



Full wwPDB NMR Structure Validation Report ⓘ

Feb 22, 2022 – 12:46 PM EST

PDB ID : 1WG1
Title : Solution structure of RNA binding domain in BAB13405(homolog EXC-7)
Authors : Tsuda, K.; Muto, Y.; Nagata, T.; Suzuki, S.; Someya, T.; Kigawa, T.; Terada, T.; Shirouzu, M.; Inoue, M.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2004-05-27

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 ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) 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 : 2.26
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.26

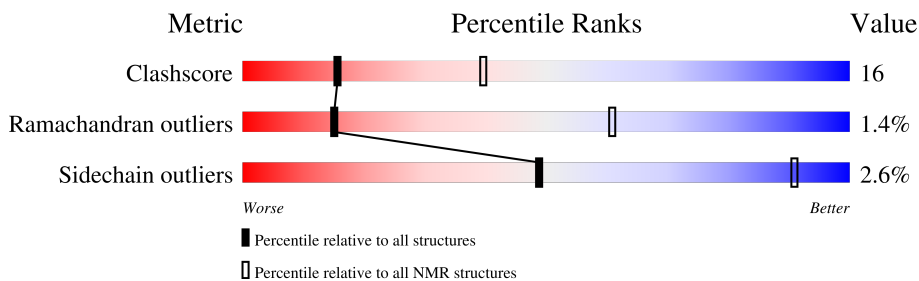
1 Overall quality at a glance

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	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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	88	 56% 22% 23%

2 Ensemble composition and analysis i

This entry contains 20 models. Model 4 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:96-A:163 (68)	0.20	4

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 3 single-model clusters were found.

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

3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1348 atoms, of which 666 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called KIAA1579 protein.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	88	1348	424	666	119	135	4	0

There are 13 discrepancies between the modelled and reference sequences:

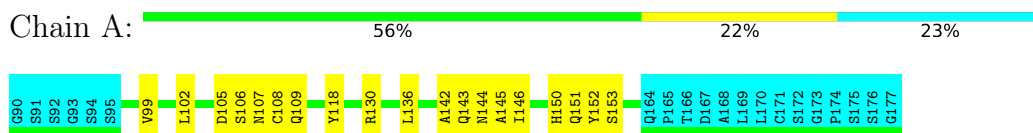
Chain	Residue	Modelled	Actual	Comment	Reference
A	90	GLY	-	cloning artifact	UNP Q9HCJ3
A	91	SER	-	cloning artifact	UNP Q9HCJ3
A	92	SER	-	cloning artifact	UNP Q9HCJ3
A	93	GLY	-	cloning artifact	UNP Q9HCJ3
A	94	SER	-	cloning artifact	UNP Q9HCJ3
A	95	SER	-	cloning artifact	UNP Q9HCJ3
A	96	GLY	-	cloning artifact	UNP Q9HCJ3
A	172	SER	-	cloning artifact	UNP Q9HCJ3
A	173	GLY	-	cloning artifact	UNP Q9HCJ3
A	174	PRO	-	cloning artifact	UNP Q9HCJ3
A	175	SER	-	cloning artifact	UNP Q9HCJ3
A	176	SER	-	cloning artifact	UNP Q9HCJ3
A	177	GLY	-	cloning artifact	UNP Q9HCJ3

4 Residue-property plots

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: KIAA1579 protein

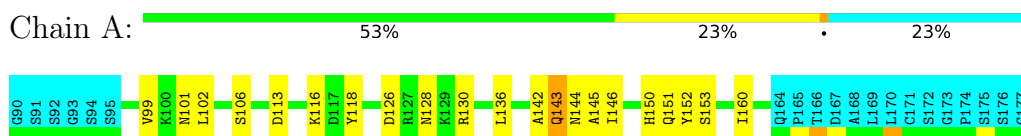


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

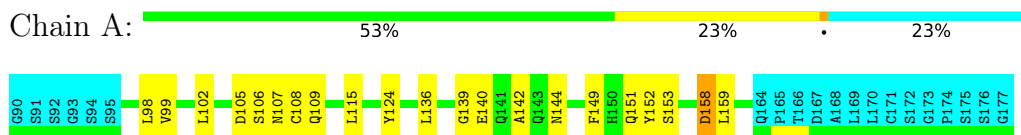
4.2.1 Score per residue for model 1

- Molecule 1: KIAA1579 protein



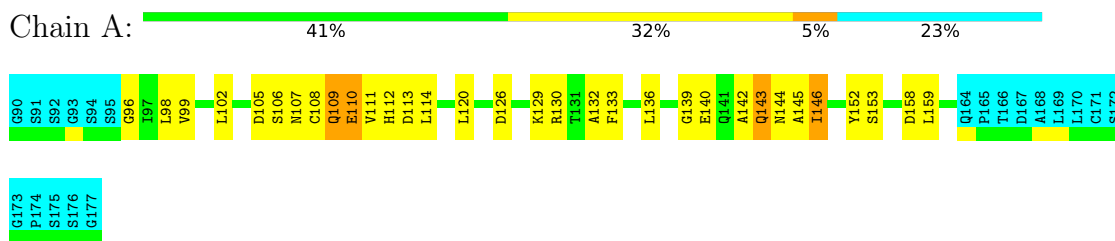
4.2.2 Score per residue for model 2

- Molecule 1: KIAA1579 protein



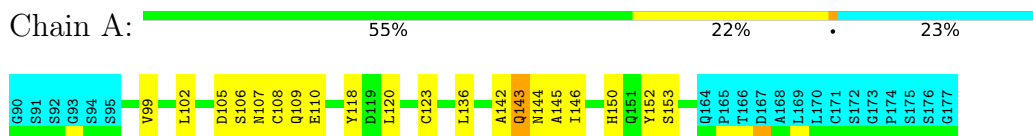
4.2.3 Score per residue for model 3

- Molecule 1: KIAA1579 protein



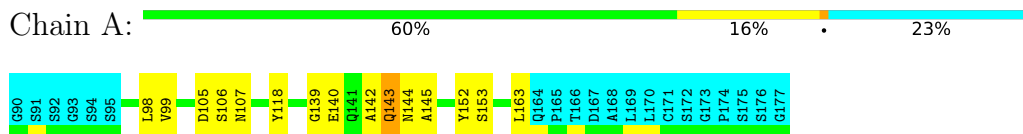
4.2.4 Score per residue for model 4 (medoid)

- Molecule 1: KIAA1579 protein



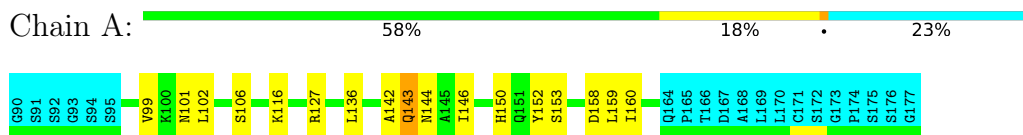
4.2.5 Score per residue for model 5

- Molecule 1: KIAA1579 protein



4.2.6 Score per residue for model 6

- Molecule 1: KIAA1579 protein



4.2.7 Score per residue for model 7

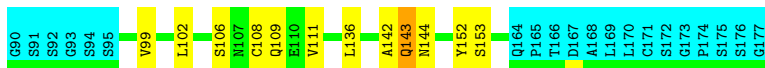
- Molecule 1: KIAA1579 protein





4.2.8 Score per residue for model 8

- Molecule 1: KIAA1579 protein



4.2.9 Score per residue for model 9

- Molecule 1: KIAA1579 protein



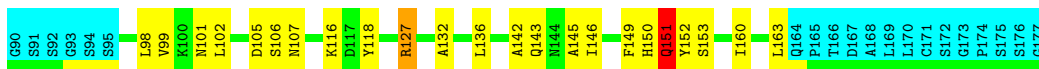
4.2.10 Score per residue for model 10

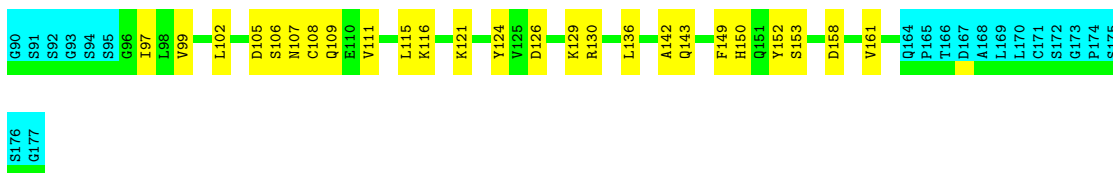
- Molecule 1: KIAA1579 protein



4.2.11 Score per residue for model 11

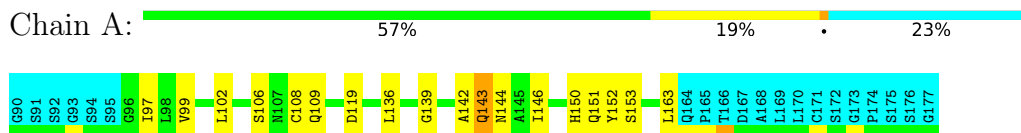
- Molecule 1: KIAA1579 protein





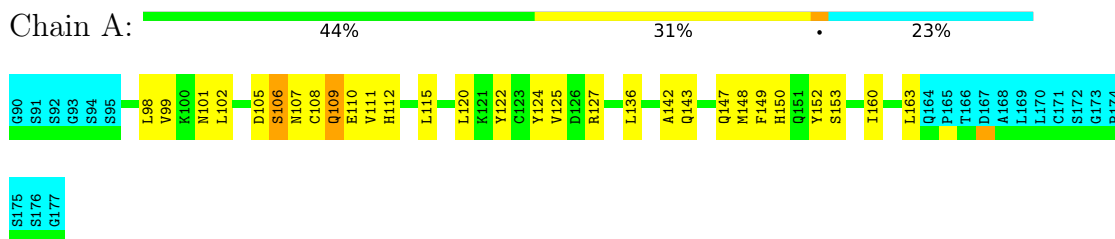
4.2.17 Score per residue for model 17

- Molecule 1: KIAA1579 protein



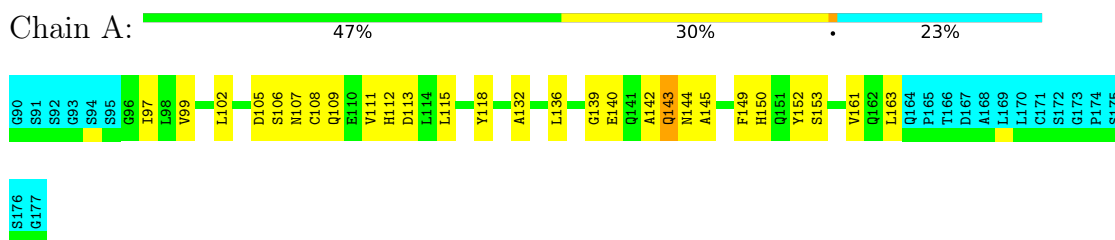
4.2.18 Score per residue for model 18

- Molecule 1: KIAA1579 protein



4.2.19 Score per residue for model 19

- Molecule 1: KIAA1579 protein



4.2.20 Score per residue for model 20

- Molecule 1: KIAA1579 protein



S90	S91	S92	G93	S94	S95	Y99	L102	D105	S106	N107	C108	Q109	E110	V111	L115	K129	R130	L136	A142	Q143	I146	F149	H150	Q151	Y152	S153	V161	Q162	L163	Q164	P165	T166	D167	A168	L169	L170	C171	S172	G173	P174	S175	S176	G177
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5 Refinement protocol and experimental data overview

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

Of the 100 calculated structures, 20 were deposited, based on the following criterion: *target function*.

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

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	559	554	552	18±5
All	All	11180	11080	11040	362

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 16.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:99:VAL:CG1	1:A:102:LEU:HD21	0.88	1.99	17	15
1:A:118:TYR:CZ	1:A:145:ALA:HB2	0.85	2.06	11	11
1:A:136:LEU:HD12	1:A:142:ALA:HB2	0.79	1.54	15	17
1:A:115:LEU:HD23	1:A:149:PHE:CE2	0.79	2.12	13	5
1:A:115:LEU:HD23	1:A:149:PHE:CZ	0.75	2.17	19	8
1:A:99:VAL:HG11	1:A:102:LEU:HD21	0.74	1.58	17	13
1:A:115:LEU:CD2	1:A:149:PHE:CE2	0.68	2.76	13	6
1:A:99:VAL:HB	1:A:132:ALA:HB3	0.67	1.67	19	3
1:A:102:LEU:HD22	1:A:106:SER:OG	0.66	1.90	12	16
1:A:101:ASN:HB2	1:A:160:ILE:HD12	0.63	1.69	7	4
1:A:99:VAL:O	1:A:99:VAL:HG12	0.61	1.95	3	18
1:A:112:HIS:CD2	1:A:120:LEU:HD22	0.59	2.32	12	2
1:A:152:TYR:CE2	1:A:153:SER:O	0.57	2.57	14	11
1:A:158:ASP:O	1:A:160:ILE:HD12	0.56	2.00	6	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:143:GLN:HE22	1:A:163:LEU:HD21	0.56	1.60	18	1
1:A:115:LEU:CD2	1:A:149:PHE:CZ	0.55	2.90	20	2
1:A:143:GLN:NE2	1:A:163:LEU:HD21	0.54	2.17	18	1
1:A:136:LEU:HD12	1:A:142:ALA:CB	0.54	2.30	15	4
1:A:115:LEU:O	1:A:120:LEU:HD11	0.53	2.03	12	3
1:A:146:ILE:HD11	1:A:163:LEU:HB2	0.52	1.80	9	2
1:A:152:TYR:CG	1:A:153:SER:N	0.52	2.78	11	12
1:A:101:ASN:O	1:A:159:LEU:HD23	0.52	2.04	9	1
1:A:150:HIS:CD2	1:A:151:GLN:OE1	0.52	2.63	17	2
1:A:149:PHE:CB	1:A:161:VAL:HG21	0.52	2.35	20	1
1:A:146:ILE:HG22	1:A:147:GLN:OE1	0.50	2.05	14	1
1:A:105:ASP:O	1:A:107:ASN:ND2	0.50	2.45	18	14
1:A:150:HIS:O	1:A:151:GLN:CG	0.50	2.60	9	3
1:A:118:TYR:CZ	1:A:145:ALA:CB	0.50	2.90	11	1
1:A:154:PHE:CD1	1:A:159:LEU:HD11	0.50	2.42	14	1
1:A:108:CYS:SG	1:A:125:VAL:HG23	0.50	2.47	18	1
1:A:126:ASP:O	1:A:130:ARG:N	0.50	2.45	3	5
1:A:142:ALA:O	1:A:144:ASN:N	0.49	2.45	4	11
1:A:99:VAL:CG1	1:A:102:LEU:CD2	0.49	2.85	17	1
1:A:149:PHE:O	1:A:152:TYR:CB	0.49	2.61	11	2
1:A:146:ILE:O	1:A:150:HIS:N	0.49	2.45	1	7
1:A:127:ARG:O	1:A:127:ARG:NE	0.49	2.45	11	1
1:A:149:PHE:O	1:A:150:HIS:C	0.48	2.52	19	5
1:A:122:TYR:CE2	1:A:124:TYR:HB2	0.48	2.43	18	1
1:A:146:ILE:CG2	1:A:147:GLN:OE1	0.48	2.62	14	1
1:A:146:ILE:HD11	1:A:163:LEU:HD13	0.48	1.84	11	1
1:A:150:HIS:CE1	1:A:151:GLN:HG3	0.48	2.44	13	3
1:A:99:VAL:HG12	1:A:102:LEU:HD21	0.48	1.86	3	3
1:A:108:CYS:O	1:A:111:VAL:N	0.48	2.46	7	8
1:A:108:CYS:N	1:A:125:VAL:HG21	0.47	2.23	10	1
1:A:150:HIS:CE1	1:A:151:GLN:HG2	0.47	2.44	10	1
1:A:108:CYS:O	1:A:110:GLU:N	0.47	2.47	18	4
1:A:97:ILE:HD12	1:A:161:VAL:CG1	0.47	2.39	16	1
1:A:144:ASN:O	1:A:146:ILE:N	0.47	2.47	3	3
1:A:120:LEU:HD12	1:A:120:LEU:N	0.47	2.25	4	1
1:A:139:GLY:O	1:A:142:ALA:N	0.47	2.48	5	8
1:A:102:LEU:HD23	1:A:159:LEU:CD2	0.47	2.39	7	1
1:A:151:GLN:N	1:A:159:LEU:O	0.47	2.48	2	2
1:A:97:ILE:HG22	1:A:146:ILE:HG12	0.47	1.86	17	1
1:A:140:GLU:O	1:A:144:ASN:ND2	0.47	2.48	13	2
1:A:129:LYS:O	1:A:130:ARG:C	0.46	2.54	10	7

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:110:GLU:N	1:A:110:GLU:OE1	0.46	2.48	4	1
1:A:152:TYR:CD1	1:A:153:SER:N	0.46	2.83	9	5
1:A:146:ILE:HD11	1:A:163:LEU:CD1	0.46	2.40	11	1
1:A:152:TYR:CZ	1:A:153:SER:O	0.46	2.69	11	4
1:A:143:GLN:O	1:A:147:GLN:NE2	0.46	2.49	14	1
1:A:151:GLN:O	1:A:151:GLN:CD	0.45	2.55	11	1
1:A:111:VAL:O	1:A:114:LEU:N	0.45	2.50	3	2
1:A:106:SER:O	1:A:107:ASN:CG	0.45	2.55	5	5
1:A:154:PHE:CD2	1:A:159:LEU:HD11	0.45	2.47	12	2
1:A:108:CYS:O	1:A:109:GLN:C	0.45	2.55	7	14
1:A:111:VAL:O	1:A:112:HIS:C	0.45	2.55	3	5
1:A:142:ALA:O	1:A:143:GLN:C	0.45	2.55	12	19
1:A:139:GLY:C	1:A:143:GLN:OE1	0.45	2.55	3	1
1:A:101:ASN:HB2	1:A:160:ILE:HD13	0.45	1.89	6	1
1:A:150:HIS:O	1:A:151:GLN:C	0.45	2.53	11	1
1:A:146:ILE:HD13	1:A:163:LEU:CD2	0.44	2.43	15	1
1:A:139:GLY:O	1:A:140:GLU:C	0.44	2.55	12	5
1:A:150:HIS:NE2	1:A:151:GLN:OE1	0.44	2.50	13	1
1:A:158:ASP:O	1:A:159:LEU:C	0.44	2.56	3	3
1:A:99:VAL:CG1	1:A:99:VAL:O	0.43	2.66	3	2
1:A:97:ILE:CG2	1:A:142:ALA:HB1	0.43	2.43	10	1
1:A:104:GLN:NE2	1:A:104:GLN:H	0.43	2.10	9	1
1:A:120:LEU:HD12	1:A:120:LEU:H	0.42	1.74	4	1
1:A:146:ILE:HD13	1:A:163:LEU:HD22	0.42	1.90	15	1
1:A:105:ASP:OD2	1:A:155:ARG:NH2	0.42	2.51	9	1
1:A:143:GLN:HA	1:A:146:ILE:HD12	0.42	1.91	9	1
1:A:110:GLU:C	1:A:110:GLU:OE1	0.42	2.58	3	1
1:A:138:ASN:CB	1:A:140:GLU:OE2	0.42	2.67	15	1
1:A:121:LYS:HD3	1:A:135:THR:HG22	0.42	1.92	12	1
1:A:98:LEU:CD2	1:A:133:PHE:CD2	0.42	3.03	3	1
1:A:113:ASP:OD1	1:A:114:LEU:N	0.41	2.53	12	1
1:A:97:ILE:HD12	1:A:161:VAL:HG13	0.41	1.91	19	1
1:A:118:TYR:CE2	1:A:145:ALA:HB2	0.41	2.51	19	1
1:A:127:ARG:NE	1:A:127:ARG:C	0.41	2.74	11	1
1:A:116:LYS:HG3	1:A:117:ASP:N	0.41	2.30	15	1
1:A:144:ASN:O	1:A:145:ALA:C	0.41	2.58	13	2
1:A:113:ASP:OD1	1:A:113:ASP:C	0.41	2.58	12	1
1:A:114:LEU:CD1	1:A:152:TYR:CE2	0.41	3.04	13	1
1:A:147:GLN:O	1:A:148:MET:C	0.41	2.60	18	2
1:A:149:PHE:HB2	1:A:161:VAL:HG21	0.40	1.93	20	1
1:A:142:ALA:C	1:A:144:ASN:N	0.40	2.74	4	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:144:ASN:C	1:A:146:ILE:N	0.40	2.73	3	1
1:A:106:SER:O	1:A:107:ASN:OD1	0.40	2.40	11	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	68/88 (77%)	56±2 (82±3%)	11±2 (16±3%)	1±1 (1±1%)	15	61
All	All	1360/1760 (77%)	1118 (82%)	223 (16%)	19 (1%)	15	61

All 6 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	143	GLN	10
1	A	109	GLN	3
1	A	146	ILE	3
1	A	145	ALA	1
1	A	96	GLY	1
1	A	151	GLN	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	62/77 (81%)	60±1 (97±2%)	2±1 (3±2%)	49	91
All	All	1240/1540 (81%)	1208 (97%)	32 (3%)	49	91

All 17 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	116	LYS	5
1	A	113	ASP	4
1	A	158	ASP	4
1	A	124	TYR	3
1	A	127	ARG	3
1	A	119	ASP	2
1	A	128	ASN	1
1	A	110	GLU	1
1	A	123	CYS	1
1	A	147	GLN	1
1	A	130	ARG	1
1	A	151	GLN	1
1	A	148	MET	1
1	A	105	ASP	1
1	A	129	LYS	1
1	A	121	LYS	1
1	A	106	SER	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](#)

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

There are no chain breaks in this entry.

7 Chemical shift validation

No chemical shift data were provided