



Full wwPDB NMR Structure Validation Report ⓘ

Mar 15, 2026 – 09:58 AM UTC

PDB ID : 2K7D / pdb_00002k7d
Title : NMR Structure of Ca²⁺-bound CaBP1 C-domain
Authors : Ames, J.
Deposited on : 2008-08-08

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/NMRValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
wwPDB-RCI : v_1n_11_5_13_A (Berjanski et al., 2005)
PANAV : Wang et al. (2010)
wwPDB-ShiftChecker : v1.2
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

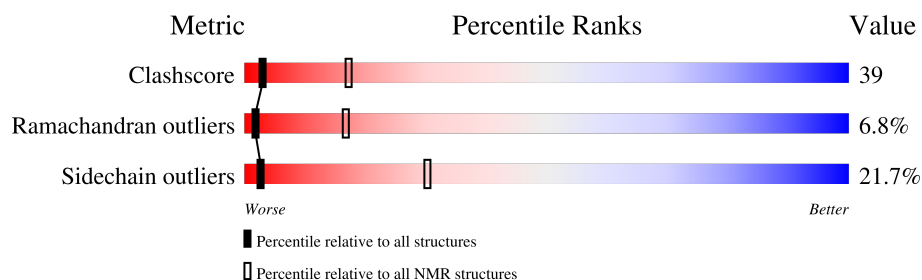
1 Overall quality at a glance

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	229148	14424
Ramachandran outliers	224038	12848
Sidechain outliers	223484	12823

The table below summarises the geometric issues observed across the polymeric chains and their fit to the experimental data. The red, orange, yellow and green segments indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A cyan segment indicates the fraction of residues that are not part of the well-defined cores, and a grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	72	18% 60% 15% 7%

2 Ensemble composition and analysis

This entry contains 15 models. Model 5 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *closest to the average*.

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:101-A:167 (67)	1.24	5

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 2 clusters and 1 single-model cluster was found.

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

3 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 1143 atoms, of which 559 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Calcium-binding protein 1.

Mol	Chain	Residues	Atoms						Trace
1	A	72	Total	C	H	N	O	S	0
			1141	353	559	108	117	4	

- Molecule 2 is CALCIUM ION (CCD ID: CA) (formula: Ca).

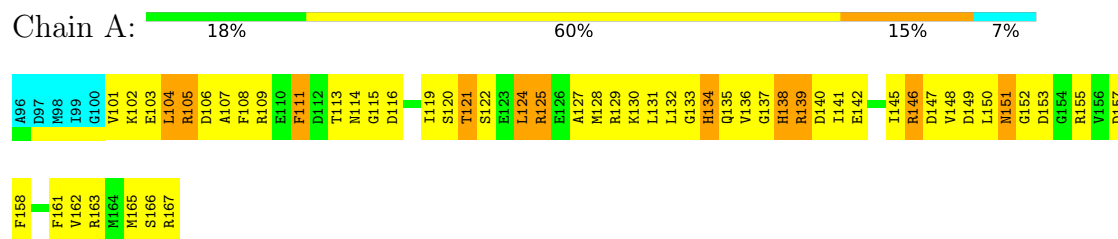
Mol	Chain	Residues	Atoms	
2	A	2	Total	Ca
			2	2

4 Residue-property plots

4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic is the same as shown in the summary in section 1 of this report. The second graphic shows the sequence where residues are colour-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outliers are shown as green connectors. Residues which are classified as ill-defined in the NMR ensemble, are shown in cyan with an underline colour-coded according to the previous scheme. Residues which were present in the experimental sample, but not modelled in the final structure are shown in grey.

- Molecule 1: Calcium-binding protein 1

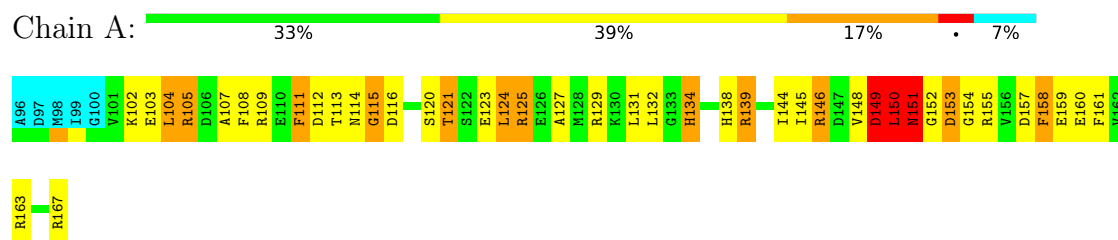


4.2 Scores per residue for each member of the ensemble

Colouring as in section 4.1 above.

4.2.1 Score per residue for model 1

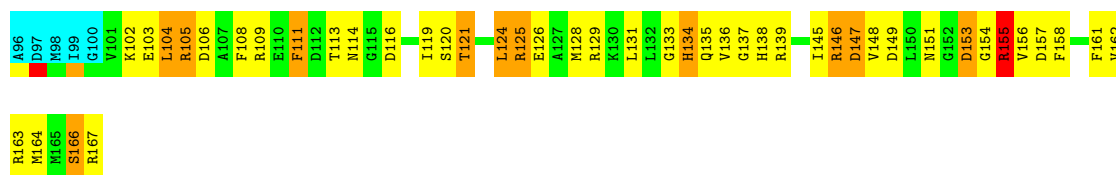
- Molecule 1: Calcium-binding protein 1



4.2.2 Score per residue for model 2

- Molecule 1: Calcium-binding protein 1

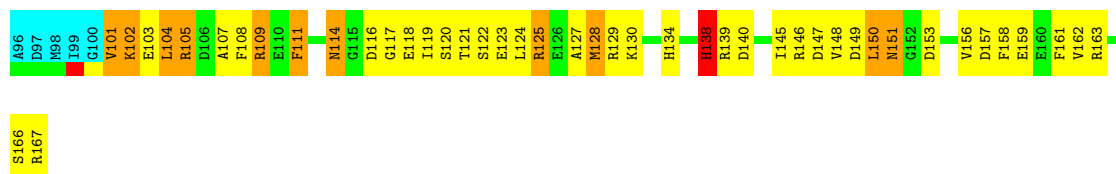




4.2.3 Score per residue for model 3

- Molecule 1: Calcium-binding protein 1

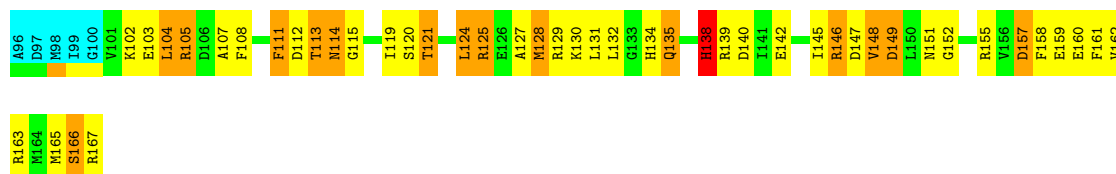
Chain A: 31% 46% 15% • 7%



4.2.4 Score per residue for model 4

- Molecule 1: Calcium-binding protein 1

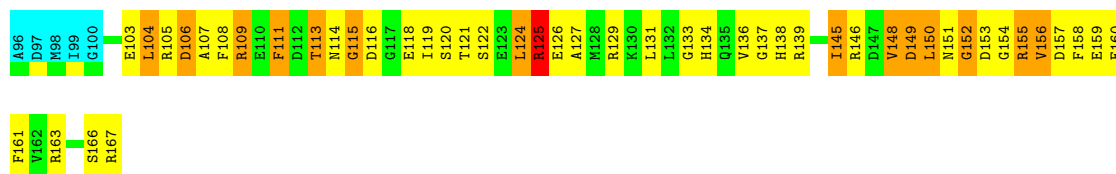
Chain A: 29% 42% 21% • 7%



4.2.5 Score per residue for model 5 (medoid)

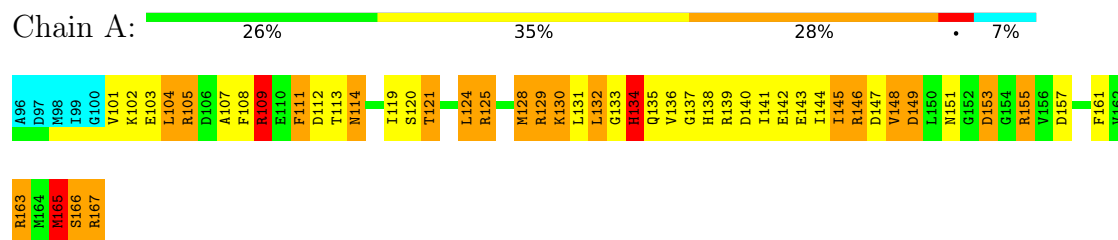
- Molecule 1: Calcium-binding protein 1

Chain A: 26% 46% 19% • 7%



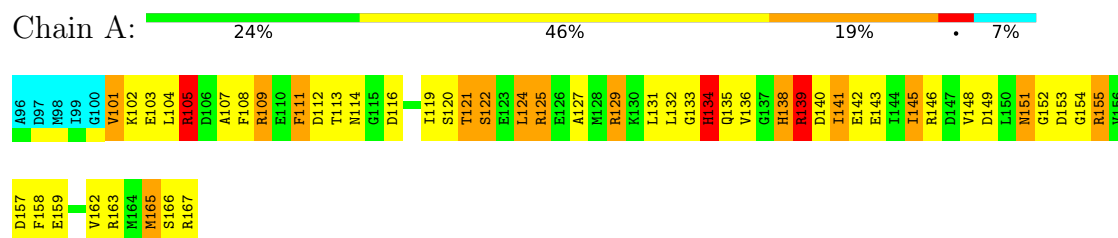
4.2.6 Score per residue for model 6

- Molecule 1: Calcium-binding protein 1



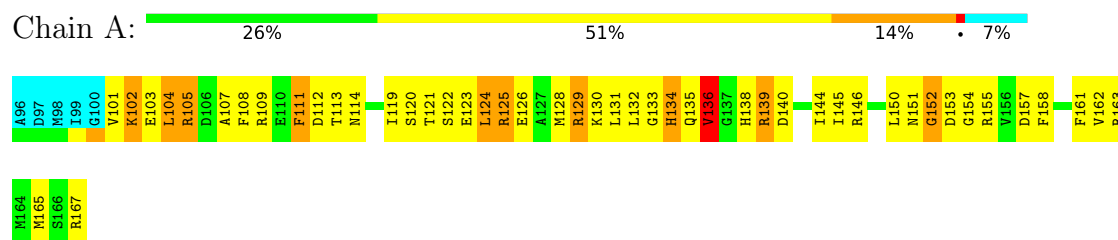
4.2.7 Score per residue for model 7

- Molecule 1: Calcium-binding protein 1



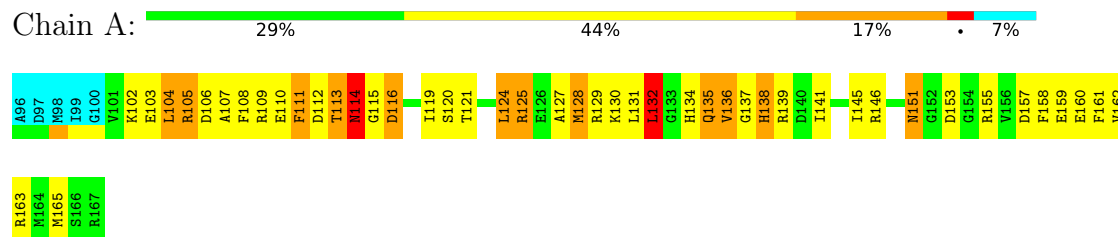
4.2.8 Score per residue for model 8

- Molecule 1: Calcium-binding protein 1



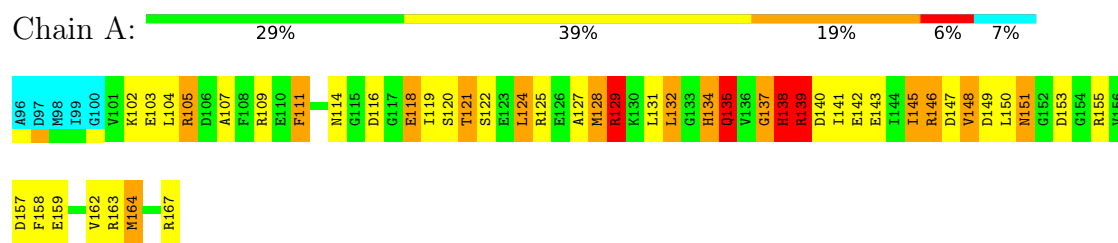
4.2.9 Score per residue for model 9

- Molecule 1: Calcium-binding protein 1



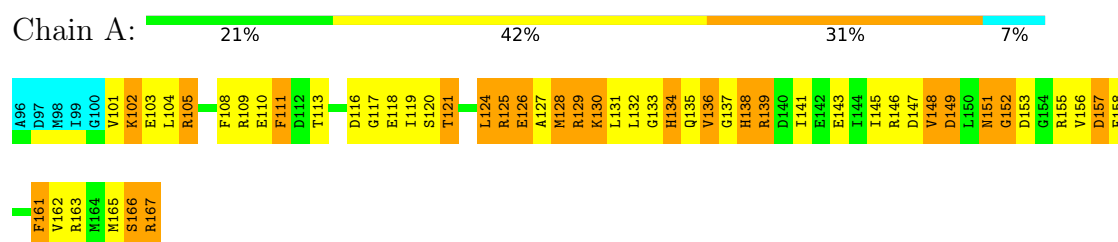
4.2.10 Score per residue for model 10

- Molecule 1: Calcium-binding protein 1



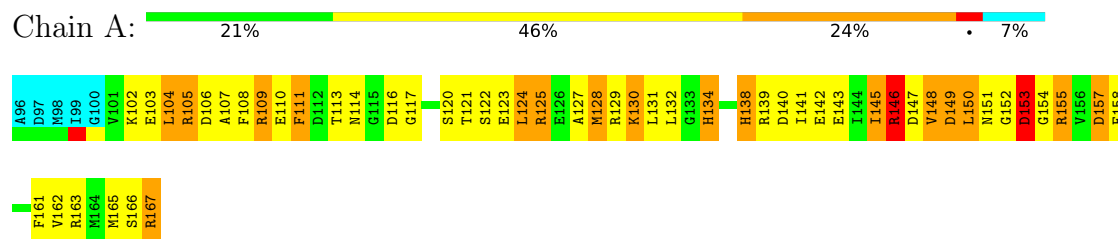
4.2.11 Score per residue for model 11

- Molecule 1: Calcium-binding protein 1



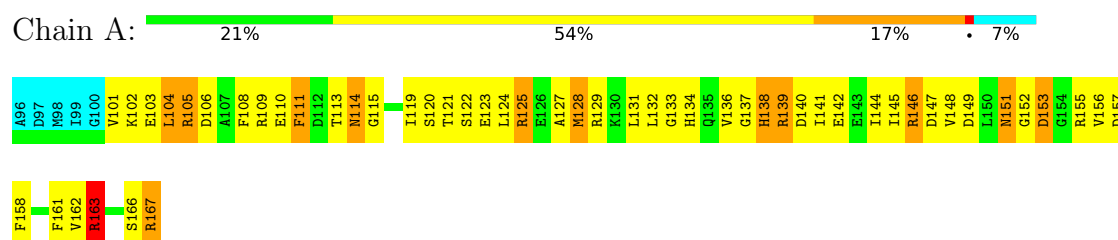
4.2.12 Score per residue for model 12

- Molecule 1: Calcium-binding protein 1



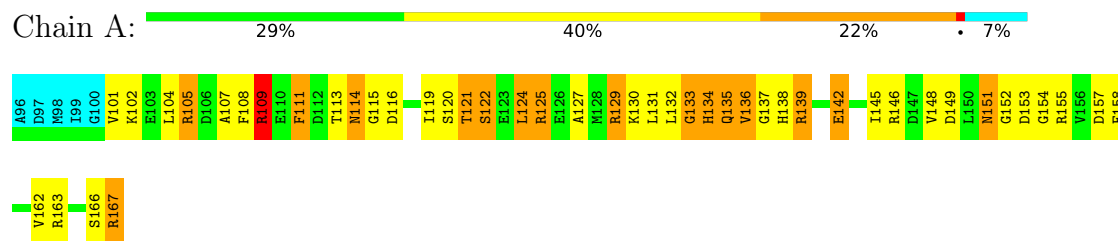
4.2.13 Score per residue for model 13

- Molecule 1: Calcium-binding protein 1



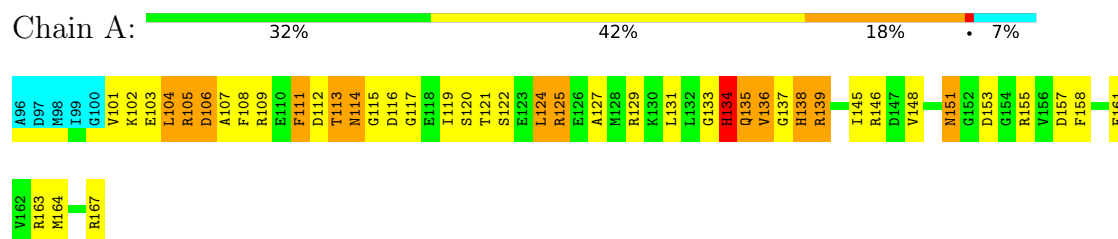
4.2.14 Score per residue for model 14

- Molecule 1: Calcium-binding protein 1



4.2.15 Score per residue for model 15

- Molecule 1: Calcium-binding protein 1



5 Refinement protocol and experimental data overview ⓘ

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

Of the 50 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
X-PLOR	refinement	3.1

No chemical shift data was provided.

6 Model quality [i](#)

6.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section:
CA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the (average) root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#Z>5	RMSZ	#Z>5
1	A	1.57±0.02	4±0/554 (0.8± 0.1%)	1.48±0.02	2±1/736 (0.3± 0.1%)
All	All	1.57	63/8310 (0.8%)	1.48	35/11040 (0.3%)

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	8.7±0.5
All	All	0	130

All unique bond outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)	Models	
								Worst	Total
1	A	134	HIS	CG-ND1	-11.97	1.25	1.38	5	15
1	A	138	HIS	CG-ND1	-11.88	1.25	1.38	7	15
1	A	133	GLY	N-CA	5.63	1.50	1.45	14	1
1	A	134	HIS	ND1-CE1	-5.48	1.27	1.32	5	15
1	A	138	HIS	ND1-CE1	-5.43	1.27	1.32	14	15
1	A	135	GLN	C-N	-5.36	1.30	1.33	9	1
1	A	152	GLY	N-CA	5.18	1.49	1.45	8	1

All unique angle outliers are listed below. They are sorted according to the Z-score of the worst occurrence in the ensemble.

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	134	HIS	CE1-NE2-CD2	-7.58	101.42	109.00	14	15

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)	Models	
								Worst	Total
1	A	138	HIS	CE1-NE2-CD2	-7.49	101.51	109.00	14	15
1	A	114	ASN	CB-CA-C	-5.72	108.83	117.07	7	2
1	A	166	SER	CB-CA-C	-5.72	108.83	117.07	3	1
1	A	135	GLN	CB-CA-C	-5.29	109.49	115.79	10	1
1	A	166	SER	CA-C-O	5.17	120.94	117.94	3	1

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	105	ARG	Sidechain	15
1	A	129	ARG	Sidechain	15
1	A	139	ARG	Sidechain	15
1	A	146	ARG	Sidechain	15
1	A	163	ARG	Sidechain	15
1	A	109	ARG	Sidechain	14
1	A	125	ARG	Sidechain	14
1	A	155	ARG	Sidechain	14
1	A	167	ARG	Sidechain	13

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	549	527	527	42±7
2	A	2	0	0	0±0
All	All	8265	7905	7905	634

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 39.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:148:VAL:HG13	1:A:149:ASP:N	0.89	1.83	4	7

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:148:VAL:HG13	1:A:149:ASP:H	0.82	1.35	12	5
1:A:114:ASN:HD22	1:A:114:ASN:H	0.82	1.16	9	1
1:A:130:LYS:C	1:A:131:LEU:HD12	0.79	2.02	6	5
1:A:114:ASN:ND2	1:A:116:ASP:N	0.76	2.31	14	1
1:A:104:LEU:CD1	1:A:161:PHE:CE2	0.76	2.69	12	10
1:A:132:LEU:HD12	1:A:133:GLY:N	0.75	1.96	14	1
1:A:114:ASN:H	1:A:114:ASN:ND2	0.75	1.78	13	2
1:A:114:ASN:ND2	1:A:115:GLY:N	0.74	2.35	14	1
1:A:111:PHE:CD1	1:A:119:ILE:HD13	0.74	2.18	6	10
1:A:124:LEU:HD21	1:A:128:MET:SD	0.74	2.22	13	1
1:A:128:MET:SD	1:A:132:LEU:HD11	0.73	2.23	11	1
1:A:124:LEU:HD11	1:A:128:MET:SD	0.71	2.25	3	3
1:A:118:GLU:N	1:A:118:GLU:CD	0.71	2.49	3	1
1:A:112:ASP:OD1	2:A:501:CA:CA	0.71	1.67	1	1
1:A:104:LEU:HD12	1:A:161:PHE:CE2	0.69	2.22	2	10
1:A:114:ASN:HD22	1:A:115:GLY:N	0.68	1.86	14	1
1:A:124:LEU:HD23	1:A:124:LEU:O	0.68	1.88	13	1
1:A:114:ASN:ND2	1:A:114:ASN:N	0.68	2.42	13	3
1:A:104:LEU:HD12	1:A:162:VAL:HG22	0.67	1.66	10	4
1:A:148:VAL:CG1	1:A:149:ASP:N	0.67	2.55	4	6
1:A:114:ASN:ND2	1:A:116:ASP:CG	0.67	2.53	14	1
1:A:104:LEU:CD1	1:A:161:PHE:CZ	0.67	2.78	2	2
1:A:148:VAL:CG1	1:A:149:ASP:H	0.66	2.03	4	2
1:A:135:GLN:H	1:A:135:GLN:CD	0.66	1.99	7	2
1:A:105:ARG:NH1	1:A:158:PHE:CG	0.66	2.64	8	1
1:A:131:LEU:CD1	1:A:131:LEU:N	0.65	2.59	4	11
1:A:108:PHE:CZ	1:A:158:PHE:N	0.65	2.65	1	8
1:A:111:PHE:CE1	1:A:119:ILE:HD13	0.65	2.27	7	8
1:A:116:ASP:CG	1:A:117:GLY:N	0.65	2.54	11	1
1:A:151:ASN:CG	1:A:152:GLY:N	0.64	2.55	7	3
1:A:114:ASN:ND2	1:A:116:ASP:H	0.64	1.90	14	1
1:A:114:ASN:N	1:A:114:ASN:HD22	0.64	1.89	13	1
1:A:153:ASP:CG	1:A:154:GLY:N	0.64	2.55	8	3
1:A:103:GLU:CG	1:A:104:LEU:N	0.64	2.60	3	2
1:A:132:LEU:CD1	1:A:133:GLY:N	0.64	2.61	14	1
1:A:151:ASN:HD22	1:A:152:GLY:H	0.63	1.35	11	1
1:A:114:ASN:HD22	1:A:114:ASN:C	0.63	2.01	14	1
1:A:112:ASP:OD2	1:A:115:GLY:N	0.62	2.33	1	1
1:A:101:VAL:CG1	1:A:102:LYS:N	0.62	2.62	11	1
1:A:116:ASP:OD1	1:A:117:GLY:N	0.62	2.33	12	2
1:A:149:ASP:OD2	1:A:154:GLY:N	0.61	2.33	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:106:ASP:N	1:A:106:ASP:OD1	0.61	2.31	5	1
1:A:151:ASN:ND2	1:A:151:ASN:H	0.61	1.92	11	1
1:A:151:ASN:HD22	1:A:152:GLY:N	0.61	1.93	11	1
1:A:116:ASP:CG	1:A:117:GLY:H	0.61	2.04	11	1
1:A:153:ASP:OD2	1:A:155:ARG:N	0.60	2.33	12	2
1:A:151:ASN:ND2	1:A:152:GLY:H	0.60	1.95	11	1
1:A:124:LEU:HD23	1:A:145:ILE:CD1	0.60	2.27	2	1
1:A:117:GLY:C	1:A:118:GLU:CD	0.60	2.70	11	1
1:A:132:LEU:HD12	1:A:132:LEU:N	0.60	2.11	1	2
1:A:138:HIS:H	1:A:138:HIS:CD2	0.60	2.10	4	1
1:A:111:PHE:CD1	1:A:119:ILE:CD1	0.60	2.85	6	8
1:A:128:MET:SD	1:A:132:LEU:CD1	0.60	2.90	11	1
1:A:112:ASP:C	1:A:114:ASN:H	0.59	2.05	15	2
1:A:148:VAL:HG22	1:A:149:ASP:N	0.59	2.11	12	3
1:A:147:ASP:C	1:A:149:ASP:H	0.59	2.06	10	1
1:A:138:HIS:N	1:A:138:HIS:ND1	0.59	2.51	3	1
1:A:147:ASP:OD1	1:A:148:VAL:N	0.59	2.36	13	1
1:A:110:GLU:OE2	1:A:130:LYS:NZ	0.59	2.34	12	1
1:A:151:ASN:ND2	1:A:160:GLU:OE2	0.59	2.34	4	1
1:A:136:VAL:O	1:A:136:VAL:HG23	0.59	1.98	7	1
1:A:150:LEU:HD23	1:A:150:LEU:N	0.59	2.13	1	1
1:A:147:ASP:OD1	1:A:147:ASP:C	0.59	2.46	13	1
1:A:158:PHE:O	1:A:162:VAL:HG23	0.58	1.97	14	5
1:A:122:SER:OG	1:A:123:GLU:N	0.58	2.36	8	3
1:A:106:ASP:CG	1:A:107:ALA:N	0.58	2.60	15	1
1:A:149:ASP:CG	1:A:150:LEU:H	0.58	2.05	12	3
1:A:111:PHE:CE1	1:A:127:ALA:CB	0.58	2.87	10	3
1:A:114:ASN:H	1:A:114:ASN:HD22	0.58	1.36	13	1
1:A:150:LEU:C	1:A:152:GLY:N	0.57	2.62	1	1
1:A:124:LEU:CD1	1:A:124:LEU:C	0.57	2.77	9	11
1:A:161:PHE:C	1:A:161:PHE:CD1	0.57	2.82	11	1
1:A:124:LEU:HD23	1:A:124:LEU:C	0.57	2.24	13	1
1:A:131:LEU:N	1:A:131:LEU:HD12	0.57	2.14	4	10
1:A:114:ASN:ND2	1:A:114:ASN:C	0.57	2.60	14	1
1:A:149:ASP:OD1	1:A:150:LEU:N	0.57	2.38	1	2
1:A:138:HIS:CG	1:A:139:ARG:N	0.56	2.72	7	1
1:A:146:ARG:O	1:A:150:LEU:HD21	0.56	2.00	1	1
1:A:138:HIS:CD2	1:A:138:HIS:N	0.56	2.73	4	1
1:A:151:ASN:ND2	1:A:153:ASP:OD2	0.56	2.38	5	1
1:A:149:ASP:CG	1:A:150:LEU:N	0.56	2.64	5	3
1:A:153:ASP:CG	1:A:155:ARG:H	0.56	2.08	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:148:VAL:HG22	1:A:149:ASP:H	0.56	1.60	6	3
1:A:101:VAL:HG13	1:A:102:LYS:N	0.56	2.15	11	1
1:A:148:VAL:HG11	1:A:156:VAL:CG2	0.56	2.30	13	1
1:A:114:ASN:HD21	1:A:116:ASP:H	0.56	1.42	14	1
1:A:150:LEU:C	1:A:152:GLY:H	0.55	2.07	1	1
1:A:109:ARG:C	1:A:111:PHE:N	0.55	2.60	12	5
1:A:157:ASP:OD1	1:A:158:PHE:N	0.55	2.40	10	2
1:A:106:ASP:OD1	1:A:106:ASP:C	0.55	2.49	15	1
1:A:148:VAL:HG11	1:A:156:VAL:HG22	0.55	1.79	5	5
1:A:112:ASP:OD1	1:A:114:ASN:ND2	0.55	2.39	9	1
1:A:109:ARG:C	1:A:111:PHE:H	0.55	2.09	12	1
1:A:138:HIS:N	1:A:138:HIS:CD2	0.55	2.71	13	1
1:A:135:GLN:CD	1:A:135:GLN:N	0.55	2.64	4	2
1:A:106:ASP:OD1	1:A:106:ASP:N	0.55	2.38	9	1
1:A:151:ASN:CG	1:A:152:GLY:H	0.55	2.09	5	1
1:A:142:GLU:O	1:A:146:ARG:N	0.55	2.40	10	2
1:A:165:MET:O	1:A:167:ARG:N	0.55	2.40	11	2
1:A:153:ASP:OD1	1:A:154:GLY:N	0.55	2.40	14	2
1:A:112:ASP:OD1	1:A:114:ASN:CG	0.55	2.50	9	1
1:A:149:ASP:OD1	1:A:151:ASN:ND2	0.55	2.39	11	1
1:A:104:LEU:HG	1:A:162:VAL:HG22	0.54	1.79	12	3
1:A:147:ASP:C	1:A:149:ASP:N	0.54	2.63	10	1
1:A:124:LEU:HB2	1:A:145:ILE:HD11	0.54	1.78	11	1
1:A:128:MET:O	1:A:132:LEU:N	0.54	2.37	9	3
1:A:132:LEU:HD12	1:A:132:LEU:C	0.54	2.26	14	1
1:A:149:ASP:OD1	1:A:160:GLU:CG	0.54	2.55	1	1
1:A:108:PHE:CD1	1:A:161:PHE:CD2	0.54	2.96	11	9
1:A:150:LEU:O	1:A:152:GLY:N	0.54	2.41	1	1
1:A:125:ARG:O	1:A:129:ARG:N	0.54	2.41	14	3
1:A:157:ASP:O	1:A:159:GLU:N	0.54	2.40	1	2
1:A:149:ASP:H	1:A:150:LEU:HD23	0.54	1.61	1	1
1:A:153:ASP:N	1:A:153:ASP:OD1	0.54	2.41	13	1
1:A:120:SER:O	1:A:124:LEU:N	0.54	2.41	14	8
1:A:102:LYS:O	1:A:105:ARG:N	0.53	2.41	9	11
1:A:151:ASN:OD1	1:A:151:ASN:N	0.53	2.41	15	3
1:A:146:ARG:O	1:A:148:VAL:N	0.53	2.42	2	1
1:A:112:ASP:C	1:A:114:ASN:N	0.53	2.66	4	2
1:A:131:LEU:HD12	1:A:131:LEU:N	0.53	2.16	6	1
1:A:112:ASP:OD1	1:A:116:ASP:CG	0.53	2.51	1	1
1:A:166:SER:OG	1:A:167:ARG:N	0.53	2.34	2	3
1:A:135:GLN:C	1:A:136:VAL:HG23	0.53	2.28	8	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:153:ASP:CG	1:A:154:GLY:H	0.53	2.10	8	1
1:A:129:ARG:C	1:A:131:LEU:N	0.53	2.66	11	1
1:A:157:ASP:CG	1:A:160:GLU:OE1	0.53	2.52	1	1
1:A:131:LEU:O	1:A:132:LEU:C	0.53	2.51	9	1
1:A:151:ASN:OD1	1:A:153:ASP:N	0.53	2.41	7	1
1:A:132:LEU:N	1:A:132:LEU:CD1	0.53	2.72	12	2
1:A:149:ASP:OD1	1:A:149:ASP:C	0.53	2.52	1	1
1:A:157:ASP:O	1:A:161:PHE:N	0.53	2.41	12	4
1:A:134:HIS:CD2	1:A:134:HIS:N	0.53	2.76	8	1
1:A:121:THR:OG1	1:A:122:SER:N	0.52	2.40	13	1
1:A:106:ASP:OD1	1:A:107:ALA:N	0.52	2.43	15	1
1:A:149:ASP:O	1:A:150:LEU:C	0.52	2.52	1	1
1:A:136:VAL:HG12	1:A:137:GLY:N	0.52	2.19	5	1
1:A:138:HIS:O	1:A:140:ASP:N	0.52	2.42	7	1
1:A:124:LEU:O	1:A:127:ALA:N	0.52	2.43	13	10
1:A:129:ARG:O	1:A:131:LEU:N	0.52	2.43	11	1
1:A:147:ASP:O	1:A:149:ASP:N	0.51	2.43	10	1
1:A:133:GLY:O	1:A:135:GLN:N	0.51	2.43	11	2
1:A:114:ASN:HD22	1:A:116:ASP:N	0.51	2.02	14	1
1:A:151:ASN:ND2	1:A:151:ASN:N	0.51	2.56	11	2
1:A:157:ASP:C	1:A:159:GLU:N	0.51	2.67	1	4
1:A:164:MET:SD	1:A:164:MET:O	0.51	2.69	2	1
1:A:159:GLU:OE1	1:A:159:GLU:C	0.51	2.53	5	1
1:A:130:LYS:O	1:A:131:LEU:HD12	0.51	2.04	11	1
1:A:138:HIS:C	1:A:140:ASP:N	0.51	2.68	7	3
1:A:151:ASN:HD21	1:A:153:ASP:CG	0.51	2.13	5	1
1:A:104:LEU:HD13	1:A:161:PHE:CE2	0.50	2.41	1	1
1:A:146:ARG:C	1:A:148:VAL:N	0.50	2.68	2	2
1:A:153:ASP:OD1	1:A:155:ARG:N	0.50	2.37	7	1
1:A:159:GLU:CG	1:A:160:GLU:N	0.50	2.74	9	1
1:A:103:GLU:OE1	1:A:103:GLU:C	0.50	2.55	1	1
1:A:140:ASP:C	1:A:142:GLU:N	0.50	2.66	7	1
1:A:136:VAL:CG1	1:A:137:GLY:N	0.50	2.75	5	1
1:A:112:ASP:O	1:A:114:ASN:N	0.50	2.44	4	2
1:A:157:ASP:OD1	1:A:157:ASP:N	0.50	2.44	5	1
1:A:165:MET:SD	1:A:165:MET:N	0.50	2.85	7	1
1:A:134:HIS:O	1:A:136:VAL:N	0.50	2.45	2	1
1:A:149:ASP:OD2	1:A:153:ASP:N	0.50	2.44	7	1
1:A:101:VAL:O	1:A:104:LEU:N	0.50	2.45	7	1
1:A:114:ASN:CG	1:A:116:ASP:OD2	0.49	2.56	14	1
1:A:116:ASP:C	1:A:116:ASP:OD1	0.49	2.54	10	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:109:ARG:O	1:A:111:PHE:N	0.49	2.45	12	1
1:A:134:HIS:CD2	1:A:134:HIS:H	0.49	2.26	12	1
1:A:163:ARG:HH11	1:A:163:ARG:CG	0.49	2.20	13	1
1:A:156:VAL:C	1:A:157:ASP:OD1	0.49	2.55	5	1
1:A:134:HIS:O	1:A:135:GLN:CB	0.49	2.61	6	1
1:A:142:GLU:O	1:A:145:ILE:N	0.49	2.46	12	3
1:A:124:LEU:CB	1:A:145:ILE:HD11	0.49	2.37	11	2
1:A:120:SER:O	1:A:121:THR:C	0.49	2.56	11	15
1:A:129:ARG:C	1:A:131:LEU:H	0.49	2.16	11	1
1:A:120:SER:CB	1:A:155:ARG:NE	0.48	2.76	5	1
1:A:157:ASP:O	1:A:158:PHE:C	0.48	2.56	1	14
1:A:165:MET:C	1:A:167:ARG:N	0.48	2.70	6	1
1:A:112:ASP:OD1	1:A:112:ASP:C	0.48	2.54	9	1
1:A:116:ASP:OD1	1:A:116:ASP:N	0.48	2.33	7	3
1:A:102:LYS:O	1:A:105:ARG:CB	0.48	2.62	15	6
1:A:140:ASP:O	1:A:143:GLU:N	0.48	2.47	10	1
1:A:124:LEU:HD23	1:A:145:ILE:HD11	0.48	1.85	2	2
1:A:143:GLU:CD	1:A:147:ASP:OD2	0.48	2.57	6	1
1:A:133:GLY:O	1:A:134:HIS:CG	0.48	2.67	15	2
1:A:124:LEU:O	1:A:125:ARG:C	0.48	2.56	13	15
1:A:149:ASP:OD1	1:A:160:GLU:CD	0.48	2.56	1	1
1:A:165:MET:O	1:A:166:SER:C	0.48	2.57	4	4
1:A:111:PHE:CD2	1:A:119:ILE:CD1	0.47	2.97	2	1
1:A:138:HIS:O	1:A:139:ARG:C	0.47	2.57	11	3
1:A:114:ASN:HD21	1:A:123:GLU:CD	0.47	2.16	8	1
1:A:103:GLU:HG3	1:A:104:LEU:N	0.47	2.24	3	2
1:A:135:GLN:C	1:A:136:VAL:HG12	0.47	2.34	9	1
1:A:116:ASP:N	1:A:116:ASP:OD1	0.47	2.46	5	1
1:A:130:LYS:CB	1:A:130:LYS:HZ2	0.47	2.23	12	1
1:A:102:LYS:O	1:A:103:GLU:C	0.47	2.57	13	12
1:A:161:PHE:CD1	1:A:161:PHE:O	0.47	2.67	11	2
1:A:138:HIS:ND1	1:A:139:ARG:N	0.47	2.63	10	1
1:A:107:ALA:O	1:A:108:PHE:C	0.47	2.58	6	11
1:A:145:ILE:O	1:A:145:ILE:HG22	0.47	2.09	1	2
1:A:103:GLU:O	1:A:106:ASP:N	0.47	2.48	12	3
1:A:152:GLY:O	1:A:153:ASP:C	0.47	2.57	8	1
1:A:158:PHE:CE1	1:A:162:VAL:CG2	0.47	2.98	9	1
1:A:126:GLU:CD	1:A:126:GLU:C	0.47	2.83	2	1
1:A:149:ASP:OD1	1:A:153:ASP:OD2	0.47	2.32	6	1
1:A:129:ARG:NE	1:A:135:GLN:OE1	0.47	2.46	10	1
1:A:111:PHE:CD2	1:A:119:ILE:HD11	0.46	2.45	2	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:136:VAL:HG12	1:A:136:VAL:O	0.46	2.10	6	1
1:A:136:VAL:CG2	1:A:137:GLY:N	0.46	2.78	9	1
1:A:104:LEU:O	1:A:105:ARG:C	0.46	2.58	10	3
1:A:157:ASP:OD2	1:A:160:GLU:OE1	0.46	2.34	1	1
1:A:114:ASN:CG	1:A:115:GLY:H	0.46	2.17	5	1
1:A:105:ARG:NH1	1:A:158:PHE:CD2	0.46	2.84	8	1
1:A:101:VAL:O	1:A:102:LYS:C	0.46	2.58	14	6
1:A:104:LEU:CD1	1:A:162:VAL:HG22	0.46	2.41	7	2
1:A:140:ASP:O	1:A:142:GLU:N	0.45	2.48	7	1
1:A:121:THR:O	1:A:124:LEU:N	0.45	2.47	12	1
1:A:135:GLN:CG	1:A:136:VAL:N	0.45	2.79	14	1
1:A:149:ASP:OD1	1:A:160:GLU:OE2	0.45	2.34	1	1
1:A:147:ASP:O	1:A:148:VAL:C	0.45	2.60	3	1
1:A:149:ASP:C	1:A:151:ASN:H	0.45	2.19	13	1
1:A:161:PHE:CD1	1:A:161:PHE:C	0.45	2.92	2	1
1:A:111:PHE:CE1	1:A:124:LEU:HD13	0.45	2.46	3	1
1:A:148:VAL:HG21	1:A:164:MET:SD	0.45	2.51	10	1
1:A:135:GLN:CG	1:A:136:VAL:H	0.45	2.24	14	1
1:A:159:GLU:HG3	1:A:160:GLU:N	0.45	2.26	9	1
1:A:104:LEU:HD22	1:A:165:MET:SD	0.45	2.51	11	1
1:A:113:THR:O	1:A:114:ASN:C	0.45	2.59	9	1
1:A:157:ASP:CG	1:A:158:PHE:N	0.45	2.74	12	1
1:A:144:ILE:HD12	1:A:144:ILE:N	0.45	2.27	6	1
1:A:137:GLY:O	1:A:138:HIS:C	0.45	2.59	10	1
1:A:151:ASN:OD1	1:A:153:ASP:CG	0.45	2.60	7	1
1:A:118:GLU:OE1	1:A:157:ASP:OD2	0.45	2.35	10	1
1:A:114:ASN:OD1	1:A:114:ASN:N	0.44	2.49	5	1
1:A:120:SER:O	1:A:123:GLU:N	0.44	2.50	1	1
1:A:151:ASN:CG	1:A:153:ASP:OD2	0.44	2.60	15	1
1:A:142:GLU:O	1:A:143:GLU:C	0.44	2.61	6	4
1:A:144:ILE:N	1:A:144:ILE:CD1	0.44	2.80	6	1
1:A:124:LEU:C	1:A:124:LEU:CD2	0.44	2.90	13	1
1:A:161:PHE:CE1	1:A:165:MET:HE3	0.44	2.47	9	1
1:A:104:LEU:HD12	1:A:161:PHE:CD2	0.44	2.47	1	2
1:A:104:LEU:O	1:A:107:ALA:N	0.44	2.51	10	1
1:A:137:GLY:O	1:A:139:ARG:N	0.44	2.51	10	1
1:A:112:ASP:OD2	1:A:115:GLY:CA	0.44	2.65	1	1
1:A:146:ARG:C	1:A:148:VAL:H	0.44	2.19	2	1
1:A:140:ASP:O	1:A:141:ILE:C	0.44	2.61	6	4
1:A:138:HIS:CD2	1:A:138:HIS:H	0.44	2.30	13	1
1:A:112:ASP:OD1	1:A:116:ASP:OD1	0.44	2.36	1	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:126:GLU:N	1:A:126:GLU:OE1	0.43	2.51	11	1
1:A:131:LEU:N	1:A:131:LEU:CD1	0.43	2.81	6	2
1:A:149:ASP:CG	1:A:153:ASP:O	0.43	2.61	5	1
1:A:150:LEU:CD1	1:A:151:ASN:ND2	0.43	2.82	3	1
1:A:153:ASP:OD1	1:A:153:ASP:C	0.43	2.59	7	1
1:A:130:LYS:NZ	1:A:130:LYS:CB	0.43	2.79	12	1
1:A:112:ASP:OD1	1:A:123:GLU:OE1	0.43	2.37	8	1
1:A:139:ARG:O	1:A:140:ASP:C	0.43	2.62	8	1
1:A:125:ARG:O	1:A:129:ARG:CB	0.43	2.67	14	1
1:A:121:THR:O	1:A:122:SER:C	0.43	2.61	3	6
1:A:146:ARG:O	1:A:147:ASP:C	0.43	2.60	12	2
1:A:128:MET:HG3	1:A:141:ILE:HG22	0.43	1.91	12	1
1:A:148:VAL:CG2	1:A:149:ASP:H	0.43	2.26	12	1
1:A:166:SER:O	1:A:167:ARG:C	0.43	2.61	13	1
1:A:142:GLU:OE1	1:A:142:GLU:N	0.43	2.51	14	1
1:A:134:HIS:O	1:A:135:GLN:C	0.42	2.62	10	1
1:A:114:ASN:HD21	1:A:116:ASP:N	0.42	2.03	14	1
1:A:114:ASN:ND2	1:A:115:GLY:H	0.42	2.12	5	1
1:A:145:ILE:O	1:A:145:ILE:CG2	0.42	2.66	4	2
1:A:118:GLU:CD	1:A:118:GLU:N	0.42	2.77	11	1
1:A:103:GLU:O	1:A:104:LEU:C	0.42	2.61	8	4
1:A:128:MET:O	1:A:129:ARG:C	0.42	2.61	6	1
1:A:149:ASP:C	1:A:151:ASN:N	0.42	2.78	13	1
1:A:141:ILE:CG1	1:A:142:GLU:N	0.42	2.82	6	2
1:A:114:ASN:ND2	1:A:123:GLU:OE2	0.42	2.42	8	1
1:A:136:VAL:HG23	1:A:137:GLY:N	0.42	2.29	11	1
1:A:149:ASP:OD1	1:A:155:ARG:N	0.42	2.53	6	1
1:A:118:GLU:OE2	1:A:157:ASP:OD2	0.42	2.37	5	1
1:A:141:ILE:HG13	1:A:142:GLU:N	0.42	2.30	10	3
1:A:111:PHE:CG	1:A:119:ILE:CD1	0.41	3.02	2	3
1:A:140:ASP:N	1:A:140:ASP:OD1	0.41	2.53	7	1
1:A:161:PHE:C	1:A:163:ARG:N	0.41	2.76	6	1
1:A:150:LEU:N	1:A:150:LEU:CD2	0.41	2.82	1	1
1:A:149:ASP:C	1:A:150:LEU:HD23	0.41	2.41	1	1
1:A:159:GLU:OE1	1:A:160:GLU:N	0.41	2.53	5	1
1:A:140:ASP:C	1:A:142:GLU:H	0.41	2.24	7	1
1:A:153:ASP:O	1:A:154:GLY:C	0.41	2.60	1	1
1:A:128:MET:SD	1:A:132:LEU:HB2	0.41	2.56	6	1
1:A:132:LEU:C	1:A:132:LEU:HD12	0.41	2.41	8	1
1:A:105:ARG:O	1:A:106:ASP:C	0.41	2.62	13	3
1:A:114:ASN:OD1	1:A:123:GLU:CD	0.41	2.64	3	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:148:VAL:O	1:A:149:ASP:C	0.41	2.62	3	2
1:A:124:LEU:CD1	1:A:128:MET:SD	0.41	3.09	10	1
1:A:138:HIS:O	1:A:141:ILE:N	0.41	2.54	11	1
1:A:121:THR:HG22	1:A:138:HIS:NE2	0.41	2.30	15	1
1:A:136:VAL:O	1:A:136:VAL:CG2	0.41	2.67	7	1
1:A:150:LEU:C	1:A:151:ASN:CG	0.41	2.86	10	1
1:A:141:ILE:O	1:A:142:GLU:C	0.41	2.62	13	1
1:A:113:THR:HG21	1:A:126:GLU:OE2	0.41	2.16	5	1
1:A:135:GLN:C	1:A:137:GLY:N	0.41	2.77	6	1
1:A:143:GLU:OE2	1:A:147:ASP:OD1	0.41	2.38	11	1
1:A:107:ALA:C	1:A:109:ARG:N	0.40	2.77	6	1
1:A:144:ILE:C	1:A:146:ARG:N	0.40	2.77	13	1
1:A:159:GLU:CD	1:A:159:GLU:H	0.40	2.23	4	1
1:A:112:ASP:CG	1:A:114:ASN:OD1	0.40	2.65	6	1
1:A:137:GLY:C	1:A:139:ARG:N	0.40	2.76	10	2
1:A:126:GLU:N	1:A:126:GLU:CD	0.40	2.79	11	1
1:A:148:VAL:CG2	1:A:149:ASP:N	0.40	2.76	12	1
1:A:145:ILE:CG2	1:A:154:GLY:O	0.40	2.69	5	1
1:A:116:ASP:OD1	1:A:116:ASP:C	0.40	2.62	9	1
1:A:138:HIS:ND1	1:A:138:HIS:N	0.40	2.70	11	1
1:A:136:VAL:O	1:A:136:VAL:CG1	0.40	2.70	6	1
1:A:143:GLU:OE1	1:A:147:ASP:OD2	0.40	2.39	6	1

6.3 Torsion angles

6.3.1 Protein backbone

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	66/72 (92%)	48±3 (73±4%)	13±3 (20±4%)	4±1 (7±2%)	2	17
All	All	990/1080 (92%)	725 (73%)	198 (20%)	67 (7%)	2	17

All 24 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	115	GLY	6
1	A	152	GLY	6
1	A	149	ASP	5
1	A	135	GLN	5
1	A	134	HIS	5
1	A	133	GLY	4
1	A	137	GLY	4
1	A	166	SER	4
1	A	148	VAL	4
1	A	150	LEU	3
1	A	136	VAL	3
1	A	151	ASN	2
1	A	101	VAL	2
1	A	113	THR	2
1	A	153	ASP	2
1	A	132	LEU	2
1	A	158	PHE	1
1	A	147	ASP	1
1	A	117	GLY	1
1	A	165	MET	1
1	A	139	ARG	1
1	A	114	ASN	1
1	A	138	HIS	1
1	A	130	LYS	1

6.3.2 Protein sidechains ⓘ

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	59/62 (95%)	46±1 (78±2%)	13±1 (22±2%)	3	30
All	All	885/930 (95%)	693 (78%)	192 (22%)	3	30

All 48 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	111	PHE	15
1	A	113	THR	13

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Mol	Chain	Res	Type	Models (Total)
1	A	124	LEU	13
1	A	151	ASN	12
1	A	104	LEU	11
1	A	114	ASN	10
1	A	128	MET	10
1	A	145	ILE	10
1	A	121	THR	8
1	A	153	ASP	8
1	A	132	LEU	5
1	A	136	VAL	5
1	A	130	LYS	4
1	A	138	HIS	4
1	A	157	ASP	4
1	A	122	SER	4
1	A	139	ARG	3
1	A	150	LEU	3
1	A	102	LYS	3
1	A	109	ARG	3
1	A	148	VAL	3
1	A	165	MET	3
1	A	110	GLU	3
1	A	134	HIS	2
1	A	144	ILE	2
1	A	149	ASP	2
1	A	116	ASP	2
1	A	142	GLU	2
1	A	106	ASP	2
1	A	129	ARG	2
1	A	141	ILE	2
1	A	126	GLU	2
1	A	164	MET	2
1	A	147	ASP	1
1	A	155	ARG	1
1	A	125	ARG	1
1	A	156	VAL	1
1	A	166	SER	1
1	A	105	ARG	1
1	A	112	ASP	1
1	A	118	GLU	1
1	A	161	PHE	1
1	A	140	ASP	1
1	A	146	ARG	1

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Mol	Chain	Res	Type	Models (Total)
1	A	167	ARG	1
1	A	101	VAL	1
1	A	163	ARG	1
1	A	135	GLN	1

6.3.3 RNA [i](#)

There are no RNA molecules in this entry.

6.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

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