Integrative Structure Validation Report ?

October 09, 2025 - 04:38 PM PDT

The following software was used in the production of this report:

IHMValidation Version 3.0
Python-IHM Version 2.5

PDB ID	9A0E	pdb_00009a0e
PDB-Dev ID	PDBDEV_00000050
Structure Title	Structural basis of CD4 downregulation by HIV-1 Nef
Structure Authors	Kwon Y; Kaake RM; Echeverria I; Suarez M; Karimian Shamsabadi M; Stoneham C; Ramirez PW; Kress J; Singh R; Sali A; Krogan N; Guatelli J; Jia X
Deposited on	2020-05-19

This is a PDB-IHM Structure Validation Report.

We welcome your comments at helpdesk@pdb-ihm.org

A user guide is available at https://pdb-ihm.org/validation_help.html with specific help available everywhere you see the ? symbol.

List of references used to build this report is available here.

1. Overview ?

1.1. Summary ?

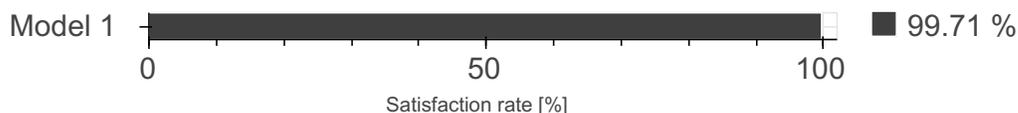*This entry consists of 1 model(s). A total of 5 dataset(s) were used to build this entry.*

Name	Type	Count
Crosslinking-MS data	Experimental data	1
Mass Spectrometry data	Experimental data	1
Comparative model	Starting model	1

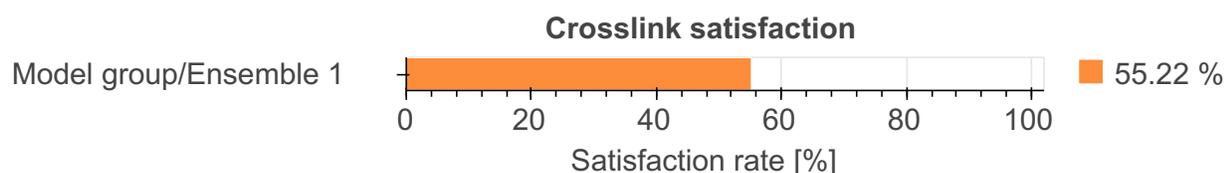| Name	Type	Count
Experimental model	Starting model	2

1.2. Overall quality ❓

This validation report contains model quality assessments for all structures, data quality and fit to model assessments for SAS and crosslinking-MS datasets. Data quality and fit to model assessments for other datasets and model uncertainty are under development. Number of plots is limited to 256.

Model Quality: Excluded Volume Analysis ❓

Model 1 — ▨ 99.71 %

Satisfaction rate [%]

Fit to Data Used for Modeling ❓

Crosslink satisfaction

Model group/Ensemble 1 — ▨ 55.22 %

Satisfaction rate [%]

2. Model Details ❓
2.1. Ensemble information ❓

This entry consists of 1 distinct ensemble(s).

2.2. Representation ❓

This entry has 1 representation(s).

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
1	1	1	Nef	A	202	13-182	1-12, 183-202	100.00 / 84.16	Multiscale: Coarse-grained: 1 - 5 residue(s) per bead
		2	CD4mut	B	26	12-25	1-11, 26	100.00 / 53.85	Coarse-grained: 1 residue(s) per bead
		3	AP2alpha2	C	627	9-619	1-8, 620-627	100.00 / 97.45	Coarse-grained: 1 residue(s) per bead
		4	AP2mu2	D	135	1-124	125-135	100.00 / 91.85	Coarse-grained: 1 residue(s) per bead

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
		5	AP2sigma	E	142	1-142	-	100.00 / 100.00	Coarse-grained: 1 residue(s) per bead
		6	AP2beta2	F	591	15-23, 29-43, 49-61, 64-78, 81-86, 91-583	1-14, 24-28, 44-48, 62-63, 79-80, 87-90, 584-591	100.00 / 93.23	Coarse-grained: 1 residue(s) per bead

2.3. Datasets used for modeling ?

There are 5 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Experimental model	Zenodo	10.5281/zenodo.3836213
2	Experimental model	PDB	pdb_00002vgl
3	Comparative model	Zenodo	10.5281/zenodo.3836213
4	Mass Spectrometry data	PRIDE	PXD019338
5	Crosslinking-MS data	Zenodo	10.5281/zenodo.3836213

2.4. Methodology and software ?

This entry is a result of 1 distinct protocol(s).

Step number	Protocol ID	Method name	Method type	Method description	Number of computed models	Multi state modeling	Multi scale modeling
1	1	Sampling	Replica exchange monte carlo	Not available	2007800	False	True

There are 3 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	IMP PMI module	develop-29bf2b61d4	integrative model building	https://integrativemodeling.org
2	Integrative Modeling Platform (IMP)	develop-29bf2b61d4	integrative model building	https://integrativemodeling.org
3	MODELLER	9.22	comparative modeling	https://salilab.org/modeller/

3. Data quality ?

3.2. Crosslinking-MS

At the moment, data validation is only available for crosslinking-MS data deposited as a fully compliant dataset in the PRIDE Crosslinking database. Correspondence between crosslinking-MS and entry entities is established using pyHMMER. Only residue pairs that passed the reported threshold are used for the analysis. The values in the report have to be interpreted in the context of the experiment (i.e. only a minor fraction of in-situ or in-vivo dataset can be used for modeling).

Crosslinking-MS dataset is not available in the PRIDE Crosslinking database.

3.4. Mass Spectrometry ?

Validation for this section is under development.

4. Model quality ?

For models with atomic structures, MolProbity analysis is performed. For models with coarse-grained or multi-scale structures, excluded volume analysis is performed.

4.1a. Excluded Volume Analysis ?

Excluded volume satisfaction for the models in the entry are listed below. The Analysed column shows the number of particle-partice or particle-atom pairs for which excluded volume was analysed.

Model ID	Analysed	Number of violations	Excluded Volume Satisfaction (%)
1	1440753	4163	99.71

5. Fit to Data Used for Modeling Assessment ?

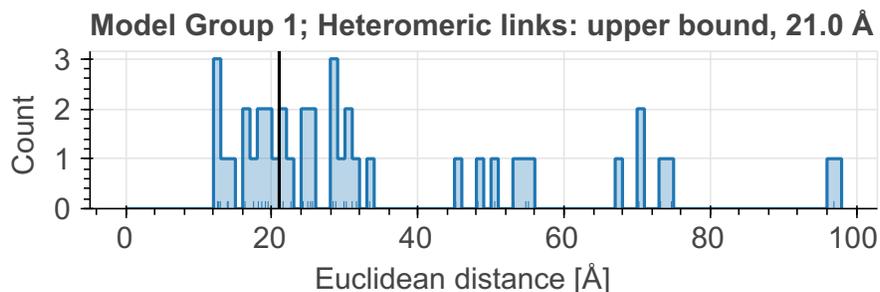## 5.2. Crosslinking-MS ?

5.2.1. Restraint types ?

This table summarizes information about crosslinker(s) used for data generation, and how crosslinking information was translated into actual modeling restraints. Restraints assigned "by-residue" are interpreted as between CA atoms. Restraints between coarse-grained beads are indicated as "coarse-grained". Restraint group represents a set of crosslinking restraints applied collectively in the modeling.

There are 90 crosslinking restraints combined in 90 restraint groups.

Linker	Residue 1	Atom 1	Residue 2	Atom 2	Restraint type	Distance, Å	Count
DSSO	LYS	CA	LYS	CA	upper bound	21.00	87
DSSO	ALA	coarse-grained	LYS	coarse-grained	upper bound	21.00	2
DSSO	ARG	CA	LYS	CA	upper bound	21.00	1

Distograms of individual restraints

Distograms (i.e., histogram plots of distances) provide an overview of distributions of distances between residues for which chemical crosslinks were identified. The shift of the distogram relative to the threshold value may indicate a poor model. Restraints with identical thresholds are grouped into one plot. Only the best distance per restraint per model group/ensemble is plotted. Inter- and intramolecular (including self-links) restraints are also grouped into one plot. Distance for a restraint between coarse-grained beads is calculated as a minimal distance between shells; if beads intersect, the distance will be reported as 0.0. A bead with the highest available resolution for a given residue is used for the assessment.

Model Group 1; Heteromeric links: upper bound, 21.0 Å

Model Group 1; Self-links: upper bound, 21.0 Å
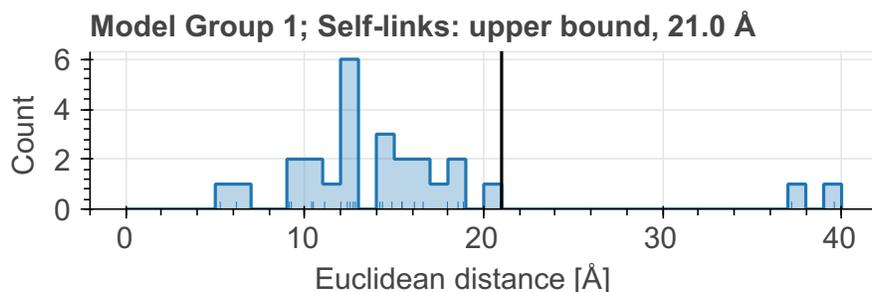
5.2.2. Satisfaction of restraints ⍰

Satisfaction of restraints is calculated on a restraint group (a set of crosslinking restraints applied collectively in the modeling) level. Satisfaction of a restraint group depends on satisfaction of individual restraints in the group and the conditionality (all/any). A restraint group is considered satisfied, if the condition was met in at least one model of the model group/ensemble. The number of measured restraints can be smaller than the total number of restraint groups if crosslinks involve non-modeled residues. Only deposited models are used for validation right now.

State group	State	Model group	# of Deposited models/Total	Restraint group type	Satisfied (%)	Violated (%)	Count (Total=90)
1	1	1	1/9999	All	55.22	44.78	67
				Heteromeric links/ Intermolecular	31.71	68.29	41
				Self-links/ Intramolecular	92.31	7.69	26

Per-model satisfaction rates in ensembles

Every point represents one model in a model group/ensemble. Where possible, boxplots with quartile marks are also plotted.

Satisfaction rates in Model Group 1
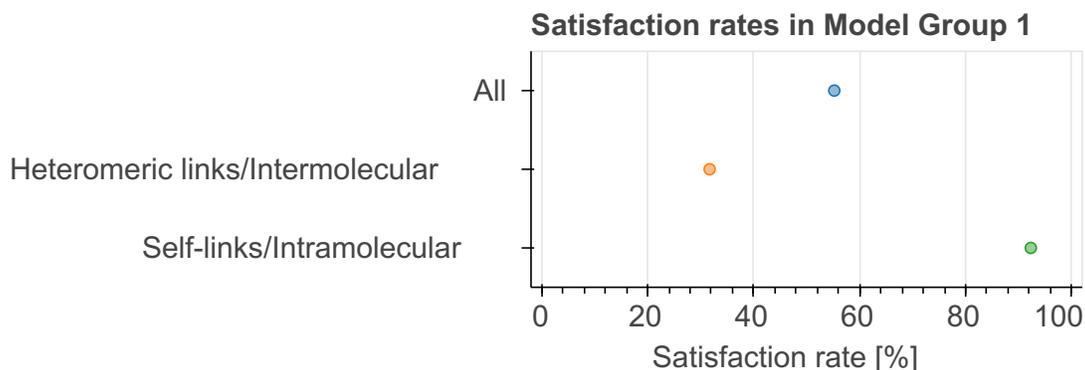
5.4. Mass Spectrometry ⍰

Validation for this section is under development.

6. Fit to Data Used for Validation Assessment ❓

Validation for this section is under development.