Full wwPDB NMR Structure Validation Report (i)

Mar 1, 2022 – 05:29 PM EST

PDB ID	:	2GQJ
Title	:	Solution structure of the two zf-C2H2 like domains(493-575) of human zinc finger protein KIAA1196
Authors	:	Kurosaki, C.; Hayashi, F.; Yoshida, M.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on	:	2006-04-21

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

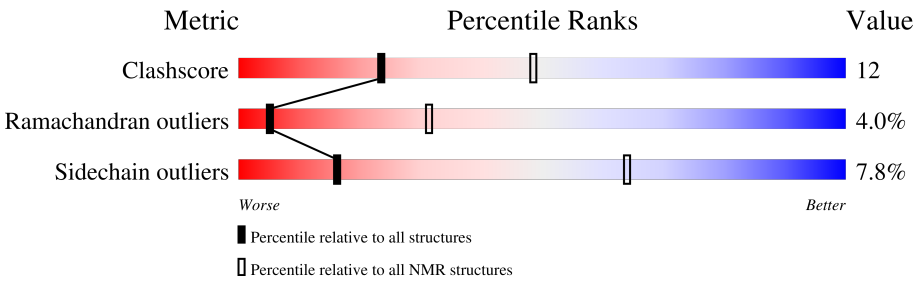
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
RCI	:	v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV	:	Wang et al. (2010)
ShiftChecker	:	2.27
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.27

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	158937	12864
Ramachandran outliers	154571	11451
Sidechain outliers	154315	11428

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	98	51% 17% • 31%

2 Ensemble composition and analysis (i)

This entry contains 20 models. Model 13 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy*.

The following residues are included in the computation of the global validation metrics.

Well-defined (core) protein residues			
Well-defined core	**Residue range (total)**	**Backbone RMSD (Å)**	**Medoid model**
1	A:11-A:78 (68)	0.78	13

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 5 clusters and 1 single-model cluster was found.

Cluster number	Models
1	5, 6, 8, 10, 13, 14, 15, 17, 20
2	1, 3, 4, 16
3	18, 19
4	2, 11
5	7, 12
Single-model clusters	9

3 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 1424 atoms, of which 697 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Zinc finger protein KIAA1196.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	98	1422	436	697	138	144	7	0

There are 13 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLY	-	cloning artifact	UNP Q96KM6
A	2	SER	-	cloning artifact	UNP Q96KM6
A	3	SER	-	cloning artifact	UNP Q96KM6
A	4	GLY	-	cloning artifact	UNP Q96KM6
A	5	SER	-	cloning artifact	UNP Q96KM6
A	6	SER	-	cloning artifact	UNP Q96KM6
A	7	GLY	-	cloning artifact	UNP Q96KM6
A	93	SER	-	cloning artifact	UNP Q96KM6
A	94	GLY	-	cloning artifact	UNP Q96KM6
A	95	PRO	-	cloning artifact	UNP Q96KM6
A	96	SER	-	cloning artifact	UNP Q96KM6
A	97	SER	-	cloning artifact	UNP Q96KM6
A	98	GLY	-	cloning artifact	UNP Q96KM6

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	
			Total	Zn
2	A	2	2	2

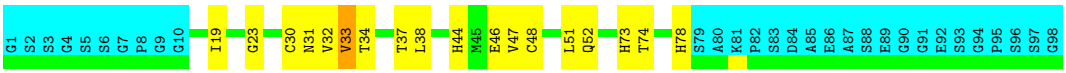
4 Residue-property plots (i)

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: Zinc finger protein KIAA1196

Chain A: 51% 17% • 31%



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

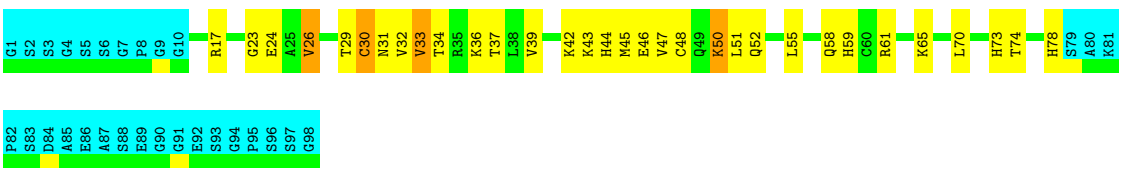
• Molecule 1: Zinc finger protein KIAA1196

Chain A: 49% 17% • • 31%

4.2.2 Score per residue for model 2

• Molecule 1: Zinc finger protein KIAA1196

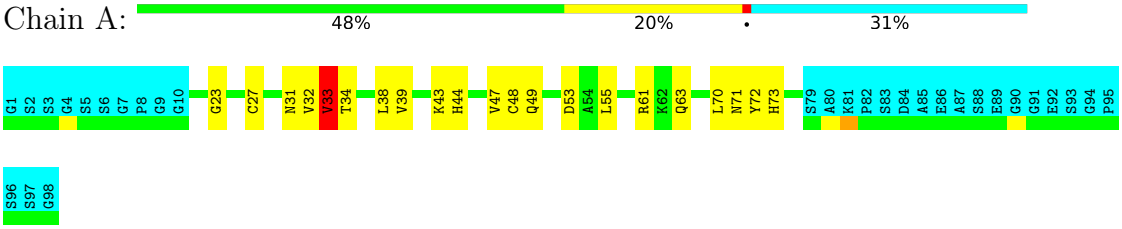
Chain A: 37% 29% • 31%



4.2.3 Score per residue for model 3

- Molecule 1: Zinc finger protein KIAA1196

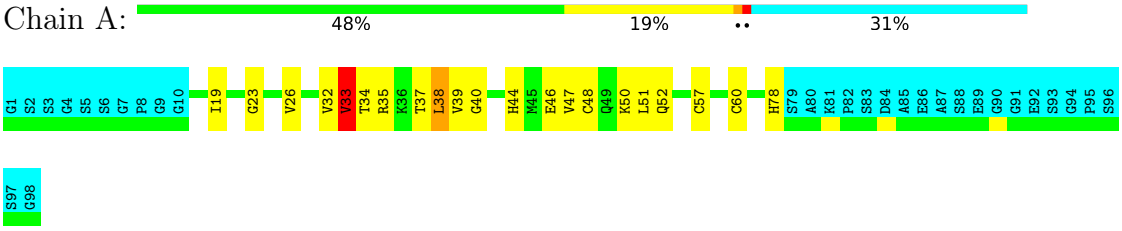
Chain A:



4.2.4 Score per residue for model 4

- Molecule 1: Zinc finger protein KIAA1196

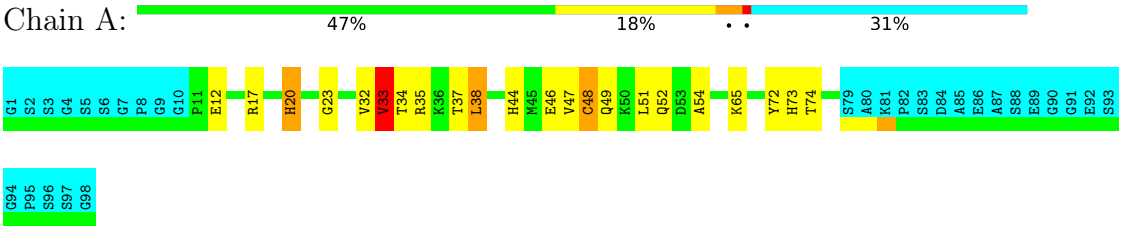
Chain A:



4.2.5 Score per residue for model 5

- Molecule 1: Zinc finger protein KIAA1196

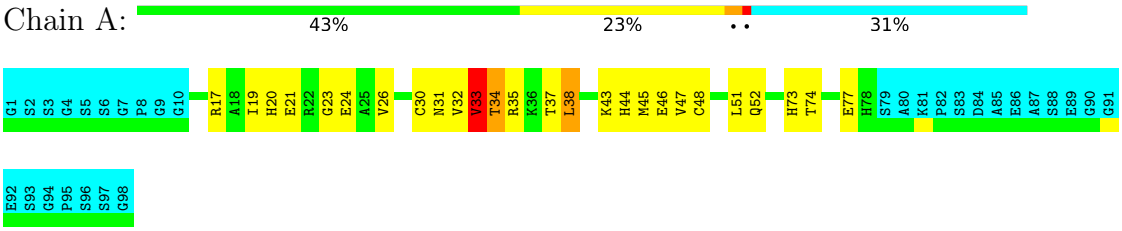
Chain A:



4.2.6 Score per residue for model 6

- Molecule 1: Zinc finger protein KIAA1196

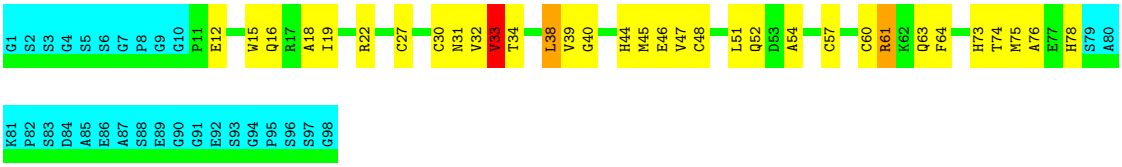
Chain A:



4.2.7 Score per residue for model 7

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 36% 31% • • 31%



4.2.8 Score per residue for model 8

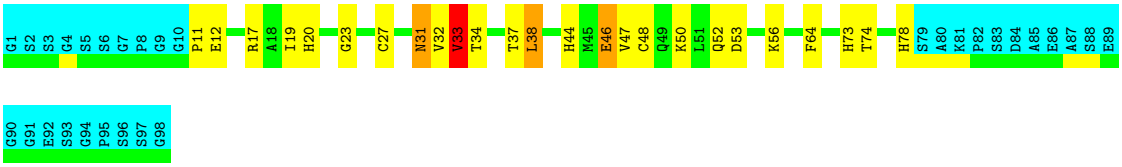
- Molecule 1: Zinc finger protein KIAA1196

Chain A: 56% 12% • 31%

4.2.9 Score per residue for model 9

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 44% 21% • • 31%



4.2.10 Score per residue for model 10

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 50% 18% • 31%

4.2.11 Score per residue for model 11

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 46% 17% 6% 31%

G1 S2 S3 G4 S5 S6 G7 P8 G9 G10 P11 E12 I19 H20 G23 V26 C30 N31 V32 V33 T34 R35 K36 T37 L38 H44 V47 C48 Q49 K50 L51 Q52 D53 A54 R61 M75 A76 S79 A80 K81 P82 S83 D84 A85 E86 A87 S88 E89 G90 G91 E92

S93 G94 P95 S96 S97 G98

4.2.12 Score per residue for model 12

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 45% 21% • 31%

G1 S2 S3 G4 S5 S6 G7 P8 G9 G10 Q16 I19 G23 C27 C30 N31 V32 V33 K36 T37 L38 V47 C48 Q49 K50 L51 Q52 D53 Q58 R61 K62 Q63 F64 K65 H73 T74 M75 S79 A80 K81 P82 S83 D84 A85 E86 A87 S88 E89 G90

G91 E92 S93 G94 P95 S96 S97 G98

4.2.13 Score per residue for model 13 (medoid)

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 44% 20% 5% 31%

G1 S2 S3 G4 S5 S6 G7 P8 G9 G10 P11 E12 Q16 R17 A18 I19 G23 C30 N31 V32 V33 T34 T37 L38 V39 G40 K43 E46 L51 Q52 D53 A54 H59 K65 Y72 H73 H78 S79 A80 K81 P82 S83 D84 A85 E86 A87 S88 E89 G90

G91 E92 S93 G94 P95 S96 S97 G98

4.2.14 Score per residue for model 14

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 45% 21% • 31%

G1 S2 S3 G4 S5 S6 G7 P8 G9 G10 Q16 I19 G23 C30 N31 V32 V33 T34 R35 L38 H44 M45 E46 V47 K50 L51 Q52 D53 A54 L55 K56 K62 K65 S66 K67 H73 T74 S79 A80 K81 P82 S83 D84 A85 E86 A87 S88 E89 G90

G91 E92 S93 G94 P95 S96 S97 G98

4.2.15 Score per residue for model 15

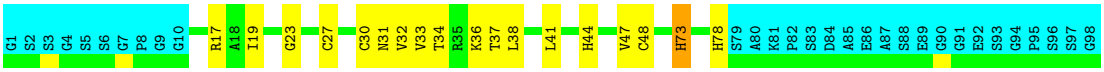
- Molecule 1: Zinc finger protein KIAA1196

Chain A: 54% 13% •• 31%

4.2.16 Score per residue for model 16

- Molecule 1: Zinc finger protein KIAA1196

Chain A: 51% 17% • 31%



4.2.17 Score per residue for model 17

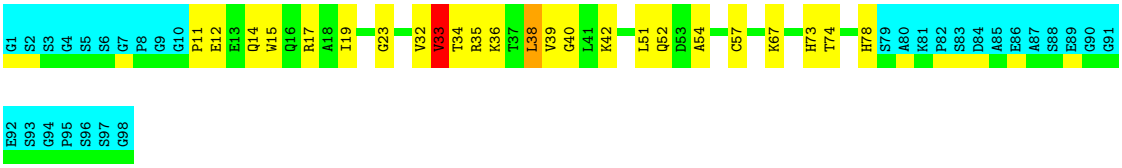
- Molecule 1: Zinc finger protein KIAA1196

Chain A: 55% 13% • 31%

4.2.18 Score per residue for model 18

- Molecule 1: Zinc finger protein KIAA1196

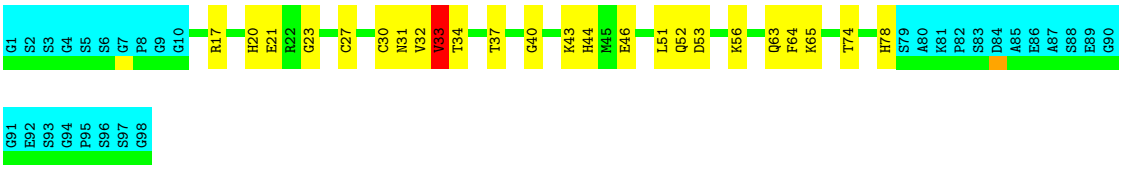
Chain A: 45% 22% •• 31%



4.2.19 Score per residue for model 19

- Molecule 1: Zinc finger protein KIAA1196

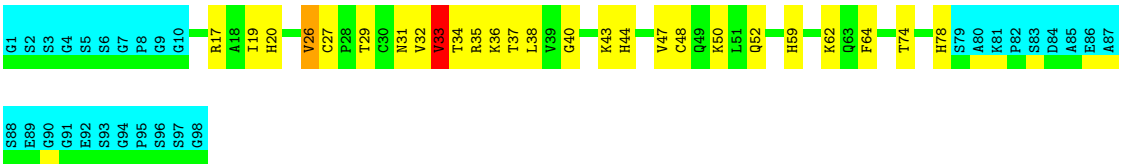
Chain A: 45% 23% • 31%



4.2.20 Score per residue for model 20

- Molecule 1: Zinc finger protein KIAA1196

Chain A:



5 Refinement protocol and experimental data overview (i)

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

Of the 100 calculated structures, 20 were deposited, based on the following criterion: *target function, structures with the lowest energy, structures with the least restraint violations*.

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

Software name	Classification	Version
CYANA	structure solution	2.0.17
CYANA	refinement	2.0.17

No chemical shift data was provided.

6 Model quality (i)

6.1 Standard geometry (i)

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

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	549	549	549	13±4
All	All	11020	10980	10980	269

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 12.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:32:VAL:O	1:A:33:VAL:HG13	0.75	1.81	15	14
1:A:15:TRP:CE2	1:A:41:LEU:HD21	0.68	2.22	15	1
1:A:19:ILE:HD13	1:A:38:LEU:CD2	0.66	2.20	6	1
1:A:26:VAL:HG12	1:A:37:THR:HG21	0.64	1.67	11	3
1:A:12:GLU:OE1	1:A:38:LEU:HD11	0.63	1.94	11	2
1:A:32:VAL:O	1:A:32:VAL:HG23	0.63	1.93	2	7
1:A:30:CYS:SG	1:A:32:VAL:HG22	0.62	2.34	12	8
1:A:30:CYS:O	1:A:32:VAL:HG13	0.61	1.95	14	1
1:A:32:VAL:HG23	1:A:32:VAL:O	0.57	1.97	14	7
1:A:26:VAL:HG21	1:A:31:ASN:HB3	0.56	1.77	2	1
1:A:73:HIS:CD2	1:A:74:THR:N	0.56	2.73	17	8
1:A:19:ILE:HG22	1:A:20:HIS:N	0.56	2.14	11	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:33:VAL:CG1	1:A:44:HIS:CG	0.56	2.89	14	4
1:A:39:VAL:HG23	1:A:40:GLY:N	0.56	2.16	13	5
1:A:16:GLN:HA	1:A:19:ILE:HD12	0.55	1.78	7	2
1:A:19:ILE:HD13	1:A:38:LEU:HD23	0.55	1.78	6	1
1:A:52:GLN:CD	1:A:63:GLN:NE2	0.54	2.61	19	1
1:A:34:THR:O	1:A:37:THR:HG22	0.52	2.04	20	7
1:A:34:THR:HG22	1:A:35:ARG:N	0.52	2.20	11	4
1:A:26:VAL:HG21	1:A:31:ASN:OD1	0.52	2.05	1	2
1:A:20:HIS:C	1:A:20:HIS:CD2	0.50	2.84	11	1
1:A:12:GLU:CD	1:A:38:LEU:HD11	0.50	2.27	13	4
1:A:74:THR:O	1:A:78:HIS:N	0.50	2.45	1	3
1:A:39:VAL:O	1:A:43:LYS:CD	0.50	2.60	3	1
1:A:26:VAL:HG21	1:A:31:ASN:CG	0.50	2.26	6	2
1:A:19:ILE:CD1	1:A:38:LEU:HD23	0.50	2.36	9	4
1:A:33:VAL:HG23	1:A:37:THR:HG22	0.50	1.84	6	2
1:A:16:GLN:O	1:A:19:ILE:N	0.50	2.45	12	4
1:A:27:CYS:O	1:A:31:ASN:ND2	0.50	2.44	12	2
1:A:44:HIS:O	1:A:46:GLU:N	0.50	2.45	15	7
1:A:12:GLU:OE1	1:A:38:LEU:CD2	0.49	2.60	17	1
1:A:51:LEU:O	1:A:53:ASP:N	0.49	2.46	14	2
1:A:73:HIS:O	1:A:76:ALA:N	0.49	2.45	17	1
1:A:15:TRP:O	1:A:19:ILE:HD12	0.49	2.08	18	1
1:A:20:HIS:CG	1:A:21:GLU:N	0.48	2.81	19	2
1:A:17:ARG:HA	1:A:20:HIS:CD2	0.48	2.43	5	1
1:A:44:HIS:CD2	1:A:44:HIS:C	0.48	2.87	8	3
1:A:47:VAL:O	1:A:48:CYS:C	0.48	2.51	4	13
1:A:19:ILE:CD1	1:A:38:LEU:CD2	0.48	2.91	6	1
1:A:34:THR:O	1:A:37:THR:N	0.48	2.47	9	2
1:A:43:LYS:O	1:A:46:GLU:CG	0.48	2.62	19	2
1:A:40:GLY:O	1:A:44:HIS:N	0.47	2.48	20	2
1:A:62:LYS:HE2	1:A:64:PHE:CZ	0.47	2.44	20	1
1:A:64:PHE:CZ	1:A:73:HIS:CG	0.47	3.03	9	1
1:A:75:MET:SD	1:A:76:ALA:N	0.47	2.88	11	1
1:A:27:CYS:O	1:A:31:ASN:N	0.47	2.48	20	5
1:A:30:CYS:O	1:A:31:ASN:CG	0.47	2.54	19	3
1:A:19:ILE:HD13	1:A:38:LEU:HD21	0.46	1.87	20	1
1:A:47:VAL:O	1:A:50:LYS:N	0.46	2.48	4	5
1:A:51:LEU:O	1:A:52:GLN:C	0.46	2.54	11	10
1:A:59:HIS:HB2	1:A:78:HIS:CD2	0.46	2.45	10	5
1:A:39:VAL:O	1:A:43:LYS:CG	0.46	2.64	2	1
1:A:60:CYS:O	1:A:61:ARG:C	0.46	2.54	7	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:33:VAL:CG1	1:A:44:HIS:CD2	0.46	2.99	14	1
1:A:72:TYR:O	1:A:73:HIS:C	0.45	2.54	13	2
1:A:51:LEU:O	1:A:54:ALA:N	0.45	2.49	7	6
1:A:32:VAL:O	1:A:32:VAL:CG2	0.45	2.65	2	2
1:A:11:PRO:C	1:A:12:GLU:OE2	0.45	2.55	9	1
1:A:33:VAL:O	1:A:34:THR:C	0.45	2.55	7	2
1:A:44:HIS:C	1:A:46:GLU:N	0.45	2.71	15	6
1:A:12:GLU:OE1	1:A:38:LEU:HD21	0.44	2.12	17	1
1:A:58:GLN:O	1:A:61:ARG:CD	0.44	2.64	12	1
1:A:75:MET:SD	1:A:75:MET:C	0.44	2.95	12	1
1:A:36:LYS:O	1:A:38:LEU:HD23	0.44	2.12	20	2
1:A:29:THR:CG2	1:A:52:GLN:CD	0.44	2.85	2	1
1:A:11:PRO:C	1:A:12:GLU:CD	0.44	2.75	9	1
1:A:73:HIS:ND1	1:A:77:GLU:OE1	0.44	2.51	6	1
1:A:31:ASN:O	1:A:32:VAL:HG13	0.44	2.13	7	1
1:A:36:LYS:O	1:A:37:THR:C	0.43	2.57	1	1
1:A:63:GLN:NE2	1:A:64:PHE:O	0.43	2.51	7	1
1:A:44:HIS:CD2	1:A:45:MET:N	0.43	2.86	1	1
1:A:39:VAL:CG2	1:A:40:GLY:N	0.43	2.81	13	1
1:A:63:GLN:CD	1:A:64:PHE:N	0.43	2.72	19	1
1:A:49:GLN:HA	1:A:52:GLN:CG	0.43	2.43	5	1
1:A:33:VAL:CG1	1:A:44:HIS:CB	0.43	2.97	11	1
1:A:60:CYS:HB3	1:A:78:HIS:CE1	0.43	2.48	4	2
1:A:34:THR:O	1:A:37:THR:CG2	0.43	2.67	6	2
1:A:32:VAL:HG23	1:A:44:HIS:CE1	0.43	2.48	11	1
1:A:17:ARG:O	1:A:20:HIS:CD2	0.43	2.72	20	4
1:A:73:HIS:O	1:A:74:THR:C	0.42	2.57	18	6
1:A:37:THR:O	1:A:41:LEU:HD22	0.42	2.14	8	1
1:A:55:LEU:N	1:A:55:LEU:CD2	0.42	2.82	3	1
1:A:15:TRP:CZ2	1:A:45:MET:HE1	0.42	2.49	7	1
1:A:34:THR:HG22	1:A:35:ARG:H	0.42	1.74	1	1
1:A:49:GLN:O	1:A:53:ASP:CB	0.42	2.67	3	1
1:A:29:THR:CG2	1:A:52:GLN:NE2	0.42	2.83	20	1
1:A:75:MET:HG3	1:A:76:ALA:N	0.42	2.30	7	1
1:A:73:HIS:CG	1:A:74:THR:N	0.42	2.88	17	1
1:A:32:VAL:O	1:A:33:VAL:CG1	0.42	2.63	15	1
1:A:53:ASP:O	1:A:56:LYS:N	0.42	2.53	9	1
1:A:11:PRO:O	1:A:15:TRP:CE3	0.42	2.73	18	2
1:A:30:CYS:SG	1:A:32:VAL:CG2	0.41	3.07	11	1
1:A:17:ARG:HG3	1:A:18:ALA:N	0.41	2.30	13	1
1:A:74:THR:O	1:A:78:HIS:O	0.41	2.38	18	4

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:40:GLY:O	1:A:44:HIS:CB	0.41	2.68	15	1
1:A:55:LEU:O	1:A:70:LEU:HD22	0.41	2.15	2	1
1:A:55:LEU:N	1:A:55:LEU:HD22	0.41	2.30	3	1
1:A:51:LEU:C	1:A:53:ASP:N	0.41	2.73	14	1
1:A:73:HIS:CD2	1:A:73:HIS:C	0.41	2.94	16	1
1:A:44:HIS:O	1:A:45:MET:C	0.41	2.59	1	1
1:A:52:GLN:HG3	1:A:53:ASP:N	0.41	2.31	13	1
1:A:37:THR:O	1:A:41:LEU:CD2	0.41	2.69	16	1
1:A:74:THR:O	1:A:78:HIS:C	0.41	2.59	20	1
1:A:18:ALA:O	1:A:22:ARG:CG	0.41	2.69	7	1
1:A:27:CYS:O	1:A:31:ASN:OD1	0.41	2.39	7	2
1:A:19:ILE:CD1	1:A:38:LEU:HD21	0.41	2.45	16	1
1:A:70:LEU:O	1:A:71:ASN:C	0.40	2.59	3	1
1:A:64:PHE:CZ	1:A:73:HIS:CE1	0.40	3.08	12	1
1:A:33:VAL:O	1:A:34:THR:O	0.40	2.39	1	1
1:A:17:ARG:HB3	1:A:17:ARG:CZ	0.40	2.46	2	1
1:A:37:THR:O	1:A:38:LEU:HD22	0.40	2.16	12	1
1:A:42:LYS:O	1:A:46:GLU:OE2	0.40	2.40	2	1
1:A:35:ARG:HG3	1:A:36:LYS:N	0.40	2.32	18	1
1:A:52:GLN:OE1	1:A:63:GLN:NE2	0.40	2.54	19	1
1:A:47:VAL:HG23	1:A:48:CYS:N	0.40	2.31	7	1
1:A:46:GLU:HG3	1:A:47:VAL:N	0.40	2.32	9	1
1:A:46:GLU:HG3	1:A:47:VAL:HG13	0.40	1.91	14	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	68/98 (69%)	50±3 (73±5%)	16±3 (23±4%)	3±1 (4±1%)	5	31
All	All	1360/1960 (69%)	995 (73%)	310 (23%)	55 (4%)	5	31

All 9 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	23	GLY	16
1	A	33	VAL	15
1	A	34	THR	9
1	A	45	MET	4
1	A	57	CYS	4
1	A	26	VAL	3
1	A	52	GLN	2
1	A	48	CYS	1
1	A	61	ARG	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	60/78 (77%)	55±2 (92±3%)	5±2 (8±3%)	16 64
All	All	1200/1560 (77%)	1107 (92%)	93 (8%)	16 64

All 27 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	33	VAL	19
1	A	38	LEU	11
1	A	65	LYS	7
1	A	50	LYS	5
1	A	30	CYS	4
1	A	61	ARG	4
1	A	36	LYS	3
1	A	63	GLN	3
1	A	35	ARG	3
1	A	20	HIS	3
1	A	43	LYS	3
1	A	46	GLU	3
1	A	52	GLN	3
1	A	53	ASP	3
1	A	56	LYS	3
1	A	24	GLU	2
1	A	75	MET	2

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Mol	Chain	Res	Type	Models (Total)
1	A	67	LYS	2
1	A	17	ARG	2
1	A	58	GLN	1
1	A	72	TYR	1
1	A	31	ASN	1
1	A	62	LYS	1
1	A	73	HIS	1
1	A	78	HIS	1
1	A	14	GLN	1
1	A	42	LYS	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 monosaccharides in this entry.

6.6 Ligand geometry (i)

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

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)

No chemical shift data were provided