wwPDB X-ray Structure Validation Summary Report (i)

Sep 25, 2023 – 12:43 PM EDT

PDB ID	:	5W1S
Title	:	X-ray crystal structure of Escherichia coli RNA polymerase and TraR complex
Authors	:	Murakami, K.S.; Molodtsov, V.
Deposited on	:	2017-06-04
Resolution	:	3.81 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 (i) 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 (i)) were used in the production of this report:

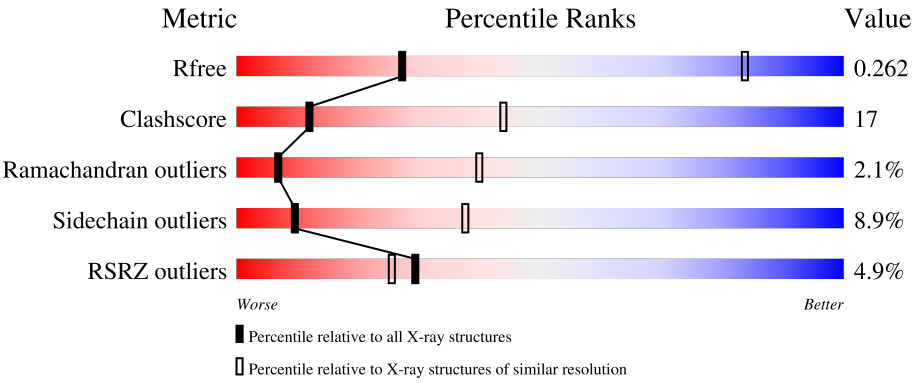
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation 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 3.81 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	1212 (4.00-3.60)
Clashscore	141614	1288 (4.00-3.60)
Ramachandran outliers	138981	1243 (4.00-3.60)
Sidechain outliers	138945	1237 (4.00-3.60)
RSRZ outliers	127900	1121 (4.00-3.60)

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 <=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	2% 45% 41% 10%
1	B	329	3% 40% 24% 34%
1	G	329	2% 37% 27% 31%
1	H	329	6% 42% 22% 34%
2	C	1342	6% 57% 38%

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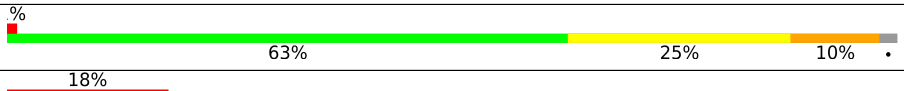
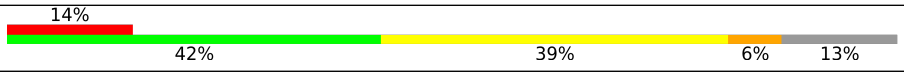
Mol	Chain	Length	Quality of chain
2	I	1342	
3	D	1407	
3	J	1407	
4	E	91	
4	K	91	
5	F	613	
5	L	613	
6	M	79	
6	N	79	

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 56825 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
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
2	C	1340	Total	C	N	O	S	0	0	0
			10564	6628	1838	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
3	D	1173	Total	C	N	O	S	0	0	0
			9095	5718	1628	1703	46			
3	J	1155	Total	C	N	O	S	0	0	0
			9001	5659	1612	1684	46			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	89	Total	C	N	O	S	0	0	0
			691	421	129	140	1			
4	K	72	Total	C	N	O	S	0	0	0
			573	350	110	112	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 Protein TraR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	M	70	Total	C	N	O	S	0	0	0
			557	346	103	103	5			
6	N	69	Total	C	N	O	S	0	0	0
			552	343	102	102	5			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
M	74	HIS	-	expression tag	UNP P41065
M	75	HIS	-	expression tag	UNP P41065
M	76	HIS	-	expression tag	UNP P41065
M	77	HIS	-	expression tag	UNP P41065
M	78	HIS	-	expression tag	UNP P41065
M	79	HIS	-	expression tag	UNP P41065
N	74	HIS	-	expression tag	UNP P41065
N	75	HIS	-	expression tag	UNP P41065
N	76	HIS	-	expression tag	UNP P41065
N	77	HIS	-	expression tag	UNP P41065
N	78	HIS	-	expression tag	UNP P41065
N	79	HIS	-	expression tag	UNP P41065

- 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).

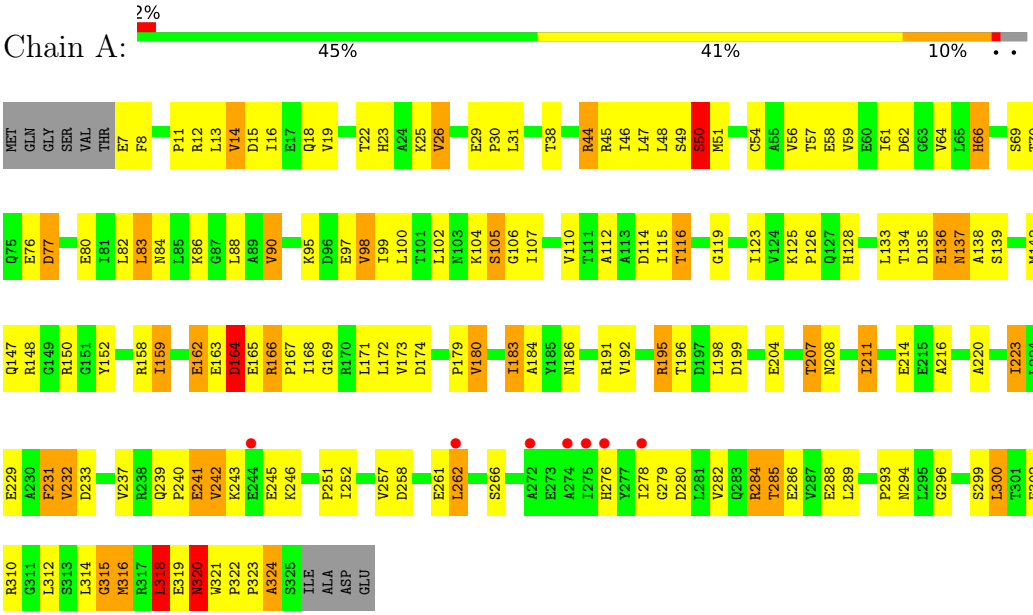
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	D	2	Total Zn 2 2	0	0
8	J	2	Total Zn 2 2	0	0
8	M	1	Total Zn 1 1	0	0
8	N	1	Total Zn 1 1	0	0

3 Residue-property plots (i)

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

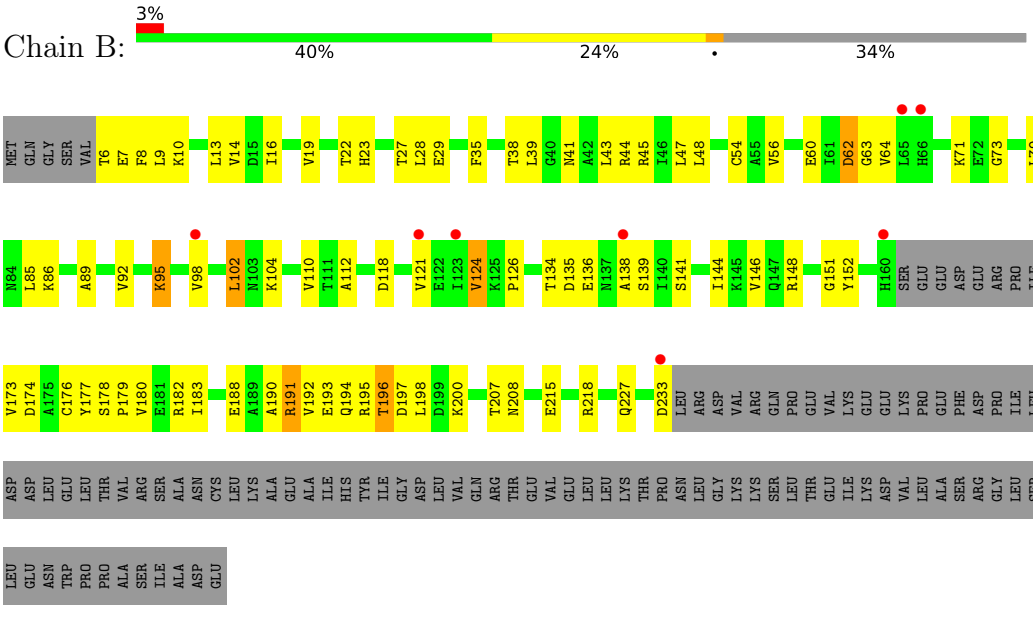
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain A:



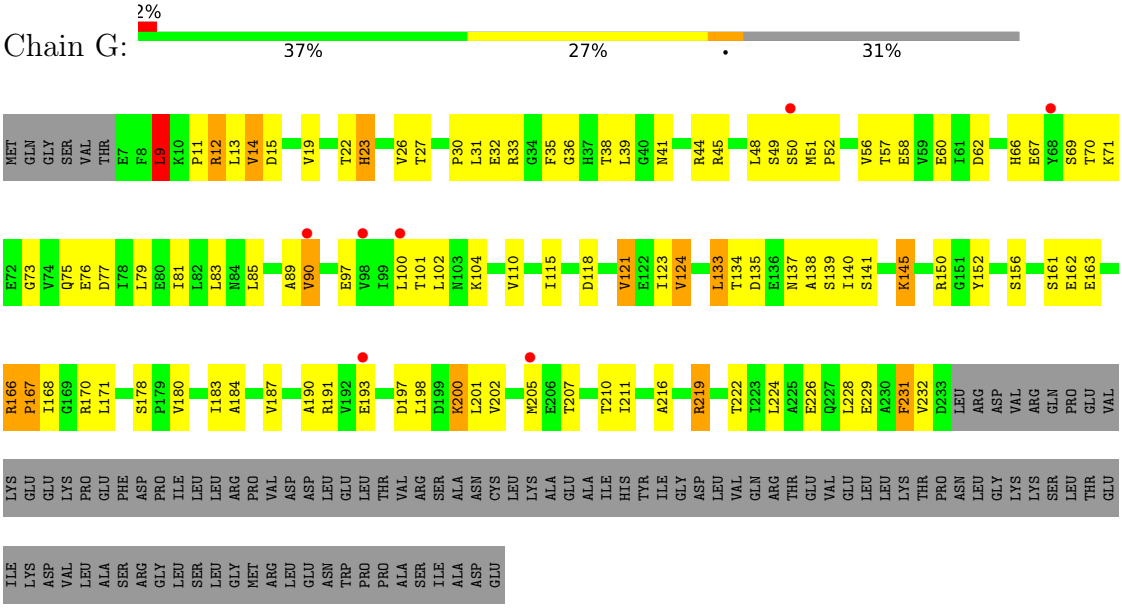
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain B:



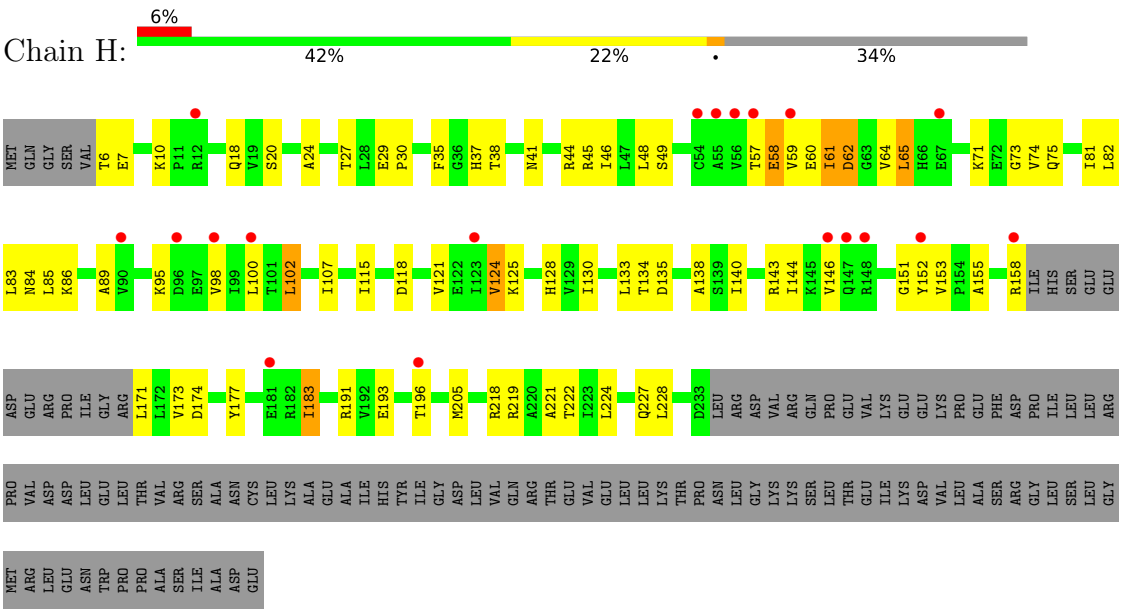
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain G:



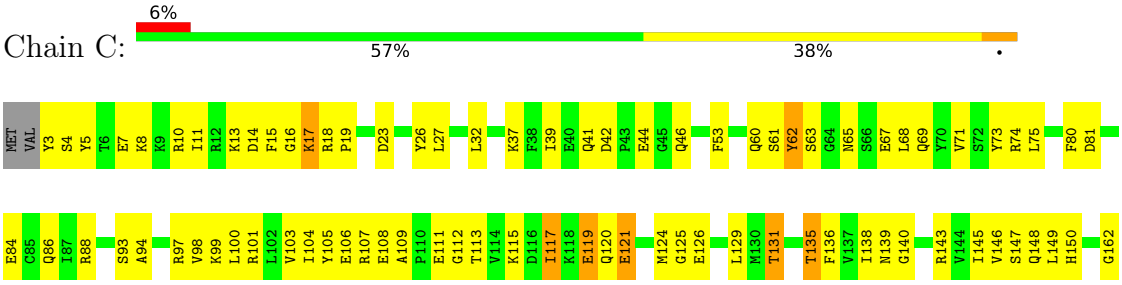
• Molecule 1: DNA-directed RNA polymerase subunit alpha

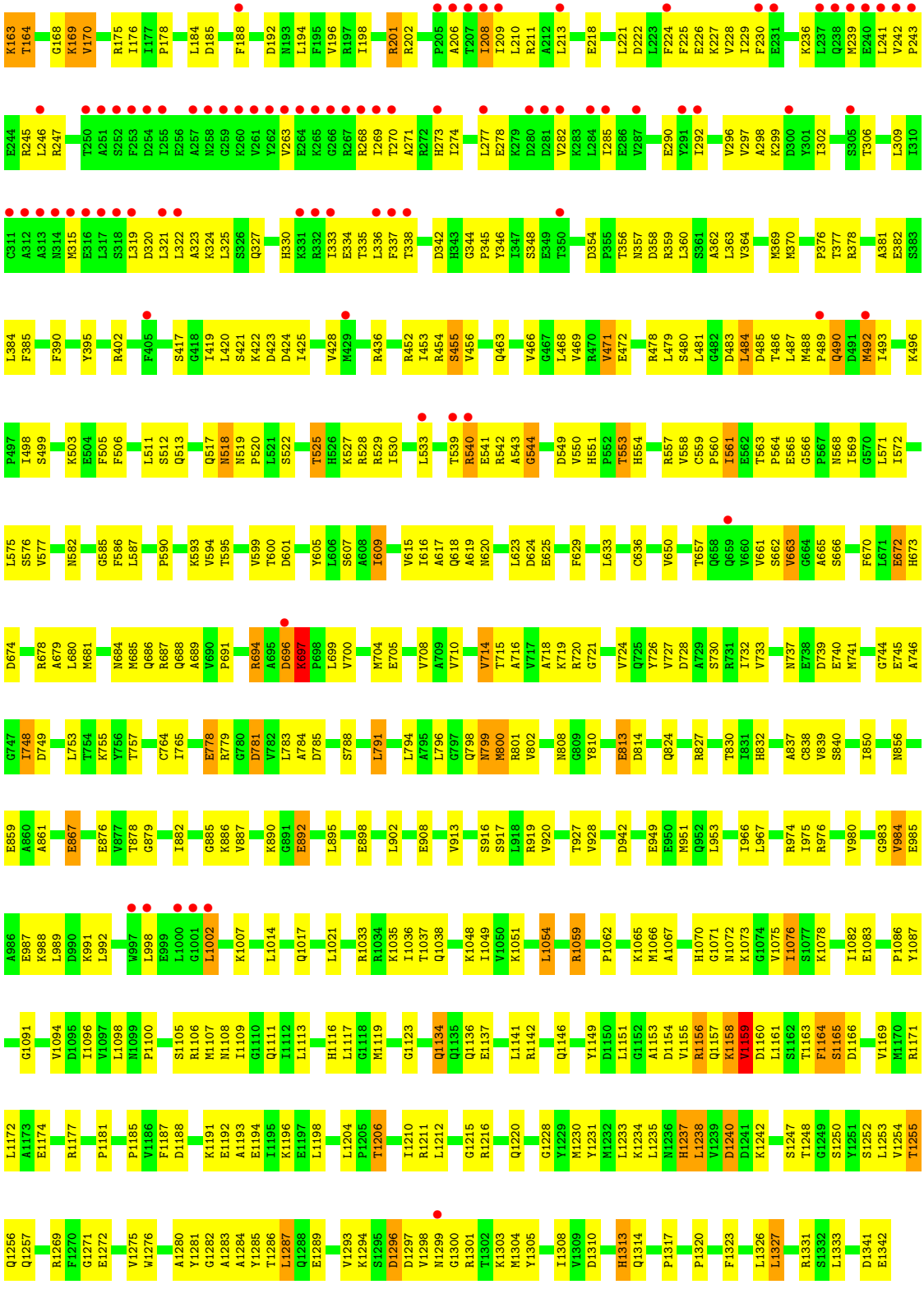
Chain H:



• Molecule 2: DNA-directed RNA polymerase subunit beta

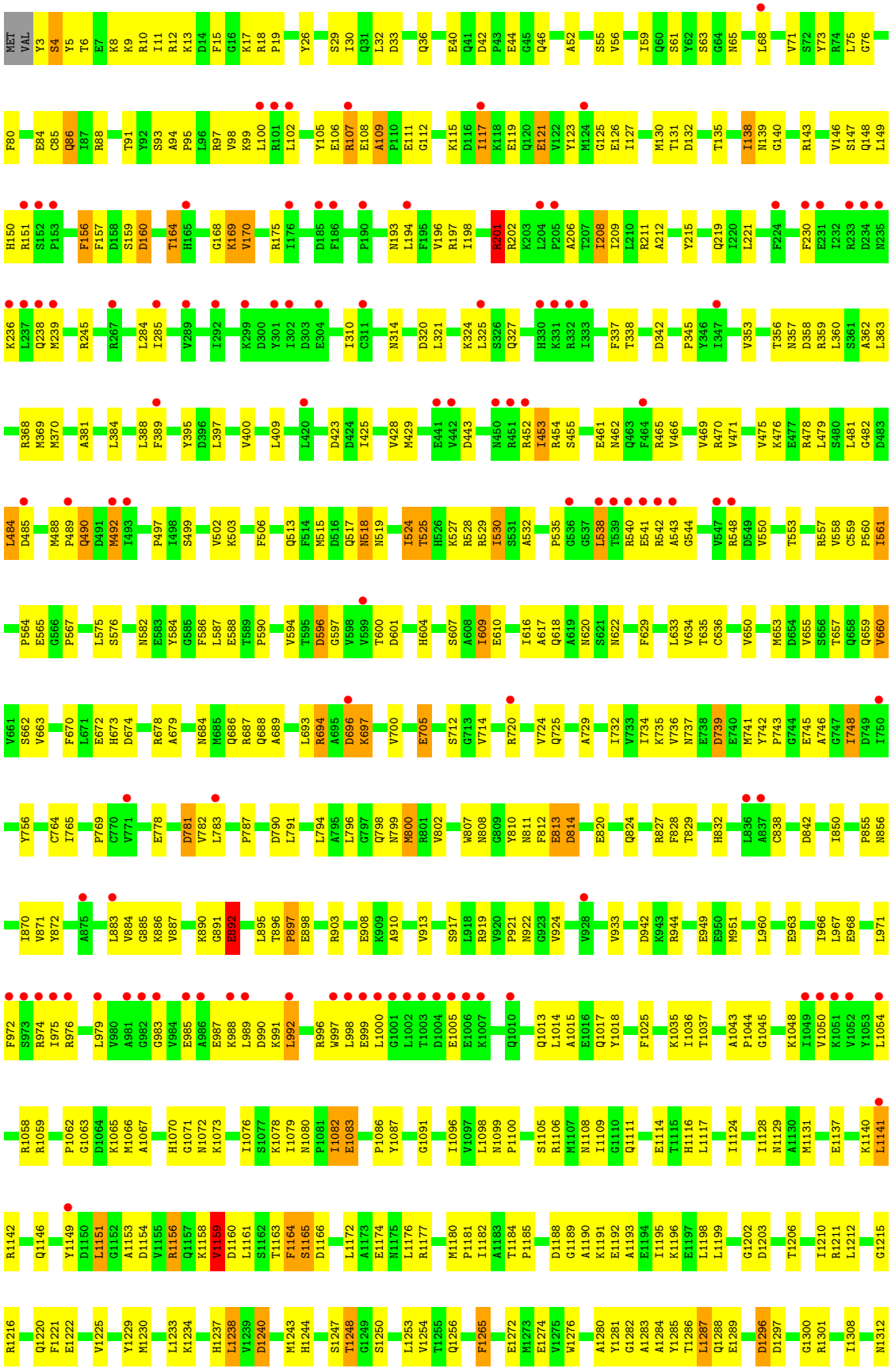
Chain C:

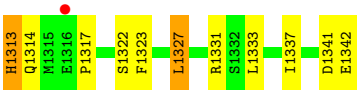




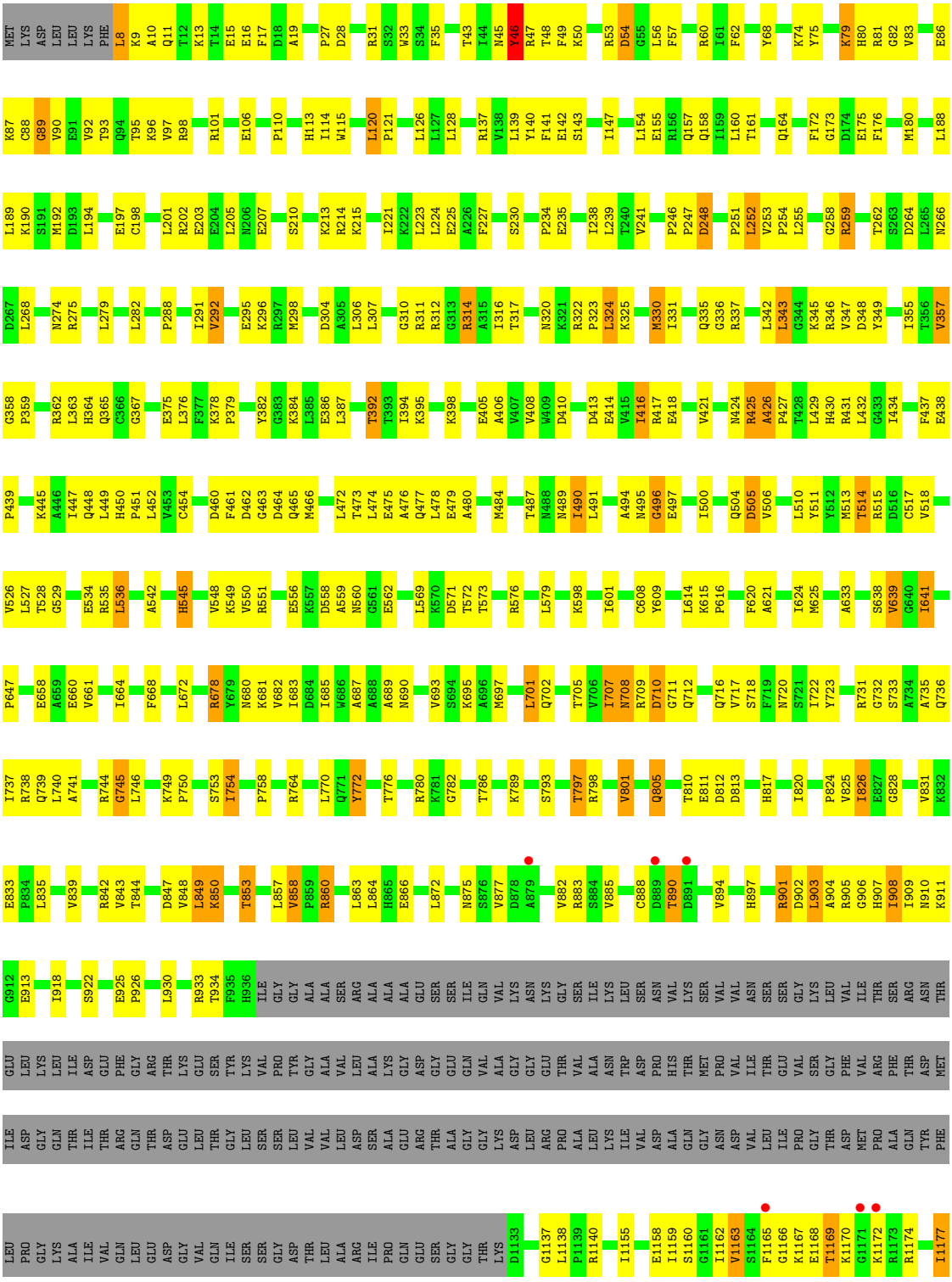
• Molecule 2: DNA-directed RNA polymerase subunit beta

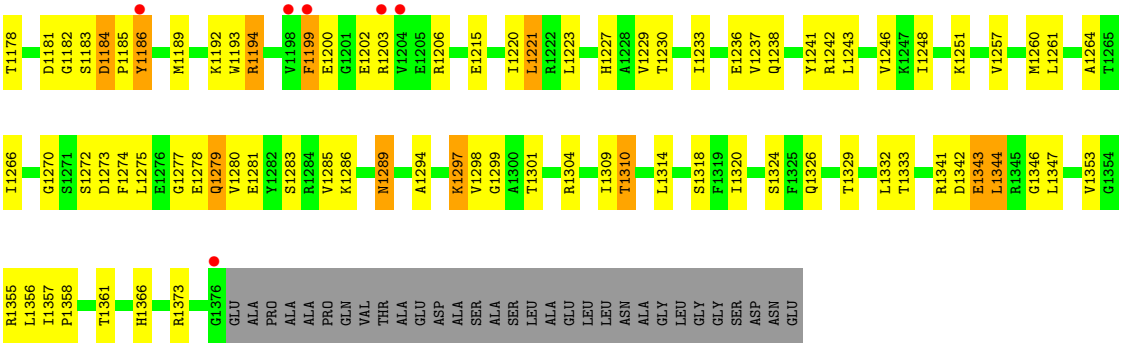
Chain I:


MET VAL Y3 S4 Y5 T6 E7 K8 K9 R10 I11 R12 K13 D14 F15 G16 K17 R18 P19 Y26 S29 I30 Q31 L32 D33 Q36 E40 Q41 D42 P43 E44 G45 Q46 A52 S55 V56 I59 Q60 S61 Y62 S63 G64 N65 L68 V71 S72 Y73 R74 L75 G76
F80 E84 C85 Q86 I87 R88 T91 Y92 S93 A94 P95 L96 R97 V98 K99 L100 R101 L102 Y105 E106 R107 E108 A109 P110 E111 G112 K115 D116 I117 K118 E119 Q120 E121 V122 Y123 M124 G125 E126 I127 M130 T131 D132 T135 I138 N139 G140 R143 V146 S147 Q148 L149
H150 R151 S152 P153 F156 F157 D158 S159 D160 T164 H165 G168 K169 V170 R175 I176 D185 F186 P190 N193 L194 F196 V196 R197 I198 R201 R202 K203 L204 P205 A206 T207 I208 I209 L210 R211 A212 Y215 Q219 I220 L221 F224 F230 E231 I232 R233 D234 N235
K236 L237 Q238 M239 R245 R267 L284 I285 V289 I292 K299 D300 Y301 I302 D303 E304 I310 C311 N314 D320 L321 K324 L325 S326 Q327 H330 K331 R332 I333 F337 T338 D342 P345 Y346 I347 V353 T356 N357 D358 R359 L360 S361 A362 L363
R368 M369 M370 A381 L384 L388 F389 Y395 D396 L397 V400 L409 L420 D423 D424 I425 V428 M429 E441 V442 D443 N450 R451 R452 I453 R454 S455 E461 N462 Q463 F464 R465 V466 V469 R470 V471 V475 K476 E477 R478 L479 S480 L481 G482 D483
L484 D485 M488 P489 Q490 D491 M492 I493 P497 I498 S499 V502 K503 F506 Q513 F514 M515 D516 Q517 N518 N519 I524 T525 H526 K527 R528 R529 I530 S531 A532 P535 G536 G537 L538 T539 R540 E541 R542 A543 G544 V547 R548 D549 V550 T553 R557 V558 C559 P560 I561
P564 E565 G566 P567 L575 S576 N582 E583 Y584 G585 F586 L587 E588 T589 P590 V594 T595 D596 G597 V598 V599 T600 D601 H604 S607 A608 I609 E610 I616 A617 Q618 A619 N620 S621 N622 F629 L633 V634 T635 C636 V650 M653 D654 V655 S656 T657 V658 Q659 V660
V661 S662 V663 F670 L671 E672 H673 D674 R678 A679 N684 M685 Q686 R687 Q688 A689 L693 R694 A695 D696 K697 V700 E705 S712 G713 V714 R720 V724 Q725 A729 I732 V733 I734 K735 V736 N737 E738 D739 E740 M741 Y742 P743 G744 E745 A746 G747 I748 D749 I750
Y756 C764 I765 P769 C770 V771 E778 D781 V782 L783 P787 D790 L791 L794 A795 L796 G797 Q798 N799 M800 R801 V802 W807 N808 G809 Y810 N811 F812 E813 D814 E820 Q824 R827 F828 T829 H832 L836 A837 C838 D842 I850 P855 N856
I870 V871 Y872 A875 L883 V884 G885 K886 V887 K890 G891 E892 L895 T896 P897 E898 R903 E908 K909 A910 V913 S917 L918 R919 V920 P921 N922 G923 V924 V928 V933 D942 K943 R944 E949 E950 M951 L960 E963 I966 L967 E968 L971
F972 S973 R974 I975 R976 L979 V980 A981 G982 G983 V984 E985 A986 E987 K988 D990 K991 L992 R996 W997 L998 E999 L1000 G1001 L1002 T1003 D1004 E1005 E1006 K1007 Q1010 Q1013 L1014 A1015 E1016 Q1017 Y1018 F1025 K1035 I1036 T1037 A1043 P1044 G1045 K1048 I1049 V1050 K1051 V1052 Y1053 L1054
R1058 R1059 P1062 G1063 D1064 K1065 M1066 A1067 H1070 G1071 N1072 K1073 I1076 S1077 K1078 I1079 N1080 P1081 I1082 E1083 P1086 Y1087 G1091 I1096 V1097 L1098 N1099 P1100 S1105 R1106 M1107 N1108 I1109 G1110 Q1111 E1114 T1115 H1116 L1117 I1124 I1128 N1129 A1130 M1131 E1137 K1140 L1141
R1142 Q1146 Y1149 D1150 L1151 G1152 A1153 D1154 V1155 R1156 Q1157 K1158 Y1159 D1160 L1161 S1162 T1163 F1164 S1165 D1166 L1172 A1173 E1174 N1175 L1176 R1177 M1180 P1181 I1182 A1183 T1184 P1185 D1188 G1189 A1190 K1191 E1192 A1193 E1194 I1195 K1196 E1197 L1198 L1199 G1202 D1203 T1206 I1210 R1211 L1212 G1215
R1216 Q1220 F1221 E1222 V1225 Y1229 M1230 L1233 K1234 H1237 L1238 V1239 D1240 M1243 H1244 S1247 T1248 G1249 S1250 L1253 V1254 T1255 Q1256 F1265 E1272 M1273 E1274 V1275 W1276 A1280 Y1281 G1282 A1283 A1284 Y1285 T1286 L1287 Q1288 E1289 D1296 D1297 G1300 R1301 I1308 N1312

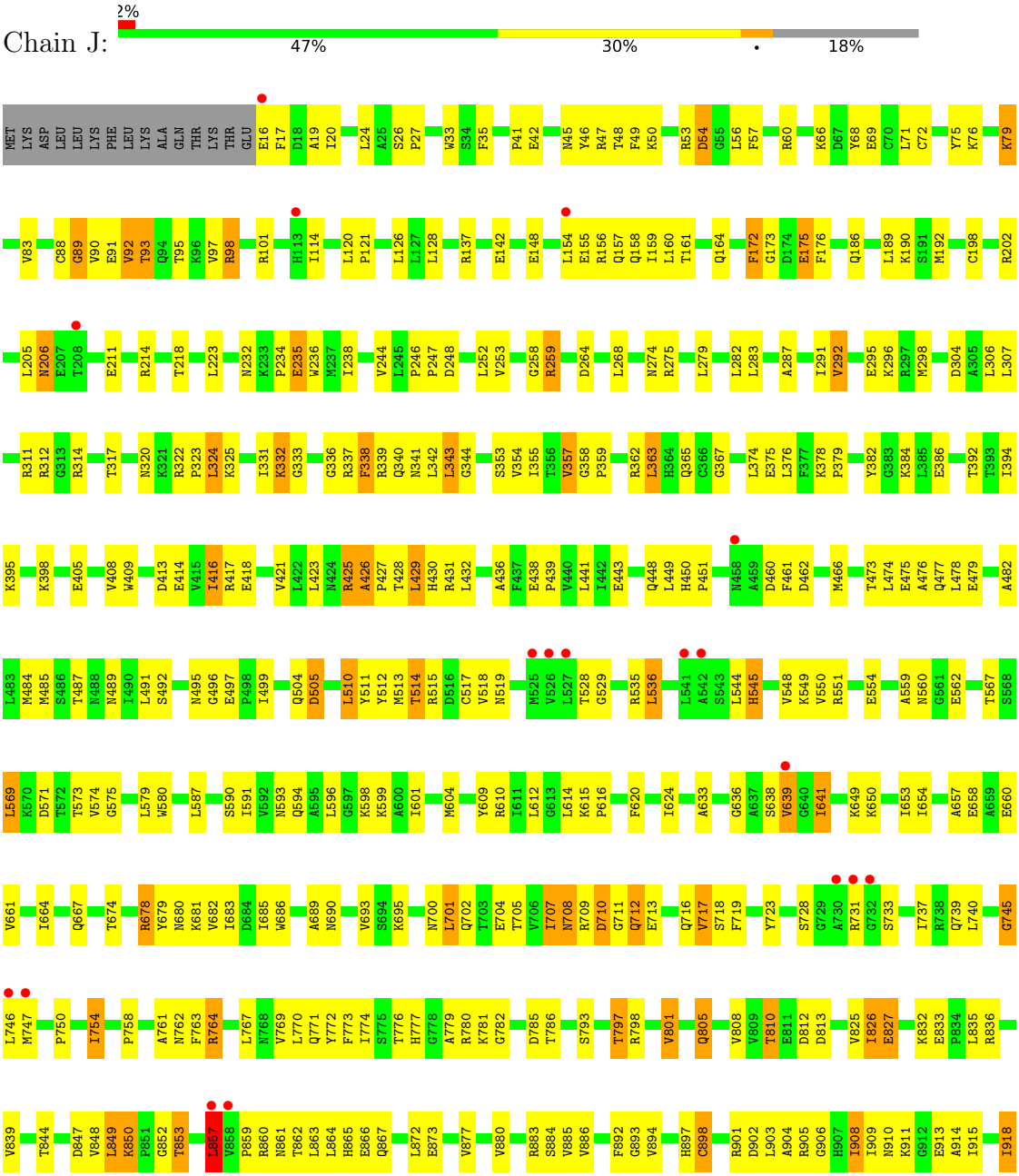


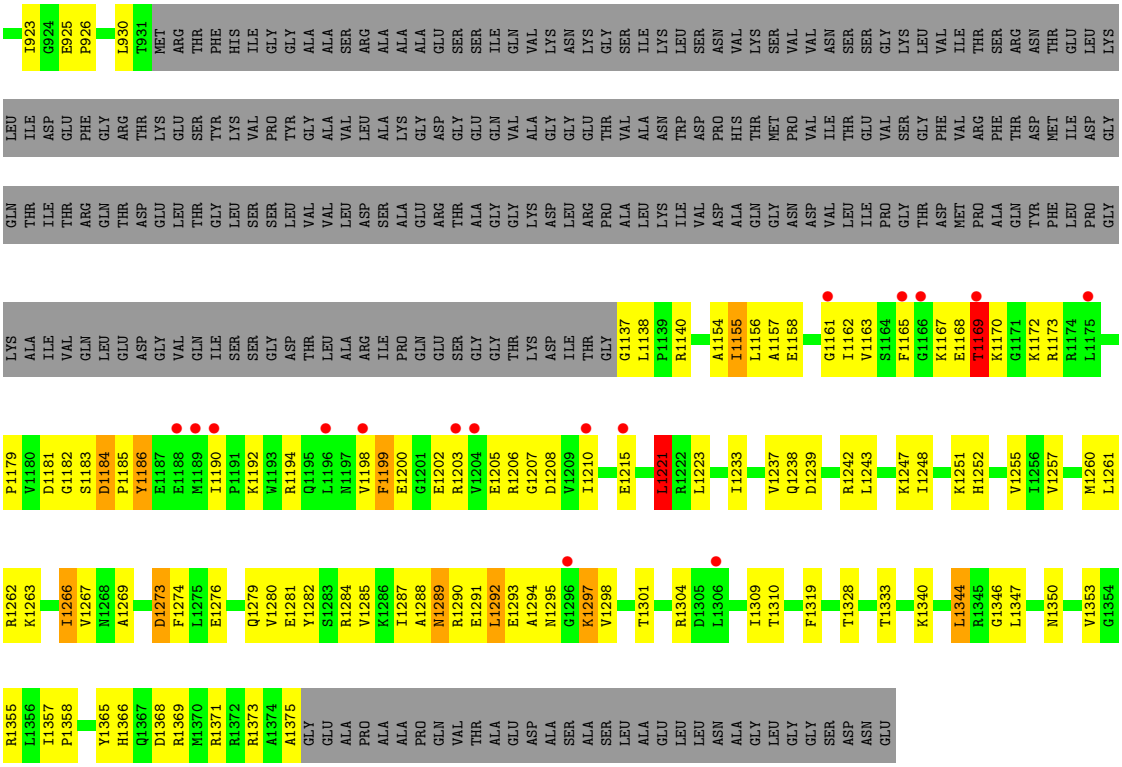
• Molecule 3: DNA-directed RNA polymerase subunit beta'



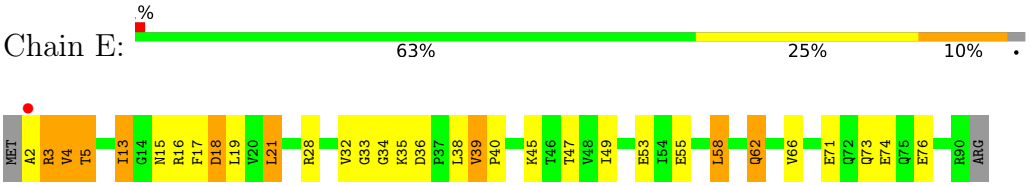


• Molecule 3: DNA-directed RNA polymerase subunit beta'

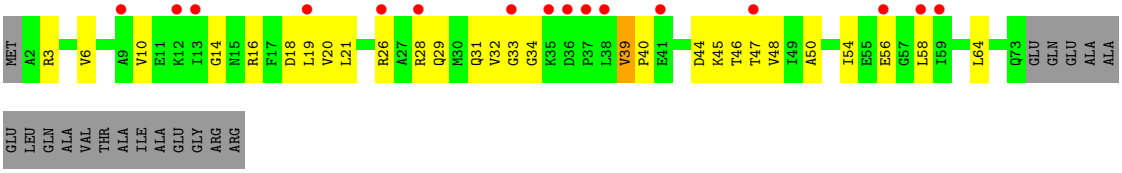




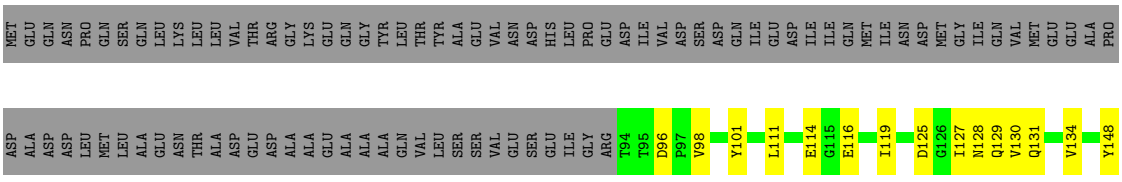
• Molecule 4: DNA-directed RNA polymerase subunit omega

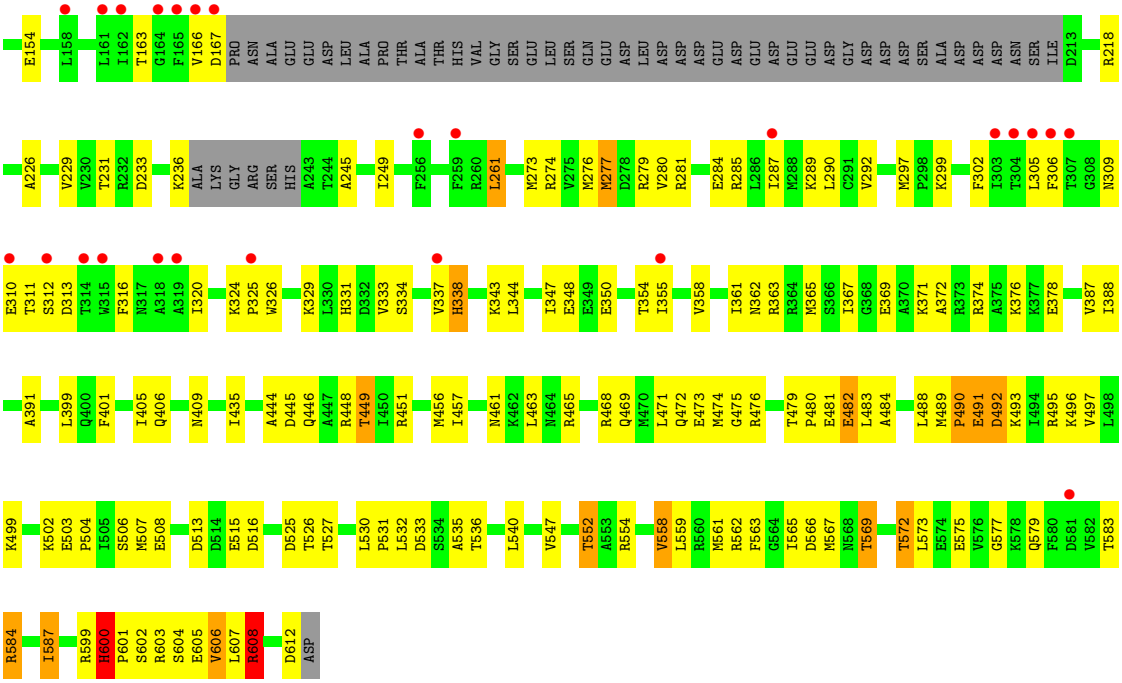


• Molecule 4: DNA-directed RNA polymerase subunit omega



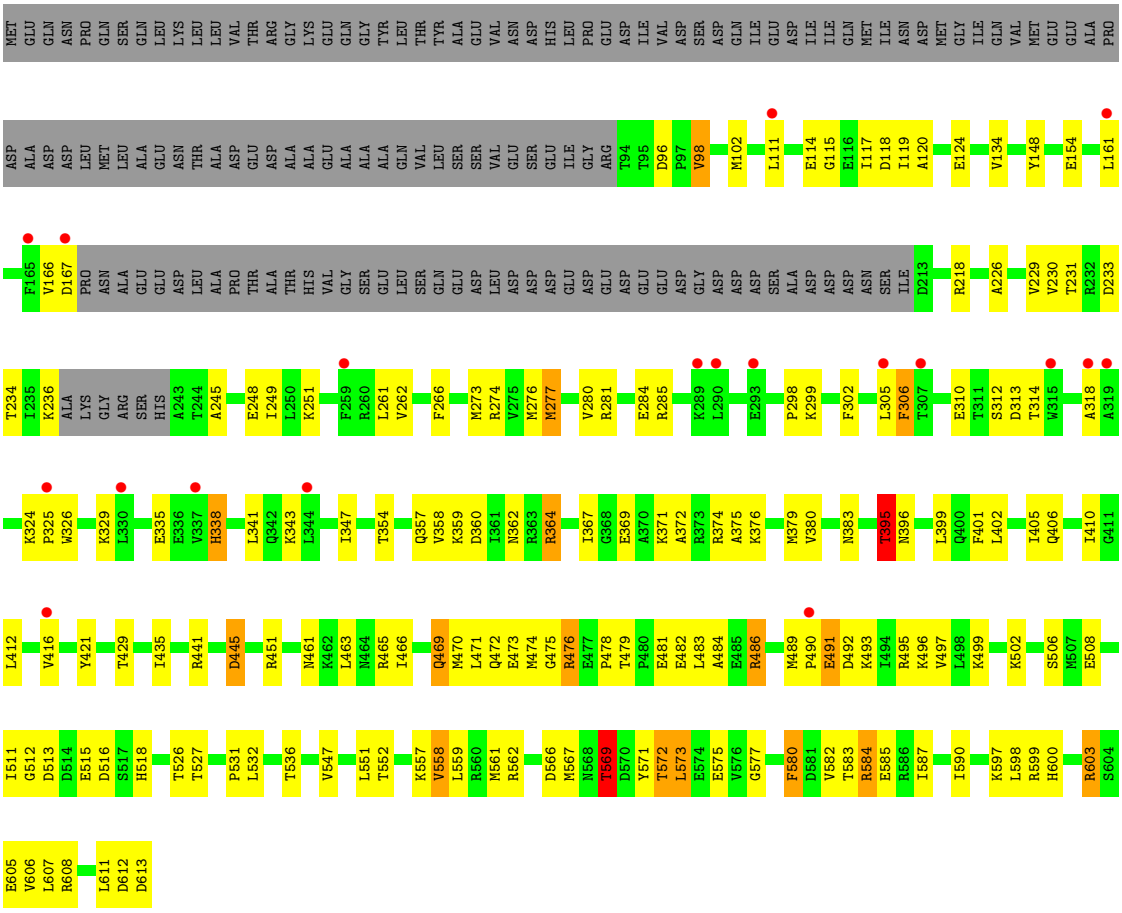
• Molecule 5: RNA polymerase sigma factor RpoD





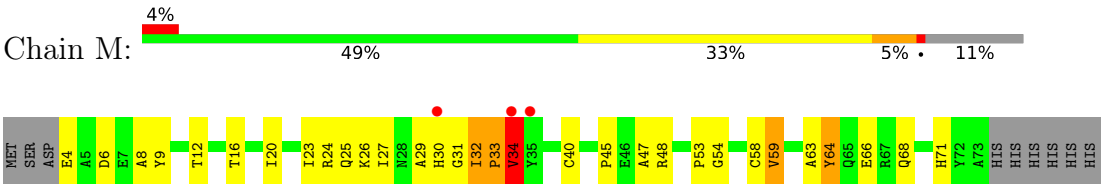
• Molecule 5: RNA polymerase sigma factor RpoD

Chain L:



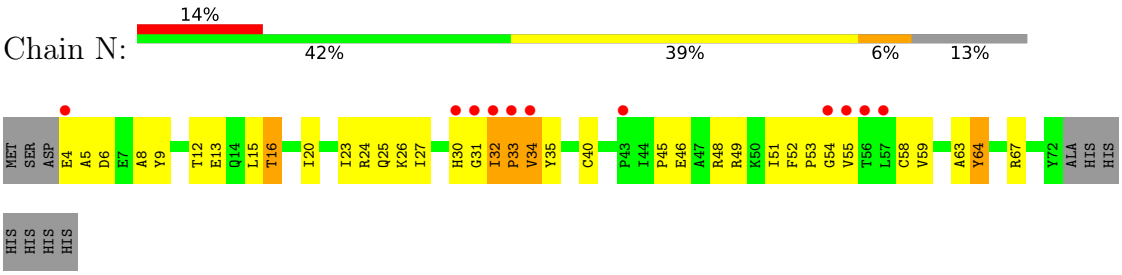
• Molecule 6: Protein TraR

Chain M:



• Molecule 6: Protein TraR

Chain N:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	186.48Å 206.04Å 310.30Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.84 – 3.81 49.84 – 3.81	Depositor EDS
% Data completeness (in resolution range)	99.6 (49.84-3.81) 86.5 (49.84-3.81)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	0.60 (at 3.77Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.208 , 0.262 0.208 , 0.262	Depositor DCC
R_{free} test set	2000 reflections (1.70%)	wwPDB-VP
Wilson B-factor (Å^2)	156.4	Xtriage
Anisotropy	0.169	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 180.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	56825	wwPDB-VP
Average B, all atoms (Å^2)	239.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.65% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: 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	0.29	0/2524	0.63	1/3421 (0.0%)
1	B	0.30	0/1697	0.60	0/2300
1	G	0.28	0/1777	0.59	0/2408
1	H	0.29	0/1681	0.63	2/2278 (0.1%)
2	C	0.30	0/10733	0.58	1/14482 (0.0%)
2	I	0.29	0/10735	0.56	0/14484
3	D	0.31	0/9235	0.59	0/12472
3	J	0.29	0/9140	0.56	2/12341 (0.0%)
4	E	0.27	0/693	0.52	0/935
4	K	0.26	0/575	0.43	0/774
5	F	0.28	0/3864	0.54	1/5194 (0.0%)
5	L	0.27	0/3872	0.53	0/5205
6	M	0.34	0/567	0.64	1/766 (0.1%)
6	N	0.37	0/562	0.64	1/759 (0.1%)
All	All	0.29	0/57655	0.57	9/77819 (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
2	C	0	2
2	I	0	2
3	D	0	2
3	J	0	2
5	F	0	1
All	All	0	9

There are no bond length outliers.

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	318	LEU	CA-CB-CG	6.11	129.35	115.30
6	M	32	ILE	C-N-CD	-6.10	107.18	120.60
1	H	29	GLU	C-N-CD	-5.98	107.44	120.60
3	J	1221	LEU	CA-CB-CG	5.83	128.71	115.30
6	N	32	ILE	C-N-CD	-5.66	108.16	120.60

There are no chirality outliers.

5 of 9 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
5	F	600	HIS	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	61	0
1	G	1755	0	1773	78	0
1	H	1662	0	1687	59	0
2	C	10564	0	10571	426	0
2	I	10566	0	10576	351	0
3	D	9095	0	9222	385	0
3	J	9001	0	9167	375	0
4	E	691	0	695	26	0
4	K	573	0	587	20	0
5	F	3813	0	3880	119	0
5	L	3821	0	3884	109	0
6	M	557	0	547	31	0
6	N	552	0	542	44	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	56825	0	57376	1966	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 17.

The worst 5 of 1966 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)
1:A:45:ARG:HG2	1:B:38:THR:HB	1.42	1.02
1:G:190:ALA:HB2	1:G:200:LYS:HB2	1.42	1.01
2:C:525:THR:HG21	2:C:687:ARG:HD2	1.38	1.00
2:C:696:ASP:HB2	2:C:798:GLN:HG2	1.44	0.99
2:C:10:ARG:HD3	2:C:1181:PRO:HG2	1.46	0.96

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	317/329 (96%)	247 (78%)	52 (16%)	18 (6%)	1 21
1	B	213/329 (65%)	194 (91%)	15 (7%)	4 (2%)	8 42
1	G	225/329 (68%)	199 (88%)	20 (9%)	6 (3%)	5 35
1	H	212/329 (64%)	196 (92%)	12 (6%)	4 (2%)	8 42
2	C	1338/1342 (100%)	1201 (90%)	118 (9%)	19 (1%)	11 46
2	I	1338/1342 (100%)	1197 (90%)	120 (9%)	21 (2%)	9 44

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
3	D	1169/1407 (83%)	1038 (89%)	104 (9%)	27 (2%)	6 38
3	J	1151/1407 (82%)	1026 (89%)	99 (9%)	26 (2%)	6 38
4	E	87/91 (96%)	80 (92%)	5 (6%)	2 (2%)	6 38
4	K	70/91 (77%)	61 (87%)	8 (11%)	1 (1%)	11 46
5	F	462/613 (75%)	426 (92%)	28 (6%)	8 (2%)	9 43
5	L	463/613 (76%)	425 (92%)	30 (6%)	8 (2%)	9 43
6	M	68/79 (86%)	56 (82%)	7 (10%)	5 (7%)	1 16
6	N	67/79 (85%)	56 (84%)	6 (9%)	5 (8%)	1 15
All	All	7180/8380 (86%)	6402 (89%)	624 (9%)	154 (2%)	7 40

5 of 154 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%)	226 (81%)	52 (19%)	1 11
1	B	186/286 (65%)	171 (92%)	15 (8%)	11 41
1	G	193/286 (68%)	169 (88%)	24 (12%)	4 24
1	H	183/286 (64%)	172 (94%)	11 (6%)	19 50
2	C	1154/1157 (100%)	1052 (91%)	102 (9%)	10 38
2	I	1154/1157 (100%)	1058 (92%)	96 (8%)	11 40
3	D	962/1168 (82%)	882 (92%)	80 (8%)	11 40
3	J	960/1168 (82%)	876 (91%)	84 (9%)	10 38

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
4	E	72/75 (96%)	63 (88%)	9 (12%)	4 24
4	K	62/75 (83%)	59 (95%)	3 (5%)	25 56
5	F	417/540 (77%)	387 (93%)	30 (7%)	14 45
5	L	418/540 (77%)	380 (91%)	38 (9%)	9 36
6	M	59/68 (87%)	55 (93%)	4 (7%)	16 47
6	N	59/68 (87%)	56 (95%)	3 (5%)	24 54
All	All	6157/7160 (86%)	5606 (91%)	551 (9%)	9 38

5 of 551 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	J	641	ILE
3	J	847	ASP
3	J	573	THR
5	L	405	ILE
3	D	425	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 72 such sidechains are listed below:

Mol	Chain	Res	Type
3	J	206	ASN
6	M	71	HIS
3	J	680	ASN
3	J	1295	ASN
3	D	320	ASN

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

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

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, 95^{th} 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%)	-0.01	8 (2%) 57 49	152, 220, 344, 468	0
1	B	217/329 (65%)	-0.05	9 (4%) 37 31	140, 238, 332, 383	0
1	G	227/329 (68%)	-0.06	7 (3%) 49 40	204, 264, 358, 416	0
1	H	216/329 (65%)	0.41	19 (8%) 10 8	204, 298, 387, 432	0
2	C	1340/1342 (99%)	0.23	83 (6%) 20 16	104, 197, 403, 528	0
2	I	1340/1342 (99%)	0.38	109 (8%) 12 10	127, 264, 377, 485	0
3	D	1173/1407 (83%)	-0.07	12 (1%) 82 76	101, 174, 294, 419	0
3	J	1155/1407 (82%)	0.07	34 (2%) 51 42	125, 213, 329, 431	0
4	E	89/91 (97%)	-0.34	1 (1%) 80 74	160, 216, 269, 393	0
4	K	72/91 (79%)	1.28	16 (22%) 0 0	227, 323, 429, 470	0
5	F	468/613 (76%)	0.08	25 (5%) 26 23	137, 239, 365, 477	0
5	L	469/613 (76%)	-0.06	19 (4%) 37 31	162, 251, 379, 489	0
6	M	70/79 (88%)	0.12	3 (4%) 35 30	226, 315, 399, 479	0
6	N	69/79 (87%)	0.45	11 (15%) 1 2	325, 403, 501, 568	0
All	All	7224/8380 (86%)	0.14	356 (4%) 29 25	101, 230, 372, 568	0

The worst 5 of 356 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	338	THR	14.4
2	C	252	SER	10.7
2	C	241	LEU	9.4
3	J	1198	VAL	9.2
2	C	251	ALA	9.1

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, 95^{th} 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
7	MG	D	2001	1/1	0.42	0.18	251,251,251,251	0
8	ZN	N	101	1/1	0.78	0.06	465,465,465,465	0
8	ZN	M	101	1/1	0.84	0.04	468,468,468,468	0
8	ZN	J	2002	1/1	0.87	0.15	229,229,229,229	0
8	ZN	D	2002	1/1	0.94	0.15	182,182,182,182	0
8	ZN	D	2003	1/1	0.97	0.49	334,334,334,334	0
7	MG	J	2001	1/1	0.98	0.47	170,170,170,170	0
8	ZN	J	2003	1/1	0.99	0.24	126,126,126,126	0

6.5 Other polymers (i)

There are no such residues in this entry.