

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	9A0L
PDB-Dev ID	PDBDEV_00000057
Structure Title	Integrative structure of Apo-GAFab
Structure Authors	Gupta R; Liu Y; Wang H; Nordyke CT; Puterbaugh RZ; Cui W; Varga K; Chu F; Ke H; Vashisth H; Cote RH

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

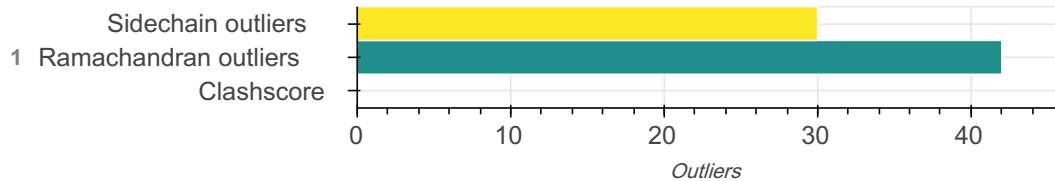
A user guide is available at https://pdb-dev.wwpdb.org/validation_help.html with specific help available everywhere you see the  symbol.

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 2 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/Best scoring model.

Model ID	Subunit number	Subunit ID	Subunit name	Chain ID	Chain ID [auth]	Total residues
1	1	1	GAFab	A	A	399
1	2	1	GAFab	B	B	399

Datasets used for modeling ?

There are 2 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	Crosslinking-MS data	PRIDE	PXD020817
2	Experimental model	PDB	6X88

Representation ?

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

Chain ID	Rigid bodies	Non-rigid segments
A	-	1-399
B	-	1-399

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	None	None	None	None	False	False

There are 2 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	Integrative Modeling Platform (IMP)	Not available	integrative model building	https://integrativemodeling.org
2	Modeller	Not available	model building	https://salilab.org/modeller/

Data quality ?

Crosslinking-MS

Validation for this section is under development.

Model quality ?

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

Standard geometry: bond outliers ?

Bond length outliers can not be evaluated for this model

Standard geometry: angle outliers ?

There are 262 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
C-CA-CB	110.10	73.57	1
C-CA-CB	110.10	76.60	1
C-N-CA	121.70	148.30	1
C-N-CA	121.70	147.92	1
CA-CB-CG	112.60	99.91	1
C-N-CA	121.70	99.52	1
CA-CB-CG	113.80	101.57	1
N-CA-C	111.00	79.60	1
CA-CB-CG	113.80	102.78	1
N-CA-CB	110.50	128.66	1
CA-CB-CG	112.60	102.26	1
N-CA-C	111.00	83.72	1
CA-CB-CG	112.60	122.32	1
CA-CB-CG	112.60	102.95	1
C-N-CA	121.70	138.87	1
N-CA-CB	110.50	126.60	1
C-N-CA	121.70	138.50	1
CA-C-O	120.80	104.98	1
C-N-CA	121.70	138.42	1
C-N-CA	121.70	138.28	1
CA-CB-CG	113.80	105.00	1
C-N-CA	121.70	137.28	1
N-CA-CB	110.50	125.17	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-N-CA	121.70	136.24	1
C-N-CA	121.70	107.21	1
N-CA-C	112.10	132.10	1
CA-CB-CG	113.80	105.97	1
C-N-CA	121.70	107.68	1
CA-CB-CG	113.80	106.03	1
C-N-CA	121.70	135.68	1
C-CA-CB	110.10	95.53	1
CA-CB-CG	113.80	121.38	1
CA-CB-CG	112.60	105.07	1
CA-CB-CG	113.80	106.28	1
CA-CB-CG	113.80	106.37	1
N-CA-C	111.00	131.68	1
CA-CB-CG	113.80	106.44	1
CA-CB-CG	113.80	106.56	1
C-N-CA	121.70	134.74	1
C-N-CA	121.70	134.71	1
CA-CB-CG	112.60	105.40	1
CA-CB-CG	112.60	105.42	1
CA-CB-CG	113.80	106.64	1
CA-CB-CG	112.60	105.45	1
C-CA-CB	110.10	96.62	1
N-CA-CB	110.50	122.24	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	113.90	101.57	1
CA-CB-CG	112.60	105.77	1
N-CA-CB	110.40	120.46	1
CA-C-N	116.20	129.57	1
N-CA-C	112.10	95.50	1
N-CA-C	112.10	95.56	1
N-CA-CB	110.50	121.72	1
CA-CB-CG	112.60	106.00	1
C-N-CA	121.70	109.84	1
C-N-CA	121.70	133.54	1
C-N-CA	121.70	133.46	1
CA-CB-CG	113.80	107.28	1
CA-CB-CG	112.60	106.09	1
CA-C-N	116.20	129.19	2
CA-C-N	116.20	103.23	1
CA-CB-CG	112.60	106.22	1
N-CA-C	111.00	93.19	1
CA-CB-CG	113.80	107.46	1
N-CA-C	111.00	93.32	1
CA-C-N	116.20	128.82	1
N-CA-CB	110.50	121.18	1
CA-CB-CG	113.80	107.60	1
CA-CB-CG	112.60	106.41	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	106.43	1
CA-C-O	120.80	110.40	1
CA-CB-CG	113.90	102.91	1
C-N-CA	121.70	132.68	1
C-CA-CB	110.10	98.52	1
N-CA-C	111.00	128.05	1
CA-CB-CG	112.60	106.52	1
N-CA-C	111.00	127.93	1
CA-CB-CG	112.60	106.57	1
CA-CB-CG	114.10	126.13	1
CA-C-N	116.20	128.20	1
N-CA-C	111.00	127.77	1
CA-CB-CG	112.60	106.65	1
C-N-CA	121.70	111.00	1
N-CA-C	111.00	94.46	1
C-N-CA	121.70	132.33	1
CA-CB-CG	113.90	103.29	1
CA-C-N	116.20	127.97	1
CA-C-N	116.20	127.93	1
CA-CB-CG	112.60	106.76	1
N-CA-C	111.00	94.68	1
CA-CB-CG	112.60	106.79	1
CA-CB-CG	112.60	106.80	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	112.60	106.82	1
O-C-N	123.00	113.84	1
C-CA-CB	110.10	99.31	1
C-N-CA	121.70	111.50	1
O-C-N	123.00	113.96	1
C-N-CA	121.70	111.58	1
CA-CB-CG	112.60	106.98	1
CA-CB-CG	112.60	106.99	1
CA-CB-CG	112.60	107.00	1
CA-CB-CG	112.60	107.01	1
CA-C-N	116.20	105.05	1
CA-CB-CG	113.80	108.22	1
O-C-N	123.00	114.13	1
CA-CB-CG	112.60	107.10	1
O-C-N	123.00	114.21	1
C-CA-CB	110.10	99.67	1
O-C-N	123.00	114.24	1
CA-CB-CG	112.60	107.15	1
CA-CB-CG	113.90	104.13	1
C-CA-CB	110.10	99.83	1
CA-C-O	120.80	129.93	1
N-CA-C	111.00	95.97	1
CA-CB-CG	112.60	107.25	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
C-N-CA	121.70	131.30	1
C-N-CA	121.70	112.11	1
N-CA-C	111.00	96.13	1
C-N-CA	121.70	131.24	1
O-C-N	123.00	114.53	1
CA-CB-CG	112.60	107.31	1
O-C-N	123.00	114.57	1
C-N-CA	121.70	131.12	1
C-CA-CB	111.60	101.15	1
C-N-CA	121.70	131.08	1
N-CA-CB	110.50	119.33	1
N-CA-C	111.00	125.54	1
CA-CB-CG	113.80	108.61	1
CA-C-N	116.20	126.57	1
O-C-N	123.00	114.81	1
C-N-CA	121.70	130.91	1
O-C-N	123.00	114.86	1
CA-CB-CG	113.80	108.73	1
CA-C-O	120.80	112.20	1
CA-CB-CG	113.80	108.74	1
CA-CB-CG	112.60	107.55	1
C-N-CA	121.70	112.63	1
N-CA-C	111.00	96.92	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-N	116.20	106.17	1
CA-CB-CG	112.60	107.64	1
N-CA-C	111.00	97.11	1
C-N-CA	121.70	130.63	1
CA-CB-CG	112.60	107.65	1
O-C-N	123.00	115.10	1
CA-CB-CG	112.60	107.66	2
C-CA-CB	110.10	100.72	1
C-N-CA	121.70	112.82	1
CA-CB-CG	112.60	107.67	1
C-N-CA	121.70	130.52	1
CA-C-N	116.20	125.99	1
C-N-CA	121.70	130.48	1
CA-CB-CG	113.80	108.93	1
C-N-CA	121.70	112.95	1
CA-C-O	120.80	112.55	1
C-N-CA	121.70	112.98	1
N-CA-C	111.00	97.47	1
CA-CB-CG	112.60	107.77	1
C-N-CA	121.70	130.36	1
CB-CG-CD	112.60	104.45	1
CB-CG-CD	112.60	104.48	1
CA-CB-CG	113.80	109.05	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
N-CA-CB	110.50	118.57	1
C-CA-CB	110.10	101.10	1
C-N-CA	121.70	130.21	1
CA-CB-CG	113.90	105.44	1
C-N-CA	121.70	130.11	1
CA-C-N	116.90	123.87	1
CA-CB-CG	112.60	107.96	1
CA-C-O	120.80	128.69	1
C-CA-CB	110.10	101.31	2
CA-CB-CG	112.60	108.00	1
N-CA-C	111.00	123.88	1
CA-C-O	120.80	128.61	1
CA-C-N	116.20	125.33	1
CA-CB-CG	112.60	108.04	1
C-CA-CB	111.60	102.48	1
CD2-NE2-CE1	109.00	104.46	1
C-N-CA	121.70	129.86	1
CA-CB-CG	113.80	109.30	1
N-CA-C	111.00	123.55	1
N-CA-C	111.00	98.46	1
C-N-CA	121.70	129.76	1
O-C-N	123.00	115.84	1
CD2-NE2-CE1	109.00	104.53	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-C-N	116.90	123.60	1
CA-CB-CG	112.60	108.14	1
CD2-NE2-CE1	109.00	104.55	2
N-CA-CB	110.50	118.06	1
CA-CB-CG	112.60	108.16	1
CD2-NE2-CE1	109.00	104.57	2
CA-CB-CG	113.80	109.37	1
C-N-CA	121.70	129.67	1
C-CA-CB	110.10	101.69	1
CD2-NE2-CE1	109.00	104.58	2
CA-CB-CG	113.90	105.95	1
CD2-NE2-CE1	109.00	104.59	1
CD2-NE2-CE1	109.00	104.61	1
C-CA-CB	110.10	118.45	1
CD2-NE2-CE1	109.00	104.62	2
CA-C-N	116.20	124.97	1
CD2-NE2-CE1	109.00	104.63	1
C-N-CA	121.70	129.56	1
CA-C-N	116.20	124.92	1
CD2-NE2-CE1	109.00	104.64	2
C-CA-CB	110.10	101.83	1
N-CA-C	111.00	123.15	1
CD2-NE2-CE1	109.00	104.67	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CA-CB-CG	113.90	106.14	2
C-CA-CB	110.10	101.91	1
C-N-CA	121.70	129.44	1
CA-CB-CG	112.60	108.30	1
CA-CB-CG	113.90	106.17	1
CA-CB-CG	113.80	109.51	1
C-N-CA	121.70	129.41	1
C-N-CA	121.70	129.38	1
C-N-CA	121.70	114.03	1
CA-CB-CG	112.60	108.35	1
C-N-CA	121.70	114.06	1
N-CA-CB	110.50	117.70	1
CA-C-N	116.20	124.66	1
CA-CB-CG	112.60	108.37	1
C-N-CA	121.70	129.31	1
CA-CB-CG	112.60	108.41	1
CA-CB-CG	112.60	108.42	1
C-N-CA	121.70	114.17	1
C-CA-CB	110.10	102.18	1
CA-C-N	116.90	123.15	1
C-N-CA	121.70	129.16	1
CA-C-O	120.80	113.75	1
N-CA-C	111.00	99.41	1

Angle type	Observed angle (°)	Ideal angle (°)	Number of outliers
CB-CG-CD	112.60	105.57	1
C-N-CA	121.70	129.12	1
CD-NE-CZ	124.40	118.63	1
N-CA-CB	110.50	117.50	1
C-N-CA	121.70	114.29	1
C-N-CA	121.70	129.09	2
CA-C-N	116.20	108.00	1
O-C-N	123.00	129.56	1
CA-C-O	120.80	113.84	1
CA-C-N	116.20	124.37	1
CA-CB-CG	112.60	108.53	1
CA-CB-CG	112.60	108.54	1
CA-C-N	116.90	122.99	1
CA-CB-CG	113.80	117.86	1
CA-CB-CG	112.60	108.55	1
CB-CG-CD	112.60	105.73	1
CD-NE-CZ	124.40	118.75	1
CB-CG-CD	112.60	105.76	1
C-CA-CB	110.10	102.47	1
CA-CB-CG	112.60	108.59	1
C-N-CA	121.70	128.91	1
N-CA-CB	110.50	103.70	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	0.00	0

All 0 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

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	794	712	40	42

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	724	634	60	30

Detailed list of outliers are tabulated below.

Model ID	Chain	Residue ID	Residue type
1	A	16	0GLN
1	A	28	0LYS
1	A	79	0GLU
1	A	101	0ILE
1	A	103	0ASP
1	A	106	0LYS
1	A	187	0GLN
1	A	206	0GLN
1	A	215	0ARG
1	A	260	0GLU

Model ID	Chain	Residue ID	Residue type
1	A	274	OLYS
1	A	307	OMET
1	A	320	OLYS
1	A	336	OLEU
1	A	342	OLYS
1	B	50	OARG
1	B	101	OILE
1	B	103	OASP
1	B	106	OLYS
1	B	117	OLYS
1	B	124	OASN
1	B	147	OASN
1	B	200	OLEU
1	B	232	OLYS
1	B	234	OLYS
1	B	251	OLYS
1	B	260	OGLU
1	B	274	OLYS
1	B	320	OLYS
1	B	336	OLEU

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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