WORLDWIDE wwPDB

PROTEIN DATA BANK

Full wwPDB NMR Structure Validation Report ⓘ

Jun 12, 2024 – 02:06 AM EDT

PDB ID	:	2DHS
BMRB ID	:	6121
Title	:	Solution Structure of Nucleic Acid Binding Protein CUGBP1ab and its Binding Study with DNA and RNA
Authors	:	Xia, Y.L.; Jun, K.Y.; Zhu, Q.; Han, X.G.; Zhang, H.; Timchenko, L.; Swanson, M.; Gao, X.L.
Deposited on	:	2006-03-25

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

We welcome your comments at *validation@mail.wwpdb.org*
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:

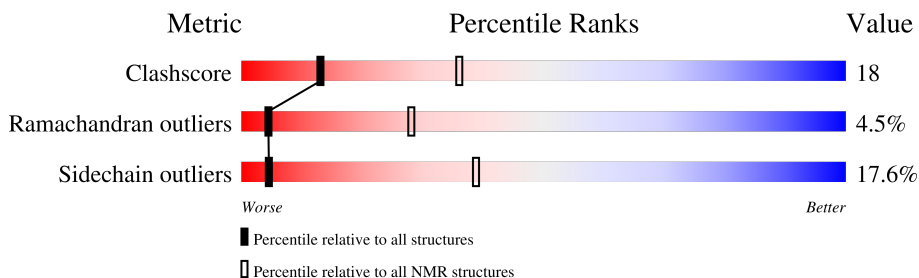|		
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 83%.

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		18
Ramachandran outliers		4.5%
Sidechain outliers		17.6%

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	187	47% 25% 5% 24%

2 Ensemble composition and analysis ⓘ

This entry contains 7 models. Model 1 is the overall representative, medoid model (most similar to other models).

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:16-A:49, A:59-A:100 (76)	1.66	1
2	A:108-A:169, A:182-A:186 (67)	0.36	6

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. No single-model clusters were found.

Cluster number	Models
1	1, 2, 3, 5, 6
2	4, 7

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 2930 atoms, of which 1460 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called CUG triplet repeat RNA-binding protein 1.
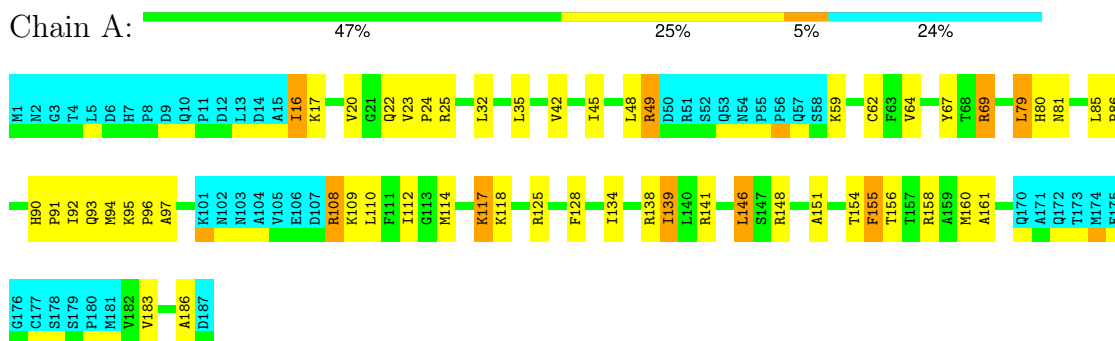
Mol	Chain	Residues	Atoms						Trace
1	A	187	Total	C	H	N	O	S	0
			2930	917	1460	262	274	17	

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: CUG triplet repeat RNA-binding protein 1

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 (medoid)

• Molecule 1: CUG triplet repeat RNA-binding protein 1

4.2.2 Score per residue for model 2

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A:

4.2.3 Score per residue for model 3

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A:

4.2.4 Score per residue for model 4

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A:

4.2.5 Score per residue for model 5

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A:

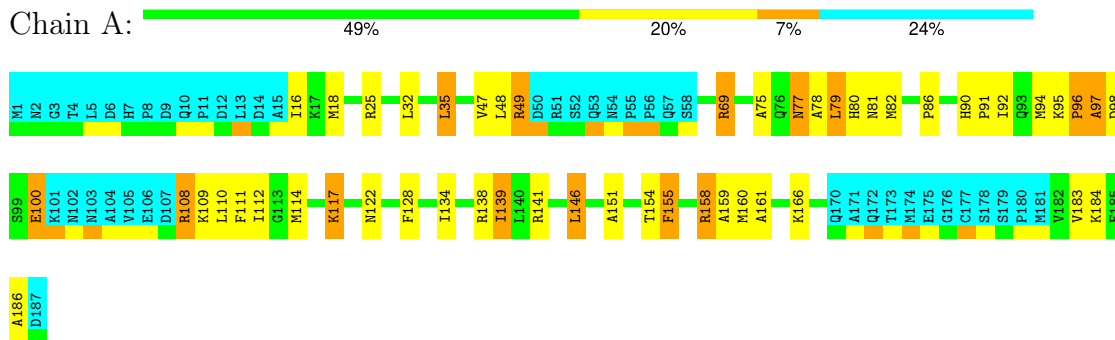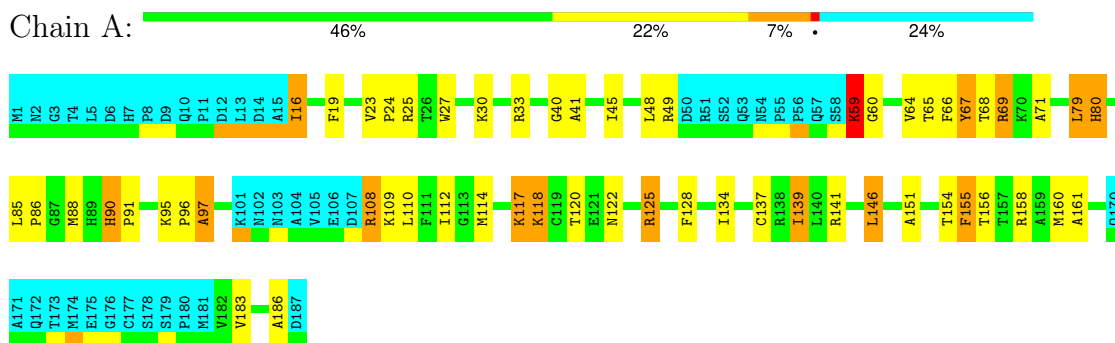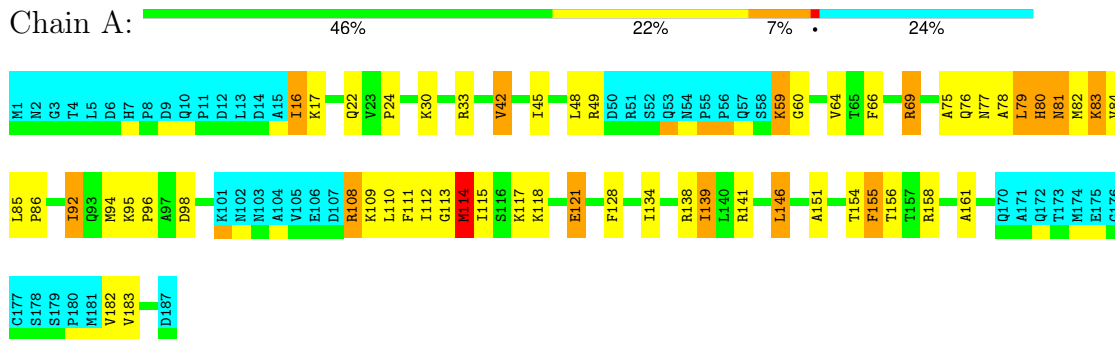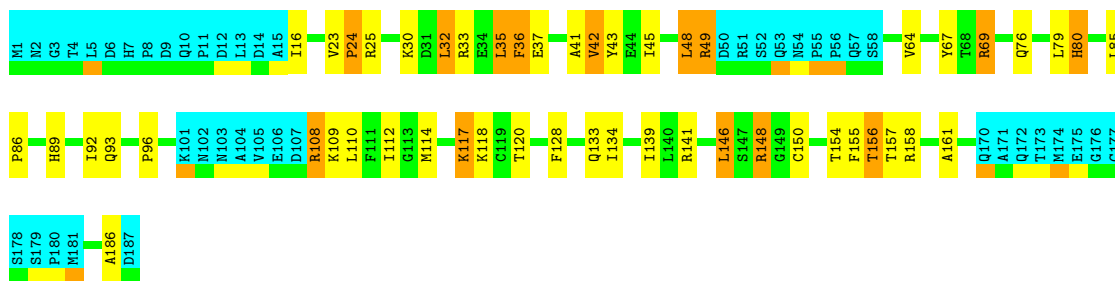M1 N2 G3 T4 L5 D6 H7 P8 D9 Q10 P11 D12 L13 D14 A15 I16 V23 P24 R25 K30 D31 L32 R33 E34 L35 F36 E37 A41 V42 Y43 E44 I45 L48 D49 D50 R51 S52 Q53 N54 P55 S56 Q57 S58 V64 Y67 T68 R69 Q76 L79 H80 L85

P86 H89 I92 Q93 P96 K101 N102 N103 A104 V105 E106 D107 R108 K109 L110 F111 I112 G113 M114 K117 K118 C119 T120 F128 Q133 I134 I139 T140 L140 R141 L146 S147 R148 G149 C150 T154 F155 T156 T157 R158 A161 Q170 A171 Q172 T173 M174 E175 G176 C177

S178 S179 P180 M181 A186 D187

4.2.6 Score per residue for model 6

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A: 48%   19%   10%   24%

M1 N2 G3 T4 L5 D6 H7 P8 D9 Q10 P11 D12 L13 D14 A15 I16 F19 V20 G21 Q22 V23 P24 R25 V42 I45 L48 R49 D50 R51 S52 Q53 N54 P55 P56 Q57 S58 K59 C62 F63 V64 R69 A75 L79 H80 K83 V84 L85 P86 G87 M88 H89

H90 P91 I92 Q93 M94 K95 P96 K101 N102 N103 A104 V105 E106 D107 R108 K109 L110 F111 I112 K117 T120 F128 I134 C137 R138 I139 L140 R141 G145 L146 S147 R148 G149 C150 T154 F155 R158 A159 M160 A161 Q170 A171 Q172 T173 M174 E175 G176 C177 S178 S179

P180 M181 V182 F185 A186 D187

4.2.7 Score per residue for model 7

• Molecule 1: CUG triplet repeat RNA-binding protein 1

Chain A: 43%   22%   10% • 24%

M1 N2 G3 T4 L5 D6 H7 P8 D9 Q10 P11 D12 L13 D14 A15 I16 K17 M18 F19 V20 G21 Q22 V23 P24 R25 E29 K30 D31 L32 R33 E34 L35 F36 G40 I45 N46 V47 L48 R49 D50 R51 S52 Q53 N54 P55 P56 Q57 S58 R59 C62 F63 V64 T65 F66 Y67 T68

R69 K70 A71 A72 L73 E74 A75 Q76 L79 H80 N81 L85 P86 G87 H90 P91 I92 Q93 M94 K95 P96 A97 K101 N102 N103 A104 V105 E106 D107 R108 K109 L110 M114 K117 K118 R138 I139 L146 A151 T154 F155 T156 T157 R158 A161 K166 Q170

A171 Q172 T173 M174 E175 G176 C177 S178 S179 P180 M181 F185 A186 D187

5 Refinement protocol and experimental data overview ⓘ

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

Of the 20 calculated structures, 7 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
ARIA	structure solution	2.0alpha
ARIA	refinement	2.0alpha

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	2122
Number of shifts mapped to atoms	2121
Number of unparsed shifts	0
Number of shifts with mapping errors	1
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	83%

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	1139	1167	1163	42±11
All	All	7973	8169	8141	296

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 18.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Models Total
1:A:125:ARG:CZ	1:A:134:ILE:HG21	0.90	1.96	1	2
1:A:114:MET:SD	1:A:182:VAL:HG12	0.82	2.15	4	1
1:A:42:VAL:HG11	1:A:45:ILE:HD11	0.79	1.55	6	2
1:A:110:LEU:HD21	1:A:161:ALA:HB1	0.79	1.53	5	7
1:A:84:VAL:C	1:A:85:LEU:HD22	0.77	1.99	4	1
1:A:16:ILE:HG22	1:A:66:PHE:N	0.75	1.95	7	1
1:A:69:ARG:HE	1:A:69:ARG:H	0.73	1.23	3	6
1:A:114:MET:SD	1:A:114:MET:N	0.73	2.62	4	1
1:A:35:LEU:C	1:A:35:LEU:HD12	0.72	2.04	2	1
1:A:21:GLY:O	1:A:93:GLN:HA	0.69	1.87	6	1
1:A:69:ARG:H	1:A:69:ARG:NE	0.68	1.87	3	6
1:A:23:VAL:HG13	1:A:25:ARG:HG2	0.66	1.67	7	3
1:A:32:LEU:O	1:A:35:LEU:HG	0.66	1.90	5	2
1:A:16:ILE:HG22	1:A:66:PHE:H	0.65	1.52	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:18:MET:CB	1:A:64:VAL:H	0.62	2.07	7	1
1:A:125:ARG:HE	1:A:137:CYS:HB3	0.62	1.52	1	2
1:A:36:PHE:CE1	1:A:42:VAL:HG11	0.61	2.29	5	1
1:A:125:ARG:NE	1:A:134:ILE:HG21	0.61	2.11	1	2
1:A:18:MET:HB3	1:A:64:VAL:H	0.61	1.56	7	1
1:A:125:ARG:HA	1:A:125:ARG:NH1	0.61	2.11	1	2
1:A:84:VAL:HG12	1:A:94:MET:N	0.61	2.09	4	1
1:A:84:VAL:HG22	1:A:92:ILE:HD11	0.60	1.71	4	1
1:A:17:LYS:HG3	1:A:72:ALA:HB1	0.60	1.73	7	1
1:A:79:LEU:HA	1:A:83:LYS:HB3	0.60	1.72	4	1
1:A:155:PHE:O	1:A:157:THR:N	0.60	2.35	5	1
1:A:134:ILE:HA	1:A:155:PHE:HB2	0.60	1.73	5	1
1:A:45:ILE:HG12	1:A:64:VAL:HG22	0.60	1.73	5	4
1:A:16:ILE:HD13	1:A:17:LYS:H	0.59	1.57	4	3
1:A:18:MET:CB	1:A:64:VAL:N	0.59	2.65	7	1
1:A:109:LYS:HB3	1:A:186:ALA:HB3	0.59	1.73	2	4
1:A:21:GLY:N	1:A:93:GLN:HB2	0.59	2.12	6	1
1:A:47:VAL:C	1:A:48:LEU:HD13	0.59	2.18	7	1
1:A:125:ARG:CZ	1:A:125:ARG:HA	0.58	2.28	3	2
1:A:90:HIS:H	1:A:91:PRO:HD2	0.58	1.58	7	1
1:A:93:GLN:HE21	1:A:93:GLN:H	0.58	1.41	6	1
1:A:20:VAL:HG13	1:A:93:GLN:O	0.57	1.98	1	1
1:A:90:HIS:N	1:A:91:PRO:HD2	0.57	2.14	7	1
1:A:93:GLN:H	1:A:93:GLN:NE2	0.57	1.97	6	1
1:A:125:ARG:NH1	1:A:134:ILE:HD13	0.57	2.15	1	2
1:A:79:LEU:HB3	1:A:83:LYS:H	0.57	1.59	4	1
1:A:36:PHE:CZ	1:A:42:VAL:HG11	0.56	2.35	5	1
1:A:125:ARG:NH2	1:A:134:ILE:HG21	0.56	2.15	1	2
1:A:125:ARG:NE	1:A:137:CYS:HB3	0.56	2.16	1	2
1:A:96:PRO:HD2	1:A:100:GLU:HB3	0.56	1.77	2	1
1:A:36:PHE:CD2	1:A:64:VAL:HG21	0.56	2.36	7	1
1:A:31:ASP:O	1:A:34:GLU:HG2	0.55	2.01	7	1
1:A:23:VAL:HG22	1:A:25:ARG:H	0.55	1.60	6	1
1:A:18:MET:SD	1:A:18:MET:O	0.55	2.64	7	1
1:A:85:LEU:HD22	1:A:85:LEU:N	0.55	2.16	4	2
1:A:30:LYS:O	1:A:33:ARG:HG2	0.55	2.02	5	3
1:A:36:PHE:HD1	1:A:37:GLU:N	0.54	2.00	5	1
1:A:18:MET:SD	1:A:63:PHE:HB2	0.54	2.42	7	1
1:A:33:ARG:HB2	1:A:36:PHE:CE2	0.54	2.37	5	1
1:A:92:ILE:HD12	1:A:92:ILE:O	0.54	2.03	7	1
1:A:108:ARG:CB	1:A:155:PHE:O	0.54	2.56	7	6

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:48:LEU:N	1:A:48:LEU:HD13	0.54	2.18	6	1
1:A:49:ARG:N	1:A:49:ARG:HD3	0.53	2.18	5	2
1:A:146:LEU:N	1:A:146:LEU:HD13	0.53	2.19	6	7
1:A:117:LYS:HD2	1:A:117:LYS:H	0.53	1.64	3	3
1:A:48:LEU:H	1:A:48:LEU:HD22	0.52	1.64	6	1
1:A:16:ILE:O	1:A:65:THR:HA	0.52	2.04	3	1
1:A:83:LYS:HE3	1:A:85:LEU:HD23	0.52	1.81	4	1
1:A:29:GLU:O	1:A:32:LEU:HG	0.52	2.04	7	1
1:A:23:VAL:HG22	1:A:25:ARG:N	0.51	2.20	6	1
1:A:114:MET:SD	1:A:182:VAL:CG1	0.51	2.96	4	1
1:A:36:PHE:CD2	1:A:45:ILE:HD11	0.51	2.40	5	1
1:A:110:LEU:HD21	1:A:161:ALA:CB	0.51	2.33	5	1
1:A:48:LEU:HD22	1:A:48:LEU:N	0.51	2.20	7	6
1:A:33:ARG:O	1:A:36:PHE:CD1	0.50	2.64	5	1
1:A:36:PHE:CG	1:A:64:VAL:HG21	0.50	2.41	7	1
1:A:111:PHE:O	1:A:183:VAL:HA	0.50	2.05	4	2
1:A:81:ASN:HB3	1:A:100:GLU:HA	0.50	1.82	2	1
1:A:85:LEU:HD22	1:A:92:ILE:O	0.50	2.06	7	1
1:A:95:LYS:HB2	1:A:100:GLU:CB	0.49	2.37	2	1
1:A:49:ARG:HD3	1:A:60:GLY:H	0.49	1.66	3	1
1:A:18:MET:CG	1:A:64:VAL:O	0.49	2.61	7	1
1:A:82:MET:O	1:A:82:MET:HG3	0.49	2.07	4	1
1:A:47:VAL:HG13	1:A:62:CYS:HB3	0.49	1.85	7	1
1:A:112:ILE:HD12	1:A:112:ILE:N	0.49	2.23	3	6
1:A:17:LYS:CG	1:A:72:ALA:HB1	0.49	2.38	7	1
1:A:41:ALA:HB1	1:A:67:TYR:CE2	0.48	2.42	5	1
1:A:84:VAL:HG13	1:A:92:ILE:HG12	0.48	1.83	4	1
1:A:134:ILE:HA	1:A:155:PHE:CB	0.48	2.37	5	1
1:A:125:ARG:HH12	1:A:128:PHE:HB2	0.48	1.69	1	2
1:A:84:VAL:HG11	1:A:94:MET:HB2	0.48	1.85	4	1
1:A:30:LYS:O	1:A:33:ARG:CG	0.48	2.60	5	1
1:A:21:GLY:N	1:A:93:GLN:CB	0.48	2.76	6	1
1:A:17:LYS:HE3	1:A:17:LYS:H	0.48	1.68	7	1
1:A:17:LYS:CD	1:A:96:PRO:HB3	0.48	2.39	7	1
1:A:79:LEU:HD22	1:A:94:MET:SD	0.47	2.50	1	1
1:A:85:LEU:N	1:A:85:LEU:CD2	0.47	2.77	4	1
1:A:42:VAL:CG2	1:A:43:TYR:N	0.47	2.78	5	1
1:A:17:LYS:O	1:A:17:LYS:HD2	0.47	2.10	7	1
1:A:108:ARG:O	1:A:154:THR:HG23	0.47	2.09	5	3
1:A:85:LEU:HD13	1:A:92:ILE:O	0.47	2.09	7	1
1:A:117:LYS:HD2	1:A:117:LYS:N	0.47	2.25	5	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:75:ALA:O	1:A:79:LEU:HG	0.47	2.09	4	3
1:A:128:PHE:HB3	1:A:134:ILE:HD11	0.47	1.86	5	4
1:A:16:ILE:HD13	1:A:17:LYS:HE3	0.47	1.87	7	1
1:A:108:ARG:O	1:A:154:THR:HA	0.47	2.09	5	5
1:A:17:LYS:HG2	1:A:76:GLN:NE2	0.47	2.25	7	1
1:A:139:ILE:HG12	1:A:151:ALA:HB2	0.47	1.87	7	4
1:A:83:LYS:O	1:A:92:ILE:HD11	0.47	2.10	6	1
1:A:148:ARG:NE	1:A:150:CYS:SG	0.46	2.88	6	1
1:A:93:GLN:HE21	1:A:93:GLN:N	0.46	2.07	6	1
1:A:117:LYS:HB3	1:A:146:LEU:HB2	0.46	1.86	1	3
1:A:16:ILE:HG22	1:A:66:PHE:HB2	0.46	1.88	4	1
1:A:108:ARG:HG3	1:A:154:THR:HG23	0.46	1.87	4	1
1:A:90:HIS:N	1:A:91:PRO:HD3	0.46	2.25	2	1
1:A:148:ARG:HD2	1:A:150:CYS:HB3	0.46	1.87	1	2
1:A:45:ILE:CG1	1:A:64:VAL:HG13	0.46	2.40	3	1
1:A:42:VAL:HG11	1:A:45:ILE:CD1	0.46	2.37	6	1
1:A:33:ARG:O	1:A:36:PHE:CG	0.46	2.69	5	1
1:A:21:GLY:C	1:A:93:GLN:HB3	0.46	2.32	6	1
1:A:18:MET:HG2	1:A:64:VAL:C	0.46	2.31	7	1
1:A:77:ASN:OD1	1:A:78:ALA:N	0.45	2.49	2	1
1:A:78:ALA:O	1:A:83:LYS:HD2	0.45	2.12	4	1
1:A:49:ARG:HB3	1:A:59:LYS:HD2	0.45	1.88	6	1
1:A:19:PHE:O	1:A:95:LYS:HG2	0.45	2.11	7	2
1:A:49:ARG:HE	1:A:60:GLY:N	0.45	2.08	4	1
1:A:113:GLY:C	1:A:114:MET:HE2	0.45	2.31	4	1
1:A:97:ALA:O	1:A:100:GLU:HG3	0.45	2.11	2	1
1:A:155:PHE:O	1:A:156:THR:C	0.45	2.55	7	1
1:A:84:VAL:CG1	1:A:94:MET:HB2	0.45	2.42	4	1
1:A:87:GLY:H	1:A:91:PRO:HG3	0.45	1.71	7	1
1:A:125:ARG:NH1	1:A:134:ILE:CD1	0.45	2.80	3	2
1:A:18:MET:HB3	1:A:64:VAL:O	0.45	2.12	7	1
1:A:93:GLN:NE2	1:A:93:GLN:N	0.45	2.64	6	1
1:A:85:LEU:HD21	1:A:93:GLN:HG2	0.44	1.87	5	1
1:A:17:LYS:HD3	1:A:96:PRO:HB3	0.44	1.88	7	1
1:A:90:HIS:O	1:A:91:PRO:O	0.44	2.36	6	1
1:A:69:ARG:O	1:A:72:ALA:HB3	0.44	2.11	7	1
1:A:79:LEU:HD13	1:A:94:MET:O	0.44	2.12	2	1
1:A:79:LEU:HD12	1:A:80:HIS:N	0.44	2.27	7	2
1:A:84:VAL:HG13	1:A:84:VAL:O	0.44	2.13	4	1
1:A:133:GLN:O	1:A:156:THR:HG23	0.44	2.13	5	1
1:A:108:ARG:HG3	1:A:154:THR:HG22	0.44	1.90	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:85:LEU:HG	1:A:92:ILE:HB	0.44	1.88	6	1
1:A:92:ILE:HD12	1:A:93:GLN:N	0.44	2.27	6	1
1:A:16:ILE:HD13	1:A:17:LYS:N	0.44	2.27	1	2
1:A:82:MET:HB3	1:A:95:LYS:HB3	0.44	1.90	4	1
1:A:19:PHE:O	1:A:95:LYS:O	0.44	2.35	6	1
1:A:85:LEU:O	1:A:86:PRO:C	0.43	2.56	7	3
1:A:112:ILE:HG13	1:A:183:VAL:HG22	0.43	1.89	1	3
1:A:36:PHE:CD1	1:A:37:GLU:N	0.43	2.86	5	1
1:A:118:LYS:N	1:A:118:LYS:HD2	0.43	2.28	7	1
1:A:81:ASN:O	1:A:95:LYS:HB2	0.43	2.14	4	1
1:A:92:ILE:HD12	1:A:92:ILE:C	0.43	2.34	7	1
1:A:24:PRO:HD3	1:A:92:ILE:HG22	0.43	1.89	1	1
1:A:25:ARG:NE	1:A:25:ARG:HA	0.43	2.28	5	1
1:A:125:ARG:HH11	1:A:125:ARG:HG3	0.43	1.73	3	1
1:A:76:GLN:O	1:A:80:HIS:N	0.43	2.52	4	1
1:A:18:MET:HB2	1:A:63:PHE:CA	0.43	2.43	7	1
1:A:122:ASN:O	1:A:125:ARG:HB3	0.43	2.14	3	1
1:A:113:GLY:O	1:A:115:ILE:HG12	0.43	2.14	4	1
1:A:20:VAL:HA	1:A:93:GLN:O	0.43	2.13	1	1
1:A:125:ARG:HH21	1:A:137:CYS:HB3	0.42	1.74	1	2
1:A:20:VAL:HG22	1:A:62:CYS:O	0.42	2.13	7	1
1:A:96:PRO:O	1:A:97:ALA:C	0.42	2.58	3	2
1:A:35:LEU:N	1:A:35:LEU:HD23	0.42	2.28	5	1
1:A:24:PRO:HD2	1:A:91:PRO:HB3	0.42	1.92	6	1
1:A:81:ASN:HA	1:A:96:PRO:HD2	0.42	1.91	7	1
1:A:18:MET:HA	1:A:96:PRO:HA	0.42	1.92	2	1
1:A:59:LYS:N	1:A:59:LYS:HD2	0.42	2.29	3	1
1:A:114:MET:N	1:A:114:MET:HE2	0.42	2.29	4	1
1:A:35:LEU:C	1:A:35:LEU:CD1	0.42	2.78	2	1
1:A:114:MET:N	1:A:114:MET:CE	0.42	2.82	4	1
1:A:48:LEU:HD22	1:A:48:LEU:H	0.42	1.75	7	1
1:A:66:PHE:O	1:A:67:TYR:C	0.41	2.58	7	1
1:A:48:LEU:HB2	1:A:59:LYS:HE3	0.41	1.91	4	1
1:A:23:VAL:O	1:A:24:PRO:C	0.41	2.59	5	1
1:A:125:ARG:NH2	1:A:137:CYS:HB3	0.41	2.31	3	2
1:A:85:LEU:CD2	1:A:92:ILE:HD13	0.41	2.45	6	1
1:A:85:LEU:HD23	1:A:92:ILE:HD13	0.41	1.92	6	1
1:A:23:VAL:HG23	1:A:91:PRO:CB	0.41	2.44	6	1
1:A:85:LEU:N	1:A:85:LEU:HD12	0.41	2.30	5	1
1:A:108:ARG:HB2	1:A:155:PHE:O	0.41	2.14	7	1
1:A:121:GLU:HB2	1:A:139:ILE:HB	0.41	1.92	4	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:118:LYS:HD3	1:A:118:LYS:N	0.41	2.30	3	1
1:A:109:LYS:C	1:A:110:LEU:HD22	0.41	2.35	5	2
1:A:18:MET:HB2	1:A:63:PHE:HB2	0.41	1.92	7	1
1:A:145:GLY:C	1:A:146:LEU:HD13	0.41	2.36	6	1
1:A:85:LEU:HD23	1:A:92:ILE:N	0.41	2.31	5	1
1:A:22:GLN:O	1:A:92:ILE:O	0.41	2.38	6	1
1:A:81:ASN:HA	1:A:96:PRO:CD	0.41	2.46	7	1
1:A:109:LYS:O	1:A:185:PHE:HA	0.41	2.16	7	1
1:A:20:VAL:HG22	1:A:62:CYS:H	0.41	1.76	7	2
1:A:79:LEU:HD13	1:A:94:MET:HG2	0.41	1.93	6	1
1:A:95:LYS:HG3	1:A:98:ASP:HB2	0.40	1.93	4	1
1:A:69:ARG:H	1:A:69:ARG:HE	0.40	1.60	5	1
1:A:23:VAL:O	1:A:25:ARG:HG3	0.40	2.15	6	1
1:A:17:LYS:NZ	1:A:79:LEU:HD21	0.40	2.32	7	1
1:A:158:ARG:NE	1:A:159:ALA:H	0.40	2.15	2	1
1:A:35:LEU:HD23	1:A:35:LEU:H	0.40	1.77	5	1
1:A:23:VAL:O	1:A:25:ARG:N	0.40	2.54	3	1
1:A:76:GLN:O	1:A:80:HIS:HB2	0.40	2.16	5	1
1:A:90:HIS:N	1:A:91:PRO:CD	0.40	2.85	2	1
1:A:49:ARG:N	1:A:49:ARG:CD	0.40	2.81	5	1
1:A:87:GLY:N	1:A:90:HIS:O	0.40	2.53	6	1
1:A:47:VAL:HG12	1:A:59:LYS:CG	0.40	2.46	7	1
1:A:49:ARG:HB2	1:A:59:LYS:HA	0.40	1.93	7	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	143/187 (76%)	121±2 (84±2%)	16±2 (11±2%)	6±2 (4±1%)	4	28
All	All	1001/1309 (76%)	844 (84%)	112 (11%)	45 (4%)	4	28

All 16 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	86	PRO	7
1	A	96	PRO	5
1	A	97	ALA	4
1	A	24	PRO	4
1	A	156	THR	4
1	A	16	ILE	3
1	A	91	PRO	3
1	A	49	ARG	2
1	A	89	HIS	2
1	A	59	LYS	2
1	A	88	MET	2
1	A	80	HIS	2
1	A	22	GLN	2
1	A	90	HIS	1
1	A	114	MET	1
1	A	186	ALA	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	122/161 (76%)	101±2 (82±2%)	21±2 (18±2%)	4	39
All	All	854/1127 (76%)	704 (82%)	150 (18%)	4	39

All 56 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	69	ARG	7
1	A	79	LEU	7
1	A	108	ARG	7
1	A	117	LYS	7
1	A	139	ILE	7
1	A	146	LEU	7
1	A	158	ARG	7
1	A	16	ILE	6
1	A	141	ARG	6
1	A	155	PHE	6

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Mol	Chain	Res	Type	Models (Total)
1	A	138	ARG	5
1	A	92	ILE	4
1	A	160	MET	4
1	A	114	MET	4
1	A	49	ARG	3
1	A	148	ARG	3
1	A	80	HIS	3
1	A	59	LYS	3
1	A	118	LYS	3
1	A	120	THR	3
1	A	48	LEU	3
1	A	62	CYS	2
1	A	125	ARG	2
1	A	185	PHE	2
1	A	35	LEU	2
1	A	77	ASN	2
1	A	67	TYR	2
1	A	42	VAL	2
1	A	32	LEU	2
1	A	20	VAL	2
1	A	93	GLN	2
1	A	133	GLN	1
1	A	25	ARG	1
1	A	47	VAL	1
1	A	82	MET	1
1	A	100	GLU	1
1	A	122	ASN	1
1	A	166	LYS	1
1	A	184	LYS	1
1	A	27	TRP	1
1	A	90	HIS	1
1	A	22	GLN	1
1	A	81	ASN	1
1	A	83	LYS	1
1	A	121	GLU	1
1	A	36	PHE	1
1	A	23	VAL	1
1	A	85	LEU	1
1	A	94	MET	1
1	A	137	CYS	1
1	A	182	VAL	1
1	A	17	LYS	1

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Mol	Chain	Res	Type	Models (Total)
1	A	18	MET	1
1	A	68	THR	1
1	A	74	GLU	1
1	A	109	LYS	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 83% for the well-defined parts and 84% for the entire structure.

7.1   Chemical shift list 1

File name: working_cs.cif

Chemical shift list name: *assigned_ chem_ shift_ list_ 1*

7.1.1   Bookkeeping ⓘ

The following table shows the results of parsing the chemical shift list and reports the number of nuclei with statistically unusual chemical shifts.

Total number of shifts	2122
Number of shifts mapped to atoms	2121
Number of unparsed shifts	0
Number of shifts with mapping errors	1
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	0

The following assigned chemical shifts were not mapped to the molecules present in the coordinate file.

- No matching atom found in the structure. All 1 occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	1	MET	H	8.52	0.02	1

7.1.2   Chemical shift referencing ⓘ

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_\alpha$	187	-0.23 ± 0.09	None needed (< 0.5 ppm)
$^{13}C_\beta$	176	-0.10 ± 0.10	None needed (< 0.5 ppm)
$^{13}C'$	182	0.10 ± 0.08	None needed (< 0.5 ppm)
^{15}N	173	0.32 ± 0.22	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 83%, i.e. 1673 atoms were assigned a chemical shift out of a possible 2017. 0 out of 19 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	704/714 (99%)	287/290 (99%)	283/286 (99%)	134/138 (97%)
Sidechain	916/1132 (81%)	605/738 (82%)	291/343 (85%)	20/51 (39%)
Aromatic	53/171 (31%)	40/84 (48%)	12/78 (15%)	1/9 (11%)
Overall	1673/2017 (83%)	932/1112 (84%)	586/707 (83%)	155/198 (78%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 84%, i.e. 2122 atoms were assigned a chemical shift out of a possible 2541. 0 out of 22 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	913/926 (99%)	371/375 (99%)	369/374 (99%)	173/177 (98%)
Sidechain	1155/1436 (80%)	761/930 (82%)	367/442 (83%)	27/64 (42%)
Aromatic	54/179 (30%)	41/88 (47%)	12/80 (15%)	1/11 (9%)
Overall	2122/2541 (84%)	1173/1393 (84%)	748/896 (83%)	201/252 (80%)

7.1.4   Statistically unusual chemical shifts (i)

There are no statistically unusual chemical shifts.

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: