



wwPDB EM Validation Summary Report ⓘ

Apr 22, 2024 – 11:21 pm BST

PDB ID : 7ADE
EMDB ID : EMD-11725
Title : Transcription termination complex IVa
Authors : Said, N.; Hilal, T.; Loll, B.; Wahl, C.M.
Deposited on : 2020-09-14
Resolution : 4.20 Å (reported)

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

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A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

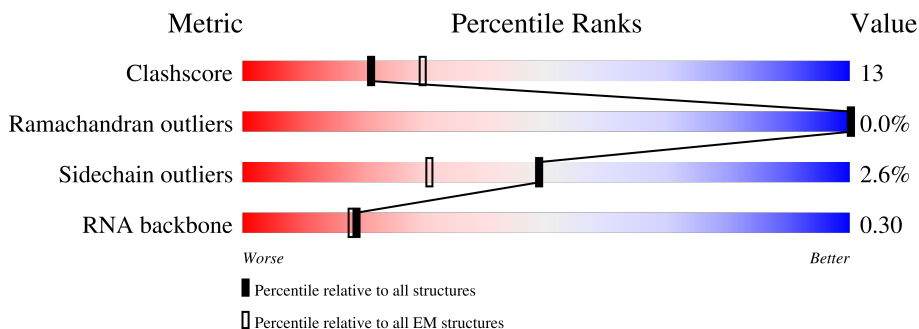
EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

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 4.20 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.






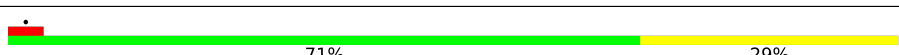
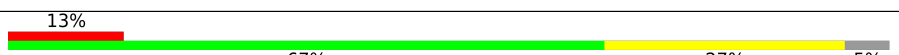
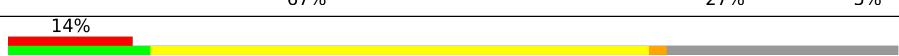
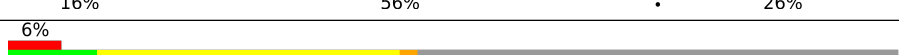

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	419	 94% 5%
1	b	419	 94% 5%
1	c	419	 94% 5%
1	d	419	 94% 5%
1	e	419	 94% 5% 6%
1	f	419	 94% 5% 9%
2	A	497	 70% 29% 48%

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

2 Entry composition [i](#)

There are 14 unique types of molecules in this entry. The entry contains 51553 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	f	417	Total 3280	C 2065	N 581	O 617	S 17	0	0
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

- 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	235	Total 1825	C 1135	N 325	O 359	S 6	0	0
3	V	321	Total 2504	C 1566	N 441	O 489	S 8	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	1343	10431	6553	1854	1974	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 tDNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
7	L	37	741	355	131	218	37	0	0

- Molecule 8 is a DNA chain called ntDNA.

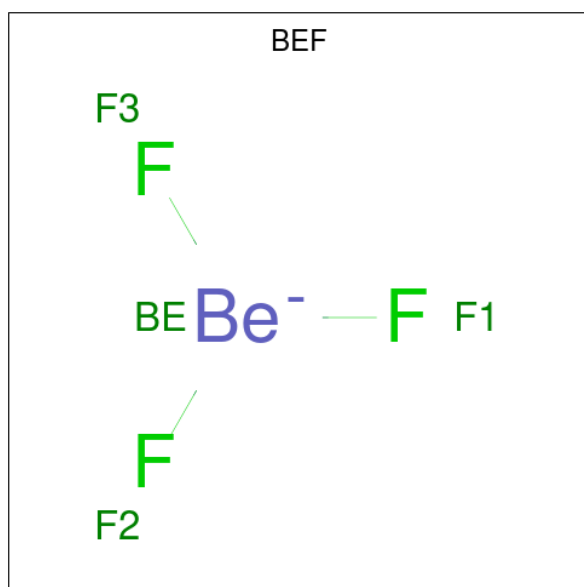
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
8	K	23	474	225	96	130	23	0	0

- Molecule 9 is a RNA chain called rut RNA.

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Mol	Chain	Residues	Atoms		AltConf
11	d	1	Total	Mg	0
			1	1	
11	e	1	Total	Mg	0
			1	1	
11	Y	1	Total	Mg	0
			1	1	

- Molecule 12 is BERYLLIUM TRIFLUORIDE ION (three-letter code: BEF) (formula: BeF₃).



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

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

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

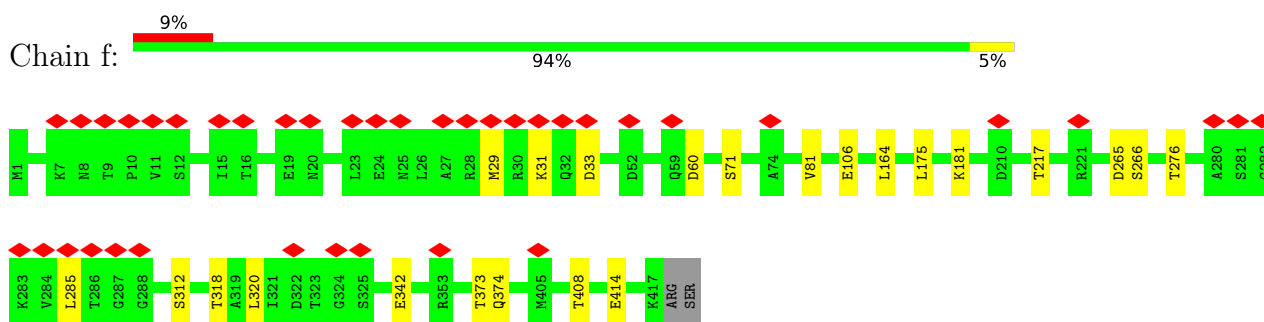
- Molecule 14 is water.

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

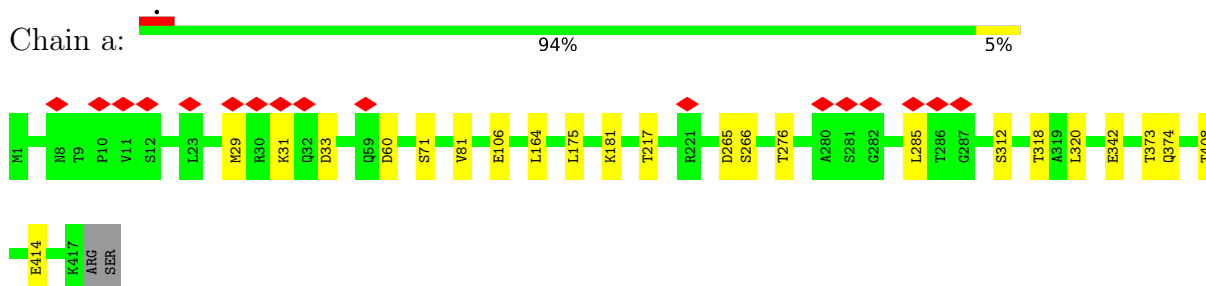
3 Residue-property plots [i](#)

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

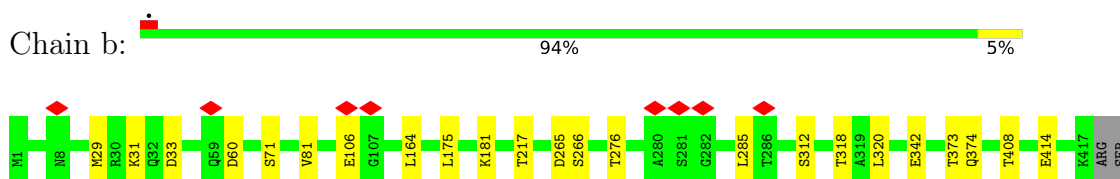
- Molecule 1: Transcription termination factor Rho



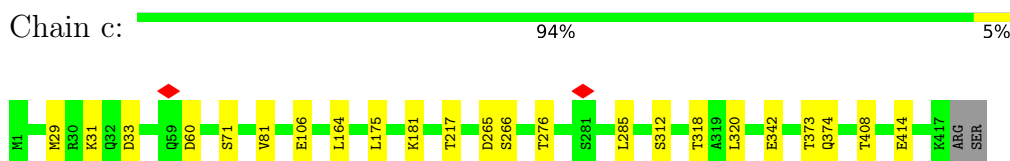
- Molecule 1: Transcription termination factor Rho



- Molecule 1: Transcription termination factor Rho



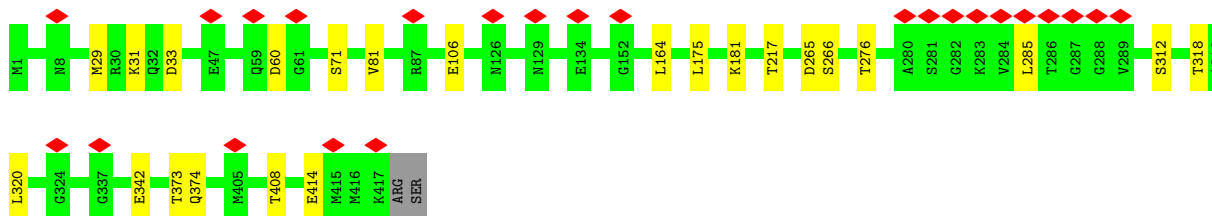
- Molecule 1: Transcription termination factor Rho



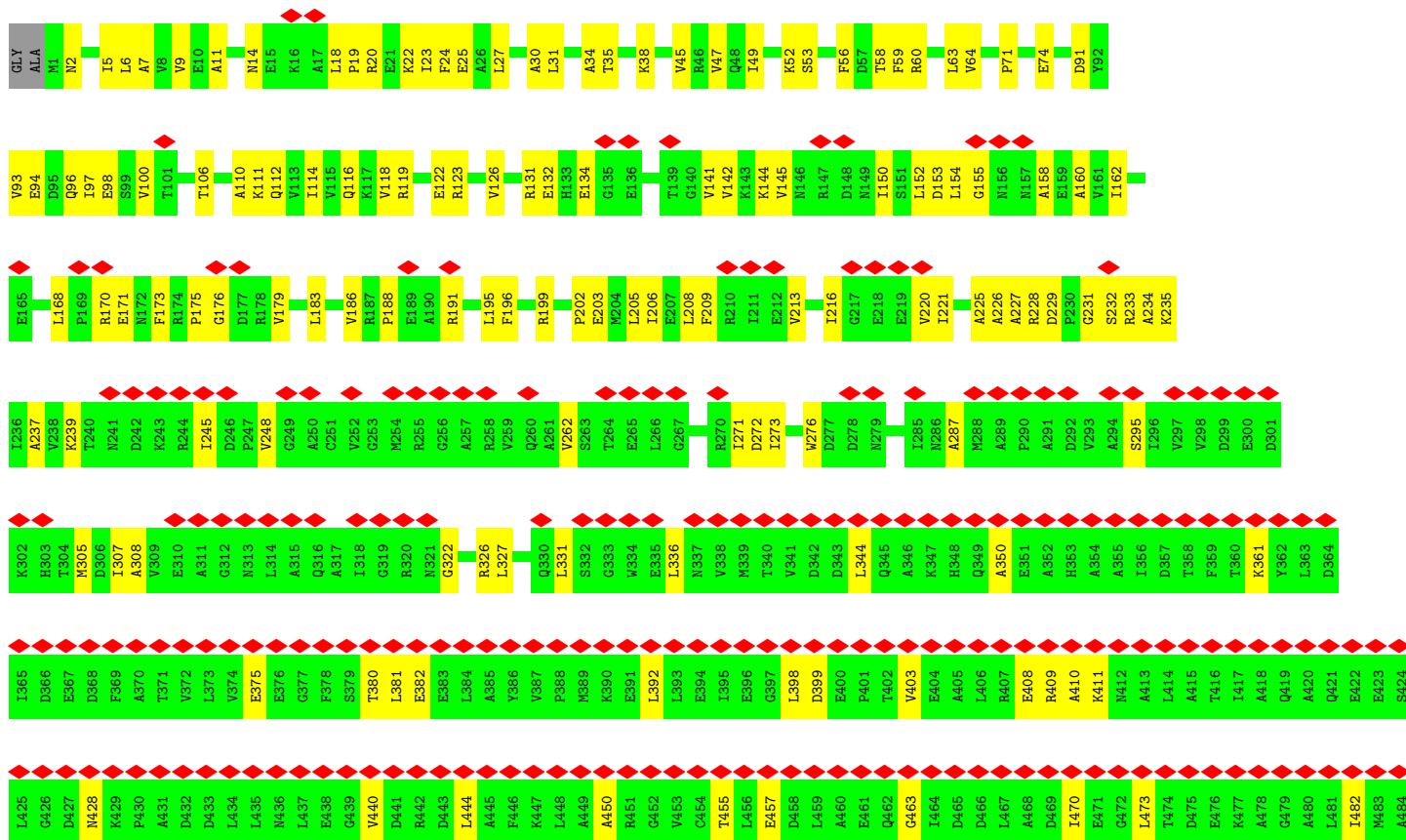
• Molecule 1: Transcription termination factor Rho

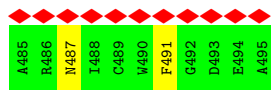


• Molecule 1: Transcription termination factor Rho

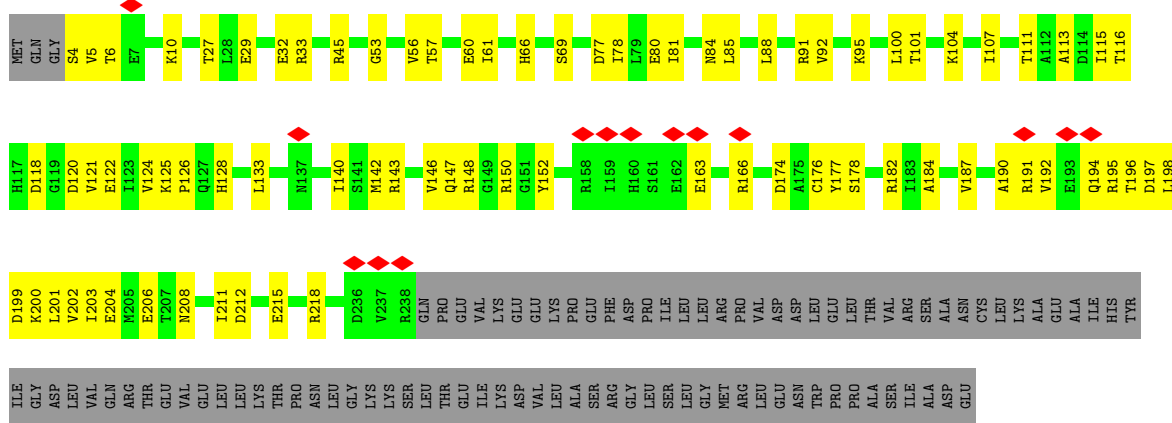


• Molecule 2: Transcription termination/antitermination protein NusA

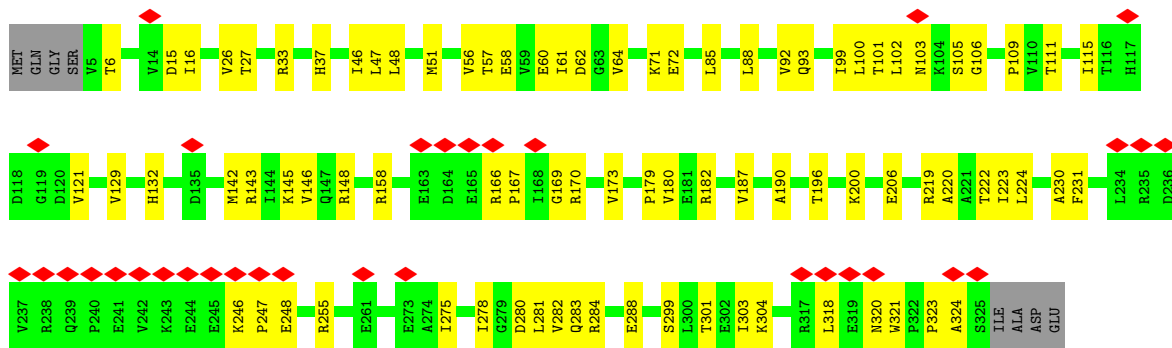




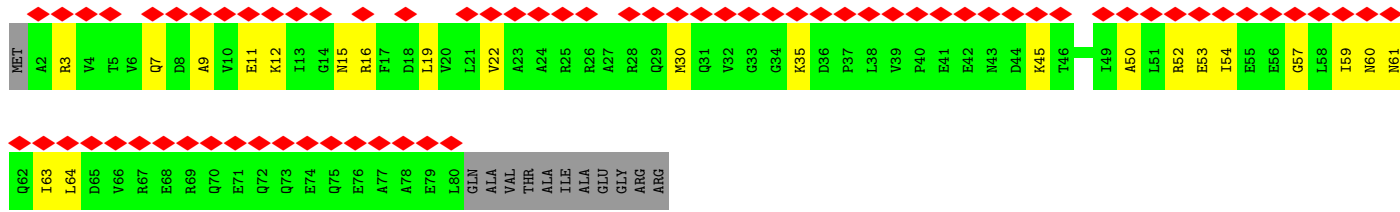
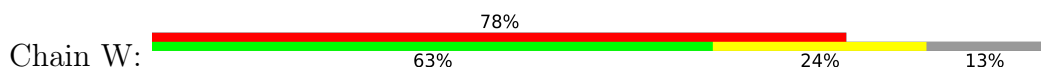
• Molecule 3: DNA-directed RNA polymerase subunit alpha



• Molecule 3: DNA-directed RNA polymerase subunit alpha

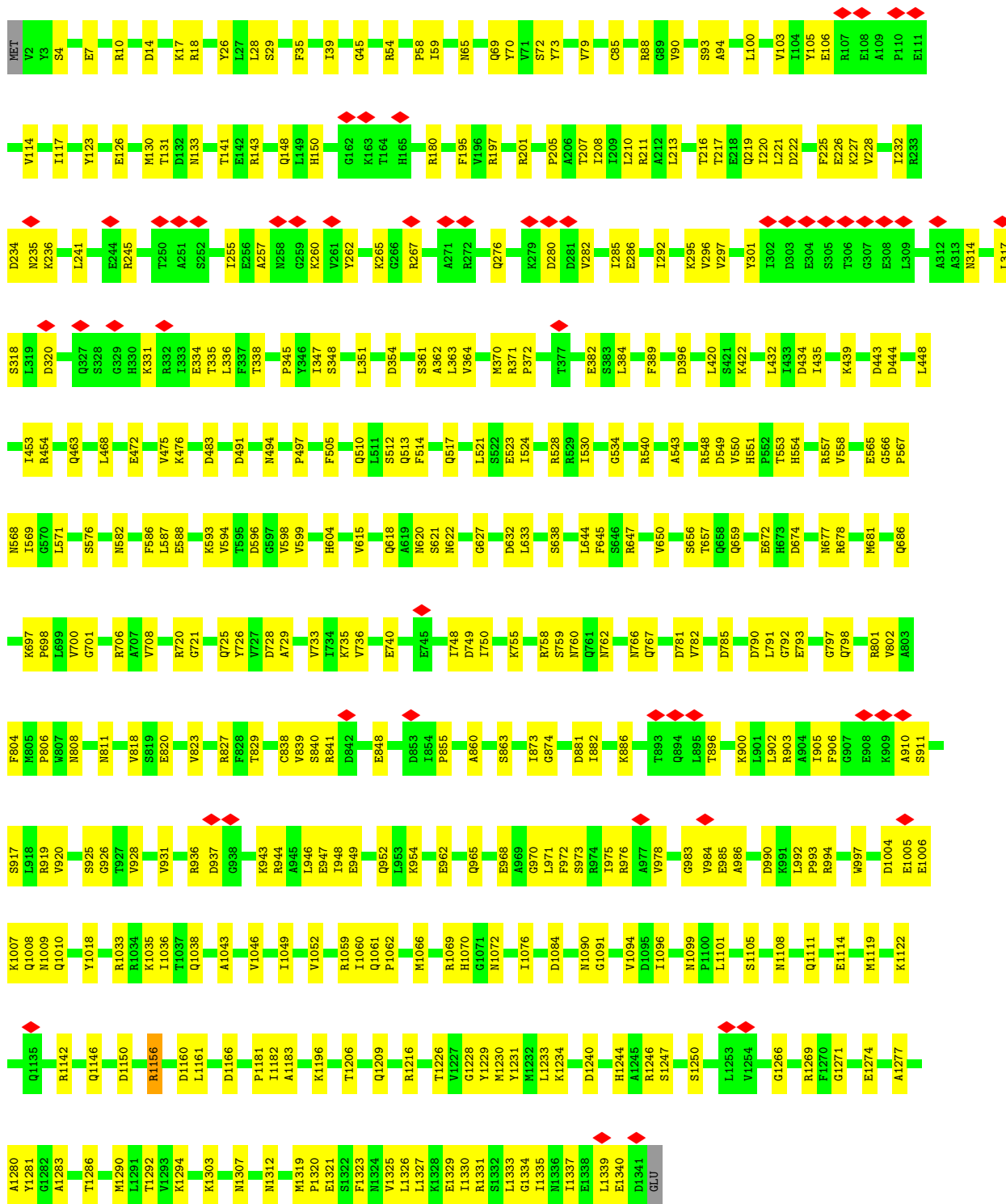


• Molecule 4: DNA-directed RNA polymerase subunit omega



• Molecule 5: DNA-directed RNA polymerase subunit beta



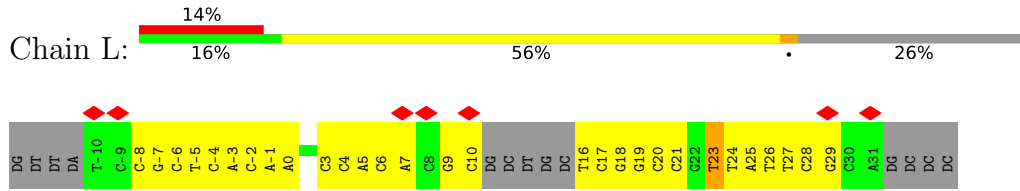


• Molecule 6: DNA-directed RNA polymerase subunit beta'

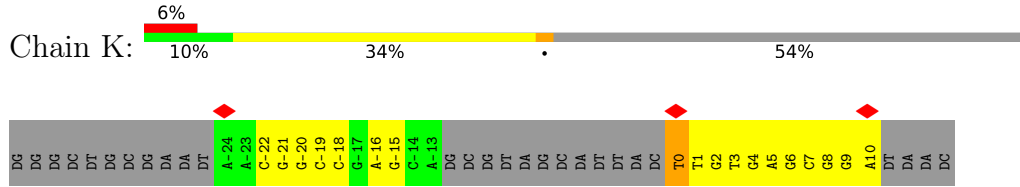


SER	T1328	Q1088	V1035	V952	L849	T705	V637	H430	LYS	D256	E162	R81
ASP	T1329	Y1099	R1036	K953	T863	R709	H545	R431	ARG	G257	E163	G82
ASN	R1330	F1100	G1036	I958	A854	D710	A546	L432	PRO	G258	Q164	V83
LEU	E1334	K1104	D1039	K959	A854	S718	R547	G433	GLU	R259	Y165	V90
LEU	E1337	I1106	M1040	L960	L857	S718	V548	I434	VAL	F260	L166	E91
VAL	I1337	I1106	I1041	K964	V858	M724	V550	Q435	HIS	A261	D167	R98
HIS	D1340	D1111	D1042	V967	W868	R731	A559	A436	HIS	T262	E170	R101
HIS	R1341	G1112	G1043	N968	C869	A735	R576	A328	HIS	D263	E171	R101
HIS	G1346	V1113	T1044	S969	L872	R738	A577	M330	HIS	S264	F172	I105
HIS	L1347	I1114	T1045	S970	V682	Q739	I682	I331	HIS	D265	G173	P110
HIS	K1348	I1115	I1046	S971	R883	A741	V452	I331	HIS	S266	D174	T111
HIS	E1349	S1116	T1047	K972	W884	A741	V453	I331	HIS	Y269	F176	H113
HIS	V1350	I1116	T1050	K974	W885	L746	D460	R337	HIS	R270	D177	H114
HIS	G1354	R1123	T1050	I975	W886	L746	P471	F338	HIS	R271	A178	V115
HIS	I1357	I1124	D1051	I976	C895	D751	P471	R339	HIS	V272	K179	F116
HIS	P1358	Q1125	E1052	S977	C898	G752	L472	Q340	HIS	I273	M180	L117
HIS	A1359	E1127	L1053	R978	C998	S753	T473	N341	HIS	I274	M180	L117
HIS	D1368	S1128	T1054	N979	A904	I754	A476	N341	HIS	N274	A184	K118
HIS	R1371	G1129	G1055	T980	A904	I754	A476	N341	HIS	R275	A184	S119
HIS	P1372	G1130	L1056	L984	A904	I754	A476	N341	HIS	L279	L188	L120
ALA	R1373	T1131	S1057	E987	N910	P758	C608	E479	HIS	R280	L188	P121
ALA	R1373	D1063	V1060	F988	R911	I759	A480	A480	HIS	R281	K190	S122
ALA	L1138	S1064	V1061	P998	G912	N762	A482	A482	HIS	L282	R190	R123
ALA	E1146	A1065	L1062	Y999	E913	F763	A483	A483	HIS	L283	S191	I124
ALA	E1147	E1066	L1062	A1001	A914	L767	M484	M484	HIS	D284	L201	G125
ALA	R1148	R1067	L1066	V1002	A914	L767	M485	M485	HIS	L285	L201	L126
ALA	G1161	T1068	T1068	A1004	A914	L767	M485	M485	HIS	L286	T208	L127
ALA	G1161	A1069	A1069	K1005	P926	L767	M485	M485	HIS	A286	N209	L128
ALA	S1164	G1070	G1070	D1007	I918	Q771	N488	N488	HIS	A287	K213	D129
ALA	F1165	G1071	G1071	G1013	Q921	L796	L491	L491	HIS	P288	K213	M130
ALA	K1167	K1072	K1072	G1014	S922	I797	S492	S492	HIS	D289	T218	R133
ALA	E1168	D1073	D1073	E1015	G924	I797	P493	P493	HIS	L290	K219	D134
ALA	T1169	L1074	L1074	E1015	E925	V603	A494	A494	HIS	V292	R220	R137
ALA	K1170	R1075	R1075	T1016	P926	A804	M495	M495	HIS	R293	L221	V138
ALA	G1171	P1076	P1076	V1017	G938	Q605	I500	I500	HIS	N294	K222	L139
ALA	K1172	K1079	K1079	A1018	G938	Q605	I500	I500	HIS	E295	K222	Y140
ALA	F1165	G1071	G1071	N1019	G939	V608	G640	G640	HIS	K296	V228	F141
ALA	K1167	K1072	K1072	D1020	A940	V609	D643	D643	HIS	R297	V228	E142
ALA	E1168	D1073	D1073	P1022	A941	C814	E658	E658	HIS	Q300	K233	V146
ALA	T1169	L1074	L1074	H1023	A941	T823	A659	A659	HIS	E301	V236	I147
ALA	K1170	R1075	R1075	T1024	S942	P824	E660	E660	HIS	A302	M237	G150
ALA	G1171	P1076	P1076	M1025	R943	G828	V661	V661	HIS	L307	I238	M151
ALA	S1164	G1070	G1070	V1027	A944	G828	A662	A662	HIS	D308	L245	T152
ALA	F1165	G1071	G1071	I1028	A945	E833	V517	V517	HIS	N309	L245	T152
ALA	K1167	K1072	K1072	I1029	A946	P834	V518	V518	HIS	GLY	P246	M153
ALA	E1168	D1073	D1073	T1029	E947	R836	L527	L527	HIS	ARG	P247	L154
ALA	T1169	L1074	L1074	V1031	S948	R836	P530	P530	HIS	ARG	D248	L154
ALA	G1171	P1076	P1076	I1031	S949	R836	K531	K531	HIS	GLY	L249	E155
ALA	S1164	G1070	G1070	S1032	I951	T844	R535	R535	HIS	ARG	R250	R156
ALA	F1165	G1071	G1071	S1032	I951	V848	L536	L536	HIS	ALA	P251	Q157
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1167	K1072	K1072	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	E1168	D1073	D1073	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	T1169	L1074	L1074	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	K1170	R1075	R1075	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	G1171	P1076	P1076	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	S1164	G1070	G1070	I1090	I951	V848	L536	L536	HIS	ALA	L252	Q158
ALA	F1165	G1071	G1071	I1090	I951	V848	L536	L536	HIS	ALA	L252	

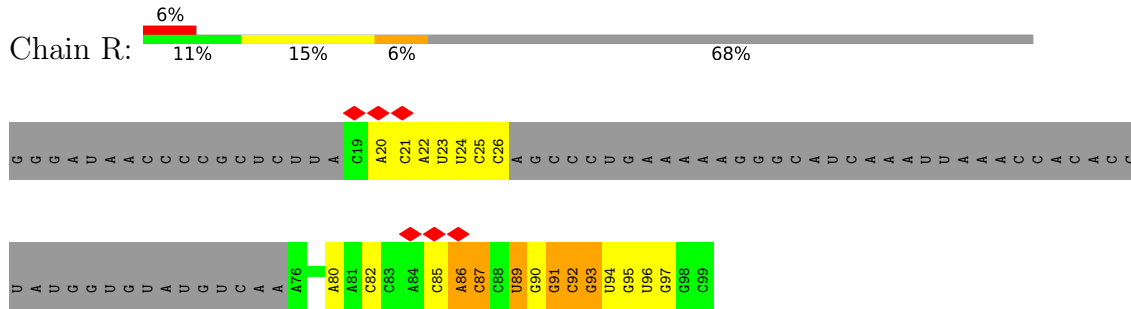
• Molecule 7: tDNA



• Molecule 8: ntDNA



• 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	42083	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	0.323	Depositor
Minimum map value	-0.000	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.018	Depositor
Recommended contour level	0.1	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, ADP, MG, ZN

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	a	0.25	0/3329	0.43	0/4483
1	b	0.25	0/3329	0.43	0/4483
1	c	0.25	0/3329	0.43	0/4483
1	d	0.25	0/3329	0.43	0/4483
1	e	0.25	0/3329	0.43	0/4483
1	f	0.25	0/3329	0.43	0/4483
2	A	0.23	0/3897	0.45	0/5273
3	U	0.23	0/1847	0.43	0/2503
3	V	0.23	0/2538	0.44	0/3441
4	W	0.23	0/629	0.43	0/847
5	X	0.25	0/10736	0.42	0/14487
6	Y	0.24	0/10590	0.44	0/14301
7	L	0.65	0/827	1.03	1/1262 (0.1%)
8	K	0.63	0/533	0.94	1/812 (0.1%)
9	R	0.25	0/750	1.07	7/1162 (0.6%)
All	All	0.26	0/52321	0.47	9/70986 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
6	Y	0	1

There are no bond length outliers.

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	R	85	C	N1-C2-O2	8.80	124.18	118.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	R	85	C	C2-N1-C1'	8.74	128.42	118.80
9	R	85	C	N3-C2-O2	-7.04	116.97	121.90
9	R	89	U	N1-C2-O2	6.51	127.36	122.80
9	R	85	C	C6-N1-C1'	-6.00	113.59	120.80

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
6	Y	120	LEU	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	3280	0	3358	0	0
1	b	3280	0	3358	0	0
1	c	3280	0	3358	0	0
1	d	3280	0	3358	0	0
1	e	3280	0	3358	0	0
1	f	3280	0	3359	0	0
2	A	3852	0	3835	101	0
3	U	1825	0	1853	57	0
3	V	2504	0	2558	55	0
4	W	627	0	634	17	0
5	X	10567	0	10585	288	0
6	Y	10431	0	10636	284	0
7	L	741	0	417	37	0
8	K	474	0	258	19	0
9	R	674	0	347	13	0
10	a	27	0	12	0	0
10	b	27	0	12	0	0
10	c	27	0	12	0	0
10	d	27	0	12	0	0
10	e	27	0	12	0	0
11	Y	1	0	0	0	0
11	a	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
11	b	1	0	0	0	0
11	c	1	0	0	0	0
11	d	1	0	0	0	0
11	e	1	0	0	0	0
12	a	4	0	0	0	0
12	b	4	0	0	0	0
12	c	4	0	0	0	0
12	d	4	0	0	0	0
12	e	4	0	0	0	0
13	Y	2	0	0	0	0
14	a	3	0	0	0	0
14	b	3	0	0	0	0
14	c	3	0	0	0	0
14	d	3	0	0	0	0
14	e	3	0	0	0	0
All	All	51553	0	51332	818	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 13.

The worst 5 of 818 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)
3:V:167:PRO:HD2	3:V:170:ARG:HG2	1.58	0.85
5:X:1327:LEU:HB3	5:X:1337:ILE:HG21	1.58	0.85
6:Y:287:ALA:HB1	6:Y:291:ILE:HG21	1.57	0.84
2:A:142:VAL:HG12	2:A:152:LEU:HG	1.60	0.83
3:U:107:ILE:HA	3:U:133:LEU:O	1.78	0.82

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	415/419 (99%)	406 (98%)	9 (2%)	0	100	100
1	b	415/419 (99%)	405 (98%)	10 (2%)	0	100	100
1	c	415/419 (99%)	406 (98%)	9 (2%)	0	100	100
1	d	415/419 (99%)	406 (98%)	9 (2%)	0	100	100
1	e	415/419 (99%)	406 (98%)	9 (2%)	0	100	100
1	f	415/419 (99%)	406 (98%)	9 (2%)	0	100	100
2	A	493/497 (99%)	450 (91%)	43 (9%)	0	100	100
3	U	233/329 (71%)	227 (97%)	6 (3%)	0	100	100
3	V	319/329 (97%)	292 (92%)	27 (8%)	0	100	100
4	W	77/91 (85%)	74 (96%)	3 (4%)	0	100	100
5	X	1338/1342 (100%)	1252 (94%)	86 (6%)	0	100	100
6	Y	1339/1416 (95%)	1266 (94%)	72 (5%)	1 (0%)	51	85
All	All	6289/6518 (96%)	5996 (95%)	292 (5%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
6	Y	1325	PHE

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%)	334 (94%)	23 (6%)	17	45
1	b	357/359 (99%)	334 (94%)	23 (6%)	17	45
1	c	357/359 (99%)	334 (94%)	23 (6%)	17	45
1	d	357/359 (99%)	334 (94%)	23 (6%)	17	45
1	e	357/359 (99%)	334 (94%)	23 (6%)	17	45
1	f	357/359 (99%)	334 (94%)	23 (6%)	17	45
2	A	409/409 (100%)	409 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	U	203/286 (71%)	203 (100%)	0	100	100
3	V	280/286 (98%)	279 (100%)	1 (0%)	91	94
4	W	67/75 (89%)	67 (100%)	0	100	100
5	X	1155/1157 (100%)	1154 (100%)	1 (0%)	93	97
6	Y	1123/1177 (95%)	1123 (100%)	0	100	100
All	All	5379/5544 (97%)	5239 (97%)	140 (3%)	49	67

5 of 140 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	e	29	MET
1	e	71	SER
1	e	312	SER
1	b	33	ASP
1	b	31	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 57 such sidechains are listed below:

Mol	Chain	Res	Type
5	X	41	GLN
6	Y	1244	GLN
5	X	659	GLN
6	Y	897	HIS
6	Y	365	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
9	R	30/99 (30%)	12 (40%)	1 (3%)

5 of 12 RNA backbone outliers are listed below:

Mol	Chain	Res	Type
9	R	23	U
9	R	24	U
9	R	25	C
9	R	26	C
9	R	80	A

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
9	R	23	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 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	ADP	c	1000	11	24,29,29	0.95	1 (4%)	29,45,45	1.47	4 (13%)
12	BEF	a	1002	-	0,3,3	-	-	-	-	-
12	BEF	c	1002	-	0,3,3	-	-	-	-	-
10	ADP	b	1000	11	24,29,29	0.96	1 (4%)	29,45,45	1.44	4 (13%)
12	BEF	d	1002	-	0,3,3	-	-	-	-	-
12	BEF	e	1002	-	0,3,3	-	-	-	-	-
12	BEF	b	1002	-	0,3,3	-	-	-	-	-
10	ADP	e	1000	11	24,29,29	0.97	1 (4%)	29,45,45	1.44	4 (13%)
10	ADP	d	1000	11	24,29,29	0.95	1 (4%)	29,45,45	1.42	4 (13%)
10	ADP	a	1000	11	24,29,29	0.96	1 (4%)	29,45,45	1.45	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
10	ADP	c	1000	11	-	4/12/32/32	0/3/3/3
10	ADP	b	1000	11	-	3/12/32/32	0/3/3/3
10	ADP	e	1000	11	-	3/12/32/32	0/3/3/3
10	ADP	d	1000	11	-	2/12/32/32	0/3/3/3
10	ADP	a	1000	11	-	3/12/32/32	0/3/3/3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	a	1000	ADP	C5-C4	2.52	1.47	1.40
10	d	1000	ADP	C5-C4	2.50	1.47	1.40
10	b	1000	ADP	C5-C4	2.48	1.47	1.40
10	c	1000	ADP	C5-C4	2.48	1.47	1.40
10	e	1000	ADP	C5-C4	2.47	1.47	1.40

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	d	1000	ADP	C3'-C2'-C1'	3.54	106.31	100.98
10	c	1000	ADP	C3'-C2'-C1'	3.52	106.28	100.98
10	b	1000	ADP	C3'-C2'-C1'	3.48	106.21	100.98
10	a	1000	ADP	C3'-C2'-C1'	3.46	106.18	100.98
10	e	1000	ADP	C3'-C2'-C1'	3.43	106.15	100.98

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

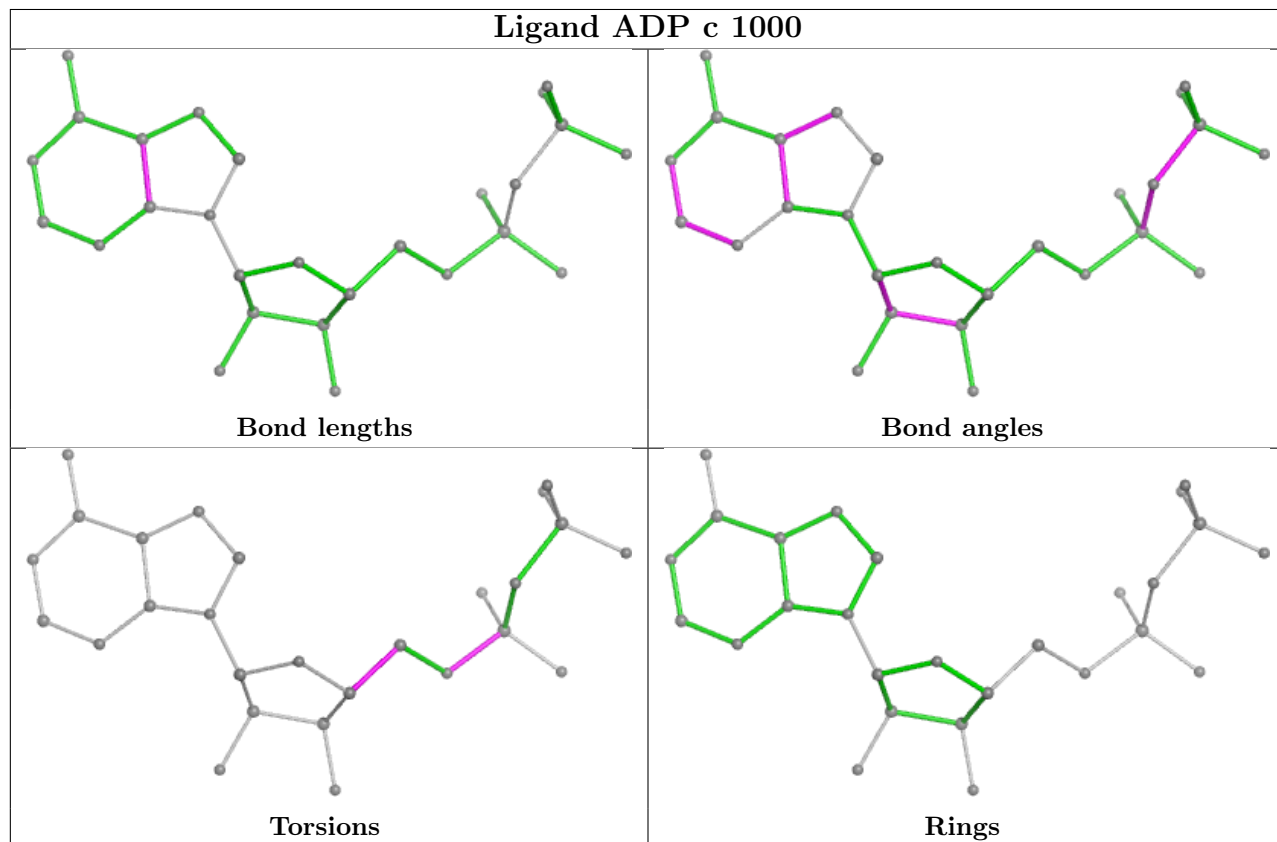
Mol	Chain	Res	Type	Atoms
10	b	1000	ADP	C5'-O5'-PA-O3A
10	c	1000	ADP	C5'-O5'-PA-O1A
10	c	1000	ADP	C5'-O5'-PA-O3A
10	e	1000	ADP	C5'-O5'-PA-O1A
10	a	1000	ADP	C5'-O5'-PA-O3A

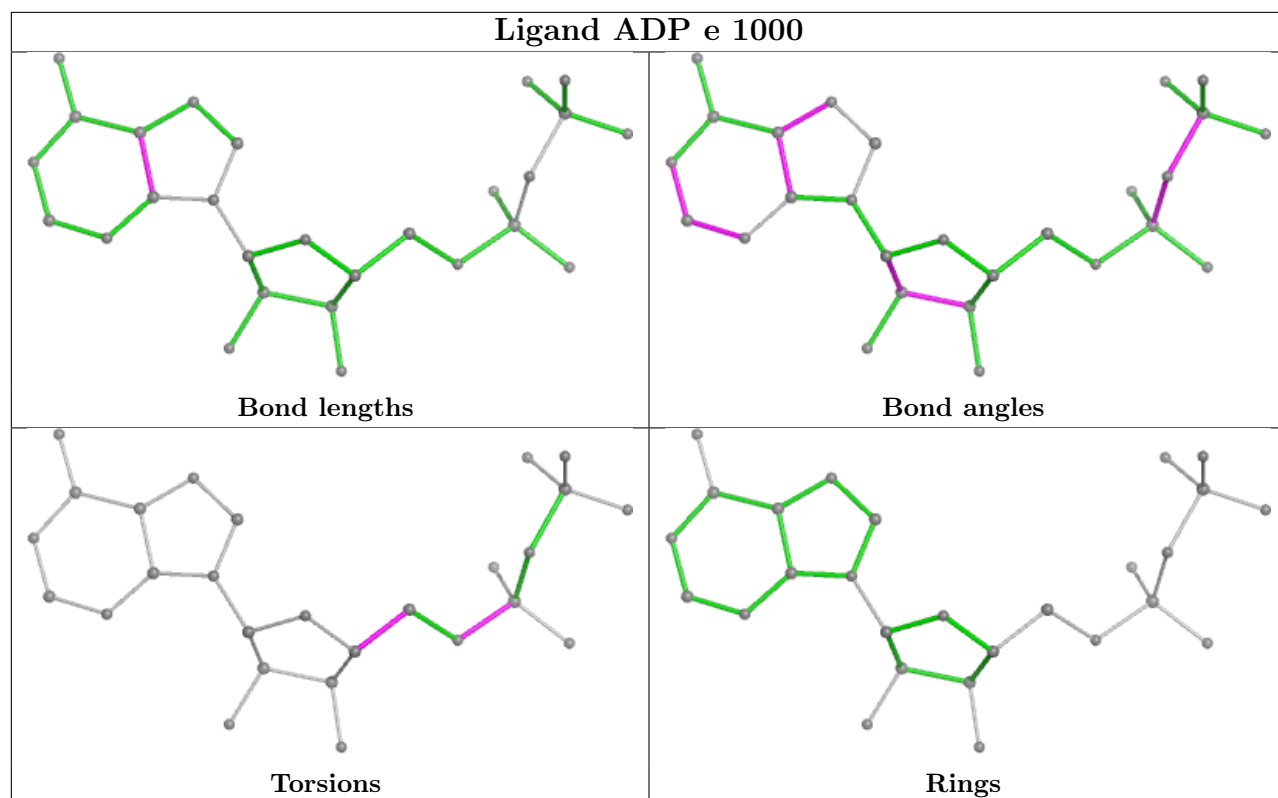
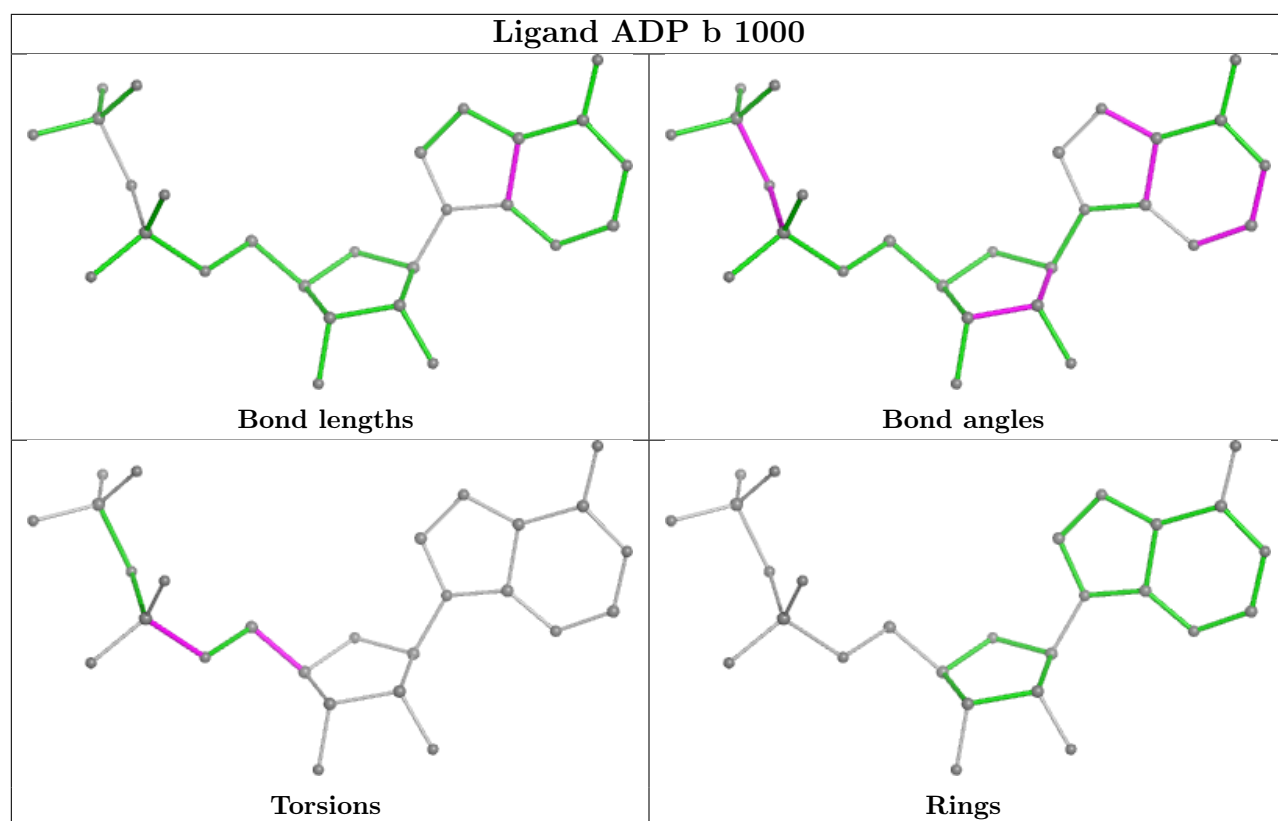
There are no ring outliers.

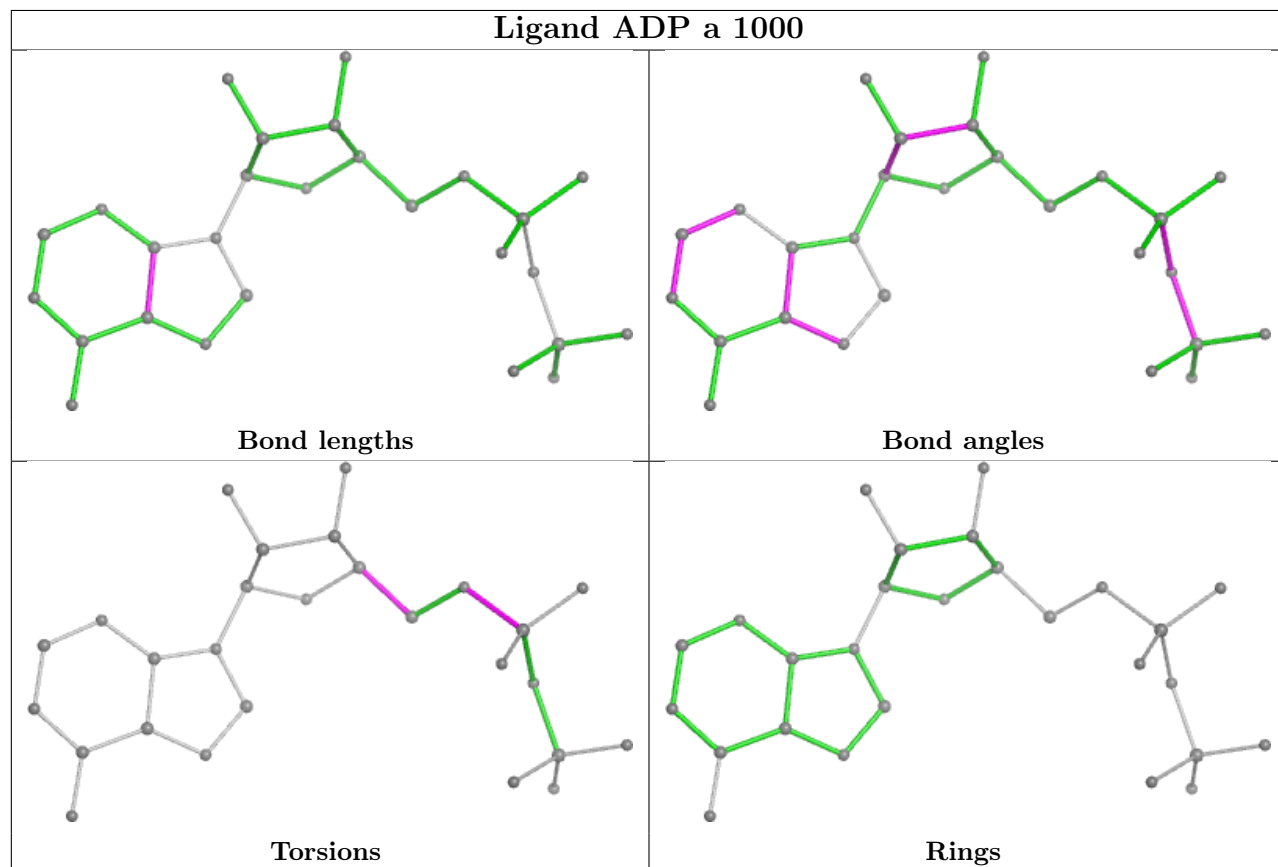
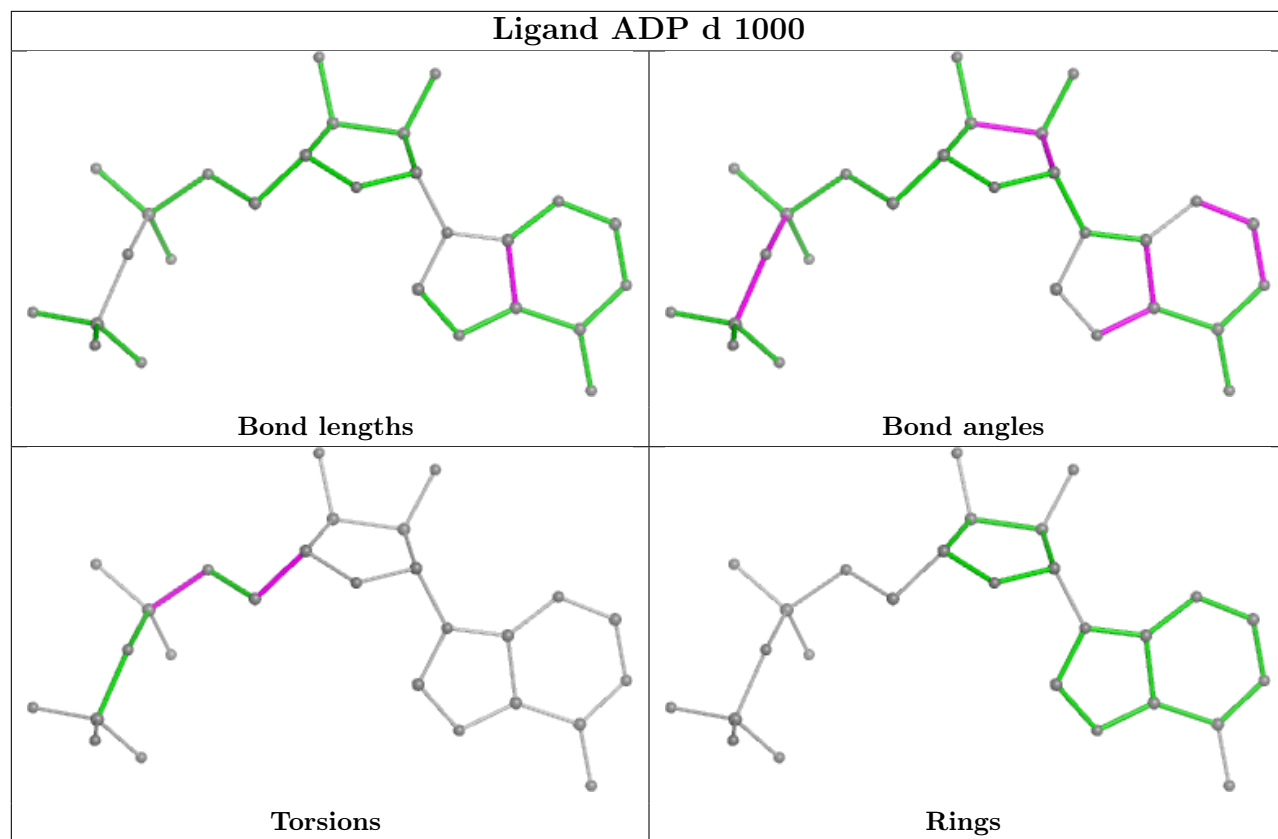
No monomer is involved in short contacts.

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.

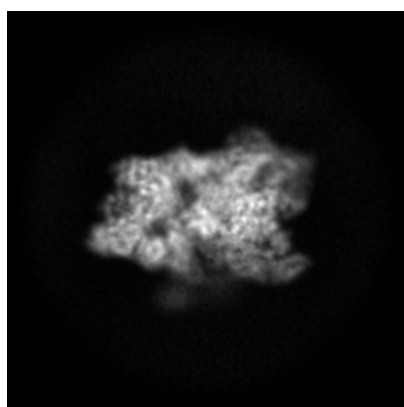
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11725. These allow visual inspection of the internal detail of the map and identification of artifacts.

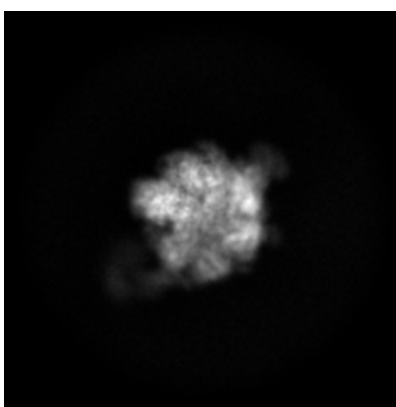
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

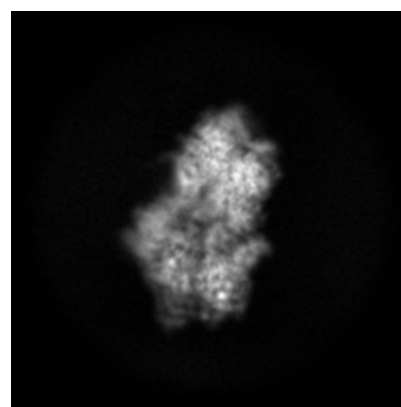
6.1.1 Primary map



X



Y

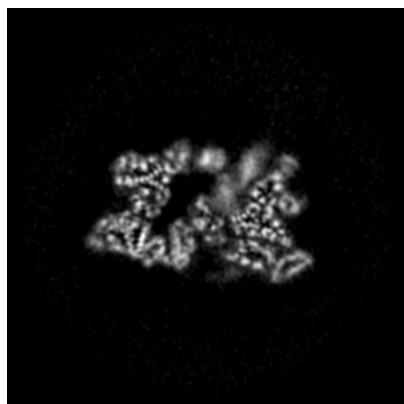


Z

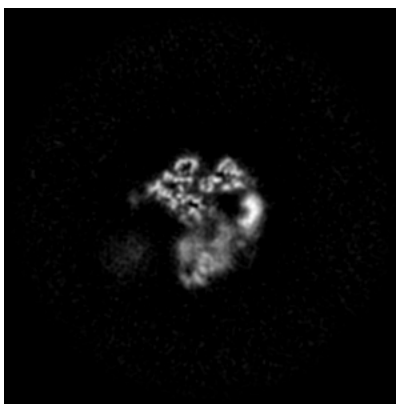
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

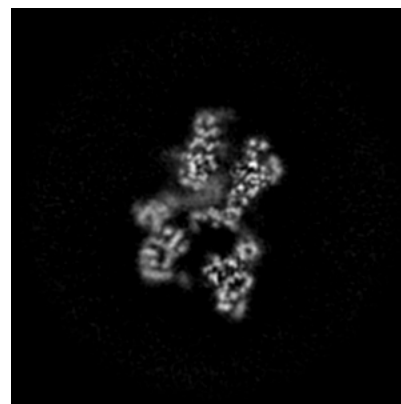
6.2.1 Primary map



X Index: 150



Y Index: 150

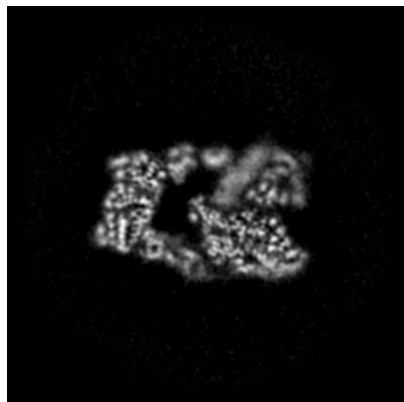


Z Index: 150

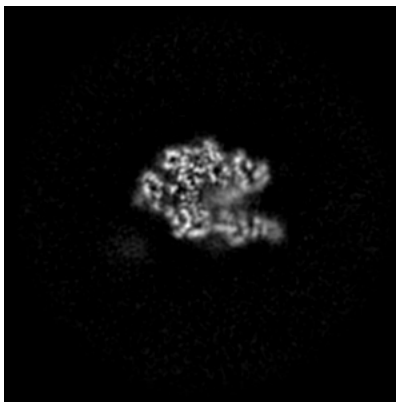
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

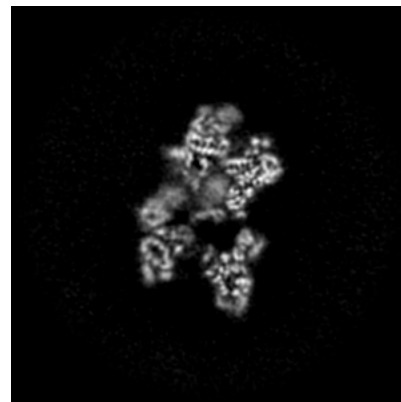
6.3.1 Primary map



X Index: 157



Y Index: 171

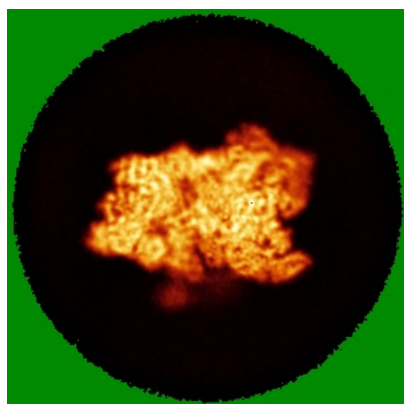


Z Index: 155

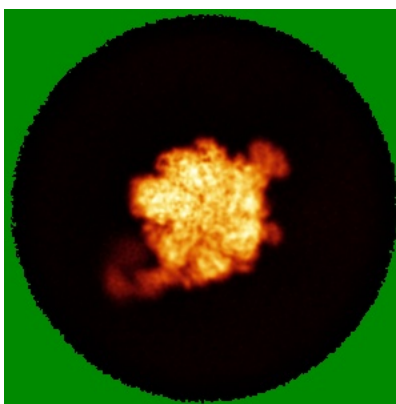
The images above show the largest variance slices of the map in three orthogonal directions.

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

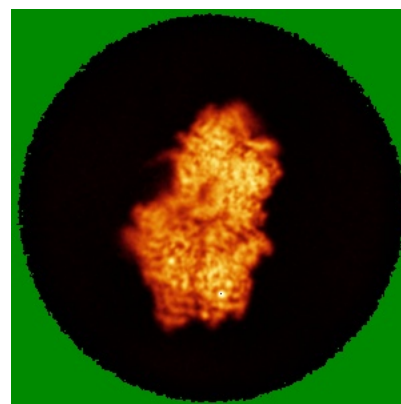
6.4.1 Primary map



X



Y



Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

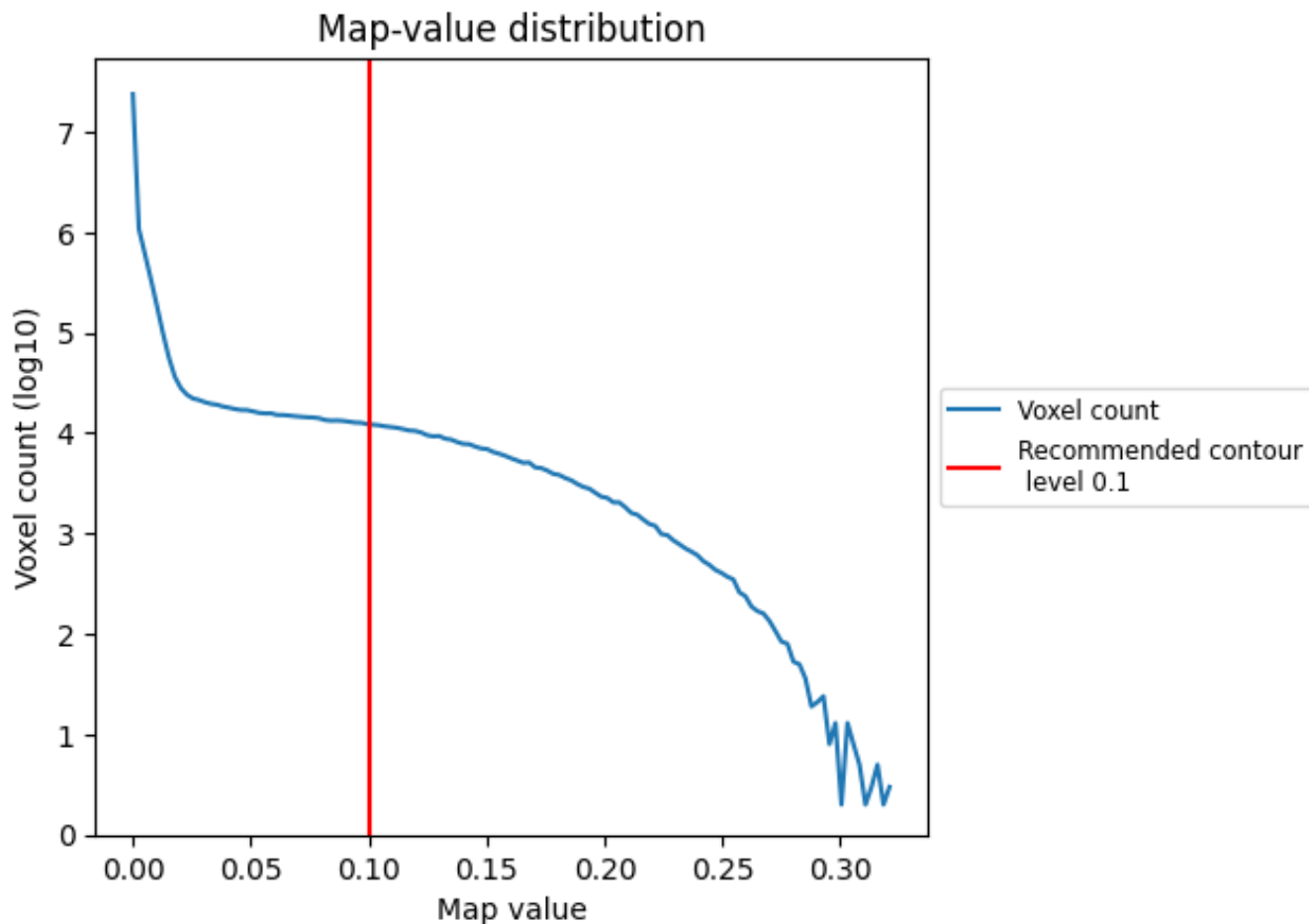
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

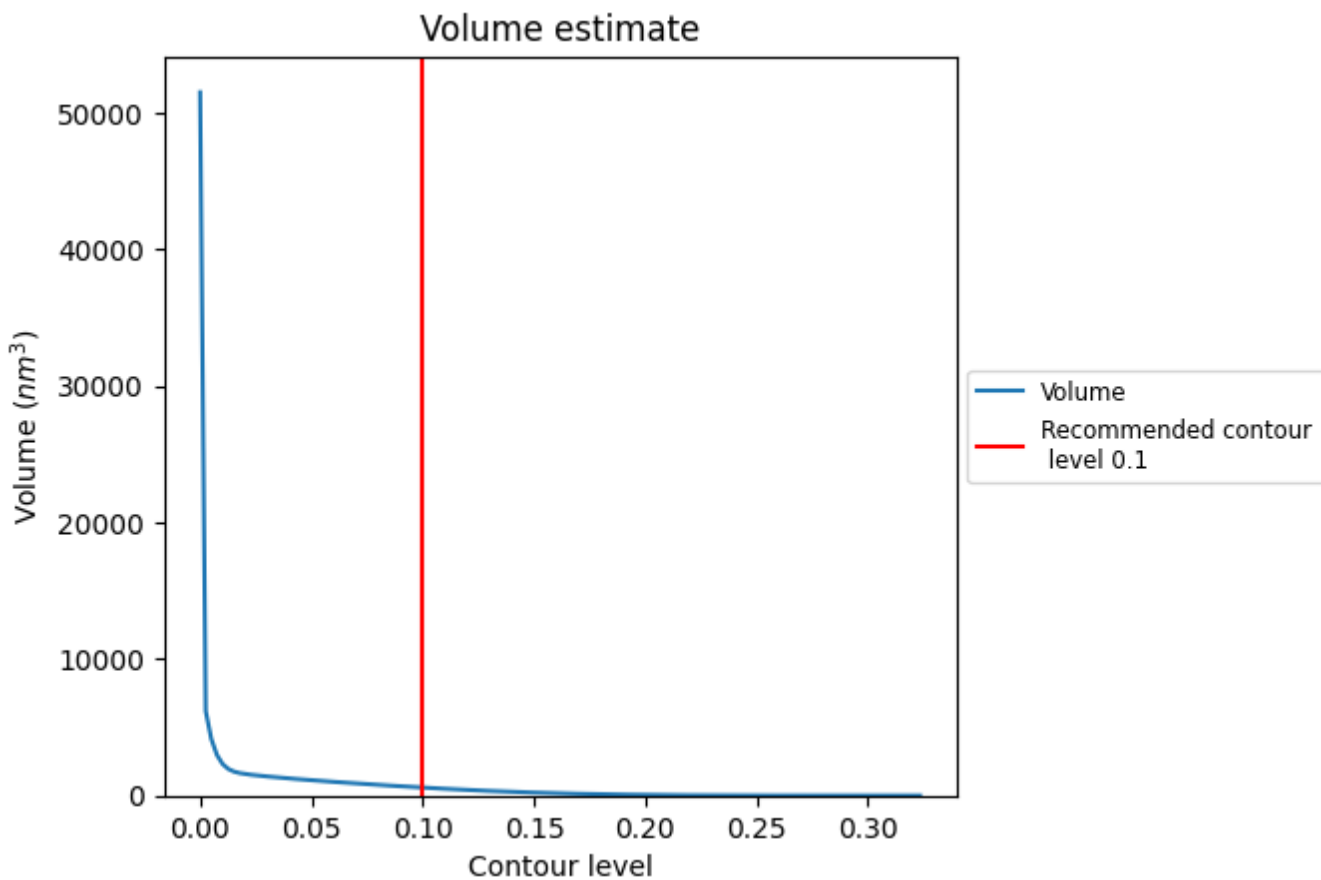
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

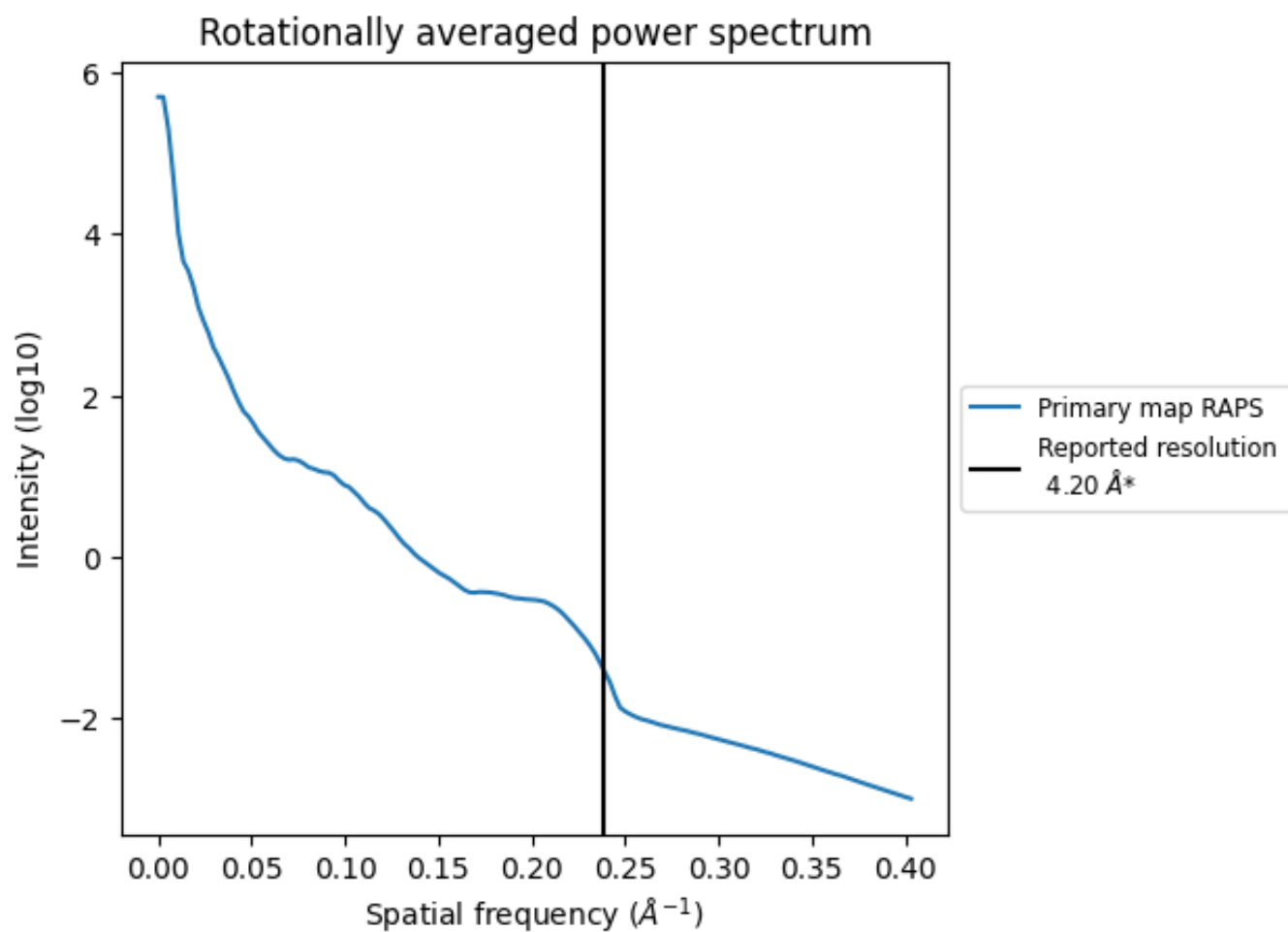
7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 585 nm^3 ; this corresponds to an approximate mass of 529 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](#)

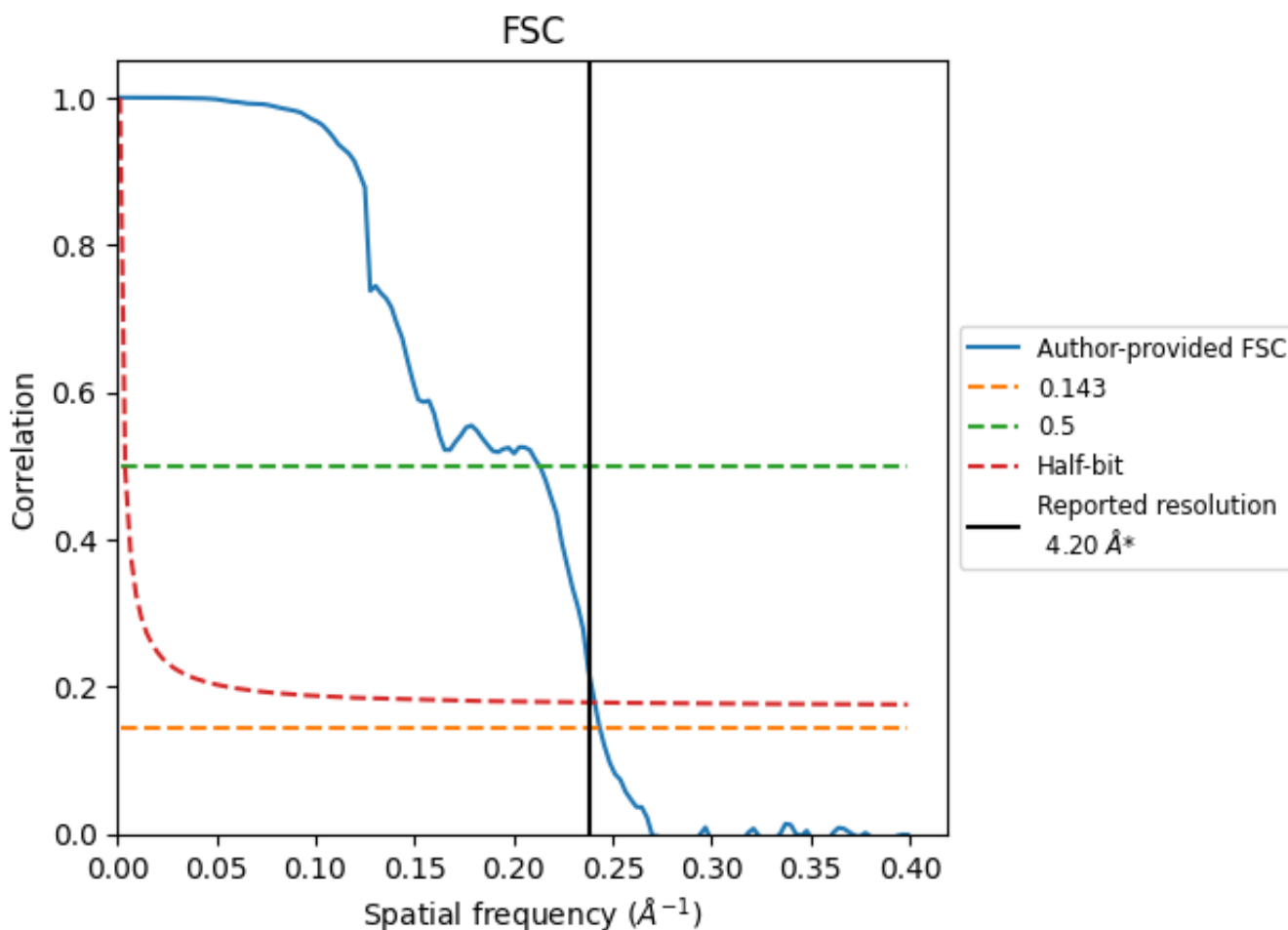


*Reported resolution corresponds to spatial frequency of 0.238 Å⁻¹

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 0.238 Å⁻¹

8.2 Resolution estimates [i](#)

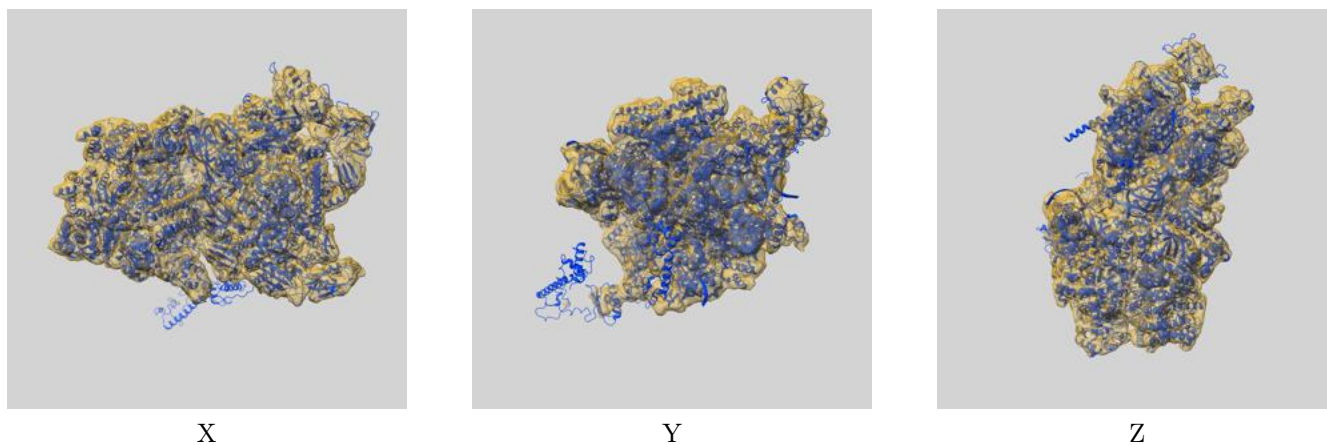
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.20	-	-
Author-provided FSC curve	4.11	4.69	4.15
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

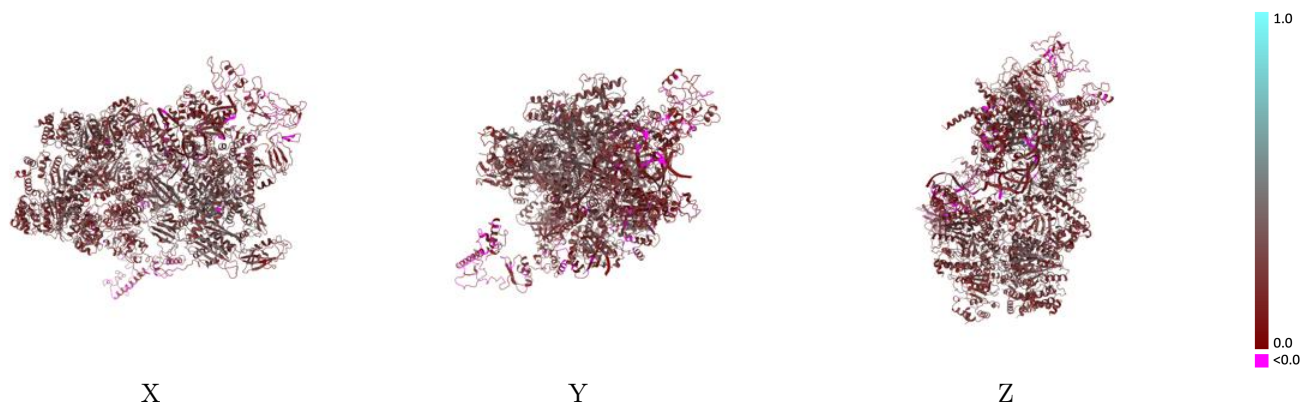
This section contains information regarding the fit between EMDB map EMD-11725 and PDB model 7ADE. Per-residue inclusion information can be found in section 3 on page 9.

9.1 Map-model overlay [i](#)



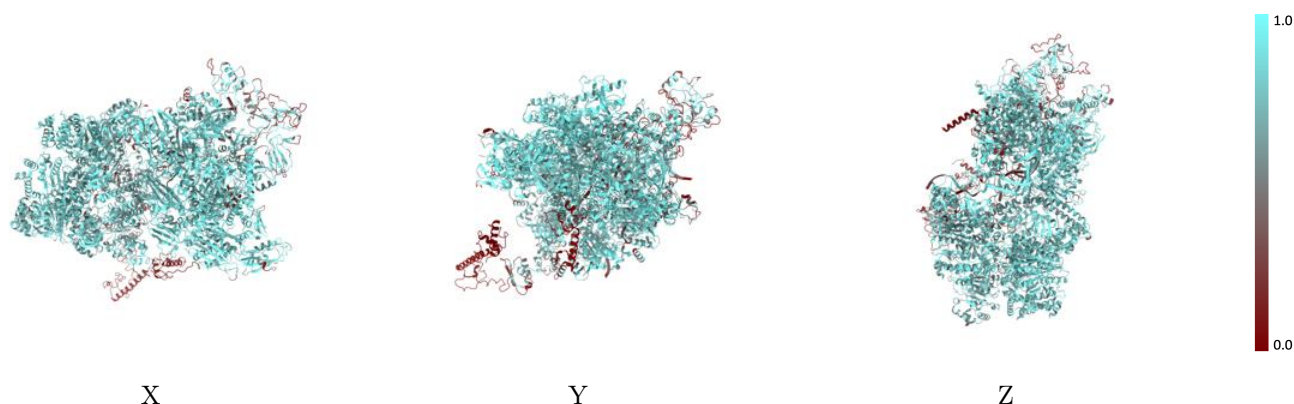
The images above show the 3D surface view of the map at the recommended contour level 0.1 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



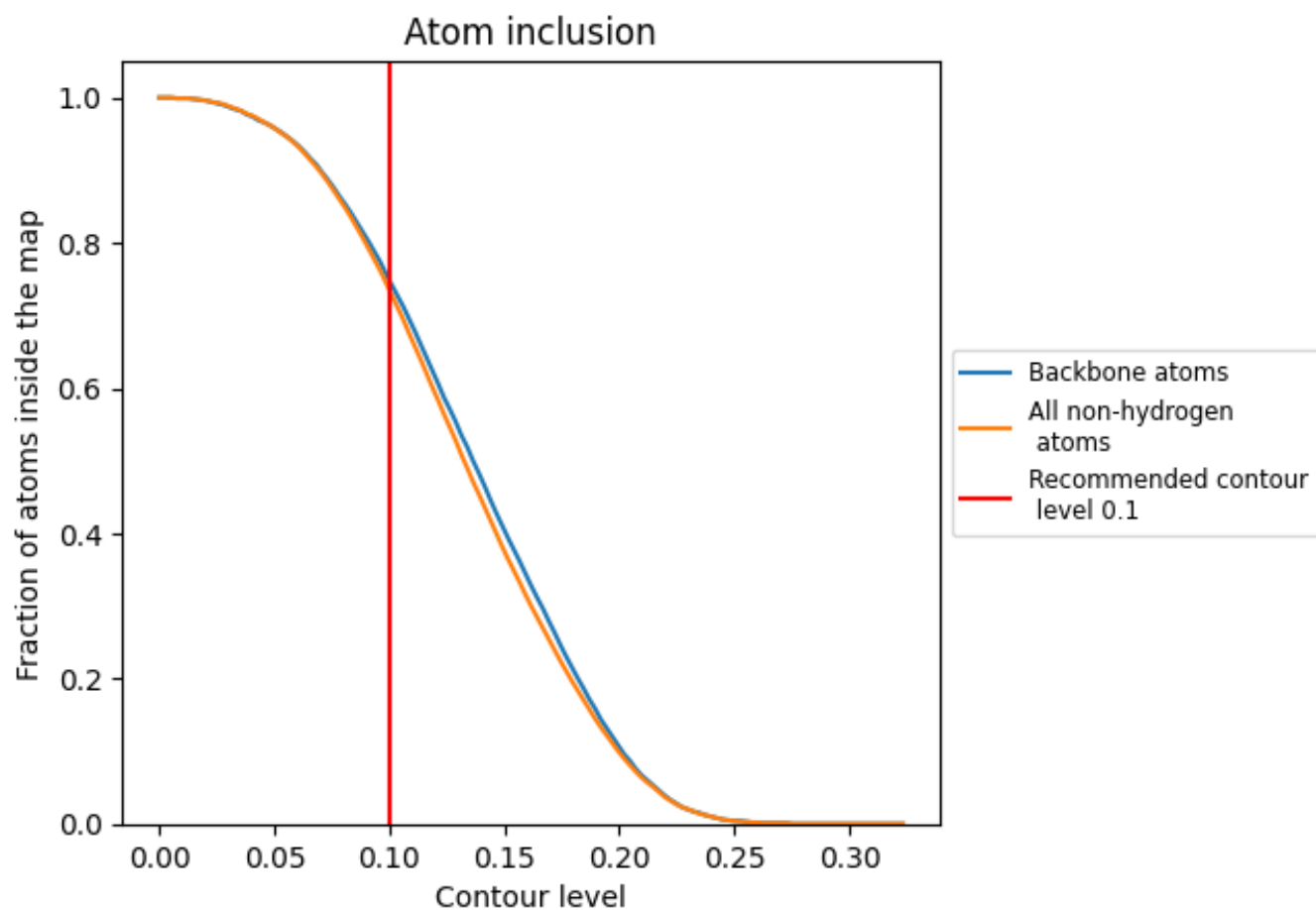
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.1).

































9.4 Atom inclusion [i](#)



At the recommended contour level, 75% of all backbone atoms, 74% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7350	 0.2350
A	 0.4220	 0.1450
K	 0.7810	 0.1130
L	 0.7140	 0.0770
R	 0.7510	 0.1610
U	 0.8020	 0.3050
V	 0.7540	 0.2480
W	 0.1390	 0.2090
X	 0.8060	 0.2790
Y	 0.7280	 0.2230
a	 0.7920	 0.2420
b	 0.8260	 0.2670
c	 0.8230	 0.2620
d	 0.8100	 0.2550
e	 0.7520	 0.2120
f	 0.7360	 0.2000

