# WORLDWIDE wwPDB PROTEIN DATA BANK

# Full wwPDB X-ray Structure Validation Report (i)

Oct 3, 2023 – 08:14 AM EDT

|  |  |  |
|---|---|---|
| PDB ID | : | 6PUH |
| Title | : | Structure of human MAIT A-F7 TCR in complex with human MR1-Ribityl-less |
| Authors | : | Awad, W.; Keller, A.N.; Rossjohn, J. |
| Deposited on | : | 2019-07-18 |
| Resolution | : | 1.88 Å(reported) |

# 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 1.88 Å.

There are no overall percentile quality scores available for this entry.

MolProbity and EDS failed to run properly - the sequence quality summary graphics cannot be shown.

# 2 Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 15614 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 Major histocompatibility complex class I-related gene protein.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---------|---------|-------|
| 1 | A | 265 | Total<br>2246 | C<br>1441 | N<br>388 | O<br>404 | S<br>13 | 0 | 13 | 0 |
| 1 | C | 268 | Total<br>2299 | C<br>1475 | N<br>387 | O<br>422 | S<br>15 | 0 | 18 | 0 |

There are 4 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|---------|-----------|
| A | 0 | MET | - | initiating methionine | UNP Q95460 |
| A | 261 | SER | CYS | conflict | UNP Q95460 |
| C | 0 | MET | - | initiating methionine | UNP Q95460 |
| C | 261 | SER | CYS | conflict | UNP Q95460 |

- Molecule 2 is a protein called Human TCR alpha chain.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---------|---------|-------|
| 2 | B | 199 | Total<br>1674 | C<br>1070 | N<br>260 | O<br>333 | S<br>11 | 0 | 24 | 0 |
| 2 | D | 194 | Total<br>1529 | C<br>976 | N<br>240 | O<br>303 | S<br>10 | 0 | 8 | 0 |

- Molecule 3 is a protein called Human TCR beta chain.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---------|---------|-------|
| 3 | E | 242 | Total<br>1949 | C<br>1234 | N<br>331 | O<br>372 | S<br>12 | 0 | 13 | 0 |
| 3 | G | 244 | Total<br>2033 | C<br>1284 | N<br>345 | O<br>391 | S<br>13 | 0 | 22 | 0 |

- Molecule 4 is a protein called Beta-2-microglobulin.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | F | 100 | Total<br>840 | C<br>540 | N<br>141 | O<br>154 | S<br>5 | 0 | 3 | 0 |
| 4 | H | 98 | Total<br>793 | C<br>510 | N<br>135 | O<br>145 | S<br>3 | 0 | 1 | 0 |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| F | 0 | MET | - | initiating methionine | UNP P61769 |
| H | 0 | MET | - | initiating methionine | UNP P61769 |

- Molecule 5 is 6-methyl-5-[(1E)-3-oxobut-1-en-1-yl]pyrimidine-2,4(1H,3H)-dione (three-letter code: OYG) (formula: $C_9H_{10}N_2O_3$).
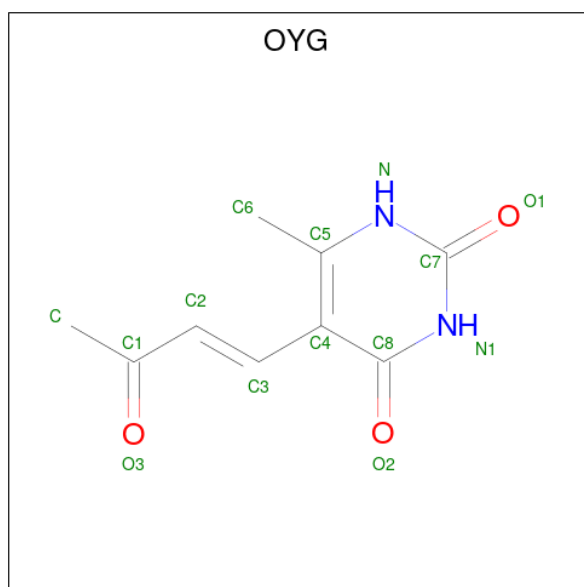


| Mol | Chain | Residues | Atoms | | | | ZeroOcc | AltConf |
|---|---|---|---|---|---|---|---|---|
| 5 | A | 1 | Total<br>13 | C<br>9 | N<br>2 | O<br>2 | 0 | 0 |
| 5 | C | 1 | Total<br>13 | C<br>9 | N<br>2 | O<br>2 | 0 | 0 |

- Molecule 6 is SODIUM ION (three-letter code: NA) (formula: Na).

| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|---|---|---|---|---|---|---|
| 6 | F | 1 | Total<br>1 | Na<br>1 | 0 | 0 |
| 6 | G | 1 | Total<br>1 | Na<br>1 | 0 | 0 |

- Molecule 7 is water.

| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|---|---|---|---|---|---|---|
| 7 | A | 378 | Total O<br>378 378 | | 0 | 0 |
| 7 | B | 344 | Total O<br>344 344 | | 0 | 0 |
| 7 | C | 393 | Total O<br>393 393 | | 0 | 0 |
| 7 | D | 176 | Total O<br>176 176 | | 0 | 0 |
| 7 | E | 244 | Total O<br>244 244 | | 0 | 0 |
| 7 | F | 150 | Total O<br>150 150 | | 0 | 0 |
| 7 | G | 417 | Total O<br>417 417 | | 0 | 0 |
| 7 | H | 121 | Total O<br>121 121 | | 0 | 0 |

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

# 3 Data and refinement statistics (i)

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

| Property | Value | Source |
|---|---|---|
| Space group | C 1 2 1 | Depositor |
| Cell constants<br>a, b, c, $\alpha$, $\beta$, $\gamma$ | 218.48Å    70.56Å    143.98Å<br>90.00°    104.74°    90.00° | Depositor |
| Resolution (Å) | 48.43    –    1.88 | Depositor |
| % Data completeness<br>(in resolution range) | 99.8 (48.43-1.88) | Depositor |
| $R_{merge}$ | 0.06 | Depositor |
| $R_{sym}$ | (Not available) | Depositor |
| $< I/\sigma(I) >$ [1] | 2.26 (at 1.88Å) | Xtriage |
| Refinement program | PHENIX 1.16_3549 | Depositor |
| R, $R_{free}$ | 0.160   ,   0.195 | Depositor |
| Wilson B-factor (Å$^2$) | 27.3 | Xtriage |
| Anisotropy | 0.476 | Xtriage |
| L-test for twinning[2] | $< |L| > = 0.50$, $< L^2 > = 0.33$ | Xtriage |
| Estimated twinning fraction | No twinning to report. | Xtriage |
| Total number of atoms | 15614 | wwPDB-VP |
| Average B, all atoms (Å$^2$) | 37.0 | wwPDB-VP |

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.61% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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 ⓘ

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

## 4.2   Too-close contacts ⓘ

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

## 4.3   Torsion angles ⓘ

### 4.3.1   Protein backbone ⓘ

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

### 4.3.2   Protein sidechains ⓘ

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

### 4.3.3   RNA ⓘ

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

## 4.4   Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 4.5   Carbohydrates ⓘ

There are no monosaccharides in this entry.

## 4.6   Ligand geometry ⓘ

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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 | $\#|Z| > 2$ |
| 5 | OYG | A | 301 | 1 | 12,13,14 | 1.09 | 1 (8%) | 15,17,19 | 2.53 | 2 (13%) |
| 5 | OYG | C | 801 | 1 | 12,13,14 | 0.67 | 0 | 15,17,19 | 1.64 | 1 (6%) |

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 |
|-----|------|-------|-----|------|---------|----------|-------|
| 5 | OYG | A | 301 | 1 | - | 1/4/4/5 | 0/1/1/1 |
| 5 | OYG | C | 801 | 1 | - | 1/4/4/5 | 0/1/1/1 |

All (1) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|------|-------------|----------|
| 5 | A | 301 | OYG | C3-C2 | 3.09 | 1.40 | 1.32 |

All (3) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|----------|-------|----------------|-------------|
| 5 | A | 301 | OYG | C1-C2-C3 | -9.09 | 115.53 | 125.84 |
| 5 | C | 801 | OYG | C1-C2-C3 | -5.86 | 119.19 | 125.84 |
| 5 | A | 301 | OYG | C2-C3-C4 | -2.63 | 122.23 | 127.02 |

There are no chirality outliers.

All (2) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------------|
| 5 | A | 301 | OYG | C2-C3-C4-C5 |
| 5 | C | 801 | OYG | C2-C3-C4-C5 |

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 ⓘ

## 5.1 Protein, DNA and RNA chains ⓘ

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

## 5.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.3 Carbohydrates ⓘ

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

## 5.4 Ligands ⓘ

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

## 5.5 Other polymers ⓘ

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