



wwPDB X-ray Structure Validation Summary Report ⓘ

Dec 14, 2023 – 03:23 am GMT

PDB ID : 2YOA
Title : Synaptotagmin-1 C2B domain with phosphoserine
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Deposited on : 2012-10-22
Resolution : 1.50 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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 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 : 4.02b-467
Xtrriage (Phenix) : 1.13
EDS : **FAILED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

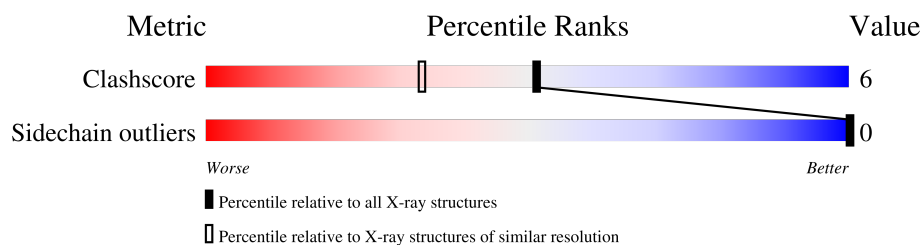
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.50 Å.

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) | Similar resolution (#Entries, resolution range(Å)) |
|--------------------|-----------------------------|---|
| Clashscore | 141614 | 3144 (1.50-1.50) |
| Sidechain outliers | 138945 | 3064 (1.50-1.50) |

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 2713 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called SYNAPTOTAGMIN-1.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|---------|-------|
| | | | Total | C | N | O | S | | | |
| 1 | A | 149 | 1208 | 777 | 205 | 219 | 7 | 0 | 2 | 0 |
| 1 | B | 149 | 1205 | 775 | 205 | 220 | 5 | 0 | 2 | 0 |

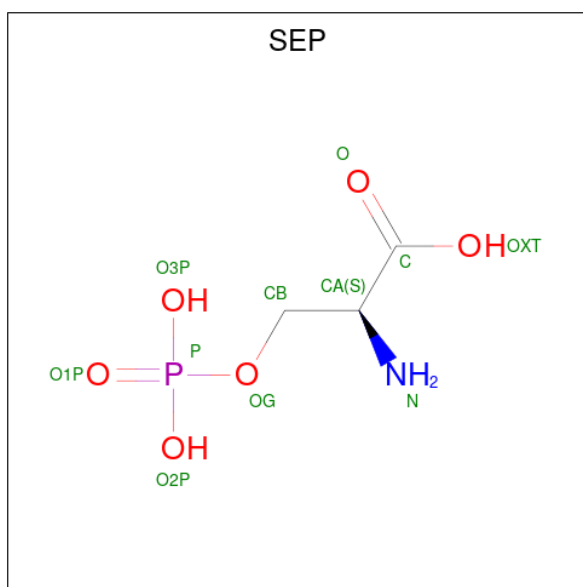
There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------------|------------|
| A | 270 | MET | - | expression tag | UNP P21707 |
| B | 270 | MET | - | expression tag | UNP P21707 |

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

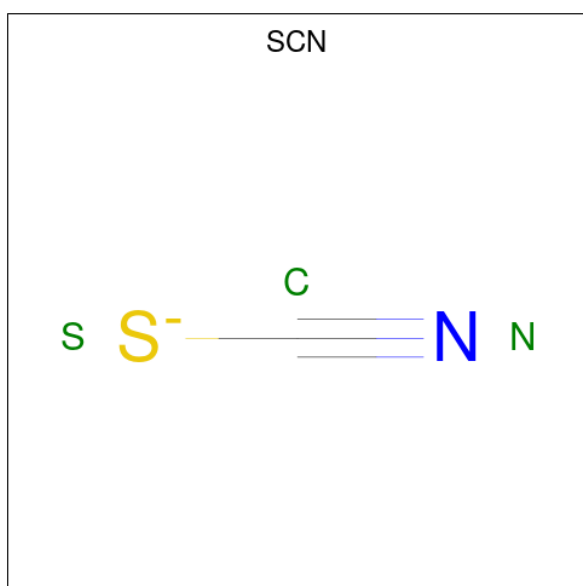
| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|-------|----|---------|---------|
| 2 | A | 4 | Total | Ca | 0 | 0 |
| | | | 4 | 4 | | |
| 2 | B | 3 | Total | Ca | 0 | 0 |
| | | | 3 | 3 | | |

- Molecule 3 is PHOSPHOSERINE (three-letter code: SEP) (formula: C₃H₈NO₆P).



| Mol | Chain | Residues | Atoms | | | | ZeroOcc | AltConf | |
|-----|-------|----------|-------|---|---|---|---------|---------|---|
| | | | Total | C | N | O | | | P |
| 3 | A | 1 | Total | C | N | O | P | 0 | 0 |
| | | | 11 | 3 | 1 | 6 | 1 | | |
| 3 | B | 1 | Total | C | N | O | P | 0 | 0 |
| | | | 11 | 3 | 1 | 6 | 1 | | |

- Molecule 4 is THIOCYANATE ION (three-letter code: SCN) (formula: CNS).



| Mol | Chain | Residues | Atoms | | | ZeroOcc | AltConf | |
|-----|-------|----------|-------|---|---|---------|---------|---|
| | | | Total | C | N | | | S |
| 4 | A | 1 | Total | C | N | S | 0 | 0 |
| | | | 3 | 1 | 1 | 1 | | |
| 4 | A | 1 | Total | C | N | S | 0 | 0 |
| | | | 3 | 1 | 1 | 1 | | |

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| Mol | Chain | Residues | Atoms | | | | ZeroOcc | AltConf |
|-----|-------|----------|------------|--------|--------|--------|---------|---------|
| 4 | B | 1 | Total 3 | C 1 | N 1 | S 1 | 0 | 0 |
| 4 | B | 1 | Total 3 | C 1 | N 1 | S 1 | 0 | 0 |
| 4 | B | 1 | Total 3 | C 1 | N 1 | S 1 | 0 | 0 |

- Molecule 5 is water.

| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|--------------|----------|---------|---------|
| 5 | A | 131 | Total 131 | O 131 | 0 | 0 |
| 5 | B | 125 | Total 125 | O 125 | 0 | 0 |

SEQUENCE-PLOTS INFOmissingINFO

3 Data and refinement statistics

EDS failed to run properly - this section is therefore incomplete.

| Property | Value | Source |
|--|---|-----------|
| Space group | P 4 21 2 | Depositor |
| Cell constants a, b, c, α , β , γ | 97.00Å 97.00Å 89.01Å 90.00° 90.00° 90.00° | Depositor |
| Resolution (Å) | 44.50 – 1.50 | Depositor |
| % Data completeness (in resolution range) | 100.0 (44.50-1.50) | Depositor |
| R_{merge} | 0.04 | Depositor |
| R_{sym} | (Not available) | Depositor |
| $\langle I/\sigma(I) \rangle$ ¹ | 6.87 (at 1.50Å) | Xtrriage |
| Refinement program | REFMAC 5.2.0019 | Depositor |
| R, R_{free} | 0.183 , 0.204 | Depositor |
| Wilson B-factor (Å ²) | 12.4 | Xtrriage |
| Anisotropy | 0.305 | Xtrriage |
| L-test for twinning ² | $\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$ | Xtrriage |
| Estimated twinning fraction | No twinning to report. | Xtrriage |
| Total number of atoms | 2713 | wwPDB-VP |
| Average B, all atoms (Å ²) | 13.0 | wwPDB-VP |

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 77.53 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.3477e-07. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

4 Model quality

4.1 Standard geometry

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

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 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 | 0.43 | 0/1231 | 0.62 | 0/1660 |
| 1 | B | 0.42 | 0/1228 | 0.61 | 0/1658 |
| All | All | 0.42 | 0/2459 | 0.62 | 0/3318 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

4.2 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 the 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 within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1 | A | 1208 | 0 | 1245 | 13 | 0 |
| 1 | B | 1205 | 0 | 1241 | 15 | 0 |
| 2 | A | 4 | 0 | 0 | 0 | 0 |
| 2 | B | 3 | 0 | 0 | 0 | 0 |
| 3 | A | 11 | 0 | 5 | 0 | 0 |
| 3 | B | 11 | 0 | 5 | 0 | 0 |
| 4 | A | 6 | 0 | 0 | 0 | 0 |
| 4 | B | 9 | 0 | 0 | 0 | 0 |
| 5 | A | 131 | 0 | 0 | 0 | 0 |
| 5 | B | 125 | 0 | 0 | 2 | 0 |
| All | All | 2713 | 0 | 2496 | 28 | 0 |

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 6.

The worst 5 of 28 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-----------------|--------------------------|-------------------|
| 1:B:315:HIS:HB3 | 1:B:317:MET:HE3 | 1.33 | 1.06 |
| 1:B:315:HIS:HB3 | 1:B:317:MET:CE | 1.84 | 1.05 |
| 1:B:317:MET:SD | 1:B:322:ARG:HG2 | 2.19 | 0.82 |
| 1:B:416:MET:HA | 1:B:416:MET:HE2 | 1.70 | 0.73 |
| 1:A:317[B]:MET:SD | 1:A:322:ARG:HG2 | 2.32 | 0.69 |

There are no symmetry-related clashes.

4.3 Torsion angles [i](#)

4.3.1 Protein backbone [i](#)

There are no protein backbone outliers to report in this entry.

4.3.2 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 | 127/135 (94%) | 127 (100%) | 0 | 100 | 100 |
| 1 | B | 134/135 (99%) | 134 (100%) | 0 | 100 | 100 |
| All | All | 261/270 (97%) | 261 (100%) | 0 | 100 | 100 |

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 315 | HIS |

4.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

4.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

4.6 Ligand geometry [i](#)

Of 14 ligands modelled in this entry, 7 are monoatomic - leaving 7 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

4.7 Other polymers [i](#)

There are no such residues in this entry.

4.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

EDS failed to run properly - this section is therefore empty.

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

EDS failed to run properly - this section is therefore empty.

5.3 Carbohydrates [i](#)

EDS failed to run properly - this section is therefore empty.

5.4 Ligands [i](#)

EDS failed to run properly - this section is therefore empty.

5.5 Other polymers [i](#)

EDS failed to run properly - this section is therefore empty.