WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB NMR Structure Validation Report ⓘ

Apr 21, 2024 – 10:32 AM EDT

PDB ID	:	2MQI
BMRB ID	:	17368
Title	:	human Fyn SH2 free state
Authors	:	Huculeci, R.; Buts, L.; Lenaerts, T.; VanNuland, N.
Deposited on	:	2014-06-20

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 89%.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
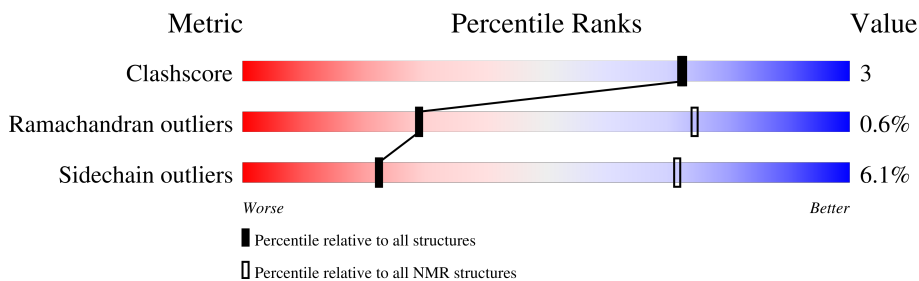
Metric	Whole archive (#Entries)	NMR archive (#Entries)
Clashscore	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

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

Mol	Chain	Length	Quality of chain
1	A	111	

2 Ensemble composition and analysis ⓘ

This entry contains 20 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:151-A:248 (98)	0.87	1

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

3 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 1635 atoms, of which 812 are hydrogens and 0 are deuteriums.

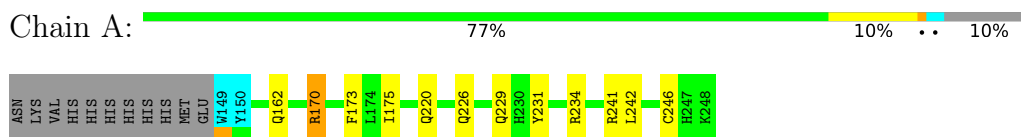- Molecule 1 is a protein called Tyrosine-protein kinase Fyn.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	100	1635	520	812	152	147	4	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	138	ASN	-	expression tag	UNP P06241
A	139	LYS	-	expression tag	UNP P06241
A	140	VAL	-	expression tag	UNP P06241
A	141	HIS	-	expression tag	UNP P06241
A	142	HIS	-	expression tag	UNP P06241
A	143	HIS	-	expression tag	UNP P06241
A	144	HIS	-	expression tag	UNP P06241
A	145	HIS	-	expression tag	UNP P06241
A	146	HIS	-	expression tag	UNP P06241
A	147	MET	-	expression tag	UNP P06241

4 Residue-property plots (i)

4.1 Average score per residue in the NMR ensemble

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

• Molecule 1: Tyrosine-protein kinase Fyn

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)

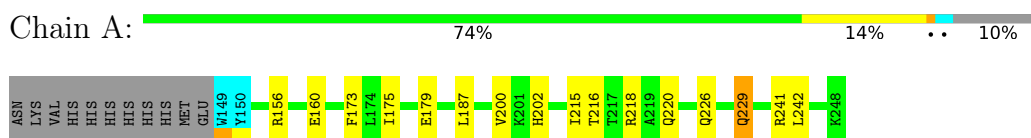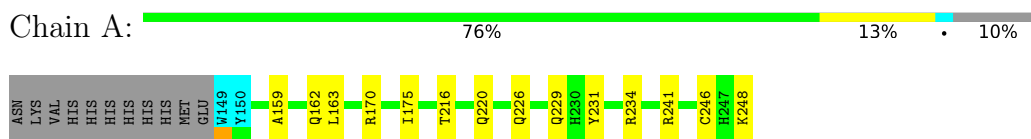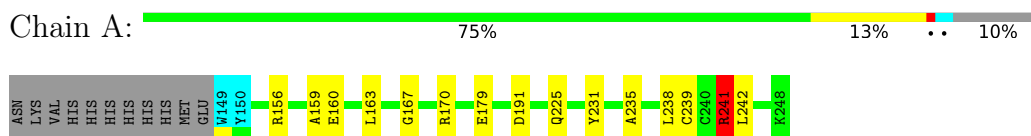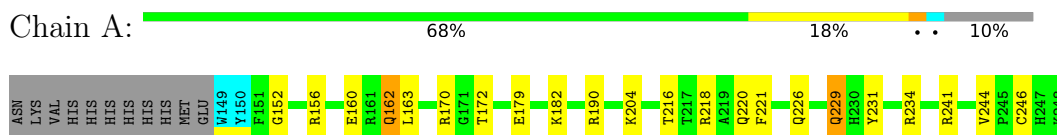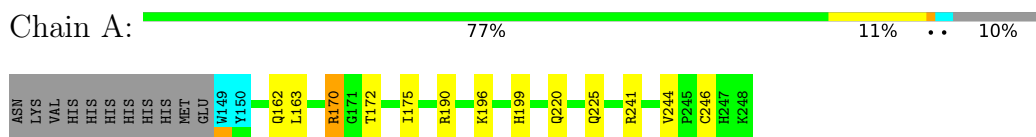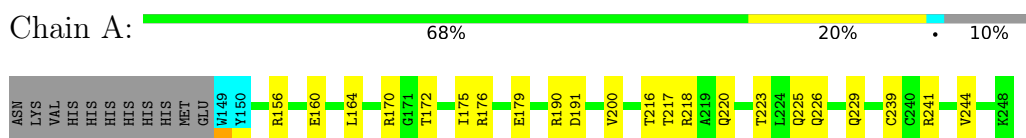• Molecule 1: Tyrosine-protein kinase Fyn

4.2.2 Score per residue for model 2

• Molecule 1: Tyrosine-protein kinase Fyn

4.2.3 Score per residue for model 3

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A: 77%   10%   • •   10%

ASN LYS VAL HIS HIS HIS HIS HIS MET GLU W149 Y150 Q162 R170 F173 L174 I175 Q220 Q226 Q229 H230 Y231 R234 R241 L242 C246 H247 K248

4.2.4 Score per residue for model 4

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A: 74%   14%   • •   10%

ASN LYS VAL HIS HIS HIS HIS HIS MET GLU W149 Y150 R156 E160 F173 L174 I175 E179 L187 V200 K201 H202 I215 T216 T217 R218 A219 Q220 Q226 Q229 R241 L242 K248

4.2.5 Score per residue for model 5

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A: 76%   13%   •   10%

ASN LYS VAL HIS HIS HIS HIS HIS MET GLU W149 Y150 A159 Q162 L163 R170 I175 T216 Q220 Q226 Q229 H230 Y231 R234 R241 C246 H247 K248

4.2.6 Score per residue for model 6

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A: 75%   13%   • •   10%

ASN LYS VAL HIS HIS HIS HIS HIS MET GLU W149 Y150 R156 A159 E160 L163 G167 R170 E179 D191 Q225 Y231 A235 L238 C239 C240 R241 L242 K248

4.2.7 Score per residue for model 7

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A: 68%   18%   • •   10%

ASN LYS VAL HIS HIS HIS HIS HIS MET GLU W149 Y150 F151 G152 R156 E160 R161 Q162 L163 R170 G171 T172 E179 K182 R190 K204 T216 T217 R218 A219 Q220 F221 Q226 Q229 H230 Y231 R234 R241 V244 P245 C246 H247 K248

4.2.8 Score per residue for model 8

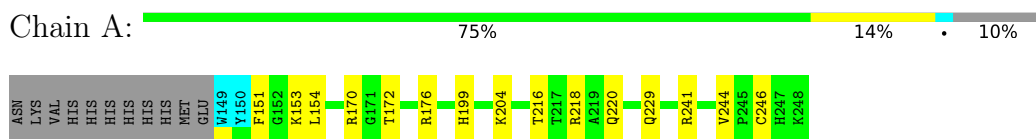• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.9 Score per residue for model 9

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.10 Score per residue for model 10

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.11 Score per residue for model 11

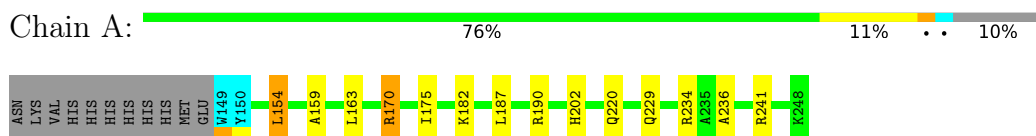• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.12 Score per residue for model 12

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.13　Score per residue for model 13

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.14　Score per residue for model 14

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

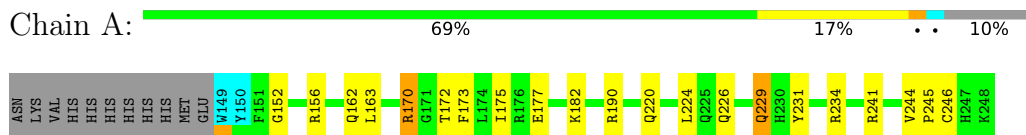**4.2.15　Score per residue for model 15**

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.16　Score per residue for model 16

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:

4.2.17　Score per residue for model 17

• Molecule 1: Tyrosine-protein kinase Fyn

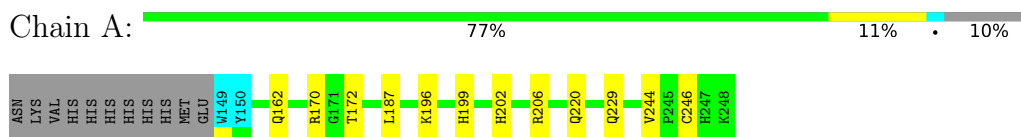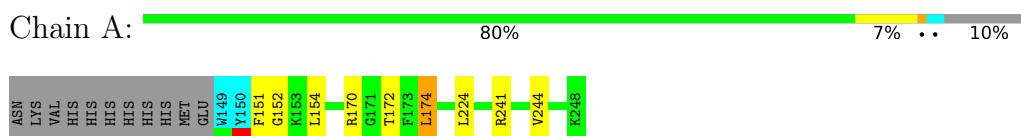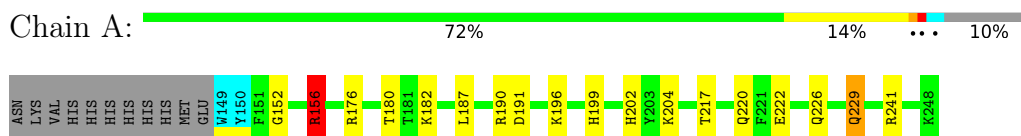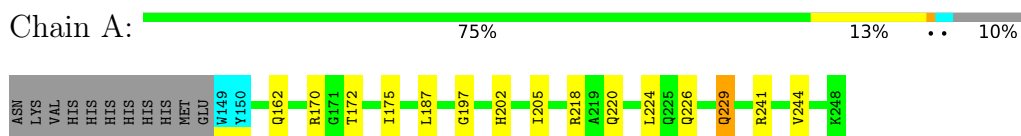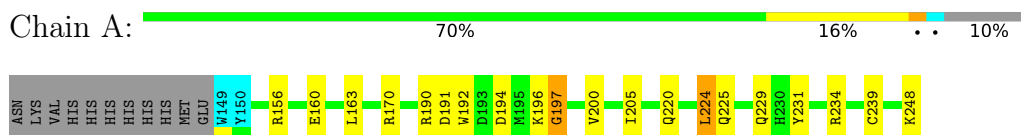Chain A:

4.2.18   Score per residue for model 18

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:
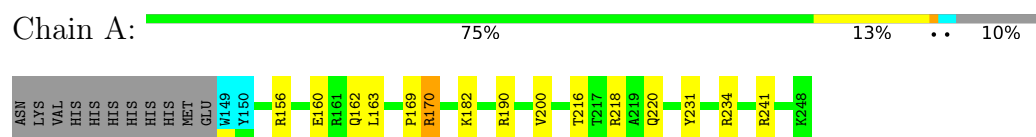
4.2.19   Score per residue for model 19

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:
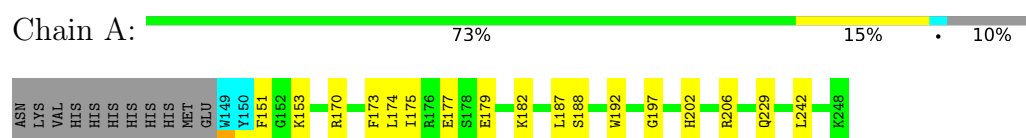
4.2.20   Score per residue for model 20

• Molecule 1: Tyrosine-protein kinase Fyn

Chain A:
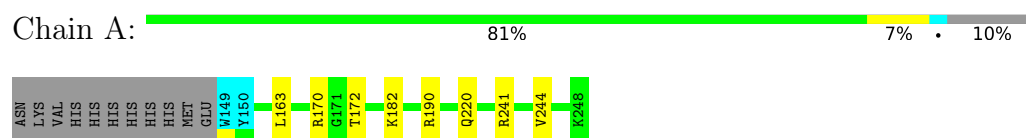
5 Refinement protocol and experimental data overview ⓘ

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

Of the 100 calculated structures, 20 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
CYANA	structure solution	
CNS	refinement	
TALOS	geometry optimization	
TALOS	structure solution	
TALOS	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	1332
Number of shifts mapped to atoms	1260
Number of unparsed shifts	0
Number of shifts with mapping errors	72
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	89%

6 Model quality (i)

6.1 Standard geometry (i)

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	0.82±0.03	0±0/813 (0.0± 0.0%)	0.67±0.02	0±0/1088 (0.0± 0.0%)
All	All	0.82	3/16260 (0.0%)	0.67	2/21760 (0.0%)

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	0.2±0.4
All	All	0	4

All unique bond 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(Å)	Ideal(Å)	Models	
								Worst	Total
1	A	197	GLY	CA-C	-6.98	1.40	1.51	17	1
1	A	152	GLY	N-CA	-5.45	1.37	1.46	14	1
1	A	241	ARG	N-CA	-5.16	1.36	1.46	6	1

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(^{o})	Ideal(^{o})	Models	
								Worst	Total
1	A	197	GLY	N-CA-C	6.05	128.23	113.10	17	1
1	A	196	LYS	C-N-CA	-5.06	111.67	122.30	17	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	156	ARG	Sidechain	2
1	A	241	ARG	Sidechain	1
1	A	206	ARG	Sidechain	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	797	793	793	5±3
All	All	15940	15860	15860	107

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:241:ARG:HA	1:A:241:ARG:NE	0.80	1.91	6	1
1:A:192:TRP:CH2	1:A:194:ASP:HA	0.79	2.12	17	1
1:A:160:GLU:HG2	1:A:200:VAL:HG21	0.65	1.67	17	1
1:A:162:GLN:HB3	1:A:246:CYS:SG	0.64	2.31	12	7
1:A:226:GLN:O	1:A:229:GLN:HG2	0.60	1.96	3	8
1:A:170:ARG:HD2	1:A:170:ARG:O	0.53	2.03	12	2
1:A:231:TYR:HA	1:A:234:ARG:O	0.53	2.03	1	7
1:A:172:THR:HA	1:A:244:VAL:O	0.53	2.03	13	9
1:A:196:LYS:O	1:A:199:HIS:HB2	0.53	2.04	13	3
1:A:156:ARG:O	1:A:160:GLU:HG3	0.52	2.05	7	5
1:A:216:THR:HG23	1:A:218:ARG:HG2	0.52	1.81	9	3
1:A:238:LEU:HD12	1:A:241:ARG:HH22	0.52	1.65	6	1
1:A:152:GLY:O	1:A:177:GLU:HG3	0.51	2.04	12	1
1:A:170:ARG:H	1:A:170:ARG:NE	0.51	2.04	3	1
1:A:187:LEU:O	1:A:202:HIS:HA	0.51	2.06	15	6
1:A:191:ASP:OD1	1:A:239:CYS:HB2	0.50	2.05	9	2
1:A:235:ALA:N	1:A:241:ARG:HD2	0.49	2.22	6	1
1:A:160:GLU:HA	1:A:200:VAL:HG21	0.49	1.85	18	1
1:A:231:TYR:HB3	1:A:241:ARG:CZ	0.48	2.38	6	1
1:A:235:ALA:HA	1:A:241:ARG:HD2	0.48	1.86	6	1
1:A:163:LEU:O	1:A:190:ARG:HD2	0.47	2.09	11	7

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models Worst	Total
1:A:223:THR:HG22	1:A:226:GLN:HG2	0.47	1.84	9	1
1:A:175:ILE:HG21	1:A:224:LEU:HD13	0.47	1.85	12	1
1:A:159:ALA:O	1:A:163:LEU:HD22	0.47	2.09	5	1
1:A:216:THR:CG2	1:A:218:ARG:HG2	0.46	2.41	7	3
1:A:241:ARG:HA	1:A:241:ARG:CZ	0.46	2.37	6	1
1:A:238:LEU:HD12	1:A:241:ARG:NH2	0.46	2.25	6	1
1:A:173:PHE:CD1	1:A:242:LEU:HB3	0.45	2.46	19	2
1:A:235:ALA:HA	1:A:241:ARG:NH1	0.45	2.26	6	1
1:A:173:PHE:O	1:A:245:PRO:HA	0.45	2.12	12	1
1:A:205:ILE:HD13	1:A:224:LEU:HD11	0.45	1.89	16	1
1:A:170:ARG:HG2	1:A:192:TRP:HB2	0.44	1.89	19	1
1:A:216:THR:CG2	1:A:218:ARG:HG3	0.44	2.43	10	1
1:A:154:LEU:HD21	1:A:159:ALA:HB2	0.43	1.89	11	1
1:A:151:PHE:CG	1:A:174:LEU:HB2	0.43	2.48	2	1
1:A:235:ALA:CA	1:A:241:ARG:HD2	0.42	2.44	6	1
1:A:151:PHE:O	1:A:176:ARG:HA	0.42	2.14	10	1
1:A:192:TRP:CD1	1:A:197:GLY:O	0.42	2.72	17	1
1:A:164:LEU:HA	1:A:190:ARG:CZ	0.42	2.45	9	1
1:A:169:PRO:HB2	1:A:170:ARG:NH2	0.42	2.30	18	1
1:A:173:PHE:HA	1:A:188:SER:O	0.42	2.14	19	1
1:A:191:ASP:OD2	1:A:239:CYS:HB2	0.41	2.14	17	1
1:A:156:ARG:HA	1:A:176:ARG:CZ	0.41	2.46	15	1
1:A:173:PHE:CE1	1:A:242:LEU:HB3	0.41	2.50	4	1
1:A:159:ALA:O	1:A:163:LEU:HG	0.41	2.14	6	1
1:A:170:ARG:N	1:A:170:ARG:HD3	0.41	2.30	11	1
1:A:160:GLU:HG2	1:A:200:VAL:CG2	0.41	2.45	9	1
1:A:169:PRO:HB2	1:A:170:ARG:CZ	0.41	2.45	18	1
1:A:160:GLU:HG2	1:A:200:VAL:HB	0.41	1.92	4	1
1:A:221:PHE:HB3	1:A:226:GLN:HB2	0.41	1.92	7	1
1:A:153:LYS:HB2	1:A:177:GLU:OE1	0.41	2.16	19	1
1:A:172:THR:CG2	1:A:246:CYS:HA	0.40	2.46	10	1
1:A:205:ILE:HD13	1:A:224:LEU:HD21	0.40	1.94	17	1
1:A:231:TYR:O	1:A:242:LEU:HG	0.40	2.17	6	1
1:A:216:THR:HG23	1:A:218:ARG:HG3	0.40	1.93	10	1
1:A:234:ARG:HG3	1:A:236:ALA:HB2	0.40	1.94	11	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	97/111 (87%)	93±1 (96±1%)	4±1 (4±1%)	1±1 (1±1%)	29	74
All	All	1940/2220 (87%)	1855 (96%)	74 (4%)	11 (1%)	29	74

All 4 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	182	LYS	6
1	A	153	LYS	2
1	A	197	GLY	2
1	A	167	GLY	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	84/97 (87%)	79±2 (94±2%)	5±2 (6±2%)	22	71
All	All	1680/1940 (87%)	1577 (94%)	103 (6%)	22	71

All 25 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	220	GLN	17
1	A	170	ARG	16
1	A	241	ARG	16
1	A	229	GLN	12
1	A	179	GLU	5
1	A	154	LEU	4

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Mol	Chain	Res	Type	Models (Total)
1	A	225	GLN	4
1	A	217	THR	3
1	A	162	GLN	3
1	A	204	LYS	3
1	A	215	ILE	2
1	A	248	LYS	2
1	A	174	LEU	2
1	A	224	LEU	2
1	A	156	ARG	2
1	A	216	THR	1
1	A	199	HIS	1
1	A	182	LYS	1
1	A	206	ARG	1
1	A	180	THR	1
1	A	190	ARG	1
1	A	191	ASP	1
1	A	222	GLU	1
1	A	218	ARG	1
1	A	151	PHE	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 89% for the well-defined parts and 89% 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	1332
Number of shifts mapped to atoms	1260
Number of unparsed shifts	0
Number of shifts with mapping errors	72
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 72 occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	138	ASN	HD21	7.654	0.000	1
1	A	138	ASN	HD22	6.935	0.000	1
1	A	138	ASN	ND2	113.061	0.010	1
1	A	139	LYS	C	176.135	0.000	1
1	A	139	LYS	CA	56.332	0.017	1
1	A	139	LYS	CB	32.946	0.015	1
1	A	139	LYS	CD	28.992	0.072	1
1	A	139	LYS	CE	42.067	0.010	1
1	A	139	LYS	CG	24.584	0.046	1
1	A	139	LYS	HA	4.236	0.004	1
1	A	139	LYS	HB2	1.667	0.000	1
1	A	139	LYS	HB3	1.667	0.000	1
1	A	139	LYS	HD2	1.635	0.000	1
1	A	139	LYS	HD3	1.635	0.000	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	139	LYS	HE2	2.951	0.000	1
1	A	139	LYS	HE3	2.94	0.011	1
1	A	139	LYS	HG2	1.276	0.000	1
1	A	139	LYS	HG3	1.276	0.000	1
1	A	140	VAL	C	175.574	0.000	1
1	A	140	VAL	CA	62.076	0.055	1
1	A	140	VAL	CB	32.833	0.055	1
1	A	140	VAL	CG1	20.129	0.000	2
1	A	140	VAL	CG2	20.774	0.055	2
1	A	140	VAL	H	8.08	0.006	1
1	A	140	VAL	HA	3.967	0.003	1
1	A	140	VAL	HB	1.883	0.000	1
1	A	140	VAL	HG11	0.815	0.004	2
1	A	140	VAL	HG12	0.815	0.004	2
1	A	140	VAL	HG13	0.815	0.004	2
1	A	140	VAL	HG21	0.715	0.005	2
1	A	140	VAL	HG22	0.715	0.005	2
1	A	140	VAL	HG23	0.715	0.005	2
1	A	140	VAL	N	121.49	0.039	1
1	A	141	HIS	C	174.955	0.000	1
1	A	141	HIS	CA	55.595	0.000	1
1	A	141	HIS	CB	30.595	0.099	1
1	A	141	HIS	CD2	119.904	0.000	1
1	A	141	HIS	H	8.381	0.005	1
1	A	141	HIS	HA	4.608	0.000	1
1	A	141	HIS	HB2	3.124	0.000	2
1	A	141	HIS	HB3	3.062	0.000	2
1	A	141	HIS	HD2	7.049	0.000	1
1	A	141	HIS	N	123.422	0.027	1
1	A	142	HIS	CA	55.364	0.000	1
1	A	142	HIS	CB	33.018	0.000	1
1	A	142	HIS	H	8.346	0.005	1
1	A	142	HIS	N	122.633	0.193	1
1	A	146	HIS	C	175.226	0.000	1
1	A	146	HIS	CA	55.555	0.016	1
1	A	146	HIS	CB	29.947	0.039	1
1	A	146	HIS	CD2	119.411	0.000	1
1	A	146	HIS	HA	4.539	0.000	1
1	A	146	HIS	HB2	3.083	0.000	2
1	A	146	HIS	HB3	2.924	0.000	2
1	A	146	HIS	HD2	6.88	0.000	1

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List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	147	MET	C	178.302	0.000	1
1	A	147	MET	CA	53.962	0.006	1
1	A	147	MET	CB	31.337	0.021	1
1	A	147	MET	H	7.554	0.008	1
1	A	147	MET	HA	4.078	0.000	1
1	A	147	MET	N	119.415	0.019	1
1	A	148	GLU	C	175.659	0.000	1
1	A	148	GLU	CA	59.11	0.006	1
1	A	148	GLU	CB	29.334	0.029	1
1	A	148	GLU	CG	36.268	0.017	1
1	A	148	GLU	H	9.229	0.003	1
1	A	148	GLU	HA	3.895	0.000	1
1	A	148	GLU	HB2	1.94	0.000	1
1	A	148	GLU	HB3	1.94	0.000	1
1	A	148	GLU	HG2	2.272	0.000	1
1	A	148	GLU	HG3	2.271	0.005	1
1	A	148	GLU	N	122.249	0.014	1

7.1.2　Chemical shift referencing ⓘ

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction ± precision, *ppm*	Suggested action
$^{13}C_\alpha$	107	-0.35 ± 0.15	None needed (< 0.5 ppm)
$^{13}C_\beta$	98	-0.10 ± 0.10	None needed (< 0.5 ppm)
$^{13}C'$	103	0.05 ± 0.20	None needed (< 0.5 ppm)
^{15}N	103	-0.45 ± 0.44	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 89%, i.e. 1224 atoms were assigned a chemical shift out of a possible 1381. 0 out of 14 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	492/495 (99%)	203/203 (100%)	193/196 (98%)	96/96 (100%)
Sidechain	641/761 (84%)	434/489 (89%)	200/230 (87%)	7/42 (17%)
Aromatic	91/125 (73%)	46/62 (74%)	44/58 (76%)	1/5 (20%)
Overall	1224/1381 (89%)	683/754 (91%)	437/484 (90%)	104/143 (73%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 89%, i.e. 1260 atoms were assigned a chemical shift out of a possible 1418. 0 out of 14 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	502/505 (99%)	207/207 (100%)	197/200 (98%)	98/98 (100%)
Sidechain	647/767 (84%)	438/493 (89%)	202/232 (87%)	7/42 (17%)
Aromatic	111/146 (76%)	56/72 (78%)	53/68 (78%)	2/6 (33%)
Overall	1260/1418 (89%)	701/772 (91%)	452/500 (90%)	107/146 (73%)

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: