wwPDB NMR Structure Validation Summary Report

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BMRB ID	:	15693
Title	:	Solution structure of Human Pax8 Paired Box Domain
Authors	:	Codutti, L.; Esposito, G.; Corazza, A.; Fogolari, F.; Tell, G.; Vascotto, C.; van Ingen, H.; Boelens, R.; Viglino, P.; Quadrifoglio, F.
Deposited on	:	2008-03-26

This is a wwPDB NMR Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/NMRValidationReportHelp
with specific help available everywhere you see the (i) 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 (1)) were used in the production of this report:

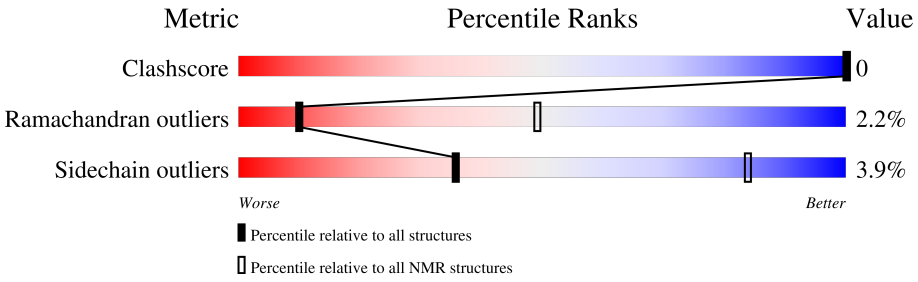
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
BMRB Restraints Analysis	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.33

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
SOLUTION NMR

The overall completeness of chemical shifts assignment is 78%.

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	159	62% 38%

2 Ensemble composition and analysis

This entry contains 20 models. Model 15 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:3-A:16 (14)	1.90	19
2	A:27-A:63 (37)	1.35	6
3	A:87-A:134 (48)	1.29	15

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 5 single-model clusters were found.

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

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 2453 atoms, of which 1228 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Paired box protein Pax-8.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	159	2453	758	1228	243	218	6	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	144	MET	-	expression tag	UNP Q06710
A	145	ASP	-	expression tag	UNP Q06710
A	146	SER	-	expression tag	UNP Q06710
A	147	GLY	-	expression tag	UNP Q06710
A	148	ALA	-	expression tag	UNP Q06710
A	149	PRO	-	expression tag	UNP Q06710
A	150	GLY	-	expression tag	UNP Q06710
A	151	GLY	-	expression tag	UNP Q06710
A	152	GLY	-	expression tag	UNP Q06710
A	153	SER	-	expression tag	UNP Q06710
A	154	HIS	-	expression tag	UNP Q06710
A	155	HIS	-	expression tag	UNP Q06710
A	156	HIS	-	expression tag	UNP Q06710
A	157	HIS	-	expression tag	UNP Q06710
A	158	HIS	-	expression tag	UNP Q06710
A	159	HIS	-	expression tag	UNP Q06710

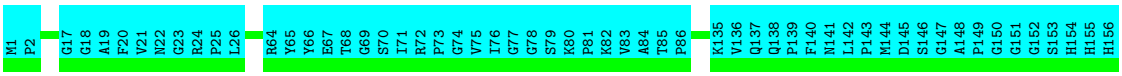
4 Residue-property plots

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: Paired box protein Pax-8

Chain A: 

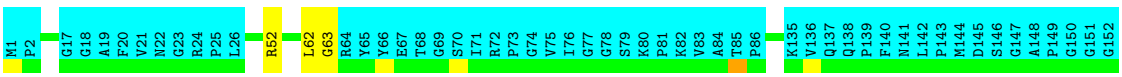


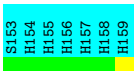
4.2 Residue scores for the representative (medoid) model from the NMR ensemble

The representative model is number 15. Colouring as in section 4.1 above.

• Molecule 1: Paired box protein Pax-8

Chain A: 





5 Refinement protocol and experimental data overview

The models were refined using the following method: *molecular mechanics*.

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
CYANA	structure solution	2.1
Discover	refinement	2.98

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	1612
Number of shifts mapped to atoms	1612
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	78%

6 Model quality

6.1 Standard geometry

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	0.51±0.00	0±0/790 (0.0± 0.0%)	0.79±0.02	0±0/1066 (0.0± 0.0%)
All	All	0.51	0/15800 (0.0%)	0.79	2/21320 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	Chirality	Planarity
1	A	0.0±0.0	0.3±0.7
All	All	0	6

There are no bond-length outliers.

All unique angle outliers are listed below.

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})	Models	
								Worst	Total
1	A	95	TYR	CB-CG-CD2	-5.29	117.83	121.00	12	2

There are no chirality outliers.

All unique planar outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Group	Models (Total)
1	A	95	TYR	Sidechain	3
1	A	33	ARG	Sidechain	1
1	A	119	ASN	Peptide	1
1	A	43	ARG	Sidechain	1

6.2 Too-close contacts

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	15560	15920	15920	-

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

6.3.1 Protein backbone

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	99/159 (62%)	86±4 (87±4%)	11±4 (11±4%)	2±2 (2±2%)	10 49
All	All	1980/3180 (62%)	1716 (87%)	221 (11%)	43 (2%)	10 49

5 of 14 unique Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
1	A	55	HIS	9
1	A	27	PRO	6
1	A	53	VAL	5
1	A	54	SER	4
1	A	100	PRO	4

6.3.2 Protein sidechains

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	88/134 (66%)	85±2 (96±2%)	3±2 (4±2%)	36 84
All	All	1760/2680 (66%)	1691 (96%)	69 (4%)	36 84

5 of 26 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	31	ARG	7
1	A	52	ARG	6
1	A	49	ARG	6
1	A	110	ARG	6
1	A	102	MET	5

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

The completeness of assignment taking into account all chemical shift lists is 78% 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

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	1612
Number of shifts mapped to atoms	1612
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	5

7.1.2 Chemical shift referencing

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_{\alpha}$	149	0.02 ± 0.08	None needed (< 0.5 ppm)
$^{13}C_{\beta}$	129	0.51 ± 0.06	Should be checked
$^{13}C'$	92	0.02 ± 0.07	None needed (< 0.5 ppm)
^{15}N	139	-0.08 ± 0.15	None needed (< 0.5 ppm)

7.1.3 Completeness of resonance assignments

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 78%, i.e. 1085 atoms were assigned a chemical shift out of a possible 1389. 0 out of 18 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	442/495 (89%)	195/202 (97%)	152/198 (77%)	95/95 (100%)
Sidechain	620/835 (74%)	407/540 (75%)	205/248 (83%)	8/47 (17%)

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	Total	^{1}H	^{13}C	^{15}N
Aromatic	23/59 (39%)	12/31 (39%)	10/23 (43%)	1/5 (20%)
Overall	1085/1389 (78%)	614/773 (79%)	367/469 (78%)	104/147 (71%)

7.1.4 Statistically unusual chemical shifts (i)

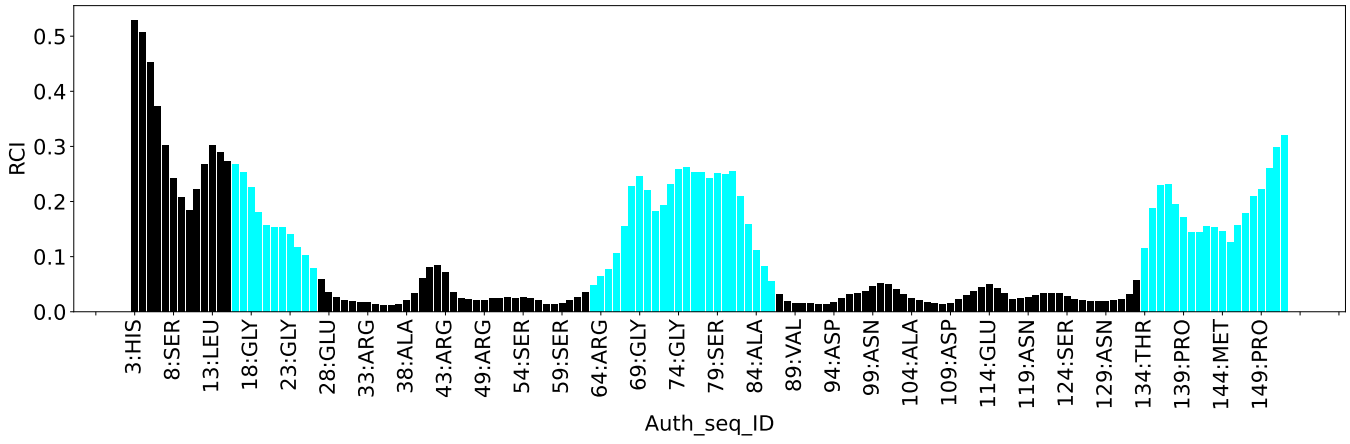
The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, *ppm*	Expected range, *ppm*	Z-score
1	A	68	THR	HG1	4.76	0.08 – 2.19	17.2
1	A	121	THR	HG1	4.76	0.08 – 2.19	17.2
1	A	134	THR	HG1	4.76	0.08 – 2.19	17.2
1	A	85	THR	HG1	4.75	0.08 – 2.19	17.1
1	A	101	THR	HG1	4.72	0.08 – 2.19	17.0

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	1406
Intra-residue (|i-j|=0)	709
Sequential (|i-j|=1)	475
Medium range (|i-j|>1 and |i-j|<5)	153
Long range (|i-j|≥5)	69
Inter-chain	0
Hydrogen bond restraints	0
Disulfide bond restraints	0
Total dihedral-angle restraints	0
Number of unmapped restraints	0
Number of restraints per residue	8.8
Number of long range restraints per residue[1]	0.4

[1]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)	56.0	0.2
0.2-0.5 (Medium)	154.2	0.5
>0.5 (Large)	300.6	7.47

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

Dihedral-angle violations less than 1° are not included in the calculation.There are no dihedral-angle violations

9 Distance violation analysis (i)

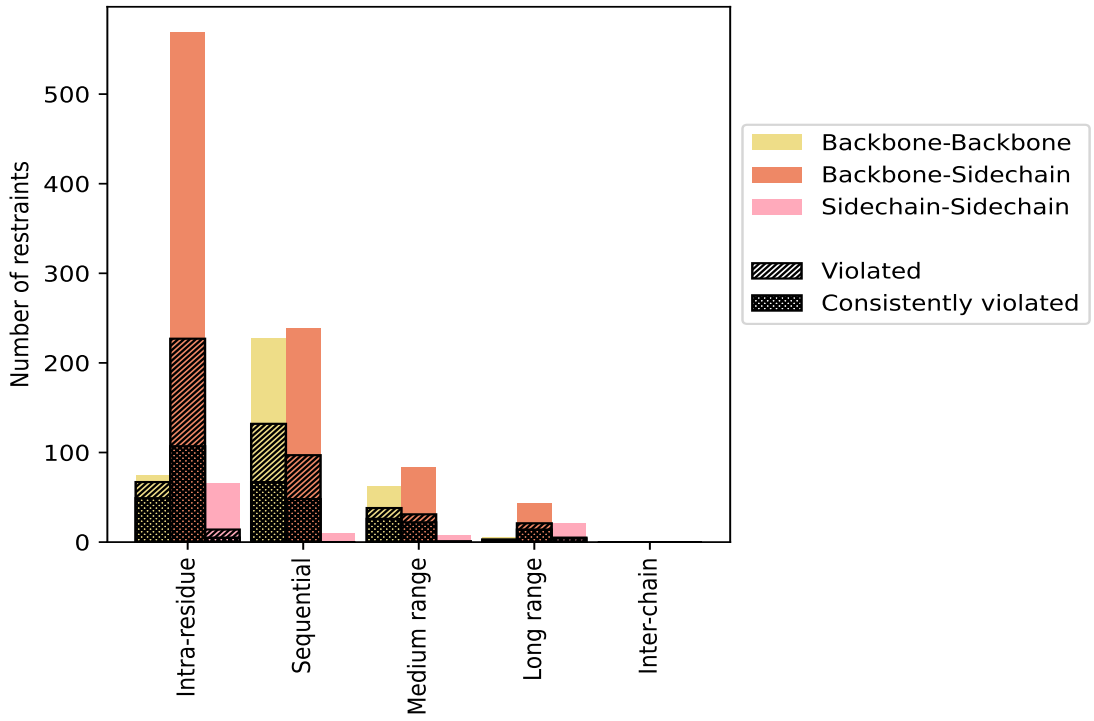
9.1 Summary of distance violations (i)

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.

Restraints type	Count	%[1]	Violated[3]			Consistently Violated[4]		
			Count	%[2]	%[1]	Count	%[2]	%[1]
Intra-residue (|i-j|=0)	709	50.4	308	43.4	21.9	161	22.7	11.5
Backbone-Backbone	75	5.3	67	89.3	4.8	49	65.3	3.5
Backbone-Sidechain	569	40.5	227	39.9	16.1	107	18.8	7.6
Sidechain-Sidechain	65	4.6	14	21.5	1.0	5	7.7	0.4
Sequential (|i-j|=1)	475	33.8	229	48.2	16.3	115	24.2	8.2
Backbone-Backbone	227	16.1	132	58.1	9.4	67	29.5	4.8
Backbone-Sidechain	238	16.9	97	40.8	6.9	48	20.2	3.4
Sidechain-Sidechain	10	0.7	0	0.0	0.0	0	0.0	0.0
Medium range (|i-j|>1 & |i-j|<5)	153	10.9	70	45.8	5.0	48	31.4	3.4
Backbone-Backbone	62	4.4	38	61.3	2.7	26	41.9	1.8
Backbone-Sidechain	83	5.9	31	37.3	2.2	22	26.5	1.6
Sidechain-Sidechain	8	0.6	1	12.5	0.1	0	0.0	0.0
Long range (|i-j|≥5)	69	4.9	29	42.0	2.1	20	29.0	1.4
Backbone-Backbone	5	0.4	3	60.0	0.2	2	40.0	0.1
Backbone-Sidechain	43	3.1	21	48.8	1.5	14	32.6	1.0
Sidechain-Sidechain	21	1.5	5	23.8	0.4	4	19.0	0.3
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	0	0.0	0	0.0	0.0	0	0.0	0.0
Disulfide bond	0	0.0	0	0.0	0.0	0	0.0	0.0
Total	1406	100.0	636	45.2	45.2	344	24.5	24.5
Backbone-Backbone	369	26.2	240	65.0	17.1	144	39.0	10.2
Backbone-Sidechain	933	66.4	376	40.3	26.7	191	20.5	13.6
Sidechain-Sidechain	104	7.4	20	19.2	1.4	9	8.7	0.6

[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



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

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	245	179	58	24	0	506	0.99	7.3	0.92	0.69
2	249	182	57	25	0	513	0.97	7.2	0.92	0.61
3	245	179	61	24	0	509	0.94	7.23	0.89	0.63
4	245	187	62	25	0	519	0.95	7.47	0.89	0.66
5	236	180	62	24	0	502	0.96	7.07	0.91	0.62
6	244	175	63	24	0	506	0.96	6.72	0.89	0.64
7	239	186	63	25	0	513	0.96	7.19	0.89	0.64
8	238	177	61	25	0	501	0.99	7.27	0.9	0.69
9	247	184	61	25	0	517	0.95	7.26	0.9	0.62
10	243	176	61	24	0	504	0.98	7.15	0.93	0.66
11	247	185	62	25	0	519	0.97	7.31	0.92	0.65

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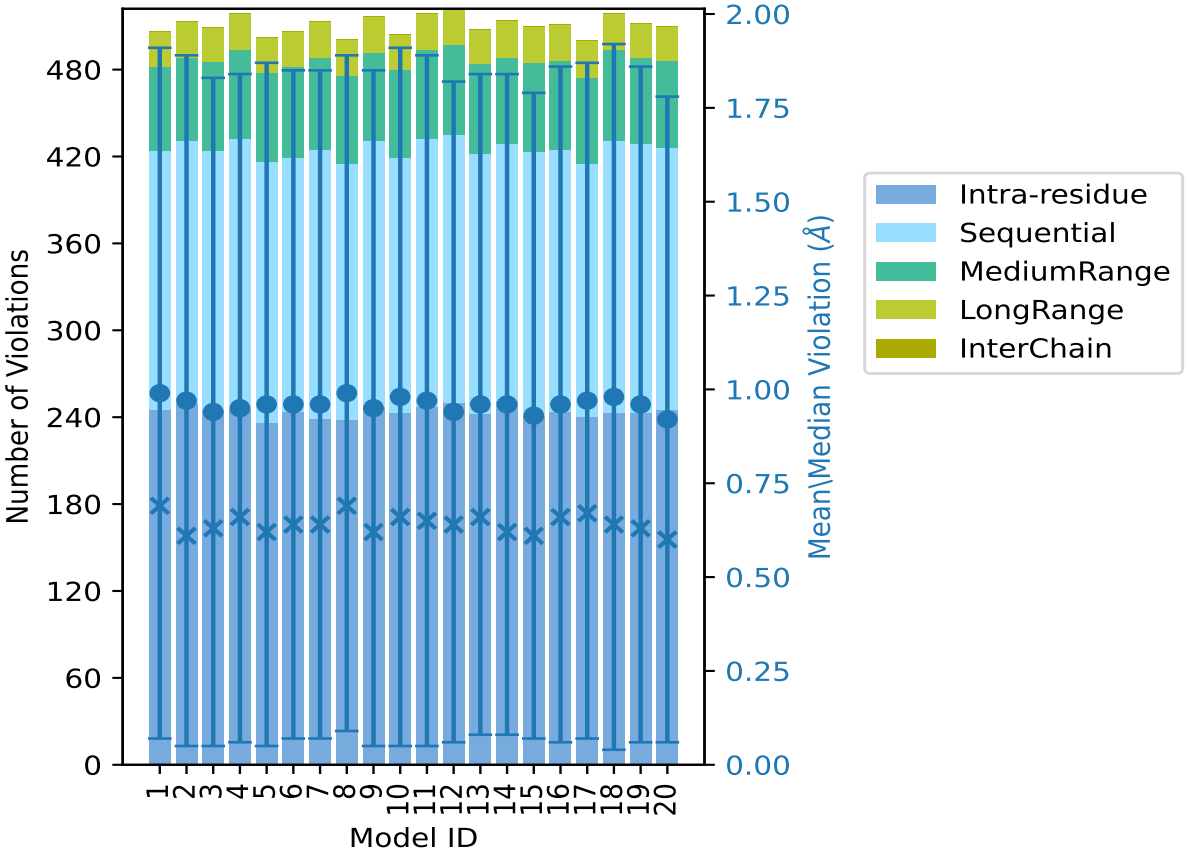
Model ID	Number of violations						Mean (Å)	Max (Å)	SD[6] (Å)	Median (Å)
	IR[1]	SQ[2]	MR[3]	LR[4]	IC[5]	Total				
12	250	185	62	25	0	522	0.94	6.72	0.88	0.64
13	242	180	62	24	0	508	0.96	7.35	0.88	0.66
14	251	178	59	26	0	514	0.96	7.0	0.88	0.62
15	241	182	62	25	0	510	0.93	7.22	0.86	0.61
16	244	181	61	25	0	511	0.96	7.17	0.9	0.66
17	240	175	59	26	0	500	0.97	7.44	0.9	0.67
18	243	188	63	25	0	519	0.98	7.3	0.94	0.64
19	243	186	59	24	0	512	0.96	7.32	0.9	0.63
20	245	181	60	24	0	510	0.92	7.38	0.86	0.6

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

9.2.1 Bar graph : Distance Violation statistics for each model



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

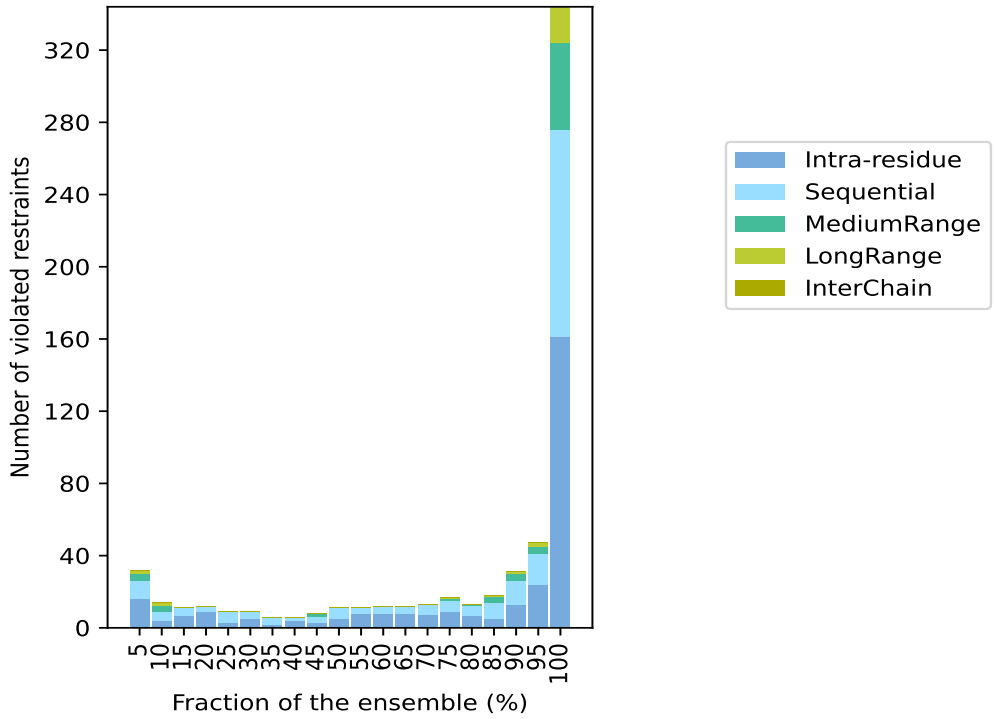
9.3 Distance violation statistics for the ensemble (i)

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, 770(IR:401, SQ:246, MR:83, LR:40, 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]	%
16	10	4	2	0	32	1	5.0
4	5	3	2	0	14	2	10.0
7	4	0	0	0	11	3	15.0
9	3	0	0	0	12	4	20.0
3	6	0	0	0	9	5	25.0
5	4	0	0	0	9	6	30.0
2	4	0	0	0	6	7	35.0
4	2	0	0	0	6	8	40.0
3	3	2	0	0	8	9	45.0
5	6	0	0	0	11	10	50.0
8	3	0	0	0	11	11	55.0
8	4	0	0	0	12	12	60.0
8	4	0	0	0	12	13	65.0
7	6	0	0	0	13	14	70.0
9	6	1	1	0	17	15	75.0
7	5	1	0	0	13	16	80.0
5	9	3	1	0	18	17	85.0
13	13	4	1	0	31	18	90.0
24	17	4	2	0	47	19	95.0
161	115	48	20	0	344	20	100.0

[1]Intra-residue restraints, [2]Sequential restraints, [3]Medium range restraints, [4]Long range restraints, [5]Inter-chain restraints, [6] Number of models with violations

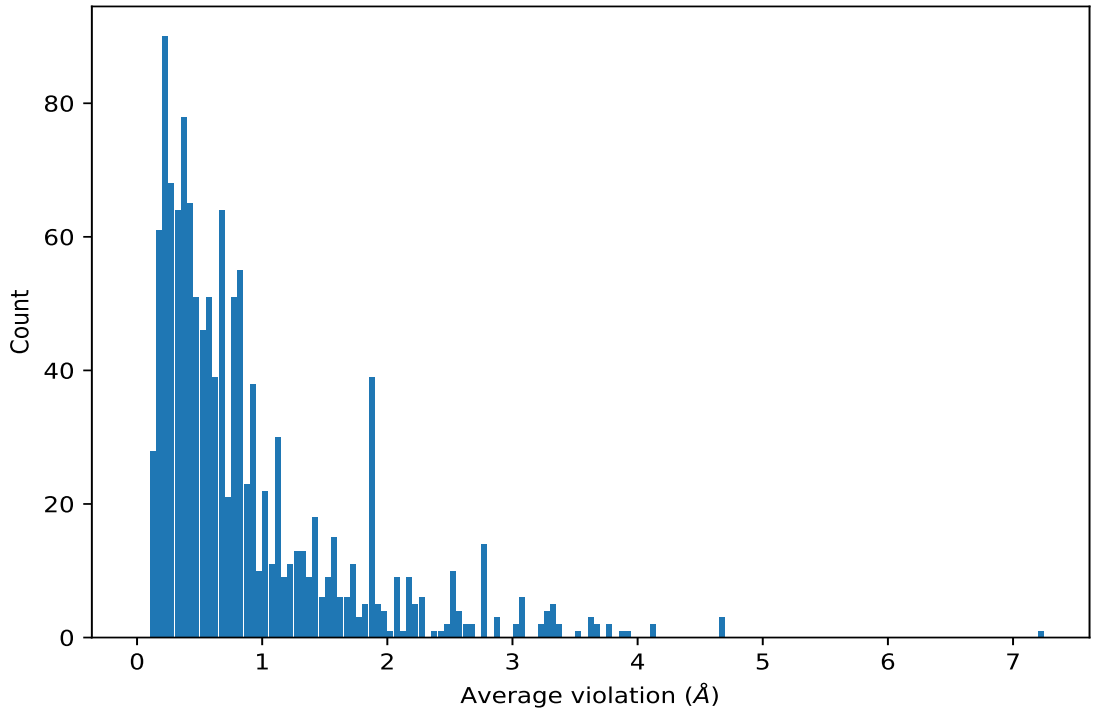
9.3.1 Bar graph : Distance violation statistics for the ensemble



9.4 Most violated distance restraints in the ensemble

9.4.1 Histogram : Distribution of mean distance violations

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

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.

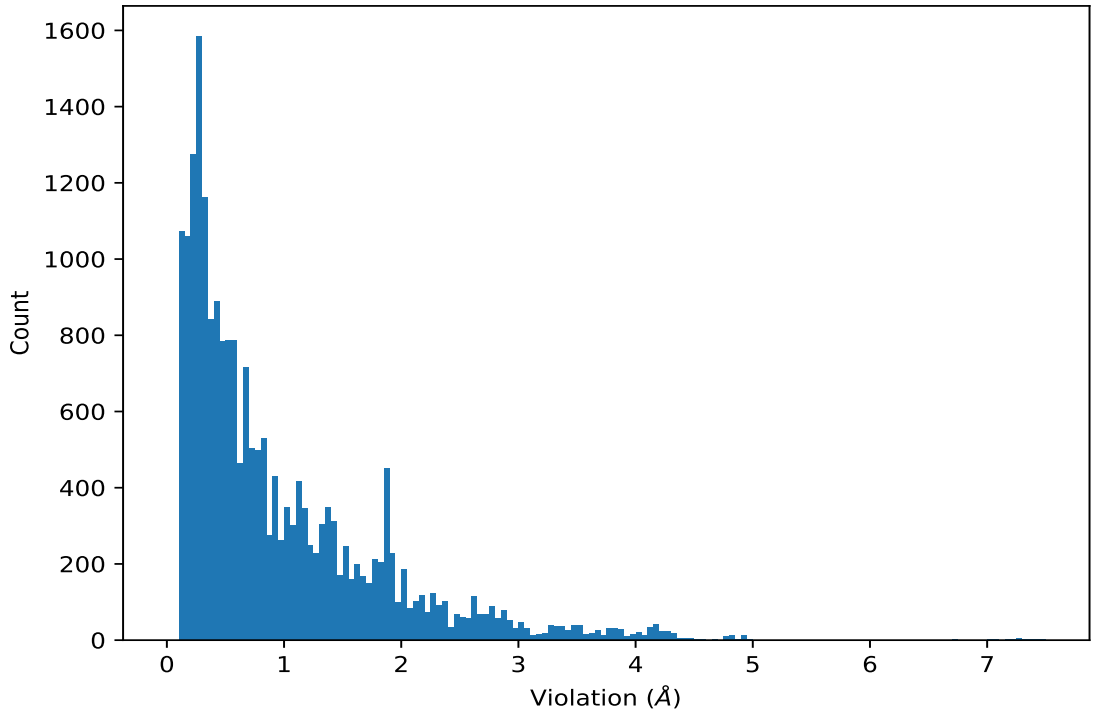
Key	Atom-1	Atom-2	Models[1]	Mean (Å)	SD[1] (Å)	Median (Å)
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	20	7.2	0.2	7.24
(1,1191)	1:A:129:ASN:H	1:A:131:ILE:HG21	20	4.69	0.27	4.81
(1,1191)	1:A:129:ASN:H	1:A:131:ILE:HG22	20	4.69	0.27	4.81
(1,1191)	1:A:129:ASN:H	1:A:131:ILE:HG23	20	4.69	0.27	4.81
(1,1234)	1:A:135:LYS:HG2	1:A:136:VAL:HA	20	4.12	0.06	4.12
(1,1234)	1:A:135:LYS:HG3	1:A:136:VAL:HA	20	4.12	0.06	4.12
(1,1055)	1:A:105:TRP:H	1:A:105:TRP:HZ2	20	3.91	0.32	4.12
(1,1243)	1:A:140:PHE:H	1:A:140:PHE:HZ	20	3.86	0.17	3.88
(1,754)	1:A:37:LEU:HG	1:A:42:VAL:H	20	3.8	0.46	3.98
(1,984)	1:A:92:ILE:H	1:A:128:ILE:HB	20	3.8	0.33	3.69
(1,897)	1:A:67:GLU:H	1:A:72:ARG:HG2	20	3.66	0.68	4.04
(1,897)	1:A:67:GLU:H	1:A:72:ARG:HG3	20	3.66	0.68	4.04
(1,1048)	1:A:104:ALA:HA	1:A:128:ILE:HG21	20	3.62	0.3	3.66
(1,1048)	1:A:104:ALA:HA	1:A:128:ILE:HG22	20	3.62	0.3	3.66
(1,1048)	1:A:104:ALA:HA	1:A:128:ILE:HG23	20	3.62	0.3	3.66
(1,880)	1:A:64:ARG:H	1:A:67:GLU:HA	20	3.5	0.7	3.79

[1]Number of violated models, [2]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)
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	4	7.47
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	17	7.44
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	20	7.38
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	13	7.35
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	19	7.32
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	11	7.31
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	1	7.3
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	18	7.3

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	8	7.27
(1,996)	1:A:95:TYR:H	1:A:110:ARG:HA	9	7.26

10 Dihedral-angle violation analysis (i)

No dihedral-angle restraints found