Full wwPDB X-ray Structure Validation Report

Mar 13, 2018 – 11:03 pm GMT

PDB ID : 1YJN
Title : Crystal Structure Of Clindamycin Bound To The G2099A Mutant 50S Ribosomal Subunit Of Haloarcula Marismortui
Authors : Tu, D.; Blaha, G.; Moore, P.B.; Steitz, T.A.
Deposited on : 2005-01-14
Resolution : 3.00 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 : 1.7.3 (157068), CSD as539be (2018)
- Xtriage (Phenix) : 1.13
- EDS : trunk31020
- 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) : trunk31020
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 3.00 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>Similar resolution (#Entries, resolution range(Å))</th>
</tr>
</thead>
<tbody>
<tr>
<td>R$_{\text{free}}$</td>
<td>111664</td>
<td>1851 (3.00-3.00)</td>
</tr>
<tr>
<td>Clashscore</td>
<td>122126</td>
<td>2167 (3.00-3.00)</td>
</tr>
<tr>
<td>Ramachandran outliers</td>
<td>120053</td>
<td>2101 (3.00-3.00)</td>
</tr>
<tr>
<td>Sidechain outliers</td>
<td>120020</td>
<td>2104 (3.00-3.00)</td>
</tr>
<tr>
<td>RSRZ outliers</td>
<td>108989</td>
<td>1751 (3.00-3.00)</td>
</tr>
<tr>
<td>RNA backbone</td>
<td>2636</td>
<td>1017 (3.30-2.70)</td>
</tr>
</tbody>
</table>

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 $\geq 3$, 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>
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<th>Length</th>
<th>Quality of chain</th>
</tr>
</thead>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>338</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page...
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<table>
<thead>
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<th>Quality of chain</th>
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</thead>
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<td>C</td>
<td>246</td>
<td>46% 49% 5%</td>
</tr>
<tr>
<td>6</td>
<td>D</td>
<td>177</td>
<td>23% 48% 5% 21%</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
<td>178</td>
<td>26% 52% 42% 10%</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>120</td>
<td>24% 52% 5%</td>
</tr>
<tr>
<td>9</td>
<td>G</td>
<td>348</td>
<td>2% 92%</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
<td>177</td>
<td>45% 42% 10%</td>
</tr>
<tr>
<td>11</td>
<td>I</td>
<td>162</td>
<td>19% 30% 57%</td>
</tr>
<tr>
<td>12</td>
<td>J</td>
<td>145</td>
<td>51% 41% 6%</td>
</tr>
<tr>
<td>13</td>
<td>K</td>
<td>132</td>
<td>49% 49%</td>
</tr>
<tr>
<td>14</td>
<td>L</td>
<td>165</td>
<td>50% 35% 12%</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>195</td>
<td>55% 42%</td>
</tr>
<tr>
<td>16</td>
<td>N</td>
<td>187</td>
<td>37% 57% 5%</td>
</tr>
<tr>
<td>17</td>
<td>O</td>
<td>116</td>
<td>55% 42%</td>
</tr>
<tr>
<td>18</td>
<td>P</td>
<td>149</td>
<td>55% 38%</td>
</tr>
<tr>
<td>19</td>
<td>Q</td>
<td>96</td>
<td>58% 39%</td>
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<tr>
<td>20</td>
<td>R</td>
<td>155</td>
<td>55% 39%</td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>85</td>
<td>56% 30% 5%</td>
</tr>
<tr>
<td>22</td>
<td>T</td>
<td>120</td>
<td>54% 42%</td>
</tr>
<tr>
<td>23</td>
<td>U</td>
<td>66</td>
<td>39% 39% 20%</td>
</tr>
<tr>
<td>24</td>
<td>V</td>
<td>71</td>
<td>42% 45% 8%</td>
</tr>
<tr>
<td>25</td>
<td>W</td>
<td>154</td>
<td>47% 50%</td>
</tr>
<tr>
<td>26</td>
<td>X</td>
<td>92</td>
<td>40% 41% 8% 11%</td>
</tr>
<tr>
<td>27</td>
<td>Y</td>
<td>241</td>
<td>32% 25% 41%</td>
</tr>
<tr>
<td>28</td>
<td>Z</td>
<td>83</td>
<td>33% 52% 12%</td>
</tr>
<tr>
<td>29</td>
<td>I</td>
<td>57</td>
<td>54% 44%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Length</th>
<th>Quality of chain</th>
</tr>
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<tbody>
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<td>50</td>
<td><img src="image" alt="Quality Graph" /></td>
</tr>
<tr>
<td>31</td>
<td>3</td>
<td>92</td>
<td><img src="image" alt="Quality Graph" /></td>
</tr>
</tbody>
</table>

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>
<th>Res</th>
<th>Chirality</th>
<th>Geometry</th>
<th>Clashes</th>
<th>Electron density</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>NA</td>
<td>0</td>
<td>8526</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>NA</td>
<td>0</td>
<td>8529</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>NA</td>
<td>0</td>
<td>8572</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>NA</td>
<td>0</td>
<td>8577</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>NA</td>
<td>R</td>
<td>8586</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>36</td>
<td>CL</td>
<td>J</td>
<td>8802</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>
2 Entry composition

There are 38 unique types of molecules in this entry. The entry contains 99060 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 RNA chain called 23S Ribosomal RNA.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2754</td>
<td>Total C N O P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>59020 26349 10873 19053 2745</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

There are 6 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>0</td>
<td>0</td>
<td>628</td>
<td>1MA A</td>
<td>MODIFIED RESIDUE</td>
<td>GB 55229667</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2099</td>
<td>A G</td>
<td>ENGINEERED</td>
<td>GB 55229667</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2587</td>
<td>OMU U</td>
<td>MODIFIED RESIDUE</td>
<td>GB 55229667</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2588</td>
<td>OMG G</td>
<td>MODIFIED RESIDUE</td>
<td>GB 55229667</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2619</td>
<td>UR3 U</td>
<td>MODIFIED RESIDUE</td>
<td>GB 55229667</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2621</td>
<td>PSU U</td>
<td>MODIFIED RESIDUE</td>
<td>GB 55229667</td>
</tr>
</tbody>
</table>

- Molecule 2 is a RNA chain called 5S Ribosomal RNA.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>9</td>
<td>122</td>
<td>Total C N O P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2599 1160 471 847 121</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 3 is a protein called 50S ribosomal protein L2P.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>A</td>
<td>237</td>
<td>Total C N O S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1753 1072 352 324 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 4 is a protein called 50S ribosomal protein L3P.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>B</td>
<td>337</td>
<td>Total C N O S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2625 1616 493 511 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 5 is a protein called 50S ribosomal protein L4E.
Molecule 6 is a protein called 50S ribosomal protein L5P.

Molecule 7 is a protein called 50S ribosomal protein L6P.

Molecule 8 is a protein called 50S ribosomal protein L7AE.

Molecule 9 is a protein called ACIDIC RIBOSOMAL PROTEIN P0 HOMOLOG.

Molecule 10 is a protein called 50S RIBOSOMAL PROTEIN L10E.

Molecule 11 is a protein called 50S RIBOSOMAL PROTEIN L11P.

Molecule 12 is a protein called 50S ribosomal protein L13P.
Molecule 13 is a protein called 50S ribosomal protein L14P.

There is a discrepancy 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>K</td>
<td>44</td>
<td>LEU</td>
<td>HIS</td>
<td>CONFLICT</td>
<td>UNP P22450</td>
</tr>
</tbody>
</table>

Molecule 14 is a protein called 50S ribosomal protein L15P.

There is a discrepancy between the modelled and reference sequences:

<table>
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<th>Residue</th>
<th>Modelled</th>
<th>Actual</th>
<th>Comment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>13</td>
<td>GLU</td>
<td>LYS</td>
<td>CONFLICT</td>
<td>GB 55231501</td>
</tr>
</tbody>
</table>

Molecule 15 is a protein called 50S ribosomal protein L15E.

There is a discrepancy between the modelled and reference sequences:

<table>
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<tr>
<th>Chain</th>
<th>Residue</th>
<th>Modelled</th>
<th>Actual</th>
<th>Comment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>13</td>
<td>GLU</td>
<td>LYS</td>
<td>CONFLICT</td>
<td>GB 55231501</td>
</tr>
</tbody>
</table>

Molecule 16 is a protein called 50S ribosomal protein L18P.

Molecule 17 is a protein called 50S ribosomal protein L18e.
• Molecule 18 is a protein called 50S ribosomal protein L19E.

<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>18</td>
<td>P</td>
<td>143</td>
<td>Total C N O</td>
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<td>0</td>
<td>0</td>
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<td></td>
<td></td>
<td>1136 683 229 224</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 19 is a protein called 50S ribosomal protein L21e.

<table>
<thead>
<tr>
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<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Q</td>
<td>95</td>
<td>Total C N O</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>735 450 141 144</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 20 is a protein called 50S ribosomal protein L22P.

<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>20</td>
<td>R</td>
<td>150</td>
<td>Total C N O S</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1149 713 209 223 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 21 is a protein called 50S ribosomal protein L23P.

<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>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>S</td>
<td>81</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>641 389 111 138 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 22 is a protein called 50S ribosomal protein L24P.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
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<td>119</td>
<td>Total C N O</td>
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<td>0</td>
<td>0</td>
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<td></td>
<td>950 568 180 202</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 23 is a protein called 50S ribosomal protein L24E.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>U</td>
<td>53</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>410 244 75 86 5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Molecule 24 is a protein called 50S ribosomal protein L29P.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
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<td>24</td>
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<td>65</td>
<td>Total C N O S</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>499 304 94 100 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mol</td>
<td>Chain</td>
<td>Residues</td>
<td>Atoms</td>
<td>ZeroOcc</td>
<td>AltConf</td>
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<td>W</td>
<td>154</td>
<td>C: 1196</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N: 737</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>O: 209</td>
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- Molecule 26 is a protein called 50S ribosomal protein L31e.

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- Molecule 27 is a protein called 50S ribosomal protein L32E.

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- Molecule 28 is a protein called 50S ribosomal protein L37Ae.

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There is a discrepancy between the modelled and reference sequences:

- Molecule 29 is a protein called 50S ribosomal protein L37e.

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- Molecule 30 is a protein called 50S ribosomal protein L39e.

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- Molecule 31 is a protein called 50S ribosomal protein L44E.
- Molecule 32 is CLINDAMYCIN (three-letter code: CLY) (formula: C_{18}H_{33}ClN_{2}O_{5}S).

- Molecule 33 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).
- Molecule 34 is POTASSIUM ION (three-letter code: K) (formula: K).

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- Molecule 35 is SODIUM ION (three-letter code: NA) (formula: Na).

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- Molecule 36 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

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- Molecule 37 is CADMIUM ION (three-letter code: CD) (formula: Cd).

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- Molecule 38 is water.

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<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>O 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>T</td>
<td>36</td>
<td>Total 36</td>
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<td>0</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>O 36</td>
<td></td>
<td></td>
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<td>U</td>
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<td>Total 27</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>O 27</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>O 68</td>
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Continued on next page...
Continued from previous page...

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<tr>
<th>Mol</th>
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<th>Residues</th>
<th>Atoms</th>
<th>ZeroOcc</th>
<th>AltConf</th>
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<td>24</td>
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<td>0</td>
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<td>38</td>
<td>Z</td>
<td>31</td>
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<td>0</td>
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<td>74</td>
<td>Total O 74 74</td>
<td>0</td>
<td>0</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 (SRZ > 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: 23S Ribosomal RNA

Chain 0:
• Molecule 2: 5S Ribosomal RNA

Chain 9:

• Molecule 3: 50S ribosomal protein L2P

Chain A:

• Molecule 4: 50S ribosomal protein L3P

Chain B:
- Molecule 5: 50S ribosomal protein L4E

Chain C:

- Molecule 6: 50S ribosomal protein L5P

Chain D:

- Molecule 7: 50S ribosomal protein L6P

Chain E:
- **Molecule 8**: 50S ribosomal protein L7AE

  Chain F:

  - [Image of Chain F]

- **Molecule 9**: ACIDIC RIBOSOMAL PROTEIN P0 HOMOLOG

  Chain G:

  - [Image of Chain G]

- **Molecule 10**: 50S RIBOSOMAL PROTEIN L10E

  Chain H:

  - [Image of Chain H]

- **Molecule 11**: 50S RIBOSOMAL PROTEIN L11P
Chain I:

<table>
<thead>
<tr>
<th>A1</th>
<th>B1</th>
<th>C1</th>
<th>D1</th>
<th>E1</th>
<th>F1</th>
<th>G1</th>
<th>H1</th>
<th>I1</th>
<th>J1</th>
<th>K1</th>
</tr>
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</table>

- Molecule 12: 50S ribosomal protein L13P

Chain J:

<table>
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<th>B1</th>
<th>C1</th>
<th>D1</th>
<th>E1</th>
<th>F1</th>
<th>G1</th>
<th>H1</th>
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</thead>
</table>

- Molecule 13: 50S ribosomal protein L14P

Chain K:

<table>
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<th>C1</th>
<th>D1</th>
<th>E1</th>
<th>F1</th>
<th>G1</th>
<th>H1</th>
</tr>
</thead>
</table>

- Molecule 14: 50S ribosomal protein L15P

Chain L:

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<th>C1</th>
<th>D1</th>
<th>E1</th>
<th>F1</th>
<th>G1</th>
<th>H1</th>
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</table>

- Molecule 15: 50S Ribosomal Protein L15E

Chain M:
- Molecule 16: 50S ribosomal protein L18P

Chain N:

- Molecule 17: 50S ribosomal protein L18e

Chain O:

- Molecule 18: 50S ribosomal protein L19E

Chain P:

- Molecule 19: 50S ribosomal protein L21e

Chain Q:

- Molecule 20: 50S ribosomal protein L22P

Chain R:
- Molecule 21: 50S ribosomal protein L23P
  
  Chain S:

- Molecule 22: 50S ribosomal protein L24P
  
  Chain T:

- Molecule 23: 50S ribosomal protein L24E
  
  Chain U:

- Molecule 24: 50S ribosomal protein L29P
  
  Chain V:

- Molecule 25: 50S ribosomal protein L30P
  
  Chain W:

- Molecule 26: 50S ribosomal protein L31e
  
  Chain X:
• Molecule 27: 50S ribosomal protein L32E

Chain Y:

• Molecule 28: 50S ribosomal protein L37Ae

Chain Z:

• Molecule 29: 50S ribosomal protein L37e

Chain 1:

• Molecule 30: 50S ribosomal protein L39e

Chain 2:

• Molecule 31: 50S ribosomal protein L44E

Chain 3:
4 Data and refinement statistics

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<tr>
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<th>Value</th>
<th>Source</th>
</tr>
</thead>
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<tr>
<td>Space group</td>
<td>C 2 2 21</td>
<td>Depositor</td>
</tr>
<tr>
<td>Cell constants</td>
<td>212.51Å 300.12Å 573.85Å</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>29.97 – 3.00 49.96 – 3.00</td>
<td>Depositor</td>
</tr>
<tr>
<td>% Data completeness (in resolution range)</td>
<td>92.0 (29.97-3.00) 92.0 (49.96-3.00)</td>
<td>Depositor</td>
</tr>
<tr>
<td>Rmerge</td>
<td>0.11</td>
<td>Depositor</td>
</tr>
<tr>
<td>Rsym</td>
<td>(Not available)</td>
<td>Depositor</td>
</tr>
<tr>
<td>&lt; I/σ(I) &gt;</td>
<td>2.00 (at 3.01Å)</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Refinement program</td>
<td>CNS 1.0</td>
<td>Depositor</td>
</tr>
<tr>
<td>R, Rfree</td>
<td>0.170 , 0.228 0.169 , 0.226</td>
<td>Depositor</td>
</tr>
<tr>
<td>R_free test set</td>
<td>3275 reflections (0.98%)</td>
<td>wwPDB-VP</td>
</tr>
<tr>
<td>Wilson B-factor (Å²)</td>
<td>53.3</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Anisotropy</td>
<td>0.318</td>
<td>Xtriage</td>
</tr>
<tr>
<td>Bulk solvent k_{sol}(e/Å³), B_{sol}(Å²)</td>
<td>0.31 , 78.0</td>
<td>EDS</td>
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<tr>
<td>L-test for twinning²</td>
<td>&lt;</td>
<td>L</td>
</tr>
<tr>
<td>Estimated twinning fraction</td>
<td>No twinning to report.</td>
<td>Xtriage</td>
</tr>
<tr>
<td>F_{o}, F_{c} correlation</td>
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<td>Total number of atoms</td>
<td>99060</td>
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<tr>
<td>Average B, all atoms (Å²)</td>
<td>57.0</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 2.79% of the height of the origin peak. No significant pseudotranslation is detected.

1Intensities estimated from amplitudes.

2Theoretical values of < |L| >, < L² > 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: MG, OMG, CL, NA, K, CD, CLY, OMU, UR3, 1MA, PSU

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>
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<tbody>
<tr>
<td></td>
<td></td>
<td>RMSZ</td>
<td>Z &gt; 5</td>
</tr>
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<td>1</td>
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<td>0.40</td>
<td>0/65957</td>
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<tr>
<td>2</td>
<td>9</td>
<td>0.36</td>
<td>0/2904</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>0.33</td>
<td>0/1786</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>0.35</td>
<td>0/2690</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>0.39</td>
<td>0/1884</td>
</tr>
<tr>
<td>6</td>
<td>D</td>
<td>0.32</td>
<td>0/1111</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
<td>0.34</td>
<td>0/1382</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>0.32</td>
<td>0/901</td>
</tr>
<tr>
<td>9</td>
<td>G</td>
<td>0.32</td>
<td>0/241</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
<td>0.35</td>
<td>0/1302</td>
</tr>
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<td>11</td>
<td>I</td>
<td>0.32</td>
<td>0/526</td>
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<td>12</td>
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<td>13</td>
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<td>14</td>
<td>L</td>
<td>0.33</td>
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<td>15</td>
<td>M</td>
<td>0.37</td>
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<td>0/438</td>
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<td>0.34</td>
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<tr>
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<td>All</td>
<td>0.38</td>
<td>0/98702</td>
</tr>
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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>
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<tr>
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<th>#Chirality outliers</th>
<th>#Planarity outliers</th>
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<td>0</td>
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</tr>
<tr>
<td>2</td>
<td>9</td>
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<td>1</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
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There are no bond length outliers.

All (12) bond angle outliers are listed below:

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<th>Type</th>
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<th>Ideal(°)</th>
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<td>1563</td>
<td>G</td>
<td>C2'-C3'-O3'</td>
<td>9.13</td>
<td>129.59</td>
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<tr>
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<td>A</td>
<td>C1'-O4'-C4'</td>
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<td>104.68</td>
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<td>G</td>
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<td>C5'-C4'-C3'</td>
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<tr>
<td>2</td>
<td>9</td>
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<td>U</td>
<td>N1-C1'-C2'</td>
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<td>105.25</td>
<td>109.90</td>
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<td>0</td>
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<td>A</td>
<td>N9-C1'-C2'</td>
<td>5.64</td>
<td>121.34</td>
<td>114.00</td>
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<td>0</td>
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<td>C5'-C4'-O4'</td>
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<td>115.51</td>
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There are no chirality outliers.

All (31) planarity outliers are listed below:

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<td>0</td>
<td>1430</td>
<td>G</td>
<td>Sidechain</td>
</tr>
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<td>0</td>
<td>1599</td>
<td>U</td>
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<td>0</td>
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<td>U</td>
<td>Sidechain</td>
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<td>0</td>
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Continued on next page...
Continued from previous page...

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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.

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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 21.

All (3113) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

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### Interatomic distances and clash overlap

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<td>Clash overlap (Å)</td>
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</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 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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<th>Favoured</th>
<th>Allowed</th>
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<th>Percentiles</th>
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<td>192 (82%)</td>
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<td>9 (4%)</td>
<td>3 100</td>
</tr>
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<td>4</td>
<td>B</td>
<td>335/338 (99%)</td>
<td>289 (86%)</td>
<td>38 (11%)</td>
<td>8 (2%)</td>
<td>6 32</td>
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<tr>
<td>5</td>
<td>C</td>
<td>244/246 (99%)</td>
<td>213 (87%)</td>
<td>24 (10%)</td>
<td>7 (3%)</td>
<td>5 26</td>
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<tr>
<td>6</td>
<td>D</td>
<td>134/177 (76%)</td>
<td>89 (66%)</td>
<td>35 (26%)</td>
<td>10 (8%)</td>
<td>1 5</td>
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<tr>
<td>7</td>
<td>E</td>
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<tr>
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<td>F</td>
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<td>1 (4%)</td>
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<td>14</td>
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Continued from previous page...

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All (85) Ramachandran outliers are listed below:

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

5 non-standard protein/DNA/RNA residues are 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).

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<td>2621</td>
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<td>C2-N1</td>
<td>2.53</td>
<td>1.43</td>
<td>1.38</td>
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<td>PSU</td>
<td>C4-N3</td>
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<td>0</td>
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<td>C4-N3</td>
<td>2.80</td>
<td>1.38</td>
<td>1.33</td>
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<td>0</td>
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<td>1MA</td>
<td>C6-N6</td>
<td>2.83</td>
<td>1.33</td>
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<td>C6-N1</td>
<td>3.32</td>
<td>1.39</td>
<td>1.33</td>
</tr>
</tbody>
</table>

All (12) bond angle outliers are listed below:
There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 5 short contacts:

<table>
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<tr>
<th>Mol</th>
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<th>Type</th>
<th>Clashes</th>
<th>Symm-Clashes</th>
</tr>
</thead>
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<td>OMU</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2588</td>
<td>OMG</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2587</td>
<td>OMU</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>628</td>
<td>1MA</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

### 5.5 Carbohydrates

There are no carbohydrates in this entry.

### 5.6 Ligand geometry

Of 232 ligands modelled in this entry, 231 are monoatomic - leaving 1 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).
### Bond Lengths

| Mol | Type | Chain | Res | Link | Counts | RMSZ | #|Z| > 2 |
|-----|------|-------|-----|------|--------|------|-----|---|
| 32  | CLY  | 0     | 9000 | -    | 25,28,28 | 1.86 | 6 (24%) |

### Bond Angles

<table>
<thead>
<tr>
<th>Mol</th>
<th>Type</th>
<th>Chain</th>
<th>Res</th>
<th>Link</th>
<th>Chirals</th>
<th>Torsions</th>
<th>Rings</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>CLY</td>
<td>0</td>
<td>9000</td>
<td>-</td>
<td>0/21/53/53</td>
<td>0/2/2/2</td>
<td></td>
</tr>
</tbody>
</table>

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.

---

### Bond Lengths

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<thead>
<tr>
<th>Mol</th>
<th>Type</th>
<th>Chain</th>
<th>Res</th>
<th>Link</th>
<th>Atoms</th>
<th>Z</th>
<th>Observed(Å)</th>
<th>Ideal(Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>CLY</td>
<td>0</td>
<td>9000</td>
<td>-</td>
<td>C6-S1</td>
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<td>1.79</td>
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<td>CLY</td>
<td>0</td>
<td>9000</td>
<td>-</td>
<td>C3-C2</td>
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<td>1.58</td>
<td>1.52</td>
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<tr>
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<td>0</td>
<td>9000</td>
<td>-</td>
<td>C10-N1</td>
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<td>1.40</td>
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<td>9000</td>
<td>-</td>
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<td>1.49</td>
<td>1.44</td>
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<td>9000</td>
<td>-</td>
<td>C15-N2</td>
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<td>-</td>
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<td>1.53</td>
<td>1.47</td>
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All (4) bond angle outliers are listed below:

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<th>Res</th>
<th>Type</th>
<th>Atoms</th>
<th>Z</th>
<th>Observed(°)</th>
<th>Ideal(°)</th>
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</thead>
<tbody>
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<td>32</td>
<td>0</td>
<td>9000</td>
<td>CLY</td>
<td>C11-C10-N1</td>
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<td>107.96</td>
<td>116.62</td>
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<tr>
<td>32</td>
<td>0</td>
<td>9000</td>
<td>CLY</td>
<td>C12-C13-C16</td>
<td>-2.26</td>
<td>111.86</td>
<td>114.60</td>
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<tr>
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<td>0</td>
<td>9000</td>
<td>CLY</td>
<td>O8-C10-N1</td>
<td>2.75</td>
<td>128.03</td>
<td>122.91</td>
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<td>32</td>
<td>0</td>
<td>9000</td>
<td>CLY</td>
<td>C7-C8-CL1</td>
<td>3.14</td>
<td>113.90</td>
<td>109.04</td>
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</table>

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 5 short contacts:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Clashes</th>
<th>Symm-Clashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>0</td>
<td>9000</td>
<td>CLY</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

### 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, 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.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Analysed</th>
<th>&lt;RSRZ&gt;</th>
<th>#RSRZ &gt; 2</th>
<th>OWAB(Å²)</th>
<th>Q&lt;0.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2749/2922 (94%)</td>
<td>-0.23</td>
<td>19 (0%)</td>
<td>87</td>
<td>68</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>122/122 (100%)</td>
<td>-0.10</td>
<td>2 (1%)</td>
<td>72</td>
<td>44</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>237/240 (98%)</td>
<td>-0.19</td>
<td>3 (1%)</td>
<td>77</td>
<td>51</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>337/338 (99%)</td>
<td>-0.35</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>246/246 (100%)</td>
<td>-0.41</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>D</td>
<td>140/177 (79%)</td>
<td>1.26</td>
<td>40 (28%)</td>
<td>0 0</td>
<td>63, 104, 125, 135</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
<td>172/178 (96%)</td>
<td>0.24</td>
<td>1 (0%)</td>
<td>89</td>
<td>71</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>119/120 (99%)</td>
<td>0.16</td>
<td>1 (0%)</td>
<td>86</td>
<td>64</td>
</tr>
<tr>
<td>9</td>
<td>G</td>
<td>29/348 (8%)</td>
<td>1.42</td>
<td>7 (24%)</td>
<td>0 0</td>
<td>77, 93, 105, 107</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
<td>160/177 (90%)</td>
<td>-0.13</td>
<td>1 (0%)</td>
<td>89</td>
<td>71</td>
</tr>
<tr>
<td>11</td>
<td>I</td>
<td>70/162 (43%)</td>
<td>2.19</td>
<td>31 (44%)</td>
<td>0 0</td>
<td>109, 125, 143, 145</td>
</tr>
<tr>
<td>12</td>
<td>J</td>
<td>142/145 (97%)</td>
<td>-0.27</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>K</td>
<td>132/132 (100%)</td>
<td>-0.30</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>L</td>
<td>145/165 (87%)</td>
<td>0.21</td>
<td>4 (2%)</td>
<td>53</td>
<td>24</td>
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<tr>
<td>15</td>
<td>M</td>
<td>194/195 (99%)</td>
<td>-0.50</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>N</td>
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<tr>
<td>17</td>
<td>O</td>
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<td>0 100 100</td>
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<td></td>
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<tr>
<td>18</td>
<td>P</td>
<td>143/149 (95%)</td>
<td>-0.10</td>
<td>1 (0%)</td>
<td>87</td>
<td>68</td>
</tr>
<tr>
<td>19</td>
<td>Q</td>
<td>95/96 (98%)</td>
<td>-0.47</td>
<td>0 100 100</td>
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<td></td>
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<tr>
<td>20</td>
<td>R</td>
<td>150/155 (96%)</td>
<td>-0.41</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>S</td>
<td>81/85 (95%)</td>
<td>-0.38</td>
<td>0 100 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>T</td>
<td>119/120 (99%)</td>
<td>-0.16</td>
<td>2 (1%)</td>
<td>70</td>
<td>41</td>
</tr>
<tr>
<td>23</td>
<td>U</td>
<td>53/66 (80%)</td>
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<td>0 100 100</td>
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<td></td>
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<tr>
<td>24</td>
<td>V</td>
<td>65/71 (91%)</td>
<td>1.22</td>
<td>13 (20%)</td>
<td>1 0</td>
<td>59, 78, 115, 120</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Analysed</th>
<th>&lt;RSRZ&gt;</th>
<th>#RSRZ&gt;2</th>
<th>OWAB(Å²)</th>
<th>Q&lt;0.9</th>
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<td>100</td>
<td>100</td>
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<td>82/92 (89%)</td>
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<td>3 (3%)</td>
<td>41</td>
<td>17</td>
</tr>
<tr>
<td>27</td>
<td>Y</td>
<td>142/241 (58%)</td>
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<td>0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>28</td>
<td>Z</td>
<td>73/83 (87%)</td>
<td>0.69</td>
<td>11 (15%)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>56/57 (98%)</td>
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<td>100</td>
<td>100</td>
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<tr>
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<td>46/50 (92%)</td>
<td>-0.16</td>
<td>1 (2%)</td>
<td>62</td>
<td>33</td>
</tr>
<tr>
<td>31</td>
<td>3</td>
<td>92/92 (100%)</td>
<td>0.49</td>
<td>5 (5%)</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
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<td>All</td>
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<td>145 (2%)</td>
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<td>33</td>
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All (145) RSRZ outliers are listed below:

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<td>I</td>
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<td>D</td>
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<td>D</td>
<td>63</td>
<td>ILE</td>
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<td>D</td>
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<th>Res</th>
<th>Type</th>
<th>RSRZ</th>
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<td>I</td>
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<td>3.4</td>
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<td>97</td>
<td>VAL</td>
<td>3.4</td>
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<td>THR</td>
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<td>V</td>
<td>38</td>
<td>GLY</td>
<td>3.4</td>
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6.2 Non-standard residues in protein, DNA, RNA chains

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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\textsuperscript{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.