



# wwPDB NMR Structure Validation Summary Report ⓘ

Jun 5, 2023 – 02:16 AM EDT

PDB ID : 2LVR  
BMRB ID : 18586  
Title : Solution structure of Miz-1 zinc finger 8  
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Deposited on : 2012-07-10

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The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
wwPDB-RCI : v\_1n\_11\_5\_13\_A (Berjanski et al., 2005)  
PANAV : Wang et al. (2010)  
wwPDB-ShiftChecker : v1.2  
BMRB Restraints Analysis : v1.2  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.33

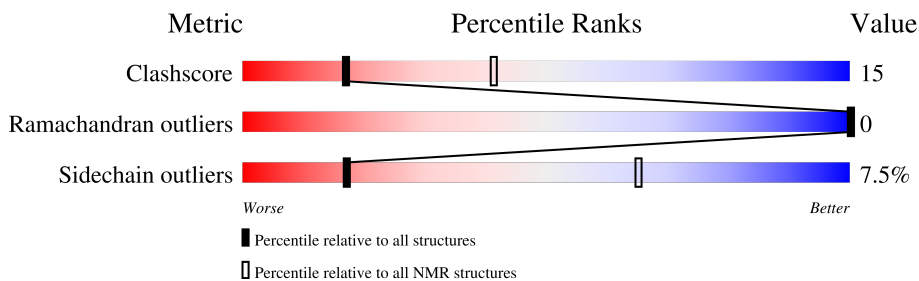
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*SOLUTION NMR*

The overall completeness of chemical shifts assignment is 80%.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	NMR archive (#Entries)
Clashscore	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and a grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	83	

## 2 Ensemble composition and analysis i

This entry contains 20 models. Model 12 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy*.

The following residues are included in the computation of the global validation metrics.

Well-defined (core) protein residues			
Well-defined core	Residue range (total)	Backbone RMSD (Å)	Medoid model
1	A:12-A:26 (15)	0.21	12

Ill-defined regions of proteins are excluded from the global statistics.

Ligands and non-protein polymers are included in the analysis.

The models can be grouped into 4 clusters and 2 single-model clusters were found.

Cluster number	Models
1	8, 9, 11, 12, 13, 15, 17
2	1, 6, 7, 14, 16, 19
3	5, 10, 18
4	2, 20
Single-model clusters	3; 4

### 3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 492 atoms, of which 246 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Zinc finger and BTB domain-containing protein 17.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	30	491	153	246	50	39	3	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP Q13105

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

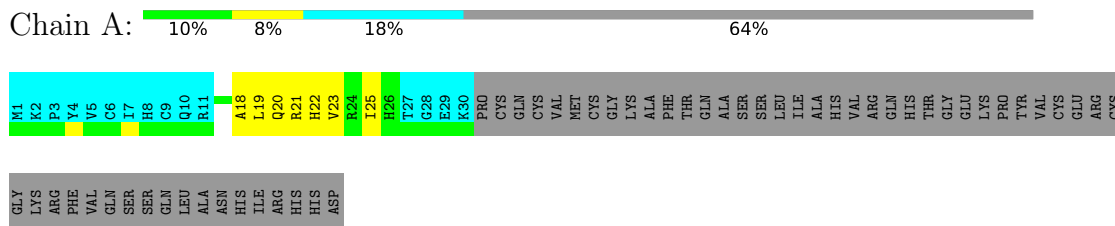
Mol	Chain	Residues	Atoms	
			Total	Zn
2	A	1	1	1

## 4 Residue-property plots [i](#)

### 4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

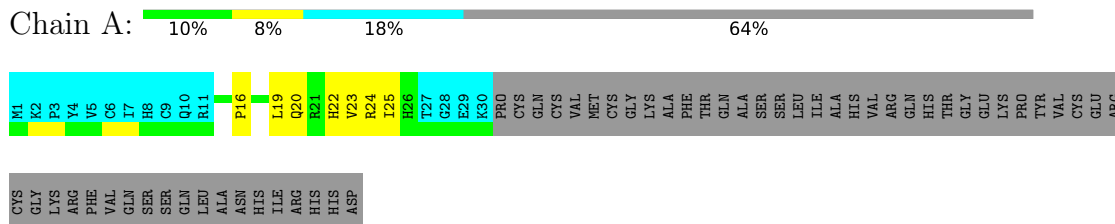
- Molecule 1: Zinc finger and BTB domain-containing protein 17



### 4.2 Residue scores for the representative (medoid) model from the NMR ensemble

The representative model is number 12. Colouring as in section 4.1 above.

- Molecule 1: Zinc finger and BTB domain-containing protein 17



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing*.

Of the 300 calculated structures, 20 were deposited, based on the following criterion: *structures with the lowest energy*.

The following table shows the software used for structure solution, optimisation and refinement.

Software name	Classification	Version
ARIA	structure calculation	2.2
ARIA	refinement	2.2
CNS	structure calculation	1.21
CNS	refinement	1.21

The following table shows chemical shift validation statistics as aggregates over all chemical shift files. Detailed validation can be found in section 7 of this report.

Chemical shift file(s)	working_cs.cif
Number of chemical shift lists	1
Total number of shifts	877
Number of shifts mapped to atoms	316
Number of unparsed shifts	0
Number of shifts with mapping errors	561
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	80%

## 6 Model quality [i](#)

### 6.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section:  
ZN

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 6.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in each chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	123	120	120	4±1
All	All	2480	2400	2400	75

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 15.

5 of 12 unique clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:22:HIS:O	1:A:25:ILE:HB	0.65	1.92	2	20
1:A:21:ARG:O	1:A:25:ILE:HG12	0.60	1.96	14	6
1:A:19:LEU:O	1:A:23:VAL:HG23	0.58	1.98	2	19
1:A:17:GLY:O	1:A:20:GLN:HG3	0.52	2.03	9	3
1:A:18:ALA:O	1:A:22:HIS:HB2	0.51	2.05	10	11

## 6.3 Torsion angles [i](#)

### 6.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all NMR entries. The Analysed column shows the number of residues for which the backbone conformation was analysed and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	15/83 (18%)	15±0 (100±0%)	0±0 (0±0%)	0±0 (0±0%)	100	100
All	All	300/1660 (18%)	300 (100%)	0 (0%)	0 (0%)	100	100

There are no Ramachandran outliers.

### 6.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all NMR entries. The Analysed column shows the number of residues for which the sidechain conformation was analysed and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	12/72 (17%)	11±1 (92±6%)	1±1 (8±6%)	17	65
All	All	240/1440 (17%)	222 (92%)	18 (8%)	17	65

All 4 unique residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	21	ARG	11
1	A	20	GLN	3
1	A	15	ASP	3
1	A	24	ARG	1

### 6.3.3 RNA [i](#)

There are no RNA molecules in this entry.



## 6.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.6 Ligand geometry [i](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

## 6.7 Other polymers [i](#)

There are no such molecules in this entry.

## 6.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 7 Chemical shift validation

The completeness of assignment taking into account all chemical shift lists is 80% for the well-defined parts and 73% for the entire structure.

### 7.1 Chemical shift list 1

File name: working\_cs.cif

Chemical shift list name: *assigned\_chem\_shift\_list*

#### 7.1.1 Bookkeeping

The following table shows the results of parsing the chemical shift list and reports the number of nuclei with statistically unusual chemical shifts.

Total number of shifts	877
Number of shifts mapped to atoms	316
Number of unparsed shifts	0
Number of shifts with mapping errors	561
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	0

The following assigned chemical shifts were not mapped to the molecules present in the coordinate file.

- No matching atom found in the structure. First 5 (of 561) occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	31	PRO	HA	4.401	0.008	1
1	A	31	PRO	HB2	2.123	0.006	2
1	A	31	PRO	HB3	2.081	0.009	2
1	A	31	PRO	HG2	1.839	0.004	2
1	A	31	PRO	HG3	1.901	0.01	2
1	A	31	PRO	HD2	3.568	0.013	2
1	A	31	PRO	HD3	3.62	0.022	2
1	A	31	PRO	C	176.585	0.2	1
1	A	31	PRO	CA	63.434	0.063	1
1	A	31	PRO	CB	32.293	0.025	1
1	A	31	PRO	CG	26.643	0.002	1
1	A	32	CYS	H	8.356	0.007	1
1	A	32	CYS	HA	4.514	0.05	1
1	A	32	CYS	C	173.747	0.2	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	32	CYS	CA	57.325	0.07	1
1	A	32	CYS	CB	35.049	0.2	1
1	A	32	CYS	N	117.577	0.046	1
1	A	33	GLN	H	8.372	0.01	1
1	A	33	GLN	HA	5.021	0.011	1
1	A	33	GLN	HB2	1.656	0.008	2
1	A	33	GLN	HB3	1.714	0.006	2
1	A	33	GLN	HG2	1.912	0.016	1
1	A	33	GLN	HG3	1.912	0.016	1
1	A	33	GLN	C	175.002	0.2	1
1	A	33	GLN	CA	54.101	0.038	1
1	A	33	GLN	CB	32.361	0.05	1
1	A	33	GLN	CG	33.837	0.2	1
1	A	33	GLN	N	120.137	0.023	1
1	A	34	CYS	H	8.993	0.008	1
1	A	34	CYS	HA	4.425	0.007	1
1	A	34	CYS	HB2	2.783	0.014	1
1	A	34	CYS	HB3	3.272	0.013	1
1	A	34	CYS	C	178.038	0.2	1
1	A	34	CYS	CA	59.22	0.045	1
1	A	34	CYS	CB	29.956	0.033	1
1	A	34	CYS	N	126.003	0.054	1
1	A	35	VAL	H	9.01	0.013	1
1	A	35	VAL	HA	3.971	0.02	1
1	A	35	VAL	HB	2.185	0.025	1
1	A	35	VAL	HG11	0.925	0.014	1
1	A	35	VAL	HG12	0.925	0.014	1
1	A	35	VAL	HG13	0.925	0.014	1
1	A	35	VAL	HG21	0.928	0.012	1
1	A	35	VAL	HG22	0.928	0.012	1
1	A	35	VAL	HG23	0.928	0.012	1
1	A	35	VAL	C	176.03	0.2	1
1	A	35	VAL	CA	64.03	0.051	1
1	A	35	VAL	CB	31.734	0.068	1
1	A	35	VAL	CG1	20.386	0.007	1
1	A	35	VAL	CG2	20.386	0.007	1
1	A	35	VAL	N	129.398	0.04	1
1	A	36	MET	H	8.726	0.007	1
1	A	36	MET	HA	4.215	0.031	1
1	A	36	MET	HB2	2.17	0.015	1
1	A	36	MET	HB3	2.17	0.015	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	36	MET	HG2	2.208	0.001	1
1	A	36	MET	HG3	2.208	0.001	1
1	A	36	MET	C	176.951	0.2	1
1	A	36	MET	CA	57.631	0.057	1
1	A	36	MET	CB	32.113	0.066	1
1	A	36	MET	CG	30.113	0.2	1
1	A	36	MET	N	120.946	0.056	1
1	A	37	CYS	H	8.038	0.012	1
1	A	37	CYS	HA	5.064	0.008	1
1	A	37	CYS	HB2	2.756	0.011	1
1	A	37	CYS	HB3	3.348	0.013	1
1	A	37	CYS	C	175.989	0.2	1
1	A	37	CYS	CA	58.484	0.023	1
1	A	37	CYS	CB	32.235	0.053	1
1	A	37	CYS	N	115.594	0.05	1
1	A	38	GLY	H	8.119	0.007	1
1	A	38	GLY	HA2	3.68	0.017	2
1	A	38	GLY	HA3	4.156	0.016	2
1	A	38	GLY	C	173.535	0.2	1
1	A	38	GLY	CA	45.994	0.03	1
1	A	38	GLY	N	113.363	0.031	1
1	A	39	LYS	H	7.877	0.005	1
1	A	39	LYS	HA	3.831	0.006	1
1	A	39	LYS	HB2	1.13	0.005	2
1	A	39	LYS	HB3	1.482	0.003	2
1	A	39	LYS	HG2	0.835	0.007	2
1	A	39	LYS	HG3	1.208	0.002	2
1	A	39	LYS	HD2	1.243	0.003	2
1	A	39	LYS	HD3	1.395	0.01	2
1	A	39	LYS	HE2	2.709	0.002	2
1	A	39	LYS	HE3	2.796	0.021	2
1	A	39	LYS	C	173.961	0.2	1
1	A	39	LYS	CA	58.248	0.036	1
1	A	39	LYS	CB	33.551	0.002	1
1	A	39	LYS	CG	25.737	0.2	1
1	A	39	LYS	CD	29.114	0.0	1
1	A	39	LYS	CE	42.282	0.0	1
1	A	39	LYS	N	123.49	0.03	1
1	A	40	ALA	H	7.89	0.005	1
1	A	40	ALA	HA	4.868	0.023	1
1	A	40	ALA	HB1	1.116	0.009	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	40	ALA	HB2	1.116	0.009	1
1	A	40	ALA	HB3	1.116	0.009	1
1	A	40	ALA	C	176.533	0.2	1
1	A	40	ALA	CA	50.845	0.053	1
1	A	40	ALA	CB	21.18	0.063	1
1	A	40	ALA	N	125.467	0.039	1
1	A	41	PHE	H	8.342	0.006	1
1	A	41	PHE	HA	4.538	0.012	1
1	A	41	PHE	HB2	2.497	0.014	1
1	A	41	PHE	HB3	3.11	0.017	1
1	A	41	PHE	HD1	7.032	0.003	3
1	A	41	PHE	HD2	7.032	0.003	3
1	A	41	PHE	C	174.934	0.2	1
1	A	41	PHE	CA	57.395	0.015	1
1	A	41	PHE	CB	44.113	0.039	1
1	A	41	PHE	CD1	135.325	0.029	3
1	A	41	PHE	CD2	135.325	0.029	3
1	A	41	PHE	N	117.232	0.03	1
1	A	42	THR	H	8.732	0.005	1
1	A	42	THR	HA	4.42	0.004	1
1	A	42	THR	HB	4.331	0.009	1
1	A	42	THR	HG21	1.079	0.011	1
1	A	42	THR	HG22	1.079	0.011	1
1	A	42	THR	HG23	1.079	0.011	1
1	A	42	THR	C	174.386	0.2	1
1	A	42	THR	CA	62.005	0.074	1
1	A	42	THR	CB	69.488	0.083	1
1	A	42	THR	CG2	22.213	0.2	1
1	A	42	THR	N	108.612	0.056	1
1	A	43	GLN	H	7.257	0.006	1
1	A	43	GLN	HA	4.623	0.008	1
1	A	43	GLN	CA	54.332	0.2	1
1	A	43	GLN	CB	31.631	0.2	1
1	A	43	GLN	N	118.161	0.025	1
1	A	44	ALA	HA	3.864	0.01	1
1	A	44	ALA	HB1	1.353	0.016	1
1	A	44	ALA	HB2	1.353	0.016	1
1	A	44	ALA	HB3	1.353	0.016	1
1	A	44	ALA	C	179.325	0.2	1
1	A	44	ALA	CA	55.569	0.055	1
1	A	44	ALA	CB	17.913	0.04	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	45	SER	H	8.744	0.001	1
1	A	45	SER	HA	2.864	0.01	1
1	A	45	SER	HB2	3.409	0.014	2
1	A	45	SER	HB3	3.217	0.011	2
1	A	45	SER	C	177.517	0.2	1
1	A	45	SER	CA	61.015	0.053	1
1	A	45	SER	CB	61.493	0.038	1
1	A	45	SER	N	111.824	0.018	1
1	A	46	SER	H	6.932	0.011	1
1	A	46	SER	HA	4.185	0.017	1
1	A	46	SER	HB2	4.231	0.05	2
1	A	46	SER	HB3	3.974	0.05	2
1	A	46	SER	C	175.729	0.2	1
1	A	46	SER	CA	60.656	0.059	1
1	A	46	SER	CB	62.578	0.085	1
1	A	46	SER	N	118.211	0.025	1
1	A	47	LEU	H	7.132	0.008	1
1	A	47	LEU	HA	2.801	0.01	1
1	A	47	LEU	HB2	0.992	0.013	1
1	A	47	LEU	HB3	1.848	0.012	1
1	A	47	LEU	HG	1.311	0.009	1
1	A	47	LEU	HD11	0.641	0.014	2
1	A	47	LEU	HD12	0.641	0.014	2
1	A	47	LEU	HD13	0.641	0.014	2
1	A	47	LEU	HD21	0.78	0.007	2
1	A	47	LEU	HD22	0.78	0.007	2
1	A	47	LEU	HD23	0.78	0.007	2
1	A	47	LEU	C	177.273	0.2	1
1	A	47	LEU	CA	57.883	0.074	1
1	A	47	LEU	CB	40.99	0.067	1
1	A	47	LEU	N	124.822	0.038	1
1	A	48	ILE	H	8.152	0.007	1
1	A	48	ILE	HA	3.457	0.012	1
1	A	48	ILE	HB	1.647	0.016	1
1	A	48	ILE	HG12	1.472	0.015	2
1	A	48	ILE	HG13	1.041	0.008	2
1	A	48	ILE	HG21	0.748	0.017	1
1	A	48	ILE	HG22	0.748	0.017	1
1	A	48	ILE	HG23	0.748	0.017	1
1	A	48	ILE	HD11	0.67	0.009	1
1	A	48	ILE	HD12	0.67	0.009	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	48	ILE	HD13	0.67	0.009	1
1	A	48	ILE	C	178.059	0.2	1
1	A	48	ILE	CA	64.674	0.051	1
1	A	48	ILE	CB	37.786	0.039	1
1	A	48	ILE	CG1	29.124	0.065	1
1	A	48	ILE	CG2	16.934	0.044	1
1	A	48	ILE	CD1	12.592	0.021	1
1	A	48	ILE	N	118.672	0.05	1
1	A	49	ALA	H	7.237	0.006	1
1	A	49	ALA	HA	3.902	0.01	1
1	A	49	ALA	HB1	1.326	0.013	1
1	A	49	ALA	HB2	1.326	0.013	1
1	A	49	ALA	HB3	1.326	0.013	1
1	A	49	ALA	C	179.603	0.2	1
1	A	49	ALA	CA	54.762	0.041	1
1	A	49	ALA	CB	18.004	0.051	1
1	A	49	ALA	N	120.061	0.041	1
1	A	50	HIS	H	7.429	0.009	1
1	A	50	HIS	HA	4.078	0.017	1
1	A	50	HIS	HB2	2.868	0.01	1
1	A	50	HIS	HB3	3.05	0.015	1
1	A	50	HIS	HD2	6.889	0.005	1
1	A	50	HIS	C	177.439	0.2	1
1	A	50	HIS	CA	59.262	0.025	1
1	A	50	HIS	CB	28.579	0.049	1
1	A	50	HIS	CD2	130.313	0.0	1
1	A	50	HIS	N	117.236	0.063	1
1	A	51	VAL	H	8.581	0.007	1
1	A	51	VAL	HA	3.484	0.017	1
1	A	51	VAL	HB	2.112	0.014	1
1	A	51	VAL	HG11	0.989	0.019	1
1	A	51	VAL	HG12	0.989	0.019	1
1	A	51	VAL	HG13	0.989	0.019	1
1	A	51	VAL	HG21	1.213	0.015	1
1	A	51	VAL	HG22	1.213	0.015	1
1	A	51	VAL	HG23	1.213	0.015	1
1	A	51	VAL	C	178.46	0.2	1
1	A	51	VAL	CA	66.744	0.029	1
1	A	51	VAL	CB	31.657	0.046	1
1	A	51	VAL	CG1	22.318	0.082	1
1	A	51	VAL	CG2	22.318	0.082	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	51	VAL	N	119.094	0.02	1
1	A	52	ARG	H	7.397	0.01	1
1	A	52	ARG	HA	4.086	0.01	1
1	A	52	ARG	C	178.13	0.2	1
1	A	52	ARG	CA	58.801	0.2	1
1	A	52	ARG	CB	29.78	0.008	1
1	A	52	ARG	CG	27.738	0.2	1
1	A	52	ARG	CD	43.414	0.2	1
1	A	52	ARG	N	118.214	0.022	1
1	A	53	GLN	H	7.525	0.009	1
1	A	53	GLN	HA	3.992	0.013	1
1	A	53	GLN	HB2	1.791	0.012	2
1	A	53	GLN	HB3	1.836	0.01	2
1	A	53	GLN	HG2	2.145	0.006	2
1	A	53	GLN	HG3	2.231	0.011	2
1	A	53	GLN	C	177.537	0.2	1
1	A	53	GLN	CA	57.204	0.019	1
1	A	53	GLN	CB	27.94	0.015	1
1	A	53	GLN	CG	33.51	0.015	1
1	A	53	GLN	N	116.882	0.018	1
1	A	54	HIS	H	7.325	0.01	1
1	A	54	HIS	HA	4.585	0.004	1
1	A	54	HIS	HB2	3.05	0.014	1
1	A	54	HIS	HB3	3.24	0.012	1
1	A	54	HIS	HD2	6.562	0.008	1
1	A	54	HIS	HE1	7.926	0.007	1
1	A	54	HIS	C	175.986	0.2	1
1	A	54	HIS	CA	56.657	0.056	1
1	A	54	HIS	CB	28.544	0.017	1
1	A	54	HIS	CD2	130.312	0.0	1
1	A	54	HIS	CE1	142.684	0.2	1
1	A	54	HIS	N	116.588	0.026	1
1	A	55	THR	H	7.707	0.004	1
1	A	55	THR	HA	4.138	0.006	1
1	A	55	THR	HB	4.17	0.006	1
1	A	55	THR	HG21	1.078	0.016	1
1	A	55	THR	HG22	1.078	0.016	1
1	A	55	THR	HG23	1.078	0.016	1
1	A	55	THR	C	175.14	0.2	1
1	A	55	THR	CA	62.768	0.041	1
1	A	55	THR	CB	69.576	0.052	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	55	THR	N	112.615	0.017	1
1	A	56	GLY	H	8.22	0.01	1
1	A	56	GLY	HA2	3.816	0.002	2
1	A	56	GLY	HA3	3.875	0.008	2
1	A	56	GLY	C	173.958	0.2	1
1	A	56	GLY	CA	45.302	0.018	1
1	A	56	GLY	N	111.071	0.044	1
1	A	57	GLU	H	7.9	0.004	1
1	A	57	GLU	HA	4.141	0.016	1
1	A	57	GLU	HB2	1.814	0.008	2
1	A	57	GLU	HB3	1.905	0.006	2
1	A	57	GLU	HG2	2.091	0.004	2
1	A	57	GLU	HG3	2.133	0.008	2
1	A	57	GLU	C	176.139	0.2	1
1	A	57	GLU	CA	56.455	0.087	1
1	A	57	GLU	CB	30.322	0.026	1
1	A	57	GLU	CG	36.063	0.005	1
1	A	57	GLU	N	120.313	0.005	1
1	A	58	LYS	H	8.207	0.011	1
1	A	58	LYS	HA	4.507	0.05	1
1	A	58	LYS	CA	54.031	0.2	1
1	A	58	LYS	CB	32.52	0.2	1
1	A	58	LYS	N	122.691	0.029	1
1	A	59	PRO	HA	4.229	0.01	1
1	A	59	PRO	HB2	1.324	0.01	2
1	A	59	PRO	HB3	1.929	0.009	2
1	A	59	PRO	HG2	1.624	0.003	2
1	A	59	PRO	HG3	1.761	0.01	2
1	A	59	PRO	HD2	3.455	0.006	2
1	A	59	PRO	HD3	3.604	0.01	2
1	A	59	PRO	C	175.793	0.2	1
1	A	59	PRO	CA	62.864	0.065	1
1	A	59	PRO	CB	32.179	0.045	1
1	A	59	PRO	CG	26.838	0.005	1
1	A	59	PRO	CD	49.888	0.033	1
1	A	60	TYR	H	8.103	0.012	1
1	A	60	TYR	HA	4.426	0.018	1
1	A	60	TYR	HB2	2.776	0.017	1
1	A	60	TYR	HB3	2.776	0.017	1
1	A	60	TYR	HD1	6.897	0.004	3
1	A	60	TYR	HD2	6.897	0.004	3

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	60	TYR	C	174.654	0.2	1
1	A	60	TYR	CA	57.478	0.081	1
1	A	60	TYR	CB	38.062	0.067	1
1	A	60	TYR	CD1	136.109	0.038	3
1	A	60	TYR	CD2	136.109	0.038	3
1	A	60	TYR	N	119.458	0.041	1
1	A	61	VAL	H	8.236	0.013	1
1	A	61	VAL	HA	4.593	0.018	1
1	A	61	VAL	HB	1.71	0.014	1
1	A	61	VAL	HG11	0.615	0.012	2
1	A	61	VAL	HG12	0.615	0.012	2
1	A	61	VAL	HG13	0.615	0.012	2
1	A	61	VAL	HG21	0.658	0.011	2
1	A	61	VAL	HG22	0.658	0.011	2
1	A	61	VAL	HG23	0.658	0.011	2
1	A	61	VAL	C	175.098	0.2	1
1	A	61	VAL	CA	60.902	0.042	1
1	A	61	VAL	CB	34.808	0.042	1
1	A	61	VAL	CG1	21.069	0.015	1
1	A	61	VAL	CG2	21.069	0.015	1
1	A	61	VAL	N	123.692	0.043	1
1	A	62	CYS	H	8.837	0.008	1
1	A	62	CYS	HA	4.496	0.013	1
1	A	62	CYS	HB2	2.757	0.021	1
1	A	62	CYS	HB3	3.281	0.015	1
1	A	62	CYS	C	177.172	0.2	1
1	A	62	CYS	CA	59.193	0.04	1
1	A	62	CYS	CB	29.875	0.037	1
1	A	62	CYS	N	128.744	0.025	1
1	A	63	GLU	H	9.397	0.008	1
1	A	63	GLU	HA	4.083	0.01	1
1	A	63	GLU	HB2	1.991	0.008	2
1	A	63	GLU	HB3	2.066	0.002	2
1	A	63	GLU	HG2	2.245	0.014	1
1	A	63	GLU	HG3	2.248	0.012	1
1	A	63	GLU	C	176.477	0.2	1
1	A	63	GLU	CA	58.437	0.066	1
1	A	63	GLU	CB	29.567	0.076	1
1	A	63	GLU	CG	36.089	0.049	1
1	A	63	GLU	N	132.308	0.023	1
1	A	64	ARG	H	8.73	0.004	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	64	ARG	HA	4.142	0.015	1
1	A	64	ARG	HB2	1.306	0.003	2
1	A	64	ARG	HB3	1.428	0.003	2
1	A	64	ARG	HG2	1.263	0.004	2
1	A	64	ARG	HG3	1.386	0.003	2
1	A	64	ARG	HD2	2.434	0.009	2
1	A	64	ARG	HD3	2.601	0.006	2
1	A	64	ARG	C	177.287	0.2	1
1	A	64	ARG	CA	58.003	0.041	1
1	A	64	ARG	CB	30.365	0.019	1
1	A	64	ARG	CG	26.65	0.0	1
1	A	64	ARG	CD	42.845	0.002	1
1	A	64	ARG	N	120.08	0.027	1
1	A	65	CYS	H	8.139	0.006	1
1	A	65	CYS	HA	5.121	0.018	1
1	A	65	CYS	HB2	2.823	0.015	1
1	A	65	CYS	HB3	3.352	0.013	1
1	A	65	CYS	C	176.073	0.2	1
1	A	65	CYS	CA	58.433	0.06	1
1	A	65	CYS	CB	32.677	0.058	1
1	A	65	CYS	N	115.27	0.027	1
1	A	66	GLY	H	8.26	0.007	1
1	A	66	GLY	HA2	3.609	0.017	2
1	A	66	GLY	HA3	4.117	0.013	2
1	A	66	GLY	C	173.561	0.2	1
1	A	66	GLY	CA	46.005	0.046	1
1	A	66	GLY	N	113.667	0.023	1
1	A	67	LYS	H	7.954	0.005	1
1	A	67	LYS	HA	3.816	0.016	1
1	A	67	LYS	HB2	1.325	0.005	2
1	A	67	LYS	HB3	1.084	0.003	2
1	A	67	LYS	HG2	1.297	0.003	2
1	A	67	LYS	HG3	0.904	0.007	2
1	A	67	LYS	HD2	1.372	0.002	1
1	A	67	LYS	HD3	1.372	0.002	1
1	A	67	LYS	HE2	2.784	0.015	2
1	A	67	LYS	HE3	2.828	0.009	2
1	A	67	LYS	C	173.84	0.2	1
1	A	67	LYS	CA	58.348	0.017	1
1	A	67	LYS	CB	33.472	0.009	1
1	A	67	LYS	CG	26.519	0.001	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	67	LYS	CD	29.195	0.2	1
1	A	67	LYS	CE	42.139	0.2	1
1	A	67	LYS	N	123.14	0.026	1
1	A	68	ARG	H	7.534	0.006	1
1	A	68	ARG	HA	5.091	0.012	1
1	A	68	ARG	HB2	1.314	0.01	2
1	A	68	ARG	HB3	1.671	0.008	2
1	A	68	ARG	HG2	1.607	0.006	2
1	A	68	ARG	HG3	1.249	0.007	2
1	A	68	ARG	HD2	3.015	0.014	2
1	A	68	ARG	HD3	3.128	0.004	2
1	A	68	ARG	C	175.397	0.2	1
1	A	68	ARG	CA	54.302	0.064	1
1	A	68	ARG	CB	33.529	0.032	1
1	A	68	ARG	CG	28.285	0.033	1
1	A	68	ARG	CD	43.309	0.033	1
1	A	68	ARG	N	119.054	0.02	1
1	A	69	PHE	H	8.823	0.005	1
1	A	69	PHE	HA	4.67	0.02	1
1	A	69	PHE	HB2	2.458	0.016	1
1	A	69	PHE	HB3	3.374	0.013	1
1	A	69	PHE	HD1	6.964	0.009	3
1	A	69	PHE	HD2	6.964	0.009	3
1	A	69	PHE	C	175.009	0.2	1
1	A	69	PHE	CA	56.798	0.011	1
1	A	69	PHE	CB	43.449	0.019	1
1	A	69	PHE	CD1	135.38	0.033	3
1	A	69	PHE	CD2	135.38	0.033	3
1	A	69	PHE	N	117.359	0.034	1
1	A	70	VAL	H	8.59	0.005	1
1	A	70	VAL	HA	4.17	0.014	1
1	A	70	VAL	HB	2.203	0.008	1
1	A	70	VAL	HG11	1.02	0.007	2
1	A	70	VAL	HG12	1.02	0.007	2
1	A	70	VAL	HG13	1.02	0.007	2
1	A	70	VAL	HG21	1.085	0.003	2
1	A	70	VAL	HG22	1.085	0.003	2
1	A	70	VAL	HG23	1.085	0.003	2
1	A	70	VAL	C	175.575	0.2	1
1	A	70	VAL	CA	64.666	0.057	1
1	A	70	VAL	CB	32.81	0.049	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	70	VAL	CG1	21.854	0.058	2
1	A	70	VAL	CG2	22.039	0.01	2
1	A	70	VAL	N	119.055	0.043	1
1	A	71	GLN	H	7.489	0.005	1
1	A	71	GLN	HA	4.758	0.01	1
1	A	71	GLN	HB2	2.166	0.003	1
1	A	71	GLN	HB3	1.595	0.019	1
1	A	71	GLN	HG2	2.262	0.011	2
1	A	71	GLN	HG3	2.304	0.01	2
1	A	71	GLN	CA	53.641	0.004	1
1	A	71	GLN	CB	32.115	0.055	1
1	A	71	GLN	CG	33.638	0.0	1
1	A	71	GLN	N	113.794	0.021	1
1	A	73	SER	HA	3.957	0.005	1
1	A	73	SER	HB2	3.727	0.01	1
1	A	73	SER	HB3	3.727	0.01	1
1	A	73	SER	C	176.771	0.2	1
1	A	73	SER	CA	60.413	0.069	1
1	A	73	SER	CB	61.588	0.056	1
1	A	74	GLN	H	6.631	0.01	1
1	A	74	GLN	HA	3.934	0.016	1
1	A	74	GLN	HB2	2.342	0.007	1
1	A	74	GLN	HB3	1.945	0.011	1
1	A	74	GLN	HG2	2.414	0.003	1
1	A	74	GLN	HG3	2.414	0.003	1
1	A	74	GLN	C	178.884	0.2	1
1	A	74	GLN	CA	57.752	0.08	1
1	A	74	GLN	CB	28.223	0.026	1
1	A	74	GLN	CG	33.81	0.046	1
1	A	74	GLN	N	121.071	0.023	1
1	A	75	LEU	H	6.652	0.007	1
1	A	75	LEU	HA	3.06	0.008	1
1	A	75	LEU	HB2	1.035	0.012	1
1	A	75	LEU	HB3	1.741	0.01	1
1	A	75	LEU	HG	1.501	0.006	1
1	A	75	LEU	HD11	0.956	0.004	2
1	A	75	LEU	HD12	0.956	0.004	2
1	A	75	LEU	HD13	0.956	0.004	2
1	A	75	LEU	HD21	0.895	0.009	2
1	A	75	LEU	HD22	0.895	0.009	2
1	A	75	LEU	HD23	0.895	0.009	2

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	75	LEU	C	177.083	0.2	1
1	A	75	LEU	CA	57.377	0.08	1
1	A	75	LEU	CB	40.208	0.069	1
1	A	75	LEU	CG	27.029	0.2	1
1	A	75	LEU	CD1	26.039	0.019	2
1	A	75	LEU	CD2	22.969	0.014	2
1	A	75	LEU	N	121.285	0.038	1
1	A	76	ALA	H	7.88	0.009	1
1	A	76	ALA	HA	3.863	0.013	1
1	A	76	ALA	HB1	1.247	0.014	1
1	A	76	ALA	HB2	1.247	0.014	1
1	A	76	ALA	HB3	1.247	0.014	1
1	A	76	ALA	C	180.212	0.2	1
1	A	76	ALA	CA	55.208	0.055	1
1	A	76	ALA	CB	17.548	0.033	1
1	A	76	ALA	N	120.443	0.028	1
1	A	77	ASN	H	7.443	0.005	1
1	A	77	ASN	HA	4.234	0.014	1
1	A	77	ASN	HB2	2.644	0.015	1
1	A	77	ASN	HB3	2.644	0.015	1
1	A	77	ASN	HD21	6.87	0.005	1
1	A	77	ASN	HD22	7.546	0.002	1
1	A	77	ASN	C	176.329	0.2	1
1	A	77	ASN	CA	56.003	0.05	1
1	A	77	ASN	CB	38.701	0.063	1
1	A	77	ASN	N	115.335	0.049	1
1	A	77	ASN	ND2	112.938	0.027	1
1	A	78	HIS	H	7.419	0.008	1
1	A	78	HIS	HA	4.133	0.015	1
1	A	78	HIS	HB2	2.737	0.013	1
1	A	78	HIS	HB3	3.154	0.017	1
1	A	78	HIS	HD2	7.003	0.006	1
1	A	78	HIS	C	176.836	0.2	1
1	A	78	HIS	CA	58.784	0.055	1
1	A	78	HIS	CB	28.529	0.027	1
1	A	78	HIS	CD2	130.312	0.001	1
1	A	78	HIS	N	119.301	0.045	1
1	A	79	ILE	H	8.253	0.012	1
1	A	79	ILE	HA	3.545	0.016	1
1	A	79	ILE	HB	1.857	0.015	1
1	A	79	ILE	HG12	1.347	0.016	2

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	79	ILE	HG13	1.662	0.013	2
1	A	79	ILE	HG21	0.908	0.009	1
1	A	79	ILE	HG22	0.908	0.009	1
1	A	79	ILE	HG23	0.908	0.009	1
1	A	79	ILE	HD11	0.885	0.015	1
1	A	79	ILE	HD12	0.885	0.015	1
1	A	79	ILE	HD13	0.885	0.015	1
1	A	79	ILE	C	178.108	0.2	1
1	A	79	ILE	CA	64.829	0.063	1
1	A	79	ILE	CB	37.947	0.025	1
1	A	79	ILE	CG1	28.859	0.068	1
1	A	79	ILE	CG2	17.556	0.07	1
1	A	79	ILE	CD1	13.609	0.03	1
1	A	79	ILE	N	116.732	0.04	1
1	A	80	ARG	H	7.295	0.008	1
1	A	80	ARG	HA	3.91	0.01	1
1	A	80	ARG	HB2	1.593	0.003	2
1	A	80	ARG	HB3	1.657	0.002	2
1	A	80	ARG	HG2	1.274	0.007	2
1	A	80	ARG	HG3	1.417	0.016	2
1	A	80	ARG	HD2	3.019	0.006	1
1	A	80	ARG	HD3	3.021	0.005	1
1	A	80	ARG	C	176.59	0.2	1
1	A	80	ARG	CA	58.192	0.052	1
1	A	80	ARG	CB	29.9	0.004	1
1	A	80	ARG	CG	27.179	0.0	1
1	A	80	ARG	CD	43.232	0.0	1
1	A	80	ARG	N	119.229	0.053	1
1	A	81	HIS	H	7.269	0.012	1
1	A	81	HIS	HA	4.608	0.011	1
1	A	81	HIS	HB2	2.717	0.02	2
1	A	81	HIS	HB3	3.157	0.026	2
1	A	81	HIS	C	174.531	0.2	1
1	A	81	HIS	CA	54.913	0.013	1
1	A	81	HIS	CB	28.647	0.046	1
1	A	81	HIS	N	115.839	0.04	1
1	A	82	HIS	H	7.325	0.021	1
1	A	82	HIS	HA	3.981	0.015	1
1	A	82	HIS	HB2	3.12	0.044	1
1	A	82	HIS	HB3	2.885	0.013	1
1	A	82	HIS	HD2	6.187	0.003	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	82	HIS	HE1	7.907	0.001	1
1	A	82	HIS	C	174.904	0.2	1
1	A	82	HIS	CA	58.009	0.02	1
1	A	82	HIS	CB	29.24	0.061	1
1	A	82	HIS	CD2	129.375	0.2	1
1	A	82	HIS	CE1	142.684	0.2	1
1	A	82	HIS	N	120.912	0.068	1
1	A	83	ASP	H	7.96	0.008	1
1	A	83	ASP	HA	4.326	0.012	1
1	A	83	ASP	HB2	2.512	0.003	2
1	A	83	ASP	HB3	2.597	0.004	2
1	A	83	ASP	CA	55.889	0.023	1
1	A	83	ASP	CB	41.649	0.019	1
1	A	83	ASP	N	127.886	0.034	1

### 7.1.2 Chemical shift referencing [i](#)

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction $\pm$ precision, ppm	Suggested action
$^{13}\text{C}_\alpha$	80	$-0.39 \pm 0.35$	None needed ( $< 0.5$ ppm)
$^{13}\text{C}_\beta$	75	$0.26 \pm 0.22$	None needed ( $< 0.5$ ppm)
$^{13}\text{C}'$	74	$-0.07 \pm 0.20$	None needed ( $< 0.5$ ppm)
$^{15}\text{N}$	74	$1.44 \pm 0.98$	None needed (imprecise)

### 7.1.3 Completeness of resonance assignments [i](#)

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 80%, i.e. 175 atoms were assigned a chemical shift out of a possible 220. 0 out of 2 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	$^1\text{H}$	$^{13}\text{C}$	$^{15}\text{N}$
Backbone	73/74 (99%)	30/30 (100%)	29/30 (97%)	14/14 (100%)
Sidechain	92/122 (75%)	62/79 (78%)	29/35 (83%)	1/8 (12%)
Aromatic	10/24 (42%)	5/13 (38%)	5/9 (56%)	0/2 (0%)
Overall	175/220 (80%)	97/122 (80%)	63/74 (85%)	15/24 (62%)



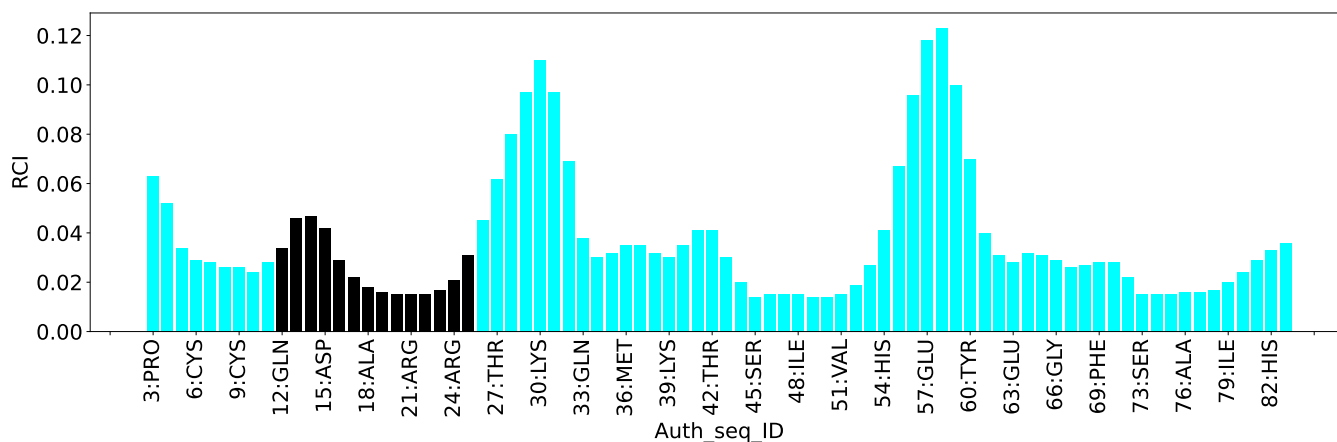
### 7.1.4 Statistically unusual chemical shifts [i](#)

There are no statistically unusual chemical shifts.

### 7.1.5 Random Coil Index (RCI) plots [i](#)

The image below reports *random coil index* values for the protein chains in the structure. The height of each bar gives a probability of a given residue to be disordered, as predicted from the available chemical shifts and the amino acid sequence. A value above 0.2 is an indication of significant predicted disorder. The colour of the bar shows whether the residue is in the well-defined core (black) or in the ill-defined residue ranges (cyan), as described in section 2 on ensemble composition. If well-defined core and ill-defined regions are not identified then it is shown as gray bars.

Random coil index (RCI) for chain A:



## 8 NMR restraints analysis

### 8.1 Conformationally restricting restraints

The following table provides the summary of experimentally observed NMR restraints in different categories. Restraints are classified into different categories based on the sequence separation of the atoms involved.

Description	Value
Total distance restraints	503
Intra-residue ( $ i-j =0$ )	255
Sequential ( $ i-j =1$ )	143
Medium range ( $ i-j >1$ and $ i-j <5$ )	59
Long range ( $ i-j \geq 5$ )	46
Inter-chain	0
Hydrogen bond restraints	0
Disulfide bond restraints	0
Total dihedral-angle restraints	58
Number of unmapped restraints	0
Number of restraints per residue	6.8
Number of long range restraints per residue <sup>1</sup>	0.6

<sup>1</sup>Long range hydrogen bonds and disulfide bonds are counted as long range restraints while calculating the number of long range restraints per residue

### 8.2 Residual restraint violations

This section provides the overview of the restraint violations analysis. The violations are binned as small, medium and large violations based on its absolute value. Average number of violations per model is calculated by dividing the total number of violations in each bin by the size of the ensemble.

#### 8.2.1 Average number of distance violations per model

Distance violations less than 0.1 Å are not included in the calculation.

Bins (Å)	Average number of violations per model	Max (Å)
0.1-0.2 (Small)	10.8	0.2
0.2-0.5 (Medium)	8.9	0.49
>0.5 (Large)	4.5	1.9

### 8.2.2 Average number of dihedral-angle violations per model [i](#)

Dihedral-angle violations less than 1° are not included in the calculation.

Bins (°)	Average number of violations per model	Max (°)
1.0-10.0 (Small)	0.7	3.6
10.0-20.0 (Medium)	None	None
>20.0 (Large)	None	None

## 9 Distance violation analysis [i](#)

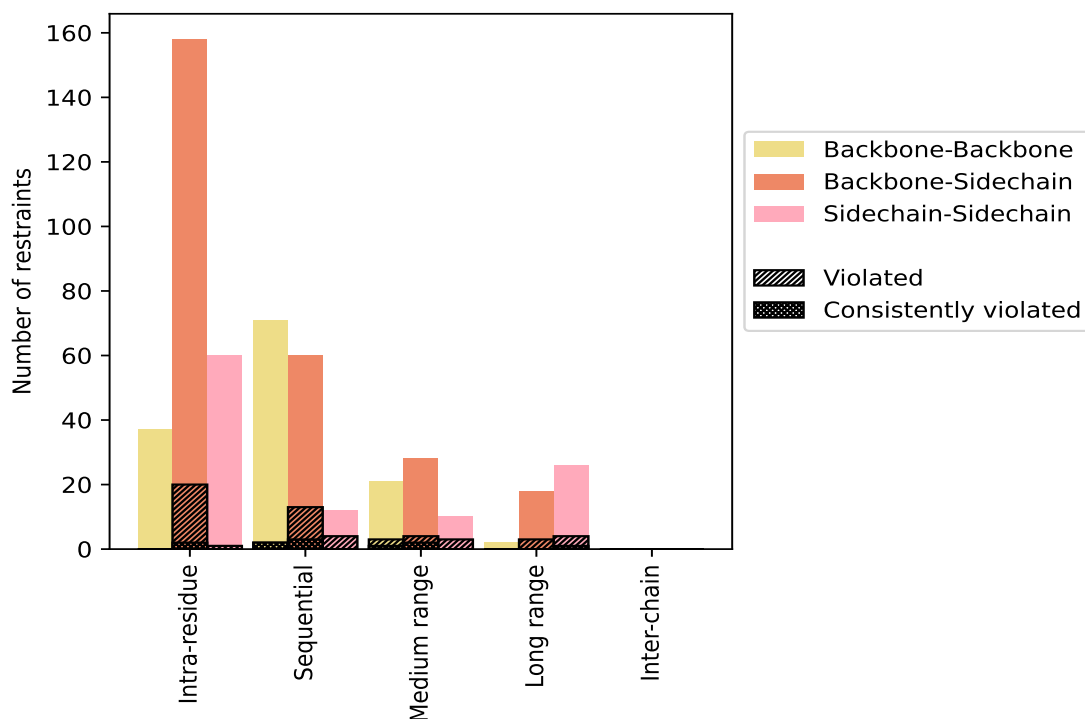
### 9.1 Summary of distance violations [i](#)

The following table shows the summary of distance violations in different restraint categories based on the sequence separation of the atoms involved. Each category is further sub-divided into three sub-categories based on the atoms involved. Violations less than 0.1 Å are not included in the statistics.

Restrains type	Count	% <sup>1</sup>	Violated <sup>3</sup>			Consistently Violated <sup>4</sup>		
			Count	% <sup>2</sup>	% <sup>1</sup>	Count	% <sup>2</sup>	% <sup>1</sup>
<b>Intra-residue (<math> i-j =0</math>)</b>	<b>255</b>	<b>50.7</b>	<b>21</b>	<b>8.2</b>	<b>4.2</b>	<b>2</b>	<b>0.8</b>	<b>0.4</b>
Backbone-Backbone	37	7.4	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	158	31.4	20	12.7	4.0	2	1.3	0.4
Sidechain-Sidechain	60	11.9	1	1.7	0.2	0	0.0	0.0
<b>Sequential (<math> i-j =1</math>)</b>	<b>143</b>	<b>28.4</b>	<b>19</b>	<b>13.3</b>	<b>3.8</b>	<b>5</b>	<b>3.5</b>	<b>1.0</b>
Backbone-Backbone	71	14.1	2	2.8	0.4	2	2.8	0.4
Backbone-Sidechain	60	11.9	13	21.7	2.6	3	5.0	0.6
Sidechain-Sidechain	12	2.4	4	33.3	0.8	0	0.0	0.0
<b>Medium range (<math> i-j &gt;1</math> &amp; <math> i-j &lt;5</math>)</b>	<b>59</b>	<b>11.7</b>	<b>10</b>	<b>16.9</b>	<b>2.0</b>	<b>3</b>	<b>5.1</b>	<b>0.6</b>
Backbone-Backbone	21	4.2	3	14.3	0.6	1	4.8	0.2
Backbone-Sidechain	28	5.6	4	14.3	0.8	2	7.1	0.4
Sidechain-Sidechain	10	2.0	3	30.0	0.6	0	0.0	0.0
<b>Long range (<math> i-j \geq 5</math>)</b>	<b>46</b>	<b>9.1</b>	<b>7</b>	<b>15.2</b>	<b>1.4</b>	<b>1</b>	<b>2.2</b>	<b>0.2</b>
Backbone-Backbone	2	0.4	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	18	3.6	3	16.7	0.6	0	0.0	0.0
Sidechain-Sidechain	26	5.2	4	15.4	0.8	1	3.8	0.2
<b>Inter-chain</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
<b>Hydrogen bond</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
<b>Disulfide bond</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
<b>Total</b>	<b>503</b>	<b>100.0</b>	<b>57</b>	<b>11.3</b>	<b>11.3</b>	<b>11</b>	<b>2.2</b>	<b>2.2</b>
Backbone-Backbone	131	26.0	5	3.8	1.0	3	2.3	0.6
Backbone-Sidechain	264	52.5	40	15.2	8.0	7	2.7	1.4
Sidechain-Sidechain	108	21.5	12	11.1	2.4	1	0.9	0.2

<sup>1</sup> percentage calculated with respect to the total number of distance restraints, <sup>2</sup> percentage calculated with respect to the number of restraints in a particular restraint category, <sup>3</sup> violated in at least one model, <sup>4</sup> violated in all the models

### 9.1.1 Bar chart : Distribution of distance restraints and violations [i](#)



Violated and consistently violated restraints are shown using different hatch patterns in their respective categories. The hydrogen bonds and disulfid bonds are counted in their appropriate category on the x-axis

## 9.2 Distance violation statistics for each model [i](#)

The following table provides the distance violation statistics for each model in the ensemble. Violations less than 0.1 Å are not included in the statistics.

Model ID	Number of violations						Mean (Å)	Max (Å)	SD <sup>6</sup> (Å)	Median (Å)
	IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>	Total				
1	4	7	6	5	0	22	0.41	1.76	0.4	0.25
2	11	10	7	4	0	32	0.37	1.82	0.39	0.21
3	5	7	6	3	0	21	0.35	1.76	0.39	0.21
4	7	9	3	3	0	22	0.36	1.81	0.36	0.24
5	7	10	3	4	0	24	0.35	1.83	0.37	0.22
6	7	10	3	3	0	23	0.31	1.82	0.35	0.2
7	6	8	4	3	0	21	0.36	1.84	0.39	0.23
8	11	9	3	4	0	27	0.36	1.8	0.37	0.26
9	8	10	5	4	0	27	0.37	1.81	0.38	0.24
10	7	9	5	4	0	25	0.36	1.86	0.39	0.21
11	6	10	5	5	0	26	0.38	1.88	0.39	0.22

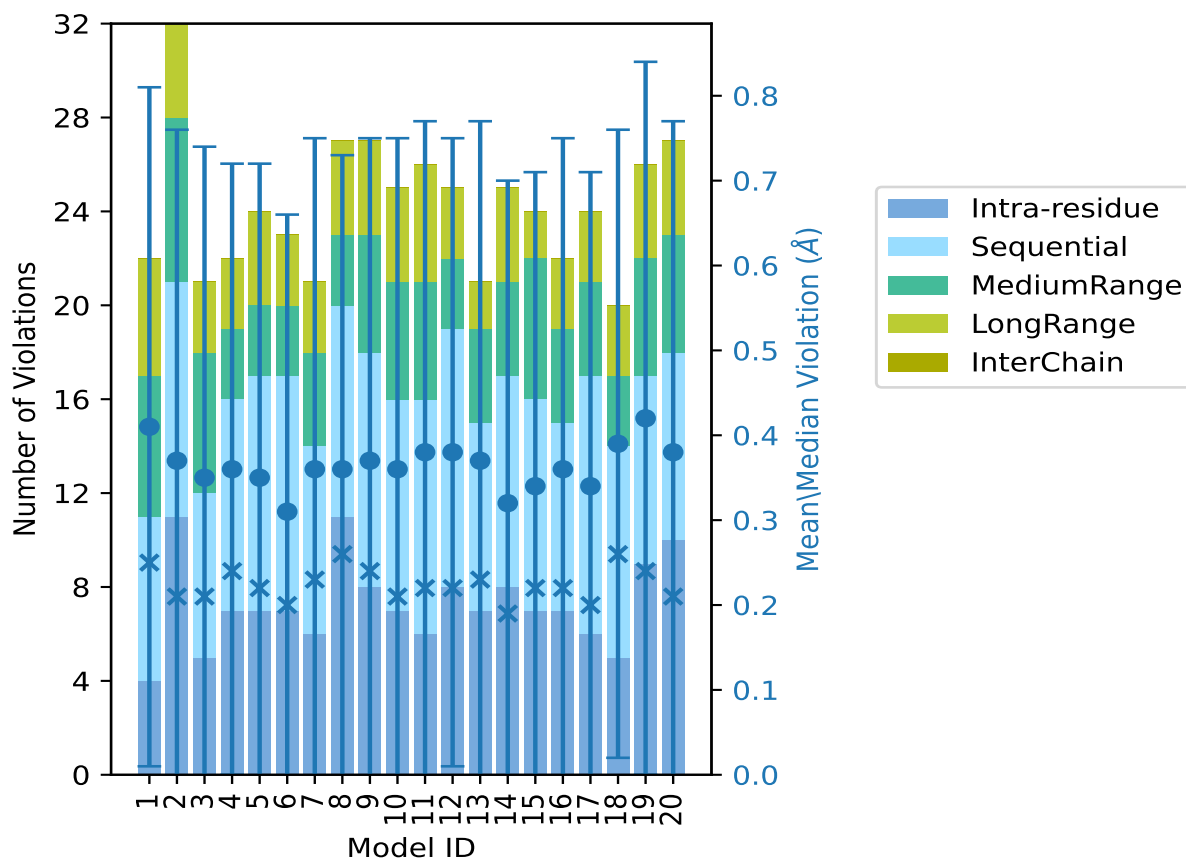
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Model ID	Number of violations					Total	Mean (Å)	Max (Å)	SD <sup>6</sup> (Å)	Median (Å)
	IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>					
12	8	11	3	3	0	25	0.38	1.77	0.37	0.22
13	7	8	4	2	0	21	0.37	1.87	0.4	0.23
14	8	9	4	4	0	25	0.32	1.88	0.38	0.19
15	7	9	6	2	0	24	0.34	1.9	0.37	0.22
16	7	8	4	3	0	22	0.36	1.76	0.39	0.22
17	6	11	4	3	0	24	0.34	1.85	0.37	0.2
18	5	9	3	3	0	20	0.39	1.77	0.37	0.26
19	9	8	5	4	0	26	0.42	1.78	0.42	0.24
20	10	8	5	4	0	27	0.38	1.8	0.39	0.21

<sup>1</sup>Intra-residue restraints, <sup>2</sup>Sequential restraints, <sup>3</sup>Medium range restraints, <sup>4</sup>Long range restraints, <sup>5</sup>Inter-chain restraints, <sup>6</sup>Standard deviation

### 9.2.1 Bar graph : Distance Violation statistics for each model [\(i\)](#)



The mean(dot),median(x) and the standard deviation are shown in blue with respect to the y axis on the right

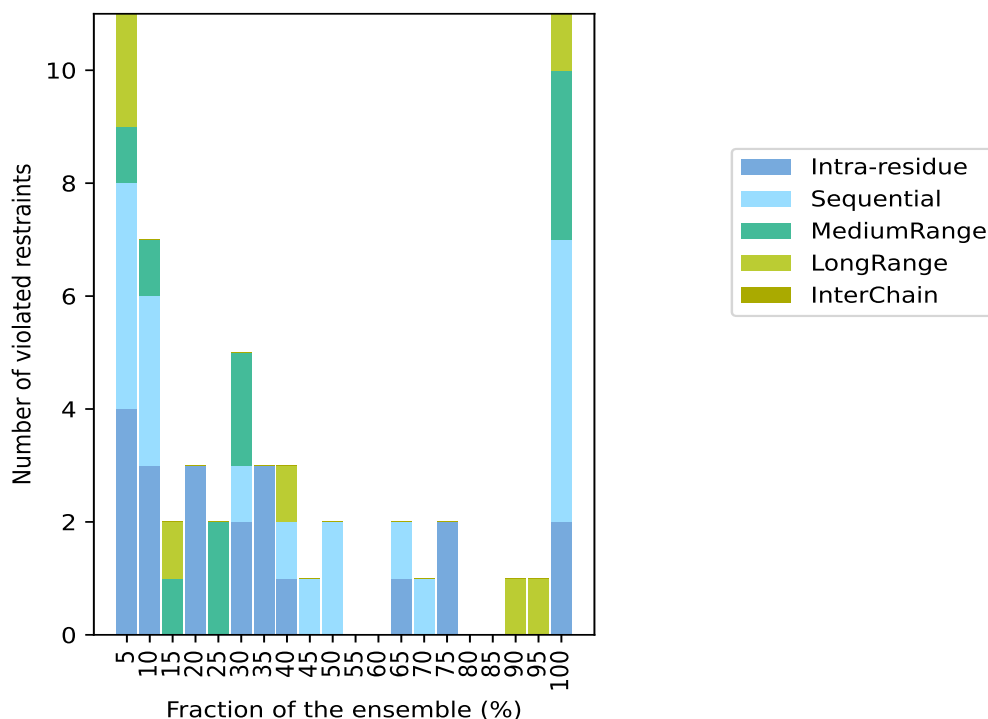
### 9.3 Distance violation statistics for the ensemble

Violation analysis may find that some restraints are violated in few models and some are violated in most of models. The following table provides this information as number of violated restraints for a given fraction of the ensemble. In total, 446(IR:234, SQ:124, MR:49, LR:39, IC:0) restraints are not violated in the ensemble.

Number of violated restraints						Fraction of the ensemble	
IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>	Total	Count <sup>6</sup>	%
4	4	1	2	0	11	1	5.0
3	3	1	0	0	7	2	10.0
0	0	1	1	0	2	3	15.0
3	0	0	0	0	3	4	20.0
0	0	2	0	0	2	5	25.0
2	1	2	0	0	5	6	30.0
3	0	0	0	0	3	7	35.0
1	1	0	1	0	3	8	40.0
0	1	0	0	0	1	9	45.0
0	2	0	0	0	2	10	50.0
0	0	0	0	0	0	11	55.0
0	0	0	0	0	0	12	60.0
1	1	0	0	0	2	13	65.0
0	1	0	0	0	1	14	70.0
2	0	0	0	0	2	15	75.0
0	0	0	0	0	0	16	80.0
0	0	0	0	0	0	17	85.0
0	0	0	1	0	1	18	90.0
0	0	0	1	0	1	19	95.0
2	5	3	1	0	11	20	100.0

<sup>1</sup>Intra-residue restraints, <sup>2</sup>Sequential restraints, <sup>3</sup>Medium range restraints, <sup>4</sup>Long range restraints, <sup>5</sup>Inter-chain restraints, <sup>6</sup> Number of models with violations

### 9.3.1 Bar graph : Distance violation statistics for the ensemble [i](#)

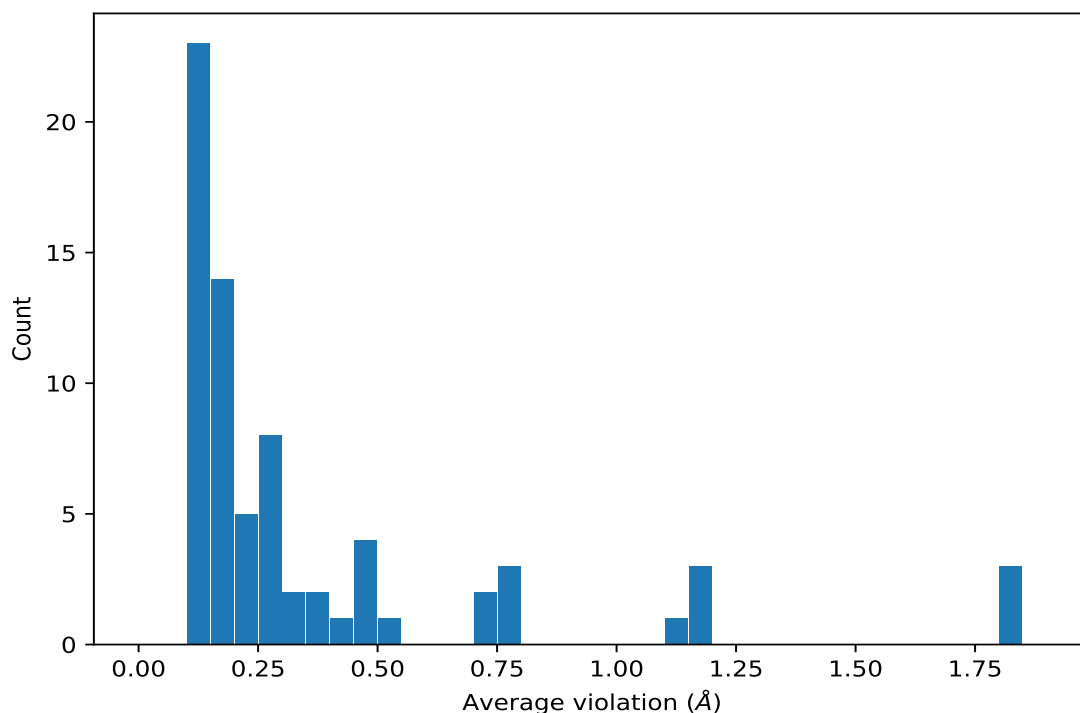


## 9.4 Most violated distance restraints in the ensemble [i](#)

### 9.4.1 Histogram : Distribution of mean distance violations [i](#)

The following histogram shows the distribution of the average value of the violation. The average is calculated for each restraint that is violated in more than one model over all the violated models in the ensemble





#### 9.4.2 Table: Most violated distance restraints [i](#)

The following table provides the mean and the standard deviation of the violations for the 10 worst performing restraints, sorted by number of violated models and the mean violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint. Rows with same key represent combinatorial or ambiguous restraints and are counted as a single restraint.

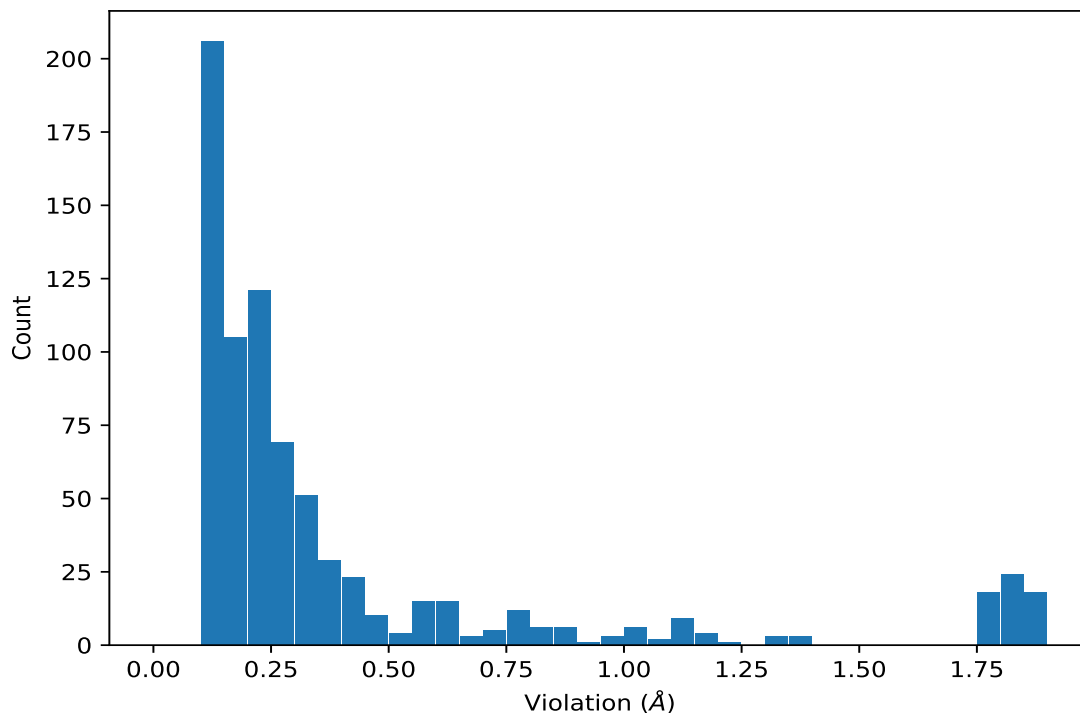
Key	Atom-1	Atom-2	Models <sup>1</sup>	Mean (Å)	SD <sup>1</sup> (Å)	Median (Å)
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	20	1.82	0.04	1.82
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	20	1.82	0.04	1.82
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	20	1.82	0.04	1.82
(1,188)	1:A:4:TYR:HB2	1:A:19:LEU:HB3	20	0.74	0.18	0.76
(1,33)	1:A:4:TYR:H	1:A:3:PRO:HG3	20	0.51	0.17	0.6
(1,228)	1:A:22:HIS:HB2	1:A:23:VAL:HA	20	0.39	0.02	0.39
(1,26)	1:A:20:GLN:HA	1:A:19:LEU:H	20	0.38	0.03	0.38
(1,19)	1:A:20:GLN:HA	1:A:22:HIS:H	20	0.3	0.04	0.3
(1,481)	1:A:22:HIS:H	1:A:18:ALA:HB1	20	0.29	0.02	0.3
(1,481)	1:A:22:HIS:H	1:A:18:ALA:HB2	20	0.29	0.02	0.3
(1,481)	1:A:22:HIS:H	1:A:18:ALA:HB3	20	0.29	0.02	0.3
(1,107)	1:A:9:CYS:HB2	1:A:9:CYS:H	20	0.28	0.03	0.28
(1,237)	1:A:7:ILE:H	1:A:7:ILE:HG21	20	0.21	0.02	0.21
(1,237)	1:A:7:ILE:H	1:A:7:ILE:HG22	20	0.21	0.02	0.21
(1,237)	1:A:7:ILE:H	1:A:7:ILE:HG23	20	0.21	0.02	0.21
(1,351)	1:A:21:ARG:H	1:A:20:GLN:HA	20	0.21	0.02	0.2

<sup>1</sup>Number of violated models, <sup>2</sup>Standard deviation

## 9.5 All violated distance restraints [i](#)

### 9.5.1 Histogram : Distribution of distance violations [i](#)

The following histogram shows the distribution of the absolute value of the violation for all violated restraints in the ensemble.



### 9.5.2 Table : All distance violations [i](#)

The following table provides the 10 worst performing restraints, sorted by the violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint. Rows with same key represent combinatorial or ambiguous restraints and are counted as a single restraint.

Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	15	1.9
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	15	1.9
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	15	1.9
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	11	1.88
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	11	1.88
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	11	1.88
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	14	1.88
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	14	1.88

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	14	1.88
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	13	1.87
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	13	1.87
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	13	1.87
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	10	1.86
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	10	1.86
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	10	1.86
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	17	1.85
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	17	1.85
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	17	1.85
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	7	1.84
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	7	1.84
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	7	1.84
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	5	1.83
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	5	1.83
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	5	1.83
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	2	1.82
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG12	2	1.82
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG13	2	1.82
(1,123)	1:A:22:HIS:H	1:A:23:VAL:HG11	6	1.82

## 10 Dihedral-angle violation analysis [i](#)

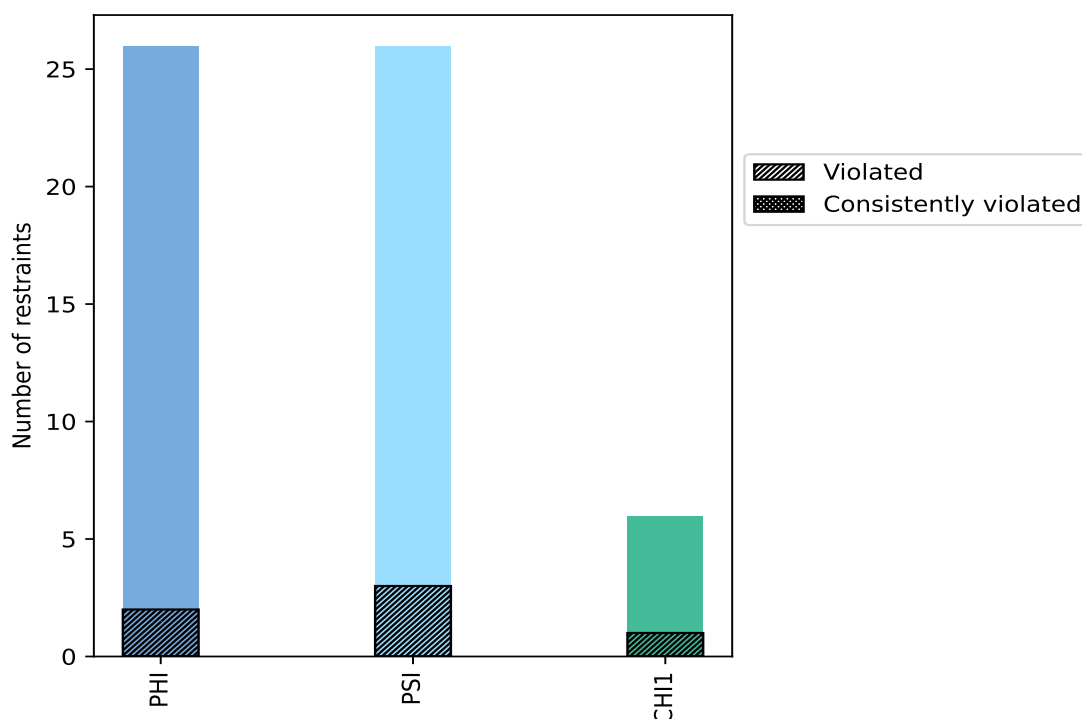
### 10.1 Summary of dihedral-angle violations [i](#)

The following table provides the summary of dihedral-angle violations in different dihedral-angle types. Violations less than 1° are not included in the calculation.

Angle type	Count	% <sup>1</sup>	Violated <sup>3</sup>			Consistently Violated <sup>4</sup>		
			Count	% <sup>2</sup>	% <sup>1</sup>	Count	% <sup>2</sup>	% <sup>1</sup>
PHI	26	44.8	2	7.7	3.4	0	0.0	0.0
PSI	26	44.8	3	11.5	5.2	0	0.0	0.0
CHI1	6	10.3	1	16.7	1.7	0	0.0	0.0
Total	58	100.0	6	10.3	10.3	0	0.0	0.0

<sup>1</sup> percentage calculated with respect to total number of dihedral-angle restraints, <sup>2</sup> percentage calculated with respect to number of restraints in a particular dihedral-angle type, <sup>3</sup> violated in at least one model, <sup>4</sup> violated in all the models

#### 10.1.1 Bar chart : Distribution of dihedral-angles and violations [i](#)



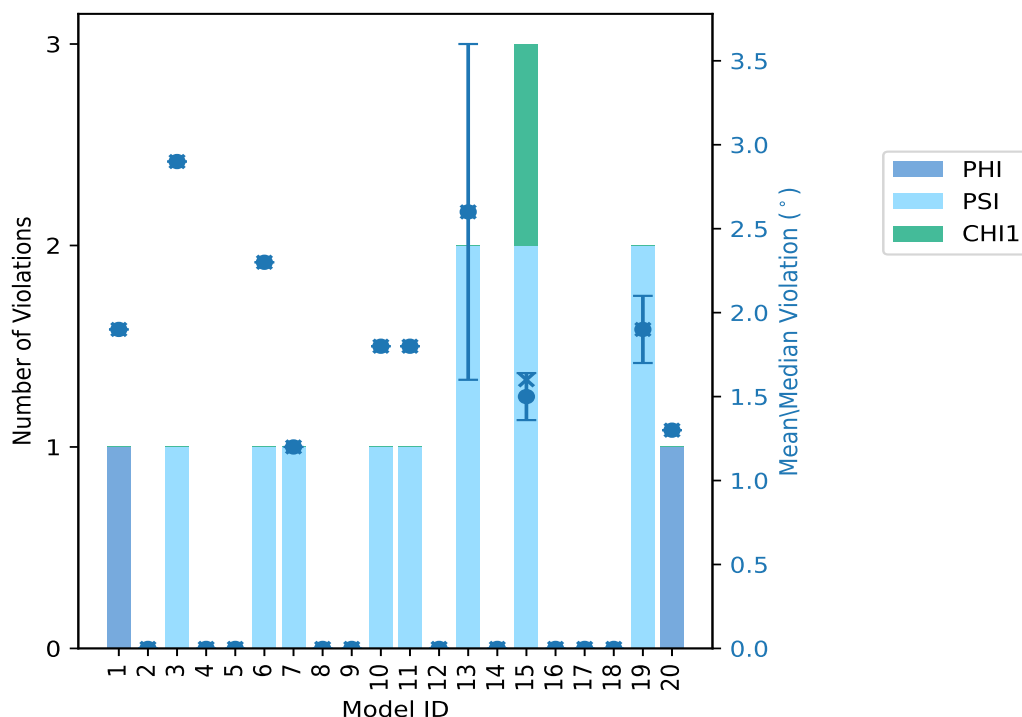
Violated and consistently violated restraints are shown using different hatch patterns in their respective categories

## 10.2 Dihedral-angle violation statistics for each model [i](#)

The following table provides the dihedral-angle violation statistics for each model in the ensemble. Violations less than 1° are not included in the statistics.

Model ID	Number of violations				Mean (°)	Max (°)	SD (°)	Median (°)
	PHI	PSI	CHI1	Total				
1	1	0	0	1	1.9	1.9	0.0	1.9
2	0	0	0	0	0.0	0.0	0.0	0.0
3	0	1	0	1	2.9	2.9	0.0	2.9
4	0	0	0	0	0.0	0.0	0.0	0.0
5	0	0	0	0	0.0	0.0	0.0	0.0
6	0	1	0	1	2.3	2.3	0.0	2.3
7	0	1	0	1	1.2	1.2	0.0	1.2
8	0	0	0	0	0.0	0.0	0.0	0.0
9	0	0	0	0	0.0	0.0	0.0	0.0
10	0	1	0	1	1.8	1.8	0.0	1.8
11	0	1	0	1	1.8	1.8	0.0	1.8
12	0	0	0	0	0.0	0.0	0.0	0.0
13	0	2	0	2	2.6	3.6	1.0	2.6
14	0	0	0	0	0.0	0.0	0.0	0.0
15	0	2	1	3	1.5	1.6	0.14	1.6
16	0	0	0	0	0.0	0.0	0.0	0.0
17	0	0	0	0	0.0	0.0	0.0	0.0
18	0	0	0	0	0.0	0.0	0.0	0.0
19	0	2	0	2	1.9	2.1	0.2	1.9
20	1	0	0	1	1.3	1.3	0.0	1.3

### 10.2.1 Bar graph : Dihedral violation statistics for each model [i](#)



The mean(dot),median(x) and the standard deviation are shown in blue with respect to the y axis on the right

### 10.3 Dihedral-angle violation statistics for the ensemble [i](#)

Violation analysis may find that some restraints are violated in very few models and some are violated in most of models. The following table provides this information as number of violated restraints for a given fraction of ensemble.

Number of violated restraints				Fraction of the ensemble	
PHI	PSI	CHI1	Total	Count <sup>1</sup>	%
2	0	1	3	1	5.0
0	1	0	1	2	10.0
0	0	0	0	3	15.0
0	1	0	1	4	20.0
0	1	0	1	5	25.0
0	0	0	0	6	30.0
0	0	0	0	7	35.0
0	0	0	0	8	40.0
0	0	0	0	9	45.0
0	0	0	0	10	50.0
0	0	0	0	11	55.0

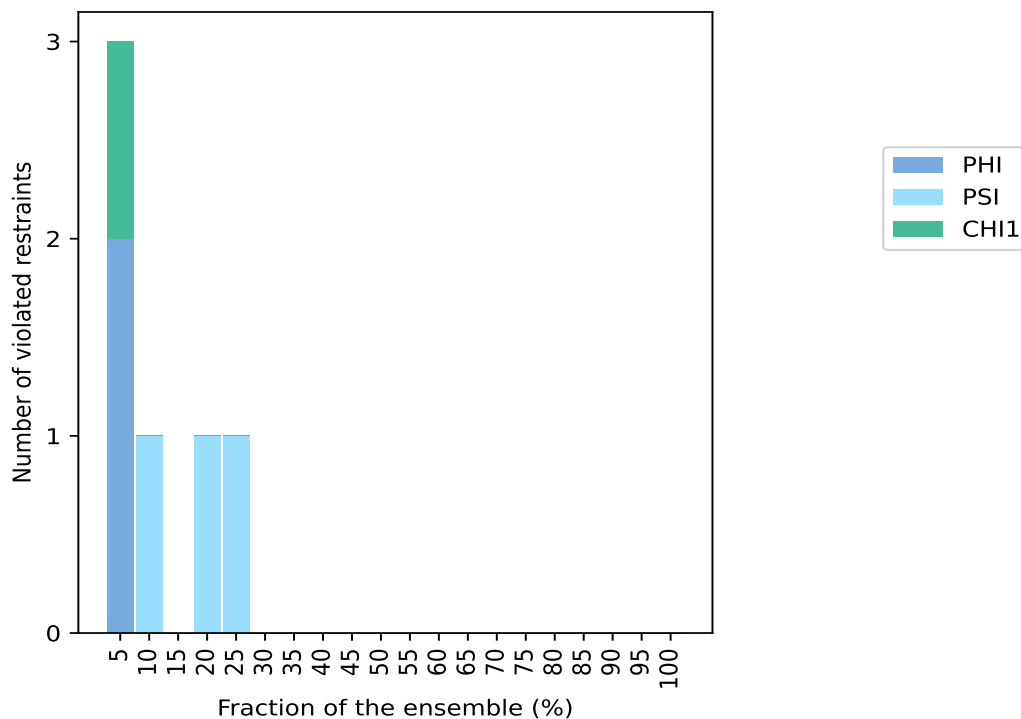
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Number of violated restraints				Fraction of the ensemble	
PHI	PSI	CHI1	Total	Count <sup>1</sup>	%
0	0	0	0	12	60.0
0	0	0	0	13	65.0
0	0	0	0	14	70.0
0	0	0	0	15	75.0
0	0	0	0	16	80.0
0	0	0	0	17	85.0
0	0	0	0	18	90.0
0	0	0	0	19	95.0
0	0	0	0	20	100.0

<sup>1</sup> Number of models with violations

### 10.3.1 Bar graph : Dihedral-angle Violation statistics for the ensemble [i](#)

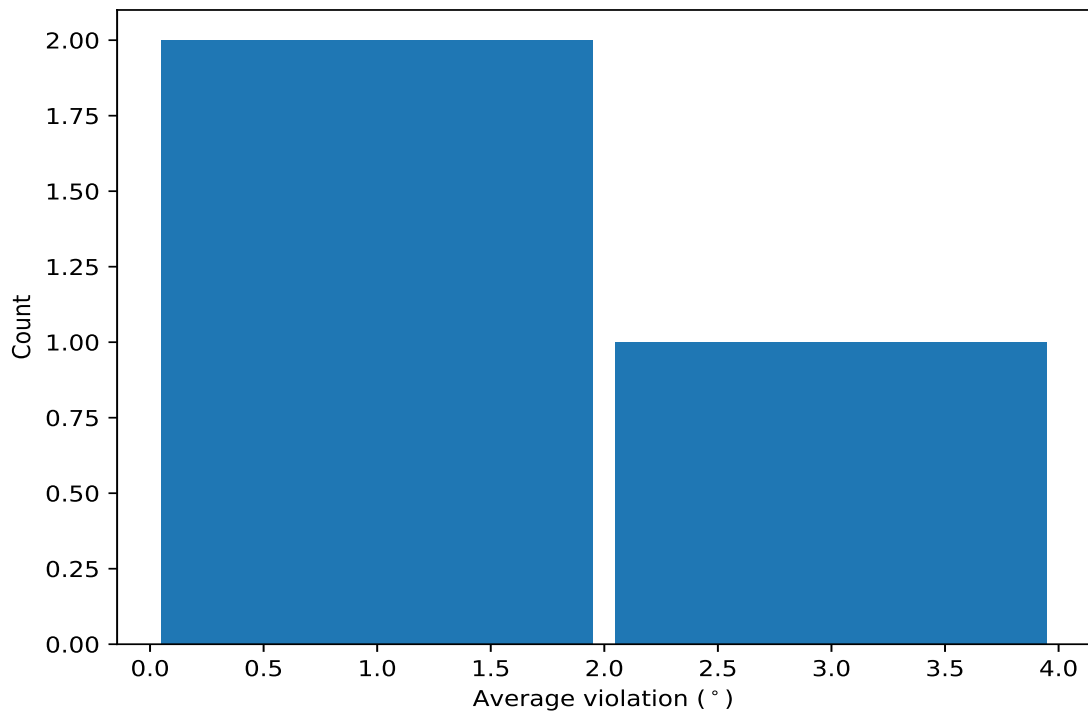


## 10.4 Most violated dihedral-angle restraints in the ensemble [i](#)

### 10.4.1 Histogram : Distribution of mean dihedral-angle violations [i](#)

The following histogram shows the distribution of the average value of the violation. The average is calculated for each restraint that is violated in more than one model over all the violated models

in the ensemble



#### 10.4.2 Table: Most violated dihedral-angle restraints [i](#)

The following table provides the mean and the standard deviation of the violation for each restraint sorted by number of violated models and the mean value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint.

Key	Atom-1	Atom-2	Atom-3	Atom-4	Models <sup>1</sup>	Mean	SD <sup>2</sup>	Median
(1,47)	1:A:26:HIS:N	1:A:26:HIS:CA	1:A:26:HIS:C	1:A:27:THR:N	5	1.66	0.29	1.6
(1,49)	1:A:27:THR:N	1:A:27:THR:CA	1:A:27:THR:C	1:A:28:GLY:N	4	2.65	0.67	2.6
(1,43)	1:A:24:ARG:N	1:A:24:ARG:CA	1:A:24:ARG:C	1:A:25:ILE:N	2	1.5	0.2	1.5

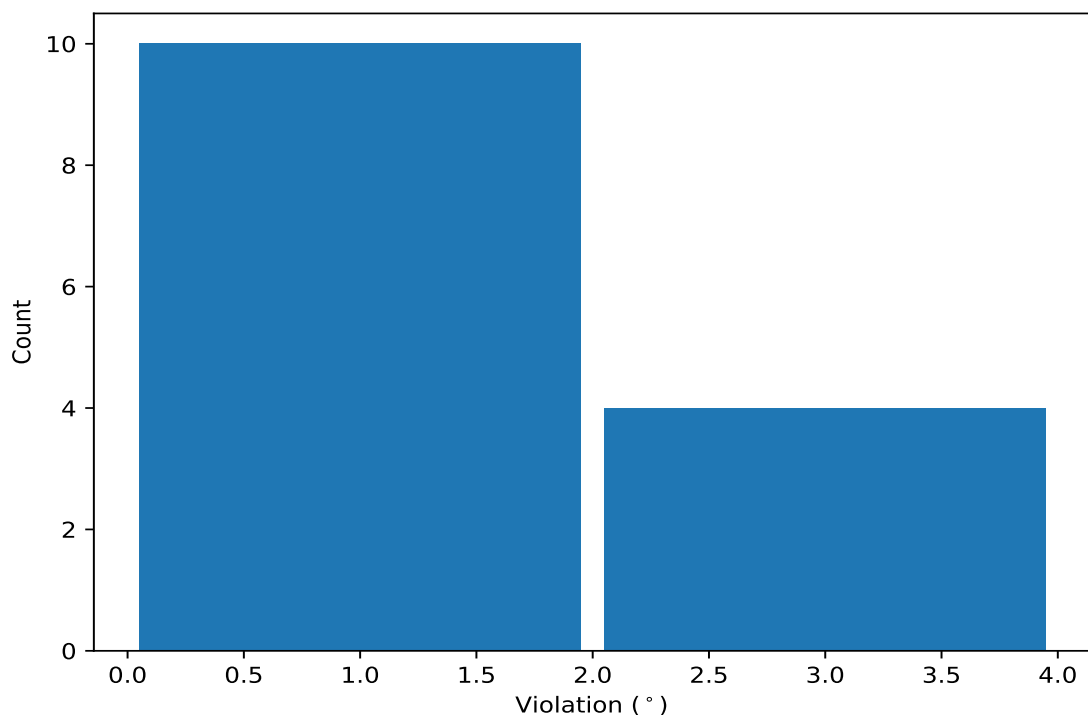
<sup>1</sup> Number of violated models, <sup>2</sup>Standard deviation, All angle values are in degree (°)

## 10.5 All violated dihedral-angle restraints [i](#)

### 10.5.1 Histogram : Distribution of violations [i](#)

The following histogram shows the distribution of the absolute value of the violation for all violated restraints in the ensemble.





### 10.5.2 Table: All violated dihedral-angle restraints [i](#)

The following table provides the list of violations for the 10 worst performing restraints, sorted by the violation value. The Key (restraint list ID, restraint ID) is the unique identifier for a given restraint.

Key	Atom-1	Atom-2	Atom-3	Atom-4	Model ID	Violation (°)
(1,49)	1:A:27:THR:N	1:A:27:THR:CA	1:A:27:THR:C	1:A:28:GLY:N	13	3.6
(1,49)	1:A:27:THR:N	1:A:27:THR:CA	1:A:27:THR:C	1:A:28:GLY:N	3	2.9
(1,49)	1:A:27:THR:N	1:A:27:THR:CA	1:A:27:THR:C	1:A:28:GLY:N	6	2.3
(1,47)	1:A:26:HIS:N	1:A:26:HIS:CA	1:A:26:HIS:C	1:A:27:THR:N	19	2.1
(1,1)	1:A:2:LYS:C	1:A:3:PRO:N	1:A:3:PRO:CA	1:A:3:PRO:C	1	1.9
(1,49)	1:A:27:THR:N	1:A:27:THR:CA	1:A:27:THR:C	1:A:28:GLY:N	10	1.8
(1,47)	1:A:26:HIS:N	1:A:26:HIS:CA	1:A:26:HIS:C	1:A:27:THR:N	11	1.8
(1,43)	1:A:24:ARG:N	1:A:24:ARG:CA	1:A:24:ARG:C	1:A:25:ILE:N	19	1.7
(1,57)	1:A:19:LEU:N	1:A:19:LEU:CA	1:A:19:LEU:CB	1:A:19:LEU:CG	15	1.6
(1,47)	1:A:26:HIS:N	1:A:26:HIS:CA	1:A:26:HIS:C	1:A:27:THR:N	13	1.6