

Integrative Structure Validation Report

September 10, 2024 - 10:23 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	9A4R
PDB-Dev ID	PDBDEV_00000248
Structure Title	Integrative model of RPSH-RPOB 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

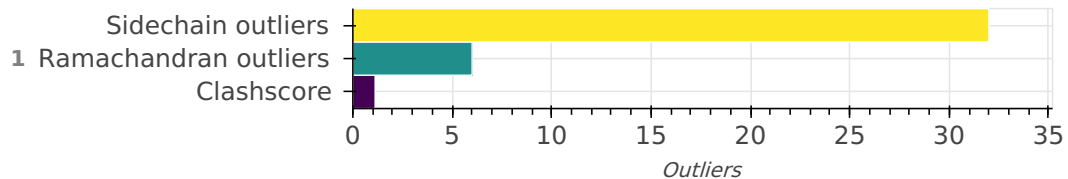
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the  symbol.

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	RPSH_BACSU	A	A	218
1	2	2	RPOB_BACSU	B	B	1193

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	-	1-218
B	-	1-1193

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

Standard geometry: bond outliers ?

There are 11135 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--HG2	1.09	0.97	455

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CE--HE3	1.09	0.97	117
CB--HB	1.09	0.97	276
CB--HB2	1.09	0.97	1025
CG1--HG13	1.09	0.97	211
CB--HB3	1.09	0.97	1025
CA--HA	1.09	0.97	1301
CD1--HD12	1.09	0.97	224
CG1--HG12	1.09	0.97	211
CD--HD2	1.09	0.97	237
CG2--HG23	1.09	0.97	276
CG--HG3	1.09	0.97	455
CD1--HD11	1.09	0.97	224
OG1--HG1	0.96	0.84	65
NZ--HZ2	1.01	0.89	81
CG2--HG21	1.09	0.97	276
CD1--HD13	1.09	0.97	224
CB--HB1	1.09	0.97	76
CD2--HD21	1.09	0.97	125
CG2--HG22	1.09	0.97	276
CD2--HD22	1.09	0.97	125
CD--HD3	1.09	0.97	237
OH--HH	0.96	0.84	49
CE--HE2	1.09	0.97	117

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CA--HA3	1.09	0.97	110
NZ--HZ1	1.01	0.89	81
CD2--HD23	1.09	0.97	125
CG1--HG11	1.09	0.97	112
NZ--HZ3	1.01	0.89	81
CA--HA2	1.09	0.97	110
CG--HG	1.09	0.97	125
OG--HG	0.96	0.84	75
CE--HE1	1.09	0.97	36
N--H3	1.01	0.89	2
N--H2	1.01	0.89	2
N--H1	1.01	0.89	2
SG--HG	1.33	1.20	1
SG--HG	1.34	1.20	5
N--H	1.01	0.86	1351
NH1--HH12	1.01	0.86	98
CE1--HE1	1.08	0.93	114
NE2--HE22	1.01	0.86	50
CD2--HD2	1.08	0.93	114
ND2--HD21	1.01	0.86	61
NE--HE	1.01	0.86	98
CD1--HD1	1.08	0.93	100
NH2--HH21	1.01	0.86	98
NH1--HH11	1.01	0.86	98

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CE2--HE2	1.08	0.93	94
NE1--HE1	1.01	0.86	6
CZ--HZ	1.08	0.93	45
NH2--HH22	1.01	0.86	98
CZ2--HZ2	1.08	0.93	6
ND2--HD22	1.01	0.86	61
ND1--HD1	1.01	0.86	18
CE3--HE3	1.08	0.93	6
NE2--HE21	1.01	0.86	50
CZ3--HZ3	1.08	0.93	6
CH2--HH2	1.08	0.93	6
NE2--HE2	1.01	0.86	2

Standard geometry: angle outliers

There are 45 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
CA-CB-CG	112.60	119.30	1
NE-CZ-NH2	119.20	124.66	1
CA-CB-CG	112.60	118.29	1
OE1-CD-NE2	122.60	117.27	1
OD1-CG-ND2	122.60	117.31	1
CD-NE-CZ	124.40	131.64	1
OE1-CD-NE2	122.60	117.56	1
CA-CB-CG	112.60	117.55	1
OD1-CG-ND2	122.60	117.65	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	117.54	1
OD1-CG-ND2	122.60	117.67	1
NE-CZ-NH2	119.20	123.61	1
CA-CB-OE1-CD-NE2	122.60	117.73	1
OD1-CG-ND2	122.60	117.77	1
CA-CB-CG	112.60	117.41	1
OE1-CD-NE2	122.60	117.83	1
NE-CZ-NH2	119.20	123.43	1
OE1-CD-NE2	122.60	117.90	1
OE1-CD-NE2	122.60	117.95	1
OE1-CD-NE2	122.60	117.96	1
CB-CG-CD2	131.20	125.20	1
OE1-CD-NE2	122.60	118.01	1
CB-CG-CD2	131.20	125.32	1
CA-CB-CG	112.60	117.11	1
OE1-CD-NE2	122.60	118.11	1
OE1-CD-NE-CZ-NH1	121.50	125.96	1
CA-CB-CG	112.60	117.02	1
CB-CG-CD2	131.20	125.46	1
OE1-CD-NE2	122.60	118.27	1
OE1-CD-NE2	122.60	118.32	1
OD1-CG-ND2	122.60	118.39	1
OE1-CD-OE1-CD-NE2	122.60	118.44	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	118.45	1
OE1-CD-NE2	122.60	118.48	1
OE1-CD-NE2	122.60	118.49	1
OD1-CG-ND2	122.60	118.51	1
C-N-OD1-CG-ND2	122.60	118.53	1
OE1-CD-NE2	122.60	118.53	1
CB-CG-CD2	131.20	125.94	1
CA-CB-CG	112.60	116.63	1
CA-CB-CG	112.60	116.62	1
OE1-CD-NE2	122.60	118.58	1
OE1-CD-NE2	122.60	118.59	1
HZ1-NZ-HZ2	96.00	109.00	1
HZ1-NZ-HZ3	95.77	109.00	1

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 the models in this entry.

Model ID	Clash score	Number of clashes
1	1.12	25

All 25 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	B:976:MET:HE1	B:987:ILE:HG21	0.852
1	B:90:ALA:HB2	B:118:ILE:HD11	0.834
1	A:170:ARG:HD3	B:118:ILE:HD11	0.585
1	B:90:ALA:CB	B:781:LEU:HD12	0.547

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	B:777:MET:HG3	B:410:ARG:HE	0.539
1	B:139:VAL:HG21	A:86:PHE:CG	0.518
1	A:24:ILE:HD11	B:471:MET:HE2	0.510
1	B:917:ARG:HH11	B:982:TYR:CZ	0.506
1	B:124:THR:HG21	B:258:ARG:HH12	0.498
1	B:978:MET:HE3	B:987:ILE:CG2	0.490
1	B:185:ASP:CB	B:712:LEU:HD23	0.472
1	B:976:MET:HE1	A:110:HIS:NE2	0.466
1	B:674:VAL:HG21	B:483:LYS:HE2	0.456
1	A:109:LYS:HE3	B:853:GLU:HB2	0.454
1	B:471:MET:HE1	A:68:MET:HE1	0.440
1	B:849:LYS:HE2	A:203:VAL:HG22	0.426
1	A:39:ILE:HG23	B:471:MET:HE2	0.418
1	B:981:ARG:HH11	B:965:ARG:HH11	0.418
1	A:165:LEU:HD22	B:987:ILE:HG21	0.413
1	B:124:THR:CG2	B:618:VAL:CG2	0.410

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	1407	1373	28	6

Detailed list of outliers are tabulated below.

Torsion angles: Protein sidechains

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	Analysed	Favored	Allowed	Outliers
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Model ID	Analyzed	Favored	Allowed	Outliers
1	1225	1142	51	32

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	1	MET
1	A	3	LEU
1	A	32	SER
1	A	52	SER
1	A	80	GLU
1	A	84	THR
1	A	113	LEU
1	A	132	LEU
1	A	141	THR
1	A	200	LEU
1	A	207	LEU
1	B	2	THR
1	B	48	MET
1	B	71	LEU
1	B	161	THR
1	B	174	THR
1	B	192	VAL
1	B	255	LEU
1	B	319	LEU
1	B	391	LEU
1	B	502	GLU

Model ID	Chain	Residue ID	Residue type
1	B	545	THR
1	B	606	ASN
1	B	753	LEU
1	B	818	GLU
1	B	846	VAL
1	B	920	SER
1	B	976	MET
1	B	1044	VAL
1	B	1048	LEU
1	B	1169	LEU
1	B	1180	THR

Fit of model to data used for modeling ?

Crosslinking-MS

Validation for this section is under development.

Fit of model to data used for validation ?

Validation for this section is under development.

Acknowledgements

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