Full wwPDB NMR Structure Validation Report (i)

Mar 6, 2026 – 11:44 PM UTC

PDB ID	:	1BBA / pdb_00001bba
Title	:	SEQUENCE-SPECIFIC 1H NMR ASSIGNMENTS AND SOLUTION STRUCTURE OF BOVINE PANCREATIC POLYPEPTIDE
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Deposited on	:	1992-03-10

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/NMRValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (i)) were used in the production of this report:

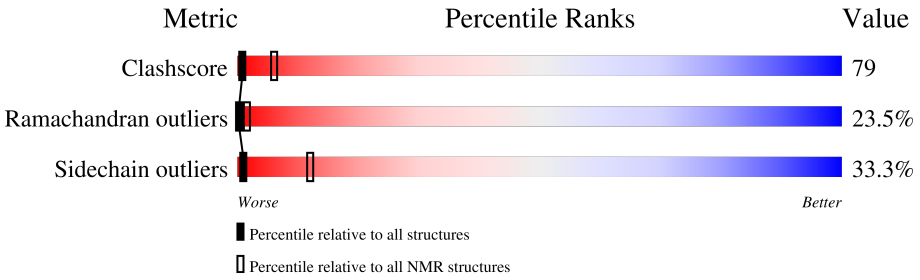
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	36	11% 19% 28% 42%

2 Ensemble composition and analysis (i)

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

3 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 582 atoms, of which 285 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called BOVINE PANCREATIC POLYPEPTIDE.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	36	582	186	285	52	57	2	0

4 Residue-property plots

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: BOVINE PANCREATIC POLYPEPTIDE

Chain A: 

5 Refinement protocol and experimental data overview

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

The authors did not provide any information on software used for structure solution, optimization or refinement.

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	5.48	71/305 (23.3%)	9.81	130/414 (31.4%)
All	All	5.48	71/305 (23.3%)	9.81	130/414 (31.4%)

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	5
All	All	0	5

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	34	PRO	N-CA	-25.74	1.20	1.46
1	A	35	ARG	N-CA	-24.94	1.16	1.46
1	A	34	PRO	CA-CB	-20.71	1.26	1.54
1	A	4	GLU	N-CA	-18.80	1.19	1.46
1	A	17	MET	CA-CB	-16.70	1.27	1.53
1	A	25	ARG	CA-CB	-15.96	1.28	1.53
1	A	2	PRO	CA-CB	-14.09	1.36	1.53
1	A	33	ARG	CA-CB	-14.08	1.31	1.53
1	A	12	ALA	CA-CB	-13.60	1.30	1.53
1	A	33	ARG	CA-C	-13.41	1.35	1.52
1	A	3	LEU	CA-CB	-13.35	1.20	1.53
1	A	4	GLU	CA-C	-12.91	1.36	1.52
1	A	26	ARG	CA-CB	-12.55	1.33	1.53
1	A	6	GLU	CA-C	-12.46	1.37	1.52
1	A	11	ASN	CA-C	-12.35	1.36	1.52
1	A	5	PRO	CA-CB	-12.18	1.36	1.53
1	A	7	TYR	CA-CB	-12.11	1.29	1.54
1	A	10	ASP	CA-C	-12.11	1.36	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	36	TYR	CE1-CZ	11.52	1.65	1.38
1	A	5	PRO	N-CA	-11.23	1.32	1.47
1	A	36	TYR	CG-CD1	10.76	1.61	1.39
1	A	6	GLU	CA-CB	-10.72	1.32	1.53
1	A	33	ARG	NE-CZ	-10.66	1.21	1.33
1	A	34	PRO	C-N	-10.62	1.20	1.33
1	A	35	ARG	NE-CZ	-10.05	1.22	1.33
1	A	35	ARG	CA-C	-9.76	1.41	1.52
1	A	32	THR	CA-C	-9.76	1.40	1.53
1	A	33	ARG	CB-CG	-9.59	1.23	1.52
1	A	15	GLU	CA-CB	-9.54	1.37	1.53
1	A	15	GLU	CA-C	-9.34	1.40	1.52
1	A	16	GLN	CA-CB	-9.31	1.38	1.53
1	A	7	TYR	CA-C	-9.20	1.45	1.52
1	A	2	PRO	C-N	-9.16	1.21	1.33
1	A	25	ARG	NE-CZ	-8.66	1.23	1.33
1	A	3	LEU	N-CA	-8.49	1.35	1.46
1	A	33	ARG	C-N	-8.28	1.23	1.33
1	A	16	GLN	CA-C	-8.12	1.41	1.52
1	A	36	TYR	CZ-OH	7.83	1.54	1.38
1	A	1	ALA	CA-C	7.62	1.69	1.52
1	A	35	ARG	CZ-NH1	-7.52	1.22	1.32
1	A	11	ASN	C-N	-7.44	1.23	1.33
1	A	16	GLN	CB-CG	-7.27	1.30	1.52
1	A	31	LEU	CB-CG	-7.25	1.39	1.53
1	A	25	ARG	CG-CD	-7.25	1.30	1.52
1	A	2	PRO	N-CA	-7.25	1.38	1.47
1	A	31	LEU	CA-CB	-7.17	1.41	1.53
1	A	29	ASN	CA-CB	-7.13	1.42	1.53
1	A	5	PRO	C-N	-6.91	1.23	1.33
1	A	9	GLY	CA-C	-6.84	1.42	1.51
1	A	36	TYR	CE2-CZ	6.82	1.54	1.38
1	A	33	ARG	CZ-NH1	-6.77	1.23	1.32
1	A	36	TYR	CA-CB	-6.71	1.40	1.53
1	A	34	PRO	CG-CD	-6.62	1.28	1.50
1	A	26	ARG	NE-CZ	-6.42	1.25	1.33
1	A	10	ASP	C-N	-6.42	1.24	1.33
1	A	3	LEU	CG-CD2	6.38	1.73	1.52
1	A	26	ARG	CD-NE	-5.92	1.38	1.46
1	A	36	TYR	CG-CD2	5.62	1.51	1.39
1	A	3	LEU	CA-C	-5.57	1.45	1.53
1	A	17	MET	CB-CG	-5.56	1.35	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	20	TYR	CA-CB	-5.56	1.44	1.53
1	A	15	GLU	C-N	-5.51	1.26	1.33
1	A	33	ARG	CG-CD	-5.49	1.35	1.52
1	A	2	PRO	N-CD	5.37	1.55	1.47
1	A	35	ARG	CB-CG	5.36	1.68	1.52
1	A	19	GLN	C-N	-5.24	1.27	1.33
1	A	25	ARG	CD-NE	-5.15	1.39	1.46
1	A	16	GLN	C-N	-5.14	1.27	1.33
1	A	6	GLU	C-N	-5.05	1.26	1.33
1	A	25	ARG	CZ-NH2	-5.05	1.26	1.33
1	A	4	GLU	CB-CG	5.03	1.67	1.52

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

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	36	TYR	CG-CD2-CE2	-57.90	34.35	121.20
1	A	25	ARG	NE-CZ-NH2	48.85	163.17	119.20
1	A	36	TYR	CZ-CE2-CD2	-47.94	33.31	119.60
1	A	26	ARG	NE-CZ-NH2	47.52	161.97	119.20
1	A	35	ARG	NE-CZ-NH2	-46.91	76.98	119.20
1	A	25	ARG	NE-CZ-NH1	-46.23	75.27	121.50
1	A	26	ARG	NE-CZ-NH1	-45.04	76.46	121.50
1	A	33	ARG	NE-CZ-NH2	-43.36	80.17	119.20
1	A	33	ARG	NE-CZ-NH1	41.27	162.77	121.50
1	A	35	ARG	NE-CZ-NH1	41.06	162.56	121.50
1	A	36	TYR	CE1-CZ-CE2	-37.23	45.83	120.30
1	A	36	TYR	CG-CD1-CE1	-32.58	72.33	121.20
1	A	33	ARG	NH1-CZ-NH2	-28.12	82.75	119.30
1	A	26	ARG	NH1-CZ-NH2	-25.98	85.53	119.30
1	A	36	TYR	CD1-CG-CD2	-25.57	79.74	118.10
1	A	25	ARG	NH1-CZ-NH2	-24.11	87.95	119.30
1	A	36	TYR	CB-CG-CD2	23.93	156.69	120.80
1	A	4	GLU	CG-CD-OE1	23.72	172.95	118.40
1	A	2	PRO	N-CA-C	-21.53	75.45	110.55
1	A	35	ARG	NH1-CZ-NH2	-19.49	93.96	119.30
1	A	3	LEU	CB-CA-C	-17.98	84.45	111.77
1	A	4	GLU	CB-CG-CD	-16.84	83.98	112.60
1	A	32	THR	N-CA-C	-16.10	89.28	110.53
1	A	3	LEU	CD1-CG-CD2	-15.49	76.71	110.80
1	A	4	GLU	OE1-CD-OE2	-15.31	86.15	122.90
1	A	33	ARG	N-CA-C	-15.31	75.97	109.81
1	A	34	PRO	CA-C-O	14.92	140.48	122.13

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	34	PRO	N-CA-C	-14.84	86.98	111.77
1	A	35	ARG	N-CA-C	-14.45	84.27	108.26
1	A	16	GLN	CB-CG-CD	13.91	136.24	112.60
1	A	3	LEU	N-CA-C	-13.76	75.97	107.48
1	A	36	TYR	CD1-CE1-CZ	-13.67	94.99	119.60
1	A	2	PRO	CA-C-O	13.30	136.53	120.97
1	A	33	ARG	CB-CA-C	-13.22	84.13	110.17
1	A	33	ARG	CG-CD-NE	-13.14	83.10	112.00
1	A	19	GLN	CB-CG-CD	12.42	133.71	112.60
1	A	36	TYR	CE1-CZ-OH	12.31	156.82	119.90
1	A	26	ARG	CD-NE-CZ	-11.95	107.67	124.40
1	A	36	TYR	OH-CZ-CE2	11.86	155.47	119.90
1	A	33	ARG	CA-CB-CG	-11.59	90.92	114.10
1	A	34	PRO	O-C-N	11.49	137.11	123.21
1	A	2	PRO	CA-C-N	-11.44	105.62	123.23
1	A	2	PRO	C-N-CA	-11.44	105.62	123.23
1	A	25	ARG	CD-NE-CZ	-11.42	108.42	124.40
1	A	33	ARG	CA-C-O	11.25	135.58	120.16
1	A	31	LEU	CB-CA-C	-10.66	92.72	110.85
1	A	4	GLU	CA-C-O	10.59	134.67	120.16
1	A	2	PRO	O-C-N	10.58	134.99	123.03
1	A	4	GLU	CG-CD-OE2	-10.57	94.08	118.40
1	A	16	GLN	OE1-CD-NE2	-10.25	112.35	122.60
1	A	32	THR	N-CA-CB	10.13	124.85	110.36
1	A	35	ARG	O-C-N	9.99	136.06	123.28
1	A	33	ARG	N-CA-CB	9.98	128.14	110.37
1	A	32	THR	CB-CA-C	-9.92	89.35	109.68
1	A	35	ARG	CA-CB-CG	-9.67	94.76	114.10
1	A	3	LEU	O-C-N	9.56	138.22	122.93
1	A	35	ARG	CB-CA-C	9.52	124.81	110.14
1	A	33	ARG	O-C-N	9.26	131.97	121.32
1	A	3	LEU	CB-CG-CD2	8.98	137.63	110.70
1	A	16	GLN	CB-CA-C	-8.88	95.58	110.68
1	A	10	ASP	OD1-CG-OD2	8.81	144.05	122.90
1	A	33	ARG	CB-CG-CD	8.70	131.31	111.30
1	A	33	ARG	CA-C-N	-8.66	111.22	120.66
1	A	33	ARG	C-N-CA	-8.66	111.22	120.66
1	A	17	MET	CB-CG-SD	-8.62	86.83	112.70
1	A	16	GLN	O-C-N	8.57	131.21	122.12
1	A	26	ARG	CG-CD-NE	-8.50	93.30	112.00
1	A	11	ASN	O-C-N	8.09	133.35	122.59
1	A	35	ARG	CA-C-O	7.63	129.51	120.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	17	MET	CA-CB-CG	7.53	129.16	114.10
1	A	20	TYR	CA-CB-CG	-7.52	100.37	113.90
1	A	31	LEU	N-CA-C	7.48	119.51	111.36
1	A	4	GLU	CA-C-N	-7.39	110.61	119.84
1	A	4	GLU	C-N-CA	-7.39	110.61	119.84
1	A	1	ALA	N-CA-C	-7.16	90.94	111.00
1	A	6	GLU	O-C-N	7.15	131.99	123.33
1	A	27	TYR	CB-CG-CD1	-7.11	110.14	120.80
1	A	36	TYR	N-CA-CB	-7.08	98.46	110.50
1	A	2	PRO	N-CA-CB	6.98	109.15	103.36
1	A	35	ARG	CD-NE-CZ	6.96	134.15	124.40
1	A	3	LEU	CA-C-O	6.81	133.83	120.69
1	A	26	ARG	CB-CG-CD	-6.77	95.72	111.30
1	A	23	GLU	CA-C-N	-6.69	109.31	120.68
1	A	23	GLU	C-N-CA	-6.69	109.31	120.68
1	A	11	ASN	N-CA-CB	6.62	121.69	110.49
1	A	25	ARG	N-CA-CB	-6.61	100.15	110.06
1	A	3	LEU	CA-C-N	6.58	137.86	121.80
1	A	3	LEU	C-N-CA	6.58	137.86	121.80
1	A	17	MET	CB-CA-C	-6.55	99.92	110.79
1	A	30	MET	CG-SD-CE	-6.51	86.57	100.90
1	A	25	ARG	CB-CG-CD	-6.46	96.44	111.30
1	A	25	ARG	CA-CB-CG	-6.36	101.38	114.10
1	A	3	LEU	N-CA-CB	6.32	122.51	110.82
1	A	25	ARG	CG-CD-NE	-6.30	98.14	112.00
1	A	31	LEU	N-CA-CB	6.28	119.45	110.16
1	A	11	ASN	CA-C-O	6.26	129.46	120.51
1	A	4	GLU	N-CA-CB	-6.19	99.35	110.37
1	A	5	PRO	N-CA-C	-6.13	99.84	112.47
1	A	5	PRO	O-C-N	6.10	130.87	122.64
1	A	15	GLU	CB-CG-CD	-6.06	102.29	112.60
1	A	5	PRO	CA-C-O	6.06	131.62	120.60
1	A	26	ARG	N-CA-CB	-6.03	101.24	110.16
1	A	19	GLN	CA-C-O	6.00	127.32	120.90
1	A	12	ALA	N-CA-CB	-5.99	100.38	110.49
1	A	9	GLY	CA-C-N	-5.93	110.22	121.54
1	A	9	GLY	C-N-CA	-5.93	110.22	121.54
1	A	2	PRO	N-CD-CG	-5.79	94.52	103.20
1	A	4	GLU	O-C-N	5.77	127.95	121.32
1	A	34	PRO	CA-C-N	-5.72	113.93	122.39
1	A	34	PRO	C-N-CA	-5.72	113.93	122.39
1	A	15	GLU	CA-C-N	-5.71	112.55	120.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	15	GLU	C-N-CA	-5.71	112.55	120.38
1	A	27	TYR	CB-CG-CD2	5.70	129.35	120.80
1	A	10	ASP	CA-C-N	-5.67	110.72	121.54
1	A	10	ASP	C-N-CA	-5.67	110.72	121.54
1	A	1	ALA	CA-C-O	5.57	130.27	120.80
1	A	24	LEU	N-CA-CB	5.57	118.88	110.30
1	A	13	THR	N-CA-CB	-5.46	100.65	110.37
1	A	16	GLN	CG-CD-NE2	5.42	124.53	116.40
1	A	29	ASN	CA-CB-CG	-5.33	107.27	112.60
1	A	4	GLU	CB-CA-C	5.30	120.61	110.17
1	A	13	THR	N-CA-C	-5.27	98.17	109.81
1	A	23	GLU	CA-CB-CG	-5.24	103.62	114.10
1	A	13	THR	CB-CA-C	5.21	120.43	110.17
1	A	10	ASP	CA-C-O	5.19	127.93	120.51
1	A	16	GLN	CA-C-N	-5.12	113.42	120.28
1	A	16	GLN	C-N-CA	-5.12	113.42	120.28
1	A	6	GLU	CB-CG-CD	5.10	121.27	112.60
1	A	36	TYR	CA-CB-CG	-5.08	104.76	113.90
1	A	10	ASP	CB-CG-OD2	-5.05	106.78	118.40

There are no chirality outliers.

All planar outliers are listed below.

Mol	Chain	Res	Type	Group
1	A	1	ALA	Peptide
1	A	25	ARG	Sidechain
1	A	26	ARG	Sidechain
1	A	35	ARG	Sidechain
1	A	36	TYR	Sidechain

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	297	285	285	46
All	All	297	285	285	46

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 79.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:2:PRO:HG3	1:A:27:TYR:CE1	1.31	1.60
1:A:32:THR:O	1:A:33:ARG:HG3	1.07	1.49
1:A:12:ALA:HB3	1:A:16:GLN:HG3	1.07	1.09
1:A:2:PRO:HG3	1:A:27:TYR:CD1	0.96	1.95
1:A:12:ALA:CB	1:A:16:GLN:HG3	0.95	1.90
1:A:2:PRO:CG	1:A:27:TYR:CE1	0.91	2.52
1:A:32:THR:C	1:A:33:ARG:HG3	0.90	1.66
1:A:34:PRO:HB2	1:A:36:TYR:OXT	0.86	1.70
1:A:27:TYR:CE1	1:A:31:LEU:HD21	0.85	2.07
1:A:1:ALA:N	1:A:2:PRO:CD	0.84	2.40
1:A:12:ALA:HB3	1:A:16:GLN:CG	0.81	2.01
1:A:1:ALA:H2	1:A:2:PRO:HD2	0.80	1.37
1:A:32:THR:O	1:A:33:ARG:CG	0.77	2.31
1:A:35:ARG:NH2	1:A:36:TYR:HB2	0.68	2.02
1:A:1:ALA:N	1:A:2:PRO:HD2	0.66	2.03
1:A:1:ALA:H2	1:A:2:PRO:CD	0.64	2.00
1:A:1:ALA:H3	1:A:2:PRO:CD	0.63	2.06
1:A:3:LEU:C	1:A:4:GLU:O	0.58	2.45
1:A:3:LEU:O	1:A:4:GLU:O	0.58	2.22
1:A:35:ARG:O	1:A:36:TYR:HB3	0.57	1.98
1:A:1:ALA:O	1:A:3:LEU:HD23	0.52	2.05
1:A:6:GLU:O	1:A:20:TYR:CE1	0.52	2.63
1:A:35:ARG:HH22	1:A:36:TYR:HB2	0.52	1.63
1:A:6:GLU:O	1:A:20:TYR:CD1	0.51	2.64
1:A:27:TYR:HE1	1:A:31:LEU:HD21	0.50	1.56
1:A:2:PRO:CD	1:A:2:PRO:O	0.49	2.57
1:A:24:LEU:O	1:A:27:TYR:HB3	0.49	2.07
1:A:2:PRO:HG3	1:A:27:TYR:CZ	0.48	2.33
1:A:27:TYR:CZ	1:A:31:LEU:HD21	0.48	2.43
1:A:2:PRO:C	1:A:4:GLU:N	0.48	2.57
1:A:15:GLU:O	1:A:18:ALA:N	0.47	2.47
1:A:24:LEU:O	1:A:25:ARG:C	0.47	2.55
1:A:27:TYR:CD1	1:A:27:TYR:C	0.47	2.90
1:A:2:PRO:C	1:A:4:GLU:H	0.46	2.13
1:A:24:LEU:O	1:A:27:TYR:N	0.46	2.49
1:A:34:PRO:CB	1:A:36:TYR:OXT	0.46	2.55
1:A:35:ARG:O	1:A:36:TYR:CB	0.46	2.55
1:A:2:PRO:CG	1:A:27:TYR:CZ	0.44	2.99
1:A:30:MET:O	1:A:33:ARG:HD2	0.44	2.12

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Atom-1	Atom-2	Clash(Å)	Distance(Å)
1:A:4:GLU:C	1:A:5:PRO:O	0.44	2.58
1:A:15:GLU:O	1:A:16:GLN:C	0.43	2.59
1:A:4:GLU:CB	1:A:5:PRO:CD	0.43	2.91
1:A:2:PRO:O	1:A:2:PRO:HG2	0.42	2.12
1:A:4:GLU:O	1:A:5:PRO:C	0.42	2.56
1:A:20:TYR:CD2	1:A:20:TYR:C	0.41	2.96
1:A:15:GLU:CG	1:A:16:GLN:N	0.41	2.82

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	34/36 (94%)	24 (71%)	2 (6%)	8 (24%)	0	1
All	All	34/36 (94%)	24 (71%)	2 (6%)	8 (24%)	0	1

All 8 Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type
1	A	4	GLU
1	A	8	PRO
1	A	9	GLY
1	A	10	ASP
1	A	11	ASN
1	A	12	ALA
1	A	15	GLU
1	A	33	ARG

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	30/30 (100%)	20 (67%)	10 (33%)	1 12
All	All	30/30 (100%)	20 (67%)	10 (33%)	1 12

All 10 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	3	LEU
1	A	4	GLU
1	A	6	GLU
1	A	10	ASP
1	A	11	ASN
1	A	19	GLN
1	A	24	LEU
1	A	31	LEU
1	A	32	THR
1	A	35	ARG

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	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	34:PRO	C	35:ARG	N	1.20

7 Chemical shift validation

No chemical shift data were provided