



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 12, 2017 – 01:01 PM EST

PDB ID : 1O6P  
Title : Importin Beta bound to a GLFG Nucleoporin peptide  
Authors : Bayliss, R.; Stewart, M.  
Deposited on : 2002-10-10  
Resolution : 2.80 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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

<http://wwpdb.org/validation/2016/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  
Mogul : unknown  
Xtriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20028442

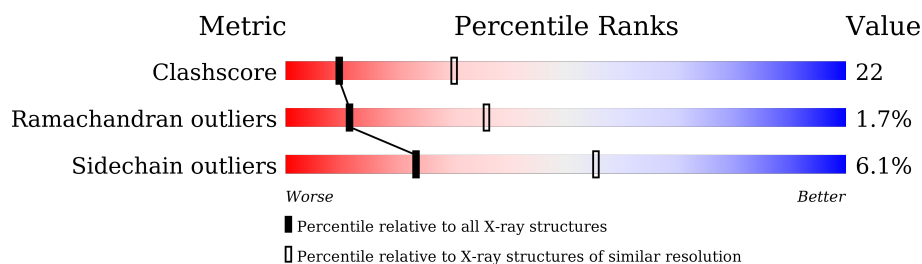
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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	102246	2827 (2.80-2.80)
Ramachandran outliers	100387	2782 (2.80-2.80)
Sidechain outliers	100360	2784 (2.80-2.80)

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. 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	442	
1	B	442	
2	C	9	
2	D	9	
2	E	9	
2	F	9	

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7022 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 IMPORTIN BETA-1 SUBUNIT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	441	Total	C	N	O	S	0	0	1
			3441	2169	577	670	25			
1	B	441	Total	C	N	O	S	0	0	1
			3441	2169	577	670	25			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	97	HIS	GLN	CONFLICT	UNP Q14974
B	97	HIS	GLN	CONFLICT	UNP Q14974

- Molecule 2 is a protein called SYNTHETIC GLFG PEPTIDE.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	5	Total	C	N	O	0	0	1
			28	19	5	4			
2	D	5	Total	C	N	O	0	0	1
			28	19	5	4			
2	E	4	Total	C	N	O	0	0	1
			24	17	4	3			
2	F	4	Total	C	N	O	0	0	1
			24	17	4	3			

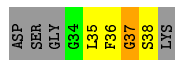
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	20	Total	O	0	0
			20	20		
3	B	16	Total	O	0	0
			16	16		

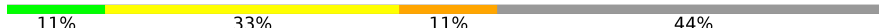


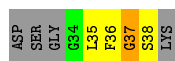
- Molecule 2: SYNTHETIC GLFG PEPTIDE

Chain C:  11% 33% 11% 44%




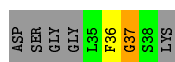
- Molecule 2: SYNTHETIC GLFG PEPTIDE

Chain D:  11% 33% 11% 44%



- Molecule 2: SYNTHETIC GLFG PEPTIDE

Chain E:  22% 11% 11% 56%



- Molecule 2: SYNTHETIC GLFG PEPTIDE

Chain F:  44% 56%



## 4 Data and refinement statistics

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	125.82Å 67.03Å 129.26Å 90.00° 98.99° 90.00°	Depositor
Resolution (Å)	20.00 – 2.80	Depositor
% Data completeness (in resolution range)	91.8 (20.00-2.80)	Depositor
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.238 , 0.267	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7022	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	56.0	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	0.55	0/3505	0.69	1/4771 (0.0%)
1	B	0.56	0/3505	0.72	1/4771 (0.0%)
2	C	1.07	0/28	0.52	0/36
2	D	0.98	0/28	0.45	0/36
2	E	1.08	0/24	0.74	0/31
2	F	1.03	0/24	0.94	0/31
All	All	0.57	0/7114	0.70	2/9676 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	337	ASP	N-CA-C	7.12	130.22	111.00
1	B	337	ASP	CB-CG-OD1	5.10	122.89	118.30

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	3441	0	3431	158	0
1	B	3441	0	3431	151	0
2	C	28	0	25	3	0
2	D	28	0	25	3	0
2	E	24	0	22	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	24	0	22	0	0
3	A	20	0	0	1	0
3	B	16	0	0	0	0
All	All	7022	0	6956	313	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 22.

The worst 5 of 313 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:A:335:GLU:HG3	1:A:381:ARG:HH22	1.21	1.03
1:B:338:ASP:OD2	1:B:341:ASP:HB3	1.58	1.02
1:B:337:ASP:CG	1:B:338:ASP:H	1.61	0.97
1:B:338:ASP:HB2	1:B:341:ASP:HB2	1.51	0.92
1:A:338:ASP:CG	1:A:341:ASP:HB2	1.89	0.92

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	
1	A	439/442 (99%)	398 (91%)	35 (8%)	6 (1%)	14	42
1	B	439/442 (99%)	400 (91%)	33 (8%)	6 (1%)	14	42
2	C	3/9 (33%)	2 (67%)	0	1 (33%)	0	0
2	D	3/9 (33%)	2 (67%)	0	1 (33%)	0	0
2	E	2/9 (22%)	1 (50%)	0	1 (50%)	0	0
2	F	2/9 (22%)	2 (100%)	0	0	100	100
All	All	888/920 (96%)	805 (91%)	68 (8%)	15 (2%)	11	36



5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	360	GLU
1	A	438	LEU
1	B	360	GLU
2	C	37	GLY
2	D	37	GLY

### 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	381/382 (100%)	359 (94%)	22 (6%)	25	57
1	B	381/382 (100%)	356 (93%)	25 (7%)	21	51
2	C	2/6 (33%)	2 (100%)	0	100	100
2	D	2/6 (33%)	2 (100%)	0	100	100
2	E	2/6 (33%)	2 (100%)	0	100	100
2	F	2/6 (33%)	2 (100%)	0	100	100
All	All	770/788 (98%)	723 (94%)	47 (6%)	23	55

5 of 47 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	408	GLN
1	B	42	ARG
1	B	346	LYS
1	B	3	LEU
1	B	51	GLN

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

Mol	Chain	Res	Type
1	A	333	GLN
1	B	49	ASN

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Mol	Chain	Res	Type
1	B	377	ASN
1	A	401	GLN
1	B	32	ASN

### 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.