PDB ID : 3H1I
Title : Stigmatellin and antimycin bound cytochrome bc1 complex from chicken
Authors : Zhang, Z.; Huang, L.; Shulmeister, V.M.; Chi, Y.I.; Kim, K.K.; Hung, L.W.; Crofts, A.R.; Berry, E.A.; Kim, S.H.
Deposited on : 2009-04-12
Resolution : 3.53 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
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 : 1.7.3 (157068), CSD as539be (2018)
- Xtriage (Phenix) : 1.13
- EDS : trunk30967
- Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)
- Refmac : 5.8.0158
- CCP4 : 7.0 (Gargrove)
- Ideal geometry (proteins) : Engh & Huber (2001)
- Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
- Validation Pipeline (wwPDB-VP) : trunk30967
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 3.53 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.

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥3, 2, 1 and 0 types of geometric quality criteria. 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%. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Whole archive (#Entries)</th>
<th>Similar resolution (#Entries, resolution range(Å))</th>
</tr>
</thead>
<tbody>
<tr>
<td>R$_{free}$</td>
<td>111664</td>
<td>1023 (3.64-3.44)</td>
</tr>
<tr>
<td>Clashscore</td>
<td>122126</td>
<td>1049 (3.62-3.46)</td>
</tr>
<tr>
<td>Ramachandran outliers</td>
<td>120053</td>
<td>1016 (3.62-3.46)</td>
</tr>
<tr>
<td>Sidechain outliers</td>
<td>120020</td>
<td>1017 (3.62-3.46)</td>
</tr>
<tr>
<td>RSRZ outliers</td>
<td>108989</td>
<td>1036 (3.66-3.42)</td>
</tr>
</tbody>
</table>

Continued on next page...
Continued from previous page...

<table>
<thead>
<tr>
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<th>Chain</th>
<th>Length</th>
<th>Quality of chain</th>
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</thead>
<tbody>
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<td>D</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>E</td>
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<td>47</td>
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<tr>
<td>10</td>
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<td>61</td>
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The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Type</th>
<th>Chain</th>
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<th>Chirality</th>
<th>Geometry</th>
<th>Clashes</th>
<th>Electron density</th>
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<td>3008</td>
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<td>E</td>
<td>501</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>
2 Entry composition

There are 20 unique types of molecules in this entry. The entry contains 32701 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 UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 1, MITOCHONDRIAL.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>443</td>
<td>Total C N O S</td>
<td>3440 2155 606 658 21</td>
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<td>0</td>
</tr>
<tr>
<td>1</td>
<td>N</td>
<td>442</td>
<td>Total C N O S</td>
<td>3437 2154 605 657 21</td>
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<td>0</td>
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</tbody>
</table>

- Molecule 2 is a protein called UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2, MITOCHONDRIAL.

<table>
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<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>B</td>
<td>421</td>
<td>Total C N O S</td>
<td>3141 1974 545 613 9</td>
<td>0</td>
<td>0</td>
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<tr>
<td>2</td>
<td>O</td>
<td>422</td>
<td>Total C N O S</td>
<td>3147 1977 546 614 10</td>
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<td>0</td>
</tr>
</tbody>
</table>

- Molecule 3 is a protein called Cytochrome b.

<table>
<thead>
<tr>
<th>Mol</th>
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<th>Atoms</th>
<th>ZeroOcc</th>
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<th>Trace</th>
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</thead>
<tbody>
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<td>3020 2024 478 505 13</td>
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<tr>
<td>3</td>
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<td>3012 2019 477 504 12</td>
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</table>

- Molecule 4 is a protein called CYTOCHROME C1, HEME PROTEIN, MITOCHONDRIAL.

<table>
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<th>Atoms</th>
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</thead>
<tbody>
<tr>
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<tr>
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<td>Total C N O S</td>
<td>1898 1212 327 347 12</td>
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<td>0</td>
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- Molecule 5 is a protein called Cytochrome b-c1 complex subunit Rieske, mitochondrial.
<table>
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<th>Atoms</th>
<th>ZeroOcc</th>
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<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>5</td>
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<td>196</td>
<td>Total C N O S</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>196</td>
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<td>0</td>
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</tbody>
</table>

- Molecule 6 is a protein called UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 14 KDA PROTEIN.

<table>
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<th>Atoms</th>
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</thead>
<tbody>
<tr>
<td>6</td>
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- Molecule 7 is a protein called UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX UBIQUINONE-BINDING PROTEIN QP-C.

<table>
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<th>Mol</th>
<th>Chain</th>
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<th>Atoms</th>
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<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
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<td>79</td>
<td>Total C N O</td>
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</table>

- Molecule 8 is a protein called UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 11 KDA PROTEIN.

<table>
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<th>Trace</th>
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<tbody>
<tr>
<td>8</td>
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<tr>
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</tbody>
</table>

- Molecule 9 is a protein called Cytochrome b-c1 complex subunit Rieske, mitochondrial.

<table>
<thead>
<tr>
<th>Mol</th>
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<th>Atoms</th>
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<tbody>
<tr>
<td>9</td>
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<td>0</td>
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<td>V</td>
<td>44</td>
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<td>0</td>
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<td>1</td>
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</table>

- Molecule 10 is a protein called UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 7.2 KDA PROTEIN.
- Molecule 11 is 1,2-Dioleoyl-sn-glycero-3-phosphoethanolamine (three-letter code: PEE) (formula: C_{41}H_{83}NO_{8}P).

- Molecule 12 is UNKNOWN LIGAND (three-letter code: UNL) (formula: ).

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<table>
<thead>
<tr>
<th>Mol</th>
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<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
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<tbody>
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</tr>
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<td>1 1</td>
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<td></td>
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<tr>
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<td>Total O</td>
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<td>1 1</td>
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<td>Total O</td>
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<td>2 2</td>
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</tbody>
</table>

- Molecule 13 is PROTOPORPHYRIN IX CONTAINING FE (three-letter code: HEM) (formula: C_{34}H_{32}FeN_{4}O_{4}).

- Molecule 14 is STIGMATELLIN A (three-letter code: SMA) (formula: C_{30}H_{42}O_{7}).
- Molecule 15 is 2-METHYL-BUTYRIC ACID 3-(3-FORMYLAMINO-2-HYDROXY-BENZ OYLAMINO)-8-HEPTYL-2,6-DIMETHYL-4,9-DIOXO-[1,5]DIOXONAN-7-YL ESTER (three-letter code: ANY) (formula: C_{29}H_{42}N_{2}O_{9}).

<table>
<thead>
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<th>Chain</th>
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<th>ZeroOcc</th>
<th>AltConf</th>
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</thead>
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<td>Total C O</td>
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<td>0</td>
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<tr>
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<td>37 30 7</td>
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Continued from previous page...

<table>
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<th>AltConf</th>
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</thead>
<tbody>
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</tr>
</tbody>
</table>

- Molecule 16 is CARDIOLIPIN (three-letter code: CDL) (formula: $C_{81}H_{156}O_{17}P_2$).

![CDL](image)

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
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<tr>
<td>16</td>
<td>P</td>
<td>1</td>
<td>Total C O P</td>
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<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Q</td>
<td>1</td>
<td>Total C O P</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 17 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).
**Molecule 18 is HEME C (three-letter code: HEC) (formula: C$_{34}$H$_{34}$FeN$_{4}$O$_{4}$).**

---

### Table: Molecule Properties

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
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</thead>
<tbody>
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<td>0</td>
</tr>
<tr>
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<td>6 3 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>P</td>
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<td>Total C O</td>
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<td>6 3 3</td>
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</tr>
</tbody>
</table>

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### Diagram: HEME C

---

### Table: Molecule Properties

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
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<tbody>
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<td>1</td>
<td>Total C Fe N O</td>
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<td>0</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>43 34 1 4 4</td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>Q</td>
<td>1</td>
<td>Total C Fe N O</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 34 1 4 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Molecule 19 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe$_2$S$_2$).

\[
\text{FES}
\]
\[
\begin{array}{c}
S1 \\
S \\
Fe \\
Fe \\
S2
\end{array}
\]

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>E</td>
<td>1</td>
<td>Total 4</td>
<td>Fe 2</td>
<td>S 2</td>
</tr>
<tr>
<td>19</td>
<td>R</td>
<td>1</td>
<td>Total 4</td>
<td>Fe 2</td>
<td>S 2</td>
</tr>
</tbody>
</table>

- Molecule 20 is DIUNDECYL PHOSPHATIDYL CHOLINE (three-letter code: PLC) (formula: C$_{32}$H$_{65}$NO$_8$P).
<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
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</thead>
<tbody>
<tr>
<td>20</td>
<td>E</td>
<td>1</td>
<td>Total C  N  O  P</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>22</td>
<td>1 8 1</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>20</td>
<td>R</td>
<td>1</td>
<td>Total C  N  O  P</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>22</td>
<td>1 8 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN I, MITOCHONDRIAL

Chain A:

![Residue-property plot for Chain A](Image)

- Molecule 1: UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN I, MITOCHONDRIAL

Chain N:

![Residue-property plot for Chain N](Image)
- Molecule 2: UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2, MITOCHONDRIAL

Chain B:

- Molecule 2: UBIQUINOL-CYTOCHROME-C REDUCTASE COMPLEX CORE PROTEIN 2, MITOCHONDRIAL

Chain O:
- **Molecule 3: Cytochrome b**

**Chain C:**

![Chain C diagram]

**Chain P:**

![Chain P diagram]
• Molecule 4: CYTOCHROME C1, HEME PROTEIN, MITOCHONDRIAL

Chain Q:

• Molecule 5: Cytochrome b-c1 complex subunit Rieske, mitochondrial

Chain E:
• Molecule 5: Cytochrome b-c1 complex subunit Rieske, mitochondrial

Chain R:

• Molecule 6: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 14 KDA PROTEIN

Chain F:

• Molecule 6: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 14 KDA PROTEIN

Chain S:

• Molecule 7: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX UBIQUINONE-BINDING PROTEIN QP-C

Chain G:
• Molecule 7: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX UBIQUINONE-BINDING PROTEIN QP-C

Chain T:

• Molecule 8: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 11 KDA PROTEIN

Chain H:

• Molecule 8: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 11 KDA PROTEIN

Chain U:

• Molecule 9: Cytochrome b-c1 complex subunit Rieske, mitochondrial

Chain I:

• Molecule 9: Cytochrome b-c1 complex subunit Rieske, mitochondrial

Chain V:

• Molecule 10: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 7.2 KDA PROTEIN

Chain J:
• Molecule 10: UBIQUINOL-CYTOCHROME C REDUCTASE COMPLEX 7.2 KDA PROTEIN

Chain W:
### 4 Data and refinement statistics

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Source</th>
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<tr>
<td>Space group</td>
<td>P 21 21 21</td>
<td>Depositor</td>
</tr>
<tr>
<td>Cell constants</td>
<td>174.69Å 181.67Å 240.73Å</td>
<td>Depositor</td>
</tr>
<tr>
<td>a, b, c, α, β, γ</td>
<td>90.00° 90.00° 90.00°</td>
<td>Depositor</td>
</tr>
<tr>
<td>Resolution (Å)</td>
<td>19.99 – 3.53</td>
<td>Depositor</td>
</tr>
<tr>
<td>% Data completeness (in resolution range)</td>
<td>90.6 (19.99-3.53)</td>
<td>Depositor</td>
</tr>
<tr>
<td>R&lt;sub&gt;merge&lt;/sub&gt;</td>
<td>(Not available)</td>
<td>Depositor</td>
</tr>
<tr>
<td>R&lt;sub&gt;sym&lt;/sub&gt;</td>
<td>0.23</td>
<td>Depositor</td>
</tr>
<tr>
<td>&lt;I/σ(I)&gt;&lt;sup&gt;1&lt;/sup&gt;</td>
<td>1.31 (at 3.57Å)</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Refinement program</td>
<td>CNS 1.1</td>
<td>Depositor</td>
</tr>
<tr>
<td>R, R&lt;sub&gt;free&lt;/sub&gt;</td>
<td>0.263 , 0.306</td>
<td>Depositor</td>
</tr>
<tr>
<td>R&lt;sub&gt;free&lt;/sub&gt; test set</td>
<td>2560 reflections (2.99%)</td>
<td>DCC</td>
</tr>
<tr>
<td>Wilson B-factor (Å&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>89.2</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Anisotropy</td>
<td>0.513</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Bulk solvent k&lt;sub&gt;sol&lt;/sub&gt;(e/Å&lt;sup&gt;3&lt;/sup&gt;), B&lt;sub&gt;sol&lt;/sub&gt;(Å&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>0.28 , 70.5</td>
<td>EDS</td>
</tr>
<tr>
<td>L-test for twinning&lt;sup&gt;2&lt;/sup&gt;</td>
<td>&lt;</td>
<td>L</td>
</tr>
<tr>
<td>Estimated twinning fraction</td>
<td>0.026 for k,h,-l</td>
<td>Xtriage</td>
</tr>
<tr>
<td>F&lt;sub&gt;o&lt;/sub&gt;-F&lt;sub&gt;c&lt;/sub&gt; correlation</td>
<td>0.89</td>
<td>EDS</td>
</tr>
<tr>
<td>Total number of atoms</td>
<td>32701</td>
<td>wwPDB-VP</td>
</tr>
<tr>
<td>Average B, all atoms (Å&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>87.0</td>
<td>wwPDB-VP</td>
</tr>
</tbody>
</table>

Xtriage’s analysis on translational NCS is as follows: The largest off-origin peak in the Patterson function is 2.57% of the height of the origin peak. No significant pseudotranslation is detected.

---

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of < |L|>, <L<sup>2</sup>> for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.
5  Model quality

5.1  Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CDL, UNL, PLC, FES, HEC, HEM, PEE, ANY, SMA

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).

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Bond lengths</th>
<th>Bond angles</th>
</tr>
</thead>
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<td></td>
<td>RMSZ</td>
<td>$</td>
</tr>
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<td>A</td>
<td>0.49</td>
<td>0/3511</td>
</tr>
<tr>
<td>1</td>
<td>N</td>
<td>0.49</td>
<td>0/3508</td>
</tr>
<tr>
<td>2</td>
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<td>0.43</td>
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</tr>
<tr>
<td>2</td>
<td>O</td>
<td>0.44</td>
<td>0/3202</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>0.59</td>
<td>0/3122</td>
</tr>
<tr>
<td>3</td>
<td>P</td>
<td>0.53</td>
<td>0/3114</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>0.52</td>
<td>0/1956</td>
</tr>
<tr>
<td>4</td>
<td>Q</td>
<td>0.43</td>
<td>0/1956</td>
</tr>
<tr>
<td>5</td>
<td>E</td>
<td>0.43</td>
<td>0/1547</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
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<td>0/1547</td>
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<tr>
<td>6</td>
<td>S</td>
<td>0.49</td>
<td>0/911</td>
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<td>7</td>
<td>G</td>
<td>0.56</td>
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<td>0.49</td>
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<td>H</td>
<td>0.48</td>
<td>0/582</td>
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<td>0.39</td>
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<td>I</td>
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<td>V</td>
<td>0.44</td>
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<td>W</td>
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<tr>
<td>All</td>
<td>All</td>
<td>0.49</td>
<td>0/32435</td>
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</table>

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>#Chirality outliers</th>
<th>#Planarity outliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>C</td>
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</table>

There are no bond length outliers.
All (4) bond angle outliers are listed below:

<table>
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<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Atoms</th>
<th>Z</th>
<th>Observed(°)</th>
<th>Ideal(°)</th>
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<tr>
<td>5</td>
<td>R</td>
<td>71</td>
<td>LEU</td>
<td>N-CA-C</td>
<td>5.94</td>
<td>127.03</td>
<td>111.00</td>
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<tr>
<td>5</td>
<td>E</td>
<td>143</td>
<td>GLY</td>
<td>N-CA-C</td>
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<td>E</td>
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<td>ALA</td>
<td>N-CA-C</td>
<td>-5.04</td>
<td>97.40</td>
<td>111.00</td>
</tr>
</tbody>
</table>

There are no chirality outliers.

All (1) planarity outliers are listed below:

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<tr>
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<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>C</td>
<td>104</td>
<td>TYR</td>
<td>Sidechain</td>
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</tbody>
</table>

5.2 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.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Non-H</th>
<th>H(model)</th>
<th>H(added)</th>
<th>Clashes</th>
<th>Symm-Clashes</th>
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</table>

Continued on next page...
Continued from previous page...

<table>
<thead>
<tr>
<th>Mol</th>
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<th>Non-H</th>
<th>H(model)</th>
<th>H(added)</th>
<th>Clashes</th>
<th>Symm-Clashes</th>
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</tr>
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</tr>
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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 38.

All (2460) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

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<th>Atom-1</th>
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<th>Clash overlap (Å)</th>
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### Interatomic distances and clash overlap

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There are no symmetry-related clashes.
5.3 **Torsion angles**

5.3.1 **Protein backbone**

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.

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<tr>
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All (267) Ramachandran outliers are listed below:

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## Full wwPDB X-ray Structure Validation Report

### 3H1I

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5.3.2 Protein sidechains

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.

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5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no carbohydrates in this entry.

5.6 Ligand geometry

Of 36 ligands modelled in this entry, 10 are unknown - leaving 26 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
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There are no torsion outliers.

There are no ring outliers.

23 monomers are involved in 91 short contacts:

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5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.
## 6  Fit of model and data

### 6.1  Protein, DNA and RNA chains

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, 95\textsuperscript{th} 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.

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<td>40, 85, 131, 143</td>
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<td>N</td>
<td>442/446 (99%)</td>
<td>-0.17</td>
<td>8 (1%)</td>
<td>68, 57</td>
<td>42, 91, 131, 143</td>
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<td>421/441 (95%)</td>
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<td>3 (0%)</td>
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<td>O</td>
<td>422/441 (95%)</td>
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<td>6 (1%)</td>
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6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

There are no carbohydrates in this entry.

6.4 Ligands

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, $95^{th}$ 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.

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6.5 Other polymers

There are no such residues in this entry.