



wwPDB EM Validation Summary Report ⓘ

Dec 10, 2025 – 05:36 pm GMT

PDB ID : 7AOD / pdb_00007aod
EMDB ID : EMD-11841
Title : Schizosaccharomyces pombe RNA polymerase I (dimer)
Authors : Heiss, F.; Daiss, J.; Becker, P.; Engel, C.
Deposited on : 2020-10-14
Resolution : 4.50 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:

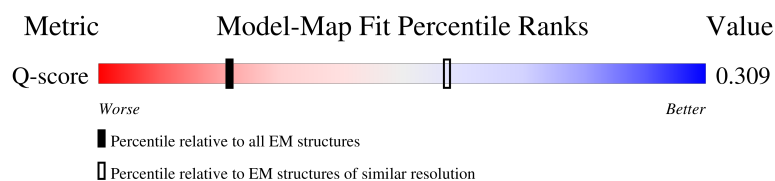
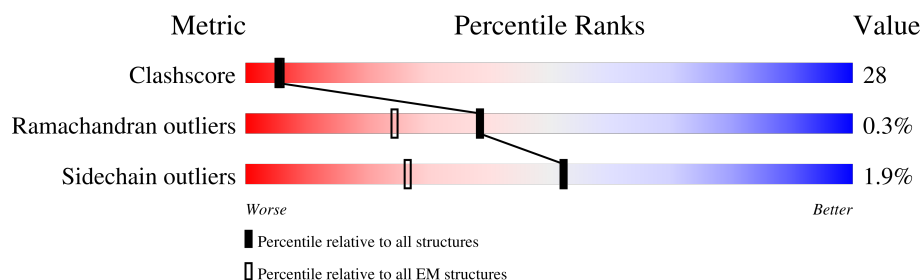
EMDB validation analysis : 0.0.1.dev129
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.47

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 4.50 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	2937 (4.00 - 5.00)

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	1689	
1	M	1689	
2	B	1174	
2	N	1174	

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Mol	Chain	Length	Quality of chain
3	C	348	
3	O	348	
4	D	147	
4	P	147	
5	E	210	
5	Q	210	
6	F	142	
6	R	142	
7	G	173	
7	S	173	
8	H	125	
8	T	125	
9	I	119	
9	U	119	
10	J	71	
10	V	71	
11	K	125	
11	W	125	
12	L	63	
12	X	63	

2 Entry composition

There are 13 unique types of molecules in this entry. The entry contains 59256 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 DNA-directed RNA polymerase I subunit rpa1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1384	Total	C	N	O	S	0	0
			10976	6965	1894	2059	58		
1	M	1384	Total	C	N	O	S	0	0
			10976	6965	1894	2059	58		

- Molecule 2 is a protein called Probable DNA-directed RNA polymerase I subunit RPA2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1156	Total	C	N	O	S	0	0
			9127	5791	1592	1685	59		
2	N	1156	Total	C	N	O	S	0	0
			9127	5791	1592	1685	59		

- Molecule 3 is a protein called DNA-directed RNA polymerases I and III subunit RPAC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	317	Total	C	N	O	S	0	0
			2533	1621	430	475	7		
3	O	317	Total	C	N	O	S	0	0
			2533	1621	430	475	7		

- Molecule 4 is a protein called DNA-directed RNA polymerase I subunit rpa14.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	39	Total	C	N	O	S	0	0
			322	203	57	61	1		
4	P	39	Total	C	N	O	S	0	0
			322	203	57	61	1		

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	207	Total	C	N	O	S	0	0
			1663	1050	301	306	6		
5	Q	207	Total	C	N	O	S	0	0
			1663	1050	301	306	6		

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	82	Total	C	N	O	S	0	0
			650	413	111	123	3		
6	R	82	Total	C	N	O	S	0	0
			650	413	111	123	3		

- Molecule 7 is a protein called DNA-directed RNA polymerase I subunit rpa43.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	160	Total	C	N	O	S	0	0
			1267	817	210	236	4		
7	S	160	Total	C	N	O	S	0	0
			1267	817	210	236	4		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	123	Total	C	N	O	S	0	0
			990	628	166	193	3		
8	T	123	Total	C	N	O	S	0	0
			990	628	166	193	3		

- Molecule 9 is a protein called DNA-directed RNA polymerase I subunit RPA12.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	57	Total	C	N	O	S	0	0
			431	269	69	89	4		
9	U	57	Total	C	N	O	S	0	0
			431	269	69	89	4		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	68	Total	C	N	O	S	0	0
			550	350	93	100	7		

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Mol	Chain	Residues	Atoms					AltConf	Trace
10	V	68	Total	C	N	O	S	0	0
			550	350	93	100	7		

- Molecule 11 is a protein called DNA-directed RNA polymerases I and III subunit RPAC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	95	Total	C	N	O	S	0	0
			745	472	123	146	4		
11	W	95	Total	C	N	O	S	0	0
			745	472	123	146	4		

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

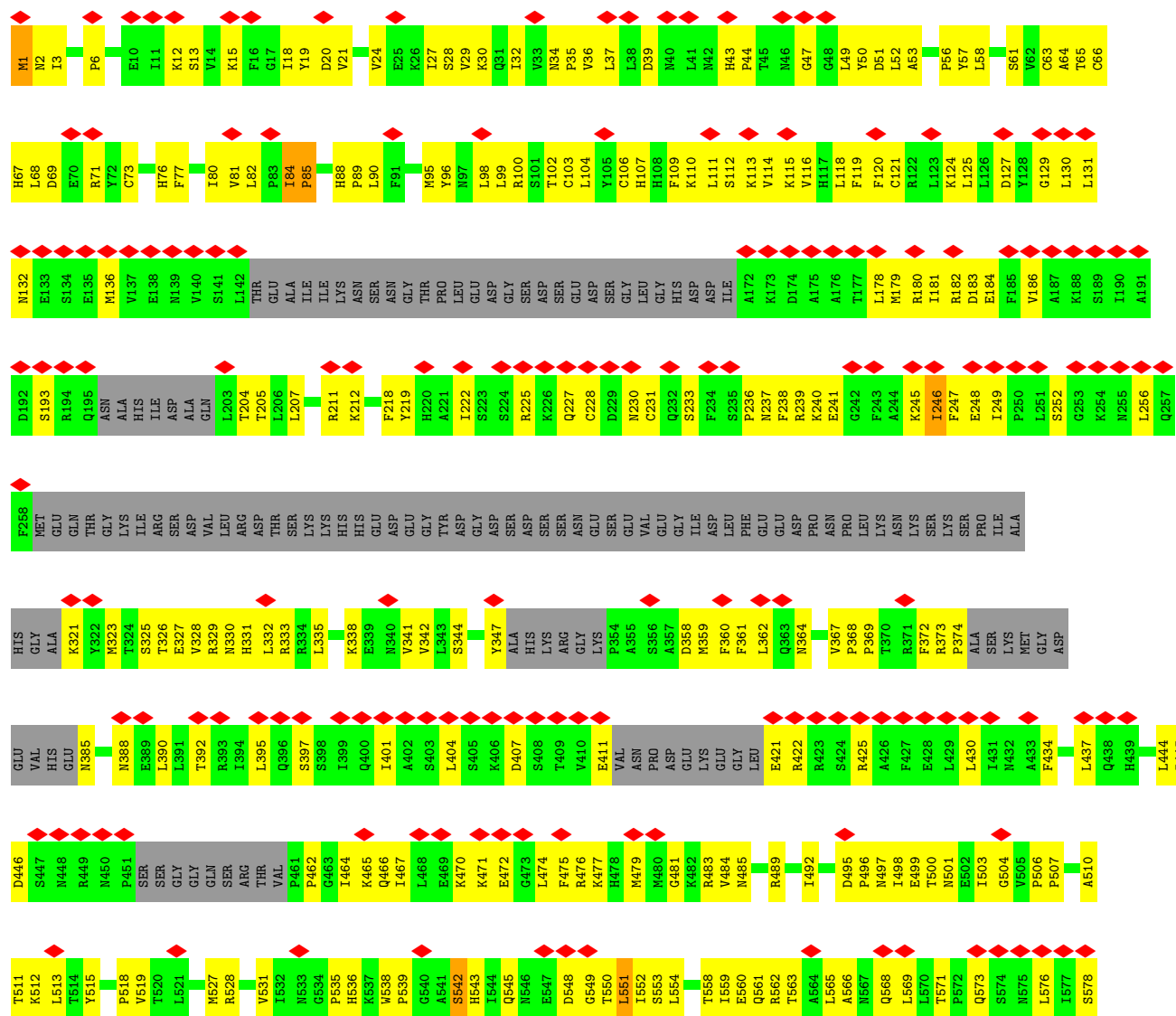
Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	45	Total	C	N	O	S	0	0
			368	225	74	61	8		
12	X	45	Total	C	N	O	S	0	0
			368	225	74	61	8		

- Molecule 13 is ZINC ION (CCD ID: ZN) (formula: Zn).

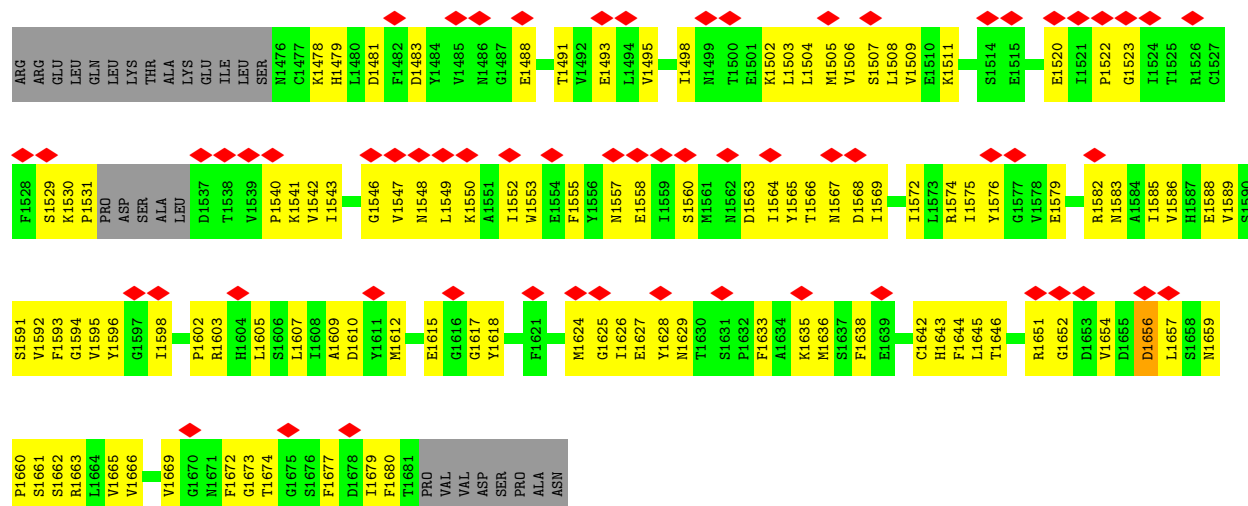
Mol	Chain	Residues	Atoms		AltConf
13	A	2	Total	Zn	0
			2	2	
13	B	1	Total	Zn	0
			1	1	
13	I	1	Total	Zn	0
			1	1	
13	J	1	Total	Zn	0
			1	1	
13	L	1	Total	Zn	0
			1	1	
13	M	2	Total	Zn	0
			2	2	
13	N	1	Total	Zn	0
			1	1	
13	U	1	Total	Zn	0
			1	1	
13	V	1	Total	Zn	0
			1	1	
13	X	1	Total	Zn	0
			1	1	

WORLDWIDE
PDB
PROTEIN DATA BANK

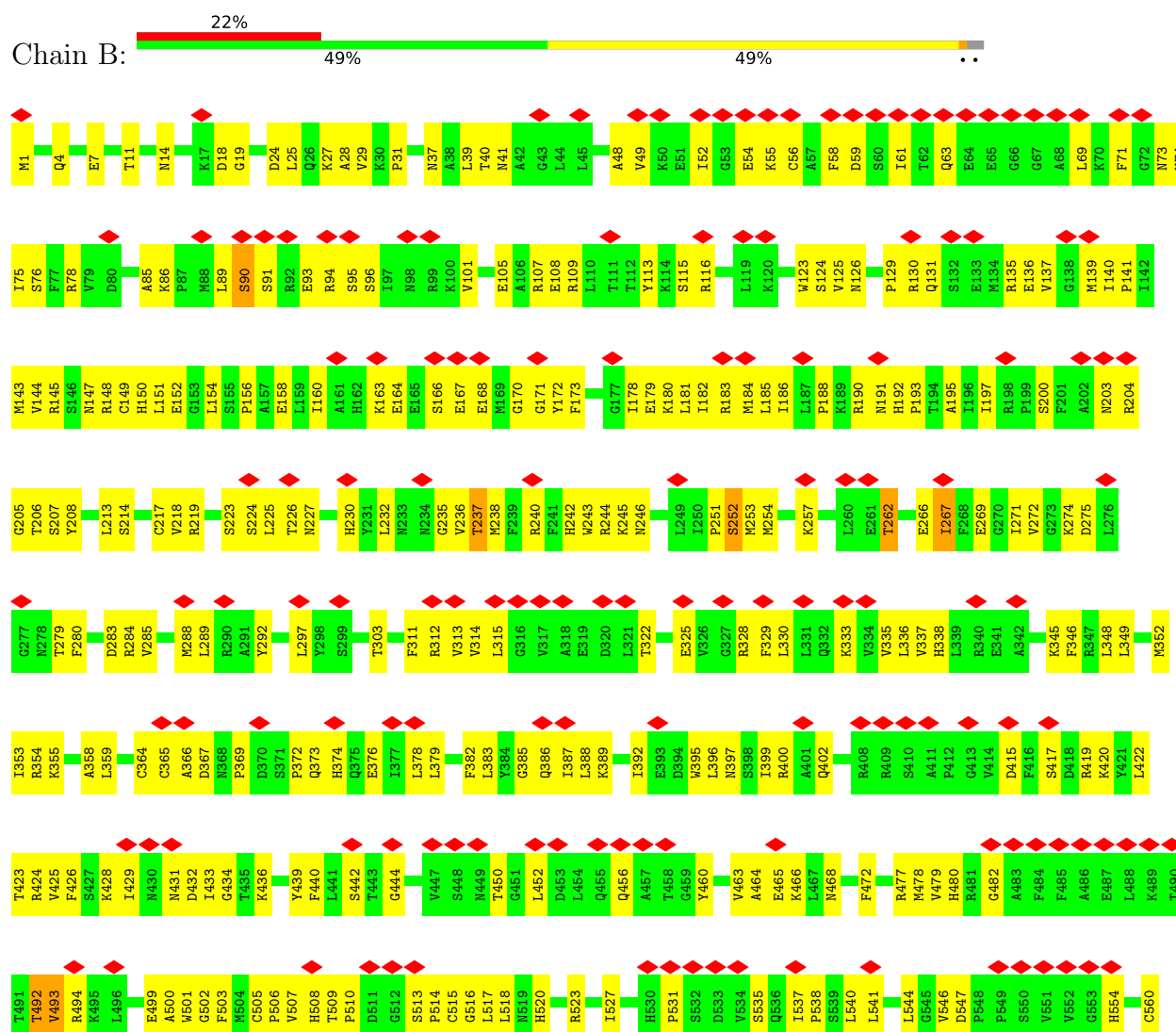
- Molecule 1: DNA-directed RNA polymerase I subunit rpa1

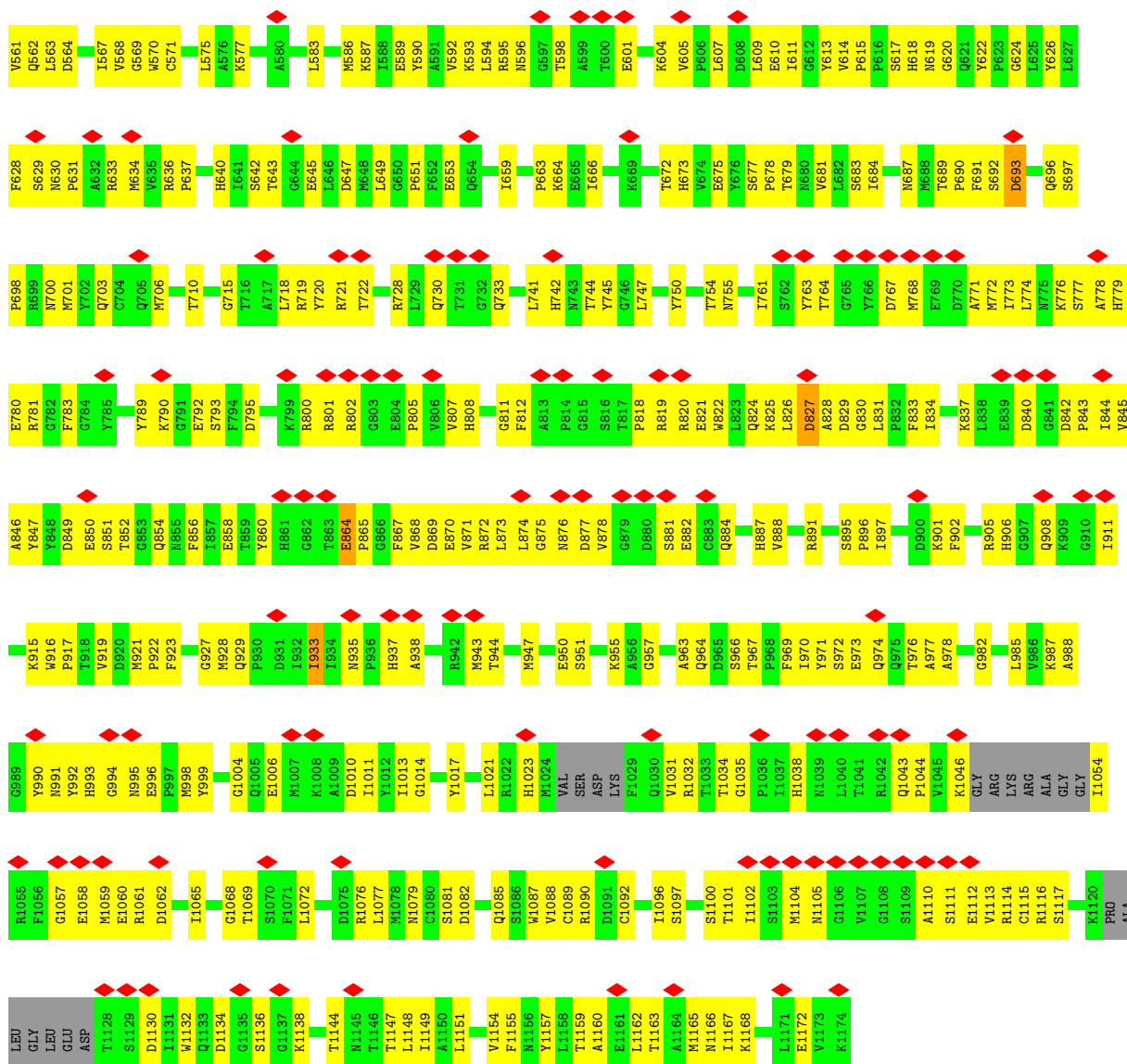




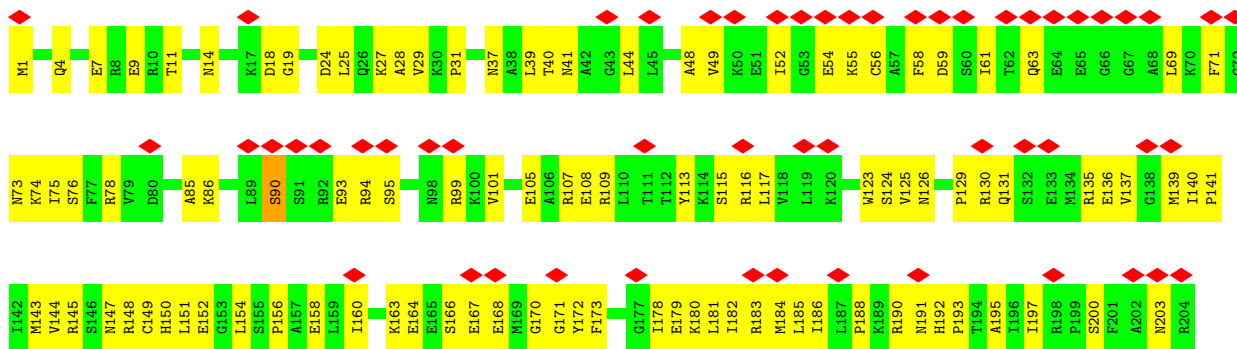


• Molecule 2: Probable DNA-directed RNA polymerase I subunit RPA2

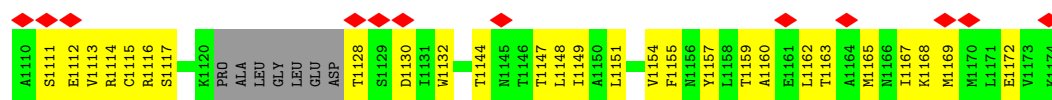




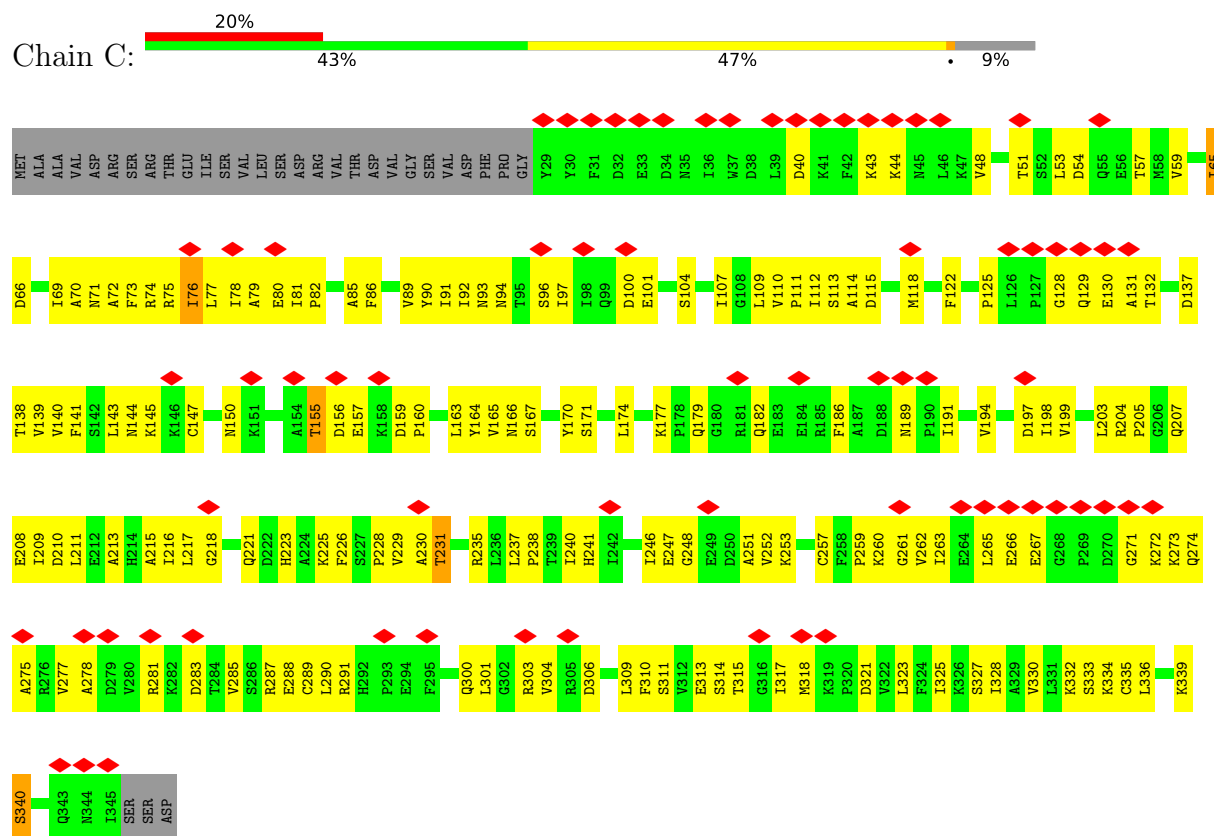
• Molecule 2: Probable DNA-directed RNA polymerase I subunit RPA2



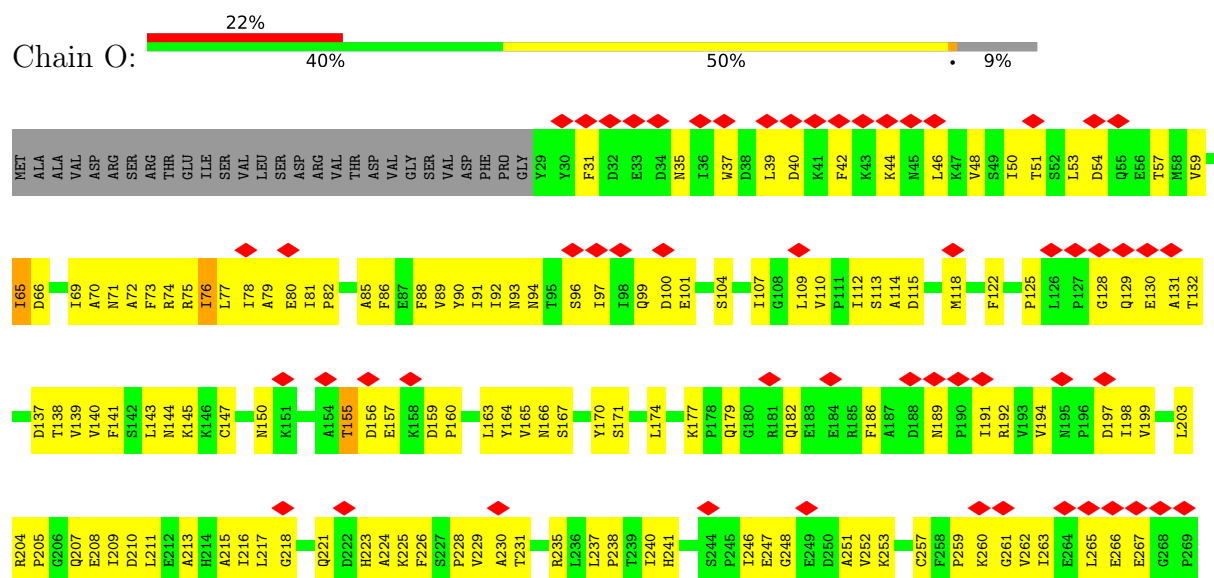
L1040	Y971	P896	F833	M768	M687	M618	D547	G482	S417	L348	L276	G205
Q1043	S972	I897	I834	E769	M688	M619	P848	A483	D418	L349	G277	T206
P1044	E973	D900	G835	D770	T689	G620	P849	F484	R419	M352	N278	S207
V1045	Q974	K901	T836	A771	Y622	D621	S550	F485	K420	I353	T279	Y208
K1046	G875	F902	K837	M772	P623	Y623	V551	A486	Y421	R354	D283	L213
GLY	T976	K902	L838	F691	G624	Y625	V552	A487	L422	K355	R284	S214
ARG	A977	R905	E839	L773	L626	G553	G553	L488	T423	L356	R285	C217
LYS	A978	H906	D840	D693	Y626	H554	H554	L489	R424	A358	V218	R219
ALA	G982	G907	G841	K776	L627	F628	C560	T490	F426	L287	R286	
GLY	L985	Q908	D842	S777	S697	S629	V561	T491	A428	M288	Q222	
I1054	Y986	P843	P843	A778	P698	S629	S561	T492	N430	L289	S223	
G1057	X987	G910	I844	H779	R699	N630	O562	I493	N431	R290	S224	
E1058	A988	I911	V845	E780	M700	P631	L563	V493	I429	A291	L225	
M1059	G989	K915	Y847	G782	Y701	A632	D564	R494	N432	Y292	T226	
E1060	Y990	W916	Y848	F783	G703	R633	L567	L496	I433	L297	N227	
R1061	N991	P917	D849	G784	G704	M634	V568	E499	D432	Y298	H230	
D1062	H993	T918	S851	G705	G705	V635	G569	A500	G434	S299	Y231	
G1065	G994	Y919	T852	M706	M706	R636	W570	W501	P372	T303	Y232	
H1066	N995	D920	T853	T710	T710	P637	C571	F503	P373	L307	Y233	
I1067	E996	P922	G853	G791	G791	H640	L575	G502	H374	F311	N234	
H1068	F997	G927	G854	E792	E792	L641	A576	F503	Q375	R312	G235	
G1069	M998	M928	N855	S793	S793	G642	K577	F504	G376	V313	T236	
S1070	Y999	Q929	T856	F794	F794	T643	A580	V507	I377	V314	T237	
L1072	G1004	P930	T857	D795	D795	G644	L583	H508	L378	R240	N238	
R1076	Q1005	H861	H861	K799	K799	E645	L586	H509	L379	F241	F239	
M1079	E1006	R800	R800	R800	R800	L646	L588	T509	F382	H242	R240	
C1080	M1007	R801	R801	R801	R801	D647	K587	P510	L383	W243	R241	
S1081	K1008	R802	R802	R802	R802	L648	L588	D511	G316	R244	N246	
D1082	A1009	R803	R803	R803	R803	E654	L589	G512	V317	K245		
Q1085	P936	R804	R804	R804	R804	E653	L590	S513	A318			
S1086	F867	P805	P805	P805	P805	G654	V592	G515	E319			
W1087	H868	H807	H807	H807	H807	L659	K993	G516	D320			
V1088	D869	H808	H808	H808	H808	A660	L594	L517	L388			
C1089	E870	H809	H809	H809	H809	C661	R595	L518	L321			
R1090	V871	F812	F812	F812	F812	P662	G597	N519	K389			
D1091	M943	A813	A813	A813	A813	P663	T598	H520	T392			
C1092	T944	P814	P814	P814	P814	L666	A599	H521	E393			
I1096	M947	G815	G815	G815	G815	X669	T600	H522	D394			
S1100	E950	N876	N876	N876	N876		E601	H523	V326			
T1101	S951	D877	D877	D877	D877			K524	G327			
R1102	K955	V878	V878	V878	V878			I527	R328			
I1103	A956	G879	G879	G879	G879			H530	F329			
S1103	G957	D880	D880	D880	D880			P531	L330			
M1104	G961	S881	S881	S881	S881			S532	Q332			
M1105	L962	E821	E821	E821	E821			D533	K333			
M1106	A963	W822	W822	W822	W822			V534	V334			
V1107	Q964	L823	L823	L823	L823			R408	V335			
G1108	T1032	R963	R963	R963	R963			R409	V336			
S1109	Q964	Q964	Q964	Q964	Q964			R409	V337			
	S965	I886	I886	I886	I886			S410	V337			
	P966	H887	H887	H887	H887			S411	V338			
	I1037	V888	V888	V888	V888			A411	H339			
	M1039	R891	R891	R891	R891			P412	A411			
		P969	P969	P969	P969			G413	R340			
		I1038	I1038	I1038	I1038			V414	E341			
		V1107	V1107	V1107	V1107			D415	A342			
		G1108	G1108	G1108	G1108			F346	K345			
		S1109	S1109	S1109	S1109			R347	F346			

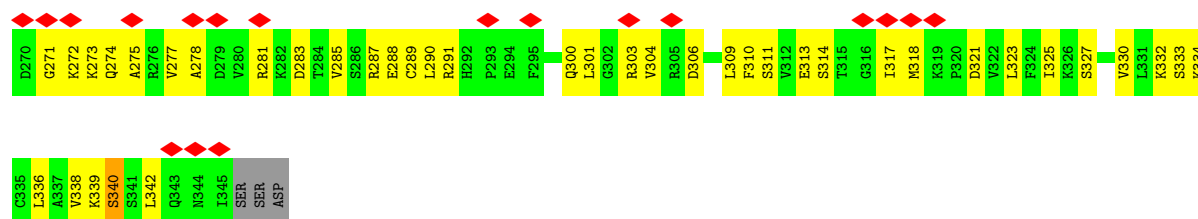


• Molecule 3: DNA-directed RNA polymerases I and III subunit RPAC1



• Molecule 3: DNA-directed RNA polymerases I and III subunit RPAC1

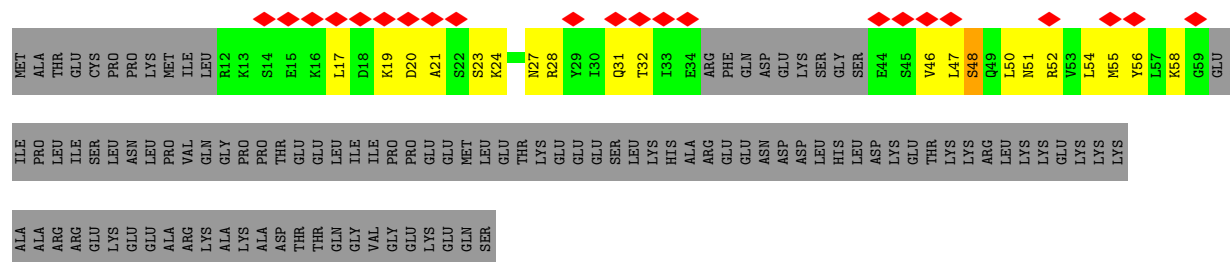




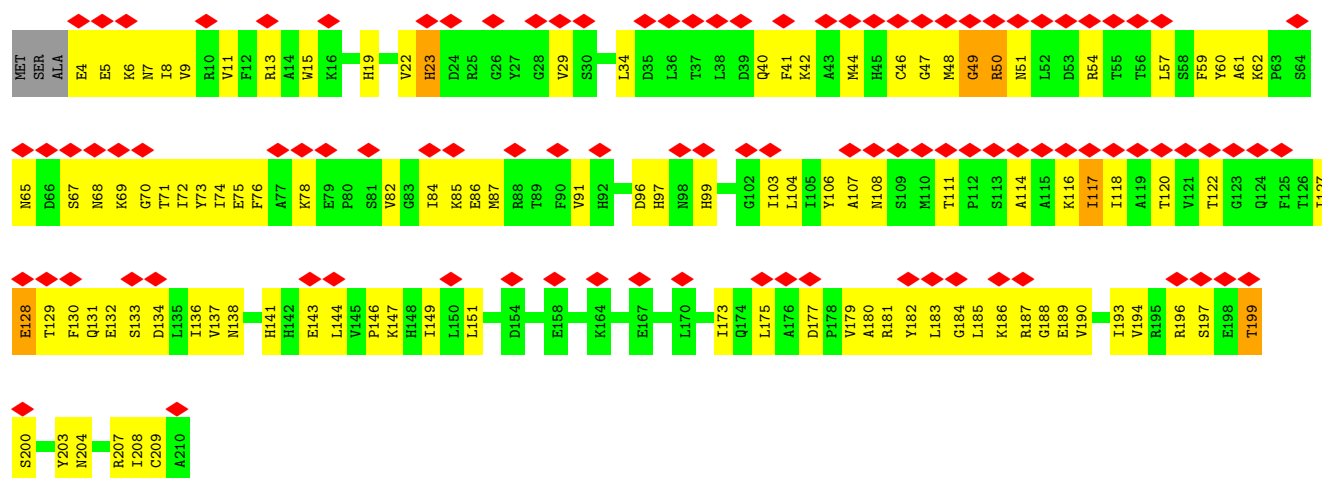
• Molecule 4: DNA-directed RNA polymerase I subunit rpa14



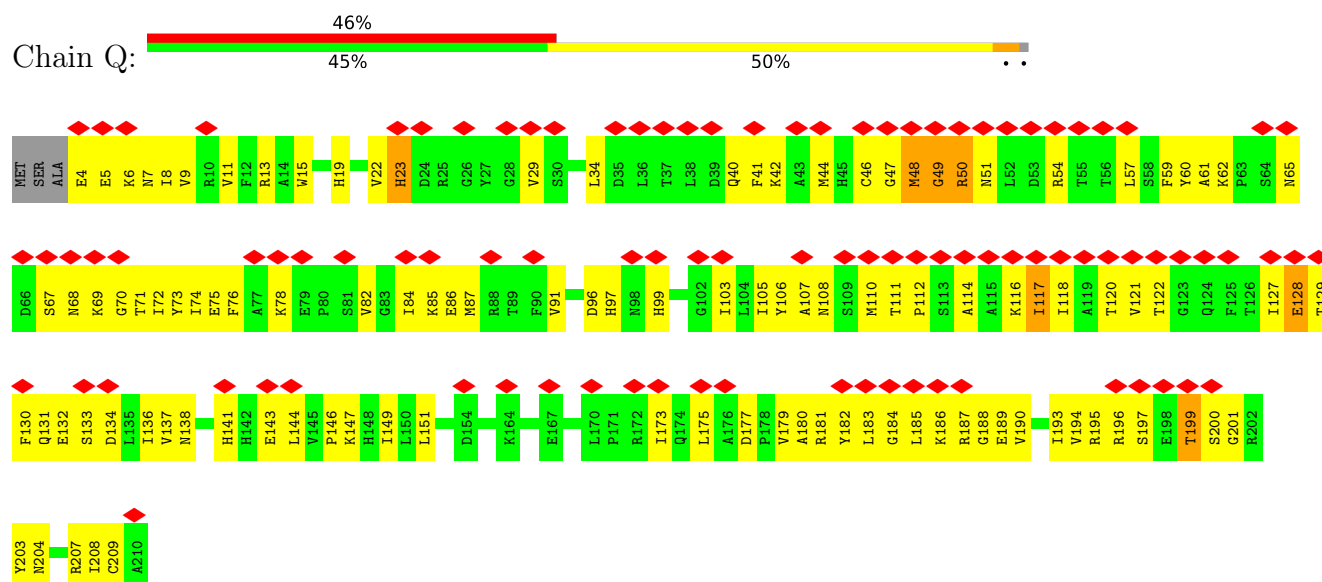
• Molecule 4: DNA-directed RNA polymerase I subunit rpa14



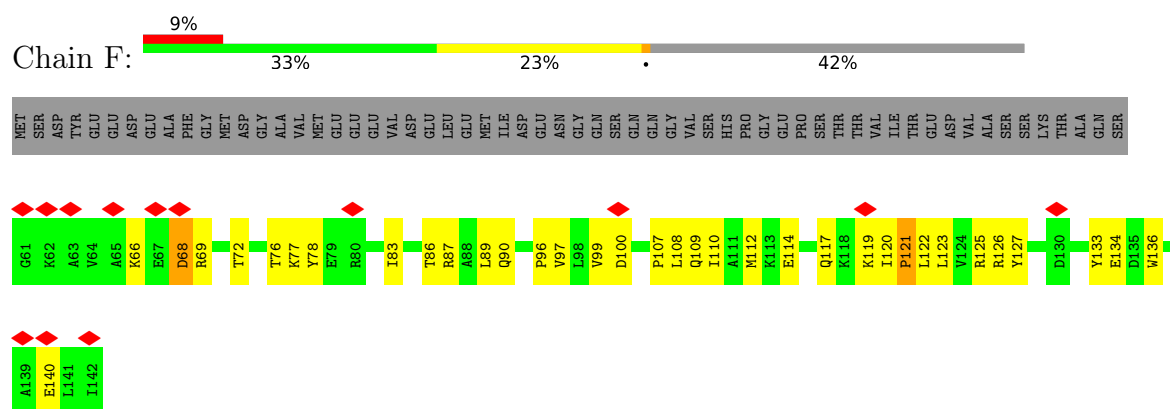
• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1



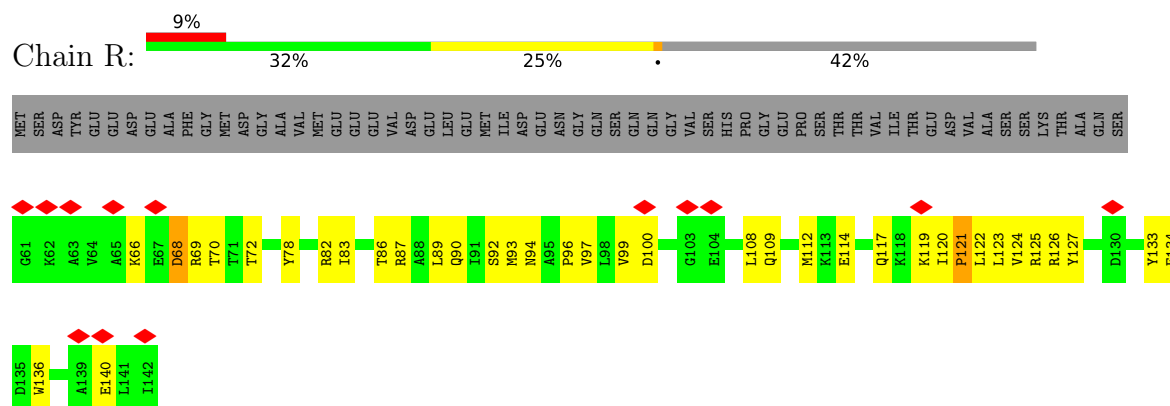
- Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1



- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2

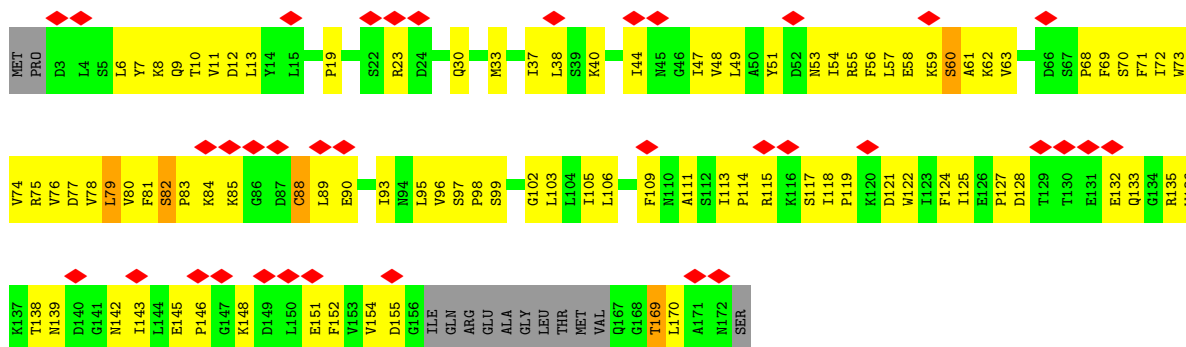


- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2

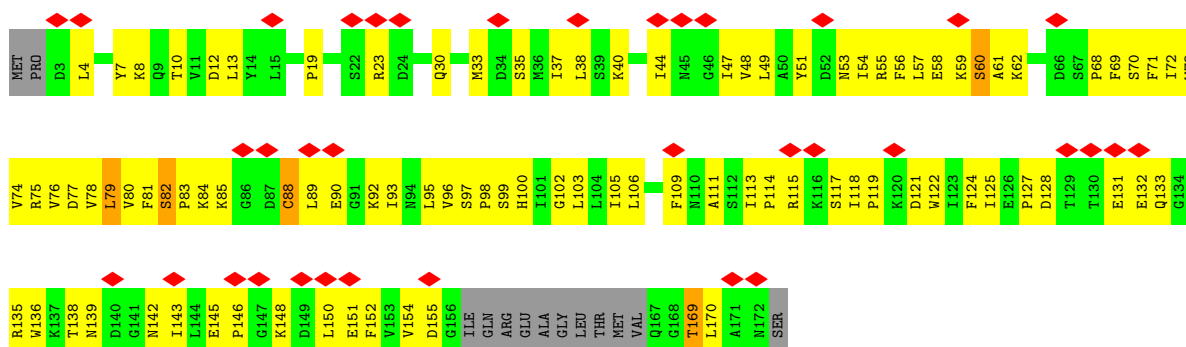


- Molecule 7: DNA-directed RNA polymerase I subunit rpa43

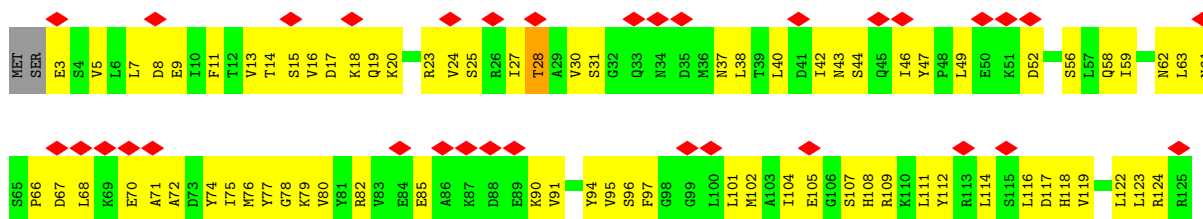




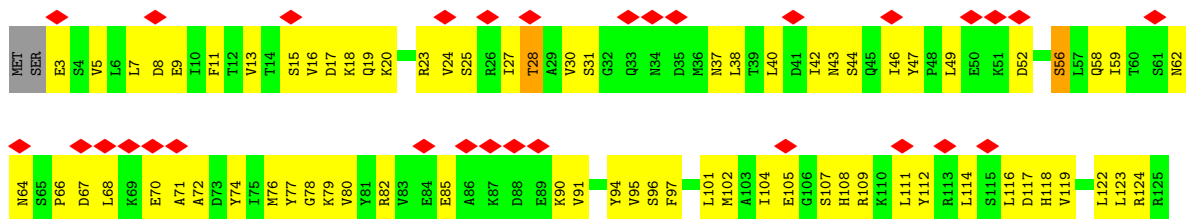
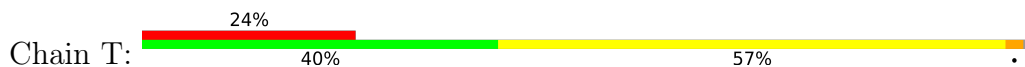
• Molecule 7: DNA-directed RNA polymerase I subunit rpa43



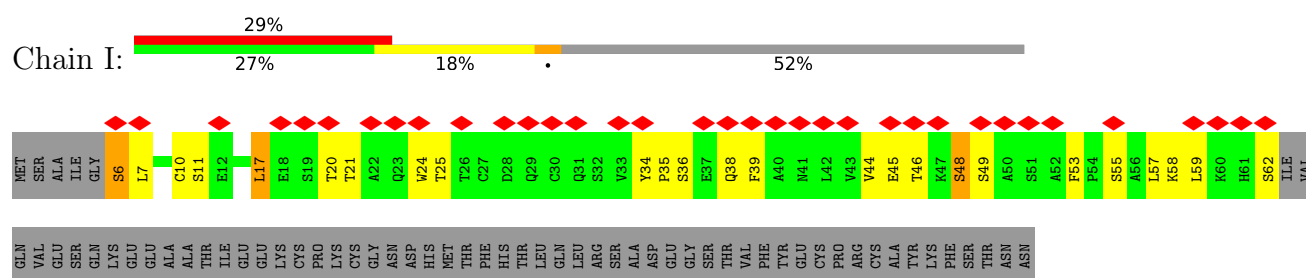
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3



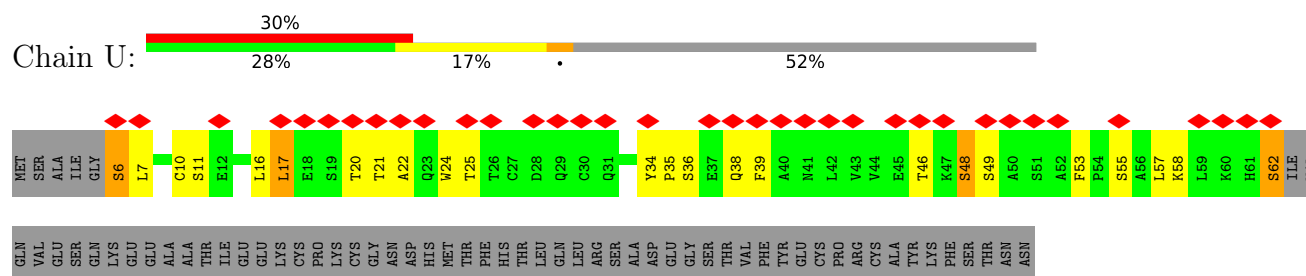
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3



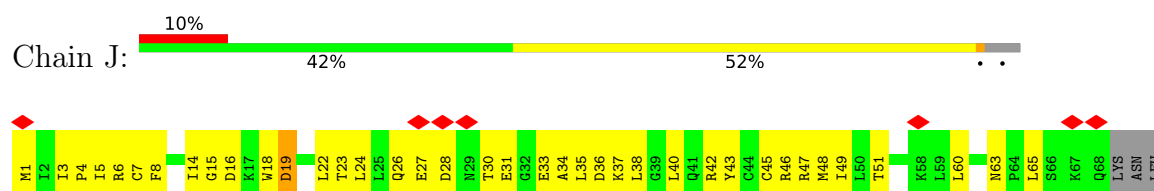
• Molecule 9: DNA-directed RNA polymerase I subunit RPA12



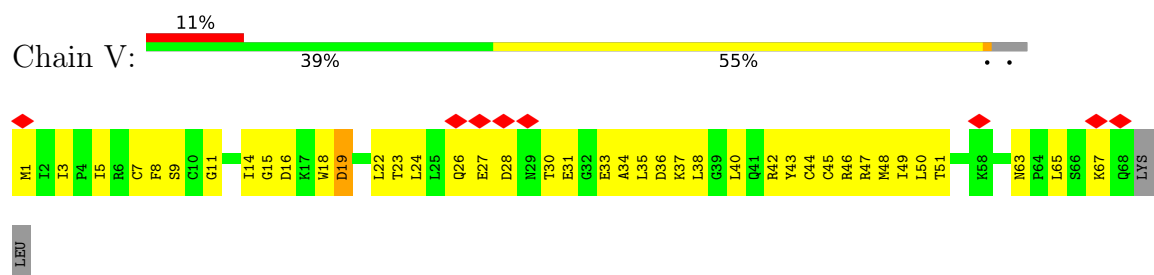
- Molecule 9: DNA-directed RNA polymerase I subunit RPA12



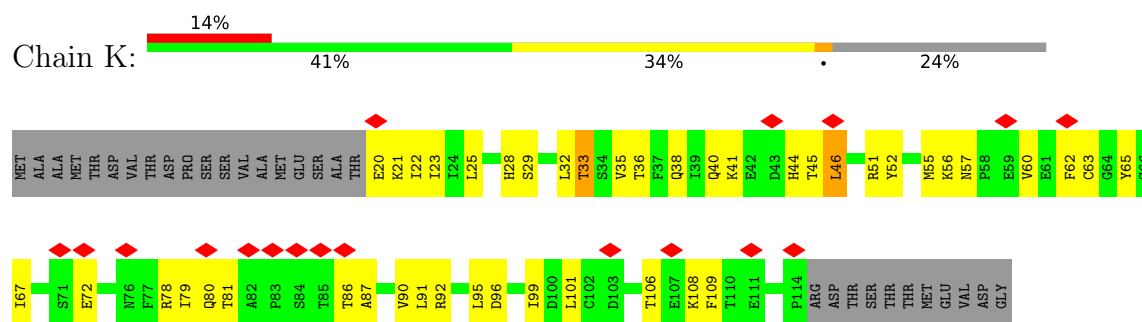
- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5



- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

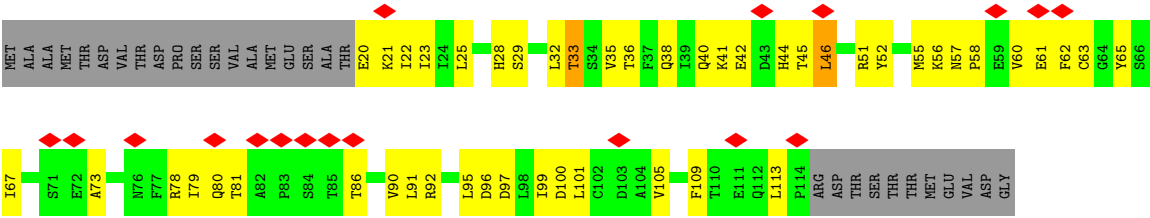


- Molecule 11: DNA-directed RNA polymerases I and III subunit RPAC2

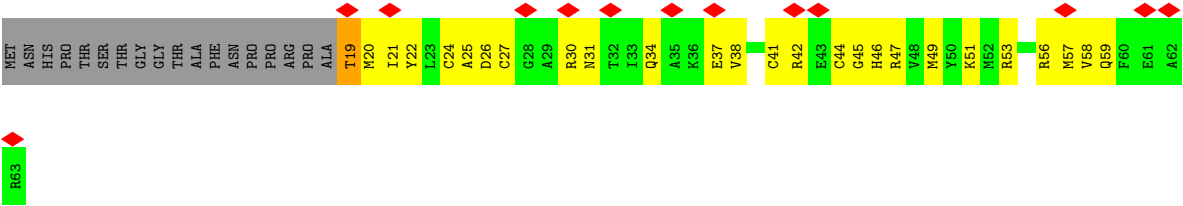


- Molecule 11: DNA-directed RNA polymerases I and III subunit RPAC2

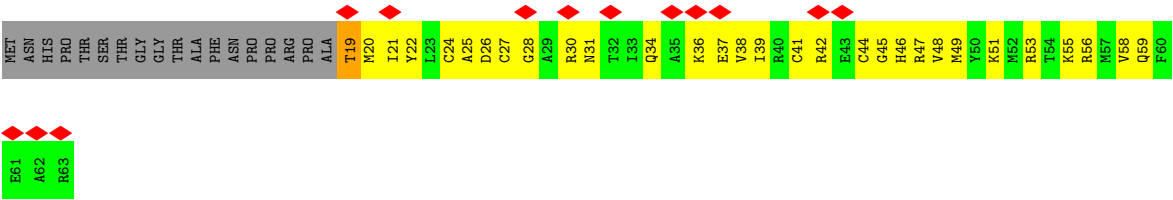
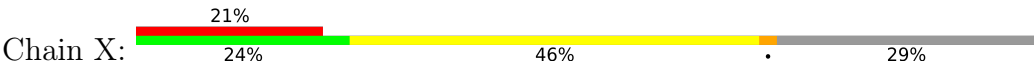




• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC4



• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC4



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	17102	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	86.5	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.099	Depositor
Minimum map value	-0.045	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.033	Depositor
Map size ($\text{\AA}$)	382.86002, 382.86002, 382.86002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.0635, 1.0635, 1.0635	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.31	0/11194	0.53	0/15122
1	M	0.31	0/11194	0.53	0/15122
2	B	0.34	0/9332	0.54	0/12615
2	N	0.34	0/9332	0.54	0/12615
3	C	0.31	0/2588	0.49	0/3505
3	O	0.31	0/2588	0.49	0/3505
4	D	0.25	0/323	0.49	0/427
4	P	0.25	0/323	0.49	0/427
5	E	0.28	0/1695	0.57	3/2287 (0.1%)
5	Q	0.28	0/1695	0.57	3/2287 (0.1%)
6	F	0.41	0/660	0.52	0/893
6	R	0.41	0/660	0.52	0/893
7	G	0.31	0/1295	0.53	0/1755
7	S	0.31	0/1295	0.53	0/1755
8	H	0.29	0/1004	0.59	0/1355
8	T	0.29	0/1004	0.60	0/1355
9	I	0.25	0/439	0.51	0/596
9	U	0.25	0/439	0.51	0/596
10	J	0.37	0/558	0.64	0/751
10	V	0.37	0/558	0.64	0/751
11	K	0.33	0/759	0.48	0/1030
11	W	0.33	0/759	0.48	0/1030
12	L	0.35	0/371	0.56	0/491
12	X	0.35	0/371	0.56	0/491
All	All	0.32	0/60436	0.53	6/81654 (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
1	A	0	4
1	M	0	4
2	B	0	1
2	N	0	1
5	E	0	4
5	Q	0	4
7	G	0	1
7	S	0	1
All	All	0	20

There are no bond length outliers.

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	Q	49	GLY	CA-C-N	5.63	131.83	121.70
5	Q	49	GLY	C-N-CA	5.63	131.83	121.70
5	E	49	GLY	CA-C-N	5.62	131.82	121.70
5	E	49	GLY	C-N-CA	5.62	131.82	121.70
5	E	91	VAL	N-CA-C	-5.16	107.54	111.62

There are no chirality outliers.

5 of 20 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1656	ASP	Peptide
1	A	246	ILE	Peptide
1	A	84	ILE	Peptide
1	A	896	TYR	Peptide
2	B	90	SER	Peptide

5.2 Too-close contacts ⓘ

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	10976	0	10980	648	0
1	M	10976	0	10980	660	0
2	B	9127	0	9092	522	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	N	9127	0	9092	571	0
3	C	2533	0	2540	155	0
3	O	2533	0	2540	174	0
4	D	322	0	338	21	0
4	P	322	0	338	19	0
5	E	1663	0	1684	79	0
5	Q	1663	0	1684	86	0
6	F	650	0	674	36	0
6	R	650	0	674	38	0
7	G	1267	0	1278	93	0
7	S	1267	0	1278	99	0
8	H	990	0	1001	67	0
8	T	990	0	1001	65	0
9	I	431	0	410	17	0
9	U	431	0	410	21	0
10	J	550	0	564	38	0
10	V	550	0	564	42	0
11	K	745	0	745	42	0
11	W	745	0	745	53	0
12	L	368	0	377	27	0
12	X	368	0	377	52	0
13	A	2	0	0	0	0
13	B	1	0	0	0	0
13	I	1	0	0	0	0
13	J	1	0	0	0	0
13	L	1	0	0	0	0
13	M	2	0	0	0	0
13	N	1	0	0	0	0
13	U	1	0	0	0	0
13	V	1	0	0	0	0
13	X	1	0	0	0	0
All	All	59256	0	59366	3265	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 28.

The worst 5 of 3265 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)
2:N:696:GLN:HG2	2:N:698:PRO:HD2	1.45	0.98
2:B:696:GLN:HG2	2:B:698:PRO:HD2	1.45	0.96

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:735:GLN:HE22	8:H:77:TYR:HB2	1.30	0.95
1:A:1279:VAL:O	9:I:48:SER:OG	1.86	0.94
8:H:17:ASP:HA	8:H:18:LYS:HB2	1.51	0.92

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	1356/1689 (80%)	1213 (90%)	136 (10%)	7 (0%)	25	64
1	M	1356/1689 (80%)	1214 (90%)	135 (10%)	7 (0%)	25	64
2	B	1148/1174 (98%)	1015 (88%)	129 (11%)	4 (0%)	37	72
2	N	1148/1174 (98%)	1015 (88%)	129 (11%)	4 (0%)	37	72
3	C	315/348 (90%)	290 (92%)	25 (8%)	0	100	100
3	O	315/348 (90%)	290 (92%)	25 (8%)	0	100	100
4	D	35/147 (24%)	34 (97%)	1 (3%)	0	100	100
4	P	35/147 (24%)	34 (97%)	1 (3%)	0	100	100
5	E	205/210 (98%)	180 (88%)	25 (12%)	0	100	100
5	Q	205/210 (98%)	179 (87%)	26 (13%)	0	100	100
6	F	80/142 (56%)	75 (94%)	4 (5%)	1 (1%)	10	42
6	R	80/142 (56%)	75 (94%)	4 (5%)	1 (1%)	10	42
7	G	156/173 (90%)	139 (89%)	17 (11%)	0	100	100
7	S	156/173 (90%)	139 (89%)	17 (11%)	0	100	100
8	H	121/125 (97%)	95 (78%)	26 (22%)	0	100	100
8	T	121/125 (97%)	95 (78%)	26 (22%)	0	100	100
9	I	55/119 (46%)	50 (91%)	5 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	U	55/119 (46%)	50 (91%)	5 (9%)	0	100	100
10	J	66/71 (93%)	46 (70%)	20 (30%)	0	100	100
10	V	66/71 (93%)	46 (70%)	20 (30%)	0	100	100
11	K	93/125 (74%)	90 (97%)	3 (3%)	0	100	100
11	W	93/125 (74%)	90 (97%)	3 (3%)	0	100	100
12	L	43/63 (68%)	40 (93%)	3 (7%)	0	100	100
12	X	43/63 (68%)	40 (93%)	3 (7%)	0	100	100
All	All	7346/8772 (84%)	6534 (89%)	788 (11%)	24 (0%)	38	72

5 of 24 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1066	ASP
1	M	1066	ASP
1	A	1154	ASP
1	M	1154	ASP
2	B	206	THR

5.3.2 Protein sidechains ⓘ

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	1225/1484 (82%)	1214 (99%)	11 (1%)	75	83
1	M	1225/1484 (82%)	1214 (99%)	11 (1%)	75	83
2	B	1001/1013 (99%)	989 (99%)	12 (1%)	67	79
2	N	1001/1013 (99%)	989 (99%)	12 (1%)	67	79
3	C	281/308 (91%)	271 (96%)	10 (4%)	30	52
3	O	281/308 (91%)	271 (96%)	10 (4%)	30	52
4	D	37/134 (28%)	36 (97%)	1 (3%)	40	60
4	P	37/134 (28%)	36 (97%)	1 (3%)	40	60
5	E	182/184 (99%)	174 (96%)	8 (4%)	24	46

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	Q	182/184 (99%)	174 (96%)	8 (4%)	24	46
6	F	70/121 (58%)	67 (96%)	3 (4%)	25	47
6	R	70/121 (58%)	67 (96%)	3 (4%)	25	47
7	G	143/154 (93%)	138 (96%)	5 (4%)	31	52
7	S	143/154 (93%)	138 (96%)	5 (4%)	31	52
8	H	112/114 (98%)	110 (98%)	2 (2%)	54	71
8	T	112/114 (98%)	110 (98%)	2 (2%)	54	71
9	I	51/105 (49%)	44 (86%)	7 (14%)	3	14
9	U	51/105 (49%)	44 (86%)	7 (14%)	3	14
10	J	63/66 (96%)	61 (97%)	2 (3%)	34	55
10	V	63/66 (96%)	61 (97%)	2 (3%)	34	55
11	K	86/111 (78%)	84 (98%)	2 (2%)	45	64
11	W	86/111 (78%)	84 (98%)	2 (2%)	45	64
12	L	39/53 (74%)	38 (97%)	1 (3%)	41	61
12	X	39/53 (74%)	38 (97%)	1 (3%)	41	61
All	All	6580/7694 (86%)	6452 (98%)	128 (2%)	52	69

5 of 128 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
8	T	56	SER
9	U	48	SER
7	G	143	ILE
7	G	88	CYS
9	U	57	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 138 such sidechains are listed below:

Mol	Chain	Res	Type
2	N	1038	HIS
3	O	182	GLN
7	S	30	GLN
3	C	166	ASN
2	B	1043	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 12 ligands modelled in this entry, 12 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

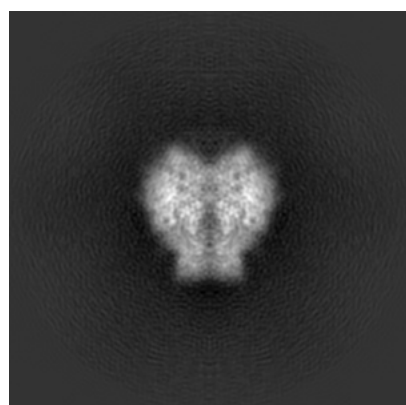
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11841. These allow visual inspection of the internal detail of the map and identification of artifacts.

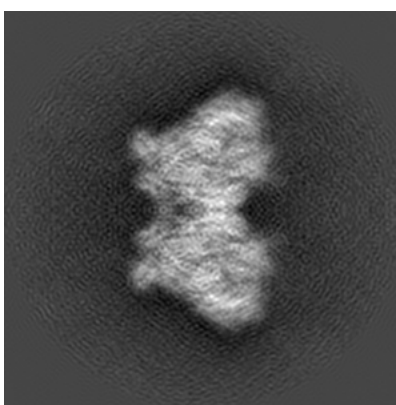
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

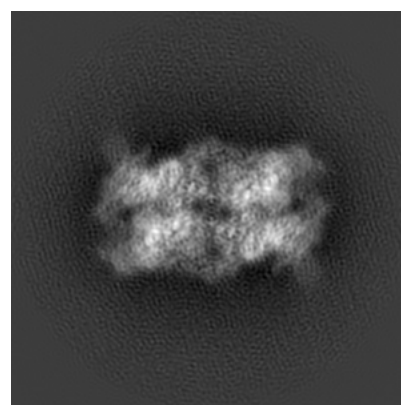
6.1.1 Primary map



X



Y

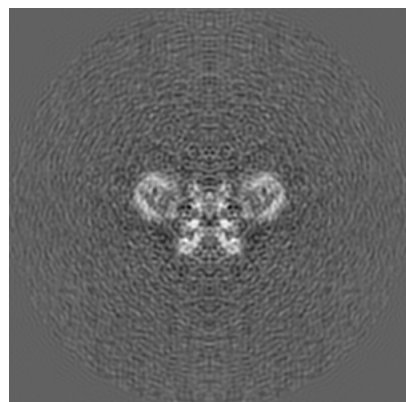


Z

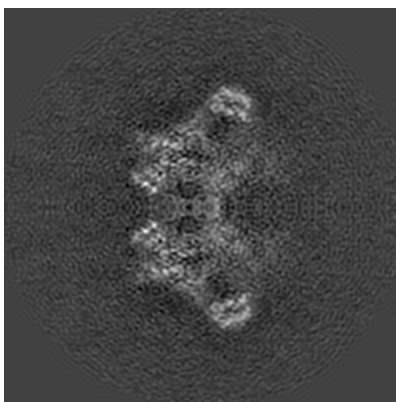
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

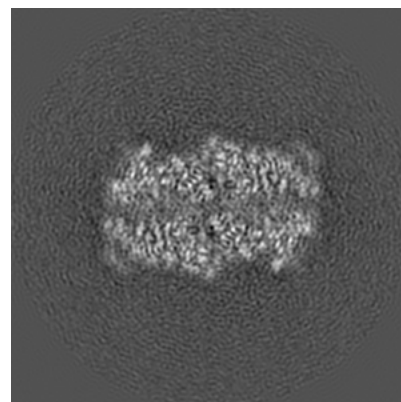
6.2.1 Primary map



X Index: 180



Y Index: 180

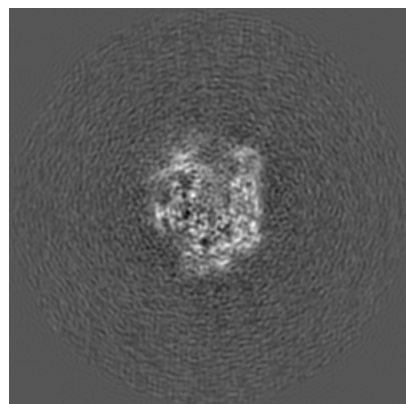


Z Index: 180

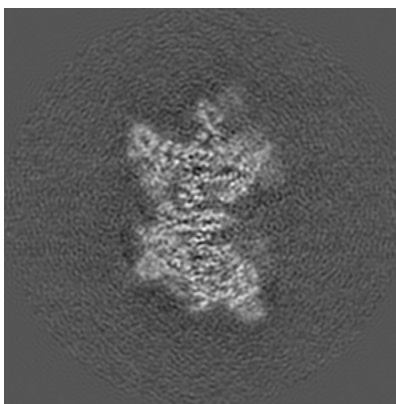
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

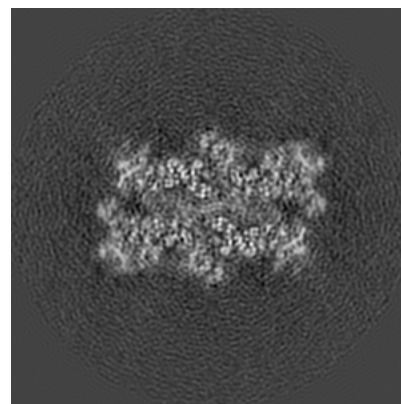
6.3.1 Primary map



X Index: 145



Y Index: 200

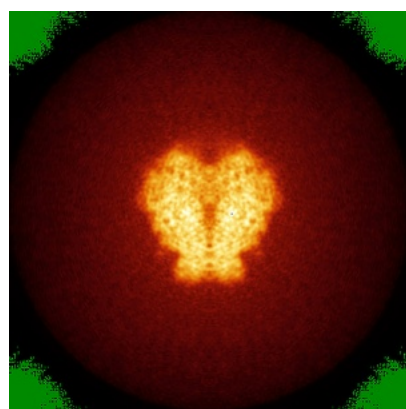


Z Index: 189

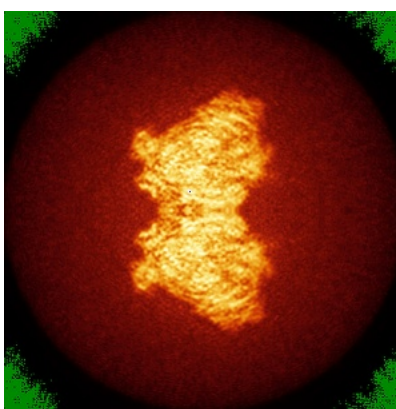
The images above show the largest variance slices of the map in three orthogonal directions.

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

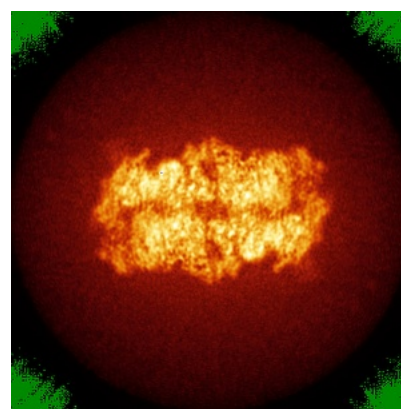
6.4.1 Primary map



X



Y

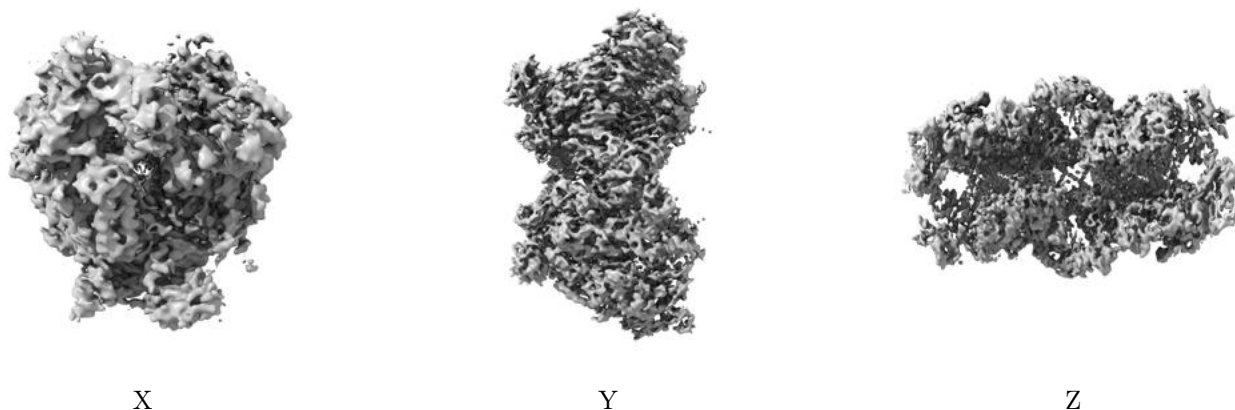


Z

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

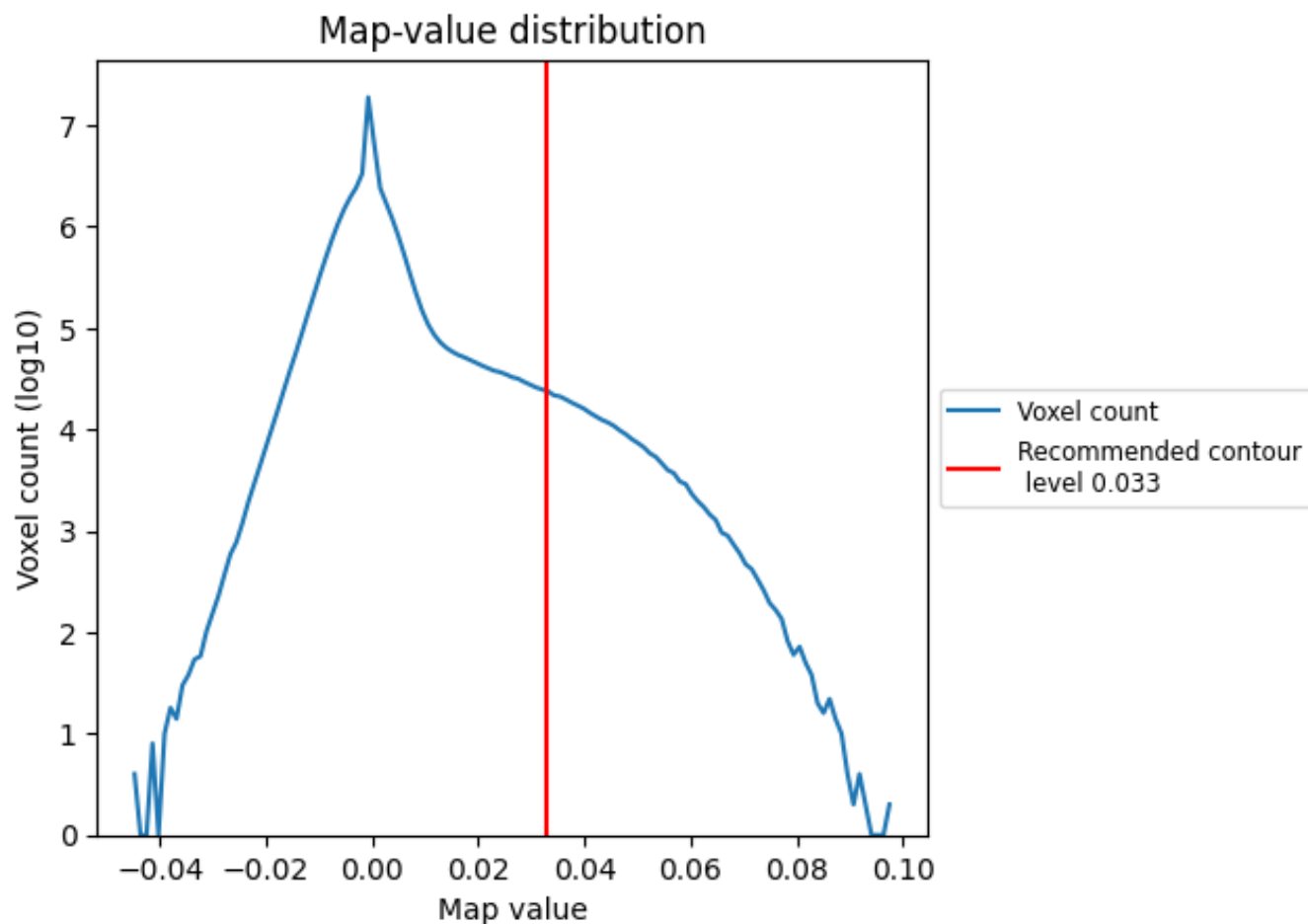
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

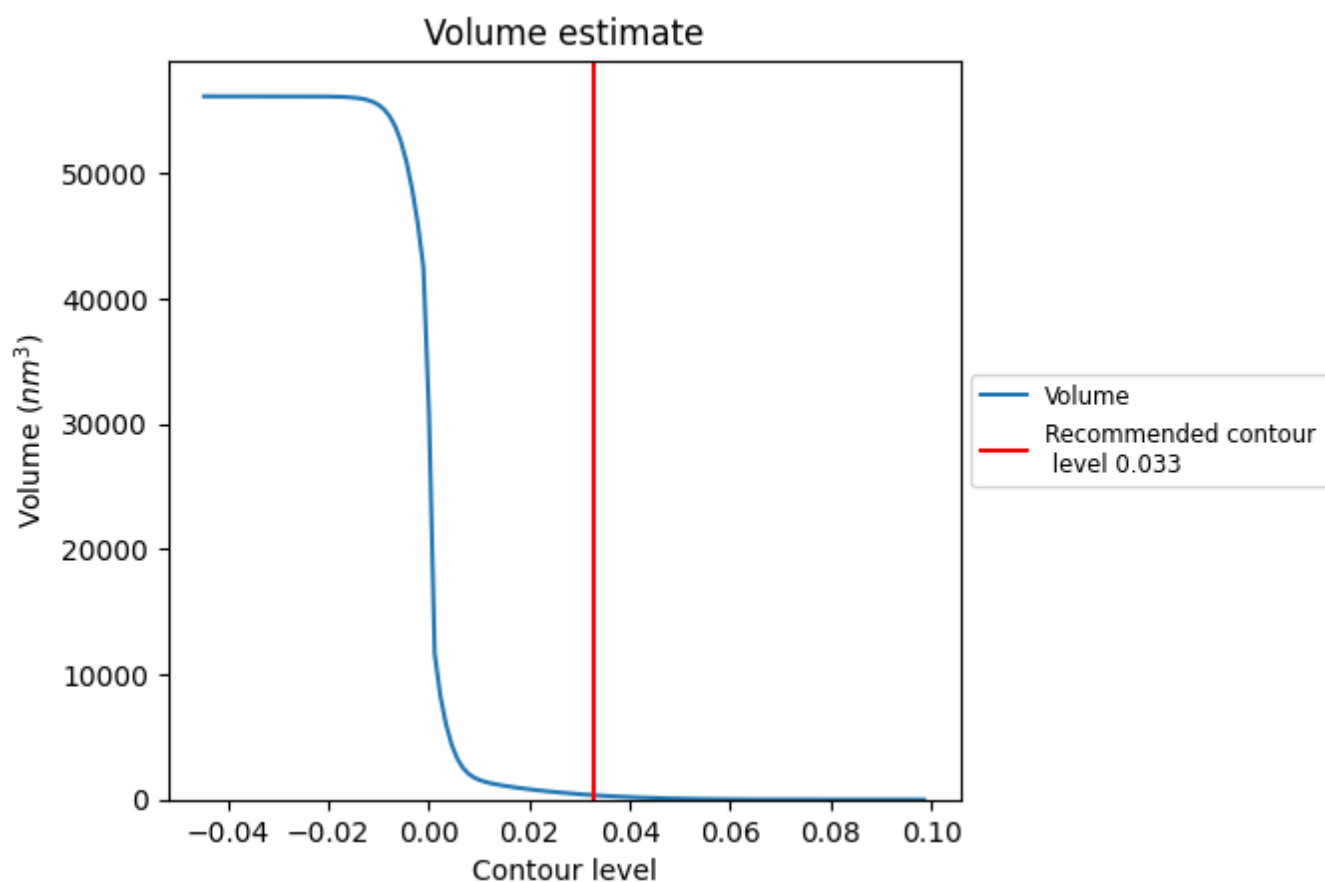
This section contains the results of statistical analysis of the map.

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.

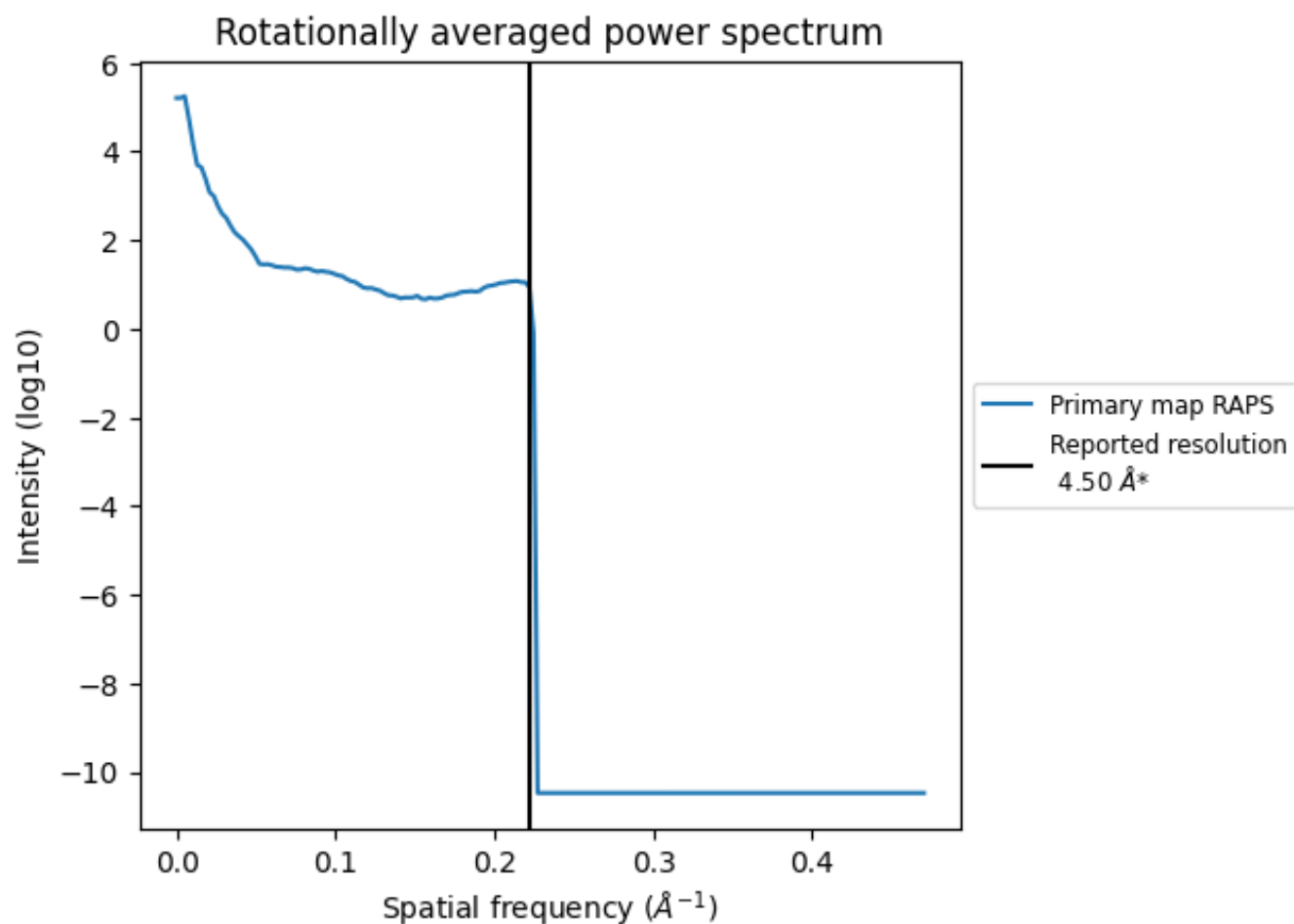
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 347 nm³; this corresponds to an approximate mass of 314 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 ⓘ



*Reported resolution corresponds to spatial frequency of 0.222 $\text{\AA}^{-1}$

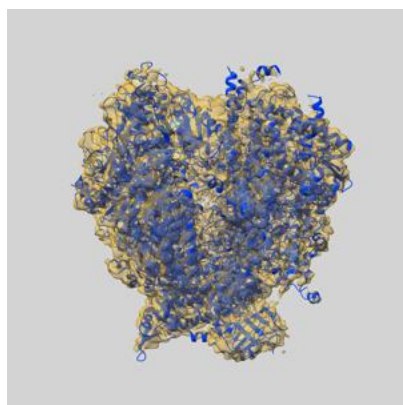
8 Fourier-Shell correlation

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

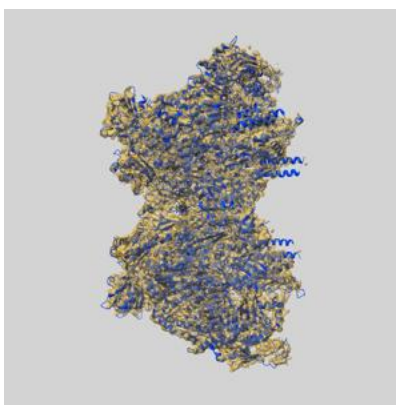
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-11841 and PDB model 7AOD. Per-residue inclusion information can be found in [section 3](#) on [page 7](#).

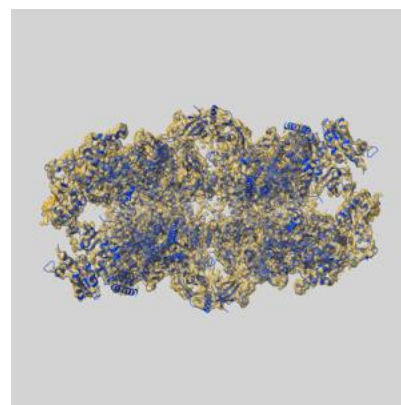
9.1 Map-model overlay [i](#)



X



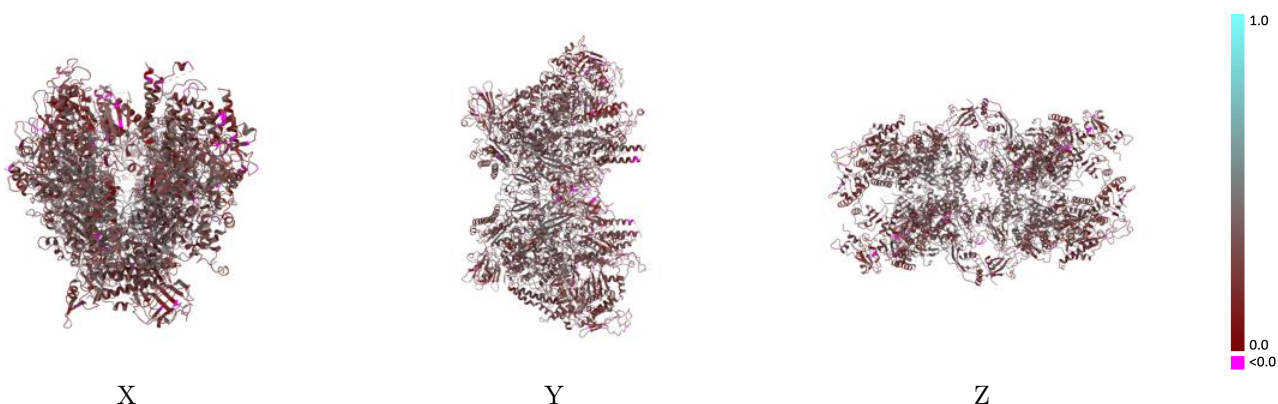
Y



Z

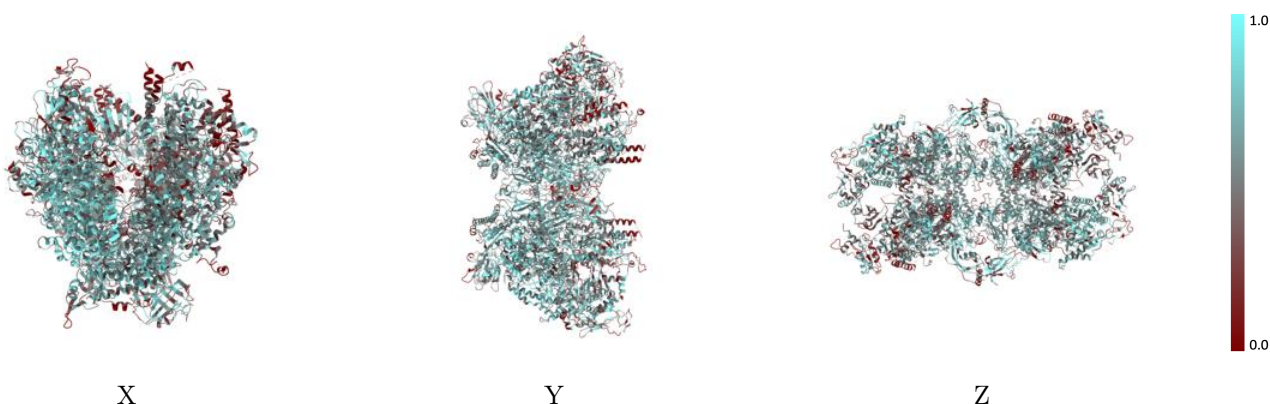
The images above show the 3D surface view of the map at the recommended contour level 0.033 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



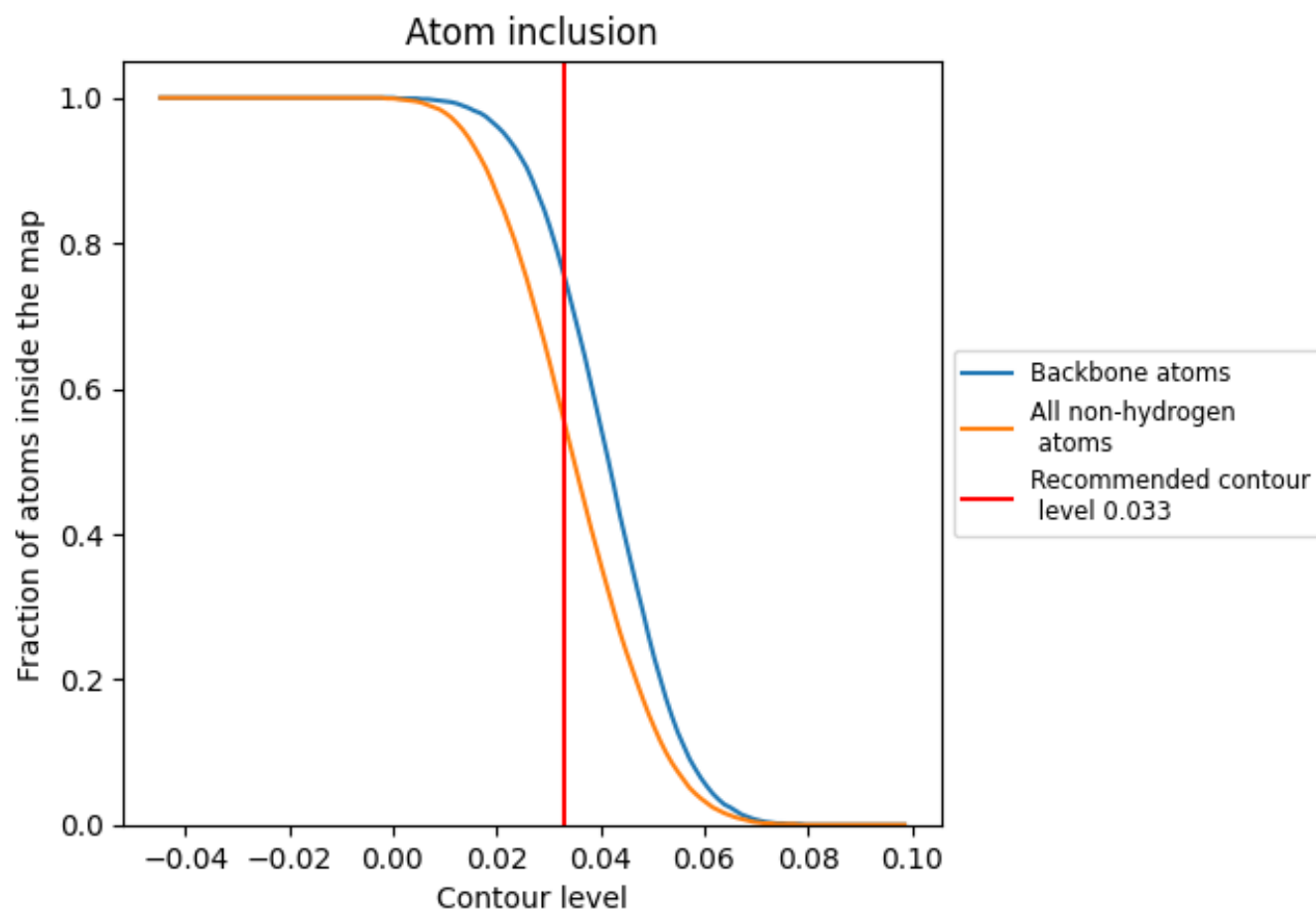
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.033).

9.4 Atom inclusion [i](#)



At the recommended contour level, 76% of all backbone atoms, 56% 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 (0.033) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.5550	 0.3090
A	 0.5320	 0.3070
B	 0.5950	 0.3230
C	 0.5730	 0.3120
D	 0.3950	 0.2420
E	 0.4360	 0.2740
F	 0.6220	 0.3460
G	 0.5960	 0.2870
H	 0.5440	 0.2730
I	 0.3300	 0.2280
J	 0.7010	 0.3360
K	 0.6010	 0.2960
L	 0.5440	 0.3340
M	 0.5300	 0.3070
N	 0.5950	 0.3220
O	 0.5750	 0.3190
P	 0.3820	 0.2390
Q	 0.4460	 0.2780
R	 0.6160	 0.3530
S	 0.5990	 0.2910
T	 0.5520	 0.2720
U	 0.3330	 0.2410
V	 0.7070	 0.3460
W	 0.6000	 0.2950
X	 0.5500	 0.3400

