Integrative Structure Validation Report ?

October 09, 2025 - 04:49 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	9A8S	pdb_00009a8s
Structure Title	Structure of human myr-Arf1-GTP bound to MSPdH5 nanodisc
Structure Authors	Zhang, Y.; Soubias, O.; Pant, S.; Heinrich, F.; Vogel, A.; Li, J.; Li, Y.; Clifton, L.A.; Daum, S.; Bacia, K.; Huster, D.; Randazzo, P.A.; Losche, M.; Tajkhorshid, E.; Byrd, R.A.
Deposited on	2024-09-05

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 3 model(s). A total of 6 dataset(s) were used to build this entry.*

Name	Type	Count
NMR data	Experimental data	2
Comparative model	Starting model	1
Experimental model	Starting model	3

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 ?
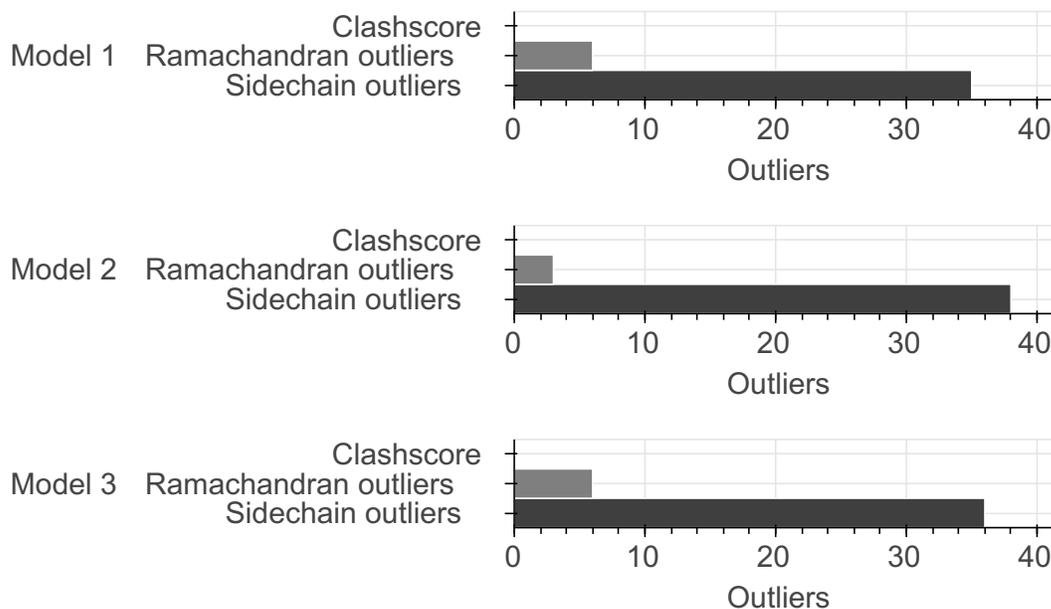
2. Model Details ?

2.1. Ensemble information ?

This entry consists of 0 distinct ensemble(s).

2.2. Representation ?

This entry has 3 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	1	Membrane Scaffold Protein (MSP) Apolipoprotein A-I	A	167	-	1-167	100.00 / 100.00	Atomic
				B					
		2	ADP-ribosylation factor 1	C [P]	180	-	1-180	100.00 / 100.00	Atomic
		3	1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine	D [A]	Non-polymeric	-	-	Not available / Not available	Atomic
				E [A]					
				F [A]					
				G [A]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				H [A]					
				I [A]					
				J [A]					
				K [A]					
				L [A]					
				M [A]					
				N [A]					
				O [A]					
				Q [A]					
				R [A]					
				S [A]					
				T [A]					
				U [A]					
				V [A]					
				W [A]					
				X [A]					
				Y [A]					
				Z [A]					
				AA [A]					
				AC [B]					
				BA [A]					
				BB [B]					
				BC [B]					
				CA [A]					
				CB [B]					
				CC [B]					
				DB [B]					
				DC [P]					
				EA [A]					
				EB [B]					
				EC [P]					
				FA [A]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				FB [B]					
				FC [P]					
				GA [A]					
				GB [B]					
				GC [P]					
				HA [A]					
				HB [B]					
				HC [P]					
				IA [B]					
				IB [B]					
				IC [P]					
				JA [B]					
				JB [B]					
				JC [P]					
				KA [B]					
				KB [B]					
				KC [P]					
				LA [B]					
				LB [B]					
				LC [P]					
				MB [B]					
				MC [P]					
				NA [B]					
				NB [B]					
				NC [P]					
				OA [B]					
				OB [B]					
				OC [P]					
				PA [B]					
				PB [B]					
				PC [P]					
				QA [B]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				QB [B]					
				QC [P]					
				RA [B]					
				RB [B]					
				RC [P]					
				SA [B]					
				SB [B]					
				TA [B]					
				TB [B]					
				UA [B]					
				UB [B]					
				UC [P]					
				VA [B]					
				VB [B]					
				VC [P]					
				WA [B]					
				WB [B]					
				WC [P]					
				XA [B]					
				XC [P]					
				YA [B]					
				YB [B]					
				YC [P]					
				ZA [B]					
				ZB [B]					
		4	[(2R)-2-[(E)-octadec-9-enoyl]oxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propyl] (E)-octadec-9-enoate	P [A]	Non-polymeric	-	-	Not available / Not available	Atomic
				AB [B]					
				DA [A]					
				MA [B]					
				SC [P]					
				TC [P]					
				XB [B]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
2	2	1	Membrane Scaffold Protein (MSP) Apolipoprotein A-I	A	167	-	1-167	100.00 / 100.00	Atomic
				B					
		2	ADP-ribosylation factor 1	C [P]	180	-	1-180	100.00 / 100.00	Atomic
		3	1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine	D [A]	Non-polymeric	-	-	Not available / Not available	Atomic
				E [A]					
				F [A]					
				G [A]					
				H [A]					
				I [A]					
				J [A]					
				K [A]					
				M [A]					
				N [A]					
				O [A]					
				Q [A]					
				R [A]					
				S [A]					
				T [A]					
				V [A]					
				W [A]					
				X [A]					
				Y [A]					
				Z [A]					
				AA [A]					
				AE [A]					
				AG [A]					
				AH [A]					
				AI [A]					
				AJ [A]					
				AK [A]					
				AL [A]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				AM [A]					
				AN [A]					
				AO [A]					
				AP [A]					
				AQ [A]					
				AR [A]					
				AS [A]					
				AT [B]					
				AW [B]					
				AZ [P]					
				BA [A]					
				BB [B]					
				BD [P]					
				CA [A]					
				CB [B]					
				DB [B]					
				DC [P]					
				EA [A]					
				EB [B]					
				EC [P]					
				FA [A]					
				FB [B]					
				FC [P]					
				GA [A]					
				GB [B]					
				GC [P]					
				HA [A]					
				HB [B]					
				HC [P]					
				IA [B]					
				IB [B]					
				IC [P]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				JA [B]					
				JB [B]					
				KA [B]					
				KB [B]					
				LA [B]					
				LB [B]					
				LC [P]					
				MB [B]					
				MC [P]					
				NB [B]					
				NC [P]					
				OA [B]					
				OB [B]					
				OC [P]					
				PA [B]					
				PB [B]					
				PC [P]					
				QA [B]					
				QB [B]					
				QC [P]					
				RA [B]					
				RB [B]					
				RC [P]					
				SA [B]					
				TA [B]					
				UA [B]					
				UC [P]					
				VA [B]					
				VC [P]					
				WA [B]					
				WC [P]					
				XA [B]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				XC [P]					
				YA [B]					
		4	[(2R)-2-[(E)-octadec-9-enoyl]oxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propyl] (E)-octadec-9-enoate	AD [A]	Non-polymeric	-	-	Not available / Not available	Atomic
				AF [A]					
				AU [B]					
				AV [B]					
				AX [P]					
				AY [P]					
3	3	1	Membrane Scaffold Protein (MSP) Apolipoprotein A-I	A	167	-	1-167	100.00 / 100.00	Atomic
				B					
		2	ADP-ribosylation factor 1	C [P]	180	-	1-180	100.00 / 100.00	Atomic
		3	1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine	D [A]	Non-polymeric	-	-	Not available / Not available	Atomic
				E [A]					
				F [A]					
				G [A]					
				H [A]					
				I [A]					
				J [A]					
				L [A]					
				M [A]					
				N [A]					
				O [A]					
				Q [A]					
				R [A]					
				S [A]					
				T [A]					
				U [A]					
				V [A]					
				W [A]					
				X [A]					
				Y [A]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				Z [A]					
				AA [A]					
				AE [A]					
				AG [A]					
				AT [B]					
				AW [B]					
				AZ [P]					
				BA [A]					
				BB [B]					
				BD [P]					
				BI [B]					
				BL [P]					
				BM [P]					
				BN [P]					
				BO [P]					
				CA [A]					
				CB [B]					
				DC [P]					
				EA [A]					
				EB [B]					
				EC [P]					
				FA [A]					
				FB [B]					
				FC [P]					
				GA [A]					
				GB [B]					
				GC [P]					
				HA [A]					
				HB [B]					
				HC [P]					
				IA [B]					
				IB [B]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				IC [P]					
				JA [B]					
				JB [B]					
				JC [P]					
				KA [B]					
				KB [B]					
				KC [P]					
				LA [B]					
				LB [B]					
				LC [P]					
				MB [B]					
				MC [P]					
				NB [B]					
				NC [P]					
				OA [B]					
				OB [B]					
				OC [P]					
				PA [B]					
				PB [B]					
				QA [B]					
				QB [B]					
				QC [P]					
				RB [B]					
				RC [P]					
				SA [B]					
				SB [B]					
				TA [B]					
				TB [B]					
				UA [B]					
				UB [B]					
				UC [P]					
				VA [B]					

ID	Model(s)	Entity ID	Molecule name	Chain(s) [auth]	Total residues	Rigid segments	Flexible segments	Model coverage/ Starting model coverage (%)	Scale
				VC [P]					
				WA [B]					
				WB [B]					
				WC [P]					
				XA [B]					
				XC [P]					
				YA [B]					
				YB [B]					
				ZA [B]					
		4	[(2R)-2-[(E)-octadec-9-enoyl]oxy-3-[oxidanyl-[(1R,2R,3S,4R,5R,6S)-2,3,6-tris(oxidanyl)-4,5-diphosphonooxy-cyclohexyl]oxy-phosphoryl]oxy-propyl] (E)-octadec-9-enoate	AU [B]	Non-polymeric	-	-	Not available / Not available	Atomic
				BE [A]					
				BF [B]					
				BG [B]					
				BH [B]					
				BJ [P]					
				BK [P]					

2.3. Datasets used for modeling ⓘ

There are 6 unique datasets used to build the models in this entry.

ID	Dataset type	Database name	Data access code
1	NMR data	BMRB	27726
2	Experimental model	PDB	pdb_00003lvq
3	NMR data	BMRbig	BMRbig101
4	Experimental model	PDB	pdb_00002n5e
5	Experimental model	PDB	pdb_00002ksq
6	Comparative model	Not available	Not available

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	NAMD multi-state modeling	Not available	True	False

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	NAMD multi-state modeling	Not available	True	False
1	1	Not available	Not available	NAMD multi-state modeling	Not available	True	False

There are 4 software packages reported in this entry.

ID	Software name	Software version	Software classification	Software location
1	NAMD2	Not available	molecular dynamics	http://www.ks.uiuc.edu/Research/namd/
2	CHARMM-GUI	Not available	molecular dynamics simulations	http://www.charmm-gui.org/
3	Swiss-Model	Not available	comparative modeling	https://swissmodel.expasy.org/
4	Visual Molecular Dynamics (VMD)	Not available	model building	https://www.ks.uiuc.edu/Research/vmd/

3. Data quality ❓

3.4. NMR ❓

Validation for this section is under development.

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 833 bond length outliers in this entry (4.69% of 17768 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)
O	1	LBN	C11-C14	126.79	4.06	1.52	2	3
NC	1	LBN	C11-C14	125.46	4.03	1.52	1	3
UA	1	LBN	C11-C14	125.29	4.03	1.52	1	3
OC	1	LBN	C11-C14	124.87	4.02	1.52	2	3
W	1	LBN	C11-C14	124.82	4.02	1.52	1	3

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
GC	1	LBN	C11-C14	124.67	4.02	1.52	3	3
BA	1	LBN	C11-C14	124.55	4.01	1.52	2	3
FB	1	LBN	C11-C14	124.00	4.00	1.52	1	3
I	1	LBN	C11-C14	123.75	4.00	1.52	2	3
RB	1	LBN	C11-C14	123.62	4.00	1.52	2	3
OA	1	LBN	C11-C14	123.48	3.99	1.52	1	3
AW	1	LBN	C11-C14	123.35	3.99	1.52	2	2
FC	1	LBN	C11-C14	122.99	3.98	1.52	2	3
AC	1	LBN	C11-C14	122.68	3.98	1.52	1	1
X	1	LBN	C11-C14	122.67	3.98	1.52	3	3
BD	1	LBN	C11-C14	122.60	3.98	1.52	2	2
TA	1	LBN	C11-C14	122.57	3.97	1.52	1	3
H	1	LBN	C11-C14	122.29	3.97	1.52	3	3
AT	1	LBN	C11-C14	122.22	3.97	1.52	2	2
RA	1	LBN	C11-C14	121.94	3.96	1.52	1	2
MB	1	LBN	C11-C14	121.90	3.96	1.52	2	3
T	1	LBN	C11-C14	121.84	3.96	1.52	2	3
WC	1	LBN	C11-C14	121.35	3.95	1.52	1	3
YB	1	LBN	C11-C14	121.27	3.95	1.52	3	2
XA	1	LBN	C11-C14	121.21	3.95	1.52	1	3
J	1	LBN	C11-C14	121.18	3.95	1.52	3	3
SB	1	LBN	C11-C14	121.08	3.94	1.52	1	2
VA	1	LBN	C11-C14	120.99	3.94	1.52	2	3
ZA	1	LBN	C11-C14	120.93	3.94	1.52	1	2
JB	1	LBN	C11-C14	120.72	3.94	1.52	1	3
MC	1	LBN	C11-C14	120.71	3.94	1.52	2	3
KA	1	LBN	C11-C14	120.57	3.93	1.52	1	3
VC	1	LBN	C11-C14	120.53	3.93	1.52	3	3
Z	1	LBN	C11-C14	120.42	3.93	1.52	2	3
G	1	LBN	C11-C14	120.36	3.93	1.52	2	3
BB	1	LBN	C11-C14	120.14	3.93	1.52	1	3
AA	1	LBN	C11-C14	120.00	3.92	1.52	3	3
EB	1	LBN	C11-C14	119.99	3.92	1.52	2	3
AH	1	LBN	C11-C14	119.75	3.92	1.52	2	1
LB	1	LBN	C11-C14	119.71	3.92	1.52	3	3

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
K	1	LBN	C11-C14	119.69	3.92	1.52	1	2
CB	1	LBN	C11-C14	119.54	3.91	1.52	1	3
AJ	1	LBN	C11-C14	119.09	3.90	1.52	2	1
FA	1	LBN	C11-C14	119.04	3.90	1.52	1	3
D	1	LBN	C11-C14	118.86	3.90	1.52	1	3
S	1	LBN	C11-C14	118.82	3.90	1.52	2	3
LC	1	LBN	C11-C14	118.77	3.90	1.52	3	3
AZ	1	LBN	C11-C14	118.08	3.88	1.52	3	2
JC	1	LBN	C11-C14	118.03	3.88	1.52	1	2
BL	1	LBN	C11-C14	117.98	3.88	1.52	3	1
M	1	LBN	C11-C14	117.94	3.88	1.52	3	3
AI	1	LBN	C11-C14	117.90	3.88	1.52	2	1
WA	1	LBN	C11-C14	117.87	3.88	1.52	3	3
N	1	LBN	C11-C14	117.73	3.88	1.52	3	3
ZB	1	LBN	C11-C14	117.65	3.88	1.52	1	1
DB	1	LBN	C11-C14	117.63	3.88	1.52	1	2
HB	1	LBN	C11-C14	117.56	3.87	1.52	1	3
Q	1	LBN	C11-C14	116.88	3.86	1.52	2	3
QB	1	LBN	C11-C14	116.85	3.86	1.52	1	3
XC	1	LBN	C11-C14	116.84	3.86	1.52	2	3
CA	1	LBN	C11-C14	116.59	3.85	1.52	3	3
WB	1	LBN	C11-C14	116.53	3.85	1.52	3	2
AG	1	LBN	C11-C14	116.29	3.85	1.52	3	2
EC	1	LBN	C11-C14	116.21	3.85	1.52	1	3
YA	1	LBN	C11-C14	116.10	3.85	1.52	2	3
IC	1	LBN	C11-C14	116.03	3.84	1.52	2	3
HC	1	LBN	C11-C14	115.99	3.84	1.52	3	3
RC	1	LBN	C11-C14	115.87	3.84	1.52	1	3
R	1	LBN	C11-C14	115.63	3.84	1.52	1	3
OB	1	LBN	C11-C14	115.30	3.83	1.52	1	3
L	1	LBN	C11-C14	114.97	3.82	1.52	3	2
IB	1	LBN	C11-C14	114.92	3.82	1.52	2	3
SA	1	LBN	C11-C14	114.53	3.81	1.52	2	3
YC	1	LBN	C11-C14	113.80	3.80	1.52	1	1
AQ	1	LBN	C11-C14	112.83	3.78	1.52	2	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
Y	1	LBN	C11-C14	112.68	3.78	1.52	1	3
PB	1	LBN	C11-C14	112.39	3.77	1.52	3	3
QC	1	LBN	C11-C14	111.24	3.75	1.52	3	3
HA	1	LBN	C11-C14	96.89	3.46	1.52	2	3
AE	1	LBN	C11-C14	91.09	3.34	1.52	2	2
GA	1	LBN	C11-C14	89.00	3.30	1.52	2	3
U	1	LBN	C11-C14	88.82	3.30	1.52	3	2
E	1	LBN	C11-C14	88.36	3.29	1.52	2	3
AO	1	LBN	C11-C14	87.85	3.28	1.52	2	1
PA	1	LBN	C11-C14	87.69	3.28	1.52	2	3
DC	1	LBN	C11-C14	87.02	3.26	1.52	3	3
QA	1	LBN	C11-C14	86.11	3.25	1.52	3	3
BN	1	LBN	C11-C14	85.52	3.23	1.52	3	1
NB	1	LBN	C11-C14	85.29	3.23	1.52	2	3
PC	1	LBN	C11-C14	85.01	3.22	1.52	1	2
F	1	LBN	C11-C14	85.00	3.22	1.52	1	3
AK	1	LBN	C11-C14	84.86	3.22	1.52	2	1
UC	1	LBN	C11-C14	84.81	3.22	1.52	1	3
AL	1	LBN	C11-C14	84.24	3.21	1.52	2	1
KC	1	LBN	C11-C14	84.11	3.21	1.52	3	2
CC	1	LBN	C11-C14	84.05	3.20	1.52	1	1
EA	1	LBN	C11-C14	83.85	3.20	1.52	3	3
AS	1	LBN	C11-C14	83.77	3.20	1.52	2	1
GB	1	LBN	C11-C14	83.71	3.20	1.52	3	3
JA	1	LBN	C11-C14	83.66	3.20	1.52	2	3

Standard geometry: angle outliers ?

There are 742 bond angle outliers in this entry (3.71% of 20008 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	9	PHE	CA-CB-CG	10.11	103.69	113.80	3	2
C	178	ARG	NE-CZ-NH1	9.26	130.76	121.50	1	1
B	35	ASP	CA-CB-CG	9.12	103.48	112.60	2	3
C	13	PHE	CA-CB-CG	8.80	105.00	113.80	3	2
A	19	ASP	CA-CB-CG	8.74	121.34	112.60	3	3

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
B	75	ARG	NE-CZ-NH2	8.74	111.34	119.20	3	3
B	75	ARG	NE-CZ-NH1	8.70	130.20	121.50	3	3
B	62	ARG	NE-CZ-NH2	8.67	127.00	119.20	3	3
C	151	ARG	NE-CZ-NH2	8.60	126.94	119.20	1	1
C	178	ARG	NH1-CZ-NH2	8.25	108.57	119.30	1	1
C	24	GLY	C-N-CA	8.22	136.50	121.70	3	2
C	135	ASN	C-N-CA	8.21	136.48	121.70	1	1
C	5	PHE	CA-CB-CG	8.01	105.79	113.80	2	1
B	73	ARG	NE-CZ-NH1	7.88	129.38	121.50	3	3
C	172	TRP	CB-CG-CD2	7.83	137.76	126.80	2	1
A	112	ARG	NE-CZ-NH2	7.71	112.26	119.20	1	3
C	103	ALA	N-CA-CB	7.66	121.89	110.40	3	1
C	117	ARG	NE-CZ-NH1	7.62	129.12	121.50	3	1
C	141	ASP	CA-CB-CG	7.47	120.07	112.60	2	1
C	82	PHE	CB-CG-CD2	7.41	108.10	120.70	3	1
C	127	LYS	N-CA-CB	7.39	123.06	110.50	1	2
C	151	ARG	C-CA-CB	6.98	96.84	110.10	1	1
B	43	VAL	CA-CB-CG2	6.98	98.54	110.40	2	3
A	88	ALA	N-CA-CB	6.93	120.79	110.40	3	3
C	46	ILE	CA-C-O	6.88	109.10	120.80	3	1
C	45	THR	OG1-CB-CG2	6.88	95.55	109.30	1	1
A	142	LEU	N-CA-CB	6.85	122.14	110.50	2	3
C	19	ARG	NE-CZ-NH1	6.79	128.29	121.50	1	2
C	151	ARG	NE-CZ-NH1	6.76	128.26	121.50	2	1
C	44	THR	C-N-CA	6.71	133.78	121.70	1	2
C	125	ALA	C-CA-CB	6.65	120.47	110.50	2	1
C	128	GLN	OE1-CD-NE2	6.63	115.97	122.60	2	2
C	97	ARG	NE-CZ-NH1	6.63	128.13	121.50	3	1
B	101	ARG	NE-CZ-NH1	6.62	128.12	121.50	2	3
C	79	ARG	NE-CZ-NH1	6.52	128.02	121.50	3	1
C	19	ARG	NH1-CZ-NH2	6.49	110.87	119.30	1	2
A	97	ARG	NE-CZ-NH1	6.43	127.93	121.50	2	3
C	75	ARG	CA-C-N	6.40	126.49	116.90	3	2
A	66	GLU	CA-C-N	6.40	126.49	116.90	3	3
C	146	HIS	ND1-CE1-NE2	6.33	114.73	108.40	3	1

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	75	ARG	N-CA-CB	6.28	121.18	110.50	1	1
C	46	ILE	CA-C-N	6.28	126.32	116.90	3	3
C	113	GLU	C-N-CA	6.28	133.00	121.70	3	1
B	143	LEU	CA-C-N	6.27	126.30	116.90	1	3
A	143	LEU	CA-C-N	6.26	126.29	116.90	2	3
C	175	ASN	OD1-CG-ND2	6.24	116.36	122.60	1	1
C	150	HIS	C-N-CA	6.22	132.90	121.70	3	1
C	146	HIS	CD2-NE2-CE1	6.20	102.80	109.00	3	2
B	101	ARG	NE-CZ-NH2	6.19	113.63	119.20	3	3
A	126	THR	CA-CB-OG1	6.18	118.87	109.60	1	3
B	92	ASP	CA-CB-CG	6.15	106.45	112.60	3	3
A	87	LEU	O-C-N	6.14	113.17	123.00	2	3
C	79	ARG	NE-CZ-NH2	6.14	113.67	119.20	3	1
B	7	ARG	NE-CZ-NH1	6.12	127.62	121.50	2	3
A	108	ASN	OD1-CG-ND2	6.11	116.49	122.60	3	3
B	165	ASN	OD1-CG-ND2	6.10	128.70	122.60	1	3
B	132	LYS	CA-C-N	6.10	126.05	116.90	1	3
C	149	ARG	NH1-CZ-NH2	6.08	111.39	119.30	2	1
C	3	ASN	CA-CB-CG	6.08	118.68	112.60	3	1
C	126	ASN	C-N-CA	6.03	132.56	121.70	1	1
C	18	MET	CG-SD-CE	6.03	87.64	100.90	3	2
B	64	LYS	N-CA-CB	6.01	120.71	110.50	3	3
A	75	ARG	NE-CZ-NH2	5.98	124.58	119.20	3	3
C	135	ASN	OD1-CG-ND2	5.97	128.57	122.60	1	3
C	83	GLN	CA-CB-CG	5.95	125.99	114.10	2	1
A	123	HIS	CD2-NE2-CE1	5.94	103.06	109.00	1	3
C	180	GLN	CB-CG-CD	5.93	122.68	112.60	2	1
B	73	ARG	NH1-CZ-NH2	5.92	111.60	119.30	2	3
C	28	ALA	CA-C-O	5.92	130.86	120.80	3	1
C	38	LYS	C-CA-CB	5.91	98.86	110.10	2	1
C	84	ASN	CA-CB-CG	5.90	106.70	112.60	3	1
C	28	ALA	O-C-N	5.88	113.59	123.00	3	1
A	97	ARG	NH1-CZ-NH2	5.86	111.68	119.30	2	3
C	126	ASN	OD1-CG-ND2	5.85	116.75	122.60	3	1
B	7	ARG	NE-CZ-NH2	5.82	113.96	119.20	2	3

Chain	Res	Type	Atoms	|Z|	Observed (Å)	Ideal (Å)	Model ID (Worst)	Models (Total)
C	175	ASN	CA-CB-CG	5.81	118.41	112.60	2	1
B	49	ASP	CA-CB-CG	5.77	106.83	112.60	2	3
C	151	ARG	NH1-CZ-NH2	5.76	111.81	119.30	1	1
C	28	ALA	C-N-CA	5.75	132.04	121.70	3	1
C	148	LEU	C-N-CA	5.73	132.02	121.70	2	1
C	38	LYS	O-C-N	5.73	113.83	123.00	2	1
C	117	ARG	C-N-CA	5.72	132.00	121.70	1	1
C	146	HIS	O-C-N	5.72	113.85	123.00	3	1
C	155	ILE	N-CA-CB	5.71	121.20	111.50	3	1
C	156	GLN	OE1-CD-NE2	5.69	116.91	122.60	3	1
C	99	ARG	O-C-N	5.68	113.91	123.00	2	1
C	179	ASN	CA-CB-CG	5.65	106.95	112.60	2	2
C	83	GLN	CB-CG-CD	5.64	122.19	112.60	1	1
A	56	GLU	C-N-CA	5.64	131.84	121.70	1	3
C	101	ASN	OD1-CG-ND2	5.63	116.97	122.60	3	1
C	75	ARG	O-C-N	5.63	114.00	123.00	3	1
C	124	PHE	CA-CB-CG	5.63	108.17	113.80	2	2
B	46	TYR	CA-CB-CG	5.62	124.01	113.90	3	3
C	20	ILE	C-N-CA	5.61	131.80	121.70	2	1
C	172	TRP	CB-CG-CD1	5.60	118.50	126.90	2	1
C	75	ARG	NE-CZ-NH1	5.58	127.08	121.50	3	1
A	138	LEU	C-N-CA	5.57	131.72	121.70	1	3
C	4	ILE	CA-CB-CG1	5.57	119.86	110.40	1	1
C	117	ARG	NE-CZ-NH2	5.55	114.21	119.20	2	1
C	64	THR	CA-CB-CG2	5.52	119.89	110.50	1	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 atomic models in this entry.

Model ID	Clash score	Number of clashes
1	0.00	0
2	0.00	0
3	0.00	0

There are no too-close contacts.

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	507	475	26	6
2	507	477	27	3
3	507	478	23	6

There are 8 unique backbone outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	89	PRO	3
B	109	GLY	3
B	166	THR	3
C	127	LYS	2
C	60	ASN	1
C	75	ARG	1
C	81	TYR	1
C	149	ARG	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	434	340	59	35
2	434	344	52	38
3	434	341	57	36

There are 44 unique sidechain outliers. Detailed list of outliers are tabulated below.

Chain	Res	Type	Models (Total)
A	6	LEU	3
A	9	GLN	3
A	10	LEU	3
A	24	GLU	3
A	26	GLU	3
A	35	ASP	3
A	43	VAL	3
A	54	TRP	3
A	57	GLU	3
A	59	GLU	3

Chain	Res	Type	Models (Total)
A	83	LEU	3
A	96	GLN	3
A	103	GLU	3
A	139	ARG	3
A	143	LEU	3
A	154	LEU	3
B	6	LEU	3
B	9	GLN	3
B	10	LEU	3
B	24	GLU	3
B	35	ASP	3
B	43	VAL	3
B	59	GLU	3
B	83	LEU	3
B	93	GLU	3
B	96	GLN	3
B	103	GLU	3
B	113	LEU	3
B	126	THR	3
B	135	LEU	3
B	139	ARG	3
B	152	SER	3
C	176	GLN	2
C	8	LEU	1
C	23	VAL	1
C	45	THR	1
C	55	THR	1
C	73	LYS	1
C	82	PHE	1
C	86	GLN	1
C	92	VAL	1
C	140	THR	1
C	158	THR	1
C	180	GLN	1

5. Fit to Data Used for Modeling Assessment ?

5.4. NMR ?

Validation for this section is under development.

6. Fit to Data Used for Validation Assessment ?

Validation for this section is under development.