



wwPDB EM Validation Summary Report ⓘ

Nov 8, 2022 – 11:38 AM JST

PDB ID : 5ZWM
EMDB ID : EMD-6972
Title : Cryo-EM structure of the yeast pre-B complex at an average resolution of 3.4 4.6 angstrom (tri-snRNP and U2 snRNP Part)
Authors : Bai, R.; Wan, R.; Yan, C.; Lei, J.; Shi, Y.
Deposited on : 2018-05-16
Resolution : 3.40 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

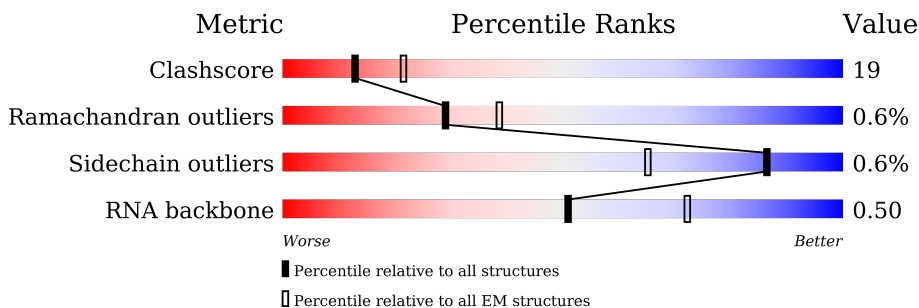
EMDB validation analysis : 0.0.1.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

1 Overall quality at a glance

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

The reported resolution of this entry is 3.40 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)
Clashscore	158937	4297
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	A	2413	
2	K	465	
3	L	494	
4	N	899	
5	J	469	
6	E	143	
7	M	126	


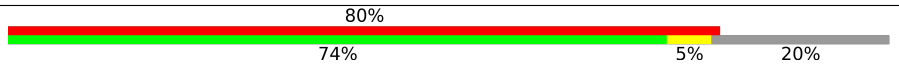

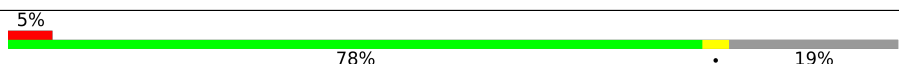

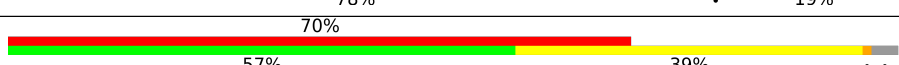
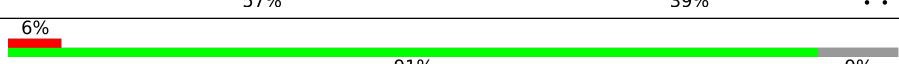
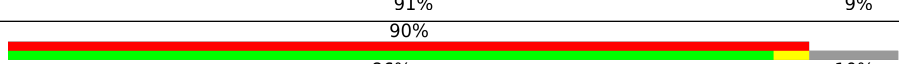
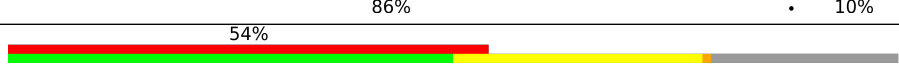
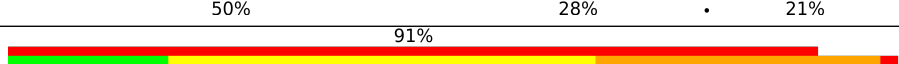
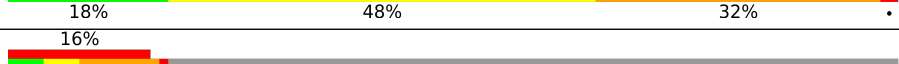

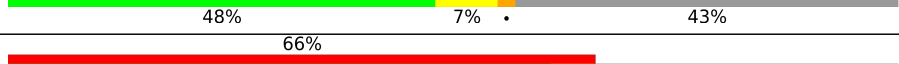

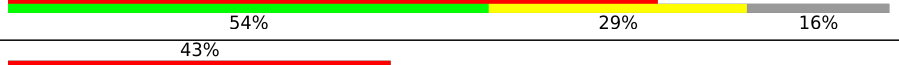


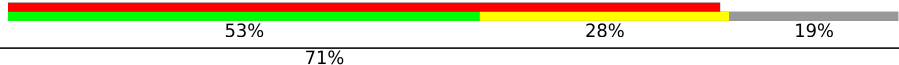

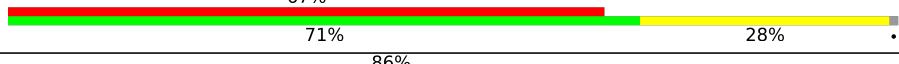
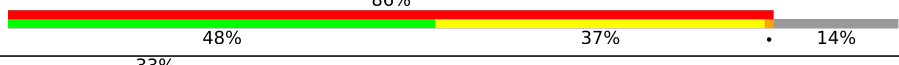

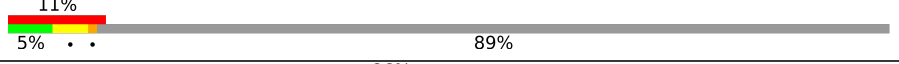


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Mol	Chain	Length	Quality of chain
8	C	1008	
9	z	109	
10	q	95	
11	r	89	
12	x	86	
13	t	93	
14	y	115	
15	s	187	
16	F	112	
17	I	160	
18	B	214	
19	O	587	
20	S	101	
20	d	101	
20	l	101	
21	P	196	
21	a	196	
21	h	196	
22	Q	146	
22	b	146	
22	m	146	
23	R	110	
23	c	110	
23	n	110	
24	T	94	

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Mol	Chain	Length	Quality of chain
24	e	94	 77% 23%
24	i	94	 80% 74% 5% 20%
25	U	86	 64% 44% 41% 15%
25	f	86	 5% 78% 19% 19%
25	j	86	 81% 78% 19% 19%
26	V	77	 70% 57% 39% 15%
26	g	77	 6% 91% 9% 9%
26	k	77	 90% 86% 10% 10%
27	D	2163	 54% 50% 28% 21%
28	G	44	 91% 18% 48% 32%
29	H	1175	 16% 9% 82% 9%
30	o	238	 57% 48% 7% 43%
31	p	111	 66% 61% 5% 34%
32	1	971	 73% 54% 29% 16%
33	2	436	 43% 31% 17% 52%
34	3	1361	 76% 51% 35% 13%
35	4	213	 80% 53% 28% 19%
36	5	107	 71% 67% 28% 19%
37	6	85	 67% 71% 28% 19%
38	X	148	 86% 48% 37% 14%
39	Y	266	 33% 19% 11% 67%
40	Z	204	 11% 5% 89% 5%
41	u	530	 86% 85% 13% 13%
42	w	280	 45% 43% 55% 19%
43	v	266	 59% 64% 35% 19%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
46	ZN	5	201	-	-	X	-

2 Entry composition [i](#)

There are 46 unique types of molecules in this entry. The entry contains 111041 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 protein called Pre-mRNA-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2177	17877	11496	3054	3263	64	0	0

- Molecule 2 is a protein called U4/U6 small nuclear ribonucleoprotein PRP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	K	429	3375	2101	610	650	14	0	0

- Molecule 3 is a protein called Pre-mRNA-processing factor 31.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	L	416	3171	2001	573	585	12	0	0

- Molecule 4 is a protein called Pre-mRNA-splicing factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	N	728	4897	3045	905	933	14	0	0

- Molecule 5 is a protein called U4/U6 small nuclear ribonucleoprotein PRP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	J	304	2439	1545	445	435	14	0	0

- Molecule 6 is a protein called Spliceosomal protein DIB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	E	139	1146	725	199	211	11	0	0

- Molecule 7 is a protein called 13 kDa ribonucleoprotein-associated protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	M	126	950	605	163	177	5	0	0

- Molecule 8 is a protein called Pre-mRNA-splicing factor SNU114.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	C	843	6732	4350	1119	1235	28	0	0

- Molecule 9 is a protein called U6 snRNA-associated Sm-like protein LSm8.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
9	z	65	260	130	65	65	0	0

- Molecule 10 is a protein called U6 snRNA-associated Sm-like protein LSm2.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
10	q	92	368	184	92	92	0	0

- Molecule 11 is a protein called U6 snRNA-associated Sm-like protein LSm3.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
11	r	77	308	154	77	77	0	0

- Molecule 12 is a protein called U6 snRNA-associated Sm-like protein LSm6.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
12	x	74	296	148	74	74	0	0

- Molecule 13 is a protein called U6 snRNA-associated Sm-like protein LSm5.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
13	t	77	308	154	77	77	0	0

- Molecule 14 is a protein called U6 snRNA-associated Sm-like protein LSm7.

Mol	Chain	Residues	Atoms				AltConf	Trace
14	y	66	Total	C	N	O	0	0
			264	132	66	66		

- Molecule 15 is a protein called U6 snRNA-associated Sm-like protein LSm4.

Mol	Chain	Residues	Atoms				AltConf	Trace
15	s	77	Total	C	N	O	0	0
			308	154	77	77		

- Molecule 16 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	F	99	Total	C	N	O	P	0	0
			2043	913	341	690	99		

- Molecule 17 is a RNA chain called U4 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	I	110	Total	C	N	O	P	0	0
			2334	1044	399	781	110		

- Molecule 18 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	B	175	Total	C	N	O	P	0	0
			3715	1663	651	1227	174		

- Molecule 19 is a protein called 66 kDa U4/U6.U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	O	74	Total	C	N	O	S	0	0
			574	350	103	120	1		

- Molecule 20 is a protein called Small nuclear ribonucleoprotein Sm D3.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	d	79	Total	C	N	O	0	0	
			316	158	79	79			
20	S	82	Total	C	N	O	S	0	0
			632	402	109	119	2		
20	l	81	Total	C	N	O	S	0	0
			611	390	106	113	2		

- Molecule 21 is a protein called Small nuclear ribonucleoprotein-associated protein B.

Mol	Chain	Residues	Atoms					AltConf	Trace
21	a	73	Total	C	N	O			
			292	146	73	73	0	0	
21	P	70	Total	C	N	O	S		
			563	360	98	102	3	0	
21	h	78	Total	C	N	O	S		
			610	389	110	108	3	0	

- Molecule 22 is a protein called Small nuclear ribonucleoprotein Sm D1.

Mol	Chain	Residues	Atoms					AltConf	Trace
22	b	77	Total	C	N	O			
			308	154	77	77	0	0	
22	Q	99	Total	C	N	O	S		
			751	475	137	137	2	0	
22	m	82	Total	C	N	O	S		
			644	409	110	123	2	0	

- Molecule 23 is a protein called Small nuclear ribonucleoprotein Sm D2.

Mol	Chain	Residues	Atoms					AltConf	Trace
23	c	90	Total	C	N	O			
			360	180	90	90	0	0	
23	R	92	Total	C	N	O	S		
			752	481	136	131	4	0	
23	n	65	Total	C	N	O	S		
			528	340	102	84	2	0	

- Molecule 24 is a protein called Small nuclear ribonucleoprotein E.

Mol	Chain	Residues	Atoms					AltConf	Trace
24	e	72	Total	C	N	O			
			288	144	72	72	0	0	
24	T	77	Total	C	N	O	S		
			602	396	95	108	3	0	
24	i	75	Total	C	N	O	S		
			575	379	92	101	3	0	

- Molecule 25 is a protein called Small nuclear ribonucleoprotein F.

Mol	Chain	Residues	Atoms					AltConf	Trace
25	f	70	Total	C	N	O			
			280	140	70	70	0	0	
25	U	73	Total	C	N	O	S		
			585	376	102	106	1	0	
25	j	70	Total	C	N	O	S		
			554	355	98	100	1	0	

- Molecule 26 is a protein called Small nuclear ribonucleoprotein G.

Mol	Chain	Residues	Atoms					AltConf	Trace
26	g	70	Total	C	N	O			
			280	140	70	70	0	0	
26	V	75	Total	C	N	O	S		
			577	363	100	112	2	0	
26	k	69	Total	C	N	O	S		
			529	337	93	97	2	0	

- Molecule 27 is a protein called Pre-mRNA-splicing helicase BRR2.

Mol	Chain	Residues	Atoms					AltConf	Trace
27	D	1699	Total	C	N	O	S		
			13601	8717	2266	2564	54	1	
								0	

- Molecule 28 is a RNA chain called Pre-mRNA-BPS.

Mol	Chain	Residues	Atoms					AltConf	Trace
28	G	44	Total	C	N	O	P		
			928	419	161	304	44	0	
								0	

- Molecule 29 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
29	H	206	Total	C	N	O	P		
			4345	1940	722	1477	206	0	
								0	

- Molecule 30 is a protein called U2 small nuclear ribonucleoprotein A'.

Mol	Chain	Residues	Atoms				AltConf	Trace
30	o	135	Total	C	N	O		
			841	538	142	161	0	0

- Molecule 31 is a protein called U2 small nuclear ribonucleoprotein B''.

Mol	Chain	Residues	Atoms				AltConf	Trace
31	p	73	Total	C	N	O	0	0
			466	304	81	81		

- Molecule 32 is a protein called U2 snRNP component HSH155.

Mol	Chain	Residues	Atoms					AltConf	Trace
32	1	816	Total	C	N	O	S	0	0
			6472	4165	1101	1166	40		

- Molecule 33 is a protein called Cold sensitive U2 snRNA suppressor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
33	2	211	Total	C	N	O	S	0	0
			1726	1121	292	304	9		

- Molecule 34 is a protein called Pre-mRNA-splicing factor RSE1.

Mol	Chain	Residues	Atoms					AltConf	Trace
34	3	1180	Total	C	N	O	S	0	0
			9380	5996	1580	1753	51		

- Molecule 35 is a protein called Protein HSH49.

Mol	Chain	Residues	Atoms					AltConf	Trace
35	4	173	Total	C	N	O	S	0	0
			1429	930	239	258	2		

- Molecule 36 is a protein called Pre-mRNA-splicing factor RDS3.

Mol	Chain	Residues	Atoms					AltConf	Trace
36	5	103	Total	C	N	O	S	0	0
			814	503	154	143	14		

- Molecule 37 is a protein called RDS3 complex subunit 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
37	6	84	Total	C	N	O	S	0	0
			693	429	130	132	2		

- Molecule 38 is a protein called U2 snRNP component IST3.

Mol	Chain	Residues	Atoms				AltConf	Trace
38	X	128	Total	C	N	O	0	0
			1051	662	181	208		

- Molecule 39 is a protein called Pre-mRNA-splicing factor CWC26.

Mol	Chain	Residues	Atoms					AltConf	Trace
39	Y	89	Total	C	N	O	S	0	0
			730	458	130	140	2		

- Molecule 40 is a protein called Pre-mRNA leakage protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
40	Z	22	Total	C	N	O	S	0	0
			173	110	25	37	1		

- Molecule 41 is a protein called Pre-mRNA-splicing factor PRP9.

Mol	Chain	Residues	Atoms					AltConf	Trace
41	u	461	Total	C	N	O	S	0	0
			3895	2475	675	730	15		

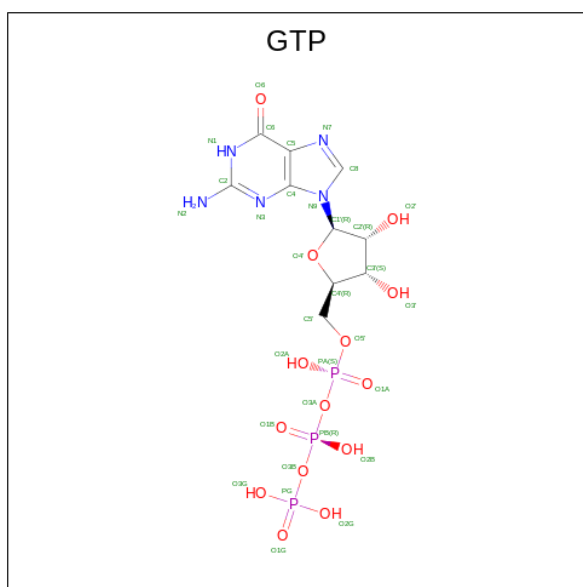
- Molecule 42 is a protein called Pre-mRNA-splicing factor PRP21.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	w	127	Total	C	N	O	S	0	0
			1084	689	193	196	6		

- Molecule 43 is a protein called Pre-mRNA-splicing factor PRP11.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	v	174	Total	C	N	O	S	0	0
			1372	862	235	269	6		

- Molecule 44 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).



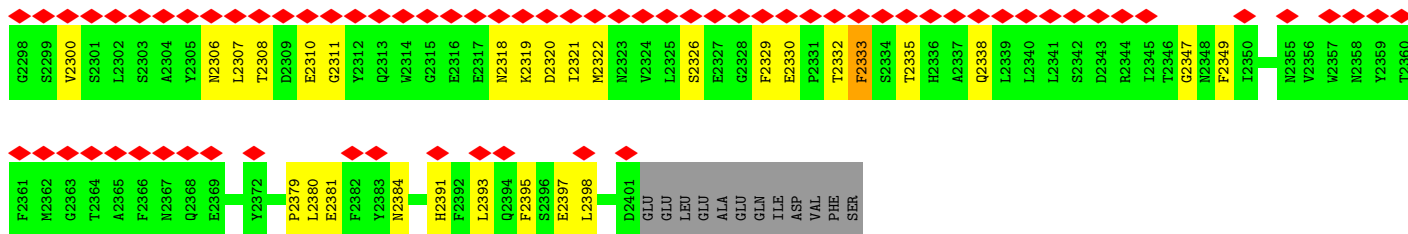
Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
44	C	1	32	10	5	14	3	0

- Molecule 45 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

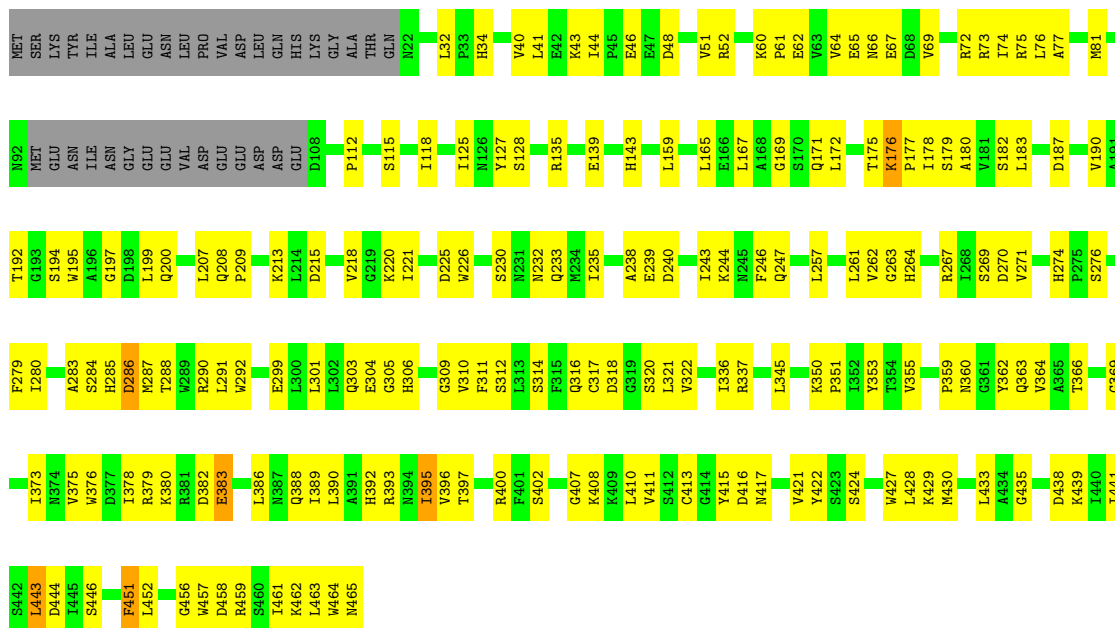
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
45	C	1	1	1	0

- Molecule 46 is ZINC ION (three-letter code: ZN) (formula: Zn).

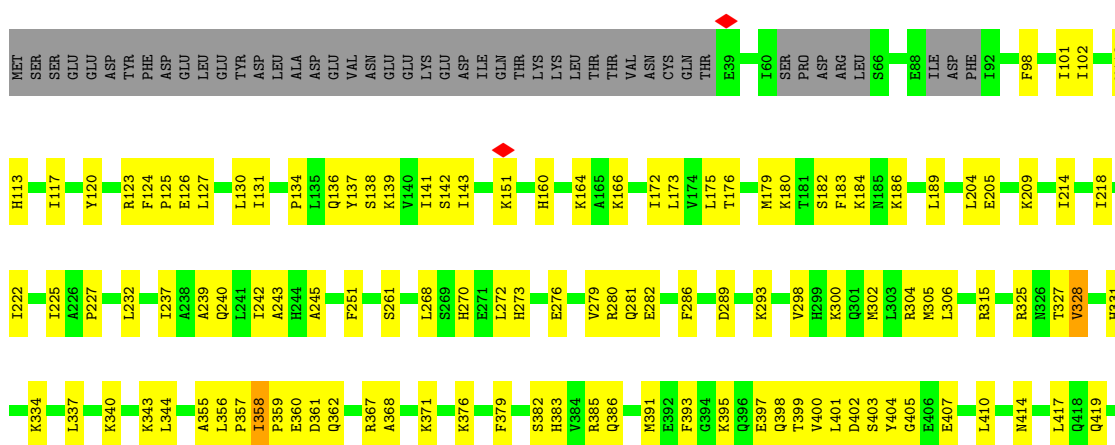
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
46	5	3	3	3	0
46	u	2	2	2	0
46	v	1	1	1	0



• Molecule 2: U4/U6 small nuclear ribonucleoprotein PRP4



• Molecule 3: Pre-mRNA-processing factor 31

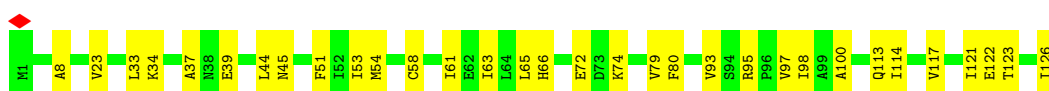




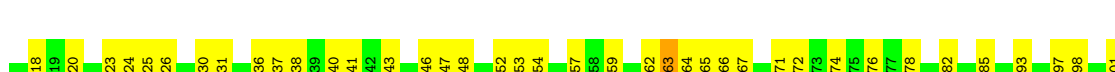
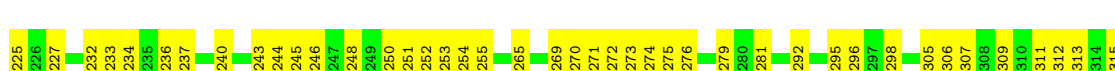
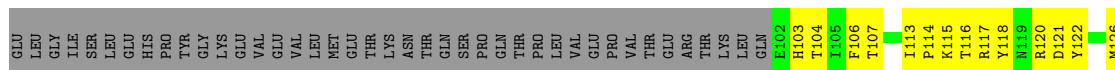
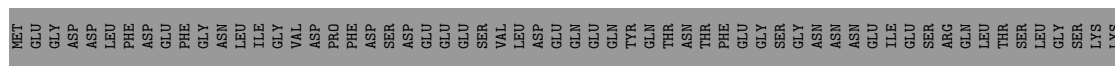
• Molecule 6: Spliceosomal protein DIB1

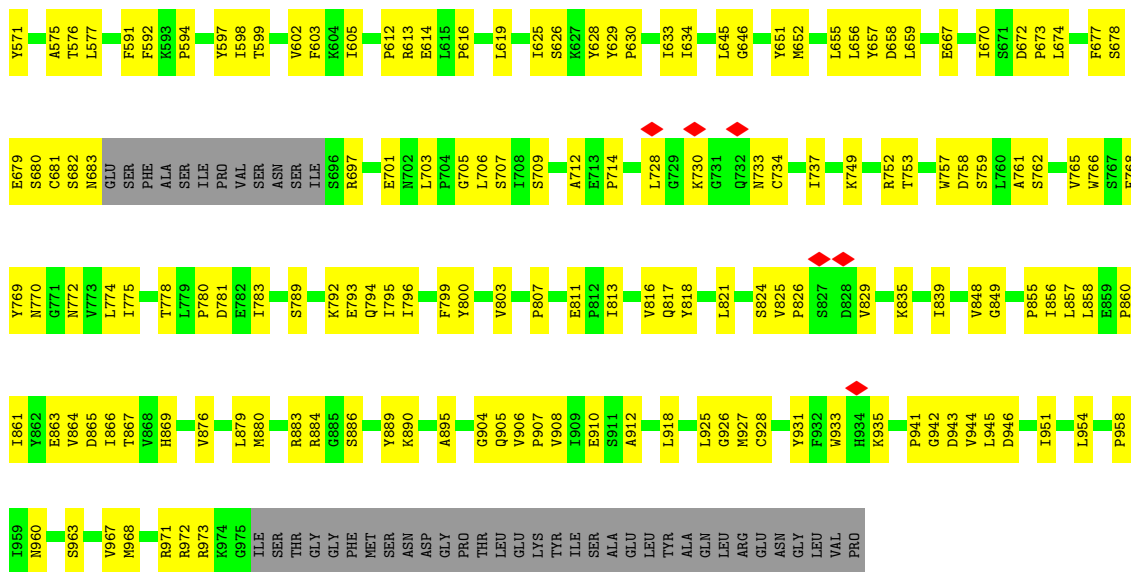


• Molecule 7: 13 kDa ribonucleoprotein-associated protein

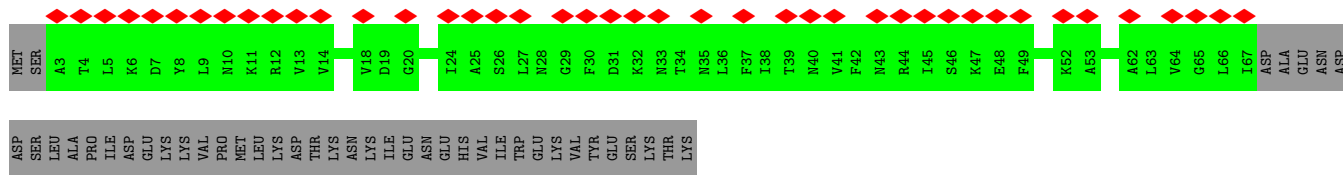
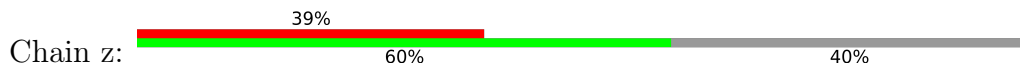


• Molecule 8: Pre-mRNA-splicing factor SNU114

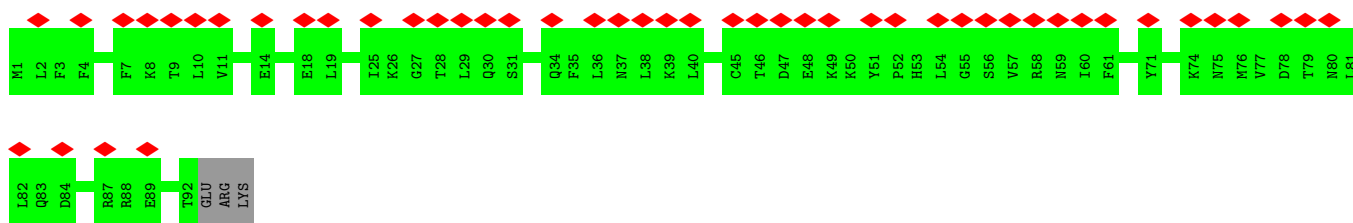




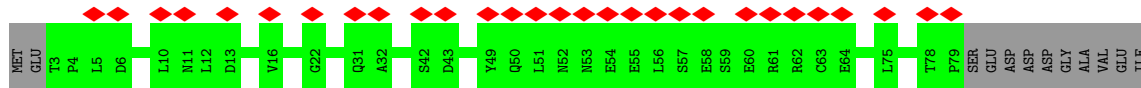
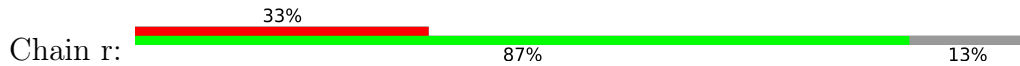
• Molecule 9: U6 snRNA-associated Sm-like protein LSm8



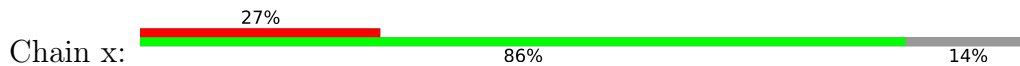
• Molecule 10: U6 snRNA-associated Sm-like protein LSm2

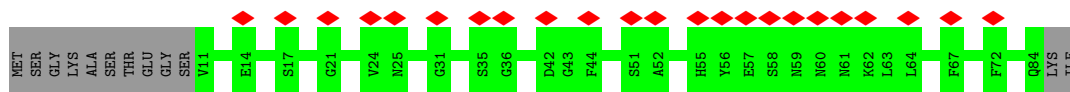


• Molecule 11: U6 snRNA-associated Sm-like protein LSm3

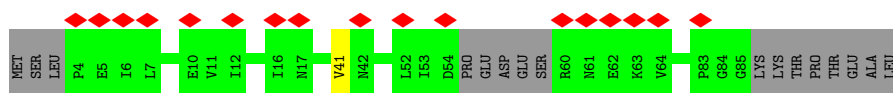
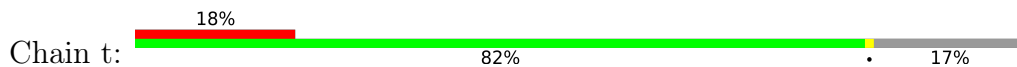


• Molecule 12: U6 snRNA-associated Sm-like protein LSm6

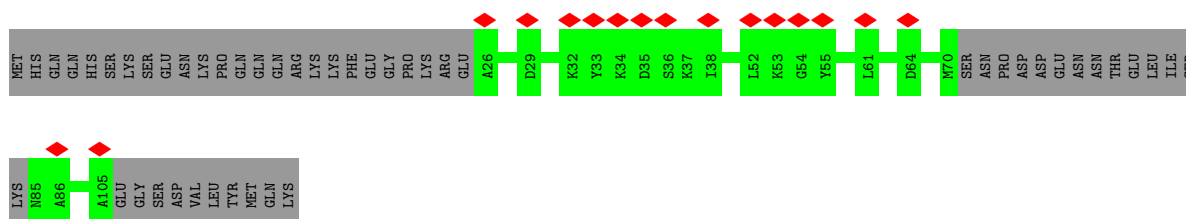




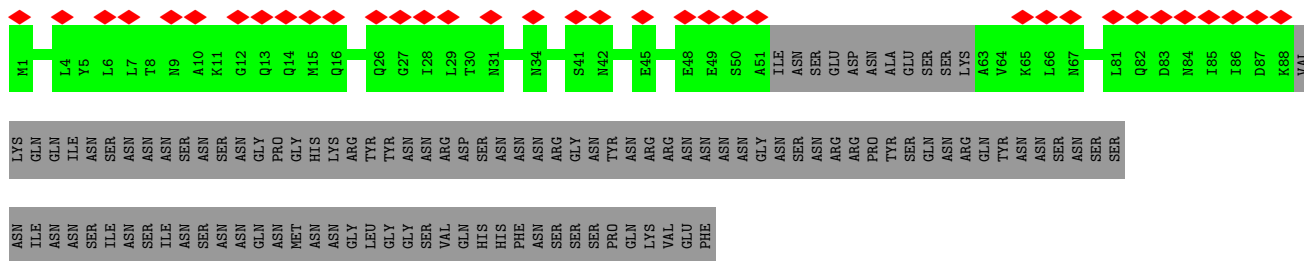
• Molecule 13: U6 snRNA-associated Sm-like protein LSm5



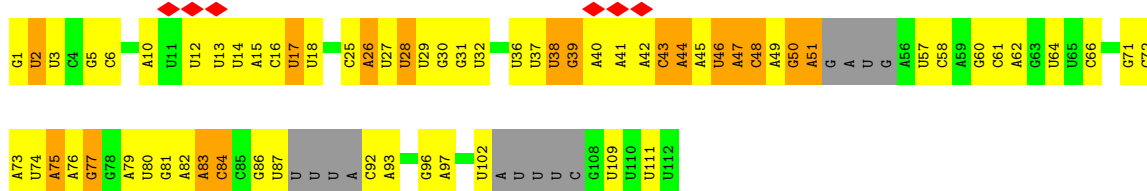
• Molecule 14: U6 snRNA-associated Sm-like protein LSm7



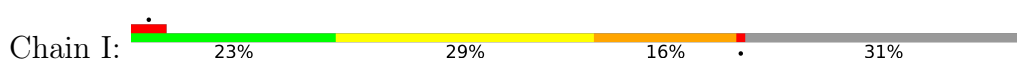
• Molecule 15: U6 snRNA-associated Sm-like protein LSm4

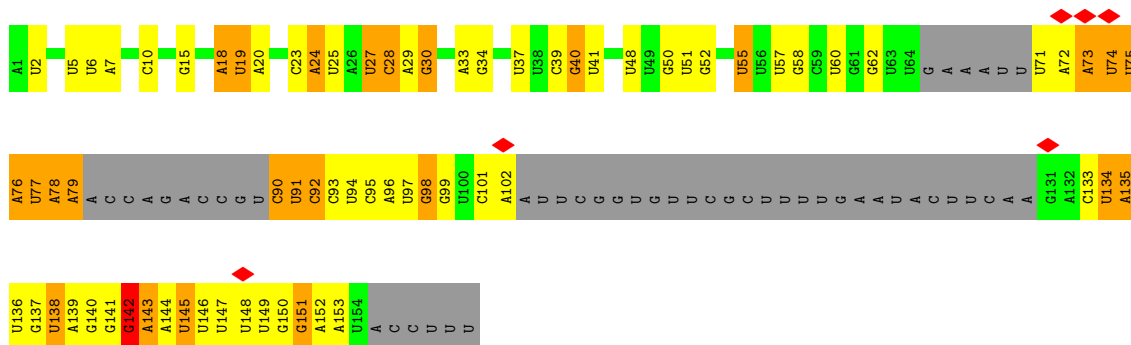


• Molecule 16: U6 snRNA

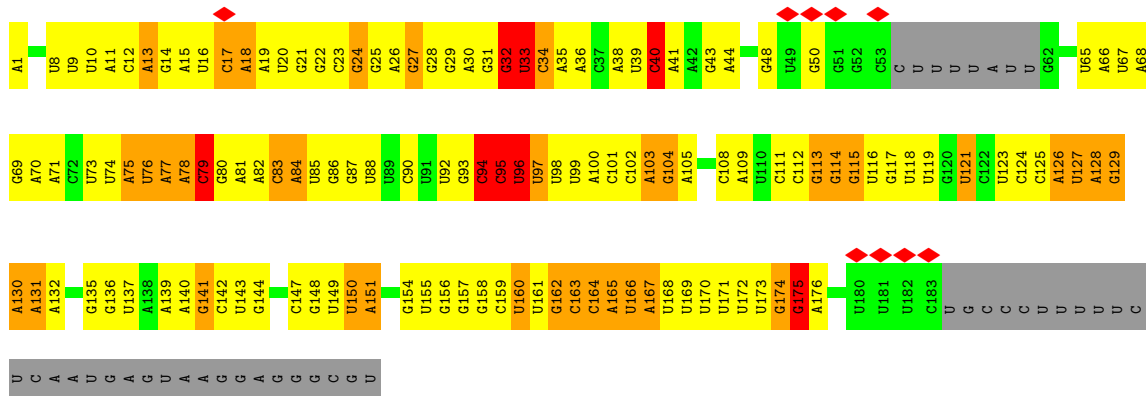
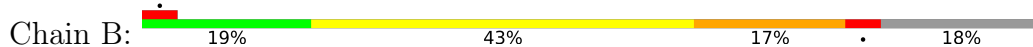


• Molecule 17: U4 snRNA

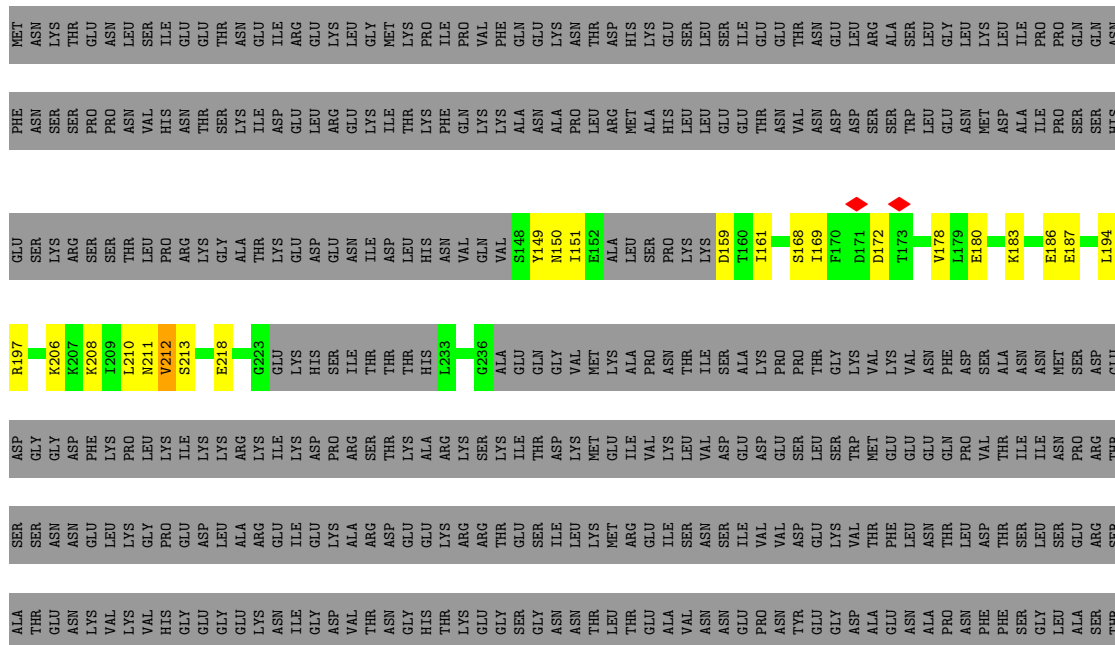


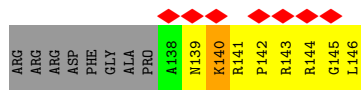


• Molecule 18: U5 snRNA

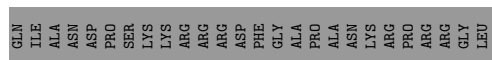
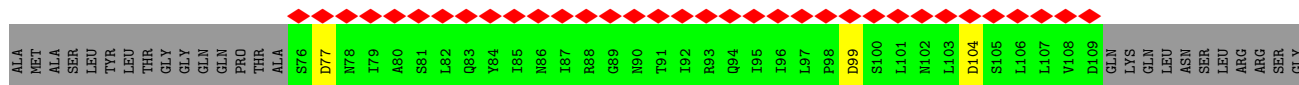
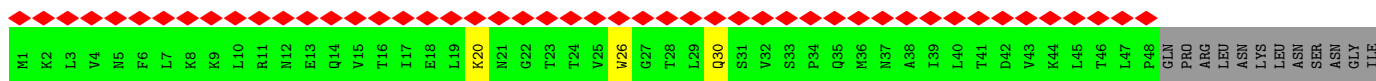


• Molecule 19: 66 kDa U4/U6.U5 small nuclear ribonucleoprotein component

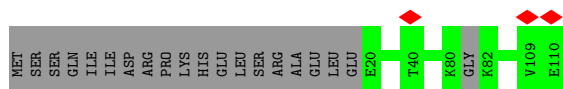
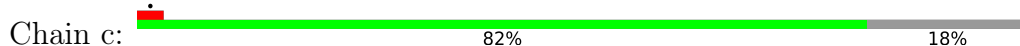




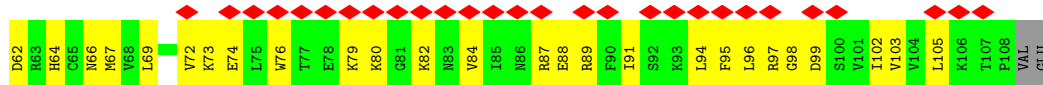
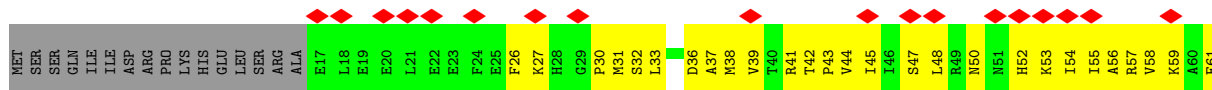
• Molecule 22: Small nuclear ribonucleoprotein Sm D1



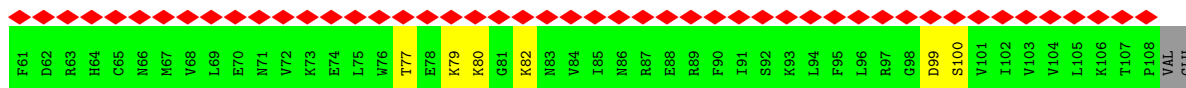
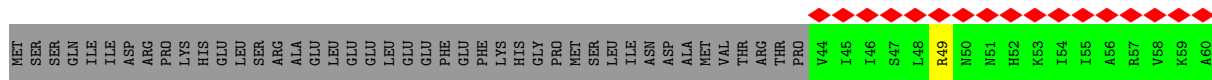
• Molecule 23: Small nuclear ribonucleoprotein Sm D2



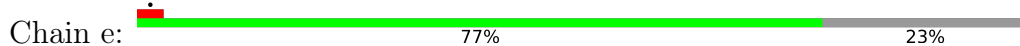
• Molecule 23: Small nuclear ribonucleoprotein Sm D2

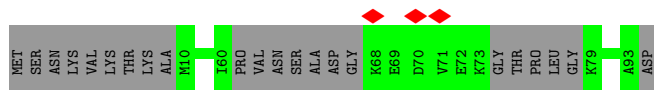


• Molecule 23: Small nuclear ribonucleoprotein Sm D2

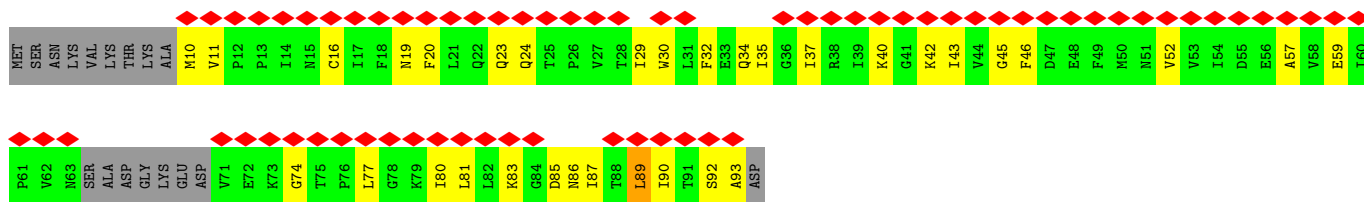
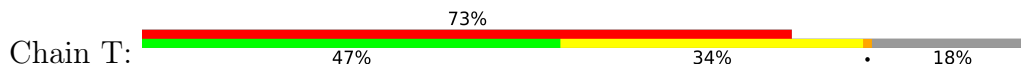


• Molecule 24: Small nuclear ribonucleoprotein E

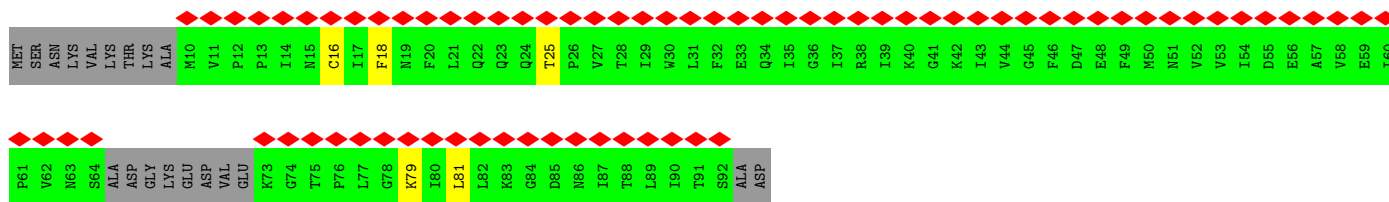
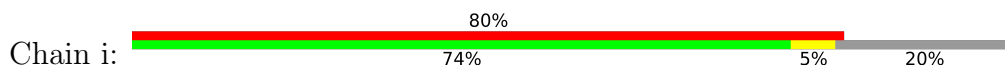




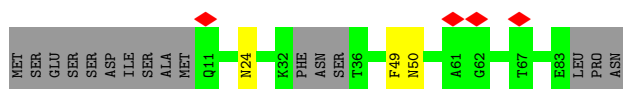
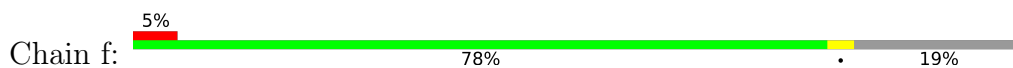
• Molecule 24: Small nuclear ribonucleoprotein E



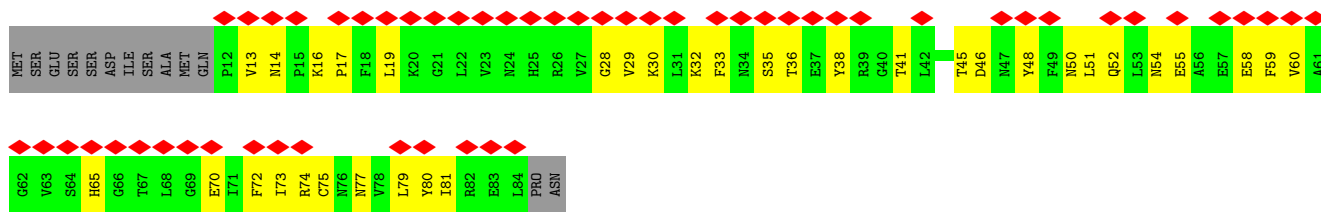
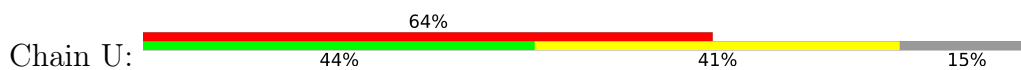
• Molecule 24: Small nuclear ribonucleoprotein E



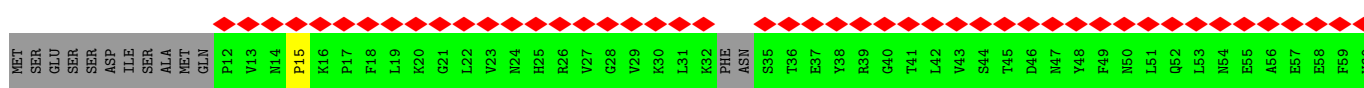
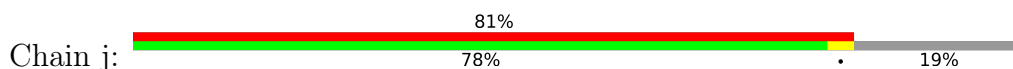
• Molecule 25: Small nuclear ribonucleoprotein F



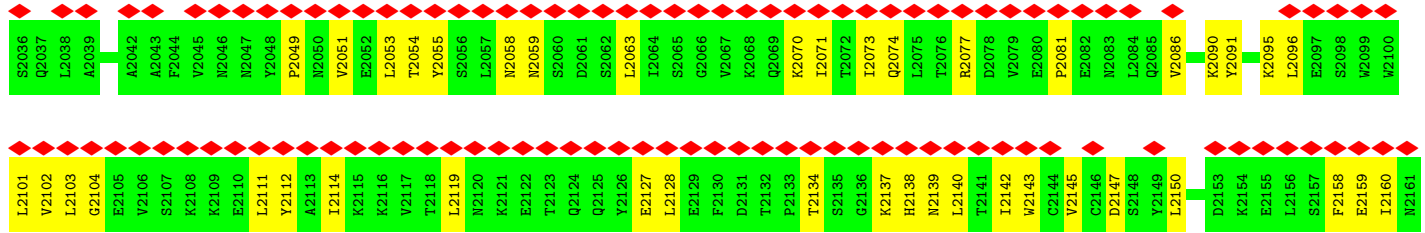
• Molecule 25: Small nuclear ribonucleoprotein F



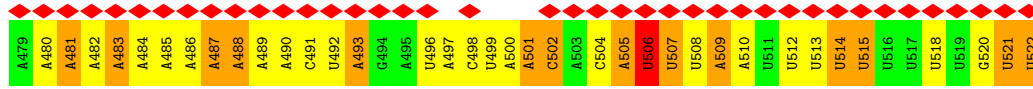
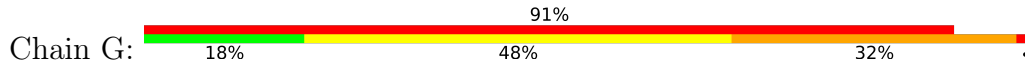
• Molecule 25: Small nuclear ribonucleoprotein F



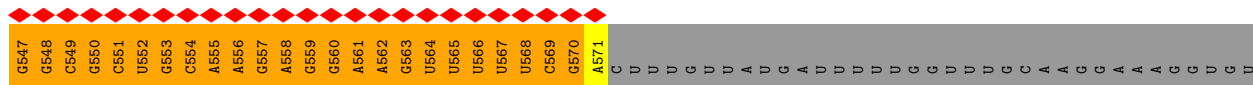
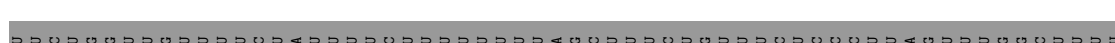
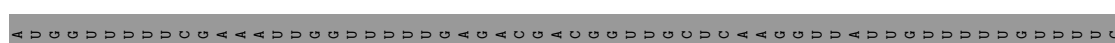
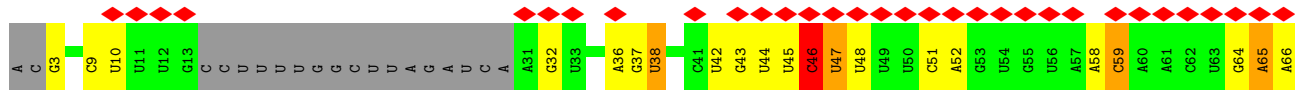
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D1898	R1899	A1900	L1901	L1902	L1905	S1906	K1907	L1908	L1909	P1910	L1911	R1912	F1913	P1914	E1915	H1916	T1917	L1994	R1995	Q1996	H1999	F2000	N2001	K2002	K2003	L2004	L1928	K2007	C2008	Q1931	A1932	Y1933	R1936	L1937	E1938	L1939	P1940	V1941	D1942	F1943	Q1944	N1945	D1946	I1960	L1951	E1952	K1953	V1954	V1960	V1961	V1962	L1963	L1964	L1965	S1966					
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S1776	Y1777	F1778	Y1779	R1780	R1781	I1782	H1783	V1784	P1785	S1786	S1787	Y1788	G1790	V1791	A1792	D1793	T1794	S1795	P1796	H1797	G1798	L1799	S1800	V1801	F1802	L1803	S1804	M1805	L1806	V1807	E1808	T1809	C1810	L1811	M1812	L1814	V1815	E1816	S1817	S1818	F1819	I1820	E1821	I1822	D1823	D1824	GLU	ALA	VAL	THR	ALA	GLU	VAL	ASN	GLY					
GLY	ASP	GLU	ALA	T1841	E1842	I1843	I1844	S1845	L1846	L1847	S1848	M1849	L1851	I1852	A1853	S1854	H1855	Y1856	G1857	V1858	F1859	F1860	T1862	I1863	Q1864	F1866	V1867	S1868	L1869	L1870	S1871	L1872	T1873	S1874	L1875	L1876	K1877	N1878	M1879	L1880	Y1881	L1882	L1883	S1884	T1885	A1886	V1887	F1888	E1890	L1894	R1895	K1896	G1897							
R1212	R1213	S1214	V1215	M1216	R1217	F1218	M1219	I1220	E1221	I1222	A1223	M1224	K1225	L1226	I1227	M1228	L1240	L1241	M1242	L1243	E1244	D1245	T1246	D1247	G1248	D1249	S1250	I1251	L1252	Y1253	Y1254	D1255	V1256	L1257	F1258	P1261	D1262	L1263	V1264	G1265	H1266	F1272	E1275	L1276	K1277	Q1278	H1279	M1280	Q1281	M1282	M1283	F1288	F1289							
L1292	E1295	M1296	W1297	W1298	H1299	M1300	E1301	I1304	S1307	F1308	M1309	F1368	G1310	F1311	K1312	L1313	K1314	K1315	K1316	F1317	P1318	P1319	P1320	T1321	P1322	L1323	L1324	E1325	N1326	I1327	I1329	W1330	T1331	S1332	E1333	G1334	G1335	N1336	D1337	D1338	F1339	S1340	E1341	V1342	F1343	E1344	F1345	K1346	D1406	F1407	L1408	N1349	K1350	I1351	Q1352	S1353	Q1354			
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● Molecule 28: Pre-mRNA-BPS

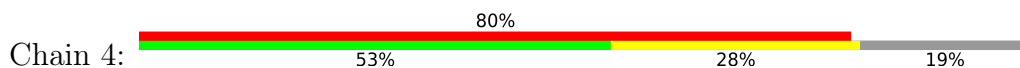


● Molecule 29: U2 snRNA



ASN	GLU	GLU	GLU	GLU	ASP	GLU	MET	GLU	GLU	MET	M918	L919	Q920	I921	T923	F924	R925	P926	R927	T928	I929	L930	R931	F932	P933	N934	N935	P936	K937	S938	I939	L940	F941	I942	D943	N944	H945	S946	G947	K948	K949	Q950	C951	R952	I953	S954	L955	Q956	I957	D958	G959	E960	C961	L962	K963	F964			
G965	S966	S967	D968	H969	L970	Y971	K972	I973	L974	D975	D976	F977	D978	C979	V980	S981	A982	A983	I984	I985	D986	F987	T988	R989	Q990	A991	D992	H993	L994	I995	I996	C997	A998	G999	D1000	K1001	R1002	L1003	L1004	T1005	Y1006	K1007	I1008	L1009	V1010	M1011	K1012	D1013	K1014	L1015	S1016	F1017	D1018	I1019	E1020	L1021	L1022	H1023	Q1024
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L1085	A1086	V1087	G1088	D1089	I1090	H1091	E1092	S1093	V1094	T1095	L1096	F1097	I1098	W1099	D1100	P1101	G1103	A1104	V1105	F1106	I1107	P1108	Y1109	V1110	D1111	D1112	V1114	K1115	R1116	H1117	V1118	K1122	F1123	L1124	D1125	E1126	A1127	T1128	V1129	I1130	G1131	A1132	D1133	R1134	Y1135	G1136	M1137	A1138	W1139	T1140	L1141	R1142	S1143	P1144	P1145	E1146			
C1147	E1148	K1149	T1150	M1151	S1152	M1153	H1154	D1155	P1156	S1157	E1158	L1159	S1160	M1161	G1162	A1163	T1164	K1165	Y1166	P1167	L1168	D1169	V1170	I1171	T1172	L1173	Q1174	Q1175	K1176	L1177	P1178	M1179	T1180	Y1181	D1182	C1183	K1184	F1185	K1186	F1187	Q1188	L1189	L1190	M1191	H1192	F1193	M1196	D1197	I1198	T1199	T1200	D1201	F1202	H1203	I1204	L1205	D1206	S1207	
L1208	S1209	M1210	S1211	D1212	P1213	P1214	G1215	I1217	G1220	L1221	Q1222	T1224	V1225	G1226	C1227	F1228	I1229	P1230	L1231	L1232	S1233	K1234	G1235	N1236	V1237	F1238	M1239	M1240	G1241	N1242	I1243	E1244	M1245	I1246	M1247	A1248	E1249	A1250	D1251	D1252	T1253	F1254	Y1255	L1256	D1257	Y1258	E1259	S1260	R1261	K1262	K1263	N1264	M1265	ASN	MET	ARG			
LYS	GLU	ASP	GLU	GLU	GLU	GLY	VAL	LEU	GLN	GLY	ARG	HIS	ILE	GLU	ASP	GLU	I1291	I1292	C1293	E1294	G1295	S1296	C1297	S1298	I1299	L1300	G1301	R1302	D1303	H1304	Q1305	E1306	Y1307	R1308	S1309	Y1310	Y1311	A1312	R1315	K1316	V1317	I1318	D1319	G1320	D1321	L1322	C1323	E1324	M1325	F1326	S1327	R1328	L1329						
S1330	L1331	M1332	E1333	Q1334	E1335	F1336	L1337	A1338	K1339	M1340	L1341	K1342	S1343	V1344	Q1345	V1346	E1347	D1348	I1349	I1350	G1351	T1352	I1353	N1354	E1355	V1356	R1357	T1358	M1359	Y1360	M1361																												

• Molecule 35: Protein HSH49



MET	ASN	TYR	SER	ALA	ASP	SER	GLY	N9	T10	V11	Y12	V13	G14	N15	I16	D17	P18	R19	I20	T21	K22	E23	Q24	L25	V26	Q85	V86	THR	ASN	F28	L28	I30	Q31	I32	N33	P34	V35	L36	R37	I38	K39	Y40	P41	K42	D43	K44	V45	L46	Q47	A48	Y49	Q50	G51	Y52	A53	F54	I55	E56	F57	Y58	N59	Q60
G61	D62	A63	Q64	Y65	A66	I67	K68	I69	M70	N71	N72	T73	V74	R75	L76	Y77	D78	R79	L80	I81	K82	V83	R84	Q85	THR	ASN	SER	THR	GLY	THR	ASN	LEU	PRO	ASN	ASN	ILE	SER	LYS	ASP	MET	ILE	LEU	P106	I107	A108	K109	L110	F111	I112	K113	M114	L115	A116	D117	S118	I119	D120					
S121	D122	Q123	L124	V125	K126	F128	M129	K130	F131	G132	K133	L134	I135	R136	E137	P138	E139	I140	F141	Y142	L143	S144	ASN	GLY	K147	L148	L149	K149	C150	A151	Y152	V153	Y154	F155	E156	D157	F158	E159	K160	A161	D162	L163	A164	I165	K166	S167	L168	N169	M170	Q171	L172	V173	A174	M175	N176	R177	I178	T179	V180			
D181	Y182	A183	F184	K185	GLU	N187	G188	K189	G190	N191	A192	K193	Y194	G195	D196	D197	V198	D199	R200	L201	L202	N203	LYS	GLU	ALA	LEU	LEU	LYS	HIS	ASN	MET	LEU	LYS																													

• Molecule 36: Pre-mRNA-splicing factor RDS3

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	500657	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.386	Depositor
Minimum map value	-0.170	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.023	Depositor
Map size (\AA)	535.2, 535.2, 535.2	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.338, 1.338, 1.338	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, GTP

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	A	0.33	2/18332 (0.0%)	0.51	1/24851 (0.0%)
2	K	0.33	0/3431	0.59	0/4631
3	L	0.31	0/3219	0.48	0/4332
4	N	0.28	0/4937	0.47	0/6704
5	J	0.30	0/2485	0.46	0/3333
6	E	0.34	0/1167	0.50	0/1571
7	M	0.31	0/963	0.51	0/1310
8	C	0.32	0/6874	0.52	0/9305
9	z	0.49	0/259	0.70	0/322
10	q	0.49	0/367	0.65	0/457
11	r	0.59	0/307	0.75	0/382
12	x	0.48	0/295	0.68	0/367
13	t	0.50	0/306	0.71	0/379
14	y	0.49	0/262	0.71	0/324
15	s	0.47	0/306	0.68	0/379
16	F	0.38	0/2277	0.90	0/3534
17	I	0.53	4/2604 (0.2%)	0.99	10/4046 (0.2%)
18	B	0.36	1/4151 (0.0%)	0.97	18/6462 (0.3%)
19	O	0.25	0/573	0.42	0/763
20	S	0.41	0/641	0.65	2/868 (0.2%)
20	d	0.29	0/315	0.46	0/392
20	l	0.45	1/620 (0.2%)	0.68	1/841 (0.1%)
21	P	0.41	0/567	0.61	0/762
21	a	0.28	0/290	0.46	0/359
21	h	0.37	0/615	0.61	0/829
22	Q	0.39	0/756	0.69	1/1023 (0.1%)
22	b	0.27	0/305	0.47	0/376
22	m	0.42	0/649	0.61	0/880
23	R	0.38	0/764	0.57	0/1026
23	c	0.25	0/358	0.45	0/444
23	n	0.41	0/535	0.57	0/717
24	T	0.38	0/612	0.59	1/830 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
24	e	0.29	0/285	0.43	0/351
24	i	0.43	0/585	0.62	0/795
25	U	0.39	0/597	0.62	0/807
25	f	0.30	0/278	0.45	0/344
25	j	0.44	0/564	0.66	2/761 (0.3%)
26	V	0.41	0/582	0.67	1/785 (0.1%)
26	g	0.25	0/277	0.46	0/341
26	k	0.37	0/532	0.60	0/715
27	D	0.40	1/13899 (0.0%)	0.62	6/18845 (0.0%)
28	G	0.26	0/1038	0.87	3/1611 (0.2%)
29	H	1.10	61/4835 (1.3%)	1.70	185/7502 (2.5%)
30	o	1.03	9/839 (1.1%)	1.65	11/1127 (1.0%)
31	p	0.81	3/467 (0.6%)	1.35	2/623 (0.3%)
32	1	0.28	0/6600	0.48	1/8962 (0.0%)
33	2	0.26	0/1775	0.45	0/2402
34	3	0.30	0/9564	0.57	1/12963 (0.0%)
35	4	0.26	0/1453	0.43	0/1954
36	5	0.28	0/827	0.46	0/1105
37	6	0.28	0/702	0.44	0/939
38	X	0.49	0/1071	0.65	0/1445
39	Y	0.52	0/743	0.70	0/994
40	Z	0.51	0/176	0.59	0/237
41	u	0.35	5/3972 (0.1%)	0.41	0/5322
42	w	0.45	4/1105 (0.4%)	0.37	0/1475
43	v	0.29	1/1396 (0.1%)	0.41	0/1881
All	All	0.42	92/114304 (0.1%)	0.71	246/157085 (0.2%)

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	A	0	1
2	K	0	2
3	L	0	1
4	N	0	2
8	C	0	2
27	D	0	4
32	1	0	4
34	3	0	1
41	u	0	2
All	All	0	19

The worst 5 of 92 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
29	H	1161	U	O3'-P	-15.59	1.42	1.61
29	H	1092	A	O3'-P	-14.82	1.43	1.61
29	H	1116	A	O3'-P	-11.52	1.47	1.61
29	H	1163	C	O5'-C5'	9.10	1.59	1.44
29	H	1116	A	C3'-O3'	-8.99	1.29	1.42

The worst 5 of 246 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
29	H	1162	U	C5'-C4'-O4'	14.85	126.92	109.10
29	H	1093	C	P-O5'-C5'	14.77	144.53	120.90
29	H	1147	A	C5'-C4'-C3'	-14.16	93.34	116.00
29	H	1092	A	C2'-C3'-O3'	14.09	140.49	109.50
29	H	1098	C	N1-C1'-C2'	-13.36	96.64	114.00

There are no chirality outliers.

5 of 19 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	239	PHE	Peptide
2	K	208	GLN	Peptide
2	K	383	GLU	Peptide
3	L	397	GLU	Peptide
4	N	11	PRO	Peptide

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	A	17877	0	17800	639	0
2	K	3375	0	3343	176	0
3	L	3171	0	3140	127	0
4	N	4897	0	3994	115	0
5	J	2439	0	2341	62	0
6	E	1146	0	1133	29	0
7	M	950	0	1004	24	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	C	6732	0	6904	274	0
9	z	260	0	72	0	0
10	q	368	0	99	0	0
11	r	308	0	80	0	0
12	x	296	0	83	0	0
13	t	308	0	85	0	0
14	y	264	0	76	0	0
15	s	308	0	85	0	0
16	F	2043	0	1033	49	0
17	I	2334	0	1173	108	0
18	B	3715	0	1878	150	0
19	O	574	0	552	31	0
20	S	632	0	653	26	0
20	d	316	0	86	0	0
20	l	611	0	627	0	0
21	P	563	0	600	40	0
21	a	292	0	78	0	0
21	h	610	0	640	0	0
22	Q	751	0	776	65	0
22	b	308	0	78	0	0
22	m	644	0	686	0	0
23	R	752	0	786	50	0
23	c	360	0	89	0	0
23	n	528	0	573	0	0
24	T	602	0	631	37	0
24	e	288	0	74	0	0
24	i	575	0	597	0	0
25	U	585	0	587	39	0
25	f	280	0	77	0	0
25	j	554	0	556	0	0
26	V	577	0	595	37	0
26	g	280	0	79	0	0
26	k	529	0	557	0	0
27	D	13601	0	13596	641	0
28	G	928	0	468	48	0
29	H	4345	0	2199	249	0
30	o	841	0	614	0	0
31	p	466	0	373	0	0
32	1	6472	0	6702	243	0
33	2	1726	0	1734	62	0
34	3	9380	0	9482	399	0
35	4	1429	0	1458	44	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
36	5	814	0	811	30	0
37	6	693	0	705	25	0
38	X	1051	0	1015	100	0
39	Y	730	0	710	52	0
40	Z	173	0	165	7	0
41	u	3895	0	3824	0	0
42	w	1084	0	1081	0	0
43	v	1372	0	1345	0	0
44	C	32	0	12	6	0
45	C	1	0	0	0	0
46	5	3	0	0	3	0
46	u	2	0	0	0	0
46	v	1	0	0	0	0
All	All	111041	0	100594	3508	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 19.

The worst 5 of 3508 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2310:GLU:CB	1:A:2333:PHE:CZ	1.85	1.52
1:A:2398:LEU:HD13	27:D:1060:LYS:CD	1.36	1.51
1:A:2310:GLU:CB	1:A:2333:PHE:HZ	1.19	1.44
1:A:2398:LEU:HD13	27:D:1060:LYS:CE	1.48	1.42
1:A:2310:GLU:HB2	1:A:2333:PHE:CZ	0.89	1.41

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	
1	A	2169/2413 (90%)	2040 (94%)	115 (5%)	14 (1%)	25	57
2	K	425/465 (91%)	388 (91%)	34 (8%)	3 (1%)	22	55
3	L	410/494 (83%)	392 (96%)	15 (4%)	3 (1%)	22	55
4	N	678/899 (75%)	626 (92%)	51 (8%)	1 (0%)	51	82
5	J	294/469 (63%)	281 (96%)	10 (3%)	3 (1%)	15	46
6	E	137/143 (96%)	128 (93%)	9 (7%)	0	100	100
7	M	124/126 (98%)	122 (98%)	2 (2%)	0	100	100
8	C	837/1008 (83%)	779 (93%)	53 (6%)	5 (1%)	25	57
9	z	63/109 (58%)	61 (97%)	2 (3%)	0	100	100
10	q	90/95 (95%)	83 (92%)	7 (8%)	0	100	100
11	r	75/89 (84%)	70 (93%)	5 (7%)	0	100	100
12	x	72/86 (84%)	70 (97%)	2 (3%)	0	100	100
13	t	73/93 (78%)	69 (94%)	3 (4%)	1 (1%)	11	37
14	y	62/115 (54%)	62 (100%)	0	0	100	100
15	s	73/187 (39%)	72 (99%)	1 (1%)	0	100	100
19	O	68/587 (12%)	64 (94%)	3 (4%)	1 (2%)	10	36
20	S	80/101 (79%)	77 (96%)	3 (4%)	0	100	100
20	d	77/101 (76%)	69 (90%)	6 (8%)	2 (3%)	5	26
20	l	79/101 (78%)	70 (89%)	8 (10%)	1 (1%)	12	39
21	P	66/196 (34%)	62 (94%)	4 (6%)	0	100	100
21	a	69/196 (35%)	63 (91%)	6 (9%)	0	100	100
21	h	74/196 (38%)	67 (90%)	7 (10%)	0	100	100
22	Q	93/146 (64%)	89 (96%)	3 (3%)	1 (1%)	14	44
22	b	71/146 (49%)	66 (93%)	4 (6%)	1 (1%)	11	37
22	m	78/146 (53%)	74 (95%)	4 (5%)	0	100	100
23	R	90/110 (82%)	89 (99%)	1 (1%)	0	100	100
23	c	86/110 (78%)	83 (96%)	3 (4%)	0	100	100
23	n	63/110 (57%)	60 (95%)	3 (5%)	0	100	100
24	T	73/94 (78%)	72 (99%)	1 (1%)	0	100	100
24	e	66/94 (70%)	62 (94%)	4 (6%)	0	100	100
24	i	71/94 (76%)	65 (92%)	6 (8%)	0	100	100
25	U	71/86 (83%)	68 (96%)	3 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
25	f	66/86 (77%)	59 (89%)	4 (6%)	3 (4%)	2	16
25	j	66/86 (77%)	61 (92%)	4 (6%)	1 (2%)	10	36
26	V	73/77 (95%)	66 (90%)	6 (8%)	1 (1%)	11	37
26	g	64/77 (83%)	58 (91%)	6 (9%)	0	100	100
26	k	65/77 (84%)	64 (98%)	1 (2%)	0	100	100
27	D	1694/2163 (78%)	1631 (96%)	60 (4%)	3 (0%)	47	78
30	o	125/238 (52%)	111 (89%)	12 (10%)	2 (2%)	9	34
31	p	69/111 (62%)	67 (97%)	2 (3%)	0	100	100
32	1	814/971 (84%)	762 (94%)	46 (6%)	6 (1%)	22	55
33	2	205/436 (47%)	192 (94%)	11 (5%)	2 (1%)	15	46
34	3	1164/1361 (86%)	1046 (90%)	109 (9%)	9 (1%)	19	51
35	4	165/213 (78%)	164 (99%)	1 (1%)	0	100	100
36	5	101/107 (94%)	87 (86%)	13 (13%)	1 (1%)	15	46
37	6	82/85 (96%)	78 (95%)	3 (4%)	1 (1%)	13	41
38	X	126/148 (85%)	117 (93%)	7 (6%)	2 (2%)	9	34
39	Y	85/266 (32%)	80 (94%)	3 (4%)	2 (2%)	6	28
40	Z	20/204 (10%)	14 (70%)	6 (30%)	0	100	100
41	u	453/530 (86%)	415 (92%)	38 (8%)	0	100	100
42	w	123/280 (44%)	112 (91%)	11 (9%)	0	100	100
43	v	168/266 (63%)	142 (84%)	25 (15%)	1 (1%)	25	57
All	All	12585/17187 (73%)	11769 (94%)	746 (6%)	70 (1%)	29	57

5 of 70 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	240	PRO
2	K	395	ILE
3	L	328	VAL
8	C	364	PHE
8	C	602	VAL

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	
1	A	1964/2182 (90%)	1962 (100%)	2 (0%)	93	98
2	K	373/410 (91%)	371 (100%)	2 (0%)	88	94
3	L	327/445 (74%)	327 (100%)	0	100	100
4	N	361/813 (44%)	361 (100%)	0	100	100
5	J	248/436 (57%)	248 (100%)	0	100	100
6	E	129/132 (98%)	129 (100%)	0	100	100
7	M	104/104 (100%)	104 (100%)	0	100	100
8	C	757/910 (83%)	757 (100%)	0	100	100
19	O	60/534 (11%)	60 (100%)	0	100	100
20	S	71/89 (80%)	71 (100%)	0	100	100
20	l	67/89 (75%)	64 (96%)	3 (4%)	27	58
21	P	64/176 (36%)	64 (100%)	0	100	100
21	h	67/176 (38%)	67 (100%)	0	100	100
22	Q	81/129 (63%)	81 (100%)	0	100	100
22	m	77/129 (60%)	71 (92%)	6 (8%)	12	39
23	R	85/103 (82%)	85 (100%)	0	100	100
23	n	59/103 (57%)	52 (88%)	7 (12%)	5	19
24	T	69/83 (83%)	69 (100%)	0	100	100
24	i	65/83 (78%)	60 (92%)	5 (8%)	13	40
25	U	65/77 (84%)	65 (100%)	0	100	100
25	j	61/77 (79%)	60 (98%)	1 (2%)	62	81
26	V	64/66 (97%)	64 (100%)	0	100	100
26	k	58/66 (88%)	55 (95%)	3 (5%)	23	53
27	D	1524/1955 (78%)	1522 (100%)	2 (0%)	93	98
30	o	46/219 (21%)	43 (94%)	3 (6%)	17	46
31	p	23/100 (23%)	22 (96%)	1 (4%)	29	59
32	1	724/867 (84%)	724 (100%)	0	100	100
33	2	190/392 (48%)	190 (100%)	0	100	100
34	3	1088/1244 (88%)	1087 (100%)	1 (0%)	93	98

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
35	4	154/189 (82%)	154 (100%)	0	100	100
36	5	93/97 (96%)	92 (99%)	1 (1%)	73	86
37	6	76/77 (99%)	76 (100%)	0	100	100
38	X	114/132 (86%)	112 (98%)	2 (2%)	59	79
39	Y	77/240 (32%)	67 (87%)	10 (13%)	4	16
40	Z	21/186 (11%)	18 (86%)	3 (14%)	3	13
41	u	425/492 (86%)	420 (99%)	5 (1%)	71	85
42	w	118/259 (46%)	115 (98%)	3 (2%)	47	72
43	v	156/236 (66%)	154 (99%)	2 (1%)	69	84
All	All	10105/14097 (72%)	10043 (99%)	62 (1%)	86	94

5 of 62 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
23	n	82	LYS
41	u	298	HIS
34	3	147	PHE
41	u	81	ILE
42	w	158	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 141 such sidechains are listed below:

Mol	Chain	Res	Type
34	3	641	GLN
34	3	920	GLN
38	X	25	ASN
8	C	817	GLN
8	C	776	ASN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	F	95/112 (84%)	38 (40%)	1 (1%)
17	I	106/160 (66%)	31 (29%)	6 (5%)
18	B	173/214 (80%)	64 (36%)	13 (7%)
28	G	43/44 (97%)	22 (51%)	2 (4%)
29	H	196/1175 (16%)	52 (26%)	23 (11%)

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Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
All	All	613/1705 (35%)	207 (33%)	45 (7%)

5 of 207 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
16	F	2	U
16	F	12	U
16	F	13	U
16	F	14	U
16	F	17	U

5 of 45 RNA pucker outliers are listed below:

Mol	Chain	Res	Type
29	H	1100	A
29	H	1122	U
29	H	1101	C
29	H	1119	C
29	H	1124	U

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 8 ligands modelled in this entry, 7 are monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
44	GTP	C	1500	45	26,34,34	0.94	1 (3%)	32,54,54	1.61	4 (12%)

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
44	GTP	C	1500	45	-	4/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
44	C	1500	GTP	C6-N1	-2.42	1.34	1.37

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
44	C	1500	GTP	PB-O3B-PG	-4.54	117.24	132.83
44	C	1500	GTP	PA-O3A-PB	-4.03	119.00	132.83
44	C	1500	GTP	C3'-C2'-C1'	3.35	106.02	100.98
44	C	1500	GTP	C8-N7-C5	2.49	107.74	102.99

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
44	C	1500	GTP	O4'-C4'-C5'-O5'
44	C	1500	GTP	C3'-C4'-C5'-O5'
44	C	1500	GTP	PB-O3A-PA-O2A
44	C	1500	GTP	PB-O3A-PA-O1A

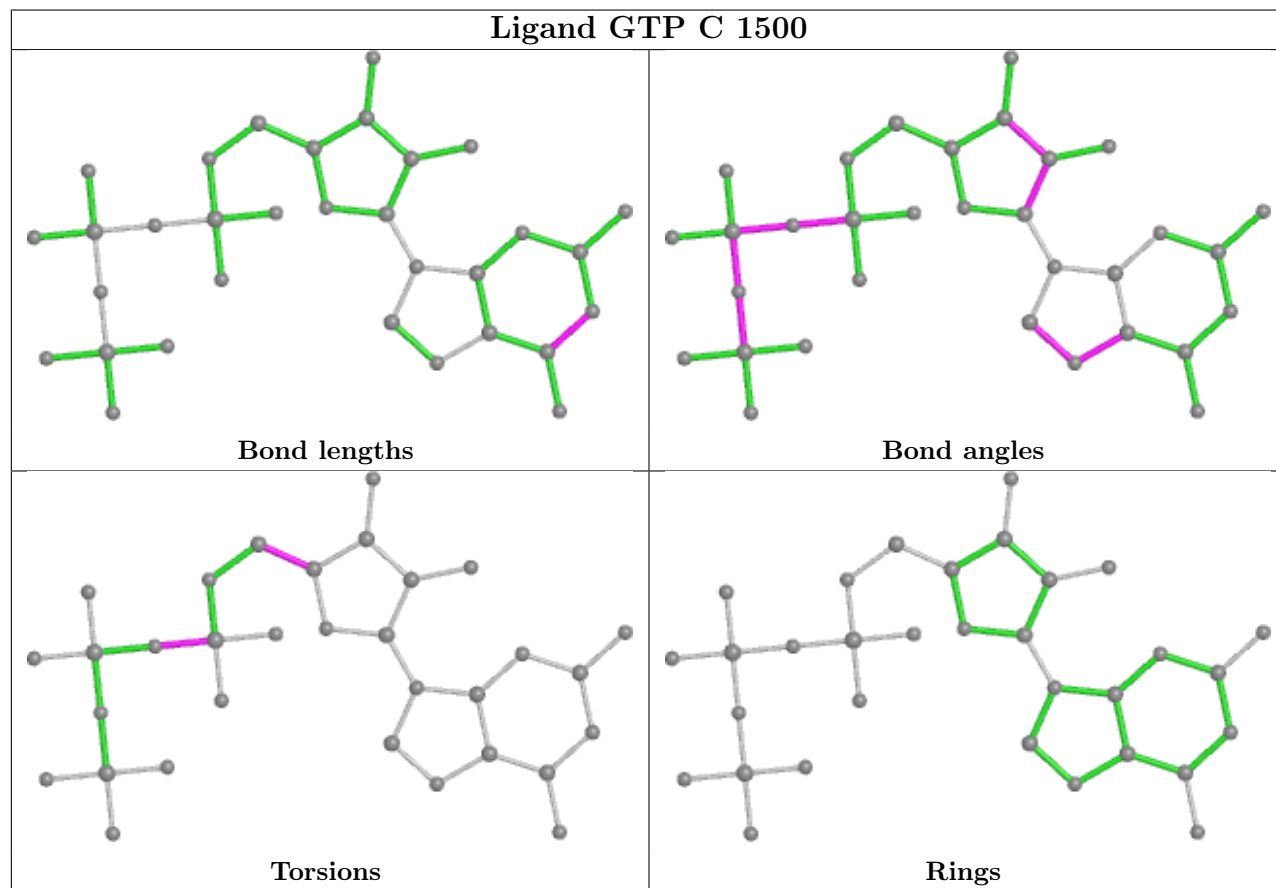
There are no ring outliers.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
44	C	1500	GTP	6	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In

addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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.

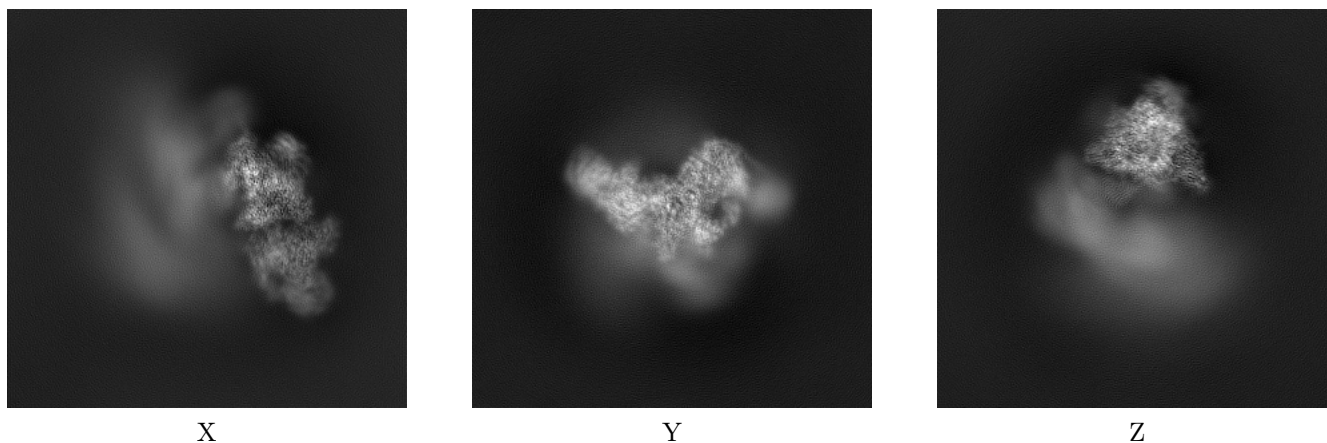
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6972. 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](#)

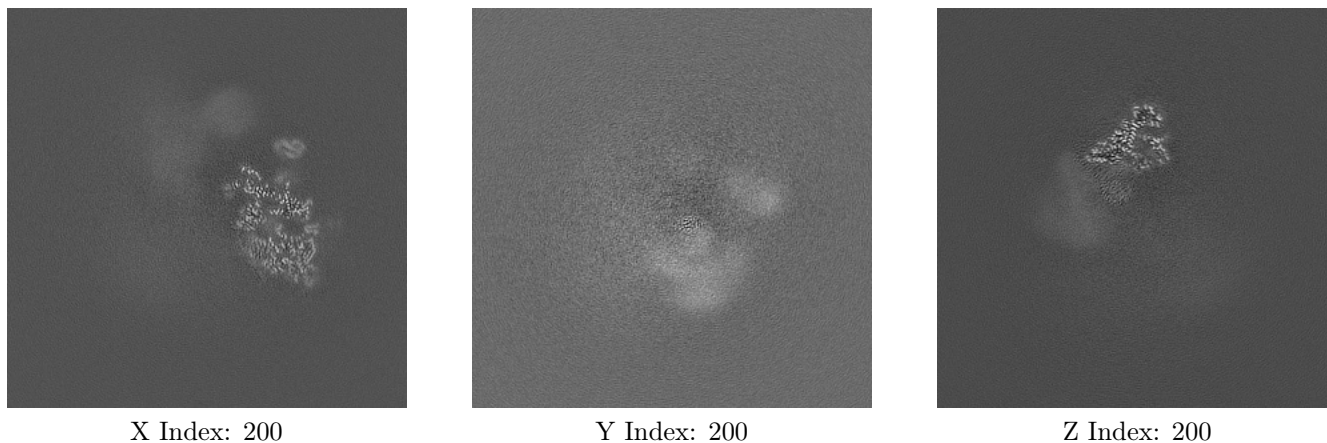
6.1.1 Primary map



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

6.2 Central slices [i](#)

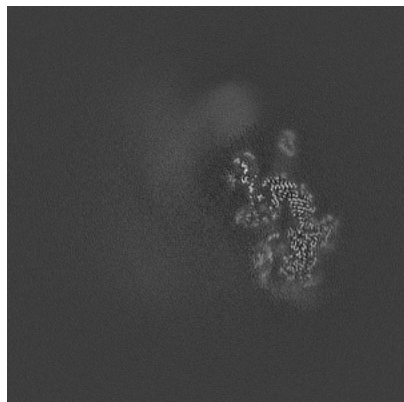
6.2.1 Primary map



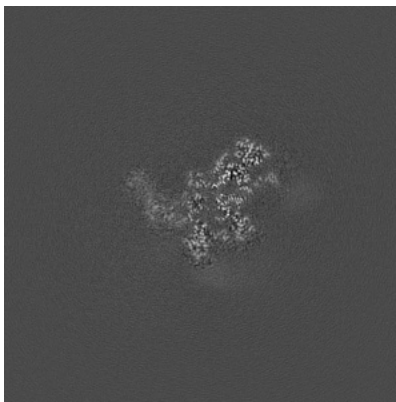
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

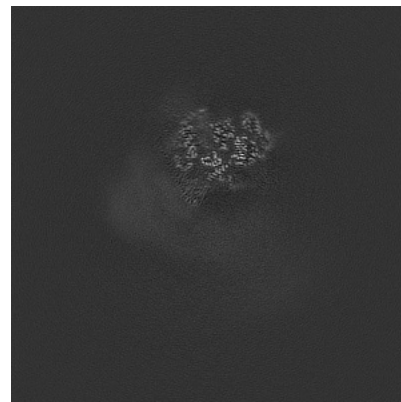
6.3.1 Primary map



X Index: 212



Y Index: 247



Z Index: 224

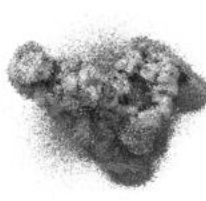
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.023. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

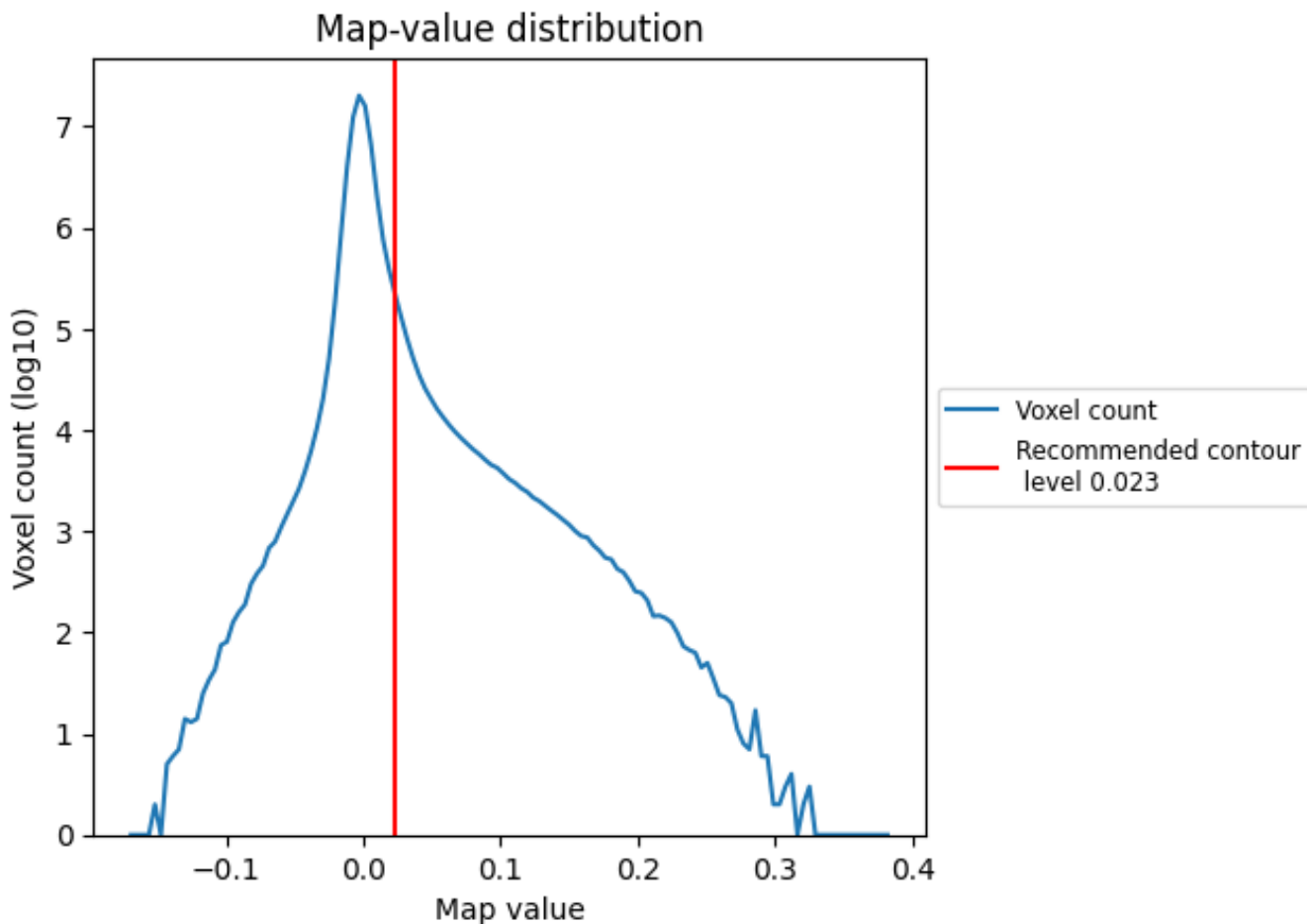
6.5 Mask visualisation

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

7 Map analysis [i](#)

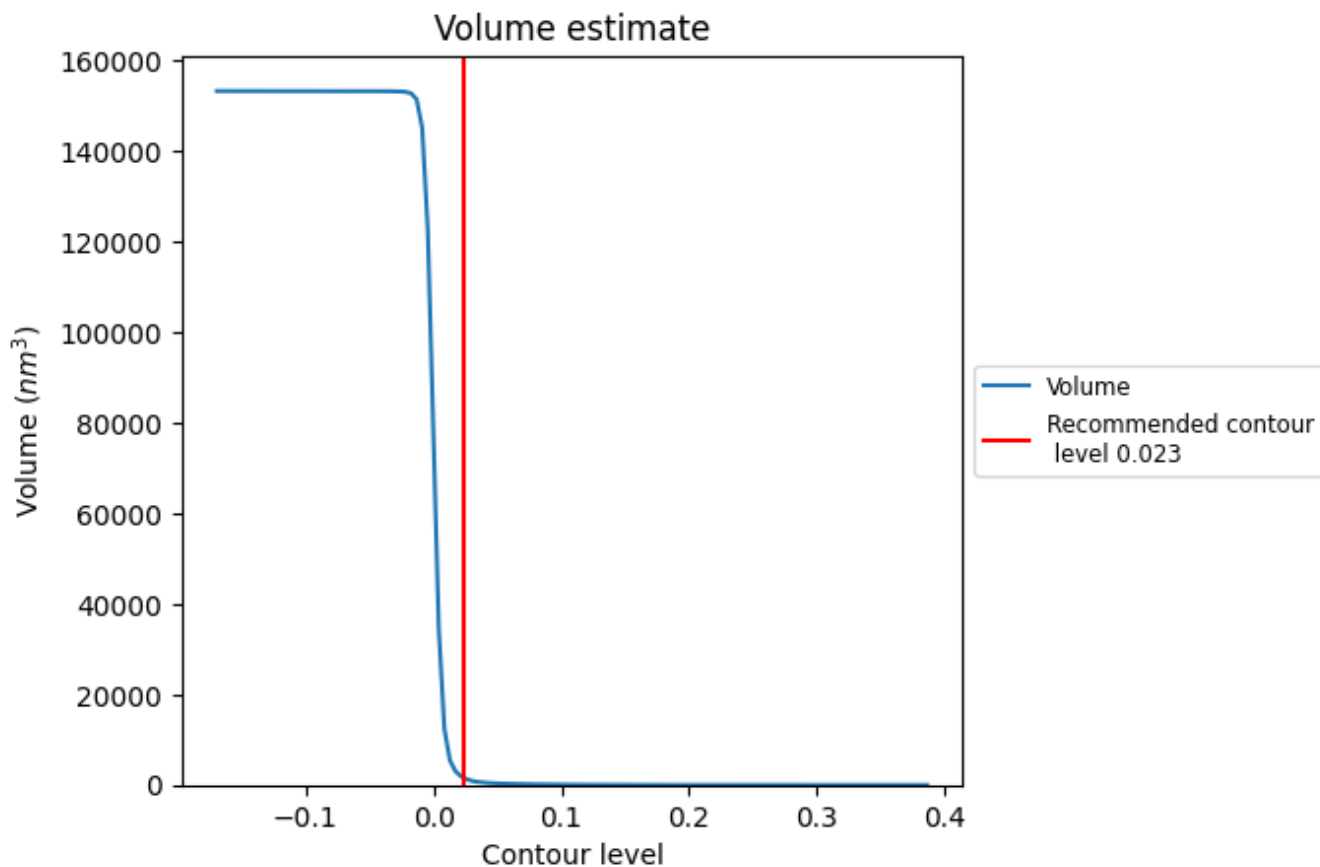
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

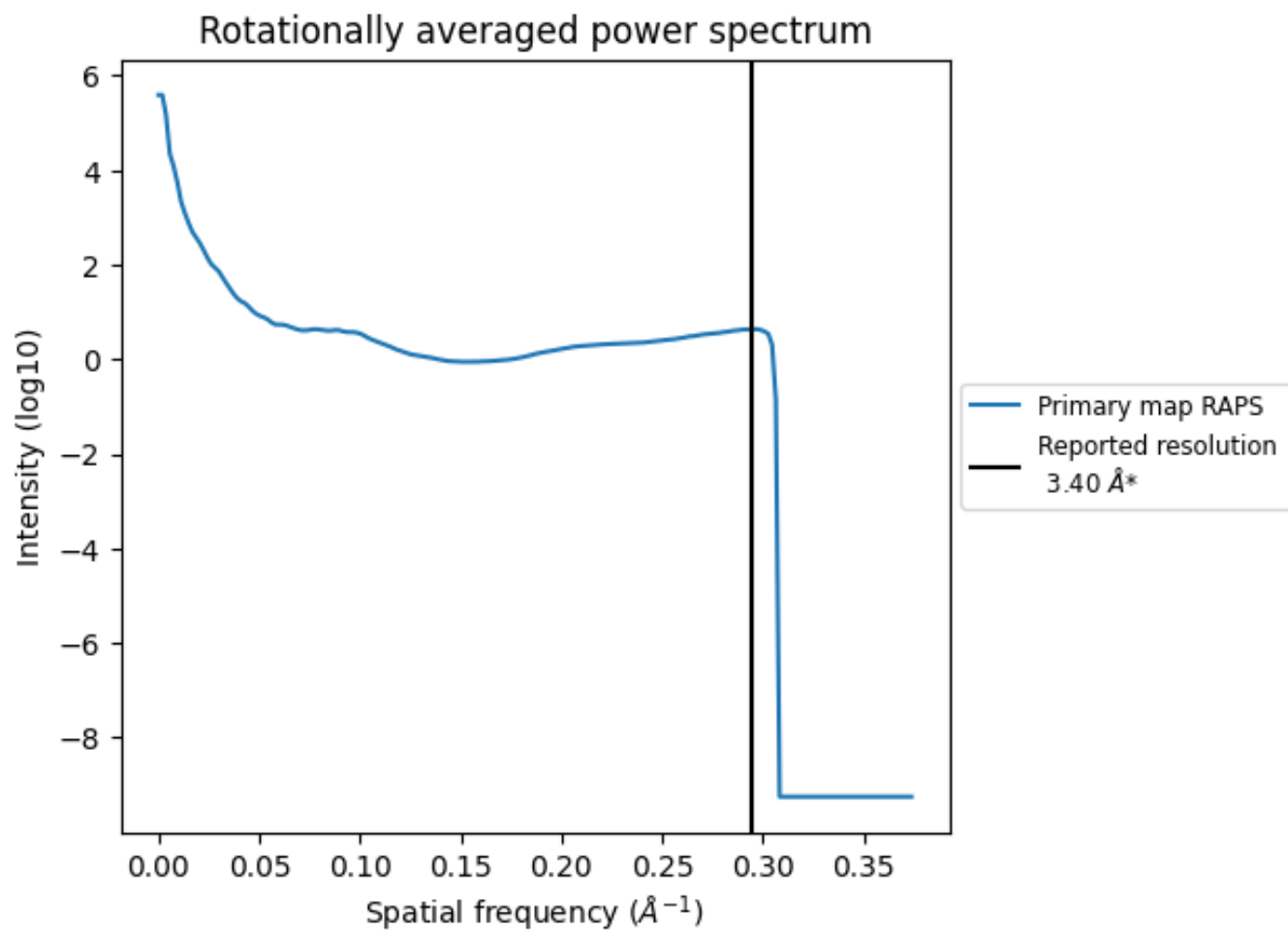
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 1701 nm^3 ; this corresponds to an approximate mass of 1536 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 0.294 Å⁻¹

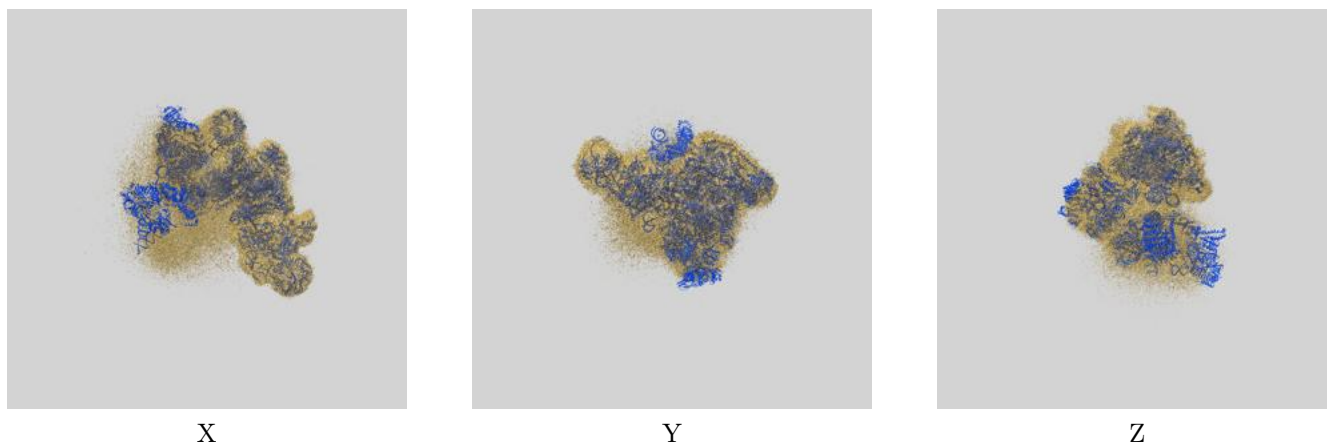
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

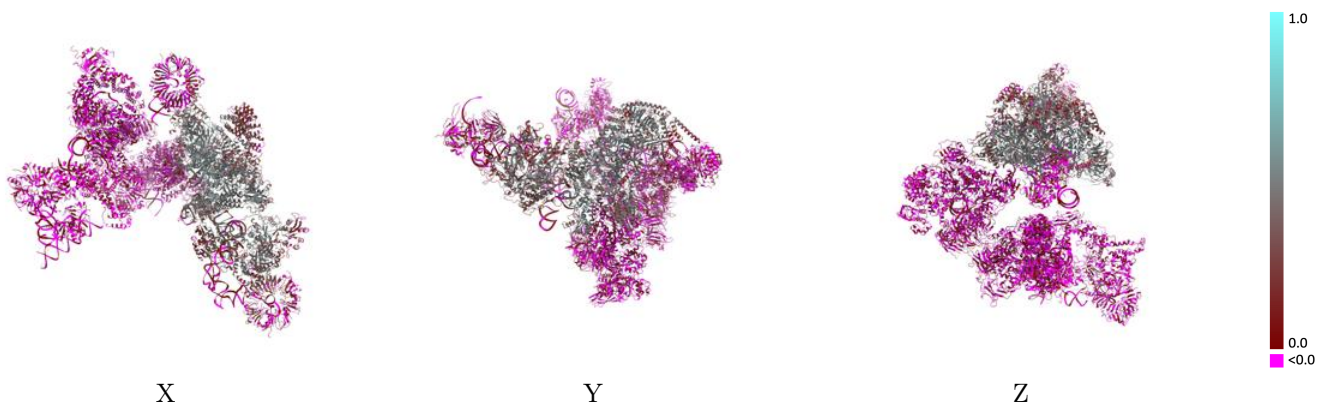
This section contains information regarding the fit between EMDB map EMD-6972 and PDB model 5ZWM. Per-residue inclusion information can be found in section 3 on page 14.

9.1 Map-model overlay [i](#)



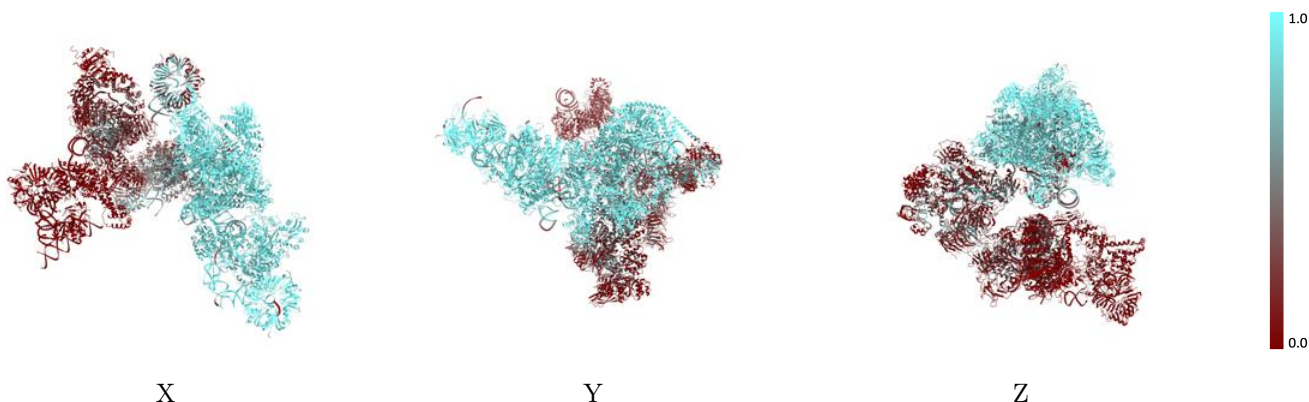
The images above show the 3D surface view of the map at the recommended contour level 0.023 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



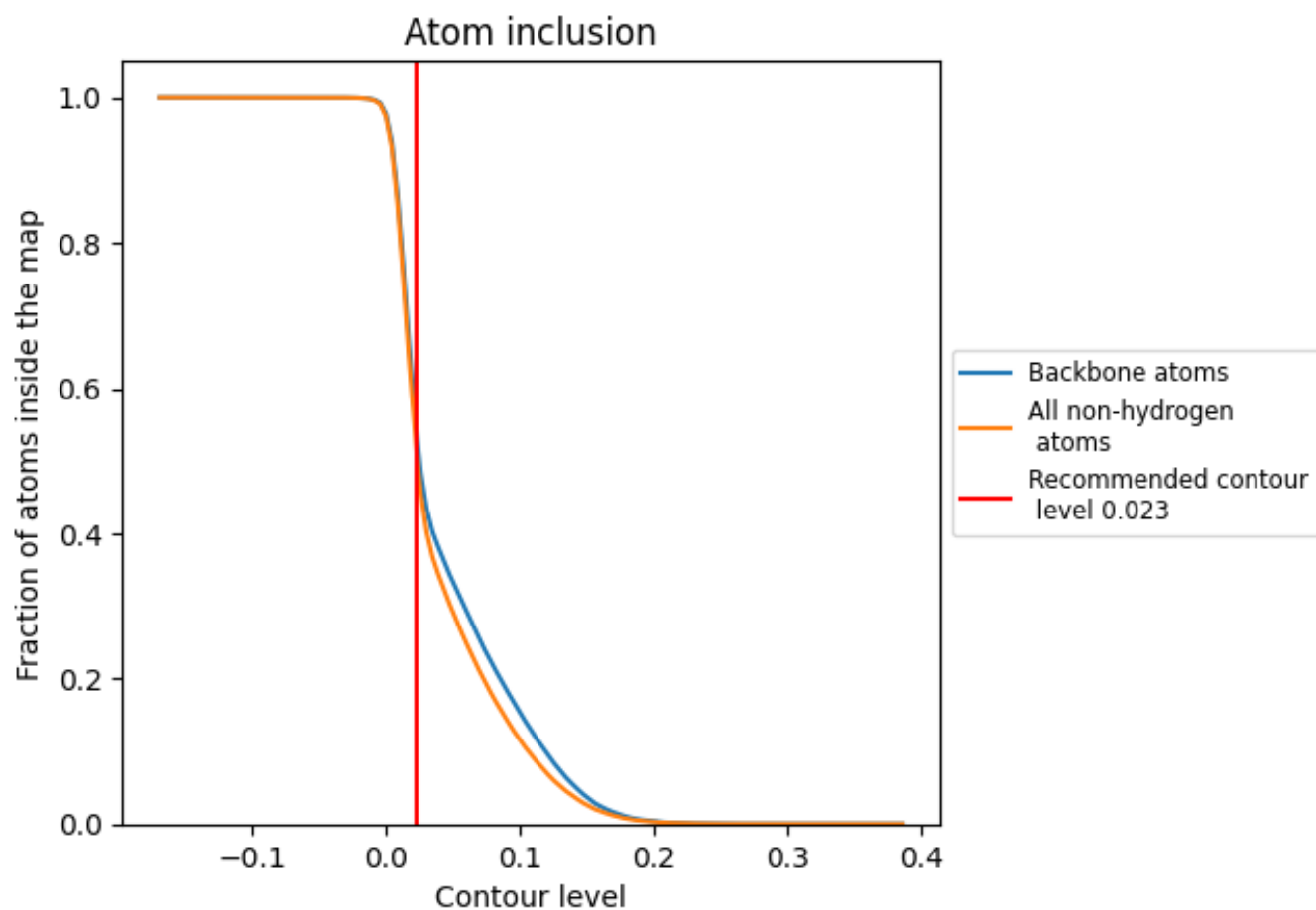
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.023).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 53% of all backbone atoms, 51% 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 (0.023) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5052	 0.1620
1	 0.1698	 0.0010
2	 0.1604	 0.0170
3	 0.1706	 0.0070
4	 0.0557	 -0.0180
5	 0.2769	 0.0070
6	 0.3174	 -0.0020
A	 0.8434	 0.3780
B	 0.8824	 0.1520
C	 0.9058	 0.3540
D	 0.2770	 -0.0020
E	 0.9179	 0.4420
F	 0.8233	 0.2670
G	 0.2004	 -0.0050
H	 0.0741	 0.0020
I	 0.8235	 0.3140
J	 0.9237	 0.4150
K	 0.9220	 0.4350
L	 0.9286	 0.4290
M	 0.9552	 0.5200
N	 0.9201	 0.3230
O	 0.7584	 0.2720
P	 0.5390	 -0.0080
Q	 0.3853	 -0.0020
R	 0.4288	 -0.0110
S	 0.5936	 0.0110
T	 0.1553	 -0.0060
U	 0.2718	 -0.0290
V	 0.2619	 0.0160
X	 0.0049	 0.0070
Y	 0.0014	 -0.0100
Z	 0.0058	 -0.0350
a	 0.9486	 0.2050
b	 0.9383	 0.1490
c	 0.9306	 0.0690



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Chain	Atom inclusion	Q-score
d	 0.9810	 0.2910
e	 0.9514	 0.0850
f	 0.9214	 0.1000
g	 0.8571	 0.0530
h	 0.0067	 0.0250
i	 0.0017	 0.0280
j	 0.0037	 -0.0190
k	 0.0038	 -0.0070
l	 0.0149	 0.0050
m	 0.0079	 0.0080
n	 0.0019	 0.0010
o	 0.0084	 0.0140
p	 0.0065	 0.0150
q	 0.4429	 0.0150
r	 0.5032	 0.0150
s	 0.4156	 0.0280
t	 0.6396	 0.0210
u	 0.0316	 -0.0030
v	 0.0982	 -0.0010
w	 0.0057	 -0.0230
x	 0.5507	 0.0480
y	 0.6174	 0.0200
z	 0.2923	 -0.0110