



# Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 02:34 am BST

PDB ID : 3G6Q  
Title : GR DNA binding domain:FKBP5 binding site complex-9  
Authors : Pufall, M.A.; Yamamoto, K.R.; Meijssing, S.H.  
Deposited on : 2009-02-08  
Resolution : 2.26 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
Xtriage (Phenix)	:	1.13
EDS	:	2.11
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)	:	2.11

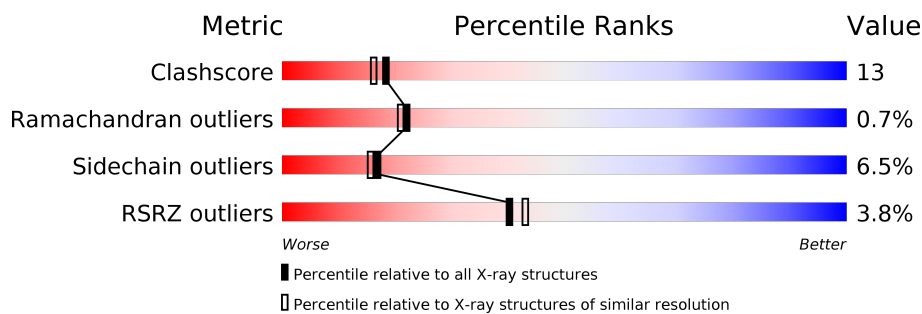
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.26 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	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

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 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  $\leq 5\%$ . 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	90	<div> <div>4%</div> <div> <div></div> <div>73%</div> <div>12%</div> <div>•</div> <div>13%</div> </div> </div>
1	B	90	<div> <div>3%</div> <div> <div></div> <div>57%</div> <div>22%</div> <div>•</div> <div>18%</div> </div> </div>
2	C	16	<div> <div></div> <div> <div>38%</div> <div>63%</div> </div> </div>
3	D	16	<div> <div></div> <div> <div>38%</div> <div>50%</div> <div>13%</div> </div> </div>

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 1851 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 Glucocorticoid receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	74	Total	C	N	O	S	0	0	0
			571	347	112	100	12			
1	A	78	Total	C	N	O	S	0	0	0
			590	359	116	103	12			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	436	GLY	-	EXPRESSION TAG	UNP P06536
B	437	SER	-	EXPRESSION TAG	UNP P06536
B	438	HIS	-	EXPRESSION TAG	UNP P06536
B	439	MET	-	EXPRESSION TAG	UNP P06536
A	436	GLY	-	EXPRESSION TAG	UNP P06536
A	437	SER	-	EXPRESSION TAG	UNP P06536
A	438	HIS	-	EXPRESSION TAG	UNP P06536
A	439	MET	-	EXPRESSION TAG	UNP P06536

- Molecule 2 is a DNA chain called DNA (5'-D(\*TP\*AP\*GP\*AP\*AP\*CP\*AP\*GP\*GP\*GP\*TP\*GP\*TP\*TP\*CP\*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	16	Total	C	N	O	P	0	0	0
			329	158	61	95	15			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	16	Total	C	N	O	P	0	0	0
			321	155	58	93	15			

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	2	Total 2	Zn 2	0	0
4	A	2	Total 2	Zn 2	0	0

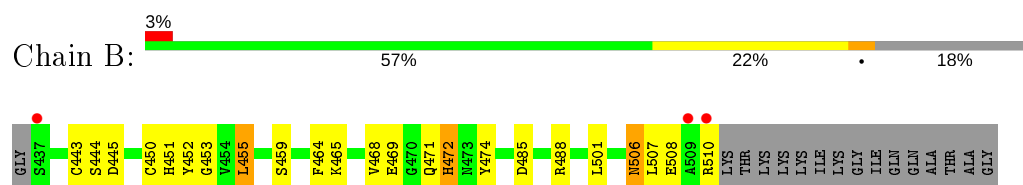
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	10	Total 10	O 10	0	0
5	A	22	Total 22	O 22	0	0
5	C	2	Total 2	O 2	0	0
5	D	2	Total 2	O 2	0	0

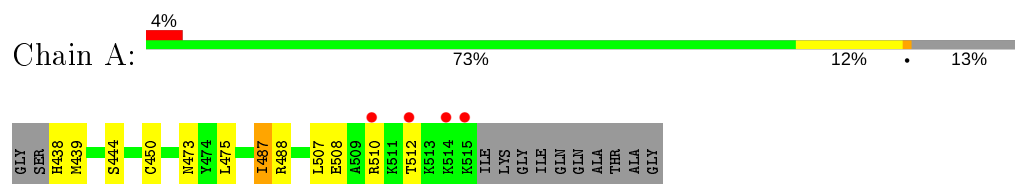
### 3 Residue-property plots [i](#)

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 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.

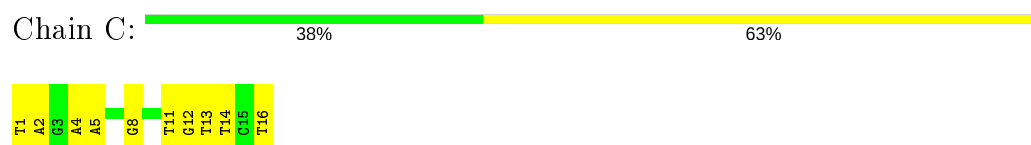
- Molecule 1: Glucocorticoid receptor



- Molecule 1: Glucocorticoid receptor



- Molecule 2: DNA (5'-D(\*TP\*AP\*GP\*AP\*AP\*CP\*AP\*GP\*GP\*GP\*TP\*GP\*TP\*TP\*CP\*T)-3')



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



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	116.04Å 38.87Å 95.52Å 90.00° 122.07° 90.00°	Depositor
Resolution (Å)	49.17 – 2.26 49.17 – 2.26	Depositor EDS
% Data completeness (in resolution range)	82.1 (49.17-2.26) 82.3 (49.17-2.26)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	0.09	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.37 (at 2.27Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, $R_{free}$	0.172 , 0.214 0.181 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	44.4	Xtriage
Anisotropy	0.512	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 56.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	1851	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	78.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.23% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  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: 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	0.61	0/598	0.69	0/799
1	B	0.44	0/579	0.66	0/772
2	C	0.72	0/369	1.40	4/569 (0.7%)
3	D	0.75	0/359	2.58	11/551 (2.0%)
All	All	0.62	0/1905	1.43	15/2691 (0.6%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1	DA	N1-C2-N3	30.43	144.51	129.30
3	D	1	DA	C6-N1-C2	-29.39	100.97	118.60
3	D	1	DA	C5-C6-N1	18.78	127.09	117.70
3	D	13	DT	O4'-C1'-N1	13.88	117.72	108.00
3	D	1	DA	C5-C6-N6	-9.14	116.39	123.70
3	D	1	DA	C2-N3-C4	-7.85	106.68	110.60
3	D	13	DT	P-O5'-C5'	-7.09	109.56	120.90
2	C	11	DT	N3-C4-O4	6.51	123.81	119.90
3	D	11	DT	P-O5'-C5'	-5.85	111.53	120.90
2	C	5	DA	C3'-C2'-C1'	-5.58	95.81	102.50
2	C	11	DT	C5-C4-O4	-5.51	121.04	124.90
3	D	9	DC	O4'-C1'-N1	-5.49	104.16	108.00
3	D	3	DG	O4'-C1'-N9	5.41	111.78	108.00
2	C	4	DA	O4'-C1'-N9	-5.21	104.36	108.00
3	D	12	DG	C3'-C2'-C1'	-5.05	96.44	102.50

There are no chirality outliers.

There are no planarity outliers.

## 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	590	0	562	10	0
1	B	571	0	557	23	0
2	C	329	0	183	11	0
3	D	321	0	182	6	5
4	A	2	0	0	0	0
4	B	2	0	0	0	0
5	A	22	0	0	0	0
5	B	10	0	0	0	0
5	C	2	0	0	0	0
5	D	2	0	0	0	0
All	All	1851	0	1484	43	5

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 13.

All (43) 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:471:GLN:CA	1:B:472:HIS:HB2	1.85	1.06
1:B:471:GLN:HA	1:B:472:HIS:CB	1.86	1.00
1:B:471:GLN:HA	1:B:472:HIS:HB2	0.94	0.91
1:B:471:GLN:HG3	1:B:472:HIS:O	1.80	0.81
1:B:455:LEU:H	1:B:455:LEU:HD12	1.48	0.79
1:A:450:CYS:O	2:C:1:DT:H5'	1.82	0.77
1:B:451:HIS:C	1:B:453:GLY:HA2	2.10	0.71
2:C:13:DT:H2''	2:C:14:DT:H5'	1.73	0.68
1:B:452:TYR:N	1:B:453:GLY:HA2	2.10	0.66
1:B:455:LEU:H	1:B:455:LEU:CD1	2.08	0.65
1:B:506:ASN:HD22	1:B:507:LEU:N	1.97	0.63
3:D:1:DA:H2''	3:D:2:DA:H5'	1.79	0.63
1:B:506:ASN:HD22	1:B:508:GLU:H	1.48	0.60
1:B:455:LEU:N	1:B:455:LEU:HD12	2.15	0.59
2:C:12:DG:H2''	2:C:13:DT:H72	1.88	0.56
2:C:1:DT:H2''	2:C:2:DA:H5'	1.89	0.55
1:B:506:ASN:ND2	1:B:508:GLU:H	2.05	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:13:DT:H2''	2:C:14:DT:C5'	2.37	0.54
1:B:464:PHE:O	1:B:468:VAL:HG23	2.08	0.53
1:A:510:ARG:HD2	2:C:2:DA:C5'	2.38	0.53
1:B:506:ASN:C	1:B:506:ASN:HD22	2.12	0.52
1:B:510:ARG:NH1	3:D:2:DA:H5''	2.24	0.52
1:B:465:LYS:O	1:B:469:GLU:HB2	2.10	0.52
2:C:13:DT:H2'	2:C:14:DT:C6	2.48	0.48
1:B:507:LEU:HA	1:B:507:LEU:HD12	1.80	0.46
1:A:439:MET:HE3	1:A:444:SER:HA	1.96	0.46
1:A:508:GLU:O	1:A:512:THR:CB	2.64	0.45
2:C:16:DT:H5'	2:C:16:DT:H6	1.82	0.45
3:D:13:DT:H5'	3:D:13:DT:H6	1.82	0.44
1:A:507:LEU:HA	1:A:507:LEU:HD12	1.82	0.44
1:B:443:CYS:SG	1:B:445:ASP:HB2	2.58	0.43
2:C:8:DG:H1	3:D:10:DC:H42	1.67	0.42
1:A:439:MET:HB3	1:A:439:MET:HE3	1.77	0.42
1:B:510:ARG:HH11	3:D:2:DA:H5''	1.84	0.42
1:B:501:LEU:HA	1:B:501:LEU:HD23	1.69	0.42
1:B:472:HIS:CE1	1:B:474:TYR:HH	2.37	0.41
1:B:485:ASP:OD2	1:B:488:ARG:NH1	2.53	0.41
3:D:15:DC:C3'	3:D:16:DT:H5'	2.51	0.41
1:A:487:ILE:HD12	1:A:488:ARG:HG3	2.02	0.41
1:A:510:ARG:HD2	2:C:2:DA:H5'	2.02	0.41
1:B:443:CYS:O	1:B:444:SER:HB2	2.21	0.41
1:A:510:ARG:HD2	2:C:2:DA:H5''	2.03	0.40
1:A:487:ILE:HG13	1:A:487:ILE:H	1.63	0.40

All (5) 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)
3:D:1:DA:C2	3:D:1:DA:C2[2_656]	0.95	1.25
3:D:1:DA:N1	3:D:1:DA:C2[2_656]	1.35	0.85
3:D:1:DA:C6	3:D:1:DA:N1[2_656]	1.38	0.82
3:D:1:DA:C2	3:D:1:DA:N3[2_656]	2.18	0.02
3:D:1:DA:N6	3:D:1:DA:N6[2_656]	2.19	0.01

## 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	76/90 (84%)	71 (93%)	5 (7%)	0	100	100
1	B	72/90 (80%)	63 (88%)	8 (11%)	1 (1%)	11	7
All	All	148/180 (82%)	134 (90%)	13 (9%)	1 (1%)	22	21

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	472	HIS

### 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	61/73 (84%)	57 (93%)	4 (7%)	16	15
1	B	62/73 (85%)	58 (94%)	4 (6%)	17	16
All	All	123/146 (84%)	115 (94%)	8 (6%)	17	16

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	450	CYS
1	B	455	LEU
1	B	459	SER
1	B	506	ASN
1	A	438	HIS

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Mol	Chain	Res	Type
1	A	473	ASN
1	A	475	LEU
1	A	487	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	506	ASN
1	A	472	HIS
1	A	473	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 ⓘ

Of 4 ligands modelled in this entry, 4 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	78/90 (86%)	0.17	4 (5%) 28 30	35, 53, 131, 174	0
1	B	74/90 (82%)	0.19	3 (4%) 37 40	35, 77, 134, 150	0
2	C	16/16 (100%)	-0.84	0 100 100	68, 85, 143, 157	0
3	D	16/16 (100%)	-0.68	0 100 100	53, 100, 120, 129	0
All	All	184/212 (86%)	0.02	7 (3%) 40 43	35, 68, 134, 174	0

All (7) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	514	LYS	5.3
1	A	515	LYS	4.6
1	B	510	ARG	3.7
1	B	509	ALA	3.3
1	B	437	SER	3.2
1	A	510	ARG	2.9
1	A	512	THR	2.9

### 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 carbohydrates 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<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
4	ZN	A	527	1/1	1.00	0.18	47,47,47,47	0
4	ZN	B	526	1/1	1.00	0.15	73,73,73,73	0
4	ZN	A	526	1/1	1.00	0.15	49,49,49,49	0
4	ZN	B	527	1/1	1.00	0.18	48,48,48,48	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.