



# Full wwPDB NMR Structure Validation Report ⓘ

Mar 19, 2026 – 12:01 PM UTC

PDB ID : 9PGN / pdb\_00009pgn  
BMRB ID : 4986  
Title : Two-conformer equilibrium of maltose-binding protein in the absence of ligand from residual dipolar coupling analysis  
Authors : Shen, Y.; Bax, A.  
Deposited on : 2025-07-08

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

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<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>.

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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  
BMRB Restraints Analysis : v1.2  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

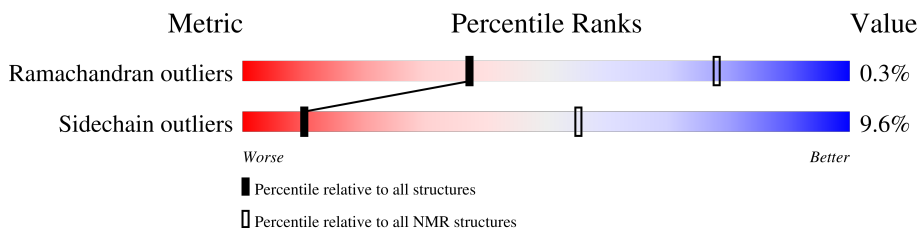
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*SOLUTION NMR*

The overall completeness of chemical shifts assignment is 35%.

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)
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  $\geq 3$ , 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	369	

## 2 Ensemble composition and analysis

This entry contains 10 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:5-A:105, A:266-A:312 (148)	0.29	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	2, 3, 5, 6
2	8, 9, 10
3	1, 7
Single-model clusters	4

### 3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 5095 atoms, of which 551 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Maltose/maltodextrin ABC transporter substrate-binding protein MalE.

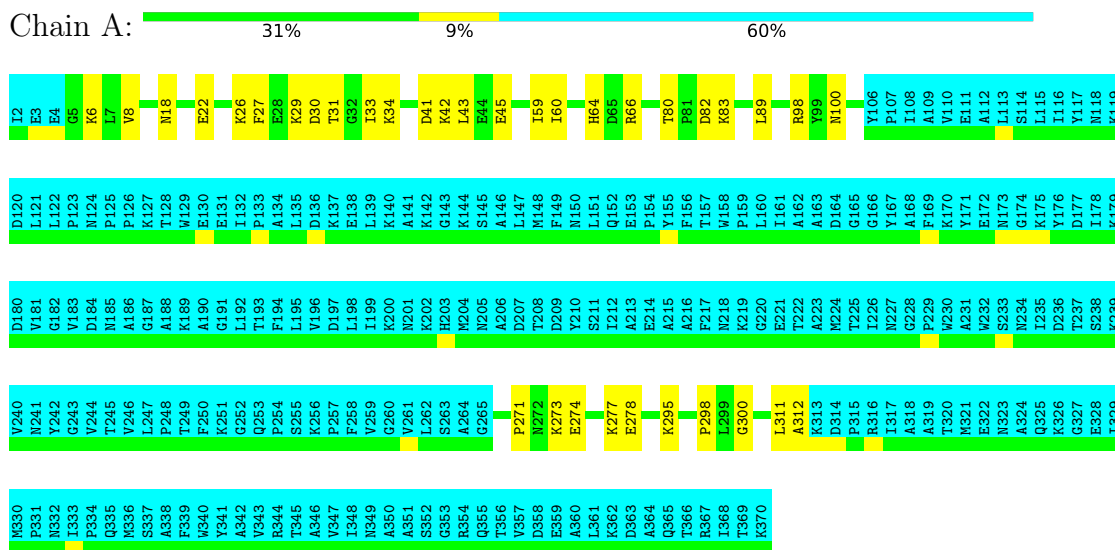
Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	369	5095	2923	551	742	867	12	0

## 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.

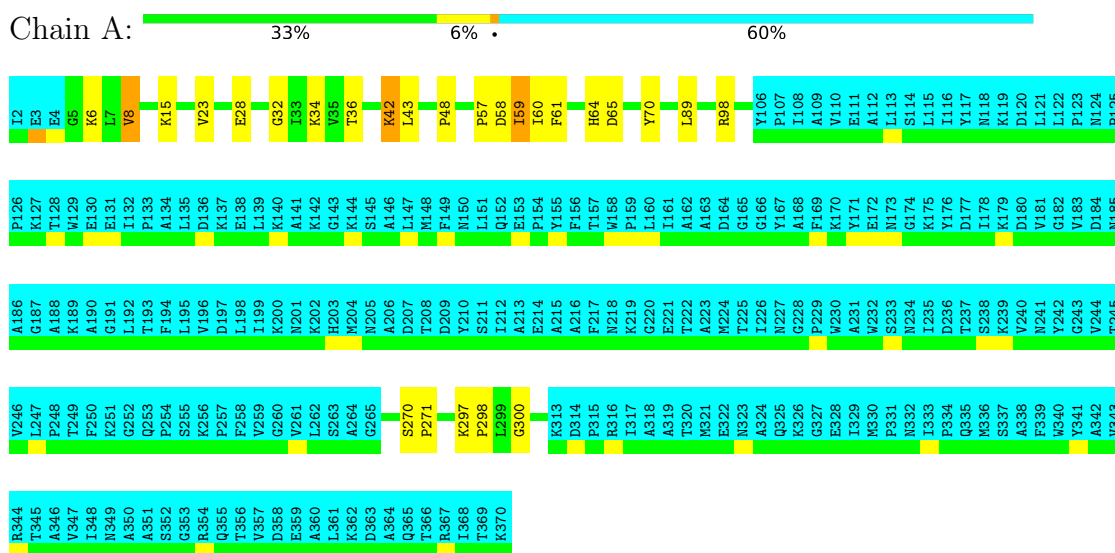
- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE





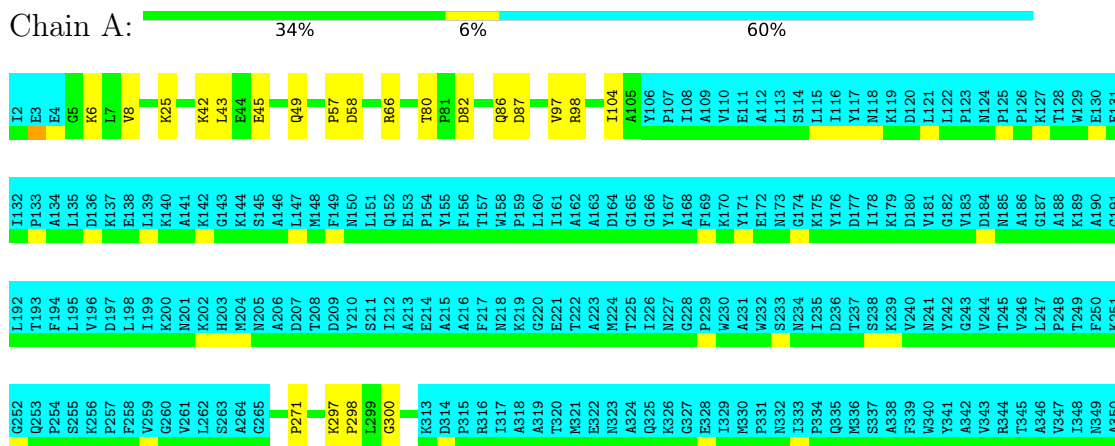
#### 4.2.2 Score per residue for model 2

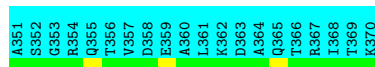
- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



#### 4.2.3 Score per residue for model 3

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE

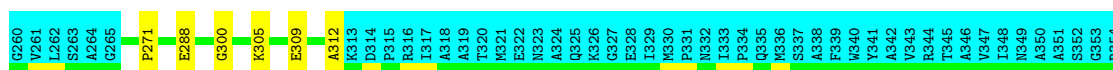
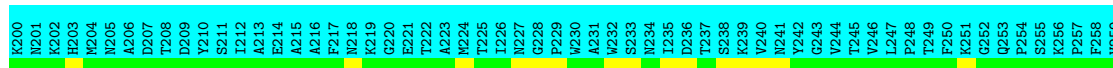
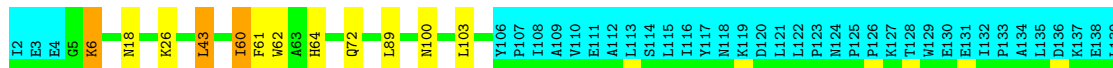




#### 4.2.4 Score per residue for model 4

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE

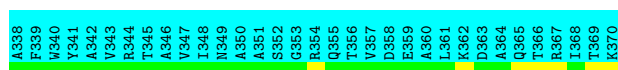
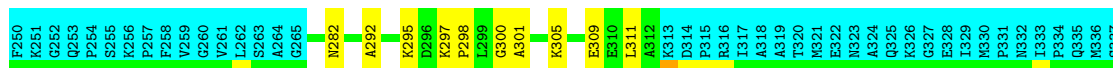
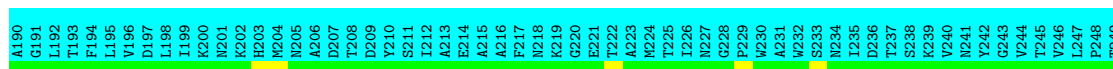
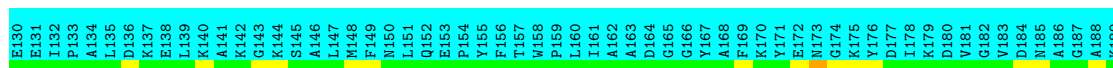
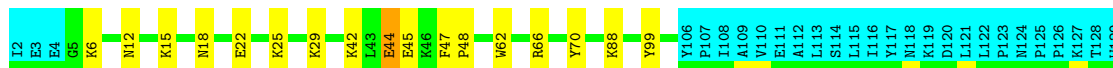
Chain A: 35% .. 60%



#### 4.2.5 Score per residue for model 5

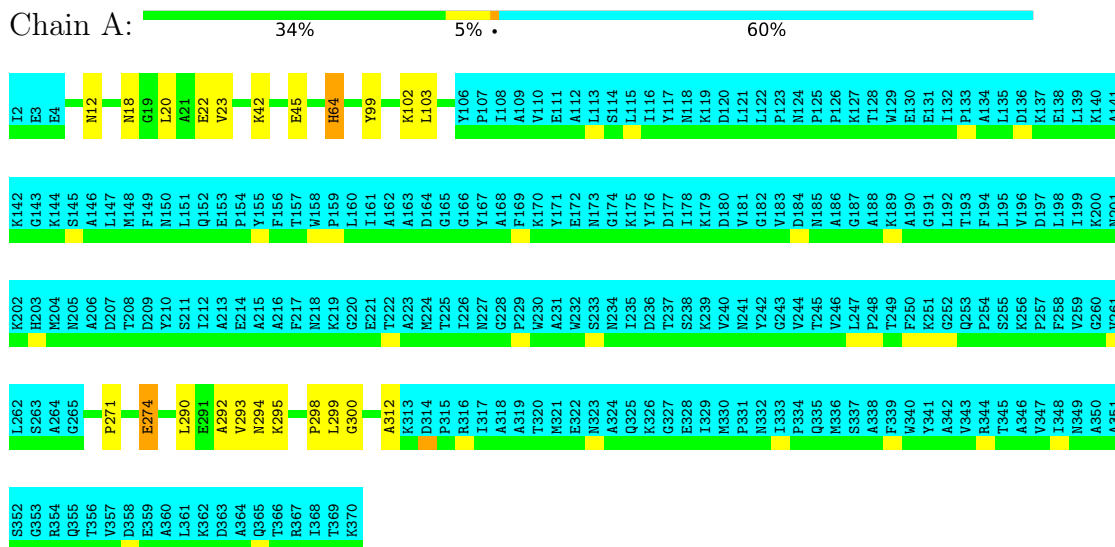
- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE

Chain A: 33% 7% 60%



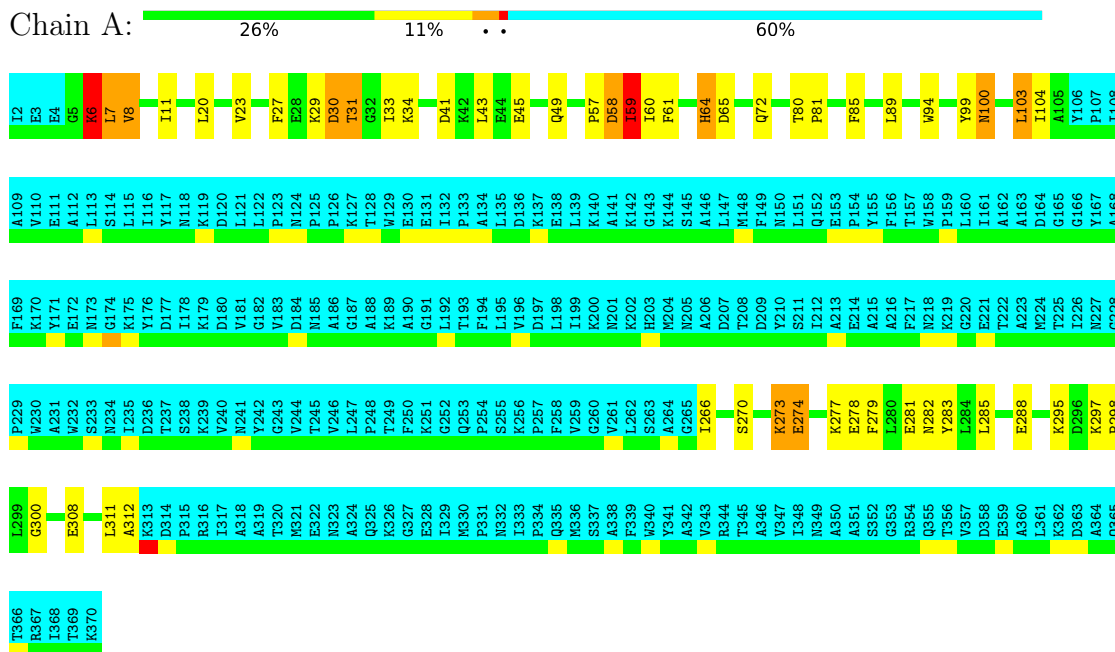
### 4.2.6 Score per residue for model 6

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



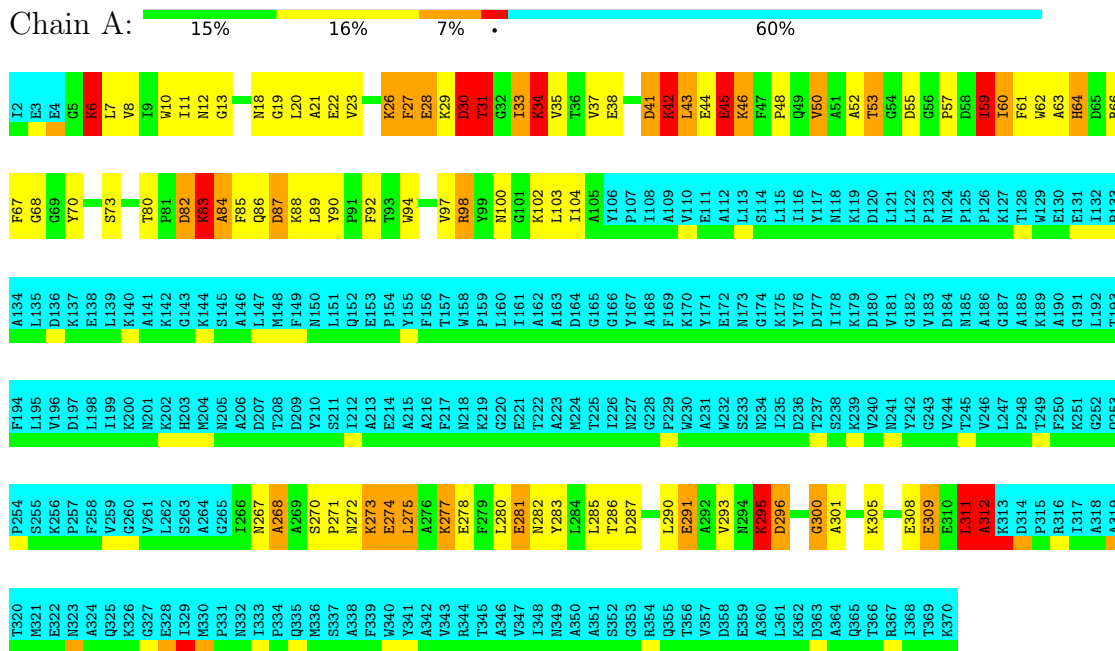
### 4.2.7 Score per residue for model 7

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



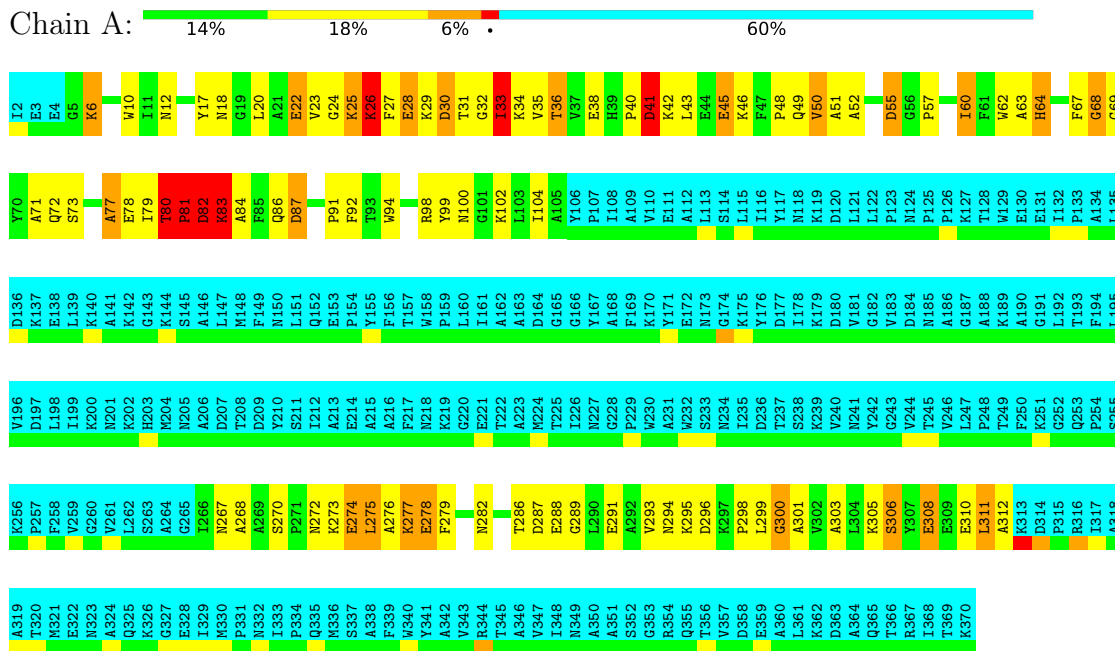
### 4.2.8 Score per residue for model 8

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



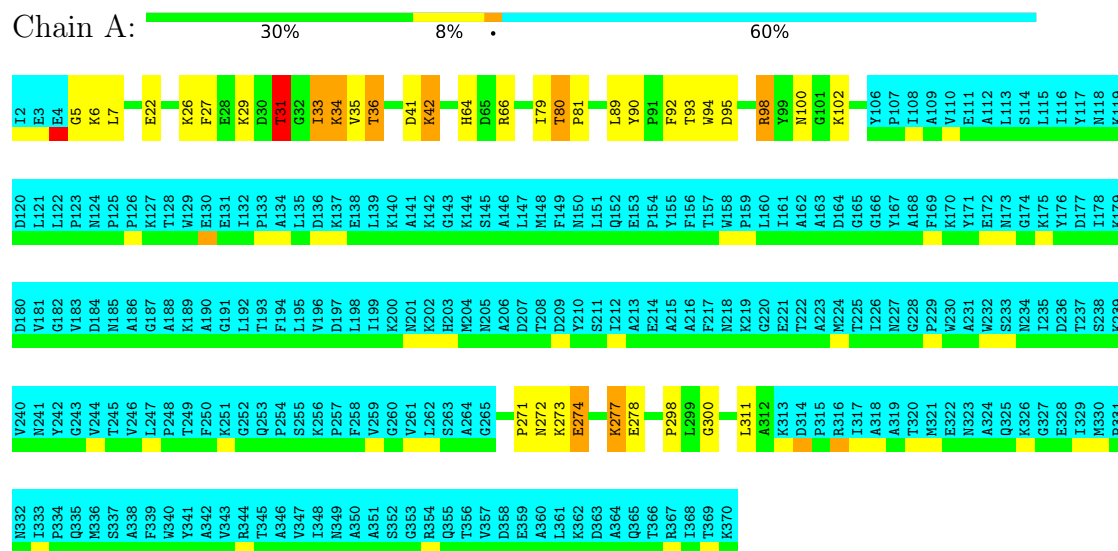
#### 4.2.9 Score per residue for model 9

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



#### 4.2.10 Score per residue for model 10

- Molecule 1: Maltose/maltodextrin ABC transporter substrate-binding protein MalE



## 5 Refinement protocol and experimental data overview

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

Of the 100 calculated structures, 10 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
DYNAMO	structure calculation	
X-PLOR NIH	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	1686
Number of shifts mapped to atoms	1683
Number of unparsed shifts	0
Number of shifts with mapping errors	3
Number of shifts with mapping warnings	0
Assignment completeness (well-defined parts)	35%

## 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	0.85±0.54	3±6/1186 ( 0.3± 0.5%)	1.53±0.86	34±56/1605 ( 2.1± 3.5%)
All	All	1.01	33/11860 ( 0.3%)	1.76	344/16050 ( 2.1%)

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	0.4±0.9
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	289	GLY	CA-C	6.84	1.59	1.52	9	1
1	A	312	ALA	C-O	-6.69	1.16	1.23	8	1
1	A	22	GLU	CA-CB	-6.46	1.42	1.53	9	1
1	A	55	ASP	N-CA	6.43	1.54	1.46	8	1
1	A	300	GLY	N-CA	6.30	1.54	1.45	9	1
1	A	64	HIS	CD2-NE2	-6.18	1.31	1.37	9	2
1	A	31	THR	CA-CB	5.98	1.63	1.53	8	2
1	A	296	ASP	C-O	5.88	1.31	1.24	8	2
1	A	300	GLY	CA-C	5.82	1.60	1.51	8	2
1	A	63	ALA	CA-C	5.81	1.60	1.52	9	1
1	A	312	ALA	C-N	-5.77	1.25	1.33	8	1
1	A	97	VAL	C-N	-5.72	1.25	1.33	8	1
1	A	30	ASP	N-CA	5.72	1.53	1.46	8	1
1	A	83	LYS	C-N	-5.62	1.25	1.33	9	1
1	A	80	THR	CA-CB	5.62	1.60	1.53	8	3
1	A	23	VAL	C-N	-5.61	1.27	1.34	9	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)	Models	
								Worst	Total
1	A	94	TRP	C-N	-5.48	1.26	1.34	8	1
1	A	311	LEU	C-N	5.37	1.41	1.34	8	1
1	A	306	SER	N-CA	5.36	1.52	1.46	9	1
1	A	286	THR	CB-OG1	5.34	1.52	1.43	8	1
1	A	63	ALA	C-O	5.23	1.30	1.23	8	1
1	A	268	ALA	N-CA	5.20	1.52	1.46	8	1
1	A	61	PHE	CA-C	5.14	1.58	1.52	8	1
1	A	104	ILE	CA-CB	5.10	1.60	1.54	7	1
1	A	61	PHE	C-N	-5.07	1.27	1.33	1	1
1	A	301	ALA	N-CA	5.04	1.52	1.46	9	1
1	A	299	LEU	C-O	5.04	1.30	1.24	9	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(°)	Ideal(°)	Models	
								Worst	Total
1	A	30	ASP	CA-CB-CG	30.69	143.29	112.60	9	3
1	A	22	GLU	CA-CB-CG	26.93	167.96	114.10	9	1
1	A	312	ALA	CA-C-N	25.94	171.08	121.54	8	2
1	A	312	ALA	C-N-CA	25.94	171.08	121.54	8	2
1	A	311	LEU	CA-C-N	-18.92	94.84	121.33	8	2
1	A	311	LEU	C-N-CA	-18.92	94.84	121.33	8	2
1	A	312	ALA	O-C-N	15.18	139.10	123.62	8	1
1	A	291	GLU	CA-C-N	13.27	137.70	120.44	9	2
1	A	291	GLU	C-N-CA	13.27	137.70	120.44	9	2
1	A	35	VAL	CA-C-O	-12.56	107.20	120.39	9	2
1	A	310	GLU	CB-CG-CD	11.36	131.92	112.60	9	1
1	A	29	LYS	N-CA-C	-11.30	98.76	112.54	9	2
1	A	59	ILE	CA-CB-CG2	10.94	129.10	110.50	8	1
1	A	78	GLU	CA-C-N	-10.92	105.05	122.64	9	1
1	A	78	GLU	C-N-CA	-10.92	105.05	122.64	9	1
1	A	55	ASP	CA-CB-CG	10.67	123.27	112.60	8	2
1	A	274	GLU	CB-CG-CD	10.43	130.32	112.60	9	3
1	A	278	GLU	CA-CB-CG	10.26	134.62	114.10	9	2
1	A	50	VAL	CA-C-O	-9.44	110.27	120.47	9	2
1	A	291	GLU	CA-CB-CG	9.39	132.88	114.10	9	1
1	A	272	ASN	CB-CG-ND2	9.25	130.28	116.40	8	1
1	A	84	ALA	N-CA-CB	9.16	123.69	110.13	8	2
1	A	84	ALA	N-CA-C	-9.06	100.35	111.40	9	2
1	A	38	GLU	CA-C-O	-9.02	110.90	121.46	9	2
1	A	84	ALA	CA-C-O	-9.00	110.92	120.55	9	2

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	278	GLU	CB-CG-CD	8.88	127.70	112.60	8	3
1	A	276	ALA	CA-C-O	8.87	130.13	120.82	9	1
1	A	86	GLN	CA-C-N	8.83	132.99	120.28	8	1
1	A	86	GLN	C-N-CA	8.83	132.99	120.28	8	1
1	A	42	LYS	CB-CA-C	-8.50	99.40	111.80	8	2
1	A	33	ILE	N-CA-CB	8.43	120.61	111.00	8	1
1	A	29	LYS	CA-C-N	-8.14	109.71	122.49	9	1
1	A	29	LYS	C-N-CA	-8.14	109.71	122.49	9	1
1	A	104	ILE	O-C-N	8.11	130.93	122.09	8	1
1	A	67	PHE	N-CA-C	8.10	120.19	111.36	9	1
1	A	270	SER	CA-C-N	8.08	127.80	119.64	8	1
1	A	270	SER	C-N-CA	8.08	127.80	119.64	8	1
1	A	33	ILE	CB-CA-C	8.06	120.91	110.91	9	2
1	A	289	GLY	CA-C-O	-8.05	111.89	120.90	9	1
1	A	68	GLY	O-C-N	-8.02	114.39	122.17	8	1
1	A	272	ASN	OD1-CG-ND2	-7.94	114.66	122.60	9	1
1	A	49	GLN	OE1-CD-NE2	7.91	130.51	122.60	9	1
1	A	272	ASN	CA-C-O	-7.86	109.27	119.80	8	1
1	A	27	PHE	N-CA-C	-7.85	100.74	112.04	8	2
1	A	86	GLN	OE1-CD-NE2	7.73	130.33	122.60	9	1
1	A	18	ASN	OD1-CG-ND2	-7.73	114.87	122.60	8	1
1	A	291	GLU	CA-C-O	-7.71	111.10	119.97	8	1
1	A	311	LEU	N-CA-C	7.71	119.76	111.36	9	1
1	A	98	ARG	NE-CZ-NH2	7.67	126.10	119.20	1	2
1	A	45	GLU	OE1-CD-OE2	7.65	141.27	122.90	8	1
1	A	25	LYS	CA-C-N	-7.63	110.44	122.73	9	1
1	A	25	LYS	C-N-CA	-7.63	110.44	122.73	9	1
1	A	84	ALA	O-C-N	7.54	131.30	122.17	8	2
1	A	282	ASN	CA-C-O	-7.54	110.90	118.97	8	2
1	A	33	ILE	CA-C-O	-7.53	111.84	120.65	8	1
1	A	45	GLU	N-CA-CB	-7.52	98.92	110.42	8	1
1	A	49	GLN	CB-CG-CD	-7.49	99.87	112.60	9	1
1	A	60	ILE	CA-C-O	7.47	128.23	120.39	9	2
1	A	83	LYS	O-C-N	-7.41	113.75	122.20	9	1
1	A	267	ASN	CA-CB-CG	7.41	120.01	112.60	9	1
1	A	8	VAL	N-CA-CB	7.41	121.63	111.41	1	1
1	A	38	GLU	O-C-N	7.40	133.03	123.11	8	2
1	A	8	VAL	CB-CA-C	7.36	121.52	110.63	1	3
1	A	67	PHE	CA-C-O	-7.36	112.62	120.42	8	2
1	A	6	LYS	CA-CB-CG	7.34	128.78	114.10	9	1
1	A	98	ARG	NE-CZ-NH1	-7.32	114.18	121.50	9	2

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	26	LYS	N-CA-C	-7.31	104.25	113.02	8	1
1	A	97	VAL	O-C-N	7.29	131.68	122.57	8	1
1	A	303	ALA	CA-C-O	-7.26	111.22	119.79	9	1
1	A	51	ALA	O-C-N	7.18	130.62	122.22	9	1
1	A	278	GLU	CA-C-N	7.17	130.22	120.54	8	2
1	A	278	GLU	C-N-CA	7.17	130.22	120.54	8	2
1	A	18	ASN	CA-C-N	7.14	127.90	119.98	9	1
1	A	18	ASN	C-N-CA	7.14	127.90	119.98	9	1
1	A	275	LEU	O-C-N	7.11	130.25	122.15	9	1
1	A	30	ASP	CB-CA-C	7.11	122.53	111.02	9	2
1	A	12	ASN	CA-CB-CG	-7.04	105.56	112.60	9	2
1	A	30	ASP	CA-C-O	-7.02	111.45	119.95	9	1
1	A	102	LYS	CB-CA-C	-7.02	97.69	109.48	9	2
1	A	294	ASN	CA-C-N	6.99	129.65	120.28	9	1
1	A	294	ASN	C-N-CA	6.99	129.65	120.28	9	1
1	A	28	GLU	N-CA-C	6.94	119.87	111.82	8	1
1	A	291	GLU	OE1-CD-OE2	6.90	139.46	122.90	8	1
1	A	300	GLY	O-C-N	6.90	131.67	122.70	9	1
1	A	64	HIS	CA-CB-CG	-6.89	106.91	113.80	8	1
1	A	22	GLU	CG-CD-OE1	-6.87	102.60	118.40	9	1
1	A	70	TYR	CA-C-N	6.86	129.47	120.28	1	2
1	A	70	TYR	C-N-CA	6.86	129.47	120.28	1	2
1	A	87	ASP	O-C-N	6.84	131.90	122.46	9	1
1	A	85	PHE	N-CA-C	-6.84	102.94	112.45	7	1
1	A	293	VAL	CA-C-O	-6.84	113.46	121.05	8	1
1	A	55	ASP	CB-CA-C	6.83	124.01	110.42	8	1
1	A	33	ILE	O-C-N	6.80	131.24	122.94	8	1
1	A	62	TRP	O-C-N	-6.79	116.50	123.29	9	1
1	A	104	ILE	CA-CB-CG1	-6.78	98.88	110.40	9	1
1	A	45	GLU	CA-C-O	6.75	127.04	119.41	9	1
1	A	94	TRP	CA-C-N	6.74	130.56	120.31	8	1
1	A	94	TRP	C-N-CA	6.74	130.56	120.31	8	1
1	A	312	ALA	N-CA-C	6.71	118.61	107.20	8	2
1	A	94	TRP	N-CA-C	-6.71	104.57	112.89	9	1
1	A	80	THR	O-C-N	6.67	126.60	121.27	9	1
1	A	290	LEU	O-C-N	6.64	129.16	122.12	8	1
1	A	51	ALA	CA-C-N	6.63	129.17	120.28	9	1
1	A	51	ALA	C-N-CA	6.63	129.17	120.28	9	1
1	A	27	PHE	CA-C-N	6.61	130.36	120.31	9	1
1	A	27	PHE	C-N-CA	6.61	130.36	120.31	9	1
1	A	49	GLN	N-CA-CB	6.59	119.53	109.98	9	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	308	GLU	CA-C-O	6.58	127.53	120.10	9	2
1	A	31	THR	N-CA-CB	6.56	121.57	110.49	9	1
1	A	25	LYS	N-CA-C	-6.54	104.23	111.36	9	1
1	A	301	ALA	O-C-N	-6.52	115.00	123.02	9	1
1	A	86	GLN	CB-CG-CD	6.49	123.63	112.60	8	1
1	A	277	LYS	CA-CB-CG	6.48	127.06	114.10	9	1
1	A	285	LEU	O-C-N	-6.48	113.97	122.59	8	1
1	A	69	GLY	O-C-N	-6.46	115.99	122.19	9	1
1	A	63	ALA	N-CA-CB	6.43	119.50	110.04	9	1
1	A	282	ASN	CB-CG-ND2	-6.43	106.75	116.40	9	2
1	A	27	PHE	CA-C-O	6.40	128.31	120.31	8	1
1	A	301	ALA	CA-C-O	-6.38	113.08	120.49	8	1
1	A	277	LYS	CB-CG-CD	6.38	125.98	111.30	8	1
1	A	68	GLY	CA-C-N	6.38	127.02	120.00	1	1
1	A	68	GLY	C-N-CA	6.38	127.02	120.00	1	1
1	A	276	ALA	O-C-N	-6.38	115.50	122.07	9	1
1	A	99	TYR	O-C-N	6.37	131.52	123.12	9	1
1	A	305	LYS	CA-C-N	6.36	128.71	120.44	8	1
1	A	305	LYS	C-N-CA	6.36	128.71	120.44	8	1
1	A	274	GLU	CA-C-O	-6.35	113.69	120.42	8	1
1	A	24	GLY	O-C-N	6.33	129.62	122.34	9	1
1	A	306	SER	CA-C-O	-6.32	114.18	120.82	9	1
1	A	7	LEU	O-C-N	-6.32	115.91	123.31	8	1
1	A	29	LYS	CA-CB-CG	6.30	126.70	114.10	8	1
1	A	41	ASP	CA-CB-CG	6.29	118.89	112.60	7	2
1	A	53	THR	CA-CB-OG1	-6.29	100.16	109.60	8	1
1	A	103	LEU	CB-CA-C	6.29	120.11	109.80	8	1
1	A	64	HIS	N-CA-C	6.28	118.93	111.71	7	2
1	A	100	ASN	OD1-CG-ND2	-6.26	116.34	122.60	8	1
1	A	37	VAL	CA-C-O	-6.25	113.78	120.59	8	1
1	A	91	PRO	CB-CA-C	6.23	122.91	112.62	9	1
1	A	21	ALA	CA-C-O	-6.19	113.98	120.55	8	1
1	A	100	ASN	CB-CG-ND2	6.19	125.69	116.40	8	1
1	A	10	TRP	CB-CG-CD2	-6.18	118.15	126.80	8	1
1	A	72	GLN	CA-C-O	-6.17	114.34	120.82	1	1
1	A	68	GLY	N-CA-C	-6.17	105.33	112.73	9	1
1	A	271	PRO	N-CA-C	-6.16	107.59	114.92	6	4
1	A	18	ASN	N-CA-C	-6.16	104.12	111.69	8	1
1	A	273	LYS	N-CA-C	6.15	117.99	111.28	8	2
1	A	88	LYS	CG-CD-CE	6.13	125.41	111.30	8	1
1	A	41	ASP	CA-C-O	-6.10	114.91	121.56	8	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	72	GLN	CA-C-N	6.08	134.10	121.94	9	1
1	A	72	GLN	C-N-CA	6.08	134.10	121.94	9	1
1	A	11	ILE	CA-C-N	6.05	129.89	120.75	8	1
1	A	11	ILE	C-N-CA	6.05	129.89	120.75	8	1
1	A	278	GLU	CG-CD-OE1	6.04	132.29	118.40	7	2
1	A	13	GLY	O-C-N	6.02	129.17	122.54	8	1
1	A	306	SER	O-C-N	6.01	128.26	122.07	9	1
1	A	49	GLN	CA-C-O	-6.01	114.71	120.90	9	2
1	A	50	VAL	O-C-N	6.00	128.58	121.80	8	1
1	A	64	HIS	ND1-CE1-NE2	-5.98	102.42	108.40	8	2
1	A	285	LEU	CA-C-O	5.97	129.05	120.51	8	1
1	A	27	PHE	CA-CB-CG	5.96	119.76	113.80	1	1
1	A	291	GLU	CG-CD-OE2	-5.96	104.69	118.40	8	1
1	A	271	PRO	CA-C-O	5.94	126.76	118.86	8	1
1	A	13	GLY	CA-C-O	-5.94	112.64	119.65	8	1
1	A	78	GLU	O-C-N	5.91	130.20	122.93	9	1
1	A	61	PHE	O-C-N	5.90	130.26	123.29	8	1
1	A	63	ALA	N-CA-C	-5.89	102.34	110.35	9	1
1	A	43	LEU	O-C-N	5.88	129.50	122.27	8	1
1	A	35	VAL	CA-C-N	5.85	131.24	123.05	8	1
1	A	35	VAL	C-N-CA	5.85	131.24	123.05	8	1
1	A	41	ASP	OD1-CG-OD2	5.85	136.93	122.90	9	1
1	A	6	LYS	N-CA-CB	5.84	121.08	111.62	9	1
1	A	23	VAL	CA-C-N	5.83	126.42	120.00	7	1
1	A	23	VAL	C-N-CA	5.83	126.42	120.00	7	1
1	A	86	GLN	CG-CD-NE2	-5.83	107.65	116.40	8	2
1	A	90	TYR	CA-C-O	5.83	125.23	119.75	8	1
1	A	312	ALA	CA-C-O	-5.83	114.20	120.09	8	1
1	A	80	THR	CA-C-N	5.83	127.12	119.84	9	1
1	A	80	THR	C-N-CA	5.83	127.12	119.84	9	1
1	A	295	LYS	CB-CA-C	-5.81	101.14	110.79	9	1
1	A	22	GLU	N-CA-CB	5.81	119.25	110.30	9	1
1	A	31	THR	CA-CB-OG1	-5.81	100.89	109.60	9	1
1	A	53	THR	CA-CB-CG2	5.79	120.35	110.50	8	1
1	A	270	SER	CA-CB-OG	5.77	122.64	111.10	9	1
1	A	94	TRP	O-C-N	-5.77	115.18	122.27	8	1
1	A	82	ASP	O-C-N	5.76	129.40	122.94	8	1
1	A	274	GLU	CA-C-N	5.76	128.46	120.29	9	1
1	A	274	GLU	C-N-CA	5.76	128.46	120.29	9	1
1	A	275	LEU	CA-C-O	5.75	126.86	120.82	8	1
1	A	31	THR	N-CA-C	-5.75	108.07	114.62	10	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	22	GLU	CB-CG-CD	5.74	122.36	112.60	8	1
1	A	46	LYS	CA-C-O	-5.74	114.34	120.42	8	1
1	A	44	GLU	CA-C-O	5.71	126.40	119.38	8	1
1	A	23	VAL	N-CA-C	-5.69	104.97	110.72	2	2
1	A	97	VAL	CA-C-O	-5.65	113.72	120.78	8	1
1	A	49	GLN	O-C-N	5.62	128.10	122.03	9	1
1	A	67	PHE	CA-C-N	5.61	126.31	120.03	8	1
1	A	67	PHE	C-N-CA	5.61	126.31	120.03	8	1
1	A	312	ALA	CB-CA-C	5.61	118.38	111.43	8	1
1	A	282	ASN	N-CA-C	5.60	120.23	113.17	5	1
1	A	81	PRO	O-C-N	5.60	130.20	122.64	9	1
1	A	80	THR	CA-CB-OG1	-5.59	101.21	109.60	7	2
1	A	268	ALA	CA-C-N	5.59	133.12	121.94	9	1
1	A	268	ALA	C-N-CA	5.59	133.12	121.94	9	1
1	A	34	LYS	CA-C-O	5.59	127.89	121.47	9	2
1	A	282	ASN	OD1-CG-ND2	-5.58	117.02	122.60	7	1
1	A	32	GLY	CA-C-O	5.58	124.95	119.04	9	1
1	A	35	VAL	O-C-N	5.57	129.27	123.26	9	1
1	A	40	PRO	CA-C-O	5.55	128.88	121.95	9	1
1	A	104	ILE	CB-CA-C	-5.54	104.89	111.65	8	1
1	A	6	LYS	O-C-N	5.54	129.87	123.17	7	1
1	A	66	ARG	CD-NE-CZ	5.53	132.14	124.40	1	1
1	A	311	LEU	O-C-N	-5.53	114.92	122.33	8	1
1	A	305	LYS	N-CA-C	5.52	118.00	111.33	8	1
1	A	41	ASP	O-C-N	5.50	129.35	122.86	9	1
1	A	286	THR	CA-C-O	-5.50	115.20	121.58	9	1
1	A	59	ILE	CB-CA-C	5.49	118.96	110.50	7	2
1	A	20	LEU	CA-C-O	-5.48	115.06	120.82	8	1
1	A	104	ILE	N-CA-C	5.48	117.69	111.88	3	1
1	A	71	ALA	CA-C-O	-5.47	115.07	120.82	9	1
1	A	73	SER	CA-C-N	5.47	130.67	120.87	9	2
1	A	73	SER	C-N-CA	5.47	130.67	120.87	9	2
1	A	81	PRO	N-CA-C	-5.47	103.26	111.57	7	1
1	A	26	LYS	CB-CA-C	5.46	119.95	110.94	9	1
1	A	293	VAL	CA-C-N	5.46	128.14	120.28	8	1
1	A	293	VAL	C-N-CA	5.46	128.14	120.28	8	1
1	A	281	GLU	N-CA-C	5.43	118.12	111.82	8	1
1	A	273	LYS	CB-CA-C	-5.43	101.78	110.79	8	1
1	A	286	THR	CA-C-N	5.41	127.53	120.28	9	1
1	A	286	THR	C-N-CA	5.41	127.53	120.28	9	1
1	A	28	GLU	CA-C-O	5.41	126.19	119.97	8	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	68	GLY	CA-C-O	5.40	126.09	120.80	8	1
1	A	21	ALA	CA-C-N	5.39	128.05	120.28	8	1
1	A	21	ALA	C-N-CA	5.39	128.05	120.28	8	1
1	A	18	ASN	CA-C-O	-5.39	114.71	120.42	9	1
1	A	59	ILE	CA-C-O	5.38	126.70	120.67	8	1
1	A	17	TYR	CA-C-O	-5.38	113.78	119.97	9	1
1	A	304	LEU	CA-C-O	-5.38	114.22	120.62	1	1
1	A	77	ALA	CA-C-O	-5.34	114.97	121.05	9	1
1	A	31	THR	CA-C-N	5.33	131.10	122.09	9	1
1	A	31	THR	C-N-CA	5.33	131.10	122.09	9	1
1	A	97	VAL	N-CA-C	5.33	117.31	111.77	3	1
1	A	308	GLU	CB-CG-CD	5.32	121.64	112.60	1	2
1	A	28	GLU	CG-CD-OE1	-5.30	106.21	118.40	8	1
1	A	65	ASP	CB-CA-C	5.28	121.46	110.32	7	1
1	A	7	LEU	CB-CA-C	5.28	119.25	109.70	7	1
1	A	28	GLU	CA-CB-CG	5.28	124.66	114.10	9	1
1	A	36	THR	CB-CA-C	5.24	119.30	109.71	9	1
1	A	103	LEU	CA-C-O	-5.24	114.62	120.54	8	1
1	A	267	ASN	O-C-N	5.24	129.45	122.95	8	1
1	A	281	GLU	CB-CG-CD	-5.23	103.71	112.60	8	1
1	A	308	GLU	N-CA-C	-5.22	105.28	110.97	7	1
1	A	28	GLU	CG-CD-OE2	5.22	130.40	118.40	8	1
1	A	80	THR	N-CA-C	5.21	118.81	110.73	3	1
1	A	305	LYS	O-C-N	5.20	127.63	122.12	9	1
1	A	293	VAL	O-C-N	5.18	127.29	121.90	1	1
1	A	58	ASP	CA-C-O	5.16	125.89	120.42	7	1
1	A	100	ASN	CA-CB-CG	5.16	117.76	112.60	7	1
1	A	293	VAL	N-CA-CB	5.16	117.17	110.57	9	1
1	A	22	GLU	CA-C-O	5.15	125.92	120.10	8	1
1	A	20	LEU	CA-C-N	5.15	127.70	120.28	9	1
1	A	20	LEU	C-N-CA	5.15	127.70	120.28	9	1
1	A	310	GLU	CA-CB-CG	5.15	124.40	114.10	9	1
1	A	57	PRO	O-C-N	-5.12	116.89	123.14	8	1
1	A	287	ASP	CA-CB-CG	5.12	117.72	112.60	8	1
1	A	83	LYS	CA-C-N	5.11	127.13	120.28	1	1
1	A	83	LYS	C-N-CA	5.11	127.13	120.28	1	1
1	A	277	LYS	O-C-N	-5.11	116.70	122.12	8	1
1	A	55	ASP	CB-CG-OD2	-5.11	106.65	118.40	9	1
1	A	279	PHE	CA-CB-CG	-5.11	108.69	113.80	9	1
1	A	267	ASN	OD1-CG-ND2	-5.10	117.50	122.60	9	1
1	A	12	ASN	CA-C-O	5.09	126.94	121.55	8	1

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	289	GLY	O-C-N	5.07	127.06	122.19	9	1
1	A	296	ASP	CB-CA-C	5.07	120.51	110.42	9	1
1	A	300	GLY	N-CA-C	-5.07	101.17	113.18	8	1
1	A	6	LYS	CA-C-N	5.06	130.54	122.74	8	1
1	A	6	LYS	C-N-CA	5.06	130.54	122.74	8	1
1	A	270	SER	CA-C-O	5.06	124.44	120.19	9	1
1	A	268	ALA	O-C-N	5.06	128.14	122.22	9	1
1	A	297	LYS	O-C-N	5.04	127.12	121.32	7	1
1	A	53	THR	N-CA-CB	5.04	118.22	110.46	8	1
1	A	98	ARG	CA-CB-CG	5.02	124.14	114.10	8	1
1	A	6	LYS	CA-C-O	-5.02	115.67	121.49	8	1
1	A	295	LYS	CA-CB-CG	5.01	124.12	114.10	8	1
1	A	270	SER	CB-CA-C	-5.00	101.82	108.87	8	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	312	ALA	Peptide	1
1	A	66	ARG	Sidechain	1
1	A	98	ARG	Sidechain	1
1	A	102	LYS	Mainchain	1

## 6.2 Too-close contacts [i](#)

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	-2191	-265	1141	15±8
All	All	-21910	-2650	11410	146

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 0.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:311:LEU:O	1:A:312:ALA:HB2	1.08	1.34	8	1
1:A:31:THR:HG23	1:A:33:ILE:H	1.04	1.09	8	1
1:A:311:LEU:O	1:A:312:ALA:CB	0.98	1.98	8	1
1:A:31:THR:CG2	1:A:33:ILE:H	0.94	1.75	8	1
1:A:43:LEU:CD1	1:A:60:ILE:HD11	0.91	1.95	9	3
1:A:26:LYS:C	1:A:26:LYS:HE3	0.84	1.96	9	1
1:A:26:LYS:HE3	1:A:26:LYS:O	0.83	1.74	9	1
1:A:31:THR:HG23	1:A:33:ILE:N	0.78	1.91	8	1
1:A:295:LYS:HD3	1:A:295:LYS:C	0.76	2.06	8	1
1:A:273:LYS:O	1:A:277:LYS:HG2	0.75	1.81	10	1
1:A:33:ILE:HD13	1:A:275:LEU:HD13	0.74	1.57	9	1
1:A:293:VAL:HG12	1:A:299:LEU:HD11	0.73	1.60	6	1
1:A:25:LYS:O	1:A:29:LYS:HG2	0.72	1.85	5	1
1:A:7:LEU:HG	1:A:33:ILE:HD11	0.72	1.60	10	1
1:A:33:ILE:HG12	1:A:275:LEU:HD13	0.69	1.63	8	1
1:A:42:LYS:HA	1:A:42:LYS:HE2	0.69	1.65	3	1
1:A:42:LYS:N	1:A:42:LYS:HE2	0.68	2.04	10	1
1:A:6:LYS:HA	1:A:33:ILE:HG23	0.68	1.65	8	1
1:A:44:GLU:HG2	1:A:62:TRP:CZ2	0.67	2.24	5	1
1:A:27:PHE:O	1:A:31:THR:HB	0.67	1.89	8	2
1:A:6:LYS:NZ	1:A:7:LEU:H	0.66	1.89	7	1
1:A:31:THR:HG23	1:A:33:ILE:HD12	0.66	1.67	8	1
1:A:59:ILE:HD11	1:A:61:PHE:CE1	0.66	2.26	2	2
1:A:28:GLU:HA	1:A:31:THR:HG22	0.65	1.68	8	1
1:A:59:ILE:HD12	1:A:60:ILE:N	0.65	2.05	2	1
1:A:287:ASP:OD1	1:A:306:SER:OG	0.64	2.16	9	1
1:A:26:LYS:O	1:A:26:LYS:CE	0.64	2.45	9	1
1:A:6:LYS:NZ	1:A:34:LYS:O	0.63	2.30	7	1
1:A:33:ILE:CD1	1:A:275:LEU:HD13	0.63	2.22	9	1
1:A:43:LEU:HD13	1:A:60:ILE:CD1	0.62	2.23	9	1
1:A:43:LEU:HD13	1:A:60:ILE:HD11	0.62	1.66	9	3
1:A:305:LYS:O	1:A:309:GLU:HG3	0.61	1.96	4	2
1:A:83:LYS:O	1:A:87:ASP:HB2	0.61	1.95	8	1
1:A:8:VAL:HG12	1:A:58:ASP:OD1	0.61	1.96	3	2
1:A:81:PRO:O	1:A:82:ASP:HB3	0.60	1.95	9	1
1:A:43:LEU:CD1	1:A:60:ILE:CD1	0.60	2.79	9	1
1:A:48:PRO:O	1:A:52:ALA:HB2	0.58	1.99	9	2
1:A:27:PHE:HA	1:A:283:TYR:CE2	0.58	2.34	7	1
1:A:59:ILE:HD12	1:A:280:LEU:HD11	0.58	1.75	8	1
1:A:59:ILE:CD1	1:A:280:LEU:HD21	0.57	2.28	8	1
1:A:99:TYR:O	1:A:102:LYS:HG2	0.57	1.98	6	1
1:A:41:ASP:O	1:A:46:LYS:HE2	0.57	1.99	9	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:94:TRP:CE3	1:A:103:LEU:HD21	0.57	2.35	7	1
1:A:31:THR:HG22	1:A:33:ILE:HG23	0.57	1.75	10	1
1:A:59:ILE:HD11	1:A:61:PHE:CD1	0.56	2.34	2	1
1:A:6:LYS:HD2	1:A:34:LYS:HE3	0.56	1.78	2	1
1:A:271:PRO:HG2	1:A:272:ASN:ND2	0.56	2.16	10	1
1:A:30:ASP:OD1	1:A:283:TYR:OH	0.55	2.24	8	1
1:A:15:LYS:C	1:A:297:LYS:HD2	0.55	2.26	2	2
1:A:45:GLU:O	1:A:48:PRO:HD2	0.55	2.01	8	1
1:A:42:LYS:HD2	1:A:45:GLU:OE2	0.54	2.02	6	1
1:A:8:VAL:HG13	1:A:57:PRO:HA	0.54	1.79	2	2
1:A:47:PHE:HB3	1:A:48:PRO:HD3	0.54	1.79	1	2
1:A:270:SER:O	1:A:273:LYS:NZ	0.53	2.41	7	1
1:A:274:GLU:H	1:A:274:GLU:CD	0.52	2.13	6	2
1:A:82:ASP:OD1	1:A:82:ASP:C	0.52	2.52	9	1
1:A:82:ASP:O	1:A:86:GLN:HG3	0.51	2.05	3	1
1:A:295:LYS:HD3	1:A:296:ASP:N	0.51	2.19	8	1
1:A:99:TYR:CD2	1:A:100:ASN:HB2	0.51	2.41	7	1
1:A:82:ASP:O	1:A:85:PHE:N	0.51	2.43	8	1
1:A:31:THR:HG22	1:A:33:ILE:HG12	0.51	1.81	1	2
1:A:60:ILE:C	1:A:60:ILE:HD13	0.50	2.31	4	1
1:A:5:GLY:O	1:A:33:ILE:HB	0.50	2.06	10	1
1:A:292:ALA:HA	1:A:295:LYS:CE	0.50	2.36	5	1
1:A:15:LYS:O	1:A:297:LYS:HD2	0.50	2.06	5	1
1:A:85:PHE:C	1:A:85:PHE:CD2	0.50	2.89	8	1
1:A:10:TRP:CD2	1:A:57:PRO:HG3	0.50	2.42	9	1
1:A:28:GLU:HB2	1:A:33:ILE:O	0.49	2.06	9	1
1:A:6:LYS:HE2	1:A:34:LYS:HB2	0.49	1.84	7	1
1:A:19:GLY:O	1:A:23:VAL:HG23	0.49	2.08	8	1
1:A:292:ALA:HA	1:A:295:LYS:NZ	0.49	2.23	6	1
1:A:92:PHE:HA	1:A:95:ASP:OD2	0.49	2.08	10	1
1:A:34:LYS:HD2	1:A:36:THR:HG22	0.48	1.85	10	1
1:A:58:ASP:OD1	1:A:270:SER:OG	0.48	2.31	7	1
1:A:277:LYS:O	1:A:281:GLU:HG3	0.48	2.09	1	3
1:A:293:VAL:CG1	1:A:299:LEU:HD11	0.47	2.34	6	1
1:A:48:PRO:HG3	1:A:70:TYR:CE2	0.47	2.44	2	3
1:A:44:GLU:OE1	1:A:45:GLU:HG2	0.47	2.09	5	1
1:A:34:LYS:O	1:A:34:LYS:HG2	0.47	2.09	8	1
1:A:34:LYS:HG2	1:A:35:VAL:N	0.47	2.24	10	1
1:A:31:THR:CG2	1:A:33:ILE:N	0.47	2.60	8	1
1:A:82:ASP:C	1:A:84:ALA:N	0.46	2.73	8	1
1:A:42:LYS:HB3	1:A:42:LYS:NZ	0.46	2.26	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:6:LYS:HZ2	1:A:7:LEU:H	0.46	1.51	7	1
1:A:6:LYS:HB2	1:A:6:LYS:NZ	0.46	2.26	4	1
1:A:89:LEU:HD12	1:A:94:TRP:CZ2	0.45	2.46	10	1
1:A:6:LYS:HZ2	1:A:7:LEU:N	0.45	2.09	7	1
1:A:294:ASN:HA	1:A:299:LEU:HD13	0.45	1.89	6	1
1:A:80:THR:HG22	1:A:80:THR:O	0.45	2.12	9	1
1:A:31:THR:CG2	1:A:33:ILE:HG23	0.45	2.41	10	1
1:A:288:GLU:CD	1:A:288:GLU:H	0.45	2.20	9	1
1:A:45:GLU:OE1	1:A:66:ARG:NH2	0.44	2.40	1	2
1:A:28:GLU:O	1:A:32:GLY:N	0.44	2.49	2	1
1:A:65:ASP:N	1:A:65:ASP:OD1	0.44	2.48	2	1
1:A:43:LEU:C	1:A:43:LEU:HD12	0.44	2.37	2	2
1:A:31:THR:HG23	1:A:33:ILE:CD1	0.44	2.42	8	1
1:A:44:GLU:CG	1:A:62:TRP:CH2	0.43	3.01	5	1
1:A:8:VAL:CG1	1:A:57:PRO:HA	0.43	2.43	2	1
1:A:18:ASN:O	1:A:22:GLU:HG3	0.43	2.14	6	2
1:A:279:PHE:CD2	1:A:279:PHE:C	0.43	2.96	7	1
1:A:18:ASN:HB2	1:A:296:ASP:OD2	0.43	2.13	1	1
1:A:279:PHE:O	1:A:283:TYR:HB2	0.43	2.14	7	1
1:A:62:TRP:CD1	1:A:66:ARG:HG3	0.42	2.50	8	1
1:A:77:ALA:HB2	1:A:273:LYS:HE3	0.42	1.91	9	1
1:A:58:ASP:HA	1:A:270:SER:OG	0.42	2.14	2	1
1:A:45:GLU:OE2	1:A:66:ARG:NH2	0.42	2.52	3	1
1:A:26:LYS:HE3	1:A:288:GLU:CD	0.42	2.40	4	1
1:A:30:ASP:OD1	1:A:30:ASP:N	0.41	2.53	1	1
1:A:25:LYS:HG2	1:A:29:LYS:HE2	0.41	1.92	5	1
1:A:42:LYS:HE3	1:A:45:GLU:HG3	0.41	1.93	5	1
1:A:292:ALA:HA	1:A:295:LYS:HE2	0.41	1.92	5	1
1:A:83:LYS:O	1:A:83:LYS:HG3	0.41	2.12	9	1
1:A:41:ASP:O	1:A:42:LYS:HB2	0.41	2.16	8	1
1:A:31:THR:HG22	1:A:33:ILE:CG1	0.41	2.46	1	1
1:A:31:THR:CG2	1:A:33:ILE:CD1	0.41	2.99	8	1
1:A:31:THR:CG2	1:A:33:ILE:HG12	0.41	2.46	1	1
1:A:43:LEU:HD12	1:A:43:LEU:C	0.41	2.41	4	1
1:A:268:ALA:O	1:A:273:LYS:NZ	0.41	2.48	8	1
1:A:80:THR:O	1:A:80:THR:HG22	0.41	2.16	10	1
1:A:11:ILE:HD12	1:A:20:LEU:HD22	0.40	1.92	7	1
1:A:82:ASP:OD1	1:A:82:ASP:N	0.40	2.54	8	1
1:A:60:ILE:HD13	1:A:61:PHE:N	0.40	2.31	4	1
1:A:11:ILE:HD12	1:A:20:LEU:CD2	0.40	2.47	7	1
1:A:58:ASP:O	1:A:266:ILE:HA	0.40	2.17	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:6:LYS:HA	1:A:33:ILE:CG2	0.40	2.41	8	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	148/369 (40%)	142±3 (96±2%)	5±2 (4±1%)	0±1 (0±0%)	37	78
All	All	1480/3690 (40%)	1421 (96%)	54 (4%)	5 (0%)	37	78

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	81	PRO	2
1	A	312	ALA	1
1	A	83	LYS	1
1	A	82	ASP	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	118/296 (40%)	107±6 (90±5%)	11±6 (10±5%)	10	55
All	All	1180/2960 (40%)	1067 (90%)	113 (10%)	10	55

All 50 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	6	LYS	7
1	A	89	LEU	5
1	A	274	GLU	5
1	A	30	ASP	4
1	A	45	GLU	4
1	A	59	ILE	4
1	A	8	VAL	3
1	A	29	LYS	3
1	A	34	LYS	3
1	A	41	ASP	3
1	A	60	ILE	3
1	A	83	LYS	3
1	A	277	LYS	3
1	A	295	LYS	3
1	A	36	THR	3
1	A	42	LYS	3
1	A	87	ASP	3
1	A	103	LEU	3
1	A	26	LYS	3
1	A	49	GLN	2
1	A	82	ASP	2
1	A	297	LYS	2
1	A	25	LYS	2
1	A	43	LEU	2
1	A	12	ASN	2
1	A	31	THR	2
1	A	50	VAL	2
1	A	98	ARG	2
1	A	22	GLU	2
1	A	33	ILE	2
1	A	79	ILE	2
1	A	80	THR	2
1	A	278	GLU	2
1	A	38	GLU	1
1	A	102	LYS	1
1	A	18	ASN	1
1	A	44	GLU	1
1	A	88	LYS	1
1	A	20	LEU	1
1	A	290	LEU	1
1	A	57	PRO	1
1	A	72	GLN	1
1	A	285	LEU	1

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Mol	Chain	Res	Type	Models (Total)
1	A	288	GLU	1
1	A	46	LYS	1
1	A	53	THR	1
1	A	291	GLU	1
1	A	309	GLU	1
1	A	311	LEU	1
1	A	55	ASP	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 [i](#)

The completeness of assignment taking into account all chemical shift lists is 35% for the well-defined parts and 34% for the entire structure.

### 7.1 Chemical shift list 1

File name: working\_cs.cif

Chemical shift list name: *shift\_set\_1*

#### 7.1.1 Bookkeeping [i](#)

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	1686
Number of shifts mapped to atoms	1683
Number of unparsed shifts	0
Number of shifts with mapping errors	3
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 3 occurrences are reported below.

List ID	Chain	Res	Type	Atom	Shift Data		
					Value	Uncertainty	Ambiguity
1	A	.	LYS	C	176.4	0.05	1
1	A	.	LYS	CA	55.8	0.05	1
1	A	.	LYS	CB	32.2	0.05	1

#### 7.1.2 Chemical shift referencing [i](#)

The following table shows the suggested chemical shift referencing corrections.

Nucleus	# values	Correction $\pm$ precision, ppm	Suggested action
$^{13}\text{C}_\alpha$	359	$0.36 \pm 0.13$	None needed ( $< 0.5$ ppm)
$^{13}\text{C}_\beta$	327	$0.95 \pm 0.10$	Should be checked
$^{13}\text{C}'$	332	$-0.02 \pm 0.10$	None needed ( $< 0.5$ ppm)
$^{15}\text{N}$	334	$1.04 \pm 0.23$	Should be applied

### 7.1.3 Completeness of resonance assignments [i](#)

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 35%, i.e. 701 atoms were assigned a chemical shift out of a possible 1979. 0 out of 23 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	<b>Total</b>	<b><sup>1</sup>H</b>	<b><sup>13</sup>C</b>	<b><sup>15</sup>N</b>
Backbone	567/740 (77%)	140/303 (46%)	287/296 (97%)	140/141 (99%)
Sidechain	134/1070 (13%)	0/693 (0%)	134/345 (39%)	0/32 (0%)
Aromatic	0/169 (0%)	0/85 (0%)	0/84 (0%)	0/0 (—%)
Overall	701/1979 (35%)	140/1081 (13%)	421/725 (58%)	140/173 (81%)

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 34%, i.e. 1683 atoms were assigned a chemical shift out of a possible 4914. 0 out of 50 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

	<b>Total</b>	<b><sup>1</sup>H</b>	<b><sup>13</sup>C</b>	<b><sup>15</sup>N</b>
Backbone	1357/1832 (74%)	334/746 (45%)	689/738 (93%)	334/348 (96%)
Sidechain	326/2691 (12%)	0/1751 (0%)	326/856 (38%)	0/84 (0%)
Aromatic	0/391 (0%)	0/195 (0%)	0/196 (0%)	0/0 (—%)
Overall	1683/4914 (34%)	334/2692 (12%)	1015/1790 (57%)	334/432 (77%)

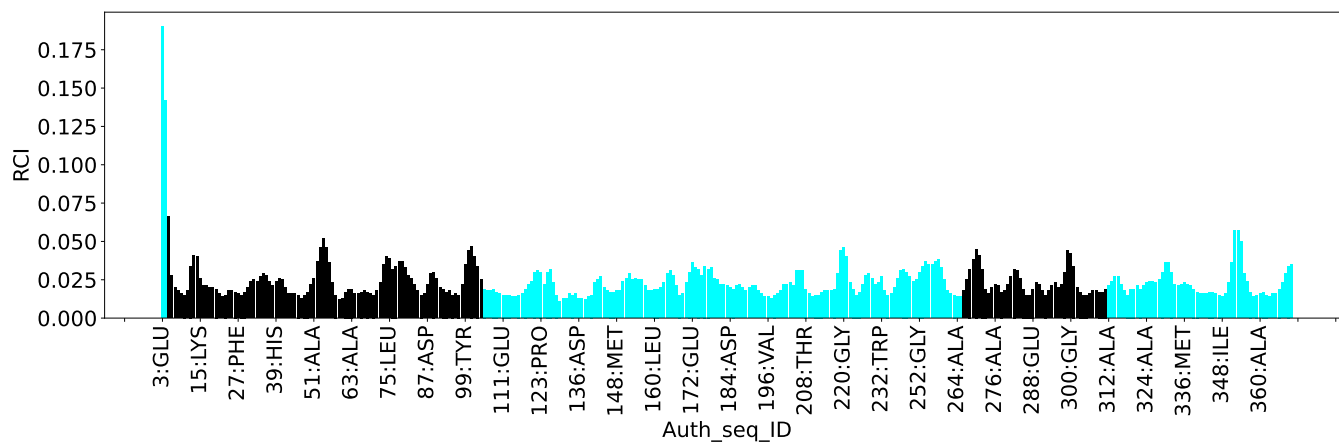
### 7.1.4 Statistically unusual chemical shifts [i](#)

There are no statistically unusual chemical shifts.

### 7.1.5 Random Coil Index (RCI) plots [i](#)

The image below reports *random coil index* values for the protein chains in the structure. The height of each bar gives a probability of a given residue to be disordered, as predicted from the available chemical shifts and the amino acid sequence. A value above 0.2 is an indication of significant predicted disorder. The colour of the bar shows whether the residue is in the well-defined core (black) or in the ill-defined residue ranges (cyan), as described in section 2 on ensemble composition. If well-defined core and ill-defined regions are not identified then it is shown as gray bars.

Random coil index (RCI) for chain A:



## 8 NMR restraints analysis

No restraints data found

## 9 Distance violation analysis

No distance restraints data found

## 10 Dihedral-angle violation analysis

No dihedral-angle restraints found