W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Oct 3, 2023 – 03:52 PM EDT

PDB ID	:	6OM3
Title	:	Crystal structure of the Orc1 BAH domain in complex with a nucleosome core particle
Authors	:	De Ioannes, P.E.; Wang, M.; Armache, K.-J.
Deposited on	:	2019-04-18
Resolution	:	3.30 Å(reported)

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

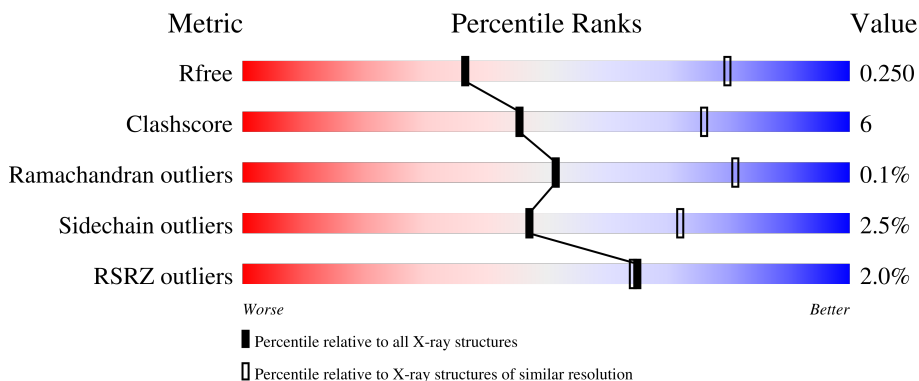|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.30 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.
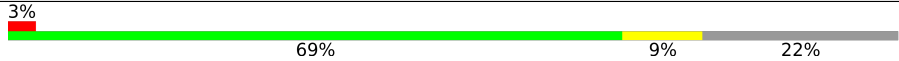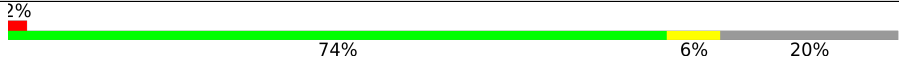
Metric	Percentile Ranks	Value
Rfree		0.250
Clashscore		6
Ramachandran outliers		0.1%
Sidechain outliers		2.5%
RSRZ outliers		2.0%

Worse   *Better*

▌Percentile relative to all X-ray structures

▯Percentile relative to X-ray structures of similar resolution
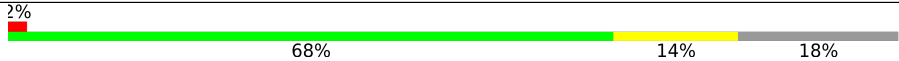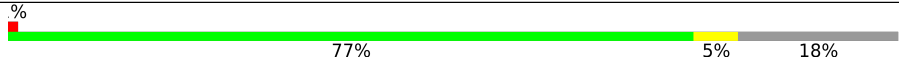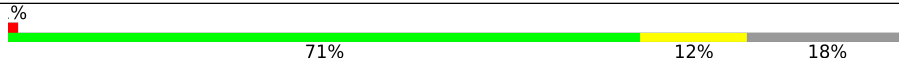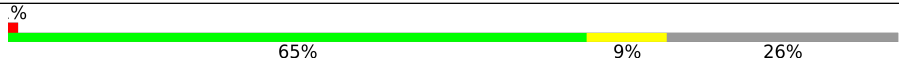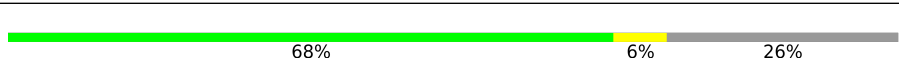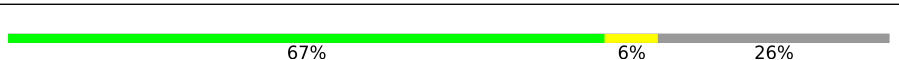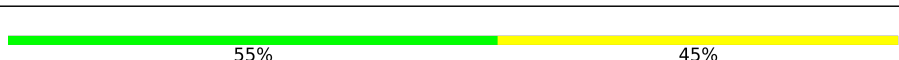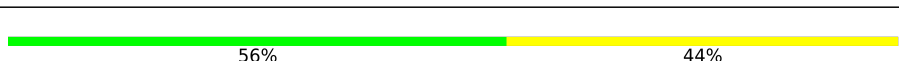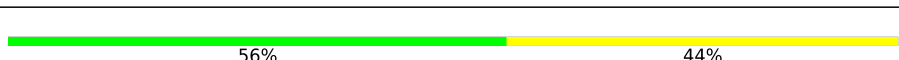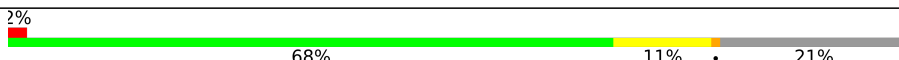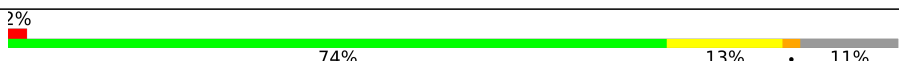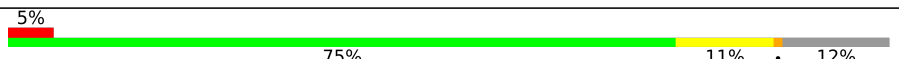
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)

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	135	% 62% / 10% / 28%
1	E	135	3% 61% / 9% / 30%
1	M	135	65% / 7% / 27%
1	Q	135	% 62% / 8% / 30%
2	B	103	2% 75% / 6% · 18%

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Mol	Chain	Length	Quality of chain
2	F	103	2% 71% 10% 19%
2	N	103	2% 72% 10% 18%
2	R	103	3% 69% 9% 22%
3	C	130	2% 74% 6% 20%
3	G	130	2% 68% 14% 18%
3	O	130	% 77% 5% 18%
3	S	130	% 71% 12% 18%
4	D	126	% 65% 9% 26%
4	H	126	68% 6% 26%
4	P	126	67% 6% 26%
4	T	126	% 62% 11% · 26%
5	I	146	52% 48%
5	U	146	55% 45%
6	J	147	56% 44%
6	V	147	56% 44%
7	K	224	2% 68% 11% · 21%
7	L	224	2% 74% 13% · 11%
7	W	224	5% 75% 11% · 12%
7	X	224	4% 38% 10% · 51%

2 Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 28906 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 H3.2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	97	Total 788	C 497	N 150	O 138	S 3	0	0	0
1	E	95	Total 785	C 495	N 151	O 136	S 3	0	0	0
1	M	98	Total 798	C 506	N 154	O 135	S 3	0	0	0
1	Q	95	Total 772	C 489	N 147	O 133	S 3	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	102	ALA	GLY	engineered mutation	UNP P84233
E	102	ALA	GLY	engineered mutation	UNP P84233
M	102	ALA	GLY	engineered mutation	UNP P84233
Q	102	ALA	GLY	engineered mutation	UNP P84233

- Molecule 2 is a protein called Histone H4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	84	Total 678	C 428	N 135	O 114	S 1	0	0	0
2	F	83	Total 649	C 409	N 126	O 113	S 1	0	0	0
2	N	84	Total 660	C 417	N 128	O 114	S 1	0	0	0
2	R	80	Total 635	C 402	N 122	O 110	S 1	0	0	0

- Molecule 3 is a protein called Histone H2A.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	C	104	Total 782	C 492	N 150	O 140	0	0	0
3	G	107	Total 797	C 502	N 154	O 141	0	0	0
3	O	107	Total 810	C 511	N 159	O 140	0	0	0
3	S	107	Total 808	C 507	N 158	O 143	0	0	0

- Molecule 4 is a protein called Histone H2B 1.1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	93	Total 723	C 454	N 130	O 137	S 2	0	0	0
4	H	93	Total 714	C 449	N 128	O 135	S 2	0	0	0
4	P	93	Total 714	C 448	N 127	O 137	S 2	0	0	0
4	T	93	Total 718	C 451	N 128	O 137	S 2	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	32	THR	SER	engineered mutation	UNP P02281
H	32	THR	SER	engineered mutation	UNP P02281
P	32	THR	SER	engineered mutation	UNP P02281
T	32	THR	SER	engineered mutation	UNP P02281

- Molecule 5 is a DNA chain called DNA (146-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	I	146	Total 2975	C 1414	N 539	O 876	P 146	0	0	0
5	U	146	Total 2975	C 1414	N 539	O 876	P 146	0	0	0

- Molecule 6 is a DNA chain called DNA (147-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	J	147	Total 3031	C 1436	N 565	O 883	P 147	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	V	147	Total 3031	C 1436	N 565	O 883	P 147	0	0	0

- Molecule 7 is a protein called Origin recognition complex subunit 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	K	178	Total 1425	C 908	N 246	O 267	S 4	0	0	0
7	L	199	Total 1484	C 946	N 250	O 284	S 4	0	0	0
7	W	196	Total 1411	C 884	N 248	O 276	S 3	0	0	0
7	X	110	Total 743	C 458	N 138	O 145	S 2	0	0	0

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	1	ACE	-	acetylation	UNP P54784
K	79	ILE	LEU	engineered mutation	UNP P54784
K	215	ALA	-	expression tag	UNP P54784
K	216	ALA	-	expression tag	UNP P54784
K	217	HIS	-	expression tag	UNP P54784
K	218	HIS	-	expression tag	UNP P54784
K	219	HIS	-	expression tag	UNP P54784
K	220	HIS	-	expression tag	UNP P54784
K	221	HIS	-	expression tag	UNP P54784
K	222	HIS	-	expression tag	UNP P54784
K	223	HIS	-	expression tag	UNP P54784
K	224	HIS	-	expression tag	UNP P54784
L	1	ACE	-	acetylation	UNP P54784
L	79	ILE	LEU	engineered mutation	UNP P54784
L	215	ALA	-	expression tag	UNP P54784
L	216	ALA	-	expression tag	UNP P54784
L	217	HIS	-	expression tag	UNP P54784
L	218	HIS	-	expression tag	UNP P54784
L	219	HIS	-	expression tag	UNP P54784
L	220	HIS	-	expression tag	UNP P54784
L	221	HIS	-	expression tag	UNP P54784
L	222	HIS	-	expression tag	UNP P54784
L	223	HIS	-	expression tag	UNP P54784
L	224	HIS	-	expression tag	UNP P54784

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Chain	Residue	Modelled	Actual	Comment	Reference
W	1	ACE	-	acetylation	UNP P54784
W	79	ILE	LEU	engineered mutation	UNP P54784
W	215	ALA	-	expression tag	UNP P54784
W	216	ALA	-	expression tag	UNP P54784
W	217	HIS	-	expression tag	UNP P54784
W	218	HIS	-	expression tag	UNP P54784
W	219	HIS	-	expression tag	UNP P54784
W	220	HIS	-	expression tag	UNP P54784
W	221	HIS	-	expression tag	UNP P54784
W	222	HIS	-	expression tag	UNP P54784
W	223	HIS	-	expression tag	UNP P54784
W	224	HIS	-	expression tag	UNP P54784
X	1	ACE	-	acetylation	UNP P54784
X	79	ILE	LEU	engineered mutation	UNP P54784
X	215	ALA	-	expression tag	UNP P54784
X	216	ALA	-	expression tag	UNP P54784
X	217	HIS	-	expression tag	UNP P54784
X	218	HIS	-	expression tag	UNP P54784
X	219	HIS	-	expression tag	UNP P54784
X	220	HIS	-	expression tag	UNP P54784
X	221	HIS	-	expression tag	UNP P54784
X	222	HIS	-	expression tag	UNP P54784
X	223	HIS	-	expression tag	UNP P54784
X	224	HIS	-	expression tag	UNP P54784

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: Histone H3.2

Chain A:

- Molecule 1: Histone H3.2

Chain E:

- Molecule 1: Histone H3.2

Chain M:

- Molecule 1: Histone H3.2

Chain Q:

• Molecule 2: Histone H4

Chain B:

• Molecule 2: Histone H4

Chain F:

• Molecule 2: Histone H4

Chain N:

• Molecule 2: Histone H4

Chain R:

• Molecule 3: Histone H2A

Chain C:

• Molecule 3: Histone H2A

Chain G:

• Molecule 3: Histone H2A

Chain O:

MET SER GLY ARG GLY LYS GLN GLY GLY LYS THR ARG **A12** T16 L23 R29 R32 I79 H82 D90 I102 **K118** LYS THR GLU SER SER LYS SER ALA LYS SER LYS

● Molecule 3: Histone H2A

Chain S:

71%   12%   18%

MET SER GLY ARG GLY LYS GLN GLY GLY LYS THR ARG **A12** P26 R29 R32 L33 R42 V43 G44 L58 L63 I79 H82 D90 E91 E92 L93 I102 A103 Q104 **K118** LYS THR GLU SER SER LYS SER ALA LYS SER LYS

● Molecule 4: Histone H2B 1.1

Chain D:

65%   9%   26%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS THR GLN LYS LYS ASP GLY LYS LYS ARG ARG LYS **T32** E35 S36 V41 I61 E76 R79 V98 L102 P103 A124 LYS

● Molecule 4: Histone H2B 1.1

Chain H:

68%   6%   26%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS THR GLN LYS LYS ASP GLY LYS LYS ARG ARG LYS **T32** R33 A38 L45 M59 S60 I61 L80 A124 LYS

● Molecule 4: Histone H2B 1.1

Chain P:

67%   6%   26%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS THR GLN LYS LYS ASP GLY LYS LYS ARG ARG LYS **T32** S36 M59 S60 I61 M62 S78 R86 I89 A124 LYS

● Molecule 4: Histone H2B 1.1

Chain T:

62%   11%   ·   26%

MET PRO GLU PRO ALA LYS SER ALA PRO ALA PRO LYS LYS GLY SER LYS LYS ALA VAL THR LYS THR GLN LYS LYS ASP GLY LYS LYS ARG ARG LYS **T32** R33 K34 E35 Y40 V41 Y42 L45 K46 I61 V69 T88 R92 V98 L102 P103 L106 H109

A124 LYS

● Molecule 5: DNA (146-MER)

Chain I:

52%   48%

T2 C3 G4 A5 G6 A7 A8 T9 C17 C18 G21 G22 C23 C24 G25 C26 T27 T28 A29 A30 T31 T32 C36 G37 T38 A39 C45 T46 C53 C54 G55 T68 A69 C70 G71 G72 A73 T77 C78 C79 C80 C81 C82 G83 C84 G85 T86 T89 A90 A91 C92 C93

G94 G102 A103 T108 C109 C110 C111 T112 C119 A120 C123 A124 T127 G128 T129 C130 G132 A133 A137 T138 C144 G145 A146 T147

- Molecule 5: DNA (146-MER)

Chain U:

55% 45%

T2 C3 G4 A5 G6 A7 A8 T15 G16 C17 C18 G21 G22 C23 C24 G25 C26 T27 C28 A29 A30 T31 T32 G33 G34 T35 G40 C45 T46 C64 A65 C66 G67 T68 A69 C70 G71 C79 C80 C81 C82 G83 T89 A90 A91 C92 C93 G94 A98 G99 G100 G101

G102 A103 T104 T105 T108 C109 C110 C111 T112 A113 C119 A120 C123 A124 T127 G128 T129 C130 T138 A139 C144 G145 A146 T147

- Molecule 6: DNA (147-MER)

Chain J:

56% 44%

A1 T2 C3 G4 G5 T9 A10 T15 C16 C20 A21 C22 G23 T28 G29 G30 A31 G32 A33 C34 T35 G38 G39 T50 T51 G52 G53 C54 G55 G56 C65 G66 G70 A71 T79 A80 C81 G82 T83 G84 T89 A90 C93 G94 G95 T96 G97 C98 T99

A100 G101 T105 G106 T109 A110 C111 G112 T119 G120 C123 G124 G125 C126 C127 C142 T143 C144 G145 A146 T147

- Molecule 6: DNA (147-MER)

Chain V:

56% 44%

A1 T2 C3 G4 G5 T9 A10 T15 C16 C17 C20 A21 T24 G25 C26 C27 T28 G29 G30 A31 G32 G38 G39 A40 G41 C49 T50 T51 G52 G53 C54 G55 G56 T57 A61 A62 T79 A80 C81 G82 T83 G84 C85 T89 A90 A91 G92 C93 G94 G95 T96

G97 C98 T99 T105 G106 T109 A110 C111 G112 A113 T119 G120 A121 G122 C123 G124 G125 C126 C127 C132 A133 C142 T143 C144 T147

- Molecule 7: Origin recognition complex subunit 1

Chain K:

2%

68% 11% · 21%

ACE1 I14 D17 E18 Q19 G20 N21 I22 I23 ASP GLY GLY GLN K28 R31 R32 R33 L41 K42 R43 S44 S45 D46 G47 L50 V57 T65 Y66 E73 L74 R75 L76 V83 E84 L85 V96 ASN PRO LEU ALA HIS TYR ARG GLN PHE ASN PRO ASP ALA ASN

ILE LEU ASN ARG PRO LEU ASN TYR TYR ASN LYS LEU PHE SER GLU THR ALA M128 L141 R148 M153 P179 E190 R202 Q205 L213 PRO ALA ALA HIS HIS HIS HIS HIS HIS HIS HIS

- Molecule 7: Origin recognition complex subunit 1

Chain L:

2%

74% 13% · 11%

ACE1 T4 L5 T15 I23 ASP GLY GLN K28 R31 R32 R33 GLY ALA K36 Y40 L41 L50 V57 T65 Y66 M70 I71 Q72 E73 L74 R75 L76 I79 E84 L85 W86 T89 Y90 N106 PRO ASP ALA ASN ILE LEU ASN ARG P115 K121

A127 L134 T135 A136 E137 L138 I147 V165 V173 R174 Y175 I176 T180 G181 E182 K183 F184 V185 D186 I187 Q205 T212 L213 PRO ALA ALA HIS HIS HIS HIS HIS HIS HIS HIS

• Molecule 7: Origin recognition complex subunit 1

Chain W:

ACE1 A2 L5 L8 W11 T16 N21 I22 I23 ASP GLY GLN K28 R31 E38 L41 K42 R43 S44 S45 I48 M58 T65 Y66 S67 V68 L76 I79 L85 T89 Y90 P107 ASP ASN ILE LEU ASN ARG PRO L116 N128

E131 L132 Y133 A136 E137 L138 L141 V149 A150 N151 D154 GLY SER K157 K162 GLY ASN V165 R169 D186 I189 E190 D191 T212 LEU PRO ALA ALA HIS HIS HIS HIS HIS HIS HIS HIS

• Molecule 7: Origin recognition complex subunit 1

Chain X:

ACE1 A2 K3 T4 L5 K6 D7 LEU Q9 G10 W11 T15 T16 D17 E18 N21 I22 ILE ASP GLY GLN LYS R29 L30 R31 ARG ARG GLY ALA LYS T37 E38 H39 K42 ARG SER S45 L50 S55 V56 V57 M58 A62 ALA GLY THR TYR SER V68 Y69 M70 R75

I79 V82 V83 E84 A87 L88 T89 Y90 LEU ARG TRP PHE GLU VAL ASN PRO LEU ALA HIS TYR ARG GLN PHE ASN PRO ASP ALA ASN ILE LEU ASN ARG PRO LEU ASN TYR TYR ASN LYS LEU PHE SER GLU THR ALA ASN LYS ASN GLU LEU TYR LEU THR ALA E137 L138 A139

L143 I147 ARG VAL ALA ASN VAL MET ASP GLY SER LYS TRP GLU VAL LEU LYS GLY ASN VAL ASP PRO GLU R169 V173 ARG TYR ILE CYS GLU PRO THR GLY GLU LYS PHE VAL ASP ILE ASN I189 Y195 I196 V199 E200 L211 THR LEU PRO ALA ALA HIS HIS HIS

HIS HIS HIS HIS HIS

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	100.25Å 166.43Å 168.28Å 90.00° 90.28° 90.00°	Depositor
Resolution (Å)	49.05 – 3.30 49.05 – 3.30	Depositor EDS
% Data completeness (in resolution range)	97.8 (49.05-3.30) 96.4 (49.05-3.30)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.48 (at 3.33Å)	Xtriage
Refinement program	PHENIX 12-2829	Depositor
R, R_{free}	0.213 , 0.250 0.213 , 0.250	Depositor DCC
R_{free} test set	8111 reflections (9.99%)	wwPDB-VP
Wilson B-factor (Å^2)	112.4	Xtriage
Anisotropy	0.149	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 88.8	EDS
L-test for twinning[2]	$< |L| > = 0.44, < L^2 > = 0.27$	Xtriage
Estimated twinning fraction	0.027 for -h,l,k 0.029 for -h,-l,-k 0.129 for h,-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	28906	wwPDB-VP
Average B, all atoms (Å^2)	133.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.57% 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: ACE

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	0.26	0/800	0.39	0/1077
1	E	0.25	0/795	0.38	0/1066
1	M	0.25	0/810	0.38	0/1088
1	Q	0.25	0/782	0.40	0/1050
2	B	0.28	0/686	0.42	0/918
2	F	0.25	0/657	0.40	0/884
2	N	0.24	0/668	0.40	0/897
2	R	0.25	0/642	0.41	0/861
3	C	0.28	0/792	0.42	0/1076
3	G	0.25	0/807	0.40	0/1096
3	O	0.24	0/820	0.40	0/1110
3	S	0.24	0/818	0.40	0/1108
4	D	0.26	0/734	0.39	0/989
4	H	0.25	0/725	0.37	0/980
4	P	0.24	0/725	0.38	0/981
4	T	0.24	0/729	0.38	0/985
5	I	0.56	0/3333	0.93	0/5137
5	U	0.54	0/3333	0.92	0/5137
6	J	0.54	0/3403	0.92	0/5255
6	V	0.54	0/3403	0.92	0/5255
7	K	0.25	0/1446	0.44	0/1957
7	L	0.25	0/1508	0.44	0/2055
7	W	0.25	0/1428	0.44	0/1951
7	X	0.24	0/740	0.44	0/998
All	All	0.41	0/30584	0.70	0/43911

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	788	0	808	11	0
1	E	785	0	826	12	0
1	M	798	0	836	8	0
1	Q	772	0	807	10	0
2	B	678	0	726	6	0
2	F	649	0	663	8	0
2	N	660	0	686	10	0
2	R	635	0	673	7	0
3	C	782	0	804	9	0
3	G	797	0	823	12	0
3	O	810	0	853	7	0
3	S	808	0	840	15	0
4	D	723	0	738	9	0
4	H	714	0	721	6	0
4	P	714	0	714	5	0
4	T	718	0	725	17	0
5	I	2975	0	1640	54	0
5	U	2975	0	1640	51	0
6	J	3031	0	1652	52	0
6	V	3031	0	1652	47	0
7	K	1425	0	1404	13	0
7	L	1484	0	1338	19	0
7	W	1411	0	1218	12	0
7	X	743	0	608	16	0
All	All	28906	0	23395	334	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 6.

The worst 5 of 334 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)
6:J:123:DC:H2'	6:J:124:DG:C8	2.15	0.82
2:N:74:GLU:HB3	7:W:79:ILE:HD11	1.61	0.81
6:V:123:DC:H2'	6:V:124:DG:C8	2.18	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:24:DC:H2'	5:I:25:DG:C8	2.20	0.76
3:C:32:ARG:NH1	6:J:30:DG:OP1	2.21	0.73

There are no symmetry-related clashes.

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	95/135 (70%)	95 (100%)	0	0	100	100
1	E	93/135 (69%)	91 (98%)	2 (2%)	0	100	100
1	M	96/135 (71%)	95 (99%)	1 (1%)	0	100	100
1	Q	93/135 (69%)	93 (100%)	0	0	100	100
2	B	82/103 (80%)	80 (98%)	2 (2%)	0	100	100
2	F	81/103 (79%)	79 (98%)	2 (2%)	0	100	100
2	N	82/103 (80%)	78 (95%)	4 (5%)	0	100	100
2	R	78/103 (76%)	76 (97%)	2 (3%)	0	100	100
3	C	102/130 (78%)	100 (98%)	2 (2%)	0	100	100
3	G	105/130 (81%)	102 (97%)	3 (3%)	0	100	100
3	O	105/130 (81%)	103 (98%)	2 (2%)	0	100	100
3	S	105/130 (81%)	103 (98%)	2 (2%)	0	100	100
4	D	91/126 (72%)	87 (96%)	4 (4%)	0	100	100
4	H	91/126 (72%)	86 (94%)	5 (6%)	0	100	100
4	P	91/126 (72%)	87 (96%)	4 (4%)	0	100	100
4	T	91/126 (72%)	88 (97%)	2 (2%)	1 (1%)	14	45
7	K	172/224 (77%)	151 (88%)	20 (12%)	1 (1%)	25	57
7	L	191/224 (85%)	178 (93%)	13 (7%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	W	186/224 (83%)	167 (90%)	19 (10%)	0	100	100
7	X	92/224 (41%)	80 (87%)	11 (12%)	1 (1%)	14	45
All	All	2122/2872 (74%)	2019 (95%)	100 (5%)	3 (0%)	51	81

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
7	K	17	ASP
7	X	5	LEU
4	T	103	PRO

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	82/110 (74%)	82 (100%)	0	100	100
1	E	83/110 (76%)	82 (99%)	1 (1%)	71	83
1	M	83/110 (76%)	83 (100%)	0	100	100
1	Q	80/110 (73%)	80 (100%)	0	100	100
2	B	70/79 (89%)	68 (97%)	2 (3%)	42	69
2	F	64/79 (81%)	62 (97%)	2 (3%)	40	67
2	N	66/79 (84%)	66 (100%)	0	100	100
2	R	65/79 (82%)	64 (98%)	1 (2%)	65	81
3	C	78/102 (76%)	77 (99%)	1 (1%)	69	82
3	G	78/102 (76%)	77 (99%)	1 (1%)	69	82
3	O	80/102 (78%)	80 (100%)	0	100	100
3	S	80/102 (78%)	80 (100%)	0	100	100
4	D	78/106 (74%)	77 (99%)	1 (1%)	69	82
4	H	76/106 (72%)	76 (100%)	0	100	100
4	P	76/106 (72%)	75 (99%)	1 (1%)	69	82

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	T	77/106 (73%)	77 (100%)	0	100	100
7	K	149/196 (76%)	143 (96%)	6 (4%)	31	61
7	L	139/196 (71%)	131 (94%)	8 (6%)	20	50
7	W	123/196 (63%)	112 (91%)	11 (9%)	9	32
7	X	56/196 (29%)	49 (88%)	7 (12%)	4	19
All	All	1683/2372 (71%)	1641 (98%)	42 (2%)	47	72

5 of 42 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
7	W	76	LEU
7	X	5	LEU
7	W	89	THR
7	W	149	VAL
7	X	21	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
4	D	67	ASN
7	K	77	ASN
7	K	142	GLN
1	Q	68	GLN
7	W	39	HIS

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 ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	97/135 (71%)	0.19	2 (2%)	63	62	72, 101, 127, 152	0
1	E	95/135 (70%)	0.23	4 (4%)	36	34	70, 108, 148, 166	0
1	M	98/135 (72%)	0.24	0	100	100	61, 89, 122, 187	0
1	Q	95/135 (70%)	0.16	2 (2%)	63	62	62, 89, 136, 148	0
2	B	84/103 (81%)	0.22	2 (2%)	59	56	62, 92, 132, 153	0
2	F	83/103 (80%)	0.37	2 (2%)	59	56	72, 106, 161, 186	0
2	N	84/103 (81%)	0.23	2 (2%)	59	56	56, 82, 154, 198	0
2	R	80/103 (77%)	0.32	3 (3%)	40	37	65, 87, 128, 156	0
3	C	104/130 (80%)	0.24	2 (1%)	66	65	73, 107, 153, 168	0
3	G	107/130 (82%)	0.34	3 (2%)	53	51	67, 100, 167, 251	0
3	O	107/130 (82%)	0.21	1 (0%)	84	84	59, 93, 132, 173	0
3	S	107/130 (82%)	0.19	1 (0%)	84	84	66, 95, 142, 157	0
4	D	93/126 (73%)	0.11	1 (1%)	80	81	68, 98, 141, 173	0
4	H	93/126 (73%)	-0.03	0	100	100	72, 103, 141, 179	0
4	P	93/126 (73%)	0.06	0	100	100	58, 84, 127, 148	0
4	T	93/126 (73%)	0.16	1 (1%)	80	81	68, 97, 138, 164	0
5	I	146/146 (100%)	-0.71	0	100	100	110, 177, 240, 295	0
5	U	146/146 (100%)	-0.60	0	100	100	101, 141, 191, 259	0
6	J	147/147 (100%)	-0.62	0	100	100	112, 172, 218, 247	0
6	V	147/147 (100%)	-0.60	0	100	100	97, 143, 190, 230	0
7	K	177/224 (79%)	0.23	4 (2%)	60	59	76, 117, 173, 200	0
7	L	198/224 (88%)	0.25	5 (2%)	57	54	94, 155, 205, 222	0
7	W	195/224 (87%)	0.33	11 (5%)	24	23	85, 161, 217, 324	0
7	X	109/224 (48%)	0.45	10 (9%)	9	9	108, 174, 212, 252	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
All	All	2778/3458 (80%)	0.05	56 (2%)	65	64	56, 116, 198, 324	0

The worst 5 of 56 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
7	W	186	ASP	4.9
7	L	136	ALA	4.8
7	W	136	ALA	4.1
2	N	18	HIS	3.7
7	W	11	TRP	3.2

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 ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.