

Integrative Structure Validation Report

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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	9A7N
PDB-Dev ID	PDBDEV_00000352
Structure Title	Integrative model of RPOZ-RPOC 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

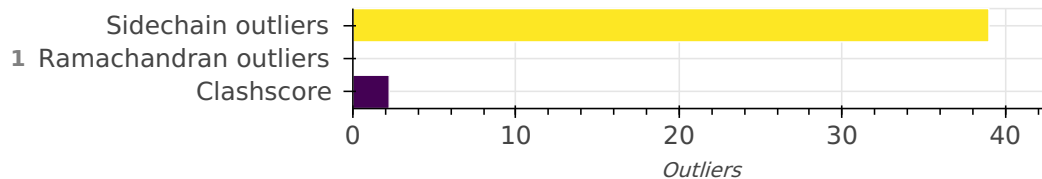
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the  symbol.

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	RPOZ_BACSU	A	A	67
1	2	2	RPOC_BACSU	B	B	1199

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	-	1-67
B	-	1-1199

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 10230 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
CG1--HG12	1.09	0.97	184

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CG2--HG21	1.09	0.97	255
CB--HB1	1.09	0.97	86
CB--HB2	1.09	0.97	919
CG--HG	1.09	0.97	124
CG--HG2	1.09	0.97	427
CD1--HD13	1.09	0.97	203
CB--HB3	1.09	0.97	919
CD--HD2	1.09	0.97	238
CA--HA	1.09	0.97	1174
CG--HG3	1.09	0.97	427
CE--HE1	1.09	0.97	38
CG2--HG23	1.09	0.97	255
CB--HB	1.09	0.97	255
CA--HA3	1.09	0.97	92
CA--HA2	1.09	0.97	92
CD2--HD23	1.09	0.97	124
CG1--HG13	1.09	0.97	184
OH--HH	0.96	0.84	32
NZ--HZ3	1.01	0.89	96
NZ--HZ2	1.01	0.89	96
CE--HE2	1.09	0.97	134
CG2--HG22	1.09	0.97	255
CE--HE3	1.09	0.97	134

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CD2--HD22	1.09	0.97	124
NZ--HZ1	1.01	0.89	96
CD1--HD12	1.09	0.97	203
OG--HG	0.96	0.84	57
OG1--HG1	0.96	0.84	71
CD2--HD21	1.09	0.97	124
CD--HD3	1.09	0.97	238
CD1--HD11	1.09	0.97	203
CG1--HG11	1.09	0.97	105
N--H2	1.01	0.89	2
N--H1	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	8
N--H	1.01	0.86	1209
CD2--HD2	1.08	0.93	91
NH1--HH11	1.01	0.86	87
NH2--HH22	1.01	0.86	87
NH1--HH12	1.01	0.86	87
NE--HE	1.01	0.86	87
NE2--HE22	1.01	0.86	46
NE1--HE1	1.01	0.86	7
NH2--HH21	1.01	0.86	87
CD1--HD1	1.08	0.93	75

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CE2--HE2	1.08	0.93	68
CE1--HE1	1.08	0.93	91
ND2--HD22	1.01	0.86	48
ND1--HD1	1.01	0.86	20
ND2--HD21	1.01	0.86	48
CZ2--HZ2	1.08	0.93	7
CZ--HZ	1.08	0.93	36
NE2--HE21	1.01	0.86	46
CH2--HH2	1.08	0.93	7
CE3--HE3	1.08	0.93	7
CZ3--HZ3	1.08	0.93	7
NE2--HE2	1.01	0.86	3

Standard geometry: angle outliers

There are 35 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
OD1-CG-ND2	122.60	117.31	1
CB-CG-CA-CB-CG	112.60	117.82	1
OE1-CD-NE2	122.60	117.51	1
CB-CG-CD2	131.20	124.72	1
CA-CB-CG	112.60	117.49	1
NE-CZ-NH2	119.20	123.58	1
OE1-CD-NE2	122.60	117.76	1
OE1-CD-NE2	122.60	117.78	1
OE1-CD-OE1-CD-NE2	122.60	117.88	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CD-NE-OE1-CD-NE2	122.60	117.96	1
OE1-CD-NE2	122.60	117.97	1
OE1-CD-NE2	122.60	118.03	1
OE1-CD-NE2	122.60	118.06	1
NE-CZ-NH2	119.20	123.28	1
OE1-CD-NE2	122.60	118.10	1
OE1-CD-NE2	122.60	118.15	1
OE1-CD-NE2	122.60	118.16	1
OE1-CD-NH1-CZ-NH2	119.30	113.57	1
OE1-CD-OE1-CD-NE2	122.60	118.21	1
OE1-CD-NE2	122.60	118.23	1
CB-CG-CD2	131.20	125.57	1
CB-CG-CD2	131.20	125.60	1
NE-CZ-NH2	119.20	115.33	1
NE-CZ-NH2	119.20	123.06	1
OE1-CD-NE2	122.60	118.32	2
CB-CG-OD1-CG-ND2	122.60	118.38	1
CA-CB-OE1-CD-NE2	122.60	118.42	1
OE1-CD-OE1-CD-NE2	122.60	118.44	1
OE1-CD-NE2	122.60	118.46	1
OD1-CG-ND2	122.60	118.46	1
CA-CB-CG	112.60	116.74	1
OE1-CD-NE2	122.60	118.47	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	118.50	1
HZ2-NZ-HZ3	96.38	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	2.23	45

All 45 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:808:ALA:CB	A:19:LEU:HD12	0.660
1	B:808:ALA:HB2	B:383:ILE:HG23	0.607
1	A:13:LEU:HD12	B:741:PHE:CE1	0.598
1	B:371:MET:CE	B:634:THR:HG23	0.595
1	B:720:LEU:HD11	B:782:GLY:HA3	0.579
1	A:1:MET:SD	B:741:PHE:CD2	0.555
1	B:751:MET:HE3	B:779:SER:HA	0.555
1	B:726:ILE:HG21	B:321:LYS:CE	0.546
1	B:751:MET:HE2	B:749:GLY:HA2	0.541
1	B:317:SER:HB3	B:741:PHE:CE2	0.505
1	B:747:MET:HE2	B:587:GLU:OE1	0.503
1	B:726:ILE:HG21	B:428:PRO:HG2	0.502
1	B:583:LYS:HE2	B:908:ALA:HB1	0.501
1	B:405:ILE:HG23	B:428:PRO:HG2	0.491
1	B:420:ARG:HH11	B:615:PHE:CD2	0.491

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	B:405:ILE:CG2	B:888:SER:HB2	0.491
1	B:503:THR:HG21	B:723:LEU:CD2	0.484
1	B:824:ILE:HD11	B:146:LYS:HE3	0.478
1	B:803:ARG:NH1	B:107:PHE:CE1	0.469
1	B:506:ARG:HE	B:7:PHE:HZ	0.459
1	B:808:ALA:HB1	B:614:PRO:HG2	0.454
1	B:137:THR:O	B:888:SER:CB	0.454
1	B:104:ILE:HA	B:209:ARG:CZ	0.441
1	B:2:LEU:HD22	B:321:LYS:HE3	0.438
1	B:500:TYR:CE2	B:762:PRO:HG3	0.432
1	B:824:ILE:HD11	B:908:ALA:HB1	0.432
1	B:119:ASP:HB2	B:7:PHE:CZ	0.431
1	B:317:SER:HB3	B:565:LEU:HB3	0.417
1	B:895:PRO:HA	B:723:LEU:CD1	0.412
1	B:705:TRP:CD2	A:63:LYS:HE3	0.411
1	B:420:ARG:NH1	B:450:PHE:CE2	0.410
1	B:2:LEU:HD22	B:764:LYS:HE2	0.406
1	B:519:THR:HG23	B:236:PRO:HD3	0.404

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	1262	1231	31	0

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	Analyzed	Favored	Allowed	Outliers
1	1088	984	65	39

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	59	LEU
1	B	4	VAL
1	B	10	MET
1	B	108	LYS
1	B	125	LEU
1	B	159	LEU
1	B	195	LEU
1	B	234	ILE
1	B	287	MET
1	B	319	MET
1	B	357	LEU
1	B	381	HIS
1	B	419	HIS
1	B	442	VAL
1	B	457	VAL
1	B	497	LEU
1	B	504	LEU
1	B	539	VAL
1	B	584	SER
1	B	666	LEU

Model ID	Chain	Residue ID	Residue type
1	B	668	ASP
1	B	716	LEU
1	B	760	GLU
1	B	761	LEU
1	B	780	THR
1	B	803	ARG
1	B	807	VAL
1	B	824	ILE
1	B	979	VAL
1	B	984	VAL
1	B	999	THR
1	B	1003	THR
1	B	1018	ILE
1	B	1023	VAL
1	B	1062	ILE
1	B	1087	ASP
1	B	1167	ILE
1	B	1171	VAL
1	B	1178	MET

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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