Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 03:12 am BST

PDB ID	:	1OCT
Title	:	CRYSTAL STRUCTURE OF THE OCT-1 POU DOMAIN BOUND TO AN OCTAMER SITE: DNA RECOGNITION WITH TETHERED DNA-BINDING MODULES
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Deposited on	:	1994-05-09
Resolution	:	3.00 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

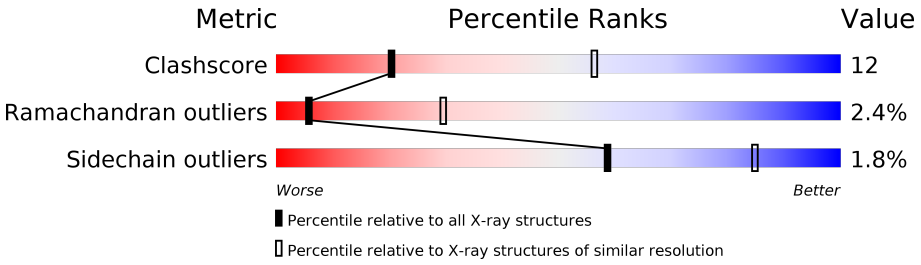
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 3.00 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))
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)

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 on 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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	15	20% 60% 20%
2	B	15	13% 40% 47%
3	C	156	57% 26% • 16%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 1670 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 DNA chain called DNA (5'-D(*TP*GP*TP*AP*TP*GP*CP*AP*AP*AP*TP*AP*AP*GP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	A	15	310	149	61	86	14	0	0	0

- Molecule 2 is a DNA chain called DNA (5'-D(*AP*CP*CP*TP*TP*AP*TP*TP*TP*GP*CP*AP*TP*AP*C)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	B	15	299	146	49	90	14	0	0	0

- Molecule 3 is a protein called PROTEIN (OCT-1 POU DOMAIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	131	1061	668	188	199	6	0	0	0

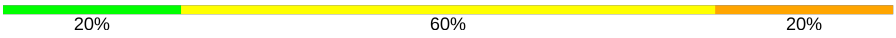
3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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. 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. 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.

Note EDS was not executed.

• Molecule 1: DNA (5'-D(*TP*GP*TP*AP*TP*GP*CP*AP*AP*AP*TP*AP*AP*GP*G)-3')

Chain A:

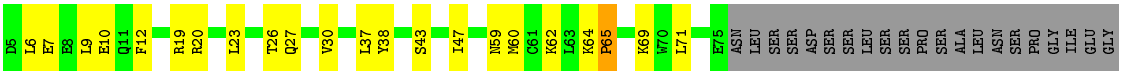


• Molecule 2: DNA (5'-D(*AP*CP*CP*TP*TP*AP*TP*TP*TP*GP*CP*AP*TP*AP*C)-3')

Chain B:

• Molecule 3: PROTEIN (OCT-1 POU DOMAIN)

Chain C:



4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	97.50Å 89.80Å 80.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00	Depositor
% Data completeness (in resolution range)	(Not available) (20.00-3.00)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR, TNT	Depositor
R, R_{free}	0.237 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	1670	wwPDB-VP
Average B, all atoms (Å^2)	31.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

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	1.45	2/349 (0.6%)	2.17	19/538 (3.5%)
2	B	1.29	0/333	2.47	25/511 (4.9%)
3	C	0.38	0/1075	0.56	0/1441
All	All	0.90	2/1757 (0.1%)	1.56	44/2490 (1.8%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	209	DA	C3'-O3'	-5.70	1.36	1.44
1	A	208	DA	C3'-O3'	-5.59	1.36	1.44

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	217	DC	O4'-C4'-C3'	-14.00	97.60	106.00
2	B	217	DC	C1'-O4'-C4'	-9.32	100.78	110.10
1	A	209	DA	O4'-C1'-N9	8.16	113.71	108.00
2	B	217	DC	O4'-C1'-N1	8.12	113.69	108.00
2	B	219	DT	P-O5'-C5'	-8.07	107.98	120.90
1	A	208	DA	O4'-C1'-C2'	-8.02	99.48	105.90
2	B	230	DC	O4'-C4'-C3'	-8.02	101.19	106.00
2	B	227	DA	O4'-C1'-N9	-7.69	102.62	108.00
2	B	223	DT	O4'-C1'-N1	-7.39	102.83	108.00
2	B	216	DA	O4'-C1'-C2'	7.33	111.76	105.90
2	B	224	DT	C1'-O4'-C4'	-7.32	102.78	110.10
2	B	216	DA	P-O3'-C3'	-7.28	110.96	119.70
2	B	225	DG	P-O5'-C5'	-7.15	109.46	120.90
2	B	222	DT	N3-C2-O2	-7.09	118.04	122.30
1	A	202	DG	O4'-C4'-C3'	-6.87	101.75	104.50
1	A	201	DT	C4'-C3'-C2'	-6.62	97.14	103.10
1	A	202	DG	C4'-C3'-C2'	6.55	109.00	103.10
1	A	202	DG	P-O3'-C3'	-6.48	111.92	119.70
1	A	212	DA	O4'-C1'-N9	-6.40	103.52	108.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	224	DT	C4-C5-C7	-6.35	115.19	119.00
2	B	218	DC	P-O5'-C5'	-6.34	110.75	120.90
2	B	216	DA	O3'-P-O5'	-6.33	91.98	104.00
2	B	225	DG	O4'-C1'-N9	-6.31	103.58	108.00
1	A	204	DA	P-O5'-C5'	-6.30	110.82	120.90
1	A	210	DA	P-O5'-C5'	-6.30	110.82	120.90
2	B	224	DT	N3-C4-O4	6.22	123.63	119.90
1	A	205	DT	C6-C5-C7	-6.14	119.21	122.90
1	A	204	DA	O4'-C1'-N9	-6.01	103.79	108.00
1	A	207	DC	P-O5'-C5'	-6.01	111.29	120.90
2	B	224	DT	C5-C4-O4	-5.71	120.91	124.90
1	A	202	DG	N1-C6-O6	5.66	123.30	119.90
1	A	212	DA	P-O5'-C5'	-5.62	111.90	120.90
1	A	211	DT	N1-C2-O2	-5.56	118.65	123.10
2	B	227	DA	O4'-C1'-C2'	-5.54	101.47	105.90
2	B	227	DA	P-O5'-C5'	-5.53	112.06	120.90
2	B	222	DT	P-O3'-C3'	5.52	126.33	119.70
1	A	201	DT	P-O3'-C3'	-5.52	113.08	119.70
1	A	206	DG	C5-C6-O6	-5.52	125.29	128.60
1	A	206	DG	C4-C5-N7	5.50	113.00	110.80
2	B	222	DT	O4'-C1'-C2'	-5.47	101.53	105.90
2	B	219	DT	N3-C4-O4	-5.29	116.73	119.90
2	B	220	DT	O4'-C4'-C3'	-5.20	102.42	104.50
2	B	219	DT	O4'-C1'-N1	-5.06	104.46	108.00
1	A	208	DA	O4'-C4'-C3'	-5.05	102.48	104.50

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	310	0	171	3	0
2	B	299	0	173	10	0
3	C	1061	0	1053	27	0
All	All	1670	0	1397	38	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 12.

All (38) 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)
3:C:9:LEU:HD21	3:C:60:MET:HB3	1.32	1.10
3:C:26:THR:O	3:C:30:VAL:HG23	1.97	0.65
3:C:146:ARG:HH11	3:C:146:ARG:HB3	1.63	0.63
3:C:7:GLU:O	3:C:10:GLU:HB3	2.00	0.61
3:C:64:LYS:HB3	3:C:65:PRO:HD3	1.84	0.60
3:C:112:ILE:O	3:C:116:LEU:HG	2.01	0.60
1:A:211:DT:H2'	1:A:212:DA:C8	2.38	0.59
3:C:12:PHE:CD2	3:C:64:LYS:HG3	2.41	0.55
3:C:38:TYR:OH	3:C:69:LYS:HD2	2.06	0.55
2:B:217:DC:H2"	2:B:218:DC:O5'	2.06	0.54
3:C:19:ARG:HD2	3:C:71:LEU:HD21	1.91	0.53
2:B:224:DT:OP1	3:C:62:LYS:NZ	2.42	0.53
3:C:19:ARG:O	3:C:23:LEU:HD13	2.09	0.53
3:C:20:ARG:NH2	3:C:27:GLN:HG3	2.25	0.51
3:C:7:GLU:HA	3:C:10:GLU:HB3	1.93	0.51
2:B:223:DT:H2"	2:B:224:DT:O5'	2.13	0.49
3:C:123:ASN:ND2	3:C:126:PRO:HA	2.28	0.48
3:C:69:LYS:C	3:C:69:LYS:HD3	2.34	0.48
3:C:131:ILE:HG23	3:C:145:ILE:HG22	1.96	0.47
2:B:217:DC:H2"	2:B:218:DC:C6	2.49	0.47
2:B:216:DA:N3	2:B:216:DA:H2'	2.31	0.45
3:C:131:ILE:HG23	3:C:145:ILE:CG2	2.47	0.44
3:C:135:ALA:HB1	3:C:140:MET:O	2.17	0.44
2:B:219:DT:C5	2:B:220:DT:H73	2.53	0.44
1:A:211:DT:C2'	1:A:212:DA:C8	3.01	0.43
2:B:217:DC:H2"	2:B:218:DC:H6	1.82	0.43
2:B:226:DC:H5'	3:C:105:ARG:HB3	2.01	0.43
3:C:133:MET:O	3:C:136:ASP:HB3	2.18	0.43
3:C:155:LYS:O	3:C:159:ILE:HG13	2.19	0.42
3:C:110:THR:O	3:C:114:VAL:HG23	2.19	0.42
1:A:202:DG:H2"	1:A:203:DT:O5'	2.18	0.42
3:C:112:ILE:HD12	3:C:138:LEU:HD22	2.02	0.41
3:C:37:LEU:HD23	3:C:38:TYR:CE2	2.56	0.41
3:C:43:SER:O	3:C:47:ILE:HG12	2.21	0.41
2:B:229:DA:H2'	2:B:229:DA:OP2	2.19	0.41
3:C:12:PHE:CE2	3:C:64:LYS:HG3	2.55	0.41
3:C:160:ASN:HA	3:C:161:PRO:HD2	1.90	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:217:DC:C2'	2:B:218:DC:C6	3.04	0.40

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
3	C	127/156 (81%)	108 (85%)	16 (13%)	3 (2%)	6 29

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	6	LEU
3	C	139	ASN
3	C	65	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
3	C	114/142 (80%)	112 (98%)	2 (2%)	59 85

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	59	ASN
3	C	146	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	40	ASN
3	C	123	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 carbohydrates 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

EDS was not executed - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.