



## Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 07:24 pm BST

PDB ID : 1DGC  
Title : THE X-RAY STRUCTURE OF THE GCN4-BZIP BOUND TO ATF/CREB  
SITE DNA SHOWS THE COMPLEX DEPENDS ON DNA FLEXIBILITY  
Authors : Koenig, P.; Richmond, T.J.  
Deposited on : 1993-07-15  
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](mailto: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.

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

MolProbity : 4.02b-467  
Xtrriage (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

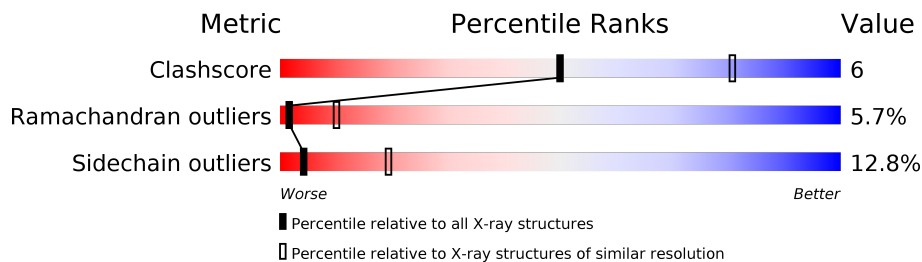
# 1 Overall quality at a glance

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  $\geq 3$ , 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  $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	B	19	
2	A	62	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 842 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\*GP\*AP\*GP\*AP\*TP\*GP\*AP\*CP\*GP\*TP\*CP\*AP\*TP\*CP\*TP\*CP\*C)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
1	B	19	386	185	70	113	18	0	0	0

- Molecule 2 is a protein called PROTEIN (GCN4).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	55	456	278	96	81	1	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\*GP\*AP\*GP\*AP\*TP\*GP\*AP\*CP\*GP\*TP\*CP\*AP\*TP\*CP\*T P\*CP\*C)-3')

Chain B: 



- Molecule 2: PROTEIN (GCN4)

Chain A: 



## 4 Data and refinement statistics

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

Property	Value	Source
Space group	P 41 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	58.66Å 58.66Å 86.66Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	10.00 – 3.00	Depositor
% Data completeness (in resolution range)	98.2 (10.00-3.00)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, $R_{free}$	0.216 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	842	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	13.0	wwPDB-VP

## 5 Model quality i

### 5.1 Standard geometry i

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	B	2.25	18/432 (4.2%)	3.22	58/665 (8.7%)
2	A	0.98	0/458	1.77	7/604 (1.2%)
All	All	1.72	18/890 (2.0%)	2.63	65/1269 (5.1%)

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	6	DC	P-O5'	10.96	1.70	1.59
1	B	-9	DG	P-O5'	7.91	1.67	1.59
1	B	5	DT	N1-C6	-7.44	1.33	1.38
1	B	-9	DG	C5'-C4'	6.88	1.58	1.51
1	B	7	DT	C5-C7	6.64	1.54	1.50
1	B	-8	DG	C5'-C4'	6.46	1.58	1.51
1	B	-3	DG	C6-N1	-6.42	1.35	1.39
1	B	-4	DT	C5-C7	6.37	1.53	1.50
1	B	-1	DC	C2'-C1'	-5.96	1.46	1.52
1	B	-8	DG	P-O5'	5.81	1.65	1.59
1	B	-10	DT	C5'-C4'	5.34	1.57	1.51
1	B	9	DC	P-O5'	5.29	1.65	1.59
1	B	-3	DG	C5'-C4'	-5.25	1.45	1.51
1	B	7	DT	N3-C4	-5.16	1.34	1.38
1	B	-1	DC	C4'-C3'	-5.07	1.47	1.52
1	B	7	DT	C4'-C3'	5.06	1.58	1.53
1	B	-5	DA	N3-C4	5.06	1.37	1.34
1	B	-6	DG	C1'-N9	-5.04	1.40	1.47

All (65) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	-9	DG	O4'-C1'-N9	21.19	122.83	108.00
1	B	9	DC	O4'-C1'-N1	-19.89	94.08	108.00
1	B	6	DC	O4'-C1'-N1	14.78	118.35	108.00
1	B	4	DA	O4'-C1'-N9	13.29	117.30	108.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	-5	DA	O4'-C1'-N9	12.84	116.98	108.00
1	B	1	DG	P-O3'-C3'	11.77	133.83	119.70
1	B	8	DC	O4'-C1'-N1	11.61	116.13	108.00
1	B	3	DC	O4'-C1'-N1	11.37	115.96	108.00
1	B	7	DT	P-O3'-C3'	11.22	133.16	119.70
1	B	5	DT	N3-C2-O2	-10.07	116.26	122.30
2	A	243	ARG	NE-CZ-NH1	10.00	125.30	120.30
1	B	-3	DG	O4'-C1'-N9	10.00	115.00	108.00
1	B	2	DT	O4'-C4'-C3'	-9.99	100.00	106.00
1	B	7	DT	O4'-C1'-N1	9.87	114.91	108.00
1	B	-5	DA	P-O3'-C3'	9.47	131.06	119.70
1	B	-8	DG	P-O5'-C5'	9.39	135.92	120.90
1	B	-10	DT	C6-C5-C7	-9.15	117.41	122.90
1	B	2	DT	O4'-C1'-C2'	-9.08	98.64	105.90
2	A	243	ARG	NE-CZ-NH2	-8.13	116.23	120.30
1	B	6	DC	N1-C2-O2	7.54	123.42	118.90
1	B	-4	DT	O3'-P-O5'	-7.50	89.74	104.00
1	B	3	DC	O4'-C1'-C2'	-7.20	100.14	105.90
1	B	5	DT	C4-C5-C6	7.14	122.29	118.00
1	B	-10	DT	O4'-C1'-C2'	-7.14	100.19	105.90
1	B	-4	DT	N3-C2-O2	-6.88	118.17	122.30
1	B	-3	DG	C5'-C4'-C3'	-6.74	101.97	114.10
1	B	-4	DT	C6-C5-C7	-6.30	119.12	122.90
2	A	249	ARG	NE-CZ-NH2	-6.24	117.18	120.30
1	B	5	DT	C6-C5-C7	-6.22	119.17	122.90
1	B	6	DC	N3-C2-O2	-6.13	117.61	121.90
1	B	7	DT	C4'-C3'-O3'	6.13	125.02	109.70
1	B	-10	DT	C4-C5-C7	6.10	122.66	119.00
1	B	8	DC	N1-C1'-C2'	-6.10	101.00	112.60
2	A	256	LYS	CA-CB-CG	6.06	126.72	113.40
1	B	-1	DC	N1-C2-O2	6.02	122.51	118.90
1	B	9	DC	P-O5'-C5'	6.00	130.49	120.90
1	B	1	DG	O4'-C1'-C2'	-5.96	101.13	105.90
2	A	273	ARG	NE-CZ-NH1	5.86	123.23	120.30
1	B	-10	DT	O4'-C1'-N1	-5.85	103.90	108.00
1	B	-8	DG	C1'-O4'-C4'	-5.82	104.28	110.10
1	B	-4	DT	O4'-C1'-C2'	-5.78	101.27	105.90
1	B	-8	DG	O4'-C4'-C3'	5.78	109.47	106.00
1	B	-2	DA	O4'-C1'-N9	5.72	112.00	108.00
1	B	7	DT	C4-C5-C6	5.72	121.43	118.00
1	B	-1	DC	P-O3'-C3'	-5.65	112.92	119.70
1	B	-9	DG	C5-C6-O6	-5.62	125.22	128.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	8	DC	N1-C2-O2	5.61	122.27	118.90
1	B	9	DC	O4'-C1'-C2'	-5.51	101.49	105.90
1	B	7	DT	N1-C2-N3	5.50	117.90	114.60
1	B	5	DT	C5'-C4'-O4'	5.49	119.72	109.30
1	B	9	DC	N1-C1'-C2'	5.41	122.87	112.60
1	B	4	DA	P-O5'-C5'	-5.36	112.33	120.90
1	B	5	DT	O4'-C1'-N1	5.29	111.70	108.00
1	B	-10	DT	O4'-C4'-C3'	-5.24	102.40	104.50
1	B	2	DT	P-O3'-C3'	5.22	125.97	119.70
1	B	3	DC	P-O3'-C3'	5.21	125.96	119.70
1	B	-8	DG	O5'-C5'-C4'	5.20	124.00	111.00
1	B	-5	DA	C5'-C4'-O4'	-5.14	99.53	109.30
1	B	-4	DT	C4-C5-C6	5.13	121.08	118.00
1	B	9	DC	C5-C4-N4	-5.13	116.61	120.20
1	B	-8	DG	N1-C2-N2	5.13	120.81	116.20
1	B	-6	DG	P-O3'-C3'	5.09	125.81	119.70
2	A	227	PRO	CA-N-CD	-5.09	104.37	111.50
2	A	227	PRO	N-CA-CB	5.08	109.40	103.30
1	B	-3	DG	C8-N9-C4	-5.01	104.40	106.40

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	B	386	0	216	5	0
2	A	456	0	490	5	0
All	All	842	0	706	9	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.

All (9) 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:B:6:DC:H2''	1:B:7:DT:O5'	1.99	0.62
2:A:240:ARG:HH11	2:A:240:ARG:HG3	1.79	0.48
1:B:-4:DT:H2''	1:B:-3:DG:C8	2.50	0.47
2:A:229:ALA:HA	2:A:232:ARG:NH2	2.33	0.44
1:B:7:DT:H2''	1:B:8:DC:C6	2.53	0.43
1:B:-10:DT:H2''	1:B:-9:DG:O5'	2.19	0.41
2:A:271:VAL:O	2:A:275:LYS:HB2	2.21	0.41
2:A:230:LEU:HA	2:A:230:LEU:HD13	1.72	0.41
1:B:1:DG:N7	2:A:243:ARG:NH2	2.69	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
2	A	53/62 (86%)	49 (92%)	1 (2%)	3 (6%)	<b>1</b> <b>10</b>

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	280	GLU
2	A	277	LEU
2	A	229	ALA

### 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
2	A	47/54 (87%)	41 (87%)	6 (13%)	4 19

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	234	ARG
2	A	249	ARG
2	A	251	LYS
2	A	269	ASN
2	A	270	GLU
2	A	280	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 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

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.