WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Mar 25, 2024 – 12:27 PM JST

PDB ID	:	6LAB
Title	:	169 bp nucleosome, harboring cohesive DNA termini, assembled with linker histone H1.0
Authors	:	Adhireksan, Z.; Sharma, D.; Bao, Q.; Lee, P.L.; Padavattan, S.; Davey, C.A.
Deposited on	:	2019-11-12
Resolution	:	3.20 Å(reported)

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

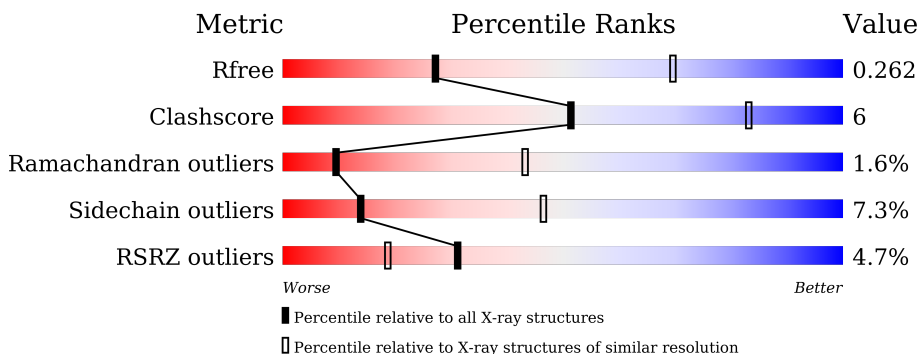|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation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

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.20 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.
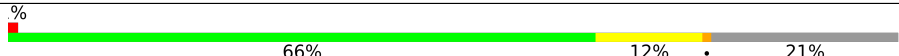
Metric	Percentile Ranks	Value
Rfree		0.262
Clashscore		6
Ramachandran outliers		1.6%
Sidechain outliers		7.3%
RSRZ outliers		4.7%

Worse   *Better*

■ Percentile relative to all X-ray structures

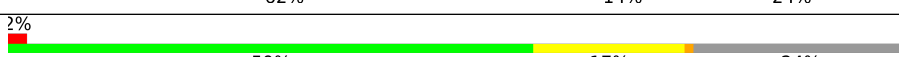▯ Percentile relative to X-ray structures of similar resolution
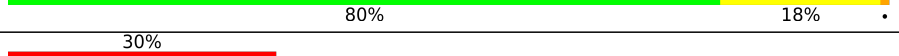
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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	136	.% 58% 14% 28%
1	E	136	60% 12% 28%
1	K	136	57% 14% • 28%
1	O	136	.% 59% 12% • 28%
2	B	103	70% 8% 22%
2	F	103	2% 67% 14% • 18%

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Mol	Chain	Length	Quality of chain
2	L	103	60% 20% 19%
2	P	103	3% 67% 16% 17%
3	C	130	71% 8% 19%
3	G	130	% 66% 12% 21%
3	M	130	64% 17% 18%
3	Q	130	70% 8% 21%
4	D	126	62% 14% 24%
4	H	126	2% 59% 17% 24%
4	N	126	64% 11% 24%
4	R	126	% 58% 16% 24%
5	I	169	5% 75% 25%
5	S	169	2% 80% 20%
6	J	169	6% 79% 20%
6	T	169	% 80% 18%
7	U	194	30% 21% 16% 60%
7	V	194	9% 25% 13% 5% 57%

2 Entry composition ⓘ

There are 10 unique types of molecules in this entry. The entry contains 27249 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 Histone H3.1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	98	Total	C	N	O	S	0	0	0
			807	508	156	139	4			
1	E	98	Total	C	N	O	S	0	0	0
			807	508	156	139	4			
1	K	98	Total	C	N	O	S	0	0	0
			807	508	156	139	4			
1	O	98	Total	C	N	O	S	0	0	0
			807	508	156	139	4			

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	80	Total	C	N	O	S	0	0	0
			638	401	125	111	1			
2	F	84	Total	C	N	O	S	0	0	0
			673	424	133	115	1			
2	L	83	Total	C	N	O	S	0	0	0
			662	418	129	114	1			
2	P	86	Total	C	N	O	S	0	0	0
			694	436	140	117	1			

- Molecule 3 is a protein called Histone H2A type 1-B/E.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	105	Total	C	N	O	0	0	0
			810	511	158	141			
3	G	103	Total	C	N	O	0	0	0
			796	502	155	139			
3	M	106	Total	C	N	O	0	0	0
			819	517	160	142			
3	Q	103	Total	C	N	O	0	0	0
			796	502	155	139			

- Molecule 4 is a protein called Histone H2B type 1-J.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	96	Total 755	C 474	N 138	O 141	S 2	0	0	0
4	H	96	Total 755	C 474	N 138	O 141	S 2	0	0	0
4	N	96	Total 755	C 474	N 138	O 141	S 2	0	0	0
4	R	96	Total 755	C 474	N 138	O 141	S 2	0	0	0

- Molecule 5 is a DNA chain called DNA (169-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	I	169	Total 3462	C 1646	N 637	O 1011	P 168	0	0	0
5	S	169	Total 3462	C 1646	N 637	O 1011	P 168	0	0	0

- Molecule 6 is a DNA chain called DNA (169-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	J	169	Total 3461	C 1646	N 634	O 1013	P 168	0	0	0
6	T	169	Total 3461	C 1646	N 634	O 1013	P 168	0	0	0

- Molecule 7 is a protein called Histone H1.0.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	U	78	Total 596	C 370	N 112	O 113	S 1	0	0	0
7	V	84	Total 647	C 402	N 121	O 123	S 1	0	0	0

- Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	C	1	Total 1	Ca 1	0	0
8	I	6	Total 6	Ca 6	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	J	2	Total 2	Ca 2	0	0
8	M	1	Total 1	Ca 1	0	0
8	S	6	Total 6	Ca 6	0	0
8	T	4	Total 4	Ca 4	0	0

- Molecule 9 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	C	1	Total 1	K 1	0	0
9	M	1	Total 1	K 1	0	0

- Molecule 10 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

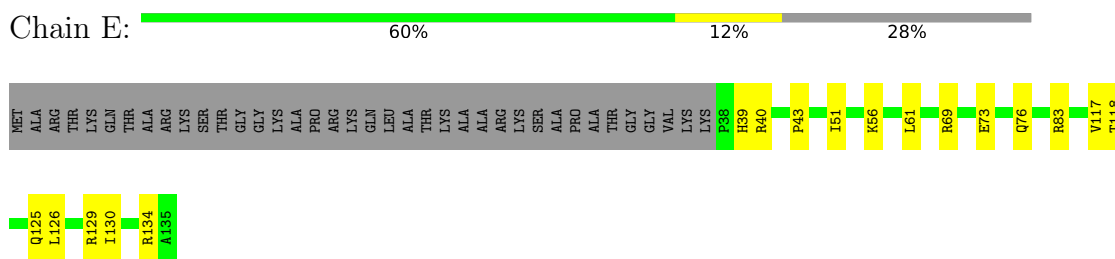| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	M	1	Total 1	Cl 1	0	0
10	Q	1	Total 1	Cl 1	0	0

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.
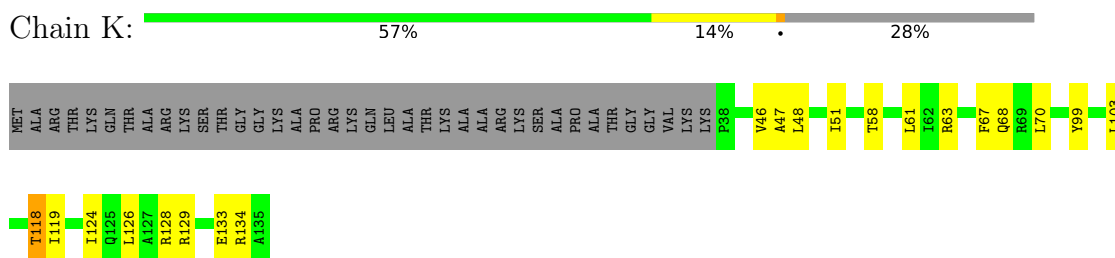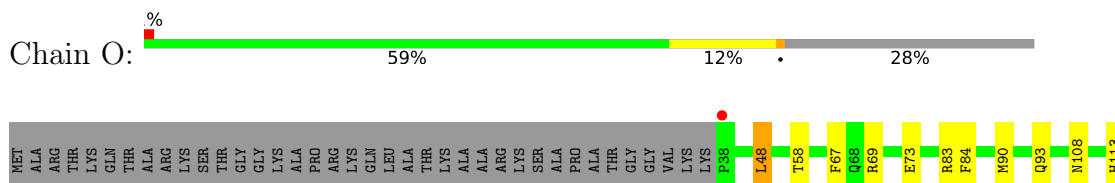
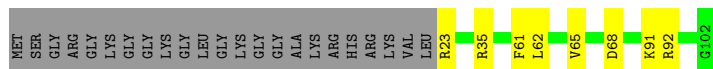- Molecule 1: Histone H3.1

Chain A:

- Molecule 1: Histone H3.1

Chain E:

- Molecule 1: Histone H3.1

Chain K:

- Molecule 1: Histone H3.1

Chain O:

T118 L126 R129 I130 R131 G132 E133 R134 A135

• Molecule 2: Histone H4

Chain B:

70%   8%   22%

MET SER GLY ARG GLY LYS GLY GLY LYS GLY LEU GLY LYS GLY GLY ALA LYS ARG HIS ARG LYS VAL LEU R23 R35 F61 L62 V65 D68 K91 R92 G102

• Molecule 2: Histone H4

2%

Chain F:

67%   14%   •   18%

MET SER GLY ARG GLY LYS GLY GLY LYS GLY LEU GLY LYS GLY GLY ALA LYS ARG HIS R19 K20 V21 L22 N25 G28 I29 T30 R36 R45 E53 F61 V65 D68 T80 R92 Q93 G102

• Molecule 2: Histone H4

Chain L:

60%   20%   19%

MET SER GLY ARG GLY LYS GLY GLY LYS GLY LEU GLY LYS GLY GLY ALA LYS ARG HIS ARG K20 V21 L22 I34 L37 A38 R39 G42 R45 I50 T54 K59 L62 E63 R67 D68 A69 V70 T71 Y72 Y88 R92 R95 G101 G102

• Molecule 2: Histone H4

3%

Chain P:

67%   16%   •   17%

MET SER GLY ARG GLY LYS GLY GLY LYS GLY LEU GLY LYS GLY GLY ALA LYS R17 H18 R19 K20 D24 N25 I26 Q27 R45 G56 V60 F61 N64 V65 D68 T80 V81 Y88 R92 G102

• Molecule 3: Histone H2A type 1-B/E

Chain C:

71%   8%   •   19%

MET SER GLY ARG GLY LYS GLN GLY LYS ALA ARG ALA LYS A14 V54 R77 I78 I79 P80 R81 Q84 D90 G106 V107 N110 L115 L116 P117 K118 LYS THR GLU SER HIS HIS LYS ALA LYS GLY LYS

• Molecule 3: Histone H2A type 1-B/E

%

Chain G:

66%   12%   •   21%

MET SER GLY ARG GLY LYS GLN GLY LYS ALA ARG ALA LYS ALA LYS T16 V27 G28 R29 R42 Y50 I62 N73 K74 R77 P80 R81 E91 I102 A103 Q104 V107 V114 L115 L116 P117 K118 LYS THR GLU SER HIS HIS LYS ALA LYS GLY LYS

• Molecule 3: Histone H2A type 1-B/E

Chain M:

64%   17%   •   18%

MET SER GLY ARG GLY LYS GLN GLY GLY LYS ALA ARG ALA **K13** A14 **K15** T16 S19 Q24 R29 R32 R35 A47 P48 V49 Y50 A53 I62 **L63** E64 **R77** **I78** I79 P80 R81 H82 R88 Q104 L108 P109 L115 **K118** LYS THR GLU SER

HIS HIS LYS ALA LYS GLY LYS

• Molecule 3: Histone H2A type 1-B/E

Chain Q:

70%   8% •   21%

MET SER GLY ARG GLY LYS GLN GLY GLY LYS ALA ARG ALA LYS ALA LYS T16 S19 R29 V30 H31 R35 N73 K74 K75 P80 R81 R88 I102 V107 **K118** LYS THR GLU SER HIS HIS LYS ALA LYS GLY LYS

• Molecule 4: Histone H2B type 1-J

Chain D:

62%   14%   24%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS ALA GLN LYS LYS ASP GLY LYS LYS ARG **K30** K34 K46 H49 T52 A58 N63 G75 E76 A77 S78 R79 R86 S87 V98 P103 G104 **E105** L106

K125

• Molecule 4: Histone H2B type 1-J

Chain H:

2%

59%   17% •   24%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS ALA GLN LYS LYS ASP GLY LYS LYS ARG **K30** **R31** Y42 H49 **P50** **D51** **T52** **G53** **I54** A58 I61 S64 F65 L80 R86 S87 **T88** I94 Q95 V98

L102 P103 A107 V111 T119 K125

• Molecule 4: Histone H2B type 1-J

Chain N:

64%   11% •   24%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS ALA GLN LYS LYS ASP GLY LYS LYS ARG **K30** **R31** S32 **S36** V48 S56 F65 I69 L80 Y83 R86 **S87** **T88** T96 L102 P103 G104 E105 **K125**

• Molecule 4: Histone H2B type 1-J

Chain R:

%

58%   16% •   24%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS ALA GLN LYS LYS ASP GLY LYS LYS ARG **K30** **R31** S32 R33 **S36** Y42 **K43** **V44** Q47 **V48** H49 **T52** K57 I61 F70 L80 Y83 T88 L102

P103 **G104** G114 V118 T119 T122 K125
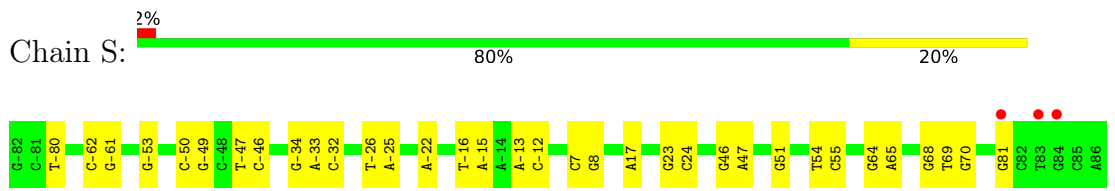
• Molecule 4: Histone H2B type 1-J

• Molecule 5: DNA (169-MER)

Chain I:

• Molecule 5: DNA (169-MER)
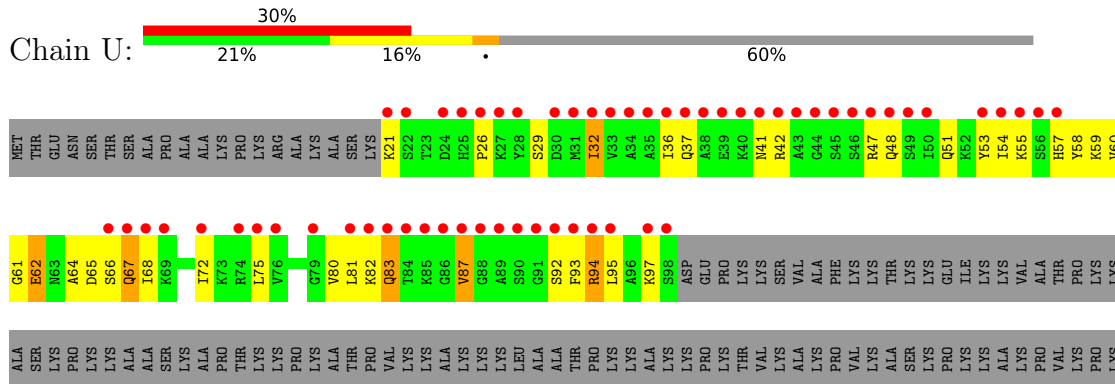
Chain S:

• Molecule 6: DNA (169-MER)

Chain J:

• Molecule 6: DNA (169-MER)

Chain T:

• Molecule 7: Histone H1.0

Chain U:

ALA
LYS
SER
SER
ALA
LYS
ARG
ALA
GLY
LYS
LYS
LYS

● **Molecule 7: Histone H1.0**

Chain V:

9%

25%   13%   5% •   57%

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	104.80Å 102.76Å 218.05Å 90.00° 97.40° 90.00°	Depositor
Resolution (Å)	39.89 – 3.20 39.86 – 3.20	Depositor EDS
% Data completeness (in resolution range)	99.2 (39.89-3.20) 99.3 (39.86-3.20)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.57 (at 3.18Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.201 , 0.262 0.206 , 0.262	Depositor DCC
R_{free} test set	1469 reflections (1.94%)	wwPDB-VP
Wilson B-factor (Å^2)	90.7	Xtriage
Anisotropy	0.182	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 80.0	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	27249	wwPDB-VP
Average B, all atoms (Å^2)	125.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.93% 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: CL, K, CA

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	0.63	0/819	0.79	0/1097
1	E	0.64	0/819	0.84	0/1097
1	K	0.69	0/819	0.89	0/1097
1	O	0.67	0/819	0.90	0/1097
2	B	0.67	0/645	0.85	0/862
2	F	0.69	0/680	0.84	0/908
2	L	0.70	0/669	0.91	0/894
2	P	0.70	0/702	0.92	0/937
3	C	0.67	0/820	0.79	0/1107
3	G	0.67	0/806	0.80	0/1089
3	M	0.70	0/829	0.87	0/1118
3	Q	0.69	0/806	0.87	0/1089
4	D	0.65	0/766	0.76	0/1026
4	H	0.70	0/766	0.83	0/1026
4	N	0.69	0/766	0.86	0/1026
4	R	0.68	0/766	0.90	0/1026
5	I	0.36	0/3884	0.77	0/5993
5	S	0.48	0/3884	0.83	1/5993 (0.0%)
6	J	0.36	0/3882	0.79	1/5990 (0.0%)
6	T	0.51	2/3882 (0.1%)	0.85	4/5990 (0.1%)
7	U	0.77	0/602	0.85	0/802
7	V	0.70	0/654	0.93	0/870
All	All	0.56	2/29085 (0.0%)	0.83	6/42134 (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
7	V	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	T	-34	DG	O3'-P	-5.70	1.54	1.61
6	T	-62	DC	O3'-P	-5.13	1.54	1.61

The worst 5 of 6 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	T	-53	DG	C1'-O4'-C4'	-6.24	103.86	110.10
6	J	-53	DG	C1'-O4'-C4'	-5.75	104.35	110.10
6	T	56	DG	O5'-P-OP2	-5.72	100.55	105.70
6	T	15	DT	O5'-P-OP2	-5.59	100.67	105.70
6	T	29	DG	C1'-O4'-C4'	-5.46	104.64	110.10

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
7	V	56	SER	Peptide
7	V	57	HIS	Peptide

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	807	0	844	10	1
1	E	807	0	844	12	0
1	K	807	0	844	12	0
1	O	807	0	844	14	0
2	B	638	0	676	4	0
2	F	673	0	722	15	1
2	L	662	0	709	11	0
2	P	694	0	742	15	0
3	C	810	0	866	8	0
3	G	796	0	848	11	0
3	M	819	0	879	15	0
3	Q	796	0	848	5	0
4	D	755	0	784	6	0

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W O R L D W I D E
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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	H	755	0	784	13	0
4	N	755	0	784	10	0
4	R	755	0	784	17	0
5	I	3462	0	1901	30	0
5	S	3462	0	1901	23	0
6	J	3461	0	1902	21	0
6	T	3461	0	1902	19	0
7	U	596	0	627	37	0
7	V	647	0	683	27	0
8	C	1	0	0	0	0
8	I	6	0	0	0	0
8	J	2	0	0	0	0
8	M	1	0	0	0	0
8	S	6	0	0	0	0
8	T	4	0	0	0	0
9	C	1	0	0	0	0
9	M	1	0	0	0	0
10	M	1	0	0	0	0
10	Q	1	0	0	0	0
All	All	27249	0	21718	273	1

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 6.

The worst 5 of 273 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:E:76:GLN:OE1	2:F:20:LYS:HG2	1.69	0.93
7:U:55:LYS:HG3	7:U:59:LYS:HD3	1.51	0.93
4:R:49:HIS:HB3	4:R:52:THR:CG2	1.98	0.93
7:U:65:ASP:HA	7:U:68:ILE:HD12	1.48	0.93
7:U:32:ILE:HD11	7:U:68:ILE:HG23	1.56	0.87

All (1) 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:A:77:ASP:OD2	2:F:19:ARG:NH2[2_746]	1.73	0.47

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	96/136 (71%)	90 (94%)	6 (6%)	0	100	100
1	E	96/136 (71%)	90 (94%)	3 (3%)	3 (3%)	4	26
1	K	96/136 (71%)	86 (90%)	10 (10%)	0	100	100
1	O	96/136 (71%)	91 (95%)	5 (5%)	0	100	100
2	B	78/103 (76%)	69 (88%)	9 (12%)	0	100	100
2	F	82/103 (80%)	73 (89%)	9 (11%)	0	100	100
2	L	81/103 (79%)	67 (83%)	14 (17%)	0	100	100
2	P	84/103 (82%)	79 (94%)	4 (5%)	1 (1%)	13	49
3	C	103/130 (79%)	96 (93%)	7 (7%)	0	100	100
3	G	101/130 (78%)	92 (91%)	6 (6%)	3 (3%)	4	28
3	M	104/130 (80%)	93 (89%)	9 (9%)	2 (2%)	8	39
3	Q	101/130 (78%)	94 (93%)	7 (7%)	0	100	100
4	D	94/126 (75%)	86 (92%)	6 (6%)	2 (2%)	7	37
4	H	94/126 (75%)	88 (94%)	4 (4%)	2 (2%)	7	37
4	N	94/126 (75%)	88 (94%)	5 (5%)	1 (1%)	14	51
4	R	94/126 (75%)	87 (93%)	4 (4%)	3 (3%)	4	26
7	U	76/194 (39%)	67 (88%)	4 (5%)	5 (7%)	1	9
7	V	82/194 (42%)	65 (79%)	13 (16%)	4 (5%)	2	17
All	All	1652/2368 (70%)	1501 (91%)	125 (8%)	26 (2%)	9	43

5 of 26 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	G	91	GLU
7	U	87	VAL
7	V	85	LYS
4	D	104	GLY

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Mol	Chain	Res	Type
3	G	27	VAL

5.3.2 Protein sidechains ⓘ

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	85/111 (77%)	82 (96%)	3 (4%)	36	69
1	E	85/111 (77%)	81 (95%)	4 (5%)	26	62
1	K	85/111 (77%)	80 (94%)	5 (6%)	19	54
1	O	85/111 (77%)	82 (96%)	3 (4%)	36	69
2	B	65/79 (82%)	62 (95%)	3 (5%)	27	63
2	F	69/79 (87%)	68 (99%)	1 (1%)	67	86
2	L	68/79 (86%)	65 (96%)	3 (4%)	28	64
2	P	71/79 (90%)	69 (97%)	2 (3%)	43	74
3	C	83/100 (83%)	79 (95%)	4 (5%)	25	61
3	G	82/100 (82%)	77 (94%)	5 (6%)	18	54
3	M	84/100 (84%)	80 (95%)	4 (5%)	25	61
3	Q	82/100 (82%)	75 (92%)	7 (8%)	10	38
4	D	82/105 (78%)	75 (92%)	7 (8%)	10	38
4	H	82/105 (78%)	74 (90%)	8 (10%)	8	31
4	N	82/105 (78%)	77 (94%)	5 (6%)	18	54
4	R	82/105 (78%)	74 (90%)	8 (10%)	8	31
7	U	65/158 (41%)	50 (77%)	15 (23%)	1	3
7	V	71/158 (45%)	55 (78%)	16 (22%)	1	4
All	All	1408/1896 (74%)	1305 (93%)	103 (7%)	14	46

5 of 103 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	Q	19	SER

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Mol	Chain	Res	Type
4	R	125	LYS
7	V	85	LYS
3	Q	73	ASN
4	R	36	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 26 such sidechains are listed below:

Mol	Chain	Res	Type
3	M	31	HIS
2	P	27	GLN
7	V	37	GLN
1	O	108	ASN
2	P	64	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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 24 ligands modelled in this entry, 24 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(Å²)	Q<0.9
1	A	98/136 (72%)	0.07	2 (2%)	65	51	92, 113, 159, 183	0
1	E	98/136 (72%)	-0.05	0	100	100	80, 102, 140, 164	0
1	K	98/136 (72%)	-0.19	0	100	100	44, 66, 108, 139	0
1	O	98/136 (72%)	-0.10	1 (1%)	82	72	46, 67, 111, 144	0
2	B	80/103 (77%)	-0.06	0	100	100	84, 109, 141, 160	0
2	F	84/103 (81%)	0.02	2 (2%)	59	44	80, 95, 141, 171	0
2	L	83/103 (80%)	-0.07	0	100	100	43, 65, 129, 163	0
2	P	86/103 (83%)	0.11	3 (3%)	44	28	45, 66, 142, 180	0
3	C	105/130 (80%)	-0.12	0	100	100	80, 101, 133, 146	0
3	G	103/130 (79%)	0.10	1 (0%)	82	72	79, 111, 146, 162	0
3	M	106/130 (81%)	-0.17	0	100	100	53, 72, 107, 137	0
3	Q	103/130 (79%)	-0.14	0	100	100	48, 71, 103, 113	0
4	D	96/126 (76%)	-0.01	0	100	100	77, 105, 149, 169	0
4	H	96/126 (76%)	-0.05	2 (2%)	63	49	82, 110, 156, 177	0
4	N	96/126 (76%)	-0.13	0	100	100	48, 75, 119, 153	0
4	R	96/126 (76%)	-0.10	1 (1%)	82	72	50, 73, 121, 172	0
5	I	169/169 (100%)	0.05	8 (4%)	31	19	106, 167, 249, 280	0
5	S	169/169 (100%)	-0.37	3 (1%)	68	55	71, 114, 226, 264	0
6	J	169/169 (100%)	0.09	10 (5%)	22	13	117, 168, 235, 294	0
6	T	169/169 (100%)	-0.33	2 (1%)	79	67	74, 113, 211, 278	0
7	U	78/194 (40%)	4.07	59 (75%)	0	0	150, 196, 246, 259	1 (1%)
7	V	84/194 (43%)	0.90	17 (20%)	1	1	109, 164, 197, 213	1 (1%)
All	All	2364/3044 (77%)	0.09	111 (4%)	31	19	43, 105, 202, 294	2 (0%)

The worst 5 of 111 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
7	U	90	SER	14.4
7	U	94	ARG	11.7
7	U	25	HIS	9.6
7	U	41	ASN	8.6
7	U	31	MET	8.5

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 ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
8	CA	I	103	1/1	0.41	0.18	124,124,124,124	0
8	CA	S	104	1/1	0.56	0.18	119,119,119,119	0
8	CA	I	104	1/1	0.63	0.12	130,130,130,130	0
8	CA	J	102	1/1	0.72	0.15	128,128,128,128	0
8	CA	J	101	1/1	0.72	0.33	131,131,131,131	0
8	CA	C	201	1/1	0.76	0.10	122,122,122,122	0
8	CA	T	101	1/1	0.76	0.27	108,108,108,108	0
8	CA	I	102	1/1	0.80	0.15	120,120,120,120	0
8	CA	S	102	1/1	0.80	0.22	76,76,76,76	0
8	CA	S	105	1/1	0.84	0.19	106,106,106,106	0
8	CA	S	103	1/1	0.84	0.18	121,121,121,121	0
8	CA	I	105	1/1	0.86	0.13	125,125,125,125	0
8	CA	S	101	1/1	0.88	0.23	86,86,86,86	0
8	CA	T	103	1/1	0.89	0.11	113,113,113,113	0
10	CL	M	203	1/1	0.89	0.19	74,74,74,74	0
8	CA	I	106	1/1	0.90	0.13	127,127,127,127	0
8	CA	M	201	1/1	0.90	0.19	116,116,116,116	0
8	CA	T	102	1/1	0.92	0.29	113,113,113,113	0
8	CA	I	101	1/1	0.93	0.10	104,104,104,104	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
8	CA	T	104	1/1	0.95	0.22	101,101,101,101	0
9	K	C	202	1/1	0.97	0.55	115,115,115,115	0
8	CA	S	106	1/1	0.97	0.25	102,102,102,102	0
10	CL	Q	201	1/1	0.97	0.11	69,69,69,69	0
9	K	M	202	1/1	0.98	0.40	103,103,103,103	0

6.5 Other polymers ⓘ

There are no such residues in this entry.