Integrative Structure Validation Report ?
September 10, 2024 - 10:28 PM PDT
The following software was used in the production of this report:

Python-IHM Version 1.3
MolProbity Version 4.5.2
Integrative Modeling Validation Version 1.2

PDB ID	9A4U
PDB-Dev ID	PDBDEV_00000251
Structure Title	Integrative model of PCKA-QOX2 by crosslinking MS and deep learning
Structure Authors	Kolja Stahl; Oliver Brock; Juri Rappsilber

This is a PDB-Dev IM Structure Validation Report for a publicly released PDB-Dev entry.

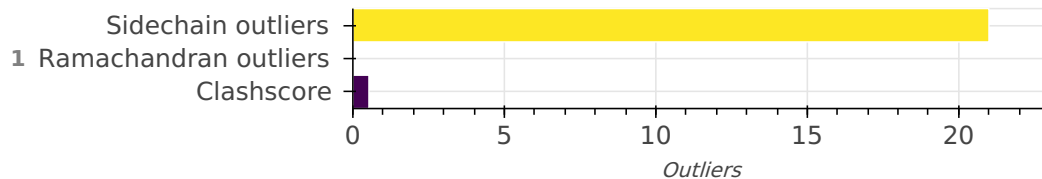We welcome your comments at *pdb-dev@mail.wwpdb.org*

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

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

Overall quality ?

This validation report contains model quality assessments for all structures, data quality assessment for SAS datasets and fit to model assessments for SAS 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

Ensemble information ⦿

This entry consists of 0 distinct ensemble(s).

Summary ⦿

This entry consists of 1 unique models, with 2 subunits in each model. A total of 1 datasets or restraints were used to build this entry. Each model is represented by 0 rigid bodies and 2 flexible or non-rigid units.

Entry composition⦿

There is 1 unique type of models in this entry. This model is titled None/None.

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	1	1	PCKA_BACSU	A	A	527
1	2	2	QOX2_BACSU	B	B	321

Datasets used for modeling ⦿

There is 1 unique dataset used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Crosslinking-MS data	PRIDE	PXD035508

Representation ⦿

This entry has only one representation and includes 0 rigid bodies and 2 flexible units.

Chain ID	Rigid bodies	Non-rigid segments

Chain ID	Rigid bodies	Non-rigid segments
A	-	1-527
B	-	1-321

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	AlphaLink2	AlphaLink2	None	1	False	False

There is 1 software package reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	AlphaLink2	1.0	model building	https://github.com/Rappsilber-Laboratory/AlphaLink2

Data quality ?
Crosslinking-MS

Validation for this section is under development.

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.

Standard geometry: bond outliers?

There are 6569 bond outliers in this entry. A summary is provided below, and a detailed list of outliers can be found here.

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CG--HG3	1.09	0.97	233

IM Structure Validation Report

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CD1--HD13	1.09	0.97	120
CG1--HG11	1.09	0.97	63
OG1--HG1	0.96	0.84	60
CD2--HD21	1.09	0.97	72
CG2--HG23	1.09	0.97	171
CD1--HD12	1.09	0.97	120
CA--HA	1.09	0.97	790
CD--HD3	1.09	0.97	125
NZ--HZ3	1.01	0.89	59
CB--HB3	1.09	0.97	619
CB--HB2	1.09	0.97	619
CG1--HG12	1.09	0.97	111
CE--HE3	1.09	0.97	78
CG2--HG21	1.09	0.97	171
NZ--HZ2	1.01	0.89	59
CD2--HD23	1.09	0.97	72
CB--HB	1.09	0.97	171
CD1--HD11	1.09	0.97	120
CG1--HG13	1.09	0.97	111
CA--HA2	1.09	0.97	58
CG2--HG22	1.09	0.97	171
CD2--HD22	1.09	0.97	72
CD--HD2	1.09	0.97	125

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CG--HG2	1.09	0.97	233
CB--HB1	1.09	0.97	65
NZ--HZ1	1.01	0.89	59
CE--HE2	1.09	0.97	78
OH--HH	0.96	0.84	29
CA--HA3	1.09	0.97	58
CG--HG	1.09	0.97	72
OG--HG	0.96	0.84	49
N--H1	1.01	0.89	2
CE--HE1	1.09	0.97	19
N--H2	1.01	0.89	2
N--H3	1.01	0.89	2
SG--HG	1.33	1.20	1
SG--HG	1.34	1.20	5
CE1--HE1	1.08	0.93	98
NE--HE	1.01	0.86	25
NE2--HE22	1.01	0.86	21
N--H	1.01	0.86	805
ND2--HD21	1.01	0.86	37
NH2--HH21	1.01	0.86	25
CD2--HD2	1.08	0.93	98
ND2--HD22	1.01	0.86	37
CE2--HE2	1.08	0.93	77
NH1--HH11	1.01	0.86	25

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CZ--HZ	1.08	0.93	48
NE2--HE21	1.01	0.86	21
CE3--HE3	1.08	0.93	10
NE2--HE2	1.01	0.86	4
NH2--HH22	1.01	0.86	25
CD1--HD1	1.08	0.93	87
NH1--HH12	1.01	0.86	25
CH2--HH2	1.08	0.93	10
CZ2--HZ2	1.08	0.93	10
ND1--HD1	1.01	0.86	17
NE1--HE1	1.01	0.86	10
CZ3--HZ3	1.08	0.93	10

Standard geometry: angle outliers⍰

There are 17 angle outliers in this entry. A summary is provided below, and a detailed list of outliers can be found here.

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	117.18	1
OD1-CG-ND2	122.60	117.60	1
C-N-CA	121.70	130.37	1
CD-NE-CZ	124.40	131.12	1
OE1-CD-NE2	122.60	117.84	1
OE1-CD-NE2	122.60	117.88	1
OD1-CG-ND2	122.60	118.12	1
OE1-CD-NE2	122.60	118.18	2
CA-CB-CG	112.60	116.93	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	118.29	1
OE1-CD-NE2	122.60	118.30	1
O-C-N	123.00	116.27	1
OD1-CG-ND2	122.60	118.46	1
OE1-CD-NE2	122.60	118.49	1
OD1-CG-ND2	122.60	118.52	1
HZ1-NZ-HZ3	96.09	109.00	1

Too-close contacts ⑦

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 the models in this entry.

Model ID	Clash score	Number of clashes
1	0.53	7

All 7 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	A:153:PHE:CE1	A:203:ILE:HD12	0.458
1	A:153:PHE:CZ	A:183:ARG:HA	0.454
1	A:117:TYR:CD1	A:213:ILE:HD11	0.449
1	A:153:PHE:CZ	A:203:ILE:CD1	0.439
1	A:235:SER:CB	B:321:GLU:OE2	0.410
1	B:38:VAL:HG13	B:118:LEU:CD2	0.405
1	A:153:PHE:CE1	A:203:ILE:CD1	0.402

Torsion angles: Protein backbone ⑦

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	Analyzed	Favored	Allowed	Outliers

Model ID	Analyzed	Favored	Allowed	Outliers
1	844	823	21	0

Detailed list of outliers are tabulated below.

<u>Torsion angles: Protein sidechains</u> ⑦

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

Model ID	Analyzed	Favored	Allowed	Outliers
1	725	681	23	21

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	47	ARG
1	A	90	LEU
1	A	153	PHE
1	A	203	ILE
1	A	280	GLU
1	A	326	MET
1	A	352	VAL
1	A	379	THR
1	A	490	THR
1	A	497	GLU
1	B	1	MET
1	B	4	LEU
1	B	8	LEU
1	B	11	LEU
1	B	12	LEU
1	B	16	LEU

Model ID	Chain	Residue ID	Residue type
1	B	18	THR
1	B	21	PHE
1	B	45	LEU
1	B	127	ASP
1	B	319	THR

Fit of model to data used for modeling ⑦
Crosslinking-MS

Validation for this section is under development.

Fit of model to data used for validation ⑦

Validation for this section is under development.