May 17, 2020 – 02:39 pm BST

PDB ID : 6HU4
EMDB ID : EMD-0272
Title : F97L Hepatitis B core protein capsid
Authors : Bottcher, B.; Nassal, M.
Deposited on : 2018-10-05
Resolution : 2.64 Å (reported)
Based on initial model : 6HTX

This is a Full wwPDB EM Map/Model 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:

- EMDB validation analysis : 0.0.0.dev33
- MolProbity : 4.02b-467
- 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) : 2.11
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

**ELECTRON MICROSCOPY**

The reported resolution of this entry is 2.64 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.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Whole archive (#Entries)</th>
<th>EM structures (#Entries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clashscore</td>
<td>158937</td>
<td>4297</td>
</tr>
<tr>
<td>Ramachandran outliers</td>
<td>154571</td>
<td>4023</td>
</tr>
<tr>
<td>Sidechain outliers</td>
<td>154315</td>
<td>3826</td>
</tr>
</tbody>
</table>

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. 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 EM map (all atom inclusion < 40%). The numeric value is given above the bar.
2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 4825 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Capsid protein.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>151</td>
<td>Total C 1207 N 781 O 201 S 219</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>144</td>
<td>Total C 1167 N 757 O 195 S 209</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>147</td>
<td>Total C 1171 N 759 O 191 S 215</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>149</td>
<td>Total C 1196 N 775 O 197 S 218</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
<td>3</td>
<td>Total C 21 N 11 O 4 S 5 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>F</td>
<td>3</td>
<td>Total C 21 N 11 O 4 S 5 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>3</td>
<td>Total C 21 N 11 O 4 S 5 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>3</td>
<td>Total C 21 N 11 O 4 S 5 1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

There are 8 discrepancies between the modelled and reference sequences:

<table>
<thead>
<tr>
<th>Chain</th>
<th>Residue</th>
<th>Modelled</th>
<th>Actual</th>
<th>Comment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>A</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>C</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>D</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>E</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>F</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>G</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</td>
</tr>
<tr>
<td>H</td>
<td>97</td>
<td>LEU</td>
<td>PHE</td>
<td>engineered mutation</td>
<td>UNP P03146</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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all atom inclusion < 40%). 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: Capsid protein**

Chain B:

- **Molecule 1: Capsid protein**

Chain A:

- **Molecule 1: Capsid protein**

Chain C:
• Molecule 1: Capsid protein

Chain D:

• Molecule 1: Capsid protein

Chain E:

• Molecule 1: Capsid protein

Chain F:
- Molecule 1: Capsid protein

Chain G: 

- Molecule 1: Capsid protein

Chain H: 

S181 ♦ Q182 ♦ C183 ♦
## 4 Experimental information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM reconstruction method</td>
<td>SINGLE PARTICLE</td>
<td>Depositor</td>
</tr>
<tr>
<td>Imposed symmetry</td>
<td>POINT, I</td>
<td>Depositor</td>
</tr>
<tr>
<td>Number of particles used</td>
<td>38292</td>
<td>Depositor</td>
</tr>
<tr>
<td>Resolution determination method</td>
<td>FSC 0.143 CUT-OFF</td>
<td>Depositor</td>
</tr>
<tr>
<td>CTF correction method</td>
<td>PHASE FLIPPING AND AMPLITUDE CORRECTION</td>
<td>Depositor</td>
</tr>
<tr>
<td>Microscope</td>
<td>FEI TITAN KRIOS</td>
<td>Depositor</td>
</tr>
<tr>
<td>Voltage (kV)</td>
<td>300</td>
<td>Depositor</td>
</tr>
<tr>
<td>Electron dose ((e^-/\text{Å}^2))</td>
<td>28</td>
<td>Depositor</td>
</tr>
<tr>
<td>Minimum defocus (nm)</td>
<td>370</td>
<td>Depositor</td>
</tr>
<tr>
<td>Maximum defocus (nm)</td>
<td>2560</td>
<td>Depositor</td>
</tr>
<tr>
<td>Magnification</td>
<td>75000</td>
<td>Depositor</td>
</tr>
<tr>
<td>Image detector</td>
<td>GATAN K2 SUMMIT (4k x 4k)</td>
<td>Depositor</td>
</tr>
<tr>
<td>Maximum map value</td>
<td>0.035</td>
<td>Depositor</td>
</tr>
<tr>
<td>Minimum map value</td>
<td>-0.011</td>
<td>Depositor</td>
</tr>
<tr>
<td>Average map value</td>
<td>0.000</td>
<td>Depositor</td>
</tr>
<tr>
<td>Map value standard deviation</td>
<td>0.002</td>
<td>Depositor</td>
</tr>
<tr>
<td>Recommended contour level</td>
<td>0.025</td>
<td>Depositor</td>
</tr>
<tr>
<td>Map size (Å)</td>
<td>539.136, 539.136, 539.136</td>
<td>Depositor</td>
</tr>
<tr>
<td>Map dimensions</td>
<td>512, 512, 512</td>
<td>Depositor</td>
</tr>
<tr>
<td>Map angles (°)</td>
<td>90.0, 90.0, 90.0</td>
<td>Depositor</td>
</tr>
<tr>
<td>Pixel spacing (Å)</td>
<td>1.053, 1.053, 1.053</td>
<td>Depositor</td>
</tr>
</tbody>
</table>
5 Model quality

5.1 Standard geometry

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>
<tbody>
<tr>
<td></td>
<td></td>
<td>RMSZ</td>
<td>#</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>0.35</td>
<td>0/1205</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>0.47</td>
<td>1/1242 (0.1%)</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>0.36</td>
<td>0/1206</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>0.34</td>
<td>0/1231</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
<td>0.21</td>
<td>0/20</td>
</tr>
<tr>
<td>1</td>
<td>F</td>
<td>0.23</td>
<td>0/20</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>0.22</td>
<td>0/20</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>0.23</td>
<td>0/20</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>0.38</td>
<td>1/4964 (0.0%)</td>
</tr>
</tbody>
</table>

All (1) bond length outliers are listed below:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Atoms</th>
<th>Z</th>
<th>Observed(Å)</th>
<th>Ideal(Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>143</td>
<td>LEU</td>
<td>C-N</td>
<td>11.12</td>
<td>1.55</td>
<td>1.34</td>
</tr>
</tbody>
</table>

All (1) bond angle outliers are listed below:

<table>
<thead>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>119</td>
<td>LEU</td>
<td>CA-CB-CG</td>
<td>5.74</td>
<td>128.51</td>
<td>115.30</td>
</tr>
</tbody>
</table>

There are no chirality outliers.

There are no planarity outliers.

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.
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 8.

All (75) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.
Continued from previous page...

<table>
<thead>
<tr>
<th>Atom-1</th>
<th>Atom-2</th>
<th>Interatomic distance (Å)</th>
<th>Clash overlap (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:B:48:CYS:HB2</td>
<td>1:B:52:HIS:CG</td>
<td>2.47</td>
<td>0.50</td>
</tr>
<tr>
<td>1:D:24:PHE:CZ</td>
<td>1:D:99:GLN:HG3</td>
<td>2.47</td>
<td>0.50</td>
</tr>
<tr>
<td>1:B:47:HIS:CE1</td>
<td>1:A:8:GLU:HG2</td>
<td>2.47</td>
<td>0.49</td>
</tr>
<tr>
<td>1:D:6:TYR:CZ</td>
<td>1:D:16:LEU:HD22</td>
<td>2.47</td>
<td>0.49</td>
</tr>
<tr>
<td>1:C:57:GLN:HE22</td>
<td>1:D:100:LEU:HD21</td>
<td>1.76</td>
<td>0.49</td>
</tr>
<tr>
<td>1:B:44:SER:HB3</td>
<td>1:E:181:SER:HB2</td>
<td>1.94</td>
<td>0.49</td>
</tr>
<tr>
<td>1:B:143:LEU:HD13</td>
<td>1:B:147:THR:HG22</td>
<td>1.95</td>
<td>0.49</td>
</tr>
<tr>
<td>1:C:112:ARG:NH2</td>
<td>1:C:113:GLU:OE2</td>
<td>2.47</td>
<td>0.48</td>
</tr>
<tr>
<td>1:D:25:PRO:O</td>
<td>1:D:98:ARG:HD2</td>
<td>2.13</td>
<td>0.48</td>
</tr>
<tr>
<td>1:A:24:PHE:CE2</td>
<td>1:A:99:GLN:HG2</td>
<td>2.49</td>
<td>0.48</td>
</tr>
<tr>
<td>1:A:24:PHE:O</td>
<td>1:A:98:ARG:NH2</td>
<td>2.37</td>
<td>0.47</td>
</tr>
<tr>
<td>1:C:6:TYR:CZ</td>
<td>1:C:16:LEU:HD22</td>
<td>2.50</td>
<td>0.47</td>
</tr>
<tr>
<td>1:A:19:LEU:HD23</td>
<td>1:A:122:PHE:CD2</td>
<td>2.50</td>
<td>0.47</td>
</tr>
<tr>
<td>1:B:33:SER:O</td>
<td>1:B:39:ARG:HB2</td>
<td>2.15</td>
<td>0.47</td>
</tr>
<tr>
<td>1:A:123:GLY:HA2</td>
<td>1:A:126:ILE:HG22</td>
<td>1.96</td>
<td>0.46</td>
</tr>
<tr>
<td>1:D:38:TYR:HB3</td>
<td>1:D:42:LEU:HD13</td>
<td>1.96</td>
<td>0.46</td>
</tr>
<tr>
<td>1:A:6:TYR:CZ</td>
<td>1:A:16:LEU:HD22</td>
<td>2.50</td>
<td>0.46</td>
</tr>
<tr>
<td>1:D:91:THR:HG23</td>
<td>1:D:92:ASN:N</td>
<td>2.30</td>
<td>0.46</td>
</tr>
<tr>
<td>1:B:27:VAL:HG11</td>
<td>1:B:62:TRP:CE2</td>
<td>2.51</td>
<td>0.46</td>
</tr>
<tr>
<td>1:D:123:GLY:HA2</td>
<td>1:D:126:ILE:HG22</td>
<td>1.98</td>
<td>0.45</td>
</tr>
<tr>
<td>1:B:105:ILE:O</td>
<td>1:B:109:THR:HG22</td>
<td>2.16</td>
<td>0.45</td>
</tr>
<tr>
<td>1:B:8:GLU:HB2</td>
<td>1:A:47:HIS:CD2</td>
<td>2.51</td>
<td>0.45</td>
</tr>
<tr>
<td>1:C:28:ARG:HA</td>
<td>1:C:28:ARG:HD2</td>
<td>1.77</td>
<td>0.45</td>
</tr>
<tr>
<td>1:C:27:VAL:HG11</td>
<td>1:C:62:TRP:CE2</td>
<td>2.52</td>
<td>0.44</td>
</tr>
<tr>
<td>1:D:109:THR:O</td>
<td>1:D:111:GLY:N</td>
<td>2.49</td>
<td>0.44</td>
</tr>
<tr>
<td>1:B:109:THR:HG23</td>
<td>1:B:110:PHE:CD2</td>
<td>2.53</td>
<td>0.44</td>
</tr>
<tr>
<td>1:B:18:PHE:HB3</td>
<td>1:B:126:ILE:HG21</td>
<td>2.00</td>
<td>0.44</td>
</tr>
<tr>
<td>1:B:9:PHE:CE2</td>
<td>1:B:104:HIS:HE1</td>
<td>2.36</td>
<td>0.43</td>
</tr>
<tr>
<td>1:C:9:PHE:CE2</td>
<td>1:C:104:HIS:HE1</td>
<td>2.36</td>
<td>0.43</td>
</tr>
<tr>
<td>1:D:9:PHE:CE2</td>
<td>1:D:104:HIS:HE1</td>
<td>2.36</td>
<td>0.43</td>
</tr>
<tr>
<td>1:A:48:CYS:HB2</td>
<td>1:A:52:HIS:CG</td>
<td>2.53</td>
<td>0.43</td>
</tr>
<tr>
<td>1:B:50:PRO:HG2</td>
<td>1:A:47:HIS:ND1</td>
<td>2.34</td>
<td>0.43</td>
</tr>
<tr>
<td>1:C:52:HIS:O</td>
<td>1:C:56:ARG:HG3</td>
<td>2.18</td>
<td>0.43</td>
</tr>
<tr>
<td>1:A:44:SER:OG</td>
<td>1:A:46:GLU:HG2</td>
<td>2.19</td>
<td>0.43</td>
</tr>
<tr>
<td>1:B:37:LEU:HD11</td>
<td>1:C:120:VAL:HG13</td>
<td>2.01</td>
<td>0.42</td>
</tr>
<tr>
<td>1:B:45:PRO:HB3</td>
<td>1:A:7:LYS:HG2</td>
<td>2.01</td>
<td>0.42</td>
</tr>
<tr>
<td>1:D:19:LEU:HD23</td>
<td>1:D:122:PHE:CD2</td>
<td>2.55</td>
<td>0.42</td>
</tr>
<tr>
<td>1:A:9:PHE:O</td>
<td>1:A:112:ARG:HD3</td>
<td>2.19</td>
<td>0.42</td>
</tr>
<tr>
<td>1:A:62:TRP:HE3</td>
<td>1:A:97:LEU:HD12</td>
<td>1.84</td>
<td>0.42</td>
</tr>
<tr>
<td>1:C:19:LEU:HD13</td>
<td>1:C:119:LEU:HD12</td>
<td>2.00</td>
<td>0.41</td>
</tr>
<tr>
<td>1:D:109:THR:HG22</td>
<td>1:D:110:PHE:CD1</td>
<td>2.54</td>
<td>0.41</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Atom-1</th>
<th>Atom-2</th>
<th>Interatomic distance (Å)</th>
<th>Clash overlap (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:D:9:PHE:O</td>
<td>1:D:112:ARG:HD2</td>
<td>2.20</td>
<td>0.41</td>
</tr>
<tr>
<td>1:C:6:TYR:HB3</td>
<td>1:C:11:ALA:HB3</td>
<td>2.02</td>
<td>0.41</td>
</tr>
<tr>
<td>1:A:7:VAL:HG13</td>
<td>1:A:76:LEU:HD22</td>
<td>2.01</td>
<td>0.41</td>
</tr>
<tr>
<td>1:D:41:ALA:CB</td>
<td>1:H:183:CYR:HB2</td>
<td>2.51</td>
<td>0.41</td>
</tr>
<tr>
<td>1:B:148:VAL:HG12</td>
<td>1:B:15:ARG:HG3</td>
<td>2.03</td>
<td>0.40</td>
</tr>
<tr>
<td>1:B:6:TYR:CZ</td>
<td>1:B:16:LEU:HD22</td>
<td>2.57</td>
<td>0.40</td>
</tr>
<tr>
<td>1:D:4:ASP:OD1</td>
<td>1:D:13:VAL:HG23</td>
<td>2.21</td>
<td>0.40</td>
</tr>
<tr>
<td>1:D:27:VAL:HG11</td>
<td>1:D:62:TRP:CE2</td>
<td>2.56</td>
<td>0.40</td>
</tr>
</tbody>
</table>

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 PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Analysed</th>
<th>Favoured</th>
<th>Allowed</th>
<th>Outliers</th>
<th>Percentiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>144/183 (79%)</td>
<td>138 (96%)</td>
<td>5 (4%)</td>
<td>1 (1%)</td>
<td>22 32</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>149/183 (81%)</td>
<td>142 (95%)</td>
<td>6 (4%)</td>
<td>1 (1%)</td>
<td>22 32</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>145/183 (79%)</td>
<td>141 (97%)</td>
<td>4 (3%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>148/183 (81%)</td>
<td>142 (96%)</td>
<td>5 (3%)</td>
<td>1 (1%)</td>
<td>22 32</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
<td>1/183 (0%)</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>F</td>
<td>1/183 (0%)</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>1/183 (0%)</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>1/183 (0%)</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>590/1464 (40%)</td>
<td>567 (96%)</td>
<td>20 (3%)</td>
<td>3 (0%)</td>
<td>32 43</td>
</tr>
</tbody>
</table>

All (3) Ramachandran outliers are listed below:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>148</td>
<td>VAL</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>3</td>
<td>ILE</td>
</tr>
</tbody>
</table>

Continued on next page...
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 PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Analysed</th>
<th>Rotameric</th>
<th>Outliers</th>
<th>Percentiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>130/166 (78%)</td>
<td>128 (98%)</td>
<td>2 (2%)</td>
<td>65 79</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>135/166 (81%)</td>
<td>135 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>131/166 (79%)</td>
<td>131 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>134/166 (81%)</td>
<td>134 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
<td>3/166 (2%)</td>
<td>3 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>F</td>
<td>3/166 (2%)</td>
<td>3 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>3/166 (2%)</td>
<td>3 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>3/166 (2%)</td>
<td>3 (100%)</td>
<td>0</td>
<td>100 100</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>542/1328 (41%)</td>
<td>540 (100%)</td>
<td>2 (0%)</td>
<td>93 95</td>
</tr>
</tbody>
</table>

All (2) residues with a non-rotameric sidechain are listed below:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>28</td>
<td>ARG</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>28</td>
<td>ARG</td>
</tr>
</tbody>
</table>

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>90</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>47</td>
<td>HIS</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>75</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>92</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>136</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>47</td>
<td>HIS</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>57</td>
<td>GLN</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>75</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>C</td>
<td>92</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>52</td>
<td>HIS</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>90</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>92</td>
<td>ASN</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>99</td>
<td>GLN</td>
</tr>
<tr>
<td>1</td>
<td>D</td>
<td>136</td>
<td>ASN</td>
</tr>
</tbody>
</table>

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

There are no ligands in this entry.

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 Map visualisation

This section contains visualisations of the EMDB entry EMD-0272. These are intended to permit visual inspection of the internal detail of the map and identification of artifacts.

6.1 Orthogonal projections

The images above show the map projected in three orthogonal projections, in greyscale.

6.2 Central slices

The images above show central slices of the map in three orthogonal directions, in greyscale.
6.3 Largest variance slices

The images above show the highest variance slices of the map in three orthogonal directions, in greyscale.

6.4 Orthogonal surface views

The images above show the 3D surface view of the map at the recommended contour level 0.025. This in conjunction with the slice images can indicate whether an appropriate contour level has been selected.
6.5 Mask visualisation

This section shows the 3d surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency.

A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.5.1 emd_0272_msk_1.map
7 Map analysis

This section contains the results of statistical analysis of the map.

7.1 Map-value distribution

The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.
7.2 Volume estimate

The volume at the recommended contour level is 2577 nm$^3$; this corresponds to an approximate mass of 2328 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.
7.3 Rotationally averaged power spectrum

![Graph showing rotationally averaged power spectrum with reported resolution of 2.64 Å and corresponding spatial frequency of 0.379 Å⁻¹.](image)
8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution for single-particle and subtomogram-averaging methods. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. Curves are displayed for $3\sigma$, 1-bit and 1/2-bit in addition to lines showing the 0.143 gold standard cut-off, 0.333 cut-off and legacy 0.5 cut-off.

8.1 Resolution estimates

These are global values for the map.

<table>
<thead>
<tr>
<th>Source</th>
<th>Criterion</th>
<th>Resolution estimate (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported value</td>
<td>FSC 0.143 CUT-OFF</td>
<td>2.64</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.5 CUT-OFF</td>
<td>3.24</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 1 BIT CUT-OFF</td>
<td>3.14</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.33 CUT-OFF</td>
<td>3.12</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 1/2 BIT CUT-OFF</td>
<td>2.99</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.143 CUT-OFF</td>
<td>2.92</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 3 SIGMA CUT-OFF</td>
<td>2.66</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.5 CUT-OFF</td>
<td>2.90</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 1 BIT CUT-OFF</td>
<td>2.80</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.33 CUT-OFF</td>
<td>2.80</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 1/2 BIT CUT-OFF</td>
<td>2.67</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.143 CUT-OFF</td>
<td>2.65</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 3 SIGMA CUT-OFF</td>
<td>2.34</td>
</tr>
</tbody>
</table>
8.2 Calculated FSC

This FSC information has been calculated from the half-maps provided by the depositor. As we request un-masked, un-processed half-maps the curve may be significantly different to the author-provided FSC.
This FSC information was provided by the depositor.
9  Map-model fit

This section contains information regarding the fit between EMDB map EMD-0272 and PDB model 6HU4. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay

The images above show the 3D surface view of the map at the recommended contour level 0.025 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.
9.2 Atom inclusion

At the recommended contour level, 53% of all backbone atoms, 45% of all non-hydrogen atoms, are inside the map.