



# Full wwPDB NMR Structure Validation Report ⓘ

Feb 28, 2022 – 12:25 AM EST

PDB ID : 2DGX  
Title : Solution structure of the RNA recognition motif in KIAA0430 protein  
Authors : Abe, C.; Muto, Y.; Inoue, M.; Kigawa, T.; Terada, T.; Shirouzu, M.;  
Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)  
Deposited on : 2006-03-16

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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.

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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 : 2.27  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.27

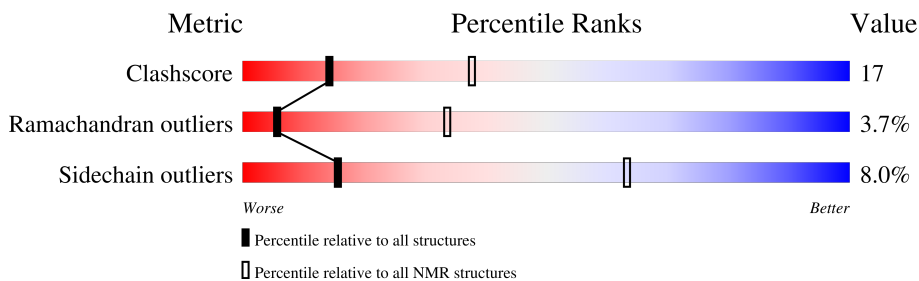
# 1 Overall quality at a glance

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  $\geq 3$ , 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	96	

## 2 Ensemble composition and analysis

This entry contains 20 models. Model 1 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:555-A:632 (78)	0.14	1

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 4 clusters and 5 single-model clusters were found.

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

### 3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1441 atoms, of which 726 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called KIAA0430 protein.

Mol	Chain	Residues	Atoms					Trace	
			Total	C	H	N	O		S
1	A	96	1441	440	726	132	142	1	0

There are 13 discrepancies between the modelled and reference sequences:

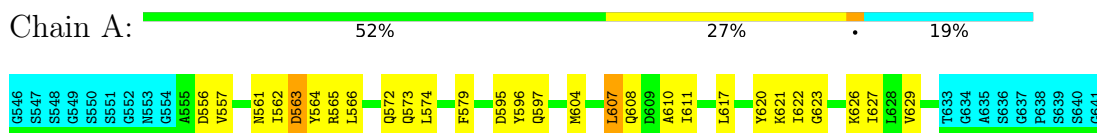
Chain	Residue	Modelled	Actual	Comment	Reference
A	546	GLY	-	cloning artifact	UNP Q9Y4J9
A	547	SER	-	cloning artifact	UNP Q9Y4J9
A	548	SER	-	cloning artifact	UNP Q9Y4J9
A	549	GLY	-	cloning artifact	UNP Q9Y4J9
A	550	SER	-	cloning artifact	UNP Q9Y4J9
A	551	SER	-	cloning artifact	UNP Q9Y4J9
A	552	GLY	-	cloning artifact	UNP Q9Y4J9
A	636	SER	-	cloning artifact	UNP Q9Y4J9
A	637	GLY	-	cloning artifact	UNP Q9Y4J9
A	638	PRO	-	cloning artifact	UNP Q9Y4J9
A	639	SER	-	cloning artifact	UNP Q9Y4J9
A	640	SER	-	cloning artifact	UNP Q9Y4J9
A	641	GLY	-	cloning artifact	UNP Q9Y4J9

## 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: KIAA0430 protein

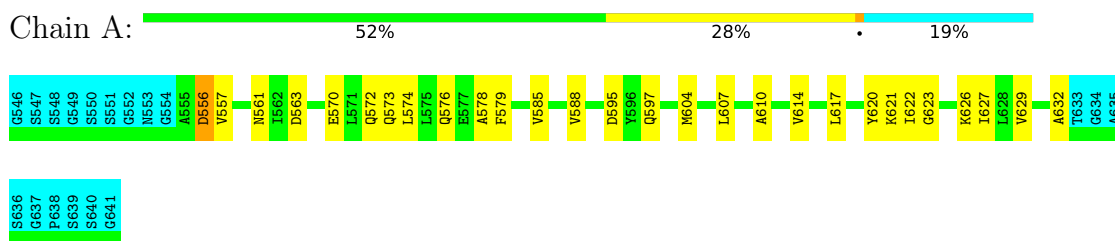


### 4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

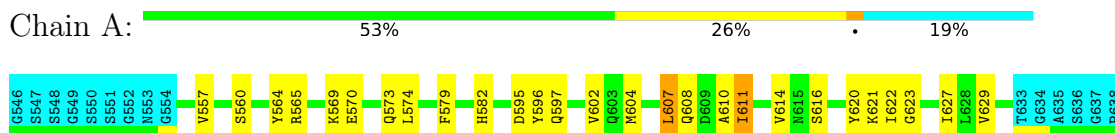
#### 4.2.1 Score per residue for model 1 (medoid)

- Molecule 1: KIAA0430 protein



#### 4.2.2 Score per residue for model 2

- Molecule 1: KIAA0430 protein



S639  
S640  
G641

### 4.2.3 Score per residue for model 3

- Molecule 1: KIAA0430 protein

Chain A: 54% 26% 19%

G546 S547 S548 S549 S550 S551 S552 S553 S554 A555 A556 V557 I562 I563 D564 R565 R566 S567 E570 L571 Q572 Q573 L574 F579 A580 R581 V585 L607 A610 V614 L617 H618 R619 Y620 K621 I622 G623 K626 I627 L628 V629 T633 G634 A635 S636 S637 P638 S639 S640 G641

### 4.2.4 Score per residue for model 4

- Molecule 1: KIAA0430 protein

Chain A: 54% 25% 19%

G546 S547 S548 S549 S550 S551 S552 S553 S554 A555 A556 V557 I562 D563 Y564 R565 L566 E570 L571 Q572 Q573 L574 F579 D595 Y596 Q597 M604 L607 Q608 I611 V614 L617 Y620 K621 I622 G623 I627 L628 V629 T633 G634 A635 S636 S637 P638 S639 S640 G641

### 4.2.5 Score per residue for model 5

- Molecule 1: KIAA0430 protein

Chain A: 50% 27% 19%

G546 S547 S548 S549 S550 S551 S552 S553 S554 A555 A556 V557 V558 V559 S560 M561 I562 D563 Y564 R565 L571 Q572 Q573 Q576 F579 D595 V585 D595 Y596 Q597 M604 L607 A610 I611 G612 A613 Y620 K621 G623 K626 I627 S630 T633 G634 A635 S636 P638

S639  
S640  
G641

### 4.2.6 Score per residue for model 6

- Molecule 1: KIAA0430 protein

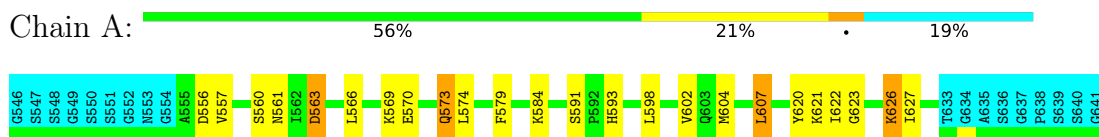
Chain A: 50% 26% 5% 19%

G546 S547 S548 S549 S550 S551 S552 S553 S554 A555 A556 V557 D563 Y564 R565 L566 E570 L571 Q572 Q573 L574 F579 H582 L590 S591 Y596 Q597 L598 V602 Q603 M604 L607 Q608 D609 A610 I611 G612 A613 Y620 K621 I622 G623 I627 L628 V629 T633 G634 A635 S636

G637  
P638  
S639  
S640  
G641

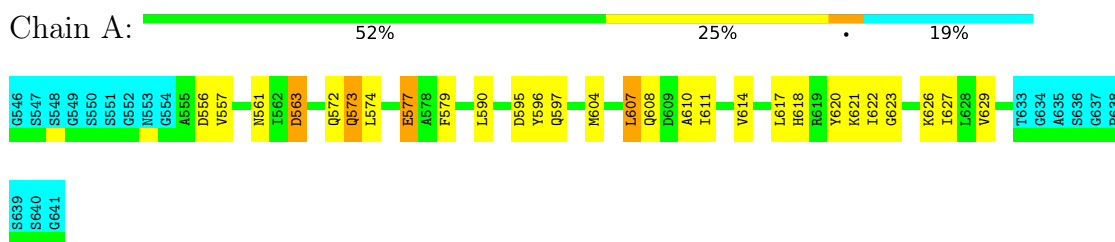
### 4.2.7 Score per residue for model 7

- Molecule 1: KIAA0430 protein



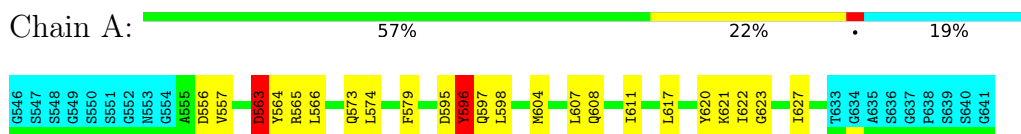
### 4.2.8 Score per residue for model 8

- Molecule 1: KIAA0430 protein



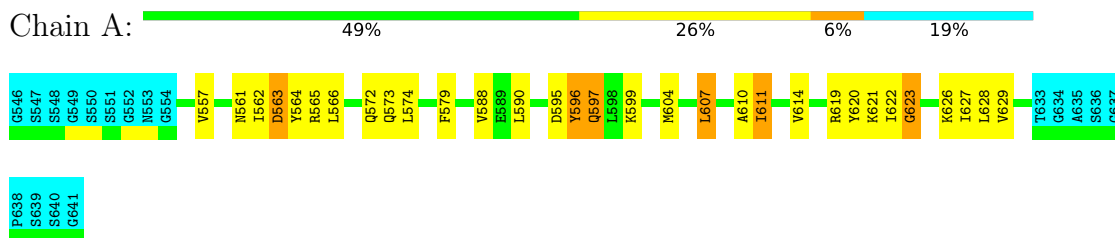
### 4.2.9 Score per residue for model 9

- Molecule 1: KIAA0430 protein



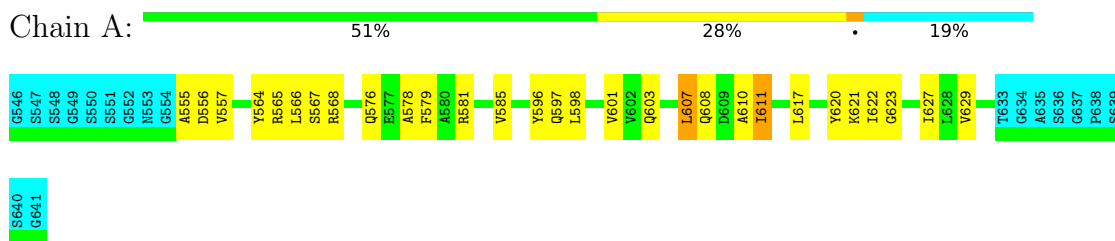
### 4.2.10 Score per residue for model 10

- Molecule 1: KIAA0430 protein



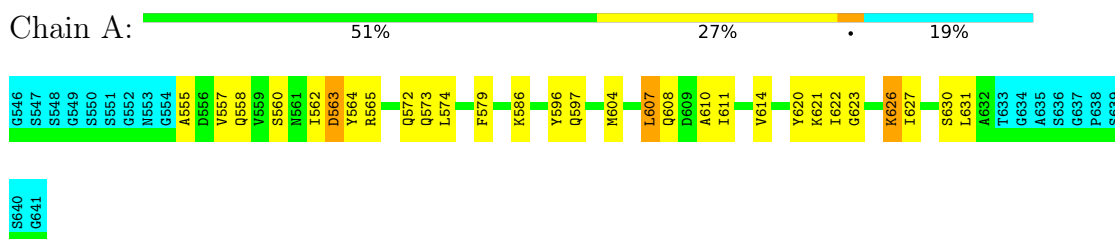
### 4.2.11 Score per residue for model 11

- Molecule 1: KIAA0430 protein



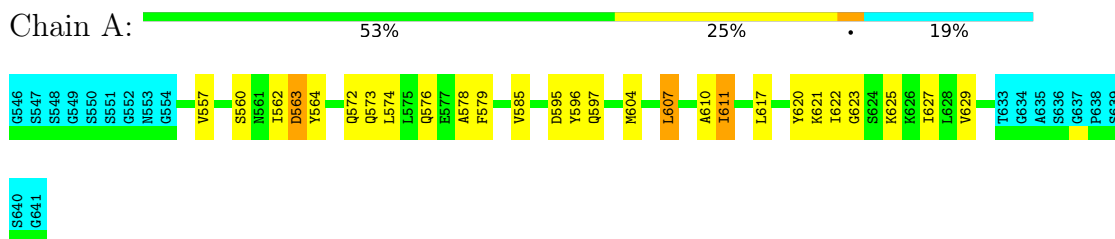
### 4.2.12 Score per residue for model 12

- Molecule 1: KIAA0430 protein



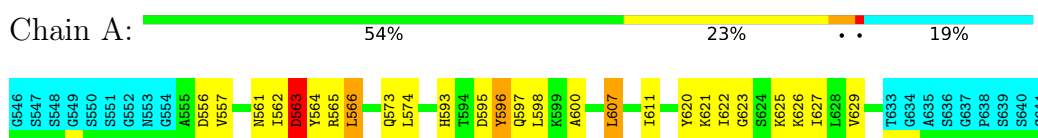
### 4.2.13 Score per residue for model 13

- Molecule 1: KIAA0430 protein



### 4.2.14 Score per residue for model 14

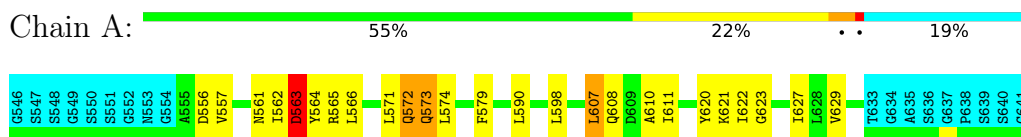
- Molecule 1: KIAA0430 protein





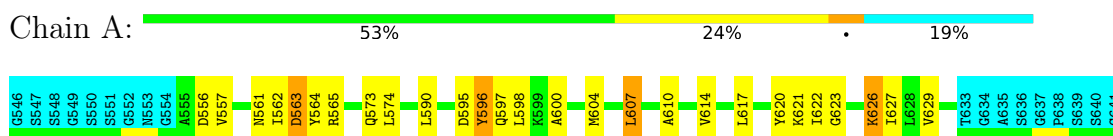
#### 4.2.15 Score per residue for model 15

- Molecule 1: KIAA0430 protein



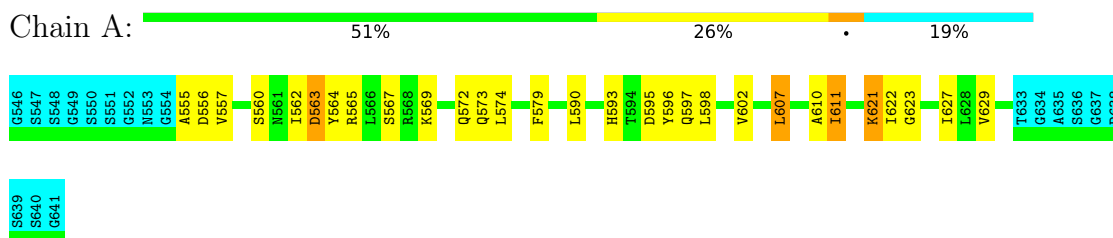
#### 4.2.16 Score per residue for model 16

- Molecule 1: KIAA0430 protein



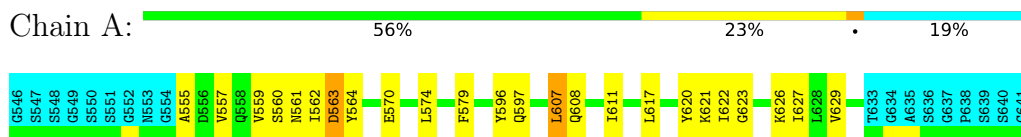
#### 4.2.17 Score per residue for model 17

- Molecule 1: KIAA0430 protein



#### 4.2.18 Score per residue for model 18

- Molecule 1: KIAA0430 protein



#### 4.2.19 Score per residue for model 19

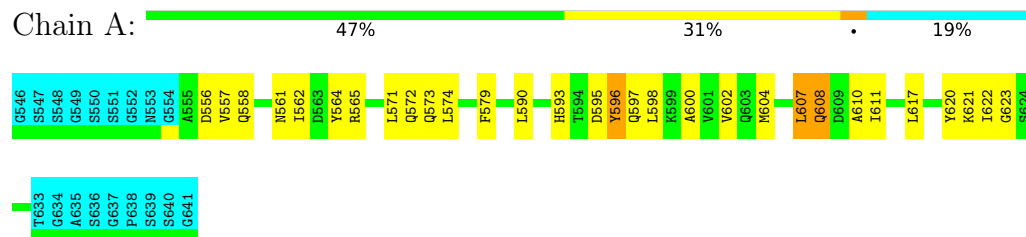
- Molecule 1: KIAA0430 protein





#### 4.2.20 Score per residue for model 20

- Molecule 1: KIAA0430 protein



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *torsion angle dynamics, restrained molecular 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
CYANA	refinement	2.0

No chemical shift data was provided.

## 6 Model quality

### 6.1 Standard geometry

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

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	618	645	642	22±3
All	All	12360	12900	12840	435

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 17.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:572:GLN:OE1	1:A:588:VAL:HG12	0.83	1.74	19	1
1:A:622:ILE:HD12	1:A:627:ILE:HD13	0.75	1.58	7	20
1:A:579:PHE:CE1	1:A:617:LEU:HD12	0.69	2.23	19	5
1:A:557:VAL:HG11	1:A:579:PHE:CZ	0.69	2.22	5	8
1:A:572:GLN:HB3	1:A:590:LEU:HD11	0.69	1.65	8	5
1:A:593:HIS:O	1:A:598:LEU:HD13	0.67	1.90	7	4
1:A:572:GLN:HG2	1:A:590:LEU:HD11	0.65	1.69	19	2
1:A:590:LEU:HD23	1:A:600:ALA:HB2	0.63	1.69	20	2
1:A:570:GLU:O	1:A:574:LEU:HD12	0.60	1.97	2	6
1:A:576:GLN:O	1:A:585:VAL:HG21	0.59	1.97	5	5
1:A:590:LEU:HD23	1:A:600:ALA:CB	0.59	2.27	20	1
1:A:561:ASN:ND2	1:A:625:LYS:HZ3	0.58	1.97	19	1
1:A:607:LEU:HD13	1:A:607:LEU:O	0.56	1.99	7	9
1:A:622:ILE:CD1	1:A:627:ILE:HD13	0.56	2.31	7	4

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:557:VAL:HG11	1:A:579:PHE:CE1	0.56	2.36	9	17
1:A:579:PHE:CD2	1:A:602:VAL:HG11	0.56	2.36	2	4
1:A:561:ASN:ND2	1:A:625:LYS:NZ	0.55	2.55	19	1
1:A:608:GLN:HA	1:A:611:ILE:HD12	0.54	1.78	12	10
1:A:591:SER:OG	1:A:598:LEU:HD12	0.54	2.02	6	2
1:A:557:VAL:CG1	1:A:629:VAL:CG1	0.54	2.86	15	13
1:A:622:ILE:CG2	1:A:623:GLY:N	0.53	2.71	10	20
1:A:579:PHE:CD1	1:A:617:LEU:HD12	0.53	2.38	19	5
1:A:563:ASP:OD2	1:A:566:LEU:HD12	0.53	2.04	7	1
1:A:573:GLN:CG	1:A:574:LEU:N	0.52	2.72	14	11
1:A:620:TYR:HB3	1:A:627:ILE:HD11	0.52	1.82	5	16
1:A:625:LYS:HZ3	1:A:625:LYS:HB3	0.52	1.65	20	1
1:A:610:ALA:O	1:A:614:VAL:HG23	0.52	2.05	16	7
1:A:579:PHE:CE2	1:A:602:VAL:HG21	0.52	2.40	2	5
1:A:562:ILE:CG2	1:A:571:LEU:HD22	0.52	2.35	5	4
1:A:620:TYR:CE2	1:A:622:ILE:HD11	0.51	2.40	19	7
1:A:555:ALA:HB2	1:A:607:LEU:HA	0.51	1.82	19	8
1:A:607:LEU:CD1	1:A:607:LEU:C	0.51	2.78	6	3
1:A:562:ILE:CD1	1:A:600:ALA:HB3	0.50	2.36	14	2
1:A:607:LEU:C	1:A:607:LEU:CD1	0.50	2.80	15	12
1:A:577:GLU:N	1:A:577:GLU:OE1	0.50	2.45	8	1
1:A:564:TYR:HA	1:A:598:LEU:HD22	0.50	1.84	11	1
1:A:607:LEU:C	1:A:607:LEU:HD13	0.49	2.28	5	8
1:A:595:ASP:O	1:A:597:GLN:N	0.49	2.46	14	13
1:A:562:ILE:O	1:A:564:TYR:N	0.49	2.46	4	8
1:A:620:TYR:C	1:A:620:TYR:CD1	0.49	2.84	6	13
1:A:572:GLN:NE2	1:A:588:VAL:HG12	0.49	2.23	10	1
1:A:614:VAL:HA	1:A:629:VAL:HG11	0.48	1.84	19	2
1:A:566:LEU:HD11	1:A:623:GLY:HA2	0.48	1.86	19	1
1:A:572:GLN:CD	1:A:588:VAL:HG12	0.48	2.28	10	1
1:A:570:GLU:O	1:A:574:LEU:CD1	0.48	2.62	2	2
1:A:607:LEU:O	1:A:607:LEU:HD13	0.48	2.08	15	3
1:A:563:ASP:OD1	1:A:563:ASP:N	0.48	2.43	10	1
1:A:596:TYR:CE2	1:A:597:GLN:HG3	0.48	2.43	17	4
1:A:562:ILE:CD1	1:A:600:ALA:CB	0.48	2.92	14	1
1:A:569:LYS:O	1:A:573:GLN:CG	0.48	2.62	7	2
1:A:619:ARG:NE	1:A:628:LEU:CD2	0.48	2.77	10	2
1:A:566:LEU:HD11	1:A:623:GLY:CA	0.48	2.39	4	5
1:A:563:ASP:OD1	1:A:566:LEU:HD12	0.47	2.08	15	2
1:A:578:ALA:HB1	1:A:617:LEU:CD2	0.47	2.39	13	3
1:A:625:LYS:HZ3	1:A:625:LYS:CB	0.47	2.22	20	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:595:ASP:O	1:A:598:LEU:N	0.47	2.47	17	2
1:A:561:ASN:ND2	1:A:626:LYS:O	0.47	2.48	8	2
1:A:593:HIS:CB	1:A:597:GLN:O	0.46	2.63	20	1
1:A:620:TYR:CD2	1:A:622:ILE:HD11	0.46	2.46	14	6
1:A:607:LEU:HD13	1:A:607:LEU:C	0.46	2.31	7	3
1:A:596:TYR:CD1	1:A:596:TYR:N	0.46	2.84	6	1
1:A:620:TYR:O	1:A:622:ILE:N	0.46	2.48	5	7
1:A:572:GLN:OE1	1:A:588:VAL:CG1	0.46	2.64	10	1
1:A:564:TYR:O	1:A:565:ARG:C	0.46	2.54	19	13
1:A:573:GLN:HG3	1:A:574:LEU:N	0.45	2.27	14	8
1:A:622:ILE:O	1:A:623:GLY:C	0.45	2.55	10	17
1:A:567:SER:O	1:A:570:GLU:N	0.45	2.49	3	1
1:A:622:ILE:HG22	1:A:623:GLY:N	0.45	2.27	10	7
1:A:593:HIS:O	1:A:598:LEU:CD1	0.45	2.64	7	1
1:A:561:ASN:CG	1:A:625:LYS:NZ	0.45	2.69	19	1
1:A:559:VAL:CG1	1:A:562:ILE:HD11	0.45	2.42	18	1
1:A:573:GLN:OE1	1:A:573:GLN:C	0.45	2.55	7	1
1:A:596:TYR:CD1	1:A:597:GLN:N	0.45	2.85	9	1
1:A:567:SER:O	1:A:568:ARG:C	0.45	2.55	11	1
1:A:621:LYS:NZ	1:A:623:GLY:O	0.44	2.51	4	1
1:A:578:ALA:HB1	1:A:617:LEU:HD22	0.44	1.88	13	1
1:A:579:PHE:CD1	1:A:613:ALA:HB1	0.44	2.48	5	1
1:A:620:TYR:CD1	1:A:620:TYR:C	0.44	2.87	18	1
1:A:562:ILE:O	1:A:598:LEU:HD23	0.43	2.13	16	1
1:A:562:ILE:O	1:A:563:ASP:C	0.43	2.55	14	1
1:A:576:GLN:HB2	1:A:588:VAL:HG21	0.43	1.90	1	1
1:A:563:ASP:OD2	1:A:566:LEU:CD1	0.43	2.66	7	1
1:A:617:LEU:O	1:A:620:TYR:N	0.43	2.52	8	4
1:A:610:ALA:O	1:A:611:ILE:C	0.43	2.56	11	10
1:A:595:ASP:O	1:A:596:TYR:C	0.43	2.57	10	5
1:A:595:ASP:C	1:A:597:GLN:N	0.43	2.72	2	4
1:A:562:ILE:HD12	1:A:599:LYS:CA	0.43	2.43	10	1
1:A:556:ASP:HB2	1:A:632:ALA:HB3	0.43	1.90	1	1
1:A:617:LEU:HB2	1:A:629:VAL:HG21	0.43	1.91	3	1
1:A:558:GLN:N	1:A:630:SER:O	0.43	2.51	20	3
1:A:563:ASP:OD1	1:A:563:ASP:C	0.42	2.58	19	1
1:A:617:LEU:O	1:A:618:HIS:C	0.42	2.58	8	1
1:A:626:LYS:N	1:A:626:LYS:HE3	0.42	2.30	16	1
1:A:579:PHE:CD1	1:A:617:LEU:CD1	0.42	3.02	19	1
1:A:620:TYR:CD2	1:A:622:ILE:CG1	0.42	3.03	8	1
1:A:564:TYR:HA	1:A:598:LEU:HD23	0.42	1.92	15	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:601:VAL:HG12	1:A:603:GLN:OE1	0.42	2.15	11	1
1:A:559:VAL:HG12	1:A:562:ILE:HD11	0.42	1.92	18	1
1:A:620:TYR:CE2	1:A:622:ILE:CG1	0.41	3.03	8	2
1:A:582:HIS:CE1	1:A:616:SER:CB	0.41	3.03	2	1
1:A:619:ARG:CD	1:A:628:LEU:CD2	0.41	2.98	10	1
1:A:582:HIS:CD2	1:A:613:ALA:HA	0.41	2.51	6	1
1:A:626:LYS:N	1:A:626:LYS:HE2	0.41	2.30	12	1
1:A:581:ARG:CZ	1:A:581:ARG:HB3	0.41	2.46	3	2
1:A:626:LYS:HE3	1:A:626:LYS:N	0.41	2.31	7	1
1:A:565:ARG:HB3	1:A:565:ARG:CZ	0.41	2.46	15	1
1:A:619:ARG:N	1:A:627:ILE:O	0.41	2.54	10	2
1:A:565:ARG:CZ	1:A:565:ARG:HB3	0.41	2.46	12	1
1:A:608:GLN:O	1:A:611:ILE:N	0.41	2.53	12	1
1:A:573:GLN:OE1	1:A:574:LEU:N	0.41	2.54	17	1
1:A:611:ILE:HA	1:A:631:LEU:HD11	0.40	1.93	12	1
1:A:620:TYR:CD2	1:A:622:ILE:HG13	0.40	2.50	12	1
1:A:564:TYR:CG	1:A:565:ARG:N	0.40	2.89	6	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	78/96 (81%)	67±2 (85±2%)	8±2 (11±2%)	3±1 (4±1%)	6	34
All	All	1560/1920 (81%)	1333 (85%)	170 (11%)	57 (4%)	6	34

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	621	LYS	20
1	A	563	ASP	14
1	A	596	TYR	10
1	A	611	ILE	9
1	A	566	LEU	3

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Mol	Chain	Res	Type	Models (Total)
1	A	623	GLY	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	68/78 (87%)	63±2 (92±2%)	5±2 (8±2%)	16 63
All	All	1360/1560 (87%)	1251 (92%)	109 (8%)	16 63

All 19 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	607	LEU	18
1	A	556	ASP	15
1	A	604	MET	14
1	A	563	ASP	14
1	A	626	LYS	9
1	A	561	ASN	8
1	A	560	SER	7
1	A	572	GLN	6
1	A	573	GLN	4
1	A	569	LYS	2
1	A	621	LYS	2
1	A	596	TYR	2
1	A	625	LYS	2
1	A	584	LYS	1
1	A	577	GLU	1
1	A	597	GLN	1
1	A	586	LYS	1
1	A	567	SER	1
1	A	608	GLN	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 [i](#)

There are no chain breaks in this entry.

## 7 Chemical shift validation

No chemical shift data were provided