Y1	79	VAL
52	Y2	14	THR
53	Z1	33	THR
55	a1	24	LYS
55	a1	140	VAL
56	a2	39	PHE
57	b1	8	THR
59	c1	28	VAL
59	c1	90	ARG
60	c2	32	VAL
61	d1	44	LEU
64	e2	96	VAL
66	g1	89	ASP
67	g2	156	PHE
67	g2	252	THR
67	g2	260	ASP
68	h1	23	ASP
68	h1	113	LEU
69	i1	18	THR
71	k1	37	ARG
73	m1	79	GLU
75	o1	42	ASP
77	r1	44	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (124) such sidechains are listed below:

Mol	Chain	Res	Type
5	A1	8	GLN
5	A1	132	ASN
5	A1	187	HIS
5	A1	216	HIS
6	A2	132	GLN
6	A2	141	ASN
7	B1	25	HIS
7	B1	55	HIS

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Mol	Chain	Res	Type
7	B1	165	HIS
7	B1	173	HIS
7	B1	175	GLN
7	B1	179	HIS
8	B2	148	ASN
8	B2	160	GLN
8	B2	163	GLN
9	C1	38	ASN
9	C1	50	GLN
9	C1	112	HIS
9	C1	118	ASN
9	C1	119	GLN
9	C1	230	GLN
11	D1	45	ASN
11	D1	291	GLN
12	D2	101	GLN
12	D2	174	HIS
13	E1	105	HIS
14	E2	67	GLN
14	E2	142	HIS
14	E2	188	ASN
15	F1	56	HIS
16	F2	65	GLN
16	F2	107	ASN
16	F2	165	ASN
17	G1	94	GLN
17	G1	112	GLN
18	G2	59	GLN
18	G2	65	GLN
18	G2	197	GLN
19	H1	52	GLN
19	H1	102	ASN
19	H1	156	ASN
20	H2	91	HIS
20	H2	126	HIS
21	I1	213	HIS
22	I2	146	GLN
23	J1	42	GLN
23	J1	71	HIS
23	J1	97	ASN
23	J1	104	ASN
23	J1	110	GLN

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Mol	Chain	Res	Type
23	J1	168	GLN
24	J2	124	HIS
24	J2	125	HIS
24	J2	140	GLN
25	K2	39	ASN
25	K2	61	GLN
25	K2	66	HIS
25	K2	77	GLN
26	L1	13	HIS
26	L1	104	ASN
27	L2	18	GLN
27	L2	84	GLN
27	L2	142	ASN
28	M1	20	HIS
29	N1	181	HIS
30	N2	69	ASN
31	O1	65	ASN
32	O2	83	GLN
33	P1	97	ASN
33	P1	118	GLN
33	P1	120	ASN
34	P2	32	GLN
34	P2	79	HIS
35	Q1	14	HIS
35	Q1	160	HIS
36	Q2	24	HIS
36	Q2	35	ASN
36	Q2	48	GLN
36	Q2	97	GLN
37	R1	158	GLN
38	R2	62	GLN
38	R2	93	GLN
38	R2	116	ASN
38	R2	118	GLN
39	S1	122	HIS
39	S1	163	HIS
42	T2	43	HIS
42	T2	127	GLN
42	T2	138	GLN
44	U2	85	HIS
45	V1	77	HIS
47	W1	17	HIS

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Mol	Chain	Res	Type
47	W1	48	GLN
47	W1	50	ASN
48	W2	24	GLN
48	W2	82	GLN
48	W2	113	HIS
49	X1	56	GLN
50	X2	110	HIS
51	Y1	20	ASN
51	Y1	56	GLN
51	Y1	65	GLN
52	Y2	85	ASN
56	a2	8	ASN
58	b2	9	HIS
59	c1	40	GLN
59	c1	72	HIS
59	c1	73	HIS
60	c2	45	ASN
61	d1	98	ASN
62	d2	4	GLN
62	d2	45	GLN
64	e2	116	ASN
67	g2	20	GLN
67	g2	143	GLN
67	g2	311	GLN
68	h1	63	GLN
69	i1	36	HIS
73	m1	84	GLN
73	m1	104	HIS
73	m1	109	ASN
75	o1	25	GLN
77	r1	46	HIS
77	r1	71	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	22	1483/1939 (76%)	290 (19%)	10 (0%)
2	51	3236/4269 (75%)	570 (17%)	37 (1%)
3	71	119/120 (99%)	6 (5%)	0
4	81	147/158 (93%)	19 (12%)	0
All	All	4985/6486 (76%)	885 (17%)	47 (0%)

All (885) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	22	3	C
1	22	4	C
1	22	33	G
1	22	41	G
1	22	46	A
1	22	56	G
1	22	66	A
1	22	67	C
1	22	82	G
1	22	83	A
1	22	103	A
1	22	111	A
1	22	113	G
1	22	115	U
1	22	123	A
1	22	140	C
1	22	142	U
1	22	145	A
1	22	161	C
1	22	184	C
1	22	241	U
1	22	242	G
1	22	243	C
1	22	336	G
1	22	349	A
1	22	350	C
1	22	359	G
1	22	360	A
1	22	361	U
1	22	365	G
1	22	377	C
1	22	380	C
1	22	387	U
1	22	389	A
1	22	393	G
1	22	402	C
1	22	410	A
1	22	414	U
1	22	416	G
1	22	431	G
1	22	432	C
1	22	444	A

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Mol	Chain	Res	Type
1	22	446	C
1	22	453	G
1	22	455	C
1	22	484	G
1	22	494	A
1	22	496	C
1	22	510	A
1	22	511	A
1	22	512	G
1	22	516	G
1	22	517	G
1	22	518	C
1	22	519	A
1	22	520	G
1	22	528	G
1	22	532	A
1	22	533	U
1	22	539	A
1	22	542	U
1	22	548	A
1	22	571	A
1	22	574	A
1	22	605	G
1	22	606	A
1	22	609	G
1	22	610	A
1	22	625	C
1	22	629	G
1	22	636	A
1	22	637	C
1	22	640	A
1	22	644	G
1	22	652	G
1	22	653	U
1	22	654	C
1	22	660	C
1	22	672	G
1	22	673	U
1	22	674	A
1	22	678	C
1	22	679	C
1	22	686	A

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Mol	Chain	Res	Type
1	22	687	A
1	22	689	A
1	22	690	G
1	22	706	C
1	22	715	A
1	22	717	A
1	22	718	A
1	22	734	U
1	22	735	C
1	22	865	A
1	22	866	A
1	22	875	G
1	22	876	U
1	22	884	A
1	22	889	C
1	22	902	C
1	22	903	A
1	22	904	U
1	22	905	U
1	22	907	A
1	22	908	A
1	22	930	A
1	22	931	A
1	22	932	U
1	22	933	A
1	22	934	G
1	22	936	A
1	22	972	G
1	22	977	A
1	22	982	C
1	22	983	G
1	22	984	A
1	22	986	A
1	22	994	C
1	22	997	G
1	22	998	G
1	22	1020	G
1	22	1034	G
1	22	1035	G
1	22	1042	G
1	22	1054	G
1	22	1056	A

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Mol	Chain	Res	Type
1	22	1063	G
1	22	1065	G
1	22	1066	U
1	22	1081	U
1	22	1087	A
1	22	1091	A
1	22	1109	U
1	22	1113	A
1	22	1124	A
1	22	1125	U
1	22	1126	A
1	22	1137	U
1	22	1147	A
1	22	1149	C
1	22	1153	G
1	22	1172	G
1	22	1173	C
1	22	1174	G
1	22	1177	U
1	22	1191	G
1	22	1196	G
1	22	1198	A
1	22	1203	U
1	22	1204	G
1	22	1205	C
1	22	1206	G
1	22	1216	G
1	22	1220	C
1	22	1221	U
1	22	1255	A
1	22	1262	A
1	22	1274	G
1	22	1275	A
1	22	1282	C
1	22	1283	C
1	22	1288	G
1	22	1299	U
1	22	1306	U
1	22	1308	A
1	22	1309	U
1	22	1314	C
1	22	1315	U

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Mol	Chain	Res	Type
1	22	1318	A
1	22	1320	A
1	22	1321	C
1	22	1323	G
1	22	1324	G
1	22	1325	G
1	22	1326	A
1	22	1330	U
1	22	1331	C
1	22	1336	G
1	22	1339	C
1	22	1340	C
1	22	1341	G
1	22	1355	U
1	22	1357	G
1	22	1359	C
1	22	1362	A
1	22	1375	U
1	22	1381	U
1	22	1382	U
1	22	1383	C
1	22	1384	U
1	22	1385	G
1	22	1387	G
1	22	1390	U
1	22	1393	U
1	22	1394	G
1	22	1398	C
1	22	1400	U
1	22	1408	C
1	22	1409	G
1	22	1438	U
1	22	1439	U
1	22	1445	A
1	22	1460	G
1	22	1461	G
1	22	1463	A
1	22	1464	U
1	22	1475	U
1	22	1478	G
1	22	1480	G
1	22	1498	U

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Mol	Chain	Res	Type
1	22	1504	A
1	22	1506	U
1	22	1518	C
1	22	1519	A
1	22	1527	U
1	22	1528	U
1	22	1529	C
1	22	1531	G
1	22	1536	G
1	22	1541	A
1	22	1542	C
1	22	1544	G
1	22	1548	A
1	22	1550	U
1	22	1551	A
1	22	1554	A
1	22	1555	G
1	22	1559	U
1	22	1562	G
1	22	1563	A
1	22	1571	A
1	22	1572	G
1	22	1573	A
1	22	1575	G
1	22	1576	U
1	22	1579	G
1	22	1580	G
1	22	1583	C
1	22	1584	U
1	22	1585	G
1	22	1586	C
1	22	1588	C
1	22	1596	A
1	22	1597	C
1	22	1598	A
1	22	1599	A
1	22	1600	U
1	22	1601	G
1	22	1602	G
1	22	1609	C
1	22	1612	C
1	22	1629	C

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Mol	Chain	Res	Type
1	22	1631	G
1	22	1644	A
1	22	1645	A
1	22	1652	G
1	22	1653	A
1	22	1664	U
1	22	1665	G
1	22	1666	A
1	22	1686	C
1	22	1688	A
1	22	1697	G
1	22	1713	G
1	22	1729	A
1	22	1730	G
1	22	1745	G
1	22	1760	A
1	22	1761	C
1	22	1764	A
1	22	1786	U
1	22	1787	G
1	22	1790	C
1	22	1813	G
1	22	1815	C
1	22	1857	G
1	22	1893	A
1	22	1895	A
1	22	1896	G
1	22	1901	A
1	22	1905	A
1	22	1906	G
1	22	1908	U
1	22	1919	G
1	22	1921	A
1	22	1922	C
1	22	1931	G
1	22	1932	G
1	22	1933	A
1	22	1935	C
2	51	13	U
2	51	21	G
2	51	25	A
2	51	33	A

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Mol	Chain	Res	Type
2	51	39	A
2	51	42	A
2	51	48	C
2	51	49	U
2	51	59	A
2	51	64	A
2	51	65	A
2	51	66	A
2	51	69	A
2	51	71	C
2	51	76	A
2	51	91	G
2	51	109	G
2	51	119	G
2	51	120	A
2	51	128	C
2	51	145	A
2	51	146	G
2	51	148	G
2	51	161	C
2	51	171	C
2	51	173	U
2	51	174	C
2	51	175	U
2	51	179	G
2	51	201	U
2	51	210	U
2	51	217	U
2	51	219	A
2	51	220	G
2	51	221	C
2	51	222	C
2	51	234	U
2	51	245	U
2	51	246	C
2	51	247	G
2	51	266	U
2	51	267	G
2	51	272	U
2	51	273	C
2	51	281	A
2	51	282	G

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Mol	Chain	Res	Type
2	51	299	U
2	51	308	A
2	51	311	C
2	51	312	G
2	51	318	U
2	51	336	A
2	51	337	A
2	51	338	A
2	51	342	C
2	51	343	G
2	51	356	U
2	51	363	C
2	51	365	A
2	51	388	A
2	51	389	G
2	51	411	C
2	51	434	U
2	51	442	U
2	51	458	C
2	51	464	G
2	51	469	U
2	51	470	U
2	51	471	C
2	51	484	C
2	51	485	G
2	51	486	G
2	51	487	G
2	51	488	G
2	51	489	U
2	51	492	G
2	51	496	G
2	51	501	G
2	51	502	U
2	51	503	G
2	51	508	C
2	51	510	C
2	51	511	C
2	51	514	U
2	51	515	C
2	51	549	G
2	51	550	A
2	51	551	C

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Mol	Chain	Res	Type
2	51	552	G
2	51	553	C
2	51	556	G
2	51	558	G
2	51	561	A
2	51	562	A
2	51	564	G
2	51	565	C
2	51	581	U
2	51	582	G
2	51	583	C
2	51	584	A
2	51	585	U
2	51	590	G
2	51	593	G
2	51	594	C
2	51	601	G
2	51	622	C
2	51	627	U
2	51	628	G
2	51	633	G
2	51	634	G
2	51	635	U
2	51	636	C
2	51	644	G
2	51	646	A
2	51	647	G
2	51	678	A
2	51	680	A
2	51	683	G
2	51	691	G
2	51	694	C
2	51	695	C
2	51	697	A
2	51	698	C
2	51	704	C
2	51	708	U
2	51	709	G
2	51	710	C
2	51	711	U
2	51	712	C
2	51	714	C

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Mol	Chain	Res	Type
2	51	721	C
2	51	722	G
2	51	745	U
2	51	746	C
2	51	751	C
2	51	752	C
2	51	753	C
2	51	778	G
2	51	780	G
2	51	782	C
2	51	791	C
2	51	792	C
2	51	804	G
2	51	805	G
2	51	806	C
2	51	807	G
2	51	811	C
2	51	820	A
2	51	827	U
2	51	828	C
2	51	860	G
2	51	873	C
2	51	874	C
2	51	875	C
2	51	876	A
2	51	878	G
2	51	879	U
2	51	880	U
2	51	886	G
2	51	893	G
2	51	894	U
2	51	896	C
2	51	902	G
2	51	903	A
2	51	904	C
2	51	905	G
2	51	935	A
2	51	963	A
2	51	968	G
2	51	969	A
2	51	974	G
2	51	975	G

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Mol	Chain	Res	Type
2	51	976	C
2	51	978	C
2	51	979	G
2	51	980	C
2	51	981	G
2	51	987	C
2	51	988	U
2	51	989	G
2	51	996	A
2	51	1003	G
2	51	1007	G
2	51	1042	C
2	51	1043	C
2	51	1044	G
2	51	1045	G
2	51	1050	G
2	51	1053	C
2	51	1054	G
2	51	1062	G
2	51	1074	G
2	51	1075	A
2	51	1077	C
2	51	1078	C
2	51	1079	U
2	51	1080	C
2	51	1081	C
2	51	1082	G
2	51	1087	G
2	51	1088	C
2	51	1095	A
2	51	1096	G
2	51	1100	G
2	51	1116	A
2	51	1121	A
2	51	1123	A
2	51	1128	G
2	51	1132	A
2	51	1145	A
2	51	1150	G
2	51	1164	C
2	51	1176	C
2	51	1189	U

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Mol	Chain	Res	Type
2	51	1194	U
2	51	1210	G
2	51	1222	G
2	51	1229	A
2	51	1231	G
2	51	1232	A
2	51	1236	A
2	51	1238	C
2	51	1239	G
2	51	1240	A
2	51	1252	G
2	51	1259	C
2	51	1274	C
2	51	1275	U
2	51	1276	C
2	51	1277	A
2	51	1292	C
2	51	1296	G
2	51	1297	A
2	51	1298	U
2	51	1312	C
2	51	1322	C
2	51	1323	A
2	51	1331	G
2	51	1358	C
2	51	1359	C
2	51	1368	A
2	51	1369	A
2	51	1384	G
2	51	1385	A
2	51	1387	G
2	51	1402	G
2	51	1403	C
2	51	1404	U
2	51	1405	G
2	51	1415	G
2	51	1417	G
2	51	1419	A
2	51	1424	G
2	51	1426	C
2	51	1427	G
2	51	1438	G

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Mol	Chain	Res	Type
2	51	1452	G
2	51	1453	C
2	51	1464	C
2	51	1465	U
2	51	1473	G
2	51	1474	A
2	51	1475	A
2	51	1480	A
2	51	1481	C
2	51	1501	U
2	51	1502	G
2	51	1503	C
2	51	1504	C
2	51	1505	G
2	51	1513	U
2	51	1514	C
2	51	1515	A
2	51	1523	U
2	51	1531	G
2	51	1541	A
2	51	1543	A
2	51	1544	G
2	51	1609	A
2	51	1624	A
2	51	1629	G
2	51	1631	U
2	51	1635	G
2	51	1638	G
2	51	1639	G
2	51	1645	C
2	51	1652	A
2	51	1653	U
2	51	1667	C
2	51	1668	G
2	51	1669	G
2	51	1701	G
2	51	1703	A
2	51	1724	C
2	51	1740	G
2	51	1747	A
2	51	1750	G
2	51	1767	G

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Mol	Chain	Res	Type
2	51	1779	G
2	51	1782	G
2	51	1785	C
2	51	1795	G
2	51	1796	U
2	51	1801	A
2	51	1804	A
2	51	1829	A
2	51	1830	A
2	51	1831	G
2	51	1851	A
2	51	1855	G
2	51	1859	U
2	51	1860	U
2	51	1882	A
2	51	1887	A
2	51	1901	U
2	51	1902	U
2	51	1904	G
2	51	1908	G
2	51	1912	G
2	51	1913	G
2	51	1933	C
2	51	1934	C
2	51	1935	C
2	51	1936	G
2	51	1937	C
2	51	1938	U
2	51	1939	C
2	51	1940	G
2	51	1941	A
2	51	1945	A
2	51	1954	C
2	51	1977	A
2	51	1978	G
2	51	1979	C
2	51	1980	G
2	51	1981	G
2	51	1988	C
2	51	1989	G
2	51	2007	A
2	51	2008	G

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Mol	Chain	Res	Type
2	51	2017	C
2	51	2020	A
2	51	2021	A
2	51	2022	A
2	51	2023	C
2	51	2035	U
2	51	2053	G
2	51	2054	A
2	51	2062	C
2	51	2073	G
2	51	2088	C
2	51	2104	C
2	51	2110	G
2	51	2121	G
2	51	2122	C
2	51	2129	G
2	51	2130	A
2	51	2131	A
2	51	2158	U
2	51	2161	G
2	51	2178	A
2	51	2179	A
2	51	2189	G
2	51	2197	G
2	51	2202	U
2	51	2203	C
2	51	2205	C
2	51	2206	G
2	51	2222	A
2	51	2229	C
2	51	2233	A
2	51	2248	A
2	51	2249	C
2	51	2261	U
2	51	2262	G
2	51	2270	A
2	51	2277	A
2	51	2291	G
2	51	2295	G
2	51	2306	A
2	51	2313	G
2	51	2858	C

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Mol	Chain	Res	Type
2	51	2859	A
2	51	2876	C
2	51	2886	G
2	51	2895	A
2	51	2904	U
2	51	2908	A
2	51	2909	A
2	51	2913	A
2	51	2922	A
2	51	2952	A
2	51	2956	C
2	51	2969	U
2	51	2971	A
2	51	2972	A
2	51	3010	G
2	51	3013	G
2	51	3034	A
2	51	3035	A
2	51	3036	G
2	51	3037	G
2	51	3044	A
2	51	3046	U
2	51	3049	C
2	51	3071	G
2	51	3072	C
2	51	3074	U
2	51	3077	A
2	51	3078	U
2	51	3079	G
2	51	3098	U
2	51	3100	U
2	51	3137	A
2	51	3138	C
2	51	3139	G
2	51	3141	G
2	51	3147	C
2	51	3157	G
2	51	3161	A
2	51	3165	A
2	51	3166	A
2	51	3167	G
2	51	3168	A

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Mol	Chain	Res	Type
2	51	3175	U
2	51	3176	G
2	51	3182	G
2	51	3295	U
2	51	3296	A
2	51	3305	G
2	51	3348	C
2	51	3350	G
2	51	3351	G
2	51	3356	A
2	51	3417	G
2	51	3430	C
2	51	3431	C
2	51	3438	A
2	51	3439	C
2	51	3451	G
2	51	3452	G
2	51	3459	G
2	51	3471	A
2	51	3490	G
2	51	3493	G
2	51	3497	U
2	51	3501	A
2	51	3517	G
2	51	3522	G
2	51	3536	A
2	51	3541	A
2	51	3548	A
2	51	3549	A
2	51	3556	C
2	51	3558	U
2	51	3559	G
2	51	3572	A
2	51	3573	G
2	51	3574	U
2	51	3582	C
2	51	3598	G
2	51	3600	C
2	51	3605	C
2	51	3616	G
2	51	3617	C
2	51	3644	A

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Mol	Chain	Res	Type
2	51	3645	G
2	51	3646	A
2	51	3648	A
2	51	3650	G
2	51	3655	C
2	51	3659	G
2	51	3662	A
2	51	3666	C
2	51	3689	C
2	51	3690	A
2	51	3694	C
2	51	3701	G
2	51	3708	G
2	51	3716	G
2	51	3717	A
2	51	3721	C
2	51	3732	A
2	51	3733	U
2	51	3743	G
2	51	3744	C
2	51	3762	G
2	51	3768	U
2	51	3775	A
2	51	3780	C
2	51	3781	A
2	51	3786	A
2	51	3787	C
2	51	3792	G
2	51	3793	C
2	51	3796	G
2	51	3816	A
2	51	3817	G
2	51	3828	C
2	51	3835	G
2	51	3841	A
2	51	3843	C
2	51	3844	C
2	51	3845	G
2	51	3851	G
2	51	3859	A
2	51	3860	A
2	51	3870	G

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Mol	Chain	Res	Type
2	51	3871	U
2	51	3904	C
2	51	3905	G
2	51	3906	U
2	51	3940	C
2	51	3942	A
2	51	3970	A
2	51	3978	A
2	51	3979	U
2	51	4010	G
2	51	4011	U
2	51	4013	G
2	51	4014	G
2	51	4016	U
2	51	4019	C
2	51	4022	A
2	51	4025	G
2	51	4027	C
2	51	4029	C
2	51	4030	C
2	51	4032	G
2	51	4036	A
2	51	4069	G
2	51	4070	C
2	51	4071	G
2	51	4074	G
2	51	4082	C
2	51	4087	C
2	51	4112	G
2	51	4114	G
2	51	4115	C
2	51	4124	C
2	51	4125	U
2	51	4126	C
2	51	4127	U
2	51	4128	U
2	51	4132	G
2	51	4137	G
2	51	4138	C
2	51	4141	C
2	51	4144	A
2	51	4150	G

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Mol	Chain	Res	Type
2	51	4155	G
2	51	4156	A
2	51	4157	A
2	51	4166	U
2	51	4167	U
2	51	4178	U
2	51	4187	U
2	51	4189	A
2	51	4190	U
2	51	4192	C
2	51	4193	U
2	51	4208	U
2	51	4216	A
2	51	4219	G
2	51	4236	A
2	51	4243	G
2	51	4252	C
2	51	4256	C
2	51	4262	A
2	51	4265	U
3	71	38	U
3	71	64	G
3	71	74	A
3	71	100	A
3	71	110	G
3	71	120	A
4	81	22	C
4	81	33	U
4	81	34	C
4	81	51	A
4	81	58	A
4	81	62	C
4	81	71	A
4	81	74	G
4	81	79	A
4	81	80	C
4	81	95	G
4	81	104	A
4	81	106	C
4	81	110	C
4	81	116	G
4	81	129	U

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Mol	Chain	Res	Type
4	81	149	G
4	81	152	G
4	81	158	C

All (47) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	22	110	U
1	22	511	A
1	22	907	A
1	22	935	G
1	22	1203	U
1	22	1204	G
1	22	1330	U
1	22	1462	C
1	22	1503	A
1	22	1905	A
2	51	170	G
2	51	221	C
2	51	265	G
2	51	387	A
2	51	457	C
2	51	469	U
2	51	488	G
2	51	495	C
2	51	507	G
2	51	552	G
2	51	560	G
2	51	600	A
2	51	697	A
2	51	804	G
2	51	819	G
2	51	875	C
2	51	879	U
2	51	903	A
2	51	1052	G
2	51	1079	U
2	51	1231	G
2	51	1358	C
2	51	1651	C
2	51	1795	G
2	51	1937	C

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Mol	Chain	Res	Type
2	51	1977	A
2	51	2205	C
2	51	2858	C
2	51	2971	A
2	51	3048	C
2	51	3743	G
2	51	3870	G
2	51	3969	U
2	51	4123	C
2	51	4124	C
2	51	4156	A
2	51	4207	G

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 210 ligands modelled in this entry, 210 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

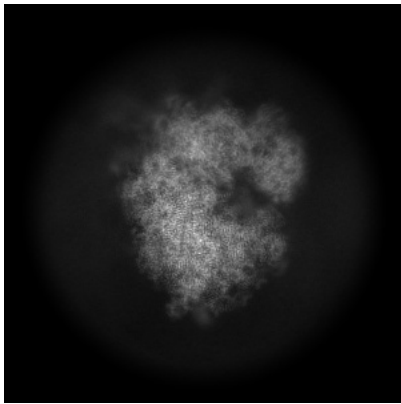
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-13112. These allow visual inspection of the internal detail of the map and identification of artifacts.

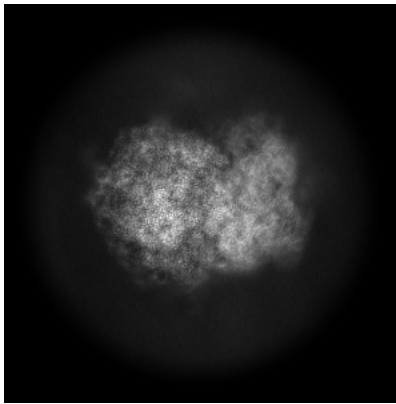
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

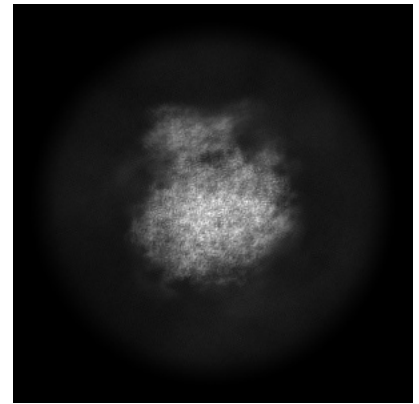
6.1.1 Primary map



X



Y

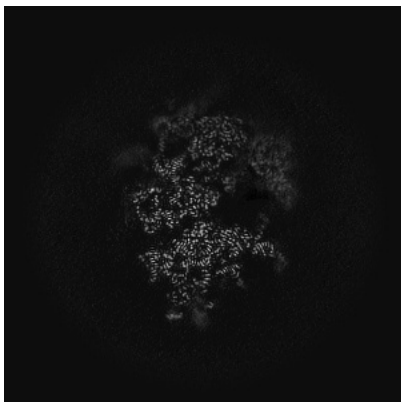


Z

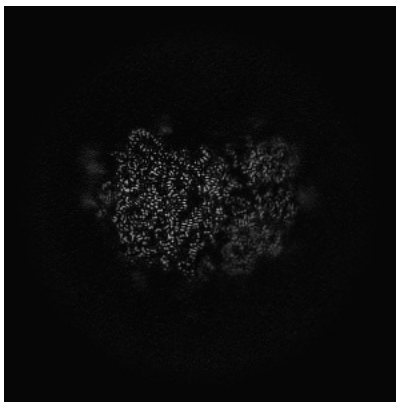
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

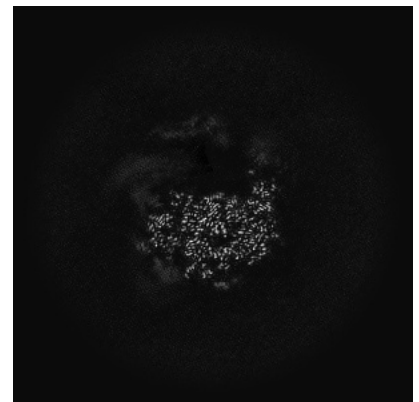
6.2.1 Primary map



X Index: 240



Y Index: 240

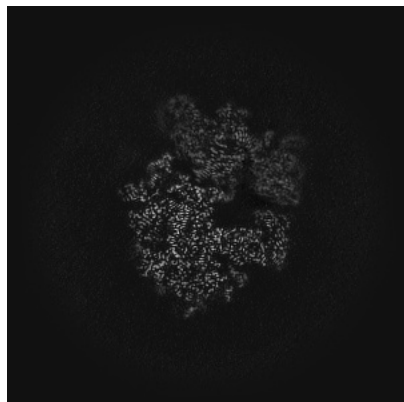


Z Index: 240

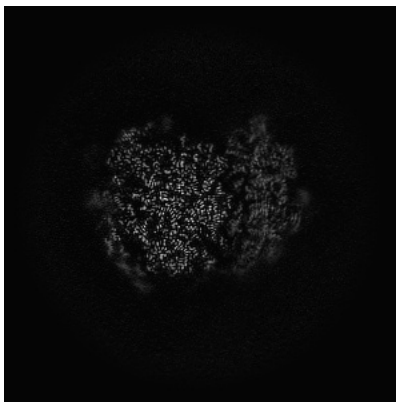
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

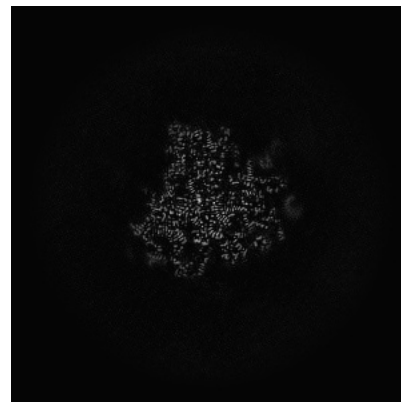
6.3.1 Primary map



X Index: 221



Y Index: 228

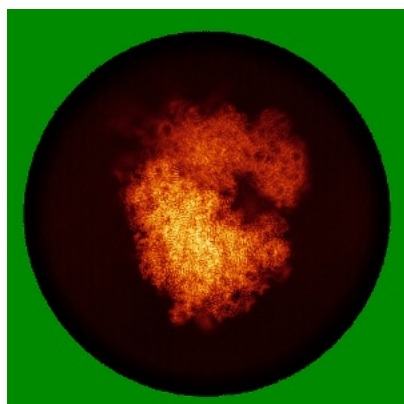


Z Index: 195

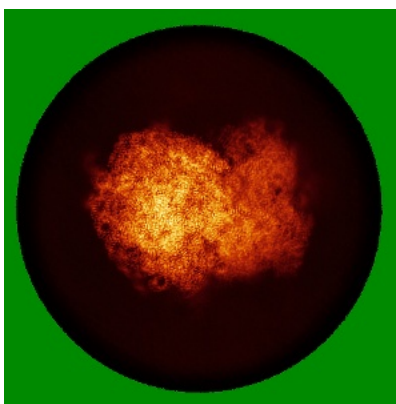
The images above show the largest variance slices of the map in three orthogonal directions.

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

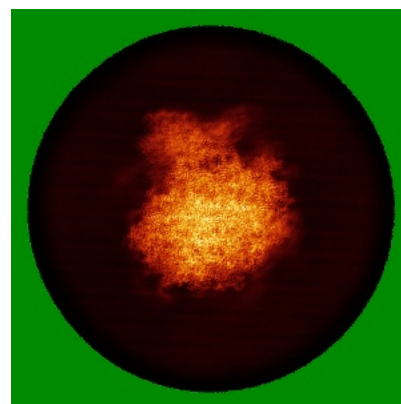
6.4.1 Primary map



X



Y

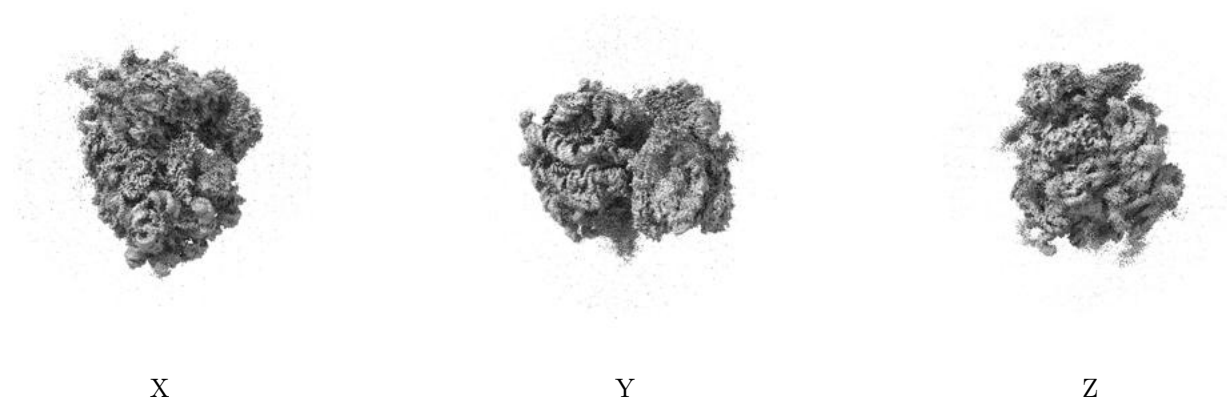


Z

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 0.7. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

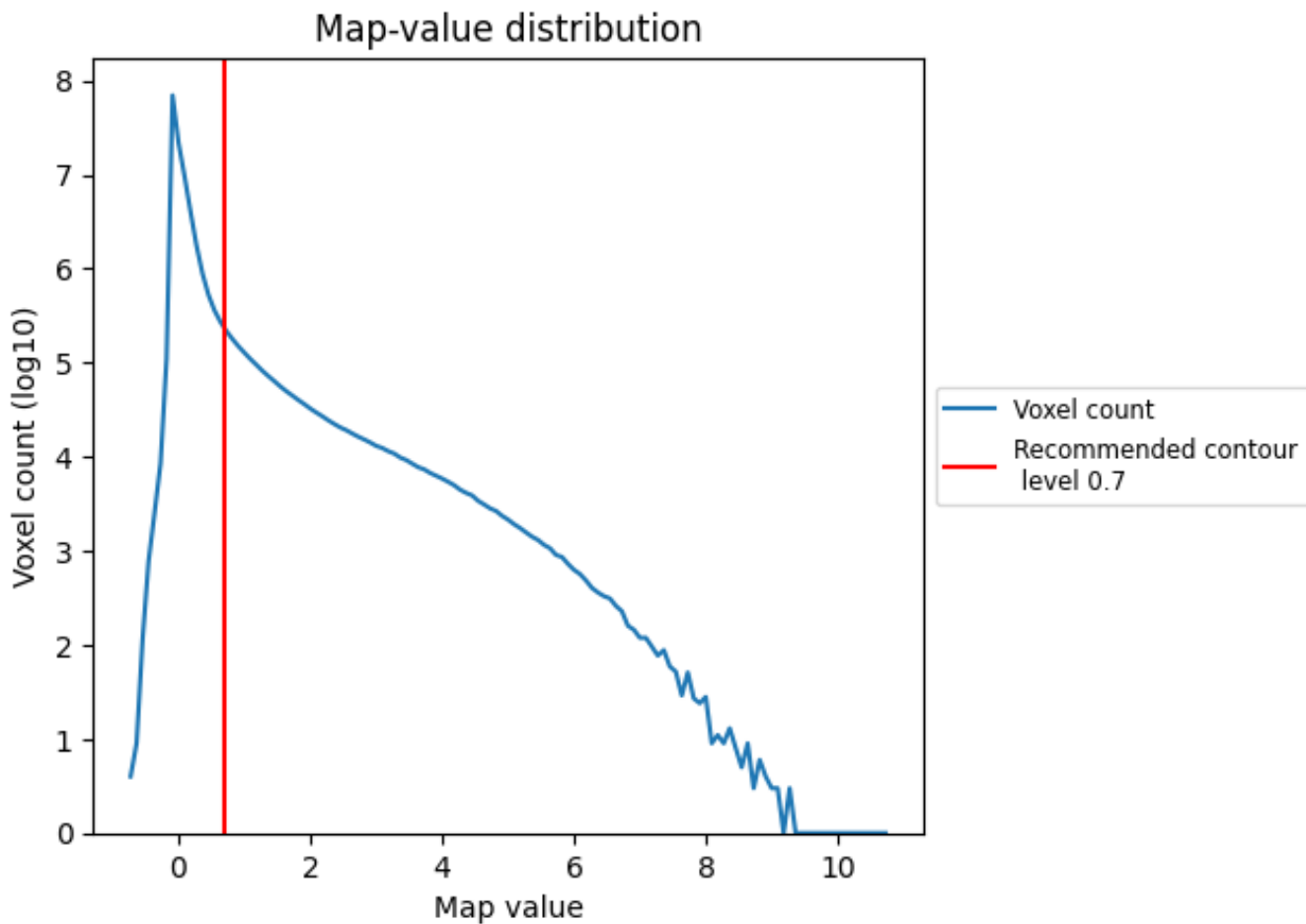
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

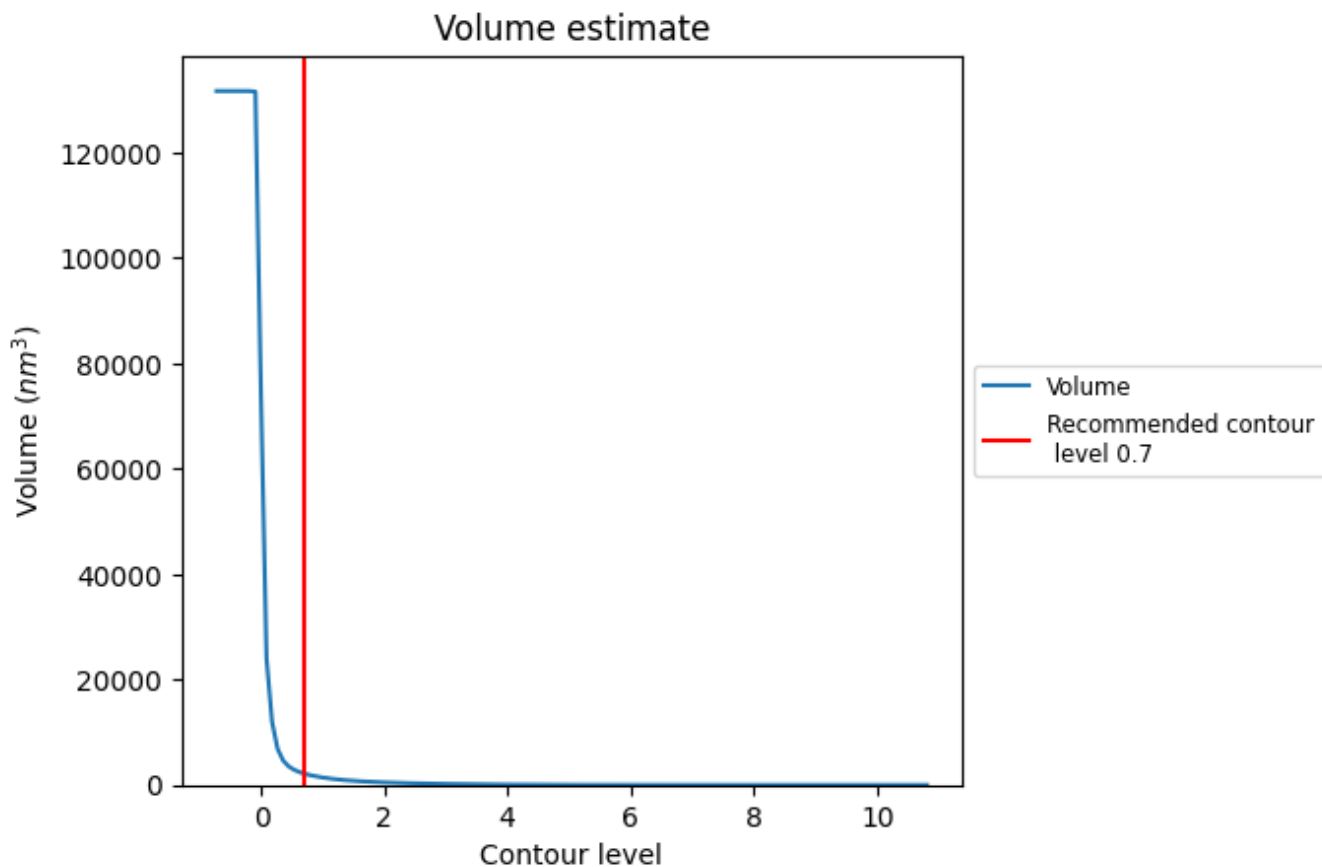
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

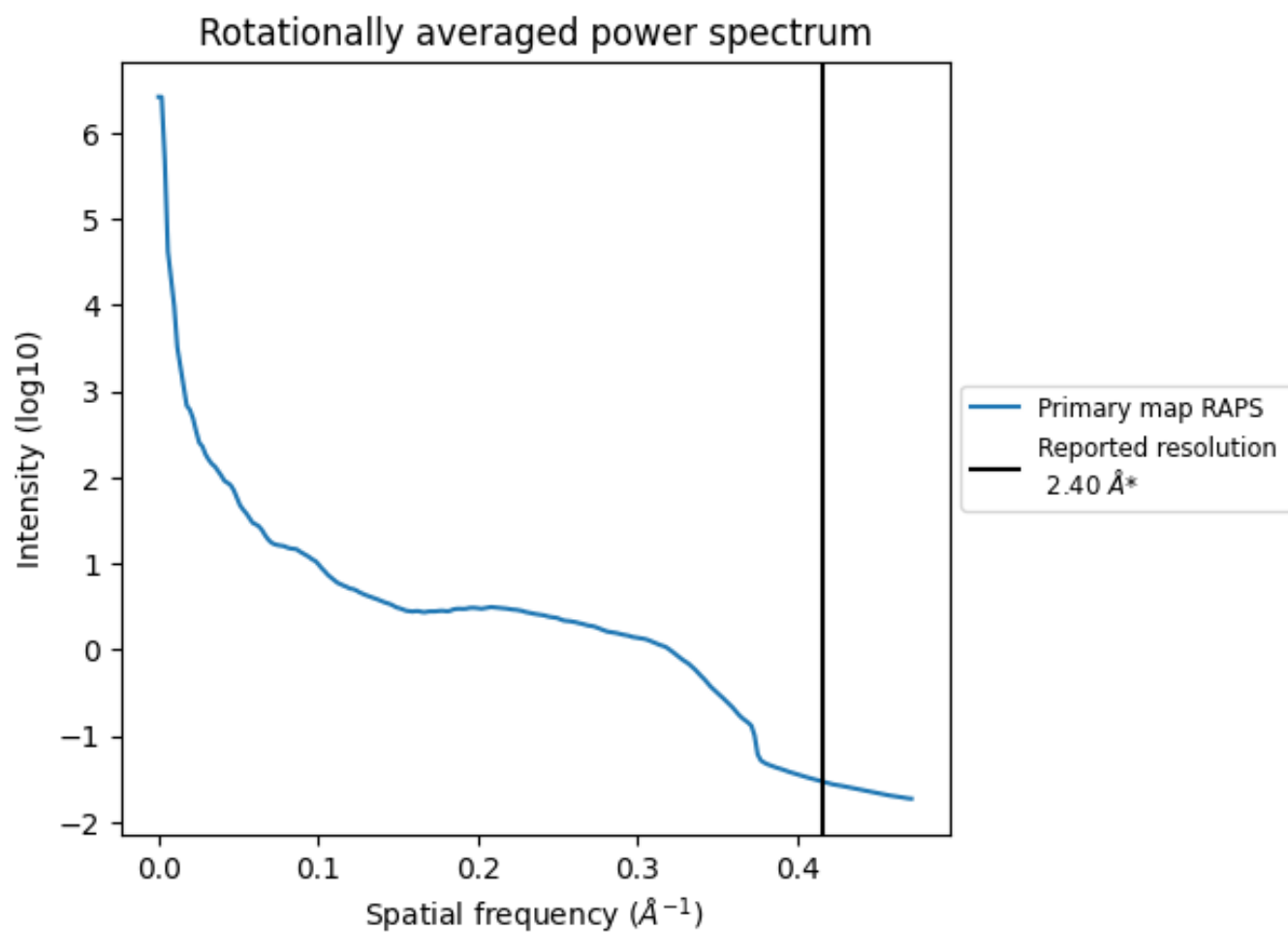
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2168 nm^3 ; this corresponds to an approximate mass of 1959 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 0.417 Å⁻¹

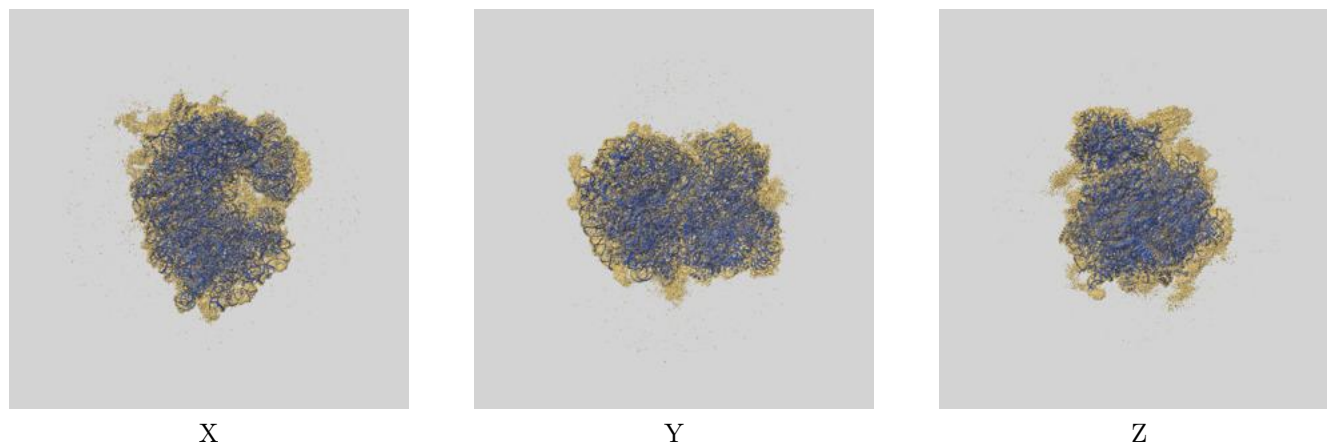
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

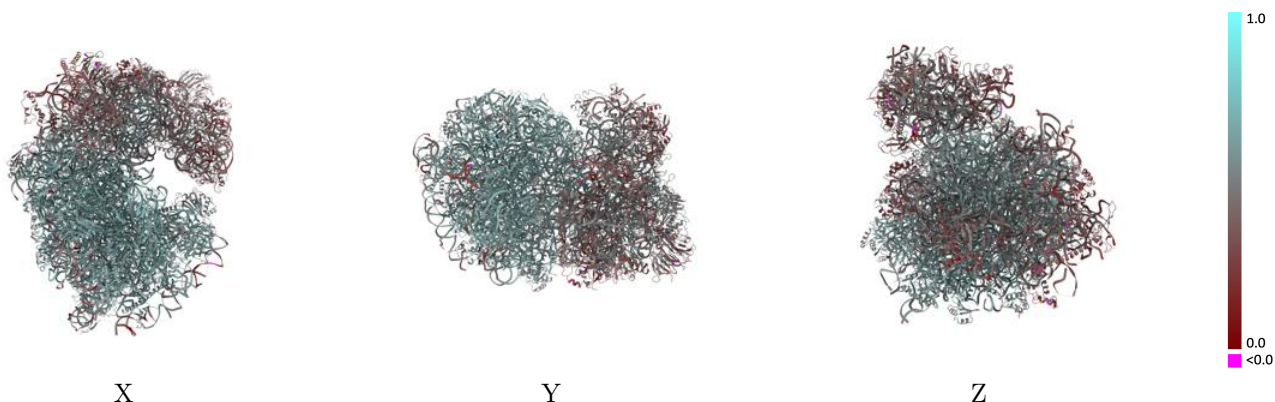
This section contains information regarding the fit between EMDB map EMD-13112 and PDB model 7OYB. Per-residue inclusion information can be found in section 3 on page 18.

9.1 Map-model overlay [i](#)



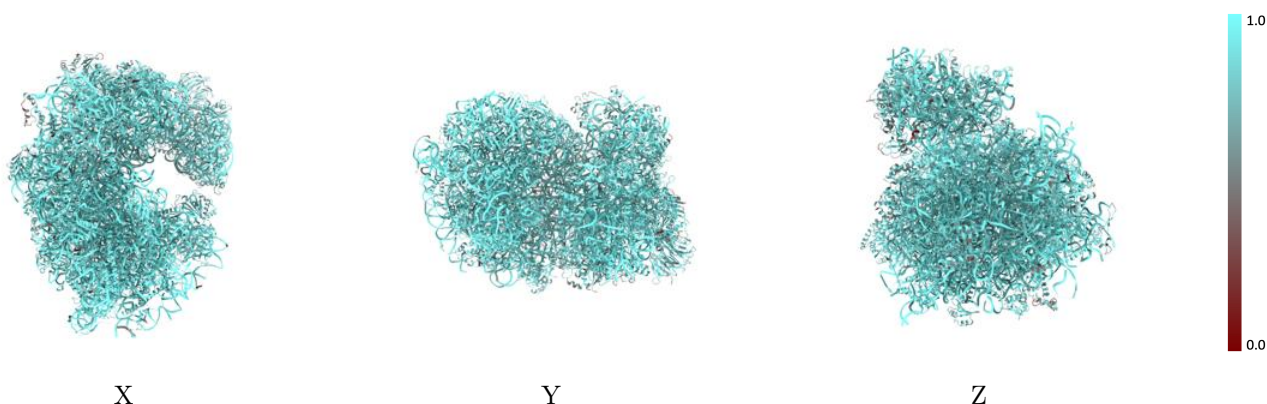
The images above show the 3D surface view of the map at the recommended contour level 0.7 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



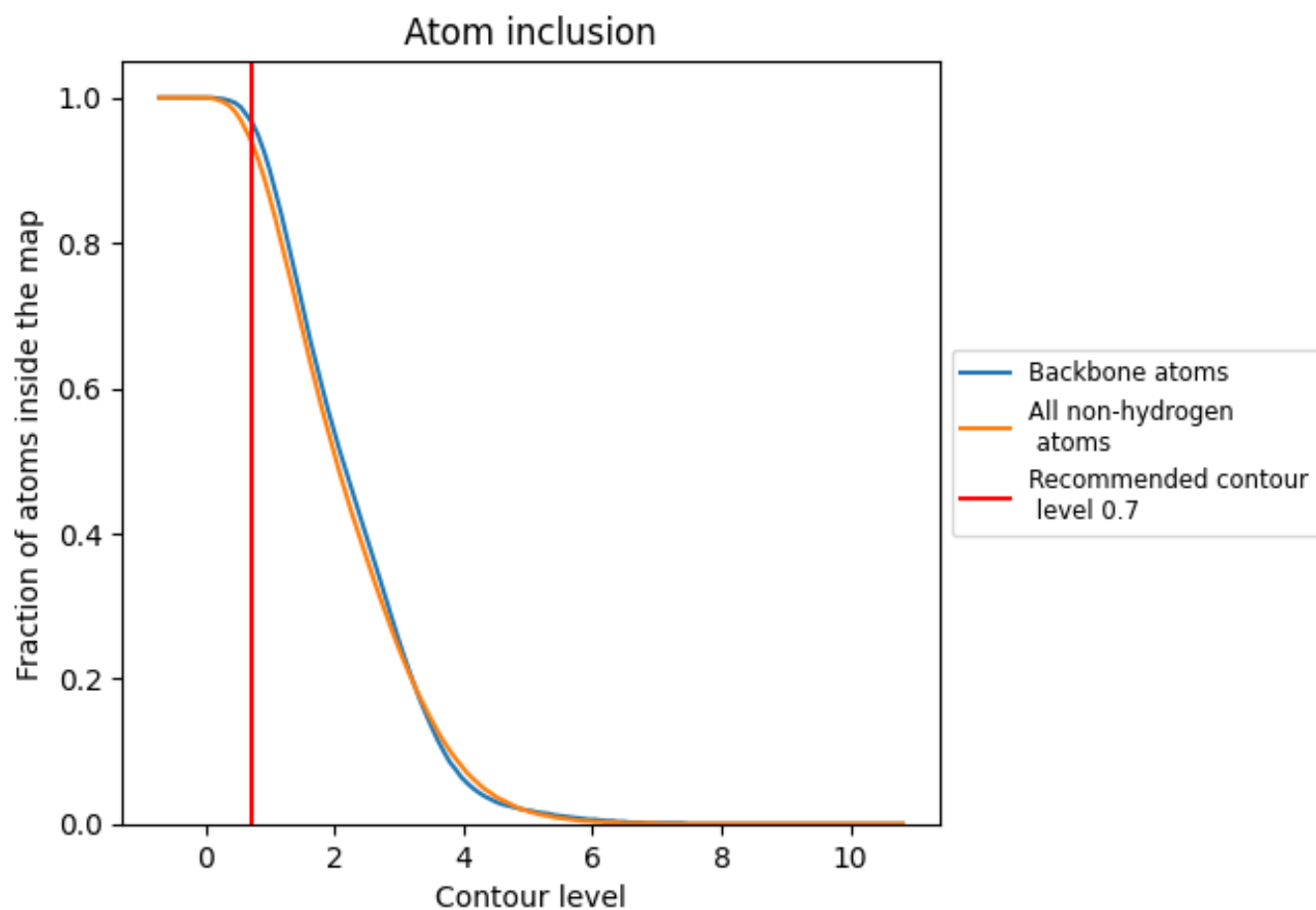
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.7).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 94% 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 (0.7) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9410	 0.5280
22	 0.9610	 0.4440
51	 0.9770	 0.5840
71	 0.9980	 0.6170
81	 0.9850	 0.5990
A1	 0.9720	 0.6120
A2	 0.9080	 0.4950
B1	 0.9640	 0.6140
B2	 0.7720	 0.3260
C1	 0.9640	 0.6040
C2	 0.9190	 0.5240
D1	 0.9390	 0.5730
D2	 0.8190	 0.3590
E1	 0.9380	 0.5720
E2	 0.8430	 0.3590
F1	 0.9620	 0.6130
F2	 0.7950	 0.3820
G1	 0.9030	 0.5450
G2	 0.7820	 0.3760
H1	 0.9420	 0.5930
H2	 0.7590	 0.3530
I1	 0.9110	 0.5850
I2	 0.7900	 0.3790
J1	 0.8790	 0.5300
J2	 0.8980	 0.4040
K2	 0.8680	 0.3160
L1	 0.9020	 0.5750
L2	 0.8110	 0.3640
M1	 0.9600	 0.6040
N1	 0.9800	 0.6220
N2	 0.8260	 0.3430
O1	 0.9680	 0.6150
O2	 0.8220	 0.3390
P1	 0.9670	 0.6160
P2	 0.8700	 0.3940





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Chain	Atom inclusion	Q-score
Q1	0.9730	0.6120
Q2	0.8710	0.4080
R1	0.9390	0.5540
R2	0.7600	0.3950
S1	0.9730	0.6220
S2	0.8100	0.3730
T1	0.9420	0.6060
T2	0.8990	0.4280
U1	0.8660	0.4930
U2	0.8320	0.3990
V1	0.9540	0.5990
V2	0.8800	0.5180
W1	0.9630	0.5890
W2	0.9260	0.5050
X1	0.9320	0.5930
X2	0.8830	0.4930
Y1	0.9420	0.5890
Y2	0.7760	0.3070
Z1	0.9550	0.5570
Z2	0.7770	0.3320
a1	0.9690	0.6070
a2	0.8980	0.4490
b1	0.9430	0.5940
b2	0.8360	0.3450
c1	0.9700	0.5630
c2	0.7730	0.3430
d1	0.9320	0.5840
d2	0.9360	0.4270
e1	0.9730	0.6190
e2	0.7790	0.3640
f1	0.9760	0.6320
g1	0.9700	0.5990
g2	0.8050	0.3800
h1	0.9230	0.5820
i1	0.9260	0.5740
j1	0.9750	0.6200
k1	0.8440	0.5270
l1	0.9250	0.5740
m1	0.9650	0.6110
n1	0.8710	0.5300
o1	0.9370	0.5960
p1	0.9380	0.5820

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Chain	Atom inclusion	Q-score
r1	 0.9640	 0.5940