Full wwPDB NMR Structure Validation Report (i)

Jun 15, 2024 – 09:30 AM EDT

PDB ID	:	2JS7
BMRB ID	:	15356
Title	:	Solution NMR structure of human myeloid differentiation primary response (MyD88). Northeast Structural Genomics target HR2869A
Authors	:	Rossi, P.; Ramelot, T.A.; Tao, X.; Ciano, M.; Ho, C.; Ma, L.-C.; Xiao, R.; Acton, T.B.; Kennedy, M.A.; Tong, L.; Montelione, G.T.; Northeast Structural Genomics Consortium (NESG)
Deposited on	:	2007-06-29

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 (i) 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 (i)) were used in the production of this report:

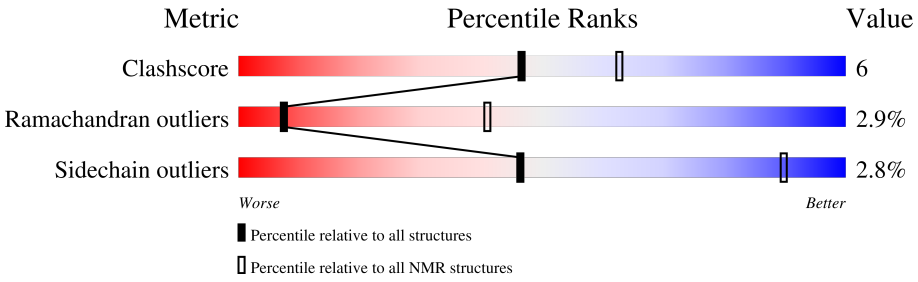
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 92%.

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	160	78% 8% • 14%

2 Ensemble composition and analysis

This entry contains 20 models. Model 13 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:16-A:153 (138)	0.94	13

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 8 single-model clusters were found.

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

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 2635 atoms, of which 1322 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Myeloid differentiation primary response protein MyD88.

Mol	Chain	Residues	Atoms						Trace
1	A	160	Total	C	H	N	O	S	0
			2635	840	1322	229	231	13	

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	expression tag	UNP Q99836
A	153	LEU	-	expression tag	UNP Q99836
A	154	GLU	-	expression tag	UNP Q99836
A	155	HIS	-	expression tag	UNP Q99836
A	156	HIS	-	expression tag	UNP Q99836
A	157	HIS	-	expression tag	UNP Q99836
A	158	HIS	-	expression tag	UNP Q99836
A	159	HIS	-	expression tag	UNP Q99836
A	160	HIS	-	expression tag	UNP Q99836

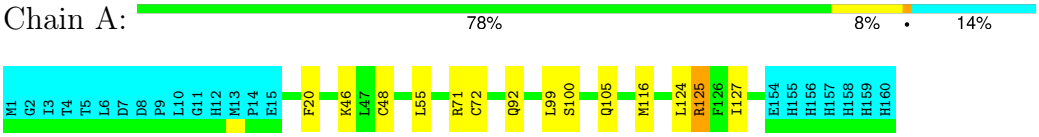
4 Residue-property plots

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: Myeloid differentiation primary response protein MyD88

Chain A:



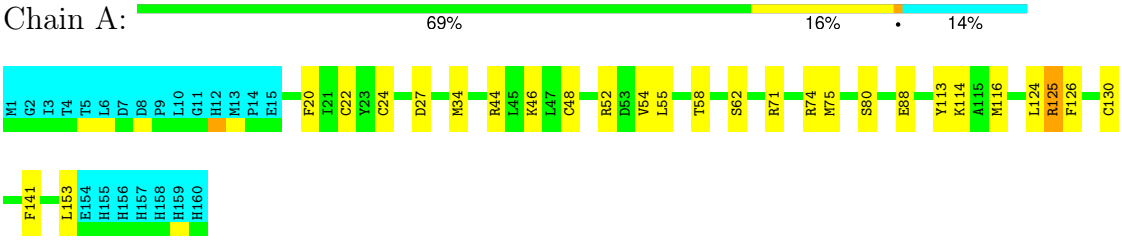
4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

• Molecule 1: Myeloid differentiation primary response protein MyD88

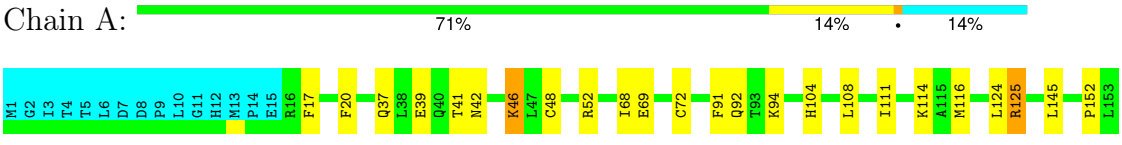
Chain A:

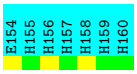


4.2.2 Score per residue for model 2

• Molecule 1: Myeloid differentiation primary response protein MyD88

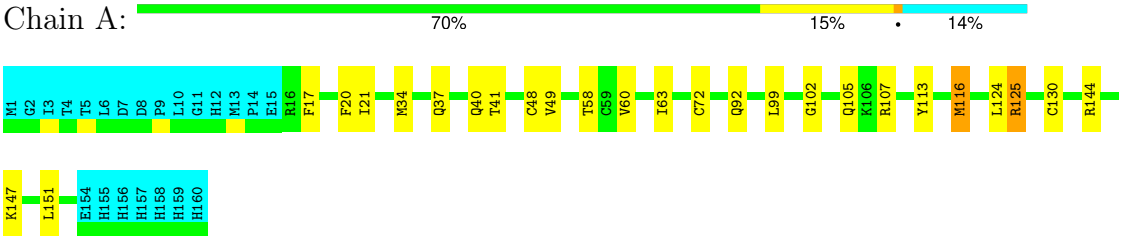
Chain A:





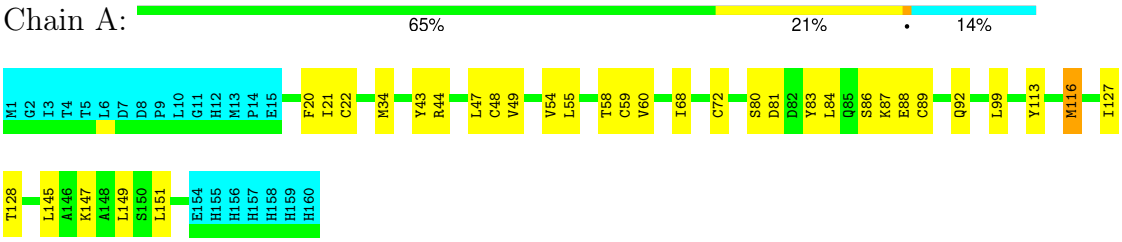
4.2.3 Score per residue for model 3

• Molecule 1: Myeloid differentiation primary response protein MyD88



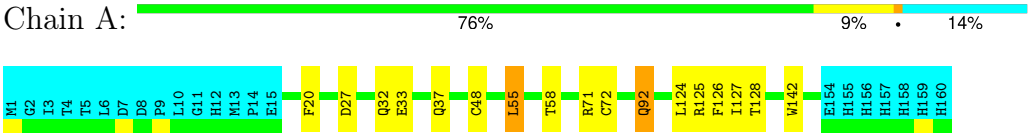
4.2.4 Score per residue for model 4

• Molecule 1: Myeloid differentiation primary response protein MyD88



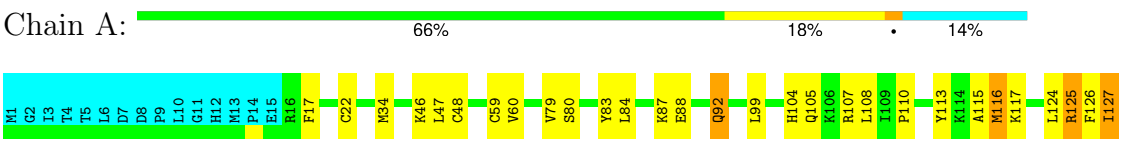
4.2.5 Score per residue for model 5

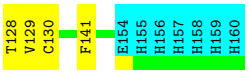
• Molecule 1: Myeloid differentiation primary response protein MyD88



4.2.6 Score per residue for model 6

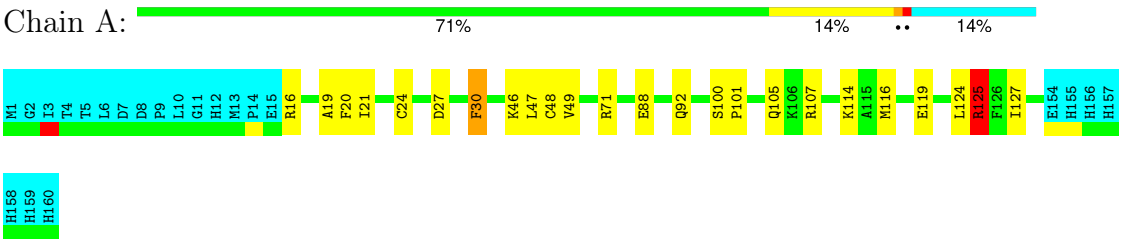
• Molecule 1: Myeloid differentiation primary response protein MyD88





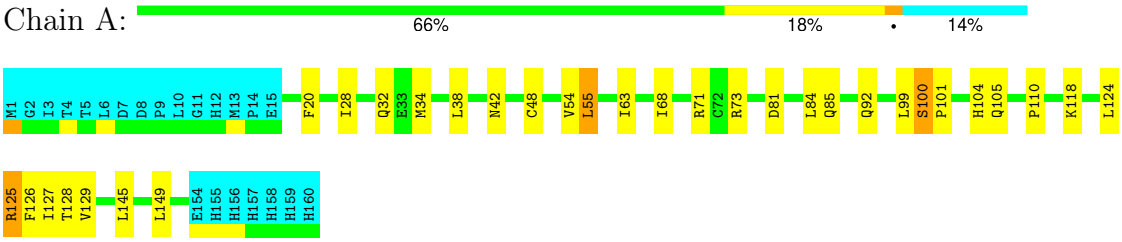
4.2.7 Score per residue for model 7

• Molecule 1: Myeloid differentiation primary response protein MyD88



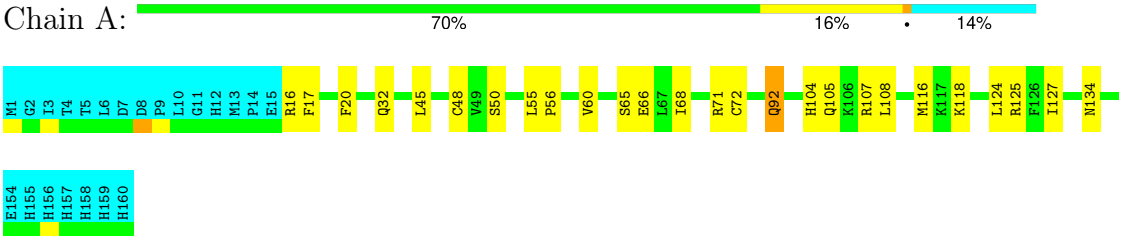
4.2.8 Score per residue for model 8

• Molecule 1: Myeloid differentiation primary response protein MyD88



4.2.9 Score per residue for model 9

• Molecule 1: Myeloid differentiation primary response protein MyD88



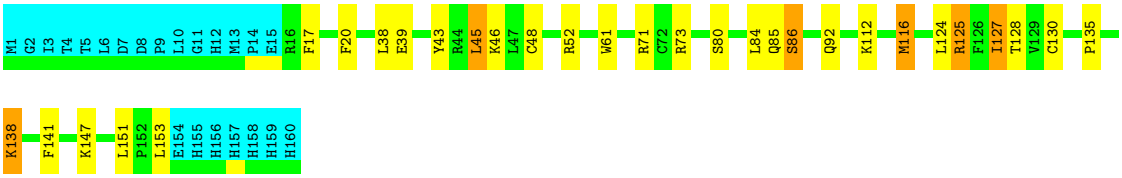
4.2.10 Score per residue for model 10

• Molecule 1: Myeloid differentiation primary response protein MyD88

4.2.11 Score per residue for model 11

• Molecule 1: Myeloid differentiation primary response protein MyD88

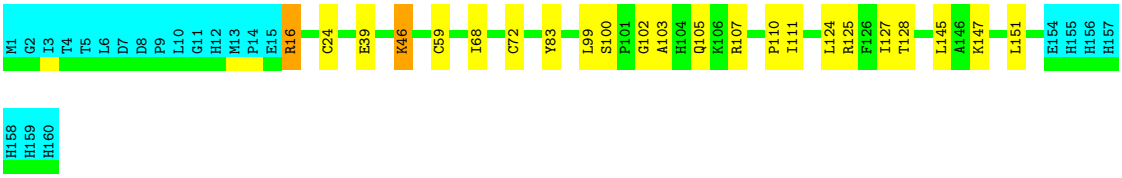
Chain A:



4.2.12 Score per residue for model 12

• Molecule 1: Myeloid differentiation primary response protein MyD88

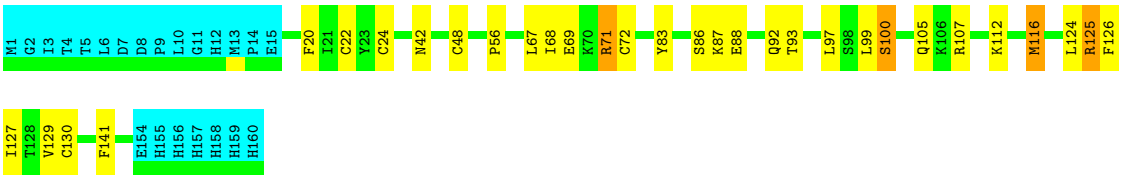
Chain A:



4.2.13 Score per residue for model 13 (medoid)

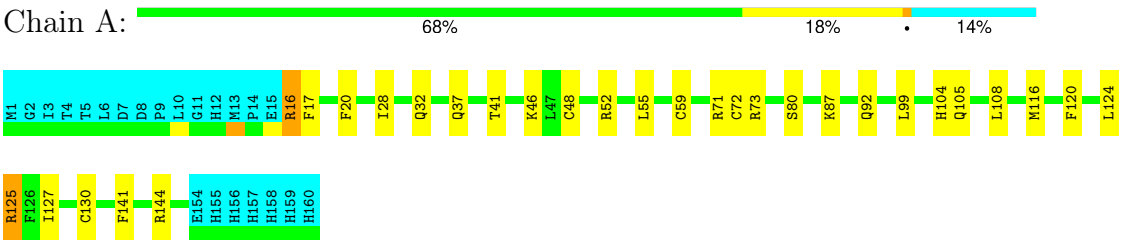
• Molecule 1: Myeloid differentiation primary response protein MyD88

Chain A:



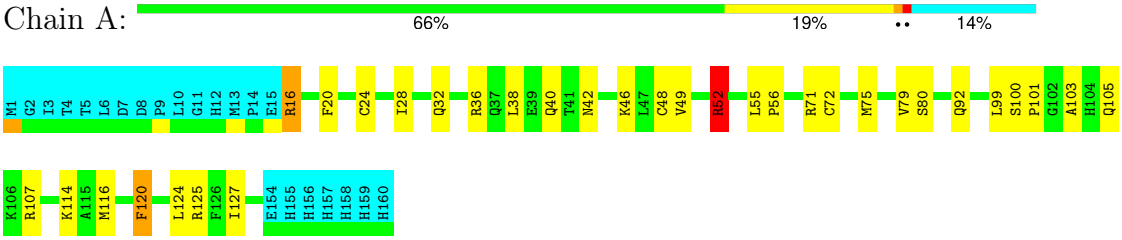
4.2.14 Score per residue for model 14

• Molecule 1: Myeloid differentiation primary response protein MyD88



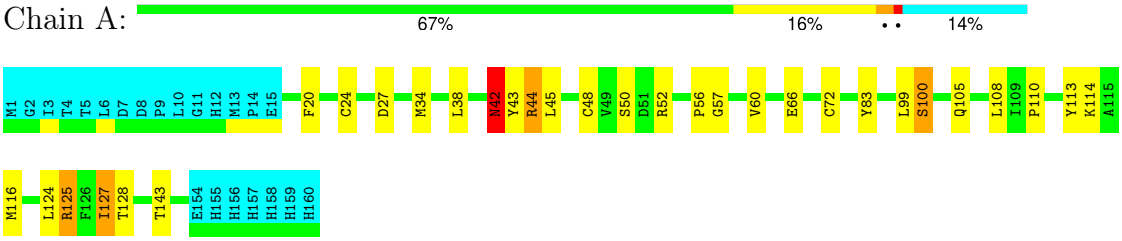
4.2.15 Score per residue for model 15

• Molecule 1: Myeloid differentiation primary response protein MyD88



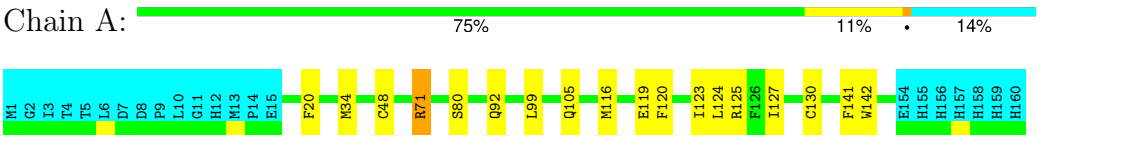
4.2.16 Score per residue for model 16

• Molecule 1: Myeloid differentiation primary response protein MyD88



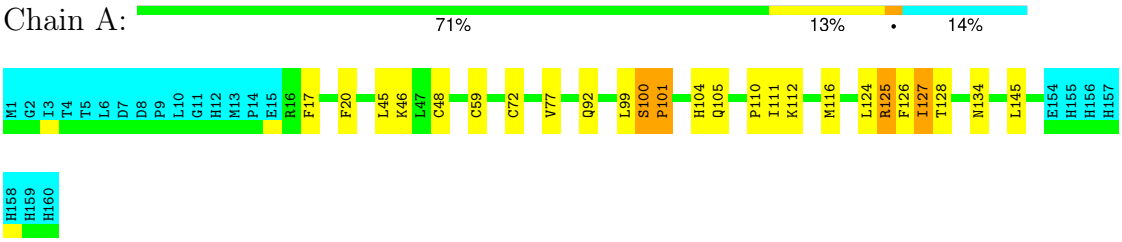
4.2.17 Score per residue for model 17

• Molecule 1: Myeloid differentiation primary response protein MyD88



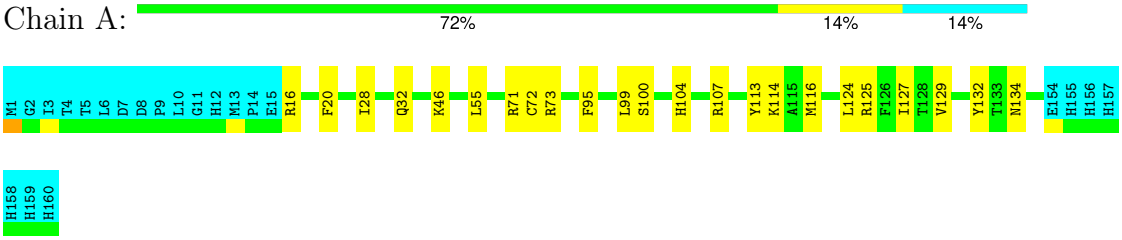
4.2.18 Score per residue for model 18

• Molecule 1: Myeloid differentiation primary response protein MyD88



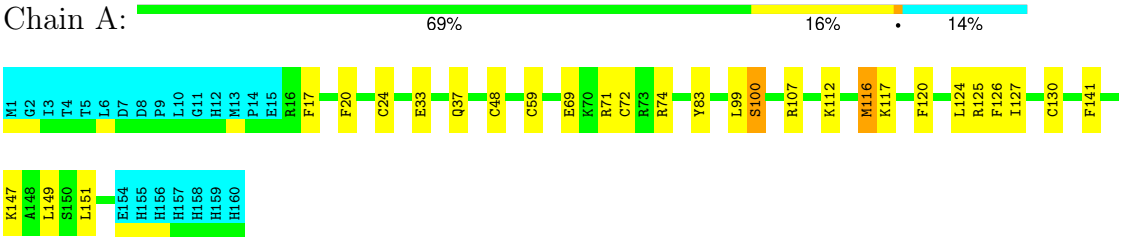
4.2.19 Score per residue for model 19

• Molecule 1: Myeloid differentiation primary response protein MyD88



4.2.20 Score per residue for model 20

• Molecule 1: Myeloid differentiation primary response protein MyD88



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	2.1
AutoStructure	structure solution	2.1.1
CNS	refinement	1.1
X-PLOR NIH	refinement	2.11.2

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	2003
Number of shifts mapped to atoms	2003
Number of unparsed shifts	0
Number of shifts with mapping errors	0
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	92%

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	1132	1159	1158	15±3
All	All	22640	23180	23160	297

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 6.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:24:CYS:SG	1:A:83:TYR:HA	0.83	2.13	13	4
1:A:112:LYS:NZ	1:A:116:MET:SD	0.71	2.64	11	3
1:A:20:PHE:HB2	1:A:72:CYS:SG	0.71	2.25	4	9
1:A:114:LYS:HG3	1:A:116:MET:SD	0.70	2.27	15	7
1:A:105:GLN:HB2	1:A:127:ILE:HG21	0.69	1.65	16	4
1:A:130:CYS:SG	1:A:144:ARG:NH1	0.66	2.68	3	2
1:A:17:PHE:CD2	1:A:48:CYS:SG	0.62	2.92	6	3
1:A:46:LYS:NZ	1:A:59:CYS:SG	0.62	2.72	18	1
1:A:124:LEU:HD12	1:A:125:ARG:N	0.62	2.09	15	19
1:A:127:ILE:HG23	1:A:128:THR:H	0.62	1.55	16	4
1:A:20:PHE:HD2	1:A:48:CYS:HG	0.60	1.38	11	5
1:A:105:GLN:HB3	1:A:127:ILE:HD13	0.60	1.74	6	8
1:A:69:GLU:HG3	1:A:107:ARG:HH22	0.59	1.58	13	1
1:A:79:VAL:HG12	1:A:116:MET:SD	0.59	2.38	6	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:86:SER:HA	1:A:89:CYS:HB3	0.58	1.75	4	1
1:A:52:ARG:CZ	1:A:52:ARG:HA	0.58	2.28	15	1
1:A:130:CYS:SG	1:A:141:PHE:CE1	0.57	2.95	1	7
1:A:20:PHE:HD1	1:A:48:CYS:HG	0.56	1.43	9	1
1:A:116:MET:SD	1:A:118:LYS:N	0.56	2.78	9	1
1:A:112:LYS:HZ1	1:A:126:PHE:HE1	0.56	1.43	18	1
1:A:116:MET:SD	1:A:116:MET:N	0.55	2.79	15	8
1:A:68:ILE:HG23	1:A:72:CYS:SG	0.55	2.41	13	3
1:A:131:ASP:HB2	1:A:137:THR:HG21	0.55	1.77	10	1
1:A:24:CYS:HG	1:A:83:TYR:HD1	0.54	1.44	12	2
1:A:24:CYS:SG	1:A:86:SER:HB3	0.54	2.43	13	1
1:A:99:LEU:HD22	1:A:107:ARG:NH1	0.54	2.18	20	3
1:A:20:PHE:HD2	1:A:48:CYS:SG	0.53	2.27	3	4
1:A:48:CYS:SG	1:A:49:VAL:N	0.53	2.82	15	1
1:A:128:THR:O	1:A:128:THR:HG22	0.53	2.04	11	2
1:A:124:LEU:O	1:A:127:ILE:HG22	0.53	2.03	16	6
1:A:22:CYS:HG	1:A:83:TYR:HE1	0.53	1.47	4	2
1:A:20:PHE:HD1	1:A:48:CYS:SG	0.52	2.27	20	7
1:A:17:PHE:CE1	1:A:48:CYS:SG	0.52	3.03	2	1
1:A:24:CYS:SG	1:A:80:SER:HB2	0.52	2.45	15	2
1:A:92:GLN:NE2	1:A:124:LEU:HD23	0.52	2.20	9	2
1:A:38:LEU:HA	1:A:42:ASN:HB2	0.51	1.82	15	1
1:A:63:ILE:HG13	1:A:68:ILE:HD13	0.51	1.80	8	1
1:A:116:MET:SD	1:A:118:LYS:HB2	0.50	2.47	9	1
1:A:42:ASN:N	1:A:42:ASN:HD22	0.50	2.05	16	1
1:A:79:VAL:HG11	1:A:120:PHE:CE2	0.49	2.42	15	1
1:A:112:LYS:HB2	1:A:112:LYS:NZ	0.49	2.21	18	1
1:A:101:PRO:HA	1:A:104:HIS:CE1	0.49	2.42	18	1
1:A:58:THR:OG1	1:A:60:VAL:HG22	0.49	2.06	3	1
1:A:99:LEU:HD13	1:A:107:ARG:HD3	0.49	1.85	3	1
1:A:99:LEU:O	1:A:100:SER:HB2	0.49	2.08	13	6
1:A:72:CYS:SG	1:A:107:ARG:NH2	0.49	2.85	9	1
1:A:22:CYS:SG	1:A:92:GLN:HB2	0.49	2.48	6	1
1:A:16:ARG:HA	1:A:16:ARG:NE	0.48	2.24	9	1
1:A:112:LYS:NZ	1:A:126:PHE:HE1	0.48	2.06	18	1
1:A:20:PHE:CD2	1:A:48:CYS:SG	0.48	3.07	1	1
1:A:116:MET:N	1:A:116:MET:SD	0.48	2.86	4	2
1:A:147:LYS:O	1:A:151:LEU:HG	0.48	2.08	20	5
1:A:38:LEU:HB3	1:A:45:LEU:HD12	0.48	1.84	11	2
1:A:104:HIS:O	1:A:108:LEU:HG	0.47	2.09	9	4
1:A:86:SER:O	1:A:88:GLU:N	0.47	2.47	4	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:47:LEU:HB2	1:A:60:VAL:HG12	0.47	1.84	6	1
1:A:46:LYS:N	1:A:46:LYS:HD3	0.47	2.25	2	1
1:A:63:ILE:HD11	1:A:72:CYS:SG	0.47	2.50	3	1
1:A:17:PHE:HB3	1:A:72:CYS:SG	0.47	2.50	18	1
1:A:33:GLU:HG3	1:A:37:GLN:NE2	0.47	2.25	5	1
1:A:34:MET:SD	1:A:113:TYR:OH	0.47	2.73	3	5
1:A:130:CYS:HG	1:A:141:PHE:HE1	0.47	1.44	17	1
1:A:126:PHE:CZ	1:A:129:VAL:HG11	0.47	2.44	13	3
1:A:99:LEU:HB2	1:A:104:HIS:HB3	0.46	1.87	8	2
1:A:37:GLN:O	1:A:41:THR:HG22	0.46	2.11	3	3
1:A:67:LEU:HD13	1:A:71:ARG:NH1	0.46	2.26	13	1
1:A:68:ILE:CG2	1:A:72:CYS:SG	0.46	3.04	4	1
1:A:145:LEU:O	1:A:149:LEU:HG	0.46	2.11	4	2
1:A:39:GLU:HA	1:A:42:ASN:ND2	0.46	2.25	2	1
1:A:22:CYS:SG	1:A:88:GLU:HB3	0.46	2.50	1	2
1:A:46:LYS:NZ	1:A:46:LYS:HB2	0.46	2.25	10	2
1:A:102:GLY:O	1:A:105:GLN:HG2	0.45	2.12	3	2
1:A:104:HIS:HA	1:A:107:ARG:HB3	0.45	1.88	19	1
1:A:19:ALA:HA	1:A:74:ARG:O	0.45	2.11	10	1
1:A:52:ARG:HD3	1:A:61:TRP:HA	0.45	1.87	11	1
1:A:39:GLU:HA	1:A:43:TYR:O	0.45	2.12	11	1
1:A:99:LEU:HD22	1:A:107:ARG:NH2	0.45	2.27	6	1
1:A:16:ARG:HD2	1:A:16:ARG:N	0.45	2.27	12	1
1:A:16:ARG:N	1:A:16:ARG:HD3	0.45	2.27	15	1
1:A:80:SER:O	1:A:84:LEU:HG	0.44	2.12	4	3
1:A:28:ILE:O	1:A:32:GLN:HG3	0.44	2.12	15	4
1:A:34:MET:O	1:A:38:LEU:HG	0.44	2.13	8	1
1:A:24:CYS:SG	1:A:86:SER:HB2	0.44	2.52	10	1
1:A:52:ARG:CD	1:A:60:VAL:HG23	0.44	2.43	16	1
1:A:111:ILE:HD11	1:A:145:LEU:HD13	0.44	1.89	18	3
1:A:108:LEU:O	1:A:110:PRO:HD3	0.44	2.12	16	1
1:A:99:LEU:HD13	1:A:107:ARG:HG2	0.44	1.90	19	1
1:A:74:ARG:HG2	1:A:75:MET:N	0.44	2.28	1	1
1:A:16:ARG:HD3	1:A:16:ARG:H	0.44	1.72	15	1
1:A:34:MET:HA	1:A:142:TRP:CZ3	0.44	2.47	17	1
1:A:81:ASP:HB3	1:A:116:MET:HB3	0.43	1.90	4	1
1:A:80:SER:HA	1:A:116:MET:SD	0.43	2.53	17	2
1:A:110:PRO:HG2	1:A:127:ILE:O	0.43	2.14	12	1
1:A:20:PHE:HA	1:A:48:CYS:O	0.43	2.13	7	1
1:A:47:LEU:O	1:A:60:VAL:HA	0.43	2.13	4	2
1:A:46:LYS:HA	1:A:59:CYS:SG	0.43	2.54	6	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:127:ILE:HD13	1:A:128:THR:N	0.43	2.28	11	2
1:A:42:ASN:HD22	1:A:42:ASN:N	0.43	2.12	10	1
1:A:100:SER:HB3	1:A:103:ALA:HB3	0.43	1.90	12	1
1:A:126:PHE:CE1	1:A:129:VAL:HG11	0.43	2.49	13	1
1:A:91:PHE:O	1:A:94:LYS:HG2	0.43	2.13	2	1
1:A:59:CYS:O	1:A:59:CYS:SG	0.43	2.76	12	3
1:A:24:CYS:HA	1:A:88:GLU:HG2	0.43	1.90	7	1
1:A:36:ARG:O	1:A:40:GLN:HG2	0.43	2.14	15	1
1:A:42:ASN:ND2	1:A:43:TYR:H	0.43	2.12	16	1
1:A:130:CYS:SG	1:A:141:PHE:HE1	0.43	2.36	17	3
1:A:113:TYR:HA	1:A:132:TYR:HB3	0.43	1.91	19	1
1:A:32:GLN:HG2	1:A:55:LEU:HD23	0.42	1.90	5	5
1:A:115:ALA:O	1:A:117:LYS:N	0.42	2.52	6	1
1:A:21:ILE:HB	1:A:49:VAL:HG12	0.42	1.90	3	3
1:A:52:ARG:HH21	1:A:55:LEU:HB2	0.42	1.73	15	1
1:A:74:ARG:HG3	1:A:149:LEU:HA	0.42	1.90	20	1
1:A:116:MET:SD	1:A:116:MET:C	0.42	2.98	9	1
1:A:85:GLN:O	1:A:86:SER:HB3	0.42	2.14	11	1
1:A:17:PHE:O	1:A:72:CYS:HA	0.42	2.14	9	1
1:A:42:ASN:HD22	1:A:42:ASN:H	0.42	1.57	10	1
1:A:17:PHE:CE2	1:A:48:CYS:SG	0.42	3.13	6	1
1:A:42:ASN:OD1	1:A:143:THR:HA	0.42	2.14	16	1
1:A:44:ARG:O	1:A:44:ARG:NE	0.42	2.53	16	1
1:A:19:ALA:HB3	1:A:47:LEU:HD22	0.42	1.90	7	1
1:A:81:ASP:O	1:A:85:GLN:HG2	0.42	2.15	8	1
1:A:93:THR:O	1:A:97:LEU:HG	0.42	2.14	13	1
1:A:52:ARG:NH2	1:A:55:LEU:HB2	0.42	2.30	15	1
1:A:95:PHE:O	1:A:99:LEU:HG	0.42	2.15	19	1
1:A:110:PRO:HD2	1:A:128:THR:O	0.42	2.15	6	2
1:A:135:PRO:HA	1:A:138:LYS:HG2	0.42	1.90	11	1
1:A:20:PHE:O	1:A:75:MET:HA	0.42	2.14	15	1
1:A:100:SER:HB2	1:A:103:ALA:HB3	0.42	1.90	15	1
1:A:84:LEU:HD12	1:A:118:LYS:HB3	0.41	1.92	8	1
1:A:78:VAL:HG13	1:A:113:TYR:CE2	0.41	2.50	10	1
1:A:27:ASP:HB3	1:A:30:PHE:CE2	0.41	2.50	7	1
1:A:87:LYS:N	1:A:87:LYS:HD2	0.41	2.30	13	1
1:A:114:LYS:CG	1:A:116:MET:SD	0.41	3.07	19	1
1:A:127:ILE:HG23	1:A:128:THR:N	0.41	2.29	4	1
1:A:24:CYS:SG	1:A:86:SER:CB	0.41	3.08	13	2
1:A:133:THR:O	1:A:134:ASN:HB3	0.41	2.16	10	1
1:A:16:ARG:HD2	1:A:16:ARG:H	0.41	1.74	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:37:GLN:NE2	1:A:142:TRP:NE1	0.41	2.68	5	1
1:A:73:ARG:O	1:A:107:ARG:NH1	0.41	2.53	19	1
1:A:46:LYS:N	1:A:46:LYS:HD2	0.41	2.31	15	1
1:A:73:ARG:NE	1:A:73:ARG:HA	0.41	2.30	8	1
1:A:17:PHE:HB2	1:A:72:CYS:SG	0.41	2.56	20	1
1:A:24:CYS:SG	1:A:27:ASP:HB2	0.41	2.56	1	1
1:A:37:GLN:O	1:A:40:GLN:HG2	0.41	2.15	3	1
1:A:65:SER:O	1:A:68:ILE:HG12	0.41	2.16	9	1
1:A:69:GLU:HG3	1:A:107:ARG:NH2	0.41	2.30	20	1
1:A:77:VAL:O	1:A:110:PRO:HA	0.41	2.16	18	1
1:A:20:PHE:CZ	1:A:50:SER:HA	0.40	2.51	9	1
1:A:99:LEU:O	1:A:100:SER:CB	0.40	2.70	10	2
1:A:73:ARG:O	1:A:153:LEU:HD21	0.40	2.15	11	1
1:A:59:CYS:SG	1:A:59:CYS:O	0.40	2.79	20	1
1:A:52:ARG:NH1	1:A:62:SER:HB3	0.40	2.31	1	1
1:A:33:GLU:O	1:A:37:GLN:HG2	0.40	2.16	20	1
1:A:68:ILE:O	1:A:72:CYS:SG	0.40	2.79	12	1

6.3 Torsion angles (i)

6.3.1 Protein backbone (i)

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	138/160 (86%)	121±4 (88±3%)	13±3 (9±2%)	4±2 (3±1%)	7	41
All	All	2760/3200 (86%)	2420 (88%)	260 (9%)	80 (3%)	7	41

All 29 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	125	ARG	12
1	A	100	SER	8
1	A	55	LEU	5
1	A	101	PRO	5
1	A	54	VAL	4

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Mol	Chain	Res	Type	Models (Total)
1	A	56	PRO	4
1	A	120	PHE	4
1	A	44	ARG	3
1	A	58	THR	3
1	A	99	LEU	3
1	A	42	ASN	3
1	A	45	LEU	3
1	A	134	ASN	3
1	A	87	LYS	2
1	A	127	ILE	2
1	A	16	ARG	2
1	A	52	ARG	2
1	A	126	PHE	1
1	A	153	LEU	1
1	A	152	PRO	1
1	A	43	TYR	1
1	A	116	MET	1
1	A	60	VAL	1
1	A	17	PHE	1
1	A	86	SER	1
1	A	128	THR	1
1	A	50	SER	1
1	A	57	GLY	1
1	A	129	VAL	1

6.3.2 Protein sidechains (i)

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	129/149 (87%)	125±2 (97±1%)	4±2 (3±1%)	46 90
All	All	2580/2980 (87%)	2508 (97%)	72 (3%)	46 90

All 24 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	92	GLN	15

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Mol	Chain	Res	Type	Models (Total)
1	A	71	ARG	13
1	A	116	MET	6
1	A	127	ILE	5
1	A	46	LYS	3
1	A	126	PHE	3
1	A	16	ARG	3
1	A	52	ARG	2
1	A	69	GLU	2
1	A	27	ASP	2
1	A	119	GLU	2
1	A	66	GLU	2
1	A	42	ASN	2
1	A	117	LYS	2
1	A	88	GLU	1
1	A	30	PHE	1
1	A	107	ARG	1
1	A	125	ARG	1
1	A	138	LYS	1
1	A	39	GLU	1
1	A	87	LYS	1
1	A	44	ARG	1
1	A	123	ILE	1
1	A	134	ASN	1

6.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

6.5 Carbohydrates (i)

There are no monosaccharides in this entry.

6.6 Ligand geometry (i)

There are no ligands in this entry.

6.7 Other polymers (i)

There are no such molecules in this entry.

6.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

7 Chemical shift validation

The completeness of assignment taking into account all chemical shift lists is 92% for the well-defined parts and 88% 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	2003
Number of shifts mapped to atoms	2003
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
$^{13}C_{\alpha}$	152	-0.31 ± 0.10	None needed (< 0.5 ppm)
$^{13}C_{\beta}$	148	0.25 ± 0.05	None needed (< 0.5 ppm)
$^{13}C'$	136	-0.07 ± 0.10	None needed (< 0.5 ppm)
^{15}N	133	0.58 ± 0.46	None needed (imprecise)

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 92%, i.e. 1827 atoms were assigned a chemical shift out of a possible 1988. 0 out of 23 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	641/678 (95%)	264/271 (97%)	257/276 (93%)	120/131 (92%)
Sidechain	1036/1141 (91%)	702/742 (95%)	315/349 (90%)	19/50 (38%)

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	Total	^{1}H	^{13}C	^{15}N
Aromatic	150/169 (89%)	75/82 (91%)	72/82 (88%)	3/5 (60%)
Overall	1827/1988 (92%)	1041/1095 (95%)	644/707 (91%)	142/186 (76%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 88%, i.e. 2003 atoms were assigned a chemical shift out of a possible 2284. 0 out of 25 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	Total	^{1}H	^{13}C	^{15}N
Backbone	715/786 (91%)	294/315 (93%)	288/320 (90%)	133/151 (88%)
Sidechain	1136/1273 (89%)	770/829 (93%)	347/394 (88%)	19/50 (38%)
Aromatic	152/225 (68%)	76/110 (69%)	73/96 (76%)	3/19 (16%)
Overall	2003/2284 (88%)	1140/1254 (91%)	708/810 (87%)	155/220 (70%)

7.1.4 Statistically unusual chemical shifts (i)

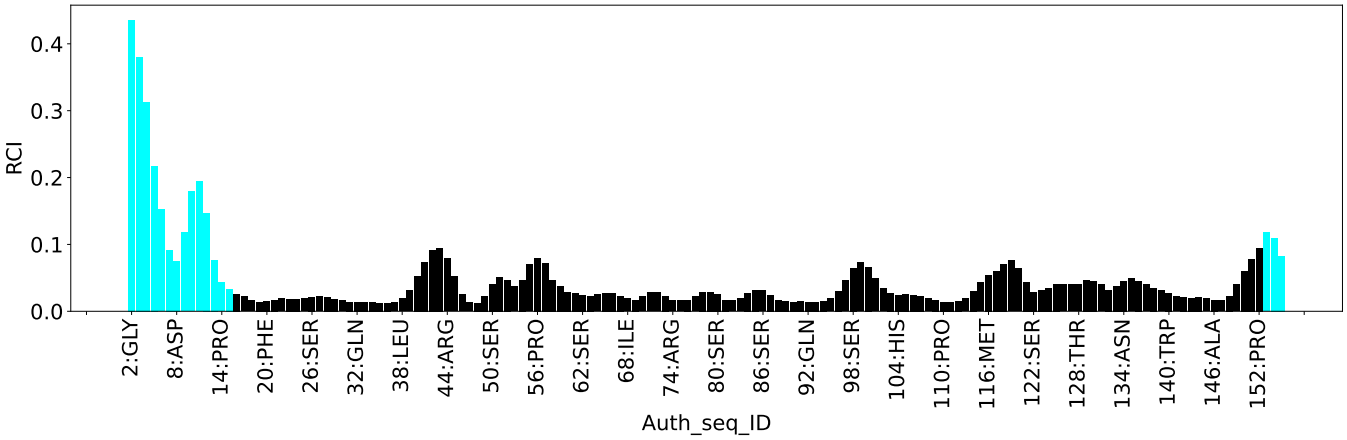
The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

List Id	Chain	Res	Type	Atom	Shift, *ppm*	Expected range, *ppm*	Z-score
1	A	37	GLN	HB3	0.49	0.71 – 3.33	-5.8
1	A	117	LYS	H	11.50	5.24 – 11.12	5.7

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:


RCI
0.4
0.3
0.2
0.1
0.0
2:GLY
8:ASP
14:PRO
20:PHE
26:SER
32:GLN
38:LEU
44:ARG
50:SER
56:PRO
62:SER
68:ILE
74:ARG
80:SER
86:SER
92:GLN
98:SER
104:HIS
110:PRO
116:MET
122:SER
128:THR
134:ASN
140:TRP
146:ALA
152:PRO
Auth_seq_ID