# W O R L D W I D E
# wwPDB
# PROTEIN DATA BANK

# Full wwPDB NMR Structure Validation Report (i)

Apr 27, 2016 – 04:38 AM BST

|  |  |  |
|---|---|---|
| PDB ID | : | 2RN1 |
| Title | : | Liquid crystal solution structure of the kissing complex formed by the apical loop of the HIV TAR RNA and a high affinity RNA aptamer optimized by SELEX |
| Authors | : | Van Melckebeke, H.; Devany, M.; Di Primo, C.; Beaurain, F.; Toulme, J.; Bryce, D.L.; Boisbouvier, J. |
| Deposited on | : | 2007-12-05 |

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

http://wwpdb.org/validation/2016/NMRValidationReportHelp

with specific help available everywhere you see the (i) symbol.

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

|  |  |  |
|---|---|---|
| Cyrange | : | Kirchner and Güntert (2011) |
| NmrClust | : | Kelley et al. (1996) |
| MolProbity | : | 4.02b-467 |
| Mogul | : | unknown |
| Percentile statistics | : | 20151230.v01 (using entries in the PDB archive December 30th 2015) |
| RCI | : | v_1n_11_5_13_A (Berjanski et al., 2005) |
| PANAV | : | Wang et al. (2010) |
| ShiftChecker | : | rb-20027457 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | rb-20027457 |

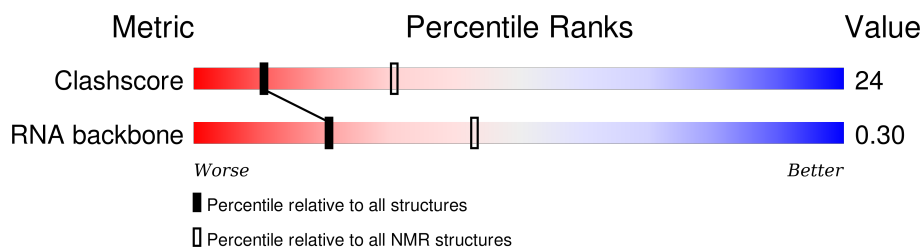Full wwPDB NMR Structure Validation Report

# 1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
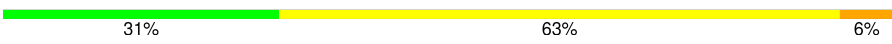*SOLUTION NMR*

The overall completeness of chemical shifts assignment is 66%.

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 | Percentile Ranks | Value |
|---|---|---|
| Clashscore | | 24 |
| RNA backbone | | 0.30 |

*Worse* *Better*

▮ Percentile relative to all structures

◻ Percentile relative to all NMR structures

| Metric | Whole archive (#Entries) | NMR archive (#Entries) |
|---|---|---|
| Clashscore | 114402 | 11133 |
| RNA backbone | 3027 | 600 |

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 <=5%

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | A | 16 | 31%     63%     6% |
| 2 | B | 16 | 50%     44%     6% |

# 2 Ensemble composition and analysis (i)

This entry contains 17 models. This entry does not contain protein, therefore identification of well-defined residues and clustering analysis are not possible. All residues are included in the validation scores.

# 3 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 1034 atoms, of which 348 are hydrogens and 0 are deuteriums.

- Molecule 1 is a RNA chain called RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP *AP*GP*GP*CP*UP*C)-3').

| Mol | Chain | Residues | Atoms | | | | | | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|-----|-------|
| | | | Total | C | H | N | O | P | |
| 1 | A | 16 | 519 | 153 | 174 | 64 | 112 | 16 | 0 |

- Molecule 2 is a RNA chain called RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP *GP*AP*CP*AP*GP*C)-3').

| Mol | Chain | Residues | Atoms | | | | | | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|-----|-------|
| | | | Total | C | H | N | O | P | |
| 2 | B | 16 | 515 | 152 | 174 | 62 | 111 | 16 | 0 |

# 4 Residue-property plots ⓘ

## 4.1 Average score per residue in the NMR ensemble

These plots are provided for all protein, RNA and DNA 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: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B:



## 4.2 Scores per residue for each member of the ensemble
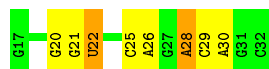
Colouring as in section 4.1 above.

### 4.2.1 Score per residue for model 1

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 50%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.2 Score per residue for model 2

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 56% 13%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 44% 6%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.3 Score per residue for model 3

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 56% 13%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 44% 6%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.4 Score per residue for model 4

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 25% 69% 6%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 38% 13%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.5 Score per residue for model 5

● Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 50% 19%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 50%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.6 Score per residue for model 6

● Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 56% 13%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 44% 6%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.7 Score per residue for model 7

• Molecule 1: RNA (5'-R(P\*GP\*AP\*GP\*CP\*CP\*CP\*UP\*GP\*GP\*GP\*AP\*GP\*GP\*CP\*UP\*C )-3')

Chain A:



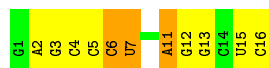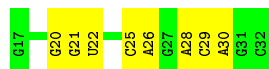• Molecule 2: RNA (5'-R(P\*GP\*CP\*UP\*GP\*GP\*UP\*CP\*CP\*CP\*AP\*GP\*AP\*CP\*AP\*GP\*C )-3')
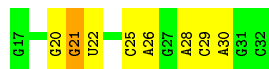
Chain B:



### 4.2.8 Score per residue for model 8

• Molecule 1: RNA (5'-R(P\*GP\*AP\*GP\*CP\*CP\*CP\*UP\*GP\*GP\*GP\*AP\*GP\*GP\*CP\*UP\*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P\*GP\*CP\*UP\*GP\*GP\*UP\*CP\*CP\*CP\*AP\*GP\*AP\*CP\*AP\*GP\*C )-3')
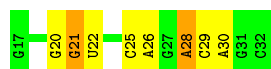
Chain B:
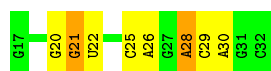


### 4.2.9 Score per residue for model 9

• Molecule 1: RNA (5'-R(P\*GP\*AP\*GP\*CP\*CP\*CP\*UP\*GP\*GP\*GP\*AP\*GP\*GP\*CP\*UP\*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P\*GP\*CP\*UP\*GP\*GP\*UP\*CP\*CP\*CP\*AP\*GP\*AP\*CP\*AP\*GP\*C )-3')

Chain B: 50% 38% 13%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.10 Score per residue for model 10

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 50% 19%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 50%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32

### 4.2.11 Score per residue for model 11

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 25% 50% 25%

G1 A2 G3 C4 C5 C6 U7 A11 G12 G13 C14 U15 C16

• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B: 50% 44% 6%

G17 G20 G21 U22 C25 A26 G27 A28 C29 A30 G31 C32
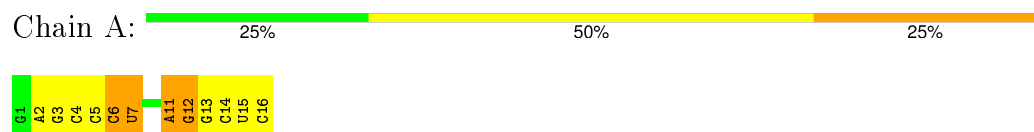
### 4.2.12 Score per residue for model 12

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A: 31% 63% 6%



● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C)-3')

Chain B: 50% 44% 6%



### 4.2.13 Score per residue for model 13

● Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C)-3')

Chain A: 31% 56% 13%



● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C)-3')

Chain B: 50% 50%



### 4.2.14 Score per residue for model 14

● Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C)-3')

Chain A: 31% 56% 13%



● Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C)-3')

Chain B: 56% 38% 6%

#### 4.2.15 Score per residue for model 15

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A:

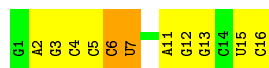

• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B:



#### 4.2.16 Score per residue for model 16

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')
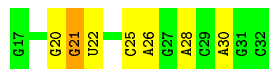
Chain B:



#### 4.2.17 Score per residue for model 17

• Molecule 1: RNA (5'-R(P*GP*AP*GP*CP*CP*CP*UP*GP*GP*GP*AP*GP*GP*CP*UP*C )-3')

Chain A:



• Molecule 2: RNA (5'-R(P*GP*CP*UP*GP*GP*UP*CP*CP*CP*AP*GP*AP*CP*AP*GP*C )-3')

Chain B:

50%

50%

# 5   Refinement protocol and experimental data overview (i)

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

Of the 800 calculated structures, 17 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 NIH | structure solution | |
| X-PLOR NIH | refinement | |

The following table shows chemical shift validation statistics as aggregates over all chemical shift files. Detailed validation can be found in section 7 of this report.

| Chemical shift file(s) | BMRB entry 11014 |
|---|---|
| Number of chemical shift lists | 1 |
| Total number of shifts | 420 |
| Number of shifts mapped to atoms | 420 |
| Number of unparsed shifts | 0 |
| Number of shifts with mapping errors | 0 |
| Number of shifts with mapping warnings | 0 |
| Assignment completeness (well-defined parts) | 66% |

No validations of the models with respect to experimental NMR restraints is performed at this time.

# 6 Model quality (i)

## 6.1 Standard geometry (i)

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 | 0.44±0.01 | 0±0/385 (0.0±0.1%) | 0.86±0.01 | 2±0/599 (0.3±0.0%) |
| 2 | B | 0.32±0.02 | 0±0/380 (0.0±0.0%) | 0.78±0.01 | 0±0/590 (0.0±0.0%) |
| All | All | 0.39 | 3/13005 (0.0%) | 0.83 | 34/20213 (0.2%) |

All unique bond outliers are listed below.

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) | Models | |
|-----|-------|-----|------|-------|---|-------------|----------|--------|--------|
| | | | | | | | | Worst | Total |
| 1 | A | 14 | C | C4'-C3' | -5.58 | 1.47 | 1.52 | 15 | 3 |

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($^o$) | Ideal($^o$) | Models | |
|-----|-------|-----|------|-------|---|----------------|-------------|--------|--------|
| | | | | | | | | Worst | Total |
| 1 | A | 11 | A | O4'-C4'-C3' | -6.80 | 97.20 | 104.00 | 17 | 17 |
| 1 | A | 7 | U | C4'-C3'-C2' | -5.21 | 97.39 | 102.60 | 1 | 17 |

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 | 345 | 174 | 175 | 17±2 |
| 2 | B | 341 | 174 | 175 | 12±3 |
| All | All | 11662 | 5916 | 5950 | 427 |

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 24.

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

| Atom-1 | Atom-2 | Clash(Å) | Distance(Å) | Models | |
|---|---|---|---|---|---|
| | | | | Worst | Total |
| 2:B:20:G:O2' | 2:B:21:G:C8 | 0.74 | 2.40 | 14 | 17 |
| 2:B:20:G:C6 | 2:B:30:A:N1 | 0.68 | 2.61 | 8 | 17 |
| 1:A:6:C:O2 | 2:B:28:A:C2 | 0.64 | 2.51 | 1 | 17 |
| 2:B:20:G:C2 | 2:B:30:A:C2 | 0.63 | 2.86 | 2 | 13 |
| 1:A:2:A:C6 | 1:A:3:G:C5 | 0.62 | 2.88 | 14 | 17 |
| 1:A:3:G:C2 | 1:A:4:C:C5 | 0.62 | 2.88 | 1 | 17 |
| 1:A:6:C:P | 2:B:21:G:HO2' | 0.61 | 2.18 | 3 | 7 |
| 2:B:28:A:C5 | 2:B:29:C:C4 | 0.61 | 2.89 | 17 | 13 |
| 2:B:28:A:C6 | 2:B:29:C:C4 | 0.61 | 2.89 | 1 | 11 |
| 1:A:6:C:P | 2:B:21:G:O2' | 0.60 | 2.60 | 17 | 15 |
| 1:A:5:C:N3 | 1:A:13:G:C6 | 0.59 | 2.70 | 4 | 17 |
| 2:B:25:C:N4 | 2:B:26:A:N6 | 0.58 | 2.50 | 16 | 17 |
| 1:A:3:G:N1 | 1:A:4:C:C4 | 0.58 | 2.71 | 4 | 17 |
| 1:A:6:C:O5' | 2:B:21:G:O2' | 0.58 | 2.22 | 1 | 17 |
| 1:A:11:A:C6 | 1:A:12:G:C5 | 0.55 | 2.95 | 10 | 7 |
| 1:A:6:C:C5' | 2:B:21:G:HO2' | 0.55 | 2.14 | 9 | 6 |
| 1:A:2:A:C4 | 1:A:3:G:C8 | 0.55 | 2.95 | 14 | 17 |
| 2:B:20:G:O2' | 2:B:21:G:N9 | 0.53 | 2.42 | 12 | 11 |
| 1:A:6:C:OP1 | 1:A:7:U:OP2 | 0.53 | 2.26 | 11 | 8 |
| 2:B:28:A:C2 | 2:B:29:C:C2 | 0.51 | 2.97 | 17 | 11 |
| 1:A:11:A:N6 | 1:A:12:G:C6 | 0.51 | 2.79 | 10 | 8 |
| 1:A:11:A:N6 | 1:A:12:G:C5 | 0.51 | 2.79 | 10 | 7 |
| 1:A:3:G:C2 | 1:A:4:C:C4 | 0.50 | 2.99 | 11 | 9 |
| 2:B:28:A:C6 | 2:B:29:C:N4 | 0.50 | 2.80 | 12 | 9 |
| 1:A:2:A:C5 | 1:A:3:G:N7 | 0.49 | 2.81 | 2 | 16 |
| 1:A:3:G:C2 | 1:A:4:C:C6 | 0.49 | 3.00 | 10 | 15 |
| 1:A:15:U:C5 | 1:A:16:C:C5 | 0.48 | 3.02 | 11 | 17 |
| 1:A:5:C:O2' | 2:B:22:U:OP1 | 0.48 | 2.32 | 4 | 1 |
| 1:A:5:C:C4 | 1:A:13:G:O6 | 0.47 | 2.67 | 4 | 10 |
| 2:B:20:G:C6 | 2:B:30:A:C6 | 0.46 | 3.03 | 8 | 8 |
| 1:A:3:G:N2 | 1:A:4:C:C2 | 0.46 | 2.83 | 4 | 17 |
| 1:A:6:C:C5' | 2:B:21:G:O2' | 0.45 | 2.65 | 4 | 8 |
| 2:B:28:A:C6 | 2:B:29:C:N3 | 0.45 | 2.84 | 17 | 3 |
| 1:A:2:A:C6 | 1:A:3:G:N7 | 0.44 | 2.86 | 9 | 13 |
| 2:B:20:G:N1 | 2:B:30:A:C2 | 0.43 | 2.86 | 8 | 4 |
| 1:A:11:A:C5 | 1:A:12:G:C8 | 0.43 | 3.07 | 10 | 3 |
| 2:B:20:G:N1 | 2:B:30:A:C6 | 0.43 | 2.86 | 15 | 7 |

## 6.3 Torsion angles (i)

### 6.3.1 Protein backbone (i)

There are no protein molecules in this entry.

### 6.3.2 Protein sidechains (i)

There are no protein molecules in this entry.

### 6.3.3 RNA (i)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers | Suiteness |
|-----|-------|----------|-------------------|-----------------|-----------|
| 1 | A | 15/16 (94%) | 2±0 (11±3%) | 0±0 (0±0%) | 0.31±0.01 |
| 2 | B | 15/16 (94%) | 2±1 (14±6%) | 0±0 (0±0%) | 0.30±0.02 |
| All | All | 510/544 (94%) | 63 (12%) | 0 (0%) | 0.30 |

The overall RNA backbone suiteness is 0.30.

All unique RNA backbone outliers are listed below:

| Mol | Chain | Res | Type | Models (Total) |
|-----|-------|-----|------|----------------|
| 1 | A | 6 | C | 17 |
| 2 | B | 22 | U | 17 |
| 1 | A | 12 | G | 10 |
| 2 | B | 28 | A | 10 |
| 2 | B | 21 | G | 6 |
| 2 | B | 29 | C | 3 |

There are no RNA pucker outliers to report.

## 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 carbohydrates 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 (i)

The completeness of assignment taking into account all chemical shift lists is 66% for the well-defined parts and 66% for the entire structure.

## 7.1 Chemical shift list 1

File name: BMRB entry 11014

Chemical shift list name: *assigned_chem_shift_list_1*

### 7.1.1 Bookkeeping (i)

The following table shows the results of parsing the chemical shift list and reports the number of nuclei with statistically unusual chemical shifts.

| | |
|---|---|
| Total number of shifts | 420 |
| Number of shifts mapped to atoms | 420 |
| Number of unparsed shifts | 0 |
| Number of shifts with mapping errors | 0 |
| Number of shifts with mapping warnings | 0 |
| Number of shift outliers (ShiftChecker) | 1 |

### 7.1.2 Chemical shift referencing (i)

No chemical shift referencing corrections were calculated (not enough data).

### 7.1.3 Completeness of resonance assignments (i)

The following table shows the completeness of the chemical shift assignments for the well-defined regions of the structure. The overall completeness is 66%, i.e. 406 atoms were assigned a chemical shift out of a possible 612. 0 out of 0 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

| | Total | $^1$H | $^{13}$C | $^{15}$N |
|---|---|---|---|---|
| Backbone | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Sidechain | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Aromatic | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Overall | 406/612 (66%) | 231/356 (65%) | 175/212 (83%) | 0/44 (0%) |

The following table shows the completeness of the chemical shift assignments for the full structure. The overall completeness is 66%, i.e. 406 atoms were assigned a chemical shift out of a possible 612. 0 out of 0 assigned methyl groups (LEU and VAL) were assigned stereospecifically.

| | Total | $^{1}$H | $^{13}$C | $^{15}$N |
|---|---|---|---|---|
| Backbone | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Sidechain | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Aromatic | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) | 0/0 (—%) |
| Overall | 406/612 (66%) | 231/356 (65%) | 175/212 (83%) | 0/44 (0%) |

### 7.1.4 Statistically unusual chemical shifts ⓘ

The following table lists the statistically unusual chemical shifts. These are statistical measures, and large deviations from the mean do not necessarily imply incorrect assignments. Molecules containing paramagnetic centres or hemes are expected to give rise to anomalous chemical shifts.

| Mol | Chain | Res | Type | Atom | Shift, $ppm$ | Expected range, $ppm$ | Z-score |
|---|---|---|---|---|---|---|---|
| 2 | B | 20 | G | H2' | 3.26 | $5.66 - 3.46$ | -5.9 |

### 7.1.5 Random Coil Index (RCI) plots ⓘ

No *random coil index* (RCI) plot could be generated from the current chemical shift list (assigned_chem_shift_list_1). RCI is only applicable to proteins.