Integrative Structure Validation Report

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

IHMValidation Version 3.0
Python-IHM Version 2.5
MolProbity Version 4.5.2

PDB ID	9A23 | pdb_00009a23
PDB-Dev ID	PDBDEV_00000140
Structure Title	Photoinduced intermediate J of bacteriorhodopsin from 1 to 30 picosecond with a contracted retinal binding pocket
Structure Authors	Ren, Z.
Deposited on	2022-07-15

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

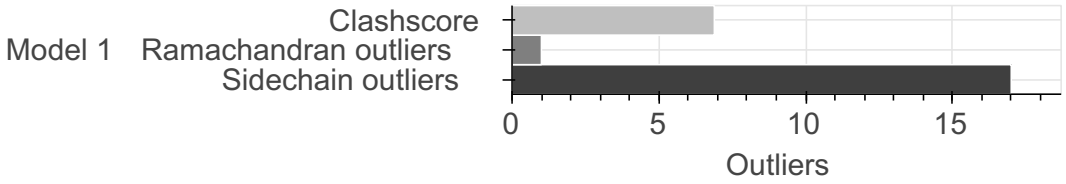
This entry consists of 1 model(s). A total of 21 dataset(s) were used to build this entry.

Name	Type	Count
X-ray diffraction data	Experimental data	20
Experimental model	Starting model	1

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: MolProbity Analysis



2. Model Details

2.1. Ensemble information

This entry consists of 0 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	BACTERIORHODOPSIN	A	248	-	1-248	100.00 / 100.00	Atomic
		2	RETINAL	B [A]	Non-polymeric	-	-	Not available / Not available	Atomic
		3	water	C [A]	Non-polymeric	-	-	Not available / Not available	Atomic

2.3. Datasets used for modeling

There are 21 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Experimental model	PDB	pdb_00006g7h
2	X-ray diffraction data	PDB	pdb_00006g7h
3	X-ray diffraction data	PDB	pdb_00006g7i
4	X-ray diffraction data	PDB	pdb_00006g7j
5	X-ray diffraction data	PDB	pdb_00006g7k
6	X-ray diffraction data	PDB	pdb_00006ga2
7	X-ray diffraction data	PDB	pdb_00006ga4
8	X-ray diffraction data	PDB	pdb_00006ga5
9	X-ray diffraction data	PDB	pdb_00006ga6

ID	Dataset type	Database name	Data access code
10	X-ray diffraction data	PDB	pdb_00006ga7
11	X-ray diffraction data	PDB	pdb_00006ga8
12	X-ray diffraction data	PDB	pdb_00006ga9
13	X-ray diffraction data	PDB	pdb_00006gaa
14	X-ray diffraction data	PDB	pdb_00006gab
15	X-ray diffraction data	PDB	pdb_00006gac
16	X-ray diffraction data	PDB	pdb_00006gad
17	X-ray diffraction data	PDB	pdb_00006gae
18	X-ray diffraction data	PDB	pdb_00006gaf
19	X-ray diffraction data	PDB	pdb_00006gag
20	X-ray diffraction data	PDB	pdb_00006gah
21	X-ray diffraction data	PDB	pdb_00006gai

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	Singular value decomposition analysis of difference Fourier maps	Singular value decomposition	Not available	1	False	False

There are 2 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	PHENIX	(1.13_2998: ???)	refinement	https://phenix-online.org/
2	dynamiX	Not available	Data reduction	Not available

3. Data quality

3.4. X-ray diffraction

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.

4.1b. MolProbity 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.

Standard geometry: bond outliers

There are no bond length outliers.

Standard geometry: angle outliers

There are no bond angle outliers.

Too-close contacts

The following all-atom clashscore is based on a MolProbity analysis. All-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The table below contains clashscores for all atomic models in this entry.

Model ID	Clash score	Number of clashes
1	6.89	25

There are 25 clashes. The table below contains the detailed list of all clashes based on a MolProbity analysis. Bad clashes are >= 0.4 Angstrom.

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
A:7:ARG:NH2	A:61:LEU:O	0.57	1	1
A:185:TYR:CE1	B:1:RET:H203	0.56	1	1
A:48:LEU:O	A:52:ILE:HG13	0.56	1	1
A:156:PHE:HB3	A:171:PHE:CZ	0.56	1	1
A:160:ALA:HA	A:163:MET:HG3	0.55	1	1
A:145:MET:HE1	A:182:TRP:HB3	0.54	1	1
A:38:ASP:OD1	A:41:LYS:NZ	0.54	1	1
A:56:MET:HG3	A:81:ALA:HB1	0.54	1	1
A:174:LEU:HD11	A:223:LEU:HB2	0.52	1	1
A:221:LEU:O	A:225:ARG:HG3	0.52	1	1
A:5:THR:OG1	A:6:GLY:N	0.52	1	1
A:153:PHE:CE2	A:179:VAL:HG21	0.52	1	1
A:66:LEU:HD11	A:77:PRO:HB2	0.52	1	1
A:149:LEU:HD13	A:179:VAL:HG13	0.47	1	1
A:184:ALA:O	A:187:VAL:HG13	0.47	1	1
A:121:THR:HG23	A:137:TRP:HE3	0.47	1	1
A:25:LEU:O	A:29:VAL:HG13	0.45	1	1
A:142:THR:O	A:145:MET:HB3	0.45	1	1
A:147:TYR:O	A:151:VAL:HG23	0.45	1	1
A:66:LEU:HD13	A:79:TYR:CZ	0.44	1	1
A:85:ASP:C	A:85:ASP:OD1	0.43	1	1
A:90:THR:N	A:91:PRO:HD2	0.42	1	1
B:1:RET:C8	B:1:RET:H171	0.41	1	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
A:190:LEU:HA	A:190:LEU:HD12	0.40	1	1
A:60:MET:HE1	C:1:HOH:O	0.40	1	1

Torsion angles: Protein backbone

In the following table, Ramachandran outliers are listed. The Analysed column shows the number of residues for which the backbone conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	228	220	7	1

There are 1 unique backbone outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	73	GLY	1

Torsion angles : Protein sidechains

In the following table, sidechain rotameric outliers are listed. The Analysed column shows the number of residues for which the sidechain conformation was analysed.

Model ID	Analysed	Favored	Allowed	Outliers
1	181	149	15	17

There are 17 unique sidechain outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	15	LEU	1
A	30	LYS	1
A	56	MET	1
A	61	LEU	1
A	75	GLN	1
A	93	LEU	1
A	95	LEU	1
A	108	ILE	1
A	123	LEU	1
A	145	MET	1
A	163	MET	1
A	164	ARG	1
A	169	SER	1
A	187	VAL	1
A	193	SER	1
A	207	LEU	1

Chain	Res	Type	Models (Total)
A	229	ILE	1

5. Fit to Data Used for Modeling Assessment

5.4. X-ray diffraction

Validation for this section is under development.

6. Fit to Data Used for Validation Assessment

Validation for this section is under development.

Acknowledgments

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