WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 16, 2024 – 10:23 AM EDT

PDB ID	:	5C4J
Title	:	Crystal structure of a transcribing RNA Polymerase II complex reveals a complete transcription bubble
Authors	:	Barnes, C.O.; Calero, M.; Malik, I.; Spahr, H.; Zhang, Q.; Pullara, F.; Kaplan, C.D.; Calero, G.
Deposited on	:	2015-06-18
Resolution	:	4.00 Å(reported)

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

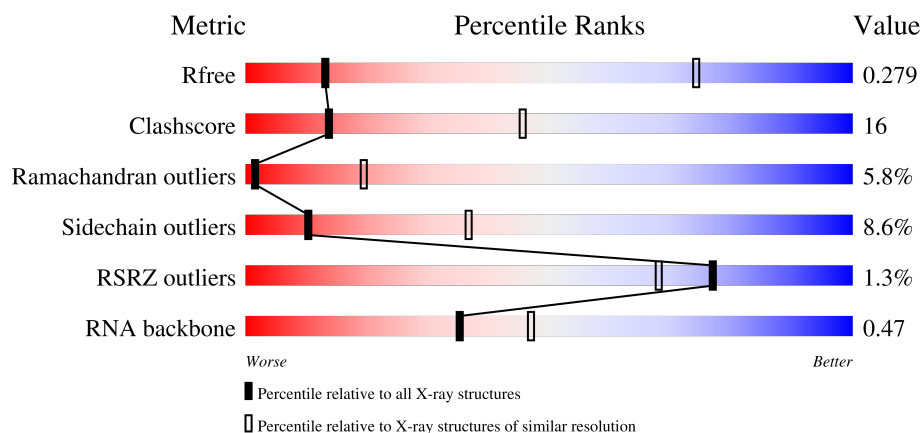|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 4.00 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	Percentile Ranks	Value
Rfree		0.279
Clashscore		16
Ramachandran outliers		5.8%
Sidechain outliers		8.6%
RSRZ outliers		1.3%
RNA backbone		0.47

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
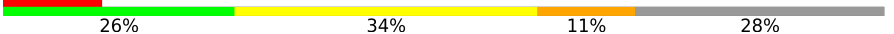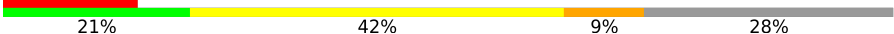
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1087 (4.30-3.70)
Clashscore	141614	1148 (4.30-3.70)
Ramachandran outliers	138981	1108 (4.30-3.70)
Sidechain outliers	138945	1099 (4.30-3.70)
RSRZ outliers	127900	1028 (4.34-3.66)
RNA backbone	3102	1048 (5.00-3.00)

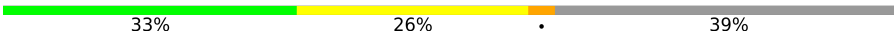The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. 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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1733	% 52% 25% 5% 17%
2	B	1224	% 60% 30% • 5%
3	C	318	53% 28% • 17%
4	E	215	67% 29% • •

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Mol	Chain	Length	Quality of chain
5	F	155	32% 23% • 44%
6	H	146	62% 34% • •
7	I	122	68% 22% • 7%
8	J	70	60% 29% 6% 6%
9	K	120	% 62% 33% •
10	L	70	33% 26% • 39%
11	R	9	67% 33%
12	S	53	11% 26% 34% 11% 28%
13	U	53	15% 21% 42% 9% 28%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
14	ZN	C	402	-	-	X	-

2 Entry composition ⓘ

There are 15 unique types of molecules in this entry. The entry contains 30496 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 DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1432	Total	C	N	O	S	0	0	0
			11240	7079	1964	2136	61			

- Molecule 2 is a protein called DNA-directed RNA polymerase II subunit RPB2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	1157	Total	C	N	O	S	0	0	0
			9145	5776	1599	1714	56			

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	265	Total	C	N	O	S	0	0	0
			2074	1304	345	412	13			

- Molecule 4 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	212	Total	C	N	O	S	0	0	0
			1735	1102	306	316	11			

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	87	Total	C	N	O	S	0	0	0
			705	451	119	132	3			

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	H	143	Total	C	N	O	S	0	0	0
			1102	689	189	220	4			

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	I	114	Total 927	C 571	N 168	O 178	S 10	0	0	0

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	J	66	Total 540	C 345	N 94	O 95	S 6	0	0	0

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
9	K	115	Total 924	C 593	N 157	O 172	S 2	0	0	0

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	L	43	Total 344	C 211	N 69	O 60	S 4	0	0	0

- Molecule 11 is a RNA chain called RNA (5'-R(P*UP*CP*GP*AP*GP*AP*GP*GP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	R	9	Total 197	C 88	N 40	O 60	P 9	0	0	0

- Molecule 12 is a DNA chain called NON-TEMPLATE STRAND DNA (38-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
12	S	38	Total 782	C 371	N 142	O 231	P 38	0	0	0

- Molecule 13 is a DNA chain called TEMPLATE STRAND DNA (38-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	U	38	Total 771	C 366	N 144	O 223	P 38	0	0	0

- Molecule 14 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
14	A	2	Total 2	Zn 2	0	0
14	B	1	Total 1	Zn 1	0	0
14	C	2	Total 2	Zn 2	0	0
14	I	2	Total 2	Zn 2	0	0
14	J	1	Total 1	Zn 1	0	0
14	L	1	Total 1	Zn 1	0	0

- Molecule 15 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
15	R	1	Total 1	Mg 1	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 and electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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: DNA-directed RNA polymerase II subunit RPB1
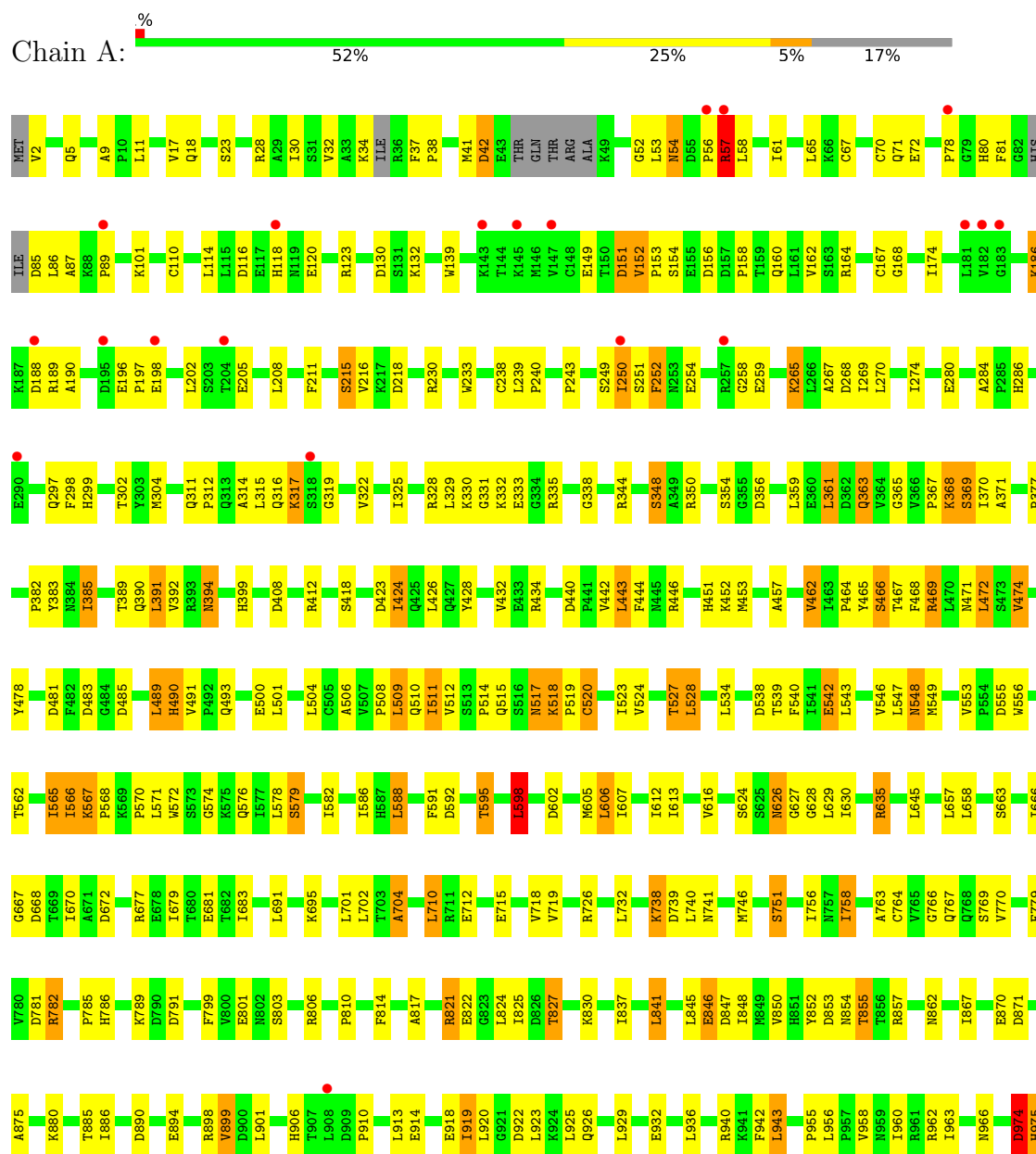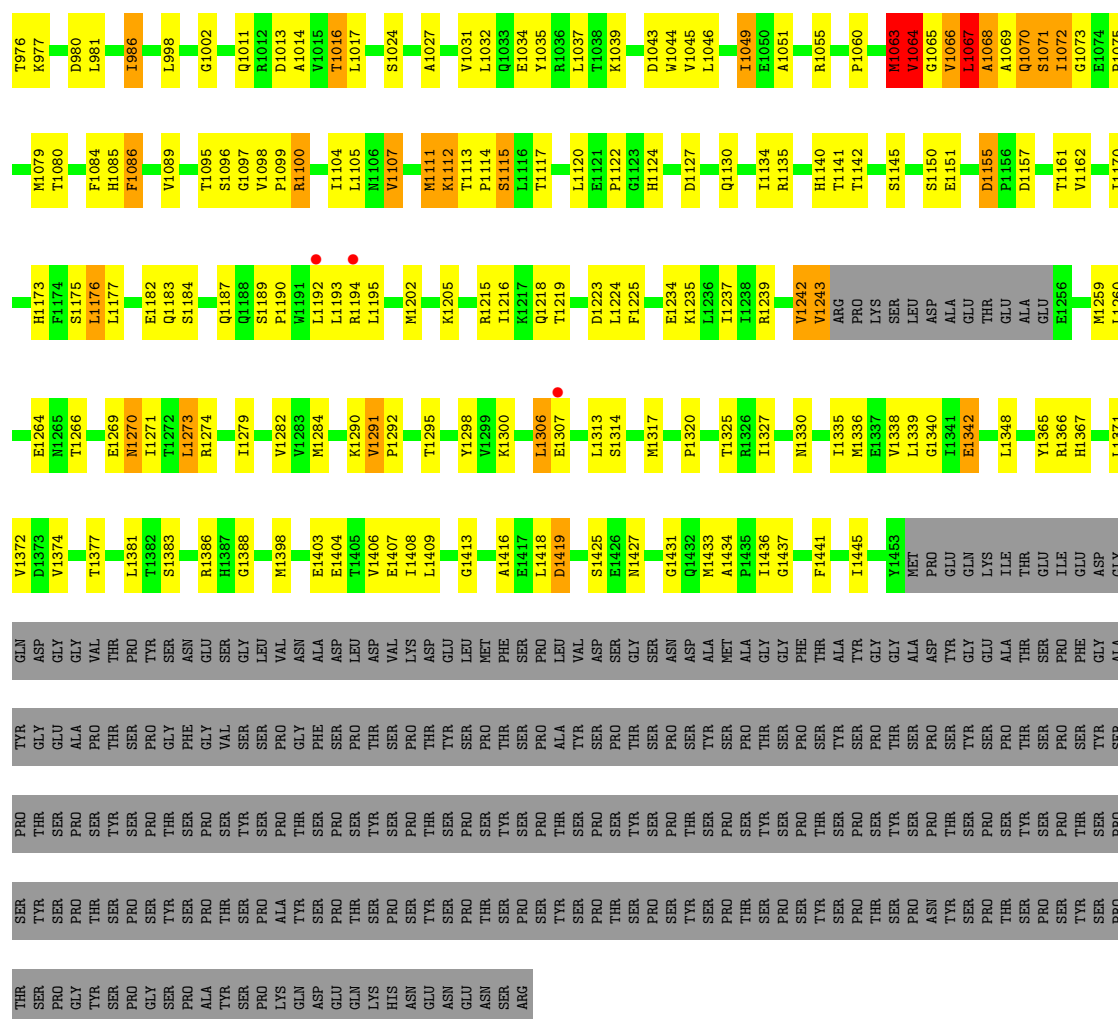
• Molecule 2: DNA-directed RNA polymerase II subunit RPB2

Chain B:

• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

Chain C:

• Molecule 4: DNA-directed RNA polymerases I, II, and III subunit RPABC1

Chain E:

I116 T117 P118 S119 A120 M121 V124 I132 E133 T134 V142 N143 I144 T145 H146 V150 P151 K152 H153 I154 R155 L164 Y168 R169 L170 K171 E172 L175 I178 Q179 D182 P183 V184 A185 L186 Y187 L188 G189 L190 V196 K197 I198 S205 G206 R207 I213 C214 M215
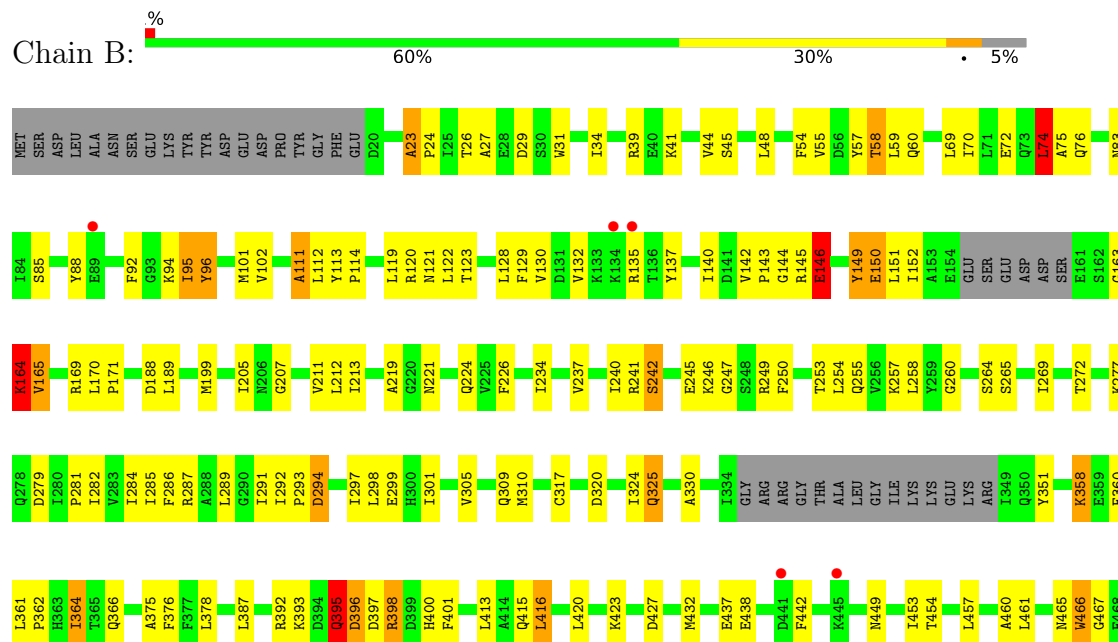
• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F: 32%   23%   •   44%

MET SER ASP TYR GLU GLU ALA PHE ASN ASP GLY ASN GLU ASN PHE GLU ASP PHE ASP VAL GLU HIS PHE SER ASP GLU GLU THR TYR GLU GLU LYS PRO GLN PHE LYS ASP GLY GLU THR THR ASP ALA ASN GLY LYS THR ILE VAL THR GLY GLY ASN GLY PRO GLU ASP PHE GLN GLN

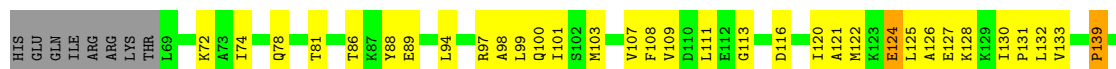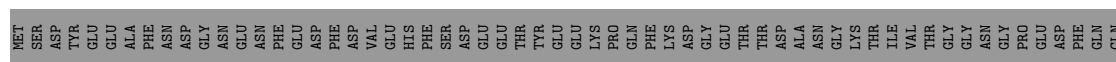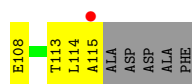HIS GLU GLN ILE ARG ARG LYS THR L69 K72 A73 I74 Q78 T81 T86 K87 Y88 E89 L94 R97 A98 L99 Q100 I101 S102 M103 V107 F108 E109 D110 L111 E112 G113 D116 I120 A121 M122 K123 E124 L125 A126 E127 K128 K129 I130 P131 L132 V133 P139

E144 D145 W146 S147 L151 L155

• Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H: 62%   34%   •   •

MET SER N3 T4 L5 F6 D7 D8 P17 K22 R25 I26 L38 T39 L40 D41 I42 N43 V44 E45 L46 F47 T56 V57 T58 I59 A60 L63 N64 D67 T68 PRO A70 S73 T76 R77 S78 W79 A84 G85 D86 R87 S88 L89 D94 Y95 V96 M97

Y102 E105 E106 V107 S108 K109 A113 V114 Y115 Y116 S117 F118 L121 L122 M123 Y129 R130 N133 N134 L143 I144 R145 R146

• Molecule 7: DNA-directed RNA polymerase II subunit RPB9

Chain I: 68%   22%   •   7%

MET T2 T3 F4 C10 N11 L14 E18 D19 K20 L25 L26 F27 E28 A38 R45 H46 I49 A56 V59 Q60 D61 P66 K77 C78 N83 S88 Q89 R92 K93 D94 T95 F101 C106 S107 H108 D113 Q114 K115 ASN LYS ARG THR

GLN PHE SER

• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J: 60%   29%   6%   6%

M1 I2 R6 C10 G11 K12 V13 V14 K17 S20 L24 L30 D31 T34 A35 L36 S37 R38 L39 G40 L41 K42 R43 C46 M49 L56 I57 E58 K59 F60 L61 L66 GLU LYS ARG ASP

• Molecule 9: DNA-directed RNA polymerase II subunit RPB11

Chain K: %   62%   33%   •

M1 N2 A3 P4 D5 R6 L11 L12 K18 L19 K20 I21 D22 P23 A27 V31 V32 I33 T34 F35 E36 K37 E38 T41 L42 L45 I46 V56 A59 A60 H65 P66 F67 L73 R74 I75 Q76 T77 P83 L87 K88 C91 I94 L98

E108 T113 L114 A115 ALA ASP ASP ALA PHE

• Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC4
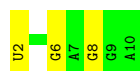
Chain L:

33%   26%   •   39%

MET SER ARG GLU GLY PHE GLN ILE PRO THR ASN LEU ASP ALA ALA ALA GLY THR SER GLN ALA ARG THR ALA THR LEU K28 Y29 I30 C31 A32 E33 C34 L38 S39 T43 D44 R47 C48 K49 H53 R54 L57 K58 A59 R60 T61 L64 V65 A69 R70
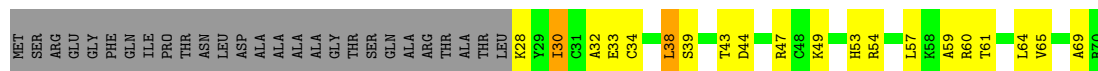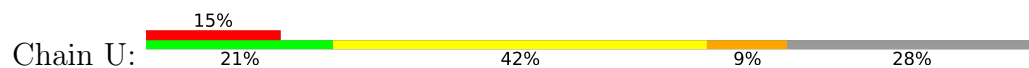
• Molecule 11: RNA (5'-R(P*UP*CP*GP*AP*GP*AP*GP*GP*A)-3')

Chain R:

67%   33%

U2 G6 A7 G8 G9 A10

• Molecule 12: NON-TEMPLATE STRAND DNA (38-MER)

Chain S:

11%

26%   34%   11%   28%

DC DG DC DT DT DG DT DA DT DA DT DA DA DA G2 A3 G4 T5 C6 C7 G10 G11 A12 A13 G14 C15 T16 C17 T18 C19 C20 T21 A22 G23 C24 A25 G26 T27 G28 C29 T30 T31 A32 T33 C34 G35 G36 T37 A38 G39 DG
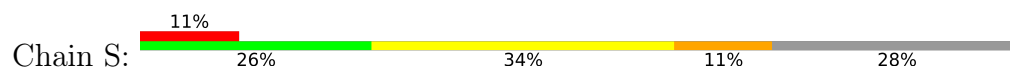
• Molecule 13: TEMPLATE STRAND DNA (38-MER)

Chain U:

15%

21%   42%   9%   28%

DC C2 T3 A4 C5 C6 G7 A8 T9 A10 A11 G12 C13 A14 G15 A16 C17 C21 C22 T23 C24 T25 C26 G27 A28 A29 C30 C31 A32 C33 G34 G35 A36 C37 T38 C39 DT DT DT DA DT DA DT DA DC DA DA DG DC DG
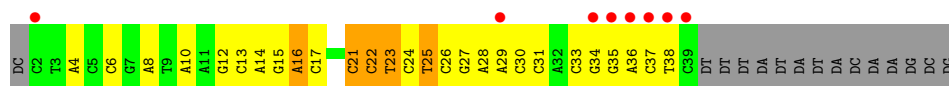
4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	280.71Å 223.38Å 156.42Å 90.00° 98.14° 90.00°	Depositor
Resolution (Å)	174.08 – 4.00 48.89 – 4.00	Depositor EDS
% Data completeness (in resolution range)	97.7 (174.08-4.00) 97.7 (48.89-4.00)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.51 (at 4.00Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.212 , 0.271 0.229 , 0.279	Depositor DCC
R_{free} test set	2689 reflections (3.42%)	wwPDB-VP
Wilson B-factor (Å^2)	155.3	Xtriage
Anisotropy	0.326	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 186.0	EDS
L-test for twinning[2]	$< |L| > = 0.43, < L^2 > = 0.26$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	30496	wwPDB-VP
Average B, all atoms (Å^2)	231.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.93% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.46	0/11441	0.77	5/15470 (0.0%)
2	B	0.45	0/9320	0.74	3/12568 (0.0%)
3	C	0.43	0/2112	0.68	0/2866
4	E	0.45	0/1771	0.74	1/2383 (0.0%)
5	F	0.43	0/717	0.77	1/967 (0.1%)
6	H	0.43	0/1120	0.81	1/1513 (0.1%)
7	I	0.42	0/945	0.78	1/1273 (0.1%)
8	J	0.45	0/549	0.73	0/738
9	K	0.42	0/942	0.69	0/1272
10	L	0.40	0/346	0.75	0/457
11	R	0.46	0/221	0.72	0/343
12	S	1.05	0/876	1.88	31/1351 (2.3%)
13	U	1.02	0/864	1.83	34/1328 (2.6%)
All	All	0.50	0/31224	0.86	77/42529 (0.2%)

There are no bond length outliers.

The worst 5 of 77 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
12	S	15	DC	O4'-C1'-N1	12.27	116.59	108.00
13	U	25	DT	P-O3'-C3'	12.22	134.36	119.70
12	S	10	DG	P-O3'-C3'	11.81	133.88	119.70
13	U	27	DG	P-O3'-C3'	11.61	133.64	119.70
13	U	35	DG	P-O3'-C3'	11.16	133.09	119.70

There are no chirality outliers.

There are no planarity outliers.

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	11240	0	11270	290	0
2	B	9145	0	9117	267	0
3	C	2074	0	2020	159	0
4	E	1735	0	1762	83	0
5	F	705	0	731	52	0
6	H	1102	0	1035	58	0
7	I	927	0	886	34	0
8	J	540	0	554	25	0
9	K	924	0	934	73	0
10	L	344	0	366	26	0
11	R	197	0	96	6	0
12	S	782	0	429	7	0
13	U	771	0	425	6	0
14	A	2	0	0	0	0
14	B	1	0	0	0	0
14	C	2	0	0	2	0
14	I	2	0	0	0	0
14	J	1	0	0	0	0
14	L	1	0	0	1	0
15	R	1	0	0	0	0
All	All	30496	0	29625	957	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 16.

The worst 5 of 957 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)
4:E:151:PRO:HD2	4:E:153:HIS:CE1	1.30	1.65
4:E:151:PRO:CD	4:E:153:HIS:HE1	1.24	1.50
7:I:56:ALA:HB2	7:I:89:GLN:CD	1.35	1.47
7:I:56:ALA:CB	7:I:89:GLN:OE1	1.64	1.46
3:C:221:TYR:CB	6:H:46:LEU:HD22	1.44	1.43

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	1422/1733 (82%)	1129 (79%)	199 (14%)	94 (7%)	1	17
2	B	1141/1224 (93%)	919 (80%)	158 (14%)	64 (6%)	2	20
3	C	263/318 (83%)	226 (86%)	30 (11%)	7 (3%)	5	34
4	E	210/215 (98%)	186 (89%)	17 (8%)	7 (3%)	4	30
5	F	85/155 (55%)	72 (85%)	9 (11%)	4 (5%)	2	23
6	H	139/146 (95%)	97 (70%)	26 (19%)	16 (12%)	0	6
7	I	112/122 (92%)	88 (79%)	16 (14%)	8 (7%)	1	16
8	J	64/70 (91%)	49 (77%)	11 (17%)	4 (6%)	1	18
9	K	113/120 (94%)	99 (88%)	12 (11%)	2 (2%)	8	41
10	L	41/70 (59%)	31 (76%)	6 (15%)	4 (10%)	0	10
All	All	3590/4173 (86%)	2896 (81%)	484 (14%)	210 (6%)	1	19

5 of 210 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	57	ARG
1	A	65	LEU
1	A	152	VAL
1	A	153	PRO
1	A	162	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	1244/1520 (82%)	1081 (87%)	163 (13%)	4	21
2	B	991/1061 (93%)	889 (90%)	102 (10%)	7	28
3	C	230/274 (84%)	229 (100%)	1 (0%)	91	94
4	E	194/197 (98%)	193 (100%)	1 (0%)	88	93
5	F	77/137 (56%)	76 (99%)	1 (1%)	69	82
6	H	115/128 (90%)	115 (100%)	0	100	100
7	I	108/116 (93%)	106 (98%)	2 (2%)	57	75
8	J	61/65 (94%)	60 (98%)	1 (2%)	62	79
9	K	99/102 (97%)	99 (100%)	0	100	100
10	L	38/57 (67%)	37 (97%)	1 (3%)	46	67
All	All	3157/3657 (86%)	2885 (91%)	272 (9%)	10	37

5 of 272 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	889	THR
2	B	961	LEU
2	B	1201	LYS
1	A	899	VAL
1	A	890	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 46 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	415	GLN
2	B	1177	HIS
2	B	494	HIS
2	B	761	HIS
3	C	112	ASN

5.3.3   RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
11	R	7/9 (77%)	2 (28%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
11	R	6	G
11	R	8	G

There are no RNA pucker outliers to report.

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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 10 ligands modelled in this entry, 10 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 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	1432/1733 (82%)	-0.21	23 (1%)	72	62	28, 216, 298, 382	0
2	B	1157/1224 (94%)	-0.22	10 (0%)	84	77	115, 221, 304, 366	0
3	C	265/318 (83%)	-0.50	0	100	100	134, 213, 270, 315	0
4	E	212/215 (98%)	-0.35	0	100	100	153, 232, 298, 322	0
5	F	87/155 (56%)	-0.36	0	100	100	134, 193, 260, 341	0
6	H	143/146 (97%)	-0.33	0	100	100	176, 258, 312, 334	0
7	I	114/122 (93%)	-0.35	0	100	100	177, 240, 306, 334	0
8	J	66/70 (94%)	-0.40	0	100	100	125, 223, 286, 318	0
9	K	115/120 (95%)	-0.31	1 (0%)	84	77	131, 202, 271, 293	0
10	L	43/70 (61%)	-0.30	0	100	100	170, 228, 283, 364	0
11	R	9/9 (100%)	0.18	0	100	100	285, 306, 337, 338	0
12	S	38/53 (71%)	0.98	6 (15%)	2	2	338, 360, 380, 381	0
13	U	38/53 (71%)	0.96	8 (21%)	1	1	275, 348, 378, 380	0
All	All	3719/4288 (86%)	-0.24	48 (1%)	77	68	28, 221, 309, 382	0

The worst 5 of 48 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	204	THR	6.9
1	A	183	GLY	4.3
13	U	35	DG	3.8
1	A	1194	ARG	3.7
2	B	1181	GLU	3.7

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

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
15	MG	R	101	1/1	0.56	0.16	201,201,201,201	0
14	ZN	I	202	1/1	0.87	0.03	213,213,213,213	0
14	ZN	J	101	1/1	0.92	0.32	207,207,207,207	0
14	ZN	A	1801	1/1	0.96	0.04	205,205,205,205	0
14	ZN	C	401	1/1	0.97	0.22	226,226,226,226	0
14	ZN	L	101	1/1	0.97	0.11	202,202,202,202	0
14	ZN	A	1802	1/1	0.97	0.10	200,200,200,200	0
14	ZN	B	1301	1/1	0.98	0.11	214,214,214,214	0
14	ZN	I	201	1/1	0.99	0.13	201,201,201,201	0
14	ZN	C	402	1/1	1.00	0.14	186,186,186,186	0

6.5 Other polymers (i)

There are no such residues in this entry.