Full wwPDB NMR Structure Validation Report (i)

Mar 29, 2026 – 05:15 AM UTC

PDB ID	:	1UR6 / pdb_00001ur6
Title	:	NMR based structural model of the UbcH5B-CNOT4 complex
Authors	:	Dominguez, C.; Bonvin, A.M.J.J.; Winkler, G.S.; Van Schaik, F.M.A.; Timmers, H.Th.M.; Boelens, R.
Deposited on	:	2003-10-27

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:

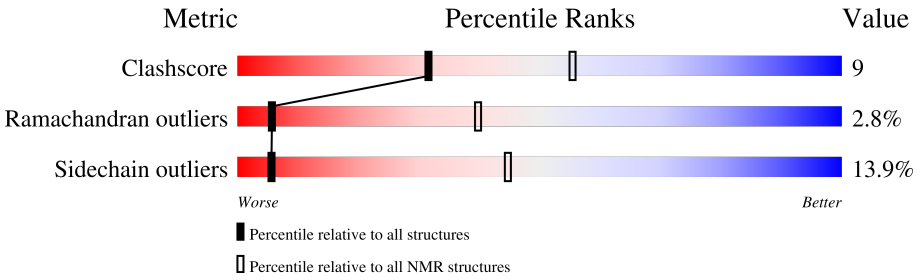
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
wwPDB-ShiftChecker	:	v1.2
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)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

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
SOLUTION NMR, THEORETICAL MODEL

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	147	65% 33% ··
2	B	52	69% 27% ·

2 Ensemble composition and analysis (i)

This entry contains 5 models. Model 2 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:2-A:147, B:12-B:61 (196)	1.50	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, 5
2	3, 4

3 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 3014 atoms, of which 1409 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	147	2223	755	1045	202	213	8	0

- Molecule 2 is a protein called POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
2	B	52	789	267	364	71	78	9	0

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	
			Total	Zn
3	B	2	2	2

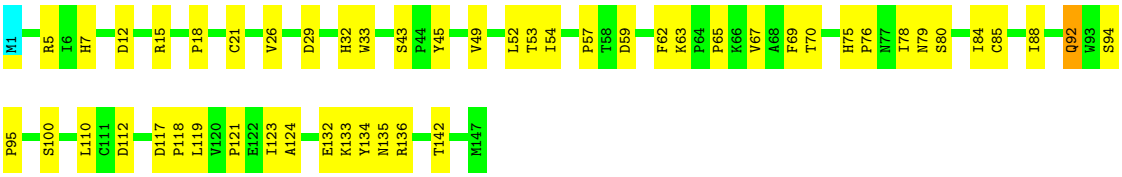
4 Residue-property plots (i)

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.

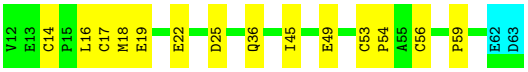
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

Chain B:



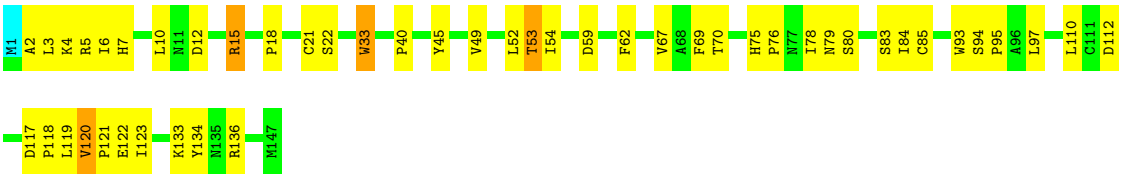
4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

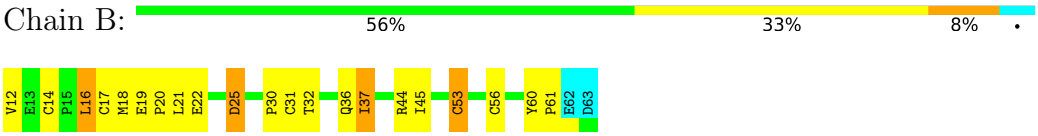
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

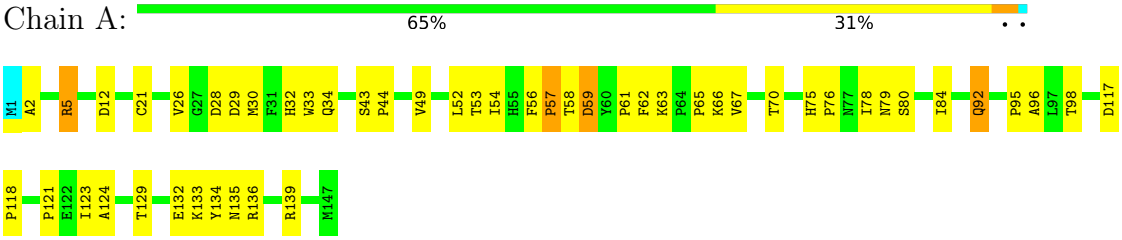
Chain B:



4.2.2 Score per residue for model 2 (medoid)

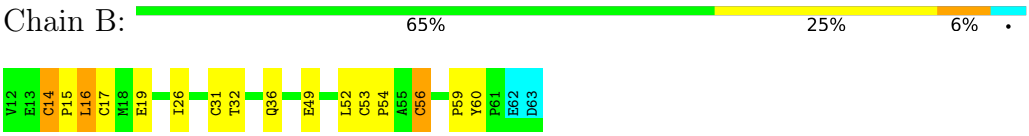
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

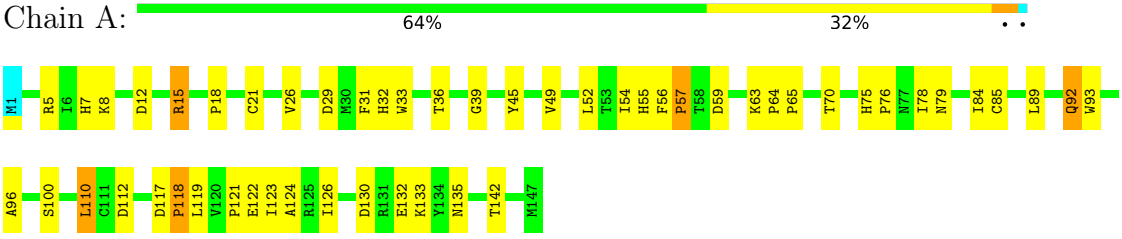
Chain B:



4.2.3 Score per residue for model 3

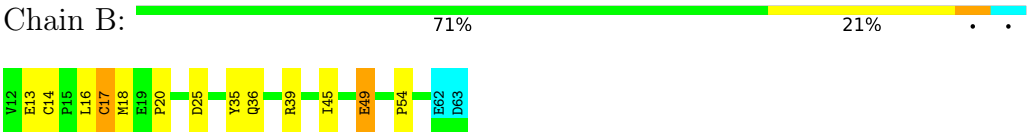
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

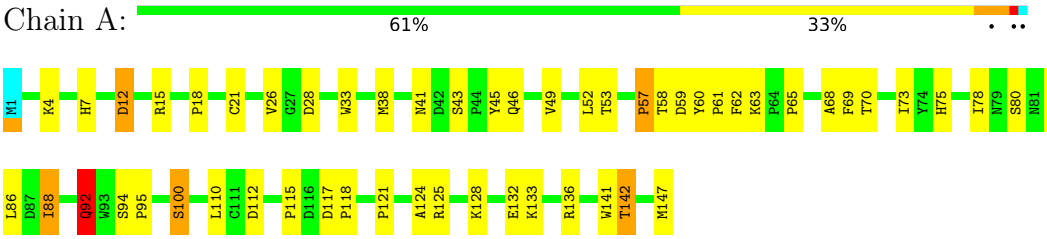
Chain B:



4.2.4 Score per residue for model 4

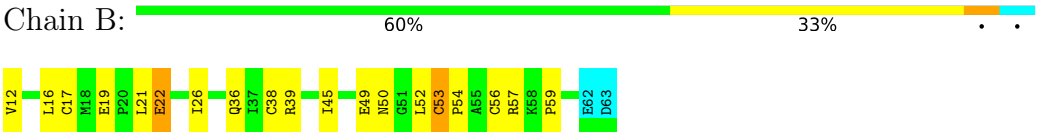
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

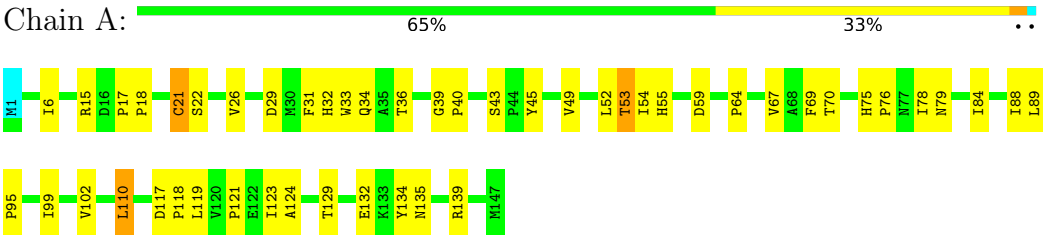
Chain B:



4.2.5 Score per residue for model 5

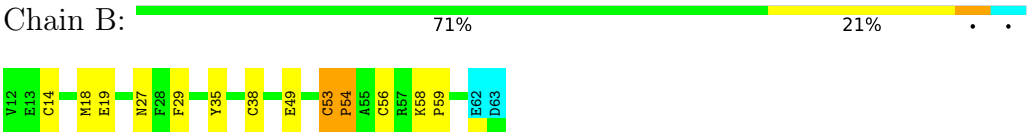
• Molecule 1: UBIQUITIN-CONJUGATING ENZYME E2-17 KDA 2

Chain A:



• Molecule 2: POTENTIAL TRANSCRIPTIONAL REPRESSOR NOT4HP

Chain B:



5 Refinement protocol and experimental data overview

The models were refined using the following method: *?*.

Of the ? calculated structures, 5 were deposited, based on the following criterion: *?*.

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

Software name	Classification	Version
CNS	refinement	

No chemical shift data was provided.

6 Model quality

6.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: ZN

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	0.36±0.00	0±0/1206 (0.0± 0.0%)	0.71±0.01	0±1/1644 (0.0± 0.0%)
2	B	0.38±0.02	0±0/421 (0.0± 0.0%)	0.77±0.03	0±1/574 (0.1± 0.1%)
All	All	0.36	0/8135 (0.0%)	0.73	4/11090 (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(^{o})	Ideal(^{o})	Models	
								Worst	Total
1	A	94	SER	CA-C-N	5.35	126.52	119.84	1	1
1	A	94	SER	C-N-CA	5.35	126.52	119.84	1	1
2	B	14	CYS	CA-C-N	5.22	126.36	119.84	2	1
2	B	14	CYS	C-N-CA	5.22	126.36	119.84	2	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	1170	1034	1154	21±4
2	B	407	354	376	9±4
All	All	7895	6940	7650	135

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 9.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
2:B:53:CYS:HB3	2:B:56:CYS:HB3	0.93	1.38	5	1
1:A:2:ALA:HA	2:B:17:CYS:HB2	0.81	1.51	1	1
1:A:96:ALA:HB2	2:B:54:PRO:HB2	0.77	1.55	2	1
1:A:18:PRO:HG2	1:A:21:CYS:HB2	0.75	1.58	3	1
1:A:95:PRO:HG2	2:B:54:PRO:HB3	0.72	1.58	2	1
1:A:45:TYR:HA	1:A:142:THR:HG21	0.70	1.64	4	1
1:A:117:ASP:HB2	1:A:121:PRO:HA	0.69	1.64	5	5
1:A:64:PRO:HB3	1:A:89:LEU:HG	0.69	1.65	5	1
1:A:132:GLU:HA	1:A:135:ASN:HB2	0.66	1.66	2	3
2:B:14:CYS:HB3	2:B:21:LEU:HD21	0.66	1.68	1	1
1:A:40:PRO:HD2	1:A:45:TYR:HB2	0.65	1.66	1	1
1:A:75:HIS:HB3	1:A:78:ILE:HB	0.64	1.69	3	5
1:A:62:PHE:HB3	2:B:49:GLU:HG3	0.64	1.67	4	1
1:A:78:ILE:HG12	1:A:84:ILE:HD13	0.63	1.71	4	1
1:A:62:PHE:HE1	2:B:45:ILE:HG12	0.61	1.54	1	1
2:B:16:LEU:HD13	2:B:37:ILE:HG21	0.59	1.73	1	1
1:A:3:LEU:HD12	1:A:6:ILE:HD13	0.59	1.72	1	1
2:B:45:ILE:HA	2:B:49:GLU:HB2	0.59	1.74	3	2
1:A:95:PRO:HD2	2:B:54:PRO:HA	0.59	1.75	4	1
1:A:29:ASP:HB3	1:A:32:HIS:HB2	0.58	1.76	2	3
1:A:76:PRO:HB3	1:A:124:ALA:HA	0.57	1.74	5	3
1:A:94:SER:HB3	2:B:54:PRO:O	0.57	2.00	4	2
1:A:79:ASN:HB2	1:A:83:SER:HB2	0.57	1.75	1	1
2:B:17:CYS:SG	2:B:19:GLU:HB2	0.57	2.39	1	1
2:B:58:LYS:HD3	2:B:59:PRO:HD2	0.56	1.75	5	1
2:B:53:CYS:HB3	2:B:56:CYS:HB2	0.55	1.78	4	2
1:A:39:GLY:HA3	1:A:45:TYR:HB3	0.55	1.78	3	2
2:B:31:CYS:HB2	2:B:60:TYR:HE1	0.53	1.64	1	2
1:A:33:TRP:O	1:A:53:THR:HA	0.53	2.04	1	2
1:A:26:VAL:HA	1:A:33:TRP:HA	0.53	1.81	4	1
1:A:79:ASN:HD22	1:A:123:ILE:HD11	0.53	1.63	5	3
1:A:76:PRO:HA	1:A:123:ILE:HB	0.52	1.81	1	1
1:A:133:LYS:HA	1:A:136:ARG:NH1	0.52	2.19	2	1
2:B:12:VAL:HB	2:B:21:LEU:HD12	0.52	1.81	1	1
1:A:45:TYR:HD1	1:A:142:THR:HG21	0.52	1.65	3	1
1:A:92:GLN:NE2	2:B:49:GLU:HA	0.52	2.20	3	2
2:B:31:CYS:HB2	2:B:60:TYR:CE1	0.51	2.40	1	1
1:A:56:PHE:HD1	1:A:65:PRO:HB3	0.51	1.66	2	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:57:PRO:HD3	1:A:65:PRO:HA	0.51	1.81	4	2
2:B:52:LEU:HA	2:B:59:PRO:HA	0.50	1.83	4	2
1:A:39:GLY:HA2	1:A:110:LEU:HD23	0.50	1.83	3	2
1:A:59:ASP:OD1	1:A:61:PRO:HD2	0.50	2.07	4	1
1:A:5:ARG:HA	2:B:18:MET:HB2	0.50	1.83	1	1
2:B:26:ILE:HA	2:B:36:GLN:OE1	0.49	2.08	2	1
1:A:61:PRO:HB3	2:B:16:LEU:O	0.49	2.08	2	1
1:A:18:PRO:HG2	1:A:21:CYS:HB3	0.49	1.84	4	1
1:A:133:LYS:O	1:A:136:ARG:HG2	0.49	2.08	4	1
1:A:40:PRO:HG2	1:A:43:SER:HB2	0.49	1.84	5	1
1:A:5:ARG:HG3	2:B:18:MET:SD	0.48	2.48	1	1
1:A:57:PRO:HG2	1:A:63:LYS:HB2	0.48	1.85	3	1
1:A:59:ASP:HB2	1:A:63:LYS:HG3	0.48	1.86	3	1
2:B:53:CYS:HB3	2:B:56:CYS:SG	0.48	2.49	2	1
2:B:22:GLU:O	2:B:26:ILE:HG13	0.48	2.09	4	1
1:A:68:ALA:HA	1:A:82:GLY:O	0.48	2.08	4	1
2:B:12:VAL:HG12	2:B:21:LEU:HD12	0.48	1.85	4	1
1:A:115:PRO:HB3	1:A:128:LYS:HB3	0.47	1.86	4	1
1:A:31:PHE:O	1:A:55:HIS:HA	0.47	2.10	5	2
1:A:59:ASP:CB	1:A:63:LYS:HG3	0.47	2.39	4	1
1:A:18:PRO:HB3	1:A:100:SER:HB3	0.47	1.86	4	1
1:A:49:VAL:HG21	1:A:147:MET:HB2	0.47	1.84	4	1
1:A:75:HIS:CE1	1:A:110:LEU:HA	0.47	2.45	4	1
1:A:125:ARG:HA	1:A:128:LYS:HE2	0.47	1.87	4	1
1:A:79:ASN:OD1	1:A:119:LEU:HB3	0.46	2.10	5	3
2:B:22:GLU:HB2	2:B:25:ASP:HB2	0.46	1.86	1	1
1:A:10:LEU:HA	1:A:33:TRP:CZ2	0.45	2.47	1	1
2:B:53:CYS:HB3	2:B:56:CYS:CB	0.45	2.26	5	1
1:A:120:VAL:HG12	1:A:122:GLU:HG2	0.45	1.89	1	1
1:A:59:ASP:HB3	1:A:62:PHE:HD2	0.45	1.72	2	1
1:A:54:ILE:HG23	1:A:67:VAL:HG22	0.44	1.89	1	1
2:B:53:CYS:CB	2:B:56:CYS:HB2	0.44	2.41	4	1
1:A:93:TRP:CZ3	1:A:97:LEU:HB3	0.44	2.48	1	1
1:A:135:ASN:HB3	1:A:139:ARG:NH2	0.44	2.28	5	2
1:A:130:ASP:HB3	1:A:133:LYS:HB3	0.44	1.89	3	1
1:A:64:PRO:HG3	1:A:93:TRP:H	0.44	1.73	3	1
2:B:56:CYS:O	2:B:57:ARG:HB2	0.43	2.13	4	1
1:A:54:ILE:HG12	1:A:67:VAL:HG13	0.43	1.90	2	2
1:A:122:GLU:O	1:A:126:ILE:HG12	0.43	2.14	3	1
1:A:12:ASP:HA	1:A:15:ARG:CZ	0.43	2.44	1	1
2:B:17:CYS:O	2:B:18:MET:HB2	0.43	2.14	3	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:88:ILE:HD11	1:A:102:VAL:HA	0.43	1.91	5	1
1:A:73:ILE:HA	1:A:141:TRP:NE1	0.43	2.28	4	1
2:B:13:GLU:HG3	2:B:20:PRO:HA	0.43	1.89	3	1
1:A:92:GLN:HB3	2:B:50:ASN:ND2	0.43	2.29	4	1
1:A:12:ASP:HA	1:A:15:ARG:NH1	0.42	2.29	3	2
1:A:17:PRO:HB3	1:A:22:SER:HA	0.42	1.92	5	1
2:B:12:VAL:O	2:B:20:PRO:HA	0.42	2.15	1	1
1:A:43:SER:HB3	1:A:44:PRO:HD2	0.42	1.92	2	1
1:A:133:LYS:HA	1:A:136:ARG:CZ	0.41	2.45	1	1
1:A:122:GLU:HG3	1:A:123:ILE:N	0.41	2.30	3	1
1:A:117:ASP:HB3	1:A:124:ALA:HB3	0.41	1.92	4	1
2:B:30:PRO:O	2:B:61:PRO:HD2	0.41	2.14	1	1
1:A:33:TRP:HB2	1:A:54:ILE:HB	0.41	1.92	3	1
2:B:16:LEU:HD21	2:B:45:ILE:HD11	0.41	1.93	1	1
1:A:2:ALA:HB1	1:A:5:ARG:HB2	0.41	1.92	2	1
1:A:79:ASN:ND2	1:A:123:ILE:HD11	0.41	2.30	5	1
1:A:89:LEU:HA	1:A:93:TRP:HB3	0.41	1.91	3	1
1:A:59:ASP:HB3	1:A:63:LYS:HG3	0.41	1.92	4	1
1:A:96:ALA:HB3	2:B:54:PRO:HB2	0.40	1.93	3	1
1:A:118:PRO:HB2	1:A:119:LEU:H	0.40	1.55	3	1
1:A:88:ILE:H	1:A:88:ILE:HD13	0.40	1.76	4	1
1:A:18:PRO:HG2	1:A:21:CYS:SG	0.40	2.56	5	1
1:A:99:ILE:HD12	1:A:102:VAL:HB	0.40	1.93	5	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	145/147 (99%)	128±3 (88±2%)	12±3 (9±2%)	5±1 (3±1%)	5 36
2	B	49/52 (94%)	40±2 (82±4%)	8±3 (16±5%)	1±1 (2±2%)	10 55
All	All	970/995 (97%)	842 (87%)	101 (10%)	27 (3%)	6 40

All 14 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	118	PRO	5
1	A	49	VAL	4
1	A	57	PRO	3
1	A	92	GLN	3
1	A	95	PRO	2
1	A	112	ASP	2
1	A	18	PRO	1
2	B	15	PRO	1
2	B	56	CYS	1
1	A	28	ASP	1
1	A	60	TYR	1
1	A	6	ILE	1
2	B	18	MET	1
2	B	54	PRO	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	130/131 (99%)	113±3 (87±2%)	17±3 (13±2%)	6	46
2	B	47/49 (96%)	40±1 (84±2%)	7±1 (16±2%)	4	41
All	All	885/900 (98%)	762 (86%)	123 (14%)	5	45

All 58 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	52	LEU	5
1	A	70	THR	5
1	A	84	ILE	5
1	A	53	THR	4
2	B	16	LEU	4
1	A	7	HIS	3
1	A	15	ARG	3
1	A	21	CYS	3
1	A	59	ASP	3
1	A	69	PHE	3
1	A	80	SER	3

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Mol	Chain	Res	Type	Models (Total)
1	A	85	CYS	3
1	A	110	LEU	3
1	A	134	TYR	3
2	B	36	GLN	3
2	B	53	CYS	3
1	A	26	VAL	3
1	A	92	GLN	3
2	B	14	CYS	3
2	B	17	CYS	3
2	B	19	GLU	3
2	B	49	GLU	3
1	A	33	TRP	2
2	B	25	ASP	2
2	B	32	THR	2
1	A	5	ARG	2
1	A	12	ASP	2
1	A	34	GLN	2
1	A	58	THR	2
1	A	129	THR	2
1	A	36	THR	2
1	A	100	SER	2
2	B	35	TYR	2
2	B	39	ARG	2
2	B	38	CYS	2
1	A	4	LYS	1
1	A	22	SER	1
1	A	120	VAL	1
2	B	37	ILE	1
2	B	44	ARG	1
1	A	28	ASP	1
1	A	30	MET	1
1	A	63	LYS	1
1	A	66	LYS	1
1	A	98	THR	1
1	A	8	LYS	1
1	A	112	ASP	1
1	A	38	MET	1
1	A	41	ASN	1
1	A	43	SER	1
1	A	46	GLN	1
1	A	86	LEU	1
1	A	88	ILE	1

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Mol	Chain	Res	Type	Models (Total)
1	A	132	GLU	1
1	A	142	THR	1
2	B	22	GLU	1
2	B	27	ASN	1
2	B	29	PHE	1

6.3.3 RNA

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains

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

6.5 Carbohydrates

There are no oligosaccharides in this entry.

6.6 Ligand geometry

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

6.7 Other polymers

There are no such molecules in this entry.

6.8 Polymer linkage issues

There are no chain breaks in this entry.

7 Chemical shift validation (i)

No chemical shift data were provided