Full wwPDB EM Map/Model Validation Report

Aug 20, 2020 – 01:39 PM BST

PDB ID : 5IQR
EMDB ID : EMD-8107
Title : Structure of RelA bound to the 70S ribosome
Authors : Brown, A.; Fernandez, I.S.; Gordienko, Y.; Ramakrishnan, V.
Deposited on : 2016-03-11
Resolution : 3.00 Å(reported)
Based on initial model : 4YBB

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
- Mogul : 1.8.5 (274361), CSD as541be (2020)
- MolProbity : 4.02b-467
- buster-report : 1.1.7 (2018)
- 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) : 2.13
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 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>EM structures (#Entries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramachandran outliers</td>
<td>154571</td>
<td>4023</td>
</tr>
<tr>
<td>Sidechain outliers</td>
<td>154315</td>
<td>3826</td>
</tr>
<tr>
<td>RNA backbone</td>
<td>4643</td>
<td>859</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 $\geq 3$, $2$, $1$ 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 $\leq 5\%$

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.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Length</th>
<th>Quality of chain</th>
</tr>
</thead>
<tbody>
<tr>
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<td>273</td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td>209</td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>3</td>
<td>D</td>
<td>201</td>
<td><img src="image" alt="" /></td>
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<tr>
<td>4</td>
<td>E</td>
<td>179</td>
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<td>5</td>
<td>F</td>
<td>177</td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>6</td>
<td>G</td>
<td>149</td>
<td><img src="image" alt="" /></td>
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<tr>
<td>7</td>
<td>H</td>
<td>165</td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>142</td>
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*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>142</td>
<td>99%</td>
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<tr>
<td>10</td>
<td>K</td>
<td>123</td>
<td>96%</td>
</tr>
<tr>
<td>11</td>
<td>L</td>
<td>144</td>
<td>95% 5%</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>136</td>
<td>99%</td>
</tr>
<tr>
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<td>N</td>
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<td>O</td>
<td>117</td>
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<td>P</td>
<td>115</td>
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<td>Q</td>
<td>118</td>
<td>92% 7%</td>
</tr>
<tr>
<td>17</td>
<td>R</td>
<td>103</td>
<td>95%</td>
</tr>
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<td>18</td>
<td>S</td>
<td>110</td>
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<td>100</td>
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<td>104</td>
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<tr>
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<td>V</td>
<td>94</td>
<td>95% 5%</td>
</tr>
<tr>
<td>22</td>
<td>W</td>
<td>85</td>
<td>91% 9%</td>
</tr>
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<td>X</td>
<td>78</td>
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</tr>
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<td>Z</td>
<td>59</td>
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<td>70</td>
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<td>c</td>
<td>55</td>
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<tr>
<td>29</td>
<td>d</td>
<td>46</td>
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<td>e</td>
<td>65</td>
<td>89% 9%</td>
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<td>31</td>
<td>f</td>
<td>38</td>
<td>89% 11%</td>
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<tr>
<td>32</td>
<td>g</td>
<td>241</td>
<td>5% 7%</td>
</tr>
<tr>
<td>33</td>
<td>h</td>
<td>233</td>
<td>84% 11%</td>
</tr>
</tbody>
</table>

Continued on next page...
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<table>
<thead>
<tr>
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<th>Quality of chain</th>
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<td>j</td>
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<td>36</td>
<td>k</td>
<td>135</td>
<td>70% 26%</td>
</tr>
<tr>
<td>37</td>
<td>l</td>
<td>179</td>
<td>78% 6% 16%</td>
</tr>
<tr>
<td>38</td>
<td>m</td>
<td>130</td>
<td>92% 7%</td>
</tr>
<tr>
<td>39</td>
<td>n</td>
<td>130</td>
<td>90% 8%</td>
</tr>
<tr>
<td>40</td>
<td>o</td>
<td>103</td>
<td>84% 11% 5%</td>
</tr>
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<td>41</td>
<td>p</td>
<td>129</td>
<td>84% 6% 9%</td>
</tr>
<tr>
<td>42</td>
<td>q</td>
<td>124</td>
<td>94% 6%</td>
</tr>
<tr>
<td>43</td>
<td>r</td>
<td>118</td>
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</tr>
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<td>44</td>
<td>s</td>
<td>101</td>
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</tr>
<tr>
<td>45</td>
<td>t</td>
<td>89</td>
<td>91% 8%</td>
</tr>
<tr>
<td>46</td>
<td>u</td>
<td>82</td>
<td>88% 12%</td>
</tr>
<tr>
<td>47</td>
<td>v</td>
<td>84</td>
<td>85% 11% 5%</td>
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<td>75</td>
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<td>x</td>
<td>92</td>
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</tr>
<tr>
<td>50</td>
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</tr>
<tr>
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<td>z</td>
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<td>78</td>
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<td>6</td>
<td>76</td>
<td>46% 54% 8%</td>
</tr>
<tr>
<td>58</td>
<td>7</td>
<td>10</td>
<td>36% 100%</td>
</tr>
</tbody>
</table>

Continued on next page...
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>57</td>
<td>H2U</td>
<td>6</td>
<td>16</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>57</td>
<td>H2U</td>
<td>6</td>
<td>20</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>57</td>
<td>PSU</td>
<td>6</td>
<td>32</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>57</td>
<td>6IA</td>
<td>6</td>
<td>37</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>57</td>
<td>PSU</td>
<td>6</td>
<td>55</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
2 Entry composition

There are 64 unique types of molecules in this entry. The entry contains 154519 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 50S ribosomal protein L2.

<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>271</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2082 1288 423 364 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Molecule 2 is a protein called 50S ribosomal protein L3.

<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>2</td>
<td>C</td>
<td>209</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1565 979 288 294 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Molecule 3 is a protein called 50S ribosomal protein L4.

<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>3</td>
<td>D</td>
<td>201</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1552 974 283 290 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Molecule 4 is a protein called 50S ribosomal protein L5.

<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>4</td>
<td>E</td>
<td>177</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1410 899 249 256 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Molecule 5 is a protein called 50S ribosomal protein L6.

<table>
<thead>
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<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>F</td>
<td>176</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1323 832 243 246 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Molecule 6 is a protein called 50S ribosomal protein L9.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>G</td>
<td>149</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1111 699 197 214 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Molecule 7 is a protein called 50S ribosomal protein L10.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>H</td>
<td>131</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>988 625 175 183 5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 8 is a protein called 50S ribosomal protein L11.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>I</td>
<td>141</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1032 651 179 196 6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 9 is a protein called 50S ribosomal protein L13.

<table>
<thead>
<tr>
<th>Mol</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>J</td>
<td>142</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>1129 714 212 199 4</td>
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<td>0</td>
</tr>
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</table>

- Molecule 10 is a protein called 50S ribosomal protein L14.

<table>
<thead>
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<th>Mol</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>K</td>
<td>123</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>946 593 181 166 6</td>
<td>0</td>
<td>0</td>
</tr>
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- Molecule 11 is a protein called 50S ribosomal protein L15.

<table>
<thead>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>L</td>
<td>144</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>1053 654 207 190 2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 12 is a protein called 50S ribosomal protein L16.

<table>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>M</td>
<td>136</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1074 686 205 177 6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 13 is a protein called 50S ribosomal protein L17.

<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>13</td>
<td>N</td>
<td>120</td>
<td>Total C N O S</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>960 593 196 166 5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 14 is a protein called 50S ribosomal protein L18.
Molecule 15 is a protein called 50S ribosomal protein L19.

Molecule 16 is a protein called 50S ribosomal protein L20.

Molecule 17 is a protein called 50S ribosomal protein L21.

Molecule 18 is a protein called 50S ribosomal protein L22.

Molecule 19 is a protein called 50S ribosomal protein L23.

Molecule 20 is a protein called 50S ribosomal protein L24.

Molecule 21 is a protein called 50S ribosomal protein L25.
- Molecule 22 is a protein called 50S ribosomal protein L27.

<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>22</td>
<td>W</td>
<td>77</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 23 is a protein called 50S ribosomal protein L28.

<table>
<thead>
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<th>Mol</th>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>X</td>
<td>77</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 24 is a protein called 50S ribosomal protein L29.

<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>24</td>
<td>Y</td>
<td>62</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 25 is a protein called 50S ribosomal protein L30.

<table>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Z</td>
<td>58</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 26 is a protein called 50S ribosomal protein L31.

<table>
<thead>
<tr>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>a</td>
<td>66</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 27 is a protein called 50S ribosomal protein L32.

<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>27</td>
<td>b</td>
<td>56</td>
<td>Total C N O S</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Molecule 28 is a protein called 50S ribosomal protein L33.
Molecule 29 is a protein called 50S ribosomal protein L34.

Molecule 30 is a protein called 50S ribosomal protein L35.

Molecule 31 is a protein called 50S ribosomal protein L36.

Molecule 32 is a protein called 30S ribosomal protein S2.

Molecule 33 is a protein called 30S ribosomal protein S3.

There are 2 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>h</td>
<td>207</td>
<td>LEU</td>
<td>ILE</td>
<td>conflict</td>
<td>UNP P0A7V3</td>
</tr>
<tr>
<td>h</td>
<td>208</td>
<td>GLY</td>
<td>LEU</td>
<td>conflict</td>
<td>UNP P0A7V3</td>
</tr>
</tbody>
</table>

Molecule 34 is a protein called 30S ribosomal protein S4.
<table>
<thead>
<tr>
<th>Mol</th>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>i</td>
<td>205</td>
<td>Total C N O S</td>
<td>1643 1026 315 298</td>
<td>4</td>
</tr>
</tbody>
</table>

- Molecule 35 is a protein called 30S ribosomal protein S5.

<table>
<thead>
<tr>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>j</td>
<td>157</td>
<td>Total C N O S</td>
<td>1156 719 218 213</td>
<td>6</td>
</tr>
</tbody>
</table>

- Molecule 36 is a protein called 30S ribosomal protein S6.

<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>36</td>
<td>k</td>
<td>100</td>
<td>Total C N O S</td>
<td>817 515 148 148</td>
<td>6</td>
</tr>
</tbody>
</table>

- Molecule 37 is a protein called 30S ribosomal protein S7.

<table>
<thead>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>l</td>
<td>151</td>
<td>Total C N O S</td>
<td>1181 735 227 215</td>
<td>4</td>
</tr>
</tbody>
</table>

- Molecule 38 is a protein called 30S ribosomal protein S8.

<table>
<thead>
<tr>
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<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>m</td>
<td>129</td>
<td>Total C N O S</td>
<td>979 616 173 184</td>
<td>6</td>
</tr>
</tbody>
</table>

- Molecule 39 is a protein called 30S ribosomal protein S9.

<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>39</td>
<td>n</td>
<td>127</td>
<td>Total C N O S</td>
<td>1022 634 206 179</td>
<td>3</td>
</tr>
</tbody>
</table>

- Molecule 40 is a protein called 30S ribosomal protein S10.

<table>
<thead>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>o</td>
<td>98</td>
<td>Total C N O S</td>
<td>786 493 150 142</td>
<td>1</td>
</tr>
</tbody>
</table>

- Molecule 41 is a protein called 30S ribosomal protein S11.
<table>
<thead>
<tr>
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<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>p</td>
<td>117</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>877</td>
<td>540</td>
<td>174</td>
</tr>
</tbody>
</table>

- Molecule 42 is a protein called 30S ribosomal protein S12.

<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>42</td>
<td>q</td>
<td>123</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>957</td>
<td>591</td>
<td>196</td>
</tr>
</tbody>
</table>

- Molecule 43 is a protein called 30S ribosomal protein S13.

<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>43</td>
<td>r</td>
<td>114</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>883</td>
<td>546</td>
<td>178</td>
</tr>
</tbody>
</table>

- Molecule 44 is a protein called 30S ribosomal protein S14.

<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>44</td>
<td>s</td>
<td>100</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>805</td>
<td>499</td>
<td>164</td>
</tr>
</tbody>
</table>

- Molecule 45 is a protein called 30S ribosomal protein S15.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>t</td>
<td>88</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>714</td>
<td>439</td>
<td>144</td>
</tr>
</tbody>
</table>

- Molecule 46 is a protein called 30S ribosomal protein S16.

<table>
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<tr>
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<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>u</td>
<td>82</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>649</td>
<td>406</td>
<td>128</td>
</tr>
</tbody>
</table>

- Molecule 47 is a protein called 30S ribosomal protein S17.

<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>47</td>
<td>v</td>
<td>80</td>
<td>Total</td>
<td>C N O S</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>648</td>
<td>411</td>
<td>121</td>
</tr>
</tbody>
</table>

- Molecule 48 is a protein called 30S ribosomal protein S18.
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>w</td>
<td>15</td>
<td>GLU</td>
<td>ALA</td>
<td>conflict</td>
<td>UNP P0A7T7</td>
</tr>
</tbody>
</table>

- **Molecule 49** is a protein called 30S ribosomal protein S19.

<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>49</td>
<td>x</td>
<td>82</td>
<td>Total C N O S 658 421 125 110 2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Molecule 50** is a protein called 30S ribosomal protein S20.

<table>
<thead>
<tr>
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<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>y</td>
<td>86</td>
<td>Total C N O S 670 414 138 115 3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Molecule 51** is a protein called 30S ribosomal protein S21.

<table>
<thead>
<tr>
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<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>z</td>
<td>56</td>
<td>Total C N O S 465 290 96 78 1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Molecule 52** is a RNA chain called LSU rRNA.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>52</td>
<td>1</td>
<td>2904</td>
<td>Total C N O P 62356 27825 11472 20155 2904</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Molecule 53** is a RNA chain called SSU rRNA.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
<th>Trace</th>
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</thead>
<tbody>
<tr>
<td>53</td>
<td>2</td>
<td>1533</td>
<td>Total C N O P 32907 14683 6036 10655 1533</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Molecule 54** is a RNA chain called 5S rRNA.
Molecule 55 is a RNA chain called E-site tRNA(Phe).

Molecule 56 is a RNA chain called P-site fMet-tRNA(fMet).

Molecule 57 is a RNA chain called A/T tRNA(Phe).

Molecule 58 is a RNA chain called mRNA.

Molecule 59 is a protein called GTP pyrophosphokinase.

Molecule 60 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).
Continued from previous page...

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>C</td>
<td>1</td>
<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>60</td>
<td>N</td>
<td>1</td>
<td>Total Mg</td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>U</td>
<td>1</td>
<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>S</td>
<td>1</td>
<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>1</td>
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<tr>
<td>60</td>
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<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>L</td>
<td>2</td>
<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
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<td>2</td>
<td>2</td>
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<td>Total Mg</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- Molecule 61 is ZINC ION (three-letter code: ZN) (formula: Zn).

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
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<tbody>
<tr>
<td>61</td>
<td>8</td>
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<td>Total Zn</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>61</td>
<td>a</td>
<td>1</td>
<td>Total Zn</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>61</td>
<td>f</td>
<td>1</td>
<td>Total Zn</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- Molecule 62 is PAROMOMYCIN (three-letter code: PAR) (formula: C_{23}H_{45}N_{5}O_{14}).
- Molecule 63 is METHIONINE (three-letter code: MET) (formula: C$_5$H$_{11}$NO$_2$S).

- Molecule 64 is water.
<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Residues</th>
<th>Atoms</th>
<th>AltConf</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>B</td>
<td>2</td>
<td>Total O 2</td>
<td>0</td>
</tr>
</tbody>
</table>
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide 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: 50S ribosomal protein L2
  Chain B:

- Molecule 2: 50S ribosomal protein L3
  Chain C:

- Molecule 3: 50S ribosomal protein L4
  Chain D:

- Molecule 4: 50S ribosomal protein L5
  Chain E:

- Molecule 5: 50S ribosomal protein L6
  Chain F:
• Molecule 6: 50S ribosomal protein L9

Chain G:

• Molecule 7: 50S ribosomal protein L10

Chain H:

• Molecule 8: 50S ribosomal protein L11

Chain I:

• Molecule 9: 50S ribosomal protein L13

Chain J:

• Molecule 10: 50S ribosomal protein L14
Chain K:

- Molecule 11: 50S ribosomal protein L15

Chain L:

- Molecule 12: 50S ribosomal protein L16

Chain M:

- Molecule 13: 50S ribosomal protein L17

Chain N:

- Molecule 14: 50S ribosomal protein L18

Chain O:

- Molecule 15: 50S ribosomal protein L19

Chain P:

- Molecule 16: 50S ribosomal protein L20

Chain Q:
- Molecule 17: 50S ribosomal protein L21

Chain R:

- Molecule 18: 50S ribosomal protein L22

Chain S:

- Molecule 19: 50S ribosomal protein L23

Chain T:

- Molecule 20: 50S ribosomal protein L24

Chain U:

- Molecule 21: 50S ribosomal protein L25

Chain V:

- Molecule 22: 50S ribosomal protein L27

Chain W:

- Molecule 23: 50S ribosomal protein L28

Chain X:
- Molecule 24: 50S ribosomal protein L29

Chain Y:

- Molecule 25: 50S ribosomal protein L30

Chain Z:

- Molecule 26: 50S ribosomal protein L31

Chain a:

- Molecule 27: 50S ribosomal protein L32

Chain b:

- Molecule 28: 50S ribosomal protein L33

Chain c:

- Molecule 29: 50S ribosomal protein L34

Chain d:

- Molecule 30: 50S ribosomal protein L35
• Molecule 36: 30S ribosomal protein S6

Chain k:

Molecule 37: 30S ribosomal protein S7

Chain l:

Molecule 38: 30S ribosomal protein S8

Chain m:

Molecule 39: 30S ribosomal protein S9

Chain n:

Molecule 40: 30S ribosomal protein S10

Chain o:

Molecule 41: 30S ribosomal protein S11

Chain p:

Molecule 42: 30S ribosomal protein S12
Chain q:

- Molecule 43: 30S ribosomal protein S13

Chain r:

- Molecule 44: 30S ribosomal protein S14

Chain s:

- Molecule 45: 30S ribosomal protein S15

Chain t:

- Molecule 46: 30S ribosomal protein S16

Chain u:

- Molecule 47: 30S ribosomal protein S17

Chain v:

- Molecule 48: 30S ribosomal protein S18
- Molecule 49: 30S ribosomal protein S19

Chain x:

- Molecule 50: 30S ribosomal protein S20

Chain y:

- Molecule 51: 30S ribosomal protein S21

Chain z:

- Molecule 52: LSU rRNA

Chain 1:
• Molecule 53: SSU rRNA

• Molecule 54: 5S rRNA

• Molecule 55: E-site tRNA(Phe)
• Molecule 56: P-site fMet-tRNA(fMet)

Chain 5:

• Molecule 57: A/T tRNA(Phe)

Chain 6:

• Molecule 58: mRNA

Chain 7:

• Molecule 59: GTP pyrophosphokinase

Chain 8:
4 Experimental information

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5  Model quality

5.1  Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PAR, MA6, 2MA, 2MG, 1MG, 3TD, G7M, D2T, 3AU, UR3, 7MG, 5MU, ZN, 6IA, 5MC, 6MZ, OMC, MG, OMG, H2U, OMU, 4OC, 4SU, 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).

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### Bond lengths

| Mol | Chain | RMSZ | #\(|Z| > 5\) | RMSZ | #\(|Z| > 5\) |
|-----|-------|------|--------------|------|--------------|
| 32  | g     | 0.47 | 0/1784       | 0.71 | 0/2403       |
| 33  | h     | 0.43 | 0/1655       | 0.72 | 0/2230       |
| 34  | i     | 0.45 | 0/1665       | 0.72 | 0/2277       |
| 35  | j     | 0.43 | 0/1169       | 0.76 | 0/1573       |
| 36  | k     | 0.42 | 0/835        | 0.72 | 0/1128       |
| 37  | l     | 0.48 | 0/1195       | 0.78 | 0/1602       |
| 38  | m     | 0.41 | 0/989        | 0.71 | 0/1326       |
| 39  | n     | 0.43 | 0/1034       | 0.77 | 0/1375       |
| 40  | o     | 0.42 | 0/796        | 0.74 | 0/1077       |
| 41  | p     | 0.40 | 0/893        | 0.71 | 0/1205       |
| 42  | q     | 0.35 | 0/960        | 0.72 | 0/1286       |
| 43  | r     | 0.46 | 0/892        | 0.86 | 0/1193       |
| 44  | s     | 0.47 | 0/817        | 0.78 | 0/1088       |
| 45  | t     | 0.54 | 0/722        | 0.85 | 0/964        |
| 46  | u     | 0.44 | 0/659        | 0.75 | 0/884        |
| 47  | v     | 0.35 | 0/657        | 0.64 | 0/881        |
| 48  | w     | 0.45 | 0/548        | 0.73 | 0/736        |
| 49  | x     | 0.41 | 0/675        | 0.70 | 0/908        |
| 50  | y     | 0.58 | 0/676        | 0.88 | 0/895        |
| 51  | z     | 0.51 | 0/472        | 0.89 | 0/627        |
| 52  | 1     | 0.34 | 11/69300 (0.0%) | 0.74 | 21/108089 (0.0%) |
| 53  | 2     | 0.27 | 2/36561 (0.0%) | 0.72 | 2/57019 (0.0%) |
| 54  | 3     | 0.24 | 0/2828       | 0.70 | 0/4410       |
| 55  | 4     | 0.25 | 0/1808       | 0.70 | 0/2815       |
| 56  | 5     | 0.35 | 0/1716       | 0.83 | 0/2672       |
| 57  | 6     | 0.42 | 1/1606 (0.1%) | 0.80 | 1/2497 (0.0%) |
| 58  | 7     | 0.31 | 0/235        | 0.71 | 0/363        |
| 59  | 8     | 0.62 | 0/4878       | 1.14 | 30/6606 (0.5%) |
| All | All   | 0.36 | 14/166043 (0.0%) | 0.75 | 55/247601 (0.0%) |

### Bond angles

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.

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5.2 Too-close contacts

Due to software issues we are unable to calculate clashes - this section is therefore empty.
### 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.

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<th>Allowed</th>
<th>Outliers</th>
<th>Percentiles</th>
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### MolChainAnalysedFavouredAllowedOutliersPercentiles

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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 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.

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

48 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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<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Atoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>1</td>
<td>2069</td>
<td>G7M</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>32</td>
<td>PSU</td>
<td>O4’-C1’-C5-C6</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>746</td>
<td>PSU</td>
<td>O4’-C1’-C5-C4</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>16</td>
<td>H2U</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2445</td>
<td>2MG</td>
<td>C3’-C4’-C5’-O5’</td>
</tr>
<tr>
<td>56</td>
<td>5</td>
<td>20</td>
<td>H2U</td>
<td>O4’-C4’-C5’-O5’</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>20</td>
<td>H2U</td>
<td>C2’-C1’-N1-C2</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>746</td>
<td>PSU</td>
<td>C2’-C1’-C5-C6</td>
</tr>
<tr>
<td>56</td>
<td>5</td>
<td>55</td>
<td>PSU</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>53</td>
<td>2</td>
<td>1519</td>
<td>MA6</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>37</td>
<td>6IA</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>32</td>
<td>PSU</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>56</td>
<td>5</td>
<td>20</td>
<td>H2U</td>
<td>O4’-C1’-N1-C2</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2498</td>
<td>OMC</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2503</td>
<td>2MA</td>
<td>O4’-C4’-C5’-O5’</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>46</td>
<td>7MG</td>
<td>C4’-C5’-O5’-P</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2069</td>
<td>G7M</td>
<td>O4’-C4’-C5’-O5’</td>
</tr>
<tr>
<td>42</td>
<td>q</td>
<td>89</td>
<td>D2T</td>
<td>CG-CB-SB-CB1</td>
</tr>
<tr>
<td>57</td>
<td>6</td>
<td>20</td>
<td>H2U</td>
<td>O4’-C1’-N1-C2</td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2030</td>
<td>6MZ</td>
<td>O4’-C4’-C5’-O5’</td>
</tr>
</tbody>
</table>

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 304 ligands modelled in this entry, 302 are monoatomic - leaving 2 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).
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.

<table>
<thead>
<tr>
<th>Mol</th>
<th>Type</th>
<th>Chain</th>
<th>Res</th>
<th>Link</th>
<th>Bond lengths</th>
<th>Bond angles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Counts</td>
<td>RMSZ</td>
</tr>
<tr>
<td>62</td>
<td>PAR</td>
<td>2</td>
<td>1665</td>
<td>-</td>
<td>45,45,45</td>
<td>0.81</td>
</tr>
</tbody>
</table>

All (2) 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>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>O51-C11-C21</td>
<td>-3.78</td>
<td>1.32</td>
<td>1.41</td>
</tr>
<tr>
<td>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>C14-C24</td>
<td>-2.17</td>
<td>1.48</td>
<td>1.52</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>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>O51-C11-C21</td>
<td>2.36</td>
<td>115.36</td>
<td>110.06</td>
</tr>
</tbody>
</table>

There are no chirality outliers.

All (3) torsion outliers are listed below:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Res</th>
<th>Type</th>
<th>Atoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>C41-C51-C61-O61</td>
</tr>
<tr>
<td>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>O51-C51-C61-O61</td>
</tr>
<tr>
<td>62</td>
<td>2</td>
<td>1665</td>
<td>PAR</td>
<td>C52-C42-O11-C11</td>
</tr>
</tbody>
</table>

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and
any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

The following chains have linkage breaks:

<table>
<thead>
<tr>
<th>Mol</th>
<th>Chain</th>
<th>Number of breaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>53</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>55</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

All chain breaks are listed below:

<table>
<thead>
<tr>
<th>Model</th>
<th>Chain</th>
<th>Residue-1</th>
<th>Atom-1</th>
<th>Residue-2</th>
<th>Atom-2</th>
<th>Distance (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1588:G</td>
<td>O3'</td>
<td>1589:U</td>
<td>P</td>
<td>4.95</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>2098:U</td>
<td>O3'</td>
<td>2099:U</td>
<td>P</td>
<td>4.28</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1408:G</td>
<td>O3'</td>
<td>1409:U</td>
<td>P</td>
<td>3.41</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1169:A</td>
<td>O3'</td>
<td>1170:C</td>
<td>P</td>
<td>3.38</td>
</tr>
</tbody>
</table>

*Continued on next page...*
### Continued from previous page...

<table>
<thead>
<tr>
<th>Model</th>
<th>Chain</th>
<th>Residue-1</th>
<th>Atom-1</th>
<th>Residue-2</th>
<th>Atom-2</th>
<th>Distance (Å)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>147:G</td>
<td>O3'</td>
<td>148:G</td>
<td>P</td>
<td>3.36</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2314:A</td>
<td>O3'</td>
<td>2315:G</td>
<td>P</td>
<td>3.34</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1579:A</td>
<td>O3'</td>
<td>1580:A</td>
<td>P</td>
<td>3.31</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1167:C</td>
<td>O3'</td>
<td>1168:G</td>
<td>P</td>
<td>3.25</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>197:A</td>
<td>O3'</td>
<td>198:G</td>
<td>P</td>
<td>3.24</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2196:C</td>
<td>O3'</td>
<td>2197:U</td>
<td>P</td>
<td>3.12</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1383:C</td>
<td>O3'</td>
<td>1384:C</td>
<td>P</td>
<td>3.09</td>
</tr>
</tbody>
</table>
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-8107. 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 0.1. This in conjunction with the slice images can indicate whether an appropriate contour level has been selected.

6.5 Mask visualisation

This section was not generated. No masks were provided.
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 1094 nm$^3$; this corresponds to an approximate mass of 988 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

![Rotationally averaged power spectrum graph]

- **Intensity (log10)**
- **Spatial frequency (Å⁻¹)**

- **Rotationally averaged power spectrum**
- **Reported resolution**: 3.00 Å
- **Corresponding to spatial frequency**: 0.333 Å⁻¹
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 3σ, 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>3.00</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.5 CUT-OFF</td>
<td>5.47</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 1 BIT CUT-OFF</td>
<td>4.42</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.33 CUT-OFF</td>
<td>4.36</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 1/2 BIT CUT-OFF</td>
<td>3.81</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 0.143 CUT-OFF</td>
<td>3.69</td>
</tr>
<tr>
<td>Calculated FSC</td>
<td>FSC 3 SIGMA CUT-OFF</td>
<td>2.98</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.5 CUT-OFF</td>
<td>3.35</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 1 BIT CUT-OFF</td>
<td>3.18</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.33 CUT-OFF</td>
<td>3.17</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 1/2 BIT CUT-OFF</td>
<td>3.04</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 0.143 CUT-OFF</td>
<td>3.02</td>
</tr>
<tr>
<td>Author-provided FSC</td>
<td>FSC 3 SIGMA CUT-OFF</td>
<td>2.81</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.
8.3 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-8107 and PDB model 5IQR. Per-residue inclusion information can be found in section 3 on page 18.

9.1 Map-model overlay

The images above show the 3D surface view of the map at the recommended contour level 0.1 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, 85% of all backbone atoms, 81% of all non-hydrogen atoms, are inside the map.