



## wwPDB/EMDataBank EM Map/Model Validation Summary Report ⓘ

Mar 2, 2017 – 11:17 am GMT

PDB ID : 3DDX  
Title : HK97 bacteriophage capsid Expansion Intermediate-II model  
Authors : Lee, K.K.; Gan, L.; Conway, J.F.; Hendrix, R.W.; Steven, A.C.; Johnson, J.E.  
Deposited on : 2008-06-06  
Resolution : unknown (reported)

This is a wwPDB/EMDataBank EM Map/Model Validation Summary Report  
for a publicly released PDB/EMDB 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/EMValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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MolProbity : 4.02b-467  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : recalc29047

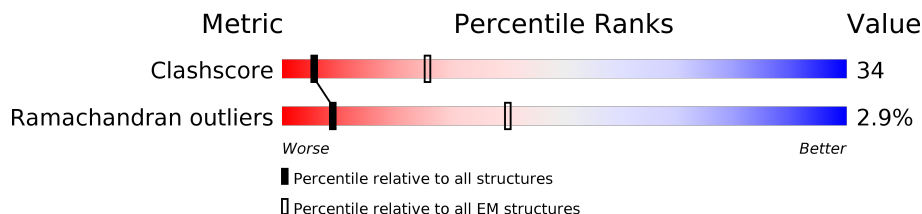
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*








The reported resolution of this entry is unknown.

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)	EM structures (#Entries)
Clashscore	125131	1336
Ramachandran outliers	121729	1120

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the 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  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	282	 82% 17% .
1	B	282	 76% 22% ..
1	C	282	 80% 18% ..
1	D	282	 78% 19% ..
1	E	282	 84% 14% ..
1	F	282	 79% 20% ..
1	G	282	 88% 12% .

## 2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 9653 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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.

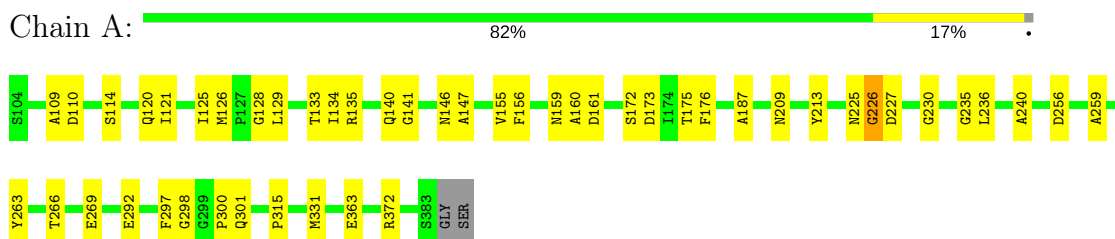
- Molecule 1 is a protein called Major capsid protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
1	A	280	Total 1379	C 819	N 280	O 280	0	0
1	B	280	Total 1379	C 819	N 280	O 280	0	0
1	C	280	Total 1379	C 819	N 280	O 280	0	0
1	D	280	Total 1379	C 819	N 280	O 280	0	0
1	E	280	Total 1379	C 819	N 280	O 280	0	0
1	F	280	Total 1379	C 819	N 280	O 280	0	0
1	G	280	Total 1379	C 819	N 280	O 280	0	0

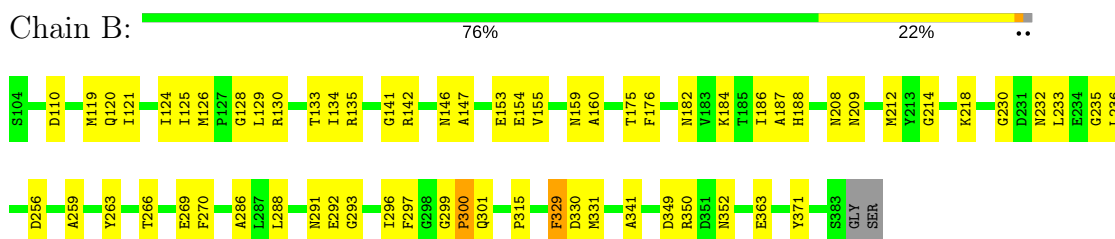
### 3 Residue-property plots

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.

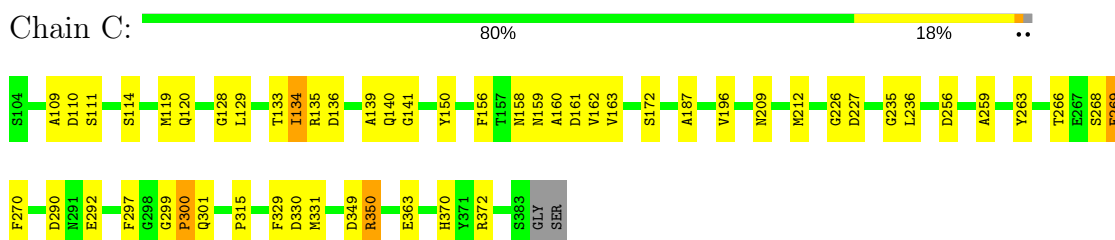
- Molecule 1: Major capsid protein



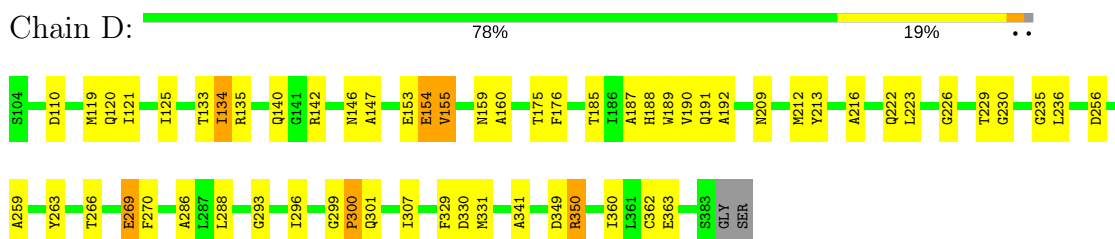
- Molecule 1: Major capsid protein



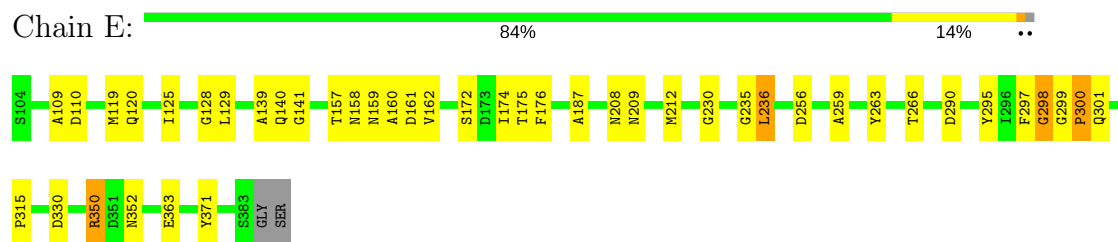
- Molecule 1: Major capsid protein



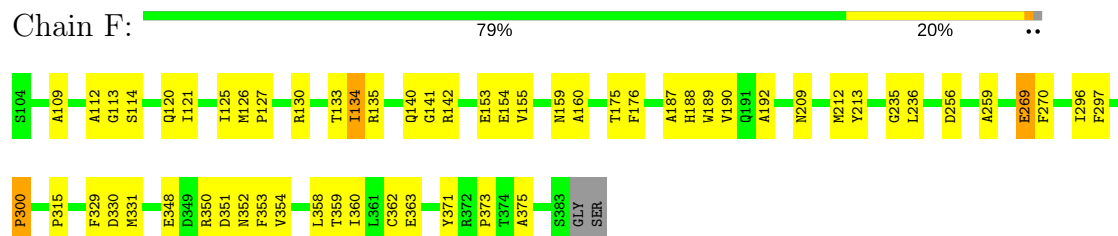
- Molecule 1: Major capsid protein



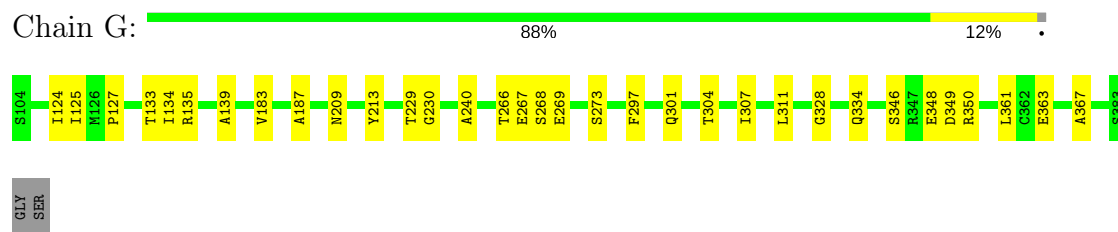
- Molecule 1: Major capsid protein



- Molecule 1: Major capsid protein



- Molecule 1: Major capsid protein



## 4 Experimental information

Property	Value	Source
Reconstruction method	Not provided	Depositor
Imposed symmetry	POINT, I	Depositor
Number of images used	Not provided	Depositor
Resolution determination method	Not provided	Depositor
CTF correction method	Not provided	Depositor
Microscope	Philips CM200-FEG	Depositor
Voltage (kV)	120	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	Not provided	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	Not provided	Depositor
Magnification	38000	Depositor
Image detector	Not provided	Depositor

## 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	$\# Z  > 2$	RMSZ	$\# Z  > 2$
1	A	0.41	0/1375	0.71	1/1906 (0.1%)
1	B	0.42	0/1375	0.70	0/1906
1	C	0.44	0/1375	0.71	0/1906
1	D	0.60	1/1376 (0.1%)	0.97	3/1909 (0.2%)
1	E	0.44	0/1375	0.72	1/1906 (0.1%)
1	F	0.42	0/1375	0.72	0/1906
1	G	0.42	0/1375	0.71	0/1906
All	All	0.45	1/9626 (0.0%)	0.75	5/13345 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	154	GLU	C-N	14.65	1.67	1.34

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	154	GLU	O-C-N	-21.77	87.86	122.70
1	D	154	GLU	C-N-CA	-15.39	83.23	121.70
1	D	154	GLU	CA-C-N	-14.38	85.57	117.20
1	A	298	GLY	N-CA-C	5.28	126.30	113.10
1	E	298	GLY	N-CA-C	5.18	126.05	113.10

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	1379	0	653	132	0
1	B	1379	0	654	165	0
1	C	1379	0	651	137	0
1	D	1379	0	649	115	0
1	E	1379	0	649	93	0
1	F	1379	0	650	150	0
1	G	1379	0	653	29	0
All	All	9653	0	4559	481	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 34.

The worst 5 of 481 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:110:ASP:CB	1:C:209:ASN:HA	1.30	1.60
1:E:128:GLY:CA	1:F:270:PHE:CB	1.80	1.59
1:B:120:GLN:CB	1:C:141:GLY:HA3	1.21	1.58
1:A:160:ALA:CB	1:F:187:ALA:HB1	1.30	1.56
1:E:128:GLY:HA2	1:F:270:PHE:CB	1.30	1.56

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 PDB entries followed by that with respect to all EM entries.

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	272/282 (96%)	232 (85%)	34 (12%)	6 (2%)	8	8
1	B	272/282 (96%)	223 (82%)	42 (15%)	7 (3%)	6	6
1	C	272/282 (96%)	231 (85%)	32 (12%)	9 (3%)	4	4
1	D	274/282 (97%)	228 (83%)	37 (14%)	9 (3%)	4	4
1	E	272/282 (96%)	233 (86%)	32 (12%)	7 (3%)	6	6

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	F	272/282 (96%)	225 (83%)	39 (14%)	8 (3%)	5	5
1	G	272/282 (96%)	227 (84%)	36 (13%)	9 (3%)	4	4
All	All	1906/1974 (97%)	1599 (84%)	252 (13%)	55 (3%)	9	5

5 of 55 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	300	PRO
1	C	134	ILE
1	C	300	PRO
1	D	155	VAL
1	D	229	THR

### 5.3.2 Protein sidechains [i](#)

There are no protein residues with a non-rotameric sidechain to report in this entry.

### 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 ⓘ

There are no chain breaks in this entry.