



# Full wwPDB NMR Structure Validation Report ⓘ

Feb 20, 2018 – 08:30 am GMT

PDB ID : 2KHH  
Title : Structural requirements for the UBA domain of the mRNA export factor Mex67 to bind its specific targets, the transcription elongation Tho complex component Hpr1 and nucleoporin FxFG repeats  
Authors : Hobeika, M.; Brockmann, C.; Gruessing, F.; Neuhaus, D.; Divita, G.; Stewart, M.; Dargemont, C.  
Deposited on : 2009-04-06

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:

Cyrange : Kirchner and Güntert (2011)  
NmrClust : Kelley et al. (1996)  
MolProbity : 4.02b-467  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
RCI : v\_1n\_11\_5\_13\_A (Berjanski et al., 2005)  
PANAV : Wang et al. (2010)  
ShiftChecker : trunk30686  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk30686

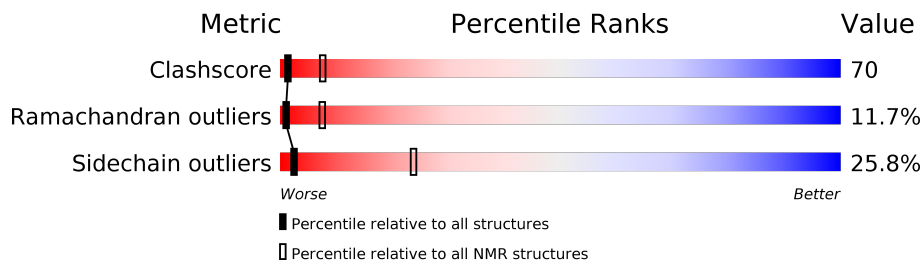
# 1 Overall quality at a glance

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	136279	12091
Ramachandran outliers	132675	10835
Sidechain outliers	132484	10811

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	59	 20% 56% 19% . .
2	B	9	 44% 56%

## 2 Ensemble composition and analysis

This entry contains 20 models. Model 20 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:544-A:599, B:4-B:7 (60)	0.11	20

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 2 single-model clusters were found.

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

### 3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 1060 atoms, of which 523 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called mRNA export factor MEX67.

Mol	Chain	Residues	Atoms					Trace	
			Total	C	H	N	O		S
1	A	57	936	303	465	79	87	2	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	541	GLY	-	EXPRESSION TAG	UNP Q99257
A	542	SER	-	EXPRESSION TAG	UNP Q99257

- Molecule 2 is a protein called FxFG.

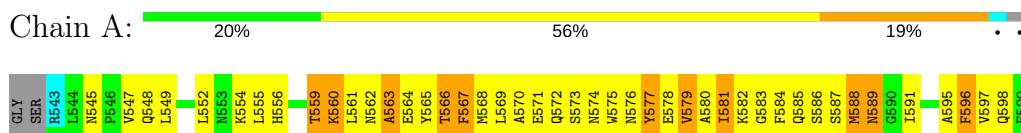
Mol	Chain	Residues	Atoms					Trace
			Total	C	H	N	O	
2	B	9	124	41	58	10	15	0

## 4 Residue-property plots [i](#)

### 4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA and DNA 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: mRNA export factor MEX67



- Molecule 2: FxFG

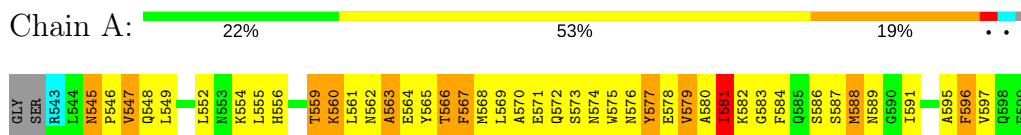


### 4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

#### 4.2.1 Score per residue for model 1

- Molecule 1: mRNA export factor MEX67

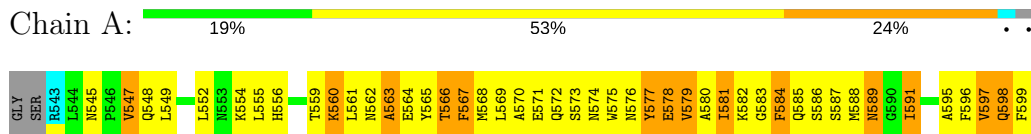


- Molecule 2: FxFG



### 4.2.2 Score per residue for model 2

- Molecule 1: mRNA export factor MEX67

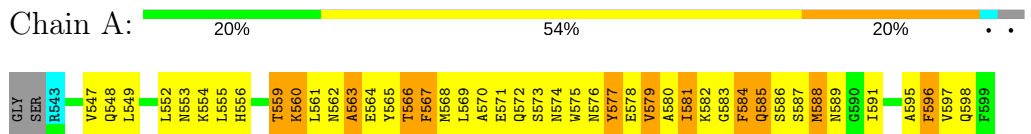


- Molecule 2: FxFG

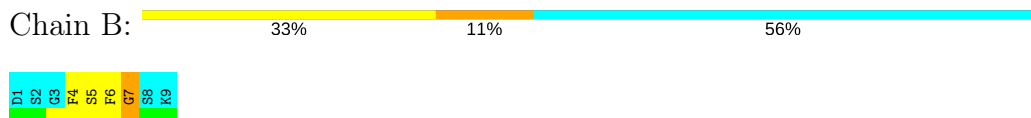


### 4.2.3 Score per residue for model 3

- Molecule 1: mRNA export factor MEX67

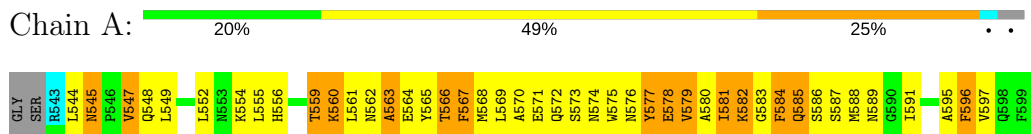


- Molecule 2: FxFG



### 4.2.4 Score per residue for model 4

- Molecule 1: mRNA export factor MEX67

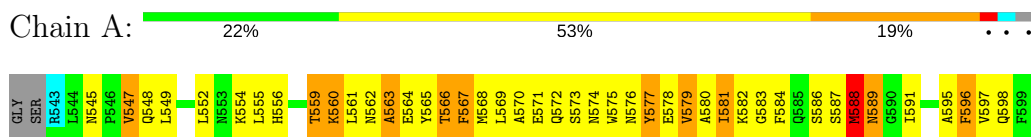


- Molecule 2: FxFG

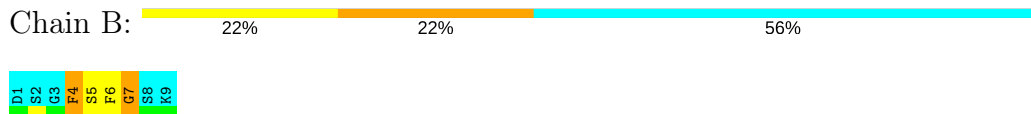


### 4.2.5 Score per residue for model 5

- Molecule 1: mRNA export factor MEX67

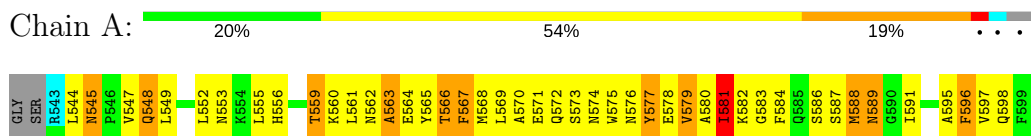


- Molecule 2: FxFG

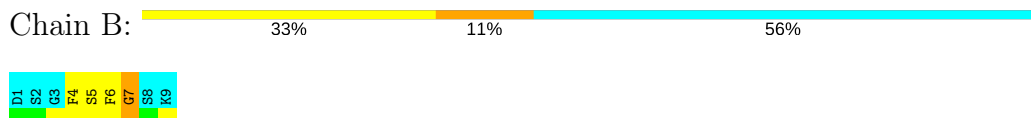


### 4.2.6 Score per residue for model 6

- Molecule 1: mRNA export factor MEX67

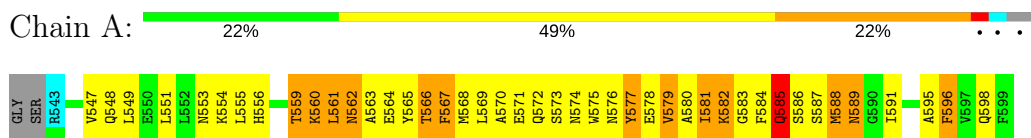


- Molecule 2: FxFG



### 4.2.7 Score per residue for model 7

- Molecule 1: mRNA export factor MEX67

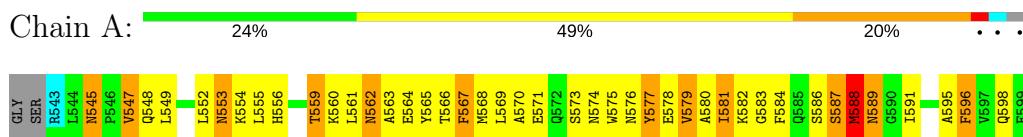


- Molecule 2: FxFG



### 4.2.8 Score per residue for model 8

- Molecule 1: mRNA export factor MEX67

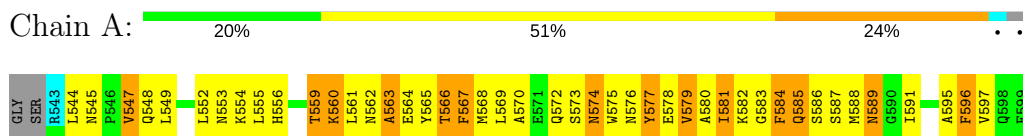


- Molecule 2: FxFG

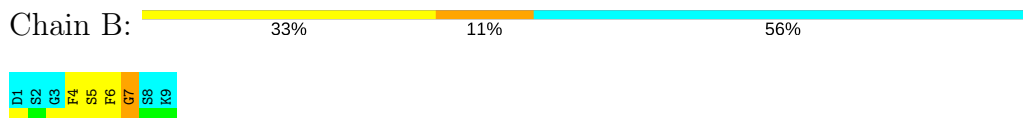


### 4.2.9 Score per residue for model 9

- Molecule 1: mRNA export factor MEX67

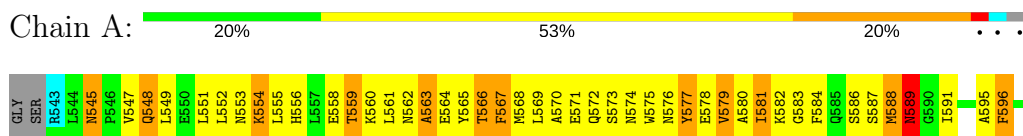


- Molecule 2: FxFG

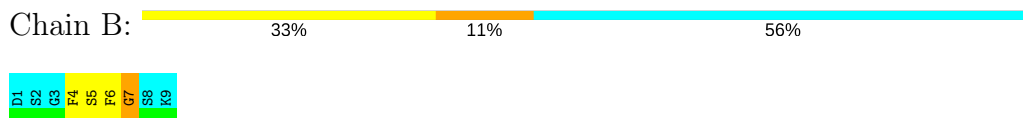


### 4.2.10 Score per residue for model 10

- Molecule 1: mRNA export factor MEX67



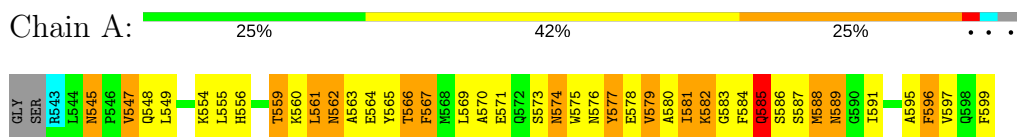
- Molecule 2: FxFG



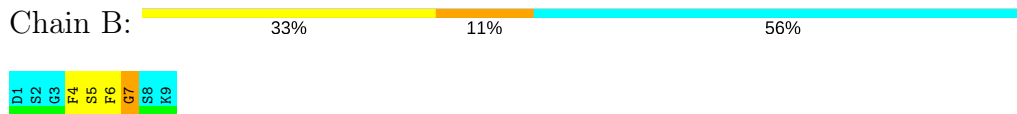


### 4.2.11 Score per residue for model 11

- Molecule 1: mRNA export factor MEX67

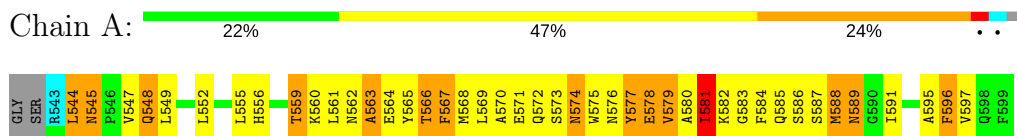


- Molecule 2: FxFG

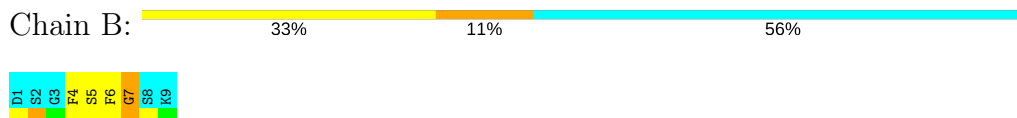


### 4.2.12 Score per residue for model 12

- Molecule 1: mRNA export factor MEX67

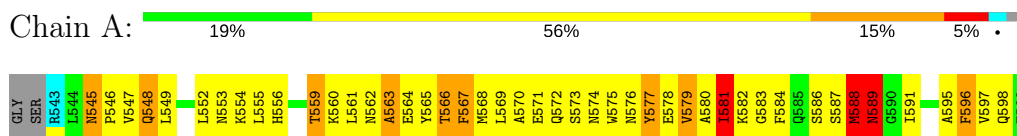


- Molecule 2: FxFG



### 4.2.13 Score per residue for model 13

- Molecule 1: mRNA export factor MEX67

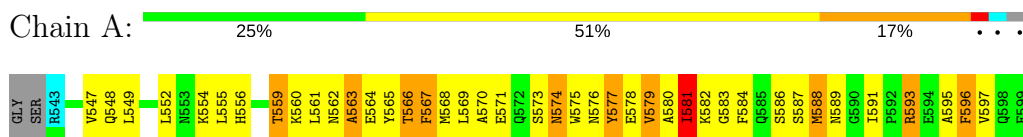


- Molecule 2: FxFG

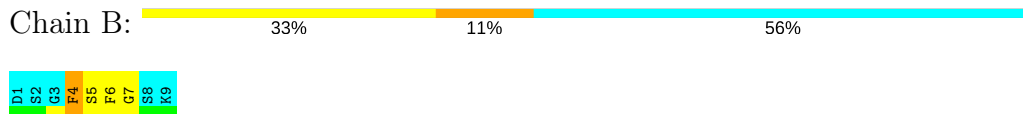


#### 4.2.14 Score per residue for model 14

- Molecule 1: mRNA export factor MEX67

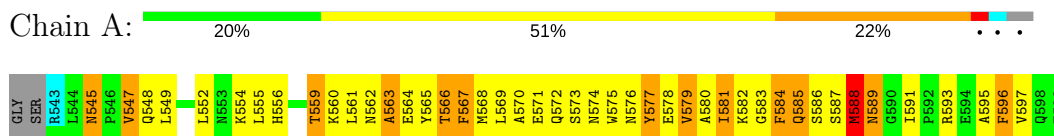


- Molecule 2: FxFG



#### 4.2.15 Score per residue for model 15

- Molecule 1: mRNA export factor MEX67

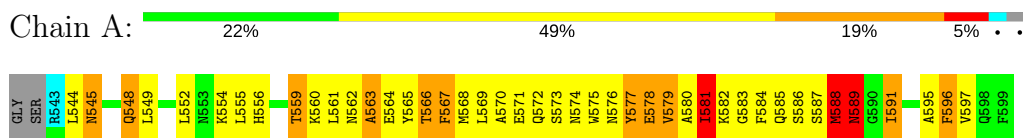


- Molecule 2: FxFG

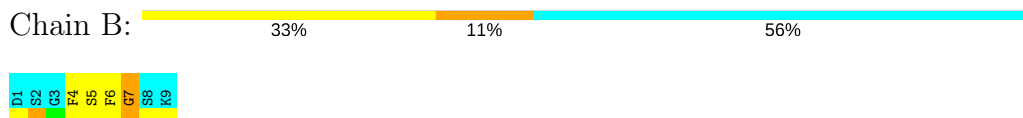


#### 4.2.16 Score per residue for model 16

- Molecule 1: mRNA export factor MEX67

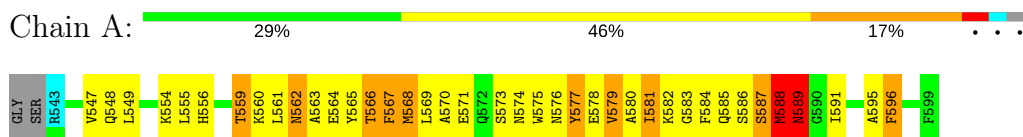


- Molecule 2: FxFG

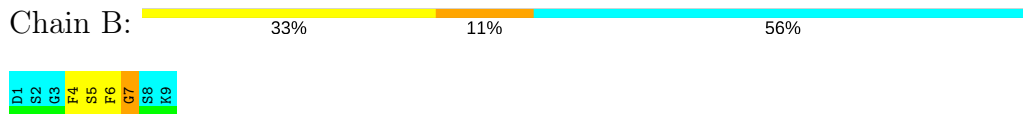


### 4.2.17 Score per residue for model 17

- Molecule 1: mRNA export factor MEX67

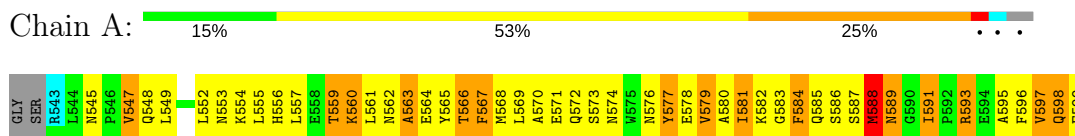


- Molecule 2: FxFG



### 4.2.18 Score per residue for model 18

- Molecule 1: mRNA export factor MEX67

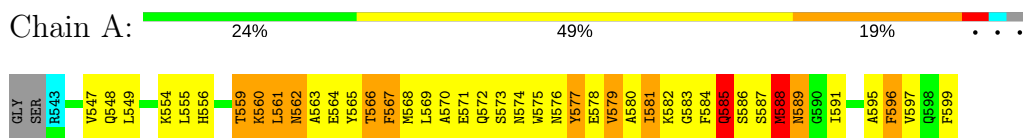


- Molecule 2: FxFG

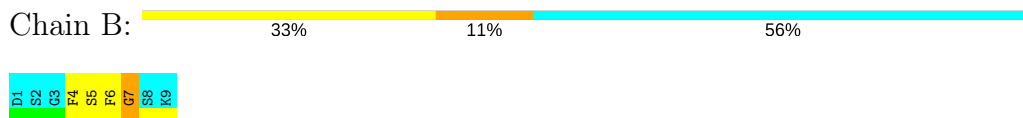


### 4.2.19 Score per residue for model 19

- Molecule 1: mRNA export factor MEX67

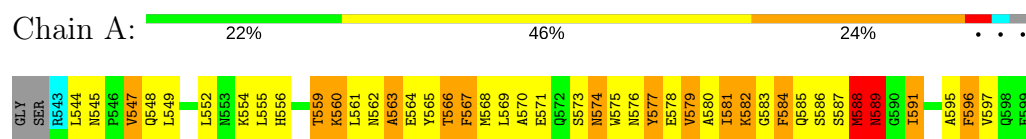


- Molecule 2: FxFG



#### 4.2.20 Score per residue for model 20 (medoid)

- Molecule 1: mRNA export factor MEX67



- Molecule 2: FxFG



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *simulated annealing*.

Of the 200 calculated structures, 20 were deposited, based on the following criterion: *structures with the lowest energy*.

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

Software name	Classification	Version
X-PLOR NIH	structure solution	
TALOS	structure solution	
TALOS	refinement	

No chemical shift data was provided. No validations of the models with respect to experimental NMR restraints is performed at this time.

## 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	460	452	451	64±3
2	B	32	26	26	10±1
All	All	9840	9560	9540	1352

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 70.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:561:LEU:O	1:A:561:LEU:HD12	0.91	1.65	16	10
1:A:561:LEU:HD12	1:A:561:LEU:O	0.90	1.65	10	10
1:A:555:LEU:O	1:A:559:THR:HG23	0.82	1.75	1	9
1:A:582:LYS:O	1:A:586:SER:N	0.77	2.18	8	20
1:A:559:THR:OG1	1:A:561:LEU:HD23	0.77	1.80	10	18
1:A:561:LEU:C	1:A:595:ALA:O	0.77	2.23	6	19
1:A:545:ASN:OD1	1:A:545:ASN:N	0.76	2.18	12	3
1:A:569:LEU:HD12	2:B:6:PHE:CG	0.74	2.18	18	18
1:A:579:VAL:O	1:A:583:GLY:N	0.73	2.21	5	20
1:A:560:LYS:O	1:A:597:VAL:HG22	0.73	1.83	18	2
1:A:569:LEU:HD12	2:B:6:PHE:CD1	0.73	2.18	18	20
1:A:587:SER:O	1:A:589:ASN:N	0.72	2.22	16	14
1:A:569:LEU:HD11	1:A:584:PHE:N	0.72	2.00	18	20

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:596:PHE:CG	1:A:596:PHE:O	0.71	2.43	7	8
1:A:561:LEU:O	1:A:561:LEU:CD1	0.71	2.39	8	9
1:A:561:LEU:O	1:A:562:ASN:O	0.71	2.09	17	5
1:A:596:PHE:O	1:A:596:PHE:CG	0.70	2.44	10	10
1:A:549:LEU:C	1:A:549:LEU:HD13	0.70	2.07	10	10
1:A:577:TYR:O	1:A:581:ILE:HG12	0.69	1.87	4	20
1:A:549:LEU:HD13	1:A:549:LEU:C	0.69	2.08	13	10
1:A:561:LEU:CD1	1:A:561:LEU:O	0.69	2.41	7	11
1:A:577:TYR:CD1	1:A:581:ILE:HD11	0.66	2.25	15	20
1:A:584:PHE:CG	1:A:585:GLN:N	0.65	2.63	18	9
1:A:584:PHE:C	1:A:584:PHE:CD1	0.64	2.71	2	5
2:B:4:PHE:CD2	2:B:5:SER:N	0.63	2.67	14	12
1:A:581:ILE:H	1:A:581:ILE:CD1	0.63	2.06	18	16
1:A:581:ILE:H	1:A:581:ILE:HD13	0.63	1.53	18	14
1:A:559:THR:OG1	1:A:561:LEU:CD2	0.62	2.47	10	13
1:A:576:ASN:O	1:A:577:TYR:CB	0.61	2.48	2	20
1:A:555:LEU:O	1:A:559:THR:HG22	0.61	1.95	2	4
1:A:545:ASN:N	1:A:545:ASN:OD1	0.61	2.33	10	2
1:A:587:SER:O	1:A:588:MET:C	0.61	2.39	18	20
1:A:565:TYR:CD2	1:A:595:ALA:HB2	0.61	2.31	1	19
1:A:581:ILE:HD13	1:A:581:ILE:N	0.60	2.10	13	9
1:A:555:LEU:HD11	1:A:580:ALA:HB1	0.60	1.73	18	20
1:A:581:ILE:N	1:A:581:ILE:HD13	0.60	2.10	11	11
1:A:553:ASN:HD22	1:A:553:ASN:N	0.60	1.92	8	1
1:A:561:LEU:CG	1:A:561:LEU:O	0.60	2.50	7	2
1:A:563:ALA:O	1:A:566:THR:N	0.60	2.35	20	16
1:A:581:ILE:CD1	1:A:581:ILE:H	0.60	2.08	15	4
1:A:581:ILE:HD13	1:A:581:ILE:H	0.59	1.56	11	6
1:A:569:LEU:CD1	2:B:6:PHE:CG	0.59	2.85	2	19
1:A:569:LEU:HD12	2:B:6:PHE:CE1	0.59	2.33	17	20
1:A:570:ALA:O	1:A:575:TRP:CG	0.58	2.57	11	19
2:B:4:PHE:CG	2:B:5:SER:N	0.58	2.71	17	16
1:A:553:ASN:N	1:A:553:ASN:ND2	0.58	2.51	8	3
2:B:4:PHE:CE1	2:B:5:SER:O	0.57	2.58	19	8
1:A:580:ALA:O	1:A:583:GLY:N	0.57	2.38	18	20
1:A:588:MET:O	1:A:589:ASN:ND2	0.57	2.37	10	2
1:A:545:ASN:ND2	1:A:548:GLN:OE1	0.57	2.38	13	4
1:A:561:LEU:O	1:A:561:LEU:CG	0.57	2.53	8	3
1:A:596:PHE:CD1	1:A:596:PHE:C	0.56	2.78	15	10
2:B:4:PHE:CE2	2:B:5:SER:O	0.56	2.59	17	12
1:A:597:VAL:O	1:A:597:VAL:HG23	0.56	2.00	18	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:596:PHE:C	1:A:596:PHE:CD1	0.56	2.78	8	8
1:A:584:PHE:CD1	1:A:584:PHE:C	0.56	2.79	3	4
1:A:563:ALA:O	1:A:564:GLU:C	0.55	2.44	15	20
1:A:583:GLY:O	1:A:586:SER:HB3	0.55	2.02	9	20
1:A:596:PHE:CD1	1:A:596:PHE:O	0.55	2.60	19	9
1:A:569:LEU:CD1	2:B:6:PHE:CD1	0.54	2.90	19	20
1:A:577:TYR:O	1:A:580:ALA:N	0.54	2.41	1	20
1:A:552:LEU:O	1:A:556:HIS:N	0.54	2.38	18	15
1:A:581:ILE:O	1:A:585:GLN:NE2	0.54	2.41	7	3
1:A:567:PHE:CE2	1:A:571:GLU:OE2	0.54	2.61	1	1
1:A:589:ASN:ND2	1:A:589:ASN:O	0.53	2.42	20	4
1:A:573:SER:O	1:A:574:ASN:ND2	0.53	2.42	4	8
2:B:4:PHE:CD1	2:B:5:SER:N	0.53	2.76	7	8
1:A:556:HIS:O	1:A:556:HIS:CG	0.53	2.61	15	12
1:A:581:ILE:CD1	1:A:581:ILE:N	0.53	2.72	13	8
1:A:567:PHE:CZ	1:A:571:GLU:OE1	0.53	2.61	11	16
1:A:596:PHE:O	1:A:596:PHE:CD1	0.53	2.62	11	9
1:A:567:PHE:O	1:A:570:ALA:N	0.53	2.42	8	20
1:A:581:ILE:N	1:A:581:ILE:CD1	0.53	2.72	9	7
1:A:588:MET:C	1:A:588:MET:SD	0.52	2.87	19	7
1:A:556:HIS:CG	1:A:556:HIS:O	0.52	2.61	16	7
1:A:597:VAL:O	1:A:598:GLN:CB	0.52	2.57	2	6
1:A:588:MET:SD	1:A:588:MET:O	0.52	2.68	5	1
1:A:570:ALA:O	1:A:575:TRP:CD2	0.52	2.63	7	14
1:A:561:LEU:O	1:A:562:ASN:C	0.52	2.48	11	5
1:A:567:PHE:CE1	1:A:571:GLU:OE1	0.52	2.63	2	9
1:A:556:HIS:O	1:A:560:LYS:CG	0.51	2.58	16	15
1:A:569:LEU:HD12	2:B:6:PHE:CD2	0.51	2.40	18	15
2:B:6:PHE:O	2:B:7:GLY:C	0.50	2.49	17	4
1:A:569:LEU:O	1:A:573:SER:OG	0.50	2.28	15	20
1:A:588:MET:O	1:A:588:MET:SD	0.50	2.69	20	2
1:A:565:TYR:O	1:A:568:MET:N	0.50	2.45	3	19
1:A:545:ASN:ND2	1:A:548:GLN:CD	0.50	2.65	16	3
1:A:555:LEU:O	1:A:559:THR:CG2	0.50	2.60	3	9
1:A:549:LEU:C	1:A:549:LEU:CD1	0.49	2.80	16	10
1:A:580:ALA:O	1:A:581:ILE:C	0.49	2.51	18	20
1:A:559:THR:HB	1:A:584:PHE:CG	0.49	2.42	19	3
1:A:586:SER:O	1:A:588:MET:N	0.48	2.46	8	2
1:A:588:MET:SD	1:A:588:MET:C	0.48	2.92	16	2
1:A:559:THR:OG1	1:A:561:LEU:CG	0.48	2.61	10	9
1:A:589:ASN:O	1:A:589:ASN:ND2	0.48	2.47	6	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:545:ASN:O	1:A:547:VAL:N	0.48	2.47	1	10
1:A:583:GLY:O	1:A:586:SER:CB	0.47	2.62	5	8
1:A:567:PHE:CZ	1:A:571:GLU:OE2	0.47	2.67	1	1
1:A:549:LEU:CD1	1:A:549:LEU:C	0.47	2.81	11	10
1:A:586:SER:C	1:A:588:MET:N	0.47	2.68	8	4
1:A:561:LEU:O	1:A:595:ALA:O	0.47	2.32	10	13
1:A:545:ASN:CB	1:A:546:PRO:CD	0.47	2.92	13	1
2:B:6:PHE:O	2:B:7:GLY:O	0.47	2.33	4	10
1:A:553:ASN:ND2	1:A:553:ASN:N	0.46	2.60	6	1
1:A:576:ASN:O	1:A:577:TYR:HB2	0.46	2.11	18	15
1:A:565:TYR:CG	1:A:595:ALA:CB	0.46	2.98	11	1
1:A:567:PHE:CD1	1:A:567:PHE:C	0.46	2.89	13	3
1:A:553:ASN:N	1:A:553:ASN:HD22	0.46	2.08	6	2
1:A:544:LEU:HD11	1:A:548:GLN:NE2	0.46	2.26	12	1
1:A:559:THR:O	1:A:560:LYS:C	0.45	2.55	7	3
1:A:569:LEU:HD21	1:A:580:ALA:O	0.45	2.12	5	6
1:A:556:HIS:O	1:A:560:LYS:HA	0.45	2.12	11	4
1:A:567:PHE:C	1:A:567:PHE:CD1	0.45	2.90	5	9
1:A:584:PHE:C	1:A:586:SER:H	0.45	2.14	7	5
1:A:572:GLN:OE1	2:B:4:PHE:O	0.45	2.35	15	13
1:A:573:SER:O	1:A:574:ASN:CG	0.45	2.55	4	3
1:A:561:LEU:CA	1:A:595:ALA:O	0.45	2.64	15	11
1:A:591:ILE:HD12	1:A:596:PHE:CE2	0.45	2.47	2	2
1:A:577:TYR:CE1	1:A:581:ILE:HD11	0.45	2.47	3	11
1:A:560:LYS:O	1:A:597:VAL:CG2	0.45	2.65	15	11
1:A:582:LYS:O	1:A:586:SER:HB2	0.45	2.12	11	3
1:A:559:THR:O	1:A:561:LEU:N	0.45	2.49	5	5
1:A:598:GLN:O	1:A:599:PHE:CD1	0.44	2.70	2	2
1:A:584:PHE:C	1:A:586:SER:N	0.44	2.71	17	2
1:A:577:TYR:O	1:A:580:ALA:HB3	0.44	2.12	18	14
1:A:588:MET:O	1:A:589:ASN:OD1	0.44	2.35	15	2
1:A:577:TYR:O	1:A:578:GLU:C	0.44	2.56	2	20
1:A:569:LEU:O	1:A:573:SER:CB	0.43	2.66	13	19
1:A:557:LEU:CD2	1:A:557:LEU:N	0.43	2.81	18	1
1:A:588:MET:O	1:A:589:ASN:CG	0.43	2.56	19	1
1:A:578:GLU:O	1:A:578:GLU:OE1	0.43	2.36	2	1
1:A:559:THR:OG1	1:A:584:PHE:CG	0.43	2.65	2	1
1:A:561:LEU:O	1:A:561:LEU:HG	0.43	2.12	11	1
1:A:570:ALA:O	1:A:575:TRP:CD1	0.43	2.71	10	1
1:A:562:ASN:O	1:A:563:ALA:C	0.43	2.57	11	1
1:A:544:LEU:CD2	1:A:552:LEU:HD11	0.43	2.43	16	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:586:SER:C	1:A:588:MET:H	0.43	2.16	8	2
1:A:560:LYS:O	1:A:597:VAL:HG23	0.43	2.14	11	2
1:A:584:PHE:CD2	1:A:585:GLN:CD	0.43	2.92	16	2
1:A:555:LEU:HD21	1:A:569:LEU:HD22	0.43	1.90	18	2
1:A:574:ASN:OD1	1:A:574:ASN:O	0.43	2.36	4	1
1:A:589:ASN:OD1	1:A:589:ASN:O	0.43	2.37	9	1
1:A:578:GLU:OE1	1:A:578:GLU:CA	0.42	2.67	2	1
1:A:574:ASN:O	1:A:574:ASN:OD1	0.42	2.37	10	1
1:A:567:PHE:C	1:A:569:LEU:N	0.42	2.69	7	5
1:A:561:LEU:HG	1:A:561:LEU:O	0.42	2.13	7	2
1:A:577:TYR:O	1:A:581:ILE:CG1	0.42	2.64	4	8
1:A:561:LEU:HD11	1:A:566:THR:HA	0.42	1.90	10	4
1:A:561:LEU:CD1	1:A:565:TYR:CB	0.42	2.97	11	1
1:A:545:ASN:OD1	1:A:548:GLN:CD	0.42	2.57	12	1
1:A:556:HIS:O	1:A:560:LYS:HG3	0.42	2.14	4	7
1:A:569:LEU:HD12	2:B:6:PHE:CZ	0.42	2.50	11	2
2:B:4:PHE:CE2	2:B:6:PHE:CZ	0.42	3.07	8	2
1:A:555:LEU:HD11	1:A:580:ALA:CB	0.42	2.44	6	5
1:A:578:GLU:OE1	1:A:578:GLU:O	0.42	2.38	4	1
1:A:551:LEU:O	1:A:551:LEU:HD12	0.42	2.14	10	2
2:B:4:PHE:CE1	2:B:6:PHE:CZ	0.42	3.08	7	2
1:A:583:GLY:O	1:A:584:PHE:C	0.41	2.59	9	5
1:A:572:GLN:CD	2:B:4:PHE:O	0.41	2.58	19	2
1:A:578:GLU:OE2	1:A:582:LYS:NZ	0.41	2.40	12	1
1:A:555:LEU:HD23	1:A:566:THR:O	0.41	2.15	7	2
1:A:571:GLU:HA	1:A:575:TRP:NE1	0.41	2.30	6	5
1:A:560:LYS:CB	1:A:599:PHE:CG	0.41	3.03	11	2
1:A:555:LEU:CD1	1:A:580:ALA:HB1	0.41	2.45	9	2
1:A:593:ARG:H	1:A:593:ARG:CD	0.41	2.28	18	1
1:A:581:ILE:O	1:A:585:GLN:HG2	0.41	2.15	17	1
1:A:562:ASN:N	1:A:595:ALA:O	0.41	2.54	19	1
1:A:583:GLY:O	1:A:586:SER:N	0.41	2.47	9	1
1:A:554:LYS:O	1:A:558:GLU:N	0.41	2.54	10	1
1:A:588:MET:HA	1:A:591:ILE:HD11	0.41	1.93	20	2
1:A:562:ASN:C	1:A:562:ASN:OD1	0.41	2.59	11	1
1:A:544:LEU:HD11	1:A:548:GLN:HE21	0.41	1.73	12	1
1:A:569:LEU:HG	2:B:6:PHE:CG	0.41	2.51	17	1
2:B:4:PHE:CZ	2:B:5:SER:O	0.40	2.73	2	1
1:A:558:GLU:C	1:A:558:GLU:OE1	0.40	2.59	10	1
1:A:567:PHE:O	1:A:568:MET:C	0.40	2.60	8	2
1:A:584:PHE:CD2	1:A:585:GLN:NE2	0.40	2.90	18	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:556:HIS:CD2	1:A:556:HIS:O	0.40	2.74	17	1
1:A:565:TYR:CG	1:A:595:ALA:HB2	0.40	2.51	11	1
1:A:566:THR:CG2	1:A:567:PHE:N	0.40	2.84	13	1
1:A:565:TYR:O	1:A:566:THR:C	0.40	2.59	20	2
1:A:567:PHE:CD1	1:A:568:MET:N	0.40	2.89	10	1
1:A:593:ARG:CD	1:A:593:ARG:H	0.40	2.27	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	55/59 (93%)	38±2 (69±4%)	11±2 (20±3%)	6±1 (11±2%)	1	8
2	B	4/9 (44%)	2±0 (44±11%)	1±1 (36±17%)	1±1 (20±15%)	0	2
All	All	1180/1360 (87%)	791 (67%)	251 (21%)	138 (12%)	1	7

All 15 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	577	TYR	20
1	A	562	ASN	20
1	A	589	ASN	20
1	A	588	MET	17
1	A	563	ALA	15
2	B	7	GLY	14
1	A	560	LYS	9
1	A	581	ILE	6
1	A	544	LEU	5
1	A	585	GLN	3
2	B	4	PHE	2
1	A	598	GLN	2
1	A	597	VAL	2
1	A	587	SER	2
1	A	546	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	50/52 (96%)	36±2 (73±3%)	14±2 (27±3%)	<b>2</b>   21
2	B	3/7 (43%)	3±0 (98±7%)	0±0 (2±7%)	66   <b>95</b>
All	All	1060/1180 (90%)	786 (74%)	274 (26%)	<b>2</b>   24

All 25 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	548	GLN	20
1	A	566	THR	20
1	A	581	ILE	20
1	A	579	VAL	20
1	A	567	PHE	20
1	A	591	ILE	20
1	A	559	THR	19
1	A	547	VAL	19
1	A	596	PHE	18
1	A	554	LYS	18
1	A	574	ASN	17
1	A	545	ASN	10
1	A	588	MET	9
1	A	585	GLN	8
1	A	584	PHE	7
1	A	553	ASN	5
1	A	589	ASN	5
1	A	578	GLU	4
1	A	582	LYS	4
1	A	593	ARG	3
1	A	561	LEU	3
1	A	598	GLN	2
1	A	568	MET	1
2	B	5	SER	1
1	A	560	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 carbohydrates 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