WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB NMR Structure Validation Report ⓘ

Apr 21, 2024 – 06:41 AM EDT

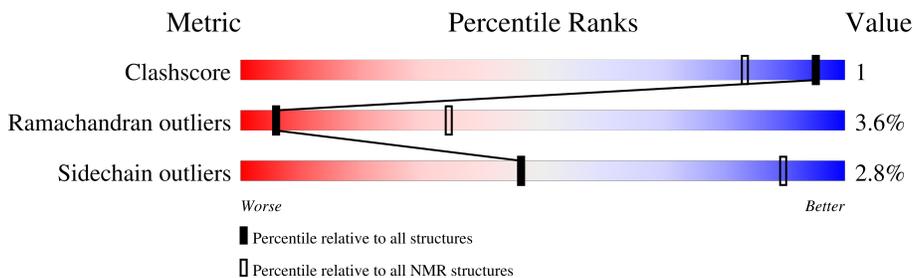|		
PDB ID	:	2MEZ
BMRB ID	:	19028
Title	:	Flexible anchoring of archaeal MBF1 on ribosomes suggests role as recruitment factor
Authors	:	Launay, H.; Blombarch, F.; Camilloni, C.; Vendruscolo, M.; van des Oost, J.; Christodoulou, J.
Deposited on	:	2013-10-03

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 30%.

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		1
Ramachandran outliers		3.6%
Sidechain outliers		2.8%

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	106	46%　　7%　　43%　　•

2 Ensemble composition and analysis ⓘ

This entry contains 16 models. Model 3 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *minimized average structure*.

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:23-A:78 (56)	2.54	3

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 3 clusters and 1 single-model cluster was found.

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

3   Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 1667 atoms, of which 850 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Multiprotein Bridging Factor (MBP-like).

Mol	Chain	Residues	Atoms					Trace
			Total	C	H	N	O	
1	A	102	1667	514	850	140	163	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	111	LEU	-	expression tag	UNP Q980M2
A	112	GLU	-	expression tag	UNP Q980M2
A	113	HIS	-	expression tag	UNP Q980M2
A	114	HIS	-	expression tag	UNP Q980M2
A	115	HIS	-	expression tag	UNP Q980M2
A	116	HIS	-	expression tag	UNP Q980M2
A	117	HIS	-	expression tag	UNP Q980M2
A	118	HIS	-	expression tag	UNP Q980M2

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: Multiprotein Bridging Factor (MBP-like)

Chain A:

| | 46% | | 7% | 43% | • |
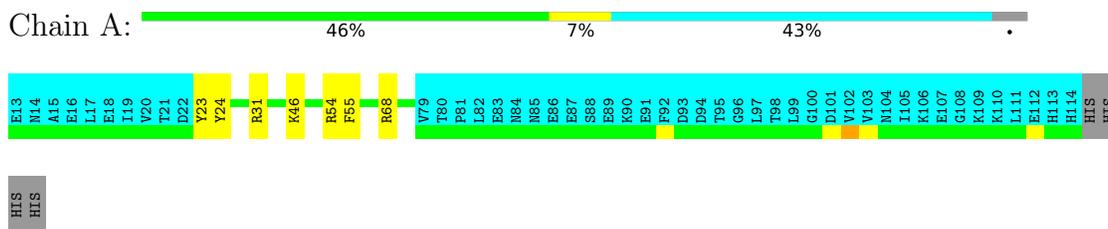
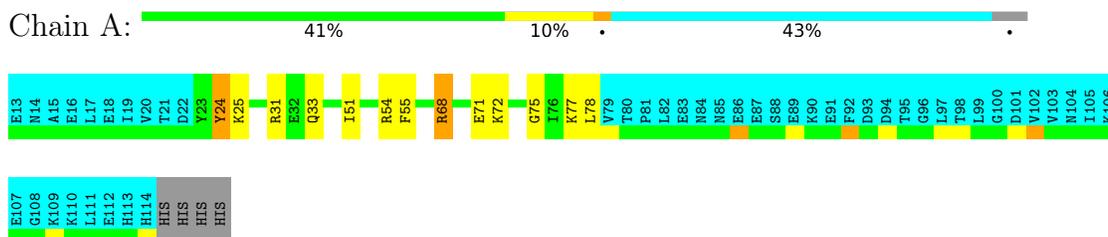## 4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

| | 41% | 10% | • | 43% | • |

4.2.2 Score per residue for model 2

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

| | 35% | 15% | • | 43% | • |

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 R31 E32 Q33 A42 Q43 K44 L45 K46 V47 S48 E49 N50 I51 V52 K53 R54 F55 E56 L60 R68 Q69 L70 E71 K72 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97

T98 L99 G100 D101 V102 V103 N104 I105 K106 E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS HIS

4.2.3 Score per residue for model 3 (medoid)

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 42% 9% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 T29 A30 R31 K46 R54 F55 L60 I64 S65 R68 L78 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100 D101 V102 V103 N104 I105 K106 E107 G108

K109 K110 L111 E112 H113 H114 HIS HIS HIS HIS

4.2.4 Score per residue for model 4

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 37% 15% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 T29 A30 R31 L41 K46 R54 F55 K61 P62 T63 I64 S65 Q66 A67 R68 Q69 L74 G75 I76 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100

D101 V102 V103 N104 I105 K106 E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS HIS

4.2.5 Score per residue for model 5

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 39% 13% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 A30 R31 G35 Q38 Q39 A42 L45 K46 R54 F55 I64 R68 L78 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100 D101 V102 V103 N104

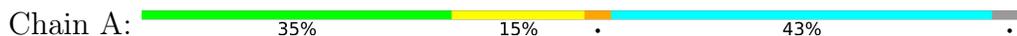I105 K106 E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS HIS

4.2.6 Score per residue for model 6

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

4.2.7 Score per residue for model 7

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

4.2.8 Score per residue for model 8

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

4.2.9 Score per residue for model 9

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A:

4.2.10 Score per residue for model 10

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

4.2.11 Score per residue for model 11

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

4.2.12 Score per residue for model 12

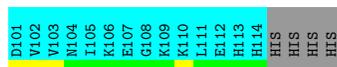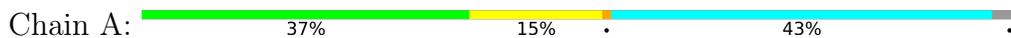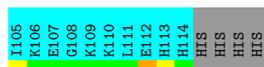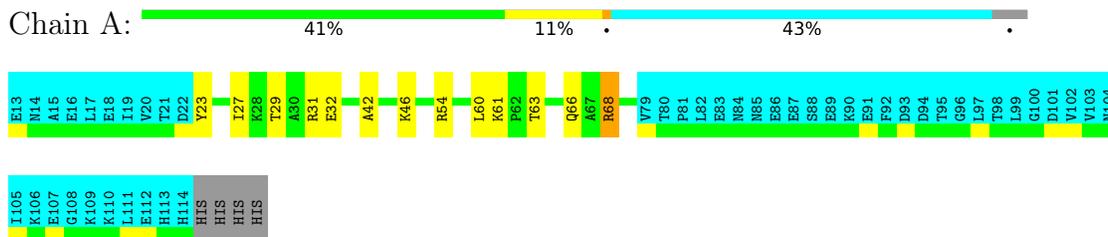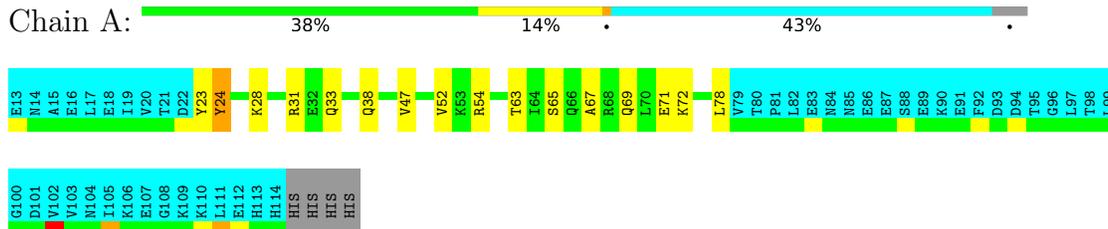• Molecule 1: Multiprotein Bridging Factor (MBP-like)
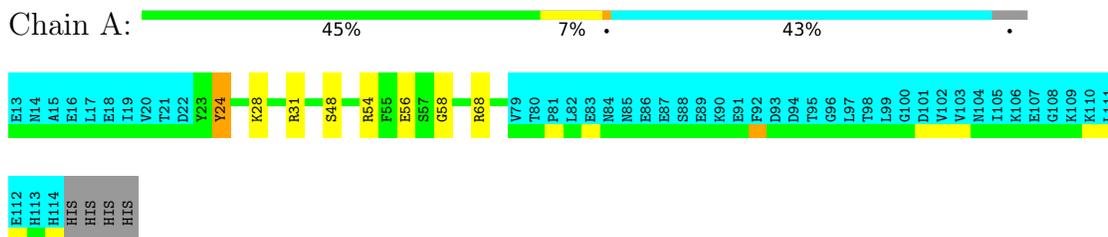
4.2.13 Score per residue for model 13

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

K110 L111 E112 H113 H114 HIS HIS HIS

4.2.14 Score per residue for model 14

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 40% 12% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 K25 I26 A30 R31 Q38 K46 V52 K53 R54 F55 E56 I64 R68 Q69 L70 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100 D101 V102 V103 N104

I105 K106 E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS

4.2.15 Score per residue for model 15

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 41% 9% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 I27 R31 E32 K44 E49 R54 F55 E56 S57 R68 I73 L78 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100 D101 V102 V103 N104 I105 K106

E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS

4.2.16 Score per residue for model 16

• Molecule 1: Multiprotein Bridging Factor (MBP-like)

Chain A: 37% 13% • 43% •

E13 N14 A15 E16 L17 E18 I19 V20 T21 D22 Y23 Y24 R31 A42 K46 V47 S48 E49 N50 I51 V52 K53 R54 F55 E56 L60 K61 P62 R68 G75 I76 V79 T80 P81 L82 E83 N84 N85 E86 E87 S88 E89 K90 E91 F92 D93 D94 T95 G96 L97 T98 L99 G100

D101 V102 V103 N104 I105 K106 E107 G108 K109 K110 L111 E112 H113 H114 HIS HIS HIS

5 Refinement protocol and experimental data overview (i)

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

Of the 1756 calculated structures, 16 were deposited, based on the following criterion: *one structure per cluster.*

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

Software name	Classification	Version
CamShift-MD	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	392
Number of shifts mapped to atoms	392
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	30%

6 Model quality ⓘ

6.1 Standard geometry ⓘ

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the (average) root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#Z>5	RMSZ	#Z>5
1	A	0.55±0.01	0±0/458 (0.0± 0.0%)	2.03±0.10	11±2/610 (1.8± 0.4%)
All	All	0.55	0/7328 (0.0%)	2.03	180/9760 (1.8%)

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

Mol	Chain	Chirality	Planarity
1	A	0.0±0.0	2.3±1.5
All	All	0	37

There are no bond-length outliers.

All unique angle outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models Worst	Total
1	A	68	ARG	NE-CZ-NH2	-21.00	109.80	120.30	12	10
1	A	31	ARG	NE-CZ-NH1	16.19	128.40	120.30	4	11
1	A	54	ARG	NE-CZ-NH1	15.69	128.15	120.30	3	11
1	A	54	ARG	NE-CZ-NH2	15.06	127.83	120.30	8	9
1	A	68	ARG	NE-CZ-NH1	14.33	127.47	120.30	3	11
1	A	31	ARG	NE-CZ-NH2	-11.49	114.55	120.30	5	8
1	A	24	TYR	CB-CG-CD1	-10.98	114.41	121.00	11	5
1	A	23	TYR	CB-CG-CD1	-10.36	114.78	121.00	4	4
1	A	56	GLU	OE1-CD-OE2	-9.95	111.36	123.30	14	2
1	A	55	PHE	CB-CG-CD2	-8.97	114.52	120.80	5	5
1	A	23	TYR	CB-CG-CD2	-8.75	115.75	121.00	16	6
1	A	78	LEU	C-N-CA	8.11	141.97	121.70	11	1
1	A	24	TYR	CG-CD2-CE2	-7.93	114.95	121.30	1	1
1	A	54	ARG	NH1-CZ-NH2	-7.93	110.68	119.40	5	2
1	A	29	THR	CA-CB-OG1	-7.76	92.71	109.00	3	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models Worst	Total
1	A	24	TYR	CG-CD1-CE1	7.73	127.48	121.30	7	1
1	A	23	TYR	CG-CD1-CE1	-7.65	115.18	121.30	16	3
1	A	55	PHE	CG-CD2-CE2	-7.30	112.77	120.80	15	1
1	A	24	TYR	CB-CG-CD2	7.14	125.29	121.00	11	5
1	A	65	SER	O-C-N	-7.12	111.30	122.70	11	2
1	A	32	GLU	N-CA-CB	-6.97	98.06	110.60	10	1
1	A	71	GLU	OE1-CD-OE2	-6.87	115.05	123.30	1	2
1	A	49	GLU	OE1-CD-OE2	-6.84	115.09	123.30	15	1
1	A	52	VAL	CA-CB-CG2	6.72	120.98	110.90	14	1
1	A	78	LEU	O-C-N	-6.69	112.00	122.70	5	4
1	A	24	TYR	CZ-CE2-CD2	6.63	125.77	119.80	1	1
1	A	32	GLU	OE1-CD-OE2	-6.60	115.38	123.30	7	3
1	A	50	ASN	C-N-CA	6.49	137.93	121.70	2	1
1	A	30	ALA	O-C-N	-6.44	112.40	122.70	14	1
1	A	64	ILE	O-C-N	-6.29	112.64	122.70	13	1
1	A	64	ILE	CB-CA-C	6.24	124.08	111.60	3	1
1	A	23	TYR	CZ-CE2-CD2	-6.23	114.19	119.80	15	1
1	A	31	ARG	NH1-CZ-NH2	-6.22	112.56	119.40	14	2
1	A	42	ALA	CB-CA-C	6.19	119.39	110.10	10	3
1	A	42	ALA	N-CA-CB	-6.13	101.51	110.10	7	2
1	A	30	ALA	N-CA-CB	-6.13	101.52	110.10	8	2
1	A	27	ILE	CB-CA-C	6.13	123.85	111.60	10	1
1	A	55	PHE	CG-CD1-CE1	6.11	127.52	120.80	4	1
1	A	29	THR	CA-CB-CG2	6.09	120.92	112.40	10	2
1	A	41	LEU	CB-CA-C	6.01	121.61	110.20	7	1
1	A	44	LYS	CA-CB-CG	-6.00	100.20	113.40	15	1
1	A	55	PHE	CB-CG-CD1	-5.96	116.63	120.80	14	3
1	A	67	ALA	N-CA-CB	-5.95	101.78	110.10	6	1
1	A	60	LEU	CB-CG-CD1	5.93	121.08	111.00	16	1
1	A	57	SER	N-CA-CB	-5.90	101.64	110.50	15	1
1	A	68	ARG	NH1-CZ-NH2	-5.87	112.94	119.40	15	3
1	A	24	TYR	CD1-CG-CD2	-5.86	111.45	117.90	7	1
1	A	67	ALA	CB-CA-C	5.81	118.81	110.10	11	1
1	A	51	ILE	O-C-N	-5.79	113.43	122.70	1	1
1	A	58	GLY	CA-C-O	-5.78	110.19	120.60	12	1
1	A	63	THR	CA-CB-CG2	5.73	120.42	112.40	11	1
1	A	23	TYR	CG-CD2-CE2	5.72	125.88	121.30	15	1
1	A	50	ASN	CA-C-N	5.70	129.73	117.20	2	1
1	A	54	ARG	CD-NE-CZ	5.68	131.56	123.60	11	2
1	A	45	LEU	CB-CA-C	5.64	120.92	110.20	5	1
1	A	50	ASN	O-C-N	-5.63	113.69	122.70	16	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})	Models Worst	Models Total
1	A	41	LEU	CB-CG-CD2	-5.55	101.56	111.00	4	1
1	A	62	PRO	N-CA-CB	5.52	109.92	103.30	16	1
1	A	68	ARG	CD-NE-CZ	-5.49	115.92	123.60	3	3
1	A	47	VAL	CA-CB-CG2	5.41	119.02	110.90	11	2
1	A	25	LYS	CA-C-N	5.41	129.10	117.20	6	1
1	A	44	LYS	C-N-CA	5.40	135.20	121.70	13	1
1	A	75	GLY	C-N-CA	5.40	135.20	121.70	4	1
1	A	52	VAL	CA-CB-CG1	-5.36	102.86	110.90	11	1
1	A	24	TYR	O-C-N	-5.32	114.19	122.70	16	1
1	A	64	ILE	CA-C-N	5.27	128.79	117.20	13	1
1	A	78	LEU	CB-CG-CD2	5.25	119.93	111.00	3	1
1	A	48	SER	N-CA-CB	-5.25	102.62	110.50	12	1
1	A	70	LEU	CB-CG-CD2	5.20	119.83	111.00	14	1
1	A	72	LYS	O-C-N	-5.19	114.39	122.70	1	1
1	A	31	ARG	CA-C-N	5.17	128.57	117.20	6	1
1	A	61	LYS	CB-CA-C	5.17	120.74	110.40	10	1
1	A	55	PHE	CD1-CG-CD2	5.14	124.98	118.30	5	1
1	A	27	ILE	C-N-CA	5.13	134.53	121.70	15	1
1	A	47	VAL	CB-CA-C	-5.13	101.66	111.40	6	1
1	A	23	TYR	CD1-CG-CD2	5.12	123.53	117.90	7	1
1	A	52	VAL	CG1-CB-CG2	-5.12	102.71	110.90	9	1
1	A	25	LYS	O-C-N	-5.10	114.53	122.70	6	1
1	A	33	GLN	CA-CB-CG	5.06	124.53	113.40	11	1
1	A	45	LEU	C-N-CA	5.02	134.25	121.70	9	1
1	A	43	GLN	OE1-CD-NE2	-5.00	110.39	121.90	13	1

There are no chirality outliers.

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

Mol	Chain	Res	Type	Group	Models (Total)
1	A	24	TYR	Sidechain,Peptide	8
1	A	23	TYR	Sidechain	5
1	A	68	ARG	Sidechain	4
1	A	56	GLU	Peptide	3
1	A	31	ARG	Sidechain	2
1	A	60	LEU	Peptide	2
1	A	77	LYS	Peptide	1
1	A	44	LYS	Peptide	1
1	A	47	VAL	Peptide	1
1	A	52	VAL	Peptide	1

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Mol	Chain	Res	Type	Group	Models (Total)
1	A	70	LEU	Peptide	1
1	A	55	PHE	Sidechain	1
1	A	78	LEU	Peptide	1
1	A	34	LEU	Mainchain	1
1	A	25	LYS	Peptide	1
1	A	66	GLN	Peptide	1
1	A	54	ARG	Sidechain	1
1	A	73	ILE	Mainchain	1
1	A	48	SER	Mainchain	1

6.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	454	506	506	1±2
All	All	7264	8096	8096	15

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 1.

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:48:SER:C	1:A:52:VAL:H	0.77	1.82	16	2
1:A:61:LYS:HB2	1:A:62:PRO:HD2	0.52	1.81	4	1
1:A:50:ASN:H	1:A:51:ILE:C	0.49	2.11	2	1
1:A:69:GLN:C	1:A:72:LYS:H	0.47	2.12	2	2
1:A:48:SER:CA	1:A:52:VAL:H	0.46	2.23	2	1
1:A:63:THR:H	1:A:66:GLN:HB2	0.45	1.72	10	1
1:A:61:LYS:HB2	1:A:62:PRO:CD	0.45	2.41	4	1
1:A:64:ILE:HD12	1:A:64:ILE:H	0.44	1.73	14	1
1:A:64:ILE:C	1:A:66:GLN:N	0.43	2.69	4	1
1:A:23:TYR:HD1	1:A:60:LEU:H	0.43	1.54	2	1
1:A:75:GLY:O	1:A:76:ILE:HG23	0.43	2.14	16	1
1:A:61:LYS:CB	1:A:62:PRO:HD2	0.42	2.45	4	1
1:A:61:LYS:CB	1:A:62:PRO:CD	0.41	2.97	4	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	56/106 (53%)	49±3 (87±5%)	5±2 (10±4%)	2±1 (4±2%)	6	34
All	All	896/1696 (53%)	777 (87%)	87 (10%)	32 (4%)	6	34

All 18 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	46	LYS	7
1	A	75	GLY	3
1	A	28	LYS	3
1	A	74	LEU	2
1	A	76	ILE	2
1	A	35	GLY	2
1	A	67	ALA	2
1	A	25	LYS	1
1	A	78	LEU	1
1	A	61	LYS	1
1	A	64	ILE	1
1	A	24	TYR	1
1	A	53	LYS	1
1	A	77	LYS	1
1	A	70	LEU	1
1	A	26	ILE	1
1	A	38	GLN	1
1	A	54	ARG	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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	50/96 (52%)	49±1 (97±2%)	1±1 (3±2%)	46	90
All	All	800/1536 (52%)	778 (97%)	22 (3%)	46	90

All 14 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	26	ILE	3
1	A	24	TYR	3
1	A	33	GLN	2
1	A	68	ARG	2
1	A	46	LYS	2
1	A	38	GLN	2
1	A	31	ARG	1
1	A	29	THR	1
1	A	23	TYR	1
1	A	39	GLN	1
1	A	77	LYS	1
1	A	49	GLU	1
1	A	60	LEU	1
1	A	51	ILE	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 30% for the well-defined parts and 27% 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	392
Number of shifts mapped to atoms	392
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Number of shift outliers (ShiftChecker)	2

7.1.2 Chemical shift referencing ⓘ

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_\alpha$	82	-0.24 ± 0.16	None needed (< 0.5 ppm)
$^{13}C_\beta$	76	-0.11 ± 0.23	None needed (< 0.5 ppm)
$^{13}C'$	80	-0.31 ± 0.15	None needed (< 0.5 ppm)
^{15}N	77	1.72 ± 0.24	Should be applied

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 30%, i.e. 255 atoms were assigned a chemical shift out of a possible 841. 0 out of 9 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^1H	^{13}C	^{15}N
Backbone	206/281 (73%)	50/114 (44%)	106/112 (95%)	50/55 (91%)
Sidechain	49/532 (9%)	0/344 (0%)	49/162 (30%)	0/26 (0%)

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	Total	^{1}H	^{13}C	^{15}N
Aromatic	0/28 (0%)	0/13 (0%)	0/15 (0%)	0/0 (—%)
Overall	255/841 (30%)	50/471 (11%)	155/289 (54%)	50/81 (62%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 27%, i.e. 392 atoms were assigned a chemical shift out of a possible 1442. 0 out of 18 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	316/512 (62%)	77/208 (37%)	162/204 (79%)	77/100 (77%)
Sidechain	76/878 (9%)	0/564 (0%)	76/280 (27%)	0/34 (0%)
Aromatic	0/52 (0%)	0/26 (0%)	0/24 (0%)	0/2 (0%)
Overall	392/1442 (27%)	77/798 (10%)	238/508 (47%)	77/136 (57%)

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	25	LYS	CB	58.06	24.03 – 41.47	14.5
1	A	25	LYS	CA	32.76	46.18 – 67.77	-11.2

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: