wwPDB NMR Structure Validation Summary Report (i)

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BMRB ID	:	34176
Title	:	NMR solution structure of murine CXCL12 gamma isoform
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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:

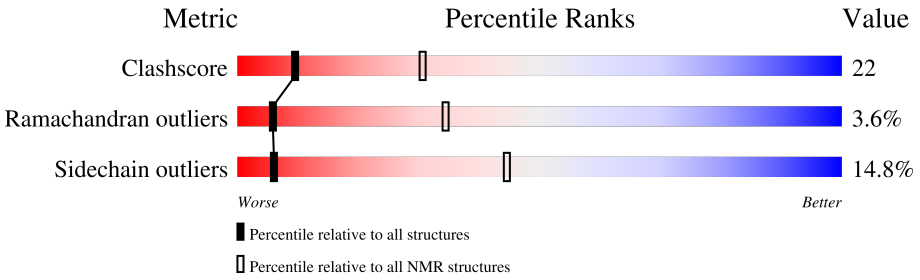
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
BMRB Restraints Analysis	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal 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 86%.

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	98	36% 19% • 41%

2 Ensemble composition and analysis (i)

This entry contains 20 models. Model 18 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:9-A:66 (58)	0.45	18

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. No single-model clusters were found.

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

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 1704 atoms, of which 891 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Stromal cell-derived factor 1.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	98	1704	511	891	166	132	4	0

4 Residue-property plots (i)

4.1 Average score per residue in the NMR ensemble

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

• Molecule 1: Stromal cell-derived factor 1

Chain A: 36% 19% • 41%

K1 P2 V3 S4 L5 S6 Y7 R8 C9 F14 I18 V23 K24 H25 L26 K27 I28 L29 N30 T31 P32 N33 Q37 I38 V39 A40 K43 I51 D52 P53 K54 L55 I58 Y61 L62 N67 K68 G69 R70 R71 E72 E73 K74 V75 G76 K77 K78 E79 K80 I81 G82

K83 K84 K85 R86 Q87 K88 K89 R90 K91 A92 A93 Q94 K95 R96 K97 N98

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

The representative model is number 18. Colouring as in section 4.1 above.

• Molecule 1: Stromal cell-derived factor 1

Chain A: 32% 23% • • 41%

K1 P2 V3 S4 L5 S6 Y7 R8 C9 I18 A19 R20 V23 K24 H25 L26 K27 I28 L29 N30 T31 P32 N33 Q37 I38 V39 A40 K43 V49 C50 I51 D52 P53 K54 L55 K56 W57 I58 Y61 L62 L66 N67 K68 G69 R70 R71 E72 E73 K74 V75 G76 K77 K78

E79 K80 I81 G82 K83 K84 K85 R86 Q87 K88 K89 R90 K91 A92 A93 Q94 K95 R96 K97 N98

5 Refinement protocol and experimental data overview (i)

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

Of the 20 calculated structures, 20 were deposited, based on the following criterion: *all calculated structures submitted*.

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

Software name	Classification	Version
CNS	refinement	
ARIA	structure calculation	

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	1021
Number of shifts mapped to atoms	1021
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	86%

6 Model quality (i)

6.1 Standard geometry (i)

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

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	476	498	496	22±3
All	All	9520	9960	9920	435

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 22.

5 of 97 unique clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:26:LEU:HD11	1:A:38:ILE:HG22	0.89	1.42	11	16
1:A:53:PRO:HA	1:A:58:ILE:HG21	0.72	1.61	4	20
1:A:26:LEU:HD21	1:A:38:ILE:HG22	0.71	1.63	10	4
1:A:32:PRO:O	1:A:33:ASN:HB3	0.65	1.91	11	1
1:A:23:VAL:CG2	1:A:40:ALA:HB1	0.63	2.24	7	20

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	58/98 (59%)	49±1 (85±2%)	7±1 (12±2%)	2±0 (4±1%)	6 34
All	All	1160/1960 (59%)	982 (85%)	136 (12%)	42 (4%)	6 34

All 5 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	33	ASN	20
1	A	32	PRO	19
1	A	36	LEU	1
1	A	25	HIS	1
1	A	10	PRO	1

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	53/88 (60%)	45±1 (85±3%)	8±1 (15±3%)	6 44
All	All	1060/1760 (60%)	903 (85%)	157 (15%)	6 44

5 of 24 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	29	LEU	20
1	A	25	HIS	19
1	A	62	LEU	18
1	A	14	PHE	16
1	A	31	THR	13

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 86% for the well-defined parts and 69% for the entire structure.

7.1 Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *shifts_starch.nmrstar*

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	1021
Number of shifts mapped to atoms	1021
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	1

7.1.2 Chemical shift referencing (i)

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_{\alpha}$	95	-0.05 ± 0.16	None needed (< 0.5 ppm)
$^{13}C_{\beta}$	91	0.04 ± 0.13	None needed (< 0.5 ppm)
$^{13}C'$	61	-0.04 ± 0.09	None needed (< 0.5 ppm)
^{15}N	91	-0.11 ± 0.29	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 86%, i.e. 737 atoms were assigned a chemical shift out of a possible 860. 0 out of 10 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	279/284 (98%)	113/113 (100%)	111/116 (96%)	55/55 (100%)
Sidechain	420/519 (81%)	276/336 (82%)	135/156 (87%)	9/27 (33%)

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	Total	^{1}H	^{13}C	^{15}N
Aromatic	38/57 (67%)	21/28 (75%)	16/24 (67%)	1/5 (20%)
Overall	737/860 (86%)	410/477 (86%)	262/296 (89%)	65/87 (75%)

7.1.4 Statistically unusual chemical shifts (i)

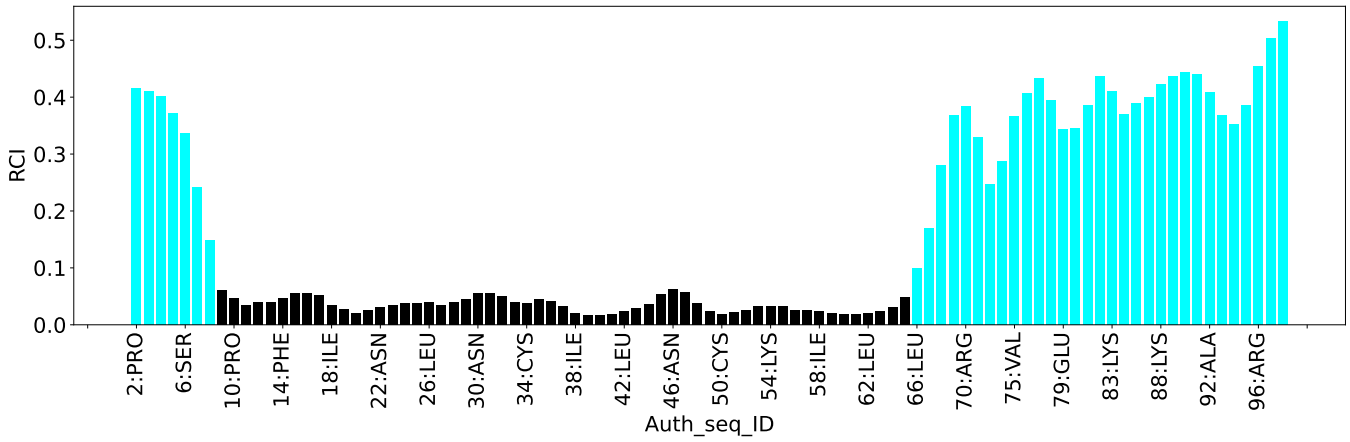
The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, *ppm*	Expected range, *ppm*	Z-score
1	A	20	ARG	HB2	0.33	0.52 – 3.08	-5.7

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 (i)

8.1 Conformationally restricting restraints (i)

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	1499
Intra-residue (|i-j|=0)	665
Sequential (|i-j|=1)	316
Medium range (|i-j|>1 and |i-j|<5)	222
Long range (|i-j|≥5)	296
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	15.3
Number of long range restraints per residue[1]	3.0

[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 (i)

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 (i)

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)	63.5	0.2
0.2-0.5 (Medium)	58.6	0.5
>0.5 (Large)	69.4	2.53

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)

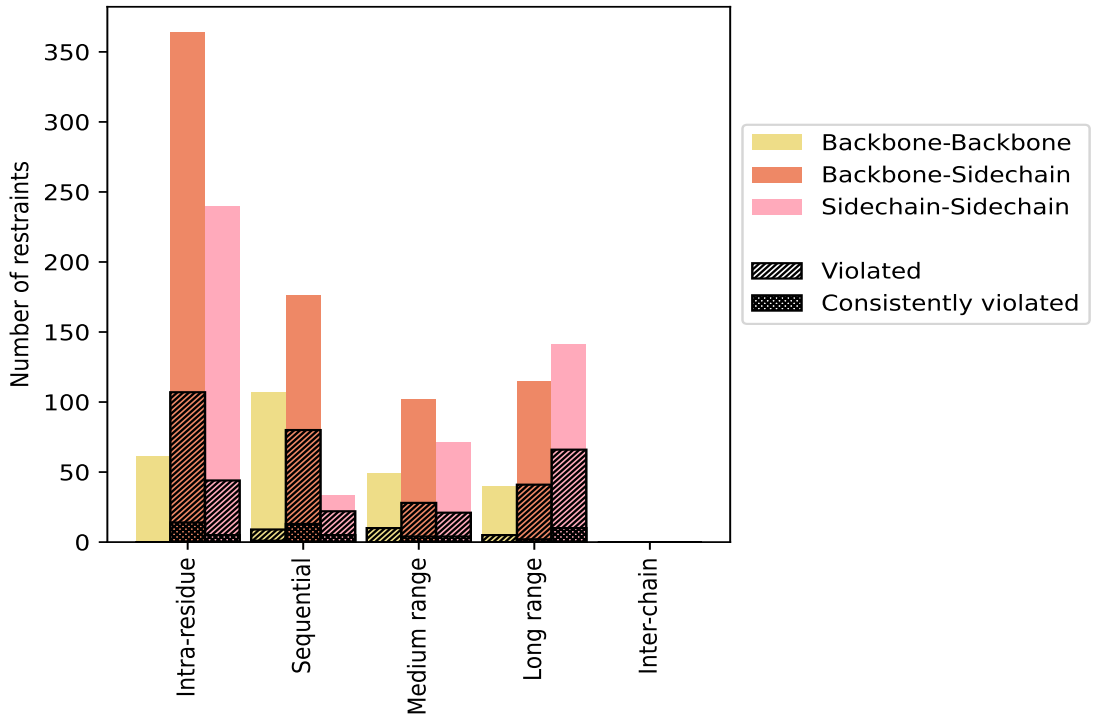
9.1 Summary of distance violations (i)

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)	665	44.4	151	22.7	10.1	19	2.9	1.3
Backbone-Backbone	61	4.1	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	364	24.3	107	29.4	7.1	14	3.8	0.9
Sidechain-Sidechain	240	16.0	44	18.3	2.9	5	2.1	0.3
Sequential (|i-j|=1)	316	21.1	111	35.1	7.4	19	6.0	1.3
Backbone-Backbone	107	7.1	9	8.4	0.6	1	0.9	0.1
Backbone-Sidechain	176	11.7	80	45.5	5.3	13	7.4	0.9
Sidechain-Sidechain	33	2.2	22	66.7	1.5	5	15.2	0.3
Medium range (|i-j|>1 & |i-j|<5)	222	14.8	59	26.6	3.9	8	3.6	0.5
Backbone-Backbone	49	3.3	10	20.4	0.7	0	0.0	0.0
Backbone-Sidechain	102	6.8	28	27.5	1.9	4	3.9	0.3
Sidechain-Sidechain	71	4.7	21	29.6	1.4	4	5.6	0.3
Long range (|i-j|≥5)	296	19.7	112	37.8	7.5	12	4.1	0.8
Backbone-Backbone	40	2.7	5	12.5	0.3	0	0.0	0.0
Backbone-Sidechain	115	7.7	41	35.7	2.7	2	1.7	0.1
Sidechain-Sidechain	141	9.4	66	46.8	4.4	10	7.1	0.7
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	1499	100.0	433	28.9	28.9	58	3.9	3.9
Backbone-Backbone	257	17.1	24	9.3	1.6	1	0.4	0.1
Backbone-Sidechain	757	50.5	256	33.8	17.1	33	4.4	2.2
Sidechain-Sidechain	485	32.4	153	31.5	10.2	24	4.9	1.6

[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 (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	70	42	26	38	0	176	0.51	1.71	0.44	0.31
2	70	56	25	65	0	216	0.57	2.53	0.5	0.38
3	71	50	23	41	0	185	0.48	1.92	0.4	0.31
4	68	48	21	36	0	173	0.47	1.87	0.41	0.26
5	70	54	21	45	0	190	0.47	1.88	0.4	0.3
6	82	46	24	53	0	205	0.53	1.73	0.44	0.39
7	68	44	27	40	0	179	0.49	1.88	0.43	0.32
8	71	50	28	42	0	191	0.5	2.5	0.43	0.34
9	75	54	27	44	0	200	0.48	1.89	0.4	0.33
10	69	49	31	49	0	198	0.56	1.72	0.43	0.4
11	63	47	28	44	0	182	0.51	2.2	0.45	0.32

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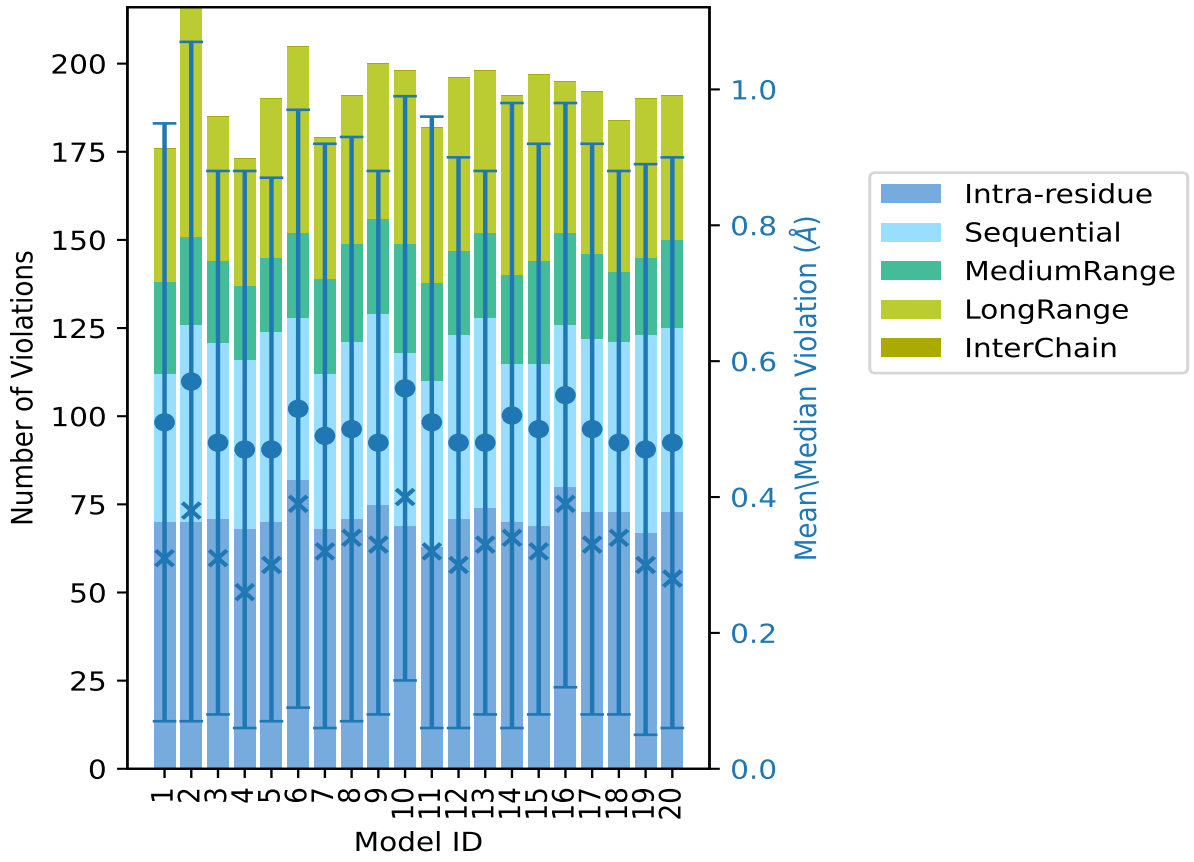
Model ID	Number of violations						Mean (Å)	Max (Å)	SD[6] (Å)	Median (Å)
	IR[1]	SQ[2]	MR[3]	LR[4]	IC[5]	Total				
12	71	52	24	49	0	196	0.48	1.84	0.42	0.3
13	74	54	24	46	0	198	0.48	1.85	0.4	0.33
14	70	45	25	51	0	191	0.52	2.51	0.46	0.34
15	69	46	29	53	0	197	0.5	1.88	0.42	0.32
16	80	46	26	43	0	195	0.55	1.96	0.43	0.39
17	73	49	24	46	0	192	0.5	1.9	0.42	0.33
18	73	48	20	43	0	184	0.48	2.07	0.4	0.34
19	67	56	22	45	0	190	0.47	2.51	0.42	0.3
20	73	52	25	41	0	191	0.48	1.89	0.42	0.28

[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 (i)



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

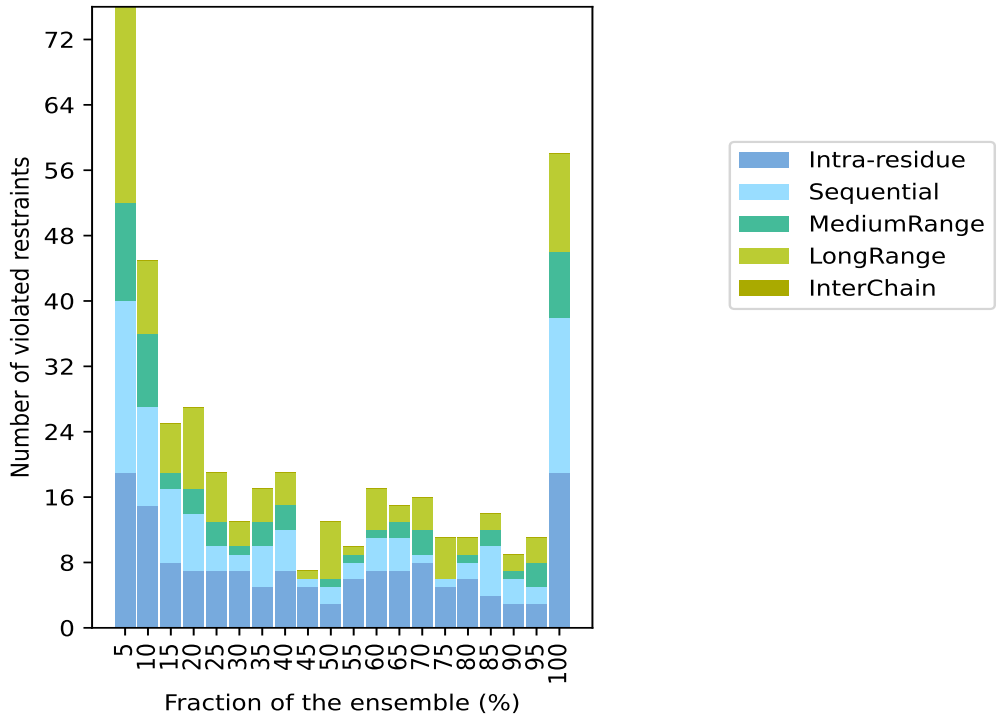
9.3 Distance violation statistics for the ensemble (i)

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, 1066(IR:514, SQ:205, MR:163, LR:184, 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]	%
19	21	12	24	0	76	1	5.0
15	12	9	9	0	45	2	10.0
8	9	2	6	0	25	3	15.0
7	7	3	10	0	27	4	20.0
7	3	3	6	0	19	5	25.0
7	2	1	3	0	13	6	30.0
5	5	3	4	0	17	7	35.0
7	5	3	4	0	19	8	40.0
5	1	0	1	0	7	9	45.0
3	2	1	7	0	13	10	50.0
6	2	1	1	0	10	11	55.0
7	4	1	5	0	17	12	60.0
7	4	2	2	0	15	13	65.0
8	1	3	4	0	16	14	70.0
5	1	0	5	0	11	15	75.0
6	2	1	2	0	11	16	80.0
4	6	2	2	0	14	17	85.0
3	3	1	2	0	9	18	90.0
3	2	3	3	0	11	19	95.0
19	19	8	12	0	58	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

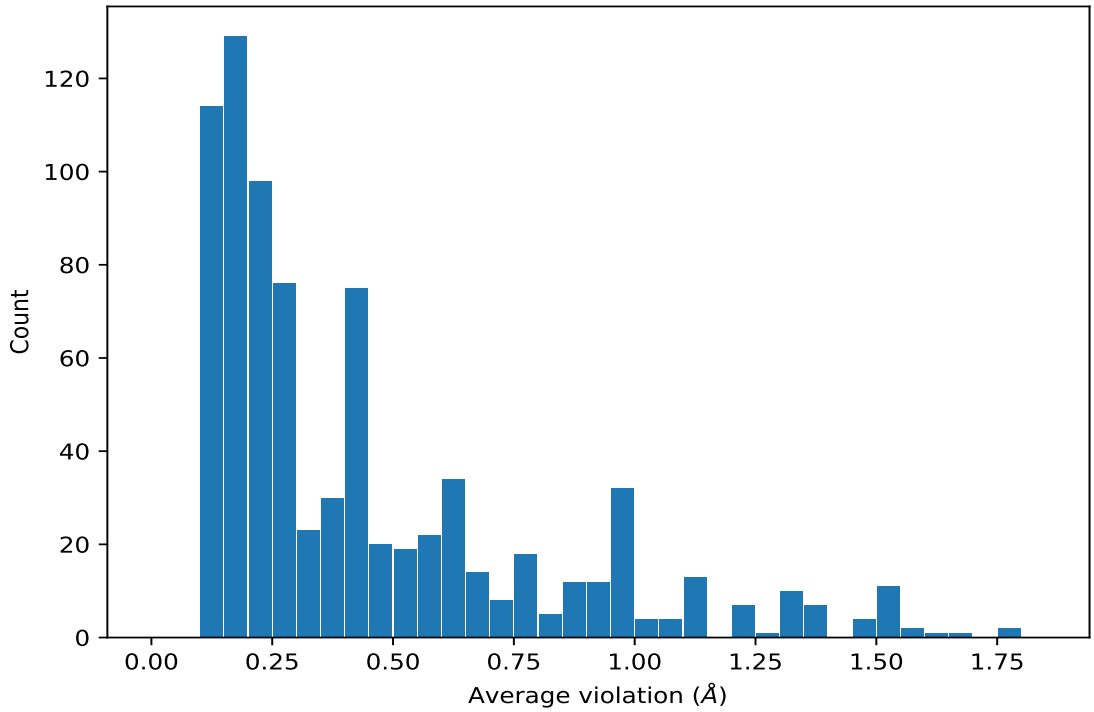
9.3.1 Bar graph : Distance violation statistics for the ensemble (i)



9.4 Most violated distance restraints in the ensemble (i)

9.4.1 Histogram : Distribution of mean distance violations (i)

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



9.4.2 Table: Most violated distance restraints (i)

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

Key	Atom-1	Atom-2	Models[1]	Mean (Å)	SD[1] (Å)	Median (Å)
(3,278)	1:A:61:TYR:HB2	1:A:62:LEU:HB3	20	1.78	0.14	1.85
(3,278)	1:A:61:TYR:HB2	1:A:64:LYS:HB3	20	1.78	0.14	1.85
(1,250)	1:A:31:THR:H	1:A:29:LEU:HB2	20	1.66	0.03	1.65
(1,556)	1:A:66:LEU:H	1:A:67:ASN:HD22	20	1.58	0.14	1.6
(1,171)	1:A:61:TYR:H	1:A:62:LEU:HB3	20	1.57	0.04	1.57
(1,1186)	1:A:61:TYR:HA	1:A:64:LYS:HB3	20	1.5	0.26	1.64
(1,1165)	1:A:58:ILE:HG23	1:A:62:LEU:HB3	20	1.47	0.05	1.46
(1,1165)	1:A:58:ILE:HG22	1:A:62:LEU:HB3	20	1.47	0.05	1.46
(1,1165)	1:A:58:ILE:HG21	1:A:62:LEU:HB3	20	1.47	0.05	1.46
(1,605)	1:A:62:LEU:HA	1:A:61:TYR:HB2	20	1.46	0.02	1.46
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	20	1.35	0.63	1.2
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	20	1.35	0.63	1.2
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	20	1.35	0.63	1.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	20	1.35	0.63	1.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	20	1.35	0.63	1.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	20	1.35	0.63	1.2

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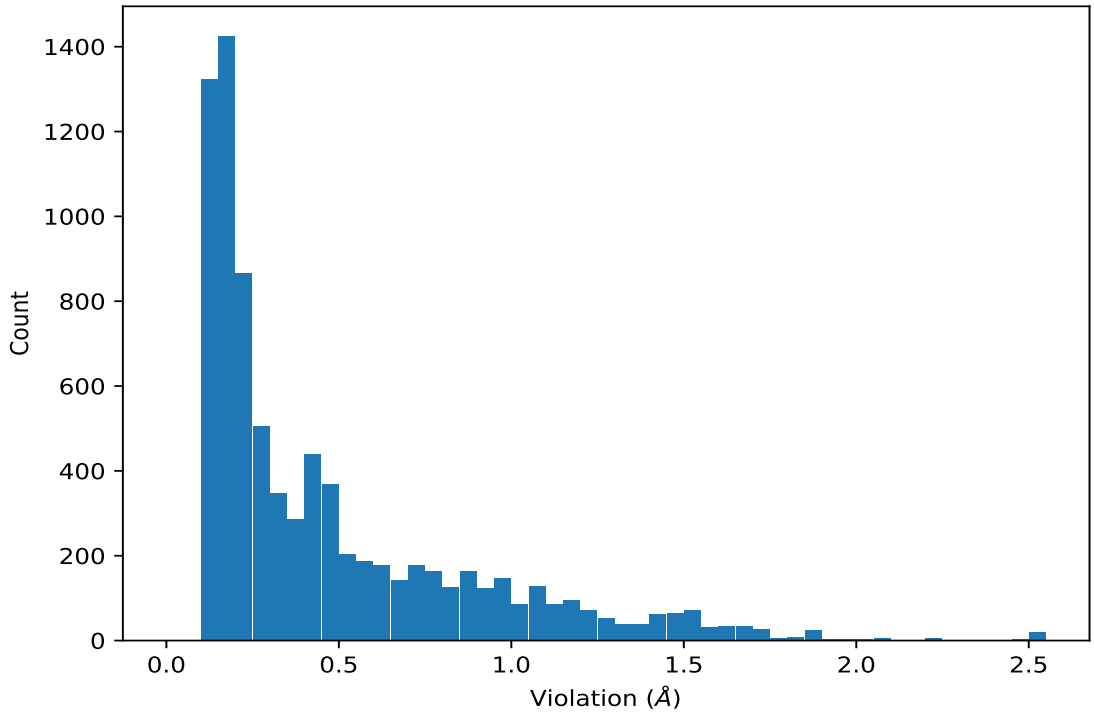
Key	Atom-1	Atom-2	Models[1]	Mean (Å)	SD[1] (Å)	Median (Å)
(1,685)	1:A:10:PRO:HD3	1:A:9:CYS:HB2	20	1.32	0.31	1.42
(1,549)	1:A:59:GLN:H	1:A:62:LEU:HB3	20	1.25	0.07	1.23

[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)
(1,1101)	1:A:48:GLN:HB3	1:A:39:VAL:HG23	2	2.53
(1,1101)	1:A:48:GLN:HB3	1:A:39:VAL:HG21	2	2.53
(1,1101)	1:A:48:GLN:HB3	1:A:39:VAL:HG22	2	2.53

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	14	2.51
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	14	2.51
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	14	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	14	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	14	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	14	2.51
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	19	2.51
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	19	2.51
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	19	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	19	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	19	2.51
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	19	2.51
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	8	2.5
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	8	2.5
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	8	2.5
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	8	2.5
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	8	2.5
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	8	2.5
(1,1039)	1:A:49:VAL:H	1:A:39:VAL:HG23	2	2.48
(1,1039)	1:A:49:VAL:H	1:A:39:VAL:HG21	2	2.48
(1,1039)	1:A:49:VAL:H	1:A:39:VAL:HG22	2	2.48
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	11	2.2
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	11	2.2
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	11	2.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	11	2.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	11	2.2
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	11	2.2
(3,280)	1:A:66:LEU:HD11	1:A:36:LEU:HB3	18	2.07
(3,280)	1:A:66:LEU:HD12	1:A:36:LEU:HB3	18	2.07
(3,280)	1:A:66:LEU:HD13	1:A:36:LEU:HB3	18	2.07
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD11	18	2.07
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD12	18	2.07
(3,280)	1:A:62:LEU:HB2	1:A:66:LEU:HD13	18	2.07
(1,1046)	1:A:39:VAL:HG12	1:A:27:LYS:HG3	2	2.02
(1,1046)	1:A:39:VAL:HG11	1:A:27:LYS:HG3	2	2.02
(1,1046)	1:A:39:VAL:HG13	1:A:27:LYS:HG3	2	2.02
(1,1047)	1:A:39:VAL:HB	1:A:29:LEU:HB3	2	1.98
(1,849)	1:A:41:ARG:HB2	1:A:25:HIS:HB2	14	1.96

10 Dihedral-angle violation analysis (i)

No dihedral-angle restraints found