



Full wwPDB NMR Structure Validation Report ⓘ

Jun 6, 2023 – 07:08 PM EDT

PDB ID : 2N7D
BMRB ID : 25801
Title : Solution structure of the UBL domain of human Ddi2
Authors : Siva, M.; Grantz Saskova, K.; Veverka, V.
Deposited on : 2015-09-08

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<https://www.wwpdb.org/validation/2017/NMRValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

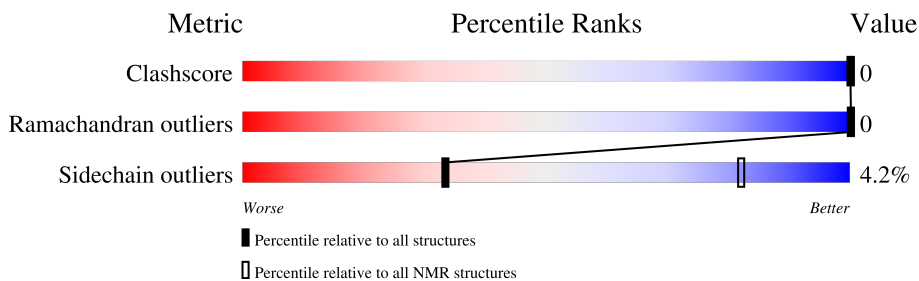
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

SOLUTION NMR

The overall completeness of chemical shifts assignment is 88%.

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 ≥ 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	97	

2 Ensemble composition and analysis i

This entry contains 40 models. Model 5 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:100-A:176 (77)	0.48	5

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 7 clusters and 5 single-model clusters were found.

Cluster number	Models
1	8, 15, 21, 27, 28, 29, 34, 36
2	3, 5, 6, 7, 11, 17, 20, 22
3	1, 10, 13, 14, 16, 18, 24, 33
4	12, 30, 31, 39
5	23, 35, 37
6	2, 19
7	4, 25
Single-model clusters	9; 26; 32; 38; 40

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1522 atoms, of which 738 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Protein DDI1 homolog 2.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	97	1522	485	738	152	143	4	0

There are 21 discrepancies between the modelled and reference sequences:

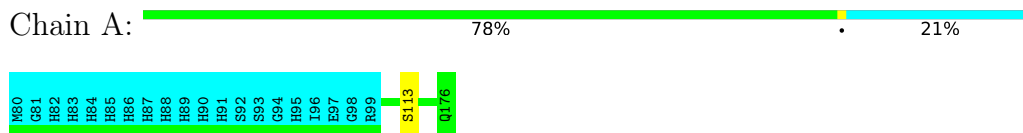
Chain	Residue	Modelled	Actual	Comment	Reference
A	80	MET	-	expression tag	UNP Q5TDH0
A	81	GLY	-	expression tag	UNP Q5TDH0
A	82	HIS	-	expression tag	UNP Q5TDH0
A	83	HIS	-	expression tag	UNP Q5TDH0
A	84	HIS	-	expression tag	UNP Q5TDH0
A	85	HIS	-	expression tag	UNP Q5TDH0
A	86	HIS	-	expression tag	UNP Q5TDH0
A	87	HIS	-	expression tag	UNP Q5TDH0
A	88	HIS	-	expression tag	UNP Q5TDH0
A	89	HIS	-	expression tag	UNP Q5TDH0
A	90	HIS	-	expression tag	UNP Q5TDH0
A	91	HIS	-	expression tag	UNP Q5TDH0
A	92	SER	-	expression tag	UNP Q5TDH0
A	93	SER	-	expression tag	UNP Q5TDH0
A	94	GLY	-	expression tag	UNP Q5TDH0
A	95	HIS	-	expression tag	UNP Q5TDH0
A	96	ILE	-	expression tag	UNP Q5TDH0
A	97	GLU	-	expression tag	UNP Q5TDH0
A	98	GLY	-	expression tag	UNP Q5TDH0
A	99	ARG	-	expression tag	UNP Q5TDH0
A	100	HIS	-	expression tag	UNP Q5TDH0

4 Residue-property plots

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: Protein DDI1 homolog 2

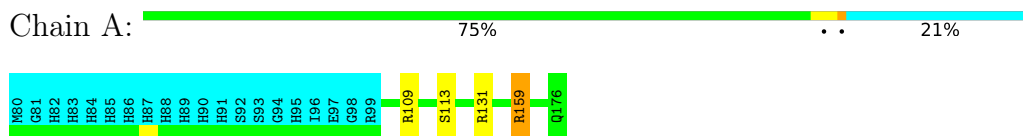


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

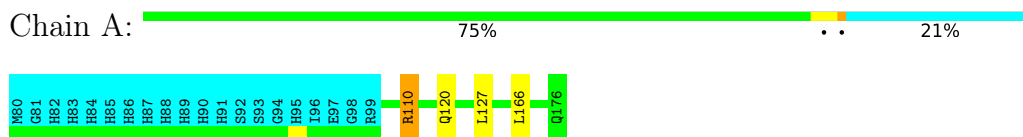
4.2.1 Score per residue for model 1

- Molecule 1: Protein DDI1 homolog 2



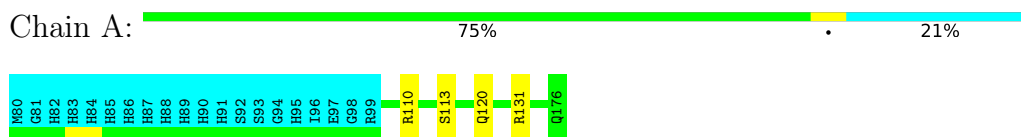
4.2.2 Score per residue for model 2

- Molecule 1: Protein DDI1 homolog 2



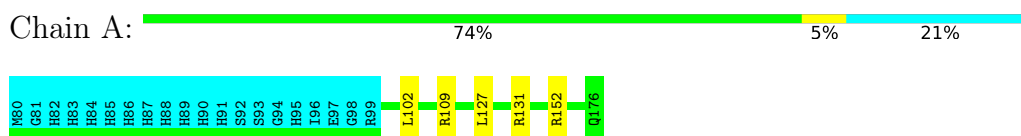
4.2.3 Score per residue for model 3

- Molecule 1: Protein DDI1 homolog 2



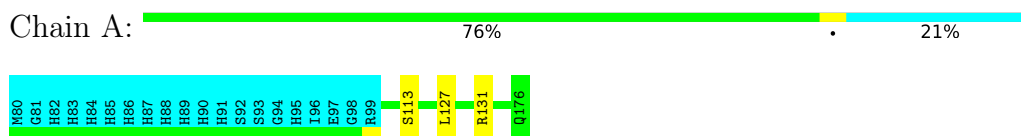
4.2.4 Score per residue for model 4

- Molecule 1: Protein DDI1 homolog 2



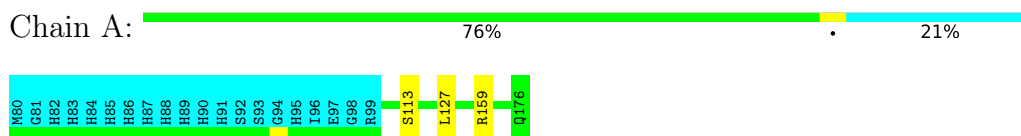
4.2.5 Score per residue for model 5 (medoid)

- Molecule 1: Protein DDI1 homolog 2



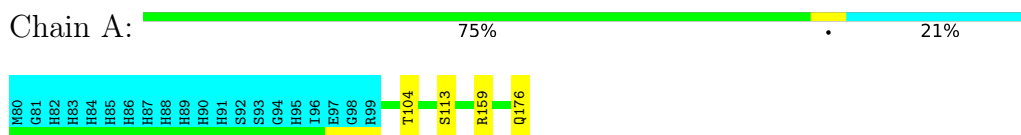
4.2.6 Score per residue for model 6

- Molecule 1: Protein DDI1 homolog 2



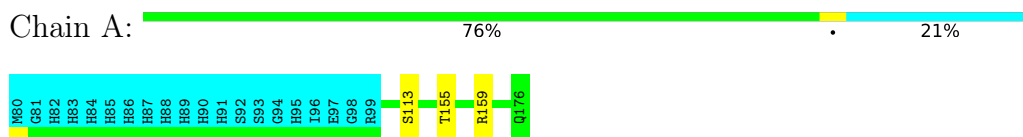
4.2.7 Score per residue for model 7

- Molecule 1: Protein DDI1 homolog 2



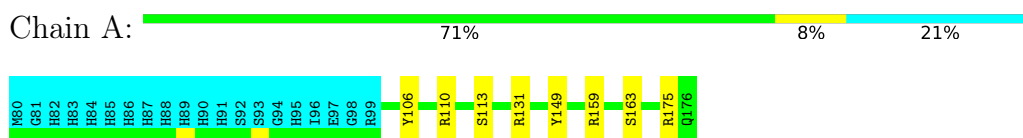
4.2.8 Score per residue for model 8

- Molecule 1: Protein DDI1 homolog 2



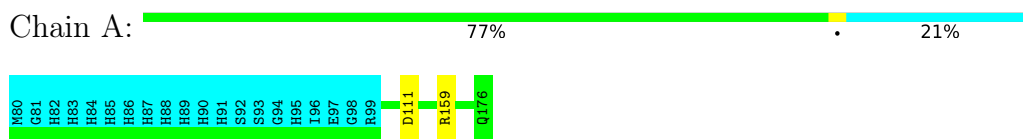
4.2.9 Score per residue for model 9

- Molecule 1: Protein DDI1 homolog 2



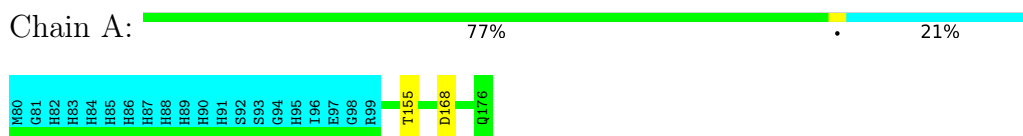
4.2.10 Score per residue for model 10

- Molecule 1: Protein DDI1 homolog 2



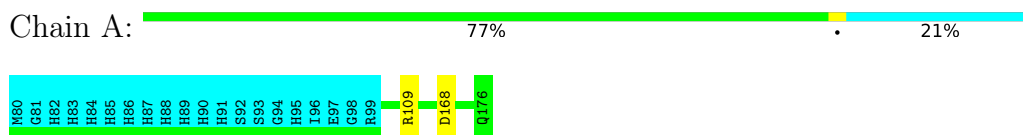
4.2.11 Score per residue for model 11

- Molecule 1: Protein DDI1 homolog 2



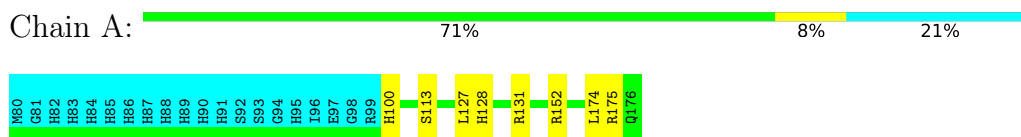
4.2.12 Score per residue for model 12

- Molecule 1: Protein DDI1 homolog 2



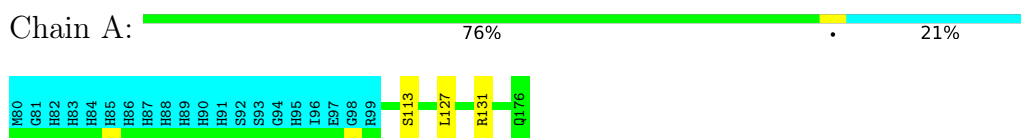
4.2.13 Score per residue for model 13

- Molecule 1: Protein DDI1 homolog 2



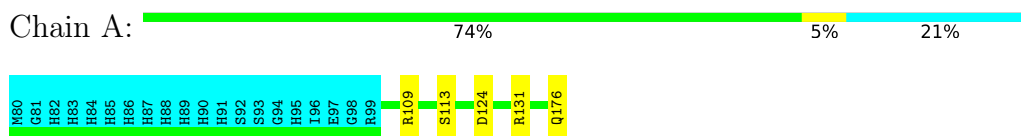
4.2.14 Score per residue for model 14

- Molecule 1: Protein DDI1 homolog 2



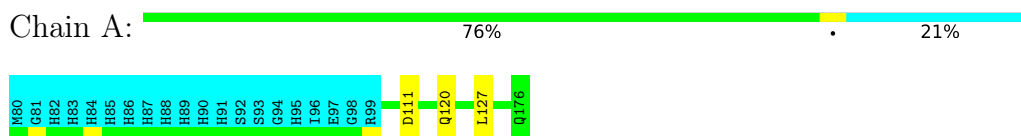
4.2.15 Score per residue for model 15

- Molecule 1: Protein DDI1 homolog 2



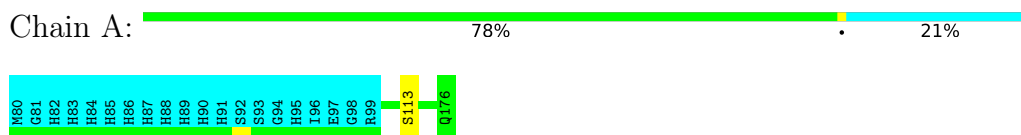
4.2.16 Score per residue for model 16

- Molecule 1: Protein DDI1 homolog 2



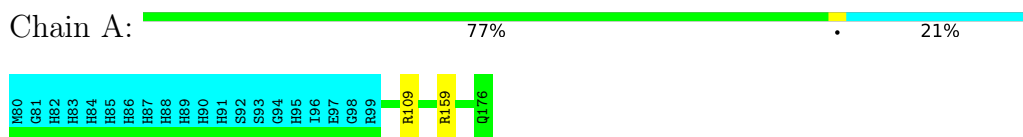
4.2.17 Score per residue for model 17

- Molecule 1: Protein DDI1 homolog 2



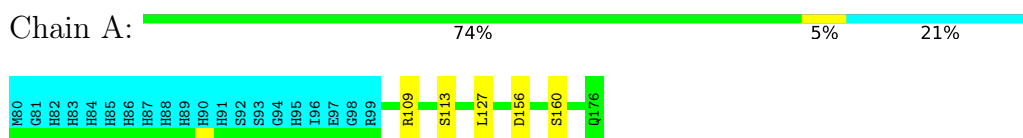
4.2.18 Score per residue for model 18

- Molecule 1: Protein DDI1 homolog 2



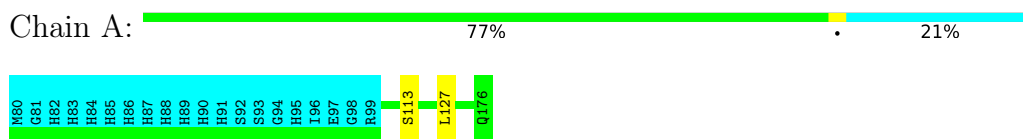
4.2.19 Score per residue for model 19

- Molecule 1: Protein DDI1 homolog 2



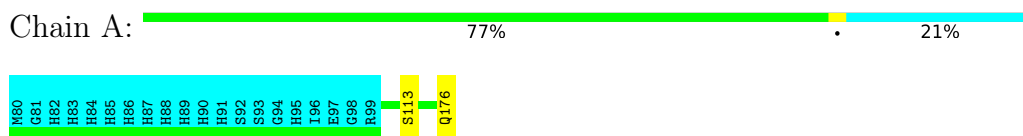
4.2.20 Score per residue for model 20

- Molecule 1: Protein DDI1 homolog 2



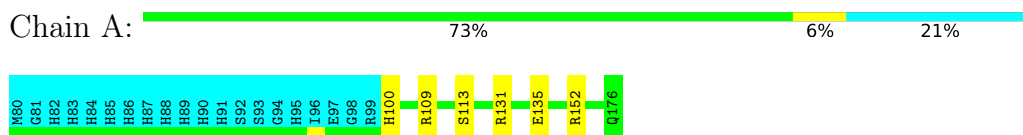
4.2.21 Score per residue for model 21

- Molecule 1: Protein DDI1 homolog 2



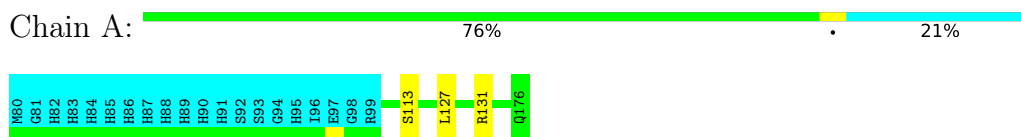
4.2.22 Score per residue for model 22

- Molecule 1: Protein DDI1 homolog 2



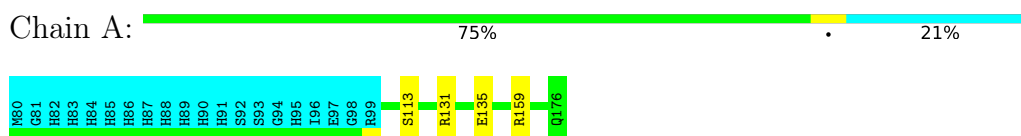
4.2.23 Score per residue for model 23

- Molecule 1: Protein DDI1 homolog 2



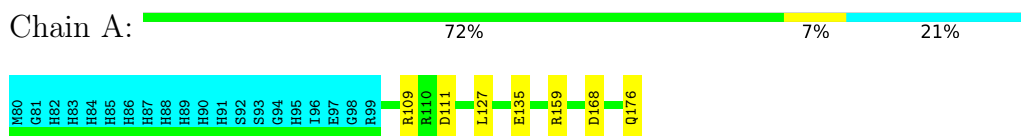
4.2.24 Score per residue for model 24

- Molecule 1: Protein DDI1 homolog 2



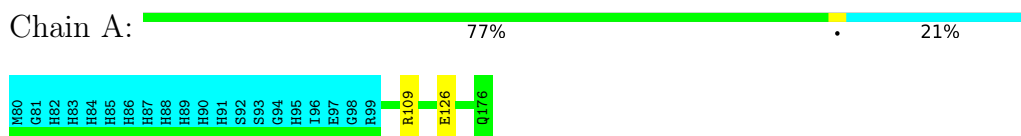
4.2.25 Score per residue for model 25

- Molecule 1: Protein DDI1 homolog 2



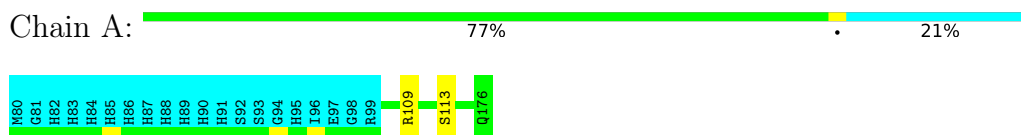
4.2.26 Score per residue for model 26

- Molecule 1: Protein DDI1 homolog 2



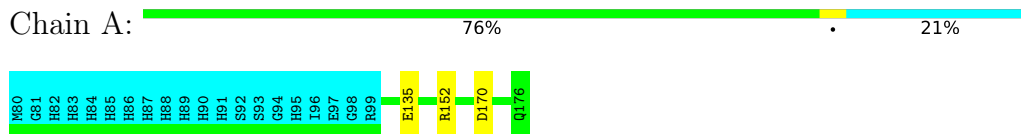
4.2.27 Score per residue for model 27

- Molecule 1: Protein DDI1 homolog 2



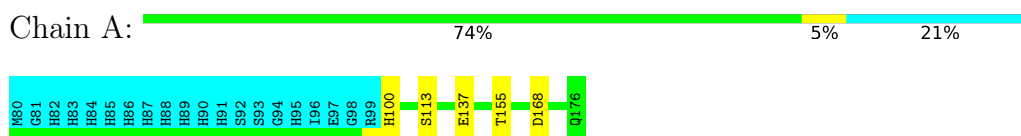
4.2.28 Score per residue for model 28

- Molecule 1: Protein DDI1 homolog 2



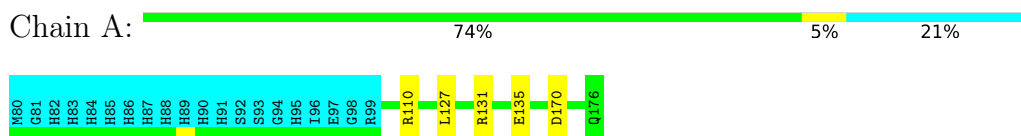
4.2.29 Score per residue for model 29

- Molecule 1: Protein DDI1 homolog 2



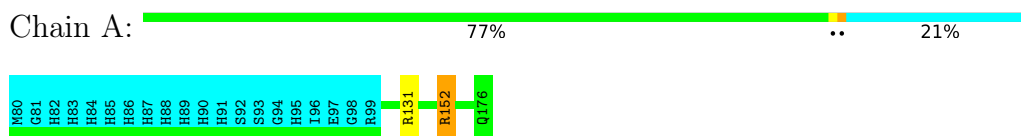
4.2.30 Score per residue for model 30

- Molecule 1: Protein DDI1 homolog 2



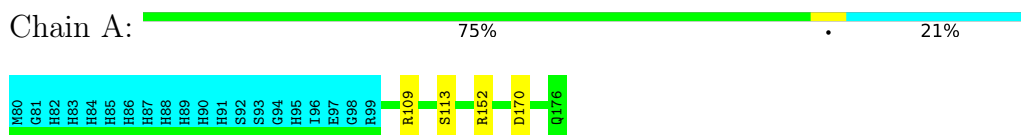
4.2.31 Score per residue for model 31

- Molecule 1: Protein DDI1 homolog 2



4.2.32 Score per residue for model 32

- Molecule 1: Protein DDI1 homolog 2



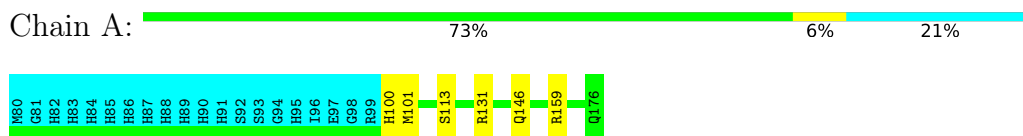
4.2.33 Score per residue for model 33

- Molecule 1: Protein DDI1 homolog 2



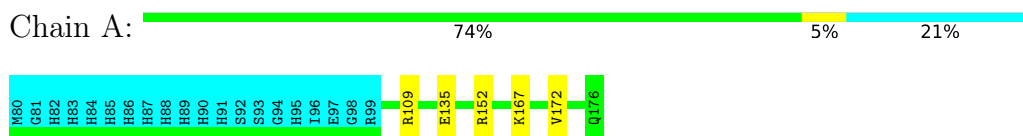
4.2.34 Score per residue for model 34

- Molecule 1: Protein DDI1 homolog 2



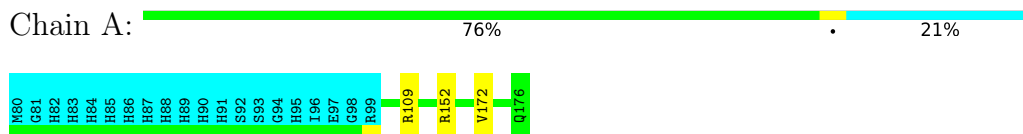
4.2.35 Score per residue for model 35

- Molecule 1: Protein DDI1 homolog 2



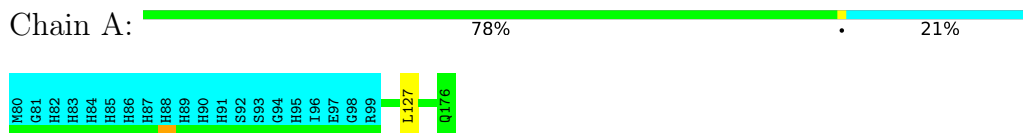
4.2.36 Score per residue for model 36

- Molecule 1: Protein DDI1 homolog 2



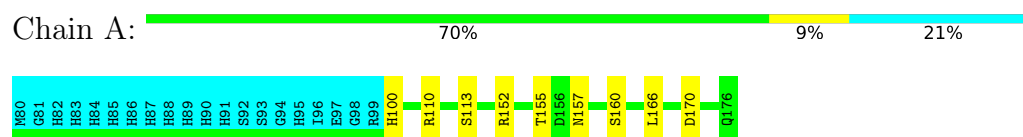
4.2.37 Score per residue for model 37

- Molecule 1: Protein DDI1 homolog 2



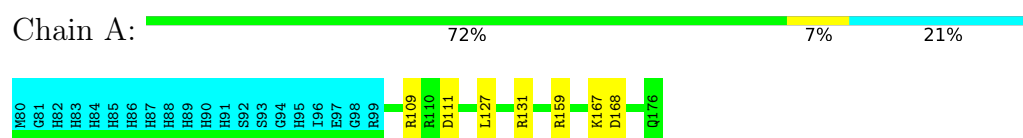
4.2.38 Score per residue for model 38

- Molecule 1: Protein DDI1 homolog 2



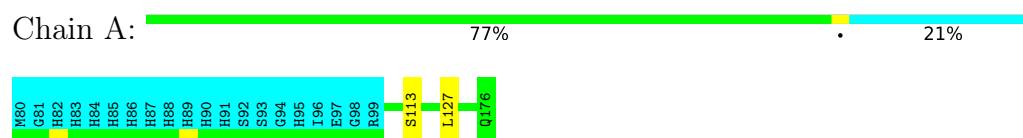
4.2.39 Score per residue for model 39

- Molecule 1: Protein DDI1 homolog 2



4.2.40 Score per residue for model 40

- Molecule 1: Protein DDI1 homolog 2



5 Refinement protocol and experimental data overview

The models were refined using the following method: *torsion angle dynamics, molecular dynamics*.

Of the 100 calculated structures, 40 were deposited, based on the following criterion: *structures with the least restraint violations*.

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

Software name	Classification	Version
YASARA	refinement	
CYANA	refinement	

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	994
Number of shifts mapped to atoms	994
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	88%

6 Model quality i

6.1 Standard geometry i

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the (average) root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#Z>5	RMSZ	#Z>5
1	A	0.64±0.07	0±0/624 (0.0± 0.0%)	0.74±0.05	1±1/844 (0.1± 0.1%)
All	All	0.65	0/24960 (0.0%)	0.75	46/33760 (0.1%)

There are no bond-length outliers.

All unique angle outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	159	ARG	NE-CZ-NH1	9.20	124.90	120.30	9	12
1	A	109	ARG	NE-CZ-NH1	6.20	123.40	120.30	26	13
1	A	131	ARG	NE-CZ-NH1	6.16	123.38	120.30	9	5
1	A	152	ARG	NE-CZ-NH1	6.05	123.33	120.30	38	9
1	A	110	ARG	NE-CZ-NH1	5.88	123.24	120.30	9	5
1	A	175	ARG	NE-CZ-NH1	5.75	123.17	120.30	9	2

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
All	All	24560	24120	24080	-

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 -.

There are no clashes.

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	76/97 (78%)	74±1 (97±1%)	2±1 (3±1%)	0±0 (0±0%)	100	100
All	All	3040/3880 (78%)	2962 (97%)	78 (3%)	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	68/85 (80%)	65±2 (96±2%)	3±2 (4±2%)	33	82
All	All	2720/3400 (80%)	2605 (96%)	115 (4%)	33	82

All 34 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	113	SER	24
1	A	127	LEU	15
1	A	131	ARG	10
1	A	168	ASP	6
1	A	135	GLU	6
1	A	100	HIS	5
1	A	176	GLN	4
1	A	155	THR	4
1	A	111	ASP	4
1	A	170	ASP	4

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Mol	Chain	Res	Type	Models (Total)
1	A	120	GLN	3
1	A	166	LEU	2
1	A	109	ARG	2
1	A	160	SER	2
1	A	152	ARG	2
1	A	146	GLN	2
1	A	167	LYS	2
1	A	172	VAL	2
1	A	159	ARG	1
1	A	110	ARG	1
1	A	102	LEU	1
1	A	104	THR	1
1	A	106	TYR	1
1	A	149	TYR	1
1	A	163	SER	1
1	A	128	HIS	1
1	A	174	LEU	1
1	A	124	ASP	1
1	A	156	ASP	1
1	A	126	GLU	1
1	A	137	GLU	1
1	A	129	ASN	1
1	A	101	MET	1
1	A	157	ASN	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](#)

There are no ligands in this entry.

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 i

The completeness of assignment taking into account all chemical shift lists is 88% for the well-defined parts and 75% for the entire structure.

7.1 Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *assigned_chem_shift_list_1*

7.1.1 Bookkeeping i

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	994
Number of shifts mapped to atoms	994
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	2

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
$^{13}\text{C}_\alpha$	82	0.38 ± 0.06	None needed (< 0.5 ppm)
$^{13}\text{C}_\beta$	78	0.18 ± 0.19	None needed (< 0.5 ppm)
$^{13}\text{C}'$	78	-0.24 ± 0.12	None needed (< 0.5 ppm)
^{15}N	78	0.03 ± 0.45	None needed (< 0.5 ppm)

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 88%, i.e. 942 atoms were assigned a chemical shift out of a possible 1066. 0 out of 18 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^1H	^{13}C	^{15}N
Backbone	378/384 (98%)	154/155 (99%)	150/154 (97%)	74/75 (99%)
Sidechain	531/604 (88%)	364/394 (92%)	162/186 (87%)	5/24 (21%)

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	Total	¹ H	¹³ C	¹⁵ N
Aromatic	33/78 (42%)	33/39 (85%)	0/36 (0%)	0/3 (0%)
Overall	942/1066 (88%)	551/588 (94%)	312/376 (83%)	79/102 (77%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 75%, i.e. 994 atoms were assigned a chemical shift out of a possible 1333. 0 out of 18 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	¹ H	¹³ C	¹⁵ N
Backbone	401/487 (82%)	163/198 (82%)	160/194 (82%)	78/95 (82%)
Sidechain	560/691 (81%)	383/451 (85%)	172/213 (81%)	5/27 (19%)
Aromatic	33/155 (21%)	33/83 (40%)	0/58 (0%)	0/14 (0%)
Overall	994/1333 (75%)	579/732 (79%)	332/465 (71%)	83/136 (61%)

7.1.4 Statistically unusual chemical shifts [i](#)

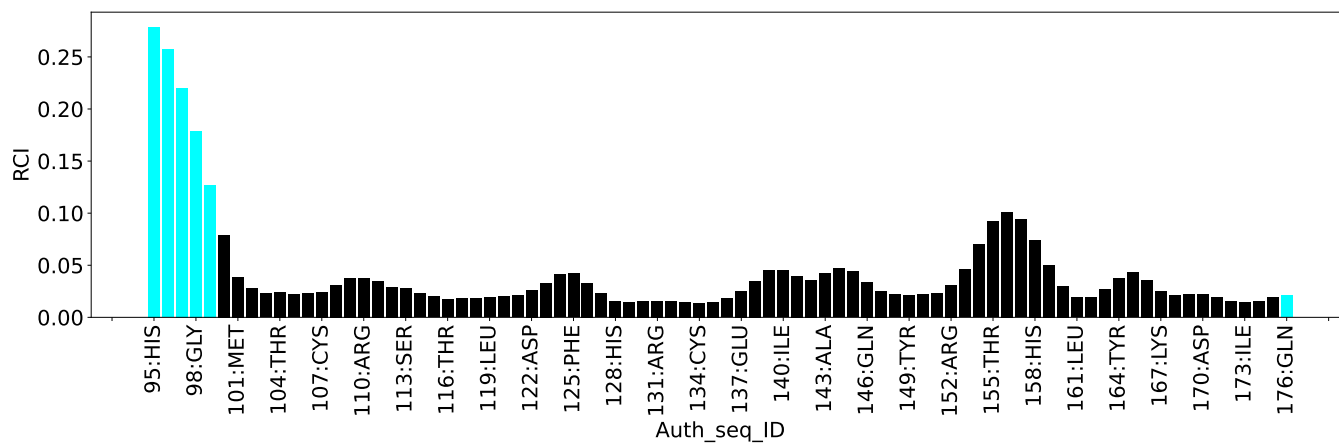
The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, ppm	Expected range, ppm	Z-score
1	A	137	GLU	HB2	0.86	1.00 – 3.05	-5.7
1	A	137	GLU	HB3	0.86	0.95 – 3.05	-5.4

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	1145
Intra-residue ($ i-j =0$)	295
Sequential ($ i-j =1$)	291
Medium range ($ i-j >1$ and $ i-j <5$)	170
Long range ($ i-j \geq 5$)	347
Inter-chain	0
Hydrogen bond restraints	42
Disulfide bond restraints	0
Total dihedral-angle restraints	132
Number of unmapped restraints	0
Number of restraints per residue	13.2
Number of long range restraints per residue ¹	3.8

¹Long 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)	1.2	0.2
0.2-0.5 (Medium)	0.4	0.35
>0.5 (Large)	None	None

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)	1.6	5.0
10.0-20.0 (Medium)	None	None
>20.0 (Large)	None	None

9 Distance violation analysis [i](#)

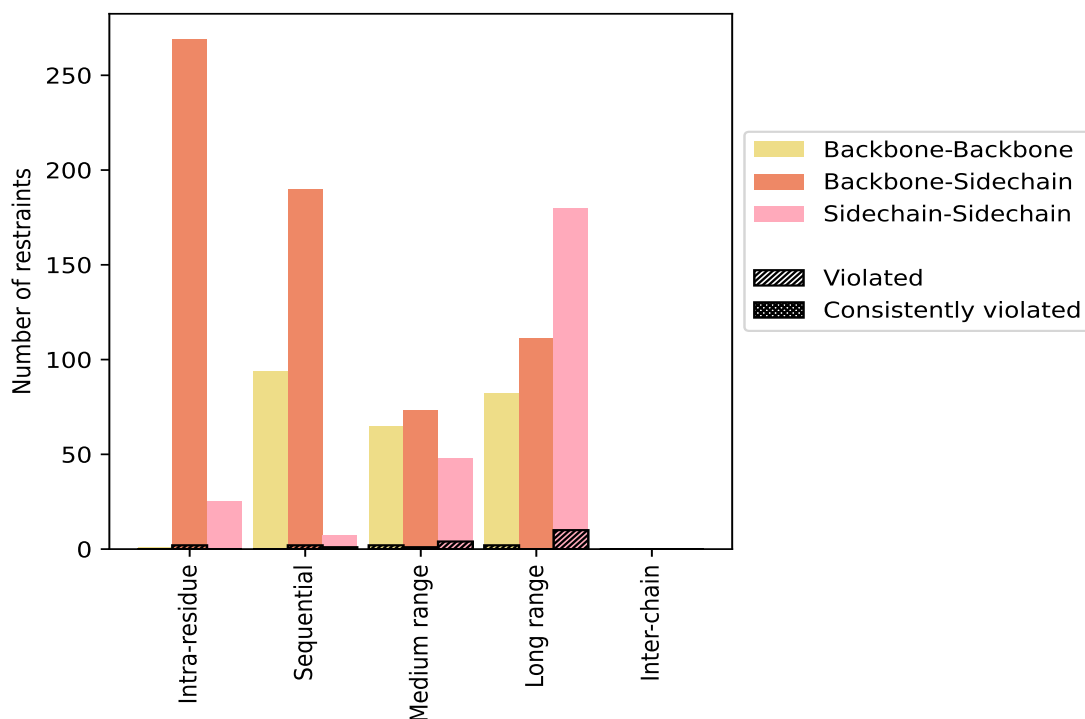
9.1 Summary of distance violations [i](#)

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	% ¹	Violated ³			Consistently Violated ⁴		
			Count	% ²	% ¹	Count	% ²	% ¹
Intra-residue ($i-j =0$)	295	25.8	2	0.7	0.2	0	0.0	0.0
Backbone-Backbone	1	0.1	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	269	23.5	2	0.7	0.2	0	0.0	0.0
Sidechain-Sidechain	25	2.2	0	0.0	0.0	0	0.0	0.0
Sequential ($i-j =1$)	291	25.4	3	1.0	0.3	0	0.0	0.0
Backbone-Backbone	94	8.2	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	190	16.6	2	1.1	0.2	0	0.0	0.0
Sidechain-Sidechain	7	0.6	1	14.3	0.1	0	0.0	0.0
Medium range ($i-j >1$ & $i-j <5$)	170	14.8	5	2.9	0.4	0	0.0	0.0
Backbone-Backbone	49	4.3	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	73	6.4	1	1.4	0.1	0	0.0	0.0
Sidechain-Sidechain	48	4.2	4	8.3	0.3	0	0.0	0.0
Long range ($i-j \geq 5$)	347	30.3	10	2.9	0.9	0	0.0	0.0
Backbone-Backbone	56	4.9	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	111	9.7	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	180	15.7	10	5.6	0.9	0	0.0	0.0
Inter-chain	0	0.0	0	0.0	0.0	0	0.0	0.0
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
Hydrogen bond	42	3.7	4	9.5	0.3	0	0.0	0.0
Disulfide bond	0	0.0	0	0.0	0.0	0	0.0	0.0
Total	1145	100.0	24	2.1	2.1	0	0.0	0.0
Backbone-Backbone	242	21.1	4	1.7	0.3	0	0.0	0.0
Backbone-Sidechain	643	56.2	5	0.8	0.4	0	0.0	0.0
Sidechain-Sidechain	260	22.7	15	5.8	1.3	0	0.0	0.0

¹ percentage calculated with respect to the total number of distance restraints, ² percentage calculated with respect to the number of restraints in a particular restraint category, ³ violated in at least one model, ⁴ 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 disulfied 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 ⁶ (Å)	Median (Å)
	IR ¹	SQ ²	MR ³	LR ⁴	IC ⁵	Total				
1	0	0	1	0	0	1	0.11	0.11	0.0	0.11
2	0	2	0	1	0	3	0.18	0.3	0.09	0.12
3	0	0	0	1	0	1	0.29	0.29	0.0	0.29
4	0	0	0	1	0	1	0.19	0.19	0.0	0.19
5	0	0	0	1	0	1	0.14	0.14	0.0	0.14
6	0	1	0	1	0	2	0.16	0.2	0.04	0.16
7	0	0	0	1	0	1	0.17	0.17	0.0	0.17
8	0	0	0	1	0	1	0.23	0.23	0.0	0.23
9	2	0	6	6	0	14	0.18	0.29	0.05	0.17
10	0	0	0	1	0	1	0.2	0.2	0.0	0.2
11	0	0	0	2	0	2	0.17	0.23	0.06	0.17

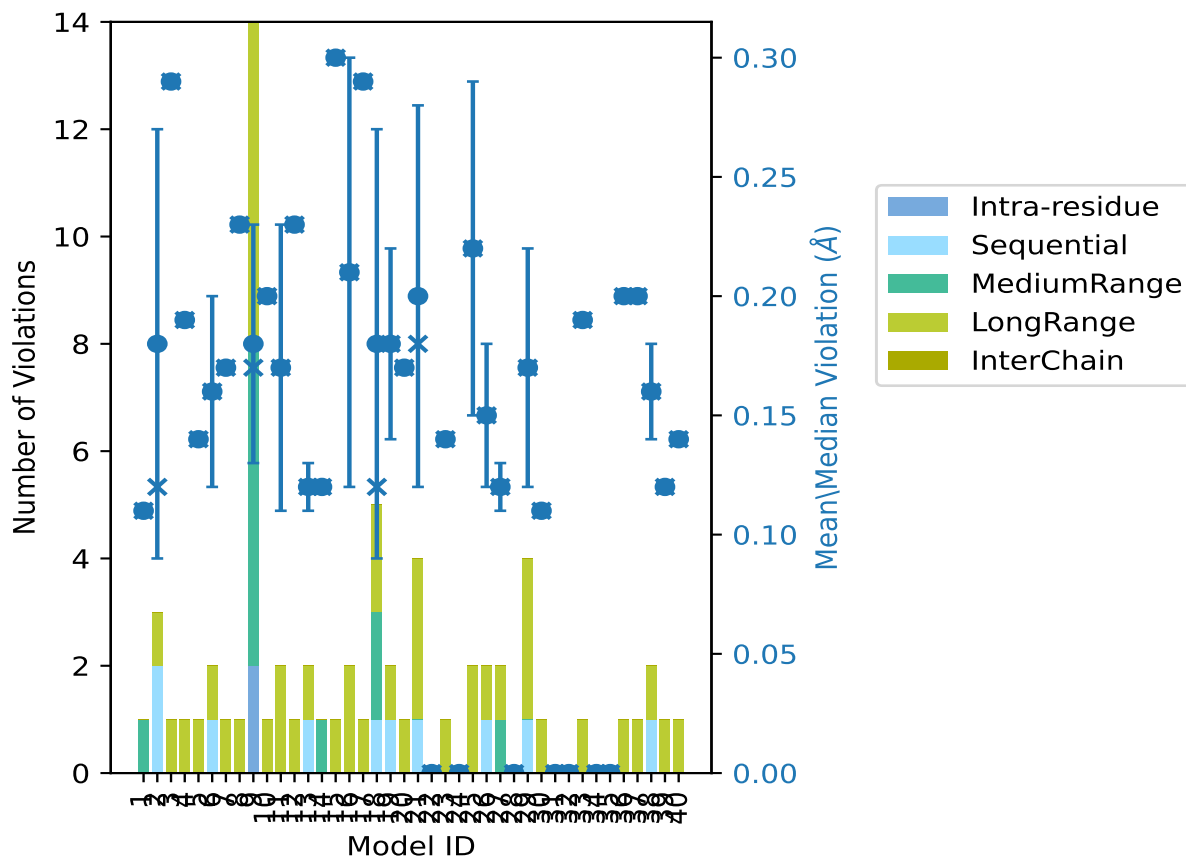
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Model ID	Number of violations						Mean (Å)	Max (Å)	SD ⁶ (Å)	Median (Å)
	IR ¹	SQ ²	MR ³	LR ⁴	IC ⁵	Total				
12	0	0	0	1	0	1	0.23	0.23	0.0	0.23
13	0	1	0	1	0	2	0.12	0.13	0.01	0.12
14	0	0	1	0	0	1	0.12	0.12	0.0	0.12
15	0	0	0	1	0	1	0.3	0.3	0.0	0.3
16	0	0	0	2	0	2	0.21	0.3	0.09	0.21
17	0	0	0	1	0	1	0.29	0.29	0.0	0.29
18	0	1	2	2	0	5	0.18	0.35	0.09	0.12
19	0	1	0	1	0	2	0.18	0.23	0.04	0.18
20	0	0	0	1	0	1	0.17	0.17	0.0	0.17
21	0	1	0	3	0	4	0.2	0.32	0.08	0.18
22	0	0	0	0	0	0	0.0	0.0	0.0	0.0
23	0	0	0	1	0	1	0.14	0.14	0.0	0.14
24	0	0	0	0	0	0	0.0	0.0	0.0	0.0
25	0	0	0	2	0	2	0.22	0.29	0.07	0.22
26	0	1	0	1	0	2	0.15	0.17	0.03	0.15
27	0	0	1	1	0	2	0.12	0.13	0.01	0.12
28	0	0	0	0	0	0	0.0	0.0	0.0	0.0
29	0	1	0	3	0	4	0.17	0.23	0.05	0.17
30	0	0	0	1	0	1	0.11	0.11	0.0	0.11
31	0	0	0	0	0	0	0.0	0.0	0.0	0.0
32	0	0	0	0	0	0	0.0	0.0	0.0	0.0
33	0	0	0	1	0	1	0.19	0.19	0.0	0.19
34	0	0	0	0	0	0	0.0	0.0	0.0	0.0
35	0	0	0	0	0	0	0.0	0.0	0.0	0.0
36	0	0	0	1	0	1	0.2	0.2	0.0	0.2
37	0	0	0	1	0	1	0.2	0.2	0.0	0.2
38	0	1	0	1	0	2	0.16	0.18	0.02	0.16
39	0	0	0	1	0	1	0.12	0.12	0.0	0.12
40	0	0	0	1	0	1	0.14	0.14	0.0	0.14

¹Intra-residue restraints, ²Sequential restraints, ³Medium range restraints, ⁴Long range restraints,
⁵Inter-chain restraints, ⁶Standard 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 [i](#)

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, 1083(IR:293, SQ:288, MR:165, LR:337, IC:0) restraints are not violated in the ensemble.

Number of violated restraints						Fraction of the ensemble	
IR ¹	SQ ²	MR ³	LR ⁴	IC ⁵	Total	Count ⁶	%
2	1	4	6	0	13	1	2.5
0	0	1	2	0	3	2	5.0
0	1	0	1	0	2	3	7.5
0	0	0	0	0	0	4	10.0
0	0	0	0	0	0	5	12.5
0	1	0	0	0	1	6	15.0

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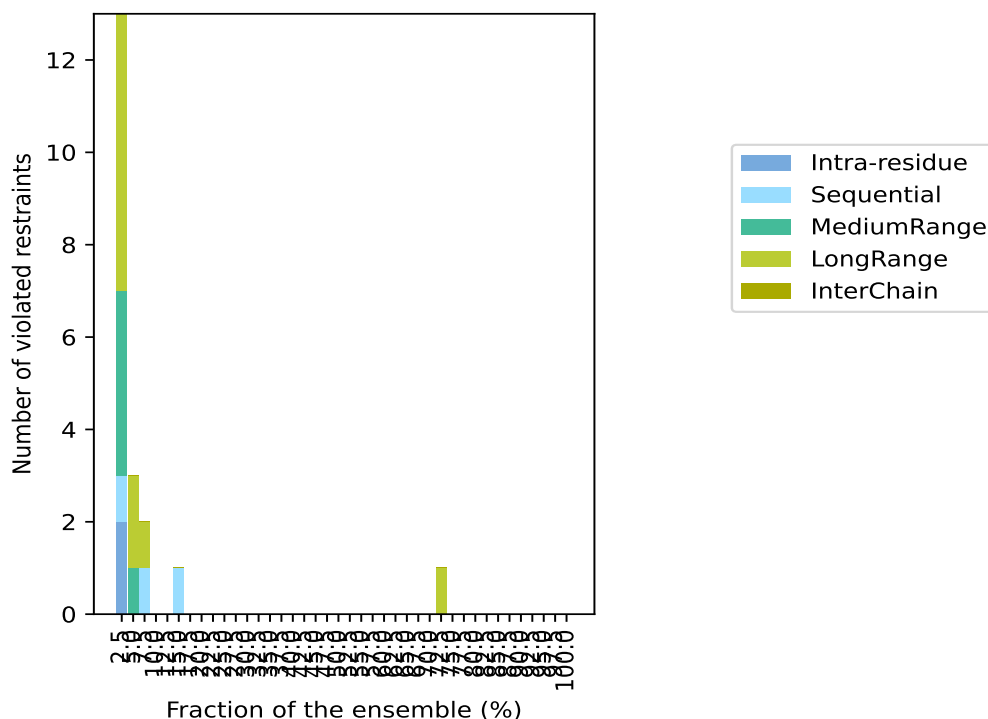
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Number of violated restraints						Fraction of the ensemble	
IR ¹	SQ ²	MR ³	LR ⁴	IC ⁵	Total	Count ⁶	%
0	0	0	0	0	0	7	17.5
0	0	0	0	0	0	8	20.0
0	0	0	0	0	0	9	22.5
0	0	0	0	0	0	10	25.0
0	0	0	0	0	0	11	27.5
0	0	0	0	0	0	12	30.0
0	0	0	0	0	0	13	32.5
0	0	0	0	0	0	14	35.0
0	0	0	0	0	0	15	37.5
0	0	0	0	0	0	16	40.0
0	0	0	0	0	0	17	42.5
0	0	0	0	0	0	18	45.0
0	0	0	0	0	0	19	47.5
0	0	0	0	0	0	20	50.0
0	0	0	0	0	0	21	52.5
0	0	0	0	0	0	22	55.0
0	0	0	0	0	0	23	57.5
0	0	0	0	0	0	24	60.0
0	0	0	0	0	0	25	62.5
0	0	0	0	0	0	26	65.0
0	0	0	0	0	0	27	67.5
0	0	0	0	0	0	28	70.0
0	0	0	1	0	1	29	72.5
0	0	0	0	0	0	30	75.0
0	0	0	0	0	0	31	77.5
0	0	0	0	0	0	32	80.0
0	0	0	0	0	0	33	82.5
0	0	0	0	0	0	34	85.0
0	0	0	0	0	0	35	87.5
0	0	0	0	0	0	36	90.0
0	0	0	0	0	0	37	92.5
0	0	0	0	0	0	38	95.0
0	0	0	0	0	0	39	97.5
0	0	0	0	0	0	40	100.0

¹Intra-residue restraints, ²Sequential restraints, ³Medium range restraints, ⁴Long range restraints,

⁵Inter-chain restraints, ⁶ Number of models with violations

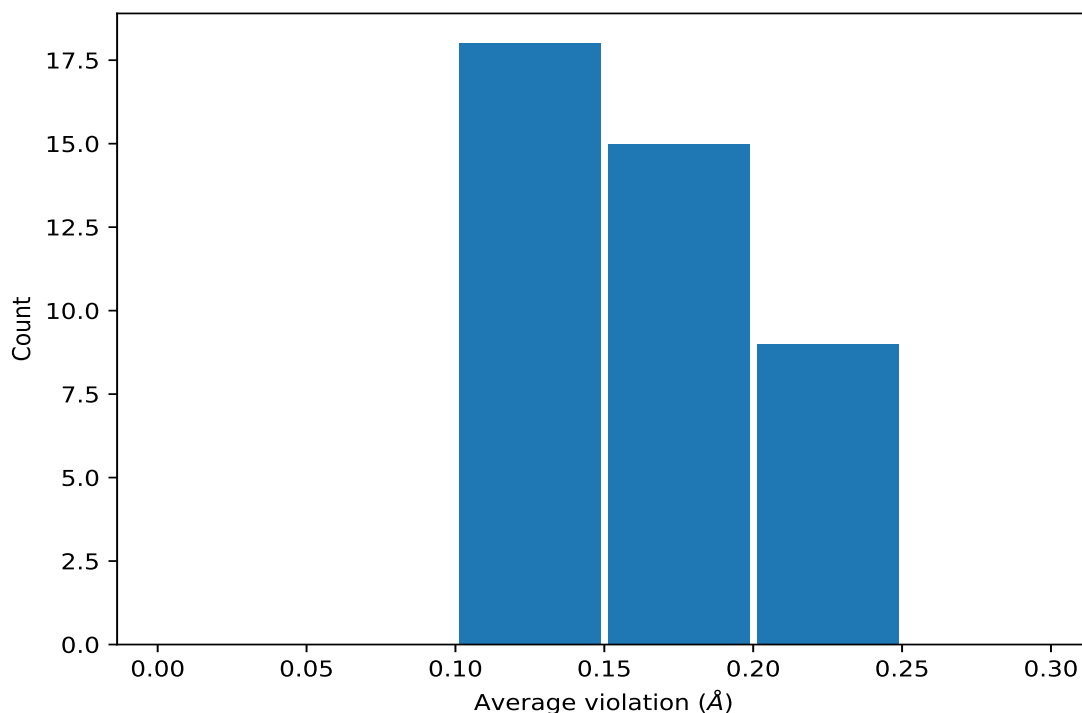
9.3.1 Bar graph : Distance violation statistics for the ensemble [i](#)



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 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. Rows with same key represent combinatorial or ambiguous restraints and are counted as a single restraint.

Key	Atom-1	Atom-2	Models ¹	Mean (Å)	SD ¹ (Å)	Median (Å)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	29	0.21	0.07	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	29	0.21	0.07	0.2
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	6	0.15	0.03	0.14
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	6	0.15	0.03	0.14
(2,27)	1:A:165:GLY:O	1:A:167:LYS:H	4	0.15	0.06	0.12
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG21	3	0.19	0.09	0.13
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG22	3	0.19	0.09	0.13
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG23	3	0.19	0.09	0.13
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG21	3	0.19	0.09	0.13

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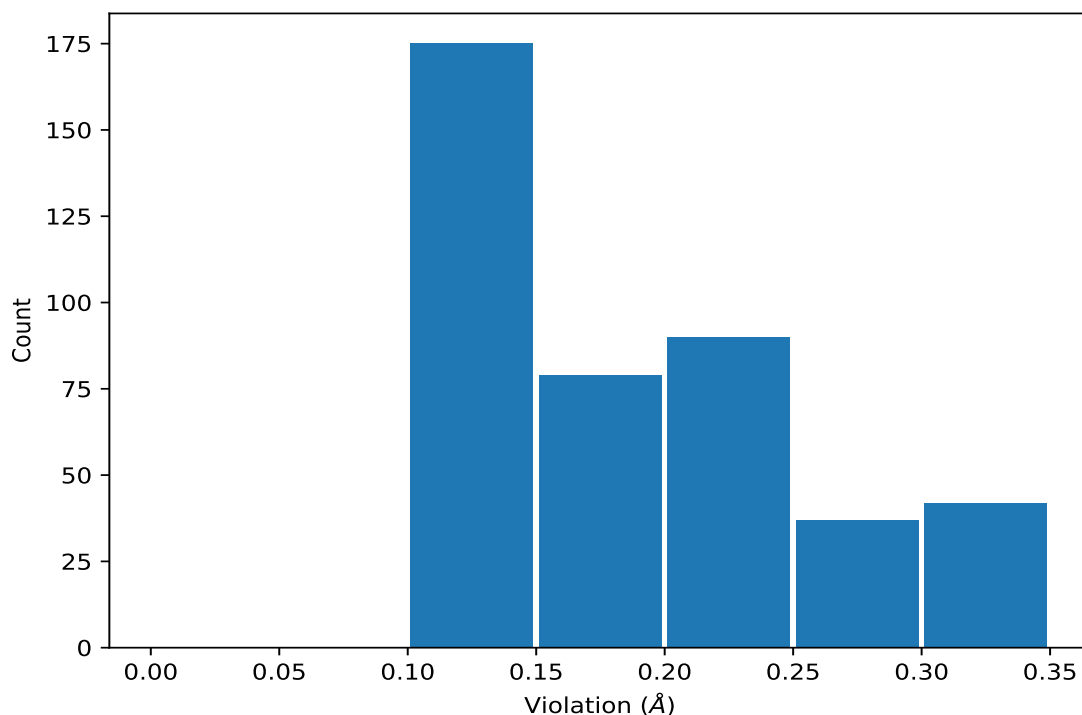
Key	Atom-1	Atom-2	Models ¹	Mean (Å)	SD ¹ (Å)	Median (Å)
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG22	3	0.19	0.09	0.13
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG23	3	0.19	0.09	0.13
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD11	3	0.16	0.03	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD12	3	0.16	0.03	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD13	3	0.16	0.03	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD11	3	0.16	0.03	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD12	3	0.16	0.03	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD13	3	0.16	0.03	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD11	2	0.14	0.0	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD12	2	0.14	0.0	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD13	2	0.14	0.0	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD11	2	0.14	0.0	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD12	2	0.14	0.0	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD13	2	0.14	0.0	0.14
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD11	2	0.13	0.02	0.13
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD12	2	0.13	0.02	0.13
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD13	2	0.13	0.02	0.13
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD21	2	0.13	0.02	0.13
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD22	2	0.13	0.02	0.13
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD23	2	0.13	0.02	0.13
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE21	2	0.12	0.0	0.12
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE22	2	0.12	0.0	0.12
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE21	2	0.12	0.0	0.12
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE22	2	0.12	0.0	0.12
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE21	2	0.12	0.0	0.12
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE22	2	0.12	0.0	0.12

¹Number of violated models, ²Standard 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 lists the absolute value of the violation for each restraint in the ensemble sorted by its 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)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	18	0.35
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	18	0.35
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	18	0.35
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	18	0.35
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	18	0.35
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	18	0.35
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	18	0.35
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	18	0.35
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	18	0.35
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG21	21	0.32
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG22	21	0.32
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG23	21	0.32
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG21	21	0.32
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG22	21	0.32
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG23	21	0.32
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	2	0.3

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	2	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	2	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	2	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	2	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	2	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	2	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	2	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	2	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	15	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	15	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	15	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	15	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	15	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	15	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	15	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	15	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	15	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	15	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	16	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	16	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	16	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	16	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	16	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	16	0.3
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	16	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	16	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	16	0.3
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	16	0.3
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	3	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	3	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	3	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	3	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	3	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	3	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	3	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	3	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	3	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	3	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	9	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	9	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	9	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	9	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	9	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	9	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	9	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	9	0.29

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	9	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	9	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	17	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	17	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	17	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	17	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	17	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	17	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	17	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	17	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	17	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	25	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	25	0.29
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	25	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	25	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	25	0.29
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	25	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	25	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	25	0.29
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	25	0.29
(2,27)	1:A:165:GLY:O	1:A:167:LYS:H	9	0.26
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	8	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	8	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	8	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	8	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	8	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	8	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	8	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	8	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	8	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	11	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	11	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	11	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	11	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	11	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	11	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	11	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	11	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	11	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	12	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	12	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	12	0.23

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	12	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	12	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	12	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	12	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	12	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	12	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	19	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	19	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	19	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	19	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	19	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	19	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	19	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	19	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	19	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	29	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	29	0.23
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	29	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	29	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	29	0.23
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	29	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	29	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	29	0.23
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	29	0.23
(2,39)	1:A:161:LEU:O	1:A:166:LEU:H	9	0.22
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD11	21	0.21
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD12	21	0.21
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD13	21	0.21
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD11	21	0.21
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD12	21	0.21
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD13	21	0.21
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	29	0.2
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	29	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	6	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	6	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	6	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	6	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	6	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	6	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	6	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	6	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	6	0.2

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	10	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	10	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	10	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	10	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	10	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	10	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	10	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	10	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	10	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	36	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	36	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	36	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	36	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	36	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	36	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	36	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	36	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	36	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	37	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	37	0.2
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	37	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	37	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	37	0.2
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	37	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	37	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	37	0.2
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	37	0.2
(2,40)	1:A:161:LEU:O	1:A:166:LEU:N	9	0.19
(1,904)	1:A:126:GLU:HB2	1:A:129:ASN:HB2	18	0.19
(1,904)	1:A:126:GLU:HB2	1:A:129:ASN:HB3	18	0.19
(1,904)	1:A:126:GLU:HB3	1:A:129:ASN:HB2	18	0.19
(1,904)	1:A:126:GLU:HB3	1:A:129:ASN:HB3	18	0.19
(1,719)	1:A:105:VAL:HG11	1:A:117:PHE:HD1	9	0.19
(1,719)	1:A:105:VAL:HG11	1:A:117:PHE:HD2	9	0.19
(1,719)	1:A:105:VAL:HG12	1:A:117:PHE:HD1	9	0.19
(1,719)	1:A:105:VAL:HG12	1:A:117:PHE:HD2	9	0.19
(1,719)	1:A:105:VAL:HG13	1:A:117:PHE:HD1	9	0.19
(1,719)	1:A:105:VAL:HG13	1:A:117:PHE:HD2	9	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	4	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	4	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	4	0.19
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	4	0.19

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	4	0.19
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	4	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	4	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	4	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	4	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	33	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	33	0.19
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	33	0.19
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	33	0.19
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	33	0.19
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	33	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	33	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	33	0.19
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	33	0.19
(1,704)	1:A:125:PHE:HD1	1:A:129:ASN:HB2	9	0.18
(1,704)	1:A:125:PHE:HD2	1:A:129:ASN:HB2	9	0.18
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	38	0.18
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	38	0.18
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	38	0.18
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	38	0.18
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	38	0.18
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	38	0.18
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	38	0.18
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	38	0.18
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	38	0.18
(1,47)	1:A:161:LEU:H	1:A:161:LEU:HG	9	0.18
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	26	0.17
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	26	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	7	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	7	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	7	0.17
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	7	0.17
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	7	0.17
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	7	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	7	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	7	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	7	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	20	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	20	0.17
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	20	0.17
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	20	0.17
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	20	0.17

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	20	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	20	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	20	0.17
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	20	0.17
(1,858)	1:A:117:PHE:HD1	1:A:119:LEU:HB2	9	0.16
(1,858)	1:A:117:PHE:HD1	1:A:119:LEU:HB3	9	0.16
(1,858)	1:A:117:PHE:HD2	1:A:119:LEU:HB2	9	0.16
(1,858)	1:A:117:PHE:HD2	1:A:119:LEU:HB3	9	0.16
(1,748)	1:A:149:TYR:HA	1:A:149:TYR:HE1	9	0.15
(1,748)	1:A:149:TYR:HA	1:A:149:TYR:HE2	9	0.15
(1,607)	1:A:130:PHE:HD1	1:A:147:ILE:HG21	21	0.15
(1,607)	1:A:130:PHE:HD1	1:A:147:ILE:HG22	21	0.15
(1,607)	1:A:130:PHE:HD1	1:A:147:ILE:HG23	21	0.15
(1,607)	1:A:130:PHE:HD2	1:A:147:ILE:HG21	21	0.15
(1,607)	1:A:130:PHE:HD2	1:A:147:ILE:HG22	21	0.15
(1,607)	1:A:130:PHE:HD2	1:A:147:ILE:HG23	21	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD11	9	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD12	9	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD13	9	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD21	9	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD22	9	0.15
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD23	9	0.15
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	19	0.14
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	19	0.14
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	38	0.14
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	38	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD11	9	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD12	9	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD13	9	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD11	9	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD12	9	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD13	9	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD11	25	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD12	25	0.14
(1,715)	1:A:149:TYR:HE1	1:A:166:LEU:HD13	25	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD11	25	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD12	25	0.14
(1,715)	1:A:149:TYR:HE2	1:A:166:LEU:HD13	25	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD11	9	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD12	9	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD13	9	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD11	9	0.14

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD12	9	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD13	9	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD11	29	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD12	29	0.14
(1,692)	1:A:125:PHE:HD1	1:A:133:LEU:HD13	29	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD11	29	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD12	29	0.14
(1,692)	1:A:125:PHE:HD2	1:A:133:LEU:HD13	29	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	5	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	5	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	5	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	5	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	5	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	5	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	5	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	5	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	5	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	23	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	23	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	23	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	23	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	23	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	23	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	23	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	23	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	23	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	40	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	40	0.14
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	40	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	40	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	40	0.14
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	40	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	40	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	40	0.14
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	40	0.14
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	6	0.13
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	6	0.13
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	27	0.13
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	27	0.13
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	27	0.13
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	27	0.13
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	27	0.13

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	27	0.13
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	27	0.13
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	27	0.13
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	27	0.13
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG21	13	0.13
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG22	13	0.13
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG23	13	0.13
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG21	13	0.13
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG22	13	0.13
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG23	13	0.13
(2,41)	1:A:167:LYS:O	1:A:170:ASP:H	9	0.12
(2,27)	1:A:165:GLY:O	1:A:167:LYS:H	14	0.12
(2,27)	1:A:165:GLY:O	1:A:167:LYS:H	18	0.12
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE21	16	0.12
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE22	16	0.12
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE21	16	0.12
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE22	16	0.12
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE21	16	0.12
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE22	16	0.12
(1,947)	1:A:131:ARG:HG2	1:A:132:ALA:H	2	0.12
(1,947)	1:A:131:ARG:HG3	1:A:132:ALA:H	2	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD11	39	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD12	39	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD13	39	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD21	39	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD22	39	0.12
(1,828)	1:A:105:VAL:HG11	1:A:174:LEU:HD23	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD11	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD12	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD13	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD21	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD22	39	0.12
(1,828)	1:A:105:VAL:HG12	1:A:174:LEU:HD23	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD11	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD12	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD13	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD21	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD22	39	0.12
(1,828)	1:A:105:VAL:HG13	1:A:174:LEU:HD23	39	0.12
(1,639)	1:A:148:VAL:HB	1:A:173:ILE:HG21	21	0.12
(1,639)	1:A:148:VAL:HB	1:A:173:ILE:HG22	21	0.12
(1,639)	1:A:148:VAL:HB	1:A:173:ILE:HG23	21	0.12

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	26	0.12
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	26	0.12
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	26	0.12
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	26	0.12
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	26	0.12
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	26	0.12
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	26	0.12
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	26	0.12
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	26	0.12
(1,470)	1:A:119:LEU:HD11	1:A:120:GLN:H	18	0.12
(1,470)	1:A:119:LEU:HD12	1:A:120:GLN:H	18	0.12
(1,470)	1:A:119:LEU:HD13	1:A:120:GLN:H	18	0.12
(2,27)	1:A:165:GLY:O	1:A:167:LYS:H	27	0.11
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE21	11	0.11
(1,979)	1:A:140:ILE:HG21	1:A:176:GLN:HE22	11	0.11
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE21	11	0.11
(1,979)	1:A:140:ILE:HG22	1:A:176:GLN:HE22	11	0.11
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE21	11	0.11
(1,979)	1:A:140:ILE:HG23	1:A:176:GLN:HE22	11	0.11
(1,978)	1:A:140:ILE:HG21	1:A:176:GLN:HB2	29	0.11
(1,978)	1:A:140:ILE:HG21	1:A:176:GLN:HB3	29	0.11
(1,978)	1:A:140:ILE:HG22	1:A:176:GLN:HB2	29	0.11
(1,978)	1:A:140:ILE:HG22	1:A:176:GLN:HB3	29	0.11
(1,978)	1:A:140:ILE:HG23	1:A:176:GLN:HB2	29	0.11
(1,978)	1:A:140:ILE:HG23	1:A:176:GLN:HB3	29	0.11
(1,922)	1:A:127:LEU:HD11	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD11	1:A:164:TYR:HE2	18	0.11
(1,922)	1:A:127:LEU:HD12	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD12	1:A:164:TYR:HE2	18	0.11
(1,922)	1:A:127:LEU:HD13	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD13	1:A:164:TYR:HE2	18	0.11
(1,922)	1:A:127:LEU:HD21	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD21	1:A:164:TYR:HE2	18	0.11
(1,922)	1:A:127:LEU:HD22	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD22	1:A:164:TYR:HE2	18	0.11
(1,922)	1:A:127:LEU:HD23	1:A:164:TYR:HE1	18	0.11
(1,922)	1:A:127:LEU:HD23	1:A:164:TYR:HE2	18	0.11
(1,861)	1:A:117:PHE:HE1	1:A:119:LEU:HB2	9	0.11
(1,861)	1:A:117:PHE:HE1	1:A:119:LEU:HB3	9	0.11
(1,861)	1:A:117:PHE:HE2	1:A:119:LEU:HB2	9	0.11
(1,861)	1:A:117:PHE:HE2	1:A:119:LEU:HB3	9	0.11
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	13	0.11

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	13	0.11
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	13	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	13	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	13	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	13	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	13	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	13	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	13	0.11
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD21	30	0.11
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD22	30	0.11
(1,616)	1:A:147:ILE:HD11	1:A:154:LEU:HD23	30	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD21	30	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD22	30	0.11
(1,616)	1:A:147:ILE:HD12	1:A:154:LEU:HD23	30	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD21	30	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD22	30	0.11
(1,616)	1:A:147:ILE:HD13	1:A:154:LEU:HD23	30	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD11	1	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD12	1	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD13	1	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD21	1	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD22	1	0.11
(1,1072)	1:A:164:TYR:H	1:A:166:LEU:HD23	1	0.11
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG21	2	0.11
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG22	2	0.11
(1,1000)	1:A:146:GLN:HB2	1:A:147:ILE:HG23	2	0.11
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG21	2	0.11
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG22	2	0.11
(1,1000)	1:A:146:GLN:HB3	1:A:147:ILE:HG23	2	0.11

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

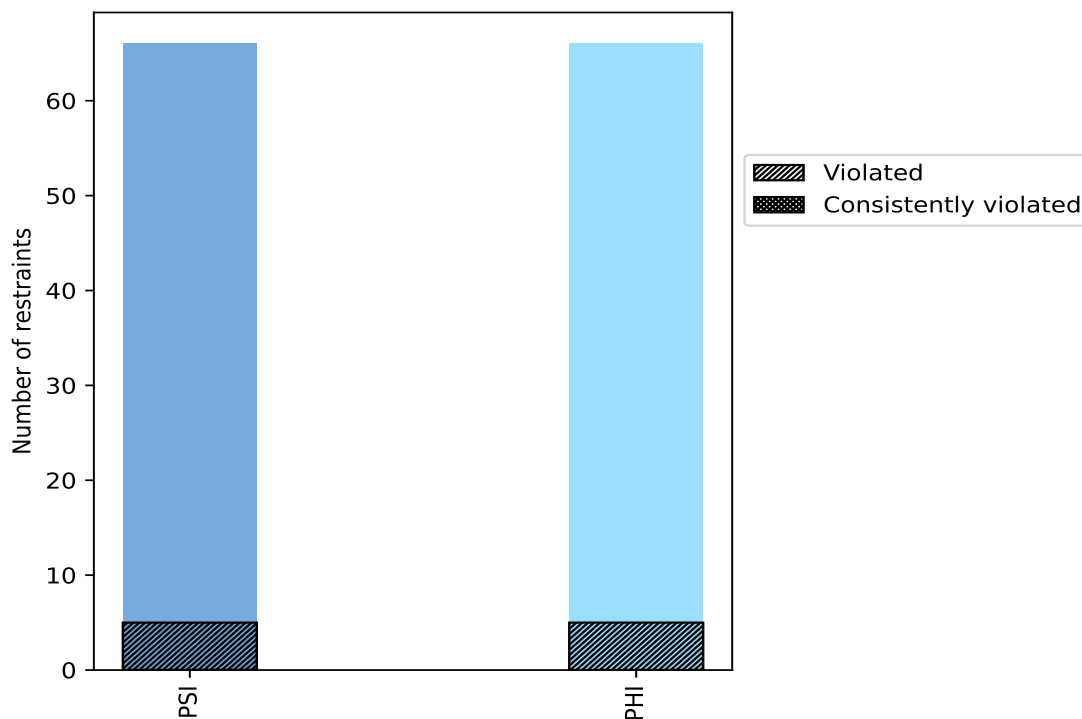
10.1 Summary of dihedral-angle violations [i](#)

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	% ¹	Violated ³			Consistently Violated ⁴		
			Count	% ²	% ¹	Count	% ²	% ¹
PSI	66	50.0	5	7.6	3.8	0	0.0	0.0
PHI	66	50.0	5	7.6	3.8	0	0.0	0.0
Total	132	100.0	10	7.6	7.6	0	0.0	0.0

¹ percentage calculated with respect to total number of dihedral-angle restraints, ² percentage calculated with respect to number of restraints in a particular dihedral-angle type, ³ violated in at least one model, ⁴ 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.

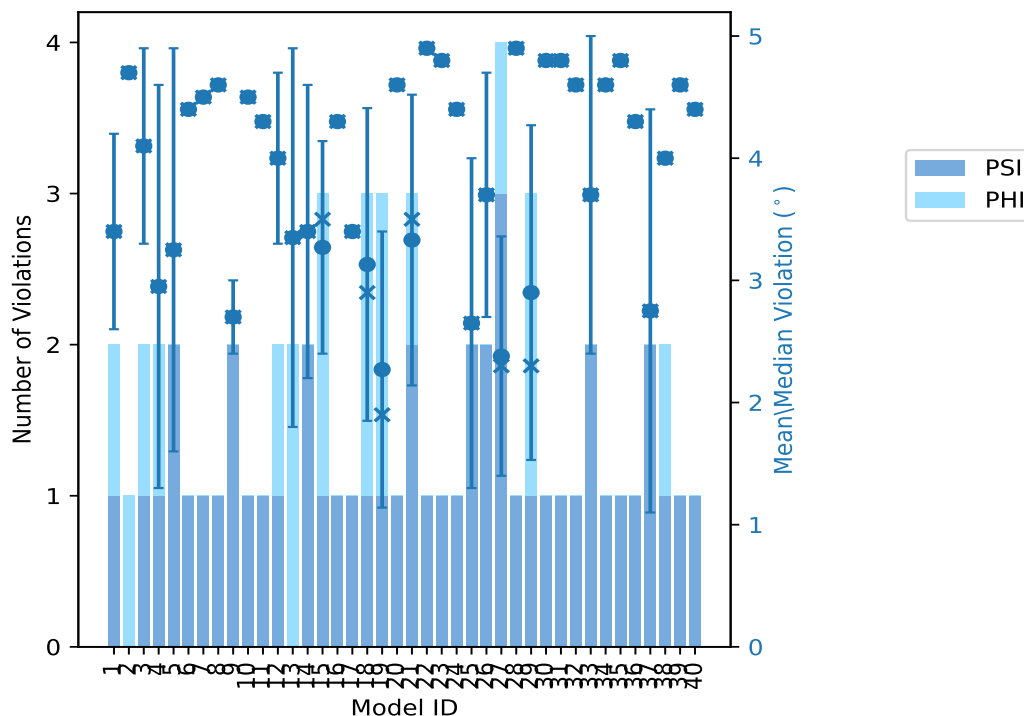
Model ID	Number of violations			Mean (°)	Max (°)	SD (°)	Median (°)
	PSI	PHI	Total				
1	1	1	2	3.4	4.2	0.8	3.4
2	0	1	1	4.7	4.7	0.0	4.7
3	1	1	2	4.1	4.9	0.8	4.1
4	1	1	2	2.95	4.6	1.65	2.95
5	2	0	2	3.25	4.9	1.65	3.25
6	1	0	1	4.4	4.4	0.0	4.4
7	1	0	1	4.5	4.5	0.0	4.5
8	1	0	1	4.6	4.6	0.0	4.6
9	2	0	2	2.7	3.0	0.3	2.7
10	1	0	1	4.5	4.5	0.0	4.5
11	1	0	1	4.3	4.3	0.0	4.3
12	1	1	2	4.0	4.7	0.7	4.0
13	0	2	2	3.35	4.9	1.55	3.35
14	2	0	2	3.4	4.6	1.2	3.4
15	1	2	3	3.27	4.2	0.87	3.5
16	1	0	1	4.3	4.3	0.0	4.3
17	1	0	1	3.4	3.4	0.0	3.4
18	1	2	3	3.13	4.8	1.28	2.9
19	1	2	3	2.27	3.8	1.13	1.9
20	1	0	1	4.6	4.6	0.0	4.6
21	2	1	3	3.33	4.7	1.19	3.5
22	1	0	1	4.9	4.9	0.0	4.9
23	1	0	1	4.8	4.8	0.0	4.8
24	1	0	1	4.4	4.4	0.0	4.4
25	2	0	2	2.65	4.0	1.35	2.65
26	2	0	2	3.7	4.7	1.0	3.7
27	3	1	4	2.38	3.7	0.98	2.3
28	1	0	1	4.9	4.9	0.0	4.9
29	1	2	3	2.9	4.8	1.37	2.3
30	1	0	1	4.8	4.8	0.0	4.8
31	1	0	1	4.8	4.8	0.0	4.8
32	1	0	1	4.6	4.6	0.0	4.6
33	2	0	2	3.7	5.0	1.3	3.7
34	1	0	1	4.6	4.6	0.0	4.6
35	1	0	1	4.8	4.8	0.0	4.8
36	1	0	1	4.3	4.3	0.0	4.3
37	2	0	2	2.75	4.4	1.65	2.75
38	1	1	2	4.0	4.0	0.0	4.0

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Model ID	Number of violations			Mean (°)	Max (°)	SD (°)	Median (°)
	PSI	PHI	Total				
39	1	0	1	4.6	4.6	0.0	4.6
40	1	0	1	4.4	4.4	0.0	4.4

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	
PSI	PHI	Total	Count ¹	%
1	2	3	1	2.5
1	0	1	2	5.0
0	0	0	3	7.5
1	2	3	4	10.0

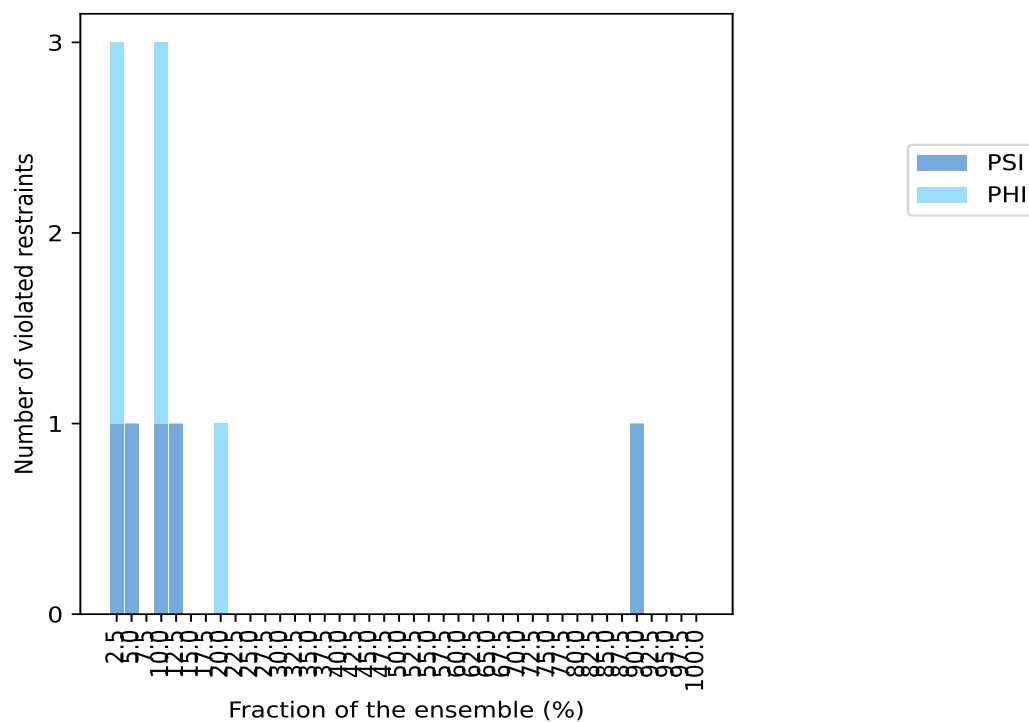
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Number of violated restraints			Fraction of the ensemble	
PSI	PHI	Total	Count ¹	%
1	0	1	5	12.5
0	0	0	6	15.0
0	0	0	7	17.5
0	1	1	8	20.0
0	0	0	9	22.5
0	0	0	10	25.0
0	0	0	11	27.5
0	0	0	12	30.0
0	0	0	13	32.5
0	0	0	14	35.0
0	0	0	15	37.5
0	0	0	16	40.0
0	0	0	17	42.5
0	0	0	18	45.0
0	0	0	19	47.5
0	0	0	20	50.0
0	0	0	21	52.5
0	0	0	22	55.0
0	0	0	23	57.5
0	0	0	24	60.0
0	0	0	25	62.5
0	0	0	26	65.0
0	0	0	27	67.5
0	0	0	28	70.0
0	0	0	29	72.5
0	0	0	30	75.0
0	0	0	31	77.5
0	0	0	32	80.0
0	0	0	33	82.5
0	0	0	34	85.0
0	0	0	35	87.5
1	0	1	36	90.0
0	0	0	37	92.5
0	0	0	38	95.0
0	0	0	39	97.5
0	0	0	40	100.0

¹ Number of models with violations

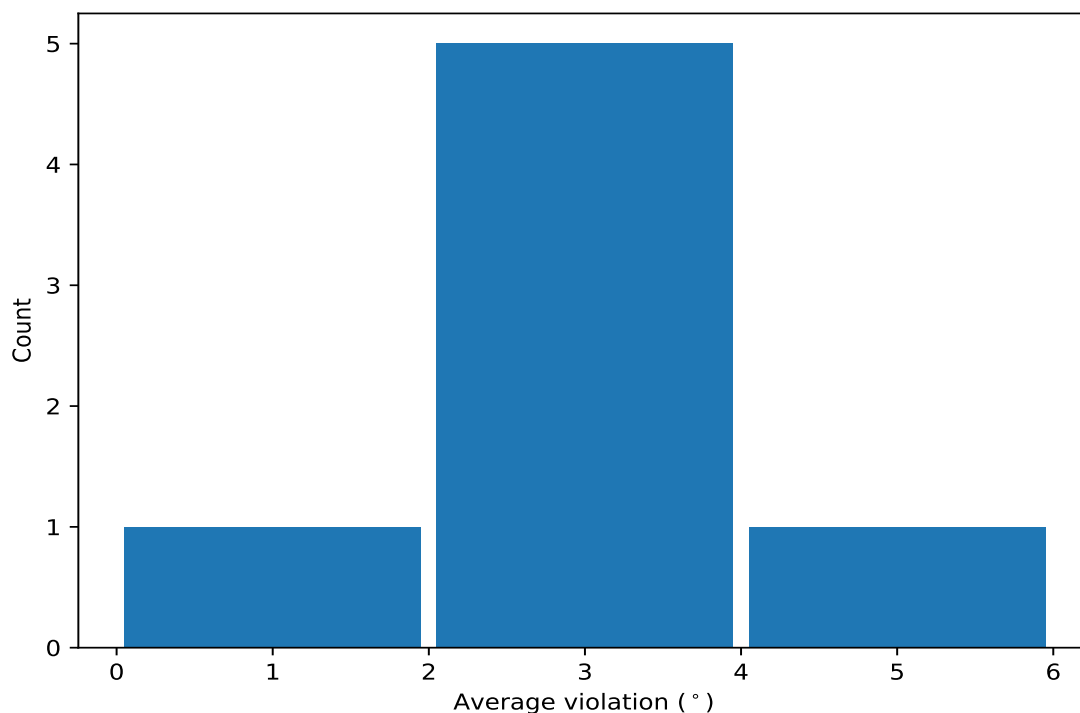
10.3.1 Bar graph : Dihedral-angle Violation statistics for the ensemble [i](#)



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.

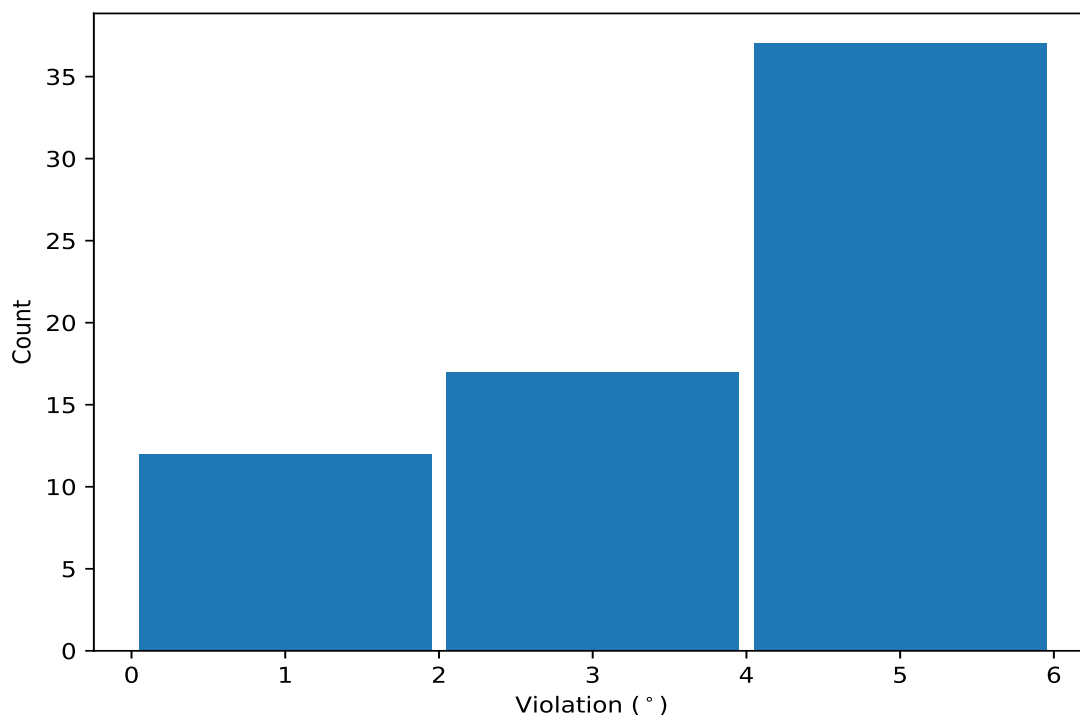
Key	Atom-1	Atom-2	Atom-3	Atom-4	Models ¹	Mean	SD ²	Median
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	36	4.4	0.6	4.6
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	8	2.49	1.33	1.75
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	5	2.06	0.55	2.2
(1,55)	1:A:128:HIS:C	1:A:129:ASN:N	1:A:129:ASN:CA	1:A:129:ASN:C	4	3.42	0.89	3.1
(1,15)	1:A:106:TYR:C	1:A:107:CYS:N	1:A:107:CYS:CA	1:A:107:CYS:C	4	2.95	1.03	3.4
(1,110)	1:A:162:ALA:N	1:A:162:ALA:CA	1:A:162:ALA:C	1:A:163:SER:N	4	2.02	0.63	1.9
(1,80)	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	1:A:143:ALA:N	2	1.7	0.1	1.7

¹ Number of violated models, ²Standard 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 lists the absolute value of the violation for each restraint in the ensemble sorted by its 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 (°)
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	33	5.0
(1,55)	1:A:128:HIS:C	1:A:129:ASN:N	1:A:129:ASN:CA	1:A:129:ASN:C	13	4.9
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	3	4.9
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	5	4.9
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	22	4.9
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	28	4.9
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	18	4.8
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	23	4.8
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	30	4.8
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	31	4.8
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	35	4.8
(1,25)	1:A:112:LEU:C	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	29	4.8
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	2	4.7
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	12	4.7
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	21	4.7
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	26	4.7
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	4	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	8	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	14	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	20	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	32	4.6

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Key	Atom-1	Atom-2	Atom-3	Atom-4	Model ID	Violation (°)
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	34	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	39	4.6
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	7	4.5
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	10	4.5
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	6	4.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	24	4.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	37	4.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	40	4.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	11	4.3
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	16	4.3
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	36	4.3
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	15	4.2
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	1	4.2
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	25	4.0
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	38	4.0
(1,101)	1:A:156:ASP:C	1:A:157:ASN:N	1:A:157:ASN:CA	1:A:157:ASN:C	38	4.0
(1,15)	1:A:106:TYR:C	1:A:107:CYS:N	1:A:107:CYS:CA	1:A:107:CYS:C	19	3.8
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	27	3.7
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	21	3.5
(1,15)	1:A:106:TYR:C	1:A:107:CYS:N	1:A:107:CYS:CA	1:A:107:CYS:C	15	3.5
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	17	3.4
(1,55)	1:A:128:HIS:C	1:A:129:ASN:N	1:A:129:ASN:CA	1:A:129:ASN:C	12	3.3
(1,15)	1:A:106:TYR:C	1:A:107:CYS:N	1:A:107:CYS:CA	1:A:107:CYS:C	3	3.3
(1,110)	1:A:162:ALA:N	1:A:162:ALA:CA	1:A:162:ALA:C	1:A:163:SER:N	9	3.0
(1,60)	1:A:131:ARG:N	1:A:131:ARG:CA	1:A:131:ARG:C	1:A:132:ALA:N	27	2.9
(1,55)	1:A:128:HIS:C	1:A:129:ASN:N	1:A:129:ASN:CA	1:A:129:ASN:C	18	2.9
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	26	2.7
(1,55)	1:A:128:HIS:C	1:A:129:ASN:N	1:A:129:ASN:CA	1:A:129:ASN:C	1	2.6
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	33	2.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	9	2.4
(1,26)	1:A:113:SER:N	1:A:113:SER:CA	1:A:113:SER:C	1:A:114:GLU:N	29	2.3
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	14	2.2
(1,110)	1:A:162:ALA:N	1:A:162:ALA:CA	1:A:162:ALA:C	1:A:163:SER:N	15	2.1
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	19	1.9
(1,80)	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	1:A:143:ALA:N	21	1.8
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	13	1.8
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	18	1.7
(1,110)	1:A:162:ALA:N	1:A:162:ALA:CA	1:A:162:ALA:C	1:A:163:SER:N	27	1.7
(1,80)	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	1:A:143:ALA:N	5	1.6
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	29	1.6
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	4	1.3
(1,110)	1:A:162:ALA:N	1:A:162:ALA:CA	1:A:162:ALA:C	1:A:163:SER:N	25	1.3
(1,15)	1:A:106:TYR:C	1:A:107:CYS:N	1:A:107:CYS:CA	1:A:107:CYS:C	27	1.2
(1,79)	1:A:141:PRO:C	1:A:142:ALA:N	1:A:142:ALA:CA	1:A:142:ALA:C	19	1.1
(1,28)	1:A:114:GLU:N	1:A:114:GLU:CA	1:A:114:GLU:C	1:A:115:VAL:N	37	1.1