



# Full wwPDB NMR Structure Validation Report ⓘ

Oct 23, 2021 – 05:32 PM EDT

PDB ID : 1APJ  
Title : NMR STUDY OF THE TRANSFORMING GROWTH FACTOR BETA BINDING PROTEIN-LIKE DOMAIN (TB MODULE/8-CYS DOMAIN), NMR, 21 STRUCTURES  
Authors : Yuan, X.; Downing, A.K.; Knott, V.; Handford, P.A.  
Deposited on : 1997-07-22

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 : 2.23.2  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.23.2

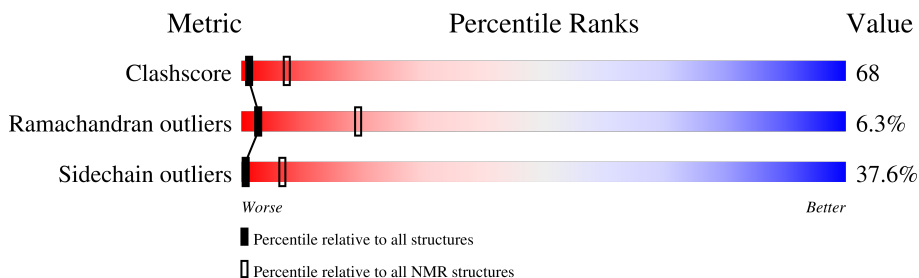
# 1 Overall quality at a glance

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	74	

## 2 Ensemble composition and analysis i

This entry contains 21 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:2057-A:2115 (59)	0.35	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 2 single-model clusters were found.

Cluster number	Models
1	2, 5, 7, 9, 12, 14, 15, 19, 21
2	1, 3, 4, 11, 16, 17
3	18, 20
4	6, 13
Single-model clusters	8; 10

### 3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1063 atoms, of which 508 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called FIBRILLIN.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	74	1063	338	508	95	113	9	0

There are 2 discrepancies between the modelled and reference sequences:

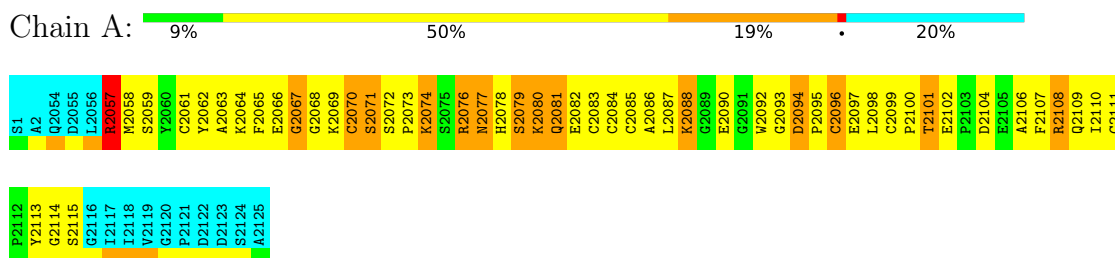
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	SER	ARG	engineered mutation	UNP P35555
A	2	ALA	CYS	engineered mutation	UNP P35555

## 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: FIBRILLIN

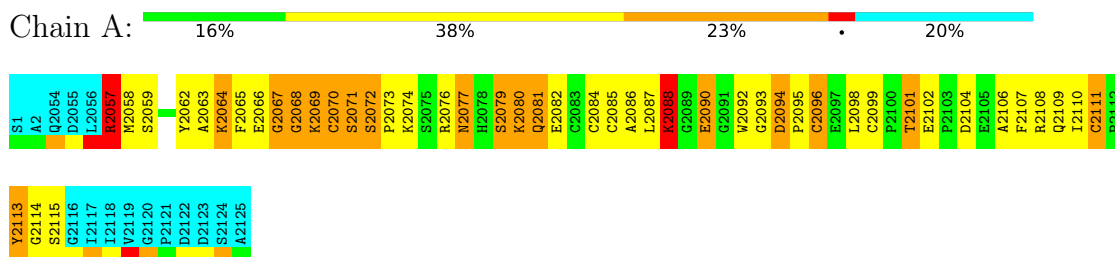


### 4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

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

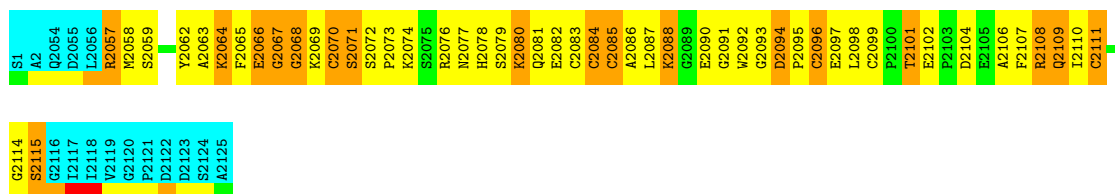
- Molecule 1: FIBRILLIN



#### 4.2.2 Score per residue for model 2

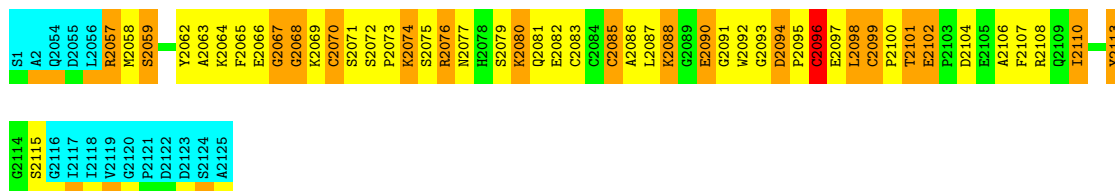
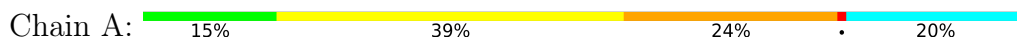
- Molecule 1: FIBRILLIN





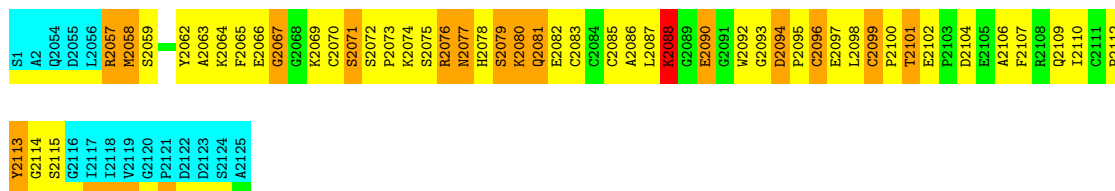
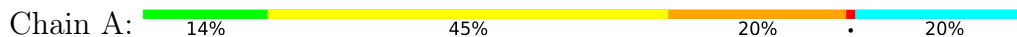
### 4.2.3 Score per residue for model 3

- Molecule 1: FIBRILLIN



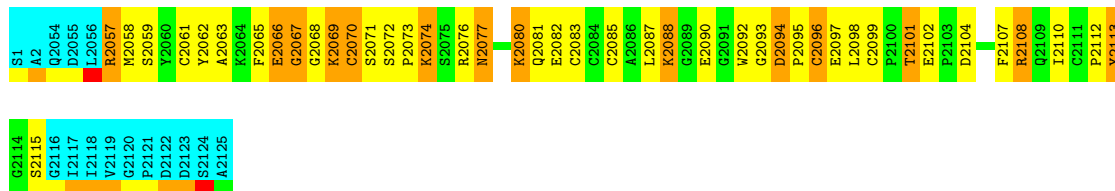
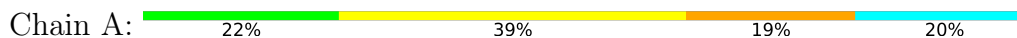
### 4.2.4 Score per residue for model 4

- Molecule 1: FIBRILLIN



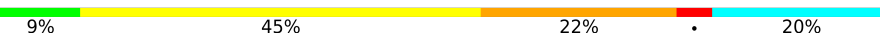
### 4.2.5 Score per residue for model 5

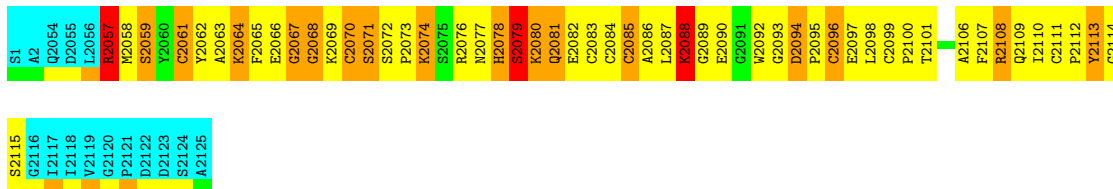
- Molecule 1: FIBRILLIN



### 4.2.6 Score per residue for model 6

- Molecule 1: FIBRILLIN

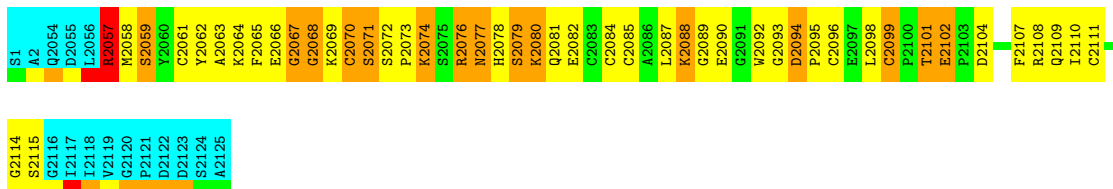
Chain A: 



### 4.2.7 Score per residue for model 7


- Molecule 1: FIBRILLIN

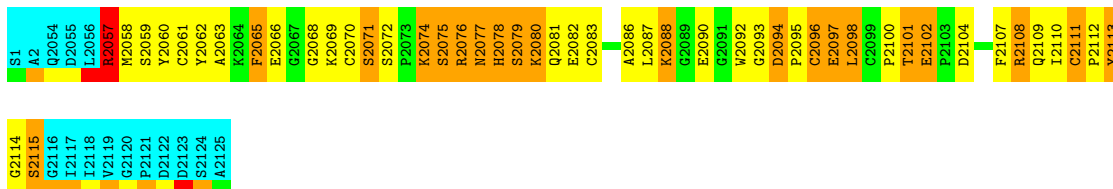
Chain A: 



### 4.2.8 Score per residue for model 8

- Molecule 1: FIBRILLIN

Chain A: 

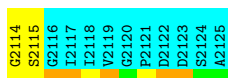


### 4.2.9 Score per residue for model 9

- Molecule 1: FIBRILLIN

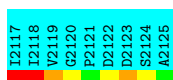
Chain A: 





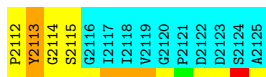
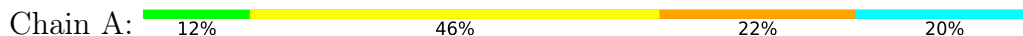
#### 4.2.10 Score per residue for model 10

- Molecule 1: FIBRILLIN



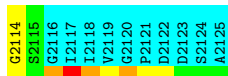
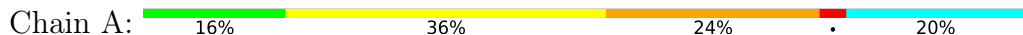
#### 4.2.11 Score per residue for model 11

- Molecule 1: FIBRILLIN



#### 4.2.12 Score per residue for model 12

- Molecule 1: FIBRILLIN

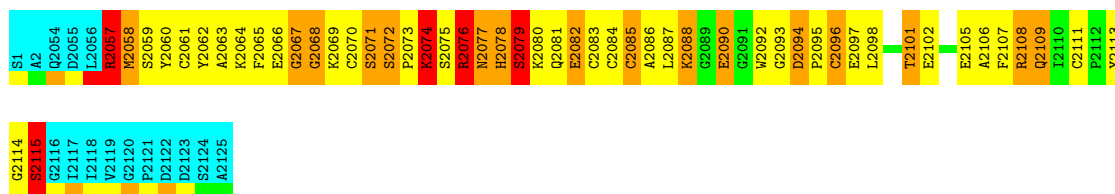


#### 4.2.13 Score per residue for model 13

- Molecule 1: FIBRILLIN



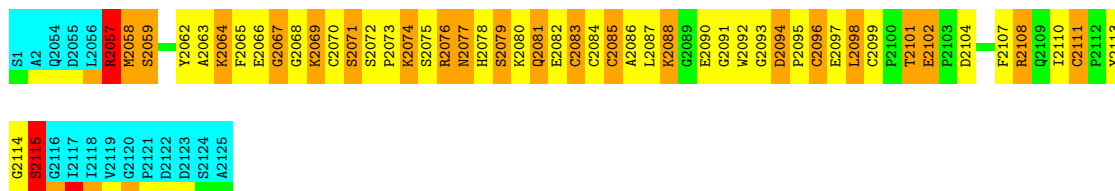




#### 4.2.14 Score per residue for model 14

- Molecule 1: FIBRILLIN

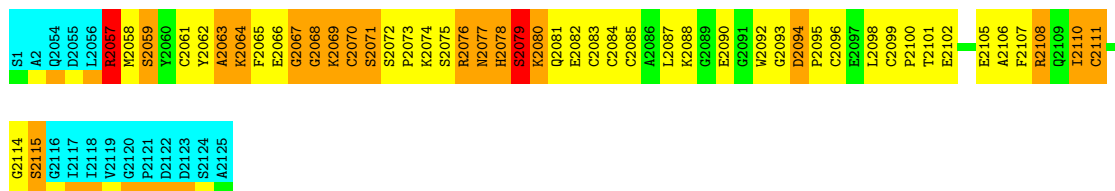
Chain A: 12% 36% 28% • 20%



#### 4.2.15 Score per residue for model 15

- Molecule 1: FIBRILLIN

Chain A: 14% 41% 23% • 20%



#### 4.2.16 Score per residue for model 16

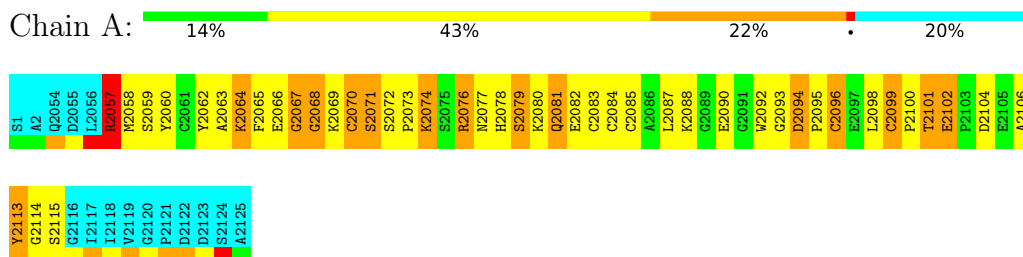
- Molecule 1: FIBRILLIN

Chain A: 12% 41% 23% • 20%



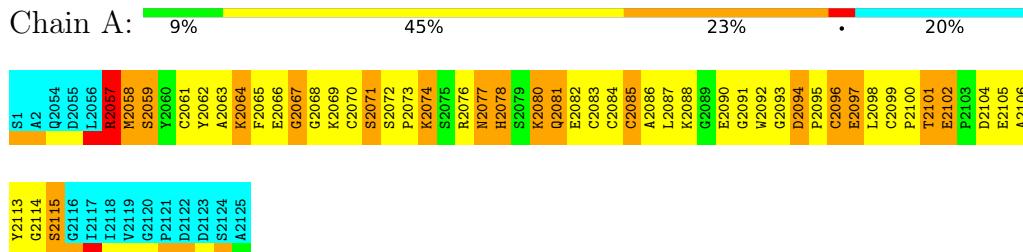
### 4.2.17 Score per residue for model 17

- Molecule 1: FIBRILLIN



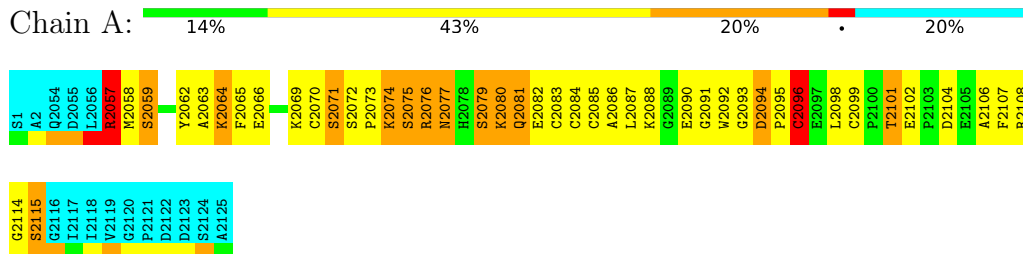
### 4.2.18 Score per residue for model 18

- Molecule 1: FIBRILLIN



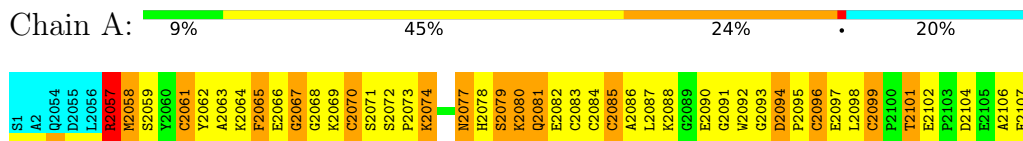
### 4.2.19 Score per residue for model 19

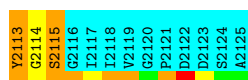
- Molecule 1: FIBRILLIN



### 4.2.20 Score per residue for model 20

- Molecule 1: FIBRILLIN

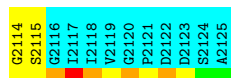




#### 4.2.21 Score per residue for model 21

##### ● Molecule 1: FIBRILLIN

Chain A: 11% 42% 24% • 20%



## 5 Refinement protocol and experimental data overview

Of the ? calculated structures, 21 were deposited, based on the following criterion: ?.

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

Software name	Classification	Version
X-PLOR	refinement	3.1

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.

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	Chirality	Planarity
1	A	0.0±0.0	2.6±0.6
All	All	0	54

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

All unique planar outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Group	Models (Total)
1	A	2057	ARG	Sidechain	20
1	A	2076	ARG	Sidechain	19
1	A	2108	ARG	Sidechain	15

### 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	453	411	411	59±10
All	All	9513	8631	8631	1240

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 68.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2082:GLU:OE2	1:A:2087:LEU:HD11	0.91	1.63	13	2
1:A:2082:GLU:OE1	1:A:2086:ALA:HB3	0.88	1.68	13	1
1:A:2082:GLU:O	1:A:2086:ALA:HB3	0.87	1.70	20	9
1:A:2081:GLN:HG2	1:A:2110:ILE:HG22	0.83	1.48	3	10
1:A:2058:MET:HE3	1:A:2058:MET:O	0.81	1.73	14	1
1:A:2083:CYS:HA	1:A:2087:LEU:HD12	0.79	1.53	9	15
1:A:2100:PRO:HG2	1:A:2110:ILE:HD11	0.73	1.58	3	5
1:A:2084:CYS:HB2	1:A:2110:ILE:HD13	0.72	1.60	10	1
1:A:2063:ALA:HB3	1:A:2072:SER:HB3	0.71	1.63	21	21
1:A:2084:CYS:CB	1:A:2110:ILE:HD13	0.67	2.19	10	1
1:A:2062:TYR:CE1	1:A:2092:TRP:N	0.66	2.63	2	1
1:A:2081:GLN:CB	1:A:2110:ILE:HG22	0.66	2.21	11	2
1:A:2062:TYR:CZ	1:A:2091:GLY:HA3	0.66	2.26	2	2
1:A:2090:GLU:O	1:A:2098:LEU:HD22	0.66	1.90	15	14
1:A:2062:TYR:CZ	1:A:2096:CYS:CB	0.66	2.79	2	2
1:A:2078:HIS:O	1:A:2092:TRP:CD1	0.65	2.50	6	3
1:A:2088:LYS:HD3	1:A:2101:THR:HG22	0.65	1.68	13	1
1:A:2098:LEU:C	1:A:2098:LEU:HD13	0.65	2.11	9	8
1:A:2080:LYS:CB	1:A:2092:TRP:CD2	0.65	2.80	18	14
1:A:2063:ALA:HB3	1:A:2072:SER:CB	0.64	2.22	18	17
1:A:2094:ASP:N	1:A:2095:PRO:CD	0.64	2.61	20	21
1:A:2080:LYS:HA	1:A:2092:TRP:CG	0.64	2.28	15	10
1:A:2062:TYR:CE1	1:A:2096:CYS:CB	0.63	2.81	9	2
1:A:2092:TRP:CG	1:A:2093:GLY:N	0.63	2.67	18	21
1:A:2113:TYR:CD1	1:A:2113:TYR:N	0.63	2.66	19	11
1:A:2100:PRO:CG	1:A:2110:ILE:HD11	0.63	2.22	21	3
1:A:2062:TYR:CD2	1:A:2070:CYS:CB	0.63	2.82	2	2
1:A:2062:TYR:CG	1:A:2070:CYS:HB2	0.61	2.30	20	12
1:A:2102:GLU:CB	1:A:2107:PHE:CE2	0.61	2.83	18	8
1:A:2062:TYR:CD2	1:A:2070:CYS:HB3	0.61	2.31	9	5
1:A:2059:SER:OG	1:A:2092:TRP:CZ2	0.61	2.52	13	4
1:A:2080:LYS:HA	1:A:2092:TRP:CD1	0.61	2.30	19	15
1:A:2080:LYS:HB3	1:A:2092:TRP:CE3	0.61	2.31	6	7
1:A:2080:LYS:CG	1:A:2092:TRP:CE3	0.60	2.83	9	3
1:A:2065:PHE:CD1	1:A:2069:LYS:O	0.60	2.54	1	17
1:A:2084:CYS:HB2	1:A:2110:ILE:HD12	0.60	1.74	17	2
1:A:2080:LYS:HB3	1:A:2092:TRP:CD2	0.60	2.32	9	16
1:A:2062:TYR:CE1	1:A:2096:CYS:HB3	0.59	2.33	2	2
1:A:2078:HIS:CB	1:A:2082:GLU:CD	0.59	2.71	10	1
1:A:2064:LYS:N	1:A:2090:GLU:HG2	0.58	2.13	18	2
1:A:2065:PHE:N	1:A:2090:GLU:CB	0.58	2.66	20	2
1:A:2081:GLN:O	1:A:2085:CYS:CB	0.58	2.50	17	8

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2078:HIS:CE1	1:A:2082:GLU:OE2	0.58	2.56	9	1
1:A:2083:CYS:O	1:A:2088:LYS:N	0.58	2.37	4	9
1:A:2074:LYS:CB	1:A:2078:HIS:NE2	0.58	2.66	17	3
1:A:2076:ARG:O	1:A:2078:HIS:CD2	0.58	2.56	13	2
1:A:2107:PHE:CZ	1:A:2111:CYS:SG	0.57	2.97	6	2
1:A:2062:TYR:CE1	1:A:2096:CYS:SG	0.57	2.97	15	1
1:A:2084:CYS:HB3	1:A:2110:ILE:HD12	0.57	1.76	19	1
1:A:2081:GLN:CG	1:A:2110:ILE:HG22	0.57	2.29	18	5
1:A:2062:TYR:CD2	1:A:2070:CYS:SG	0.57	2.97	13	6
1:A:2062:TYR:CZ	1:A:2096:CYS:HB3	0.57	2.34	2	1
1:A:2074:LYS:HA	1:A:2074:LYS:CE	0.57	2.30	8	12
1:A:2080:LYS:CA	1:A:2092:TRP:CG	0.57	2.88	15	3
1:A:2078:HIS:ND1	1:A:2078:HIS:N	0.57	2.53	18	1
1:A:2078:HIS:CD2	1:A:2087:LEU:HD13	0.57	2.35	12	1
1:A:2065:PHE:N	1:A:2090:GLU:HB2	0.57	2.14	20	2
1:A:2062:TYR:CE1	1:A:2093:GLY:O	0.57	2.58	11	3
1:A:2102:GLU:HB3	1:A:2107:PHE:CE2	0.56	2.35	18	18
1:A:2062:TYR:OH	1:A:2097:GLU:N	0.56	2.38	2	1
1:A:2102:GLU:CB	1:A:2107:PHE:CD2	0.56	2.88	15	5
1:A:2098:LEU:HD22	1:A:2099:CYS:N	0.56	2.16	2	3
1:A:2061:CYS:HB3	1:A:2078:HIS:CE1	0.56	2.36	18	2
1:A:2083:CYS:CA	1:A:2087:LEU:HD12	0.56	2.30	16	4
1:A:2074:LYS:CD	1:A:2076:ARG:O	0.56	2.54	13	2
1:A:2065:PHE:C	1:A:2065:PHE:CD1	0.56	2.78	8	2
1:A:2080:LYS:HB3	1:A:2092:TRP:CE2	0.55	2.37	8	10
1:A:2062:TYR:CZ	1:A:2096:CYS:HB2	0.55	2.36	9	1
1:A:2062:TYR:CE2	1:A:2070:CYS:SG	0.55	2.99	13	5
1:A:2074:LYS:O	1:A:2076:ARG:N	0.55	2.39	8	1
1:A:2082:GLU:OE2	1:A:2087:LEU:CD1	0.55	2.54	10	1
1:A:2101:THR:O	1:A:2104:ASP:CB	0.55	2.55	16	17
1:A:2065:PHE:CE1	1:A:2066:GLU:O	0.55	2.60	8	2
1:A:2090:GLU:CD	1:A:2091:GLY:N	0.55	2.60	18	2
1:A:2111:CYS:CB	1:A:2114:GLY:O	0.54	2.55	15	3
1:A:2107:PHE:O	1:A:2110:ILE:CG1	0.54	2.56	20	6
1:A:2062:TYR:CB	1:A:2070:CYS:SG	0.54	2.96	7	4
1:A:2066:GLU:O	1:A:2068:GLY:N	0.54	2.40	1	17
1:A:2062:TYR:CD2	1:A:2070:CYS:HB2	0.54	2.37	15	12
1:A:2082:GLU:O	1:A:2087:LEU:HG	0.54	2.02	21	13
1:A:2082:GLU:OE1	1:A:2083:CYS:N	0.54	2.41	10	1
1:A:2057:ARG:O	1:A:2079:SER:CB	0.54	2.56	6	2
1:A:2060:TYR:O	1:A:2093:GLY:N	0.54	2.41	13	5

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2081:GLN:HB3	1:A:2110:ILE:HG22	0.53	1.79	11	3
1:A:2059:SER:O	1:A:2077:ASN:CB	0.53	2.56	19	5
1:A:2085:CYS:O	1:A:2115:SER:CB	0.53	2.57	13	1
1:A:2062:TYR:CD1	1:A:2070:CYS:HB2	0.53	2.39	21	1
1:A:2064:LYS:HG3	1:A:2071:SER:CB	0.53	2.33	9	12
1:A:2090:GLU:O	1:A:2098:LEU:CD2	0.53	2.57	8	9
1:A:2084:CYS:SG	1:A:2110:ILE:CD1	0.53	2.97	14	3
1:A:2064:LYS:CG	1:A:2071:SER:O	0.53	2.56	21	1
1:A:2081:GLN:CB	1:A:2110:ILE:O	0.53	2.57	21	1
1:A:2062:TYR:CZ	1:A:2096:CYS:SG	0.52	3.02	15	1
1:A:2090:GLU:CG	1:A:2091:GLY:N	0.52	2.72	20	2
1:A:2064:LYS:CG	1:A:2071:SER:CB	0.52	2.88	2	3
1:A:2078:HIS:O	1:A:2092:TRP:NE1	0.52	2.43	20	3
1:A:2098:LEU:HD13	1:A:2099:CYS:N	0.52	2.20	6	1
1:A:2076:ARG:O	1:A:2078:HIS:NE2	0.52	2.42	13	3
1:A:2100:PRO:HB3	1:A:2106:ALA:CB	0.52	2.34	12	2
1:A:2064:LYS:O	1:A:2071:SER:N	0.52	2.42	18	1
1:A:2058:MET:HA	1:A:2078:HIS:O	0.52	2.05	9	4
1:A:2102:GLU:HB3	1:A:2107:PHE:CZ	0.52	2.40	18	15
1:A:2060:TYR:O	1:A:2093:GLY:CA	0.52	2.58	8	4
1:A:2092:TRP:CD2	1:A:2093:GLY:N	0.52	2.78	10	9
1:A:2079:SER:O	1:A:2083:CYS:SG	0.52	2.68	8	3
1:A:2077:ASN:C	1:A:2078:HIS:CD2	0.52	2.83	8	2
1:A:2074:LYS:N	1:A:2074:LYS:HE3	0.52	2.19	13	2
1:A:2078:HIS:CB	1:A:2082:GLU:OE1	0.52	2.58	11	1
1:A:2065:PHE:N	1:A:2090:GLU:HB3	0.52	2.20	8	12
1:A:2062:TYR:CE2	1:A:2070:CYS:HB3	0.52	2.39	2	1
1:A:2064:LYS:CG	1:A:2071:SER:HB3	0.52	2.35	2	3
1:A:2062:TYR:O	1:A:2064:LYS:N	0.52	2.43	15	1
1:A:2080:LYS:HG3	1:A:2092:TRP:CD2	0.52	2.40	17	1
1:A:2080:LYS:HB3	1:A:2092:TRP:CZ2	0.51	2.41	3	5
1:A:2077:ASN:N	1:A:2077:ASN:OD1	0.51	2.43	5	2
1:A:2065:PHE:HB3	1:A:2098:LEU:HD23	0.51	1.81	15	1
1:A:2106:ALA:O	1:A:2109:GLN:CB	0.51	2.59	1	7
1:A:2061:CYS:C	1:A:2062:TYR:CD1	0.51	2.84	11	2
1:A:2112:PRO:HG2	1:A:2113:TYR:CE1	0.51	2.41	11	4
1:A:2078:HIS:ND1	1:A:2082:GLU:OE2	0.51	2.43	9	1
1:A:2078:HIS:CD2	1:A:2078:HIS:N	0.51	2.78	8	2
1:A:2074:LYS:HB3	1:A:2078:HIS:NE2	0.51	2.21	17	1
1:A:2080:LYS:HB2	1:A:2092:TRP:CE3	0.51	2.41	19	2
1:A:2069:LYS:CG	1:A:2069:LYS:O	0.51	2.59	13	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2077:ASN:O	1:A:2078:HIS:ND1	0.51	2.44	14	2
1:A:2081:GLN:O	1:A:2085:CYS:HB3	0.51	2.06	10	4
1:A:2081:GLN:CB	1:A:2110:ILE:CG2	0.50	2.89	11	1
1:A:2059:SER:CB	1:A:2093:GLY:HA2	0.50	2.37	12	15
1:A:2081:GLN:O	1:A:2085:CYS:HB2	0.50	2.06	13	14
1:A:2080:LYS:CA	1:A:2092:TRP:CE2	0.50	2.95	19	2
1:A:2062:TYR:CE2	1:A:2073:PRO:HB3	0.50	2.41	4	8
1:A:2066:GLU:CB	1:A:2069:LYS:HG2	0.50	2.36	18	3
1:A:2064:LYS:C	1:A:2090:GLU:HG2	0.50	2.26	20	2
1:A:2062:TYR:CD1	1:A:2096:CYS:SG	0.50	3.04	1	2
1:A:2072:SER:N	1:A:2073:PRO:HD3	0.50	2.21	4	16
1:A:2091:GLY:CA	1:A:2097:GLU:O	0.50	2.60	9	1
1:A:2080:LYS:CB	1:A:2092:TRP:CE2	0.50	2.95	8	8
1:A:2078:HIS:O	1:A:2079:SER:O	0.50	2.30	13	5
1:A:2100:PRO:HD2	1:A:2110:ILE:HD11	0.50	1.83	12	2
1:A:2069:LYS:CG	1:A:2070:CYS:N	0.50	2.74	10	3
1:A:2112:PRO:HB2	1:A:2113:TYR:CE1	0.50	2.42	6	2
1:A:2082:GLU:O	1:A:2087:LEU:N	0.50	2.44	12	4
1:A:2062:TYR:CB	1:A:2070:CYS:HB2	0.50	2.35	19	6
1:A:2064:LYS:CA	1:A:2090:GLU:HB2	0.49	2.36	16	2
1:A:2058:MET:CB	1:A:2079:SER:N	0.49	2.75	15	1
1:A:2059:SER:OG	1:A:2092:TRP:CE2	0.49	2.64	11	2
1:A:2074:LYS:CD	1:A:2074:LYS:C	0.49	2.80	9	2
1:A:2069:LYS:O	1:A:2069:LYS:CG	0.49	2.60	8	1
1:A:2071:SER:O	1:A:2072:SER:CB	0.49	2.59	16	3
1:A:2081:GLN:HB2	1:A:2110:ILE:HG22	0.49	1.83	11	1
1:A:2080:LYS:HG3	1:A:2092:TRP:CZ3	0.49	2.41	9	2
1:A:2062:TYR:CD1	1:A:2070:CYS:HB3	0.49	2.42	7	2
1:A:2059:SER:OG	1:A:2093:GLY:HA2	0.49	2.07	13	3
1:A:2066:GLU:O	1:A:2067:GLY:C	0.49	2.51	12	18
1:A:2062:TYR:CG	1:A:2070:CYS:HB3	0.49	2.43	7	2
1:A:2058:MET:O	1:A:2077:ASN:CB	0.49	2.60	13	3
1:A:2065:PHE:CE2	1:A:2098:LEU:HB2	0.49	2.43	2	1
1:A:2081:GLN:HG3	1:A:2082:GLU:N	0.49	2.23	15	2
1:A:2062:TYR:CE1	1:A:2091:GLY:C	0.49	2.87	2	2
1:A:2080:LYS:HG3	1:A:2092:TRP:CE3	0.48	2.41	9	2
1:A:2062:TYR:CE1	1:A:2073:PRO:HB3	0.48	2.43	7	3
1:A:2066:GLU:HB2	1:A:2069:LYS:HG2	0.48	1.85	2	2
1:A:2080:LYS:O	1:A:2084:CYS:SG	0.48	2.71	6	4
1:A:2065:PHE:CD1	1:A:2066:GLU:O	0.48	2.67	8	2
1:A:2059:SER:OG	1:A:2093:GLY:CA	0.48	2.61	11	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2107:PHE:O	1:A:2110:ILE:HG13	0.48	2.08	19	17
1:A:2074:LYS:HD3	1:A:2076:ARG:O	0.48	2.08	9	2
1:A:2078:HIS:O	1:A:2079:SER:C	0.48	2.52	15	8
1:A:2100:PRO:HB3	1:A:2106:ALA:HB3	0.48	1.84	12	3
1:A:2078:HIS:HB3	1:A:2082:GLU:CG	0.48	2.39	10	2
1:A:2074:LYS:C	1:A:2074:LYS:HD2	0.48	2.28	13	2
1:A:2080:LYS:HB3	1:A:2092:TRP:CG	0.48	2.44	15	2
1:A:2082:GLU:OE1	1:A:2082:GLU:C	0.47	2.52	10	1
1:A:2087:LEU:O	1:A:2088:LYS:C	0.47	2.51	10	15
1:A:2074:LYS:N	1:A:2074:LYS:HD2	0.47	2.25	15	7
1:A:2095:PRO:O	1:A:2096:CYS:C	0.47	2.53	19	21
1:A:2065:PHE:CE2	1:A:2067:GLY:HA2	0.47	2.44	10	4
1:A:2082:GLU:OE1	1:A:2082:GLU:O	0.47	2.33	13	1
1:A:2062:TYR:CD2	1:A:2096:CYS:HB2	0.47	2.44	17	1
1:A:2115:SER:O	1:A:2115:SER:OG	0.47	2.29	14	1
1:A:2082:GLU:CD	1:A:2087:LEU:HD11	0.47	2.27	13	1
1:A:2073:PRO:O	1:A:2074:LYS:O	0.47	2.32	9	1
1:A:2084:CYS:HB2	1:A:2110:ILE:CD1	0.47	2.35	10	1
1:A:2080:LYS:CB	1:A:2092:TRP:CE3	0.47	2.98	18	6
1:A:2080:LYS:HB2	1:A:2092:TRP:CD2	0.47	2.44	19	3
1:A:2078:HIS:HB3	1:A:2082:GLU:CD	0.47	2.30	10	1
1:A:2111:CYS:HB3	1:A:2114:GLY:O	0.47	2.09	2	2
1:A:2083:CYS:SG	1:A:2092:TRP:CD1	0.47	3.08	4	1
1:A:2061:CYS:SG	1:A:2062:TYR:N	0.47	2.87	21	3
1:A:2111:CYS:SG	1:A:2114:GLY:O	0.47	2.73	6	4
1:A:2069:LYS:O	1:A:2069:LYS:HG3	0.47	2.08	13	3
1:A:2062:TYR:CE2	1:A:2096:CYS:HB2	0.47	2.45	17	1
1:A:2057:ARG:O	1:A:2079:SER:HA	0.47	2.10	6	11
1:A:2061:CYS:CB	1:A:2078:HIS:CE1	0.47	2.98	18	1
1:A:2064:LYS:HA	1:A:2090:GLU:CB	0.47	2.40	6	4
1:A:2080:LYS:HD2	1:A:2081:GLN:N	0.47	2.25	11	3
1:A:2100:PRO:CB	1:A:2106:ALA:HB3	0.47	2.39	12	2
1:A:2074:LYS:O	1:A:2076:ARG:O	0.46	2.33	15	3
1:A:2064:LYS:CD	1:A:2072:SER:HB2	0.46	2.40	9	1
1:A:2080:LYS:O	1:A:2084:CYS:HB3	0.46	2.09	20	3
1:A:2091:GLY:HA3	1:A:2097:GLU:O	0.46	2.10	9	1
1:A:2100:PRO:CB	1:A:2106:ALA:CB	0.46	2.93	12	1
1:A:2107:PHE:O	1:A:2111:CYS:SG	0.46	2.74	16	1
1:A:2064:LYS:N	1:A:2090:GLU:CG	0.46	2.78	18	2
1:A:2090:GLU:OE1	1:A:2090:GLU:C	0.46	2.54	18	2
1:A:2081:GLN:NE2	1:A:2110:ILE:HA	0.46	2.25	4	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2098:LEU:HD13	1:A:2099:CYS:O	0.46	2.11	17	2
1:A:2102:GLU:HB2	1:A:2107:PHE:CE2	0.46	2.45	18	1
1:A:2089:GLY:O	1:A:2099:CYS:SG	0.46	2.73	21	2
1:A:2058:MET:O	1:A:2077:ASN:HB2	0.46	2.11	21	2
1:A:2085:CYS:O	1:A:2115:SER:O	0.46	2.33	7	1
1:A:2102:GLU:OE2	1:A:2102:GLU:O	0.46	2.33	17	2
1:A:2085:CYS:SG	1:A:2114:GLY:O	0.46	2.74	17	3
1:A:2062:TYR:CD1	1:A:2062:TYR:N	0.46	2.83	14	2
1:A:2084:CYS:SG	1:A:2100:PRO:O	0.46	2.73	15	1
1:A:2078:HIS:O	1:A:2083:CYS:SG	0.46	2.73	17	1
1:A:2097:GLU:O	1:A:2098:LEU:C	0.46	2.54	6	12
1:A:2064:LYS:CA	1:A:2090:GLU:HB3	0.46	2.41	20	2
1:A:2098:LEU:C	1:A:2098:LEU:CD1	0.46	2.84	9	1
1:A:2100:PRO:HD2	1:A:2110:ILE:CD1	0.46	2.41	15	2
1:A:2077:ASN:OD1	1:A:2077:ASN:N	0.46	2.48	20	1
1:A:2107:PHE:CE1	1:A:2111:CYS:SG	0.45	3.09	12	1
1:A:2101:THR:O	1:A:2104:ASP:HB3	0.45	2.11	5	11
1:A:2082:GLU:O	1:A:2087:LEU:CD1	0.45	2.65	10	1
1:A:2074:LYS:CE	1:A:2074:LYS:CA	0.45	2.93	8	6
1:A:2059:SER:O	1:A:2077:ASN:CA	0.45	2.65	15	1
1:A:2064:LYS:HG2	1:A:2071:SER:O	0.45	2.11	21	2
1:A:2083:CYS:HA	1:A:2087:LEU:CD1	0.45	2.39	16	1
1:A:2097:GLU:O	1:A:2099:CYS:N	0.45	2.50	3	1
1:A:2102:GLU:N	1:A:2107:PHE:CD1	0.45	2.84	18	3
1:A:2059:SER:O	1:A:2077:ASN:HA	0.45	2.11	15	1
1:A:2098:LEU:HD12	1:A:2098:LEU:C	0.45	2.31	3	1
1:A:2074:LYS:HD2	1:A:2075:SER:N	0.45	2.27	13	2
1:A:2082:GLU:HG2	1:A:2087:LEU:HD11	0.45	1.89	9	3
1:A:2080:LYS:HA	1:A:2092:TRP:CE2	0.45	2.47	19	1
1:A:2092:TRP:O	1:A:2096:CYS:HA	0.45	2.12	16	5
1:A:2082:GLU:O	1:A:2087:LEU:CG	0.45	2.65	7	5
1:A:2111:CYS:HB2	1:A:2114:GLY:O	0.45	2.11	16	3
1:A:2112:PRO:HB2	1:A:2113:TYR:CD1	0.45	2.46	4	1
1:A:2078:HIS:CD2	1:A:2087:LEU:CD1	0.45	3.00	12	1
1:A:2064:LYS:HA	1:A:2090:GLU:HB3	0.45	1.88	15	4
1:A:2061:CYS:O	1:A:2073:PRO:HA	0.44	2.12	10	5
1:A:2100:PRO:HG2	1:A:2110:ILE:CD1	0.44	2.42	6	2
1:A:2065:PHE:CD2	1:A:2098:LEU:HB2	0.44	2.47	2	1
1:A:2081:GLN:NE2	1:A:2110:ILE:O	0.44	2.50	4	1
1:A:2111:CYS:SG	1:A:2115:SER:HA	0.44	2.52	13	1
1:A:2100:PRO:CD	1:A:2110:ILE:HD11	0.44	2.42	15	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2080:LYS:HB3	1:A:2092:TRP:CH2	0.44	2.46	3	2
1:A:2065:PHE:HA	1:A:2069:LYS:O	0.44	2.12	18	2
1:A:2071:SER:O	1:A:2072:SER:HB3	0.44	2.12	16	5
1:A:2078:HIS:HA	1:A:2082:GLU:OE1	0.44	2.11	6	1
1:A:2098:LEU:HD13	1:A:2098:LEU:O	0.44	2.11	9	1
1:A:2094:ASP:CB	1:A:2095:PRO:HD3	0.44	2.42	10	1
1:A:2074:LYS:HG2	1:A:2078:HIS:NE2	0.44	2.27	13	1
1:A:2074:LYS:O	1:A:2075:SER:C	0.44	2.56	3	5
1:A:2059:SER:C	1:A:2077:ASN:CB	0.44	2.86	15	1
1:A:2081:GLN:HB3	1:A:2110:ILE:CB	0.44	2.42	21	1
1:A:2099:CYS:SG	1:A:2100:PRO:HD2	0.44	2.52	17	2
1:A:2062:TYR:HB2	1:A:2096:CYS:SG	0.44	2.52	12	2
1:A:2082:GLU:O	1:A:2087:LEU:HD12	0.44	2.12	10	1
1:A:2085:CYS:O	1:A:2115:SER:C	0.44	2.56	15	1
1:A:2106:ALA:O	1:A:2109:GLN:HB3	0.44	2.13	9	5
1:A:2080:LYS:N	1:A:2092:TRP:CE2	0.44	2.85	15	2
1:A:2098:LEU:HD13	1:A:2098:LEU:C	0.44	2.32	6	2
1:A:2078:HIS:HB3	1:A:2082:GLU:OE1	0.44	2.13	11	1
1:A:2085:CYS:SG	1:A:2107:PHE:CE1	0.44	3.11	21	1
1:A:2069:LYS:HG3	1:A:2070:CYS:N	0.44	2.26	6	4
1:A:2107:PHE:O	1:A:2110:ILE:HG12	0.44	2.12	20	1
1:A:2080:LYS:HG3	1:A:2110:ILE:CG2	0.43	2.43	10	1
1:A:2081:GLN:HB2	1:A:2110:ILE:O	0.43	2.13	21	1
1:A:2062:TYR:HB2	1:A:2070:CYS:SG	0.43	2.54	10	4
1:A:2085:CYS:SG	1:A:2110:ILE:HB	0.43	2.53	1	2
1:A:2082:GLU:HA	1:A:2086:ALA:HB3	0.43	1.90	14	3
1:A:2104:ASP:OD2	1:A:2106:ALA:HB3	0.43	2.14	3	1
1:A:2111:CYS:SG	1:A:2114:GLY:C	0.43	2.97	8	2
1:A:2105:GLU:O	1:A:2108:ARG:HG3	0.43	2.13	12	4
1:A:2083:CYS:SG	1:A:2091:GLY:O	0.43	2.77	12	1
1:A:2064:LYS:HG3	1:A:2071:SER:HB2	0.43	1.91	2	2
1:A:2057:ARG:O	1:A:2079:SER:CA	0.43	2.66	20	2
1:A:2080:LYS:O	1:A:2084:CYS:CB	0.43	2.66	6	2
1:A:2082:GLU:O	1:A:2082:GLU:CD	0.43	2.57	11	1
1:A:2062:TYR:HB2	1:A:2091:GLY:O	0.43	2.14	19	3
1:A:2080:LYS:O	1:A:2084:CYS:HB2	0.43	2.14	6	3
1:A:2064:LYS:CD	1:A:2071:SER:HB3	0.43	2.44	19	2
1:A:2091:GLY:HA3	1:A:2096:CYS:SG	0.43	2.54	10	2
1:A:2059:SER:O	1:A:2077:ASN:HB3	0.43	2.13	18	1
1:A:2074:LYS:HE3	1:A:2074:LYS:O	0.43	2.14	9	2
1:A:2059:SER:O	1:A:2060:TYR:C	0.43	2.57	11	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2064:LYS:HA	1:A:2090:GLU:HB2	0.43	1.91	4	2
1:A:2066:GLU:CA	1:A:2066:GLU:OE1	0.43	2.67	8	1
1:A:2066:GLU:CB	1:A:2069:LYS:HD3	0.43	2.44	9	1
1:A:2061:CYS:HB3	1:A:2083:CYS:HB3	0.42	1.73	8	1
1:A:2070:CYS:HB3	1:A:2090:GLU:OE2	0.42	2.14	18	1
1:A:2065:PHE:HB2	1:A:2090:GLU:OE1	0.42	2.14	20	1
1:A:2059:SER:C	1:A:2077:ASN:HB3	0.42	2.34	15	5
1:A:2080:LYS:HG3	1:A:2081:GLN:N	0.42	2.28	2	4
1:A:2078:HIS:HB2	1:A:2083:CYS:SG	0.42	2.54	8	2
1:A:2101:THR:O	1:A:2107:PHE:HB2	0.42	2.14	4	1
1:A:2059:SER:CA	1:A:2077:ASN:HB3	0.42	2.44	13	2
1:A:2080:LYS:HA	1:A:2092:TRP:NE1	0.42	2.29	19	1
1:A:2062:TYR:CG	1:A:2070:CYS:CB	0.42	3.02	9	2
1:A:2066:GLU:C	1:A:2068:GLY:N	0.42	2.73	1	5
1:A:2095:PRO:O	1:A:2097:GLU:OE1	0.42	2.38	3	1
1:A:2082:GLU:HG2	1:A:2087:LEU:CD1	0.42	2.44	7	2
1:A:2090:GLU:O	1:A:2098:LEU:HA	0.42	2.14	6	2
1:A:2090:GLU:O	1:A:2098:LEU:HD23	0.42	2.15	8	1
1:A:2074:LYS:O	1:A:2074:LYS:CE	0.42	2.68	9	1
1:A:2058:MET:O	1:A:2058:MET:CE	0.42	2.57	14	1
1:A:2057:ARG:O	1:A:2092:TRP:CZ2	0.42	2.72	15	1
1:A:2062:TYR:HB3	1:A:2070:CYS:HB2	0.42	1.92	15	1
1:A:2060:TYR:O	1:A:2093:GLY:C	0.42	2.58	8	1
1:A:2062:TYR:CE1	1:A:2096:CYS:CA	0.42	3.03	9	1
1:A:2060:TYR:CE1	1:A:2075:SER:O	0.42	2.72	8	1
1:A:2081:GLN:CB	1:A:2110:ILE:HB	0.42	2.44	20	1
1:A:2064:LYS:HG3	1:A:2071:SER:O	0.42	2.15	21	1
1:A:2094:ASP:OD1	1:A:2094:ASP:C	0.42	2.58	6	5
1:A:2065:PHE:H	1:A:2090:GLU:HB2	0.42	1.75	18	1
1:A:2066:GLU:OE1	1:A:2066:GLU:HA	0.42	2.14	8	1
1:A:2072:SER:N	1:A:2073:PRO:CD	0.42	2.83	14	3
1:A:2081:GLN:HB2	1:A:2110:ILE:CG2	0.42	2.44	11	1
1:A:2102:GLU:HB2	1:A:2107:PHE:CD2	0.42	2.50	15	2
1:A:2080:LYS:HG3	1:A:2092:TRP:CG	0.42	2.49	17	1
1:A:2057:ARG:O	1:A:2079:SER:OG	0.42	2.35	20	1
1:A:2062:TYR:CE1	1:A:2070:CYS:SG	0.42	3.13	21	1
1:A:2063:ALA:O	1:A:2090:GLU:HB2	0.42	2.14	2	2
1:A:2060:TYR:CD1	1:A:2074:LYS:NZ	0.42	2.82	13	1
1:A:2084:CYS:SG	1:A:2110:ILE:HD11	0.42	2.54	14	1
1:A:2085:CYS:SG	1:A:2110:ILE:C	0.41	2.99	1	1
1:A:2063:ALA:HB3	1:A:2072:SER:OG	0.41	2.15	18	1

*Continued on next page...*

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:2084:CYS:SG	1:A:2084:CYS:O	0.41	2.79	7	1
1:A:2066:GLU:HB2	1:A:2069:LYS:CG	0.41	2.45	9	2
1:A:2102:GLU:N	1:A:2107:PHE:CG	0.41	2.88	18	1
1:A:2110:ILE:O	1:A:2112:PRO:HD3	0.41	2.15	19	1
1:A:2105:GLU:N	1:A:2105:GLU:OE1	0.41	2.53	21	1
1:A:2074:LYS:N	1:A:2074:LYS:CD	0.41	2.82	19	2
1:A:2102:GLU:HB3	1:A:2107:PHE:CE1	0.41	2.51	2	1
1:A:2089:GLY:O	1:A:2099:CYS:HB2	0.41	2.15	6	1
1:A:2112:PRO:HG2	1:A:2113:TYR:CZ	0.41	2.50	11	1
1:A:2094:ASP:N	1:A:2095:PRO:HD2	0.41	2.31	11	2
1:A:2095:PRO:O	1:A:2097:GLU:HG2	0.41	2.15	2	1
1:A:2065:PHE:CG	1:A:2069:LYS:O	0.41	2.74	14	1
1:A:2106:ALA:O	1:A:2110:ILE:HG12	0.41	2.16	21	1
1:A:2066:GLU:CB	1:A:2069:LYS:HE3	0.41	2.46	5	1
1:A:2074:LYS:HA	1:A:2074:LYS:HE3	0.41	1.93	20	2
1:A:2080:LYS:HG3	1:A:2110:ILE:HG22	0.41	1.93	10	1
1:A:2086:ALA:HA	1:A:2115:SER:O	0.41	2.15	13	1
1:A:2062:TYR:CE1	1:A:2096:CYS:HA	0.41	2.51	2	1
1:A:2097:GLU:OE1	1:A:2097:GLU:HA	0.41	2.15	3	1
1:A:2060:TYR:CD1	1:A:2075:SER:O	0.41	2.74	8	1
1:A:2062:TYR:CD1	1:A:2096:CYS:HB3	0.41	2.51	9	1
1:A:2079:SER:O	1:A:2082:GLU:HB3	0.41	2.16	17	1
1:A:2084:CYS:SG	1:A:2100:PRO:HD2	0.41	2.56	18	1
1:A:2088:LYS:N	1:A:2088:LYS:HD3	0.41	2.31	4	1
1:A:2074:LYS:HA	1:A:2074:LYS:HE2	0.41	1.93	8	1
1:A:2066:GLU:HB3	1:A:2069:LYS:HD3	0.40	1.92	9	1
1:A:2059:SER:HB3	1:A:2093:GLY:HA2	0.40	1.92	15	2
1:A:2102:GLU:HB3	1:A:2107:PHE:CD2	0.40	2.52	19	1
1:A:2064:LYS:C	1:A:2090:GLU:HB3	0.40	2.36	6	1
1:A:2082:GLU:OE1	1:A:2087:LEU:CD1	0.40	2.69	11	1
1:A:2094:ASP:CG	1:A:2095:PRO:HD3	0.40	2.36	14	1
1:A:2066:GLU:OE1	1:A:2066:GLU:CA	0.40	2.70	16	1
1:A:2106:ALA:O	1:A:2109:GLN:HB2	0.40	2.16	2	1
1:A:2078:HIS:HB2	1:A:2082:GLU:OE1	0.40	2.16	10	1
1:A:2059:SER:HB2	1:A:2093:GLY:HA2	0.40	1.93	12	1
1:A:2101:THR:C	1:A:2107:PHE:HB2	0.40	2.37	18	2
1:A:2094:ASP:OD2	1:A:2095:PRO:HD3	0.40	2.16	10	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	59/74 (80%)	48±2 (81±3%)	8±2 (13±3%)	4±1 (6±2%)	3	19
All	All	1239/1554 (80%)	1003 (81%)	158 (13%)	78 (6%)	3	19

All 13 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	2067	GLY	19
1	A	2068	GLY	13
1	A	2088	LYS	13
1	A	2115	SER	11
1	A	2079	SER	7
1	A	2096	CYS	5
1	A	2098	LEU	2
1	A	2074	LYS	2
1	A	2057	ARG	2
1	A	2075	SER	1
1	A	2089	GLY	1
1	A	2063	ALA	1
1	A	2072	SER	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	50/61 (82%)	31±2 (62±4%)	19±2 (38±4%)	1	7
All	All	1050/1281 (82%)	655 (62%)	395 (38%)	1	7

All 39 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	2071	SER	21
1	A	2077	ASN	21
1	A	2094	ASP	21
1	A	2101	THR	21
1	A	2057	ARG	19
1	A	2058	MET	19
1	A	2080	LYS	17
1	A	2096	CYS	17
1	A	2074	LYS	16
1	A	2108	ARG	15
1	A	2070	CYS	14
1	A	2113	TYR	14
1	A	2099	CYS	14
1	A	2115	SER	13
1	A	2064	LYS	12
1	A	2079	SER	12
1	A	2081	GLN	12
1	A	2111	CYS	10
1	A	2059	SER	10
1	A	2085	CYS	10
1	A	2088	LYS	9
1	A	2109	GLN	8
1	A	2102	GLU	8
1	A	2076	ARG	7
1	A	2069	LYS	6
1	A	2090	GLU	6
1	A	2078	HIS	6
1	A	2066	GLU	5
1	A	2110	ILE	5
1	A	2061	CYS	5
1	A	2072	SER	4
1	A	2105	GLU	4
1	A	2065	PHE	3
1	A	2083	CYS	3
1	A	2084	CYS	2
1	A	2097	GLU	2
1	A	2075	SER	2
1	A	2098	LEU	1
1	A	2082	GLU	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