Full wwPDB NMR Structure Validation Report ⓘ

Apr 16, 2023 – 08:19 AM EDT

PDB ID	:	8DPX
BMRB ID	:	31034
Title	:	Preligand association structure of DR5
Authors	:	Du, G.; Zhao, L.; Chou, J.J.
Deposited on	:	2022-07-17

This is a Full wwPDB NMR Structure Validation 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 ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

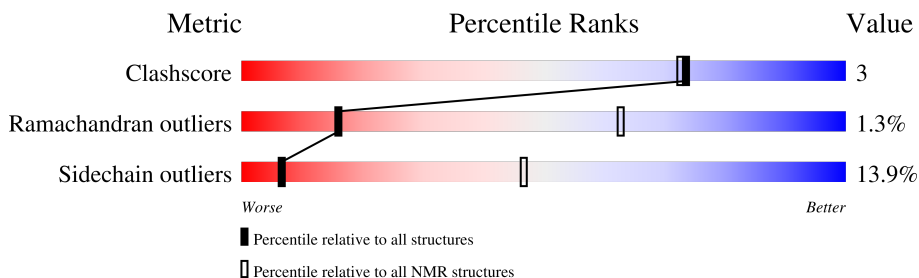|		
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.2

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 22%.

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	Percentile Ranks	Value
Clashscore		3
Ramachandran outliers		1.3%
Sidechain outliers		13.9%

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all NMR structures

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	109	76%	18%	6%
1	B	109	74%	13%	13%
1	C	109	77%	11%	12%

WORLDWIDE
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2 Ensemble composition and analysis ⓘ

This entry contains 15 models. Model 14 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:79-A:181,　　B:79-B:145, B:153-B:180,　　C:79-C:145, C:152-C:180 (294)	0.24	14

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 2 clusters and 6 single-model clusters were found.

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

3 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 4809 atoms, of which 2289 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Tumor necrosis factor receptor superfamily member 10B.

Mol	Chain	Residues	Atoms						Trace
1	A	109	Total	C	H	N	O	S	0
			1603	501	763	151	172	16	
1	B	109	Total	C	H	N	O	S	0
			1603	501	763	151	172	16	
1	C	109	Total	C	H	N	O	S	0
			1603	501	763	151	172	16	

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	185	ASP	-	expression tag	UNP O14763
B	185	ASP	-	expression tag	UNP O14763
C	185	ASP	-	expression tag	UNP O14763

W O R L D W I D E
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PROTEIN DATA BANK

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.
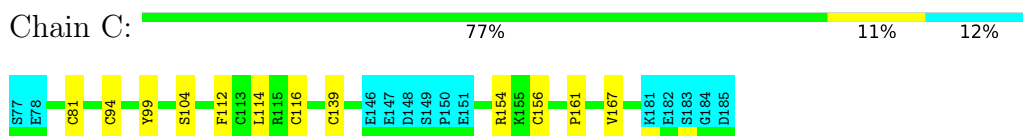
• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
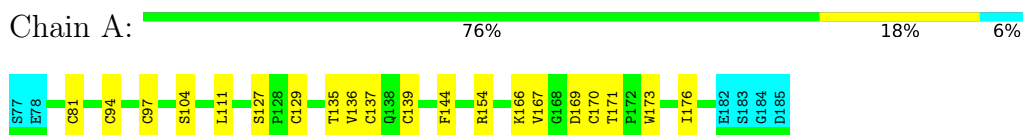
Chain A:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
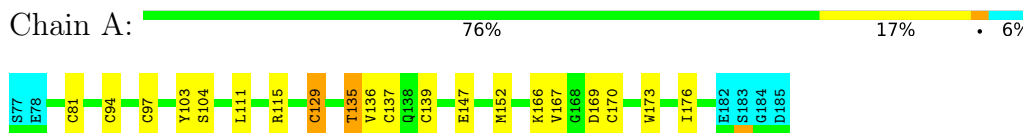
Chain C:
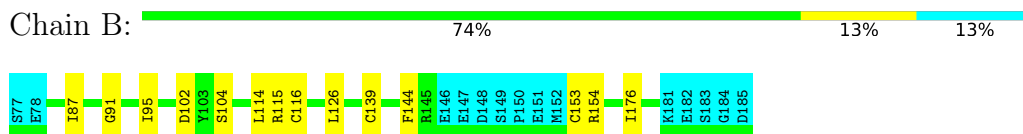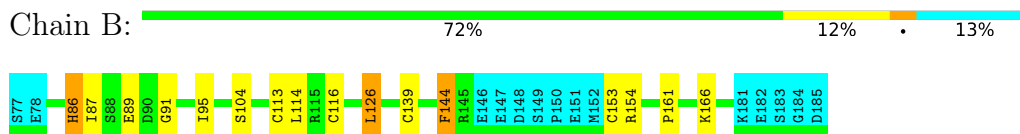
4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:

4.2.2 Score per residue for model 2

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
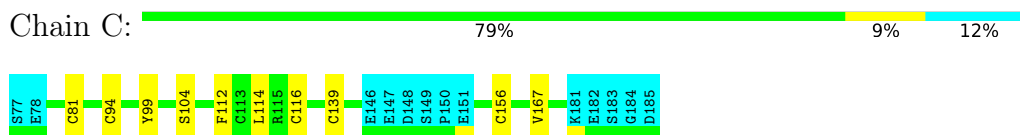
Chain C:

4.2.3 Score per residue for model 3

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

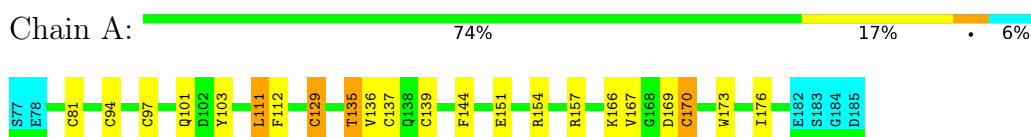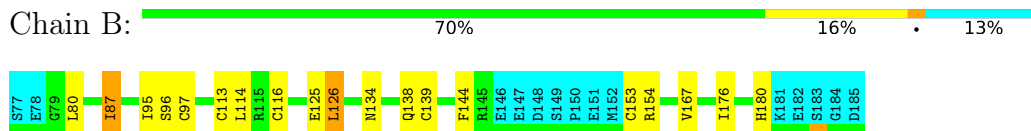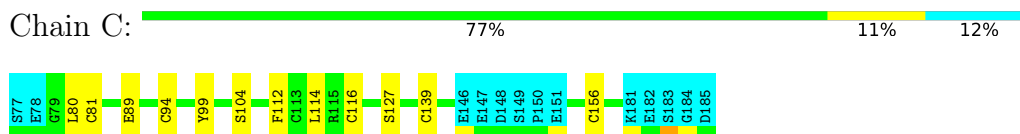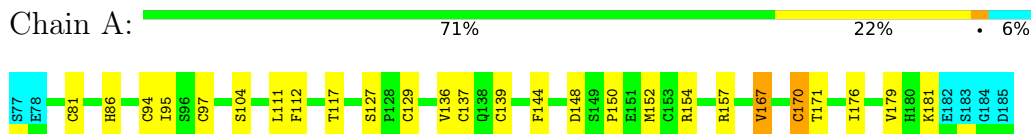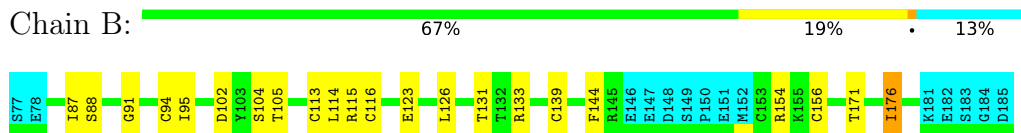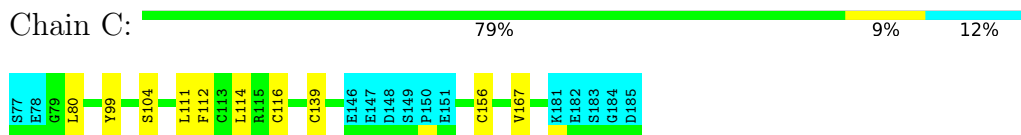• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 67% 19% • 13%

S77 E78 I87 S88 G91 C94 I95 D102 Y103 S104 T105 C113 L114 R115 C116 E123 L126 T131 T132 R133 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 K155 C156 T171 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 79% 9% 12%

S77 E78 G79 L80 Y99 S104 L111 F112 C113 L114 R115 C116 C139 E146 E147 D148 S149 P150 E151 C156 V167 K181 E182 S183 G184 D185

4.2.4 Score per residue for model 4

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
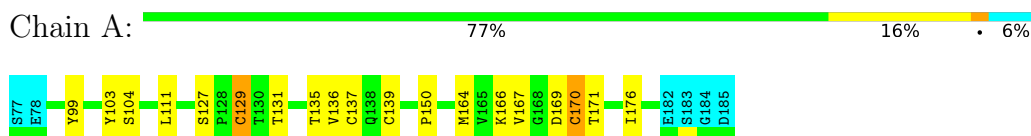
Chain A: 77% 16% • 6%

S77 E78 Y99 Y103 S104 L111 S127 P128 C129 T130 T131 T135 V136 C137 Q138 C139 P150 M164 V165 K166 V167 G168 D169 C170 T171 I176 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 72% 14% • 13%

S77 E78 I87 G91 C94 I95 D102 Y103 S104 L114 R115 C116 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 M164 S174 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 78% 9% • 12%

S77 E78 C81 C94 Y99 S104 F112 C113 L114 R115 C116 C139 E146 E147 D148 S149 P150 E151 R154 K155 C156 I176 K181 E182 S183 G184 D185
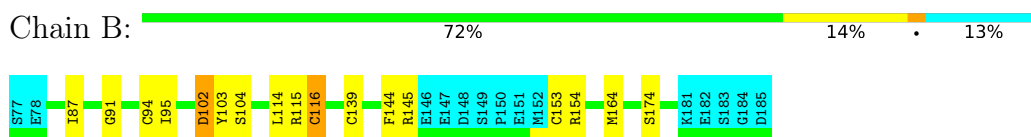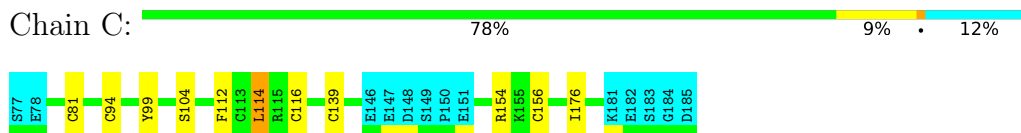
4.2.5 Score per residue for model 5

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
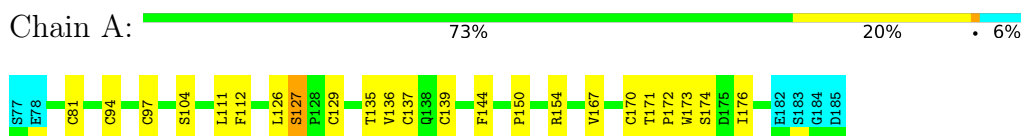
Chain A: 73% 20% • 6%

S77 E78 C81 C94 C97 S104 L111 F112 L126 S127 P128 C129 T135 V136 C137 Q138 C139 F144 P150 R154 V167 C170 T171 P172 W173 S174 D175 I176 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 72% 14% • 13%

S77 E78 G79 L80 S88 E89 D90 I95 S96 C97 Y103 S104 L111 L114 R115 C116 C139 F144 R145 E146 E147 D148 S149 P150 M152 C153 R154 K166 V167 D175 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 74% 14% 12%

S77 E78 C81 C94 Y99 S104 F112 C113 L114 R115 C116 S127 C139 E146 E147 D148 S149 P150 E151 C156 P161 M164 V165 K166 S174 D175 I176 K181 E182 S183 G184 D185
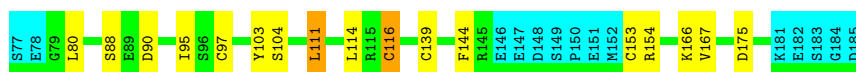
4.2.6 Score per residue for model 6

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A: 63% 29% 6%

S77 E78 G79 L80 C81 D93 C94 I95 S96 C97 S104 T105 H106 L111 L126 S127 P128 C129 N134 T135 V136 C137 Q138 C139 F144 R145 E146 E147 E151 M152 C153 R154 M164 V165 K166 V167 C170 T171 P172 W173 S174 D175 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 72% 14% 13%

S77 E78 I87 S88 E89 I95 S96 C97 D102 Y103 S104 C113 L114 R115 C116 E125 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 V167 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 72% 15% 12%

S77 E78 G79 L80 C81 C94 I95 Y99 S104 L114 R115 C116 Q138 C139 E146 E147 D148 S149 P150 E151 C156 P161 V167 C170 S174 D175 I176 K181 E182 S183 G184 D185

4.2.7 Score per residue for model 7

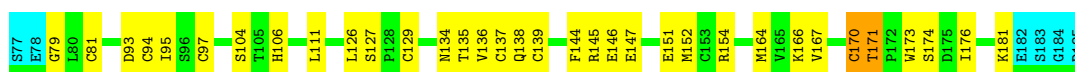• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A: 76% 14% 5% 6%

S77 E78 I95 S96 C97 S104 L111 F112 S127 P128 C129 T135 V136 C137 Q138 C139 E140 F144 R145 S149 R154 V167 T171 P172 W173 V179 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 71% 16% 13%

S77 E78 I95 Y99 D102 Y103 S104 W107 C113 L114 R115 E123 L126 T130 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 P161 T171 D175 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:

71% 17% • 12%

S77 E78 G79 L80 C81 C94 I95 Y99 S104 F112 C113 L114 R115 C116 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 K155 C156 P161 V167 S174 D175 I176 K181 E182 S183 G184 D185

4.2.8 Score per residue for model 8

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
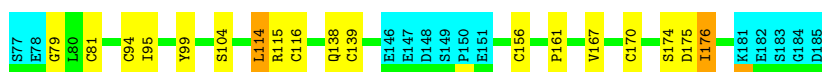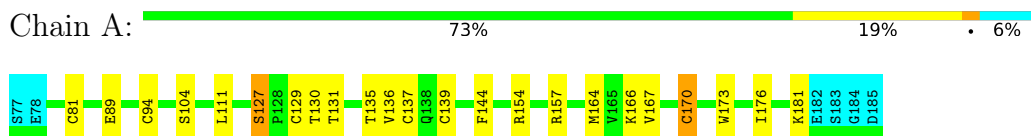
Chain A:

73% 19% • 6%

S77 E78 C81 E89 C94 S104 L111 S127 P128 C129 T130 T131 T135 V136 C137 Q138 C139 F144 R154 R157 M164 V165 K166 V167 C170 W173 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

72% 15% • 13%

S77 E78 I87 G91 C94 I95 Y99 S104 L114 R115 C116 T130 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 T171 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:

78% 8% • 12%

S77 E78 Y99 Y103 S104 L114 R115 C116 C139 E146 E147 D148 S149 P150 E151 M164 V165 K166 V167 C170 V179 H180 K181 E182 S183 G184 D185
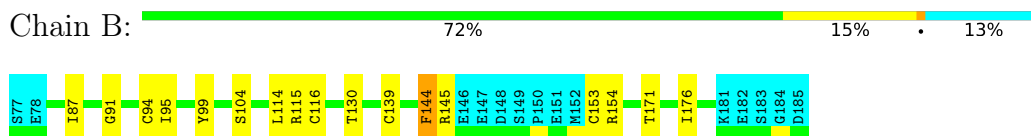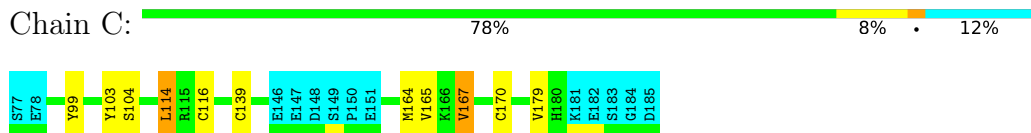
4.2.9 Score per residue for model 9

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

72% 21% • 6%

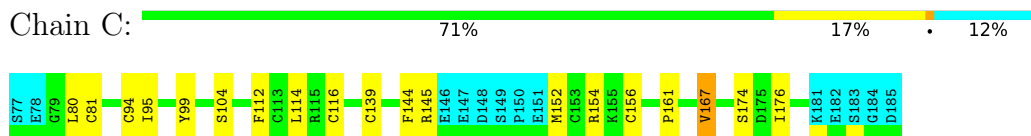S77 E78 C81 C94 C97 Y103 S104 F112 T117 S127 P128 C129 T130 T131 T132 R133 N134 T135 V136 C137 Q138 C139 F144 R154 K166 V167 G168 D169 C170 T171 T172 W173 S174 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

74% 12% • 13%

S77 E78 I87 G91 C94 I95 S96 S104 L111 L114 L126 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 72%   15%   ·   12%

S77 E78 G79 L80 C81 C94 Y99 S104 F112 C113 L114 R115 C116 L126 T130 T131 T132 C139 F144 R145 E146 E147 D148 S149 P150 E151 R154 K155 C156 M164 V167 K181 E182 S183 G184 D185

4.2.10   Score per residue for model 10

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A: 73%   18%   ·   6%

S77 E78 C81 E89 C94 D102 Y103 S104 L111 F112 S127 P128 C129 T135 V136 C137 Q138 C139 F144 E147 D148 E151 R154 K166 V167 C170 W173 V179 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 71%   14%   ·   13%

S77 E78 I87 G91 I95 Y103 S104 C113 L114 R115 C116 L126 S127 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 K166 T171 S174 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 75%   13%   12%

S77 E78 C81 D90 C94 Y99 S104 F112 C113 C116 T132 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 K155 C156 K181 E182 S183 G184 D185

4.2.11   Score per residue for model 11

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A: 69%   21%   5%   6%

S77 E78 C81 C94 I95 S96 C97 D102 Y103 S104 L111 T117 S127 P128 C129 R133 N134 T135 V136 C137 Q138 C139 F144 S149 R154 T158 V165 K166 V167 G168 D169 C170 T171 P172 W173 I176 V179 H180 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B: 70%   16%   ·   13%

S77 E78 I87 G91 C94 I95 S96 C97 Q101 D102 Y103 S104 C113 L114 R115 C116 C139 F144 R145 E146 E147 D148 S149 P150 E151 M152 C153 R154 I176 K181 E182 S183 G184 D185

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C: 72%   16%   ·   12%

4.2.12 Score per residue for model 12

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

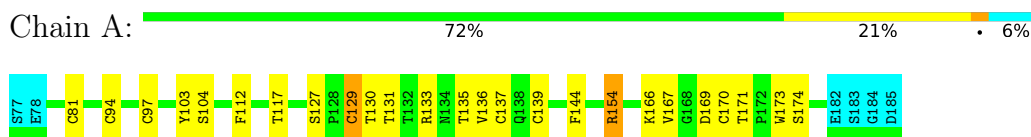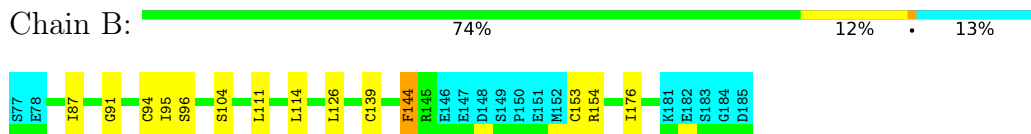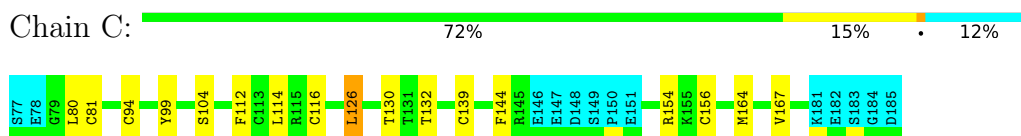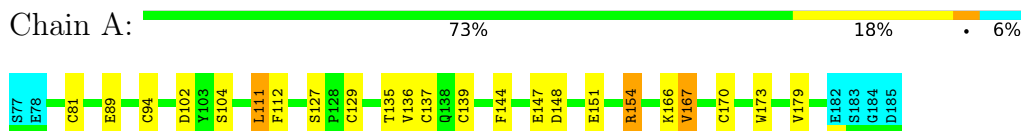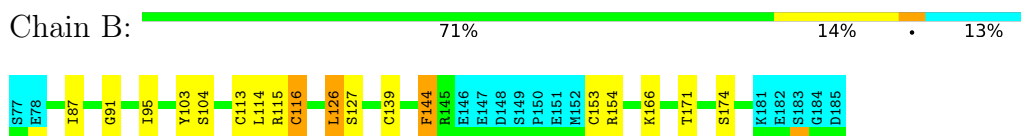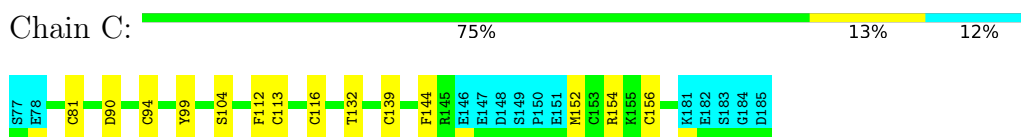• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:

4.2.13 Score per residue for model 13

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain A:

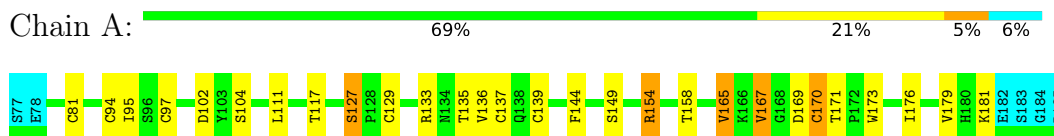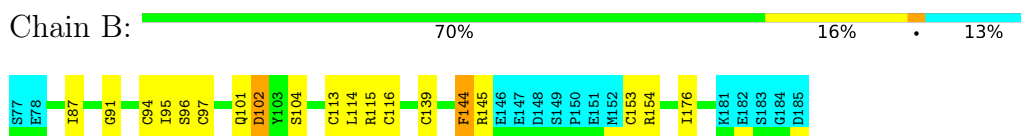• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:

4.2.14 Score per residue for model 14 (medoid)

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
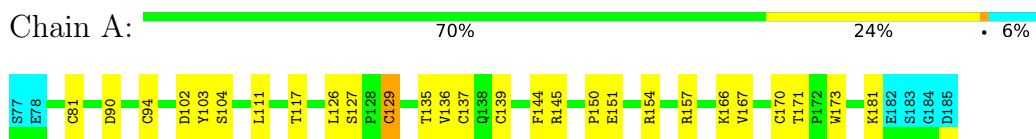
Chain A:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

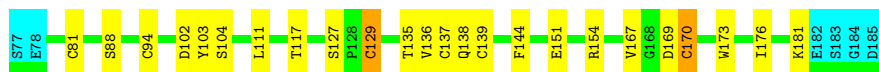• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:
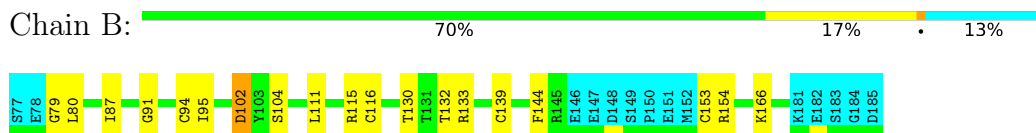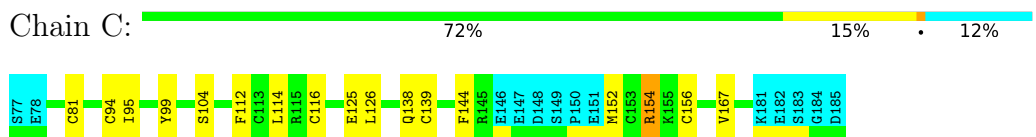
4.2.15 Score per residue for model 15

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B
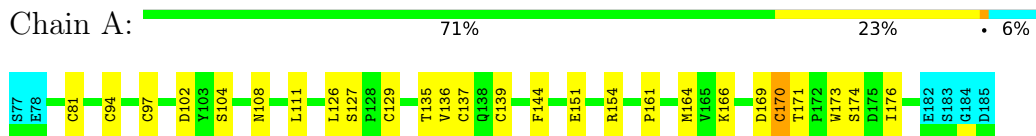
Chain A:

• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain B:

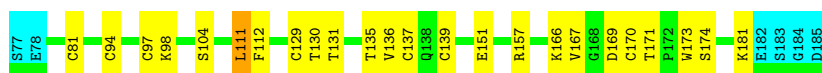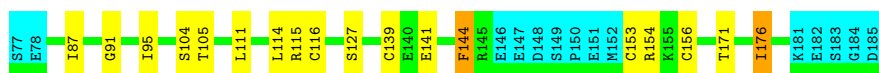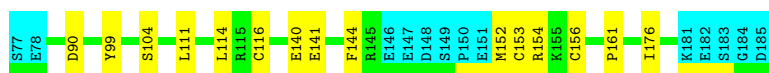• Molecule 1: Tumor necrosis factor receptor superfamily member 10B

Chain C:
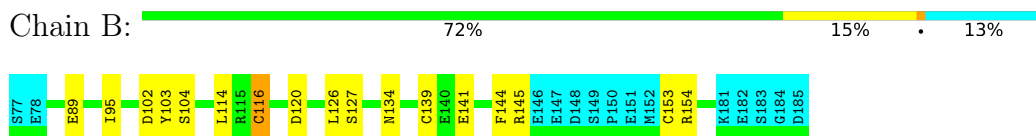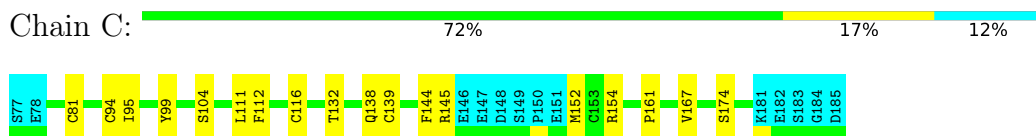
5 Refinement protocol and experimental data overview ⓘ

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

Of the 100 calculated structures, 15 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
X-PLOR NIH	refinement	

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

Chemical shift file(s)	working_cs.cif
Number of chemical shift lists	1
Total number of shifts	831
Number of shifts mapped to atoms	831
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	22%

6 Model quality ⓘ

6.1 Standard geometry ⓘ

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 ⓘ

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	799	732	728	8±2
1	B	734	676	672	7±2
1	C	742	685	681	2±1
All	All	34125	31395	31215	215

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 3.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:136:VAL:HG13	1:B:95:ILE:CG1	0.70	2.16	4	5
1:A:171:THR:HG21	1:B:102:ASP:OD1	0.66	1.89	7	3
1:B:99:TYR:CD1	1:B:130:THR:HG23	0.65	2.27	8	1
1:B:99:TYR:CE1	1:B:130:THR:HG22	0.61	2.30	7	1
1:A:127:SER:OG	1:A:136:VAL:HG23	0.60	1.96	15	1
1:A:136:VAL:HG13	1:B:95:ILE:HG23	0.60	1.73	2	10
1:A:171:THR:HG21	1:B:102:ASP:OD2	0.59	1.96	15	4
1:A:165:VAL:HG23	1:A:179:VAL:O	0.59	1.95	11	1
1:B:87:ILE:HD11	1:B:91:GLY:O	0.59	1.97	11	9
1:B:111:LEU:O	1:B:111:LEU:HD22	0.56	1.99	5	1
1:A:170:CYS:SG	1:A:176:ILE:HG23	0.54	2.42	8	8
1:A:136:VAL:HG13	1:B:95:ILE:HG13	0.54	1.79	9	4

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:B:87:ILE:HD13	1:B:87:ILE:O	0.53	2.02	2	1
1:A:127:SER:O	1:A:135:THR:HG23	0.53	2.04	11	4
1:B:126:LEU:O	1:B:126:LEU:HD13	0.52	2.05	3	5
1:A:136:VAL:HG13	1:B:95:ILE:CG2	0.51	2.35	11	11
1:B:94:CYS:C	1:B:95:ILE:HD12	0.51	2.24	9	5
1:A:126:LEU:HD11	1:A:138:GLN:OE1	0.51	2.05	6	1
1:A:167:VAL:HG21	1:A:179:VAL:HG23	0.50	1.84	3	4
1:A:158:THR:OG1	1:C:117:THR:HG23	0.50	2.07	11	1
1:B:130:THR:HG22	1:B:133:ARG:HB2	0.50	1.83	14	1
1:B:130:THR:HG23	1:B:132:THR:H	0.49	1.67	14	1
1:A:126:LEU:HD12	1:A:136:VAL:HG11	0.48	1.85	6	2
1:A:136:VAL:CG1	1:B:95:ILE:HG23	0.47	2.37	2	9
1:B:144:PHE:N	1:B:154:ARG:O	0.47	2.48	10	15
1:A:164:MET:O	1:C:114:LEU:HD21	0.47	2.10	6	3
1:B:99:TYR:CE1	1:B:130:THR:HG23	0.47	2.44	8	1
1:C:95:ILE:HD12	1:C:95:ILE:N	0.47	2.25	14	4
1:A:95:ILE:HD12	1:A:95:ILE:N	0.46	2.26	7	4
1:A:167:VAL:HG21	1:A:179:VAL:CG2	0.45	2.40	3	2
1:A:127:SER:O	1:A:135:THR:HA	0.45	2.11	5	3
1:C:126:LEU:HD13	1:C:138:GLN:OE1	0.45	2.12	14	1
1:A:111:LEU:N	1:A:111:LEU:HD12	0.45	2.27	1	7
1:A:111:LEU:HD11	1:A:112:PHE:CZ	0.44	2.47	7	3
1:B:114:LEU:HD13	1:B:115:ARG:O	0.44	2.13	10	6
1:B:156:CYS:SG	1:B:176:ILE:HG23	0.44	2.53	3	2
1:C:130:THR:HG23	1:C:132:THR:H	0.44	1.72	9	1
1:C:111:LEU:HD12	1:C:111:LEU:N	0.44	2.28	11	4
1:A:111:LEU:HD12	1:A:111:LEU:H	0.44	1.73	3	3
1:A:111:LEU:HD11	1:A:112:PHE:CE1	0.43	2.47	5	2
1:B:167:VAL:O	1:B:167:VAL:HG22	0.43	2.13	6	1
1:C:126:LEU:HD13	1:C:126:LEU:O	0.43	2.12	9	1
1:A:130:THR:HG22	1:A:131:THR:N	0.43	2.28	13	3
1:A:144:PHE:N	1:A:154:ARG:O	0.43	2.52	5	12
1:B:86:HIS:C	1:B:86:HIS:CD2	0.43	2.92	12	1
1:C:125:GLU:OE2	1:C:135:THR:HG21	0.43	2.13	11	1
1:A:111:LEU:HD12	1:A:111:LEU:N	0.43	2.29	3	1
1:A:136:VAL:HG13	1:B:95:ILE:HG12	0.43	1.89	4	1
1:C:176:ILE:HD12	1:C:176:ILE:C	0.43	2.34	5	5
1:C:144:PHE:N	1:C:154:ARG:O	0.42	2.51	7	7
1:B:176:ILE:HD12	1:B:176:ILE:C	0.42	2.34	9	1
1:C:176:ILE:HD13	1:C:176:ILE:O	0.42	2.14	6	1
1:A:103:TYR:CE1	1:A:129:CYS:SG	0.42	3.13	12	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
1:A:99:TYR:CE2	1:A:131:THR:HG22	0.42	2.50	4	1
1:B:99:TYR:CZ	1:B:130:THR:HG22	0.42	2.49	7	1
1:B:103:TYR:CD1	1:B:116:CYS:SG	0.42	3.13	15	4
1:B:111:LEU:HD22	1:B:111:LEU:C	0.42	2.36	5	1
1:C:170:CYS:HB2	1:C:176:ILE:HG22	0.41	1.92	6	1
1:C:167:VAL:HG21	1:C:179:VAL:HG21	0.41	1.93	8	1
1:A:129:CYS:SG	1:A:135:THR:OG1	0.41	2.79	2	3
1:A:176:ILE:C	1:A:176:ILE:HD12	0.41	2.36	1	1
1:C:111:LEU:HD12	1:C:111:LEU:H	0.41	1.75	3	1
1:B:111:LEU:C	1:B:111:LEU:HD12	0.40	2.37	9	1
1:B:114:LEU:HD13	1:B:115:ARG:N	0.40	2.32	7	1
1:C:80:LEU:HD12	1:C:80:LEU:N	0.40	2.31	7	1
1:B:86:HIS:CD2	1:B:86:HIS:C	0.40	2.95	1	1
1:C:167:VAL:O	1:C:167:VAL:HG22	0.40	2.17	7	1
1:B:80:LEU:N	1:B:80:LEU:HD12	0.40	2.32	2	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	103/109 (94%)	90±1 (88±1%)	11±1 (10±1%)	2±1 (2±1%)	10	50
1	B	95/109 (87%)	87±1 (91±1%)	8±1 (8±1%)	0±0 (0±1%)	32	76
1	C	96/109 (88%)	89±1 (92±1%)	6±1 (6±1%)	1±1 (1±1%)	16	63
All	All	4410/4905 (90%)	3989 (90%)	364 (8%)	57 (1%)	16	63

All 12 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	167	VAL	13
1	C	167	VAL	10
1	A	151	GLU	7
1	C	161	PRO	7

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Mol	Chain	Res	Type	Models (Total)
1	A	181	LYS	6
1	A	150	PRO	4
1	B	167	VAL	3
1	B	161	PRO	2
1	B	79	GLY	2
1	A	79	GLY	1
1	C	79	GLY	1
1	A	161	PRO	1

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	94/99 (95%)	79±3 (84±3%)	15±3 (16±3%)	5	41
1	B	86/99 (87%)	75±2 (88±2%)	11±2 (12±2%)	8	50
1	C	87/99 (88%)	76±2 (87±2%)	11±2 (13±2%)	7	48
All	All	4005/4455 (90%)	3447 (86%)	558 (14%)	7	47

All 127 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	129	CYS	15
1	A	137	CYS	15
1	A	139	CYS	15
1	B	139	CYS	15
1	C	99	TYR	15
1	C	104	SER	15
1	C	116	CYS	15
1	A	104	SER	14
1	A	170	CYS	14
1	B	104	SER	14
1	B	153	CYS	14
1	C	139	CYS	14
1	A	81	CYS	13
1	A	94	CYS	13
1	A	173	TRP	13

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Mol	Chain	Res	Type	Models (Total)
1	B	116	CYS	13
1	C	114	LEU	13
1	C	156	CYS	13
1	C	112	PHE	12
1	C	81	CYS	11
1	C	94	CYS	11
1	A	97	CYS	10
1	A	166	LYS	10
1	A	127	SER	9
1	A	135	THR	8
1	A	169	ASP	8
1	B	113	CYS	7
1	B	114	LEU	7
1	B	126	LEU	7
1	B	176	ILE	7
1	B	144	PHE	6
1	C	152	MET	6
1	B	166	LYS	5
1	A	111	LEU	5
1	A	157	ARG	5
1	A	117	THR	5
1	B	171	THR	5
1	A	174	SER	5
1	A	102	ASP	5
1	B	97	CYS	4
1	B	145	ARG	4
1	A	171	THR	4
1	C	174	SER	4
1	A	154	ARG	4
1	A	147	GLU	3
1	A	152	MET	3
1	B	89	GLU	3
1	B	96	SER	3
1	C	80	LEU	3
1	C	127	SER	3
1	B	88	SER	3
1	B	102	ASP	3
1	B	111	LEU	3
1	C	164	MET	3
1	A	145	ARG	3
1	B	127	SER	3
1	B	87	ILE	2

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Mol	Chain	Res	Type	Models (Total)
1	B	125	GLU	2
1	B	134	ASN	2
1	B	138	GLN	2
1	A	112	PHE	2
1	A	148	ASP	2
1	B	105	THR	2
1	B	123	GLU	2
1	B	174	SER	2
1	C	154	ARG	2
1	A	126	LEU	2
1	B	80	LEU	2
1	B	175	ASP	2
1	C	115	ARG	2
1	C	138	GLN	2
1	C	175	ASP	2
1	A	149	SER	2
1	C	145	ARG	2
1	A	89	GLU	2
1	A	133	ARG	2
1	C	126	LEU	2
1	C	90	ASP	2
1	C	132	THR	2
1	B	141	GLU	2
1	A	115	ARG	1
1	B	86	HIS	1
1	A	101	GLN	1
1	B	180	HIS	1
1	C	89	GLU	1
1	A	86	HIS	1
1	A	181	LYS	1
1	B	131	THR	1
1	B	133	ARG	1
1	B	164	MET	1
1	A	172	PRO	1
1	A	176	ILE	1
1	B	90	ASP	1
1	C	166	LYS	1
1	A	93	ASP	1
1	A	106	HIS	1
1	A	134	ASN	1
1	A	146	GLU	1
1	A	167	VAL	1

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Mol	Chain	Res	Type	Models (Total)
1	C	176	ILE	1
1	A	140	GLU	1
1	B	107	TRP	1
1	C	103	TYR	1
1	C	170	CYS	1
1	C	113	CYS	1
1	A	165	VAL	1
1	B	94	CYS	1
1	B	101	GLN	1
1	C	119	CYS	1
1	C	161	PRO	1
1	A	88	SER	1
1	A	138	GLN	1
1	B	154	ARG	1
1	C	88	SER	1
1	C	106	HIS	1
1	C	117	THR	1
1	C	157	ARG	1
1	A	98	LYS	1
1	C	140	GLU	1
1	C	141	GLU	1
1	C	153	CYS	1
1	A	90	ASP	1
1	B	115	ARG	1
1	C	125	GLU	1
1	A	108	ASN	1
1	A	164	MET	1
1	B	120	ASP	1

6.3.3　RNA ⓘ

There are no RNA molecules in this entry.

6.4　Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.5　Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.6 Ligand geometry ⓘ

There are no ligands in this entry.

6.7 Other polymers ⓘ

There are no such molecules in this entry.

6.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

7 Chemical shift validation ⓘ

The completeness of assignment taking into account all chemical shift lists is 22% for the well-defined parts and 20% for the entire structure.

7.1 Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *bmrb.txt*

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	831
Number of shifts mapped to atoms	831
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	0

7.1.2 Chemical shift referencing ⓘ

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_\alpha$	102	0.67 ± 0.23	Should be applied
$^{13}C_\beta$	93	0.37 ± 0.27	None needed (< 0.5 ppm)
$^{13}C'$	101	-0.07 ± 0.12	None needed (< 0.5 ppm)
^{15}N	95	0.03 ± 0.48	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 22%, i.e. 817 atoms were assigned a chemical shift out of a possible 3737. 0 out of 30 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	479/1465 (33%)	188/599 (31%)	198/588 (34%)	93/278 (33%)
Sidechain	334/1990 (17%)	192/1274 (15%)	142/622 (23%)	0/94 (0%)

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	Total	**¹H**	**¹³C**	**¹⁵N**
Aromatic	4/282 (1%)	2/138 (1%)	0/114 (0%)	2/30 (7%)
Overall	817/3737 (22%)	382/2011 (19%)	340/1324 (26%)	95/402 (24%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 20%, i.e. 831 atoms were assigned a chemical shift out of a possible 4083. 0 out of 30 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	**¹H**	**¹³C**	**¹⁵N**
Backbone	488/1629 (30%)	190/666 (29%)	203/654 (31%)	95/309 (31%)
Sidechain	339/2172 (16%)	194/1383 (14%)	145/693 (21%)	0/96 (0%)
Aromatic	4/282 (1%)	2/138 (1%)	0/114 (0%)	2/30 (7%)
Overall	831/4083 (20%)	386/2187 (18%)	348/1461 (24%)	97/435 (22%)

7.1.4 Statistically unusual chemical shifts ⓘ

There are no statistically unusual chemical shifts.

7.1.5 Random Coil Index (RCI) plots ⓘ

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: