wwPDB X-ray Structure Validation Summary Report (i)

Oct 26, 2023 – 03:22 AM EDT

PDB ID	:	3AOH
Title	:	RNA polymerase-Gfh1 complex (Crystal type 1)
Authors	:	Tagami, S.; Sekine, S.; Kumarevel, T.; Yamamoto, M.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on	:	2010-09-28
Resolution	:	4.10 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 (1)) were used in the production of this report:

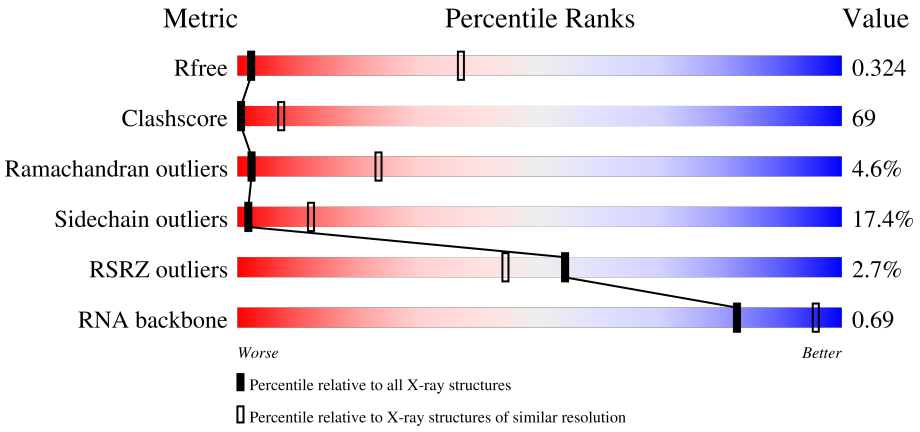
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 4.10 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	1193 (4.50-3.70)
Clashscore	141614	1003 (4.44-3.76)
Ramachandran outliers	138981	1005 (4.48-3.72)
Sidechain outliers	138945	1199 (4.50-3.70)
RSRZ outliers	127900	1034 (4.50-3.70)
RNA backbone	3102	1049 (5.04-3.00)

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	315	17% 46% 7% 29%
1	B	315	21% 41% 9% 29%
1	F	315	18% 43% 9% 30%
1	G	315	22% 40% 8% 29%

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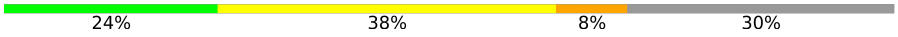
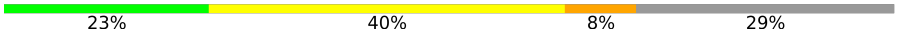
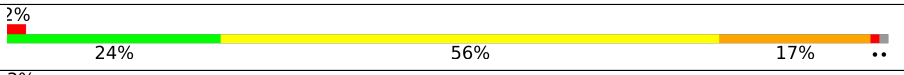
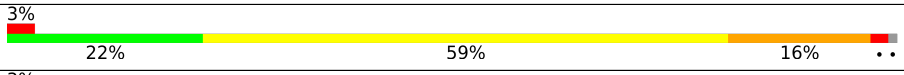
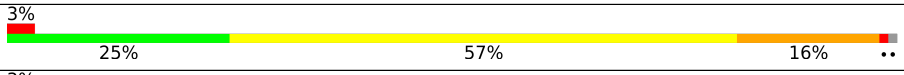
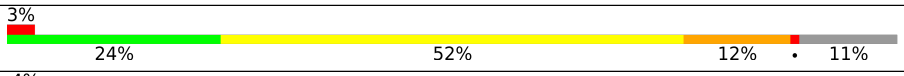
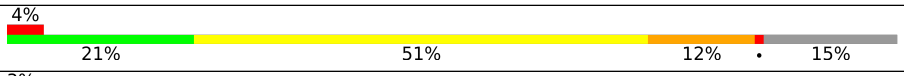
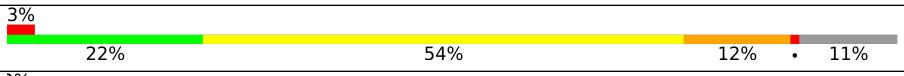
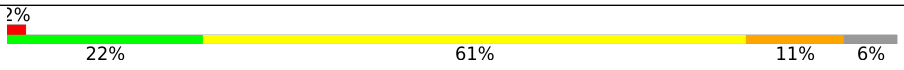
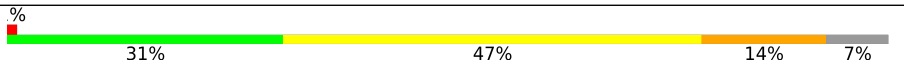
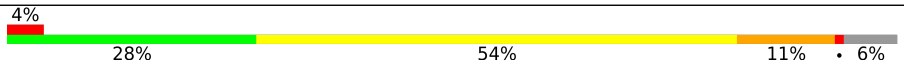
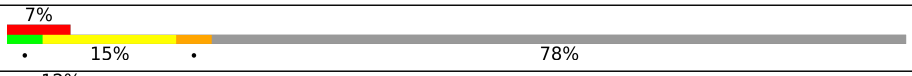
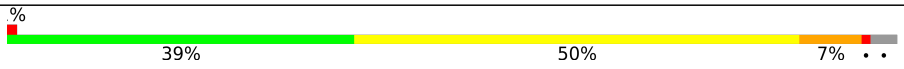
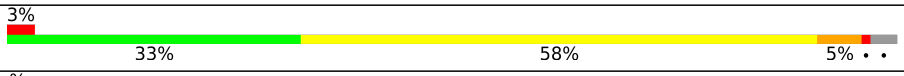
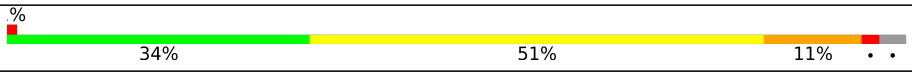
Mol	Chain	Length	Quality of chain
1	K	315	
1	L	315	
2	C	1119	
2	H	1119	
2	M	1119	
3	D	1524	
3	I	1524	
3	N	1524	
4	E	99	
4	J	99	
4	O	99	
5	P	27	
6	Q	33	
7	X	156	
7	Y	156	
7	Z	156	

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 74250 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	223	Total	C	N	O	S	0	0	0
			1759	1123	306	328	2			
1	B	223	Total	C	N	O	S	0	0	0
			1759	1123	306	328	2			
1	F	222	Total	C	N	O	S	0	0	0
			1750	1117	304	327	2			
1	G	223	Total	C	N	O	S	0	0	0
			1759	1123	306	328	2			
1	K	222	Total	C	N	O	S	0	0	0
			1750	1117	304	327	2			
1	L	223	Total	C	N	O	S	0	0	0
			1759	1123	306	328	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	1106	Total	C	N	O	S	0	0	0
			8733	5525	1558	1626	24			
2	H	1103	Total	C	N	O	S	0	0	0
			8710	5508	1555	1623	24			
2	M	1105	Total	C	N	O	S	0	0	0
			8729	5523	1557	1625	24			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	1349	Total	C	N	O	S	0	0	0
			10651	6740	1888	1991	32			
3	I	1289	Total	C	N	O	S	0	0	0
			10182	6444	1804	1903	31			
3	N	1351	Total	C	N	O	S	0	0	0
			10667	6749	1891	1995	32			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	93	Total	C	N	O	S	0	0	0
			754	481	131	138	4			
4	J	92	Total	C	N	O	S	0	0	0
			749	478	130	137	4			
4	O	93	Total	C	N	O	S	0	0	0
			754	481	131	138	4			

- Molecule 5 is a DNA chain called DNA (5'-D(*GP*GP*TP*CP*TP*GP*TP*AP*TP*CP*AP*CP*GP*AP*GP*CP*CP*AP*CP*CP*GP*CP*CP*GP*CP*AP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	P	6	Total	C	N	O	P	0	0	0
			120	56	22	36	6			

- Molecule 6 is a RNA chain called RNA (5'-R(*CP*CP*CP*CP*GP*GP*AP*AP*GP*AP*UP*CP*AP*UP*CP*UP*UP*CP*CP*GP*GP*GP*GP*GP*AP*U*GP*CP*GP*GP*CP*GP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	Q	7	Total	C	N	O	P	0	0	0
			152	68	31	47	6			

- Molecule 7 is a protein called Anti-cleavage anti-GreA transcription factor Gfh1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	X	152	Total	C	N	O	S	0	0	0
			1169	719	207	239	4			
7	Y	152	Total	C	N	O	S	0	0	0
			1169	719	207	239	4			
7	Z	152	Total	C	N	O	S	0	0	0
			1169	719	207	239	4			

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

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	D	1	Total	Zn	0	0
			1	1		
8	I	1	Total	Zn	0	0
			1	1		
8	N	1	Total	Zn	0	0
			1	1		

- Molecule 9 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

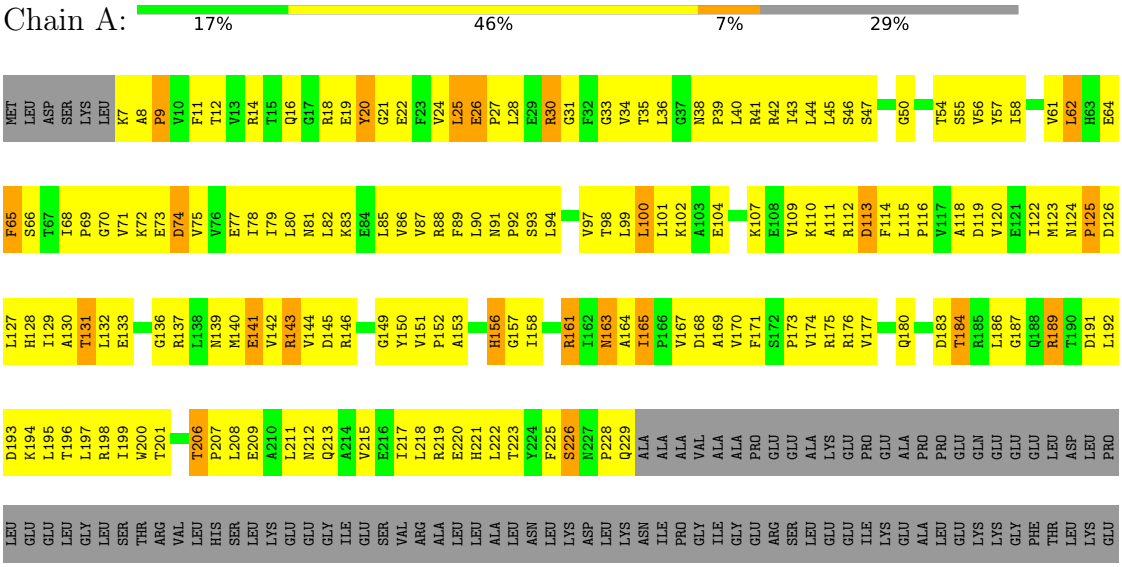
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	D	1	Total Mg 1 1	0	0
9	I	1	Total Mg 1 1	0	0
9	N	1	Total Mg 1 1	0	0

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.

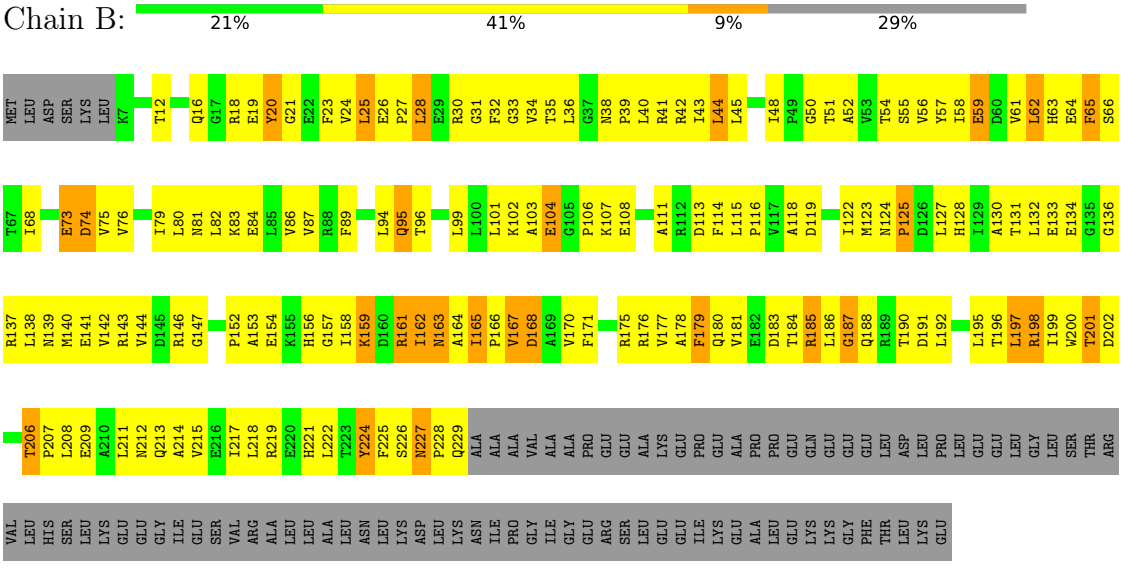
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain A:



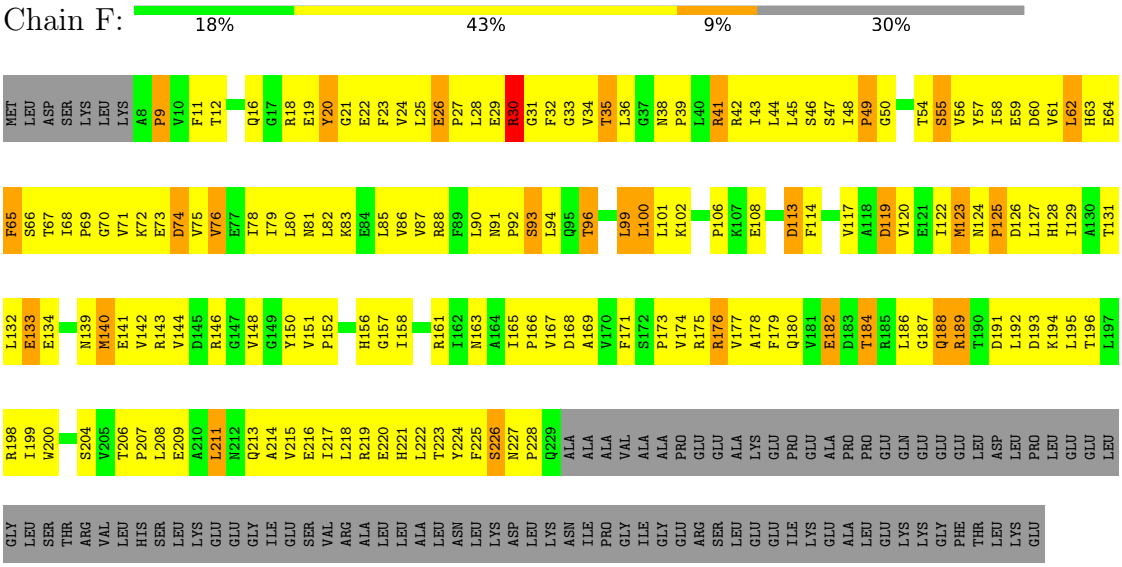
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain B:



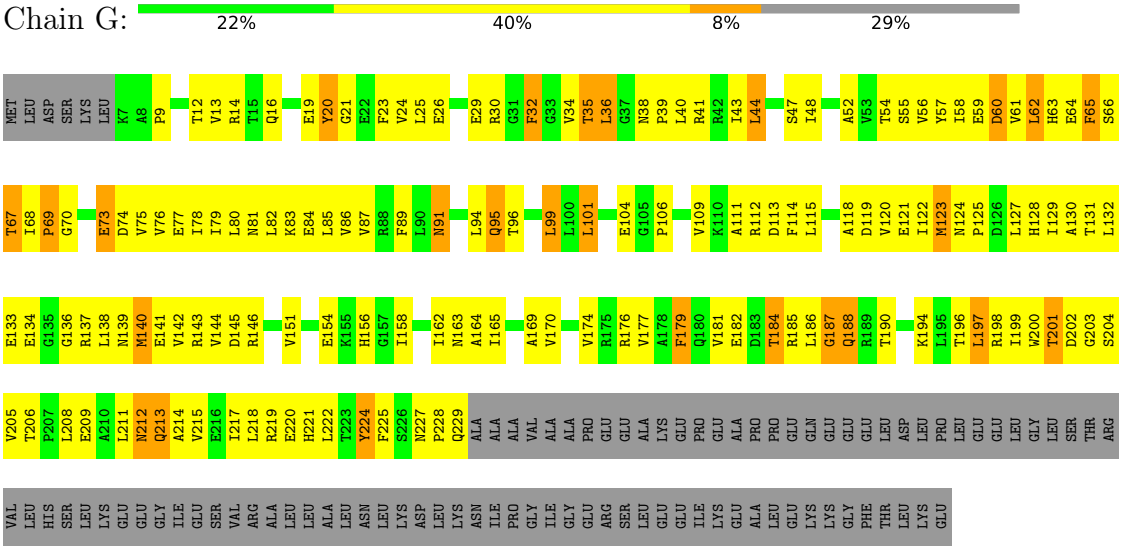
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain F:



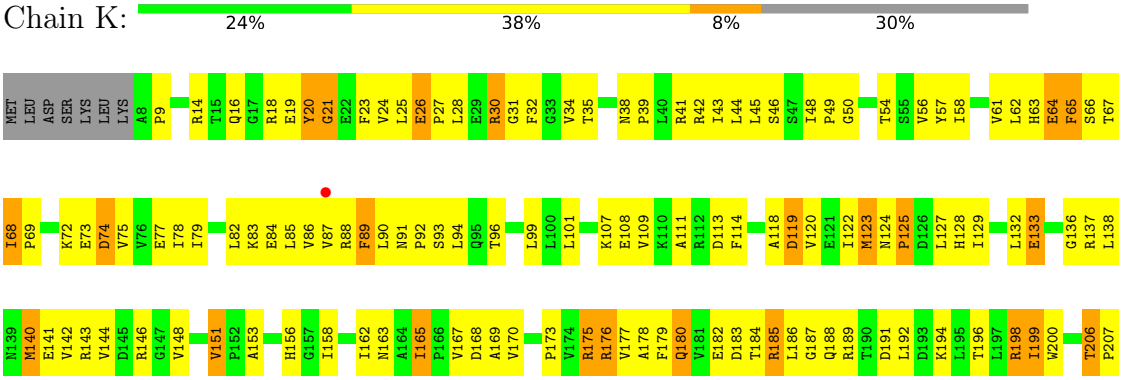
• Molecule 1: DNA-directed RNA polymerase subunit alpha

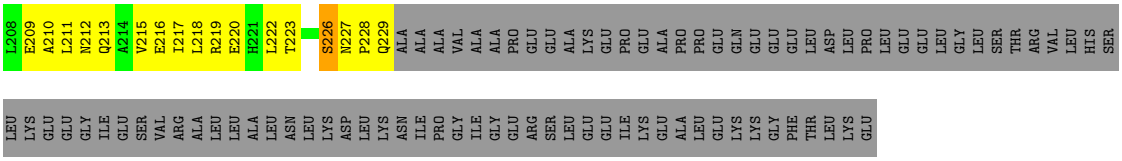
Chain G:



• Molecule 1: DNA-directed RNA polymerase subunit alpha

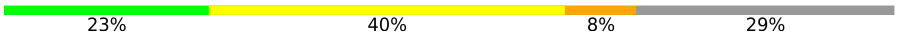
Chain K:

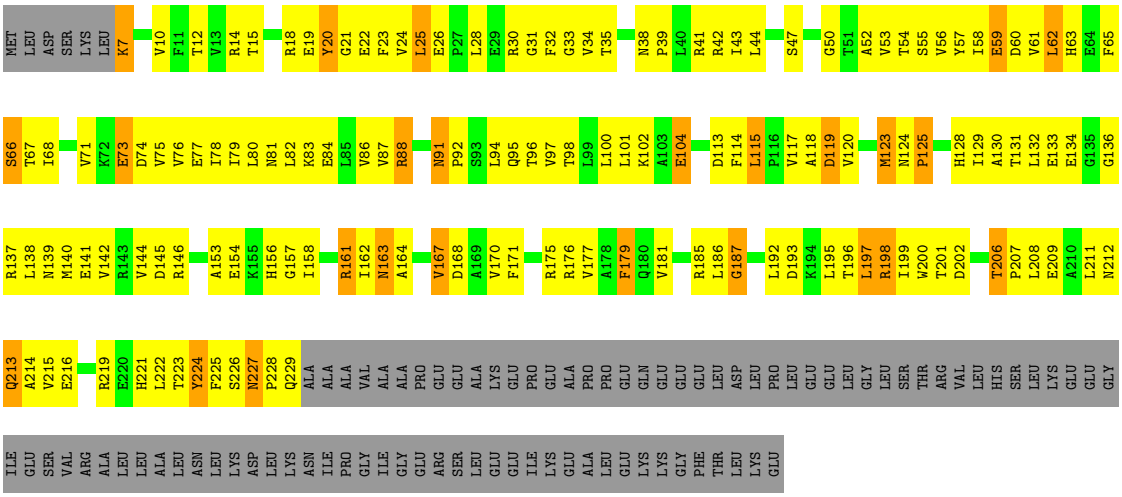




• Molecule 1: DNA-directed RNA polymerase subunit alpha

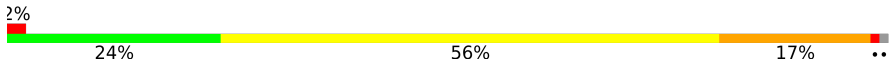
Chain L:

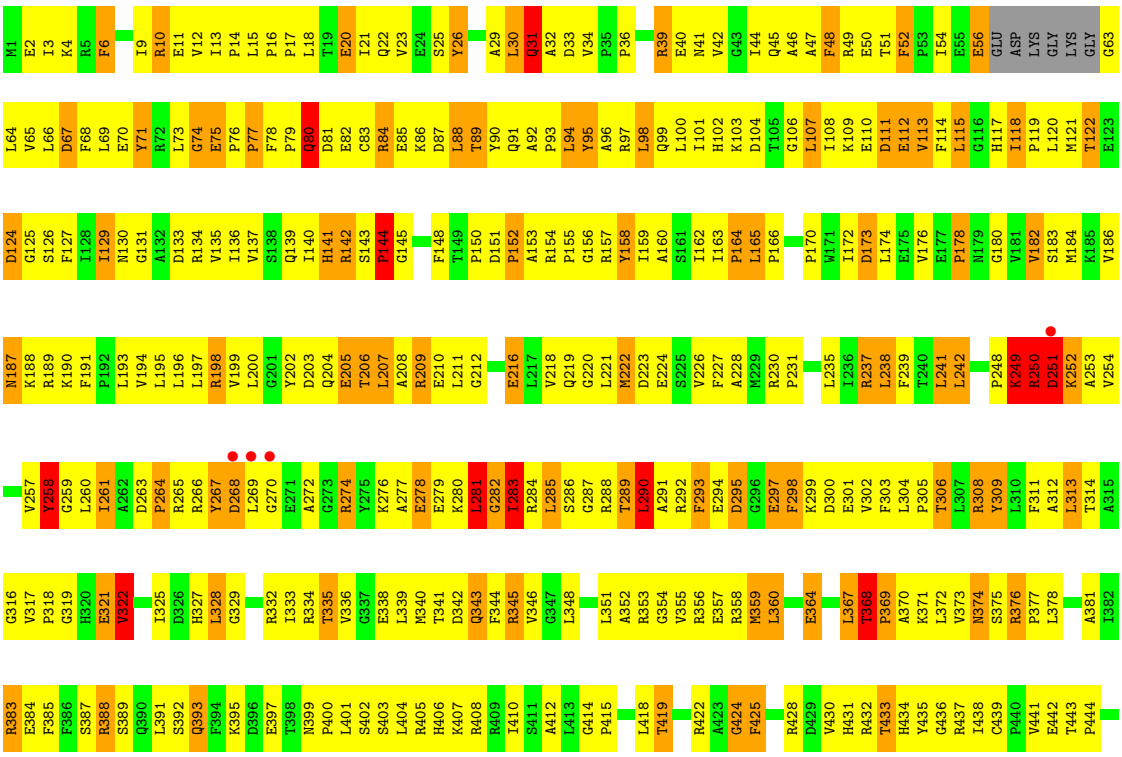


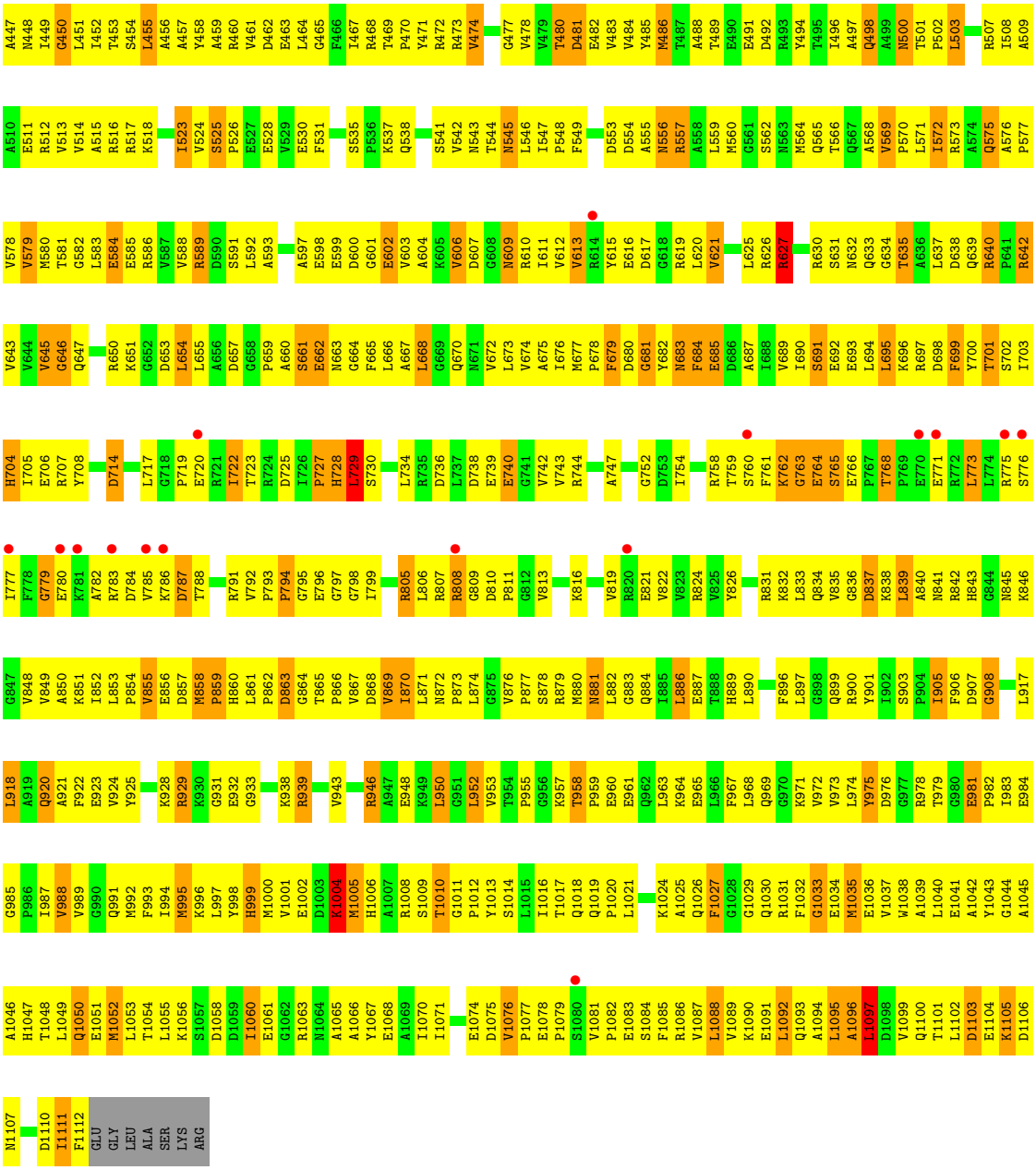


• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain C:

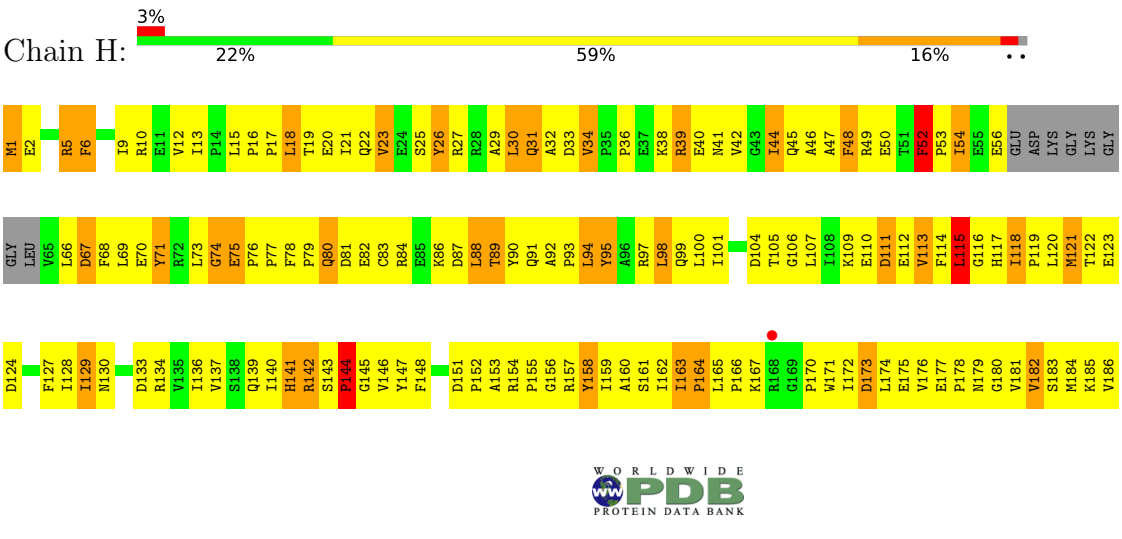


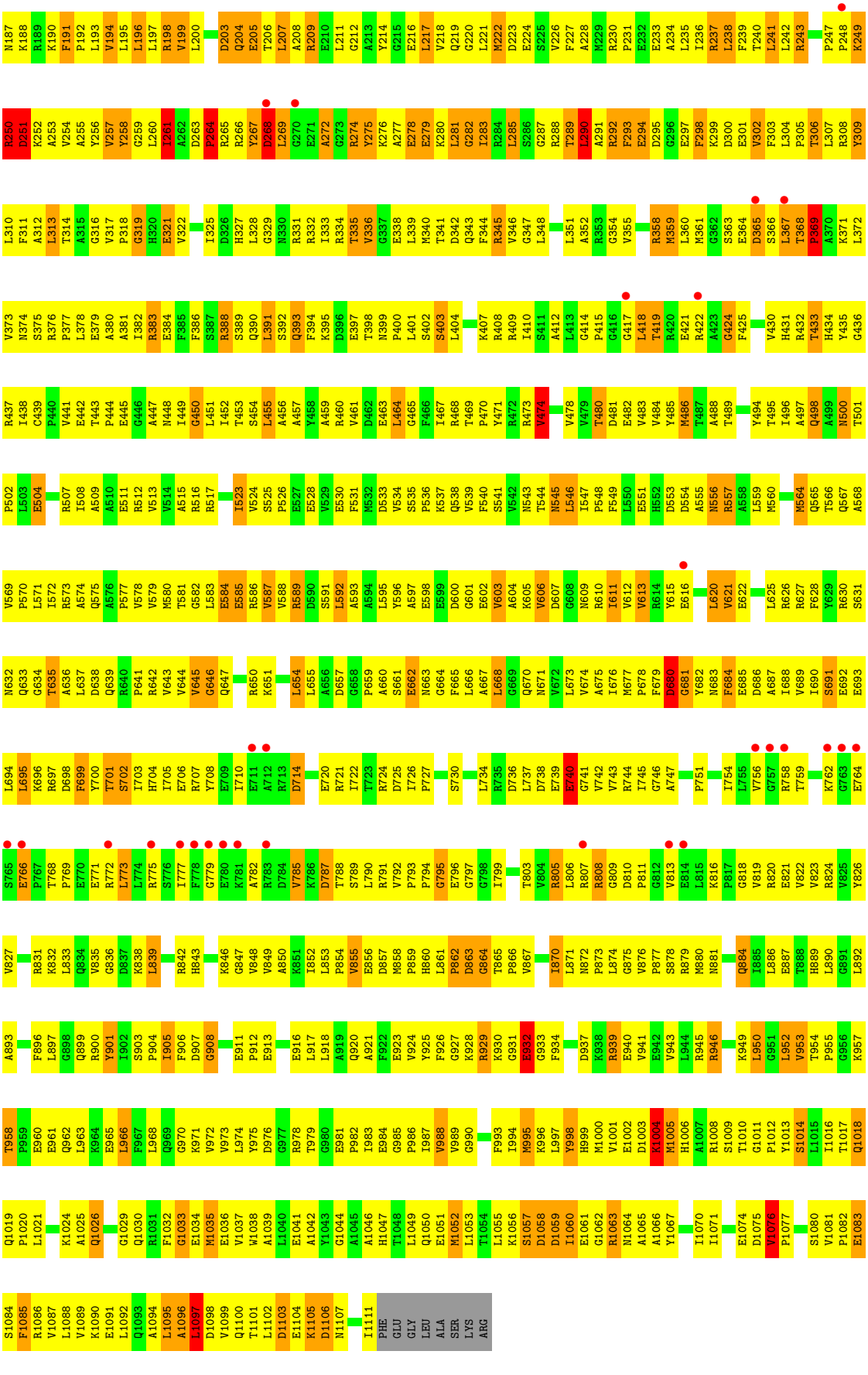




• Molecule 2: DNA-directed RNA polymerase subunit beta

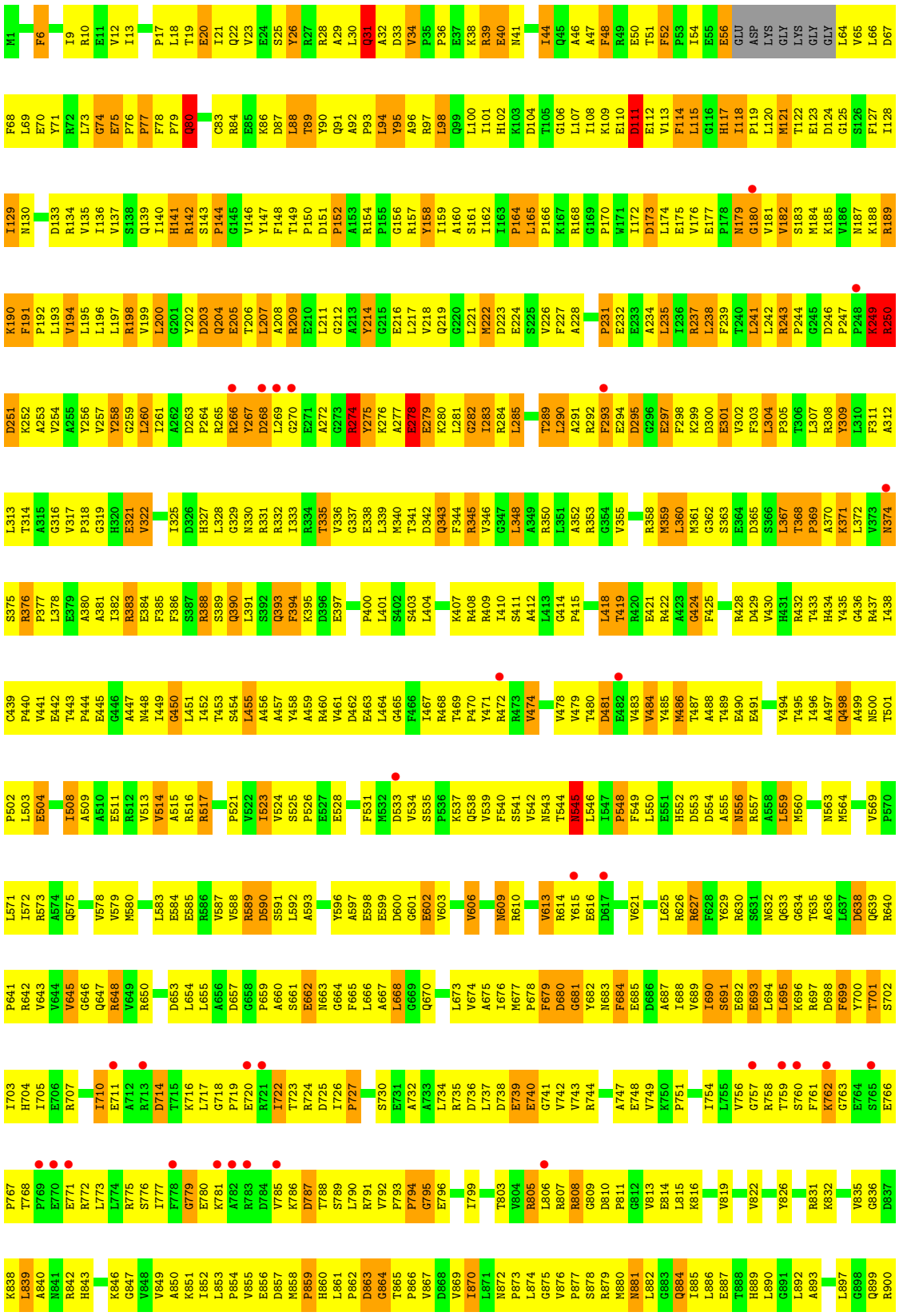
Chain H:

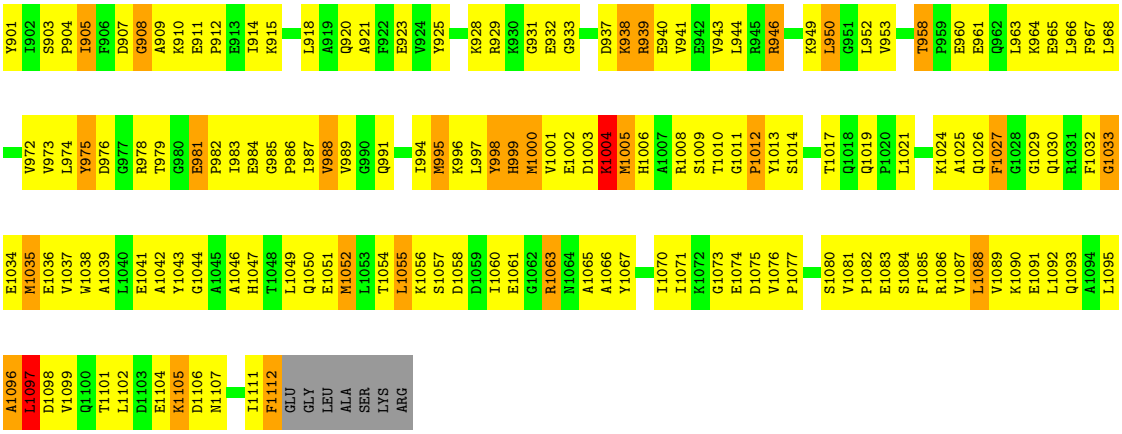




• Molecule 2: DNA-directed RNA polymerase subunit beta

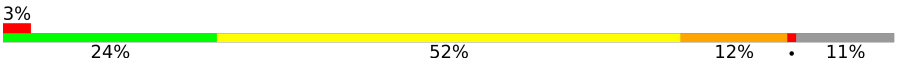
Chain M:

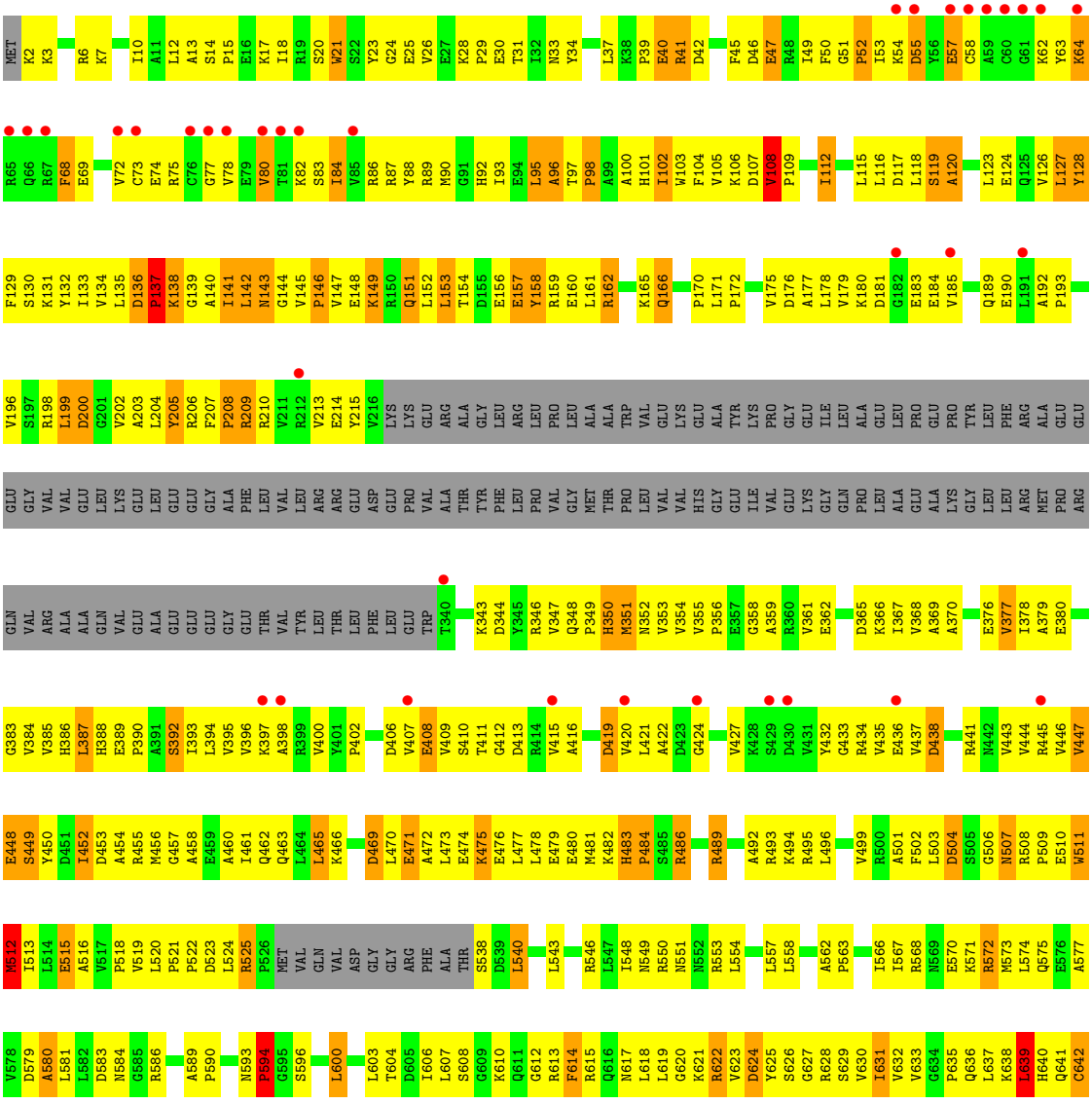


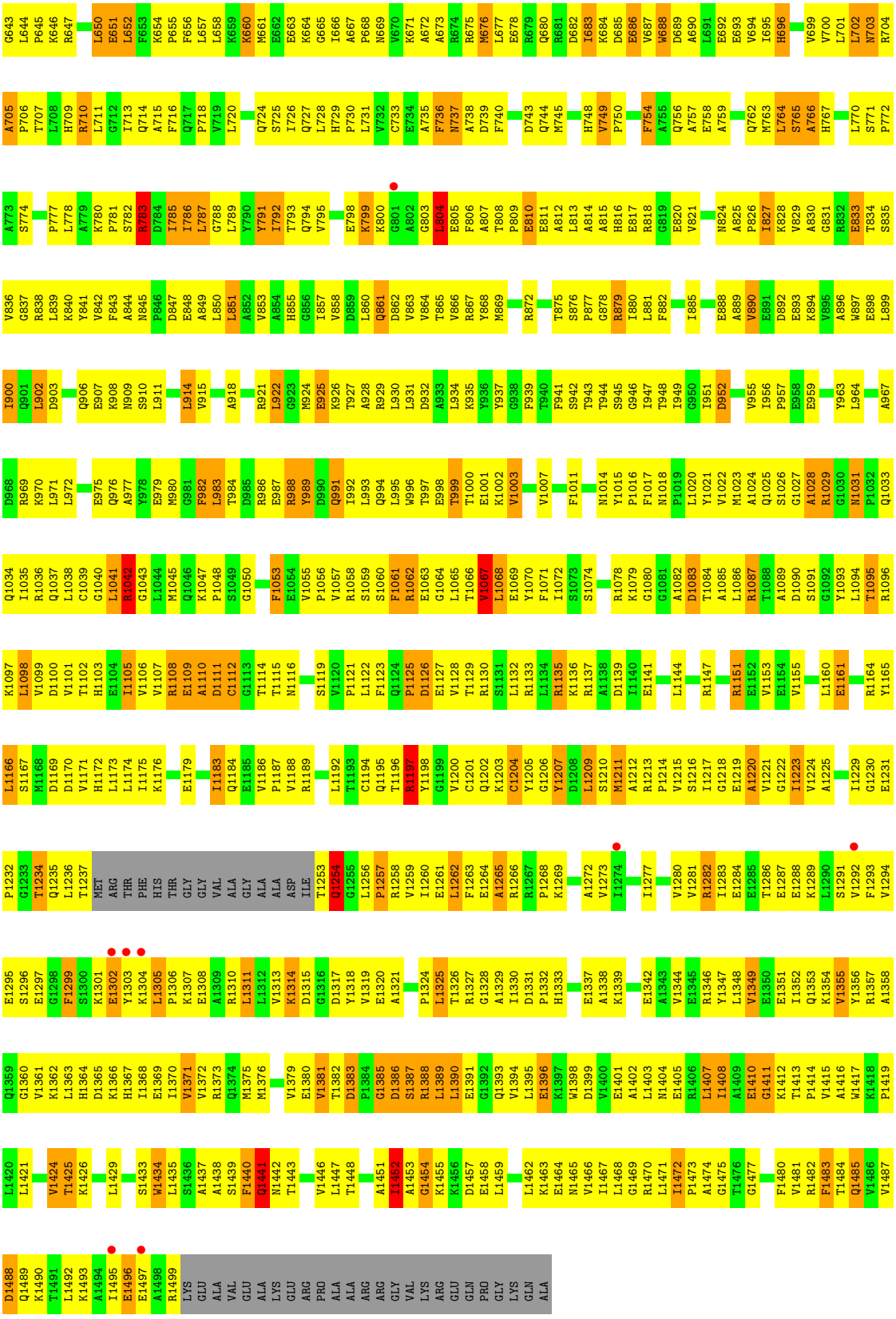


• Molecule 3: DNA-directed RNA polymerase subunit beta'

Chain D:

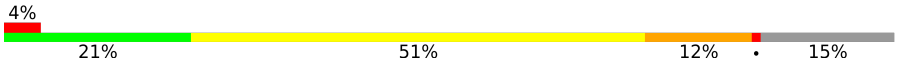


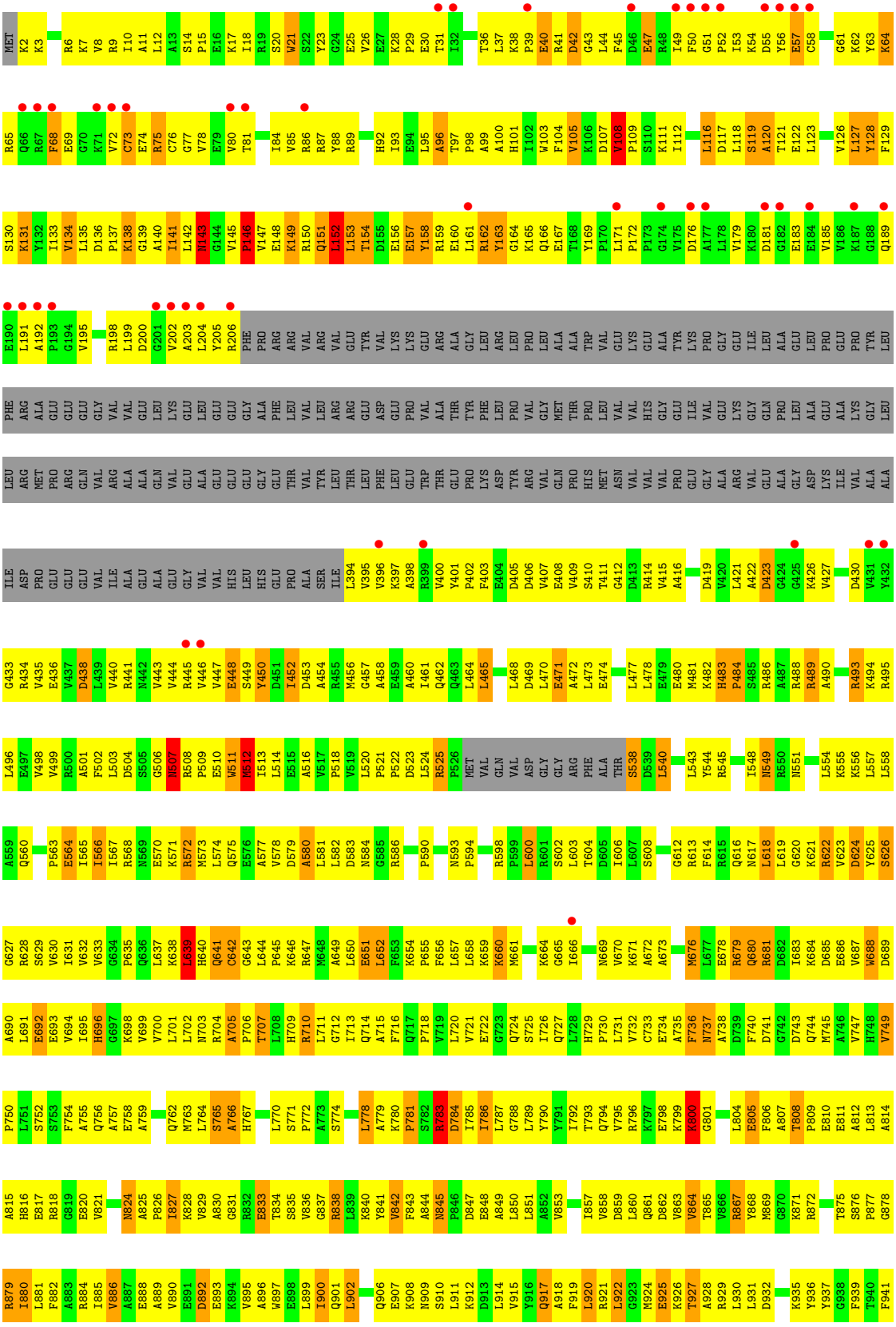


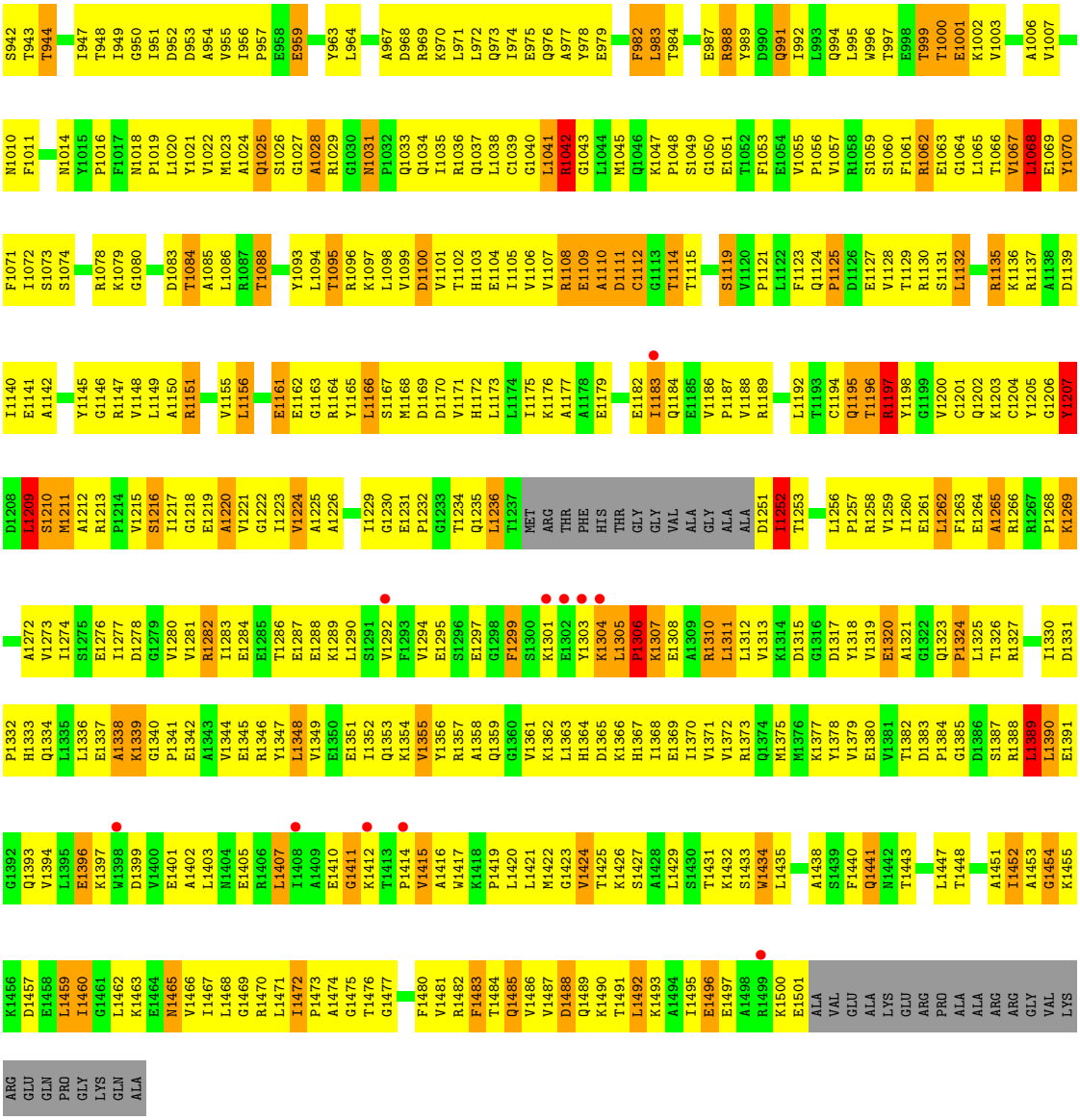


• Molecule 3: DNA-directed RNA polymerase subunit beta'

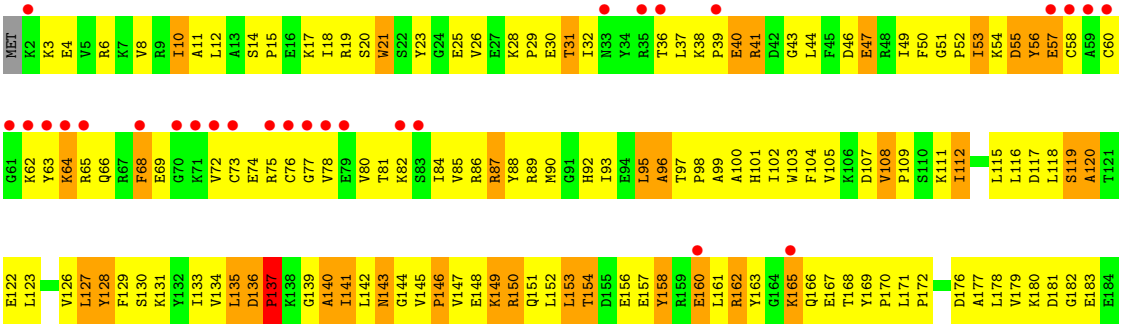
Chain I:

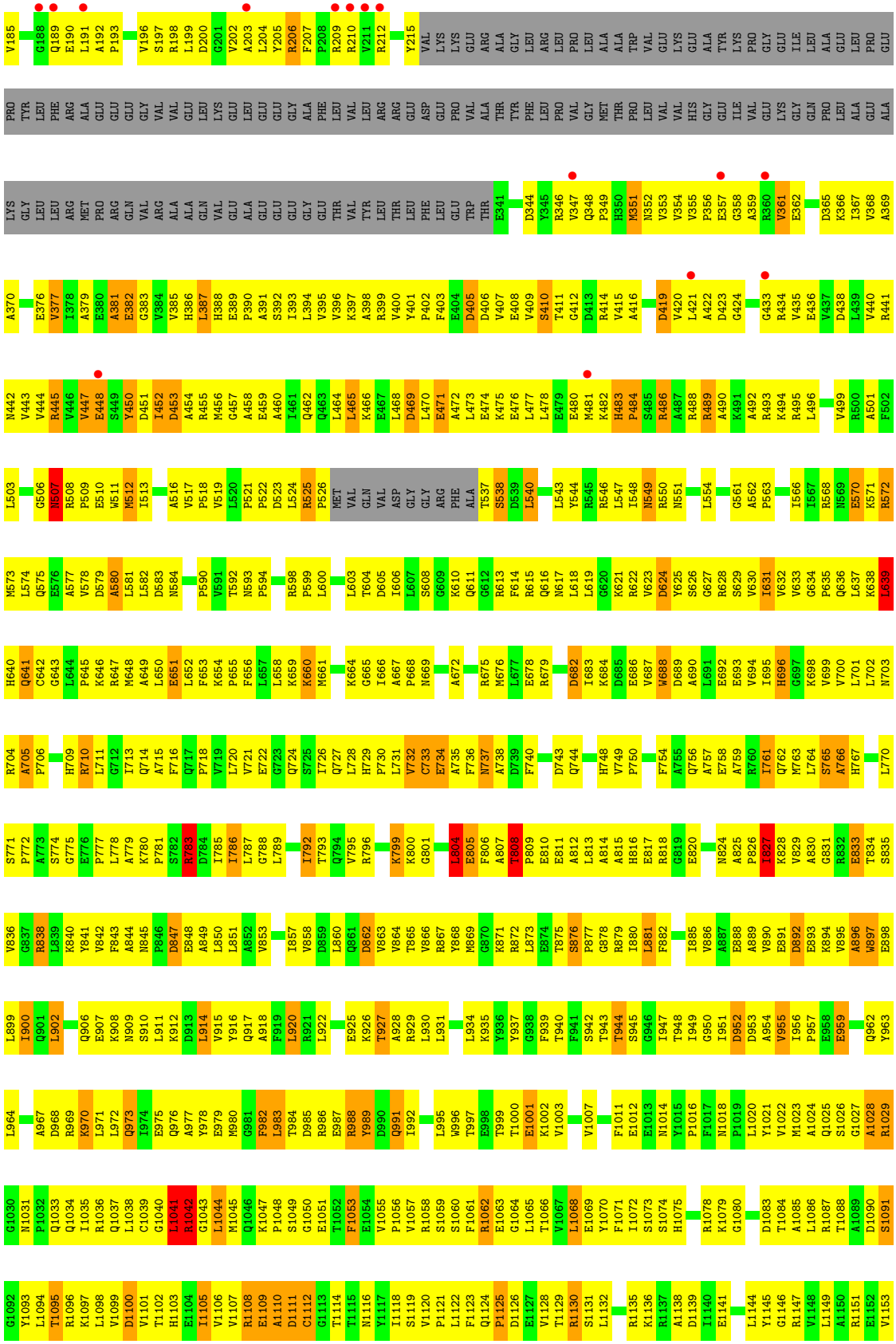


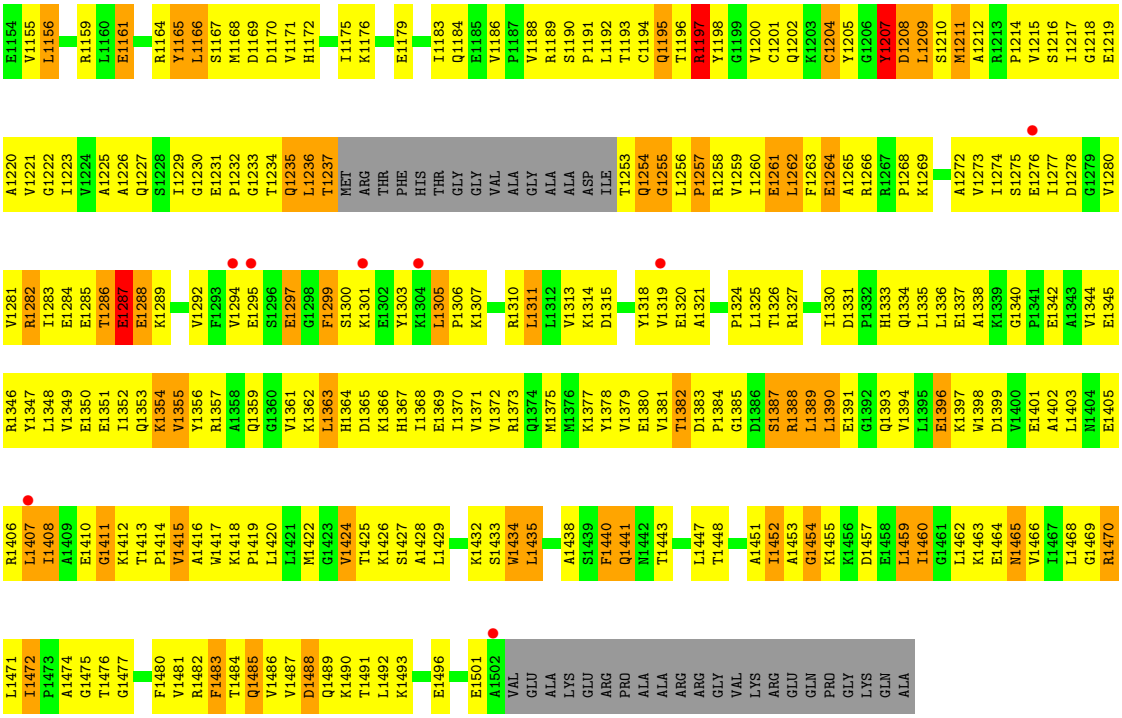




• Molecule 3: DNA-directed RNA polymerase subunit beta'

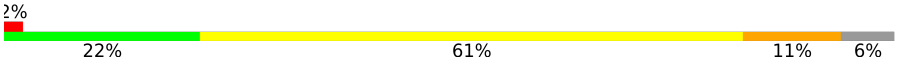


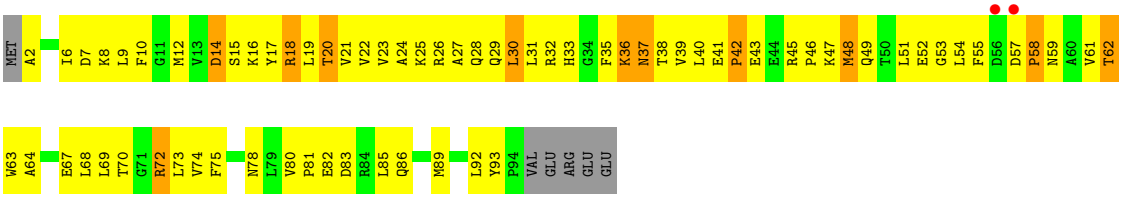




• Molecule 4: DNA-directed RNA polymerase subunit omega

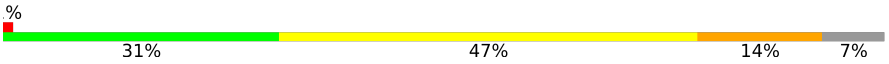
Chain E:

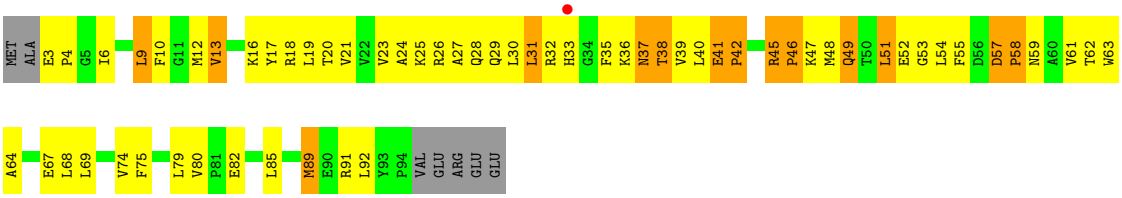




• Molecule 4: DNA-directed RNA polymerase subunit omega

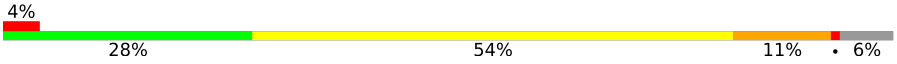
Chain J:

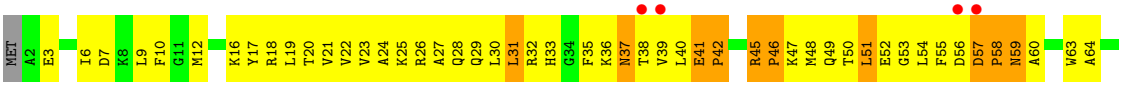




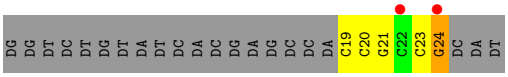
• Molecule 4: DNA-directed RNA polymerase subunit omega

Chain O:



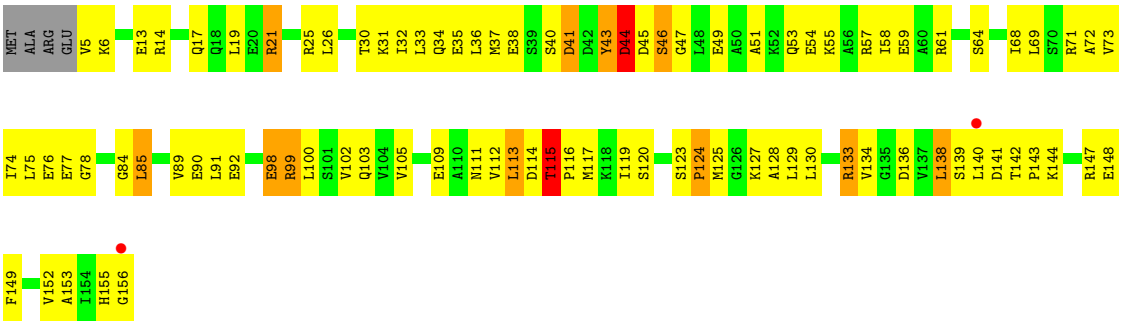


• Molecule 5: DNA (5'-D(*GP*GP*TP*CP*TP*GP*TP*AP*TP*CP*AP*CP*GP*AP*GP*CP*CP*AP*CP*CP*GP*CP*CP*GP*CP*AP*T)-3')

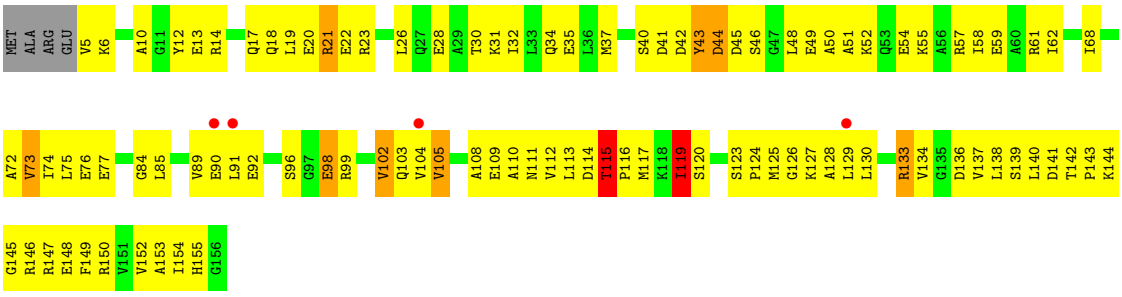


• Molecule 6: RNA (5'-R(*CP*CP*CP*CP*GP*GP*AP*AP*GP*AP*UP*CP*AP*UP*CP*UP*UP*CP*CP*GP*GP*GP*GP*GP*AP*U*GP*CP*GP*GP*CP*GP*G)-3')

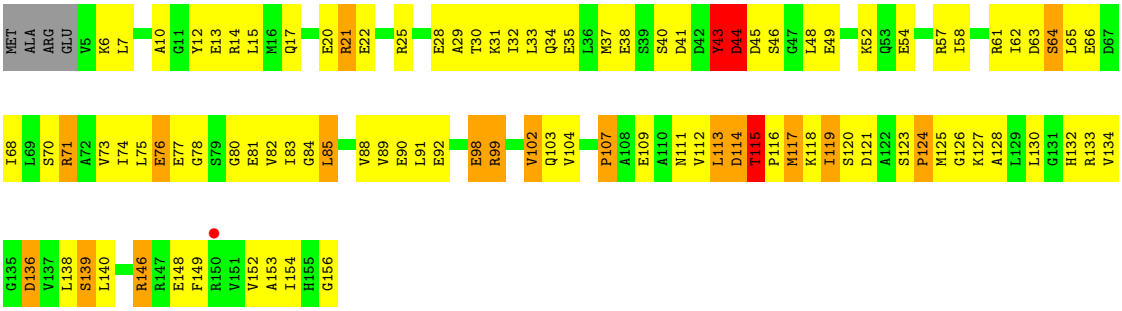
• Molecule 7: Anti-cleavage anti-GreA transcription factor Gfh1



• Molecule 7: Anti-cleavage anti-GreA transcription factor Gfh1



• Molecule 7: Anti-cleavage anti-GreA transcription factor Gfh1


MET
ALA
ARG
GLU
V5
K6
L7
A10
G11
Y12
E13
R14
L15
M16
Q17
E20
R21
E22
R25
E28
A29
T30
K31
I32
L33
Q34
E35
L36
M37
E38
S39
S40
D41
D42
Y43
D44
D45
S46
G47
L48
E49
K52
Q53
E54
R57
I58
R61
I62
D63
S64
L65
E66
D67
I68
L69
S70
R71
A72
V73
I74
L75
E76
E77
G78
S79
G80
E81
V82
I83
G84
L85
V88
V89
E90
L91
E92
E98
R99
V102
Q103
V104
P107
A108
E109
A110
N111
V112
L113
D114
T115
P116
M117
K118
I119
S120
D121
A122
S123
P124
M125
G126
K127
A128
L129
L130
G131
H132
R133
V134
G135
D136
V137
L138
S139
L140
R146
R147
E148
F149
R150
V151
V152
A153
I154
H155
G156

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	192.76Å 260.70Å 198.56Å 90.00° 117.58° 90.00°	Depositor
Resolution (Å)	49.87 – 4.10 49.87 – 4.10	Depositor EDS
% Data completeness (in resolution range)	96.9 (49.87-4.10) 97.0 (49.87-4.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.25 (at 4.14Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, R_{free}	0.262 , 0.318 0.271 , 0.324	Depositor DCC
R_{free} test set	3932 reflections (2.98%)	wwPDB-VP
Wilson B-factor (Å^2)	136.4	Xtriage
Anisotropy	0.211	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.25 , 83.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.44$, $< L^2 > = 0.27$	Xtriage
Estimated twinning fraction	0.038 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.87	EDS
Total number of atoms	74250	wwPDB-VP
Average B, all atoms (Å^2)	171.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 1.77% 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: 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	0.44	0/1791	0.75	1/2436 (0.0%)
1	B	0.45	0/1791	0.71	0/2436
1	F	0.47	0/1782	0.76	0/2425
1	G	0.47	0/1791	0.73	0/2436
1	K	0.43	0/1782	0.72	0/2425
1	L	0.45	0/1791	0.71	0/2436
2	C	0.49	0/8900	0.84	12/12038 (0.1%)
2	H	0.52	1/8876 (0.0%)	0.85	13/12006 (0.1%)
2	M	0.48	0/8896	0.80	8/12033 (0.1%)
3	D	0.49	0/10832	0.81	8/14638 (0.1%)
3	I	0.50	0/10351	0.81	13/13979 (0.1%)
3	N	0.48	0/10848	0.81	10/14658 (0.1%)
4	E	0.53	1/768 (0.1%)	0.77	1/1035 (0.1%)
4	J	0.46	0/763	0.77	1/1028 (0.1%)
4	O	0.60	0/768	0.88	3/1035 (0.3%)
5	P	0.94	0/133	1.17	0/202
6	Q	1.22	0/170	1.09	1/265 (0.4%)
7	X	0.40	0/1178	0.74	1/1582 (0.1%)
7	Y	0.41	0/1178	0.74	1/1582 (0.1%)
7	Z	0.41	0/1178	0.76	0/1582
All	All	0.49	2/75567 (0.0%)	0.80	73/102257 (0.1%)

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	H	0	1
2	M	0	1

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Mol	Chain	#Chirality outliers	#Planarity outliers
3	I	0	1
3	N	0	1
5	P	0	1
6	Q	0	1
7	Z	0	1
All	All	0	9

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	258	TYR	CB-CG	-5.54	1.43	1.51
4	E	43	GLU	CB-CG	5.46	1.62	1.52

The worst 5 of 73 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	1097	LEU	CA-CB-CG	10.26	138.90	115.30
3	D	142	LEU	CA-CB-CG	9.03	136.07	115.30
3	D	804	LEU	CA-CB-CG	-8.40	95.97	115.30
3	D	1209	LEU	N-CA-C	-8.10	89.14	111.00
3	N	1209	LEU	N-CA-C	-8.07	89.20	111.00

There are no chirality outliers.

5 of 9 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	258	TYR	Sidechain
2	C	71	TYR	Sidechain
2	H	71	TYR	Sidechain
3	I	1070	TYR	Sidechain
2	M	258	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.

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1759	0	1805	210	0
1	B	1759	0	1805	226	0
1	F	1750	0	1792	251	0
1	G	1759	0	1805	230	0
1	K	1750	0	1792	199	0
1	L	1759	0	1805	196	0
2	C	8733	0	8834	1393	1
2	H	8710	0	8811	1418	2
2	M	8729	0	8831	1386	0
3	D	10651	0	10880	1742	2
3	I	10182	0	10418	1528	0
3	N	10667	0	10894	1632	1
4	E	754	0	769	96	0
4	J	749	0	764	106	0
4	O	754	0	769	107	0
5	P	120	0	67	10	0
6	Q	152	0	78	7	0
7	X	1169	0	1186	114	0
7	Y	1169	0	1186	129	0
7	Z	1169	0	1186	145	0
8	D	1	0	0	0	0
8	I	1	0	0	0	0
8	N	1	0	0	0	0
9	D	1	0	0	0	0
9	I	1	0	0	0	0
9	N	1	0	0	0	0
All	All	74250	0	75477	10329	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 69.

The worst 5 of 10329 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:H:282:GLY:O	2:H:283:ILE:HG13	1.34	1.25
3:D:1093:TYR:OH	3:D:1097:LYS:HE3	1.07	1.25
3:D:1093:TYR:OH	3:D:1097:LYS:CE	1.85	1.23
2:C:987:ILE:HG23	3:D:948:THR:HG21	1.20	1.20
3:I:108:VAL:HB	3:I:109:PRO:HD3	1.20	1.19

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)
2:C:223:ASP:O	3:N:562:ALA:O[2_647]	1.66	0.54
3:D:562:ALA:O	2:H:223:ASP:O[2_646]	2.02	0.18
3:D:159:ARG:O	2:H:209:ARG:NH1[2_646]	2.15	0.05

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	221/315 (70%)	181 (82%)	33 (15%)	7 (3%)	4 30
1	B	221/315 (70%)	188 (85%)	28 (13%)	5 (2%)	6 36
1	F	220/315 (70%)	182 (83%)	32 (14%)	6 (3%)	5 33
1	G	221/315 (70%)	190 (86%)	27 (12%)	4 (2%)	8 40
1	K	220/315 (70%)	183 (83%)	29 (13%)	8 (4%)	3 28
1	L	221/315 (70%)	189 (86%)	26 (12%)	6 (3%)	5 33
2	C	1102/1119 (98%)	873 (79%)	169 (15%)	60 (5%)	2 21
2	H	1099/1119 (98%)	882 (80%)	157 (14%)	60 (6%)	2 21
2	M	1101/1119 (98%)	892 (81%)	150 (14%)	59 (5%)	2 21
3	D	1341/1524 (88%)	1055 (79%)	221 (16%)	65 (5%)	2 22
3	I	1281/1524 (84%)	1006 (78%)	216 (17%)	59 (5%)	2 23
3	N	1343/1524 (88%)	1068 (80%)	211 (16%)	64 (5%)	2 22
4	E	91/99 (92%)	71 (78%)	15 (16%)	5 (6%)	2 21
4	J	90/99 (91%)	71 (79%)	14 (16%)	5 (6%)	2 20
4	O	91/99 (92%)	70 (77%)	16 (18%)	5 (6%)	2 21
7	X	150/156 (96%)	119 (79%)	26 (17%)	5 (3%)	4 29
7	Y	150/156 (96%)	121 (81%)	26 (17%)	3 (2%)	7 39

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
7	Z	150/156 (96%)	123 (82%)	21 (14%)	6 (4%)	3 25
All	All	9313/10584 (88%)	7464 (80%)	1417 (15%)	432 (5%)	2 23

5 of 432 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	133	GLU
1	A	226	SER
2	C	44	ILE
2	C	80	GLN
2	C	152	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	196/273 (72%)	170 (87%)	26 (13%)	4 21
1	B	196/273 (72%)	169 (86%)	27 (14%)	3 20
1	F	195/273 (71%)	160 (82%)	35 (18%)	2 11
1	G	196/273 (72%)	165 (84%)	31 (16%)	2 16
1	K	195/273 (71%)	168 (86%)	27 (14%)	3 20
1	L	196/273 (72%)	168 (86%)	28 (14%)	3 18
2	C	932/941 (99%)	740 (79%)	192 (21%)	1 7
2	H	930/941 (99%)	743 (80%)	187 (20%)	1 8
2	M	932/941 (99%)	761 (82%)	171 (18%)	1 10
3	D	1142/1279 (89%)	943 (83%)	199 (17%)	2 12
3	I	1092/1279 (85%)	902 (83%)	190 (17%)	2 12
3	N	1143/1279 (89%)	957 (84%)	186 (16%)	2 14
4	E	82/88 (93%)	70 (85%)	12 (15%)	3 18
4	J	82/88 (93%)	69 (84%)	13 (16%)	2 15
4	O	82/88 (93%)	69 (84%)	13 (16%)	2 15

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
7	X	128/131 (98%)	114 (89%)	14 (11%)	6	26
7	Y	128/131 (98%)	109 (85%)	19 (15%)	3	17
7	Z	128/131 (98%)	109 (85%)	19 (15%)	3	17
All	All	7975/8955 (89%)	6586 (83%)	1389 (17%)	2	12

5 of 1389 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	K	140	MET
3	N	60	CYS
1	L	104	GLU
1	K	133	GLU
2	M	363	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 249 such sidechains are listed below:

Mol	Chain	Res	Type
2	H	498	GLN
3	N	727	GLN
3	I	717	GLN
3	N	703	ASN
4	O	33	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
6	Q	6/33 (18%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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 6 ligands modelled in this entry, 6 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

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	223/315 (70%)	-0.30	0 100 100	81, 153, 225, 265	0
1	B	223/315 (70%)	-0.30	0 100 100	97, 154, 223, 265	0
1	F	222/315 (70%)	-0.36	0 100 100	84, 150, 216, 265	0
1	G	223/315 (70%)	-0.35	0 100 100	85, 150, 216, 248	0
1	K	222/315 (70%)	-0.06	1 (0%) 91 85	110, 167, 229, 262	0
1	L	223/315 (70%)	-0.23	0 100 100	103, 164, 222, 265	0
2	C	1106/1119 (98%)	-0.18	20 (1%) 68 59	70, 158, 243, 265	0
2	H	1103/1119 (98%)	-0.16	30 (2%) 54 44	73, 155, 251, 267	0
2	M	1105/1119 (98%)	-0.08	31 (2%) 53 42	79, 166, 255, 265	0
3	D	1349/1524 (88%)	-0.06	44 (3%) 46 37	74, 171, 259, 267	0
3	I	1289/1524 (84%)	-0.05	59 (4%) 32 27	70, 173, 259, 267	0
3	N	1351/1524 (88%)	-0.07	51 (3%) 40 32	76, 167, 254, 267	0
4	E	93/99 (93%)	-0.01	2 (2%) 62 52	114, 183, 262, 265	0
4	J	92/99 (92%)	-0.08	1 (1%) 80 72	92, 176, 254, 265	0
4	O	93/99 (93%)	-0.05	4 (4%) 35 29	99, 173, 246, 265	0
5	P	6/27 (22%)	1.66	2 (33%) 0 0	198, 198, 198, 198	0
6	Q	7/33 (21%)	2.30	4 (57%) 0 0	188, 198, 198, 198	0
7	X	152/156 (97%)	0.14	2 (1%) 77 68	105, 187, 241, 267	0
7	Y	152/156 (97%)	0.10	4 (2%) 56 45	99, 186, 246, 267	0
7	Z	152/156 (97%)	-0.07	1 (0%) 87 82	109, 171, 248, 267	0
All	All	9386/10644 (88%)	-0.11	256 (2%) 54 44	70, 166, 252, 267	0

The worst 5 of 256 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	763	GLY	6.7
2	H	765	SER	6.2
2	M	721	ARG	5.8
2	H	764	GLU	5.5
3	D	801	GLY	5.4

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
9	MG	N	2006	1/1	0.90	0.48	94,94,94,94	0
9	MG	I	2005	1/1	0.92	0.36	94,94,94,94	0
8	ZN	D	2001	1/1	0.97	0.06	94,94,94,94	0
9	MG	D	2004	1/1	0.97	0.08	94,94,94,94	0
8	ZN	N	2003	1/1	0.99	0.08	94,94,94,94	0
8	ZN	I	2002	1/1	0.99	0.07	94,94,94,94	0

6.5 Other polymers (i)

There are no such residues in this entry.