



Full wwPDB NMR Structure Validation Report ⓘ

Mar 9, 2026 – 07:44 AM UTC

PDB ID : 1K8M / pdb_00001k8m
Title : Solution Structure of the Lipoic Acid-Bearing Domain of the E2 component of Human, Mitochondrial Branched-Chain alpha-Ketoacid Dehydrogenase
Authors : Chang, C.-F.; Chou, H.-T.; Chuang, J.L.; Chuang, D.T.; Huang, T.-h.
Deposited on : 2001-10-24

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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>.

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

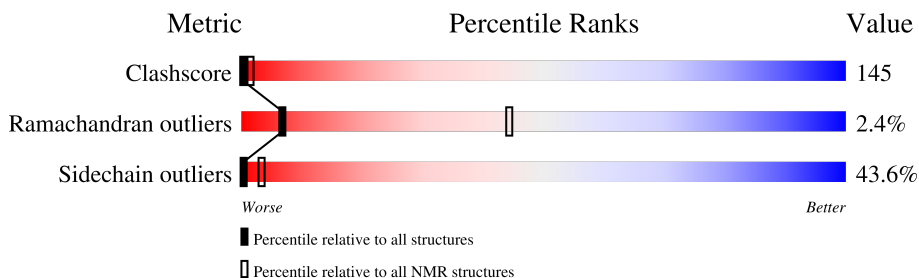
1 Overall quality at a glance

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	93	

2 Ensemble composition and analysis

This entry contains 1 models. Identification of well-defined residues and clustering analysis are not possible.

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1378 atoms, of which 688 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called E2 component of Branched-Chain alpha-Ketoacid Dehydrogenase.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	87	1378	439	688	107	142	2	0

There are 9 discrepancies between the modelled and reference sequences:

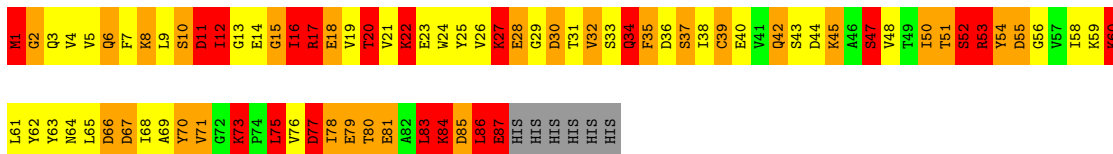
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP P11182
A	86	LEU	-	expression tag	UNP P11182
A	87	GLU	-	expression tag	UNP P11182
A	88	HIS	-	expression tag	UNP P11182
A	89	HIS	-	expression tag	UNP P11182
A	90	HIS	-	expression tag	UNP P11182
A	91	HIS	-	expression tag	UNP P11182
A	92	HIS	-	expression tag	UNP P11182
A	93	HIS	-	expression tag	UNP P11182

4 Residue-property plots [i](#)

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: E2 component of Branched-Chain alpha-Ketoacid Dehydrogenase

Chain A: 



5 Refinement protocol and experimental data overview

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

Of the ? calculated structures, 1 were deposited, based on the following criterion: ?.

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

Software name	Classification	Version
ARIA	refinement	1.0
ARIA	structure solution	1.0

No chemical shift data was provided.

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	12.45	208/699 (29.8%)	7.19	124/944 (13.1%)
All	All	12.45	208/699 (29.8%)	7.19	124/944 (13.1%)

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	1	0
All	All	1	0

All bond outliers are listed below. They are sorted according to the Z-score.

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	53	ARG	CZ-NH1	-80.34	0.20	1.32
1	A	17	ARG	CZ-NH1	-65.89	0.40	1.32
1	A	17	ARG	CZ-NH2	-57.11	0.59	1.33
1	A	17	ARG	CD-NE	-54.35	0.70	1.46
1	A	1	MET	SD-CE	-51.40	0.51	1.79
1	A	10	SER	CB-OG	-48.92	0.44	1.42
1	A	3	GLN	CD-OE1	-45.82	0.36	1.23
1	A	10	SER	C-O	-45.02	0.73	1.24
1	A	53	ARG	NE-CZ	-44.11	0.84	1.33
1	A	53	ARG	CZ-NH2	-42.96	0.77	1.33
1	A	40	GLU	CD-OE1	-41.46	0.46	1.25
1	A	11	ASP	CG-OD2	-41.28	0.47	1.25
1	A	53	ARG	CD-NE	-41.03	0.88	1.46
1	A	44	ASP	CG-OD1	-40.90	0.47	1.25
1	A	1	MET	CG-SD	-39.76	0.81	1.80
1	A	23	GLU	CD-OE1	-38.49	0.52	1.25
1	A	1	MET	CA-CB	-37.59	0.78	1.53
1	A	34	GLN	CD-NE2	-37.52	0.54	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	87	GLU	C-O	-36.41	0.50	1.23
1	A	81	GLU	CD-OE1	-36.35	0.56	1.25
1	A	3	GLN	CD-NE2	-35.14	0.59	1.33
1	A	85	ASP	CG-OD2	-34.26	0.60	1.25
1	A	85	ASP	CG-OD1	-33.98	0.60	1.25
1	A	17	ARG	NE-CZ	-33.95	0.95	1.33
1	A	1	MET	N-CA	-33.88	0.81	1.46
1	A	34	GLN	CD-OE1	-33.56	0.59	1.23
1	A	14	GLU	CD-OE2	-33.48	0.61	1.25
1	A	86	LEU	CG-CD1	-33.37	0.42	1.52
1	A	44	ASP	CB-CG	-33.26	0.68	1.52
1	A	28	GLU	CD-OE1	-31.98	0.64	1.25
1	A	87	GLU	CD-OE1	-31.76	0.65	1.25
1	A	11	ASP	CB-CG	-31.48	0.73	1.52
1	A	35	PHE	CB-CG	-30.97	0.79	1.50
1	A	87	GLU	CG-CD	-30.52	0.75	1.52
1	A	59	LYS	CE-NZ	-29.52	0.60	1.49
1	A	53	ARG	CG-CD	-28.80	0.66	1.52
1	A	84	LYS	CB-CG	-27.87	0.68	1.52
1	A	55	ASP	CG-OD2	-27.50	0.73	1.25
1	A	28	GLU	CD-OE2	-27.50	0.73	1.25
1	A	87	GLU	CD-OE2	-27.39	0.73	1.25
1	A	14	GLU	CD-OE1	-27.17	0.73	1.25
1	A	23	GLU	CD-OE2	-27.00	0.74	1.25
1	A	14	GLU	CB-CG	-26.22	0.73	1.52
1	A	84	LYS	CE-NZ	-26.16	0.70	1.49
1	A	18	GLU	CD-OE2	-25.68	0.76	1.25
1	A	30	ASP	CG-OD2	-25.25	0.77	1.25
1	A	11	ASP	CG-OD1	-25.09	0.77	1.25
1	A	18	GLU	CD-OE1	-24.75	0.78	1.25
1	A	43	SER	CB-OG	-24.60	0.93	1.42
1	A	52	SER	CB-OG	-24.36	0.93	1.42
1	A	47	SER	CB-OG	-24.27	0.93	1.42
1	A	22	LYS	CE-NZ	-24.18	0.76	1.49
1	A	55	ASP	CB-CG	-23.98	0.92	1.52
1	A	81	GLU	CD-OE2	-23.90	0.80	1.25
1	A	81	GLU	CG-CD	-23.88	0.92	1.52
1	A	10	SER	C-N	-23.77	1.00	1.33
1	A	70	TYR	CG-CD1	-23.74	0.89	1.39
1	A	70	TYR	CB-CG	-23.72	0.99	1.51
1	A	70	TYR	CG-CD2	-23.63	0.89	1.39
1	A	73	LYS	CE-NZ	-23.34	0.79	1.49

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	66	ASP	CG-OD1	-23.26	0.81	1.25
1	A	1	MET	CB-CG	-23.14	0.83	1.52
1	A	22	LYS	CG-CD	-22.94	0.83	1.52
1	A	75	LEU	CG-CD1	-22.87	0.77	1.52
1	A	86	LEU	CA-C	-22.85	1.23	1.52
1	A	35	PHE	CG-CD2	-22.70	0.91	1.38
1	A	70	TYR	CZ-OH	-22.68	0.90	1.38
1	A	35	PHE	CG-CD1	-22.49	0.91	1.38
1	A	39	CYS	CB-SG	-22.38	1.07	1.81
1	A	45	LYS	CE-NZ	-22.26	0.82	1.49
1	A	35	PHE	CD1-CE1	-21.91	0.72	1.38
1	A	45	LYS	CB-CG	-21.90	0.86	1.52
1	A	35	PHE	CD2-CE2	-21.88	0.73	1.38
1	A	14	GLU	C-O	-21.82	0.96	1.24
1	A	6	GLN	CD-OE1	-21.81	0.82	1.23
1	A	23	GLU	CG-CD	-21.78	0.97	1.52
1	A	30	ASP	CG-OD1	-21.65	0.84	1.25
1	A	33	SER	CB-OG	-20.86	1.00	1.42
1	A	86	LEU	CG-CD2	-20.65	0.84	1.52
1	A	70	TYR	CE2-CZ	-20.64	0.88	1.38
1	A	70	TYR	CE1-CZ	-20.52	0.89	1.38
1	A	3	GLN	CG-CD	-20.42	1.01	1.52
1	A	67	ASP	CG-OD2	-20.35	0.86	1.25
1	A	14	GLU	CG-CD	-20.26	1.01	1.52
1	A	75	LEU	CG-CD2	-20.18	0.85	1.52
1	A	27	LYS	CE-NZ	-19.94	0.89	1.49
1	A	87	GLU	CA-CB	-19.64	1.14	1.53
1	A	34	GLN	CB-CG	-19.47	0.94	1.52
1	A	40	GLU	CD-OE2	-19.11	0.89	1.25
1	A	66	ASP	CG-OD2	-19.08	0.89	1.25
1	A	17	ARG	CG-CD	-19.08	0.95	1.52
1	A	37	SER	CB-OG	-19.00	1.04	1.42
1	A	67	ASP	CG-OD1	-18.77	0.89	1.25
1	A	84	LYS	CD-CE	-18.66	0.96	1.52
1	A	73	LYS	CG-CD	-18.65	0.96	1.52
1	A	16	ILE	C-O	-18.64	1.01	1.24
1	A	44	ASP	CG-OD2	-18.17	0.90	1.25
1	A	87	GLU	CA-C	-17.90	1.15	1.52
1	A	51	THR	CB-OG1	-17.02	1.16	1.43
1	A	84	LYS	CG-CD	-16.96	1.01	1.52
1	A	55	ASP	CG-OD1	-16.86	0.93	1.25
1	A	17	ARG	CB-CG	-16.81	1.02	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	27	LYS	CG-CD	-16.62	1.02	1.52
1	A	28	GLU	CG-CD	-16.46	1.10	1.52
1	A	59	LYS	CD-CE	-16.06	1.04	1.52
1	A	70	TYR	CD2-CE2	-15.93	0.90	1.38
1	A	70	TYR	CD1-CE1	-15.92	0.90	1.38
1	A	79	GLU	CD-OE2	-15.88	0.95	1.25
1	A	75	LEU	CB-CG	-15.79	1.21	1.53
1	A	35	PHE	CE1-CZ	-15.78	0.91	1.38
1	A	73	LYS	CB-CG	-15.75	1.05	1.52
1	A	35	PHE	CE2-CZ	-15.73	0.91	1.38
1	A	85	ASP	CB-CG	-15.61	1.13	1.52
1	A	12	ILE	CB-CG1	-15.59	1.22	1.53
1	A	45	LYS	CD-CE	-15.45	1.06	1.52
1	A	86	LEU	C-O	-15.14	1.05	1.23
1	A	2	GLY	C-O	-15.09	1.03	1.24
1	A	22	LYS	CD-CE	-14.92	1.07	1.52
1	A	79	GLU	CD-OE1	-14.67	0.97	1.25
1	A	87	GLU	N-CA	-14.58	1.18	1.46
1	A	53	ARG	CB-CG	-14.45	1.09	1.52
1	A	40	GLU	CG-CD	-14.36	1.16	1.52
1	A	12	ILE	CB-CG2	-14.19	1.05	1.52
1	A	3	GLN	CB-CG	-14.12	1.10	1.52
1	A	87	GLU	CB-CG	-13.89	1.10	1.52
1	A	8	LYS	CE-NZ	-13.69	1.08	1.49
1	A	2	GLY	N-CA	-13.53	1.26	1.45
1	A	71	VAL	CB-CG2	-13.32	1.08	1.52
1	A	8	LYS	CB-CG	-13.29	1.12	1.52
1	A	86	LEU	CA-CB	-13.17	1.35	1.54
1	A	86	LEU	CB-CG	-13.16	1.27	1.53
1	A	73	LYS	CD-CE	-13.10	1.13	1.52
1	A	6	GLN	CD-NE2	-12.81	1.06	1.33
1	A	71	VAL	CB-CG1	-12.74	1.10	1.52
1	A	36	ASP	CG-OD1	-12.65	1.01	1.25
1	A	36	ASP	CG-OD2	-12.63	1.01	1.25
1	A	85	ASP	C-N	-12.15	1.16	1.33
1	A	16	ILE	C-N	-11.99	1.17	1.33
1	A	83	LEU	CG-CD2	-11.90	1.13	1.52
1	A	34	GLN	CG-CD	-11.49	1.23	1.52
1	A	2	GLY	C-N	-11.34	1.17	1.33
1	A	85	ASP	CA-CB	-11.00	1.36	1.53
1	A	83	LEU	CG-CD1	-10.96	1.16	1.52
1	A	18	GLU	CG-CD	-10.94	1.24	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	40	GLU	CB-CG	-10.57	1.20	1.52
1	A	85	ASP	C-O	-10.45	1.12	1.24
1	A	42	GLN	CD-OE1	-10.40	1.03	1.23
1	A	42	GLN	CG-CD	-10.36	1.26	1.52
1	A	86	LEU	C-N	-10.32	1.19	1.33
1	A	1	MET	C-N	-9.97	1.20	1.33
1	A	77	ASP	CG-OD2	-9.88	1.06	1.25
1	A	67	ASP	CB-CG	-9.85	1.27	1.52
1	A	45	LYS	CG-CD	-9.71	1.23	1.52
1	A	1	MET	CA-C	-9.65	1.32	1.52
1	A	6	GLN	CB-CG	-9.43	1.24	1.52
1	A	66	ASP	CB-CG	-9.43	1.28	1.52
1	A	20	THR	CB-OG1	-9.38	1.28	1.43
1	A	12	ILE	C-O	-9.35	1.11	1.23
1	A	64	ASN	CG-OD1	-9.33	1.05	1.23
1	A	77	ASP	CG-OD1	-9.26	1.07	1.25
1	A	64	ASN	CG-ND2	-9.14	1.14	1.33
1	A	50	ILE	CG1-CD1	-8.98	1.16	1.51
1	A	13	GLY	C-O	-8.67	1.09	1.23
1	A	79	GLU	CG-CD	-8.53	1.30	1.52
1	A	10	SER	CA-C	-8.52	1.42	1.52
1	A	10	SER	CA-CB	-8.44	1.40	1.53
1	A	14	GLU	CA-C	-8.39	1.41	1.52
1	A	63	TYR	CG-CD1	-8.38	1.21	1.39
1	A	51	THR	CB-CG2	-8.23	1.25	1.52
1	A	63	TYR	CG-CD2	-8.21	1.22	1.39
1	A	15	GLY	C-O	-8.16	1.12	1.23
1	A	60	LYS	CE-NZ	-8.02	1.25	1.49
1	A	8	LYS	CG-CD	-7.92	1.28	1.52
1	A	11	ASP	CA-CB	-7.85	1.40	1.53
1	A	11	ASP	C-N	-7.81	1.25	1.33
1	A	25	TYR	CG-CD1	-7.78	1.23	1.39
1	A	16	ILE	CG1-CD1	-7.58	1.22	1.51
1	A	81	GLU	CB-CG	-7.52	1.29	1.52
1	A	85	ASP	CA-C	-7.40	1.43	1.52
1	A	63	TYR	CE2-CZ	-7.39	1.20	1.38
1	A	63	TYR	CE1-CZ	-7.36	1.20	1.38
1	A	60	LYS	CD-CE	-7.34	1.30	1.52
1	A	14	GLU	C-N	-7.33	1.22	1.33
1	A	86	LEU	N-CA	-7.31	1.36	1.45
1	A	62	TYR	CG-CD2	-7.27	1.24	1.39
1	A	25	TYR	CG-CD2	-7.24	1.24	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	30	ASP	CB-CG	-7.20	1.34	1.52
1	A	27	LYS	CD-CE	-7.09	1.31	1.52
1	A	11	ASP	C-O	-7.01	1.15	1.24
1	A	60	LYS	CB-CG	-6.96	1.31	1.52
1	A	62	TYR	CG-CD1	-6.96	1.24	1.39
1	A	1	MET	C-O	-6.94	1.09	1.23
1	A	25	TYR	CE2-CZ	-6.78	1.22	1.38
1	A	23	GLU	CB-CG	-6.63	1.32	1.52
1	A	62	TYR	CE1-CZ	-6.45	1.22	1.38
1	A	25	TYR	CE1-CZ	-6.43	1.22	1.38
1	A	15	GLY	C-N	-6.36	1.25	1.33
1	A	59	LYS	CB-CG	-6.34	1.33	1.52
1	A	15	GLY	N-CA	-6.31	1.36	1.45
1	A	3	GLN	N-CA	-6.28	1.38	1.45
1	A	14	GLU	CA-CB	-6.24	1.43	1.53
1	A	11	ASP	N-CA	-6.23	1.38	1.46
1	A	8	LYS	CD-CE	-6.20	1.33	1.52
1	A	62	TYR	CE2-CZ	-6.06	1.23	1.38
1	A	13	GLY	C-N	-5.51	1.25	1.33
1	A	54	TYR	CG-CD2	-5.31	1.28	1.39
1	A	6	GLN	CG-CD	-5.29	1.38	1.52
1	A	2	GLY	CA-C	-5.08	1.43	1.51

All angle outliers are listed below. They are sorted according to the Z-score.

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	17	ARG	NH1-CZ-NH2	-67.58	31.45	119.30
1	A	34	GLN	OE1-CD-NE2	-63.99	58.61	122.60
1	A	3	GLN	OE1-CD-NE2	-62.27	60.33	122.60
1	A	17	ARG	NE-CZ-NH2	53.47	167.32	119.20
1	A	53	ARG	NE-CZ-NH2	52.98	166.88	119.20
1	A	86	LEU	CD1-CG-CD2	-40.78	21.07	110.80
1	A	17	ARG	NE-CZ-NH1	39.72	161.22	121.50
1	A	44	ASP	CA-CB-CG	36.01	148.61	112.60
1	A	53	ARG	NH1-CZ-NH2	-33.79	75.38	119.30
1	A	17	ARG	CD-NE-CZ	31.55	168.56	124.40
1	A	53	ARG	CD-NE-CZ	30.99	167.78	124.40
1	A	44	ASP	CB-CG-OD1	-28.67	52.46	118.40
1	A	35	PHE	CA-CB-CG	27.99	141.79	113.80
1	A	3	GLN	CG-CD-NE2	26.37	155.96	116.40
1	A	84	LYS	CA-CB-CG	25.91	165.93	114.10
1	A	23	GLU	CB-CG-CD	24.80	154.75	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	22	LYS	CB-CG-CD	24.25	167.09	111.30
1	A	87	GLU	CA-C-O	23.61	160.94	120.80
1	A	22	LYS	CG-CD-CE	23.23	164.72	111.30
1	A	84	LYS	CB-CG-CD	22.78	163.70	111.30
1	A	45	LYS	CB-CG-CD	22.74	163.60	111.30
1	A	1	MET	CA-CB-CG	22.44	158.97	114.10
1	A	10	SER	O-C-N	-21.88	97.67	123.27
1	A	53	ARG	CG-CD-NE	21.78	159.92	112.00
1	A	45	LYS	CA-CB-CG	20.98	156.06	114.10
1	A	84	LYS	CG-CD-CE	20.84	159.22	111.30
1	A	34	GLN	CG-CD-NE2	20.64	147.35	116.40
1	A	86	LEU	CB-CG-CD2	20.53	172.29	110.70
1	A	73	LYS	CB-CG-CD	20.02	157.35	111.30
1	A	17	ARG	CG-CD-NE	19.87	155.71	112.00
1	A	75	LEU	CD1-CG-CD2	-18.85	69.33	110.80
1	A	3	GLN	CB-CG-CD	18.82	144.59	112.60
1	A	81	GLU	CB-CG-CD	18.32	143.75	112.60
1	A	1	MET	CB-CG-SD	17.89	166.38	112.70
1	A	55	ASP	CA-CB-CG	17.72	130.32	112.60
1	A	34	GLN	CG-CD-OE1	16.62	154.03	120.80
1	A	11	ASP	CA-CB-CG	16.39	128.99	112.60
1	A	6	GLN	OE1-CD-NE2	-16.23	106.36	122.60
1	A	86	LEU	CB-CG-CD1	16.16	159.18	110.70
1	A	44	ASP	CB-CG-OD2	16.14	155.51	118.40
1	A	1	MET	CG-SD-CE	16.08	136.28	100.90
1	A	27	LYS	CG-CD-CE	16.03	148.16	111.30
1	A	73	LYS	CG-CD-CE	15.71	147.42	111.30
1	A	85	ASP	OD1-CG-OD2	-15.55	85.57	122.90
1	A	14	GLU	CB-CG-CD	15.32	138.65	112.60
1	A	1	MET	N-CA-CB	-15.32	84.46	110.50
1	A	14	GLU	CA-CB-CG	15.23	144.57	114.10
1	A	11	ASP	CB-CG-OD2	-15.01	83.87	118.40
1	A	17	ARG	CB-CG-CD	14.61	144.90	111.30
1	A	53	ARG	CB-CG-CD	-14.51	77.94	111.30
1	A	22	LYS	CD-CE-NZ	14.45	158.14	111.90
1	A	27	LYS	CB-CG-CD	14.43	144.50	111.30
1	A	40	GLU	CG-CD-OE2	13.81	150.17	118.40
1	A	10	SER	CA-CB-OG	13.58	138.26	111.10
1	A	45	LYS	CG-CD-CE	12.97	141.13	111.30
1	A	84	LYS	CD-CE-NZ	12.57	152.14	111.90
1	A	70	TYR	CA-CB-CG	12.48	136.36	113.90
1	A	39	CYS	CA-CB-SG	12.16	142.37	114.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	44	ASP	OD1-CG-OD2	12.14	152.03	122.90
1	A	8	LYS	CG-CD-CE	11.90	138.68	111.30
1	A	3	GLN	CG-CD-OE1	11.46	143.71	120.80
1	A	11	ASP	CB-CG-OD1	10.80	143.24	118.40
1	A	73	LYS	CD-CE-NZ	10.76	146.32	111.90
1	A	64	ASN	OD1-CG-ND2	-10.56	112.04	122.60
1	A	6	GLN	CG-CD-NE2	10.48	132.13	116.40
1	A	75	LEU	CB-CG-CD2	10.40	141.90	110.70
1	A	12	ILE	CA-CB-CG1	10.32	127.94	110.40
1	A	10	SER	CA-C-N	10.13	140.90	121.54
1	A	10	SER	C-N-CA	10.13	140.90	121.54
1	A	1	MET	CB-CA-C	10.10	129.30	110.10
1	A	30	ASP	OD1-CG-OD2	-9.96	99.01	122.90
1	A	3	GLN	CA-CB-CG	9.65	133.40	114.10
1	A	12	ILE	CB-CG1-CD1	9.49	133.73	113.80
1	A	23	GLU	CG-CD-OE2	9.18	139.51	118.40
1	A	34	GLN	CA-CB-CG	9.13	132.37	114.10
1	A	18	GLU	OE1-CD-OE2	-8.96	101.39	122.90
1	A	53	ARG	CA-CB-CG	8.92	131.94	114.10
1	A	35	PHE	CD1-CG-CD2	8.88	131.92	118.60
1	A	28	GLU	OE1-CD-OE2	-8.77	101.84	122.90
1	A	40	GLU	OE1-CD-OE2	-8.49	102.52	122.90
1	A	27	LYS	CD-CE-NZ	8.44	138.90	111.90
1	A	85	ASP	CB-CG-OD1	8.35	137.59	118.40
1	A	81	GLU	CG-CD-OE2	8.13	137.10	118.40
1	A	59	LYS	CD-CE-NZ	8.02	137.56	111.90
1	A	85	ASP	CB-CG-OD2	8.02	136.84	118.40
1	A	55	ASP	CB-CG-OD2	-8.00	100.01	118.40
1	A	73	LYS	CA-CB-CG	7.94	129.98	114.10
1	A	1	MET	N-CA-C	7.93	133.19	111.00
1	A	75	LEU	CB-CG-CD1	7.90	134.40	110.70
1	A	43	SER	CA-CB-OG	7.84	126.77	111.10
1	A	83	LEU	CD1-CG-CD2	-7.80	93.63	110.80
1	A	16	ILE	O-C-N	-7.53	113.15	122.57
1	A	86	LEU	N-CA-C	-7.19	104.77	113.97
1	A	34	GLN	CB-CG-CD	7.14	124.74	112.60
1	A	35	PHE	CE1-CZ-CE2	7.04	132.67	120.00
1	A	47	SER	CA-CB-OG	6.92	124.94	111.10
1	A	8	LYS	CA-CB-CG	6.88	127.85	114.10
1	A	17	ARG	CA-CB-CG	6.61	127.32	114.10
1	A	28	GLU	CG-CD-OE2	6.50	133.36	118.40
1	A	30	ASP	CB-CG-OD1	6.46	133.27	118.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	71	VAL	CA-CB-CG1	6.43	121.33	110.40
1	A	66	ASP	OD1-CG-OD2	-6.43	107.47	122.90
1	A	63	TYR	CD1-CG-CD2	-6.39	108.52	118.10
1	A	23	GLU	OE1-CD-OE2	-6.29	107.80	122.90
1	A	28	GLU	CB-CG-CD	6.29	123.28	112.60
1	A	14	GLU	CG-CD-OE1	6.19	132.64	118.40
1	A	81	GLU	CG-CD-OE1	-6.19	104.16	118.40
1	A	86	LEU	N-CA-CB	6.13	119.19	110.67
1	A	42	GLN	CB-CG-CD	6.13	123.02	112.60
1	A	59	LYS	CG-CD-CE	6.12	125.37	111.30
1	A	60	LYS	CB-CG-CD	6.11	125.35	111.30
1	A	14	GLU	OE1-CD-OE2	-5.88	108.78	122.90
1	A	87	GLU	CB-CG-CD	-5.74	102.85	112.60
1	A	75	LEU	CA-CB-CG	5.50	135.55	116.30
1	A	71	VAL	CG1-CB-CG2	-5.43	98.86	110.80
1	A	85	ASP	N-CA-C	5.40	117.59	111.11
1	A	16	ILE	CA-C-N	5.36	128.84	120.75
1	A	16	ILE	C-N-CA	5.36	128.84	120.75
1	A	12	ILE	CG1-CB-CG2	-5.33	94.71	110.70
1	A	86	LEU	CA-CB-CG	5.30	134.84	116.30
1	A	71	VAL	CA-CB-CG2	5.16	119.17	110.40
1	A	18	GLU	CG-CD-OE1	5.09	130.11	118.40
1	A	66	ASP	CB-CG-OD2	5.04	129.99	118.40
1	A	2	GLY	O-C-N	-5.04	116.54	122.38

All chiral outliers are listed below.

Mol	Chain	Res	Type	Atoms
1	A	1	MET	CA

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	690	688	684	199
All	All	690	688	684	199

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 145.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:75:LEU:CD1	1:A:75:LEU:CB	1.51	1.83
1:A:34:GLN:NE2	1:A:34:GLN:CG	1.49	1.71
1:A:53:ARG:NH2	1:A:53:ARG:NE	1.49	1.60
1:A:22:LYS:CG	1:A:22:LYS:CE	1.47	1.89
1:A:87:GLU:O	1:A:87:GLU:CA	1.45	1.63
1:A:1:MET:CB	1:A:1:MET:C	1.43	1.91
1:A:75:LEU:CB	1:A:75:LEU:CD2	1.43	1.96
1:A:22:LYS:NZ	1:A:22:LYS:CD	1.42	1.80
1:A:34:GLN:CB	1:A:34:GLN:CD	1.39	1.92
1:A:73:LYS:NZ	1:A:73:LYS:CD	1.39	1.84
1:A:11:ASP:CG	1:A:11:ASP:CA	1.37	1.94
1:A:10:SER:OG	1:A:10:SER:CA	1.33	1.75
1:A:86:LEU:O	1:A:87:GLU:HG2	1.33	1.20
1:A:45:LYS:CB	1:A:45:LYS:CD	1.33	2.07
1:A:34:GLN:CG	1:A:34:GLN:OE1	1.31	1.78
1:A:86:LEU:CD2	1:A:86:LEU:CB	1.28	2.10
1:A:18:GLU:OE2	1:A:18:GLU:CG	1.26	1.82
1:A:18:GLU:CG	1:A:18:GLU:OE1	1.25	1.84
1:A:81:GLU:CD	1:A:81:GLU:CB	1.23	2.11
1:A:39:CYS:SG	1:A:39:CYS:CB	1.17	1.07
1:A:34:GLN:CG	1:A:34:GLN:CA	1.14	2.27
1:A:22:LYS:CD	1:A:22:LYS:CB	1.12	2.26
1:A:75:LEU:CD2	1:A:75:LEU:HG	1.12	1.66
1:A:1:MET:C	1:A:1:MET:N	1.11	1.97
1:A:45:LYS:CG	1:A:45:LYS:CA	1.08	2.31
1:A:1:MET:CB	1:A:1:MET:HA	1.04	1.58
1:A:39:CYS:SG	1:A:39:CYS:CA	1.03	2.45
1:A:12:ILE:HG22	1:A:16:ILE:HD11	1.03	1.03
1:A:86:LEU:O	1:A:87:GLU:CG	1.02	1.97
1:A:75:LEU:CD1	1:A:75:LEU:HG	1.00	1.63
1:A:75:LEU:CD2	1:A:75:LEU:HD12	1.00	1.85
1:A:86:LEU:C	1:A:87:GLU:HG2	1.00	1.72
1:A:34:GLN:CB	1:A:34:GLN:HG3	0.98	1.52
1:A:12:ILE:CG2	1:A:16:ILE:HD11	0.98	1.88
1:A:34:GLN:CG	1:A:34:GLN:HB2	0.97	1.50
1:A:34:GLN:CG	1:A:34:GLN:HB3	0.97	1.50
1:A:81:GLU:CD	1:A:81:GLU:CG	0.97	0.92
1:A:34:GLN:CB	1:A:34:GLN:HG2	0.96	1.52
1:A:86:LEU:C	1:A:87:GLU:CG	0.96	2.02

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:75:LEU:CD1	1:A:75:LEU:HD23	0.96	1.85
1:A:81:GLU:CD	1:A:81:GLU:HG2	0.96	1.45
1:A:34:GLN:NE2	1:A:34:GLN:CB	0.96	2.27
1:A:81:GLU:CD	1:A:81:GLU:HG3	0.96	1.45
1:A:75:LEU:CG	1:A:75:LEU:HD22	0.96	1.49
1:A:75:LEU:HD23	1:A:75:LEU:CG	0.95	1.49
1:A:73:LYS:NZ	1:A:73:LYS:HE3	0.95	1.35
1:A:75:LEU:CG	1:A:75:LEU:HD21	0.95	1.49
1:A:39:CYS:SG	1:A:39:CYS:HB3	0.94	1.58
1:A:73:LYS:NZ	1:A:73:LYS:HE2	0.94	1.35
1:A:1:MET:N	1:A:1:MET:HA	0.93	1.57
1:A:39:CYS:SG	1:A:39:CYS:HB2	0.93	1.58
1:A:34:GLN:CG	1:A:34:GLN:CB	0.93	0.94
1:A:75:LEU:CD1	1:A:75:LEU:CD2	0.92	0.93
1:A:73:LYS:NZ	1:A:73:LYS:CE	0.91	0.79
1:A:22:LYS:NZ	1:A:22:LYS:HE2	0.90	1.30
1:A:22:LYS:NZ	1:A:22:LYS:HE3	0.90	1.30
1:A:10:SER:OG	1:A:10:SER:HB3	0.89	1.15
1:A:10:SER:OG	1:A:10:SER:HB2	0.89	1.15
1:A:75:LEU:HD12	1:A:75:LEU:CG	0.89	1.42
1:A:9:LEU:HD21	1:A:19:VAL:CG1	0.88	1.98
1:A:86:LEU:C	1:A:87:GLU:HG3	0.88	1.82
1:A:53:ARG:NH2	1:A:53:ARG:HH11	0.87	1.55
1:A:11:ASP:CG	1:A:11:ASP:HB2	0.87	1.35
1:A:75:LEU:CG	1:A:75:LEU:HD13	0.87	1.42
1:A:75:LEU:CD1	1:A:75:LEU:HB2	0.86	2.01
1:A:45:LYS:CB	1:A:45:LYS:CG	0.85	0.86
1:A:4:VAL:HG12	1:A:79:GLU:HG3	0.85	1.45
1:A:75:LEU:CD2	1:A:75:LEU:CG	0.85	0.86
1:A:11:ASP:CG	1:A:11:ASP:HB3	0.85	1.35
1:A:75:LEU:CD2	1:A:75:LEU:HD13	0.85	1.39
1:A:22:LYS:CE	1:A:22:LYS:NZ	0.84	0.76
1:A:75:LEU:CG	1:A:75:LEU:HD11	0.83	1.42
1:A:45:LYS:CG	1:A:45:LYS:HB3	0.83	1.38
1:A:12:ILE:HG22	1:A:16:ILE:CD1	0.82	1.99
1:A:75:LEU:CD1	1:A:75:LEU:HD22	0.82	1.37
1:A:45:LYS:CG	1:A:45:LYS:HB2	0.81	1.38
1:A:45:LYS:CB	1:A:45:LYS:HG2	0.81	1.35
1:A:53:ARG:NH2	1:A:53:ARG:CZ	0.81	0.77
1:A:34:GLN:CD	1:A:34:GLN:OE1	0.81	0.59
1:A:45:LYS:CB	1:A:45:LYS:HG3	0.81	1.35
1:A:22:LYS:CG	1:A:22:LYS:HD3	0.79	1.33

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:39:CYS:CB	1:A:39:CYS:HG	0.79	1.85
1:A:22:LYS:CG	1:A:22:LYS:HD2	0.79	1.33
1:A:22:LYS:CG	1:A:22:LYS:CD	0.78	0.83
1:A:22:LYS:CD	1:A:22:LYS:HG3	0.78	1.32
1:A:11:ASP:CG	1:A:11:ASP:CB	0.78	0.73
1:A:22:LYS:CD	1:A:22:LYS:HG2	0.77	1.32
1:A:75:LEU:CD1	1:A:75:LEU:CG	0.76	0.77
1:A:75:LEU:HD22	1:A:75:LEU:HD13	0.75	1.05
1:A:75:LEU:CD2	1:A:75:LEU:HD11	0.75	0.96
1:A:20:THR:OG1	1:A:68:ILE:HD13	0.74	1.82
1:A:20:THR:OG1	1:A:68:ILE:CD1	0.74	2.36
1:A:32:VAL:HG11	1:A:38:ILE:HG12	0.74	1.59
1:A:10:SER:OG	1:A:10:SER:CB	0.73	0.44
1:A:18:GLU:OE2	1:A:18:GLU:CD	0.73	0.76
1:A:4:VAL:HG12	1:A:79:GLU:CG	0.71	2.14
1:A:1:MET:CA	1:A:1:MET:HB3	0.71	1.31
1:A:9:LEU:HD21	1:A:19:VAL:HG12	0.70	1.62
1:A:86:LEU:HD11	1:A:86:LEU:HD23	0.70	0.73
1:A:1:MET:HB3	1:A:1:MET:CG	0.70	1.34
1:A:1:MET:CG	1:A:1:MET:HB2	0.70	1.34
1:A:22:LYS:NZ	1:A:22:LYS:HD3	0.70	1.99
1:A:86:LEU:CD2	1:A:86:LEU:CG	0.70	0.84
1:A:1:MET:CB	1:A:1:MET:O	0.69	2.37
1:A:1:MET:CA	1:A:1:MET:H2	0.69	1.39
1:A:53:ARG:CZ	1:A:53:ARG:HH21	0.69	1.41
1:A:10:SER:CA	1:A:10:SER:HG	0.69	1.77
1:A:22:LYS:CG	1:A:22:LYS:HE2	0.69	2.13
1:A:34:GLN:NE2	1:A:34:GLN:OE1	0.69	0.56
1:A:1:MET:CA	1:A:1:MET:H3	0.68	1.39
1:A:1:MET:CA	1:A:1:MET:HB2	0.67	1.31
1:A:73:LYS:CE	1:A:73:LYS:HZ3	0.67	1.37
1:A:1:MET:N	1:A:1:MET:CA	0.66	0.81
1:A:73:LYS:CE	1:A:73:LYS:HZ2	0.66	1.37
1:A:87:GLU:O	1:A:87:GLU:C	0.66	0.50
1:A:73:LYS:CE	1:A:73:LYS:HZ1	0.66	1.37
1:A:21:VAL:HG11	1:A:24:TRP:CD1	0.66	2.26
1:A:22:LYS:CE	1:A:22:LYS:HZ1	0.65	1.35
1:A:53:ARG:NH2	1:A:53:ARG:HE	0.65	1.82
1:A:86:LEU:CD1	1:A:86:LEU:HD21	0.64	1.18
1:A:18:GLU:OE1	1:A:18:GLU:CD	0.64	0.78
1:A:22:LYS:CE	1:A:22:LYS:HZ2	0.64	1.35
1:A:1:MET:SD	1:A:1:MET:HG2	0.63	1.31

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:22:LYS:CE	1:A:22:LYS:HZ3	0.63	1.35
1:A:86:LEU:CD2	1:A:86:LEU:HD12	0.63	1.17
1:A:21:VAL:HG11	1:A:24:TRP:NE1	0.63	2.09
1:A:86:LEU:HD23	1:A:86:LEU:CD1	0.63	1.31
1:A:75:LEU:CD2	1:A:75:LEU:HB3	0.63	2.15
1:A:53:ARG:NH2	1:A:53:ARG:HH12	0.61	0.43
1:A:75:LEU:CD1	1:A:75:LEU:HD21	0.61	1.10
1:A:1:MET:SD	1:A:1:MET:HG3	0.61	1.31
1:A:60:LYS:O	1:A:76:VAL:HG23	0.61	1.95
1:A:1:MET:SD	1:A:1:MET:HE1	0.60	1.23
1:A:1:MET:CB	1:A:1:MET:HG2	0.60	1.32
1:A:1:MET:SD	1:A:1:MET:HE2	0.60	1.23
1:A:34:GLN:NE2	1:A:34:GLN:CD	0.60	0.54
1:A:1:MET:SD	1:A:1:MET:HE3	0.60	1.23
1:A:86:LEU:HB3	1:A:87:GLU:HG3	0.60	1.73
1:A:12:ILE:O	1:A:71:VAL:HG21	0.59	1.98
1:A:1:MET:CB	1:A:1:MET:HG3	0.58	1.32
1:A:19:VAL:C	1:A:68:ILE:HG23	0.58	2.24
1:A:26:VAL:HG21	1:A:38:ILE:HG23	0.57	1.74
1:A:9:LEU:C	1:A:9:LEU:HD13	0.57	2.23
1:A:26:VAL:HG11	1:A:32:VAL:HG13	0.57	1.76
1:A:53:ARG:NH2	1:A:53:ARG:NH1	0.57	0.75
1:A:86:LEU:HD11	1:A:86:LEU:HD21	0.57	0.92
1:A:34:GLN:CD	1:A:34:GLN:HE21	0.57	1.22
1:A:34:GLN:CD	1:A:34:GLN:HE22	0.56	1.22
1:A:86:LEU:HD22	1:A:86:LEU:HD13	0.56	0.66
1:A:86:LEU:CD1	1:A:86:LEU:HD22	0.56	1.12
1:A:81:GLU:CD	1:A:81:GLU:OE2	0.54	0.79
1:A:24:TRP:CZ3	1:A:61:LEU:HD22	0.54	2.38
1:A:76:VAL:HG13	1:A:78:ILE:HD11	0.54	1.80
1:A:84:LYS:HA	1:A:87:GLU:O	0.53	2.04
1:A:42:GLN:HG2	1:A:47:SER:HB3	0.53	1.81
1:A:11:ASP:CG	1:A:11:ASP:OD1	0.52	0.77
1:A:58:ILE:HG12	1:A:78:ILE:HG23	0.52	1.80
1:A:86:LEU:HB3	1:A:87:GLU:CG	0.51	2.34
1:A:34:GLN:NE2	1:A:34:GLN:HB2	0.51	2.19
1:A:1:MET:HB3	1:A:1:MET:O	0.51	2.02
1:A:24:TRP:CH2	1:A:61:LEU:HD22	0.51	2.40
1:A:26:VAL:HG11	1:A:32:VAL:CG1	0.51	2.35
1:A:1:MET:C	1:A:1:MET:HB3	0.50	1.89
1:A:1:MET:HB2	1:A:1:MET:HG3	0.49	1.16
1:A:26:VAL:HB	1:A:58:ILE:HD12	0.49	1.84

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:28:GLU:HG2	1:A:61:LEU:H	0.48	1.68
1:A:24:TRP:CH2	1:A:39:CYS:HB3	0.48	2.43
1:A:7:PHE:CZ	1:A:50:ILE:HG13	0.47	2.44
1:A:86:LEU:CD2	1:A:86:LEU:HD13	0.46	1.00
1:A:86:LEU:CD2	1:A:86:LEU:CD1	0.46	0.47
1:A:5:VAL:N	1:A:78:ILE:O	0.46	2.47
1:A:20:THR:HG23	1:A:67:ASP:O	0.45	2.11
1:A:73:LYS:NZ	1:A:73:LYS:HD2	0.45	2.08
1:A:86:LEU:HD21	1:A:86:LEU:HD12	0.45	1.09
1:A:56:GLY:CA	1:A:79:GLU:O	0.45	2.64
1:A:9:LEU:C	1:A:9:LEU:CD1	0.45	2.90
1:A:9:LEU:HB2	1:A:69:ALA:HB1	0.45	1.87
1:A:83:LEU:O	1:A:87:GLU:C	0.45	2.59
1:A:53:ARG:HH12	1:A:53:ARG:HH22	0.45	0.46
1:A:86:LEU:CD2	1:A:86:LEU:HD11	0.45	0.64
1:A:31:THR:HG23	1:A:56:GLY:O	0.44	2.12
1:A:18:GLU:HB3	1:A:68:ILE:HG22	0.44	1.90
1:A:29:GLY:N	1:A:58:ILE:O	0.43	2.51
1:A:31:THR:CG2	1:A:56:GLY:O	0.43	2.66
1:A:58:ILE:HG12	1:A:78:ILE:CG2	0.43	2.44
1:A:9:LEU:HD23	1:A:69:ALA:HB3	0.42	1.91
1:A:58:ILE:CG1	1:A:78:ILE:HG23	0.42	2.45
1:A:1:MET:SD	1:A:1:MET:CE	0.42	0.51
1:A:27:LYS:O	1:A:30:ASP:HB2	0.42	2.15
1:A:52:SER:O	1:A:53:ARG:CG	0.42	2.67
1:A:1:MET:CG	1:A:1:MET:SD	0.42	0.81
1:A:26:VAL:CG1	1:A:32:VAL:HG13	0.42	2.44
1:A:12:ILE:HG21	1:A:17:ARG:O	0.41	2.15
1:A:77:ASP:OD1	1:A:77:ASP:N	0.41	2.52
1:A:1:MET:N	1:A:2:GLY:N	0.41	2.56
1:A:5:VAL:CG2	1:A:80:THR:OG1	0.41	2.69
1:A:21:VAL:CG1	1:A:24:TRP:CD1	0.41	3.02
1:A:20:THR:CB	1:A:68:ILE:HD13	0.40	2.46
1:A:60:LYS:N	1:A:60:LYS:HD2	0.40	2.31

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	85/93 (91%)	79 (93%)	4 (5%)	2 (2%)	7	44
All	All	85/93 (91%)	79 (93%)	4 (5%)	2 (2%)	7	44

All 2 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	11	ASP
1	A	15	GLY

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	78/84 (93%)	44 (56%)	34 (44%)	0	3
All	All	78/84 (93%)	44 (56%)	34 (44%)	0	3

All 34 residues with a non-rotameric sidechain are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	1	MET
1	A	6	GLN
1	A	8	LYS
1	A	12	ILE
1	A	16	ILE
1	A	17	ARG
1	A	20	THR
1	A	22	LYS
1	A	27	LYS
1	A	32	VAL
1	A	34	GLN
1	A	35	PHE
1	A	37	SER
1	A	47	SER
1	A	48	VAL

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Mol	Chain	Res	Type
1	A	51	THR
1	A	52	SER
1	A	53	ARG
1	A	54	TYR
1	A	55	ASP
1	A	60	LYS
1	A	65	LEU
1	A	66	ASP
1	A	70	TYR
1	A	73	LYS
1	A	75	LEU
1	A	77	ASP
1	A	78	ILE
1	A	80	THR
1	A	83	LEU
1	A	84	LYS
1	A	85	ASP
1	A	86	LEU
1	A	87	GLU

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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	5

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	86:LEU	C	87:GLU	N	1.18
1	A	2:GLY	C	3:GLN	N	1.17
1	A	16:ILE	C	17:ARG	N	1.17
1	A	85:ASP	C	86:LEU	N	1.16
1	A	10:SER	C	11:ASP	N	1.00

7 Chemical shift validation

No chemical shift data were provided