



# Full wwPDB NMR Structure Validation Report ⓘ

Jan 27, 2025 – 04:09 PM JST

PDB ID : 8XLC  
BMRB ID : 36634  
Title : Clamda1 domain of human immunoglobulin  
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Deposited on : 2023-12-25

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

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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>.

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

MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
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) : 2.40

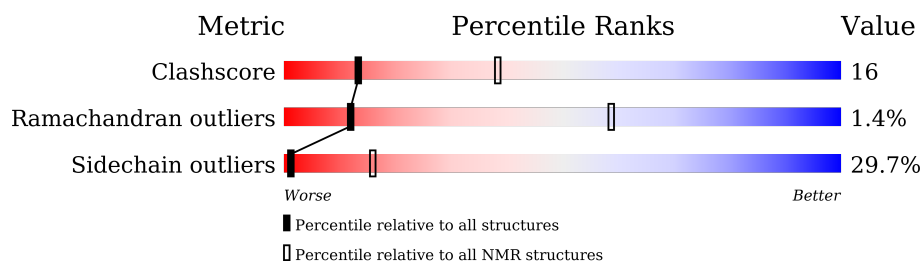
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*SOLUTION NMR*

The overall completeness of chemical shifts assignment is 94%.

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	210492	14027
Ramachandran outliers	207382	12486
Sidechain outliers	206894	12463

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

Mol	Chain	Length	Quality of chain
1	A	111	

## 2 Ensemble composition and analysis

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

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:4-A:101 (98)	0.23	12

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

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

The models can be grouped into 4 clusters and 5 single-model clusters were found.

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

### 3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1663 atoms, of which 817 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Immunoglobulin lambda constant 2.

Mol	Chain	Residues	Atoms						Trace
1	A	111	Total	C	H	N	O	S	0
			1663	532	817	138	174	2	

There are 8 discrepancies between the modelled and reference sequences:

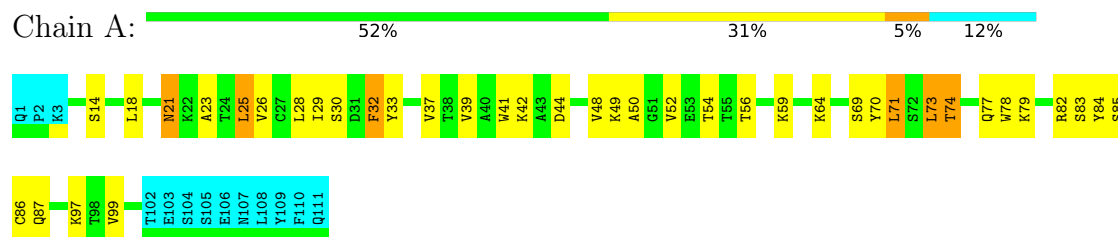
Chain	Residue	Modelled	Actual	Comment	Reference
A	104	SER	-	expression tag	UNP P0DOY2
A	105	SER	-	expression tag	UNP P0DOY2
A	106	GLU	-	expression tag	UNP P0DOY2
A	107	ASN	-	expression tag	UNP P0DOY2
A	108	LEU	-	expression tag	UNP P0DOY2
A	109	TYR	-	expression tag	UNP P0DOY2
A	110	PHE	-	expression tag	UNP P0DOY2
A	111	GLN	-	expression tag	UNP P0DOY2

## 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: Immunoglobulin lambda constant 2

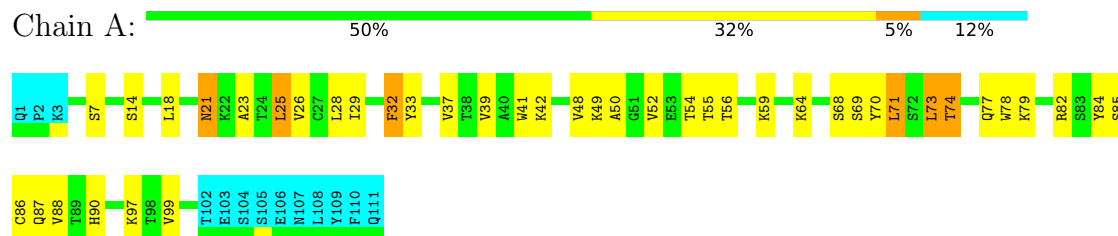


### 4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

#### 4.2.1 Score per residue for model 1

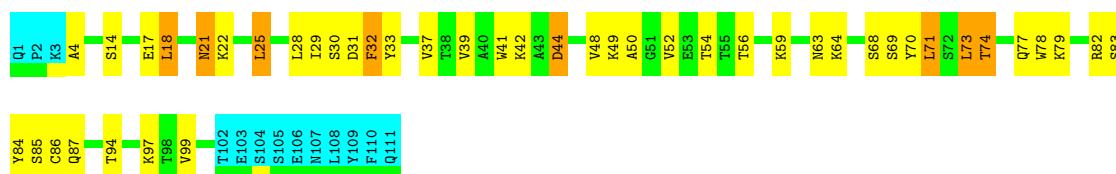
- Molecule 1: Immunoglobulin lambda constant 2



#### 4.2.2 Score per residue for model 2

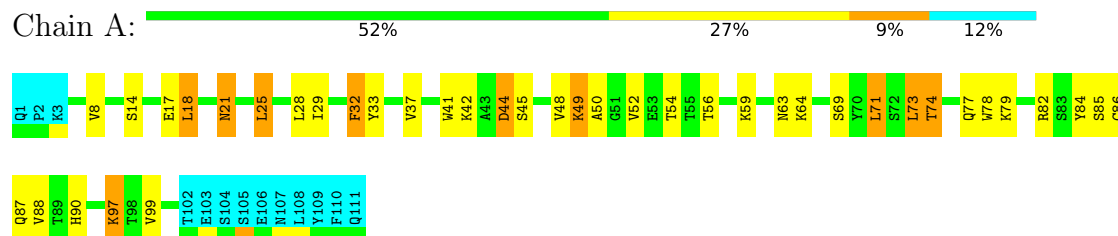
- Molecule 1: Immunoglobulin lambda constant 2





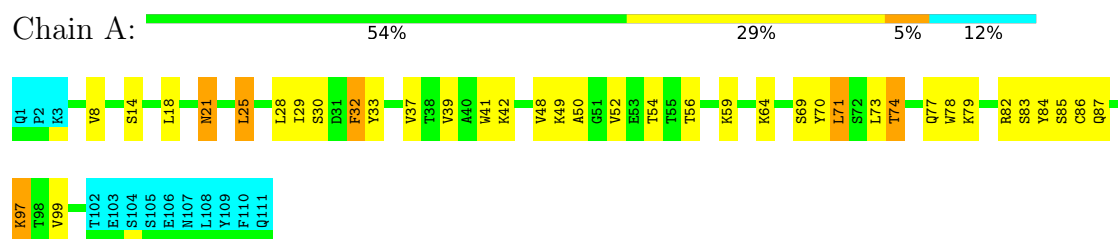
#### 4.2.3 Score per residue for model 3

- Molecule 1: Immunoglobulin lambda constant 2



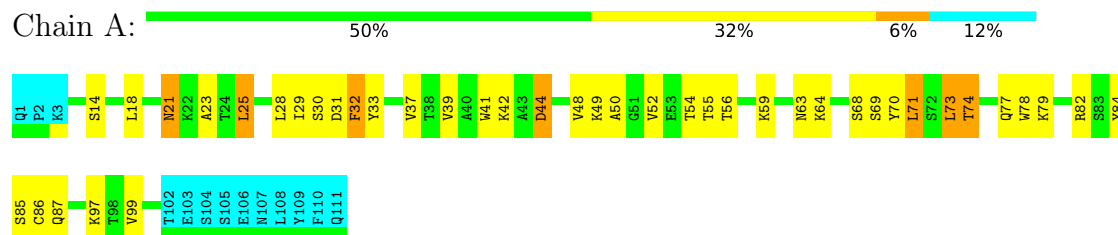
#### 4.2.4 Score per residue for model 4

- Molecule 1: Immunoglobulin lambda constant 2



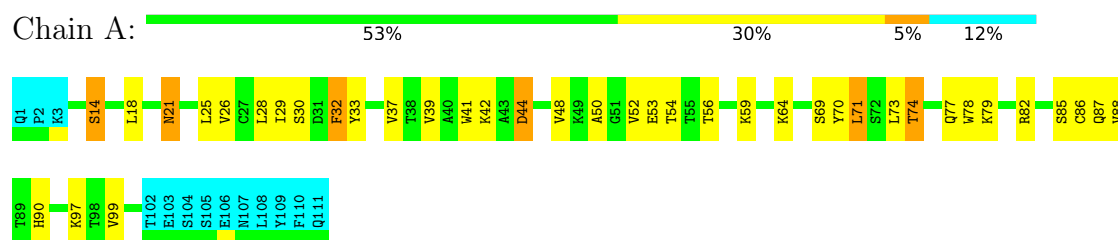
#### 4.2.5 Score per residue for model 5

- Molecule 1: Immunoglobulin lambda constant 2



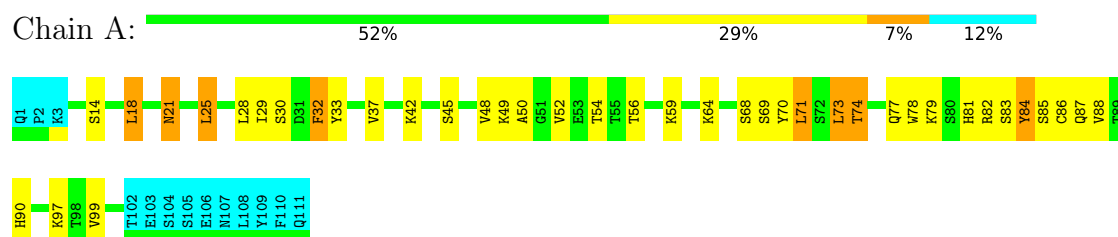
#### 4.2.6 Score per residue for model 6

- Molecule 1: Immunoglobulin lambda constant 2



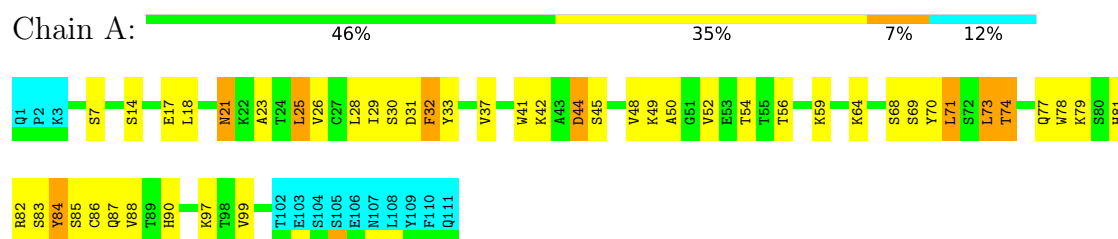
#### 4.2.7 Score per residue for model 7

- Molecule 1: Immunoglobulin lambda constant 2



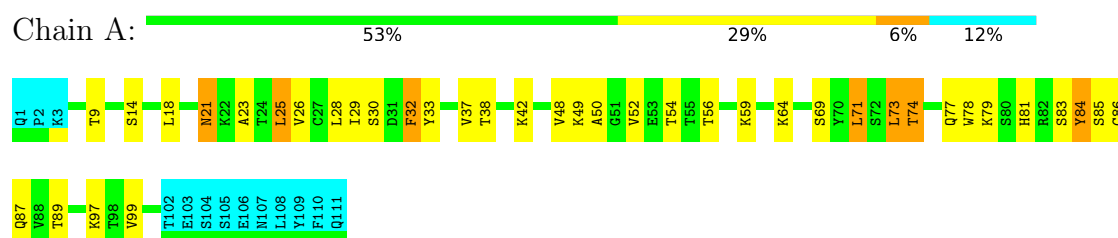
#### 4.2.8 Score per residue for model 8

- Molecule 1: Immunoglobulin lambda constant 2



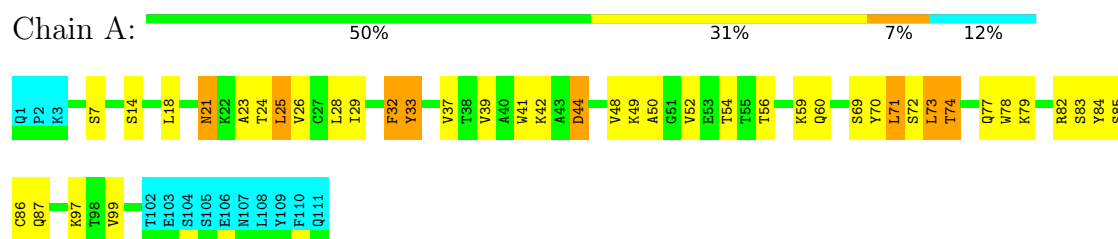
#### 4.2.9 Score per residue for model 9

- Molecule 1: Immunoglobulin lambda constant 2



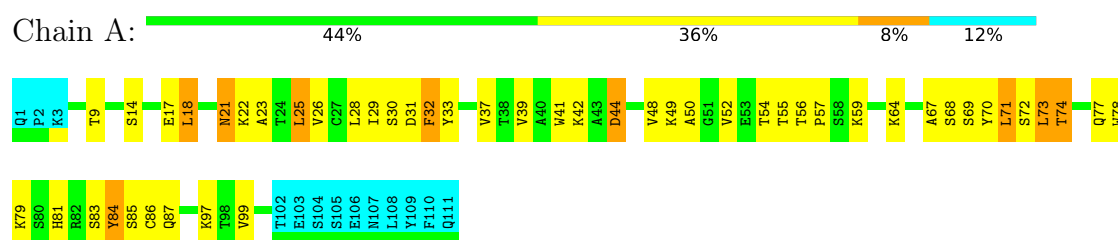
### 4.2.10 Score per residue for model 10

- Molecule 1: Immunoglobulin lambda constant 2



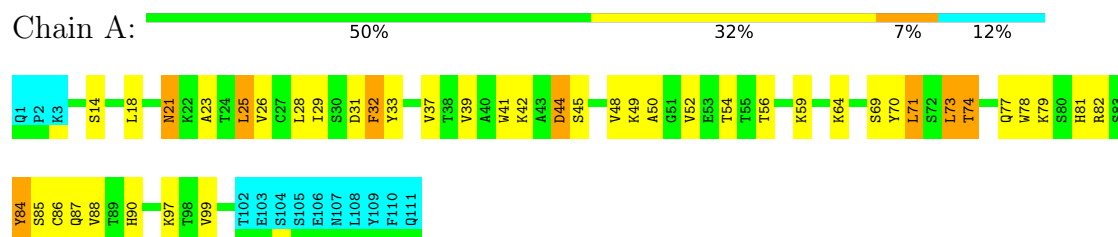
### 4.2.11 Score per residue for model 11

- Molecule 1: Immunoglobulin lambda constant 2



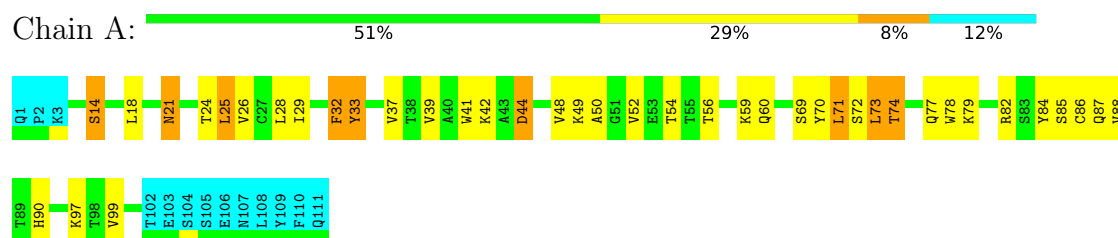
### 4.2.12 Score per residue for model 12 (medoid)

- Molecule 1: Immunoglobulin lambda constant 2



### 4.2.13 Score per residue for model 13

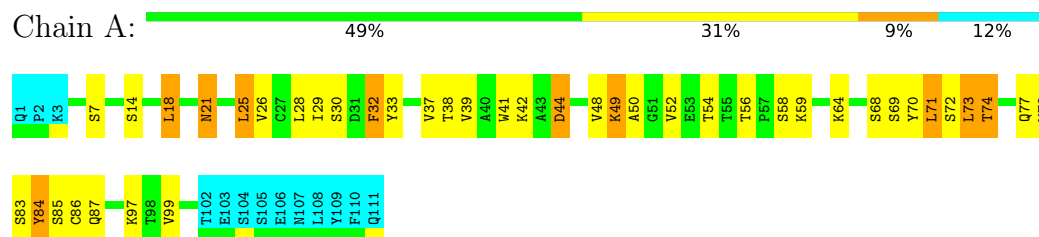
- Molecule 1: Immunoglobulin lambda constant 2





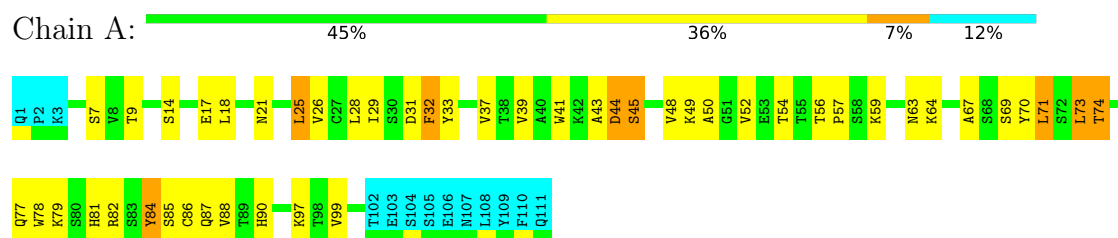
### 4.2.14 Score per residue for model 14

- Molecule 1: Immunoglobulin lambda constant 2



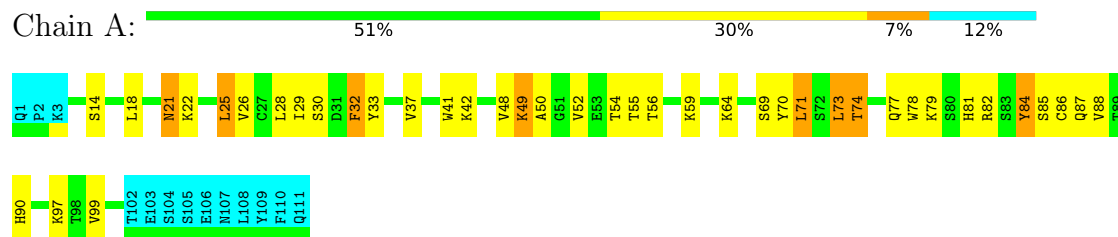
### 4.2.15 Score per residue for model 15

- Molecule 1: Immunoglobulin lambda constant 2



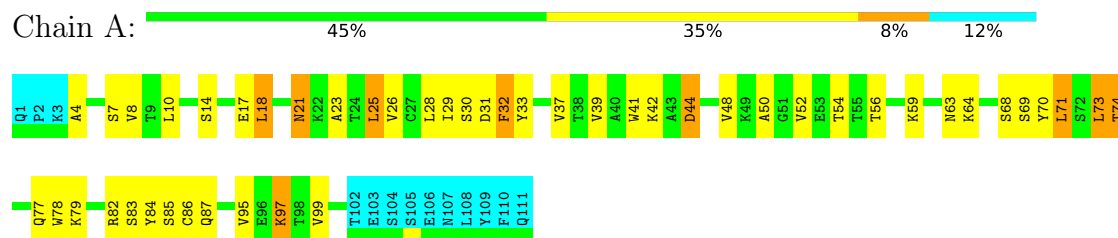
### 4.2.16 Score per residue for model 16

- Molecule 1: Immunoglobulin lambda constant 2



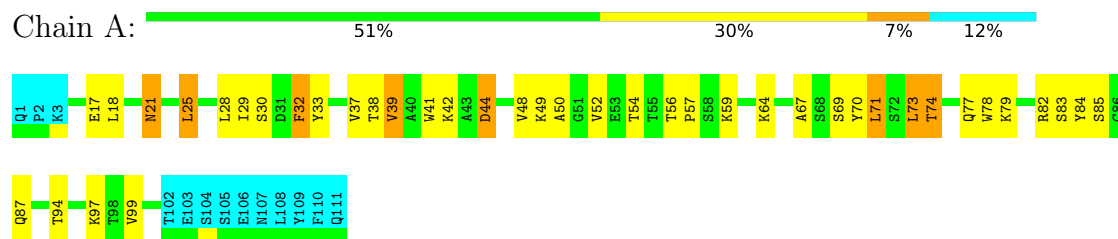
### 4.2.17 Score per residue for model 17

- Molecule 1: Immunoglobulin lambda constant 2



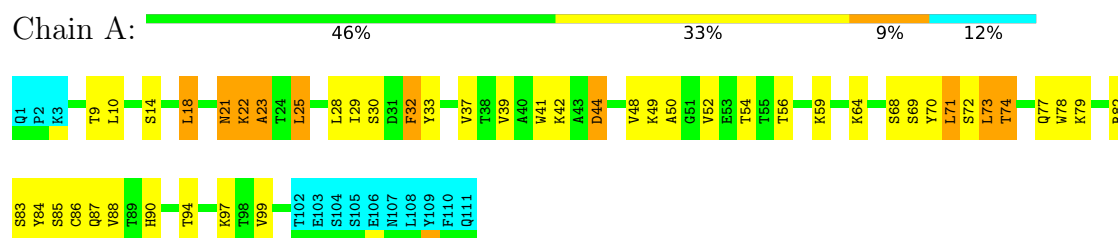
### 4.2.18 Score per residue for model 18

- Molecule 1: Immunoglobulin lambda constant 2



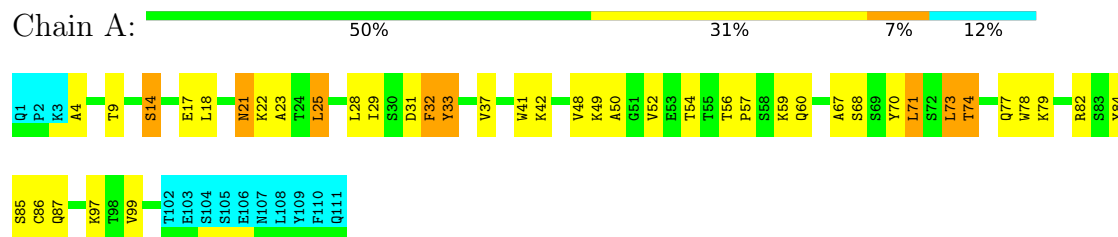
### 4.2.19 Score per residue for model 19

- Molecule 1: Immunoglobulin lambda constant 2



### 4.2.20 Score per residue for model 20

- Molecule 1: Immunoglobulin lambda constant 2



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *distance geometry*.

Of the 40 calculated structures, 20 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
ARTINA	refinement	
ARTINA	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	1341
Number of shifts mapped to atoms	1341
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	94%

## 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	736	717	717	23±3
All	All	14720	14340	14340	461

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 16.

All unique clashes are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:52:VAL:HG13	1:A:71:LEU:HD12	1.01	1.31	12	12
1:A:52:VAL:HG13	1:A:71:LEU:HD22	0.81	1.50	16	8
1:A:21:ASN:CG	1:A:21:ASN:O	0.73	2.26	19	20
1:A:73:LEU:HD21	1:A:84:TYR:OH	0.70	1.85	14	14
1:A:18:LEU:HD11	1:A:78:TRP:CZ3	0.67	2.25	9	20
1:A:52:VAL:HG12	1:A:70:TYR:O	0.66	1.89	18	17
1:A:32:PHE:CD1	1:A:37:VAL:HG11	0.64	2.27	7	20
1:A:41:TRP:O	1:A:48:VAL:HG12	0.61	1.96	18	18
1:A:24:THR:HG23	1:A:71:LEU:O	0.61	1.94	13	2
1:A:26:VAL:HG22	1:A:70:TYR:CB	0.60	2.26	14	8
1:A:28:LEU:O	1:A:29:ILE:HD13	0.60	1.95	14	20
1:A:39:VAL:HG11	1:A:54:THR:HG21	0.60	1.74	18	1
1:A:25:LEU:HD13	1:A:84:TYR:CD2	0.60	2.32	16	19
1:A:52:VAL:HG13	1:A:71:LEU:CD2	0.59	2.28	10	7

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:32:PHE:C	1:A:32:PHE:CD2	0.57	2.78	6	18
1:A:54:THR:HG21	1:A:69:SER:HA	0.56	1.76	15	18
1:A:41:TRP:HB2	1:A:71:LEU:HD13	0.56	1.78	1	6
1:A:32:PHE:CD2	1:A:32:PHE:C	0.56	2.78	5	2
1:A:39:VAL:HG23	1:A:69:SER:HB2	0.54	1.79	17	11
1:A:52:VAL:CG1	1:A:71:LEU:HD12	0.54	2.32	9	5
1:A:39:VAL:HG23	1:A:69:SER:CB	0.53	2.34	17	12
1:A:48:VAL:HG13	1:A:50:ALA:H	0.53	1.64	16	20
1:A:50:ALA:HA	1:A:71:LEU:HD11	0.53	1.79	8	8
1:A:81:HIS:CD2	1:A:81:HIS:C	0.53	2.82	16	8
1:A:18:LEU:HD11	1:A:78:TRP:CE3	0.53	2.39	10	8
1:A:41:TRP:CB	1:A:71:LEU:HD13	0.52	2.34	1	5
1:A:74:THR:HG22	1:A:77:GLN:HG2	0.52	1.82	16	20
1:A:32:PHE:CE1	1:A:37:VAL:HG11	0.51	2.40	20	4
1:A:28:LEU:C	1:A:29:ILE:HD13	0.51	2.25	18	17
1:A:32:PHE:CE1	1:A:37:VAL:HG21	0.51	2.41	18	17
1:A:26:VAL:HG22	1:A:70:TYR:HB3	0.51	1.82	13	5
1:A:25:LEU:HD13	1:A:84:TYR:CE2	0.51	2.41	16	5
1:A:71:LEU:HD23	1:A:73:LEU:CD2	0.49	2.37	17	3
1:A:14:SER:O	1:A:18:LEU:HD12	0.49	2.07	6	3
1:A:52:VAL:HG13	1:A:71:LEU:CD1	0.49	2.34	9	3
1:A:39:VAL:HG12	1:A:69:SER:HB2	0.48	1.85	18	1
1:A:39:VAL:HG21	1:A:54:THR:OG1	0.47	2.09	18	1
1:A:24:THR:HG23	1:A:71:LEU:C	0.47	2.29	13	2
1:A:22:LYS:O	1:A:23:ALA:HB2	0.47	2.10	19	1
1:A:54:THR:HG21	1:A:68:SER:O	0.46	2.09	20	1
1:A:26:VAL:HG13	1:A:69:SER:O	0.46	2.11	8	4
1:A:57:PRO:HB3	1:A:67:ALA:HB2	0.45	1.87	20	4
1:A:71:LEU:HD23	1:A:73:LEU:HG	0.45	1.88	3	1
1:A:39:VAL:HG22	1:A:52:VAL:HG21	0.45	1.87	6	1
1:A:4:ALA:HB1	1:A:31:ASP:OD1	0.45	2.12	20	3
1:A:8:VAL:HG21	1:A:97:LYS:HE2	0.45	1.88	4	2
1:A:88:VAL:HG13	1:A:90:HIS:HD2	0.44	1.73	12	10
1:A:49:LYS:O	1:A:50:ALA:HB3	0.44	2.13	14	6
1:A:26:VAL:HG23	1:A:69:SER:O	0.44	2.13	9	2
1:A:41:TRP:CB	1:A:71:LEU:HD23	0.44	2.42	19	2
1:A:48:VAL:O	1:A:49:LYS:C	0.43	2.57	9	8
1:A:71:LEU:HD12	1:A:73:LEU:HG	0.43	1.90	18	4
1:A:32:PHE:HE1	1:A:37:VAL:HG21	0.43	1.73	13	7
1:A:8:VAL:HG13	1:A:8:VAL:O	0.42	2.14	3	1
1:A:41:TRP:CG	1:A:71:LEU:HD23	0.42	2.49	6	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:8:VAL:CG2	1:A:95:VAL:HG21	0.42	2.44	17	1
1:A:71:LEU:HD12	1:A:73:LEU:CD2	0.42	2.45	20	1
1:A:88:VAL:HG13	1:A:90:HIS:CD2	0.41	2.50	12	3
1:A:41:TRP:HB2	1:A:71:LEU:HD23	0.41	1.92	19	2
1:A:10:LEU:HD11	1:A:97:LYS:HD3	0.41	1.91	17	1
1:A:9:THR:O	1:A:10:LEU:HD23	0.41	2.16	19	1
1:A:38:THR:HG22	1:A:89:THR:N	0.41	2.30	9	1
1:A:39:VAL:HG23	1:A:69:SER:OG	0.41	2.16	17	3
1:A:43:ALA:O	1:A:45:SER:N	0.41	2.54	15	1

## 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	98/111 (88%)	87±1 (89±1%)	9±1 (9±1%)	1±1 (1±1%)	12	59
All	All	1960/2220 (88%)	1748 (89%)	185 (9%)	27 (1%)	12	59

All 3 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	44	ASP	14
1	A	23	ALA	10
1	A	33	TYR	3

### 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	84/97 (87%)	59±3 (70±3%)	25±3 (30±3%)	1	16
All	All	1680/1940 (87%)	1181 (70%)	499 (30%)	1	16

All 41 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	25	LEU	20
1	A	32	PHE	20
1	A	33	TYR	20
1	A	56	THR	20
1	A	59	LYS	20
1	A	71	LEU	20
1	A	73	LEU	20
1	A	74	THR	20
1	A	79	LYS	20
1	A	85	SER	20
1	A	87	GLN	20
1	A	97	LYS	20
1	A	99	VAL	20
1	A	14	SER	19
1	A	21	ASN	19
1	A	42	LYS	19
1	A	86	CYS	19
1	A	64	LYS	17
1	A	82	ARG	17
1	A	44	ASP	14
1	A	30	SER	13
1	A	83	SER	11
1	A	68	SER	9
1	A	49	LYS	9
1	A	17	GLU	8
1	A	84	TYR	8
1	A	18	LEU	7
1	A	7	SER	6
1	A	22	LYS	5
1	A	63	ASN	5
1	A	45	SER	5
1	A	31	ASP	5
1	A	72	SER	5
1	A	55	THR	4
1	A	9	THR	4
1	A	94	THR	3

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Mol	Chain	Res	Type	Models (Total)
1	A	60	GLN	3
1	A	38	THR	2
1	A	53	GLU	1
1	A	58	SER	1
1	A	39	VAL	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 oligosaccharides 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 94% for the well-defined parts and 93% for the entire structure.

### 7.1 Chemical shift list 1

File name: `working_cs.cif`

Chemical shift list name: *starch\_output*

#### 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	1341
Number of shifts mapped to atoms	1341
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	17

#### 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
$^{13}\text{C}_\alpha$	111	$2.75 \pm 0.20$	Should be applied
$^{13}\text{C}_\beta$	108	$2.64 \pm 0.13$	Should be applied
$^{13}\text{C}'$	109	$3.05 \pm 0.08$	Should be applied
$^{15}\text{N}$	102	$-0.31 \pm 0.39$	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 94%, i.e. 1150 atoms were assigned a chemical shift out of a possible 1229. 0 out of 15 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	$^1\text{H}$	$^{13}\text{C}$	$^{15}\text{N}$
Backbone	475/477 (100%)	191/191 (100%)	194/196 (99%)	90/90 (100%)
Sidechain	627/658 (95%)	427/432 (99%)	193/209 (92%)	7/17 (41%)

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	<b>Total</b>	<b><sup>1</sup>H</b>	<b><sup>13</sup>C</b>	<b><sup>15</sup>N</b>
Aromatic	48/94 (51%)	44/46 (96%)	0/44 (0%)	4/4 (100%)
Overall	1150/1229 (94%)	662/669 (99%)	387/449 (86%)	101/111 (91%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 93%, i.e. 1309 atoms were assigned a chemical shift out of a possible 1405. 0 out of 16 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	<b>Total</b>	<b><sup>1</sup>H</b>	<b><sup>13</sup>C</b>	<b><sup>15</sup>N</b>
Backbone	537/540 (99%)	215/216 (100%)	220/222 (99%)	102/102 (100%)
Sidechain	715/752 (95%)	486/491 (99%)	219/240 (91%)	10/21 (48%)
Aromatic	57/113 (50%)	53/55 (96%)	0/54 (0%)	4/4 (100%)
Overall	1309/1405 (93%)	754/762 (99%)	439/516 (85%)	116/127 (91%)

#### 7.1.4 Statistically unusual chemical shifts ⓘ

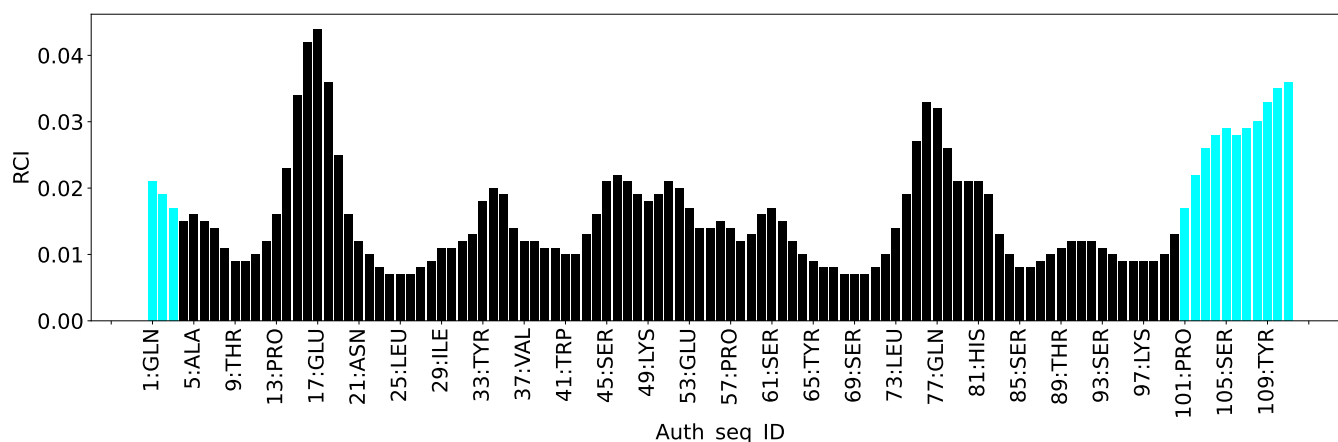
The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, ppm	Expected range, ppm	Z-score
1	A	56	THR	HG1	5.53	0.08 – 2.19	20.8
1	A	9	THR	HG1	5.25	0.08 – 2.19	19.5
1	A	54	THR	HG1	5.25	0.08 – 2.19	19.5
1	A	74	THR	HG1	4.70	0.08 – 2.19	16.9
1	A	24	THR	HG1	4.70	0.08 – 2.19	16.9
1	A	38	THR	HG1	4.70	0.08 – 2.19	16.9
1	A	102	THR	HG1	4.70	0.08 – 2.19	16.9
1	A	55	THR	HG1	4.53	0.08 – 2.19	16.1
1	A	89	THR	HG1	4.20	0.08 – 2.19	14.5
1	A	94	THR	HG1	3.65	0.08 – 2.19	11.9
1	A	98	THR	HG1	3.36	0.08 – 2.19	10.5
1	A	71	LEU	HB2	-1.08	-0.07 – 3.30	-8.0
1	A	109	TYR	HD1	4.70	5.49 – 8.39	-7.7
1	A	110	PHE	HD1	4.70	5.51 – 8.60	-7.6
1	A	33	TYR	HE2	8.19	5.58 – 7.83	6.6
1	A	70	TYR	HE2	8.14	5.58 – 7.83	6.4
1	A	22	LYS	HE2	1.85	1.95 – 3.88	-5.5

### 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	1844
Intra-residue ( $ i-j =0$ )	432
Sequential ( $ i-j =1$ )	548
Medium range ( $ i-j >1$ and $ i-j <5$ )	209
Long range ( $ i-j \geq 5$ )	655
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	16.6
Number of long range restraints per residue <sup>1</sup>	5.9

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

### 8.2 Residual restraint violations

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

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

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

Bins (Å)	Average number of violations per model	Max (Å)
0.1-0.2 (Small)	8.1	0.2
0.2-0.5 (Medium)	1.4	0.42
>0.5 (Large)	0.5	2.04

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

Dihedral-angle violations less than  $1^\circ$  are not included in the calculation. There are no dihedral-angle violations

## 9 Distance violation analysis

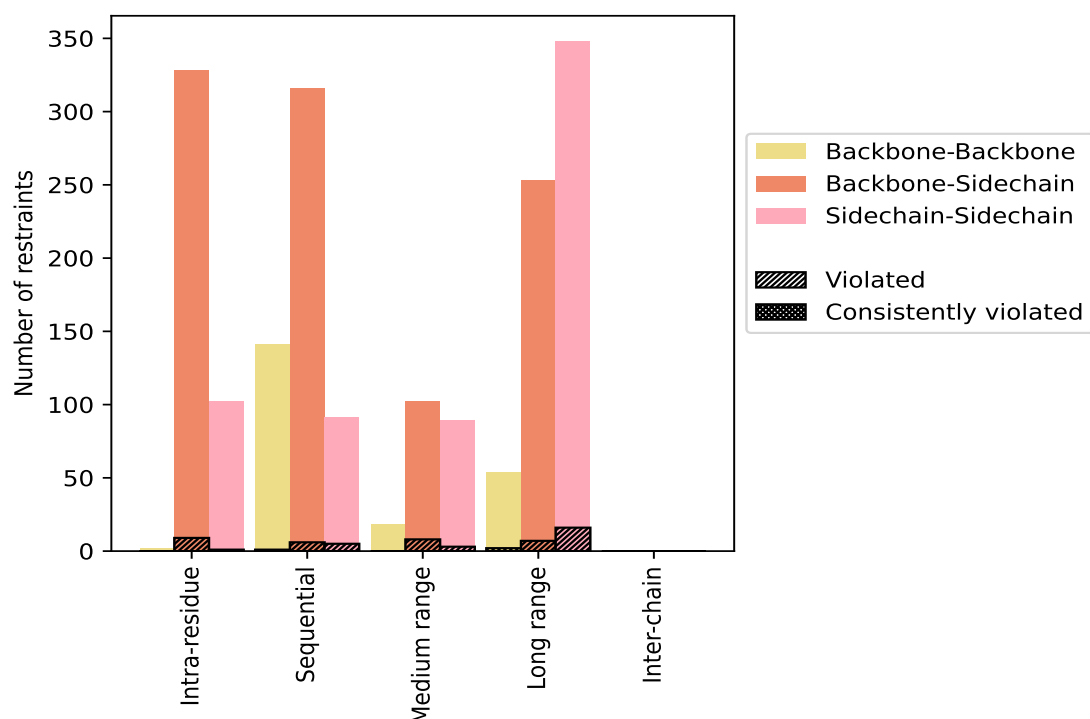
### 9.1 Summary of distance violations

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

Restrains type	Count	% <sup>1</sup>	Violated <sup>3</sup>			Consistently Violated <sup>4</sup>		
			Count	% <sup>2</sup>	% <sup>1</sup>	Count	% <sup>2</sup>	% <sup>1</sup>
<b>Intra-residue (<math> i-j =0</math>)</b>	<b>432</b>	<b>23.4</b>	<b>10</b>	<b>2.3</b>	<b>0.5</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	2	0.1	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	328	17.8	9	2.7	0.5	0	0.0	0.0
Sidechain-Sidechain	102	5.5	1	1.0	0.1	0	0.0	0.0
<b>Sequential (<math> i-j =1</math>)</b>	<b>548</b>	<b>29.7</b>	<b>12</b>	<b>2.2</b>	<b>0.7</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	141	7.6	1	0.7	0.1	0	0.0	0.0
Backbone-Sidechain	316	17.1	6	1.9	0.3	0	0.0	0.0
Sidechain-Sidechain	91	4.9	5	5.5	0.3	0	0.0	0.0
<b>Medium range (<math> i-j &gt;1</math> &amp; <math> i-j &lt;5</math>)</b>	<b>209</b>	<b>11.3</b>	<b>11</b>	<b>5.3</b>	<b>0.6</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	18	1.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	102	5.5	8	7.8	0.4	0	0.0	0.0
Sidechain-Sidechain	89	4.8	3	3.4	0.2	0	0.0	0.0
<b>Long range (<math> i-j \geq 5</math>)</b>	<b>655</b>	<b>35.5</b>	<b>25</b>	<b>3.8</b>	<b>1.4</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	54	2.9	2	3.7	0.1	0	0.0	0.0
Backbone-Sidechain	253	13.7	7	2.8	0.4	0	0.0	0.0
Sidechain-Sidechain	348	18.9	16	4.6	0.9	0	0.0	0.0
<b>Inter-chain</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	0	0.0	0	0.0	0.0	0	0.0	0.0
Backbone-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
Sidechain-Sidechain	0	0.0	0	0.0	0.0	0	0.0	0.0
<b>Hydrogen bond</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
<b>Disulfide bond</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
<b>Total</b>	<b>1844</b>	<b>100.0</b>	<b>58</b>	<b>3.1</b>	<b>3.1</b>	<b>0</b>	<b>0.0</b>	<b>0.0</b>
Backbone-Backbone	215	11.7	3	1.4	0.2	0	0.0	0.0
Backbone-Sidechain	999	54.2	30	3.0	1.6	0	0.0	0.0
Sidechain-Sidechain	630	34.2	25	4.0	1.4	0	0.0	0.0

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

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



Violated and consistently violated restraints are shown using different hatch patterns in their respective categories. The hydrogen bonds and 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 <sup>6</sup> (Å)	Median (Å)
	IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>	Total				
1	0	2	1	1	0	4	0.12	0.15	0.02	0.12
2	2	2	3	2	0	9	0.17	0.28	0.05	0.14
3	2	1	3	2	0	8	0.18	0.33	0.08	0.14
4	2	3	4	3	0	12	0.29	1.97	0.51	0.15
5	2	3	4	6	0	15	0.26	2.03	0.47	0.12
6	1	3	3	3	0	10	0.32	2.01	0.56	0.13
7	0	2	4	3	0	9	0.14	0.21	0.04	0.13
8	1	1	2	3	0	7	0.42	2.0	0.65	0.16
9	0	3	1	2	0	6	0.16	0.2	0.02	0.16
10	0	3	1	6	0	10	0.14	0.35	0.07	0.11

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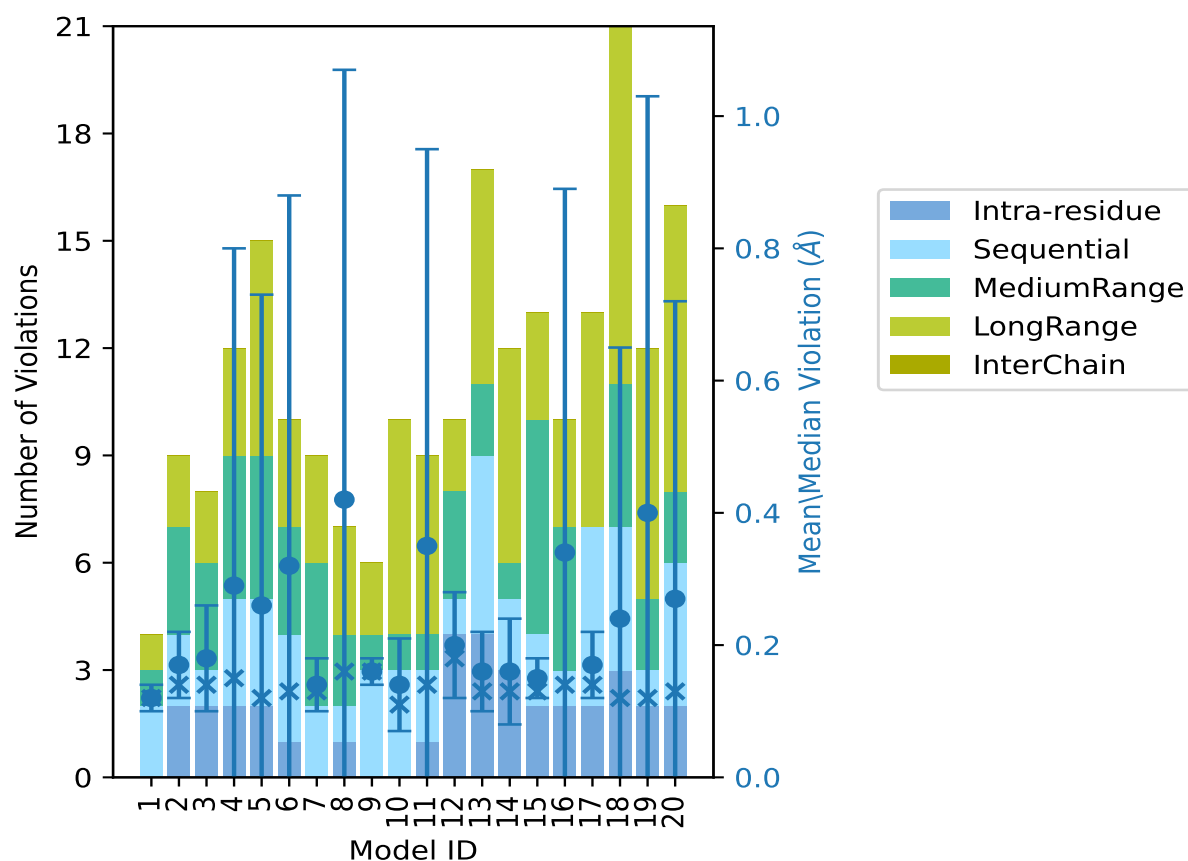
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Model ID	Number of violations						Mean (Å)	Max (Å)	SD <sup>6</sup> (Å)	Median (Å)
	IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>	Total				
11	1	2	1	5	0	9	0.35	2.03	0.6	0.14
12	4	1	3	2	0	10	0.2	0.34	0.08	0.18
13	4	5	2	6	0	17	0.16	0.34	0.06	0.13
14	3	2	1	6	0	12	0.16	0.34	0.08	0.13
15	2	2	6	3	0	13	0.15	0.21	0.03	0.13
16	2	1	4	3	0	10	0.34	1.98	0.55	0.14
17	2	5	0	6	0	13	0.17	0.28	0.05	0.14
18	3	4	4	10	0	21	0.24	2.04	0.41	0.12
19	2	1	2	7	0	12	0.4	2.02	0.63	0.12
20	2	4	2	8	0	16	0.27	2.0	0.45	0.13

<sup>1</sup>Intra-residue restraints, <sup>2</sup>Sequential restraints, <sup>3</sup>Medium range restraints, <sup>4</sup>Long range restraints,

<sup>5</sup>Inter-chain restraints, <sup>6</sup>Standard deviation

### 9.2.1 Bar graph : Distance Violation statistics for each model ⓘ



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



### 9.3 Distance violation statistics for the ensemble

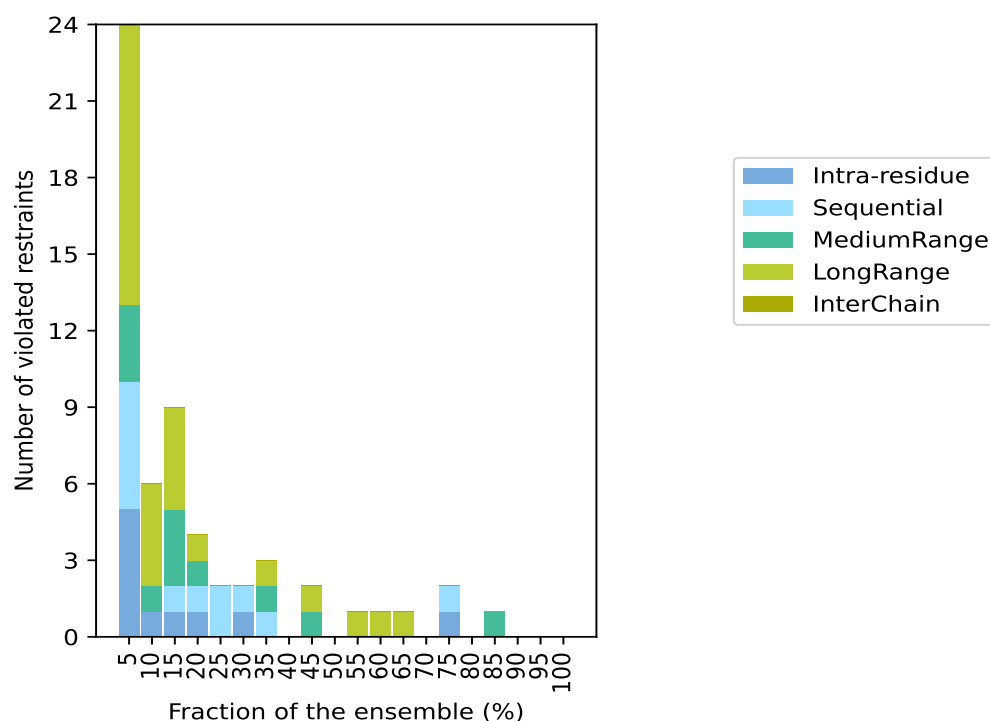
Violation analysis may find that some restraints are violated in few models and some are violated in most of models. The following table provides this information as number of violated restraints for a given fraction of the ensemble. In total, 1786(IR:422, SQ:536, MR:198, LR:630, IC:0) restraints are not violated in the ensemble.

Number of violated restraints						Fraction of the ensemble	
IR <sup>1</sup>	SQ <sup>2</sup>	MR <sup>3</sup>	LR <sup>4</sup>	IC <sup>5</sup>	Total	Count <sup>6</sup>	%
5	5	3	11	0	24	1	5.0
1	0	1	4	0	6	2	10.0
1	1	3	4	0	9	3	15.0
1	1	1	1	0	4	4	20.0
0	2	0	0	0	2	5	25.0
1	1	0	0	0	2	6	30.0
0	1	1	1	0	3	7	35.0
0	0	0	0	0	0	8	40.0
0	0	1	1	0	2	9	45.0
0	0	0	0	0	0	10	50.0
0	0	0	1	0	1	11	55.0
0	0	0	1	0	1	12	60.0
0	0	0	1	0	1	13	65.0
0	0	0	0	0	0	14	70.0
1	1	0	0	0	2	15	75.0
0	0	0	0	0	0	16	80.0
0	0	1	0	0	1	17	85.0
0	0	0	0	0	0	18	90.0
0	0	0	0	0	0	19	95.0
0	0	0	0	0	0	20	100.0

<sup>1</sup>Intra-residue restraints, <sup>2</sup>Sequential restraints, <sup>3</sup>Medium range restraints, <sup>4</sup>Long range restraints,

<sup>5</sup>Inter-chain restraints, <sup>6</sup> Number of models with violations

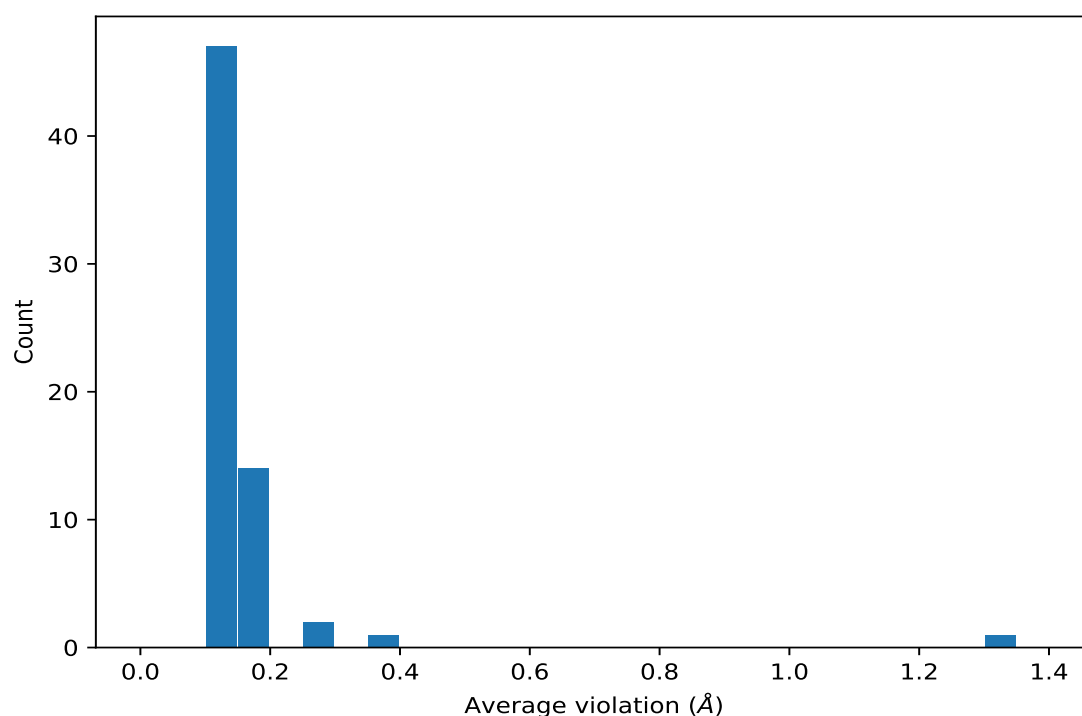
### 9.3.1 Bar graph : Distance violation statistics for the ensemble [i](#)



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

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

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



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

The following table provides the mean and the standard deviation of the 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 <sup>1</sup>	Mean (Å)	SD <sup>1</sup> (Å)	Median (Å)
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	17	0.15	0.02	0.15
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	17	0.15	0.02	0.15
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	15	1.33	0.84	1.98
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	15	0.16	0.03	0.16
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	15	0.16	0.03	0.16
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	15	0.16	0.03	0.16
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	13	0.16	0.04	0.16
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	13	0.16	0.04	0.16
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	13	0.16	0.04	0.16
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	12	0.13	0.01	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	12	0.13	0.01	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	12	0.13	0.01	0.12
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	11	0.13	0.02	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	11	0.13	0.02	0.14
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	9	0.12	0.01	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	9	0.12	0.01	0.11

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Key	Atom-1	Atom-2	Models <sup>1</sup>	Mean (Å)	SD <sup>1</sup> (Å)	Median (Å)
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	9	0.12	0.01	0.12
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	7	0.19	0.02	0.19
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	7	0.13	0.02	0.13
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	7	0.13	0.02	0.13
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	6	0.27	0.05	0.28
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	6	0.15	0.01	0.15
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	6	0.15	0.01	0.15
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	5	0.15	0.03	0.13
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	5	0.11	0.01	0.11
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG2	4	0.16	0.02	0.15
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG3	4	0.16	0.02	0.15
(1,1520)	1:78:A:TRP:HB2	1:80:A:SER:H	4	0.12	0.01	0.12
(1,532)	1:17:A:GLU:HB2	1:18:A:LEU:HG	4	0.12	0.01	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG11	4	0.11	0.01	0.11
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG12	4	0.11	0.01	0.11
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG13	4	0.11	0.01	0.11
(1,526)	1:31:A:ASP:HA	1:64:A:LYS:HG3	3	0.37	0.04	0.35
(1,671)	1:93:A:SER:H	1:93:A:SER:HB2	3	0.26	0.0	0.26
(1,1411)	1:43:A:ALA:H	1:46:A:SER:HB3	3	0.14	0.02	0.14
(1,992)	1:42:A:LYS:HE2	1:45:A:SER:H	3	0.13	0.01	0.13
(1,992)	1:42:A:LYS:HE3	1:45:A:SER:H	3	0.13	0.01	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB2	3	0.12	0.01	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB3	3	0.12	0.01	0.13
(1,257)	1:10:A:LEU:HD11	1:85:A:SER:H	3	0.12	0.01	0.11
(1,257)	1:10:A:LEU:HD12	1:85:A:SER:H	3	0.12	0.01	0.11
(1,257)	1:10:A:LEU:HD13	1:85:A:SER:H	3	0.12	0.01	0.11
(1,46)	1:4:A:ALA:HB1	1:64:A:LYS:HE3	3	0.11	0.0	0.11
(1,46)	1:4:A:ALA:HB2	1:64:A:LYS:HE3	3	0.11	0.0	0.11
(1,46)	1:4:A:ALA:HB3	1:64:A:LYS:HE3	3	0.11	0.0	0.11
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB2	3	0.11	0.01	0.1
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB3	3	0.11	0.01	0.1
(1,1473)	1:37:A:VAL:H	1:57:A:PRO:HG2	3	0.11	0.0	0.11
(1,1418)	1:28:A:LEU:H	1:69:A:SER:H	2	0.12	0.02	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD11	2	0.12	0.0	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD12	2	0.12	0.0	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD13	2	0.12	0.0	0.12

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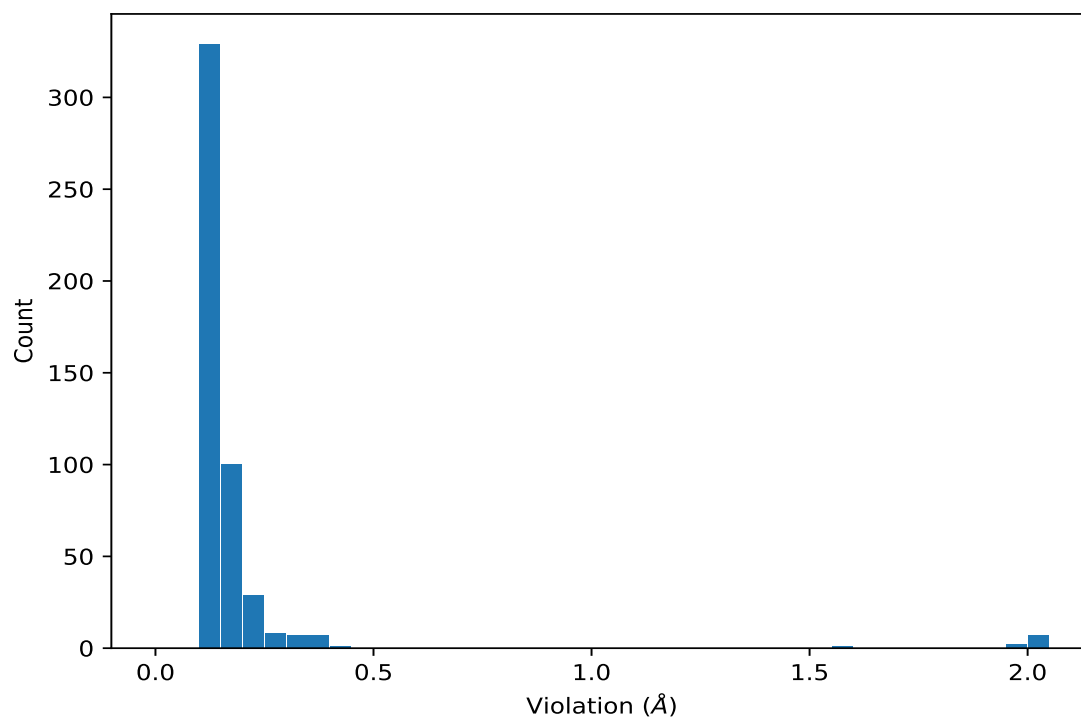
Key	Atom-1	Atom-2	Models <sup>1</sup>	Mean (Å)	SD <sup>1</sup> (Å)	Median (Å)
(1,1291)	1:46:A:SER:H	1:46:A:SER:HG	2	0.12	0.0	0.12
(1,448)	1:40:A:ALA:H	1:86:A:CYS:HA	2	0.11	0.01	0.11
(1,1064)	1:30:A:SER:HB2	1:32:A:PHE:H	2	0.11	0.01	0.11
(1,1064)	1:30:A:SER:HB3	1:32:A:PHE:H	2	0.11	0.01	0.11
(1,1044)	1:52:A:VAL:HG21	1:70:A:TYR:H	2	0.11	0.0	0.11
(1,1044)	1:52:A:VAL:HG22	1:70:A:TYR:H	2	0.11	0.0	0.11
(1,1044)	1:52:A:VAL:HG23	1:70:A:TYR:H	2	0.11	0.0	0.11

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

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

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

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



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

The following table 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)
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	18	2.04
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	5	2.03
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	11	2.03
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	19	2.02
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	6	2.01
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	8	2.0
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	20	2.0
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	16	1.98
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	4	1.97
(1,483)	1:109:A:TYR:HA	1:109:A:TYR:HD2	19	1.57
(1,526)	1:31:A:ASP:HA	1:64:A:LYS:HG3	20	0.42
(1,1638)	1:39:A:VAL:HG11	1:40:A:ALA:H	18	0.35
(1,1638)	1:39:A:VAL:HG12	1:40:A:ALA:H	18	0.35
(1,1638)	1:39:A:VAL:HG13	1:40:A:ALA:H	18	0.35
(1,1638)	1:39:A:VAL:HG21	1:40:A:ALA:H	18	0.35
(1,1638)	1:39:A:VAL:HG22	1:40:A:ALA:H	18	0.35
(1,1638)	1:39:A:VAL:HG23	1:40:A:ALA:H	18	0.35
(1,526)	1:31:A:ASP:HA	1:64:A:LYS:HG3	10	0.35
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	12	0.34
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	14	0.34
(1,526)	1:31:A:ASP:HA	1:64:A:LYS:HG3	13	0.34
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	3	0.33
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	3	0.32
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	12	0.32
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	14	0.32
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	2	0.28
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	17	0.28
(1,819)	1:39:A:VAL:HB	1:54:A:THR:HB	18	0.28
(1,1335)	1:110:A:PHE:H	1:110:A:PHE:HD1	13	0.26
(1,671)	1:93:A:SER:H	1:93:A:SER:HB2	5	0.26
(1,671)	1:93:A:SER:H	1:93:A:SER:HB2	20	0.26
(1,671)	1:93:A:SER:H	1:93:A:SER:HB2	12	0.25
(1,353)	1:102:A:THR:HB	1:103:A:GLU:H	17	0.25
(1,1768)	1:76:A:GLU:HB2	1:80:A:SER:HG	16	0.23
(1,1768)	1:76:A:GLU:HB3	1:80:A:SER:HG	16	0.23
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	16	0.23
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	13	0.23
(1,171)	1:39:A:VAL:H	1:39:A:VAL:HB	18	0.23
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	2	0.22
(1,975)	1:110:A:PHE:HA	1:110:A:PHE:HD1	17	0.22
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	8	0.22
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	8	0.22
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	8	0.22

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	15	0.21
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	15	0.21
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	15	0.21
(1,1302)	1:81:A:HIS:HB3	1:82:A:ARG:H	17	0.21
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	7	0.21
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	7	0.21
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	7	0.21
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	15	0.21
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	15	0.21
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	15	0.21
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	16	0.2
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	16	0.2
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	16	0.2
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	9	0.2
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	9	0.2
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	9	0.2
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	12	0.2
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	12	0.2
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	12	0.2
(1,1758)	1:73:A:LEU:HD11	1:81:A:HIS:HD1	17	0.19
(1,1758)	1:73:A:LEU:HD12	1:81:A:HIS:HD1	17	0.19
(1,1758)	1:73:A:LEU:HD13	1:81:A:HIS:HD1	17	0.19
(1,1758)	1:73:A:LEU:HD21	1:81:A:HIS:HD1	17	0.19
(1,1758)	1:73:A:LEU:HD22	1:81:A:HIS:HD1	17	0.19
(1,1758)	1:73:A:LEU:HD23	1:81:A:HIS:HD1	17	0.19
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	5	0.19
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	12	0.19
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	13	0.19
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	9	0.19
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG2	13	0.19
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG3	13	0.19
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	2	0.18
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	2	0.18
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	2	0.18
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	3	0.18
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	3	0.18
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	3	0.18
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	7	0.18
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	7	0.18
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	7	0.18
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	17	0.18
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	17	0.18

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	17	0.18
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	2	0.18
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	4	0.18
(1,1399)	1:74:A:THR:HG1	1:77:A:GLN:H	15	0.18
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	8	0.18
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	8	0.18
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	10	0.18
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	10	0.18
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	7	0.18
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	12	0.17
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	12	0.17
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	12	0.17
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	4	0.17
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	4	0.17
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	6	0.17
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	6	0.17
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	11	0.17
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	11	0.17
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	13	0.17
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	13	0.17
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	15	0.17
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	15	0.17
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	11	0.17
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	11	0.17
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	11	0.17
(1,1806)	1:93:A:SER:H	1:93:A:SER:HB2	12	0.16
(1,1806)	1:93:A:SER:H	1:93:A:SER:HB3	12	0.16
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	4	0.16
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	4	0.16
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	20	0.16
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	20	0.16
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	8	0.16
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	8	0.16
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	8	0.16
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	9	0.16
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	9	0.16
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	9	0.16
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	18	0.16
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	18	0.16
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	18	0.16
(1,1411)	1:43:A:ALA:H	1:46:A:SER:HB3	6	0.16
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	9	0.16

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	9	0.16
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	20	0.16
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	20	0.16
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	20	0.16
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	5	0.16
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	5	0.16
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	5	0.16
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	5	0.15
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	5	0.15
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	9	0.15
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	9	0.15
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	11	0.15
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	11	0.15
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	10	0.15
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	10	0.15
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	10	0.15
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	10	0.15
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	10	0.15
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	10	0.15
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	1	0.15
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	1	0.15
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	1	0.15
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	4	0.15
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	4	0.15
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	5	0.15
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	5	0.15
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	7	0.15
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	7	0.15
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	14	0.15
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	14	0.15
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG2	4	0.15
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG3	4	0.15
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG2	14	0.15
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG3	14	0.15
(1,292)	1:59:A:LYS:HA	1:60:A:GLN:HG2	20	0.15
(1,1799)	1:90:A:HIS:HB2	1:91:A:GLU:HA	14	0.14
(1,1799)	1:90:A:HIS:HB3	1:91:A:GLU:HA	14	0.14
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	13	0.14
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	13	0.14
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	13	0.14
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	13	0.14
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	13	0.14

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	13	0.14
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	19	0.14
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	19	0.14
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	19	0.14
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	19	0.14
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	19	0.14
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	19	0.14
(1,1639)	1:39:A:VAL:HG11	1:41:A:TRP:HE1	18	0.14
(1,1639)	1:39:A:VAL:HG12	1:41:A:TRP:HE1	18	0.14
(1,1639)	1:39:A:VAL:HG13	1:41:A:TRP:HE1	18	0.14
(1,1639)	1:39:A:VAL:HG21	1:41:A:TRP:HE1	18	0.14
(1,1639)	1:39:A:VAL:HG22	1:41:A:TRP:HE1	18	0.14
(1,1639)	1:39:A:VAL:HG23	1:41:A:TRP:HE1	18	0.14
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	11	0.14
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	11	0.14
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	11	0.14
(1,1418)	1:28:A:LEU:H	1:69:A:SER:H	20	0.14
(1,1411)	1:43:A:ALA:H	1:46:A:SER:HB3	15	0.14
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	19	0.14
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	19	0.14
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	3	0.14
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	3	0.14
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	12	0.14
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	12	0.14
(1,992)	1:42:A:LYS:HE2	1:45:A:SER:H	15	0.14
(1,992)	1:42:A:LYS:HE3	1:45:A:SER:H	15	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	6	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	6	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	8	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	8	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	13	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	13	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	14	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	14	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	16	0.14
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	16	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	4	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	4	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	4	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	10	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	10	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	10	0.14

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	19	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	19	0.14
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	19	0.14
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	17	0.14
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	18	0.14
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	1	0.14
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	1	0.14
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	2	0.14
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	2	0.14
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	17	0.14
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	17	0.14
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	17	0.14
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	20	0.13
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	20	0.13
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	20	0.13
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	20	0.13
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	20	0.13
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	20	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB2	6	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB3	6	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB2	15	0.13
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB3	15	0.13
(1,1640)	1:39:A:VAL:HG11	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG11	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG11	1:52:A:VAL:HG23	18	0.13
(1,1640)	1:39:A:VAL:HG12	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG12	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG12	1:52:A:VAL:HG23	18	0.13
(1,1640)	1:39:A:VAL:HG13	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG13	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG13	1:52:A:VAL:HG23	18	0.13
(1,1640)	1:39:A:VAL:HG21	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG21	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG21	1:52:A:VAL:HG23	18	0.13
(1,1640)	1:39:A:VAL:HG22	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG22	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG22	1:52:A:VAL:HG23	18	0.13
(1,1640)	1:39:A:VAL:HG23	1:52:A:VAL:HG21	18	0.13
(1,1640)	1:39:A:VAL:HG23	1:52:A:VAL:HG22	18	0.13
(1,1640)	1:39:A:VAL:HG23	1:52:A:VAL:HG23	18	0.13
(1,1520)	1:78:A:TRP:HB2	1:80:A:SER:H	4	0.13
(1,1520)	1:78:A:TRP:HB2	1:80:A:SER:H	20	0.13

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	6	0.13
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	6	0.13
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	20	0.13
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	20	0.13
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	2	0.13
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	2	0.13
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	9	0.13
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	9	0.13
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	18	0.13
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	18	0.13
(1,992)	1:42:A:LYS:HE2	1:45:A:SER:H	3	0.13
(1,992)	1:42:A:LYS:HE3	1:45:A:SER:H	3	0.13
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	7	0.13
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	7	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	13	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	13	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	13	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	18	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	18	0.13
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	18	0.13
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	15	0.13
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	15	0.13
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	2	0.13
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	13	0.13
(1,721)	1:110:A:PHE:HA	1:111:A:GLN:H	17	0.13
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	3	0.13
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	3	0.13
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	3	0.13
(1,532)	1:17:A:GLU:HB2	1:18:A:LEU:HG	6	0.13
(1,532)	1:17:A:GLU:HB2	1:18:A:LEU:HG	13	0.13
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG2	16	0.13
(1,388)	1:111:A:GLN:HA	1:111:A:GLN:HG3	16	0.13
(1,257)	1:10:A:LEU:HD11	1:85:A:SER:H	17	0.13
(1,257)	1:10:A:LEU:HD12	1:85:A:SER:H	17	0.13
(1,257)	1:10:A:LEU:HD13	1:85:A:SER:H	17	0.13
(1,1843)	1:110:A:PHE:HB2	1:110:A:PHE:HE1	15	0.12
(1,1843)	1:110:A:PHE:HB3	1:110:A:PHE:HE1	15	0.12
(1,1520)	1:78:A:TRP:HB2	1:80:A:SER:H	3	0.12
(1,1520)	1:78:A:TRP:HB2	1:80:A:SER:H	5	0.12
(1,1291)	1:46:A:SER:H	1:46:A:SER:HG	18	0.12
(1,1064)	1:30:A:SER:HB2	1:32:A:PHE:H	19	0.12
(1,1064)	1:30:A:SER:HB3	1:32:A:PHE:H	19	0.12

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	13	0.12
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	16	0.12
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	16	0.12
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	19	0.12
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	19	0.12
(1,1003)	1:59:A:LYS:HE2	1:61:A:SER:H	20	0.12
(1,1003)	1:59:A:LYS:HE3	1:61:A:SER:H	20	0.12
(1,992)	1:42:A:LYS:HE2	1:45:A:SER:H	7	0.12
(1,992)	1:42:A:LYS:HE3	1:45:A:SER:H	7	0.12
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	15	0.12
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	15	0.12
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	20	0.12
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	20	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG11	11	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG12	11	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG13	11	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG11	14	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG12	14	0.12
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG13	14	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	2	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	2	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	2	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	3	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	3	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	3	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	5	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	5	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	5	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	6	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	6	0.12
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	6	0.12
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB2	15	0.12
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB3	15	0.12
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	11	0.12
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	13	0.12
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	20	0.12
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	16	0.12
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	16	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD11	14	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD12	14	0.12
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD13	14	0.12
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	4	0.12

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	4	0.12
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	4	0.12
(1,448)	1:40:A:ALA:H	1:86:A:CYS:HA	11	0.12
(1,327)	1:41:A:TRP:HB2	1:52:A:VAL:HG21	18	0.12
(1,327)	1:41:A:TRP:HB2	1:52:A:VAL:HG22	18	0.12
(1,327)	1:41:A:TRP:HB2	1:52:A:VAL:HG23	18	0.12
(1,273)	1:18:A:LEU:HA	1:18:A:LEU:HD21	13	0.12
(1,273)	1:18:A:LEU:HA	1:18:A:LEU:HD22	13	0.12
(1,273)	1:18:A:LEU:HA	1:18:A:LEU:HD23	13	0.12
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	6	0.11
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	16	0.11
(1,1745)	1:71:A:LEU:HD11	1:77:A:GLN:HB3	18	0.11
(1,1745)	1:71:A:LEU:HD12	1:77:A:GLN:HB3	18	0.11
(1,1745)	1:71:A:LEU:HD13	1:77:A:GLN:HB3	18	0.11
(1,1745)	1:71:A:LEU:HD21	1:77:A:GLN:HB3	18	0.11
(1,1745)	1:71:A:LEU:HD22	1:77:A:GLN:HB3	18	0.11
(1,1745)	1:71:A:LEU:HD23	1:77:A:GLN:HB3	18	0.11
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB2	18	0.11
(1,1656)	1:43:A:ALA:H	1:46:A:SER:HB3	18	0.11
(1,1646)	1:39:A:VAL:HG11	1:70:A:TYR:H	18	0.11
(1,1646)	1:39:A:VAL:HG12	1:70:A:TYR:H	18	0.11
(1,1646)	1:39:A:VAL:HG13	1:70:A:TYR:H	18	0.11
(1,1646)	1:39:A:VAL:HG21	1:70:A:TYR:H	18	0.11
(1,1646)	1:39:A:VAL:HG22	1:70:A:TYR:H	18	0.11
(1,1646)	1:39:A:VAL:HG23	1:70:A:TYR:H	18	0.11
(1,1542)	1:3:A:LYS:HE2	1:34:A:PRO:HD2	15	0.11
(1,1542)	1:3:A:LYS:HE2	1:34:A:PRO:HD3	15	0.11
(1,1542)	1:3:A:LYS:HE3	1:34:A:PRO:HD2	15	0.11
(1,1542)	1:3:A:LYS:HE3	1:34:A:PRO:HD3	15	0.11
(1,1473)	1:37:A:VAL:H	1:57:A:PRO:HG2	5	0.11
(1,1473)	1:37:A:VAL:H	1:57:A:PRO:HG2	14	0.11
(1,1418)	1:28:A:LEU:H	1:69:A:SER:H	18	0.11

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,1411)	1:43:A:ALA:H	1:46:A:SER:HB3	18	0.11
(1,1313)	1:4:A:ALA:HB1	1:32:A:PHE:H	20	0.11
(1,1313)	1:4:A:ALA:HB2	1:32:A:PHE:H	20	0.11
(1,1313)	1:4:A:ALA:HB3	1:32:A:PHE:H	20	0.11
(1,1291)	1:46:A:SER:H	1:46:A:SER:HG	15	0.11
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	10	0.11
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	10	0.11
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD2	13	0.11
(1,1120)	1:21:A:ASN:HD22	1:22:A:LYS:HD3	13	0.11
(1,1044)	1:52:A:VAL:HG21	1:70:A:TYR:H	5	0.11
(1,1044)	1:52:A:VAL:HG22	1:70:A:TYR:H	5	0.11
(1,1044)	1:52:A:VAL:HG23	1:70:A:TYR:H	5	0.11
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	10	0.11
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	17	0.11
(1,983)	1:18:A:LEU:HA	1:79:A:LYS:HE2	14	0.11
(1,983)	1:18:A:LEU:HA	1:79:A:LYS:HE3	14	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	1	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	1	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	1	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG21	17	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG22	17	0.11
(1,846)	1:84:A:TYR:HB3	1:99:A:VAL:HG23	17	0.11
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	8	0.11
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	12	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	5	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	5	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	8	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	8	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	12	0.11
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	12	0.11
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD11	11	0.11
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD12	11	0.11
(1,707)	1:13:A:PRO:HG3	1:18:A:LEU:HD13	11	0.11
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	2	0.11
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	2	0.11
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	2	0.11
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	14	0.11
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	14	0.11
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	14	0.11
(1,532)	1:17:A:GLU:HB2	1:18:A:LEU:HG	4	0.11
(1,532)	1:17:A:GLU:HB2	1:18:A:LEU:HG	20	0.11
(1,504)	1:59:A:LYS:HG2	1:63:A:ASN:HA	5	0.11

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,407)	1:17:A:GLU:HG2	1:23:A:ALA:HB1	19	0.11
(1,407)	1:17:A:GLU:HG2	1:23:A:ALA:HB2	19	0.11
(1,407)	1:17:A:GLU:HG2	1:23:A:ALA:HB3	19	0.11
(1,407)	1:17:A:GLU:HG3	1:23:A:ALA:HB1	19	0.11
(1,407)	1:17:A:GLU:HG3	1:23:A:ALA:HB2	19	0.11
(1,407)	1:17:A:GLU:HG3	1:23:A:ALA:HB3	19	0.11
(1,357)	1:48:A:VAL:HB	1:71:A:LEU:HD21	18	0.11
(1,357)	1:48:A:VAL:HB	1:71:A:LEU:HD22	18	0.11
(1,357)	1:48:A:VAL:HB	1:71:A:LEU:HD23	18	0.11
(1,257)	1:10:A:LEU:HD11	1:85:A:SER:H	18	0.11
(1,257)	1:10:A:LEU:HD12	1:85:A:SER:H	18	0.11
(1,257)	1:10:A:LEU:HD13	1:85:A:SER:H	18	0.11
(1,257)	1:10:A:LEU:HD11	1:85:A:SER:H	19	0.11
(1,257)	1:10:A:LEU:HD12	1:85:A:SER:H	19	0.11
(1,257)	1:10:A:LEU:HD13	1:85:A:SER:H	19	0.11
(1,46)	1:4:A:ALA:HB1	1:64:A:LYS:HE3	7	0.11
(1,46)	1:4:A:ALA:HB2	1:64:A:LYS:HE3	7	0.11
(1,46)	1:4:A:ALA:HB3	1:64:A:LYS:HE3	7	0.11
(1,46)	1:4:A:ALA:HB1	1:64:A:LYS:HE3	17	0.11
(1,46)	1:4:A:ALA:HB2	1:64:A:LYS:HE3	17	0.11
(1,46)	1:4:A:ALA:HB3	1:64:A:LYS:HE3	17	0.11
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	10	0.1
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	10	0.1
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	10	0.1
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	13	0.1
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	13	0.1
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	13	0.1
(1,1488)	1:20:A:ALA:HB1	1:21:A:ASN:HD21	14	0.1
(1,1488)	1:20:A:ALA:HB2	1:21:A:ASN:HD21	14	0.1
(1,1488)	1:20:A:ALA:HB3	1:21:A:ASN:HD21	14	0.1
(1,1473)	1:37:A:VAL:H	1:57:A:PRO:HG2	10	0.1
(1,1064)	1:30:A:SER:HB2	1:32:A:PHE:H	7	0.1
(1,1064)	1:30:A:SER:HB3	1:32:A:PHE:H	7	0.1
(1,1044)	1:52:A:VAL:HG21	1:70:A:TYR:H	20	0.1
(1,1044)	1:52:A:VAL:HG22	1:70:A:TYR:H	20	0.1
(1,1044)	1:52:A:VAL:HG23	1:70:A:TYR:H	20	0.1
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	1	0.1
(1,1009)	1:59:A:LYS:HG2	1:60:A:GLN:HA	5	0.1
(1,1002)	1:46:A:SER:HG	1:47:A:PRO:HD3	18	0.1
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	10	0.1
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	10	0.1
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB2	19	0.1

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Key	Atom-1	Atom-2	Model ID	Violation (Å)
(1,991)	1:27:A:CYS:HB3	1:69:A:SER:HB3	19	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG11	4	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG12	4	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG13	4	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG11	5	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG12	5	0.1
(1,964)	1:6:A:PRO:HD2	1:37:A:VAL:HG13	5	0.1
(1,860)	1:17:A:GLU:HG2	1:22:A:LYS:HD2	19	0.1
(1,860)	1:17:A:GLU:HG2	1:22:A:LYS:HD3	19	0.1
(1,860)	1:17:A:GLU:HG3	1:22:A:LYS:HD2	19	0.1
(1,860)	1:17:A:GLU:HG3	1:22:A:LYS:HD3	19	0.1
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB2	6	0.1
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB3	6	0.1
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB2	18	0.1
(1,836)	1:18:A:LEU:HB2	1:19:A:GLN:HB3	18	0.1
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	5	0.1
(1,808)	1:42:A:LYS:HD2	1:47:A:PRO:HD3	10	0.1
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	4	0.1
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	4	0.1
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG2	7	0.1
(1,776)	1:75:A:PRO:HD2	1:77:A:GLN:HG3	7	0.1
(1,600)	1:48:A:VAL:HG11	1:73:A:LEU:HB3	16	0.1
(1,600)	1:48:A:VAL:HG12	1:73:A:LEU:HB3	16	0.1
(1,600)	1:48:A:VAL:HG13	1:73:A:LEU:HB3	16	0.1
(1,448)	1:40:A:ALA:H	1:86:A:CYS:HA	13	0.1
(1,46)	1:4:A:ALA:HB1	1:64:A:LYS:HE3	19	0.1
(1,46)	1:4:A:ALA:HB2	1:64:A:LYS:HE3	19	0.1
(1,46)	1:4:A:ALA:HB3	1:64:A:LYS:HE3	19	0.1

## 10 Dihedral-angle violation analysis ⓘ

No dihedral-angle restraints found