



wwPDB EM Validation Summary Report ⓘ

Dec 18, 2022 – 09:25 am GMT

PDB ID : 7ADB
EMDB ID : EMD-11722
Title : Transcription termination intermediate complex 1 delta NusG
Authors : Said, N.; Hilal, T.; Loll, B.; Wahl, C.M.
Deposited on : 2020-09-14
Resolution : 4.40 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 : 1.8.4, 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) : 2.31.3

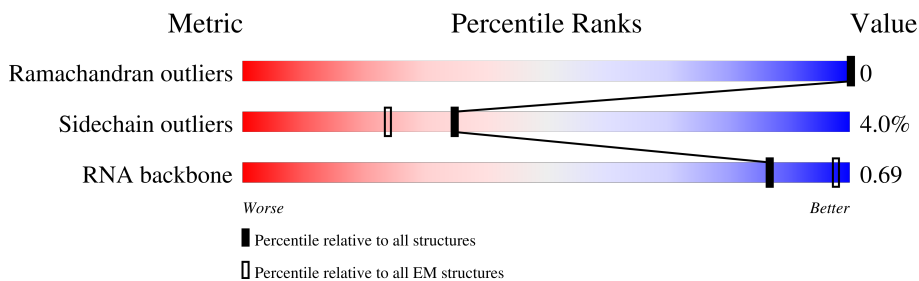
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.40 Å.

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



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

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

Mol	Chain	Length	Quality of chain
1	a	419	<div style="display: flex; justify-content: space-between;"> 74% 91% 9% </div>
1	b	419	<div style="display: flex; justify-content: space-between;"> 49% 91% 9% </div>
1	c	419	<div style="display: flex; justify-content: space-between;"> 45% 91% 9% </div>
1	d	419	<div style="display: flex; justify-content: space-between;"> 51% 91% 9% </div>
1	e	419	<div style="display: flex; justify-content: space-between;"> 73% 91% 9% </div>
1	f	419	<div style="display: flex; justify-content: space-between;"> 92% 91% 9% </div>
2	A	497	<div style="display: flex; justify-content: space-between;"> 99% 99% </div>
3	U	329	<div style="display: flex; justify-content: space-between;"> 46% 98% . </div>

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Mol	Chain	Length	Quality of chain
3	V	329	
4	W	91	
5	X	1342	
6	Y	1416	
7	K	50	
8	L	50	
9	R	99	

2 Entry composition [i](#)

There are 14 unique types of molecules in this entry. The entry contains 51330 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 Transcription termination factor Rho.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	a	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
1	b	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
1	c	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
1	d	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
1	e	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
1	f	417	Total 3280	C 2065	N 581	O 617	S 17	0	0

- Molecule 2 is a protein called Transcription termination/antitermination protein NusA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	495	Total 3852	C 2396	N 669	O 774	S 13	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP C3SSN7
A	0	ALA	-	expression tag	UNP C3SSN7

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	U	322	Total 2510	C 1569	N 442	O 491	S 8	0	0
3	V	235	Total 1828	C 1137	N 326	O 359	S 6	0	0

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	W	79	627	382	118	126	1	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	X	1340	10567	6631	1841	2052	43	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	Y	1358	10545	6620	1883	1992	50	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Y	1408	LEU	-	expression tag	UNP C3SIA2
Y	1409	GLU	-	expression tag	UNP C3SIA2
Y	1410	VAL	-	expression tag	UNP C3SIA2
Y	1411	HIS	-	expression tag	UNP C3SIA2
Y	1412	HIS	-	expression tag	UNP C3SIA2
Y	1413	HIS	-	expression tag	UNP C3SIA2
Y	1414	HIS	-	expression tag	UNP C3SIA2
Y	1415	HIS	-	expression tag	UNP C3SIA2
Y	1416	HIS	-	expression tag	UNP C3SIA2

- Molecule 7 is a DNA chain called ntDNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	K	24	497	235	95	143	24	0	0

- Molecule 8 is a DNA chain called tDNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	L	34	682	325	122	202	33	0	0

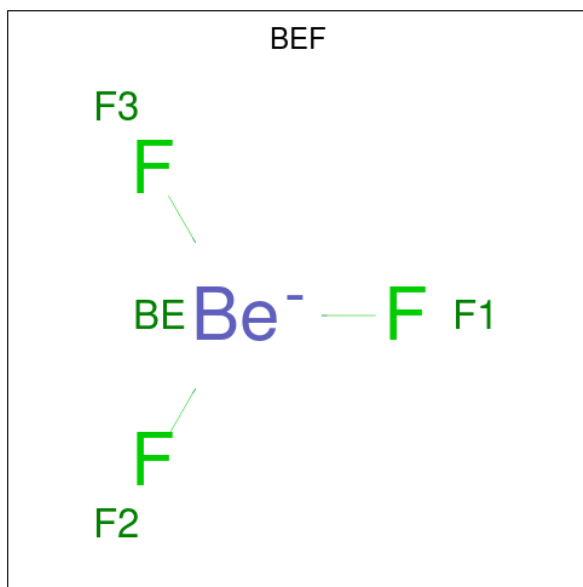
- Molecule 9 is a RNA chain called rut RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
9	R	17	364	162	65	120	17	0	0

There are 27 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	1	G	-	expression tag	GB 1227111474
R	2	G	-	expression tag	GB 1227111474
R	3	G	-	expression tag	GB 1227111474
R	72	U	-	insertion	GB 1227111474
R	77	U	-	expression tag	GB 1227111474
R	78	U	-	expression tag	GB 1227111474
R	79	A	-	expression tag	GB 1227111474
R	80	A	-	expression tag	GB 1227111474
R	81	A	-	expression tag	GB 1227111474
R	82	C	-	expression tag	GB 1227111474
R	83	C	-	expression tag	GB 1227111474
R	84	A	-	expression tag	GB 1227111474
R	85	C	-	expression tag	GB 1227111474
R	86	A	-	expression tag	GB 1227111474
R	87	C	-	expression tag	GB 1227111474
R	88	C	-	expression tag	GB 1227111474
R	89	U	-	expression tag	GB 1227111474
R	90	G	-	expression tag	GB 1227111474
R	91	G	-	expression tag	GB 1227111474
R	92	C	-	expression tag	GB 1227111474
R	93	G	-	expression tag	GB 1227111474
R	94	U	-	expression tag	GB 1227111474
R	95	G	-	expression tag	GB 1227111474
R	96	U	-	expression tag	GB 1227111474
R	97	G	-	expression tag	GB 1227111474
R	98	G	-	expression tag	GB 1227111474
R	99	C	-	expression tag	GB 1227111474

- Molecule 10 is BERYLLIUM TRIFLUORIDE ION (three-letter code: BEF) (formula: BeF₃).



Mol	Chain	Residues	Atoms			AltConf
			Total	Be	F	
10	b	1	4	1	3	0
10	c	1	4	1	3	0
10	d	1	4	1	3	0
10	e	1	4	1	3	0
10	f	1	4	1	3	0

- Molecule 11 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
11	b	1	Total	C	N	O	P	0
			27	10	5	10	2	
11	c	1	Total	C	N	O	P	0
			27	10	5	10	2	
11	d	1	Total	C	N	O	P	0
			27	10	5	10	2	
11	e	1	Total	C	N	O	P	0
			27	10	5	10	2	
11	f	1	Total	C	N	O	P	0
			27	10	5	10	2	

- Molecule 12 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
12	b	1	Total	Mg	0
			1	1	
12	c	1	Total	Mg	0
			1	1	
12	d	1	Total	Mg	0
			1	1	
12	e	1	Total	Mg	0
			1	1	
12	f	1	Total	Mg	0
			1	1	
12	Y	1	Total	Mg	0
			1	1	

- Molecule 13 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
13	Y	2	Total 2	Zn 2	0

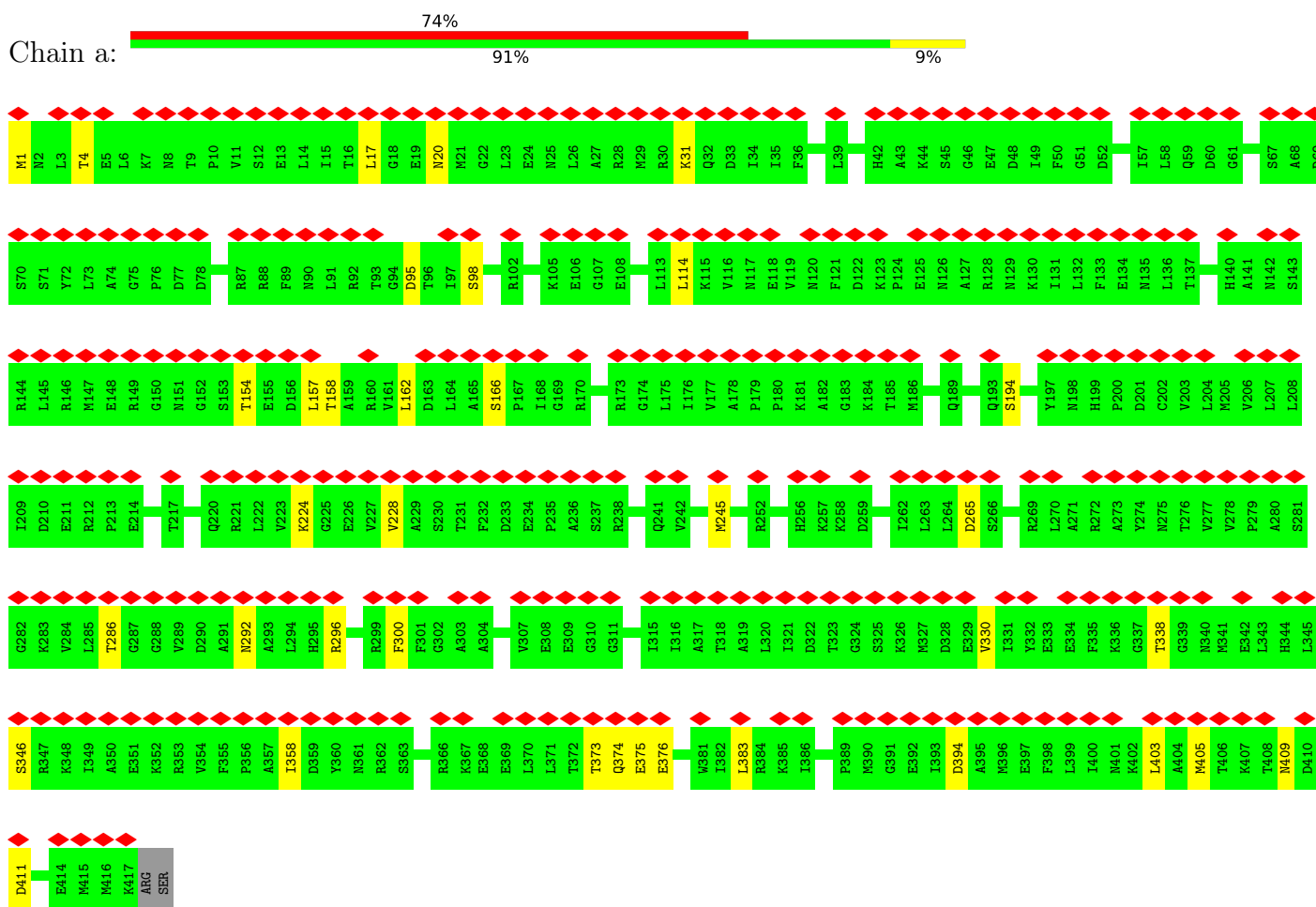
- Molecule 14 is water.

Mol	Chain	Residues	Atoms		AltConf
14	b	3	Total 3	O 3	0
14	c	3	Total 3	O 3	0
14	d	3	Total 3	O 3	0
14	e	3	Total 3	O 3	0
14	f	3	Total 3	O 3	0

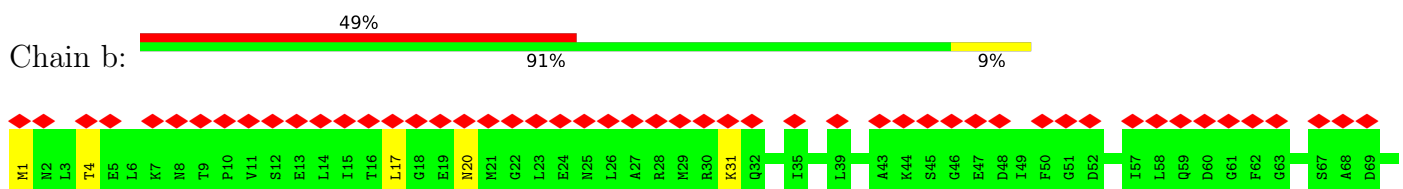
3 Residue-property plots

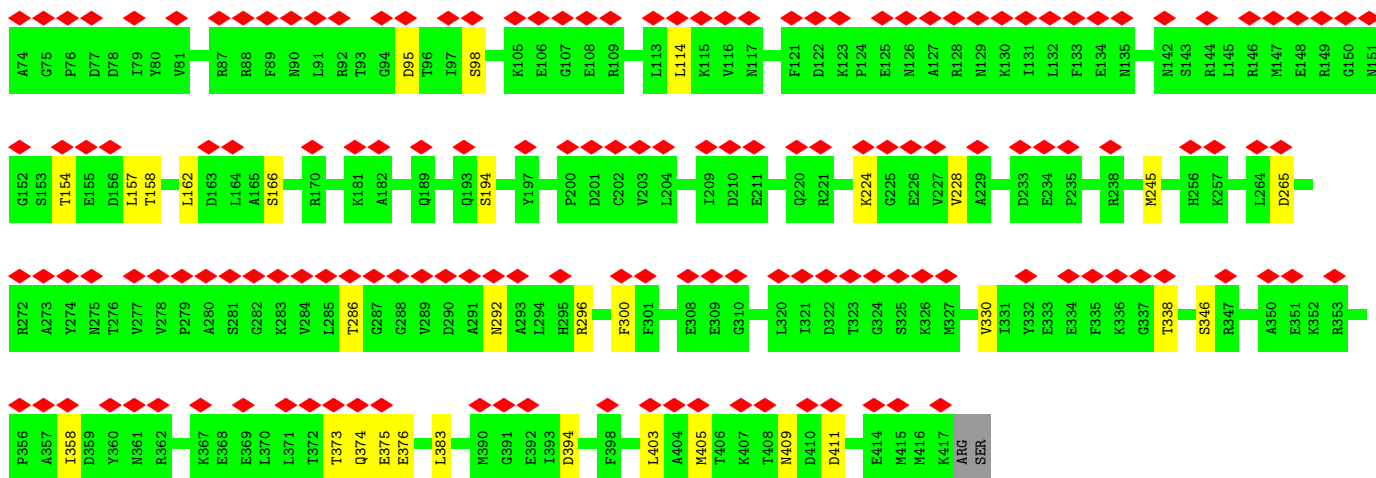
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

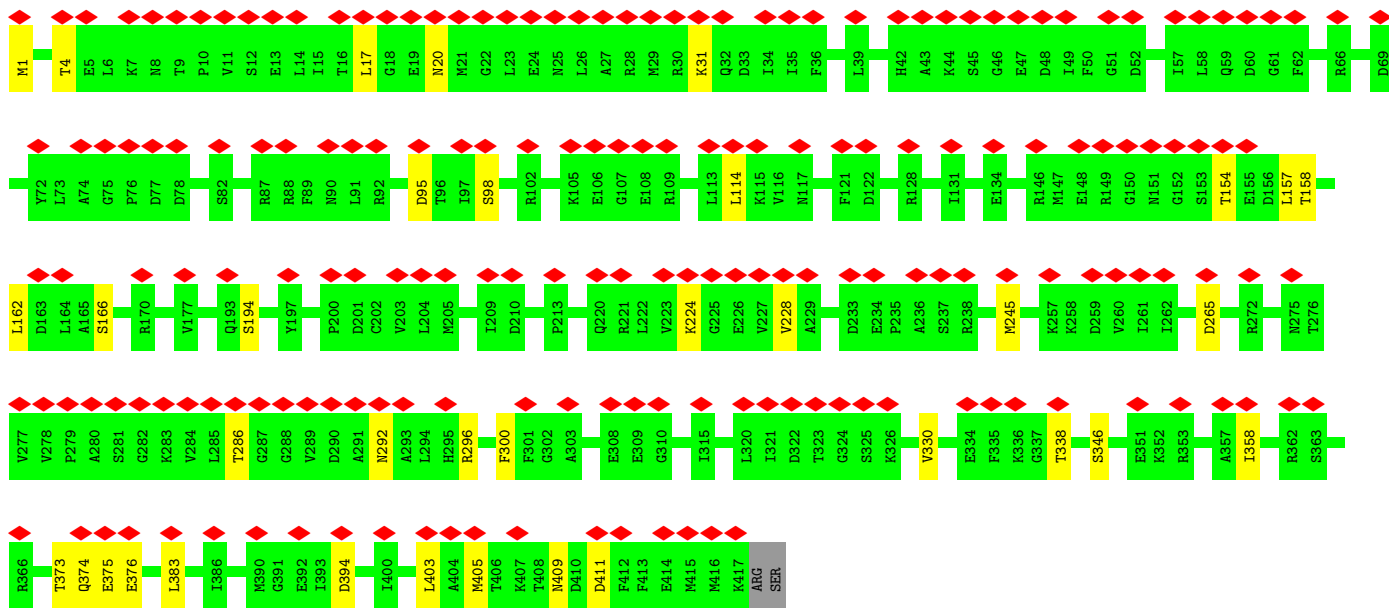
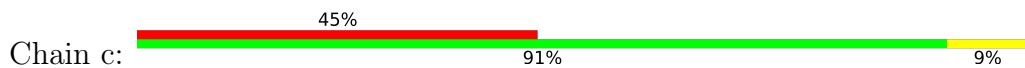


- Molecule 1: Transcription termination factor Rho

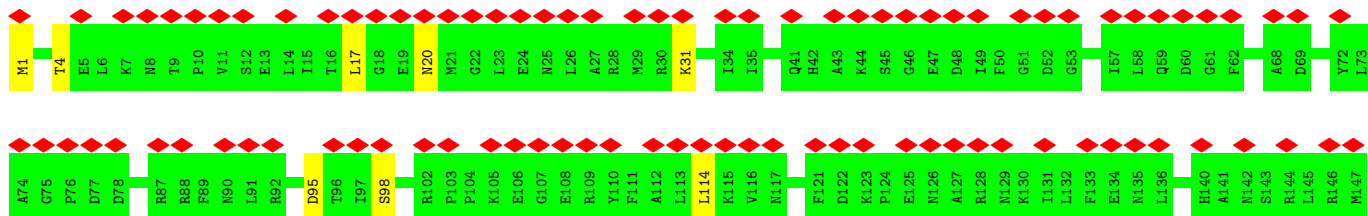
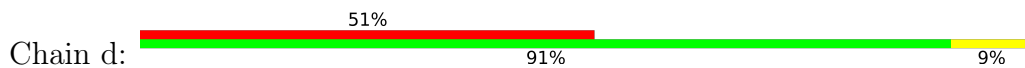


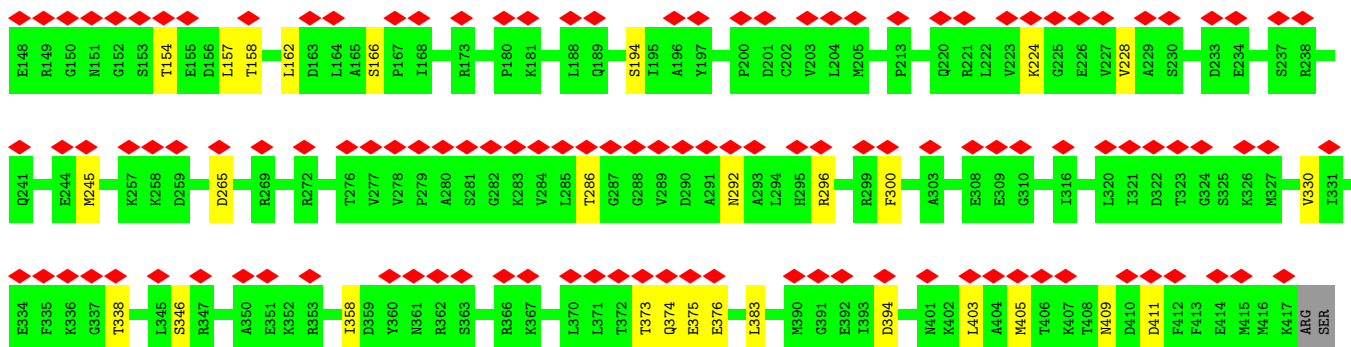


• Molecule 1: Transcription termination factor Rho

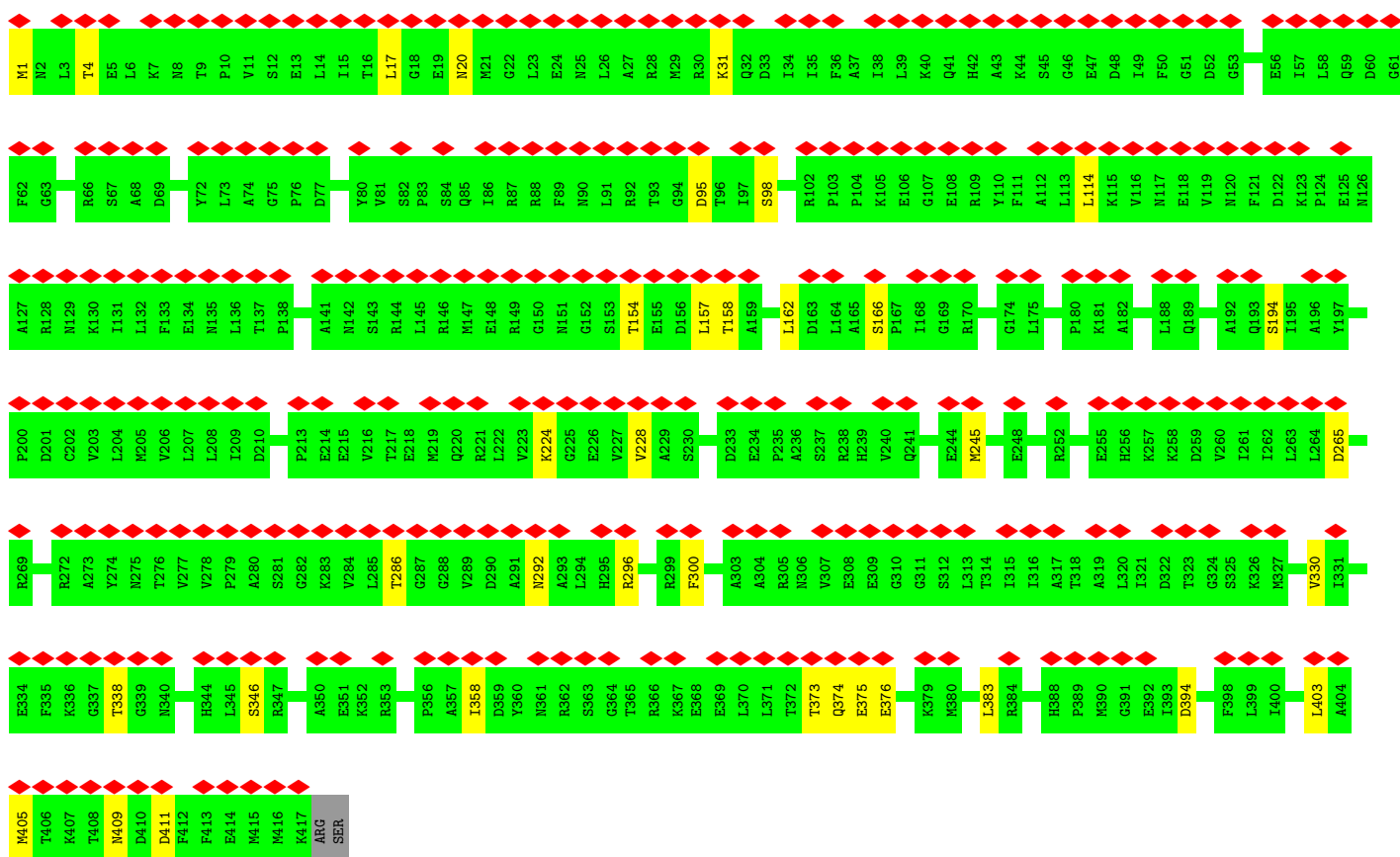
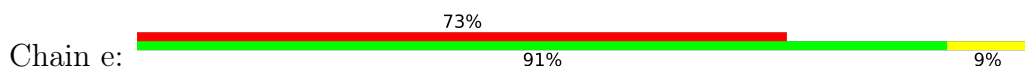


• Molecule 1: Transcription termination factor Rho

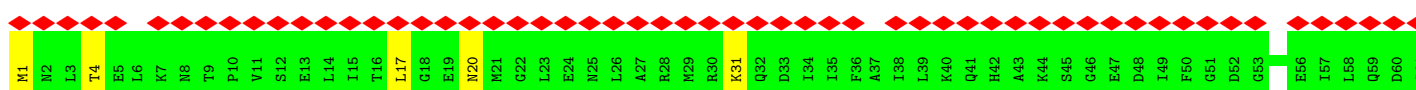
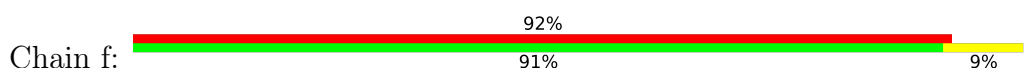


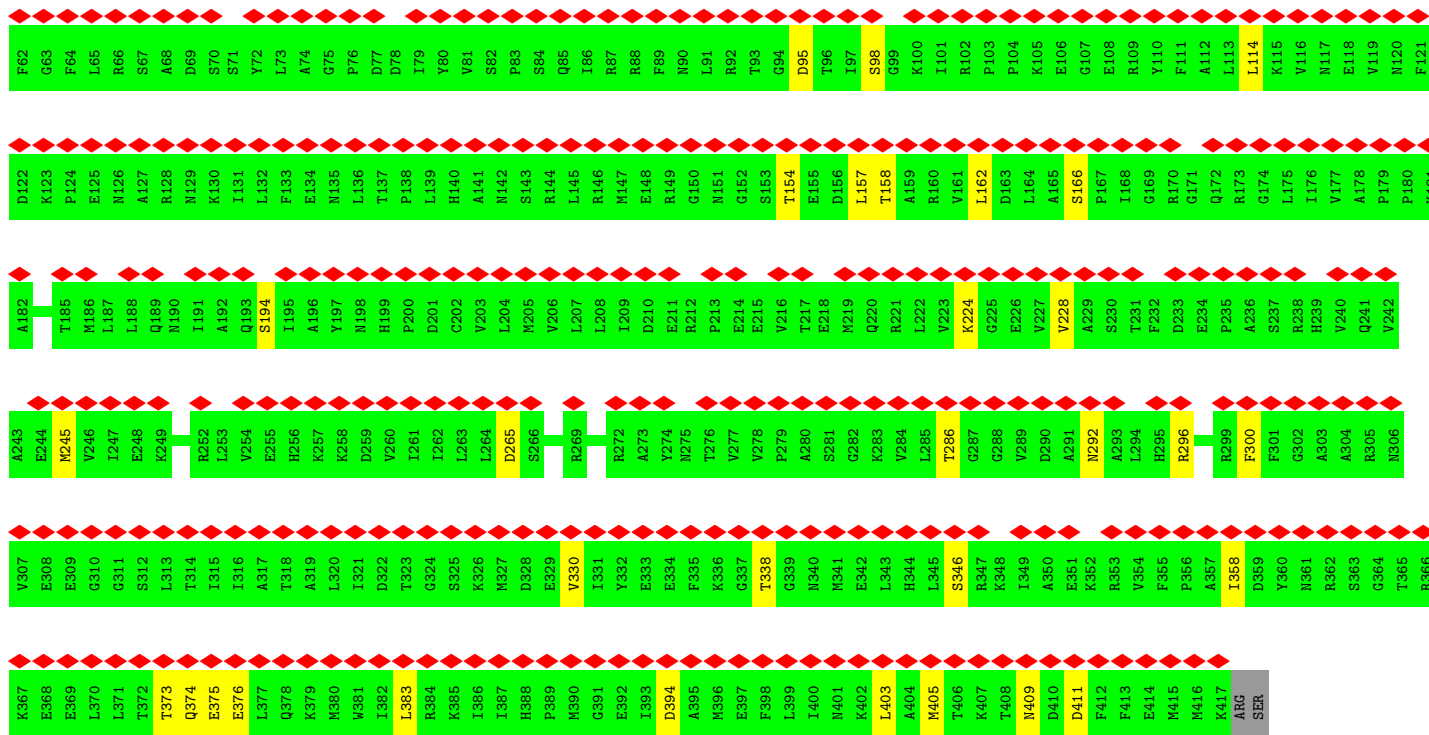


• Molecule 1: Transcription termination factor Rho

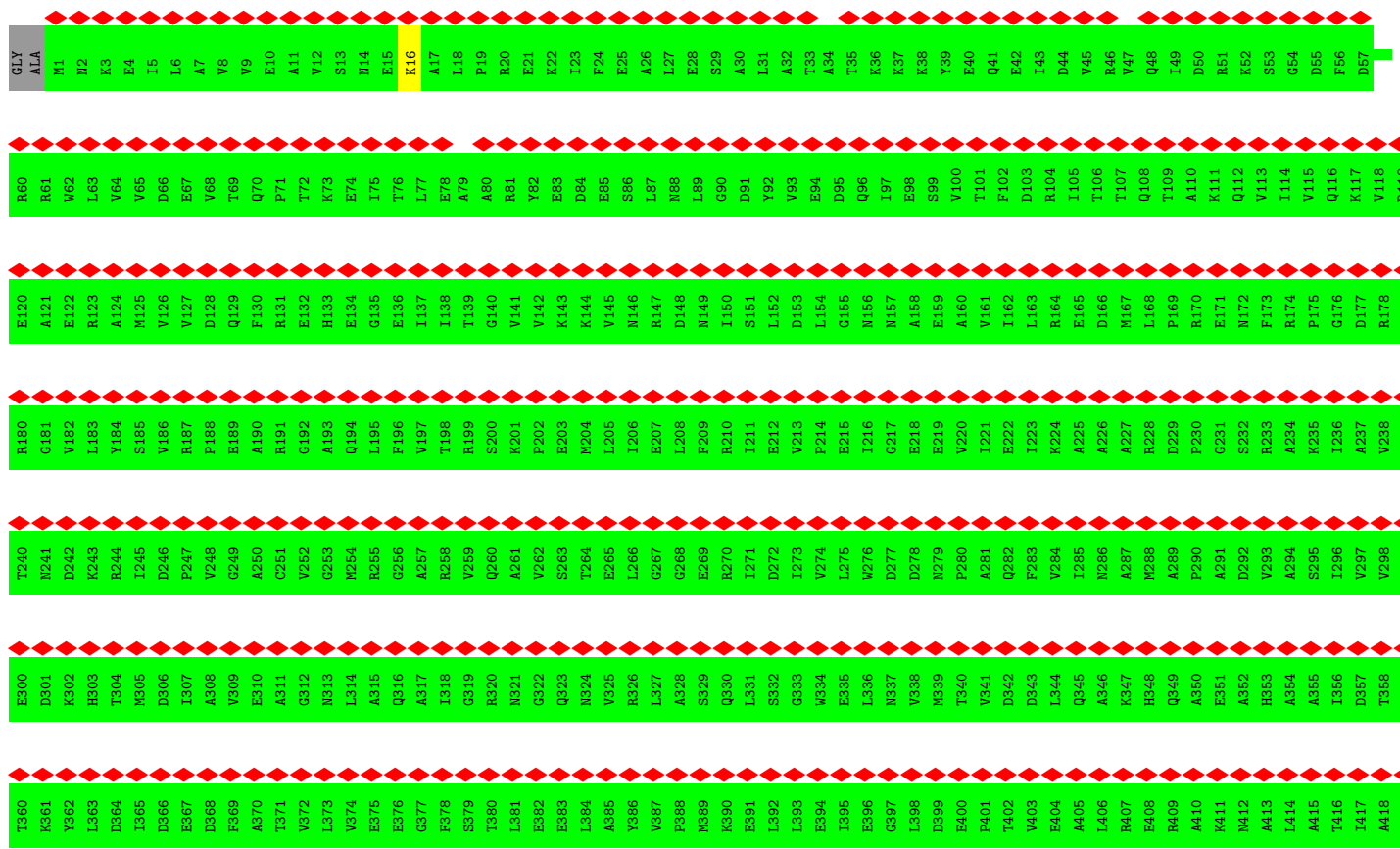


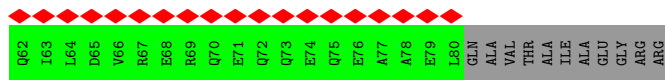
• Molecule 1: Transcription termination factor Rho



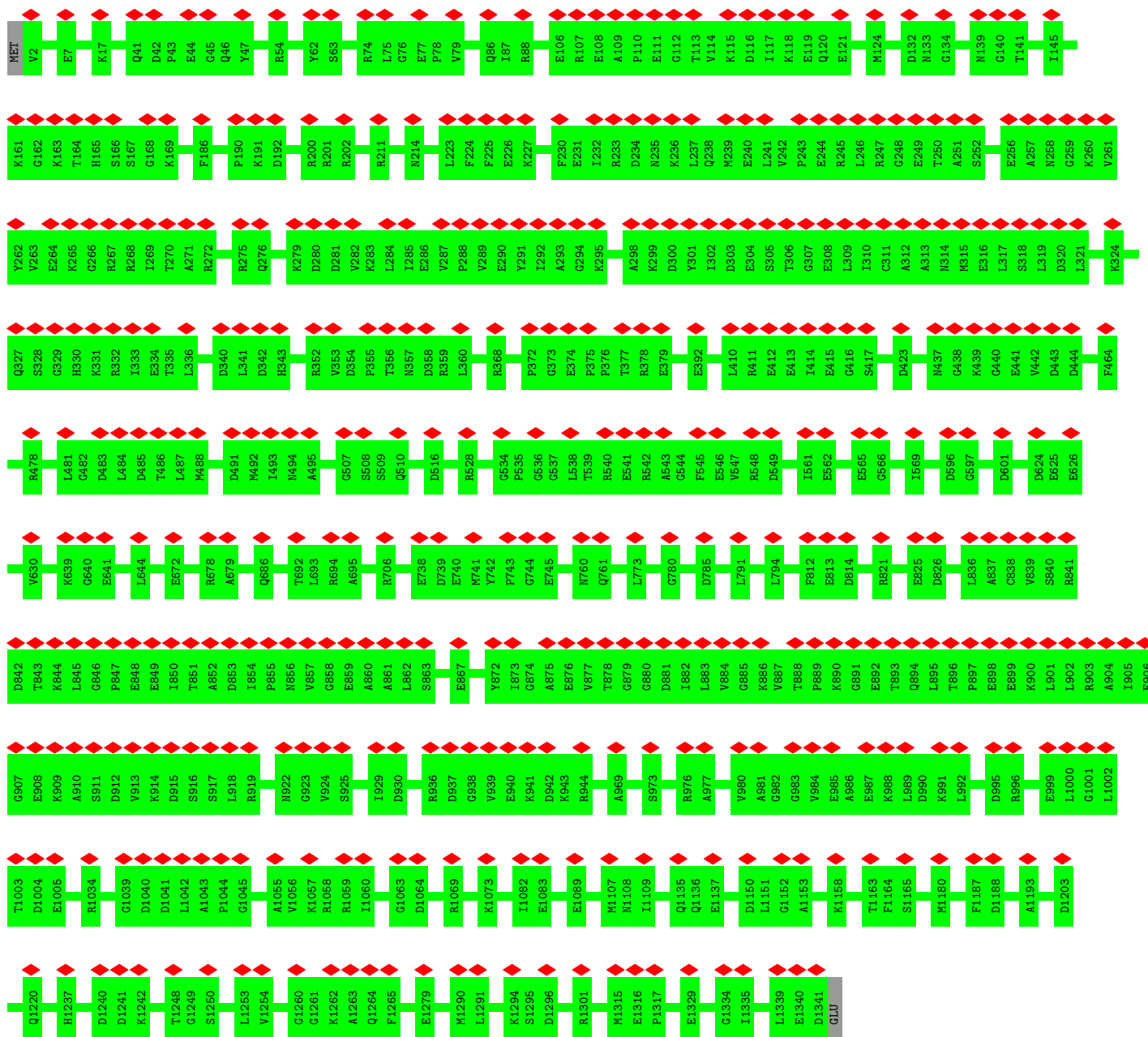


• Molecule 2: Transcription termination/antitermination protein NusA

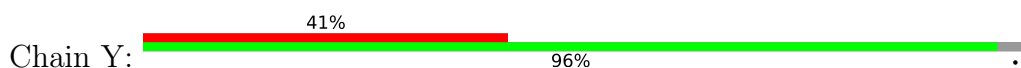




• Molecule 5: DNA-directed RNA polymerase subunit beta

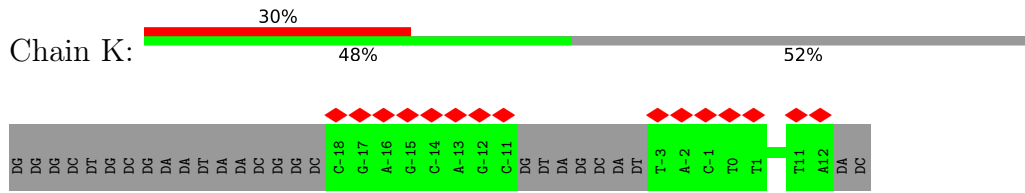


• Molecule 6: DNA-directed RNA polymerase subunit beta'

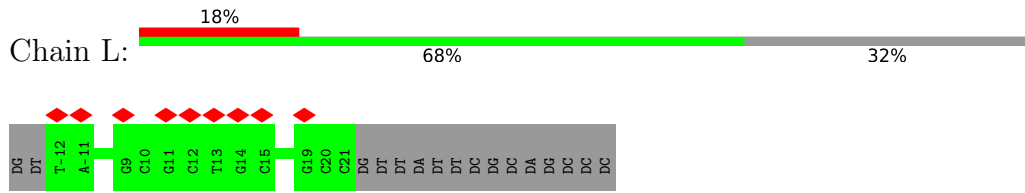


VAL	THR	ALA	GLU	ASP	GLY	ALA	ALA	ALA	LEU	LEU	GLN	THR	THR	THR	GLU	E16	F17	D18	A19	L24	A25	R31	K39	K40	P41	E42	T43	I44	N45	Y46	R47	T48	F49	E52	R53	L56	F57	R60	V65	K66	D67	Y68	E69	C70	L71	C72	G73	K74	Y75	K76	R77	L78	K79			
F1274	L1275	E1276	G1277	E1278	Q1279	R1284	E1283	A1284	N1285	G1286	K1287	V1288	F1289	G1300	R1304	D1305	L1306	L1307	S1313	L1314	T1315	E1316	E1317	S1324	F1325	Q1326	A1338	R1341	D1342	E1343	L1344	R1345	V1352	V1353	G1354	Y1365	R1371	R1372	R1373	ALA	ALA	GLY	GLU	ALA	PRO	ALA	ALA	PRO	GLN							
D1184	P1185	Y1186	E1187	E1188	M1189	I1190	P1191	K1192	W1193	R1194	Q1195	L1196	M1197	V1198	F1199	E1200	G1201	E1202	R1203	V1204	E1205	R1206	G1207	D1208	V1209	I1210	S1211	D1212	G1213	P1214	E1215	A1216	P1217	H1218	Y1232	D1239	R1242	L1243	I1248	I1253	R1262	V1267	M1268	A1269	G1270	S1271	D1272	D1273								
Q1049	T1050	D1051	E1052	L1053	G1055	L1056	S1057	G1058	L1059	V1060	V1061	L1062	D1063	S1064	E1066	R1067	T1068	A1069	G1070	G1071	K1072	D1073	L1074	R1075	P1076	A1077	L1078	K1079	I1080	V1081	D1082	A1083	Q1084	G1085	M1086	D1087	V1088	L1089	P1091	G1092	T1093	D1094	M1095	P1096	A1097	Q1098	Y1099	F1100	L1101	L1102	G1103	K1104	A1105	V1107	Q1108	
N979	E981	I985	D986	E987	F988	G989	R990	T991	K992	E993	S994	Y995	K996	V997	P998	Y999	A1004	K1005	G1006	D1007	G1008	E1009	Q1010	V1011	A1012	G1013	G1014	E1015	T1016	H1023	T1024	M1025	P1026	G1027	I1028	T1029	E1030	V1031	S1032	G1033	F1034	V1035	R1036	F1037	T1038	D1039	M1040	I1041	D1042	G1043	Q1044	T1045	I1046	T1047	R1048	
R901	D902	L903	G906	S922	I923	T928	Q929	L930	T931	R932	R933	T934	F935	H936	I937	G938	G939	A940	A941	S942	R943	A944	A945	A946	E947	S948	S949	I950	Q951	V952	K953	R954	K955	G956	S957	I958	K959	L960	S961	R962	V963	K964	S965	V966	V967	R968	S969	S970	G971	K972	L973	I974	T975	T976	S977	R978
K715	Q716	D727	R731	R744	G745	L746	F750	D751	G752	E756	R764	E765	G766	H777	R780	Y795	D806	E818	L826	E827	G828	G829	D830	R831	K832	D837	R838	L849	K850	P851	G852	T853	A854	D855	L856	M861	E874	D878	A879	D889																
M489	G496	E497	P498	I499	I500	Q504	E523	G524	R547	K557	D558	A559	N560	G561	E562	L563	V564	A565	L569	K570	D571	I591	A595	K599	R634	L641	D642	D643	E648	Q669	S670	G671	L672	A675	G676	T703	E704	D710	G711	Q712	E713	E714														
G544	I355	Y360	L363	G367	L376	L387	R388	G389	L390	A391	T392	R403	E404	A405	A406	M409	D413	I416	R417	E418	H419	R425	A426	L429	H430	R431	L432	G433	L441	I442	E443	G444	K445	A446	A455	M459	F461	D462	G463	F338	R339	Q340	L342	L343												
F260	A261	T262	S263	D264	D267	R270	L282	L283	D284	L285	A286	P288	D289	L290	I291	E301	D304	A305	D308	N309	G310	R312	G313	R314	A315	I316	T317	G318	S319	N320	K321	R322	P323	L324	K325	A328	D329	K332	G333	K334	Q335	G336	F337	R339	Q340	L342	L343									
T161	E162	E163	Q164	Y165	L166	D167	A168	L169	E170	E171	F172	G173	D174	E175	F176	D177	A178	K190	S191	M192	D193	R202	L205	N206	E207	T208	N209	S210	E211	T212	K222	Q229	S230	G231	M237	I238	L239	L242	L245	D248	L249	L252	V253	P254	L255	D256	G257	G258	R259							
G82	V83	E86	K87	C88	G89	V90	E91	Q94	T95	K96	R99	M102	E106	L107	A108	S109	P110	T111	A112	H113	I114	W115	K118	S119	L120	R123	D129	M130	P131	L132	R133	R137	Y140	F141	E142	S143	E148	G149	G150	M151	T152	M153	L154	E155	R156	Q157										

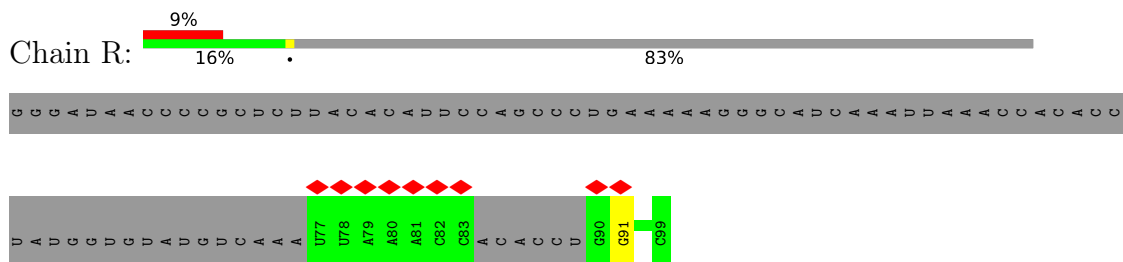
• Molecule 7: ntDNA



• Molecule 8: tDNA



• Molecule 9: rut RNA



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	27226	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI POLARA 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	8000	Depositor
Maximum defocus (nm)	25000	Depositor
Magnification	31000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.247	Depositor
Minimum map value	0.000	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.11	Depositor
Map size (Å)	372.0, 372.0, 372.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.24, 1.24, 1.24	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: BEF, ZN, ADP, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	a	0.28	0/3329	0.48	0/4483
1	b	0.28	0/3329	0.48	0/4483
1	c	0.28	0/3329	0.48	0/4483
1	d	0.28	0/3329	0.48	0/4483
1	e	0.28	0/3329	0.48	0/4483
1	f	0.28	0/3329	0.48	0/4483
2	A	0.25	0/3897	0.44	0/5273
3	U	0.23	0/2544	0.44	0/3449
3	V	0.24	0/1850	0.45	0/2507
4	W	0.23	0/629	0.43	0/847
5	X	0.25	0/10736	0.42	0/14487
6	Y	0.24	0/10706	0.42	1/14456 (0.0%)
7	K	0.55	0/557	0.94	0/856
8	L	0.53	0/762	0.88	0/1171
9	R	0.20	0/405	0.83	0/627
All	All	0.27	0/52060	0.47	1/70571 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	Y	1344	LEU	CA-CB-CG	5.13	127.10	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	a	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
1	b	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
1	c	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
1	d	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
1	e	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
1	f	415/419 (99%)	397 (96%)	18 (4%)	0	100	100
2	A	493/497 (99%)	453 (92%)	40 (8%)	0	100	100
3	U	320/329 (97%)	292 (91%)	28 (9%)	0	100	100
3	V	233/329 (71%)	218 (94%)	15 (6%)	0	100	100
4	W	77/91 (85%)	72 (94%)	5 (6%)	0	100	100
5	X	1338/1342 (100%)	1251 (94%)	87 (6%)	0	100	100
6	Y	1356/1416 (96%)	1302 (96%)	54 (4%)	0	100	100
All	All	6307/6518 (97%)	5970 (95%)	337 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	a	357/359 (99%)	321 (90%)	36 (10%)	7	28
1	b	357/359 (99%)	321 (90%)	36 (10%)	7	28

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	c	357/359 (99%)	321 (90%)	36 (10%)	7	28
1	d	357/359 (99%)	321 (90%)	36 (10%)	7	28
1	e	357/359 (99%)	321 (90%)	36 (10%)	7	28
1	f	357/359 (99%)	321 (90%)	36 (10%)	7	28
2	A	409/409 (100%)	408 (100%)	1 (0%)	93	96
3	U	281/286 (98%)	281 (100%)	0	100	100
3	V	203/286 (71%)	203 (100%)	0	100	100
4	W	67/75 (89%)	67 (100%)	0	100	100
5	X	1155/1157 (100%)	1155 (100%)	0	100	100
6	Y	1134/1177 (96%)	1133 (100%)	1 (0%)	93	97
All	All	5391/5544 (97%)	5173 (96%)	218 (4%)	35	56

5 of 218 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	d	114	LEU
1	d	411	ASP
1	f	292	ASN
1	d	162	LEU
1	d	330	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
5	X	139	ASN
5	X	932	GLN
5	X	193	ASN
5	X	688	GLN
6	Y	365	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
9	R	15/99 (15%)	1 (6%)	0

All (1) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
9	R	91	G

There are no RNA pucker outliers to report.

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 18 ligands modelled in this entry, 8 are monoatomic - leaving 10 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	$\# Z > 2$
10	BEF	e	1002	-	0,3,3	-	-	-		
10	BEF	c	1002	-	0,3,3	-	-	-		
10	BEF	b	501	-	0,3,3	-	-	-		
11	ADP	b	502	1,12	24,29,29	0.97	1 (4%)	29,45,45	1.45	4 (13%)
10	BEF	d	1002	-	0,3,3	-	-	-		
11	ADP	d	1000	1,12	24,29,29	0.96	1 (4%)	29,45,45	1.49	4 (13%)
11	ADP	e	1000	12	24,29,29	0.95	1 (4%)	29,45,45	1.47	4 (13%)
10	BEF	f	1002	-	0,3,3	-	-	-		
11	ADP	c	1000	1,12	24,29,29	0.95	1 (4%)	29,45,45	1.50	4 (13%)
11	ADP	f	1000	1	24,29,29	0.97	1 (4%)	29,45,45	1.42	4 (13%)

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
11	ADP	b	502	1,12	-	6/12/32/32	0/3/3/3
11	ADP	e	1000	12	-	1/12/32/32	0/3/3/3
11	ADP	d	1000	1,12	-	1/12/32/32	0/3/3/3
11	ADP	c	1000	1,12	-	1/12/32/32	0/3/3/3
11	ADP	f	1000	1	-	2/12/32/32	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	b	502	ADP	C5-C4	2.56	1.47	1.40
11	f	1000	ADP	C5-C4	2.53	1.47	1.40
11	d	1000	ADP	C5-C4	2.51	1.47	1.40
11	e	1000	ADP	C5-C4	2.50	1.47	1.40
11	c	1000	ADP	C5-C4	2.48	1.47	1.40

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	e	1000	ADP	C3'-C2'-C1'	3.66	106.50	100.98
11	c	1000	ADP	C3'-C2'-C1'	3.60	106.40	100.98
11	d	1000	ADP	C3'-C2'-C1'	3.55	106.32	100.98
11	b	502	ADP	C3'-C2'-C1'	3.51	106.27	100.98
11	f	1000	ADP	C3'-C2'-C1'	3.46	106.19	100.98

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

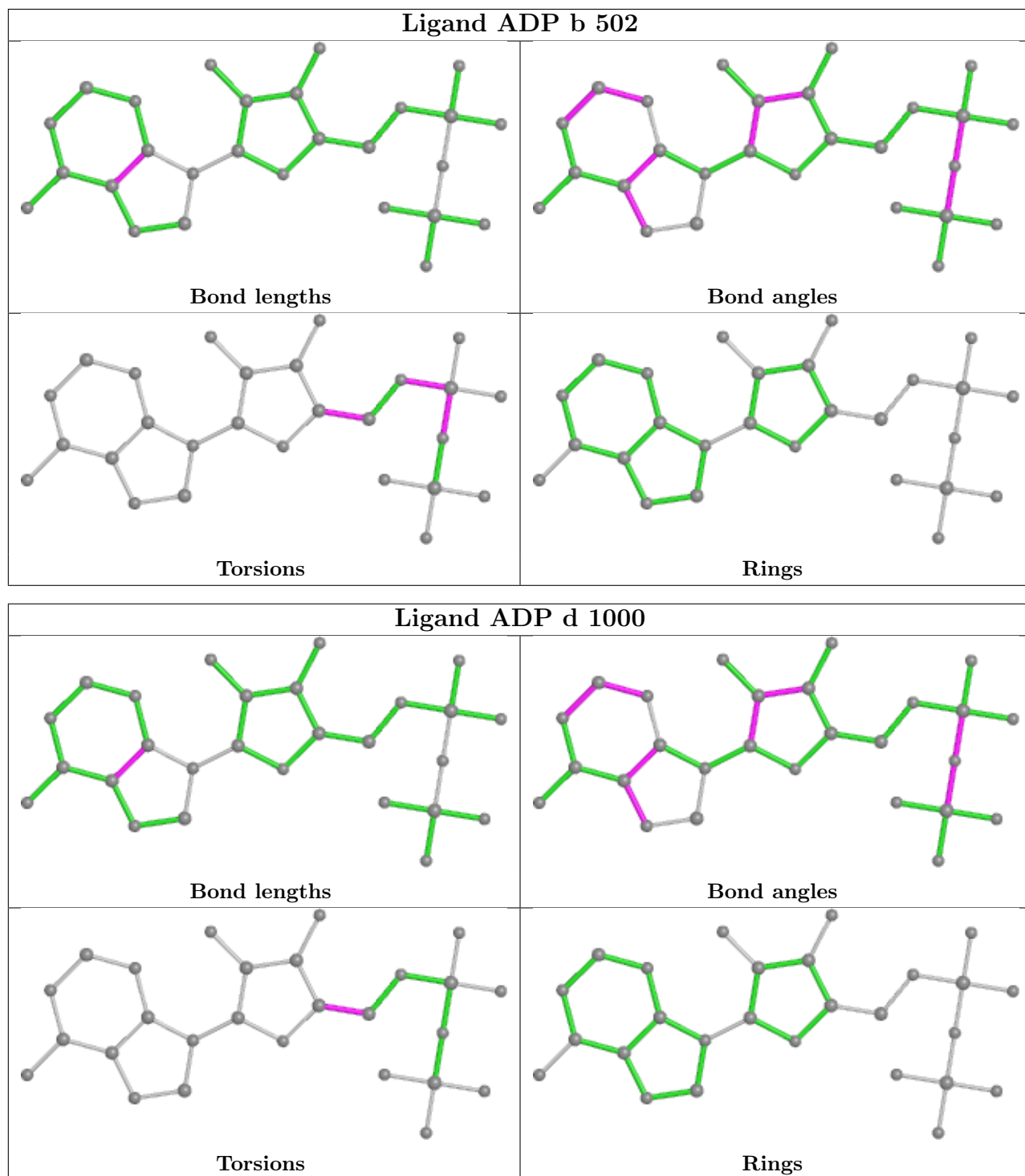
Mol	Chain	Res	Type	Atoms
11	b	502	ADP	C5'-O5'-PA-O2A
11	b	502	ADP	C5'-O5'-PA-O3A
11	f	1000	ADP	O4'-C4'-C5'-O5'
11	b	502	ADP	PB-O3A-PA-O1A
11	b	502	ADP	O4'-C4'-C5'-O5'

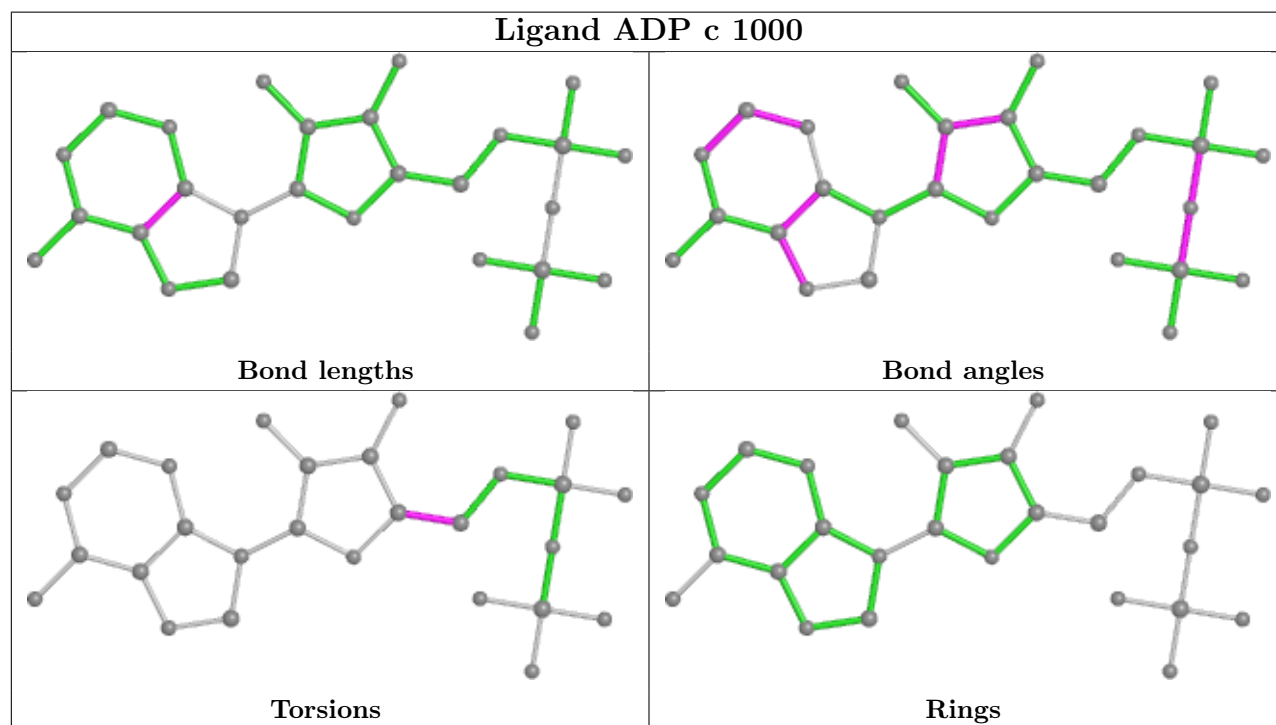
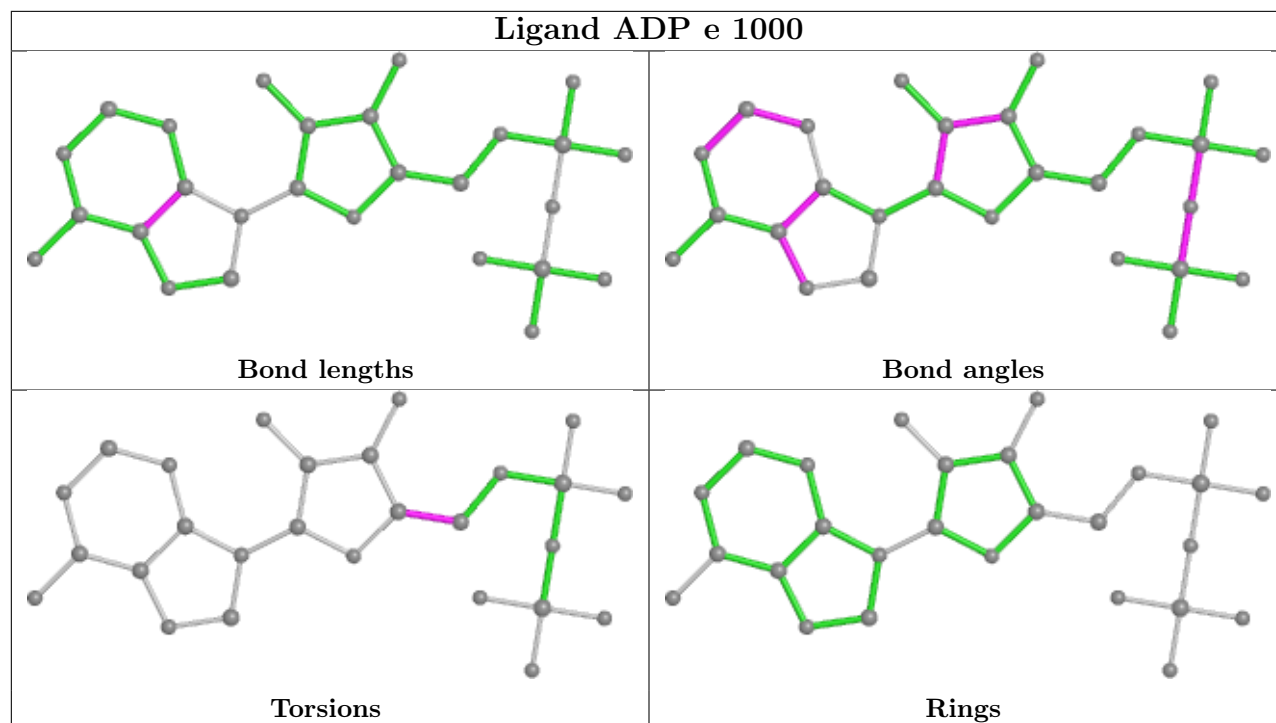
There are no ring outliers.

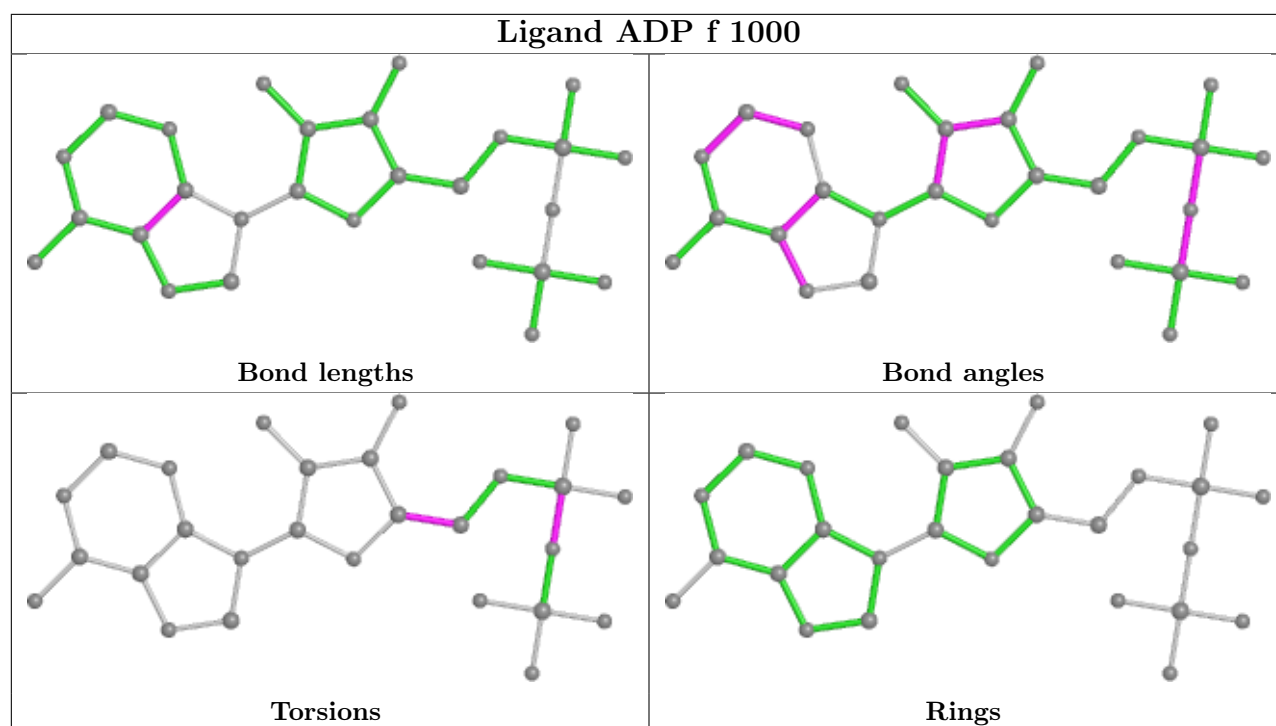
No monomer is involved in short contacts.

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.

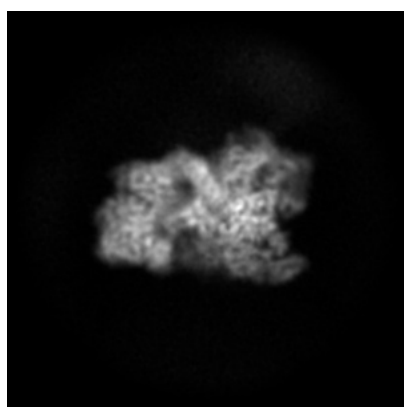
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11722. These allow visual inspection of the internal detail of the map and identification of artifacts.

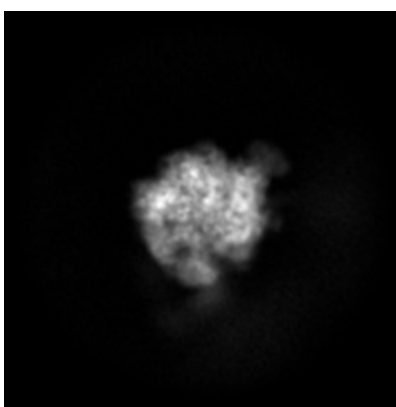
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

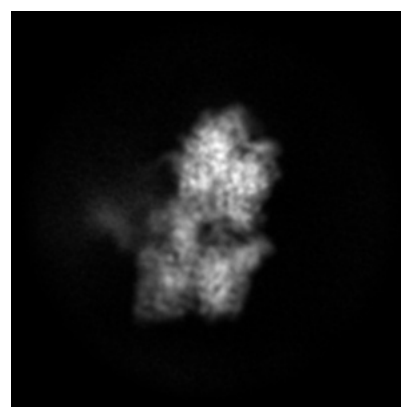
6.1.1 Primary map



X



Y

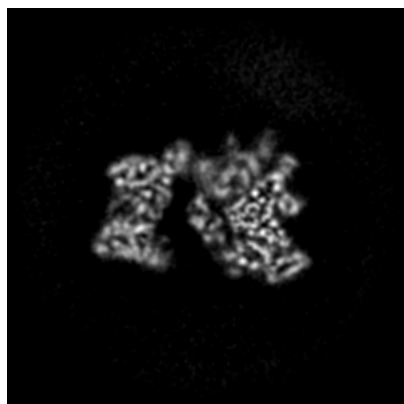


Z

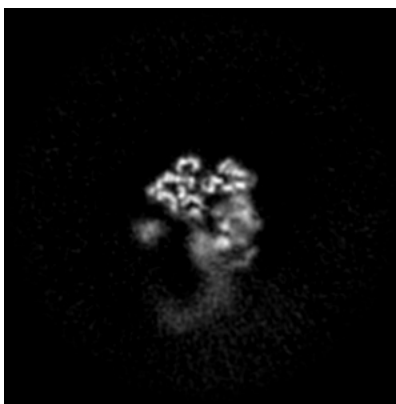
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

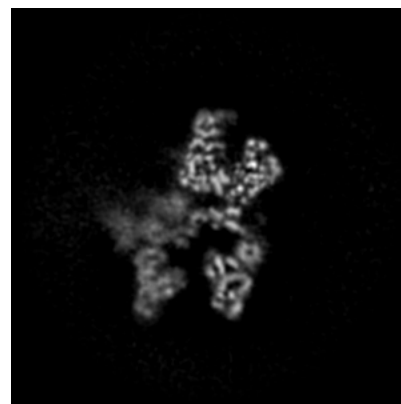
6.2.1 Primary map



X Index: 150



Y Index: 150

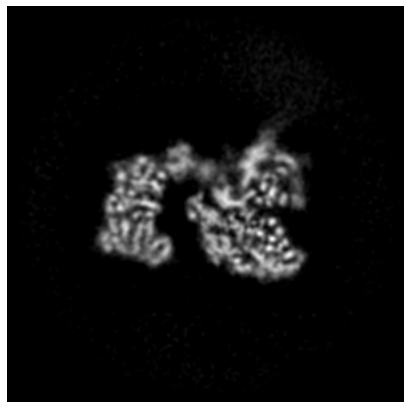


Z Index: 150

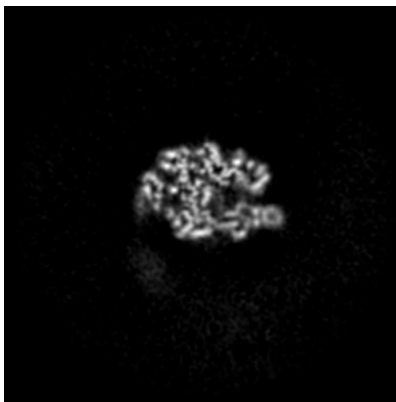
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

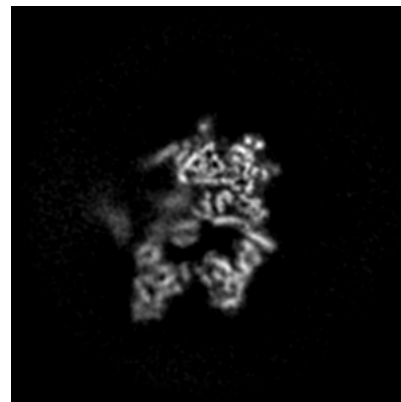
6.3.1 Primary map



X Index: 156



Y Index: 169

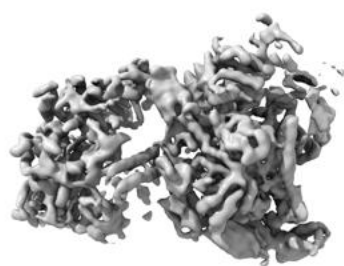


Z Index: 143

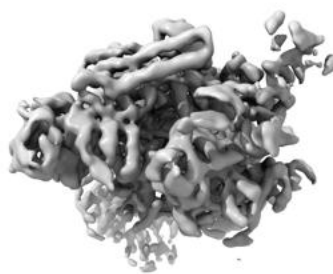
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal surface views [i](#)

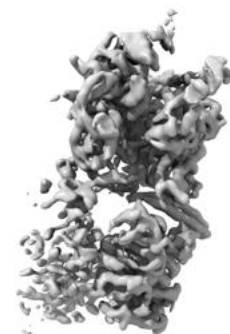
6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.11. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

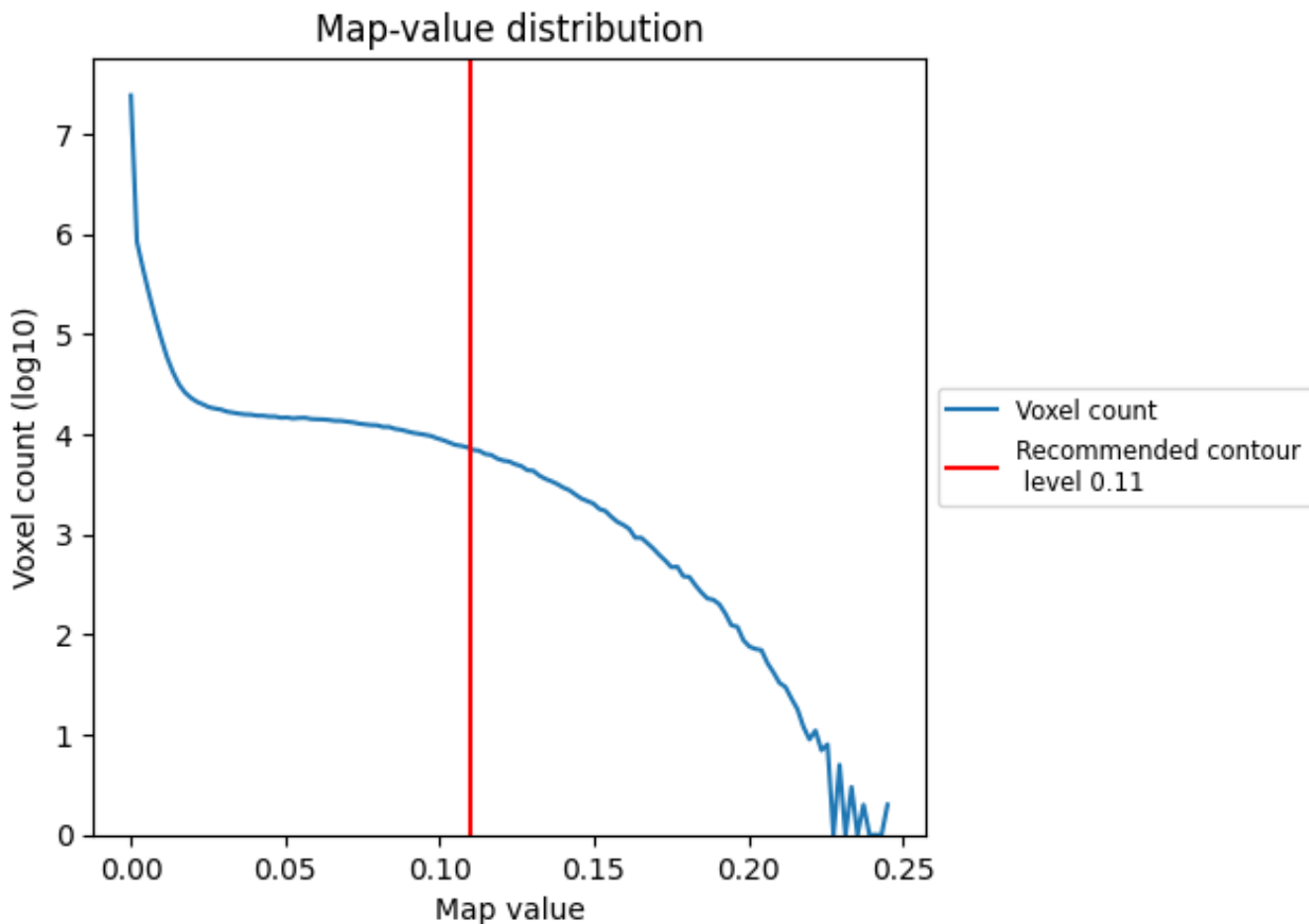
6.5 Mask visualisation

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

7 Map analysis [i](#)

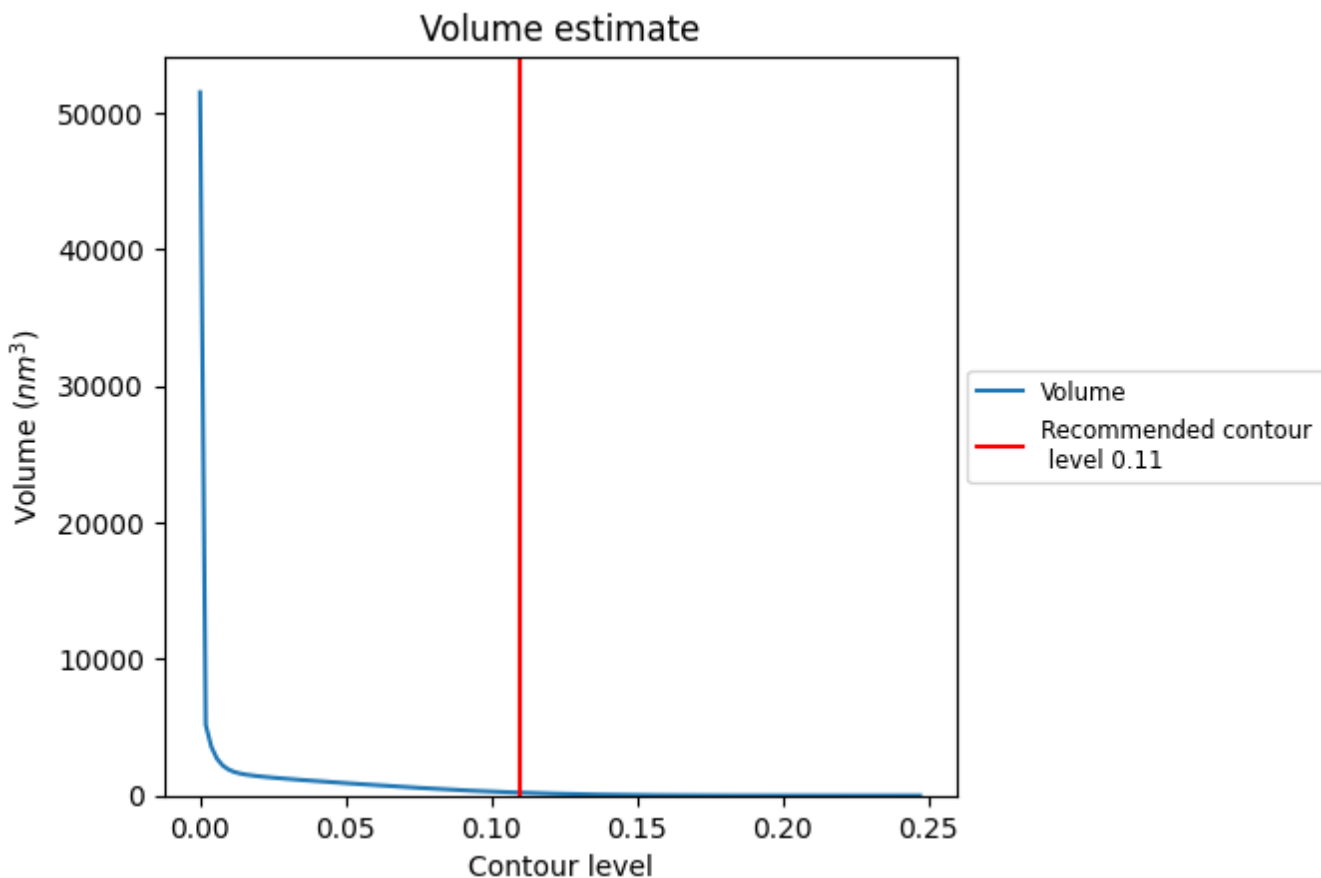
This section contains the results of statistical analysis of the map.

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.

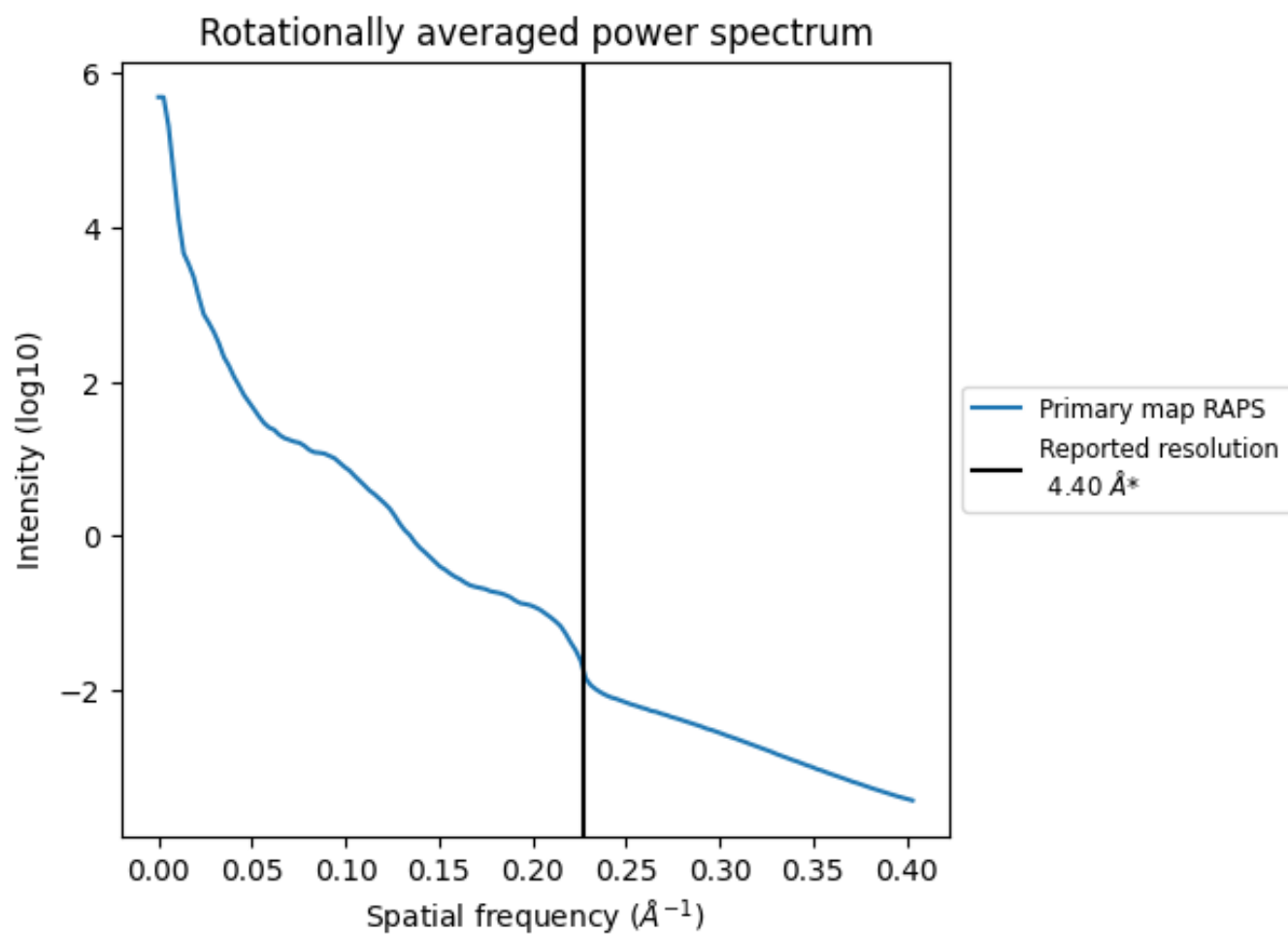
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 212 nm³; this corresponds to an approximate mass of 191 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

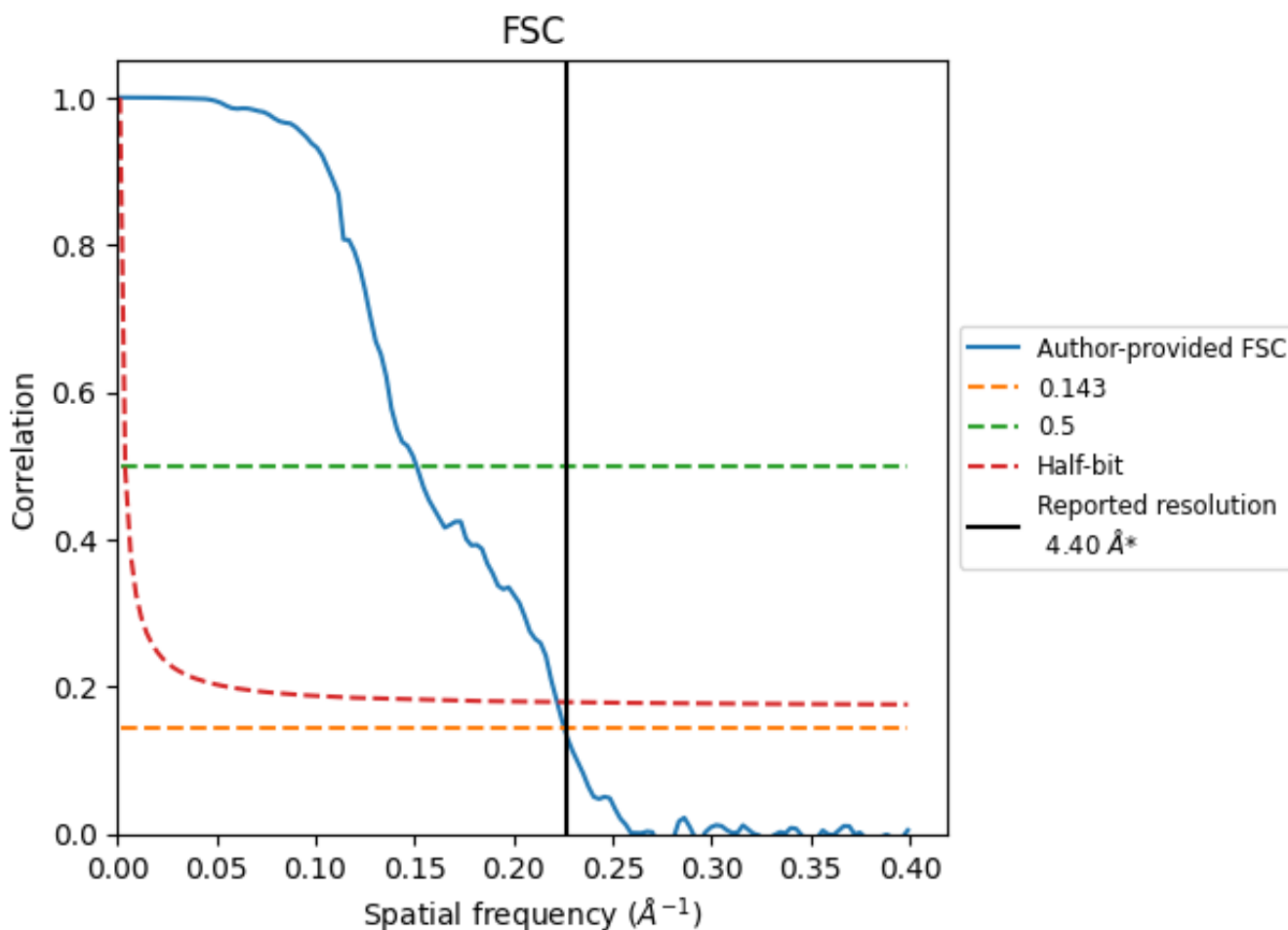


*Reported resolution corresponds to spatial frequency of 0.227 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.227 Å⁻¹

8.2 Resolution estimates [i](#)

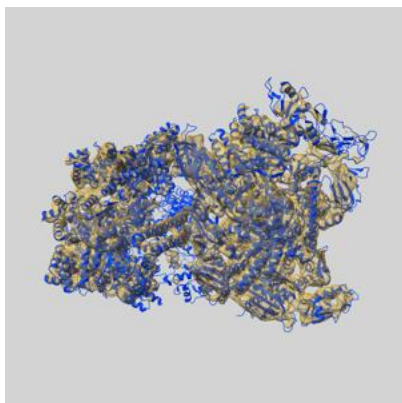
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.40	-	-
Author-provided FSC curve	4.43	6.63	4.50
Unmasked-calculated*	-	-	-

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

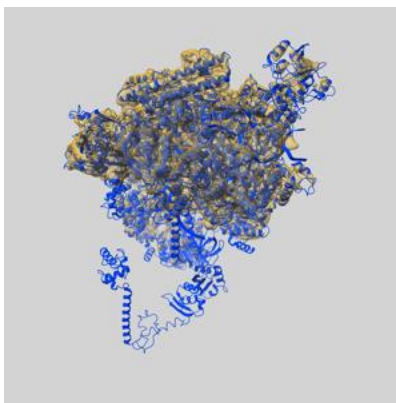
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-11722 and PDB model 7ADB. Per-residue inclusion information can be found in section 3 on page 10.

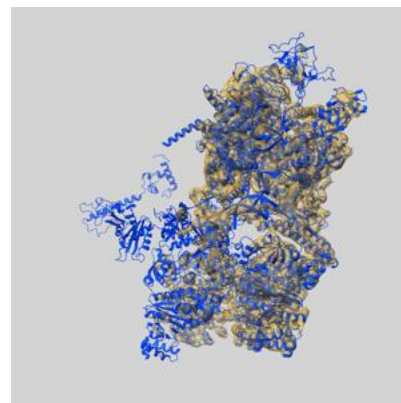
9.1 Map-model overlay [i](#)



X



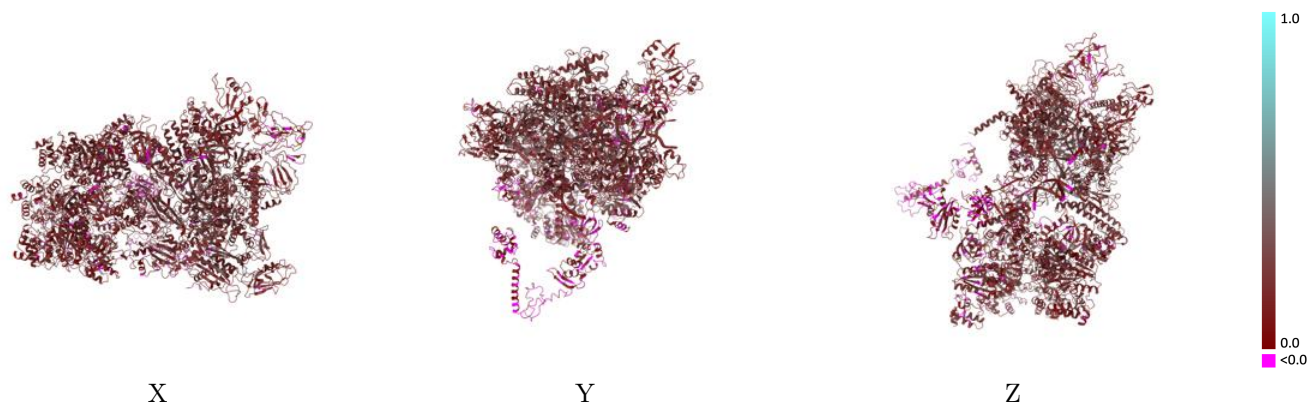
Y



Z

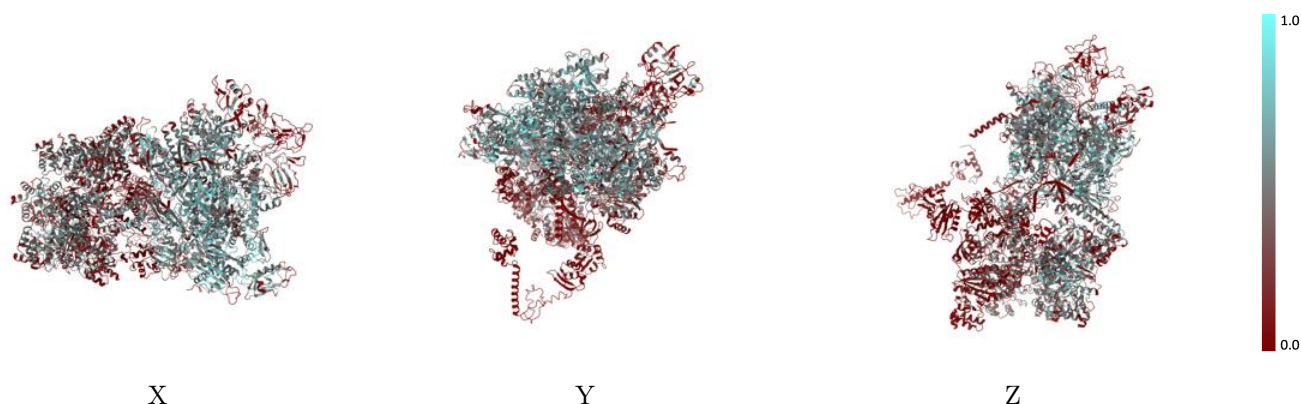
The images above show the 3D surface view of the map at the recommended contour level 0.11 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



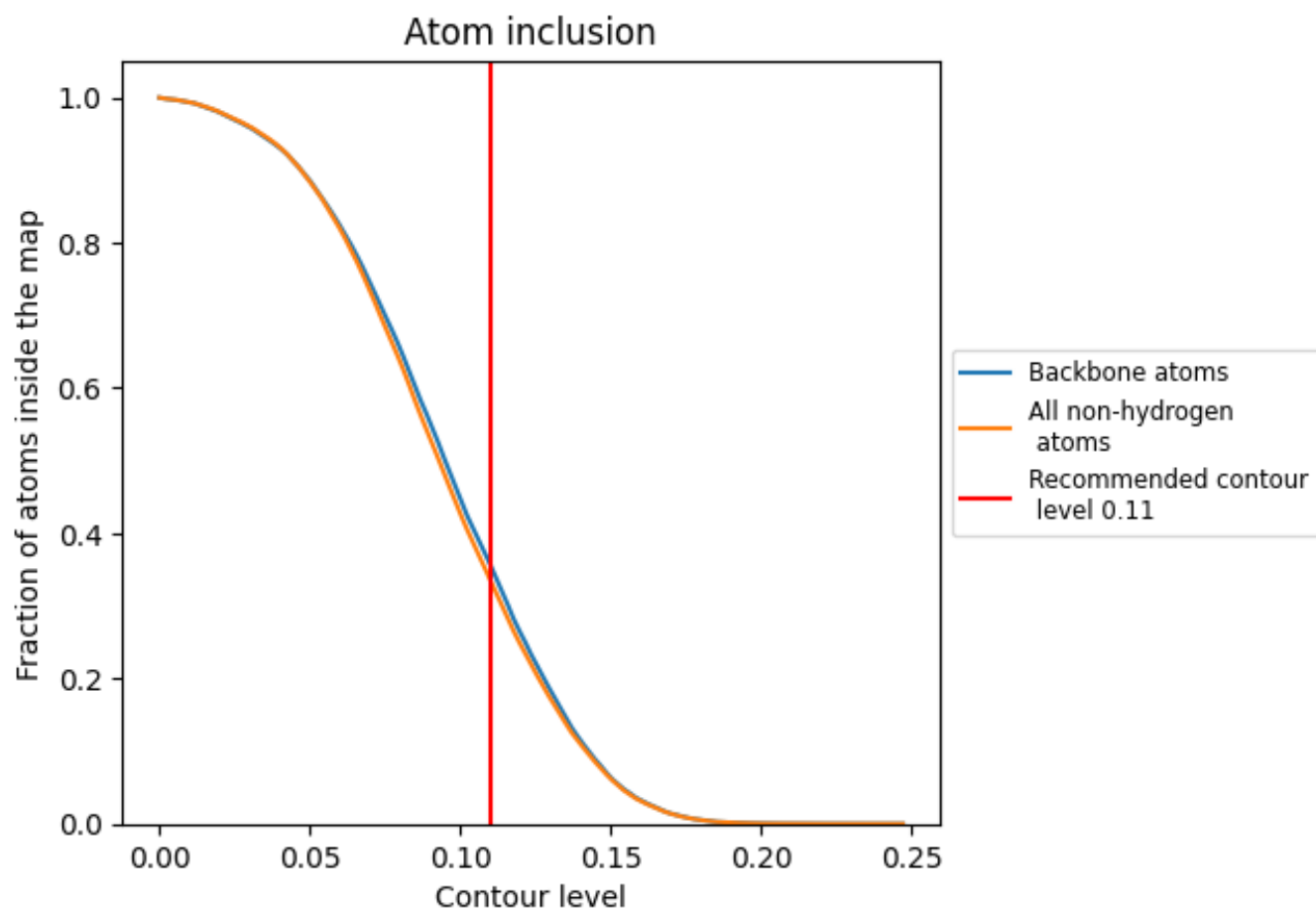
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.11).

































9.4 Atom inclusion [i](#)



At the recommended contour level, 36% of all backbone atoms, 34% 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 (0.11) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.3355	 0.1860
A	 0.0130	 0.0780
K	 0.2636	 0.1400
L	 0.5249	 0.2030
R	 0.4011	 0.1810
U	 0.3596	 0.1990
V	 0.4603	 0.2070
W	 0.1260	 0.2140
X	 0.4733	 0.2240
Y	 0.4169	 0.2040
a	 0.2256	 0.1670
b	 0.3777	 0.1860
c	 0.4017	 0.1840
d	 0.3660	 0.1820
e	 0.2428	 0.1620
f	 0.0860	 0.1520

