



# Full wwPDB NMR Structure Validation Report ⓘ

Mar 5, 2022 – 10:43 AM EST

PDB ID : 2JSA  
Title : Solution structure of Caenopore-5 (81 Pro Trans conformer)  
Authors : Mysliwy, J.; Grotzinger, J.  
Deposited on : 2007-07-02

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

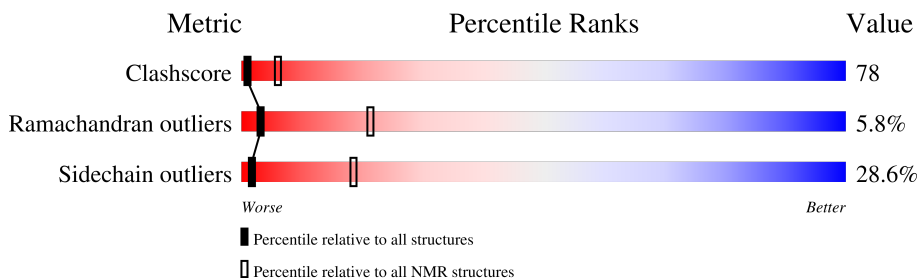
# 1 Overall quality at a glance

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	99	

## 2 Ensemble composition and analysis

This entry contains 15 models. Model 10 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *minimized average structure*.

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:4-A:79 (76)	0.34	10

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 1 single-model cluster was found.

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

### 3 Entry composition

There is only 1 type of molecule in this entry. The entry contains 1264 atoms, of which 634 are hydrogens and 0 are deuteriums.

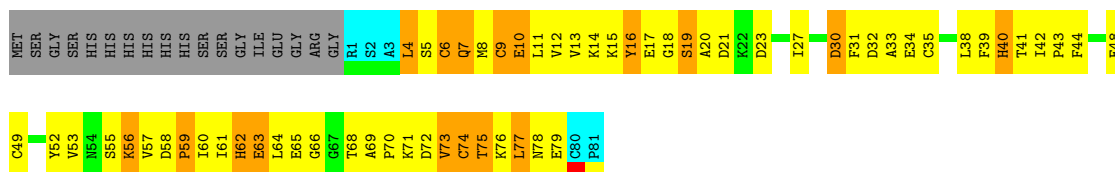
- Molecule 1 is a protein called Saposin-like protein family protein 5.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	81	1264	393	634	107	123	7	0

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	expression tag	UNP Q86FL8
A	-16	SER	-	expression tag	UNP Q86FL8
A	-15	GLY	-	expression tag	UNP Q86FL8
A	-14	SER	-	expression tag	UNP Q86FL8
A	-13	HIS	-	expression tag	UNP Q86FL8
A	-12	HIS	-	expression tag	UNP Q86FL8
A	-11	HIS	-	expression tag	UNP Q86FL8
A	-10	HIS	-	expression tag	UNP Q86FL8
A	-9	HIS	-	expression tag	UNP Q86FL8
A	-8	HIS	-	expression tag	UNP Q86FL8
A	-7	SER	-	expression tag	UNP Q86FL8
A	-6	SER	-	expression tag	UNP Q86FL8
A	-5	GLY	-	expression tag	UNP Q86FL8
A	-4	ILE	-	expression tag	UNP Q86FL8
A	-3	GLU	-	expression tag	UNP Q86FL8
A	-2	GLY	-	expression tag	UNP Q86FL8
A	-1	ARG	-	expression tag	UNP Q86FL8
A	0	GLY	-	expression tag	UNP Q86FL8

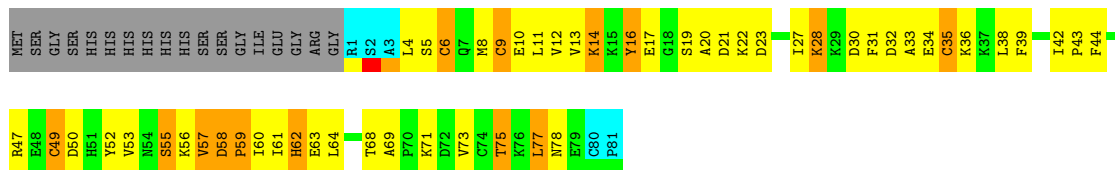




### 4.2.3 Score per residue for model 3

- Molecule 1: Sapsin-like protein family protein 5

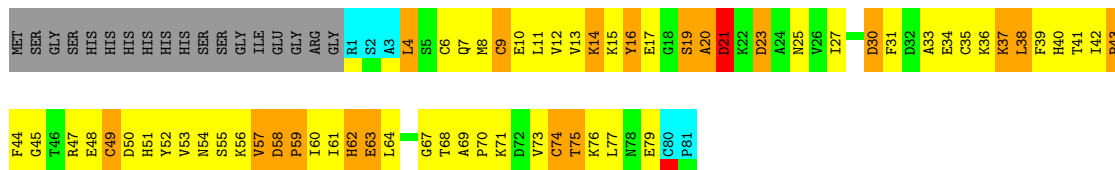
Chain A: 23% 39% 14% 5% 18%



### 4.2.4 Score per residue for model 4

- Molecule 1: Sapsin-like protein family protein 5

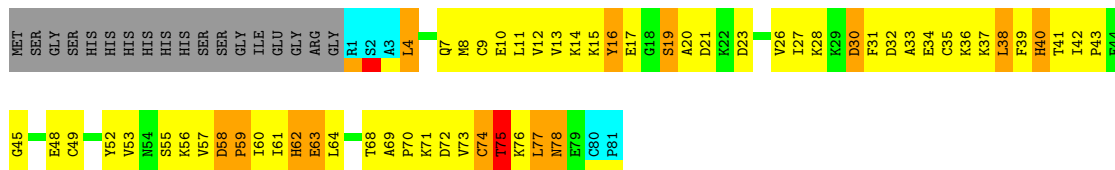
Chain A: 13% 43% 19% 5% 18%



### 4.2.5 Score per residue for model 5

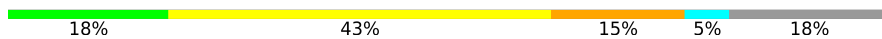
- Molecule 1: Sapsin-like protein family protein 5

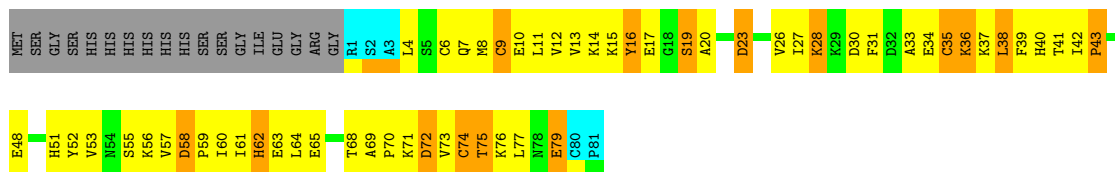
Chain A: 17% 45% 13% 5% 18%



### 4.2.6 Score per residue for model 6


- Molecule 1: Sapsin-like protein family protein 5

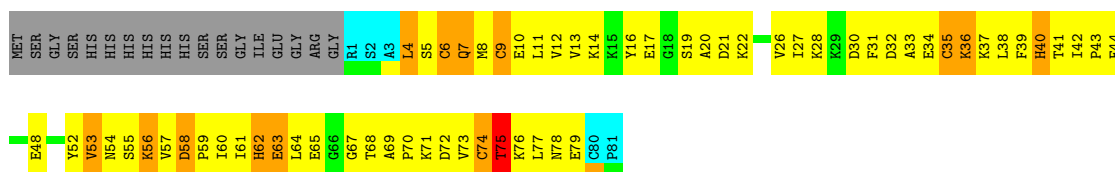
Chain A: 



#### 4.2.7 Score per residue for model 7


- Molecule 1: Sapsin-like protein family protein 5

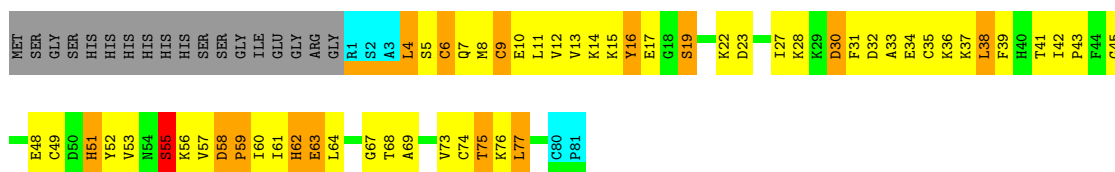
Chain A: 



#### 4.2.8 Score per residue for model 8

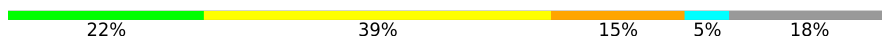
- Molecule 1: Sapsin-like protein family protein 5

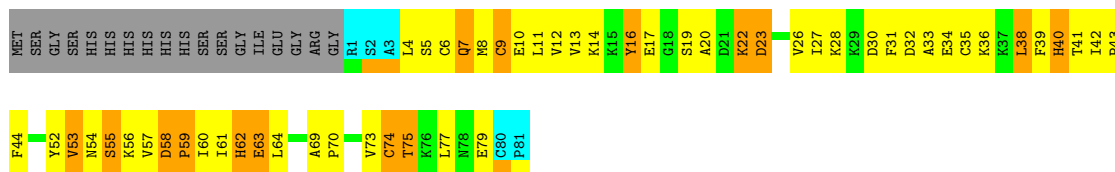
Chain A: 



#### 4.2.9 Score per residue for model 9

- Molecule 1: Sapsin-like protein family protein 5

Chain A: 

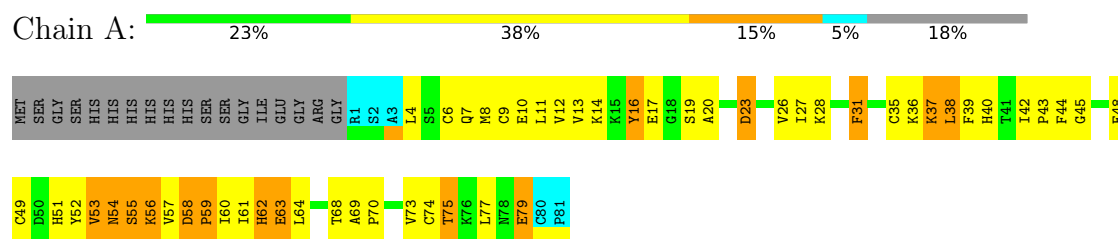






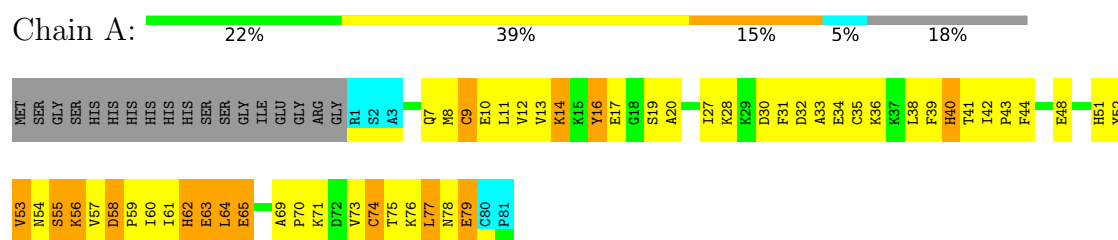
#### 4.2.14 Score per residue for model 14

- Molecule 1: Sapsin-like protein family protein 5



#### 4.2.15 Score per residue for model 15

- Molecule 1: Sapsin-like protein family protein 5



## 5 Refinement protocol and experimental data overview

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

Of the 400 calculated structures, 15 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
DYANA 1.5	refinement	

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	595	600	583	92±9
All	All	8925	9000	8745	1378

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 78.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:13:VAL:HG12	1:A:64:LEU:HD11	1.10	1.13	11	15
1:A:16:TYR:CE2	1:A:61:ILE:HG23	1.08	1.83	7	15
1:A:63:GLU:CD	1:A:77:LEU:HD21	0.95	1.82	13	3
1:A:11:LEU:HD23	1:A:31:PHE:CD2	0.93	1.99	7	15
1:A:69:ALA:O	1:A:73:VAL:HG23	0.93	1.63	4	15
1:A:13:VAL:HG12	1:A:64:LEU:CD1	0.92	1.92	9	6
1:A:4:LEU:HD23	1:A:5:SER:N	0.90	1.82	7	2
1:A:13:VAL:CG1	1:A:64:LEU:HD11	0.87	1.99	9	11
1:A:4:LEU:HD22	1:A:4:LEU:O	0.87	1.68	1	3
1:A:11:LEU:HD23	1:A:31:PHE:CE2	0.86	2.03	6	14
1:A:63:GLU:HG2	1:A:77:LEU:HD22	0.86	1.46	5	1
1:A:64:LEU:HD23	1:A:68:THR:O	0.85	1.71	13	7
1:A:11:LEU:HD11	1:A:34:GLU:HB3	0.82	1.50	3	11
1:A:63:GLU:OE1	1:A:77:LEU:HD11	0.82	1.73	8	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:30:ASP:O	1:A:33:ALA:HB3	0.80	1.76	1	13
1:A:12:VAL:CG2	1:A:60:ILE:HG21	0.79	2.06	8	9
1:A:31:PHE:CD1	1:A:53:VAL:CG1	0.77	2.67	12	15
1:A:63:GLU:HB3	1:A:73:VAL:HG22	0.77	1.56	4	11
1:A:64:LEU:HD21	1:A:70:PRO:HA	0.77	1.56	11	9
1:A:11:LEU:HD21	1:A:31:PHE:O	0.73	1.84	14	15
1:A:31:PHE:CZ	1:A:52:TYR:CD2	0.73	2.77	14	6
1:A:62:HIS:CD2	1:A:62:HIS:C	0.73	2.62	15	11
1:A:63:GLU:CG	1:A:77:LEU:HD22	0.73	2.13	5	1
1:A:4:LEU:HD23	1:A:4:LEU:C	0.72	2.04	7	2
1:A:53:VAL:O	1:A:53:VAL:HG23	0.72	1.84	15	5
1:A:4:LEU:HD22	1:A:4:LEU:C	0.72	2.05	10	3
1:A:59:PRO:O	1:A:62:HIS:CG	0.71	2.42	14	15
1:A:11:LEU:CD2	1:A:31:PHE:CD2	0.71	2.73	7	15
1:A:77:LEU:HD23	1:A:77:LEU:N	0.71	2.00	8	3
1:A:16:TYR:CD2	1:A:61:ILE:HG23	0.70	2.20	10	15
1:A:59:PRO:O	1:A:62:HIS:CD2	0.70	2.44	11	10
1:A:16:TYR:HB2	1:A:27:ILE:HG21	0.70	1.63	7	7
1:A:31:PHE:CD1	1:A:53:VAL:HG12	0.70	2.22	11	12
1:A:31:PHE:CE2	1:A:52:TYR:CD2	0.70	2.79	14	5
1:A:38:LEU:HD23	1:A:39:PHE:CE2	0.70	2.22	7	2
1:A:64:LEU:HG	1:A:73:VAL:HG21	0.70	1.64	2	5
1:A:9:CYS:O	1:A:13:VAL:HG22	0.69	1.87	2	13
1:A:9:CYS:O	1:A:13:VAL:HG13	0.69	1.88	15	3
1:A:4:LEU:HD23	1:A:39:PHE:CE1	0.69	2.22	2	1
1:A:63:GLU:OE2	1:A:68:THR:HG21	0.68	1.88	14	3
1:A:12:VAL:HG21	1:A:60:ILE:HG21	0.68	1.65	11	3
1:A:55:SER:O	1:A:56:LYS:CB	0.68	2.42	13	1
1:A:19:SER:O	1:A:20:ALA:HB2	0.67	1.90	1	1
1:A:19:SER:O	1:A:20:ALA:HB3	0.67	1.90	4	13
1:A:75:THR:HG22	1:A:76:LYS:N	0.67	2.05	5	8
1:A:39:PHE:CD2	1:A:42:ILE:HD12	0.67	2.25	4	2
1:A:58:ASP:N	1:A:59:PRO:CD	0.66	2.58	6	15
1:A:11:LEU:HD11	1:A:34:GLU:CB	0.66	2.21	12	3
1:A:73:VAL:HA	1:A:77:LEU:HD23	0.65	1.68	10	2
1:A:28:LYS:CB	1:A:57:VAL:HG11	0.65	2.22	14	6
1:A:16:TYR:CE2	1:A:61:ILE:CG2	0.65	2.75	1	12
1:A:40:HIS:C	1:A:41:THR:HG22	0.65	2.12	13	1
1:A:77:LEU:N	1:A:77:LEU:HD22	0.65	2.07	15	2
1:A:62:HIS:CE1	1:A:63:GLU:OE1	0.64	2.50	10	1
1:A:8:MET:CE	1:A:39:PHE:CE2	0.64	2.80	11	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:4:LEU:HD12	1:A:39:PHE:CE1	0.64	2.27	11	2
1:A:31:PHE:CZ	1:A:35:CYS:SG	0.64	2.91	9	4
1:A:12:VAL:CG1	1:A:31:PHE:CD2	0.64	2.80	1	13
1:A:76:LYS:HG3	1:A:77:LEU:HD23	0.64	1.70	11	1
1:A:40:HIS:CE1	1:A:41:THR:HG23	0.63	2.28	4	2
1:A:60:ILE:HG23	1:A:73:VAL:HG11	0.63	1.70	4	3
1:A:63:GLU:HG2	1:A:77:LEU:HD21	0.63	1.70	10	1
1:A:31:PHE:CE1	1:A:35:CYS:SG	0.62	2.92	15	4
1:A:38:LEU:HD21	1:A:39:PHE:CZ	0.62	2.28	9	1
1:A:11:LEU:CG	1:A:31:PHE:CD2	0.62	2.82	4	14
1:A:73:VAL:O	1:A:77:LEU:HD23	0.62	1.94	7	2
1:A:11:LEU:CD2	1:A:35:CYS:SG	0.62	2.88	12	1
1:A:34:GLU:O	1:A:38:LEU:N	0.62	2.32	7	4
1:A:73:VAL:HG12	1:A:79:GLU:OE2	0.62	1.94	9	1
1:A:35:CYS:HA	1:A:38:LEU:HD23	0.61	1.70	5	2
1:A:38:LEU:HD11	1:A:39:PHE:CE1	0.60	2.31	4	3
1:A:11:LEU:HD11	1:A:34:GLU:CD	0.60	2.16	1	1
1:A:62:HIS:CE1	1:A:63:GLU:CD	0.60	2.74	3	3
1:A:4:LEU:HD13	1:A:5:SER:N	0.60	2.11	1	1
1:A:17:GLU:HG2	1:A:64:LEU:HD13	0.60	1.74	13	2
1:A:12:VAL:HG13	1:A:31:PHE:CD2	0.60	2.30	1	9
1:A:62:HIS:CE1	1:A:63:GLU:OE2	0.60	2.54	1	2
1:A:42:ILE:HG23	1:A:43:PRO:HD2	0.60	1.71	2	10
1:A:64:LEU:HD21	1:A:70:PRO:CA	0.60	2.27	2	5
1:A:43:PRO:O	1:A:44:PHE:CD1	0.60	2.54	14	1
1:A:39:PHE:CG	1:A:42:ILE:HD12	0.60	2.30	6	2
1:A:40:HIS:CD2	1:A:41:THR:HG23	0.59	2.32	6	2
1:A:40:HIS:CE1	1:A:41:THR:CG2	0.59	2.85	2	2
1:A:4:LEU:HD11	1:A:39:PHE:CE2	0.59	2.32	5	2
1:A:31:PHE:CD1	1:A:31:PHE:C	0.59	2.76	14	9
1:A:62:HIS:CE1	1:A:77:LEU:HD11	0.59	2.32	14	2
1:A:35:CYS:SG	1:A:39:PHE:CD2	0.59	2.95	7	4
1:A:12:VAL:HG11	1:A:57:VAL:HG23	0.58	1.74	13	6
1:A:77:LEU:N	1:A:77:LEU:CD2	0.58	2.66	15	3
1:A:40:HIS:CG	1:A:41:THR:N	0.58	2.71	12	3
1:A:8:MET:HB3	1:A:52:TYR:CE2	0.58	2.34	11	15
1:A:62:HIS:CD2	1:A:63:GLU:N	0.58	2.72	2	11
1:A:42:ILE:HG22	1:A:45:GLY:N	0.57	2.14	8	3
1:A:38:LEU:CD2	1:A:39:PHE:CE2	0.57	2.87	7	2
1:A:55:SER:O	1:A:56:LYS:HB2	0.57	1.99	13	1
1:A:13:VAL:HG23	1:A:14:LYS:N	0.57	2.14	10	15

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:55:SER:O	1:A:56:LYS:CG	0.57	2.53	13	1
1:A:63:GLU:CD	1:A:68:THR:CB	0.57	2.72	14	4
1:A:35:CYS:SG	1:A:39:PHE:CE2	0.57	2.98	7	3
1:A:40:HIS:C	1:A:40:HIS:CD2	0.57	2.77	7	1
1:A:43:PRO:C	1:A:44:PHE:CG	0.56	2.79	7	6
1:A:62:HIS:C	1:A:62:HIS:HD2	0.56	2.04	7	6
1:A:31:PHE:CD1	1:A:53:VAL:HG11	0.56	2.36	12	2
1:A:13:VAL:CG1	1:A:60:ILE:CG2	0.56	2.83	13	3
1:A:12:VAL:HG11	1:A:57:VAL:CG2	0.55	2.31	4	9
1:A:39:PHE:CG	1:A:42:ILE:CD1	0.55	2.89	6	1
1:A:59:PRO:HA	1:A:62:HIS:ND1	0.55	2.17	15	5
1:A:38:LEU:CD1	1:A:39:PHE:CD1	0.55	2.89	1	3
1:A:35:CYS:HA	1:A:39:PHE:CD2	0.55	2.37	3	2
1:A:4:LEU:HD12	1:A:39:PHE:HE1	0.55	1.62	11	1
1:A:16:TYR:HA	1:A:27:ILE:HD13	0.55	1.79	1	1
1:A:59:PRO:O	1:A:62:HIS:CB	0.55	2.55	11	10
1:A:63:GLU:HB2	1:A:77:LEU:CD2	0.55	2.32	5	1
1:A:16:TYR:CD2	1:A:64:LEU:HD12	0.55	2.37	13	4
1:A:53:VAL:O	1:A:53:VAL:CG2	0.55	2.55	12	5
1:A:28:LYS:O	1:A:53:VAL:HG11	0.55	2.02	14	2
1:A:59:PRO:O	1:A:62:HIS:N	0.54	2.40	14	14
1:A:58:ASP:N	1:A:59:PRO:HD2	0.54	2.17	13	15
1:A:41:THR:O	1:A:41:THR:HG23	0.54	2.03	7	1
1:A:19:SER:O	1:A:20:ALA:CB	0.54	2.55	1	14
1:A:28:LYS:HB3	1:A:57:VAL:HG11	0.54	1.80	14	6
1:A:69:ALA:O	1:A:73:VAL:CG2	0.54	2.56	15	3
1:A:28:LYS:O	1:A:53:VAL:CG1	0.54	2.56	3	5
1:A:63:GLU:CB	1:A:77:LEU:HD22	0.54	2.32	5	1
1:A:38:LEU:C	1:A:38:LEU:HD23	0.54	2.24	15	1
1:A:11:LEU:HG	1:A:31:PHE:CD2	0.54	2.38	10	10
1:A:41:THR:O	1:A:42:ILE:C	0.54	2.45	9	3
1:A:63:GLU:CA	1:A:63:GLU:OE1	0.53	2.56	2	1
1:A:60:ILE:CG1	1:A:79:GLU:OE1	0.53	2.55	14	2
1:A:16:TYR:HD2	1:A:64:LEU:HD12	0.53	1.62	14	3
1:A:35:CYS:O	1:A:39:PHE:CB	0.53	2.56	11	1
1:A:43:PRO:O	1:A:44:PHE:CB	0.53	2.57	2	7
1:A:63:GLU:HB2	1:A:77:LEU:HD22	0.53	1.80	5	1
1:A:6:CYS:O	1:A:9:CYS:N	0.53	2.42	3	10
1:A:43:PRO:O	1:A:44:PHE:CD2	0.53	2.62	15	5
1:A:15:LYS:O	1:A:19:SER:CB	0.53	2.57	10	8
1:A:31:PHE:CE1	1:A:49:CYS:SG	0.53	3.02	4	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:63:GLU:HB2	1:A:73:VAL:HG13	0.52	1.82	14	4
1:A:56:LYS:O	1:A:60:ILE:CG1	0.52	2.58	12	15
1:A:8:MET:HE2	1:A:39:PHE:CE2	0.52	2.40	11	1
1:A:57:VAL:O	1:A:61:ILE:HG13	0.52	2.03	1	14
1:A:38:LEU:HD22	1:A:39:PHE:CD1	0.52	2.39	6	1
1:A:57:VAL:HG13	1:A:61:ILE:CD1	0.52	2.35	10	1
1:A:13:VAL:O	1:A:16:TYR:N	0.52	2.43	10	13
1:A:75:THR:CG2	1:A:76:LYS:N	0.52	2.72	5	6
1:A:13:VAL:HG21	1:A:70:PRO:O	0.51	2.04	2	1
1:A:63:GLU:OE1	1:A:77:LEU:CD1	0.51	2.58	4	3
1:A:16:TYR:HA	1:A:27:ILE:CD1	0.51	2.36	1	15
1:A:63:GLU:OE2	1:A:77:LEU:HD21	0.51	2.06	7	2
1:A:36:LYS:O	1:A:40:HIS:CB	0.51	2.59	9	4
1:A:16:TYR:C	1:A:16:TYR:CD1	0.51	2.84	15	8
1:A:40:HIS:O	1:A:41:THR:CB	0.51	2.56	13	1
1:A:16:TYR:CE2	1:A:64:LEU:HB2	0.51	2.41	4	6
1:A:57:VAL:O	1:A:61:ILE:HD12	0.51	2.06	6	1
1:A:54:ASN:O	1:A:55:SER:CB	0.51	2.58	14	3
1:A:9:CYS:CA	1:A:52:TYR:OH	0.51	2.59	2	10
1:A:11:LEU:CD1	1:A:34:GLU:CD	0.51	2.79	1	1
1:A:30:ASP:O	1:A:33:ALA:CB	0.51	2.59	10	10
1:A:69:ALA:HB1	1:A:70:PRO:HD2	0.51	1.81	4	6
1:A:63:GLU:OE2	1:A:77:LEU:CD2	0.51	2.58	8	1
1:A:22:LYS:N	1:A:22:LYS:CD	0.50	2.74	8	2
1:A:62:HIS:ND1	1:A:62:HIS:C	0.50	2.65	3	2
1:A:56:LYS:O	1:A:60:ILE:HD12	0.50	2.06	15	5
1:A:39:PHE:CD2	1:A:45:GLY:CA	0.50	2.95	11	1
1:A:35:CYS:O	1:A:39:PHE:HB2	0.50	2.06	14	1
1:A:4:LEU:O	1:A:8:MET:CG	0.50	2.60	14	1
1:A:52:TYR:CE1	1:A:56:LYS:HB2	0.50	2.41	2	2
1:A:35:CYS:SG	1:A:36:LYS:N	0.50	2.85	3	1
1:A:76:LYS:C	1:A:77:LEU:HD23	0.50	2.26	8	1
1:A:40:HIS:CD2	1:A:41:THR:N	0.50	2.80	7	1
1:A:62:HIS:NE2	1:A:63:GLU:OE1	0.50	2.45	5	5
1:A:13:VAL:O	1:A:17:GLU:N	0.50	2.45	15	12
1:A:63:GLU:OE2	1:A:77:LEU:HD11	0.50	2.07	7	1
1:A:4:LEU:HD21	1:A:39:PHE:CE2	0.50	2.41	8	1
1:A:36:LYS:O	1:A:40:HIS:CA	0.50	2.60	1	2
1:A:40:HIS:NE2	1:A:41:THR:HG22	0.50	2.22	2	1
1:A:15:LYS:O	1:A:19:SER:CA	0.49	2.60	11	2
1:A:62:HIS:CG	1:A:63:GLU:N	0.49	2.80	8	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:12:VAL:HG23	1:A:13:VAL:N	0.49	2.22	2	7
1:A:8:MET:HB3	1:A:52:TYR:CD2	0.49	2.42	4	9
1:A:31:PHE:CZ	1:A:49:CYS:SG	0.49	3.05	4	1
1:A:63:GLU:OE2	1:A:68:THR:CG2	0.49	2.60	14	2
1:A:52:TYR:CD1	1:A:56:LYS:HB2	0.49	2.42	10	1
1:A:52:TYR:CE1	1:A:56:LYS:HD2	0.49	2.41	11	1
1:A:9:CYS:CB	1:A:79:GLU:OE1	0.49	2.61	4	1
1:A:34:GLU:O	1:A:38:LEU:CB	0.49	2.61	15	3
1:A:13:VAL:CG2	1:A:14:LYS:N	0.49	2.75	6	14
1:A:57:VAL:O	1:A:61:ILE:CG1	0.49	2.60	6	3
1:A:73:VAL:O	1:A:74:CYS:C	0.49	2.51	2	1
1:A:8:MET:CB	1:A:52:TYR:CE2	0.49	2.96	11	5
1:A:16:TYR:CD1	1:A:27:ILE:HD13	0.49	2.42	4	4
1:A:23:ASP:HB3	1:A:26:VAL:HG23	0.49	1.84	9	6
1:A:73:VAL:HG12	1:A:74:CYS:N	0.49	2.22	2	1
1:A:38:LEU:HD22	1:A:39:PHE:CE1	0.49	2.43	3	2
1:A:4:LEU:C	1:A:4:LEU:CD2	0.49	2.79	10	2
1:A:11:LEU:HB3	1:A:31:PHE:CD2	0.48	2.43	5	9
1:A:35:CYS:O	1:A:39:PHE:N	0.48	2.46	13	4
1:A:31:PHE:CD1	1:A:32:ASP:N	0.48	2.81	15	5
1:A:23:ASP:OD2	1:A:26:VAL:HG23	0.48	2.07	5	1
1:A:73:VAL:HG13	1:A:77:LEU:HD23	0.48	1.86	5	1
1:A:40:HIS:NE2	1:A:41:THR:CG2	0.48	2.76	2	2
1:A:62:HIS:NE2	1:A:63:GLU:CD	0.48	2.66	3	1
1:A:53:VAL:HA	1:A:57:VAL:HG21	0.48	1.84	5	3
1:A:10:GLU:HA	1:A:13:VAL:CG2	0.48	2.39	10	9
1:A:63:GLU:OE1	1:A:63:GLU:HA	0.48	2.08	2	1
1:A:63:GLU:CB	1:A:73:VAL:HG22	0.48	2.34	4	3
1:A:68:THR:HG23	1:A:72:ASP:CB	0.48	2.39	6	1
1:A:13:VAL:HG23	1:A:14:LYS:H	0.48	1.67	10	13
1:A:30:ASP:O	1:A:33:ALA:N	0.48	2.47	3	7
1:A:43:PRO:HG2	1:A:44:PHE:CE2	0.48	2.44	14	2
1:A:63:GLU:CB	1:A:73:VAL:HG13	0.48	2.39	15	2
1:A:40:HIS:NE2	1:A:41:THR:HG23	0.48	2.24	6	1
1:A:12:VAL:HG12	1:A:31:PHE:CD2	0.47	2.44	3	6
1:A:77:LEU:O	1:A:79:GLU:N	0.47	2.47	11	2
1:A:38:LEU:C	1:A:38:LEU:CD2	0.47	2.82	15	1
1:A:6:CYS:O	1:A:7:GLN:C	0.47	2.52	14	2
1:A:62:HIS:NE2	1:A:63:GLU:OE2	0.47	2.47	3	1
1:A:6:CYS:O	1:A:9:CYS:SG	0.47	2.71	6	8
1:A:49:CYS:O	1:A:53:VAL:HG13	0.47	2.09	5	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:38:LEU:HD23	1:A:38:LEU:O	0.47	2.10	15	1
1:A:7:GLN:O	1:A:10:GLU:N	0.47	2.48	14	12
1:A:36:LYS:O	1:A:40:HIS:N	0.47	2.47	6	3
1:A:9:CYS:N	1:A:52:TYR:OH	0.47	2.48	9	6
1:A:57:VAL:N	1:A:59:PRO:HD2	0.47	2.25	11	11
1:A:28:LYS:HB2	1:A:57:VAL:HG11	0.47	1.86	14	1
1:A:27:ILE:O	1:A:30:ASP:N	0.47	2.48	4	3
1:A:4:LEU:HD12	1:A:8:MET:HG3	0.47	1.87	8	1
1:A:16:TYR:CZ	1:A:61:ILE:HG23	0.47	2.38	7	2
1:A:43:PRO:O	1:A:44:PHE:CG	0.47	2.68	15	5
1:A:12:VAL:CG1	1:A:57:VAL:CG2	0.47	2.93	4	3
1:A:57:VAL:O	1:A:61:ILE:CD1	0.47	2.63	6	1
1:A:38:LEU:CD2	1:A:39:PHE:CZ	0.47	2.98	9	2
1:A:8:MET:CE	1:A:49:CYS:SG	0.47	3.03	12	1
1:A:40:HIS:C	1:A:41:THR:CG2	0.47	2.79	13	1
1:A:77:LEU:C	1:A:79:GLU:N	0.47	2.68	11	3
1:A:19:SER:OG	1:A:27:ILE:CG1	0.47	2.62	4	1
1:A:52:TYR:CD1	1:A:56:LYS:HD2	0.47	2.45	11	1
1:A:34:GLU:C	1:A:36:LYS:N	0.46	2.67	7	3
1:A:11:LEU:HD23	1:A:31:PHE:CZ	0.46	2.44	11	2
1:A:45:GLY:O	1:A:48:GLU:N	0.46	2.49	11	1
1:A:56:LYS:C	1:A:59:PRO:HD2	0.46	2.31	13	1
1:A:39:PHE:CE2	1:A:42:ILE:HD12	0.46	2.44	4	1
1:A:40:HIS:ND1	1:A:40:HIS:C	0.46	2.69	12	2
1:A:51:HIS:O	1:A:55:SER:CB	0.46	2.63	8	1
1:A:36:LYS:O	1:A:40:HIS:ND1	0.46	2.49	14	2
1:A:19:SER:OG	1:A:20:ALA:N	0.46	2.49	1	1
1:A:44:PHE:O	1:A:47:ARG:N	0.46	2.48	4	1
1:A:32:ASP:HB2	1:A:53:VAL:HG11	0.46	1.88	5	1
1:A:35:CYS:C	1:A:37:LYS:N	0.46	2.69	14	3
1:A:10:GLU:HA	1:A:13:VAL:HG22	0.46	1.87	10	5
1:A:40:HIS:ND1	1:A:41:THR:N	0.46	2.63	12	1
1:A:12:VAL:CG2	1:A:13:VAL:N	0.46	2.79	2	9
1:A:63:GLU:CG	1:A:77:LEU:HD21	0.46	2.40	2	4
1:A:57:VAL:C	1:A:59:PRO:HD2	0.46	2.31	11	5
1:A:9:CYS:HB3	1:A:79:GLU:OE1	0.46	2.11	4	1
1:A:11:LEU:HB3	1:A:31:PHE:CE2	0.46	2.46	11	3
1:A:63:GLU:OE2	1:A:68:THR:OG1	0.46	2.33	11	2
1:A:34:GLU:O	1:A:36:LYS:N	0.46	2.49	7	1
1:A:62:HIS:ND1	1:A:63:GLU:N	0.46	2.64	8	1
1:A:9:CYS:CB	1:A:52:TYR:OH	0.46	2.65	15	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:39:PHE:CG	1:A:42:ILE:HG13	0.46	2.46	8	3
1:A:38:LEU:CD1	1:A:39:PHE:CE1	0.45	2.99	4	2
1:A:8:MET:HB2	1:A:52:TYR:CZ	0.45	2.46	11	1
1:A:74:CYS:O	1:A:78:ASN:N	0.45	2.49	2	1
1:A:10:GLU:O	1:A:14:LYS:CB	0.45	2.64	12	6
1:A:21:ASP:OD1	1:A:22:LYS:N	0.45	2.49	10	4
1:A:35:CYS:O	1:A:37:LYS:N	0.45	2.49	4	1
1:A:59:PRO:O	1:A:62:HIS:HB3	0.45	2.12	2	1
1:A:38:LEU:HD21	1:A:39:PHE:CD2	0.45	2.47	14	1
1:A:40:HIS:O	1:A:41:THR:HG22	0.45	2.12	13	1
1:A:16:TYR:CG	1:A:27:ILE:HD13	0.45	2.47	9	3
1:A:42:ILE:CG2	1:A:43:PRO:HD2	0.45	2.42	6	4
1:A:77:LEU:O	1:A:78:ASN:CB	0.45	2.65	5	1
1:A:16:TYR:OH	1:A:65:GLU:CG	0.45	2.65	13	3
1:A:68:THR:HG23	1:A:72:ASP:HB2	0.45	1.88	6	1
1:A:16:TYR:CD1	1:A:27:ILE:CD1	0.44	3.00	4	2
1:A:11:LEU:HD23	1:A:31:PHE:CG	0.44	2.45	15	3
1:A:12:VAL:CG1	1:A:57:VAL:HG22	0.44	2.43	14	3
1:A:11:LEU:CD1	1:A:34:GLU:HB3	0.44	2.41	12	1
1:A:55:SER:C	1:A:56:LYS:CG	0.44	2.84	13	1
1:A:63:GLU:OE1	1:A:68:THR:CB	0.44	2.65	2	2
1:A:17:GLU:CD	1:A:17:GLU:C	0.44	2.76	10	5
1:A:77:LEU:O	1:A:78:ASN:C	0.44	2.56	11	2
1:A:40:HIS:CD2	1:A:40:HIS:C	0.44	2.91	2	2
1:A:76:LYS:CG	1:A:77:LEU:HD23	0.44	2.42	11	1
1:A:63:GLU:CD	1:A:68:THR:OG1	0.44	2.56	2	3
1:A:35:CYS:CA	1:A:39:PHE:CD2	0.44	3.01	3	1
1:A:45:GLY:O	1:A:49:CYS:SG	0.44	2.76	14	4
1:A:35:CYS:O	1:A:40:HIS:N	0.44	2.51	12	1
1:A:38:LEU:HG	1:A:39:PHE:N	0.44	2.27	14	4
1:A:79:GLU:CD	1:A:79:GLU:O	0.44	2.56	4	1
1:A:60:ILE:HA	1:A:73:VAL:HG11	0.44	1.90	6	1
1:A:63:GLU:CD	1:A:77:LEU:CD2	0.44	2.76	7	1
1:A:60:ILE:HD11	1:A:79:GLU:OE1	0.44	2.12	15	1
1:A:62:HIS:HD2	1:A:63:GLU:N	0.43	2.11	5	2
1:A:4:LEU:C	1:A:4:LEU:HD13	0.43	2.34	1	1
1:A:63:GLU:HG3	1:A:77:LEU:CD2	0.43	2.43	2	1
1:A:44:PHE:O	1:A:45:GLY:C	0.43	2.56	4	1
1:A:34:GLU:O	1:A:35:CYS:C	0.43	2.56	7	2
1:A:16:TYR:CB	1:A:27:ILE:HD13	0.43	2.42	9	2
1:A:4:LEU:O	1:A:5:SER:C	0.43	2.57	3	2

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:56:LYS:O	1:A:60:ILE:CD1	0.43	2.66	15	3
1:A:60:ILE:HA	1:A:73:VAL:CG1	0.43	2.43	9	2
1:A:13:VAL:CG2	1:A:14:LYS:H	0.43	2.27	10	6
1:A:15:LYS:CD	1:A:30:ASP:HB3	0.43	2.43	5	2
1:A:53:VAL:HA	1:A:57:VAL:CG2	0.43	2.43	15	2
1:A:68:THR:HG23	1:A:72:ASP:HB3	0.43	1.91	10	2
1:A:38:LEU:C	1:A:38:LEU:HD12	0.43	2.34	10	1
1:A:11:LEU:HD23	1:A:35:CYS:SG	0.43	2.53	12	1
1:A:11:LEU:CD2	1:A:35:CYS:HB2	0.43	2.44	1	3
1:A:39:PHE:HD1	1:A:42:ILE:HD12	0.43	1.74	2	1
1:A:23:ASP:OD1	1:A:23:ASP:N	0.43	2.51	4	1
1:A:16:TYR:O	1:A:19:SER:N	0.43	2.50	7	1
1:A:11:LEU:HD21	1:A:35:CYS:HB2	0.43	1.91	1	1
1:A:59:PRO:HB2	1:A:77:LEU:CD1	0.43	2.44	6	2
1:A:74:CYS:SG	1:A:79:GLU:OE2	0.43	2.77	4	1
1:A:62:HIS:CD2	1:A:63:GLU:HG3	0.43	2.49	9	1
1:A:21:ASP:OD1	1:A:21:ASP:C	0.43	2.58	3	1
1:A:35:CYS:O	1:A:39:PHE:C	0.43	2.57	12	1
1:A:16:TYR:O	1:A:17:GLU:C	0.42	2.58	15	2
1:A:35:CYS:C	1:A:37:LYS:H	0.42	2.16	14	1
1:A:61:ILE:O	1:A:65:GLU:CG	0.42	2.66	15	1
1:A:23:ASP:O	1:A:27:ILE:CG1	0.42	2.67	2	2
1:A:28:LYS:HB2	1:A:53:VAL:HB	0.42	1.90	3	1
1:A:13:VAL:CB	1:A:64:LEU:HD11	0.42	2.44	2	1
1:A:20:ALA:O	1:A:21:ASP:OD1	0.42	2.37	4	1
1:A:26:VAL:O	1:A:30:ASP:CG	0.42	2.58	7	2
1:A:35:CYS:HA	1:A:39:PHE:CE2	0.42	2.49	3	1
1:A:17:GLU:CD	1:A:18:GLY:N	0.42	2.73	2	1
1:A:63:GLU:HG3	1:A:68:THR:HG21	0.42	1.92	5	1
1:A:52:TYR:CD1	1:A:56:LYS:CD	0.42	3.03	7	1
1:A:77:LEU:CB	1:A:79:GLU:OE2	0.42	2.67	7	2
1:A:23:ASP:C	1:A:25:ASN:N	0.42	2.72	11	1
1:A:39:PHE:CE2	1:A:45:GLY:HA2	0.42	2.49	11	1
1:A:64:LEU:CD2	1:A:70:PRO:CA	0.42	2.97	15	1
1:A:15:LYS:CE	1:A:34:GLU:OE1	0.42	2.67	1	1
1:A:56:LYS:O	1:A:60:ILE:HG13	0.42	2.14	8	1
1:A:17:GLU:CD	1:A:64:LEU:HD22	0.41	2.36	4	1
1:A:33:ALA:O	1:A:36:LYS:N	0.41	2.53	11	2
1:A:69:ALA:HB1	1:A:70:PRO:CD	0.41	2.45	4	1
1:A:59:PRO:HB2	1:A:77:LEU:HD12	0.41	1.92	11	1
1:A:39:PHE:O	1:A:46:THR:CG2	0.41	2.68	13	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:72:ASP:O	1:A:73:VAL:O	0.41	2.39	2	1
1:A:22:LYS:N	1:A:22:LYS:HD3	0.41	2.30	9	1
1:A:73:VAL:CA	1:A:77:LEU:HD23	0.41	2.42	10	1
1:A:53:VAL:O	1:A:57:VAL:CG1	0.41	2.69	13	1
1:A:74:CYS:CB	1:A:79:GLU:O	0.41	2.68	2	1
1:A:4:LEU:HD11	1:A:39:PHE:HE2	0.41	1.74	8	1
1:A:8:MET:HB3	1:A:52:TYR:CZ	0.41	2.50	8	1
1:A:73:VAL:O	1:A:79:GLU:OE2	0.41	2.38	10	1
1:A:27:ILE:O	1:A:28:LYS:C	0.41	2.58	12	1
1:A:63:GLU:O	1:A:66:GLY:N	0.41	2.53	2	1
1:A:34:GLU:O	1:A:38:LEU:HB3	0.41	2.16	8	1
1:A:39:PHE:O	1:A:46:THR:HG23	0.41	2.16	13	1
1:A:74:CYS:O	1:A:75:THR:C	0.41	2.59	2	1
1:A:31:PHE:CE1	1:A:49:CYS:HB2	0.41	2.51	3	1
1:A:52:TYR:OH	1:A:79:GLU:OE2	0.41	2.38	6	1
1:A:16:TYR:CD2	1:A:64:LEU:CD1	0.41	3.04	7	1
1:A:10:GLU:O	1:A:14:LYS:CG	0.41	2.69	10	1
1:A:74:CYS:HB3	1:A:79:GLU:O	0.41	2.16	12	1
1:A:20:ALA:O	1:A:21:ASP:CB	0.41	2.67	4	1
1:A:16:TYR:CD1	1:A:16:TYR:C	0.41	2.92	7	1
1:A:77:LEU:CB	1:A:79:GLU:HG2	0.41	2.45	14	1
1:A:11:LEU:HD11	1:A:34:GLU:CG	0.41	2.45	1	1
1:A:68:THR:HG22	1:A:73:VAL:HG22	0.41	1.92	1	1
1:A:10:GLU:O	1:A:10:GLU:CD	0.41	2.59	2	1
1:A:54:ASN:C	1:A:55:SER:OG	0.41	2.59	13	1
1:A:35:CYS:O	1:A:36:LYS:C	0.41	2.59	4	1
1:A:9:CYS:O	1:A:12:VAL:HG22	0.41	2.16	10	1
1:A:37:LYS:O	1:A:38:LEU:C	0.40	2.59	1	1
1:A:4:LEU:CD1	1:A:42:ILE:HG21	0.40	2.46	13	1
1:A:42:ILE:CG2	1:A:44:PHE:CD1	0.40	3.05	13	1
1:A:31:PHE:O	1:A:35:CYS:HB2	0.40	2.16	1	1
1:A:63:GLU:OE1	1:A:77:LEU:HD21	0.40	2.15	1	1
1:A:11:LEU:CB	1:A:31:PHE:CD2	0.40	3.04	4	2
1:A:65:GLU:C	1:A:65:GLU:CD	0.40	2.80	6	1
1:A:65:GLU:CD	1:A:65:GLU:C	0.40	2.79	7	1
1:A:4:LEU:O	1:A:8:MET:CB	0.40	2.69	14	1
1:A:39:PHE:CD1	1:A:42:ILE:CD1	0.40	3.04	6	1
1:A:47:ARG:C	1:A:47:ARG:CD	0.40	2.87	1	1
1:A:17:GLU:HG2	1:A:70:PRO:CB	0.40	2.47	5	1
1:A:26:VAL:O	1:A:30:ASP:OD2	0.40	2.39	5	1
1:A:42:ILE:C	1:A:44:PHE:H	0.40	2.19	13	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:34:GLU:O	1:A:37:LYS:N	0.40	2.49	4	1
1:A:41:THR:O	1:A:42:ILE:O	0.40	2.39	9	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	76/99 (77%)	56±3 (74±3%)	16±2 (21±3%)	4±1 (6±1%)	3	21
All	All	1140/1485 (77%)	840 (74%)	234 (21%)	66 (6%)	3	21

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	55	SER	14
1	A	59	PRO	10
1	A	75	THR	10
1	A	67	GLY	5
1	A	43	PRO	5
1	A	53	VAL	5
1	A	54	ASN	5
1	A	20	ALA	3
1	A	21	ASP	2
1	A	78	ASN	2
1	A	73	VAL	1
1	A	36	LYS	1
1	A	41	THR	1
1	A	44	PHE	1
1	A	56	LYS	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	68/86 (79%)	49±3 (71±4%)	19±3 (29±4%)	2	18
All	All	1020/1290 (79%)	728 (71%)	292 (29%)	2	18

All 49 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	62	HIS	15
1	A	16	TYR	14
1	A	75	THR	14
1	A	9	CYS	13
1	A	58	ASP	13
1	A	63	GLU	12
1	A	71	LYS	11
1	A	74	CYS	11
1	A	48	GLU	11
1	A	38	LEU	10
1	A	23	ASP	10
1	A	4	LEU	9
1	A	40	HIS	9
1	A	19	SER	8
1	A	37	LYS	8
1	A	51	HIS	8
1	A	7	GLN	7
1	A	77	LEU	7
1	A	55	SER	7
1	A	36	LYS	6
1	A	30	ASP	6
1	A	78	ASN	6
1	A	21	ASP	5
1	A	57	VAL	5
1	A	5	SER	5
1	A	6	CYS	5
1	A	35	CYS	5
1	A	14	LYS	5
1	A	72	ASP	4
1	A	76	LYS	4
1	A	56	LYS	4
1	A	79	GLU	4
1	A	32	ASP	3

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Mol	Chain	Res	Type	Models (Total)
1	A	50	ASP	3
1	A	64	LEU	3
1	A	47	ARG	2
1	A	10	GLU	2
1	A	28	LYS	2
1	A	49	CYS	2
1	A	22	LYS	2
1	A	44	PHE	2
1	A	65	GLU	2
1	A	42	ILE	2
1	A	25	ASN	1
1	A	54	ASN	1
1	A	39	PHE	1
1	A	34	GLU	1
1	A	41	THR	1
1	A	31	PHE	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