



# wwPDB EM Validation Summary Report ⓘ

Feb 22, 2024 – 05:37 PM EST

PDB ID : 4V6K  
EMDB ID : EMD-1849  
Title : Structural insights into cognate vs. near-cognate discrimination during decoding.  
Authors : Agirrezabala, X.; Schreiner, E.; Trabuco, L.G.; Lei, J.; Ortiz-Meoz, R.F.; Schulten, K.; Green, R.; Frank, J.  
Deposited on : 2011-01-07  
Resolution : 8.25 Å (reported)  
Based on initial model : 2I2V

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev70  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
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) : 2.36

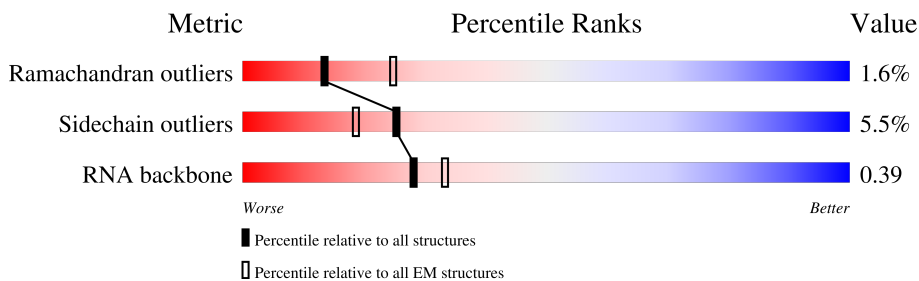
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 8.25 Å.

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



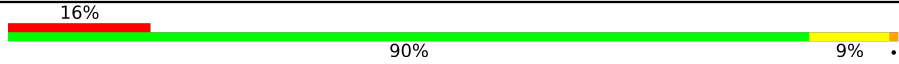
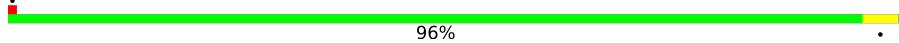
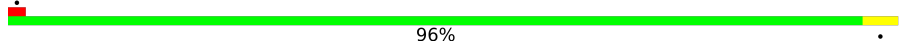

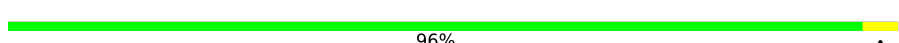
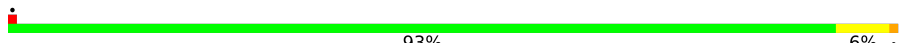
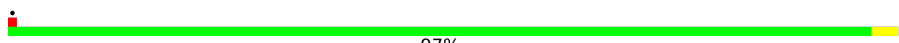
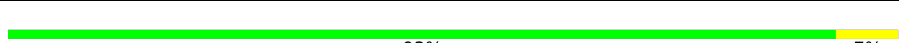
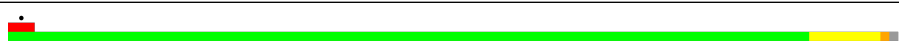

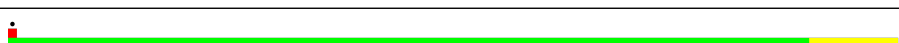

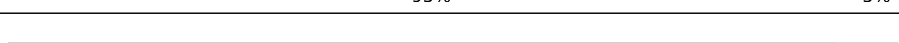
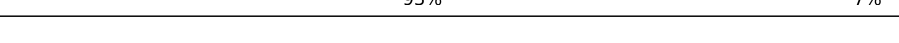
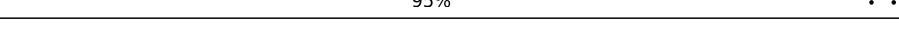
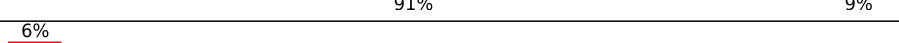
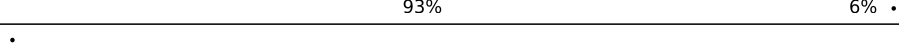
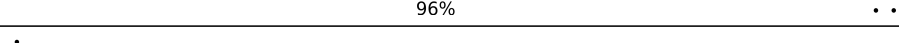
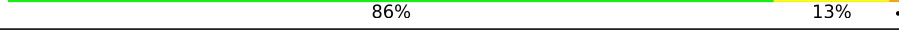
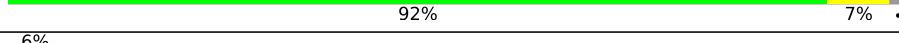


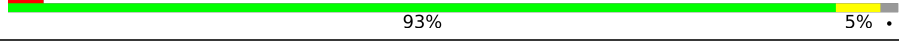

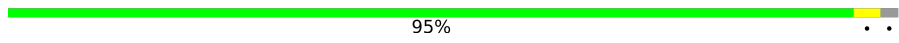
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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

Mol	Chain	Length	Quality of chain
1	AA	120	
2	AB	2904	
3	AC	234	
4	AD	273	
5	AE	209	
6	AF	201	
7	AG	179	
8	AH	177	

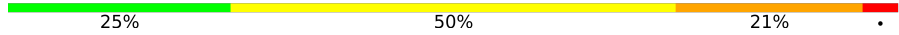

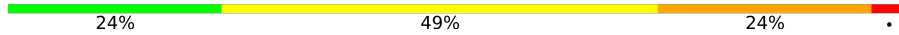
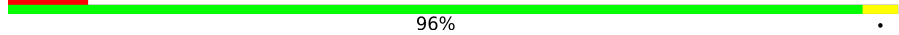

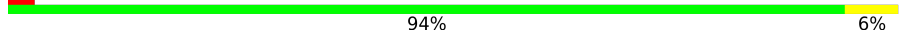
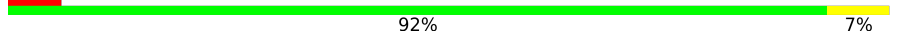
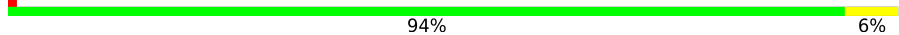

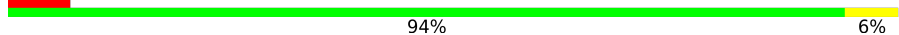
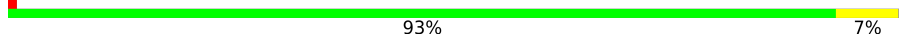
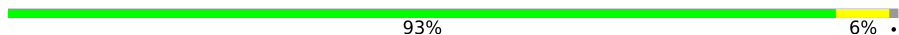


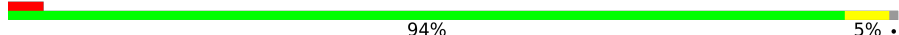

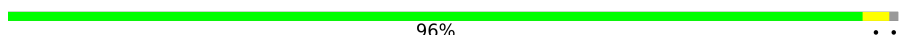

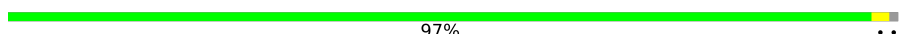
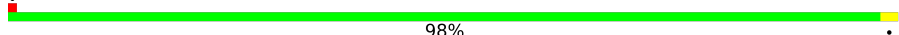
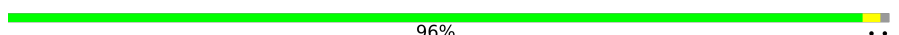




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Mol	Chain	Length	Quality of chain
9	AI	149	 16% 90% 9%
10	AJ	142	 96%
11	AK	142	 96%
12	AL	123	 90% 10%
13	AM	144	 96%
14	AN	136	 93% 6%
15	AO	127	 97%
16	AP	117	 93% 7%
17	AQ	115	 90% 8%
18	AR	118	 91% 8%
19	AS	103	 90% 10%
20	AT	110	 95% 5%
21	AU	100	 93% 7%
22	AV	104	 95%
23	AW	94	 91% 9%
24	AX	85	 6% 93% 6%
25	AY	78	 96%
26	AZ	63	 86% 13%
27	Aa	59	 92% 7%
28	Ab	70	 6% 89% 11%
29	Ac	57	 88% 11%
30	Ad	55	 93% 5%
31	Ae	46	 87% 13%
32	Af	65	 95%
33	Ag	38	 95% 5%

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Mol	Chain	Length	Quality of chain
34	BA	1542	 25% 50% 21%
35	BB	76	 30% 50% 14% 5%
35	BE	76	 24% 49% 24%
36	BC	393	 9% 96%
37	BD	24	 21% 50% 25%
38	BF	241	 94% 6%
39	BG	233	 6% 92% 7%
40	BH	206	 94% 6%
41	BI	167	 92% 8%
42	BJ	135	 7% 94% 6%
43	BK	179	 93% 7%
44	BL	130	 93% 6%
45	BM	130	 90% 9%
46	BN	103	 86% 14%
47	BO	129	 94% 5%
48	BP	124	 92% 7%
49	BQ	118	 96%
50	BR	101	 84% 14%
51	BS	89	 97%
52	BT	82	 98%
53	BU	84	 96%
54	BV	75	 87% 9%
55	BW	92	 5% 92% 5%
56	BX	87	 97%
57	BY	71	 11% 85% 14%

## 2 Entry composition

There are 57 unique types of molecules in this entry. The entry contains 153634 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 ribosomal RNA 5S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	AA	120	2566	1144	468	835	119	0	0

- Molecule 2 is a RNA chain called ribosomal RNA 23S.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	AB	2904	62351	27824	11469	20155	2903	0	0

- Molecule 3 is a protein called 50S ribosomal protein L1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	AC	234	1733	1081	315	330	7	0	0

- Molecule 4 is a protein called 50S ribosomal protein L2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	AD	272	2092	1294	425	366	7	0	0

- Molecule 5 is a protein called 50S ribosomal protein L3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	AE	209	1565	979	288	294	4	0	0

- Molecule 6 is a protein called 50S ribosomal protein L4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	AF	201	1552	974	283	290	5	0	0

- Molecule 7 is a protein called 50S ribosomal protein L5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	AG	178	1420	905	251	258	6	0	0

- Molecule 8 is a protein called 50S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	AH	176	1323	832	243	246	2	0	0

- Molecule 9 is a protein called 50S ribosomal protein L9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	AI	149	1111	699	197	214	1	0	0

- Molecule 10 is a protein called 50S ribosomal protein L11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	AJ	141	1032	651	179	196	6	0	0

- Molecule 11 is a protein called 50S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	AK	142	1129	714	212	199	4	0	0

- Molecule 12 is a protein called 50S ribosomal protein L14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	AL	123	947	593	181	167	6	0	0

- Molecule 13 is a protein called 50S ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	AM	144	1053	654	207	190	2	0	0

- Molecule 14 is a protein called 50S ribosomal protein L16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	AN	136	1074	686	205	177	6	0	0

- Molecule 15 is a protein called 50S ribosomal protein L17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	AO	127	1008	621	204	178	5	0	0

- Molecule 16 is a protein called 50S ribosomal protein L18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	AP	117	900	557	179	163	1	0	0

- Molecule 17 is a protein called 50S ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	AQ	114	917	574	179	163	1	0	0

- Molecule 18 is a protein called 50S ribosomal protein L20.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
18	AR	117	947	604	192	151	0	0

- Molecule 19 is a protein called 50S ribosomal protein L21.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	AS	103	816	516	153	145	2	0	0

- Molecule 20 is a protein called 50S ribosomal protein L22.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	AT	110	857	532	166	156	3	0	0

- Molecule 21 is a protein called 50S ribosomal protein L23.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	AU	100	Total	C	N	O	S	0	0
			787	496	146	143	2		

- Molecule 22 is a protein called 50S ribosomal protein L24.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	AV	103	Total	C	N	O	S	0	0
			789	498	148	143			

- Molecule 23 is a protein called 50S ribosomal protein L25.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	AW	94	Total	C	N	O	S	0	0
			753	479	137	134	3		

- Molecule 24 is a protein called 50S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	AX	84	Total	C	N	O	S	0	0
			634	391	129	113	1		

- Molecule 25 is a protein called 50S ribosomal protein L28.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	AY	77	Total	C	N	O	S	0	0
			625	388	129	106	2		

- Molecule 26 is a protein called 50S ribosomal protein L29.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	AZ	63	Total	C	N	O	S	0	0
			509	313	99	95	2		

- Molecule 27 is a protein called 50S ribosomal protein L30.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	Aa	58	Total	C	N	O	S	0	0
			449	281	87	79	2		

- Molecule 28 is a protein called 50S ribosomal protein L31.



Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	Ab	70	549	339	104	100	6	0	0

- Molecule 29 is a protein called 50S ribosomal protein L32.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	Ac	56	444	269	94	80	1	0	0

- Molecule 30 is a protein called 50S ribosomal protein L33.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
30	Ad	54	441	284	81	76	0	0

- Molecule 31 is a protein called 50S ribosomal protein L34.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
31	Ae	46	377	228	90	57	2	0	0

- Molecule 32 is a protein called 50S ribosomal protein L35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	Af	64	504	323	105	74	2	0	0

- Molecule 33 is a protein called 50S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	Ag	38	302	185	65	48	4	0	0

- Molecule 34 is a RNA chain called 16S ribosomal RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
34	BA	1542	33089	14767	6064	10717	1541	0	0

- Molecule 35 is a RNA chain called A/T-site tRNA Phe.

Mol	Chain	Residues	Atoms					AltConf	Trace	
35	BB	76	Total	C	N	O	P	S	0	0
			1635	735	291	532	75	2		
35	BE	76	Total	C	N	O	P	S	0	0
			1635	735	291	532	75	2		

- Molecule 36 is a protein called Elongation factor Tu 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	BC	393	Total	C	N	O	S	0	0
			3036	1918	523	582	13		

- Molecule 37 is a RNA chain called mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	BD	24	Total	C	N	O	P	0	0
			495	222	68	181	24		

- Molecule 38 is a protein called 30S ribosomal protein S2.

Mol	Chain	Residues	Atoms					AltConf	Trace
38	BF	240	Total	C	N	O	S	0	0
			1872	1180	332	352	8		

- Molecule 39 is a protein called 30S ribosomal protein S3.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	BG	232	Total	C	N	O	S	0	0
			1822	1149	346	323	4		

- Molecule 40 is a protein called 30S ribosomal protein S4.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	BH	205	Total	C	N	O	S	0	0
			1643	1026	315	298	4		

- Molecule 41 is a protein called 30S ribosomal protein S5.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	BI	166	Total	C	N	O	S	0	0
			1225	761	232	226	6		

- Molecule 42 is a protein called 30S ribosomal protein S6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
42	BJ	135	1101	677	198	219	7	0	0

- Molecule 43 is a protein called 30S ribosomal protein S7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
43	BK	178	1400	874	269	253	4	0	0

- Molecule 44 is a protein called 30S ribosomal protein S8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
44	BL	129	979	616	173	184	6	0	0

- Molecule 45 is a protein called 30S ribosomal protein S9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
45	BM	129	1036	642	208	183	3	0	0

- Molecule 46 is a protein called 30S ribosomal protein S10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
46	BN	103	825	514	158	151	2	0	0

- Molecule 47 is a protein called 30S ribosomal protein S11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
47	BO	128	965	595	196	171	3	0	0

- Molecule 48 is a protein called 30S ribosomal protein S12.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
48	BP	123	955	590	196	165	4	0	0

- Molecule 49 is a protein called 30S ribosomal protein S13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	BQ	117	910	564	183	160	3	0	0

- Molecule 50 is a protein called 30S ribosomal protein S14.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	BR	100	805	499	164	139	3	0	0

- Molecule 51 is a protein called 30S ribosomal protein S15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	BS	88	716	440	146	129	1	0	0

- Molecule 52 is a protein called 30S ribosomal protein S16.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	BT	82	649	406	128	114	1	0	0

- Molecule 53 is a protein called 30S ribosomal protein S17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	BU	83	672	425	124	120	3	0	0

- Molecule 54 is a protein called 30S ribosomal protein S18.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
54	BV	74	626	395	123	107	1	0	0

- Molecule 55 is a protein called 30S ribosomal protein S19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
55	BW	91	727	464	139	122	2	0	0

- Molecule 56 is a protein called 30S ribosomal protein S20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	BX	86	670	414	138	115	3	0	0

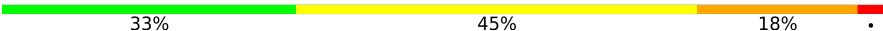
- Molecule 57 is a protein called 30S ribosomal protein S21.

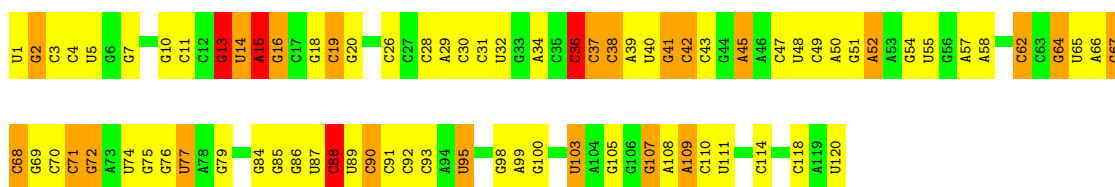
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
57	BY	70	590	366	125	98	1	0	0

### 3 Residue-property plots

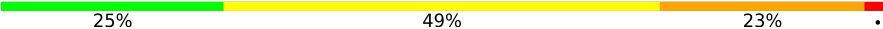
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

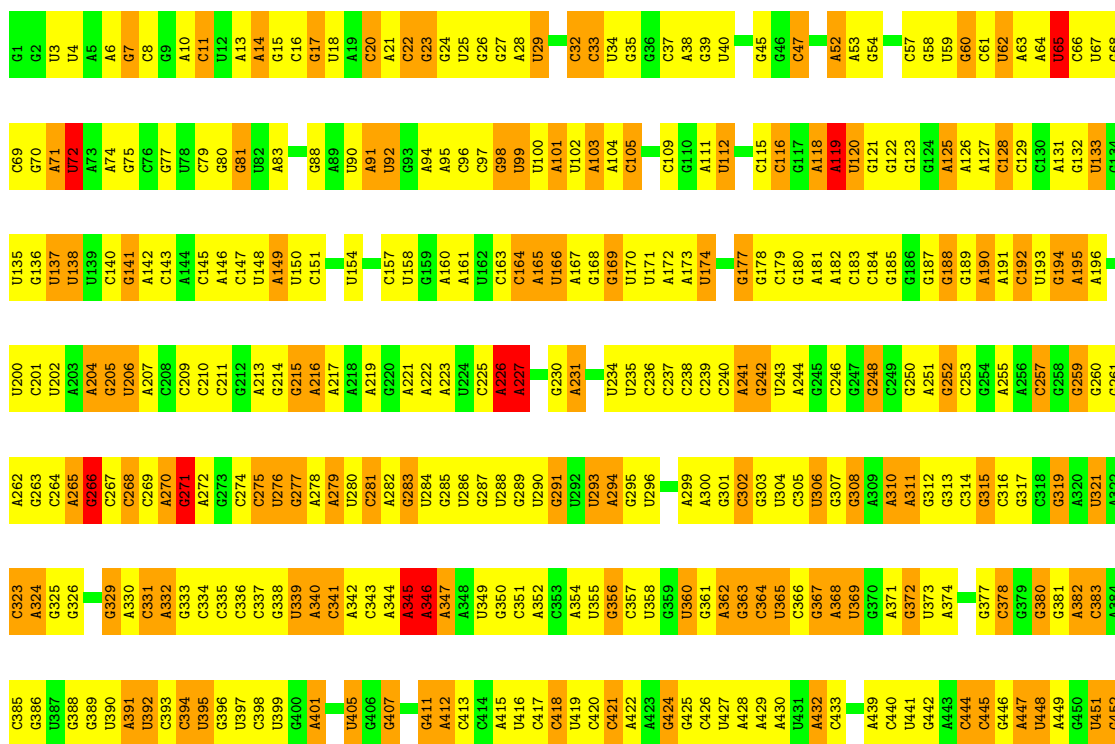
- Molecule 1: ribosomal RNA 5S

Chain AA: 



- Molecule 2: ribosomal RNA 23S

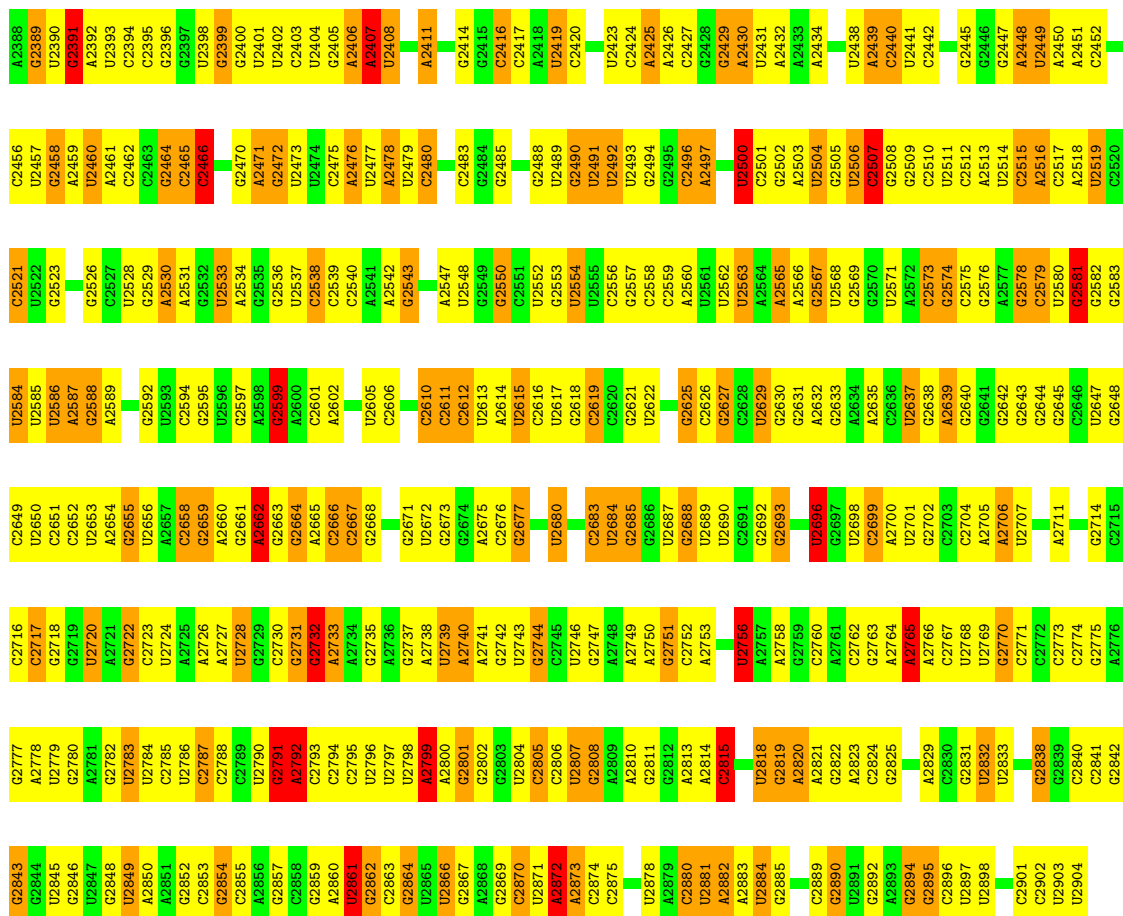
Chain AB: 



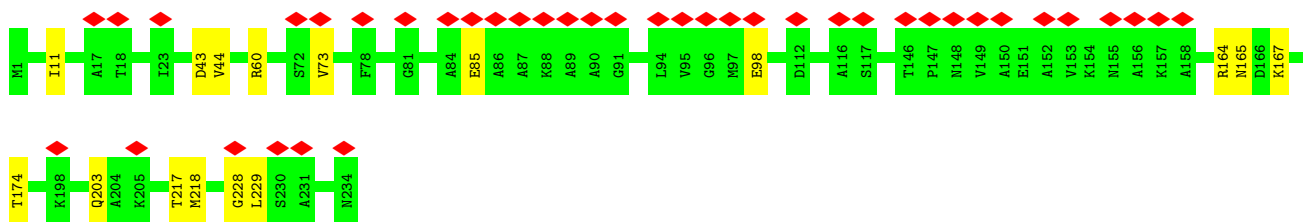
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U1217	G1218	U1219	G1220	C1221	U1222	G1223	U1224	C1225	G1226	C1227	G1228	C1229	A1230	U1231	G1232	C1233	U1234	G1235	G1236	A1237	G1238	A1241	U1242	C1243	A1244	U1245	A1246	U1247	G1248	U1249	G1250	A1254	U1255	G1256	U1258	C1261	A1262	U1263	G1268	U1267	A1268	G1271	A1272	C1275	U1276	U1277	G1278	C1279	A1280	U1281	U1282	G1283							
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C516	C517	U518	U519	C520	U521	A522	C523	G524	U525	A526	G527	A528	A529	G530	C531	A532	G533	U534	G535	G536	G537	U538	A539	G540	C541	G542	G543	C544	U545	U546	A547	G548	G549	C550	G551	U552	G553	U554	G555	A556	C557	U558	G559	C560	A563	C564	G565	U566	U569	G570	U571	C509	C510	U572	U573	A574	A575	U576	G578
G648	G649	C650	G651	A654	G655	G656	U657	G658	G659	G660	A661	G662	G663	G664	U665	A666	G667	G668	G669	A670	C670	C671	C672	G673	A674	A675	A676	A677	C678	G681	G682	G683	G684	A685	U686	C687	U688	A689	G690	G691	C692	C693	U694	G695	U701	U702	U703	G704	A705	U642	A643	A644	U710	G711	U712	G713			
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G2061	A2062	C2063	C2064	C2065	C2066	C2067	U2068	C2069	A2070	A2071	A2072	C2073	U2074	U2075	U2076	A2077	C2078	U2079	A2080	U2081	A2082	G2083	C2084	U2085	U2086	G2087	U2088	C2089	A2090	C2091	U2092	G2093	A2094	A2097	U2098	U2099	G2102	C2103	C2104	U2105	U2106	G2107	A2108	U2109	G2110	U2111	G2112	U2113	A2114	C2115	G2116	U2117	U2118	U2119	A2119	G2120	G2123									
G2124	G2125	A2126	U2127	G2128	C2129	U2130	U2131	U2132	C2133	A2134	A2135	G2136	U2137	G2138	U2139	G2140	C2145	C2146	A2147	C2150	G2156	G2157	A2158	C2159	C2160	C2161	A2162	A2163	C2164	G2168	U2169	A2170	U2171	U2172	A2173	C2174	C2175	A2176	C2177	C2178	C2179	U2180	U2181	U2182	A2183	U2184	U2185	C2186	U2187	U2188	C2189	C2190	A2191	U2192	G2193											
U2194	U2195	C2196	U2197	A2198	C2199	C2200	G2201	U2202	G2203	G2204	A2205	C2206	C2207	C2208	A2211	G2212	A2213	C2214	C2215	G2218	U2219	U2220	C2221	C2222	G2223	U2224	A2225	C2226	U2227	U2228	U2229	C2230	U2231	U2232	U2233	C2234	G2235	U2236	A2237	C2238	C2239	C2240	A2241	U2244	U2245	U2246	U2247	C2248	U2249	G2250	C2251	G2252	U2253	C2254	G2255	U2256	U2257	C2258								
U2259	C2260	C2261	U2262	C2263	C2264	U2265	A2266	A2267	A2268	C2269	C2270	A2271	C2272	C2273	C2274	A2275	G2276	G2277	A2278	G2279	G2280	A2281	C2282	C2283	A2284	C2285	C2286	C2287	G2288	C2289	U2291	U2292	G2293	C2294	C2295	U2296	A2297	A2298	U2299	C2300	C2301	U2302	C2303	C2304	U2305	C2306	G2307	C2308	A2309	C2310	A2311	A2314	A2317	C2318	U2319	U2320										
C2321	C2322	C2323	C2324	C2325	C2326	C2327	C2328	C2329	C2330	C2331	C2332	C2333	C2334	C2335	C2336	C2337	C2338	C2339	C2340	C2341	C2342	C2343	C2344	C2345	C2346	C2347	C2348	C2349	C2350	C2351	C2352	C2353	C2354	C2355	C2356	C2357	C2358	C2359	C2360	C2361	C2362	C2363	C2364	C2365	C2366	C2367	C2368	C2369	C2370	C2371	C2372	C2373	C2374	C2375	C2376	C2377	C2378	C2379	C2380	C2381	C2382	C2383	C2384	C2385	C2386	C2387

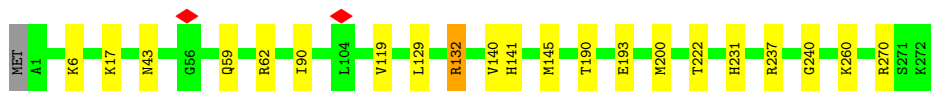




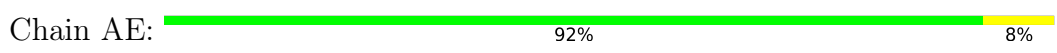
• Molecule 3: 50S ribosomal protein L1

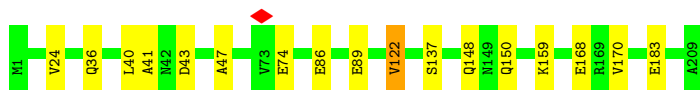


• Molecule 4: 50S ribosomal protein L2



• Molecule 5: 50S ribosomal protein L3





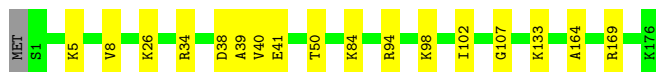
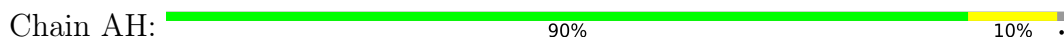
- Molecule 6: 50S ribosomal protein L4



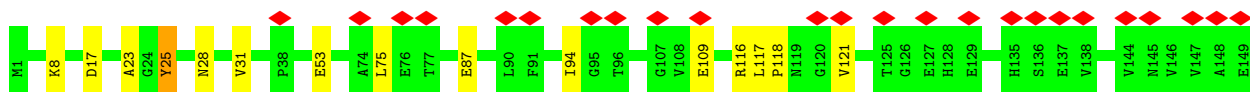
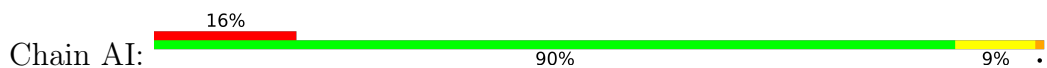
- Molecule 7: 50S ribosomal protein L5



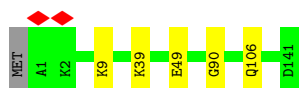
- Molecule 8: 50S ribosomal protein L6



- Molecule 9: 50S ribosomal protein L9



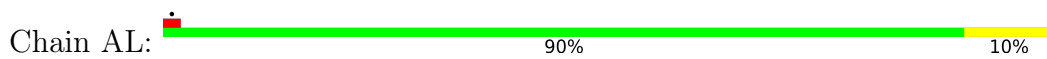
- Molecule 10: 50S ribosomal protein L11



- Molecule 11: 50S ribosomal protein L13



- Molecule 12: 50S ribosomal protein L14



- Molecule 13: 50S ribosomal protein L15



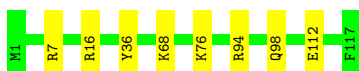
- Molecule 14: 50S ribosomal protein L16



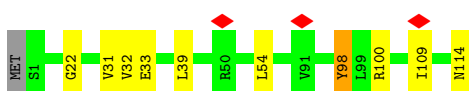
- Molecule 15: 50S ribosomal protein L17



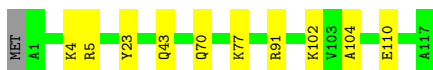
- Molecule 16: 50S ribosomal protein L18



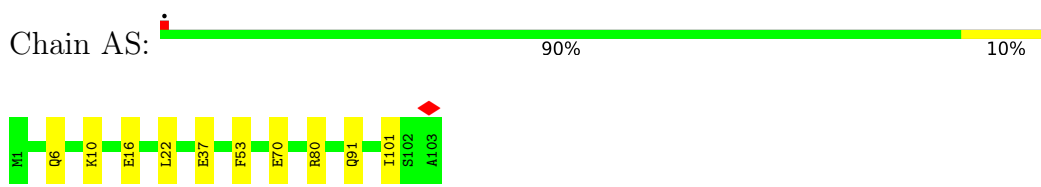
- Molecule 17: 50S ribosomal protein L19



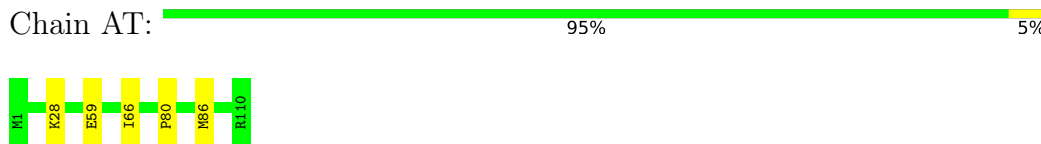
- Molecule 18: 50S ribosomal protein L20



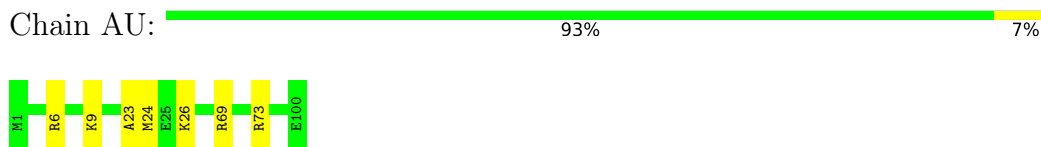
- Molecule 19: 50S ribosomal protein L21



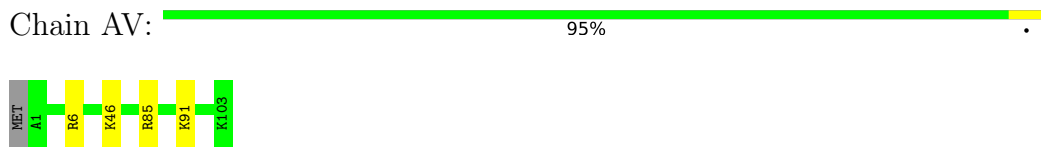
- Molecule 20: 50S ribosomal protein L22



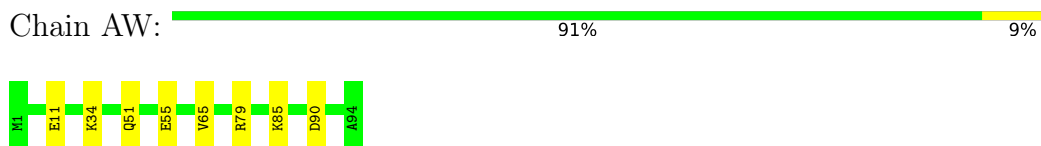
- Molecule 21: 50S ribosomal protein L23



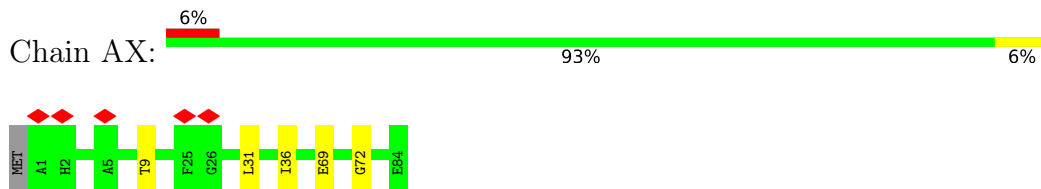
- Molecule 22: 50S ribosomal protein L24



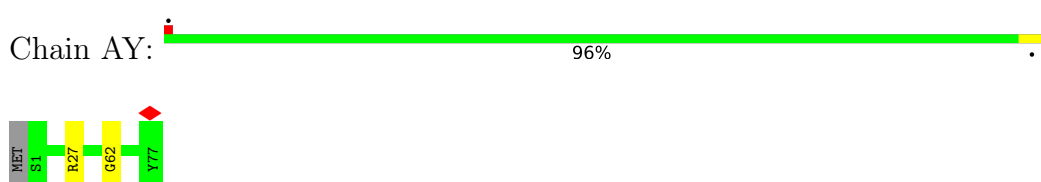
- Molecule 23: 50S ribosomal protein L25




- Molecule 24: 50S ribosomal protein L27

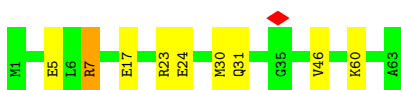


- Molecule 25: 50S ribosomal protein L28



- Molecule 26: 50S ribosomal protein L29

Chain AZ:  86% 13%

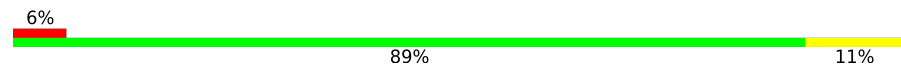


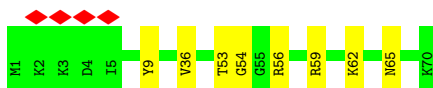
- Molecule 27: 50S ribosomal protein L30

Chain Aa:  92% 7%



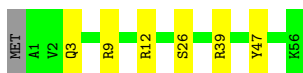
- Molecule 28: 50S ribosomal protein L31

Chain Ab:  6% 89% 11%



- Molecule 29: 50S ribosomal protein L32

Chain Ac:  88% 11%



- Molecule 30: 50S ribosomal protein L33

Chain Ad:  93% 5%



- Molecule 31: 50S ribosomal protein L34

Chain Ae:  87% 13%

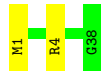


- Molecule 32: 50S ribosomal protein L35

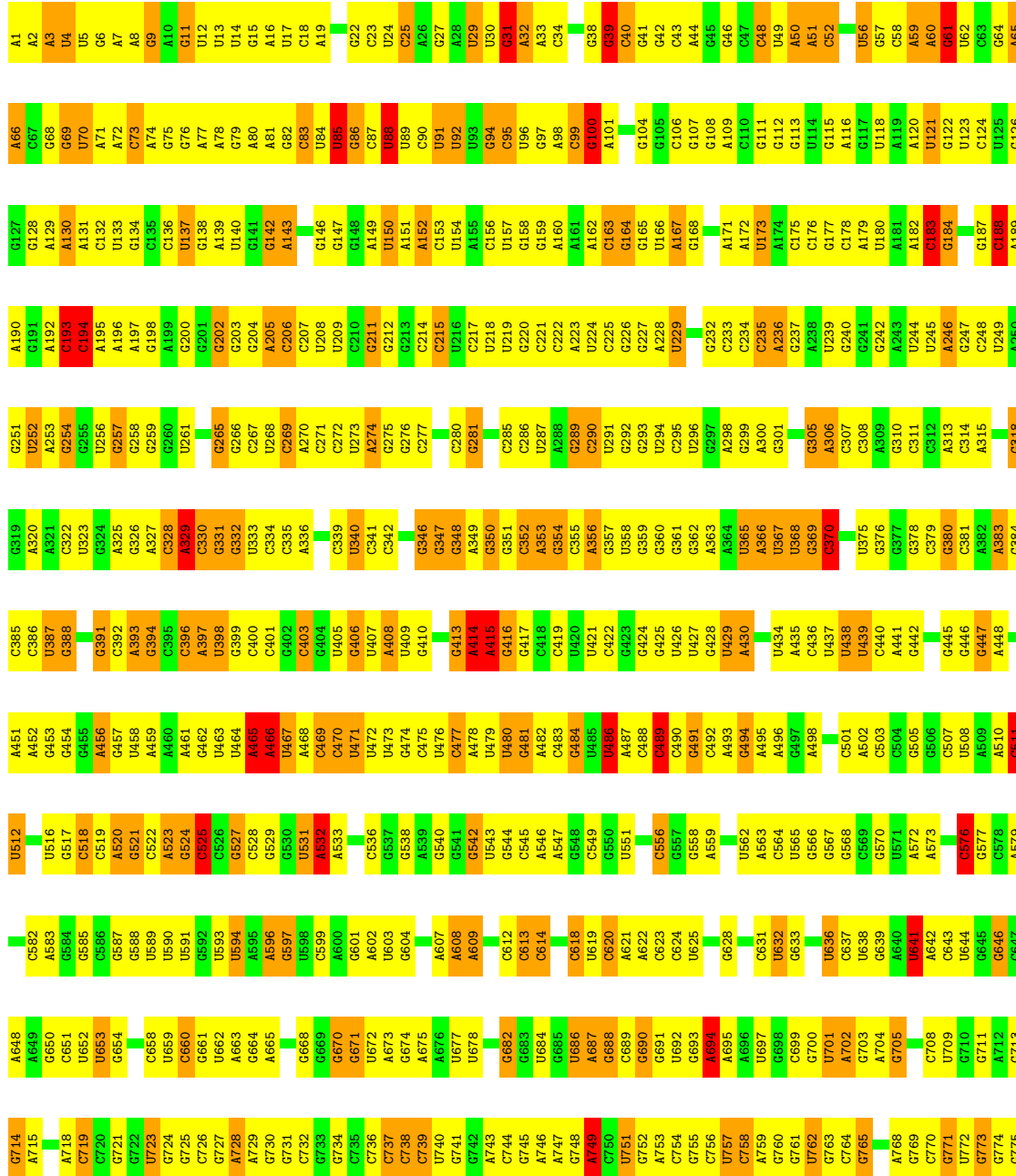
Chain Af:  95%



• Molecule 33: 50S ribosomal protein L36



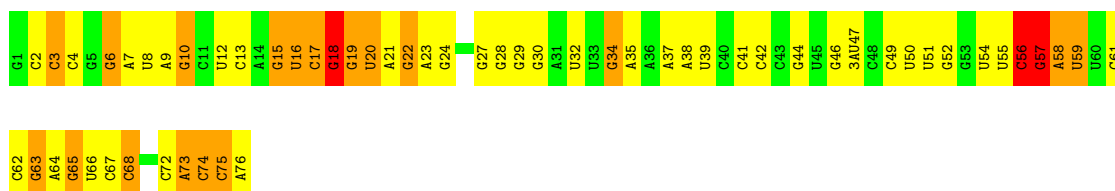
• Molecule 34: 16S ribosomal RNA





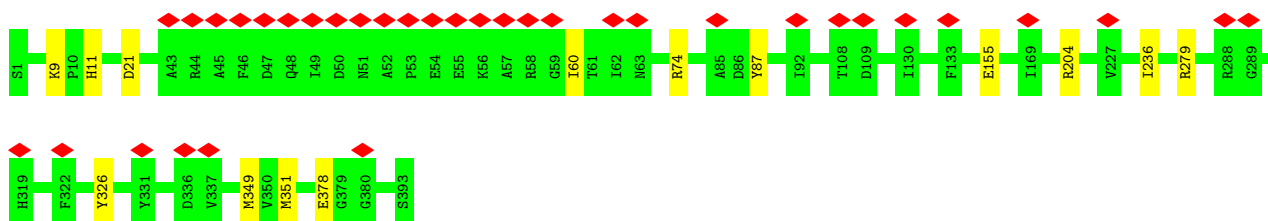
- Molecule 35: A/T-site tRNA Phe

Chain BE: 

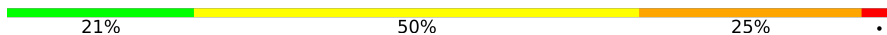


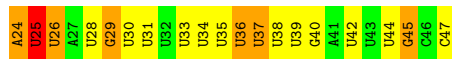
- Molecule 36: Elongation factor Tu 2

Chain BC: 



- Molecule 37: mRNA

Chain BD: 



- Molecule 38: 30S ribosomal protein S2

Chain BF: 



- Molecule 39: 30S ribosomal protein S3

Chain BG: 



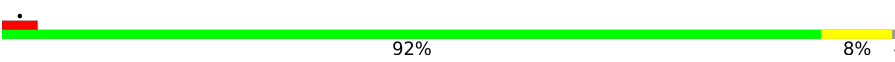
- Molecule 40: 30S ribosomal protein S4

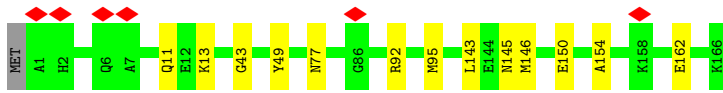
Chain BH: 





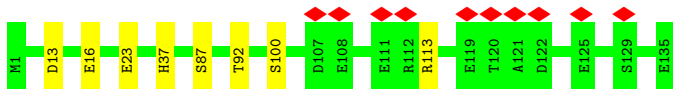
- Molecule 41: 30S ribosomal protein S5

Chain BI:  92% 8%



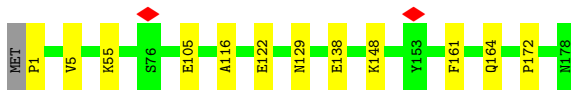
- Molecule 42: 30S ribosomal protein S6

Chain BJ:  7% 94% 6%



- Molecule 43: 30S ribosomal protein S7

Chain BK:  93% 7%



- Molecule 44: 30S ribosomal protein S8

Chain BL:  93% 6%




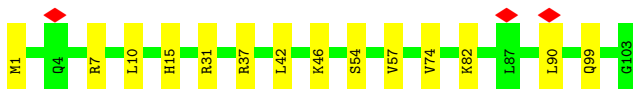
- Molecule 45: 30S ribosomal protein S9

Chain BM:  90% 9%



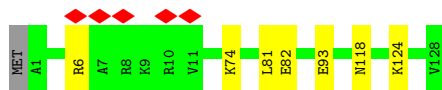
- Molecule 46: 30S ribosomal protein S10

Chain BN:  86% 14%



- Molecule 47: 30S ribosomal protein S11

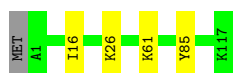
Chain BO:  94% 5%



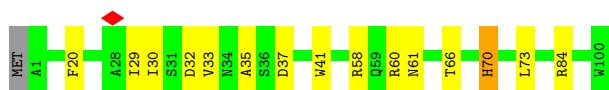
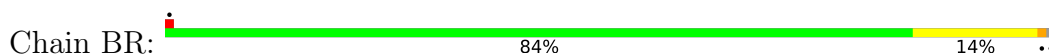
- Molecule 48: 30S ribosomal protein S12



- Molecule 49: 30S ribosomal protein S13



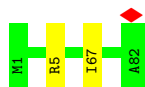
- Molecule 50: 30S ribosomal protein S14



- Molecule 51: 30S ribosomal protein S15




- Molecule 52: 30S ribosomal protein S16



- Molecule 53: 30S ribosomal protein S17



- Molecule 54: 30S ribosomal protein S18

Chain BV:  87% 9% ..



- Molecule 55: 30S ribosomal protein S19

Chain BW:  5% 92% 5% ..




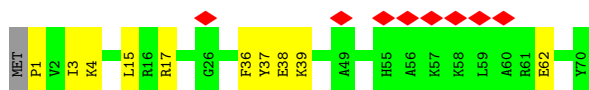
- Molecule 56: 30S ribosomal protein S20

Chain BX:  97% ..



- Molecule 57: 30S ribosomal protein S21

Chain BY:  11% 85% 14% .



## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	359223	Depositor
Resolution determination method	Not provided	
CTF correction method	Not provided	
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	20	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	59000	Depositor
Image detector	TVIPS TEMCAM-F415 (4k x 4k)	Depositor
Maximum map value	299.406	Depositor
Minimum map value	-102.404	Depositor
Average map value	5.380	Depositor
Map value standard deviation	28.487	Depositor
Recommended contour level	32.4	Depositor
Map size ( $\text{\AA}$ )	375, 375, 375	wwPDB
Map dimensions	250, 250, 250	wwPDB
Map angles ( $^\circ$ )	90, 90, 90	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.5, 1.5, 1.5	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: CH, PSU, MA6, MIA, 1MG, 3AU, 7MG, 4SU, OMU, H2U, OMC, UR3, 3TD, 5MC, 4OC, 6MZ, 5MU, OMG, 2MA, 2MG

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	AA	1.18	0/2869	2.04	104/4474 (2.3%)
2	AB	1.17	0/69257	1.96	2261/108040 (2.1%)
3	AC	0.56	0/1748	0.96	1/2355 (0.0%)
4	AD	0.60	0/2131	1.07	1/2863 (0.0%)
5	AE	0.58	0/1586	1.02	0/2134
6	AF	0.57	0/1571	0.99	0/2113
7	AG	0.65	0/1444	1.10	4/1937 (0.2%)
8	AH	0.59	0/1343	1.02	0/1816
9	AI	0.57	0/1122	1.01	1/1515 (0.1%)
10	AJ	0.57	0/1046	0.92	0/1410
11	AK	0.63	0/1152	0.99	0/1551
12	AL	0.57	0/956	1.00	0/1279
13	AM	0.60	0/1062	1.01	0/1413
14	AN	0.63	0/1093	1.05	1/1460 (0.1%)
15	AO	0.61	0/1021	1.03	0/1364
16	AP	0.60	0/910	1.00	0/1219
17	AQ	0.61	0/929	1.06	0/1242
18	AR	0.67	0/960	1.02	1/1278 (0.1%)
19	AS	0.62	0/829	1.01	0/1107
20	AT	0.52	0/864	0.96	0/1156
21	AU	0.55	0/794	0.99	0/1060
22	AV	0.56	0/797	1.03	0/1062
23	AW	0.60	0/766	0.97	0/1025
24	AX	0.64	0/642	1.09	0/848
25	AY	0.64	0/635	1.06	0/848
26	AZ	0.56	0/510	1.10	1/677 (0.1%)
27	Aa	0.54	0/453	0.98	0/605
28	Ab	0.63	0/559	1.17	2/745 (0.3%)
29	Ac	0.59	0/450	1.05	0/599
30	Ad	0.61	0/448	1.00	0/594
31	Ae	0.63	0/380	1.11	1/498 (0.2%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
32	Af	0.58	0/513	1.01	1/676 (0.1%)
33	Ag	0.53	0/303	1.00	0/397
34	BA	1.17	1/36769 (0.0%)	1.96	1171/57354 (2.0%)
35	BB	1.23	0/1580	1.96	45/2459 (1.8%)
35	BE	1.20	0/1580	2.05	59/2459 (2.4%)
36	BC	0.61	0/3092	0.96	1/4183 (0.0%)
37	BD	1.30	0/548	1.88	16/848 (1.9%)
38	BF	0.60	0/1904	1.00	0/2565
39	BG	0.60	0/1852	1.04	0/2490
40	BH	0.63	0/1665	1.02	0/2227
41	BI	0.56	0/1239	1.00	1/1664 (0.1%)
42	BJ	0.61	0/1121	1.05	0/1509
43	BK	0.62	0/1422	1.04	1/1908 (0.1%)
44	BL	0.58	0/989	0.97	0/1326
45	BM	0.65	0/1048	1.03	0/1394
46	BN	0.59	0/835	1.08	0/1127
47	BO	0.61	0/982	1.00	0/1323
48	BP	0.61	0/969	1.09	0/1300
49	BQ	0.57	0/919	1.01	0/1226
50	BR	0.63	0/817	1.14	1/1088 (0.1%)
51	BS	0.58	0/724	1.00	1/966 (0.1%)
52	BT	0.63	0/659	1.04	0/884
53	BU	0.58	0/681	0.99	0/913
54	BV	0.71	0/637	1.06	0/851
55	BW	0.60	0/744	1.02	3/995 (0.3%)
56	BX	0.55	0/676	0.91	0/895
57	BY	0.69	0/598	1.17	1/792 (0.1%)
All	All	1.03	1/165193 (0.0%)	1.75	3679/246106 (1.5%)

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
1	AA	0	27
2	AB	0	821
3	AC	0	2
5	AE	0	3
6	AF	0	1
8	AH	0	2
9	AI	0	2

*Continued on next page...*

Continued from previous page...

Mol	Chain	#Chirality outliers	#Planarity outliers
11	AK	0	2
15	AO	0	1
17	AQ	0	1
18	AR	0	1
28	Ab	0	1
30	Ad	0	1
31	Ae	0	2
34	BA	0	473
35	BB	0	12
35	BE	0	15
37	BD	0	4
38	BF	0	1
39	BG	0	2
40	BH	0	2
41	BI	0	3
42	BJ	0	1
43	BK	0	2
45	BM	0	2
47	BO	0	1
48	BP	0	1
50	BR	0	1
54	BV	0	1
55	BW	0	1
57	BY	0	3
All	All	0	1392

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
34	BA	1535	C	P-O5'	5.14	1.64	1.59

The worst 5 of 3679 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	AA	13	G	O4'-C1'-N9	15.20	120.36	108.20
2	AB	736	C	O4'-C1'-N1	14.43	119.74	108.20
34	BA	465	A	O4'-C1'-N9	13.60	119.08	108.20
2	AB	2832	U	O4'-C1'-N1	12.97	118.58	108.20
34	BA	1152	A	O4'-C1'-N9	12.96	118.57	108.20

There are no chirality outliers.

5 of 1392 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	AA	13	G	Sidechain
1	AA	14	U	Sidechain
1	AA	15	A	Sidechain
1	AA	2	G	Sidechain
1	AA	7	G	Sidechain

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	AA	2566	0	1302	0	0
2	AB	62351	0	31387	0	0
3	AC	1733	0	1824	0	0
4	AD	2092	0	2170	0	0
5	AE	1565	0	1616	0	0
6	AF	1552	0	1619	0	0
7	AG	1420	0	1460	0	0
8	AH	1323	0	1374	0	0
9	AI	1111	0	1148	0	0
10	AJ	1032	0	1088	0	0
11	AK	1129	0	1162	0	0
12	AL	947	0	1023	0	0
13	AM	1053	0	1129	0	0
14	AN	1074	0	1157	0	0
15	AO	1008	0	1045	0	0
16	AP	900	0	935	0	0
17	AQ	917	0	965	0	0
18	AR	947	0	1022	0	0
19	AS	816	0	839	0	0
20	AT	857	0	922	0	0
21	AU	787	0	846	0	0
22	AV	789	0	847	0	0
23	AW	753	0	780	0	0
24	AX	634	0	656	0	0
25	AY	625	0	655	0	0
26	AZ	509	0	543	0	0
27	Aa	449	0	491	0	0
28	Ab	549	0	552	0	0
29	Ac	444	0	461	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
30	Ad	441	0	485	0	0
31	Ae	377	0	418	0	0
32	Af	504	0	574	0	0
33	Ag	302	0	343	0	0
34	BA	33089	0	16678	0	0
35	BB	1635	0	849	0	0
35	BE	1635	0	849	0	0
36	BC	3036	0	3052	0	0
37	BD	495	0	249	0	0
38	BF	1872	0	1885	0	0
39	BG	1822	0	1913	0	0
40	BH	1643	0	1710	0	0
41	BI	1225	0	1273	0	0
42	BJ	1101	0	1050	0	0
43	BK	1400	0	1449	0	0
44	BL	979	0	1034	0	0
45	BM	1036	0	1084	0	0
46	BN	825	0	865	0	0
47	BO	965	0	997	0	0
48	BP	955	0	1019	0	0
49	BQ	910	0	981	0	0
50	BR	805	0	847	0	0
51	BS	716	0	742	0	0
52	BT	649	0	666	0	0
53	BU	672	0	716	0	0
54	BV	626	0	651	0	0
55	BW	727	0	769	0	0
56	BX	670	0	722	0	0
57	BY	590	0	631	0	0
All	All	153634	0	105519	0	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). Clashscore could not be calculated for this entry.

There are no clashes within the asymmetric unit.

There are no symmetry-related clashes.

## 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	
3	AC	232/234 (99%)	204 (88%)	25 (11%)	3 (1%)	12	48
4	AD	270/273 (99%)	239 (88%)	23 (8%)	8 (3%)	4	28
5	AE	207/209 (99%)	186 (90%)	15 (7%)	6 (3%)	4	29
6	AF	199/201 (99%)	182 (92%)	14 (7%)	3 (2%)	10	46
7	AG	176/179 (98%)	147 (84%)	27 (15%)	2 (1%)	14	52
8	AH	174/177 (98%)	163 (94%)	8 (5%)	3 (2%)	9	42
9	AI	147/149 (99%)	126 (86%)	16 (11%)	5 (3%)	3	26
10	AJ	139/142 (98%)	123 (88%)	15 (11%)	1 (1%)	22	63
11	AK	140/142 (99%)	132 (94%)	8 (6%)	0	100	100
12	AL	121/123 (98%)	106 (88%)	13 (11%)	2 (2%)	9	42
13	AM	142/144 (99%)	125 (88%)	15 (11%)	2 (1%)	11	46
14	AN	134/136 (98%)	122 (91%)	9 (7%)	3 (2%)	6	35
15	AO	125/127 (98%)	117 (94%)	7 (6%)	1 (1%)	19	60
16	AP	115/117 (98%)	104 (90%)	10 (9%)	1 (1%)	17	57
17	AQ	112/115 (97%)	100 (89%)	10 (9%)	2 (2%)	8	40
18	AR	115/118 (98%)	110 (96%)	4 (4%)	1 (1%)	17	57
19	AS	101/103 (98%)	91 (90%)	6 (6%)	4 (4%)	3	23
20	AT	108/110 (98%)	98 (91%)	9 (8%)	1 (1%)	17	57
21	AU	98/100 (98%)	85 (87%)	11 (11%)	2 (2%)	7	38
22	AV	101/104 (97%)	89 (88%)	11 (11%)	1 (1%)	15	55
23	AW	92/94 (98%)	85 (92%)	5 (5%)	2 (2%)	6	35
24	AX	82/85 (96%)	67 (82%)	12 (15%)	3 (4%)	3	24
25	AY	75/78 (96%)	64 (85%)	9 (12%)	2 (3%)	5	31
26	AZ	61/63 (97%)	49 (80%)	9 (15%)	3 (5%)	2	20
27	Aa	56/59 (95%)	54 (96%)	1 (2%)	1 (2%)	8	40

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	Ab	68/70 (97%)	57 (84%)	10 (15%)	1 (2%)	10	46
29	Ac	54/57 (95%)	47 (87%)	5 (9%)	2 (4%)	3	24
30	Ad	52/55 (94%)	45 (86%)	7 (14%)	0	100	100
31	Ae	44/46 (96%)	40 (91%)	4 (9%)	0	100	100
32	Af	62/65 (95%)	60 (97%)	2 (3%)	0	100	100
33	Ag	36/38 (95%)	32 (89%)	3 (8%)	1 (3%)	5	30
36	BC	391/393 (100%)	368 (94%)	20 (5%)	3 (1%)	19	60
38	BF	238/241 (99%)	215 (90%)	20 (8%)	3 (1%)	12	48
39	BG	230/233 (99%)	211 (92%)	17 (7%)	2 (1%)	17	57
40	BH	203/206 (98%)	191 (94%)	10 (5%)	2 (1%)	15	55
41	BI	164/167 (98%)	144 (88%)	17 (10%)	3 (2%)	8	40
42	BJ	133/135 (98%)	128 (96%)	3 (2%)	2 (2%)	10	46
43	BK	176/179 (98%)	160 (91%)	14 (8%)	2 (1%)	14	52
44	BL	127/130 (98%)	117 (92%)	8 (6%)	2 (2%)	9	44
45	BM	127/130 (98%)	111 (87%)	14 (11%)	2 (2%)	9	44
46	BN	101/103 (98%)	86 (85%)	11 (11%)	4 (4%)	3	23
47	BO	126/129 (98%)	113 (90%)	11 (9%)	2 (2%)	9	44
48	BP	121/124 (98%)	104 (86%)	12 (10%)	5 (4%)	3	23
49	BQ	115/118 (98%)	108 (94%)	7 (6%)	0	100	100
50	BR	98/101 (97%)	83 (85%)	8 (8%)	7 (7%)	1	14
51	BS	86/89 (97%)	81 (94%)	5 (6%)	0	100	100
52	BT	80/82 (98%)	79 (99%)	1 (1%)	0	100	100
53	BU	81/84 (96%)	73 (90%)	8 (10%)	0	100	100
54	BV	72/75 (96%)	65 (90%)	5 (7%)	2 (3%)	5	30
55	BW	89/92 (97%)	80 (90%)	9 (10%)	0	100	100
56	BX	84/87 (97%)	78 (93%)	6 (7%)	0	100	100
57	BY	68/71 (96%)	60 (88%)	7 (10%)	1 (2%)	10	46
All	All	6548/6682 (98%)	5904 (90%)	536 (8%)	108 (2%)	13	44

5 of 108 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	AD	260	LYS

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Mol	Chain	Res	Type
5	AE	122	VAL
5	AE	150	GLN
5	AE	170	VAL
9	AI	23	ALA

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	AC	181/181 (100%)	171 (94%)	10 (6%)	21	47
4	AD	217/218 (100%)	204 (94%)	13 (6%)	19	44
5	AE	164/164 (100%)	154 (94%)	10 (6%)	18	44
6	AF	165/165 (100%)	158 (96%)	7 (4%)	30	54
7	AG	149/150 (99%)	138 (93%)	11 (7%)	13	38
8	AH	137/138 (99%)	125 (91%)	12 (9%)	10	31
9	AI	114/114 (100%)	106 (93%)	8 (7%)	15	40
10	AJ	109/110 (99%)	105 (96%)	4 (4%)	34	58
11	AK	116/116 (100%)	113 (97%)	3 (3%)	46	66
12	AL	104/104 (100%)	94 (90%)	10 (10%)	8	27
13	AM	103/103 (100%)	99 (96%)	4 (4%)	32	56
14	AN	109/109 (100%)	103 (94%)	6 (6%)	21	47
15	AO	103/103 (100%)	101 (98%)	2 (2%)	57	75
16	AP	87/87 (100%)	80 (92%)	7 (8%)	12	35
17	AQ	99/100 (99%)	91 (92%)	8 (8%)	11	35
18	AR	89/90 (99%)	82 (92%)	7 (8%)	12	35
19	AS	84/84 (100%)	78 (93%)	6 (7%)	14	39
20	AT	93/93 (100%)	89 (96%)	4 (4%)	29	53
21	AU	84/84 (100%)	79 (94%)	5 (6%)	19	44
22	AV	84/85 (99%)	81 (96%)	3 (4%)	35	59

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
23	AW	78/78 (100%)	72 (92%)	6 (8%)	13	37
24	AX	62/63 (98%)	60 (97%)	2 (3%)	39	61
25	AY	67/68 (98%)	67 (100%)	0	100	100
26	AZ	55/55 (100%)	49 (89%)	6 (11%)	6	23
27	Aa	48/49 (98%)	45 (94%)	3 (6%)	18	43
28	Ab	62/62 (100%)	58 (94%)	4 (6%)	17	42
29	Ac	47/48 (98%)	43 (92%)	4 (8%)	10	33
30	Ad	48/49 (98%)	46 (96%)	2 (4%)	30	54
31	Ae	38/38 (100%)	35 (92%)	3 (8%)	12	35
32	Af	51/52 (98%)	50 (98%)	1 (2%)	55	74
33	Ag	34/34 (100%)	33 (97%)	1 (3%)	42	64
36	BC	326/326 (100%)	316 (97%)	10 (3%)	40	62
38	BF	198/199 (100%)	188 (95%)	10 (5%)	24	48
39	BG	189/190 (100%)	176 (93%)	13 (7%)	15	40
40	BH	172/173 (99%)	164 (95%)	8 (5%)	26	51
41	BI	125/126 (99%)	118 (94%)	7 (6%)	21	46
42	BJ	116/116 (100%)	111 (96%)	5 (4%)	29	53
43	BK	146/147 (99%)	139 (95%)	7 (5%)	25	51
44	BL	104/105 (99%)	98 (94%)	6 (6%)	20	45
45	BM	106/107 (99%)	98 (92%)	8 (8%)	13	38
46	BN	90/90 (100%)	80 (89%)	10 (11%)	6	22
47	BO	98/99 (99%)	94 (96%)	4 (4%)	30	55
48	BP	103/104 (99%)	100 (97%)	3 (3%)	42	64
49	BQ	95/96 (99%)	91 (96%)	4 (4%)	30	54
50	BR	83/84 (99%)	76 (92%)	7 (8%)	11	33
51	BS	76/77 (99%)	75 (99%)	1 (1%)	69	81
52	BT	65/65 (100%)	63 (97%)	2 (3%)	40	62
53	BU	77/78 (99%)	75 (97%)	2 (3%)	46	66
54	BV	64/65 (98%)	56 (88%)	8 (12%)	4	19
55	BW	78/79 (99%)	74 (95%)	4 (5%)	24	48
56	BX	65/66 (98%)	63 (97%)	2 (3%)	40	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
57	BY	60/61 (98%)	55 (92%)	5 (8%)	11	34
All	All	5417/5447 (99%)	5119 (94%)	298 (6%)	25	47

5 of 298 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
43	BK	164	GLN
54	BV	69	TYR
45	BM	12	LYS
48	BP	81	ILE
14	AN	100	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	AA	119/120 (99%)	15 (12%)	3 (2%)
2	AB	2898/2904 (99%)	396 (13%)	130 (4%)
34	BA	1538/1542 (99%)	192 (12%)	77 (5%)
35	BB	73/76 (96%)	12 (16%)	2 (2%)
35	BE	73/76 (96%)	12 (16%)	6 (8%)
37	BD	24/24 (100%)	4 (16%)	5 (20%)
All	All	4725/4742 (99%)	631 (13%)	223 (4%)

5 of 631 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	AA	10	G
1	AA	13	G
1	AA	15	A
1	AA	16	G
1	AA	36	C

5 of 223 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	AB	2602	A
35	BE	56	C

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Mol	Chain	Res	Type
34	BA	193	C
35	BE	18	G
34	BA	1302	C

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
2	3TD	AB	1915	2	18,22,23	0.80	0	22,32,35	0.93	1 (4%)
35	H2U	BB	16	35	18,21,22	0.82	0	21,30,33	1.08	1 (4%)
35	PSU	BB	39	35	18,21,22	0.86	0	22,30,33	0.94	1 (4%)
2	6MZ	AB	2030	2	18,25,26	0.97	1 (5%)	16,36,39	1.39	3 (18%)
35	4SU	BE	8	35	18,21,22	1.40	1 (5%)	26,30,33	1.64	6 (23%)
35	5MU	BE	54	35	19,22,23	0.67	0	28,32,35	1.15	3 (10%)
2	PSU	AB	2580	2	18,21,22	0.96	0	22,30,33	1.24	2 (9%)
2	PSU	AB	1917	2	18,21,22	0.92	0	22,30,33	0.72	1 (4%)
2	1MG	AB	745	2	18,26,27	1.16	2 (11%)	19,39,42	1.34	2 (10%)
35	PSU	BB	32	35	18,21,22	0.95	1 (5%)	22,30,33	1.09	2 (9%)
2	5MU	AB	1939	2	19,22,23	0.66	0	28,32,35	1.25	3 (10%)
35	5MU	BB	54	35	19,22,23	0.66	0	28,32,35	1.23	3 (10%)
35	4SU	BB	8	35	18,21,22	1.41	1 (5%)	26,30,33	1.15	3 (11%)
2	OMG	AB	2251	2	18,26,27	1.11	2 (11%)	19,38,41	0.90	0
34	2MG	BA	1516	34	18,26,27	1.21	3 (16%)	16,38,41	0.83	1 (6%)
2	5MU	AB	747	2	19,22,23	0.71	0	28,32,35	1.39	3 (10%)
2	5MC	AB	1962	2	18,22,23	0.56	0	26,32,35	1.17	3 (11%)
2	PSU	AB	2457	2	18,21,22	0.98	1 (5%)	22,30,33	1.37	3 (13%)
35	3AU	BE	47	-	25,28,29	0.90	1 (4%)	32,40,43	1.22	4 (12%)
34	PSU	BA	516	34	18,21,22	0.93	1 (5%)	22,30,33	1.11	1 (4%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	PSU	AB	746	2	18,21,22	1.00	1 (5%)	22,30,33	1.31	2 (9%)
34	2MG	BA	966	34	18,26,27	1.17	1 (5%)	16,38,41	1.31	3 (18%)
35	MIA	BB	37	35	24,31,32	1.09	3 (12%)	26,44,47	1.72	5 (19%)
35	H2U	BE	16	35	18,21,22	0.84	0	21,30,33	1.07	1 (4%)
34	UR3	BA	1498	34	19,22,23	0.72	0	26,32,35	0.92	1 (3%)
34	MA6	BA	1519	34	19,26,27	1.05	1 (5%)	18,38,41	1.21	2 (11%)
35	H2U	BE	20	35	18,21,22	0.81	0	21,30,33	1.26	2 (9%)
2	PSU	AB	2504	2	18,21,22	1.09	2 (11%)	22,30,33	1.30	2 (9%)
34	5MC	BA	1407	34	18,22,23	0.65	0	26,32,35	0.93	1 (3%)
2	2MG	AB	1835	2	18,26,27	1.16	2 (11%)	16,38,41	1.00	1 (6%)
34	MA6	BA	1518	34	19,26,27	1.06	2 (10%)	18,38,41	0.74	0
34	7MG	BA	527	34	22,26,27	4.60	1 (4%)	29,39,42	1.40	3 (10%)
2	PSU	AB	1911	2	18,21,22	0.90	0	22,30,33	0.81	1 (4%)
35	H2U	BB	20	35	18,21,22	0.81	0	21,30,33	1.00	1 (4%)
35	7MG	BE	46	35	22,26,27	4.63	2 (9%)	29,39,42	1.40	2 (6%)
2	CH	AB	2575	2	16,21,22	1.03	1 (6%)	20,30,33	1.26	2 (10%)
2	2MG	AB	2445	2	18,26,27	1.21	2 (11%)	16,38,41	0.77	0
34	5MC	BA	967	34	18,22,23	0.65	0	26,32,35	0.84	1 (3%)
2	2MA	AB	2503	2	17,25,26	1.17	2 (11%)	17,37,40	1.33	2 (11%)
34	2MG	BA	1207	34	18,26,27	1.20	1 (5%)	16,38,41	0.95	0
35	PSU	BE	55	35	18,21,22	1.00	1 (5%)	22,30,33	0.94	1 (4%)
2	PSU	AB	2605	2	18,21,22	0.91	0	22,30,33	0.94	1 (4%)
35	PSU	BE	39	35	18,21,22	0.93	1 (5%)	22,30,33	1.00	1 (4%)
2	7MG	AB	2069	2	22,26,27	4.64	1 (4%)	29,39,42	1.34	1 (3%)
2	6MZ	AB	1618	2	18,25,26	0.98	1 (5%)	16,36,39	1.32	2 (12%)
2	H2U	AB	2449	2	18,21,22	0.81	0	21,30,33	0.91	1 (4%)
35	PSU	BB	55	35	18,21,22	0.93	1 (5%)	22,30,33	1.04	1 (4%)
35	PSU	BE	32	35	18,21,22	0.96	1 (5%)	22,30,33	1.08	2 (9%)
2	OMU	AB	2552	2	19,22,23	0.71	0	26,31,34	0.95	2 (7%)
2	PSU	AB	955	2	18,21,22	0.88	0	22,30,33	1.08	1 (4%)
34	4OC	BA	1402	34	20,23,24	0.71	0	26,32,35	1.08	2 (7%)
35	7MG	BB	46	35	22,26,27	4.67	2 (9%)	29,39,42	1.34	2 (6%)
35	3AU	BB	47	-	25,28,29	0.88	1 (4%)	32,40,43	0.90	1 (3%)
35	MIA	BE	37	35	24,31,32	1.10	3 (12%)	26,44,47	1.56	4 (15%)
2	OMC	AB	2498	2	19,22,23	0.56	0	26,31,34	0.87	0



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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	3TD	AB	1915	2	-	0/7/25/26	0/2/2/2
35	H2U	BB	16	35	-	1/7/38/39	0/2/2/2
35	PSU	BB	39	35	-	0/7/25/26	0/2/2/2
2	6MZ	AB	2030	2	-	1/5/27/28	0/3/3/3
35	4SU	BE	8	35	-	0/7/25/26	0/2/2/2
35	5MU	BE	54	35	-	0/7/25/26	0/2/2/2
2	PSU	AB	2580	2	-	0/7/25/26	0/2/2/2
2	PSU	AB	1917	2	-	0/7/25/26	0/2/2/2
2	1MG	AB	745	2	-	0/3/25/26	0/3/3/3
35	PSU	BB	32	35	-	2/7/25/26	0/2/2/2
2	5MU	AB	1939	2	-	0/7/25/26	0/2/2/2
35	5MU	BB	54	35	-	0/7/25/26	0/2/2/2
35	4SU	BB	8	35	-	0/7/25/26	0/2/2/2
2	OMG	AB	2251	2	-	0/5/27/28	0/3/3/3
34	2MG	BA	1516	34	-	0/5/27/28	0/3/3/3
2	5MU	AB	747	2	-	4/7/25/26	0/2/2/2
2	5MC	AB	1962	2	-	5/7/25/26	0/2/2/2
2	PSU	AB	2457	2	-	0/7/25/26	0/2/2/2
35	3AU	BE	47	-	-	5/16/34/35	0/2/2/2
34	PSU	BA	516	34	-	0/7/25/26	0/2/2/2
2	PSU	AB	746	2	-	2/7/25/26	0/2/2/2
34	2MG	BA	966	34	-	0/5/27/28	0/3/3/3
35	MIA	BB	37	35	-	1/11/33/34	0/3/3/3
35	H2U	BE	16	35	-	0/7/38/39	0/2/2/2
34	UR3	BA	1498	34	-	0/7/25/26	0/2/2/2
34	MA6	BA	1519	34	-	0/7/29/30	0/3/3/3
35	H2U	BE	20	35	-	0/7/38/39	0/2/2/2
2	PSU	AB	2504	2	-	2/7/25/26	0/2/2/2
34	5MC	BA	1407	34	-	0/7/25/26	0/2/2/2
2	2MG	AB	1835	2	-	0/5/27/28	0/3/3/3
34	MA6	BA	1518	34	-	0/7/29/30	0/3/3/3
34	7MG	BA	527	34	-	1/7/37/38	0/3/3/3
2	PSU	AB	1911	2	-	0/7/25/26	0/2/2/2
35	H2U	BB	20	35	-	1/7/38/39	0/2/2/2
35	7MG	BE	46	35	-	0/7/37/38	0/3/3/3
2	CH	AB	2575	2	-	1/5/25/26	0/2/2/2
2	2MG	AB	2445	2	-	0/5/27/28	0/3/3/3
34	5MC	BA	967	34	-	0/7/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	2MA	AB	2503	2	-	0/3/25/26	0/3/3/3
34	2MG	BA	1207	34	-	0/5/27/28	0/3/3/3
35	PSU	BE	55	35	-	1/7/25/26	0/2/2/2
2	PSU	AB	2605	2	-	0/7/25/26	0/2/2/2
35	PSU	BE	39	35	-	0/7/25/26	0/2/2/2
2	7MG	AB	2069	2	-	0/7/37/38	0/3/3/3
2	6MZ	AB	1618	2	-	0/5/27/28	0/3/3/3
2	H2U	AB	2449	2	-	0/7/38/39	0/2/2/2
35	PSU	BB	55	35	-	1/7/25/26	0/2/2/2
35	PSU	BE	32	35	-	0/7/25/26	0/2/2/2
2	OMU	AB	2552	2	-	0/9/27/28	0/2/2/2
2	PSU	AB	955	2	-	0/7/25/26	0/2/2/2
34	4OC	BA	1402	34	-	0/9/29/30	0/2/2/2
35	7MG	BB	46	35	-	1/7/37/38	0/3/3/3
35	3AU	BB	47	-	-	2/16/34/35	0/2/2/2
35	MIA	BE	37	35	-	0/11/33/34	0/3/3/3
2	OMC	AB	2498	2	-	1/9/27/28	0/2/2/2

The worst 5 of 47 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
35	BB	46	7MG	C8-N9	-21.59	1.33	1.46
2	AB	2069	7MG	C8-N9	-21.49	1.34	1.46
35	BE	46	7MG	C8-N9	-21.44	1.34	1.46
34	BA	527	7MG	C8-N9	-21.30	1.34	1.46
35	BB	8	4SU	C5-C4	-5.01	1.36	1.42

The worst 5 of 100 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
35	BB	37	MIA	C11-S10-C2	5.98	106.73	102.27
35	BE	46	7MG	N9-C8-N7	5.91	111.82	103.38
2	AB	2069	7MG	N9-C8-N7	5.82	111.70	103.38
34	BA	527	7MG	N9-C8-N7	5.72	111.56	103.38
35	BB	46	7MG	N9-C8-N7	5.60	111.39	103.38

There are no chirality outliers.

5 of 32 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	AB	747	5MU	C2'-C1'-N1-C2

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Mol	Chain	Res	Type	Atoms
34	BA	527	7MG	C4'-C5'-O5'-P
35	BB	37	MIA	N6-C12-C13-C14
35	BB	46	7MG	C4'-C5'-O5'-P
2	AB	1962	5MC	C2'-C1'-N1-C6

There are no ring outliers.

No monomer is involved in short contacts.

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

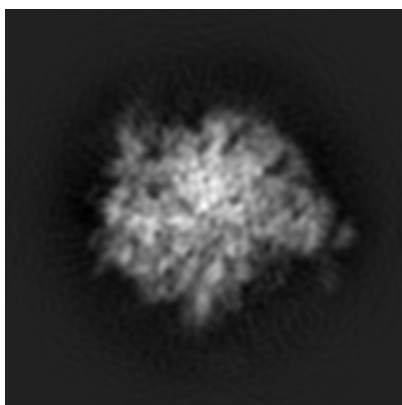
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-1849. These allow visual inspection of the internal detail of the map and identification of artifacts.

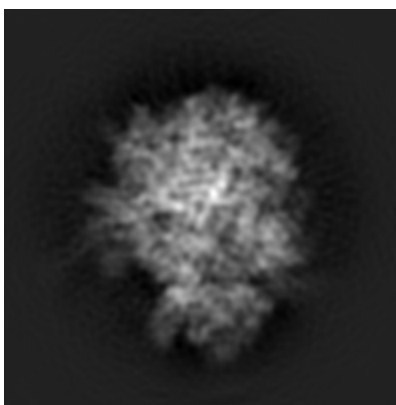
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

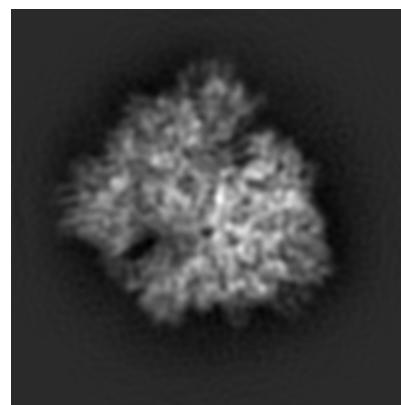
#### 6.1.1 Primary map



X



Y

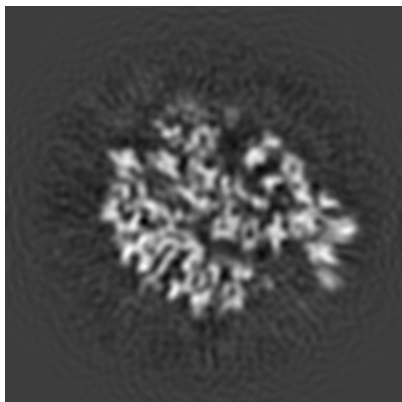


Z

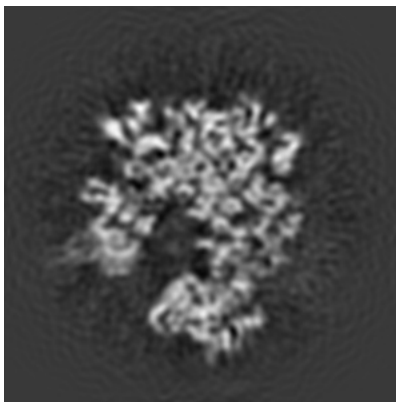
The images above show the map projected in three orthogonal directions.

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

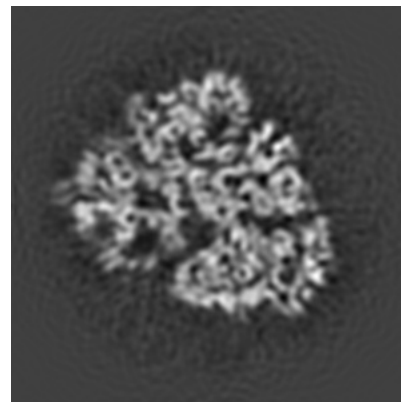
#### 6.2.1 Primary map



X Index: 125



Y Index: 125

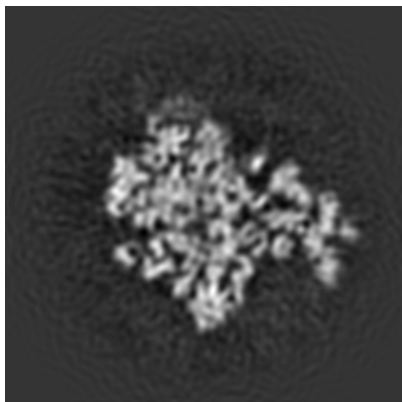


Z Index: 125

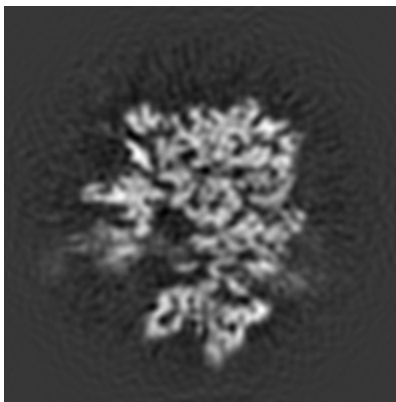
The images above show central slices of the map in three orthogonal directions.

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

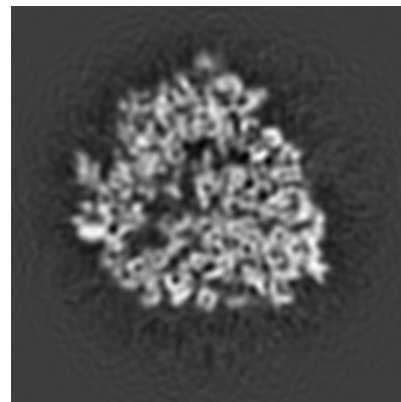
### 6.3.1 Primary map



X Index: 130



Y Index: 130

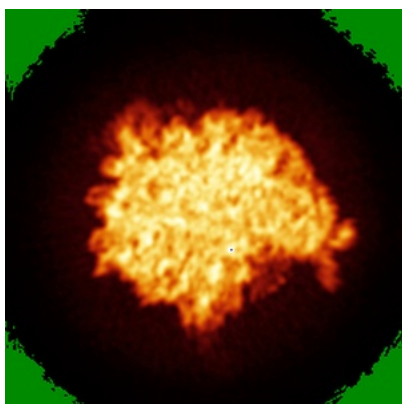


Z Index: 117

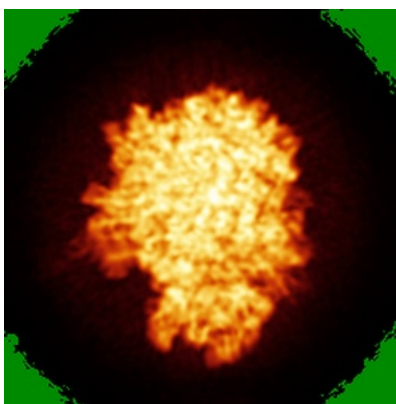
The images above show the largest variance slices of the map in three orthogonal directions.

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

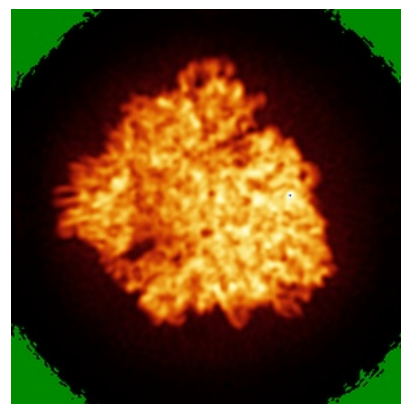
### 6.4.1 Primary map



X



Y

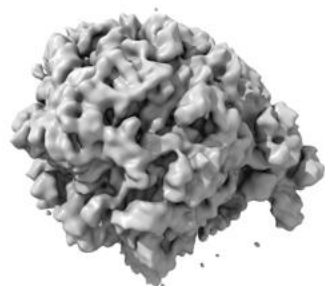


Z

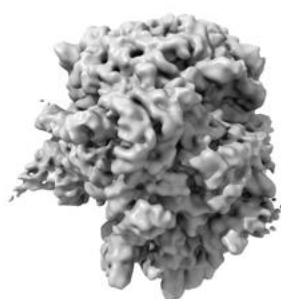
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

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

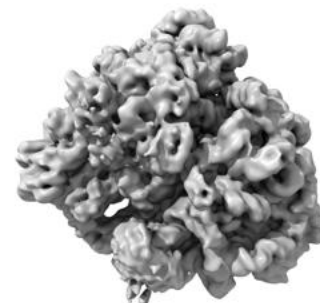
### 6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 32.4. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

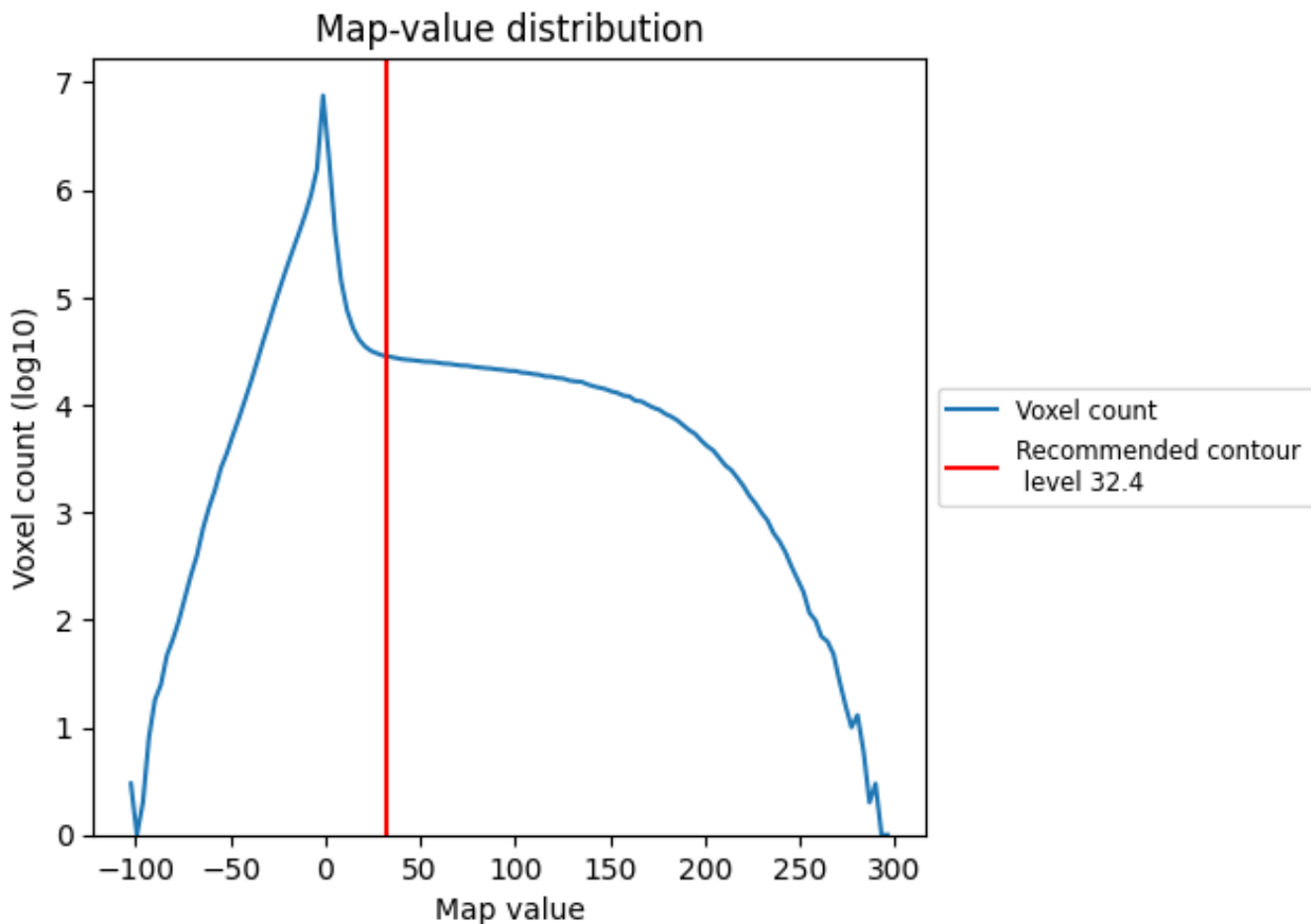
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

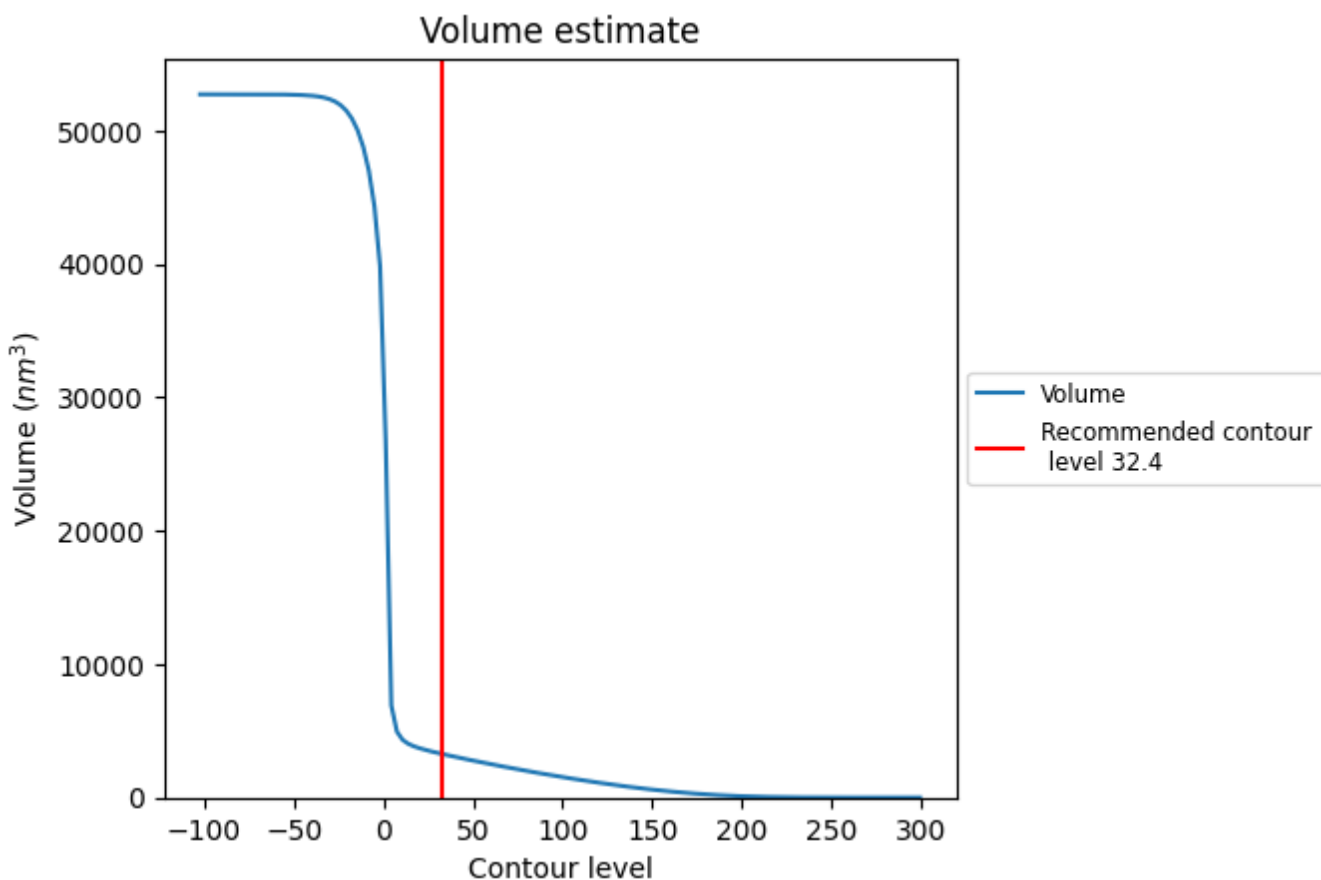
This section contains the results of statistical analysis of the map.

### 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](#)

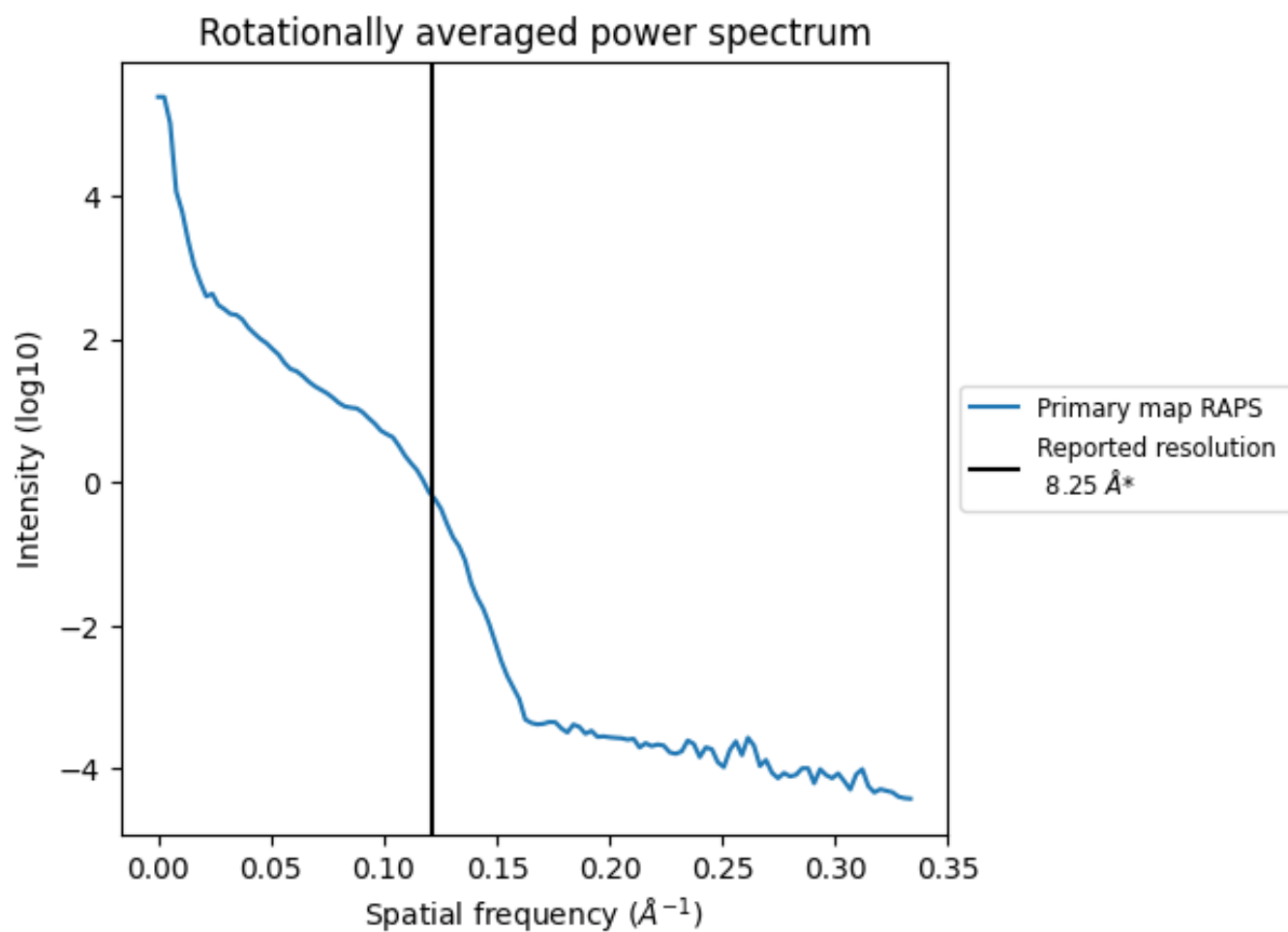


The volume at the recommended contour level is 3278  $\text{nm}^3$ ; this corresponds to an approximate mass of 2961 kDa.

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  $0.121 \text{\AA}^{-1}$

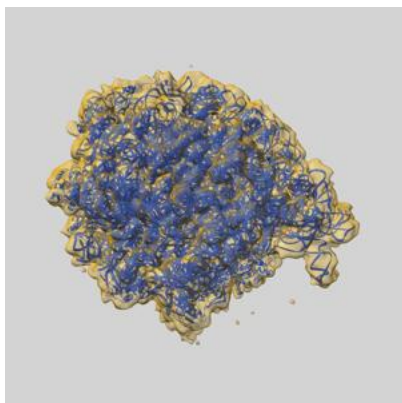
## 8 Fourier-Shell correlation

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

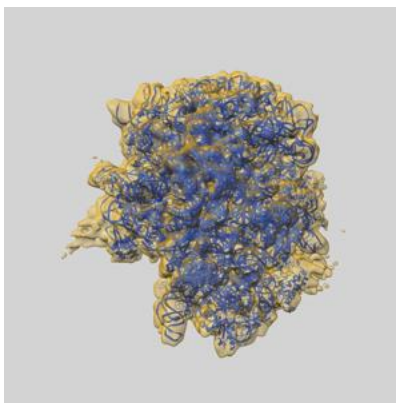
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-1849 and PDB model 4V6K. Per-residue inclusion information can be found in section 3 on page 14.

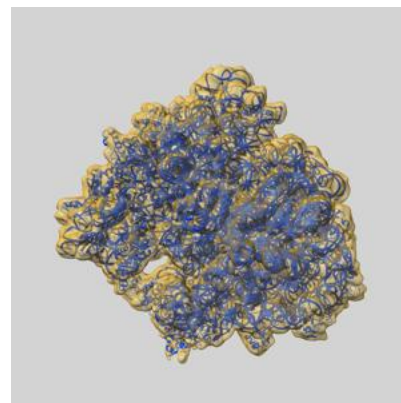
### 9.1 Map-model overlay [i](#)



X



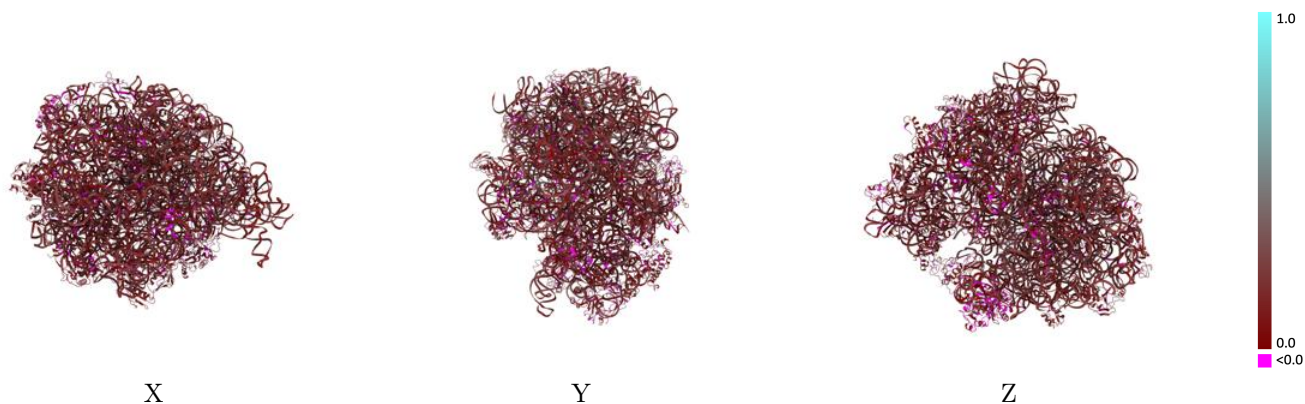
Y



Z

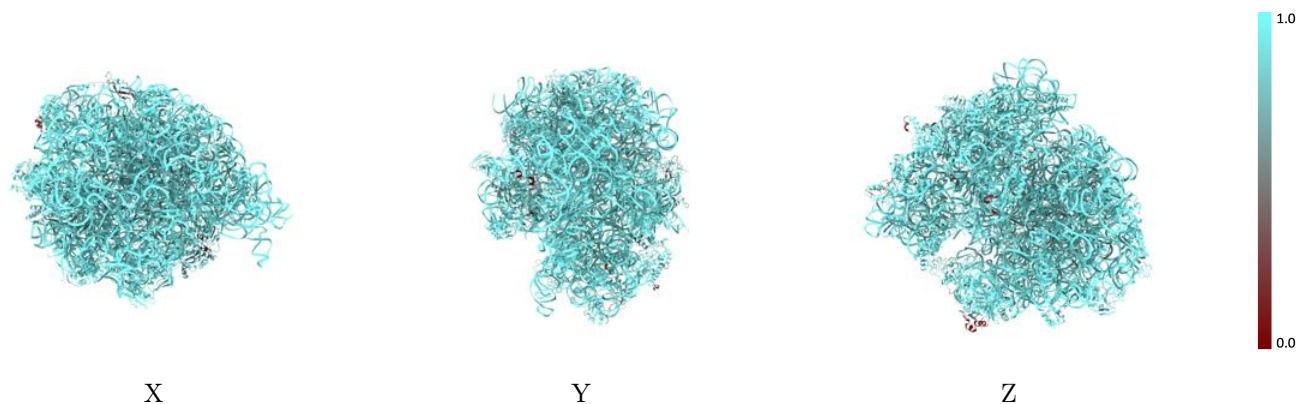
The images above show the 3D surface view of the map at the recommended contour level 32.4 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



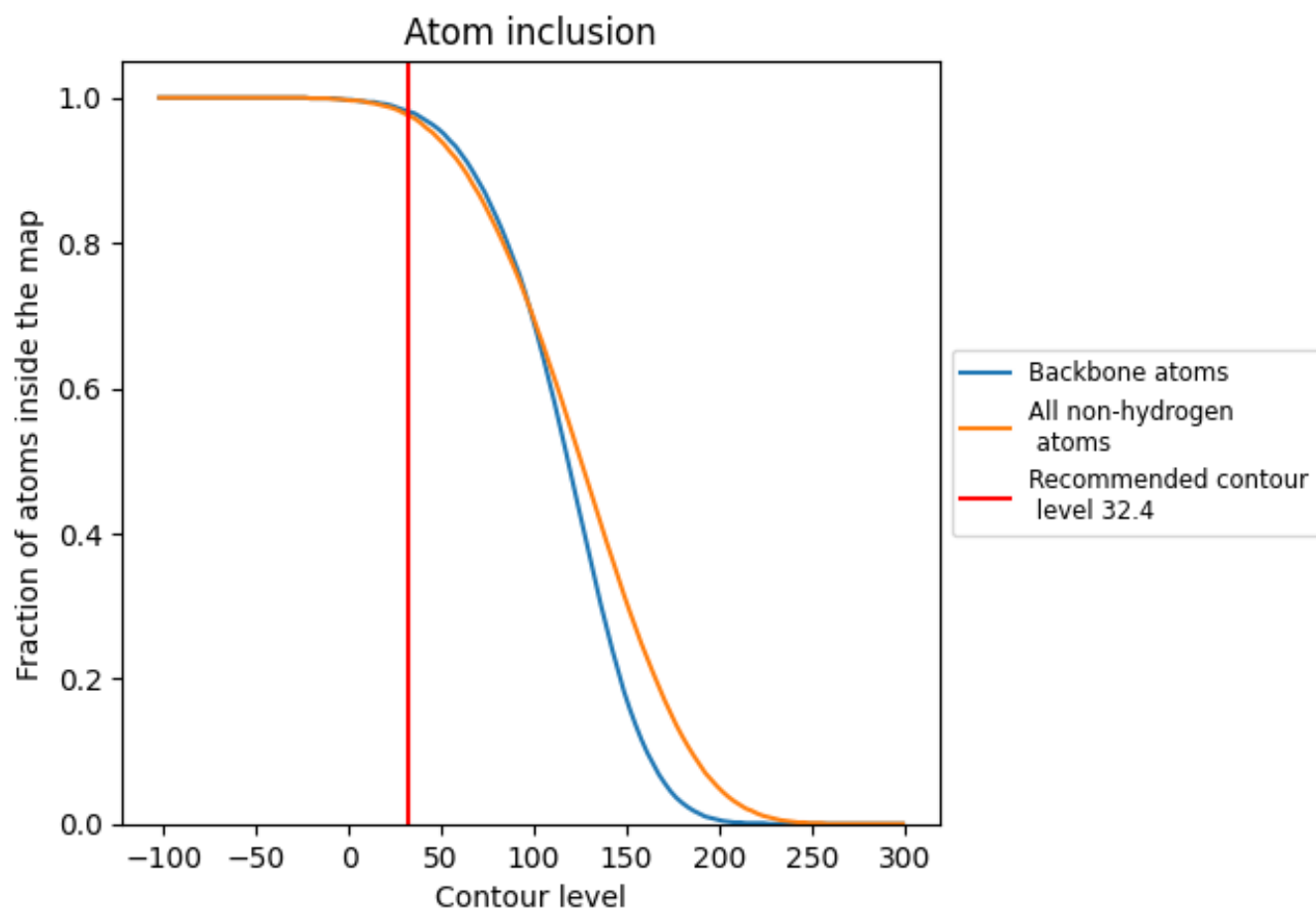
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (32.4).







































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 98% 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 (32.4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9750	 0.1600
AA	 0.9980	 0.1930
AB	 0.9960	 0.1830
AC	 0.7850	 0.0430
AD	 0.9680	 0.1080
AE	 0.9690	 0.1100
AF	 0.9620	 0.1180
AG	 0.9740	 0.1250
AH	 0.9830	 0.1540
AI	 0.7900	 0.1140
AJ	 0.9600	 0.0990
AK	 0.9330	 0.1130
AL	 0.9500	 0.1230
AM	 0.9670	 0.1220
AN	 0.9610	 0.1210
AO	 0.9800	 0.1190
AP	 0.9900	 0.1380
AQ	 0.9410	 0.1510
AR	 0.9570	 0.1030
AS	 0.9440	 0.1270
AT	 0.9700	 0.1360
AU	 0.9700	 0.1300
AV	 0.9820	 0.1410
AW	 0.9850	 0.1560
AX	 0.8980	 0.0680
AY	 0.9520	 0.1110
AZ	 0.9520	 0.1250
Aa	 0.9790	 0.1460
Ab	 0.8830	 0.0890
Ac	 0.9860	 0.0910
Ad	 0.9610	 0.1000
Ae	 0.9750	 0.0930
Af	 0.9800	 0.1240
Ag	 0.9660	 0.0680
BA	 0.9960	 0.1780



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Chain	Atom inclusion	Q-score
BB	 0.9310	 0.1780
BC	 0.8140	 0.1240
BD	 0.9780	 0.1760
BE	 0.9800	 0.1800
BF	 0.9340	 0.1320
BG	 0.9010	 0.1260
BH	 0.9430	 0.1040
BI	 0.9240	 0.1220
BJ	 0.8730	 0.1110
BK	 0.9650	 0.1270
BL	 0.9810	 0.1450
BM	 0.9690	 0.1090
BN	 0.9250	 0.0960
BO	 0.9390	 0.1190
BP	 0.9500	 0.1150
BQ	 0.9780	 0.1320
BR	 0.9790	 0.1030
BS	 0.9860	 0.1310
BT	 0.9700	 0.1100
BU	 0.9790	 0.1210
BV	 0.9880	 0.1210
BW	 0.9060	 0.0800
BX	 0.9850	 0.1370
BY	 0.8660	 0.0860