



Full wwPDB NMR Structure Validation Report ⓘ

Mar 6, 2026 – 02:28 AM UTC

PDB ID : 2K8M / pdb_00002k8m
Title : S100A13-C2A binary complex structure
Authors : Mohan, S.K.; Rani, S.G.; Kumar, S.M.; Yu, C.
Deposited on : 2008-09-14

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

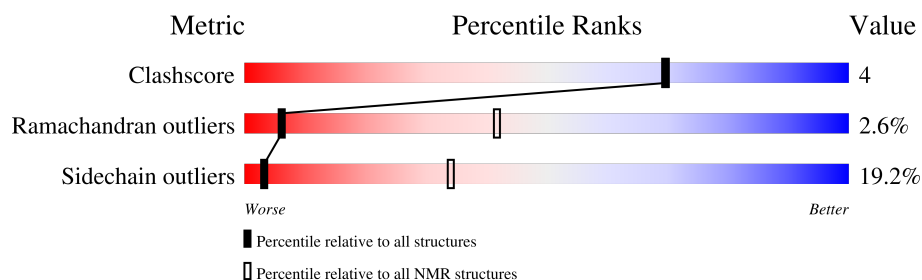
1 Overall quality at a glance

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	128	76% 23% .
1	D	128	76% 23% .
2	B	98	81% 16% ..
2	C	98	82% 17% .

2 Ensemble composition and analysis

This entry contains 20 models. Model 8 is the overall representative, medoid model (most similar to other models). The authors have identified model 1 as representative, based on the following criterion: *lowest energy*.

The following residues are included in the computation of the global validation metrics.

Well-defined (core) protein residues			
Well-defined core	Residue range (total)	Backbone RMSD (Å)	Medoid model
1	A:1-A:128, B:1-B:96, C:2-C:98, D:1-D:128 (449)	0.64	8

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 5 clusters and 2 single-model clusters were found.

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

3 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7451 atoms, of which 3750 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Putative uncharacterized protein.

Mol	Chain	Residues	Atoms						Trace
1	A	128	Total	C	H	N	O	S	0
			2086	677	1042	169	195	3	
1	D	128	Total	C	H	N	O	S	0
			2086	677	1042	169	195	3	

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	GLU	-	expression tag	UNP Q6AI31
A	2	LYS	-	expression tag	UNP Q6AI31
D	1	GLU	-	expression tag	UNP Q6AI31
D	2	LYS	-	expression tag	UNP Q6AI31

- Molecule 2 is a protein called Protein S100-A13.

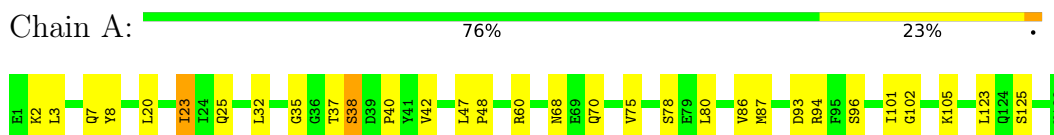
Mol	Chain	Residues	Atoms						Trace
2	B	98	Total	C	H	N	O	S	0
			1640	512	834	136	156	2	
2	C	98	Total	C	H	N	O	S	0
			1639	512	832	136	157	2	

4 Residue-property plots [i](#)

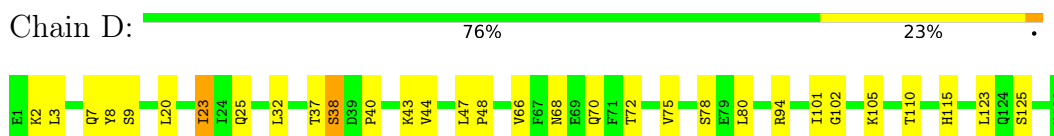
4.1 Average score per residue in the NMR ensemble

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.

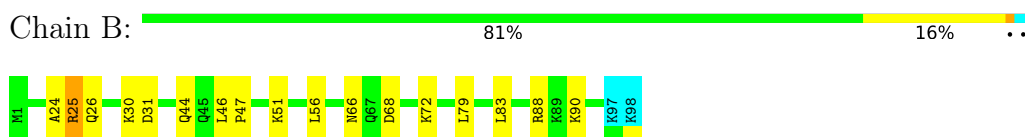
- Molecule 1: Putative uncharacterized protein



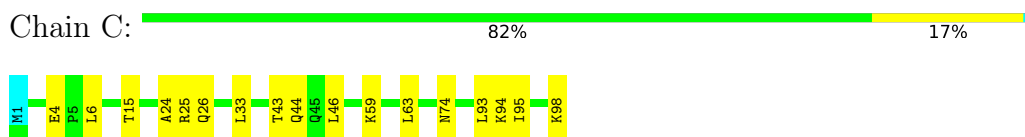
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13



- Molecule 2: Protein S100-A13

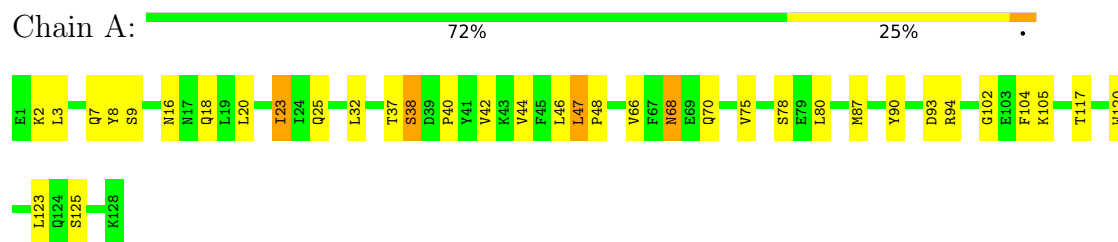


4.2 Scores per residue for each member of the ensemble

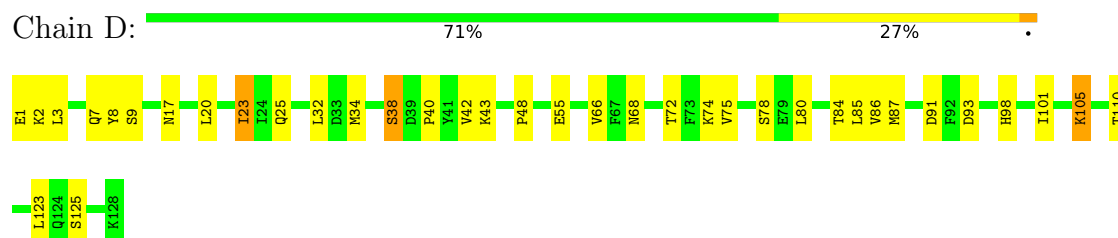
Colouring as in section [4.1](#) above.

4.2.1 Score per residue for model 1

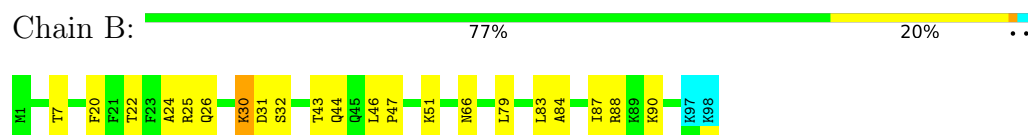
- Molecule 1: Putative uncharacterized protein



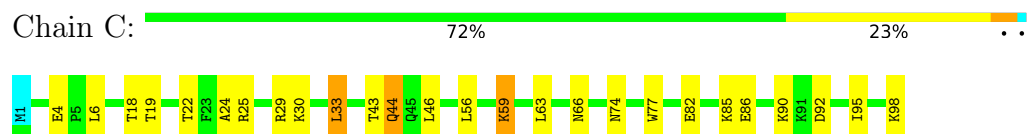
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

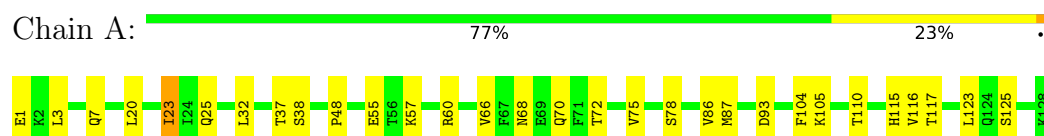


- Molecule 2: Protein S100-A13

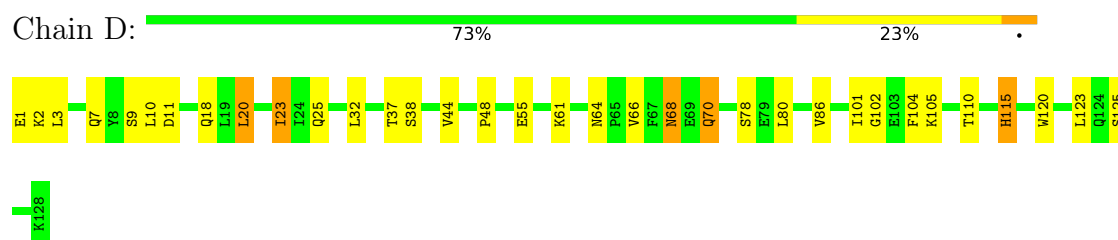


4.2.2 Score per residue for model 2

- Molecule 1: Putative uncharacterized protein



- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

Chain B:  70% 24% ..



- Molecule 2: Protein S100-A13

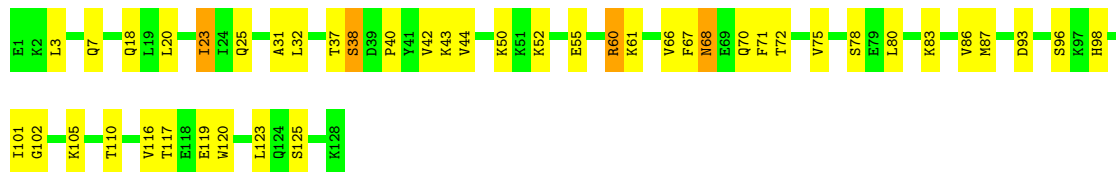
Chain C:  81% 16% ..



4.2.3 Score per residue for model 3

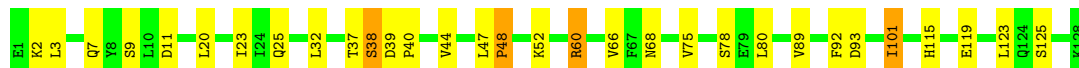
- Molecule 1: Putative uncharacterized protein

Chain A:  66% 31% .



- Molecule 1: Putative uncharacterized protein

Chain D:  76% 21% .



- Molecule 2: Protein S100-A13

Chain B:  72% 23% ..



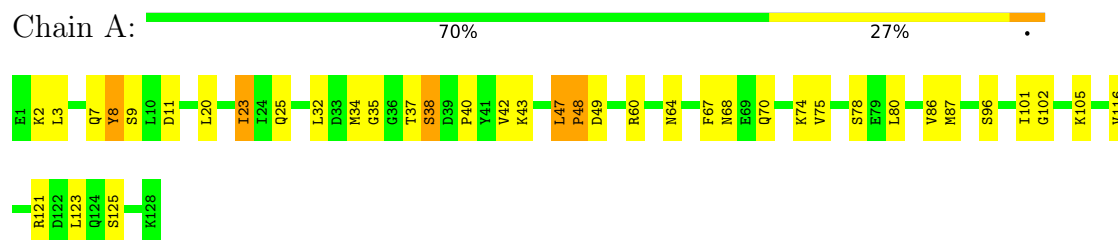
- Molecule 2: Protein S100-A13

Chain C:  81% 16% ..

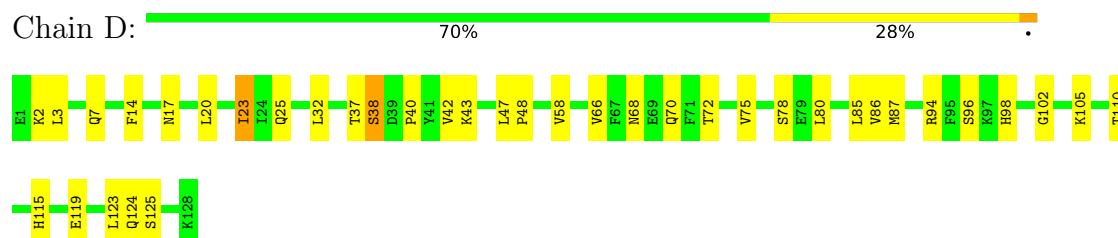


4.2.4 Score per residue for model 4

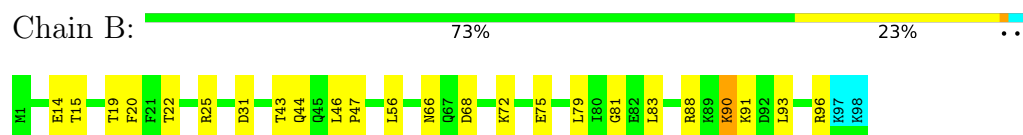
- Molecule 1: Putative uncharacterized protein



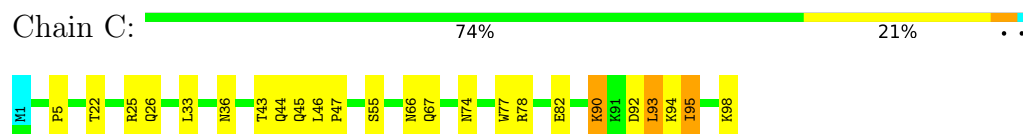
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

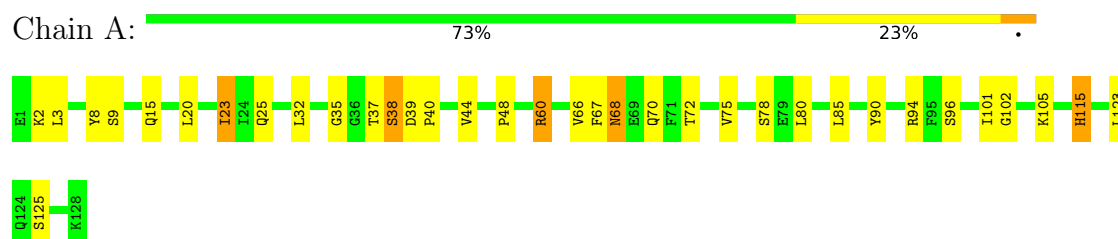


- Molecule 2: Protein S100-A13

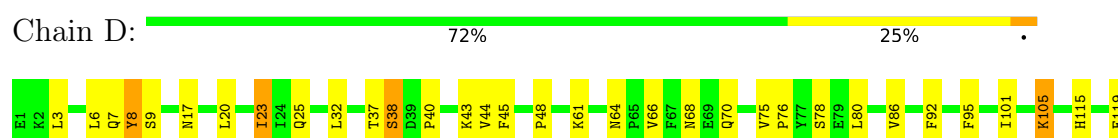


4.2.5 Score per residue for model 5

- Molecule 1: Putative uncharacterized protein



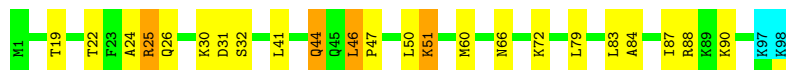
- Molecule 1: Putative uncharacterized protein





• Molecule 2: Protein S100-A13

Chain B: 74% 19% ..



• Molecule 2: Protein S100-A13

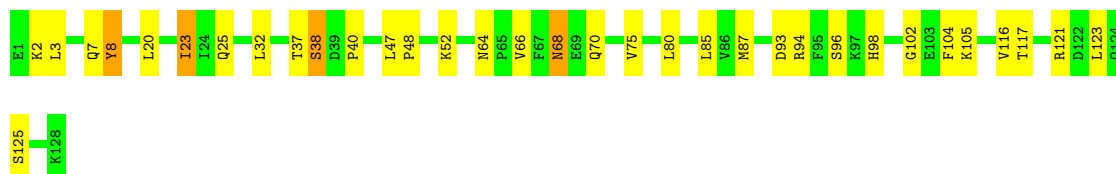
Chain C: 79% 18% ..



4.2.6 Score per residue for model 6

• Molecule 1: Putative uncharacterized protein

Chain A: 73% 23% .



• Molecule 1: Putative uncharacterized protein

Chain D: 72% 24% .



• Molecule 2: Protein S100-A13

Chain B: 78% 15% 5% .



• Molecule 2: Protein S100-A13

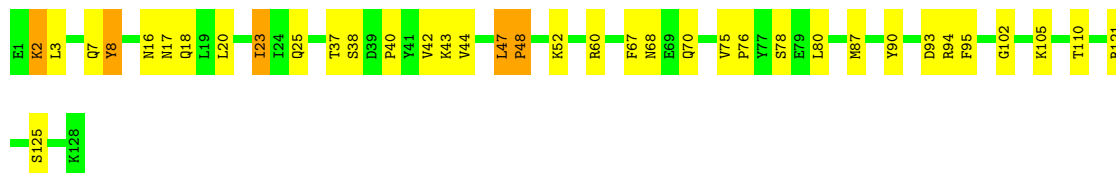
Chain C: 74% 20% . .



4.2.7 Score per residue for model 7

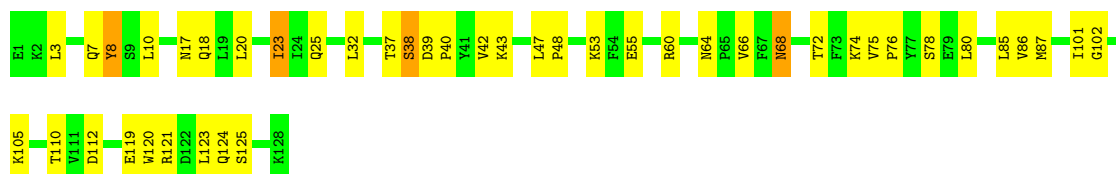
- Molecule 1: Putative uncharacterized protein

Chain A: 71% 25% .



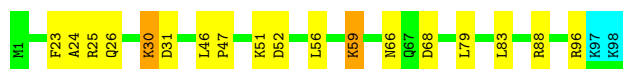
- Molecule 1: Putative uncharacterized protein

Chain D: 66% 31% .



- Molecule 2: Protein S100-A13

Chain B: 80% 16% . .



- Molecule 2: Protein S100-A13

Chain C: 72% 23% . .



4.2.8 Score per residue for model 8 (medoid)

- Molecule 1: Putative uncharacterized protein

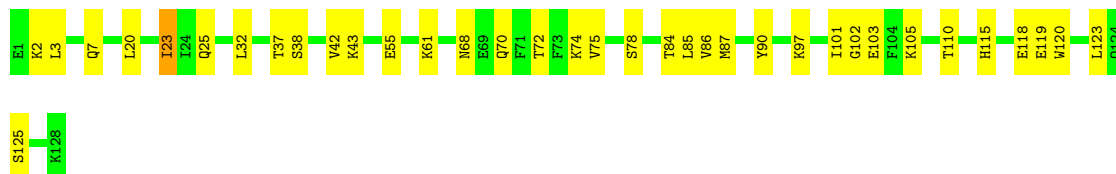
Chain A: 68% 30% .





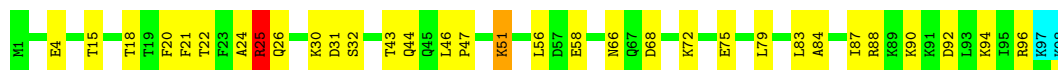
- Molecule 1: Putative uncharacterized protein

Chain D: 72% 27%



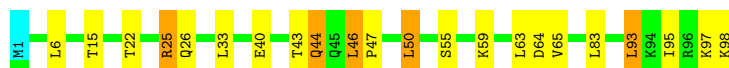
- Molecule 2: Protein S100-A13

Chain B: 65% 31%



- Molecule 2: Protein S100-A13

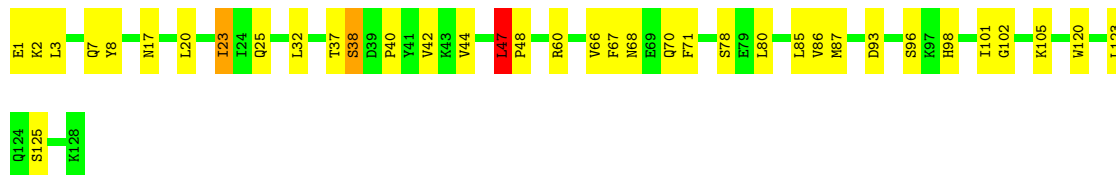
Chain C: 77% 17% 5%



4.2.9 Score per residue for model 9

- Molecule 1: Putative uncharacterized protein

Chain A: 71% 27%



- Molecule 1: Putative uncharacterized protein

Chain D: 77% 21%



- Molecule 2: Protein S100-A13

Chain B: 78% 18%



• Molecule 2: Protein S100-A13

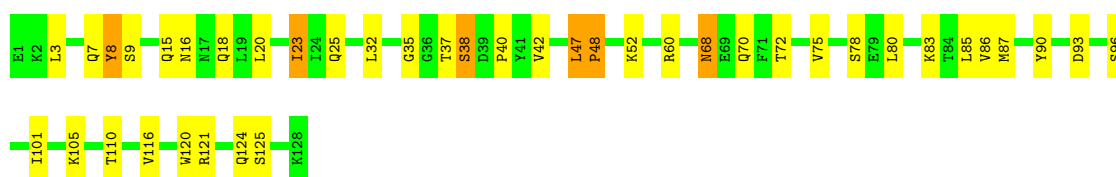
Chain C: 77% 18% ..



4.2.10 Score per residue for model 10

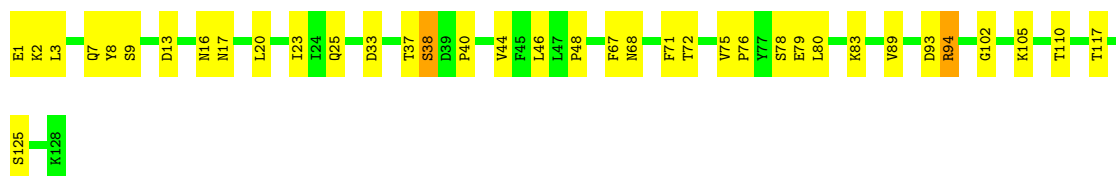
• Molecule 1: Putative uncharacterized protein

Chain A: 68% 27% 5%



• Molecule 1: Putative uncharacterized protein

Chain D: 71% 27% .



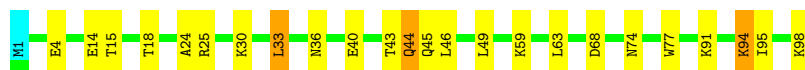
• Molecule 2: Protein S100-A13

Chain B: 73% 21% ..



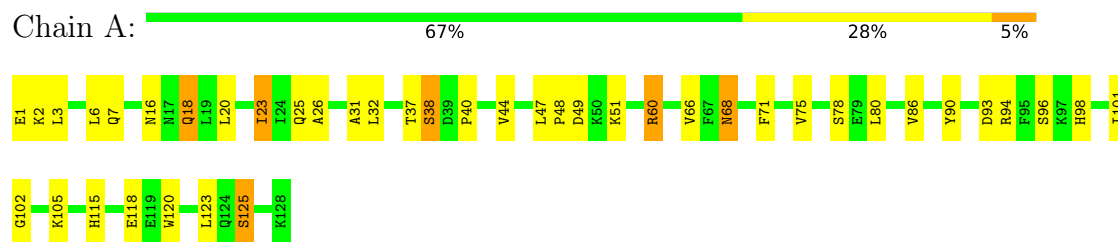
• Molecule 2: Protein S100-A13

Chain C: 74% 21% ..

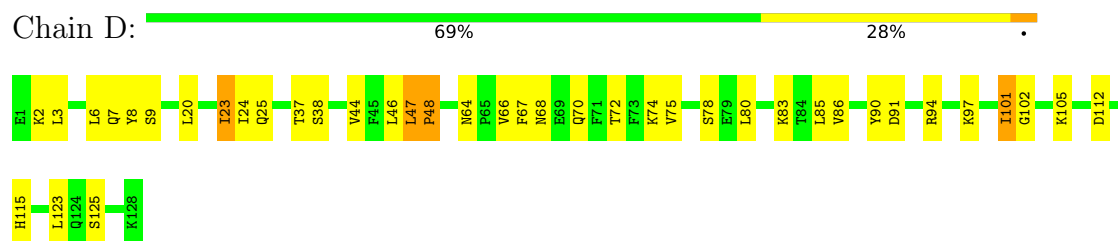


4.2.11 Score per residue for model 11

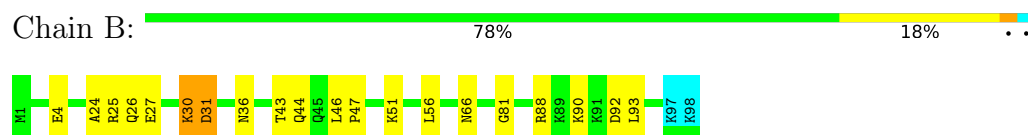
• Molecule 1: Putative uncharacterized protein



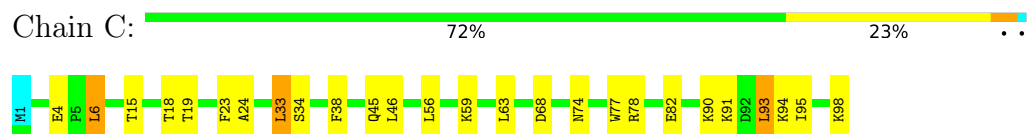
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

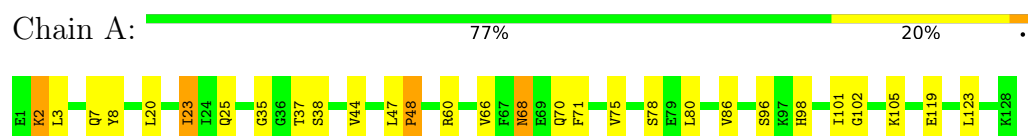


- Molecule 2: Protein S100-A13

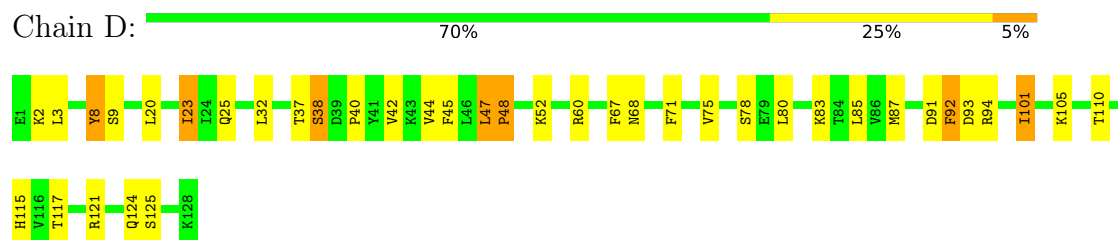


4.2.12 Score per residue for model 12

- Molecule 1: Putative uncharacterized protein

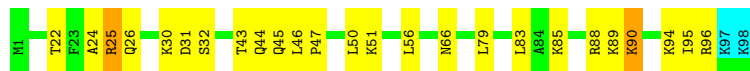


- Molecule 1: Putative uncharacterized protein



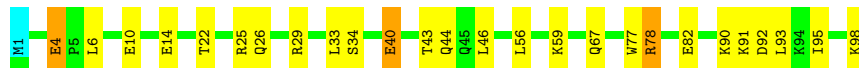
- Molecule 2: Protein S100-A13

Chain B:  72% 23% ..



- Molecule 2: Protein S100-A13

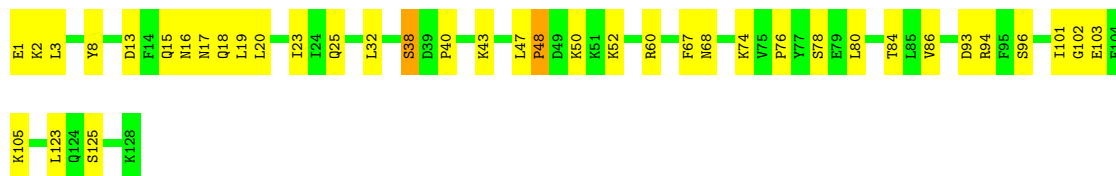
Chain C:  72% 23% ..



4.2.13 Score per residue for model 13

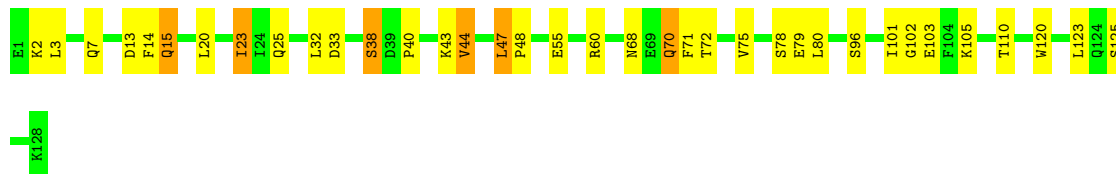
- Molecule 1: Putative uncharacterized protein

Chain A:  70% 29% .



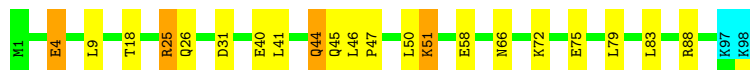
- Molecule 1: Putative uncharacterized protein

Chain D:  72% 23% 5%



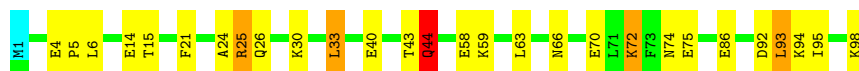
- Molecule 2: Protein S100-A13

Chain B:  77% 17% ..



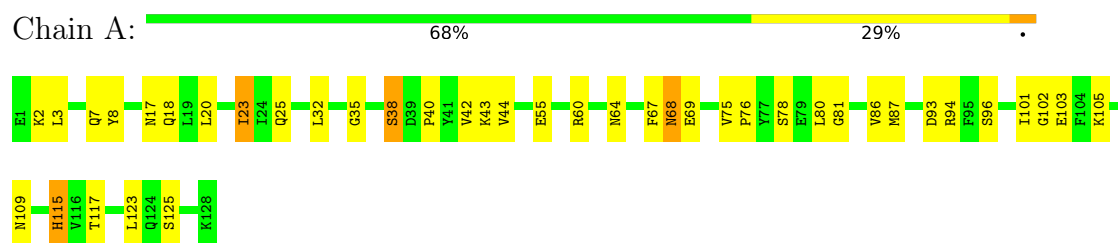
- Molecule 2: Protein S100-A13

Chain C:  70% 23% ..

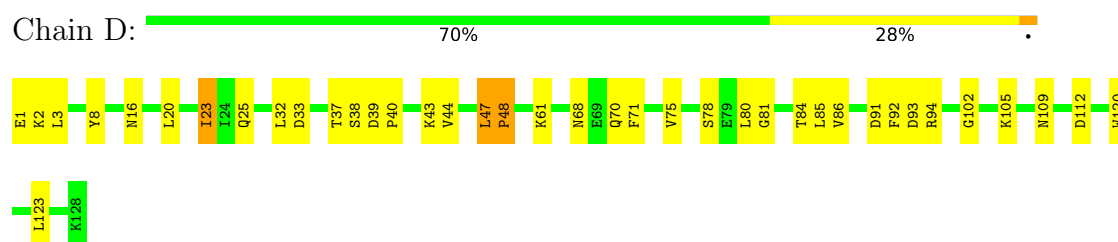


4.2.14 Score per residue for model 14

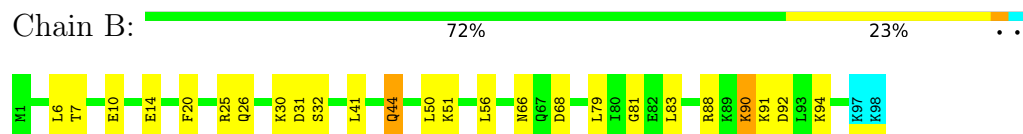
- Molecule 1: Putative uncharacterized protein



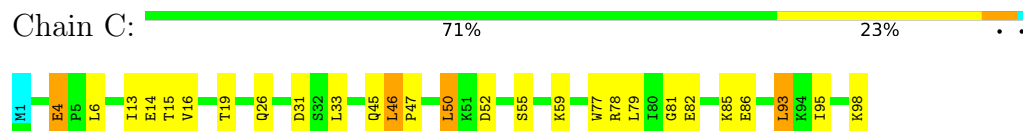
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

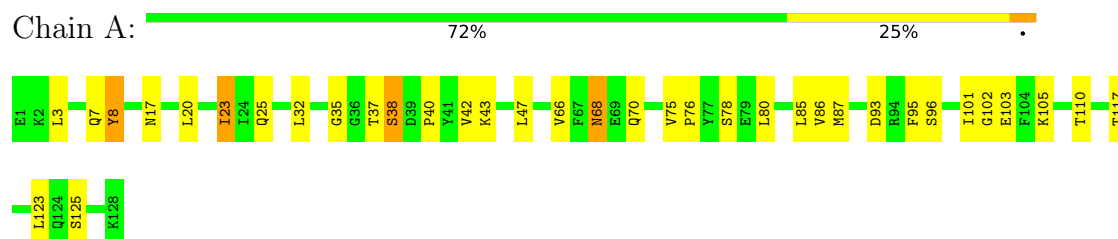


- Molecule 2: Protein S100-A13

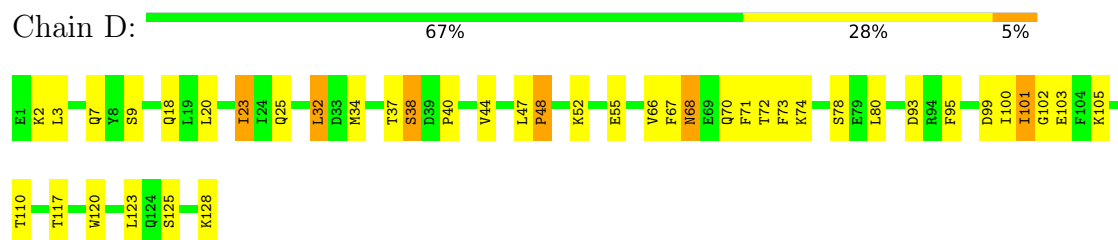


4.2.15 Score per residue for model 15

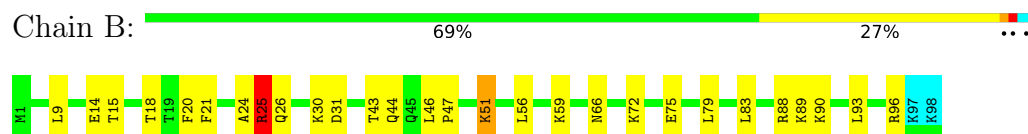
- Molecule 1: Putative uncharacterized protein



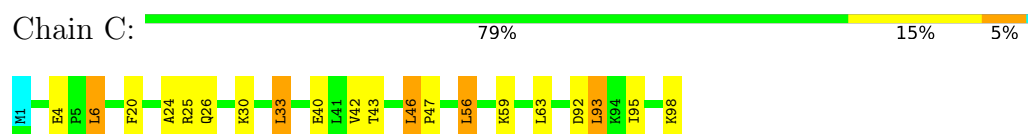
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13

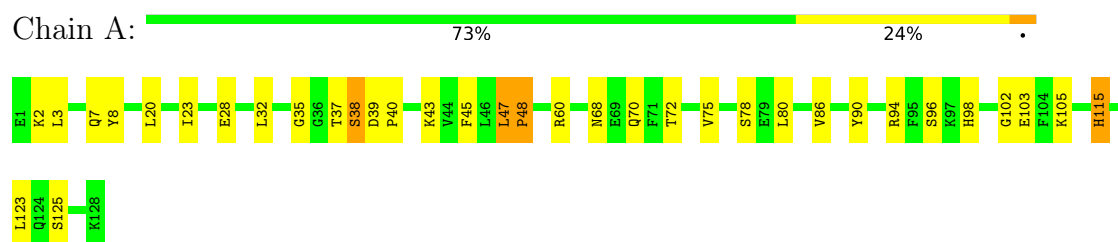


- Molecule 2: Protein S100-A13

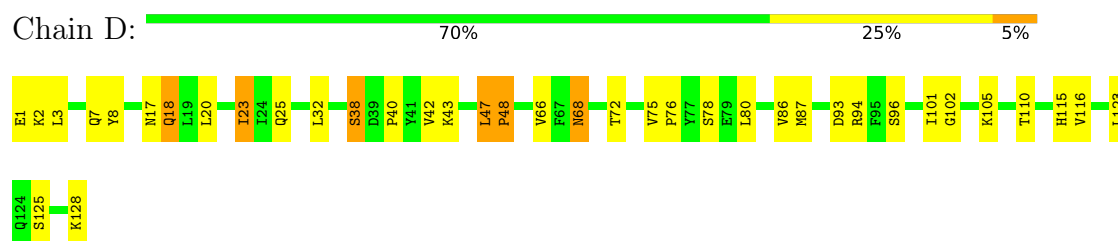


4.2.16 Score per residue for model 16

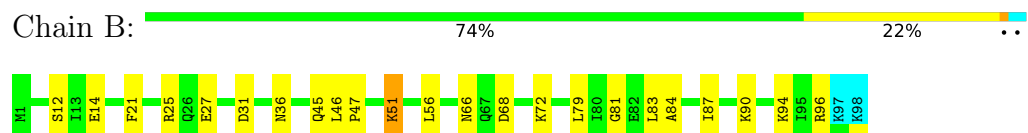
- Molecule 1: Putative uncharacterized protein



- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13



- Molecule 2: Protein S100-A13

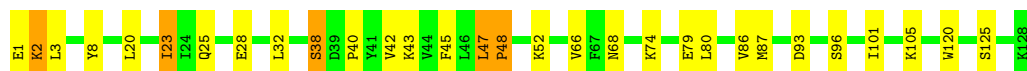
Chain C:  76% 22% ..



4.2.17 Score per residue for model 17

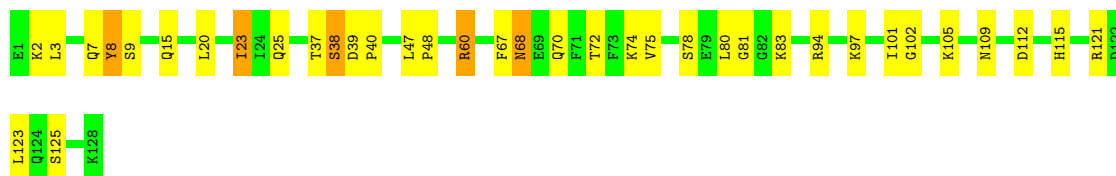
- Molecule 1: Putative uncharacterized protein

Chain A:  77% 20% .



- Molecule 1: Putative uncharacterized protein

Chain D:  71% 25% .



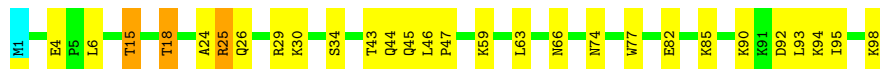
- Molecule 2: Protein S100-A13

Chain B:  71% 23% ..



- Molecule 2: Protein S100-A13

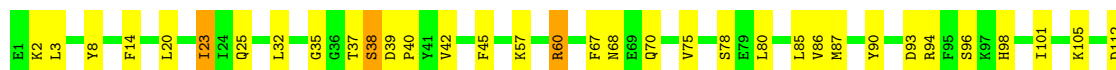
Chain C:  70% 26% ..



4.2.18 Score per residue for model 18

- Molecule 1: Putative uncharacterized protein

Chain A:  70% 27% .





- Molecule 1: Putative uncharacterized protein

Chain D: 72% 27%



- Molecule 2: Protein S100-A13

Chain B: 73% 19%



- Molecule 2: Protein S100-A13

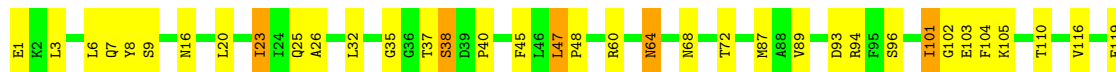
Chain C: 74% 20%



4.2.19 Score per residue for model 19

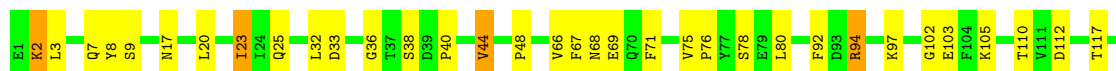
- Molecule 1: Putative uncharacterized protein

Chain A: 70% 27%

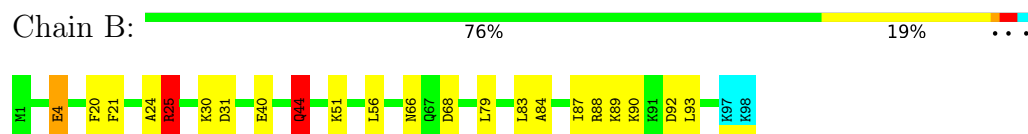


- Molecule 1: Putative uncharacterized protein

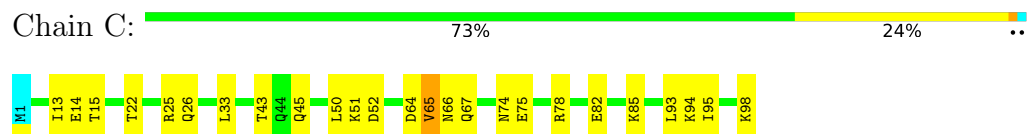
Chain D: 72% 25%



- Molecule 2: Protein S100-A13

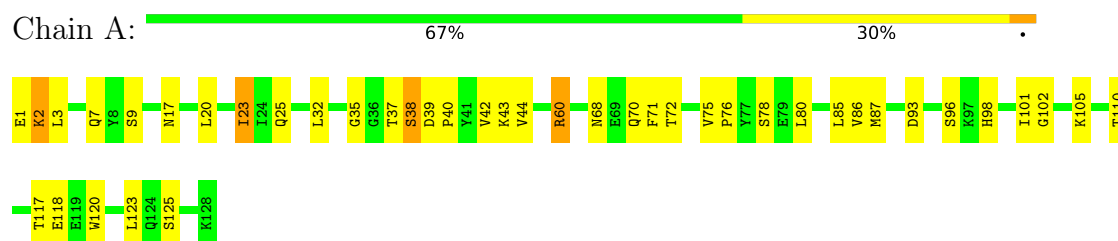


- Molecule 2: Protein S100-A13

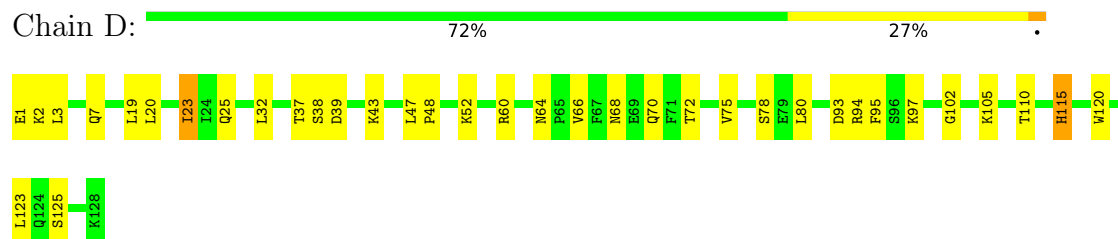


4.2.20 Score per residue for model 20

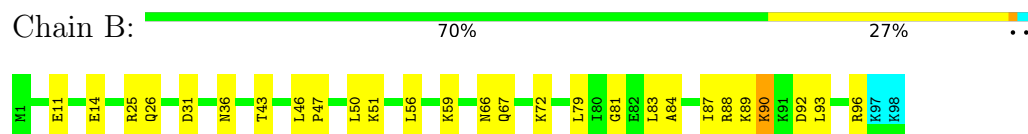
- Molecule 1: Putative uncharacterized protein



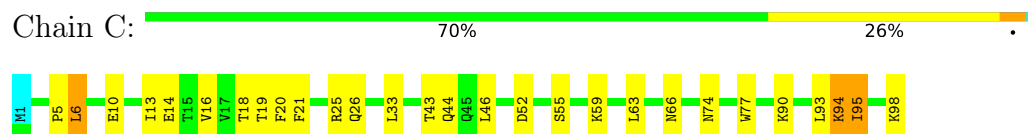
- Molecule 1: Putative uncharacterized protein



- Molecule 2: Protein S100-A13



- Molecule 2: Protein S100-A13



5 Refinement protocol and experimental data overview

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

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

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

Software name	Classification	Version
CNS	structure solution	1.2
CNS	refinement	1.2
ARIA	structure solution	1.2 & 2.2

No chemical shift data was provided.

6 Model quality

6.1 Standard geometry

There are no covalent bond-length or bond-angle outliers.

There are no bond-length outliers.

There are no bond-angle outliers.

There are no chirality outliers.

There are no planarity outliers.

6.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in each chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes averaged over the ensemble.

Mol	Chain	Non-H	H(model)	H(added)	Clashes
1	A	1044	1042	1039	9±2
1	D	1044	1042	1039	8±2
2	B	788	808	807	6±1
2	C	799	823	822	5±2
All	All	73500	74300	74140	531

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 4.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:D:3:LEU:HD23	1:D:123:LEU:HB3	0.75	1.59	9	18
1:A:3:LEU:HD23	1:A:123:LEU:HB3	0.75	1.58	11	16
1:D:3:LEU:HD22	1:D:102:GLY:HA3	0.68	1.65	18	16
1:A:23:ILE:O	1:A:68:ASN:HA	0.66	1.89	12	19
1:D:23:ILE:O	1:D:68:ASN:HA	0.66	1.91	6	20
1:A:52:LYS:HE2	1:A:75:VAL:HG23	0.65	1.66	7	2
2:C:24:ALA:O	2:C:30:LYS:HA	0.64	1.93	1	8
2:C:24:ALA:HB2	2:C:33:LEU:HD22	0.63	1.69	1	9
2:B:24:ALA:O	2:B:30:LYS:HA	0.62	1.95	19	15
2:B:79:LEU:O	2:B:83:LEU:HG	0.62	1.95	19	19
2:C:4:GLU:O	2:C:6:LEU:HG	0.61	1.95	15	11

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:47:LEU:HB2	1:A:48:PRO:CD	0.60	2.26	1	6
1:D:47:LEU:HB2	1:D:48:PRO:CD	0.59	2.27	11	2
1:D:92:PHE:O	1:D:94:ARG:HD3	0.58	1.99	6	4
1:D:13:ASP:OD1	1:D:15:GLN:HG2	0.58	1.98	13	1
2:C:50:LEU:HG	2:C:83:LEU:HD21	0.57	1.76	8	1
1:A:42:VAL:HB	1:A:87:MET:SD	0.56	2.40	17	12
2:C:59:LYS:O	2:C:63:LEU:HG	0.56	1.98	11	14
2:C:42:VAL:HG21	2:C:56:LEU:HG	0.56	1.75	7	2
1:A:3:LEU:HD22	1:A:102:GLY:HA3	0.55	1.78	11	15
2:B:81:GLY:HA2	2:C:77:TRP:CH2	0.55	2.37	4	6
1:D:38:SER:C	1:D:40:PRO:HD3	0.55	2.26	19	14
2:B:46:LEU:N	2:B:47:PRO:HD3	0.55	2.16	7	16
2:C:51:LYS:HB3	1:D:36:GLY:N	0.54	2.17	18	2
1:A:47:LEU:HB2	1:A:48:PRO:HD2	0.54	1.79	1	10
1:D:100:ILE:HD12	1:D:128:LYS:HG3	0.53	1.79	15	2
2:B:40:GLU:O	2:B:44:GLN:HB2	0.53	2.03	13	2
1:A:35:GLY:O	2:B:94:LYS:HB2	0.52	2.04	8	4
2:C:40:GLU:O	2:C:44:GLN:HB3	0.52	2.03	8	1
1:D:52:LYS:HE2	1:D:75:VAL:HG23	0.52	1.82	6	1
2:B:21:PHE:O	2:B:25:ARG:HG2	0.52	2.05	19	5
1:D:86:VAL:HG12	1:D:105:LYS:HB3	0.51	1.80	5	2
1:D:42:VAL:HB	1:D:87:MET:SD	0.51	2.46	9	7
1:A:44:VAL:HG21	1:A:71:PHE:CE1	0.51	2.41	9	6
1:D:47:LEU:HB2	1:D:48:PRO:HD2	0.51	1.82	11	5
2:B:84:ALA:O	2:B:87:ILE:HG22	0.51	2.05	19	9
2:B:72:LYS:HB2	2:B:75:GLU:OE1	0.51	2.06	8	5
1:A:17:ASN:OD1	1:A:76:PRO:HA	0.50	2.07	7	6
1:A:38:SER:C	1:A:40:PRO:HD3	0.50	2.30	15	17
1:A:8:TYR:CE1	1:A:121:ARG:HB2	0.50	2.42	10	4
2:B:90:LYS:C	2:B:91:LYS:HD2	0.50	2.31	9	1
1:D:60:ARG:O	1:D:60:ARG:HD3	0.49	2.07	3	1
2:C:46:LEU:N	2:C:47:PRO:HD3	0.49	2.22	17	5
1:A:52:LYS:HE2	1:A:74:LYS:O	0.49	2.07	17	1
1:A:39:ASP:CG	1:A:60:ARG:HA	0.49	2.32	20	4
1:A:60:ARG:HD2	1:A:60:ARG:O	0.49	2.06	5	1
2:B:51:LYS:O	2:B:51:LYS:HD3	0.48	2.09	2	8
2:B:18:THR:O	2:B:22:THR:HB	0.48	2.08	2	1
2:B:12:SER:O	2:B:15:THR:HG22	0.48	2.09	18	2
2:C:82:GLU:O	2:C:85:LYS:HG2	0.48	2.08	1	4
2:C:72:LYS:HB2	2:C:75:GLU:OE1	0.47	2.09	9	1
1:A:13:ASP:OD1	1:A:15:GLN:HG2	0.47	2.09	13	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
2:C:64:ASP:O	2:C:65:VAL:HG22	0.47	2.09	18	1
1:D:39:ASP:CG	1:D:60:ARG:HA	0.47	2.33	17	4
1:A:23:ILE:H	1:A:23:ILE:HD13	0.47	1.69	1	1
2:B:27:GLU:OE2	2:B:36:ASN:HB3	0.47	2.09	16	4
2:C:13:ILE:O	2:C:16:VAL:HG22	0.47	2.09	20	2
2:B:89:LYS:HG2	2:B:90:LYS:N	0.47	2.24	17	1
2:C:64:ASP:OD2	2:C:67:GLN:HA	0.47	2.08	19	1
1:A:45:PHE:O	1:A:86:VAL:HB	0.47	2.09	18	1
1:D:17:ASN:OD1	1:D:76:PRO:HA	0.47	2.10	19	5
2:B:23:PHE:HA	2:B:26:GLN:NE2	0.47	2.25	7	2
2:C:45:GLN:C	2:C:47:PRO:HD3	0.47	2.35	17	2
1:A:75:VAL:HG21	1:A:83:LYS:HG2	0.47	1.85	10	1
1:A:40:PRO:HA	1:A:90:TYR:O	0.47	2.10	11	5
1:D:3:LEU:O	1:D:3:LEU:HG	0.46	2.10	8	4
1:D:44:VAL:HG21	1:D:71:PHE:CE1	0.46	2.45	15	2
2:C:40:GLU:O	2:C:44:GLN:HB2	0.46	2.09	12	4
1:D:75:VAL:HG21	1:D:83:LYS:HG2	0.46	1.87	6	1
1:D:8:TYR:CE1	1:D:121:ARG:HB2	0.46	2.46	17	3
1:A:16:ASN:OD1	1:A:18:GLN:HG3	0.46	2.11	1	4
2:C:15:THR:O	2:C:18:THR:HG22	0.46	2.10	11	2
1:D:81:GLY:O	1:D:109:ASN:HB2	0.45	2.12	17	2
1:A:34:MET:O	2:B:91:LYS:HG3	0.45	2.12	4	1
2:C:94:LYS:O	2:C:95:ILE:HG12	0.45	2.12	20	5
2:C:52:ASP:OD2	2:C:55:SER:HB2	0.45	2.11	20	3
1:A:3:LEU:O	1:A:3:LEU:HG	0.45	2.12	9	4
2:C:78:ARG:O	2:C:82:GLU:HG2	0.45	2.11	14	5
1:A:81:GLY:O	1:A:109:ASN:HB2	0.44	2.12	14	1
2:C:6:LEU:HB3	2:C:10:GLU:CB	0.44	2.42	5	4
1:A:87:MET:HB3	1:A:104:PHE:CE2	0.44	2.48	6	1
1:D:11:ASP:OD2	1:D:20:LEU:HB3	0.44	2.12	2	1
1:D:89:VAL:HG13	1:D:101:ILE:HG12	0.44	1.89	3	1
1:A:2:LYS:O	1:A:2:LYS:HD3	0.44	2.13	17	5
1:A:89:VAL:HG13	1:A:101:ILE:HG12	0.44	1.89	19	1
1:A:60:ARG:O	1:A:60:ARG:HD3	0.44	2.12	3	2
2:C:65:VAL:HG23	2:C:66:ASN:H	0.44	1.72	19	1
2:B:66:ASN:OD1	2:B:68:ASP:HB3	0.44	2.13	6	1
2:B:86:GLU:O	2:B:90:LYS:HD2	0.44	2.12	9	1
1:D:20:LEU:HD11	1:D:70:GLN:HG3	0.43	1.89	2	1
2:C:75:GLU:HA	2:C:78:ARG:NH1	0.43	2.28	19	1
1:D:2:LYS:O	1:D:2:LYS:HD3	0.43	2.12	19	1
1:A:94:ARG:HH22	2:B:58:GLU:CD	0.43	2.21	8	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:D:44:VAL:HG11	1:D:71:PHE:CE2	0.43	2.49	10	1
2:C:93:LEU:O	2:C:94:LYS:HB2	0.43	2.13	11	1
1:D:24:ILE:HA	1:D:68:ASN:OD1	0.43	2.13	11	1
1:A:31:ALA:HA	1:A:38:SER:OG	0.43	2.14	3	2
1:D:93:ASP:O	1:D:94:ARG:HB2	0.43	2.13	20	3
2:C:38:PHE:CE2	2:C:71:LEU:HG	0.43	2.49	5	1
1:D:91:ASP:HB2	1:D:101:ILE:HD11	0.43	1.88	11	2
2:B:52:ASP:CG	2:B:59:LYS:HZ3	0.43	2.22	7	1
2:C:91:LYS:HZ1	1:D:33:ASP:CG	0.43	2.21	10	1
1:A:16:ASN:OD1	1:A:18:GLN:HG2	0.43	2.13	11	1
2:B:72:LYS:HE2	2:B:75:GLU:OE2	0.43	2.13	4	1
1:A:1:GLU:HB3	1:A:125:SER:H	0.43	1.74	11	1
2:B:30:LYS:O	2:B:31:ASP:HB2	0.43	2.14	11	1
1:D:38:SER:O	1:D:40:PRO:HD3	0.42	2.12	15	4
1:A:87:MET:HB3	1:A:104:PHE:CE1	0.42	2.49	2	2
1:A:38:SER:O	1:A:40:PRO:HD3	0.42	2.14	3	3
1:D:18:GLN:OE1	1:D:72:THR:HG23	0.42	2.14	16	2
2:B:92:ASP:OD1	2:B:96:ARG:HD3	0.42	2.14	8	1
2:C:50:LEU:HD11	2:C:79:LEU:HD11	0.42	1.91	14	1
2:B:90:LYS:NZ	2:B:90:LYS:HB2	0.42	2.30	12	1
1:D:44:VAL:HG21	1:D:71:PHE:CD1	0.42	2.49	13	1
1:D:39:ASP:O	1:D:91:ASP:HA	0.42	2.14	14	1
1:D:8:TYR:CZ	1:D:121:ARG:HB2	0.42	2.50	5	1
2:C:81:GLY:O	2:C:85:LYS:HE3	0.42	2.15	14	1
1:D:44:VAL:HG11	1:D:71:PHE:CD2	0.42	2.48	14	1
1:A:3:LEU:HB3	1:A:123:LEU:CB	0.42	2.45	2	1
1:A:47:LEU:CB	1:A:48:PRO:HD2	0.42	2.44	13	3
1:A:35:GLY:HA2	2:B:95:ILE:O	0.42	2.14	10	1
1:A:26:ALA:O	1:A:64:ASN:HA	0.42	2.15	19	1
1:A:8:TYR:N	1:A:8:TYR:CD1	0.41	2.88	15	1
2:B:4:GLU:H	2:B:4:GLU:CD	0.41	2.22	19	2
1:D:13:ASP:HB3	1:D:16:ASN:OD1	0.41	2.15	10	1
1:D:79:GLU:O	1:D:83:LYS:HE2	0.41	2.15	10	1
1:D:18:GLN:HB2	1:D:73:PHE:O	0.41	2.15	15	1
2:B:6:LEU:HB3	2:B:10:GLU:OE1	0.41	2.16	14	1
2:B:81:GLY:HA2	2:C:77:TRP:CZ2	0.41	2.50	17	1
1:D:44:VAL:HG21	1:D:71:PHE:CG	0.41	2.51	19	1
2:C:21:PHE:O	2:C:25:ARG:HG2	0.41	2.15	13	1
2:C:27:GLU:OE2	2:C:36:ASN:HB3	0.41	2.16	16	1
2:C:96:ARG:HD2	2:C:96:ARG:O	0.41	2.16	18	1
2:C:90:LYS:HB3	2:C:92:ASP:OD1	0.41	2.16	4	1

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:49:ASP:O	1:A:51:LYS:HG3	0.41	2.16	11	1
2:C:34:SER:O	2:C:38:PHE:HB2	0.41	2.15	11	1
1:D:47:LEU:CB	1:D:48:PRO:CD	0.41	2.99	13	4
2:C:70:GLU:O	2:C:72:LYS:HD2	0.41	2.16	13	1
2:C:64:ASP:O	2:C:66:ASN:N	0.41	2.54	19	1
1:D:47:LEU:CB	1:D:48:PRO:HD2	0.41	2.46	3	1
1:A:47:LEU:C	1:A:49:ASP:H	0.41	2.24	4	1
2:B:85:LYS:O	2:B:89:LYS:HB3	0.41	2.16	12	1
1:A:44:VAL:HG21	1:A:71:PHE:CD1	0.40	2.51	3	1
1:D:3:LEU:CD2	1:D:123:LEU:HB3	0.40	2.46	11	1
1:D:70:GLN:HG2	1:D:71:PHE:N	0.40	2.31	13	1
1:A:23:ILE:HD13	1:A:23:ILE:H	0.40	1.76	4	1
1:A:6:LEU:HD12	1:A:26:ALA:HB2	0.40	1.92	11	1
1:A:95:PHE:CG	2:B:51:LYS:HB2	0.40	2.51	15	1
2:C:59:LYS:HE2	1:D:34:MET:SD	0.40	2.57	15	1
1:D:32:LEU:HG	1:D:101:ILE:HD12	0.40	1.94	15	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	126/128 (98%)	106±2 (84±2%)	18±2 (14±2%)	2±1 (2±1%)	11	57
1	D	126/128 (98%)	108±2 (85±2%)	16±3 (13±2%)	2±1 (2±1%)	9	52
2	B	95/98 (97%)	77±2 (81±2%)	14±2 (15±2%)	4±1 (4±1%)	4	32
2	C	96/98 (98%)	79±2 (82±2%)	14±2 (14±2%)	4±1 (4±1%)	4	30
All	All	8860/9040 (98%)	7383 (83%)	1248 (14%)	229 (3%)	6	42

All 39 unique Ramachandran outliers are listed below. They are sorted by the frequency of occurrence in the ensemble.

Mol	Chain	Res	Type	Models (Total)
2	B	31	ASP	20
2	C	95	ILE	20

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	D	48	PRO	17
2	B	25	ARG	14
2	B	44	GLN	13
2	C	74	ASN	11
1	A	48	PRO	11
1	D	47	LEU	10
1	A	47	LEU	9
2	C	44	GLN	9
2	B	93	LEU	8
2	C	29	ARG	7
2	C	93	LEU	7
2	C	25	ARG	6
1	A	35	GLY	6
1	D	67	PHE	6
2	B	30	LYS	5
1	D	61	LYS	5
1	A	67	PHE	5
2	B	90	LYS	5
1	D	74	LYS	4
2	B	92	ASP	4
2	C	65	VAL	4
2	C	5	PRO	3
1	A	115	HIS	3
1	D	115	HIS	2
1	A	61	LYS	2
2	C	90	LYS	2
2	B	47	PRO	1
2	B	48	HIS	1
2	C	54	GLY	1
1	A	74	LYS	1
1	D	95	PHE	1
1	A	95	PHE	1
2	C	96	ARG	1
2	C	94	LYS	1
1	A	28	GLU	1
2	C	34	SER	1
2	C	52	ASP	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	115/115 (100%)	89±3 (78±3%)	26±3 (22±3%)	2	29
1	D	115/115 (100%)	89±3 (77±2%)	26±3 (23±2%)	2	29
2	B	89/91 (98%)	76±3 (86±3%)	13±3 (14±3%)	5	43
2	C	90/91 (99%)	76±3 (85±3%)	14±3 (15±3%)	5	41
All	All	8180/8240 (99%)	6613 (81%)	1567 (19%)	3	34

All 233 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	20	LEU	20
1	A	105	LYS	20
2	B	66	ASN	20
2	C	98	LYS	20
1	D	20	LEU	20
1	D	25	GLN	20
1	D	78	SER	20
1	A	23	ILE	19
1	A	25	GLN	19
1	A	38	SER	19
1	A	125	SER	19
2	B	51	LYS	19
1	D	80	LEU	19
1	D	105	LYS	19
1	D	125	SER	19
1	A	32	LEU	18
1	A	80	LEU	18
2	B	25	ARG	18
2	C	33	LEU	18
1	D	2	LYS	18
1	D	7	GLN	18
1	D	23	ILE	18
1	D	38	SER	18
2	C	93	LEU	18
1	A	37	THR	17
1	A	78	SER	17
2	B	88	ARG	17
2	C	43	THR	17
1	D	32	LEU	17

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	D	75	VAL	17
1	A	96	SER	17
1	A	7	GLN	16
1	A	8	TYR	16
1	A	93	ASP	16
2	B	26	GLN	16
2	B	90	LYS	16
2	C	25	ARG	16
1	D	37	THR	16
2	C	26	GLN	16
1	A	2	LYS	15
1	A	70	GLN	15
2	C	46	LEU	15
1	A	60	ARG	15
1	A	101	ILE	15
2	B	56	LEU	15
1	A	75	VAL	14
1	A	86	VAL	14
1	D	8	TYR	13
1	D	101	ILE	13
1	D	110	THR	13
1	D	66	VAL	12
1	D	70	GLN	12
1	D	9	SER	11
1	D	43	LYS	11
1	A	66	VAL	10
1	A	68	ASN	10
1	A	94	ARG	10
1	D	72	THR	10
2	B	68	ASP	10
1	D	115	HIS	10
2	B	43	THR	9
2	B	96	ARG	9
1	A	43	LYS	9
1	A	98	HIS	9
2	C	15	THR	9
2	C	14	GLU	9
1	A	117	THR	8
1	A	120	TRP	8
2	C	22	THR	8
2	C	56	LEU	8
2	C	92	ASP	8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	D	85	LEU	8
2	B	14	GLU	8
2	C	45	GLN	8
1	D	44	VAL	8
1	D	86	VAL	8
1	A	85	LEU	8
2	B	22	THR	7
2	B	32	SER	7
1	D	55	GLU	7
1	A	1	GLU	7
1	A	72	THR	7
1	A	110	THR	7
1	D	68	ASN	7
1	D	120	TRP	7
2	B	50	LEU	7
2	C	94	LYS	7
1	A	9	SER	6
2	B	20	PHE	6
2	C	18	THR	6
2	C	59	LYS	6
2	C	86	GLU	6
2	C	90	LYS	6
1	D	1	GLU	6
1	D	93	ASP	6
1	A	115	HIS	6
1	A	116	VAL	6
1	D	64	ASN	6
1	D	94	ARG	6
2	B	89	LYS	6
2	C	6	LEU	5
2	C	19	THR	5
2	C	66	ASN	5
2	B	19	THR	5
1	A	119	GLU	5
2	B	15	THR	5
2	B	72	LYS	5
1	D	60	ARG	5
1	D	119	GLU	5
1	D	96	SER	5
2	C	68	ASP	5
2	B	59	LYS	5
1	D	112	ASP	5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	D	97	LYS	5
1	D	117	THR	5
1	A	103	GLU	5
1	A	44	VAL	4
2	C	4	GLU	4
1	D	84	THR	4
2	C	20	PHE	4
1	D	52	LYS	4
1	D	92	PHE	4
1	A	64	ASN	4
2	C	67	GLN	4
1	A	67	PHE	4
2	B	41	LEU	4
2	B	44	GLN	4
2	B	4	GLU	4
1	D	103	GLU	4
2	B	21	PHE	4
2	B	45	GLN	4
1	D	33	ASP	4
2	B	7	THR	3
2	C	44	GLN	3
1	A	55	GLU	3
1	D	18	GLN	3
1	A	18	GLN	3
1	A	52	LYS	3
2	B	91	LYS	3
2	C	55	SER	3
1	D	124	GLN	3
1	D	45	PHE	3
2	C	40	GLU	3
2	C	91	LYS	3
1	D	74	LYS	3
1	D	90	TYR	3
2	B	18	THR	3
2	C	50	LEU	3
1	A	3	LEU	3
1	D	83	LYS	3
1	A	45	PHE	3
1	A	90	TYR	2
2	C	77	TRP	2
1	D	17	ASN	2
1	D	98	HIS	2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	A	57	LYS	2
1	D	10	LEU	2
1	A	50	LYS	2
2	B	60	MET	2
2	B	95	ILE	2
2	C	34	SER	2
2	C	36	ASN	2
1	D	14	PHE	2
1	A	15	GLN	2
1	D	6	LEU	2
2	C	49	LEU	2
1	D	116	VAL	2
2	C	97	LYS	2
1	D	53	LYS	2
2	C	65	VAL	2
1	A	47	LEU	2
2	C	96	ARG	2
1	A	124	GLN	2
2	B	67	GLN	2
1	D	46	LEU	2
1	A	118	GLU	2
2	B	9	LEU	2
2	C	72	LYS	2
1	D	15	GLN	2
1	D	95	PHE	2
2	B	12	SER	2
1	A	46	LEU	1
1	A	104	PHE	1
1	D	34	MET	1
1	D	91	ASP	1
2	C	57	ASP	1
1	D	104	PHE	1
1	A	83	LYS	1
2	B	40	GLU	1
1	D	11	ASP	1
1	A	11	ASP	1
1	D	58	VAL	1
2	B	46	LEU	1
2	C	41	LEU	1
1	D	56	THR	1
1	A	10	LEU	1
2	C	64	ASP	1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Models (Total)
1	D	118	GLU	1
1	A	17	ASN	1
1	D	89	VAL	1
2	C	23	PHE	1
2	C	78	ARG	1
1	D	3	LEU	1
1	A	19	LEU	1
1	A	74	LYS	1
1	A	84	THR	1
2	B	58	GLU	1
2	C	58	GLU	1
2	C	75	GLU	1
1	D	79	GLU	1
1	A	69	GLU	1
2	B	92	ASP	1
2	C	31	ASP	1
1	D	16	ASN	1
1	D	99	ASP	1
1	A	28	GLU	1
1	D	128	LYS	1
1	A	79	GLU	1
1	A	14	PHE	1
1	A	112	ASP	1
2	B	31	ASP	1
2	C	60	MET	1
1	D	113	PHE	1
1	A	6	LEU	1
1	A	16	ASN	1
2	C	13	ILE	1
2	C	74	ASN	1
1	D	67	PHE	1
1	D	69	GLU	1
2	B	11	GLU	1
2	B	36	ASN	1
2	C	21	PHE	1
1	D	19	LEU	1

6.3.3 RNA ⓘ

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](#)

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