



Full wwPDB X-ray Structure Validation Report ⓘ

May 15, 2020 – 07:27 am BST

PDB ID : 2UZN
Title : Crystal structure of human CDK2 complexed with a thiazolidinone inhibitor
Authors : Richardson, C.M.; Dokurno, P.; Murray, J.B.; Surgenor, A.E.
Deposited on : 2007-04-30
Resolution : 2.30 Å(reported)

This is a Full wwPDB X-ray 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/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.11

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:34:LYS:HG2 | 1:A:77:TYR:CD1 | 2.54 | 0.43 |
| 1:A:111:LEU:HA | 1:A:111:LEU:HD23 | 1.75 | 0.43 |
| 1:A:10:ILE:HG21 | 1:A:20:LYS:HB2 | 2.00 | 0.42 |
| 1:A:195:GLU:HG3 | 1:A:201:ALA:HA | 2.00 | 0.42 |
| 1:A:252:VAL:HG23 | 1:A:252:VAL:O | 2.18 | 0.42 |
| 1:A:118:CYS:SG | 1:A:146:PHE:CZ | 3.11 | 0.42 |
| 1:A:85:GLN:CD | 1:A:89:LYS:HD3 | 2.40 | 0.41 |
| 1:A:169:ARG:NH2 | 3:A:2064:HOH:O | 2.49 | 0.41 |
| 1:A:7:VAL:O | 1:A:7:VAL:CG1 | 2.67 | 0.41 |
| 1:A:105:LYS:NZ | 1:A:288:ASP:OD1 | 2.45 | 0.41 |
| 1:A:135:ILE:HD13 | 1:A:135:ILE:HG21 | 1.85 | 0.41 |
| 1:A:230:VAL:HA | 1:A:233:MET:HE1 | 2.01 | 0.41 |
| 1:A:90:PHE:CE2 | 1:A:99:ILE:HG12 | 2.56 | 0.41 |
| 1:A:118:CYS:HB3 | 1:A:146:PHE:HE1 | 1.86 | 0.40 |
| 1:A:137:THR:CG2 | 1:A:296:LEU:HD12 | 2.47 | 0.40 |
| 1:A:128:LEU:HD21 | 1:A:143:LEU:HD22 | 2.04 | 0.40 |

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 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 X-ray entries followed by that with respect to entries of similar resolution.

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 | 273/298 (92%) | 253 (93%) | 17 (6%) | 3 (1%) | 14 15 |

All (3) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 151 | ALA |
| 1 | A | 8 | GLU |
| 1 | A | 25 | LEU |

5.3.2 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 X-ray entries followed by that with respect to entries of similar resolution.

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 | 244/263 (93%) | 227 (93%) | 17 (7%) | 15 19 |

All (17) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 2 | GLU |
| 1 | A | 9 | LYS |
| 1 | A | 54 | LEU |
| 1 | A | 57 | GLU |
| 1 | A | 69 | VAL |
| 1 | A | 73 | GLU |
| 1 | A | 97 | THR |
| 1 | A | 122 | ARG |
| 1 | A | 124 | LEU |
| 1 | A | 126 | ARG |
| 1 | A | 131 | GLN |
| 1 | A | 137 | THR |
| 1 | A | 146 | PHE |
| 1 | A | 169 | ARG |
| 1 | A | 262 | LEU |
| 1 | A | 273 | LYS |
| 1 | A | 295 | HIS |

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 59 | ASN |
| 1 | A | 60 | HIS |
| 1 | A | 84 | HIS |
| 1 | A | 246 | GLN |

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

1 ligand is modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
| | | | | | Counts | RMSZ | # Z > 2 | Counts | RMSZ | # Z > 2 |
| 2 | C96 | A | 1299 | - | 20,26,26 | 2.10 | 4 (20%) | 23,39,39 | 1.92 | 4 (17%) |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|------|------|---------|-----------|---------|
| 2 | C96 | A | 1299 | - | - | 2/9/30/30 | 0/3/3/3 |

All (4) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 2 | A | 1299 | C96 | C9-S1 | -6.36 | 1.66 | 1.74 |
| 2 | A | 1299 | C96 | C8-C7 | -4.64 | 1.39 | 1.48 |
| 2 | A | 1299 | C96 | C7-S1 | -3.98 | 1.66 | 1.74 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|------|-------------|----------|
| 2 | A | 1299 | C96 | C13-C4 | 2.25 | 1.50 | 1.46 |

All (4) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 2 | A | 1299 | C96 | O3-S2-O4 | -5.69 | 109.41 | 118.76 |
| 2 | A | 1299 | C96 | O1-C8-C7 | -3.67 | 124.44 | 129.03 |
| 2 | A | 1299 | C96 | C7-C8-N2 | 3.45 | 111.78 | 106.49 |
| 2 | A | 1299 | C96 | C9-S1-C7 | 2.21 | 92.02 | 88.73 |

There are no chirality outliers.

All (2) torsion outliers are listed below:

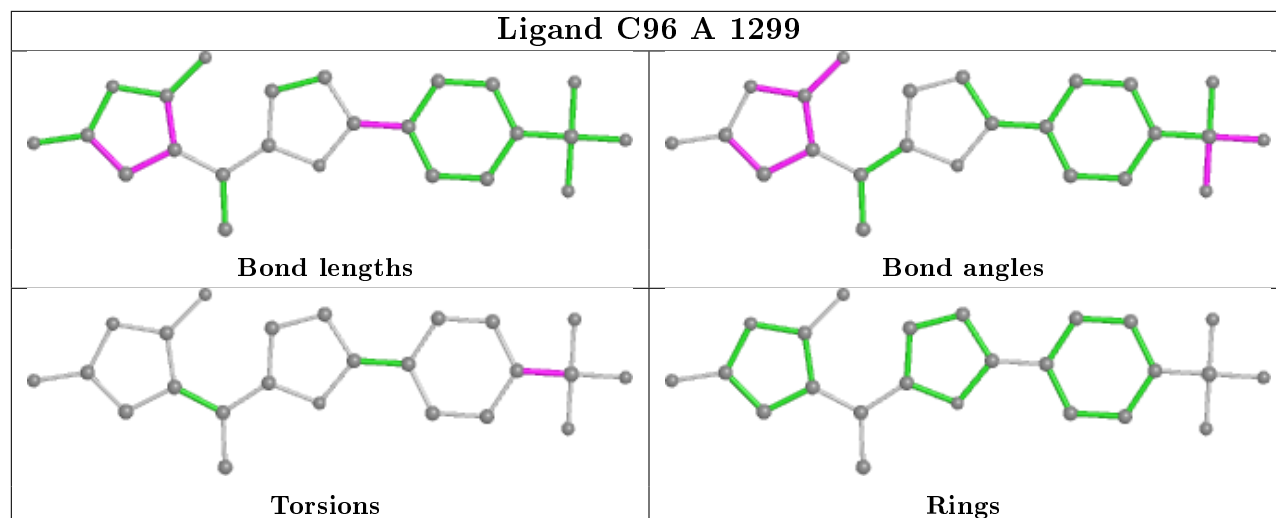
| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|------|---------------|
| 2 | A | 1299 | C96 | C17-C16-S2-O3 |
| 2 | A | 1299 | C96 | C15-C16-S2-O3 |

There are no ring outliers.

1 monomer is involved in 5 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 2 | A | 1299 | C96 | 5 | 0 |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

| Mol | Chain | Analysed | <RSRZ> | #RSRZ>2 | OWAB(Å ²) | Q<0.9 |
|-----|-------|---------------|--------|---------------|-----------------------|---------|
| 1 | A | 279/298 (93%) | -0.27 | 13 (4%) 31 38 | 11, 27, 49, 61 | 25 (8%) |

All (13) RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|-----|-------|-----|------|------|
| 1 | A | 15 | TYR | 6.7 |
| 1 | A | 14 | THR | 4.1 |
| 1 | A | 74 | ASN | 4.1 |
| 1 | A | 298 | LEU | 3.9 |
| 1 | A | 151 | ALA | 3.6 |
| 1 | A | 296 | LEU | 3.2 |
| 1 | A | 13 | GLY | 3.1 |
| 1 | A | 150 | ARG | 3.1 |
| 1 | A | 297 | ARG | 3.0 |
| 1 | A | 45 | PRO | 2.9 |
| 1 | A | 1 | MET | 2.3 |
| 1 | A | 73 | GLU | 2.2 |
| 1 | A | 21 | ALA | 2.0 |

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

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

6.3 Carbohydrates [i](#)

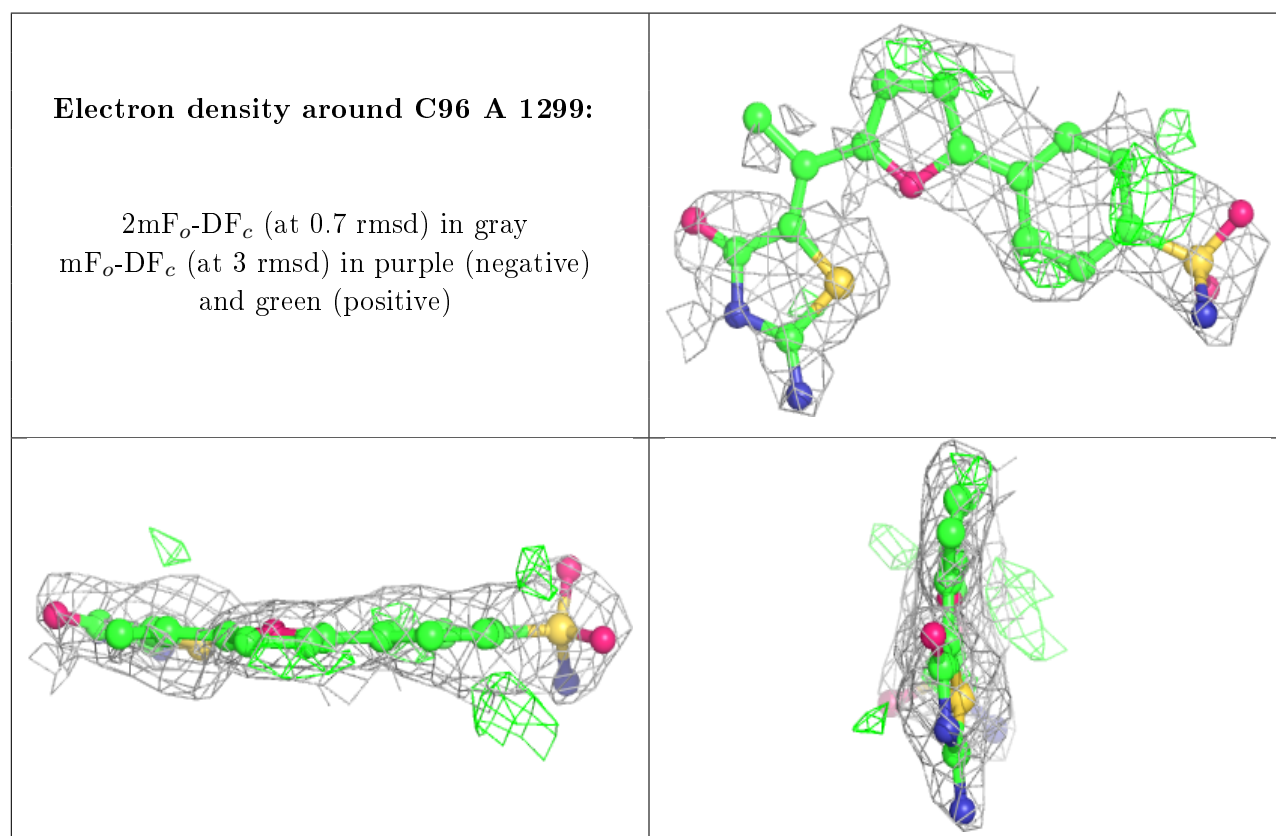
There are no carbohydrates in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

| Mol | Type | Chain | Res | Atoms | RSCC | RSR | B-factors(\AA^2) | Q<0.9 |
|-----|------|-------|------|-------|------|------|-----------------------------|-------|
| 2 | C96 | A | 1299 | 24/24 | 0.80 | 0.27 | 29,31,38,39 | 24 |

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



6.5 Other polymers [i](#)

There are no such residues in this entry.