



# Full wwPDB NMR Structure Validation Report ⓘ

Mar 28, 2026 – 05:18 AM UTC

PDB ID : 2ROC / pdb\_00002roc  
Title : Solution structure of Mcl-1 Complexed with Puma  
Authors : Day, C.L.; Smits, C.; Fan, F.C.; Lee, E.F.; Fairlie, W.D.; Hinds, M.G.  
Deposited on : 2008-03-17

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.

The types of validation reports are described at

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

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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

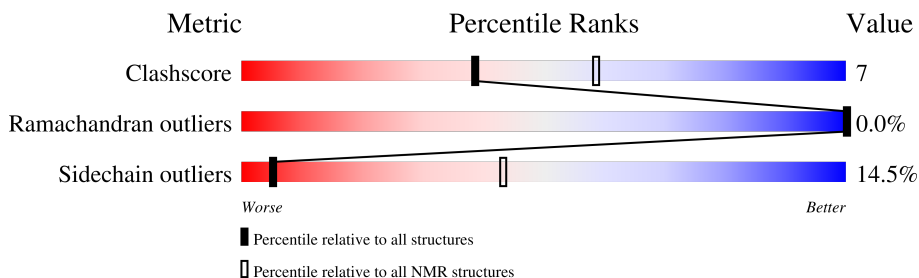
# 1 Overall quality at a glance

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  $\geq 3$ , 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	162	 68% 20% 12%
2	B	27	 48% 15% 37%

## 2 Ensemble composition and analysis i

This entry contains 20 models. Model 7 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:153-A:173, A:180-A:300, B:134-B:150 (159)	0.73	7

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 5 single-model clusters were found.

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

### 3 Entry composition i

There are 2 unique types of molecules in this entry. The entry contains 3032 atoms, of which 1511 are hydrogens and 0 are deuteriums.

- Molecule 1 is a protein called Induced myeloid leukemia cell differentiation protein Mcl-1 homolog.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
1	A	162	2577	810	1289	236	240	2	0

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	147	GLY	-	expression tag	UNP P97287
A	148	PRO	-	expression tag	UNP P97287
A	149	LEU	-	expression tag	UNP P97287
A	150	GLY	-	expression tag	UNP P97287
A	151	SER	-	expression tag	UNP P97287

- Molecule 2 is a protein called Bcl-2-binding component 3.

Mol	Chain	Residues	Atoms						Trace
			Total	C	H	N	O	S	
2	B	27	455	140	222	46	46	1	0

There are 2 discrepancies between the modelled and reference sequences:

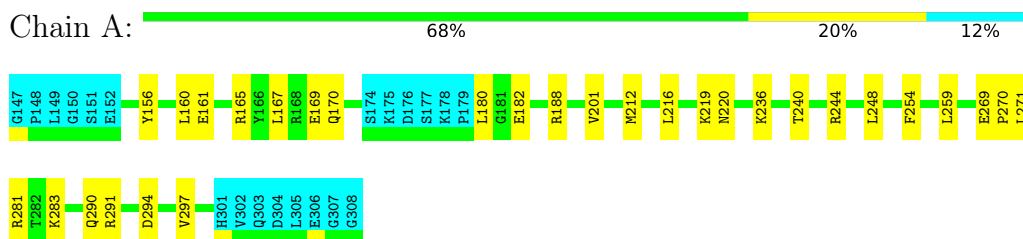
Chain	Residue	Modelled	Actual	Comment	Reference
B	144	ILE	MET	engineered mutation	UNP Q99ML1
B	156	MET	-	expression tag	UNP Q99ML1

## 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: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog



- Molecule 2: Bcl-2-binding component 3

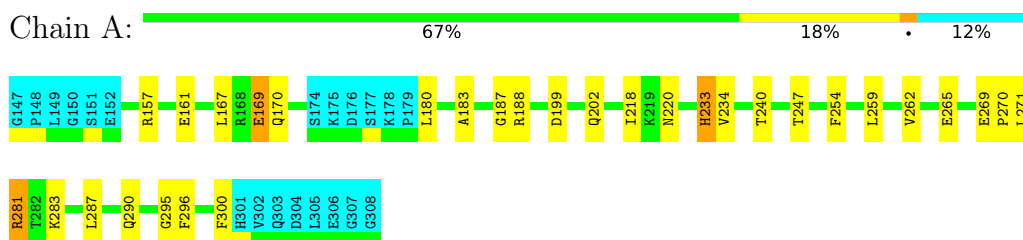


### 4.2 Scores per residue for each member of the ensemble

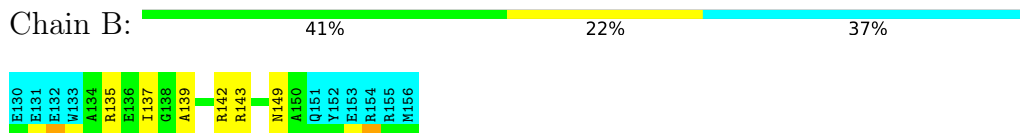
Colouring as in section 4.1 above.

#### 4.2.1 Score per residue for model 1

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

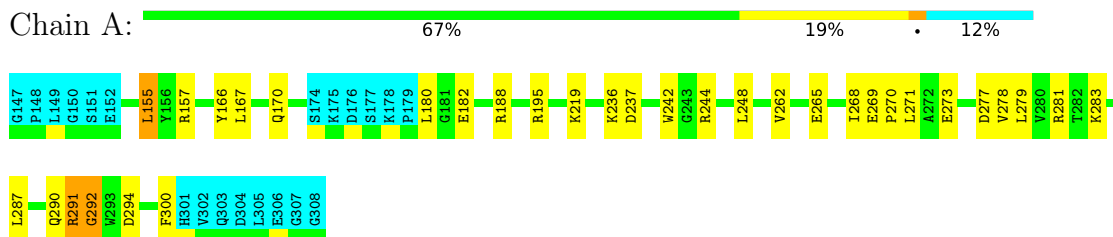


- Molecule 2: Bcl-2-binding component 3



#### 4.2.2 Score per residue for model 2

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

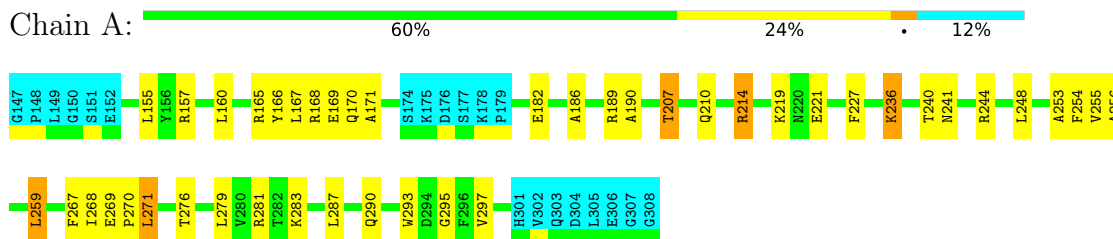


- Molecule 2: Bcl-2-binding component 3



#### 4.2.3 Score per residue for model 3

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog



- Molecule 2: Bcl-2-binding component 3



#### 4.2.4 Score per residue for model 4

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

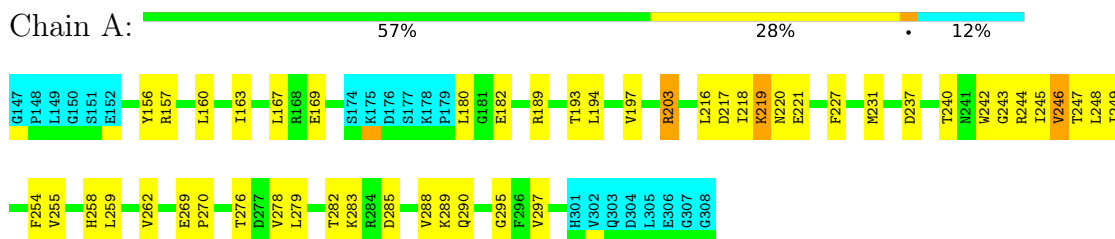


- Molecule 2: Bcl-2-binding component 3

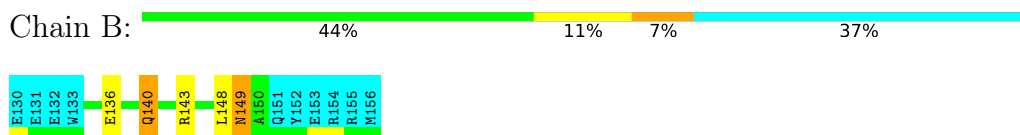


#### 4.2.5 Score per residue for model 5

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

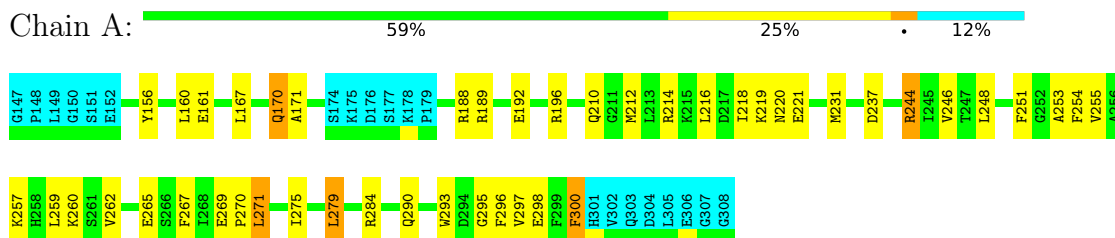


- Molecule 2: Bcl-2-binding component 3

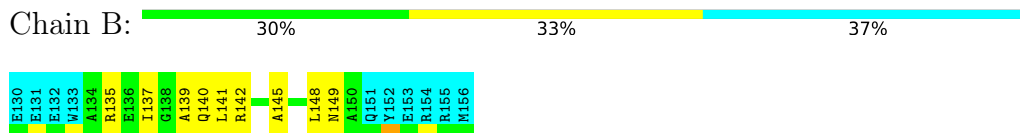


#### 4.2.6 Score per residue for model 6

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

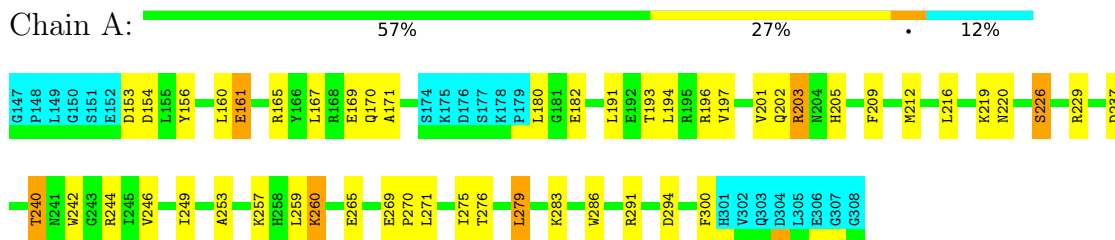


- Molecule 2: Bcl-2-binding component 3

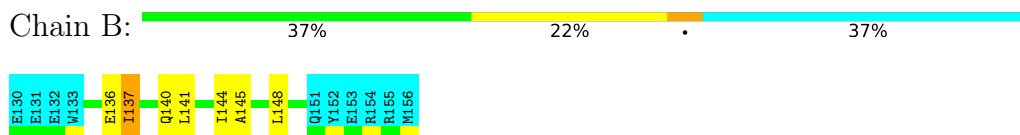


#### 4.2.7 Score per residue for model 7 (medoid)

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

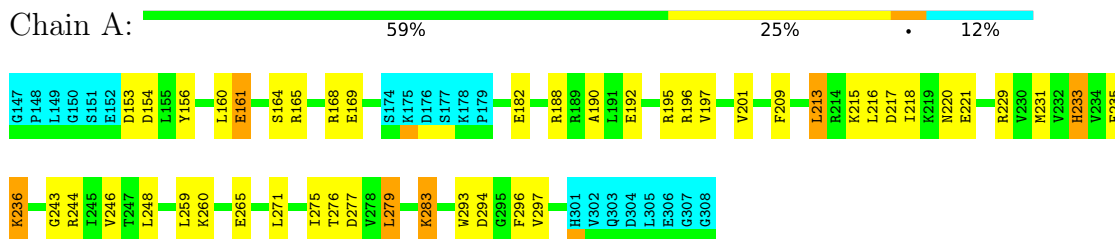


- Molecule 2: Bcl-2-binding component 3

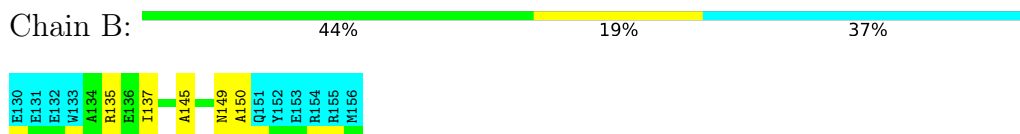


#### 4.2.8 Score per residue for model 8

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

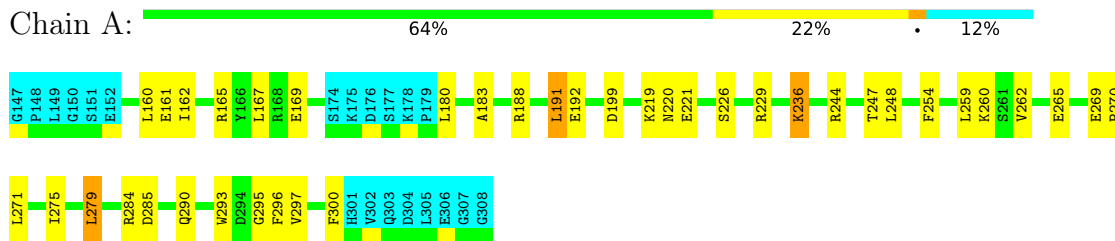


- Molecule 2: Bcl-2-binding component 3



#### 4.2.9 Score per residue for model 9

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

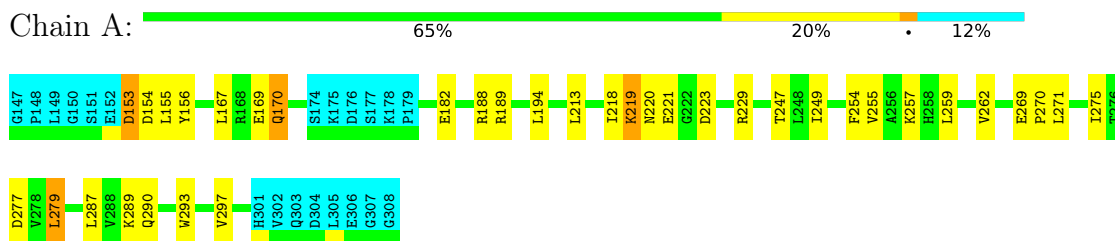


- Molecule 2: Bcl-2-binding component 3



#### 4.2.10 Score per residue for model 10

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

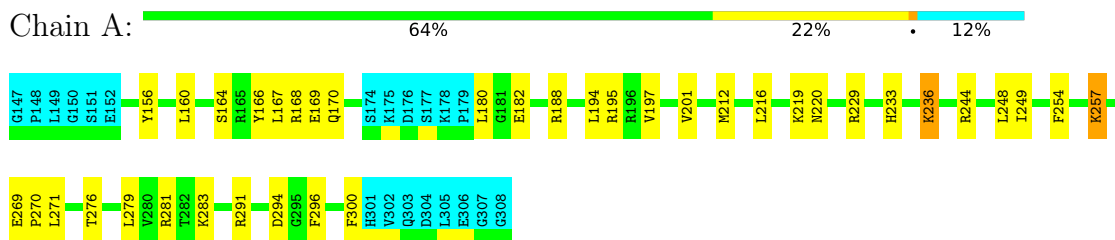


- Molecule 2: Bcl-2-binding component 3

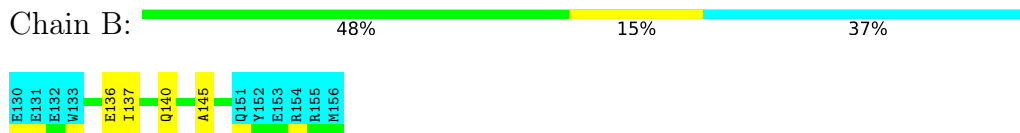


#### 4.2.11 Score per residue for model 11

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

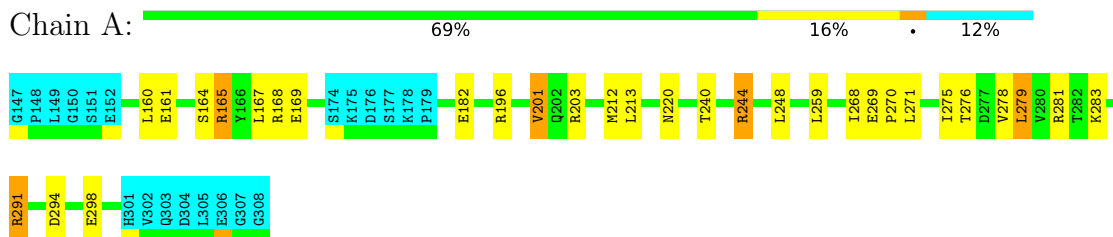


- Molecule 2: Bcl-2-binding component 3

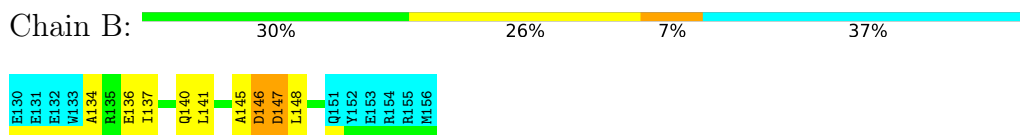


#### 4.2.12 Score per residue for model 12

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

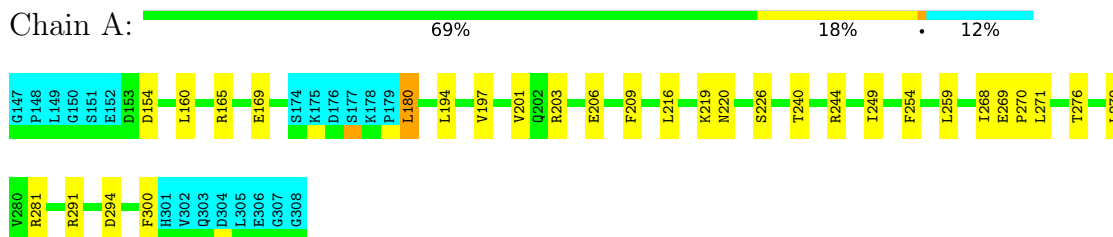


- Molecule 2: Bcl-2-binding component 3



#### 4.2.13 Score per residue for model 13

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

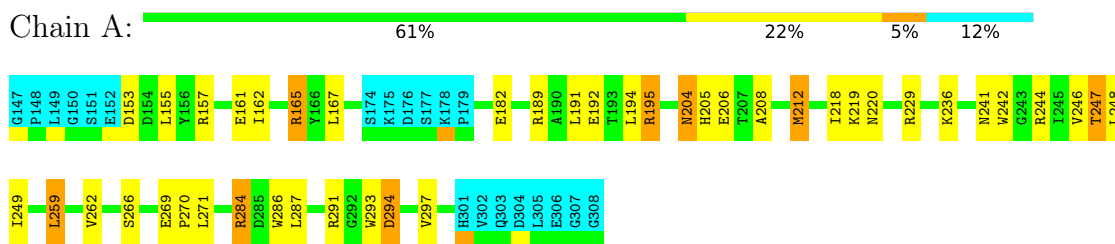


- Molecule 2: Bcl-2-binding component 3

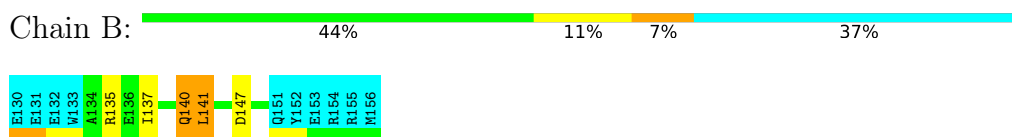


#### 4.2.14 Score per residue for model 14

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

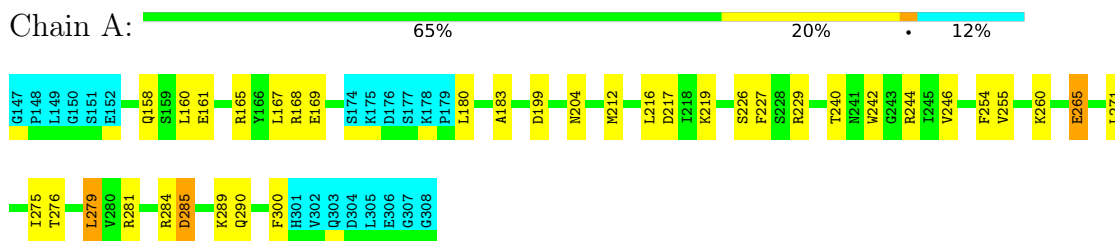


- Molecule 2: Bcl-2-binding component 3

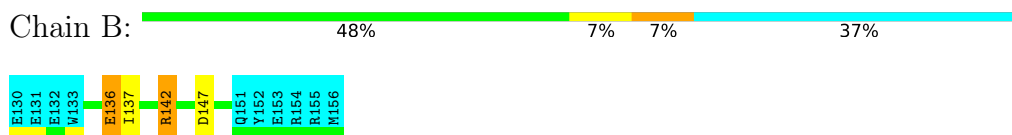


#### 4.2.15 Score per residue for model 15

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

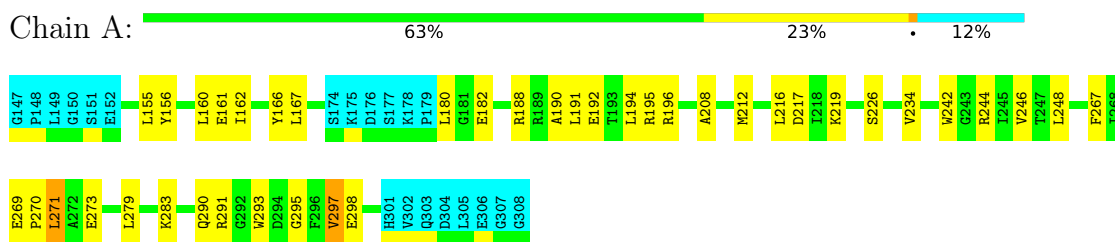


- Molecule 2: Bcl-2-binding component 3

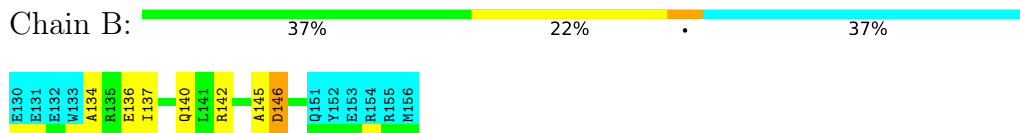


#### 4.2.16 Score per residue for model 16

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

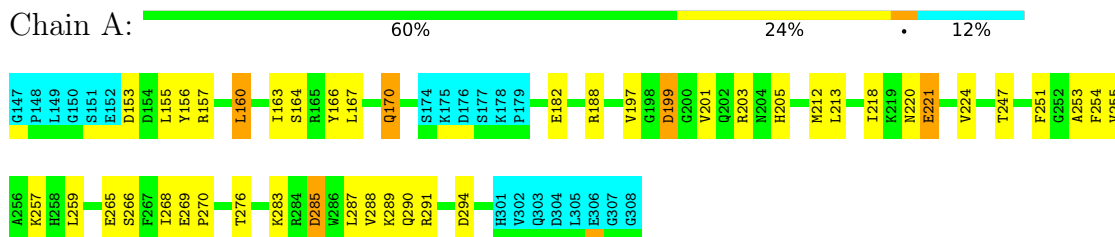


- Molecule 2: Bcl-2-binding component 3

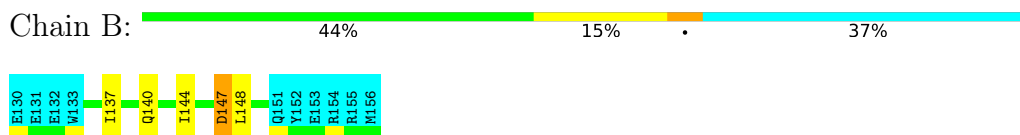


#### 4.2.17 Score per residue for model 17

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog



- Molecule 2: Bcl-2-binding component 3



#### 4.2.18 Score per residue for model 18

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

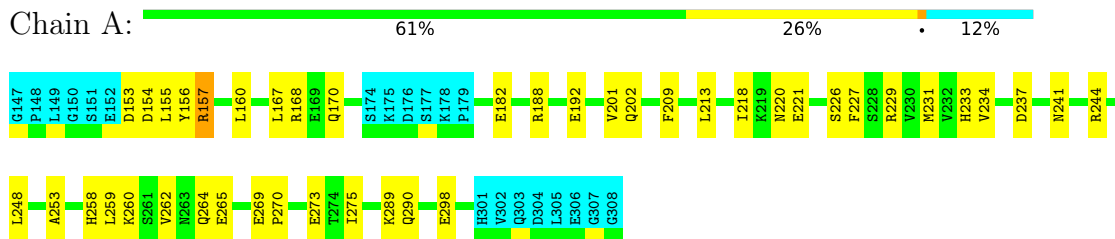


- Molecule 2: Bcl-2-binding component 3

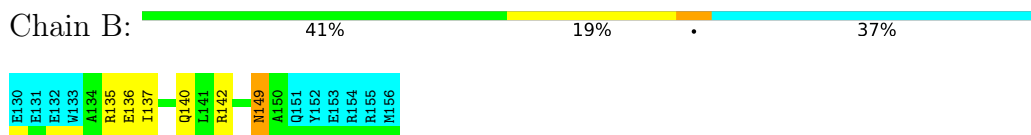


#### 4.2.19 Score per residue for model 19

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog

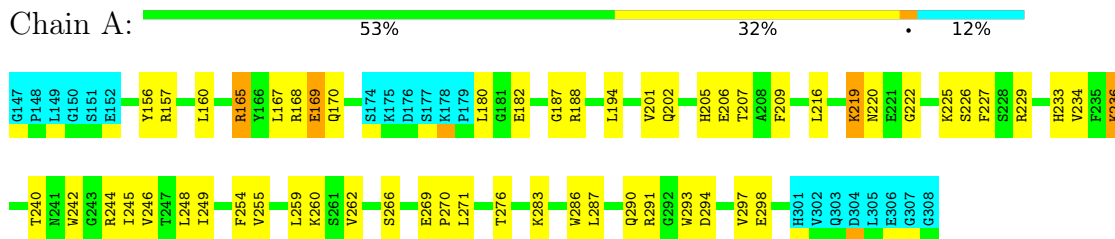


- Molecule 2: Bcl-2-binding component 3



#### 4.2.20 Score per residue for model 20

- Molecule 1: Induced myeloid leukemia cell differentiation protein Mcl-1 homolog



- Molecule 2: Bcl-2-binding component 3



## 5 Refinement protocol and experimental data overview

The models were refined using the following method: *DGSA-distance geometry simulated annealing*.

Of the 256 calculated structures, 20 were deposited, based on the following criterion: *structures with the least restraint violations*.

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

Software name	Classification	Version
CYANA	structure solution	2.1
X-PLOR NIH	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	1145	1153	1150	18±5
2	B	131	134	134	4±2
All	All	25520	25740	25680	373

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 7.

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

Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:189:ARG:HG2	1:A:297:VAL:HG11	0.90	1.40	6	2
1:A:165:ARG:HH12	1:A:191:LEU:HD13	0.82	1.33	14	1
1:A:218:ILE:HB	1:A:259:LEU:HD21	0.81	1.52	8	8
1:A:170:GLN:HG2	1:A:253:ALA:HB1	0.77	1.55	19	5
1:A:247:THR:HB	2:B:141:LEU:HG	0.75	1.55	14	1
1:A:160:LEU:HA	1:A:276:THR:HG21	0.74	1.58	12	9
1:A:194:LEU:HD12	1:A:246:VAL:HG12	0.71	1.62	7	1
1:A:291:ARG:HB3	1:A:294:ASP:HB2	0.71	1.62	20	5
1:A:186:ALA:HA	1:A:189:ARG:HD3	0.71	1.62	3	1
1:A:242:TRP:HB3	1:A:300:PHE:HE1	0.68	1.48	7	2
1:A:203:ARG:HH11	1:A:203:ARG:HA	0.68	1.48	5	1
1:A:212:MET:HG2	2:B:137:ILE:HD12	0.68	1.65	11	2
1:A:153:ASP:HB3	1:A:156:TYR:HB3	0.68	1.65	8	5

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:191:LEU:O	1:A:195:ARG:HG3	0.67	1.89	16	1
1:A:161:GLU:HG2	1:A:183:ALA:HB2	0.67	1.66	1	1
1:A:269:GLU:HB2	1:A:270:PRO:HD3	0.66	1.67	9	18
1:A:171:ALA:HA	1:A:257:LYS:HG2	0.64	1.68	6	1
1:A:241:ASN:HB2	1:A:244:ARG:HG3	0.64	1.70	3	1
1:A:165:ARG:NH1	1:A:191:LEU:HD13	0.64	2.07	14	1
1:A:201:VAL:HB	1:A:205:HIS:NE2	0.62	2.08	20	2
1:A:244:ARG:HA	2:B:145:ALA:HB1	0.62	1.71	20	11
1:A:244:ARG:O	1:A:248:LEU:HG	0.62	1.94	11	6
1:A:212:MET:SD	2:B:137:ILE:HA	0.62	2.35	7	2
1:A:285:ASP:HA	1:A:288:VAL:HG22	0.62	1.71	17	2
1:A:226:SER:HA	1:A:229:ARG:HE	0.61	1.55	19	1
1:A:155:LEU:HG	1:A:287:LEU:HD11	0.61	1.72	17	1
1:A:216:LEU:HD11	2:B:137:ILE:HG21	0.61	1.71	15	7
1:A:153:ASP:HB3	1:A:156:TYR:CB	0.60	2.25	8	1
1:A:168:ARG:HH12	1:A:265:GLU:HG3	0.60	1.57	15	1
1:A:169:GLU:HG3	1:A:170:GLN:N	0.60	2.11	20	3
1:A:156:TYR:O	1:A:160:LEU:HB2	0.59	1.97	5	8
1:A:241:ASN:HB2	1:A:244:ARG:HD2	0.59	1.73	14	1
1:A:194:LEU:HD21	1:A:249:ILE:HG21	0.58	1.74	5	9
1:A:212:MET:HG3	2:B:137:ILE:HG13	0.58	1.75	12	1
1:A:248:LEU:HD23	1:A:279:LEU:HD12	0.58	1.75	6	2
1:A:180:LEU:HG	1:A:187:GLY:C	0.58	2.23	1	2
1:A:162:ILE:HG23	1:A:191:LEU:HG	0.57	1.76	9	1
1:A:290:GLN:O	1:A:295:GLY:HA3	0.57	2.00	16	4
1:A:153:ASP:O	1:A:157:ARG:HG2	0.57	1.99	19	1
1:A:201:VAL:HG22	2:B:148:LEU:HD13	0.57	1.77	17	2
1:A:212:MET:SD	2:B:140:GLN:HB3	0.56	2.40	6	2
1:A:259:LEU:HB3	1:A:268:ILE:HG12	0.56	1.78	12	3
1:A:290:GLN:HB3	1:A:295:GLY:HA3	0.55	1.76	5	2
1:A:234:VAL:HG21	1:A:248:LEU:HD21	0.55	1.79	16	1
1:A:275:ILE:O	1:A:279:LEU:HB2	0.55	2.02	1	7
1:A:231:MET:HE1	1:A:275:ILE:O	0.54	2.02	19	3
1:A:165:ARG:HH11	1:A:180:LEU:HG	0.54	1.61	13	1
1:A:201:VAL:HG13	2:B:148:LEU:HD13	0.54	1.78	12	1
1:A:219:LYS:HE3	1:A:219:LYS:HA	0.53	1.80	5	2
1:A:226:SER:O	1:A:229:ARG:HG2	0.53	2.03	7	1
1:A:163:ILE:HD12	1:A:276:THR:HG23	0.53	1.79	4	3
1:A:227:PHE:CE1	1:A:255:VAL:HG21	0.53	2.39	20	3
1:A:234:VAL:HA	2:B:142:ARG:HG3	0.53	1.81	16	3
1:A:165:ARG:HH11	1:A:165:ARG:HB2	0.53	1.63	12	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:278:VAL:HA	1:A:281:ARG:HG2	0.53	1.81	12	2
1:A:233:HIS:CE1	2:B:135:ARG:HA	0.52	2.40	8	2
1:A:201:VAL:HG12	1:A:209:PHE:HE2	0.52	1.65	13	3
1:A:244:ARG:HH12	2:B:146:ASP:CG	0.52	2.13	16	2
1:A:248:LEU:HD23	1:A:279:LEU:HG	0.52	1.80	12	2
1:A:161:GLU:OE2	1:A:165:ARG:HD2	0.52	2.05	7	2
1:A:231:MET:HE2	1:A:278:VAL:HG13	0.52	1.80	5	1
1:A:254:PHE:HD1	1:A:257:LYS:HE3	0.52	1.63	6	1
1:A:242:TRP:HB3	1:A:300:PHE:CE1	0.51	2.36	7	2
1:A:161:GLU:HB2	1:A:183:ALA:HB2	0.51	1.81	15	1
1:A:161:GLU:O	1:A:165:ARG:HG2	0.51	2.06	8	1
1:A:197:VAL:O	1:A:201:VAL:HG23	0.51	2.06	17	4
1:A:212:MET:HE1	2:B:140:GLN:HB3	0.51	1.82	14	1
2:B:142:ARG:NH1	2:B:142:ARG:HB3	0.51	2.21	15	1
1:A:248:LEU:HD12	1:A:279:LEU:HD21	0.51	1.83	18	2
1:A:293:TRP:O	1:A:297:VAL:HG23	0.50	2.05	3	6
1:A:170:GLN:HG3	1:A:253:ALA:HB1	0.50	1.83	3	1
1:A:291:ARG:HD3	1:A:294:ASP:OD2	0.50	2.06	11	2
1:A:212:MET:HG2	2:B:137:ILE:HG23	0.50	1.84	6	1
1:A:212:MET:SD	2:B:140:GLN:HG2	0.50	2.47	17	1
2:B:139:ALA:HA	2:B:142:ARG:HE	0.50	1.67	6	1
1:A:215:LYS:HB3	2:B:137:ILE:HD11	0.50	1.83	18	1
1:A:153:ASP:OD2	1:A:284:ARG:HD3	0.50	2.05	14	1
1:A:170:GLN:O	1:A:257:LYS:HG2	0.49	2.08	11	1
1:A:233:HIS:O	1:A:236:LYS:HG2	0.49	2.08	11	1
2:B:143:ARG:CZ	2:B:143:ARG:HA	0.49	2.37	13	1
1:A:222:GLY:HA2	1:A:225:LYS:HE2	0.49	1.84	20	1
1:A:197:VAL:O	1:A:201:VAL:HG22	0.49	2.06	8	2
1:A:237:ASP:OD1	2:B:142:ARG:HD2	0.49	2.07	19	1
1:A:226:SER:HA	1:A:229:ARG:NH1	0.49	2.21	20	1
2:B:139:ALA:O	2:B:143:ARG:HD3	0.49	2.08	1	1
1:A:180:LEU:HD13	1:A:188:ARG:HA	0.49	1.84	2	3
1:A:241:ASN:HD22	2:B:149:ASN:ND2	0.49	2.06	3	1
1:A:213:LEU:HD21	1:A:258:HIS:HB2	0.49	1.83	19	2
2:B:136:GLU:HG3	2:B:137:ILE:N	0.49	2.23	15	1
2:B:142:ARG:HB3	2:B:142:ARG:HH11	0.49	1.68	15	1
1:A:234:VAL:HG21	1:A:248:LEU:HD11	0.48	1.83	20	1
1:A:236:LYS:HG2	1:A:236:LYS:O	0.48	2.07	3	1
1:A:180:LEU:HD12	1:A:188:ARG:HE	0.48	1.67	16	1
1:A:210:GLN:O	1:A:214:ARG:HG2	0.48	2.07	4	1
1:A:202:GLN:HB3	1:A:203:ARG:NH2	0.48	2.24	7	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:166:TYR:O	1:A:169:GLU:HG2	0.48	2.09	3	2
1:A:170:GLN:HG3	1:A:257:LYS:HE3	0.48	1.85	7	1
1:A:162:ILE:HA	1:A:165:ARG:NH2	0.48	2.24	14	1
1:A:162:ILE:HG12	1:A:180:LEU:CD2	0.47	2.39	4	2
1:A:255:VAL:O	1:A:259:LEU:HG	0.47	2.09	5	2
2:B:137:ILE:O	2:B:141:LEU:HB2	0.47	2.09	14	2
1:A:286:TRP:O	1:A:290:GLN:HG2	0.47	2.08	20	1
1:A:212:MET:CG	2:B:137:ILE:HG13	0.47	2.40	16	1
1:A:216:LEU:HG	2:B:137:ILE:HG12	0.47	1.84	18	1
1:A:213:LEU:HD11	1:A:255:VAL:HA	0.47	1.86	17	1
1:A:219:LYS:HA	1:A:219:LYS:HE3	0.47	1.87	10	1
1:A:192:GLU:HA	1:A:195:ARG:NH1	0.47	2.24	14	1
1:A:260:LYS:O	1:A:260:LYS:HD3	0.47	2.10	18	1
1:A:246:VAL:HG11	1:A:296:PHE:CE1	0.46	2.45	8	1
1:A:241:ASN:HB3	2:B:149:ASN:OD1	0.46	2.11	19	1
1:A:216:LEU:HD13	2:B:137:ILE:HG12	0.46	1.87	16	1
1:A:212:MET:HB2	2:B:137:ILE:HG13	0.46	1.88	18	1
1:A:240:THR:HB	1:A:286:TRP:CD1	0.46	2.46	18	1
1:A:190:ALA:HB2	1:A:293:TRP:HB3	0.46	1.87	3	2
1:A:236:LYS:O	1:A:236:LYS:HG2	0.46	2.10	8	2
1:A:180:LEU:HD23	1:A:188:ARG:HA	0.46	1.87	1	1
1:A:195:ARG:HH11	1:A:195:ARG:HB2	0.46	1.70	14	1
1:A:233:HIS:O	1:A:236:LYS:HB3	0.46	2.11	18	1
1:A:235:PHE:HB3	1:A:283:LYS:HE2	0.46	1.87	8	1
1:A:218:ILE:HB	1:A:259:LEU:HD11	0.46	1.87	14	1
1:A:171:ALA:HB2	1:A:256:ALA:HB1	0.46	1.88	3	1
1:A:193:THR:O	1:A:197:VAL:HG22	0.46	2.10	5	1
1:A:155:LEU:HD11	1:A:287:LEU:HD23	0.46	1.86	18	1
1:A:296:PHE:O	1:A:300:PHE:HB2	0.45	2.11	9	4
1:A:277:ASP:O	1:A:281:ARG:HB2	0.45	2.10	18	2
1:A:212:MET:HE3	2:B:141:LEU:HG	0.45	1.89	6	2
1:A:156:TYR:CE1	1:A:160:LEU:HD13	0.45	2.47	8	1
2:B:136:GLU:O	2:B:140:GLN:HB2	0.45	2.12	5	1
1:A:208:ALA:O	1:A:212:MET:HG3	0.45	2.12	16	1
1:A:164:SER:O	1:A:168:ARG:HG3	0.45	2.11	11	2
1:A:180:LEU:HG	1:A:187:GLY:CA	0.45	2.41	20	1
1:A:221:GLU:O	1:A:224:VAL:HG22	0.45	2.12	17	1
1:A:294:ASP:O	1:A:298:GLU:HG2	0.45	2.11	20	1
1:A:197:VAL:HG11	1:A:300:PHE:CE2	0.45	2.47	13	1
1:A:233:HIS:HA	1:A:236:LYS:HG2	0.45	1.87	20	1
1:A:229:ARG:O	1:A:233:HIS:HB2	0.45	2.11	20	3

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:211:GLY:O	1:A:214:ARG:HG3	0.45	2.11	18	1
1:A:267:PHE:O	1:A:271:LEU:HB2	0.44	2.12	16	3
1:A:166:TYR:CE1	1:A:195:ARG:HG2	0.44	2.47	4	2
1:A:244:ARG:HA	2:B:145:ALA:CB	0.44	2.42	3	3
1:A:204:ASN:HD22	1:A:205:HIS:N	0.44	2.11	14	1
1:A:242:TRP:O	1:A:246:VAL:HG23	0.44	2.13	14	1
1:A:180:LEU:HG	1:A:187:GLY:HA3	0.44	1.90	20	1
1:A:166:TYR:CE1	1:A:195:ARG:HA	0.44	2.47	2	2
1:A:293:TRP:O	1:A:297:VAL:HG13	0.44	2.13	18	4
1:A:213:LEU:CD1	1:A:255:VAL:HA	0.44	2.42	17	1
1:A:237:ASP:OD1	2:B:142:ARG:HD3	0.44	2.13	6	1
1:A:207:THR:O	1:A:210:GLN:HG2	0.44	2.12	3	1
1:A:284:ARG:HA	1:A:287:LEU:HD12	0.44	1.90	14	1
1:A:215:LYS:HD2	2:B:137:ILE:HD11	0.43	1.90	4	1
2:B:136:GLU:HG2	2:B:140:GLN:NE2	0.43	2.28	12	1
1:A:189:ARG:HG3	1:A:297:VAL:HG21	0.43	1.90	5	1
1:A:244:ARG:O	1:A:248:LEU:HB2	0.43	2.13	19	1
1:A:160:LEU:HD12	1:A:276:THR:HG21	0.43	1.90	20	1
1:A:285:ASP:O	1:A:289:LYS:HG3	0.43	2.13	5	1
1:A:242:TRP:CZ3	1:A:245:ILE:HD12	0.43	2.48	20	1
1:A:244:ARG:CA	2:B:145:ALA:HB1	0.43	2.43	3	1
1:A:208:ALA:HB1	2:B:140:GLN:HG2	0.43	1.89	14	1
1:A:214:ARG:HH11	1:A:214:ARG:HA	0.43	1.74	3	1
1:A:166:TYR:O	1:A:170:GLN:HB3	0.43	2.14	17	1
1:A:192:GLU:O	1:A:196:ARG:HG3	0.43	2.13	8	1
1:A:165:ARG:O	1:A:169:GLU:HG2	0.43	2.12	7	1
1:A:170:GLN:CD	1:A:257:LYS:HE3	0.43	2.38	17	1
1:A:251:PHE:O	1:A:255:VAL:HG23	0.43	2.14	17	2
1:A:165:ARG:O	1:A:169:GLU:HG3	0.43	2.13	13	1
1:A:274:THR:O	1:A:278:VAL:HG23	0.43	2.14	18	1
1:A:161:GLU:CD	1:A:165:ARG:HH21	0.42	2.22	4	1
1:A:262:VAL:HG23	1:A:264:GLN:HG3	0.42	1.90	19	1
1:A:227:PHE:HE1	1:A:255:VAL:HG21	0.42	1.74	3	1
1:A:190:ALA:O	1:A:194:LEU:HB2	0.42	2.15	16	1
1:A:205:HIS:NE2	2:B:144:ILE:HG21	0.42	2.29	7	1
1:A:212:MET:SD	2:B:137:ILE:HD12	0.42	2.53	7	1
1:A:291:ARG:HB3	1:A:294:ASP:HB3	0.42	1.90	13	1
1:A:217:ASP:OD1	1:A:258:HIS:NE2	0.42	2.49	5	1
1:A:161:GLU:O	1:A:165:ARG:HB2	0.42	2.14	12	2
1:A:269:GLU:HB2	1:A:270:PRO:CD	0.42	2.45	17	1
1:A:254:PHE:HA	1:A:257:LYS:HD3	0.42	1.90	10	1

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Atom-1	Atom-2	Clash(Å)	Distance(Å)	Models	
				Worst	Total
1:A:291:ARG:HD2	1:A:294:ASP:CG	0.42	2.40	4	1
1:A:216:LEU:HD11	2:B:137:ILE:HG13	0.42	1.89	4	1
1:A:209:PHE:O	1:A:213:LEU:HB2	0.42	2.15	8	1
1:A:281:ARG:HD2	1:A:281:ARG:N	0.42	2.30	1	1
1:A:180:LEU:HD11	1:A:191:LEU:HD22	0.42	1.92	7	1
1:A:242:TRP:O	1:A:246:VAL:HG12	0.42	2.14	15	2
1:A:285:ASP:O	1:A:289:LYS:HG2	0.42	2.14	15	1
1:A:155:LEU:CG	1:A:287:LEU:HD11	0.42	2.42	17	1
1:A:227:PHE:O	1:A:231:MET:HG3	0.41	2.15	19	1
1:A:160:LEU:HD12	1:A:276:THR:CG2	0.41	2.45	17	1
1:A:265:GLU:HG2	1:A:268:ILE:HD12	0.41	1.92	17	1
1:A:212:MET:CB	2:B:137:ILE:HG13	0.41	2.45	18	1
1:A:188:ARG:NH1	1:A:192:GLU:HB2	0.41	2.30	19	1
1:A:277:ASP:OD2	1:A:281:ARG:HD2	0.41	2.15	2	1
1:A:205:HIS:CD2	2:B:144:ILE:HG23	0.41	2.50	17	1
1:A:264:GLN:HB3	1:A:267:PHE:HD2	0.41	1.75	4	1
1:A:246:VAL:HG21	1:A:300:PHE:CE2	0.41	2.51	6	1
1:A:193:THR:HG21	1:A:300:PHE:HB3	0.41	1.91	7	1
1:A:240:THR:HB	1:A:286:TRP:CE2	0.41	2.50	7	1
1:A:155:LEU:HD21	1:A:292:GLY:HA3	0.41	1.93	2	1
1:A:291:ARG:HE	1:A:294:ASP:CG	0.41	2.24	14	1
1:A:199:ASP:O	1:A:203:ARG:HG2	0.41	2.15	17	1
1:A:269:GLU:O	1:A:273:GLU:HG2	0.41	2.15	19	1
1:A:165:ARG:HH21	1:A:182:GLU:CD	0.41	2.22	8	1
1:A:243:GLY:O	1:A:246:VAL:HG22	0.41	2.16	5	1
1:A:242:TRP:HB2	2:B:149:ASN:HD21	0.40	1.77	5	1
1:A:171:ALA:O	1:A:260:LYS:HG2	0.40	2.16	7	1
1:A:291:ARG:HD3	1:A:298:GLU:OE1	0.40	2.16	16	1
1:A:160:LEU:CA	1:A:276:THR:HG21	0.40	2.38	12	1
1:A:265:GLU:HA	1:A:268:ILE:HD12	0.40	1.94	2	1
1:A:161:GLU:OE1	1:A:183:ALA:HB2	0.40	2.16	9	1
1:A:285:ASP:HA	1:A:288:VAL:CG2	0.40	2.46	4	1
1:A:243:GLY:HA3	2:B:149:ASN:HB2	0.40	1.94	8	1
1:A:164:SER:O	1:A:168:ARG:HB2	0.40	2.17	8	1
1:A:180:LEU:HB3	1:A:183:ALA:HB3	0.40	1.94	18	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	142/162 (88%)	136±2 (96±1%)	6±1 (4±1%)	0±0 (0±0%)	100	100
2	B	17/27 (63%)	17±0 (100±0%)	0±0 (0±0%)	0±0 (0±0%)	100	100
All	All	3180/3780 (84%)	3064 (96%)	115 (4%)	1 (0%)	100	100

All 1 unique Ramachandran outliers are listed below.

Mol	Chain	Res	Type	Models (Total)
1	A	292	GLY	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	120/136 (88%)	102±3 (85±3%)	18±3 (15±3%)	5	43
2	B	12/22 (55%)	10±1 (88±9%)	2±1 (12±9%)	7	48
All	All	2640/3160 (84%)	2258 (86%)	382 (14%)	5	43

All 89 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	167	LEU	17
1	A	271	LEU	17
1	A	220	ASN	16
1	A	182	GLU	14
1	A	219	LYS	14
1	A	283	LYS	13
1	A	279	LEU	12

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Mol	Chain	Res	Type	Models (Total)
1	A	254	PHE	11
1	A	240	THR	10
1	A	262	VAL	9
1	A	221	GLU	8
2	B	136	GLU	8
1	A	260	LYS	8
1	A	157	ARG	7
1	A	265	GLU	7
1	A	155	LEU	7
1	A	236	LYS	7
1	A	247	THR	6
1	A	281	ARG	6
1	A	287	LEU	6
1	A	259	LEU	6
2	B	140	GLN	6
1	A	188	ARG	6
1	A	290	GLN	5
1	A	154	ASP	5
1	A	203	ARG	5
1	A	161	GLU	5
1	A	199	ASP	4
2	B	149	ASN	4
1	A	170	GLN	4
1	A	237	ASP	4
1	A	291	ARG	4
1	A	165	ARG	4
1	A	206	GLU	4
1	A	294	ASP	4
1	A	192	GLU	4
1	A	284	ARG	4
1	A	226	SER	4
1	A	217	ASP	4
1	A	289	LYS	4
2	B	147	ASP	4
1	A	202	GLN	3
1	A	233	HIS	3
1	A	168	ARG	3
1	A	160	LEU	3
1	A	180	LEU	3
1	A	244	ARG	3
1	A	298	GLU	3
1	A	300	PHE	3

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Mol	Chain	Res	Type	Models (Total)
1	A	213	LEU	3
1	A	285	ASP	3
1	A	266	SER	3
1	A	169	GLU	2
1	A	273	GLU	2
1	A	207	THR	2
1	A	214	ARG	2
1	A	189	ARG	2
1	A	216	LEU	2
1	A	246	VAL	2
2	B	143	ARG	2
1	A	209	PHE	2
1	A	277	ASP	2
1	A	191	LEU	2
1	A	257	LYS	2
2	B	146	ASP	2
1	A	204	ASN	2
1	A	212	MET	2
1	A	248	LEU	1
1	A	269	GLU	1
1	A	227	PHE	1
1	A	245	ILE	1
1	A	282	THR	1
2	B	148	LEU	1
1	A	210	GLN	1
2	B	137	ILE	1
1	A	215	LYS	1
1	A	153	ASP	1
1	A	223	ASP	1
1	A	196	ARG	1
1	A	201	VAL	1
1	A	195	ARG	1
1	A	229	ARG	1
1	A	286	TRP	1
2	B	141	LEU	1
1	A	158	GLN	1
2	B	142	ARG	1
1	A	297	VAL	1
1	A	164	SER	1
1	A	225	LYS	1

### 6.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 6.5 Carbohydrates [i](#)

There are no 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