



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 17, 2023 – 03:55 AM EDT

PDB ID : 1IW7
Title : Crystal structure of the RNA polymerase holoenzyme from *Thermus thermophilus* at 2.6Å resolution
Authors : RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2002-04-22
Resolution : 2.60 Å(reported)

This is a wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : 4.02b-467
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

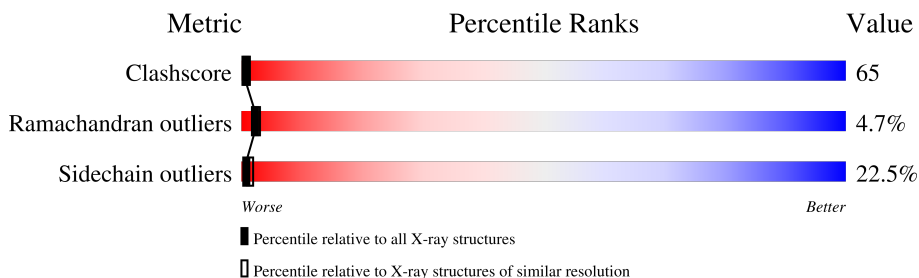
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	3518 (2.60-2.60)
Ramachandran outliers	138981	3455 (2.60-2.60)
Sidechain outliers	138945	3455 (2.60-2.60)

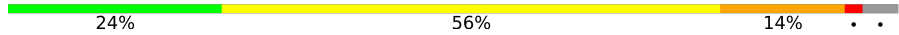
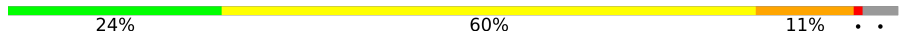


The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. 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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	315	18% 44% 9% . 27%
1	B	315	21% 42% 8% . 27%
1	K	315	17% 43% 11% . 27%
1	L	315	20% 42% 10% . 27%
2	C	1119	23% 58% 17% .
2	M	1119	21% 59% 18% .
3	D	1524	23% 51% 16% . 9%
3	N	1524	23% 51% 16% . 9%

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Mol	Chain	Length	Quality of chain
4	E	99	 24% 56% 14% . .
4	O	99	 24% 60% 11% . .
5	F	423	 20% 47% 12% . 18%
5	P	423	 21% 44% 14% . 18%

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 59529 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 RNA polymerase alpha subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	229	Total 1806	C 1153	N 313	O 337	S 3	0	0	0
1	B	229	Total 1806	C 1153	N 313	O 337	S 3	0	0	0
1	K	229	Total 1806	C 1153	N 313	O 337	S 3	0	0	0
1	L	229	Total 1806	C 1153	N 313	O 337	S 3	0	0	0

- Molecule 2 is a protein called RNA polymerase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	1119	Total 8829	C 5581	N 1577	O 1647	S 24	0	0	0
2	M	1119	Total 8829	C 5581	N 1577	O 1647	S 24	0	0	0

- Molecule 3 is a protein called RNA polymerase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	1392	Total 10801	C 6823	N 1925	O 2020	S 33	0	0	0
3	N	1392	Total 10801	C 6823	N 1925	O 2020	S 33	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	95	Total 769	C 488	N 133	O 144	S 4	0	0	0
4	O	95	Total 769	C 488	N 133	O 144	S 4	0	0	0

- Molecule 5 is a protein called RNA polymerase sigma-70 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	F	345	2771	1744	504	519	4	0	0	0
5	P	345	2771	1744	504	519	4	0	0	0

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	18	Total 18	Mg 18	0	0
6	B	24	Total 24	Mg 24	0	0
6	C	63	Total 63	Mg 63	0	0
6	D	118	Total 118	Mg 118	0	0
6	E	6	Total 6	Mg 6	0	0
6	F	31	Total 31	Mg 31	0	0
6	K	20	Total 20	Mg 20	0	0
6	L	19	Total 19	Mg 19	0	0
6	M	64	Total 64	Mg 64	0	0
6	N	92	Total 92	Mg 92	0	0
6	O	8	Total 8	Mg 8	0	0
6	P	22	Total 22	Mg 22	0	0

- Molecule 7 is LEAD (II) ION (three-letter code: PB) (formula: Pb).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	2	Total 2	Pb 2	0	0
7	N	2	Total 2	Pb 2	0	0

- Molecule 8 is water.

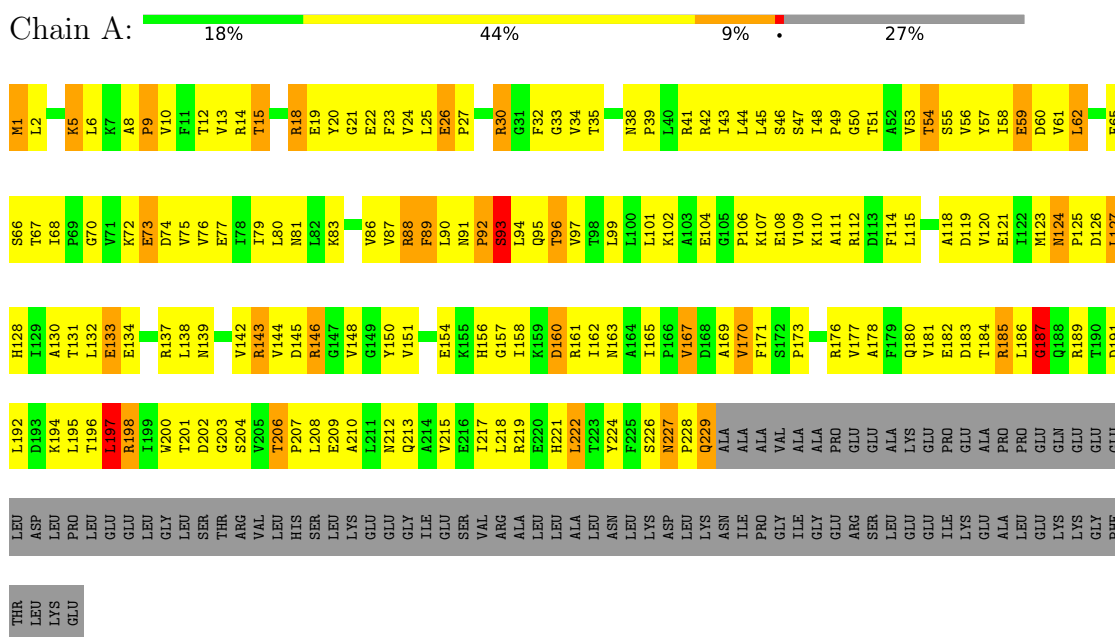
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	194	Total O 194 194	0	0
8	B	193	Total O 193 193	0	0
8	C	869	Total O 869 869	0	0
8	D	1163	Total O 1163 1163	0	0
8	E	114	Total O 114 114	0	0
8	F	381	Total O 381 381	0	0
8	K	161	Total O 161 161	0	0
8	L	157	Total O 157 157	0	0
8	M	822	Total O 822 822	0	0
8	N	983	Total O 983 983	0	0
8	O	114	Total O 114 114	0	0
8	P	325	Total O 325 325	0	0

3 Residue-property plots

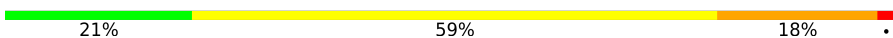
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. 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.

Note EDS was not executed.

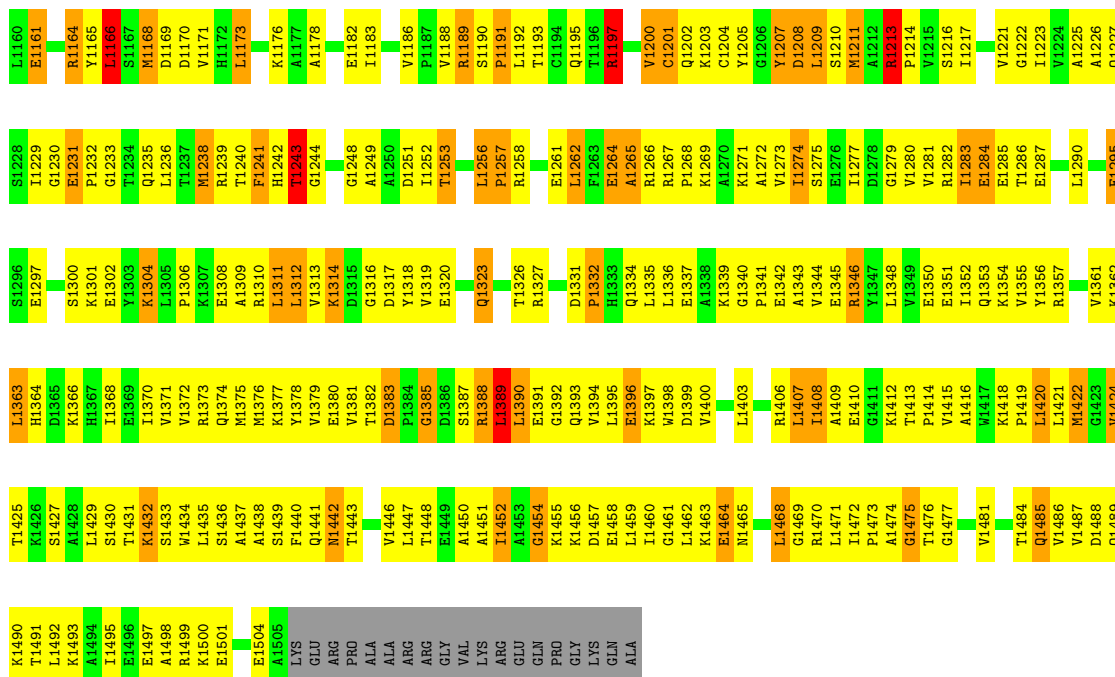
- Molecule 1: RNA polymerase alpha subunit



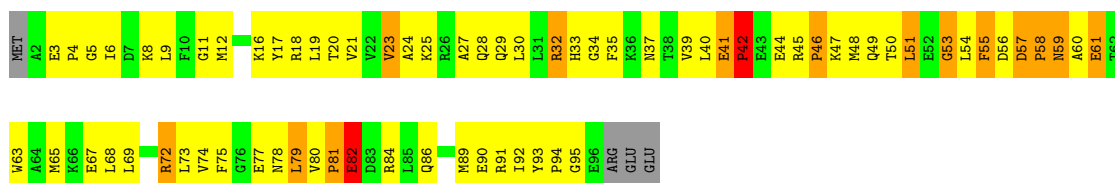
● Molecule 2: RNA polymerase beta subunit

Chain M:  21% 59% 18%

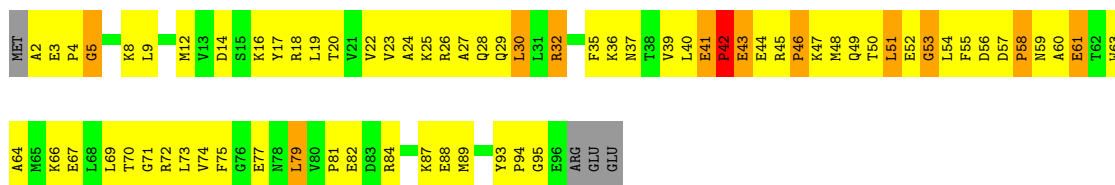
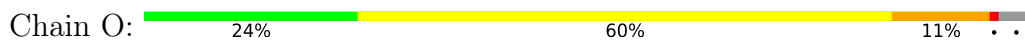
M1	G62	T122	K185	K249	L310	L372	Y435	A497	L625	A687	P751	E814	S878
E2	G63	E123	V186	R250	F311	V373	G436	Q498	R626	I688	G752	L815	R879
I3	L64	D124	V187	D251	A312	N374	R437	A499	R627	M664	D753	K816	M880
F6	V65		K188	K252	L313	S375	I438	N500	R630	Q565	P754	K817	M881
G7	L66	F127	K189	A253	T314	R376	C439	T501	S631	Q566	V755	G818	
R8	D67	I128	K190	V254	A315	P377	P440	F502	S632	Q567	V756	G819	Q894
I9	F68	I128	F191	A255	G316	L378	V441	L503	M632	A568	G757	R820	L885
R10	L69	M130	F192	V256	V317	A380	E442	G504	Q633	V669	R758	R821	L886
E11	E70	G131	L193	V257	P318	A380	T443	G505	G634	P570	T759	R822	R887
V12	Y71	A132	V194	G258	G319	P444	P444	N506	T635	L571	S760	R823	T888
I13	R72	D133	L195	G259	H320	L195	E445	R507	A636	I572	F761	R824	H889
L14	L73	R134	L196	L260	E321	E321	M448	I508	L637	R573	K762	R825	L890
L15	G74	V135	L197	I263	V322	F385	I449	A509	D638	A574	G763	Y826	G891
L16	E75	I136	R198	A262	D323	F386	I449	A510	Q639	R575	E766	Y827	L892
P17	P76	V137	V199	D263	D324	S397	G450	E511	R640	A576	E767	A828	A893
P18	P77	S138	L200	P264	L451	R388	L451	R512	P641	P577	T768	K829	G894
L19	F78	Q139	G201	R265	D326	S389	I452	V513	R642	V578	I705	K830	T895
T18	P79	Q140	Y202	R266	H327	S392	T453	V514	V643	V579	E706	R831	F896
L18	F79	I140	G203	R267	L328	S392	S454	A515	V644	M580	R707	K832	L897
E20	Q80	I149	D203	Y267	L328	S392	S454	A515	V645	M581	E711	L833	G898
I21	D81	S143	Q204	D268	G329	Q393	L455	R516	G646	G582	T710	K834	Q899
Q22	E82	P144	Q205	L269	N330	F394	A456	R517	G647	G583	I711	K835	R900
V23	C83	G145	E205	G270	R331	K395	A457	K518	Q648	L583	E712	L836	Y901
E24	R84	V146	L207	G271	R332	D396	Y458	G619	R648	E584	A712	L837	Y902
S25	E85	Y147	A208	A272	I333	E397	A459	E520	V649	E585	R713	R840	I902
Y26	K86	F148	R209	G273	R334	T398	R460	P521	R650	R586	D714	M841	S903
R27	D87	T149	E210	R274	T335	M399	V461	V522	K651	V587	T715	R842	P904
R28	L88	P150	L211	Y275	V336	P400	D462	I523	G652	V588	K716	H843	I905
A29	T89	A151	L211	K276	G337	L401	E463	V524	R653	R589	L717	G846	F906
L30	L90	P152	Y214	A277	E338	S402	L464	S525	L654	L583	G718	K847	D907
Q31	Q91	A153	G215	E278	R339	S403	G465	P826	L655	S591	P719	L839	Y908
A32	A92	R154	E215	E279	M340	L404	F466	E527	A656	L592	E720	V848	A909
D33	P93	P155	L217	K280	T341	R405	I467	E528	D657	L593	R721	V849	K910
V34	L94	G156	V218	L281	Q342	H406	R468	V529	G658	A594	I722	A850	E911
P35	Y95	Y158	Q219	G282	Q343	R407	T469	E530	P659	L595	T723	K851	P912
P36	A96	Y158	R157	L283	F344	R408	P470	E531	A660	Y596	R724	L852	E913
E37	R97	I159	L221	R284	R345	R409	Y471	V534	S661	A597	D725	L853	I914
K38	L98	I159	M222	L285	R346	I410	R472	S635	E662	E598	I726	P854	K915
R39	Q99	I162	D223	S286	G347	S411	R473	P636	M663	E599	P727	V855	E916
E40	L100	I163	D223	G287	L348	A412	V474	Q537	G664	D600	H728	A856	L917
M41	I101	P164	V226	R288	A349	L413	V475	Q538	F665	G601	L729	D857	L918
V42	H102	L165	F227	T289	R350	G414	G476	G538	L666	E602	S730	M858	A919
Q43	K103	P166	A228	L290	L351	G476	G477	S541	A667	R603	E731	P859	Q920
I44	D104	K167	M229	A291	A352	V478	V478	N541	L668	A604	A732	H860	A921
Q45	T105	R168	R230	R292	R353	L418	V479	M543	G669	K605	A733	L861	Y925
A46	G106	G169	P231	F293	G354	T419	T480	T544	Q670	V606	L734	P862	Y926
A47	L107	P170	E232	F293	V355	R420	D481	N545	M671	D607	R735	G863	F926
F48	I108	M171	E233	G296	R356	E421	E482	N545	N672	G608	D736	G864	G927
R49	K109	I172	E233	E297	R357	R422	V483	P543	L673	N609	L737	T865	K928
E50	E110	D173	R237	F298	R358	R423	V484	F549	R610	R610	D738	P866	R929
T51	D111	L174	L238	K299	M359	G424	Y485	L550	A675	I611	E739	V867	K930
F52	E112	E175	F239	D300	L360	F425	M486	E551	L676	V612	E740	D868	G931
P53	V113	V176	T240	E301	E364	D426	T487	H552	F679	V613	G741	V869	E932
L54	F114	E177	L241	V302	D365	V427	R428	D553	R679	R614	V742	L806	I933
E55	L115	P178	L242	F303	R366	V428	E490	D554	D680	Y615	V743	L807	F934
E56	G116	N179	L242	L304	S366	D429	E491	A555	G681	E616	R744	R808	Y934
E57	H117	G180	P244	P305	L367	V430	D492	M556	G682	D617		G809	
D58	I118	V181	G245	T306	T368	H431	R493	R557	M683		A747	D810	D937
K59	P119	V182	D246	L307	P369	H432	T494	A558	F684	E622	E748	P811	K938
G60	L120	S183	P247	R308	P369	T433	T495	A559	E685	Y623	E749	P812	R939
K61	M121	M184	P248	Y309	K371	H434	I496	M560	D686	P624	K750	V813	Y941



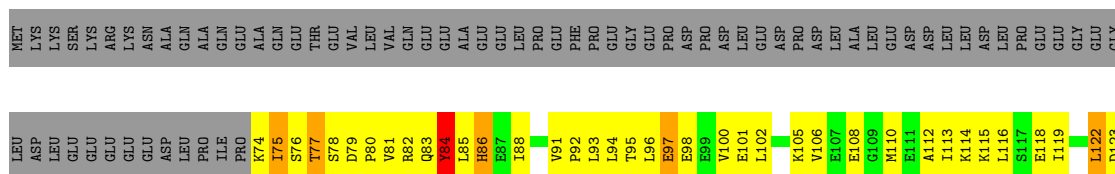
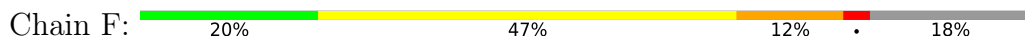
● Molecule 4: RNA polymerase omega subunit

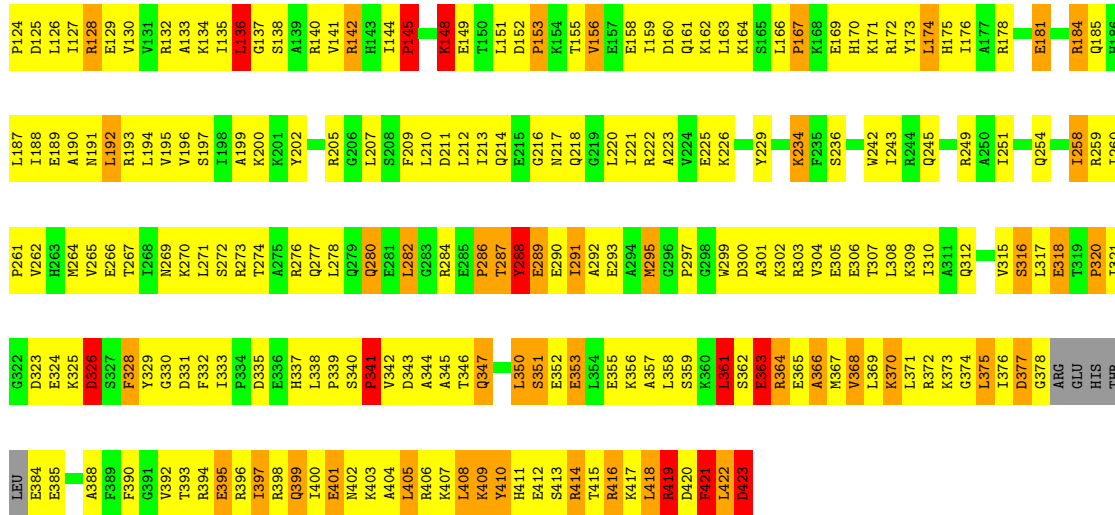


● Molecule 4: RNA polymerase omega subunit

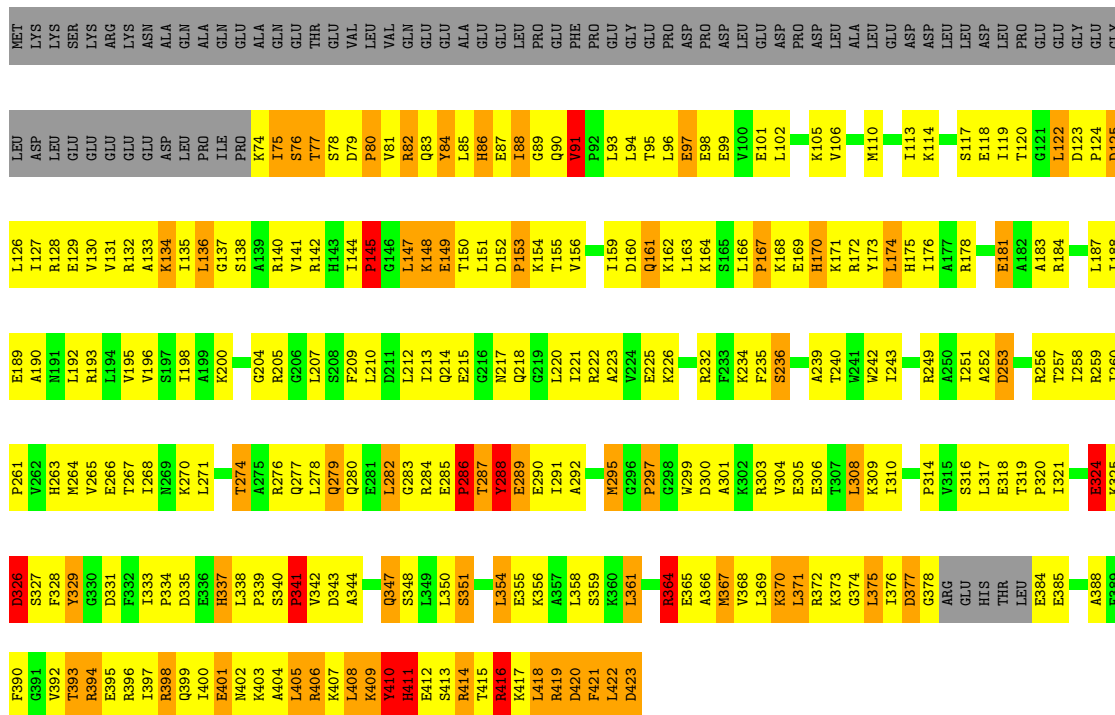
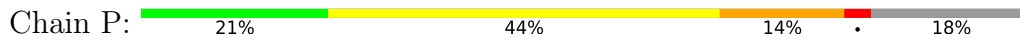


● Molecule 5: RNA polymerase sigma-70 subunit





● Molecule 5: RNA polymerase sigma-70 subunit



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, α , β , γ	236.35Å 236.35Å 249.04Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.00 – 2.60	Depositor
% Data completeness (in resolution range)	(Not available) (40.00-2.60)	Depositor
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.228 , 0.274	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	59529	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: MG, PB

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	0.68	0/1838	0.87	4/2498 (0.2%)
1	B	0.68	0/1838	0.85	7/2498 (0.3%)
1	K	0.66	1/1838 (0.1%)	0.85	5/2498 (0.2%)
1	L	0.67	0/1838	0.90	4/2498 (0.2%)
2	C	0.72	3/8997 (0.0%)	0.97	30/12164 (0.2%)
2	M	0.73	2/8997 (0.0%)	0.97	26/12164 (0.2%)
3	D	0.71	8/10979 (0.1%)	1.01	52/14844 (0.4%)
3	N	0.73	6/10979 (0.1%)	1.02	38/14844 (0.3%)
4	E	0.72	0/783	1.01	2/1054 (0.2%)
4	O	0.71	0/783	1.02	2/1054 (0.2%)
5	F	0.90	8/2812 (0.3%)	1.08	20/3781 (0.5%)
5	P	0.85	4/2812 (0.1%)	1.12	20/3781 (0.5%)
All	All	0.73	32/54494 (0.1%)	0.99	210/73678 (0.3%)

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
3	D	0	3
3	N	0	3
5	F	0	1
All	All	0	7

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	F	401	GLU	CG-CD	13.42	1.72	1.51
5	F	401	GLU	CB-CG	13.27	1.77	1.52
5	P	401	GLU	CG-CD	13.01	1.71	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	P	401	GLU	CB-CG	12.94	1.76	1.52
5	F	423	ASP	C-OXT	11.47	1.45	1.23

The worst 5 of 210 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	L	229	GLN	CA-C-O	17.63	157.12	120.10
5	P	416	ARG	NE-CZ-NH1	13.69	127.14	120.30
2	C	243	ARG	C-N-CD	-12.01	94.19	120.60
2	M	163	ILE	C-N-CD	-11.12	96.14	120.60
3	D	380	GLU	CA-C-O	-11.07	96.85	120.10

There are no chirality outliers.

5 of 7 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	D	132	TYR	Sidechain
3	D	379	ALA	Peptide
3	D	380	GLU	Mainchain
5	F	421	PHE	Sidechain
3	N	132	TYR	Sidechain

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1806	0	1861	247	0
1	B	1806	0	1861	213	0
1	K	1806	0	1861	216	0
1	L	1806	0	1861	213	0
2	C	8829	0	8933	1312	0
2	M	8829	0	8933	1273	0
3	D	10801	0	10887	1543	0
3	N	10801	0	10885	1539	0
4	E	769	0	775	94	0
4	O	769	0	775	106	0
5	F	2771	0	2843	392	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	P	2771	0	2844	429	0
6	A	18	0	0	0	0
6	B	24	0	0	0	0
6	C	63	0	0	0	0
6	D	118	0	0	1	0
6	E	6	0	0	0	0
6	F	31	0	0	0	0
6	K	20	0	0	0	0
6	L	19	0	0	0	0
6	M	64	0	0	0	0
6	N	92	0	0	0	0
6	O	8	0	0	0	0
6	P	22	0	0	0	0
7	D	2	0	0	0	0
7	N	2	0	0	0	0
8	A	194	0	0	44	0
8	B	193	0	0	50	0
8	C	869	0	0	254	0
8	D	1163	0	0	325	0
8	E	114	0	0	30	0
8	F	381	0	0	67	0
8	K	161	0	0	49	0
8	L	157	0	0	52	0
8	M	822	0	0	266	0
8	N	983	0	0	291	0
8	O	114	0	0	30	0
8	P	325	0	0	75	0
All	All	59529	0	54319	7072	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 65.

The worst 5 of 7072 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)
5:F:419:ARG:CB	5:F:419:ARG:CG	1.76	1.60
5:P:401:GLU:CG	5:P:401:GLU:CB	1.76	1.56
5:F:401:GLU:CB	5:F:401:GLU:CG	1.77	1.55
3:N:218:LYS:CB	8:N:9902:HOH:O	1.85	1.18
1:A:94:LEU:HD21	1:A:119:ASP:HB2	1.26	1.16

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 X-ray entries followed by that with respect to entries of similar resolution.

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	227/315 (72%)	201 (88%)	21 (9%)	5 (2%)	6	12
1	B	227/315 (72%)	200 (88%)	24 (11%)	3 (1%)	12	24
1	K	227/315 (72%)	199 (88%)	24 (11%)	4 (2%)	8	16
1	L	227/315 (72%)	199 (88%)	25 (11%)	3 (1%)	12	24
2	C	1117/1119 (100%)	923 (83%)	139 (12%)	55 (5%)	2	2
2	M	1117/1119 (100%)	928 (83%)	135 (12%)	54 (5%)	2	2
3	D	1388/1524 (91%)	1119 (81%)	196 (14%)	73 (5%)	2	2
3	N	1388/1524 (91%)	1113 (80%)	200 (14%)	75 (5%)	2	2
4	E	93/99 (94%)	72 (77%)	13 (14%)	8 (9%)	1	0
4	O	93/99 (94%)	71 (76%)	15 (16%)	7 (8%)	1	1
5	F	341/423 (81%)	295 (86%)	31 (9%)	15 (4%)	2	3
5	P	341/423 (81%)	288 (84%)	34 (10%)	19 (6%)	2	2
All	All	6786/7590 (89%)	5608 (83%)	857 (13%)	321 (5%)	2	2

5 of 321 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	187	GLY
2	C	111	ASP
2	C	152	PRO
2	C	231	PRO
2	C	244	PRO

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 X-ray entries followed by that with respect to entries of similar resolution.

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	202/273 (74%)	165 (82%)	37 (18%)	1	2
1	B	202/273 (74%)	164 (81%)	38 (19%)	1	2
1	K	202/273 (74%)	160 (79%)	42 (21%)	1	2
1	L	202/273 (74%)	161 (80%)	41 (20%)	1	2
2	C	941/941 (100%)	730 (78%)	211 (22%)	1	1
2	M	941/941 (100%)	718 (76%)	223 (24%)	1	1
3	D	1123/1279 (88%)	865 (77%)	258 (23%)	1	1
3	N	1123/1279 (88%)	841 (75%)	282 (25%)	0	1
4	E	83/87 (95%)	68 (82%)	15 (18%)	1	2
4	O	83/87 (95%)	68 (82%)	15 (18%)	1	2
5	F	295/370 (80%)	232 (79%)	63 (21%)	1	1
5	P	295/370 (80%)	239 (81%)	56 (19%)	1	2
All	All	5692/6446 (88%)	4411 (78%)	1281 (22%)	1	1

5 of 1281 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	M	1115	LEU
3	N	1190	SER
3	N	112	ILE
2	M	1107	ASN
3	N	676	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 165 such sidechains are listed below:

Mol	Chain	Res	Type
2	M	889	HIS
3	N	1116	ASN
2	M	1019	GLN
3	N	703	ASN

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Mol	Chain	Res	Type
3	N	1353	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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 489 ligands modelled in this entry, 489 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 [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	D	1
3	N	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	D	380:GLU	C	381:ALA	N	1.17
1	N	380:GLU	C	381:ALA	N	1.17

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.