



Full wwPDB NMR Structure Validation Report ⓘ

Mar 5, 2026 – 05:49 PM UTC

PDB ID : 2KSM / pdb_00002ksm
Title : Central B domain of Rv0899 from Mycobacterium tuberculosis
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Deposited on : 2010-01-07

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	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
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)	:	2.49

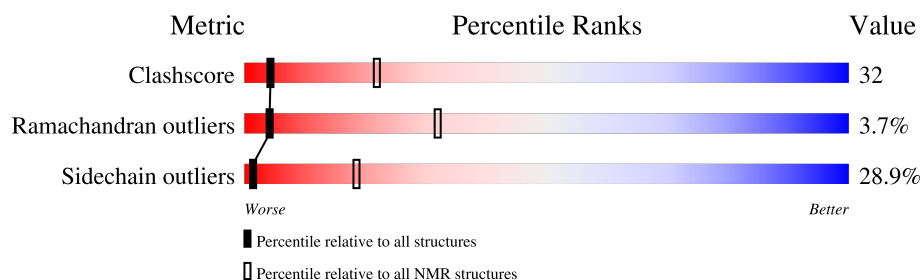
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

SOLUTION NMR

The overall completeness of chemical shifts assignment was not calculated.

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	229148	14424
Ramachandran outliers	224038	12848
Sidechain outliers	223484	12823

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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	131	31% 45% 7% 18%

2 Ensemble composition and analysis

This entry contains 20 models. Model 2 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:81-A:127, A:133-A:193 (108)	0.61	2

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

3 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 1917 atoms, of which 965 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb.

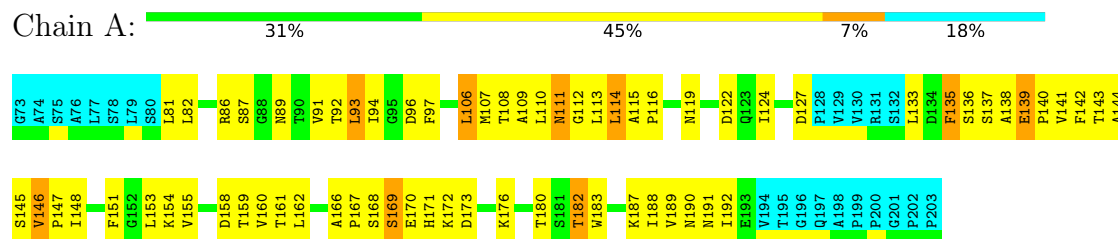
Mol	Chain	Residues	Atoms						Trace
1	A	131	Total	C	H	N	O	S	0
			1917	599	965	160	191	2	

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: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb

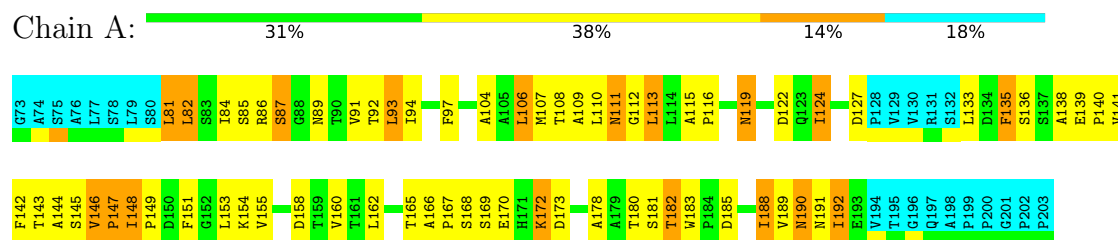


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

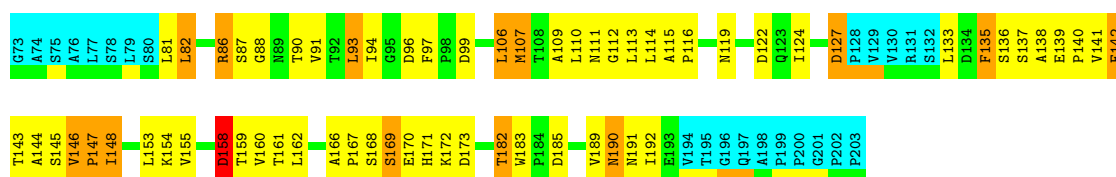
- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



4.2.2 Score per residue for model 2 (medoid)

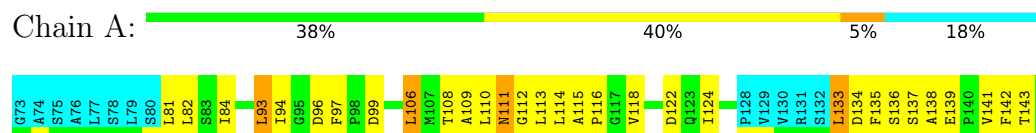
- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb





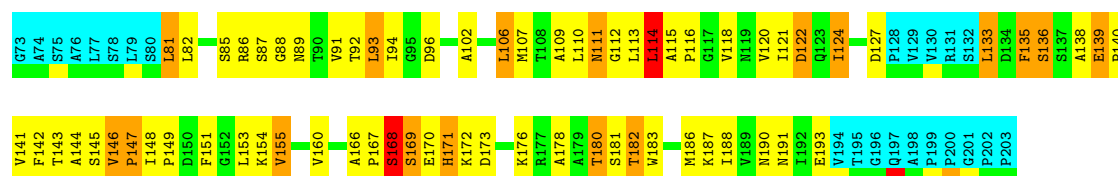
4.2.3 Score per residue for model 3

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



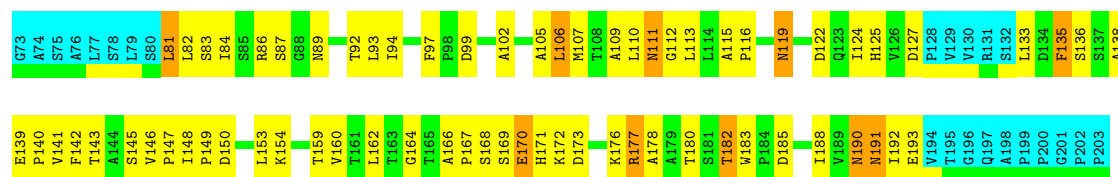
4.2.4 Score per residue for model 4

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



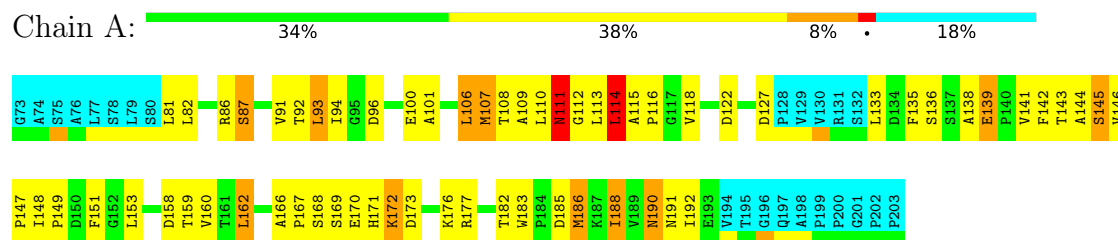
4.2.5 Score per residue for model 5

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



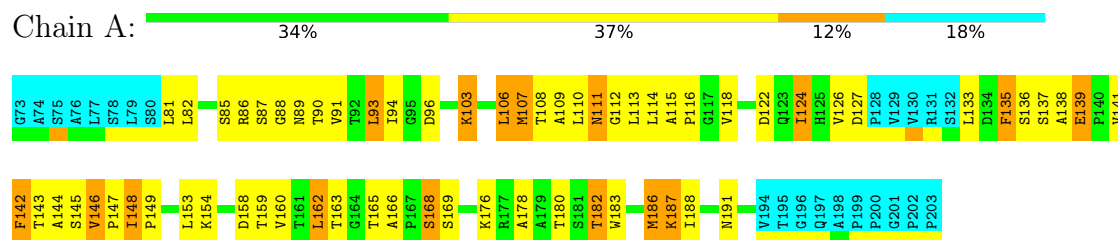
4.2.6 Score per residue for model 6

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



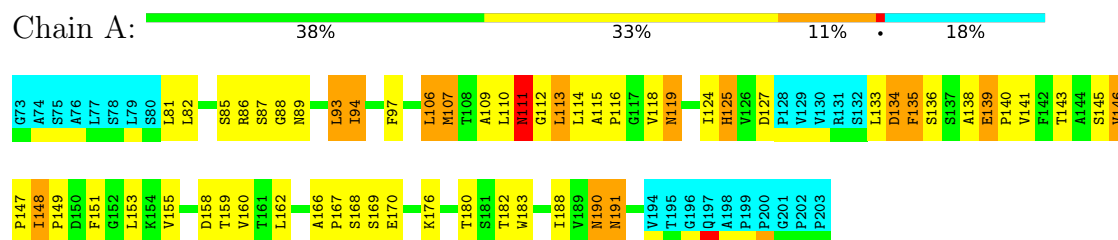
4.2.7 Score per residue for model 7

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



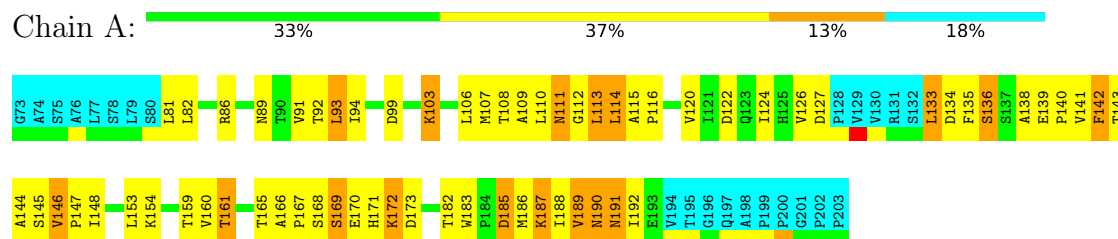
4.2.8 Score per residue for model 8

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



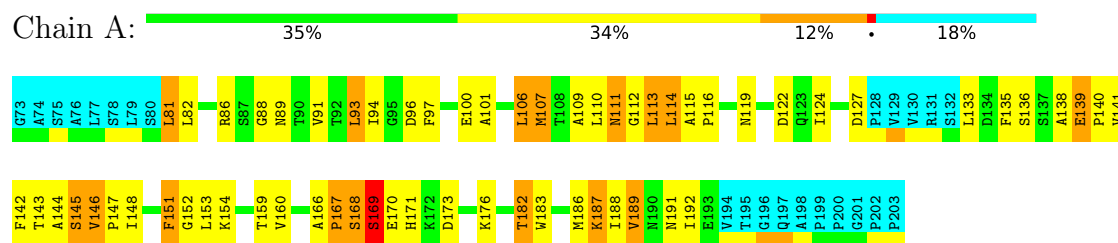
4.2.9 Score per residue for model 9

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



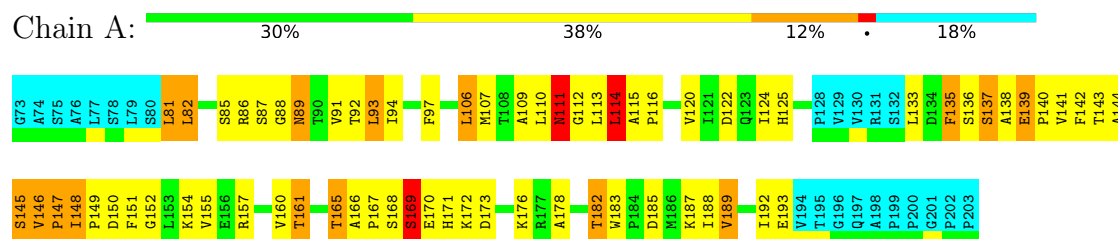
4.2.10 Score per residue for model 10

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



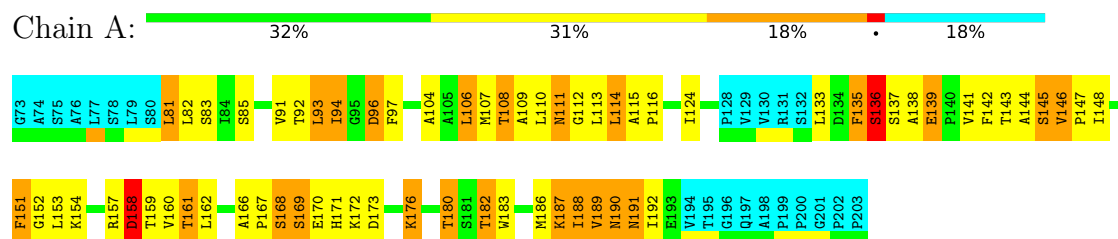
4.2.11 Score per residue for model 11

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



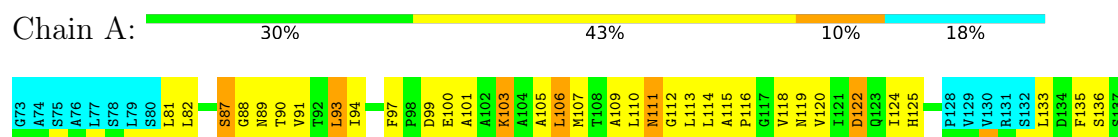
4.2.12 Score per residue for model 12

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



4.2.13 Score per residue for model 13

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb





4.2.14 Score per residue for model 14

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb

Chain A: 37% 34% 11% 18%



4.2.15 Score per residue for model 15

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb

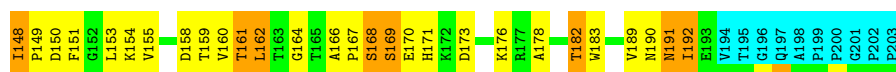
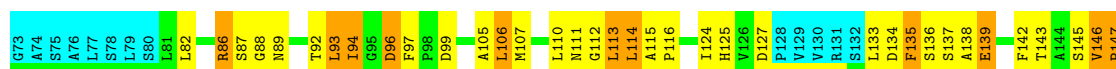
Chain A: 41% 28% 13% 18%



4.2.16 Score per residue for model 16

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb

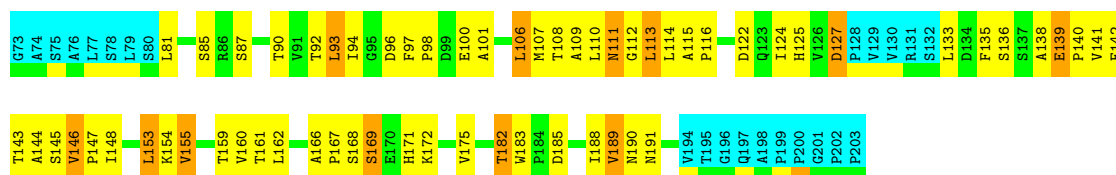
Chain A: 34% 34% 15% 18%



4.2.17 Score per residue for model 17

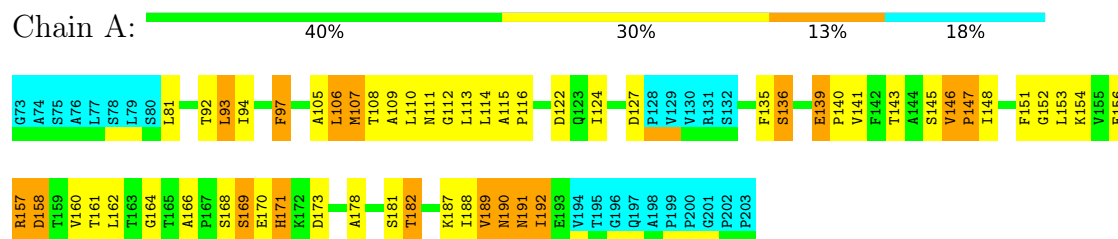
- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb

Chain A: 35% 38% 9% 18%



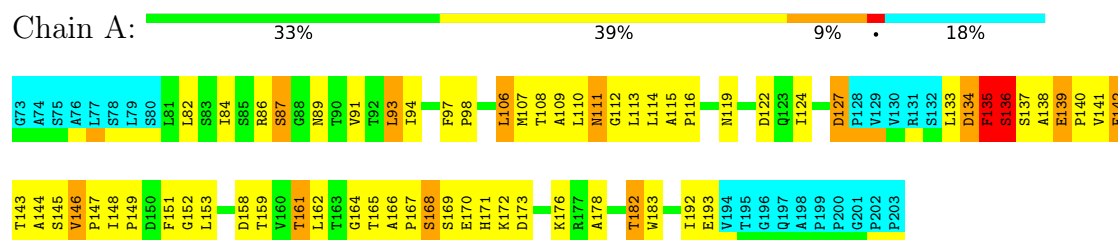
4.2.18 Score per residue for model 18

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



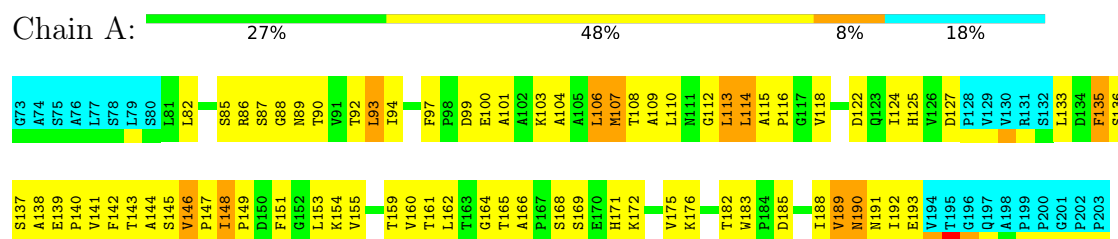
4.2.19 Score per residue for model 19

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



4.2.20 Score per residue for model 20

- Molecule 1: MYCOBACTERIUM TUBERCULOSIS RV0899/MT0922/OmpATb



5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing, torsion angle dynamics*.

Of the 500 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
X-PLOR NIH	refinement	2.24

No chemical shift data was provided.

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	0.60±0.00	0±0/816 (0.0± 0.0%)	1.01±0.01	0±0/1118 (0.0± 0.0%)
All	All	0.60	0/16320 (0.0%)	1.01	4/22360 (0.0%)

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	157	ARG	CB-CA-C	-5.40	109.89	117.23	11	1
1	A	168	SER	CB-CA-C	-5.25	109.51	117.07	16	2
1	A	135	PHE	CA-CB-CG	-5.04	108.76	113.80	19	1

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	801	807	805	51±5
All	All	16020	16140	16100	1027

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 32.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:133:LEU:HD21	1:A:183:TRP:CZ2	0.80	2.12	8	10
1:A:93:LEU:HD12	1:A:93:LEU:N	0.79	1.93	13	11
1:A:92:THR:C	1:A:93:LEU:HD23	0.77	2.04	14	3
1:A:133:LEU:HD23	1:A:183:TRP:CZ2	0.74	2.17	3	7
1:A:81:LEU:HD12	1:A:81:LEU:H	0.74	1.43	12	2
1:A:133:LEU:HD22	1:A:155:VAL:HG21	0.73	1.61	1	4
1:A:146:VAL:HG12	1:A:146:VAL:O	0.72	1.85	5	1
1:A:176:LYS:O	1:A:180:THR:HG23	0.72	1.85	7	4
1:A:164:GLY:O	1:A:192:ILE:HG23	0.71	1.85	5	4
1:A:171:HIS:O	1:A:175:VAL:HG23	0.71	1.85	20	1
1:A:93:LEU:HD23	1:A:93:LEU:N	0.71	2.01	4	3
1:A:86:ARG:HH22	1:A:110:LEU:HD21	0.70	1.46	10	1
1:A:84:ILE:HG23	1:A:93:LEU:CD2	0.70	2.17	5	1
1:A:192:ILE:HD13	1:A:192:ILE:N	0.69	2.00	1	1
1:A:84:ILE:HG23	1:A:93:LEU:HD22	0.69	1.65	5	1
1:A:93:LEU:HD12	1:A:94:ILE:N	0.69	2.01	12	3
1:A:192:ILE:HD12	1:A:192:ILE:N	0.68	2.03	13	5
1:A:106:LEU:C	1:A:106:LEU:HD13	0.68	2.13	9	1
1:A:81:LEU:HD12	1:A:81:LEU:N	0.67	2.04	12	2
1:A:191:ASN:ND2	1:A:191:ASN:H	0.67	1.88	5	3
1:A:139:GLU:O	1:A:143:THR:HG23	0.66	1.90	7	19
1:A:151:PHE:CG	1:A:152:GLY:N	0.65	2.65	10	3
1:A:133:LEU:HD21	1:A:183:TRP:CE2	0.64	2.28	20	7
1:A:133:LEU:HD11	1:A:183:TRP:CE2	0.64	2.27	1	3
1:A:97:PHE:CE1	1:A:135:PHE:CZ	0.63	2.87	19	4
1:A:81:LEU:C	1:A:82:LEU:HD22	0.63	2.18	15	1
1:A:97:PHE:CZ	1:A:135:PHE:CZ	0.63	2.87	1	8
1:A:82:LEU:HD21	1:A:97:PHE:CE1	0.62	2.29	12	1
1:A:97:PHE:CZ	1:A:135:PHE:CE2	0.62	2.87	17	9
1:A:190:ASN:ND2	1:A:190:ASN:H	0.62	1.91	9	2
1:A:97:PHE:CE1	1:A:135:PHE:CE2	0.61	2.88	18	3
1:A:135:PHE:N	1:A:135:PHE:CD1	0.60	2.68	15	1
1:A:106:LEU:O	1:A:109:ALA:HB3	0.60	1.95	10	19
1:A:142:PHE:O	1:A:146:VAL:HG23	0.60	1.96	5	1
1:A:191:ASN:ND2	1:A:191:ASN:N	0.60	2.49	5	2
1:A:86:ARG:NH1	1:A:142:PHE:CE2	0.60	2.69	2	1
1:A:133:LEU:HD23	1:A:183:TRP:CH2	0.60	2.31	3	3
1:A:93:LEU:HD12	1:A:93:LEU:C	0.59	2.22	8	3
1:A:138:ALA:O	1:A:142:PHE:N	0.59	2.36	3	18
1:A:146:VAL:N	1:A:147:PRO:CD	0.58	2.65	14	11
1:A:102:ALA:HB1	1:A:135:PHE:CZ	0.58	2.33	15	2
1:A:141:VAL:HG21	1:A:182:THR:OG1	0.58	1.99	14	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:97:PHE:CE2	1:A:135:PHE:CE2	0.57	2.92	12	4
1:A:146:VAL:C	1:A:148:ILE:H	0.57	2.07	11	17
1:A:86:ARG:CZ	1:A:142:PHE:CZ	0.57	2.88	7	1
1:A:164:GLY:H	1:A:192:ILE:HG22	0.57	1.59	16	2
1:A:155:VAL:HG13	1:A:160:VAL:HG22	0.57	1.77	4	7
1:A:168:SER:CB	1:A:171:HIS:CD2	0.57	2.88	2	2
1:A:161:THR:O	1:A:162:LEU:HD12	0.56	2.01	19	1
1:A:93:LEU:N	1:A:93:LEU:CD1	0.56	2.67	17	8
1:A:188:ILE:HG22	1:A:190:ASN:HD21	0.56	1.60	8	6
1:A:192:ILE:N	1:A:192:ILE:CD1	0.56	2.68	13	5
1:A:97:PHE:CE2	1:A:135:PHE:CE1	0.55	2.94	1	1
1:A:146:VAL:O	1:A:146:VAL:HG13	0.55	2.00	3	2
1:A:135:PHE:O	1:A:138:ALA:N	0.55	2.38	20	12
1:A:190:ASN:HD22	1:A:190:ASN:N	0.55	1.98	18	1
1:A:89:ASN:O	1:A:118:VAL:HG23	0.55	2.02	13	1
1:A:81:LEU:O	1:A:82:LEU:HD12	0.54	2.02	5	7
1:A:168:SER:CB	1:A:171:HIS:ND1	0.54	2.70	5	1
1:A:93:LEU:HD12	1:A:93:LEU:H	0.54	1.62	2	4
1:A:191:ASN:OD1	1:A:191:ASN:N	0.54	2.40	16	4
1:A:110:LEU:O	1:A:113:LEU:N	0.54	2.41	3	20
1:A:139:GLU:N	1:A:140:PRO:CD	0.54	2.70	5	2
1:A:189:VAL:CG2	1:A:191:ASN:ND2	0.54	2.70	3	6
1:A:133:LEU:O	1:A:135:PHE:CE2	0.54	2.61	13	6
1:A:161:THR:HG23	1:A:189:VAL:CG2	0.53	2.33	18	1
1:A:190:ASN:OD1	1:A:190:ASN:N	0.53	2.41	6	6
1:A:145:SER:OG	1:A:151:PHE:CZ	0.53	2.62	11	5
1:A:190:ASN:ND2	1:A:190:ASN:N	0.53	2.57	5	7
1:A:125:HIS:CD2	1:A:125:HIS:N	0.53	2.77	8	1
1:A:159:THR:HG22	1:A:160:VAL:N	0.53	2.18	15	12
1:A:151:PHE:CD1	1:A:151:PHE:O	0.53	2.62	15	2
1:A:119:ASN:ND2	1:A:119:ASN:N	0.53	2.54	1	1
1:A:146:VAL:O	1:A:148:ILE:N	0.53	2.42	11	5
1:A:188:ILE:HG22	1:A:190:ASN:ND2	0.53	2.18	18	5
1:A:156:GLU:O	1:A:157:ARG:C	0.53	2.51	18	1
1:A:189:VAL:HG23	1:A:189:VAL:O	0.53	2.01	18	1
1:A:139:GLU:N	1:A:139:GLU:CD	0.53	2.66	5	2
1:A:139:GLU:CD	1:A:139:GLU:N	0.53	2.66	13	3
1:A:119:ASN:N	1:A:119:ASN:OD1	0.52	2.42	8	2
1:A:102:ALA:HB1	1:A:135:PHE:CE1	0.52	2.39	4	1
1:A:107:MET:O	1:A:110:LEU:N	0.52	2.43	15	14
1:A:110:LEU:C	1:A:112:GLY:N	0.52	2.67	9	19

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:88:GLY:C	1:A:90:THR:N	0.52	2.67	15	2
1:A:134:ASP:N	1:A:134:ASP:OD1	0.52	2.43	16	1
1:A:97:PHE:CE2	1:A:135:PHE:CZ	0.52	2.98	8	6
1:A:182:THR:O	1:A:183:TRP:CD1	0.52	2.62	11	7
1:A:193:GLU:N	1:A:193:GLU:OE1	0.52	2.43	19	1
1:A:141:VAL:O	1:A:144:ALA:N	0.52	2.42	7	14
1:A:189:VAL:CG2	1:A:191:ASN:HD21	0.52	2.17	3	5
1:A:170:GLU:O	1:A:173:ASP:N	0.52	2.43	11	14
1:A:169:SER:OG	1:A:170:GLU:N	0.52	2.40	19	3
1:A:166:ALA:O	1:A:168:SER:N	0.51	2.44	12	18
1:A:158:ASP:N	1:A:158:ASP:OD1	0.51	2.43	2	1
1:A:139:GLU:N	1:A:139:GLU:OE1	0.51	2.44	16	2
1:A:133:LEU:O	1:A:135:PHE:CE1	0.51	2.63	17	1
1:A:86:ARG:NH2	1:A:148:ILE:O	0.51	2.42	19	1
1:A:81:LEU:N	1:A:81:LEU:CD1	0.51	2.68	12	2
1:A:110:LEU:O	1:A:112:GLY:N	0.51	2.43	10	18
1:A:93:LEU:N	1:A:93:LEU:CD2	0.51	2.69	4	3
1:A:133:LEU:HD21	1:A:183:TRP:CH2	0.51	2.40	11	3
1:A:104:ALA:O	1:A:108:THR:HG23	0.51	2.06	1	1
1:A:124:ILE:HD13	1:A:124:ILE:N	0.51	2.21	7	3
1:A:96:ASP:N	1:A:96:ASP:OD1	0.51	2.44	16	1
1:A:189:VAL:CG2	1:A:189:VAL:O	0.51	2.59	18	1
1:A:146:VAL:O	1:A:146:VAL:CG1	0.50	2.57	5	2
1:A:86:ARG:NH1	1:A:113:LEU:HD22	0.50	2.21	9	1
1:A:141:VAL:CG2	1:A:182:THR:OG1	0.50	2.60	18	1
1:A:141:VAL:O	1:A:145:SER:N	0.50	2.44	3	3
1:A:167:PRO:O	1:A:168:SER:CB	0.50	2.59	4	2
1:A:151:PHE:CD1	1:A:151:PHE:C	0.50	2.88	12	3
1:A:173:ASP:OD2	1:A:177:ARG:NH2	0.50	2.43	6	1
1:A:122:ASP:OD1	1:A:122:ASP:N	0.50	2.43	5	2
1:A:145:SER:OG	1:A:151:PHE:CE2	0.50	2.62	10	2
1:A:133:LEU:HD11	1:A:183:TRP:CD1	0.50	2.42	20	1
1:A:139:GLU:O	1:A:143:THR:CG2	0.50	2.60	2	19
1:A:180:THR:HG23	1:A:181:SER:N	0.50	2.22	13	1
1:A:88:GLY:O	1:A:90:THR:N	0.49	2.44	15	1
1:A:168:SER:OG	1:A:169:SER:N	0.49	2.42	13	6
1:A:144:ALA:O	1:A:175:VAL:HG22	0.49	2.07	17	1
1:A:166:ALA:C	1:A:168:SER:H	0.49	2.15	13	20
1:A:166:ALA:C	1:A:168:SER:N	0.49	2.71	11	20
1:A:82:LEU:HD22	1:A:82:LEU:N	0.49	2.21	15	1
1:A:107:MET:C	1:A:109:ALA:N	0.49	2.69	10	17

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:122:ASP:O	1:A:122:ASP:CG	0.49	2.55	13	8
1:A:135:PHE:C	1:A:137:SER:N	0.49	2.70	12	7
1:A:162:LEU:HD23	1:A:163:THR:N	0.49	2.23	7	1
1:A:93:LEU:HD13	1:A:122:ASP:HB3	0.49	1.85	15	9
1:A:121:ILE:O	1:A:121:ILE:HG22	0.49	2.07	4	1
1:A:172:LYS:CD	1:A:172:LYS:C	0.49	2.86	9	1
1:A:148:ILE:CD1	1:A:165:THR:O	0.49	2.61	11	1
1:A:96:ASP:OD1	1:A:96:ASP:N	0.49	2.46	14	2
1:A:169:SER:C	1:A:171:HIS:N	0.48	2.70	3	14
1:A:188:ILE:HG22	1:A:190:ASN:OD1	0.48	2.08	6	1
1:A:151:PHE:CD1	1:A:152:GLY:N	0.48	2.81	18	3
1:A:115:ALA:HB1	1:A:116:PRO:HD2	0.48	1.85	14	20
1:A:139:GLU:CD	1:A:139:GLU:H	0.48	2.14	13	4
1:A:103:LYS:CB	1:A:103:LYS:NZ	0.48	2.76	7	3
1:A:161:THR:HG23	1:A:189:VAL:HG22	0.48	1.84	18	1
1:A:133:LEU:HD13	1:A:155:VAL:HG11	0.48	1.85	17	2
1:A:113:LEU:N	1:A:113:LEU:CD2	0.48	2.76	6	1
1:A:135:PHE:O	1:A:136:SER:C	0.48	2.57	8	20
1:A:142:PHE:O	1:A:146:VAL:CG2	0.48	2.62	5	1
1:A:91:VAL:CG2	1:A:120:VAL:HG13	0.48	2.38	13	1
1:A:139:GLU:O	1:A:143:THR:OG1	0.48	2.32	3	11
1:A:168:SER:O	1:A:169:SER:CB	0.48	2.62	19	4
1:A:172:LYS:HG3	1:A:192:ILE:HD12	0.47	1.86	6	1
1:A:159:THR:CG2	1:A:160:VAL:N	0.47	2.78	17	14
1:A:168:SER:OG	1:A:171:HIS:CD2	0.47	2.67	5	1
1:A:86:ARG:NH1	1:A:91:VAL:HG11	0.47	2.24	6	1
1:A:122:ASP:CG	1:A:122:ASP:O	0.47	2.57	6	5
1:A:113:LEU:N	1:A:113:LEU:HD22	0.47	2.25	6	1
1:A:86:ARG:CZ	1:A:142:PHE:CE2	0.47	2.98	20	2
1:A:93:LEU:HD13	1:A:122:ASP:HB2	0.47	1.85	11	1
1:A:188:ILE:CG2	1:A:190:ASN:HD21	0.47	2.23	12	1
1:A:135:PHE:O	1:A:137:SER:N	0.47	2.48	12	3
1:A:113:LEU:O	1:A:114:LEU:C	0.47	2.58	17	14
1:A:162:LEU:HD22	1:A:190:ASN:HD22	0.47	1.68	2	1
1:A:157:ARG:O	1:A:158:ASP:C	0.47	2.58	18	1
1:A:155:VAL:HG13	1:A:160:VAL:CG2	0.47	2.39	1	1
1:A:115:ALA:O	1:A:118:VAL:HG12	0.47	2.09	3	3
1:A:106:LEU:C	1:A:106:LEU:CD1	0.47	2.85	9	1
1:A:93:LEU:C	1:A:93:LEU:CD1	0.47	2.87	12	1
1:A:135:PHE:CD1	1:A:135:PHE:N	0.46	2.80	20	4
1:A:161:THR:CG2	1:A:189:VAL:HG13	0.46	2.40	11	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:139:GLU:OE1	1:A:143:THR:CG2	0.46	2.64	10	7
1:A:162:LEU:CD1	1:A:190:ASN:HD22	0.46	2.23	15	1
1:A:160:VAL:O	1:A:187:LYS:O	0.46	2.33	18	1
1:A:133:LEU:CD2	1:A:183:TRP:CZ2	0.46	2.95	11	3
1:A:141:VAL:HG22	1:A:178:ALA:HB1	0.46	1.86	3	2
1:A:97:PHE:CZ	1:A:135:PHE:CD2	0.46	3.03	17	2
1:A:161:THR:O	1:A:162:LEU:HD22	0.46	2.11	17	1
1:A:86:ARG:O	1:A:149:PRO:O	0.46	2.33	1	9
1:A:93:LEU:HD12	1:A:122:ASP:HB3	0.46	1.87	5	1
1:A:110:LEU:N	1:A:110:LEU:CD1	0.46	2.78	16	5
1:A:88:GLY:O	1:A:89:ASN:CB	0.46	2.64	8	3
1:A:87:SER:C	1:A:149:PRO:O	0.46	2.59	1	10
1:A:86:ARG:NE	1:A:142:PHE:CZ	0.46	2.84	7	1
1:A:172:LYS:CG	1:A:192:ILE:HD12	0.46	2.40	6	1
1:A:134:ASP:OD1	1:A:134:ASP:N	0.46	2.49	19	2
1:A:170:GLU:C	1:A:172:LYS:N	0.46	2.74	11	9
1:A:139:GLU:CB	1:A:140:PRO:CD	0.45	2.95	10	10
1:A:146:VAL:N	1:A:147:PRO:HD2	0.45	2.26	4	13
1:A:161:THR:HG23	1:A:189:VAL:HG13	0.45	1.88	13	4
1:A:146:VAL:C	1:A:148:ILE:N	0.45	2.74	11	6
1:A:115:ALA:O	1:A:118:VAL:CG1	0.45	2.65	3	1
1:A:158:ASP:O	1:A:186:MET:SD	0.45	2.74	7	2
1:A:126:VAL:C	1:A:127:ASP:CG	0.45	2.84	9	1
1:A:118:VAL:O	1:A:118:VAL:HG13	0.45	2.12	13	3
1:A:97:PHE:CE2	1:A:135:PHE:CD2	0.45	3.04	17	1
1:A:106:LEU:O	1:A:109:ALA:CB	0.45	2.65	13	5
1:A:178:ALA:O	1:A:182:THR:OG1	0.45	2.35	19	8
1:A:167:PRO:C	1:A:168:SER:OG	0.45	2.60	4	2
1:A:89:ASN:ND2	1:A:89:ASN:N	0.44	2.64	14	1
1:A:133:LEU:HD23	1:A:183:TRP:CE2	0.44	2.48	15	1
1:A:168:SER:OG	1:A:171:HIS:CE1	0.44	2.71	5	1
1:A:133:LEU:HD11	1:A:183:TRP:NE1	0.44	2.27	11	2
1:A:86:ARG:CZ	1:A:91:VAL:HG11	0.44	2.43	10	1
1:A:87:SER:O	1:A:87:SER:OG	0.44	2.36	14	2
1:A:153:LEU:HD13	1:A:154:LYS:N	0.44	2.28	17	1
1:A:84:ILE:HG23	1:A:93:LEU:HB3	0.44	1.90	3	2
1:A:105:ALA:O	1:A:139:GLU:CD	0.44	2.61	18	3
1:A:172:LYS:HB2	1:A:192:ILE:HD12	0.44	1.89	14	1
1:A:162:LEU:HD13	1:A:190:ASN:ND2	0.44	2.28	16	1
1:A:88:GLY:C	1:A:90:THR:H	0.43	2.20	7	3
1:A:124:ILE:N	1:A:124:ILE:CD1	0.43	2.82	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:93:LEU:HD13	1:A:122:ASP:CB	0.43	2.43	13	1
1:A:177:ARG:O	1:A:180:THR:OG1	0.43	2.36	3	3
1:A:88:GLY:O	1:A:89:ASN:C	0.43	2.62	4	4
1:A:191:ASN:H	1:A:191:ASN:HD22	0.43	1.51	5	1
1:A:186:MET:O	1:A:187:LYS:C	0.43	2.62	7	4
1:A:98:PRO:O	1:A:127:ASP:O	0.43	2.37	19	2
1:A:162:LEU:HD22	1:A:190:ASN:ND2	0.43	2.28	2	1
1:A:145:SER:OG	1:A:145:SER:O	0.43	2.36	10	1
1:A:110:LEU:N	1:A:110:LEU:HD12	0.43	2.29	16	3
1:A:86:ARG:HH22	1:A:110:LEU:CD2	0.43	2.27	6	1
1:A:110:LEU:C	1:A:112:GLY:H	0.43	2.21	17	4
1:A:105:ALA:O	1:A:139:GLU:OE2	0.43	2.36	16	2
1:A:148:ILE:O	1:A:150:ASP:N	0.43	2.52	11	1
1:A:110:LEU:O	1:A:111:ASN:C	0.42	2.62	4	10
1:A:110:LEU:O	1:A:114:LEU:N	0.42	2.51	3	1
1:A:176:LYS:O	1:A:180:THR:OG1	0.42	2.37	12	2
1:A:126:VAL:O	1:A:127:ASP:CG	0.42	2.62	9	1
1:A:151:PHE:CD2	1:A:152:GLY:N	0.42	2.87	11	1
1:A:133:LEU:O	1:A:135:PHE:CZ	0.42	2.72	8	1
1:A:122:ASP:O	1:A:122:ASP:OD1	0.42	2.37	9	3
1:A:118:VAL:O	1:A:118:VAL:CG1	0.42	2.68	7	5
1:A:168:SER:CB	1:A:171:HIS:CE1	0.42	3.02	5	1
1:A:100:GLU:CG	1:A:101:ALA:N	0.42	2.82	6	5
1:A:86:ARG:NH2	1:A:142:PHE:CE1	0.42	2.87	7	1
1:A:106:LEU:O	1:A:107:MET:C	0.42	2.62	16	1
1:A:161:THR:HG22	1:A:189:VAL:HG13	0.42	1.92	12	2
1:A:126:VAL:C	1:A:127:ASP:OD1	0.42	2.62	9	2
1:A:150:ASP:OD1	1:A:150:ASP:O	0.42	2.37	3	1
1:A:85:SER:OG	1:A:92:THR:OG1	0.42	2.37	17	1
1:A:87:SER:CA	1:A:149:PRO:O	0.41	2.68	1	3
1:A:133:LEU:O	1:A:135:PHE:CD2	0.41	2.73	3	1
1:A:148:ILE:C	1:A:150:ASP:H	0.41	2.23	5	2
1:A:169:SER:O	1:A:171:HIS:N	0.41	2.53	13	3
1:A:168:SER:O	1:A:169:SER:OG	0.41	2.37	19	2
1:A:185:ASP:N	1:A:185:ASP:OD1	0.41	2.52	17	1
1:A:172:LYS:NZ	1:A:176:LYS:N	0.41	2.67	19	1
1:A:167:PRO:O	1:A:168:SER:OG	0.41	2.37	4	1
1:A:156:GLU:OE1	1:A:159:THR:O	0.41	2.37	14	1
1:A:106:LEU:O	1:A:109:ALA:N	0.41	2.51	3	2
1:A:155:VAL:HG22	1:A:160:VAL:HG13	0.41	1.91	11	1
1:A:104:ALA:O	1:A:108:THR:OG1	0.41	2.36	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:97:PHE:O	1:A:127:ASP:N	0.41	2.53	5	1
1:A:180:THR:CG2	1:A:181:SER:N	0.41	2.83	13	1
1:A:116:PRO:C	1:A:118:VAL:N	0.41	2.78	14	1
1:A:86:ARG:HH21	1:A:110:LEU:CD2	0.41	2.29	11	1
1:A:107:MET:O	1:A:108:THR:C	0.41	2.64	14	1
1:A:103:LYS:CG	1:A:104:ALA:N	0.41	2.83	15	2
1:A:162:LEU:HD12	1:A:190:ASN:ND2	0.41	2.31	6	1
1:A:157:ARG:C	1:A:158:ASP:CG	0.41	2.89	12	1
1:A:186:MET:O	1:A:188:ILE:N	0.41	2.54	12	1
1:A:111:ASN:OD1	1:A:111:ASN:C	0.41	2.63	19	1
1:A:88:GLY:C	1:A:89:ASN:CG	0.41	2.87	20	1
1:A:142:PHE:O	1:A:146:VAL:HG12	0.41	2.16	3	1
1:A:185:ASP:OD1	1:A:185:ASP:N	0.41	2.52	9	1
1:A:86:ARG:NH2	1:A:91:VAL:HG11	0.40	2.31	10	1
1:A:133:LEU:O	1:A:135:PHE:CD1	0.40	2.74	17	1
1:A:190:ASN:HD22	1:A:190:ASN:H	0.40	1.58	12	1
1:A:158:ASP:OD1	1:A:158:ASP:C	0.40	2.64	19	1
1:A:146:VAL:O	1:A:146:VAL:HG22	0.40	2.16	14	1
1:A:107:MET:O	1:A:109:ALA:N	0.40	2.54	6	1
1:A:139:GLU:OE1	1:A:139:GLU:CA	0.40	2.68	18	1
1:A:139:GLU:O	1:A:140:PRO:C	0.40	2.63	18	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	108/131 (82%)	90±2 (83±1%)	14±2 (13±2%)	4±1 (4±1%)	4	32
All	All	2160/2620 (82%)	1791 (83%)	289 (13%)	80 (4%)	4	32

All 13 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	111	ASN	17

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Mol	Chain	Res	Type	Models (Total)
1	A	167	PRO	16
1	A	169	SER	14
1	A	147	PRO	9
1	A	87	SER	4
1	A	114	LEU	4
1	A	187	LYS	4
1	A	89	ASN	3
1	A	158	ASP	3
1	A	168	SER	2
1	A	136	SER	2
1	A	134	ASP	1
1	A	157	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.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	90/107 (84%)	64±4 (71±4%)	26±4 (29±4%)	1	18
All	All	1800/2140 (84%)	1280 (71%)	520 (29%)	1	18

All 70 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	94	ILE	20
1	A	182	THR	20
1	A	93	LEU	19
1	A	106	LEU	19
1	A	153	LEU	19
1	A	124	ILE	18
1	A	145	SER	17
1	A	146	VAL	16
1	A	81	LEU	15
1	A	154	LYS	15
1	A	139	GLU	14
1	A	82	LEU	13
1	A	135	PHE	13

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Mol	Chain	Res	Type	Models (Total)
1	A	114	LEU	13
1	A	162	LEU	12
1	A	188	ILE	11
1	A	190	ASN	11
1	A	191	ASN	11
1	A	96	ASP	10
1	A	91	VAL	9
1	A	113	LEU	9
1	A	108	THR	9
1	A	85	SER	8
1	A	92	THR	8
1	A	119	ASN	8
1	A	151	PHE	8
1	A	185	ASP	8
1	A	99	ASP	8
1	A	107	MET	8
1	A	189	VAL	8
1	A	148	ILE	7
1	A	111	ASN	7
1	A	125	HIS	7
1	A	176	LYS	7
1	A	158	ASP	6
1	A	165	THR	6
1	A	172	LYS	6
1	A	87	SER	5
1	A	127	ASP	5
1	A	142	PHE	5
1	A	136	SER	5
1	A	161	THR	5
1	A	192	ILE	4
1	A	134	ASP	4
1	A	137	SER	4
1	A	171	HIS	4
1	A	186	MET	4
1	A	193	GLU	4
1	A	89	ASN	4
1	A	180	THR	3
1	A	181	SER	3
1	A	86	ARG	3
1	A	133	LEU	3
1	A	120	VAL	3
1	A	155	VAL	3

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Mol	Chain	Res	Type	Models (Total)
1	A	168	SER	3
1	A	83	SER	3
1	A	103	LYS	3
1	A	122	ASP	2
1	A	187	LYS	2
1	A	170	GLU	2
1	A	169	SER	2
1	A	90	THR	2
1	A	177	ARG	1
1	A	141	VAL	1
1	A	173	ASP	1
1	A	150	ASP	1
1	A	97	PHE	1
1	A	84	ILE	1
1	A	159	THR	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 oligosaccharides 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

No chemical shift data were provided