



wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 25, 2023 – 10:36 AM EDT

PDB ID : 5W1T
Title : X-ray crystal structure of Escherichia coli RNA polymerase and DksA complex
Authors : Murakami, K.S.; Molodtsov, V.
Deposited on : 2017-06-04
Resolution : 4.50 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
Xtriage (Phenix) : 1.13
EDS : 2.35.1
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) : 2.35.1

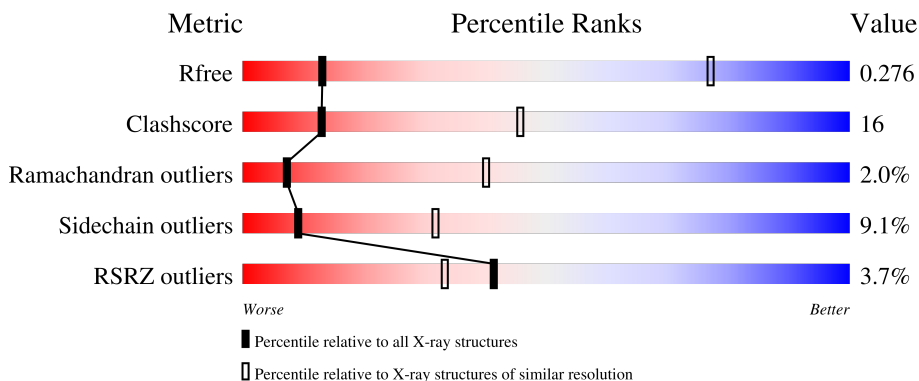
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1055 (5.20-3.80)
Clashscore	141614	1123 (5.20-3.80)
Ramachandran outliers	138981	1069 (5.20-3.80)
Sidechain outliers	138945	1050 (5.20-3.80)
RSRZ outliers	127900	1101 (5.30-3.70)

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 $\leq 5\%$. 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	329	
1	B	329	
1	G	329	
1	H	329	
2	C	1342	

Continued on next page...

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Mol	Chain	Length	Quality of chain
2	I	1342	
3	D	1407	
3	J	1407	
4	E	91	
4	K	91	
5	F	613	
5	L	613	
6	M	151	
6	N	151	

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 58066 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 subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	319	Total	C	N	O	S	0	0	0
			2490	1557	439	486	8			
1	B	217	Total	C	N	O	S	0	0	0
			1677	1047	295	329	6			
1	G	227	Total	C	N	O	S	0	0	0
			1755	1093	311	345	6			
1	H	216	Total	C	N	O	S	0	0	0
			1662	1038	292	326	6			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	1340	Total	C	N	O	S	0	0	0
			10570	6631	1841	2055	43			
2	I	1340	Total	C	N	O	S	0	0	0
			10566	6629	1840	2054	43			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	1171	Total	C	N	O	S	0	0	0
			9085	5712	1626	1701	46			
3	J	1159	Total	C	N	O	S	0	0	0
			9021	5671	1616	1688	46			

- Molecule 4 is a protein called RpoZ.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	89	Total	C	N	O	S	0	0	0
			691	421	129	140	1			
4	K	79	Total	C	N	O	S	0	0	0
			627	382	118	126	1			

- Molecule 5 is a protein called RNA polymerase sigma factor RpoD.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	468	Total	C	N	O	S	0	0	0
			3813	2389	678	723	23			
5	L	469	Total	C	N	O	S	0	0	0
			3821	2393	679	726	23			

- Molecule 6 is a protein called RNA polymerase-binding transcription factor DksA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	M	140	Total	C	N	O	S	0	0	0
			1140	703	206	224	7			
6	N	140	Total	C	N	O	S	0	0	0
			1140	703	206	224	7			

- Molecule 7 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	D	1	Total	Mg	0	0
			1	1		
7	J	1	Total	Mg	0	0
			1	1		

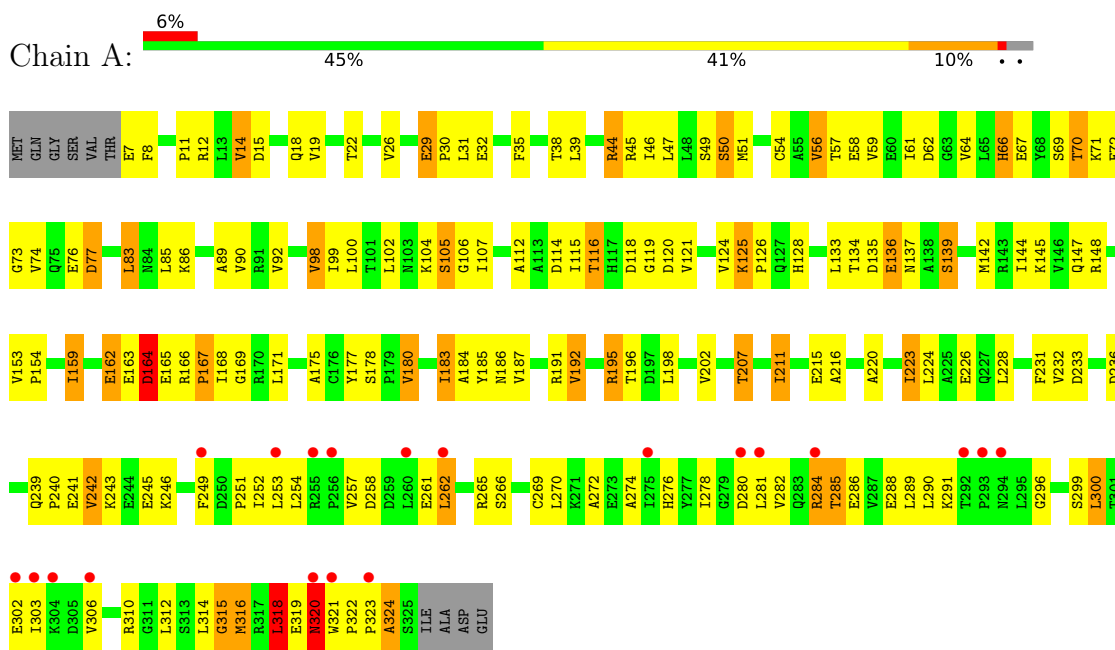
- Molecule 8 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	D	2	Total	Zn	0	0
			2	2		
8	J	2	Total	Zn	0	0
			2	2		
8	M	1	Total	Zn	0	0
			1	1		
8	N	1	Total	Zn	0	0
			1	1		

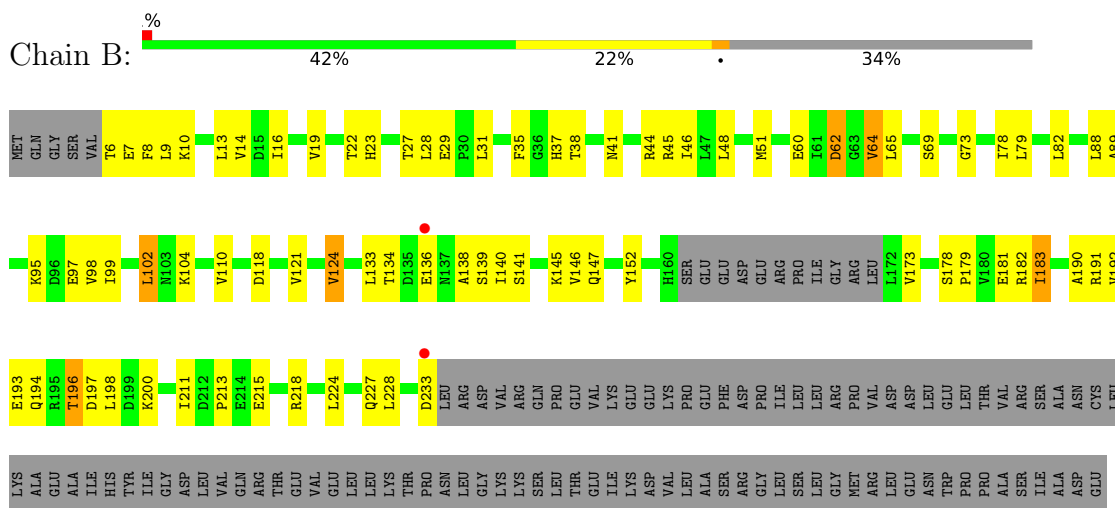
3 Residue-property plots

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.

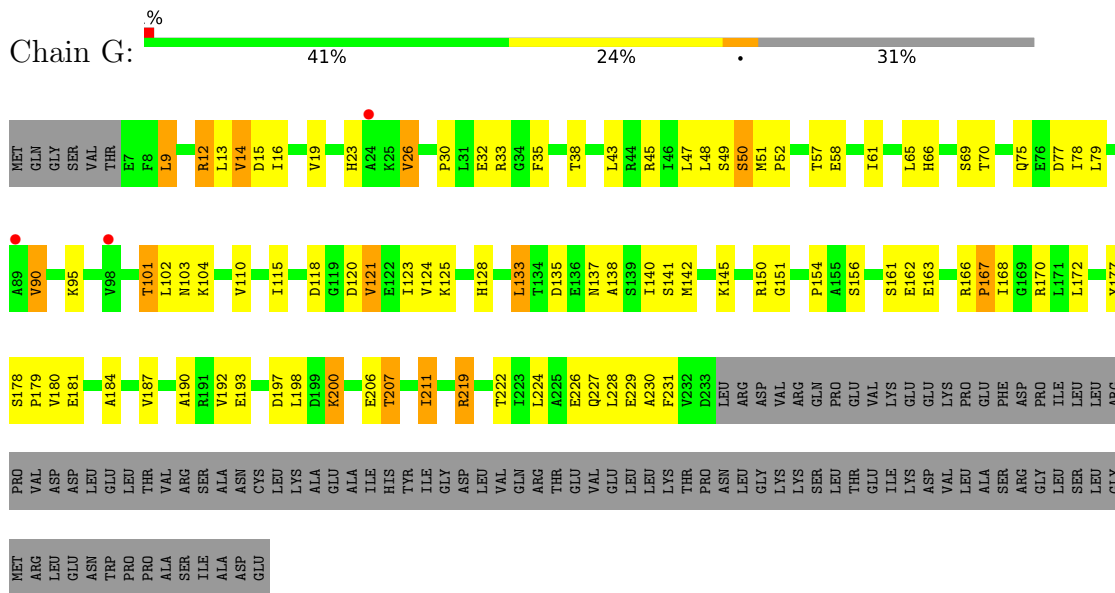
- Molecule 1: DNA-directed RNA polymerase subunit alpha



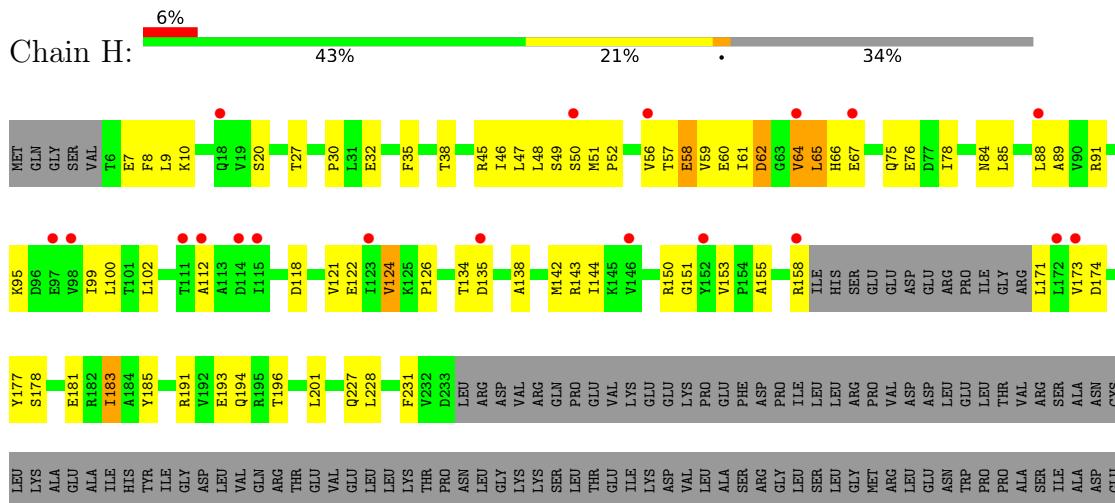
- Molecule 1: DNA-directed RNA polymerase subunit alpha



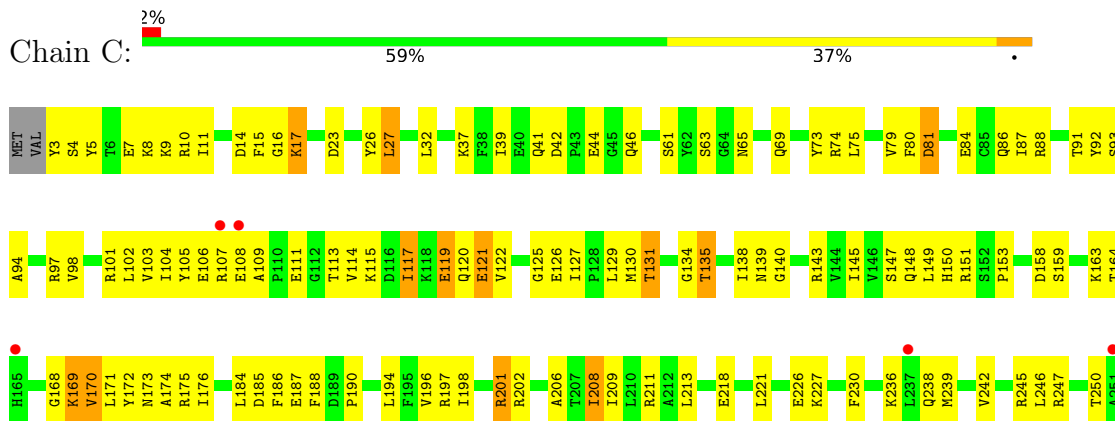
- Molecule 1: DNA-directed RNA polymerase subunit alpha

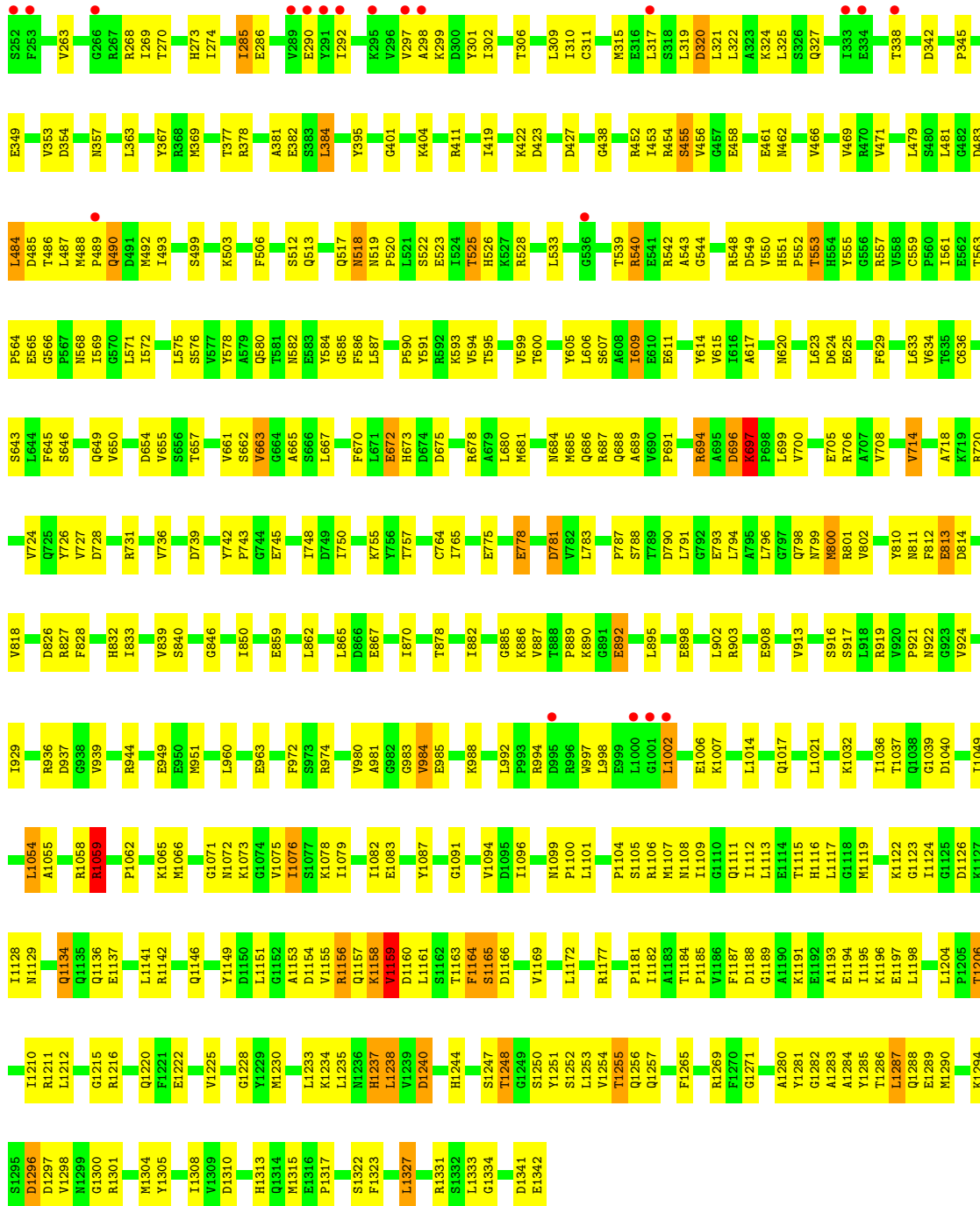


• Molecule 1: DNA-directed RNA polymerase subunit alpha

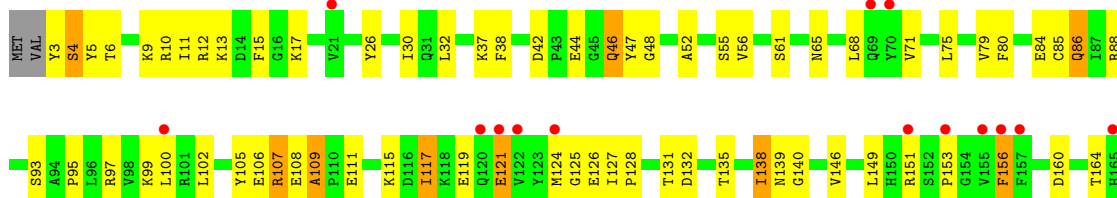


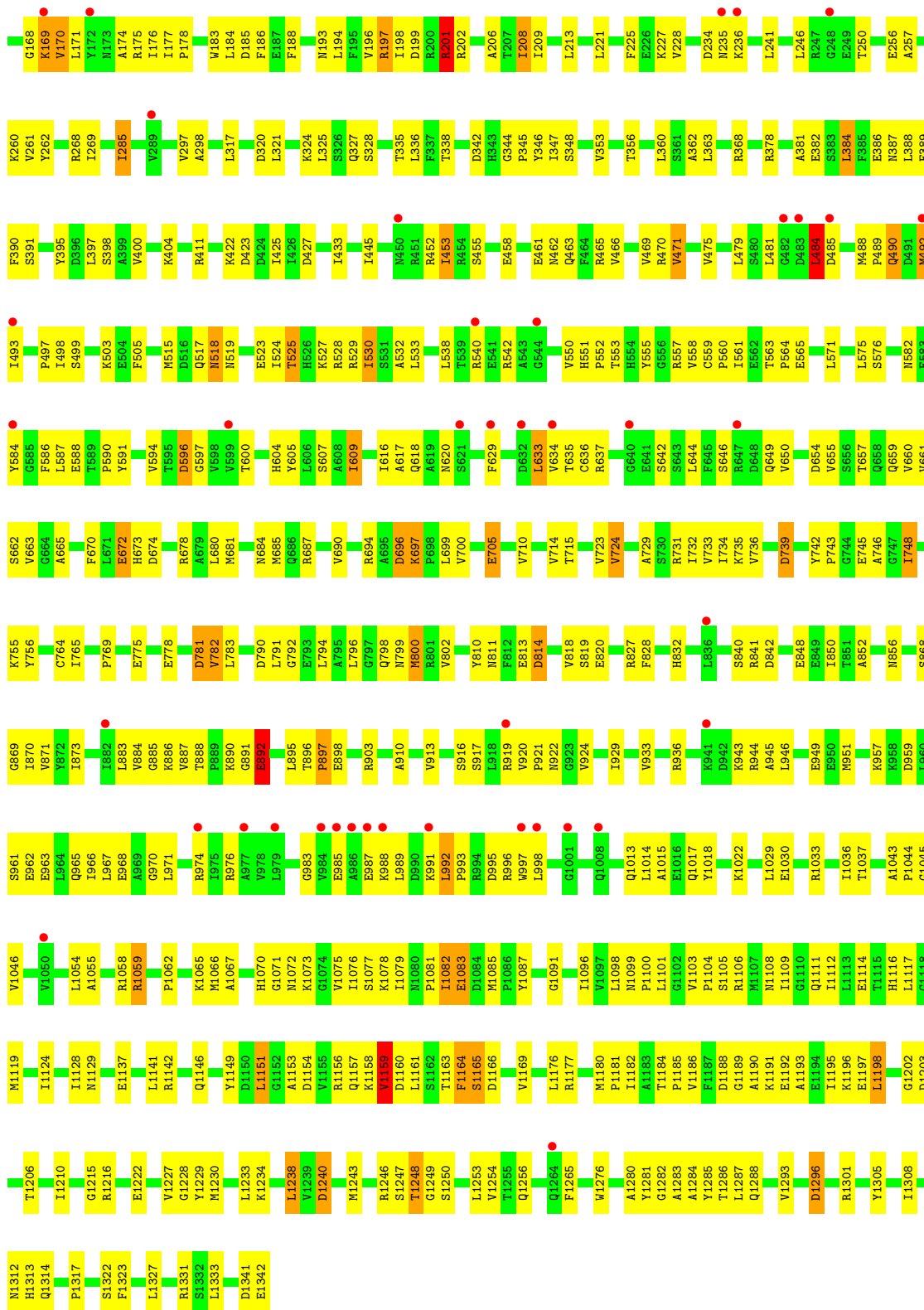
• Molecule 2: DNA-directed RNA polymerase subunit beta





● Molecule 2: DNA-directed RNA polymerase subunit beta

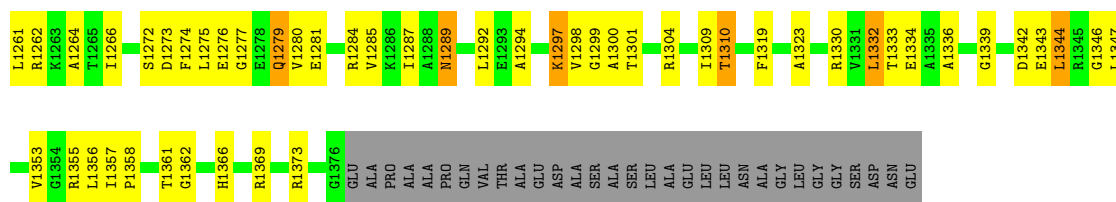




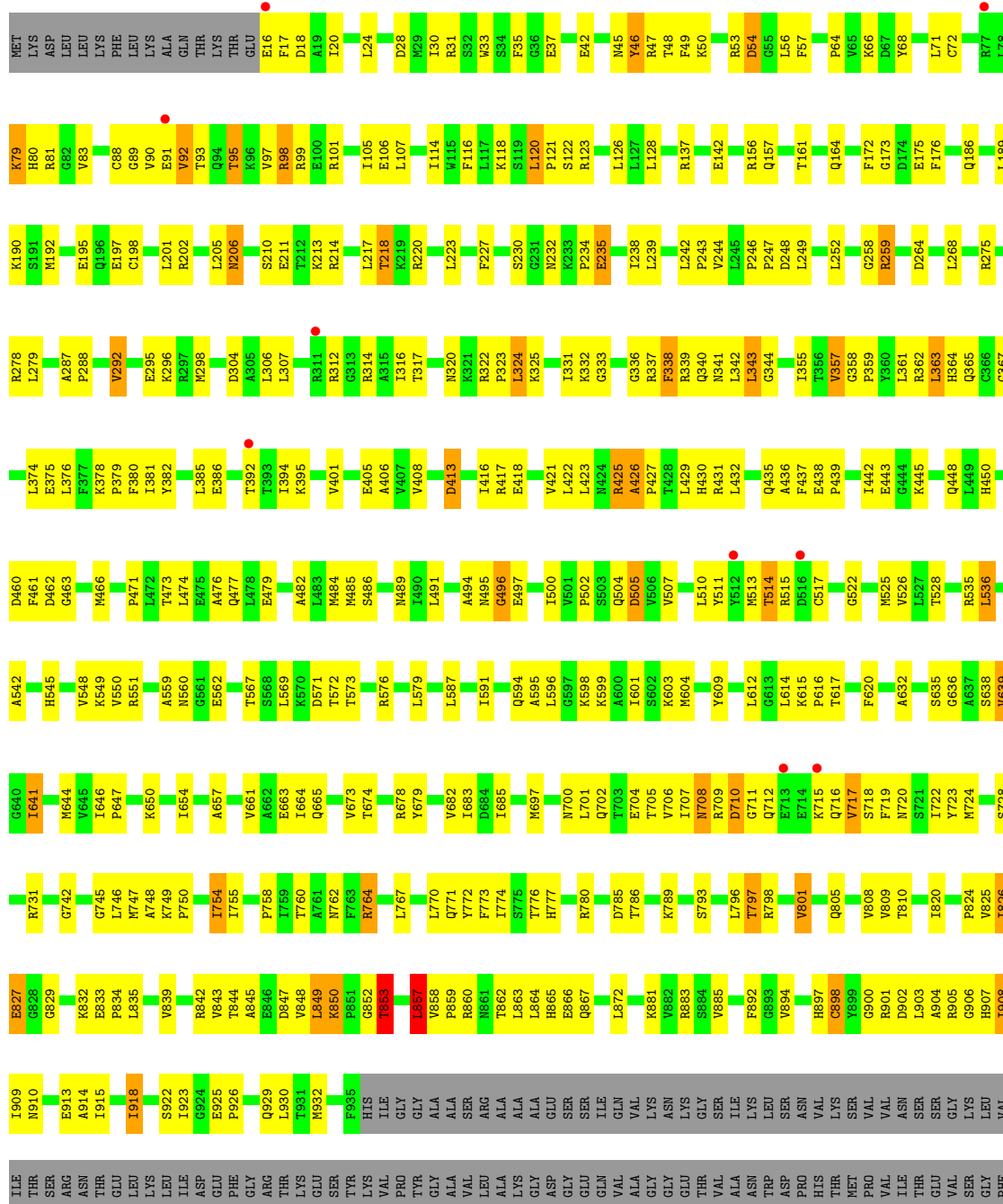
• Molecule 3: DNA-directed RNA polymerase subunit beta'

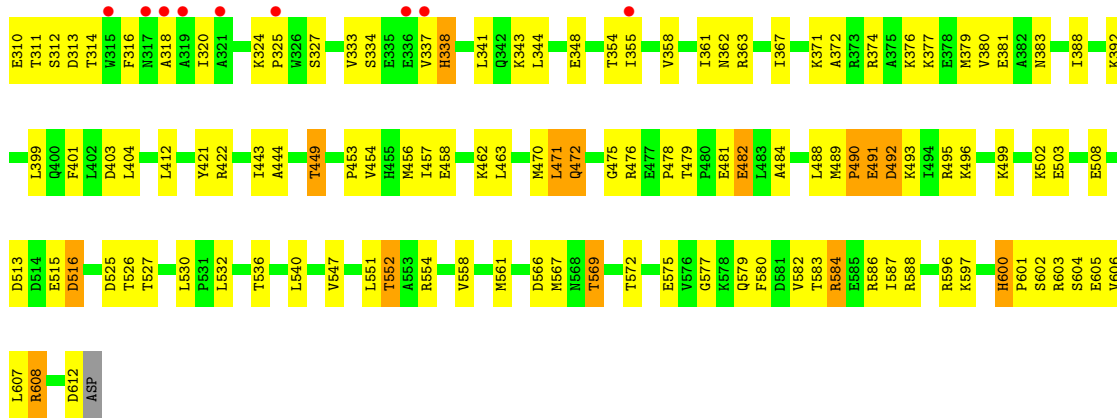


I1177	I1178	D1181	G1182	S1183	D1184	F1185	Y1186	E1187	E1188	K1192	W1193	R1194	V1198	F1199	E1200	G1201	E1202	R1206	G1207	I1210	S1211	D1212	E1215	D1219	I1220	L1221	R1222	H1227	M1228	V1229	T1230	R1231	Y1232	I1233	E1236	V1237	Q1238	R1242	V1246	K1247	I1248	K1251	H1252	V1257	M1260																																																																
GLY	VAL	GLN	ILE	SER	SER	GLY	ASP	THR	ALA	ARG	ILE	PRO	GLN	GLU	THR	ALA	GLY	ASP	ASP	PRO	ALA	LEU	LYS	ILE	LEU	THR	ASN	TRP	ASP	ASP	LEU	ILE	PRO	GLY	THR	ASP	PRO	ALA	GLN	TYR	PHE	LEU	PRO	GLY	LYS	ALA	THR	ILE	VAL	GLN	LEU	THR	ASP																																																								
T831	M832	F935	HIS	ILE	GLY	GLY	ALA	ALA	SER	ARG	ALA	ALA	ALA	GLY	GLU	GLY	SER	SER	GLY	GLN	VAL	VAL	VAL	ASN	ASN	LYS	ASN	TRP	ASP	ASN	VAL	VAL	GLY	GLY	VAL	VAL	THR	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR																																																										
G745	L746	M747	A748	K749	P750	S753	I754	P758	M762	F763	R764	A675	G676	Y655	A559	M560	G561	A476	Q477	L478	L479	L483	M484	M485	M489	L490	L491	S492	P493	A494	M495	G496	E497	I500	S503	Q504	D505	L614	K615	P616	R634	S638	V639	I641	P647	K650	R731	G732	S733	G640	Q736	Q739	L740	R744																																																							
G745	L746	M747	A748	K749	P750	S753	I754	P758	M762	F763	R764	A675	G676	Y655	A559	M560	G561	A476	Q477	L478	L479	L483	M484	M485	M489	L490	L491	S492	P493	A494	M495	G496	E497	I500	S503	Q504	D505	L614	K615	P616	R634	S638	V639	I641	P647	K650	R731	G732	S733	G640	Q736	Q739	L740	R744																																																							
T844	D847	V848	L849	K850	P851	G852	T853	A854	R855	I856	L857	V858	P859	R860	T861	L862	L863	L864	H865	E866	L872	V877	D878	V882	R883	S884	V885	T890	G893	V894	H897	R901	L902	L903	R905	G906	H907	I908	I909	N910	E913	I918	L918	L935	E925	P926	Q929	L930	V843																																																												
T844	D847	V848	L849	K850	P851	G852	T853	A854	R855	I856	L857	V858	P859	R860	T861	L862	L863	L864	H865	E866	L872	V877	D878	V882	R883	S884	V885	T890	G893	V894	H897	R901	L902	L903	R905	G906	H907	I908	I909	N910	E913	I918	L918	L935	E925	P926	Q929	L930	V843																																																												
T831	M832	F935	HIS	ILE	GLY	GLY	ALA	ALA	SER	ARG	ALA	ALA	ALA	GLY	GLU	GLY	SER	SER	GLY	GLN	VAL	VAL	VAL	ASN	ASN	LYS	ASN	TRP	ASP	ASN	VAL	VAL	GLY	GLY	VAL	VAL	THR	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR																																																									
GLU	LEU	THR	THR	LEU	SER	LEU	VAL	ASP	SER	ARG	ALA	ALA	ALA	GLU	THR	GLY	GLY	GLY	GLY	GLN	VAL	VAL	VAL	ASN	ASN	LYS	ASN	TRP	ASP	ASN	VAL	VAL	GLY	GLY	VAL	VAL	THR	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR																																																							
GLY	VAL	GLN	ILE	SER	SER	GLY	ASP	THR	ALA	ARG	ILE	PRO	GLN	GLU	THR	ALA	GLY	ASP	ASP	PRO	ALA	LEU	LYS	ILE	LEU	THR	ASN	TRP	ASP	ASN	VAL	VAL	GLY	GLY	VAL	VAL	THR	ARG	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR																																																
I1134	T1135	G1136	G1137	L1138	P1139	R1140	D1143	R1148	R1149	P1150	K1151	E1152	I1155	L1156	A1157	E1158	I1159	S1160	G1161	V1162	V1163	S1164	F1165	G1166	K1167	E1168	K1170	T1169	G1171	K1172	R1173	L1174	V1176	I1185	I1186	I1187	I1188	I1189	I1190	I1191	I1192	I1193	I1194	I1195	I1196	I1197	I1198	I1199	I1200	I1201	I1202	I1203	I1204	I1205	I1206	I1207	I1208	I1209	I1210	I1211	I1212	I1213	I1214	I1215	I1216	I1217	I1218	I1219	I1220	I1221	I1222	I1223	I1224	I1225	I1226	I1227	I1228	I1229	I1230	I1231	I1232	I1233	I1234	I1235	I1236	I1237	I1238	I1239	I1240	I1241	I1242	I1243	I1244	I1245	I1246	I1247	I1248	I1249	I1250	I1251	I1252	I1253	I1254	I1255	I1256	I1257	I1258	I1259	I1260

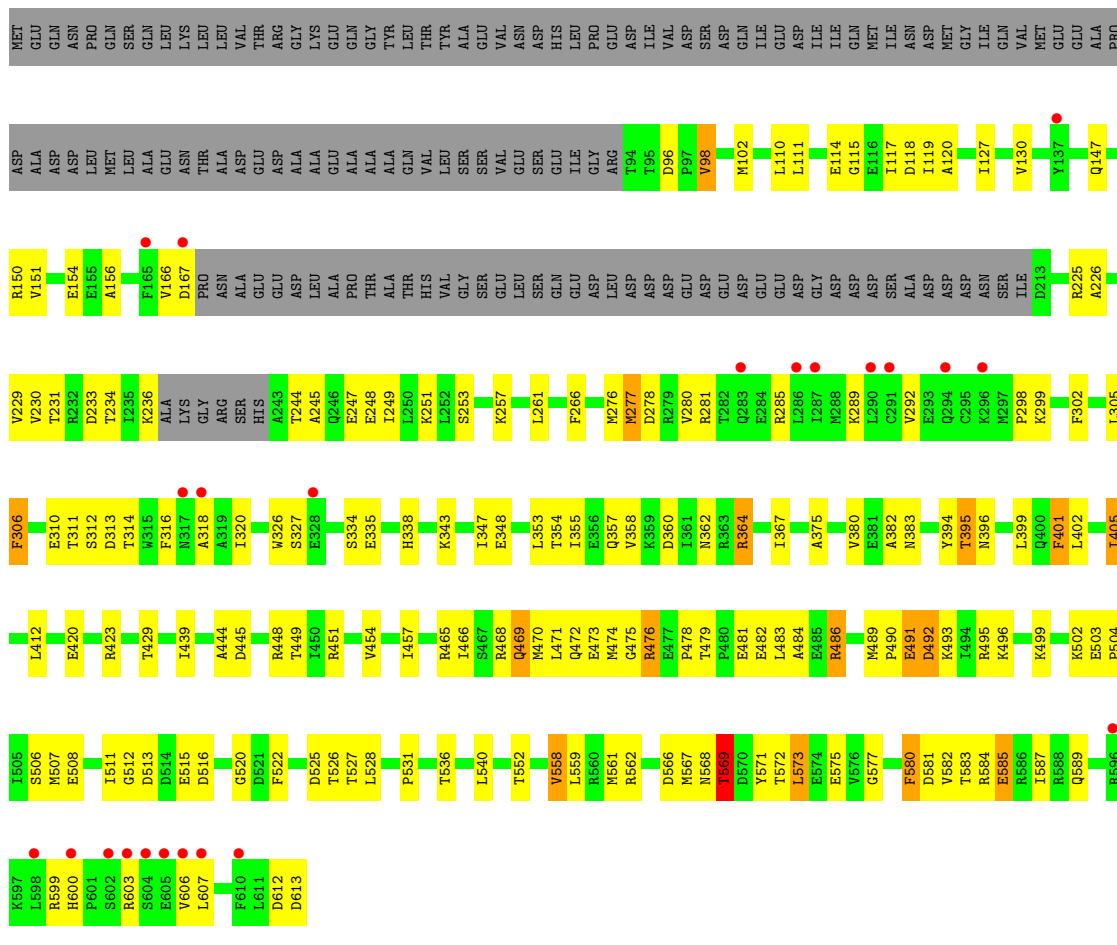


● Molecule 3: DNA-directed RNA polymerase subunit beta'

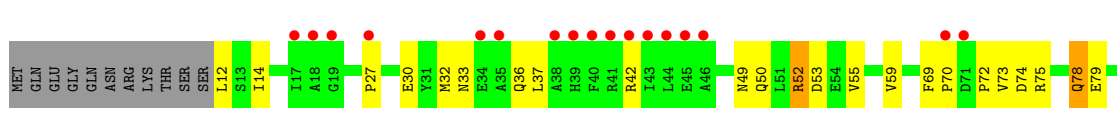


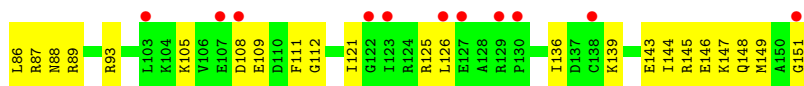


• Molecule 5: RNA polymerase sigma factor RpoD

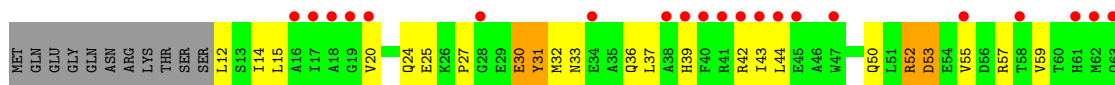


• Molecule 6: RNA polymerase-binding transcription factor DksA





● Molecule 6: RNA polymerase-binding transcription factor DksA



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	184.00Å 204.89Å 314.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.08 – 4.50 49.64 – 4.50	Depositor EDS
% Data completeness (in resolution range)	98.8 (47.08-4.50) 88.6 (49.64-4.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.95 (at 4.45Å)	Xtrriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.220 , 0.276 0.220 , 0.276	Depositor DCC
R_{free} test set	1995 reflections (2.83%)	wwPDB-VP
Wilson B-factor (Å ²)	198.5	Xtrriage
Anisotropy	0.193	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 232.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	58066	wwPDB-VP
Average B, all atoms (Å ²)	291.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.60% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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: ZN, MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.34	0/2524	0.67	1/3421 (0.0%)
1	B	0.33	0/1697	0.64	1/2300 (0.0%)
1	G	0.32	0/1777	0.61	0/2408
1	H	0.29	0/1681	0.62	1/2278 (0.0%)
2	C	0.36	0/10739	0.61	1/14489 (0.0%)
2	I	0.32	0/10735	0.57	1/14484 (0.0%)
3	D	0.37	0/9225	0.66	1/12458 (0.0%)
3	J	0.35	0/9160	0.63	3/12369 (0.0%)
4	E	0.34	0/693	0.57	0/935
4	K	0.27	0/629	0.54	0/847
5	F	0.32	0/3864	0.58	0/5194
5	L	0.31	0/3872	0.54	0/5205
6	M	0.31	0/1155	0.66	0/1549
6	N	0.33	0/1155	0.70	0/1549
All	All	0.34	0/58906	0.61	9/79486 (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	H	0	1
2	C	0	2
2	I	0	2
3	D	0	2
3	J	0	2
4	K	0	1
All	All	0	10

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(°)
1	B	65	LEU	CA-CB-CG	6.76	130.84	115.30
3	J	857	LEU	CA-CB-CG	6.38	129.96	115.30
3	D	239	LEU	CA-CB-CG	-6.19	101.06	115.30
1	H	65	LEU	CA-CB-CG	6.01	129.11	115.30
1	A	318	LEU	CA-CB-CG	5.91	128.90	115.30

There are no chirality outliers.

5 of 10 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	109	ALA	Peptide
2	C	236	LYS	Peptide
3	D	1184	ASP	Peptide
3	D	901	ARG	Peptide
1	H	171	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	2490	0	2542	120	0
1	B	1677	0	1703	53	1
1	G	1755	0	1773	61	1
1	H	1662	0	1687	49	0
2	C	10570	0	10582	391	2
2	I	10566	0	10576	366	0
3	D	9085	0	9218	384	1
3	J	9021	0	9175	375	0
4	E	691	0	695	21	0
4	K	627	0	634	15	0
5	F	3813	0	3880	112	1
5	L	3821	0	3884	109	0
6	M	1140	0	1119	33	0
6	N	1140	0	1119	50	0
7	D	1	0	0	0	0
7	J	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	D	2	0	0	0	0
8	J	2	0	0	0	0
8	M	1	0	0	0	0
8	N	1	0	0	0	0
All	All	58066	0	58587	1914	3

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 1914 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:C:525:THR:HG21	2:C:687:ARG:HD2	1.39	1.04
1:G:190:ALA:HB2	1:G:200:LYS:HB2	1.45	0.98
2:C:10:ARG:HD3	2:C:1181:PRO:HG2	1.43	0.97
1:A:45:ARG:HG2	1:B:38:THR:HB	1.48	0.95
2:C:1073:LYS:HE3	3:D:462:ASP:HB2	1.49	0.94

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:62:ASP:O	1:G:101:THR:OG1[4_545]	1.98	0.22
2:C:44:GLU:OE2	5:F:596:ARG:NH1[4_555]	2.17	0.03
2:C:1006:GLU:OE1	3:D:68:TYR:OH[4_555]	2.17	0.03

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	317/329 (96%)	248 (78%)	52 (16%)	17 (5%)	2 22

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	213/329 (65%)	195 (92%)	14 (7%)	4 (2%)	8	41
1	G	225/329 (68%)	202 (90%)	18 (8%)	5 (2%)	6	38
1	H	212/329 (64%)	197 (93%)	11 (5%)	4 (2%)	8	41
2	C	1338/1342 (100%)	1202 (90%)	118 (9%)	18 (1%)	12	48
2	I	1338/1342 (100%)	1197 (90%)	120 (9%)	21 (2%)	9	45
3	D	1167/1407 (83%)	1037 (89%)	103 (9%)	27 (2%)	6	37
3	J	1155/1407 (82%)	1029 (89%)	100 (9%)	26 (2%)	6	37
4	E	87/91 (96%)	80 (92%)	5 (6%)	2 (2%)	6	37
4	K	77/91 (85%)	69 (90%)	4 (5%)	4 (5%)	2	22
5	F	462/613 (75%)	426 (92%)	28 (6%)	8 (2%)	9	43
5	L	463/613 (76%)	425 (92%)	31 (7%)	7 (2%)	10	46
6	M	138/151 (91%)	128 (93%)	8 (6%)	2 (1%)	11	47
6	N	138/151 (91%)	129 (94%)	6 (4%)	3 (2%)	6	38
All	All	7330/8524 (86%)	6564 (90%)	618 (8%)	148 (2%)	7	40

5 of 148 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	14	VAL
1	A	107	ILE
1	A	136	GLU
1	A	162	GLU
1	A	167	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	278/286 (97%)	228 (82%)	50 (18%)	1	11
1	B	186/286 (65%)	171 (92%)	15 (8%)	11	37
1	G	193/286 (68%)	169 (88%)	24 (12%)	4	22

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	H	183/286 (64%)	172 (94%)	11 (6%)	19	46
2	C	1155/1157 (100%)	1051 (91%)	104 (9%)	9	32
2	I	1154/1157 (100%)	1056 (92%)	98 (8%)	10	36
3	D	962/1168 (82%)	878 (91%)	84 (9%)	10	34
3	J	960/1168 (82%)	877 (91%)	83 (9%)	10	35
4	E	72/75 (96%)	63 (88%)	9 (12%)	4	21
4	K	67/75 (89%)	61 (91%)	6 (9%)	9	32
5	F	417/540 (77%)	386 (93%)	31 (7%)	13	40
5	L	418/540 (77%)	380 (91%)	38 (9%)	9	32
6	M	121/131 (92%)	111 (92%)	10 (8%)	11	36
6	N	121/131 (92%)	111 (92%)	10 (8%)	11	36
All	All	6287/7286 (86%)	5714 (91%)	573 (9%)	9	32

5 of 573 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	J	536	LEU
3	J	764	ARG
3	J	514	THR
5	L	266	PHE
3	D	394	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 65 such sidechains are listed below:

Mol	Chain	Res	Type
5	L	362	ASN
5	L	446	GLN
3	D	929	GLN
3	D	861	ASN
5	L	469	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 8 ligands modelled in this entry, 8 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](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	319/329 (96%)	0.26	20 (6%) 20 16	230, 295, 400, 420	0
1	B	217/329 (65%)	-0.13	2 (0%) 84 77	243, 301, 356, 388	0
1	G	227/329 (68%)	-0.01	3 (1%) 77 68	270, 312, 357, 389	0
1	H	216/329 (65%)	0.41	19 (8%) 10 9	287, 356, 409, 427	0
2	C	1340/1342 (99%)	-0.07	25 (1%) 66 58	166, 255, 352, 403	0
2	I	1340/1342 (99%)	0.12	55 (4%) 37 30	203, 302, 382, 423	0
3	D	1171/1407 (83%)	-0.10	12 (1%) 82 74	169, 238, 355, 404	0
3	J	1159/1407 (82%)	-0.07	22 (1%) 66 58	183, 262, 356, 405	0
4	E	89/91 (97%)	-0.06	0 100 100	225, 281, 318, 330	0
4	K	79/91 (86%)	0.86	13 (16%) 1 2	320, 426, 502, 516	0
5	F	468/613 (76%)	-0.01	18 (3%) 40 32	199, 288, 436, 472	0
5	L	469/613 (76%)	0.19	23 (4%) 29 25	212, 309, 420, 437	0
6	M	140/151 (92%)	0.71	28 (20%) 1 1	374, 435, 492, 503	0
6	N	140/151 (92%)	0.99	32 (22%) 0 1	417, 439, 458, 465	0
All	All	7374/8524 (86%)	0.05	272 (3%) 41 33	166, 283, 416, 516	0

The worst 5 of 272 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	1001	GLY	7.6
2	I	482	GLY	6.8
6	N	41	ARG	6.7
1	A	303	ILE	5.9
3	J	1375	ALA	5.8

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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(\AA^2)	Q<0.9
8	ZN	N	200	1/1	0.68	0.07	506,506,506,506	0
8	ZN	M	200	1/1	0.92	0.17	512,512,512,512	0
7	MG	J	2001	1/1	0.93	0.39	335,335,335,335	0
7	MG	D	2001	1/1	0.97	0.47	268,268,268,268	0
8	ZN	J	2002	1/1	0.97	0.09	269,269,269,269	0
8	ZN	D	2003	1/1	0.98	0.26	245,245,245,245	0
8	ZN	D	2002	1/1	0.98	0.14	271,271,271,271	0
8	ZN	J	2003	1/1	0.99	0.23	211,211,211,211	0

6.5 Other polymers [i](#)

There are no such residues in this entry.