

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	9A58
PDB-Dev ID	PDBDEV_00000265
Structure Title	Integrative model of SIGA-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

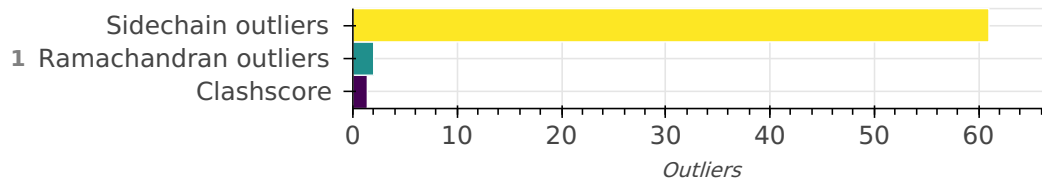
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the  symbol.

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	SIGA_BACSU	A	A	371
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	-	1-371
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 12686 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	548

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CB--HB	1.09	0.97	309
CB--HB2	1.09	0.97	1152
CG--HG3	1.09	0.97	548
CG2--HG21	1.09	0.97	309
CB--HB3	1.09	0.97	1152
NZ--HZ1	1.01	0.89	113
CD1--HD13	1.09	0.97	254
CG2--HG23	1.09	0.97	309
CA--HA	1.09	0.97	1461
CE--HE3	1.09	0.97	156
CD2--HD21	1.09	0.97	156
OH--HH	0.96	0.84	40
CD2--HD22	1.09	0.97	156
CG--HG	1.09	0.97	156
CG1--HG13	1.09	0.97	221
NZ--HZ2	1.01	0.89	113
CD1--HD12	1.09	0.97	254
CD1--HD11	1.09	0.97	254
CG2--HG22	1.09	0.97	309
CB--HB1	1.09	0.97	105
OG1--HG1	0.96	0.84	88
CA--HA3	1.09	0.97	109
CD2--HD23	1.09	0.97	156

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
CD--HD3	1.09	0.97	292
CD--HD2	1.09	0.97	292
CE--HE2	1.09	0.97	156
CG1--HG11	1.09	0.97	123
CG1--HG12	1.09	0.97	221
NZ--HZ3	1.01	0.89	113
OG--HG	0.96	0.84	67
CA--HA2	1.09	0.97	109
CE--HE1	1.09	0.97	43
N--H1	1.01	0.89	2
N--H2	1.01	0.89	2
N--H3	1.01	0.89	2
SG--HG	1.34	1.20	11
NH1--HH12	1.01	0.86	113
CD1--HD1	1.08	0.93	95
N--H	1.01	0.86	1502
NH1--HH11	1.01	0.86	113
CD2--HD2	1.08	0.93	112
NH2--HH21	1.01	0.86	113
ND2--HD21	1.01	0.86	56
ND2--HD22	1.01	0.86	56
NE2--HE22	1.01	0.86	62
NE--HE	1.01	0.86	113
CE3--HE3	1.08	0.93	9

Bond type	Observed distance (Å)	Ideal distance (Å)	Number of outliers
NH2--HH22	1.01	0.86	113
ND1--HD1	1.01	0.86	24
CZ--HZ	1.08	0.93	46
CH2--HH2	1.08	0.93	9
CE2--HE2	1.08	0.93	86
CE1--HE1	1.08	0.93	112
CZ3--HZ3	1.08	0.93	9
NE2--HE21	1.01	0.86	62
NE2--HE2	1.01	0.86	2
NE1--HE1	1.01	0.86	9
CZ2--HZ2	1.08	0.93	9

Standard geometry: angle outliers?

There are 53 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	118.91	1
CA-CB-CG	112.60	118.37	1
NH1-CZ-NH2	119.30	112.22	1
CA-CB-CG	112.60	117.87	1
OE1-CD-NE2	122.60	117.38	1
CA-CB-CG	112.60	117.81	1
OD1-CG-ND2	122.60	117.50	1
OD1-CG-ND2	122.60	117.51	1
CA-CB-CG	112.60	117.63	1
OE1-CD-NE2	122.60	117.58	3

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG-CD2	131.20	124.71	1
CA-CB-CG	112.60	117.57	1
OE1-CD-NE2	122.60	117.91	2
OE1-CD-NE2	122.60	117.92	1
OE1-CD-NE2	122.60	117.96	2
OE1-CD-NE2	122.60	117.97	1
NE-CZ-NH2	119.20	123.30	1
OE1-CD-NE2	122.60	118.09	1
CB-CG-CD2	131.20	125.35	1
CA-CB-CG	113.80	109.34	1
OE1-CD-NE2	122.60	118.15	1
OE1-CD-CB-CG-CD2	131.20	125.47	1
OE1-CD-NE-CZ-NH2	119.20	123.14	1
OE1-CD-NE2	122.60	118.27	1
OE1-CD-NE2	122.60	118.30	1
OE1-CD-NE2	122.60	118.33	1
CB-CG-CD2	131.20	125.66	1
OE1-CD-NE2	122.60	118.34	1
OE1-CD-OE1-CD-NE2	122.60	118.35	1
OE1-CD-NE2	122.60	118.38	1
OE1-CD-NE2	122.60	118.41	2
CA-CB-CG	112.60	116.78	1
OD1-CG-ND2	122.60	118.42	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
OE1-CD-NE2	122.60	118.42	1
NE-CZ-NH2	119.20	122.95	1
CB-CG-CD2	131.20	125.79	1
OE1-CD-NE2	122.60	118.45	1
OE1-CD-NE2	122.60	118.46	1
CB-CG-OE1-CD-NE2	122.60	118.49	1
OD1-CG-ND2	122.60	118.50	1
CB-CG-CD2	131.20	125.90	1
OE1-CD-NE2	122.60	118.53	1
CB-CG-CD2	131.20	125.93	1
OE1-CD-NE2	122.60	118.57	2
NH1-CZ-NH2	119.30	114.07	1
CB-CG-CD2	131.20	125.99	1
HH21-NH2-HH22	106.91	120.00	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	1.39	35

All 35 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:HB2	A:330:ARG:CZ	0.648
1	B:808:ALA:CB	B:383:ILE:HG23	0.601
1	B:978:VAL:CG2	B:495:MET:HE1	0.593

Model ID	Atom-1	Atom-2	Clash overlap (Å)
1	A:320:LEU:HD22	B:321:LYS:HE2	0.551
1	B:978:VAL:HG22	B:7:PHE:CZ	0.527
1	B:371:MET:CE	B:596:LEU:HD11	0.527
1	B:441:LEU:HD21	B:375:VAL:HG11	0.522
1	B:317:SER:HB3	B:596:LEU:CD1	0.521
1	B:2:LEU:HD22	B:280:ILE:HD12	0.514
1	B:559:ILE:HD11	B:644:LYS:HA	0.495
1	A:302:GLN:HE22	B:565:LEU:HD11	0.493
1	B:559:ILE:HD11	B:619:ILE:CD1	0.490
1	B:277:PRO:HD2	B:87:VAL:HG22	0.472
1	B:495:MET:HE3	B:7:PHE:HZ	0.464
1	B:539:VAL:HG21	B:146:LYS:HE3	0.458
1	B:978:VAL:HG23	B:723:LEU:HD22	0.447
1	B:581:PRO:HB2	B:321:LYS:HE2	0.445
1	B:84:ARG:O	B:762:PRO:HG3	0.444
1	B:2:LEU:HD22	A:330:ARG:NH1	0.425
1	B:137:THR:O	B:741:PHE:CE1	0.421
1	B:895:PRO:HA	B:143:PRO:HD2	0.419
1	B:506:ARG:HH21	B:615:PHE:CD2	0.410
1	B:317:SER:CB	B:764:LYS:HE2	0.410
1	B:705:TRP:CD2	B:209:ARG:CZ	0.406
1	B:808:ALA:HB2	A:324:LEU:HD22	0.402
1	A:320:LEU:HD22	B:723:LEU:CD2	0.400

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	Analyzed	Favored	Allowed	Outliers
1	1566	1532	32	2

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	1356	1225	70	61

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	6	THR
1	A	9	THR
1	A	39	MET
1	A	41	SER
1	A	70	THR
1	A	341	VAL
1	B	76	ASP
1	B	107	PHE
1	B	125	LEU
1	B	135	VAL
1	B	159	LEU
1	B	187	GLU
1	B	195	LEU
1	B	204	THR
1	B	234	ILE

Model ID	Chain	Residue ID	Residue type
1	B	327	PHE
1	B	345	VAL
1	B	357	LEU
1	B	373	GLU
1	B	381	HIS
1	B	408	HIS
1	B	431	VAL
1	B	438	LEU
1	B	444	THR
1	B	449	ASP
1	B	453	ASP
1	B	474	LEU
1	B	497	LEU
1	B	504	LEU
1	B	519	THR
1	B	524	LEU
1	B	531	VAL
1	B	580	GLU
1	B	583	LYS
1	B	634	THR
1	B	646	LEU
1	B	657	THR
1	B	666	LEU
1	B	716	LEU

Model ID	Chain	Residue ID	Residue type
1	B	753	ASN
1	B	761	LEU
1	B	774	LEU
1	B	780	THR
1	B	809	GLN
1	B	810	ASP
1	B	816	THR
1	B	869	ASP
1	B	883	GLU
1	B	938	THR
1	B	949	ILE
1	B	971	ILE
1	B	974	ILE
1	B	977	THR
1	B	999	THR
1	B	1003	THR
1	B	1006	TYR
1	B	1018	ILE
1	B	1041	THR
1	B	1042	THR
1	B	1124	THR
1	B	1171	VAL

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 ?

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Acknowledgements

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