Integrative Structure Validation Report

October 16, 2025 - 05:51 PM PDT

The following software was used in the production of this report:

IHMValidation Version 3.0
Python-IHM Version 2.5
MolProbity Version 4.5.2

PDB ID	9AA1 | pdb_00009aa1
Structure Title	Integrative structure of Glutamate transporter homolog based in 3D localization AFM (3D-LAFM) density map
Structure Authors	Jiang, Y.; Wang, Z.; Scheuring, S.
Deposited on	2025-05-16

This is a PDB-IHM Structure Validation Report.

We welcome your comments at helpdesk@pdb-ihm.org

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

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

1. Overview

1.1. Summary

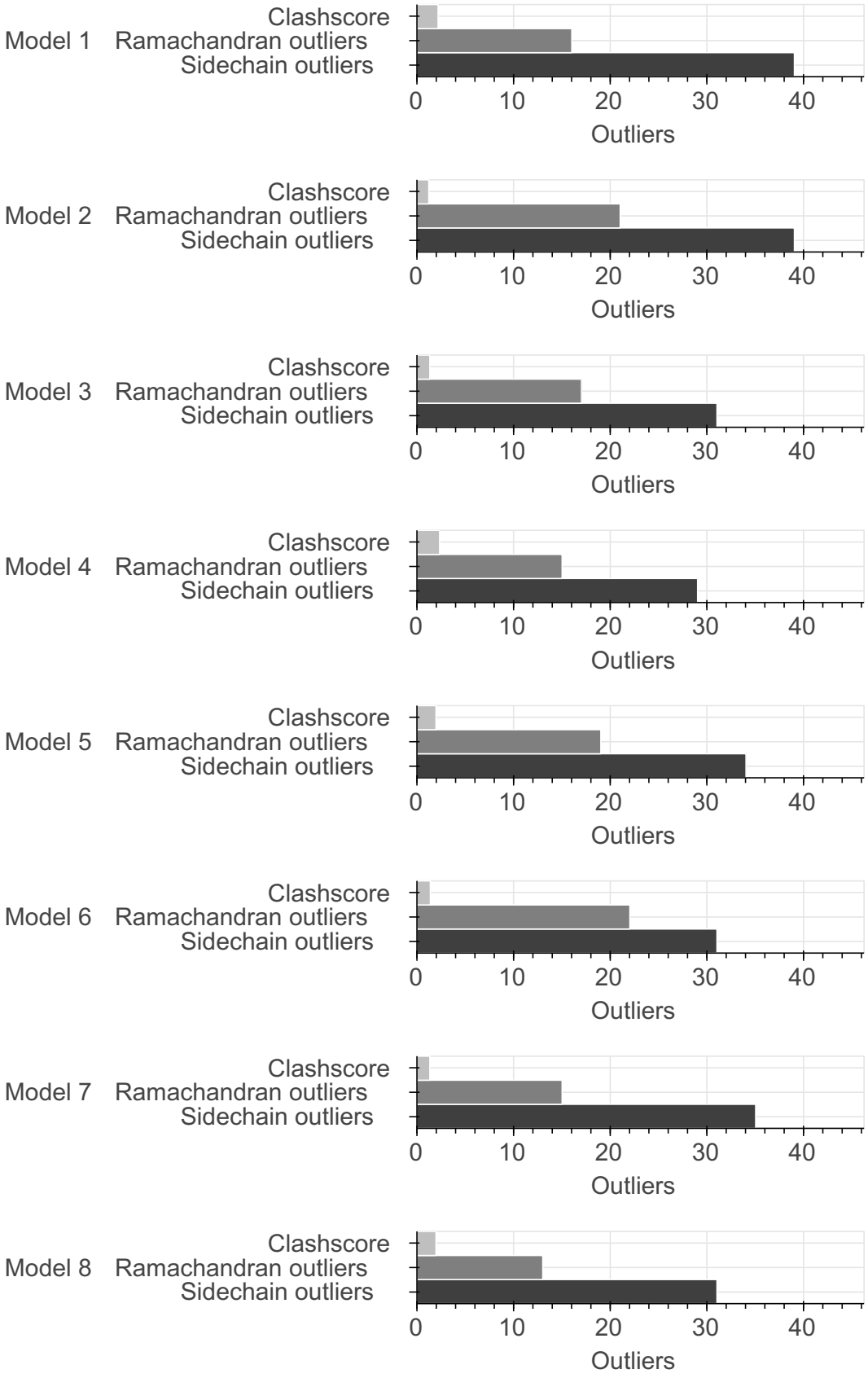
This entry consists of 10 model(s). A total of 2 dataset(s) were used to build this entry.

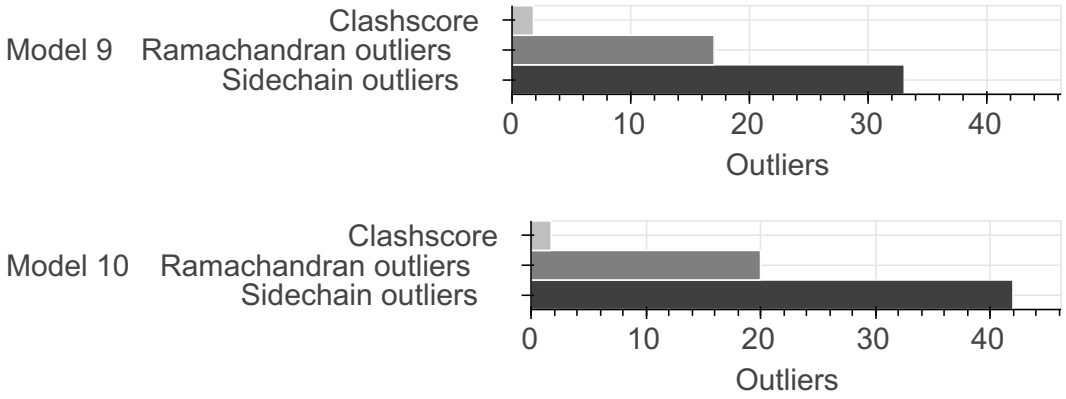
Name	Type	Count
Other	Experimental data	1
Experimental model	Starting model	1

1.2. Overall quality

This validation report contains model quality assessments for all structures, data quality and fit to model assessments for SAS and crosslinking-MS 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





2. Model Details

2.1. Ensemble information

This entry consists of 0 distinct ensemble(s).

2.2. Representation

This entry has 1 representation(s).

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
1	1-10	1	Glutamate transporter homolog	A	415	-	1-415	100.00 / 100.00	Atomic
				B					
				C					

2.3. 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	Other	Zenodo	10.5281/zenodo.14171038
2	Experimental model	PDB	pdb_00004p19

2.4. 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	Not available	Not available	Not available	Not available	False	False

There are 2 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	UCSF ChimeraX	Not available	model building	https://www.rbvi.ucsf.edu/chimerax/
2	Visual Molecular Dynamics (VMD)	Not available	model building	https://www.ks.uiuc.edu/Research/vmd/

3. Data quality

4. 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.

4.1b. MolProbity Analysis

Excluded volume satisfaction for the models in the entry are listed below. The Analysed column shows the number of particle-partice or particle-atom pairs for which excluded volume was analysed.

Standard geometry: bond outliers

There are 3666 bond length outliers in this entry (3.93% of 93250 assessed bonds). A summary is provided below. The output is limited to 100 rows.

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	32	HIS	CG-CD2	11.08	1.48	1.35	9	3
B	225	LYS	C-N	10.44	1.48	1.33	1	1
B	120	HIS	ND1-CE1	10.13	1.42	1.32	4	4
A	34	VAL	C-N	9.34	1.46	1.33	3	4
C	120	HIS	ND1-CE1	9.27	1.41	1.32	9	4
A	47	ARG	NE-CZ	9.19	1.43	1.33	9	4
B	259	HIS	CG-CD2	9.18	1.45	1.35	6	2
B	253	PRO	N-CD	8.94	1.35	1.47	5	1
C	80	ILE	C-N	8.90	1.45	1.33	7	2
A	27	HIS	ND1-CE1	8.82	1.41	1.32	9	5
B	301	GLY	C-N	8.69	1.45	1.33	10	3
C	47	ARG	CD-NE	8.69	1.58	1.46	3	4
C	172	ARG	NE-CZ	8.69	1.42	1.33	6	2
C	47	ARG	NE-CZ	8.69	1.42	1.33	9	5
B	218	HIS	CB-CG	8.68	1.62	1.50	8	3
C	72	ARG	NE-CZ	8.67	1.42	1.33	3	5
B	75	ARG	CZ-NH2	8.67	1.44	1.33	5	2

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	218	HIS	ND1-CE1	8.62	1.41	1.32	10	6
A	327	HIS	ND1-CE1	8.45	1.41	1.32	9	4
A	209	ALA	C-N	8.45	1.45	1.33	1	3
A	370	THR	C-N	8.41	1.45	1.33	10	5
C	27	HIS	ND1-CE1	8.38	1.40	1.32	2	5
B	35	HIS	ND1-CE1	8.35	1.40	1.32	9	7
B	242	TYR	C-N	8.29	1.45	1.33	8	2
B	109	HIS	ND1-CE1	8.29	1.40	1.32	7	5
A	71	ALA	C-N	8.20	1.44	1.33	3	1
A	339	THR	C-N	8.19	1.44	1.33	8	1
A	172	ARG	C-N	8.14	1.44	1.33	10	3
C	271	ARG	CD-NE	8.14	1.57	1.46	5	4
C	45	PHE	C-N	8.12	1.44	1.33	7	1
C	183	ASN	C-N	8.12	1.44	1.33	9	2
C	76	VAL	C-N	8.11	1.44	1.33	4	4
A	232	VAL	C-N	8.11	1.44	1.33	1	3
A	47	ARG	CD-NE	8.10	1.57	1.46	4	3
C	70	PRO	C-N	8.10	1.44	1.33	3	2
A	172	ARG	NE-CZ	8.09	1.41	1.33	8	5
A	126	VAL	C-N	8.08	1.44	1.33	1	1
B	329	THR	C-N	8.08	1.44	1.33	1	1
A	344	SER	CA-CB	8.07	1.69	1.53	10	1
A	231	TYR	C-N	8.07	1.44	1.33	4	3
A	218	HIS	CE1-NE2	8.02	1.40	1.32	4	3
A	127	HIS	CD2-NE2	7.99	1.46	1.37	4	1
A	266	THR	C-N	7.98	1.44	1.33	9	3
B	58	PHE	C-N	7.95	1.44	1.33	2	1
A	63	VAL	C-N	7.93	1.44	1.33	9	3
A	82	VAL	C-N	7.92	1.44	1.33	5	4
C	254	ILE	C-N	7.91	1.44	1.33	10	4
C	12	LEU	C-N	7.89	1.44	1.33	6	3
A	119	PRO	C-N	7.89	1.44	1.33	7	1
B	220	VAL	C-N	7.88	1.44	1.33	1	3
B	17	LEU	C-N	7.88	1.44	1.33	7	3
B	363	HIS	ND1-CE1	7.88	1.40	1.32	3	5

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	395	VAL	C-N	7.87	1.44	1.33	9	4
B	406	ILE	C-N	7.87	1.44	1.33	4	3
C	396	ASN	C-N	7.82	1.44	1.33	5	2
C	237	GLN	C-N	7.81	1.44	1.33	6	3
A	323	ALA	C-N	7.80	1.44	1.33	1	3
B	127	HIS	ND1-CE1	7.76	1.40	1.32	9	3
A	391	GLY	C-N	7.75	1.44	1.33	2	1
C	72	ARG	CZ-NH1	7.73	1.43	1.32	5	5
A	127	HIS	ND1-CE1	7.73	1.40	1.32	1	6
B	328	LEU	CA-CB	7.72	1.68	1.53	1	3
B	199	TYR	CZ-OH	7.72	1.54	1.38	8	1
B	259	HIS	ND1-CE1	7.69	1.40	1.32	5	3
B	85	LEU	C-N	7.67	1.44	1.33	2	1
A	368	PRO	N-CD	7.67	1.37	1.47	2	1
B	216	GLY	C-N	7.67	1.44	1.33	5	2
A	187	GLU	C-N	7.67	1.44	1.33	7	3
A	109	HIS	CB-CG	7.66	1.39	1.50	7	2
A	345	ILE	C-N	7.63	1.44	1.33	8	3
C	72	ARG	C-N	7.62	1.44	1.33	6	4
C	264	MET	C-N	7.60	1.44	1.33	8	3
A	302	ALA	C-N	7.60	1.44	1.33	10	1
A	176	GLU	C-N	7.60	1.44	1.33	4	2
B	247	LYS	C-N	7.59	1.44	1.33	8	5
C	35	HIS	ND1-CE1	7.59	1.40	1.32	2	6
C	32	HIS	ND1-CE1	7.59	1.40	1.32	6	5
C	111	ALA	C-N	7.58	1.44	1.33	5	4
B	403	GLY	C-N	7.56	1.43	1.33	1	2
A	35	HIS	ND1-CE1	7.56	1.40	1.32	4	6
A	159	ALA	C-N	7.49	1.43	1.33	10	4
B	179	LEU	CA-CB	7.49	1.68	1.53	5	1
A	258	LYS	C-N	7.49	1.43	1.33	10	3
C	175	ALA	C-N	7.48	1.43	1.33	7	2
B	71	ALA	C-N	7.47	1.43	1.33	2	2
B	43	ASP	C-N	7.46	1.43	1.33	2	4
C	282	ARG	CD-NE	7.45	1.56	1.46	10	2

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	151	PHE	C-N	7.45	1.43	1.33	3	2
C	243	PHE	C-N	7.43	1.43	1.33	10	2
B	317	THR	C-N	7.43	1.43	1.33	7	1
A	24	ILE	C-N	7.42	1.43	1.33	10	1
C	74	GLY	CA-C	7.40	1.38	1.52	7	1
A	61	LEU	C-N	7.39	1.43	1.33	10	4
C	88	SER	C-N	7.38	1.43	1.33	6	2
C	218	HIS	ND1-CE1	7.37	1.39	1.32	8	4
A	259	HIS	ND1-CE1	7.37	1.39	1.32	3	4
B	271	ARG	CD-NE	7.36	1.56	1.46	1	2
B	27	HIS	ND1-CE1	7.35	1.39	1.32	8	4
A	215	GLN	C-N	7.34	1.43	1.33	8	3
B	268	PHE	C-N	7.33	1.43	1.33	5	3

Standard geometry: angle outliers

There are 5516 bond angle outliers in this entry (4.33% of 127260 assessed bonds). A summary is provided below. The output is limited to 100 rows.

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	396	ASN	CA-CB-CG	13.54	126.14	112.60	7	5
A	102	PHE	CA-CB-CG	13.29	100.51	113.80	7	2
C	138	PHE	CA-CB-CG	11.98	101.82	113.80	10	6
A	392	ARG	NE-CZ-NH2	11.86	129.87	119.20	2	2
A	205	PHE	CA-CB-CG	11.50	125.30	113.80	7	5
C	259	HIS	CA-CB-CG	11.28	102.52	113.80	4	3
C	35	HIS	CA-CB-CG	10.84	124.64	113.80	6	4
A	385	ASP	CA-CB-CG	10.80	123.40	112.60	4	2
C	183	ASN	CA-CB-CG	10.71	101.89	112.60	10	2
B	39	LYS	CA-C-N	10.70	132.95	116.90	1	9
B	152	PHE	CA-CB-CG	10.39	103.41	113.80	8	2
C	39	LYS	CA-C-N	10.27	132.31	116.90	5	6
C	277	LEU	CA-C-N	10.23	132.24	116.90	5	10
B	262	ASP	CA-CB-CG	10.18	122.78	112.60	10	2
B	58	PHE	CA-CB-CG	10.18	123.98	113.80	6	3
B	373	ASN	CA-CB-CG	10.06	122.66	112.60	3	4
C	32	HIS	CD2-NE2-CE1	10.05	98.95	109.00	7	6

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	54	MET	CA-C-N	9.93	131.80	116.90	6	6
B	138	PHE	CA-CB-CG	9.92	103.88	113.80	7	7
A	138	PHE	CA-CB-CG	9.89	103.91	113.80	3	9
A	143	ASN	CA-CB-CG	9.85	102.75	112.60	9	5
B	35	HIS	CA-CB-CG	9.82	123.62	113.80	3	2
B	180	ASP	CA-CB-CG	9.82	102.78	112.60	7	3
A	45	PHE	CA-CB-CG	9.81	103.99	113.80	2	3
A	151	PHE	CA-CB-CG	9.79	104.01	113.80	4	4
C	90	PHE	CA-CB-CG	9.76	104.04	113.80	5	1
B	127	HIS	CA-CB-CG	9.74	104.06	113.80	10	3
C	305	ASN	CA-CB-CG	9.69	122.29	112.60	5	3
A	147	LEU	CA-C-N	9.61	131.32	116.90	10	7
B	200	ALA	CA-C-N	9.58	131.27	116.90	9	9
B	136	ASN	OD1-CG-ND2	9.56	132.16	122.60	6	3
B	35	HIS	CD2-NE2-CE1	9.36	99.64	109.00	6	5
B	147	LEU	CA-C-N	9.33	130.90	116.90	4	6
B	282	ARG	NE-CZ-NH1	9.30	130.80	121.50	9	2
C	243	PHE	CA-CB-CG	9.24	123.04	113.80	3	2
B	277	LEU	CA-C-N	9.23	130.75	116.90	9	8
A	127	HIS	CD2-NE2-CE1	9.22	99.78	109.00	9	9
B	363	HIS	ND1-CE1-NE2	9.17	117.57	108.40	6	5
C	32	HIS	CA-CB-CG	9.10	104.70	113.80	9	3
C	200	ALA	CA-C-N	9.07	130.50	116.90	8	6
A	367	LEU	CA-C-N	9.06	130.49	116.90	3	2
B	35	HIS	ND1-CE1-NE2	9.05	117.45	108.40	6	6
C	115	GLN	OE1-CD-NE2	9.04	131.64	122.60	8	1
B	302	ALA	C-CA-CB	9.03	96.96	110.50	2	3
C	72	ARG	NE-CZ-NH1	8.96	130.46	121.50	8	3
A	277	LEU	CA-C-N	8.94	130.30	116.90	3	9
B	363	HIS	CA-CB-CG	8.89	122.69	113.80	2	4
C	307	ASP	CA-CB-CG	8.87	103.73	112.60	9	2
B	259	HIS	CD2-NE2-CE1	8.84	100.16	109.00	2	6
A	165	ASN	OD1-CG-ND2	8.78	131.38	122.60	6	3
A	120	HIS	CD2-NE2-CE1	8.77	100.23	109.00	10	6
A	218	HIS	CD2-NE2-CE1	8.75	100.25	109.00	6	7

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
A	127	HIS	CA-CB-CG	8.74	122.54	113.80	10	2
A	318	PHE	CA-CB-CG	8.67	105.13	113.80	4	3
B	32	HIS	CA-CB-CG	8.63	122.43	113.80	7	4
A	363	HIS	CD2-NE2-CE1	8.61	100.39	109.00	6	7
C	127	HIS	CD2-NE2-CE1	8.59	100.41	109.00	10	9
C	400	ASP	CA-CB-CG	8.58	104.02	112.60	2	2
C	127	HIS	CA-CB-CG	8.57	122.37	113.80	10	3
A	135	THR	C-N-CA	8.55	137.08	121.70	5	6
B	127	HIS	CD2-NE2-CE1	8.51	100.49	109.00	8	6
C	385	ASP	CA-CB-CG	8.49	121.09	112.60	2	2
C	186	ALA	C-N-CA	8.44	136.90	121.70	3	4
A	313	GLN	OE1-CD-NE2	8.42	131.02	122.60	3	4
A	276	THR	CA-CB-OG1	8.41	122.22	109.60	8	3
A	298	LEU	CA-C-N	8.40	129.50	116.90	3	10
A	5	TYR	CA-C-N	8.40	129.50	116.90	7	5
B	133	VAL	CA-C-N	8.38	129.47	116.90	9	3
A	307	ASP	CA-CB-CG	8.38	120.98	112.60	3	1
B	282	ARG	NE-CZ-NH2	8.36	111.68	119.20	9	3
B	349	GLY	C-N-CA	8.34	136.72	121.70	4	10
C	72	ARG	NE-CZ-NH2	8.33	111.71	119.20	8	1
A	41	PHE	CA-CB-CG	8.32	105.48	113.80	3	3
A	32	HIS	CD2-NE2-CE1	8.30	100.70	109.00	1	6
C	120	HIS	CA-CB-CG	8.30	122.10	113.80	3	4
C	210	TYR	N-CA-CB	8.28	124.57	110.50	10	4
C	116	GLN	OE1-CD-NE2	8.28	130.88	122.60	7	3
A	127	HIS	CG-CD2-NE2	8.24	115.44	107.20	9	9
C	363	HIS	CG-CD2-NE2	8.20	115.40	107.20	5	5
B	103	ASN	CA-CB-CG	8.19	104.41	112.60	7	4
B	118	GLN	OE1-CD-NE2	8.19	114.41	122.60	1	2
B	4	GLU	C-N-CA	8.15	136.36	121.70	10	1
B	363	HIS	CD2-NE2-CE1	8.08	100.92	109.00	6	7
C	313	GLN	CB-CG-CD	8.08	98.87	112.60	5	2
C	109	HIS	CD2-NE2-CE1	8.07	100.93	109.00	6	5
C	143	ASN	CA-CB-CG	8.03	120.63	112.60	10	6
C	188	ALA	N-CA-CB	7.99	122.39	110.40	7	5

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
A	183	ASN	CA-CB-CG	7.98	120.58	112.60	2	6
C	218	HIS	C-N-CA	7.96	136.03	121.70	4	4
A	76	VAL	CA-CB-CG2	7.95	123.92	110.40	1	1
C	35	HIS	CD2-NE2-CE1	7.92	101.08	109.00	5	7
C	256	PHE	CA-CB-CG	7.91	105.89	113.80	1	3
B	272	SER	N-CA-CB	7.89	123.91	110.50	9	3
C	326	SER	N-CA-CB	7.89	123.91	110.50	2	2
B	6	PRO	O-C-N	7.87	135.59	123.00	7	2
B	327	HIS	CA-CB-CG	7.85	121.65	113.80	8	3
C	166	SER	C-N-CA	7.80	135.73	121.70	3	4
C	363	HIS	CD2-NE2-CE1	7.79	101.21	109.00	5	7
A	218	HIS	CG-CD2-NE2	7.78	114.98	107.20	6	5
A	200	ALA	CA-C-N	7.77	128.56	116.90	7	10

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 atomic models in this entry.

Model ID	Clash score	Number of clashes
1	2.18	41
2	1.22	23
3	1.33	25
4	2.34	44
5	1.97	37
6	1.38	26
7	1.33	25
8	1.97	37
9	1.81	34
10	1.76	33

There are 325 clashes. The table below contains the detailed list of all clashes based on a MolProbity analysis. Bad clashes are >= 0.4 Angstrom. The output is limited to 100 rows.

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
B:54:MET:HA	B:54:MET:HE2	0.76	8	3
B:289:ILE:HG21	B:404:THR:HG23	0.69	10	3
C:259:HIS:CE1	C:286:GLU:HB3	0.66	9	1
B:188:ALA:HA	C:163:LEU:HD11	0.66	9	2

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
B:254:ILE:H	B:254:ILE:HD12	0.64	10	3
B:110:LEU:H	B:116:GLN:HG2	0.64	5	1
C:234:LEU:HD23	C:235:THR:HG23	0.63	2	1
A:321:ALA:HB1	A:328:LEU:HD23	0.63	5	1
A:46:VAL:HG22	A:382:LEU:HD22	0.63	10	1
B:183:ASN:HD22	B:184:GLY:N	0.61	8	2
A:44:LEU:HD22	B:133:VAL:CG2	0.61	9	1
C:160:ILE:HA	C:163:LEU:HD12	0.61	9	2
A:44:LEU:HD22	B:133:VAL:HG21	0.61	9	1
B:363:HIS:CE1	B:369:LEU:HD12	0.61	4	1
B:230:VAL:HG22	B:315:VAL:HG21	0.60	1	1
C:291:GLU:HA	C:294:TYR:CE1	0.60	7	2
C:52:LEU:O	C:56:ILE:HG22	0.60	1	1
A:409:LYS:HE2	A:414:LEU:H	0.59	4	1
C:287:MET:HE1	C:401:LEU:HD13	0.59	8	2
A:68:ILE:HD12	A:300:LEU:HD13	0.59	1	2
B:183:ASN:HD22	B:184:GLY:H	0.58	8	2
A:271:ARG:HH21	A:351:PRO:HA	0.58	8	1
A:99:ALA:HB2	A:315:VAL:HA	0.57	2	1
A:92:VAL:HG12	A:334:LEU:HD12	0.56	1	1
A:119:PRO:HA	A:367:LEU:HD11	0.56	9	1
C:272:SER:HB3	C:275:GLY:H	0.56	4	1
C:260:ALA:HB1	C:264:MET:HE1	0.56	5	4
B:350:VAL:HB	B:353:ALA:HB2	0.56	5	1
A:188:ALA:HA	B:163:LEU:HD11	0.56	10	2
B:109:HIS:CE1	B:325:GLY:HA3	0.55	10	1
A:171:VAL:HA	C:187:GLU:OE1	0.54	2	3
C:48:LEU:HG	C:196:VAL:HG22	0.54	4	2
A:103:ASN:HD21	A:327:HIS:CE1	0.54	5	1
A:163:LEU:HD22	A:171:VAL:HG13	0.54	9	2
C:100:ARG:HH12	C:333:GLN:HG2	0.54	10	1
C:289:ILE:HG21	C:404:THR:HG23	0.53	3	5
A:98:MET:HE3	A:236:LEU:HD13	0.53	4	1
C:163:LEU:O	C:172:ARG:HA	0.53	1	1
A:298:LEU:HB2	A:299:PRO:HD3	0.53	9	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
C:68:ILE:HG23	C:300:LEU:HD11	0.53	5	1
B:144:GLY:HA2	C:136:ASN:HD21	0.52	9	1
A:284:ALA:HB1	A:294:TYR:CD2	0.52	6	4
A:46:VAL:HG22	A:382:LEU:CD2	0.52	10	1
A:291:GLU:HA	A:294:TYR:CE2	0.52	10	5
A:305:ASN:HD21	A:307:ASP:CG	0.52	10	1
B:349:GLY:HA3	B:392:ARG:HH12	0.52	1	1
A:251:ILE:HD11	A:409:LYS:CG	0.52	1	1
A:284:ALA:HB1	A:294:TYR:CE2	0.52	6	1
B:52:LEU:HD13	B:193:VAL:HG22	0.51	1	1
A:180:ASP:HB2	B:177:THR:HG21	0.51	7	1
A:266:THR:O	A:270:THR:HG22	0.51	1	1
A:164:MET:HA	A:172:ARG:HA	0.51	7	2
C:313:GLN:HB3	C:337:VAL:HG13	0.51	6	1
A:363:HIS:CE1	A:369:LEU:HD23	0.51	6	1
C:222:GLU:O	C:226:VAL:HG23	0.51	10	1
C:92:VAL:HG23	C:310:ALA:HB1	0.51	1	1
B:349:GLY:HA2	B:350:VAL:HB	0.51	2	1
B:92:VAL:HG11	B:338:LEU:HG	0.51	8	1
B:74:GLY:O	B:78:VAL:HG12	0.51	3	3
C:80:ILE:HA	C:407:VAL:HG21	0.51	4	2
A:340:ALA:HB1	A:361:VAL:HG22	0.51	1	1
A:68:ILE:HD11	A:73:LEU:HD12	0.51	10	1
A:163:LEU:HD11	C:188:ALA:HA	0.50	3	2
C:202:ILE:H	C:202:ILE:HD12	0.50	2	3
C:163:LEU:HB3	C:171:VAL:HG12	0.50	6	2
C:109:HIS:CE1	C:377:ALA:HB2	0.50	8	1
B:48:LEU:HB3	B:196:VAL:HG13	0.50	4	1
C:100:ARG:HH21	C:330:VAL:HA	0.50	6	1
A:147:LEU:HB2	A:148:PRO:HD3	0.50	8	2
A:208:ILE:HD11	A:212:MET:HE2	0.50	5	1
C:77:GLY:HA2	C:296:PHE:CE1	0.50	4	1
A:92:VAL:HG23	A:310:ALA:HB1	0.50	10	1
C:313:GLN:HA	C:316:ALA:HB3	0.49	3	1
C:109:HIS:HE1	C:377:ALA:HA	0.49	6	1

Atom 1	Atom 2	Clash(Å)	Model ID (Worst)	Models (Total)
B:291:GLU:HA	B:294:TYR:CE2	0.49	8	1
A:52:LEU:HD11	A:193:VAL:HG22	0.49	10	1
B:362:LEU:HD12	B:369:LEU:HD21	0.49	4	1
B:313:GLN:HA	B:313:GLN:OE1	0.49	7	1
B:363:HIS:CE1	B:369:LEU:CD1	0.49	4	1
B:188:ALA:CA	C:163:LEU:HD11	0.48	4	1
C:242:TYR:CD1	C:402:THR:HG21	0.48	5	1
C:259:HIS:HB2	C:287:MET:HE3	0.48	9	1
C:228:ALA:O	C:232:VAL:HG22	0.48	10	1
C:401:LEU:HA	C:404:THR:HG22	0.48	10	2
B:134:PRO:HA	B:148:PRO:HB3	0.48	4	3
A:197:MET:HA	A:197:MET:HE2	0.48	10	1
A:174:SER:HB3	C:183:ASN:O	0.48	4	1
B:164:MET:HA	B:172:ARG:HA	0.48	6	2
B:59:ALA:HB1	B:186:ALA:HA	0.47	4	1
C:298:LEU:HA	C:298:LEU:HD23	0.47	10	1
C:263:ALA:HB2	C:283:VAL:HG11	0.47	9	2
B:190:TYR:HB3	B:350:VAL:HG22	0.47	8	1
B:163:LEU:O	B:172:ARG:HA	0.47	9	2
B:77:GLY:O	B:81:VAL:HG23	0.47	2	1
A:96:ILE:HG22	A:333:GLN:HE21	0.47	3	1
B:165:ASN:C	B:172:ARG:HE	0.47	3	1
B:91:ALA:HB1	B:311:LEU:HG	0.47	1	1
B:76:VAL:O	B:80:ILE:HG22	0.47	2	2
B:58:PHE:O	B:62:VAL:HG23	0.47	9	1
B:141:LEU:HD21	B:149:THR:HG23	0.47	9	1

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	1229	1147	66	16
2	1229	1155	53	21
3	1229	1147	65	17
4	1229	1144	70	15
5	1229	1141	69	19

Model ID	Analysed	Favored	Allowed	Outliers
6	1229	1144	63	22
7	1229	1142	72	15
8	1229	1154	62	13
9	1229	1138	74	17
10	1229	1142	67	20

There are 55 unique backbone outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	350	VAL	10
B	133	VAL	10
B	350	VAL	10
C	106	ALA	8
C	305	ASN	8
A	146	VAL	7
B	136	ASN	7
A	106	ALA	6
A	136	ASN	6
B	106	ALA	6
A	326	SER	5
A	346	GLY	5
B	305	ASN	5
B	167	GLU	4
B	168	ASN	4
B	290	SER	4
C	4	GLU	4
C	120	HIS	4
C	347	THR	4
C	350	VAL	4
A	6	PRO	3
A	168	ASN	3
B	73	LEU	3
B	108	ILE	3
B	326	SER	3
B	367	LEU	3
C	136	ASN	3

Chain	Res	Type	Models (Total)
A	275	GLY	2
B	366	GLY	2
C	114	GLY	2
C	326	SER	2
C	348	ALA	2
A	27	HIS	1
A	104	PRO	1
A	119	PRO	1
A	167	GLU	1
A	348	ALA	1
B	72	ARG	1
B	104	PRO	1
B	273	SER	1
B	329	THR	1
B	346	GLY	1
B	349	GLY	1
B	351	PRO	1
C	72	ARG	1
C	107	GLY	1
C	111	ALA	1
C	119	PRO	1
C	123	PRO	1
C	124	PRO	1
C	167	GLU	1
C	274	SER	1
C	349	GLY	1
C	351	PRO	1
C	368	PRO	1

Torsion angles : Protein sidechains

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

Model ID	Analysed	Favored	Allowed	Outliers
1	963	851	73	39
2	963	856	68	39
3	963	864	68	31

Model ID	Analysed	Favored	Allowed	Outliers
4	963	870	64	29
5	963	848	81	34
6	963	854	78	31
7	963	855	73	35
8	963	849	83	31
9	963	856	74	33
10	963	854	67	42

There are 205 unique sidechain outliers. Detailed list of outliers are tabulated below. The output is limited to 100 rows.

Chain	Res	Type	Models (Total)
A	258	LYS	9
A	51	MET	8
A	176	GLU	7
A	345	ILE	7
C	300	LEU	7
C	68	ILE	6
A	413	THR	5
B	68	ILE	5
B	360	MET	5
C	234	LEU	5
A	52	LEU	4
B	176	GLU	4
B	299	PRO	4
B	350	VAL	4
C	406	ILE	4
A	49	LEU	3
A	78	VAL	3
A	119	PRO	3
A	133	VAL	3
A	135	THR	3
A	283	VAL	3
B	258	LYS	3
B	294	TYR	3
B	304	ILE	3
C	40	PRO	3

Chain	Res	Type	Models (Total)
C	49	LEU	3
C	79	LYS	3
C	132	ILE	3
C	306	MET	3
C	328	LEU	3
C	396	ASN	3
A	8	LEU	2
A	10	LYS	2
A	55	PRO	2
A	110	LEU	2
A	132	ILE	2
A	149	THR	2
A	155	ILE	2
A	182	ILE	2
A	219	VAL	2
A	285	LYS	2
A	304	ILE	2
A	339	THR	2
A	369	LEU	2
A	406	ILE	2
A	410	THR	2
B	40	PRO	2
B	87	THR	2
B	108	ILE	2
B	136	ASN	2
B	170	LYS	2
B	261	LYS	2
B	309	THR	2
B	329	THR	2
B	336	ILE	2
B	387	ILE	2
C	5	TYR	2
C	61	LEU	2
C	134	PRO	2
C	176	GLU	2

Chain	Res	Type	Models (Total)
C	177	THR	2
C	235	THR	2
C	261	LYS	2
C	279	VAL	2
C	298	LEU	2
C	311	LEU	2
C	347	THR	2
C	351	PRO	2
C	360	MET	2
A	3	ILE	1
A	40	PRO	1
A	47	ARG	1
A	56	ILE	1
A	75	ARG	1
A	80	ILE	1
A	102	PHE	1
A	125	LEU	1
A	128	ILE	1
A	137	PRO	1
A	158	ILE	1
A	168	ASN	1
A	177	THR	1
A	178	LEU	1
A	198	GLN	1
A	211	VAL	1
A	235	THR	1
A	244	VAL	1
A	247	LYS	1
A	248	ILE	1
A	257	ILE	1
A	261	LYS	1
A	266	THR	1
A	276	THR	1
A	278	PRO	1
A	291	GLU	1

Chain	Res	Type	Models (Total)
A	299	PRO	1
A	303	THR	1
A	327	HIS	1
A	330	VAL	1
A	347	THR	1

5. Fit to Data Used for Modeling Assessment

6. Fit to Data Used for Validation Assessment

Validation for this section is under development.

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